

**TECHNICAL MANUAL**

**AVIATION UNIT AND  
AVIATION INTERMEDIATE  
TROUBLESHOOTING MANUAL  
CH-47D HELICOPTER**

This copy is a reprint which includes current  
pages from Changes 1 through 17.

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**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**10 MAY 1983**

CHANGE  
  
NO. 23

Aviation Unit and Aviation Intermediate  
Troubleshooting Manual  
  
CH-47D HELICOPTER

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A through C/(D blank)  
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10-2.3 through 10-2.6  
10-35 through 10-38  
10-41 and 10-42  
10-79 through 10-98  
11-2.1 through 11-2.3/(11-2.4 blank)  
11-2.4.3 and 11-2.4.4  
11-2.5 through 11-2.8  
11-37 and 11-38  
11-42.11 and 11-42.12  
11-49 through 11-58  
11-75 through 11-80  
11-87 through 11-90  
11-90.1/(11-90.2 blank)  
11-111 through 11-114  
11-114.1/(11-114.2 blank)  
12-2.3 and 12-2.4  
12-33 and 12-34  
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12-37 and 12-38  
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12-39 and 12-40  
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12-41 through 12-44  
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12-47 and 12-48  
-----  
12-55 through 12-68  
13-2.1 through 13-2.4  
13-2.7 and 13-2.8  
13-3 through 13-8  
13-27 and 13-28  
15-7 through 15-10

Insert pages

A through C/(D blank)  
i through iii/(iv blank)  
10-2.3 through 10-2.6  
10-35 through 10-38  
10-41 and 10-42  
10-79 through 10-98  
11-2.1 through 11-2.3/(11-2.4 blank)  
11-2.4.3 and 11-2.4.4  
11-2.5 through 11-2.8  
11-37 and 11-38  
11-42.11 and 11-42.12  
11-49 through 11-58  
11-75 through 11-80  
11-87 through 11-90  
11-90.1 and 11-90.2  
11-111 through 11-114  
11-114.1 and 11-114.2  
12-2.3 and 12-2.4  
12-33 and 12-34  
12-34.1/(12-34.2 blank)  
12-37 and 12-38  
12-38.1/(12-38.2 blank)  
12-39 and 12-40  
12-40.1/(12-40.2 blank)  
12-41 through 12-44  
12-44.1/(12-44.2 blank)  
12-47 and 12-48  
12-48.1/(12-48.2 blank)  
12-55 through 12-68  
13-2.1 through 13-2.4  
13-2.7 and 13-2.8  
13-3 through 13-8  
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-----  
15-11 and 15-12  
-----  
15-13 through 15-17/(15-18 blank)  
15-21 through 15-24  
15-27 through 15-32  
15-35 through 15-38  
15-43 through 15-46  
15-57 through 15-60  
15-69 through 15-72  
15-89 and 15-90  
-----  
15-91 through 15-93/(15-94 blank)  
-----  
15-95 and 15-96  
-----  
15-97 and 15-98  
-----  
15-99 and 15-100  
15-109 through 15-112  
15-117 through 15-132  
15-135 and 15-136  
16-2.3 through 16-2.6  
-----  
16-3 through 16-6  
16-10 through 16-16  
16-19 and 16-20  
16-33 through 16-38  
16-41 through 16-44  
16-53 through 16-56  
16-59 through 16-66  
Index-1 through Index-9/(-10 blank)

Insert Pages

15-10.1 and 15-10.2  
15-11 and 15-12  
15-12.1/(15-12.2 blank)  
15-13 through 15-17/(15-18 blank)  
15-21 through 15-24  
15-27 through 15-32  
15-35 through 15-38  
15-43 through 15-46  
15-57 through 15-60  
15-69 through 15-72  
15-89 and 15-90  
15-90.1/(15-90.2 blank)  
15-91 through 15-94  
15-94.1 and 15-94.2  
15-95 and 15-96  
15-96.1 and 15-96.2  
15-97 and 15-98  
15-98.1 and 15-98.2  
15-99 and 15-100  
15-109 through 15-112  
15-117 through 15-132  
15-135 and 15-136  
16-2.3 through 16-2.6  
16-2.9 and 16-2.10  
16-3 through 16-6  
16-10 through 16-16  
16-19 and 16-20  
16-33 through 16-38  
16-41 through 16-44  
16-53 through 16-56  
16-59 through 16-66  
Index-1 through Index-9/(-10 blank)

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Troubleshooting Manual

CH-47D HELICOPTER

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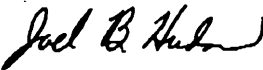
A through C/(D blank)  
i and ii  
vii and viii  
10-2.3 and 10-2.4  
10-2.7/(10-2.8 blank)  
10-123 through 10-126  
10-129 through 10-132  
-----  
-----  
- - - -  
-----  
-----

Insert pages

A through C/(D blank)  
i and ii  
vii and viii  
10-2.3 and 10-2.4  
10-2.7/(10-2.8 blank)  
10-123 through 10-126  
10-129 through 10-132  
10-179 through 10-182  
(10-183 blank)/10-184  
10-185 through 10-190  
(10-191 blank)/10-192  
10-193 and 10-194

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----	A-C/( D blank)
A/(B blank)	a/(b blank)
iiv(iv blank)	iii/(iv blank)
vii and viii	vii and viii
18-3 and 18-4	18-3 and 18-4
18-4.1 and 18-4.2	18-4.1 and 18-4.2
-----	18-6A/(18-6B blank)
----	18-6.3 and 18-6.4
----	18-97 through 18-142
Index-5 and Index-6	Index-5 and Index-6

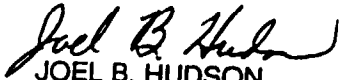
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TM 55-1520-240-T-3  
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10-125 through 10-130

Insert pages

i through iii/(iv blank)  
10-125 through 10-130

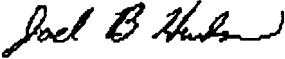
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CH-47 HELICOPTER

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iii/(iv blank)	iii/(iv blank)
vii and viii	vii and viii
18-3 and 18-4	18-3 and 18-4
-----	18-4.1/(18-4.2 blank)
18-5/(18-6 blank)	18-5 and 18-6
-----	18-6.1 and 18-6.2
-----	18-61 through 18-95/(18-96 blank)
Index-3 and Index-4	Index-3 and Index -4
-----	Index-4.1/(Index-4.2 blank)

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CH-47D HELICOPTER

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- Remove pages

III/(iv blank)

vii and viii

16-2.1 through 16-2.4

.....

.....

.....

Index-1 through Index-9/(Index-10 blank)

Insert pages

iii/(iv blank)

vii and viii

16-2.1 through 16-2.4

16-2.6.1 /(16-2.6.2 blank)

16-143 through 16-179/(16-180 blank)

18-1 through 18-59(18-60 blank)

Index-1 through Index-9/(Index-10 blank)
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NO. 17

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CH-47 Helicopter

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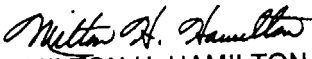
10-39 and 10-40  
11-89 and 11-90  
11-113 and 11-114  
11-145 and 11-146  
15-119 and 15-120  
15-123 and 15-124  
15-127 and 15-128  
15-131 through 15-134  
16-75 and 16-76

Insert Pages

10-39 and 10-40  
11-89 and 11-90  
11-113 and 11-114  
11-145 and 11-146  
15-119 and 15-120  
15-123 and 15-124  
15-127 and 15-128  
15-131 through 15-134  
16-75 and 16-76

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CH-47 HELICOPTER

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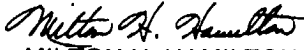
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CH-47 HELICOPTER

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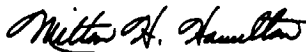
Remove pages

vii/(viii blank)  
10-2.3 and 10-2.4  
10-2.5 and 10-2.6  
10-35 through 10-40  
10-83 and 10-84  
10-91 and 10-92  
10-95 and 10-96  
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10-111 and 10-112  
11-42.11 and 11-42.12  
11-42.17/(11-42.18 blank)  
13-2.1 and 13-2.2  
15-143/(15-144 blank)  
16-15 and 16-16

Insert pages

vii and viii  
10-2.3 and 10-2.4  
10-2.5 and 10-2.6  
10-35 through 10-40  
10-83 and 10-84  
10-91 and 10-92  
10-95 and 10-96  
10-99 and 10-100  
10-111 and 10-112  
11-42.11 and 11-42.12  
11-42.17/(11-42.18 blank)  
13-2.1 and 13-2.2  
15-143/(15-144 blank)  
16-15 and 16-16

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CH-47D HELICOPTER

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11-41 and 11-42  
11-203 and 11-204  
11-221 and 11-222  
11-231 through 11-236

Insert pages

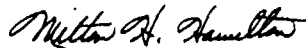
11-41 and 11-42  
11-203 and 11-204  
11-221 and 11-222  
11-231 through 11-236

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Troubleshooting Manual

CH-47D HELICOPTER

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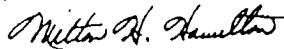
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Remove pages	Insert pages
11-42.13 and 11-42.14	11-42.13 and 11-42.14
11-87 and 11-88	11-87 and 11-88
11-209 through 11-222	11-209 through 11-222
11-227/11-228	11-227/11-228

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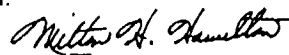
Remove pages	Insert pages
vii and viii	vii/viii
11-13 and 11-14	11-13 and 11-14
11-45 and 11-46	11-45 and 11-46
11-51 and 11-52	11-51 and 11-52
11-55 and 11-56	11-55 and 11-56
12-17 and 12-18	12-17 and 12-18
12-59 and 12-60	12-59 and 12-60
16-78 through 16-82	16-78 through 16-82
16-86 through 16-100	16-86 through 16-100
16-103 through 16-106	16-103 through 16-106

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i and ii	i and ii

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Remove pages	Insert pages
vii and viii	vii and viii
11-7/11-8	11-7/11-8
11-42.11 through 11-42.14	11-42.11 through 11-42.14
11-131 and 11-132	11-131 and 11-132
-----	11-132.1 through 11-132.6
11-134	11-134
11-134.1 through 11-134.7/11-134.8	-----
11-137 and 11-138	11-137 and 11-138
13-2.7 and 13-2.8	13-2.7 and 13-2.8
14-11 and 14-12	14-11 and 14-12
14-15 and 14-16	14-15 and 14-16
15-33 through 15-39/15-40	15-33 through 15-39/15-40
15-43 through 15-47/15-48	15-43 through 15-47/15-48
15-79 through 15-82	15-79 through 15-82
15-123 and 15-124	15-123 and 15-124
15-131 and 15-132	15-131 and 15-132
15-135 and 15-136	15-135 and 15-136
16-11 and 16-12	16-11 and 16-12
16-15 and 16-16	16-15 and 16-16
16-49 and 16-50	16-49 and 16-50
16-83 and 16-84	16-83 and 16-84
16-93 and 16-94	16-93 and 16-94

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The Adjutant General

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WASHINGTON, D.C., 1 November 1989

CHANGE }  
NO. 9 }

Aviation Unit and Aviation Intermediate  
Troubleshooting Manual

CH-47D HELICOPTER

TM 55-1520-240-T-3, 10 May 1983, is changed as follows:

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Remove pages	Insert pages
v through vii/viii	v through viii
10-2.5 and 10-2.6	10-2.5 and 10-2.6
10-35 and 10-36	10-35 and 10-36
10-66.1/10-66.2	10-66.1/10-66.2
10-101 and 10-102	10-101 and 10-102
10-105 through 10-108	10-105 through 10-108
10-119 and 10-120	10-119 and 10-120
10-125 and 10-126	10-125 and 10-126
10-155 through 10-164	10-155 through 10-164
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11-41 and 11-42	11-41 and 11-42
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11-69 and 11-70	11-69 and 11-70
11-81 and 11-82	11-81/11-82
11-89 and 11-90	11-89 and 11-90
- - - -	11-90.1/11-90.2
11-113 and 11-114	11-113 and 11-114
- - - -	11-114.1/11-114.2
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11-123 and 11-124	11-123 and 11-124
11-127 and 11-128	11-127 and 11-128
11-135 through 11-138	11-135 through 11-138
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- - - -	13-2.8.1/13-2.8.2
13-3 and 13-4	13-3 and 13-4
13-13 and 13-14	13-13 and 13-14
14-9 and 14-10	14-9 and 14-10
16-2.5 through 16-2.8	16-2.5 through 16-2.8
16-7 and 16-8	16-7 and 16-8

Remove pages	Insert pages
16-10	16-10
16-13 through 16-16	16-13 through 16-16
- - - -	16-16.1/16-16.2
16-17 through 16-20	16-17 through 16-20
16-33 and 16-34	16-33 and 16-34
16-47 and 16-48	16-47 and 16-48
16-53 and 16-54	16-53 and 16-54
16-59 through 16-62	16-59 through 16-62
16-67 through 16-72	16-67 through 16-72
16-75 and 16-76	16-75 and 16-76
16-97 and 16-98	16-97 and 16-98

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Remove pages	Insert pages
i through iii/vi	i through iii/vi
v and vi	v and vi
15-2.1 through 15-2.6	-----
15-3 through 15-6	15-3 through 15-5/15-6
15-7 through 15-40	15-7 through 15-40
-----	15-41 through 15-144
Index 1 through Index 8	Index 1 through Index 8
-----	Index 9/Index 10

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Remove pages	Insert pages
vii/viii	vii and viii
10-15 and 10-16	10-15 and 10-16
10-29 and 10-30	10-29 and 10-30
10-46.1/(10-46.2 Blank)	10-46.1/(10-46.2 Blank)
10-50.1/(10-50.2 Blank)	10-50.1/(10-50.2 Blank)
10-52.1/(10-52.2 Blank)	10-52.1/(10-52.2 Blank)
11-37 and 11-38	11-37 and 11-38
11-219 and 11-220	11-219 and 11-220
14-15 and 14-16	14-15 and 14-16
15-7 and 15-8	15-7 and 15-8
15-10	15-10
15-11 and 15-12	15-11 and 15-12
15-15 and 15-16	15-15 and 15-16
15-18	15-18
15-19 through 15-32	15-19 through 15-32
15-34	15-34
15-37 through 15-40	15-37 through 15-40
Index-1 and Index-2	Index-1 and Index-2

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Remove pages

vii/viii  
10-91 and 10-92  
10-95 and 10-96  
10-99 and 10-100  
10-111 and 10-112  
10-117 and 10-118  
10-123 and 10-124  
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11-145 and 11-146  
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13-9 and 13-10  
13-23 and 13-24  
14-19 through 14-22  
14-29 and 14-30  
15-2.1 and 15-2.2  
15-7 and 15-8

Insert pages

vii/viii  
10-91 and 10-92  
10-95 and 10-96  
10-99 and 10-100  
10-111 and 10-112  
10-117 and 10-118  
10-123 and 10-124  
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10-177/10-178  
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11-12 through 11-18  
11-42.13 and 11-42.14  
11-63 through 11-66  
11-73 through 11-76  
11-79 through 11-90  
11-107 and 11-108  
11-111 through 11-114  
11-140.2  
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12-17 and 12-18  
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13-9 and 13-10  
13-23 and 13-24  
14-19 through 14-22  
14-29 and 14-30  
15-2.1 and 15-2.2  
15-7 and 15-8

Remove pages

15-37/(15-38 blank)  
16-43 and 16-44  
16-83 and 16-84  
16-86 through 16-88

Insert pages

15-37 and 15-38  
16-43 and 16-44  
16-83 and 16-84  
16-86 through 16-88

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Remove pages

vii/(viii)  
11-42.1 and 11-42.2  
Index 5 and Index 6

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11-42.1 and 11-42.2  
Index 5 and Index 6

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Remove pages	Insert pages
i through iii/iv v and vi ---	i through iii/iv v and vi vii/viii
10-2.3 through 10-2.7/10-2.8 ---	10-2.3 through 10-2.7/10-2.8 10-2.9 and 10-2.10
10-3 and 10-4 10-35 through 10-40 10-43 and 10-44 ---	10-3 and 10-4 10-35 through 10-40 10-43 and 10-44 10-44.1/10-44.2
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Remove pages

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11-2.4.1 through 11-2.4.4  
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17-2.1 and 17-2.2  
17-2.5 and 17-2.6  
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Insert pages

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17-3 through 17-10/17-11  
17-12 through 17-14/17-15  
17-16 through 17-19/17-20

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Troubleshooting Manual

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Remove pages

v and vi  
10-2.1 and 10-2.2  
10-35 through 10-44  
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10-75 through 10-84  
10-87 and 10-88  
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11-93 through 11-100  
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Insert pages

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10-59 through 10-62  
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10-87 and 10-88  
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10-99 and 10-100  
10-105 and 10-106  
10-111 and 10-112  
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10-161 through 10-164  
10-173 and 10-174  
10-175 and 10-176  
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11-2.4.1 through 11-2.4.4  
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11-41 and 11-42  
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11-77 and 11-78  
11-85 through 11-90  
11-93 through 11-100  
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Remove pages

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11-127 through 11-132  
11-135 through 11-138  
  
11-141 and 11-142  
11-145 and 11-146  
11-149 through 11-152  
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16-2.1 and 16-2.2  
16-5 and 16-6  
16-15 and 16-16  
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16-91 through 16-95/16-96  
  
17-2.1 and 17-2.2  
17-2.5 and 17-2.6  
17-3 through 17-6  
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11-135 through 11-138  
11-140.2  
11-141 and 11-142  
11-145 and 11-146  
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16-15 and 16-16  
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17-2.1 and 17-2.2  
17-2.5 and 17-2.6  
17-3 through 17-6  
17-9 and 17-10  
17-16 through 17-19/17-20

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Troubleshooting Manual

CH-47D HELICOPTER

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Remove pages	Insert pages
11-43 and 11-44	11-43 and 11-44
11-65 and 11-66	11-65 and 11-66

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WARNING AND FIRST AID DATA.

Warnings, cautions, and notes emphasize important critical instructions. They are defined as follows:

**WARNING**

An operating procedure or practice which, if not correctly followed, will result in personnel injury or loss of life.

**CAUTION**

An operating procedure or practice which, if not strictly observed, will result in damage or destruction of equipment.

**NOTE**

An operating procedure or condition which it is essential to highlight.

Personnel performing instructions involving operations, procedures, materials, and practices which are included or implied in this technical manual shall observe the following instructions. Disregard of these warnings and precautionary information can cause serious injury or death. Refer to FM 21-11 for first aid data to treat injuries resulting from working on the helicopter.

**Dangerous Static Charges.** Ground the helicopter during parking. fueling, or defueling.

**Dangerous Voltage Exist in the Electronic Equipment.** Be careful when working on the 150- and 300-volt dc circuits and on the ac generator 115 and 200 volt ac outputs.

**Dangerous Voltage may Exist at Antenna Terminals.** Be careful when working near the antenna or the antenna terminals. Radio-frequency (rf) high voltages exist at these points when transmitters are operating. Contact with radiating antennas can cause serious rf burns.

**Poisonous Carbon Monoxide Fumes.** Toxic carbon monoxide fumes may be present inside the helicopter whenever the apu or engines are operating with the cargo ramp open. Ventilate the cockpit.

**Dangerous Fuel Handling.** Incorrect fuel handling causes fire hazards. Ground the helicopter when fueling or defueling.

**Corrosive Battery Electrolyte (Potassium Hydroxide).** Wear rubber gloves. apron, and face shield when handling leaking batteries. If potassium hydroxide is spilled on clothing, or other material wash immediately with clean water. If personnal contact is made, immediately start flushing the affected area with clean water. Continue washing until medical assistance arrives.

**Acids and Alkalines.** Do not add water to acids. A violent action will result. Acids should be added to water in small quantities. Ruststripper is an alkaline solution. Avoid contact with the skin. Wear protective clothing. Wash thoroughly after using.

**Solvent and Cleaning Solutions.** These materials are generally toxic and many (toluene, benzene. xylene, methyl-ethyl-ketone, perchlorethylene, naphtha, trichloroethylene) are highly flammable. Work in a well ventilated area away from open flames. Avoid inhaling fumes and prolonged contact with the skin, Wear protective clothing and goggles. Wash thoroughly after using.

**Windshield Repellant.** Do not let windshield rain repellant contact open flame. Deadly hydrogen fluoride gas could be generated. Wash hands with soap and water after handling repellant.

**Antiseize Compounds.** Some antiseize compounds are irritants. Avoid inhaling fumes and contact with the skin. Wear protective clothing. Wash thoroughly after using.

**Paints, Varnishes, Dopes, Thinners, Lubricants, and Fuels.** These materials are generally highly flammable and may be irritants. Work in a well ventilated area away from open flames. Avoid inhaling fumes and prolonged contact with the skin. Wash thoroughly after using.

**Epoxy Resins, Cements, and Adhesives.** These materials may contain toxic or irritating substances. They may also be flammable. Work in a well ventilated area away from open flames. Wear protective clothing. Avoid contact with the skin. Wash thoroughly after using.

**Radiation Hazard.** Some instruments contain radioactive material. (See TB 55-1500-314-25.) Do not try to disassemble these instruments. They present no radiation hazard unless seal is broken. If you think seal is broken, do not remove instrument from aircraft until you consult Base Radioactive Protection Officer (AR 40-15). Use a beta-gamma radiac meter AN/PDR-27 or equivalent to determine if instrument contains radioactive material (radium).

**Fin Extinguishing Agents.** Avoid repeated or prolonged exposure to high concentration of bromochloromethane (CB) or decomposition products. CB is a narcotic agent of moderate intensity but prolonged duration. It is less toxic than carbon tetrachloride, methylbromide, or products of combustion. Take normal precautions while using bromochloromethane. Use oxygen masks when available.

Monobromotrifluoromethane (**CF<sub>3</sub>Br**) is highly volatile but is not easily detected by its odor. Although nontoxic. it is about the same as other freons and carbon dioxide, causing danger to personnel primarily by reduction of oxygen available for proper breathing. Do not allow the liquid to come into contact with your skin. It may cause frostbite or low temperature burns.

**Noise.** Sound pressure levels in this aircraft during some operating conditions exceed the Surgeon General’s hearing conservation criteria, as defined in TB MED 251. Hearing protection devices, such as the aviator helmet or ear plugs, are required to be worn by all personnel in and around the aircraft during its operation.

**FOD.** Make sure area is clear of foreign objects before closing access doors, panels, and fairings. If the area is not cleared, damage to components and systems could result in personal injury or death.

**Hydraulic Pressures.** High pressures used in testing hydraulic components can cause line rupture or component failure. Only qualified personnel shall operate, service and maintain hydraulic test equipment. Use heavy plastic shielding, 1/2-inch thickness or more, when applying pressures over 250 psi, to prevent injury to personnel.

**Compressed Air.** Do not use more than 30 psi compressed air for cleaning purposes. Debris trajected under pressure can cause injury to eyes. Use source of compressed air under 30 psi and eye protection to prevent injury to personnel.

**Flare Dispenser.** Remove all power from helicopter before installing loaded payload module on dispenser assembly. Keep hands and face away from end of payload module during installation. Flares can accidentally fire. sometimes from stray voltage. resulting in injury or death.

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Aviation Unit and Aviation Intermediate  
Troubleshooting Manual  
CH-47D HELICOPTER

REPORTING OF 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 letter, 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 Aviation and Missile Command, ATTN: AMSAM-MMC-LS-LP, Redstone Arsenal, AL 35898-5230. A reply will be furnished to you. You may also send your comments electronically to our e-mail address: ls-lp@redstone.army.mil or by fax 205-842-6546/DSN 788-6546. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028.

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HOW TO USE THIS MANUAL (TM 55-1520-240-1)

This manual has 17 Chapters that have instructions for troubleshooting 72 CH-47 Helicopter Systems.

Chapter 1 has:

- The Complete List of Troubleshooting Symptoms you will find in this manual. This list outlines each chapter by system and symptom.
- Complete wiring for 300 Series Connectors and Receptacles, Terminal Boards, and Ground Devices.

Chapters 2 thru 17 have sets of troubleshooting instructions that include:

- A Chapter outline of all systems and symptoms found in the beginning of each Chapter.
- Connector part numbers and pin patterns for each connector and receptacle in systems contained in chapter. Also included are relay termination views and ground termination types and location.
- System Component Diagrams
- System Block Diagrams
- System Schematics, Ladder Schematics and Wiring Diagrams
- Fuel Piping Diagrams
- Hydraulic Piping Diagrams
- Tables
- Visual Checks with locator figures and step by step procedures.
- Operational Checks with locator figures and step by step procedures.
- Fault Isolation Procedures with locator figures and troubleshooting logic for specific system faults.

HOW TO FIND WHAT YOU NEED

Maintenance -Refer to TM 55-1520-240-23.

Troubleshooting -Use the index in Chapter 1 or in the beginning of each chapter. This is where you will find the system troubleshooting procedures (visual checks, operational checks and fault isolation procedures).

1. The troubleshooting procedures are listed under the name of the system that the component or system belongs to.
2. Each system has a number:  
*Example:*

System No.	System
9-15	Cabin and Ramp Lights
3. Each item in your set of troubleshooting instructions has a task number. The system number is prefixed to each of the item task numbers.  
*Example:*

System No.	System Symptom	Task No.
9-15	Cabin and Ramp Lights	
	Wiring Diagram	9-15.1
	Visual Check	9-15.2
	Operational Check	9-15.3
	Cabin and Ramp Circuit Breaker Does not Stay Closed	9-15.4

TASK PREPARATION

Each Troubleshooting procedure begins with INITIAL SETUP information. Read it carefully before starting. It tells you what you need and what you have to know before you begin the job.

1. **Applicable Configurations.** Tells you what configurations or effectivity the task applies to.
2. **Tools.** If any tools from your tool kit are needed, just the kit is listed. Tools needed that are not in the kit are called for by name. Special ground support tools, containers, and test equipment are listed by tool number (Txx). Find these items in TM 55-1520-240-23.
3. **Materials.** Materials needed are listed by expendable number (EXX). Find these Items in TM 55-1520-240-23.
4. **Parts.** New parts required, such as gaskets, packings, and washers, are listed by name only. If parts are not needed, you will not see this heading.
5. **Personnel Required.** Each MOS needed to do the task is listed. When more than one of any MOS is needed, the number is shown in parentheses.
6. **References.** Lists references such as TM 55-1520-240-23. These references will provide where information can be found when you need to repair or replace a part or component. When more than one reference is listed, the Fault Isolation Procedure blocks will contain a refer to statement for all references other than TM 55-1520-240-23.
7. **Equipment Condition.** Procedures which must be done before starting the task are listed and task or TM number is given. Tasks that are not indented under a TM manual can be found in this manual. Refer to the TM manual listed above the indented tasks.
8. **General Safety Instructions.** These are safety precautions that must be observed throughout task. Warnings Include basic first aid instructions.
9. Locator Figure. The area of the helicopter where the task will be performed is shown, with components to be worked on called out.

TASK PERFORMANCE

1. Visual Checks are performed to determine if the cause of the system fault is visually apparent.
2. Operational Checks are performed step by step on the system to determine the system fault. Continue the operational check TASK until the symptom is confirmed in the RESULT column.
3. Fault Isolation Procedures are performed to identify the specific trouble in the system. Start with the first block. Read it through and answer the question, The questions will always have a YES or NO answer. If you answer the question YES, follow the direction of the YES arrow to the next block. If you answer the question NO, follow the direction of the NO arrow to the next block. Continue troubleshooting until the symptom cause is identified.
4. Use the integrated schematic during troubleshooting for a view of system component connections and system interfaces.
5. Use the wiring diagram when the troubleshooting instructions require wire tests to isolate the symptom cause.



TM 55-1520-240-T-3

6. Before starting, read the entire task. Familiarize yourself with the entire procedure before beginning the task.
7. As you read, pay attention to **WARNINGS, CAUTIONS,** and **NOTES.**
8. **When the word INSPECT** is in your procedures, an inspector must ok the completed step(s).
9. Major steps and key words are printed in boldface for experienced repairers.
10. A glossary is on page 1-87. It lists the abbreviations, special words and terms used in this manual and gives their meaning.
11. When a special tool is used or a common tool is used in an unusual way, the use of the tool will be shown.
12. When a block states, "Repair or replace wire as required.", refer to TM 55-1500-323-24 for recommended maintenance practices.
13. Voltages specified in blocks are nominal values unless a range is given. These nominal values and their acceptable ranges are as follows:

Nominal voltage	Range
28 VDC	24 to 30
26 VAC	24 to 28
24 VDCV (Battery)	20 to 74
5 VAC	4 to 6
115 VAC	110 to 120

14. in the event of the necessity to add or replace electrical wiring, the colors of wire received from supply may not be the same as the original wire colors. Use wire numbers only for identification of wires. Tag or identify wires by proper number when disconnecting or replacing.

AIRCRAFT MODIFICATION (ECP/MWO) RETROFIT INFORMATION

Throughout this manual, black squares containing white numerals are used to distinguish information relating to helicopters modified by an MWO or ECP. Refer to Helicopter Configuration Legend on the following pages for specific modification and effectivities relating to each numeral. A list of delivered helicopters serial numbers is included with the legend.

information pertaining only to unmodified helicopters is identified by the appropriate effectivity symbol preceded by WITHOUT. For example, WITHOUT 4 indicates that the information that follows is applicable only to helicopters not modified by ECP DO18. Information pertaining only to helicopters that have been modified by ECP DO18 is preceded by WITH 4. . All information not preceded by an effectivity symbol is common to all helicopters.

The following helicopter Designation Legend pages are solely for user convenience. They have no official status.

DELIVERED HELICOPTER SERIAL NUMBERS

81-23382	82-23762	83-24102	84-24152	85-24322
through	through	through	through	through
81-23389	82-23780	83-24125	84-24187	85-24336

HELICOPTER CONFIGURATION LEGEND				
CODE	ECP/MWO NO.	TITLE	EFFECTIVITY	
			PRODUCTION (Serial Number)	RETROFIT
<b>1</b>	ECP D003RI	Improved Synch Shaft Vibration Mount	84-24108 and on	Attrition
<b>2</b>	ECP DO10R2C1	Fuel Cell Manifold Control Bracket	82-23389 and on	Attrition
<b>3</b>	ECP DO08	Rotor Hub Protective Cover En- largement	85-24322 and on	Attrition
<b>4</b>	ECP D018R2	Composite Fuel Pods	84-24162 and on	Attrition
<b>5</b>	ECP DO06	Removable Support Structure Py- lon Hyd. Module	81-23385 and on	By Kit all D
<b>6</b>	ECP DO37R2	Shorter 114C1014 Yaw Connecting Link	85-24322 and on	Attrition
<b>7</b>	ECP DO34	Pilot and Co-Pilot Seat Armor	81-23386 and on	Attrition
<b>8</b>	ECP DO42	Redesign Link Assy for Increased Parked Blade Loads	83-24105 and on	Attrition
<b>9</b>	ECP DO48C1	Flare Dispenser Blanket Mod and Stowage Provision	83-24107 and on	None
<b>10</b>	ECP DO61R	Floor Former/Fuselage Bilge Paint  (Special paint for 14 aircraft)	83-24107 and on (Interior) 83-24105 thru 83- 24118 (Exterior)	None
<b>11</b>	ECP DO65	Second Source 114PS494 Fuel Shutoff Valve (Motorized)	82-23776 and on	Attrition
<b>12</b>	ECP DO71	2-Inch Dia. Fuel Breakaway Fittings	83-24110 and on	Attrition
<b>13</b>	ECP DO74C1	Install Steel Control Rods Aft Pylon	83-24103 and on	81-23381 thru 83- 24102 by Tech Bulletin
<b>14</b>	ECP DO15C2	Install Bubble Windows	85-24322 and on	Attrition
<b>15</b>	ECP DO51C1	Rainshield Redesign	84-24158 and on	Attrition
<b>16</b>	ECP DO75	Heater Modification	85-24322 and on	Attrition
<b>17</b>	ECP DO27R1C1	Night Vision Goggles (NVG)	85-24322 and on	MWO
<b>18</b>	ECP DO36R1	Improved N1 System	85-24322 and on	Attrition
<b>19</b>	ECP DO69R4	Ferry Fuel Provisions	85-24322 and on	MWO
<b>20</b>	ECP DO64R1	Aft Pylon Work Platform Redesign	85-24322 and on	Attrition
<b>21</b>	ECP DO29C1	ILCA Actuator and Manifold Seal Change	85-24322 and on	Attrition
<b>22</b>	ECP DO60R1	Ramp Skin and Ramp End Former	85-24322 and on	Attrition
<b>23</b>	ECP DO01R1	Improved N2 Control Box	84-24156 and on	Attrition
<b>24</b>	ECP DO56R2	Redesign Droop Stop Arm to In- crease Clearance With Shroud; Modify Spring Limiter	85-24322 and on	Contractor Kit
<b>25</b>	ECP DO81R2	Ground Contact Annunciator	87-0069 and on	MWO

HELICOPTER CONFIGURATION LEGEND (Continued)				
CODE	ECP/MWO NO.	TITLE	EFFECTIVITY	
			PRODUCTION (Serial Number)	RETROFIT
<b>26</b>	ECP D118C1	Improved Heat Resistance of Flight Control System Bellcranks and Connecting Rods	85-24353 and on	MWO
<b>27</b>	ECP D054R1	Combining Transmission Support Fitting Redesign	84-24154 and on	Attrition
<b>28</b>	ECP D126C1	Accumulator, APU/Flight Control Modules	86-1635 and on	Attrition
<b>29</b>	ECP DO85C1	Reduced Length Servo-Cylinder Safety Blocks	GSE	MWO
<b>30</b>	ECP 712R7	Portable Calculator and Hardware for Vibrex	OBSOLETE	- - - - -
<b>31</b>	ECP D108	Aft Transmission Torque Reactor Improvement	GSE	MWO
<b>32</b>	ECP D111	Deletion of KY-28 Secure Voice Control Panel	87-0069 and on	AVSCOM MSG.
<b>33</b>	ECP D133	UH60/CH47D Common ESU	86-1650 and on	MWO
<b>34</b>	ECP D122	Change Droop Stop Shroud From Installed to Flyaway Equipment	85-24361 and on	N/A
<b>35</b>	ECP D016R1	Single Handle Cargo Hook Release System	88-0079 and on	MWO
<b>36</b>	ECP D113	Hook Release Button Ring Guard on Cyclic Grip	88-0085 and on	MWO
<b>37</b>	ECP D115	Transmission and Engine Chip Burn-Off System	89-0139 and on	MWO
<b>38</b>	ECP D154R1 (Phase 1)	Installation of Stainless Steel Flight Control Connecting Links	88-0091 and on	MWO
<b>39</b>	ECP DO69R4	Ramp Extension/Center Skid Pad Modification for Compatibility With HICHS	90-0180 and on	Attrition
<b>40</b>	ECP D121R2	Fine Mesh Inlet Screen	88-0095 and on	Retrofit
<b>41</b>	ECP D105R1	Shotpeen Horizontal Hinge Pins	88-0107 and on	MWO
<b>42</b>	ECP D135	Improved Rotor Blade Grounding Strap	88-0103 and on	MWO
<b>43</b>	ECP DO89	Delete Engine Anti-Ice System	87-0077 and on	MWO
<b>44</b>	ECP D101	Engine Oil Pressure Transmitter Vibration Absorber	90-0180 and on	MWO
<b>45</b>	ECP D092R1	Elastomeric Lag Damper and Pitch Link Bearings	90-0180 and on	MWO
<b>46</b>	ECP D114C2	Upper and Middle Drive Scissors Positive Locking Bolts	90-0180 and on	MWO
<b>47</b>	ECP D095R1	Airframe Structural Improvements	90-0180 and on	Attrition
<b>48</b>	ECP D173	Combining Transmission Sync Shaft Shielding Baffle	88-0099 and on	MWO
<b>49</b>	ECP D131R1	Transmission Drip Pan Material Change	90-0214 and on	Attrition

HELICOPTER CONFIGURATION LEGEND (Continued)				
		EFFECTIVITY		
CODE ECP/MWO NO.	TITLE	PRODUCTION (Serial Number)	RETROFIT	
50	ECP D145R1C1	Boft/Bushing Assembly Improve- ments	90-0180 and on	MWO 1-1520-240-50-37
51	ECP D157R1	One Piece Engine Drive Shaft	90-0180 and on	MWO 55-1520-240-50-43
52	ECP D190R1	Improved Clamshell Door Latch	92-0282 and on	MWO 1-1520-240-50-62
53	ECP D164	Incorporation of Dome Light Positive Locking Lever Switch	91-0252 and on	MWO 55-1520-240-50-50
54	ECP D154R1 (Phase 2)	Control System Hardening and Smoke Containment	81-23381 thru 89-0177	MWO 1-1520-250-50-40
55	ECP D185R1	Separate Fuel Control Relay Box Ground Connections	90-0202 and on	MWO 1-1520-240-50-58
56	ECP D183	Helicopter Internal Cargo Handling System (HICHS) Ramp Centerline Attachment	81-23381 thru 91-0227	MWO 1-1520-240-50-59
57	ECP D175	Engine Aft Mount Adjustable Link	81-23381 thru 92-0302	MWO 1-1520-240-50-60
58	ECP D145R2	Improved Bolt/Bushing Connection	N/A	MWO 1-1520-240-50-69
59	ECP D198A1	Polyurethane Paint for CH-47D Aircraft	-	Attrition
60	ECP A098	Heads Up Display System (HUD) AN/AVS-7	81-23381 thru 91-0271	MWO 1-1520-240-50-56
61	ECP A0027	Global Positioning System (GPS) AN/ASN-149(V)1	81-23381 thru 92-0302	MWO 1-1520-240-50-68
62	ECP AEEMH- 03009	Altitude Voice Warning System Radar Altimeter, AN/APN-209(V)	81-23381 thru 93-0934	MWO 1-1520-240-50-61
63	ECP D200 (Phase 2)	Replace Lower Pitch Link Elastomeric Bearing	90-0180 and on	MWO 1-1520-240-50-64 and MWO 1-1520-240-50-63
64	ECP D194R1	Stainless Steel Bellcranks in Combining Transmission Area	81-23381 and on	MWO 1-1520-240-50-65

HELICOPTER CONFIGURATIONLEGEND(Continued)				
		EFFECTIVITY		
CODE ECP/MWO NO.	TITLE	PRODUCTION (Serial Number)	RETROFIT	
65	ECP D168R1	Cockpit Remote Emergency Ramp Extension System	81-23381 thru 92-0309	MWO 1-1520-240-50-48
66	ECP D199	Non-Metallic Spline Adapters for Combining Transmission Cooling Fan Drive Shaft	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-67
67	ECP D214R1	Aft Position Lights Switch	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-75
68	ECP D216	Pressure Refueling Vacuum Relief Valve	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-81
69	ECP D215	NVG Bezel	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-71
70	ECP D210R1	Easily Replaceable Cabin Escape Hatch	76-18479 and 81-23381 thru 93-00934	TB 1-1520-240-30-02
71	ECP END HO30015	Installation of AN/ASN-128B Doppler GPS Navigation System	76-18479 and on	MWO 1-1520-240-50-73
72	ECP D209	Installation of Radar Altimeter in Center Hook Compartment	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-72
73	ECP EJCH 007016	Installation of AN/ARC-220 and TSEC/KY-100 HF Liaison Facility	81-23381 thru 93-00934	MWO 1-1520-240-50-74
74	ECP D218	714/FADEC	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-83
82	ECP D230	ERFS II Wiring	81-23385 and on	MWO 1-1520-240-50-84

# CHAPTER 10

## FUEL SYSTEMS TROUBLESHOOTING

CHAPTER 10  
FUEL SYSTEMS TROUBLESHOOTING  
CHAPTER OVERVIEW

Chapter 10 contains procedures for Fuel Systems troubleshooting. Each fuel system and failure symptom is listed below. Included in this chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for Fuel System,  
Refer to TM 55-1520-240-23 for required Fuel System maintenance procedures.

SYSTEM	PARA
ENGINE FUEL SHUTOFF AND CROSS-FEED VALVES	10-1
FUEL BOOST PUMPS	10-2
SINGLE POINT PRESSURE REFUELING	10-3

FAILURE SYMPTOM LIST  
ENGINE FUEL SHUTOFF AND CROSSFEED VALVES

SYMPTOM	TASK	SYMPTOM	TASK	SYMPTOM	TASK
CROSSFEED FUEL VALVE HANDLE IS NOT AT CLSD WITH CROSSFEED FUEL VALVES SWITCH AT CLOSE	10-1.4	ENGINE FUEL VALVE HANDLE IS NOT AT OPEN WITH FIRE HANDLE IN	10-1.4	NO. 1 ENGINE FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST	10-1.4
CROSSFEED FUEL VALVE HANDLE IS NOT AT OPEN WITH CROSSFEED VALVES SWITCH AT OPEN	10-1.4	ENGINE FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL	10-1.4	NO.2 ENGINE FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST	10-1.4
CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL	10-1.4	ENGINE FUEL VALVE HANDLE IS NOT AT CLSD WITH FIRE HANDLE PULLED	10-1.4	RIGHT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST	10-1.4
ENGINE FUEL SHUTOFF CIRCUIT BREAKER DOES NOT STAY CLOSED	10-1.4	FUEL XFEED CONT CIRCUIT BREAKER DOES NOT STAY CLOSED	10-1.4		
		LEFT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST	10-1.4		

GO TO NEXT PAGE

CHAPTER 10  
FUEL SYSTEMS TROUBLESHOOTING  
CHAPTER OVERVIEW  
FAILURE SYMPTOM LIST (Continued)

FUEL BOOST PUMPS

SYMPTOM	TASK	SYMPTOM	TASK	SYMPTOM	TASK
LH FUEL PUMP AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3	L FUEL PRESS CAPSULE DOES NOT GO OUT WHEN LEFT SIDE MAIN FWD FUEL PUMP SWITCH IS SET TO ON	10-2.3	RH FUEL PUMP CONT AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3
LH FUEL PUMPS AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3	L OR R FUEL PRESS CAPSULE IS NOT ON	10-2.3	RH FUEL PUMP CONT AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3
LH FUEL PUMP CONT AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3	LEFT OR RIGHT SIDE AUX PRESS LIGHT DOES COME ON WHEN PRESSED TO TEST	10-2.3	RH FUEL PUMPS AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3
LH FUEL PUMPS CONT AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3	LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE AUX AFT FUEL PUMP SWITCH IS SET TO ON	10-2.3	RH FUEL PUMPS MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3
LH FUEL PUMP CONT MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3	LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE AUX FWD FUEL PUMP SWITCH IS SET TO ON	10-2.3	RH FUEL PUMPS MAIN FWD CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3
LH FUEL PUMP CONT MAIN FWD CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3	R FUEL PRESS CAPSULE DOES NOT GO OUT WHEN RIGHT SIDE MAIN AFT FUEL PUMP SWITCH IS SET TO ON	10-2.3	RH FUEL PUMP CONT MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3
LH FUEL PUMPS MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3	R FUEL PRESS CAPSULE DOES NOT GO OUT WHEN RIGHT SIDE MAIN FWD FUEL PUMP SWITCH IS SET TO ON	10-2.3	RH FUEL PUMP CONT MAIN FWD CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3
LH FUEL PUMPS MAIN FWD CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3	RH FUEL PUMPS AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED	10-2.3	RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE AUX AFT FUEL PUMP SWITCH IS SET TO ON	10-2.3
L FUEL PRESS CAPSULE DOES NOT GO OUT WHEN LEFT SIDE MAIN AFT FUEL PUMP SWITCH IS SET TO ON	10-2.3			RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE AUX FWD FUEL PUMP SWITCH IS SET TO ON	10-2.3

FAILURE SYMPTOM LIST (Continued).

SINGLE POINT PRESSURE REFUELING

SYMPTOM	TASK
FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT PRI OFF	10-3.4
FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF	10-3.4
FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED	10-3.4

SYMPTOM	TASK
LH OR RH REFUEL VALVE POSN LIGHT DOES NOT COME ON OR COMES ON AND STAYS ON	10-3.4
LH OR RH REFUEL VALVE POSN LIGHT DOES NOT COME ON WHEN PRESSED	10-3.4
LH OR RH REFUEL VALVE POSN LIGHT IS ON	10-3.4

SYMPTOM	TASK
PWR LIGHT DOES NOT COME ON	10-3.4
REFUEL PANEL FUEL QUANTITY INDICATOR DOES NOT INDICATE FUEL LEVEL	10-3.4
REFUEL PANEL LIGHT DOES NOT COME ON	10-3.4
TANK WILL NOT ACCEPT FUEL WHILE PRESSURE REFUELING	10-3.4

EXTENDED RANGE FUEL SYSTEM (ERFS II) (WITH 32 )

SYMPTOM	TASK
ERFS II REFUEL VALVE HANDLE NOT AT CLSD WHEN CONTROL PANEL REFUEL VALVE SWITCH SET TO CLOSE	10-4.4
ERFS II REFUEL VALVE HANDLE NOT AT OPEN POSITION AND CONTROL PANEL REFUEL VALVE IN TRANSIT LIGHT STAYS ON	10-4.4

SYMPTOM	TASK
ERFS II REFUEL VALVE HANDLE NOT AT OPEN POSITION WITH CONTROL PANEL REFUEL VALVE SWITCH SET TO OPEN	10-4.4

SYMPTOM	TASK
ERFS II CONTROL PANEL REFUEL VALVE IN TRANSIT LIGHT DOES NOT COME ON WITH ERFS II REFUEL VALVE OPERATION NORMAL	10-4.4
FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED WHEN ERFS II FUEL CONTROL PANEL IS CONNECTED	10-4.4

FUEL SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST

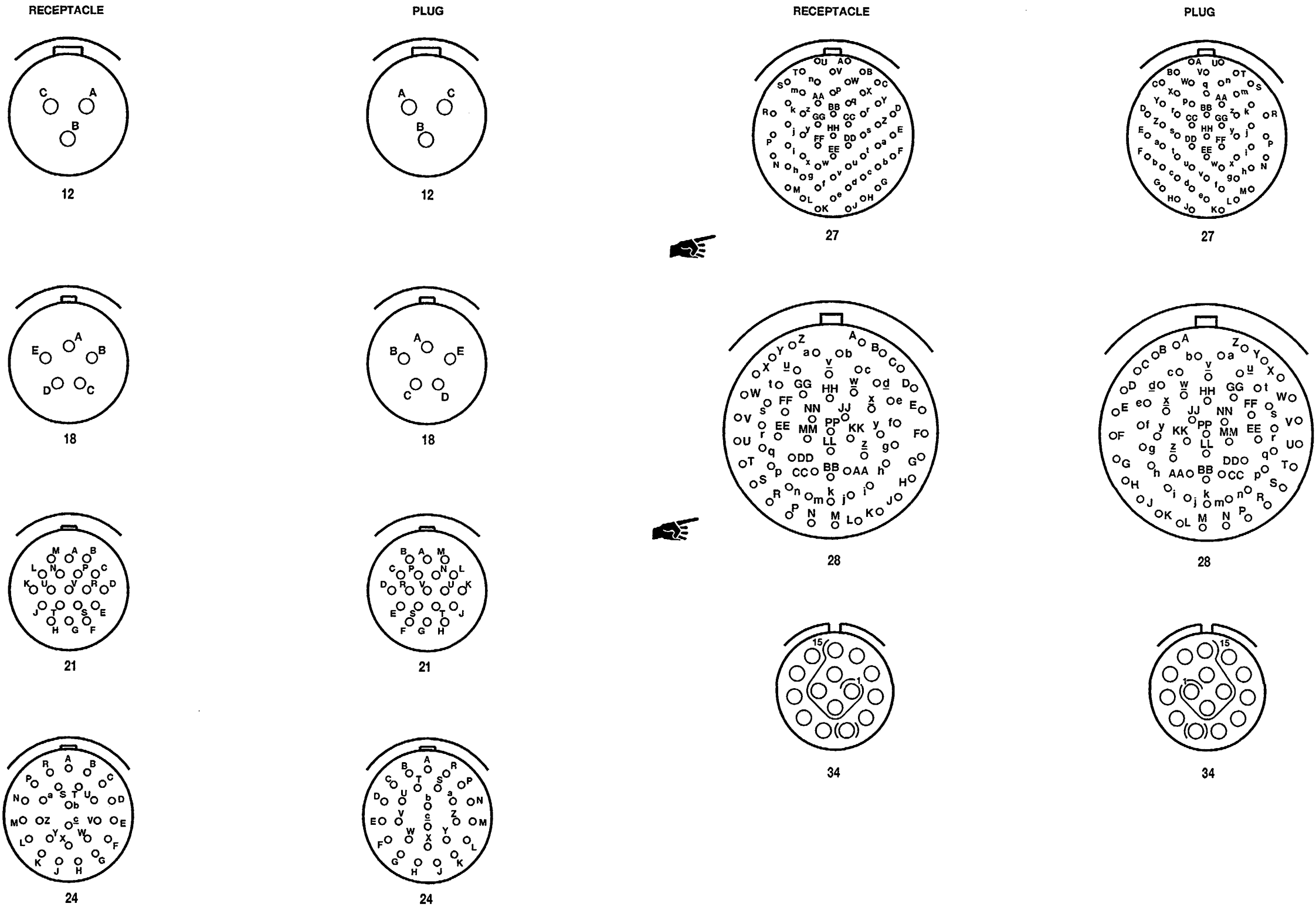
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GD109		151		518	10	50R	174P3	MS3476W8-98S	12	RH FWD FUEL PRESS SWITCH	240	-5	54R
GD110		151		508	25	50R	174P4	MS3476W8-98S	12	RH AFT FUEL PRESS SWITCH	380	-5	54R
GD111		151		492	20	50L	174P5	MS3476W14-19P	21	L AUX AFT FUEL TANK PLUG, LH POD	385	-5	52L
GD147		151		230	-10	50L	174J5	MS3474W14-19S	21	L AUX AFT FUEL TANK RCPT	385	-5	52L
GD148		151		230	-10	50L	174P6	MS3476W14-19P	21	R AUX AFT FUEL TANK PLUG RH POD	385	-5	52R
GD149		151		365	-15	50L	174J6	MS3474W14-19S	21	R AUX AFT FUEL TANK RCPT	385	-5	50R
GD150		151		365	-15	50L	174P7	MS3476W14-19S	21	LH FUEL PUMP THERMISTER CONT	340	8	50L
GD151		151		230	-5	50L	174P8	MS3476W14-19S	21	RH FUEL PUMP THERMISTER CONT	340	8	50R
GD153		151		380	-10	50L	232P1	MS3476W22-55S	27	CTR INSTR PNL, MSTR CAUTION PNL			
GD154		151		230	-15	50R	232P2	MS3476W16-26S	24	CTR INSTR PNL, MSTR CAUTION PNL			
GD155		151		230	10	50R	300J1	M83723-74A2041N	40	NO. 1 PDP DISC OVHD PNL RCPT			
GD156		151		230	-20	50R	300P1	M83723-75A2041N	40	NO. 1 PDP DISC OVHD PNL PLUG			
GD158		151		365	-15	50R	300J2	M83723-74A2255N	42	NO. 1 PDP DISC CONSOLE RCPT			
GD159		151		365	-15	50R	300P2	M83723-75A2255N	42	NO. 1 PDP DISC CONSOLE PLUG			
GD160		151		380	-10	50R	300J4	M83723-74A2461N	43	NO. 1 PDP AFT RCPT			
GD175		151		340	30	50L	300P4	M83723-75A2461N	43	NO. 1 PDP AFT PLUG			
GD176		151		348	10	50R	300J5	M83723-74A2041N	40	NO. 2 PDP DISC OVHD PNL RCPT			
GD248		151		348	10	50R	300P5	M83723-75A2041N	40	NO. 2 PDP DISC OVHD PNL PLUG			
GD249		151		348	10	50L	300J6	M83723-74A24616	43	NO. 2 PDP DISC CONSOLE RCPT			
GD265		151		348	32	50L	300P6	M83723-75A24616	43	NO. 2 PDP DISC CONSOLE PLUG			
GD266		151		350	32	50R	300J8	M83723-74A2461 N	42	NO. 2 PDP AFT RCPT			
TB36			OVERHEAD PANEL-COCKPIT				300P8	M83723-75A2461 N	42	NO. 2 PDP AFT PLUG			
171K1		108					300J11	M83723-73A2255N	42	CONSOLE, UNDERFLOOR DISCONNECT	85	-20	
171K2		108	IN LH AND RH FUEL CONTROL	345	0	50L	300P11	M83723-76A2255N	42	CONSOLE, UNDERFLOOR DISCONNECT	85	-20	
174K1		108	RELAY BOX, 171A1	345	0	50R	300J15	M83723-75A24617	43	CONSOLE, UNDERFLOOR DISCONNECT	85	-20	
174K2		108					300P15	M83723-75A24617	43	CONSOLE, UNDERFLOOR DISCONNECT	85	-20	
057P4	M83723-75A2025N	153	J1 FUEL QTY SW BOX	232	2		300J18	M83723-73A2041N	40	OVERHEAD PANEL, COCKPIT			
057P6	M83723-75A20257	153	J3 FUEL QTY SW BOX	232	2		300P18	M83723-76A2041N	40	OVERHEAD PANEL, COCKPIT			
057P11	M83723-75A1624N	35	REFUEL PRECHECK PANEL				300J19	M83723-73A2041N	40	OVERHEAD PANEL, COCKPIT			
057J15	D38999/24WB98SN	330	ERFS II CONTROL RECEPTACLE	353	4	50L	300P19	M83723-76A2041N	40	OVERHEAD PANEL, COCKPIT			
057P16	MS83723-75A1005N	30	ERFS II REFUEL VALVE PLUG	255	-8	54L	300J20	M83723-74A2461N	43	OVERHEAD PANEL, COCKPIT			
171P1	PT06CE-8-3S	12	NO. 1 ENG FUEL PRESS SW	504	10	50L	300P20	M83723-75A2461N	43	OVERHEAD PANEL, COCKPIT			
171P2	PT06CE-8-3S	12	NO. 2 ENG FUEL PRESS SW	504	10	50R	300J21	M83723-74A2461N	43	OVERHEAD PANEL, COCKPIT			
171P3	MS3476W16-26S	24	LH FUEL CONT RELAY BOX, J3	340	8	50L	300P21	M83723-75A2461N	43	OVERHEAD PANEL, COCKPIT			
171P4	MS3476W16-26S	24	RH FUEL CONT RELAY BOX, J3	340	8	50R	300J34	MS3474W16-26P	24	LH FWD FUEL TANK RCPT	245	-15	50L
171P5	MS3476W14-19S	24	LH FUEL CONT RELAY BOX, J5	340	8	50L	300P34	NO PART NUMBER	24	LH FWD FUEL TANK PLUG-LH POD	245	-15	52L
171P6	MS3476W14-19S	21	RH FUEL CONT RELAY BOX, J5	340	8	50R	300J35	MS3474W16-26P	24	LH CABIN, L MAIN TANK RCPT	260	-15	50L
171J7	MS3474W16-26P	24	R MAIN AFT FUEL TANK RCPT	375	-15	50R	300J36	MS3474W16-26P	24	RH FWD AUX FUEL TANK RCPT	245	-15	50R
171J8	MS3474W16-26P	24	L MAIN AFT FUEL TANK RCPT	375	-15	50L	300P36	NO PART NUMBER	24	RH FWD AUX FUEL TANK, PLUG RH POD	245	-15	52R
172P1	MS3476W14-5S	18	NO. 1 ENG FUEL VALVE	498	10	50L	300J37	MS3474W16-26P	24	RH CABIN, R MAIN TANK RCPT	260	-15	50R
172P2	MS3476W14-5S	18	NO. 2 ENG FUEL VALVE	498	15	50R	300J38	MS3474W16-26P	24	LH AFT AUX FUEL TANK RCPT	380	-15	50L
173P1	MS3476W14-5S	18	LH FUEL CROSSFEED VALVE	504	15	50L	300P38	NO PART NUMBER	24	LH AFT AUX FUEL TANK PLUG LH POD	380	-15	52L
173P2	MS3476W14-5S	18	RH FUEL CROSSFEED VALVE	504	15	50R							
174P1	MS3476W8-98S	12	LH FWD FUEL PRESS SWITCH	240	-5	54L							



FUEL SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

REF DESIG	PART NUMBER	TYPE	MATE WITH/LOCATION	STATION LOCATION		
				FS	WL	BL
300J39	MS3474W16-26P	24	RH AFT AUX FUEL TANK RCPT	375	-25	50R
300P39	NO PART NUMBER	24	RH AFT AUX FUEL TANK PLUG, RH POD	375	-25	52R
300J40	M83723-73A1415N	34	LH CABIN	222	-5	52L
300P40	M83723-76A1415N	34	LH CABIN	222	-5	52L
300J41	M83723-73A1415N	34	RH CABIN	245	-5	52R
300P41	M83723-76A1415N	34	RH CABIN	245	-5	52R
300J45	M83723-73A2461N	43	HEATER COMPARTMENT	105	40	30R
300P45	M83723-76A2461N	43	HEATER COMPARTMENT	105	40	30R
300J48	M83723-74A2461N	43	ELECTRONICS COMPARTMENT	105	40	20L
300P48	M83723-75A2461N	43	ELECTRONICS COMPARTMENT	105	40	20L
300J51	M83723-74A2461N	43	AFT CROWN-OVHD	460	45	20R
300P51	M83723-75A2461N	43	AFT CROWN-OVHD	460	45	20R
300J52	M83723-74A2255N	42	AFT CROWN-OVHD	460	45	30L
300P52	M83723-75A2255N	42	AFT CROWN-OVHD	460	45	30L
300J55	M83723-73A2255N	42	ELECTRONICS COMPARTMENT	105	40	20L
			(WITHOUT 74)			
300J55	M83723-73W2255N	27	ELECTRONICS COMPARTMENT	105	40	20L
			(WITH 74)			
300P55	M83723-76A2255N	42	ELECTRONICS COMPARTMENT	105	40	20L
			(WITHOUT 74)			
300P55	M83723-76W2255N	27	ELECTRONICS COMPARTMENT	105	40	20L
			(WITH 74)			
300J56	M83723-73A2255N	42	HEATER COMPARTMENT	105	40	25R
300P56	M83723-76A2255N	42	HEATER COMPARTMENT	105	40	25R
300J58	M83723-73A22558	42	CONSOLE, UNDERFLOOR DISCONNECT	85	-20	
300P58	M83723-76A22558	42	CONSOLE, UNDERFLOOR DISCONNECT	85	-20	
300J61	M83723-73A24619	43	CONSOLE, UNDERFLOOR DISCONNECT	85	-20	
			(WITHOUT 74)			
300J61	M83723-73W24619	28	CONSOLE, UNDERFLOOR DISCONNECT	85	-20	
			(WITH 74)			
300P61	M83723-76A24619	43	CONSOLE, UNDERFLOOR DISCONNECT	85	-20	
			(WITHOUT 74)			
300P61	M83723-76W24619	28	CONSOLE, UNDERFLOOR DISCONNECT	85	-20	
			(WITH 74)			

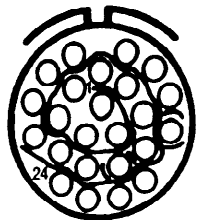
FUEL SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)



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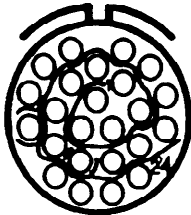
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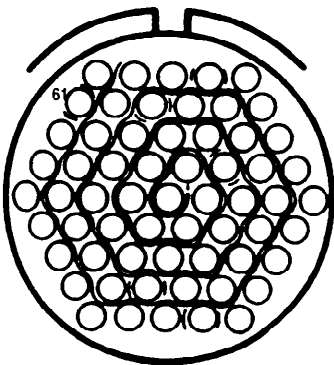


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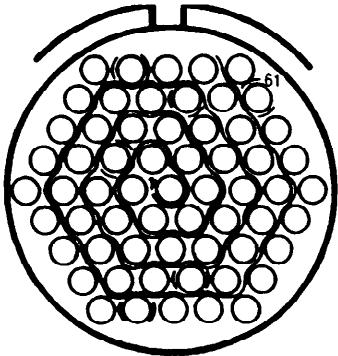
PLUG



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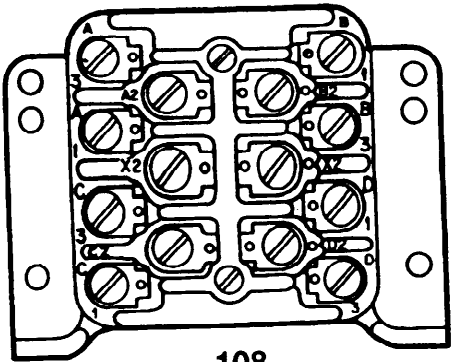


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RELAY

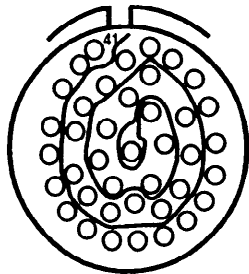


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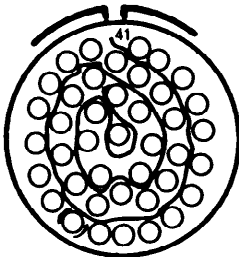
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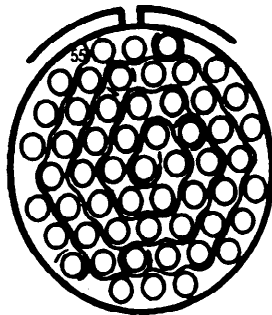
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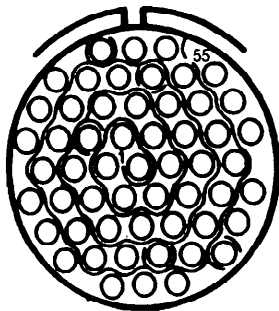
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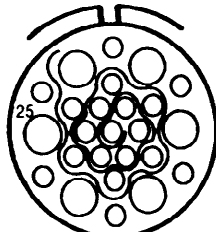


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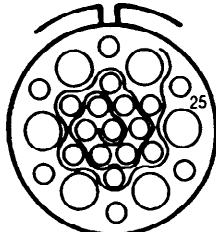
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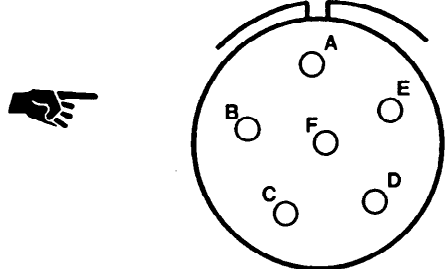
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PLUG



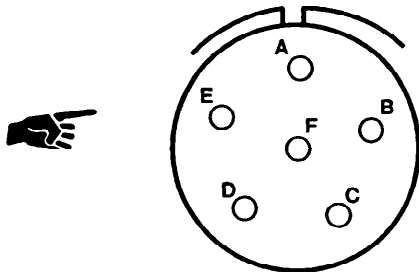
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330

PLUG



330

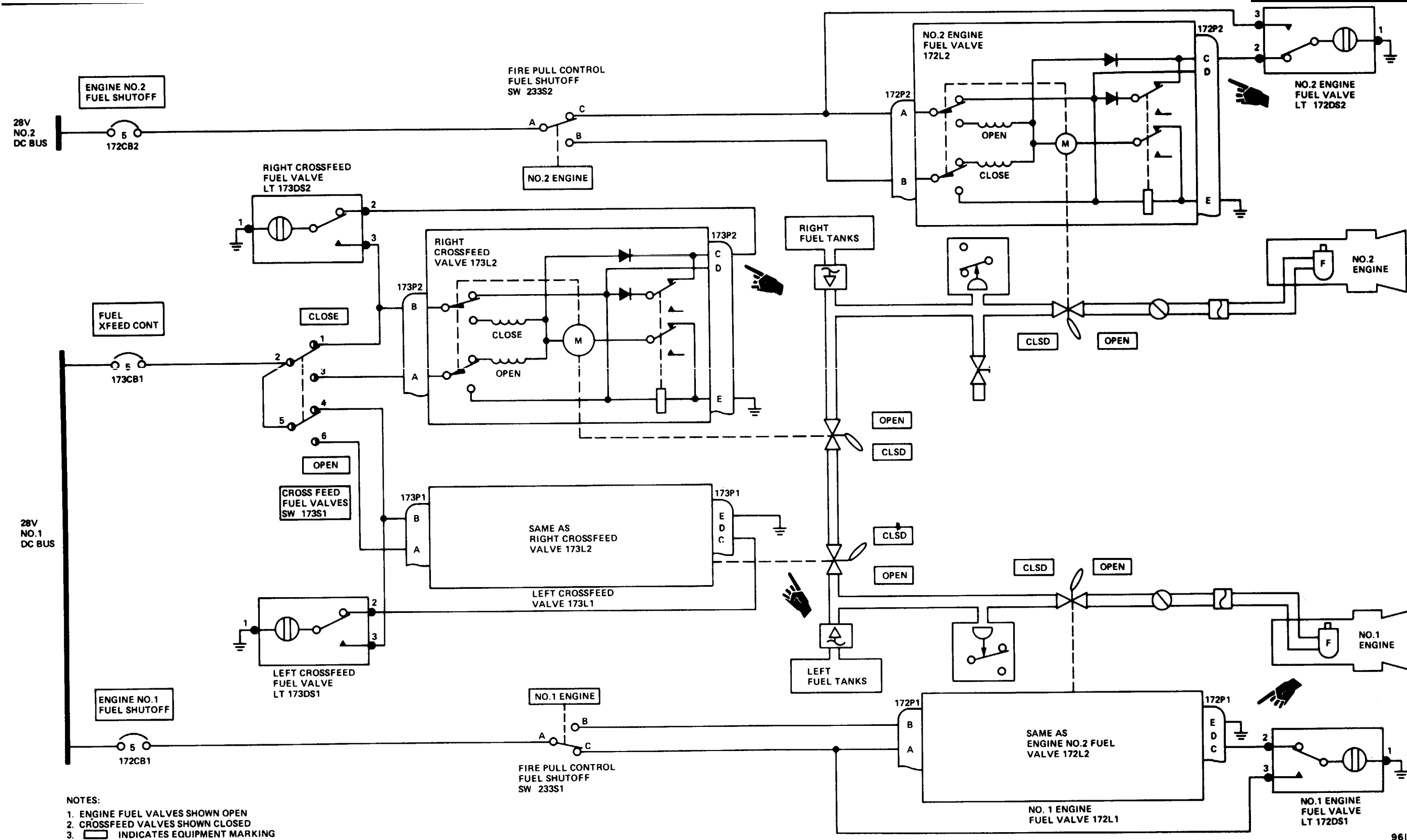
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## 10-1 ENGINE FUEL SHUTOFF AND CROSSFEED VALVES

## 10-1 ENGINE FUEL SHUTOFF AND CROSSFEED VALVES

10-1.1

## 10-1.1 ENGINE FUEL SHUTOFF AND CROSSFEED VALVES SCHEMATIC DIAGRAM



9611



10-1.3 ENGINE FUEL SHUTOFF AND CROSSFEED VALVES  
VISUAL CHECK

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

Materials:  
None

Personnel Required:  
67U10 Medium Helicopter Repairer

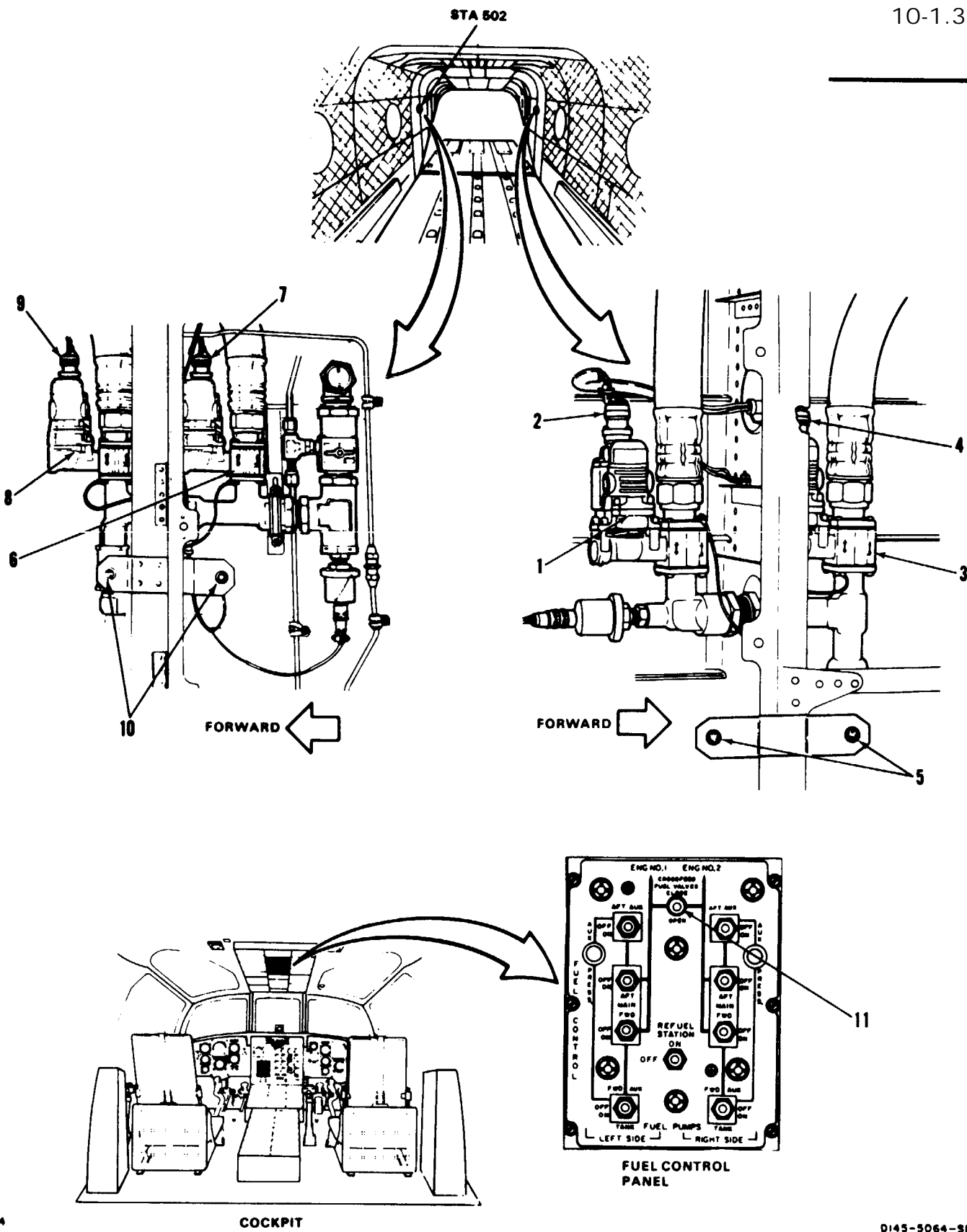
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off

TASK	RESULT
1. Check left crossfeed valve (1).	If valve (1) is loose or damaged, tighten or replace it as required. If wiring or connector (2) is damaged, repair or replace wiring or connector as required.
2. Check No. 1 engine fuel valve (3).	If valve (3) is loose or damaged, tighten or replace it as required. If wiring or connector (4) is damaged, repair or replace wiring, or connector as required.
3. Check left crossfeed valve and No. 1 engine fuel valve lights (5).	If either light (5) is damaged, replace it. If wiring to either light is damaged, repair or replace it as required,
4. Check right crossfeed valve (6).	If valve (6) is loose or damaged, tighten or replace it as required. If wiring or connector (7) is damaged, repair or replace wiring or connector as required.
5. Check No. 2 engine fuel valve (8).	If valve (8) is loose or damaged, tighten or replace it as required, If wiring or connector (9) is damaged, repair or replace wiring or connector as required.
6. Check right crossfeed valve and No. 2 engine fuel valve lights (10).	If either light (10) is damaged, replace it. If wiring to either light is damaged, repair or replace it as required.
7. Check CROSSFEED FUEL VALVES switch (11).	If switch (11) is loose or damaged, tighten or replace it as required.

FOLLOW-ON MAINTENANCE:

None



45x54

COCKPIT

D145-5064-SPA

END OF TASK

## 10-1.4 ENGINE FUEL SHUTOFF AND CROSSFEED VALVES OPERATIONAL CHECK

10-1.4

## INITIAL SETUP

*Applicable Configurations:*  
All

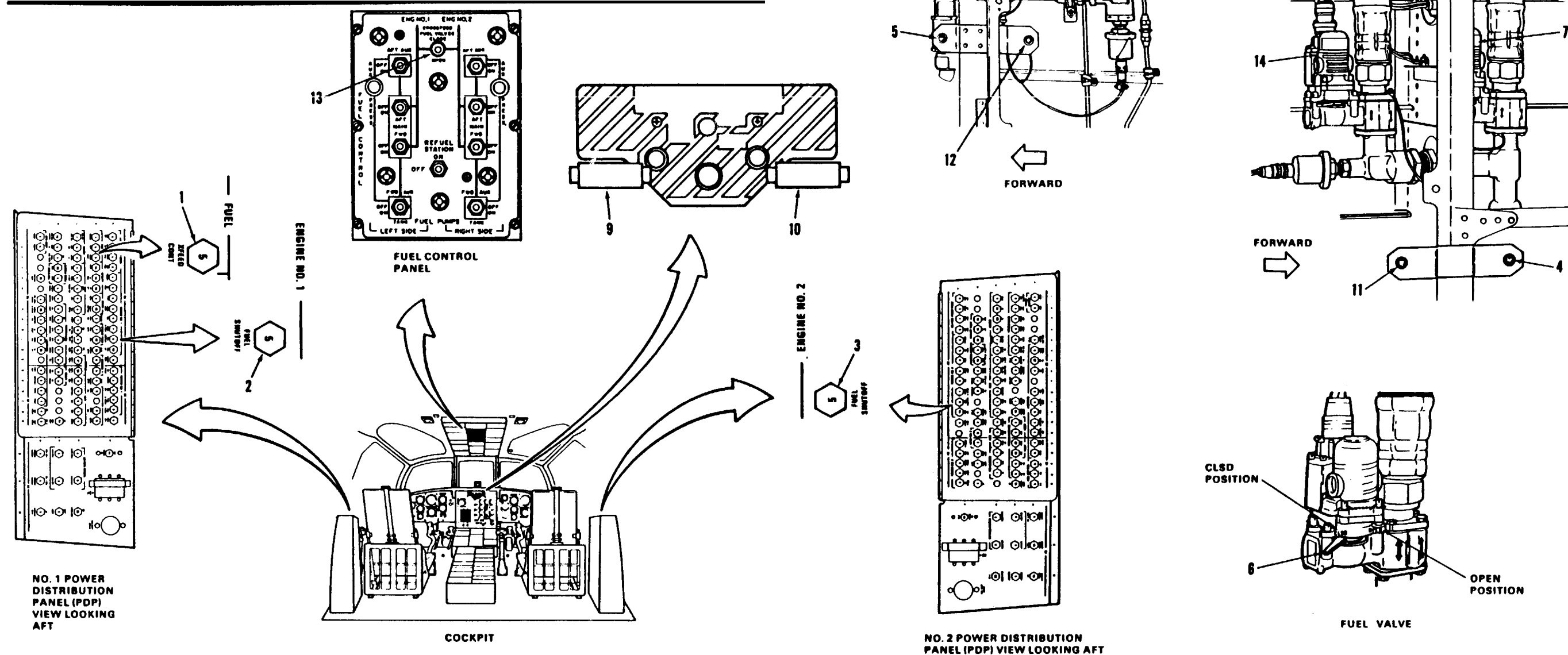
Tools:  
None

Materials:  
None

*Personnel Required:*  
68F20 Aircraft Electrician  
67U10 Medium Helicopter Repairer

References:  
TM 55-1520-240-23

*Equipment Condition:*  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Engine Fuel Shutoff And Crossfeed  
Valves Visual Check Performed (Task 10- 1.3)



**90x54**



10-1.4 ENGINE FUEL SHUTOFF AND CROSSFEED VALVES  
OPERATIONAL CHECK (Continued)

10-1.4

TASK	RESULT
<b>CHECK CIRCUIT BREAKERS</b>	
1. Check that FUEL XFEED CONT circuit breaker (1) is closed.	If XFEED CONT circuit breaker (1) is open, close it. If it opens again, go to task 10-1.5.
2. Check that ENGINE NO. 1 FUEL SHUTOFF circuit breaker (2) is closed.	If FUEL SHUTOFF circuit breaker (2) is open, close it. If it opens again, go to task 10-1.6.
3. Check that ENGINE NO. 2 FUEL SHUTOFF circuit breaker (3) is closed.	If FUEL SHUTOFF circuit breaker (3) is open, close it. If it opens again, go to task 10-1.6.
<b>CHECK ENGINE FUEL SHUTOFF VALVES</b>	
4. Press and release No. 1 engine fuel valve light (4).	Light (4) shall momentarily come on. If it does not, go to task 10-1.7.
5 Press and release No. 2 engine fuel valve light (5).	Light (5) shall momentarily come on. If it does not, go to task 10-1.8.
6 Open ENGINE NO. 1 FUEL SHUTOFF circuit breaker (2) and ENGINE NO. 2 FUEL SHUTOFF circuit breaker (3).	
7 Set handles (6) on No 1 engine fuel valve (7) and No 2 engine fuel valve (8) to CLSD.	If handle (6) cannot be moved to CLSD, replace No. 1 or No. 2 engine fuel valve as required.
8 Close ENGINE NO. 1 FUEL SHUTOFF circuit breaker (2).	Handle (6) on No. 1 engine fuel valve (7) shall move to OPEN. No. 1 engine fuel valve light (4) shall come on and remain on until handle is at OPEN. If handle is not at OPEN or light comes on and stays on, go to task 10-1.9. If light did not come on but handle is at OPEN, go to task 10-1.10. If light is on and handle is at OPEN, replace No. 1 engine fuel valve.
9. Close ENGINE NO. 2 FUEL SHUTOFF circuit breaker (3).	Handle (6) on No. 2 engine fuel valve (8) shall move to OPEN. No. 2 engine fuel valve light (5) shall come on and remain on until handle is at OPEN. If handle is not at OPEN or light comes on and stays on, go to task 10-1.9. If light did not come on but handle is at OPEN, go to task 10-1.10. If light is on and handle is at OPEN, replace No. 2 engine fuel valve.
<div><div>CAUTION</div><p>Do not operate FIRE AGENT switch while fire handles are out. Fire bottles will discharge into engines.</p></div>	

TASK	RESULT
10. Pull out No. 1 ENGINE fire handle (9).	Handle (6) on No. 1 engine fuel valve (7) shall move to CLSD. No. 1 engine fuel valve light (4) shall come on and remain on until handle is at CLSD. If handle is not at CLSD or light (4) comes on and stays on, go to task 10-1.11. If light did not come on but handle is at CLSD, go to task 10-1.10. If light is on and handle is at CLSD, replace No. 1 engine fuel valve.
11. Pull out No. 2 ENGINE fire handle (10).	Handle (6) on No. 2 engine fuel valve (8) shall move to CLSD. No. 2 engine fuel valve light (5) shall come on and remain on until handle is at CLSD. If handle is not at CLSD or light comes on and stays on, go to task 10-1.11. If light (4) did not come on but handle (6) is at CLSD, go to task 10-1.10. If light is on and handle is at CLSD, replace No. 2 engine fuel valve.
12. Open ENGINE NO. 1 FUEL SHUTOFF circuit breaker (2) and ENGINE NO. 2 FUEL SHUTOFF circuit breaker (3).	
13 Set handles (6) on No. 1 engine fuel valve (7) and No. 2 engine fuel valve (8) to OPEN.	
14 Close ENGINE NO. 1 FUEL SHUTOFF circuit breaker (2).	Handle (6) on No. 1 engine fuel valve (7) shall move to CLSD. No. 1 engine fuel valve light (4) shall come on and remain on until handle is at CLSD. If not, replace No. 1 engine fuel valve.
15. Close ENGINE NO. 2 FUEL SHUTOFF circuit breaker (3).	Handle (6) on No. 2 engine fuel valve (8) shall move to CLSD. No. 2 engine fuel valve light (5) shall come on and remain on until handle is at CLSD, If not, replace No. 2 engine fuel valve
16. Push in No. 1 ENGINE fire handle (9).	Handle (6) on No 1 engine fuel valve (7) shall move to OPEN. If not, replace No. 1 ENGINE fire pull control.
17. Push in No. 2 ENGINE fire handle (10).	Handle (6) on No. 2 engine fuel valve (8) shall move to OPEN, If not, replace No. 2 ENGINE fire pull control.
<b>CHECK CROSSFEED VALVES</b>	
18. Press and release left crossfeed fuel valve light (11).	Light (11) shall momentarily come on. If it does not, go to task 10-1.12.

GO TO NEXT PAGE

10-1.4 ENGINE FUEL SHUTOFF AND CROSSFEED VALVES  
OPERATIONAL CHECK (Continued)

TASK	RESULT
19. Press and release right crossfeed fuel valve light (12).	Light (12) shall momentarily come on. If it does not, go to task 10-1,13.
20. Set CROSSFEED FUEL VALVES switch (13) to OPEN.	Handles (6) on left crossfeed fuel valve (14) and right crossfeed fuel valve (15) shall move to OPEN. Left and right crossfeed fuel valve lights (11 and 12) shall come on and remain on until handles are at OPEN. If either crossfeed fuel valve handle is not at OPEN or light comes on and stays on, go to task 10-1.14. If either light did not come on but handle is at OPEN, go to task 10-1.15. If either light is on and handle is at OPEN, replace faulty crossfeed fuel valve.
21. Open FUEL XFEED CONT circuit breaker (1).	
22. Set handle (6) on left and right crossfeed fuel valves (14 and 15) to CLSD.	If handle (6) cannot be moved to CLSD, replace left or right crossfeed fuel valve, as required.
23. Close FUEL XFEED CONT circuit breaker (1).	Handles (6) on left and right crossfeed fuel valves (14 and 15) shall move to OPEN. Left and right crossfeed fuel valve lights (11 and 12) shall come on and remain on until handles are at OPEN. If not, replace faulty crossfeed fuel valve.
24. Set CROSSFEED FUEL VALVES switch (13) to CLOSE.	Handles (6) on left and right crossfeed fuel valves (14 and 15) shall move to CLSD. Left and right crossfeed fuel valve lights (11 and 12) shall come on and remain on until handles are at CLSD. If either crossfeed fuel valve handle is not at CLSD or light comes on and stays on, go to task 10-1.16. If either light did not come on but handles are at CLSD, go to task 10-1.15. If light is on and handle is at OPEN, replace faulty crossfeed fuel valve.
25. Open FUEL XFEED CONT circuit breaker (1).	
26. Set handle (6) on left and right crossfeed fuel valves (14 and 15) to OPEN.	

TASK	RESULT
27. Close FUEL XFEED CONT circuit breaker (1).	Handles (6) on left and right crossfeed fuel valves (14 and 15) shall move to CLSD. Left and right crossfeed fuel valve lights (11 and 12) shall come on and remain on until handles are at CLSD. If either handle is not at CLSD or light comes on and stays on, replace faulty crossfeed fuel valve.

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:  
Electrical Power Off  
Disconnect Battery



10-1.5 FUEL XFEED CONT CIRCUIT BREAKER DOES NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

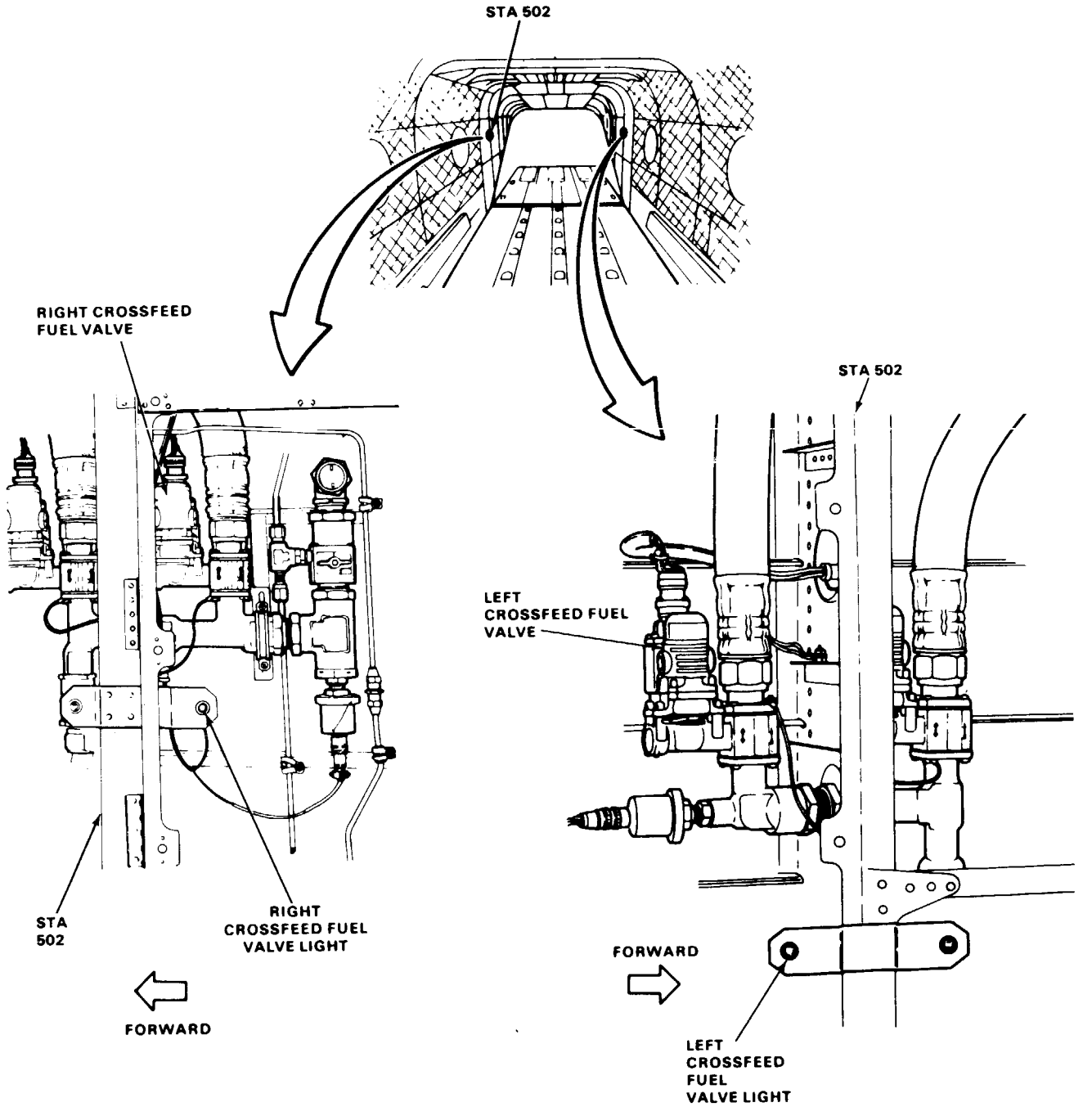
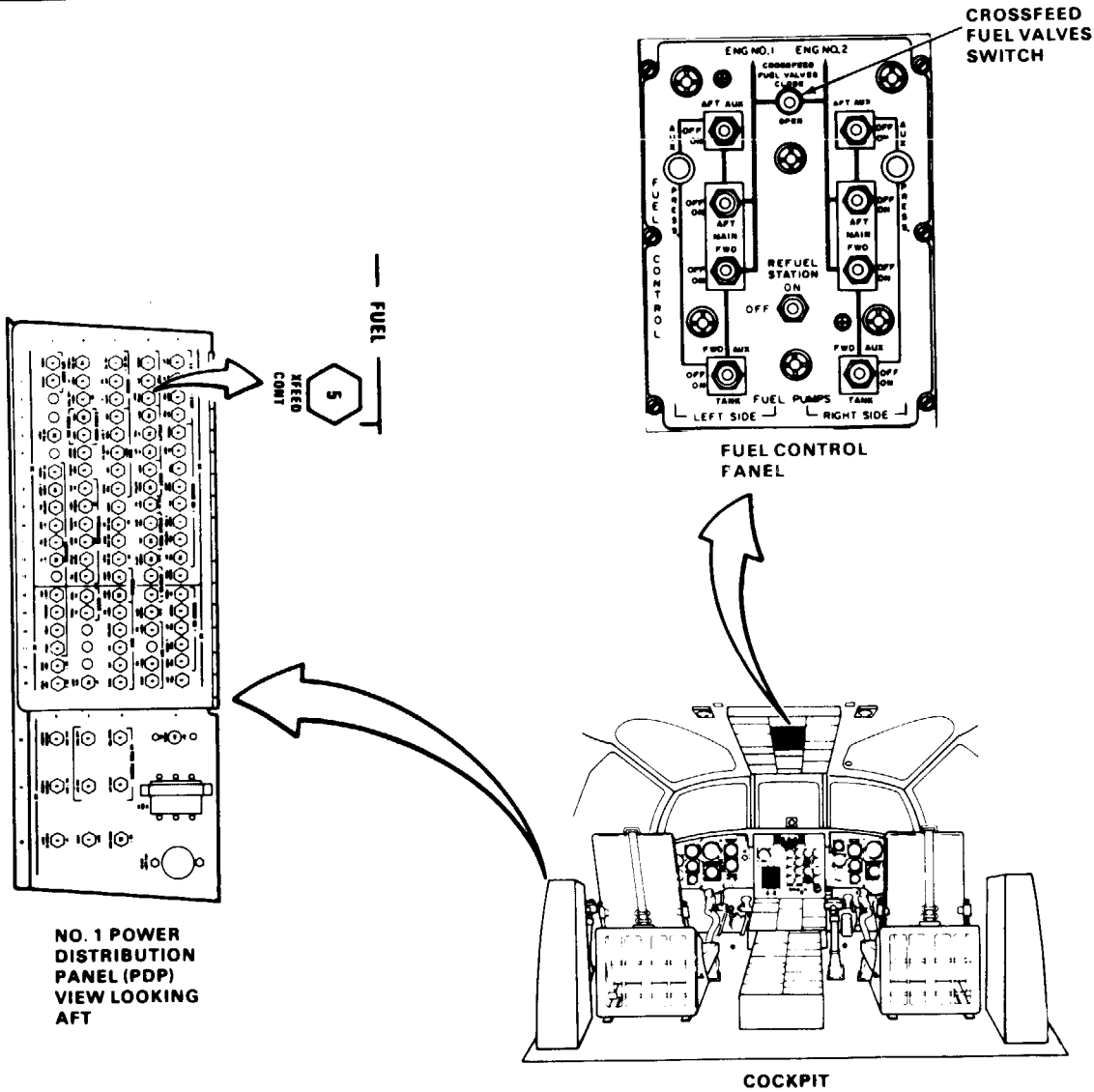
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

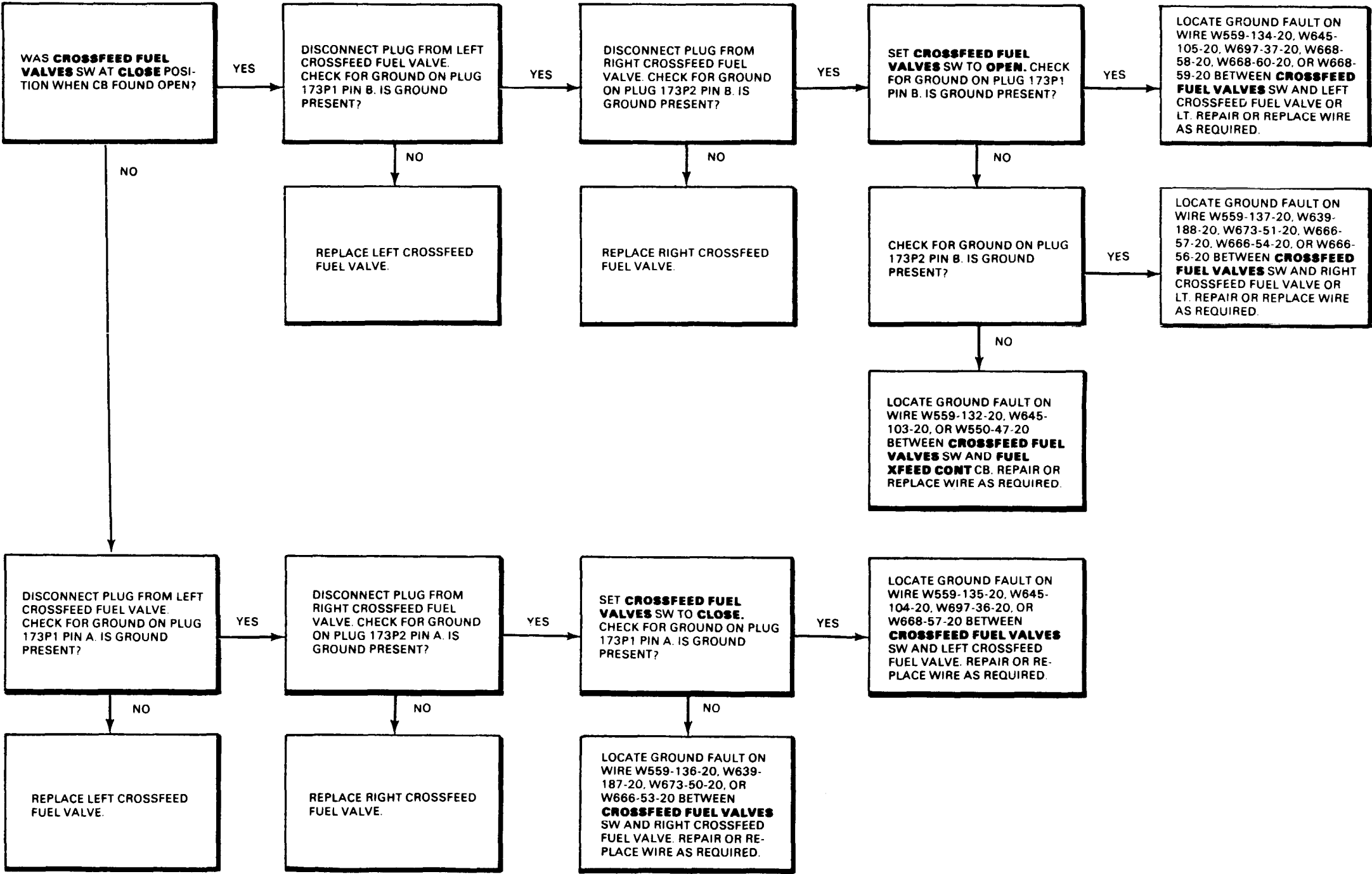
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



10-1.5 FUEL XFEED CONT CIRCUIT BREAKER DOES NOT STAY CLOSED (Continued)

10-1.5



END OF TASK

## 10-1.6 ENGINE FUEL SHUTOFF CIRCUIT BREAKER DOES NOT STAY CLOSED

## FAULT ISOLATION PROCEDURE

## INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

Electrical Repairer's Tool Kit,

NSN 5180-00-323-4915

## Multimeter

**Materials:**

None

**Personnel Required:**

68F10 Aircraft Electrician

68F20 Aircraft Electrician

**References:**

TM 55-1520-240-23

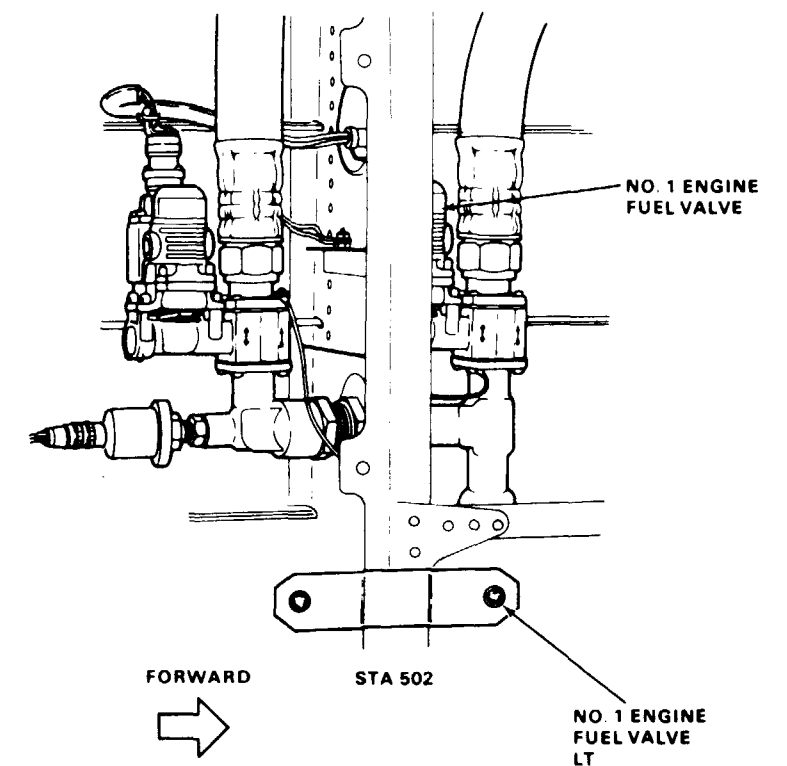
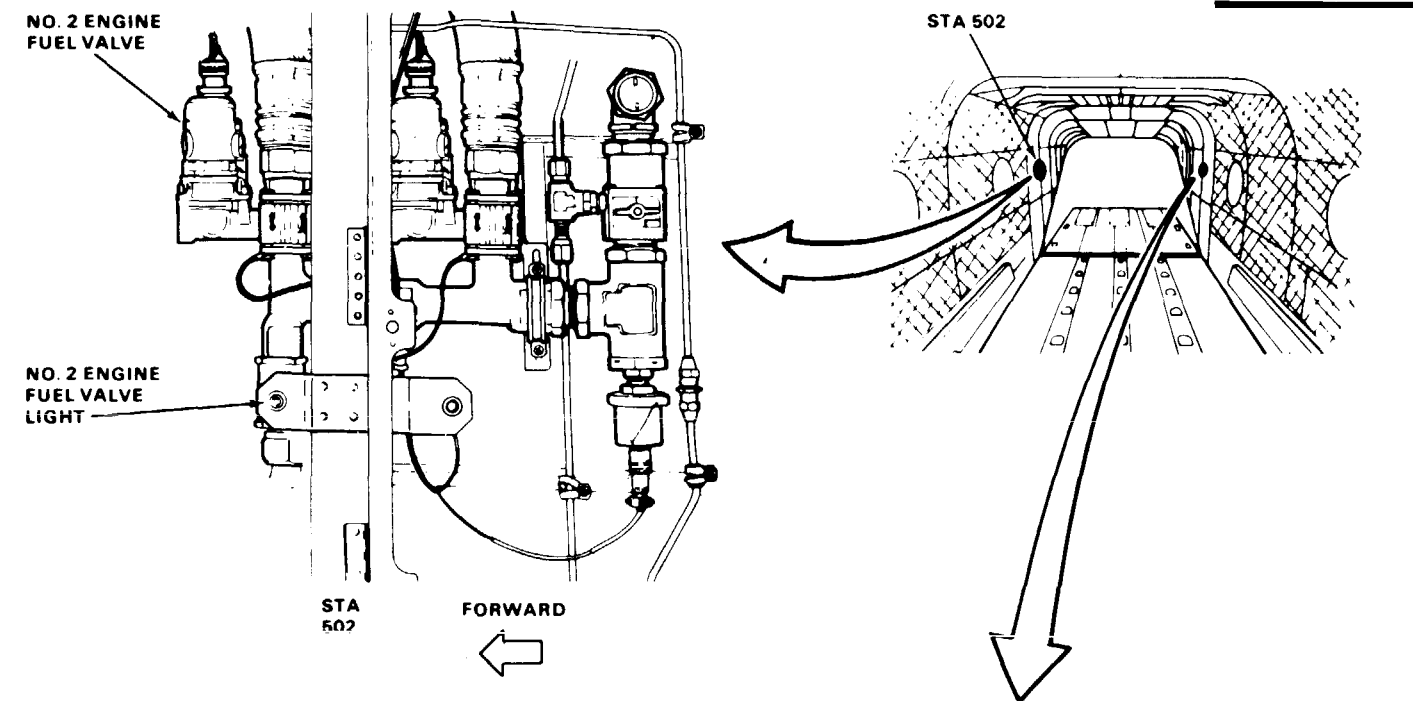
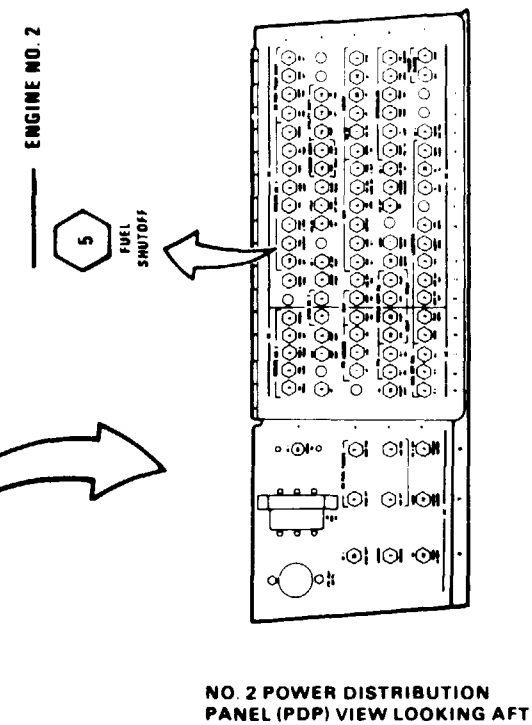
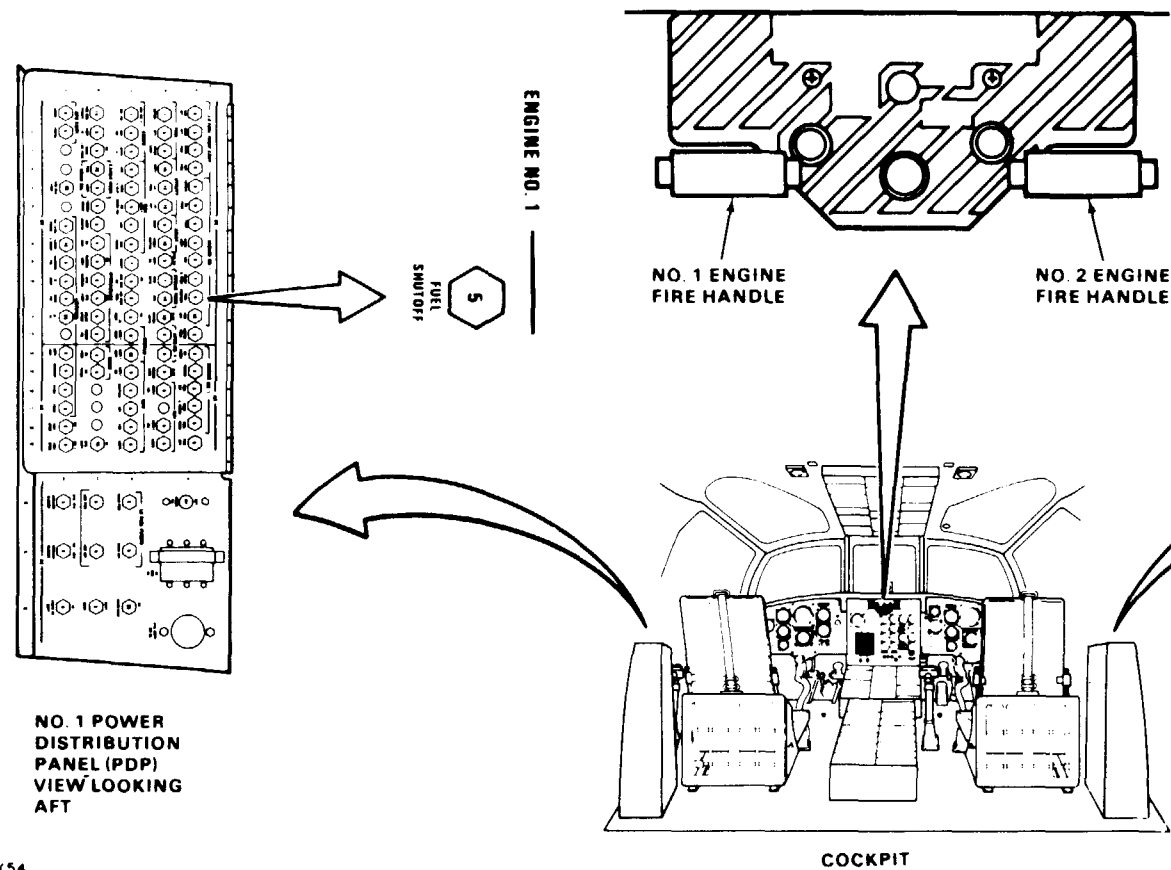
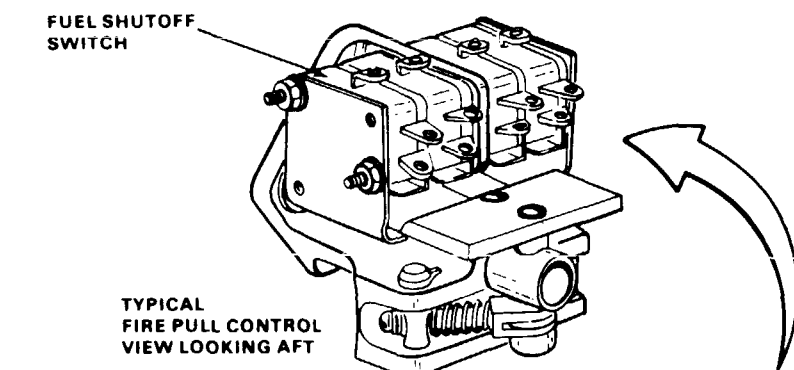
**Equipment Condition:**

TM 55-1520-240-23:

Battery Disconnected

Electrical Power Off

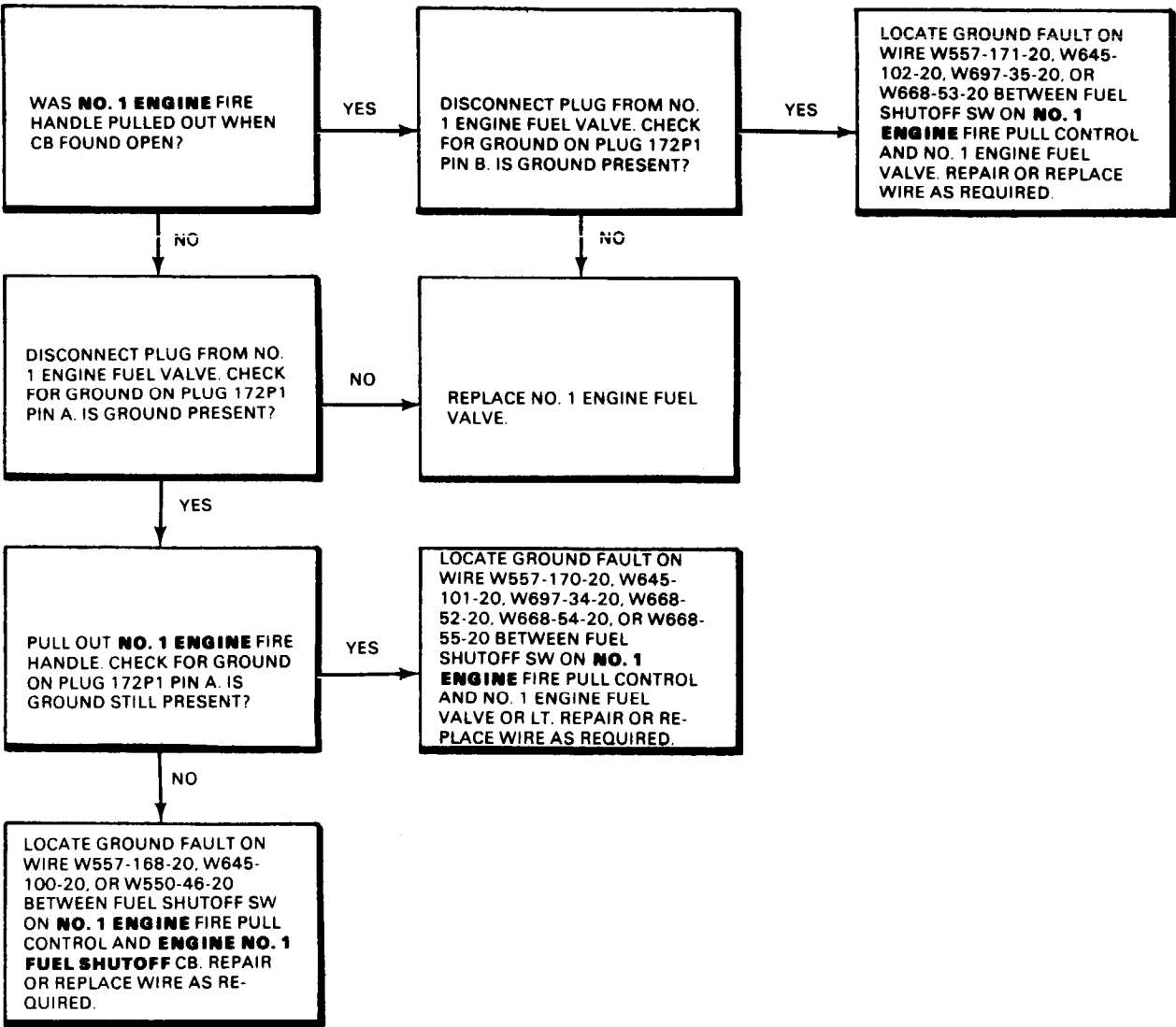
Hydraulic Power Off



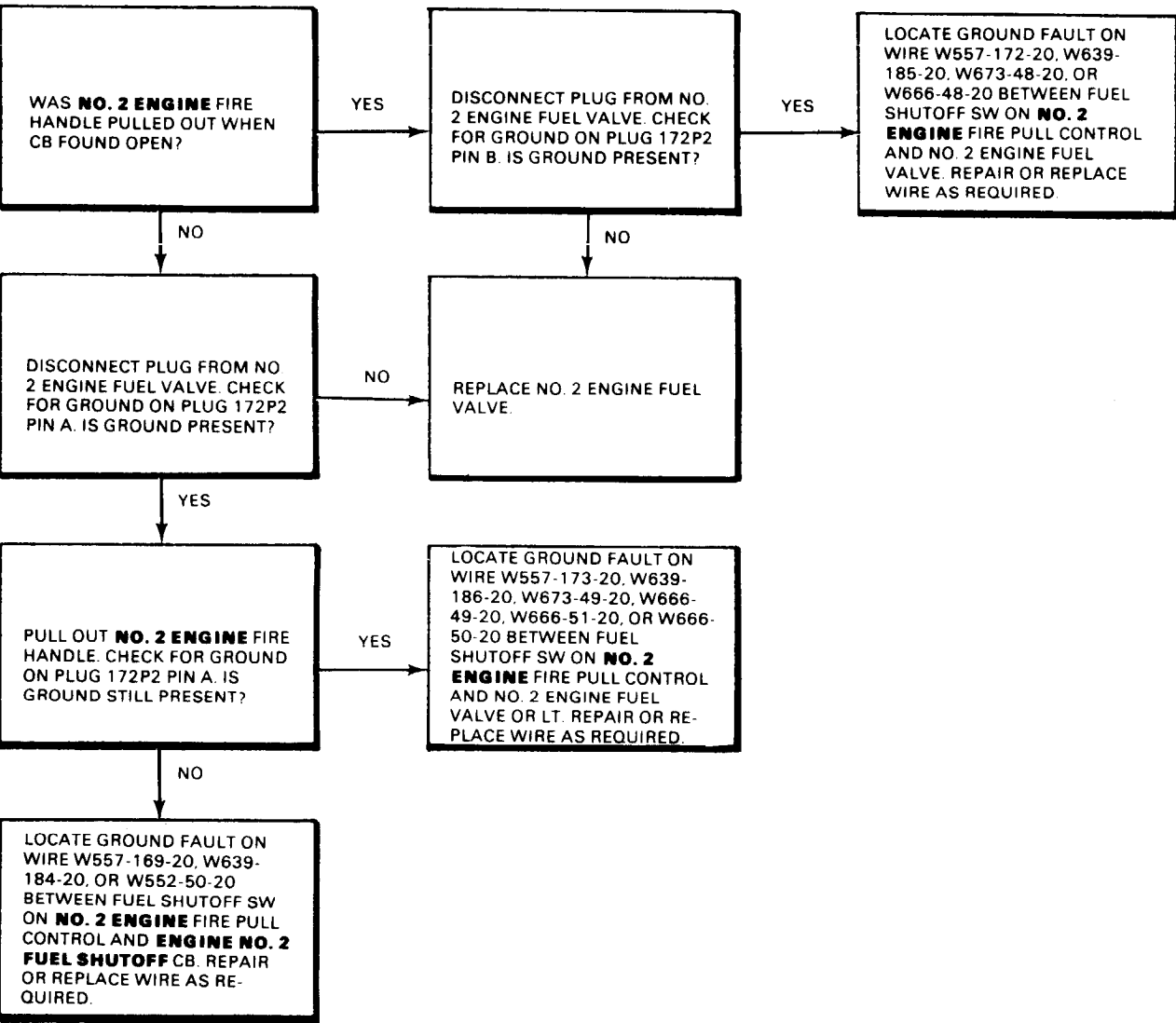
10-1.6 ENGINE FUEL SHUTOFF CIRCUIT BREAKER DOES NOT STAY CLOSED (Continued)

10-1.6

ENGINE NO. 1 FUEL SHUTOFF CIRCUIT BREAKER DOES NOT STAY CLOSED



ENGINE NO. 2 FUEL SHUTOFF CIRCUIT BREAKER DOES NOT STAY CLOSED



END OF TASK

10-1.7 NO. 1 ENGINE FUEL VALVE LIGHT DOES NOT  
COME ON DURING PRESS-TO-TEST

10-1.7

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

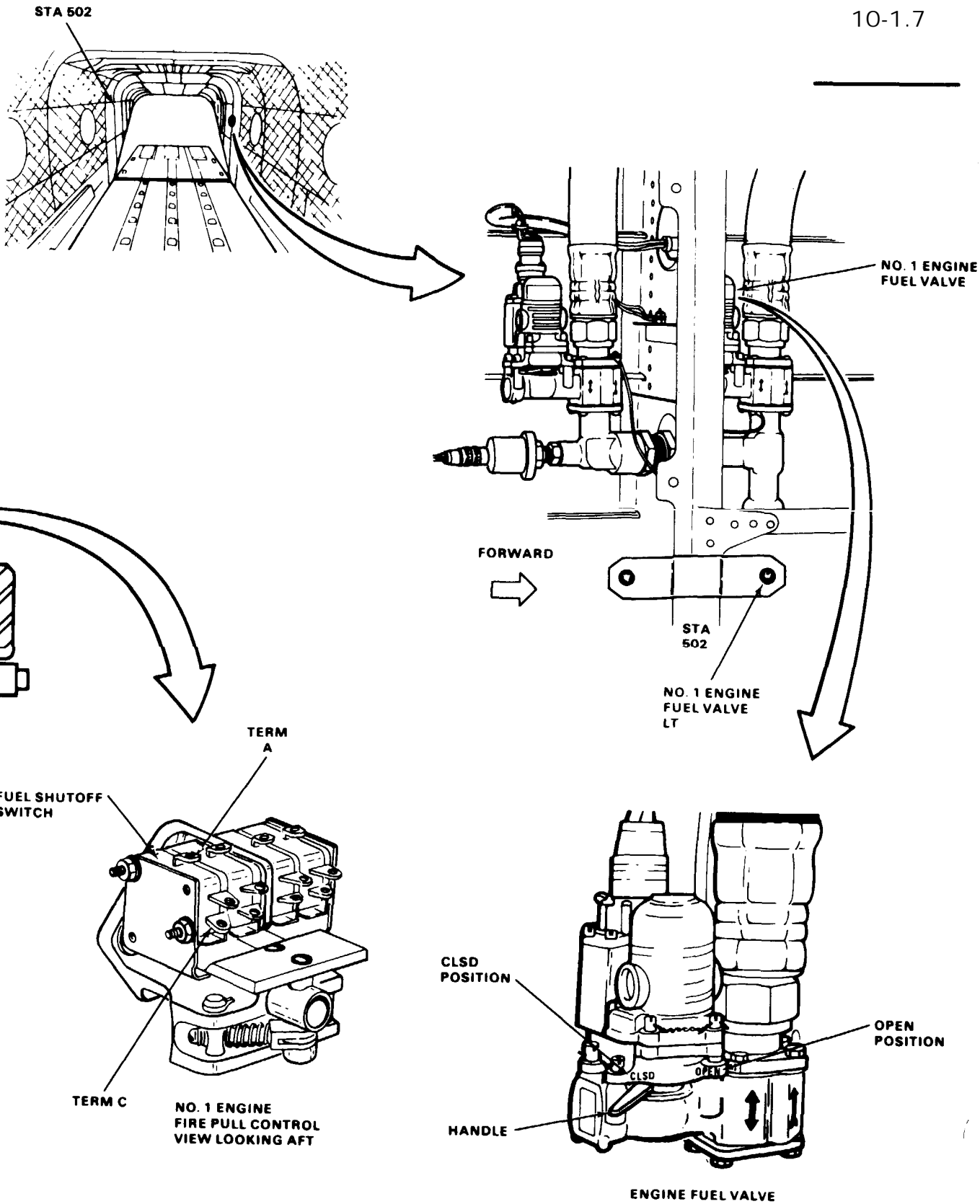
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

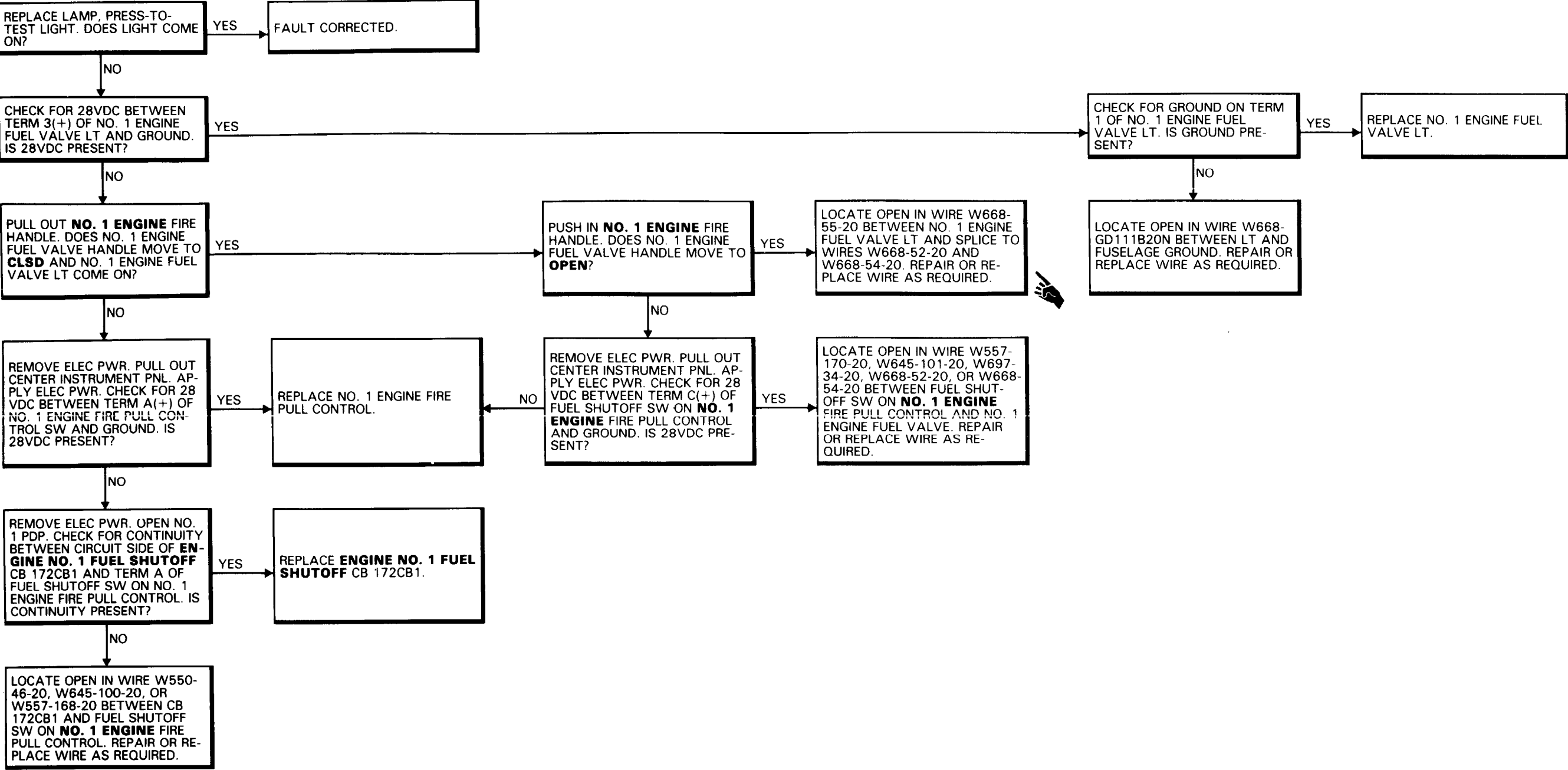
Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off







10-1.8 NO. 2 ENGINE FUEL VALVE LIGHT DOES NOT  
COME ON DURING PRESS-TO-TEST

10-1.8

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

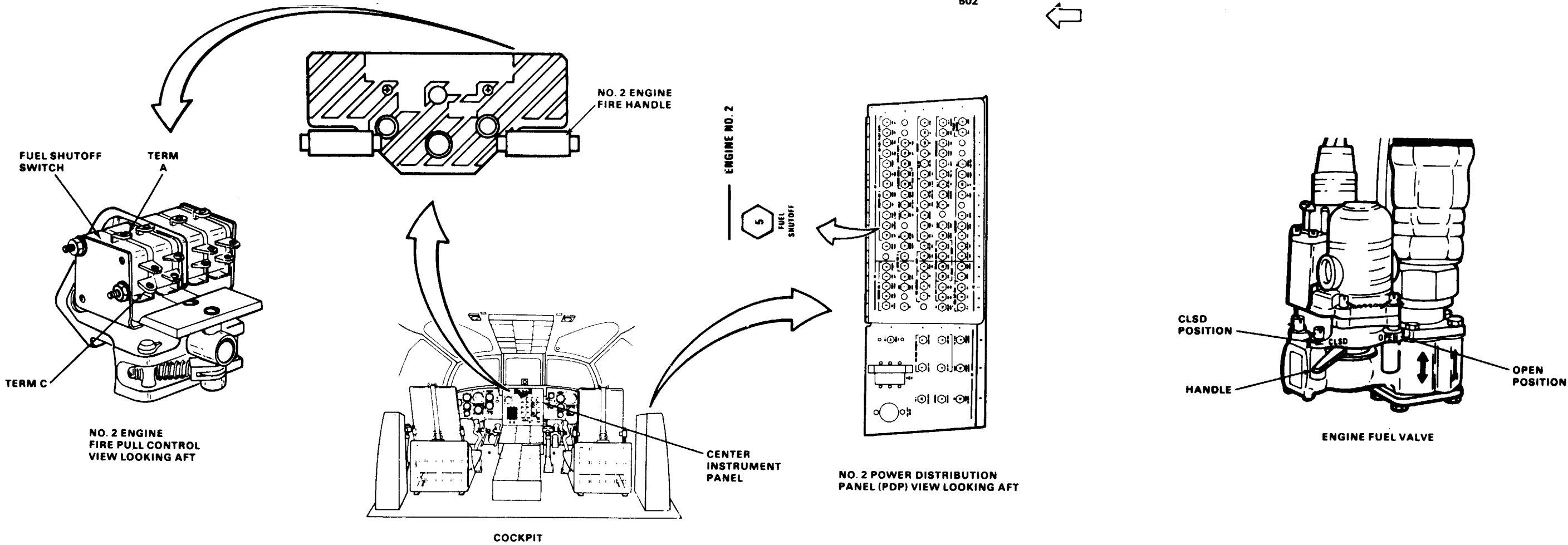
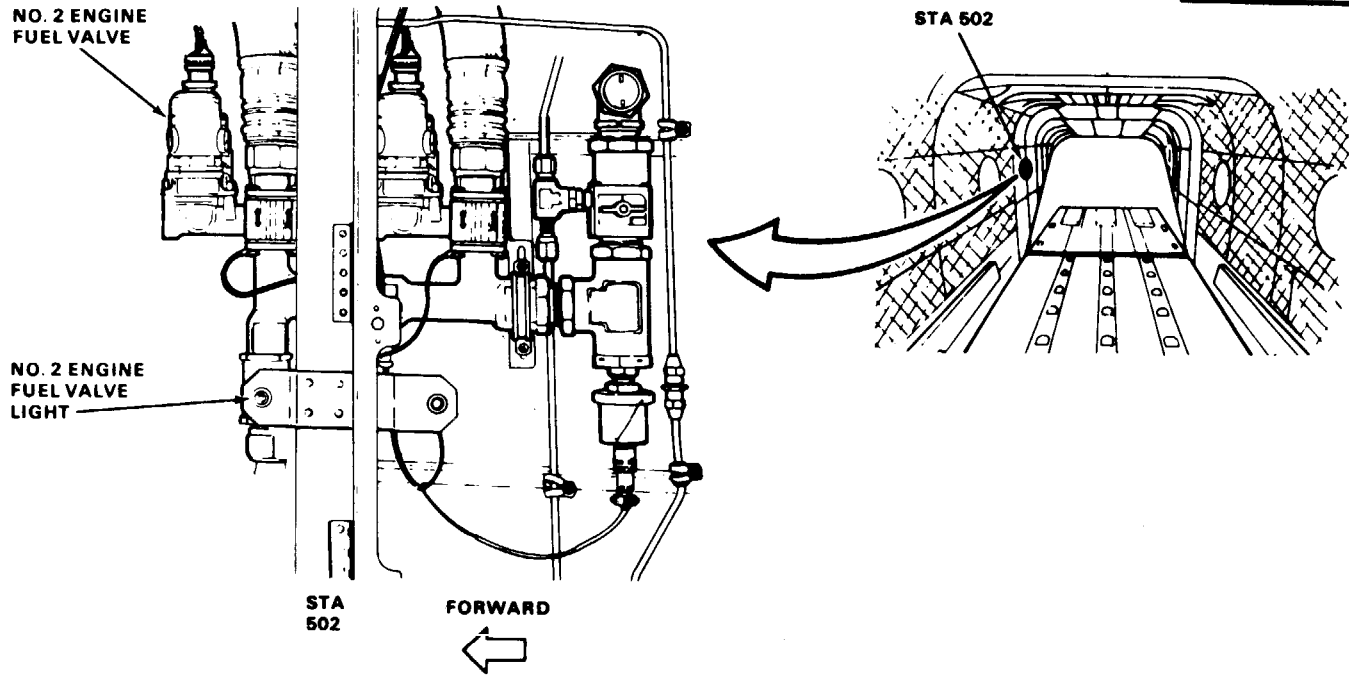
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:

TM 55-1520-240-23

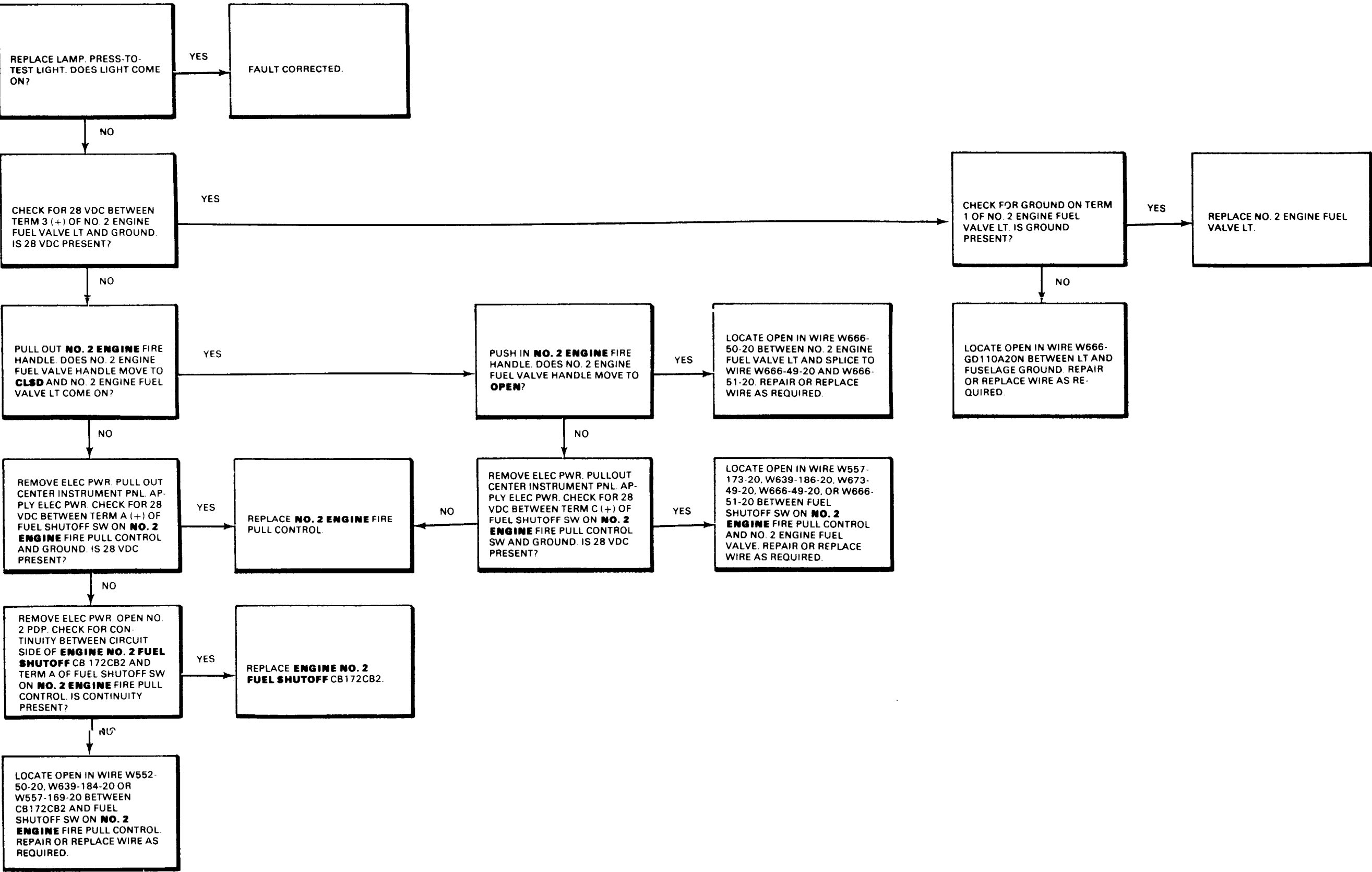
Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



10-1.8 NO. 2 ENGINE FUEL VALVE LIGHT DOES NOT  
COME ON DURING PRESS-TO-TEST (Continued)

10-1.8



END OF TASK

10-1.9 ENGINE FUEL VALVE HANDLE IS NOT AT OPEN  
WITH FIRE HANDLE IN

10-1.9

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

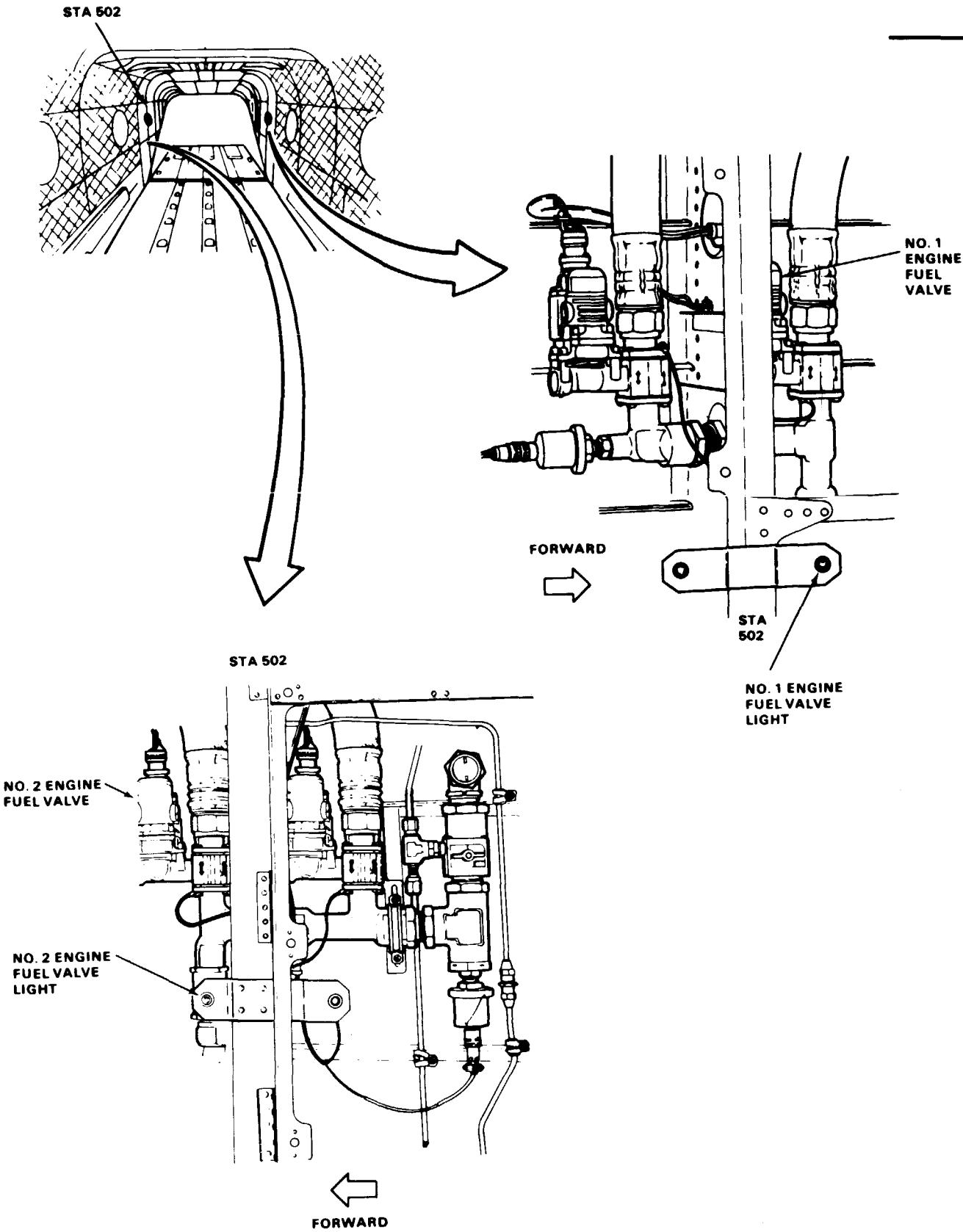
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



45x54

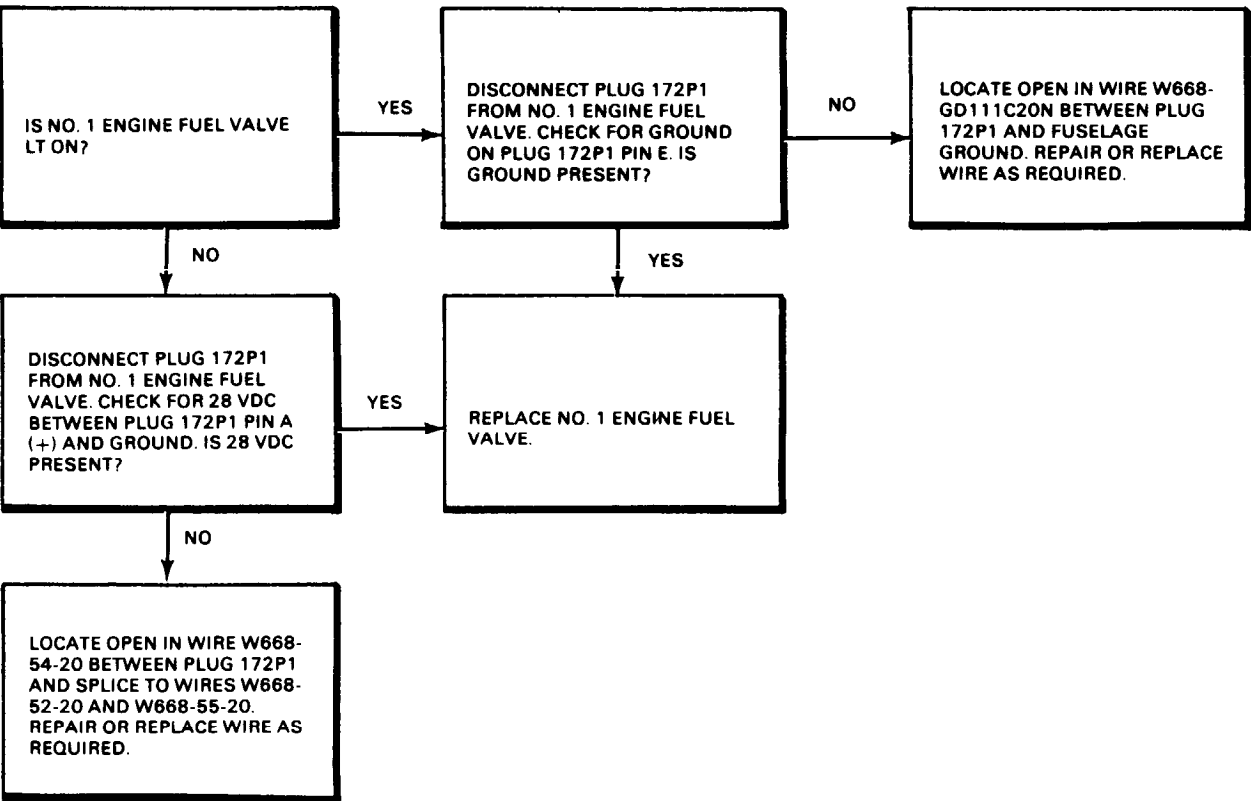
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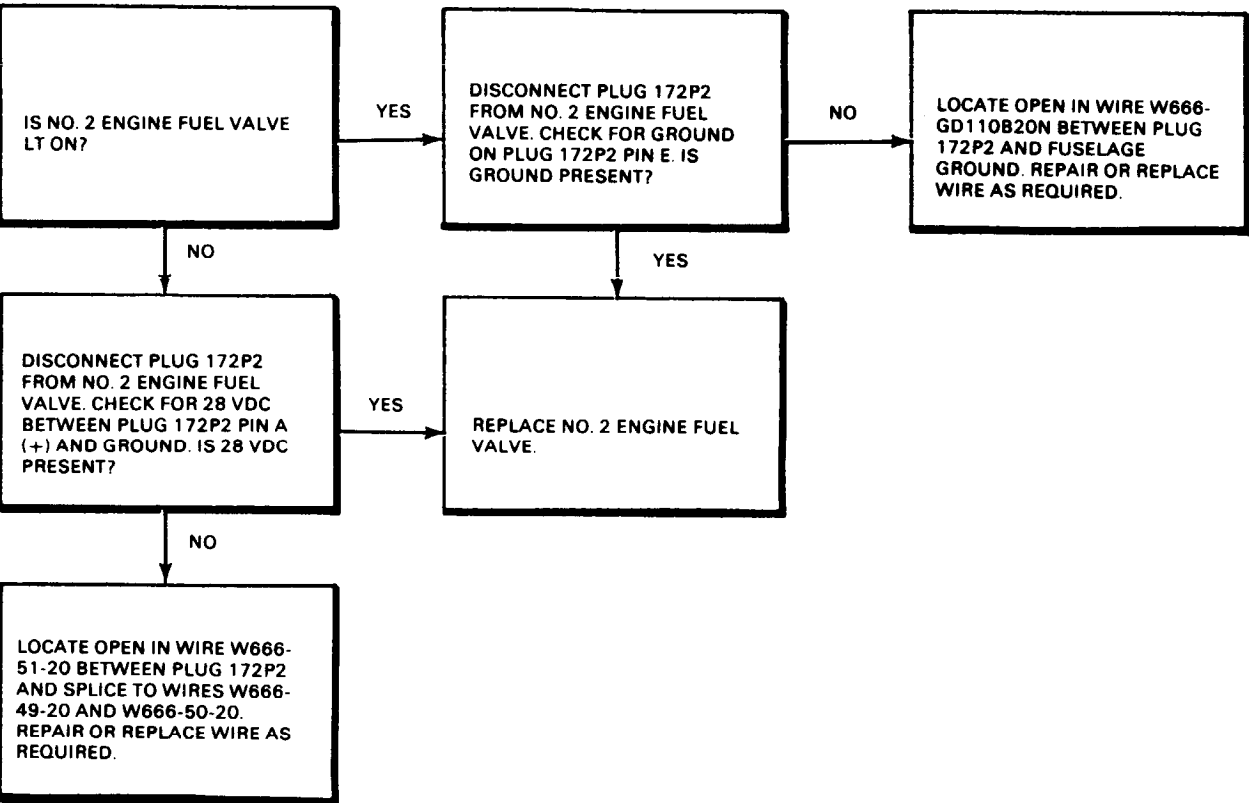
10-1.9 ENGINE FUEL VALVE HANDLE IS NOT AT OPEN  
WITH FIRE HANDLE IN (Continued)

10-1.9

NO. 1 ENGINE FUEL VALVE HANDLE IS NOT AT OPEN  
WITH NO. 1 ENGINE FIRE HANDLE IN



NO. 2 ENGINE FUEL VALVE HANDLE IS NOT AT OPEN  
WITH NO. 2 ENGINE FIRE HANDLE IN



END OF TASK

10-1.10 ENGINE FUEL VALVE LIGHT DOES NOT COME ON,  
VALVE OPERATION NORMAL

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

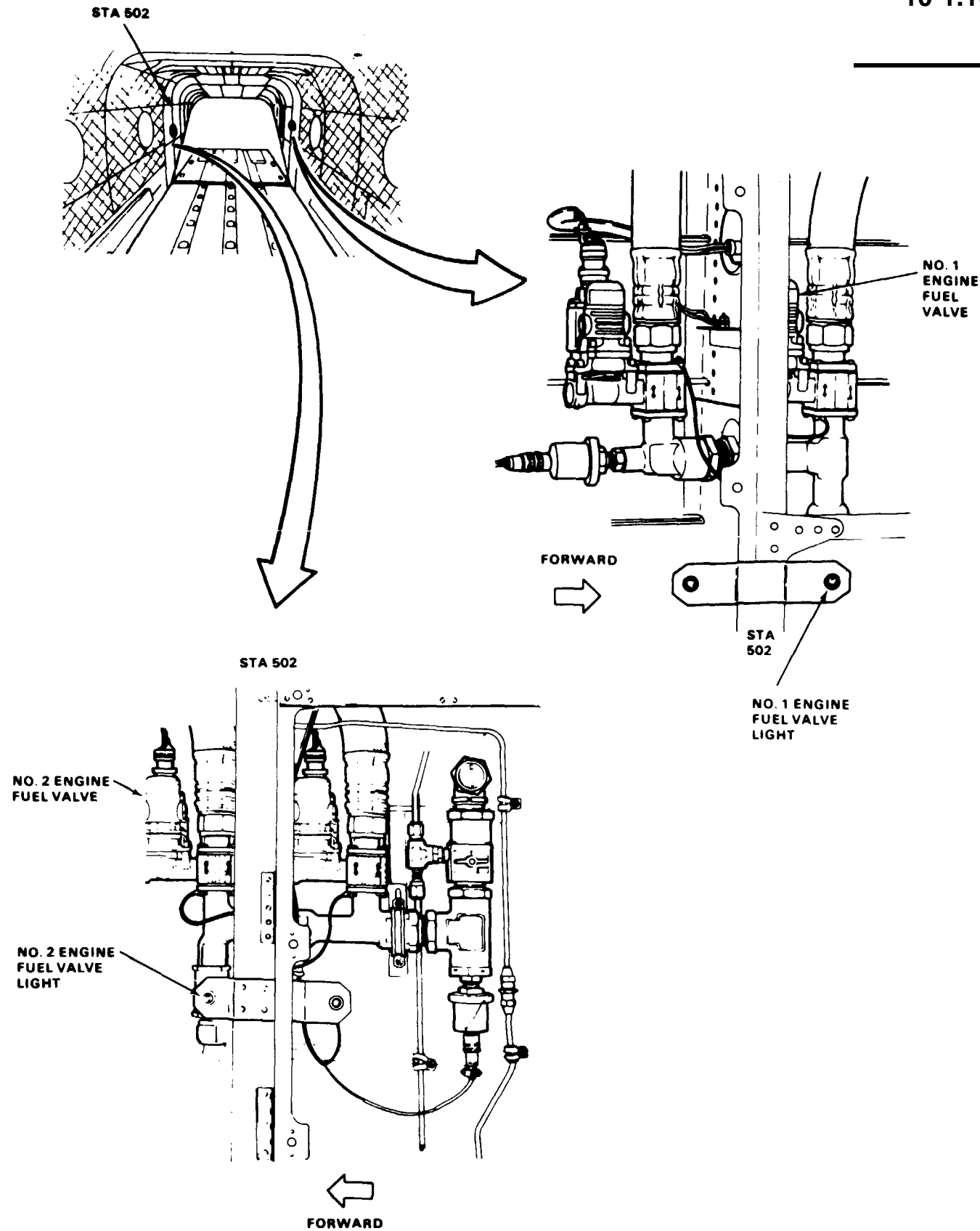
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

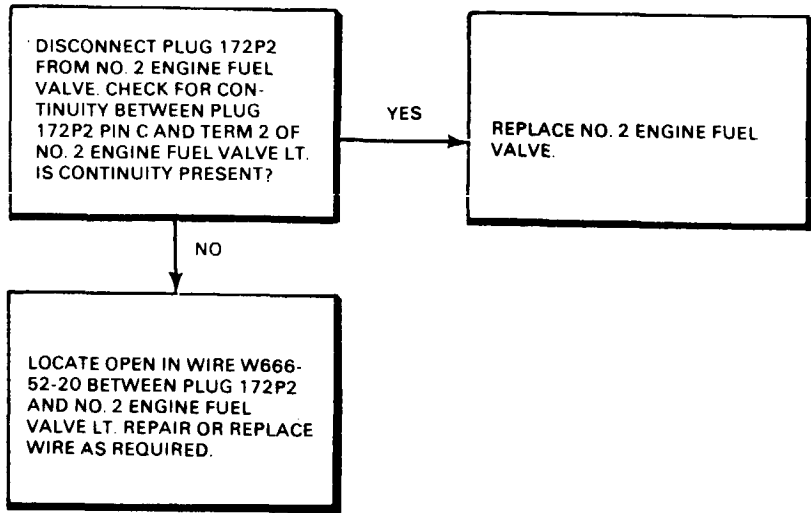
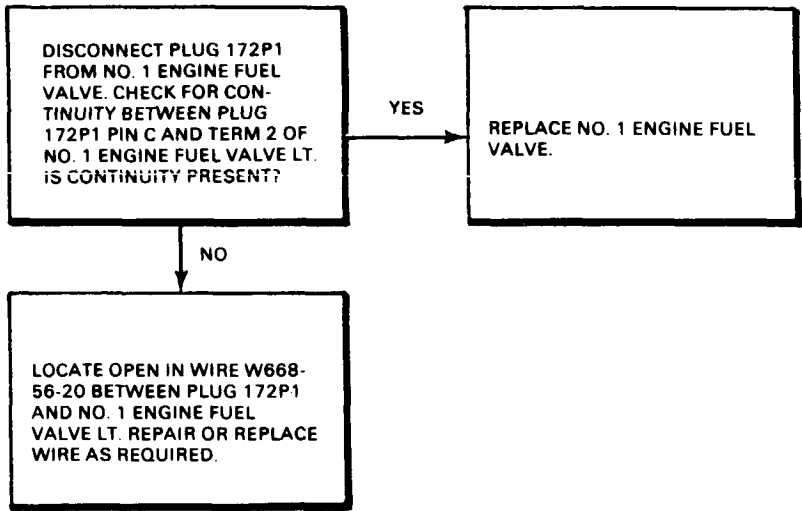


10-1.10 ENGINE FUEL VALVE LIGHT DOES NOT  
COME ON, VALVE OPERATION NORMAL (Continued)

10-1.10

NO. 1 ENGINE FUEL VALVE LIGHT DOES NOT COME ON,  
VALVE OPERATION NORMAL

NO. 2 ENGINE FUEL VALVE LIGHT DOES NOT COME ON,  
VALVE OPERATION NORMAL



END OF TASK

### 10-1.11 ENGINE FUEL VALVE HANDLE IS NOT AT CLSD WITH FIRE HANDLE PULLED

## FAULT ISOLATION PROCEDURE

## INITIAL SETUP

*Applicable Configurations:*

All

**Tools:**

Electrical Repairer's Tool Kit,

NSN 5180-00-323-4915

### Multimeter

**Materials:**

None

**Personnel Required:**

68F20 Aircraft Electrician

**References:**

TM 55-1520-240-23

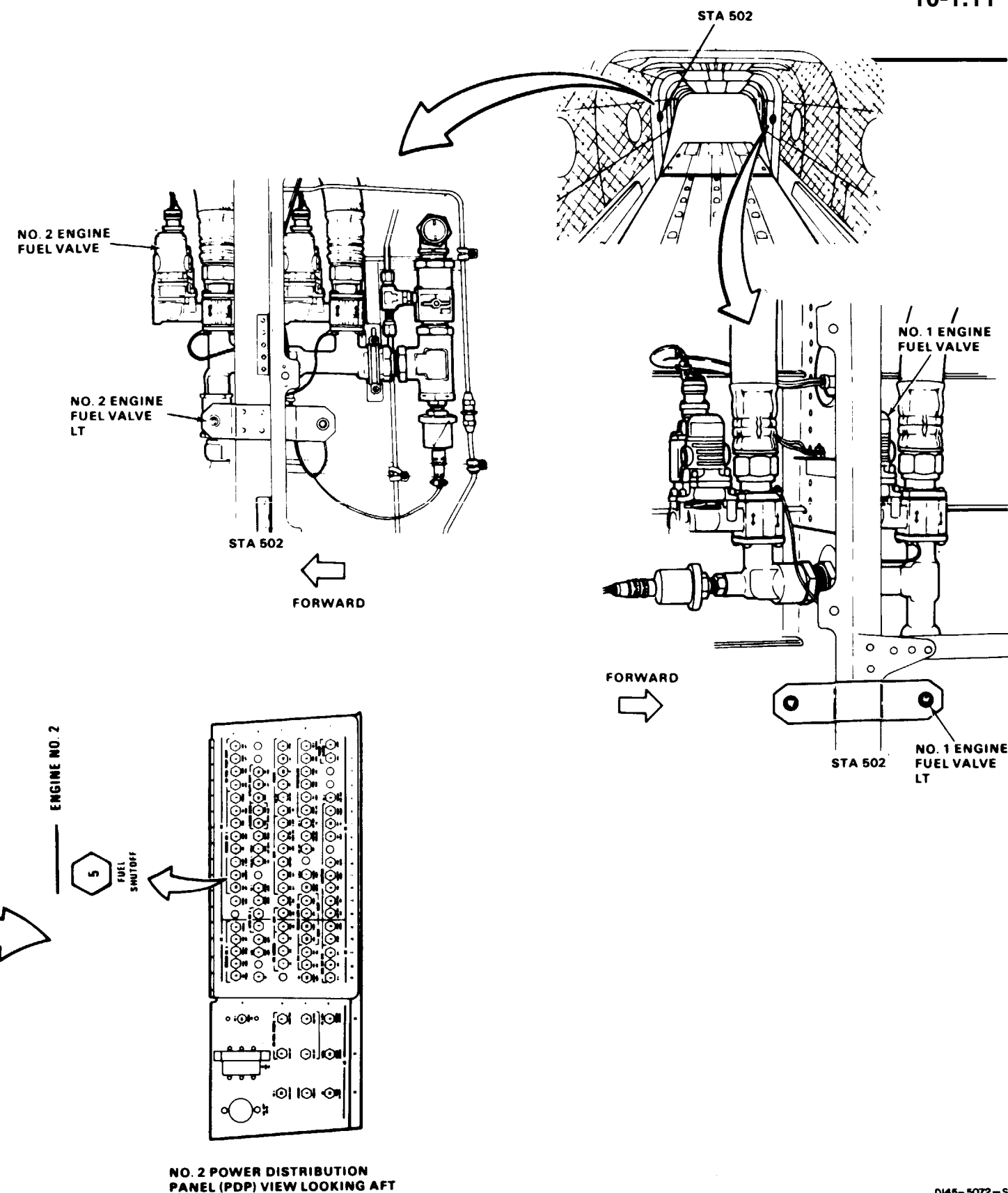
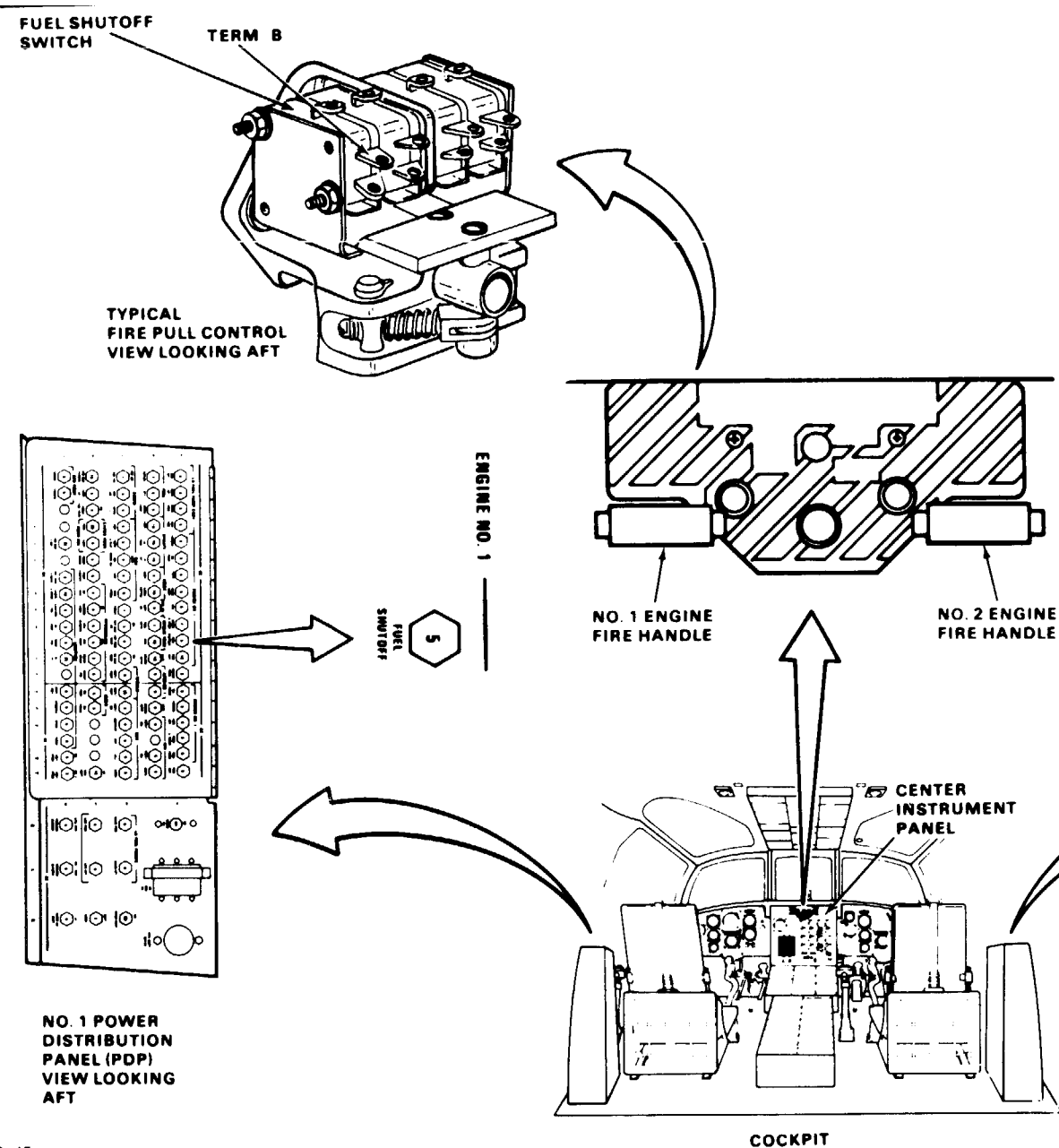
**Equipment Condition:**

TM 55-1520-240-23:

Battery Connected

Electrical Power On

Hydraulic Power Off

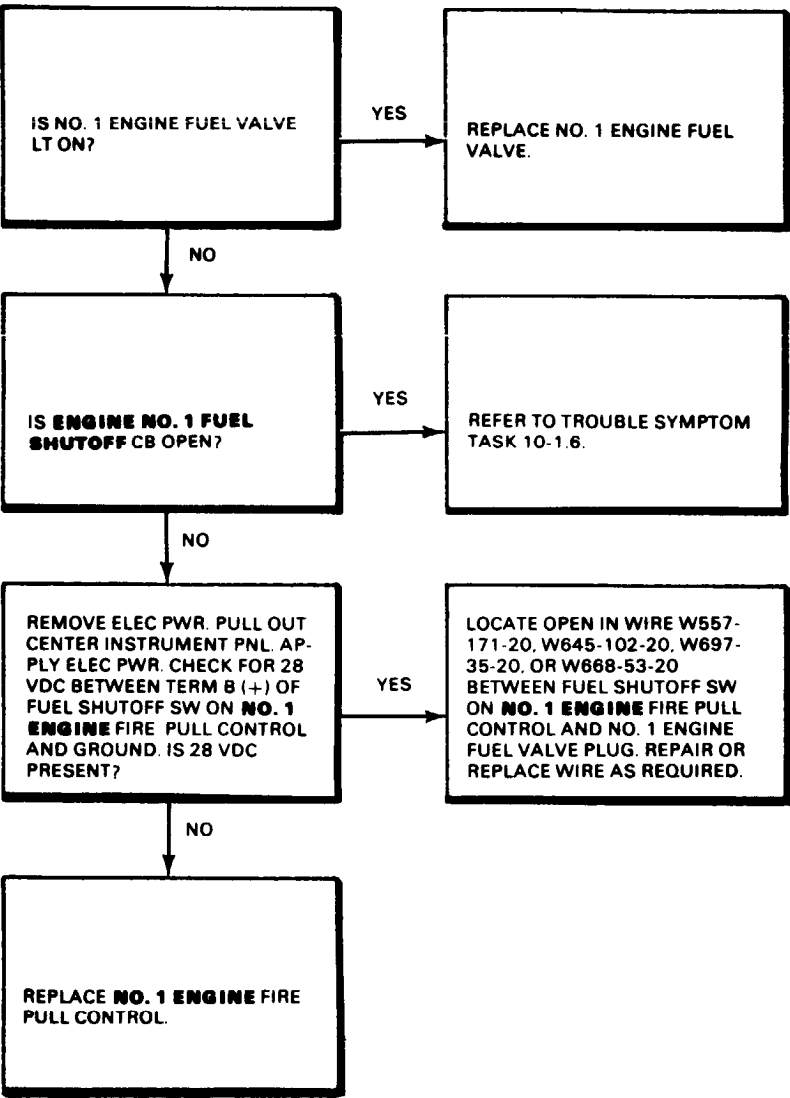




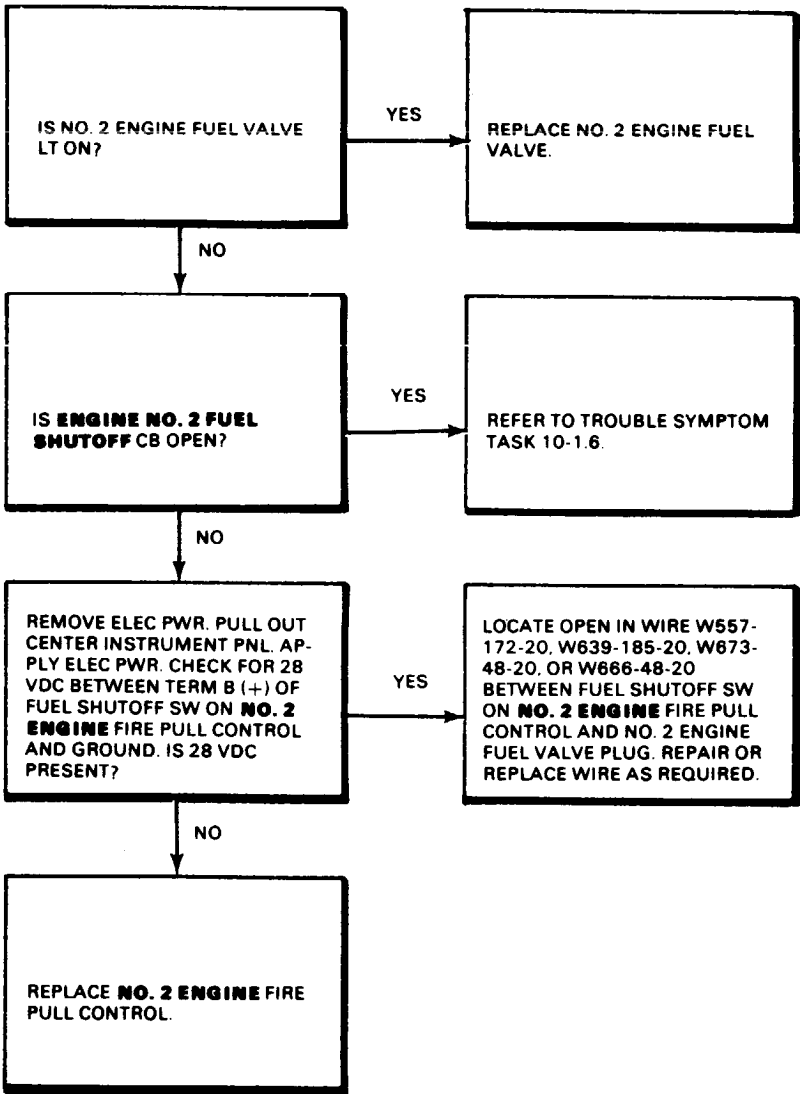
10-1.11 ENGINE FUEL VALVE HANDLE IS NOT AT CLSD  
WITH FIRE HANDLE PULLED (Continued)

10-1.11

NO. 1 ENGINE FUEL VALVE HANDLE IS NOT AT CLSD  
WITH NO. 1 ENGINE FIRE HANDLE PULLED



NO. 2 ENGINE FUEL VALVE HANDLE IS NOT AT CLSD  
WITH NO. 2 ENGINE FIRE HANDLE PULLED



END OF TASK

10-1.12 LEFT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST

10-1.12

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

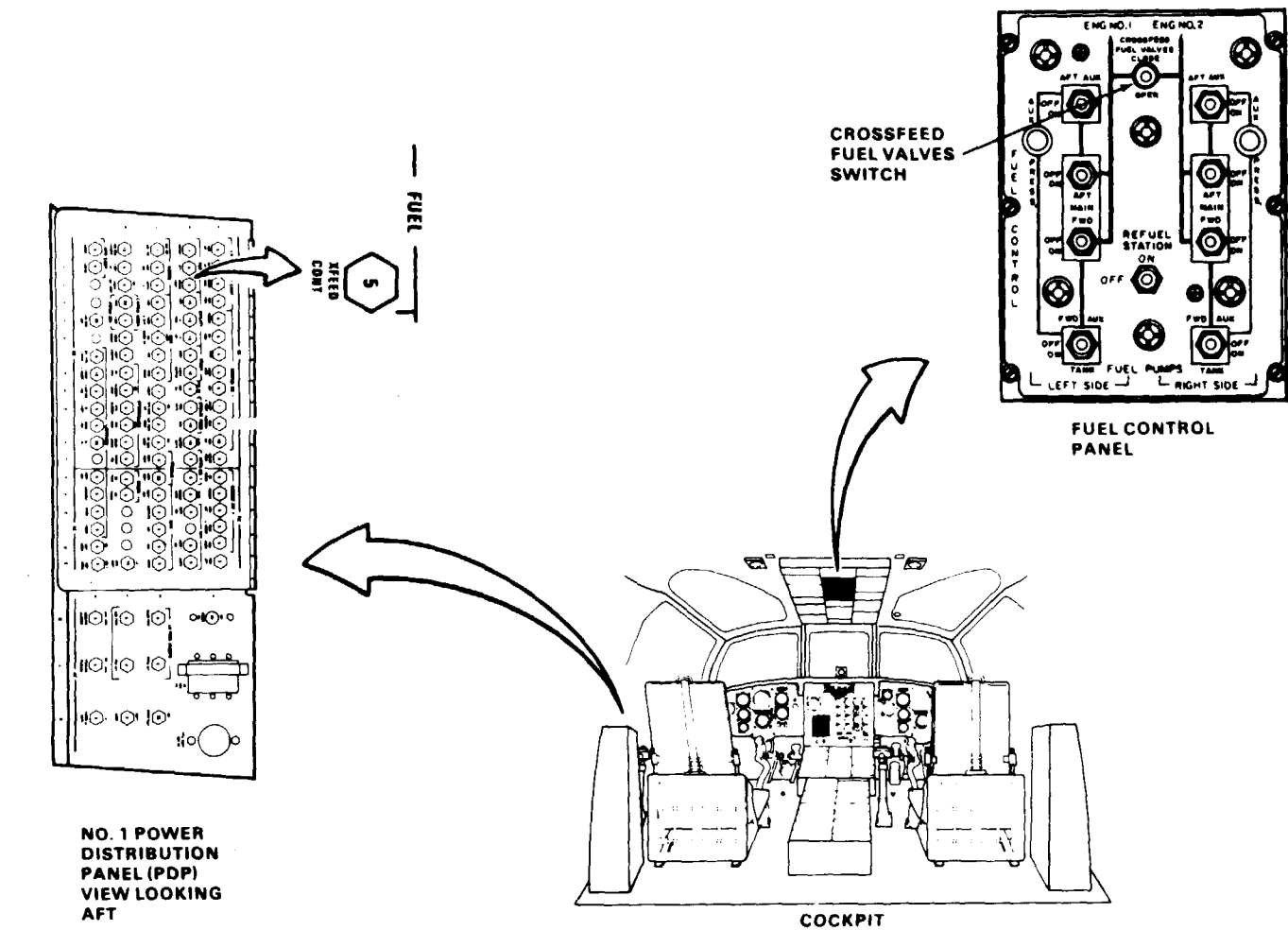
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

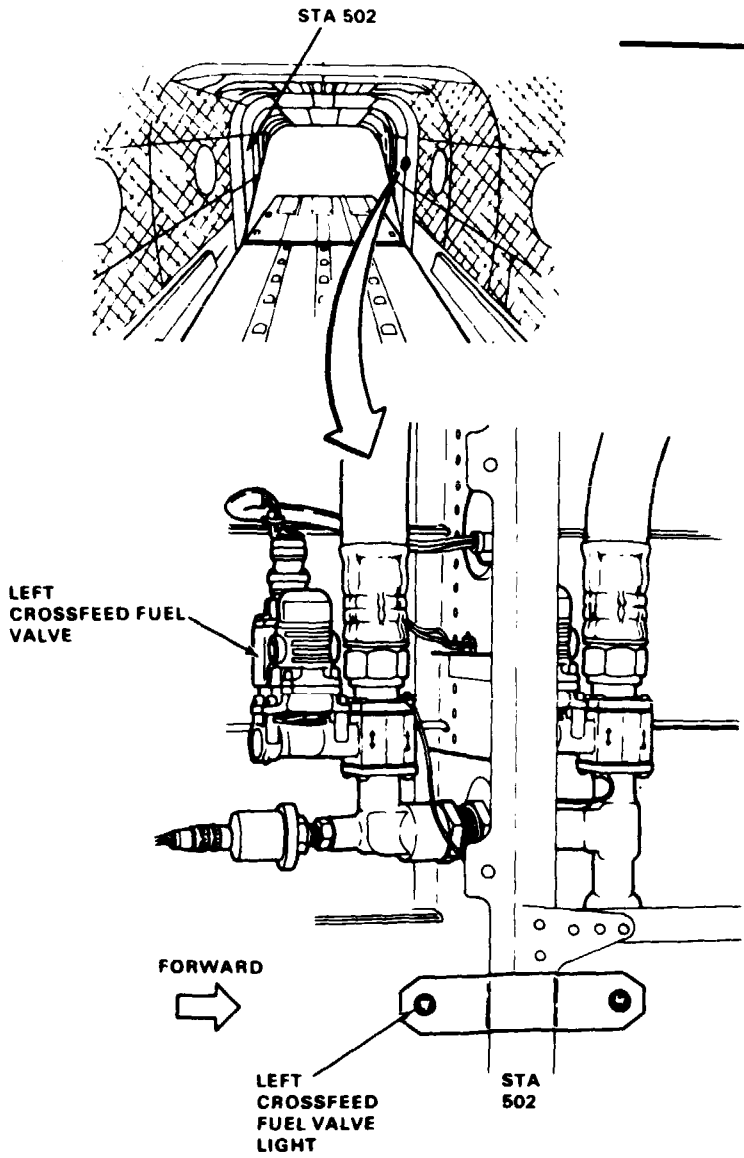
Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

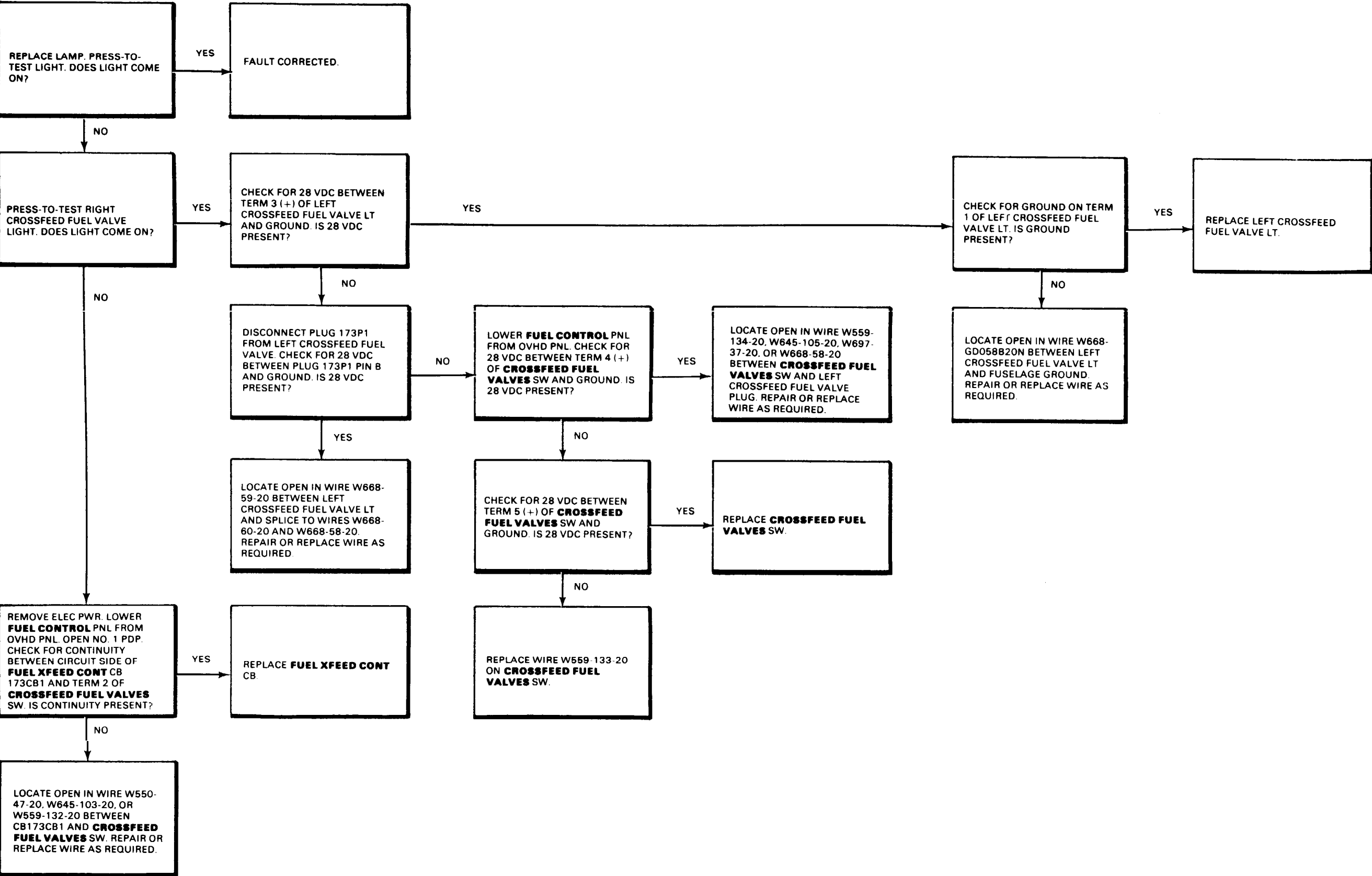


90x45



10-1.12 LEFT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST (Continued)

10-1.12



END OF TASK

10-1.13 RIGHT CROSSFEED FUEL VALVE LIGHT DOES NOT  
COME ON DURING PRESS-TO-TEST

10-1.13

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Personnel Required:  
68F20 Aircraft Electrician

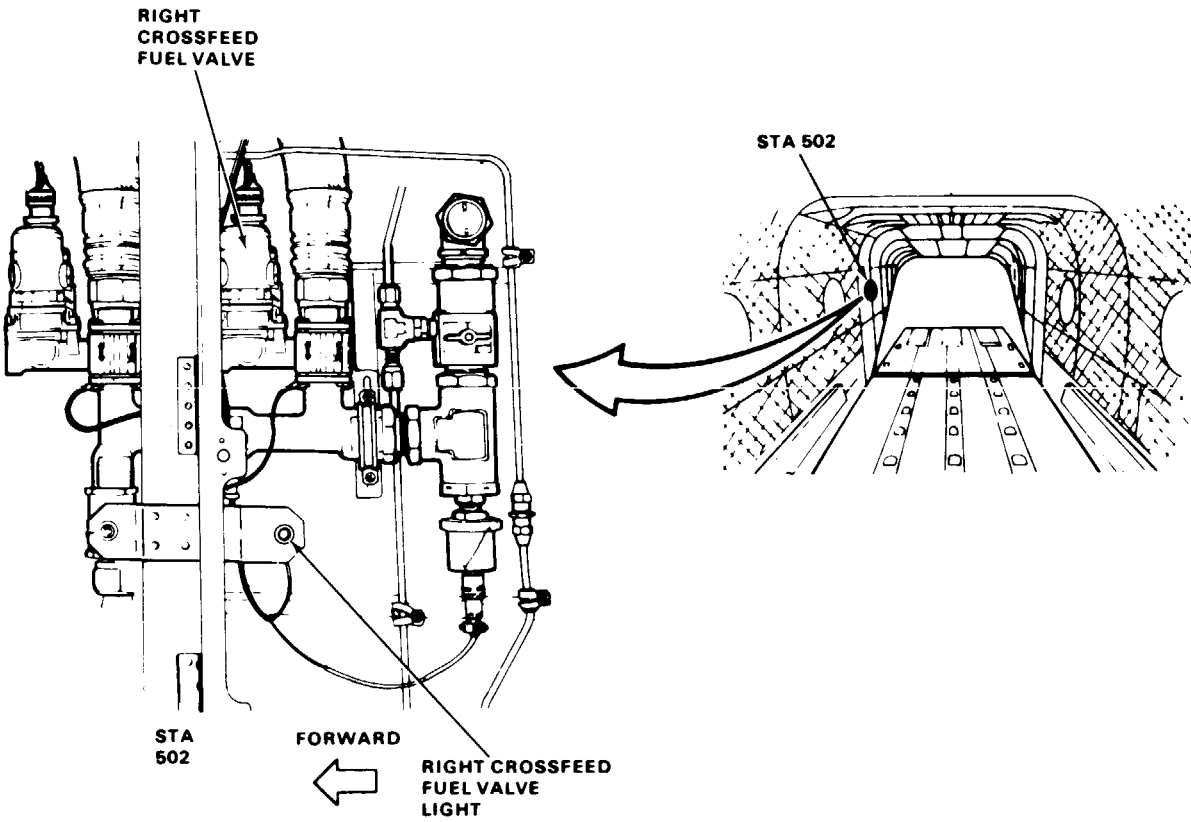
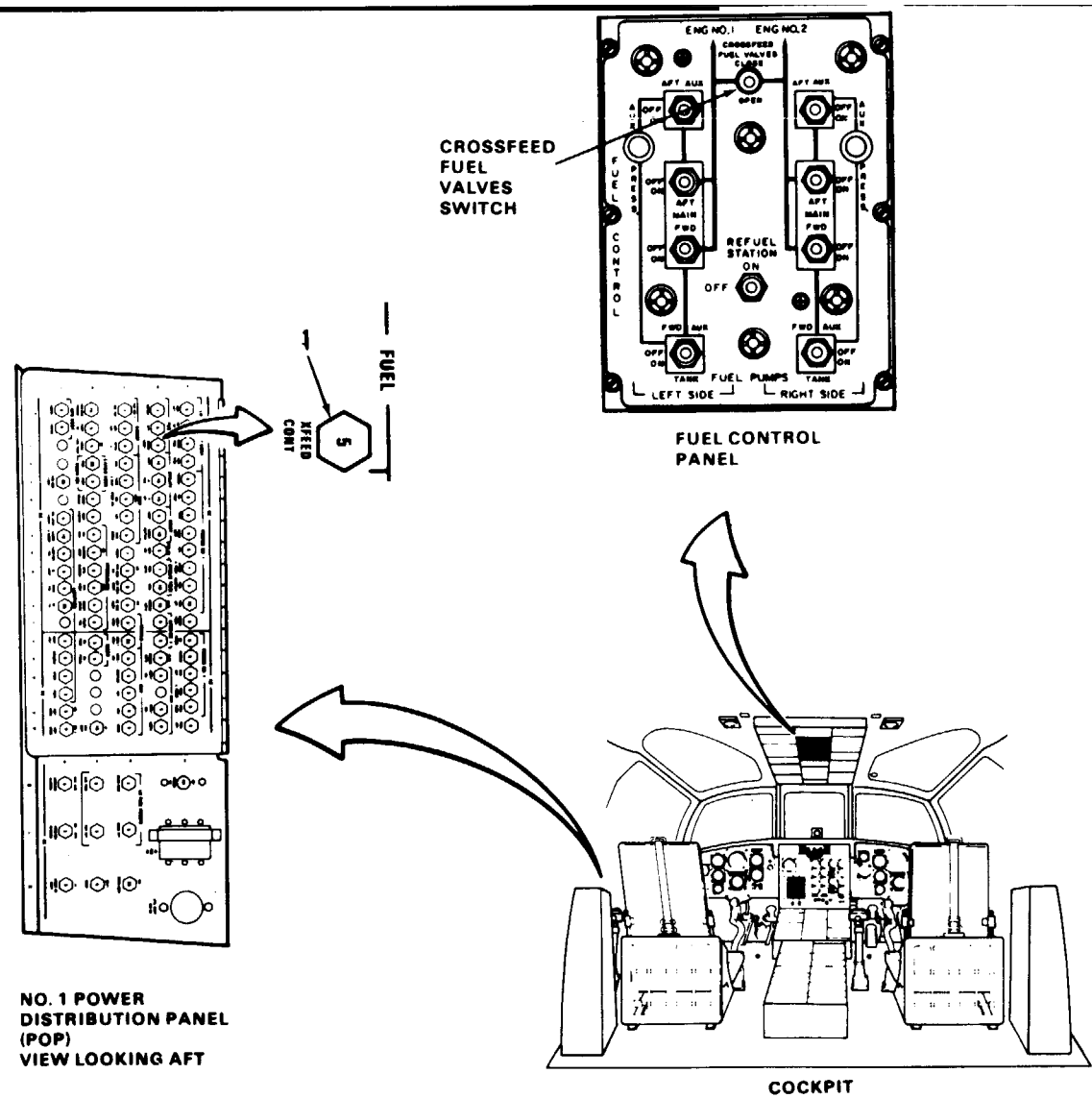
Applicable Configurations:  
All

References:  
TM 55-1520-240-23

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

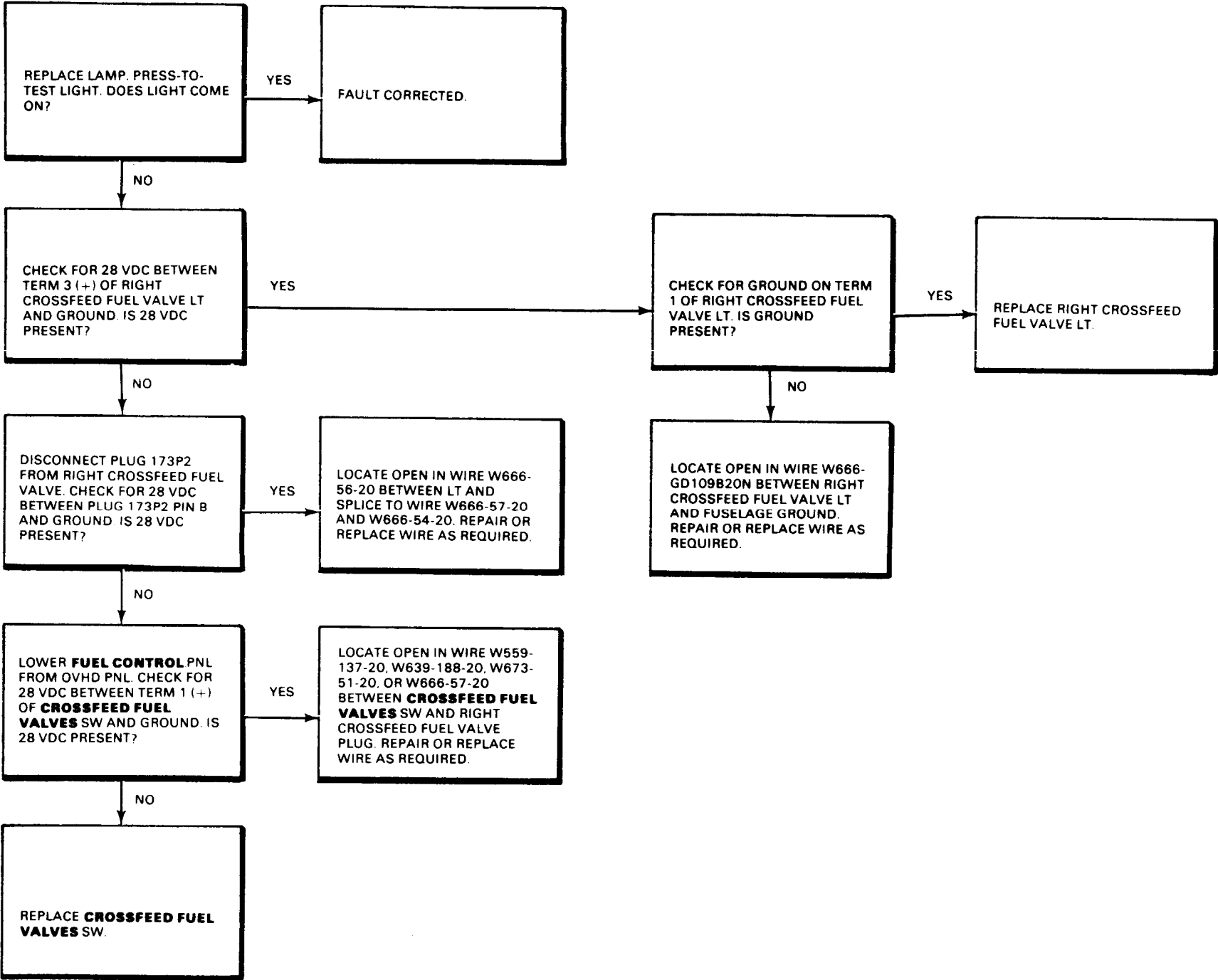
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

Materials:  
None



10-1.13 RIGHT CROSSFEED FUEL VALVE LIGHT DOES NOT  
COME ON DURING PRESS-TO-TEST (Continued)

10-1.13



END OF TASK

10-1.14 CROSSFEED FUEL VALVE HANDLE IS NOT AT OPEN WITH  
CROSSFEED FUEL VALVES SWITCH AT OPEN

10-1.14

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

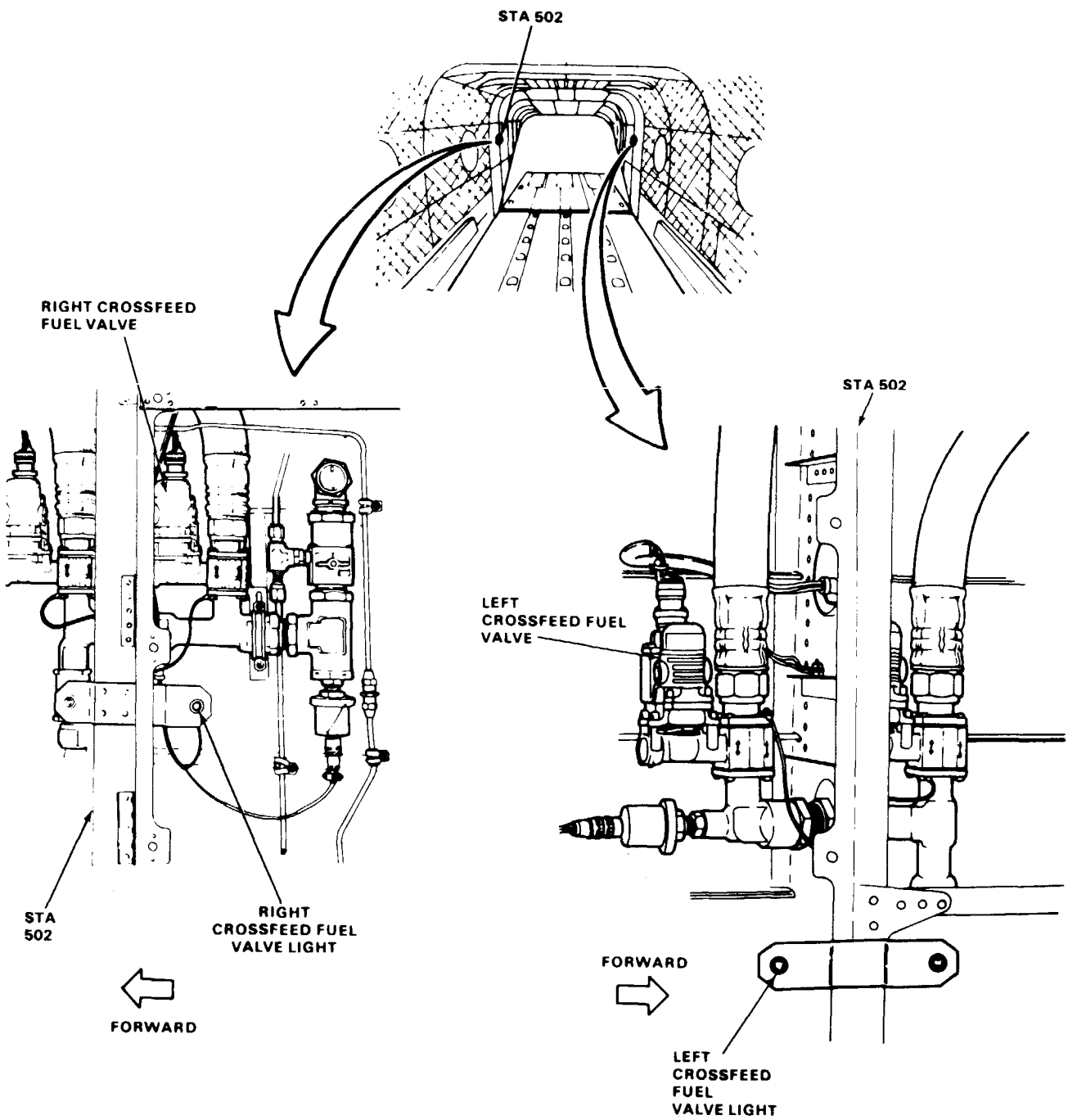
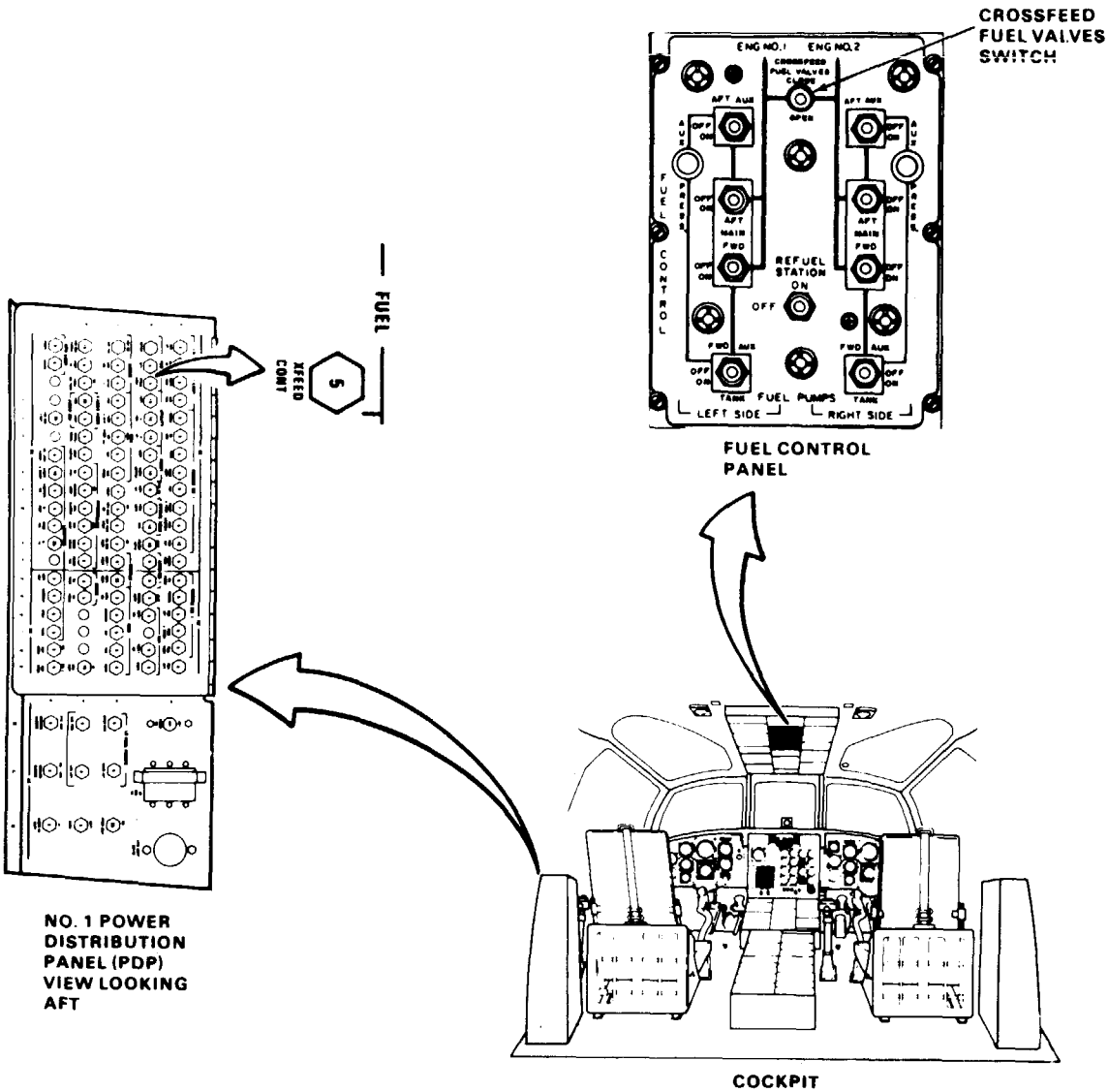
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



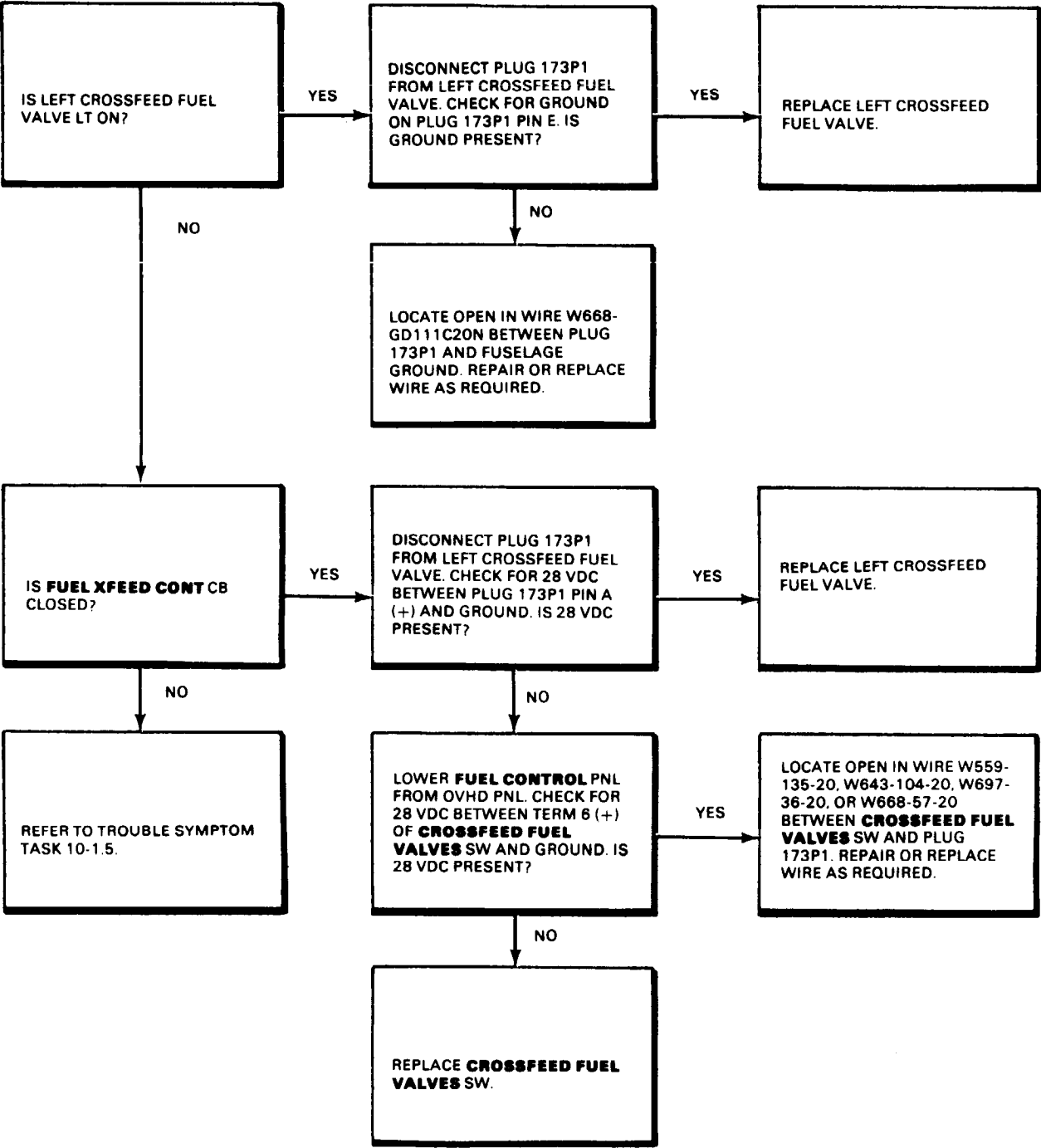
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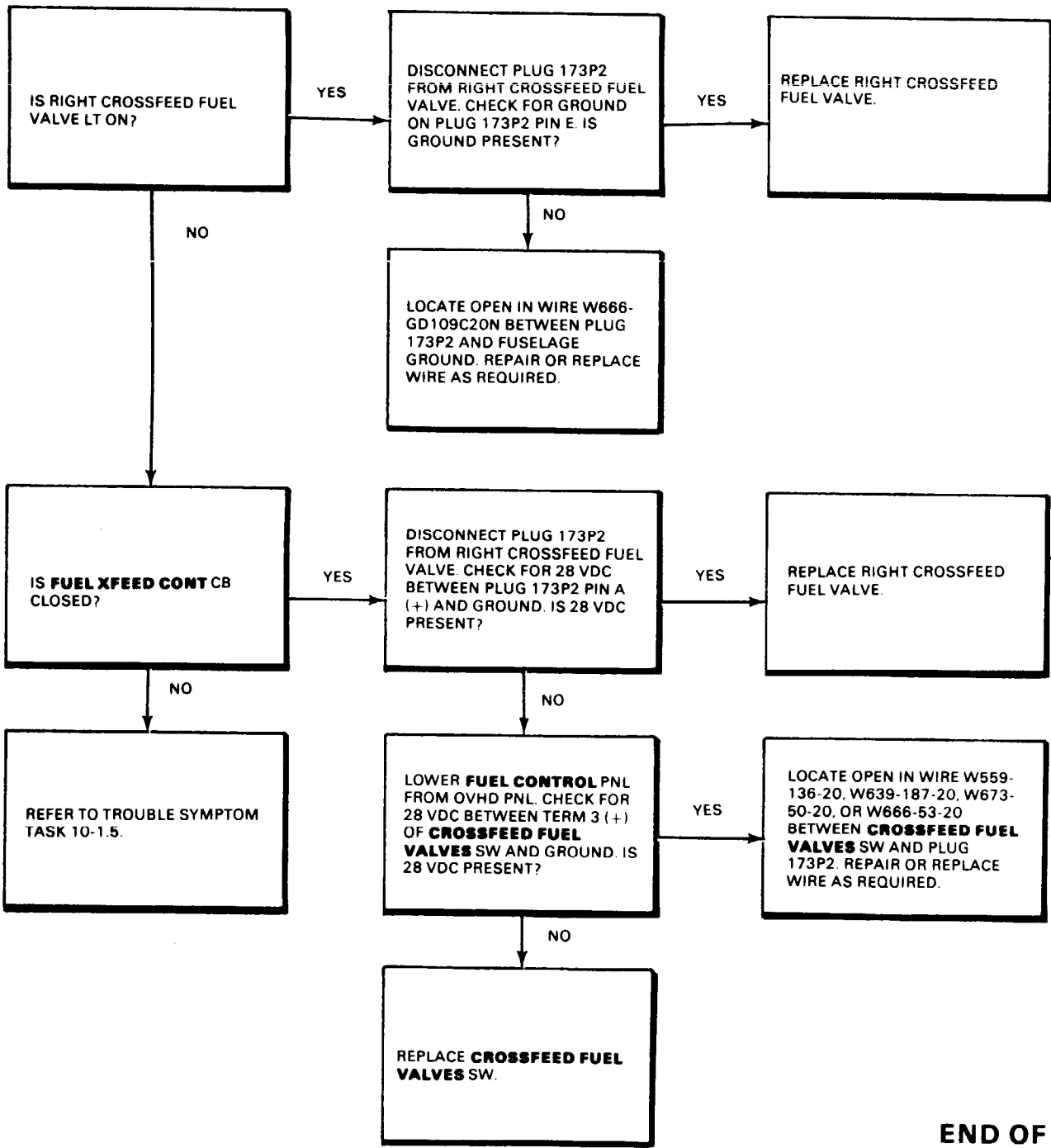
10-1.14 CROSSFEED FUEL VALVE HANDLE IS NOT AT OPEN  
WITH CROSSFEED FUEL VALVES SWITCH AT OPEN (Continued)

10-1.14

LEFT CROSSFEED FUEL VALVE HANDLE IS NOT AT OPEN  
WITH CROSSFEED FUEL VALVES SWITCH AT OPEN



RIGHT CROSSFEED FUEL VALVE HANDLE IS NOT AT OPEN  
WITH CROSSFEED FUEL VALVES SWITCH AT OPEN



END OF TASK

10-1.15 CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Personnel Required:  
68F20 Aircraft Electrician

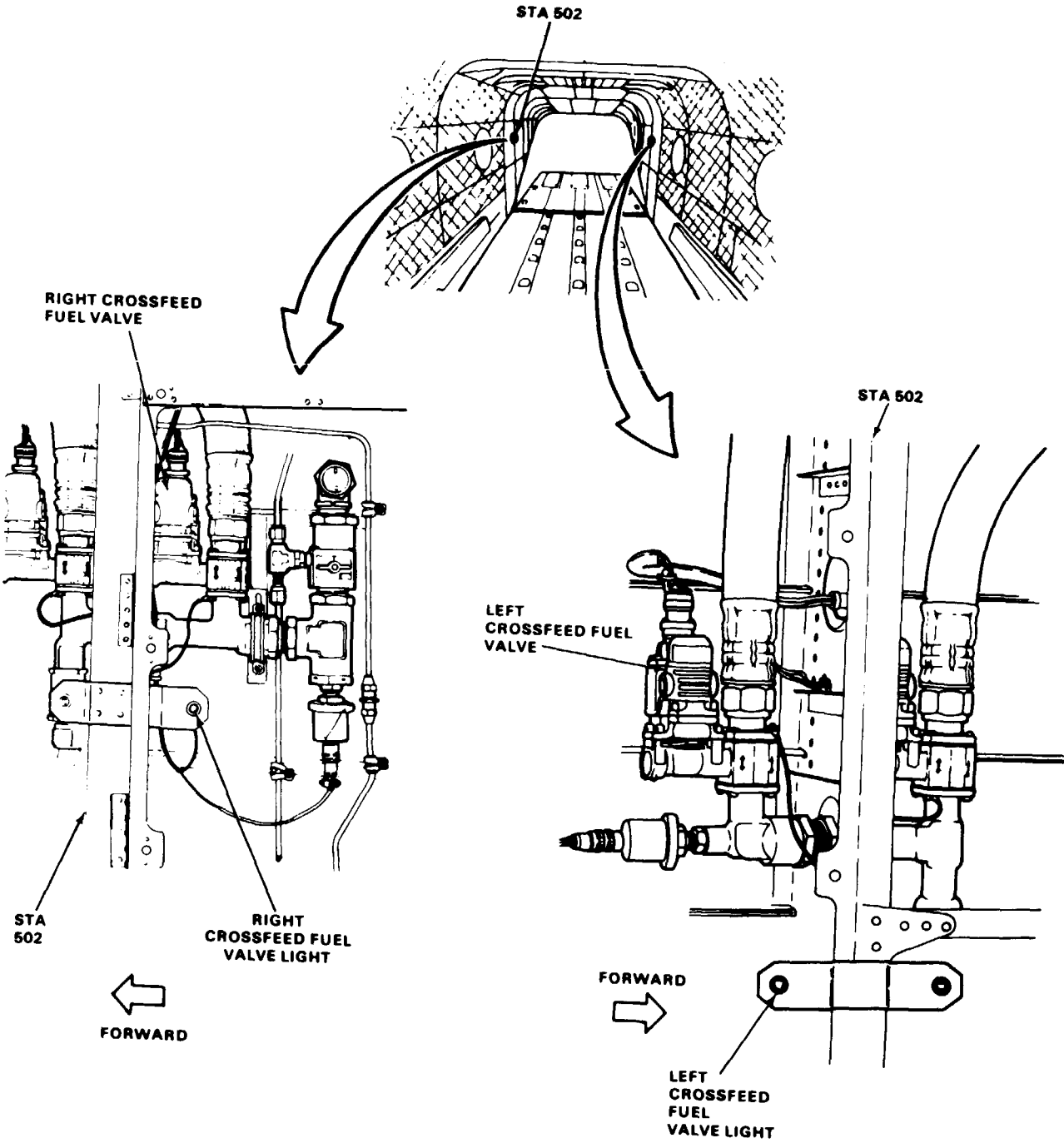
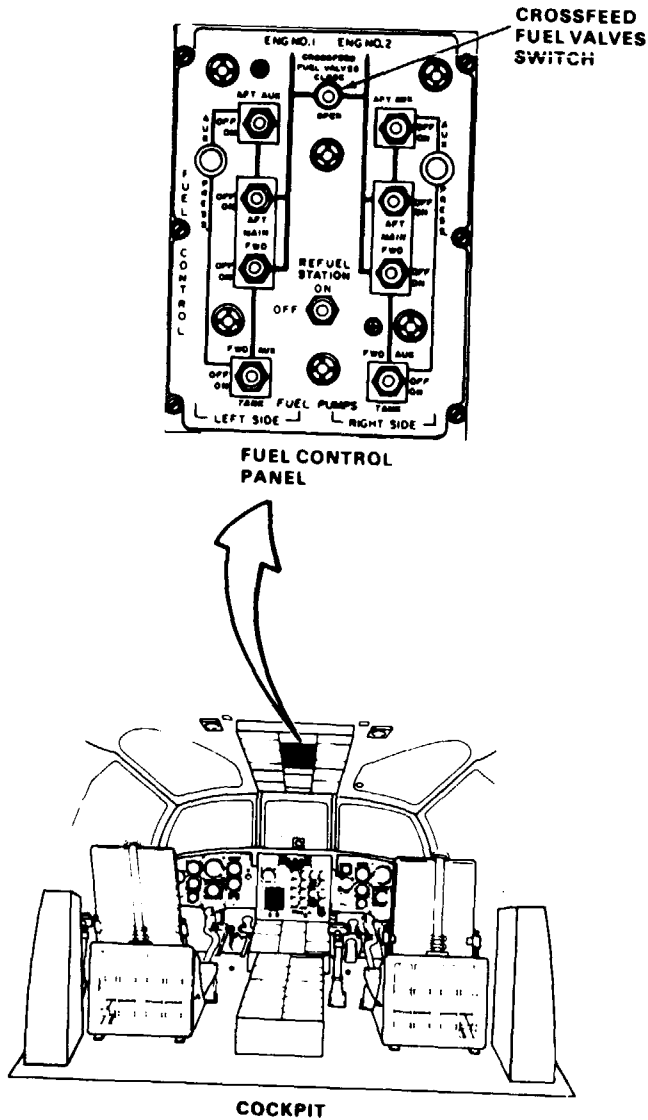
Applicable Configurations:  
All

References:  
TM 55-1520-240-23

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

Materials:  
None



D145-3076-SPA

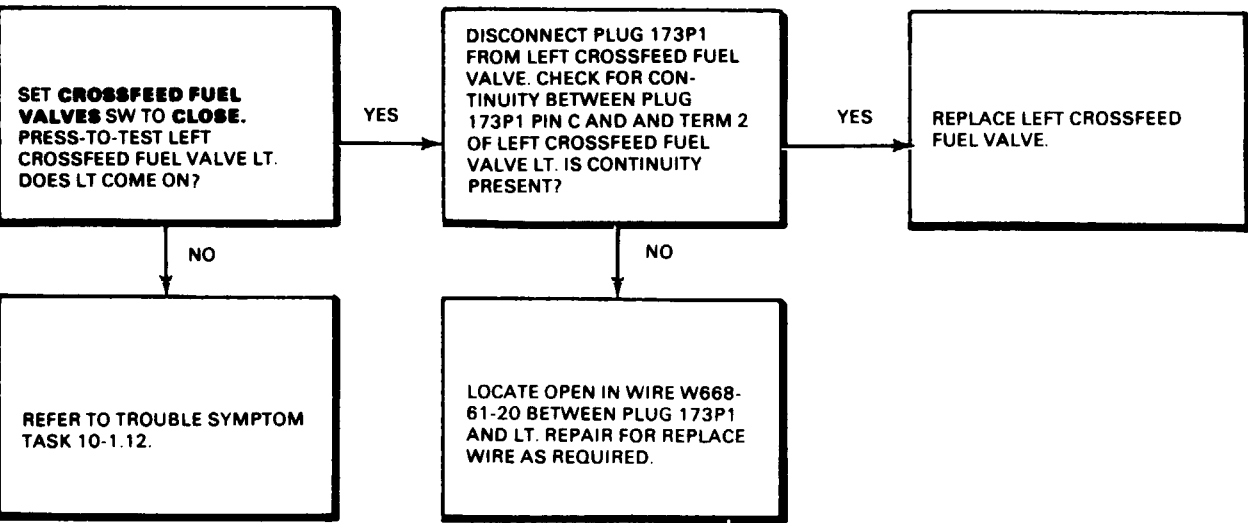
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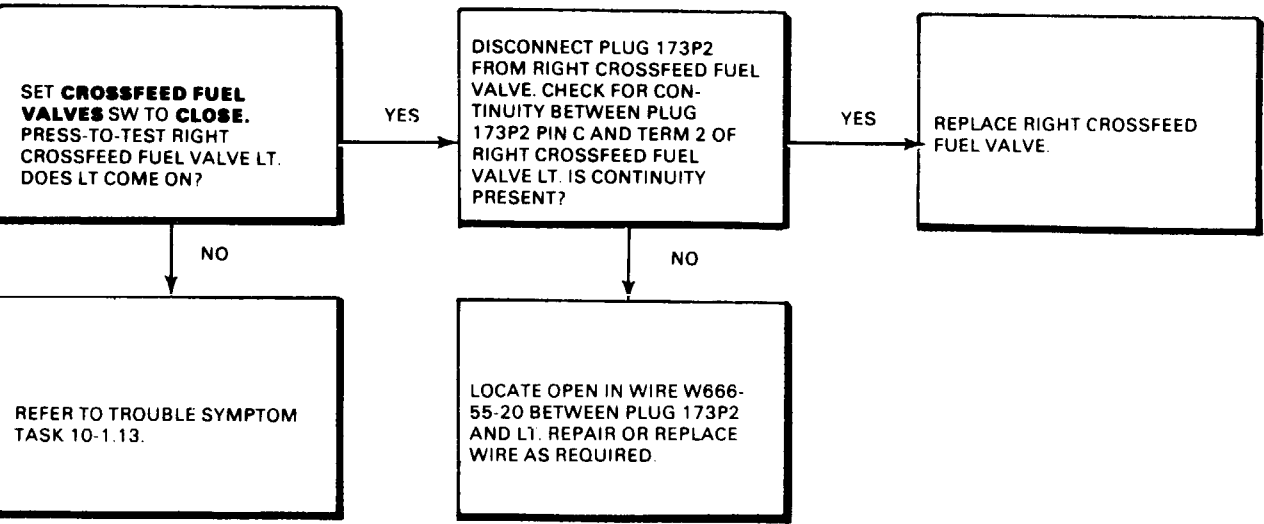
10-1.15 CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL (Continued)

10-1.15

LEFT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL



RIGHT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL



10-1.16 CROSSFEED FUEL VALVE HANDLE IS NOT AT CLSD  
WITH CROSSFEED FUEL VALVES SWITCH AT CLOSE

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

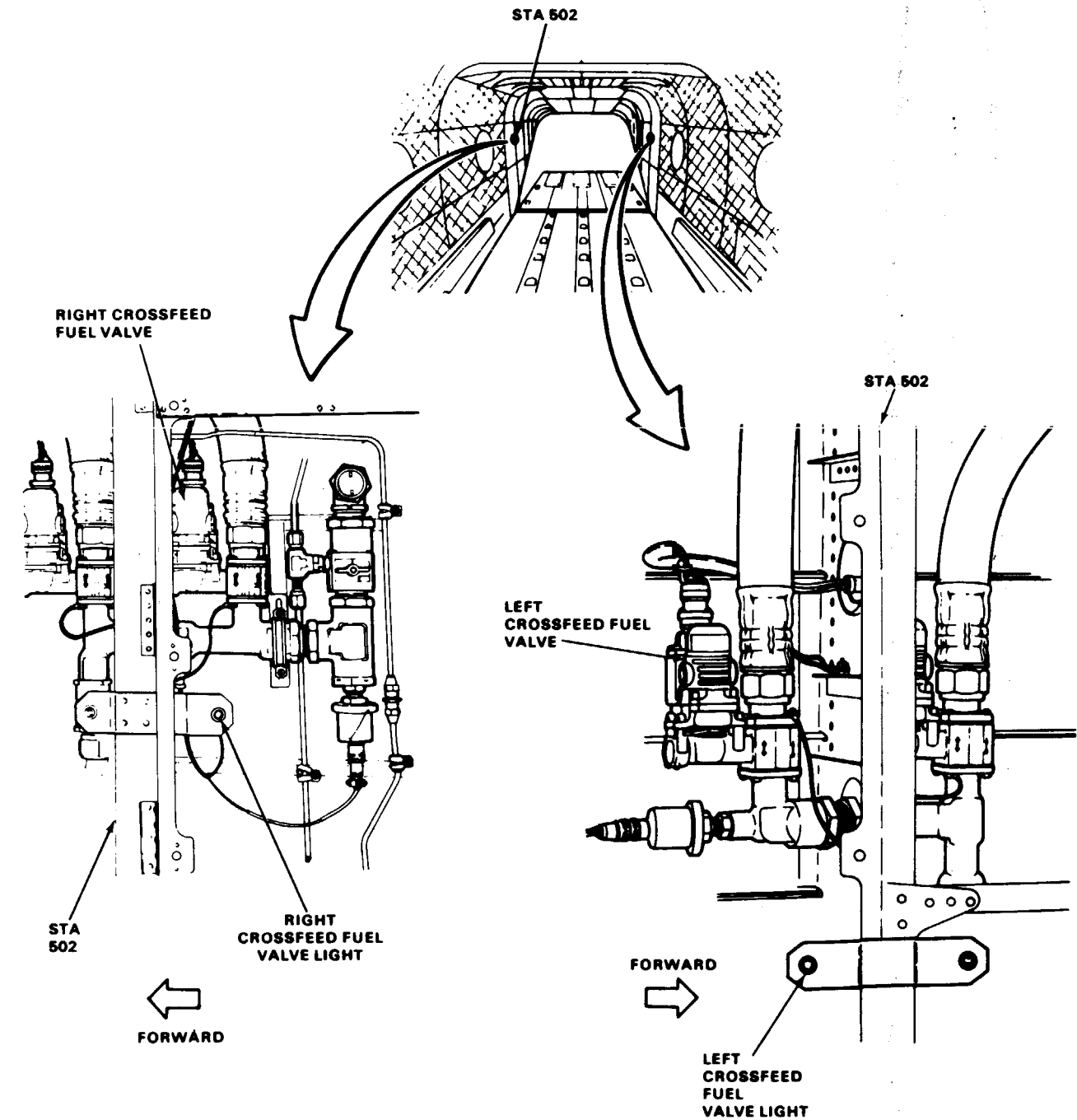
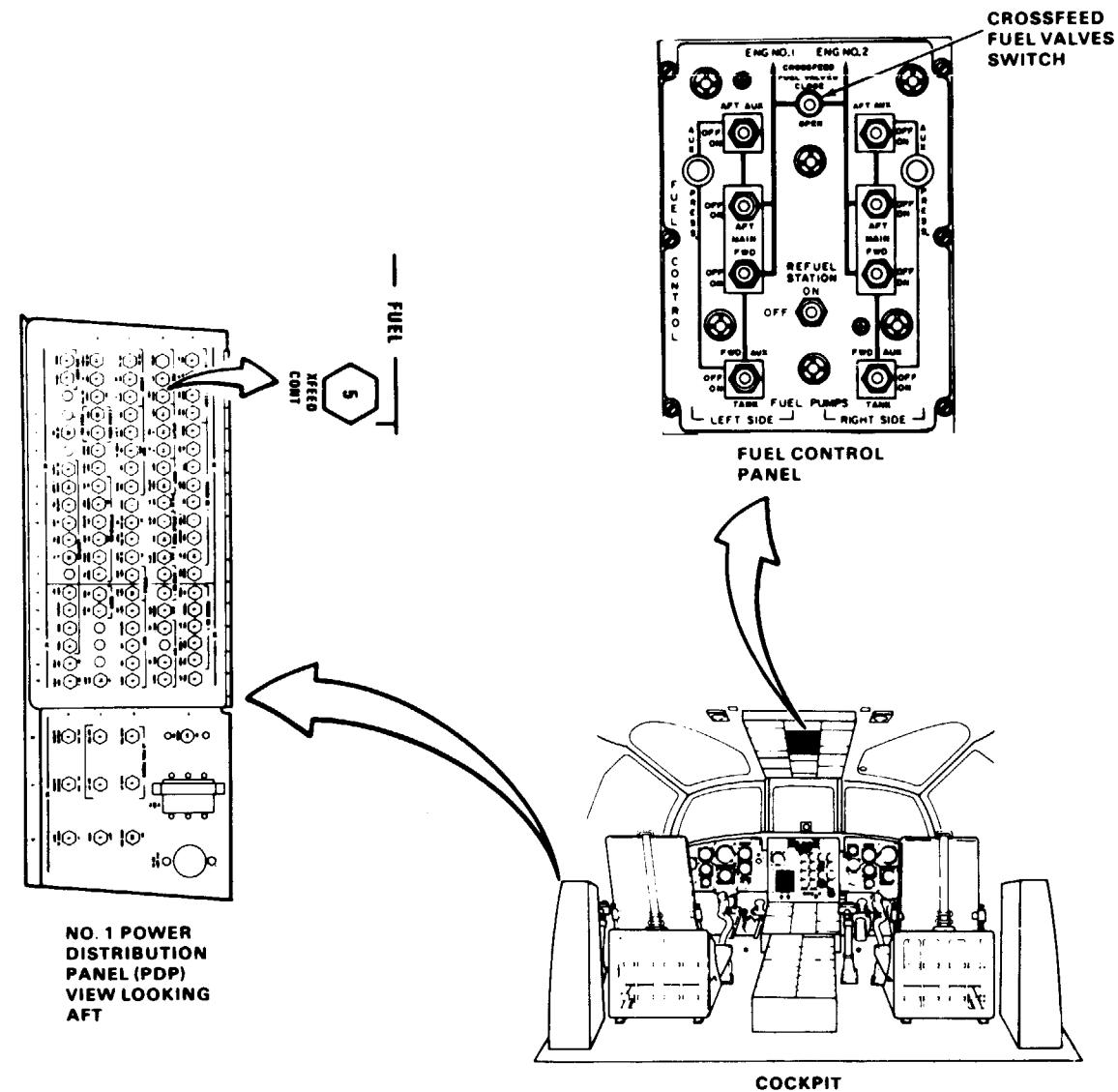
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

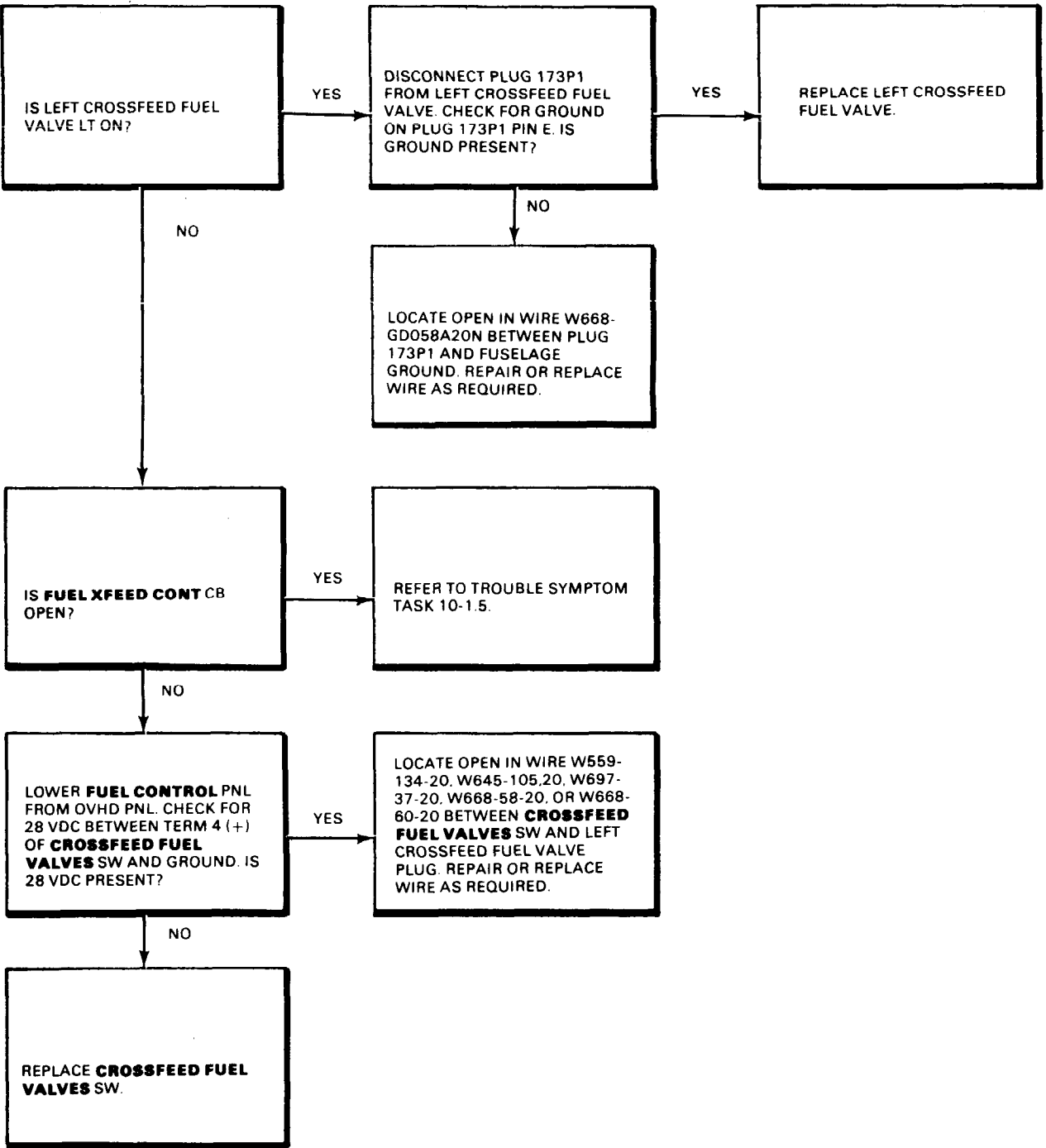
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



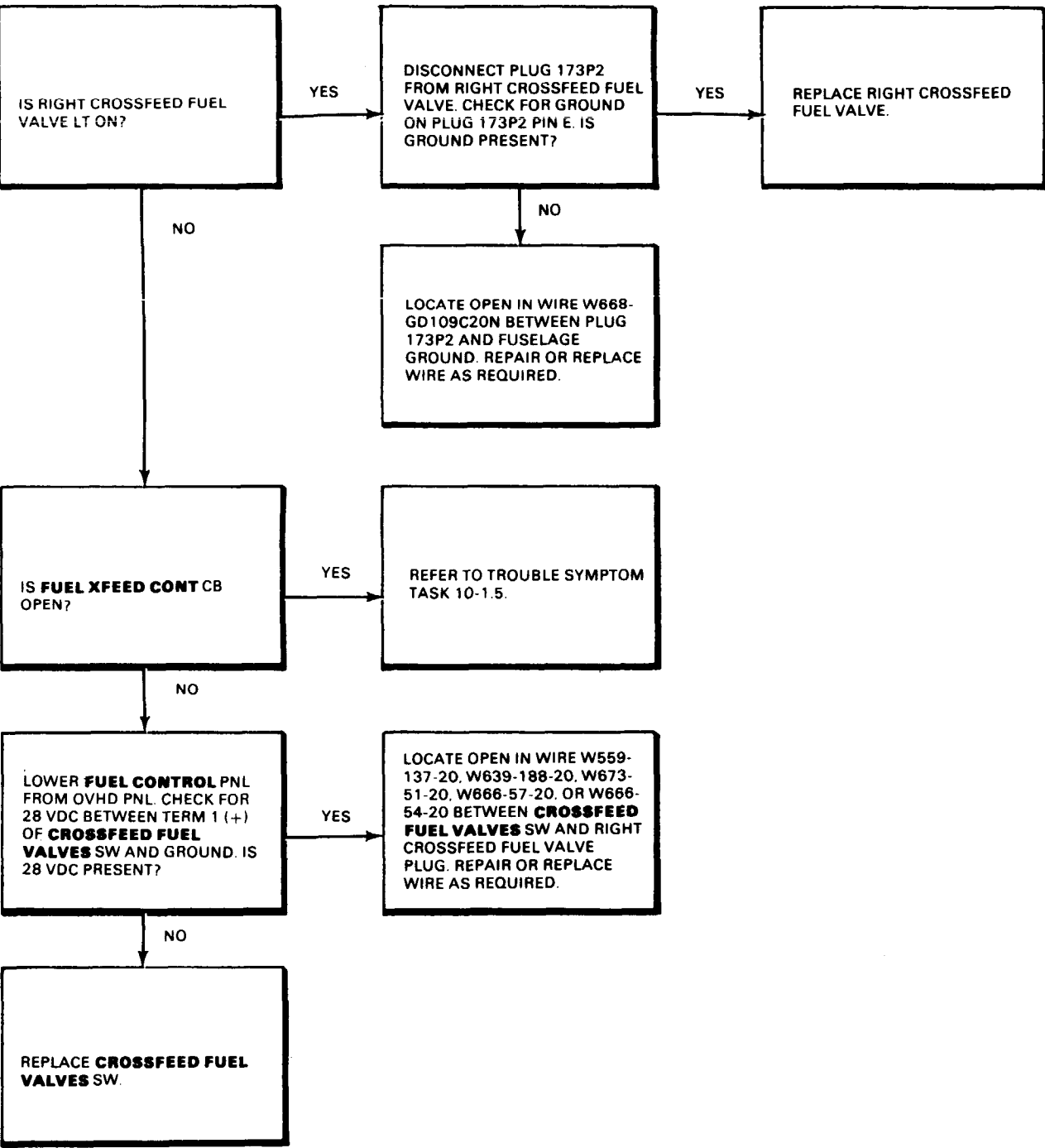
10-1.16 CROSSFEED FUEL VALVE HANDLE IS NOT AT CLSD  
WITH CROSSFEED FUEL VALVES SWITCH AT CLOSE (Continued)

10-1.16

LEFT CROSSFEED FUEL VALVE HANDLE IS NOT AT CLSD  
WITH CROSSFEED FUEL VALVES SWITCH AT CLOSE.

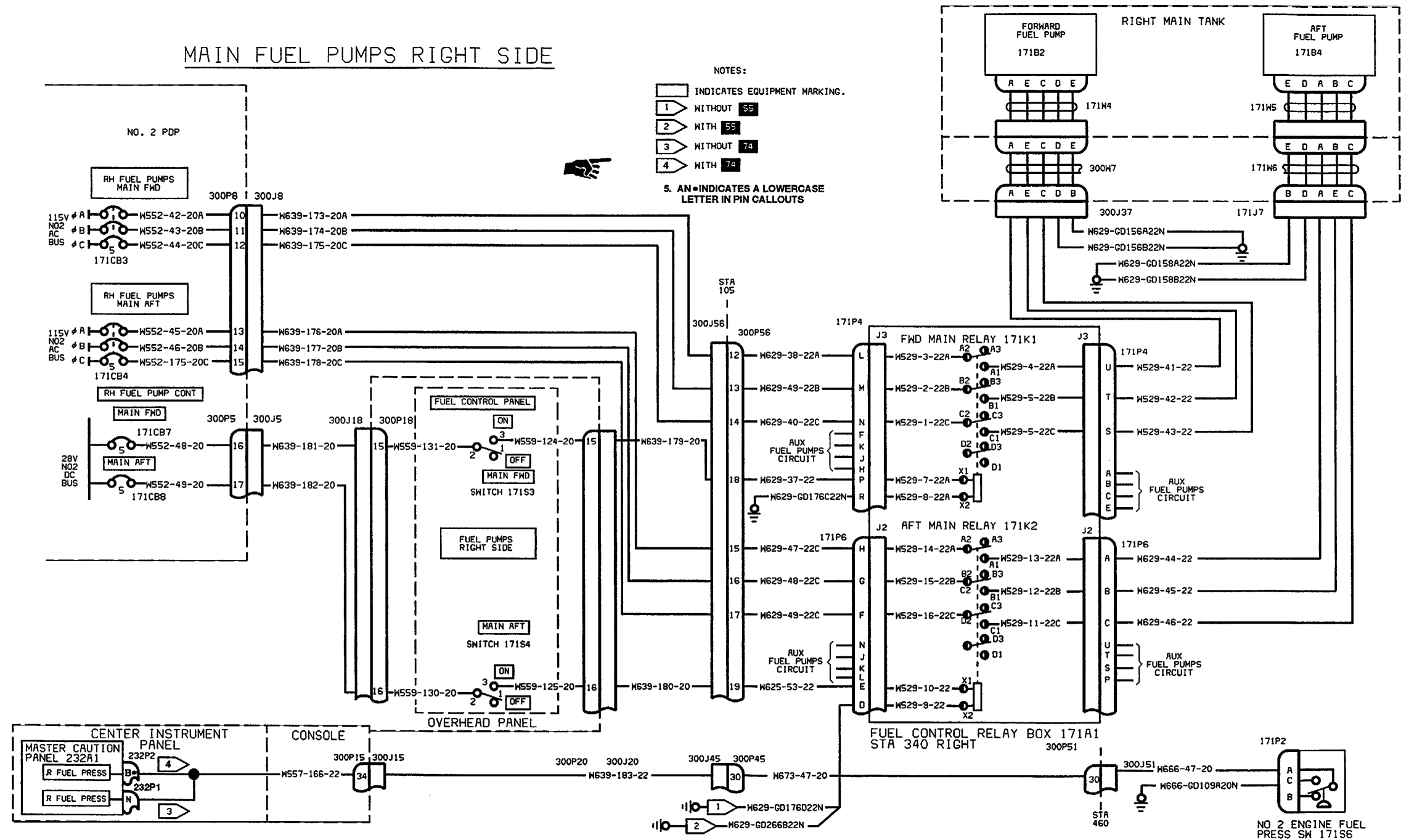


RIGHT CROSSFEED FUEL VALVE HANDLE IS NOT AT CLSD  
WITH CROSSFEED FUEL VALVES SWITCH AT CLOSE.



END OF TASK

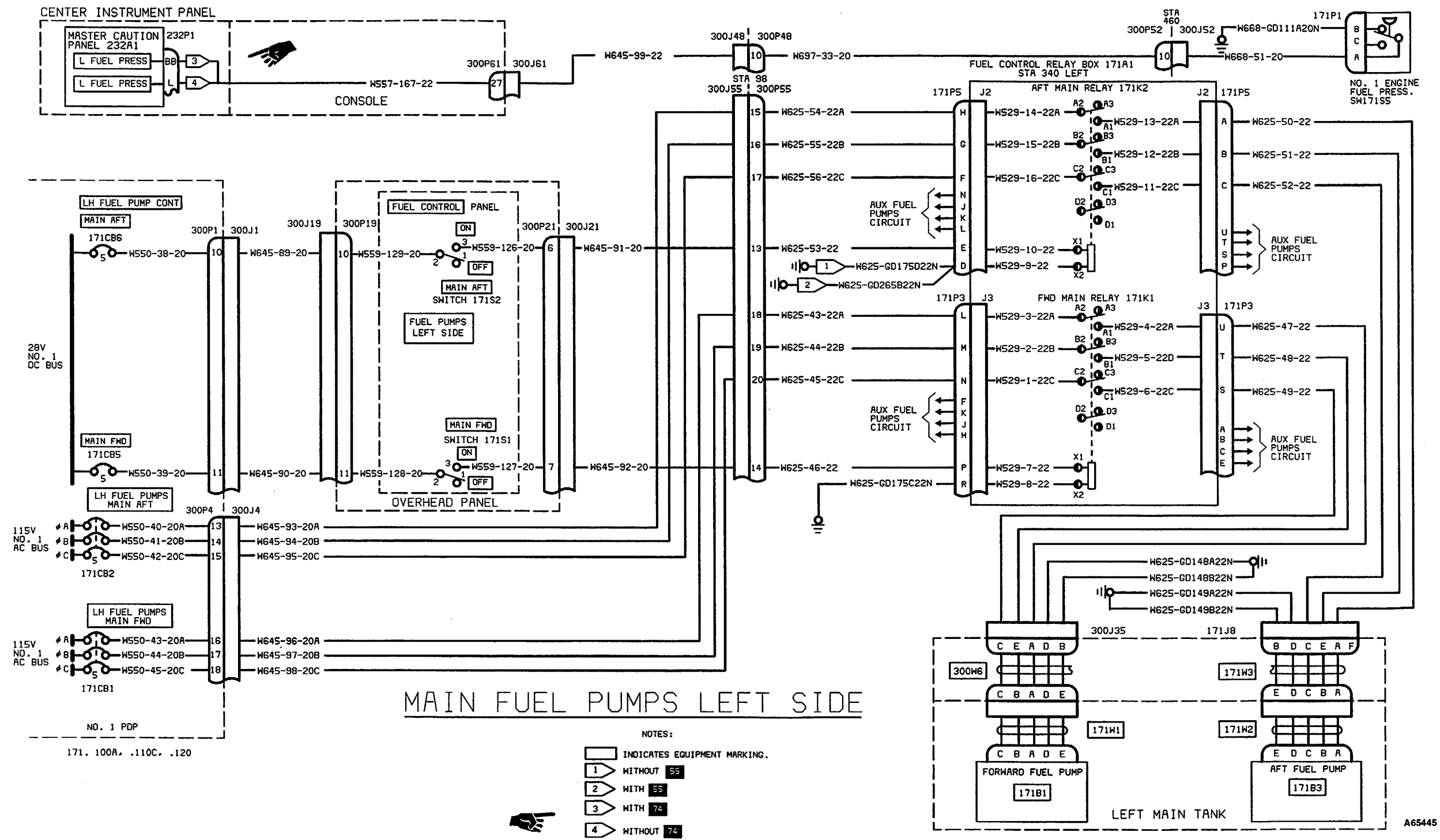
10-2 FUEL BOOST PUMPS

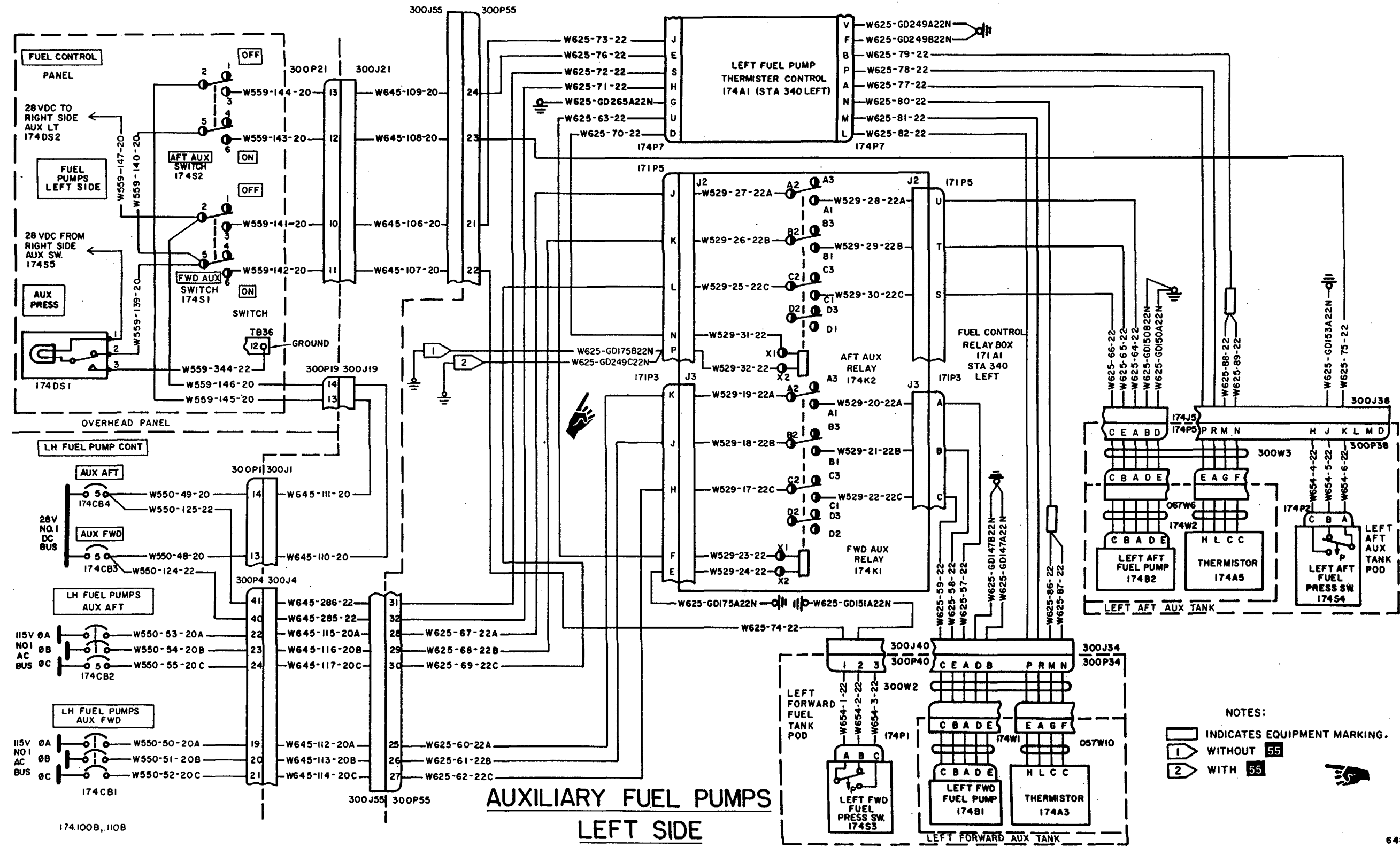


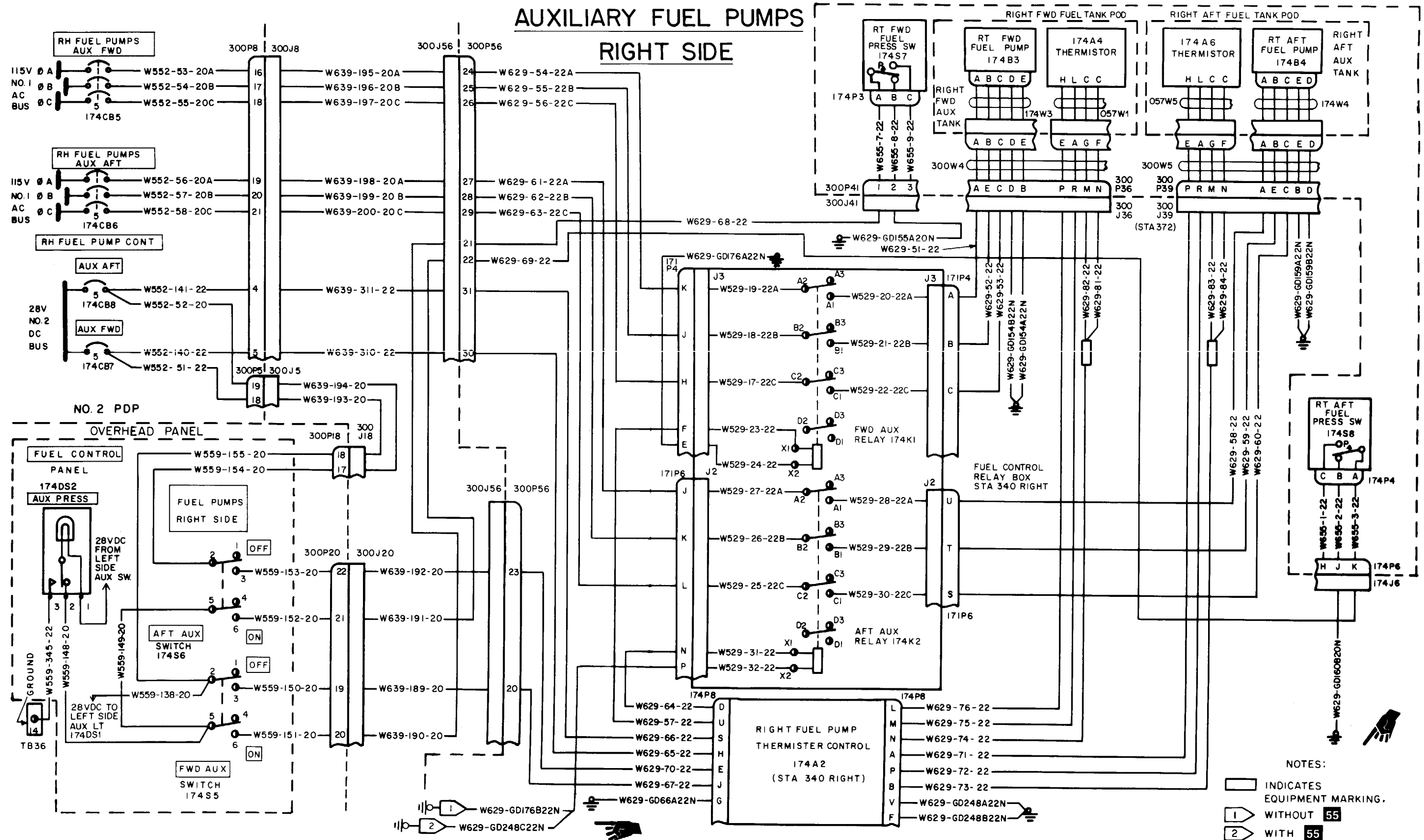
A73598

10-2.1 FUEL BOOST PUMPS WIRING DIAGRAM (Continued)

10-2.1









10-2.2 FUEL BOOST PUMP SYSTEM VISUAL CHECK

10-2.2

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

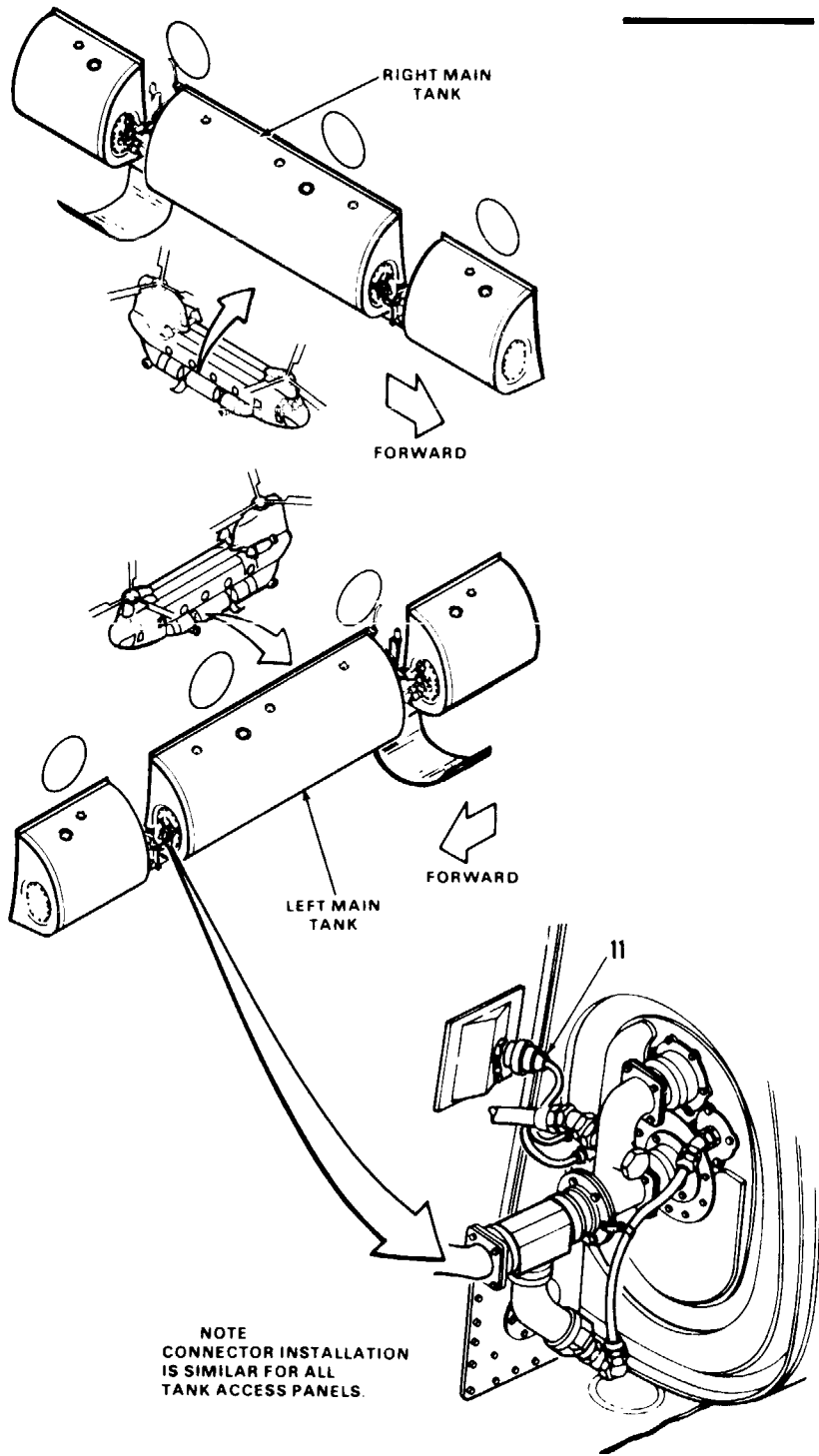
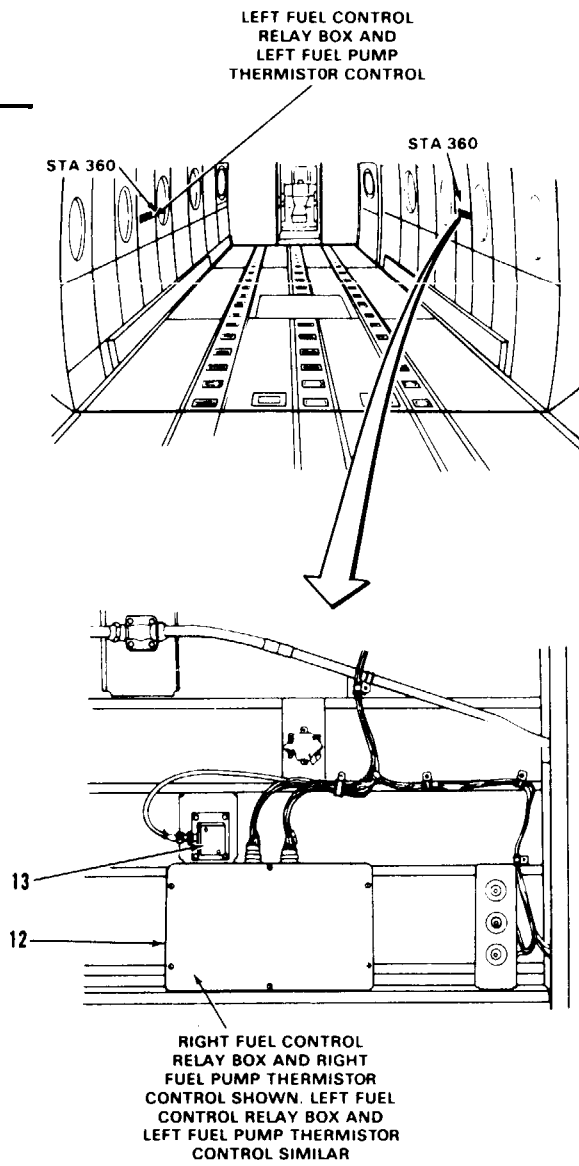
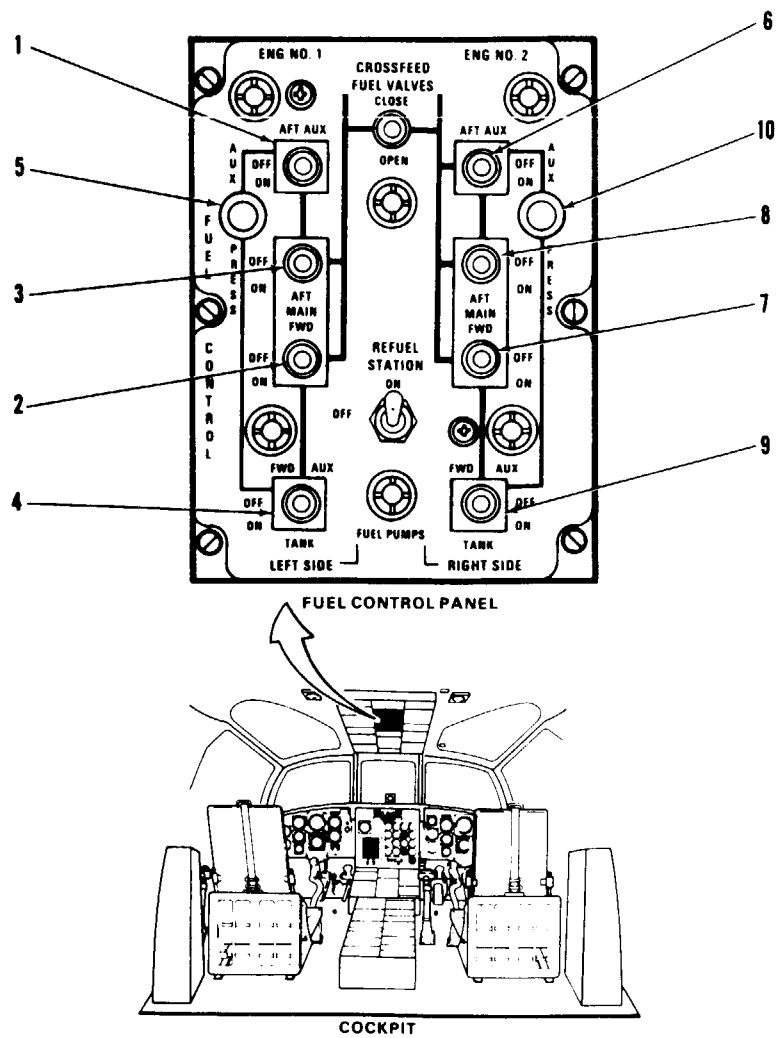
Aircraft Electrician

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off  
Left and Right Forward Landing Gear Access  
Panels Open  
Left and Right Aft Intertank Pod Panels Open



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GO TO NEXT PAGE

TASK	RESULT	TASK	RESULT
1. On <b>FUEL CONTROL</b> panel, check <b>LEFT SIDE AFT AUX, FWD</b> and <b>AFT MAIN, and FWD AUX</b> boost pump switches (1, 2, 3, and 4).	If switches (1, 2, 3, and 4) are loose or damaged, tighten or replace them as required.	13. <b>Check right fuel control relay box (12).</b>	If box (12) is loose or damaged, tighten or replace it as required. If either connector to box (12) is loose or damaged, tighten or replace it as required. If wiring to either connector is damaged, repair or replace it as required.
2. On <b>FUEL CONTROL</b> panel, check <b>LEFT SIDE AUX PRESS</b> light (5).	If light (5) is loose or damaged, tighten or replace it as required.	14. <b>Check right fuel pump thermister control (13).</b>	If control (13) is loose or damaged, tighten or replace it as required. If connector to control is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.
3. On <b>FUEL CONTROL</b> panel, check <b>RIGHT SIDE AFT AUX, FWD</b> and <b>AFT MAIN, and FWD AUX</b> boost pump switches (6, 7, 8, and 9).	If switches (6, 7, 8, and 9) are loose or damaged, tighten or replace them as required.	15. Repeat steps 13 and 14 for left fuel control relay box (12) and left fuel pump thermister control (13).	
4. On <b>FUEL CONTROL</b> panel, check <b>RIGHT SIDE AUX PRESS</b> light (10).	If light (10) is loose or damaged, tighten or replace it as required.		
5. On left FWD AUX tank access panel, check wiring and connector (11). damaged, repair or replace as required.	If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is		
6. On left MAIN tank forward access panel, check wiring and connector (11). damaged, repair or replace as required.	If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is		
7. On left MAIN tank aft access panel, check wiring and connector (11). damaged, repair or replace as required.	If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is		
8. On left AFT AUX tank access panel, check wiring and connector (11). damaged, repair or replace as required.	If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is		
9. On right FWD AUX tank access panel, check wiring and connector (11). damaged, repair or replace as required.	If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is		
10. On right MAIN tank forward access panel, check wiring and connector (11). damaged, repair or replace as required.	If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is		
11. On right MAIN tank aft access panel, check wiring and connector (11). damaged, repair or replace as required.	If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is		
12. On right AFT AUX tank access panel, check wiring and connector (11). damaged, repair or replace as required.	If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is		

FOLLOW-ON MAINTENANCE:  
TM 55-1520-240-23:  
Left and Right Forward Landing Gear Access Panels Closed  
Left and Right Aft Intertank Pod Panel Closed

END OF TASK

10-2.3 FUEL BOOST PUMP SYSTEM OPERATIONAL CHECK

10-2.3

INITIAL SETUP

**Applicable Configurations:**  
All

**Tools:**

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**

None

**Personnel Required:**

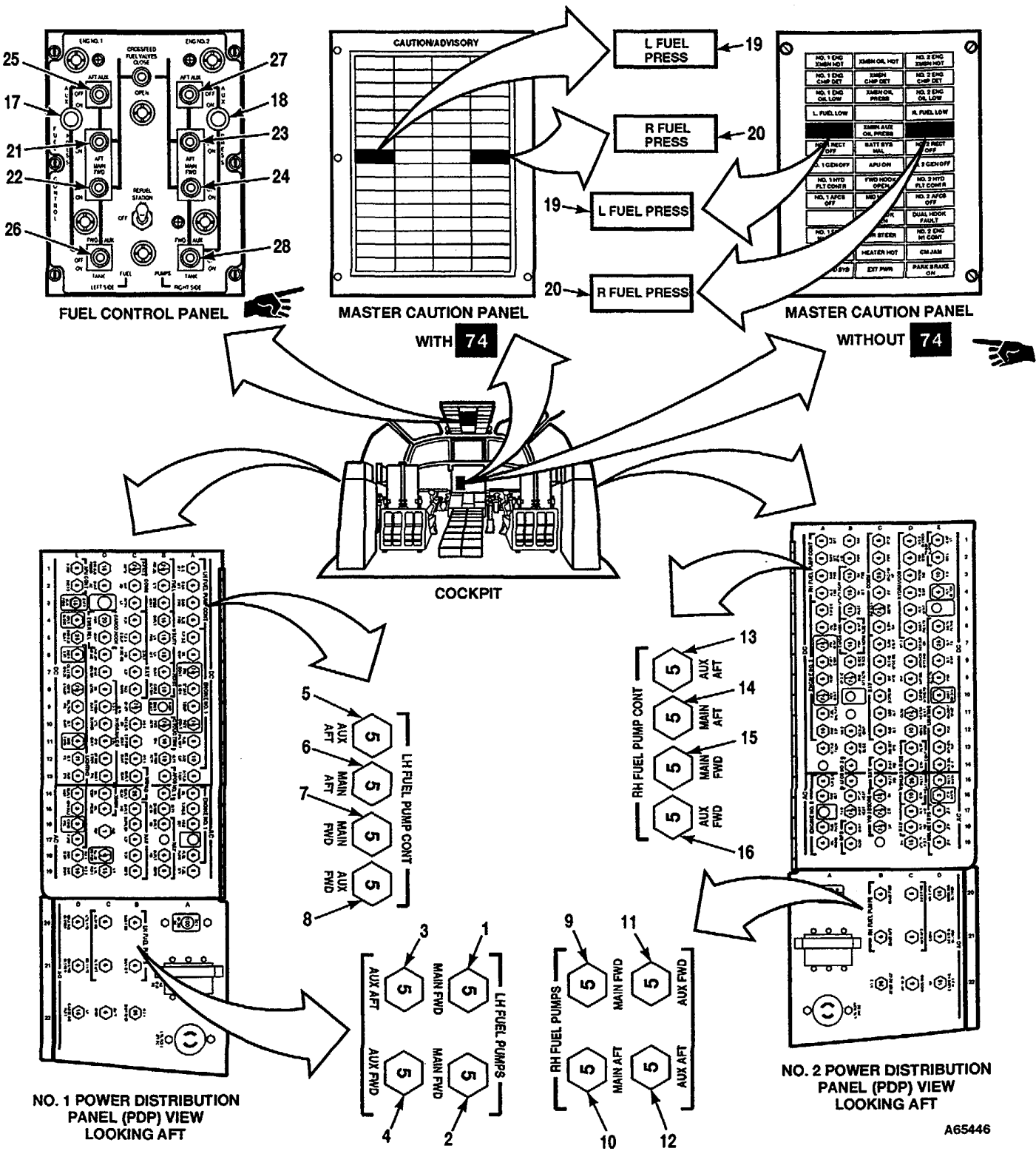
Aircraft Electrician  
Rotary-Wing Aviator

**References:**

TM 55-1520-240-10  
TM 55-1520-240-23

**Equipment Condition:**

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Visual Check of Fuel Boost Pump System Performed  
(Task 10-2.2)



10-2.3 FUEL BOOST PUMP SYSTEM OPERATIONAL CHECK  
(Continued)

10-2.3

TASK	RESULT
1. Check that LH FUEL PUMPS MAIN FWD, MAIN AFT, AUX FWD, and AUX AFT AC circuit breakers (1,2,3, and 4) are closed.	If circuit breaker (1) is open, close it, If it opens again, go to Task 10-2.4. If circuit breaker (2) is open, close it. If it opens again, go to Task 10-2.5. If circuit breaker (3) is open, close it. If it opens again, go to Task 10-2.6. If circuit breaker (4) is open, close it. If it opens again, go to Task 10-2.7.
2. Check that LH FUEL PUMP CONT AUX AFT, MAIN AFT, MAIN FWD, and AUX FWD DC circuit breakers (5,6, 7, and 8) are closed.	if circuit breaker (5) is open, ciose it, if it opens again, go to Task 10-2.8. If circuit breaker (6) is open, close it. If it opens again, go to Task 10-2.9 If circuit breaker (7) is open, close it. If it opens again, go to Task 10-2.10. If circuit breaker (8) is open, close it. If it opens again, go to Task 10-2.11.
3. Check that RH FUEL PUMPS MAIN FWD, MAIN AFT, AUX FWD, and AUX AFT AC circuit breakers (9, 10, 11, and 12) are closed.	If circuit breaker (9) is open, close it, If it opens again, go to Task 10-2.12. If circuit breaker (10) is open, close it, If it opens again, go to Task 10-2.13. If circuit breaker (11) is open, close it. If it opens again, go to Task 10-2.14. If circuit breaker (12) is open, close it. If it opens again, go to Task 10-2.15.
4. Check that RH FUEL PUMP CONT AUX AFT, MAIN AFT, MAIN FWD, and AUX FWD, DC circuit breakers (13, 14, 15, and 16) are closed.	If circuit breaker (13) is open, close it. If it opens again, go to Task 10-2.16. If circuit breaker (14) is open, close it. If it opens again, go to Task 10-2.17. If circuit breaker (15) is open, close it. If it opens again, go to Task 10-2.18. If circuit breaker (16) is open, close it. If it opens again, go to Task 10-2.19.
5. Check that all FUEL PUMP switches (21, 22, 23, 24, 25, 26, 27, 27 and 28) on FUEL CONTROL PANEL are set to OFF.	If switches are ON, set them to OFF.
6. Press and release LEFT SIDE AUX PRESSURE light (17).	AUX PRESSURE light (17) shall momentarily come on. If it does not, go to Task 10-2.20.
7. Press and release RIGHT SIDE AUX PRESSURE light (18).	AUX PRESSURE light (18) shall momentarily come on. If it does not, go to Task 10-2.20.

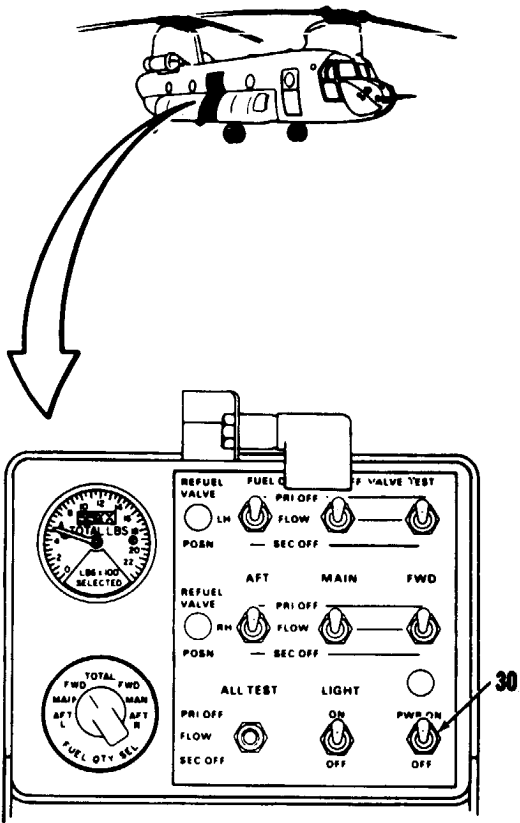
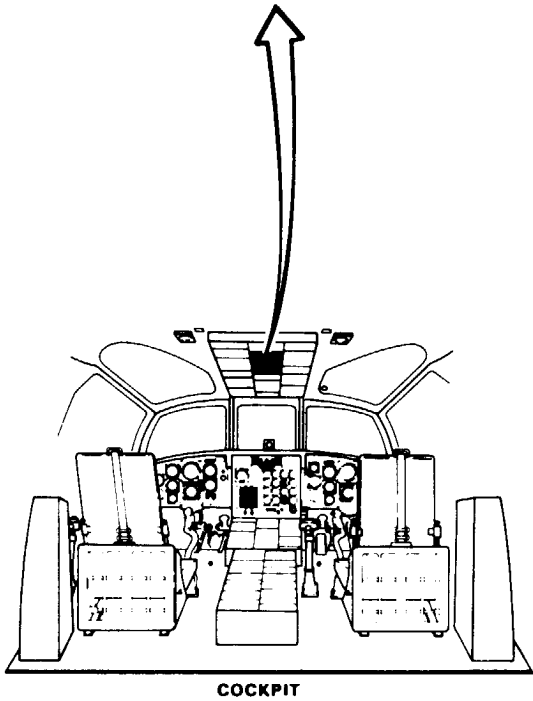
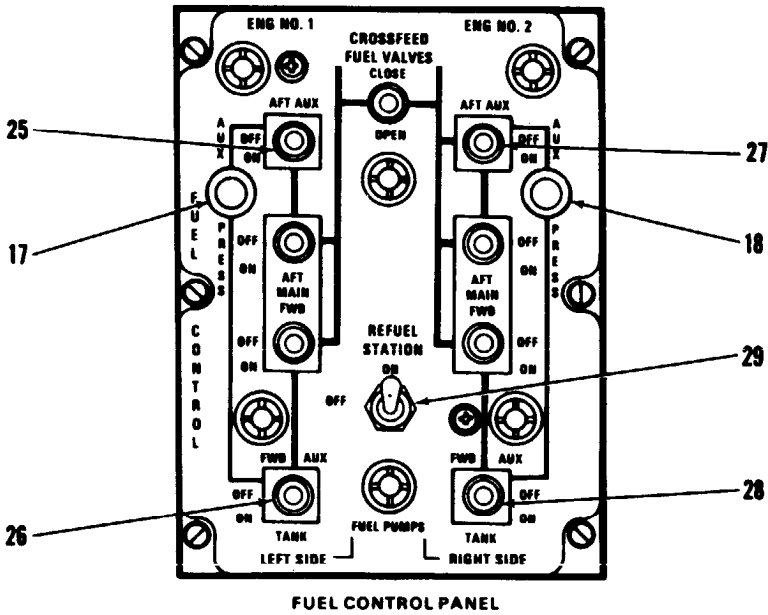
TASK	RESULT
<div><b>WARNING</b></div> <div>An inoperative fuel pump in main tanks cannot be detected unless the following methods, steps 8 thru 17, are utilized. Flight operations with an undeteced pump failure can result in engine flameout when operative pump fails. This could result in loss of helicopter lift.</div>	
8. Check that L FUEL PRESS capsule (19) is lit.	If capsule (19) is not lit, go to Task 10-2.21.
9. Check that R FUEL PRESS capsule (20) is lit.	If capsule (20) is not lit, go to Task 10-2.21.
10. Have pilot start engines and stabilize rotors at ground idle. Set eight FUEL PUMP switches (21 through 28) to OFF.	
11. Set LEFT SIDE MAIN AFT FUEL PUMP switch (21) to ON.	Capsule (19) shall go out. If not, go to Task 10-2.22.
12. Set LEFT SIDE MAIN AFT FUEL PUMP switch (21) to OFF.	Capsule (19) shall come on. If not, go to Task 10-2.21.
13. Set LEFT SIDE MAIN FWD FUEL PUMP switch (22) to ON.	Capsule (19) shall go out. If not, go to Task 10-2.23.
14. Set LEFT SIDE MAIN FWD FUEL PUMP switch (22) to OFF.	Capsule (19) shall come on. If not, go to Task 10-2.21.
15. Set RIGHT SIDE MAIN FWD FUEL PUMP switch (24) to ON.	Capsule (20) shall go out. If not, go to Task 10-2.24.
16. Set RIGHT SIDE MAIN FWD FUEL PUMP switch (24) to OFF.	Capsule (20) shall come on. If not, go to Task 10-2.21.
17. Set RIGHT SIDE MAIN AFT FUEL PUMP switch (23) to ON.	Capsule (20) shall go out. If not, go to Task 10-2.25.
18. Set RIGHT SIDE MAIN AFT FUEL PUMP switch (23) to OFF.	Capsule (20) shall come on. If not, go to Task 10-2.21.

GO TO NEXT PAGE

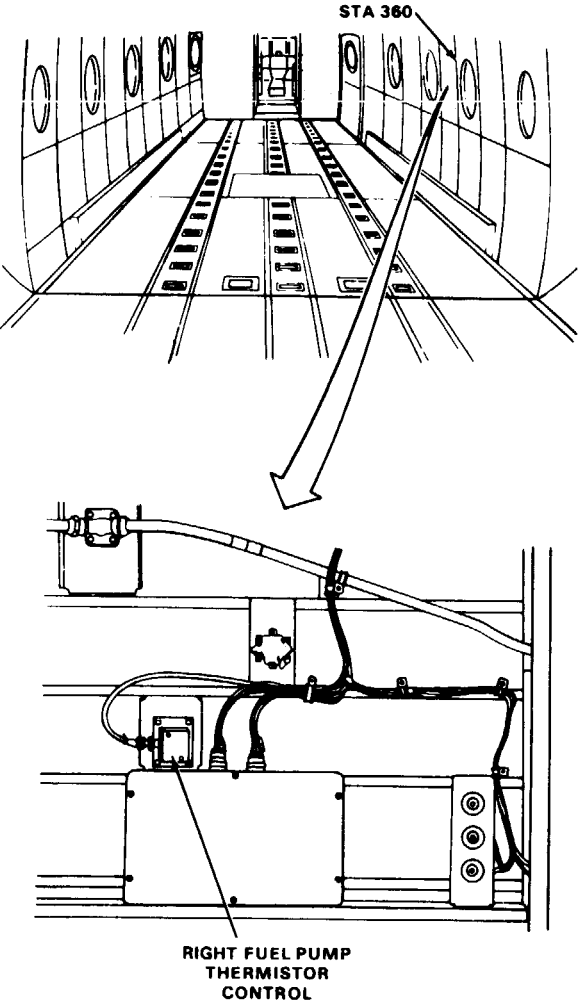
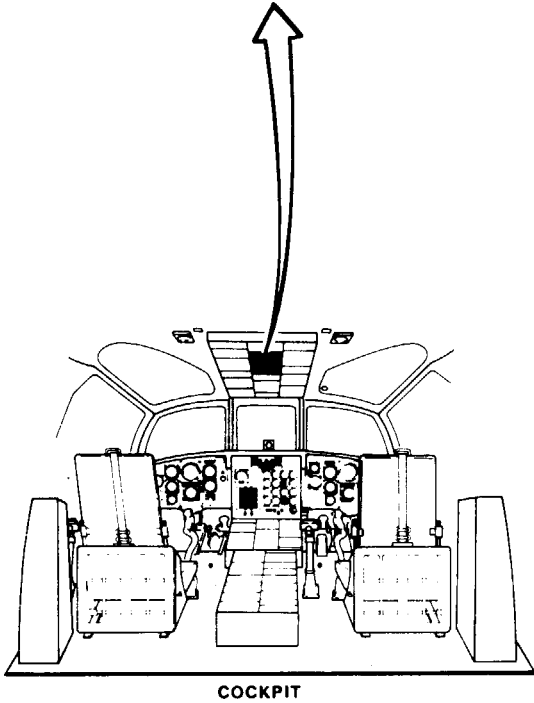
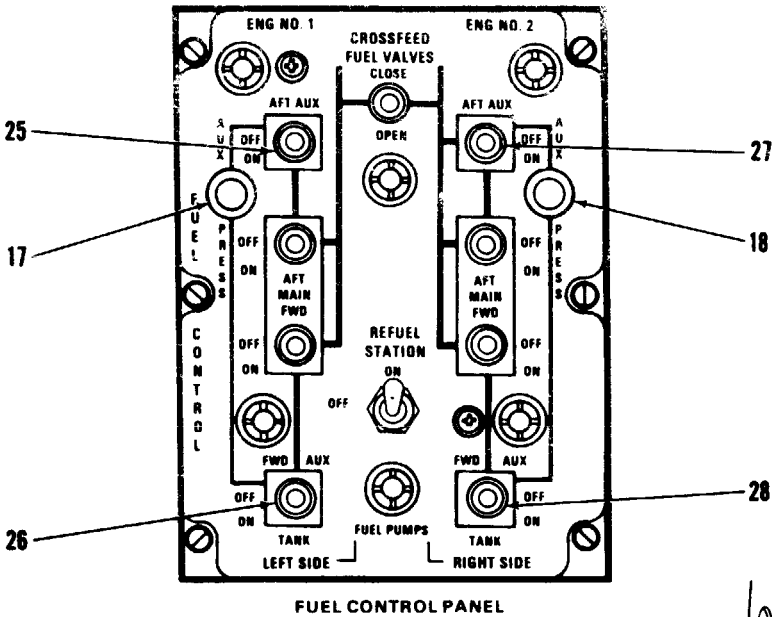
TASK	RESULT
19. Set LEFT SIDE AFT AUX FUEL PUMP switch (25) to ON.	AUX PRESS light (17) shall stay out. If it is on, go to task 10-2.26.
20. Set LEFT SIDE AFT AUX FUEL PUMP switch (25) to OFF.	
21. Set LEFT SIDE FWD AUX FUEL PUMP switch (26) to ON.	AUX PRESS light (17) shall stay out. If it is on, go to task 10-2.27.
22. Set LEFT SIDE FWD AUX FUEL PUMP switch (26) to OFF.	
23. Set RIGHT SIDE AFT AUX FUEL PUMP switch (27) to ON.	AUX PRESS light (18) shall stay out. If it is on, go to task 10-2.28.
24. Set RIGHT SIDE AFT AUX FUEL PUMP switch (27) to OFF.	
25. Set RIGHT SIDE FWD AUX FUEL PUMP switch (28) to ON.	AUX PRESS light (18) shall stay out. If it is on, go to task 10-2.29.
26. Set RIGHT SIDE FWD AUX FUEL PUMP switch (28) to OFF.	
27. Have pilot shut down engines.	

CHECK AUX TANK FUEL PUMP SHUTOFF (NO FUEL)

- |  |   |
|--|---|
| 28. Check that fuel level in main tank is low enough to accept transfer of fuel from associated auxiliary tanks. | If too much fuel is in main tank, remove quantity required. Refer to TM 55-1520-240-23. |
| 29. (Deleted.)   |   |
| 30. (Deleted.)   |   |



TASK	RESULT
31. Set RIGHT SIDE FWD AUX FUEL PUMP switch (28) to ON. Have helper standby right side fwd aux tank and listen for operation of boost pump.	AUX PRESS light (18) will go out. If not, go. to task 10-2.29. Fuel will transfer from RIGHT SIDE FWD AUX tank to RIGHT SIDE MAIN TANK. AUX PRESS light (18) will come on when RIGHT SIDE FWD AUX tank is depleted. The fuel pump will shut off automatically. If fuel pump continues running after AUX PRESS light comes on and tank is empty, replace right side thermistor control box.
32. Set RIGHT SIDE AFT AUX FUEL PUMP switch (27) to ON. Have helper standby right side aft aux tank and listen for operation of boost pump.	AUX PRESS light (18) will go out. If not, go to task 10-2.28. Fuel will transfer from RIGHT SIDE AFT AUX tank to RIGHT SIDE MAIN TANK. AUX PRESS light (18) will come on when RIGHT SIDE AFT AUX tank is depleted. The fuel pump will shutoff automatically. If fuel pump continues running after AUX PRESS light comes on and tank is empty, replace right side thermistor control box.

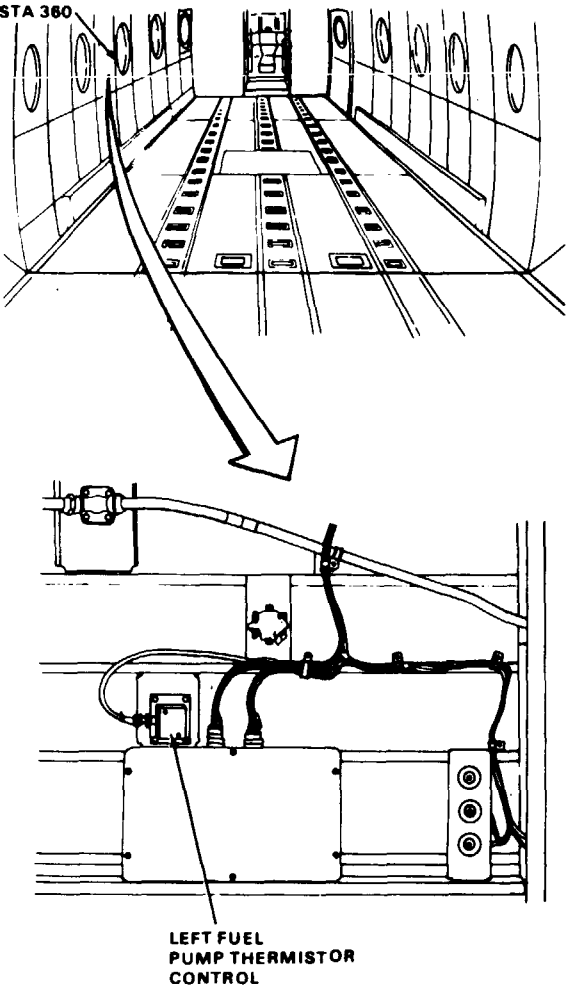
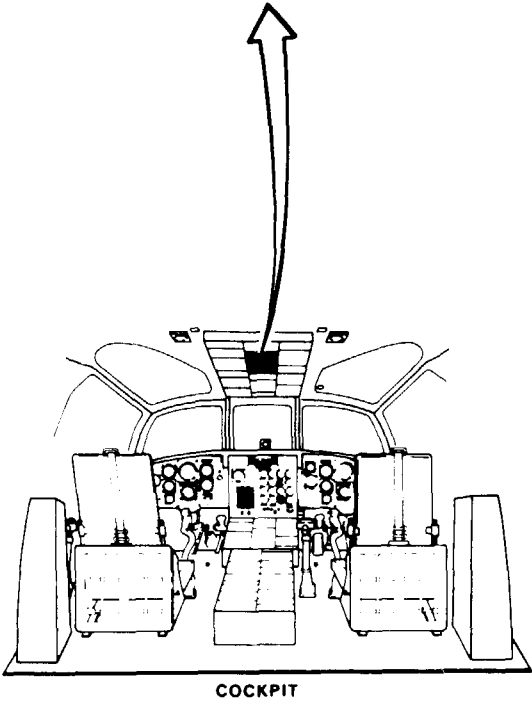
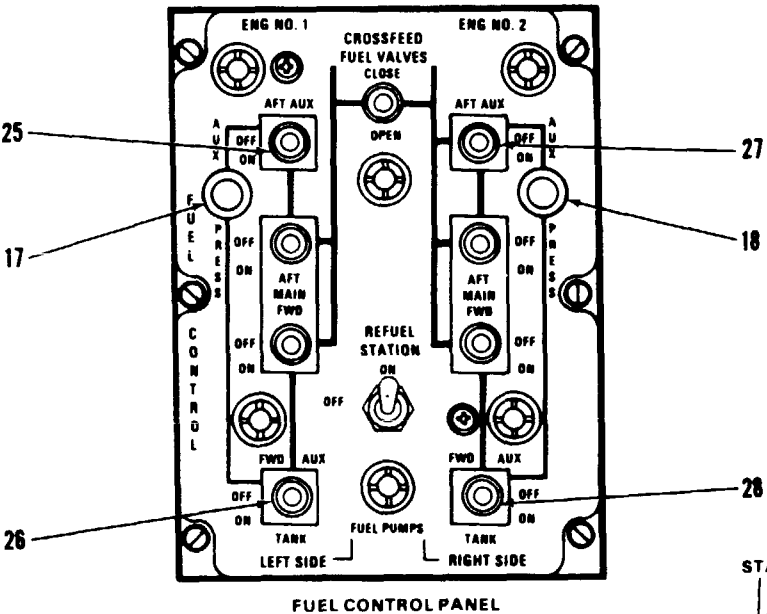


10-2.3 FUEL BOOST PUMP SYSTEM OPERATIONAL CHECK (Continued)

10-2.3

TASK	RESULT
33. <b>Set LEFT SIDE FWD AUX FUEL PUMP switch (26) to ON.</b> Have helper standby left side fwd aux tank and listen for operation of boost pump.	AUX PRESS light (17) will go out. If not, go to task 10-2.27. Fuel will transfer from LEFT SIDE FWD AUX TANK to LEFT SIDE MAIN TANK. AUX PRESS light (17) will come on when LEFT SIDE FWD AUX tank is depleted. The fuel pump will shut off automatically. If fuel pump continues running after AUX PRESS light comes on and tank is empty, replace left side thermistor control box.
34. <b>Set LEFT SIDE AFT AUX FUEL PUMP switch (25) to ON.</b> Have helper standby left side aft aux tank and listen for operation of boost pump.	Fuel will transfer from LEFT SIDE AFT AUX tank to LEFT SIDE MAIN tank. AUX PRESS light (17) will come on when LEFT SIDE AFT AUX tank is depleted. The fuel pump will shut off automatically. If fuel pump continues running after AUX PRESS light comes on and tank is empty, replace left side thermistor control box.

FOLLOW-ON MAINTENANCE:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

- All
- Tools:
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
  - Multimeter

Materials:

- None

Personnel Required:

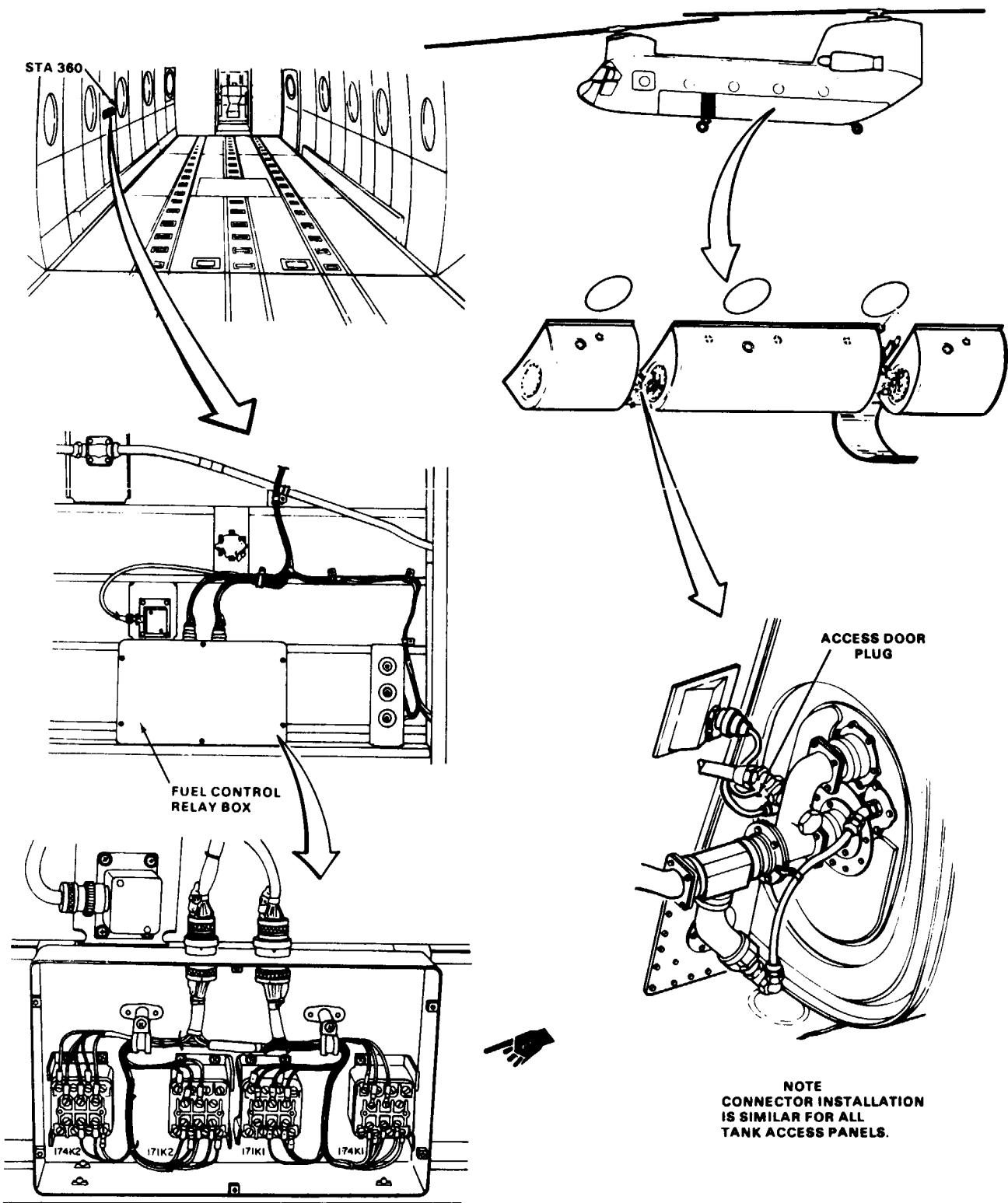
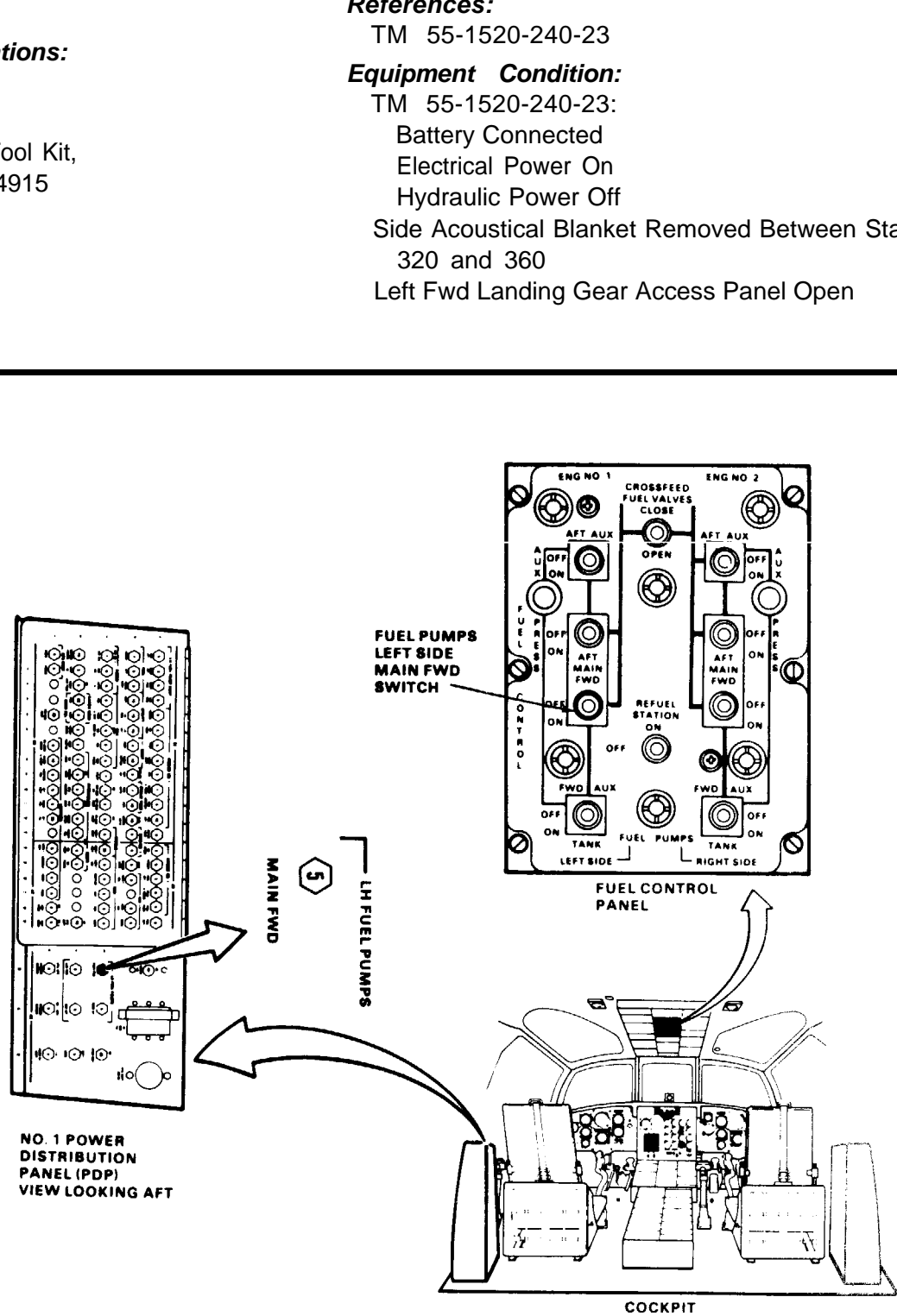
- Aircraft Electrician (2)

References:

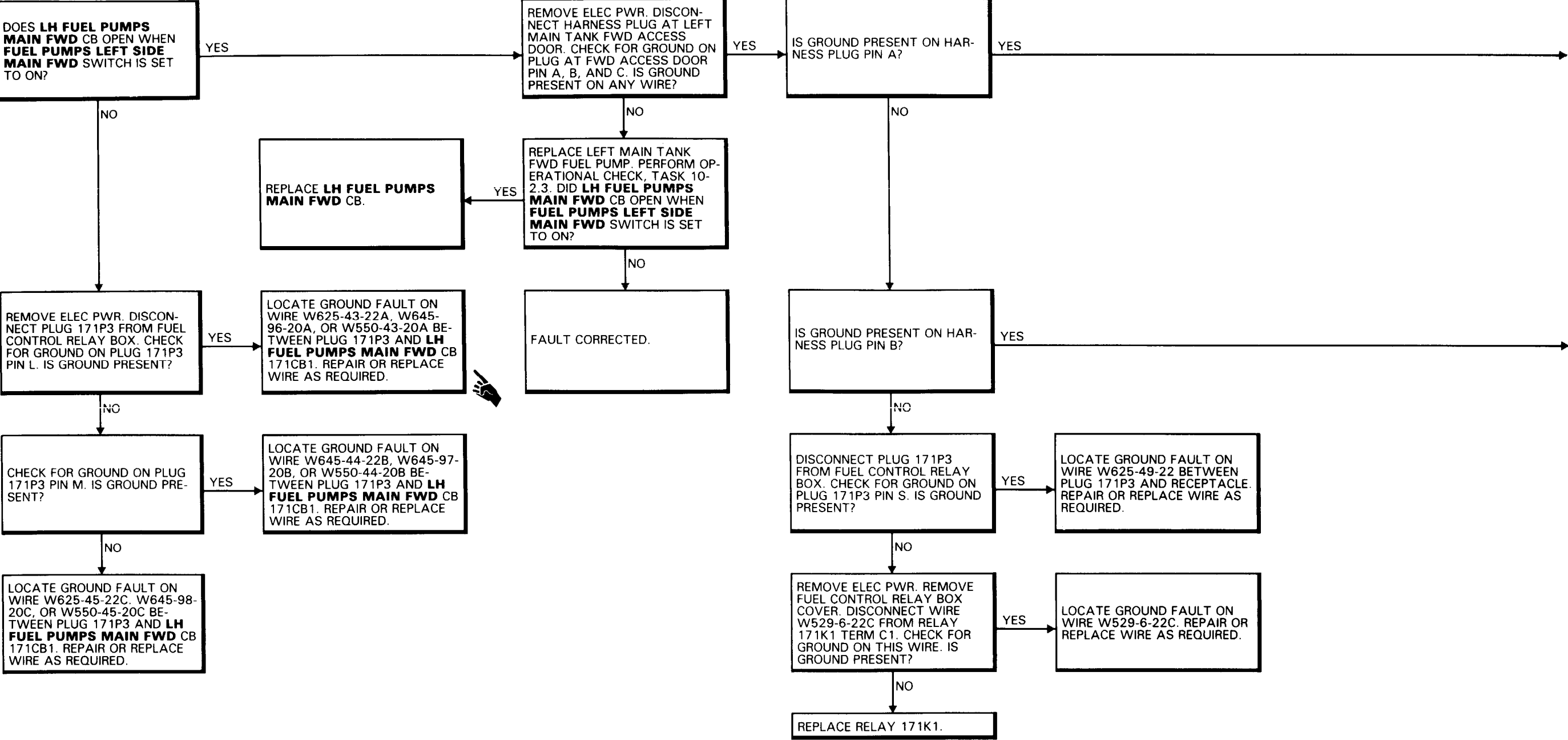
TM 55-1520-240-23

Equipment Condition:

- TM 55-1520-240-23:
- Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Side Acoustical Blanket Removed Between Sta 320 and 360
  - Left Fwd Landing Gear Access Panel Open

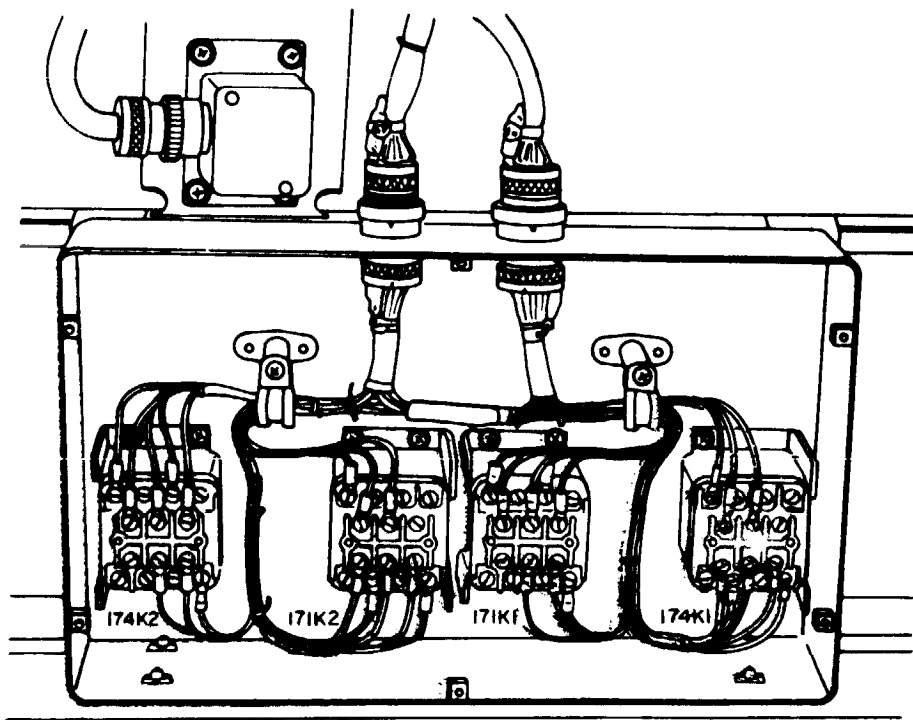
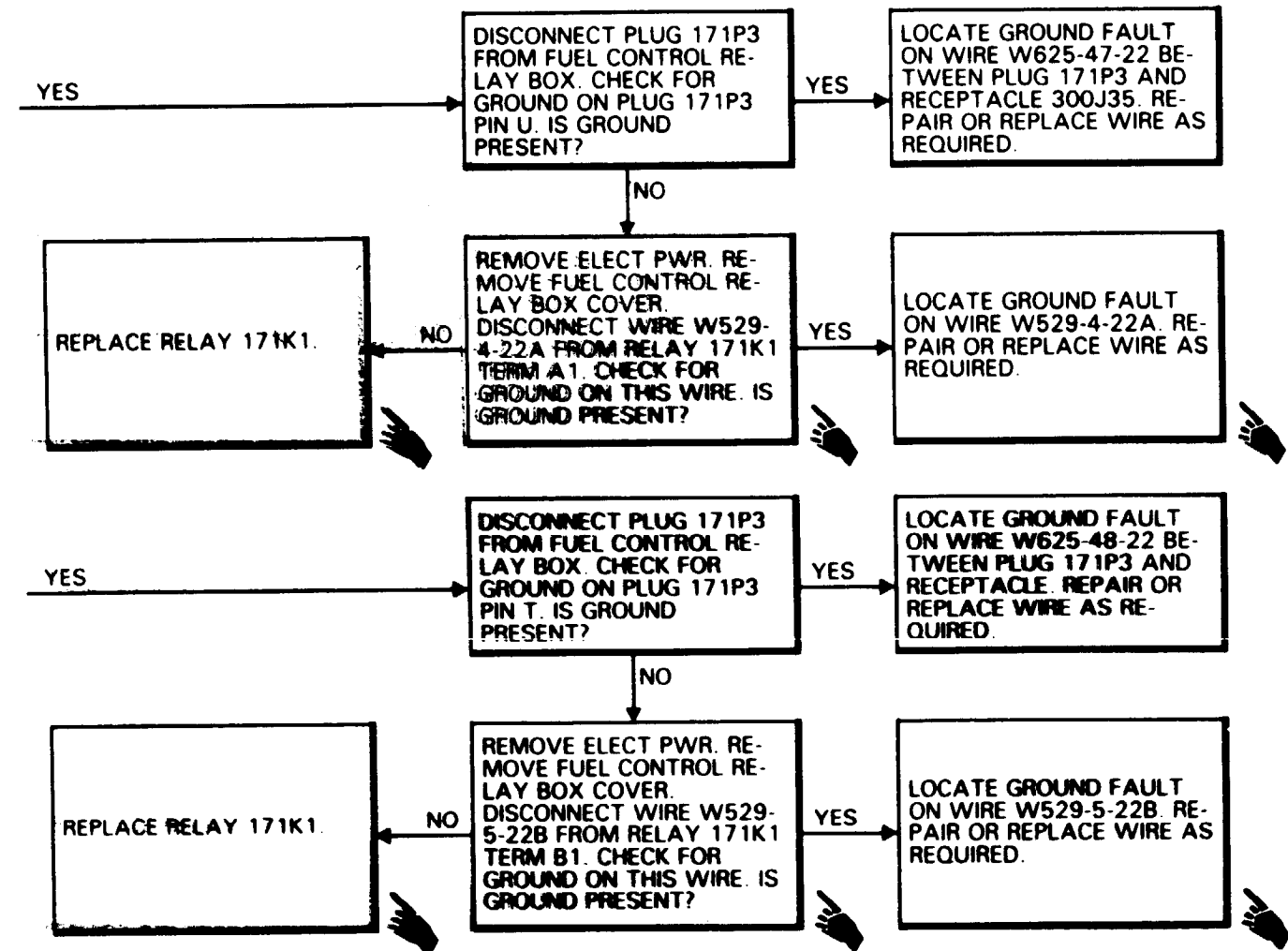






10-2.4 LH FUEL PUMPS MAIN FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.4



9676

FAULT /SOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

- All
- Tools:
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
  - Multimeter

Materials:

- None

Personnel Required:

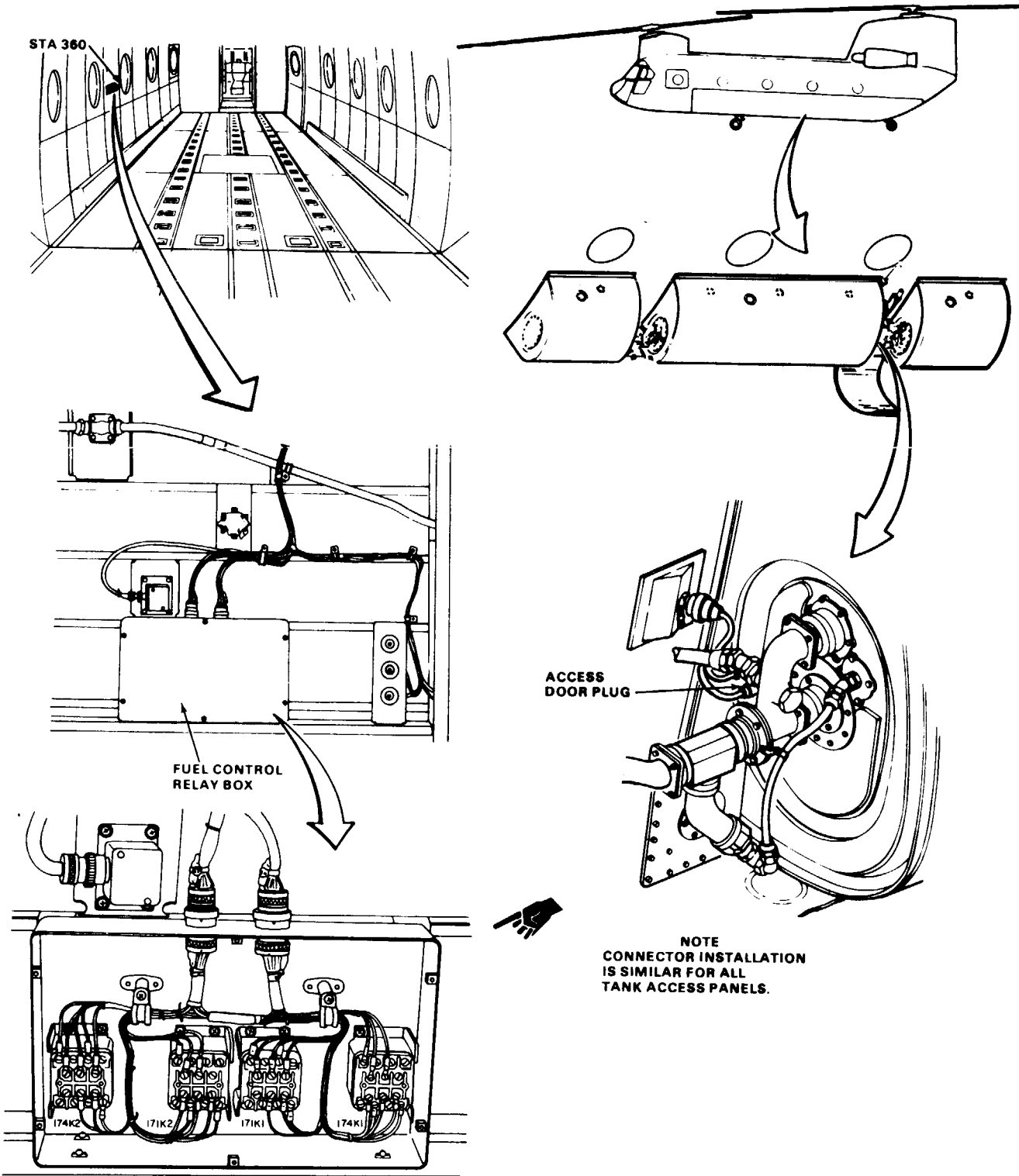
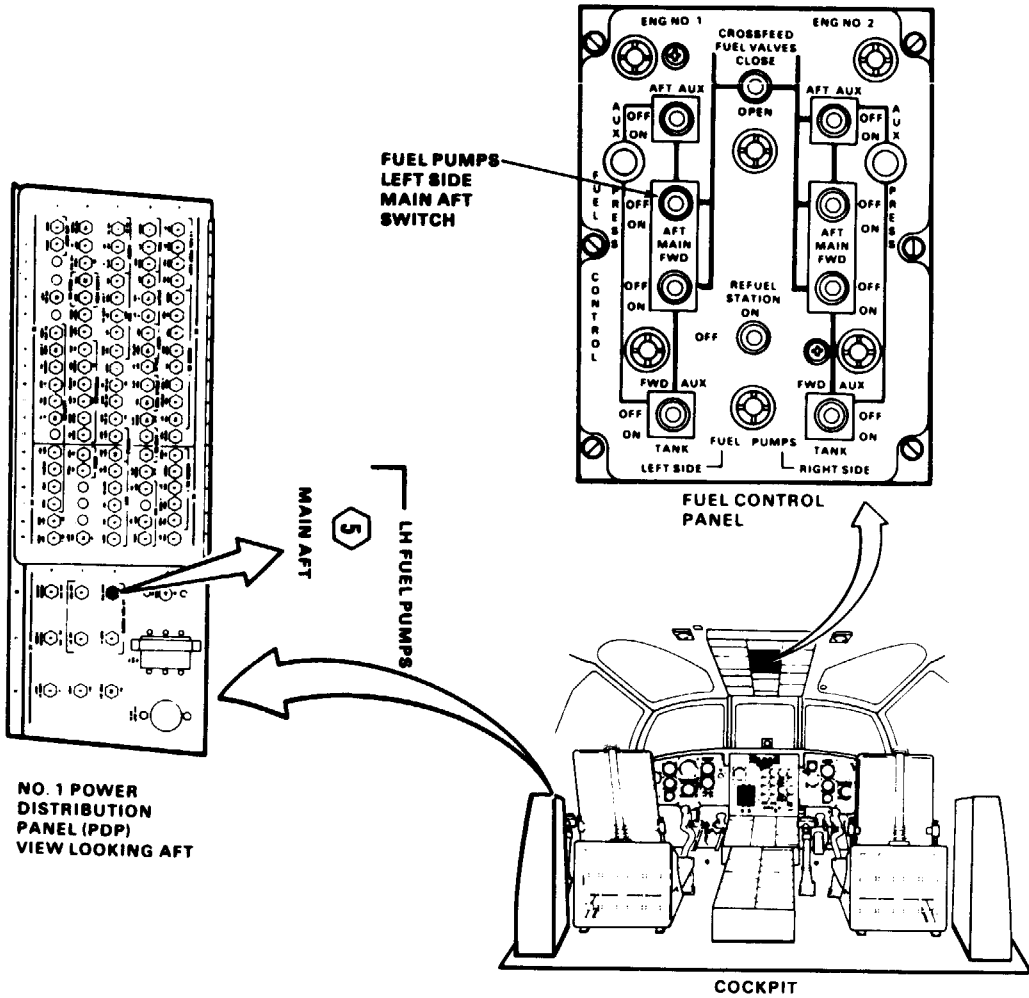
- Aircraft Electrician (2)

References

TM 55-1520-240-23

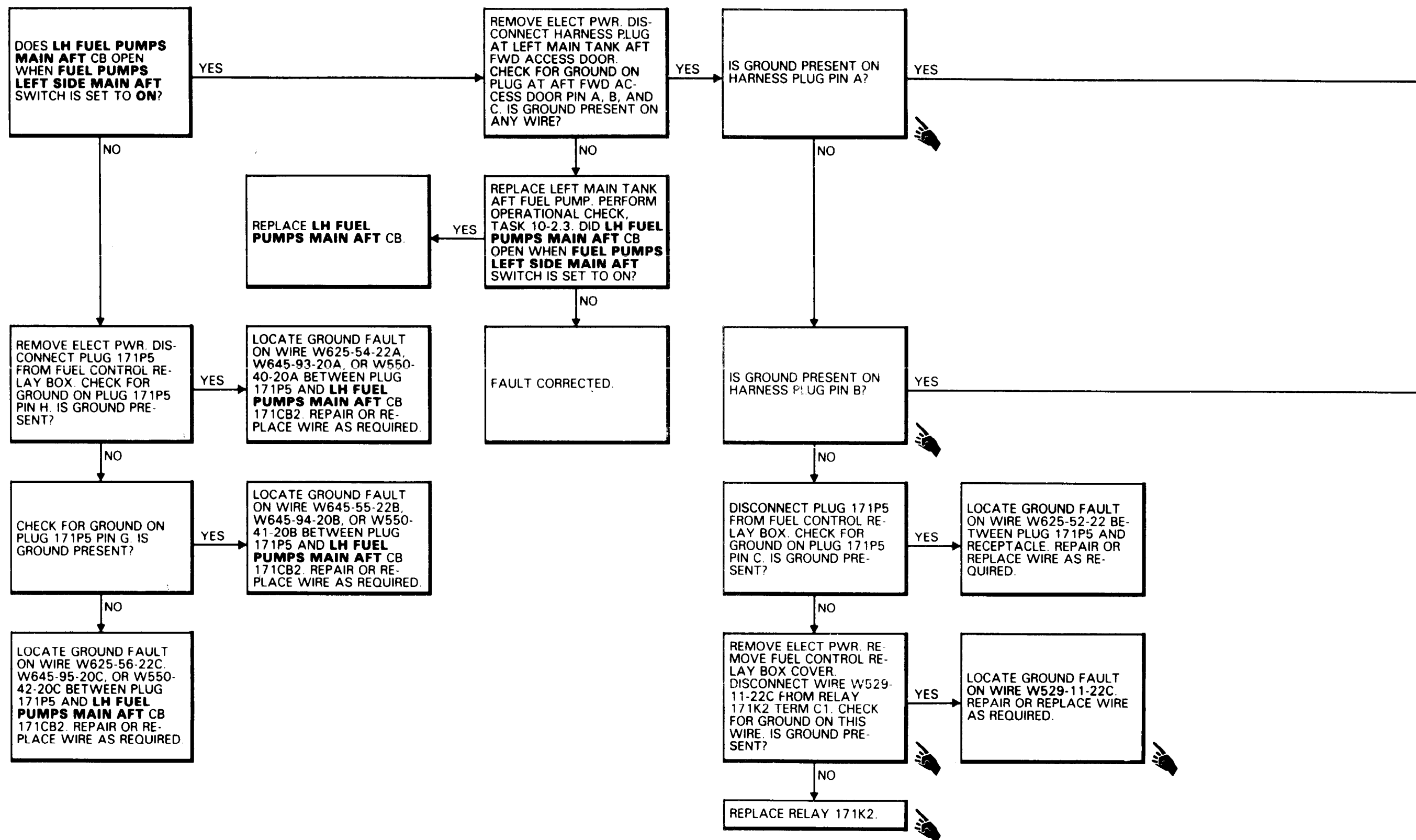
Equipment Condition:

- TM 55-1520-240-23:
- Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Side Acoustical Blanket Removed Between Sta 320 and 360
  - Left Aft Intertank Access Panel Open



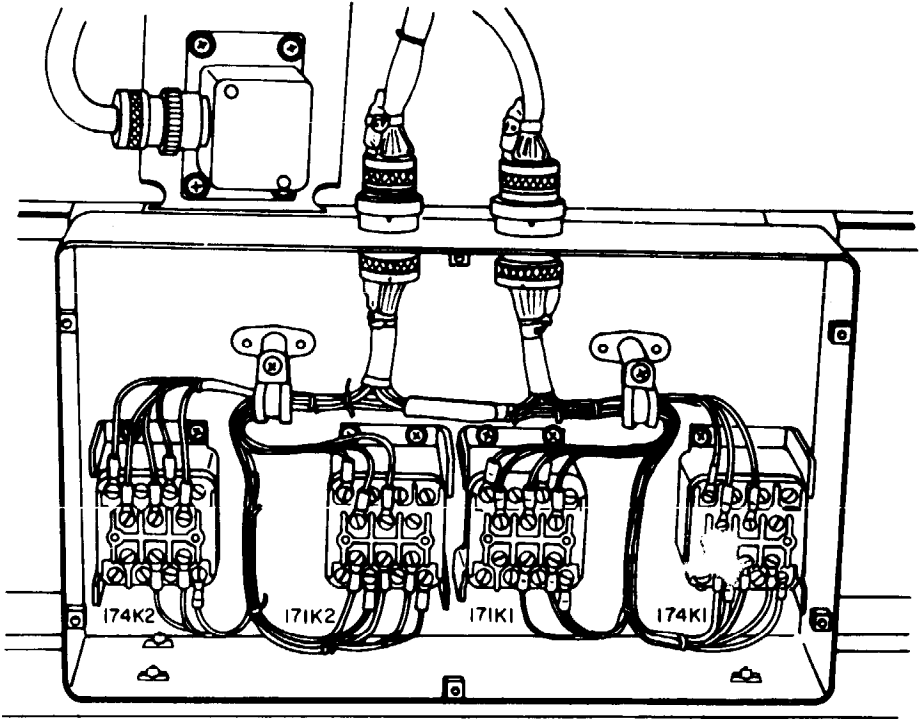
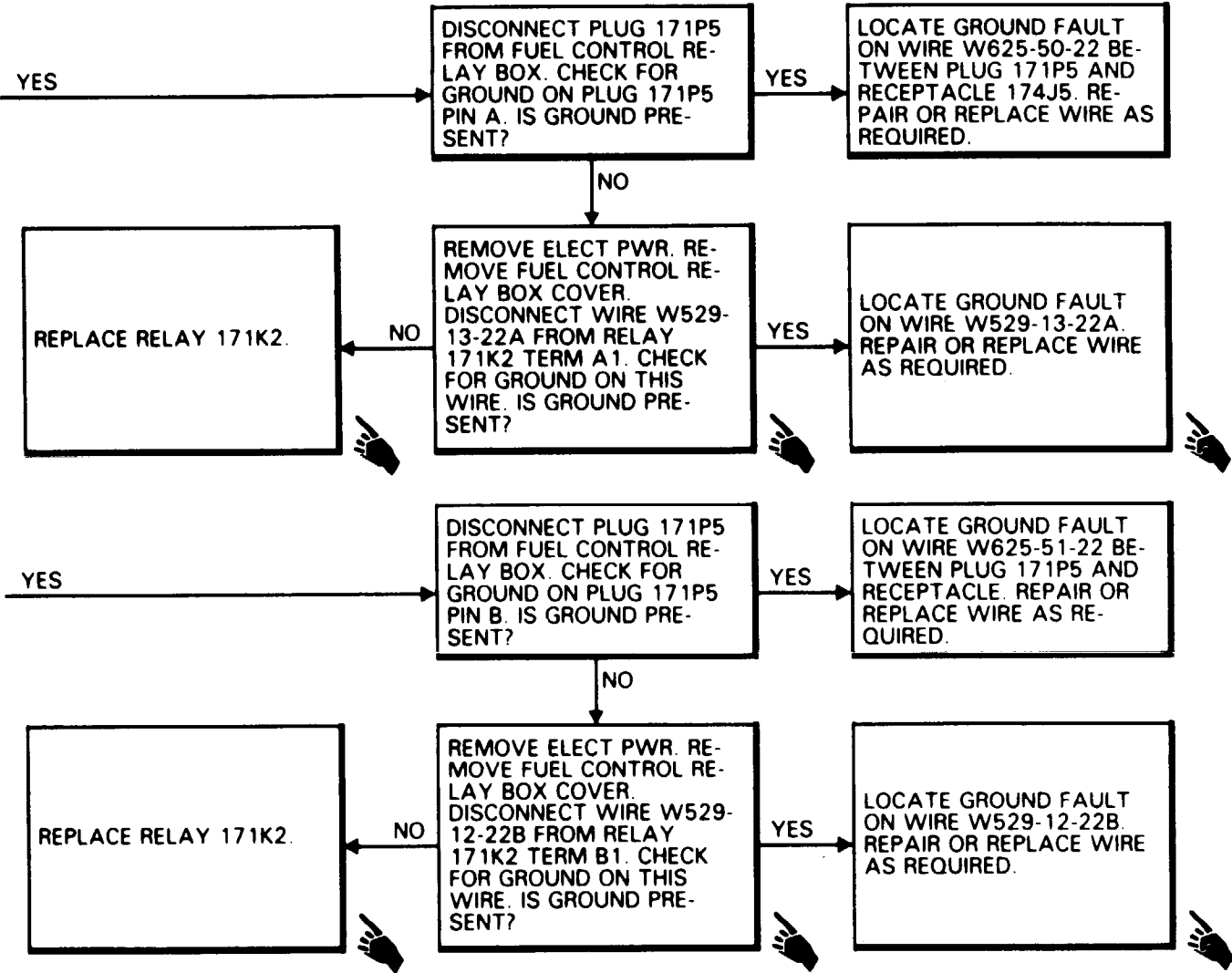
## 10-2.5 LH FUEL PUMPS MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.5



10-2.5 LH FUEL PUMPS MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.5



9677

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electrical Repairer's Tool Kit,
- NSN 5180-00-323-4915
- Multimeter

Materials:

None

Personnel Required

- Aircraft Electrician (2)

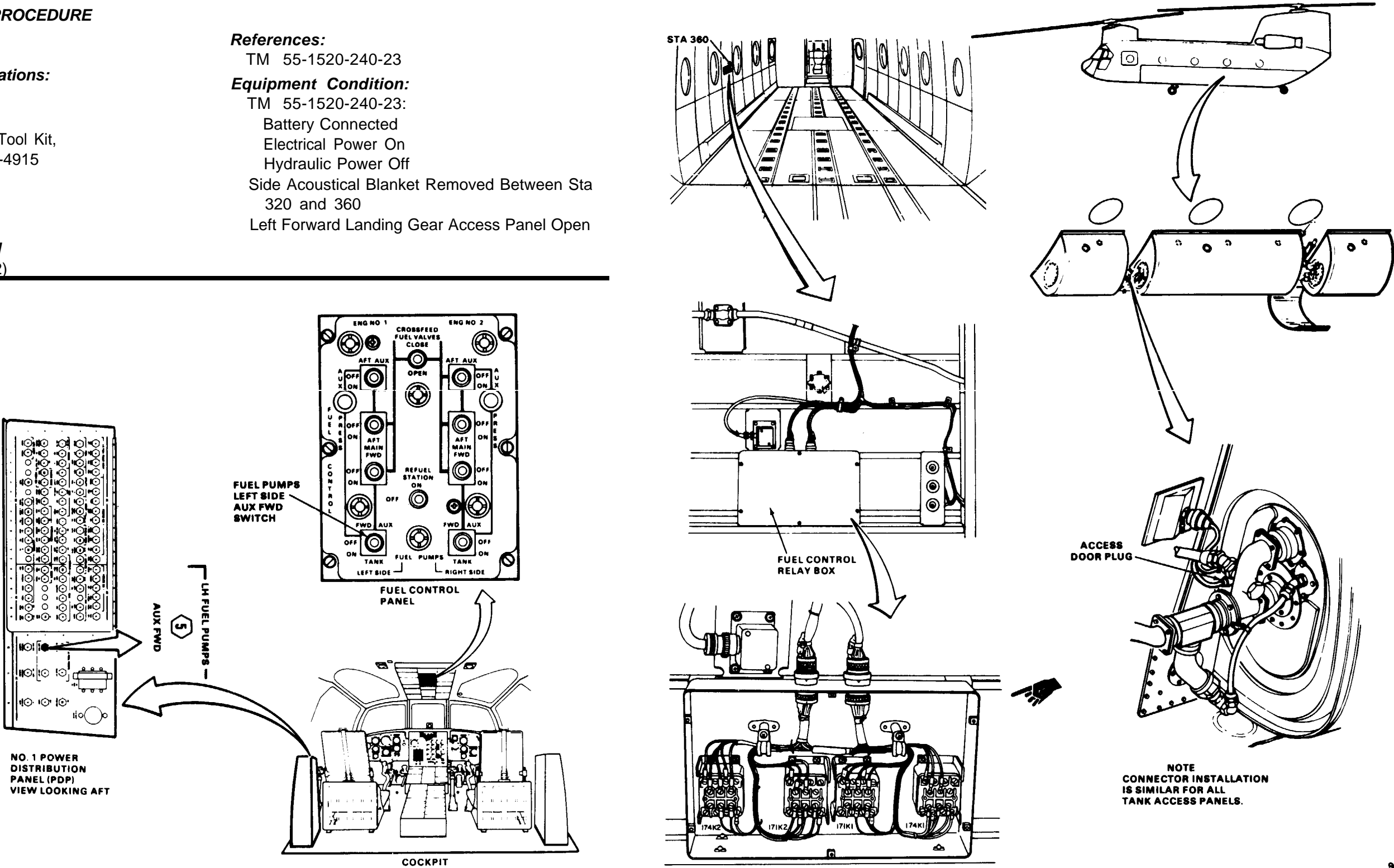
References:

TM 55-1520-240-23

Equipment Condition:

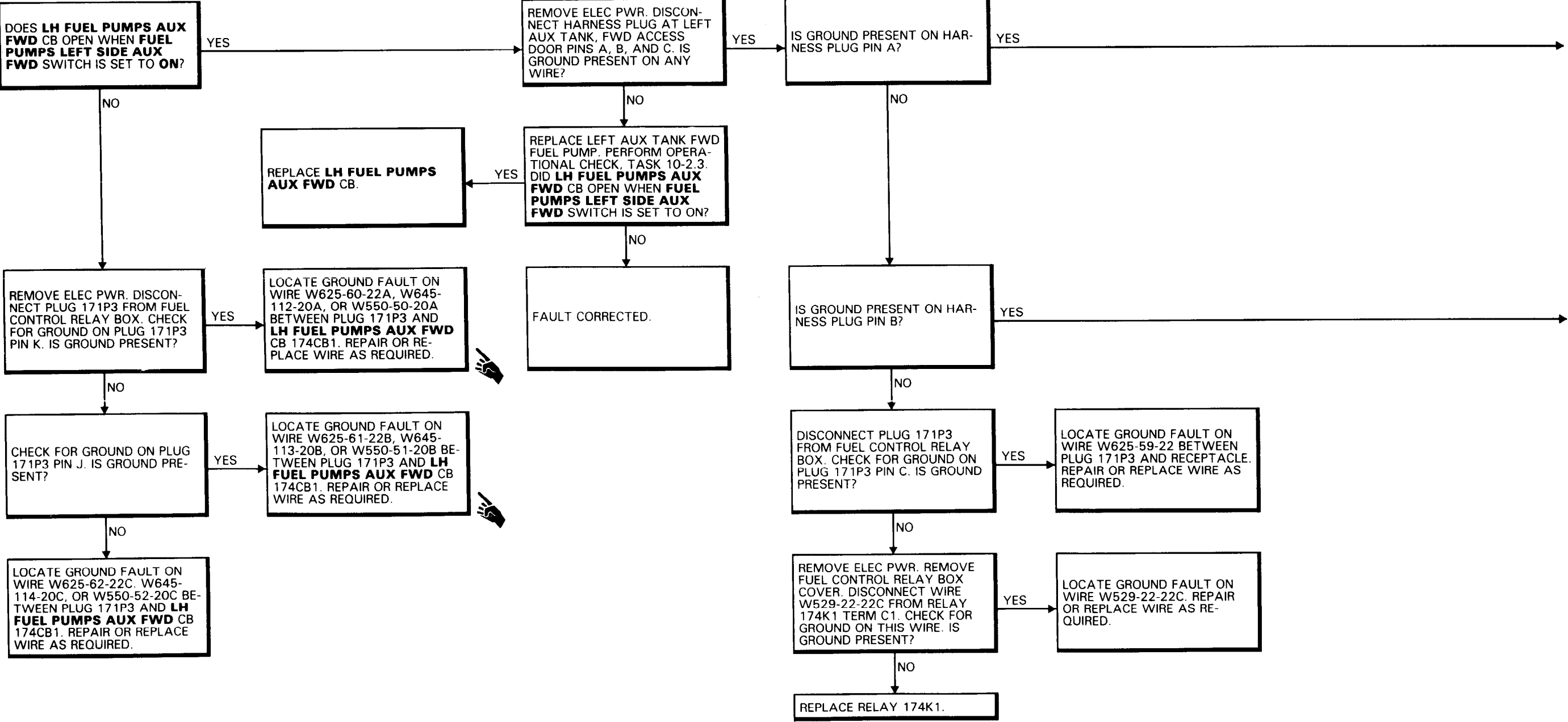
TM 55-1520-240-23:

- Battery Connected
- Electrical Power On
- Hydraulic Power Off
- Side Acoustical Blanket Removed Between Sta 320 and 360
- Left Forward Landing Gear Access Panel Open



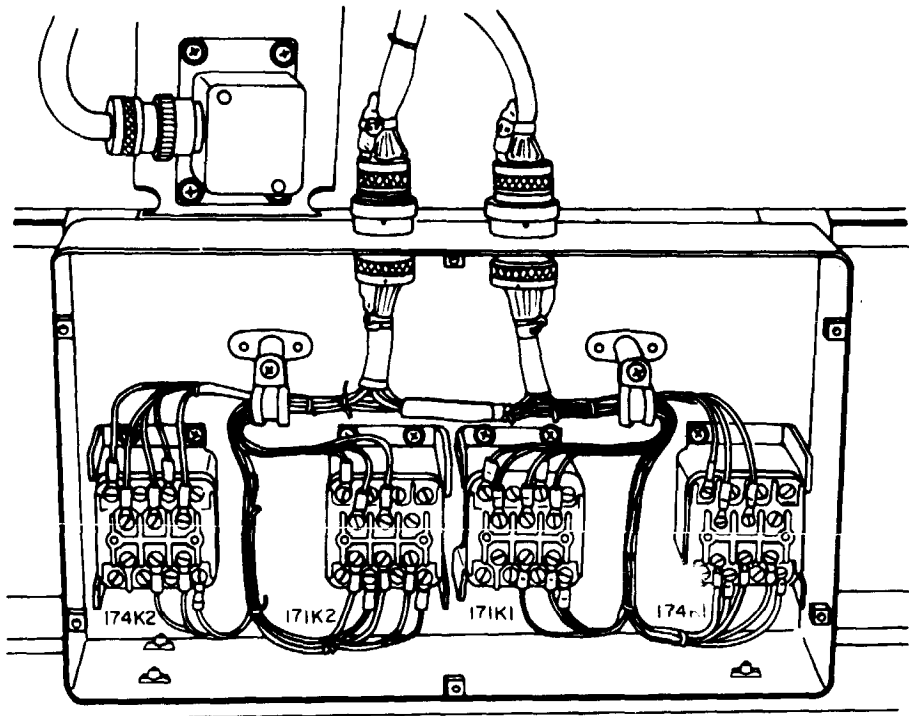
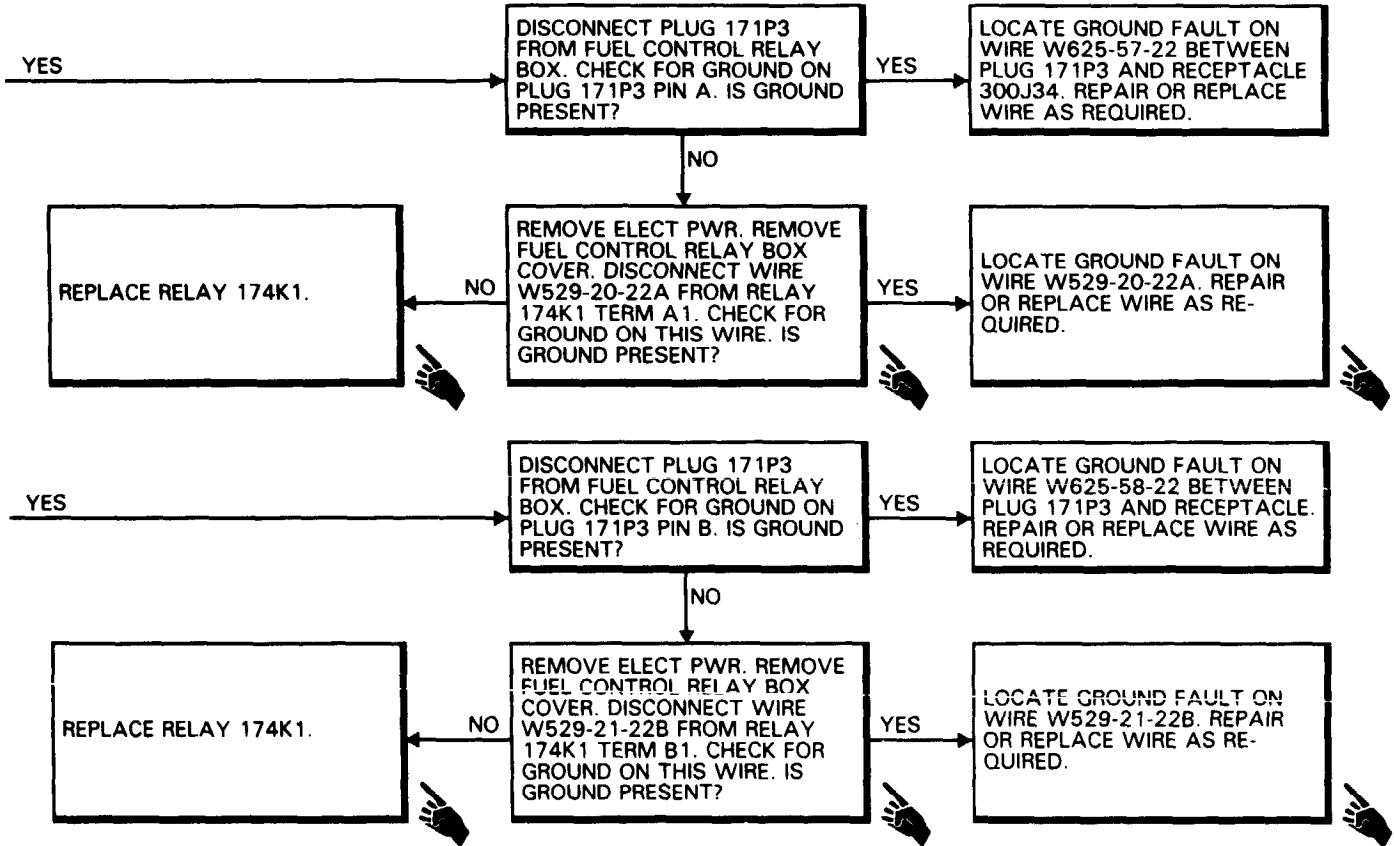
10-2.6 LH FUEL PUMPS AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.6



10-2.6 LH FUEL PUMPS AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.6





FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

Aircraft Electrician (2)

References:

TM 55-1520-240-23

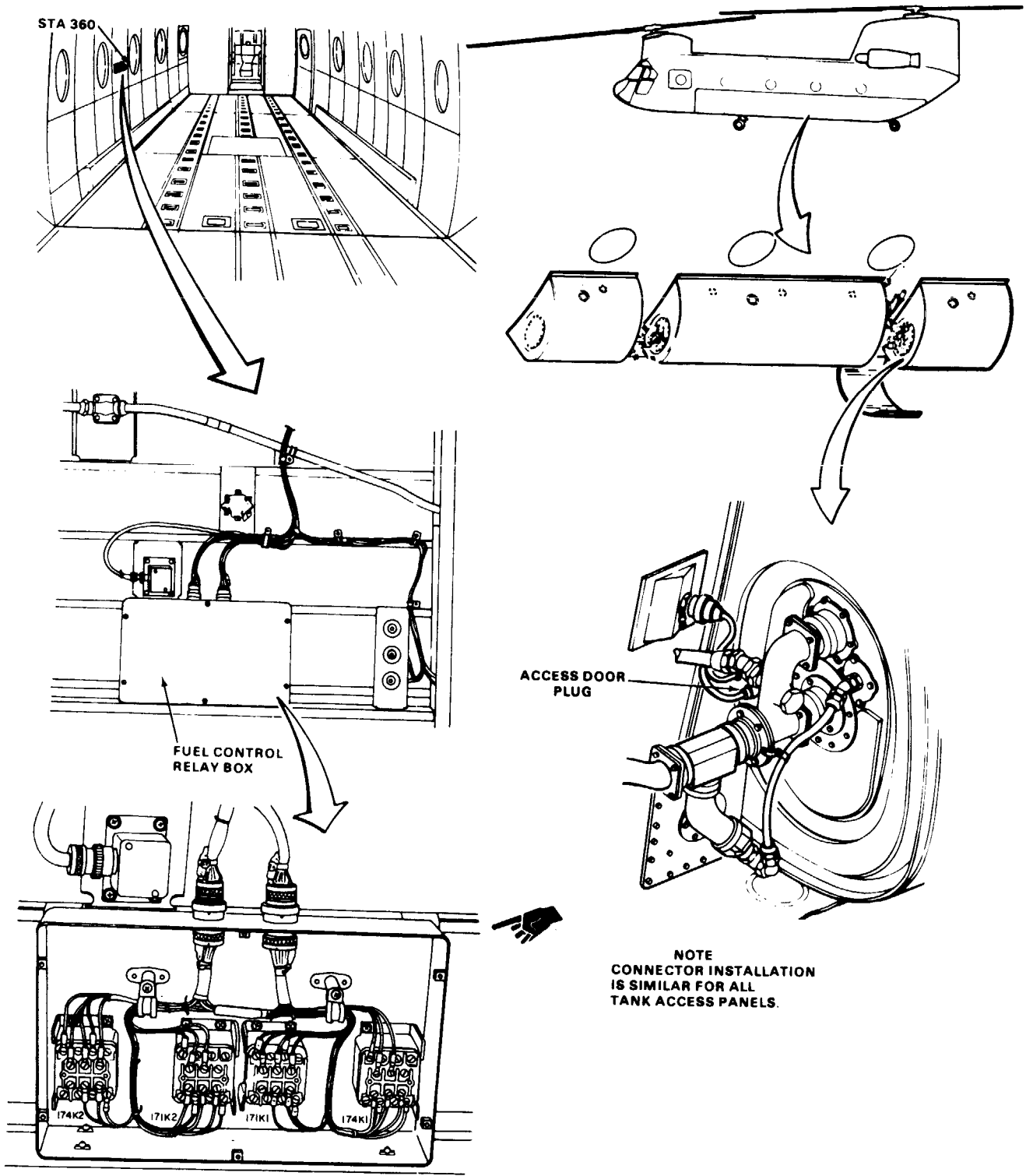
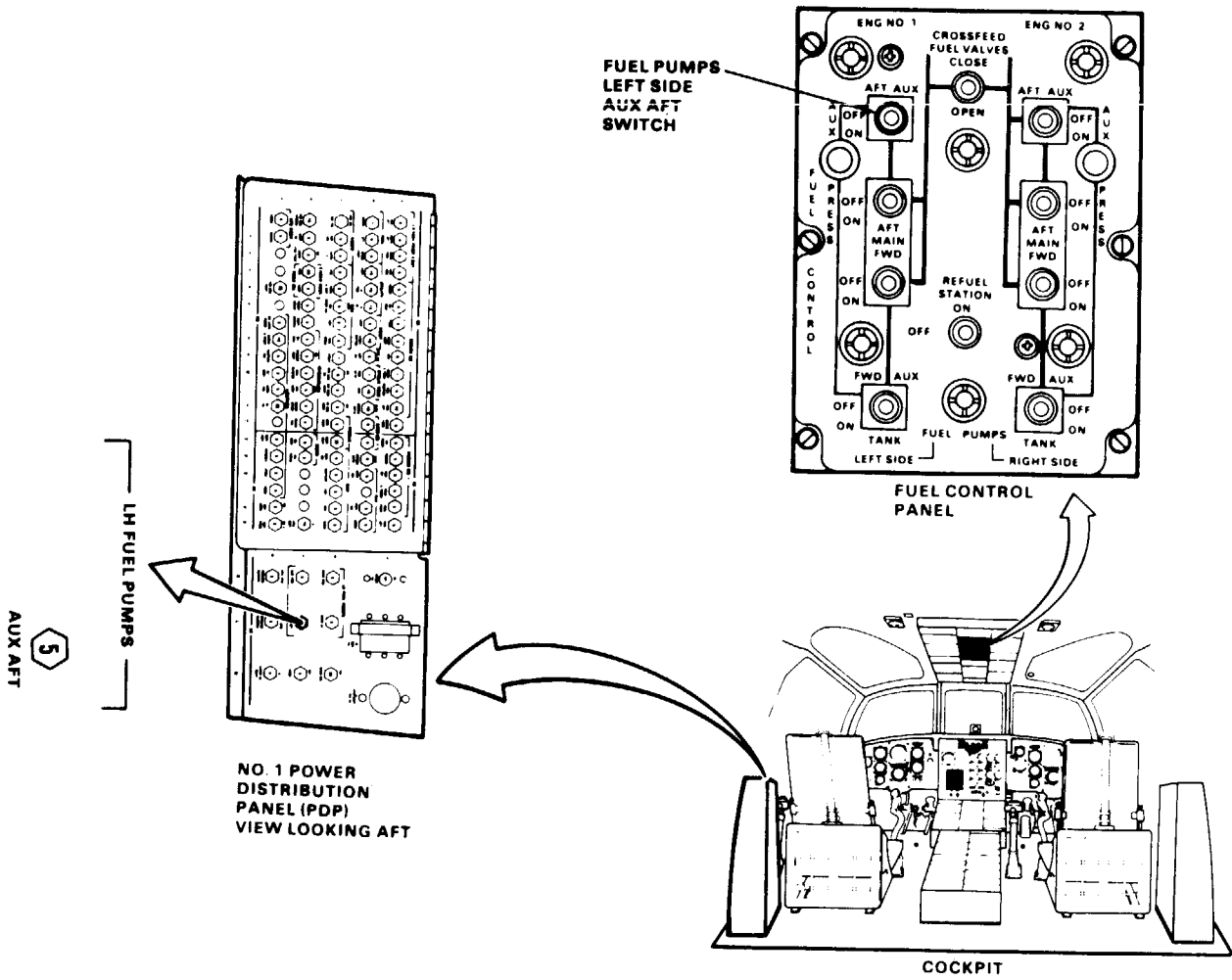
Equipment Condition:

TM 55-1520-240-23:

Battery Connected  
Electrical Power On  
Hydraulic Power Off

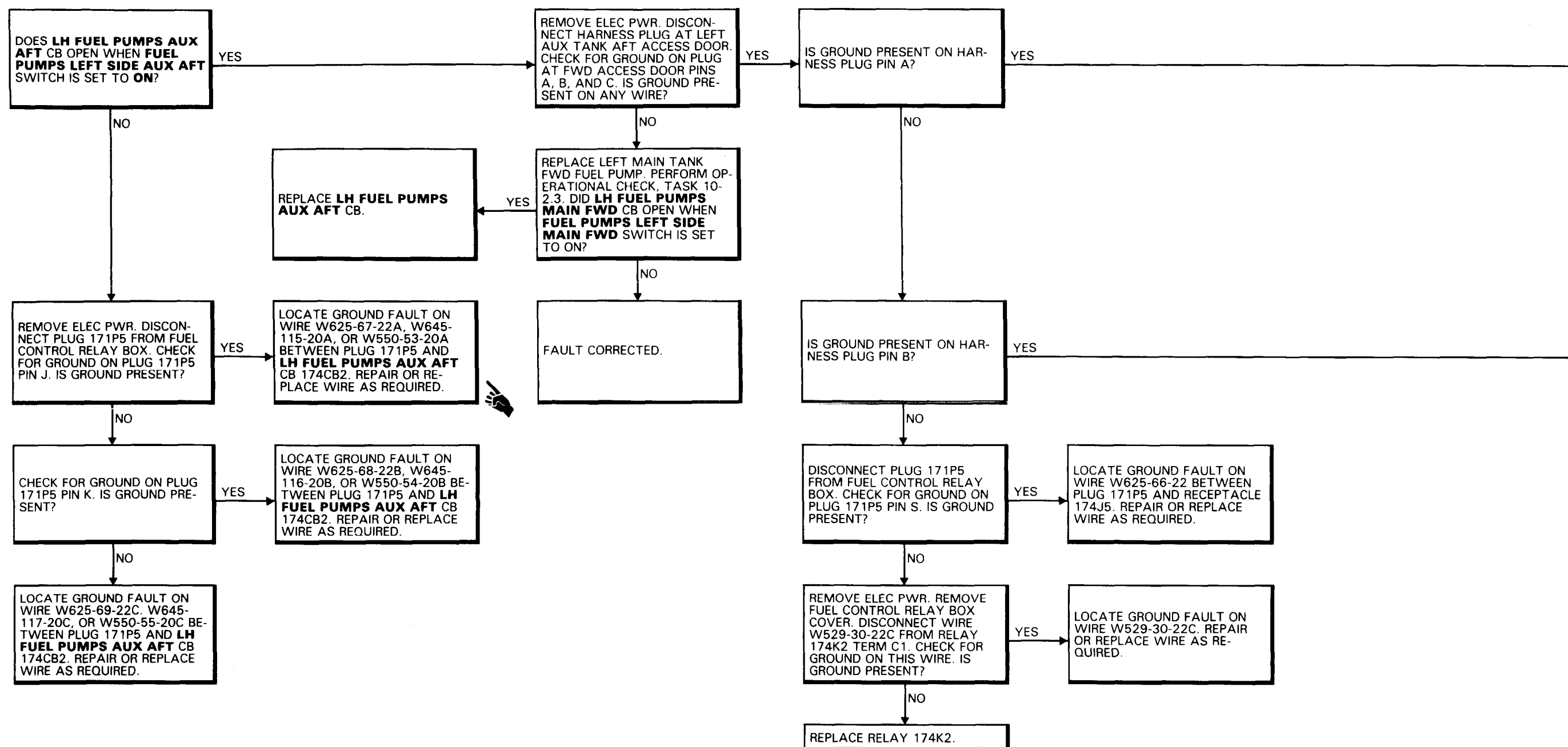
Side Acoustical Blanket Removed Between Sta  
320 and 360

Left Aft Intertank Access Panel Open



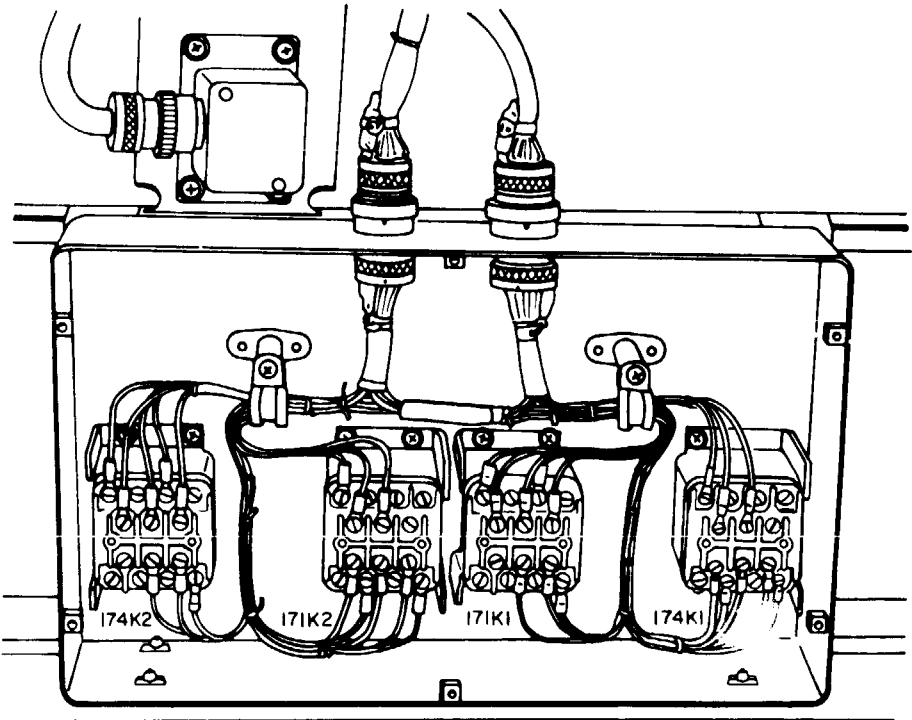
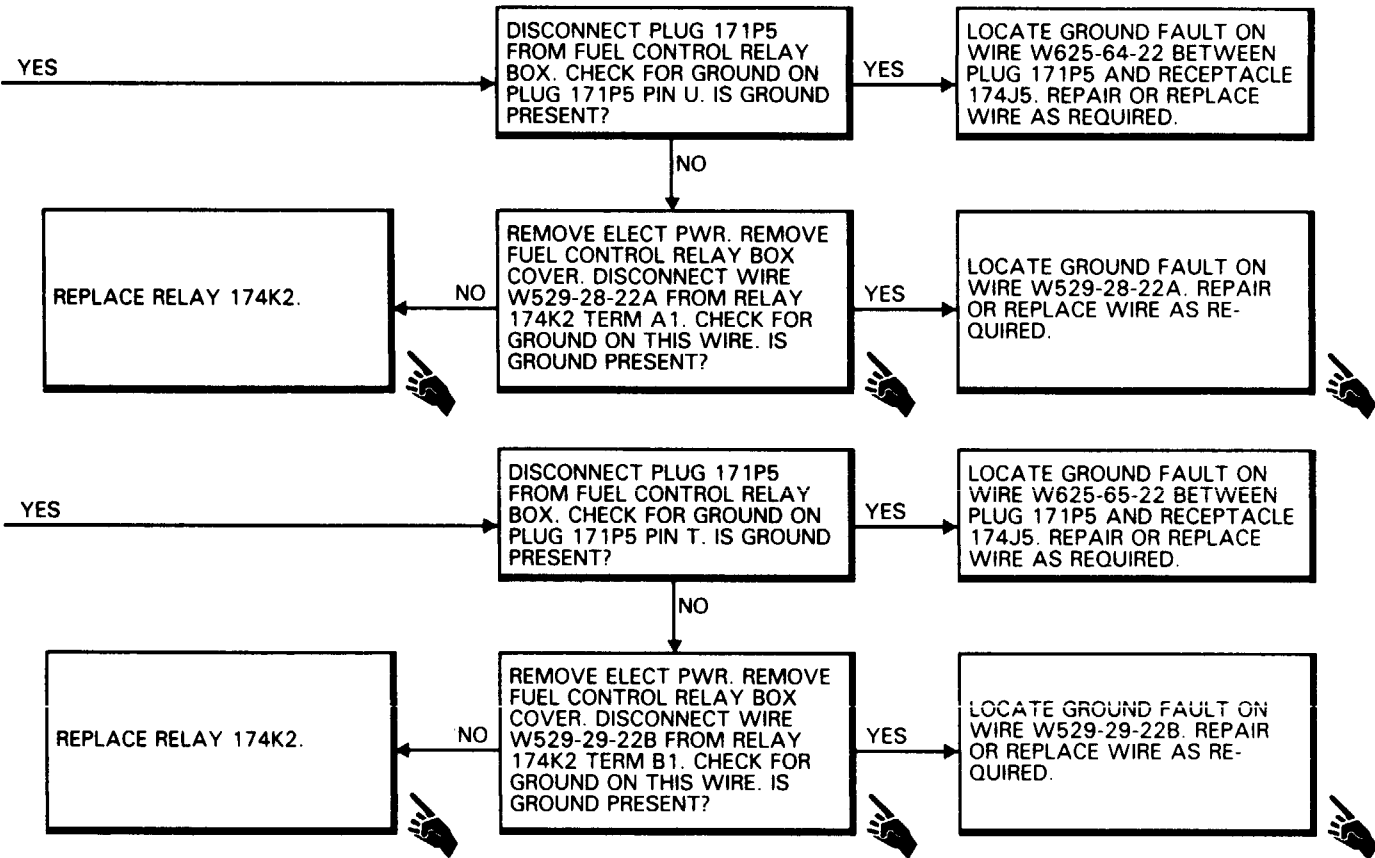
## 10-2.7 LH FUEL PUMPS AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.7



10-2.7 LH FUEL PUMPS AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.7



10-2.8 LH FUEL PUMP CONT AUX AFT CIRCUIT  
NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

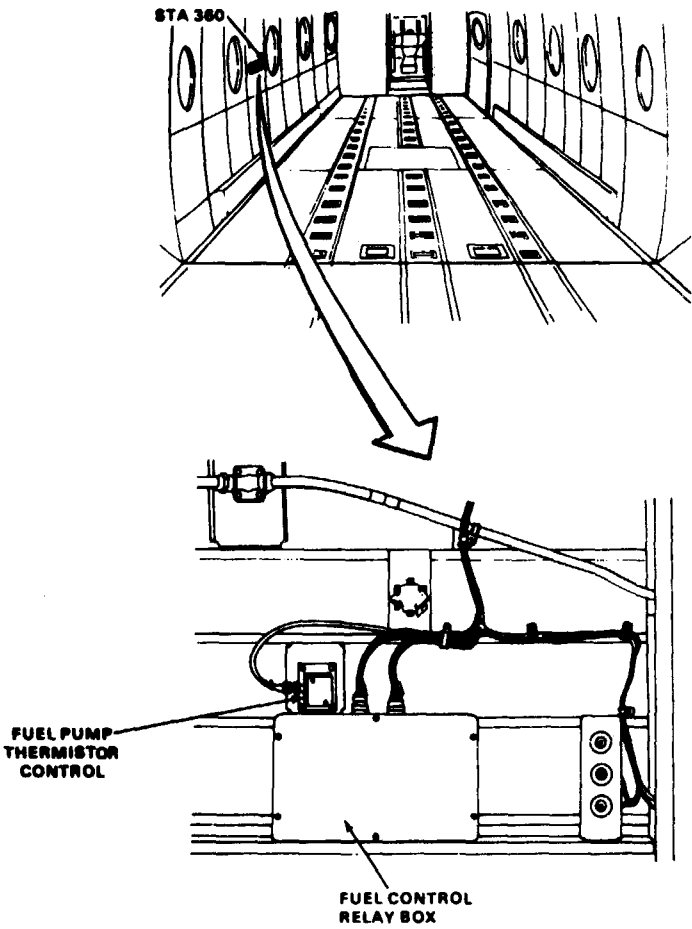
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:

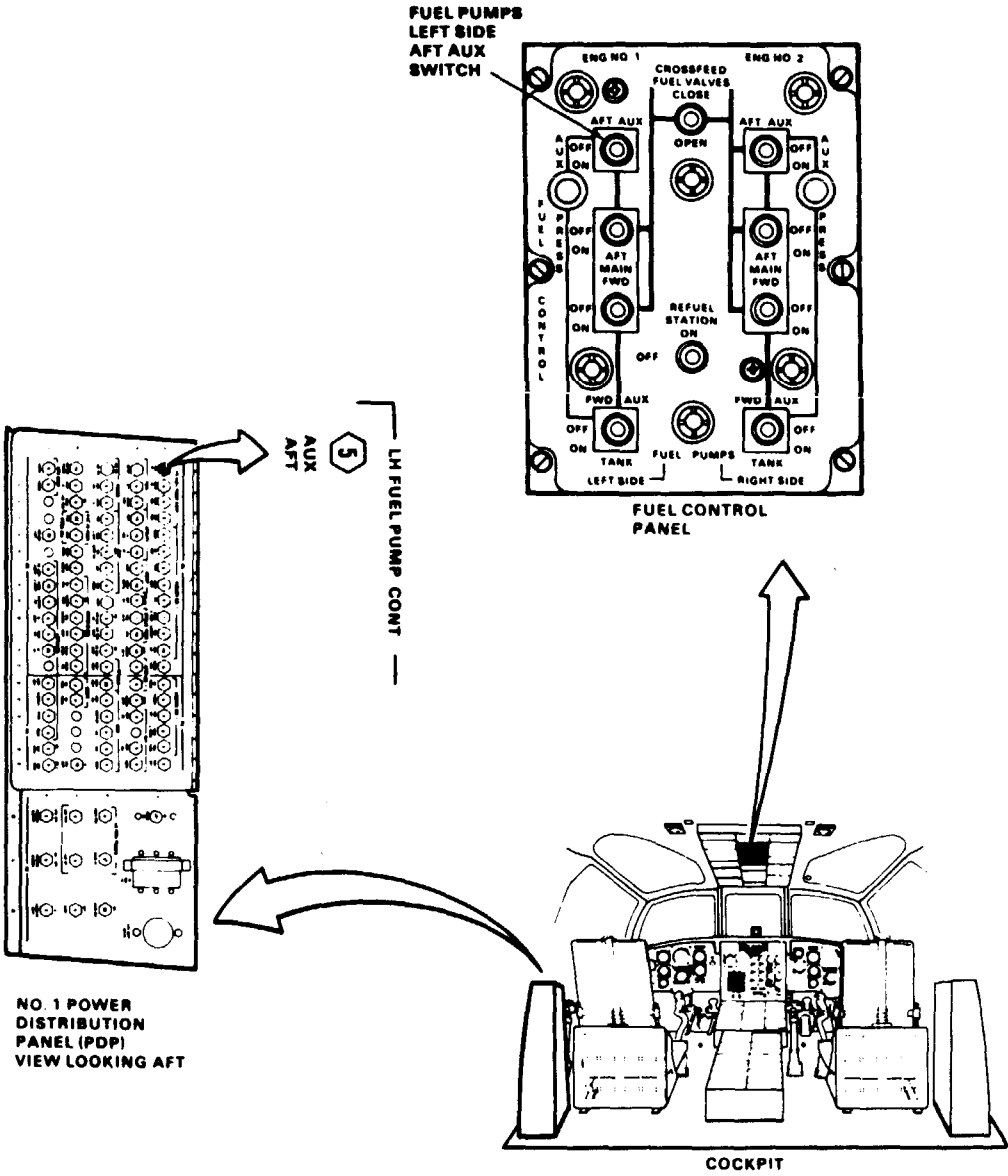
TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Side Acoustical Blanket Removed Between  
Sta 320 and 360



90 X 54

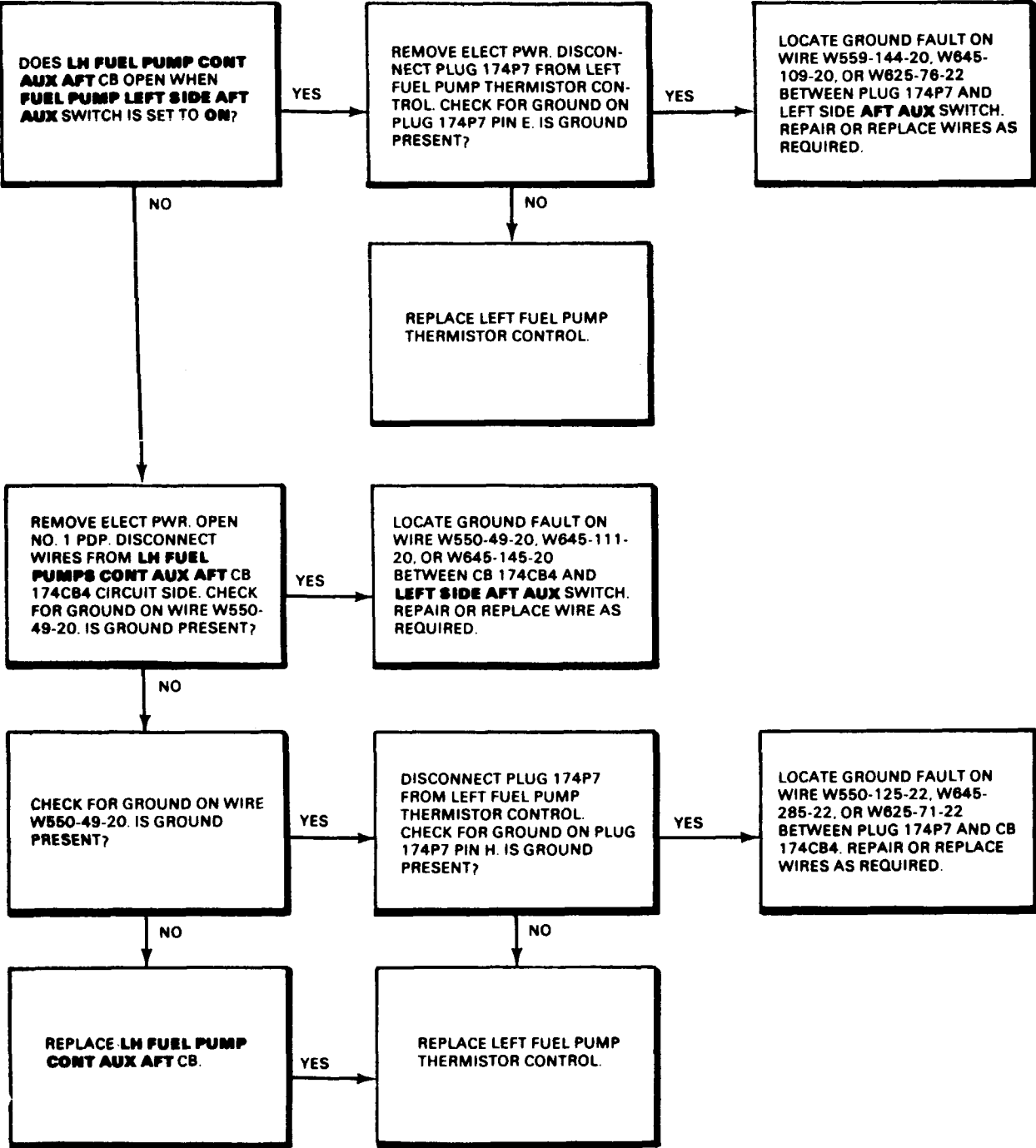


D145-11735-SPA

GO TO NEXT PAGE

10-2.8 LH FUEL PUMP CONT AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.8



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

- All
- Tools:
- Electrical Repairer's Tool Kit,
  - NSN 5180-00-323-4915
  - Multimeter

Materials:

- None

Personnel Required:

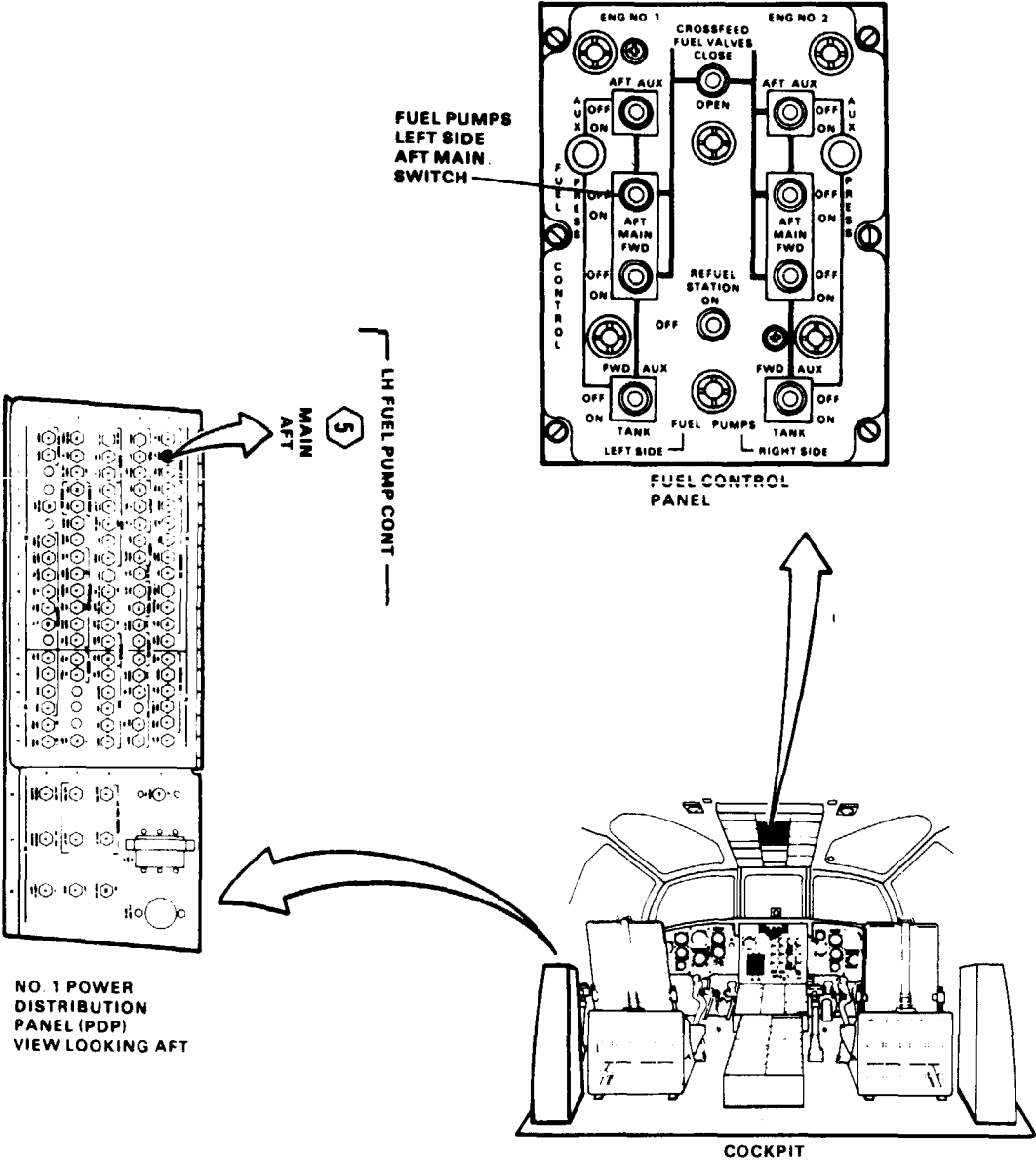
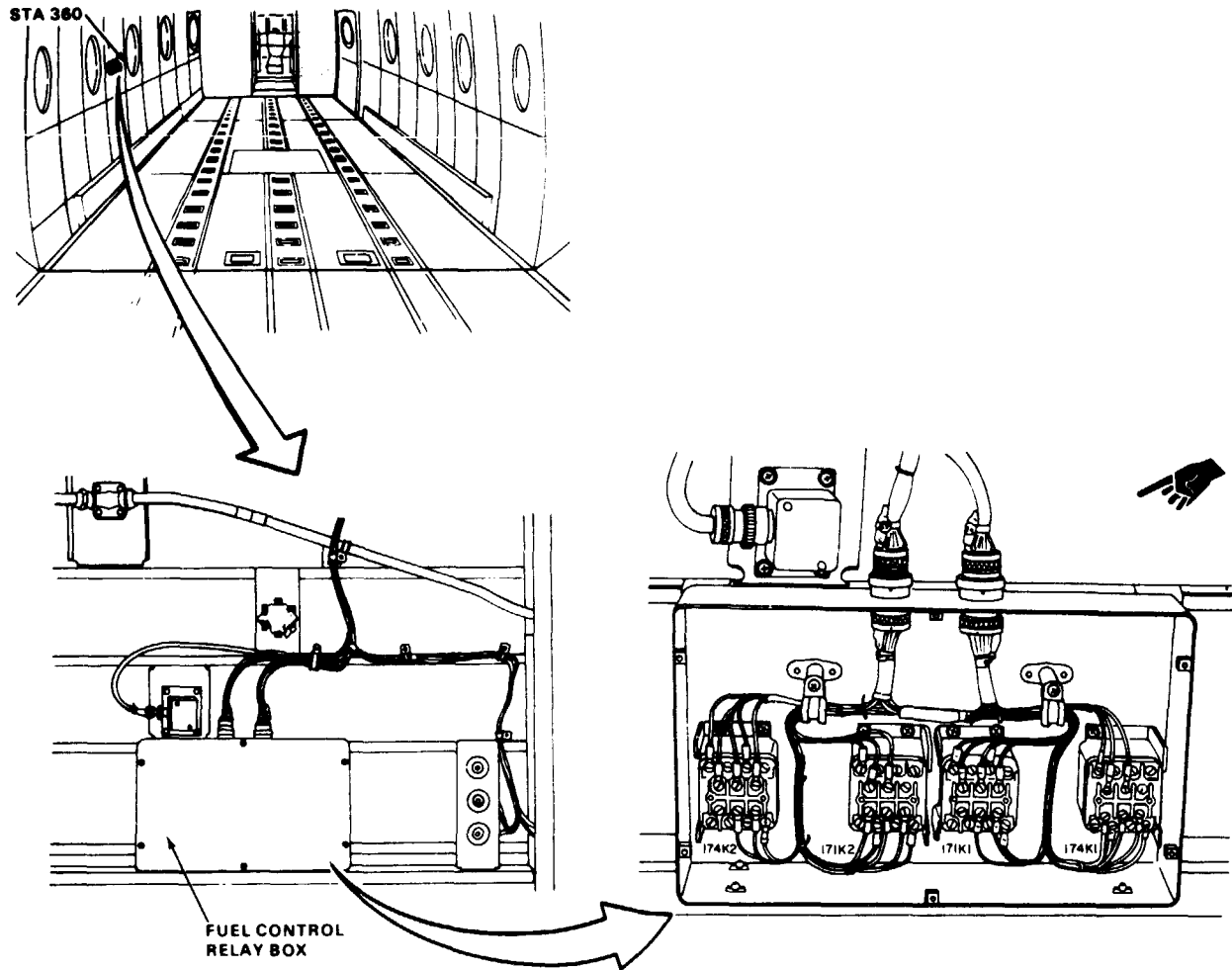
- Aircraft Electrician (2)

References:

TM 55-1520-240-23

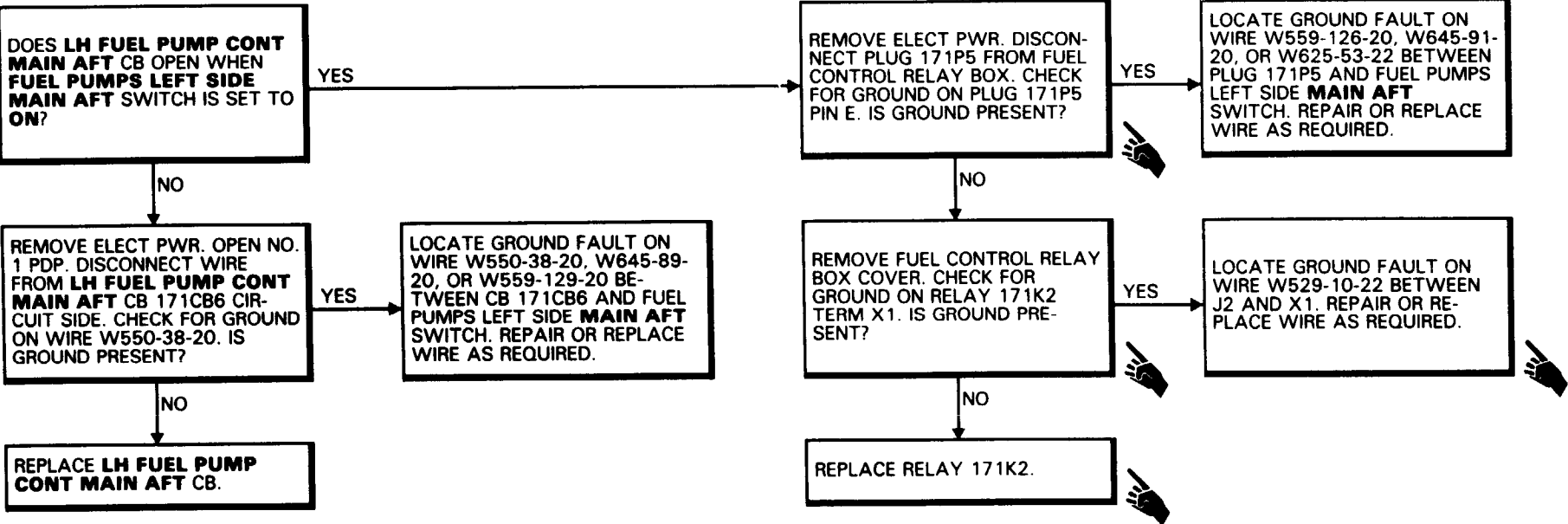
Equipment Condition:

- TM 55-1520-240-23:
- Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Side Acoustical Blanket Removed Between Sta 320 and 360



10-2.9 LH FUEL PUMP CONT MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.9



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electrical Repairer's Tool Kit,
- NSN 5180-00-323-4915
- Multimeter

Materials:

None

Personnel Required:

Aircraft Electrician (2)

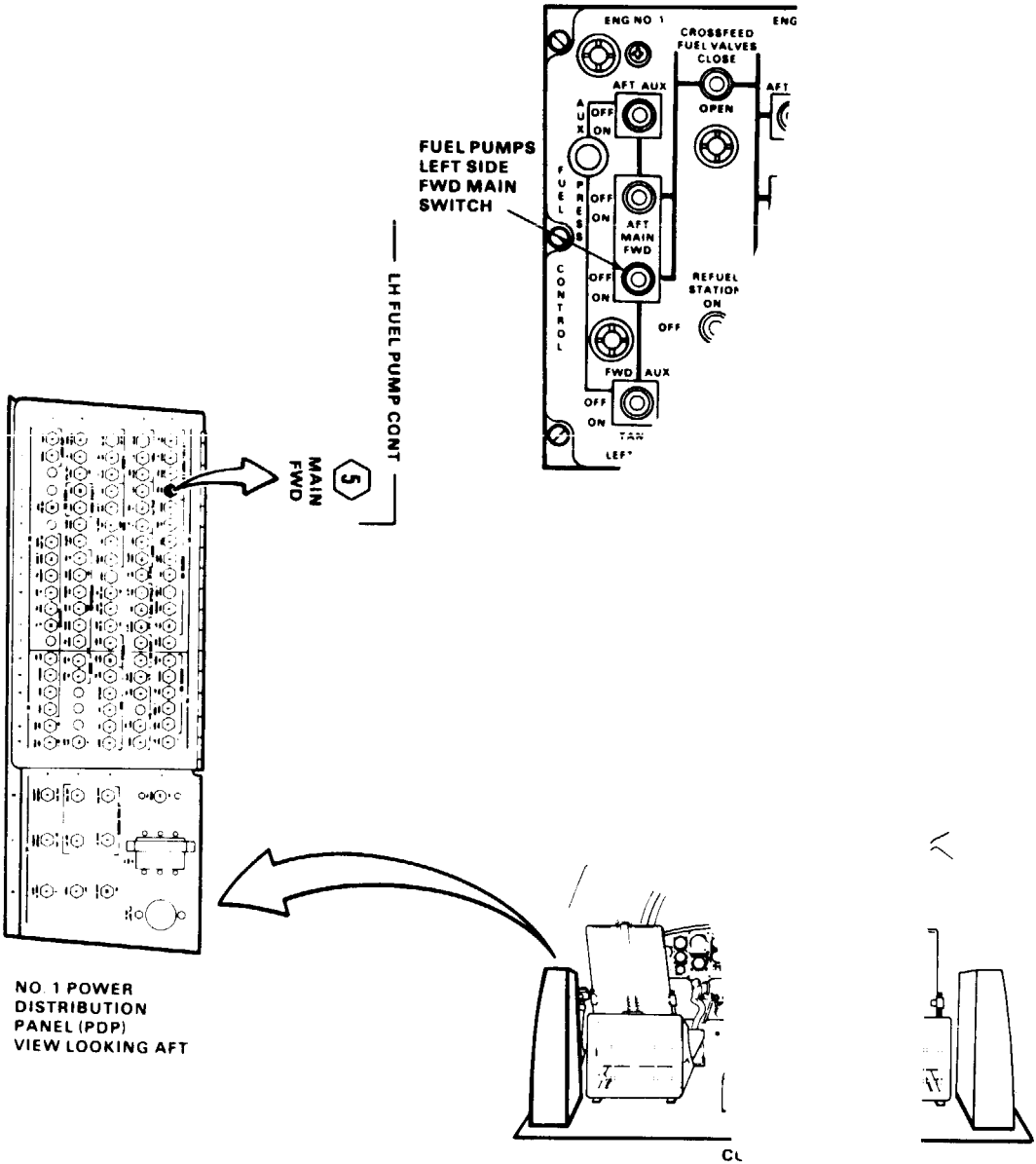
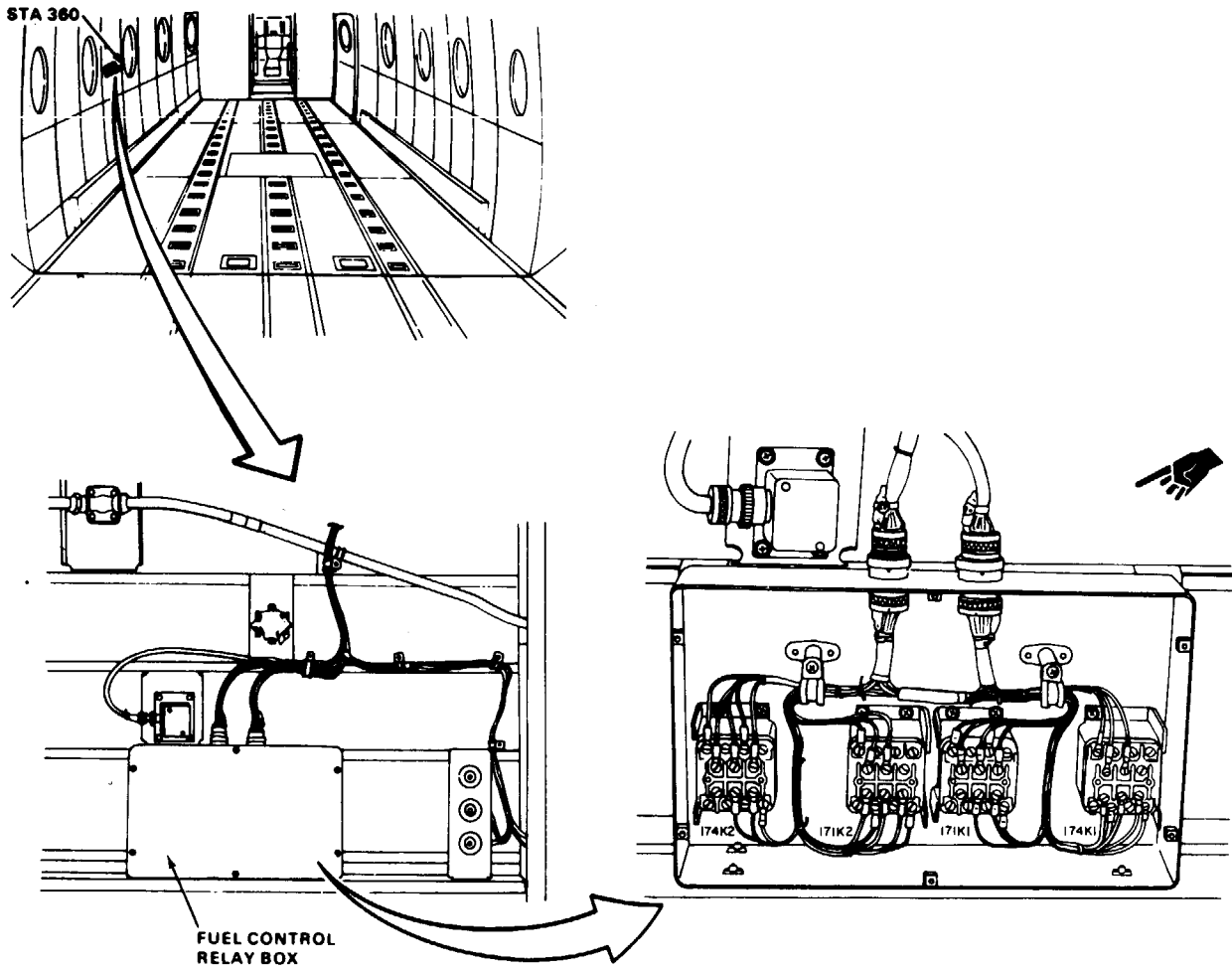
References:

TM 55-1520-240-23

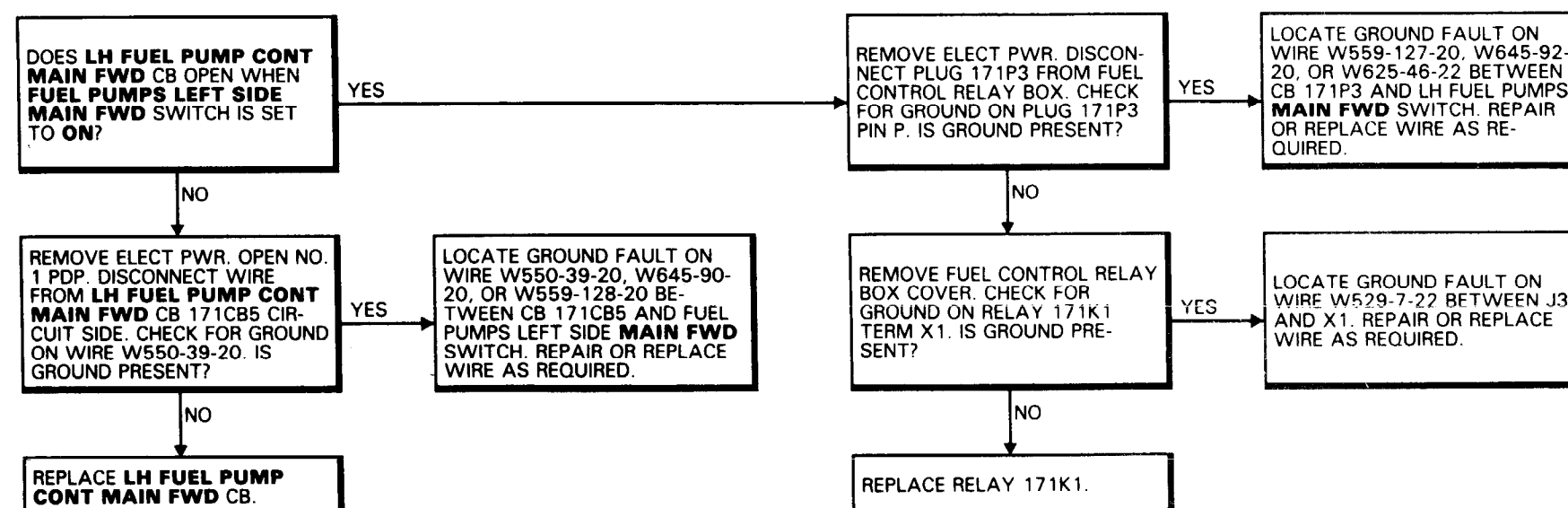
Equipment Condition:

TM 55-1520-240-23:

- Battery Connected
- Electrical Power On
- Hydraulic Power Off
- Side Acoustical Blanket Removed Between Sta 320 and 360







10-2.11 LH FUEL PUMP CONT AUX FWD CIRCUIT BREAKER  
WILL NOT STAY CLOSED

10-2.11

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

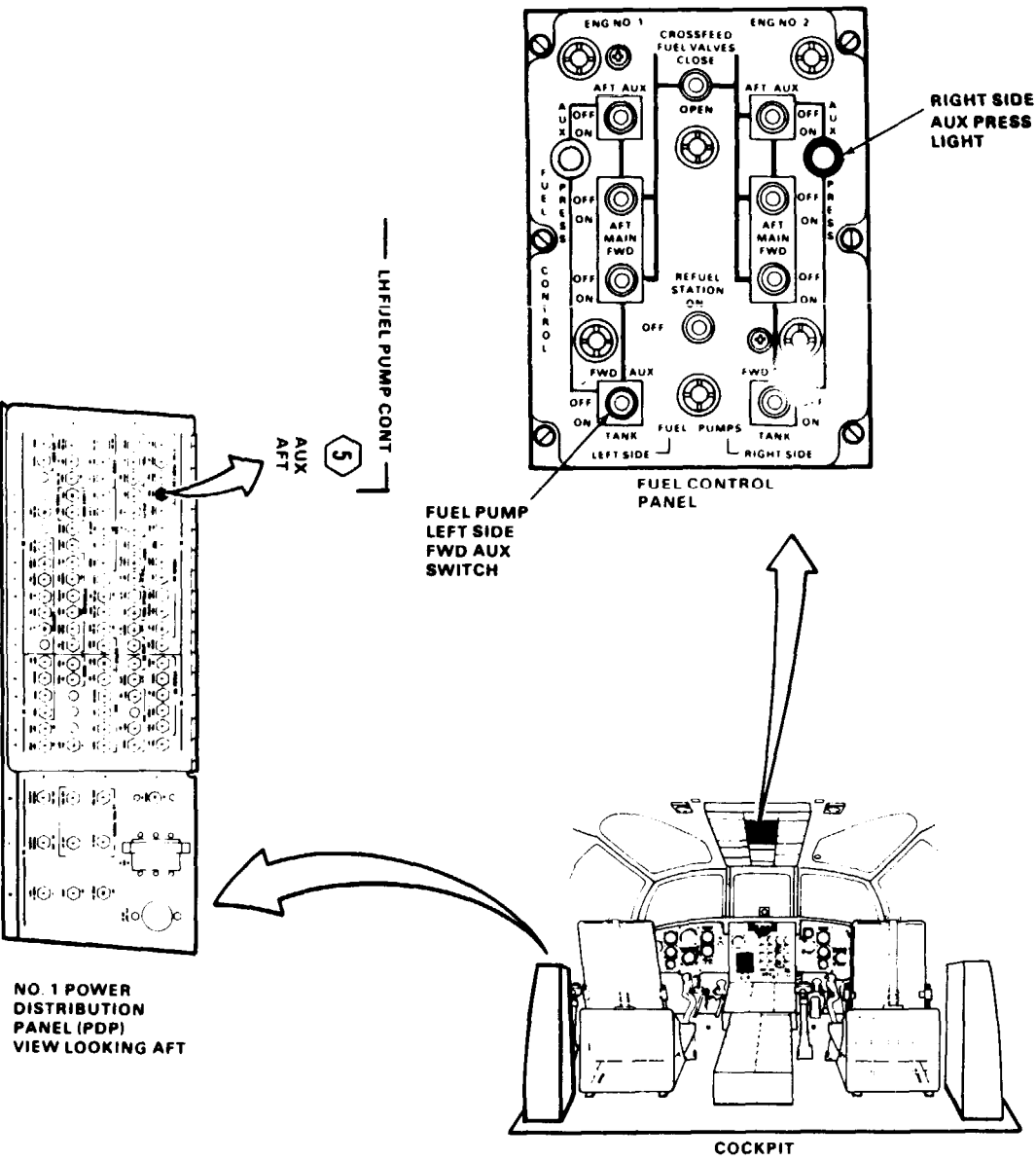
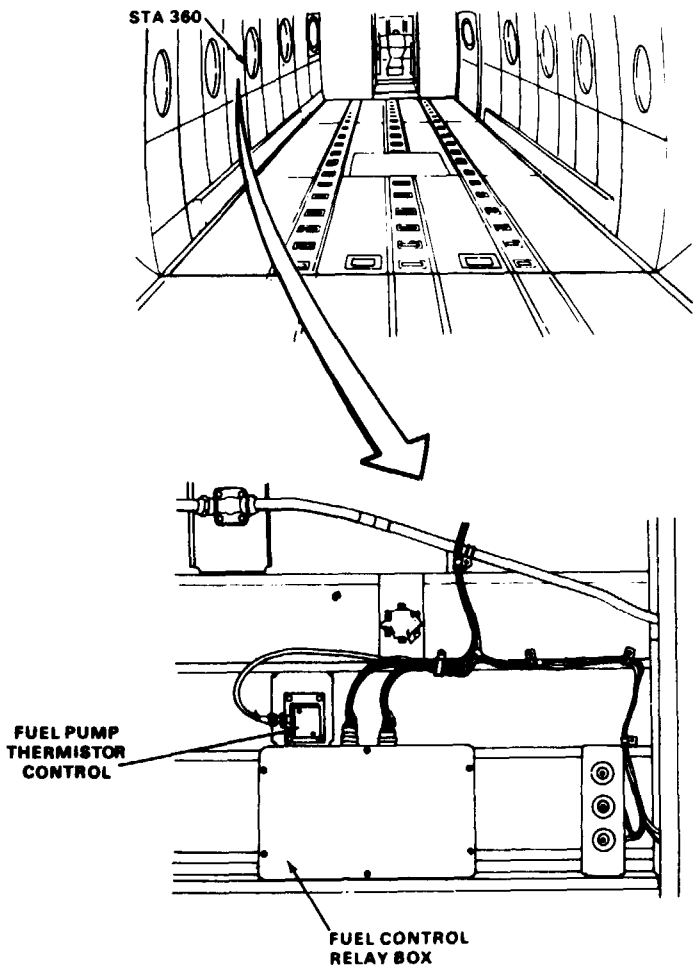
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Side Acoustical Blanket Removed Between Sta  
320 and 360

Materials:  
None

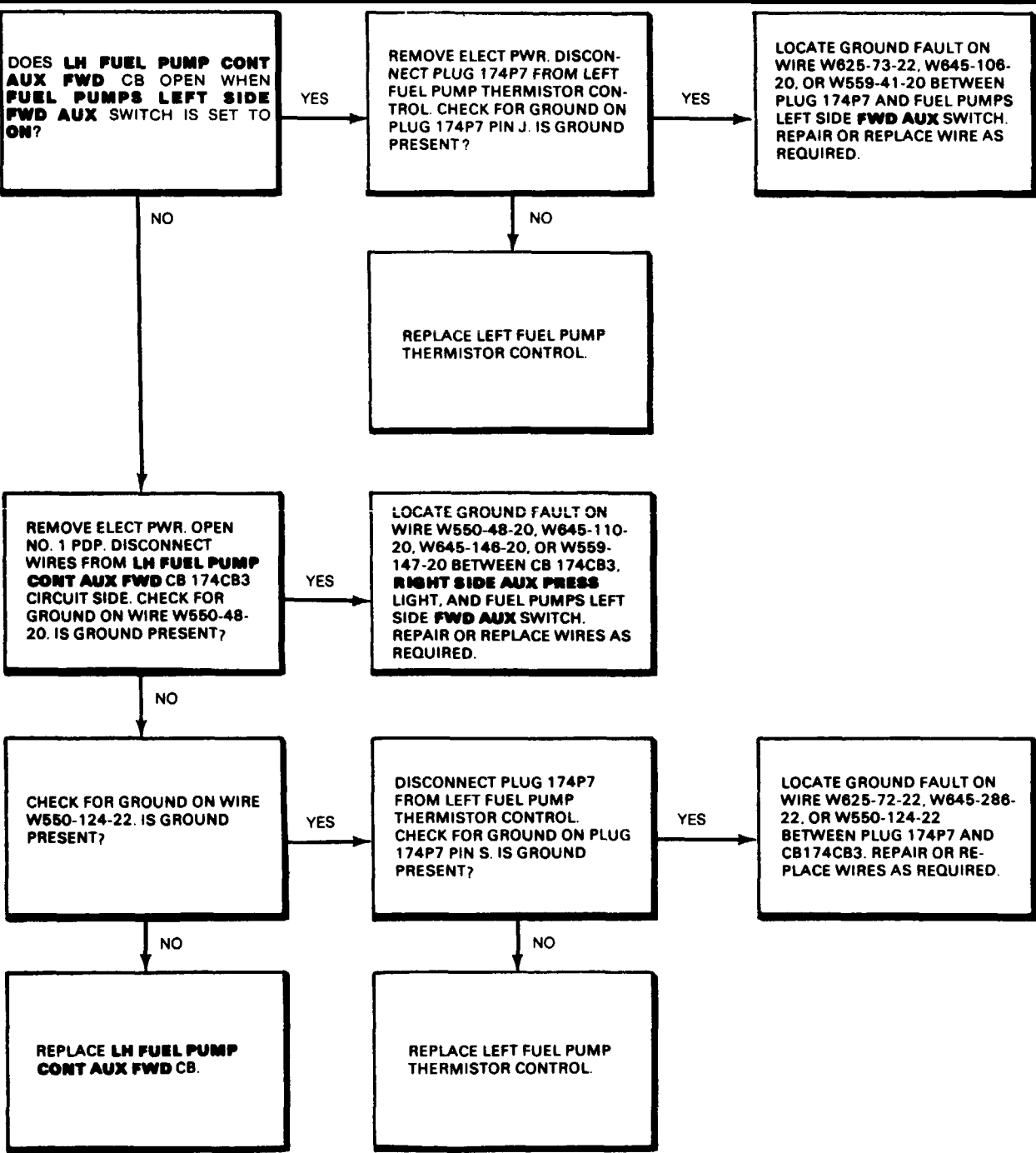
Personnel Required:  
Aircraft Electrician (2)



650  
GO TO NEXT PAGE

10-2.11 LH FUEL PUMP CONT AUX FWD CIRCUIT BREAKER  
WILL NOT STAY CLOSED (Continued)

10-2.11



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
- Multimeter

Materials:

None

Personnel Required:

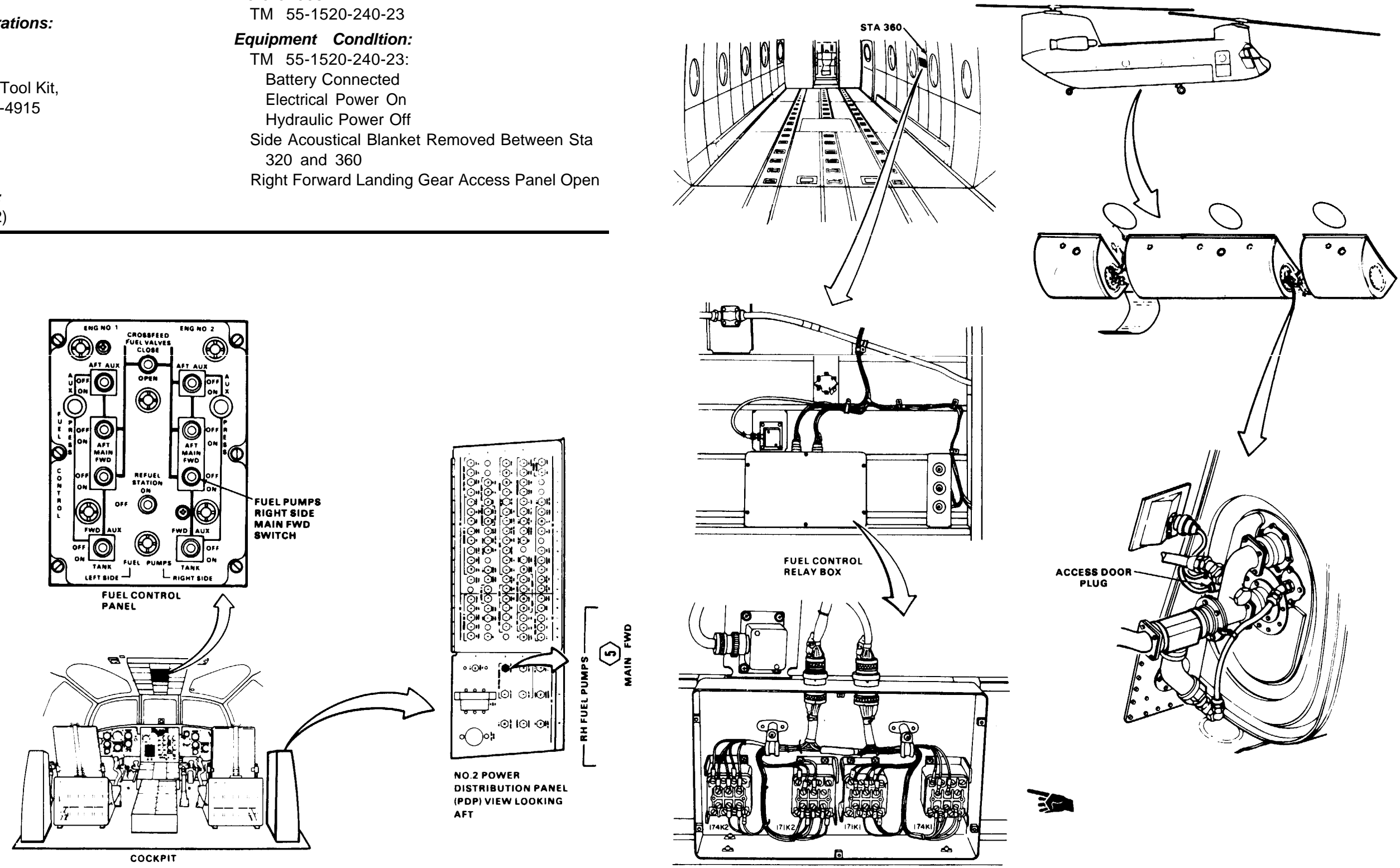
Aircraft Electrician (2)

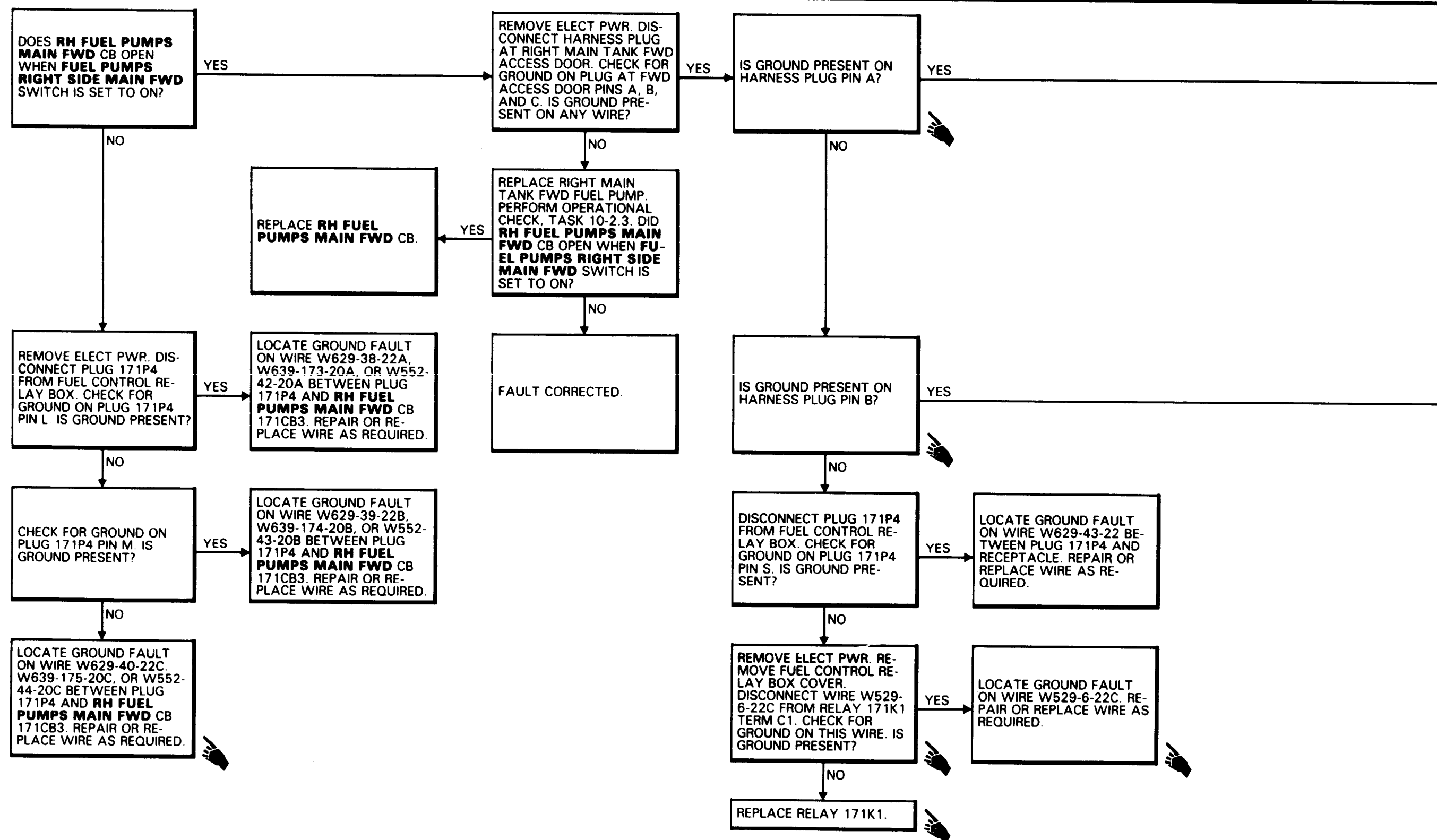
References:

TM 55-1520-240-23

Equipment Condition:

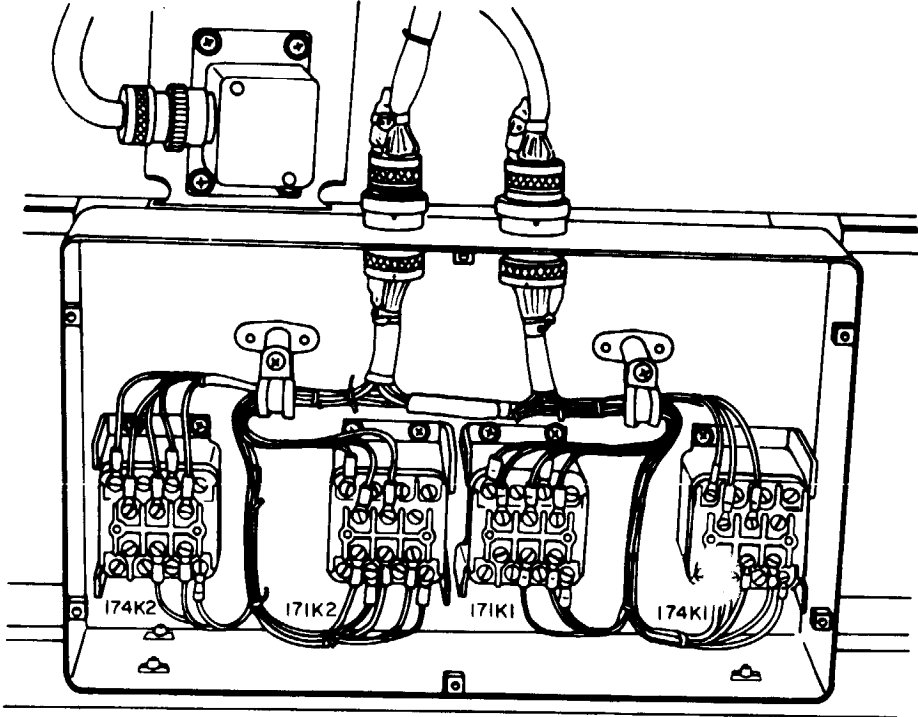
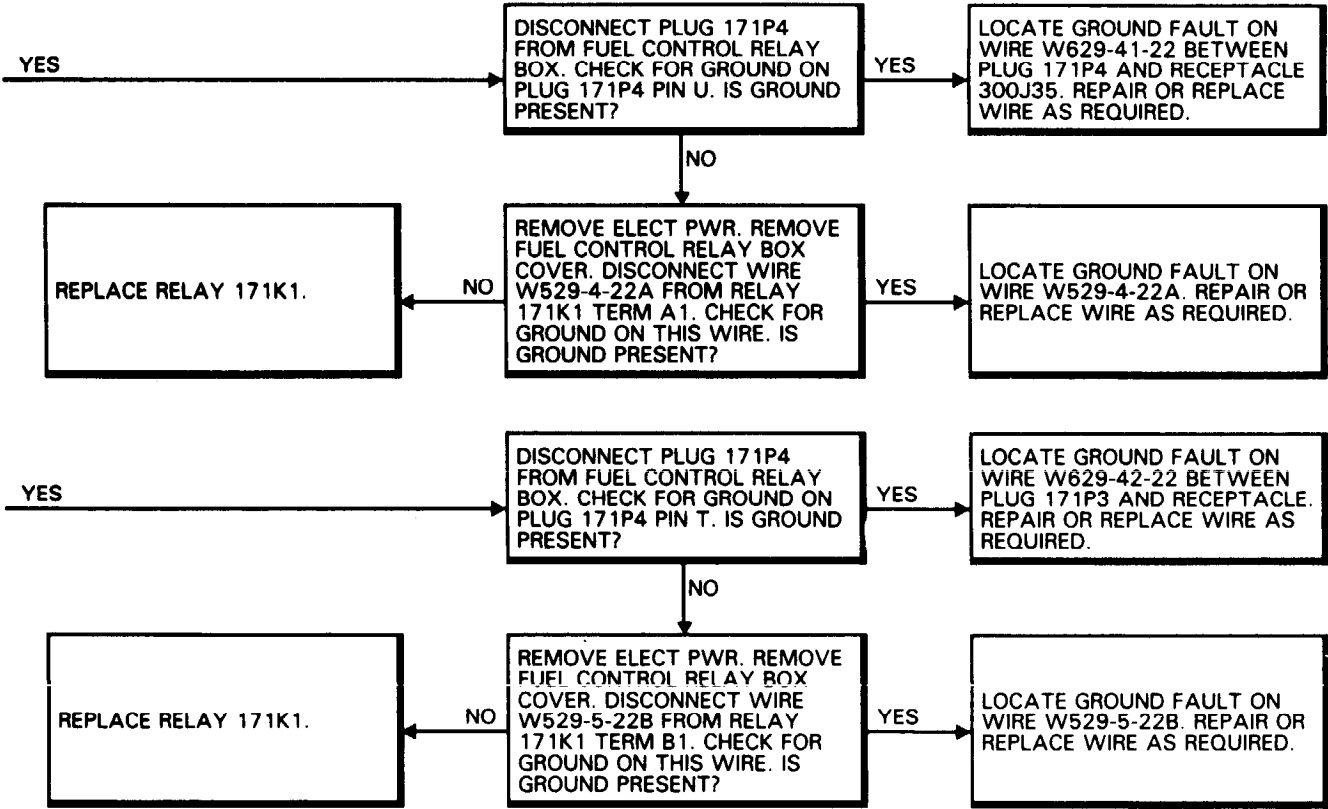
- TM 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off
- Side Acoustical Blanket Removed Between Sta 320 and 360
- Right Forward Landing Gear Access Panel Open





10-2.12 RH FUEL PUMP MAIN FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.12



9680

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

- All
- Tools:**
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
  - Multimeter

Materials:

None

Personnel Required:

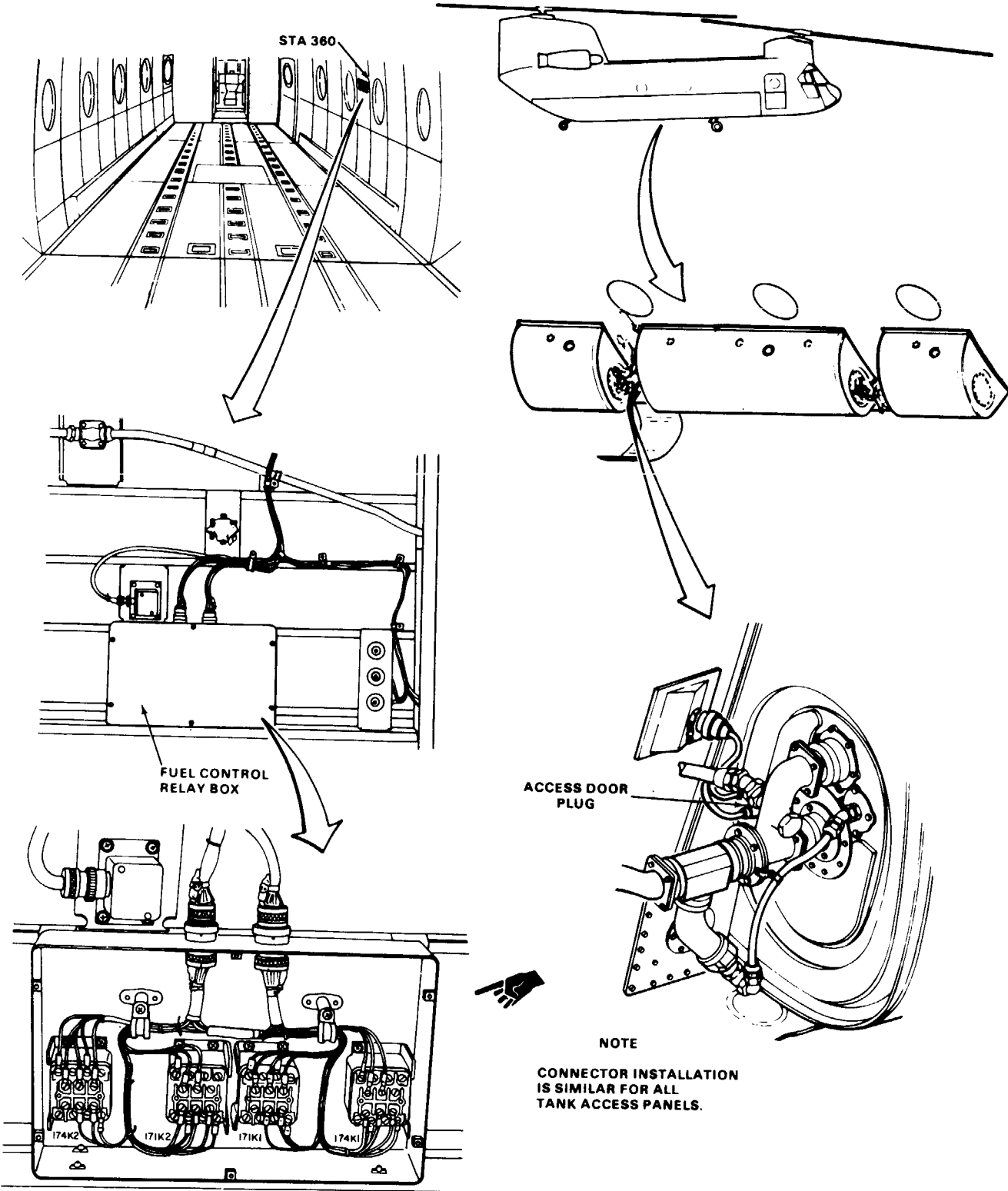
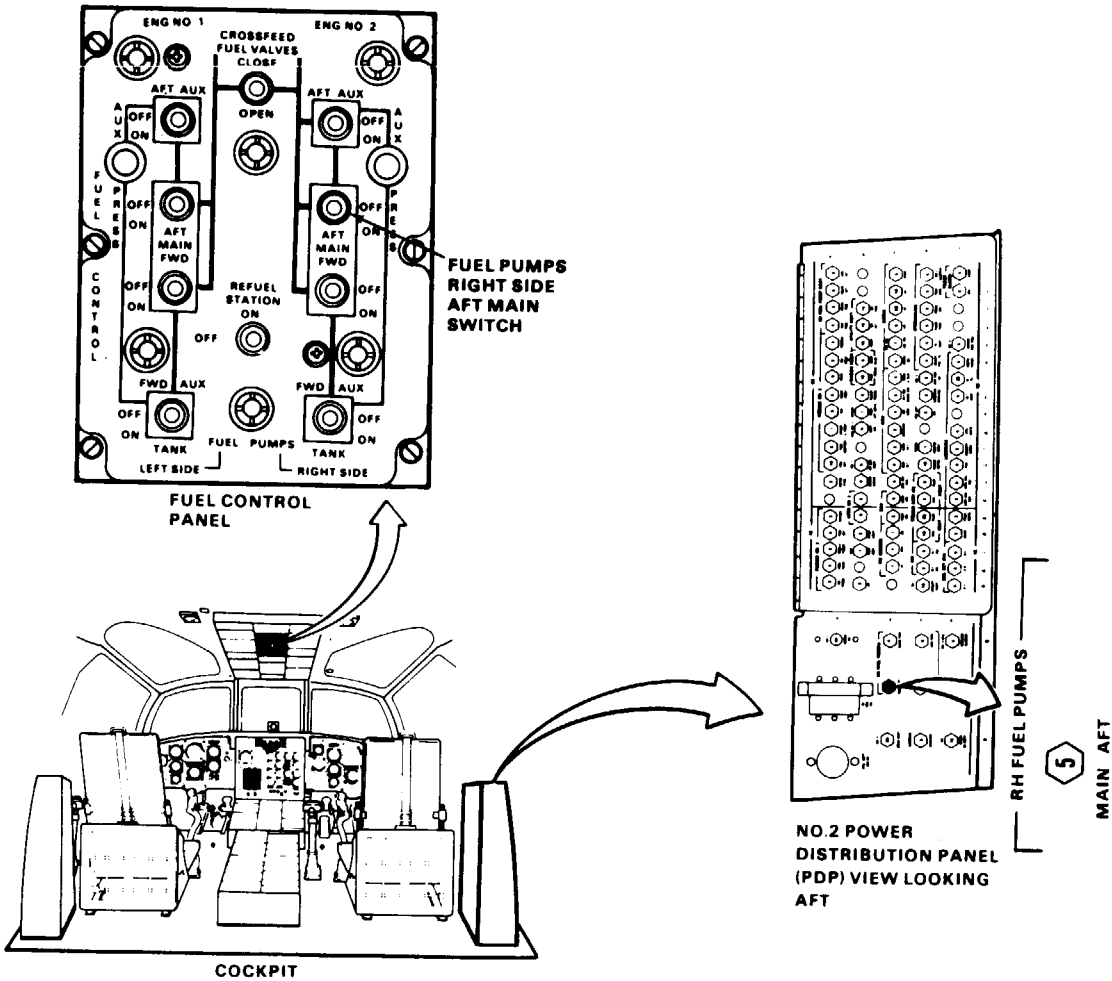
Aircraft Electrician (2)

References:

TM 55-1520-240-23

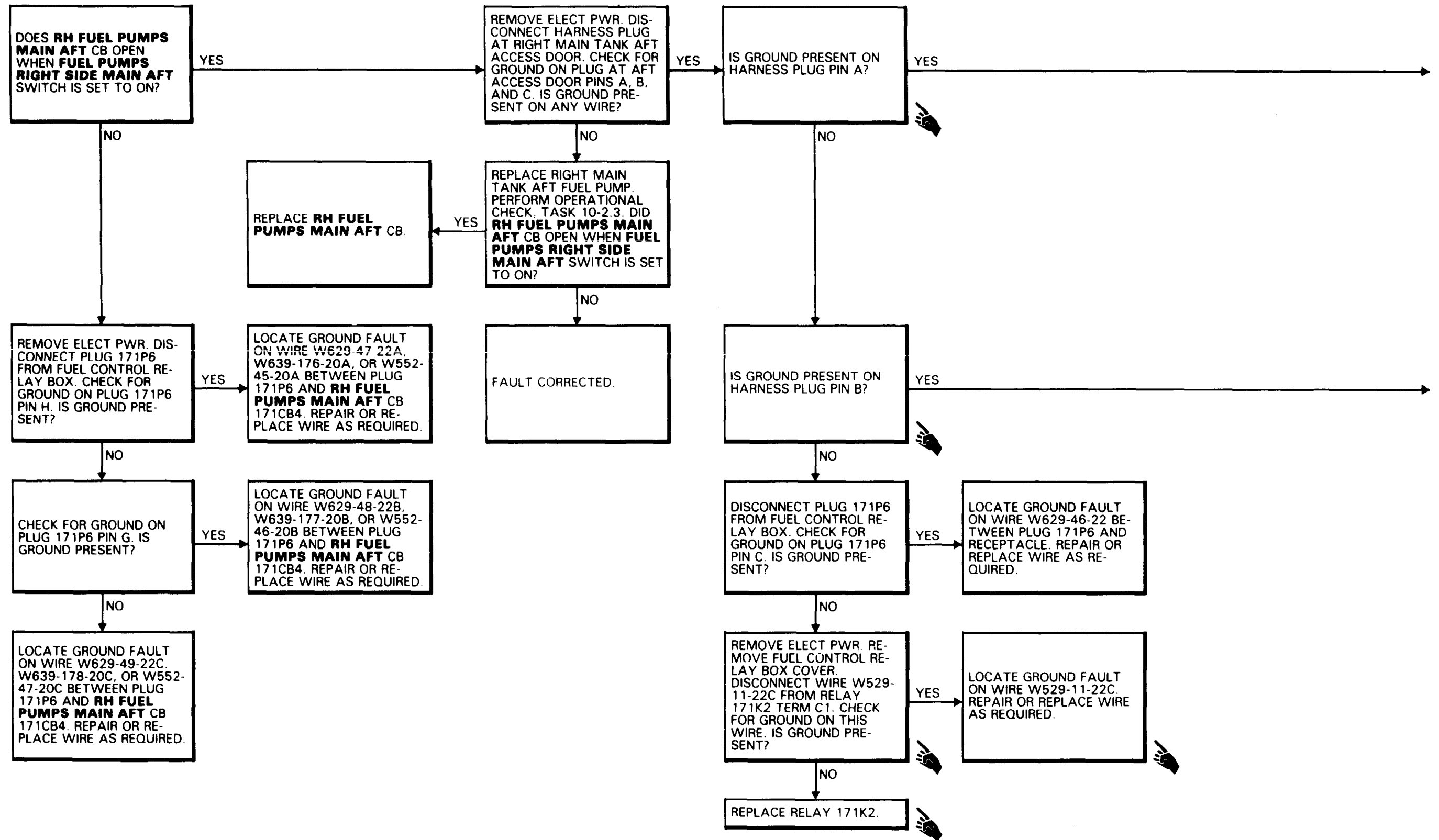
Equipment Condition:

- TM 55-1520-240-23:
- Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Side Acoustical Blanket Removed Between Sta 320 and 360
  - Right Aft Intertank Access Panel Open



10-2.13 RH FUEL PUMP MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

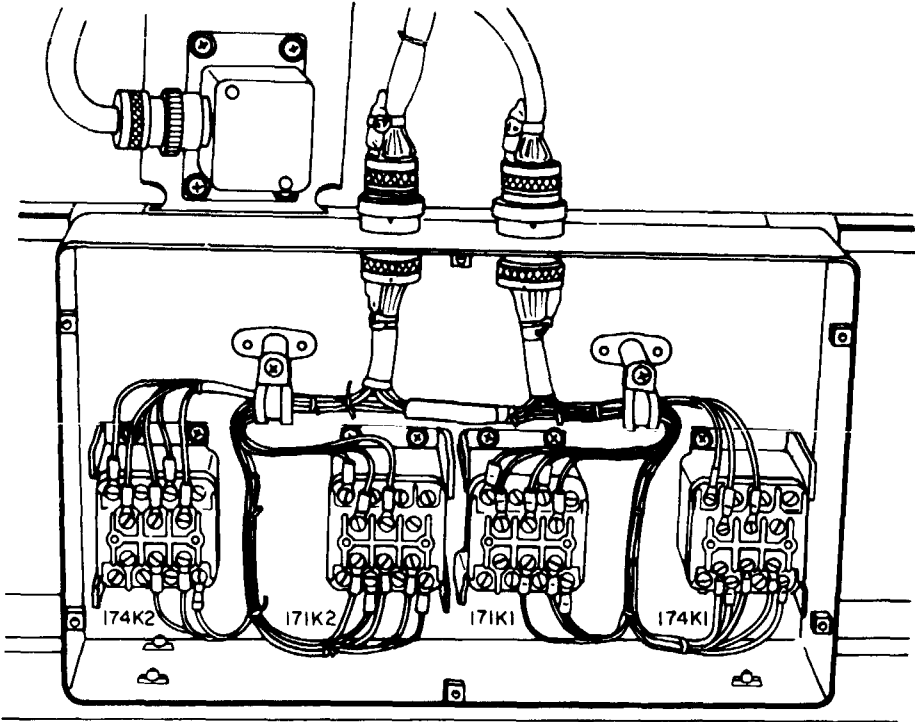
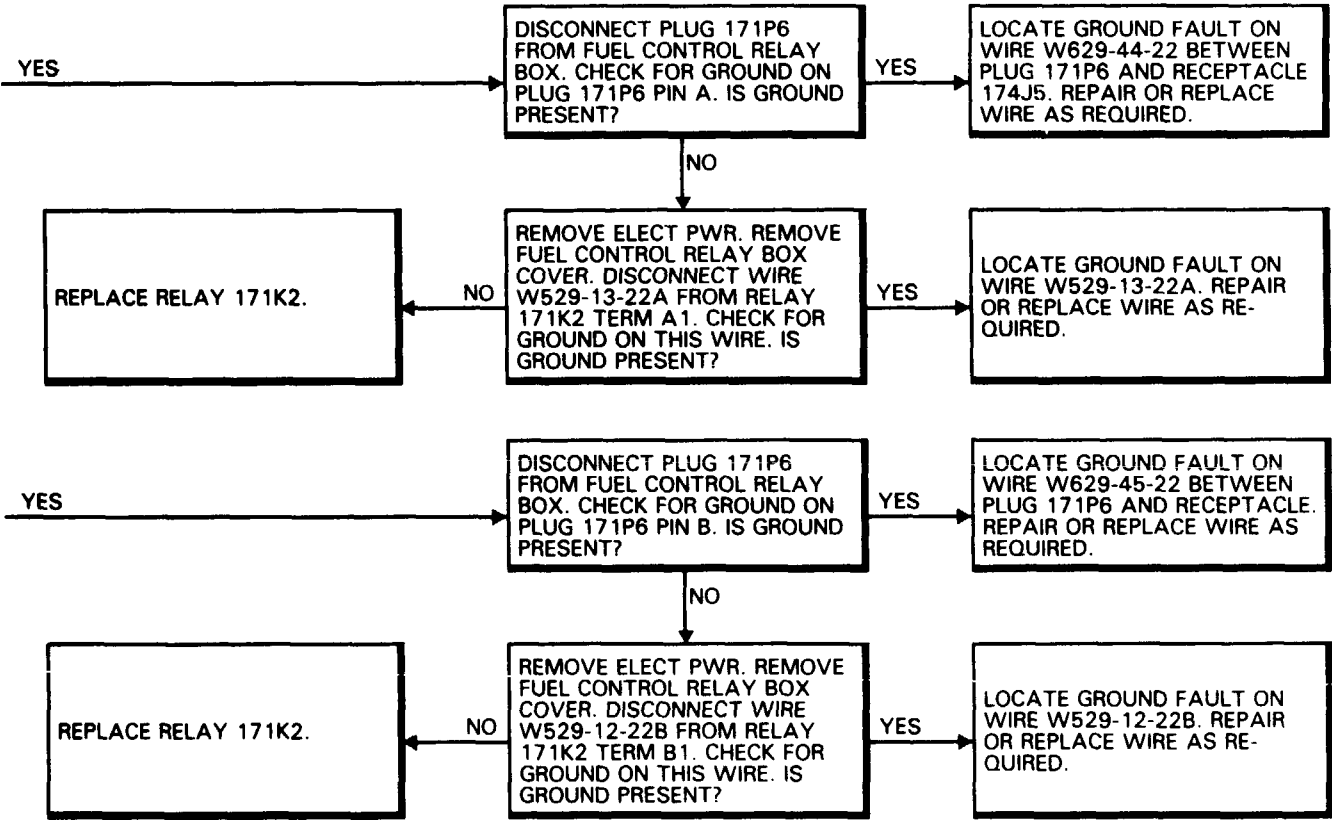
10-2.13





10-2.13 RH FUEL PUMP MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.13



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

- All
- Tools:**
- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
  - Multimeter

Materials:

- None

Personnel Required:

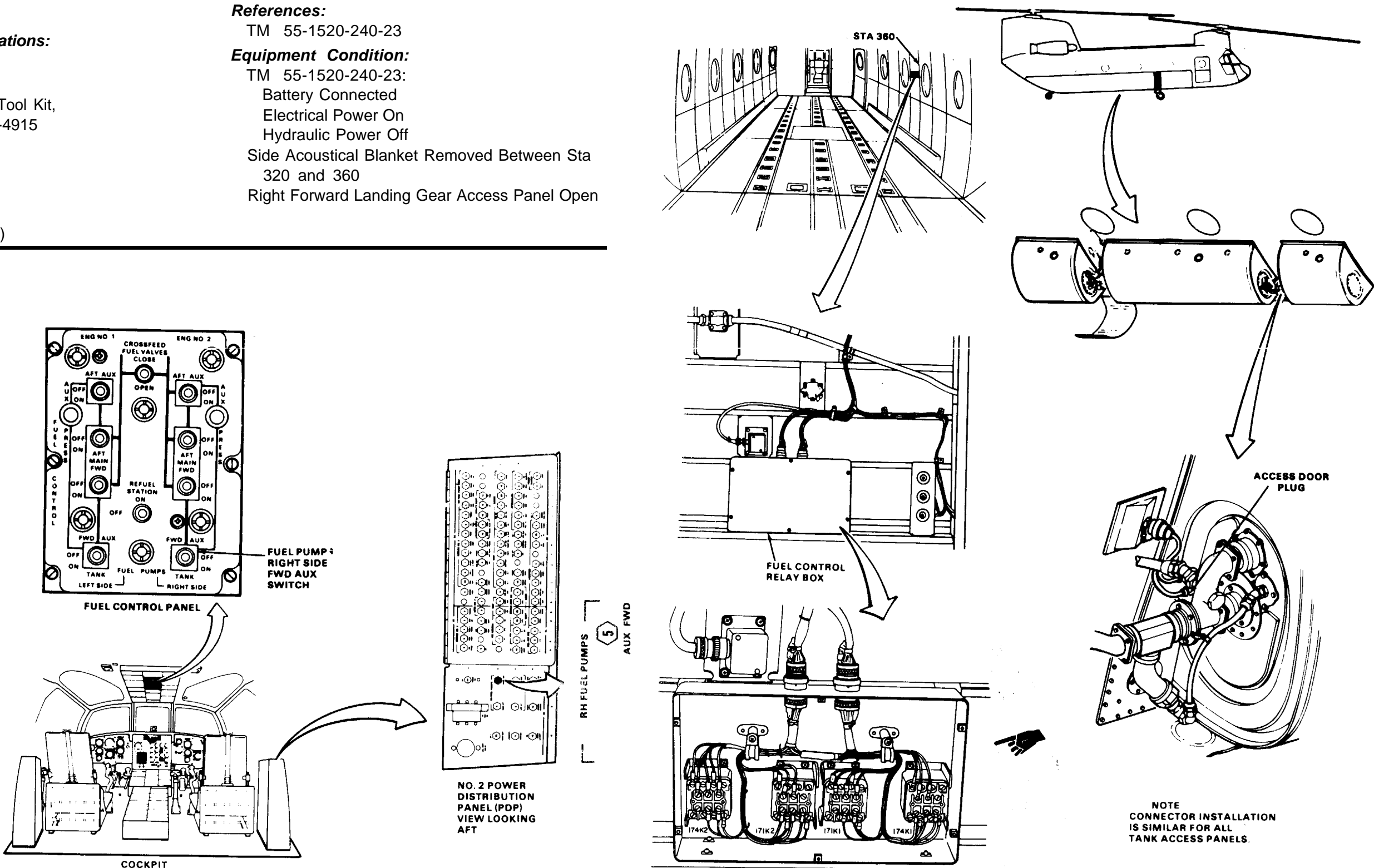
- Aircraft Electrician (2)

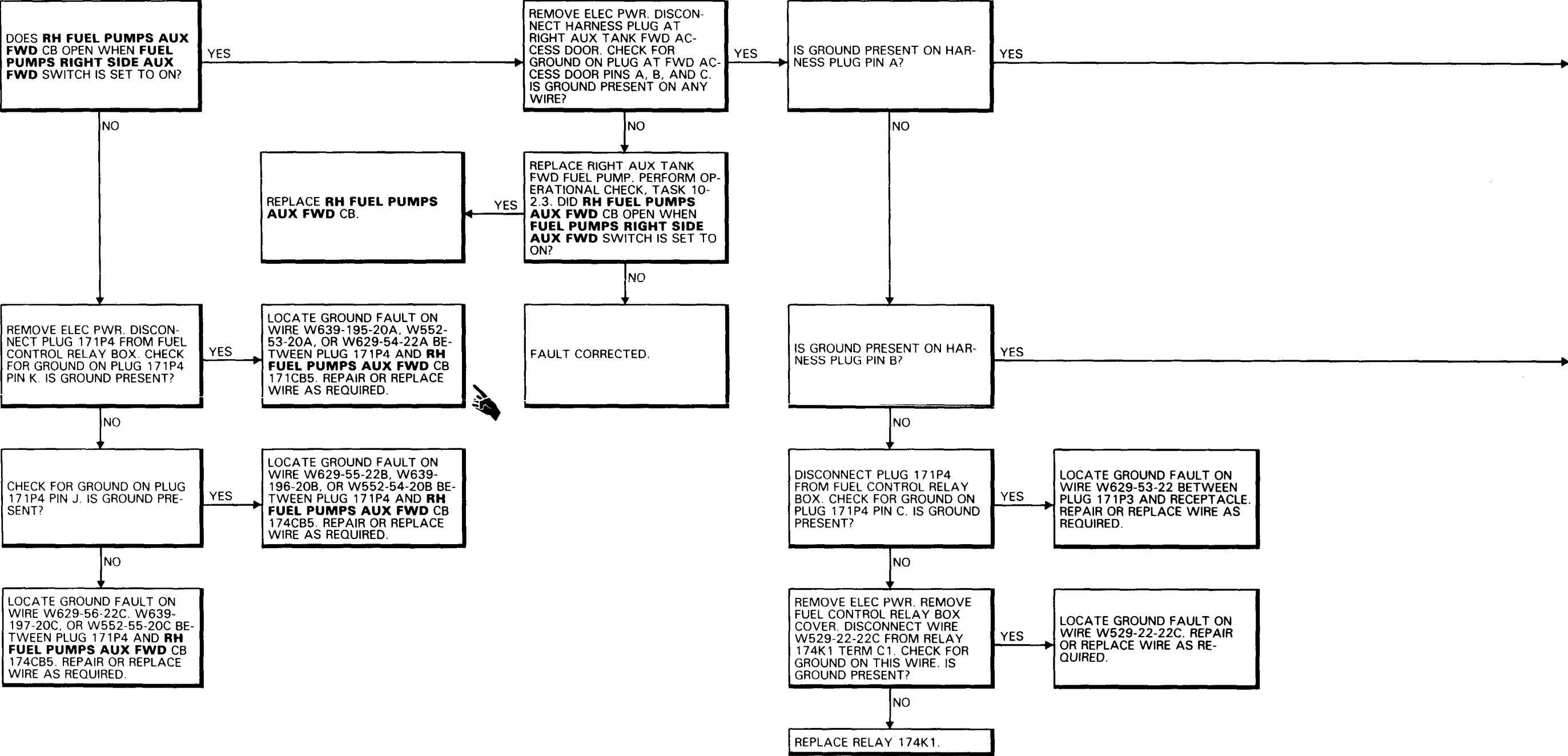
References:

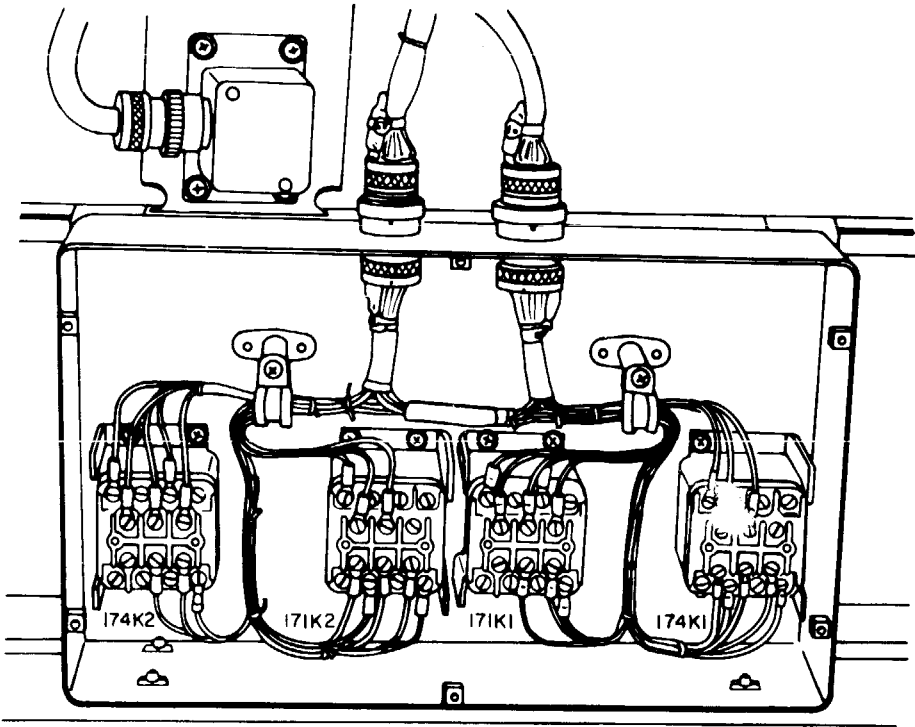
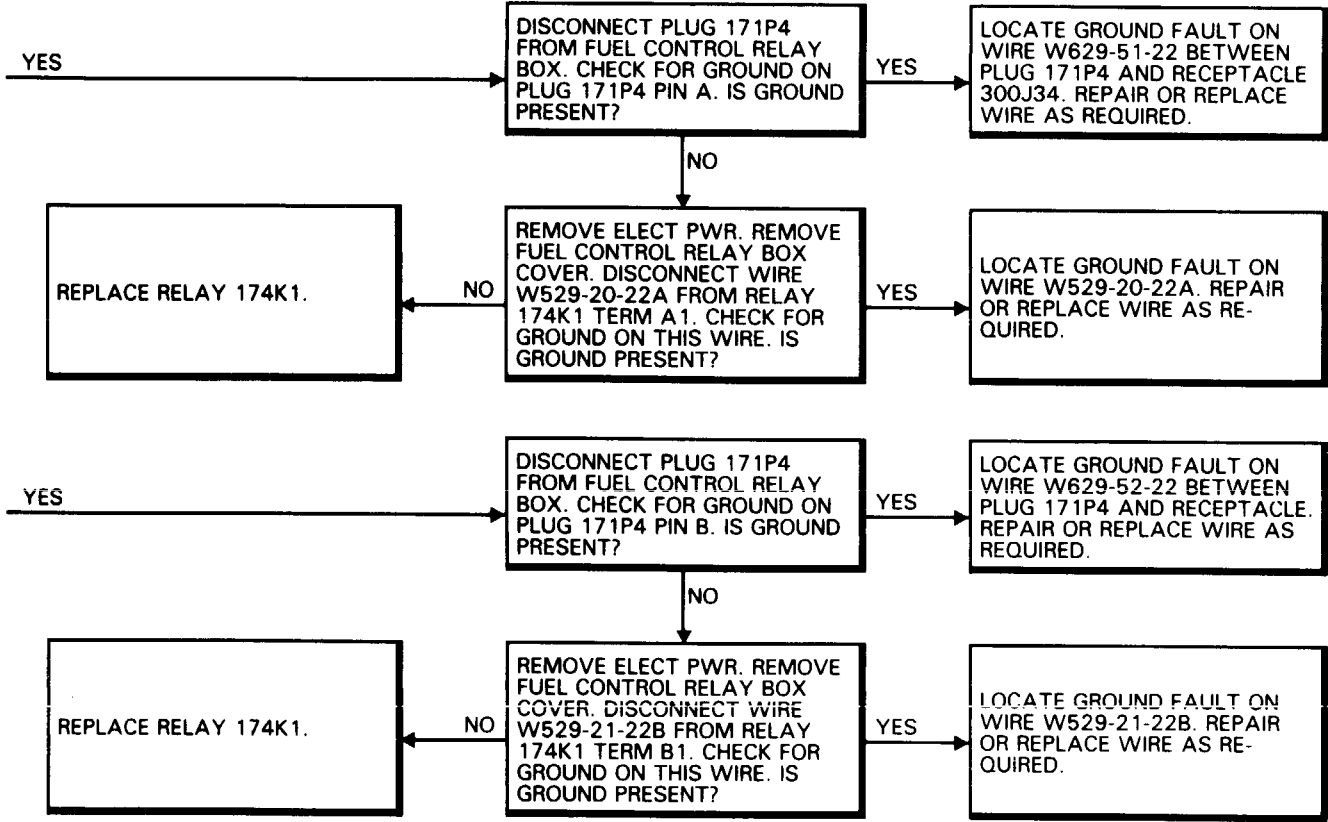
- TM 55-1520-240-23

Equipment Condition:

- TM 55-1520-240-23:
- Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Side Acoustical Blanket Removed Between Sta 320 and 360
  - Right Forward Landing Gear Access Panel Open







FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

Aircraft Electrician (2)

References:

TM 55-1520-240-23

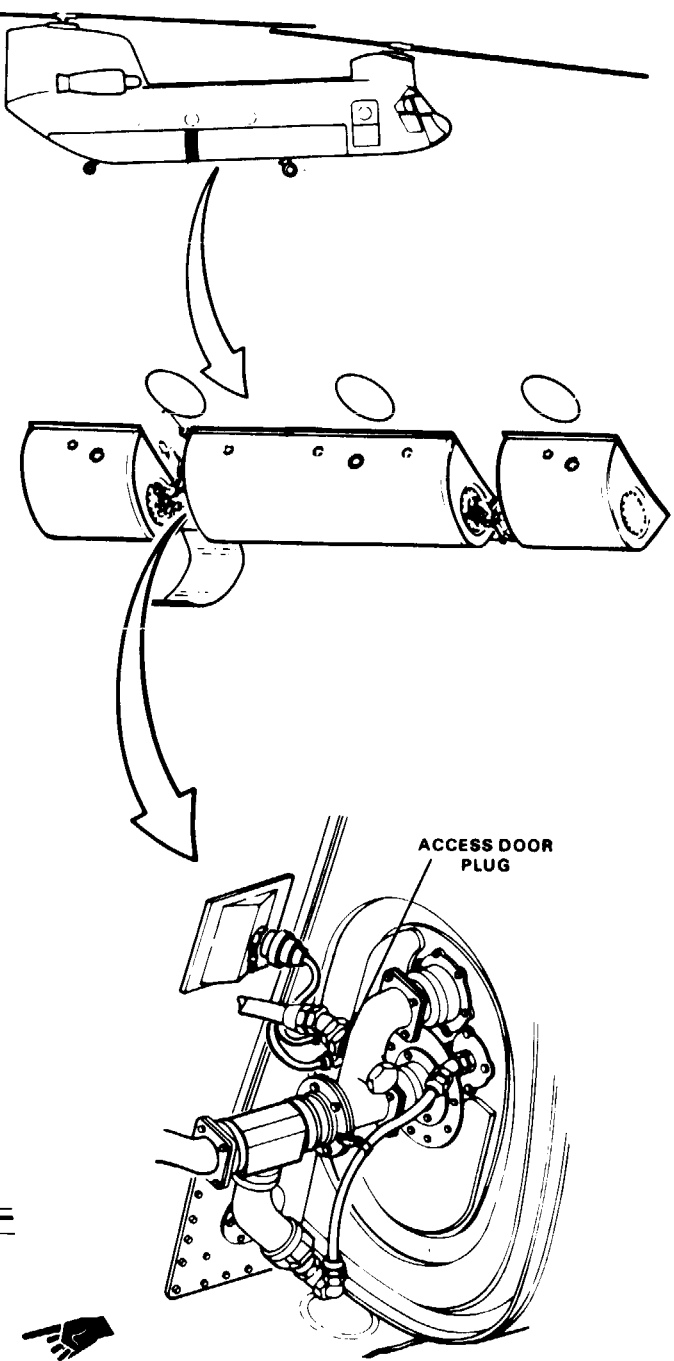
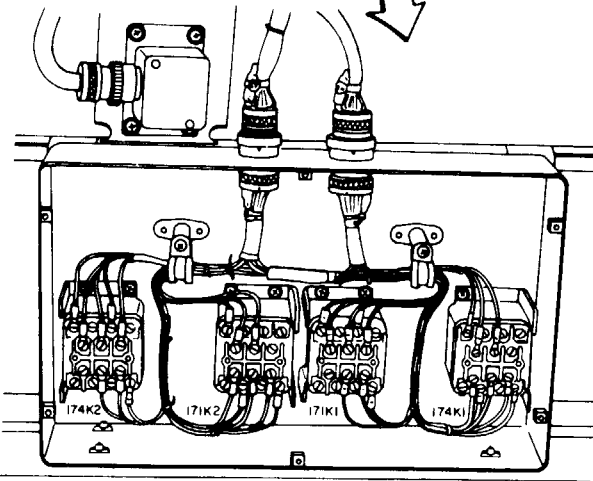
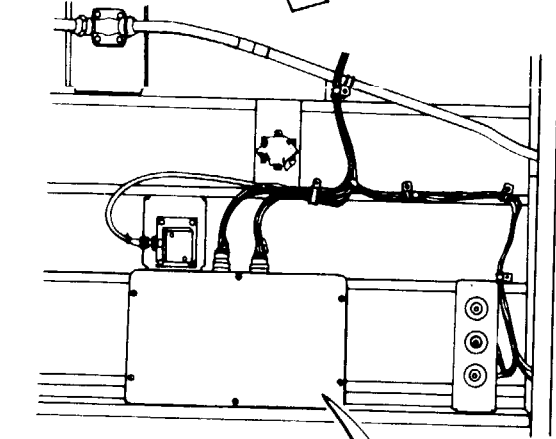
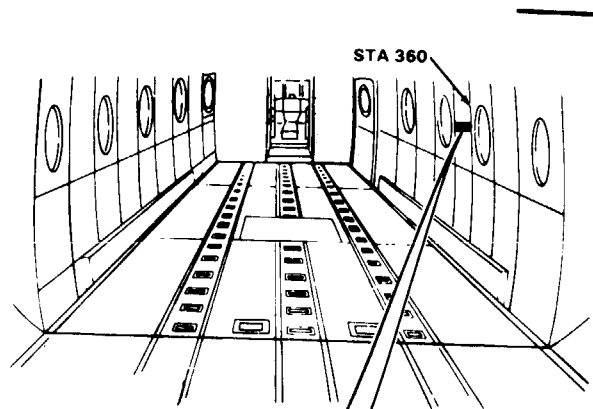
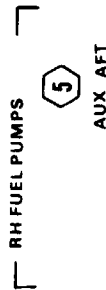
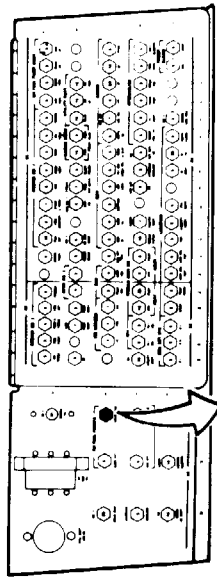
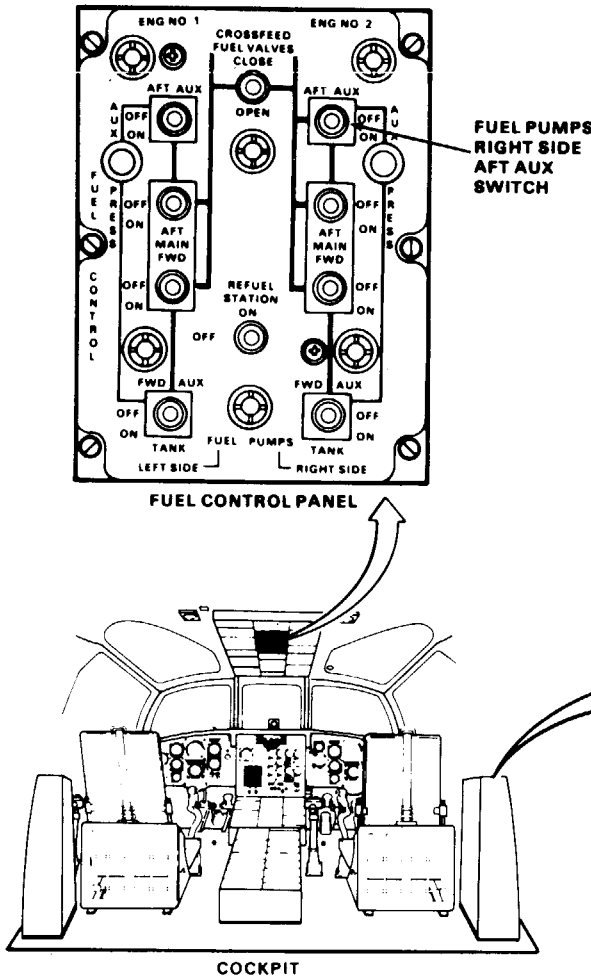
Equipment Condition:

TM 55-1520-240-23:

Battery Connected  
Electrical Power On  
Hydraulic Power Off

Side Acoustical Blanket Removed Between Sta  
320 and 360

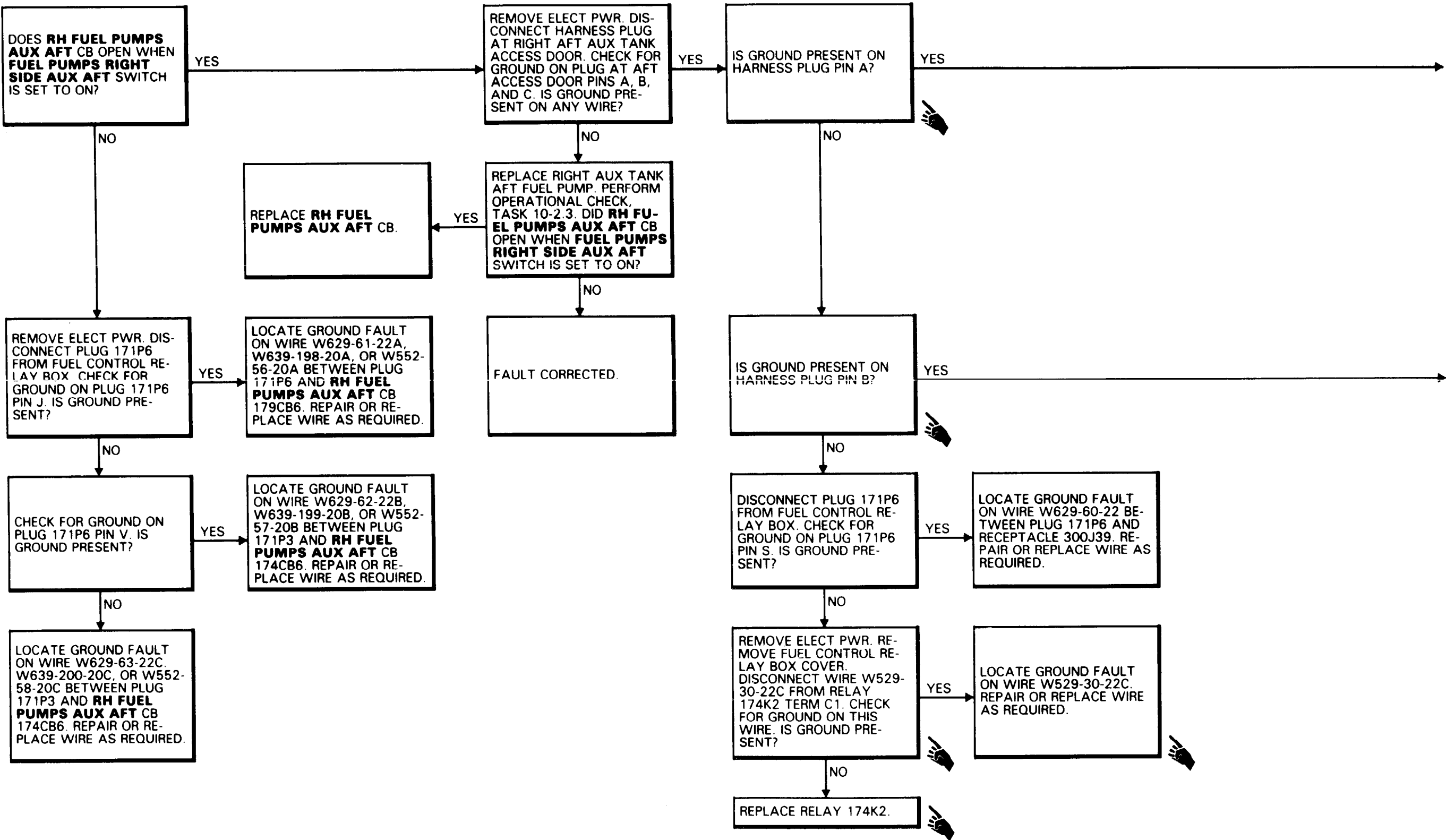
Right Aft Intertank Access Panel Open



NOTE  
CONNECTOR INSTALLATION  
IS SIMILAR FOR ALL  
TANK ACCESS PANELS

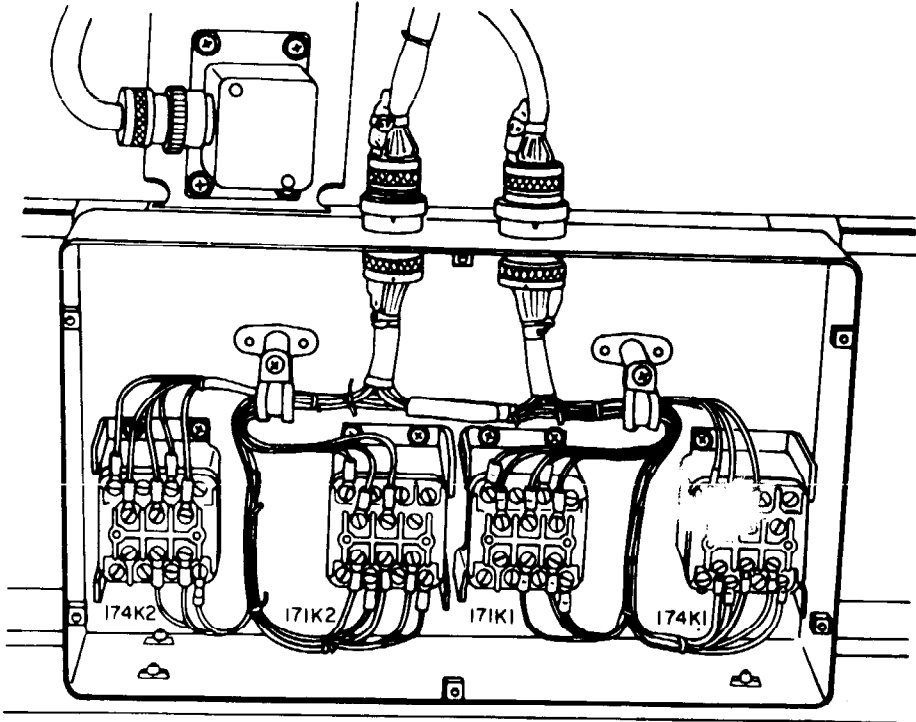
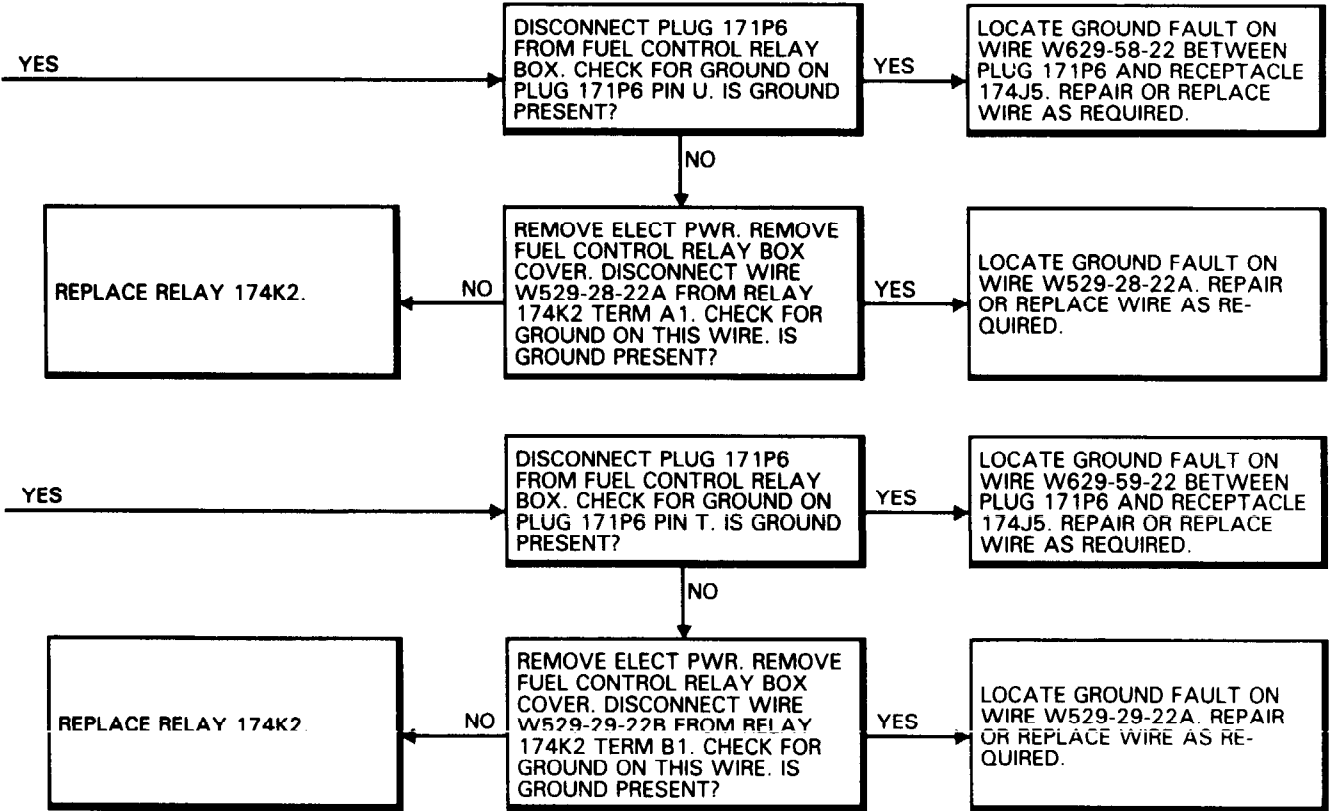
10-2.15 RH FUEL PUMP AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.15



10-2.15 RH FUEL PUMP AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.15



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

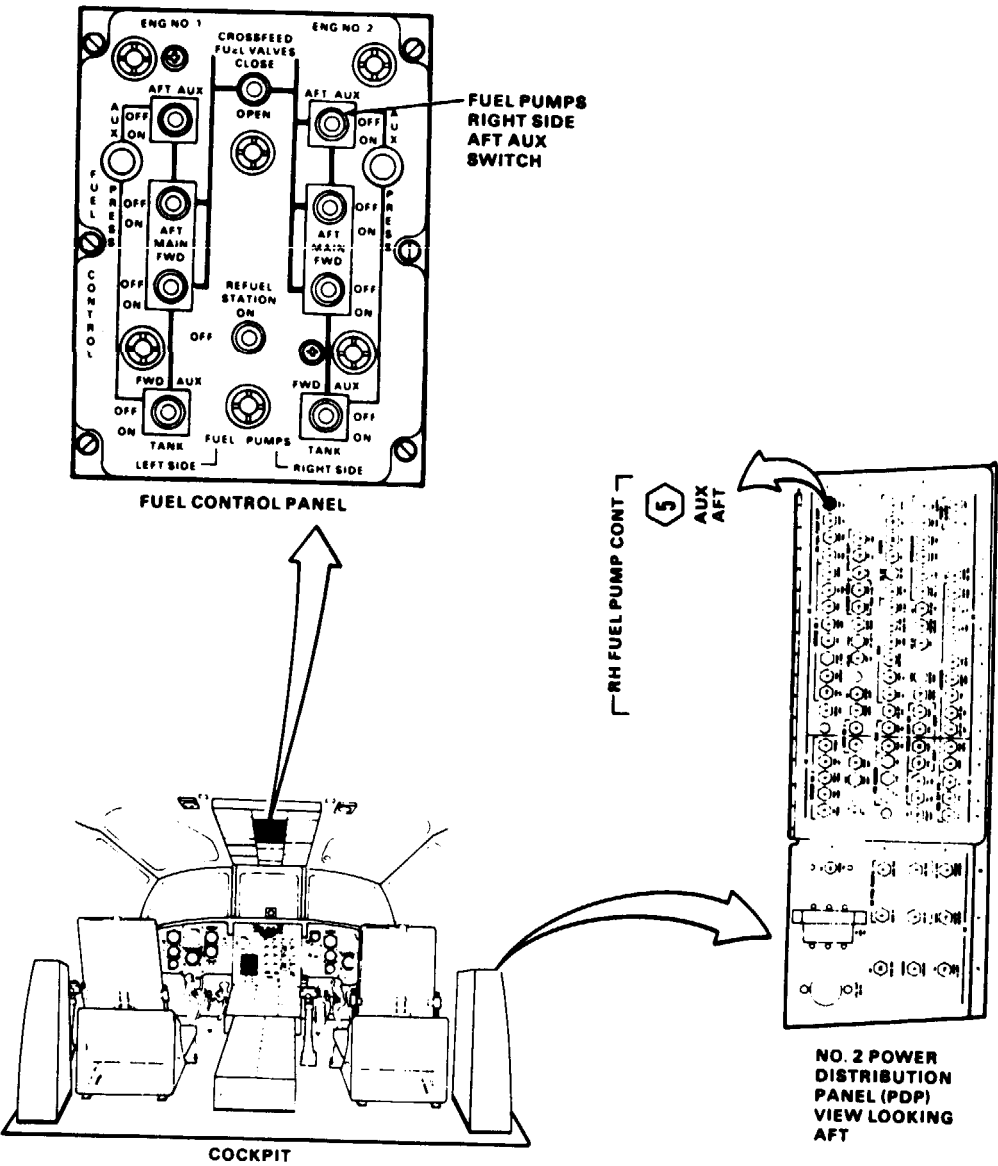
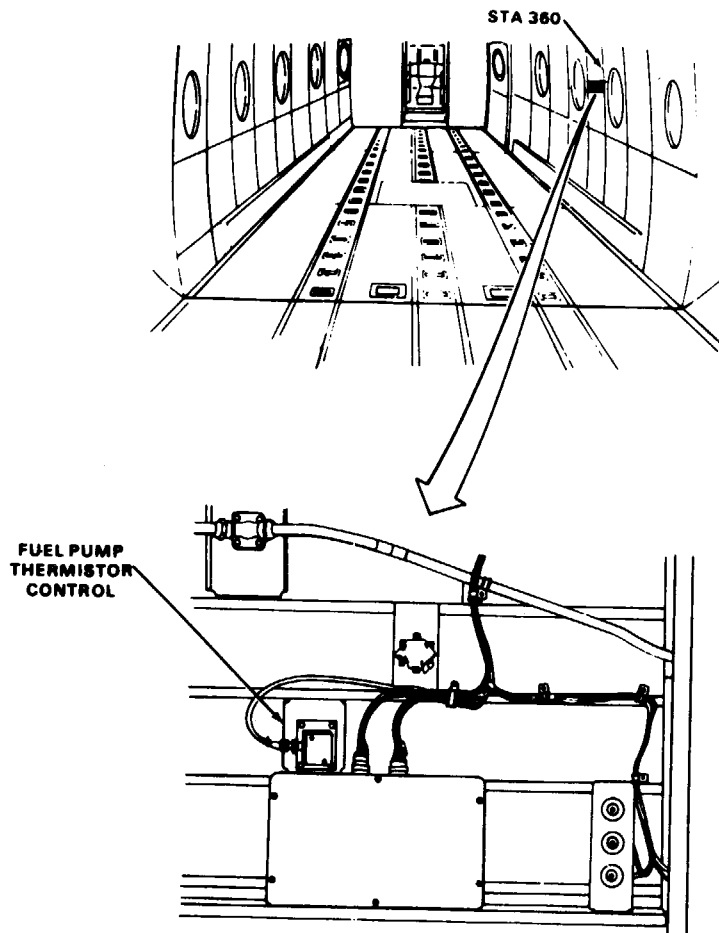
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

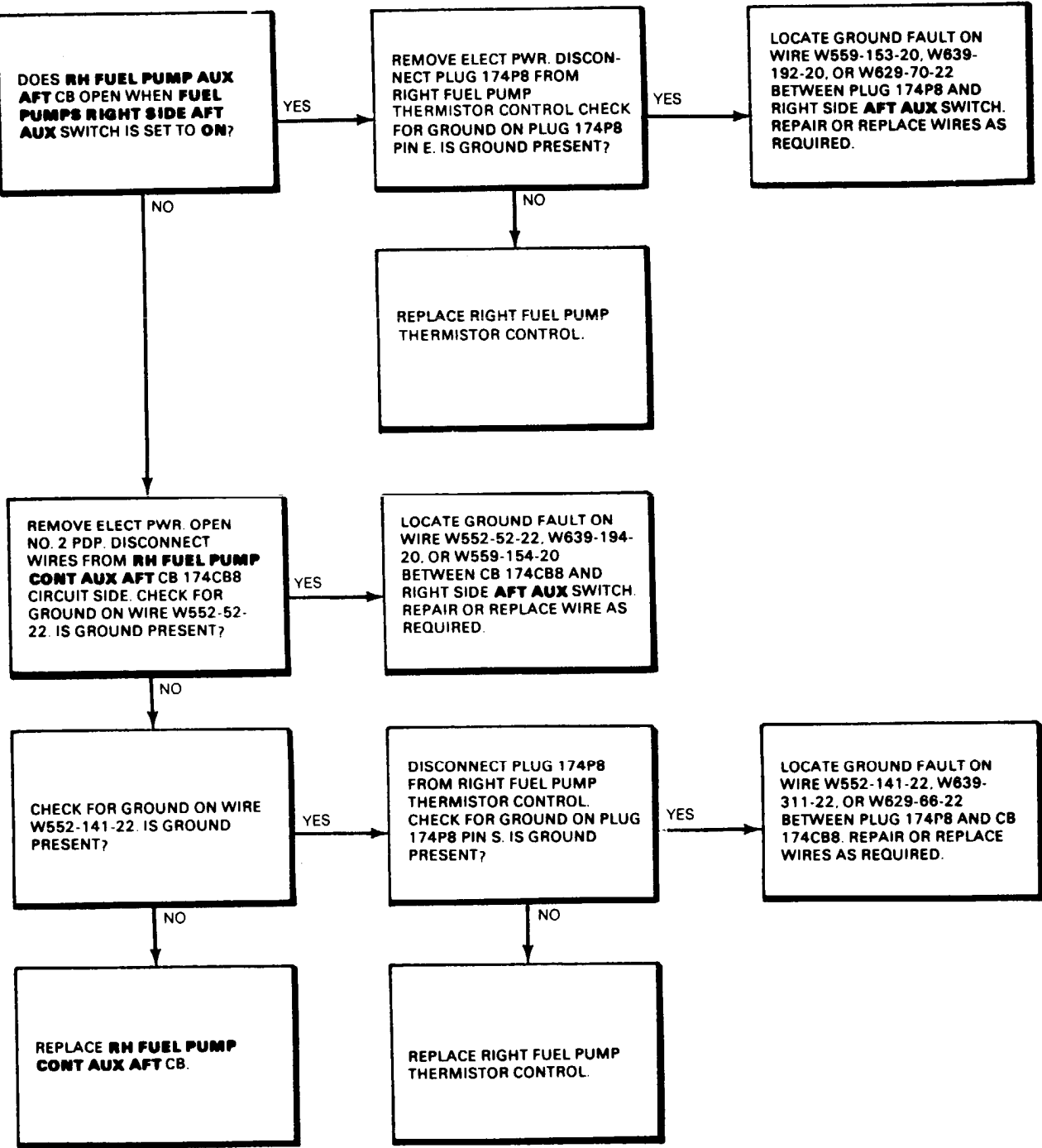
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Side Acoustical Blanket Removed  
Between Sta 320 and 360.





10-2.16 RH FUEL PUMP CONT AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electrical Repairer's Tool Kit,
- NSN 5180-00-323-4915
- Multimeter

Materials:

None

Personnel Required:

Aircraft Electrician (2)

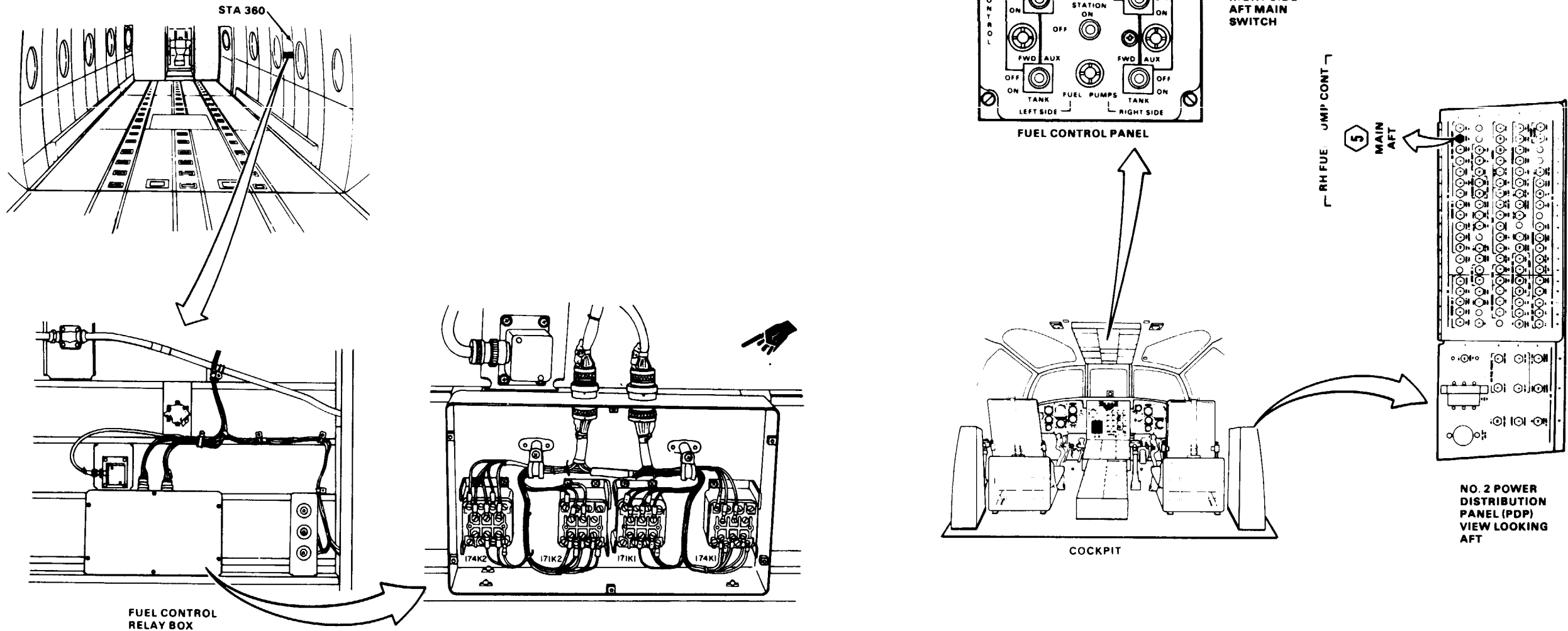
References:

TM 55-1520-240-23

Equipment Condition:

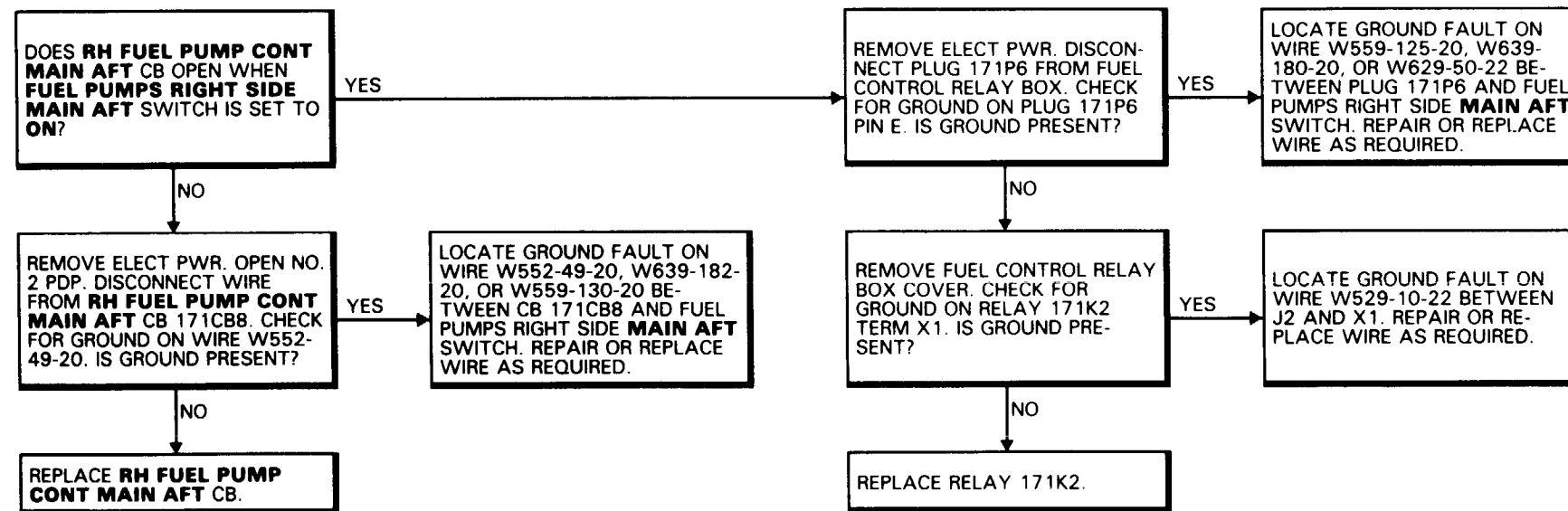
TM 55-1520-240-23:

- Battery Connected
- Electrical Power On
- Hydraulic Power Off
- Side Acoustical Blanket Removed Between Sta 320 and 360



10-2.17 RH FUEL PUMP CONT MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.17



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electrical Repairer's Tool Kit,
- NSN 5180-00-323-4915
- Multimeter

Materials:

None

Personnel Required:

- Aircraft Electrician (2)

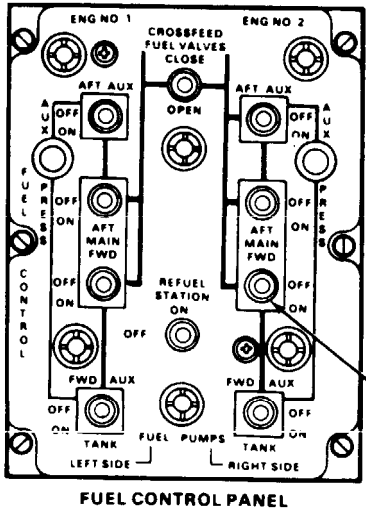
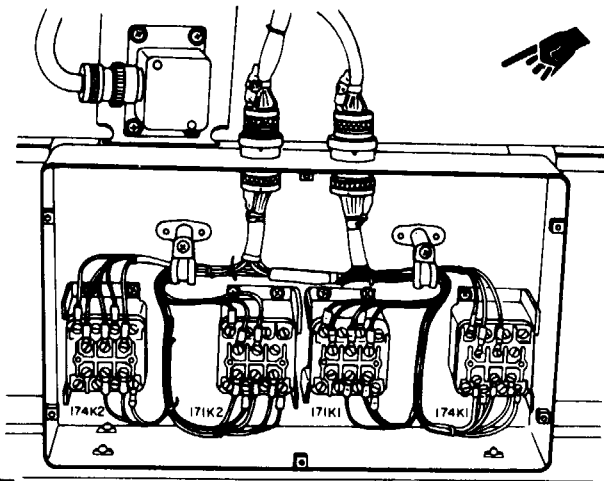
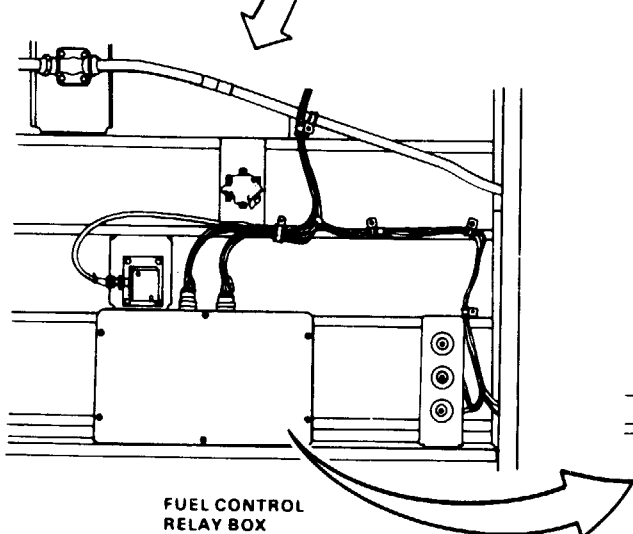
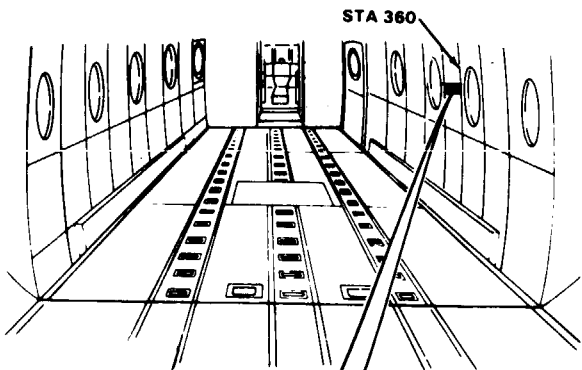
References:

TM 55-1520-240-23

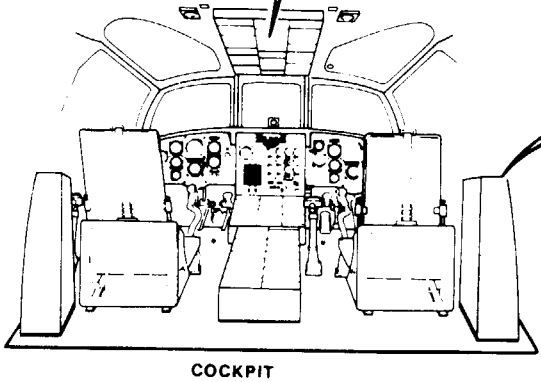
Equipment Condition:

TM 55-1520-240-23:

- Battery Connected
- Electrical Power On
- Hydraulic Power Off
- Side Acoustical Blanket Removed Between Sta 320 and 360

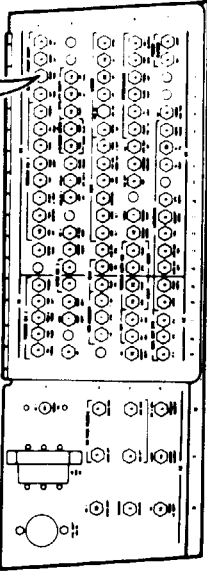


FUEL PUMPS  
RIGHT SIDE  
FWD MAIN  
SWITCH

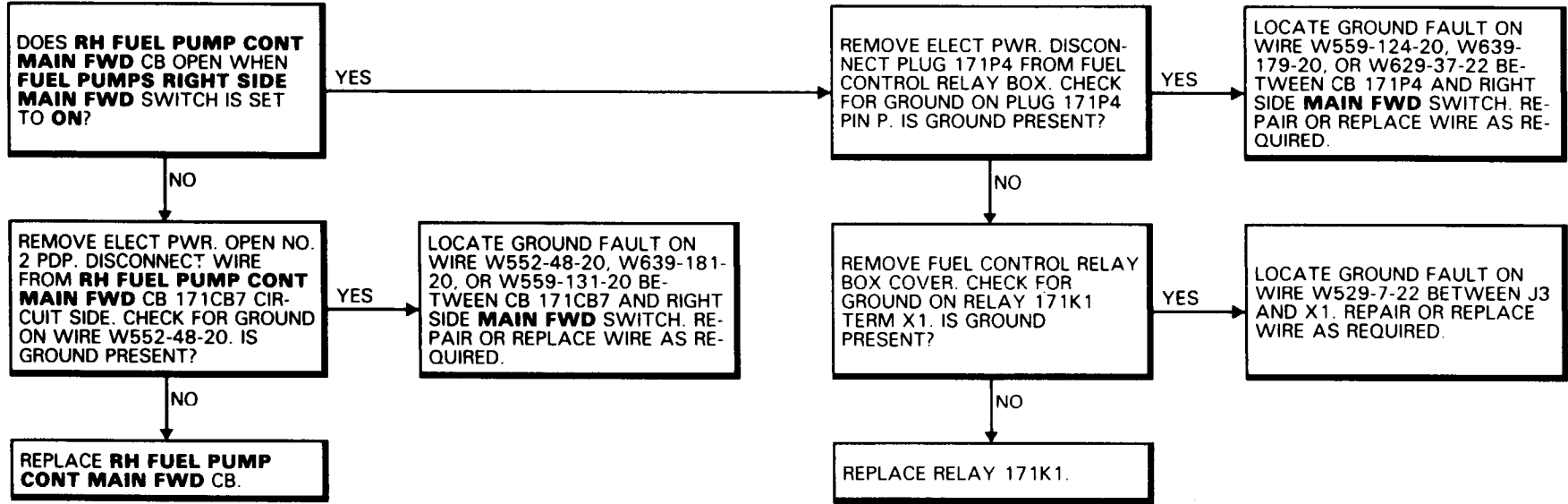


COCKPIT

RH FUEL PUMP CONT



NO. 2 POWER  
DISTRIBUTION  
PANEL (PDP)  
VIEW LOOKING  
AFT



10-2.19 RH FUEL PUMP CONT AUX FWD CIRCUIT  
BREAKER WILL NOT STAY CLOSED

10-2.19

FAULT ISOLATION PROCEDURE

INITIAL SETUP

References:  
TM 55-1520-240-23

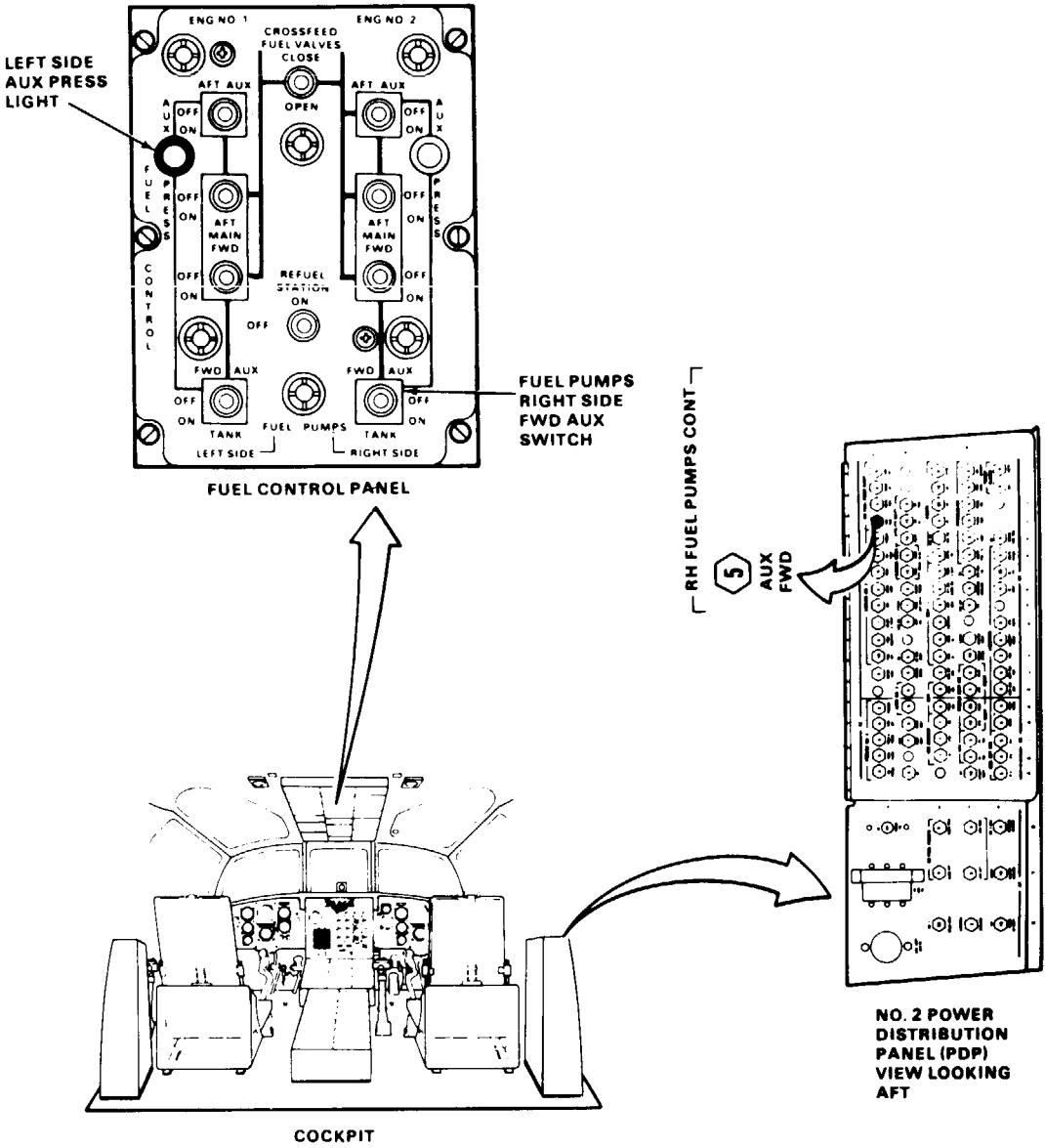
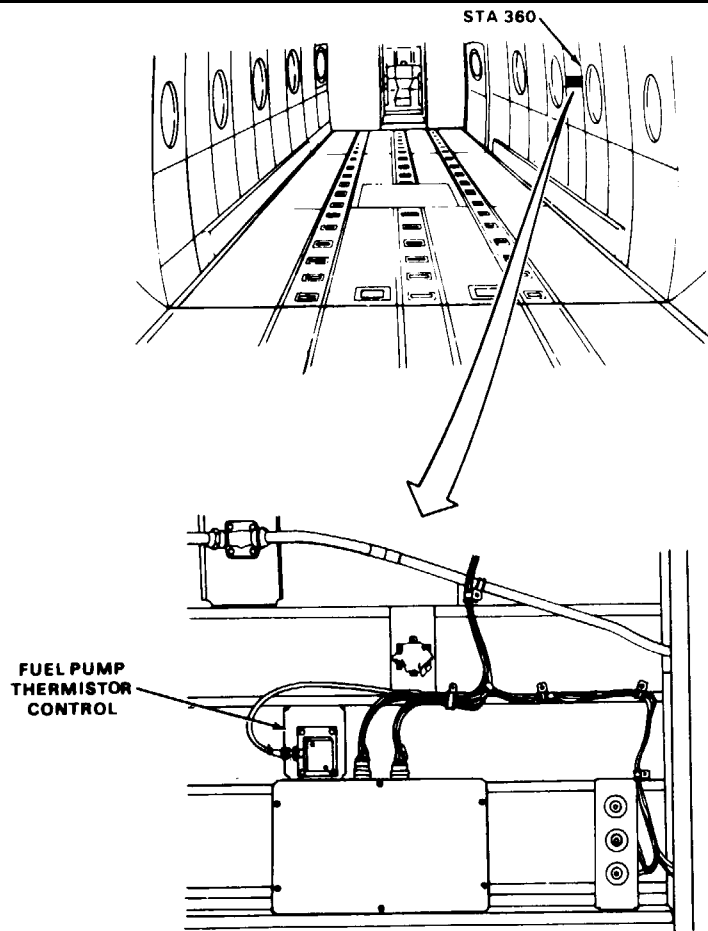
Applicable Configurations:  
All

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Side Acoustical Blanket Removed Between  
Sta 320 and 360

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

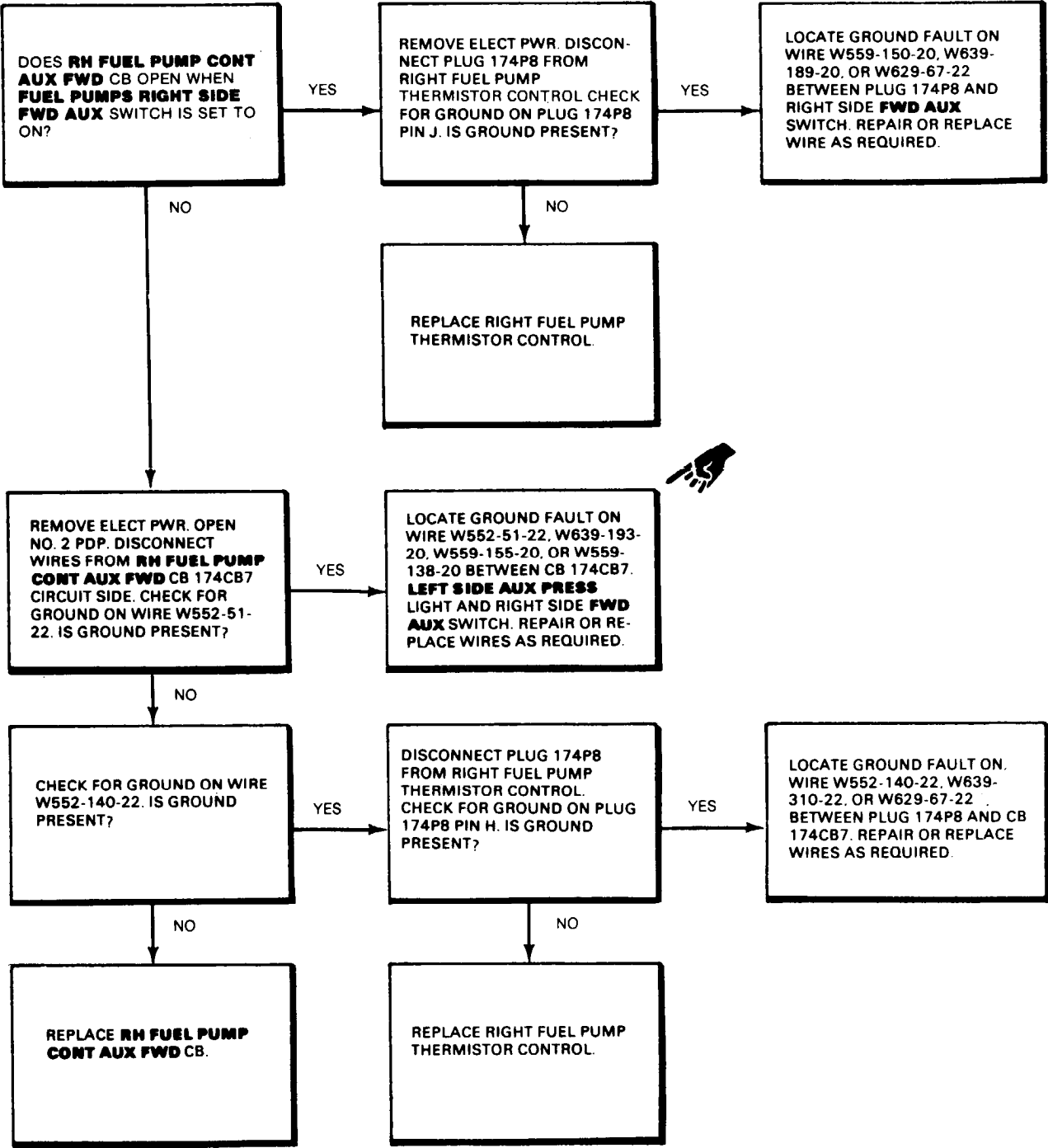
Materials:  
None

Personnel Required:  
Aircraft Electrician (2)



10-2.19 RH FUEL PUMP CONT AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.19



END OF TASK

10-2.20 LEFT OR RIGHT SIDE AUX PRESS LIGHTS  
DOES NOT COME ON WHEN PRESSED TO TEST

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Personnel Required:  
68F20 Aircraft Electrician

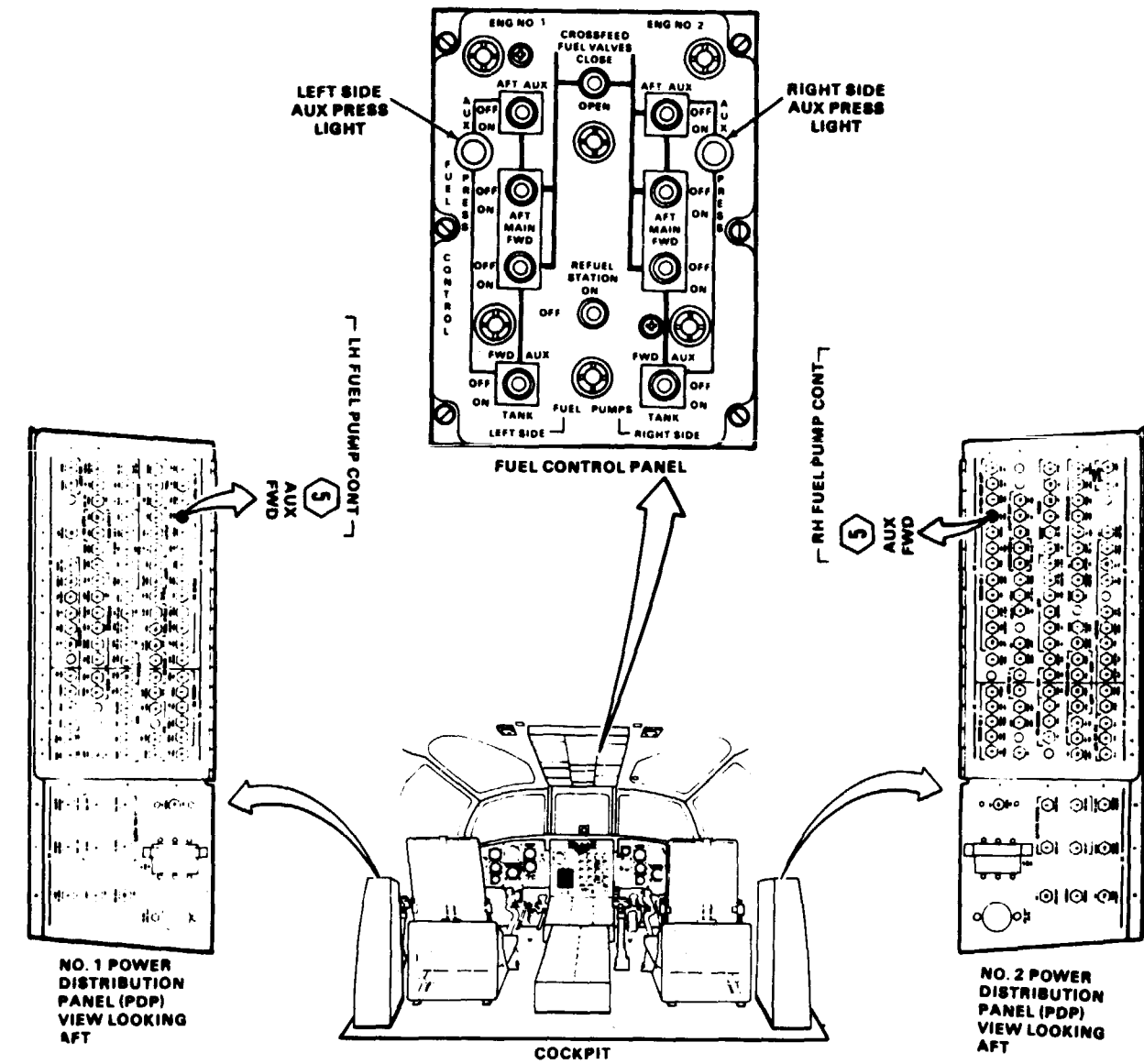
Applicable Configurations:  
All

References:  
TM 55-1520-240-23

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

Materials:  
None



48X84

D145-11747-8PA

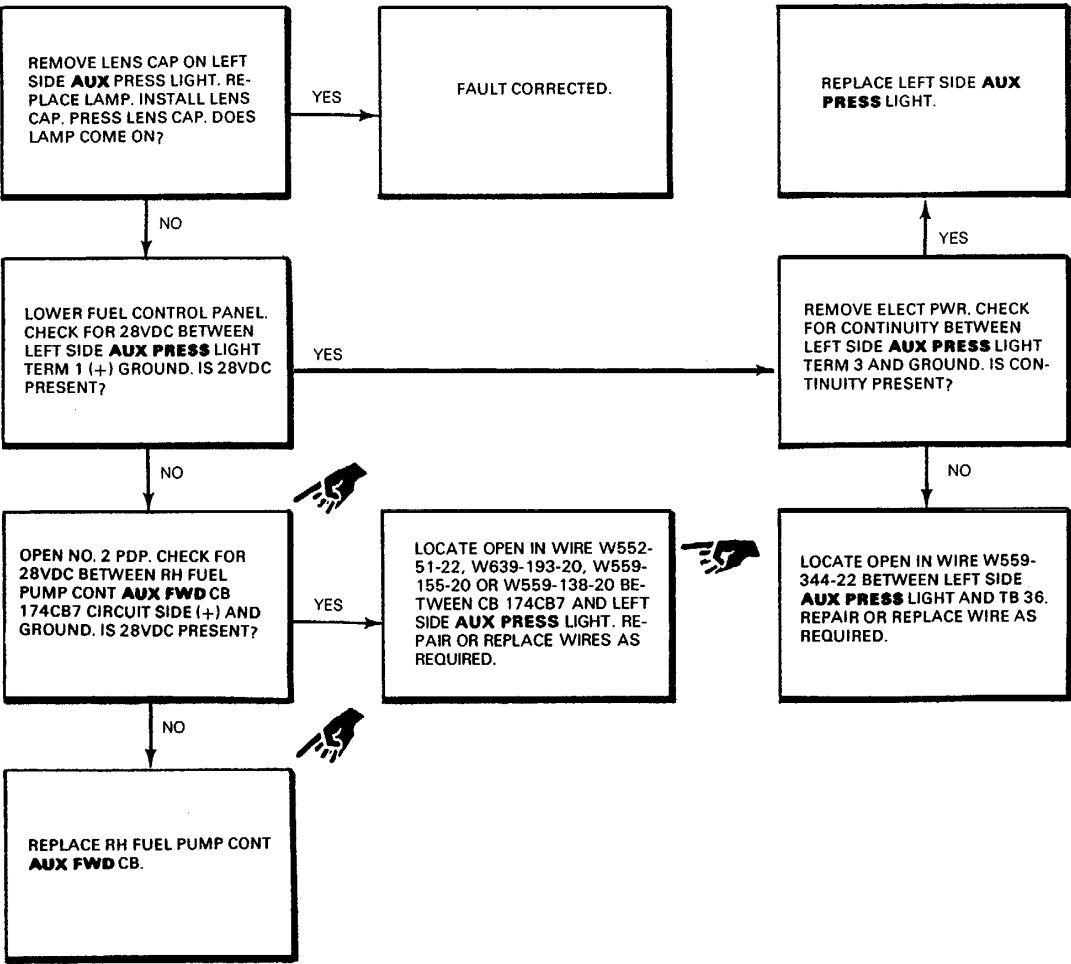
GO TO NEXT PAGE



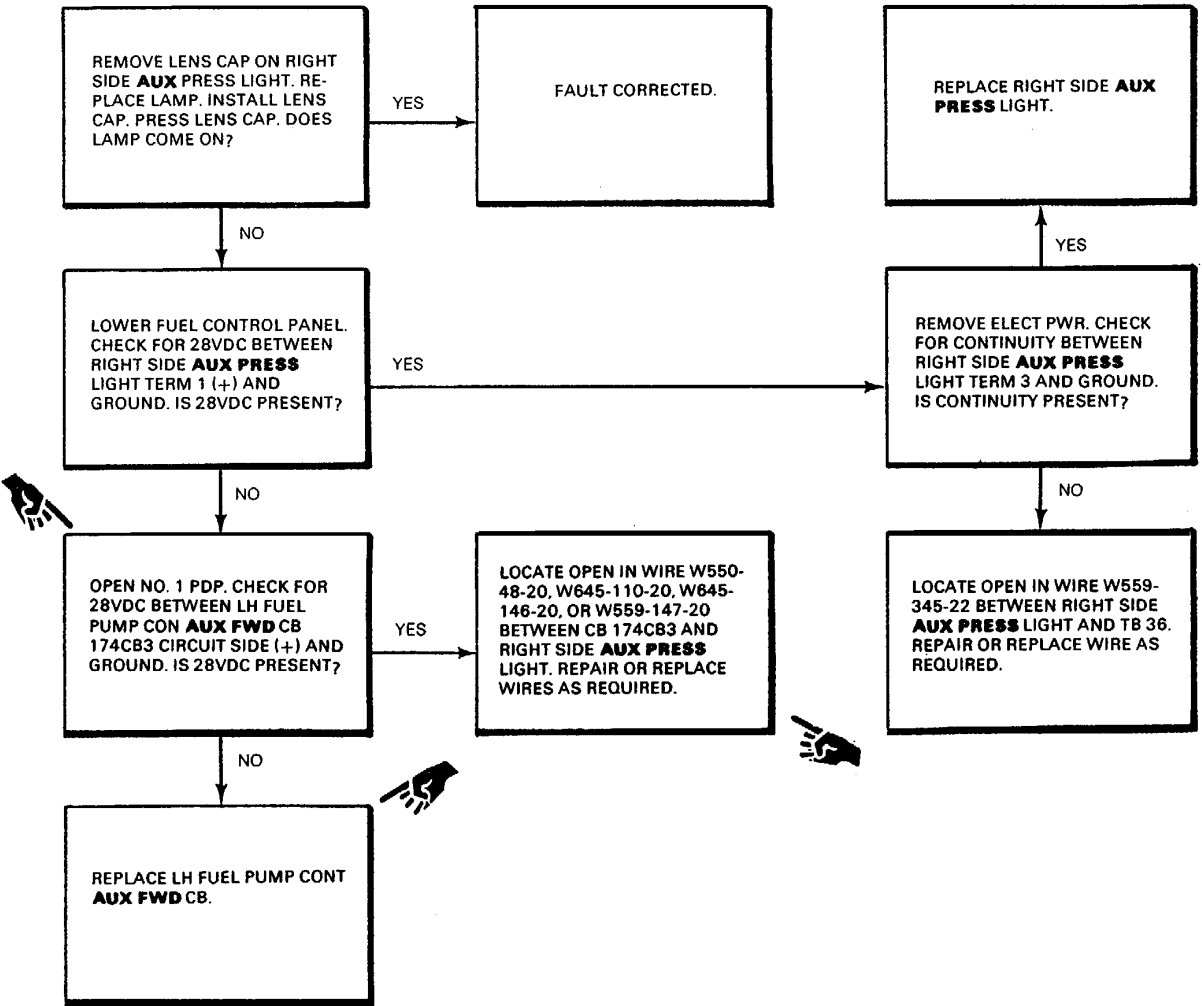
10-2.20 LEFT OR RIGHT SIDE AUX PRESS LIGHTS DOES NOT COME ON WHEN PRESSED TO TEST (Continued)

10-2.20

LEFT SIDE AUX PRESS LIGHT DOES NOT COME ON WHEN PRESSED TO TEST



RIGHT SIDE AUX PRESS LIGHT DOES NOT COME ON WHEN PRESSED TO TEST



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials

None

Personnel Required:

Aircraft Electrician (2)

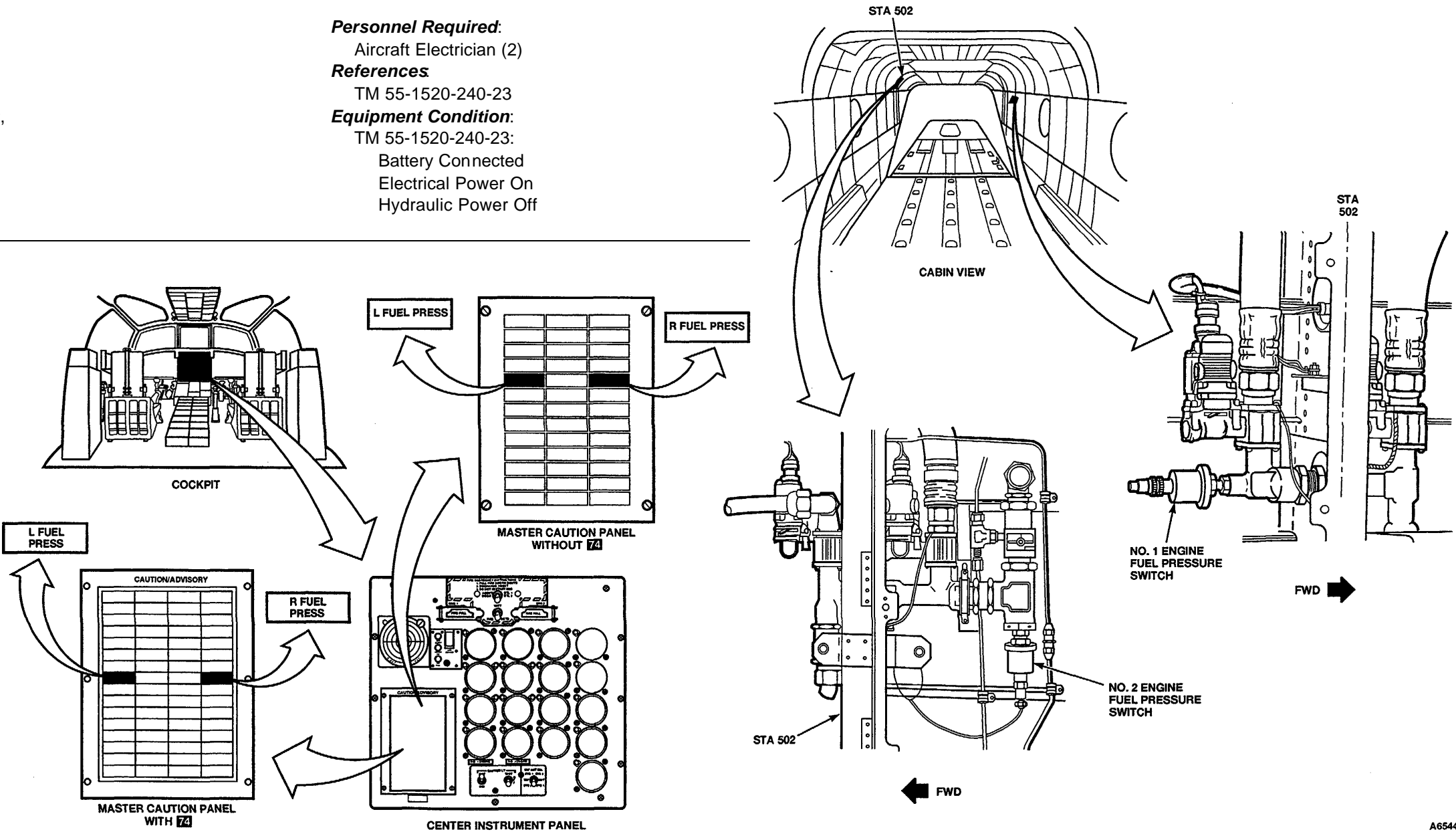
References

TM 55-1520-240-23

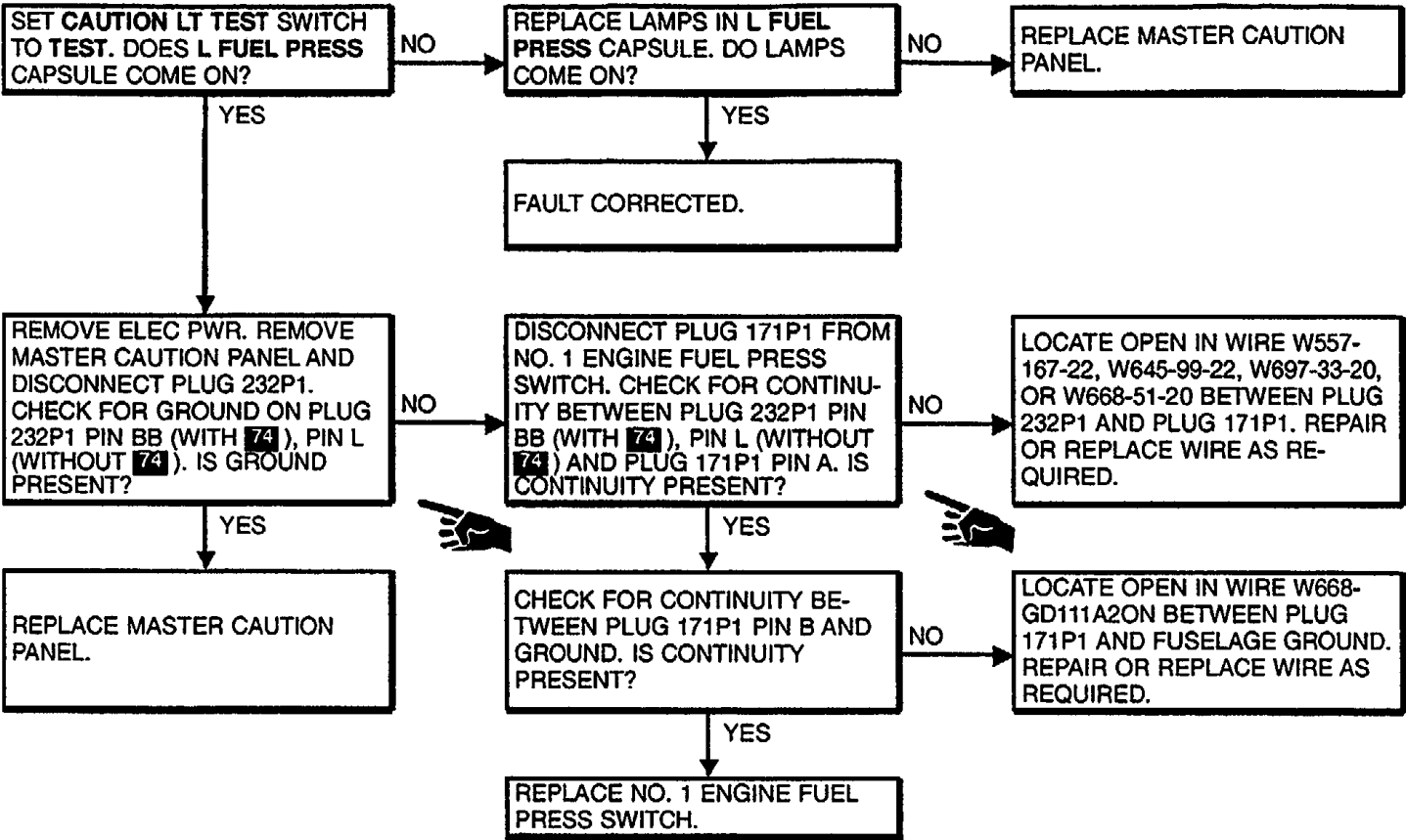
Equipment Condition:

TM 55-1520-240-23:

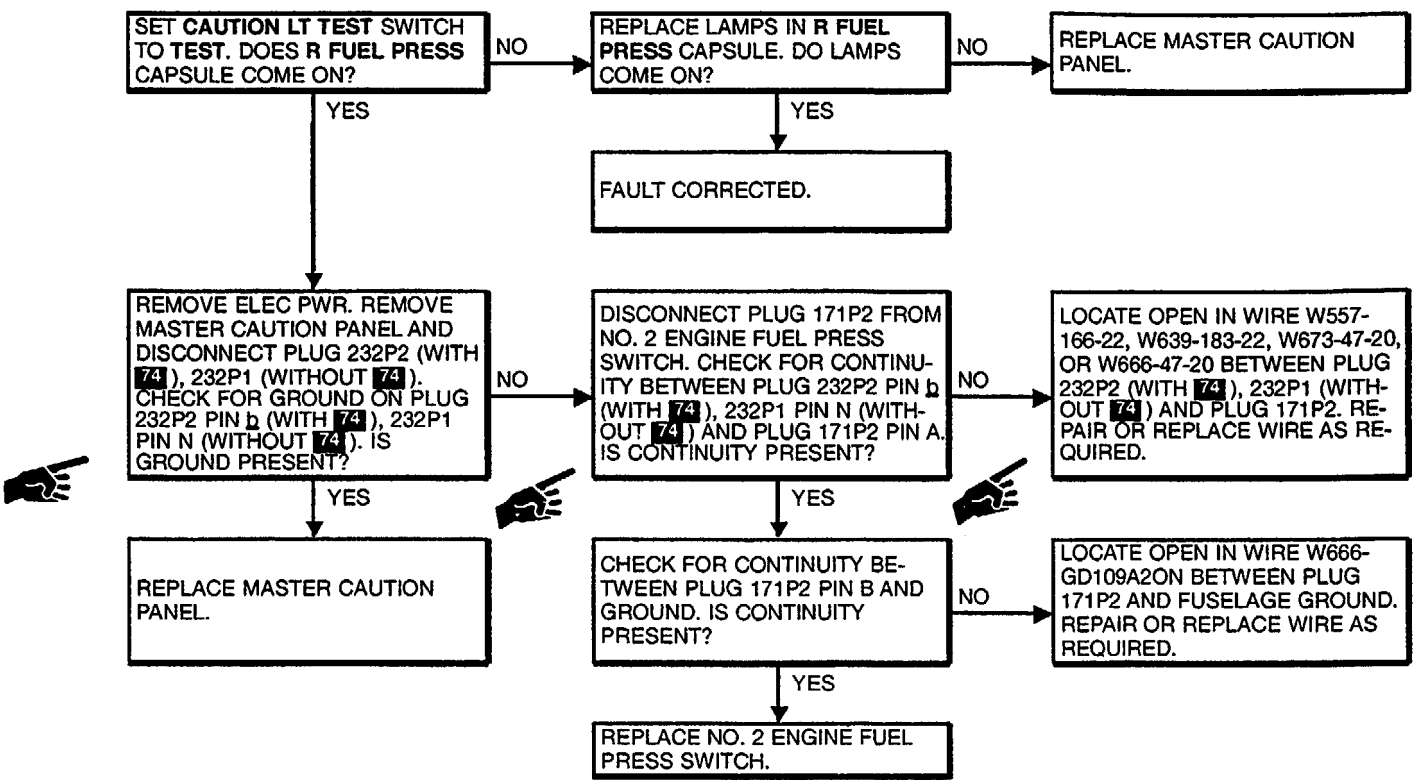
Battery Connected  
Electrical Power On  
Hydraulic Power Off



L FUEL PRESS CAPSULE IS NOT ON



R FUEL PRESS CAPSULE IS NOT ON



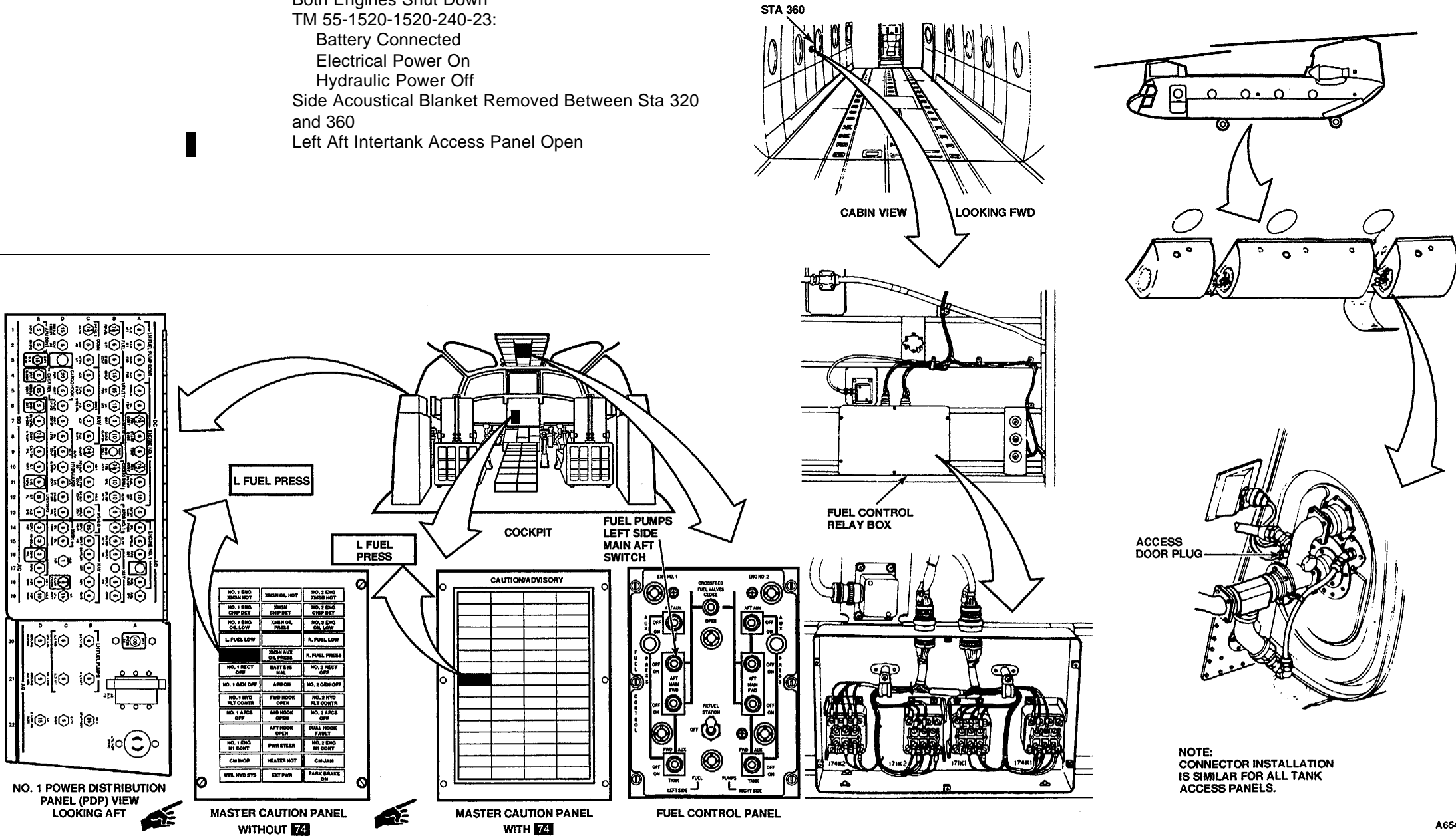
10-2.22 L FUEL PRESS CAPSULE DOES NOT GO OUT WHEN LEFT SIDE MAIN AFT FUEL PUMPS SWITCH IS SET TO ON

10-2.22

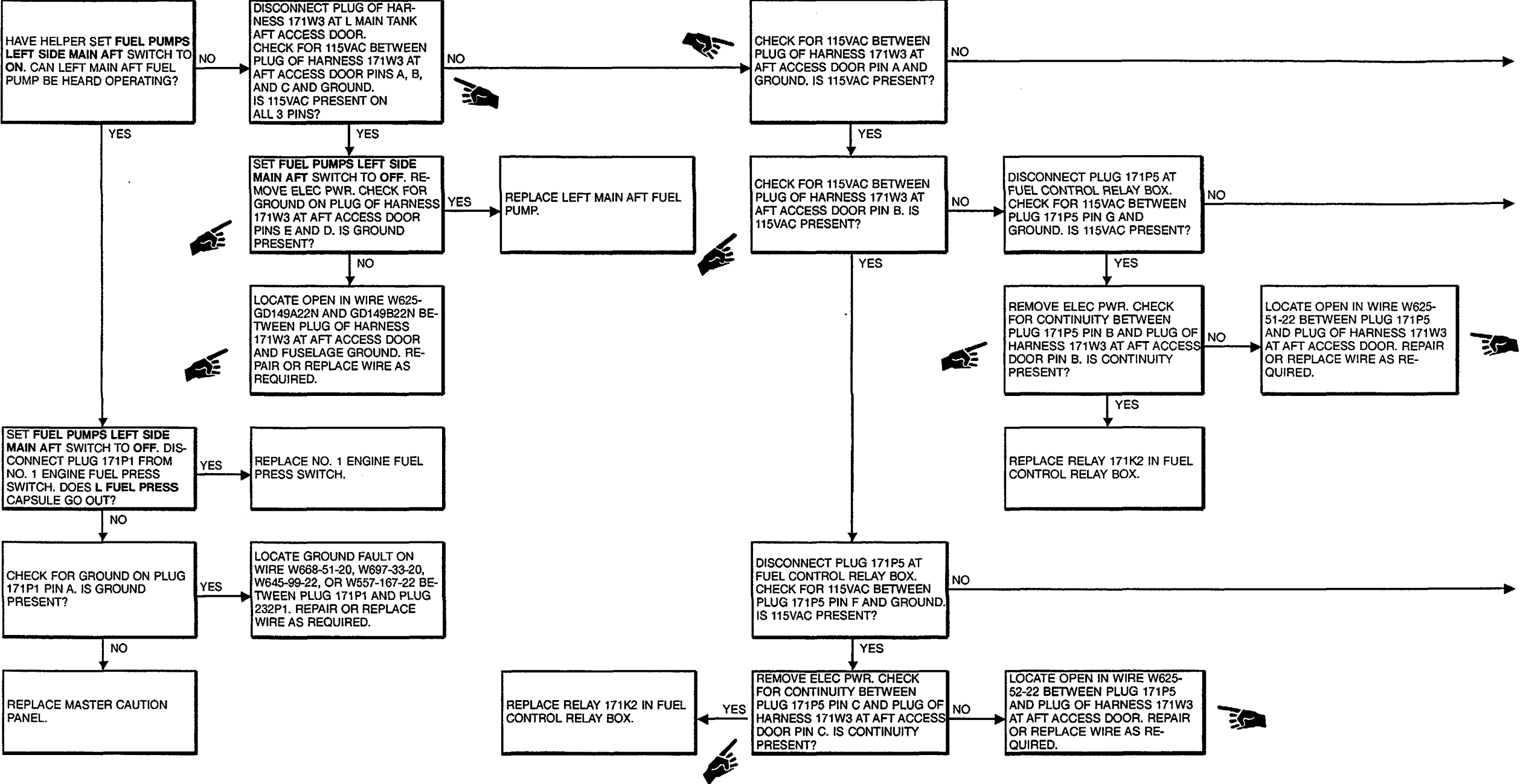
FAULT ISOLATION PROCEDURE

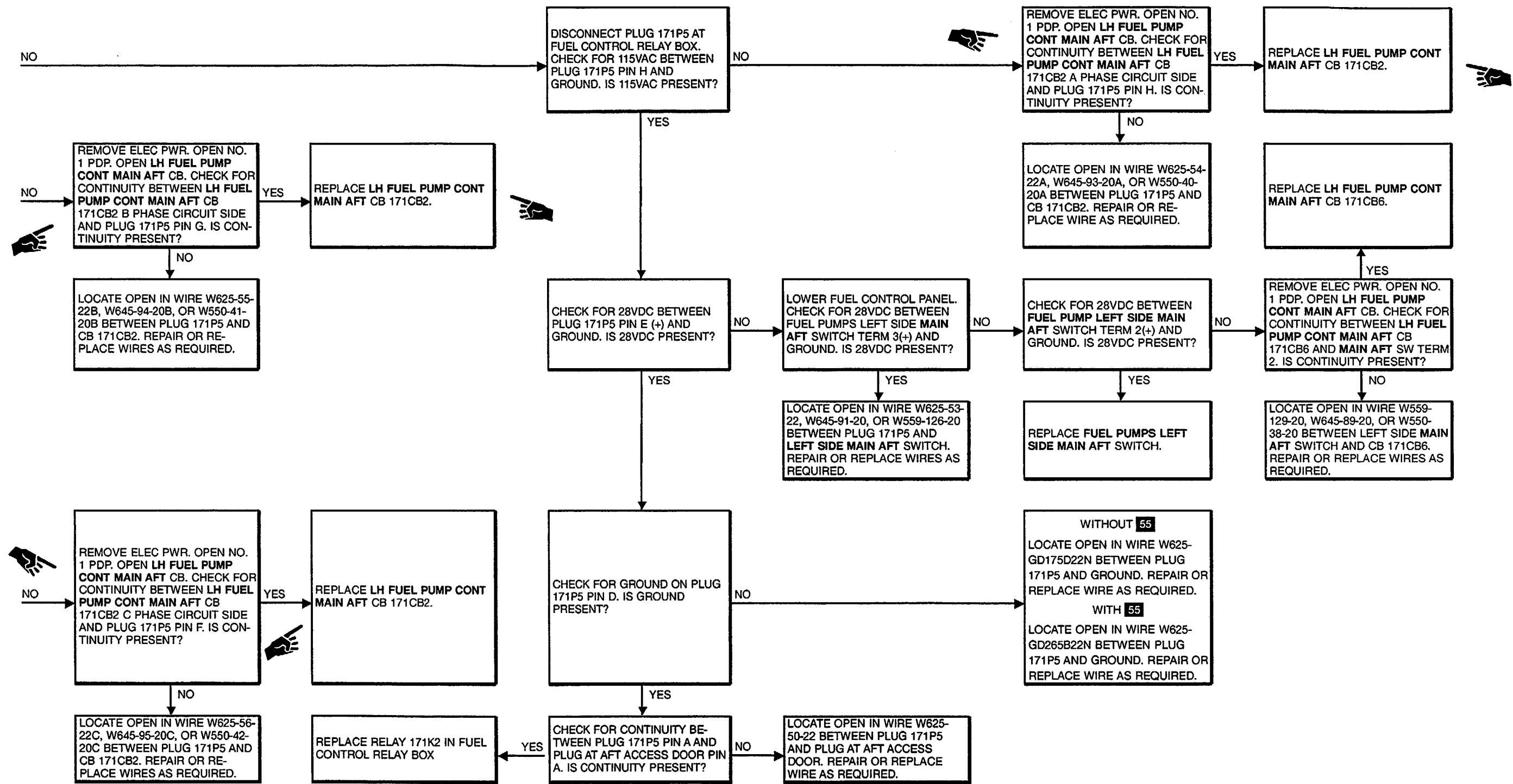
- INITIAL SETUP
- Applicable Configurations:**
- All
- Tools:**
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
  - Multimeter
- Materials:**
- None
- Personnel Required:**
- Aircraft Electrician (2)
- References:**
- TM 55-1520-240-10
  - TM 55-1520-240-23

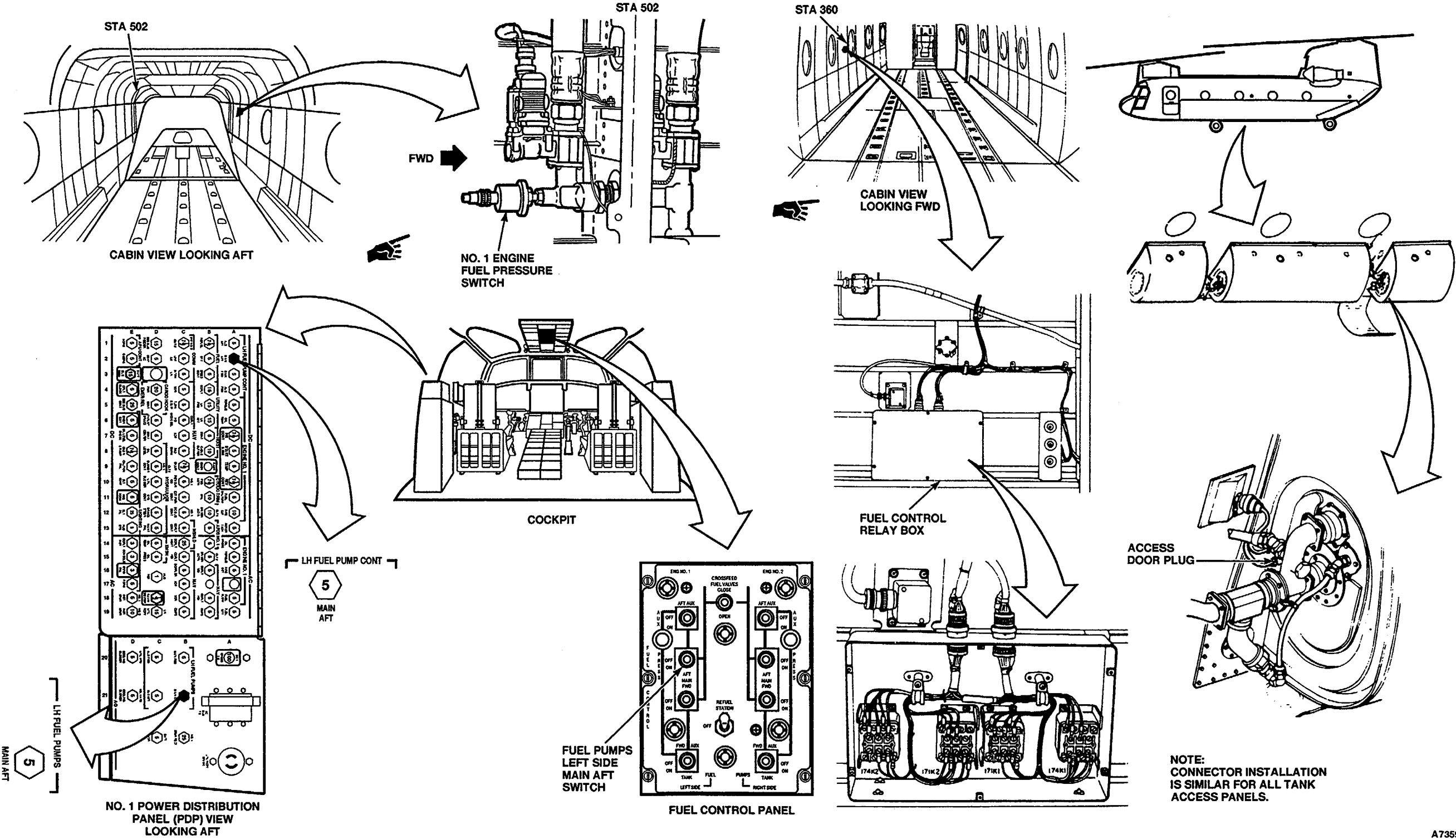
- Equipment Condition:**
- TM 55-1520-240-10: Both Engines Shut Down
  - TM 55-1520-1520-240-23: Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Side Acoustical Blanket Removed Between Sta 320 and 360
  - Left Aft Intertank Access Panel Open



A65448







A73597

10-2.23 L FUEL PRESS CAPSULE DOES NOT GO OUT WHEN LEFT SIDE MAIN FWD FUEL PUMPS SWITCH IS SET TO ON

10-2.23

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

- All
- Tools:
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
  - Multimeter

Materials:

- None

Personnel Required:

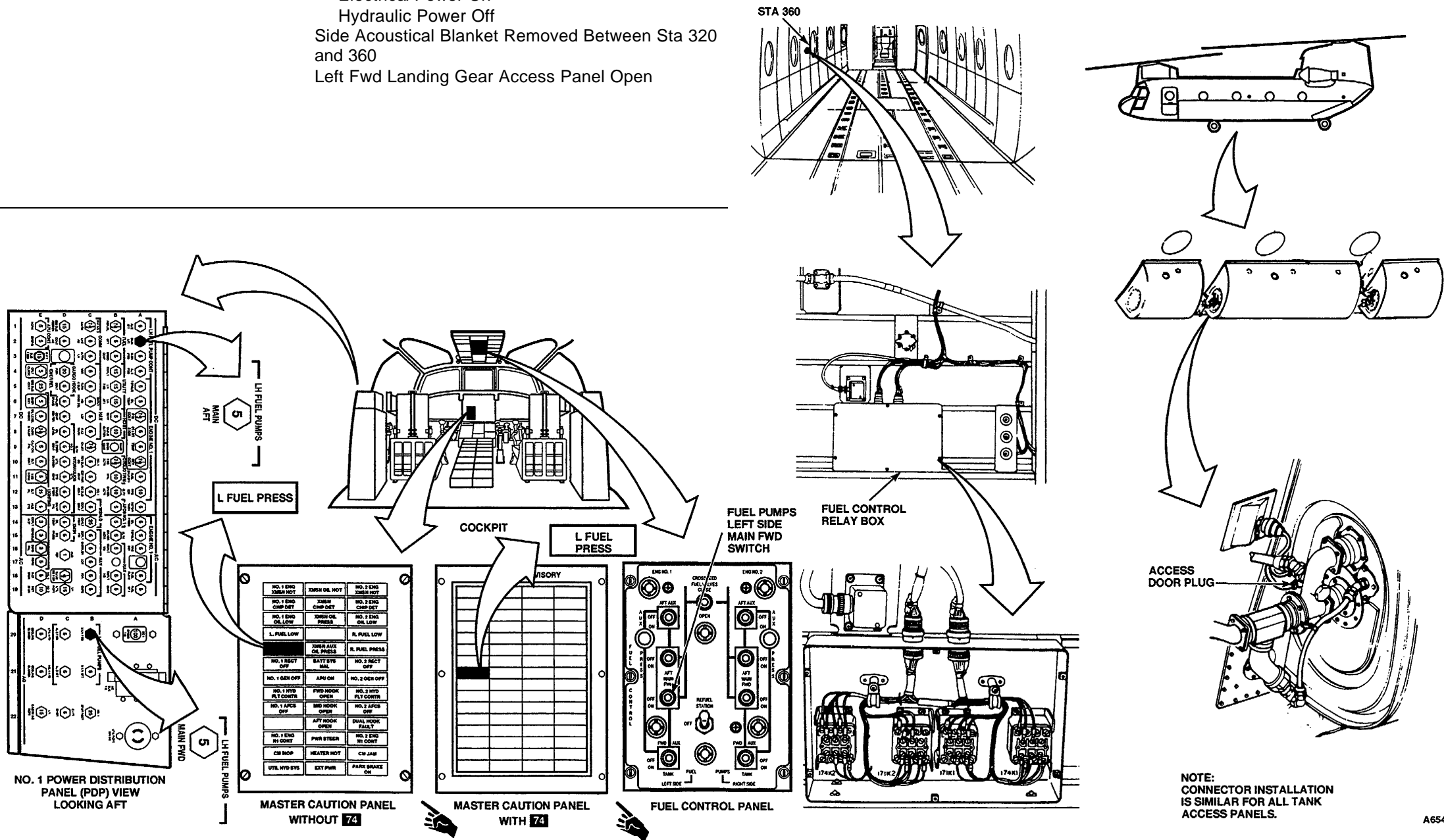
- Aircraft Electrician (2)

References:

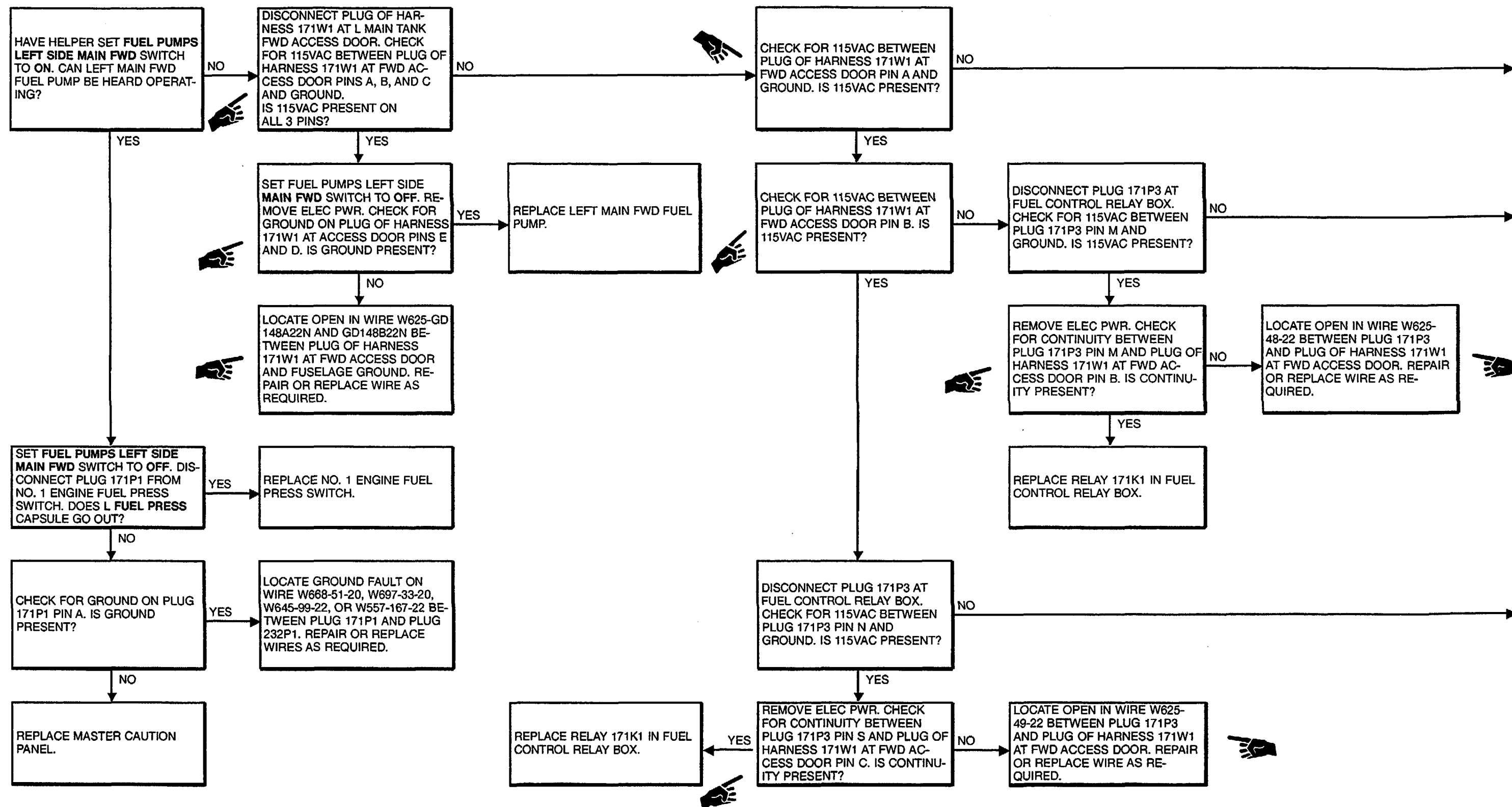
- TM 55-1520-240-10
- TM 55-1520-240-23

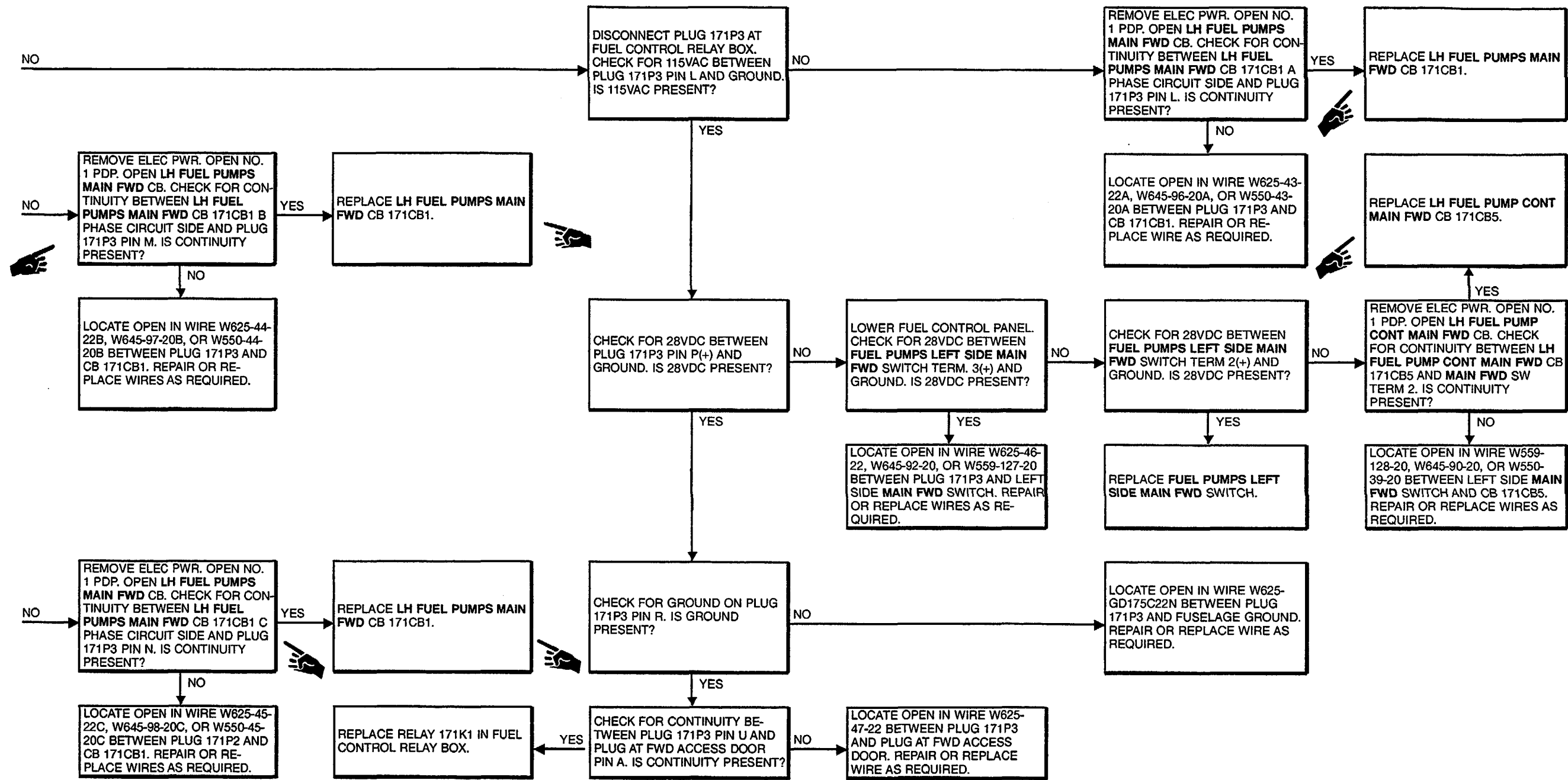
Equipment Condition:

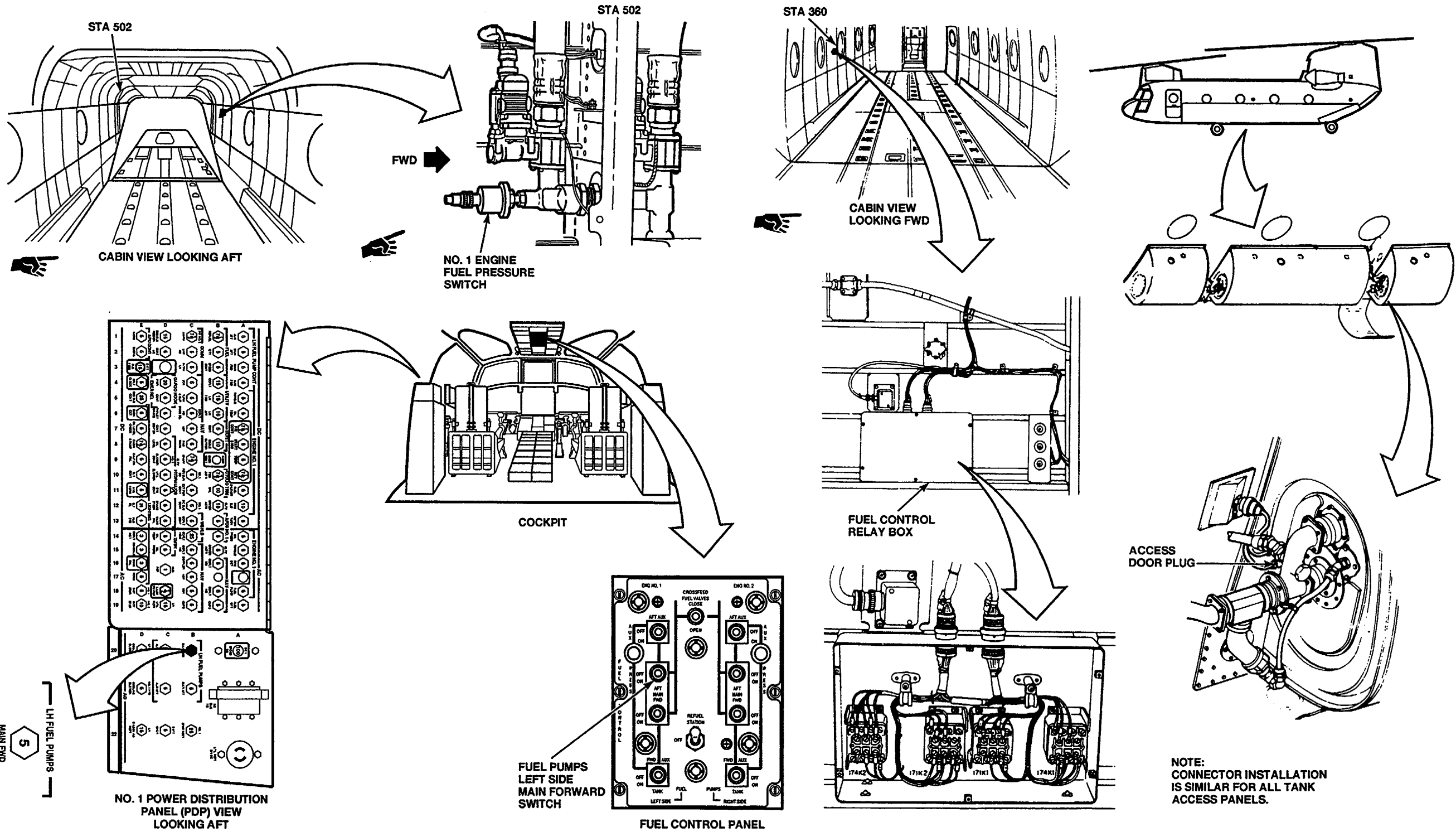
- TM 55-1520-240-10:
- Both Engines Shut Down
- TM 55-1520-240-23:
- Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Side Acoustical Blanket Removed Between Sta 320 and 360
  - Left Fwd Landing Gear Access Panel Open











A73596

10-2.24 R FUEL PRESS CAPSULE DOES NOT GO OUT WHEN RIGHT SIDE MAIN FWD FUEL PUMPS SWITCH IS SET TO ON

10-2.24

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

- All
- Tools:
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
  - Multimeter

Materials:

None

Personnel Required:

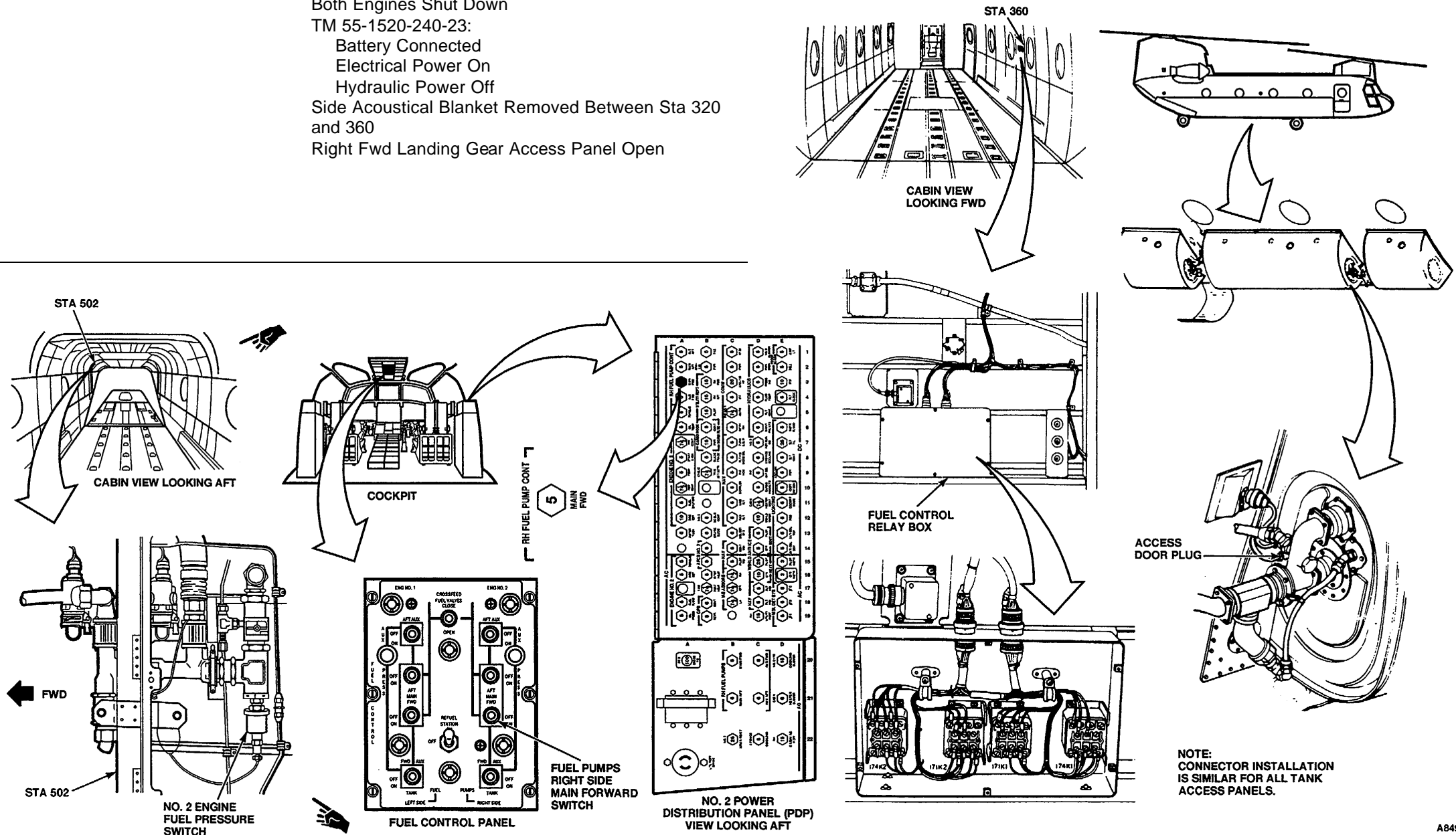
Aircraft Electrician (2)

References:

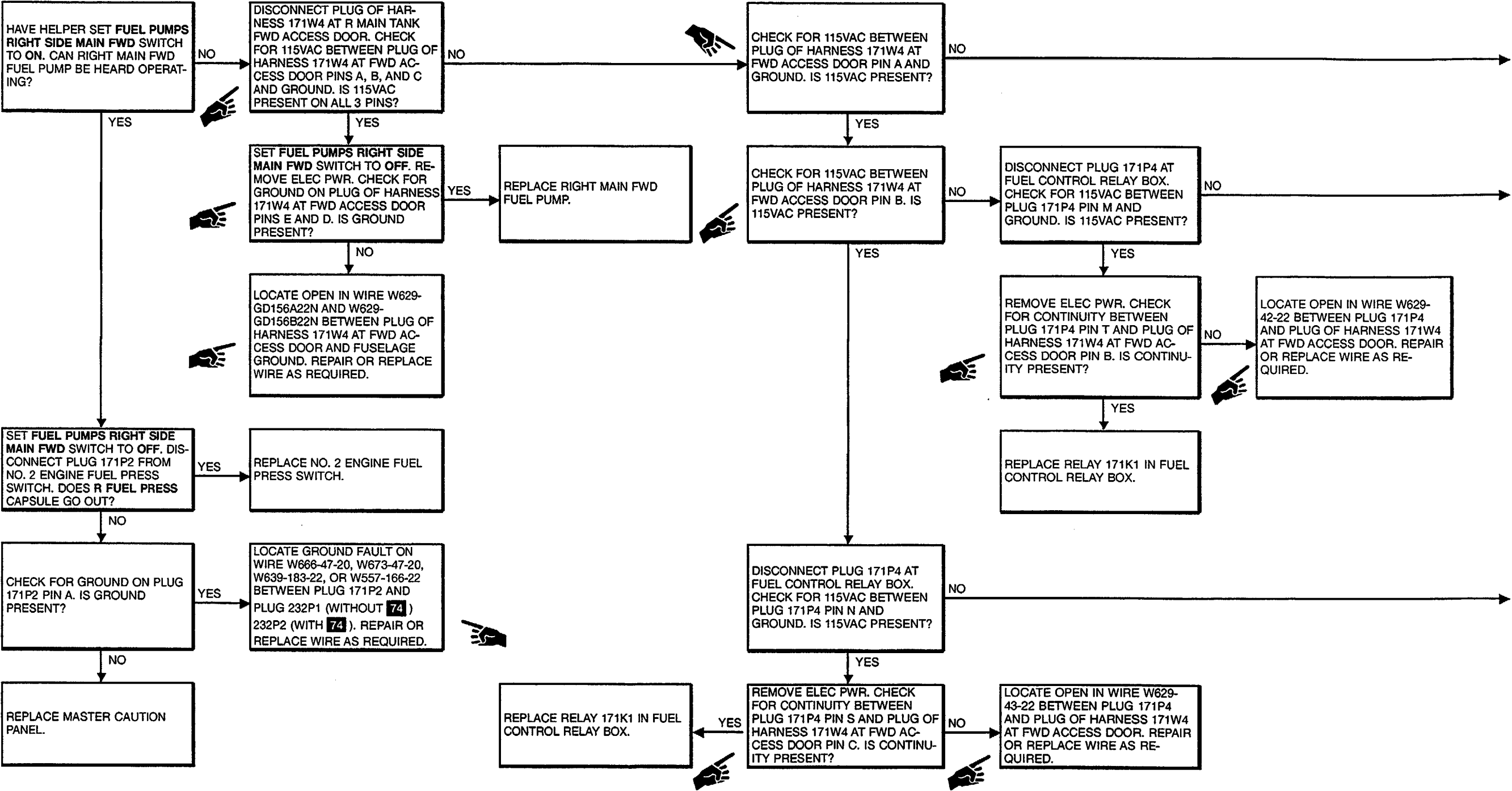
- TM 55-1520-240-10
- TM 55-1520-240-23

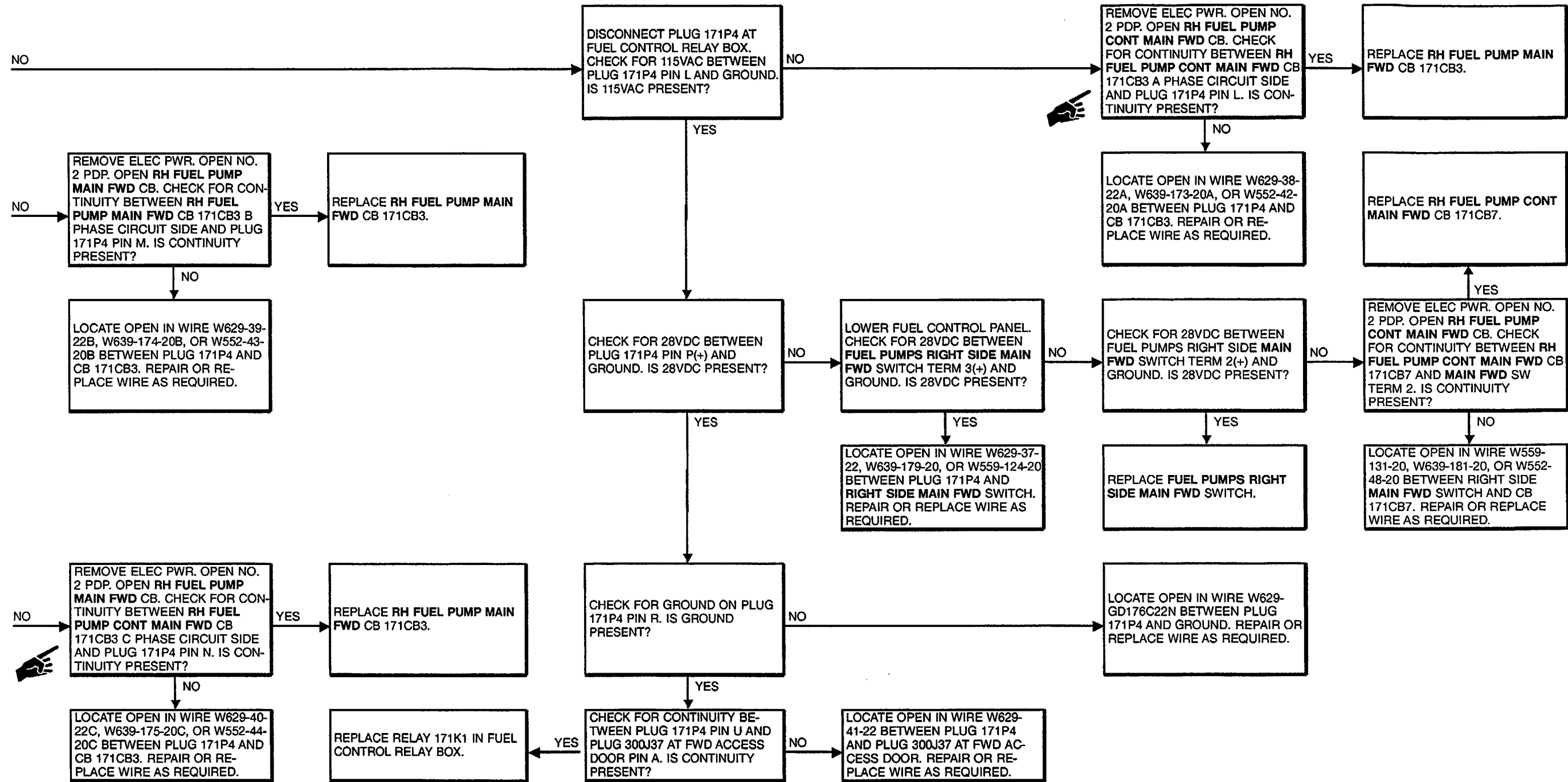
Equipment Condition:

- TM 55-1520-240-10:
  - Both Engines Shut Down
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Side Acoustical Blanket Removed Between Sta 320 and 360
  - Right Fwd Landing Gear Access Panel Open

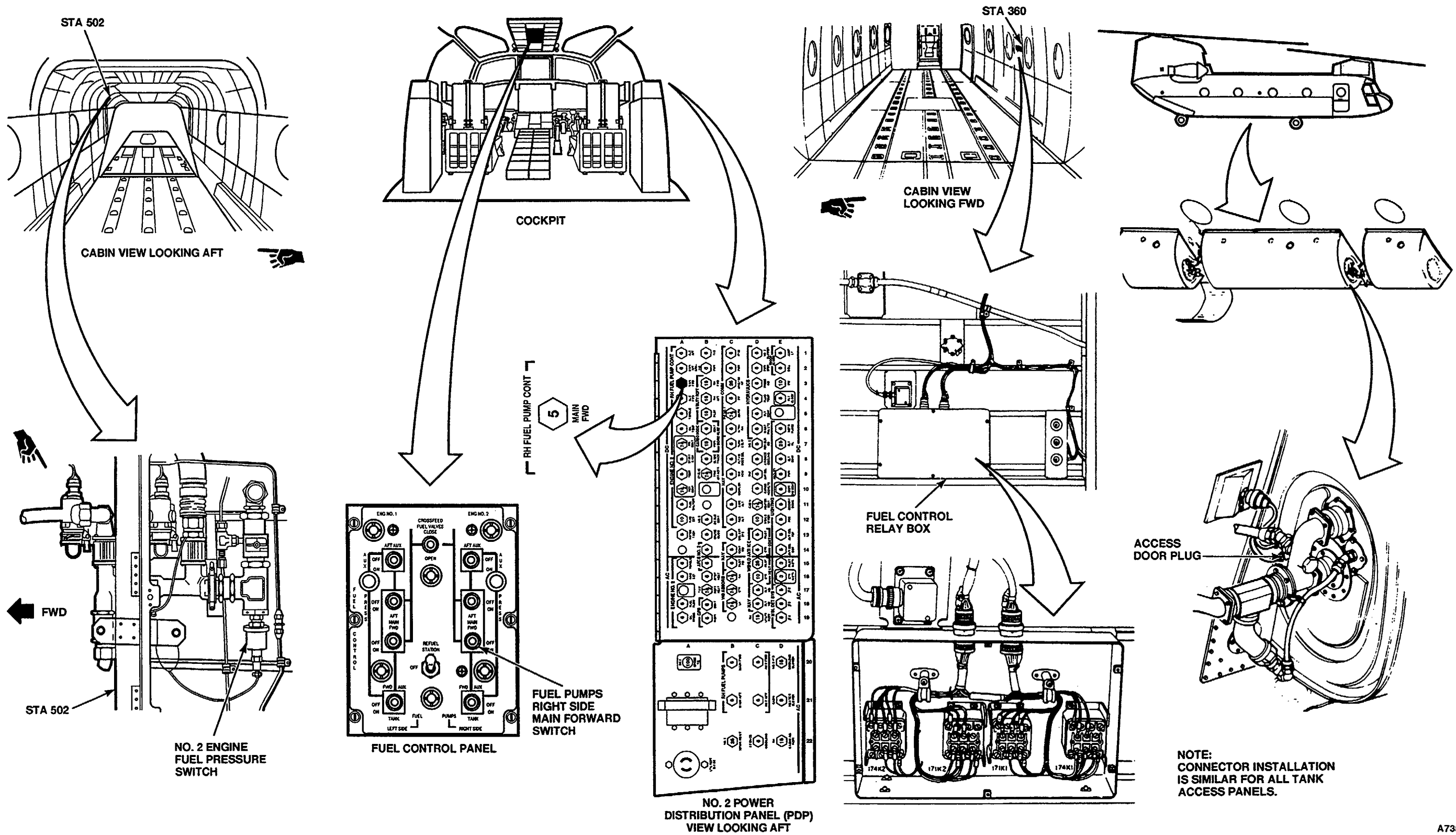


A84925





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10-2.25 R FUEL PRESS CAPSULE DOES NOT GO OUT WHEN RIGHT SIDE MAIN AFT FUEL PUMPS SWITCH IS SET TO ON

10-2.25

FAULT ISOLATION PROCEDURE

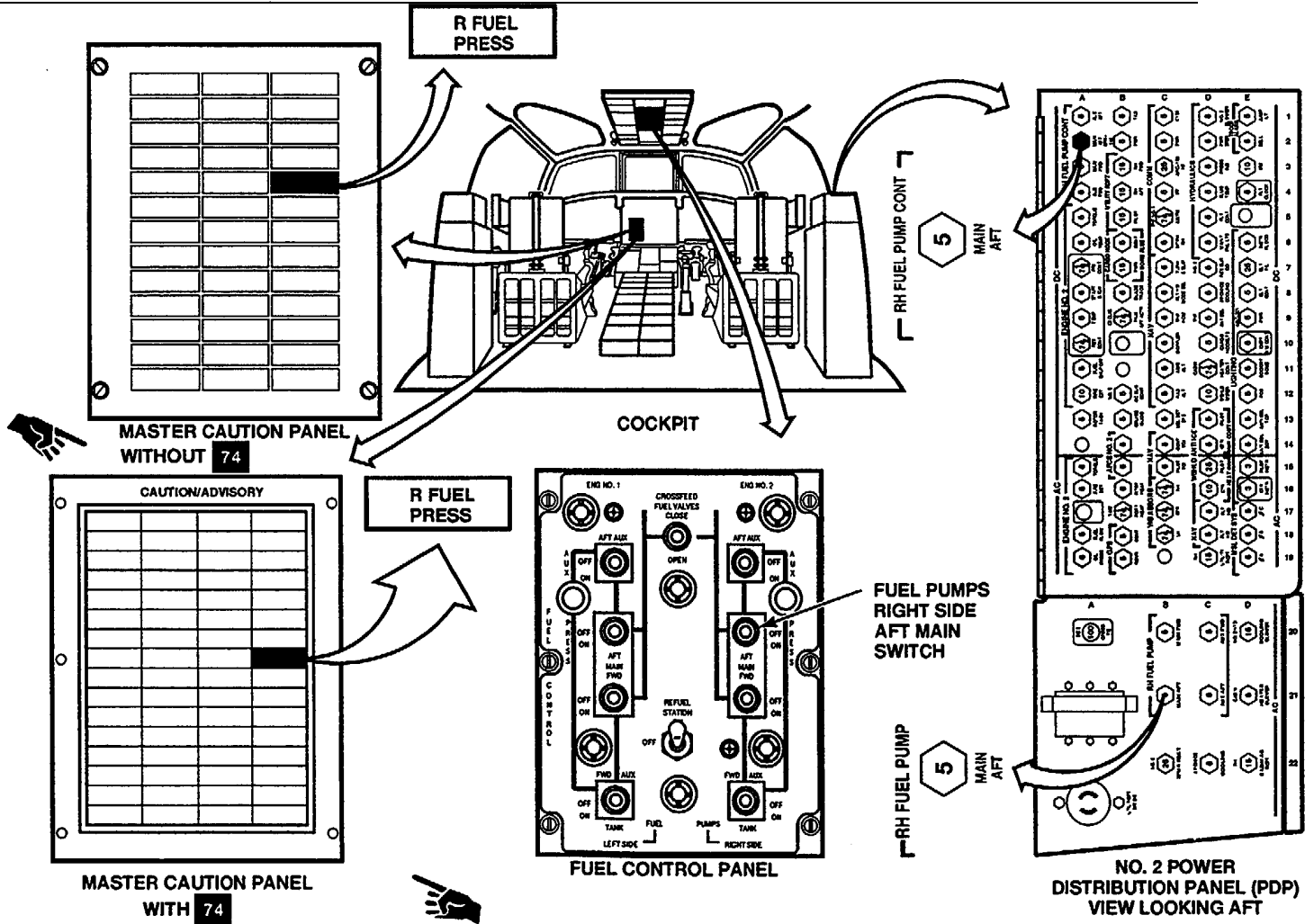
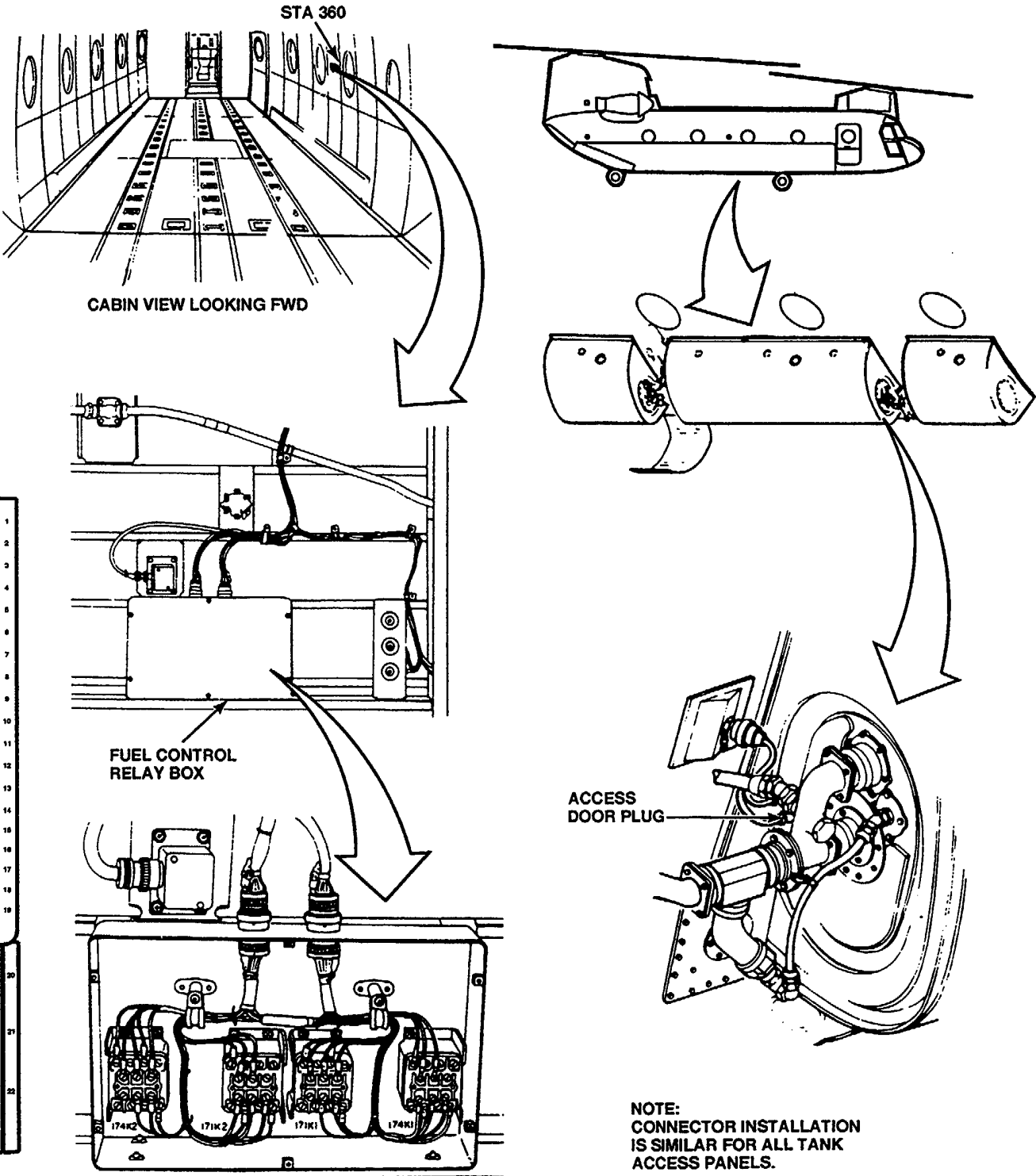
INITIAL SETUP

Applicable Configurations:

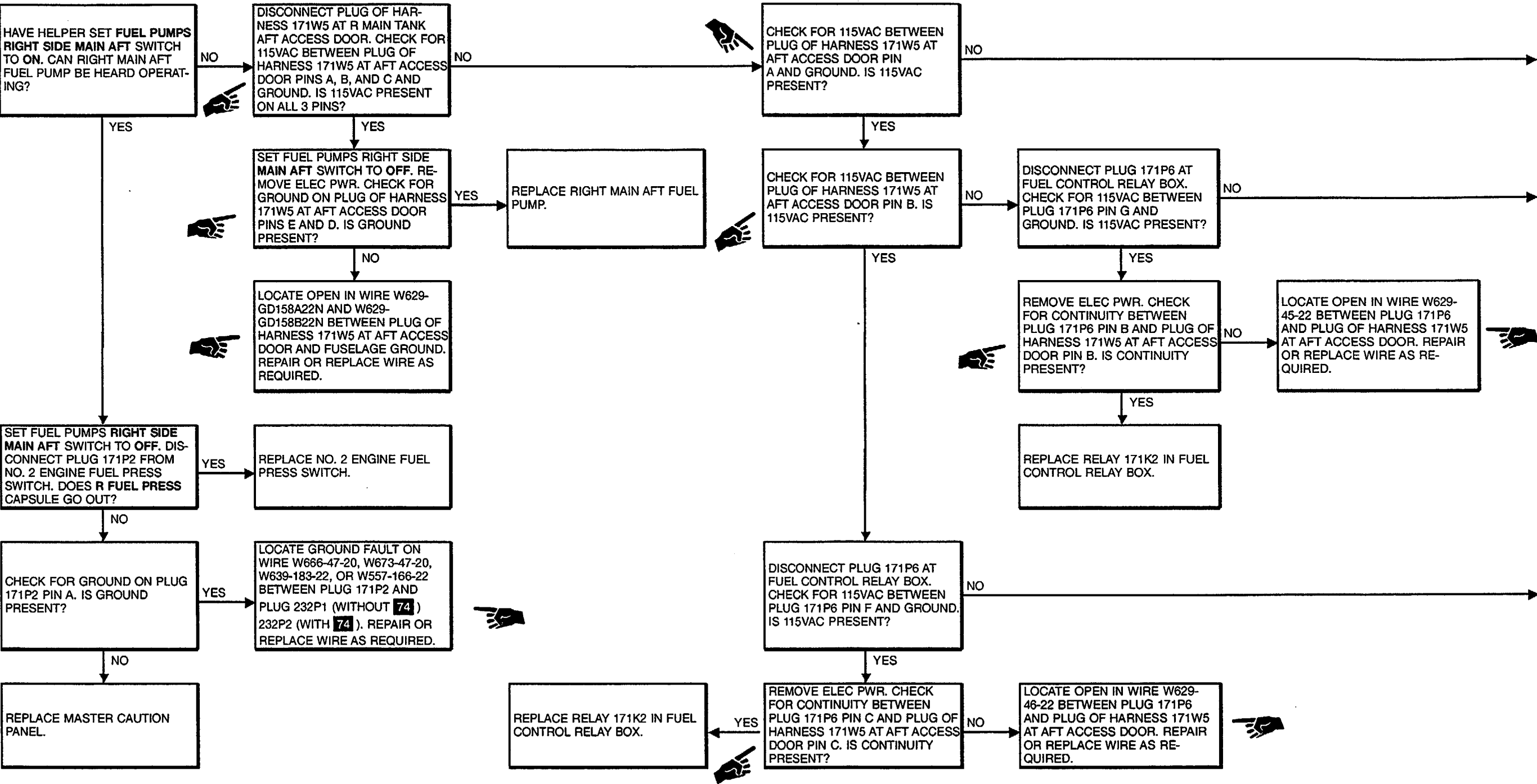
- All
- Tools:
- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
  - Multimeter
- Materials:

- None
- Personnel Required:
- Aircraft Electrician (2)
- References:
- TM 55-1520-240-10
  - TM 55-1520-240-23

- Equipment Condition:
- TM 55-1520-240-10
  - Both Engines Shut Down
  - TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Side Acoustical Blanket Removed Between Sta 320 and 360
  - Right Side Intertank Access Panel Open

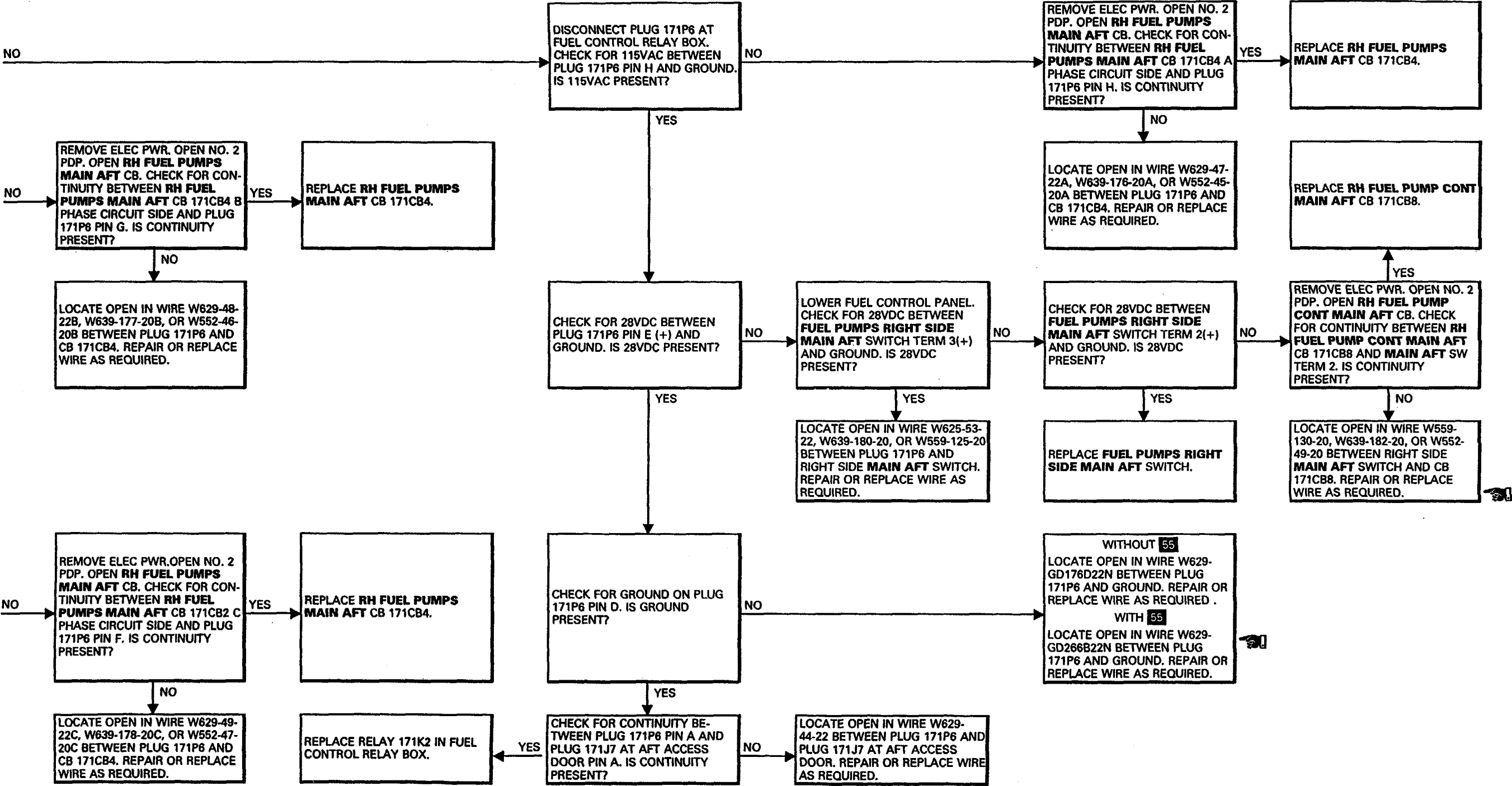




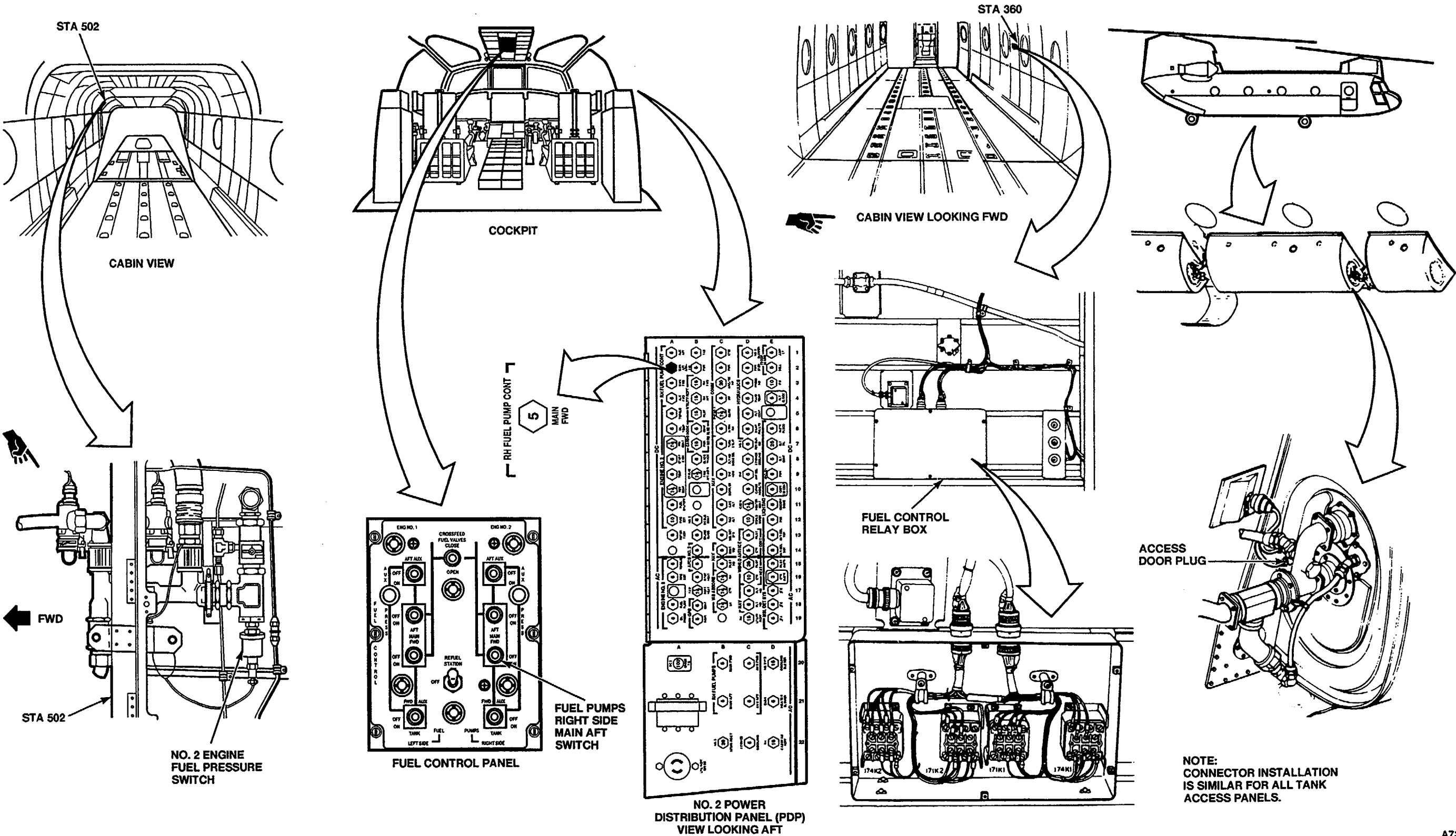


GO TO NEXT PAGE

Change 23 10-95



GO TO NEXT PAGE



A73594

10-2.26 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE AFT AUX FUEL PUMP SWITCH IS SET TO ON

10-2.26

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

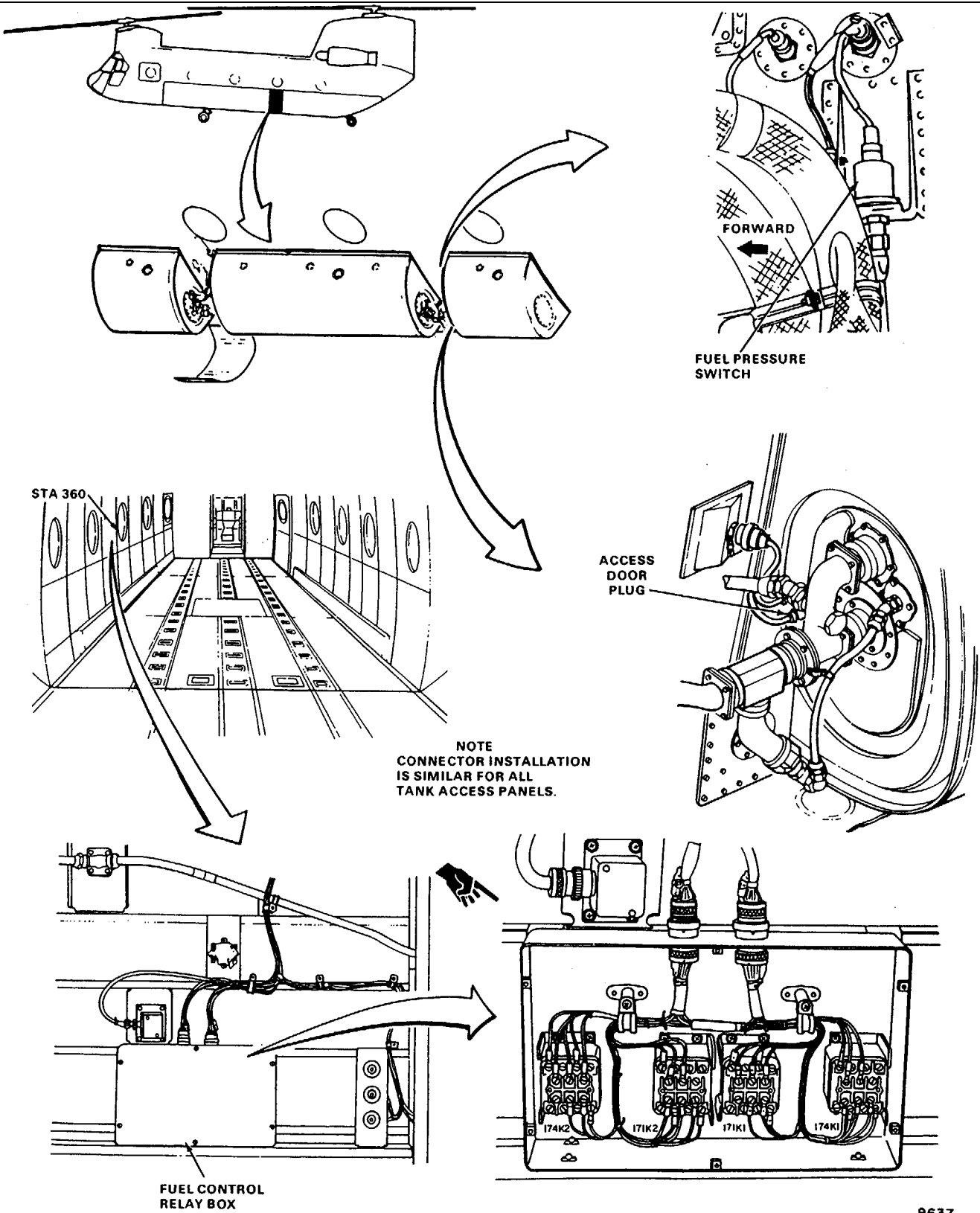
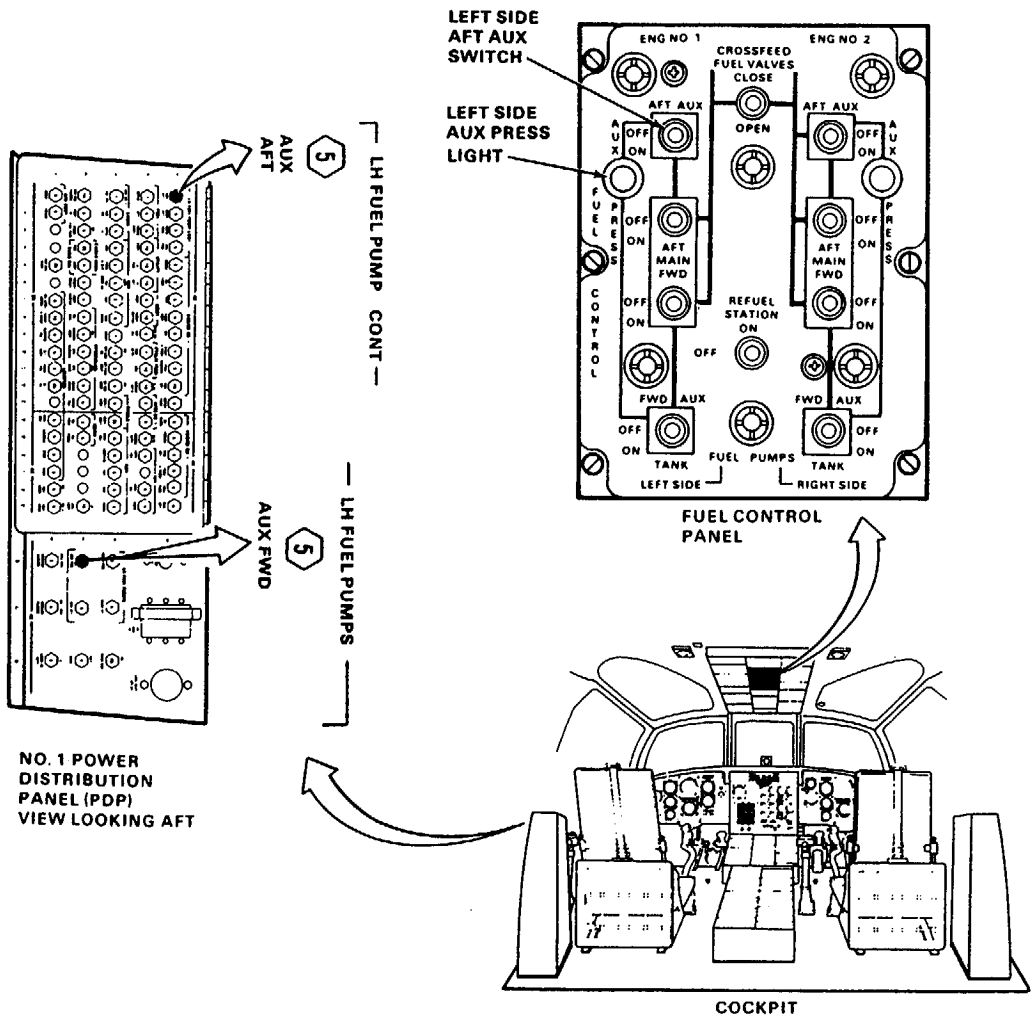
Tools  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:  
None

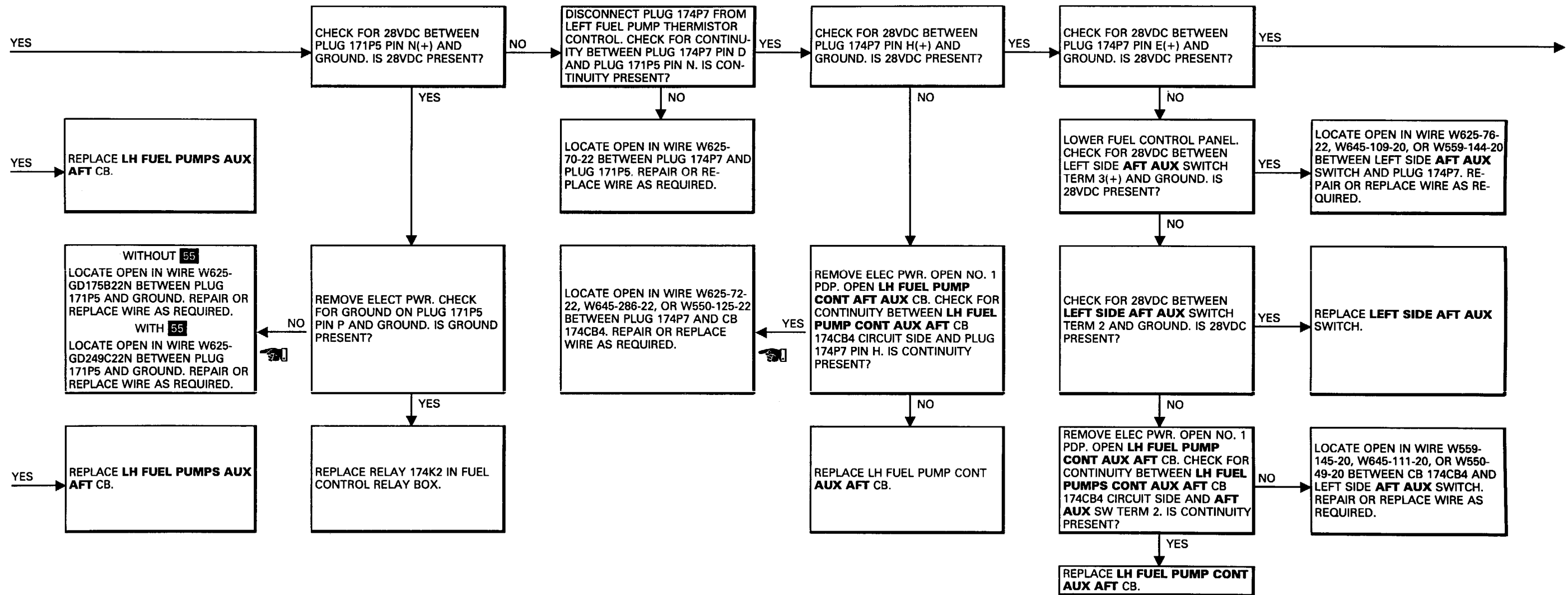
Personnel Required:  
Aircraft Electrician (2)

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Side Acoustical Blanket Removed Between Sta 320 and 360  
Left Aft Intertank Access Panel Open

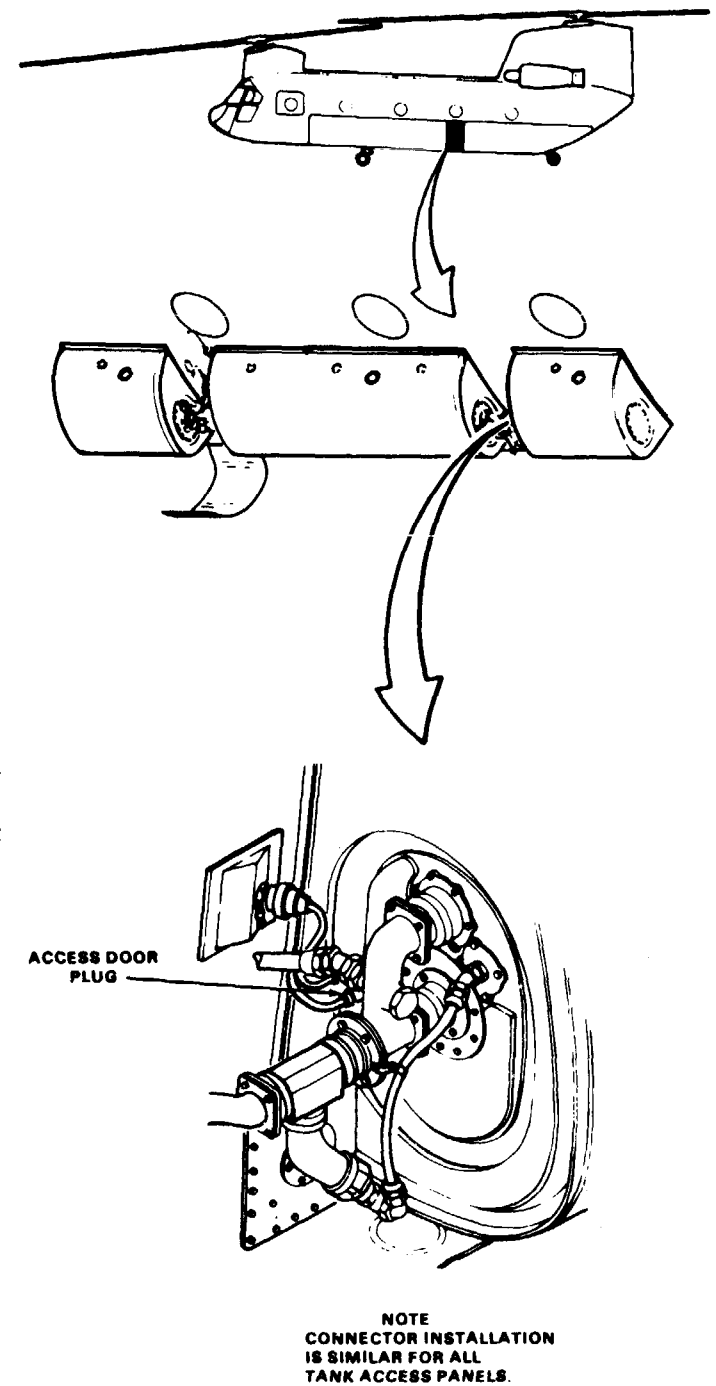
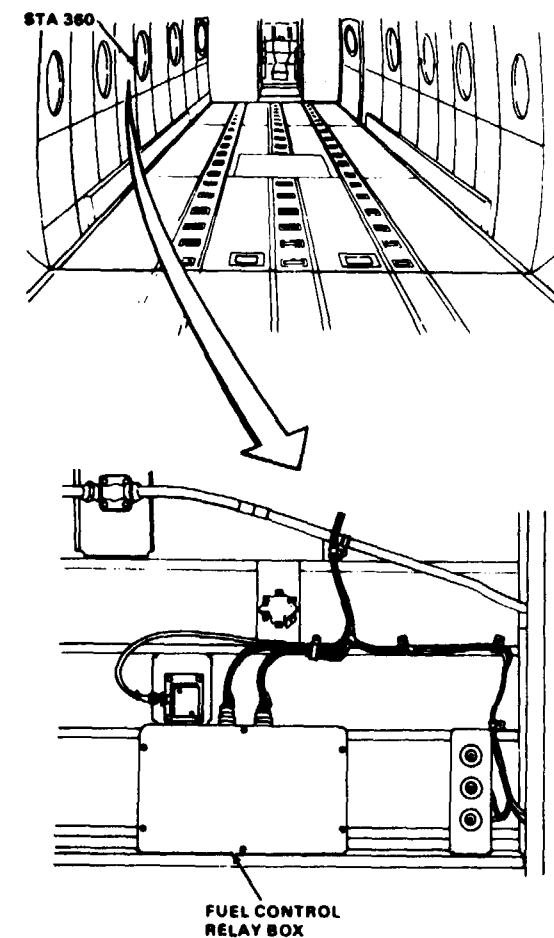
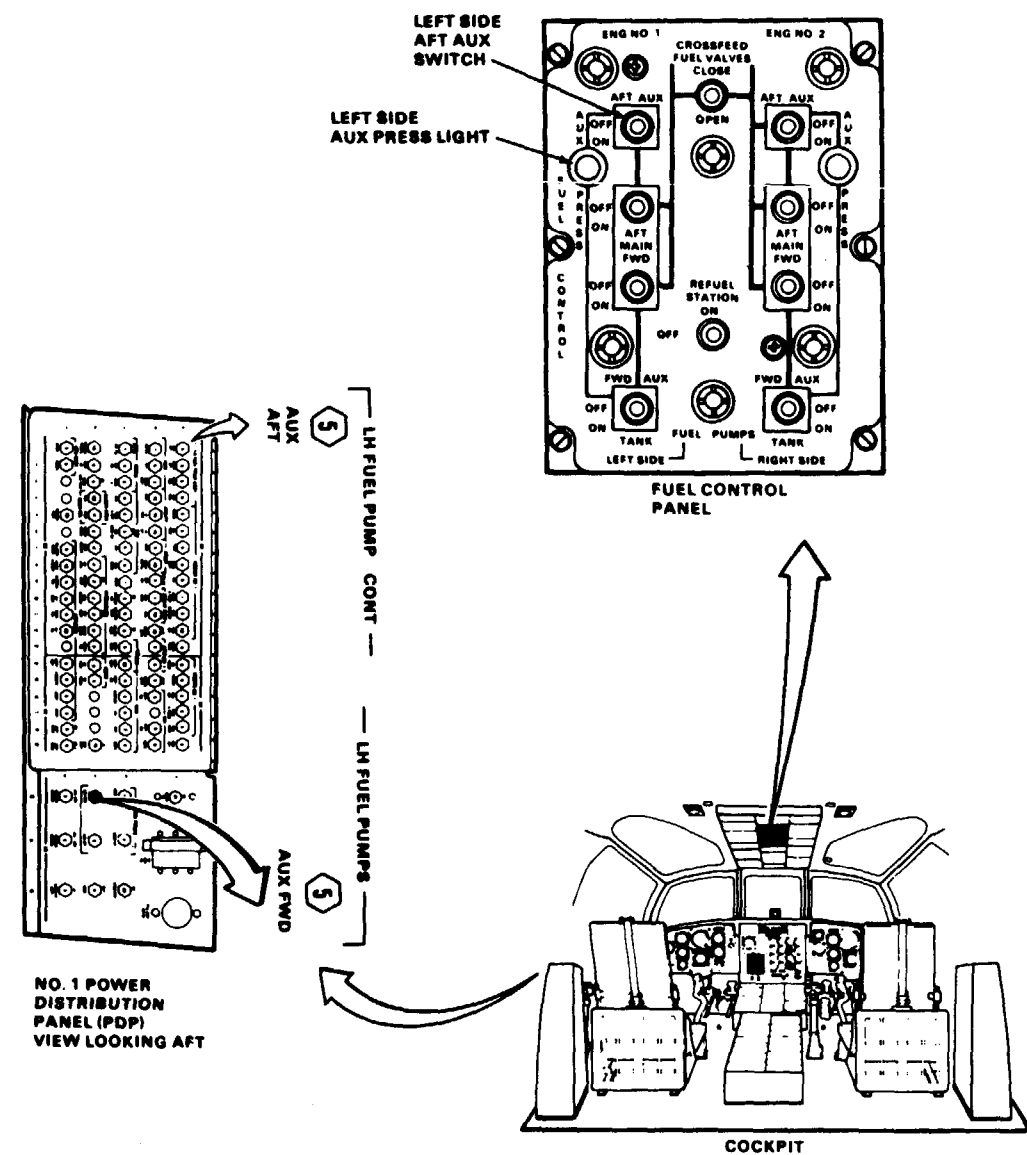






10-2.26 LEFT SIDE AUX PRESS LIGHT COMES ON  
WHEN LEFT SIDE AFT AUX FUEL PUMP  
SWITCH IS SET TO ON (Continued)

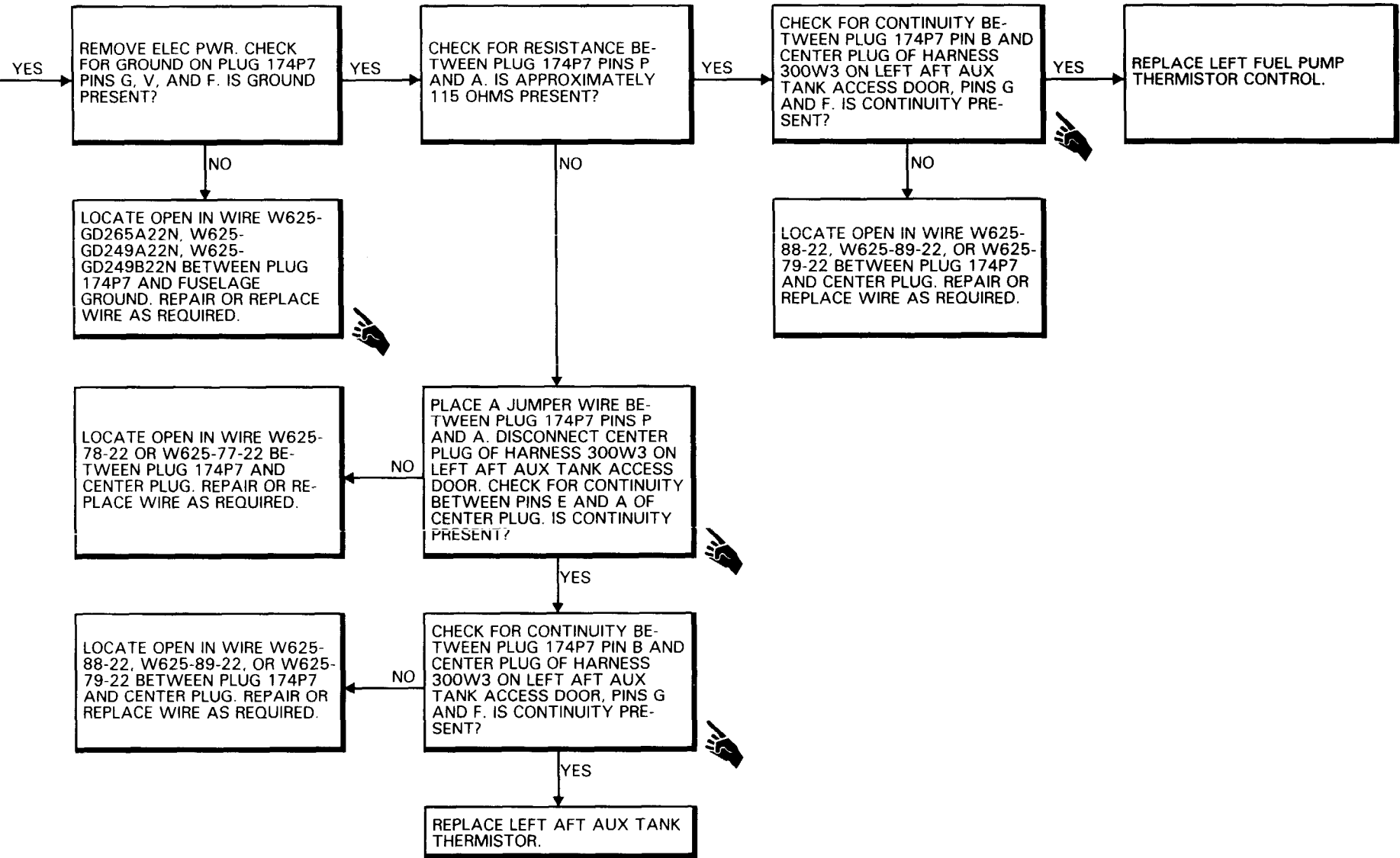
10-2.26



90 X 54

0145-11758-3PA

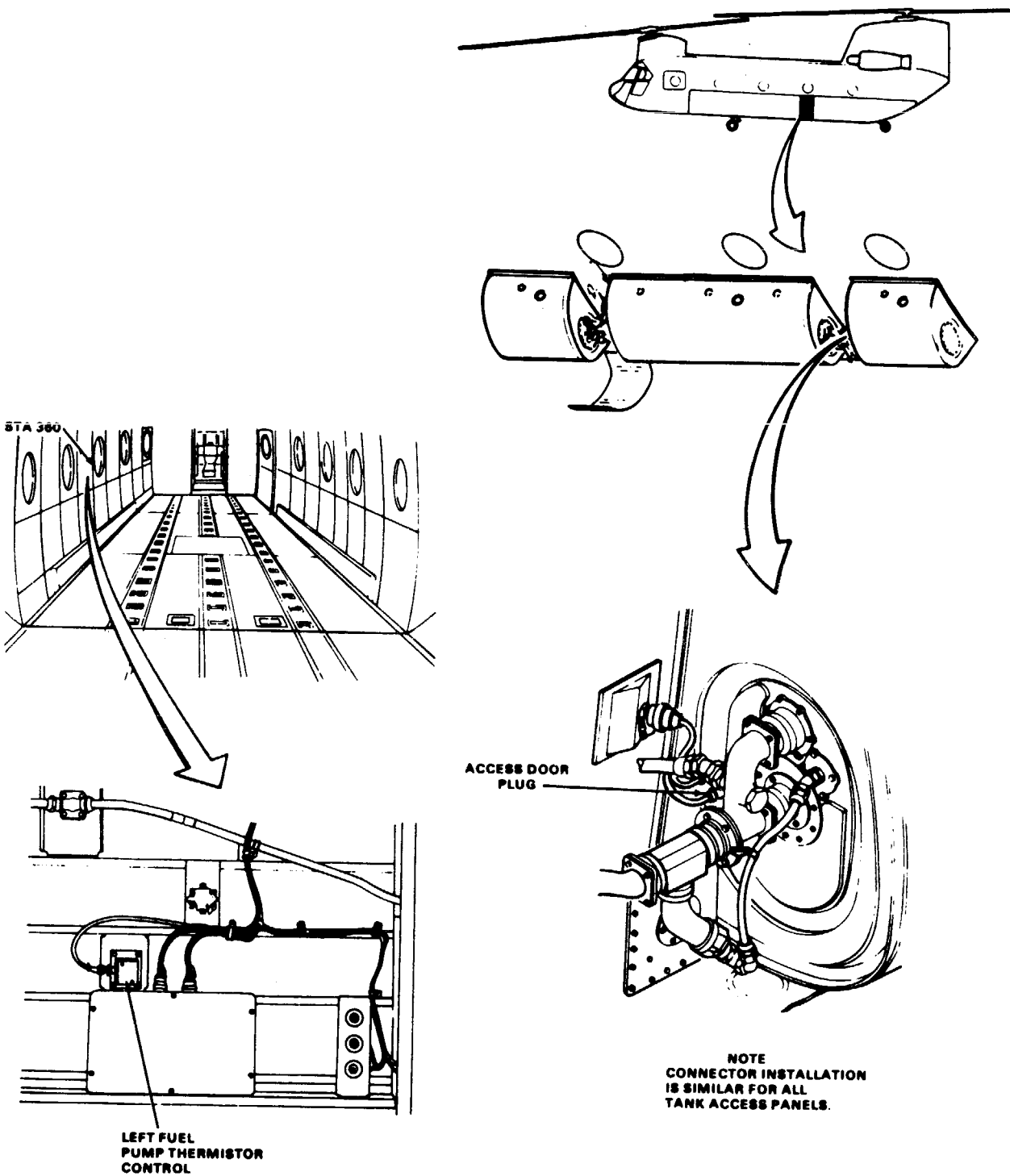
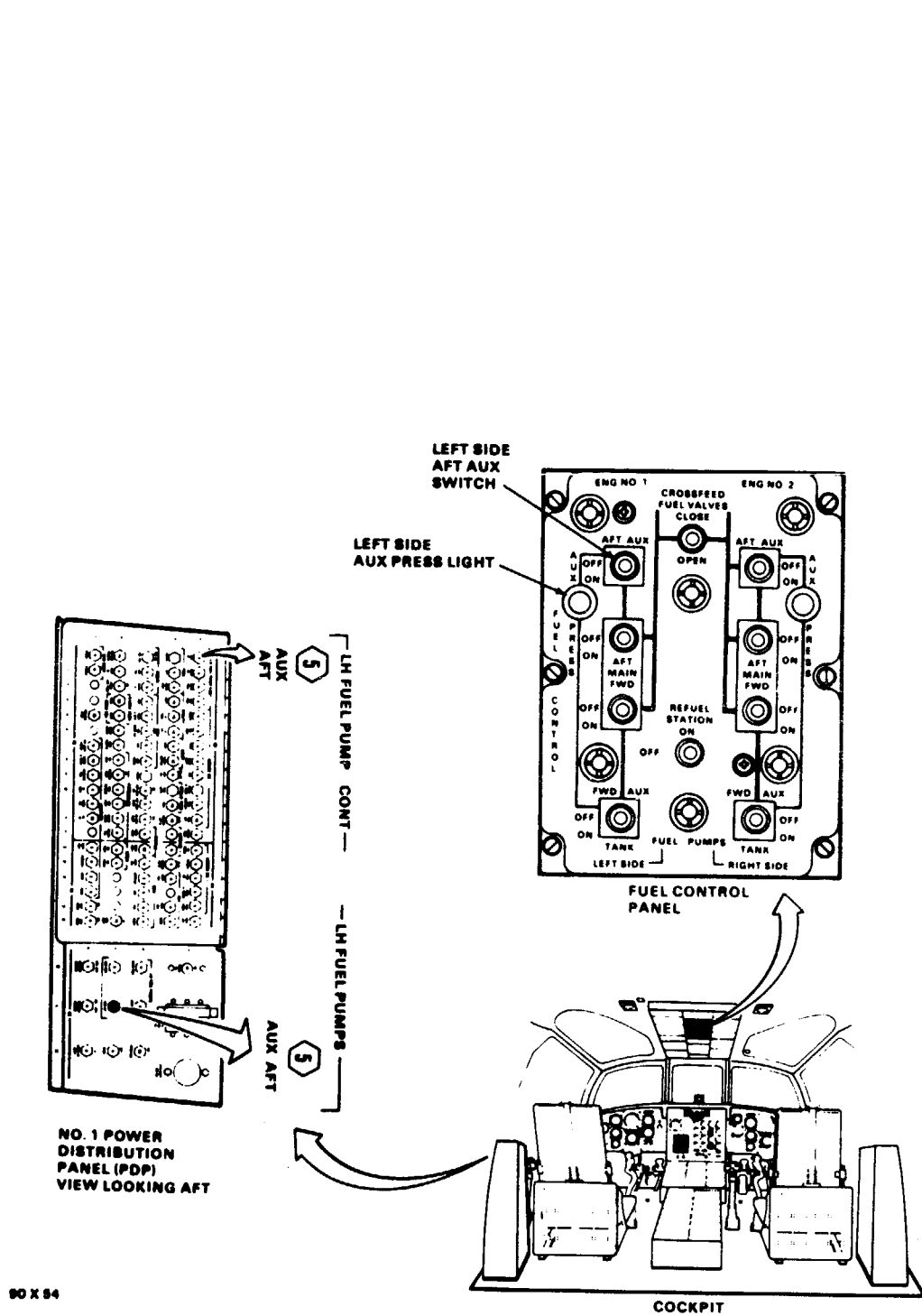
GO TO NEXT PAGE





10-2.26 LEFT SIDE AUX PRESS LIGHT COMES ON  
WHEN LEFT SIDE AFT AUX FUEL PUMP  
SWITCH IS SET TO ON (Continued)

10-2.26



D145-11759-SPA

END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

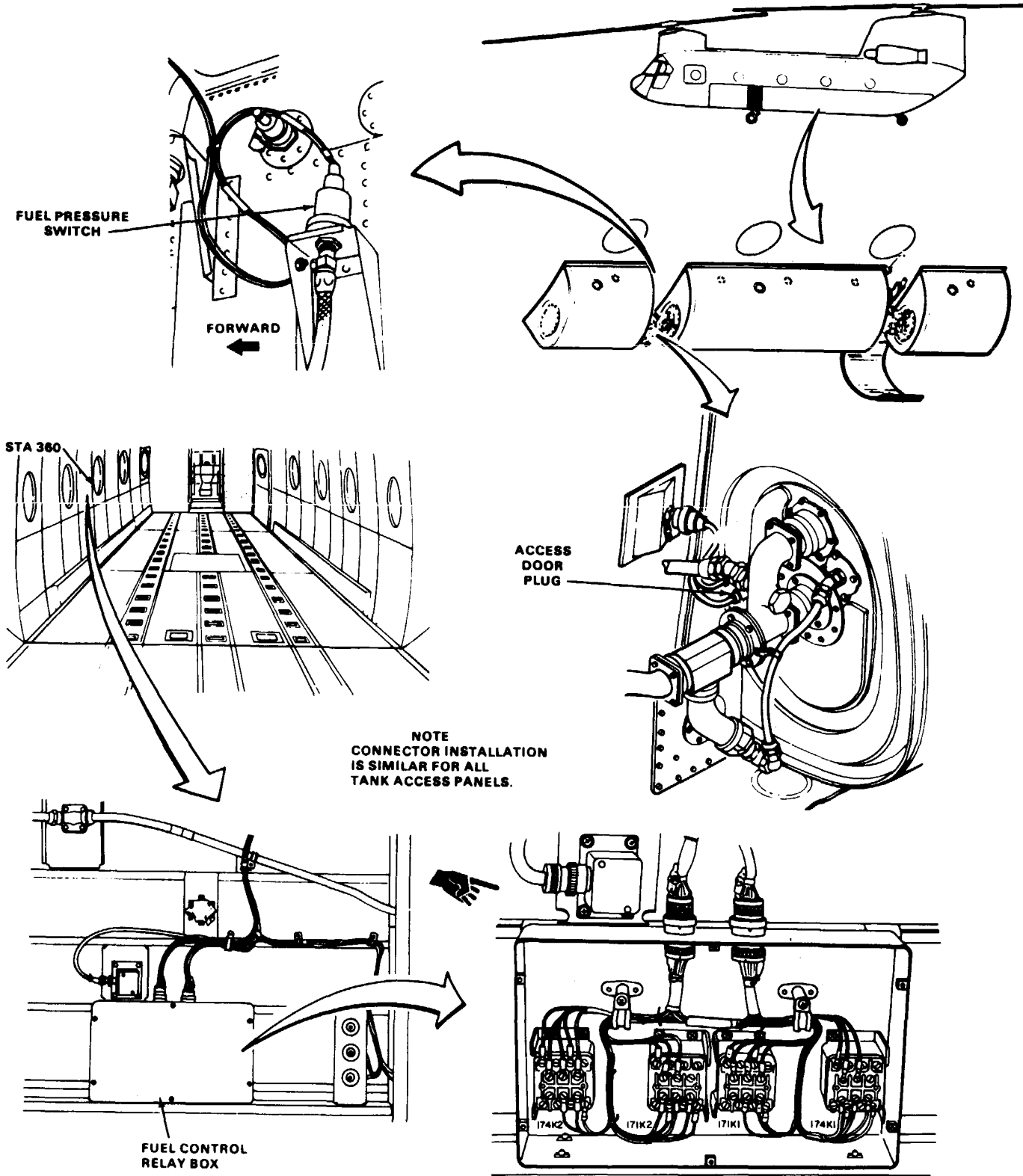
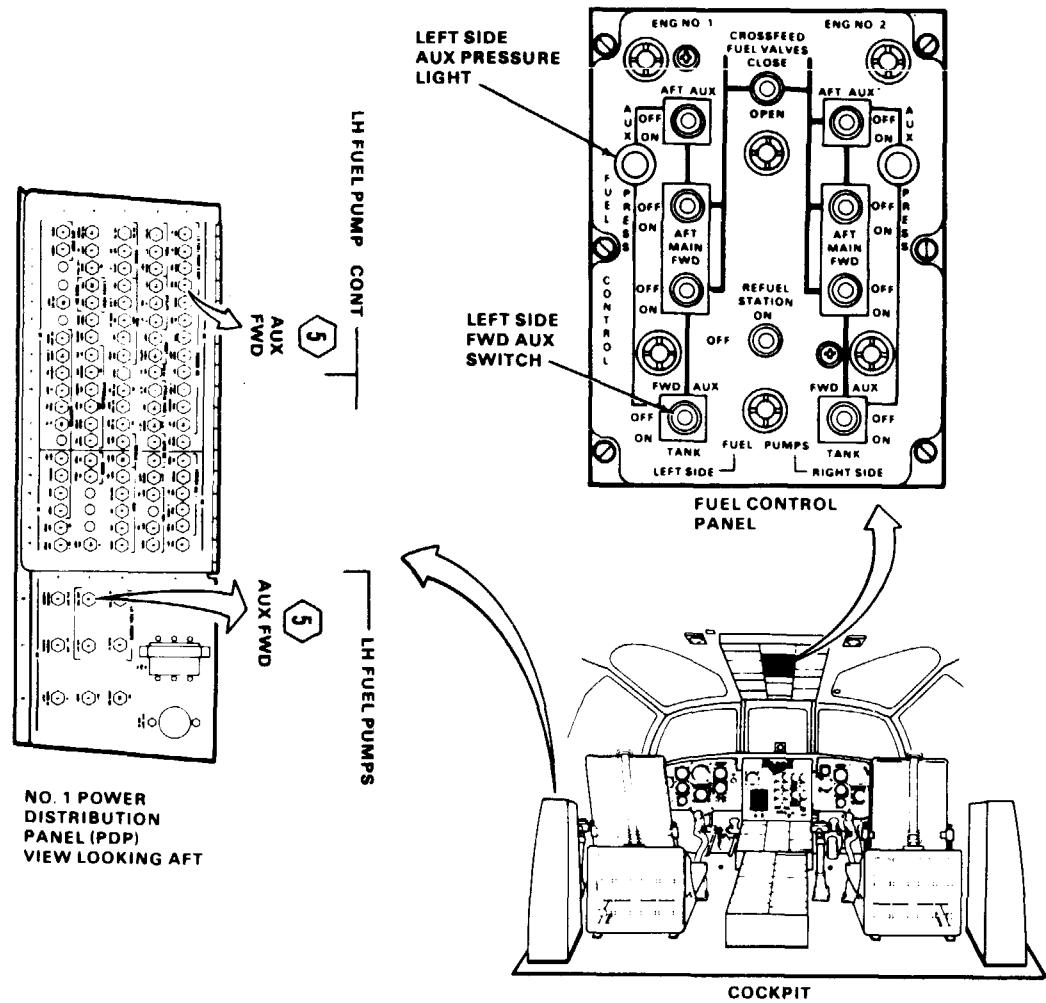
Aircraft Electrician (2)

References:

TM 55-1520-240-23

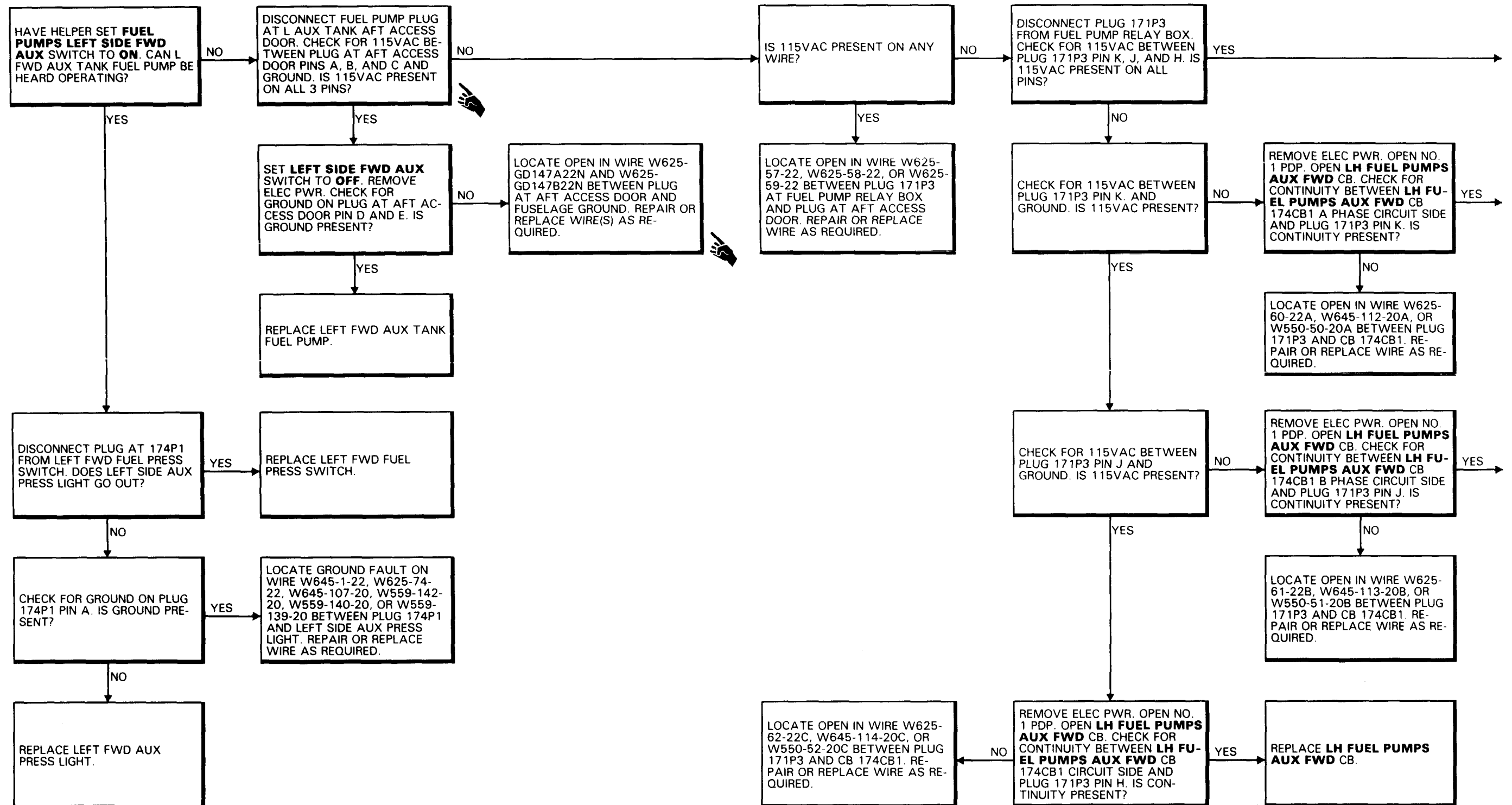
Equipment Condition:

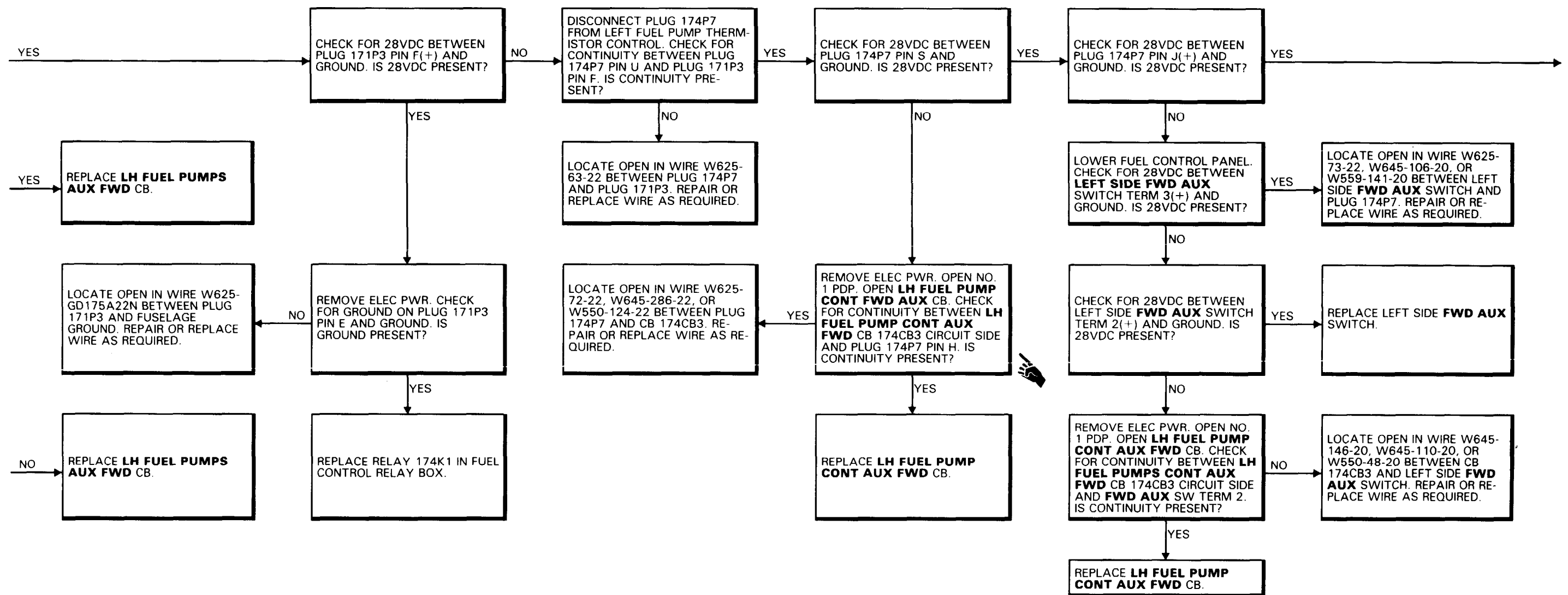
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Side Acoustical Blanket Removed Between Sta  
320 and 360  
Left Forward Landing Gear Access Panel Open



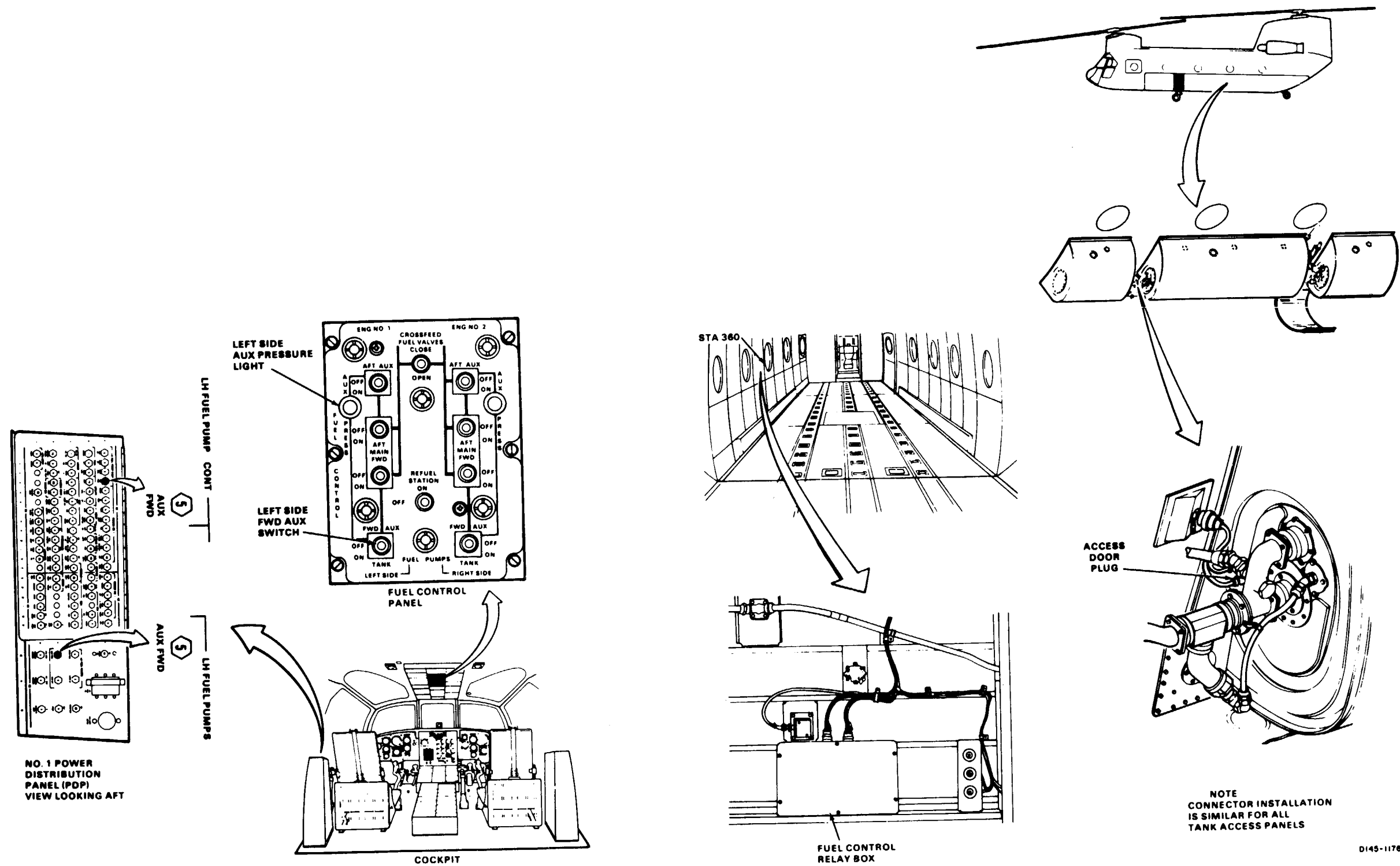
10-2.27 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON (Continued)

10-2.27



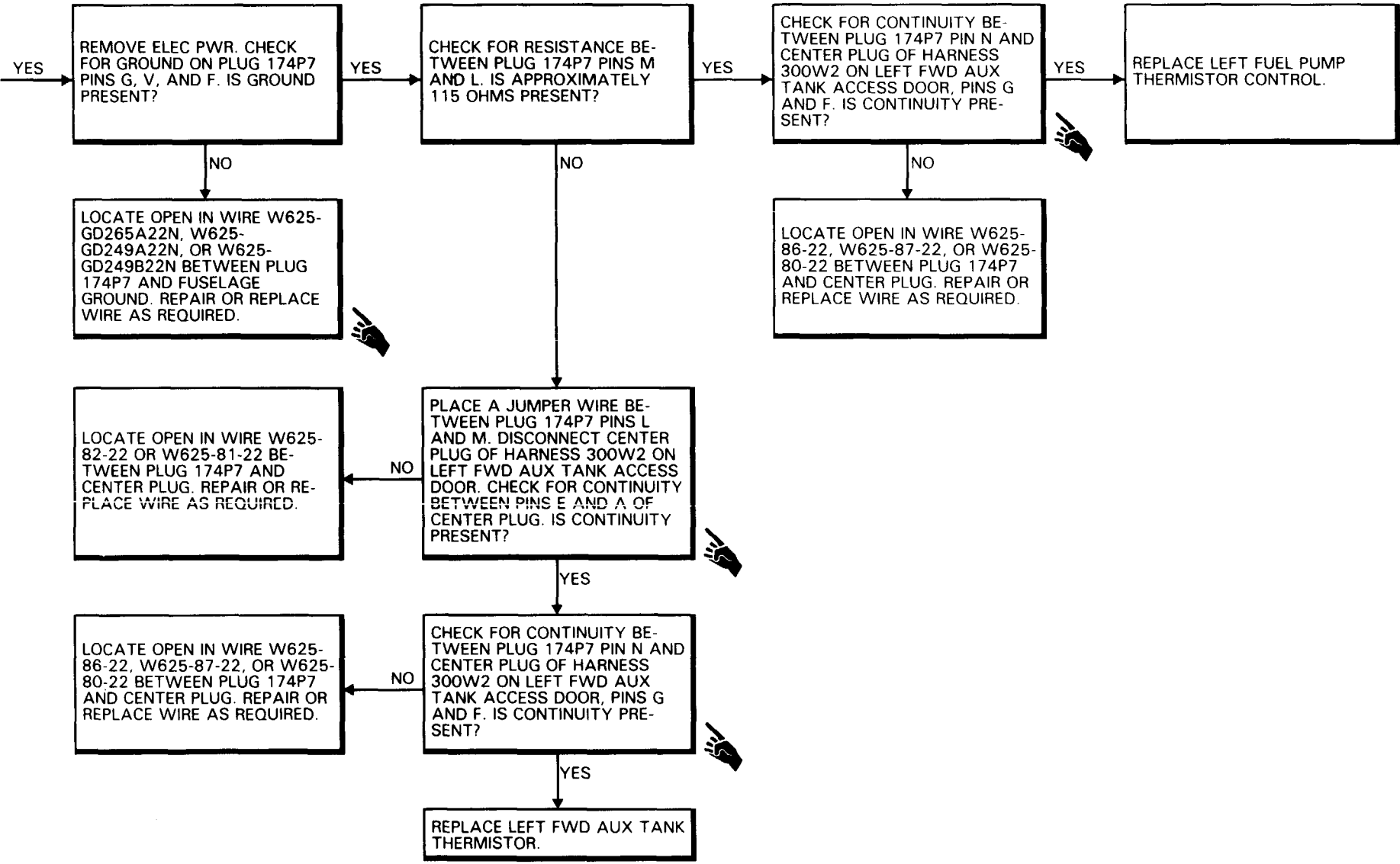


10-2.27 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT  
SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON  
(Continued)



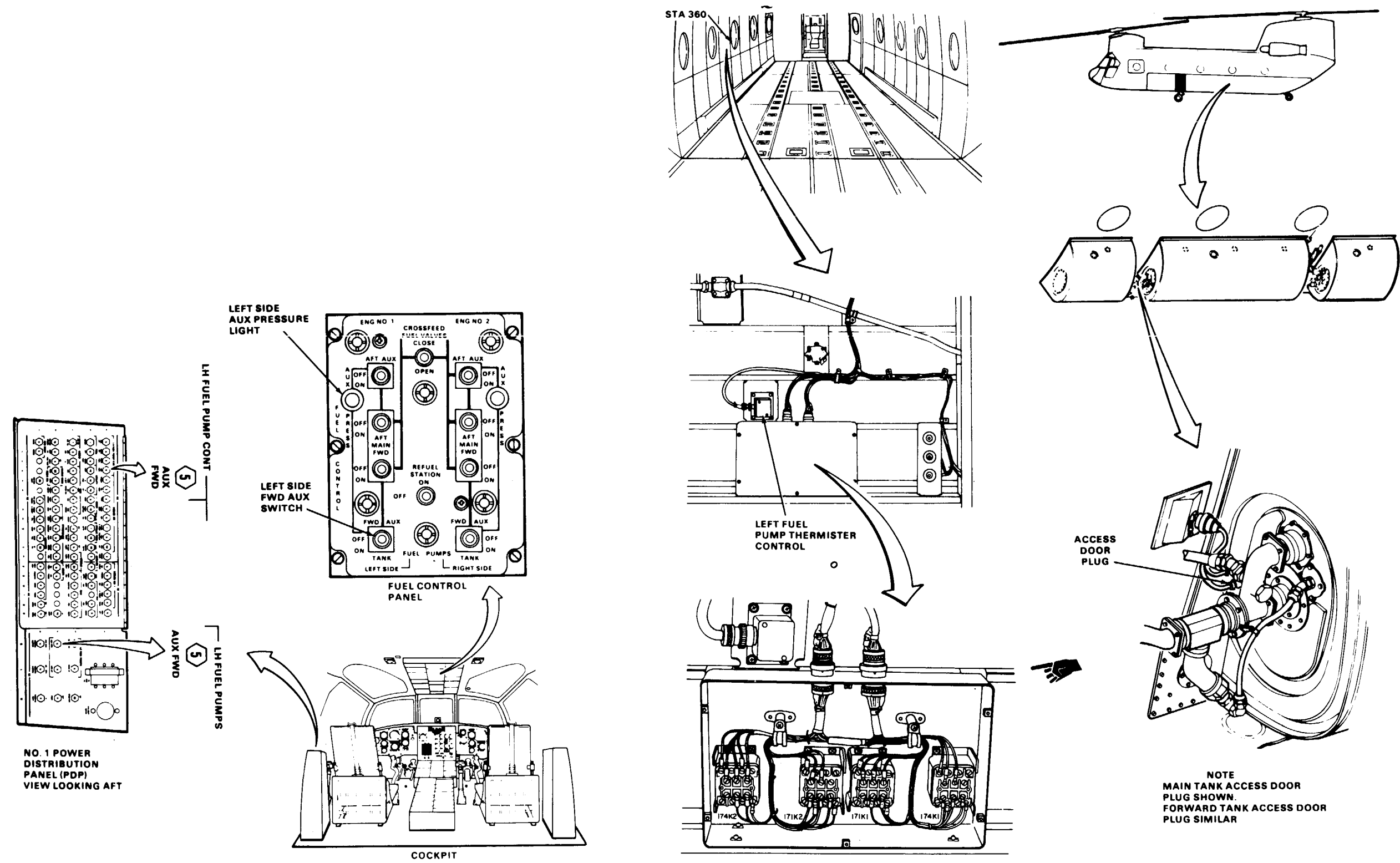
90 X 54

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10-2.27 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON (Continued)

10-2.27



9639

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

Aircraft Electrician (2)

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

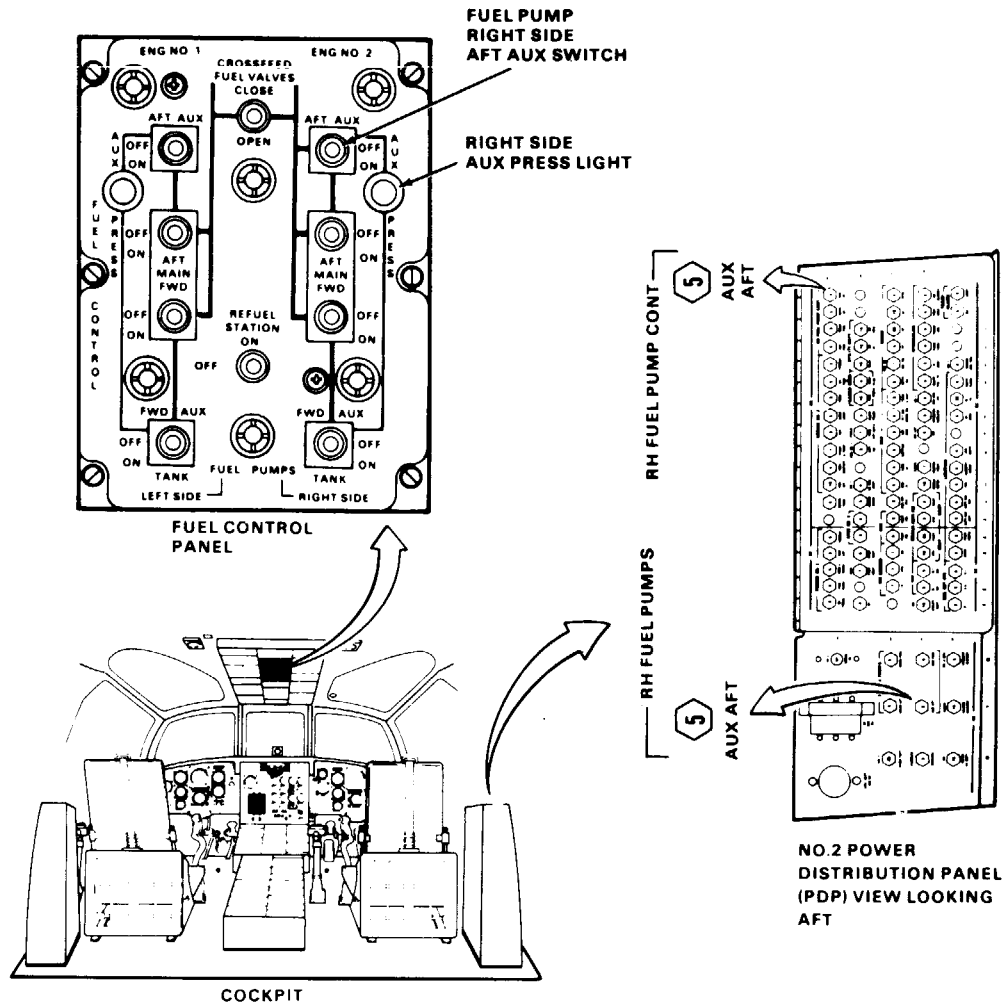
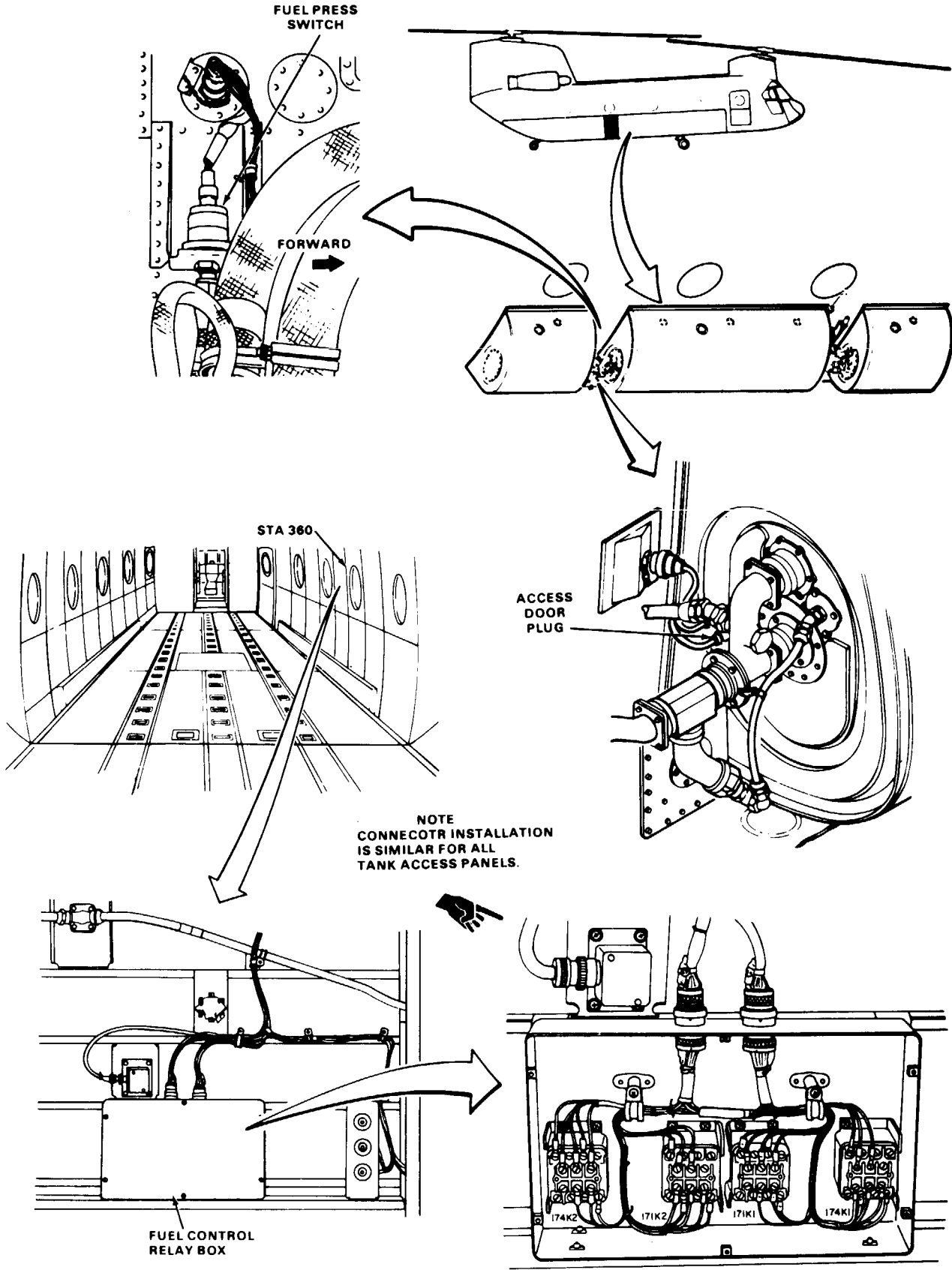
Battery Connected

Electrical Power On

Hydraulic Power Off

Side Acoustical Blanket Removed Between Sta  
320 and 360.

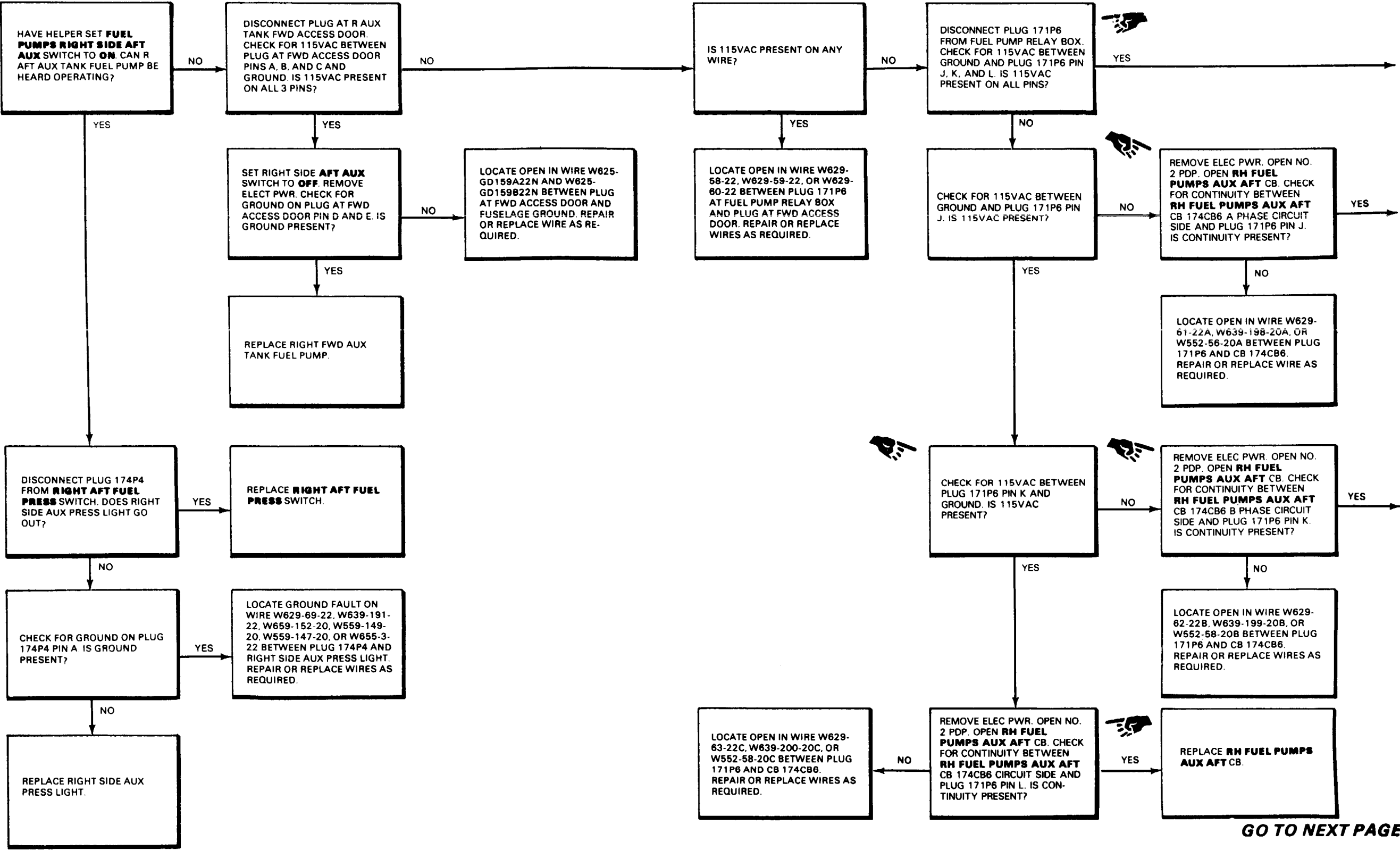
Right Aft Intertank Access Panel Open



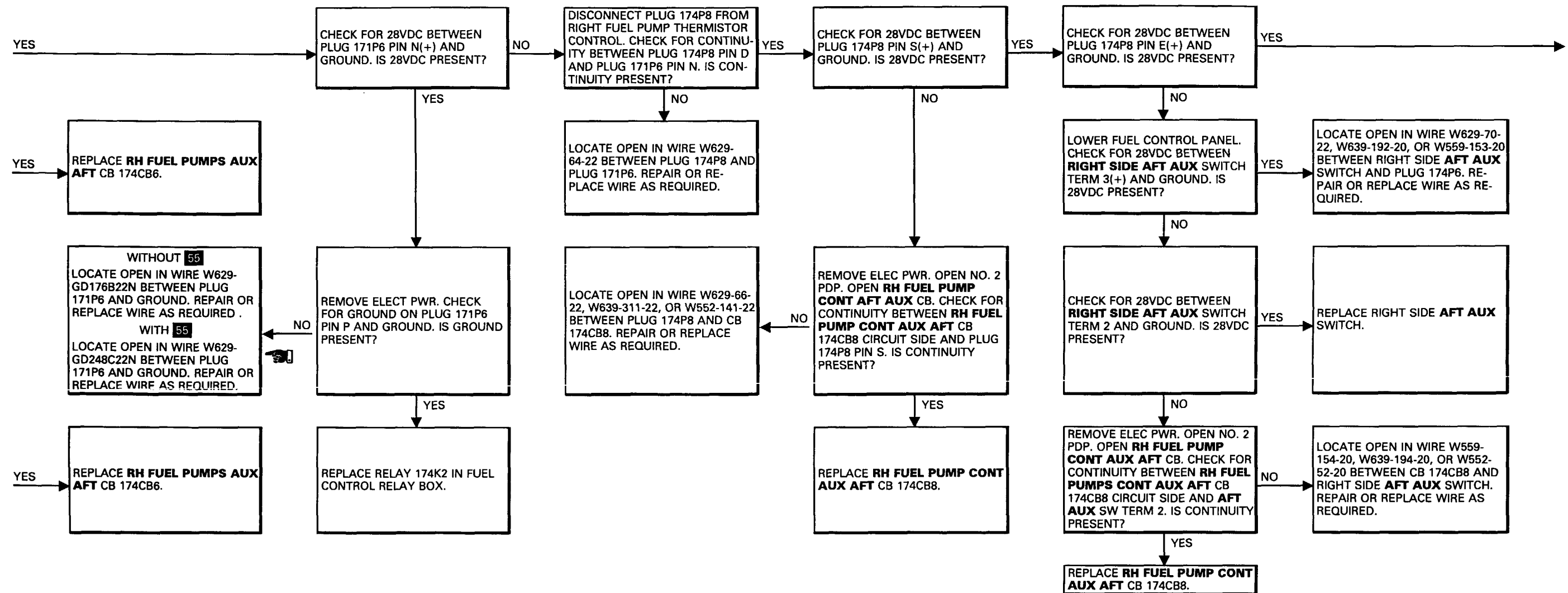


10-2.28 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE  
AUX AFT FUEL PUMP SWITCH IS SET TO ON (Continued)

10-2.28

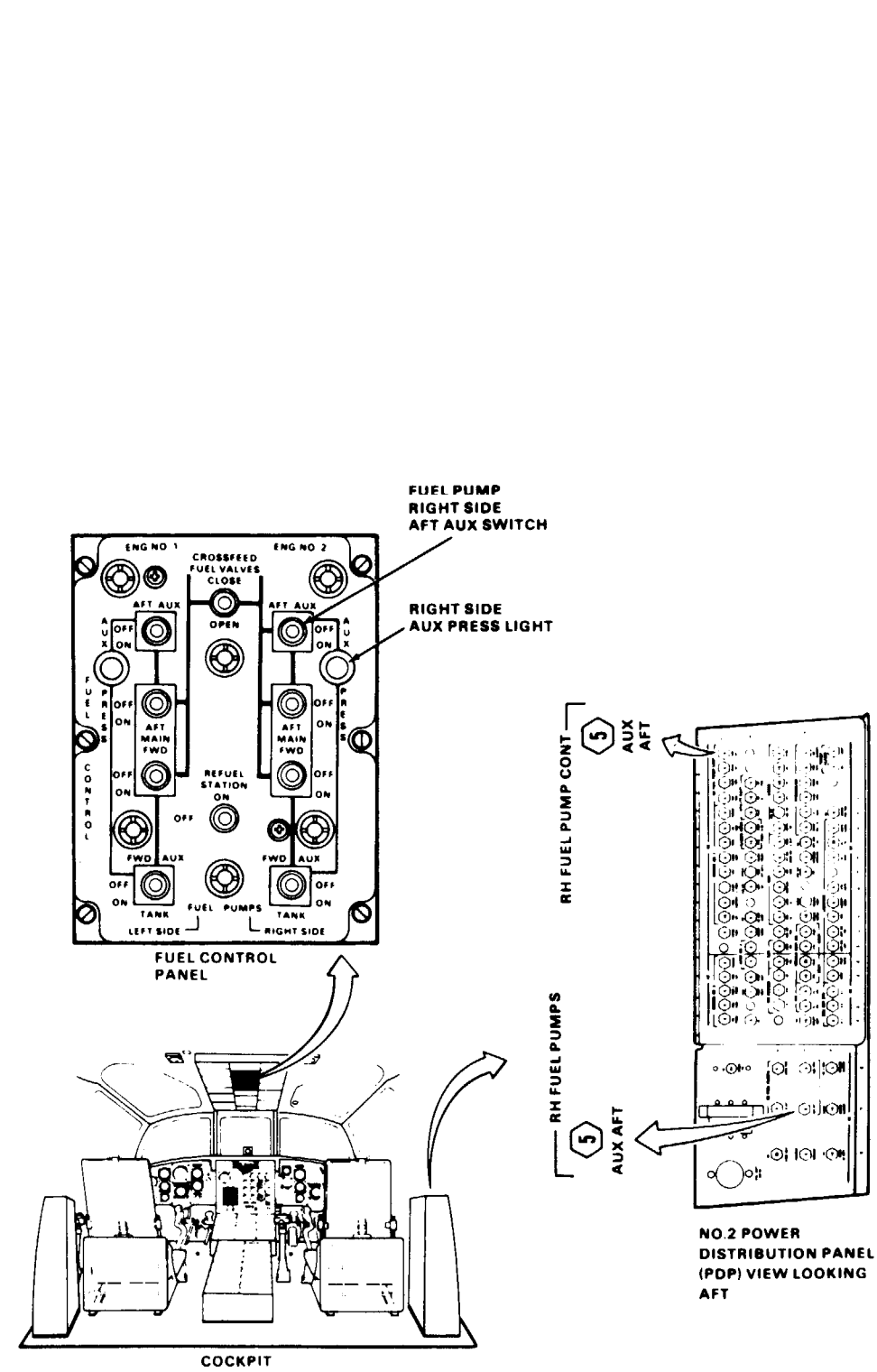


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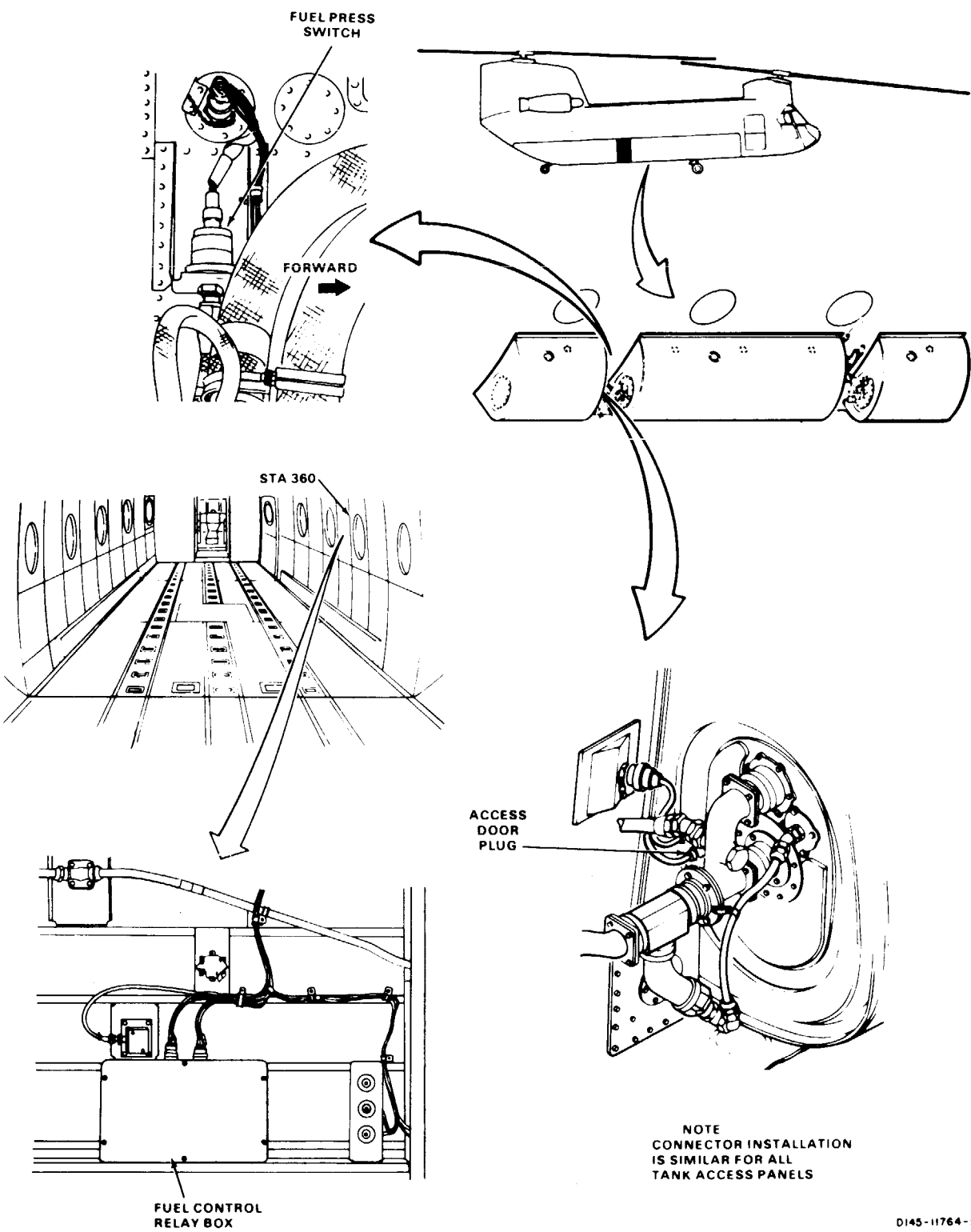


10-2.28 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT  
SIDE AFT AUX FUEL PUMP SWITCH IS SET TO ON  
(Continued)

10-2.28



90 X 54

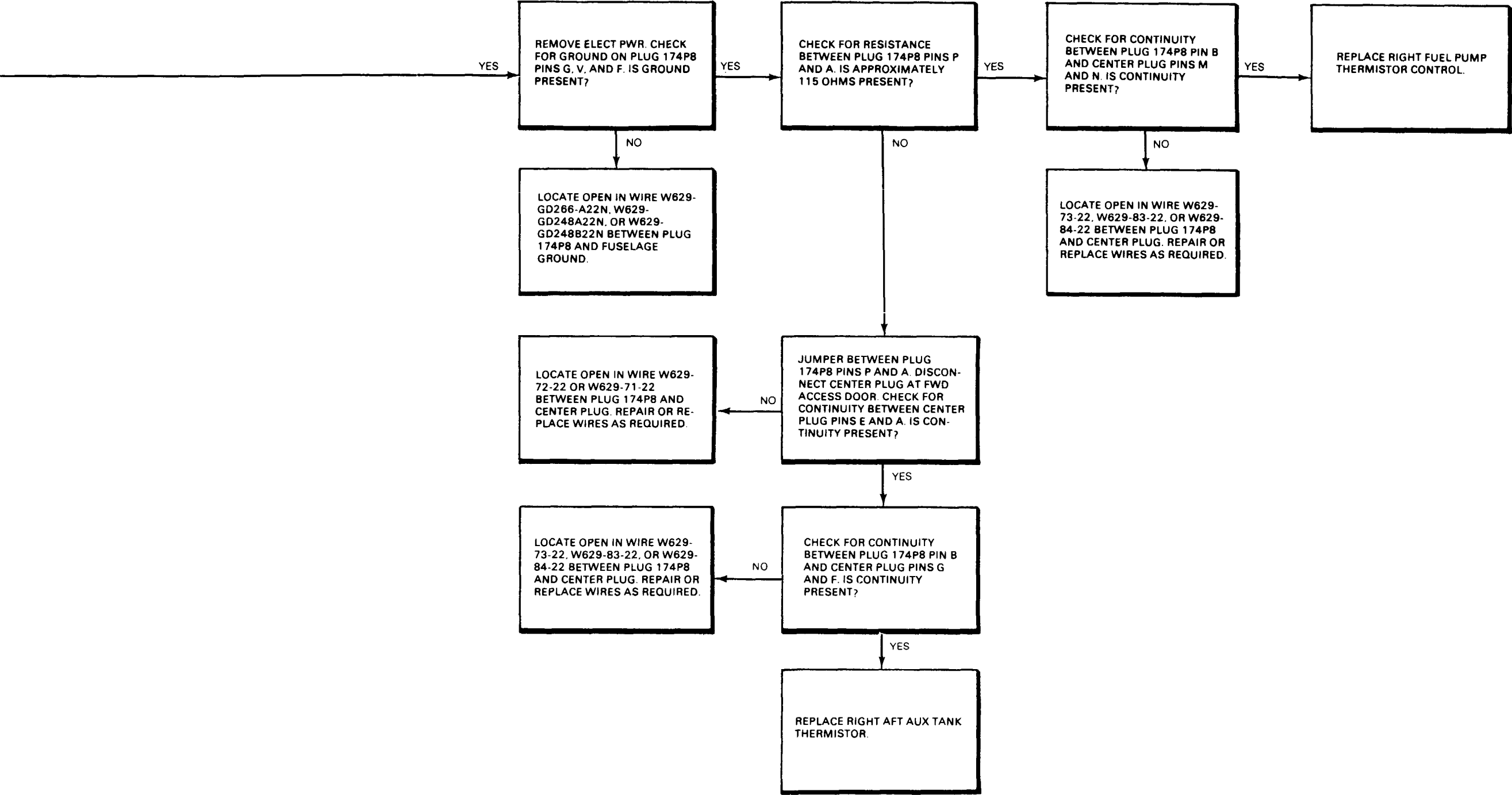


0145-11764-SPA

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10-2.28 RIGHT SIDE AUX PRESS LIGHT DOES NOT COME ON WHEN RIGHT  
SIDE AUX AFT FUEL PUMP SWITCH IS SET TO ON (Continued)

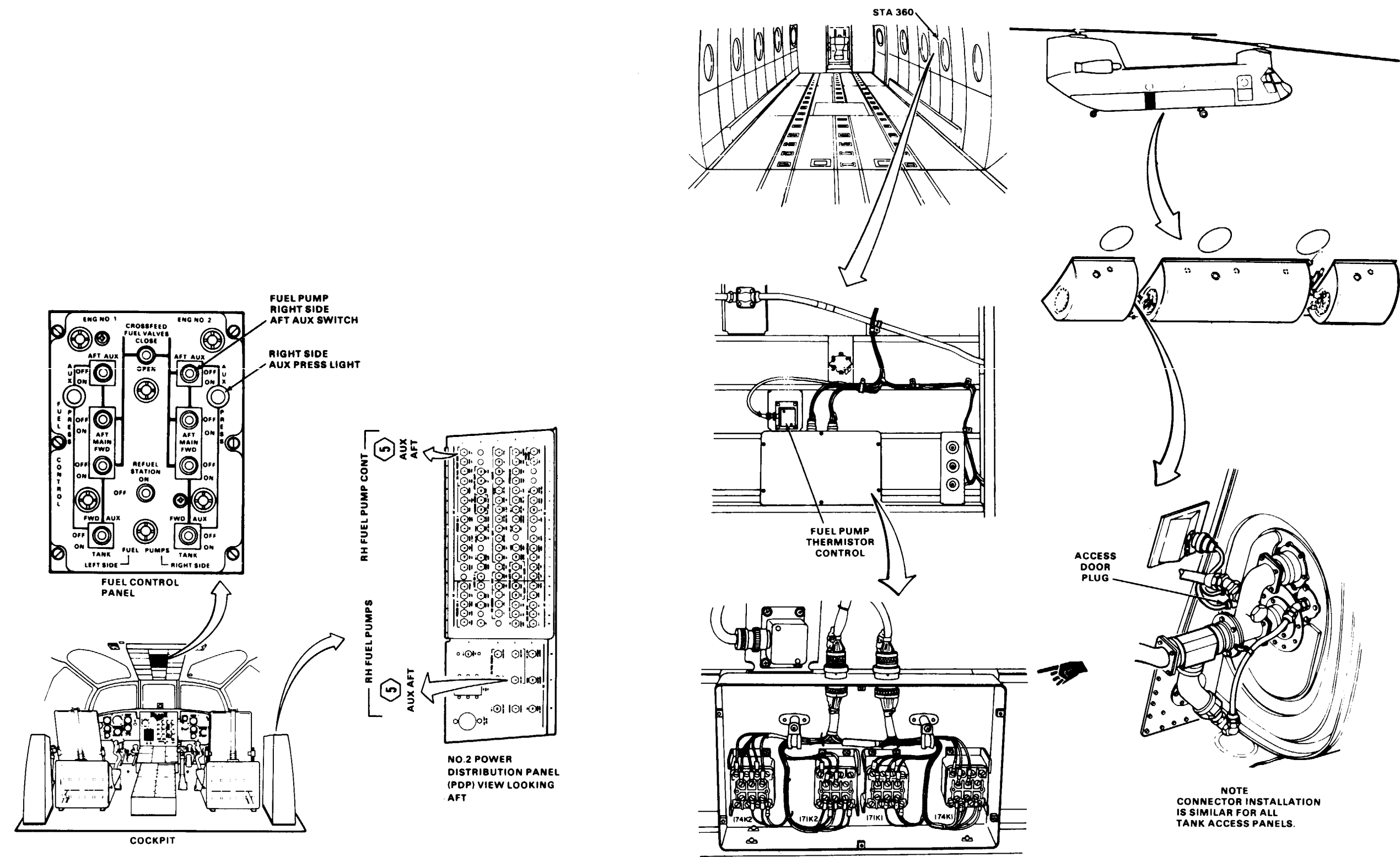
10-2.28



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10-2.28 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE AFT AUX FUEL PUMP SWITCH IS SET TO ON (Continued)

10-2.28



9641

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

Aircraft Electrician (2)

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

Battery Connected

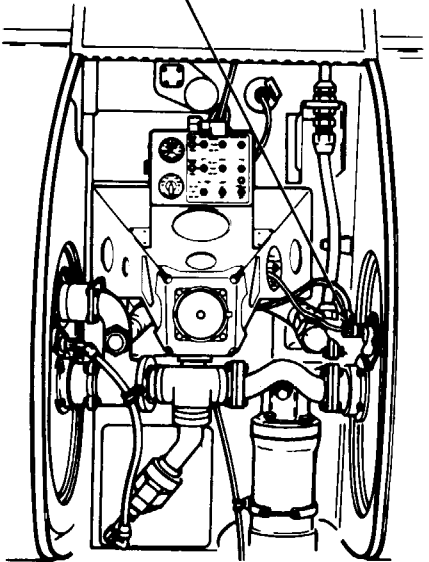
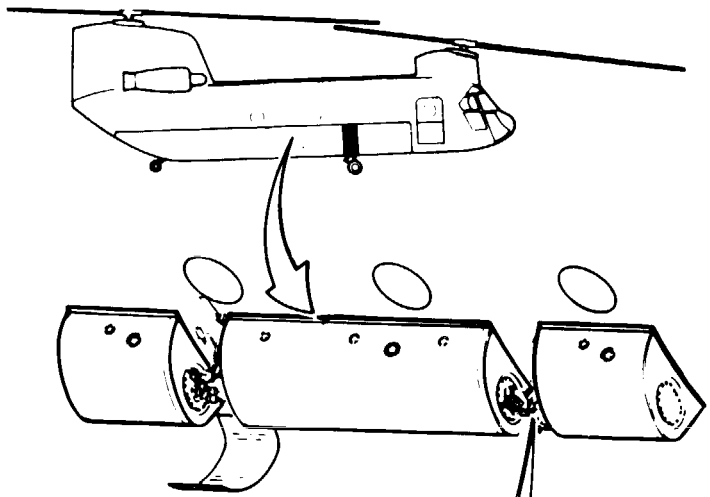
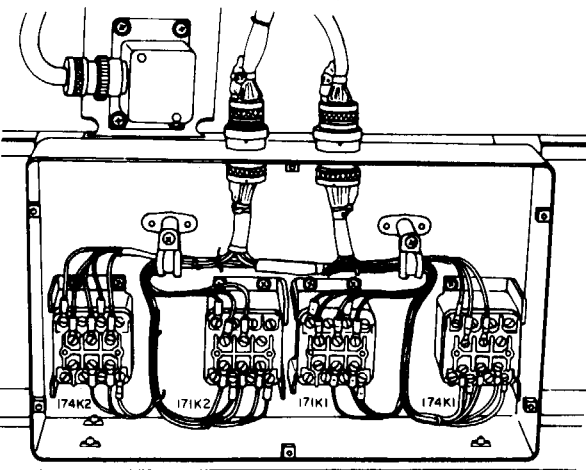
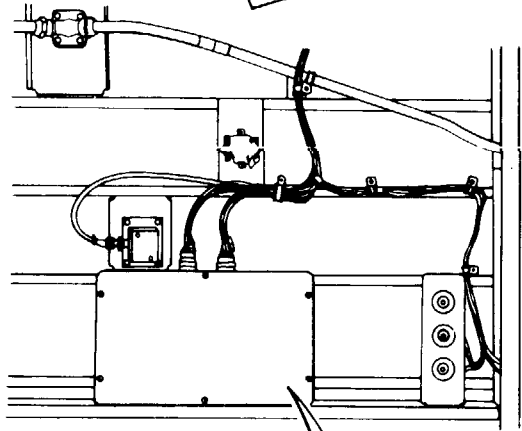
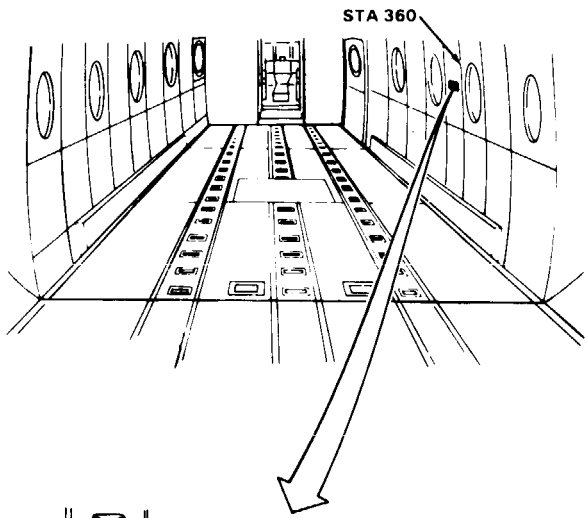
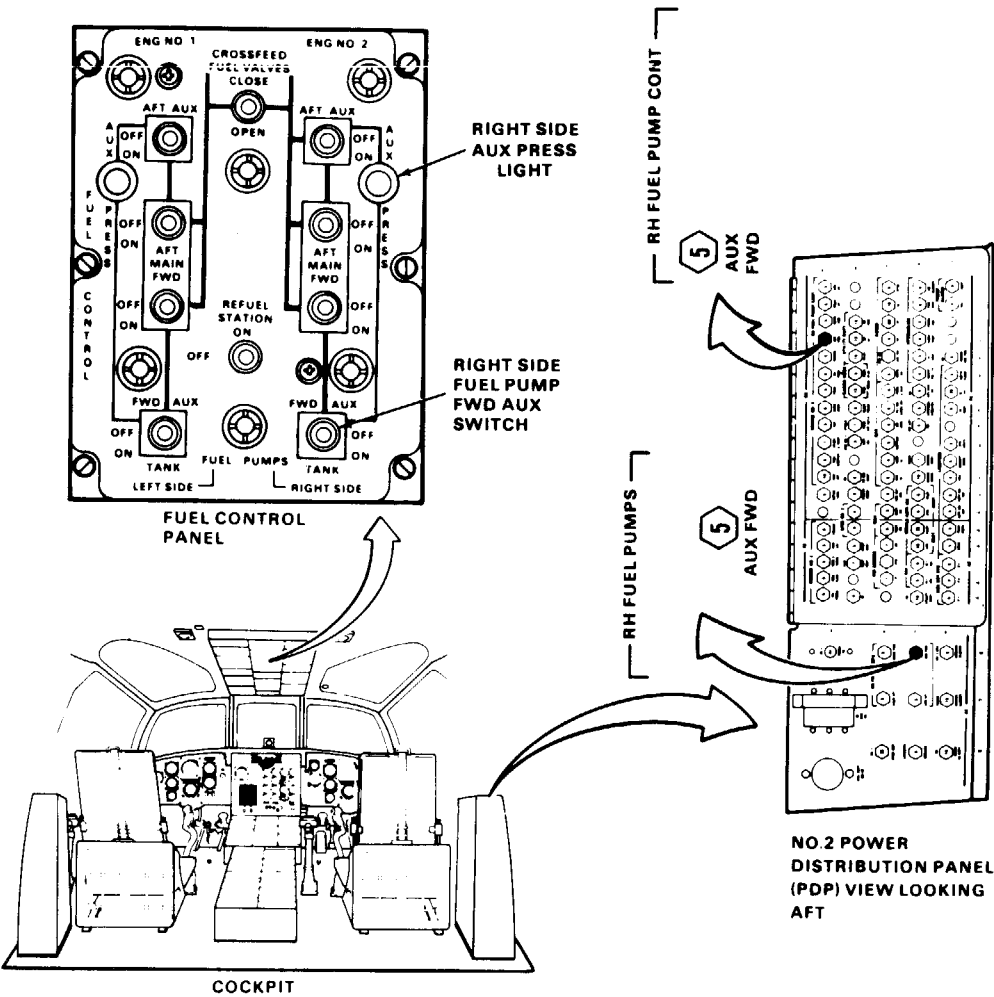
Electrical Power On

Hydraulic Power Off

Side Acoustical Blanket Removed Between Sta

320 and 360

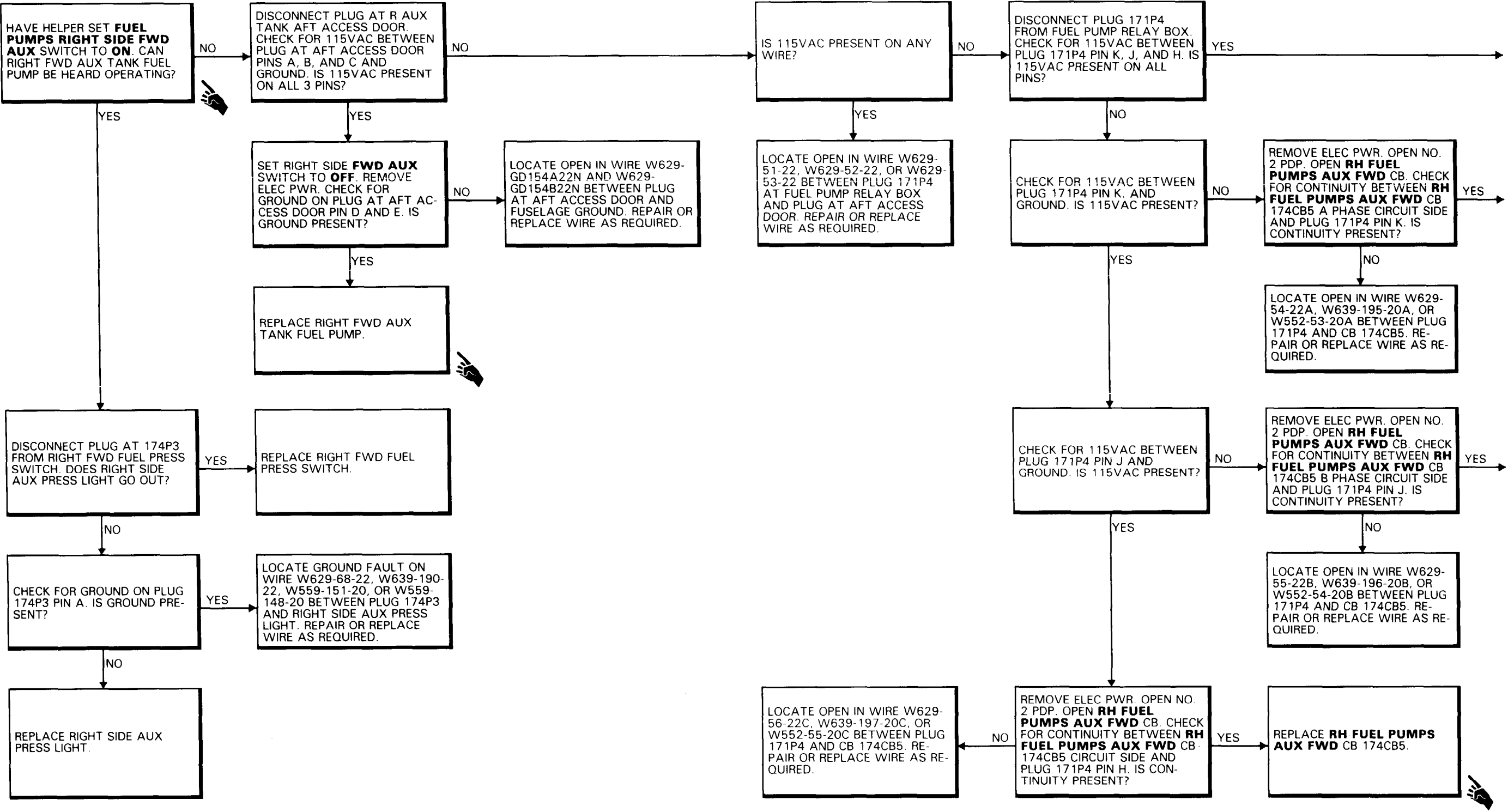
Right Forward Landing Gear Access Panel Open



NOTE  
CONNECTOR INSTALLATION  
IS SIMILAR FOR ALL  
TANK ACCESS PANELS

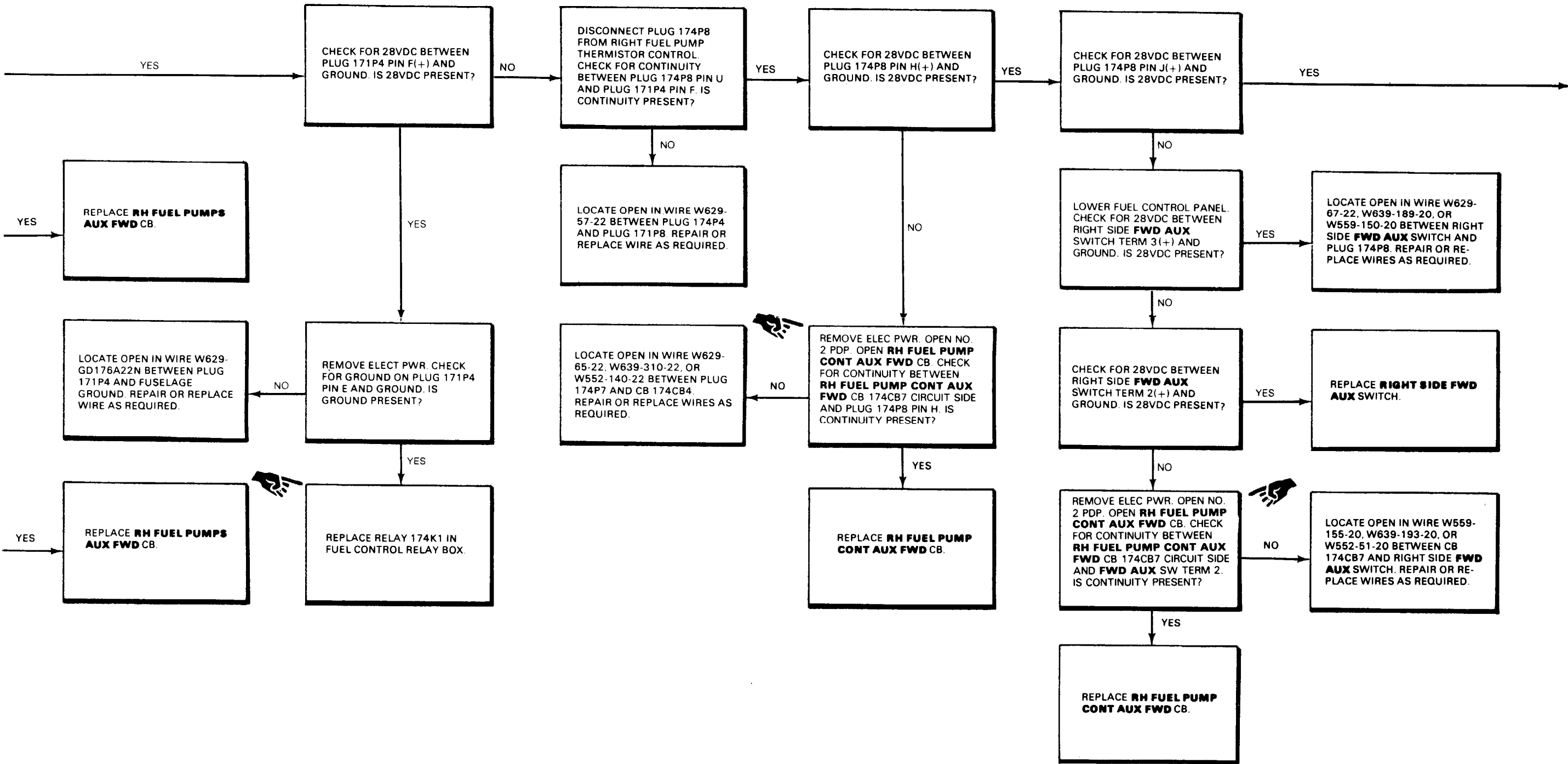
10-2.29 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON (CONTINUED)

10-2.29



10-2.29 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT  
SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON  
(Continued)

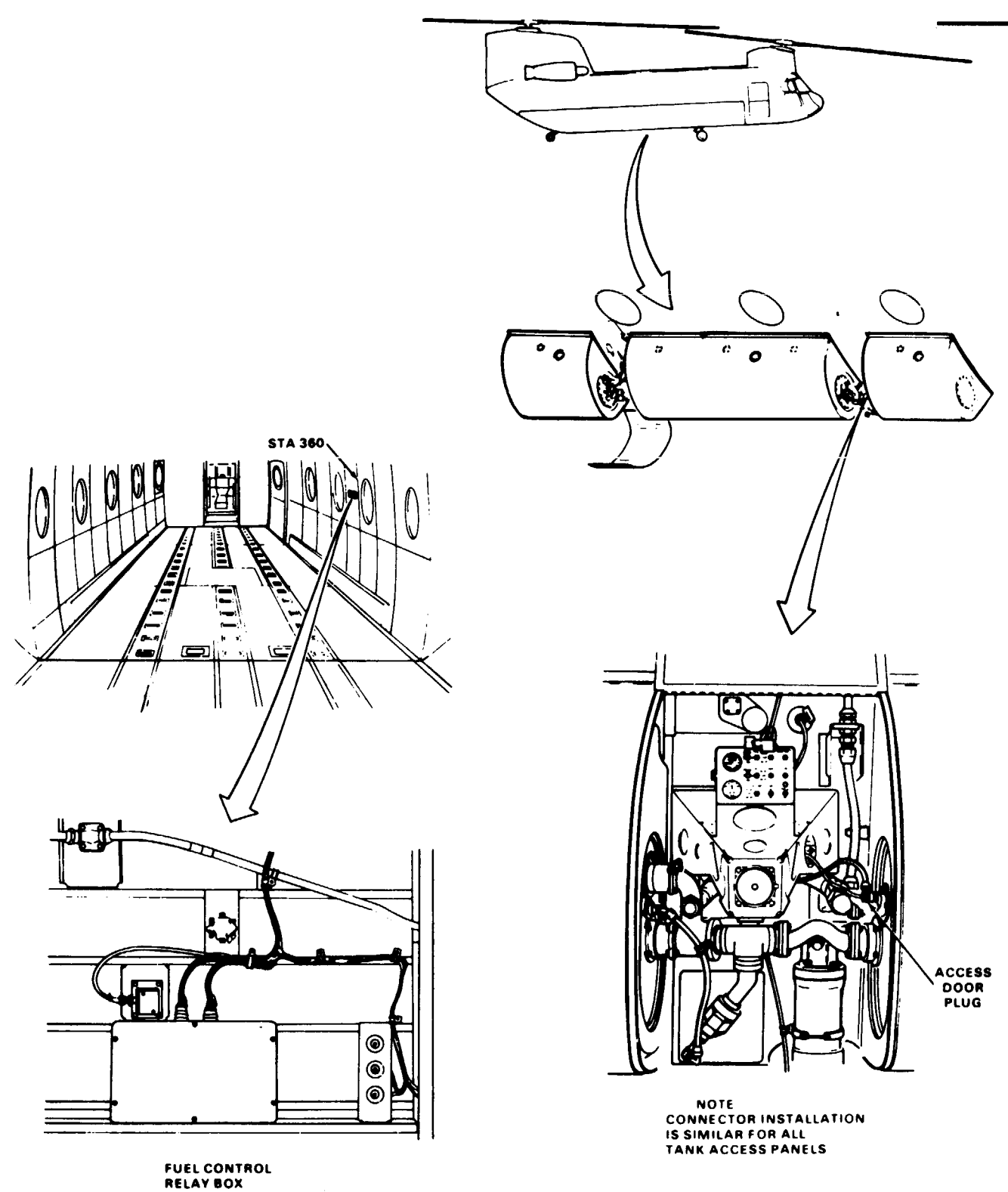
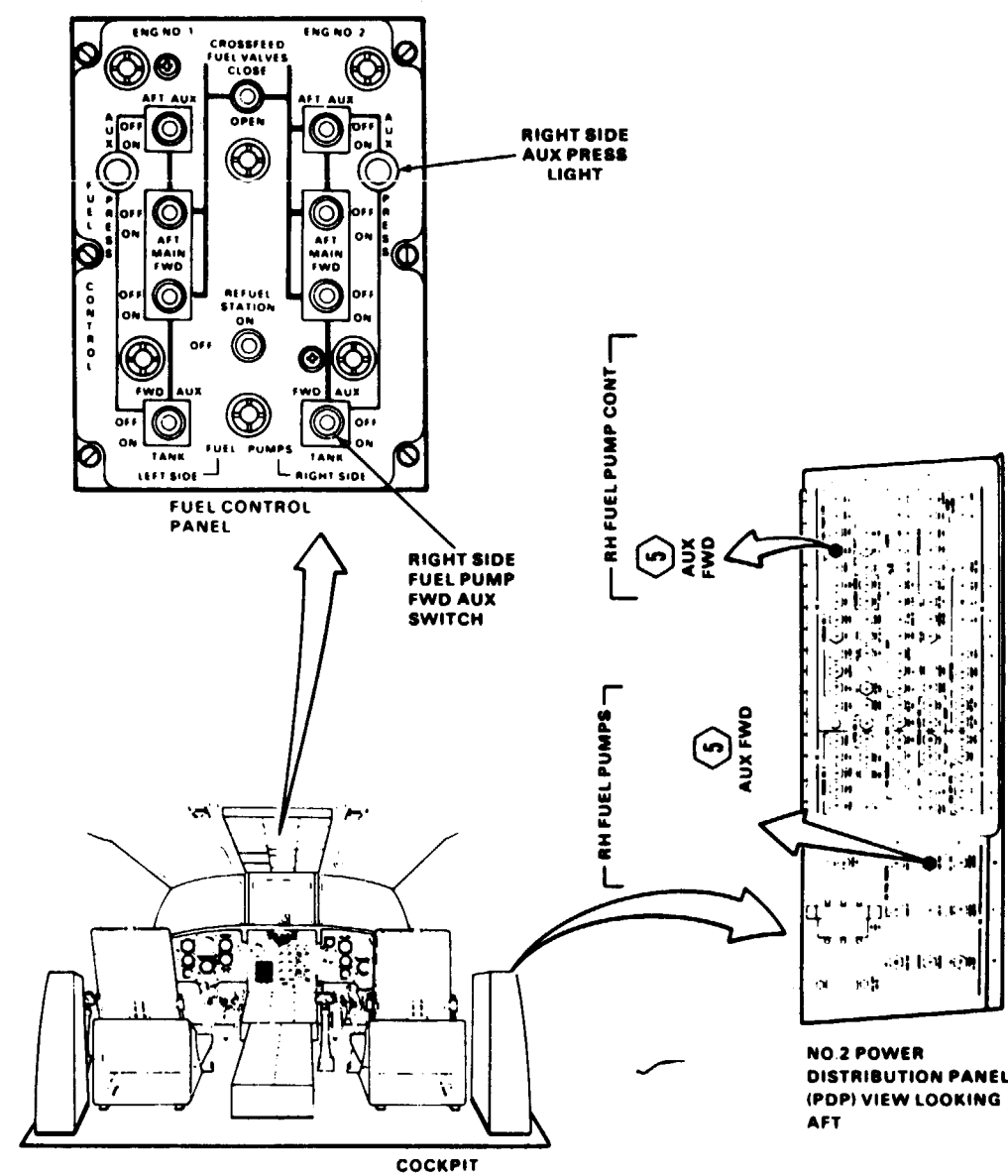
10-2.29

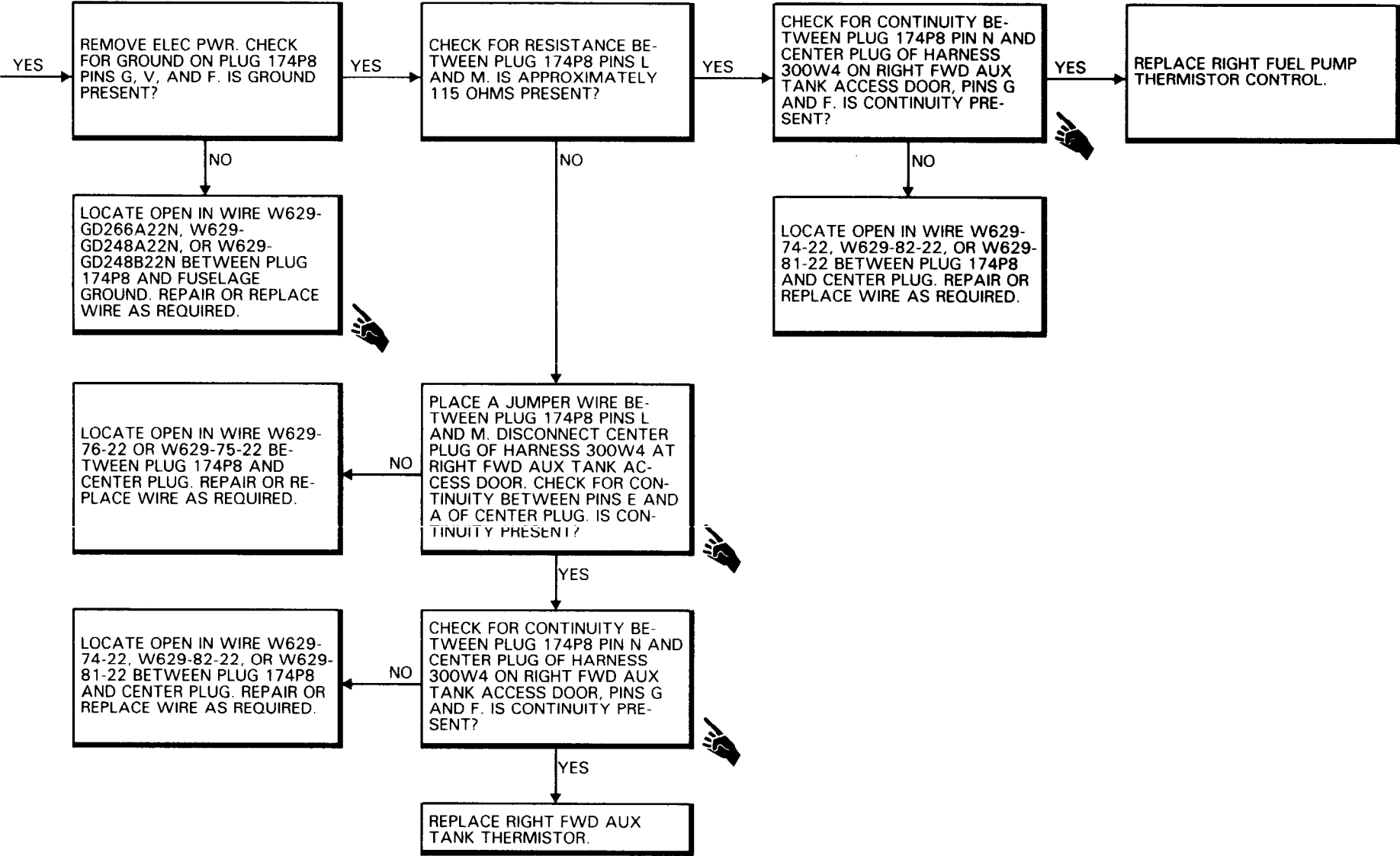




10-2.29 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT  
SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON  
(Continued)

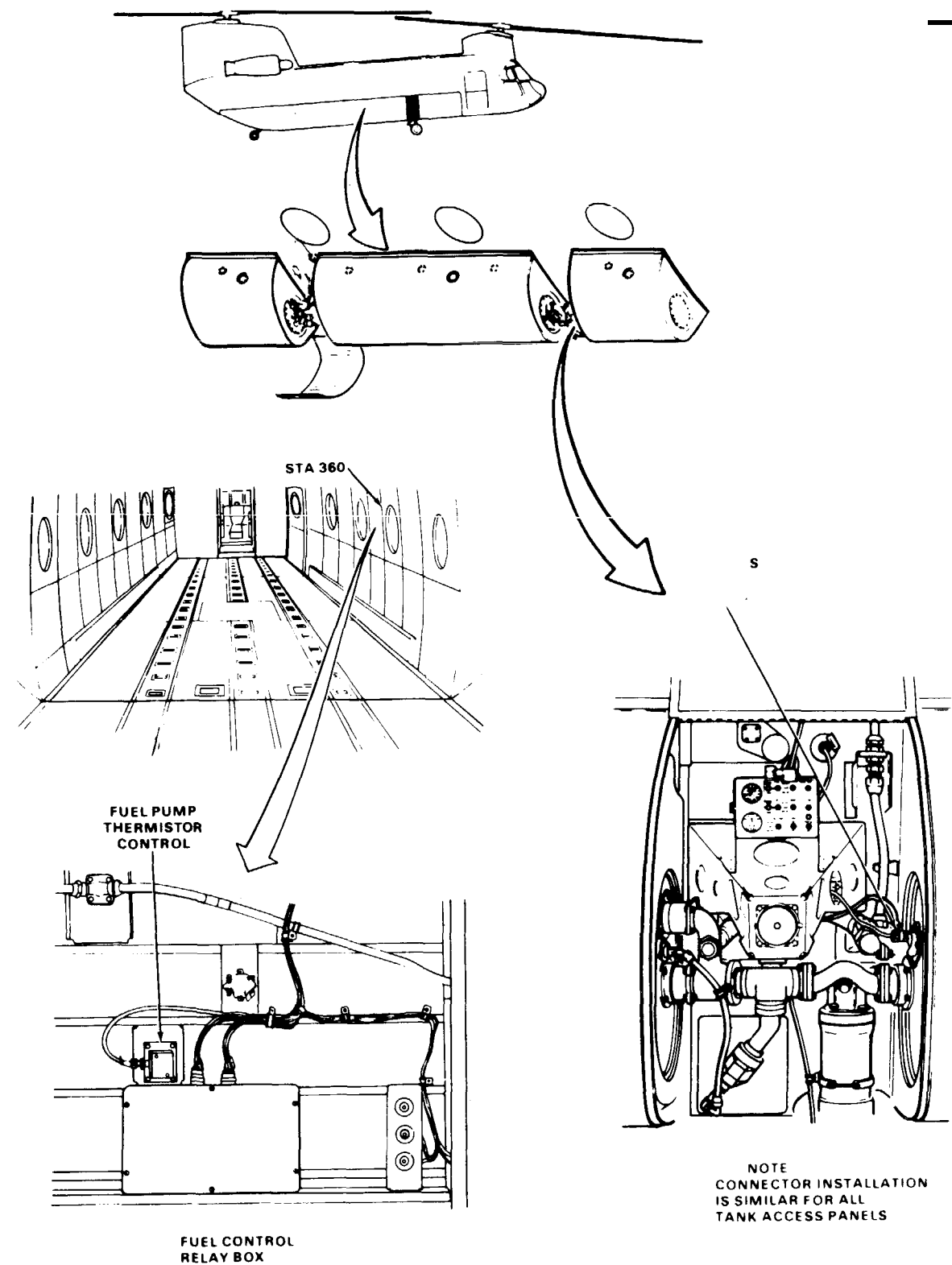
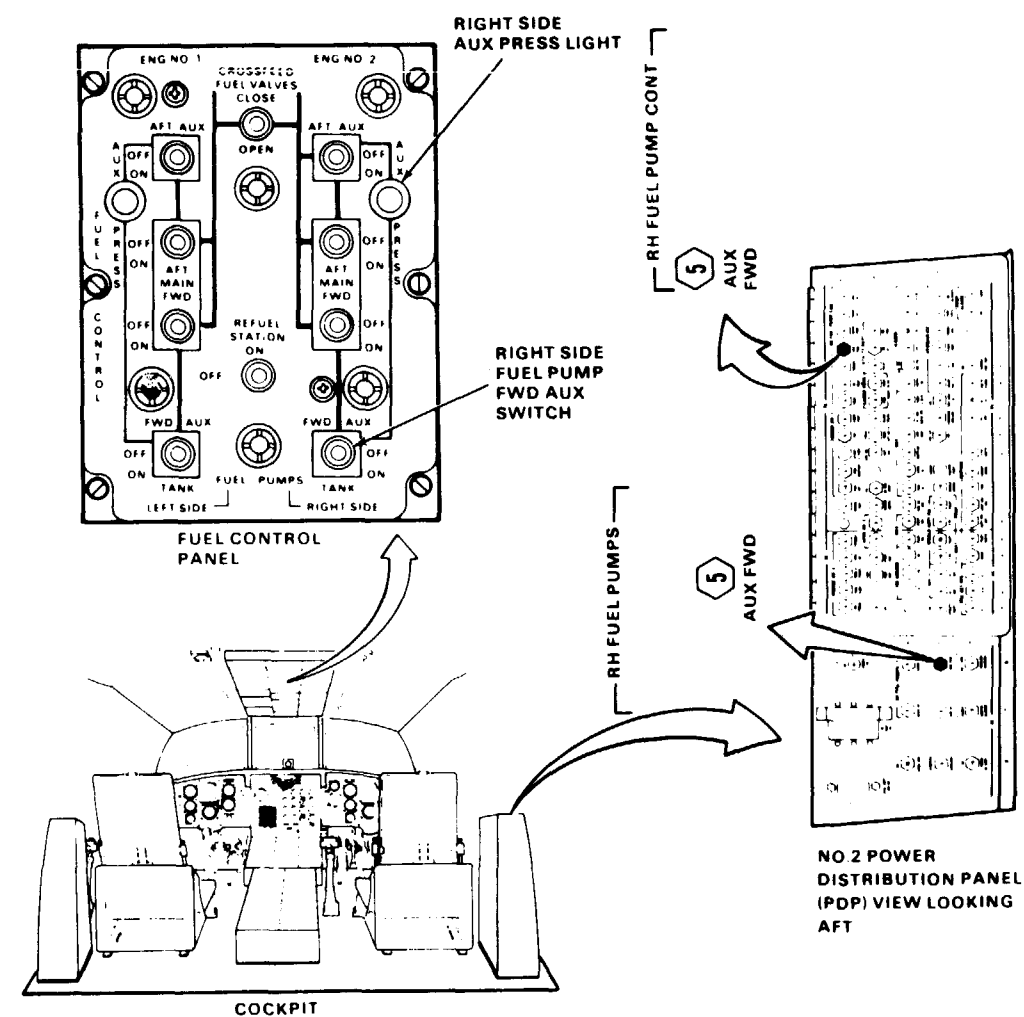
10-2.29





10-2.29 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON  
(Continued)

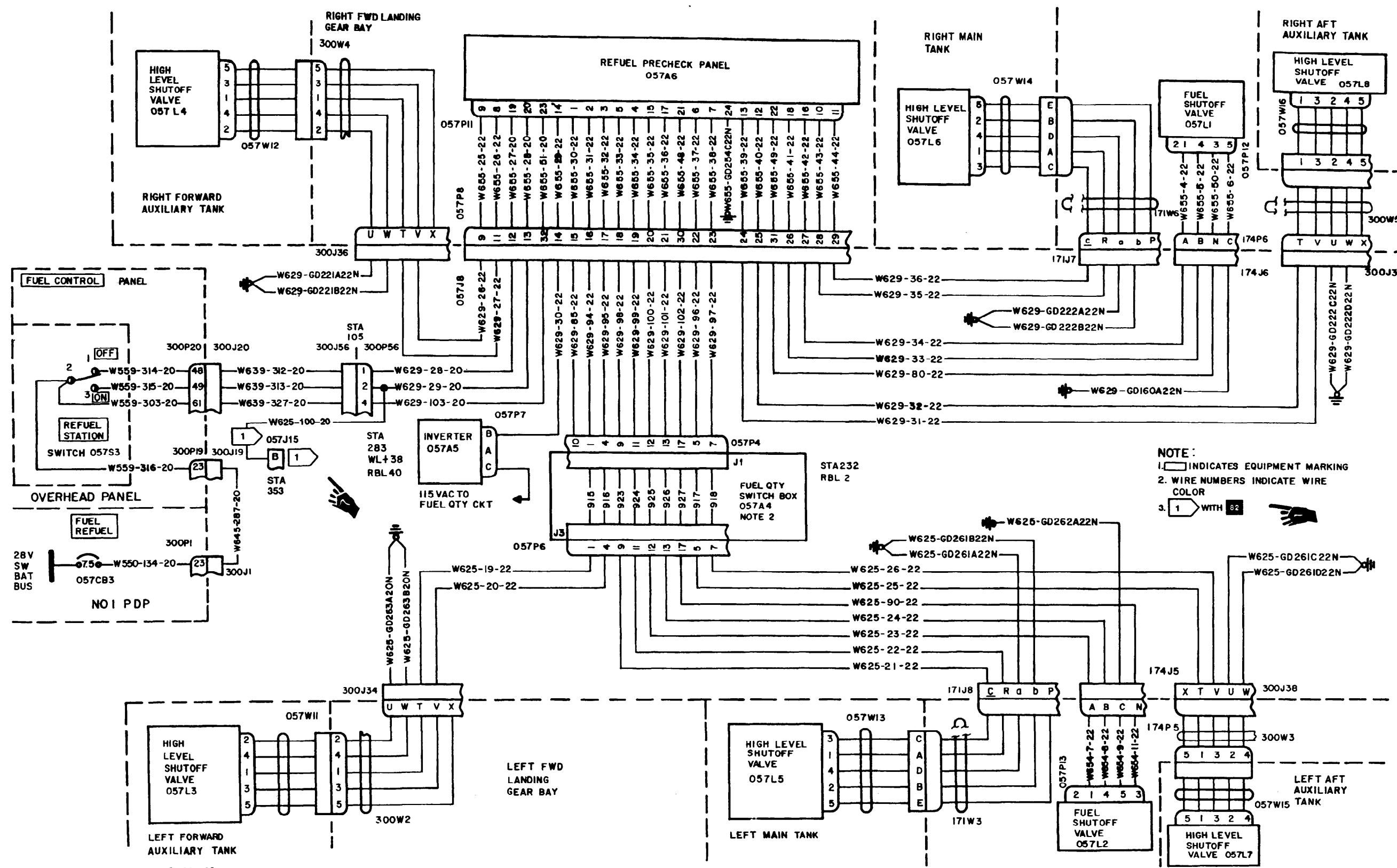
10-2.29



## **10-3 SINGLE POINT PRESSURE REFUELING SYSTEM**



10-3.2 SINGLE POINT PRESSURE REFUELING SYSTEM WIRING DIAGRAM

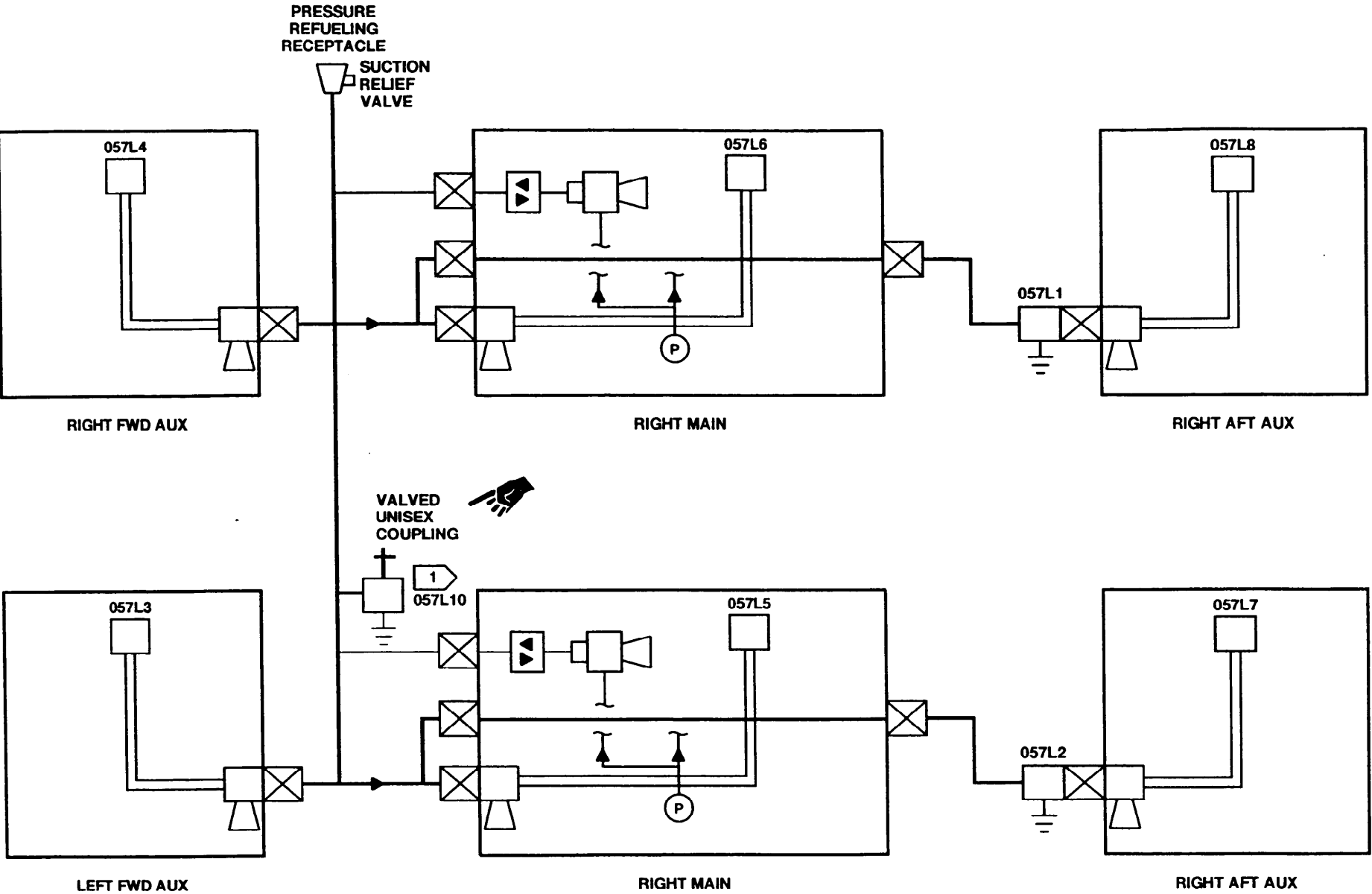


NOTE:  
 1. INDICATES EQUIPMENT MARKING  
 2. WIRE NUMBERS INDICATE WIRE COLOR  
 3. WITH 82









057. 100A, 110A, 120A, 130, 140D, 150, 160

A73204

END OF TASK  
 Change 22 10-125



NOTE:  
1. SYMBOLS

- |   |  |   |
|---|--|---|
|  BREAKAWAY FITTING         |  JET PUMP<br>(REFUELING MANIFOLD<br>EVACUATION) |  PRESSURE FUELING<br>SHUTOFF VALVE |
|  CHECK VALVE               |  MOTOR OPERATED<br>SHUTOFF VALVE                |  LEVEL CONTROL PILOT VALVE         |
|  ENGINE FEED<br>BOOST PUMP |  |  TWO WAY CHECK VALVE               |

2.  WITH  

A73205

END OF TASK

10-3.3 SINGLE POINT PRESSURE REFUELING SYSTEM VISUAL CHECK

10-3.3

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

Aircraft Electrician

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

Electrical Power Off

Battery Disconnected

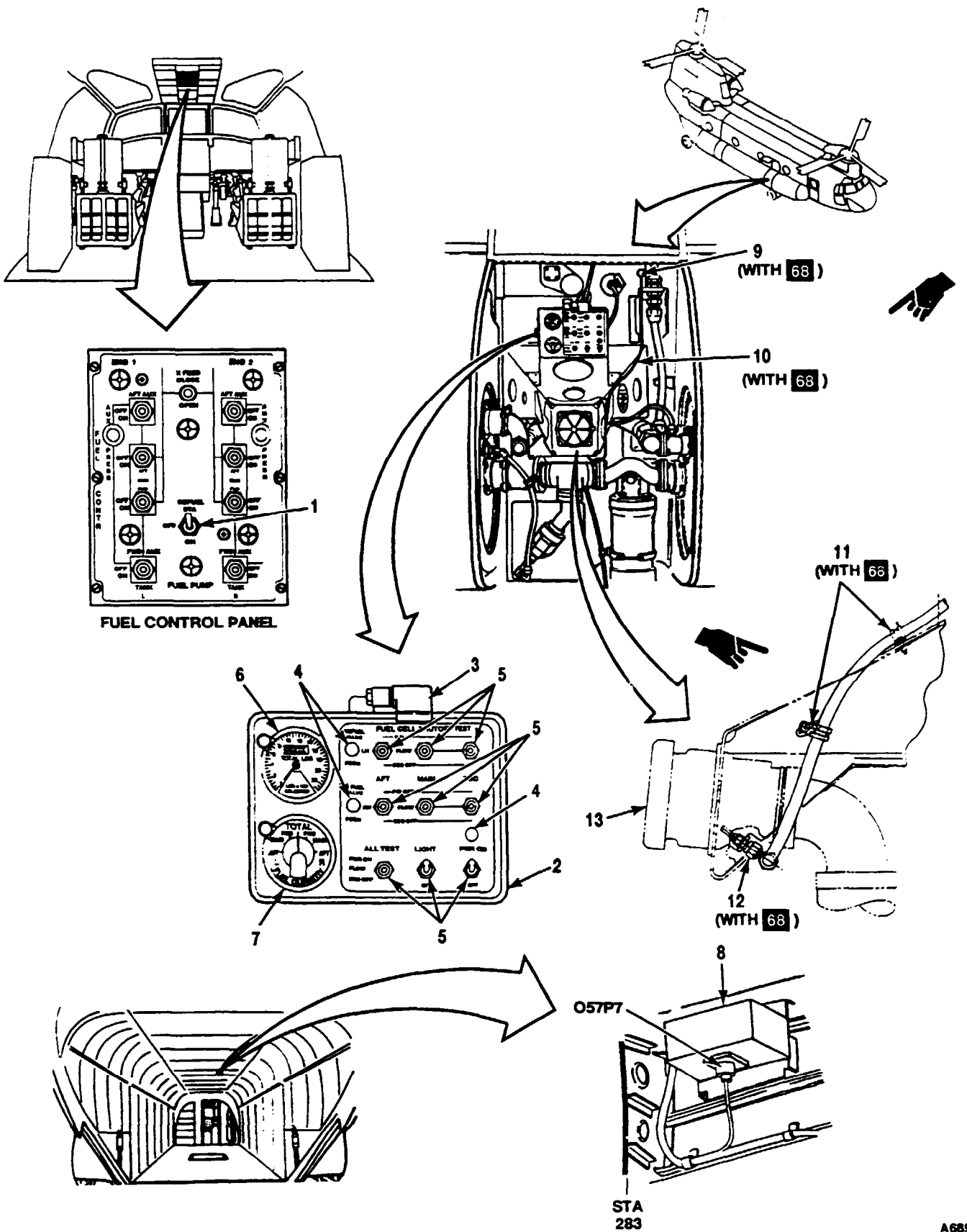
Hydraulic Power Off

Forward Right Landing Gear Access Panel Open

TASK	RESULT
1. Check REFUEL STATION switch (1).	If switch (1) is loose or damaged, tighten or replace it as required.
2. Check pre-check panel (2).	If panel (2) is loose or damaged, tighten, repair, or replace it as required.
3. Check light (3).	If light (3) is loose or damaged, tighten or replace it as required.
4. Check three lights (4).	If any light (4) is damaged, repair or replace it as required.
5. Check nine switches (5).	If any switch (5) is loose or damaged, tighten or replace as required.
6. Check fuel quantity indicator (6).	H indicator (6) is loose or damaged, tighten or replace it as required.
7. Check fuel quantity selector switch (7).	If switch (7) is loose or damaged, tighten or replace it as required.
8. Check inverter (8).	If inverter (8) is loose or damaged, tighten or replace it as required.
9. On aircraft with 68, check installation of vacuum relief valve (9), security of hose (10) at clamps (11), and connection (12) on refueling adapter (13).	If components are loose or damaged, tighten or replace as required.

FOLLOW-ON MAINTENANCE:

None



A689



INITIAL SETUP

Applicable Configurations:  
All

Tools:  
None

Materials:  
None

Personnel Required:  
Medium Helicopter Repairer

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

Electrical Power Off

Battery Connected

Hydraulic Power Off

Visual Check of Single Point Pressure Refueling System Performed (Task 10-3.3)

TASK	RESULT
1. Make sure FUEL REFUEL circuit breaker (1) is closed.	If circuit breaker (1) is open, dose it. If it opens again, go to Task 10-3.5.
2. Set REFUEL STATION switch (2) to ON.	
3. Make sure LH REFUEL VALVE POSN and RH REFUEL VALVE POSN lights (3 and 4).	Both lights (3 and 4) shall be out If either light is on, go to Task 10-3.6.
4. Press and release LH REFUEL VALVE POSN and RH REFUEL VALVE POSN lights (3 and 4).	Both lights (3 and 4) shall momentarily come on. If either light does not come on, go to Task 10-3.7.
5. Set PWR switch (5) to ON.	tight (6) shall come on. LH REFUEL VALVE POSN and RH REFUEL VALVE POSN lights (3 and 4) shall come on and go out. If light (6) does not come on, go to Task 10-3.7. If either (3 or 4) does not come on, go to Task 10-3.8. If either light comes on and stays on, go to Task 10-3.9.
6. Set LIGHT switch (7) to ON.	Light (8) shall come on. If it does not, go to Task 10-3.10.
7. Turn FUEL QTY SEL switch (9) through its positions.	Pointer on indicator (10) shall indicate fuel level in tank selected. If pointer does not move for any switch position, go to Task 8-13.18. If pointer indicates fuel amount for all but one position, go to Task 8-13.19.

TASK

RESULT

NOTE

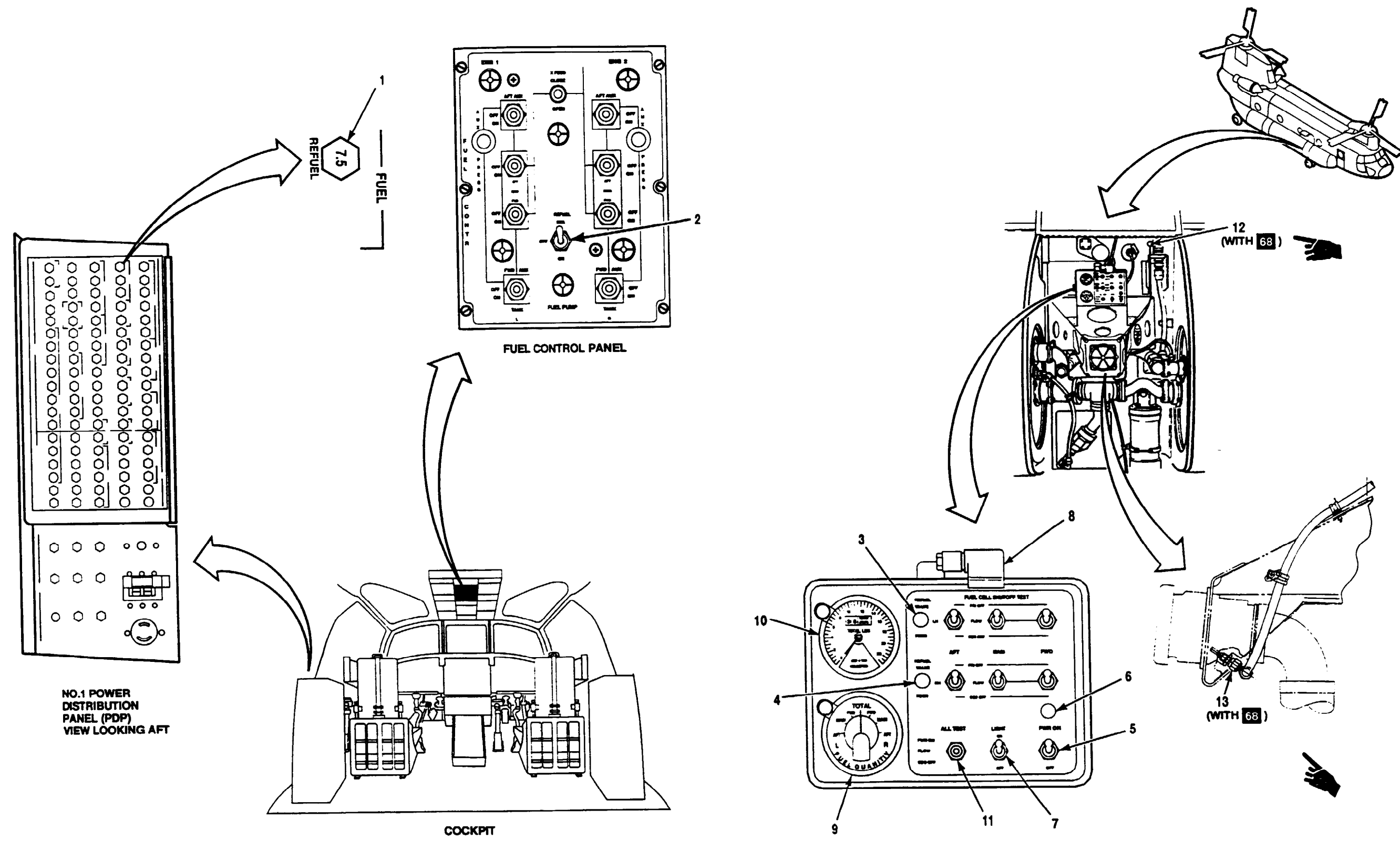
A small amount of fuel will continue to flow through me open primary and secondary valves when the refueling valve is dosed.

8. Perform single point refueling of all tanks or individual tank as required. Refer to TM 55-1520-240-23.	If fuel does not stop flowing within 4 seconds with ALL TEST switch (11) at PRI OFF, stop refueling and go to Task 10-3.12.  If fuel does not stop flowing within 4 seconds with ALL TEST switch (11) at SEC OFF, stop refueling and go to Task 10-3.13.  If during initial single tank refueling procedures. fuel begins flowing before tank is selected, stop refueling and go to Task 10-3.12 or 10-3.13.  If fuel does not flow in one or more tanks during single point refueling, go to Task 10-3.14.  On aircraft with 68,, if fuel leaks from vacuum relief valve (12), remove and clean valve. Refer to TM 55-1520-240-23, Task 10-119.  On aircraft with 68, if fuel leaks around nipple or fitting (13) to vacuum relief line, remove hardware and repair or replace components as required Refer to TM 55-1520-240-23, Task 10-119
--	--

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:

Battery disconnected.



A51213

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

- All
- Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Multimeter

Materials:

None

Personnel Required:

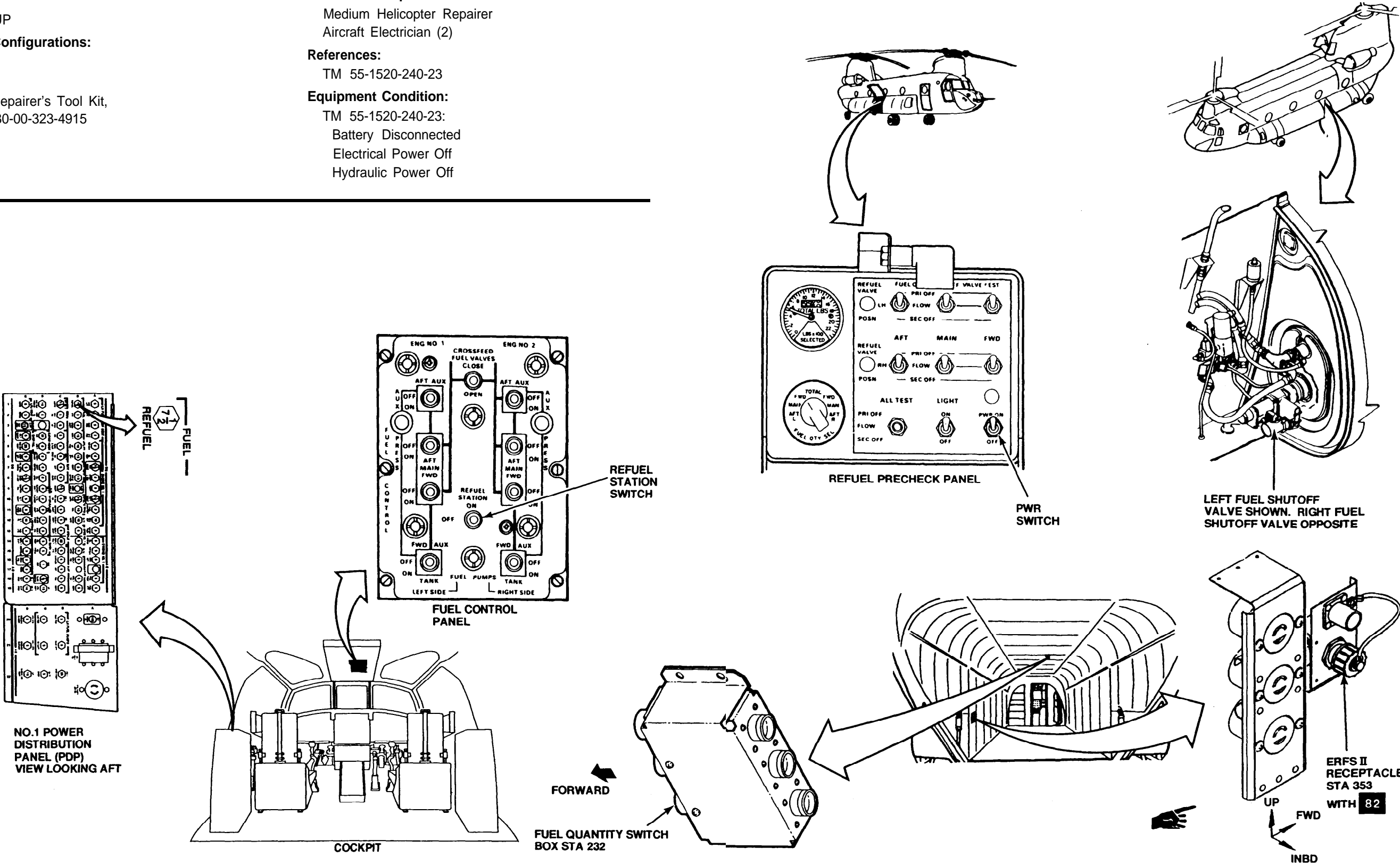
- Medium Helicopter Repairer
- Aircraft Electrician (2)

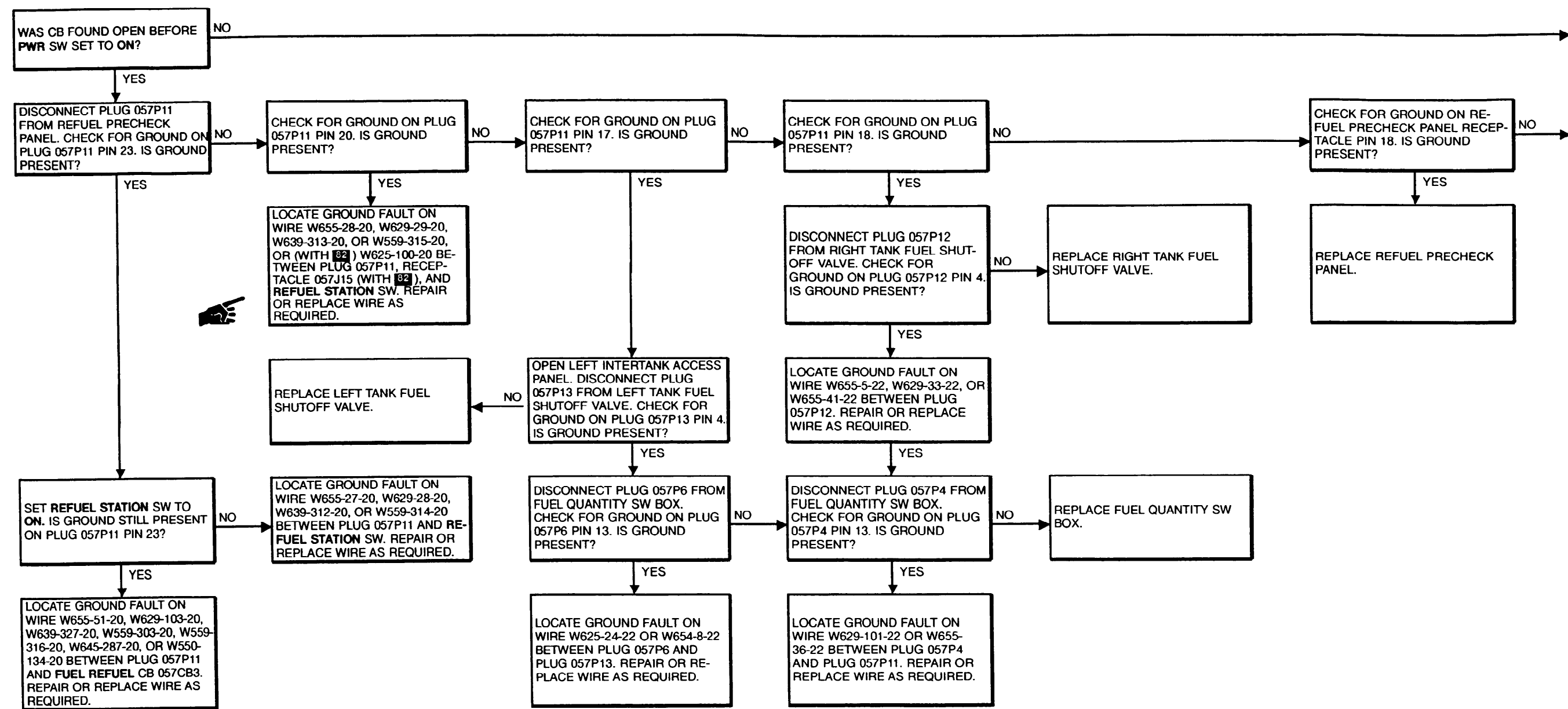
References:

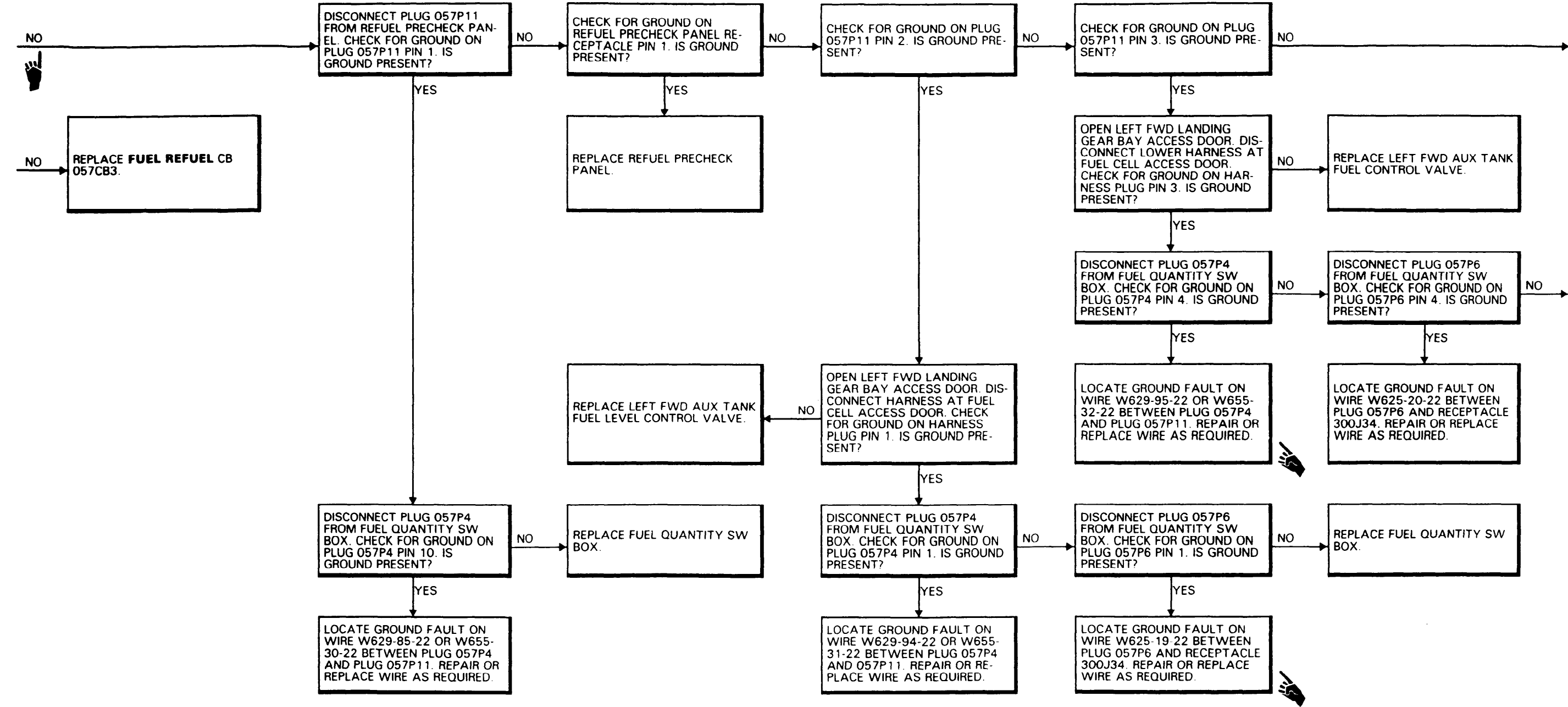
TM 55-1520-240-23

Equipment Condition:

- TM 55-1520-240-23:
- Battery Disconnected
- Electrical Power Off
- Hydraulic Power Off

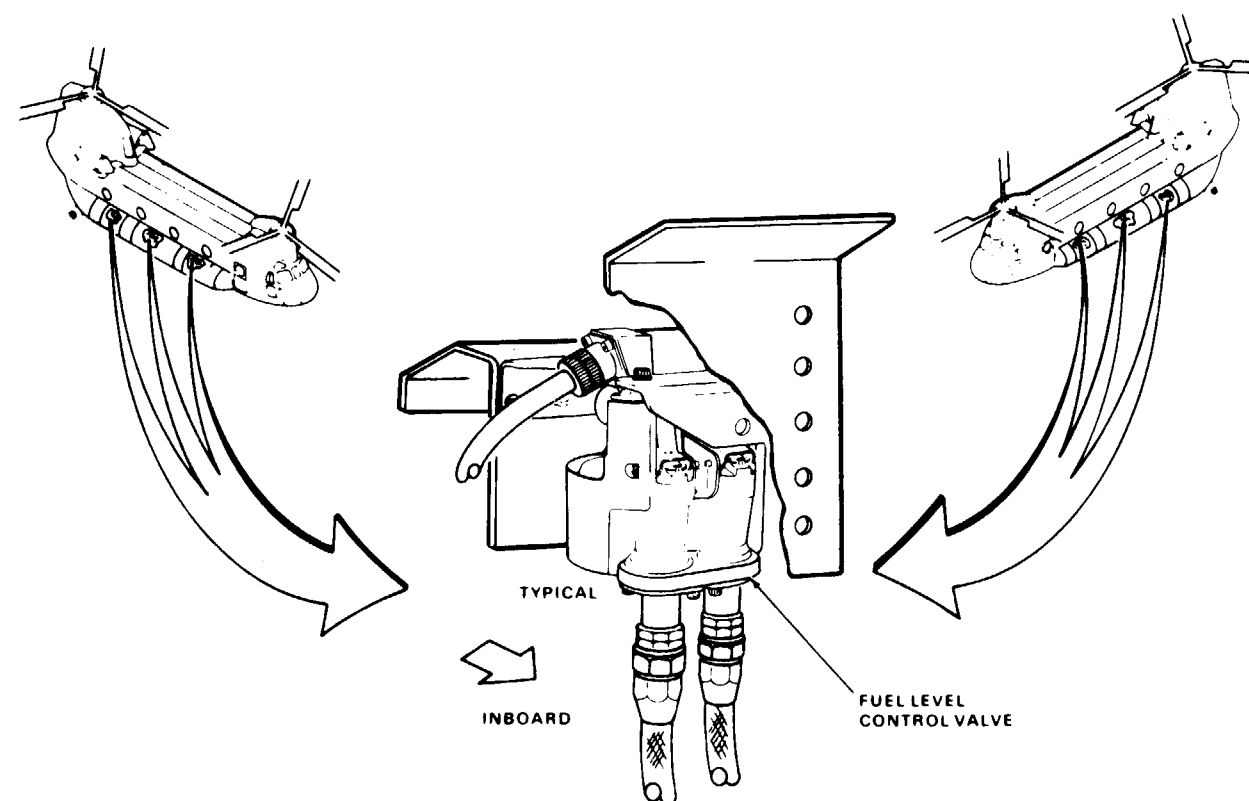
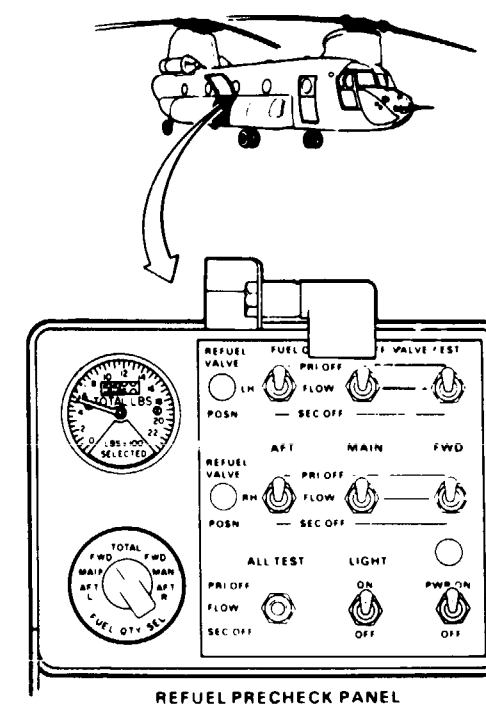
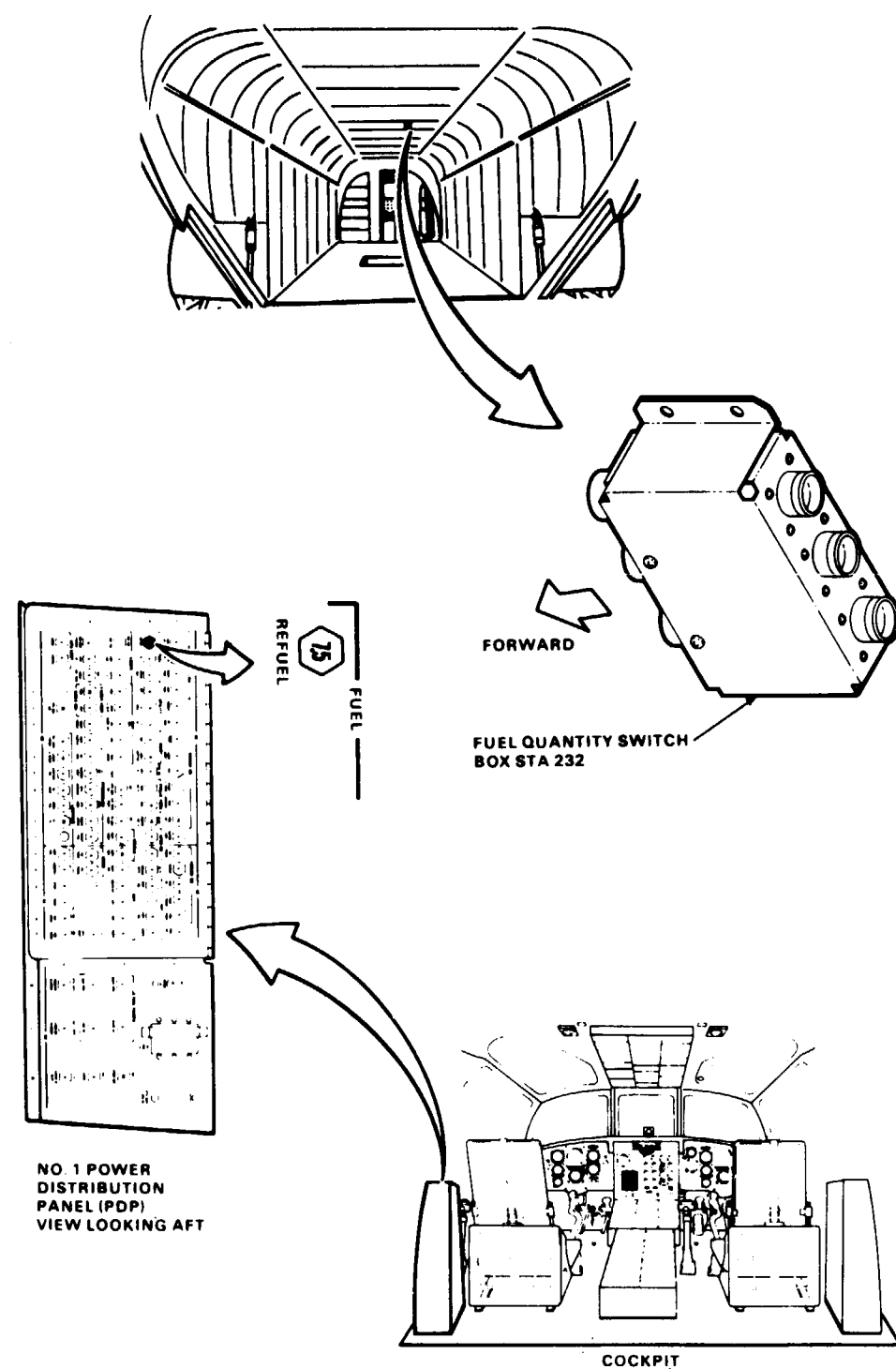


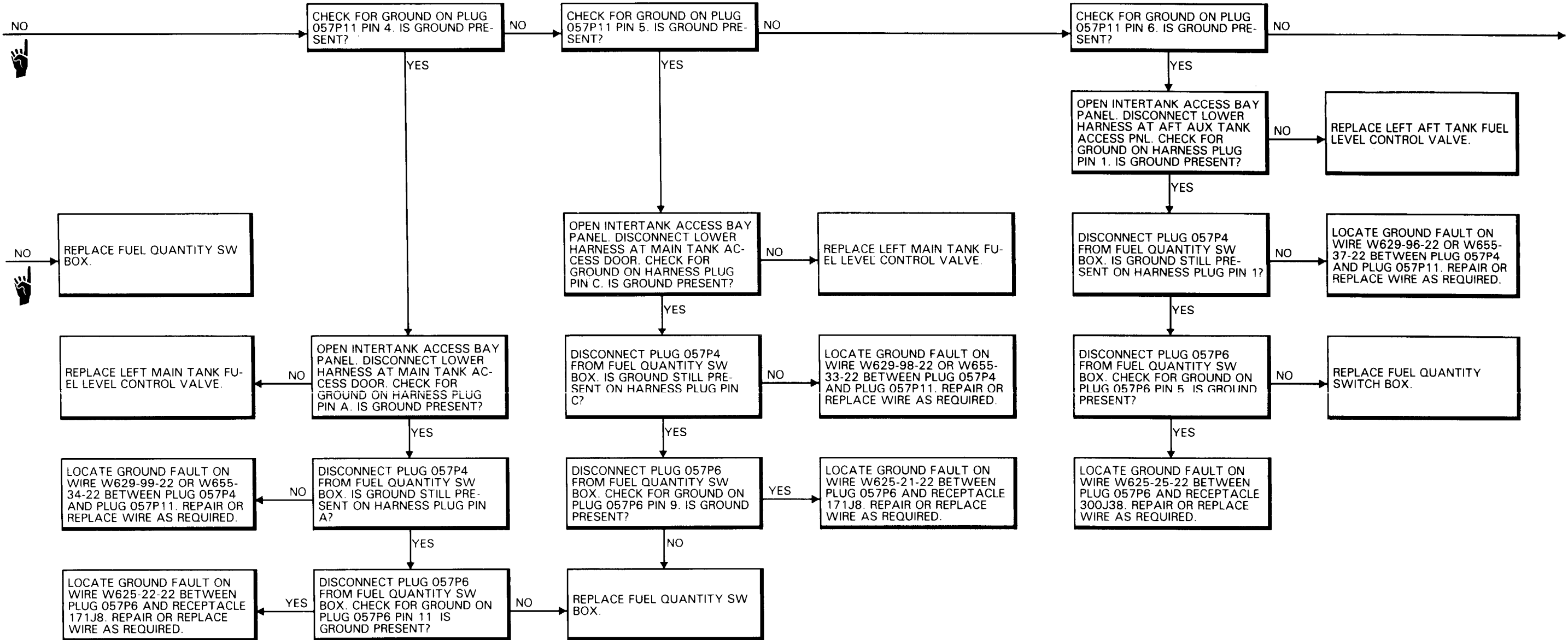




### 10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-3.5

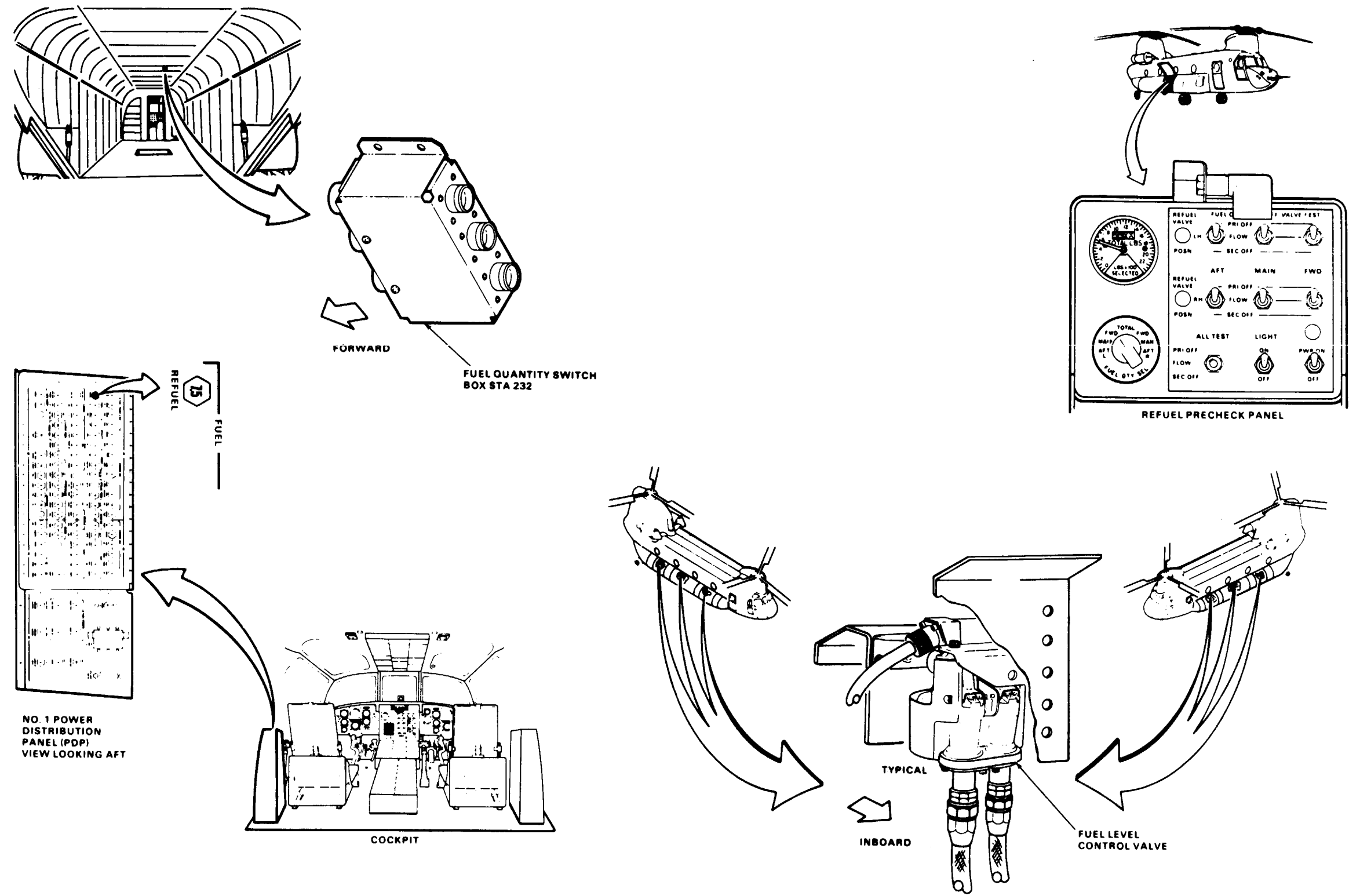




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10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

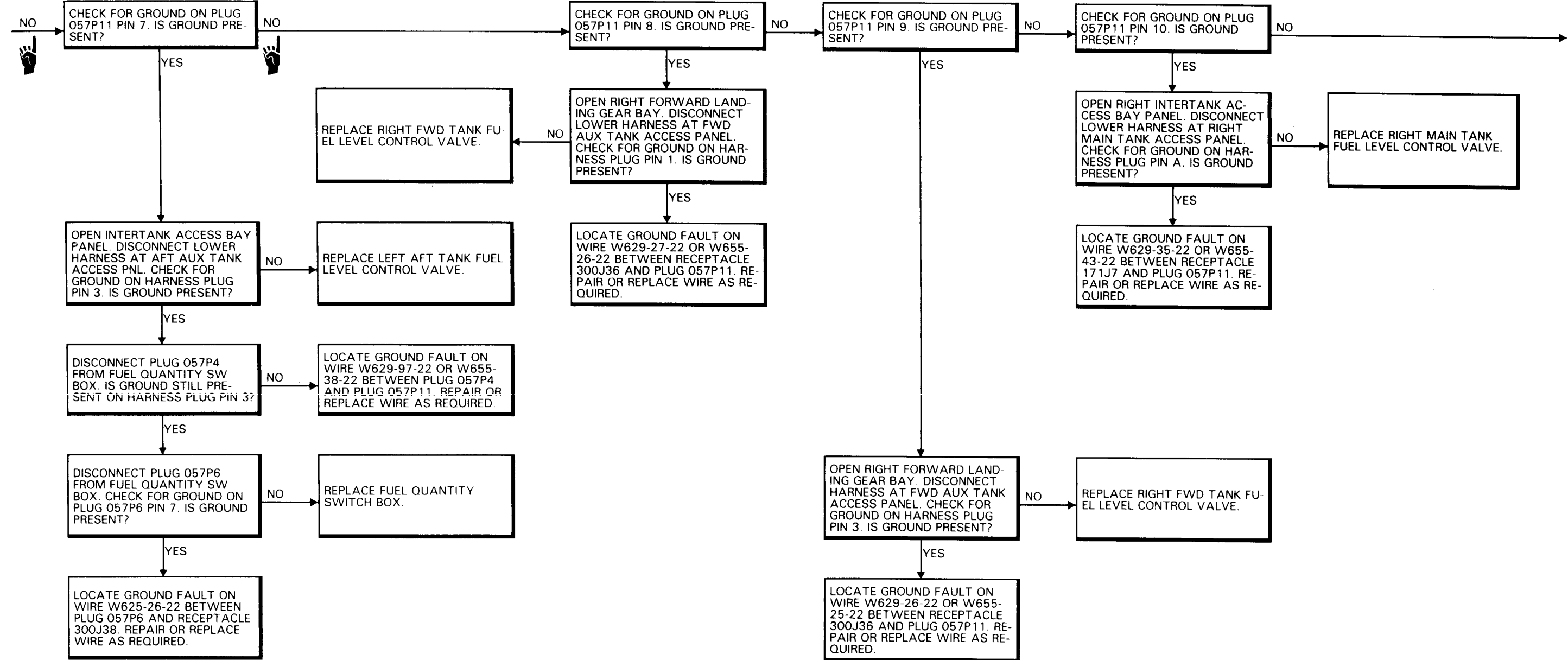
10-3.5





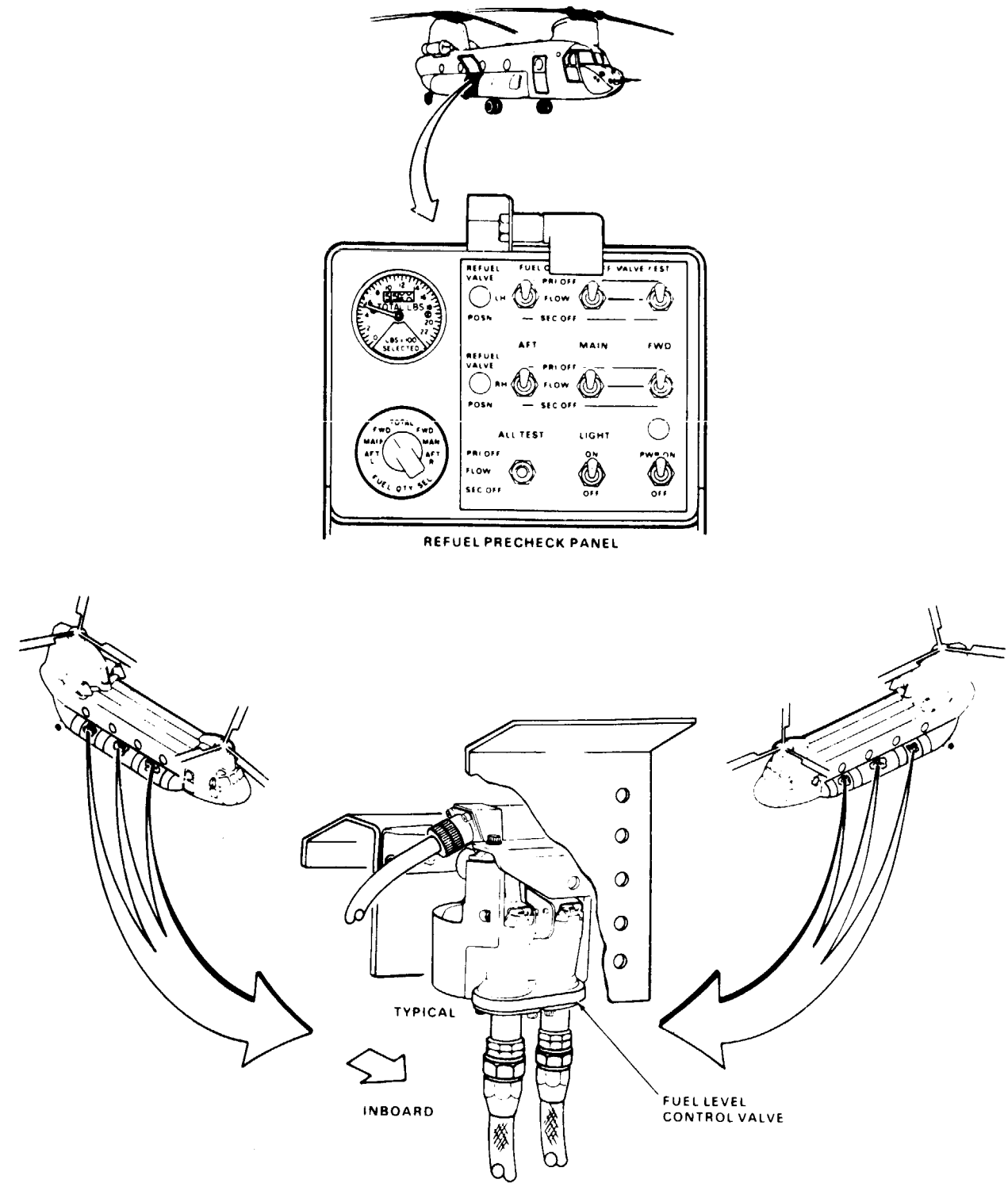
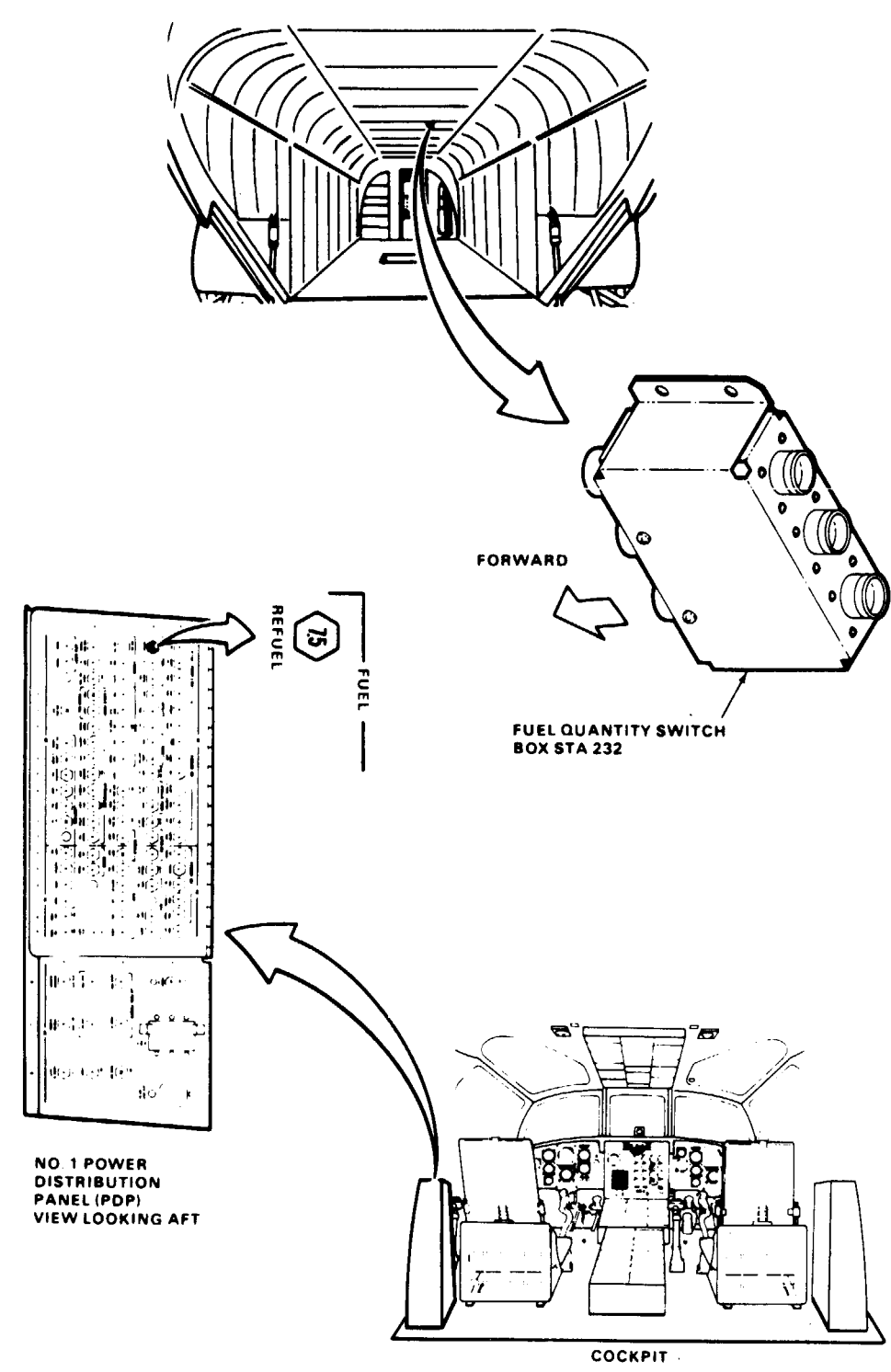
10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-3.5



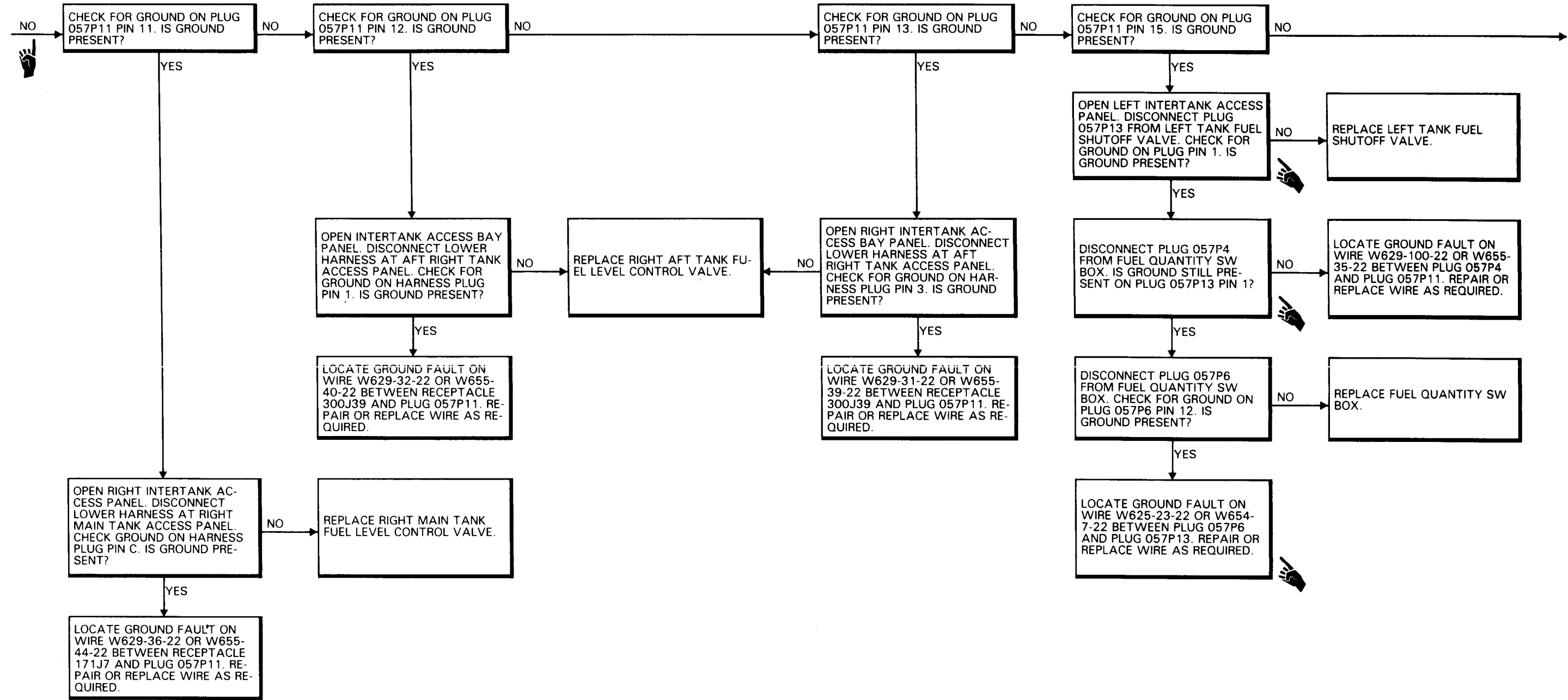
10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT  
STAY CLOSED (Continued)

10-3.5



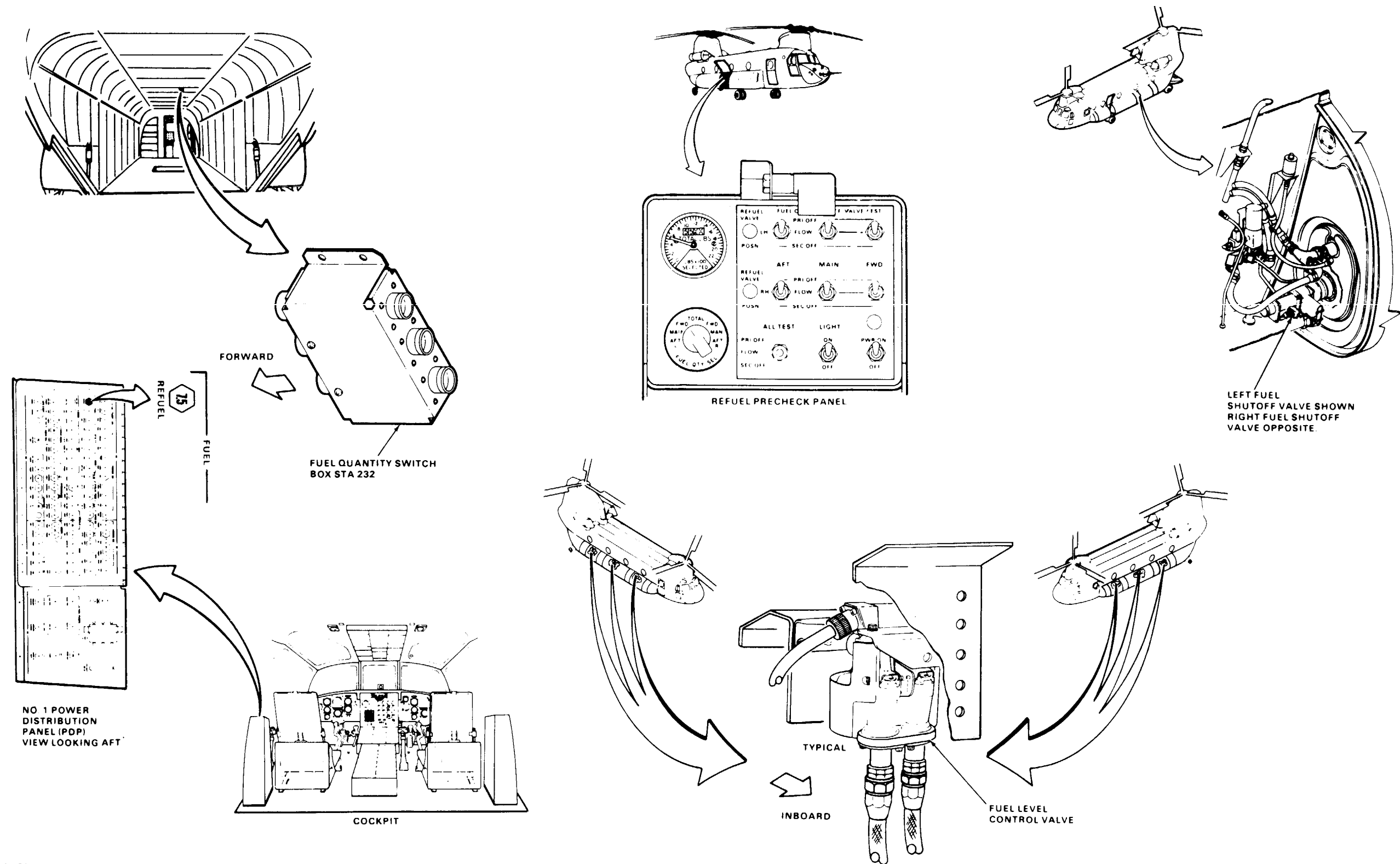
10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

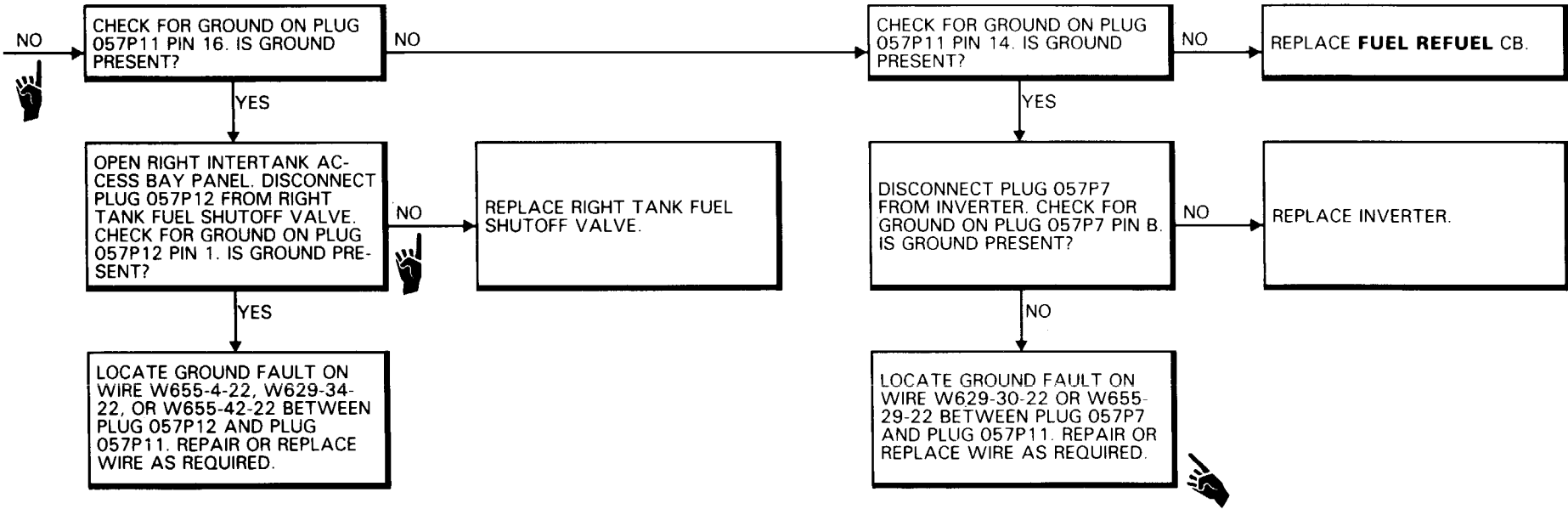
10-3.5



10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT  
STAY CLOSED (Continued)

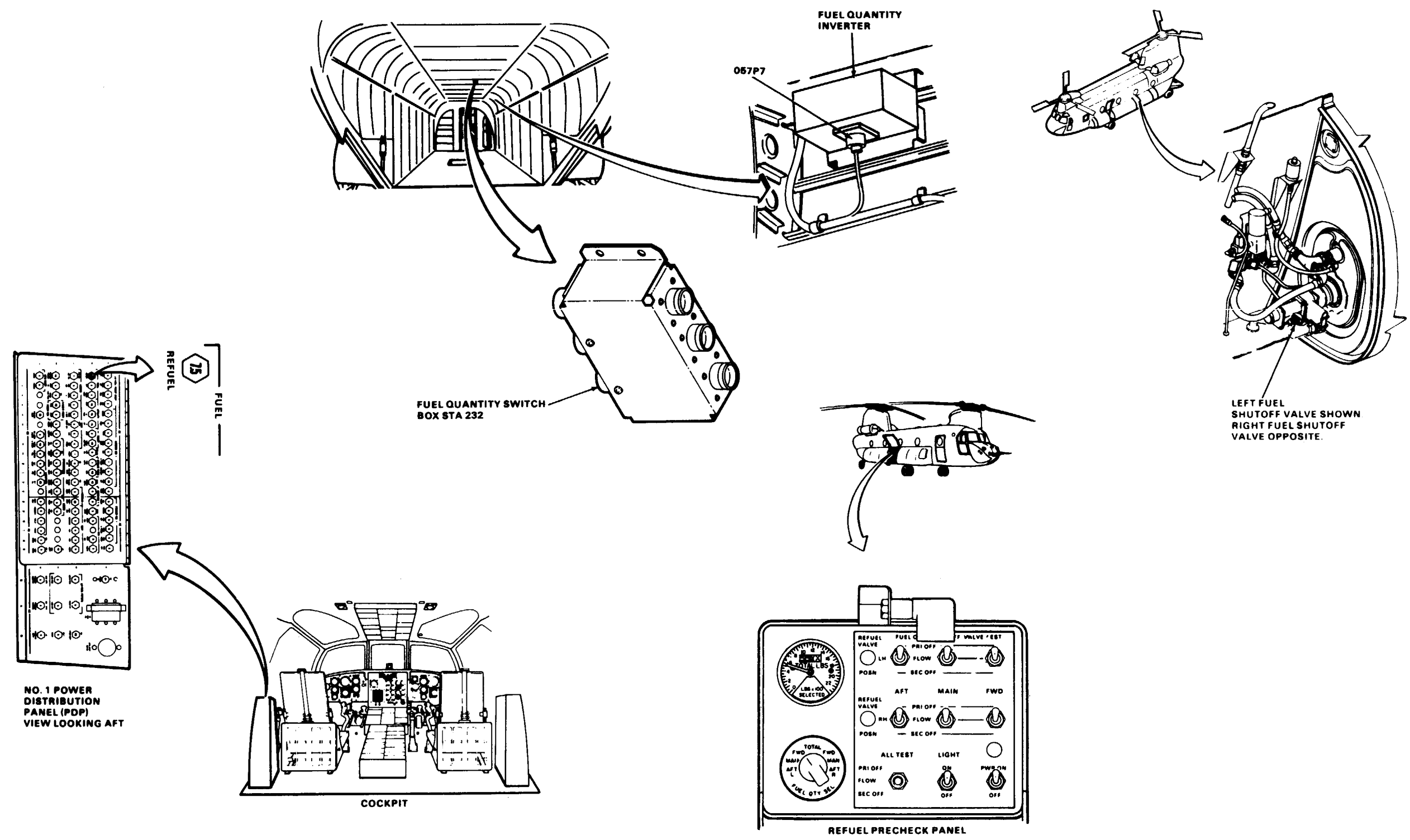
10-3.5





10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT  
STAY CLOSED (Continued)

10-3.5



10-3.6 LH OR RH REFUEL VALVE POSN LIGHT  
IS ON

10-3.6

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

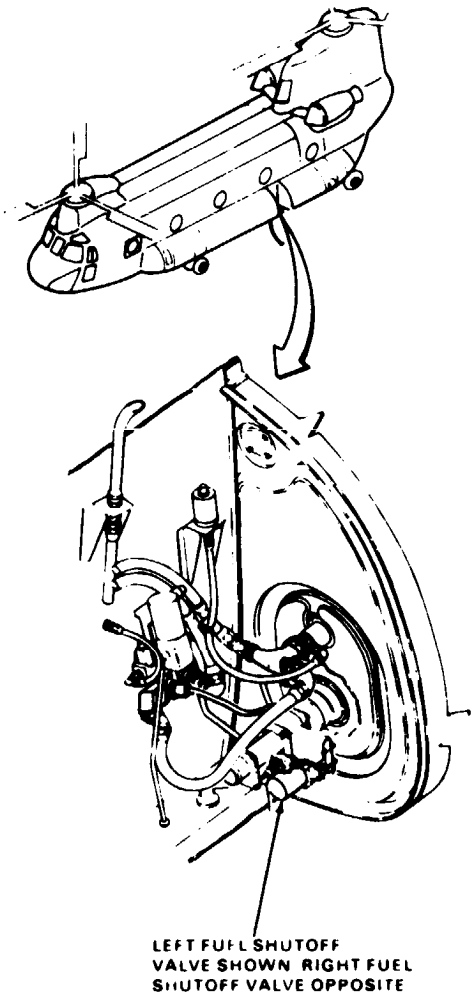
Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692  
Multimeter

Materials:  
None

Personnel Required  
67U10 Medium Helicopter Repairer  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

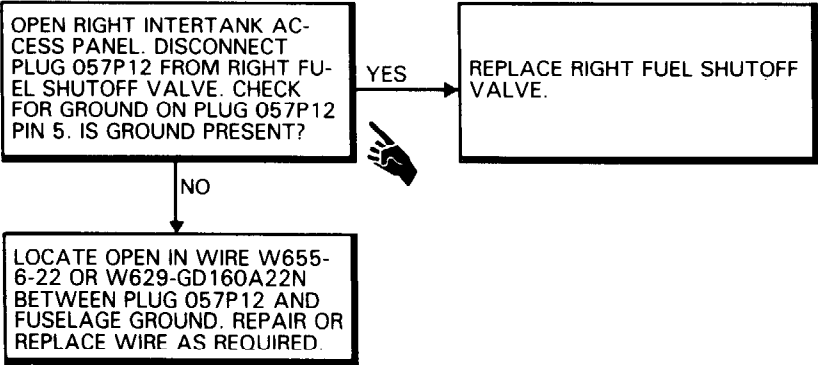
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



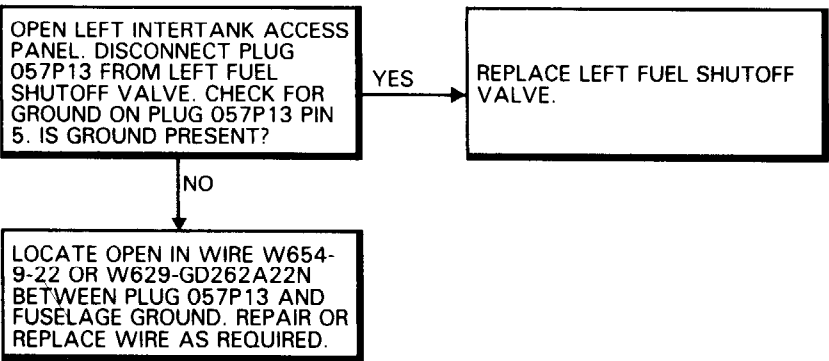
45 x 54

D145-11795-SPA

RIGHT REFUEL VALVE POSN LIGHT IS ON



LEFT REFUEL VALVE POSN LIGHT IS ON





10-3.7 LH OR RH REFUEL VALVE POSN LIGHT DOES NOT COME ON WHEN PRESSED

10-3.7

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
 All

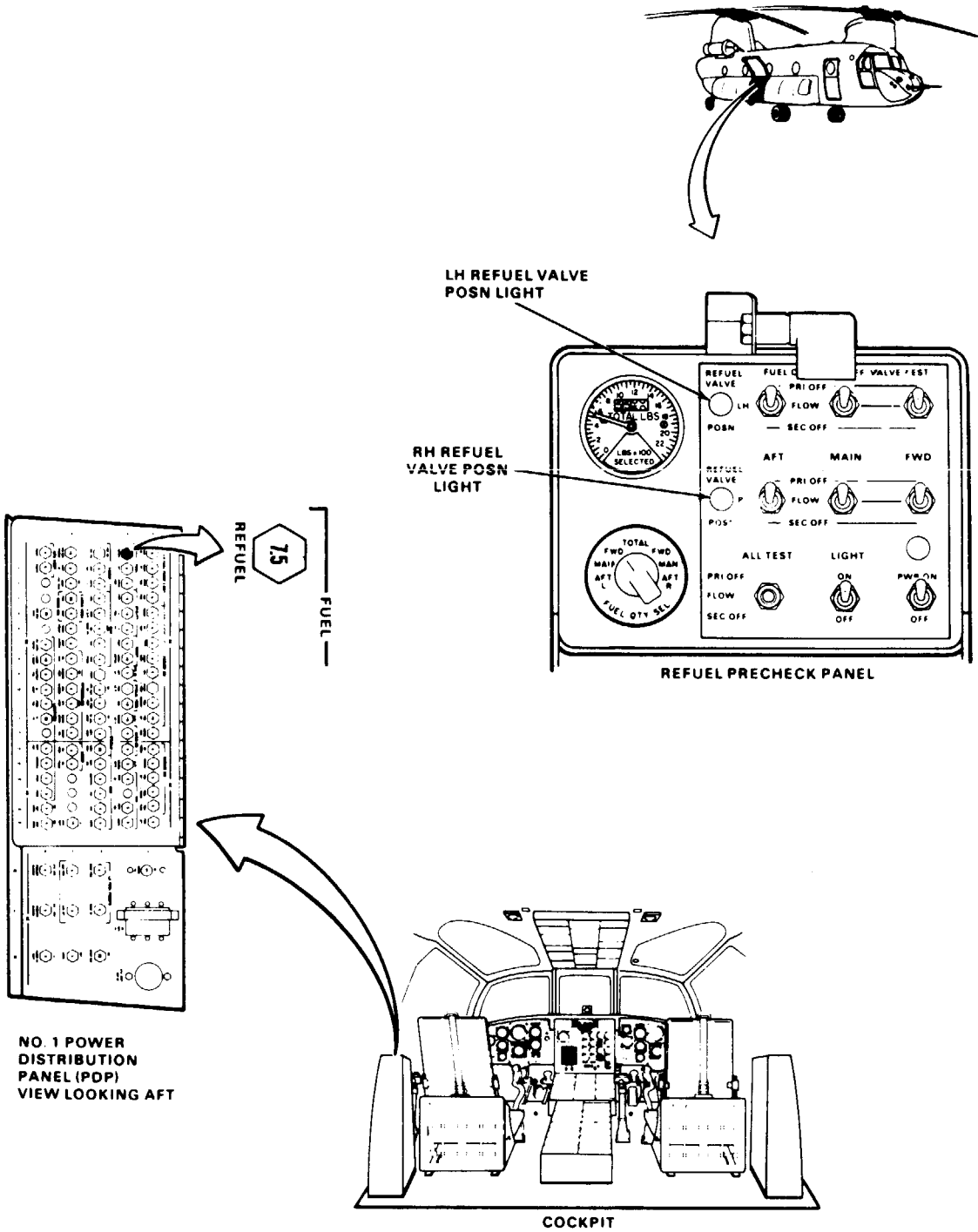
Tools:  
 Electrical Repairer's Tool Kit,  
 NSN 5180-00-323-4915  
 Multimeter

Materials:  
 None

Personnel Required:  
 68F20 Aircraft Electrician

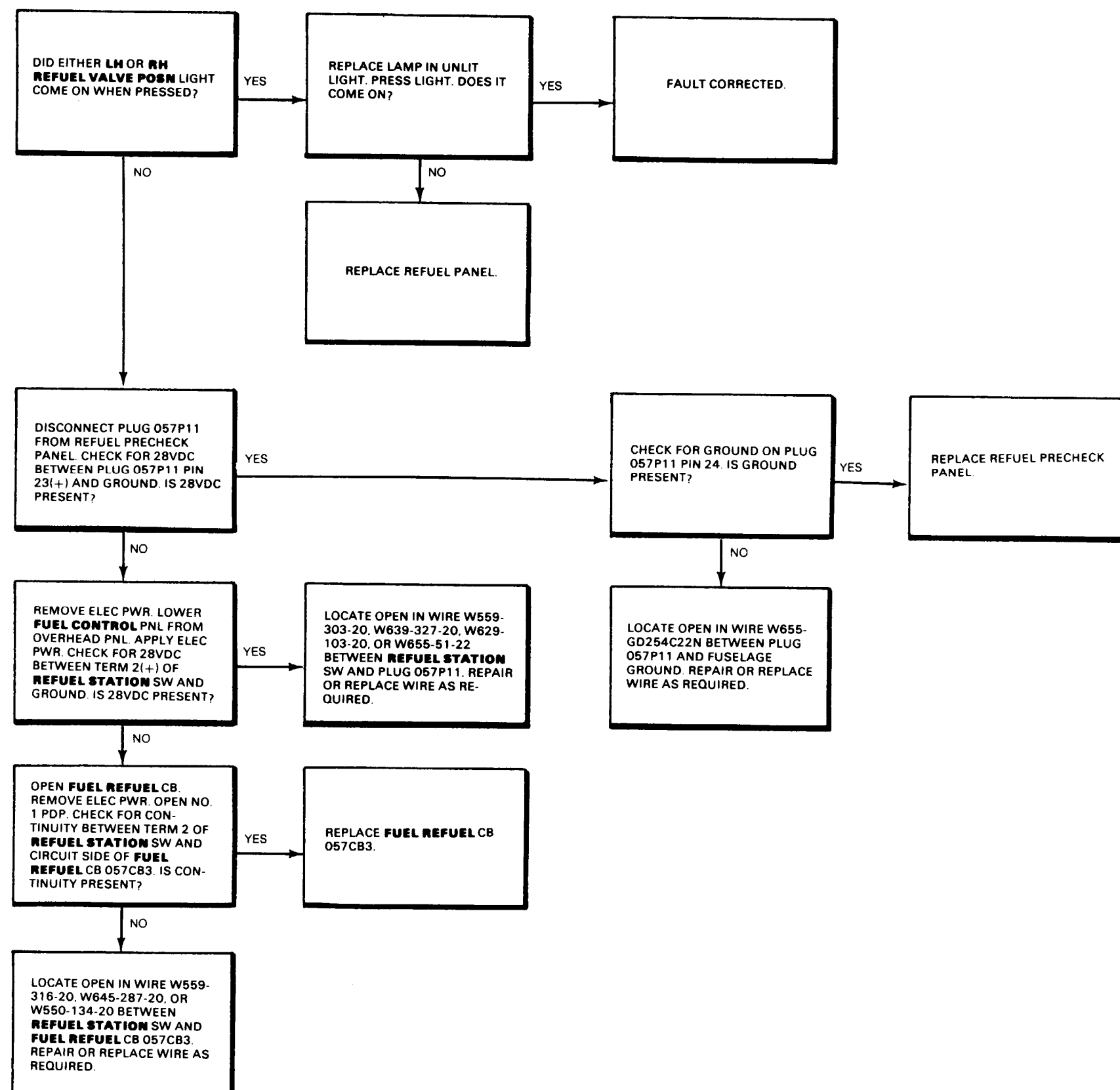
References:  
 TM 55-1520-240-23

Equipment Condition:  
 TM 55-1520-240-23:  
 Battery Connected  
 Electrical Power On  
 Hydraulic Power Off



# 10-3.7 LH OR RH REFUEL VALVE POSN LIGHT DOES NOT COME ON WHEN PRESSED (Continued)

10-3.7



END OF TASK

10-3.8 PWR LIGHT DOES NOT COME ON

10-3.8

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
 All

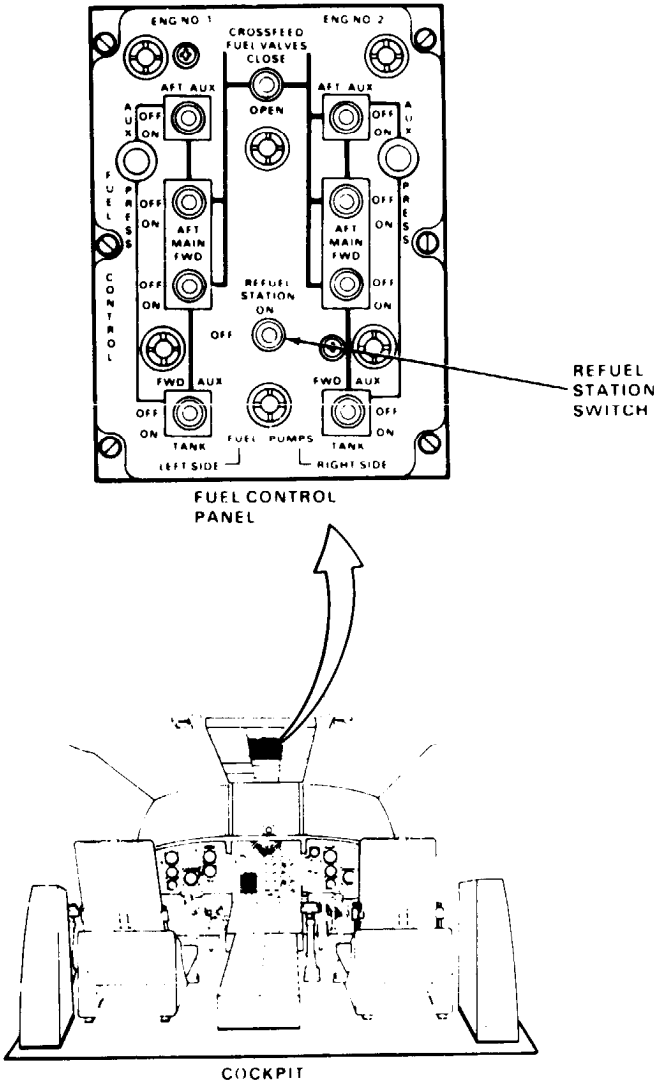
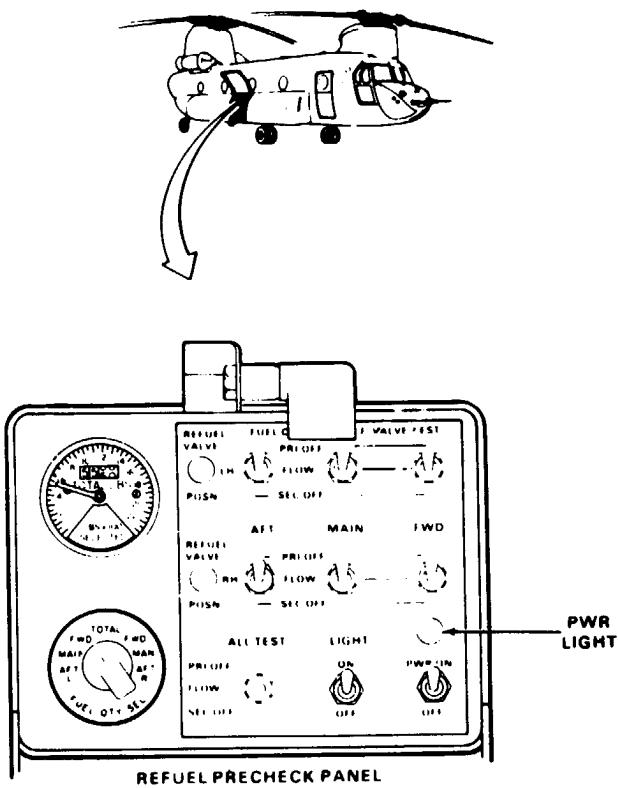
Tools:  
 Electrical Repairer's Tool Kit,  
 NSN 5180-00-323-4915  
 Multimeter

Materials:  
 None

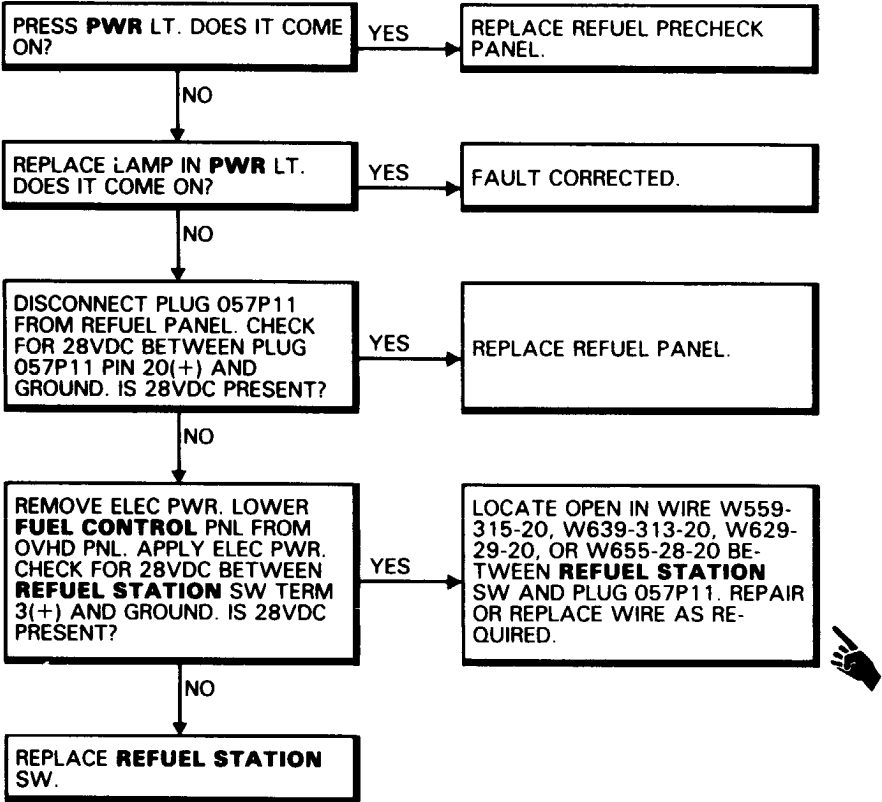
Personnel Required:  
 68F20 Aircraft Electrician

References:  
 TM 55-1520-240-23

Equipment Condition:  
 TM 55-1520-240-23:  
 Battery Connected  
 Electrical Power On  
 Hydraulic Power Off



GO TO NEXT PAGE



10-3.9 LH OR RH REFUEL VALVE POSN LIGHT DOES NOT COME ON OR COMES ON AND STAY ON

10-3.9

FAULT ISOLATION PROCEDURE

INITIAL SETUP

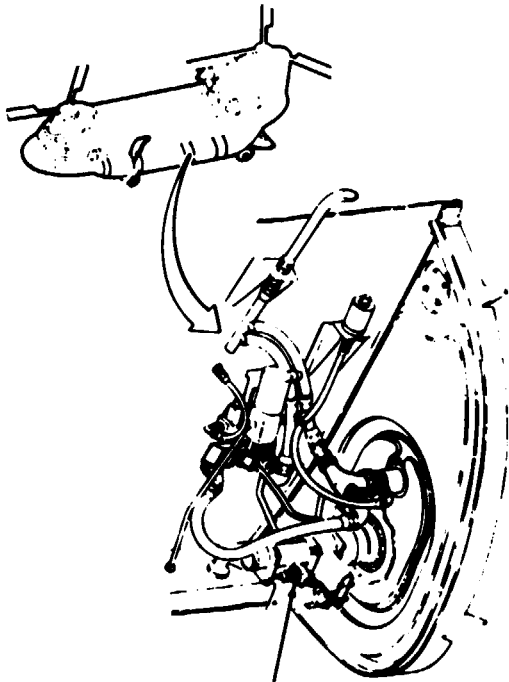
Applicable Configurations:  
All

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

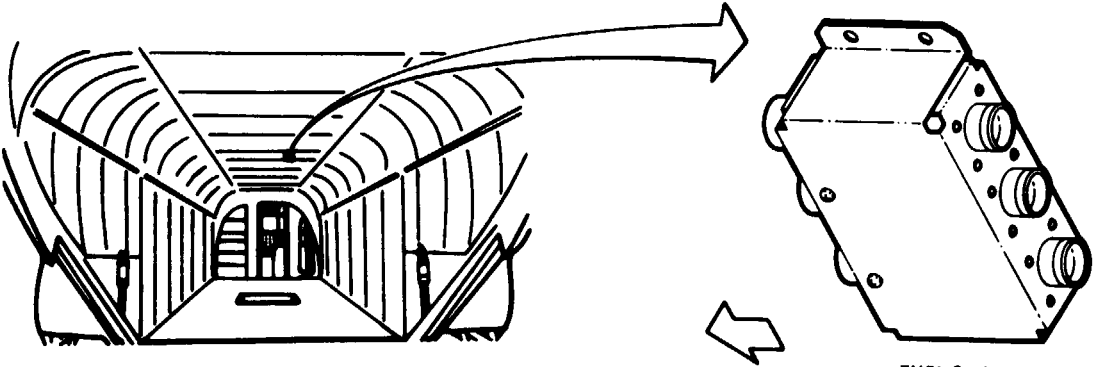
Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

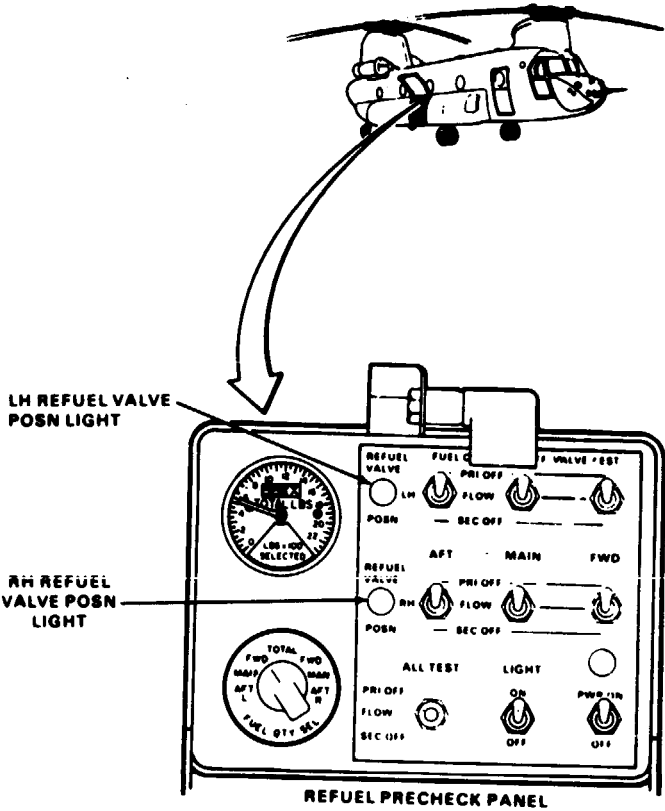


LEFT FUEL LEVEL SHUTOFF VALVES SHOWN. RIGHT FUEL LEVEL SHUTOFF VALVES SIMILAR.

90X54



FUEL QUANTITY SWITCH BOX STA 232



LH REFUEL VALVE POSN LIGHT

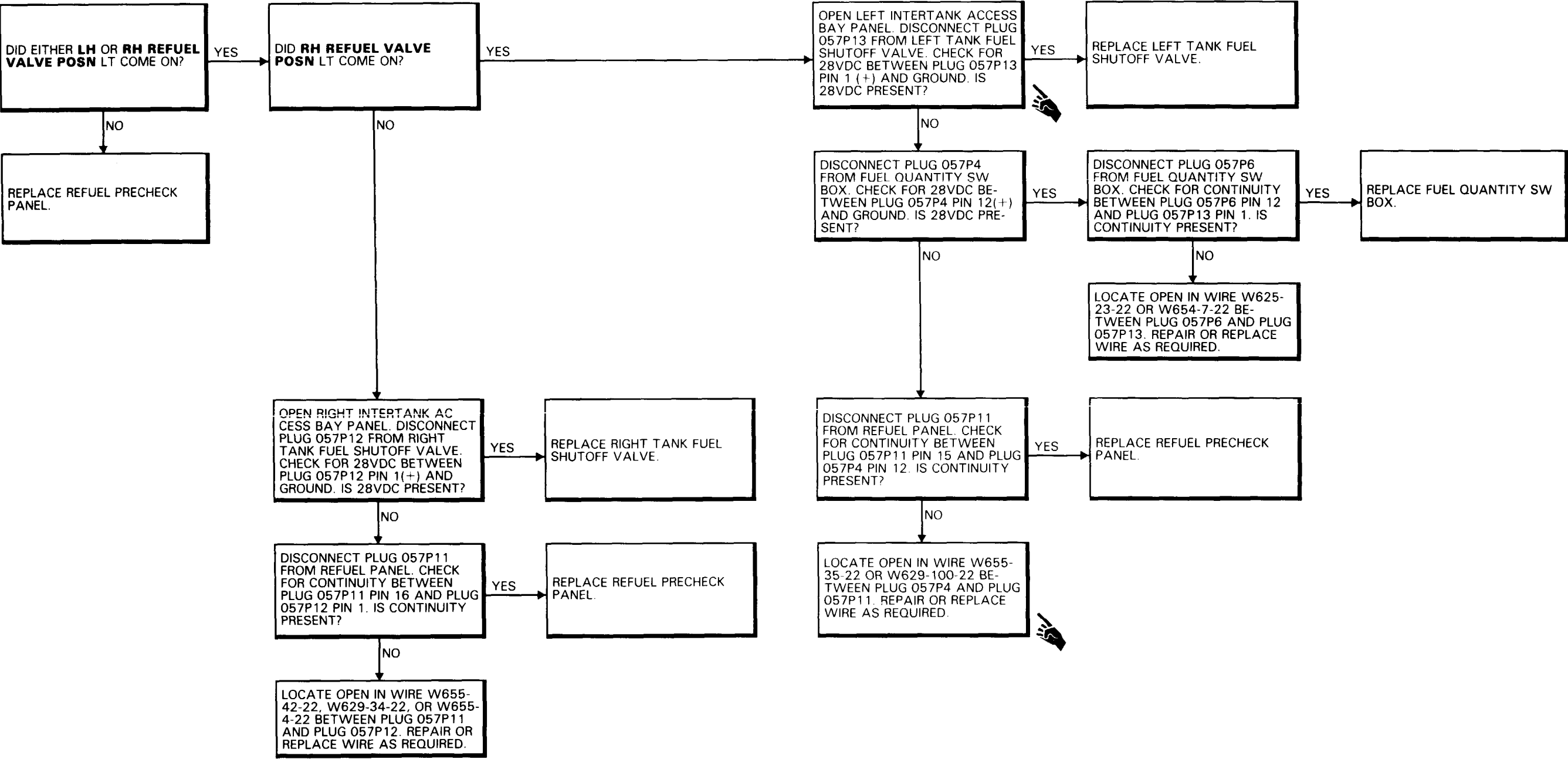
RH REFUEL VALVE POSN LIGHT

GO TO NEXTPAGE

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10-3.9 LH OR RH REFUEL VALVE POSN LIGHT DOES NOT COME ON OR COMES ON AND STAYS ON  
(Continued)

10-3.9



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Personnel Required  
68F10 Aircraft Electrician

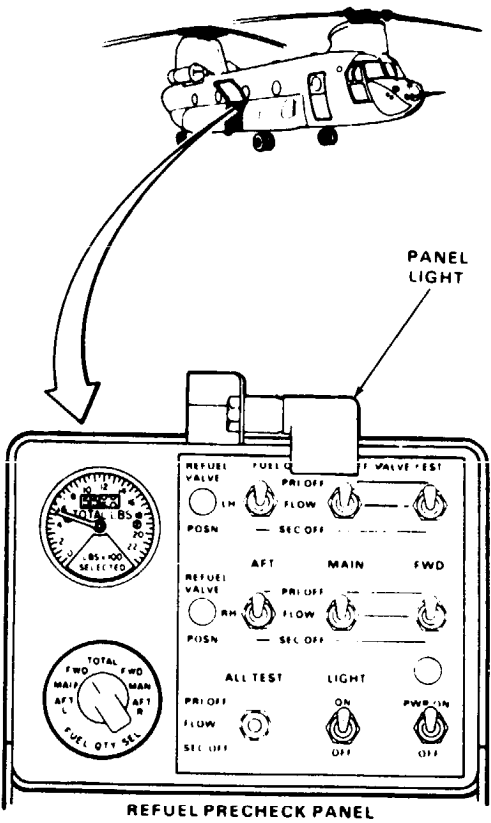
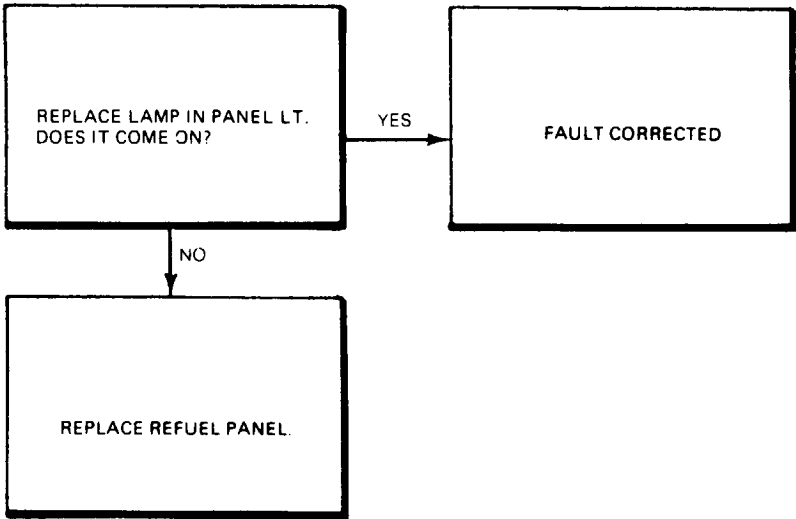
Applicable Configurations:  
All

References:  
TM 55-1520-240-23

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

Materials:  
None



D145-11799-SPA

END OF TASK

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**Task 10-3.11 Deleted.  
Pages 10-152 and 10-153 Deleted.**



10-3.12 FUEL DOES NOT STOP FLOWING WITHIN  
4 SECONDS WITH ALL TEST SWITCH  
AT PRI OFF

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

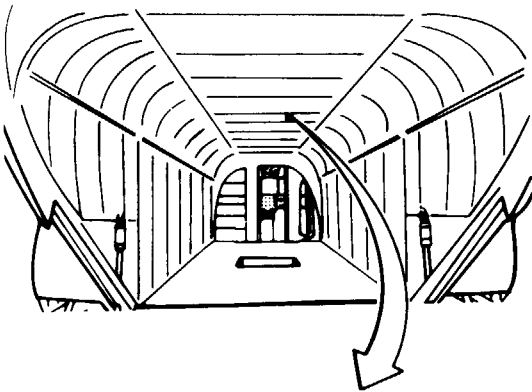
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692  
Multimeter

Materials:  
None

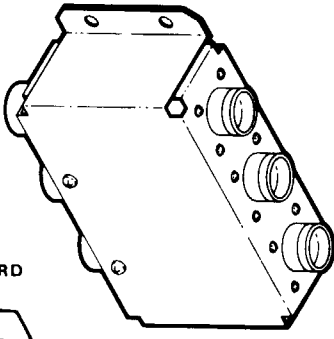
Personnel Required:  
67U20 Medium Helicopter Repairer  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

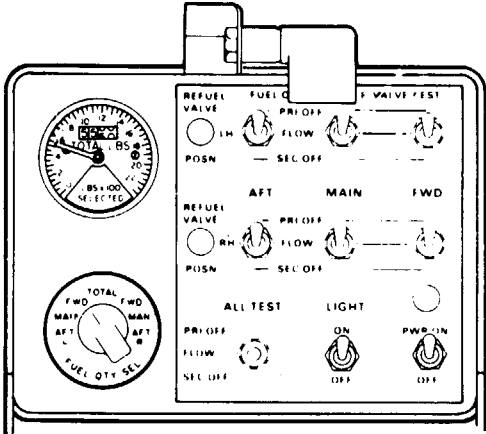
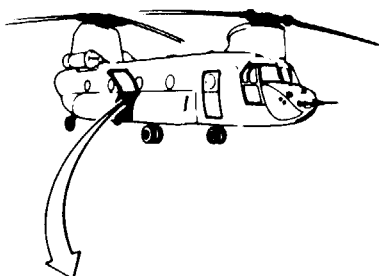
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Aircraft Being Refueled  
Hydraulic Power Off



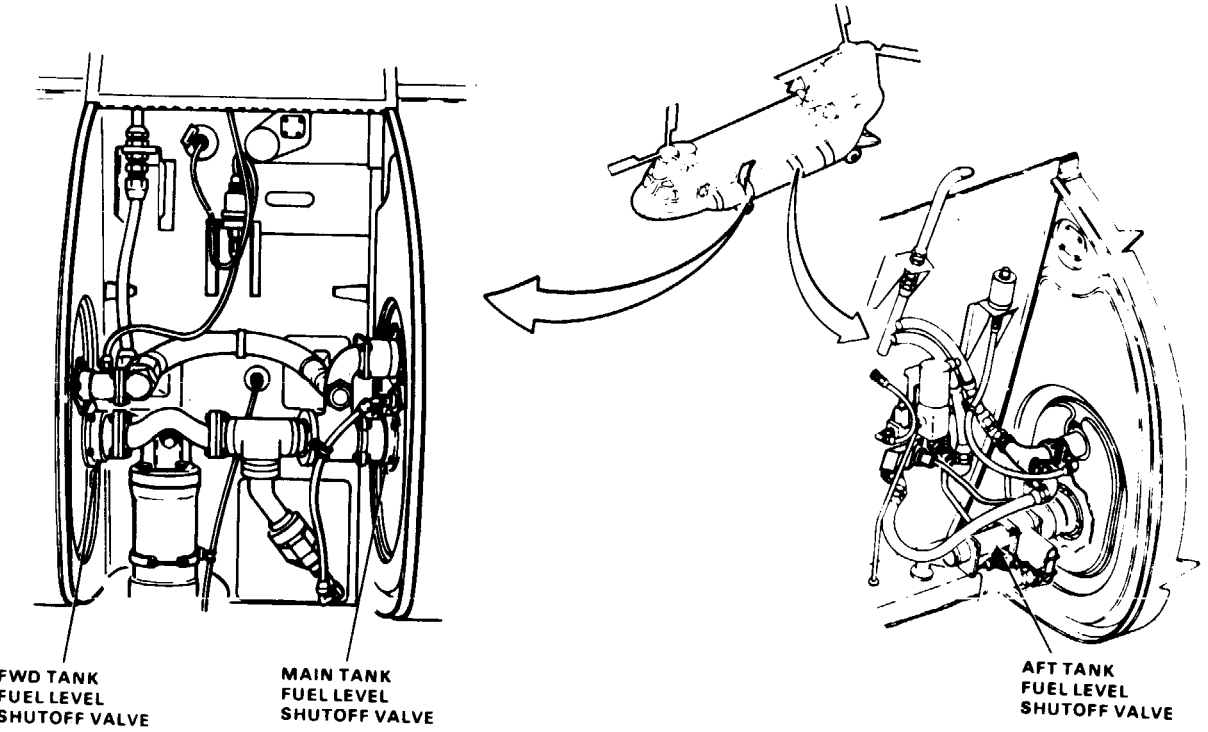
FORWARD



FUEL QUANTITY SWITCH  
BOX STA 232



REFUEL PRECHECK PANEL

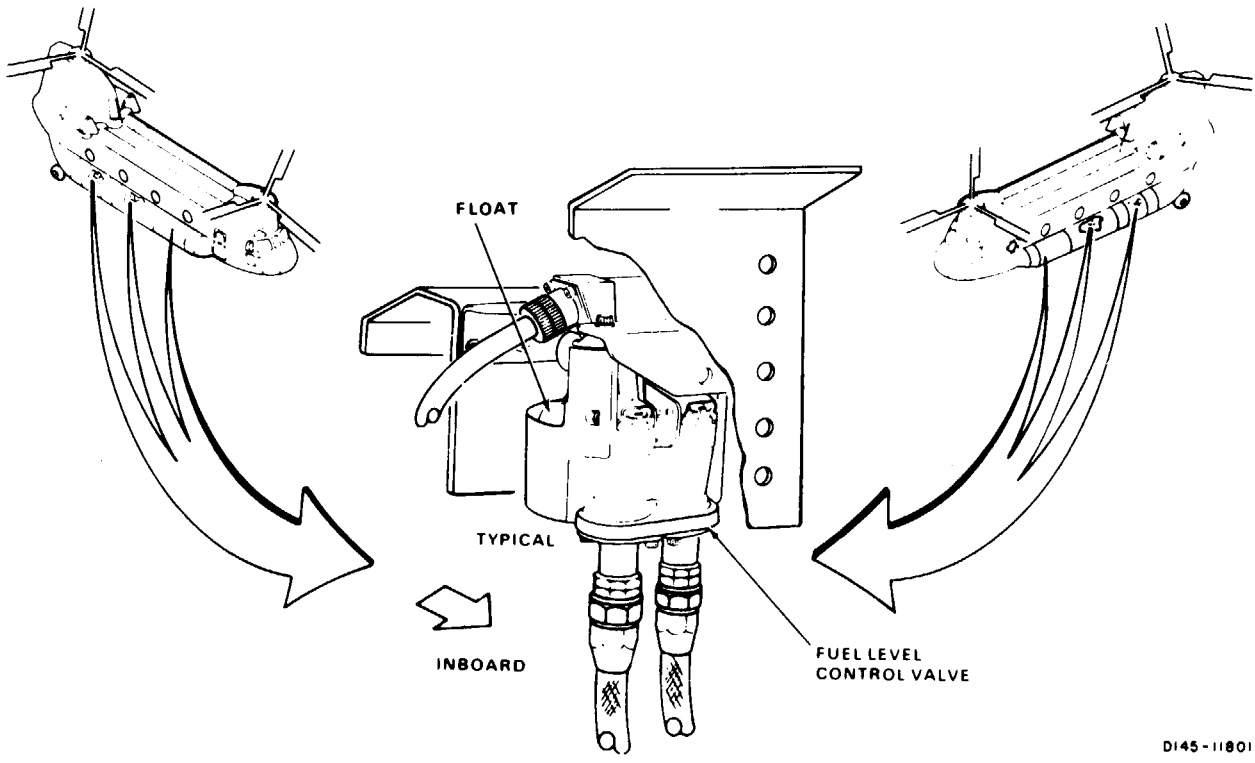


FWD TANK  
FUEL LEVEL  
SHUTOFF VALVE

MAIN TANK  
FUEL LEVEL  
SHUTOFF VALVE

AFT TANK  
FUEL LEVEL  
SHUTOFF VALVE

LEFT FUEL LEVEL  
SHUTOFF VALVES SHOWN.  
RIGHT FUEL LEVEL  
SHUTOFF VALVES SIMILAR.



FLOAT

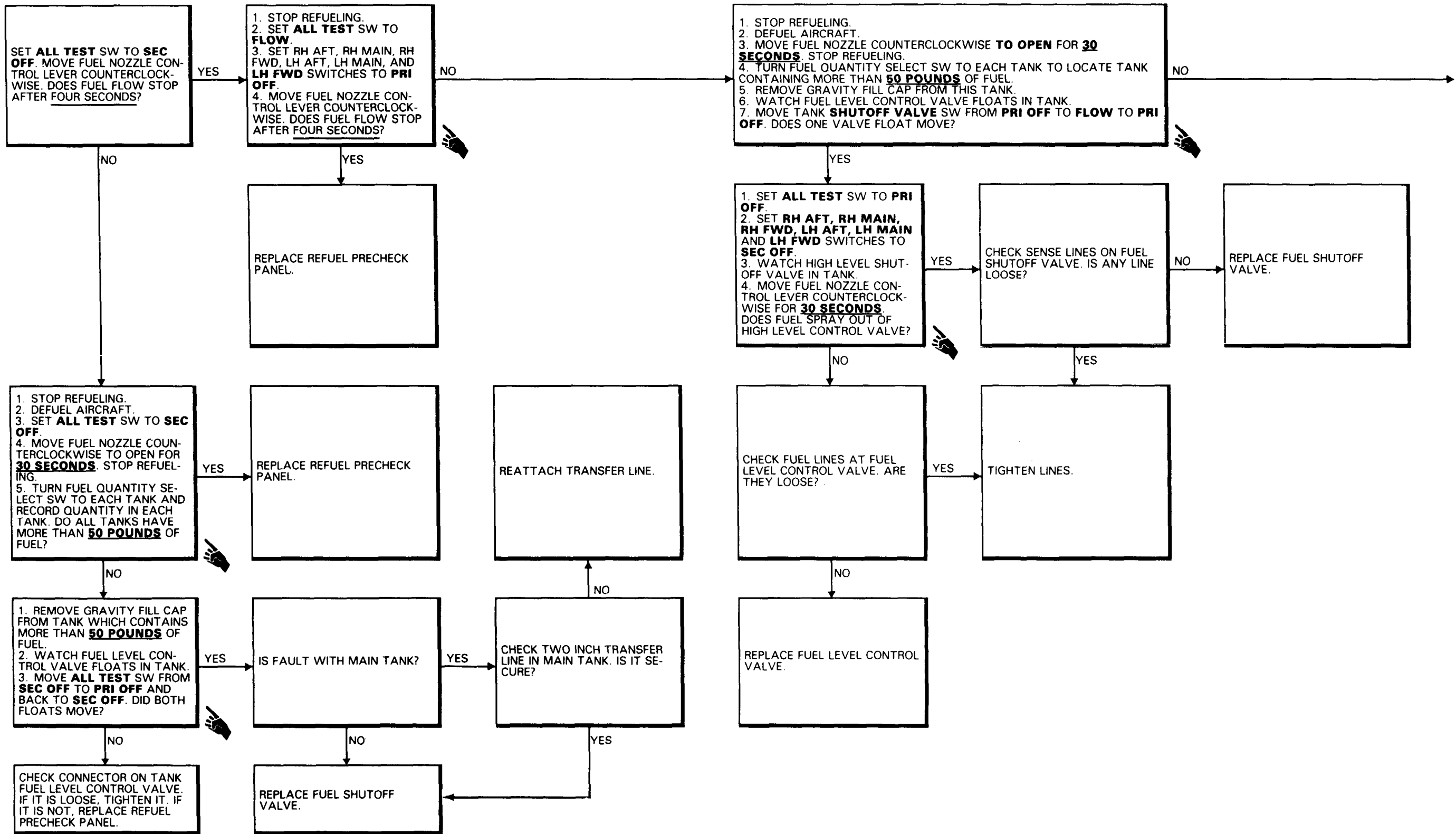
TYPICAL

INBOARD

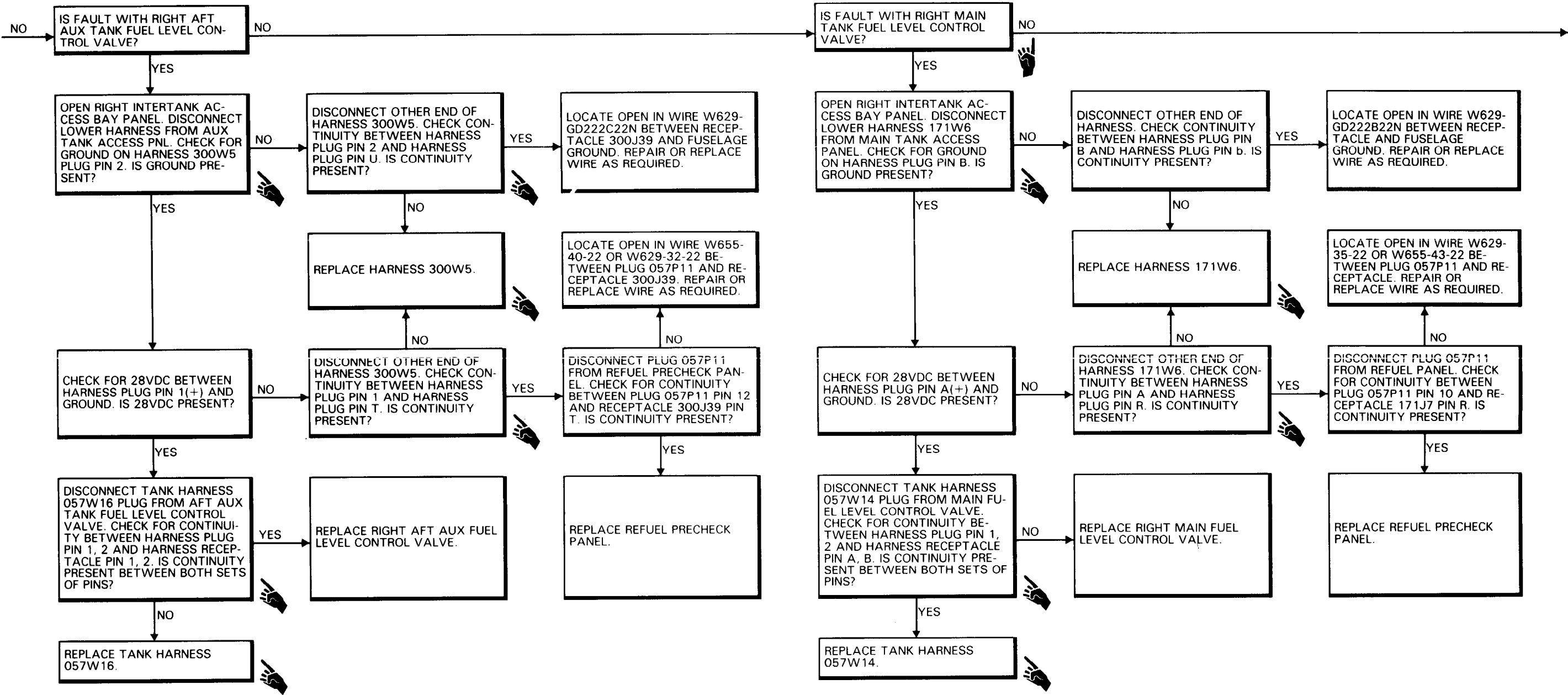
FUEL LEVEL  
CONTROL VALVE

10-3.12 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT PRI OFF  
(Continued)

10-3.12

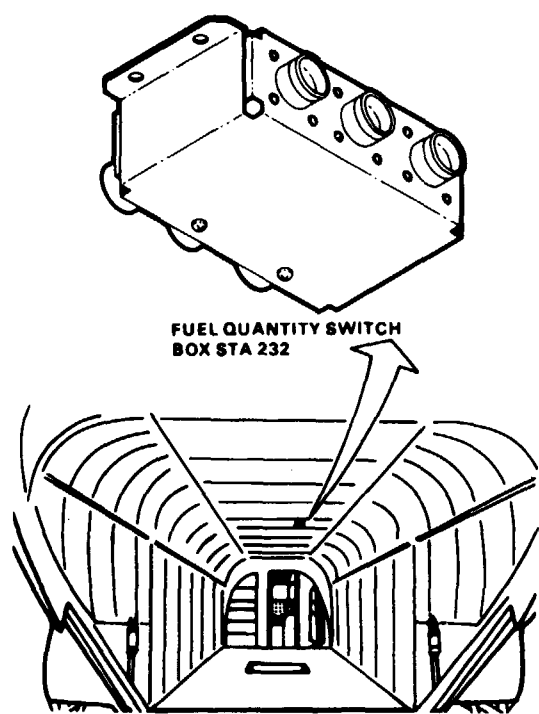


(Continued)

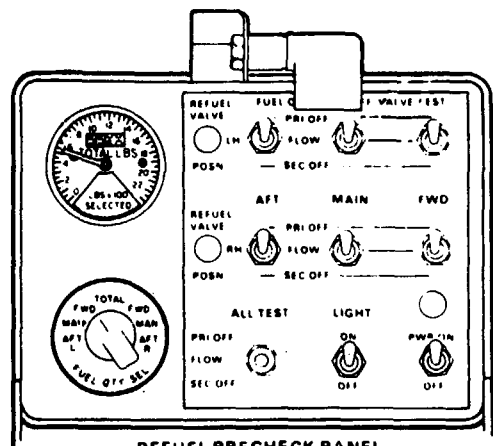
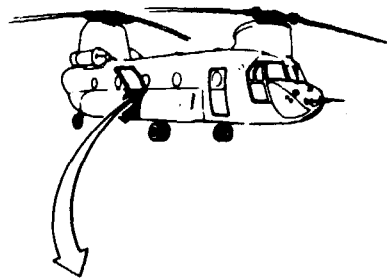


10-3.12 FUEL DOES NOT STOP FLOWING WITH IN  
4 SECONDS WITH ALL TEST SWITCH  
AT PRI OFF (Continued)

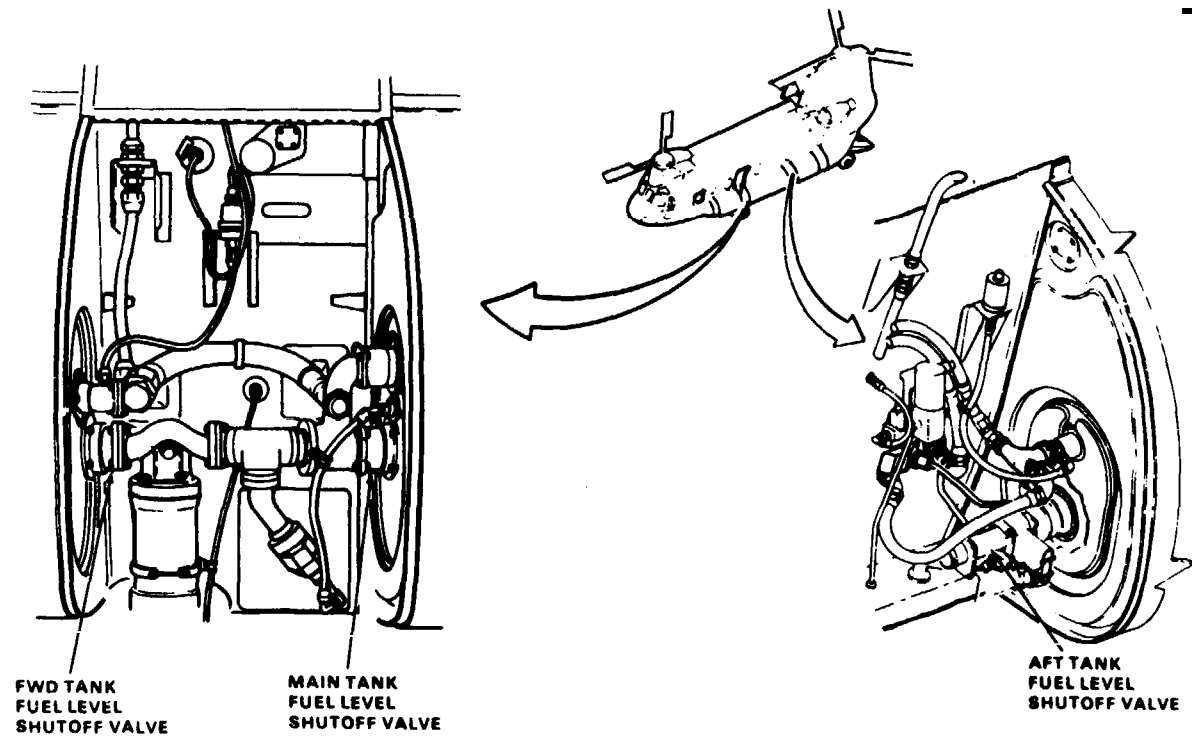
10-3.12



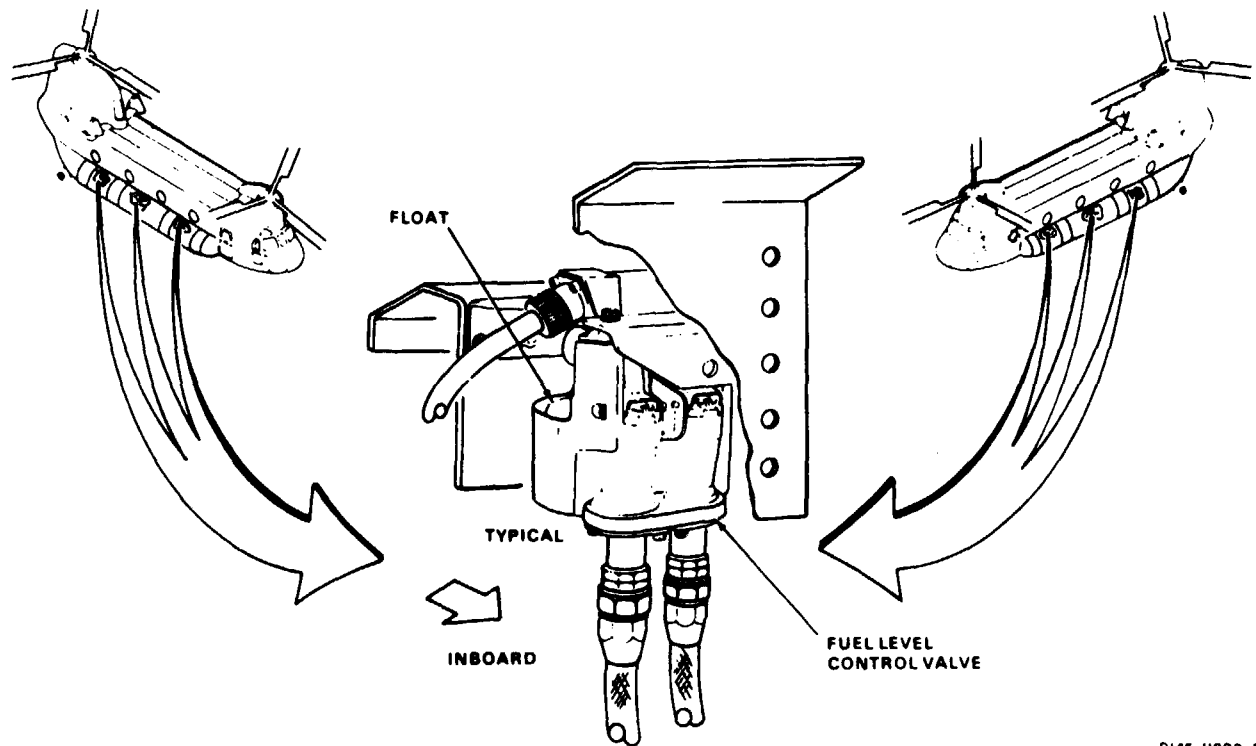
FUEL QUANTITY SWITCH  
BOX STA 232



REFUEL PRECHECK PANEL



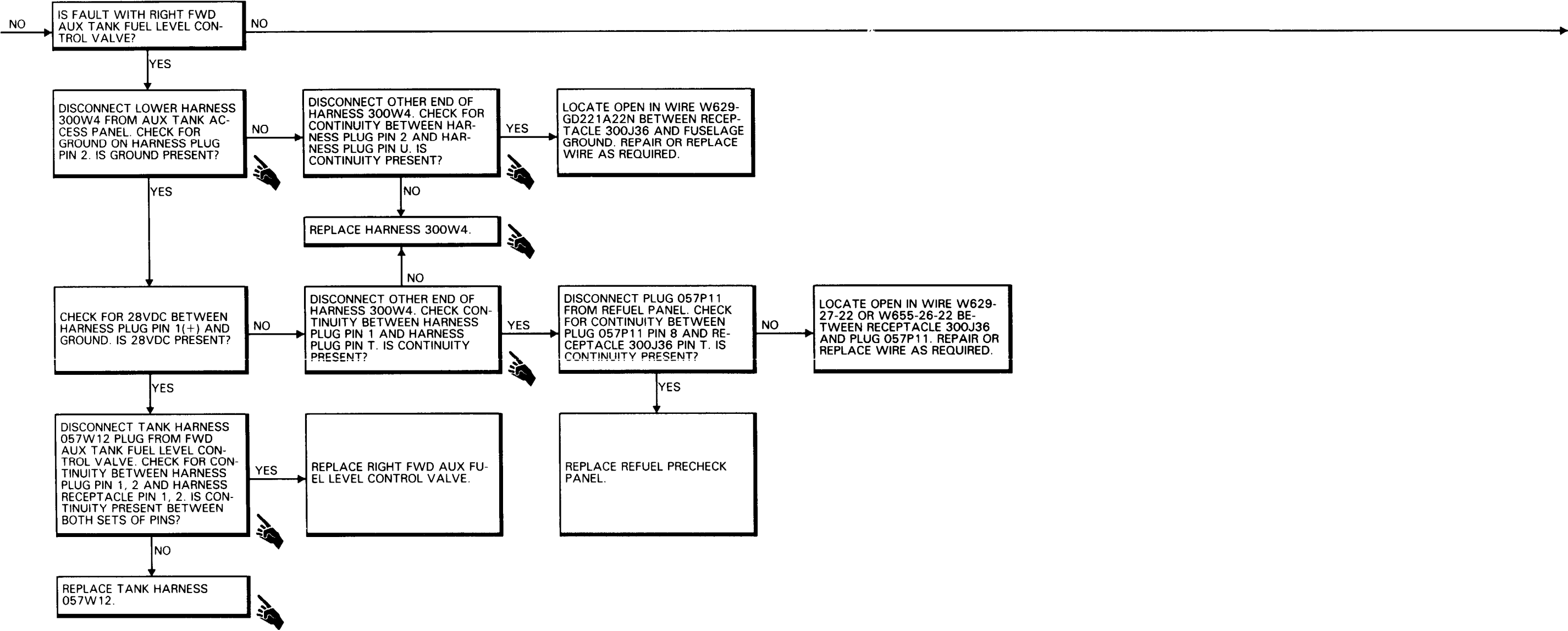
LEFT FUEL LEVEL  
SHUTOFF VALVES SHOWN.  
RIGHT FUEL LEVEL  
SHUTOFF VALVES SIMILAR.



D145-11802-SPA

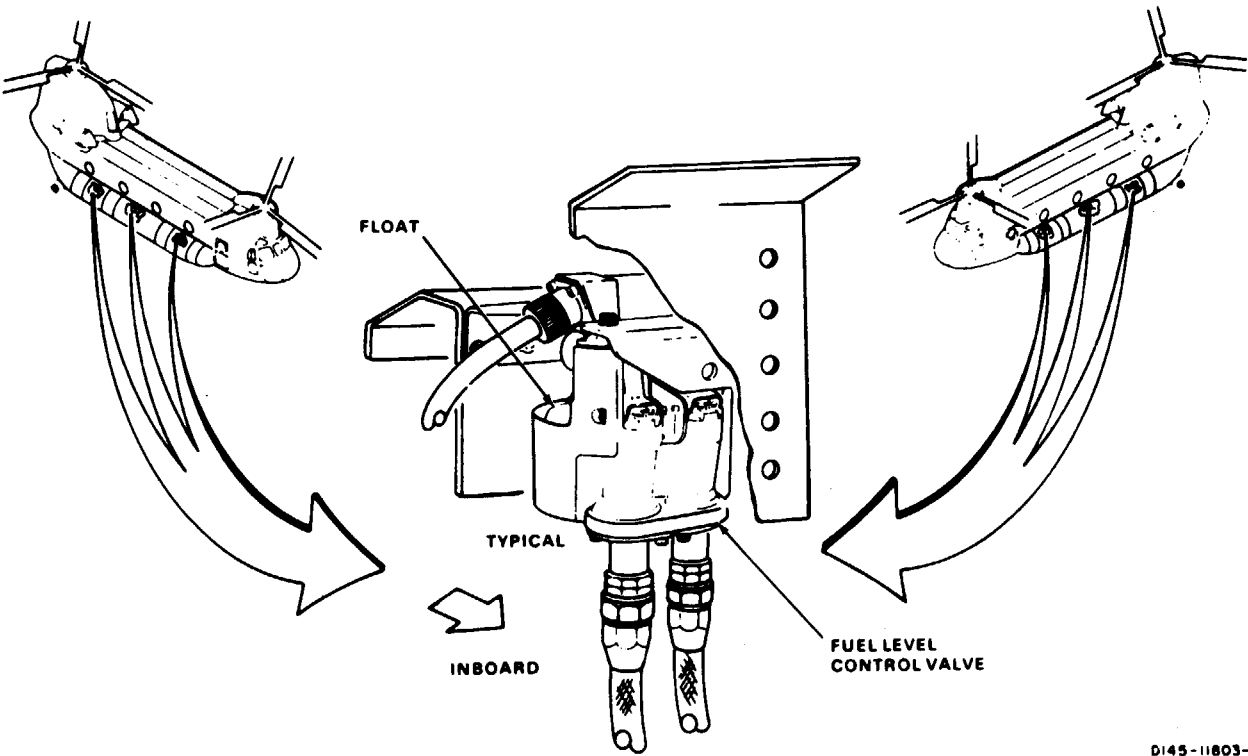
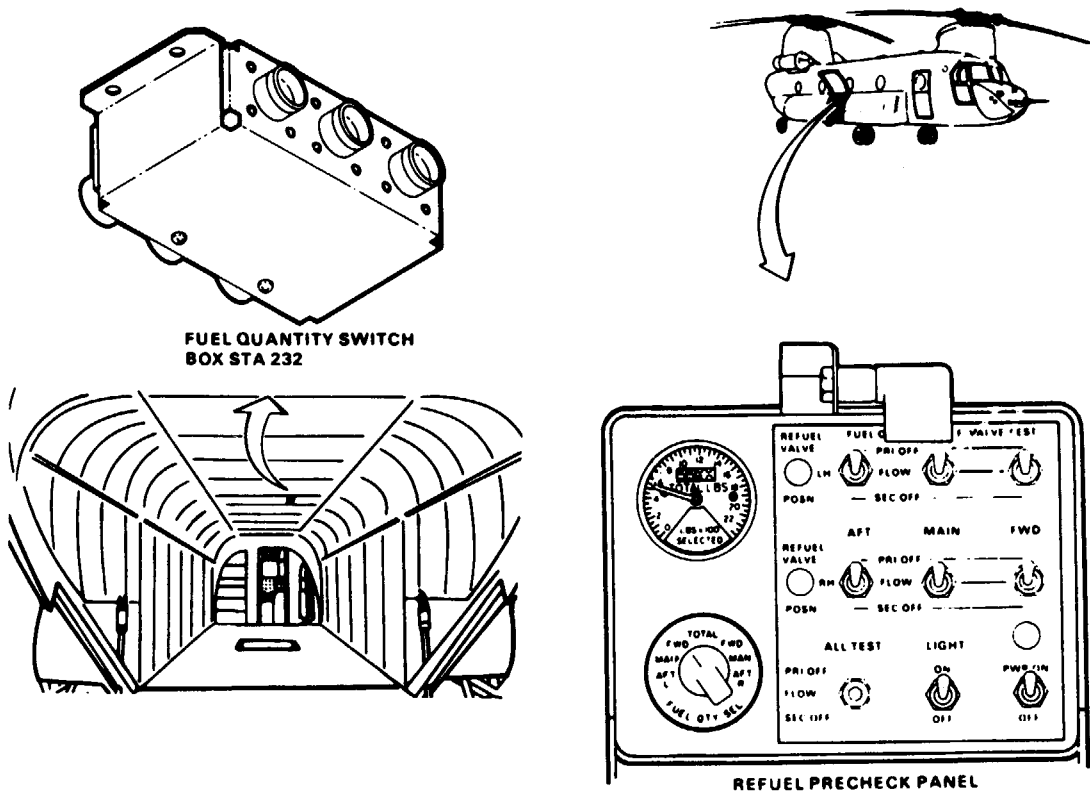
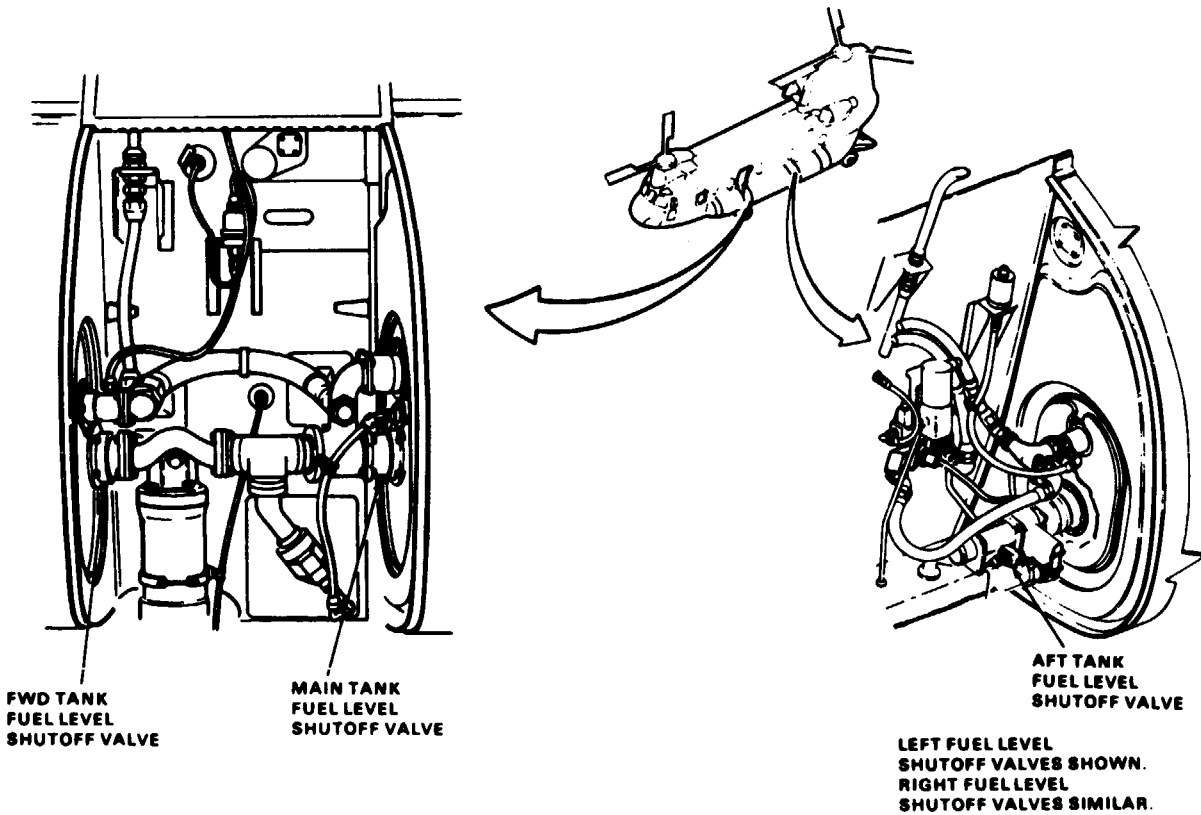
90 X 54

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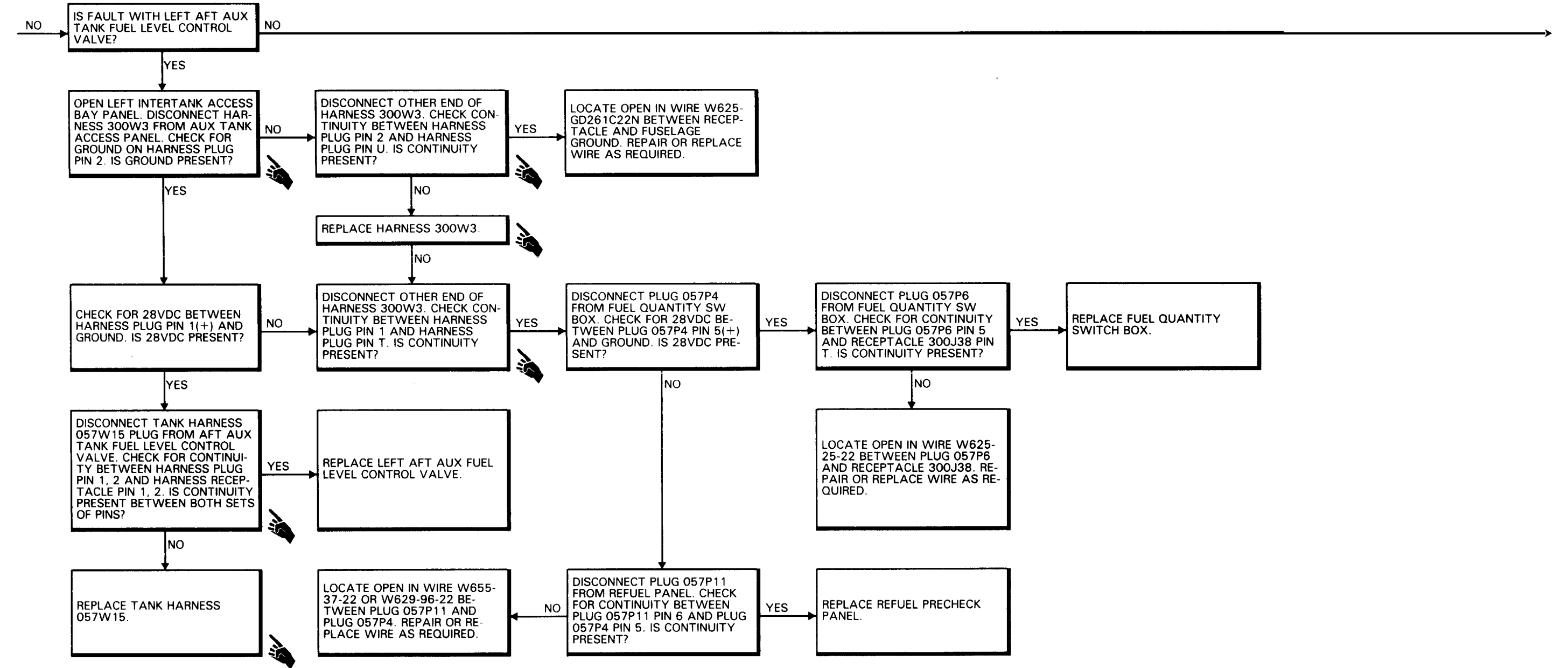
10-3.12 FUEL DOES NOT STOP FLOWING WITHIN  
4 SECONDS WITH ALL TEST SWITCH  
AT PRI OFF (Continued)

10-3.12



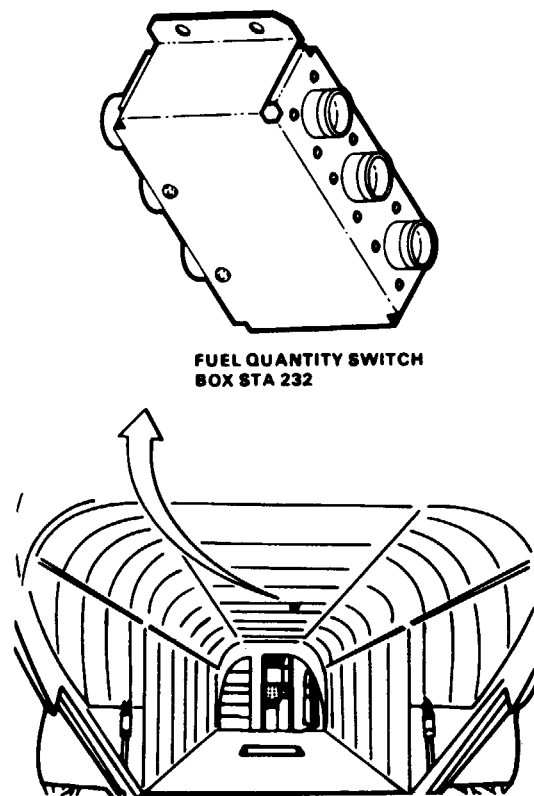
D145-11803-SPA

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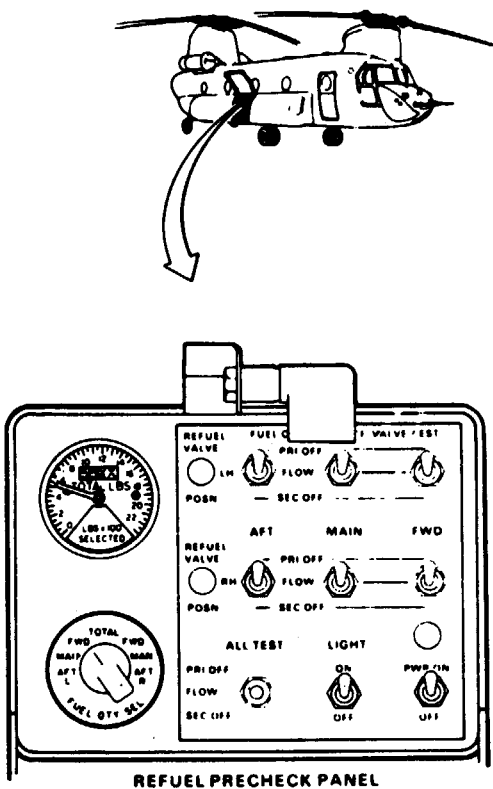


10-3.12 FUEL DOES NOT STOP FLOWING WITHIN  
4 SECONDS WITH ALL TEST SWITCH  
AT PRI OFF (Continued)

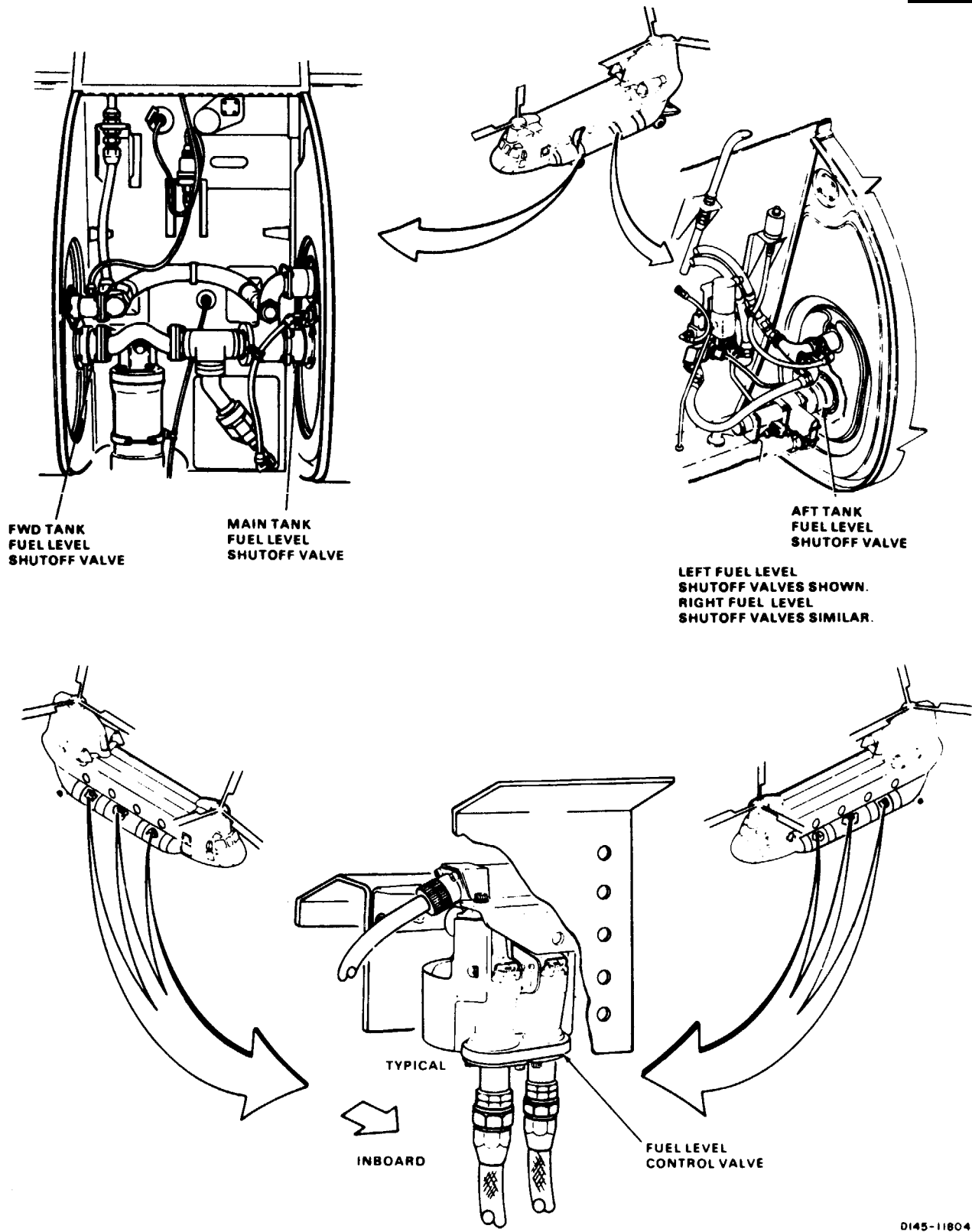
10-3.12



FUEL QUANTITY SWITCH  
BOX STA 232



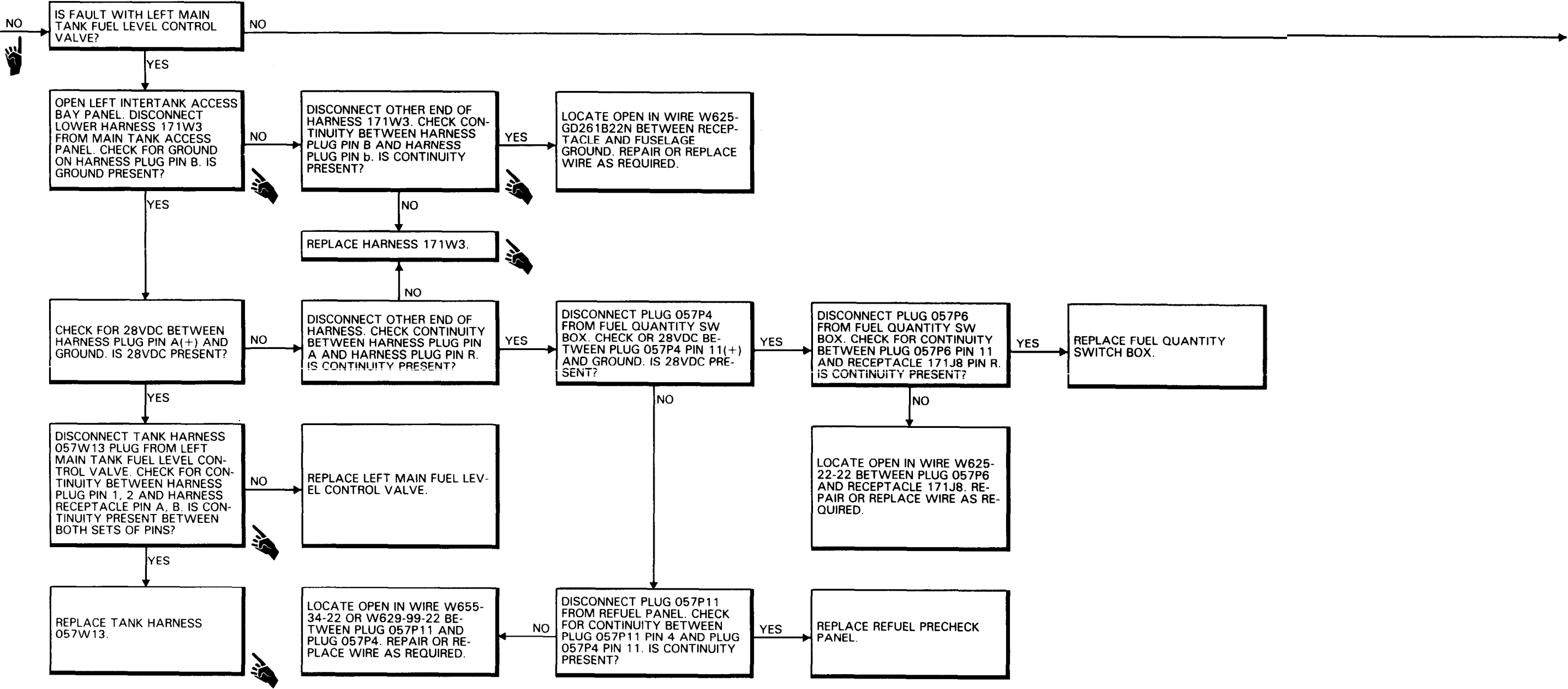
REFUEL PRECHECK PANEL



DI45-11804-SPA

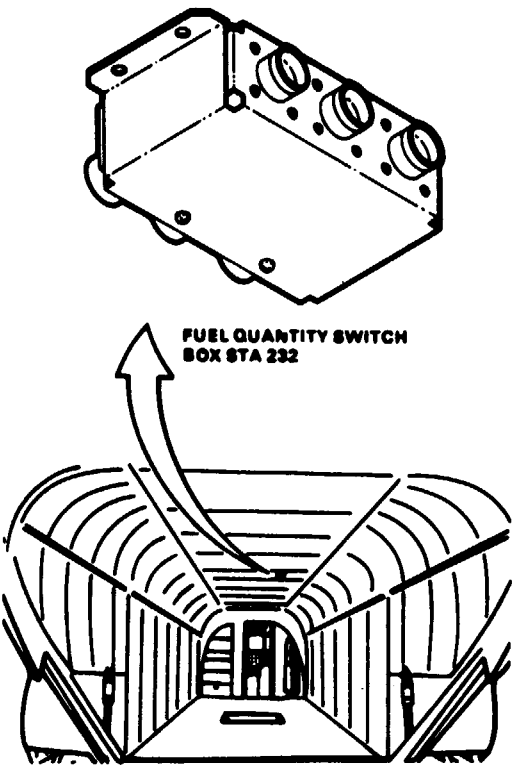
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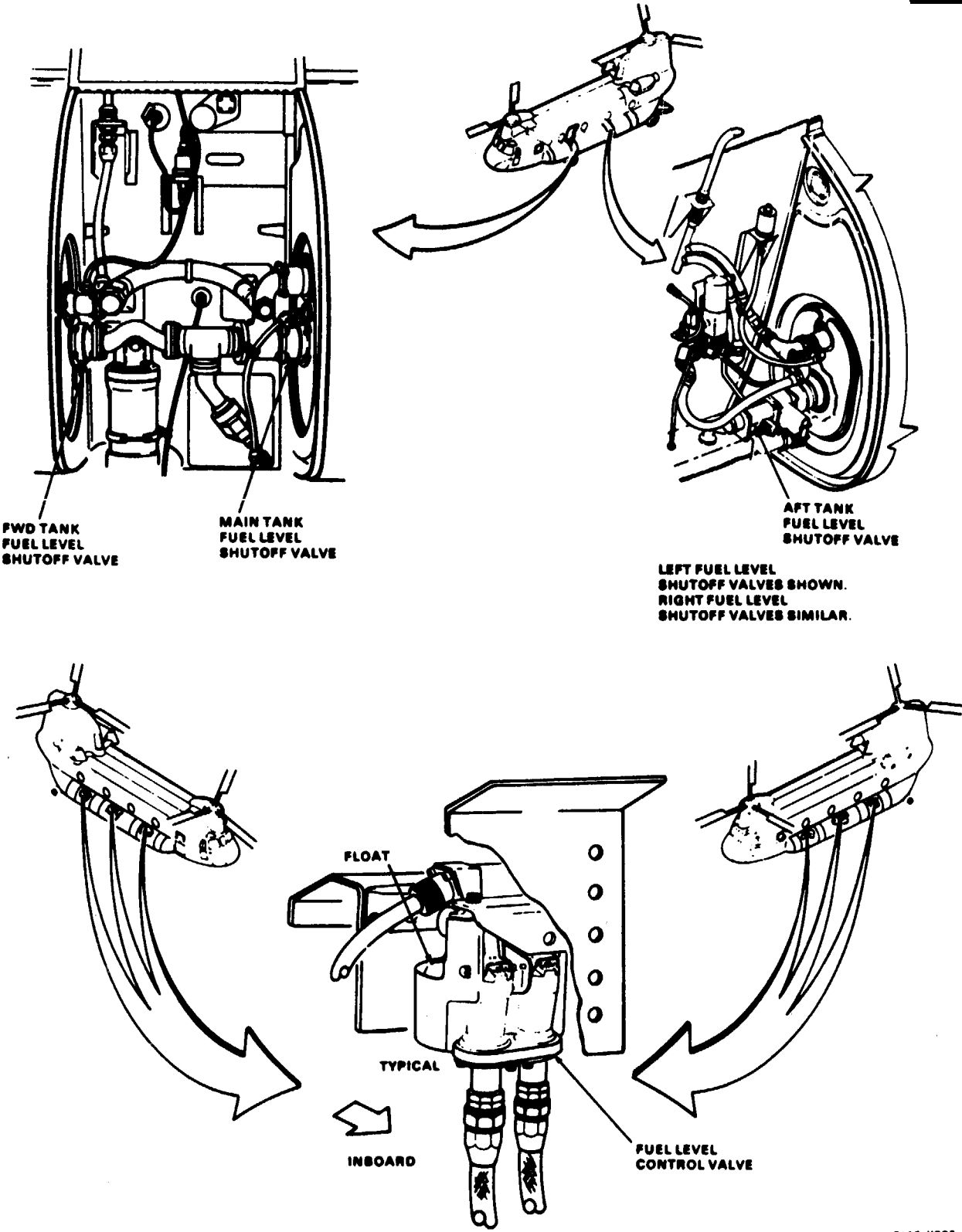
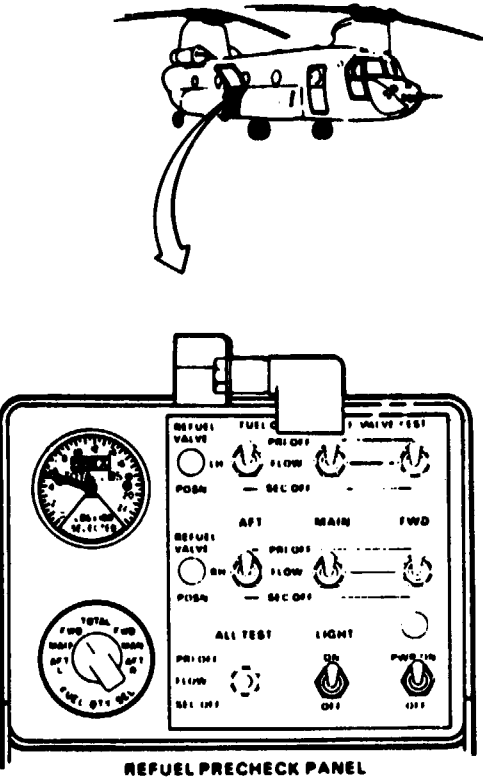


10-3.12 FUEL DOES NOT STOP FLOWING WITHIN  
4 SECONDS WITH ALL TEST SWITCH  
AT PRI OFF (Continued)

10-3.12

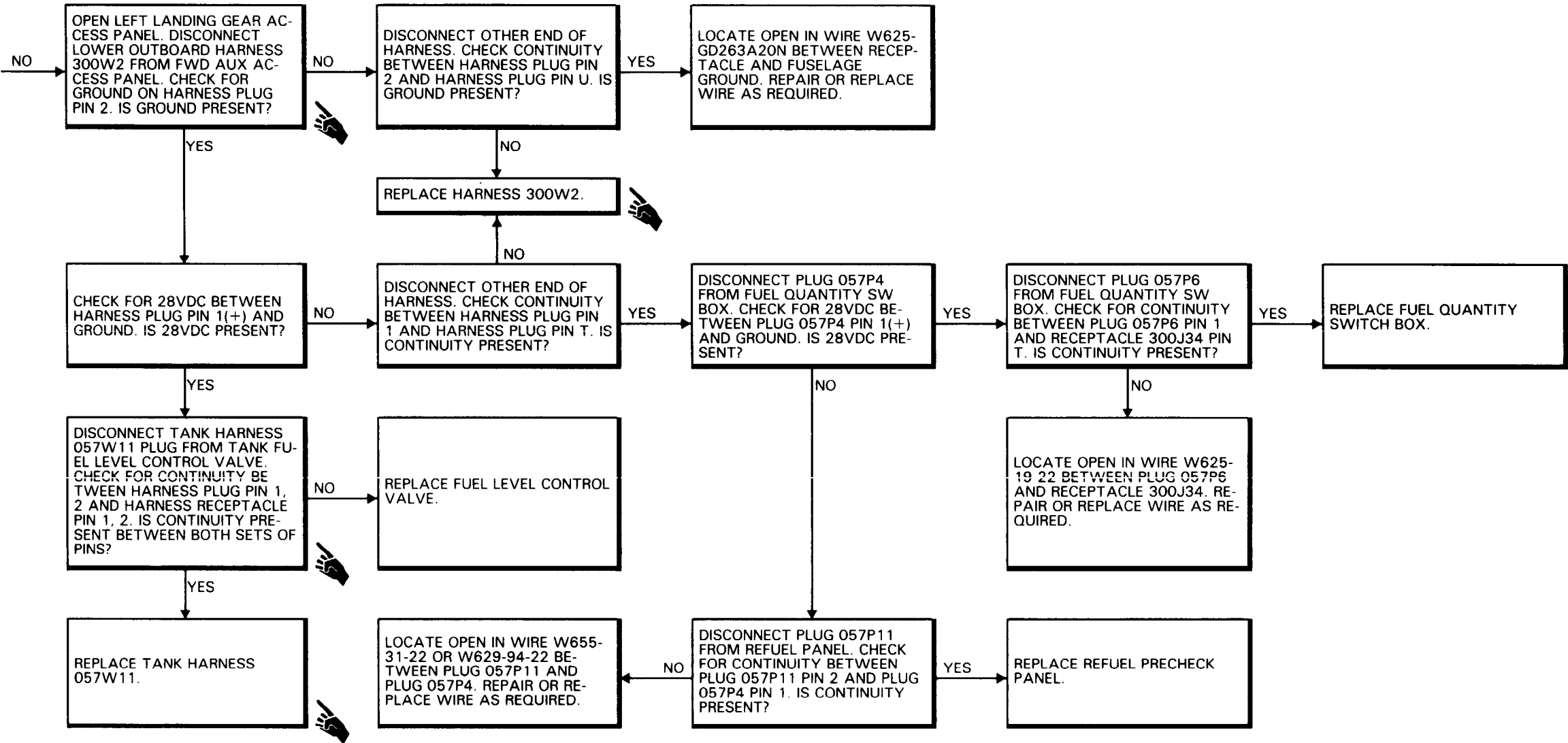


90 X 54



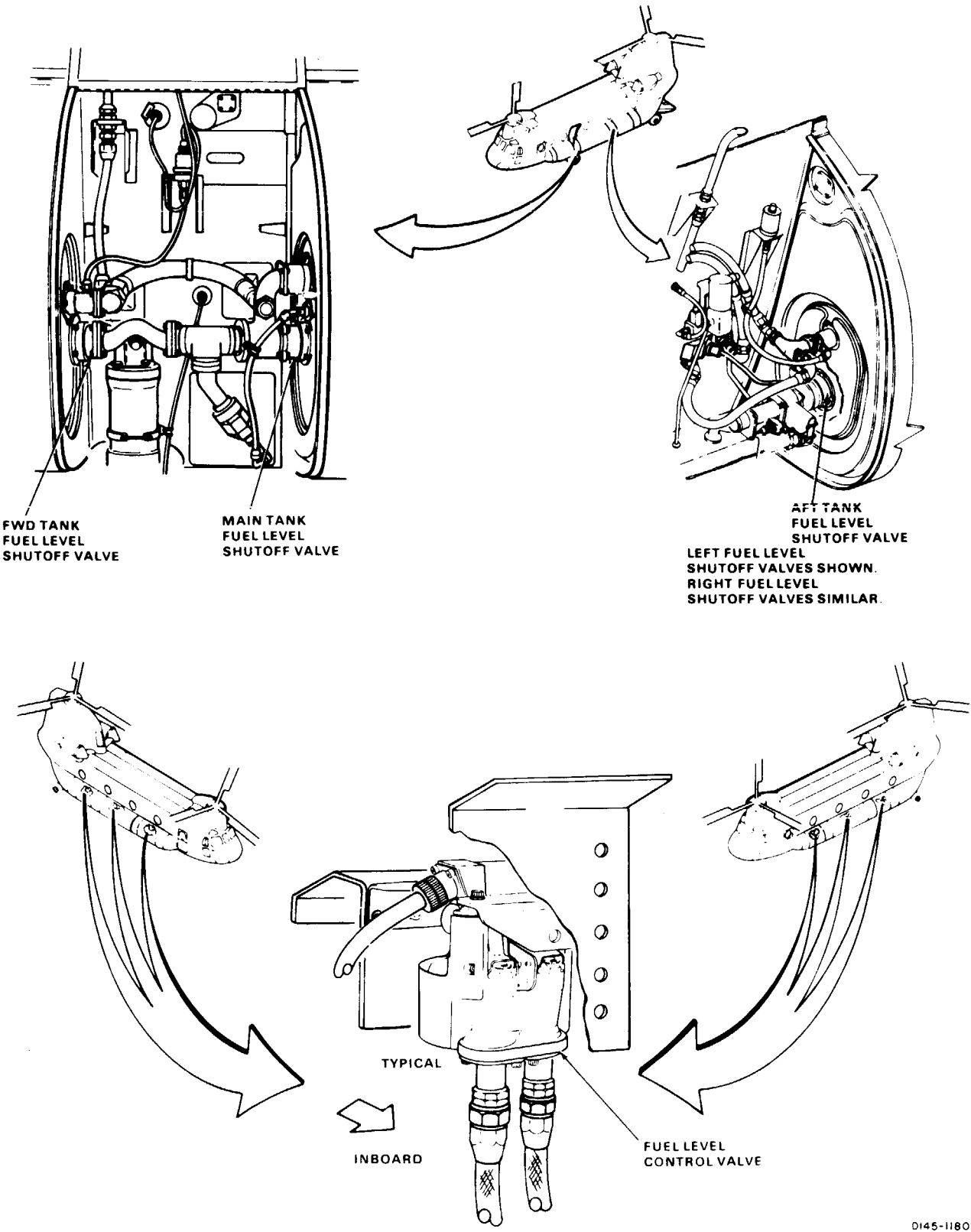
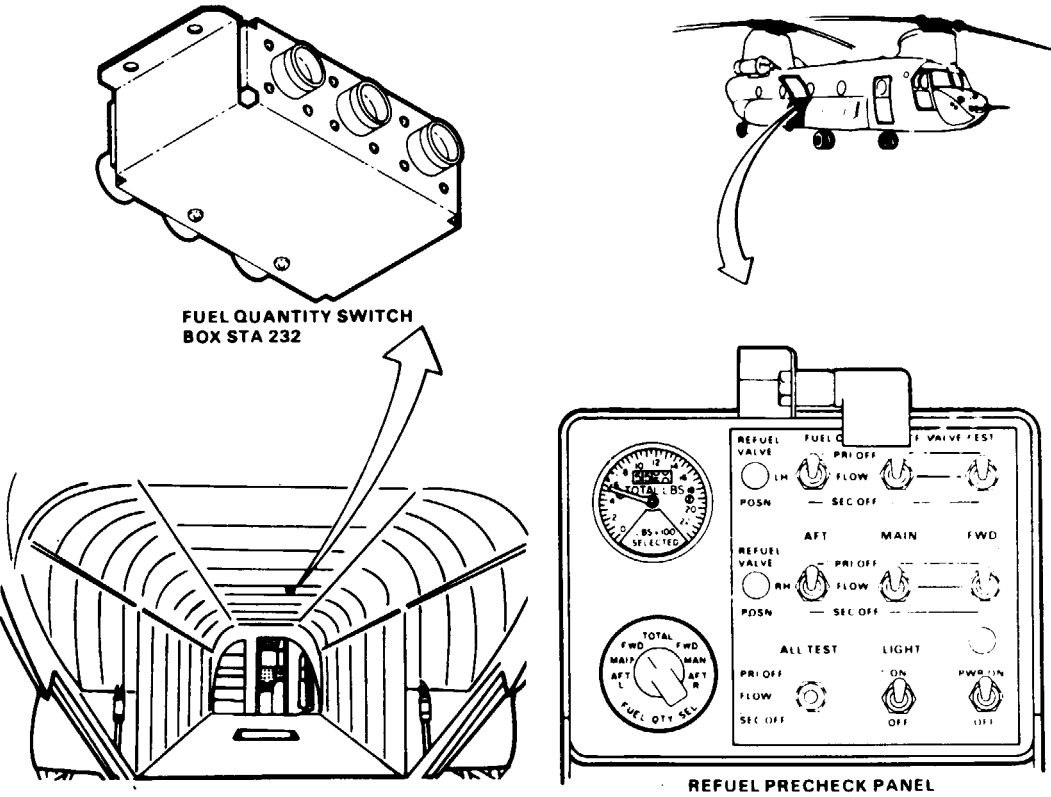
D143-11805-8PA

GO TO NEXTPAGE



10-3.12 FUEL DOES NOT STOP FLOWING WITH IN  
4 SECONDS WITH ALL TEST SWITCH  
AT PRI OFF (Continued)

10-3.12



D145-11806-SPA

END OF TASK

10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS  
WITH ALL TEST SWITCH AT SEC OFF

FAULT ISOLATION PROCEDURE

INITIAL STUP

Applicable Configurations:  
All

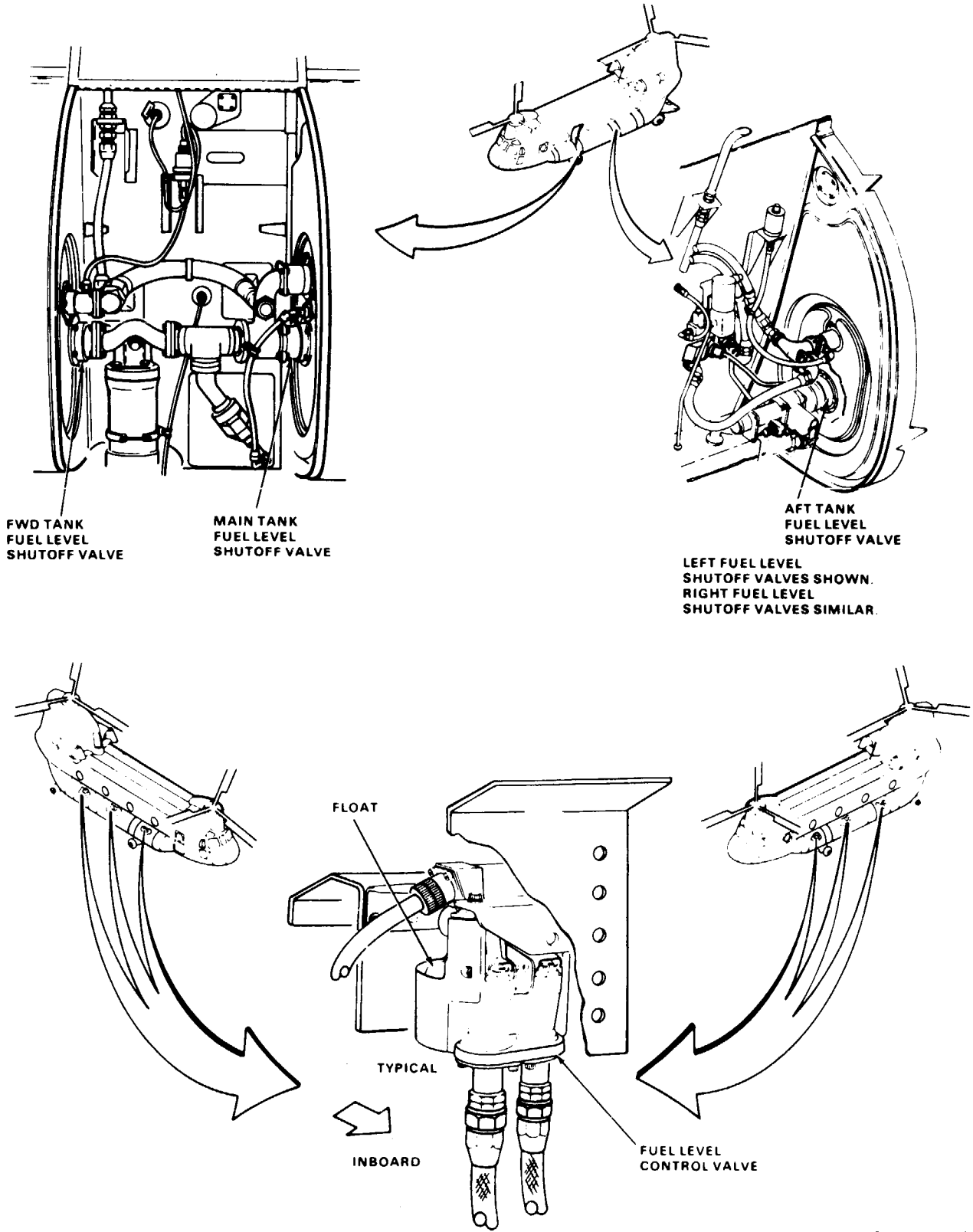
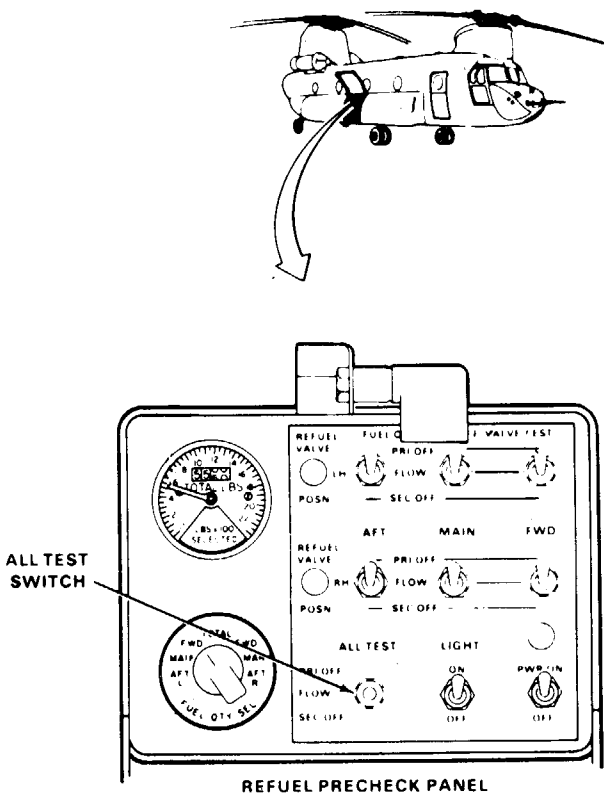
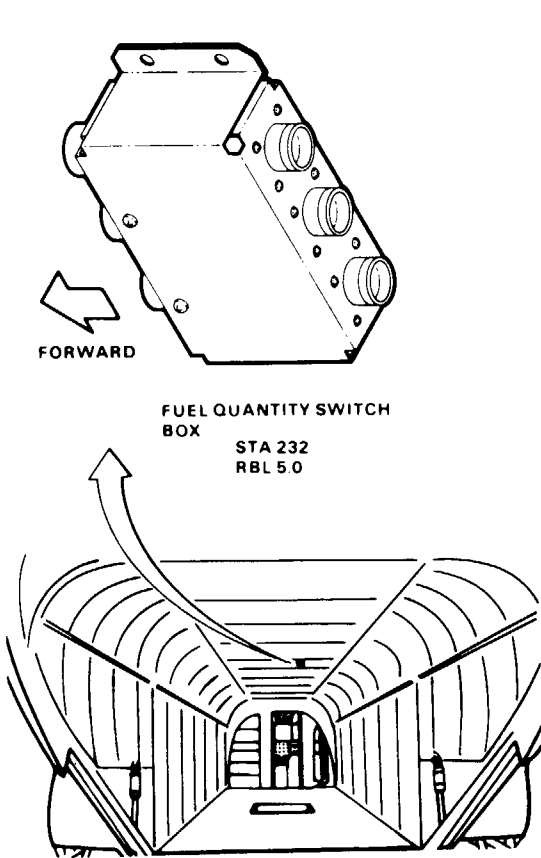
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692  
Multimeter

Materials:  
None

Personnel Required:  
67U20 Medium Helicopter Repairer  
68F20 Aircraft Electrician

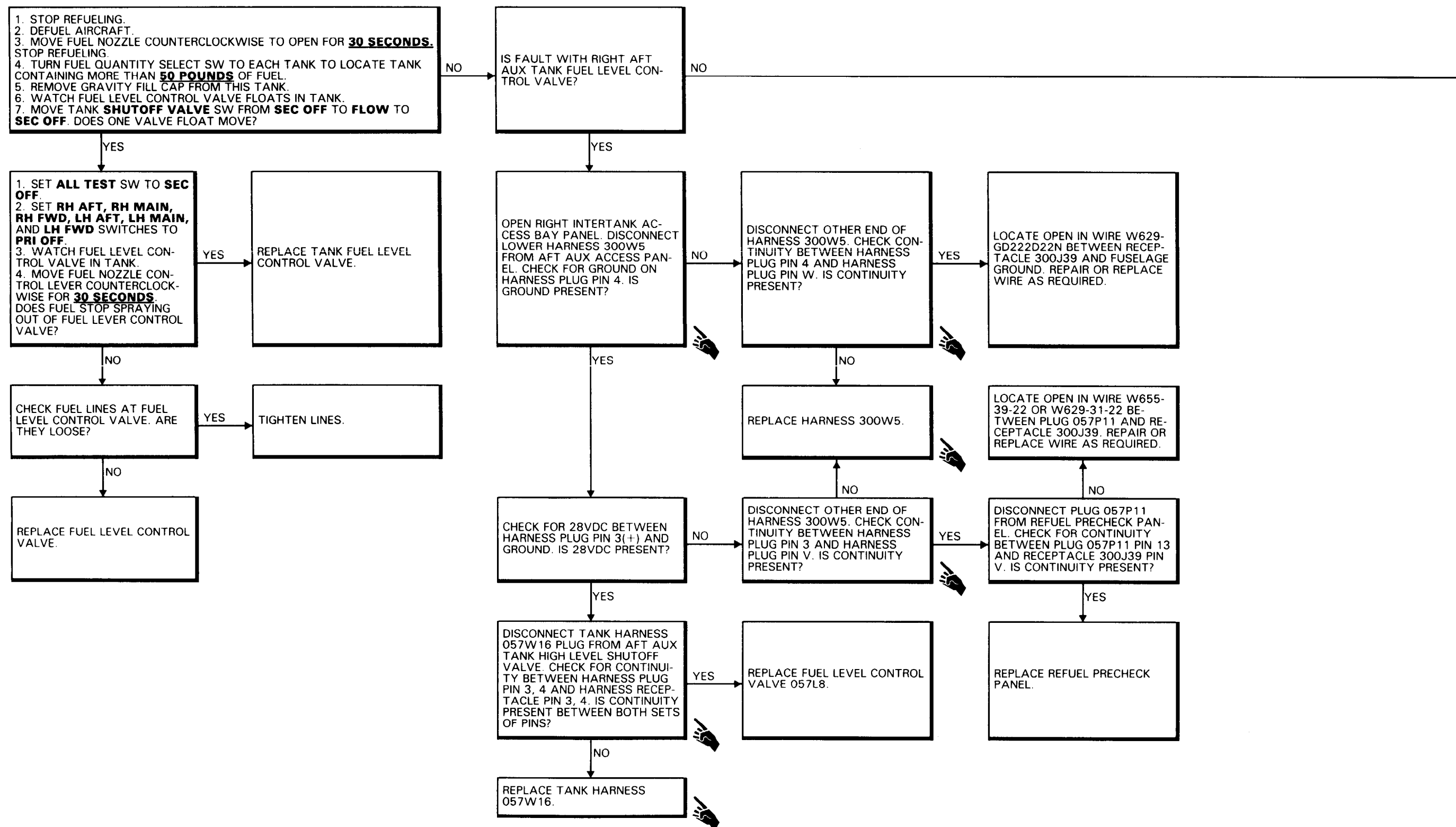
References:  
TM 55-1520-240-23

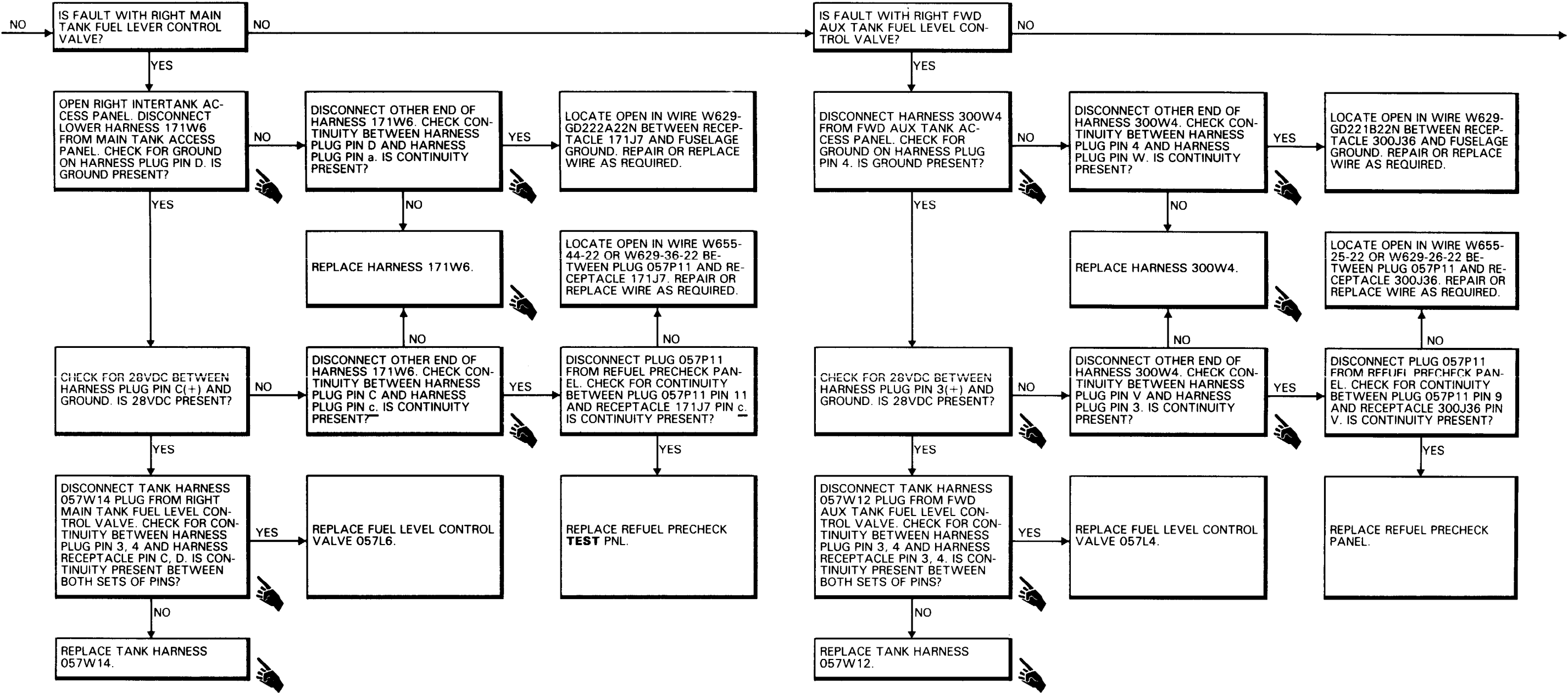
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Aircraft Being Refueled  
Hydraulic Power Off



10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF  
(Continued)

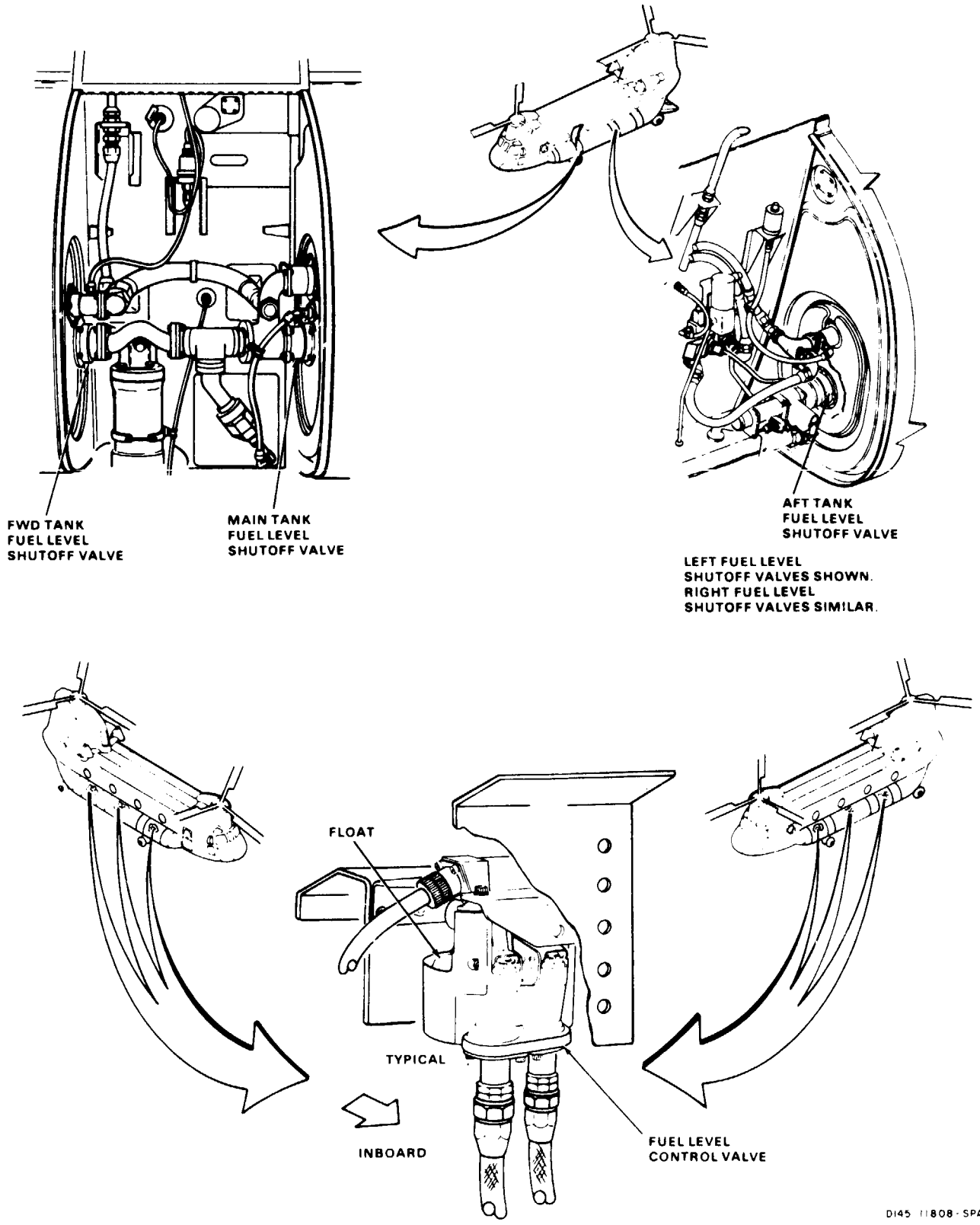
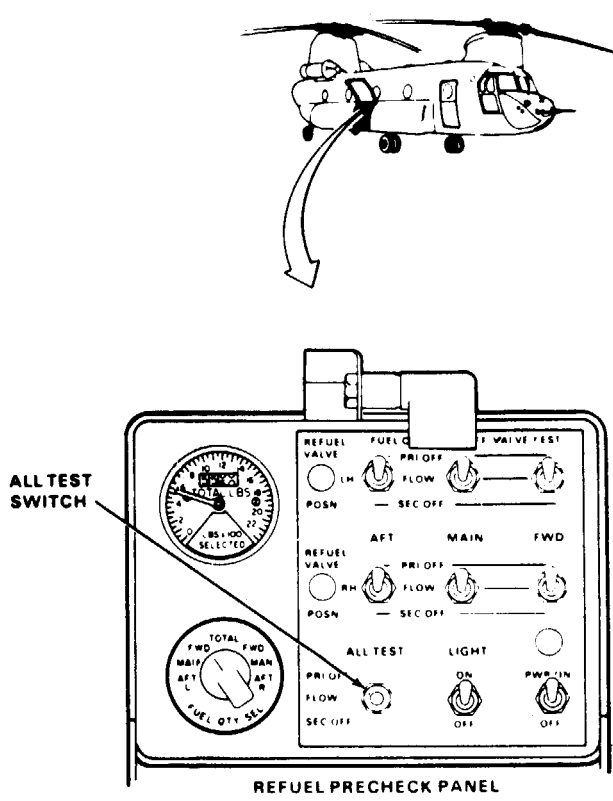
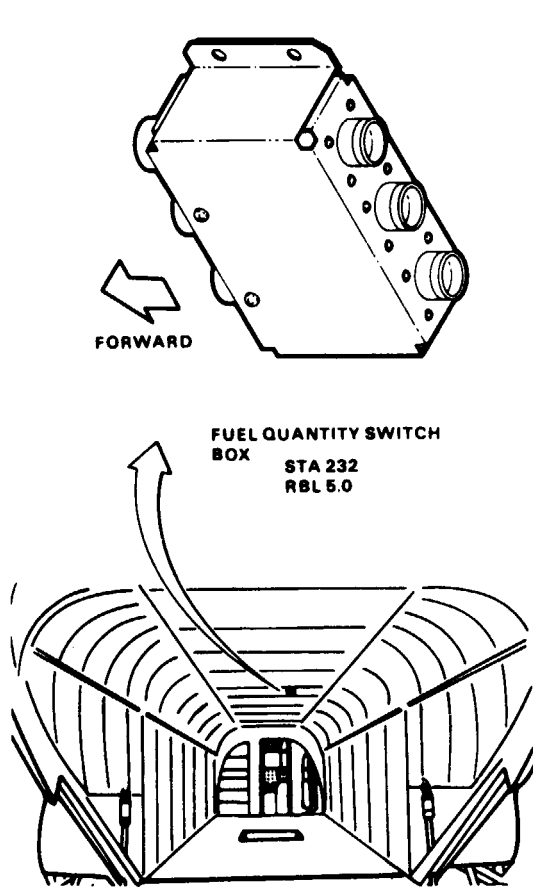
10-3.13



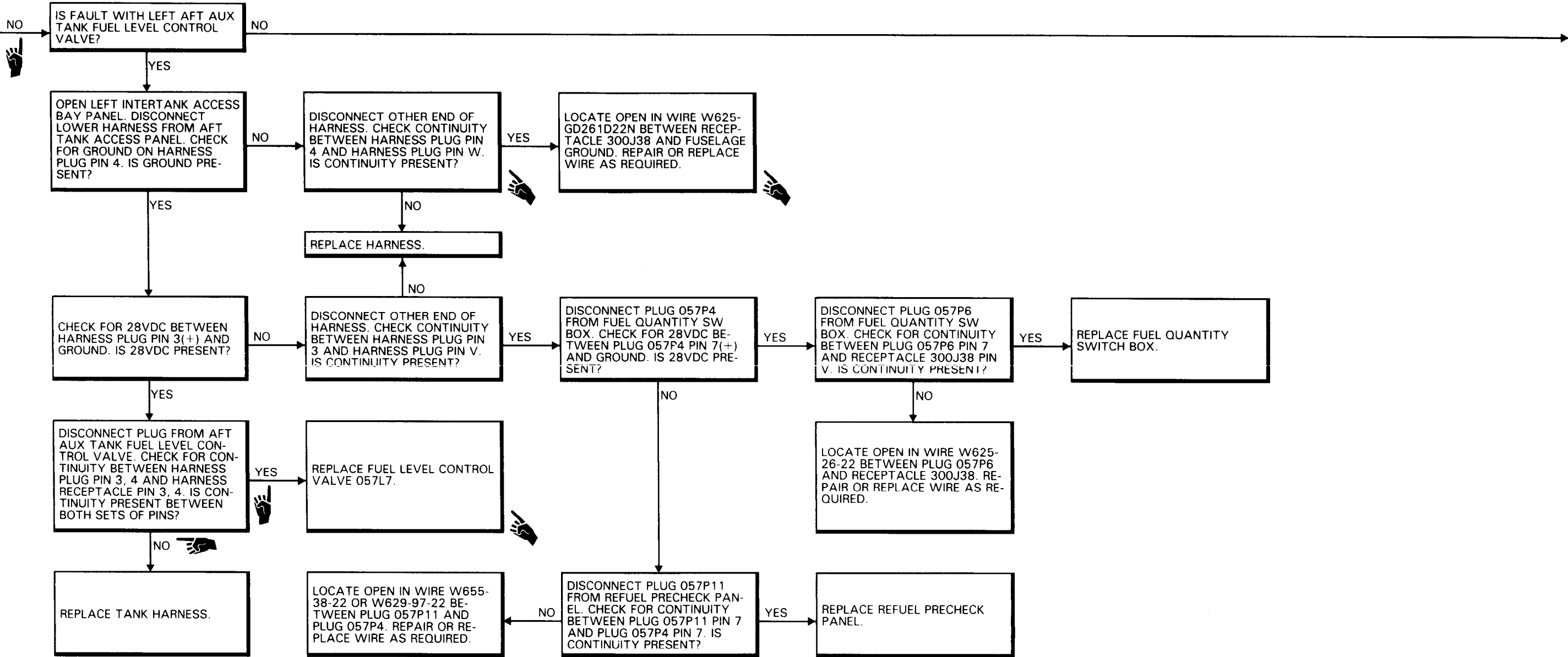


10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF (Continued)

10-3.13

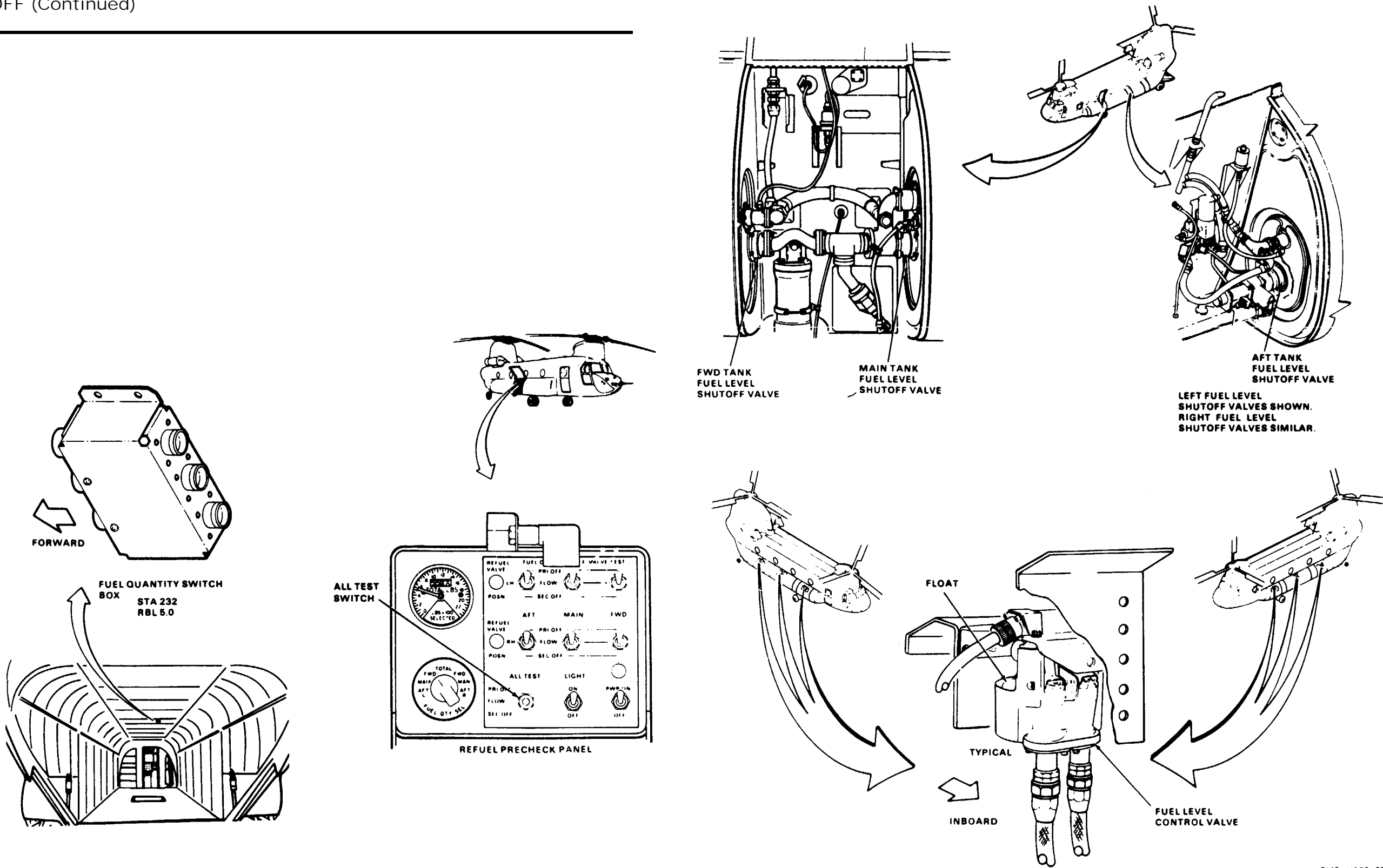


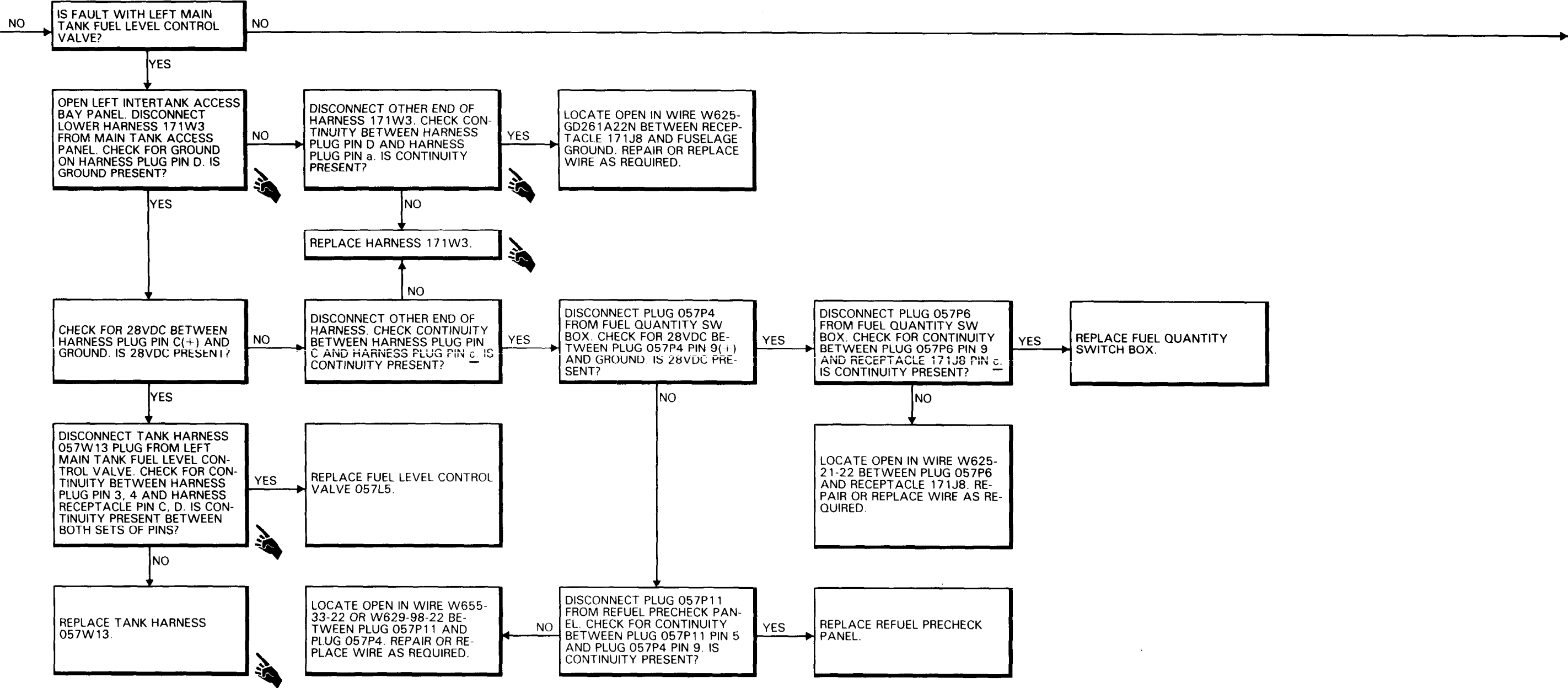




10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF (Continued)

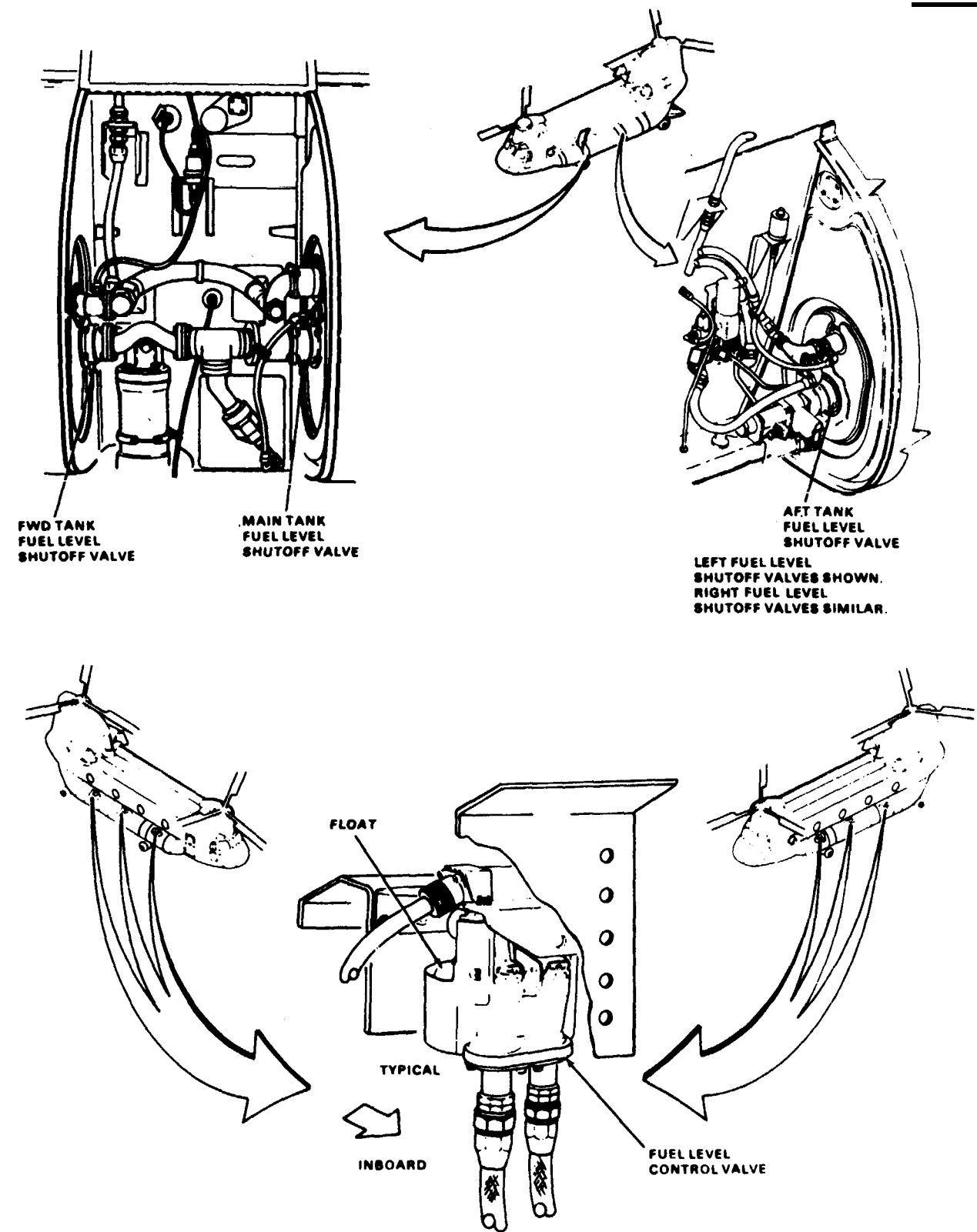
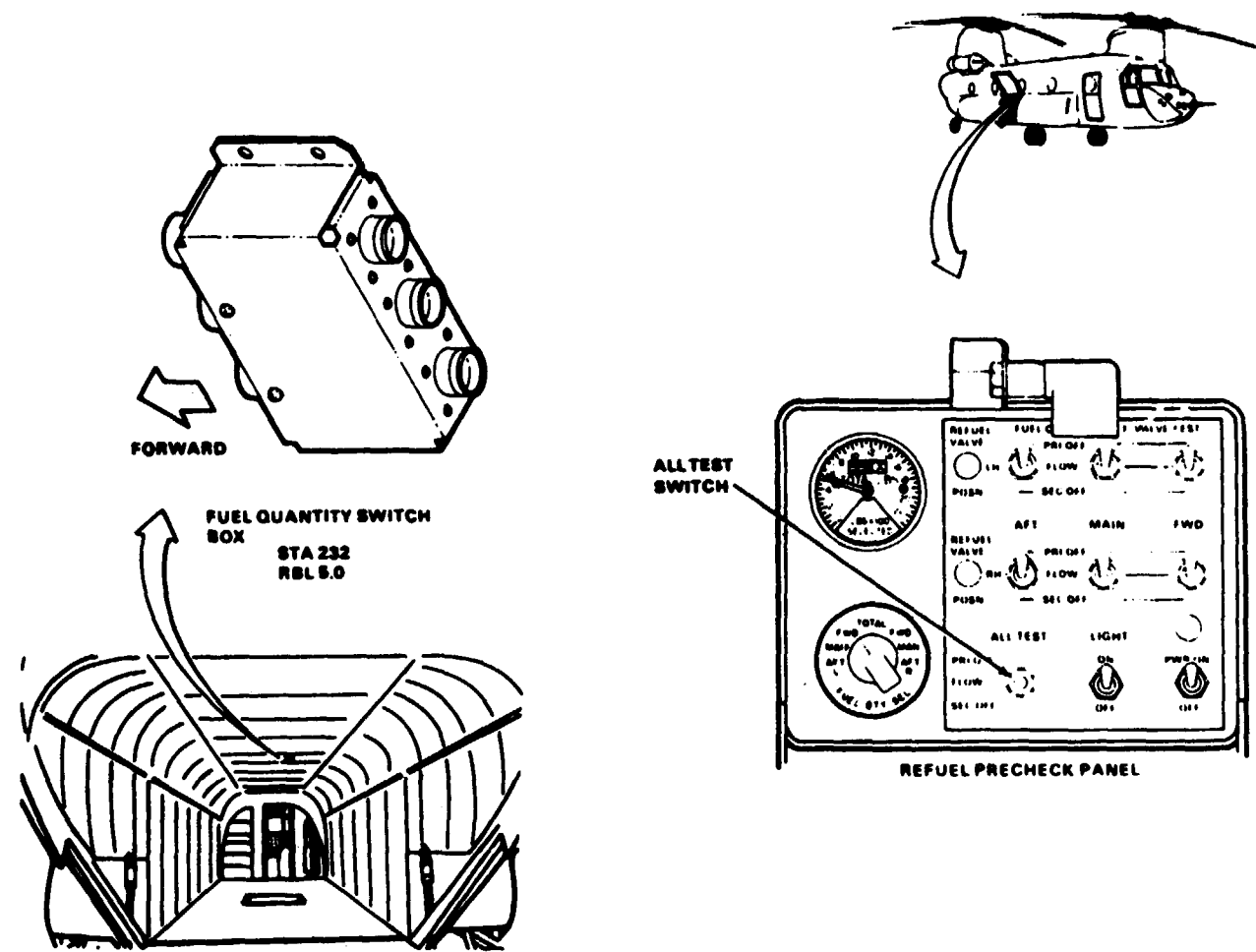
10-3.13





10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF (Continued)

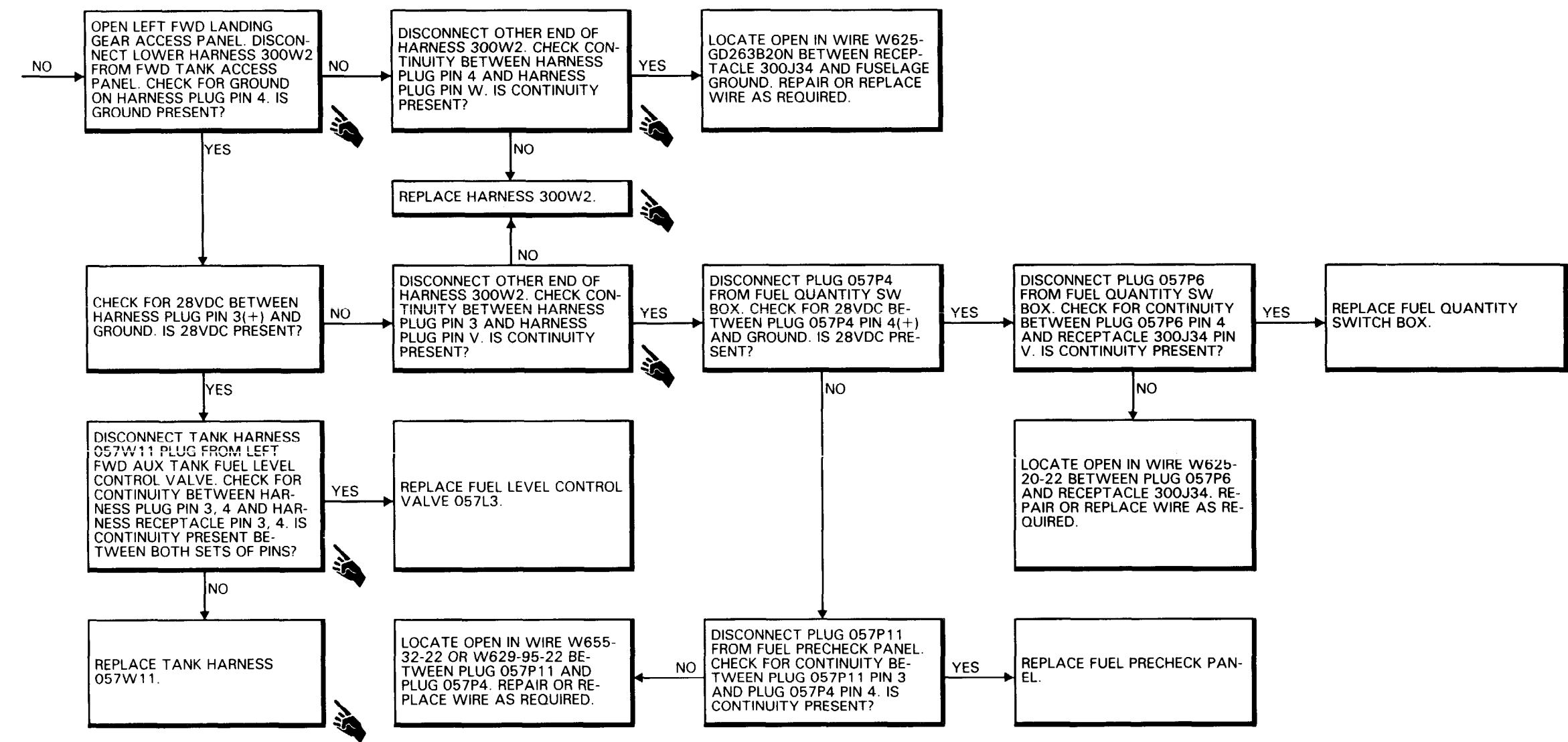
10-3.13



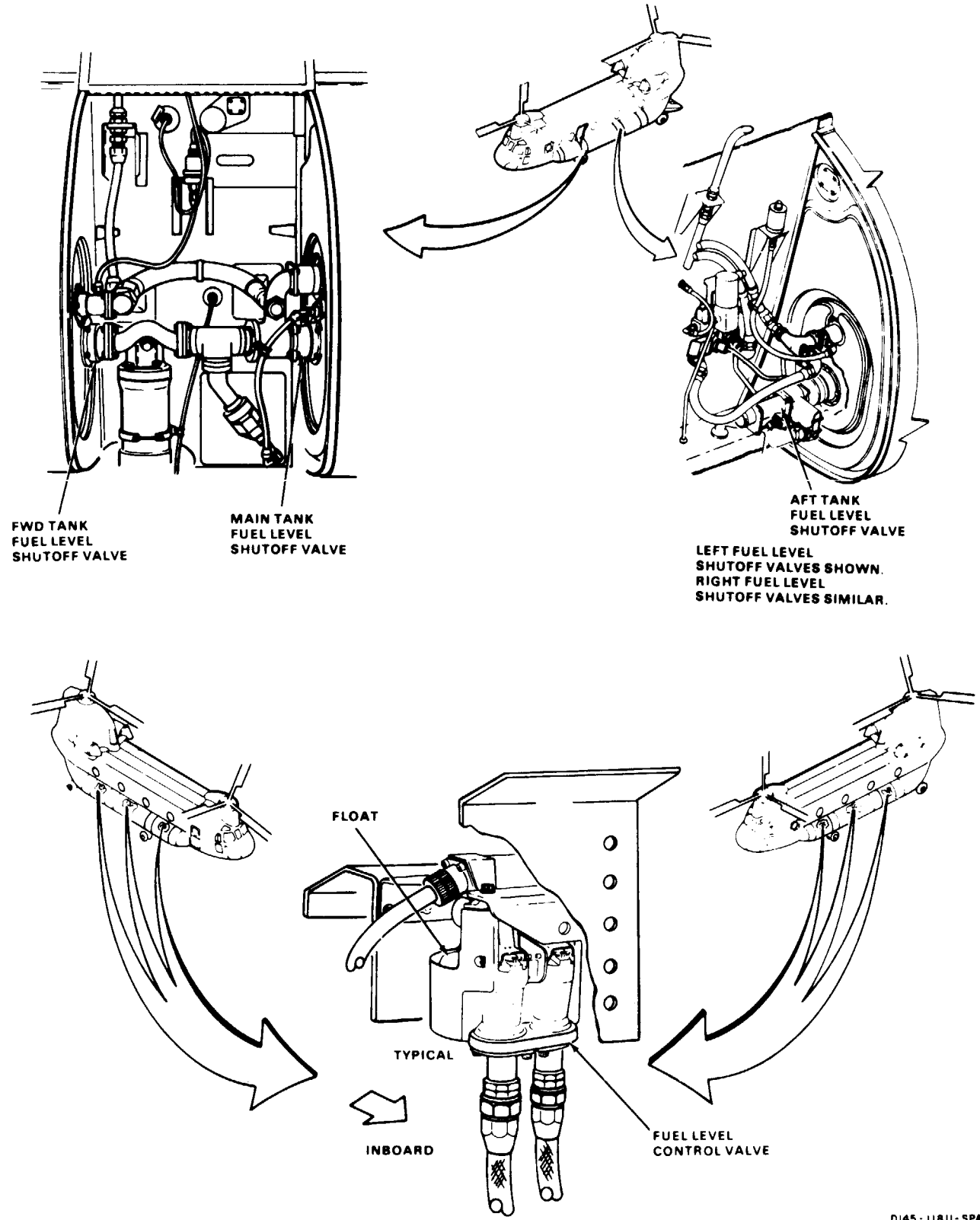
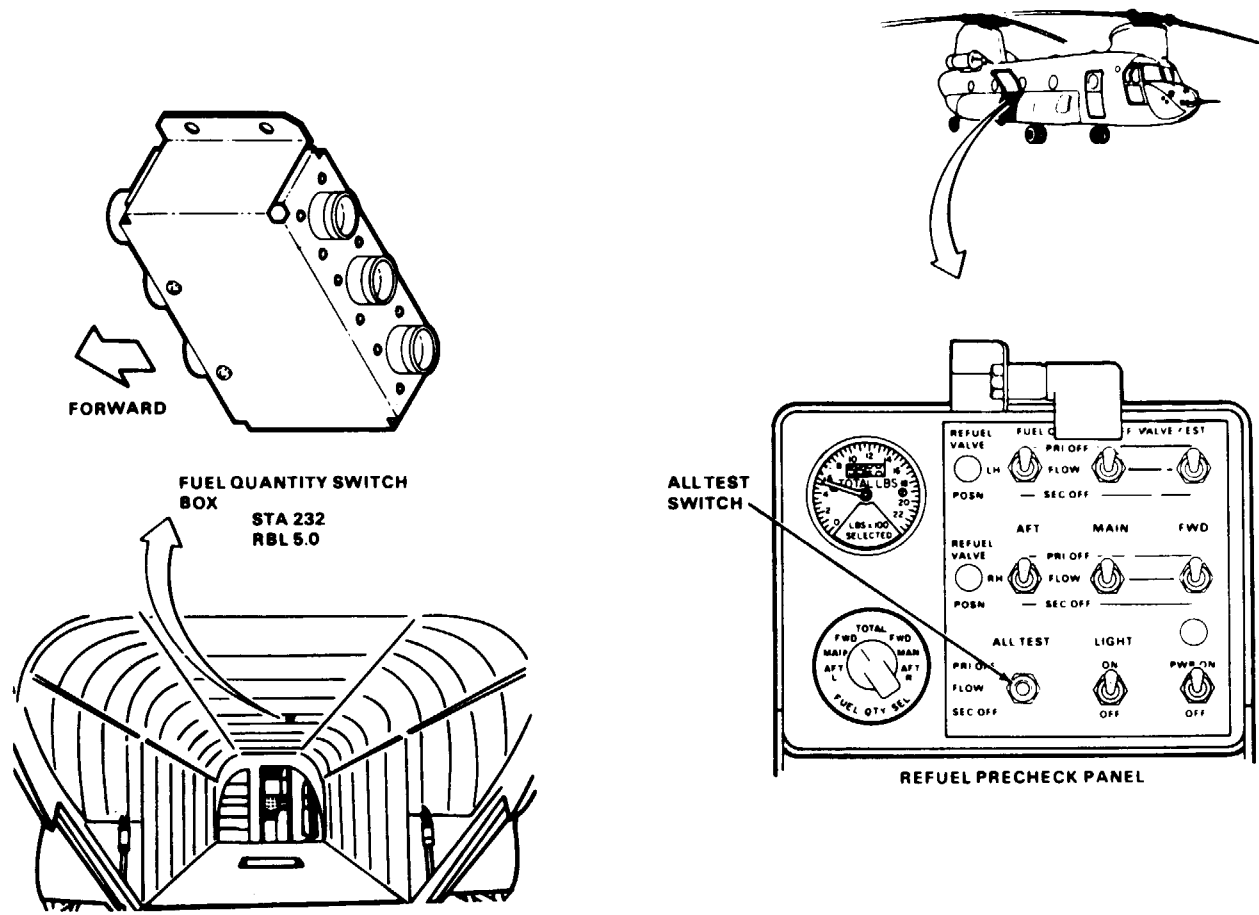
90 X 94

D145-11810-SPA

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10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF (Continued)



10-3.14 TANK WILL NOT ACCEPT FUEL WHILE PRESSURE REFUELING

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

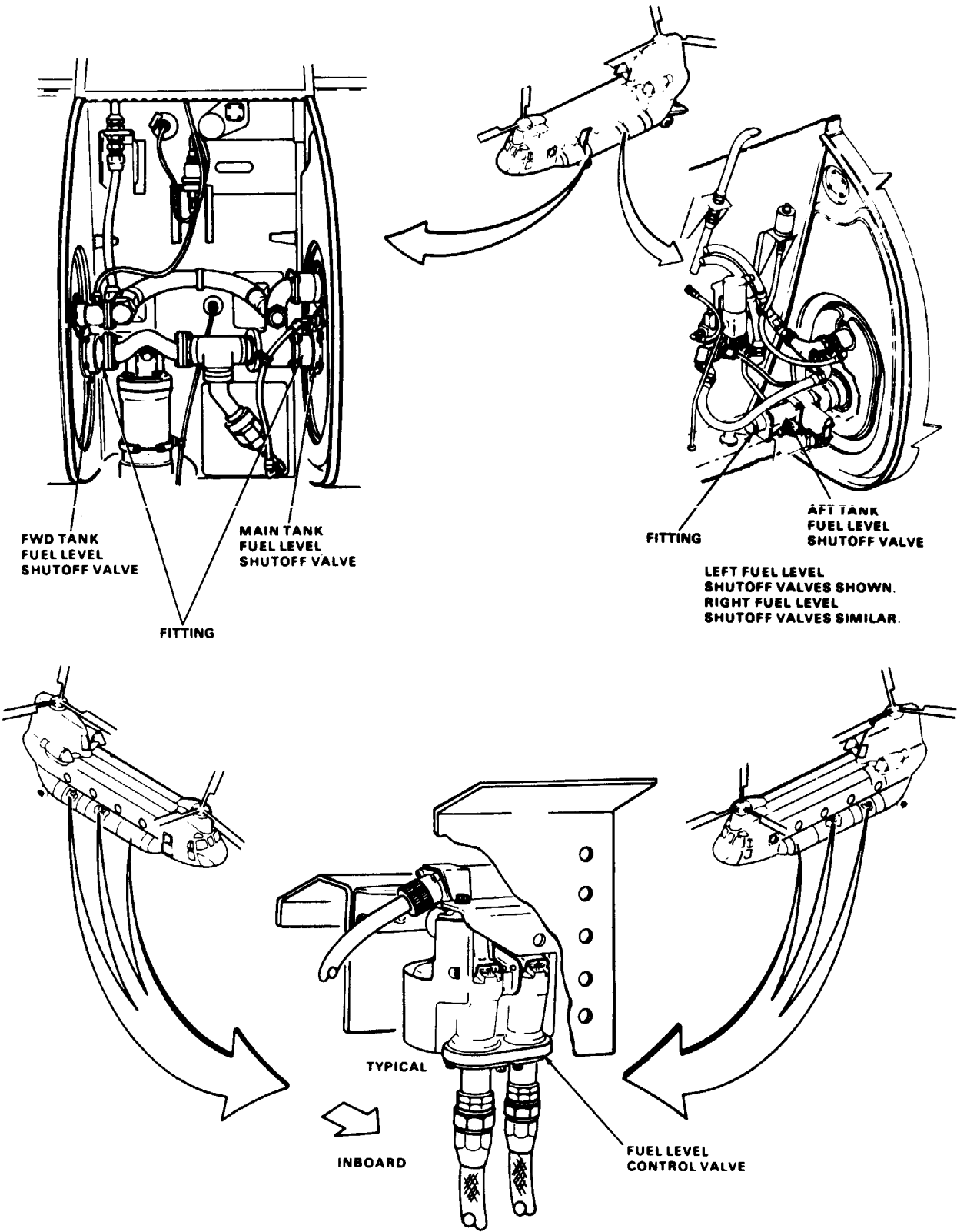
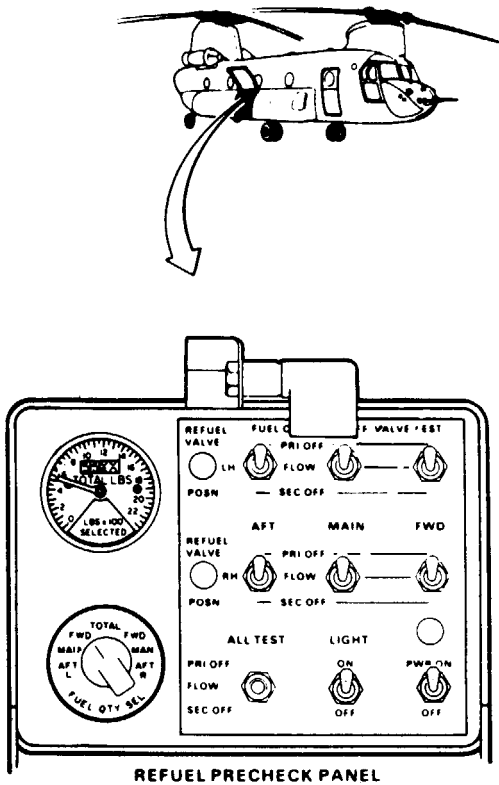
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692  
Multimeter

Materials:  
None

Personnel Required  
Medium Helicopter Repairer  
Aircraft Electrician

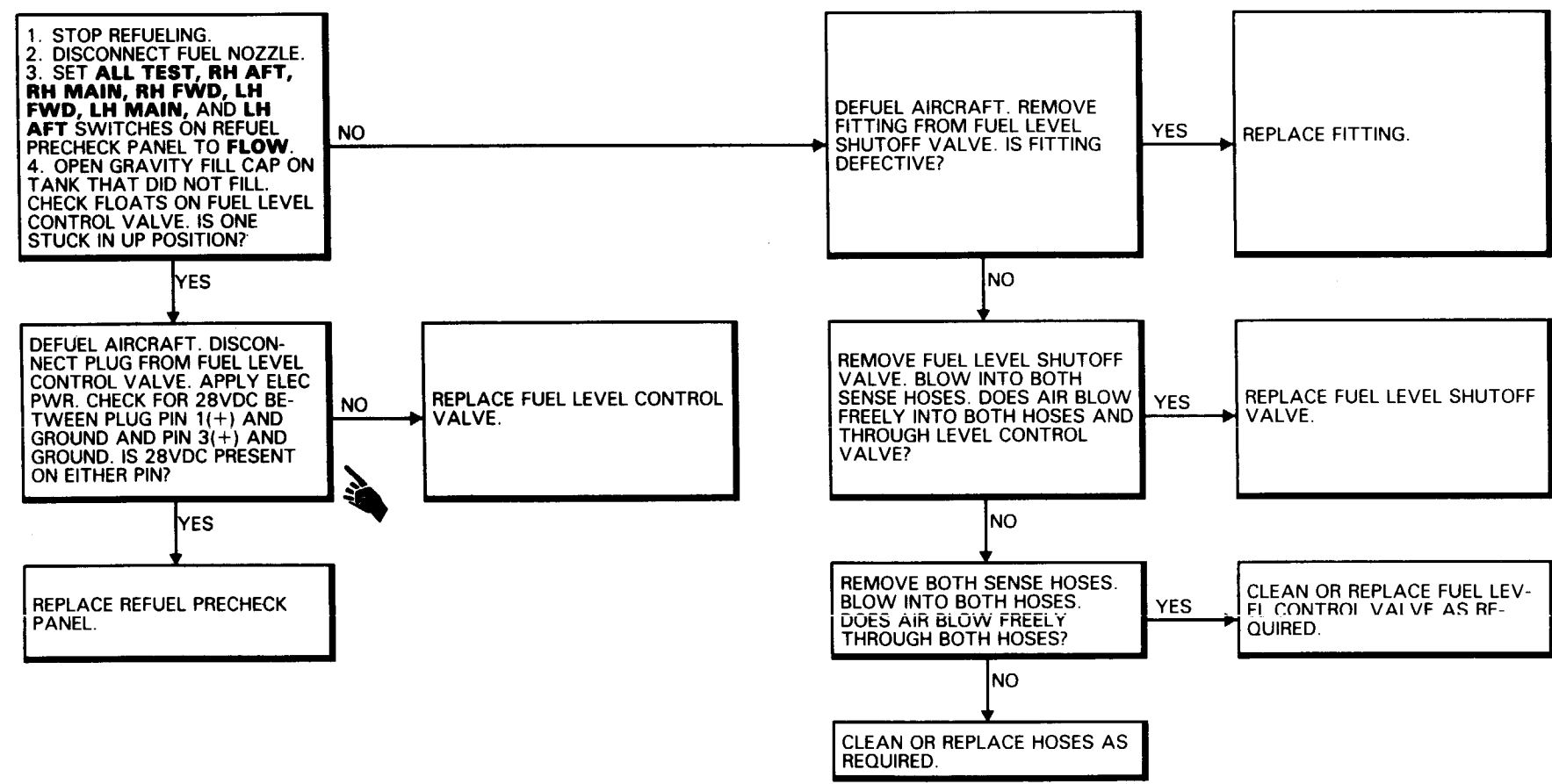
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Aircraft Being Refueled



10-3.14 TANK WILL NOT ACCEPT FUEL WHILE PRESSURE REFUELING (Continued)

10-3.14

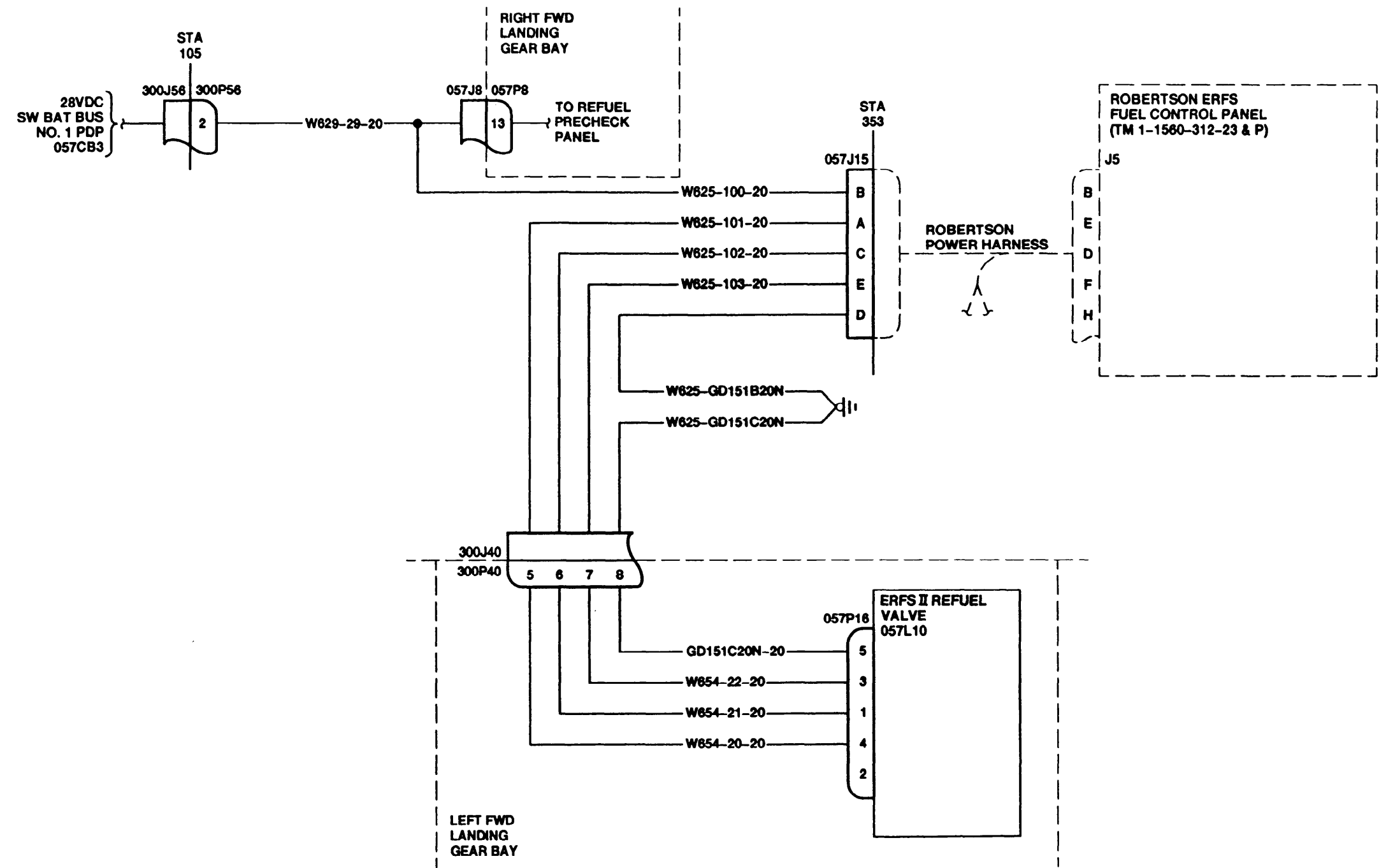




SECTION 10-4 EXTENDED RANGE FUEL SYSTEM (ERFS II) (WITH 82)

I





INITIAL SETUP

Applicable Configurations:

With 82

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

Aircraft Electrician

Refefences:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

Electrical Power Off

Battery Disconnected

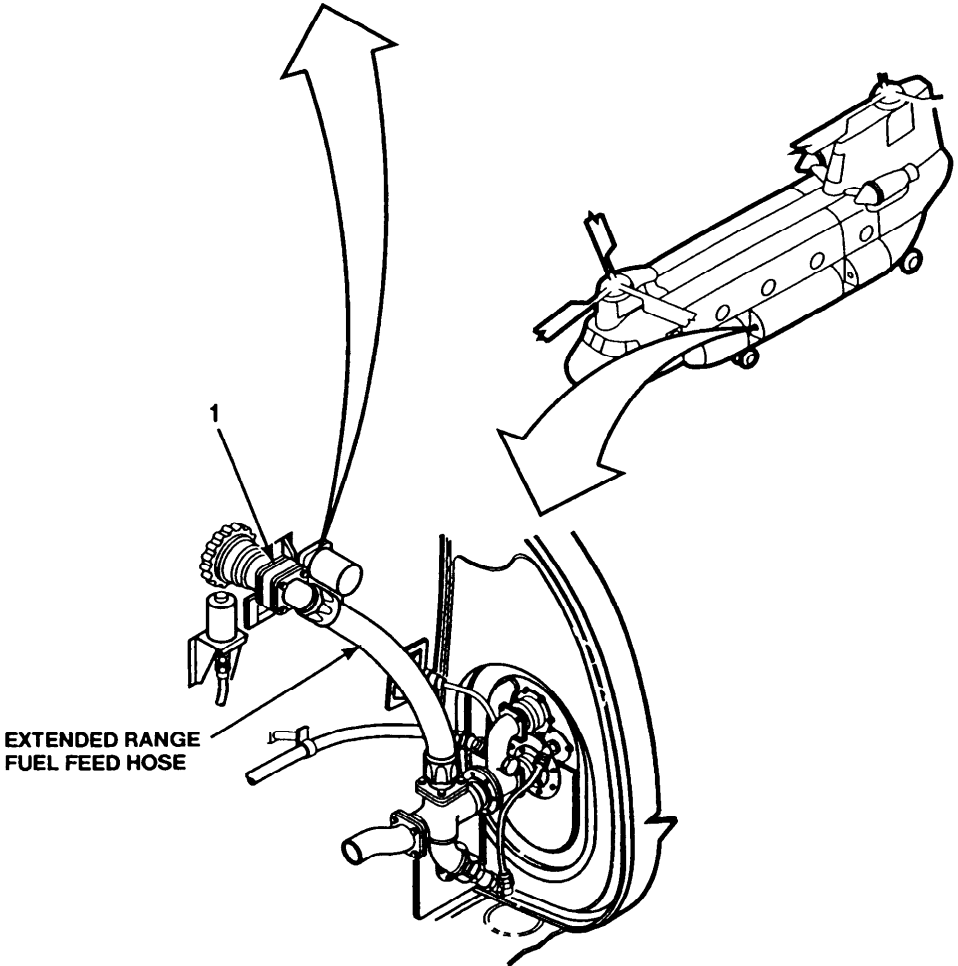
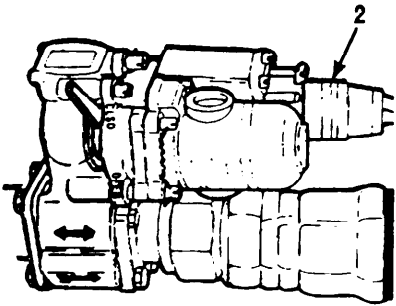
Hydraulic Power Off

Forward Left Landing Gear Access Panel Open

TASK	RESULT
1. Check ERFS II refuel valve (1).	If valve (1) is loose or damaged, tighten or replace it as required. If wiring or connector (2) is damaged, repair or replace wiring or connector as required.

FOLLOW-ON MAINTENANCE:

None



A73209

END OF TASK

INITIAL SETUP

Applicable Configurations:  
With 82

Tools:  
None

Materials:  
None

Personnel Required:  
Medium Helicopter Repairer

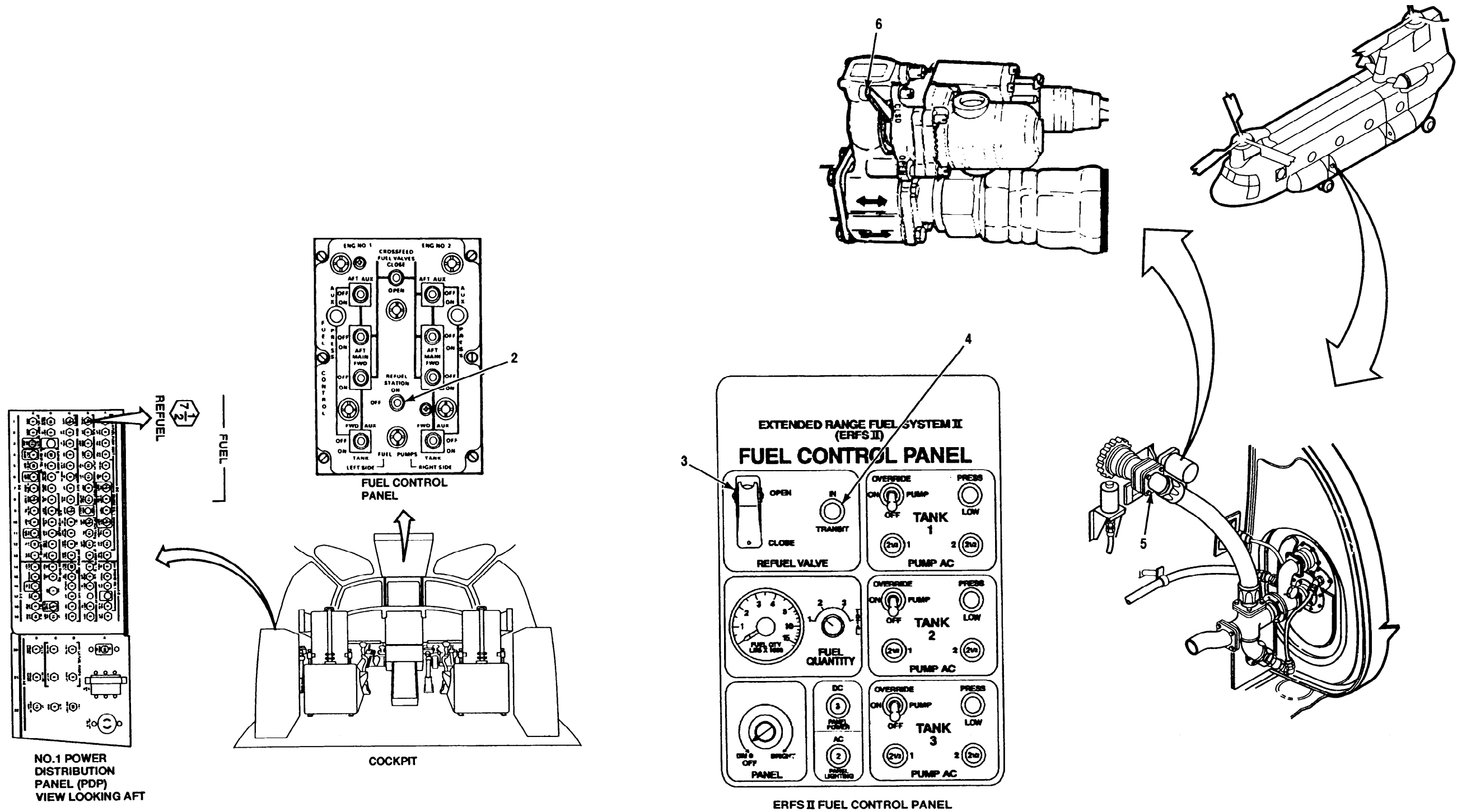
References:  
TM 55-1520-240-23

TM 1-1560-312-10

Equipment Condition:  
TM 55-1520-240-23:  
Electrical Power Off  
Battery Connected  
Hydraulic Power Off  
TM 1-1560-312-10:  
ERFS II Fuel Control Panel Connected  
Visual Check of ERFS II Airframe Components  
Performed (Task 10-4.3)

TASK	RESULT
1. Check that FUEL REFUEL circuit breaker (1) is closed.	If circuit breaker (1) is open, close it. If it opens again, go to task 10-4.5.
2. Set REFUEL STATION switch (2) to ON.	
3. Set ERFS II REFUEL VALVE switch (3) to OPEN.	IN-TRANSIT light (4) comes on during valve (5) operation and goes out when valve is open. Check that ERFS II refuel valve handle (6) is in OPEN position. If light (4) does not come on and handle is not at OPEN, go to task 10-4.6. If light comes on and stays on but handle is not at OPEN, go to task 10-4.7. If light does not come on but handle is at OPEN, go to task 10-4.8. If light comes on and stays on but handle is at OPEN, replace ERFS II refuel valve.
4 Set ERFS II REFUEL VALVE switch (3) to CLOSE.	IN-TRANSIT light (4) comes on during valve (5) operation and goes out when valve is closed. Check that ERFS II refuel valve handle (6) is in CLSD position. If light (4) does not come on and handle is not at CLSD, go to task 10-4.9. If light comes on and stays on but handle is at CLSD, replace ERFS II refuel valve.

FOLLOW-ON MAINTENANCE:  
TM 55-1520-240-23:  
Battery disconnected.



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FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

With 82

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

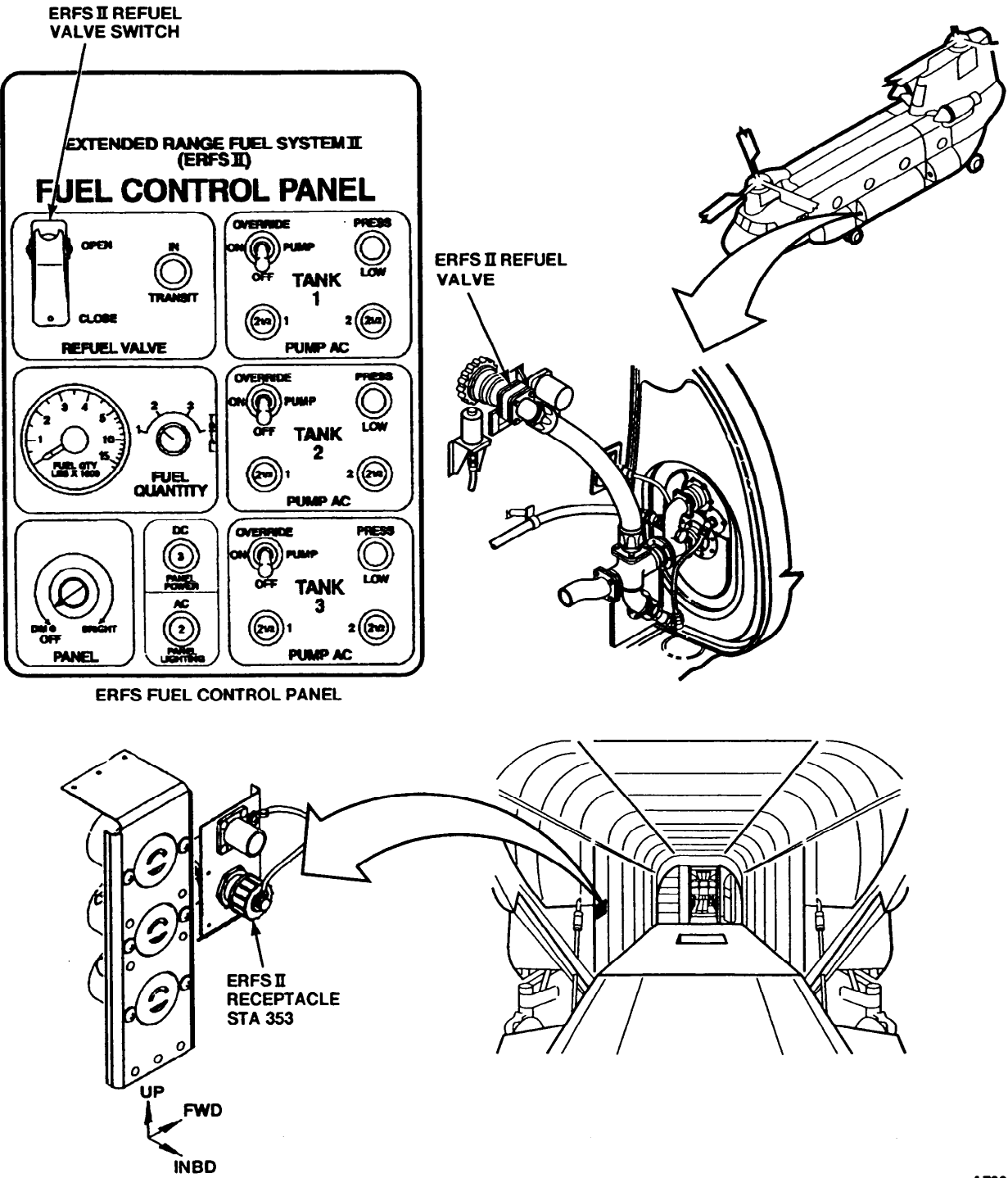
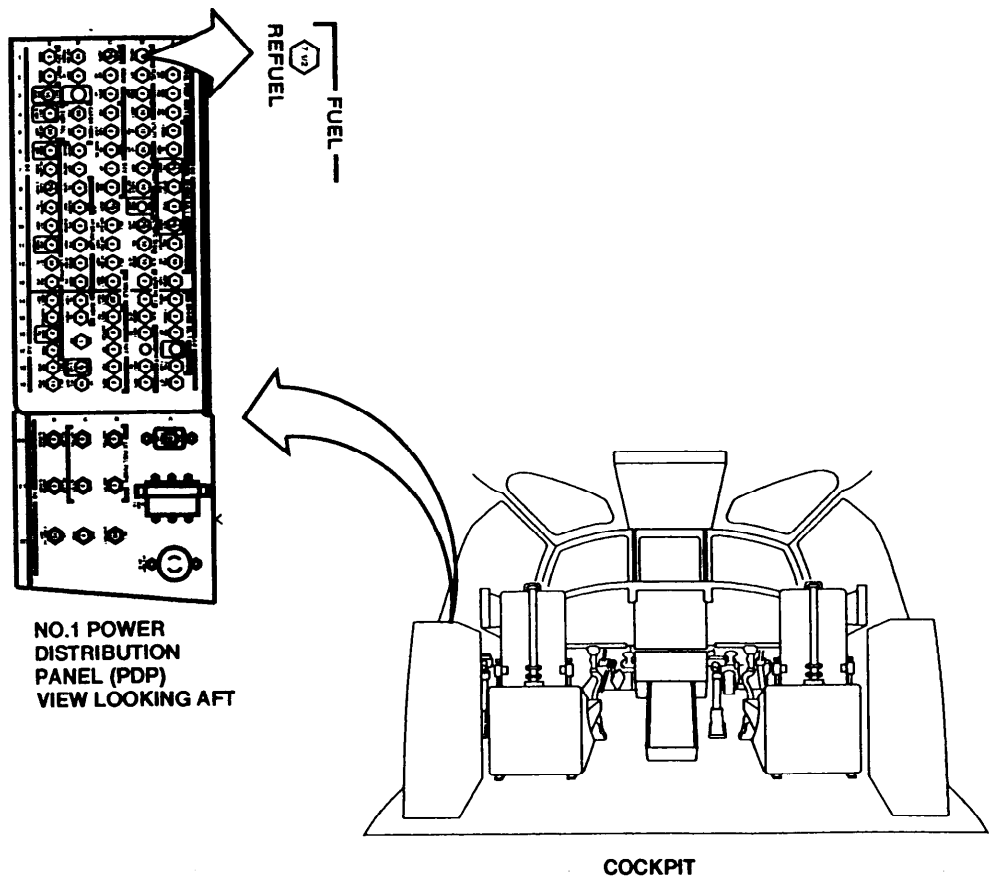
Aircraft Electrician

References:

TM 55-1520-240-23  
TM 1-1560-312-23 & P

Equipment Condition:

TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power On  
Hydraulic Power Off

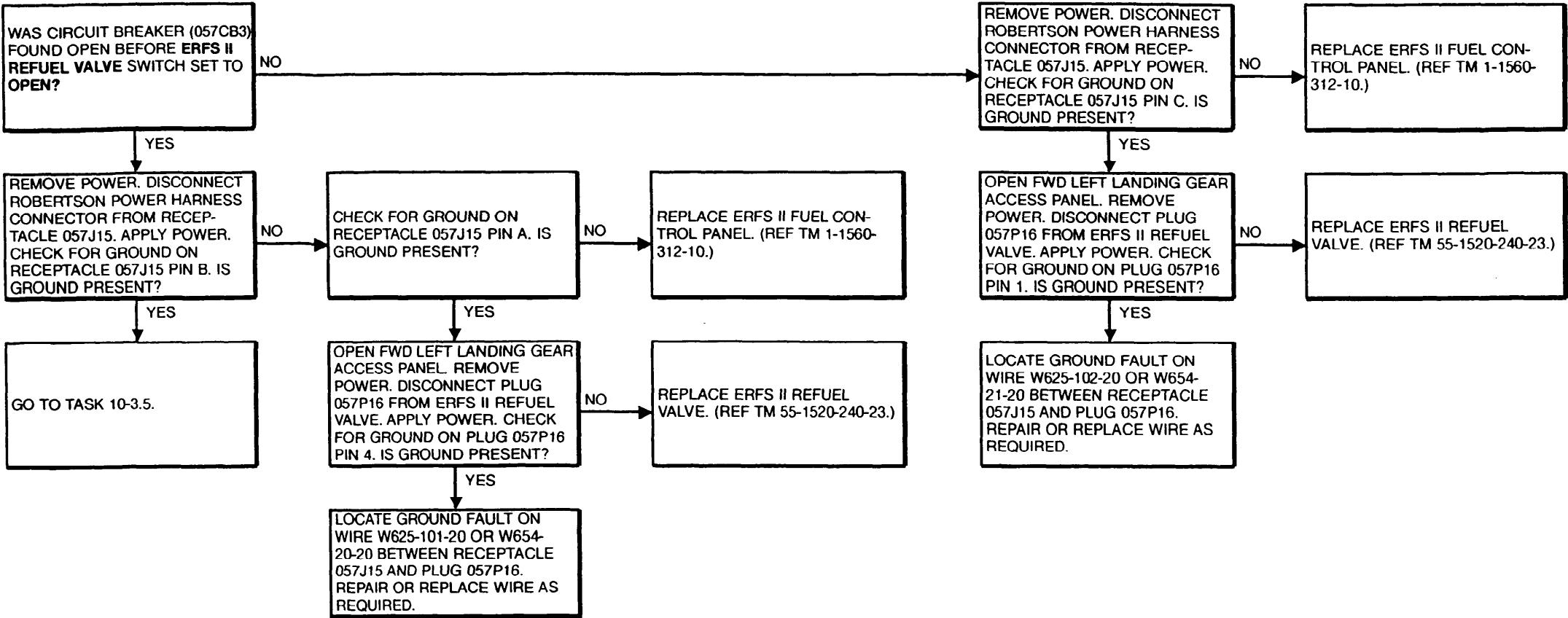


A73211

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10-4.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED WHEN ERFS II FUEL CONTROL PANEL IS CONNECTED (Continued)

10-4.5





FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

With 82

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

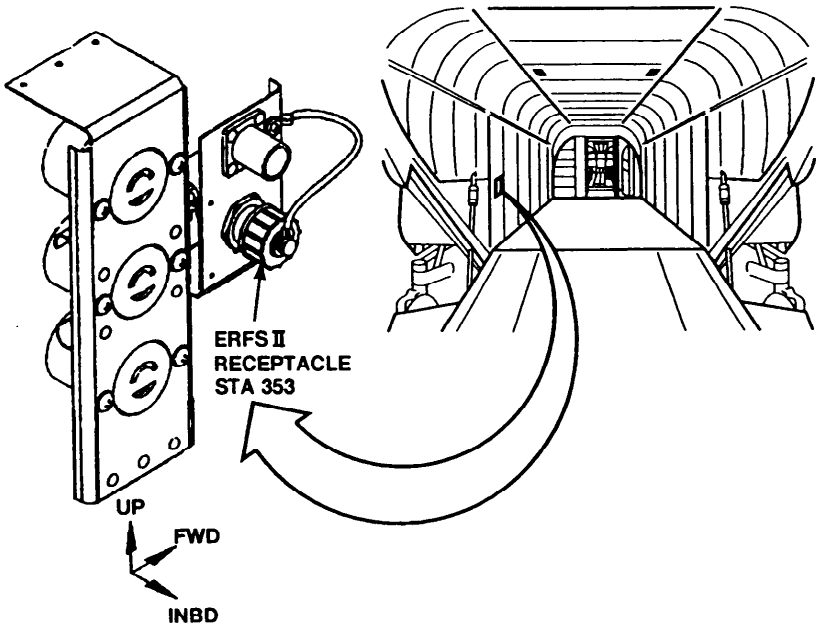
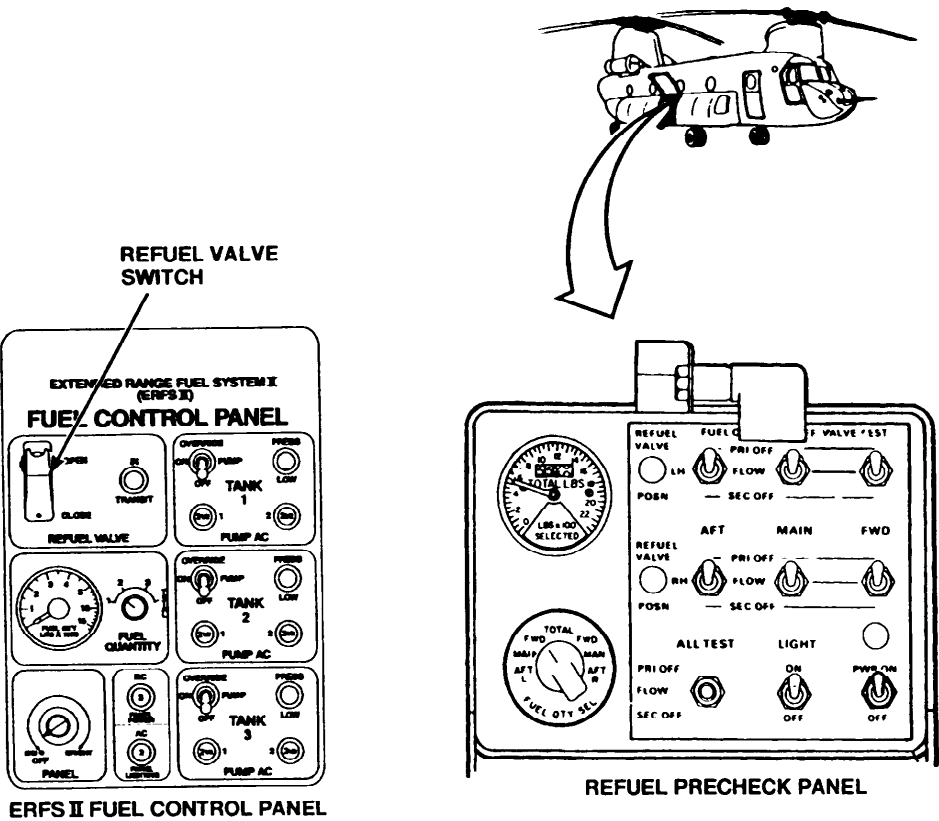
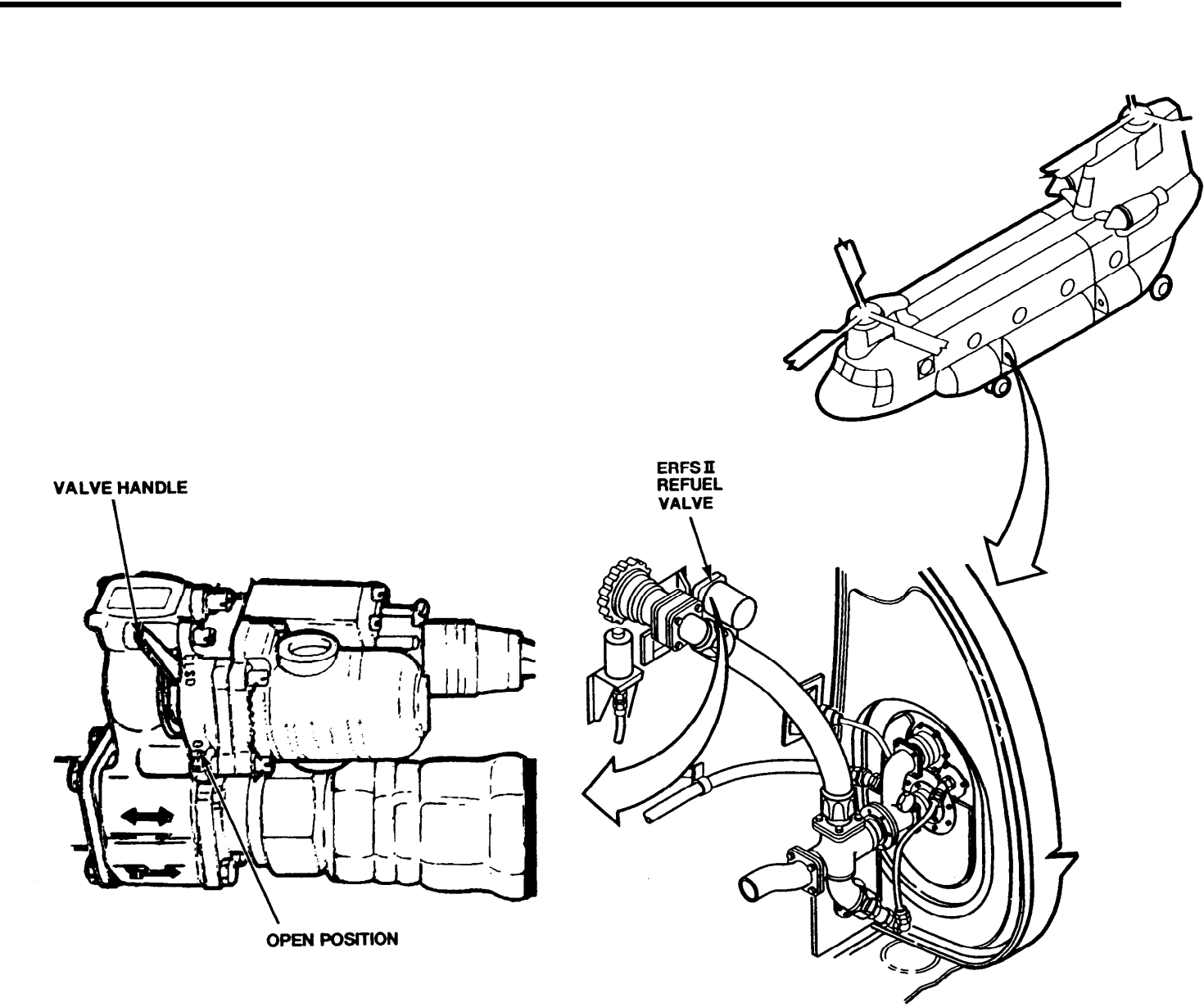
Aircraft Electrician

References:

TM 55-1520-240-23  
TM 1-1560-312-23 & P

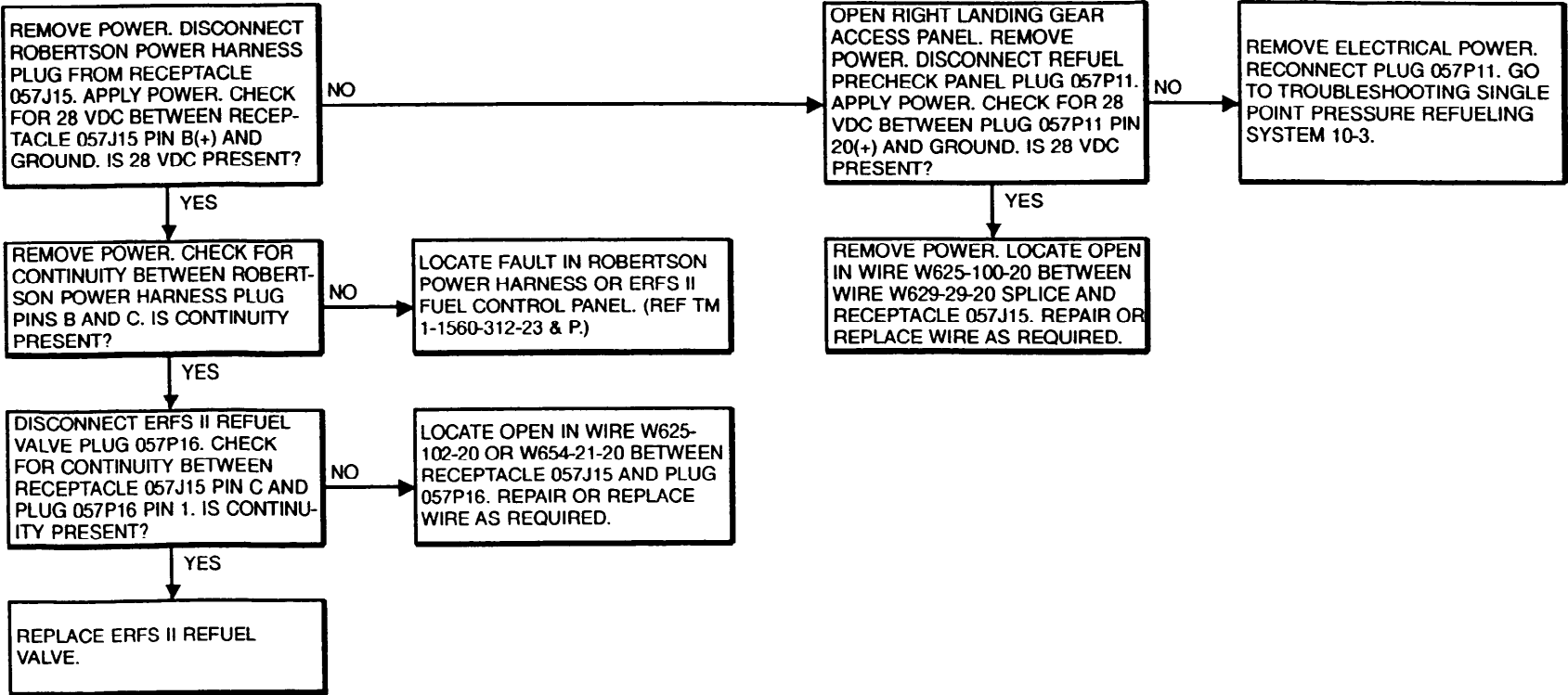
Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



A73215

GO TO NEXT PAGE



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

With 82

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

Aircraft Electrician

References:

TM 55-1520-240-23

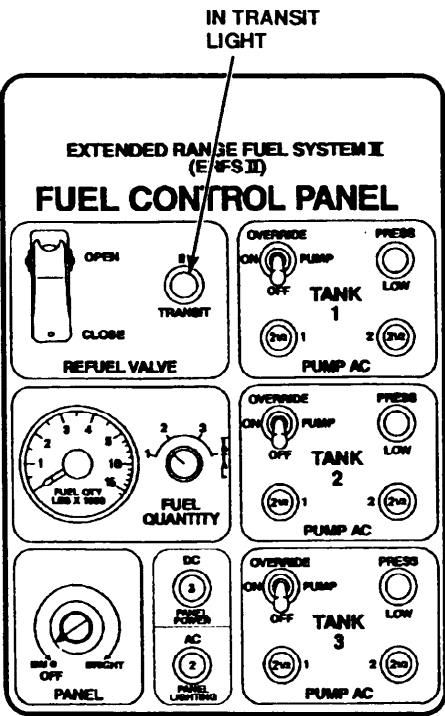
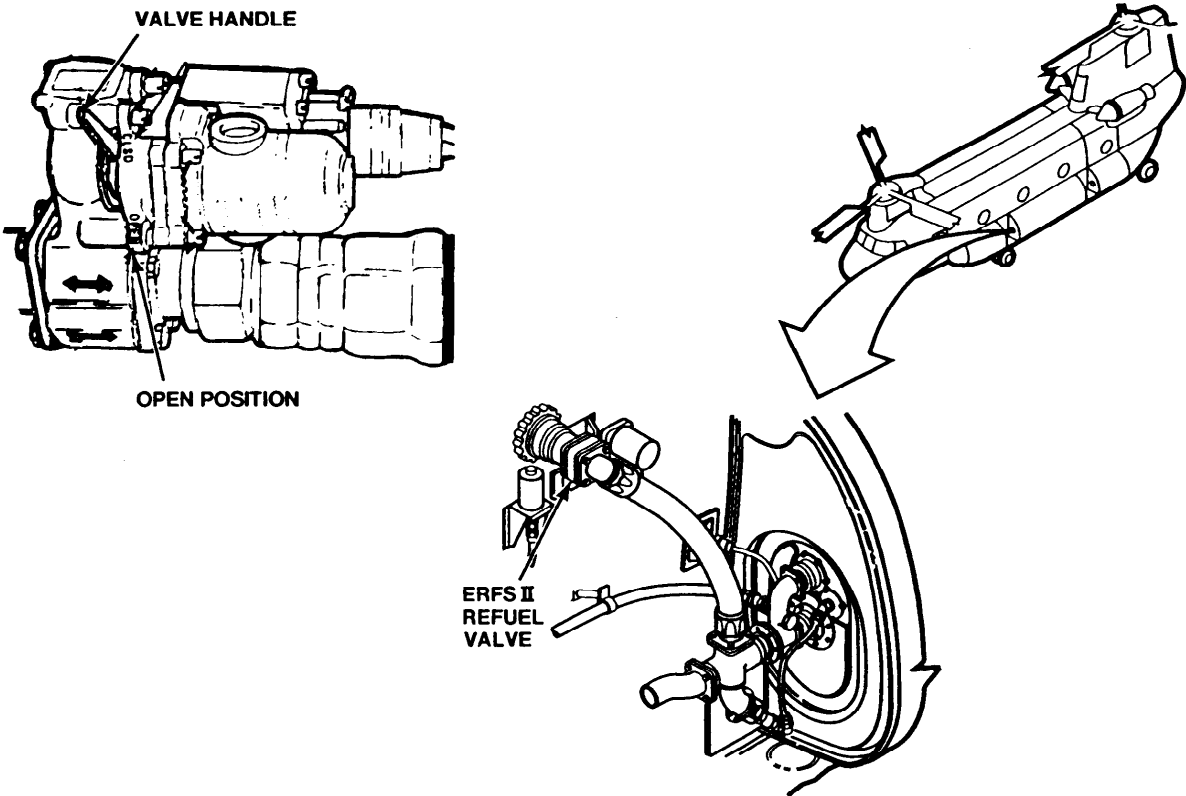
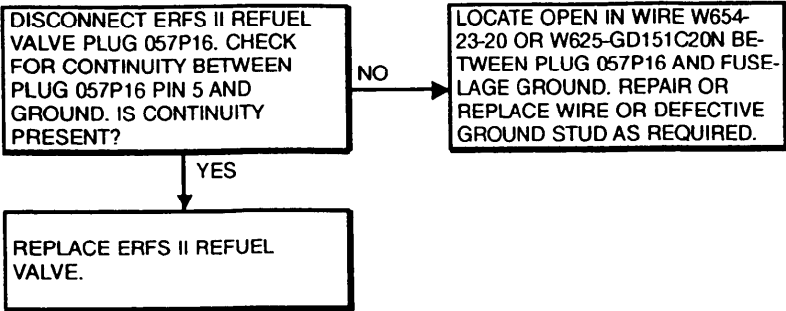
Equipment Condition:

TM 55-1520-240-23:

Battery Connected

Power Off

Hydraulic Power Off



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

With 82

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

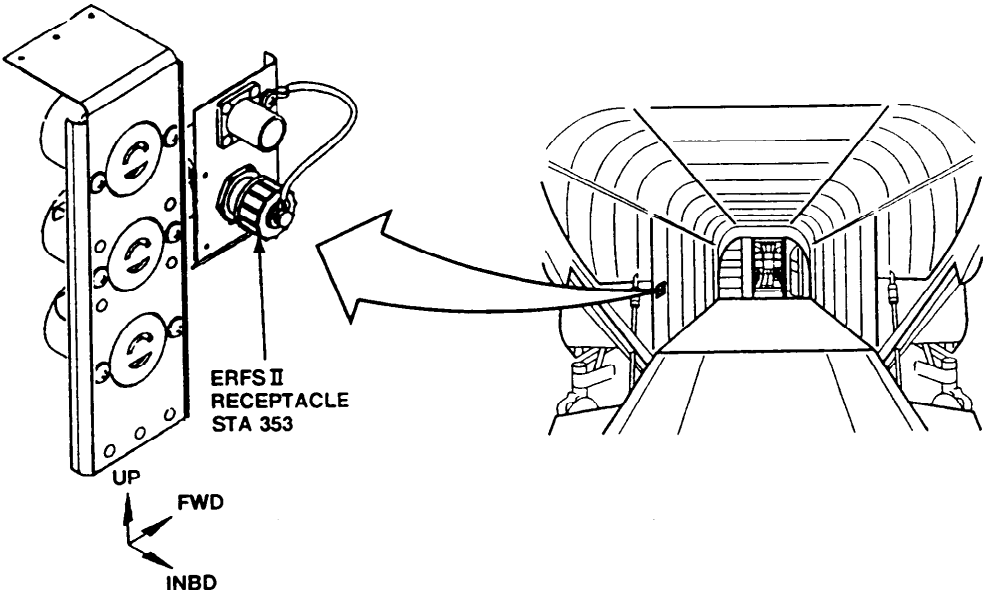
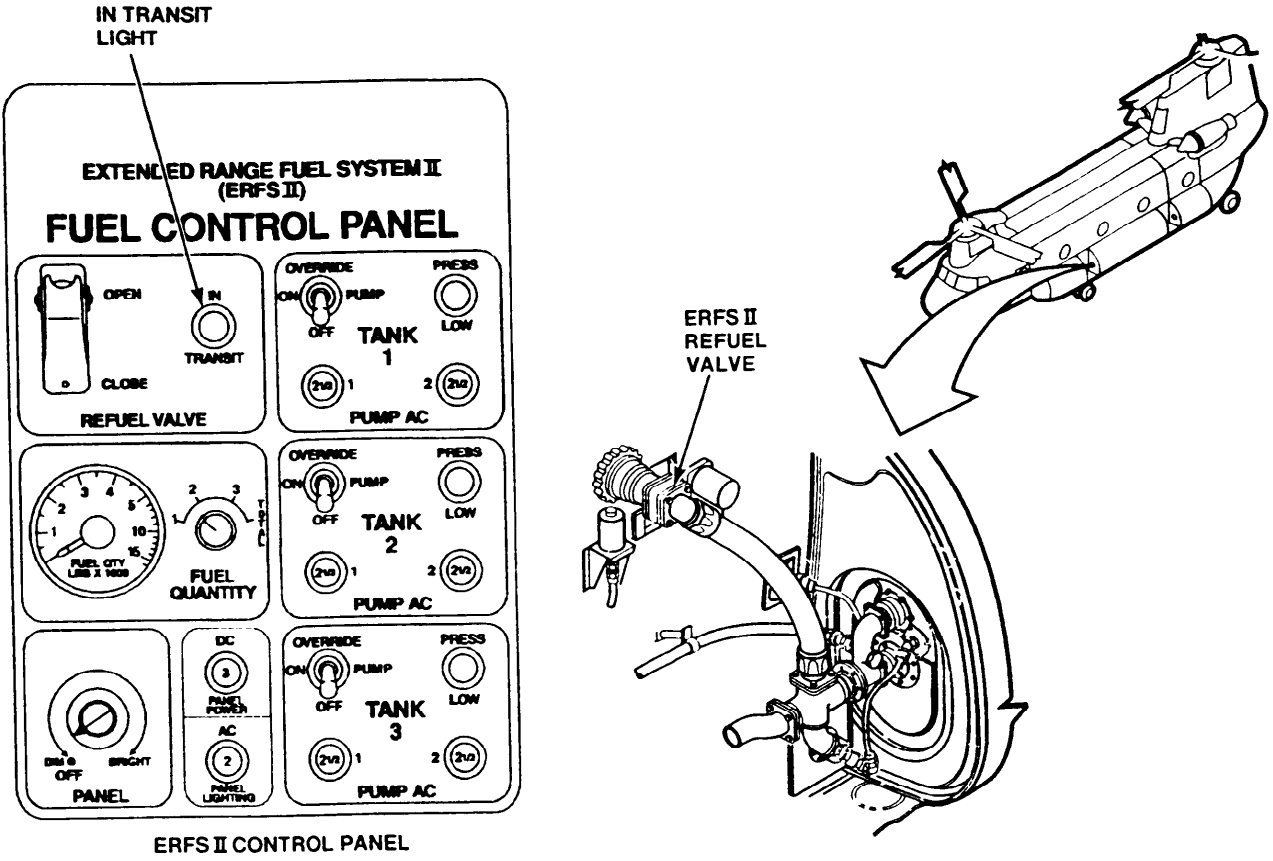
Aircraft Electrician

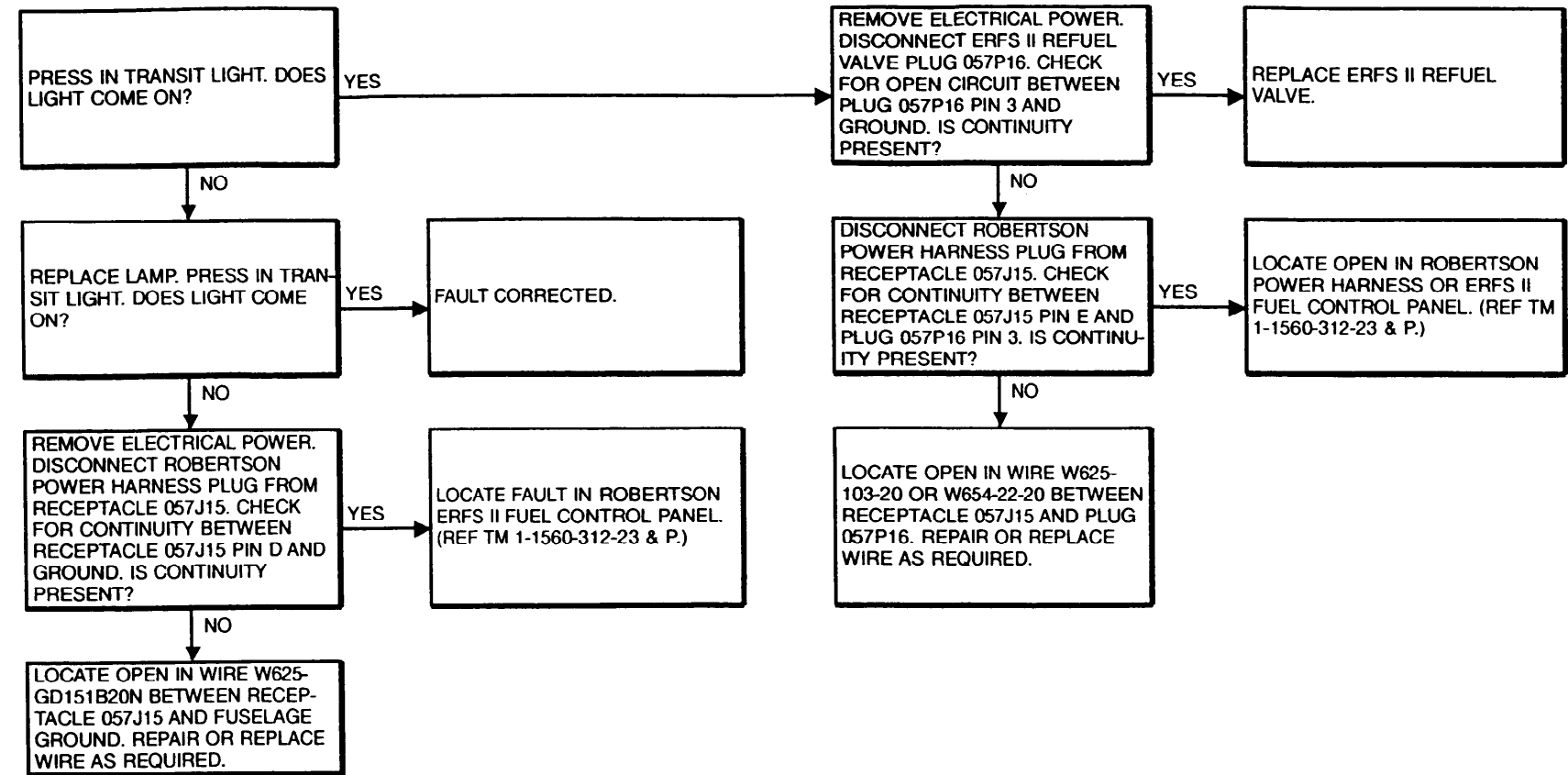
References:

TM 55-1520-240-23  
TM 1-1560-312-23 & P

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off





FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

With 82

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-3234915

Materials:

None

Personnel Required:

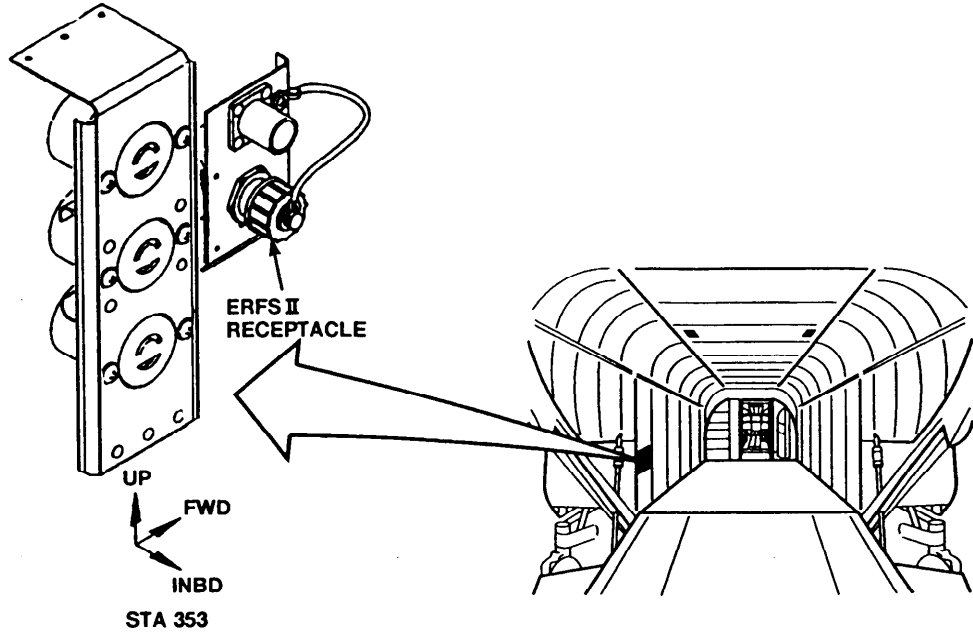
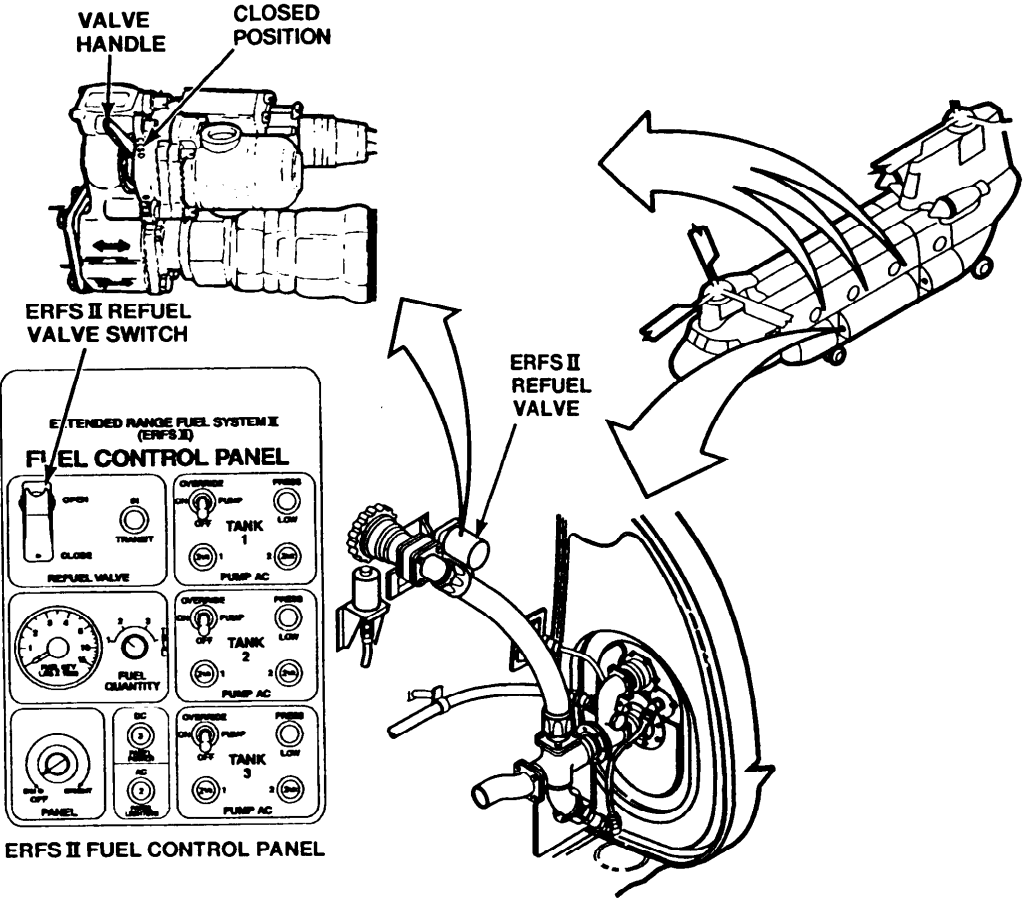
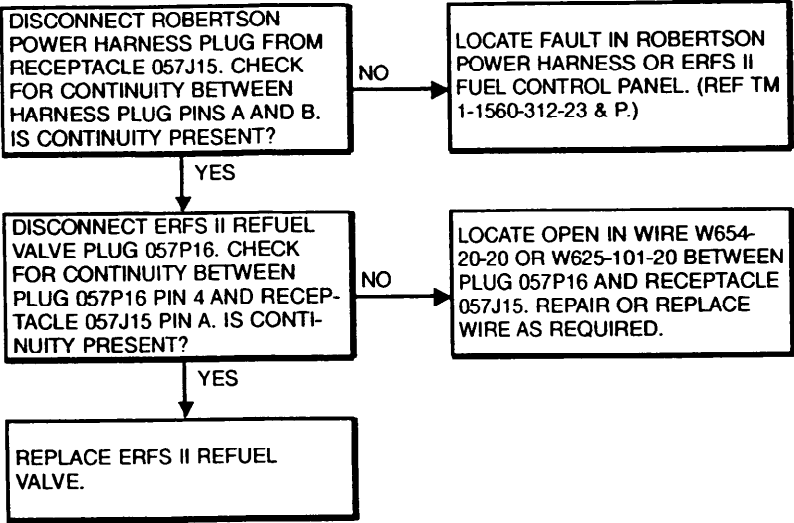
Aircraft Electrician

References:

TM 55-1520-240-23  
TM 1-1560-312-23 & P

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off



END OF TASK

# CHAPTER 11

## FLIGHT CONTROLS SYSTEMS

### TROUBLESHOOTING

CHAPTER 11

FLIGHT SYSTEM TROUBLESHOOTING

CHAPTER OVERVIEW

Chapter 11 contains procedures for Flight System troubleshooting. Each system and failure symptom is listed below. Included in this chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for the Flight System.

Refer to TM 55-1520-240-23 for required maintenance procedures.

SYMPTOM	PARA	SYMPTOM	PARA
FLIGHT CONTROL SYSTEM	11-1	AFCS CONTROL PANEL	11-4
ARTIFICIAL FEEL - MAGNETIC BRAKES	11-2	AFCS COMPUTER	11-5
ADVANCED FLIGHT CONTROLS SYSTEM (AFCS)	11-3	COCKPIT CONTROL DRIVE ACTUATOR (CCDA)	11-6

FAILURE SYMPTOM LIST

ARTIFICIAL FEEL - MAGNETIC BRAKES

SYMPTOM	TASK	SYMPTOM	TASK	SYMPTOM	TASK
CONT CENTER CIRCUIT BREAKER DOES NOT STAY CLOSED	11-2.3	CONTROL STICK WILL NOT REMAIN AT SELECTED POSITION AFTER COPILOT'S CENTERING DEVICE RELEASE SWITCH RELEASED	11-2.3	PEDALS DO NOT REMAIN AT SELECTED POSITION	11-2.3
CONTROL STICK AND PEDALS WILL NOT STAY CENTERED AFTER PILOT'S CENTERING DEVICE RELEASE SWITCH RELEASED	11-2.3	COPILOT'S THRUST CONTROL DOES NOT EASILY MOVE OR DOES NOT REMAIN AT SELECTED POSITION	11-2.3	PILOT'S THRUST CONTROL DOES NOT EASILY MOVE OR DOES NOT REMAIN AT SELECTED POSITION	11-2.3
CONTROL STICK DOES NOT REMAIN AT SELECTED POSITION	11-2.3			THRUST BRAKE CIRCUIT BREAKER DOES NOT STAY CLOSED	11-2.3



ADVANCED FLIGHT CONTROLS SYSTEM

SYMPTOM	TASK
AFCS BITE OPERATES WITH ENGINE CONDITION LEVER IN FLIGHT POSITION	11-3.3
AFCS COMPUTER BITE INDICATES 48	11-3.3
AFCS COMPUTER BITE INDICATES 6, 9, OR 18	11-3.3
AFCS COMPUTER BITE INDICATES 70-74	11-3.3
AFCS COMPUTER BITE INDICATES 95	11-3.3
AFCS HEADING HOLD WEAK OR INOPERATIVE	11-3.3
AFCS LONGITUDINAL CONTROL POSITION OUT OF TRIM	11-3.3
AFT LCT INDICATOR DOES NOT SHOW EXTENSION OR RETRACTION IN MANUAL CONTROL	11-3.3
AFT LCT INDICATOR NOT IN GND POSITION	11-3.3
AFCS LATERAL STICK ONLY TURNS NOT COORDINATED	11-3.3
AFCS NO. 1 DC CIRCUIT BREAKER WILL NOT STAY CLOSED	11-3.3
AFCS NO. 2 DC CIRCUIT BREAKER WILL NOT STAY CLOSED	11-3.3
AFCS PITCH STABILIZATION ERRATIC OR OSCILLATORY	11-3.3
AFCS ROLL STABILIZATION ERRATIC/OSCILLATORY OR ROLL ATTITUDE HOLD WEAK OR INOPERATIVE	11-3.3
BAROMETRIC ALTITUDE HOLD INOPERATIVE OR RESPONSE ERRATIC (RADAR ATTITUDE HOLD OKAY)	11-3.3
BAROMETRIC AND RADAR ALTITUDE HOLD INOPERATIVE OR RESPONSE ERRATIC	11-3.3

SYMPTOM	TASK
BOTH LCT INDICATORS NOT IN GROUND POSITION	11-3.3
CLTV DRIVER ACTR AC CIRCUIT BREAKER WILL NOT STAY CLOSED	11-3.3
CLTV DRIVER ACTR CIRCUIT BREAKER WILL NOT STAY CLOSED	11-3.3
CYCLIC TRIM AFT ACTR CIRCUIT BREAKER WILL NOT STAY CLOSED	11-3.3
CYCLIC TRIM FWD ACTR CIRCUIT BREAKER WILL NOT STAY CLOSED	11-3.3
CYCLIC TRIM MNL CIRCUIT BREAKER WILL NOT STAY CLOSED	11-3.3
FORWARD LCT INDICATOR DOES NOT INDICATE EXTEND OR RETRACT DURING MANUAL CONTROL	11-3.3
FORWARD LCT INDICATOR NOT IN GND POSITION	11-3.3
HDG SWITCH ENGAGE CAPTION DOES NOT LIGHT	11-3.3
HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE (BOTH SYSTEMS)	11-3.3
NO. 1 AFCS AC CIRCUIT BREAKER WILL NOT STAY CLOSED	11-3.3
NO. 1 AFCS COMPUTER BITE INDICATES 85 OR 86	11-3.3
NO. 1 AFCS COMPUTER BITE INDICATES 87	11-3.3
NO. 1 AFCS COMPUTER BITE INDICATES 89	11-3.3

SYMPTOM	TASK
NO. 1 AFCS COMPUTER BITE SWITCH DOES NOT LIGHT AND COUNTER DOES NOT STOP WHEN BITE SWITCH PRESSED AND RELEASED	11-3.3
NO. 1 AFCS HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE	11-3.3
NO. 1 AFCS OFF (WITHOUT 74) OR AFCS 1 (WITH 74) CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED	11-3.3
NO. 1 AFCS OFF (WITHOUT 74) OR AFCS 1 (WITH 74) CAPSULE IS OUT WITH SYSTEM SELECTED OFF	11-3.3
NO. 1 AFCS PITCH ATTITUDE/AIR SPEED HOLD WEAK OR INOPERATIVE	11-3.3
NO. 1 AFCS YAW STABILITY ERRATIC/OSCILLATORY	11-3.3
NO. 1 PITCH ILCA HAS ENGAGE TRANSIENT	11-3.3
NO. 1 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION	11-3.3
NO. 1 ROLL ILCA DOES NOT MOVE WHEN PILOT'S PITCH AND ROLL TRIM SWITCH MOVED RIGHT OR LEFT	11-3.3
NO. 1 ROLL ILCA HAS ENGAGE TRANSIENT	11-3.3

ADVANCED FLIGHT CONTROLS SYSTEM (Continued)

SYMPTOM	TASK
NO. 1 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED	11-3.3
NO. 1 YAW ILCA HAS ENGAGE TRANSIENT	11-3.3
NO. 2 AFCS AC CIRCUIT BREAKER WILL NOT STAY CLOSED	11-3.3
NO. 2 AFCS COMPUTER BITE INDICATES 85 OR 86	11-3.3
NO. 2 AFCS COMPUTER BITE INDICATES 89	11-3.3
NO. 2 AFCS COMPUTER BITE SWITCH DOES NOT LIGHT AND COUNTER DOES NOT STEP WHEN BITE SWITCH IS PRESSED AND RELEASED	11-3.3
NO. 2 AFCS HEADING SELECT MOVE RESPONSE WEAK OR INOPERATIVE	11-3.3

SYMPTOM	TASK
NO. 2 AFCS OFF (WITHOUT 74) OR AFCS 2 (WITH 74) CAP-SULE DOES NOT GO OUT WHEN SYSTEM SELECTED	11-3.3
NO. 2 AFCS OFF (WITHOUT 74) OR AFCS 2 (WITH 74) CAP-SULE IS OUT WITH SYSTEM SELECTED OFF	11-3.3
NO. 2 AFCS PITCH ATTITUDE/AIR SPEED HOLD WEAK OR INOPERATIVE	11-3.3
NO. 2 AFCS YAW STABILITY ERRATIC/OSCILLATORY	11-3.3
NO. 2 PITCH ILCA HAS ENGAGE TRANSIENT	11-3.3
NO. 2 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION	11-3.3

SYMPTOM	TASK
NO. 2 ROLL ILCA DOES NOT MOVE WHEN PILOT'S OR CO-PILOT'S PITCH AND ROLL TRIM SWITCH MOVED RIGHT OR LEFT	11-3.3
NO. 2 ROLL ILCA HAS ENGAGE TRANSIENT	11-3.3
NO. 2 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED	11-3.3
NO. 2 YAW ILCA HAS ENGAGE TRANSIENT	11-3.3
PITCH AND ROLL CONTROL STICK DOES NOT MOVE FORWARD OR AFT WHEN PILOT'S OR COPILOT'S PITCH AND ROLL TRIM SWITCH IS MOVED FORWARD AND AFT	11-3.3
RADAR ALTITUDE HOLD INOPERATIVE OR RESPONSE ER-RATIC (BAROMETRIC ALTITUDE HOLD OKAY)	11-3.3
RADAR OR BARO ALT ENGAGED CAPTIONS DO NOT COME ON WHEN PRESSED	11-3.3

AFCS CONTROL PANEL

SYMPTOM	TASK
AFCS CONTROL PANEL FAILS BAROMETRIC ALTI- TUDE TESTS	11-4.2
AFCS CONTROL PANEL FAILS CYCLIC TRIM - AUTOMATIC TEST	11-4.2
AFCS CONTROL PANEL FAILS CYCLIC TRIM MANU- AL TEST	11-4.2

SYMPTOM	TASK
AFCS CONTROL PANEL FAILS DIODE TEST	11-4.2
AFCS CONTROL PANEL FAILS HEADING TEST	11-4.2
AFCS CONTROL PANEL FAILS PANEL ILLUMINATION TEST	11-4.2

SYMPTOM	TASK
AFCS CONTROL PANEL FAILS RADAR ALTITUDE TESTS	11-4.2
AFCS CONTROL PANEL FAILS SYSTEMS SELECT TEST	11-4.2

CHAPTER 11  
FLIGHT CONTROLS SYSTEMS TROUBLESHOOTING

CHAPTER OVERVIEW (Continued)

FAILURE SYMPTOM LIST (Continued)

AFCS COMPUTER

SYMPTOM	TASK	SYMPTOM	TASK	SYMPTOM	TASK
AFCS COMPUTER FAILS TEST 1 (CONTINUITY TEST)	11-5.2	AFCS COMPUTER FAILS TEST 5 (ROLL AXIS TEST)	11-5.2	AFCS COMPUTER FAILS TEST 10 (YAW RATE TEST)	11-5.2
AFCS COMPUTER FAILS TEST 2 (POWER SUPPLY TEST)	11-5.2	AFCS COMPUTER FAILS TEST 6 (YAW AXIS TEST)	11-5.2	AFCS COMPUTER FAILS TEST 11 (NORMAL ACCELERATION TEST)	11-5.2
AFCS COMPUTER FAILS TEST 3 (LOGIC TEST)	11-5.2	AFCS COMPUTER FAILS TEST 7 (DASH TEST)	11-5.2	AFCS COMPUTER FAILS TEST 12 (PRESSURE TRANSDUCERS TEST)	11-5.2
AFCS COMPUTER FAILS TEST 4 (PITCH AXIS TEST)	11-5.2	AFCS COMPUTER FAILS TEST 8 (LONGITUDINAL CYCLIC TRIM (LCT) TEST)	11-5.2	AFCS COMPUTER FAILS TEST 13 (BITE TEST)	11-5.2
		AFCS COMPUTER FAILS TEST 9 (COLLECTIVE CONTROL DRIVER ACTUATOR (CCDA) TEST)	11-5.2		

FAILURE SYMPTOM LIST (Continued)  
COCKPIT CONTROL DRIVE ACTUATOR (CCDA)

SYMPTOM	TASK	SYMPTOM	TASK	SYMPTOM	TASK
PITCH COCKPIT CONTROL DRIVE ACTUATOR FAILS BRAKE FUNCTION TEST	11-6.2	PITCH COCKPIT CONTROL DRIVE ACTUATOR FAILS TRIM MOTOR TEST	11-6.2	THRUST COCKPIT CONTROL DRIVE ACTUATOR FAILS CIRCUIT RESISTANCE TEST	11-6.2
PITCH COCKPIT CONTROL DRIVE ACTUATOR FAILS CIRCUIT RESISTANCE TEST	11-6.2	THRUST COCKPIT CONTROL DRIVE ACTUATOR FAILS BRAKE FUNCTION TEST	11-6.2	THRUST COCKPIT CONTROL DRIVE ACTUATOR FAILS NULL VOLTAGE AND PHASING TEST	11-6.2

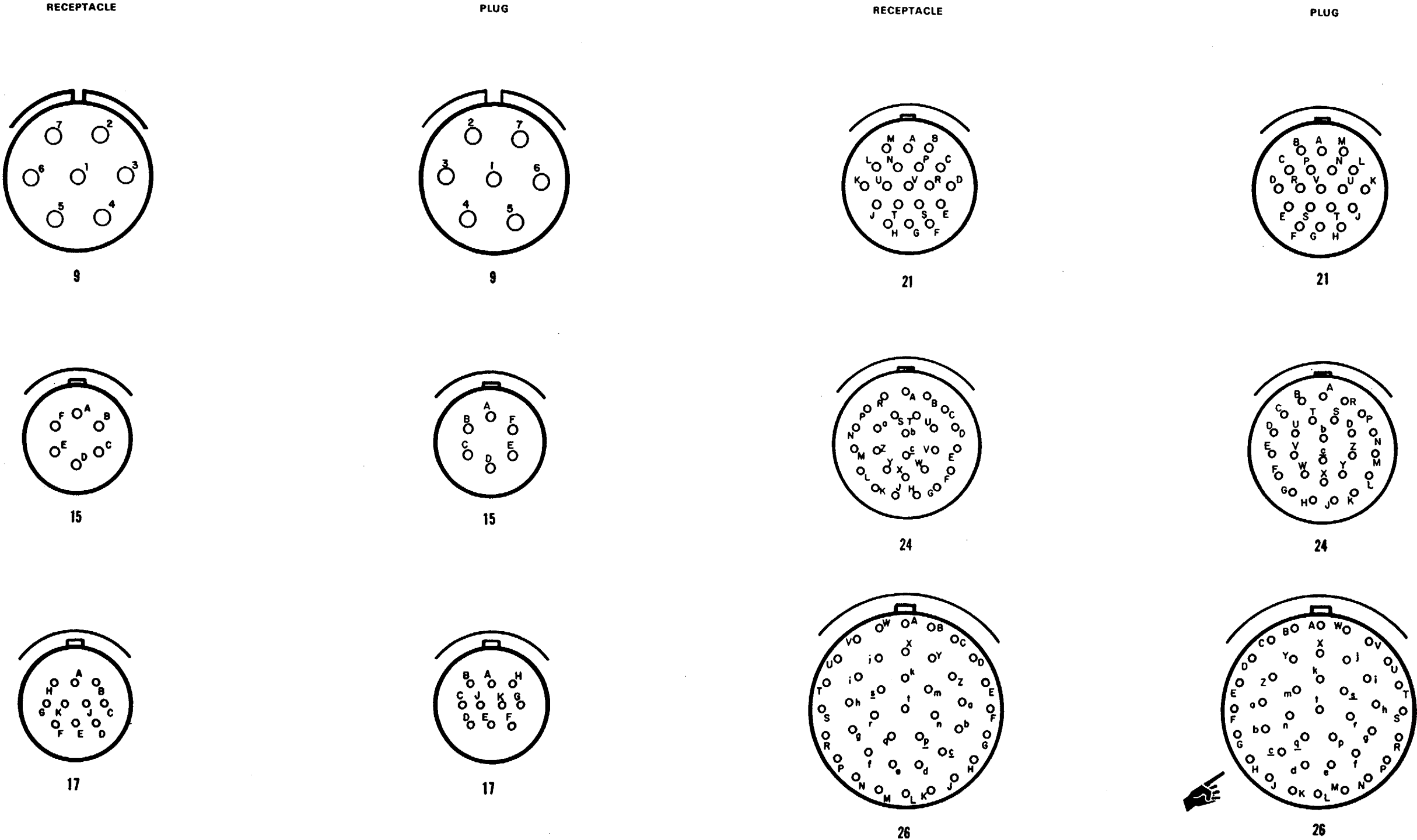
FLIGHT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST

REF				STATION LOCATION			REF				STATION LOCATION		
DESIG	PART NUMBER	TYPE	MATE WITH/LOCATION	FS	WL	BL	DESIG	PART NUMBER	TYPE	MATE WITH/LOCATION	FS	WL	BL
009		150	CONSOLE, FWD CTR INSTR PNL				031P15	M83723-95A1415N	34	CONTROLS CLOSET, ROLL LWR CONTACT			
040		150	CONSOLE, FWD CTR INSTR PNL				031P16	M83723-95A1415N	34	CONTROLS CLOSET, ROLL LWR CONTACT			
131		151	RH AFT CABIN	485	-5	50R	031P17	M83723-95A1415N	34	CONTROLS CLOSET, YAW LWR CONTACT			
GD217		151	CONTROLS CLOSET	110	15	18L	031P18	M83723-95A1415N	34	CONTROLS CLOSET, YAW LWR CONT ACT			
GD218		151	CONTROLS CLOSET	110	15	18L	031 P19	M83723-95A1212N	31	CONTROLS CLOSET, DUAL DIFF A/S HOLD ACT			
GD220		151	CONTROLS CLOSET	110	15	18L	031 P20	M83723-95A1212N	31	CONTROLS CLOSET, DUAL DIFF A/S HOLD ACT			
GD223		151	CONTROLS CLOSET	110	15	18L	031P22	MS3476W14-19S	21	CONT CLOSET, CLTV CONT DR ACTR	95	-2	15L
GD224		151	CONTROLS CLOSET	117	30	18L	031P26	M83723-95A0803N	29	CONT CLOSET, ROLL MAG BRAKE	120	-10	15L
GD228		151	FWD XMSN AREA	105	45	20L	031P27	MS3476W14-19S	21	CONT CLOSET, PITCH CCDA	120	0	15L
GD229		151	FWD XMSN AREA	105	45	20L	031 P28	M83723-95A0803N	29	CONT CLOSET, YAW MAG BRAKE	95	8	15L
GD230		151	ELECTRONIC COMP	110	15	50L	031 P32	MS3147E7-50S	9	CONSOLE, CTR INSTR PNL, FWD CYCLIC TRIM IND			
GD231		151	ELECTRONIC COMP	110	15	50L	031 P33	MS3147E7-50S	9	CONSOLE, CTR INSTR PNL, AFT CYCLIC TRIM IND			
GD250		151	ELECTRONIC COMP	115	10	18L	031P34	M83723-75A1212N	31	ELECTRONICS COMP, ROLL ERECT CUTOUT RLY			
GD251		151	RH POD	256	-10	52R	031P35	M83723-75A1212N	31	ELECTRONICS COMP, ROLL ERECT CUTOUT RLY			
GD252		151	ELECTRONIC COMP	115	10	18L	031P36	MS3476W14-19S	21	CONSOLE, AFCS CONT PNL			
GD253		151	ELECTRONIC COMP	110	15	50L	062P3	MS3476W16-26S	24	ELECTRONICS COMP, 3RD SHLF, CPLT GYRO			
GD254		151	RH POD	258	-10	52R	062P4	MS3476W16-26S	24	ELECTRONICS COMP, 2ND SHLF, PLT GYRO			
GD255		151	ELECTRONIC COMP	110	15	18L	102P5	MS3476W14-19SW	21	OVHD PNL, ENG COND CONT PNL			
GD258		151	LH AFT, CABIN	502	-20	50L	148J1	MS3474W10-6S	15	RH AFT RAMP AREA	485	-30	52R
TB 18			COCKPIT, UNDERFLOOR, CPLT				148P1	MS3476W10-6P	15	RH AFT LDG GEAR COMP	485	-30	52R
TB 52			ELECTRONIC COMP	95	14	246	148J2	MS3474W10-6S	15	LH AFT RAMP AREA	485	-30	52L
TB 53			ELECTRONIC COMP	95	14	30L	148P2	MS3476W10-6P	15	LH AFT LDG GEAR COMP	485	-30	52L
148K1		103	LH AFT CABIN	482	20	50L	232P1	MS3476W20-41S	26	CONSOLE, CTR INSTR PNL, MSTR			
148K2		103	RH AFT CABIN	482	20	50R				CAUTION PNL (WITHOUT 74)			
031J1	MS3470W12-10S	17	PYLON, AFT CYCLIC PITCH ACT	528	130	12L	232P1	MS3476W22-55S	27	CONSOLE — CTR INSTR PNL — MASTER CAUTION			
031J2	MS3474W10-6S	15	CONTROLS CLOSET	118	-25	22L				PANEL (WITH 74)			
031J5	MS3474W10-6S	15	CONTROLS CLOSET	118	-25	22L	232P2	MS3476W16-26S	24	CONSOLE — CTR INSTR PNL — MASTER CAUTION			
031J6	MS3474W10-6S	15	CONTROLS CLOSET	118	-25	26L				PANEL (WITH 74)			
031J9	MS3474W10-6S	15	CONTROLS CLOSET	118	-25	24L							
031J11	MS3474W10-6S	15	CONTROLS CLOSET	95	-10	18L							
031J12	MS3474W10-6S	15	CONTROLS CLOSET	95	-10	18L							
031J21	MS3119E12-10	17	FWD XMSN AREA, FWD CYCLIC PITCH ACT	100	65	12L							
031P3	MS3476W24-61SX	28	ELECTRONICS COMP, NO. 1 AFCS, J3										
031P4	MS3476W24-61SX	28	ELECTRONICS COMP, NO. 2 AFCS, J3										
031P7	MS3476W14-19SX	21	CONSOLE, AFCS CONTROL PNL										
031P8	MS3476W24-61S	28	ELECTRONICS COMP, NO. 1 AFCS, J1										
031P10	MS3476W24-61 S	28	ELECTRONICS COMP, NO. 2 AFCS, J1										
031P13	M83723-95A1415N	34	CONTROLS CLOSET, PITCH LWR CONT ACT										
031P14	M83723-95A1415N	34	CONTROLS CLOSET, PITCH LWR CONT ACT										

FLIGHT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

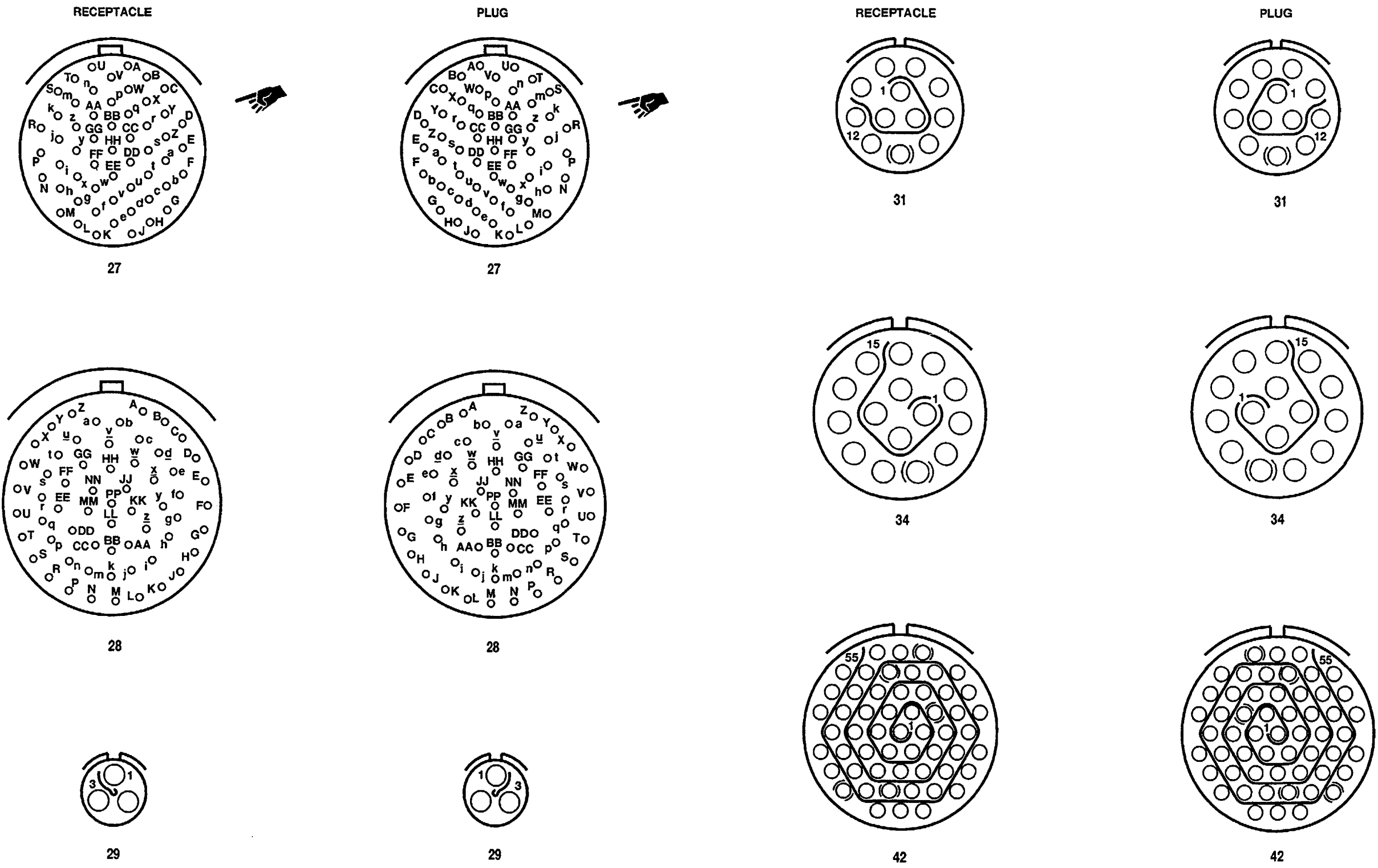
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				FS	WL	BL					FS	WL	BL
300J2	M83723-74A2255N	42	NO. 1 PDP				300J50	M83723-73A2461N	43	ELECTRONICS COMPARTMENT	120	40	20L
300P2	M83723-75A2255N	42	NO. 1 PDP				300P50	M83723-76A2461N	43	ELECTRONICS COMPARTMENT	120	40	20L
300J3	M83723-74A22556	42	NO. 1 PDP				300J51	M83723-74A2461N	43	AFT CROWN-OVHD	460	45	20R
300P3	M83723-75A22556	42	NO. 1 PDP				300P51	M83723-75A2461N	43	AFT CROWN-OVHD	460	45	20R
300J4	M83723-74A2461N	43	NO. 1 PDP				300J54	M83723-74A2461N	43	AFT CROWN-OVHD	460	50	20L
300P4	M83723-75A2461N	43	NO. 1 PDP				300P54	M83723-75A2461N	43	AFT CROWN-OVHD	460	50	20L
300J7	M83723-74A2255N	42	NO. 2 PDP				300J58	M83723-73A22558	42	CONSOLE-UNDERFLOOR DISCONNECT	85	-20	
300P7	M83723-75A2255N	42	NO. 2 PDP				300P58	M83723-76A22558	42	CONSOLE-UNDERFLOOR DISCONNECT	85	-20	
300J8	M83723-74A2461N	42	NO. 2 PDP				300J59	M83723-74A22556	42	CONSOLE-UNDERFLOOR DISCONNECT	85	-20	
300P8	M83723-75A2461N	42	NO. 2 PDP				300P59	M83723-75A22556	42	CONSOLE-UNDERFLOOR DISCONNECT	85	-20	
300J21	M83723-74A2461N	43	OVERHEAD PANEL-COCKPIT				300J60	M83723-74A22557	42	CONSOLE-UNDERFLOOR DISCONNECT	85	-20	
300P21	M83723-75A2461N	43	OVERHEAD PANEL-COCKPIT				300P60	M83723-75A22557	42	CONSOLE-UNDERFLOOR DISCONNECT	85	-20	
300J25	MS3474W16-26S	24	COCKPIT, UNDERFLOOR, PLT SIDE	70	-20	12R	300J61	M83723-73A24619	43	CONSOLE-UNDERFLOOR DISCONNECT	85	-20	
300P25	MS3476W16-26P	24	COCKPIT, UNDERFLOOR, PLT SIDE	70	-20	12R							
300J26	MS3474W16-26S	24	COCKPIT, UNDERFLOOR, CPLT SIDE	70	-30	40L	300J61	M83723-73W24619	28	CONSOLE-UNDERFLOOR DISCONNECT	85	-20	
300P26	MS3476W16-26P	24	COCKPIT, UNDERFLOOR, CPLT SIDE	70	-30	40L							
300J29	MS3474W14-19S	21	COCKPIT, UNDERFLOOR, PLT SIDE	65	-27	25R	300P61	M83723-76A24619	43	CONSOLE-UNDERFLOOR DISCONNECT	85	-20	
300P29	MS3476W14-19P	21	COCKPIT, UNDERFLOOR, PLT SIDE	65	-27	25R							
300J30	MS3474W14-19S	21	COCKPIT, UNDERFLOOR, CPLT SIDE	70	-27	25L	300P61	M83723-76W24619	28	CONSOLE-UNDERFLOOR DISCONNECT	85	-20	
300J44	M83723-74A2461N	43	AFT PYLON	520	72	15L							
300P44	M83723-75A2461N	43	AFT PYLON	520	72	15L							
300J45	M83723-73A2461N	43	HEATER COMPARTMENT	105	40	30R							
300P45	M83723-76A2461N	43	HEATER COMPARTMENT	105	40	30R							

FLIGHT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)





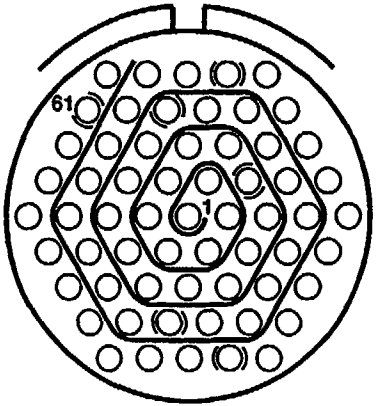
FLIGHT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)



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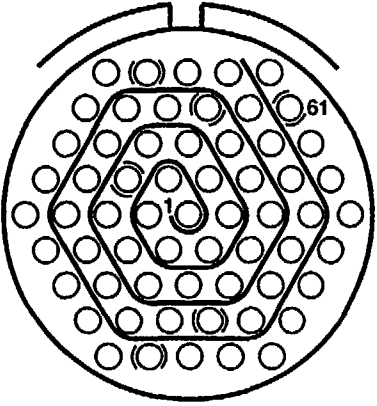
FLIGHT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

RECEPTACLE



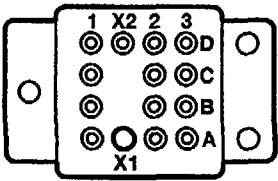
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PLUG



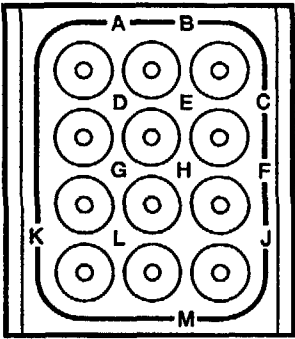
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RELAY



103

GND MODULE



150

GND STUD



151

A67626

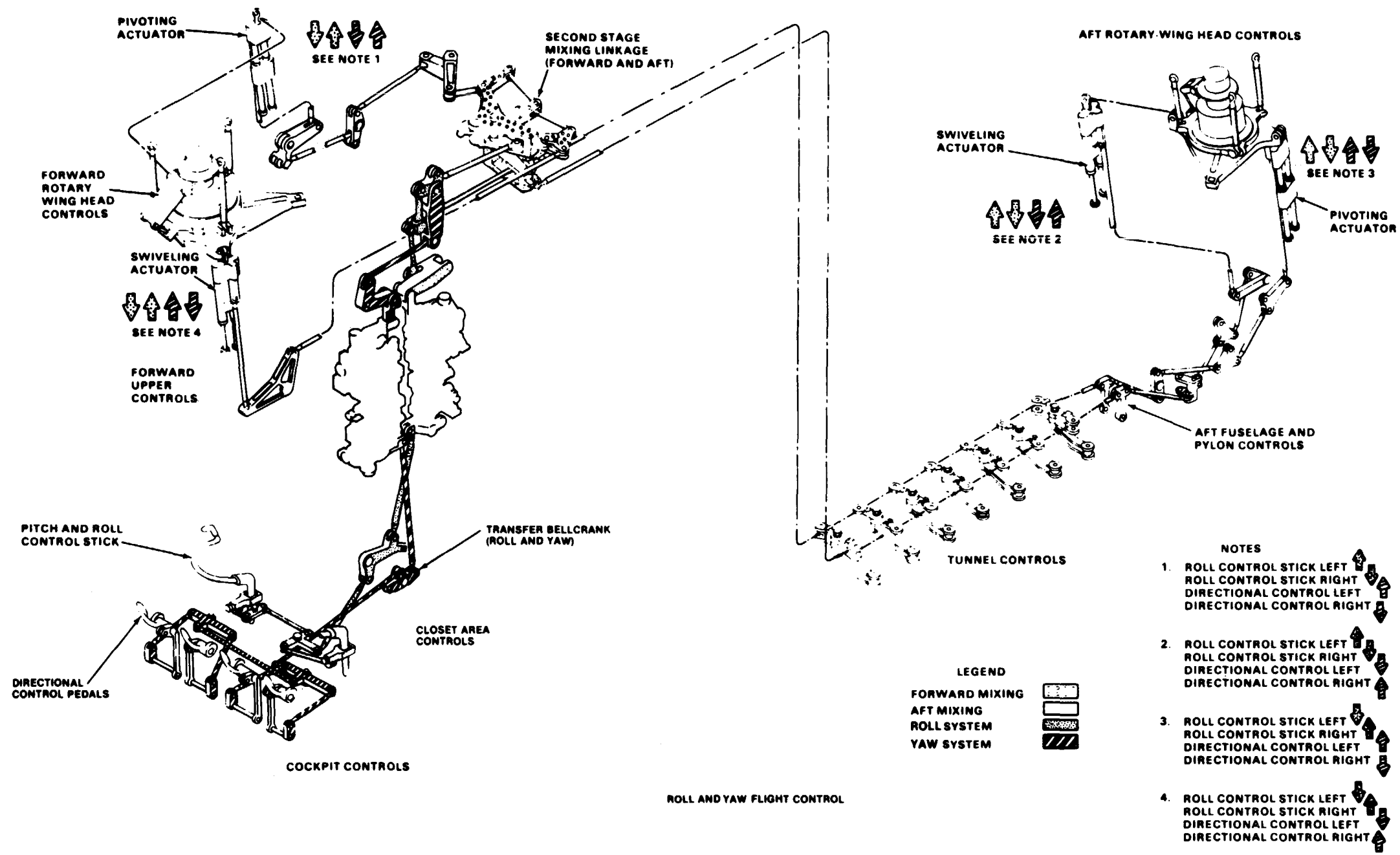
## 11-1 FLIGHT CONTROL SYSTEM

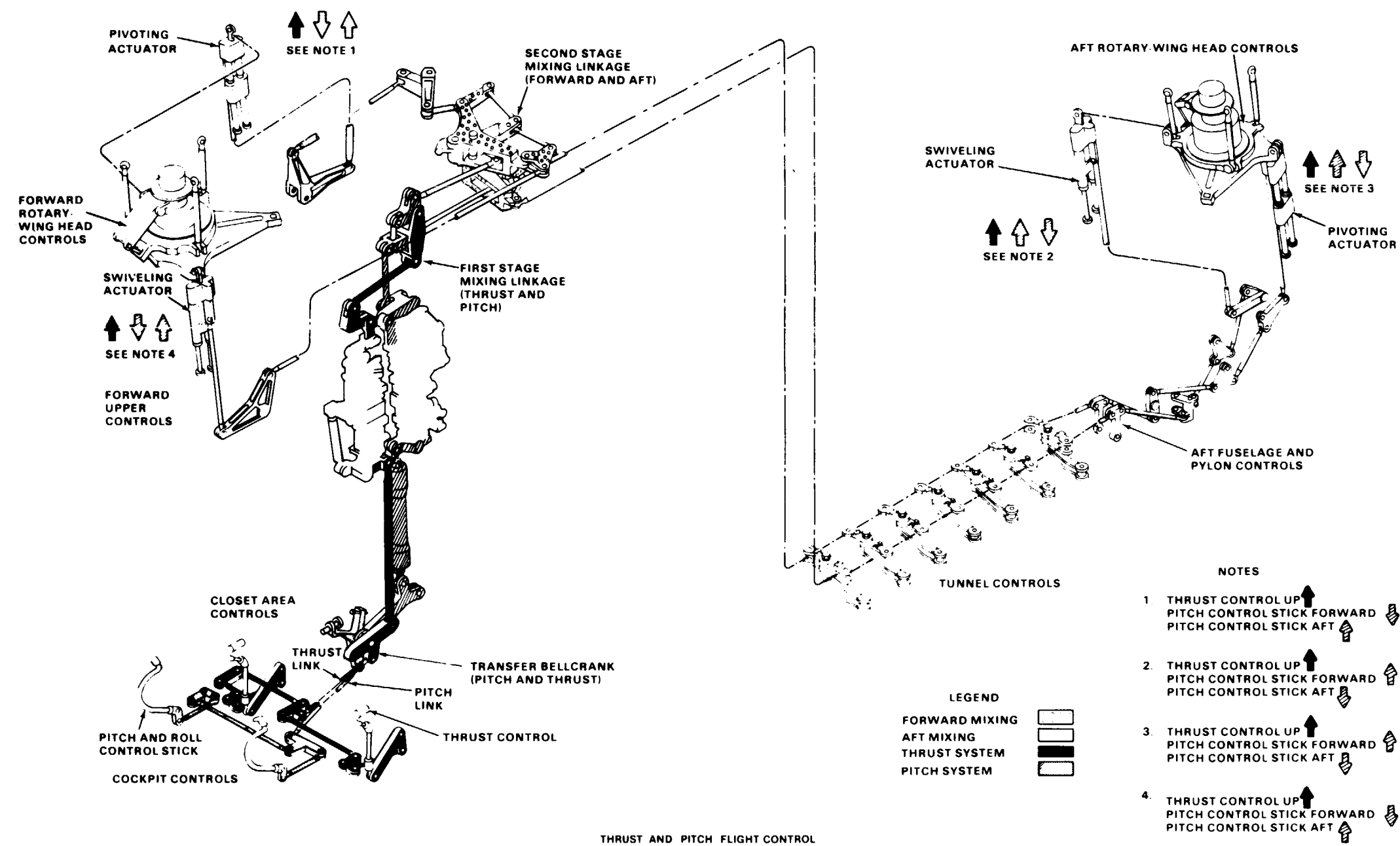
11-1 FLIGHT CONTROL SYSTEM

11-1.1 FLIGHT CONTROL SYSTEM SCHEMATIC

11-1

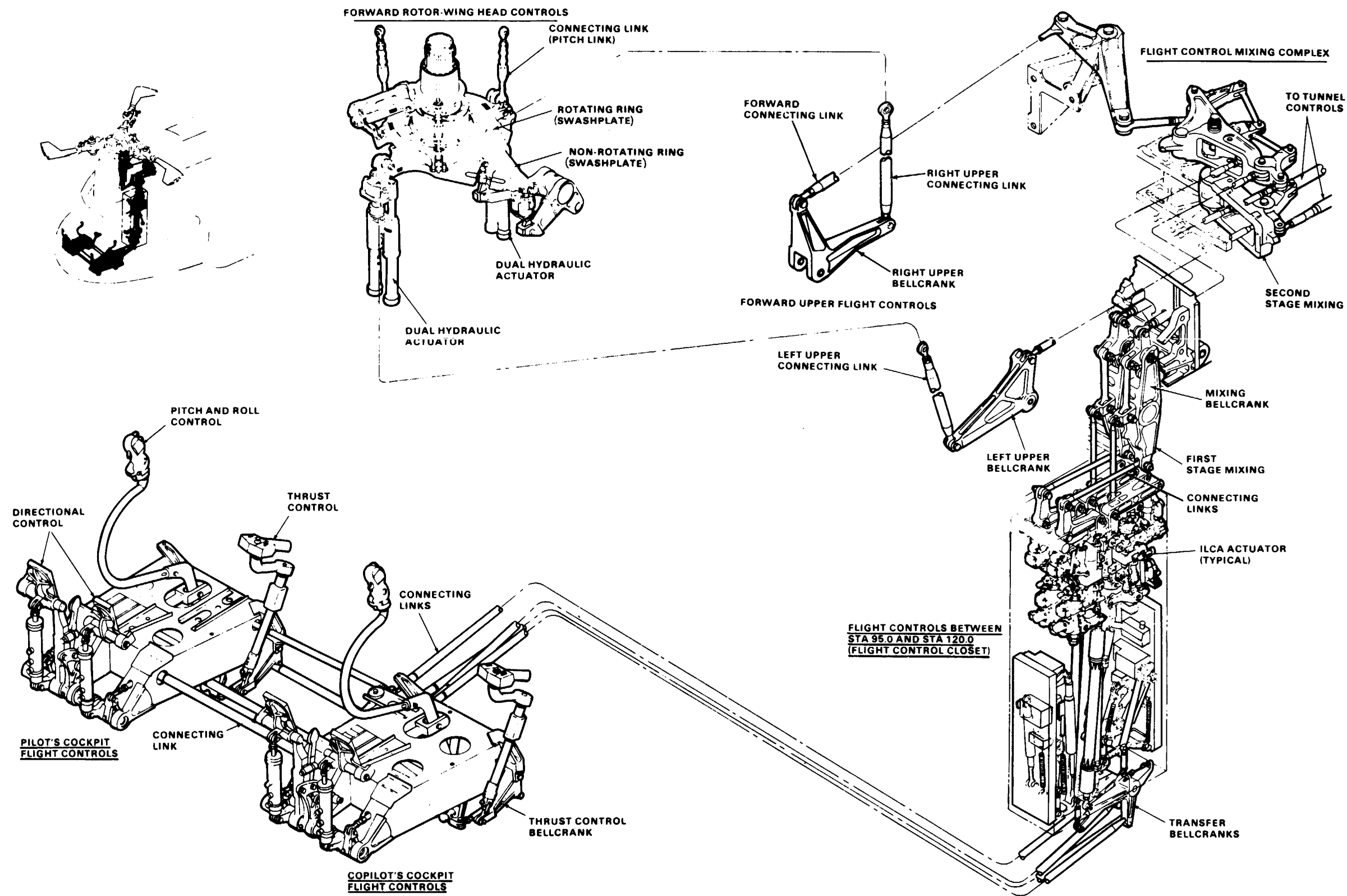
11-1.1





11-1.2 FLIGHT CONTROL SYSTEM CONNECTION DIAGRAM

11-1.2

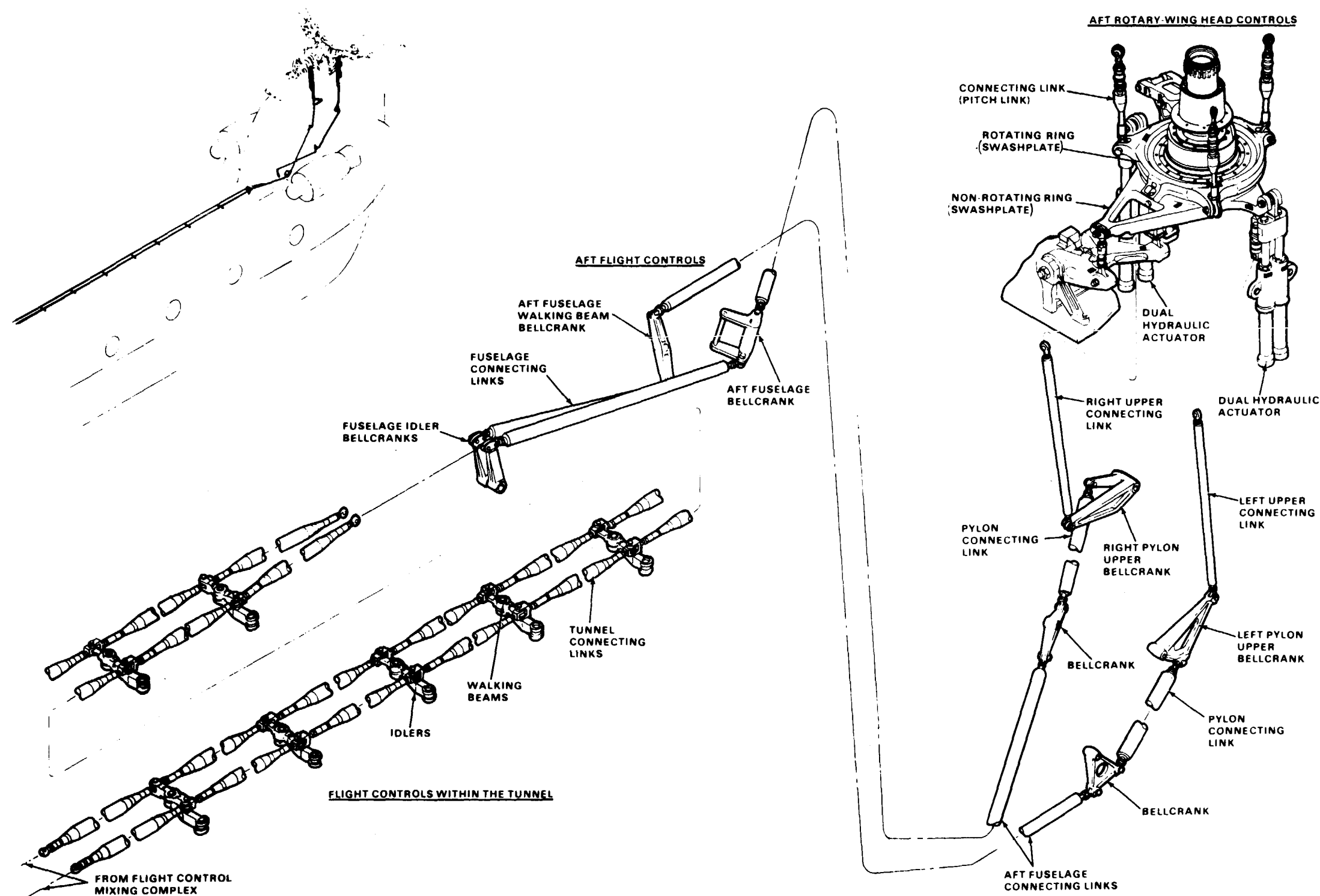


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11-1.2 FLIGHT CONTROL SYSTEM CONNECTION DIAGRAM  
(Continued)



90-54

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END OF TASK

INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

None

Personnel Required:

Medium Helicopter Repairer (2)

References:

TM 55-1520-240-23

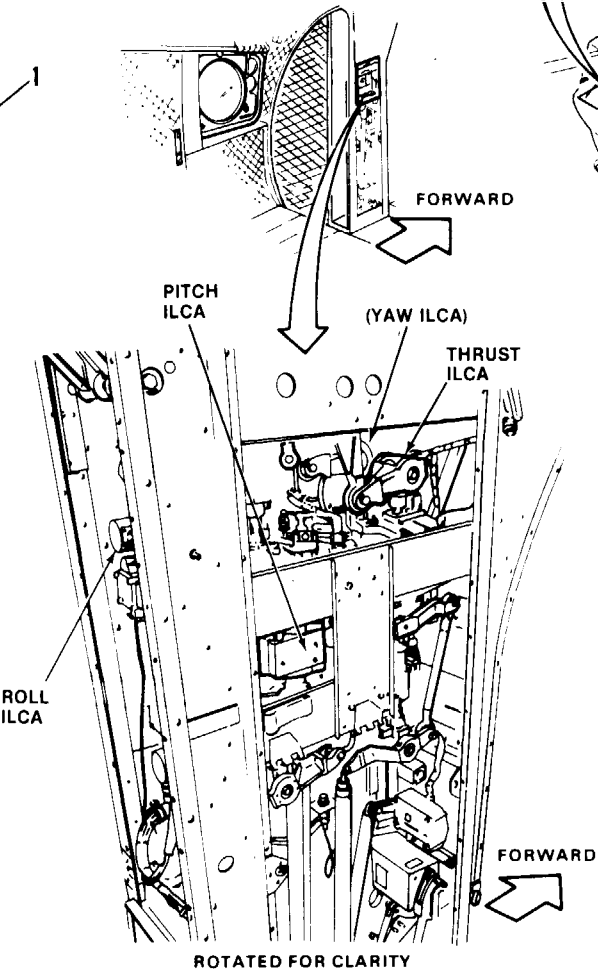
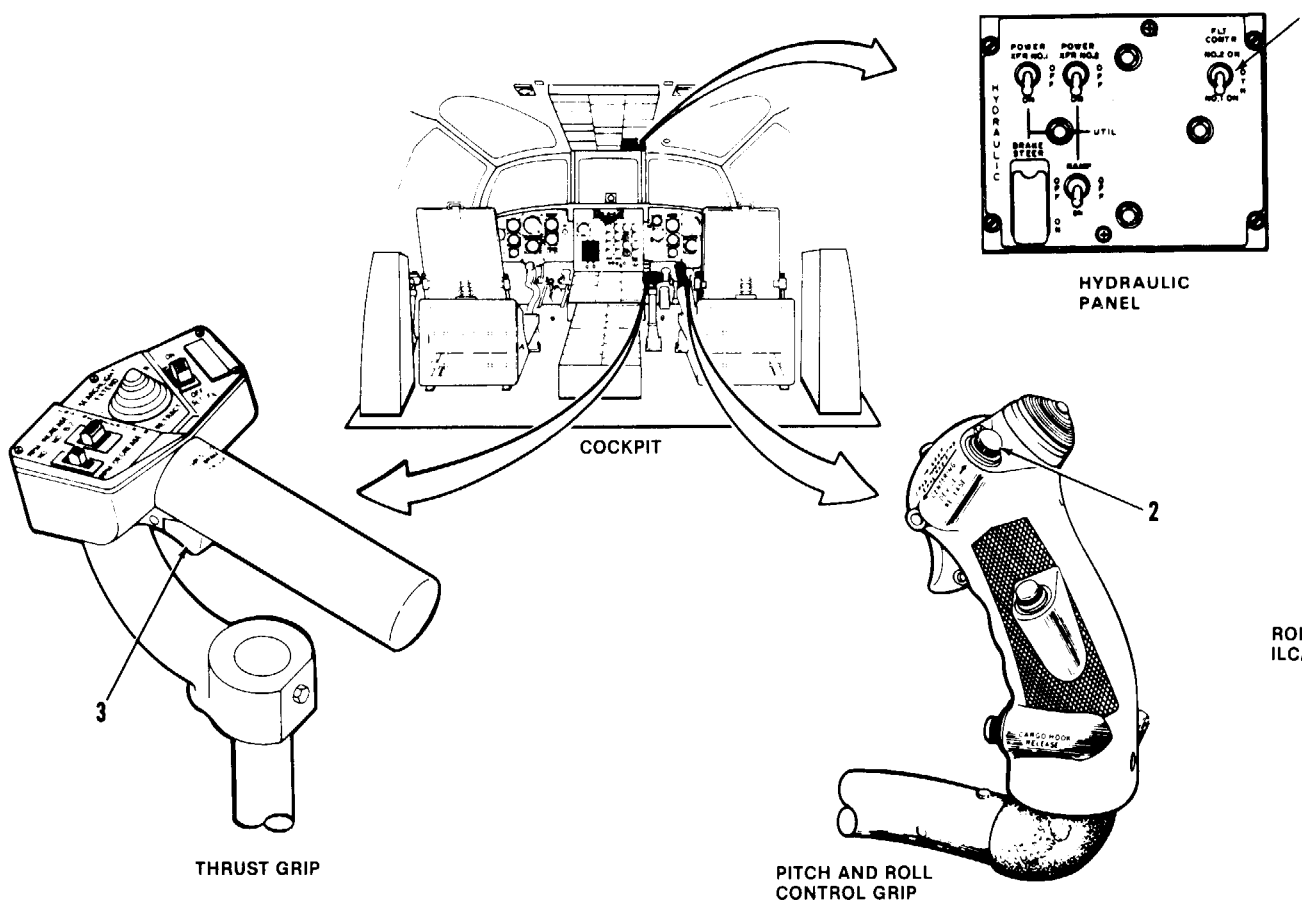
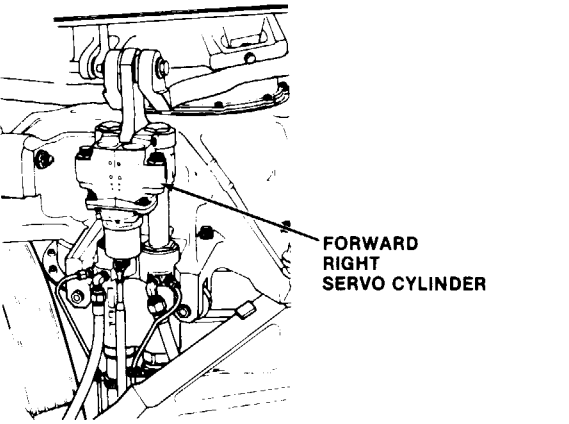
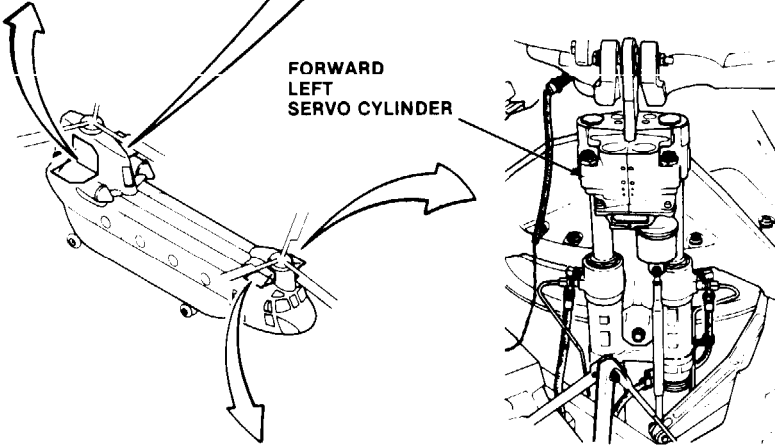
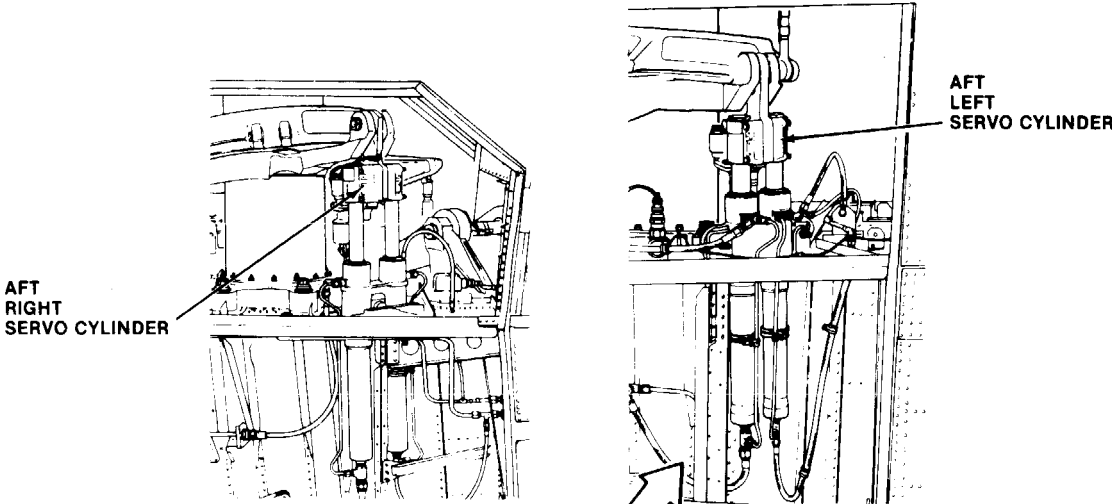
Equipment Condition:

- TM 55-1520-240-23:
- Flight Control Closet Acoustic Blanket Removed
- Flight Control Closet Backup Panel Removed
- Forward Work Platform Open
- Pylon Work Platform Open
- Tunnel Covers Open
- One Aft Blade Positioned Behind and Off Helicopter Centerline
- Battery Connected
- Electrical Power On
- Hydraulic Power On

General Safety Instructions:

**WARNING**

Keep head, hands, and other body parts clear of moving flight controls. Hydraulic forces are strong enough to cause severe injury.



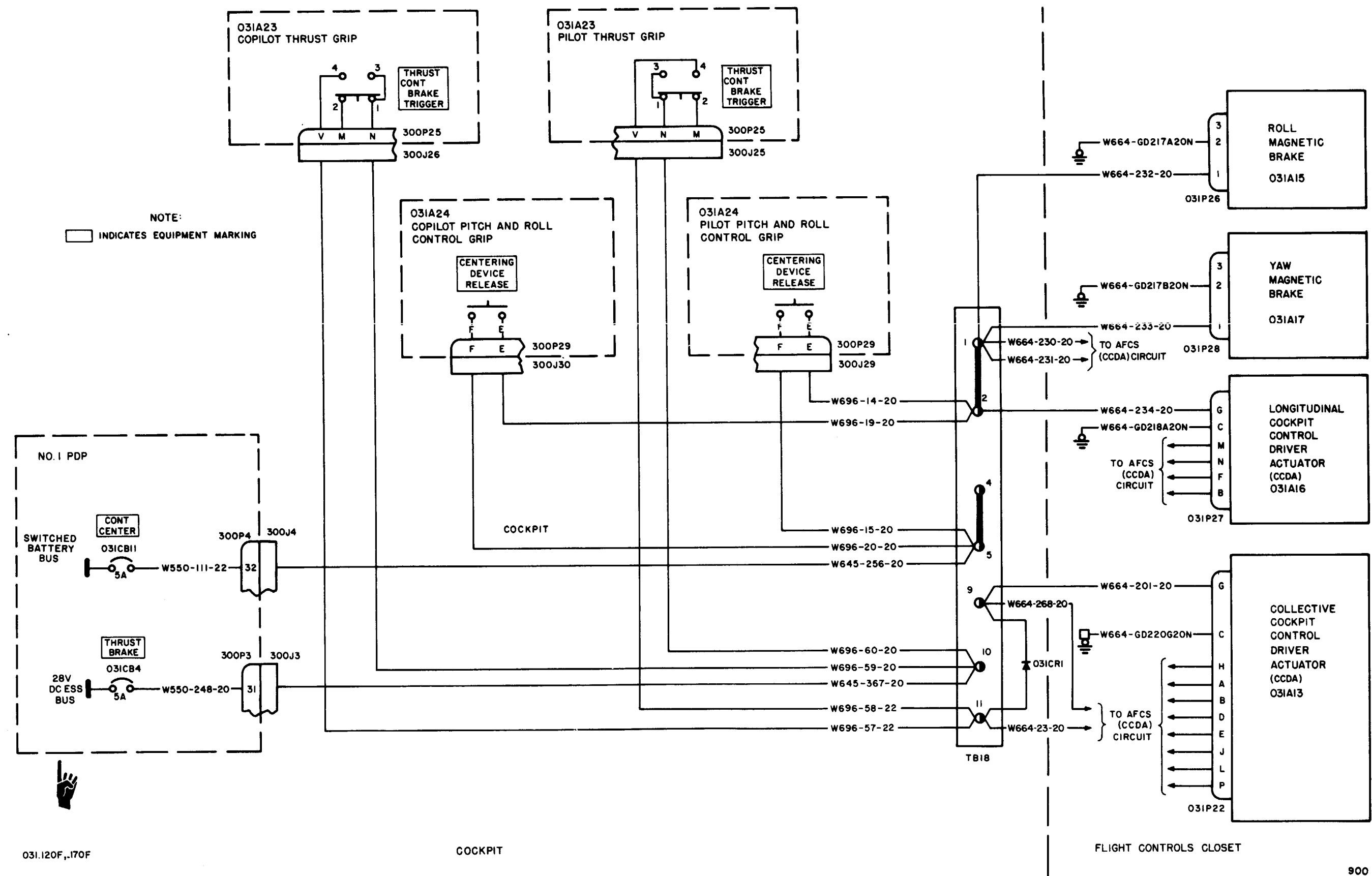


TASK	RESULT
<div>1. Set FLT CONTR switch (1) to NO. 1 ON.</div> <div>2. Press pilot CENTERING DEVICE RELEASE switch (2). Press pilot CP BRAKE TRIGGER switch (3). Move pilot pitch and roll control grip in a box pattern. Move pilot thrust grip up and down. Move pilot directional pedals forward and aft. Check all flight controls as cockpit controls are being moved.</div> <div>3. Release pilot CENTERING DEVICE RELEASE switch (2) and CP BRAKE TRIGGER switch (3).</div> <div>4. Set FLT CONTR switch (1) to NO. 2 ON.</div> <div>5. Repeat step 2 and step 3, then go to step 6.</div> <div>6. Set FLT CONTR switch (1) to BOTH.</div> <div>7. Press pilot CENTERING DEVICE RELEASE switch (2). Press pilot CP BRAKE TRIGGER switch (3). Move thrust control down to detent. Move pitch and roll control and pedals to neutral. Release CENTERING DEVICE RELEASE and CP BRAKE TRIGGER switches (2 and 3).</div>	<div>Control travel shall be smooth and easy.</div> <div>Hydraulic fluid leakage shall not exceed that specified in TM 55-1520-240-23.</div> <div>If control travel is stiff or binding, check controls for interference or defective bearings. Correct interference or replace defective bearings.</div> <div>If unusual noises are heard, replace noisy component.</div> <div>NOTE</div> <div>It is not unusual for swashplate slider bearings to make some noise and chatter during ground operational checks.</div> <div>If hydraulic fluid is observed, refer to TM 55-1520-240-23 to determine allowable leakage.</div>

FOLLOW-ON MAINTENANCE:

- TM 55-1520-240-23:
- Hydraulic power off.
- Electrical power off.
- Battery disconnected.
- Flight control closet backup panel installed.
- Flight control closet acoustic blanket installed.
- Tunnel covers closed.
- Pylon work platforms closed.
- Forward work platforms closed.

## 11-2 ARTIFICIAL FEEL - MAGNETIC BRAKES



INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

Materials:

None

Personnel Required:

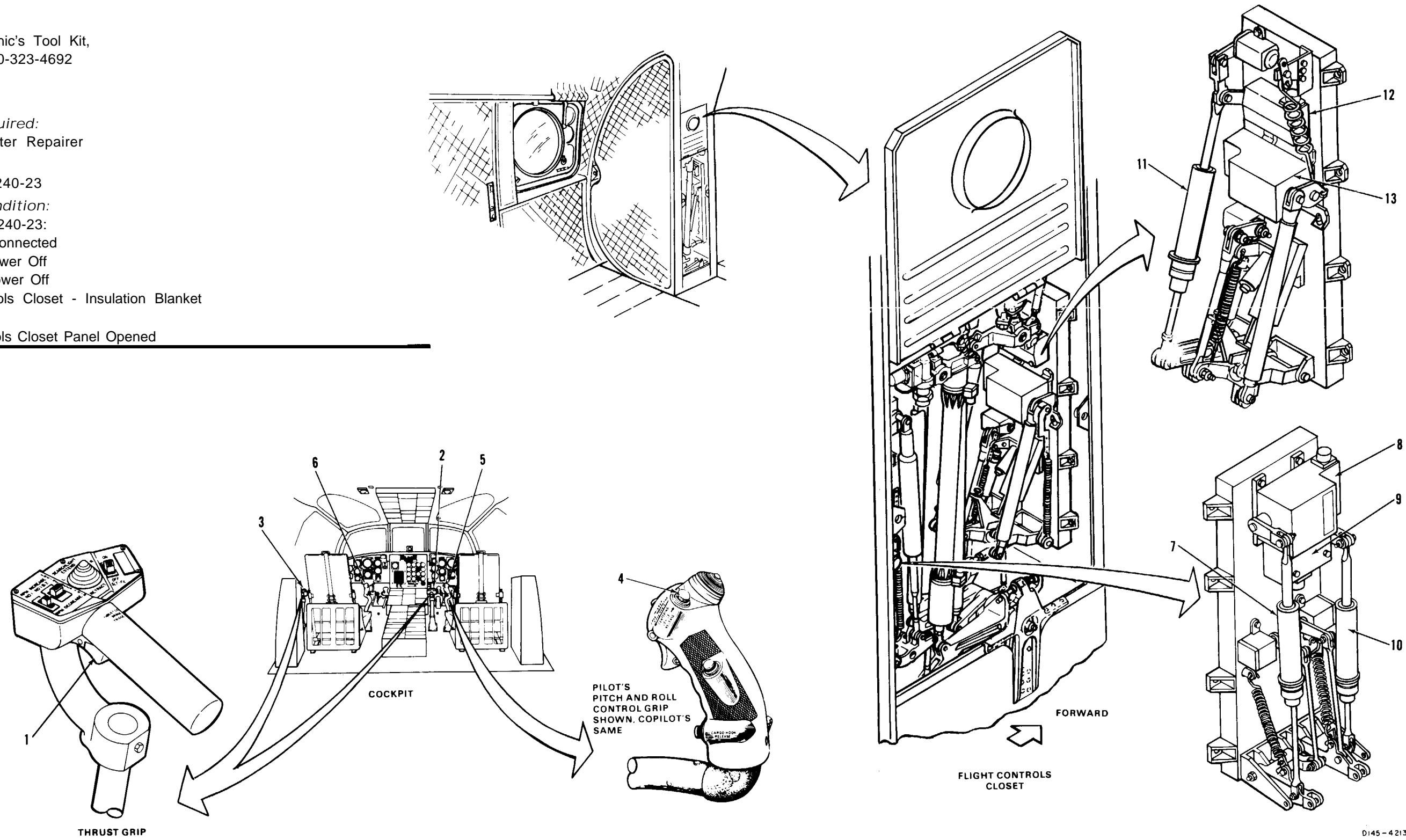
Medium Helicopter Repairer

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off  
Flight Controls Closet - Insulation Blanket  
Removed  
Flight Controls Closet Panel Opened



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TASK	RESULT	TASK	RESULT
1. Check THRUST CONT BRAKE TRIGGER switch (1) on pilot's and copilot's thrust grips (2 and 3).	If either switch (1) is damaged, replace it.	7. Check yaw centering spring (11).	If centering spring (11) is bent or has damaged parts, replace it.
2. Check CENTERING DEVICE RELEASE switch (4) on pilot's and copilot's pitch and roll control grips (5 and 6).	If either switch (4) is damaged, replace it.	8. Check yaw magnetic brake (12).	If brake (12) is loose or damaged, tighten or replace it as required. If wiring to brake is damaged, repair or replace it as required.
3. Chock longitudinal centering spring (7).	If centering spring (7) is bent or has damaged pans, replace it.	9. Check collective ccda (13).	If ccda (13) is loose or damaged, tighten or replace it as required. If wiring to ccda is damaged, repair or replace it as required.
4. Check longitudinal cockpit control driver actuator (ccda) (8).	If ccda (8) is loose or damaged, tighten or replace it as required. If wiring to ccda is damaged, repair or replace it as required.	FOLLOW-ON MAINTENANCE: None	
5. Check roll magnetic brake (9).	If brake (9) is loose or damaged, tighten or replace it as required. If wiring to brake is damaged, repair or replace it as required.		
6. Check roll centering spring (10).	If centering spring (10) is bent or has damaged parts, replace it.		

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
None

Materials:  
None

Personnel Required:  
Medium Helicopter Repairer

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

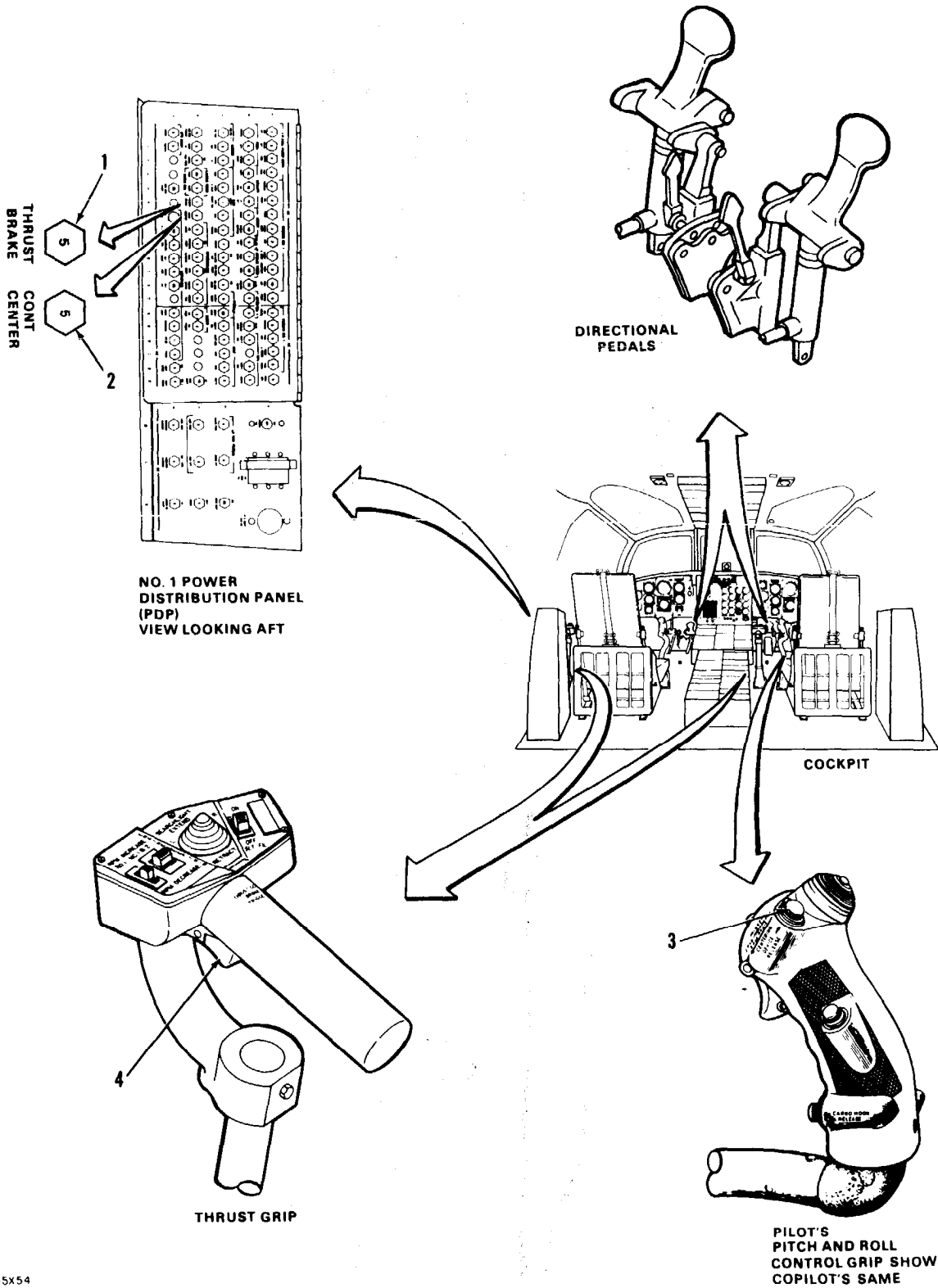
Battery Connected

Electrical Power On

Hydraulic Power On

Artificial Feel - Magnetic Brakes Visual Check  
Performed

TASK	RESULT
<b>CHECK CIRCUIT BREAKERS</b>	
1. Check that <b>THRUST BRAKE</b> circuit breaker (1) is closed.	If circuit breaker (1) is open, close it. If it opens again, go to task 11-2.4
2. Check that <b>CONT CENTER</b> circuit breaker (2) is closed.	If circuit breaker (2) is open, close it. If it opens again, go to task 11-2.5.
<b>CHECK ARTIFICIAL FEEL AND PILOT CONTROL OF MAGNETIC BRAKES</b>	
3. Press and hold pilot <b>CENTERING DEVICE RELEASE</b> switch (3). Center pilot pitch and roll control stick and directional pedals. Release <b>CENTERING DEVICE RELEASE</b> switch.	Control stick and directional pedals shall center easily and remain there after <b>CENTERING DEVICE RELEASE</b> switch (3) is released. If both control stick and directional pedals do NOT remain centered, go to task 11-2.6. If either control stick or directional pedals do not remain centered, continue operational check to identify problem.
4. Press and hold pilot <b>CENTERING DEVICE RELEASE</b> switch (3). Move pilot control stick through longitudinal travel range. Position control <u>1 inch</u> forward of center position. Release switch.	Control stick shall move easily through longitudinal travel range and remain at selected position when switch (3) is released. If it does not, go to task 11-2.7.
5. Move pilot control stick <u>1 inch</u> forward and release control stick. Move pilot control stick <u>1 inch</u> aft and release control stick.	Control stick shall return to original position when control stick is released. If it does not, go to task 11-2.7



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TASK	RESULT
6. Press and hold pilot's CENTERING DE-VICE RELEASE switch (3). Move pilot's control stick through lateral travel range. Position control stick <u>1 inch</u> left of center position. Release switch.	Control stick shall move easily through lateral travel range and remain at selected position when switch (3) is released. If it does not, go to task 11-2.7.
7. Move pilot's control stick <u>1 inch</u> left and release control stick. Move pilot's control stick <u>1 inch</u> right and release control stick.	Control stick shall return to original position when control stick is released. If it does not, go to task 11-2.7.
8. Press and hold pilot's CENTERING DE-VICE RELEASE switch (3). Move pilot's pedals through directional range. Position left pedal <u>1 inch</u> forward of center. Release switch.	Pedals shall move easily through directional range and remain at selected position when switch (3) is released. If they do not, go to task 11-2.8.
9. Move pilot's left pedal <u>1 inch</u> forward and release it. Move pilot's right pedal <u>1 inch</u> forward and release it.	Pedals shall return to original position when pedals are released. If they do not, go to task 11-2.8.
10. Press and hold pilot's THRUST CONT BRAKE TRIGGER switch (4). Move pilot's thrust control full up. Release switch.	Thrust control shall move easily to full up and remain there after switch (4) is released. If not, go to task 11-2.9.

TASK	RESULT
11. Press and hold pilot's THRUST CONT BRAKE TRIGGER switch (4). Move pilot's thrust control full down. Release switch.	Thrust control shall move easily and remain down after switch (4) is released. If not, go to task 11-2.9.
<div>NOTE</div> <div>Thrust control down stop is spring loaded. Control will raise up from full down to a pre-determined position when released.</div>	
<div>CHECK COPILOT CONTROL OF MAGNETIC BRAKES</div> <div>12. Press and hold copilot's THRUST CONT BRAKE TRIGGER switch (4). Move co-pilot's thrust control from full down to full up and back to mid position. Release switch.</div> <div>13. Press and hold copilot's CENTERING DE-VICE RELEASE switch (3). Move copilot's pitch and roll control stick forward. Release switch.</div> <div>14. Move control stick to center position. Press and release CENTERING DEVICE RELEASE switch.</div>	
<div>Thrust control shall move easily and remain at selected position after switch (4) is released. If not, go to task 11-2.10.</div> <div>Control stick shall remain at selected position after switch (3) is released. If it does not, go to task 11-2.11.</div> <div>Control stick shall remain at center position.</div>	

FOLLOW-ON MAINTENANCE:

- TM 55-1520-240-23:
- Battery disconnected.
- Electrical power off.
- Hydraulic power off.
- Flight controls closet panel closed.
- Flight controls insulated blanket installed.

11-2.4 THRUST BRAKE CIRCUIT BREAKER DOES NOT STAY CLOSED

11-2.4

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

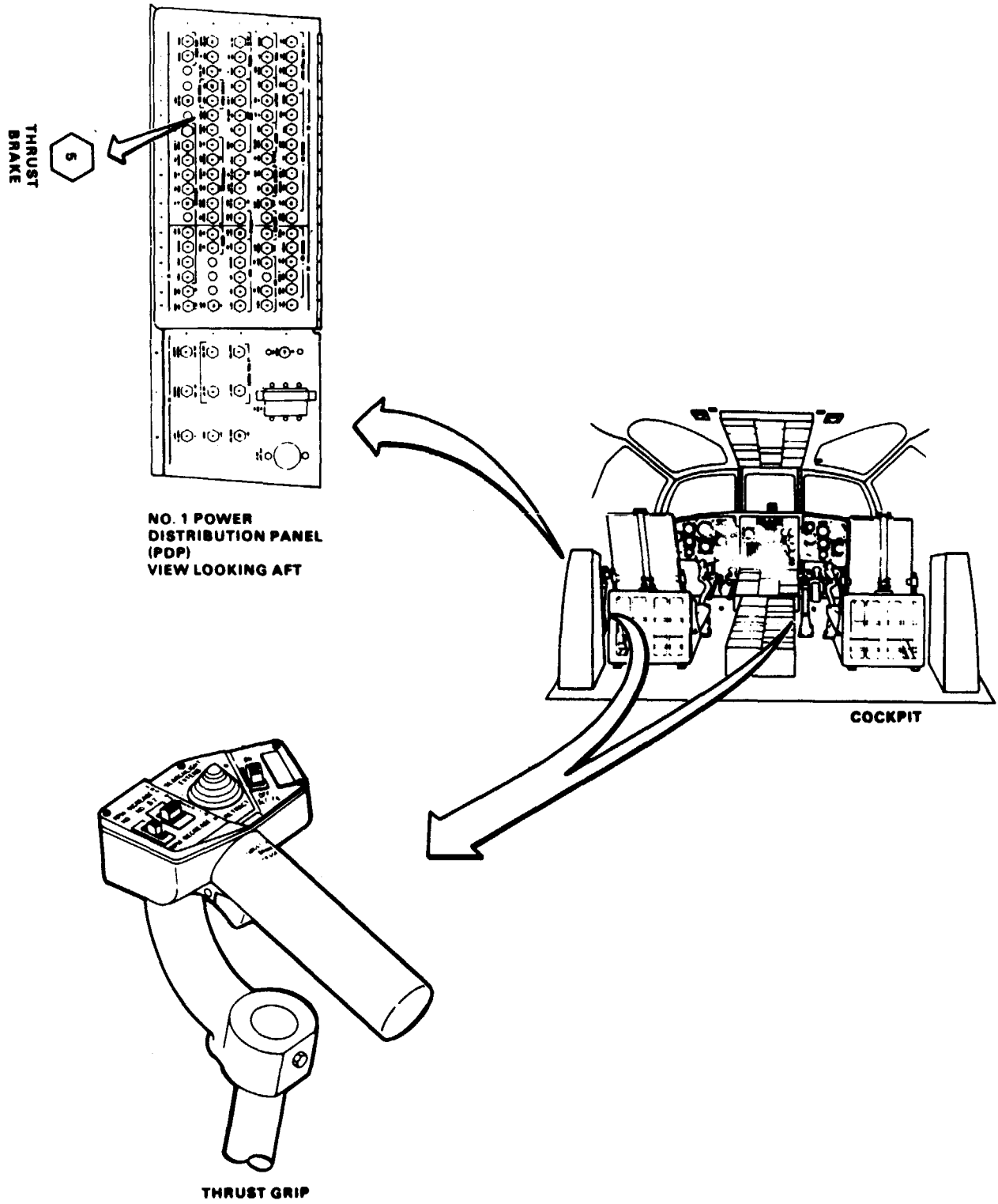
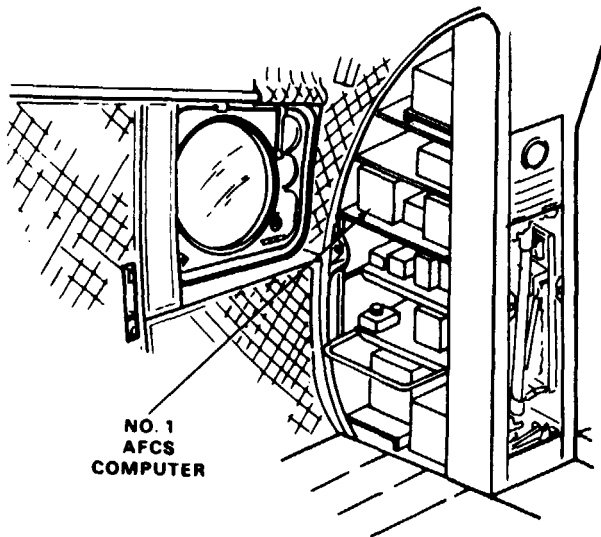
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

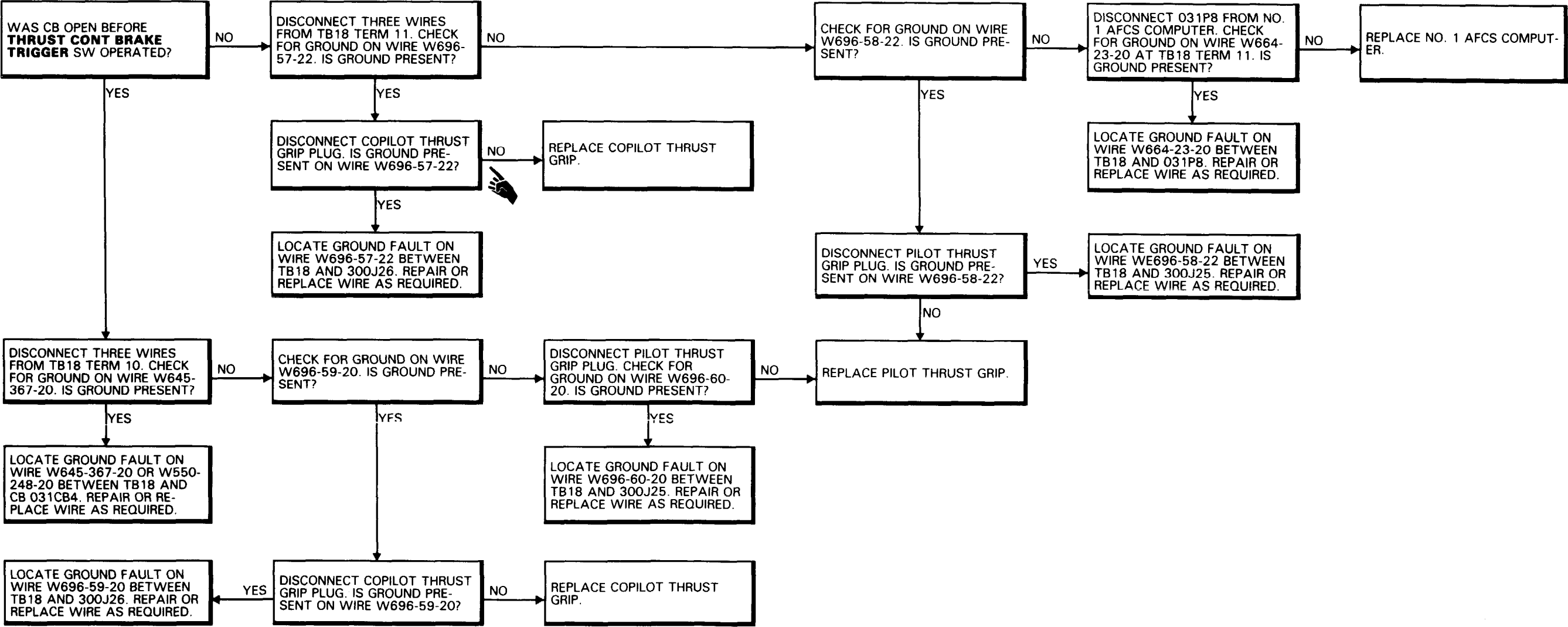
Equipment Condition:  
TM 55-1520-240-23  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off  
Electronic Compartment Acoustic  
Blanket Removed





11-2.4 THRUST BRAKE CIRCUIT BREAKER DOES NOT STAY CLOSED (Continued)

11-2.4



11-2.5 CONT CENTER CIRCUIT BREAKER DOES NOT STAY CLOSED

11-2.5

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

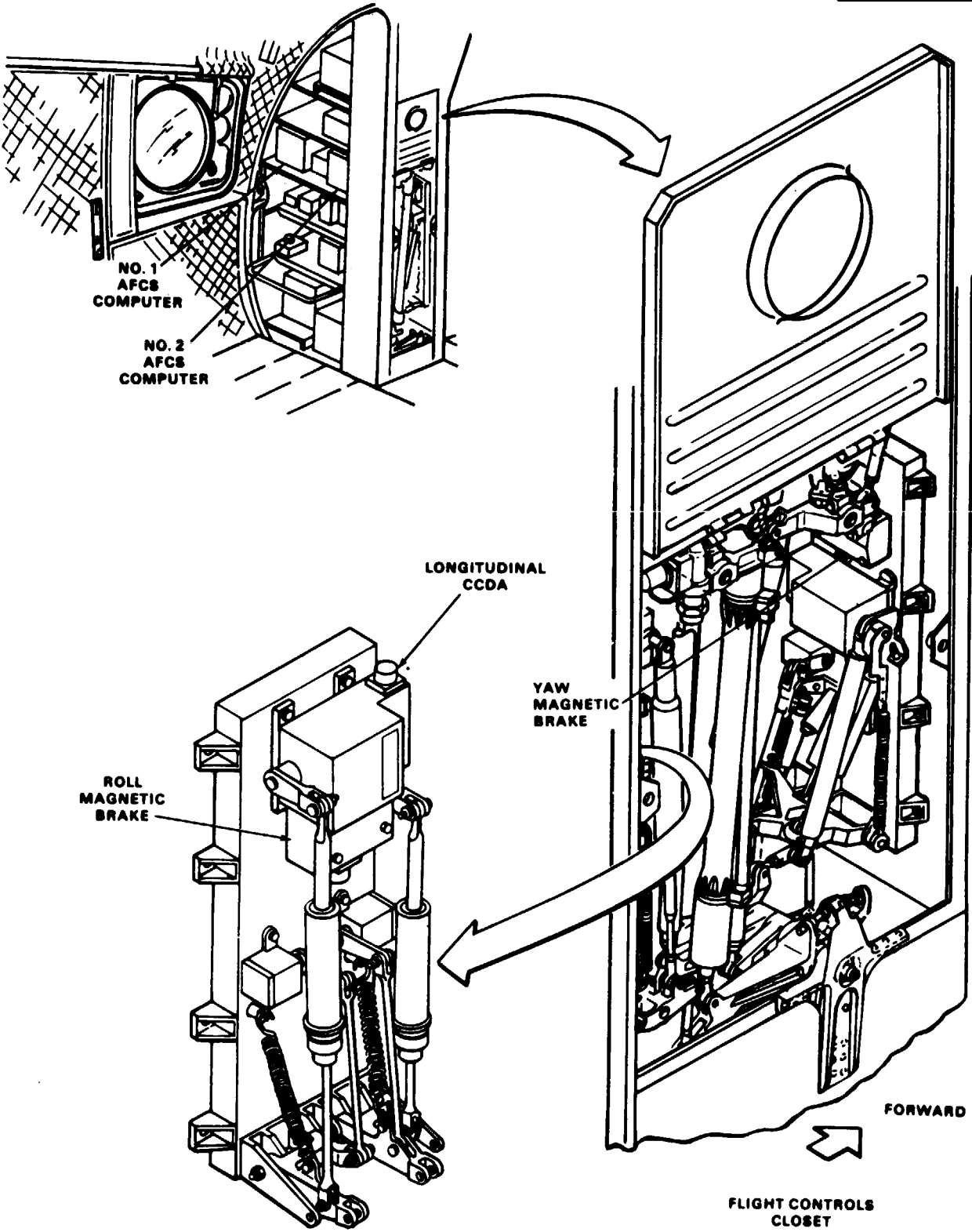
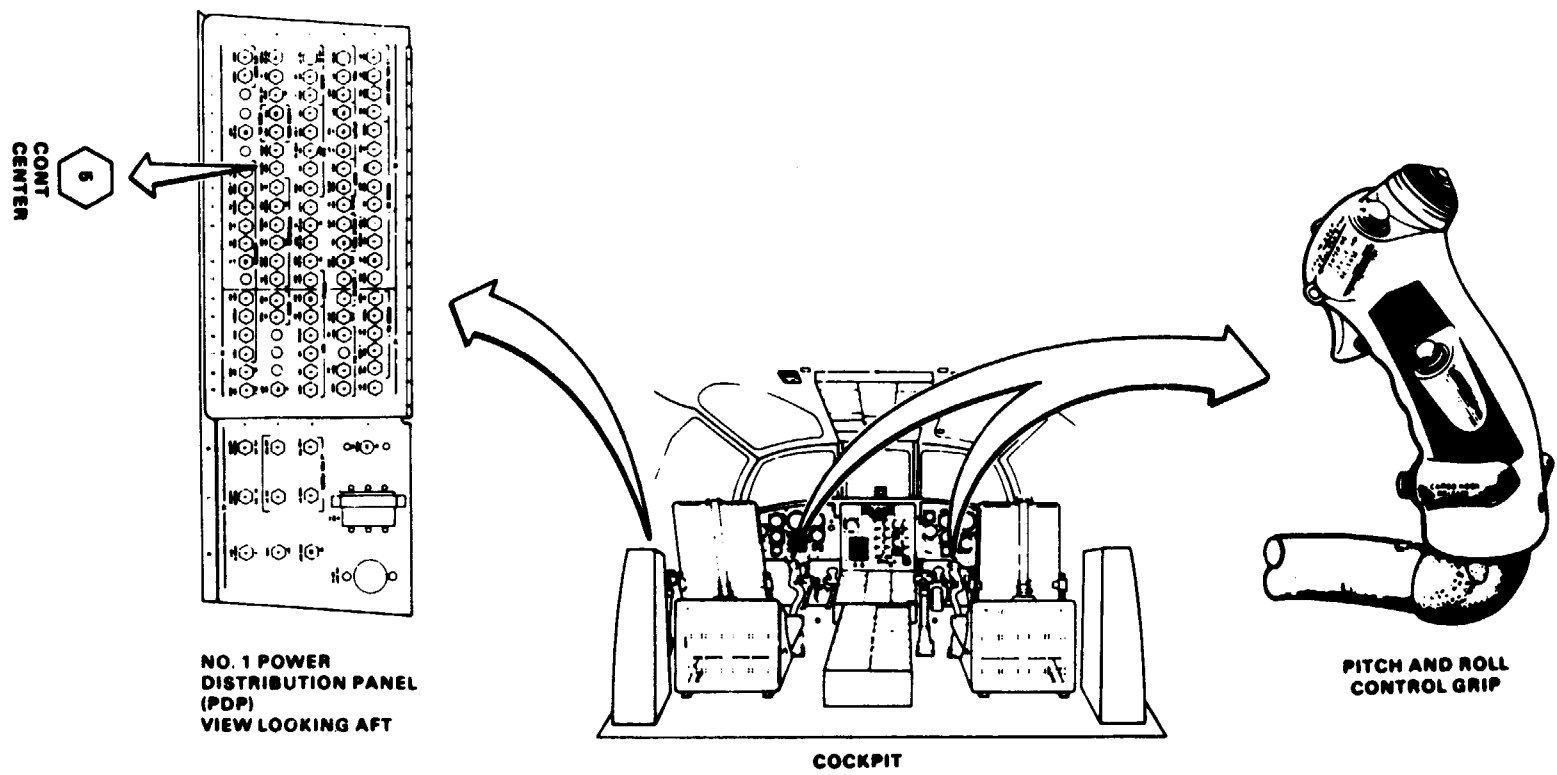
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

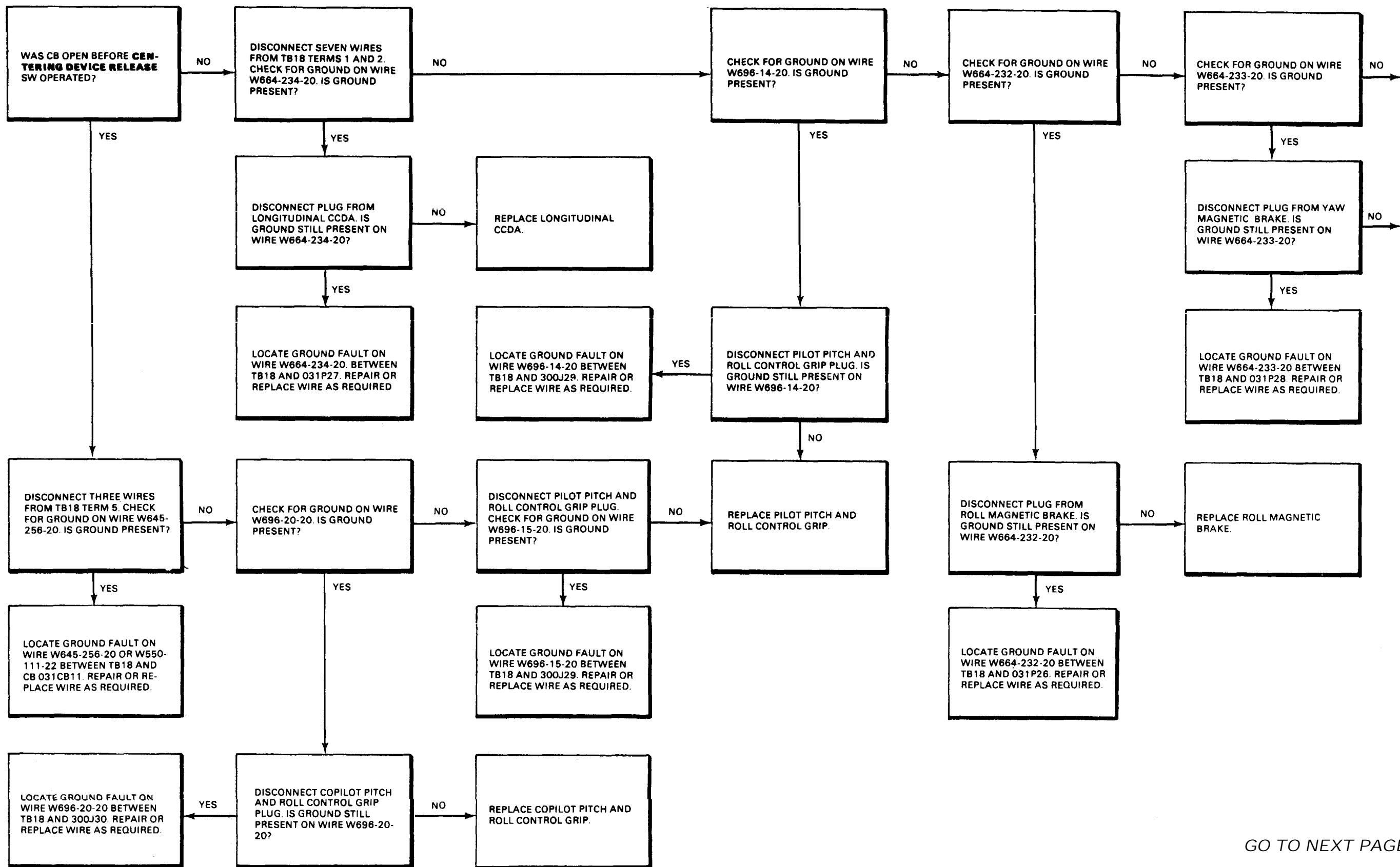
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off  
Electronic Compartment Acoustic  
Blanket Removed



11-2.5 CONT CENTER CIRCUIT BREAKER DOES NOT STAY CLOSED  
(Continued)

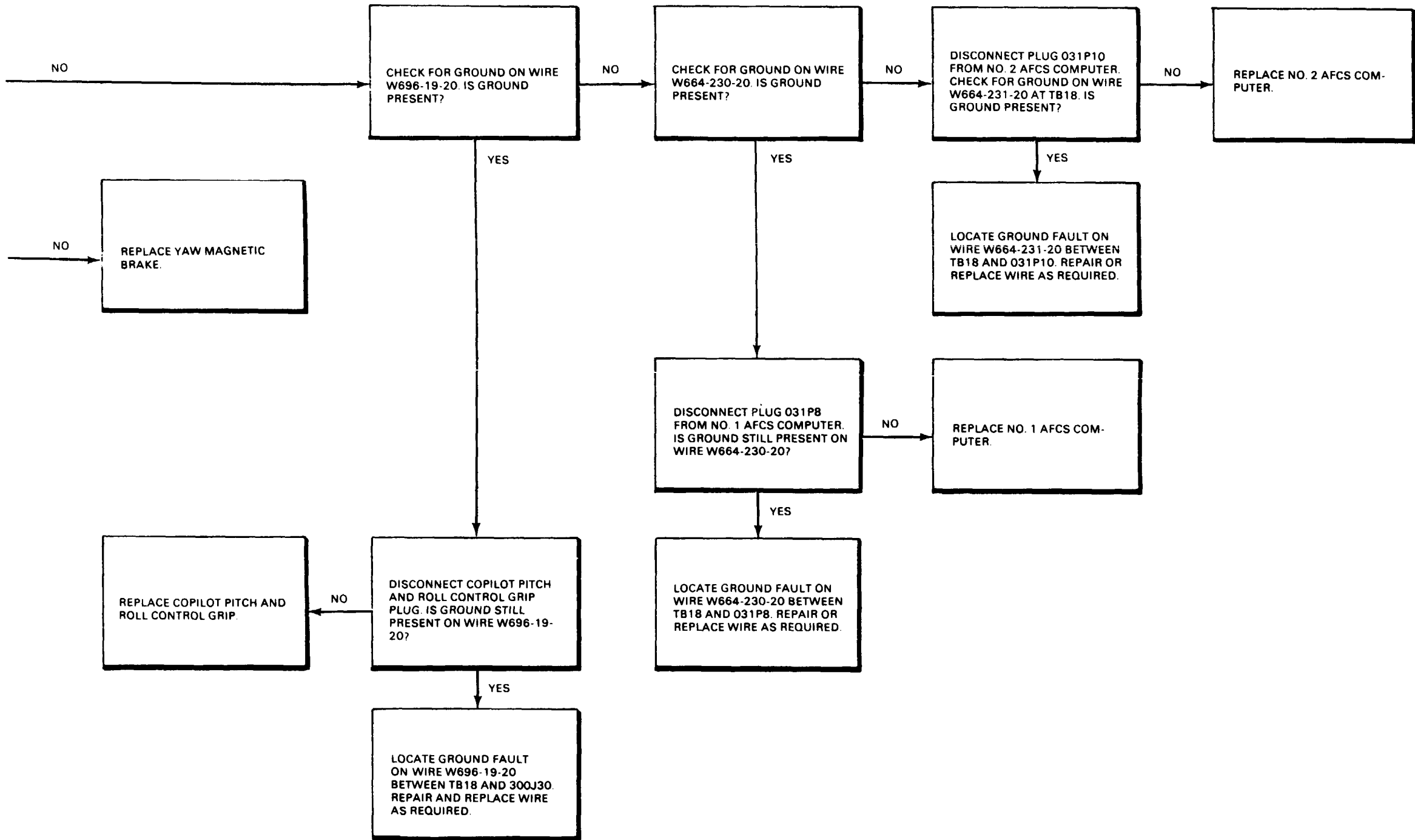
11-2.5



GO TO NEXT PAGE

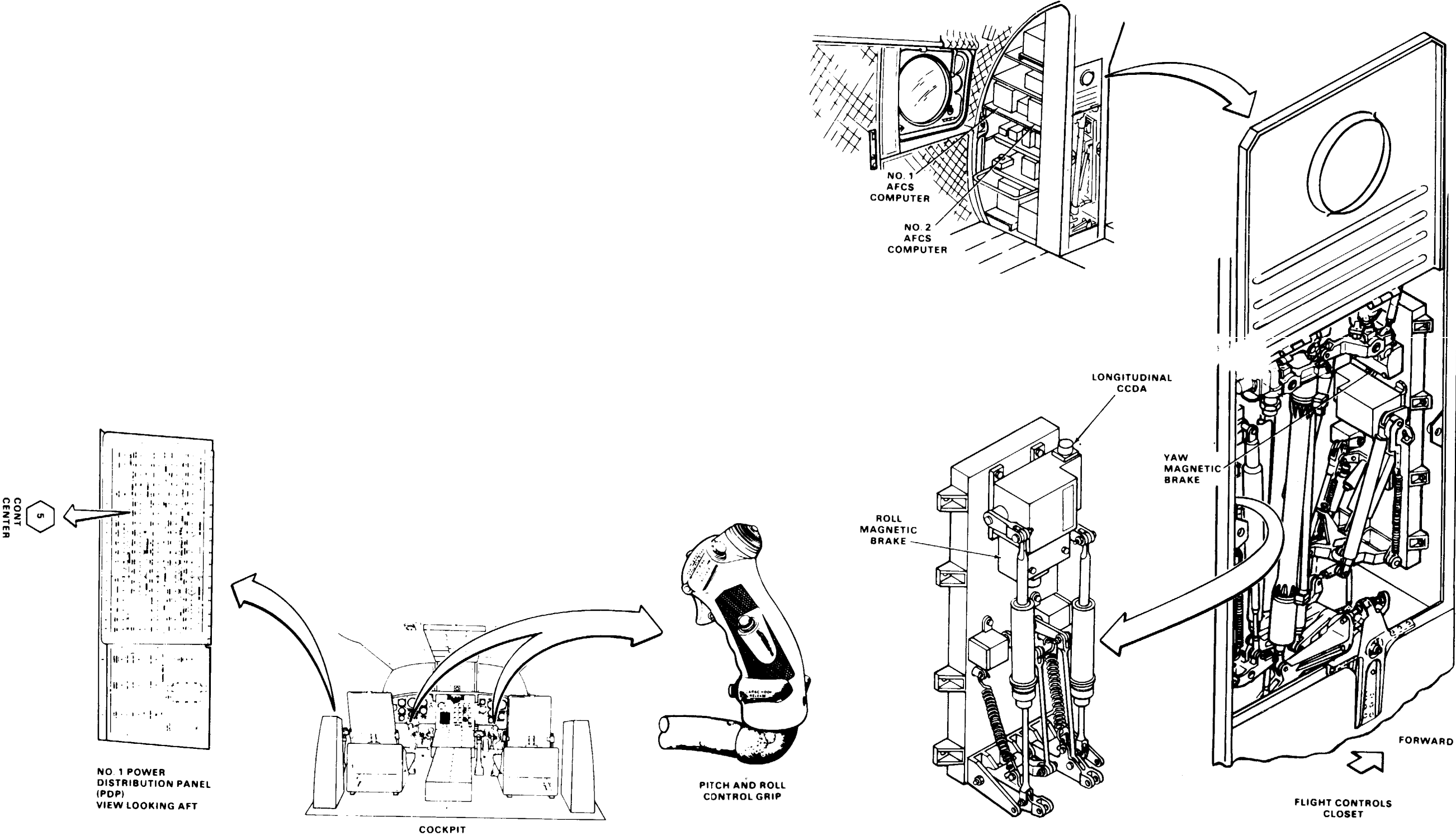
11-2.5 CONT CENTER CIRCUIT BREAKER DOES NOT STAY CLOSED  
(Continued)

11-2.5



11-2.5 CONT CENTER CIRCUIT BREAKER DOES NOT STAY CLOSED  
(Continued)

11-2.5



90 X 54

D145-11829-SPA

END OF TASK

11-2.6 CONTROL STICK AND PEDALS WILL NOT STAY CENTERED  
AFTER PILOT'S CENTERING DEVICE RELEASE SWITCH  
RELEASED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
- Multimeter

Materials:

None

Personnel Required:

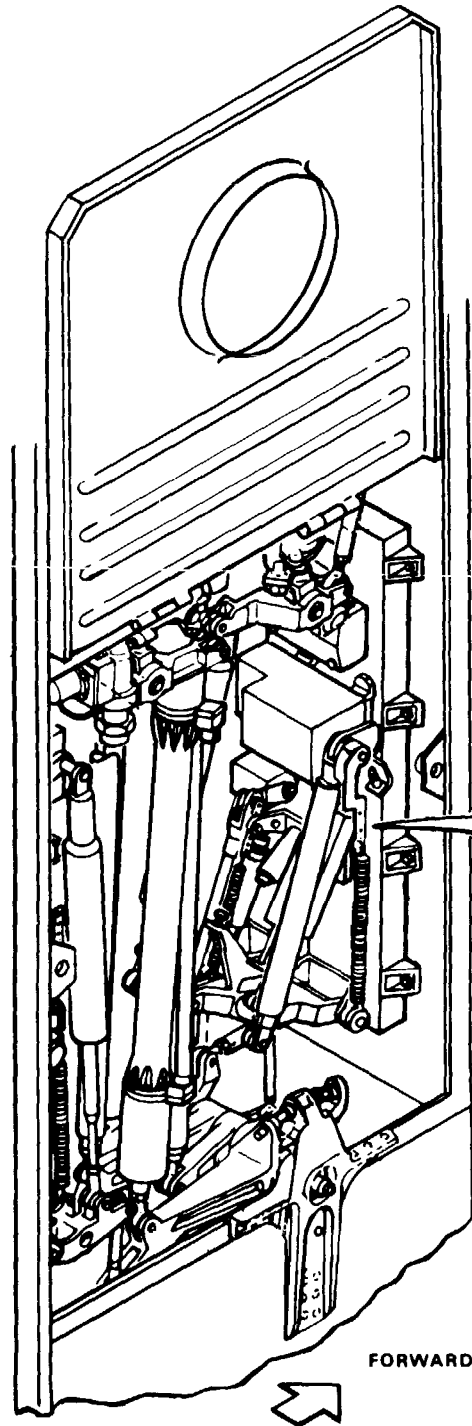
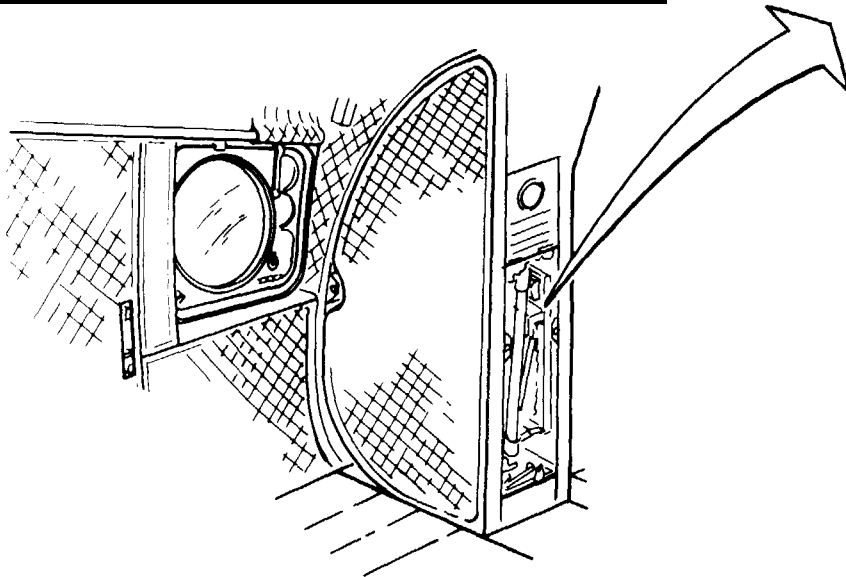
- 67U10 Medium Helicopter Repairer
- 68F20 Aircraft Electrician

References:

TM 55-1520-240-23

Equipment Condition:

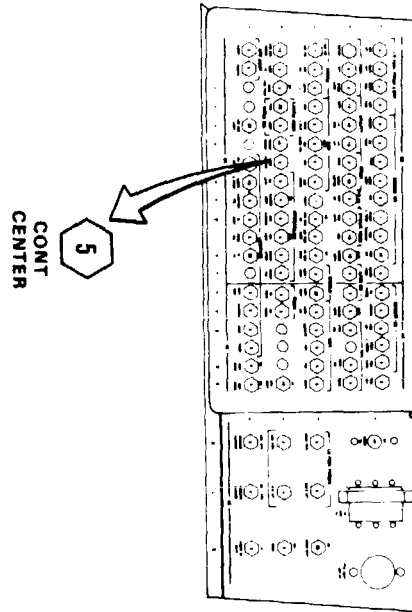
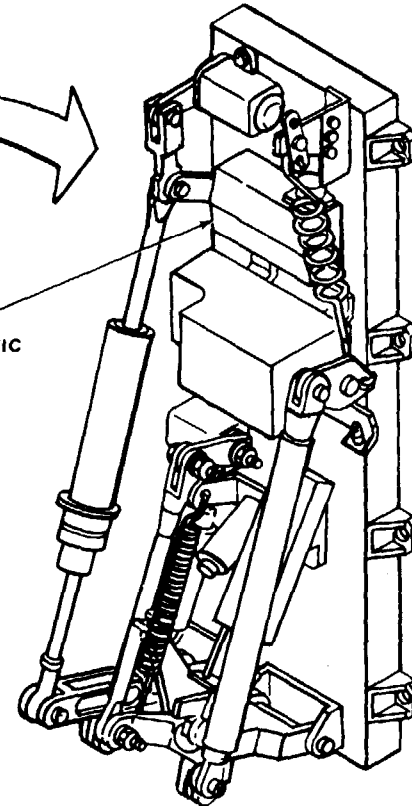
- TM 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power On



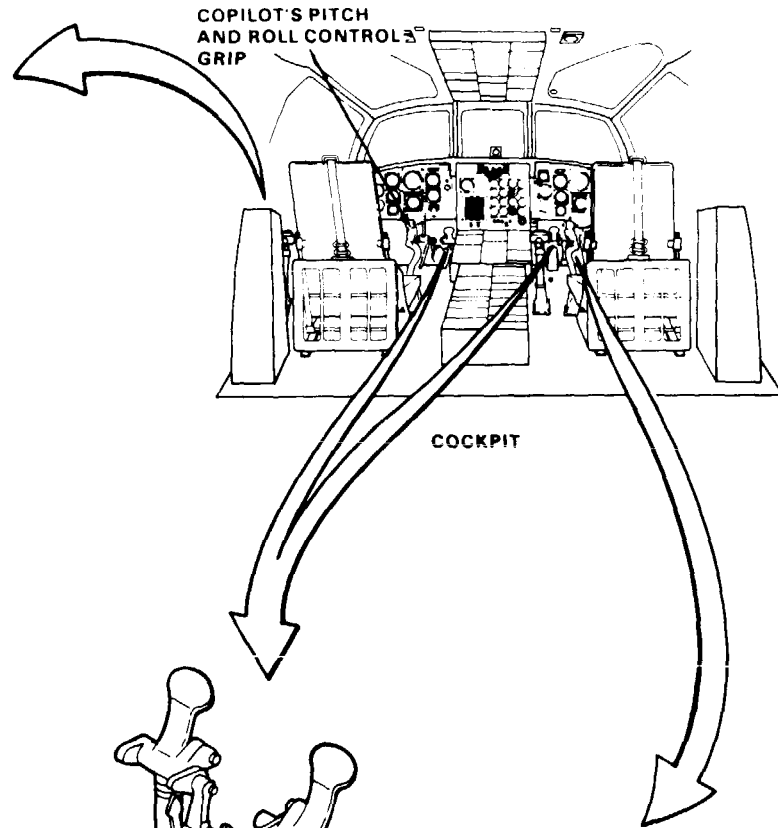
FLIGHT CONTROLS CLOSET

FORWARD

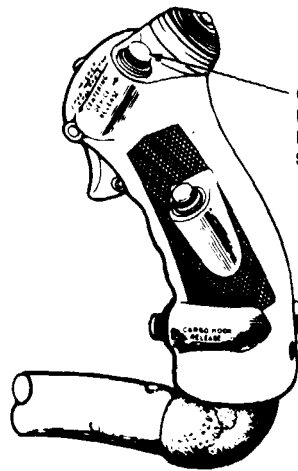
YAW  
MAGNETIC  
BRAKE



NO. 1 POWER  
DISTRIBUTION PANEL  
(PDP)  
VIEW LOOKING AFT



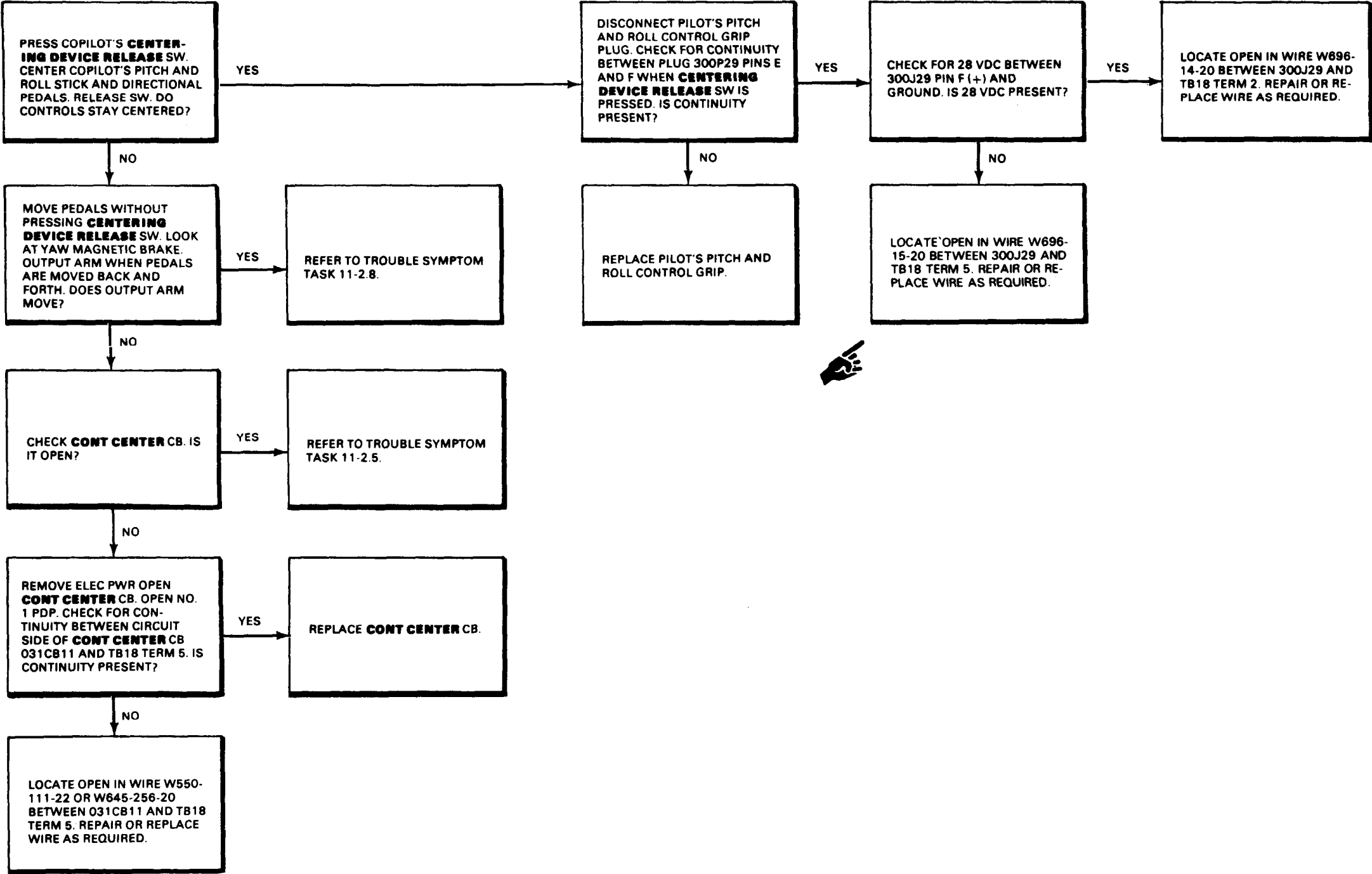
DIRECTIONAL  
PEDALS



PILOT'S  
PITCH AND ROLL  
CONTROL GRIP  
SHOWN. COPILOT'S  
SAME

11-2.6 STICK AND PEDALS WILL NOT STAY CENTERED  
AFTER PILOT'S CENTERING DEVICE RELEASE SWITCH  
RELEASED (Continued)

11-2.6



END OF TASK

11-2.7 CONTROL STICK DOES NOT REMAIN AT SELECTED POSITION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Application Configurations:  
All

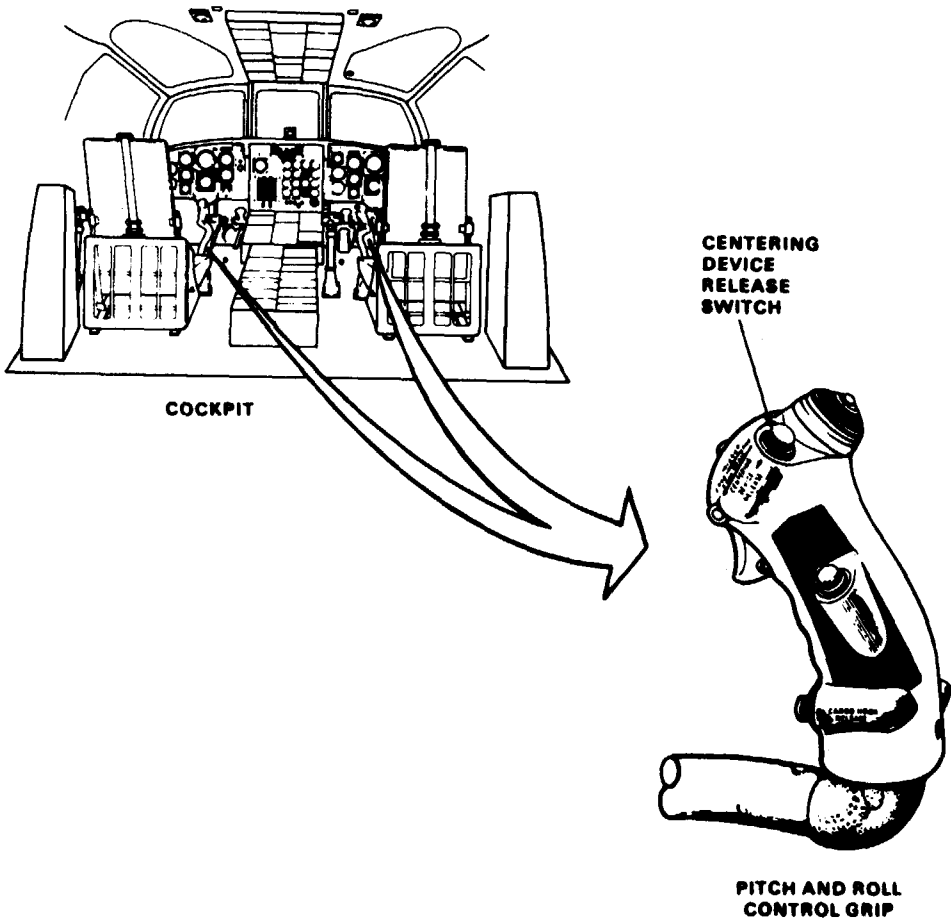
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

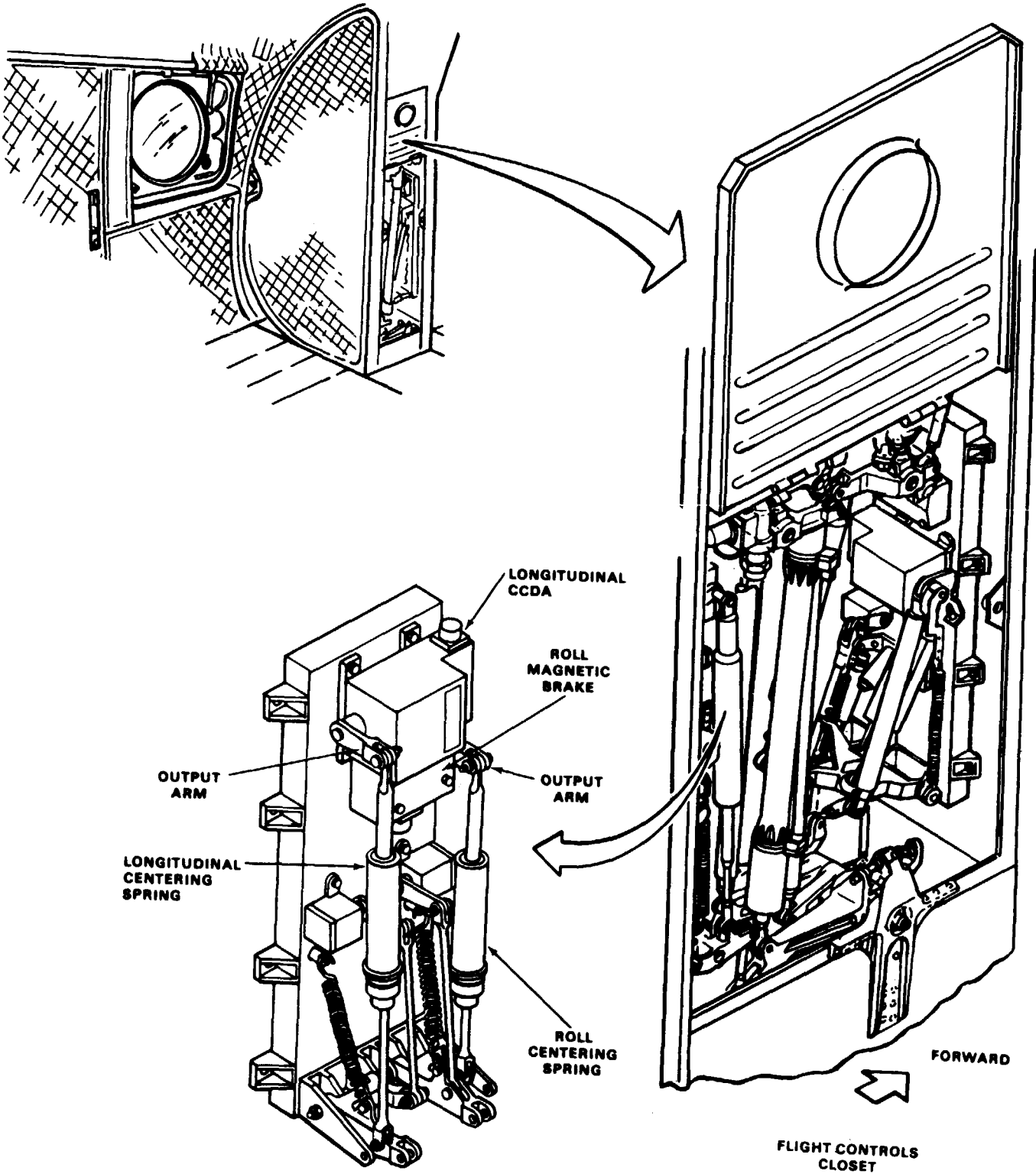
Personnel Required:  
67U10 Medium Helicopter Repairer  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On



68X54



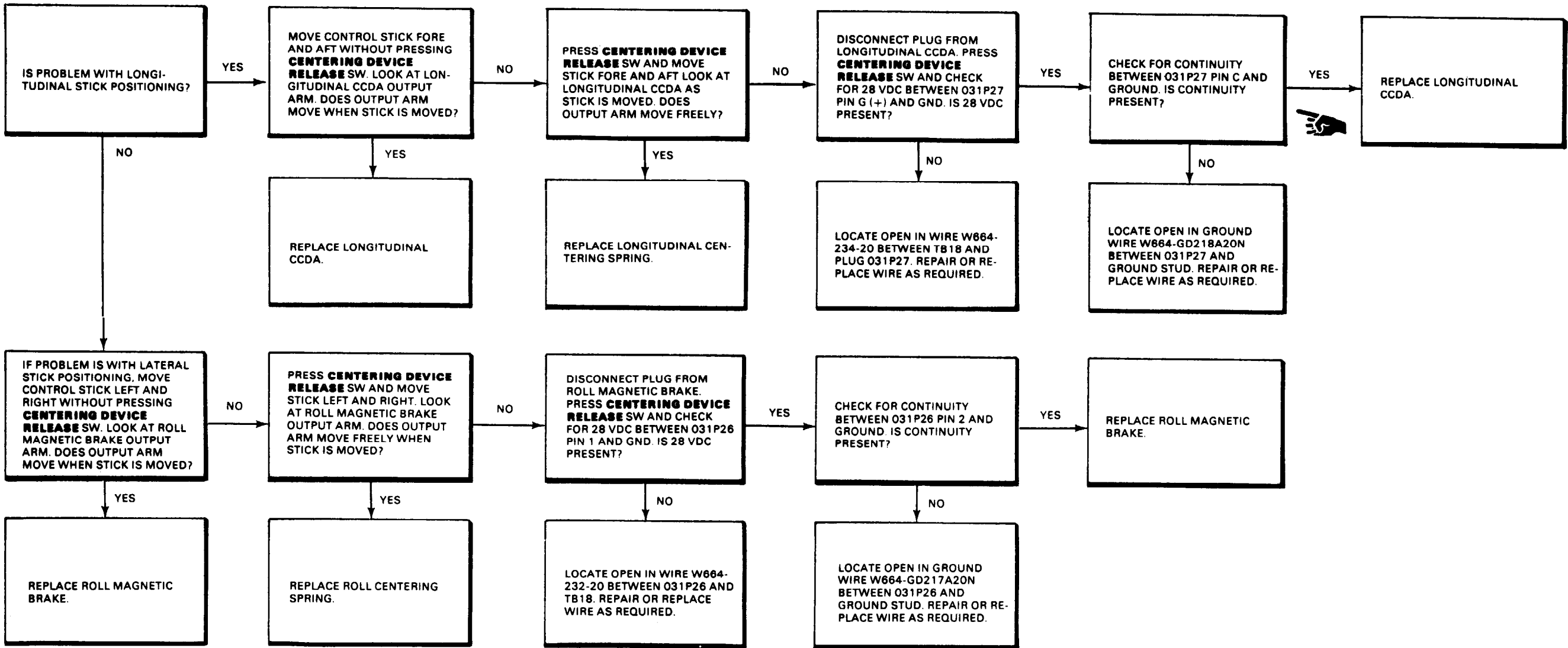
D145 - 4218 - SPA

GO TO NEXT PAGE



11-2.7 CONTROL STICK DOES NOT REMAIN AT SELECTED POSITION (Continued)

11-2.7



END OF TASK

11-2.8 PEDALS DO NOT REMAIN AT SELECTED POSITION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

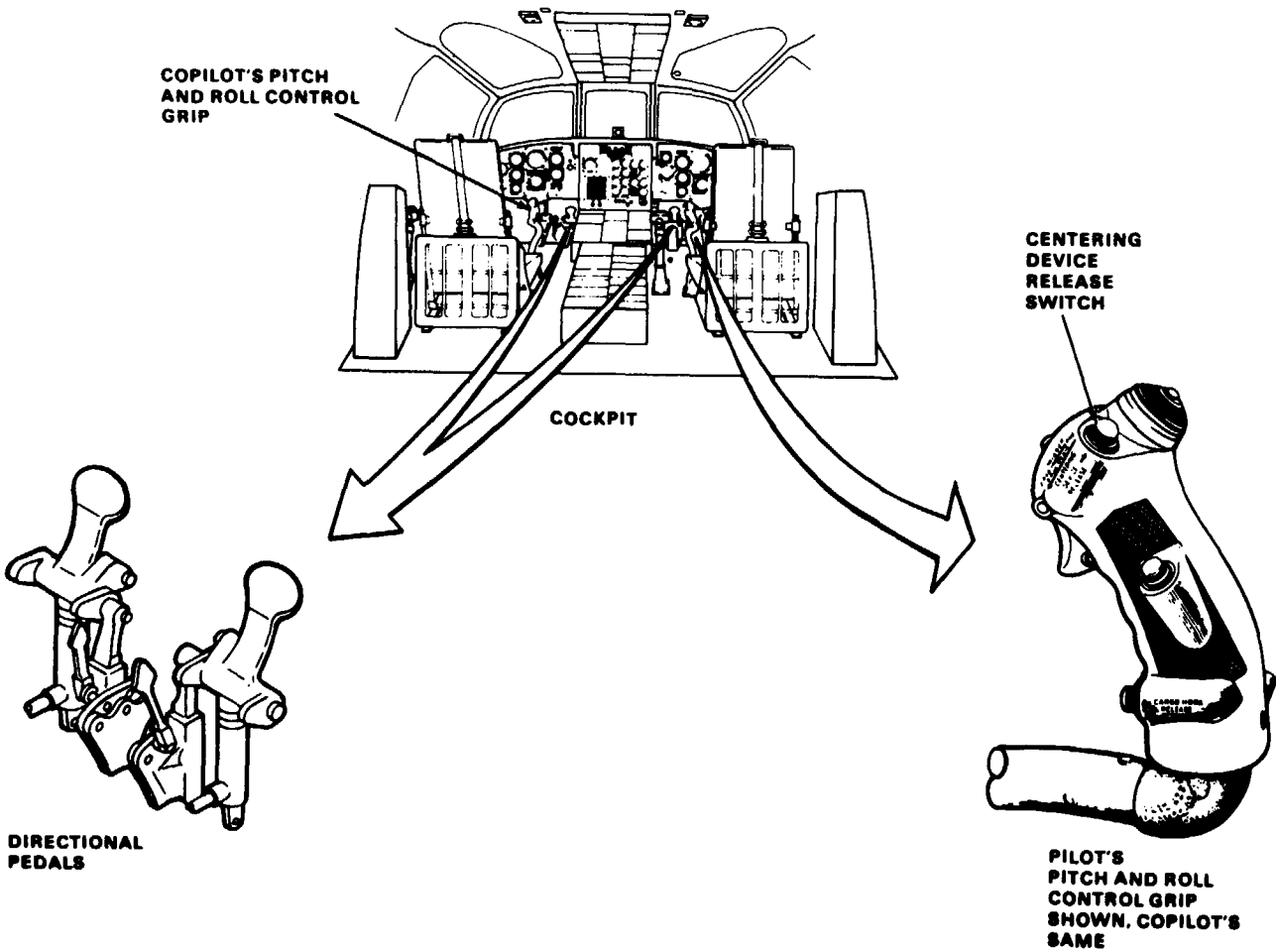
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

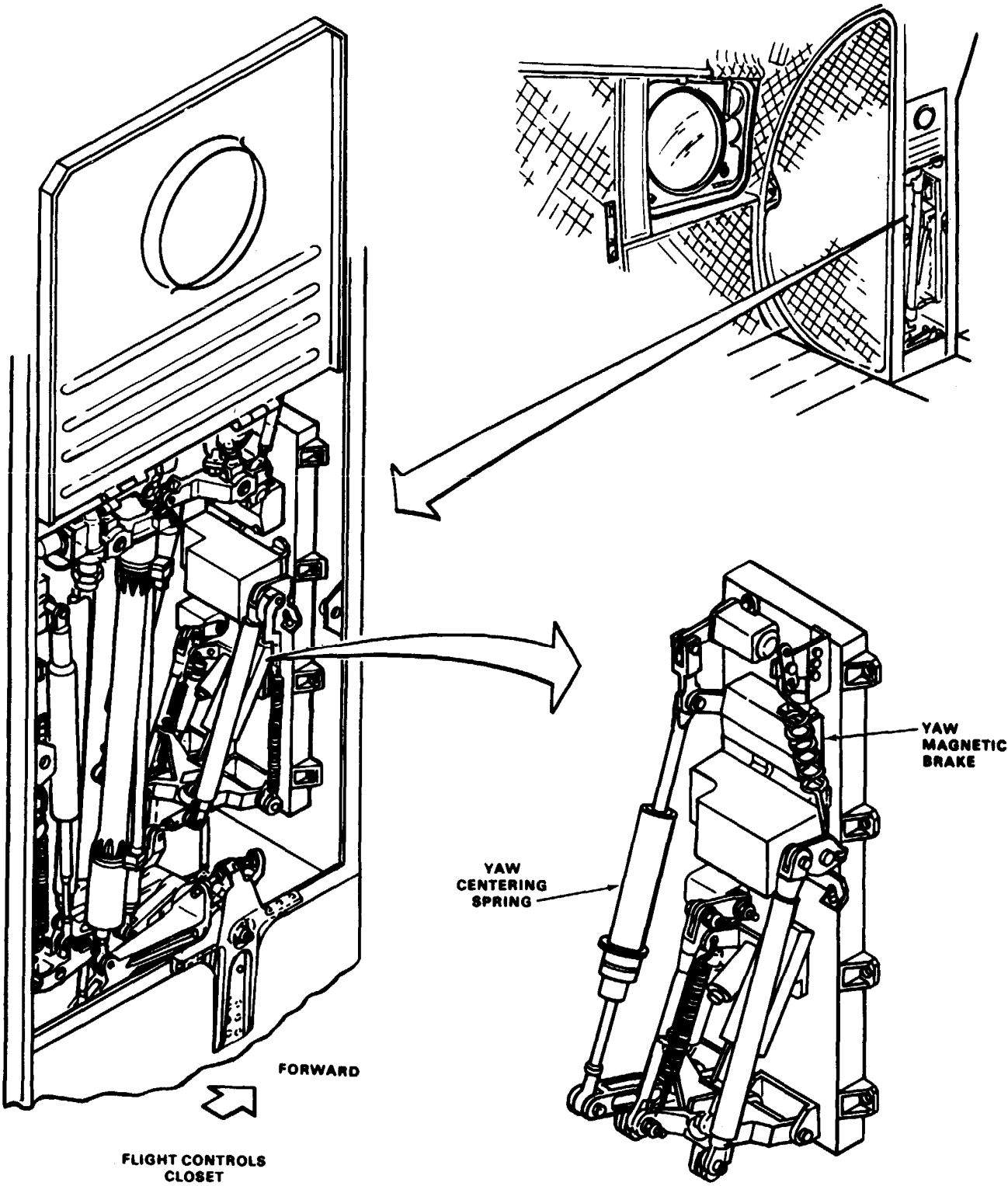
**Personnel Required**  
67U10 Medium Helicopter Repairer  
68F20 Aircraft Electrician

**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On



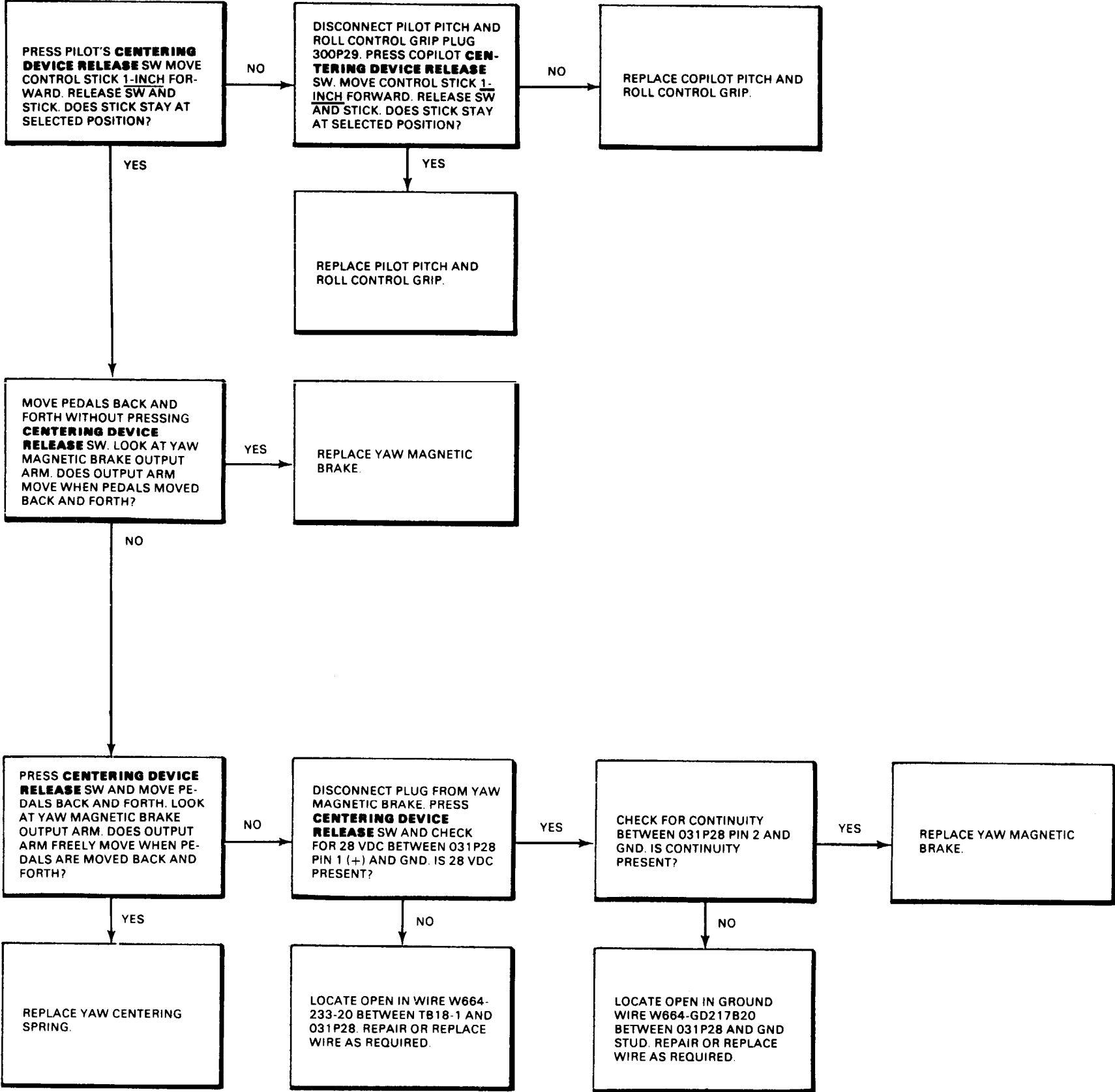
90X54



D145 - 4219 - SPA  
**GO TO NEXT PAGE**

11-2.8 PEDALS DO NOT REMAIN AT SELECTED POSITION  
(Continued)

11-2.8



END OF TASK

11-2.9 PILOT'S THRUST CONTROL DOES NOT EASILY MOVE OR DOES NOT REMAIN AT SELECTED POSITION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

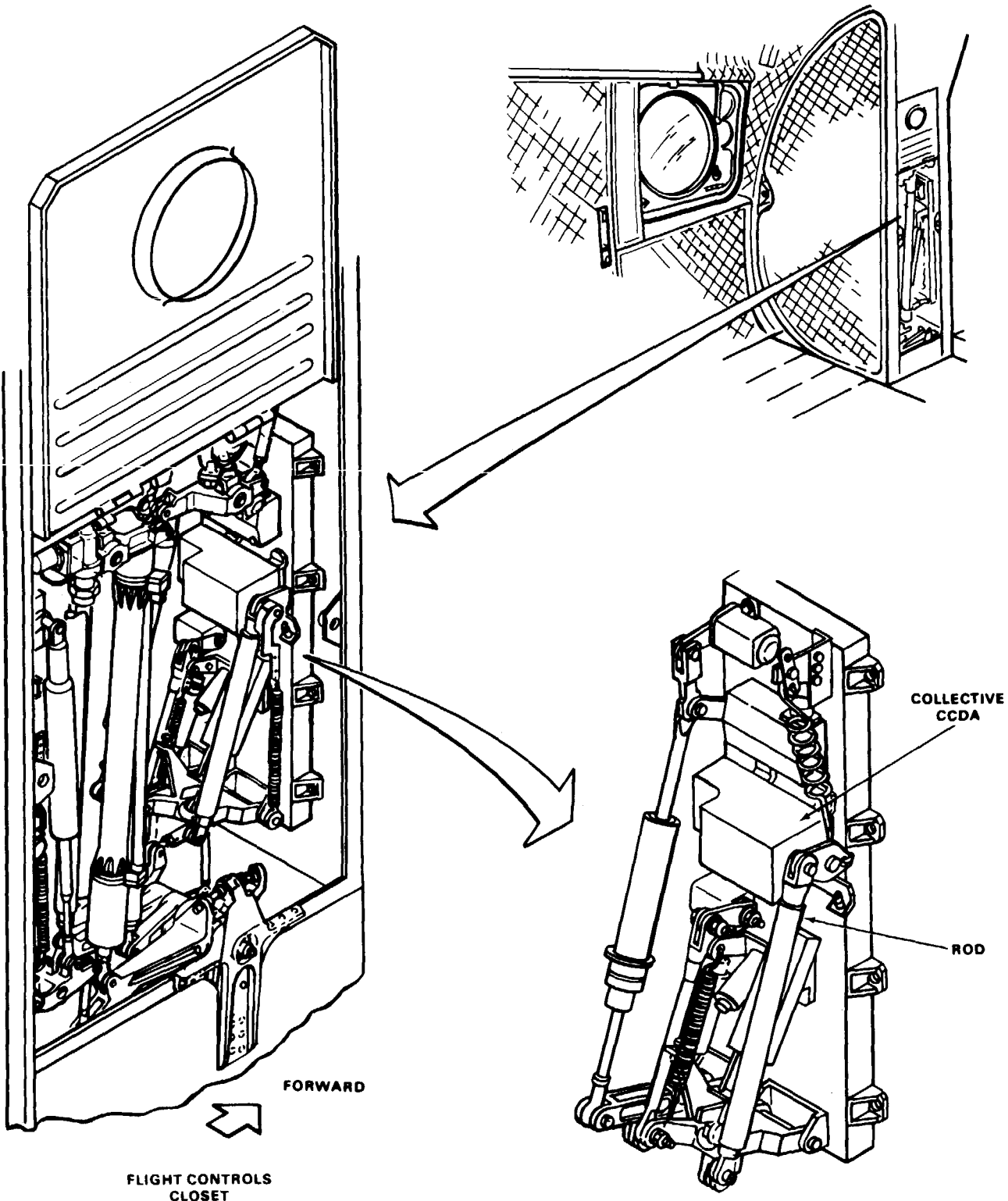
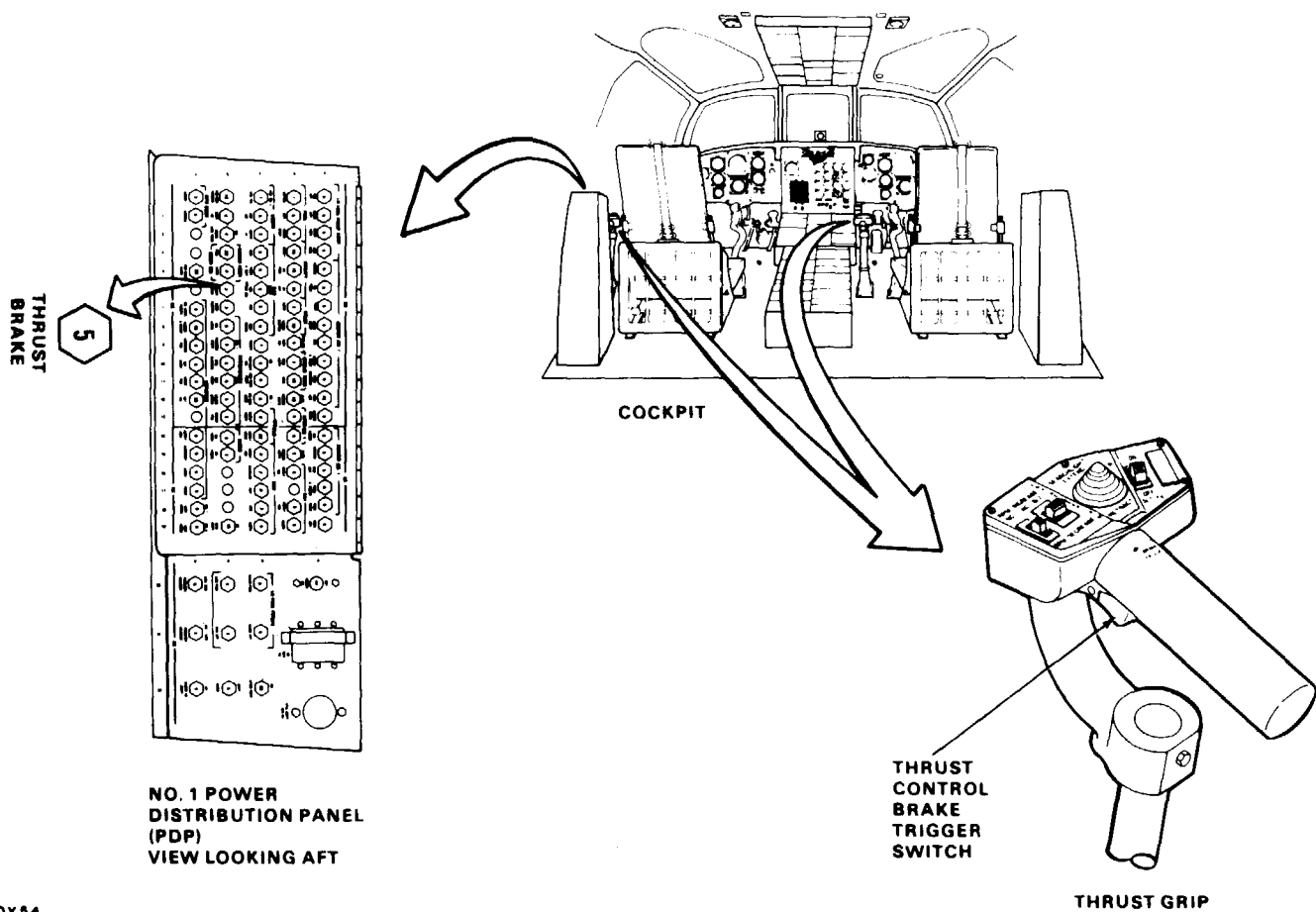
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692  
Multimeter

Materials:  
None

Personnel Required:  
67U10 Medium Helicopter Repairer  
68F20 Aircraft Electrician

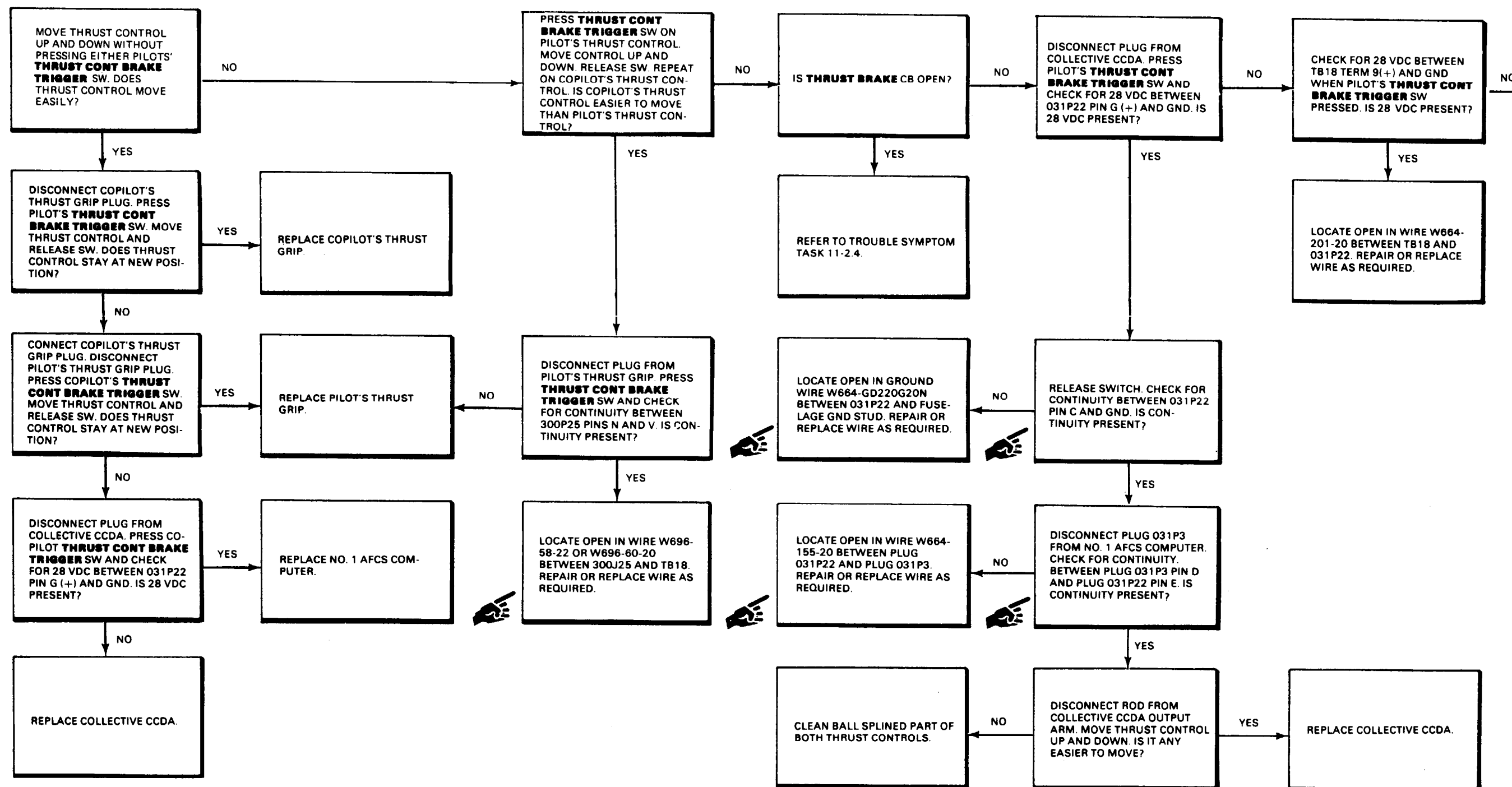
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On



11-2.9 PILOT'S THRUST CONTROL DOES NOT EASILY MOVE OR DOES NOT REMAIN AT SELECTED POSITION (Continued)

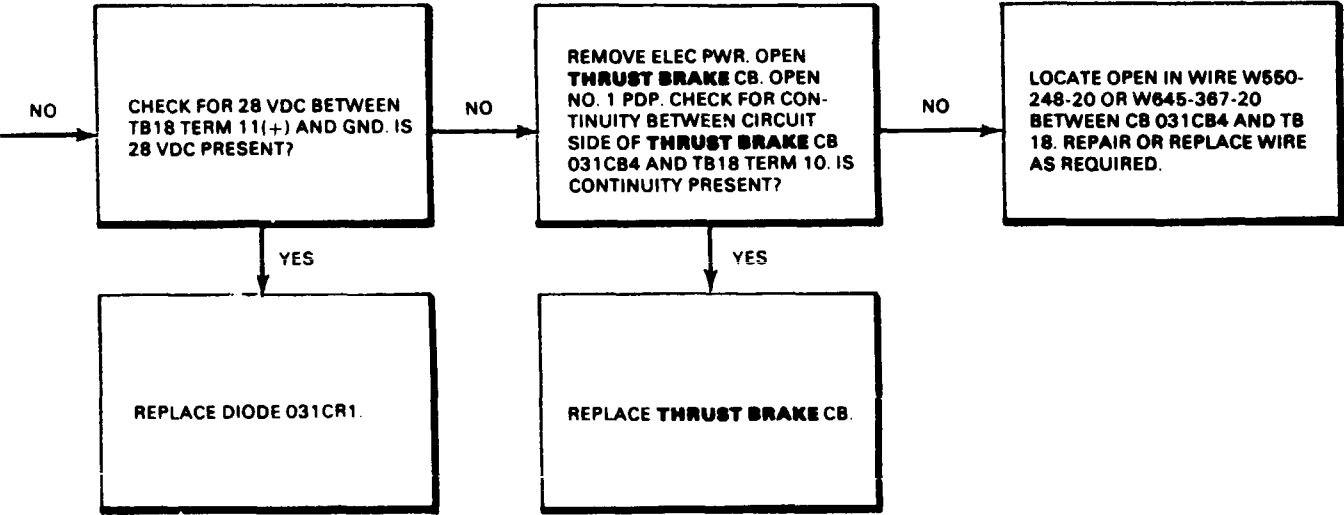
11-2.9



GO TO NEXT PAGE

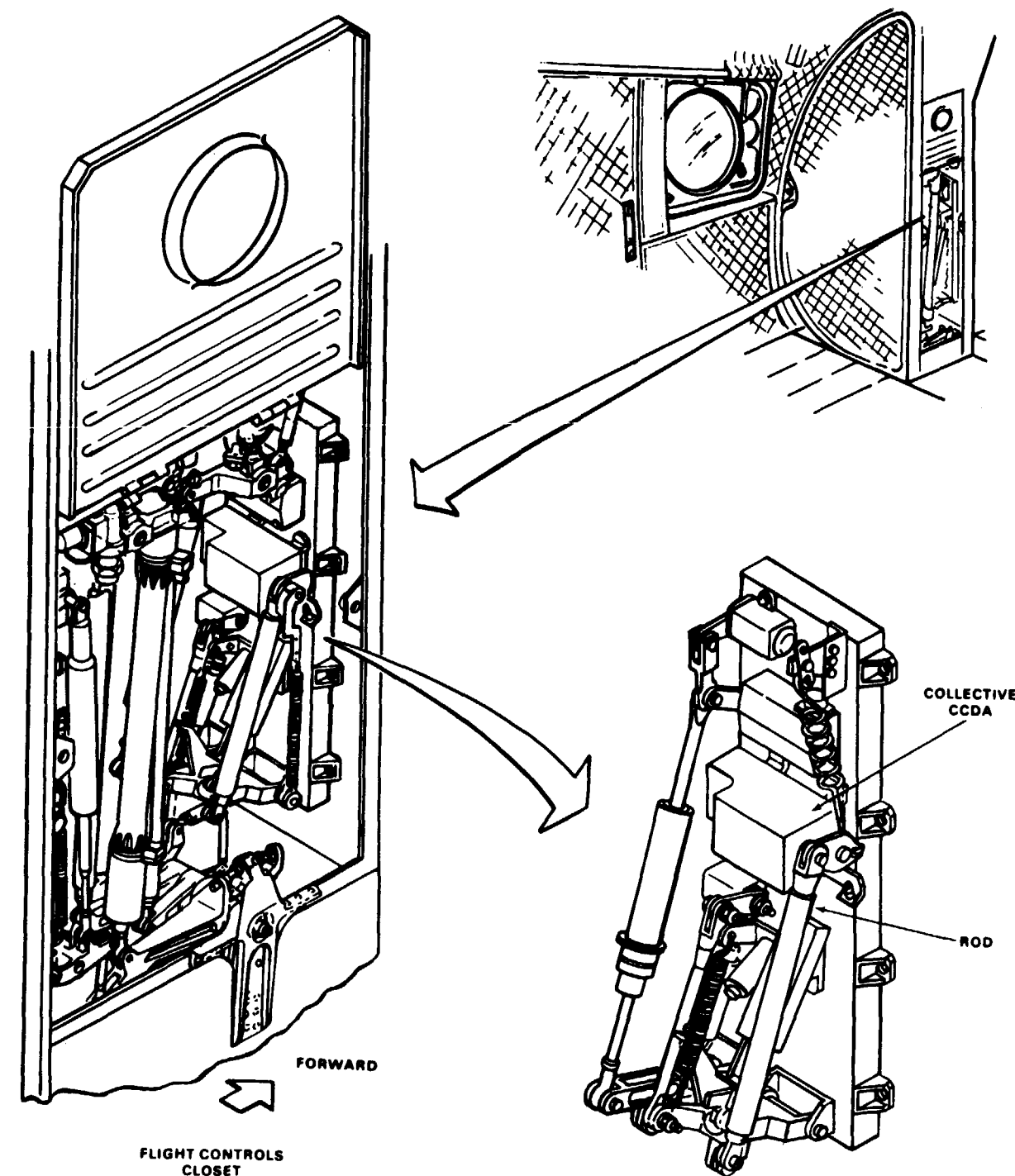
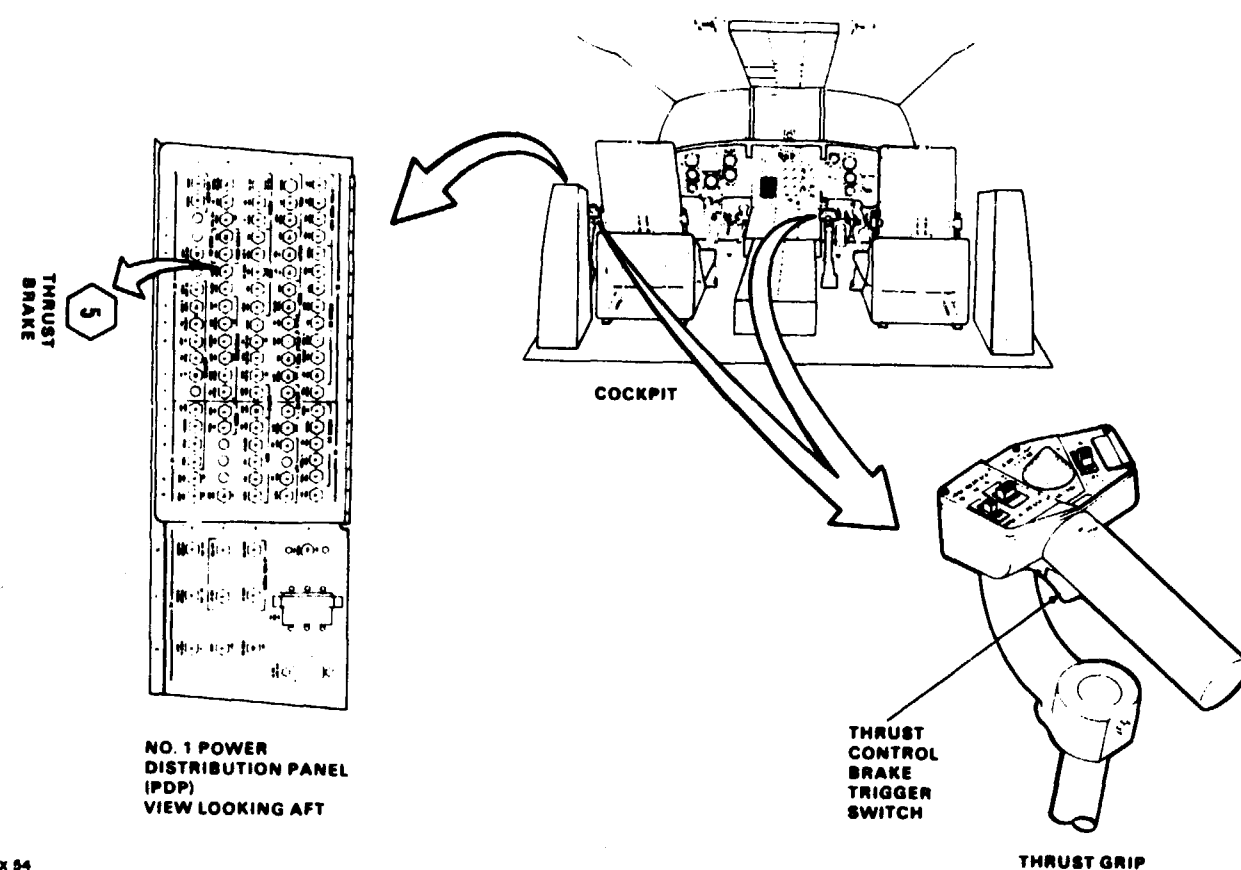
11-2.9 PILOT'S THRUST CONTROL DOES NOT EASILY MOVE OR  
DOES NOT REMAIN AT SELECTED POSITION (Continued)

11-2.9



11-2.9 PILOT'S THRUST CONTROL DOES NOT EASILY MOVE OR  
DOES NOT REMAIN AT SELECTED POSITION (Continued)

11-2.9



D145-11820-SPA

END OF TASK

11-2.10 COPILOT'S THRUST CONTROL DOES NOT EASILY MOVE  
OR DOES NOT REMAIN AT SELECTED POSITION

11-2.10

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

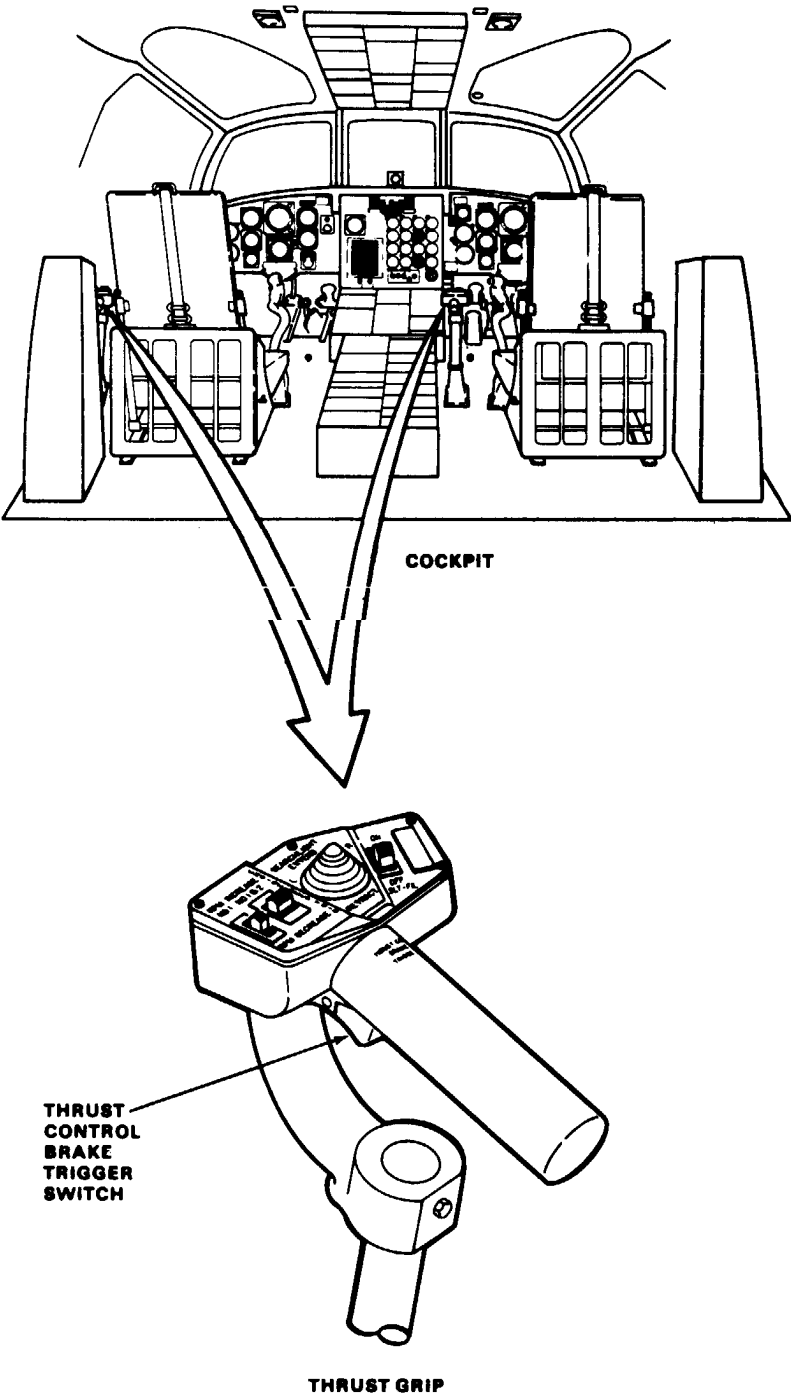
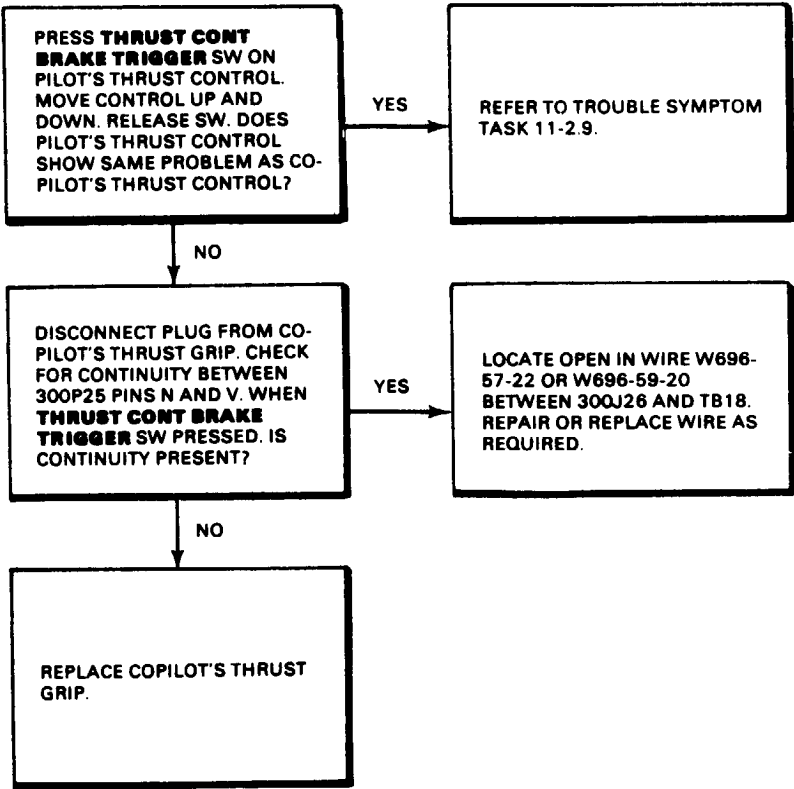
Personnel Required:  
Aircraft Electrician (2)

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

References:  
TM 55-1520-240-23

Materials:  
None

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On





11-2.11 CONTROL STICK WILL NOT REMAIN AT SELECTED POSITION  
AFTER COPILOT'S CENTERING DEVICE RELEASE SWITCH  
RELEASED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

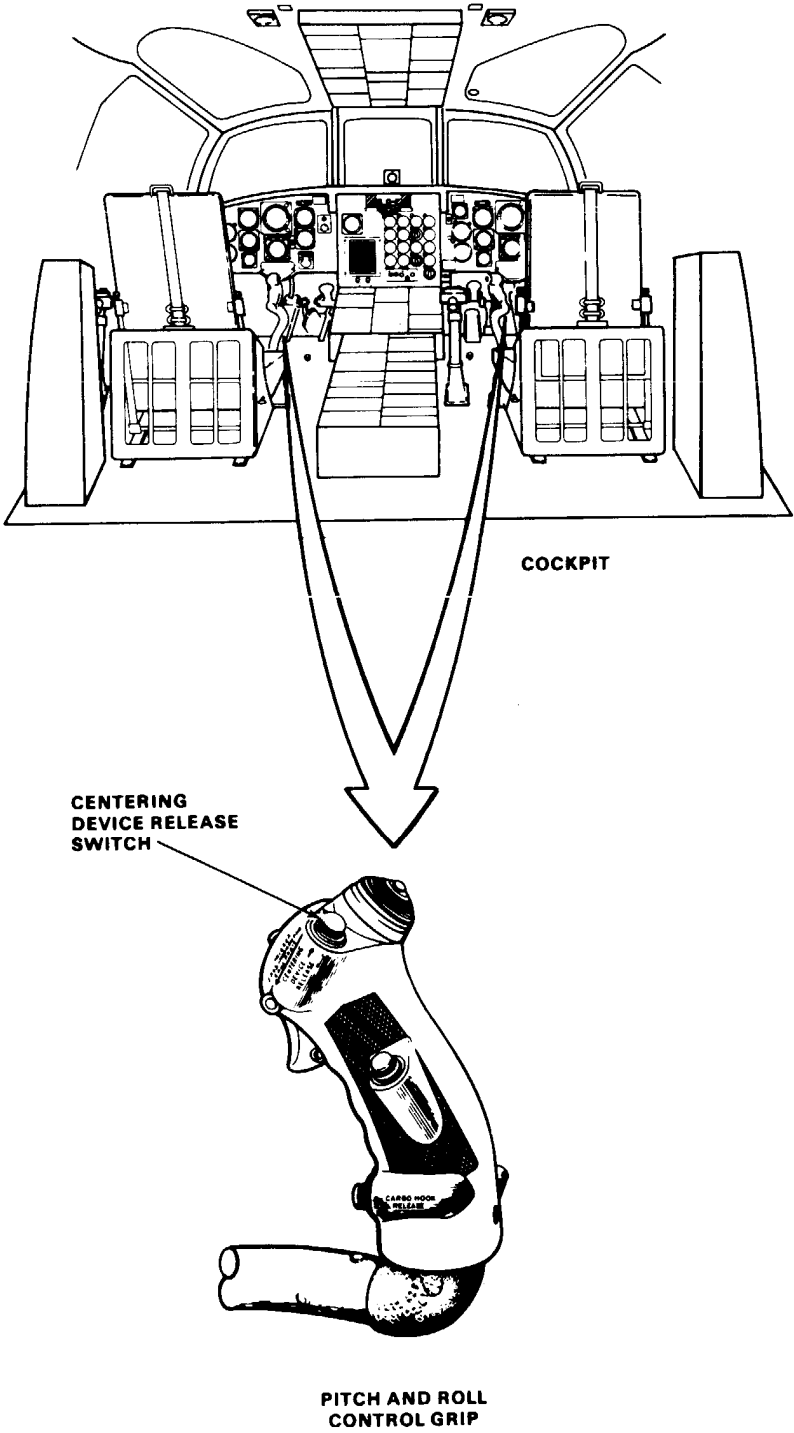
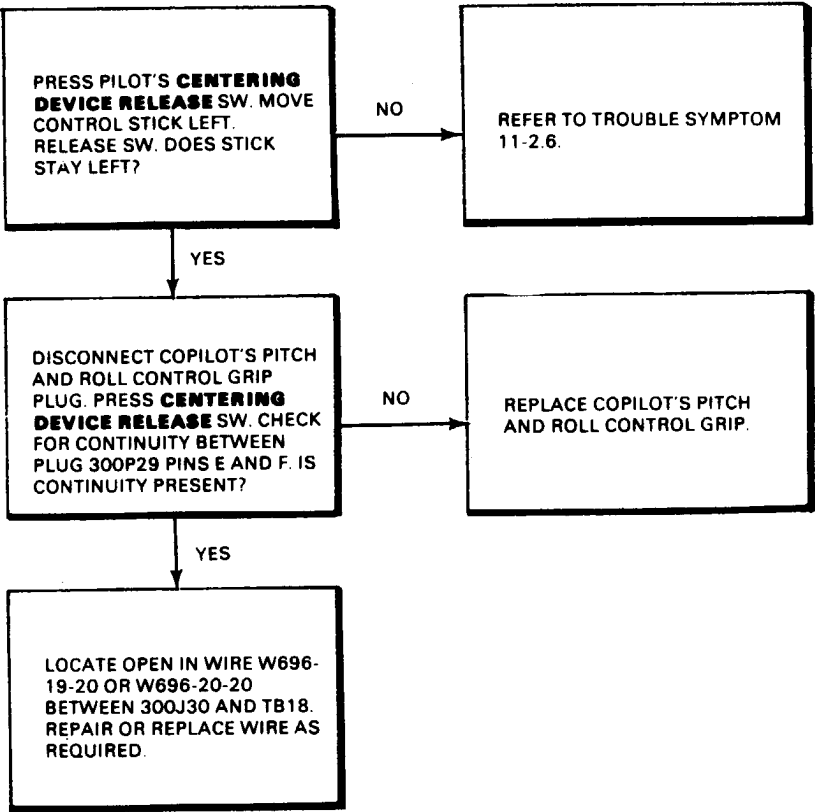
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

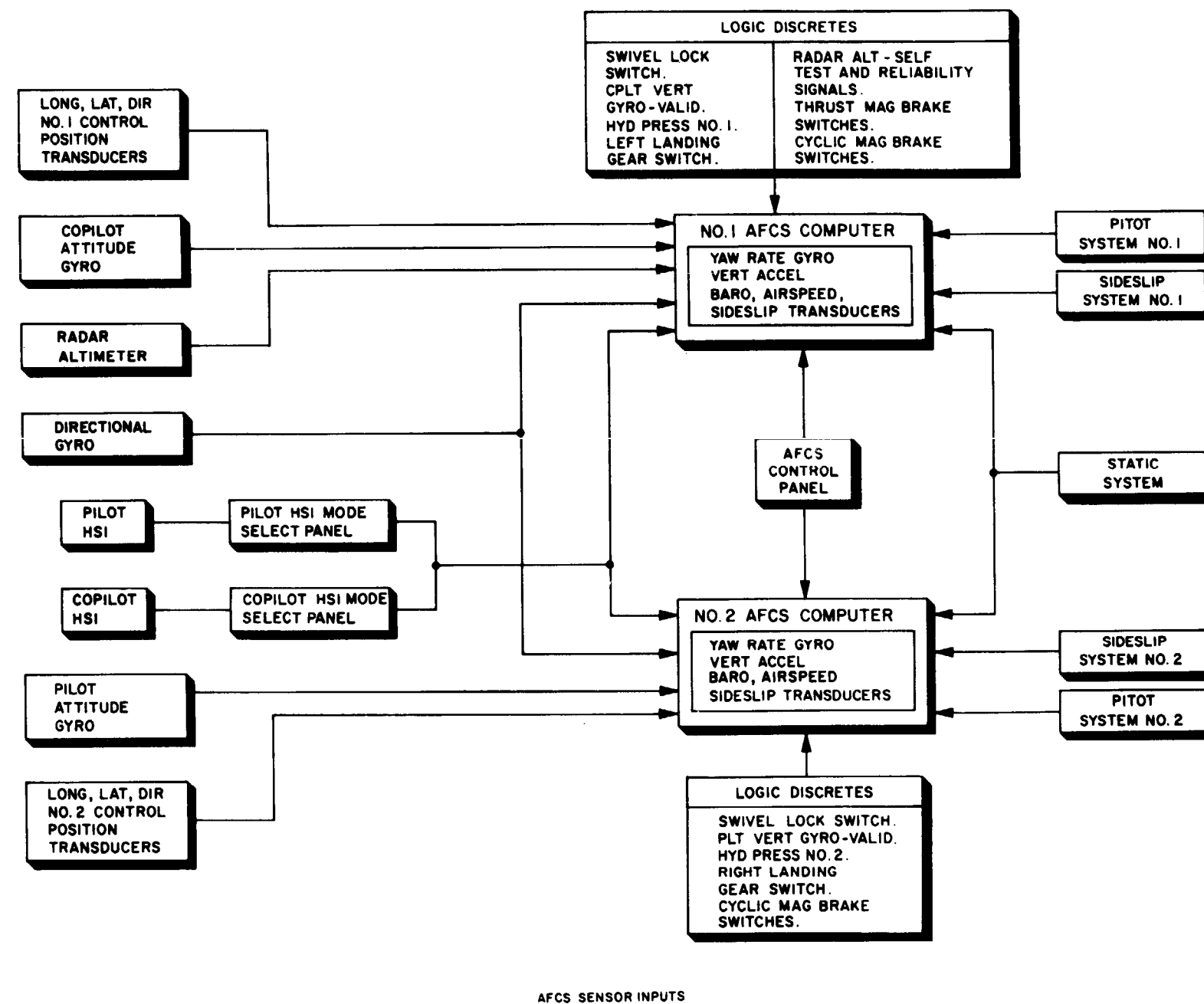
Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

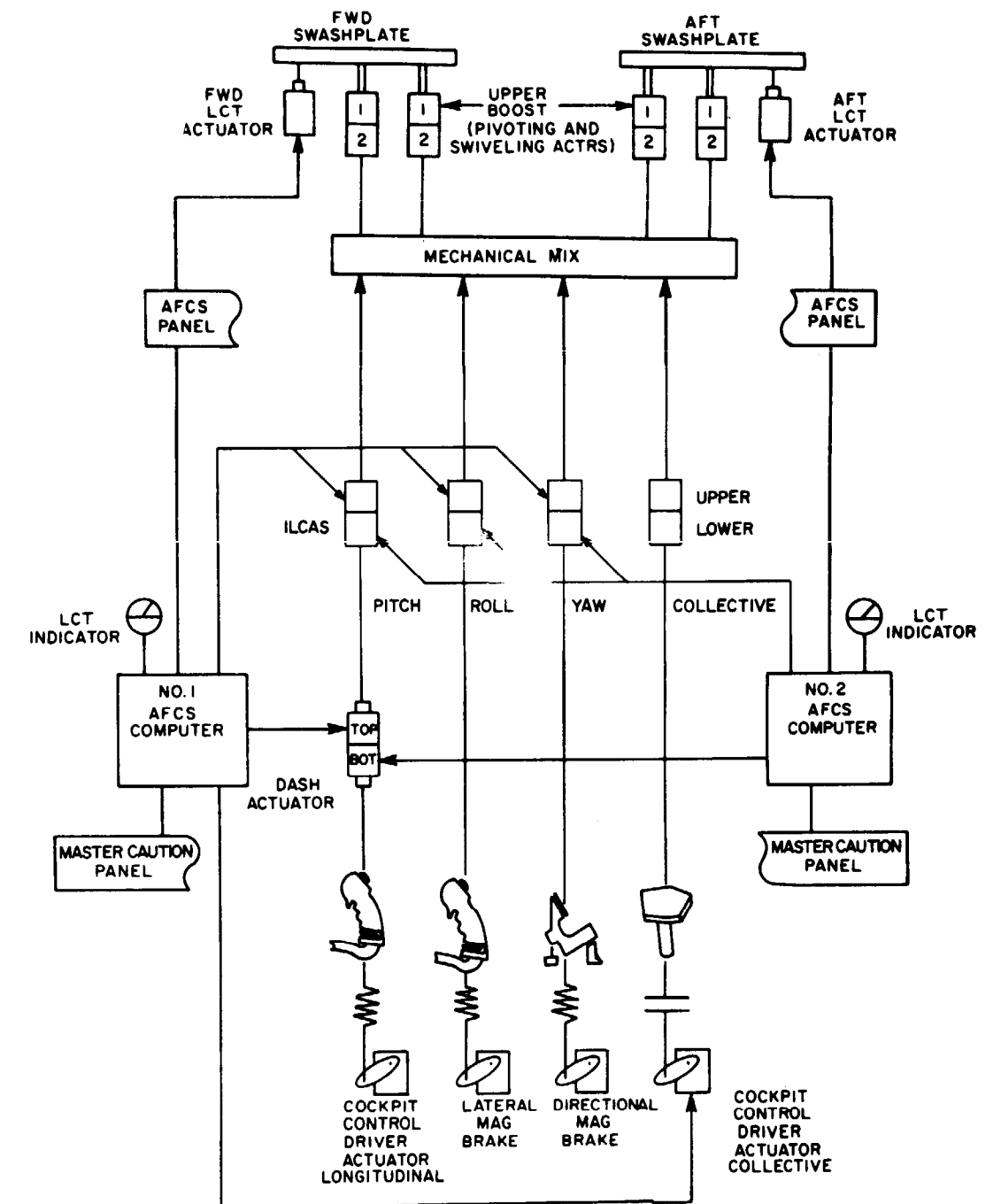
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On



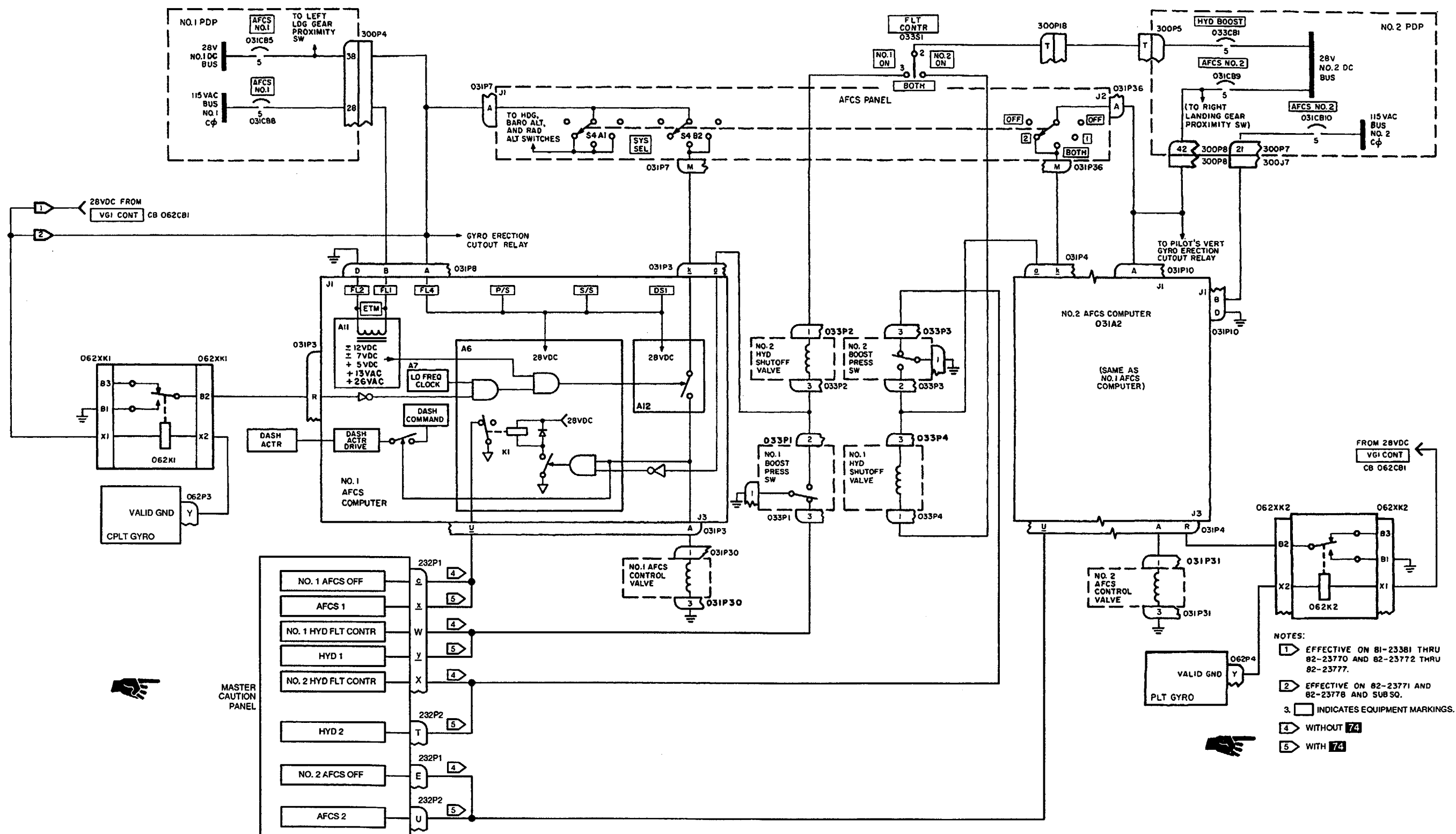
## 11-3 AFCS



AFCS SENSOR INPUTS



NO.1 AND NO.2 AFCS COMPONENT INTERFACES

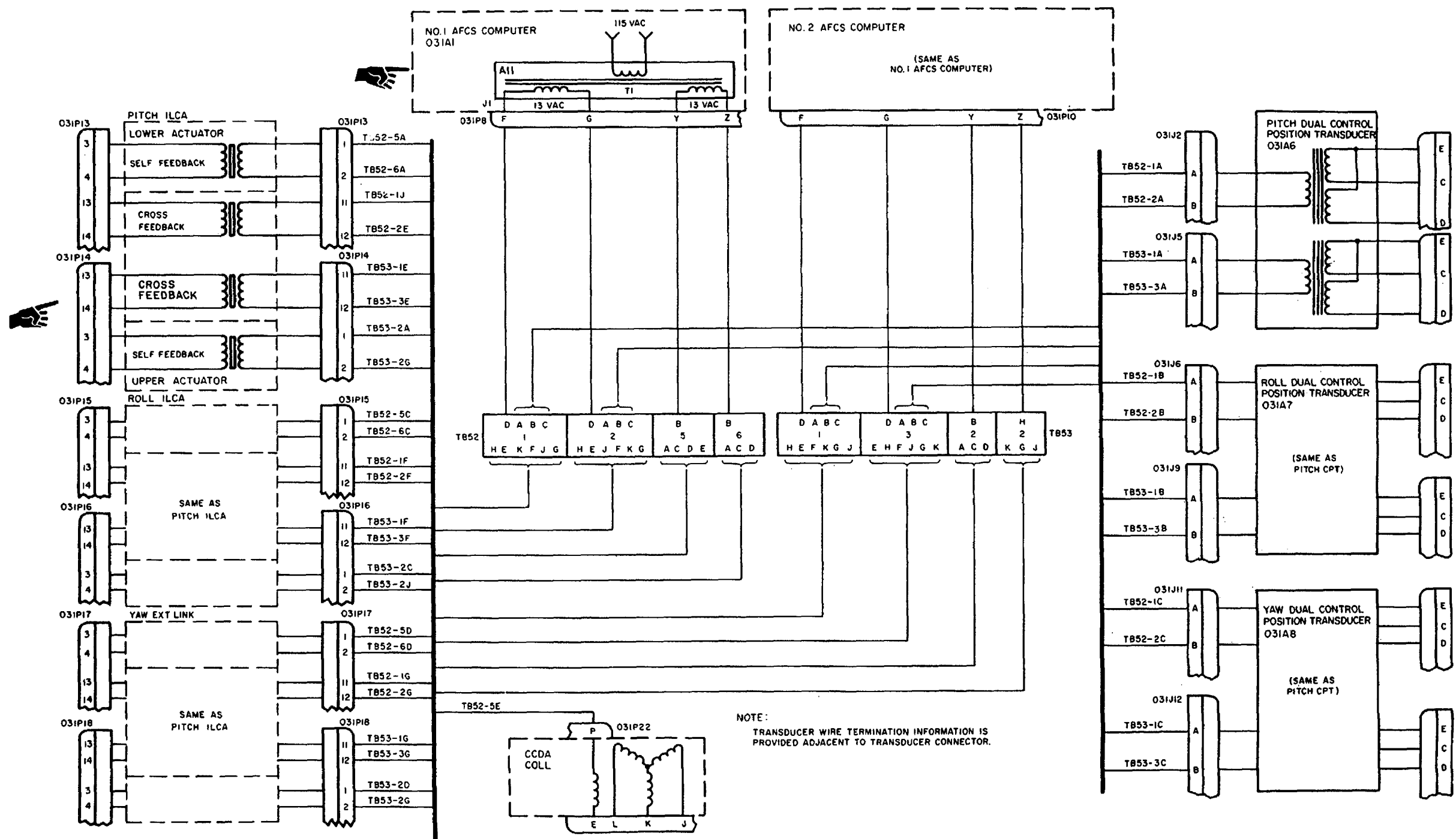


**A67625**

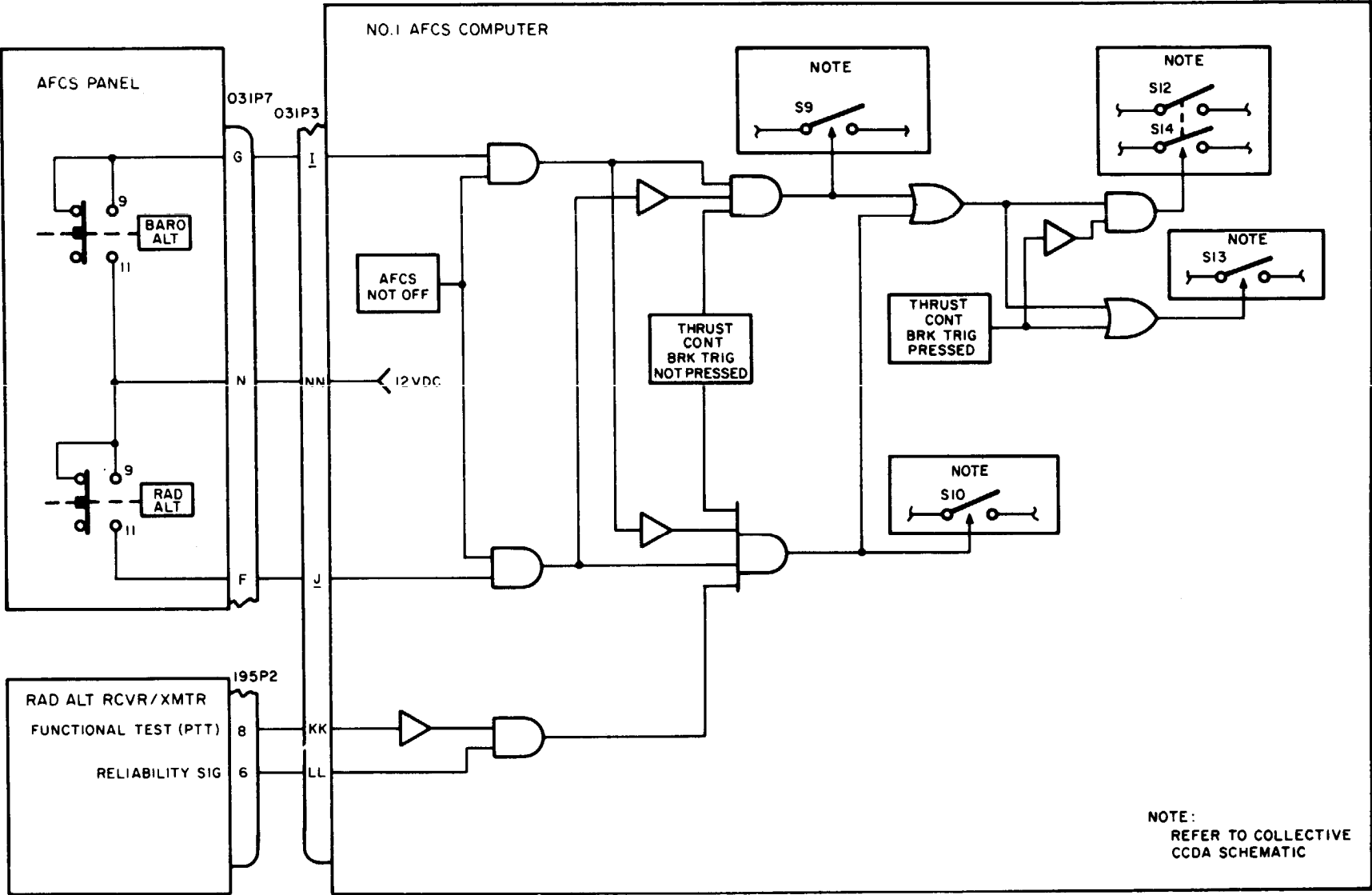
**GO TO NEXT PAGE**  
**Change 23 11-37**

11-3 AFCS  
11-3.1 AFCS SCHEMATIC (13VAC DISTRIBUTION)

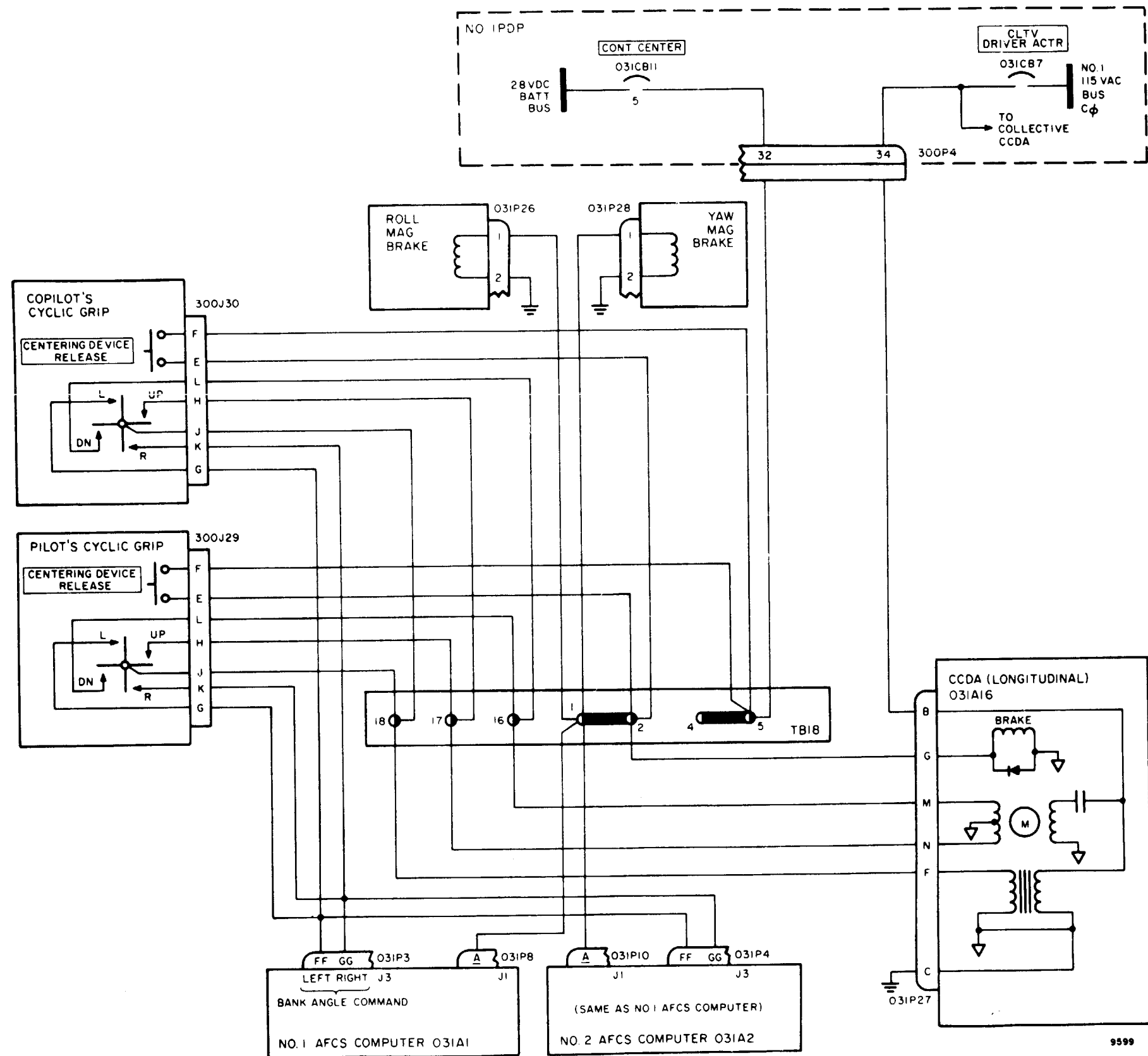
11-3  
11-3.1



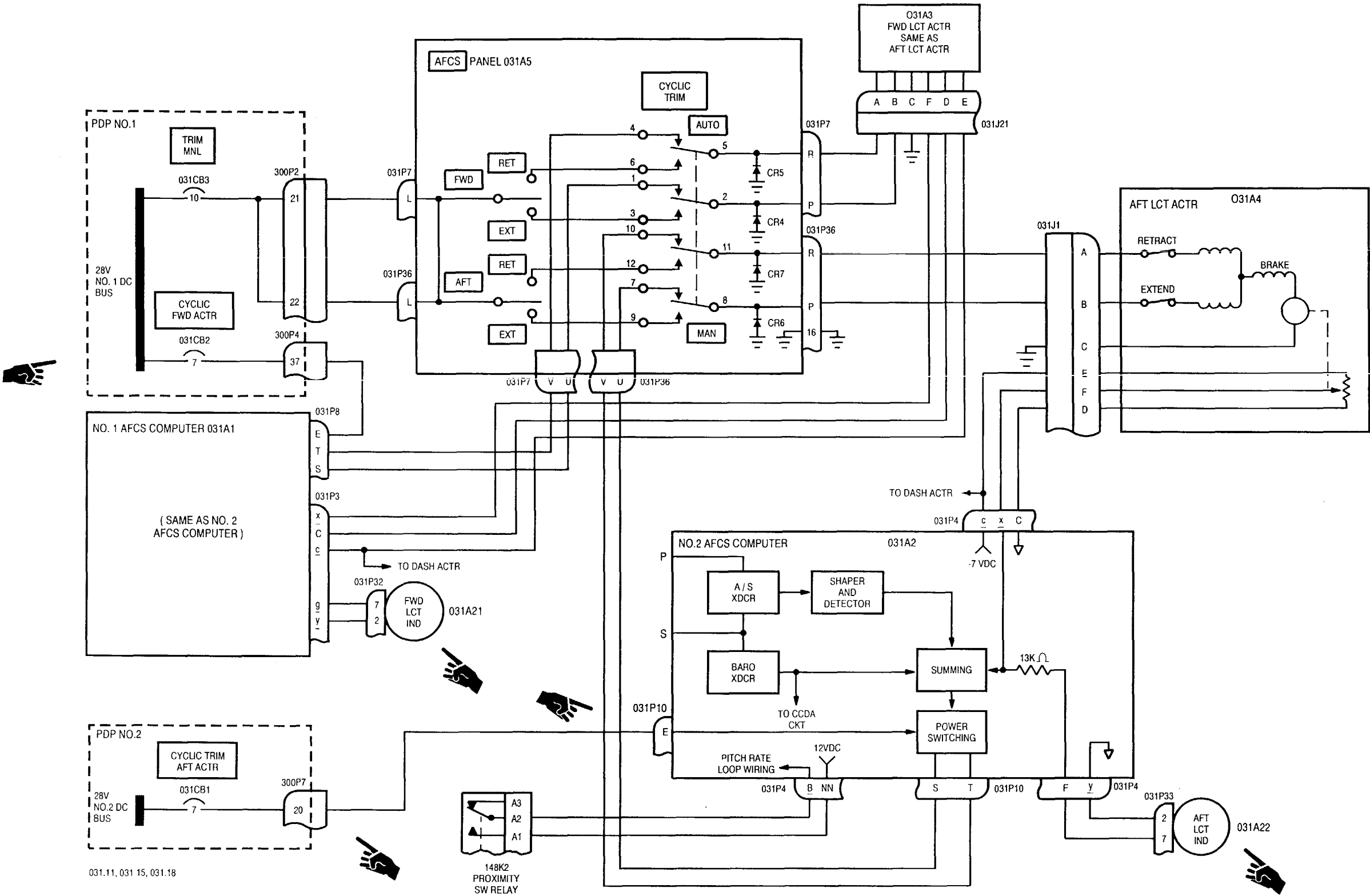




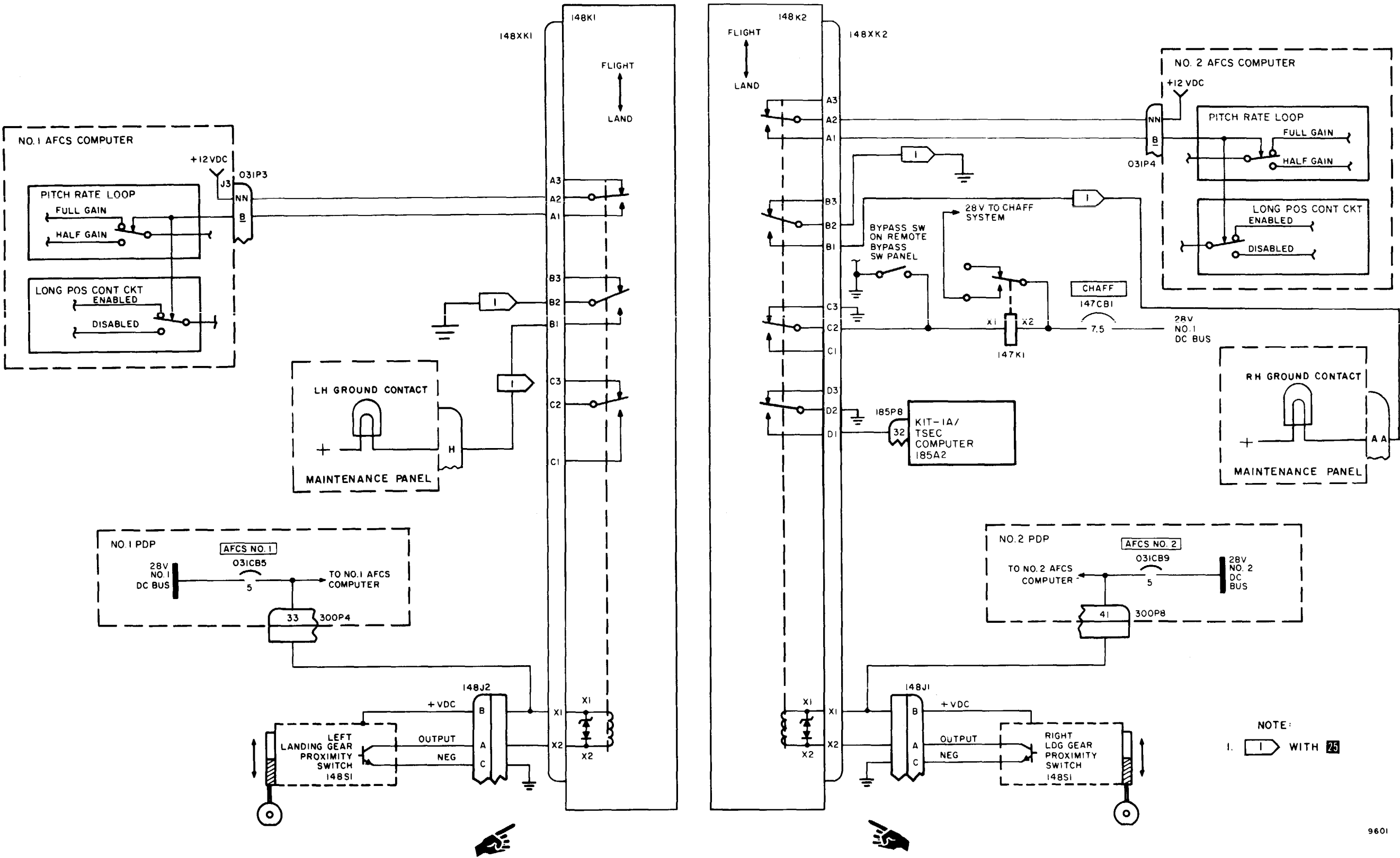
11-3.1 AFCS SCHEMATIC (LONGITUDINAL CCDA AND MAGNETIC BRAKES POWER AND CONTROL)

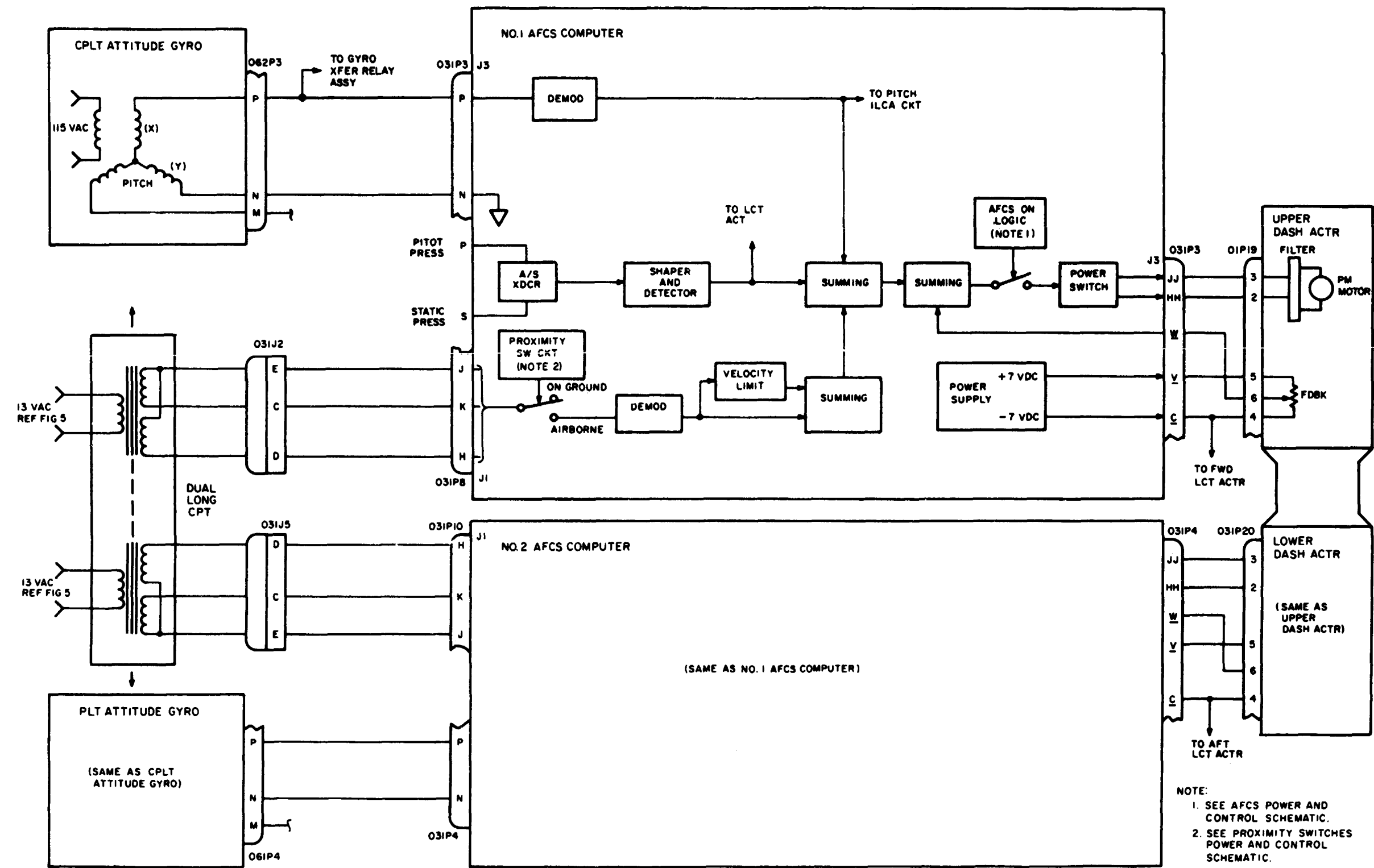






A9600

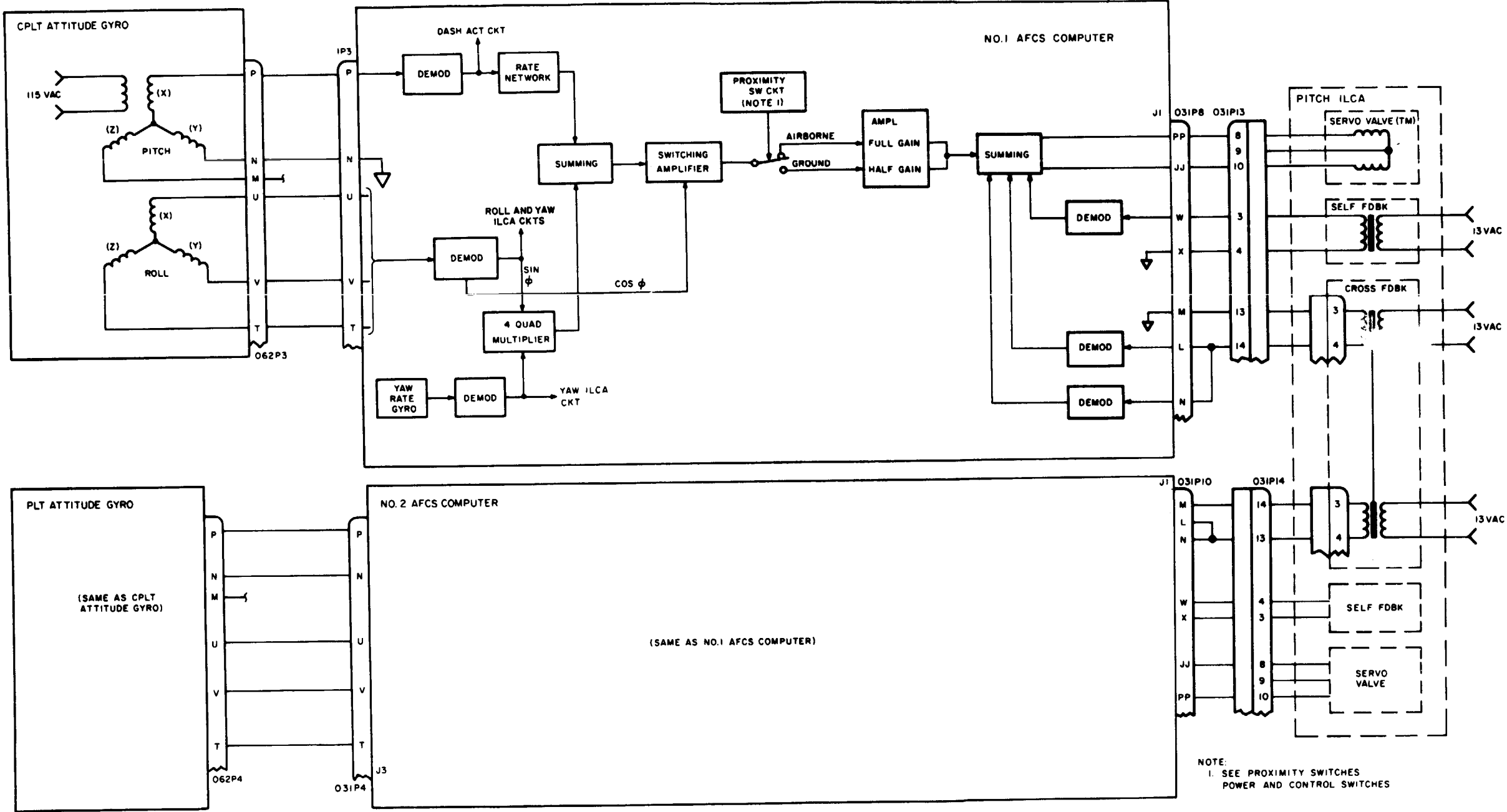


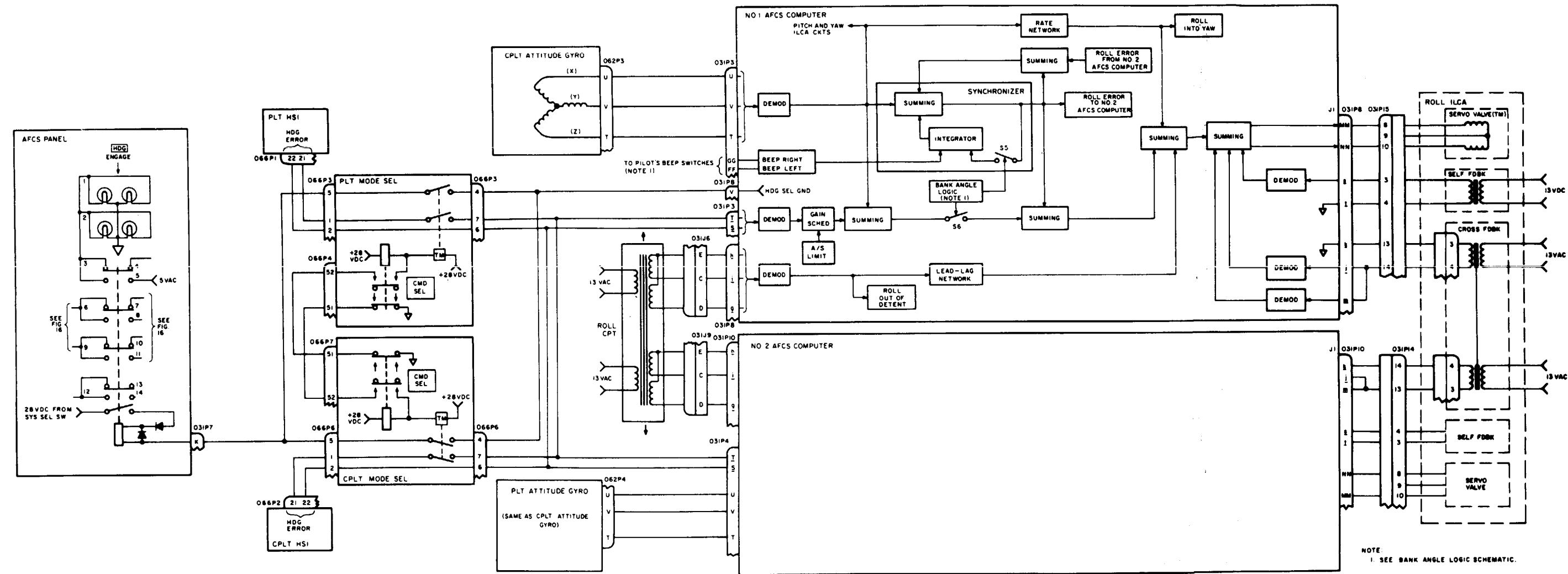


9602

11-3 AFCS

11-3.1 AFCS SCHEMATIC (PITCH ILCA SIGNAL CIRCUIT)



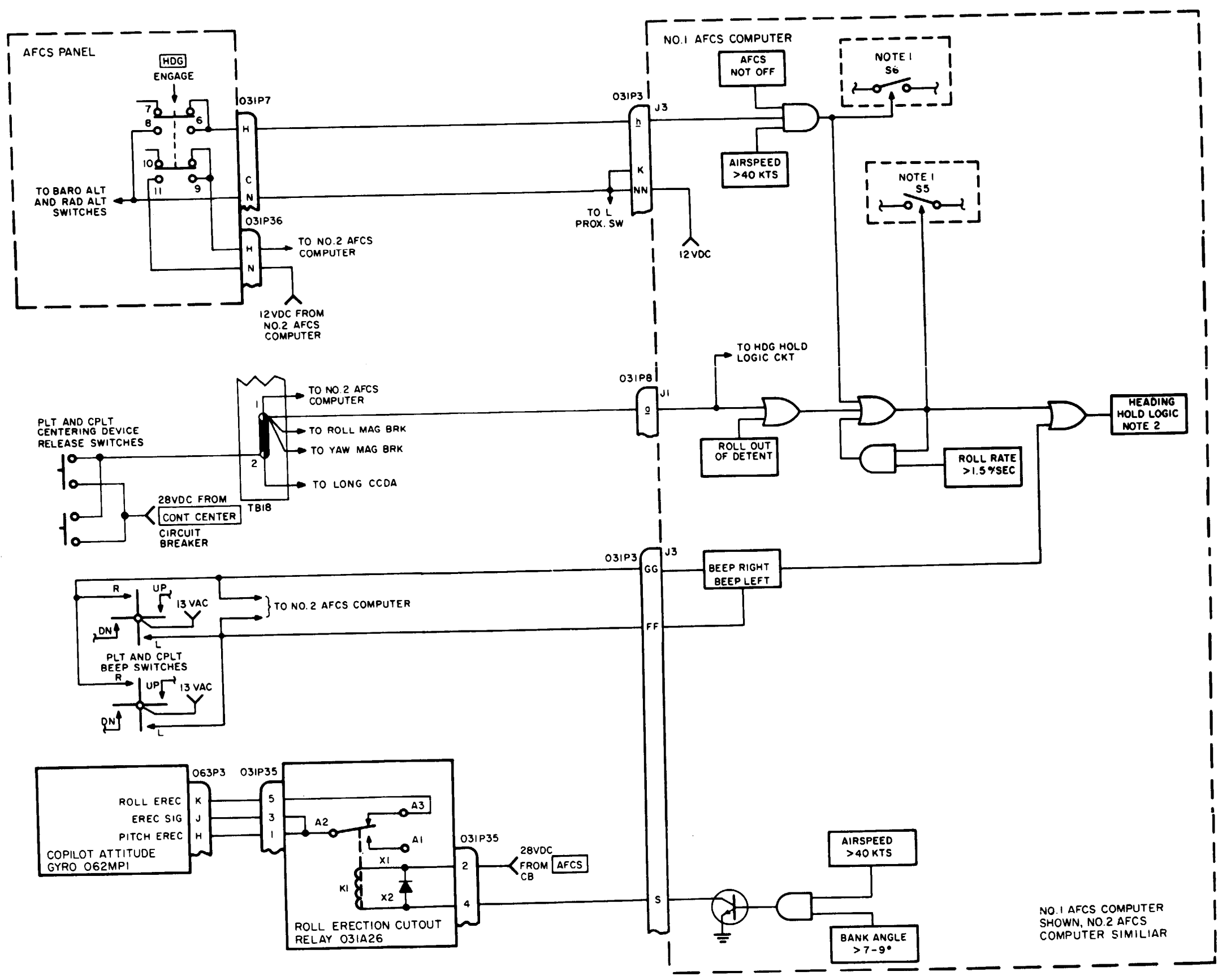


11-3 AFCS

11-3

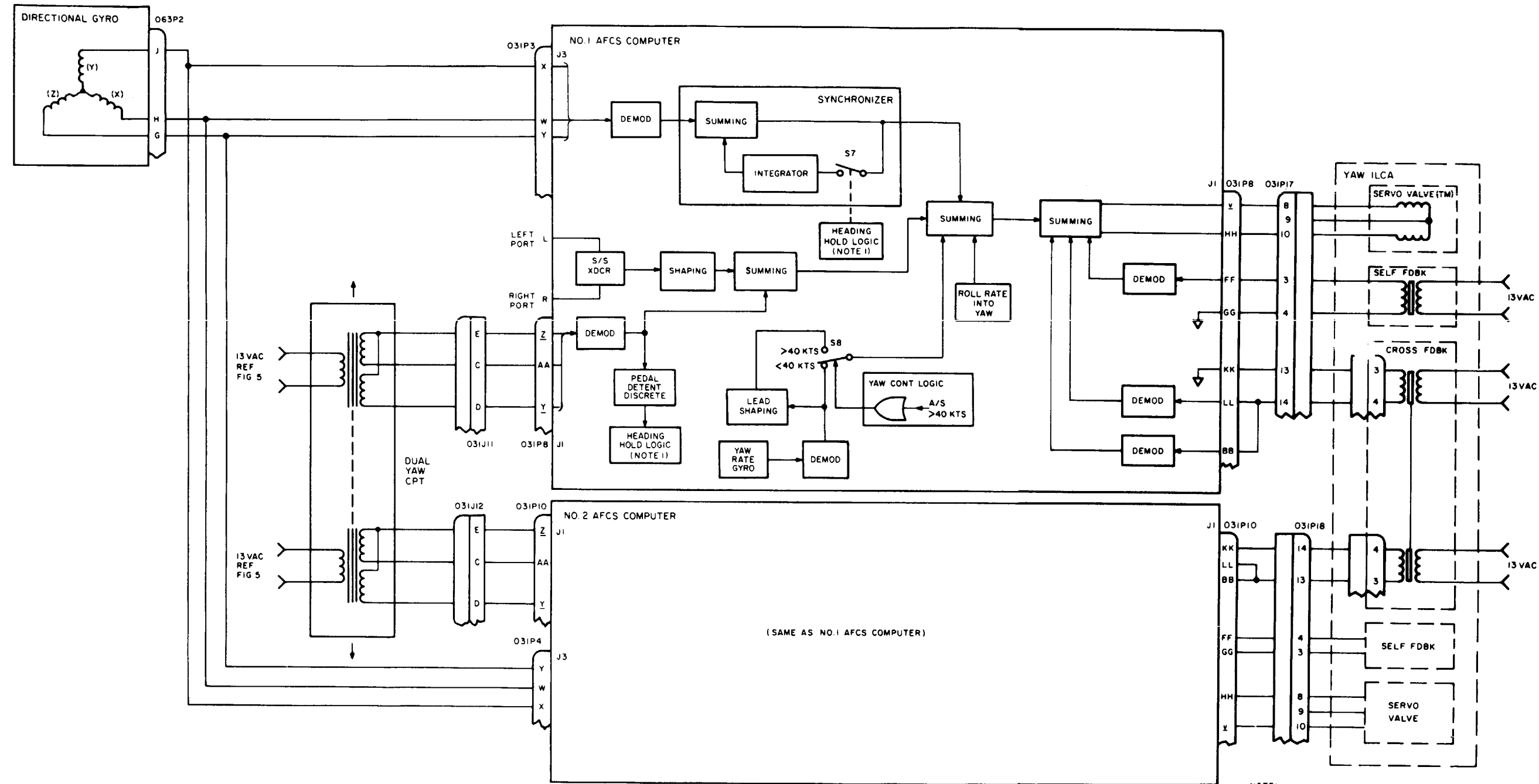
11-3.1 AFCS SCHEMATIC (BANK ANGLE LOGIC)

11-3.1



- NOTES
1. SEE ROLL ILCA SIGNAL CIRCUIT SCHEMATIC.
  2. SEE HEADING HOLD LOGIC SCHEMATIC.

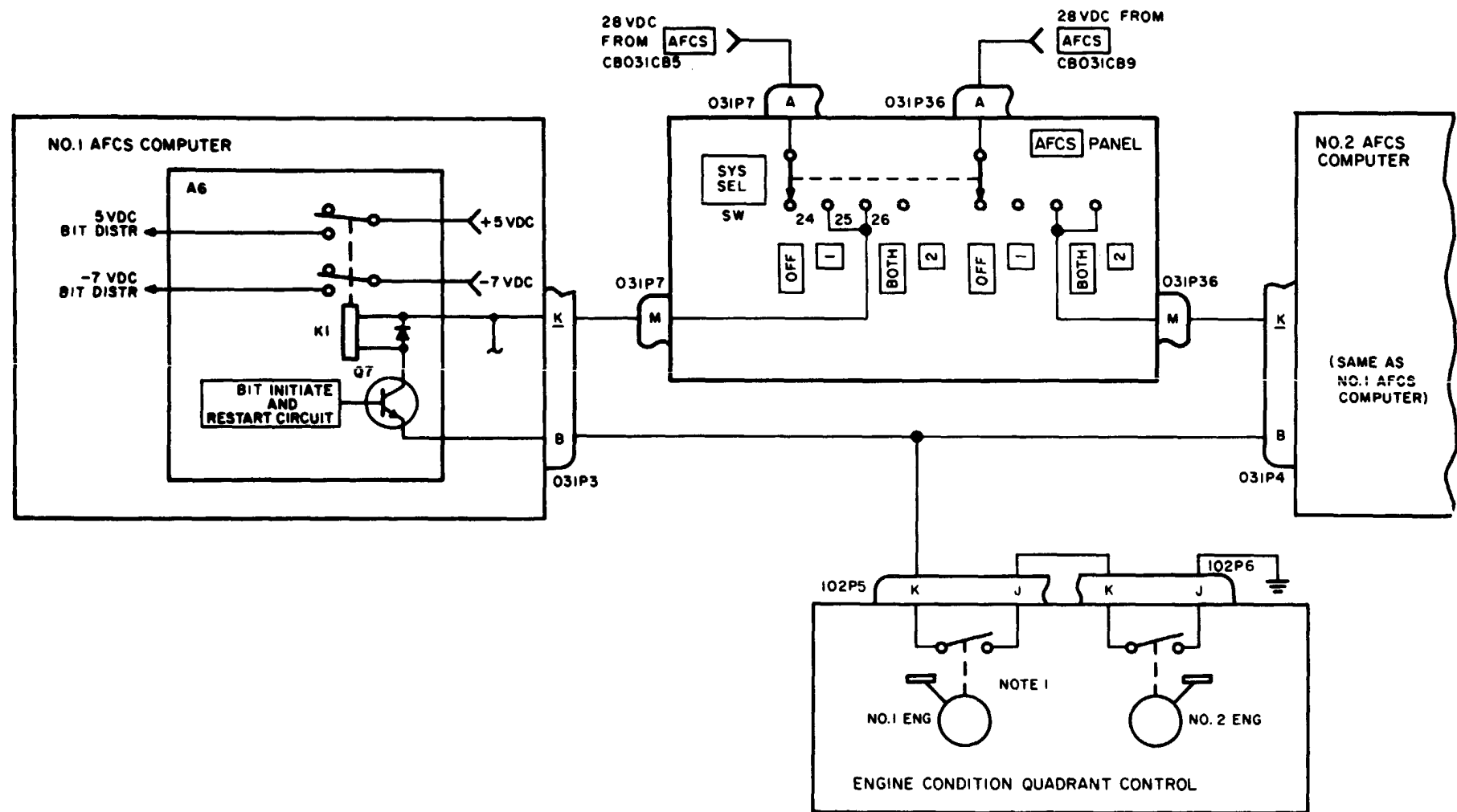
GO TO NEXT PAGE  
Change 3 11-42.5



NOTE  
1. SEE HEADING HOLD LOGIC SCHEMATIC.







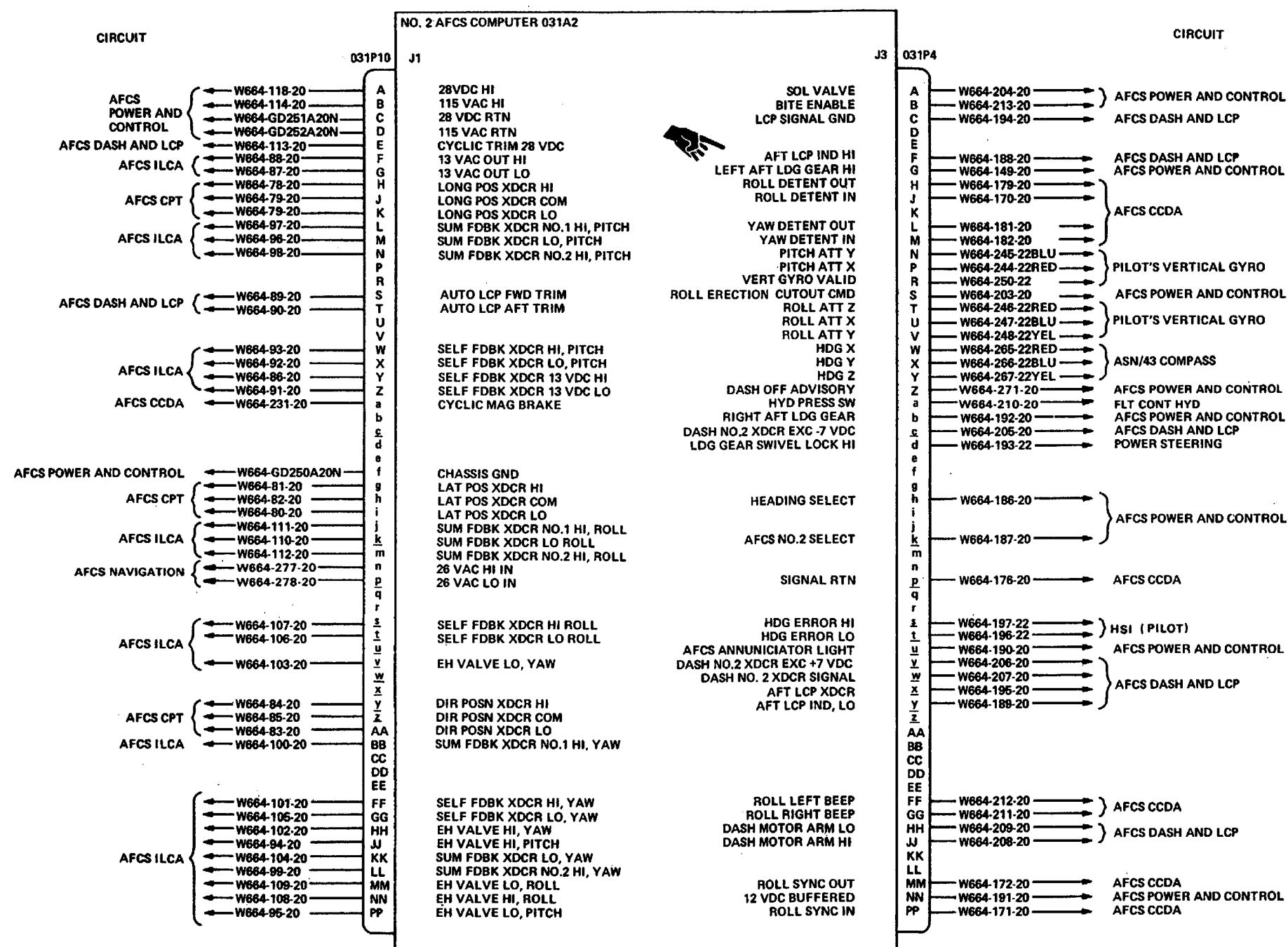
NOTE:  
1. SWITCH CLOSED WITH LEVER IN STOP

9608

## NO.1 AFCS COMPUTER 031A1



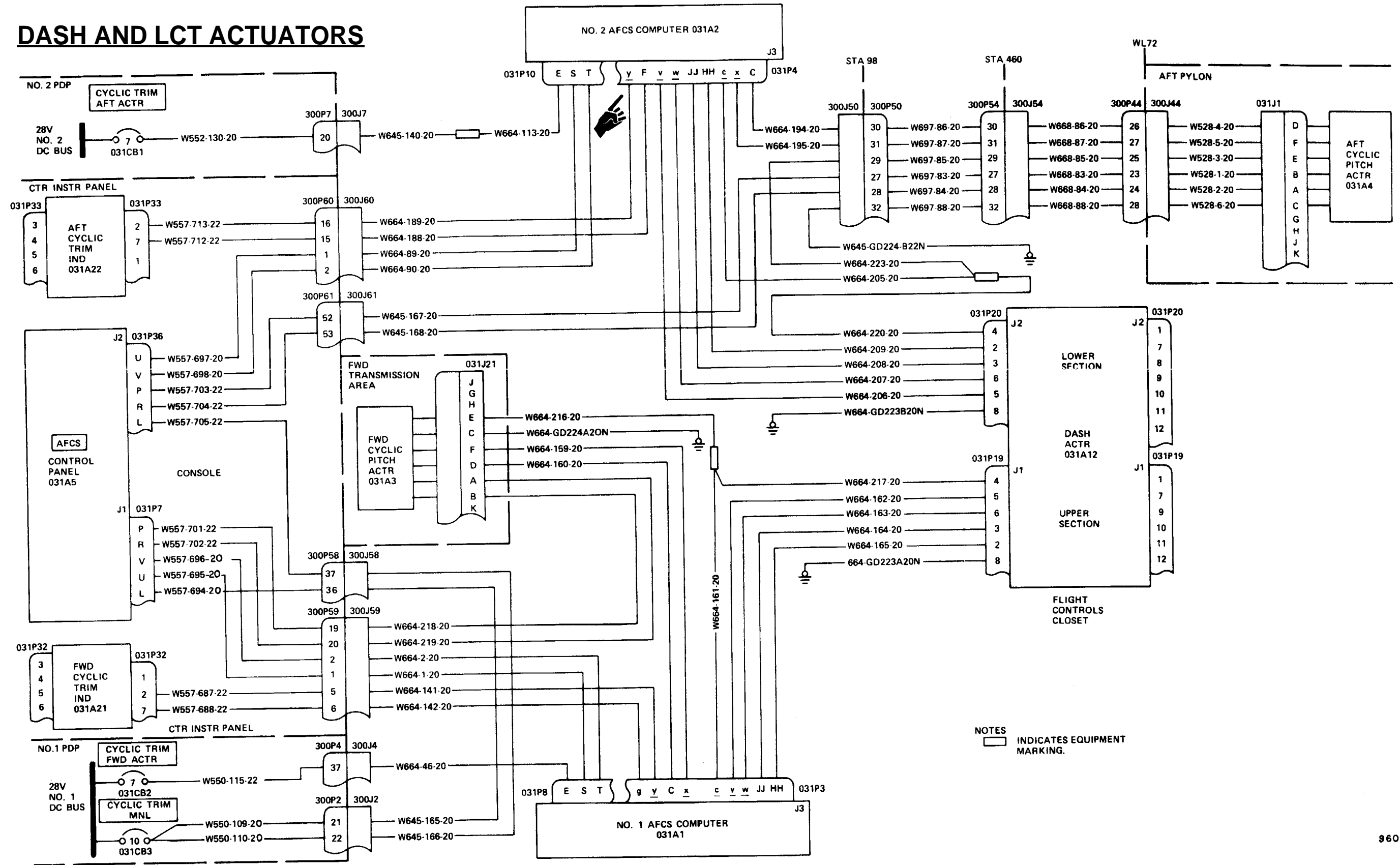
## NO 2 AFCS COMPUTER



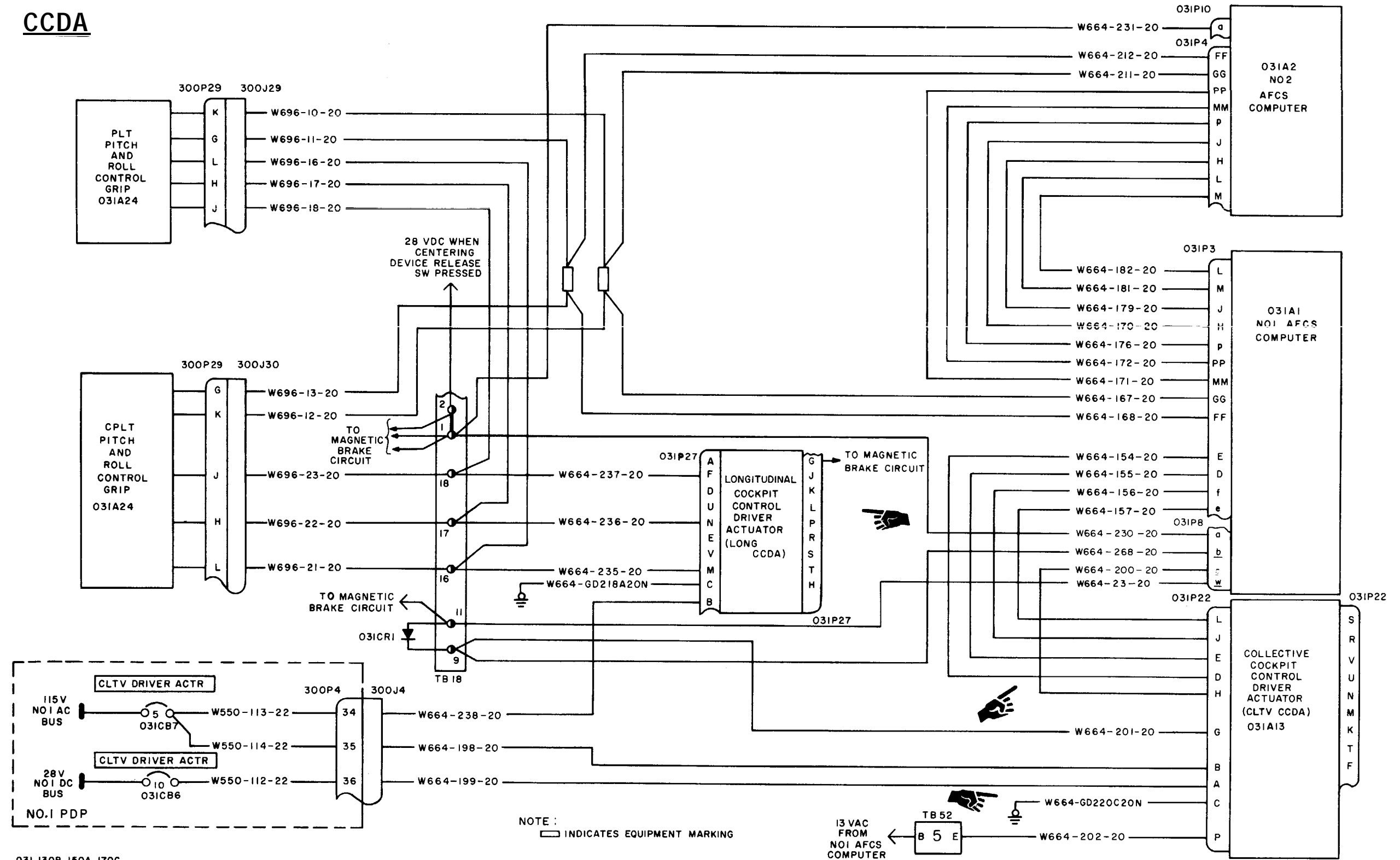




DASH AND LCT ACTUATORS

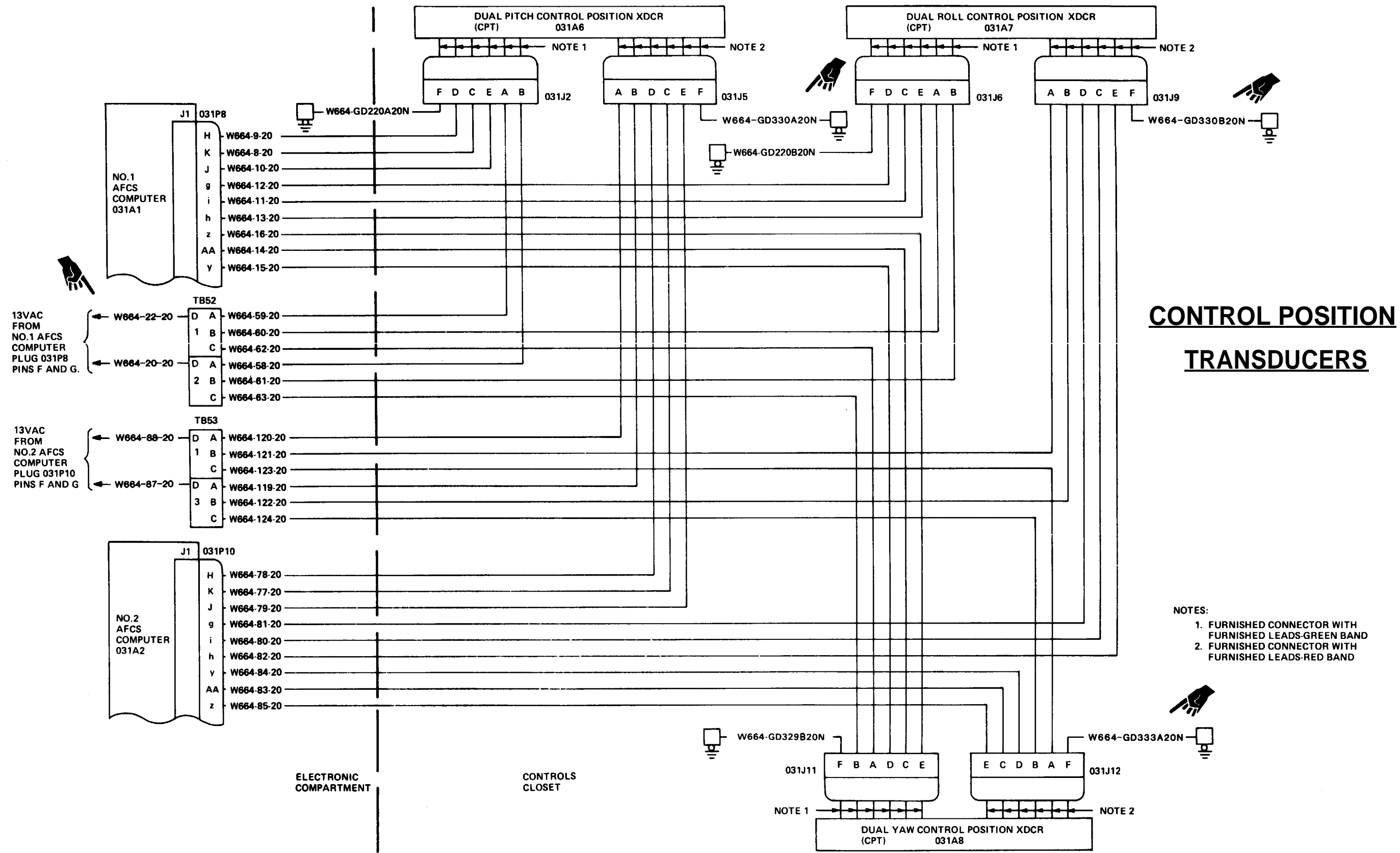


**CCDA**



031.130B,150A,170C

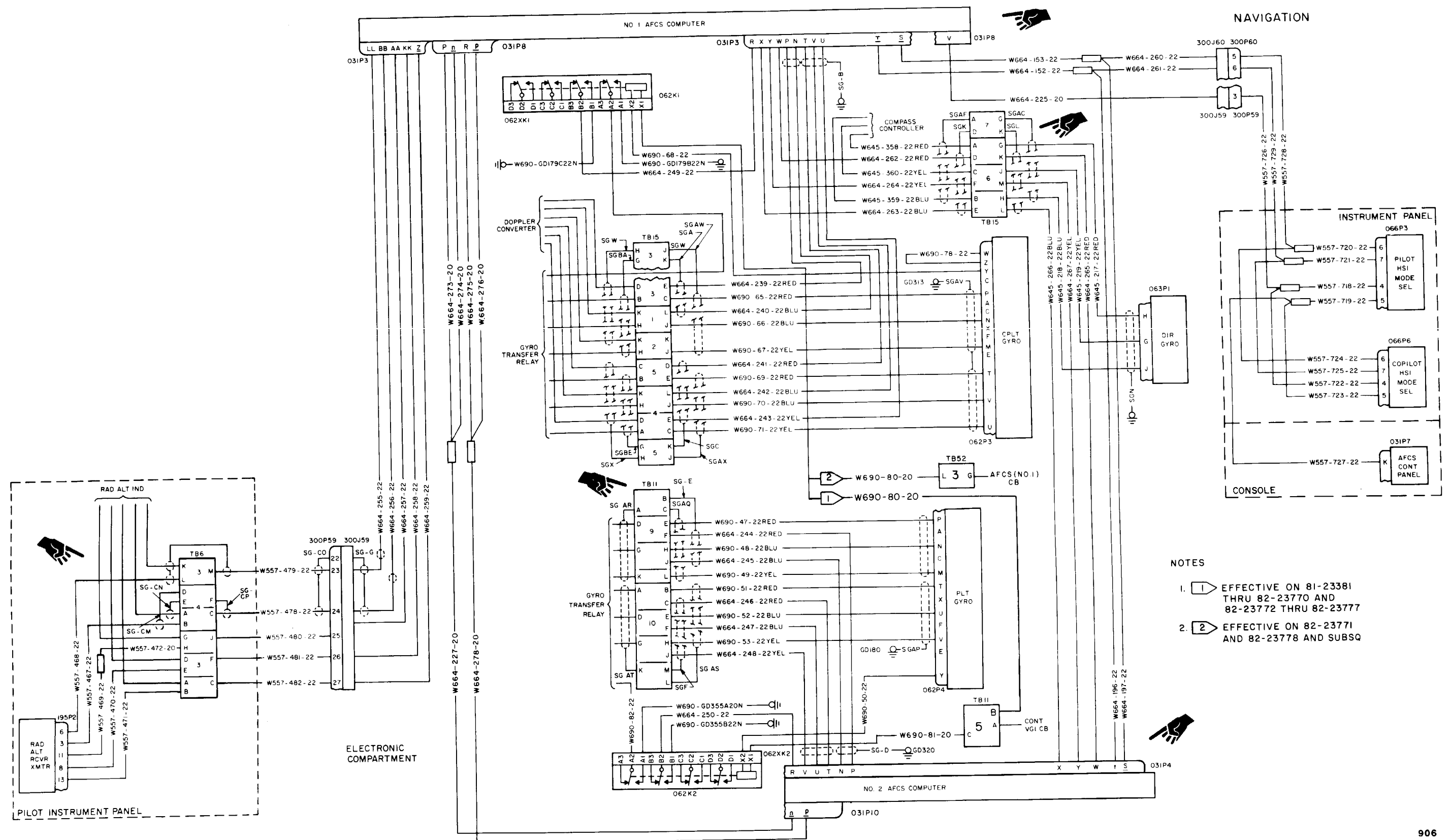
904



**CONTROL POSITION  
TRANSDUCERS**

031.13B, 14B





11-3.1.2 BITE TEST MEASUREMENT DATA

11-3.1.2

TST NO.	TEST NAME	MONITOR POINT	OUTPUT	DELAY (SEC)	STIM POINT	STIM LEVEL	REMARKS
0	BITE POS. GO	STIM GEN. OUTPUT	< +4.0	.16	MON. MULTIPLEXER	+3.760	
1	BITE POS. NO-GO	STIM GEN. OUTPUT	> +4.0	.16	MON. MULTIPLEXER	+ 4.960	
2	BITE NEG. GO	STIM GEN. OUTPUT	> -4.0	.16	MON. MULTIPLEXER	-3.760	
3	BITE NEG. NO-GO	STIM GEN. OUTPUT	> -4.0	20.48	MON. MULTIPLEXER	-4.960	STOP PUSH BITE
4	DERIVED P. RATE	PELA DRIVE	< -6.0	.0025	PITCH ATT. DEMOD	- .547	
5	CONTINUE	SAME	> -6.0	.0025	SAME	SAME	HI-PASS DECAY
6	LCP AIRSPEED	LCP FDBK POT.	< -2.0	.8	T24 LAG AMP	+2.5	
7	DER. P/R MULTP.	PITCH ILCA DRIVE	< -6.0	.16	SIN, Y/R DEMOD	+4.020	
8	CONTINUE	SAME	> -6.0	.8	SAME	+4.020	HI-PASS DECAY
9	LCP AIRSPEED	LCP FOBK POT.	> -2.0	5.12	NONE		SYNCHRONIZES
10	AUTOMATIC PASS	NONE	> -2.0	.0025	NONE	NONE	
11	DER. R/R-ROLL	ROLL ILCA DRIVE	> +6.0	.0025	SIN DEMOD	+ .940	
12	CONTINUE	R/R LEVEL DET	> +6.0	.0025	SAME	+ .940	
13	CONTINUE	8 DEG R. ATT L DET	> +6.0	.0025	SAME	+ .940	
14	CONTINUE	ROLL ILCA DRIVE	< +6.0	.16	SAME	+ .940	HI-PASS DECAY
15	CONTINUE	R/R LEVEL DET.	< -6.0	.0025	SAME	+ .840	
16	CONTINUE	8 DEG R. ATT L DET	< -6.0	.0025	SAME	0	
11	DER R/R-YAW	YAW ILCA DRIVE	< -6.0	6.82	ROLL RATE AMP	-2.150	
18	LCP ALTITUDE	LCP FDBK POT.	< -2.0	.8	T23 LAG AMP	- 3.520	
19	DASH PITCH ATT.	DASH SUM. AMP	> +4.0	.16	PITCH ATT. DEMOD	+ .117	DASH SW S3 OPEN
20	CONTINUE	SAME	< -4.0	.16	SAME	- .117	DASH SW S3 OPEN
21	DASH AIRSPEED	SAME	> +4.0	.16	T24 LAG AMP	+ .39	DASH SW S3 OPEN
22	CONTINUE	V40 LOGIC	> +3.0	.0025	SAME	+ .38	DASH SW S3 OPEN
23	CONTINUE	SAME	< -4.0	.0025	NONE	NONE	OASH SW S3 OPEN
24	DASH LGT STICK	OASH SUM AMP	< -4.0	.0025	LGT. STICK DEMOD	+ .508	DASH SW S3 OPEN
25	CONTINUE	SAME	> +4.0	.0026	SAME	- .608	DASH SW S3 OPEN
26	BARO ALT. SYNC	CCDA SUM AMP	> -4.0	.64	T23 LAG AMP	-1.52	S9 SYNC
27	BARO ALT. HOLD	SAME	< +4.0	.8	SAME	-1.52	S9 HOLD
28	CONTINUE	SAME	> +4.0	.16	SAME	0	S8 HOLD
29	CCOA RADAR ALT.	SAME	> -4.0	.16	NONE	NONE	S10 SYNC
30	CONTINUE	CCDA SUM AMP	< +4.0	.80	NONE	NONE	S10 HOLD
31	CONTINUE	SAME	< -4.0	.16	RADAR ALT SELFTST	+4.960	S10 HOLD
32	YAW PEDAL POS	YAW ILCA DRIVE	> +6.0	.16	PEDAL CPT DEMOD	+2.030	PED SYNC H. <40
33	CONTINUE	YD LEVEL DET.	> +6.0	.16	SAME	+2.03	PEO SYNC H. <40
34	CONTINUE	SAME	< -6.0	.16	SAME	+ 2.03	PEO SYNC-SYNC
35	HEADING	YAW ILCA DRIVE	< +2.8	.16	NONE		H SYNC-HOLD
36	HEADING SYNC	SAME	< +2.8	.8	HEADING DEMOD	0	H SYNC-SYNC
37	HEADING	SAME	> -4.0	5.3	SAME	0	H SYNC-HOLD
38	CONTINUE	SAME	< -4.0	.16	SAME	- .78	H SYNC-HOLD
39	YAW RATE	YAW ILCA DRIVE	< + 6.0	5.12	NONE		S8 -40 KTS
40	CONTINUE	SAME	< -6.0	.16	YAW RATE DEMOD	-1.679	S8 -40 KTS
41	CONTINUE	SAME	> -6.0	.8	SAME	-1.679	S8 -40 KTS
42	CONTINUE	Y/R LEVEL DET.	> +6.0	.16	SAME	-1.679	S8 -40 KTS
43	CONTINUE	SAME	< -6.0	.16	NONE	NONE	S8 -40 KTS
44	SIDESLIP	YAW ILCA DRIVE	> +6.0	.16	SSLP BUFFER AMP	- .500	S8 -40 KTS
45	ROLL ATTITUDE	ROLL ILCA DRIVE	> +6.0	.16	SIN DEMOD	+ .700	S5 HOLD

TST NO.	TEST NAME	MONITOR POINT	OUTPUT	DELAY (SEC)	STIM POINT	STIM LEVEL	REMARKS
46	CONTINUE	SAME	< +6.0	.16	SAME	+ .700	S5 SYNC
47	CONTINUE	ROLL ATT. ERROR	< -4.0	.16	SAME	+ .700	S5 SYNC, S6C
48	HSI HEADING	SAME	<-4.0	.8	NONE	NONE	HSI BIT C, S6C
49	LAT STICK POS.	ROLL ILCA DRIVE	>+6.0	.8	LAT CPT DEMOD	- 3.00	LAT STK SYNCH
60	CONTINUE	SAME	<+6.0	.8	SAME	- 3.00	LAT STK SYNCH
51	CONTINUE	RD LEVEL OET.	> +6.0	.16	SAME	- 3.00	LAT STK SYNCH
52	CONTINUE	SAME	< -6.0	.16	SAME	- 3.00	SENSOR TORQUE
53	AUTOMATIC PASS	P/R GYRO TORQUE	> -2.0	.0025	P/R GYRO	26VAC	DROP SENS TO
54	NORMAL ACCEL	CCDA SUM AMP	< +4.0	5.92	ACCELEROMETER	+12VDC	SENSOR TOUE
55	AUTOMATIC PASS	NONE	< +2.0	.0025	NONE	NONE	SPARE
56	YAW RATE GYRO	Y/R LEVEL DET.	> +6.0	.0025	Y/R GYRO	26VAC	DROP SENS TO
57	YAW GYRO SMRO	SMRD	> +6.0	.16	NONE (SELF TEST)	NONE	GYRO SMRO OUT
58	AUTOMATIC PASS	NONE	> -2.0	.0025	NONE	NONE	SPARE
59	SAME	NONE	> -2.0	.0025	NONE	NONE	SPARE
TO							
69	SAME	NONE	> -2.0	.0025	NONE	NONE	SPARE
70	PITCH ILCA	PILCA FDBK DEMOD 1	> +4.0	.16	PILCA SUM AMP	-1.250	ENG SOL VALVE
71	CONTINUE	PILCA FOBK DEMOD 2	> +2.0	.16	SAME	-1.260	ENG SOL VALVE
72	CONTINUE	PILCA FOBK DEMOD 3	> +2.0	.16	SAME	-1.250	ENG SOL VALVE
73	CONTINUE	PILCA FOBK DEMOD 3	< +2.0	.16	NONE	NONE	ENG SOL VALVE
74	CONTINUE	NONE	> -2.0	.0025	NONE	NONE	SPARE
75	YAW ILCA	YILCA FOBK DEMOD 1	> +4.0	.16	PEDAL CPT DEMOD	+2.030	ENG SOL VALVE
76	CONTINUE	YILCA FOBK DEMOD 2	> +2.0	.16	SAME	+2.030	SAME
77	CONTINUE	YILCA FDBK DEMOD 3	> +2.0	.16	SAME	+2.030	SAME
78	SAME	SAME	< +2.0	.16	NONE	NONE	SAME
79	AUTOMATIC PASS	NONE	> -2.0	.0026	NONE	NONE	SPARE
80	ROLL ILCA	RILCA FDBK DEMOD 1	> +4.0	.16	RILCA SUM AMP	-1.560	ENG SOL VALVE
81	CONTINUE	RILCA FDBK DEMOD 2	> +4.0	.16	SAME	SAME	SAME
82	CONTINUE	RILCA FDBK DEMOD 3	> +2.0	.16	SAME	-1.56	SAME
83	CONTINUE	SAME	< +2.0	.16	NONE	NONE	SAME
84	AUTOMATIC PASS	NONE	> -2.0	.0025	NONE	NONE	SAME
85	DASH ACTUATOR	DASH FDBK POT	<-3.0	.6	DASH DRIVER AMP	+4.961	DASH S3 OPEN
86	CONTINUE	SAME	>+3.0	.8	SAME	-5.000	SAME
87	CCDA	CCDA LEAD-LAG OUTP.	>+4.0	.8	CCDA MODULATOR	+2.031	AFCS 1, S12, 14 SYNC
88	AUTOMATIC PASS	NONE	> -2.0	.0025	NONE	NONE	SPARE
89	LG. STK POS TDCR	LONG. SPT LEVEL DET.	< -3.0	.16	NONE	NONE	
80	AUTOMATIC PASS	NONE	> -2.0	.0025	NONE	NONE	SPARE
91	PEDAL POS TDCR	PEDAL POS LEVEL DET	< -3.0	.16	NONE	NONE	
92	AUTOMATIC PASS	NONE	> -2.0	.0025	NONE	NONE	SPARE
93	LAT STK POS TDCR	LATERAL CPT L/DET.	< - 3.0	.16	NONE	NONE	
94	AUTOMATIC PASS	NONE	> -2.0	.0025	NONE	NONE	SPARE
95	RADAR ALTIMETER	RADAR ALT CONF SIG	> +4.0	.16	RADAR ALT SELFTST	+4.960	NO. 1 AFCS ONLY
96	AUTOMATIC PASS	NONE	> -2.0	.0025	NONE	NONE	SPARE
TO							
127	AUTOMATIC PASS	NONE	> -2.0	.0025	NONE	NONE	SPARE

11-3.2 AFCS VISUAL CHECK

11-3.2

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

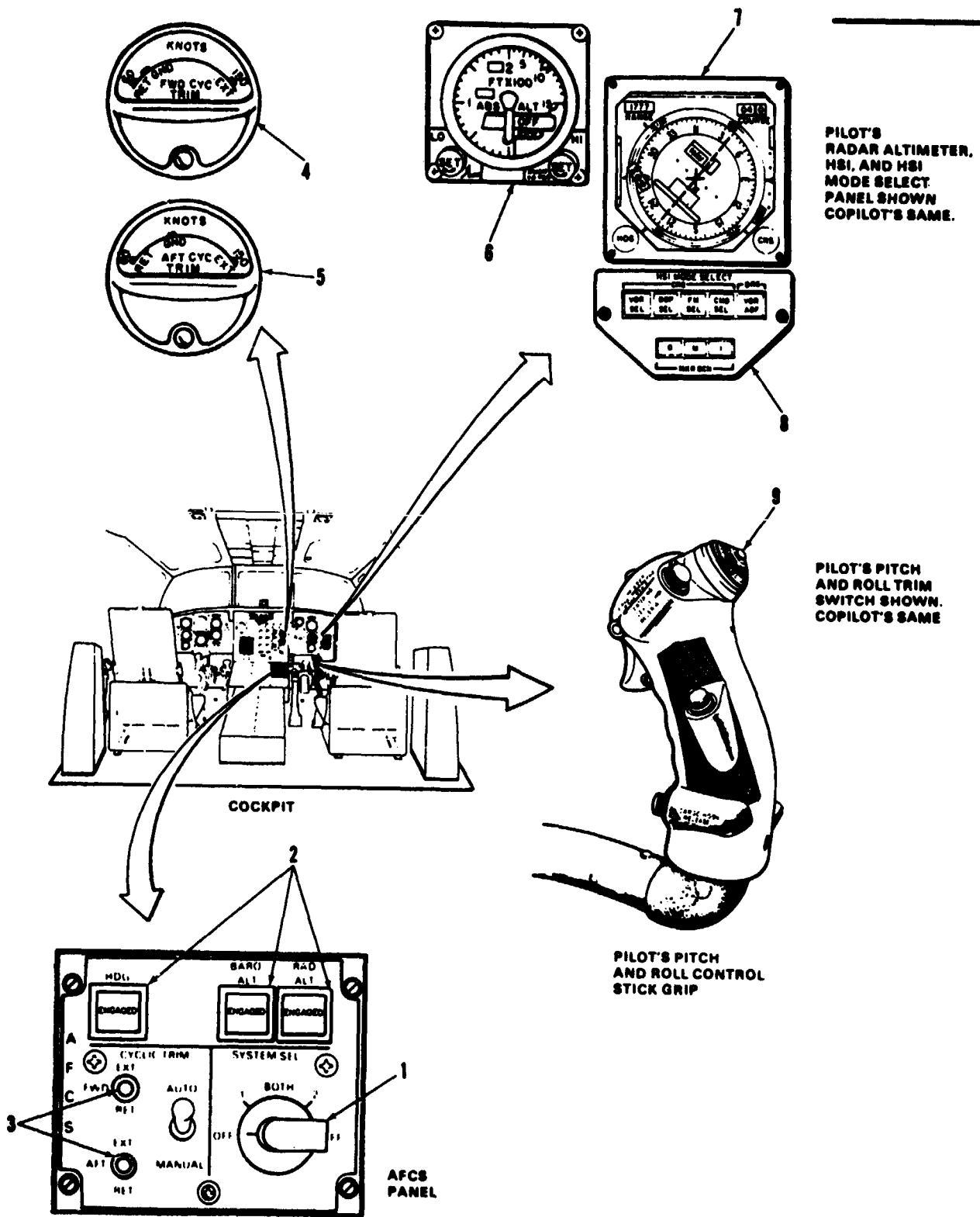
Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic

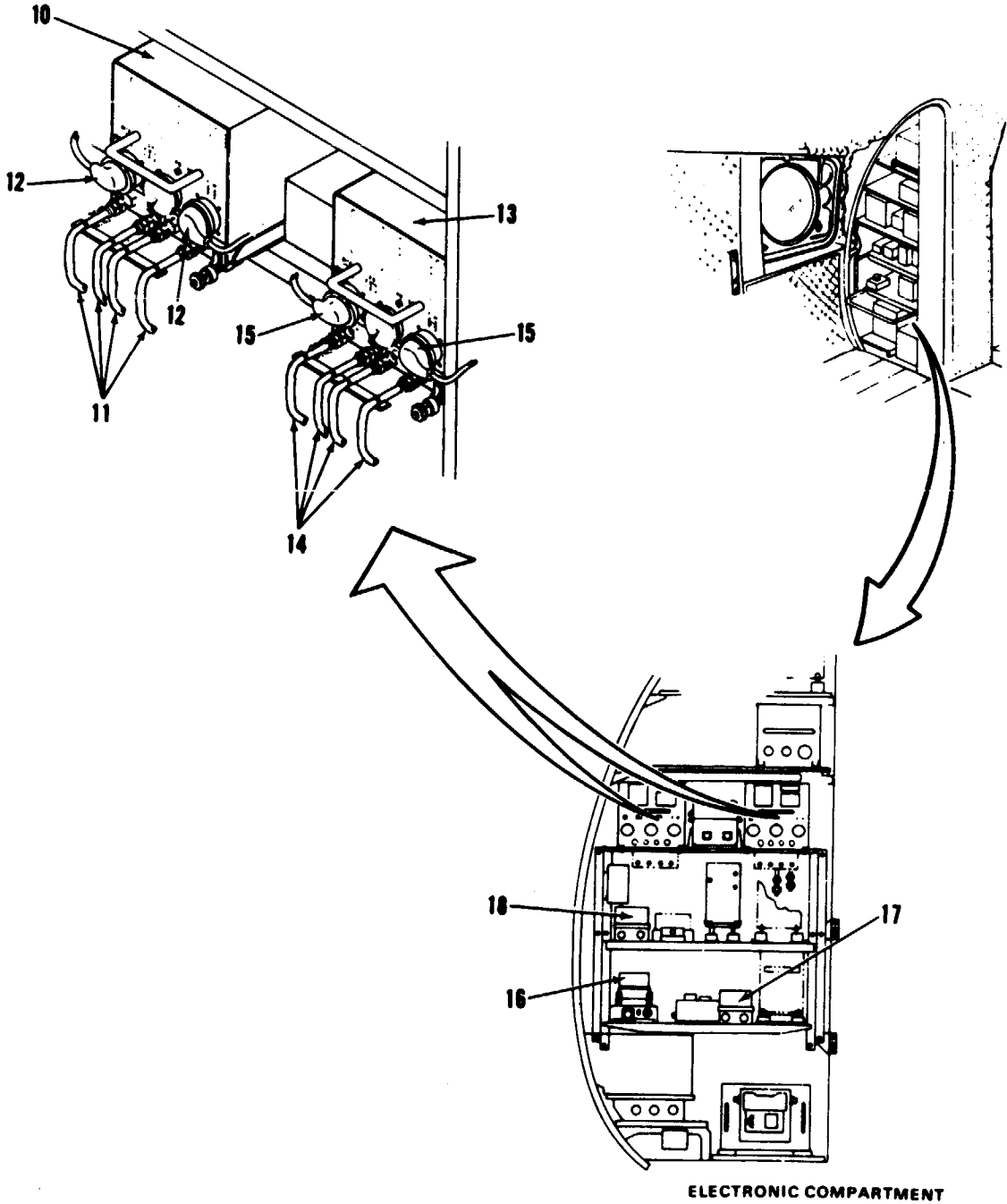
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off  
Pylon Left Work  
Platform Open  
Forward Left Work  
Platform Open  
Flight Controls Closet Acoustic  
Blanket Removed  
Electronic Compartment Acoustic  
Blanket Removed  
Flight Controls Closet Panel  
Open

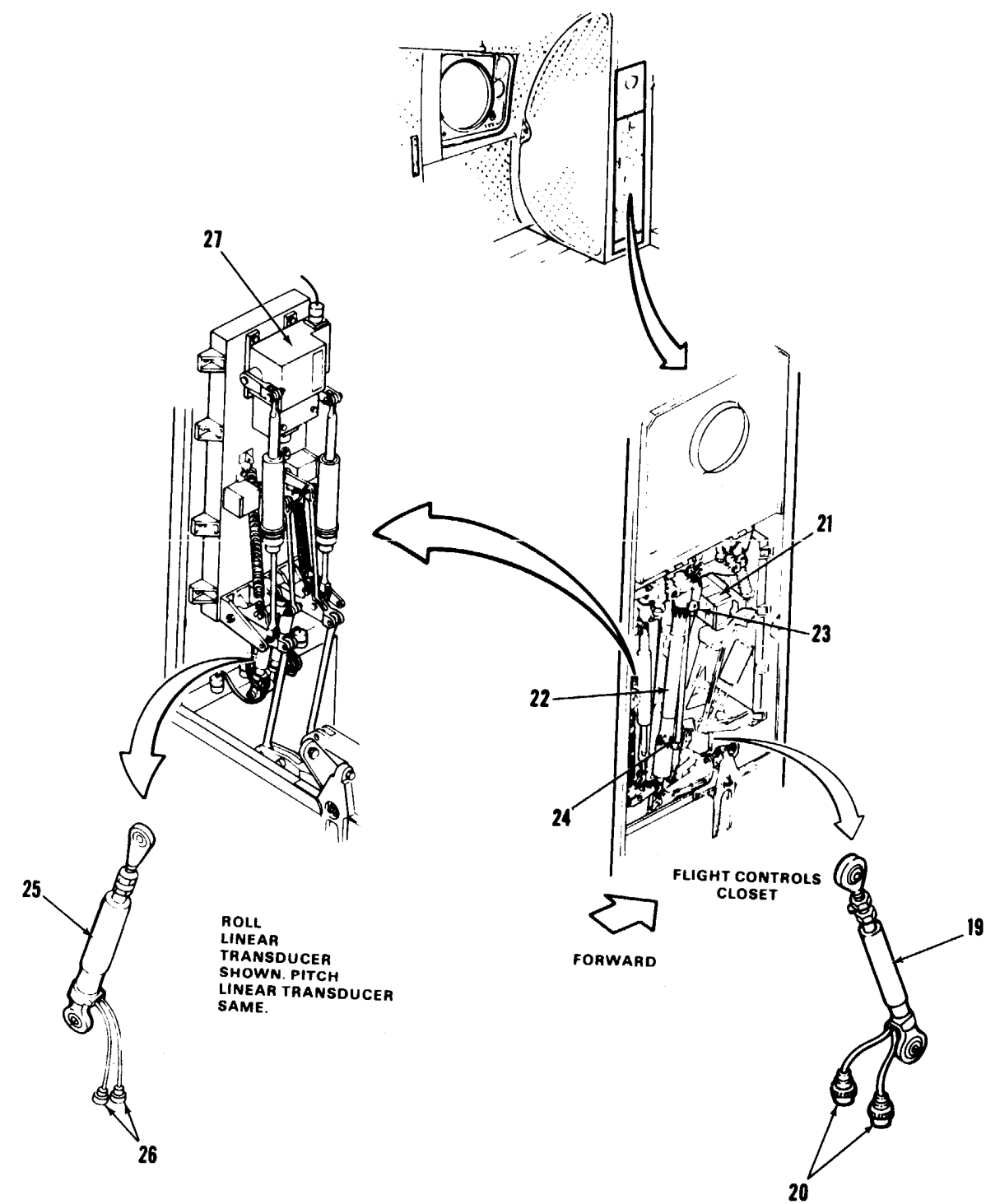
TASK	RESULT
1. Check AFCS panel.	If knob (1) is loose, tighten it. If any switch (2 or 3) is damaged, replace AFCS panel.
2. Check FWD and AFT CYC TRIM indicators (4 and 5).	If either indicator (4 or 5) is damaged, replace it.
3. Check pilot's radar altimeter (6).	If altimeter (6) is damaged, replace it.
4. Check pilot's HSI (7).	IF HSI (7) is damaged, replace it.
5. Check pilot's HSI MODE SELECT panel (8).	If panel (8) is damaged, replace it.
6. Check pilot's pitch and roll trim switch (9).	If switch (9) is damaged. replace it.
7. Repeat steps 4, 5, and 6 for copilot's radar altimeter HSI, and HSI MODE SELECT panel (6, 7, and 8). then go to step 8.	
8. Check copilot's pitch and roll trim switch (9).	If switch (9) is damaged, replace it.



TASK	RESULT
9. Check NO. 1 AFCS computer (10).	If computer (10) is loose or damaged, tighten or replace it as required. If any of four lines (11) are loose or damaged, tighten or replace them as required. If either connector (12) is loose or damaged, tighten or replace it as required. If wiring to either connector (12) is damaged, repair or replace it as required.
10. Check NO. 2 AFCS computer (13).	If computer (13) is loose or damaged, tighten or replace it as required. If any of four lines (14) are loose or damaged, tighten or replace them as required. If either connector (15) is loose or damaged, tighten or replace it as required. If wiring to either connector (15) is damaged, repair or replace it as required.
11. Check directional gyro (16).	If gyro (16) is damaged, replace it. If connector to gyro is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.
12. Check pilot's vertical gyro (17).	If gyro (17) is damaged, replace it. If connector to gyro is loose or damaged, tighten or replace it. if wiring to connector is damaged, repair or replace it as required.
13. Check copilot's vertical gyro (18).	If gyro (18) is damaged, replace it. If connector to gyro is loose or damaged, tighten or replace it. if wiring to connector is damaged, repair or replace it as required.



TASK	RESULT
14. Check yaw linear transducer (cpt) (19).	If transducer (19) is damaged, replace it. If either connector (10) is loose or damaged, tighten or replace it. If wiring to either connector is damaged, replace transducer.
15. Check collective cockpit control driver actuator (ccda) (21).	If ccda (21) is loose or damaged, tighten or replace it as required. If connector to ccda is loose or damaged, tighten or replace it as required. If wiring to connector is damaged repair or replace it as required.
16. Check dash actuator (22).	If actuator (22) is damaged, replace it. If connector (23 or 24) is loose or damaged, tighten or replace it as required. If wiring to either connector is damaged, repair or replace it as required.
17. Check pitch and roll linear transducer (25).	If either transducers (25) is damaged, replace it. If any connector (26) is loose or damaged, tighten or replace it as required. If wiring to any connector is damaged, replace transducer.
18. Check longitudinal ccda (27).	If ccda (27) is loose or damaged, tighten or replace it as required. If connector to ccda is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.
18.1 Check all electrical connectors in flight control closet.	If any connector contains hydraulic fluid, clean it thoroughly.



45 x 54

D145 - 11660 - SPA

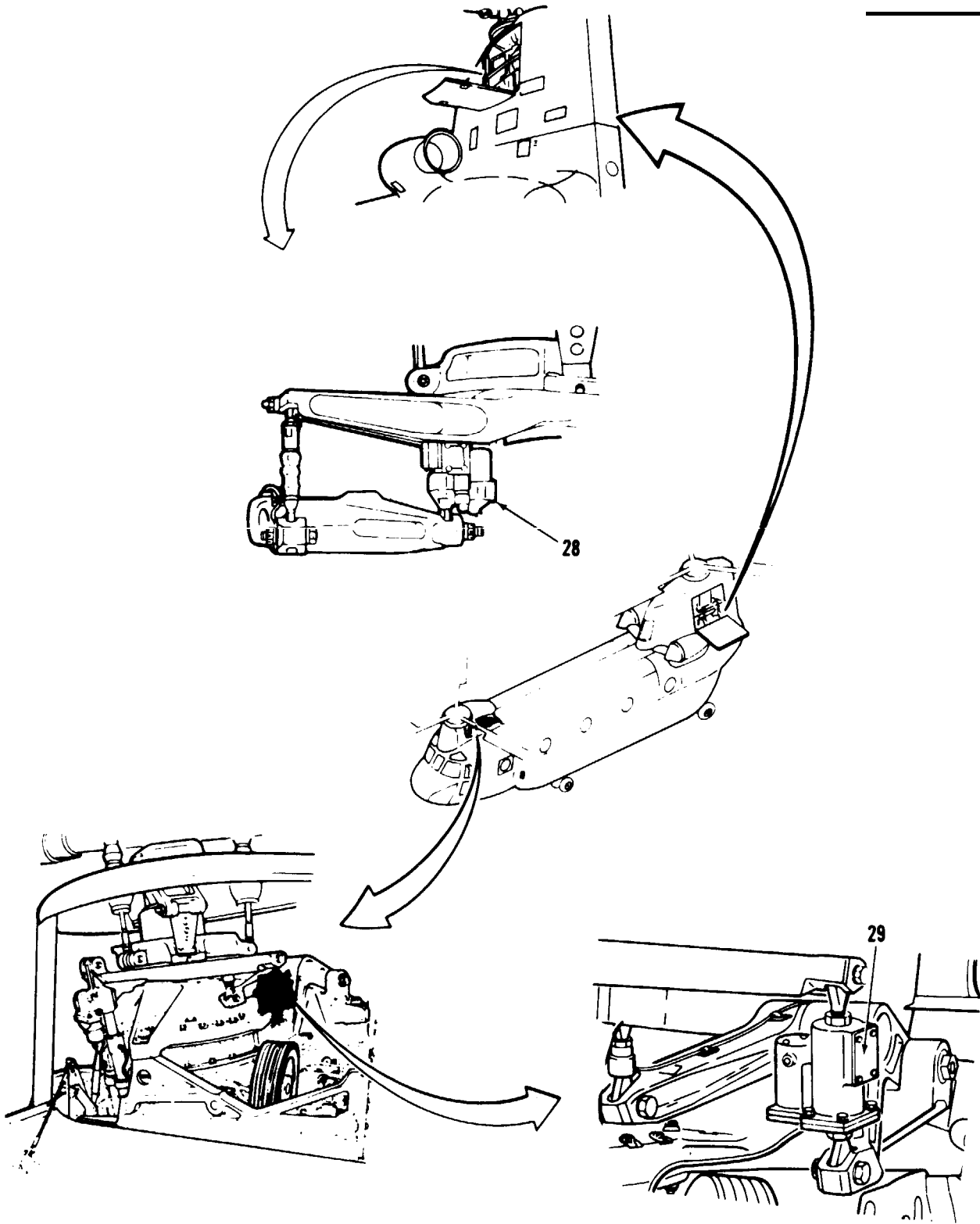
11-3.2 AFCS VISUAL CHECK (Continued)

11-3.2

TASK	RESULT
19 Check aft longitudinal cyclic trim actuator (28).	If actuator (28) is damaged, replace it. If connector to actuator is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.
20 Check forward longitudinal cyclic trim actuator (29).	If actuator (29) is damaged, replace it. If connector to actuator is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.

FOLLOW-ON MAINTENANCE:

- TM 55-1520-240-23:
- Close Flight Controls Closet
- Panel
- Flight Controls Closet
- Acoustic Blanket Installed
- Forward Left Work
- Platform Closed
- Pylon Left Work
- Platform Closed



11-3.3 AFCS OPERATIONAL CHECK

11-3.3

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
None

Materials:  
None

Personnel Required:  
35K20 Avionic Mechanic

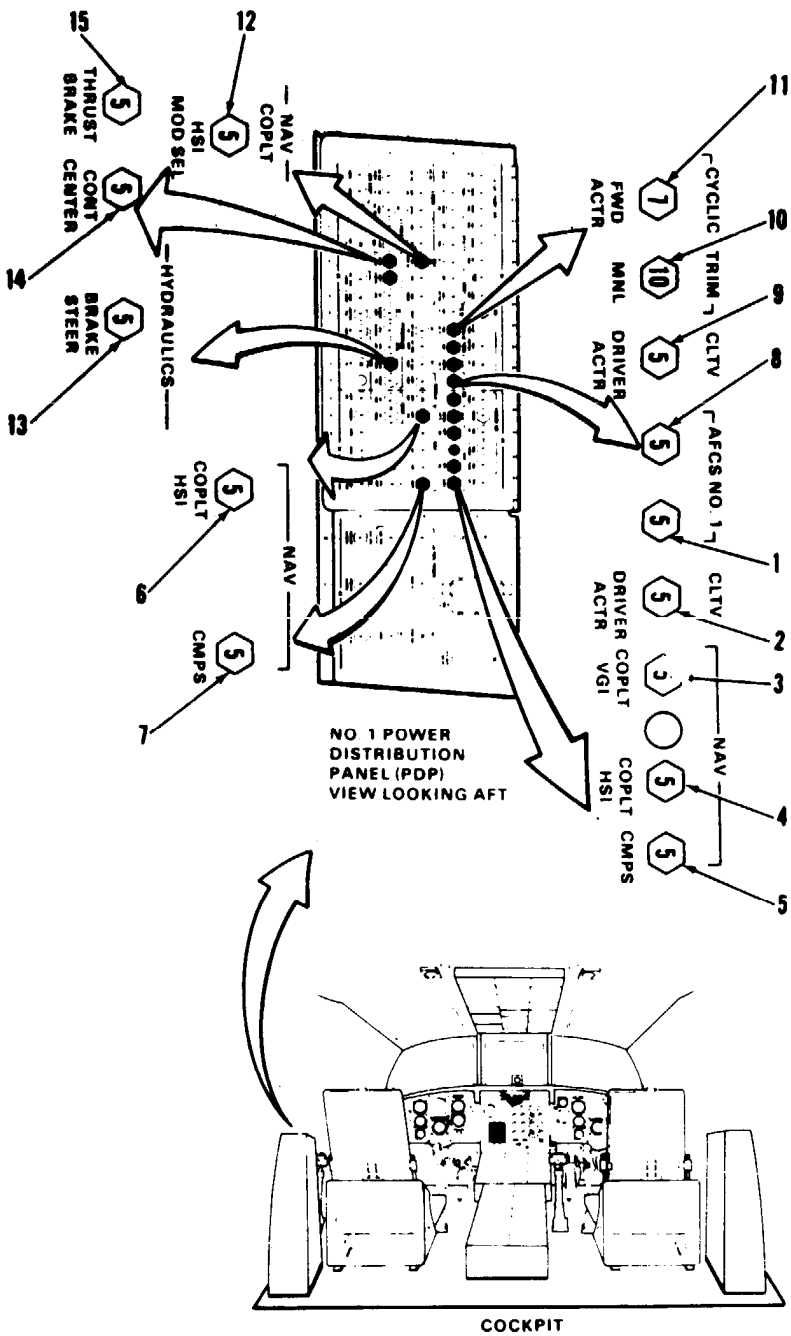
References:

- TM 11-1520-240-20
- TM 55-1520-240-23

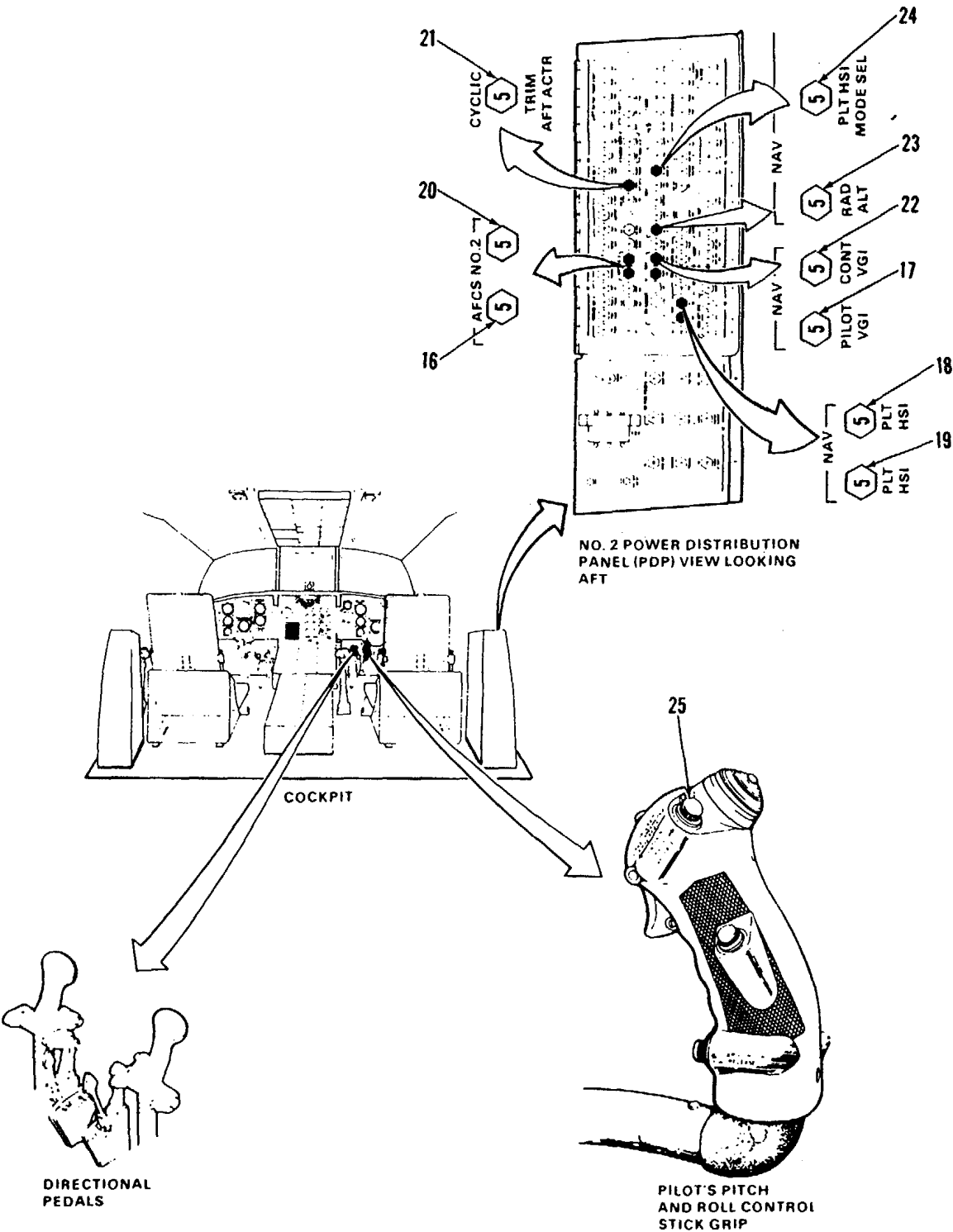
Equipment Condition:

- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
  - Aircraft Weight Supported By Its Own Wheels.
  - Visual Check of AFCS Performed (Task 11-3.2)

TASK	RESULT
<b>CHECK CIRCUIT BREAKERS</b>	
1. Check that following circuit breakers in NO. 1 PDP are closed: AC AFCS NO. 1 (1) CLTV DRIVER ACTR (2) NAV COPLT VG I (3) NAV COPLT HS I (4) NAV CMPS (5) NAV COPLT HSI (6) NAV CMPS (7) DC AFCS NO. 1 (8) CLTV DRIVER ACTR (9) CYCLIC TRIM MNL (10) and FWD ACTR (11) NAV COPLT HSI MODE SEL (12) HYDRAULICS BRAKE STEER (13) CONT CENTER (14) THRUST BRAKE (15)	<p>If any circuit breaker (1 through 14) is open close it. If AFCS NO. 1 circuit breaker (1) opens again, go to task 11-3.4.</p> <p>If CLTV DRIVER ACTR circuit breaker (2) opens again, go to task 11-3.5.</p> <p>If NAV COPLT VGI, COPLT HSI, CMPS, COPLT HSI, CMPS circuit breaker (3, 4, 5, 6, or 7) open again, refer to TM 11-1520-240-20.</p> <p>If AFCS NO. 1 circuit breaker (8) opens again, go to task 11-3.6.</p> <p>If CLTV DRIVER ACTR circuit breaker (9) opens again, go to task 11-3.7.</p> <p>If CYCLIC TRIM MNL circuit breaker (10) opens again, go to task 11-3.8</p> <p>If CYCLIC TRIM FWD ACTR circuit breaker (11) opens again, go to task 11-3.9.</p> <p>If NAV COPLT HSI MODE SEL circuit breaker (12) opens again, refer to TM 11-1520-240-20.</p> <p>If BRAKE STEER circuit breaker (13) opens again, go to task 7-4.4.</p> <p>If CONT CENT or THRUST BRAKE circuit breaker (14 or 15) opens again, go to task 11-2.3.</p>



TASK	RESULT
<div>2. Check that following circuit breakers in NO. 2 PDP are closed. AC AFCS NO. 2 (16) NAV PILOT VGI (17) NAV PLT HSI (19) DC AFCS NO. 2 (20) CYCLIC TRIM AFT ACTR (21) NAV CONT VG 1 (22) NAV RAD ALT (23) NAV PLT HSI MODE SEL (24)</div> <div>CHECK NO. 1 AFCS</div> <div>3. Press and hold pilot's CENTERING DEVICE RELEASE switch (25). Center pilot's pitch, roll control stick, and directional pedals. Release CENTER ING DEVICE RELEASE switch.</div>	<div>If any circuit breaker (16 through 24) is open, close it. If AFCS NO. 2 circuit breaker (16) opens again, go to task 11-3.10. If NAV PILOT VGI, PLT HSI or PLT HSI circuit breaker (17, 18, or 19) opens again, refer to TM 11-1520-240-20 for troubleshooting information If AFCS NO. 2 circuit breaker (20) opens again, go to task 11-3.11. If CYCLIC TRIM AFT ACTR circuit breaker (21) opens again, go to task 11-3.12. If NAV CONT VGI, RAD ALT, or PLT HSI MODE SEL circuit breaker (22, 23, or 24) opens again, refer to TM 11-1520-240-20 for troubleshooting information.</div> <div>Control stick and directional pedals shall center easily and remain there after CENTERING DEVICE RELEASE switch (25) is released. If not, go to task 11-2.3.</div>





11-3.3 AFCS OPERATIONAL CHECK (Continued)

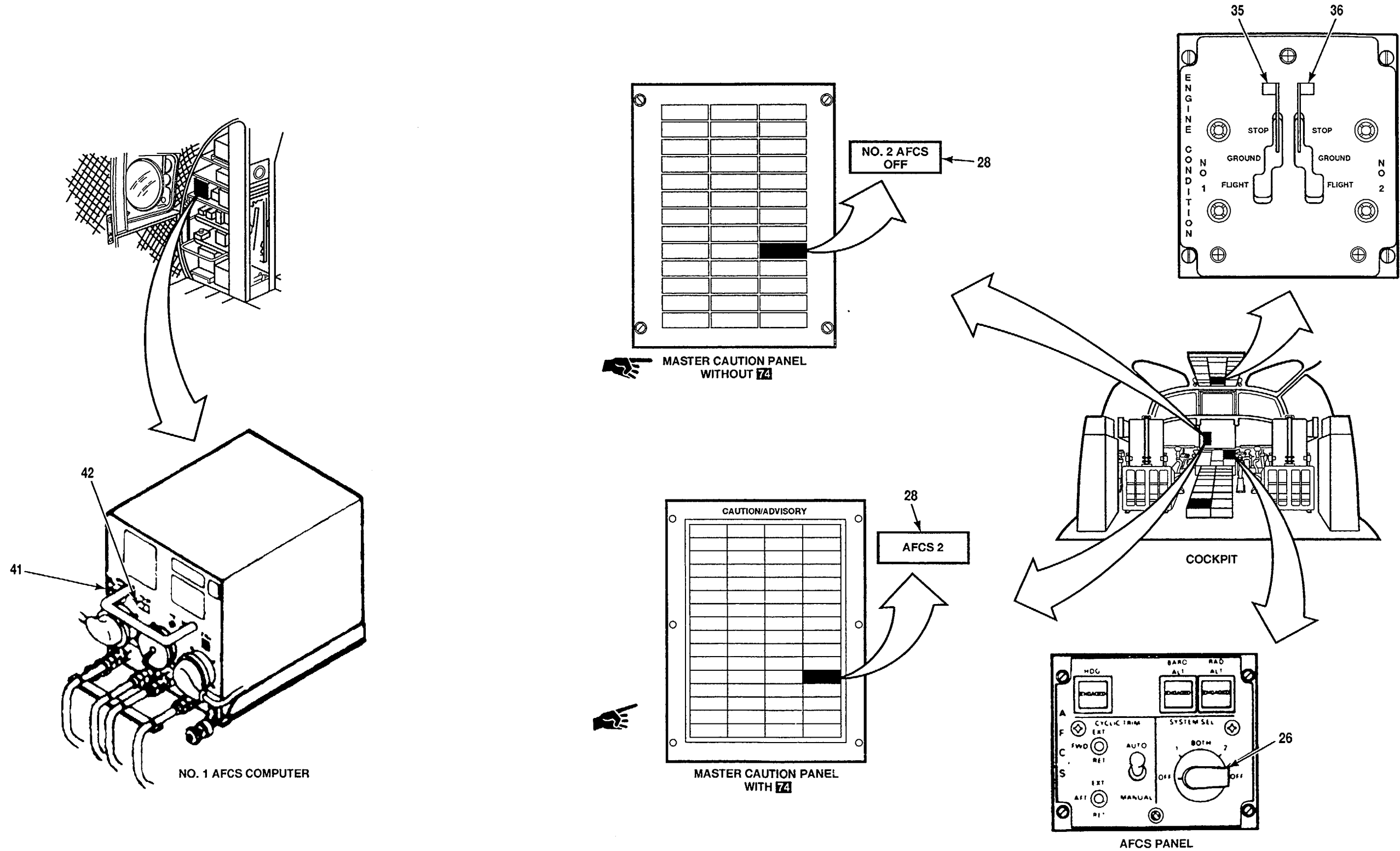
11-3.3

TASK	RESULT
4. Set SYSTEM SEL switch (26) to OFF.	NO. 1 AFCS OFF and NO. 2 AFCS OFF (Without 74) AFCS 1 and 2 (With 74) capsules (27 and 28) shall come on. If NO. 1 AFCS OFF (Without 74) AFCS 1 (With 74) capsule (27) is out, go to Task 11-3.13. If NO. 2 AFCS OFF (Without 74)AFCS 2 (With 74) capsule (28) is out, go to Task 11-3.14.
5. Set SWIVEL switch (29) to LOCK.	
6. Turn pilot's radar altimeter LO SET knob (30) until lo set index (31) is at 100.	Radar altimeter OFF flag shall go out of view. Digital readout shall indicate 0 to 5 feet after 1 minute warmup. If OFF flag is still in view or digital indication is not 0 to 5 feet, refer to TM 11-1520-240-20 for troubleshooting information.
7. Turn pilot's HSI HDG knob (32) until heading cursor (33) is 30° degrees clockwise from aircraft heading.	
8. Press and release pilot's CMD SEL switch (34).	CMD SEL caption shall come on. If it does not, refer to TM 11-1520-240-20.
9. Check that both ENGINE CONDITION levers (35 and 36) are at STOP.	Set them to STOP if required.
10. Check that CYCLIC TRIM AUTO MANUAL switch (37) is at AUTO.	Set switch to AUTO if required.
11. Check FWD and AFT CYC TRIM indicators (38 and 39).	Pointers on both indicators (38 and 39) shall be in GND position. If both pointers are not in GND position, go to Task 11-3.15. If FWD CYC TRIM indicator pointer is not as GND position, go to Task 11-3.16. If AFT CYC TRIM indicator pointer is not at GND position, go to Task 11-3.17.

TASK	RESULT
12. Set SYSTEM SEL switch (26) to 1.	NO. 1 AFCS OFF (Without 74) AFCS 1 (With 74) capsule (27) shall go out. No large Integrated Lower Control Actuator (ILCA) engagement transients (hardovers) shall occur. If capsule (27) is still on, go to Task 11-3.18. If large ILCA engagement transients (hardovers) occurs, go to Task 11-3.19 for pitch transient, Task 11-3.20 for roll transient, or Task 11-3.21 for yaw transient.
13. Move pilot's directional pedals right, then left. Return pedals to center.	No. 1 Yaw ILCA output shaft shall extend with pedal right and retract with pedal left. If No. 1 yaw ILCA output shaft does not extend or retract, go to Task 11-3.22.
14. Move pilot's pitch and roll control stick right, then left. Return grip to center.	No. 1 roll ILCA output shaft shall extend with stick right and retract with stick left. If No. 1 roll ILCA output shaft does not extend or retract, go to Task 11-3.23.
15. Momentarily set pilot's pitch and roll trim switch (40) right then left. Release switch.	No. 1 roll ILCA output shaft shall extend when switch (40) is right and retract when switch is left. If No. 1 roll ILCA output shaft does not extend or retract, go to Task 11-3.24.
15.1 Momentarily set co-pilot's pitch and roll trim switch (40) right then left. Release switch.	No. 1 roll ILCA output shaft shall extend when switch (40) is right and retract when switch is left. If No. 1 roll ILCA output shaft does not extend or retract, go to Task 11-3.24.
16. Press and hold pilot's CENTERING DEVICE RELEASE switch (25). Center pilot's pitch and roll control stick and directional pedals. Release CENTERING DEVICE RELEASE switch.	

**GO TO NEXT PAGE**  
**Change 23 11-51**

TASK	RESULT
<p><b><u>WARNING</u></b> Keep head, hands, and other body parts clear of flight controls, especially those in flight controls closet. AFCS BITE automatically causes actuator and controls motion. Severe injury can occur.</p>	
17. Set NO. 1 ENGINE CONDITION lever (35) to FLIGHT.	
18. Press and release NO. 1 AFCS computer BITE switch (41).	Computer digital test counter (42) shall remain blank. BITE switch (41) shall not flash. If counter does not remain blank or BITE switch flashes, go to task 11-3.25.
19. Set NO. 1 ENDING CONDITION lever (35) to STOP. Set NO. 2 ENGINE CONDITION lever (36) to FLIGHT. Repeat step 18 then go to step 20.	
20. Set NO. 2 ENGINE CONDITION lever (36) to STOP.	
21. Press and release BITE switch (41).	Computer counter (42) shall step and display from 1 through 3 and stop at 3. BITE switch (41) shall light and flash while display is stepping and then glow steadily after display indicates 3. If display is blank and BITE switch does not light, go to task 11-3.26. If counter steps to and stops at 3 but BITE switch does not light, replace NO. 1 AFCS computer. If BITE switch lights but display stops at 1 or 2, repeat operational check task 11-3.3. If same result occurs, replace NO. 1 AFCS computer.
22. Press and release BITE switch (41).	Computer counter (42) shall step and display from 4 through 95 (end of test) and go blank. BITE switch shall flash while display is stepping. If BITE switch lights steadily, and counter stops at an intermediate number, record that number. Push BITE switch to continue test. Go to table 11-3.1 to determine maintenance action. At end of test, counter shall go blank and BITE switch light shall go out. If BITE switch lamp flashes at step 95, the PUSH TO TEST switch on the Pilots or Copilots radar altimeter indicator must be actuated within 20 seconds in order to avoid a false failure indication.



A65458

11-3.3 AFCS OPERATIONAL CHECK (Continued)

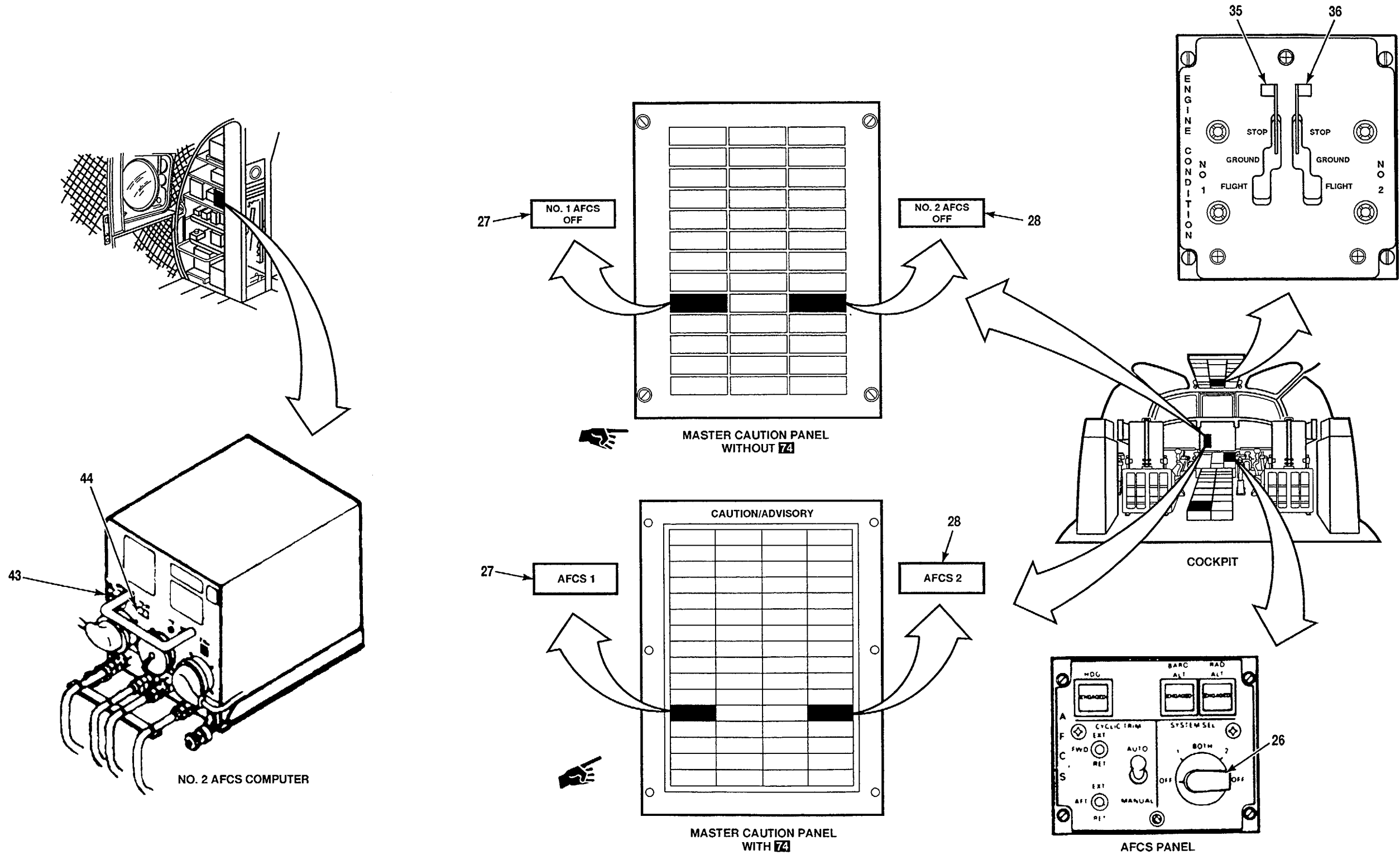
11-3.3

TASK	RESULT
<b>CHECK NO. 2 AFCS</b>	
23. Set SYSTEM SEL switch (26) to BOTH, pause for 10 seconds then set it to OFF through position 2.	NO. 1 AFCS OFF and NO. 2 AFCS OFF (Without 74) AFCS 1 and 2 (With 74) capsules (27 and 28) shall come on. If NO. 1 AFCS OFF (Without 74) AFCS 1 (With 74) (capsule (27) is out, go to Task 11-3.13. If NO. 2 AFCS OFF (Without 74) AFCS 2 (With 74) capsule (28) is out, go to Task 11-3.14.
24. Set SWIVEL switch (26) to LOCK.	
25. Turn pilot's radar altimeter LO SET knob (30) until lo set index (31) is at 100.	Radar altimeter OFF flag shall go out of view. Digital readout shall indicate 0 to 5 feet after 1 minute warmup. If OFF flag is still in view or digital indication is not 0 to 5 feet, refer to TM 11-1520-240-20 for troubleshooting information.
26. Turn pilot's HSI HDG knob (32) until heading cursor (33) is 30° degrees clockwise from aircraft heading.	
27. Press and release pilot's CMD SEL switch (34).	CMD SEL caption shall come on. If it does not, refer to TM 11-1520-240-20.
28. Check that both ENGINE CONDITION levers (35 and 36) are at STOP.	Set them to STOP if required.
29. Check that CYCLIC TRIM AUTO MANUAL switch (37) is at AUTO.	Set switch to AUTO if required.
30. Check FWD and AFT CYC TRIM indicators (38 and 39).	Pointers on both indicators (38 and 39) shall be in GND position. If both pointers are not in GND position, go to Task 11-3.15. If FWD CYC TRIM indictor pointer is not at GND position, go to Task 11-3.16. If AFT CYC TRIM indicator pointer is not at GND position, go to Task 11-3.17.

TASK	RESULT
31. Set SYSTEM SEL switch (26) to 2.	NO. 2 AFCS OFF (Without 74) AFCS 2 (With 74) capsule (28) shall go out. No large Integrated Lower Control Actuator (ILCA) engagement transients (hardovers) shall occur. If capsule (28) is still on, go to Task 11-3.27. If large ILCA engagement transients (hardovers) occur, go to Task 11-3.28 for pitch transient, Task 11-3.29 for roll transient, or Task 11-3.30 for yaw transient.
32. Move pilot's directional pedals right, then left. Return pedals to center.	No. 2 yaw ILCA output shaft shall extend with pedal right and retract with pedal left. If No. 2 yaw ILCA output shaft does not extend or retract, go to Task 11-3.31.
33. Move pilot's pitch and roll control stick right, then left. Return grip to center.	No. 2 roll ILCA output shaft shall extend with stick right and retract with stick left. If No. 2 roll ILCA output shaft does not extend or retract, go to Task 11-3.32.
34. Momentarily set pilot's pitch and roll trim switch (40) right then left. Release switch.	No. 2 roll ILCA output shaft shall extend when switch (40) is right and retract when switch is left. If No. 2 roll ILCA output shaft does not extend or retract, go to Task 11-3.33.
34.1 Momentarily set copilot's pitch and roll trim switch (40) right then left. Release switch.	No. 2 roll ILCA output shaft shall extend when switch (40) is right and retract when switch is left. If No. 2 roll ILCA output shaft does not extend or retract, go to Task 11-3.33.
35. Press and hold pilot's CENTERING DEVICE RELEASE switch (25). Center pilot's pitch and roll control stick and directional pedals. Release CENTERING DEVICE RELEASE switch.	



TASK	RESULT
<p><b><u>WARNING</u></b> Keep head, hands, and other body parts clear of flight controls, especially those in flight controls closet. AFCS BITE automatically causes actuator and controls motion. Severe injury can occur.</p>	
36. Set NO. 1 ENGINE CONDITION lever (35) to FLIGHT.	
37. Press and release NO. 2 AFCS computer BITE switch (43).	Computer digital test counter (44) shall remain blank. BITE switch (43) shall not flash. If counter does not remain blank or BITE switch flashes, go to task 11-3.25.
38. Set NO. 1 ENGINE CONDITION lever (35) to STOP. Set NO. 2 ENGINE CONDITION lever (36) to FLIGHT. Repeat step 37 then go to step 39.	
39. Set NO. 2 ENGINE CONDITION lever (36) to STOP.	
40. Press and release BITE switch (43).	Computer counter (44) shall step and display from 1 through 3 and stop at 3. BITE switch (41) shall light and flash while display is stopping and then glow steadily after display indicates 3. If display is blank and BITE switch does not light, go to task 11-3.34. If counter steps to and stops at 3 but BITE switch does not light, replace NO. 2 AFCS computer. If BITE switch lights but display stops at 1 or 2, repeat operational check task 11-3.2. If same result occurs, replace NO. 2 AFCS computer.
41. Press and release BITE switch (43).	Computer counter (44) shall step and display from 4 through 95 (end of test) and go blank. BITE switch shall flash while display is stepping. If BITE switch lights steadily, and counter stops at an intermediate number, record that number. Push BITE switch to continue test. Go to table 11-3.1 to determine maintenance action. At end of test, counter shall go blank and BITE switch light shall go out. If BITE switch lamp flashes at step 95, the PUSH TO TEST switch on the Pilots or Copilots radar altimeter indicator must be actuated within 20 seconds in order to avoid a false failure indication.



A65459



11-3.3 AFCS OPERATIONAL CHECK (Continued)

11-3.3

TASK	RESULT
<b>CHECK LONGITUDINAL CYCLIC TRIM ACTUATOR CONTROL</b>	
42. Set CYCLIC TRIM AUTO MANUAL switch (37) to MANUAL.	
43. Set and hold FWD switch (45) to EXT.	FWD CYC TRIM indicator (38) pointer shall move from GND to EXT position. If it does not, go to task 11-3.35.
44. Set and hold FWD switch (45) to RET.	FWD CYC TRIM indicator (38) pointer shall move from EXT to RET position. If it does not, go to task 11-3.35.
45. Release FWD switch (45). Set and hold AFT switch (46) to EXT.	AFT CYC TRIM indicator (39) pointer shall move from GND to EXT position. If it does not, go to task 11 -3.36.
46. Set and hold AFT switch (46) to RET.	AFT CYC TRIM indicator (39) pointer shall move from EXT to RET position. If it does not, go to task 11-3.36.
47. Release AFT switch (46).	
48. Set CYCLIC TRIM AUTO MANUAL switch (37) to AUTO.	Pointers on FWD and AFT CYC TRIM indicators (38 and 39) shall move to GND positions.

**CHECK HDG, RAD ALT, AND BARO ALT SWITCHES**

49. Check that SYSTEM SEL switch (26) is at BOTH.	If not, set it to BOTH.
50. Press and hold HDG switch (47).	HDG switch (47) ENGAGED caption shall come on. If not, go to task 11-3-37.
51. Release HDG switch (47).	
52. Press and release RAD ALT switch (48).	RAD ALT switch (48) ENGAGED caption shall come on and stay on. If not, go to task 11 -3.38.

TASK	RESULT
53. Press and release BARO ALT switch (49).	RAD ALT switch (48) ENGAGED caption shall go out. BARO ALT switch (49) ENGAGED caption shall come on. If not, go to task 11-3.38.
54. Set SYSTEM SEL switch to position 1, then to OFF.	BARO ALT switch (49) ENGAGED caption shall go out. If not, replace AFCS control panel.

**CHECK LONGITUDINAL COCKPIT CONTROL DRIVER ACTUATOR**

55. Set and hold pilot's pitch and roll trim switch (40) forward.	Pitch and roll control sticks shall move forward. If not, go to task 1 1-3-39.
56. Set and hold pilot's pitch and roll trim switch (40) aft.	Pitch and roll control sticks shall move aft. If not, go to task 11 -3.39.
57. Repeat steps 55 and 56 using copilot's pitch and roll trim switch (40).	

**NOTE**  
If a problem with AFCS occurred during flight and could not be verified by the AFCS operational check, refer to table 11-3.2 to locate trouble symptom task number.

TABLE 11-3.1

BITE TEST NUMBER	TASK NO. OR MAINTENANCE ACTION
4, 5, 7, 8, 10-17, 19-47, 49-69.....	Replace computer
75-84, 88, 90-94, 96-127. ....	
6, 9, 18.....	11-3.40
48.....	11 -3.41
70-74 .....	11-3.42
85, 86.....	11-3.43 or 11-3.44
87 .....	11-3.45
89 .....	11-3.46 or 11-3.47
95.....	11-3.48

11-3.3 AFCS OPERATIONAL CHECK (Continued)

11-3.3

TASK RESULT

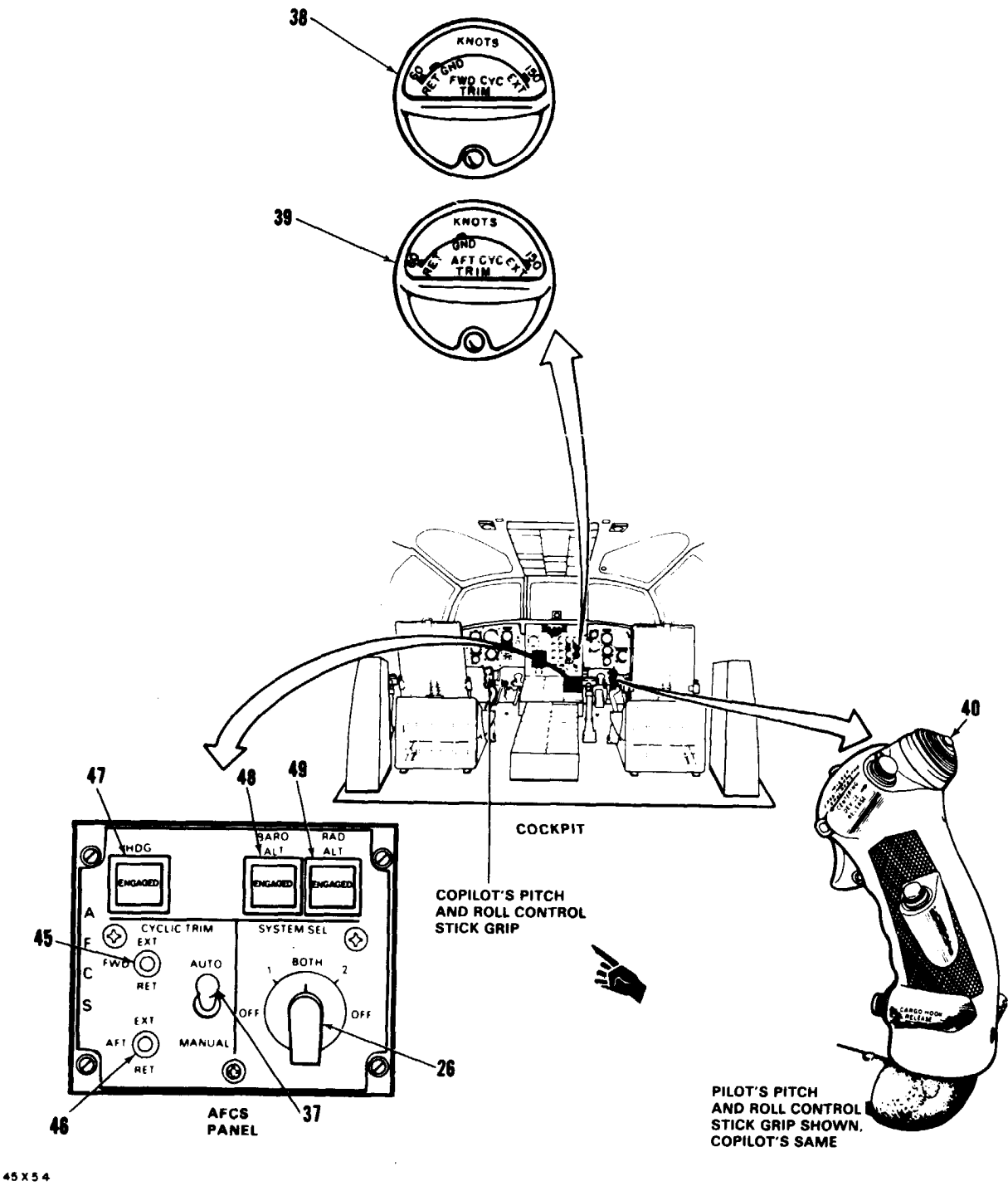
TABLE 11-3.2

TROUBLE SYMPTOM	Task Number	
	NO. 1 AFCS	NO. 2 AFCS
Longitudinal Axis:		
AFCS Pitch Stabilization Erratic or Oscillatory	11-3.49	11-3.49
AFCS Pitch Attitude/Airspeed Hold Weak or Inoperative	11-3.50	11-3.51
AFCS Longitudinal Control Position Out of Trim	11-3.52	11-3.52
Lateral Axis:		
AFCS Roll Stabilization Erratic/Oscillatory or Roll Atitude Hold Weak or Inoperative	11-3.53	11-3.53
Heading Select Mode Response Weak or Inoperative (Both Systems)	11-3.54	11-3.54
AFCS Heading Select Mode Response Weak or Inoperative	11-3.55	11-3.56
Directional Axis:		
YAW Stability Erratic/Oscillatory	11-3.57	11-3.58
AFCS Heading Hold Weak or Inoperative	11-3.59	11-3.59
AFCS Lateral Stick Only Turns Not Coordinated	11-3.60	11-3.60
Collective Axis:		
Barometric Altitude Hold Inoperative or Response Erratic (Radar Altitude Hold Okay)	11-3.61	
Radar Altitude Hold Inoperative or Response Erratic (Barometric Altitude Hold Okay)	11-3.62	
Barometric and Radar Altitude Hold Inoperative or Response Erratic	11-3.63	

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:  
Hydraulic Power Off  
Electrical Power Off  
Battery Disconnected  
Flight Controls Closet Acoustic  
Blanket Installed.

Electronic Compartment Acoustic  
Blanket Installed  
Pylon Left Work Platform  
Closed.  
Forward Left Work Platform  
Closed.



END OF TASK

11-3.4 NO. 1 AFCS AC CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

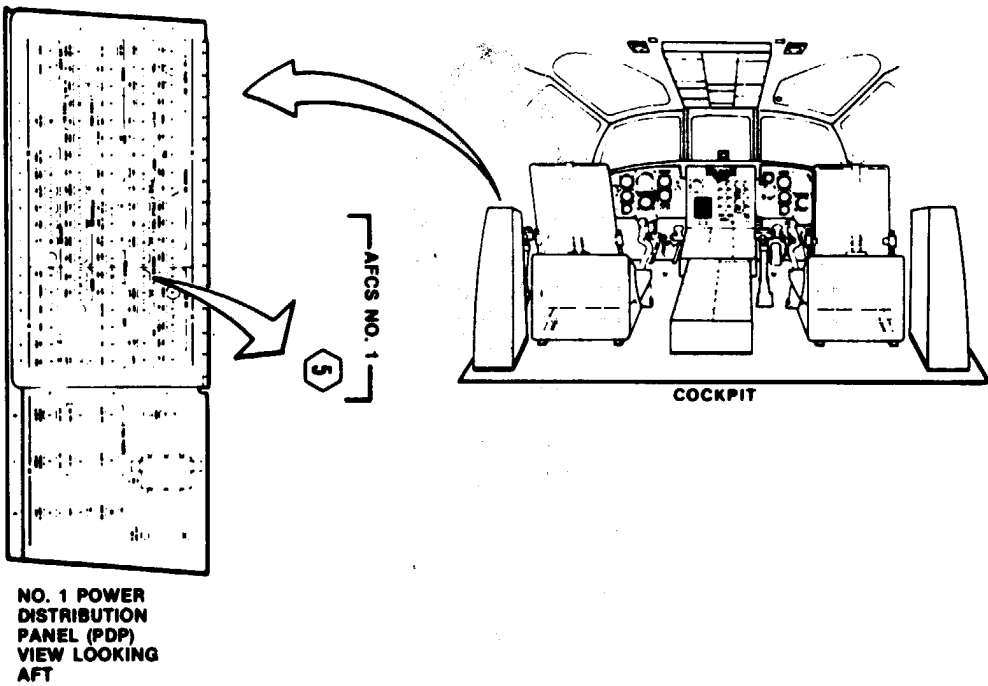
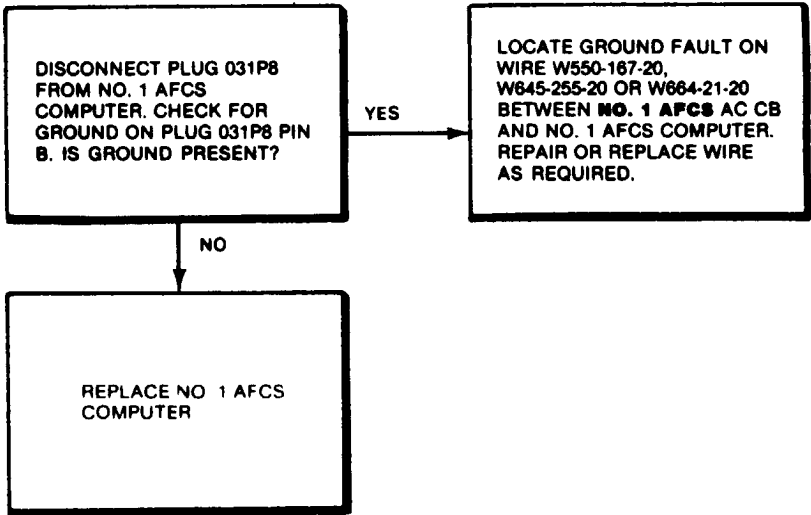
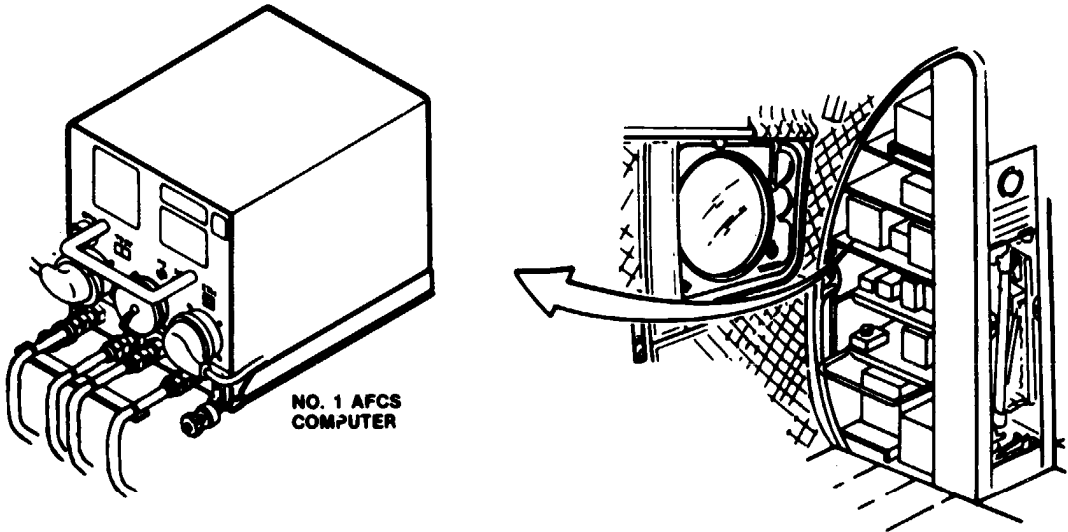
Materials:

None

Personnel Required:  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



D145-11910-SPA

END OF TASK

11-3.5 CLTV DRIVER ACTR AC CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

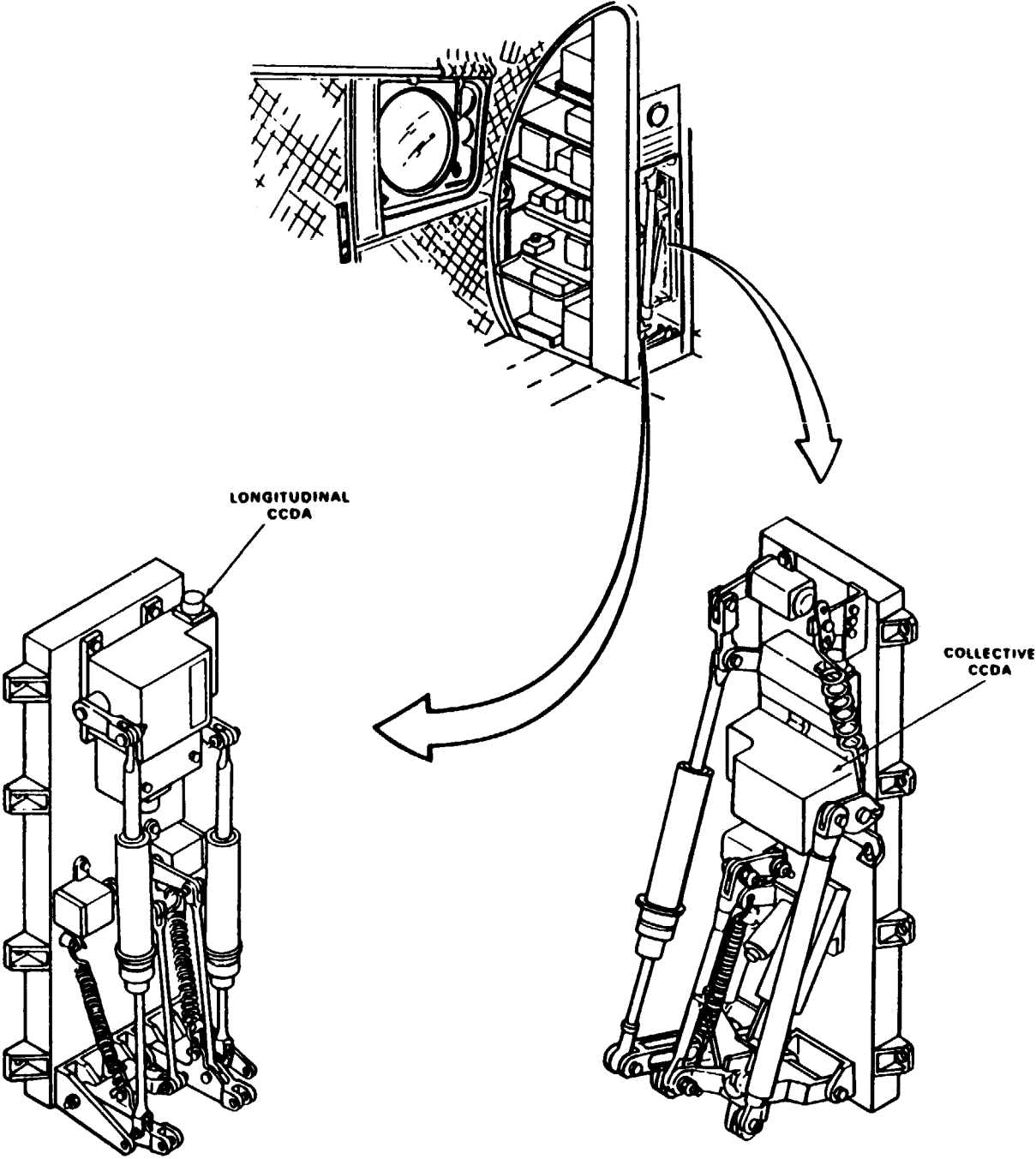
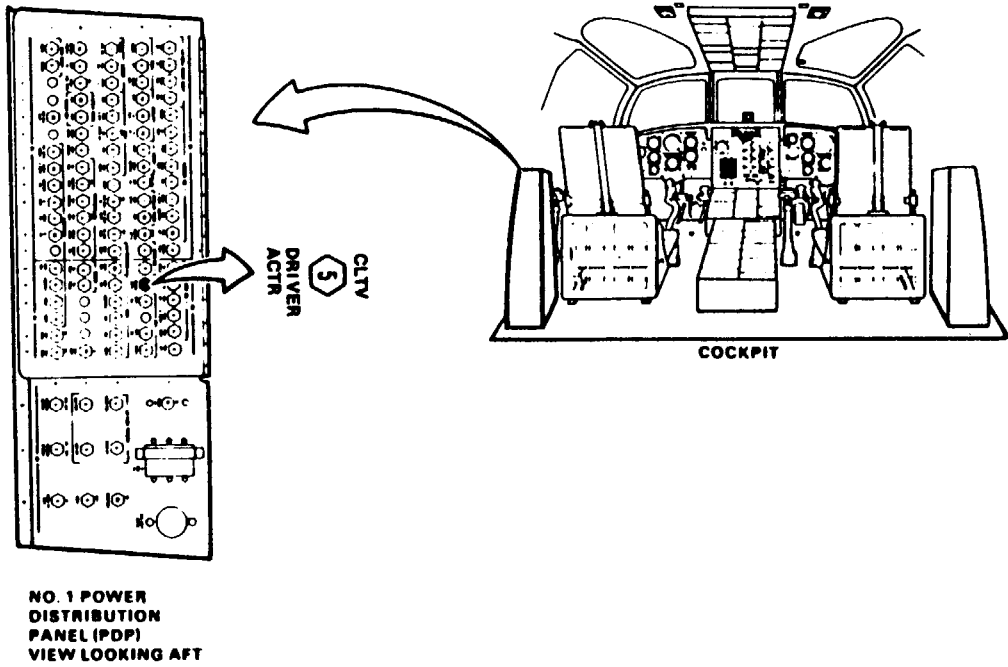
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

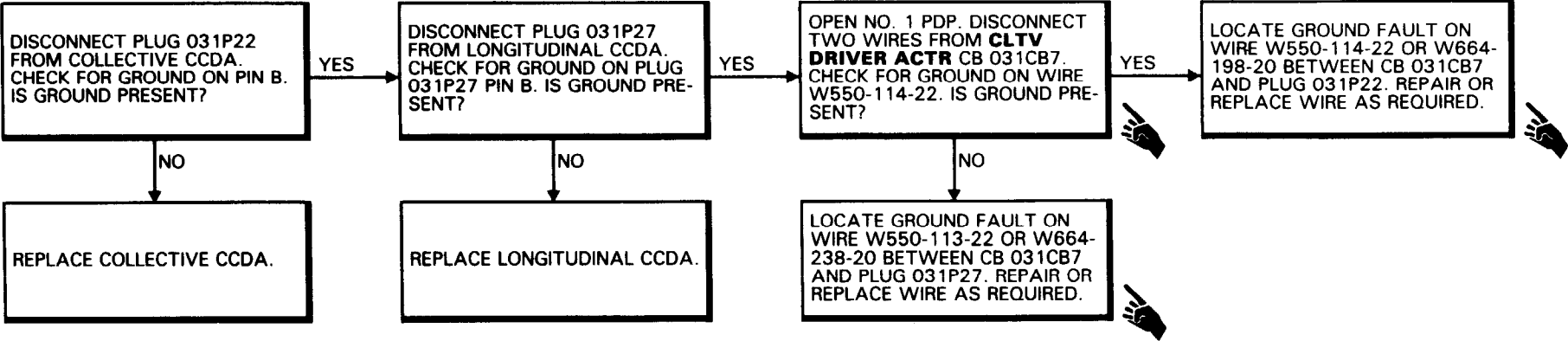
**Personnel Required:**  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



11-3.5 CLTV DRIVER ACTR AC CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)



11-3.6 AFCS NO. 1 DC CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

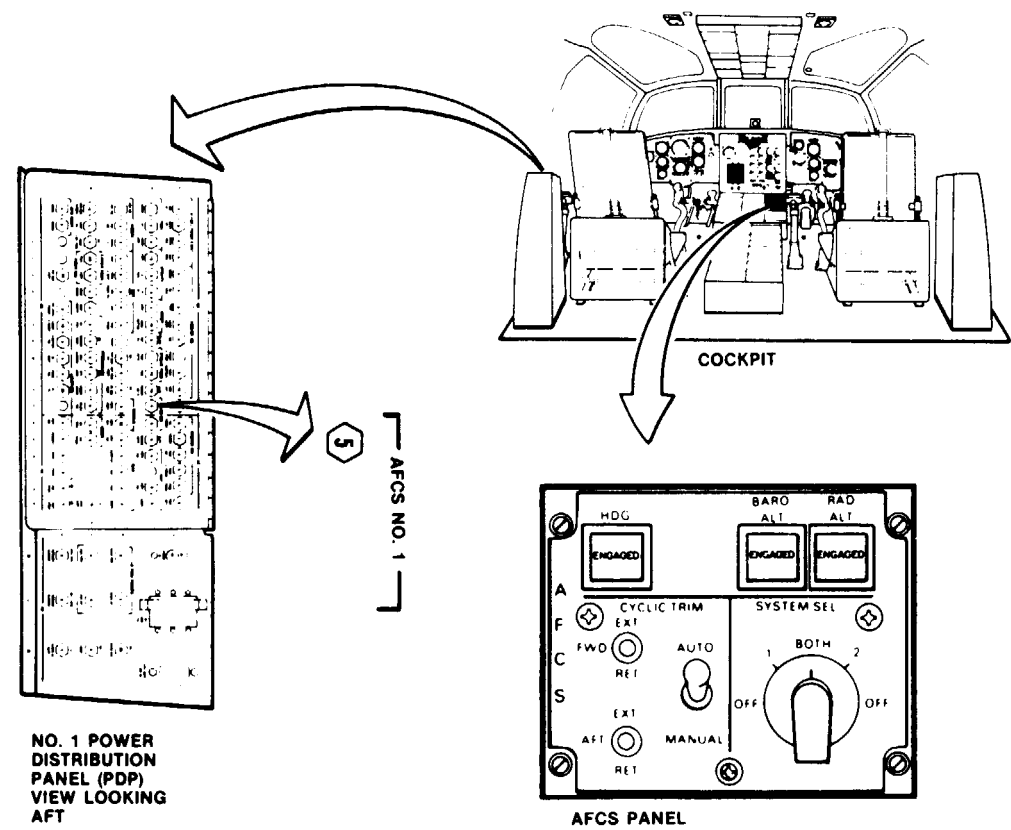
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

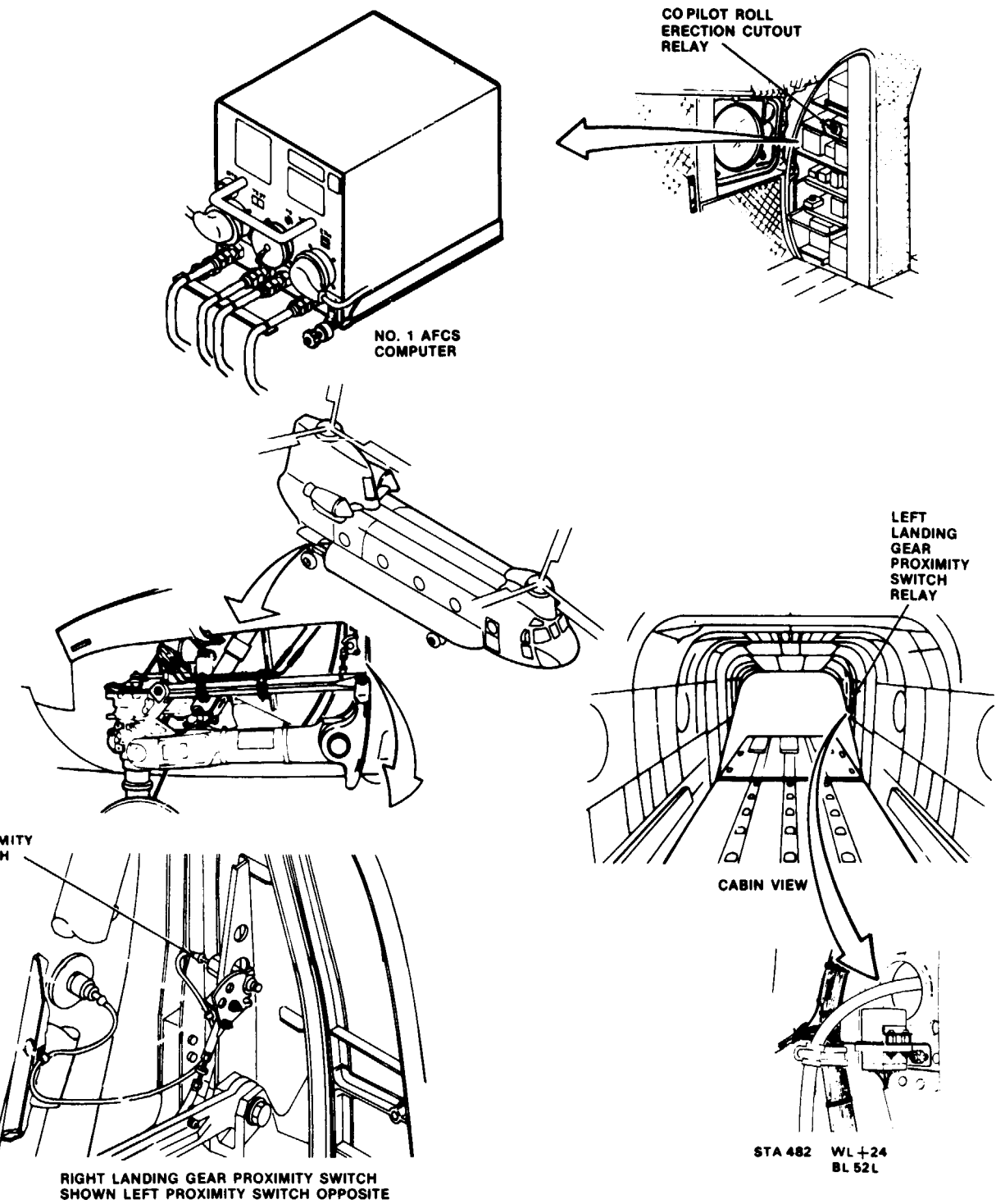
Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



90x54

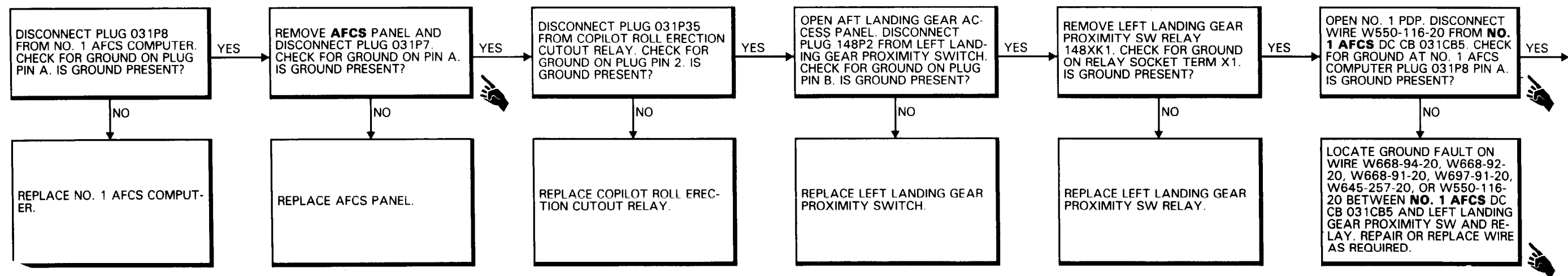


D145-11923-SPA

GO TO NEXT PAGE

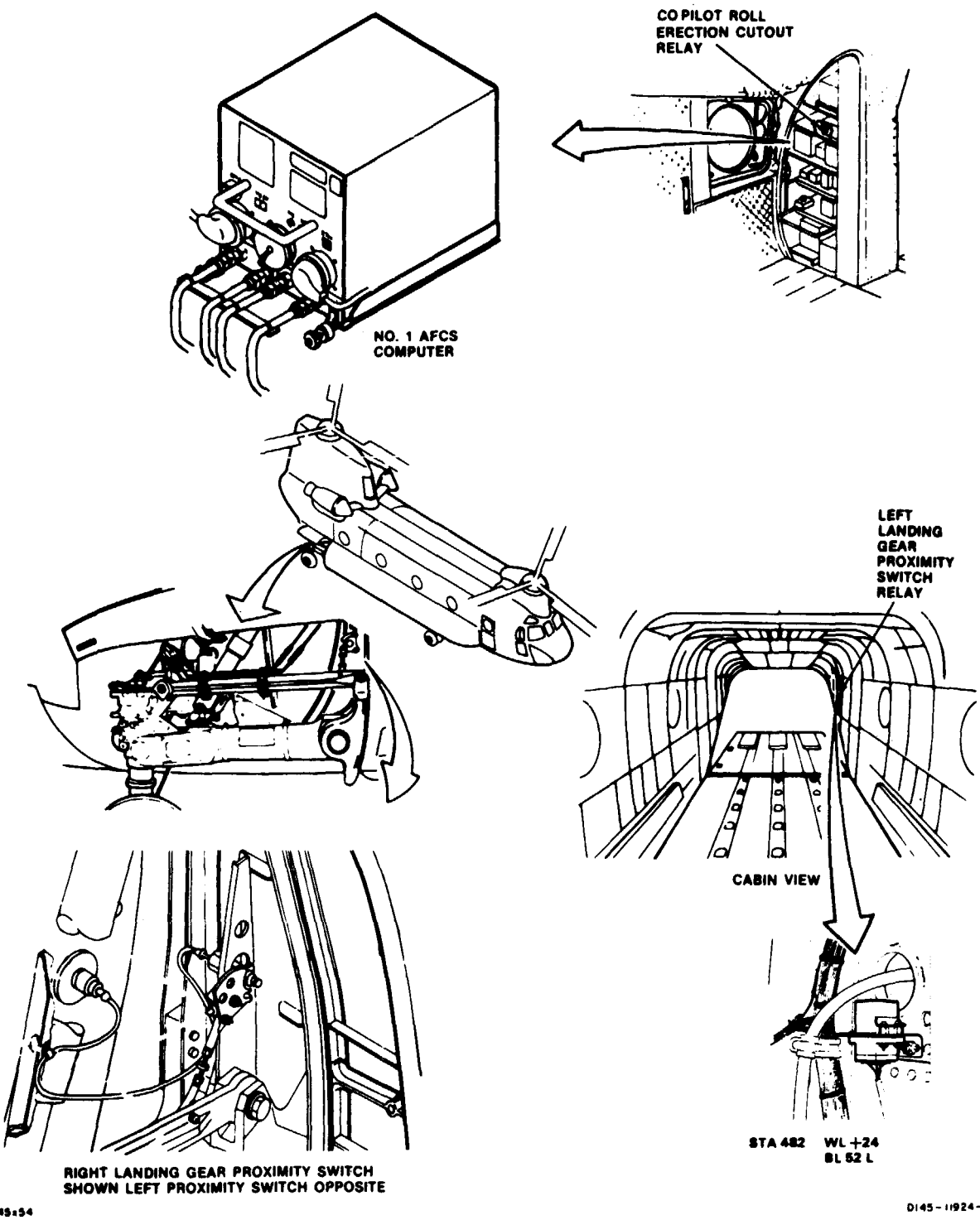
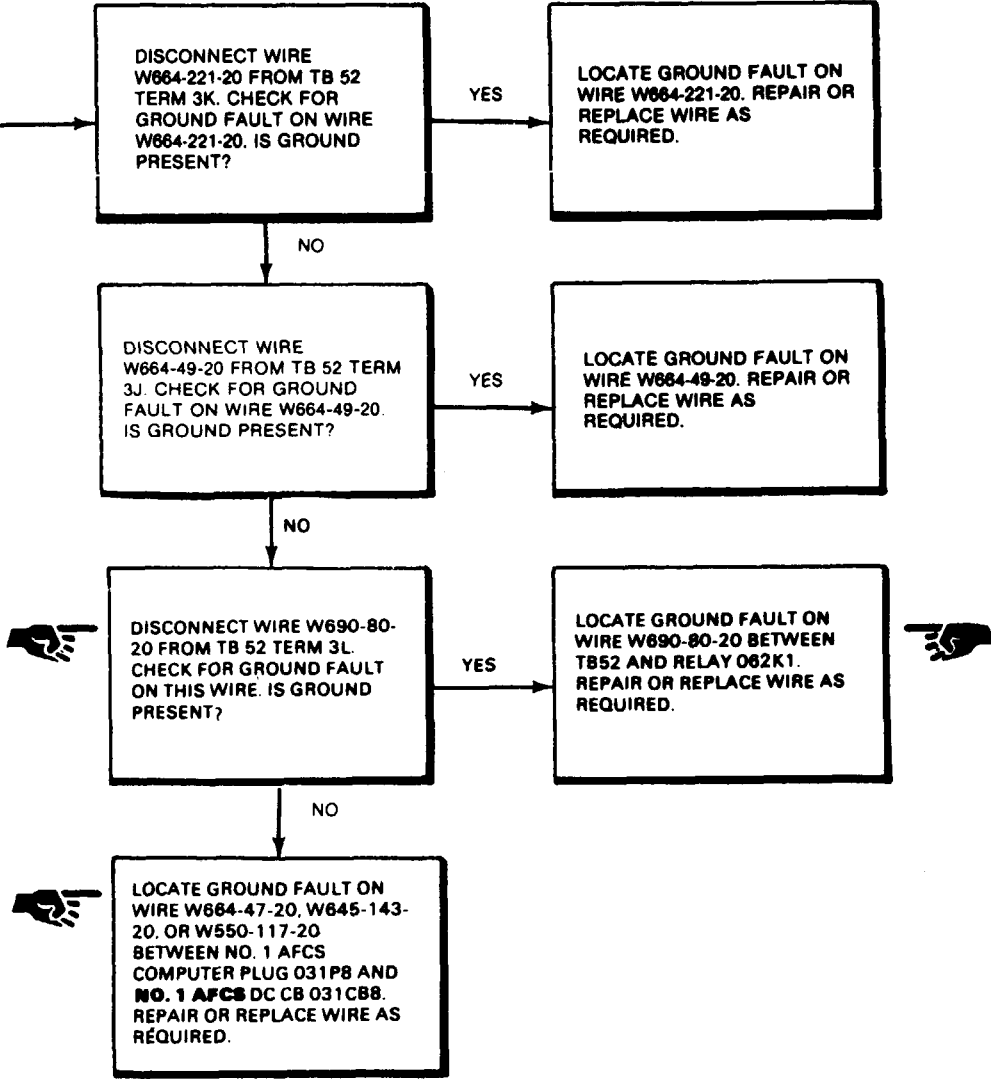
11-3.6 AFCS NO. 1 DC CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

11-3.6



11-3.6 AFCS NO. 1 DC CIRCUIT BREAKER WILL NOT STAY CLOSED  
(Continued)

11-3.6



END OF TASK



11-3.7 CLTV DRIVER ACTR CIRCUIT BREAKER WILL NOT STAY CLOSED

11-3.7

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

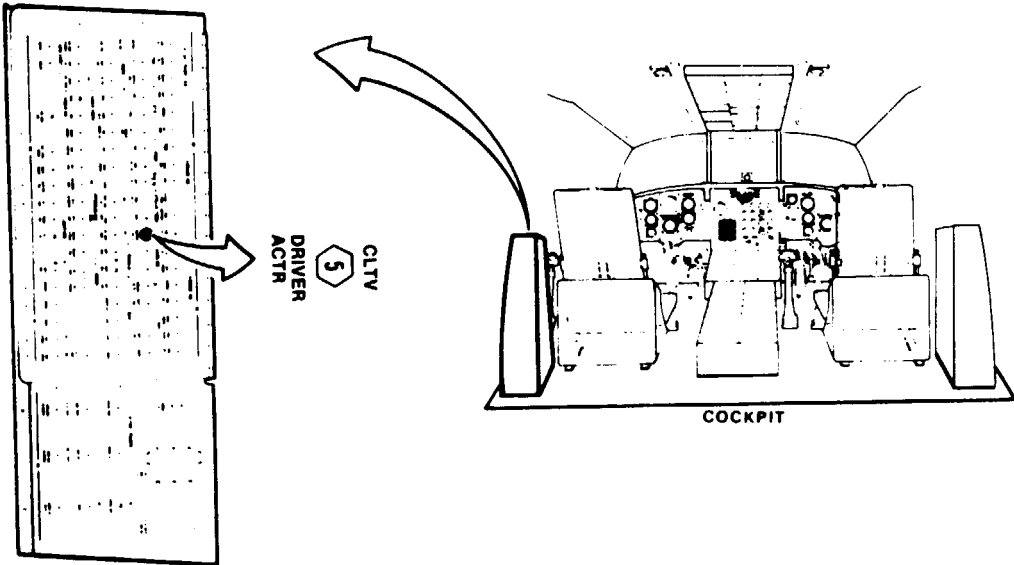
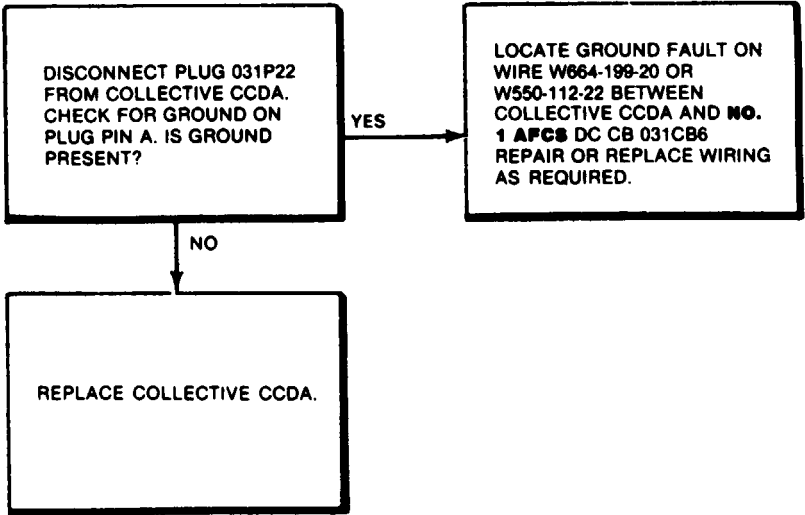
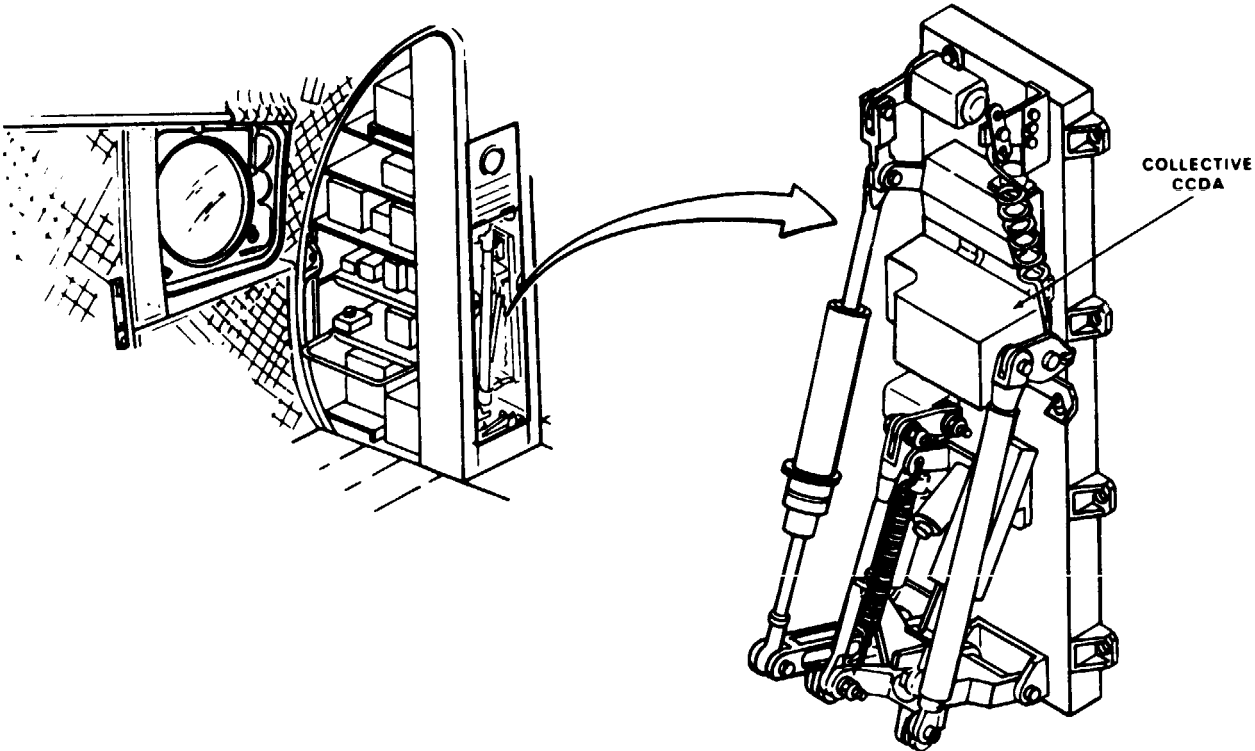
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



NO 1 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

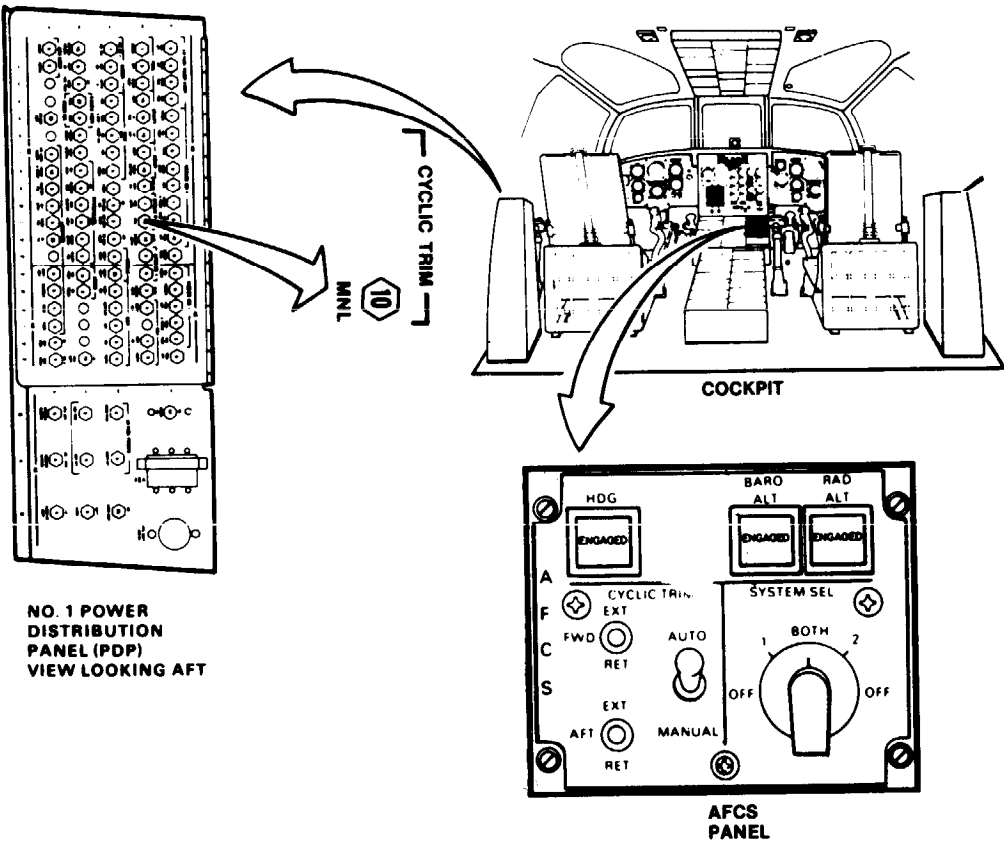
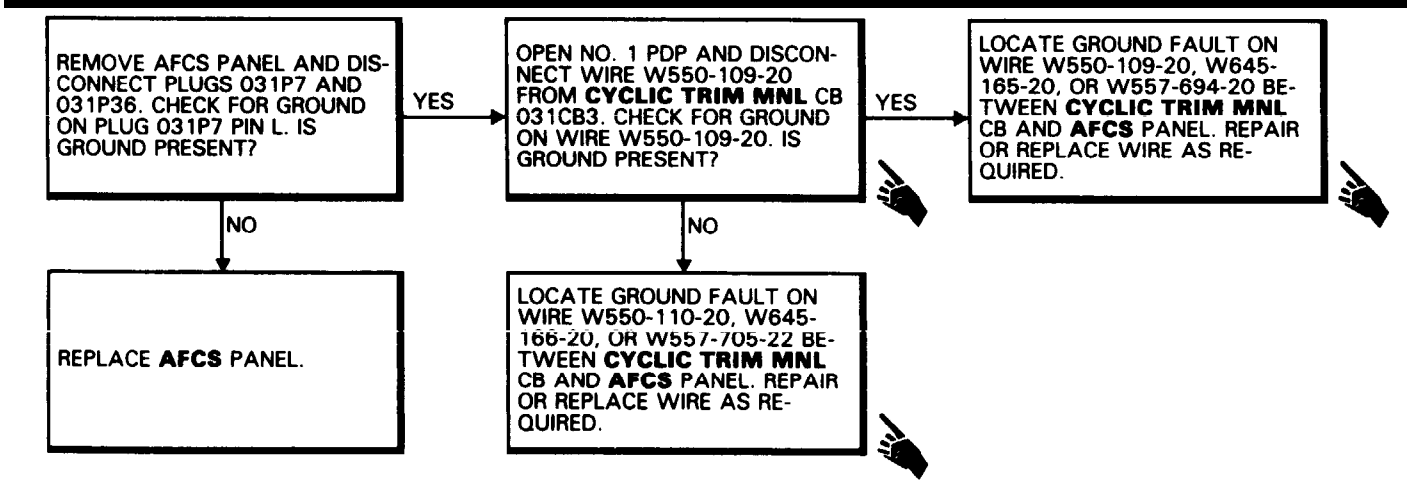
Avionic Mechanic (2)

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



45 x 54

DI48-11911-3PA

11-3.9 CYCLIC TRIM FWD ACTR CIRCUIT BREAKER WILL NOT STAY CLOSED

11-3.9

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

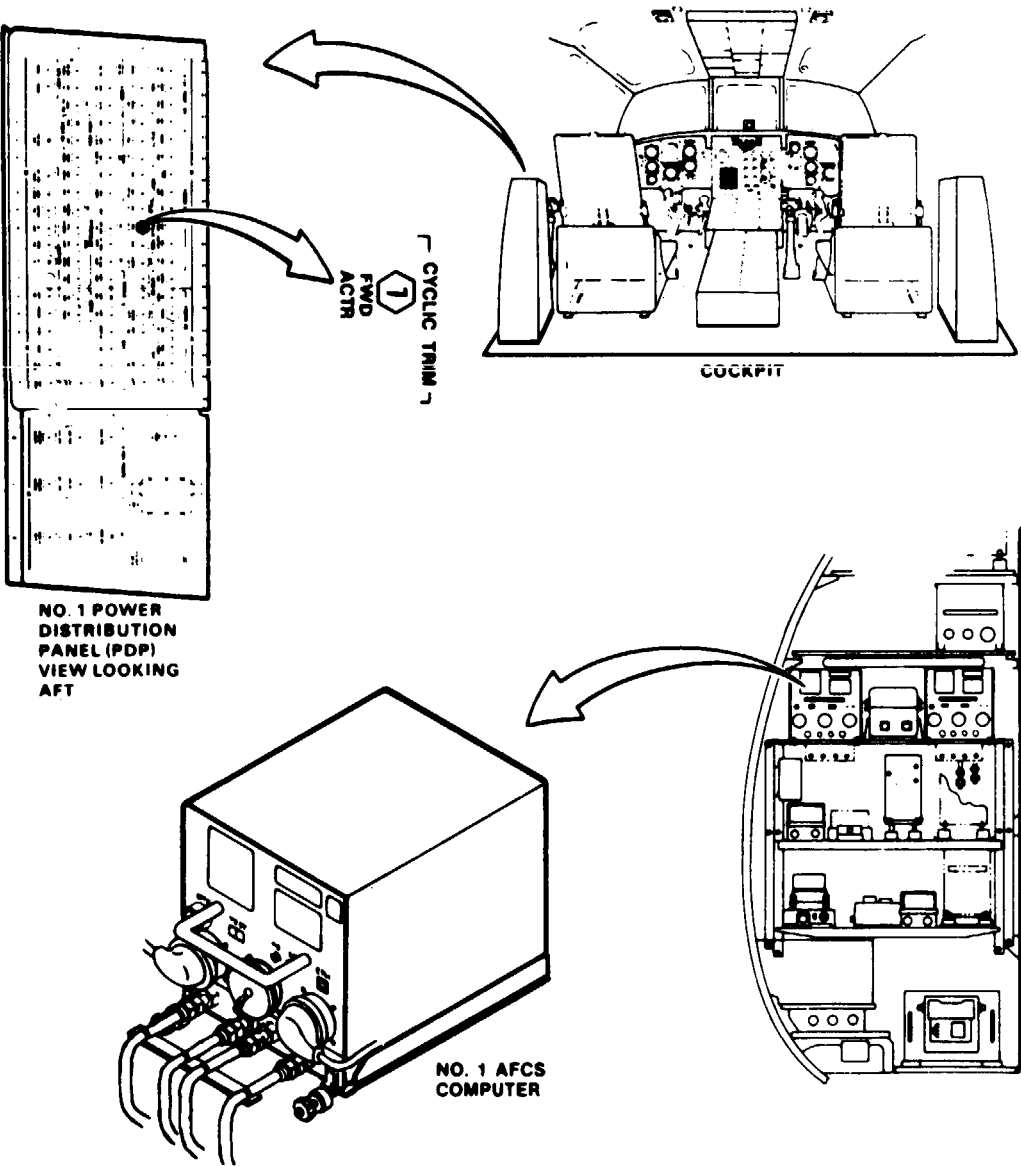
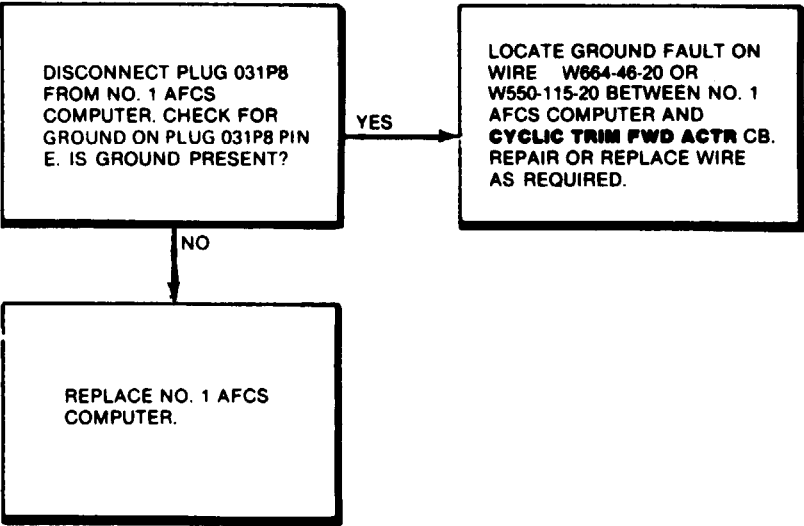
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

**Personnel Required:**  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



48 X84

D145-11012-SPA  
END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

- All
- Tools:**
- Electrical Repairer Tool Kit, NSN 5180-00-323-4915
  - Multimeter

Materials:

None

Personnel Required:

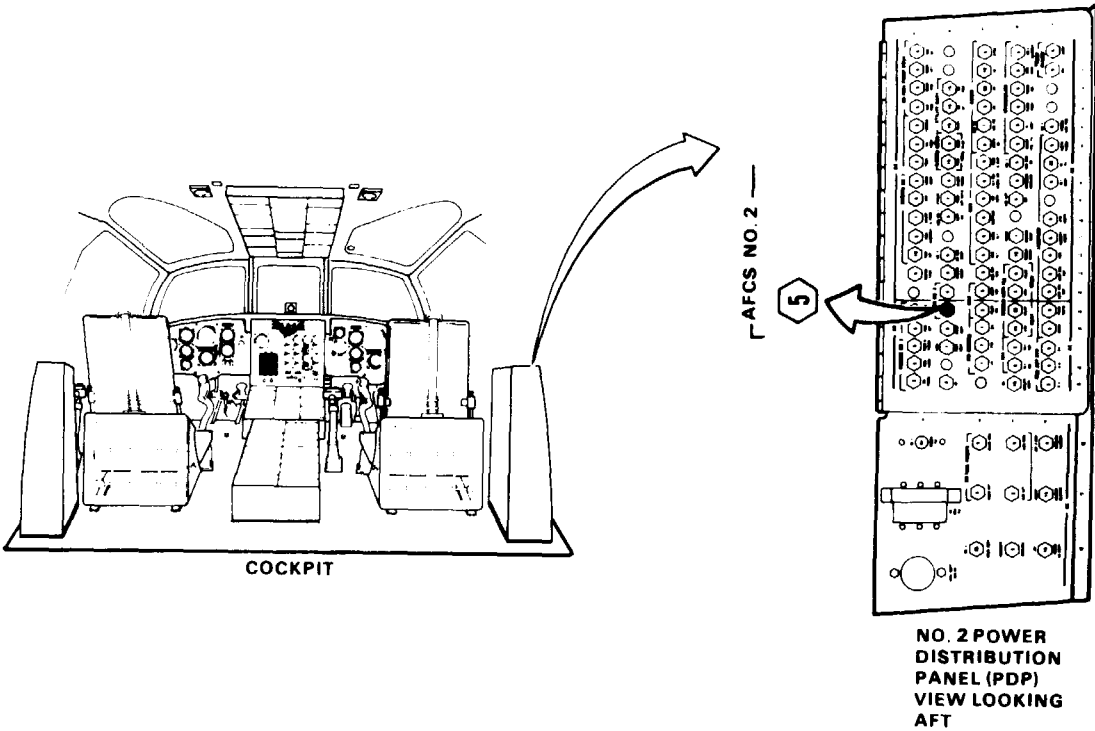
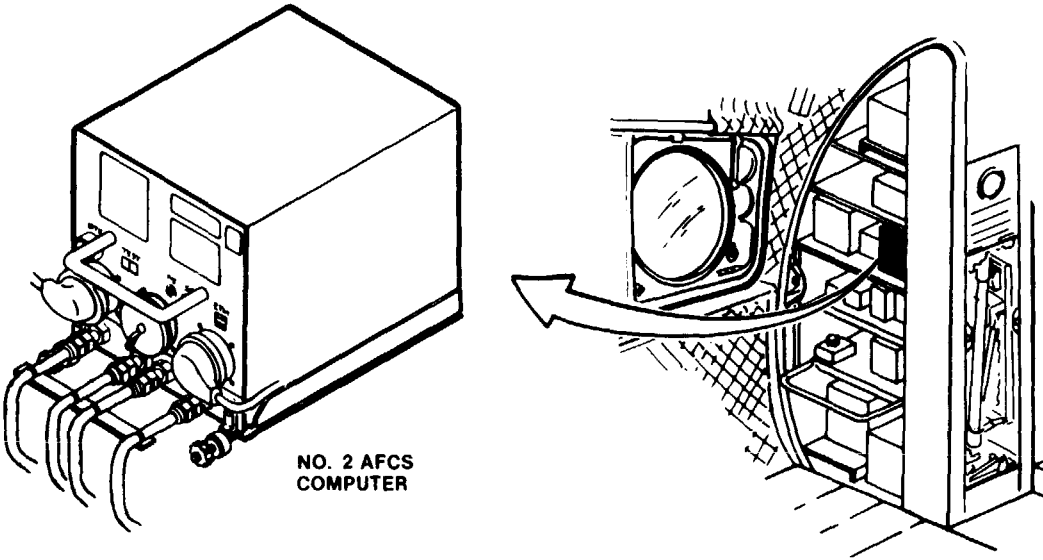
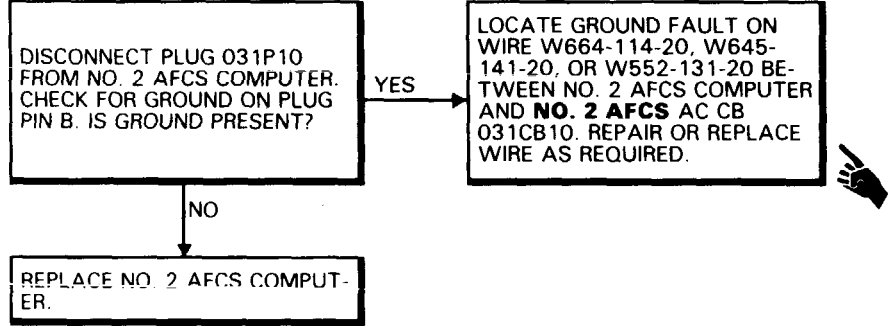
Avionic Mechanic

References:

TM 55-1520-240-23

Equipment Condition:

- TM 55-1520-240-23:
- Battery Disconnected
- Electrical Power Off
- Hydraulic Power Off



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

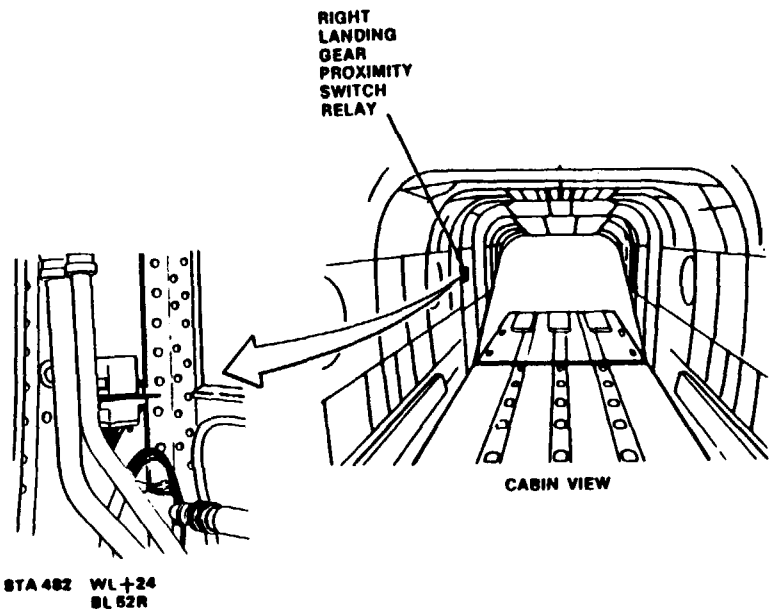
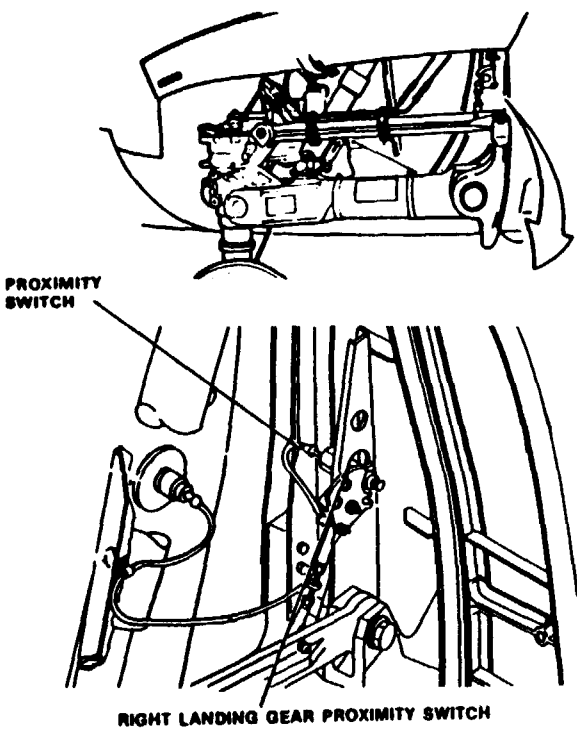
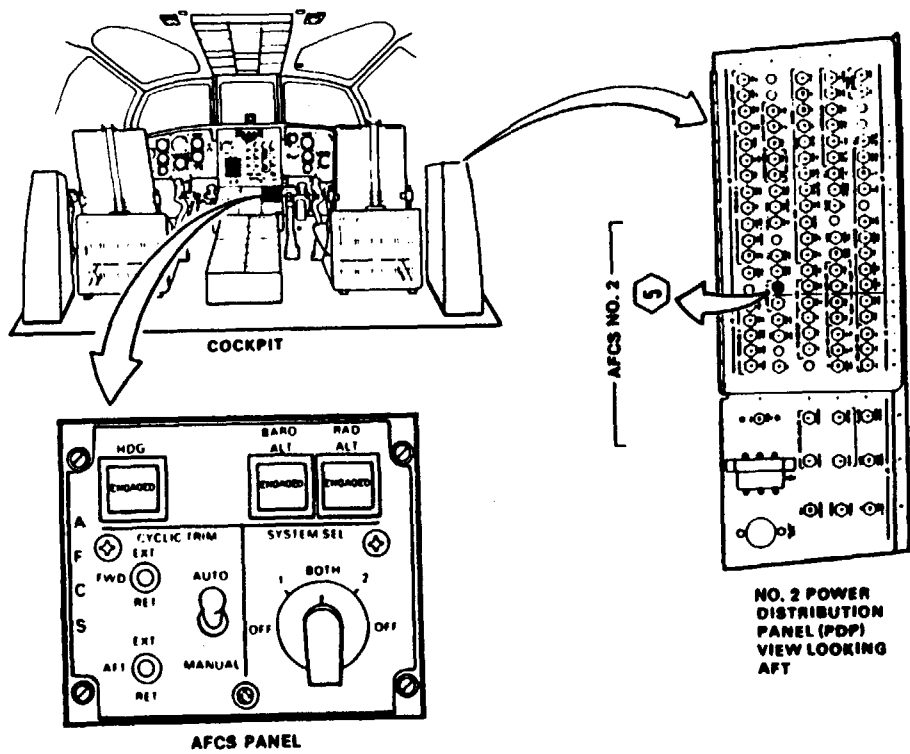
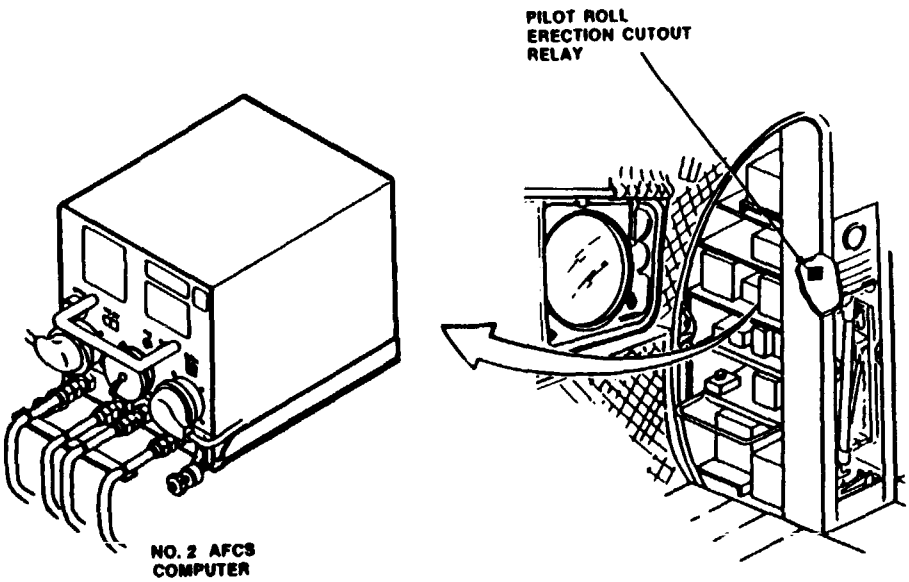
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off

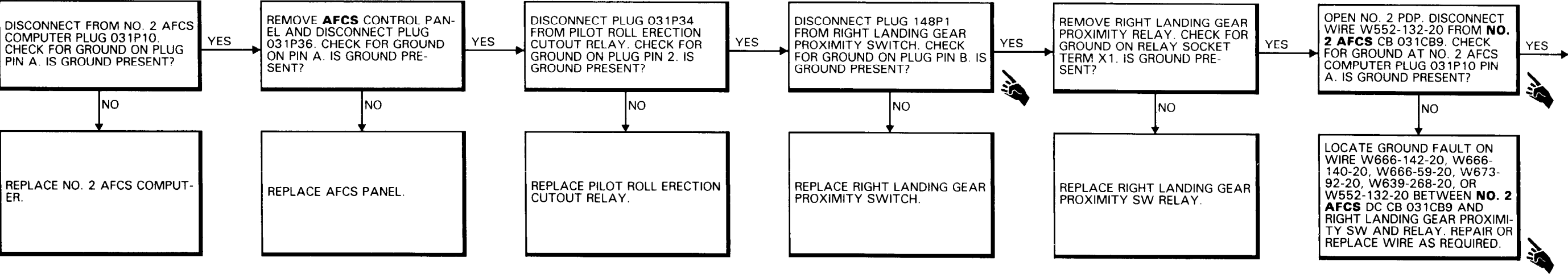


Page 11-71 is a blank page.

GO TO NEXT PAGE

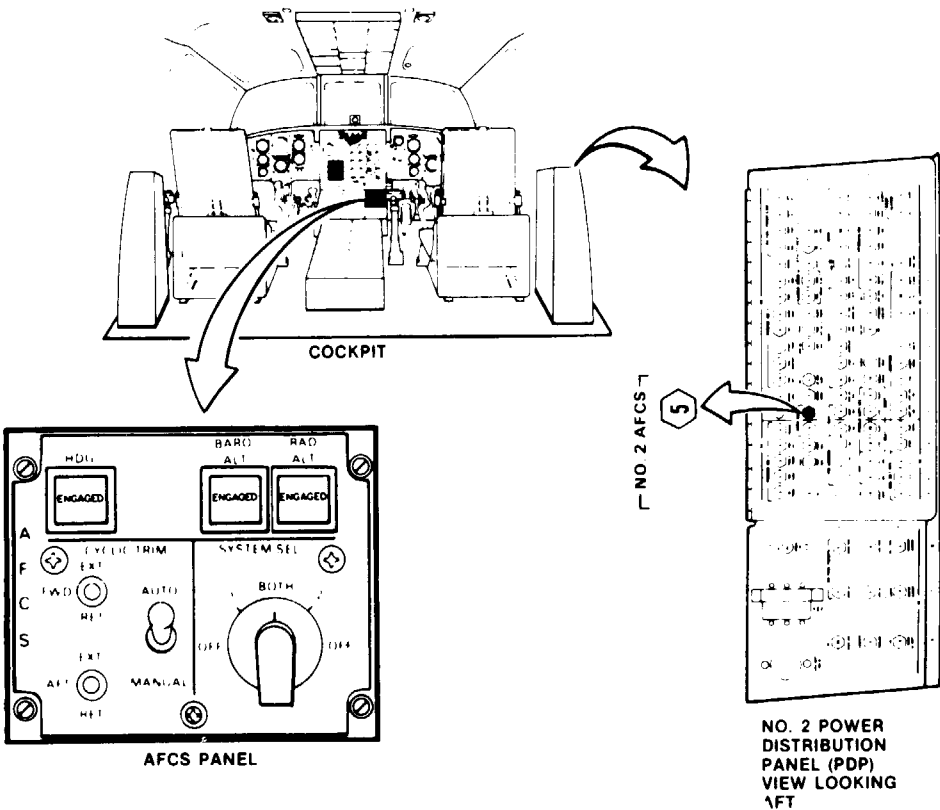
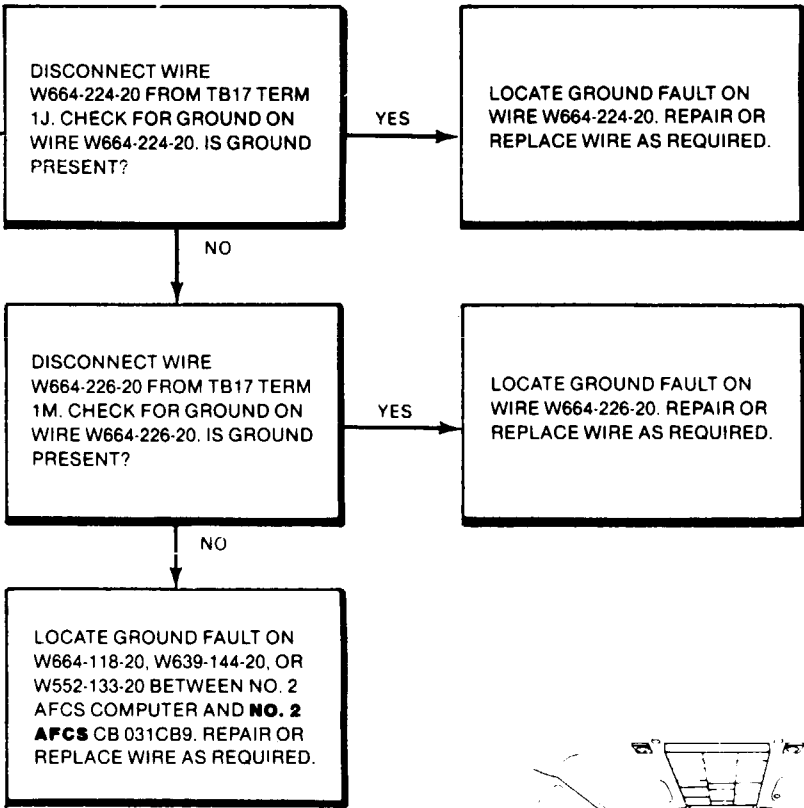
11-3.11 AFCS NO. 2 DC CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

11-3.11

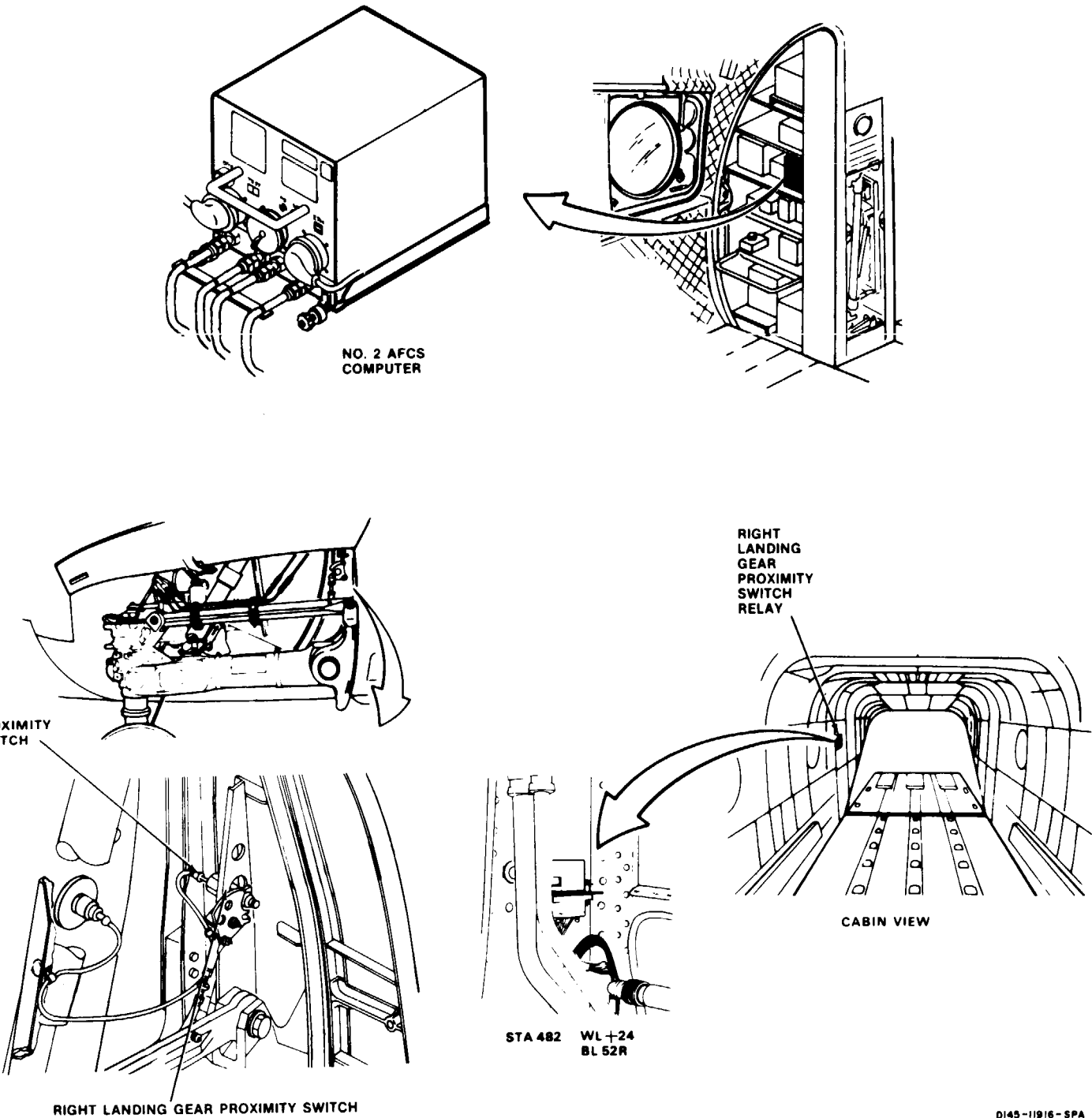


11-3.11 AFCS NO. 2 DC CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

11-3.11



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D145-11916-SPA

END OF TASK

11-3.12 CYCLIC TRIM AFT ACTUATOR CIRCUIT BREAKER WILL NOT STAY CLOSED

11-3.12

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

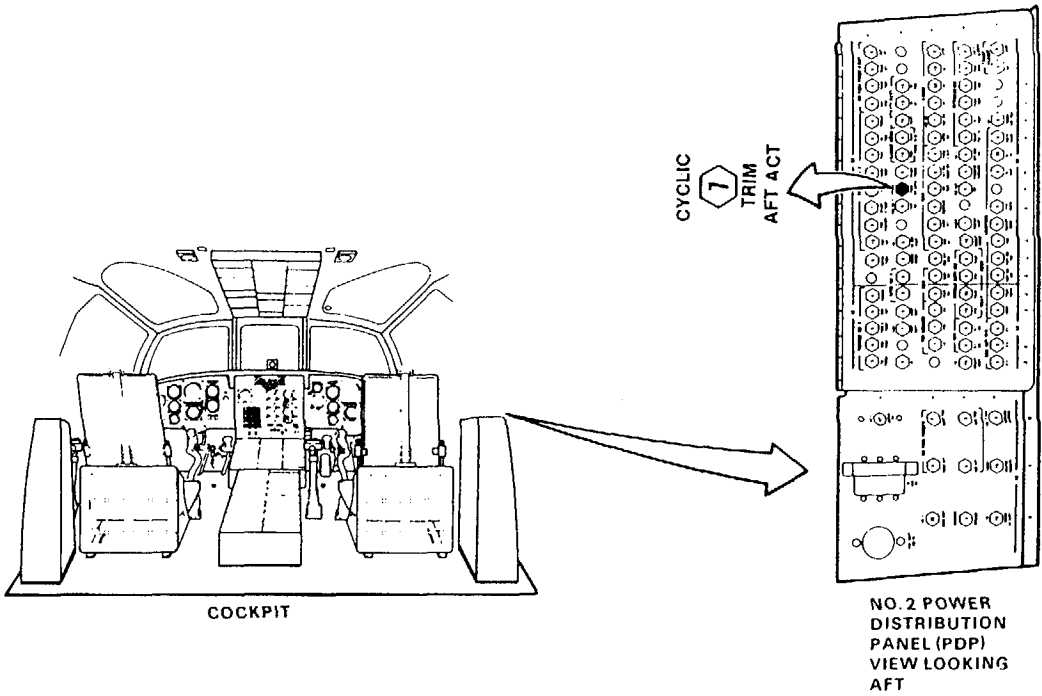
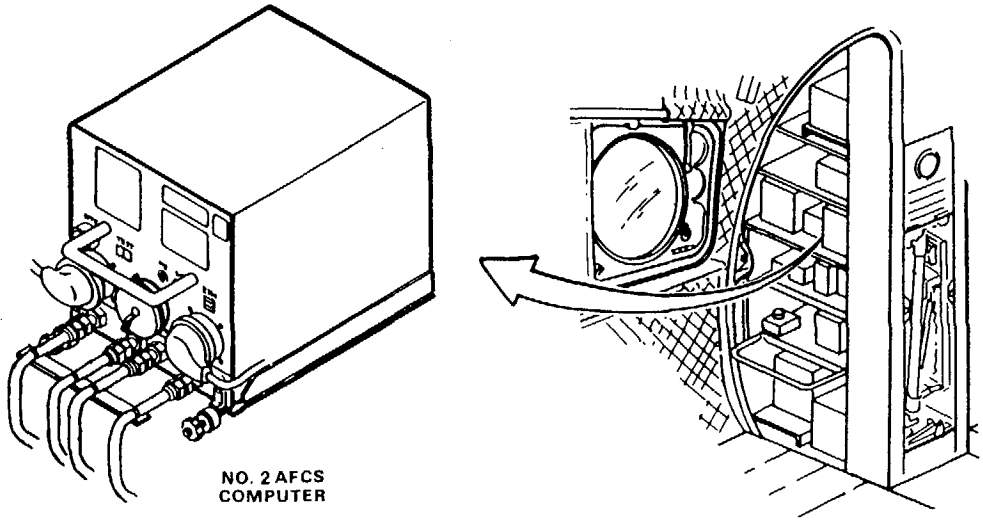
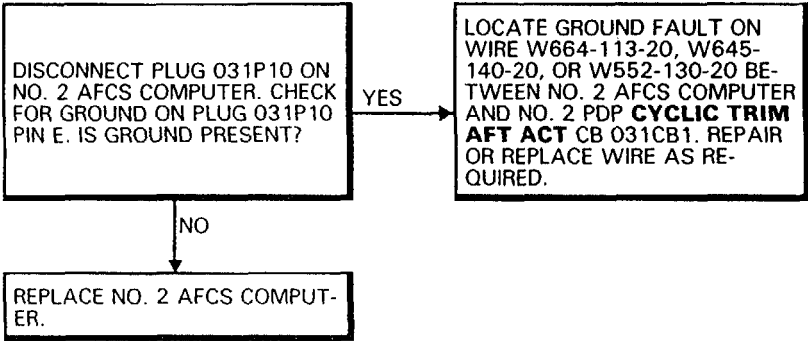
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
Avionic Mechanic (2)

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off





11-3.13 NO. 1 AFCS OFF (WITHOUT 74) OR AFCS 1 (WITH 74) CAPSULE IS OUT WITH SYSTEM SELECTED OFF

11-3.13

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

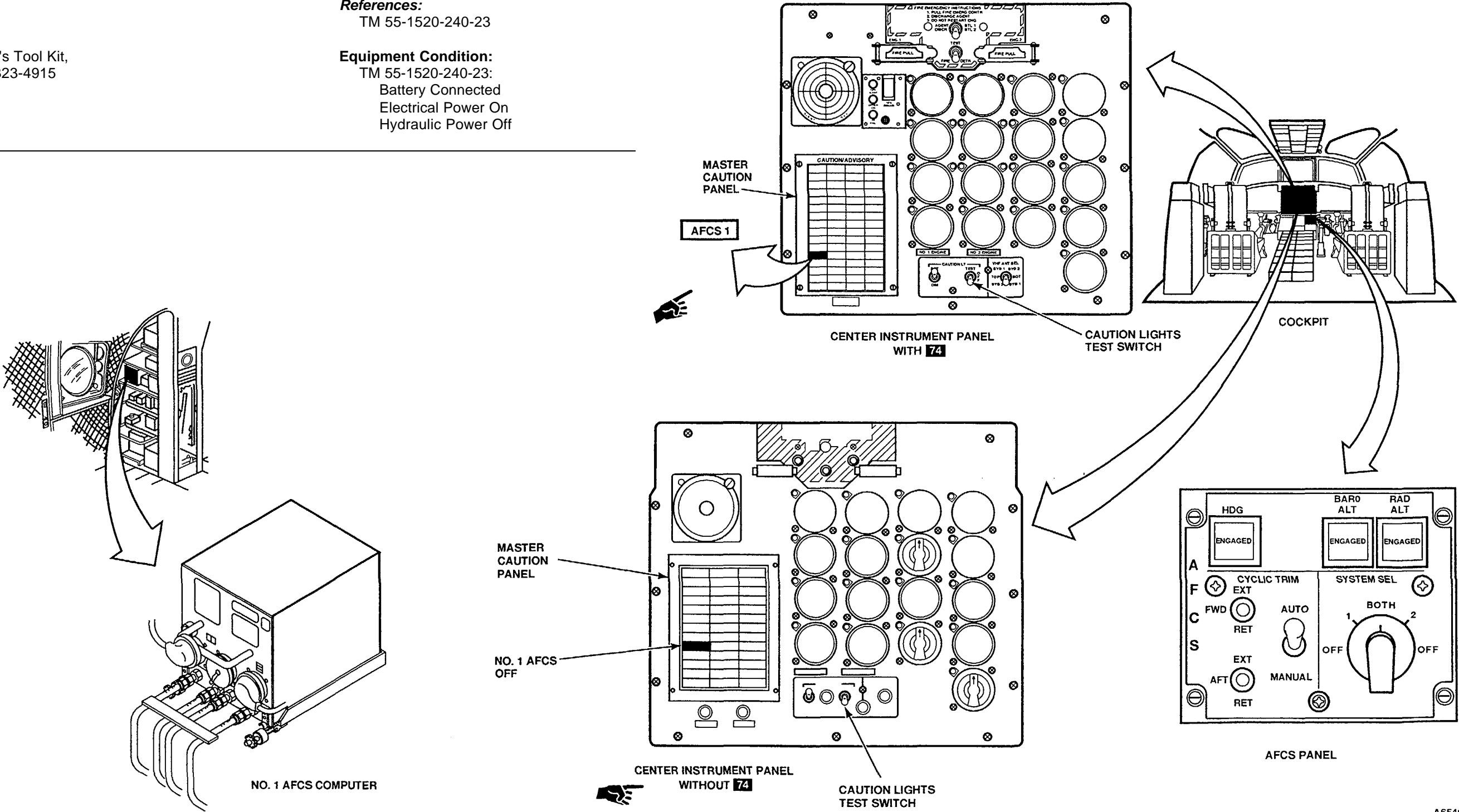
Avionic Mechanic (2)

References:

TM 55-1520-240-23

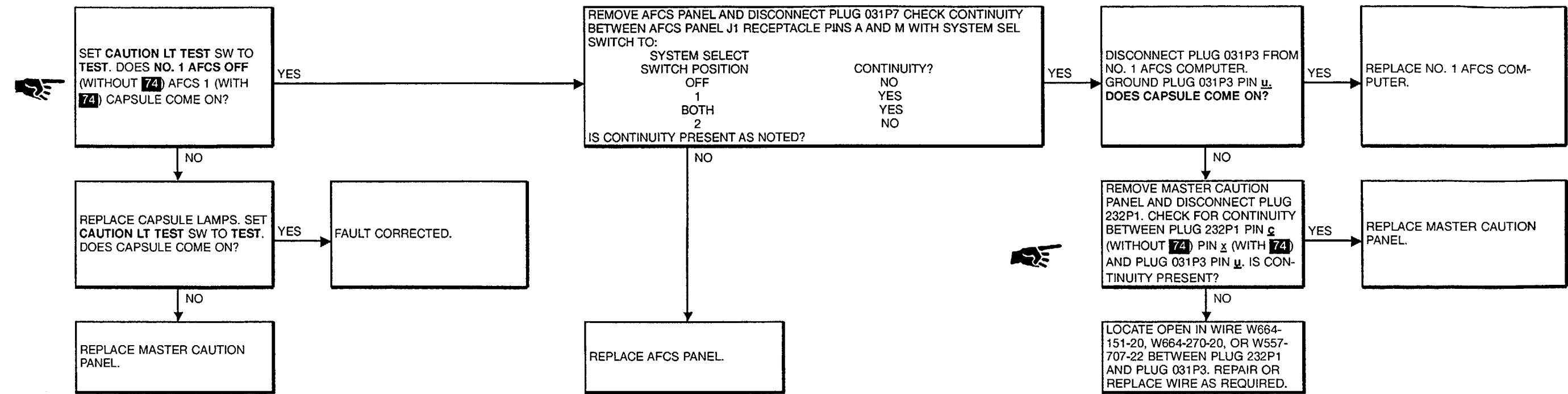
Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



A65460

GO TO NEXT PAGE



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

- All
- Tools:
- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Multimeter

Materials:

None

Personnel Required:

Avionic Mechanic (2)

References:

TM 55-1520-240-23

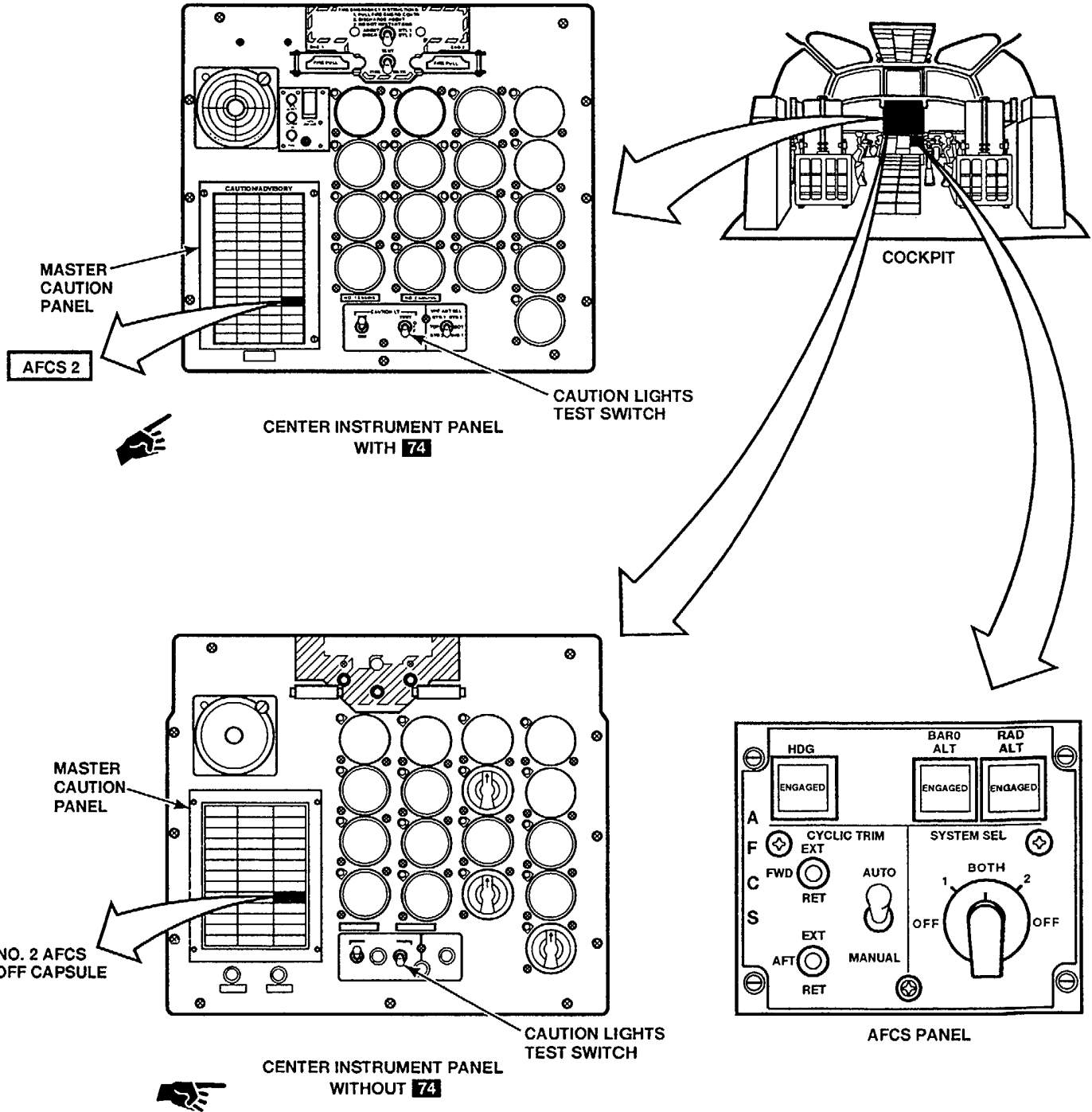
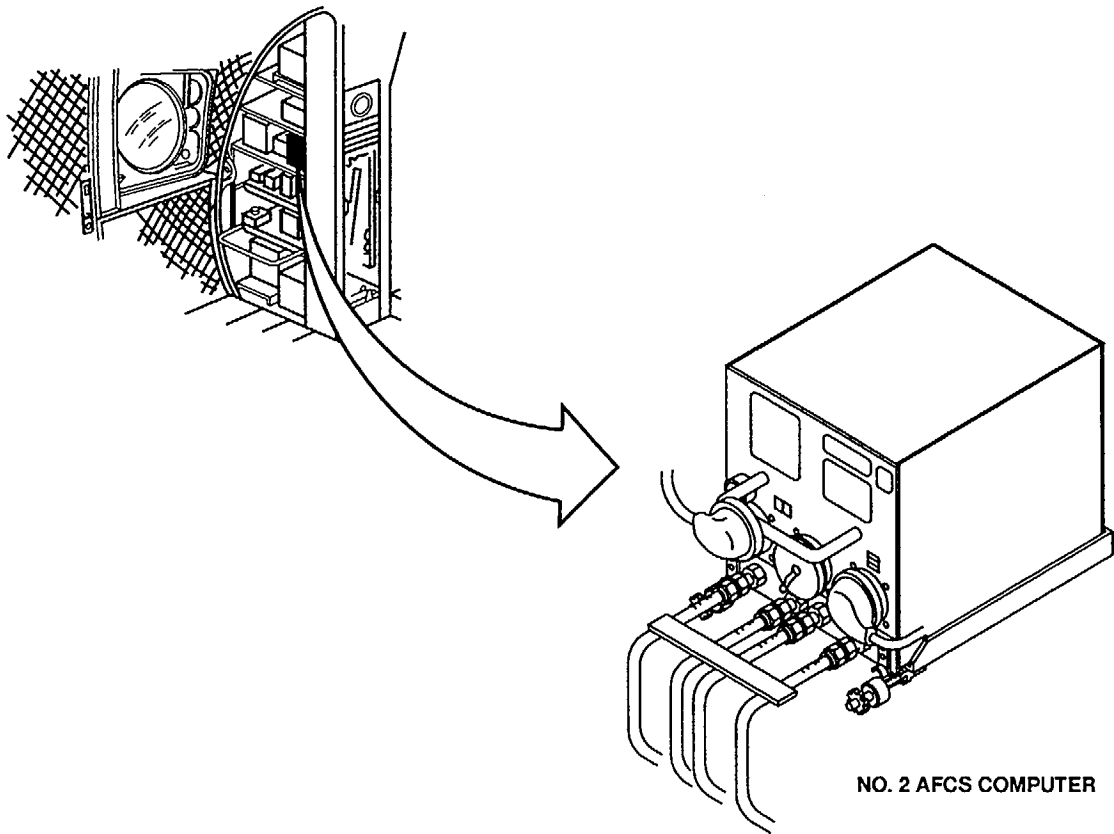
Equipment Condition:

TM 55-1520-240-23

Battery Connected

Electrical Power On

Hydraulic Power On



**11-3.14**



11-3.15 BOTH LCT INDICATORS NOT IN GROUND POSITION

11-3.15

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations  
All

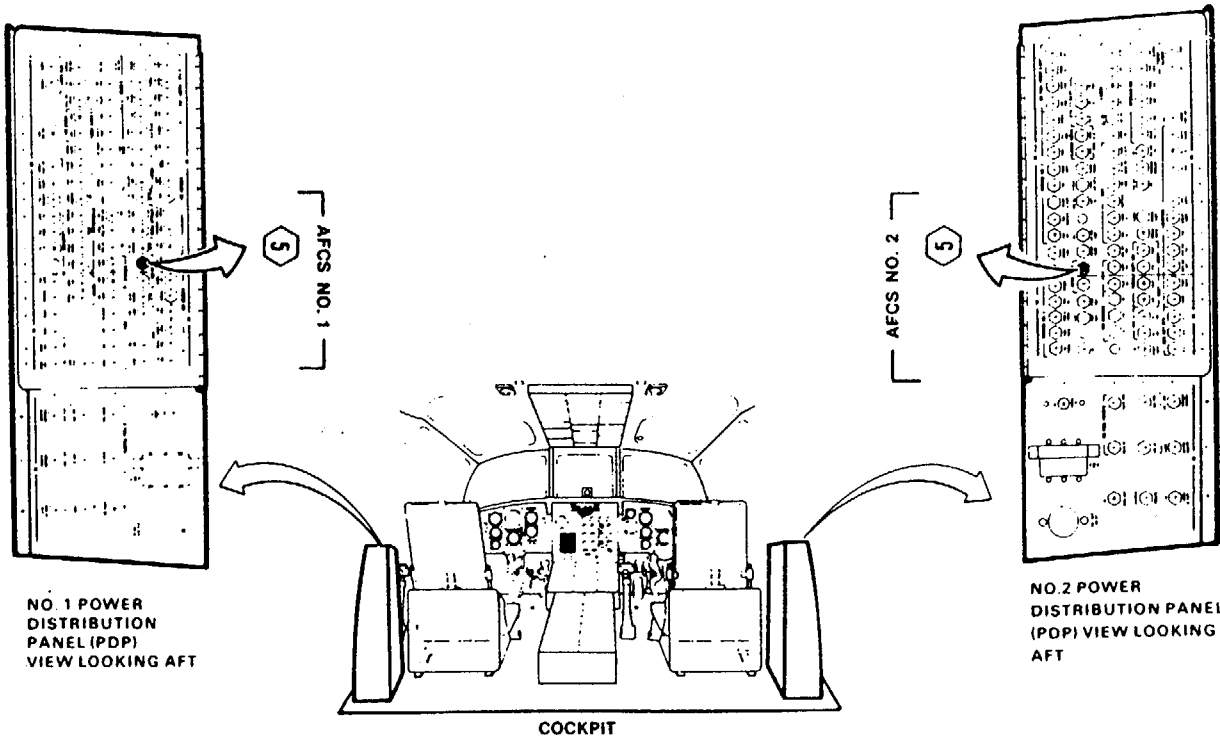
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

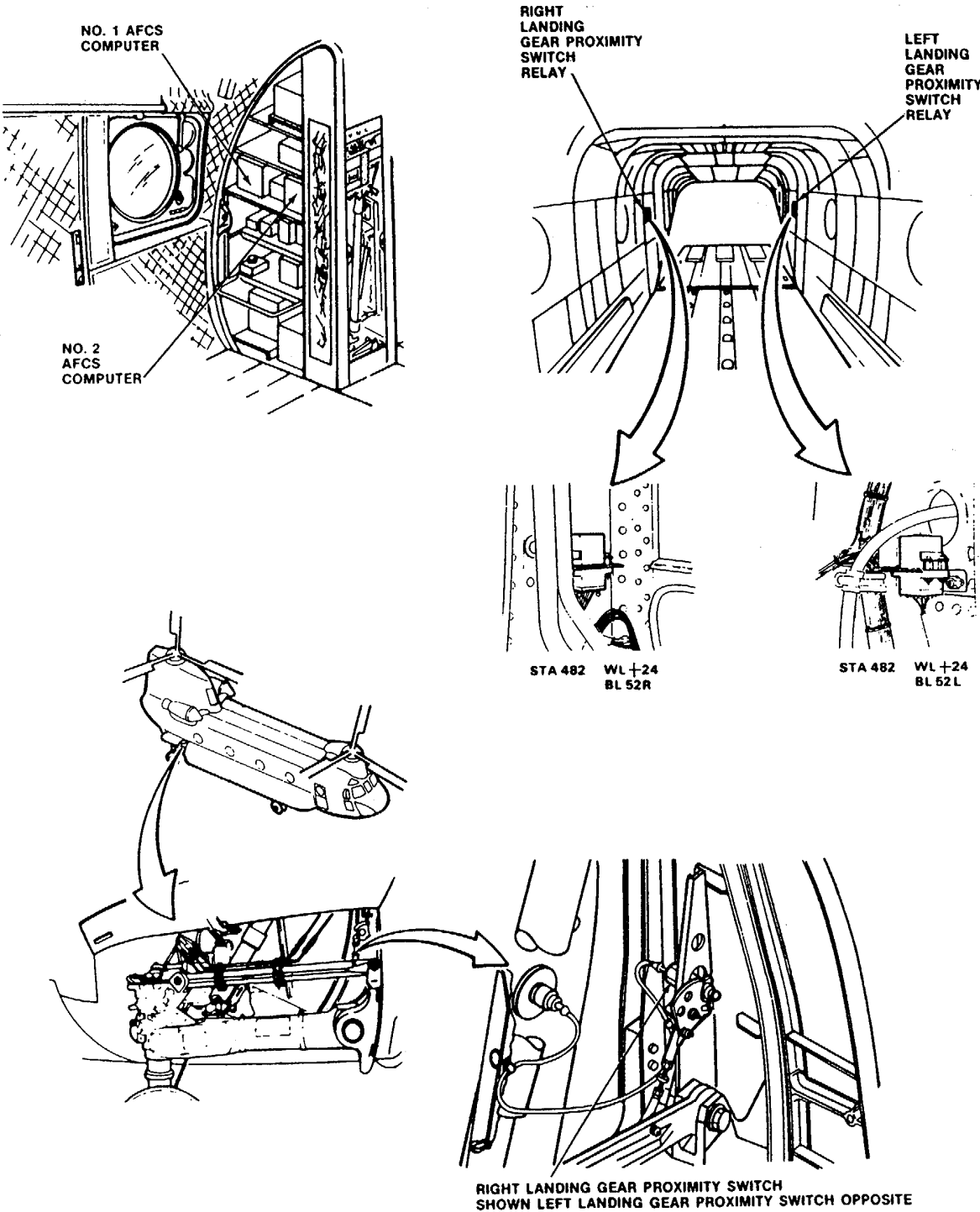
Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23  
TM 55-4920-429-13

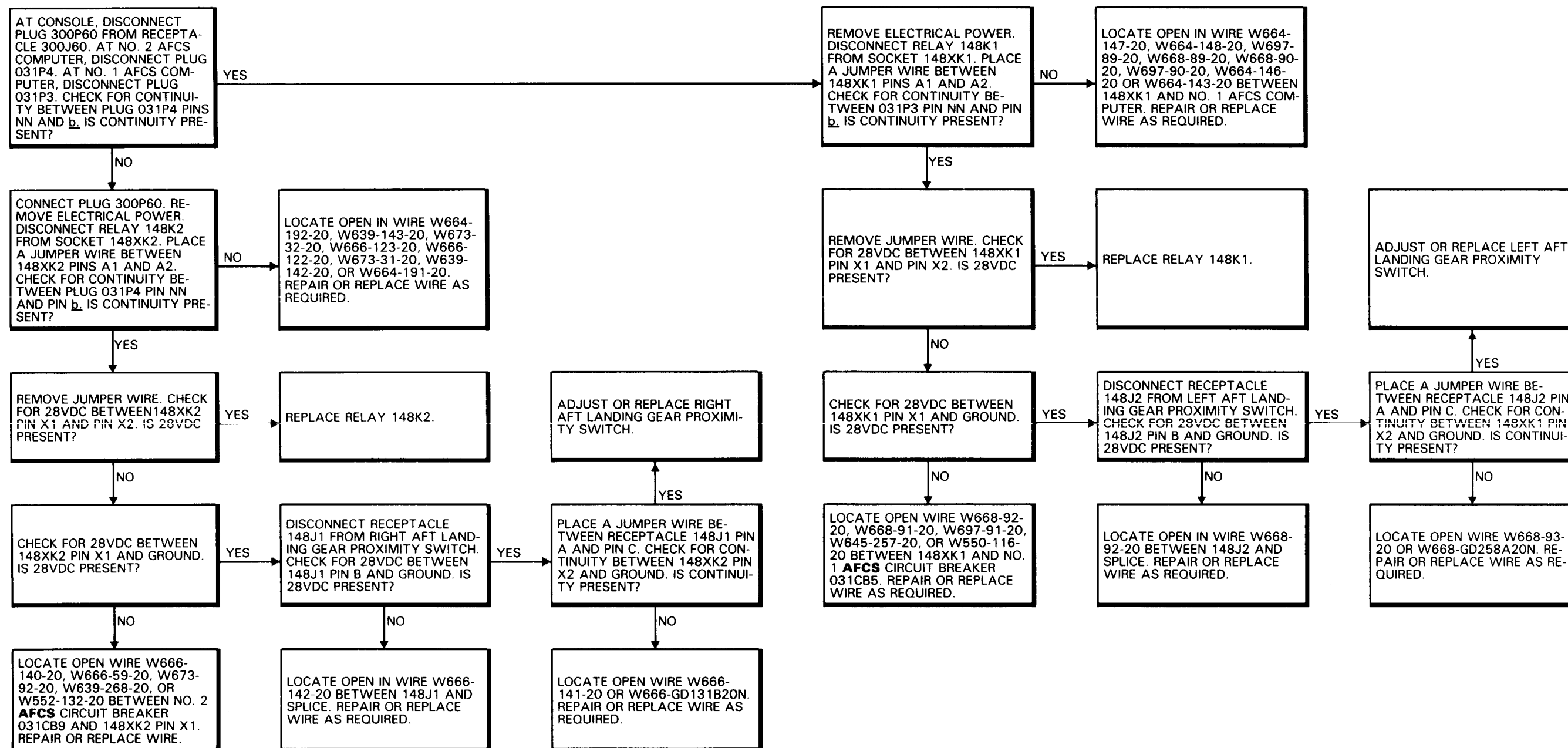
Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared For Use



90 x 54



D145 - 11917 - SPA



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

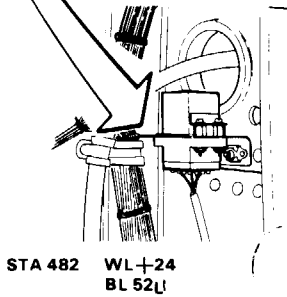
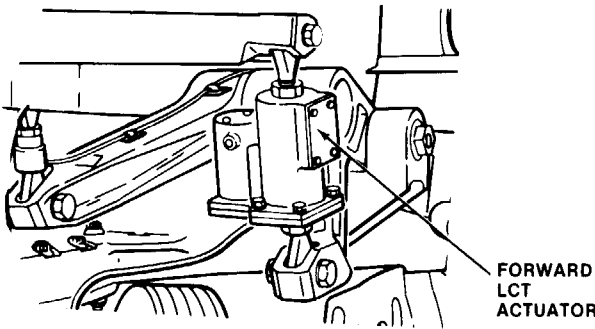
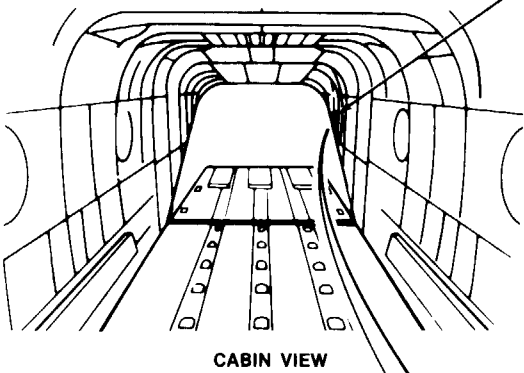
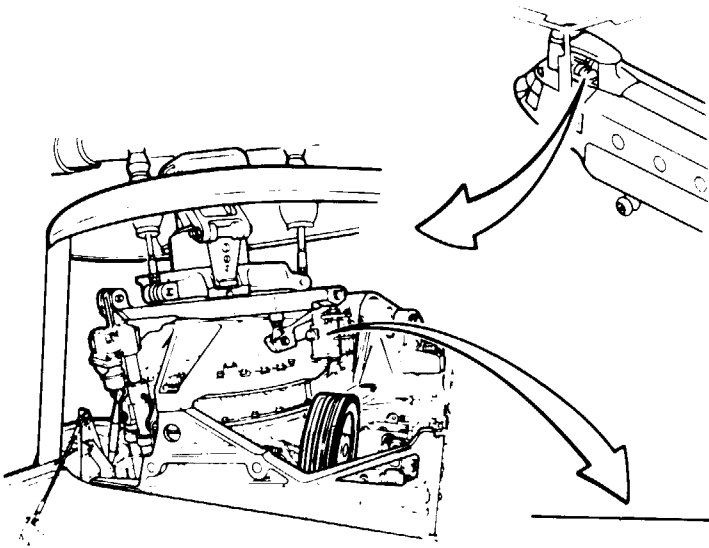
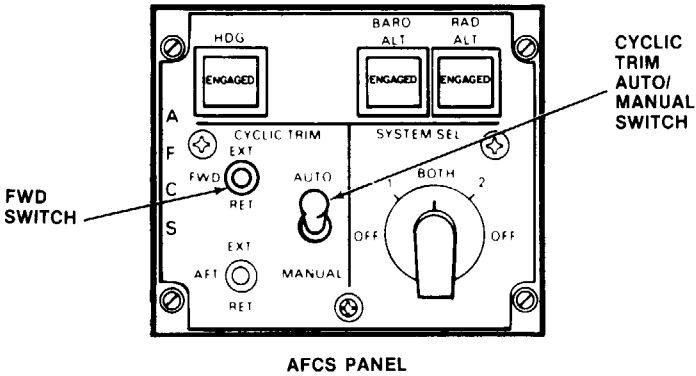
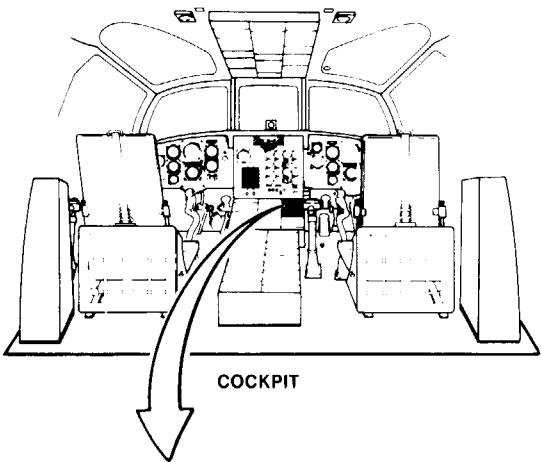
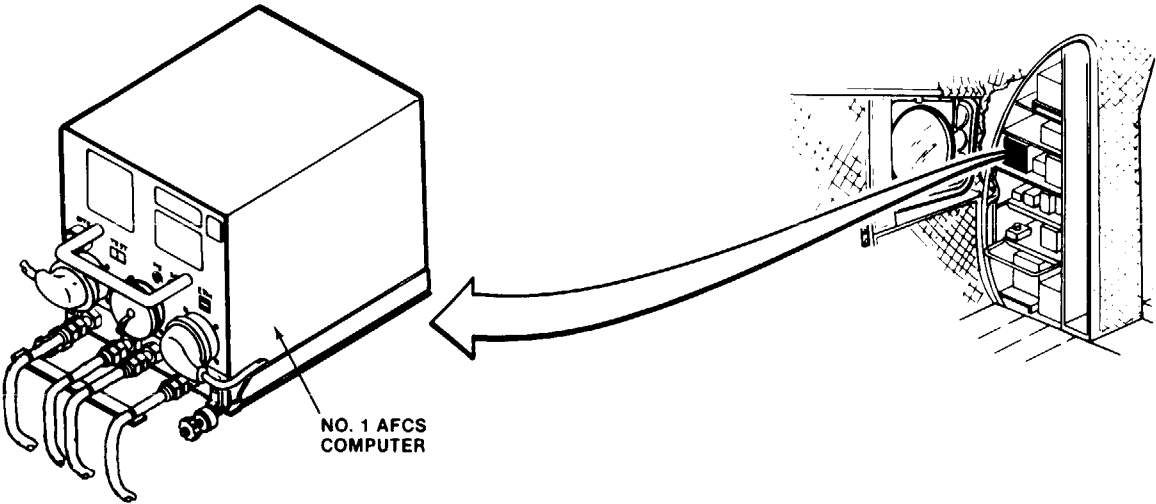
Avionic Mechanic (2)

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On

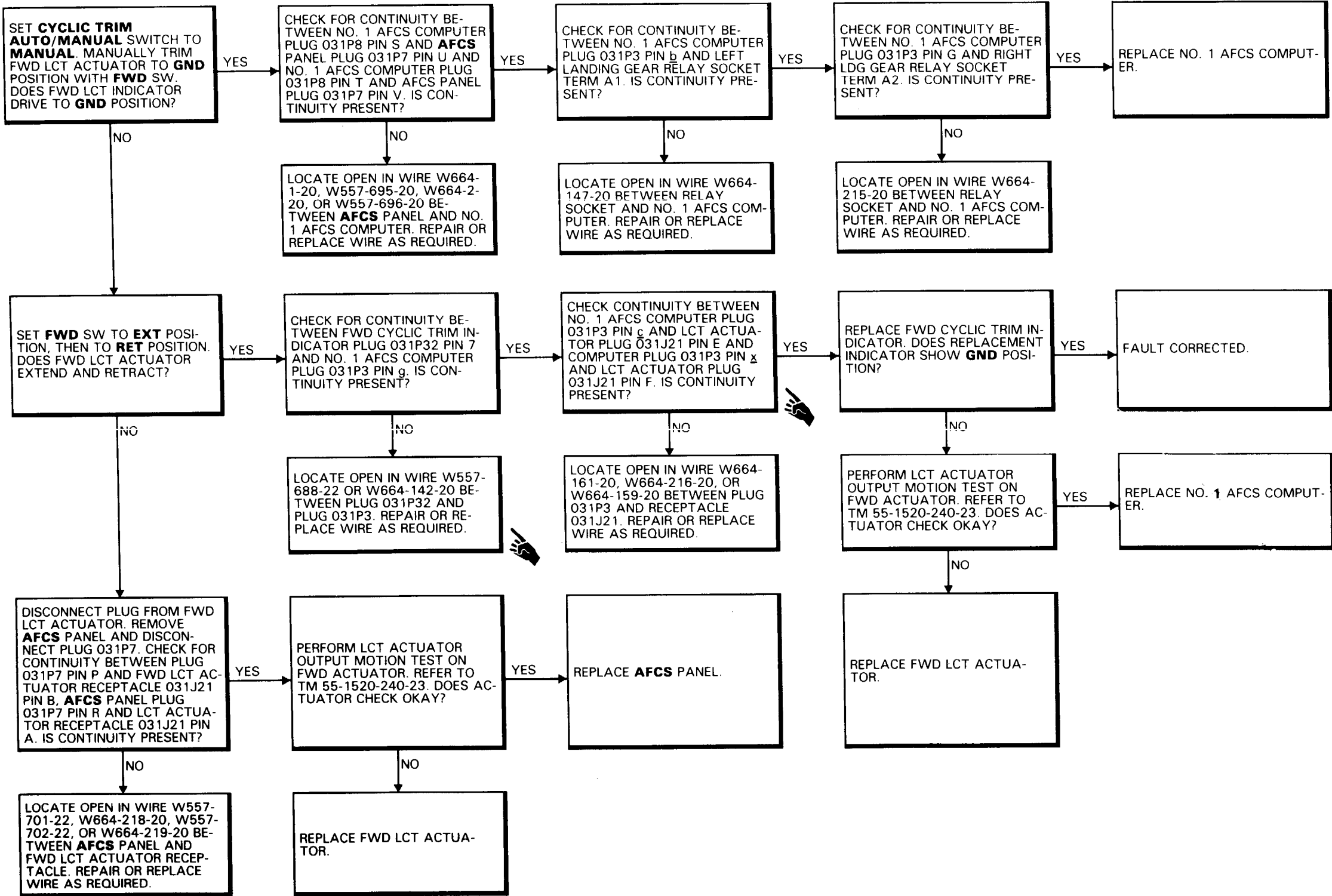


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D145 - 11921 - SPA

11-3.16 FORWARD LCT INDICATOR NOT IN GND POSITION (Continued)

11-3.16





11-3.17 AFT LCT INDICATOR NOT IN GND POSITION

11-3.17

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required

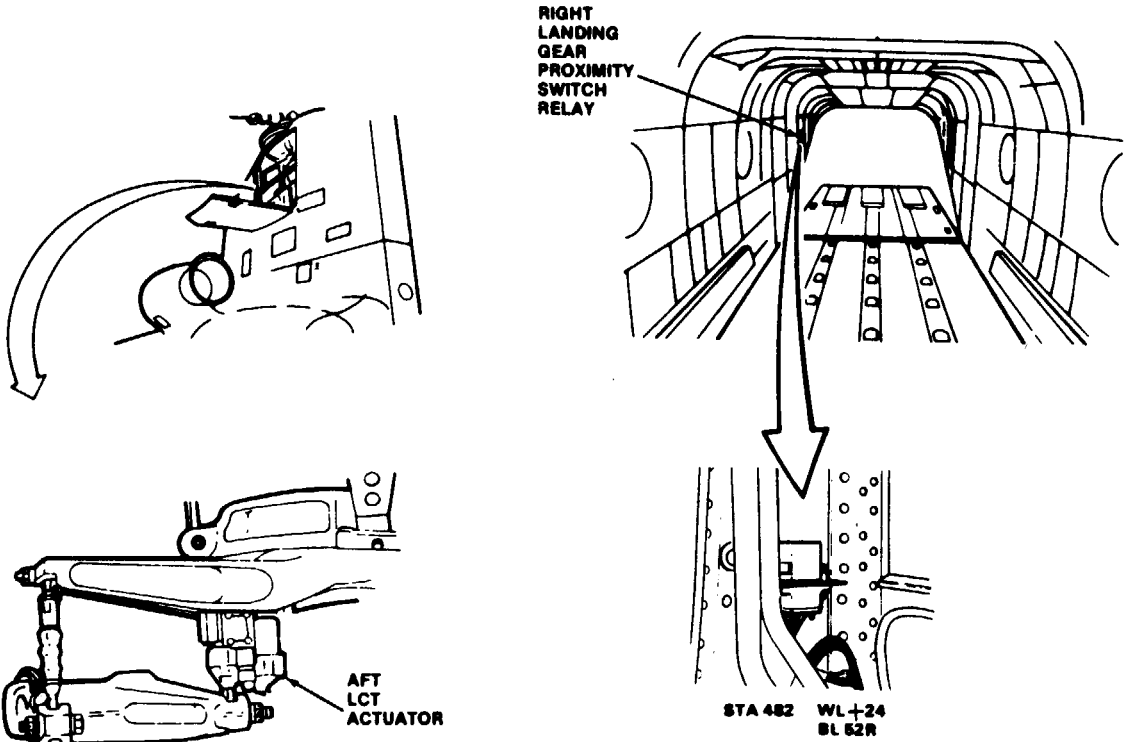
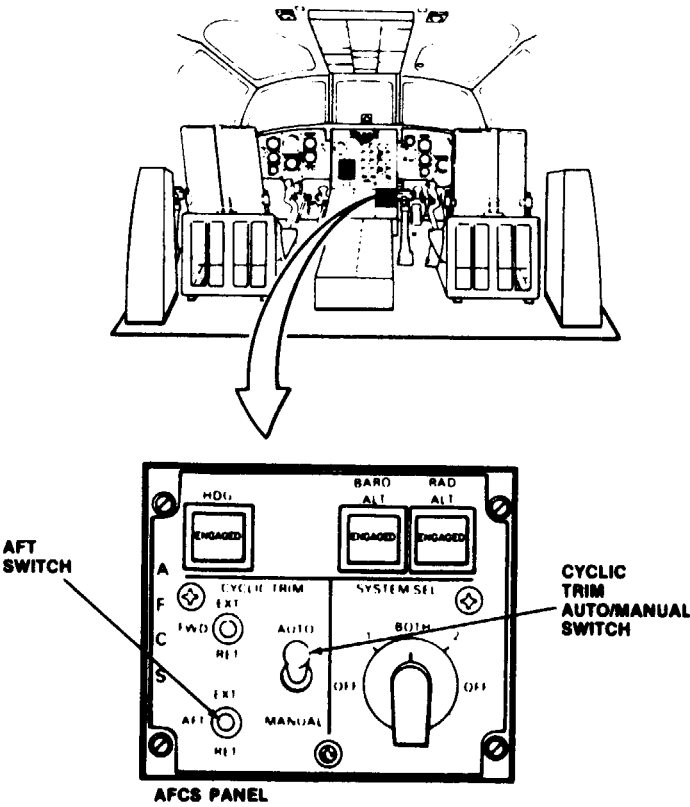
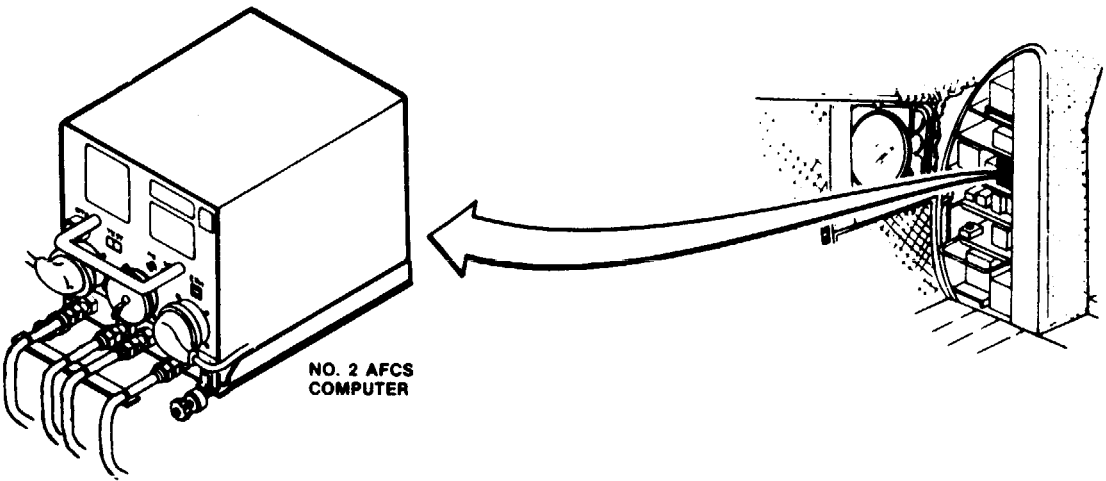
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

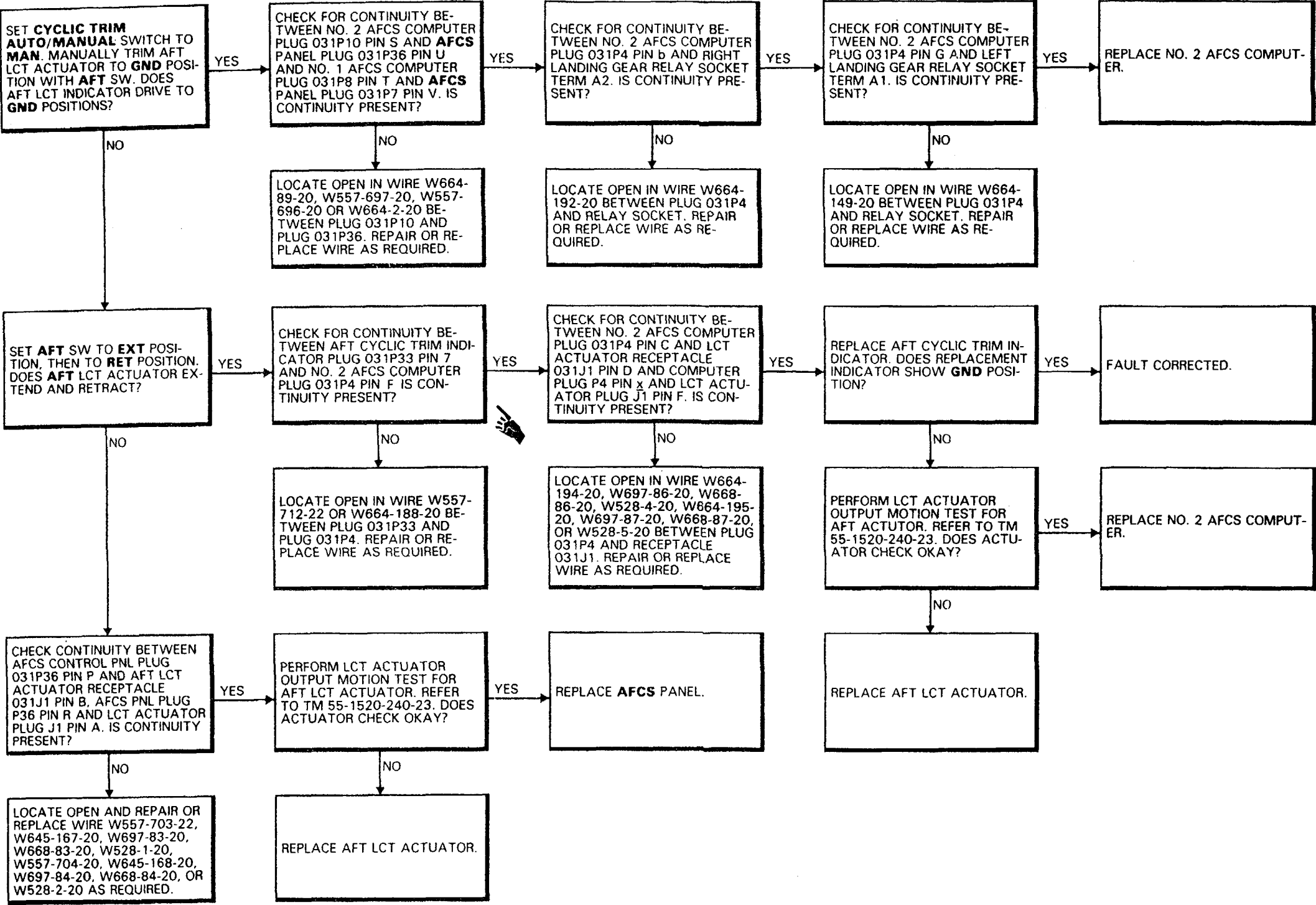
References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On





11-3.18 NO. 1 AFCS OFF (WITHOUT 74) OR AFCS 1 (WITH 74) CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED

11-3.18

FAULT ISOLATION PROCEDURE

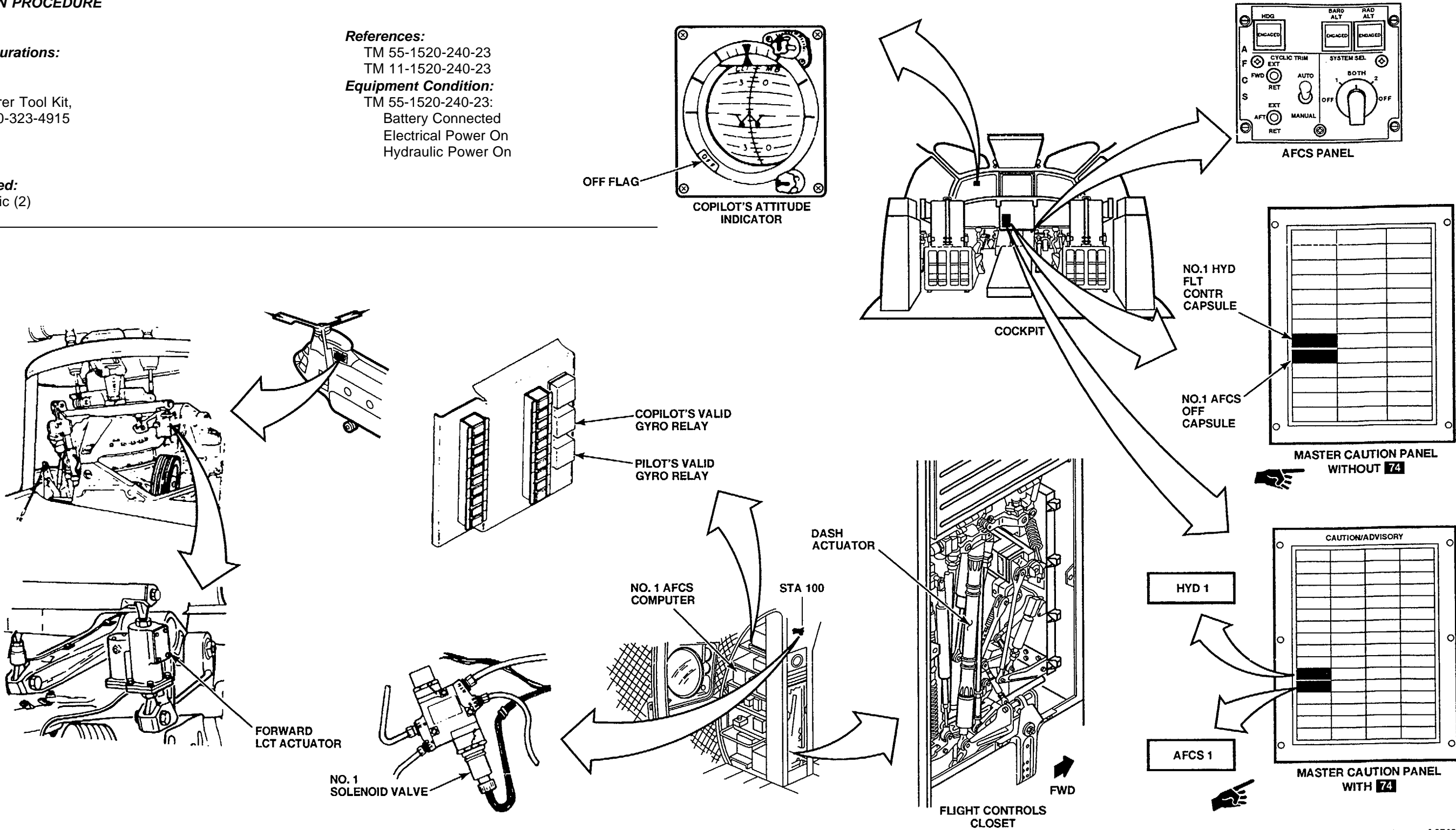
INITIAL SETUP  
**Applicable Configurations:**  
All

**Tools:**  
Electrical Repairer Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

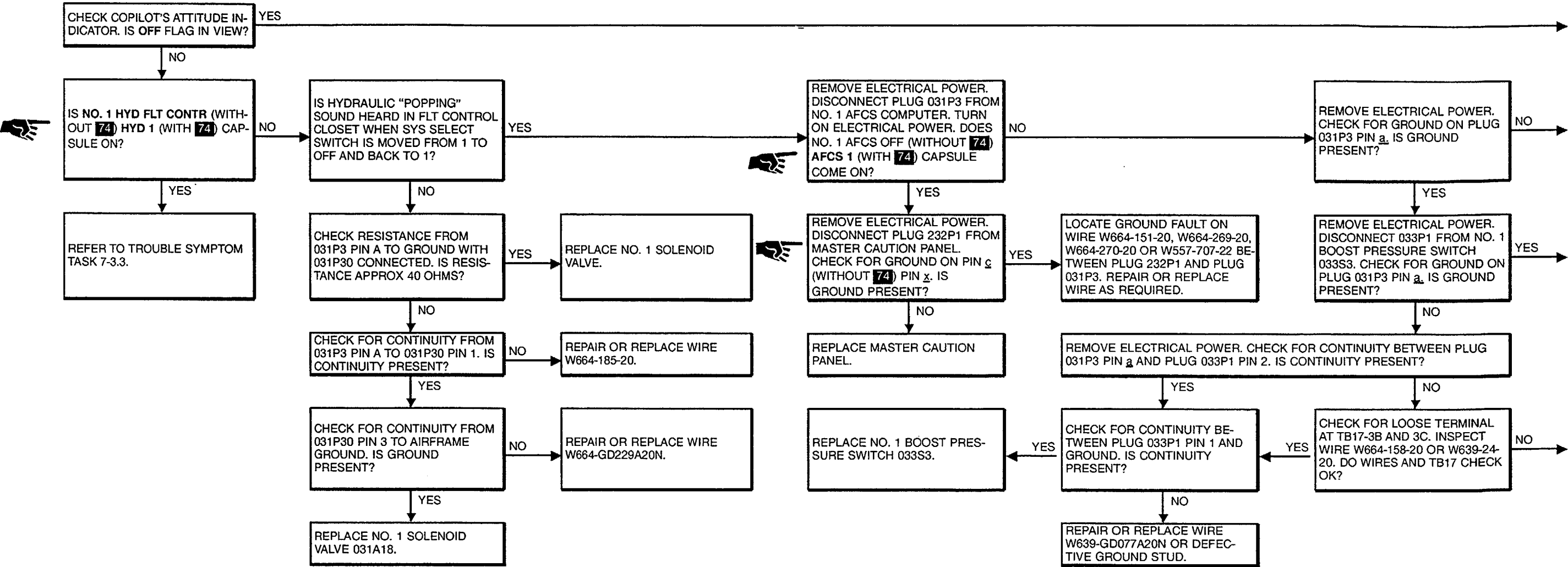
**Materials:**  
None

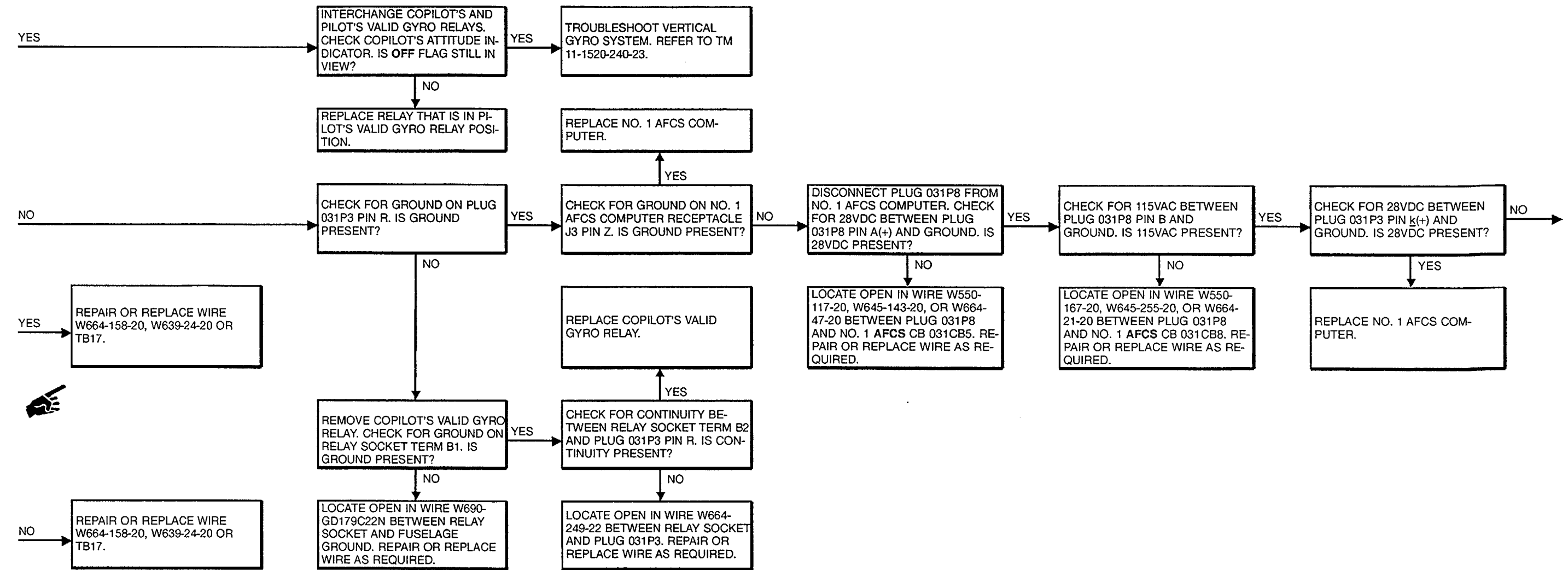
**Personnel Required:**  
Avionic Mechanic (2)

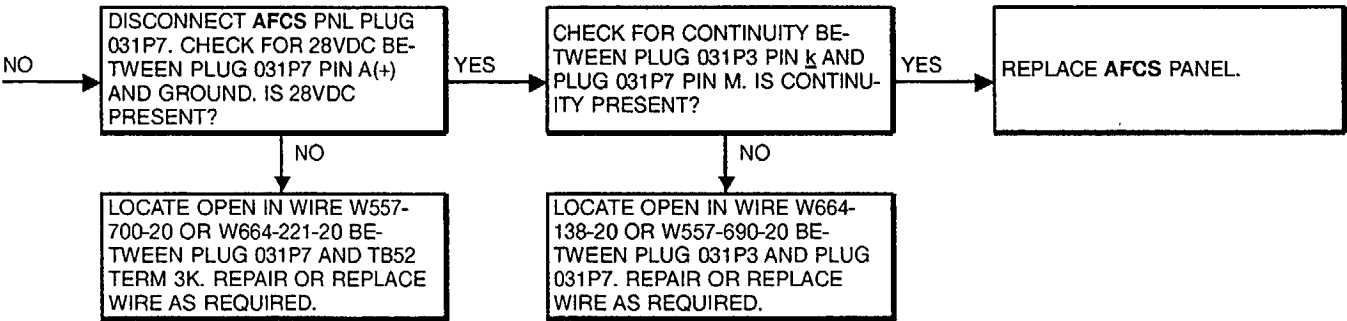
**References:**  
TM 55-1520-240-23  
TM 11-1520-240-23  
**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On

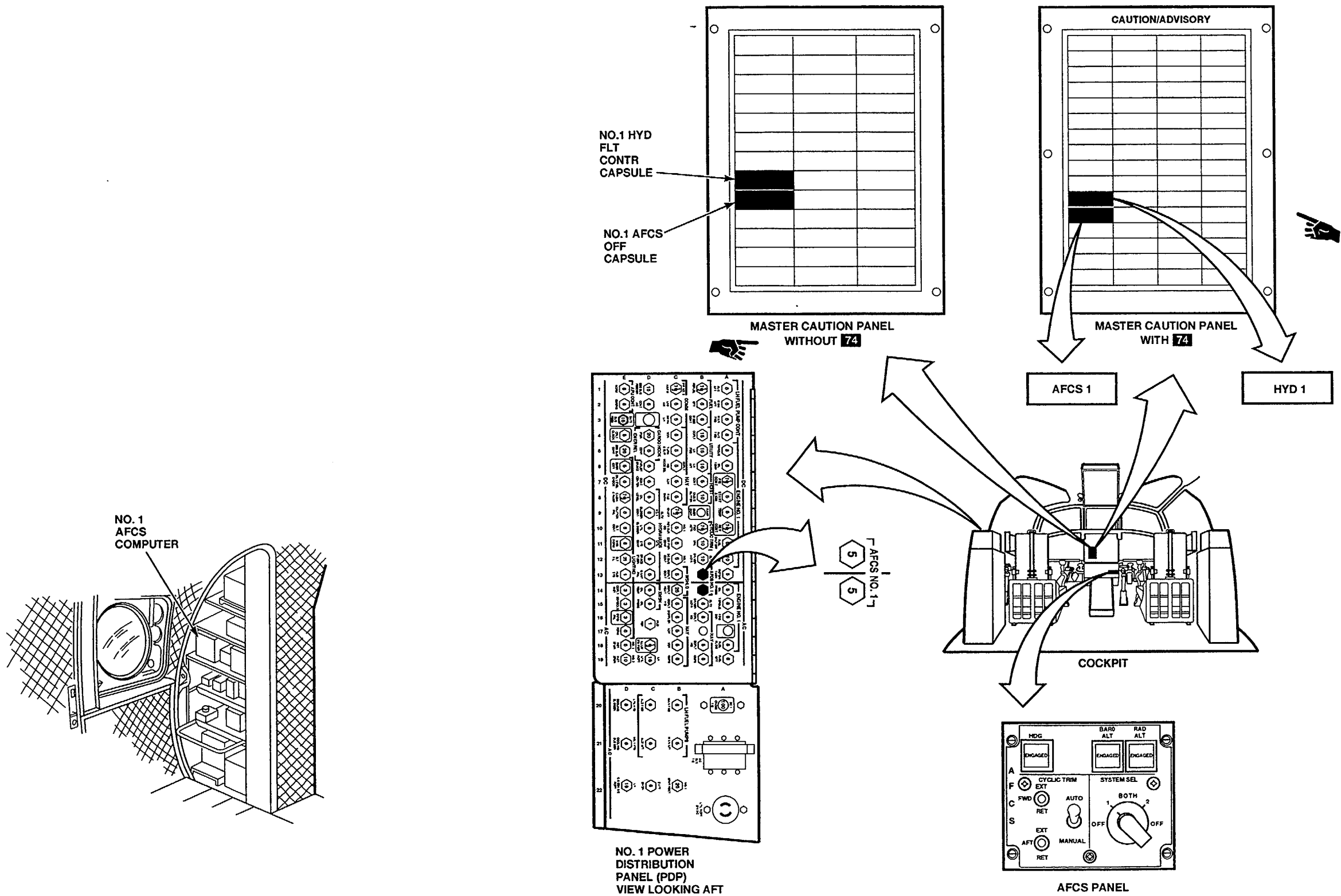


A65462



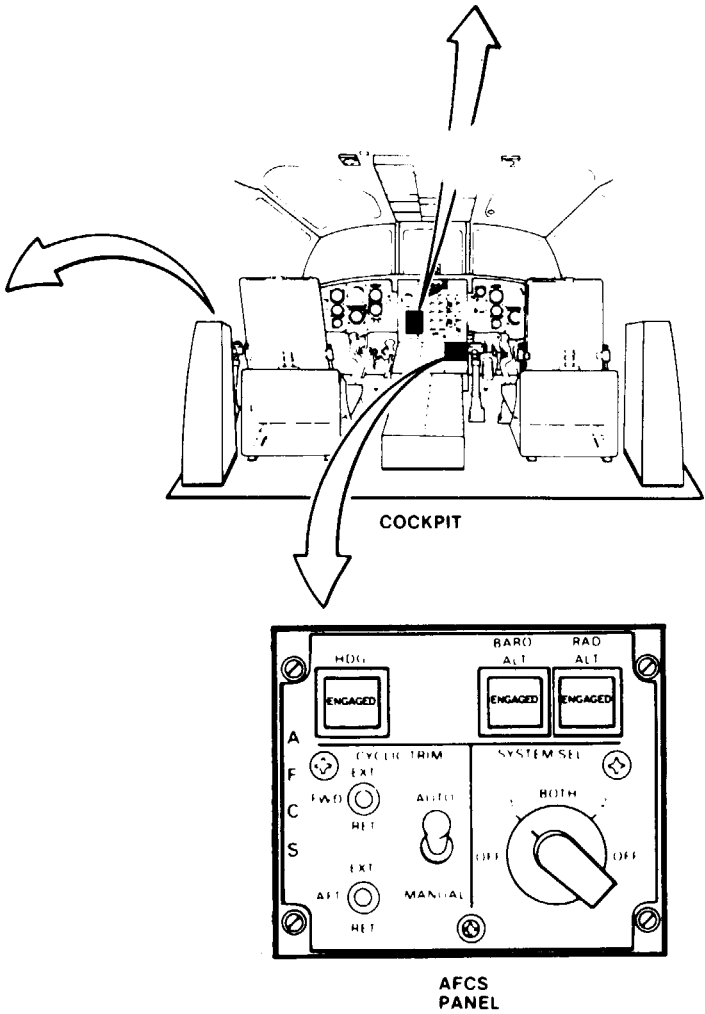
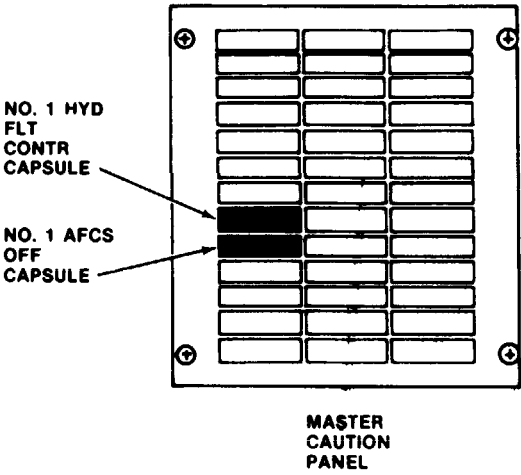
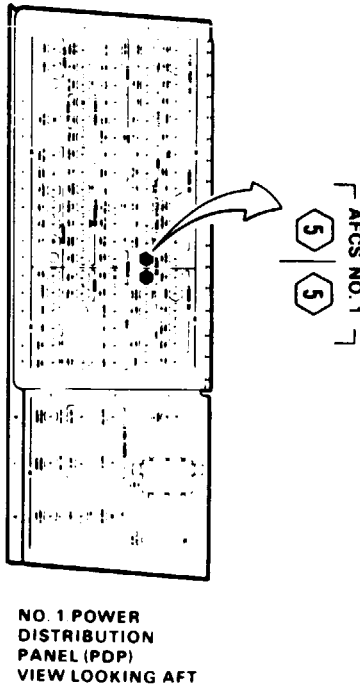
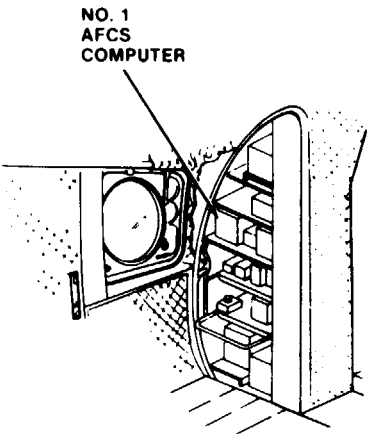






11-3.18 NO. 1 AFCS OFF CAPSULE DOES NOT GO OUT WHEN SYSTEM  
SELECTED (Continued)

11-3.18





FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

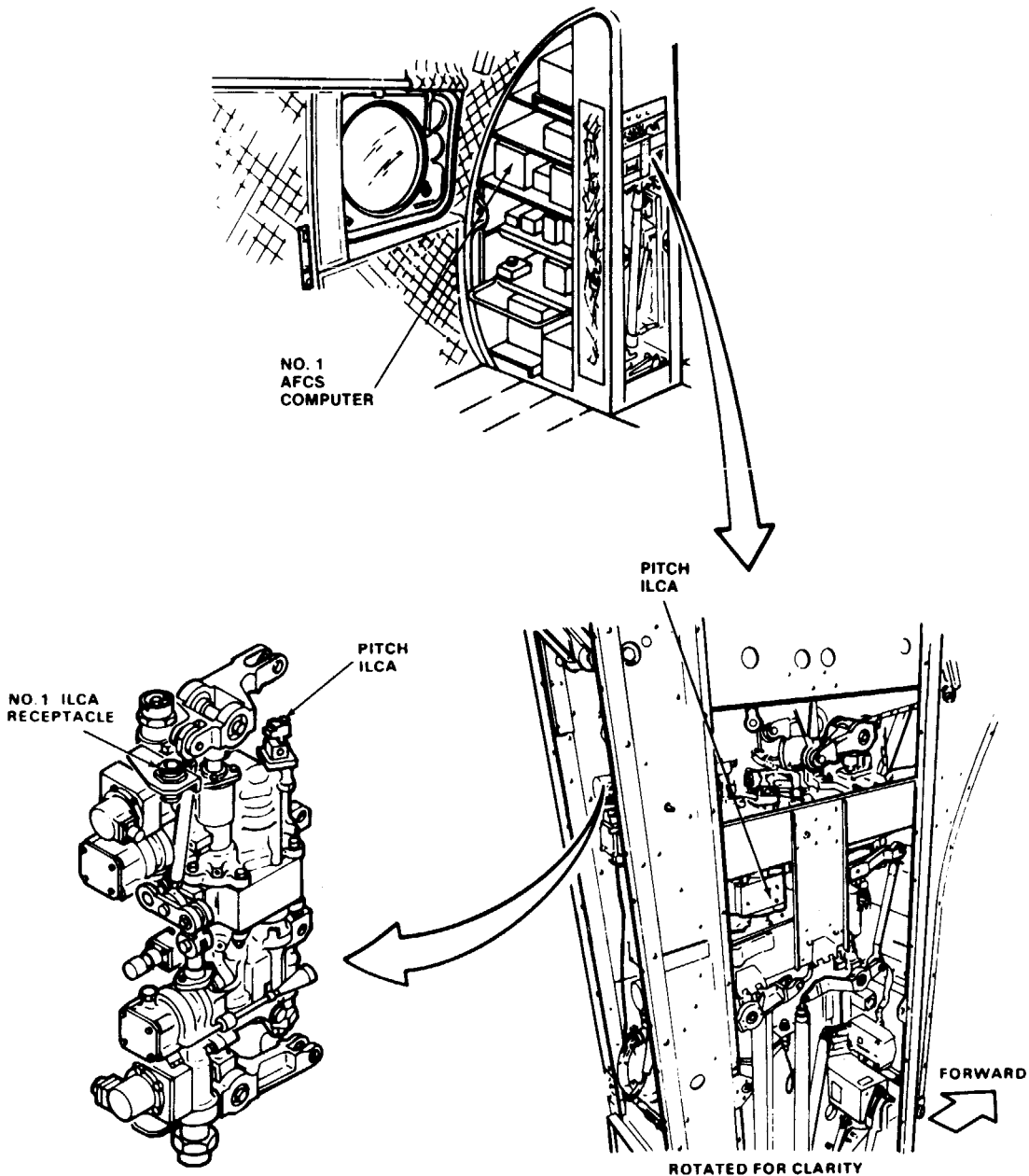
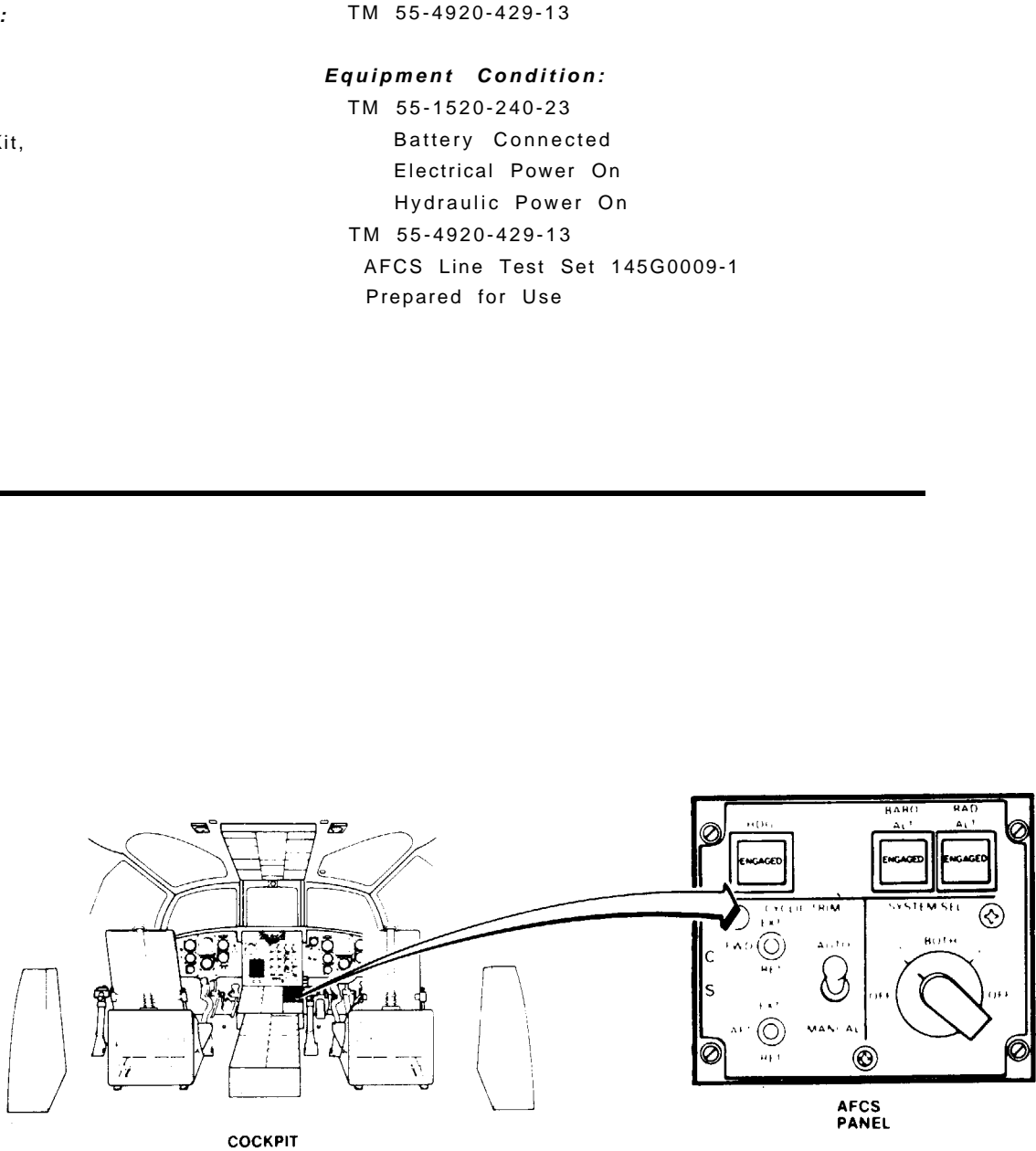
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:

TM 55-1520-240-23  
TM 55-4920-429-13

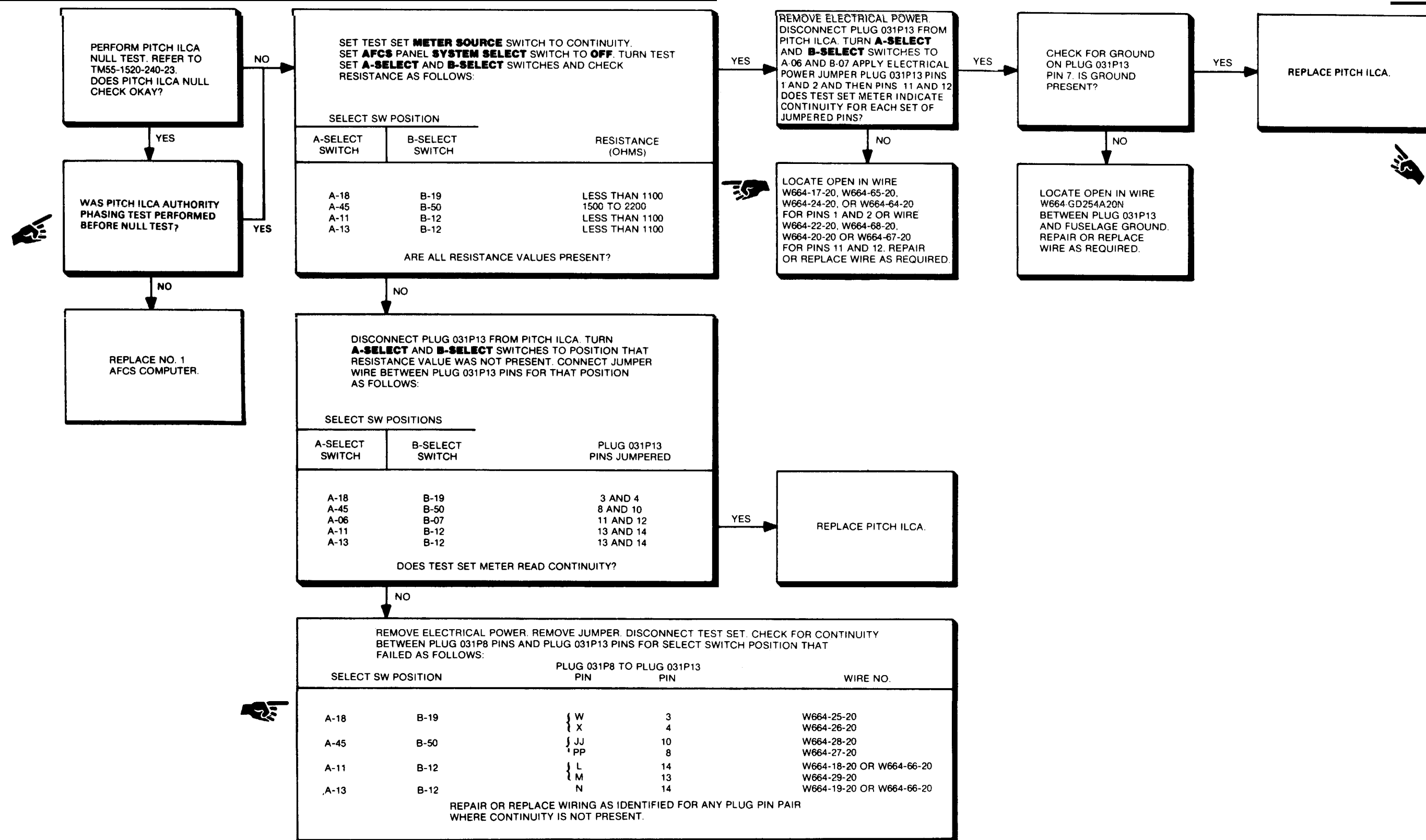
Equipment Condition:

TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared for Use



11-3.19 NO. 1 PITCH ILCA HAS ENGAGE TRANSIENT (Continued)

11-3.19



11-3.20 NO. 1 ROLL HAS ILCA ENGAGE TRANSIENT

11-3.20

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
- Multimeter

Materials:

None

Personnel Required:

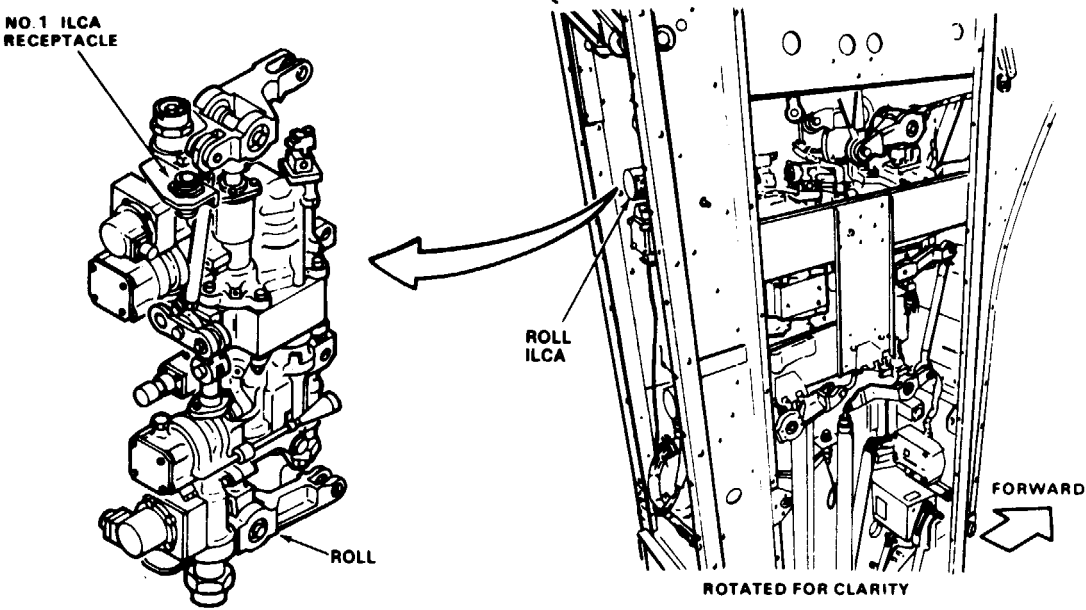
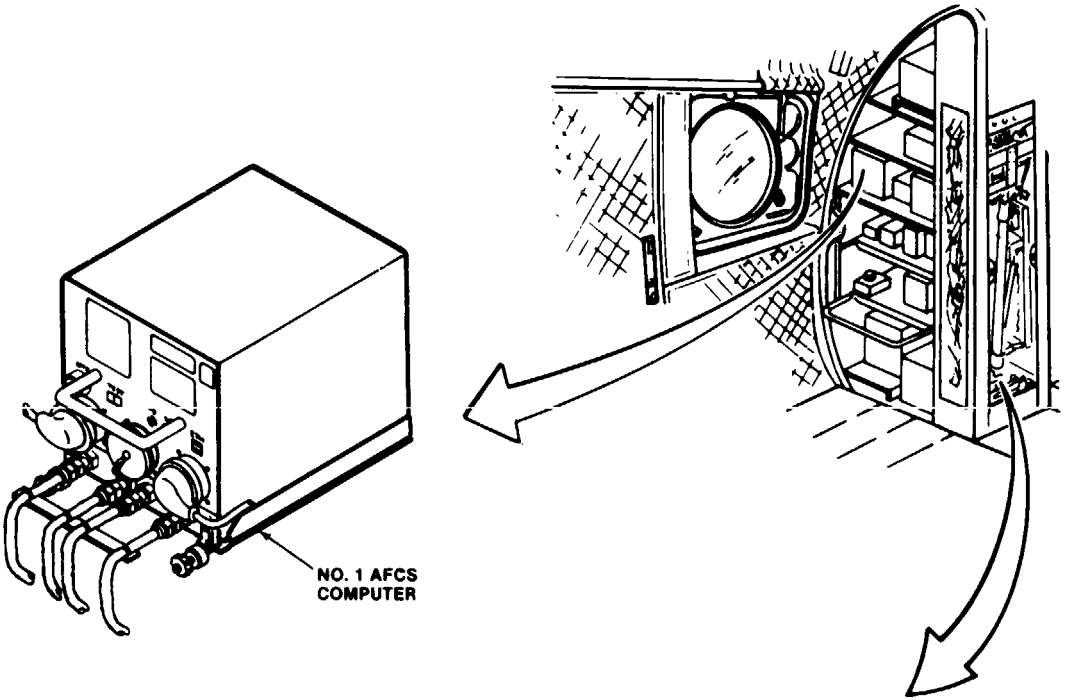
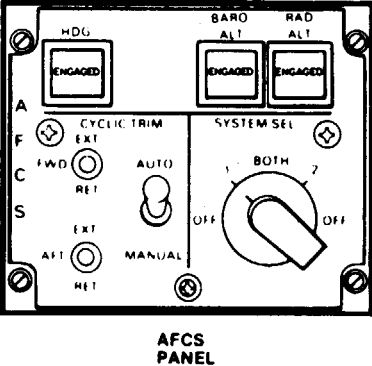
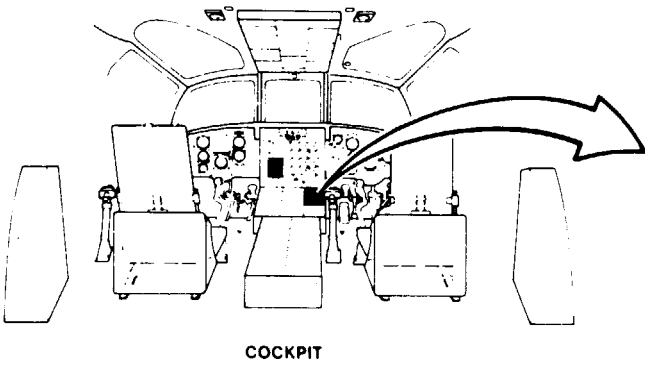
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

References:

- TM 55-1520-240-23
- TM 55-4920-429-13

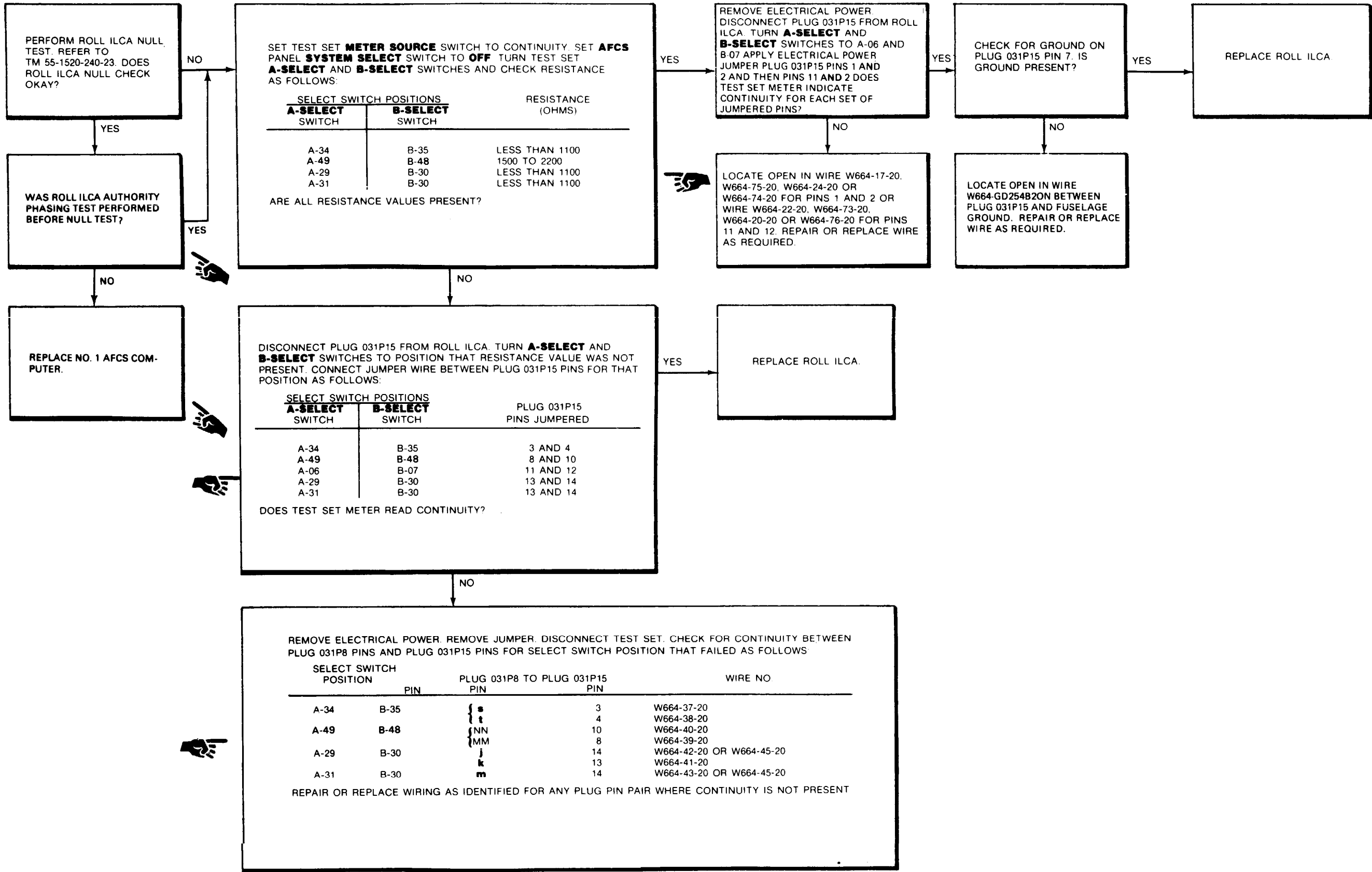
Equipment Condition:

- TM 55-1520-240-23
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
- TM 55-4920-429-13
  - AFCS Line Test Set Prepared For Use



11-3.20 NO. 1 ROLL ILCA HAS ENGAGE TRANSIENT (Continued)

11-3.20



11-3.21 NO. 1 YAW ILCA HAS ENGAGE TRANSIENT

11-3.21

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

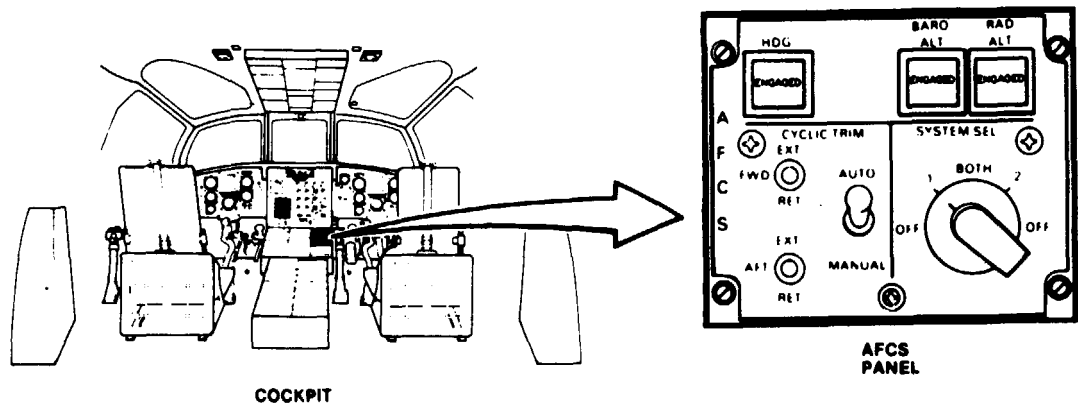
Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:

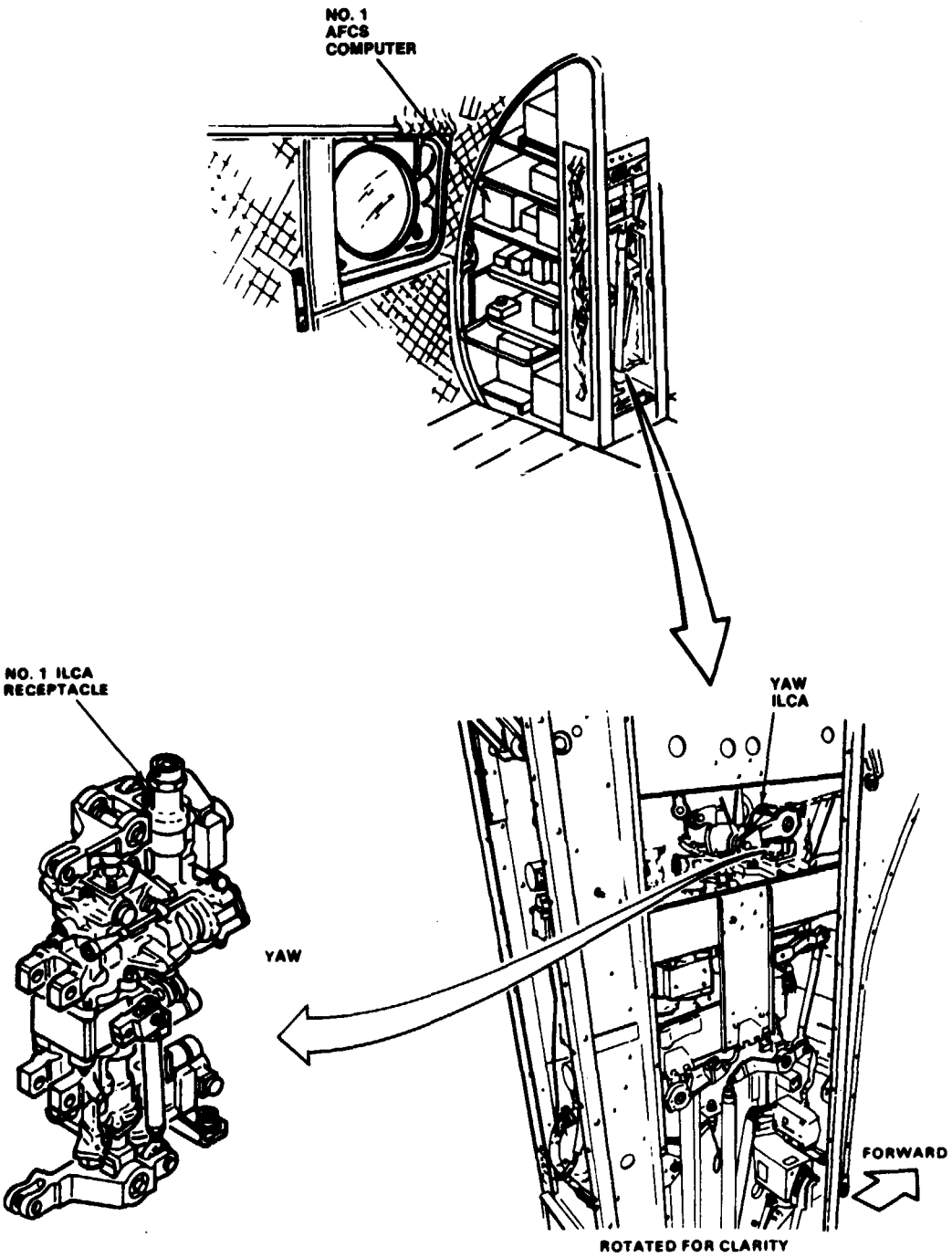
TM 55-1520-240-23  
TM 55-4920-429-13

Equipment Condition:

TM 55-1520-240-23  
Battery Connector  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared For Use



90154

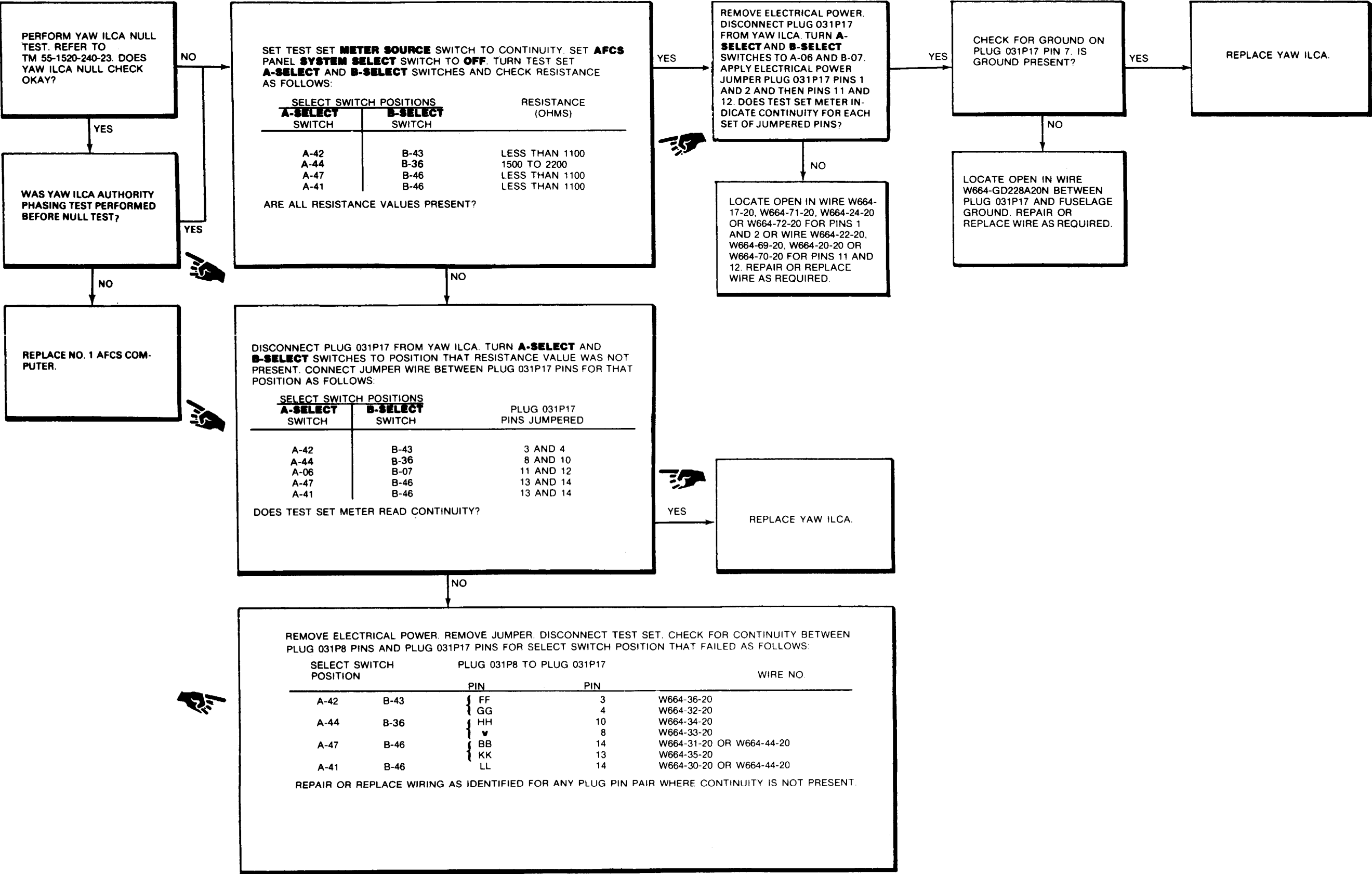


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11-3.21 NO. 1 YAW ILCA HAS ENGAGE TRANSIENT (Continued)

11-3.21



END OF TASK

11-3.22 NO. 1 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

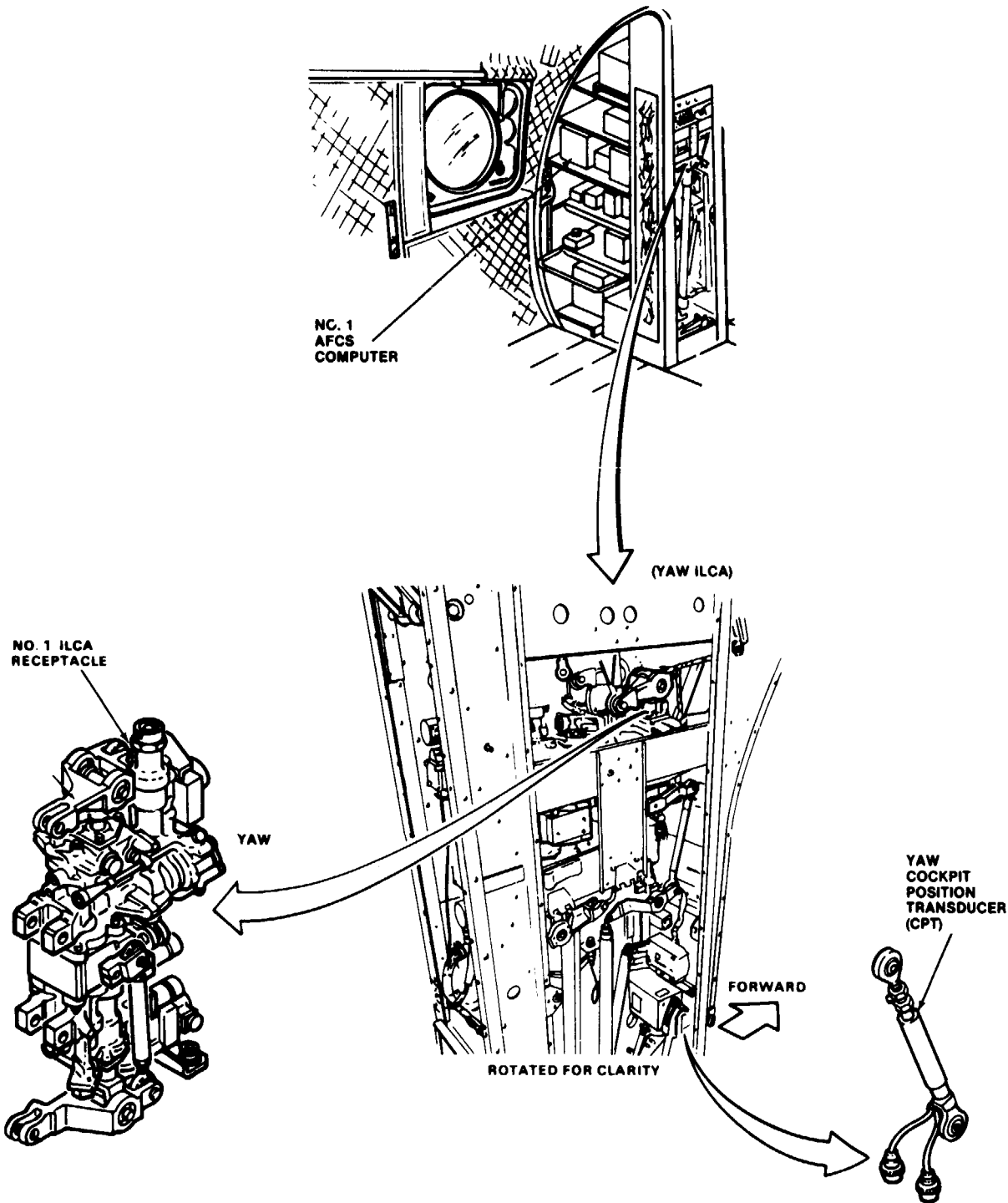
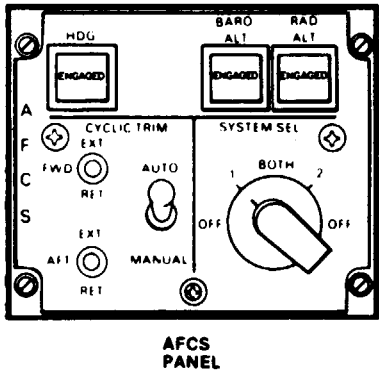
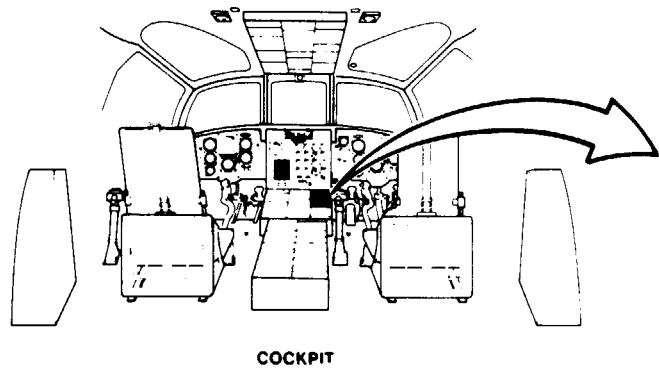
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

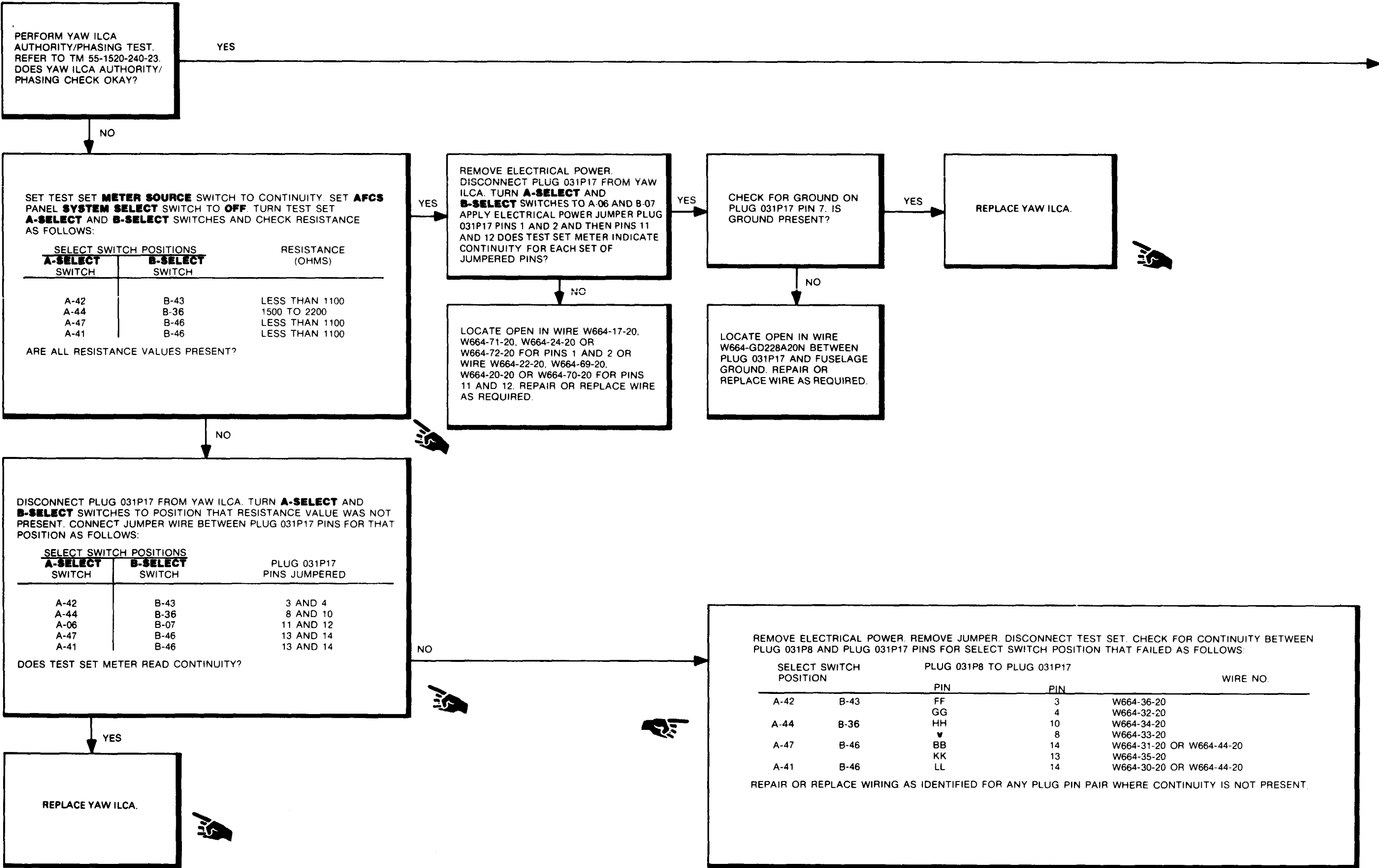
References:  
TM 55-1520-240-23  
TM 55-4920-429-13

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared For Use



11-3.22 NO. 1 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED (Continued)

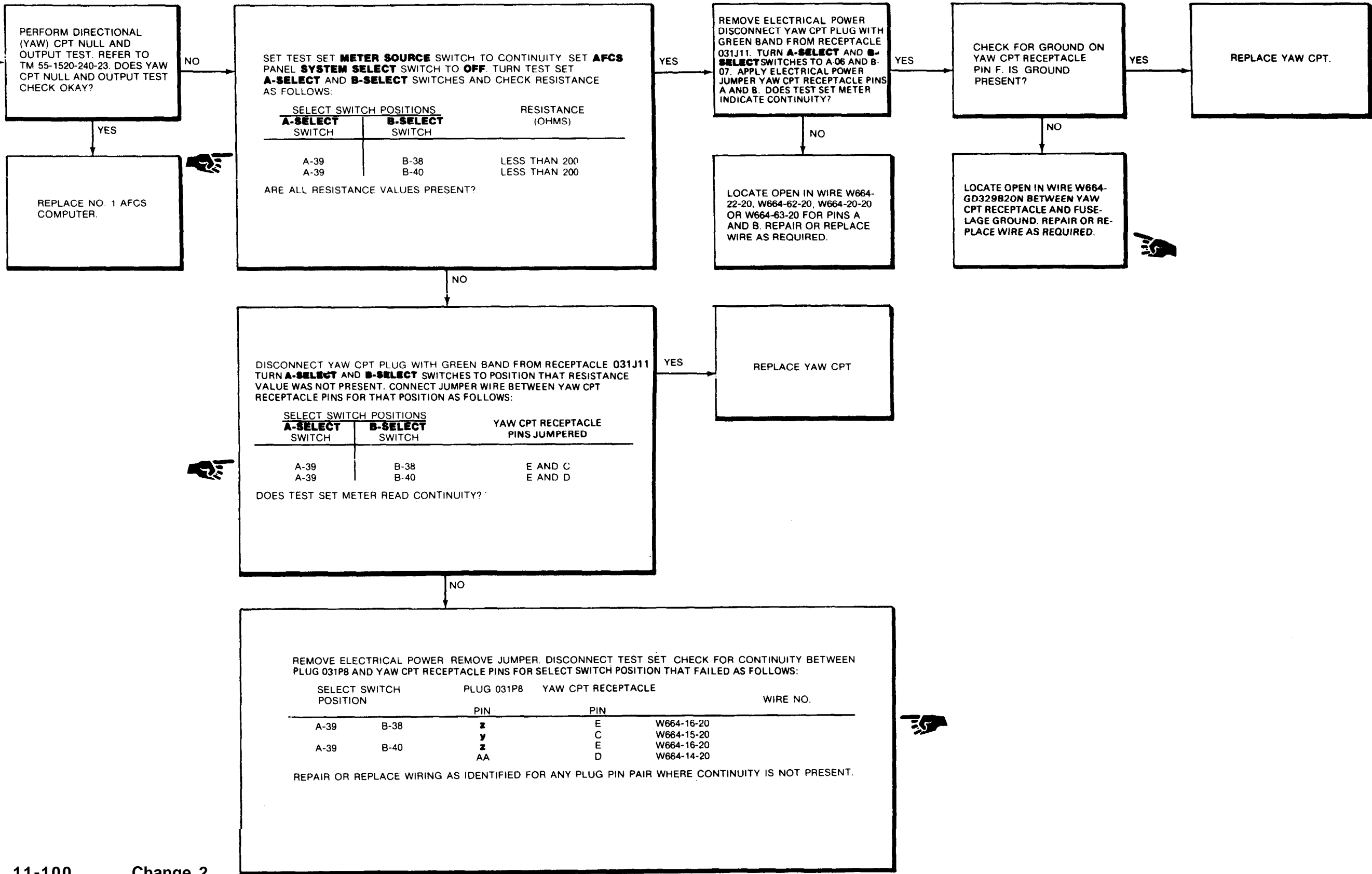
11-3.22



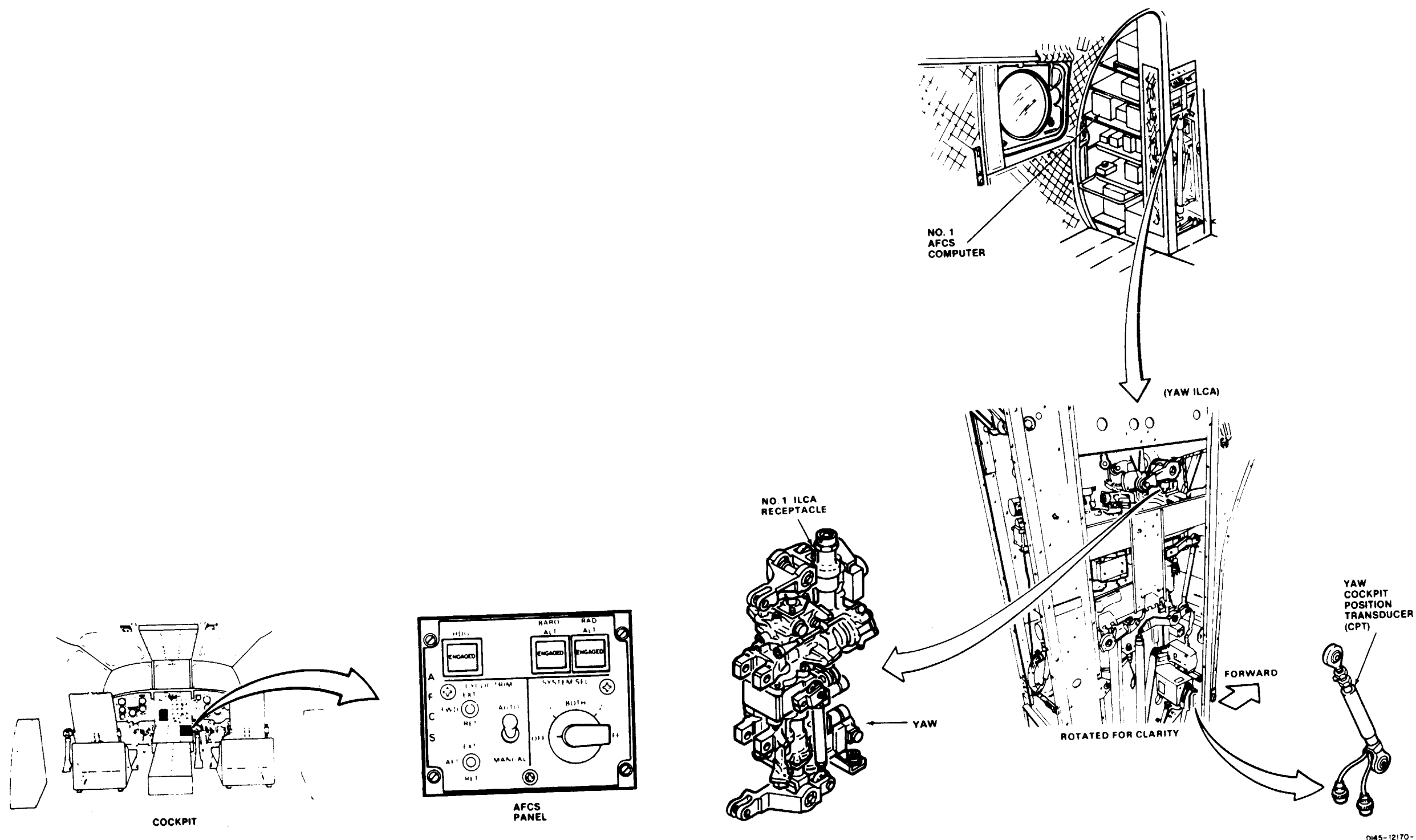
GO TO  
NEXT PAGE



11-3.22 NO. 1 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED (Continued)



11-3.22 NO. 1 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED (Continued)



90x54

END OF TASK

11-3.23 NO. 1 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
- Multimeter

Materials:

None

Personnel Required:

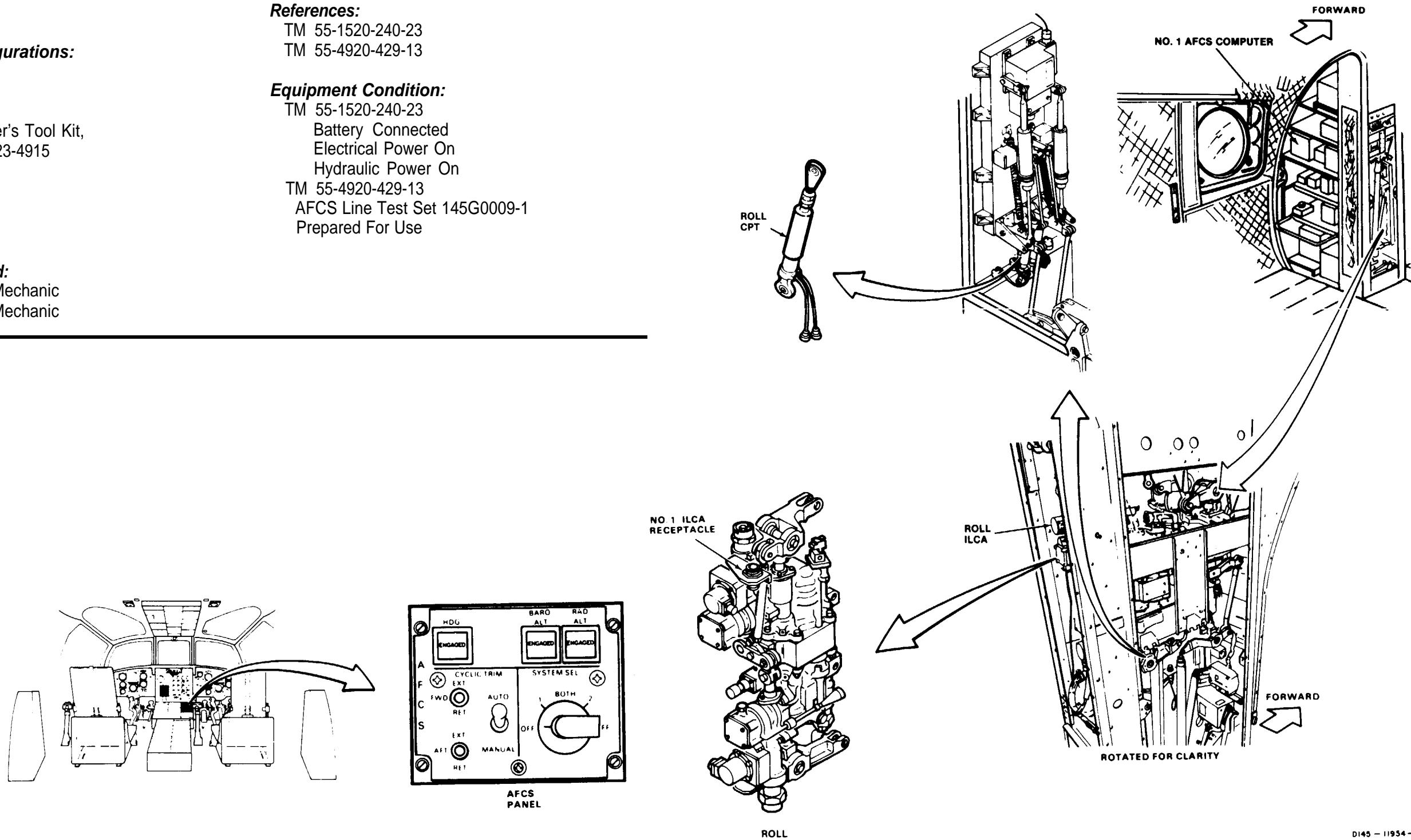
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

References:

- TM 55-1520-240-23
- TM 55-4920-429-13

Equipment Condition:

- TM 55-1520-240-23
- Battery Connected
- Electrical Power On
- Hydraulic Power On
- TM 55-4920-429-13
- AFCS Line Test Set 145G0009-1
- Prepared For Use



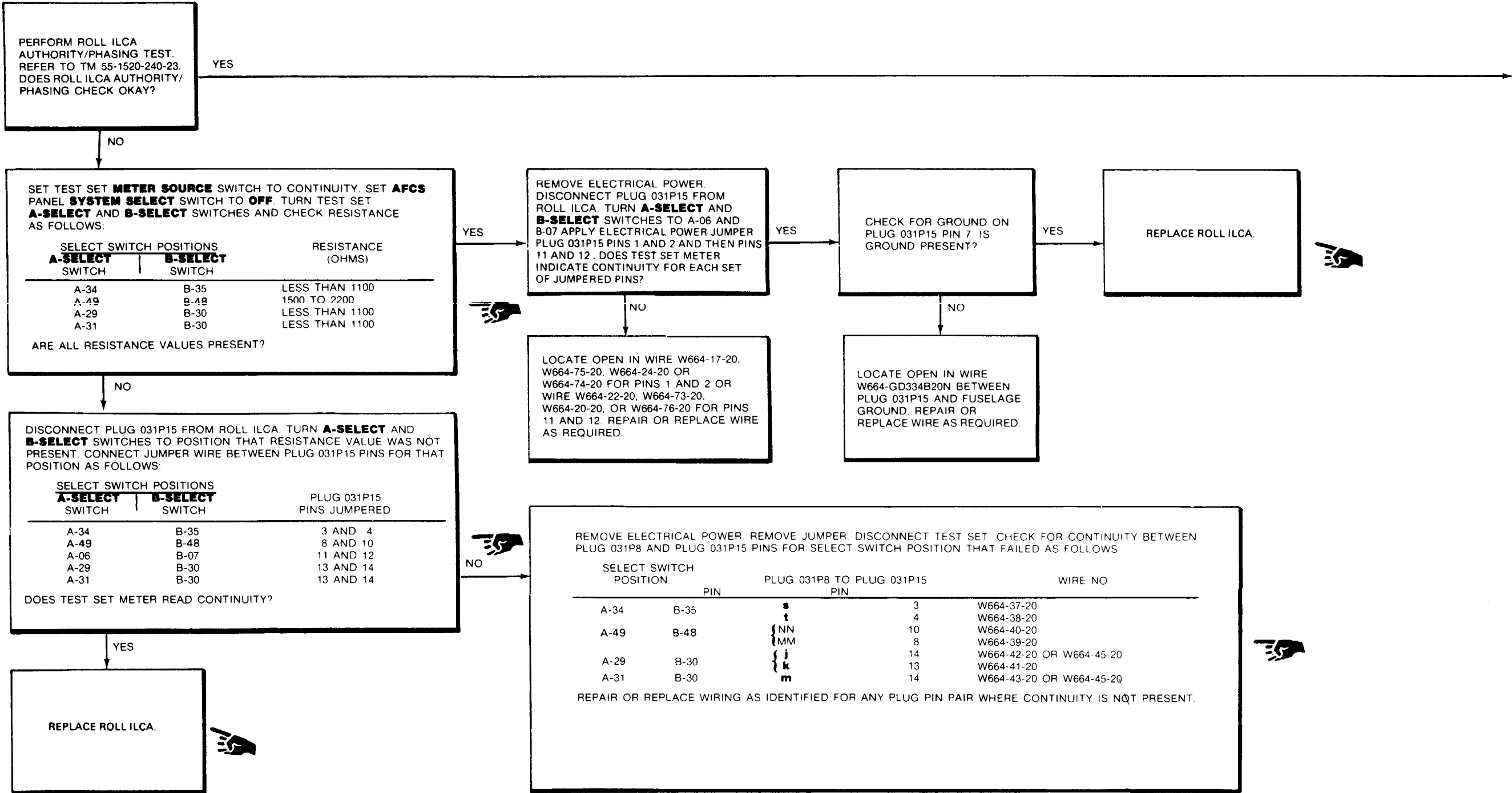
90 x 54

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11-3.23 NO. 1 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION (Continued)

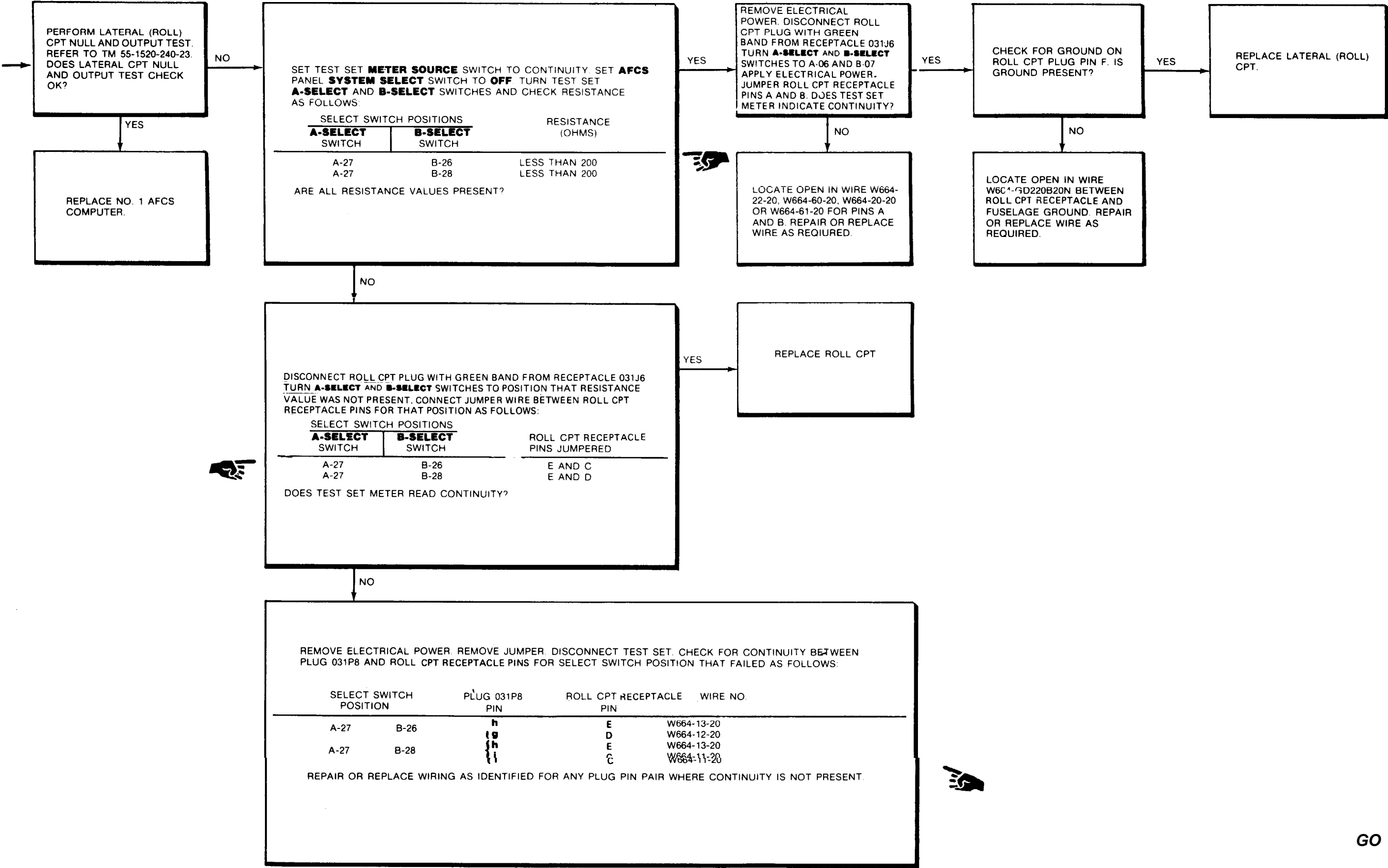
11-3.23



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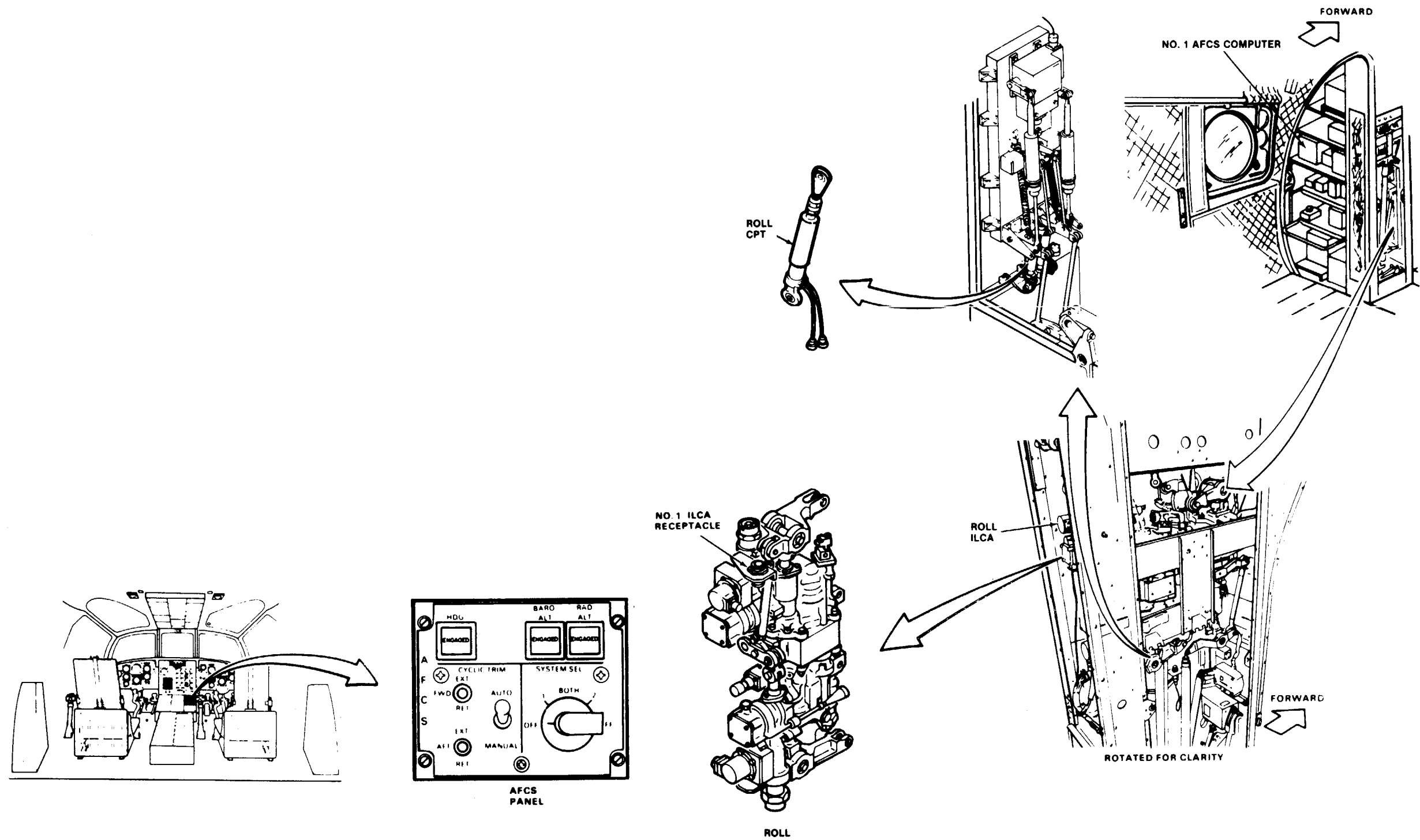
11-3.23 NO. 1 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION (Continued)

11-3.23



11-3.23 NO. 1 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION (Continued)

11-3.23



11-3.24 NO. 1 ROLL ILCA DOES NOT MOVE WHEN PILOT'S OR  
COPILOT'S PITCH AND ROLL TRIM SWITCH MOVED  
RIGHT OR LEFT

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
- Multimeter

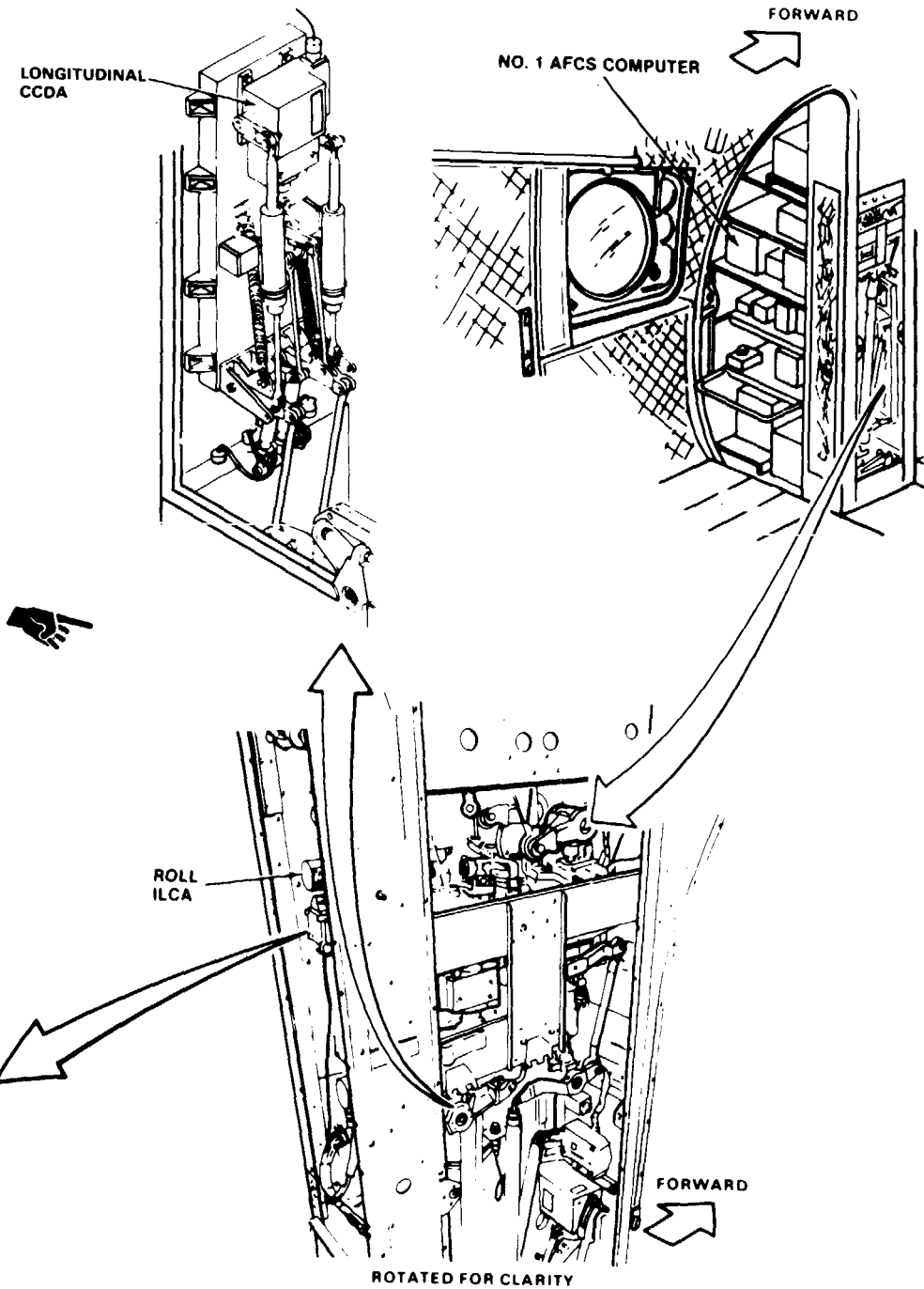
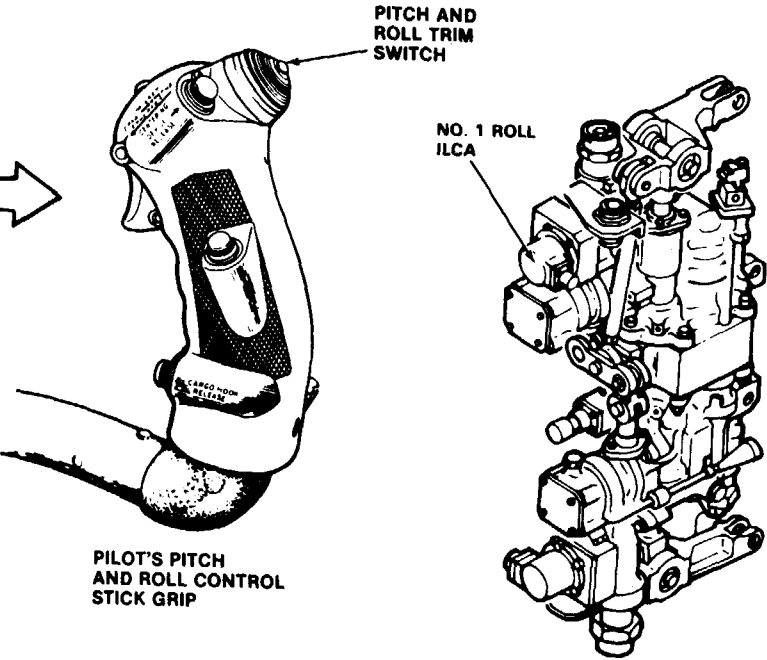
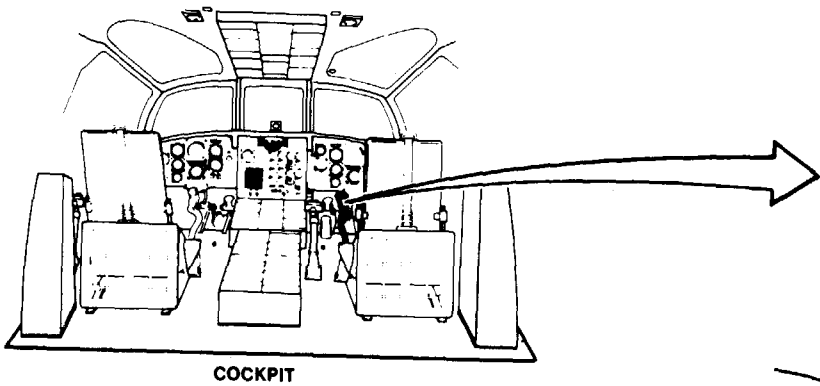
Materials:

- None

Personnel Required:  
Avionic Mechanic (2)

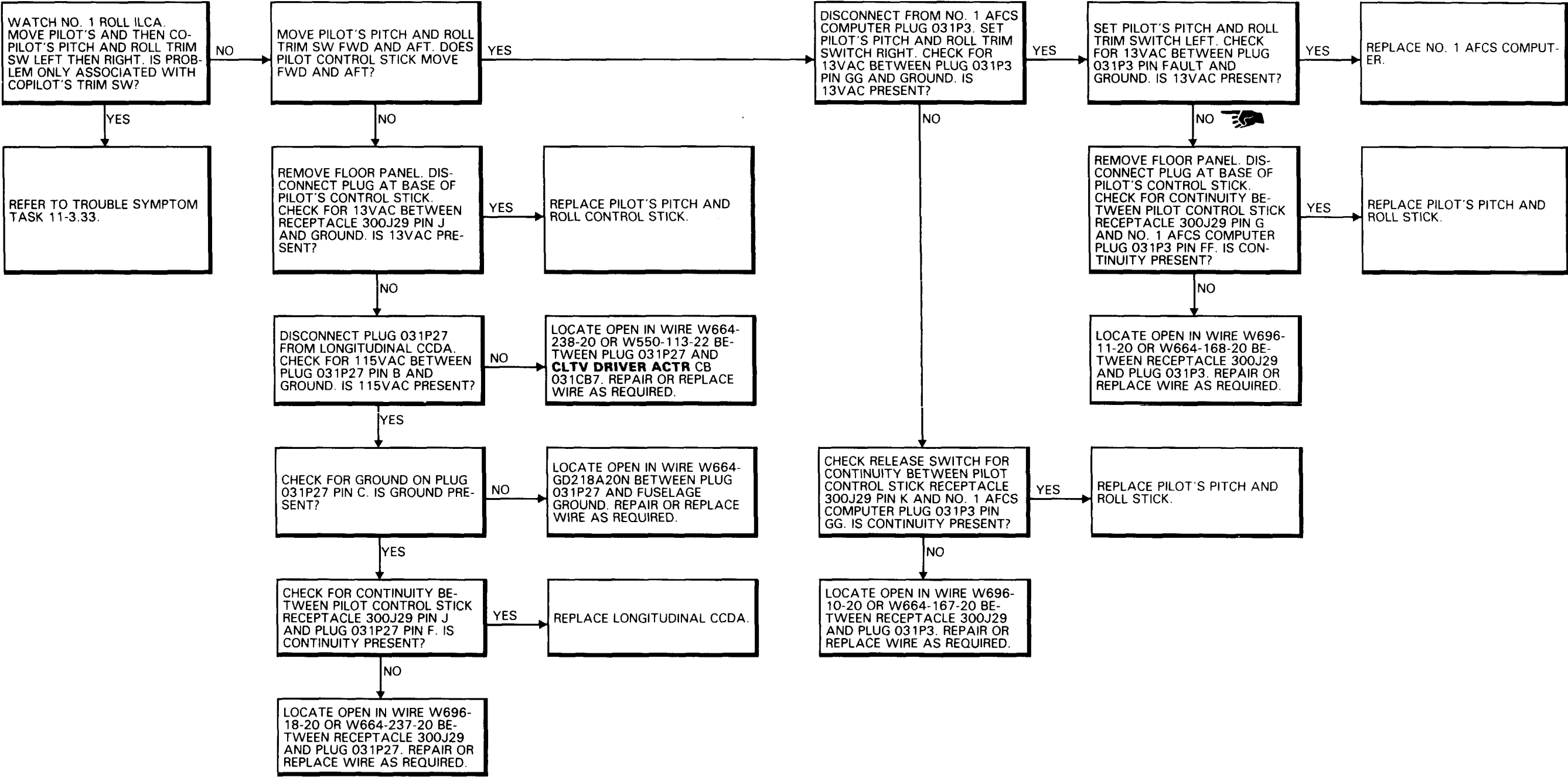
References.  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On



11-3.24 NO. 1 ROLL ILCA DOES NOT MOVE WHEN PILOT'S OR COPILOT'S PITCH AND ROLL TRIM SWITCH MOVED RIGHT OR LEFT (Continued)

11-3.24





11-3.25 AFCS BITE OPERATES WITH ENQINK CONDITION LEVER IN FLIGHT POSITION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configuratlons:  
All

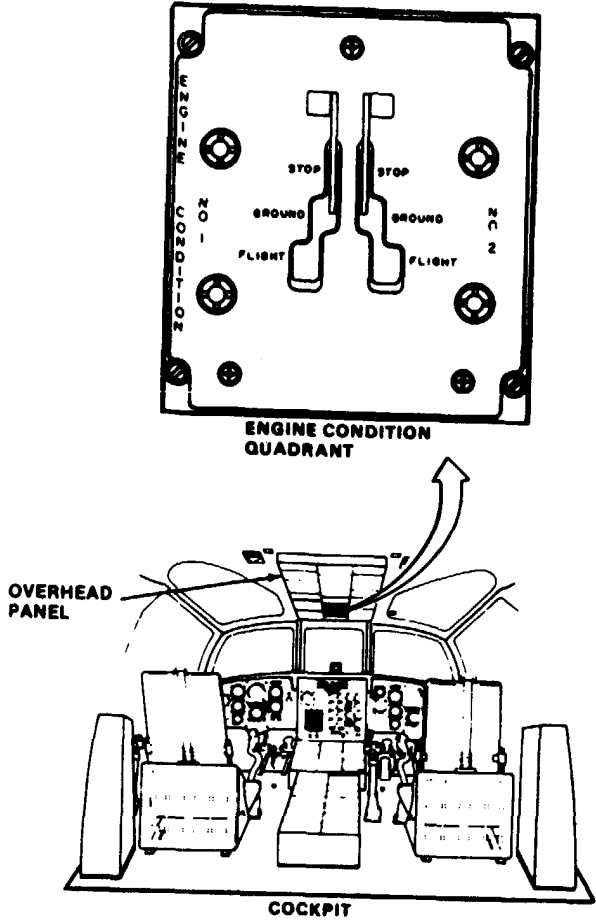
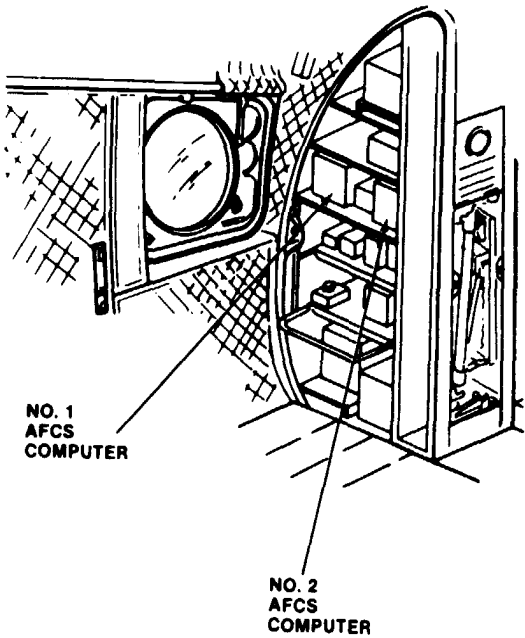
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
33K20 Avionic Mechanic

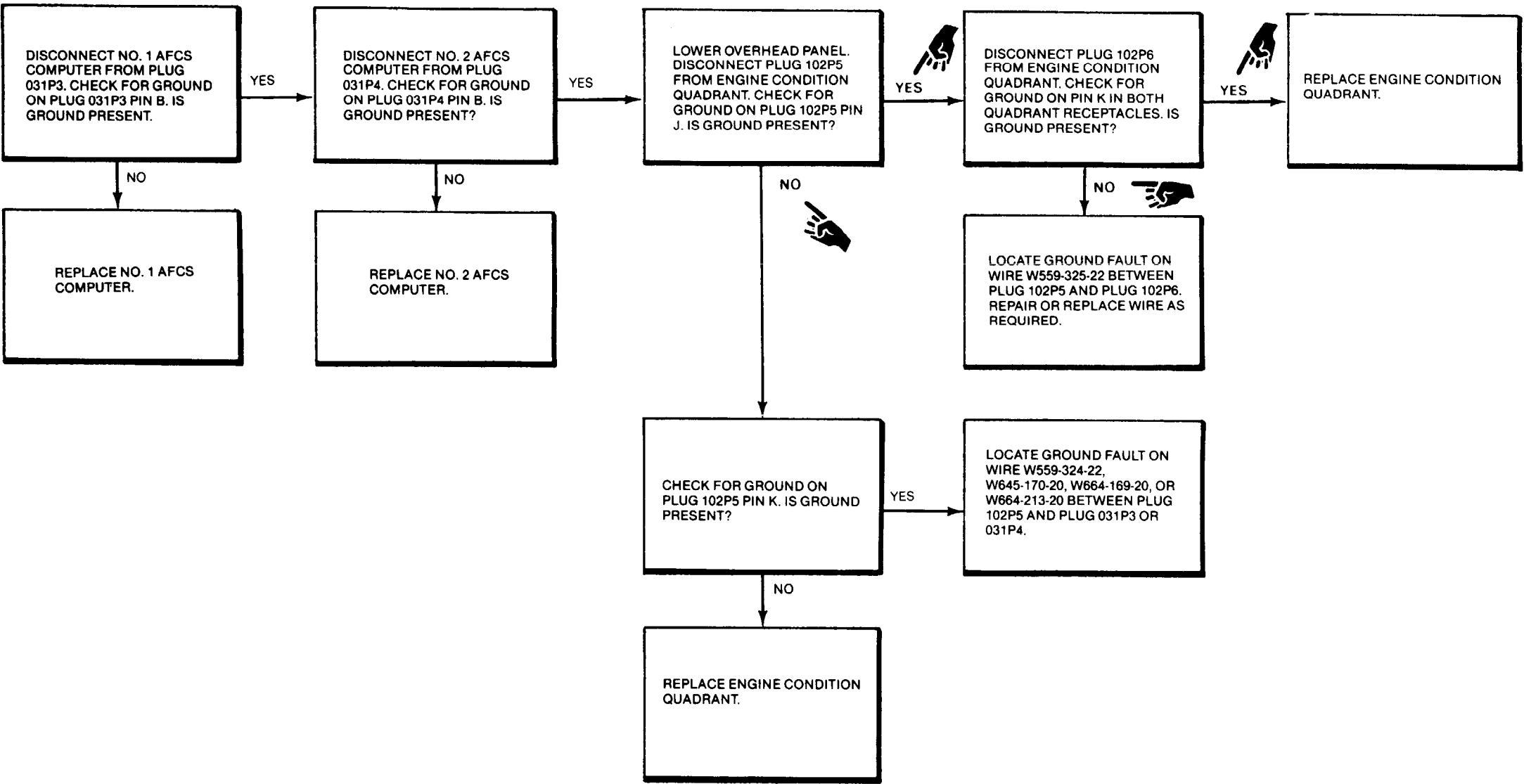
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On



11-3.25 AFCS BITE OPERATES WITH ENGINE CONDITION  
LEVER IN FLIGHT POSITION (Continued)

11-3.25



END OF TASK

11-3.26 NO. 1 AFCS COMPUTER BITE SWITCH DOES NOT LIGHT AND  
COUNTER DOES NOT STEP WHEN BITE SWITCH IS PRESSED AND  
RELEASED

11-3.26

FAULT ISOLUTION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

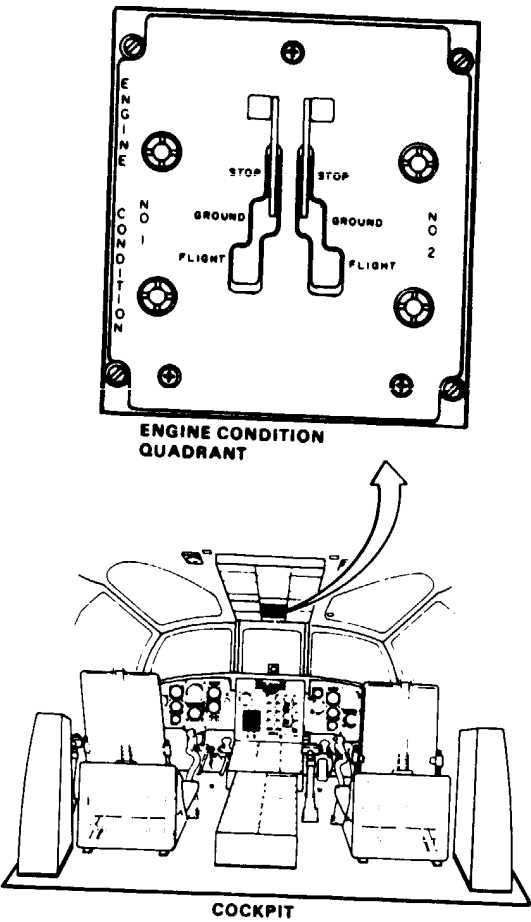
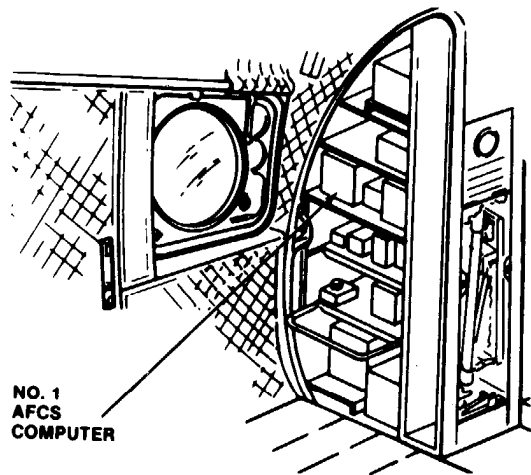
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23

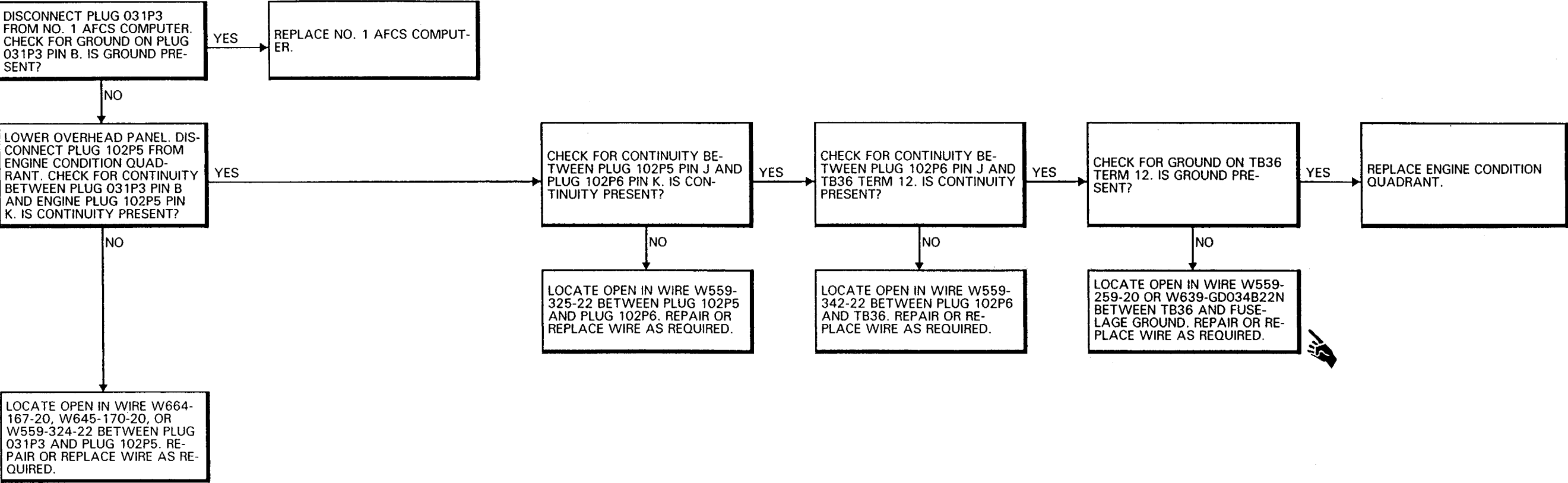
Equipment Condition:  
TM 55-1520-240-23  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



90 x 54

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11-3.27 NO. 2 AFCS OFF (WITHOUT 74) OR AFCS 2 (WITH 74) CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED

11-3.27

FAULT ISOLATION PROCEDURE  
INITIAL SETUP

**Applicable Configurations:**  
All

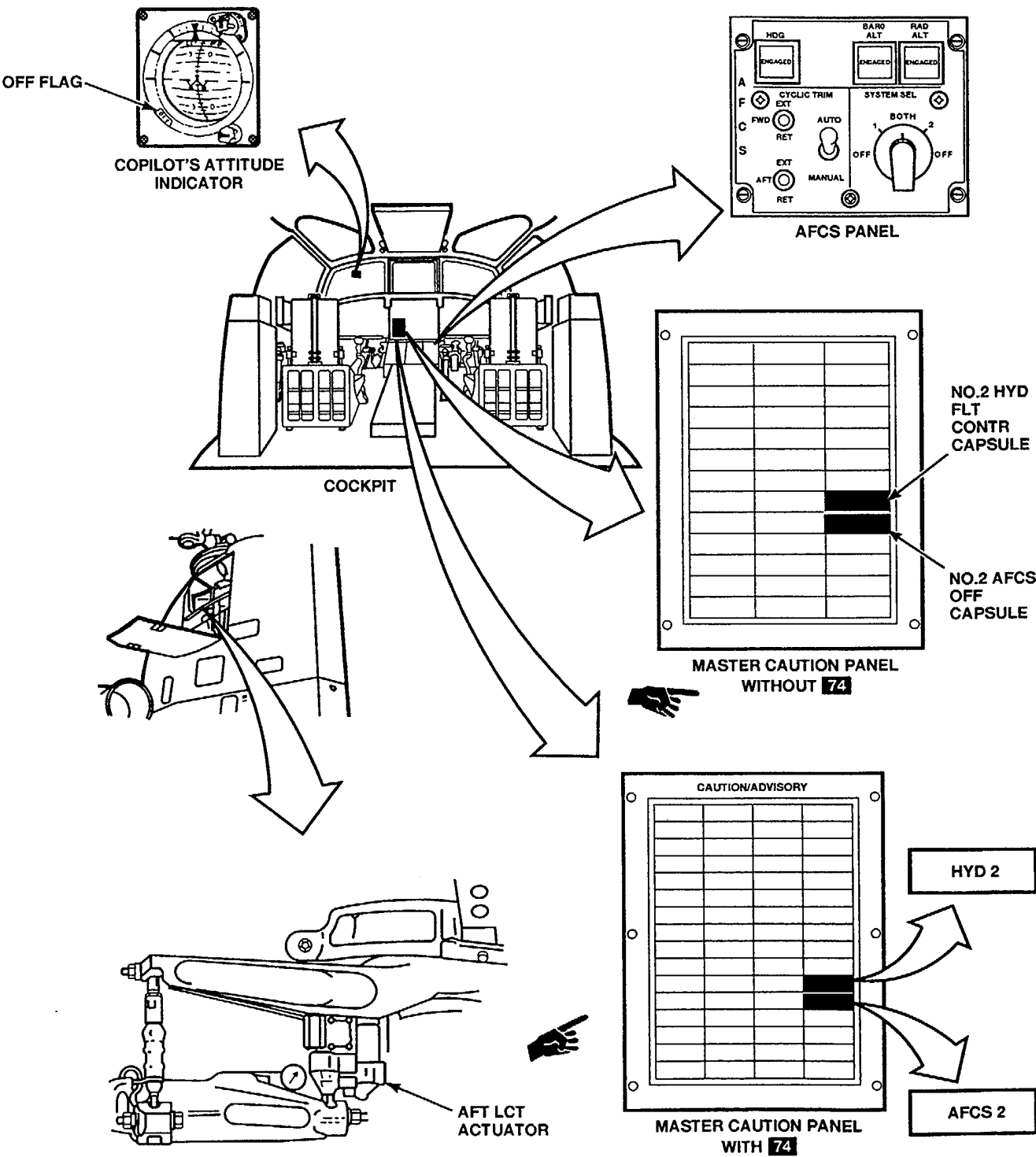
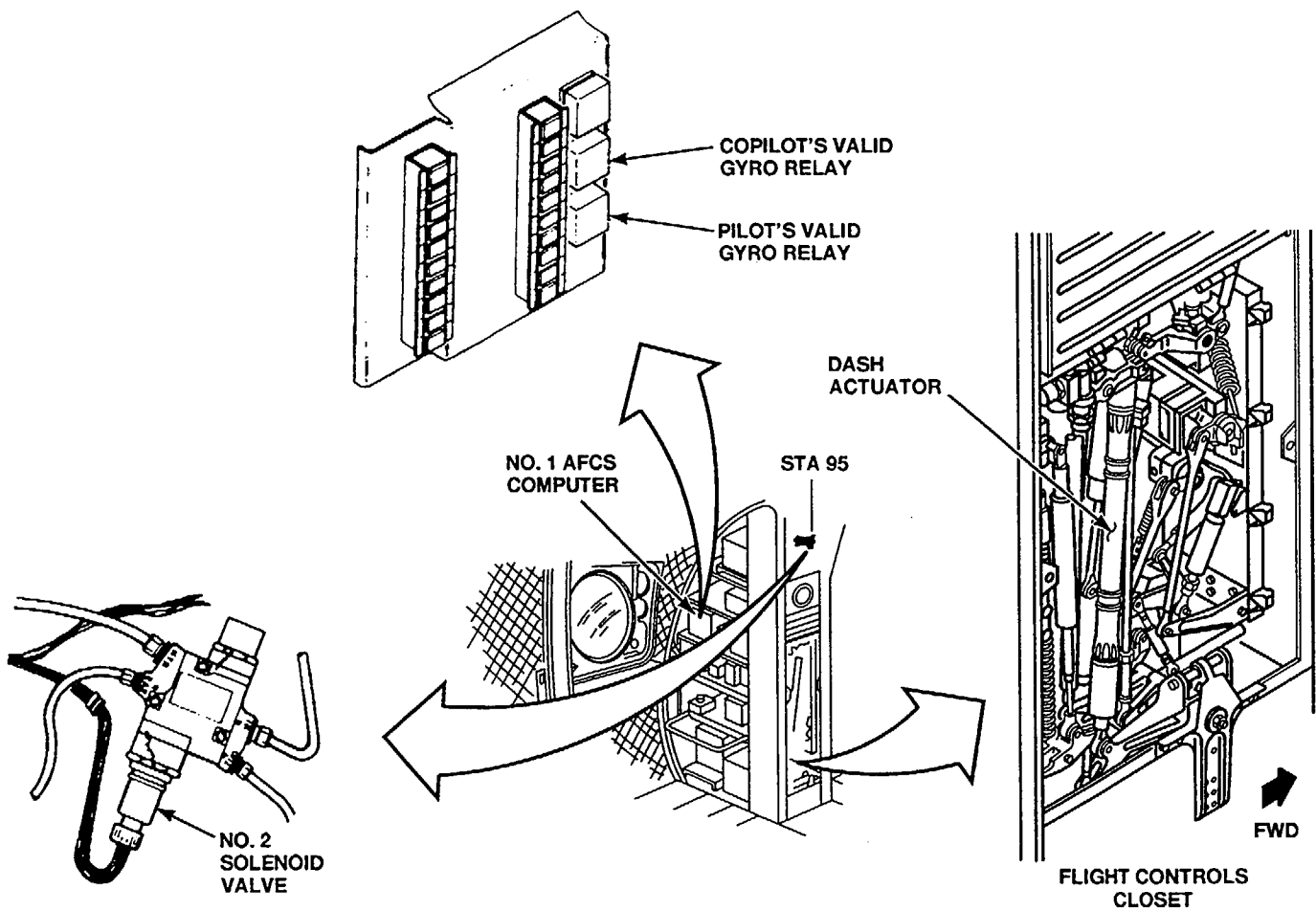
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

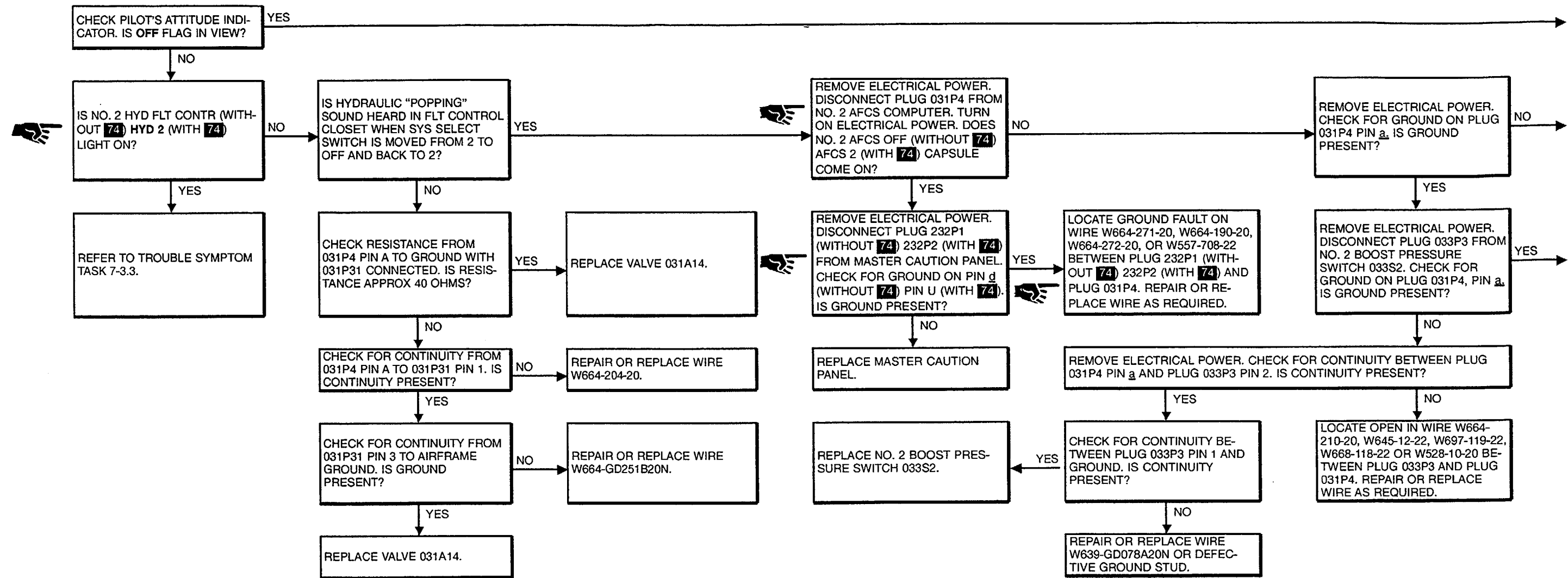
**Personnel Required:**  
Avionic Mechanic (2)

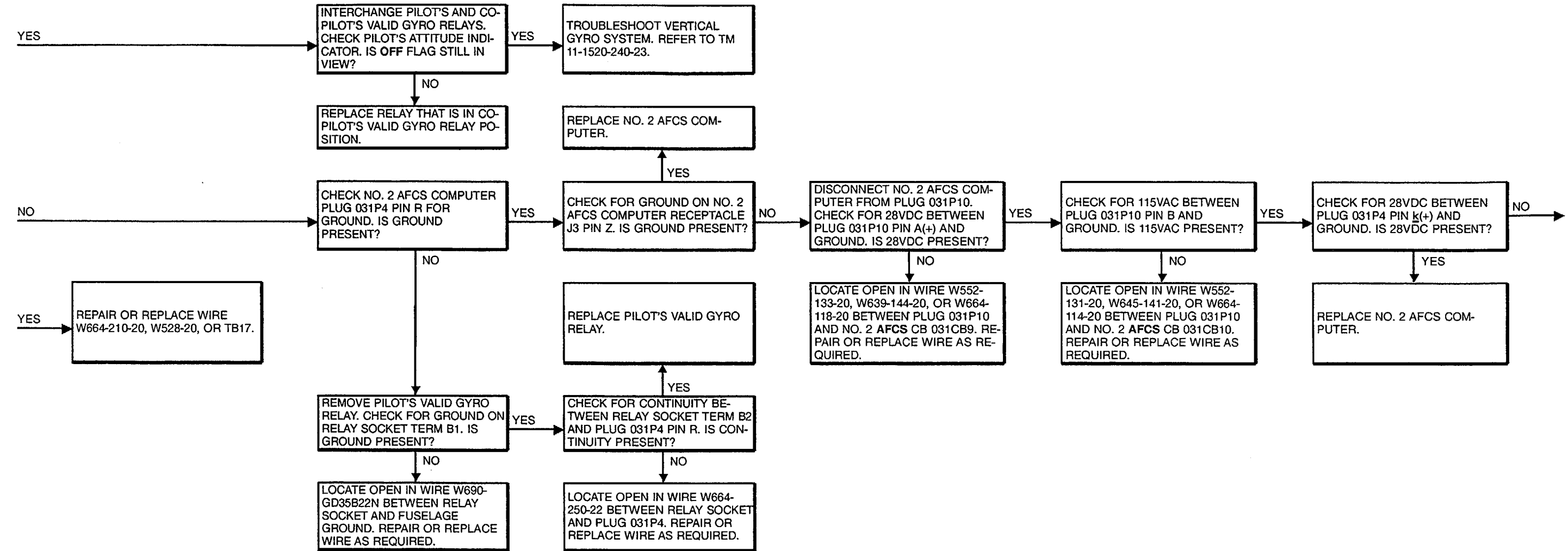
**References:**  
TM 55-1520-240-23  
TM 11-1520-240-23

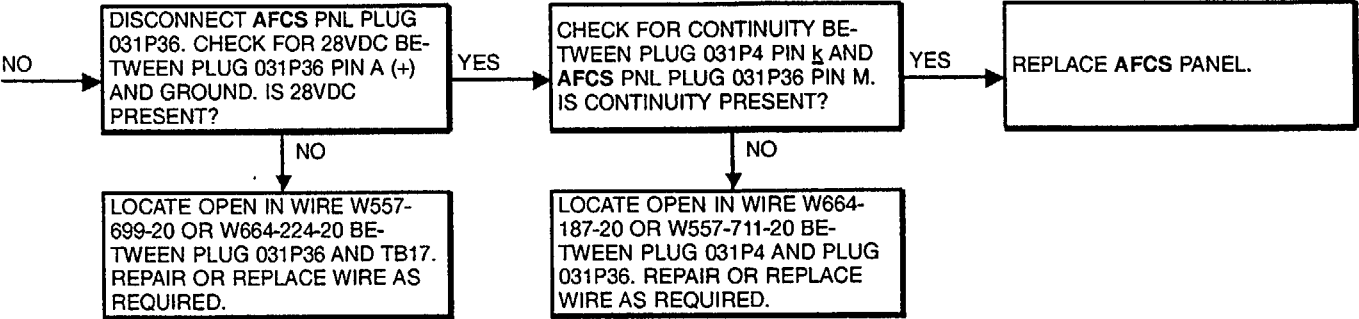
**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On



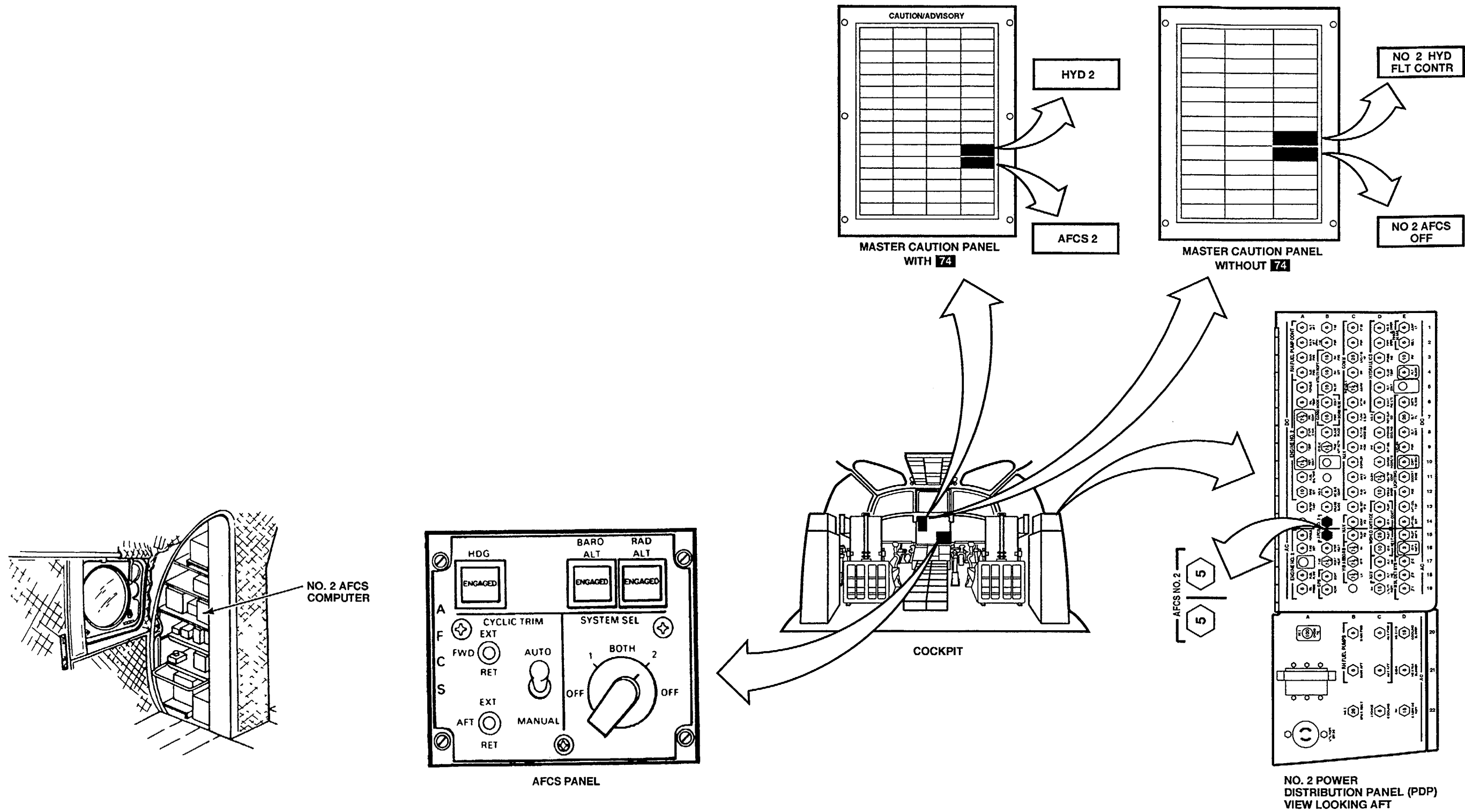
A65463







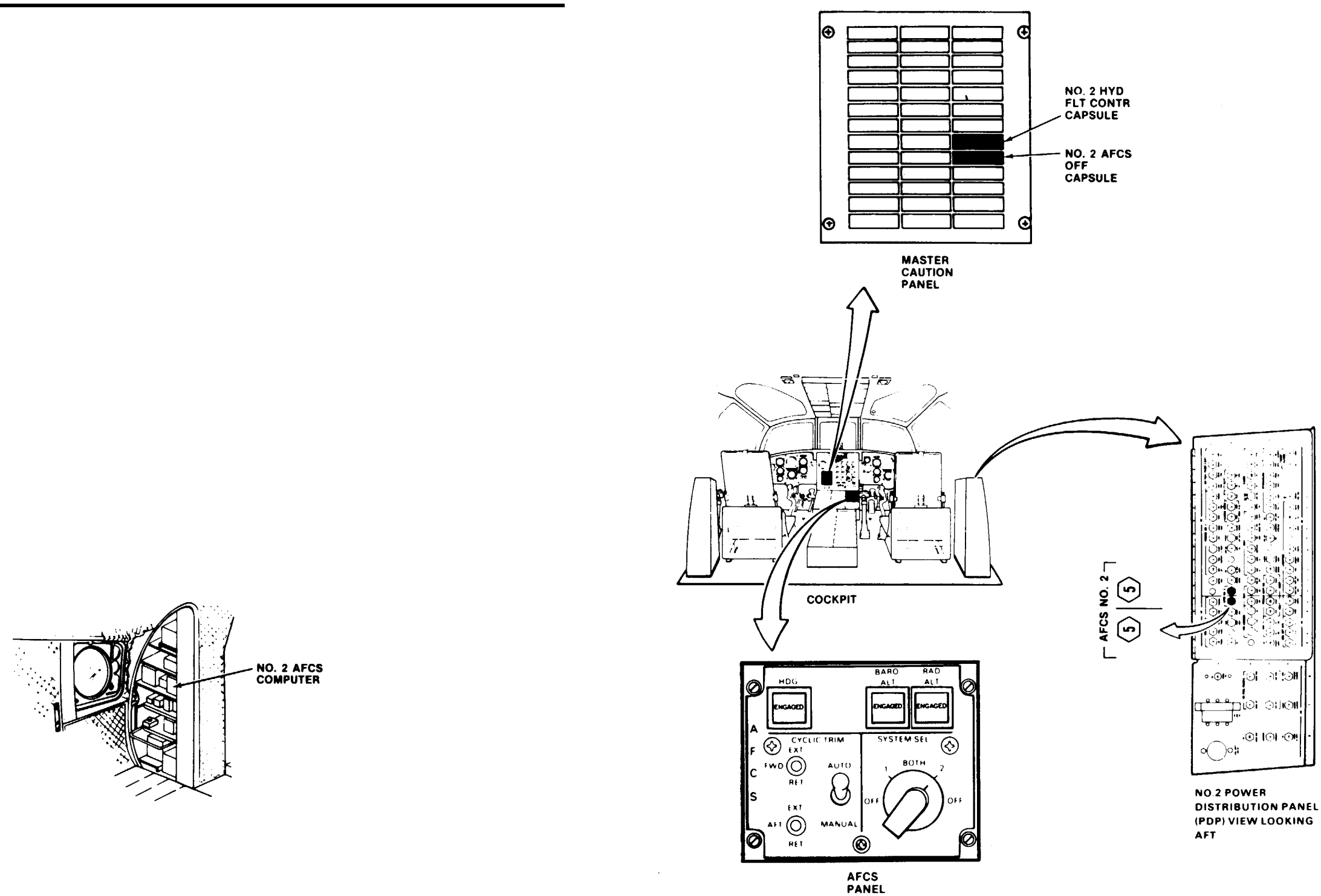




A73591

11-3.27 NO. 2 AFCS OFF CAPSULE DOES NOT GO OUT WHEN SYSTEM  
SELECTED (Continued)

11-3.27



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

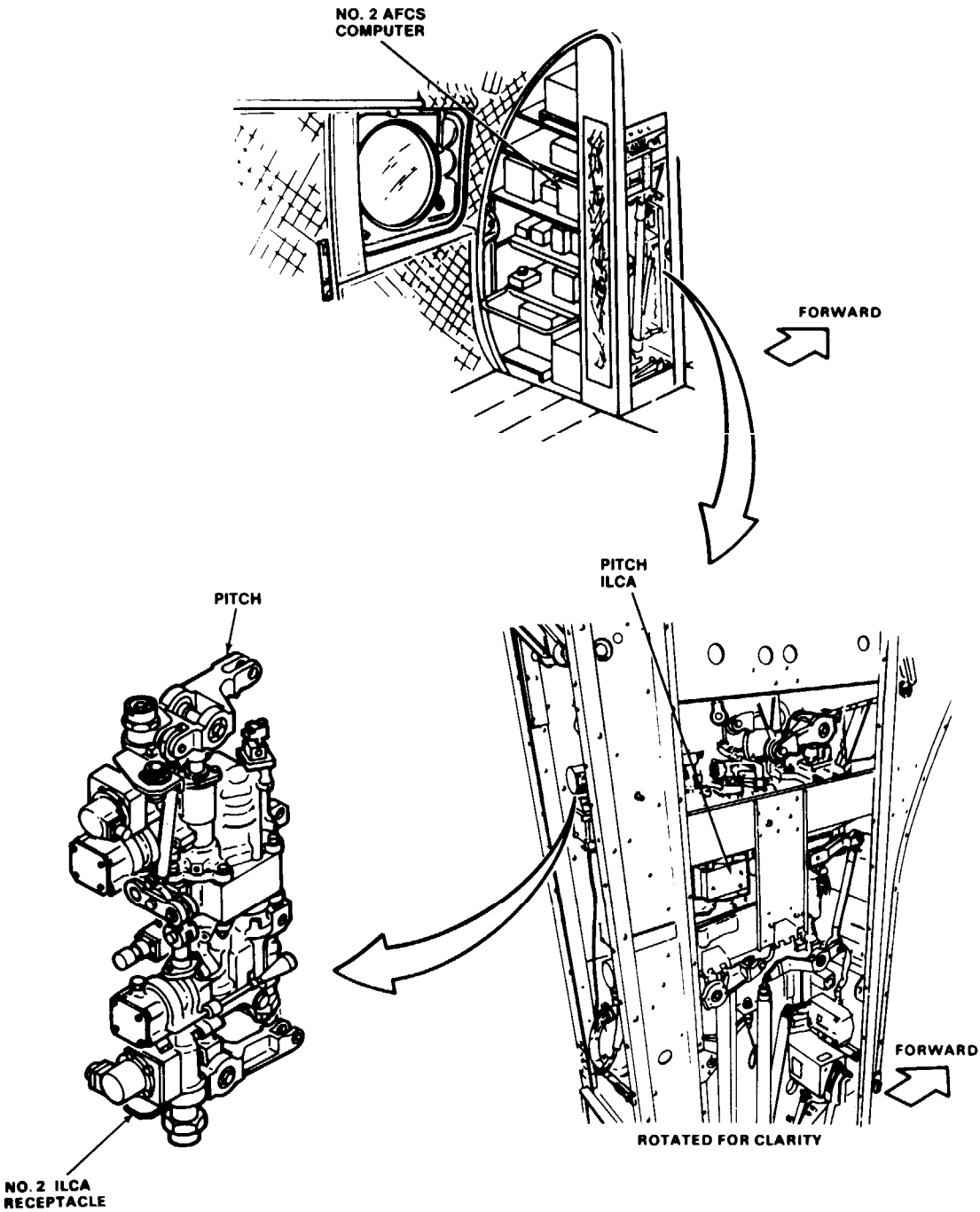
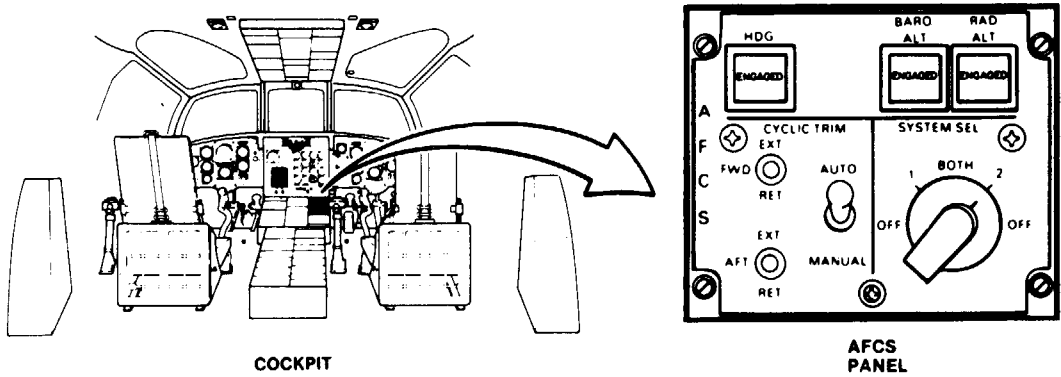
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23  
TM 55-4920-429-13

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared For Use

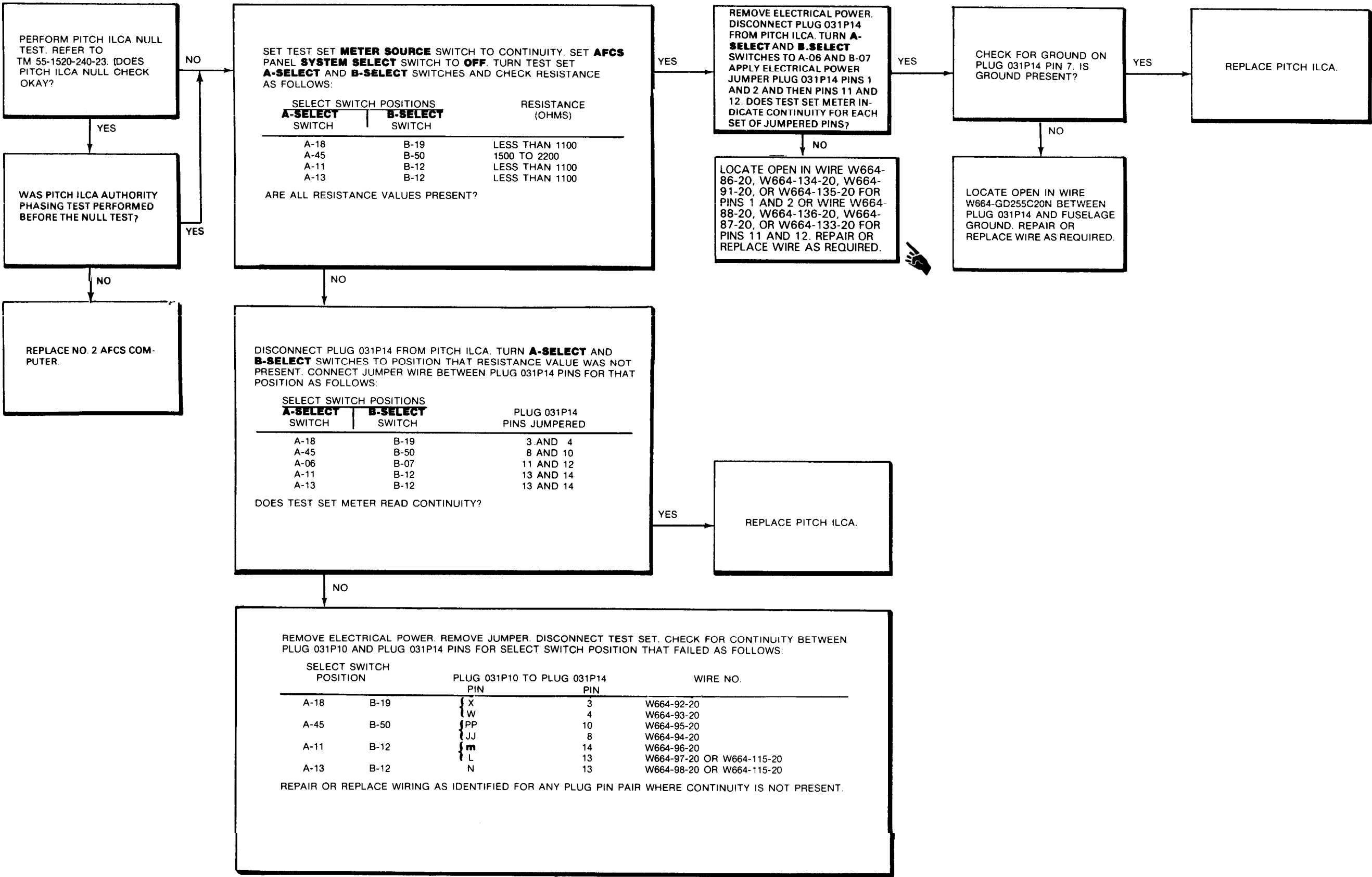


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11-3.28 NO. 2 PITCH ILCA HAS ENGAGE TRANSIENT (Continued)

11-3.28



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

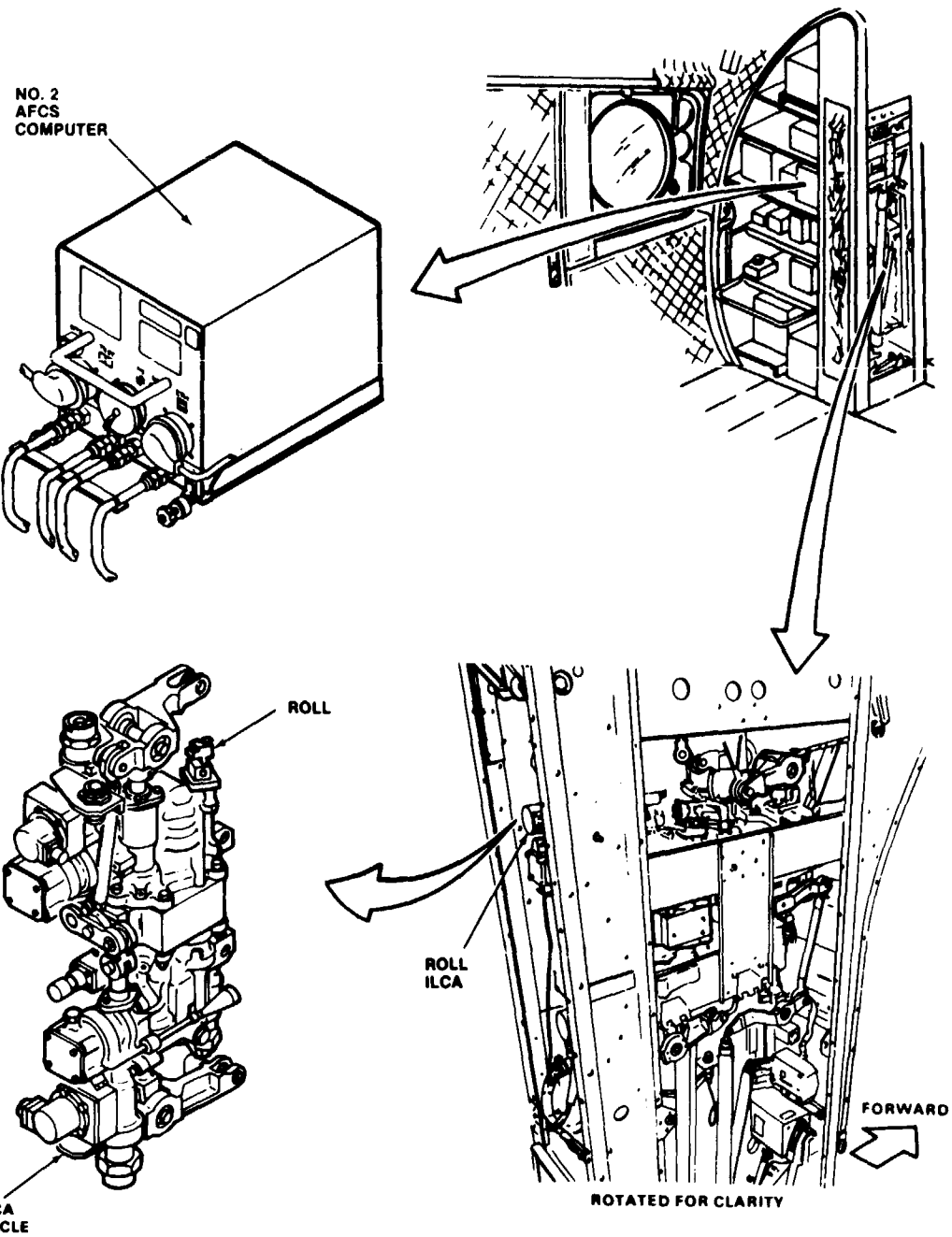
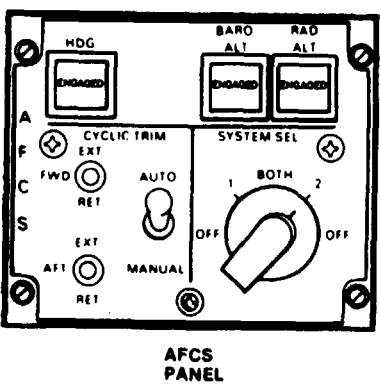
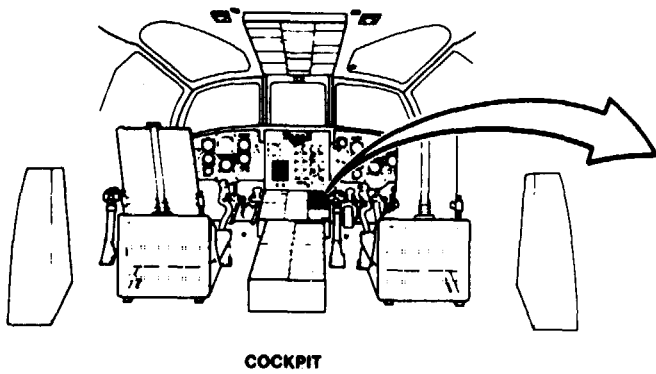
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23  
TM 55-4920-429-13

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared For Use

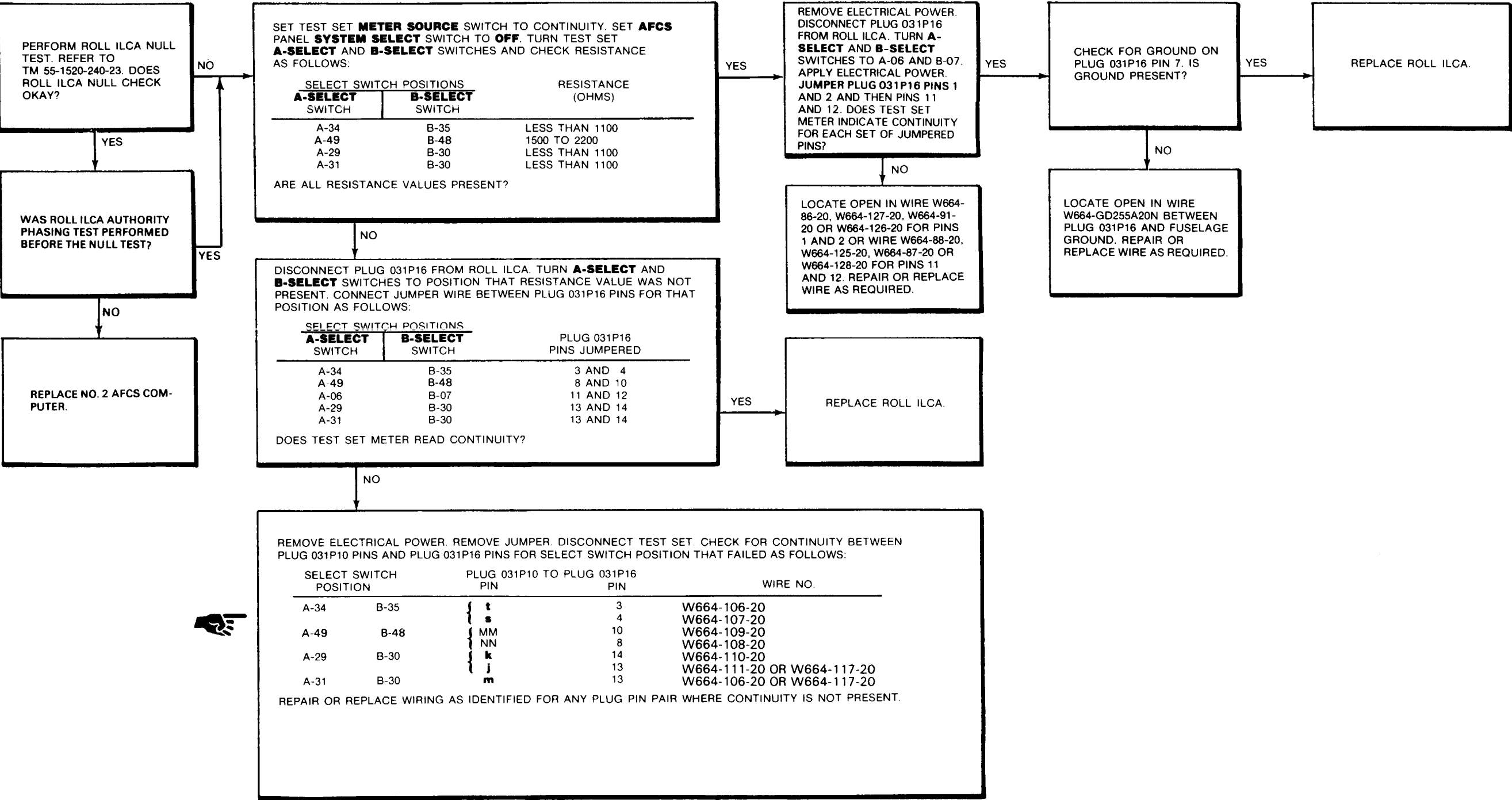


90-54

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11-3.29 NO. 2 ROLL ILCA HAS ENGAGE TRANSIENT (Continued)

11-3.29



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

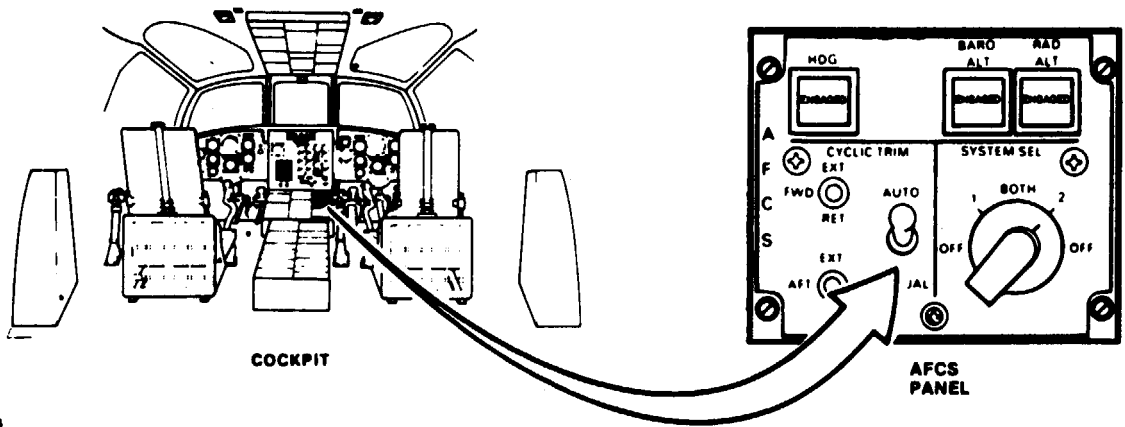
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

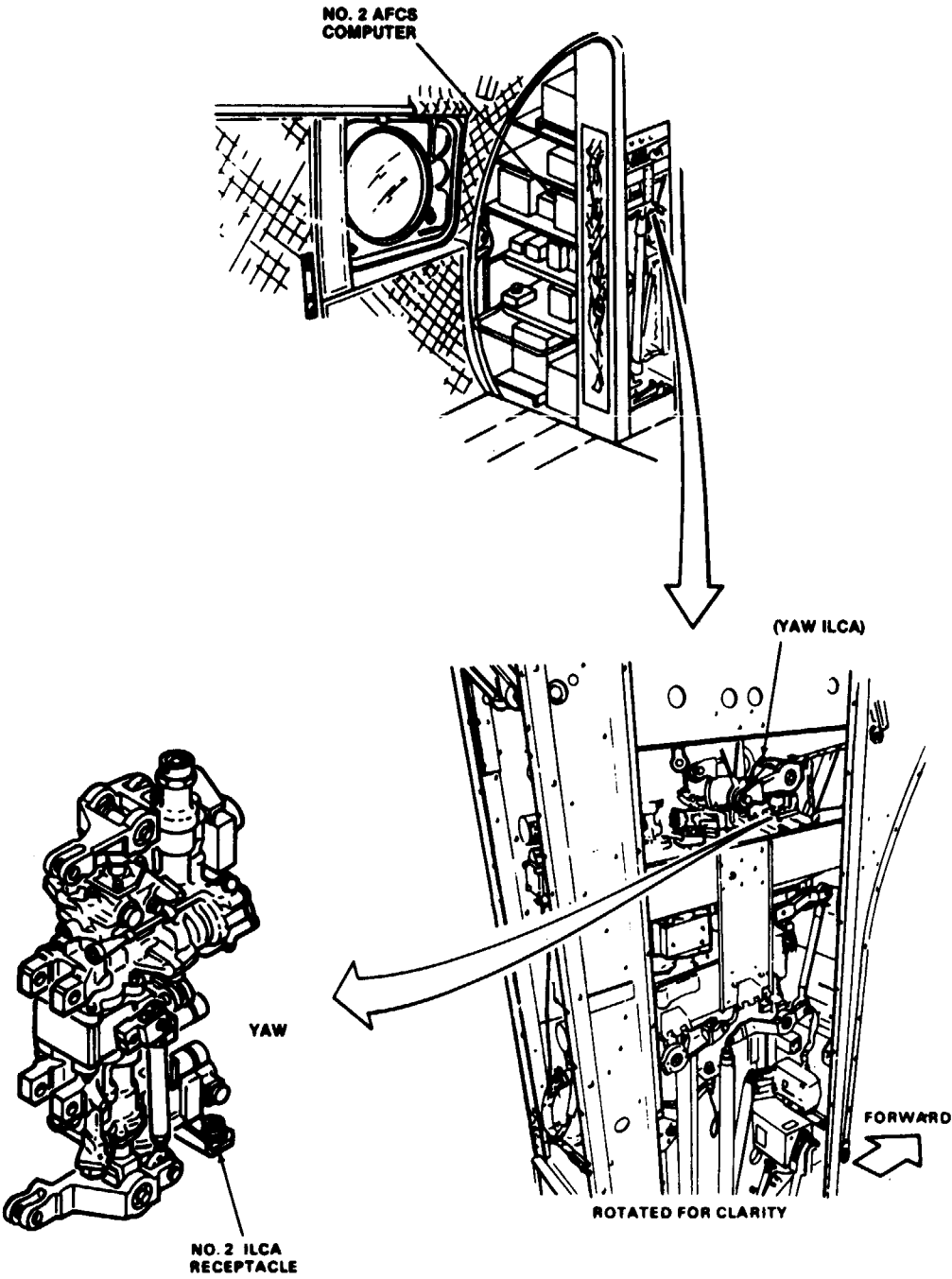
**Personnel Required**  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

**References:**  
TM 55-1520-240-23  
TM 55-4920-429-13

**Equipment Condition:**  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared for Use



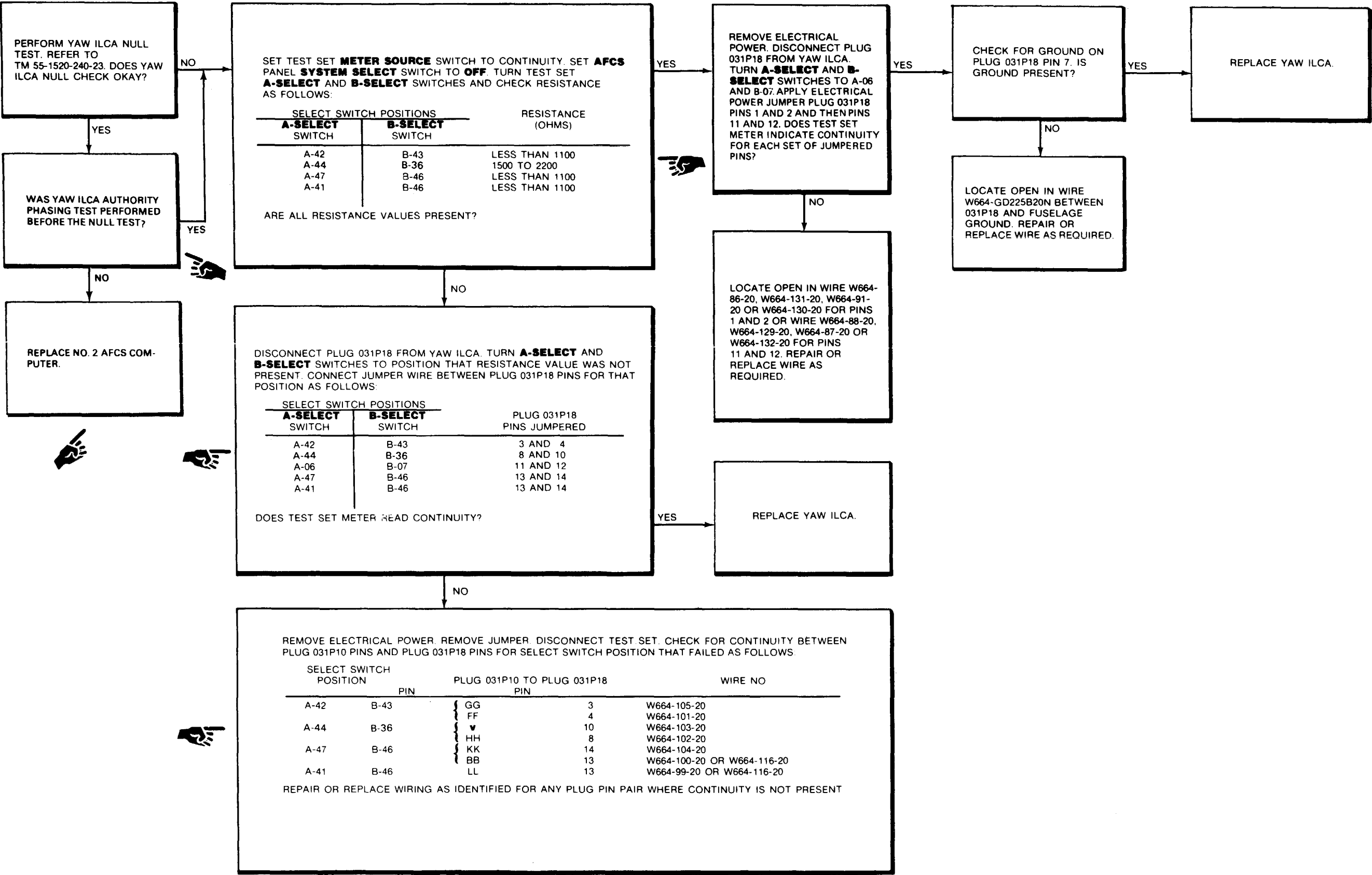
90154



0145-11957-SPA

11-3.30 NO. 2 YAW ILCA HAS ENGAGE TRANSIENT (Continued)

11-3.30





11-3.31 NO. 2 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED

11-3.31

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

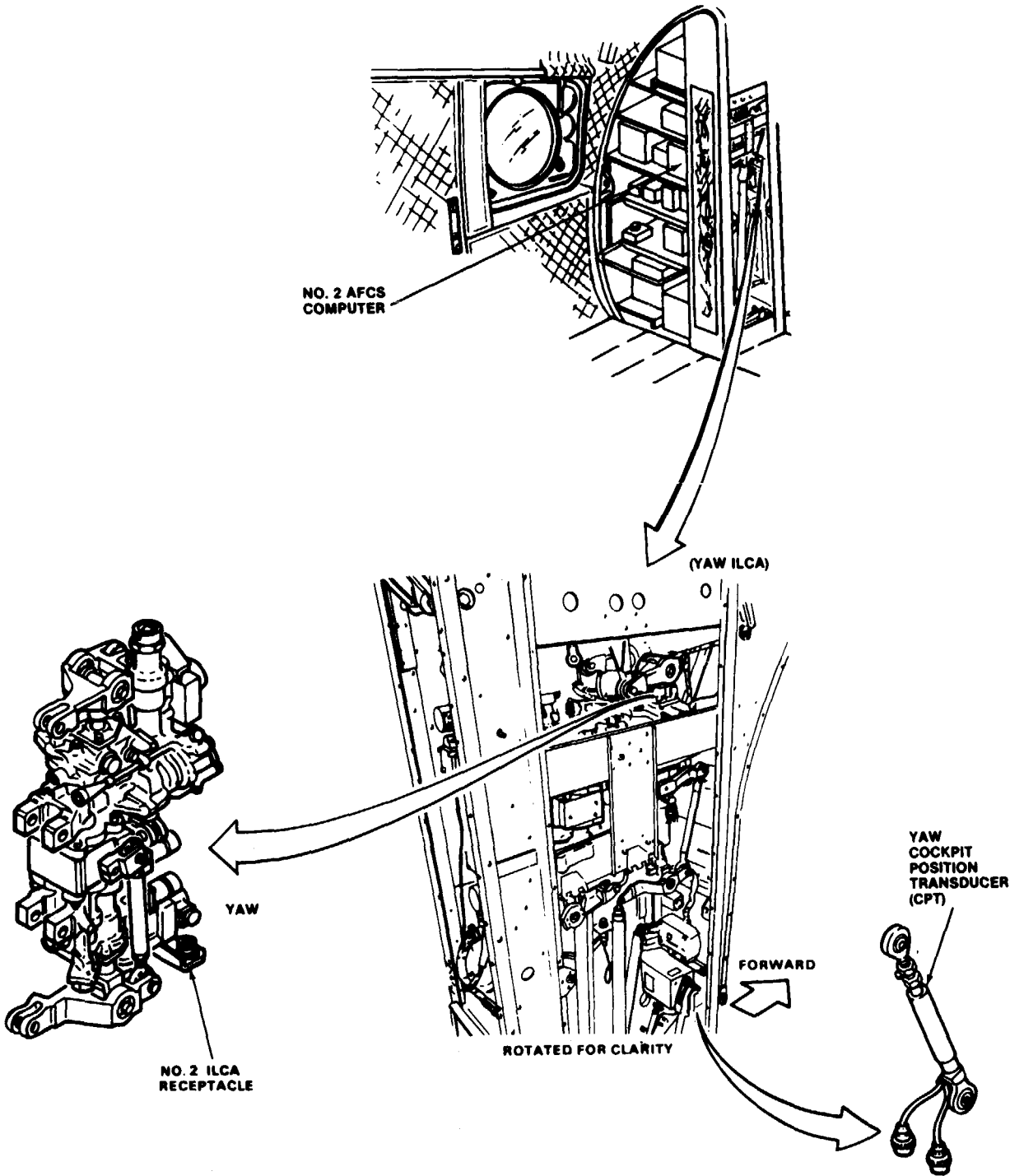
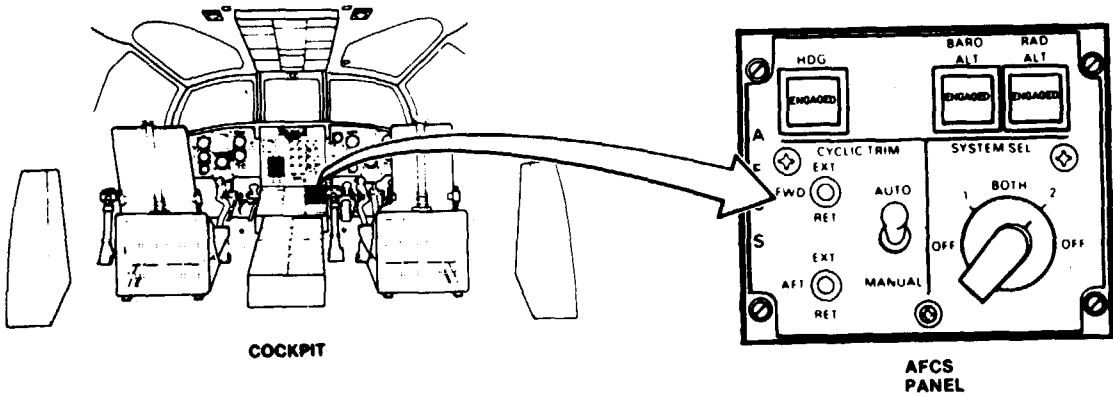
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:

TM 55-1520-240-23  
TM 55-4920-429-13

Equipment Condition:

TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared For Use

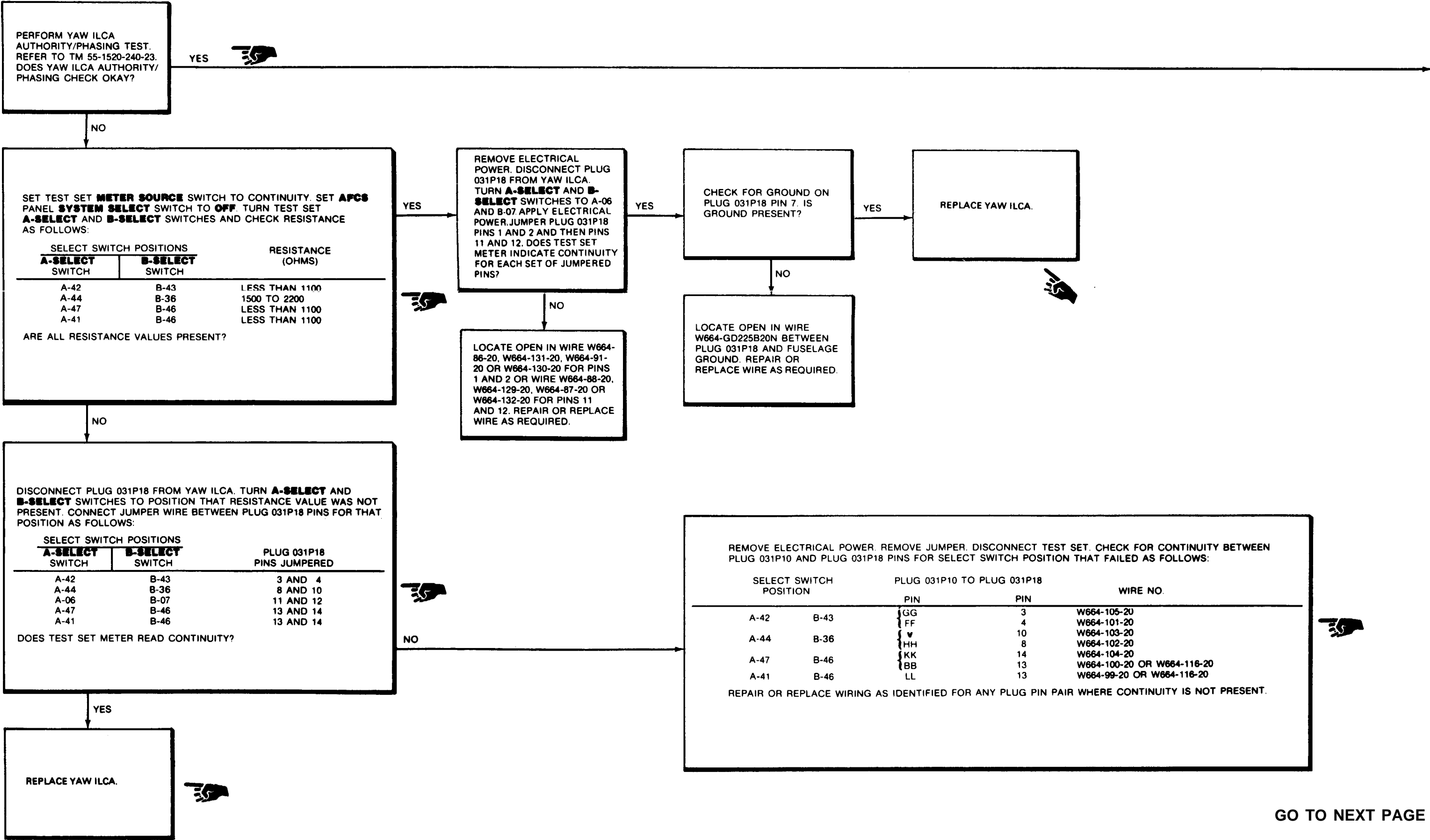


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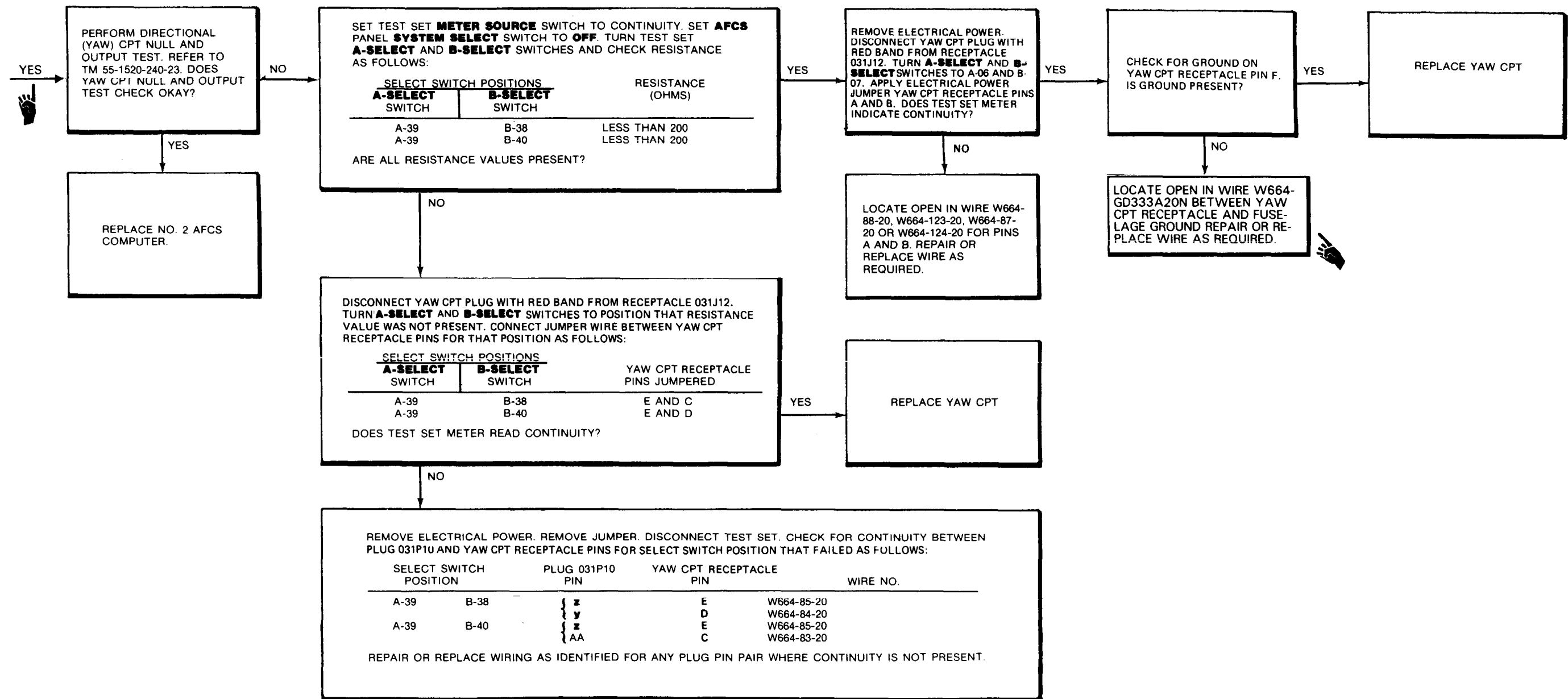
11-3.31 NO. 2 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED (Continued)

11-3.31



11-3.31 NO. 2 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED (Continued)

11-3.31





11-3.32 NO. 2 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

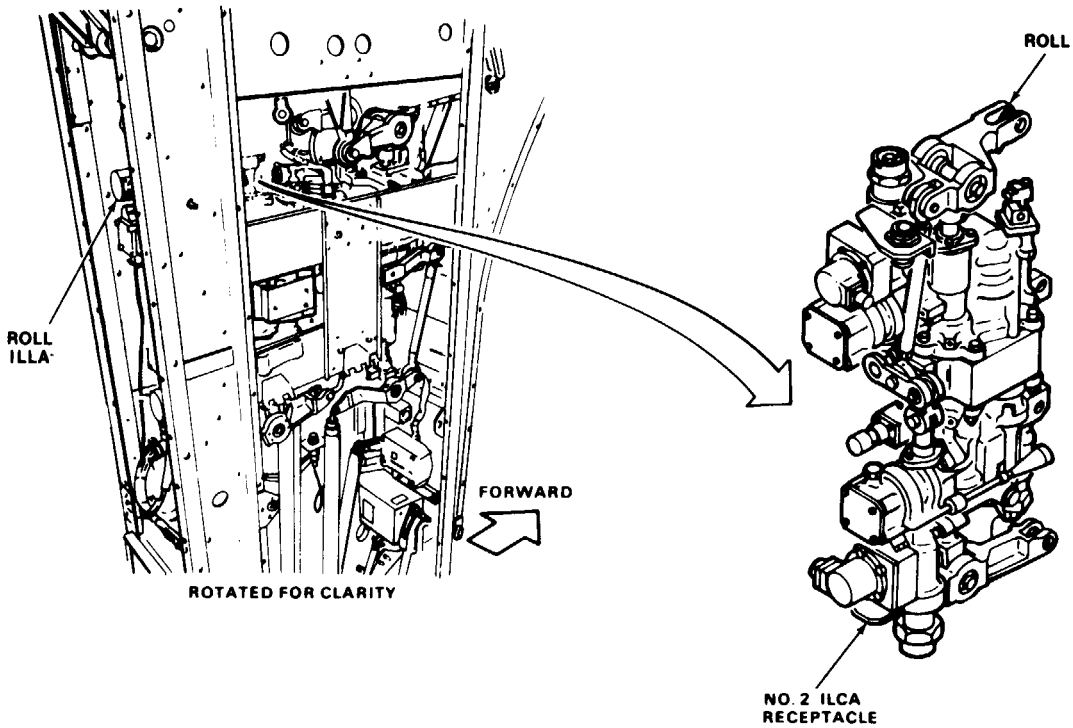
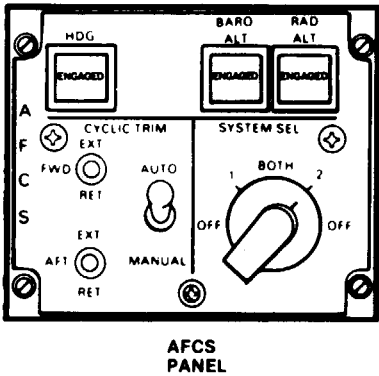
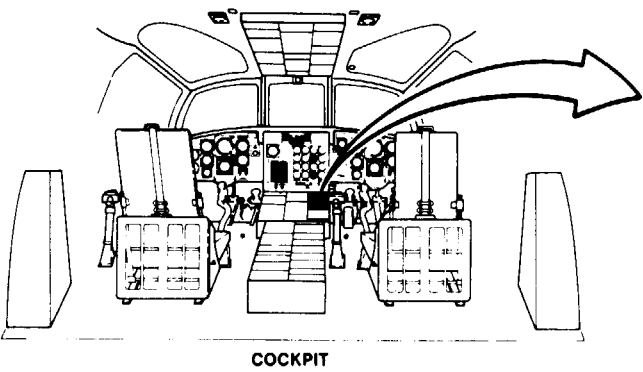
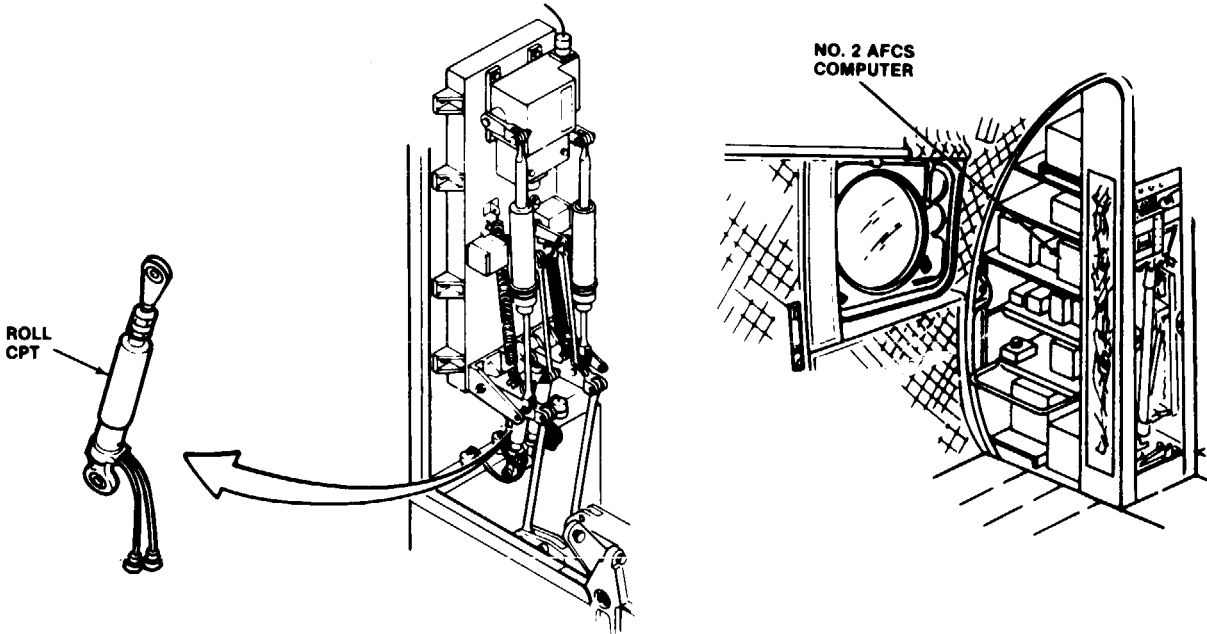
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

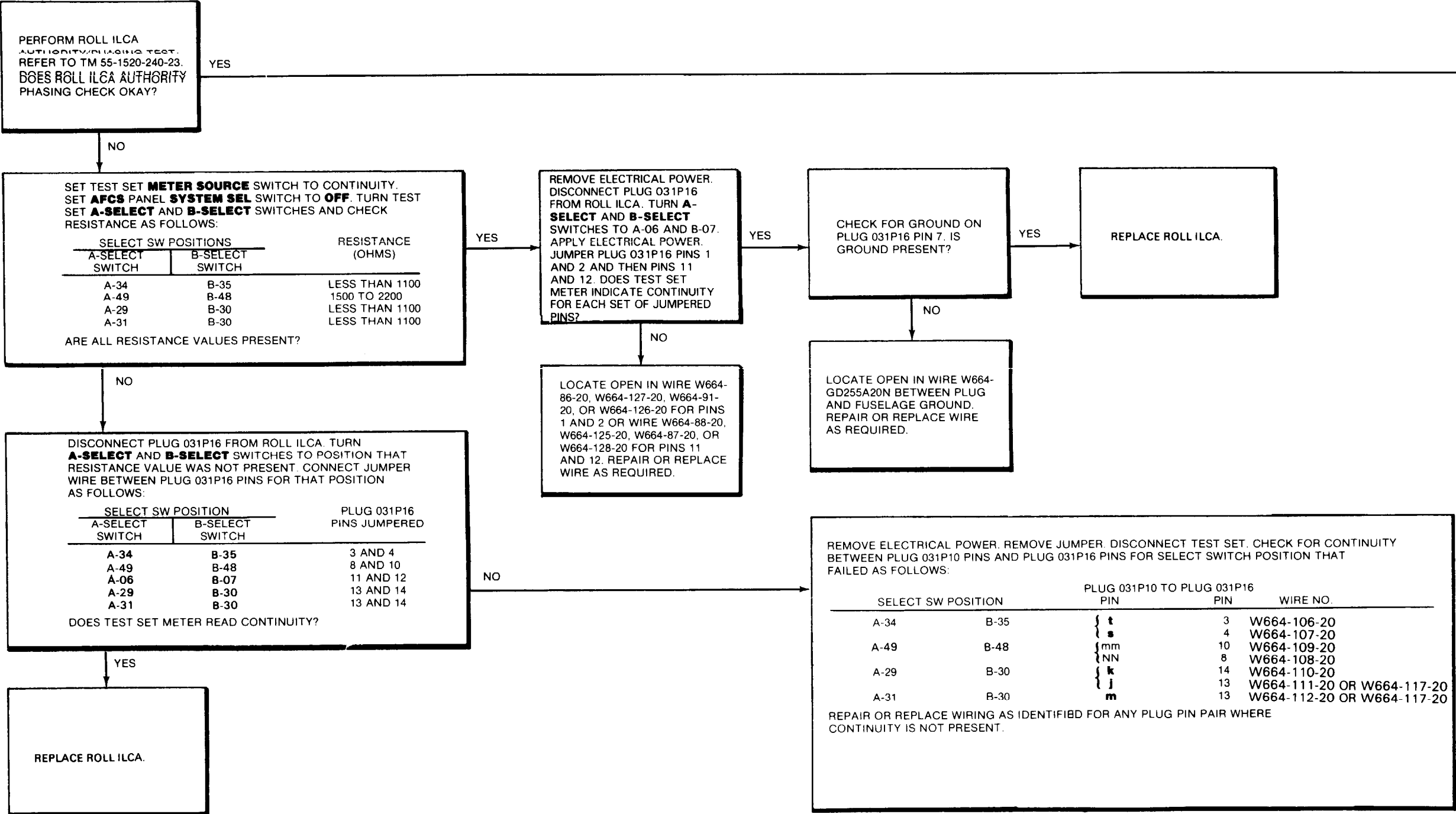
References:  
TM 55-1520-240-23  
TM 55-4920-429-13

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared For Use



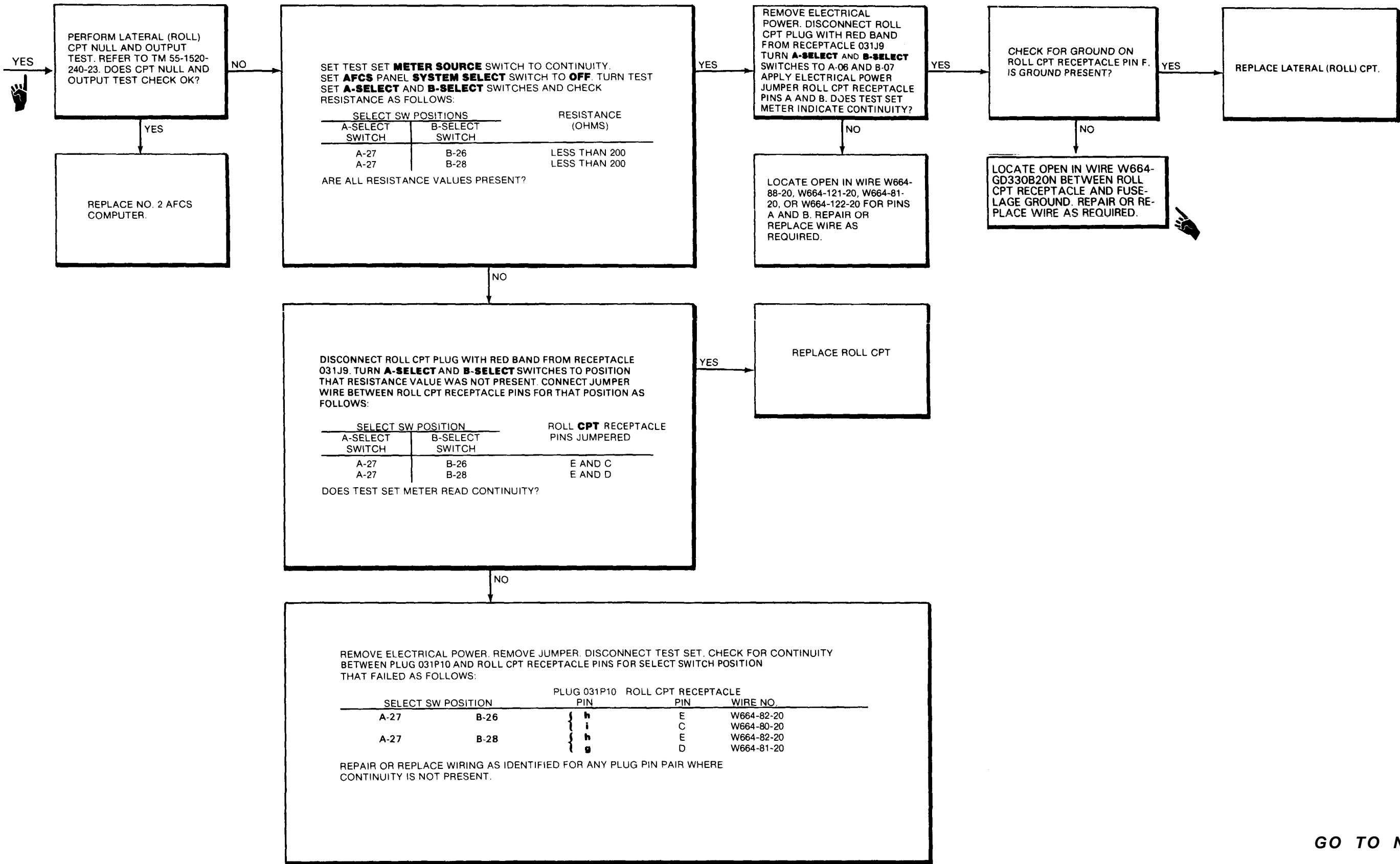
11-3.32 NO. 2 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION (Continued)

11-3.32



GO TO NEXT PAGE

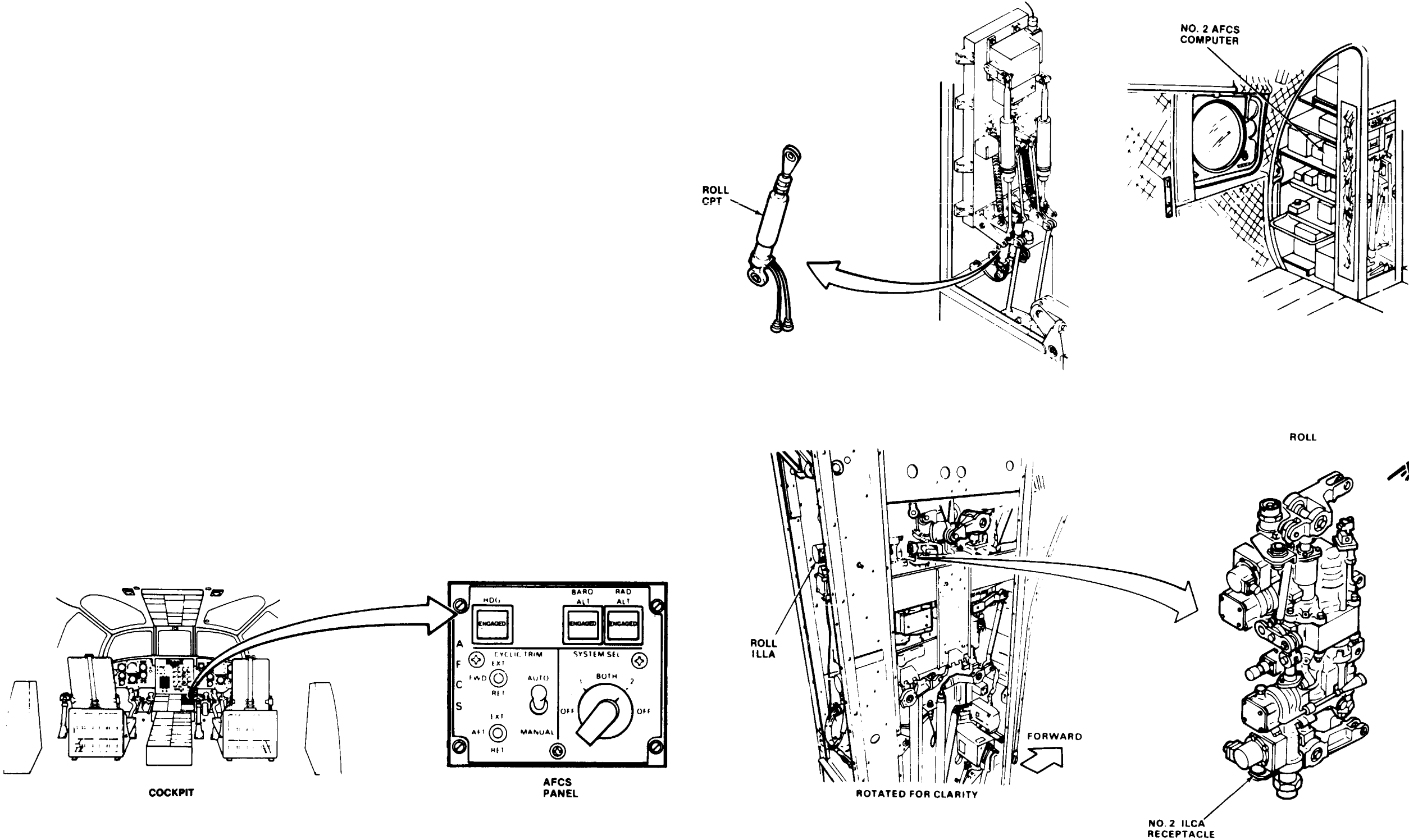
11-3.32 NO. 2 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION (Continued)



GO TO NEXT PAGE

11-3.32 NO. 2 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION (Continued)

11-3.32





11-3.33 NO. 2 ROLL ILCA DOES NOT MOVE WHEN PILOT'S OR COPILOT'S PITCH AND ROLL TRIM SWITCH MOVED RIGHT OR LEFT

11-3.33

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

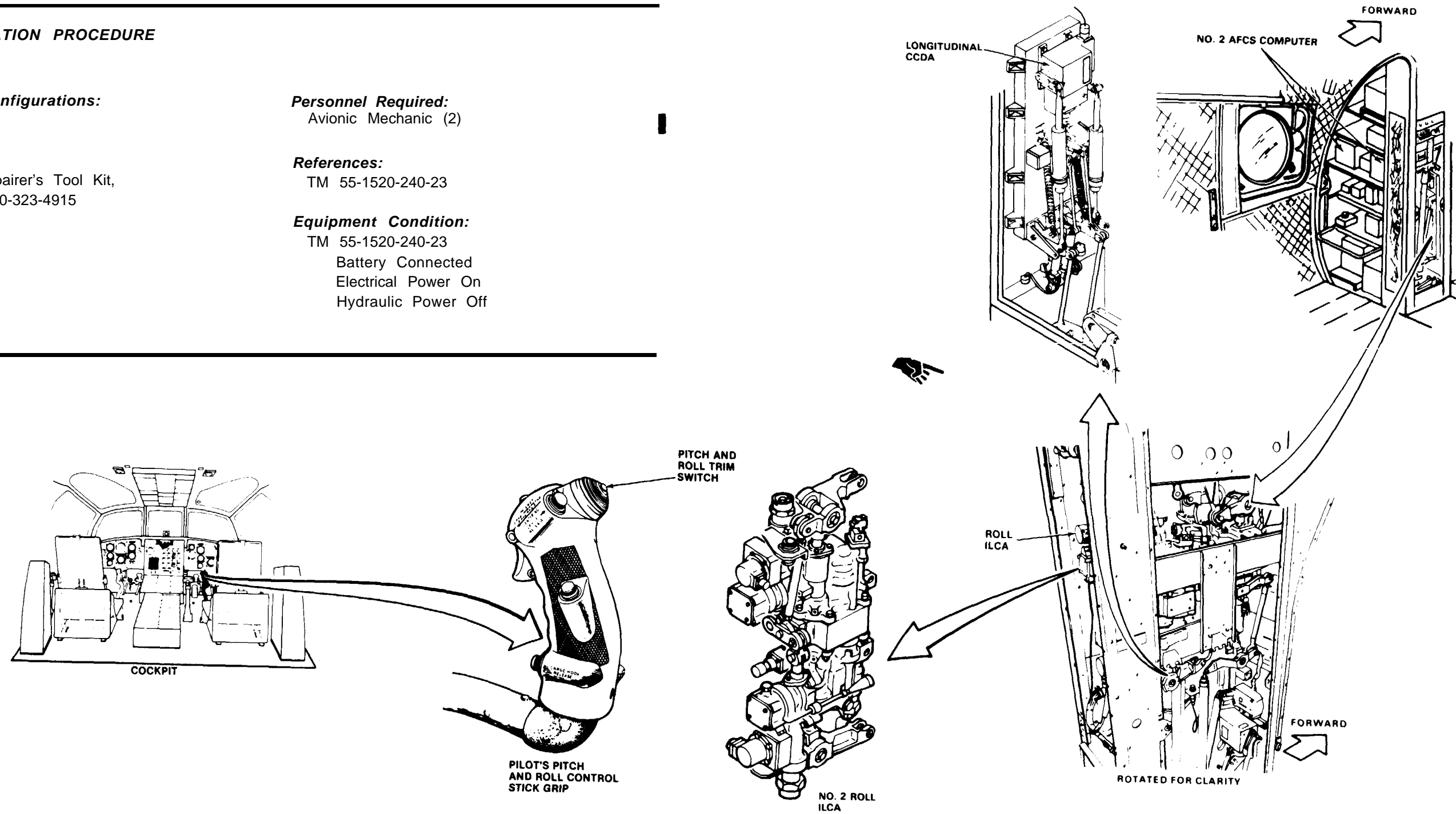
Avionic Mechanic (2)

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

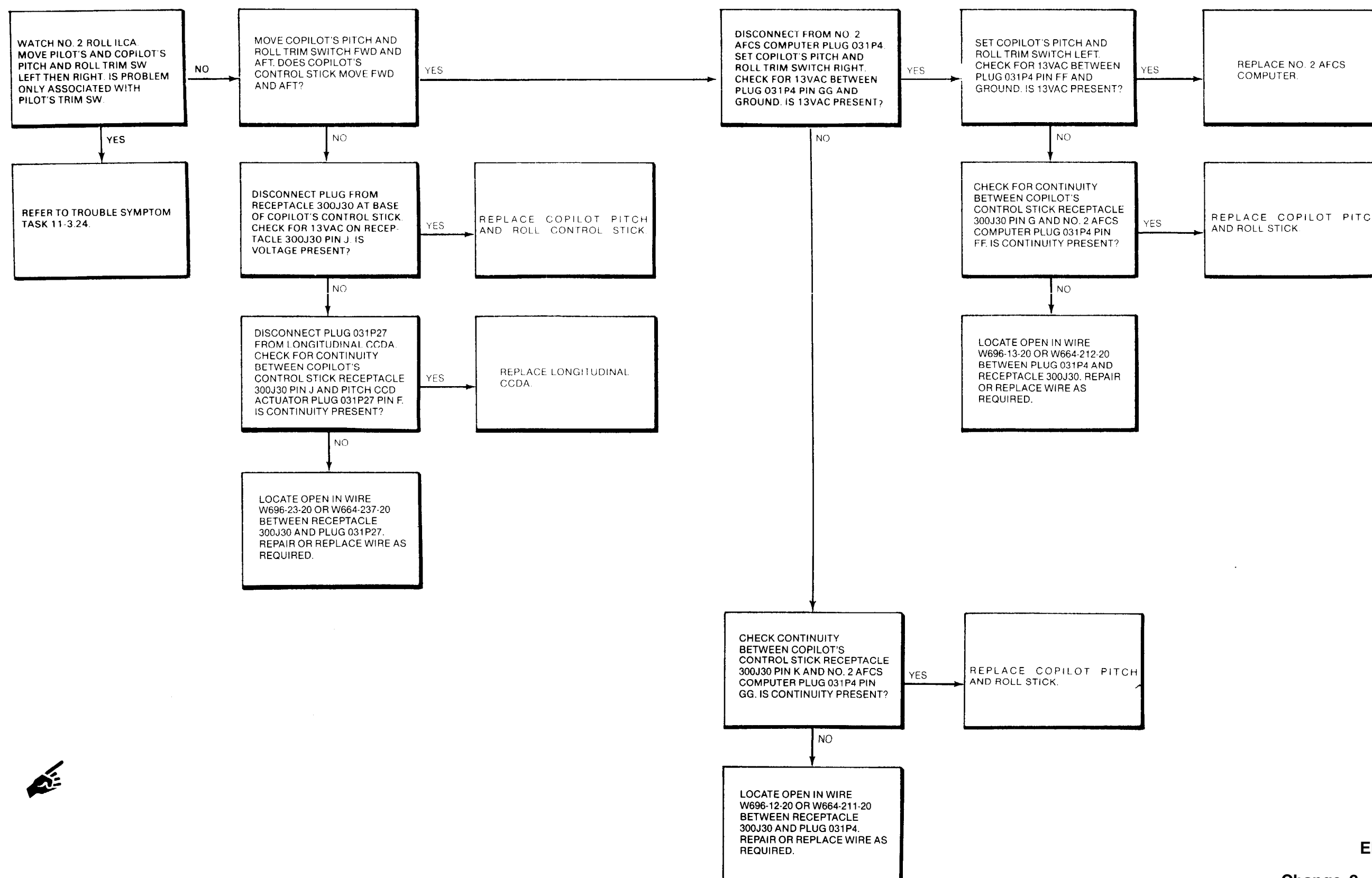


90 X 54

914

# 11-3.33 NO. 2 ROLL ILCA DOES NOT MOVE WHEN PILOT'S OR COPILOT'S PITCH AND ROLL TRIM SWITCH MOVED RIGHT OR LEFT (Continued)

11-3.33



END OF TASK

Change 2

11-131

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

Avionic Mechanic (2)

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On

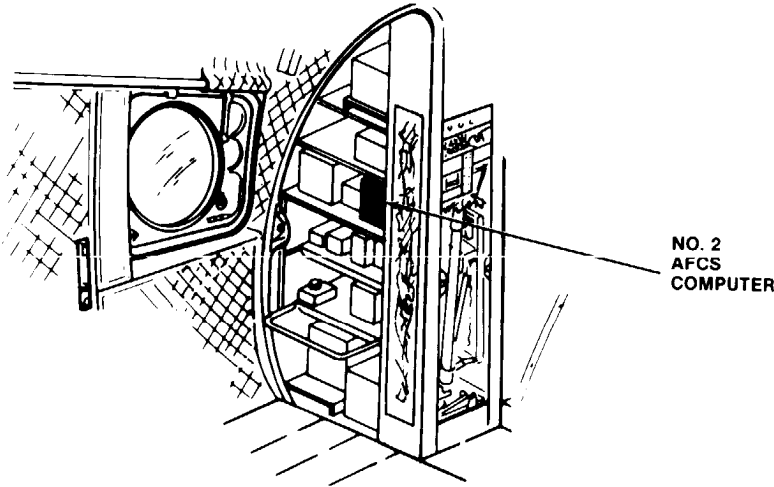
DISCONNECT PLUG 031P4 FROM NO. 2 AFCS COMPUTER. CHECK FOR GROUND ON PIN B. IS GROUND PRESENT?

YES

REPLACE NO. 2 AFCS COMPUTER.

NO

LOCATE OPEN IN WIRE W664-213-20 BETWEEN PLUG 031P4 AND TB11. REPAIR OR REPLACE WIRE AS REQUIRED.



D145-11935-SPA

11-3.34.1 FORWARD LCT ACTUATOR OPERATIONAL CHECK

11-3.34.1

INITIAL SETUP

Applicable Configurations:

All

Tools:

Digital Ohmmeter

Materials:

None

Personnel Required:

Aircraft Electrician

Medium Helicopter Repairer

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

Battery Connected

Electrical Power On

Hydraulic Power On

Work Platform Open

TASK	RESULT
1. Set cyclic trim switch (1) to MANUAL position.	
<div><div>CAUTION</div><p>Do not operate the LCT actuators without hydraulic power on the helicopter.</p></div>	
2. Using FWD (EXT-RET) switch (2), fully retract the FWD LCT actuator (3).	
3. Remove electrical power from the actuator and disconnect the connector.	
4. Using a digital ohmmeter, check pins A and C of FWD actuator connection (Task 11-3.1).	Circuit should show open.
5. Reconnect the actuator and apply electrical power.	
6. Using FWD (EXT-RET) switch (2), fully extend the FWD LCT actuator (3).	
7. Remove electrical power from the actuator and disconnect the connector.	
8. Using a digital ohmmeter, check pins B and C of FWD actuator connection (Task 11-3.1).	Circuit should show open.

TASK	RESULT
9. Reconnect the actuator and apply electrical power.	
10. Using FWD (EXT-RET) switch (2), operate the FWD actuator from full extend to full retract. Clock the travel time.	Time must not exceed 25 seconds.
11. Using FWD (EXT-RET) switch (2), operate the FWD actuator from full retract to full extend. Clock the travel time.	Time must not exceed 25 seconds
12. Manually operate the actuator to full retract.	If acceptable FWD actuator operation is not obtained in all preceding steps, replace defective actuator (TM 55-1520-240-23).
13. Move cyclic trim switch (1) to AUTO.	Cockpit LCT indicator (4) should show GND.
14. Perform an AFCS BITE TEST on the No. 1 and No. 2 systems (Task 11-3.3).	Failure of any AFCS BITE steps for LCT operation indicates possible actuator defects, Replace defective actuator (TM 55-1520-240-23),
15. Monitor the cockpit LCT indicator (4).	Erratic indicator movement indicates possible actuator defect. Replace defective actuator (TM 55-1520-240-23).

FOLLOW-ON MAINTENANCE:

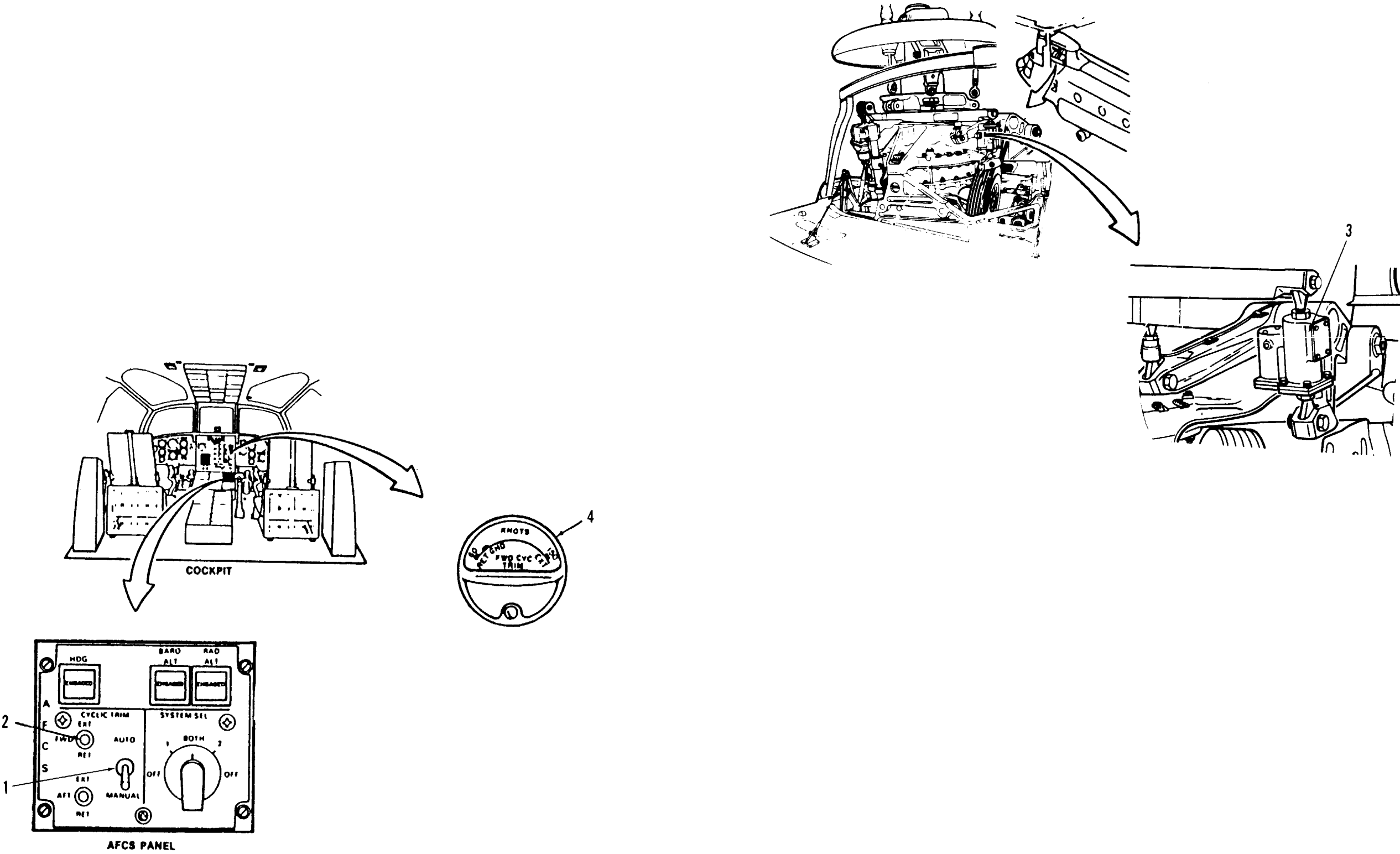
TM 55-1520-240-23:

Hydraulic power off.

Electrical power off.

Battery disconnected.

Work platform closed.



11-3.34.2 AFT LCT ACTUATOR OPERATIONAL CHECK

11-3.34.2

INITIAL SETUP

Applicable Configurations:

All

Tools:

Digital Ohmmeter

Materials:

None

Personnel Required:

Aircraft Electrician

Medium Helicopter Repairer

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

Battery Connected

Electrical Power On

Hydraulic Power On

Work Platform Open

TASK	RESULT
1. Set cyclic trim switch (1) to MANUAL position.	
<div><div>CAUTION</div><div>Do not operate the LCT actuators without hydraulic power on the helicopter.</div></div>	
2. Using AFT (EXT-RET) switch (2), fully retract the AFT LCT actuator (3).	
3. Remove electrical power from the actuator and disconnect the connector.	
4. Using a digital ohmmeter, check pins A and C of AFT actuator connection (Task 11-3.1).	Circuit should show open.
5. Reconnect the actuator and apply electrical power.	
6. Using AFT (EXT-RET) switch (2), fully extend the AFT LCT actuator (3).	
7. Remove electrical power from the actuator and disconnect the connector.	
8. Using a digital ohmmeter, check pins B and C of AFT actuator connection (Task 11-3.1).	Circuit should show open.

TASK	RESULT
9. Reconnect the actuator and apply electrical power.	
10. Using AFT (EXT-RET) switch (2), operate the AFT actuator (3) from full extend to full retract. Clock the travel time.	Time must not exceed 25 seconds.
11. Using AFT (EXT-RET) switch (2), operate the AFT actuator (3) from full retract to full extend. Clock the travel time.	Time must not exceed 25 seconds.
12. Manually operate the actuator to full retract.	If acceptable AFT actuator operation is not obtained in all preceding steps, replace defective actuator (TM 55-1520-240-23).
13. Move cyclic trim switch (1) to AUTO.	Cockpit LCT indicator (4) should show GND.
14. Perform an AFCS BITE TEST on the No. 1 and No. 2 systems (Task 11-3.3).	Failure of any AFCS BITE steps for LCT operation indicates possible actuator defect. Replace defective actuator (TM 55-1520-240-23).
15. Monitor the cockpit LCT indicator (4).	Erratic indicator movement indicates possible actuator defect. Replace defective actuator (TM 55-1520-240-23).

FOLLOW-ON MAINTENANCE:

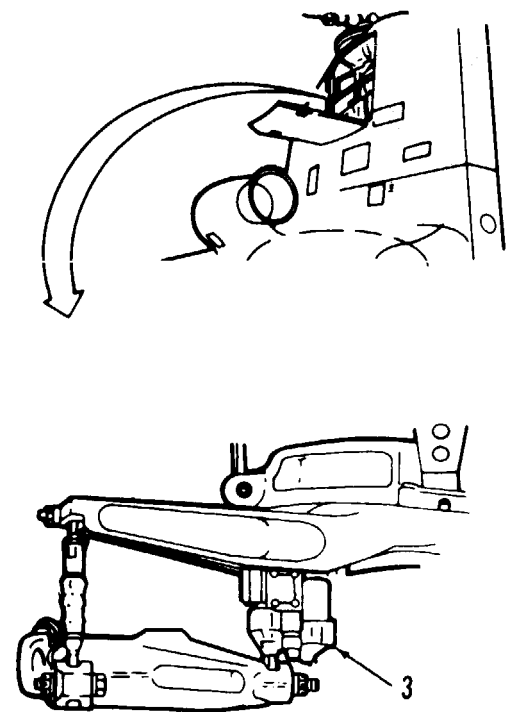
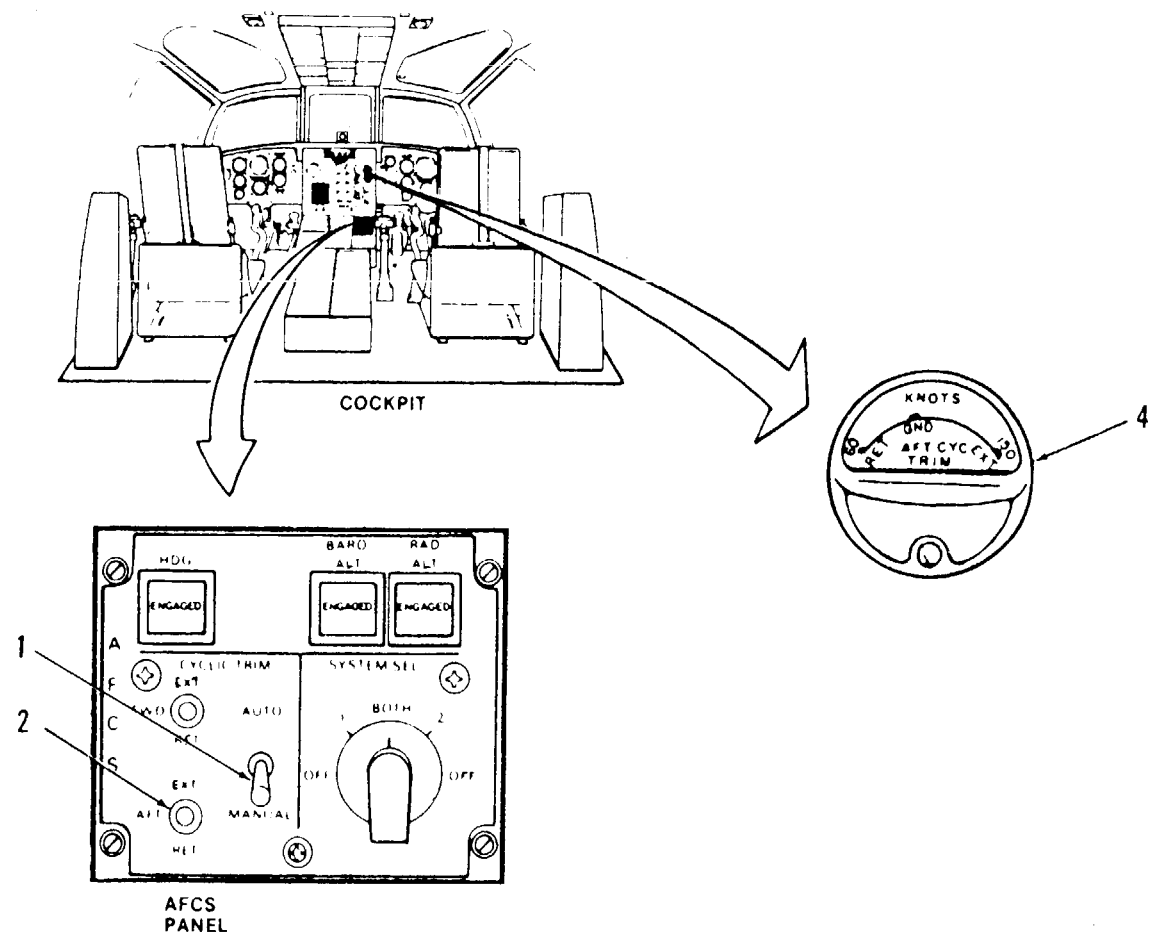
TM 55-1520-240-23:

Hydraulic power off.

Electrical power off.

Battery disconnected.

Work platform closed.



11-3.34.3 LCT ACTUATOR CONTROL TRANSISTOR BURNS OUT

11-3.34.3

INITIAL SETUP

Applicable Configurations:

All

Tools:

None

Materials:

None

Personnel Required:

Aircraft Electrician

Medium Helicopter Repairer

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23

Battery Connected

Electrical Power On

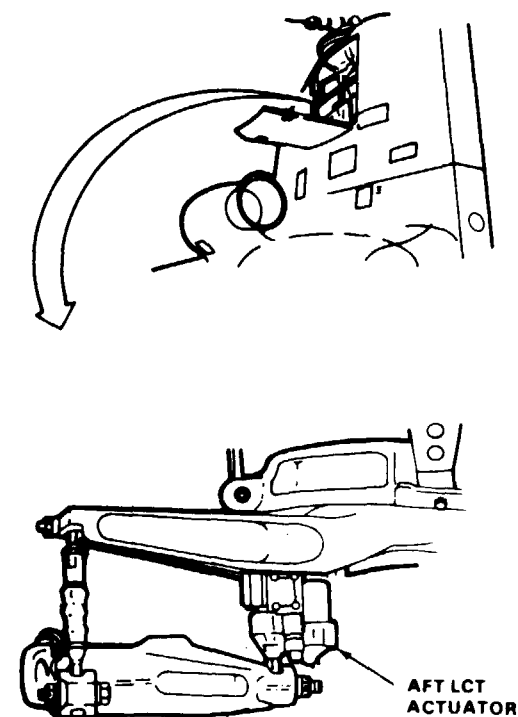
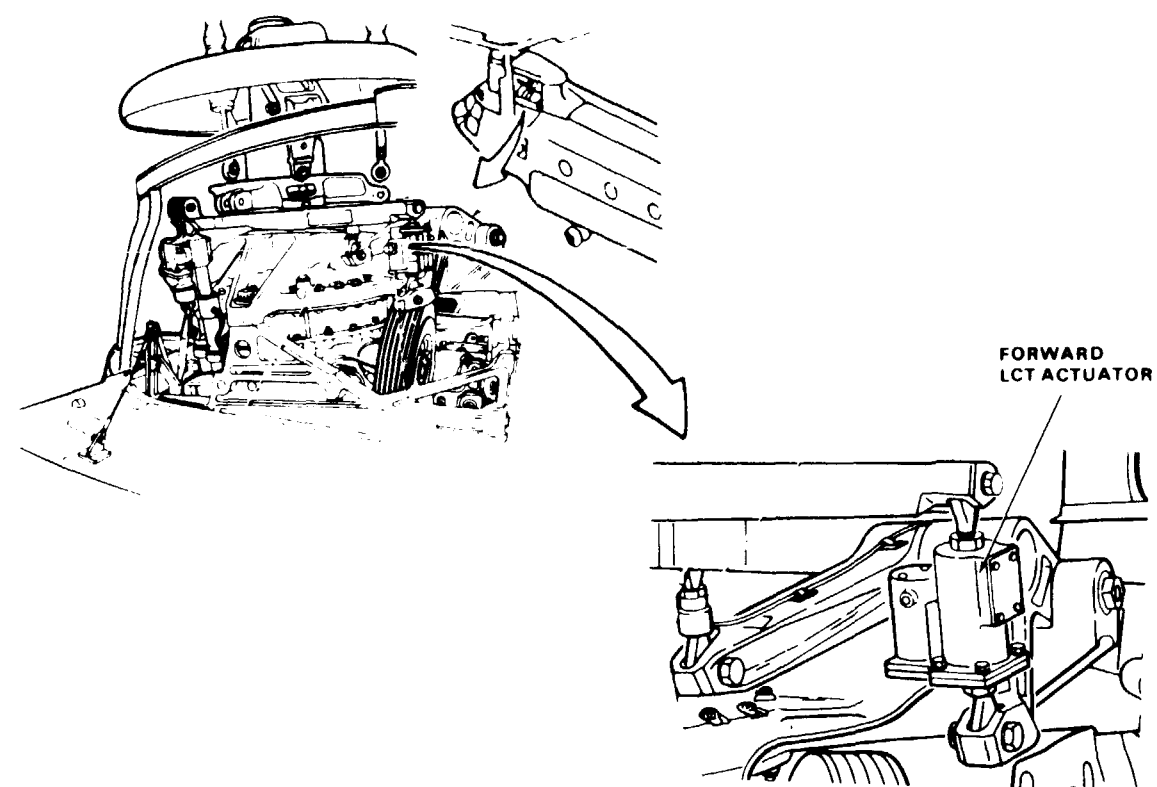
Hydraulic Power On

Work Platform Open

TASK	RESULT
1. Perform forward and aft LCT actuator operational checks (Tasks 11-3.34.1 and 11-3.34.2).	
2. Inspect forward and aft LCT actuators.	Replace LCT actuators as required (TM 55-1520-240-23).
3. Inspect helicopter wires and connectors for damage and contamination (Task 11-3.1).	



11-3.34.3 LCT ACTUATOR CONTROL TRANSISTOR BURNS OUT (Continued)



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

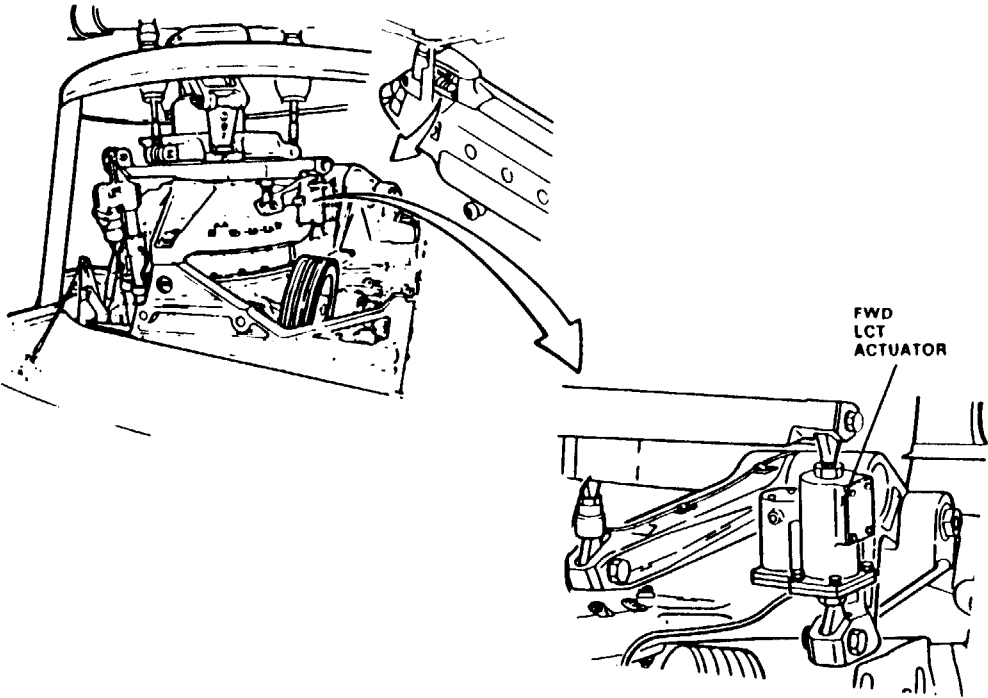
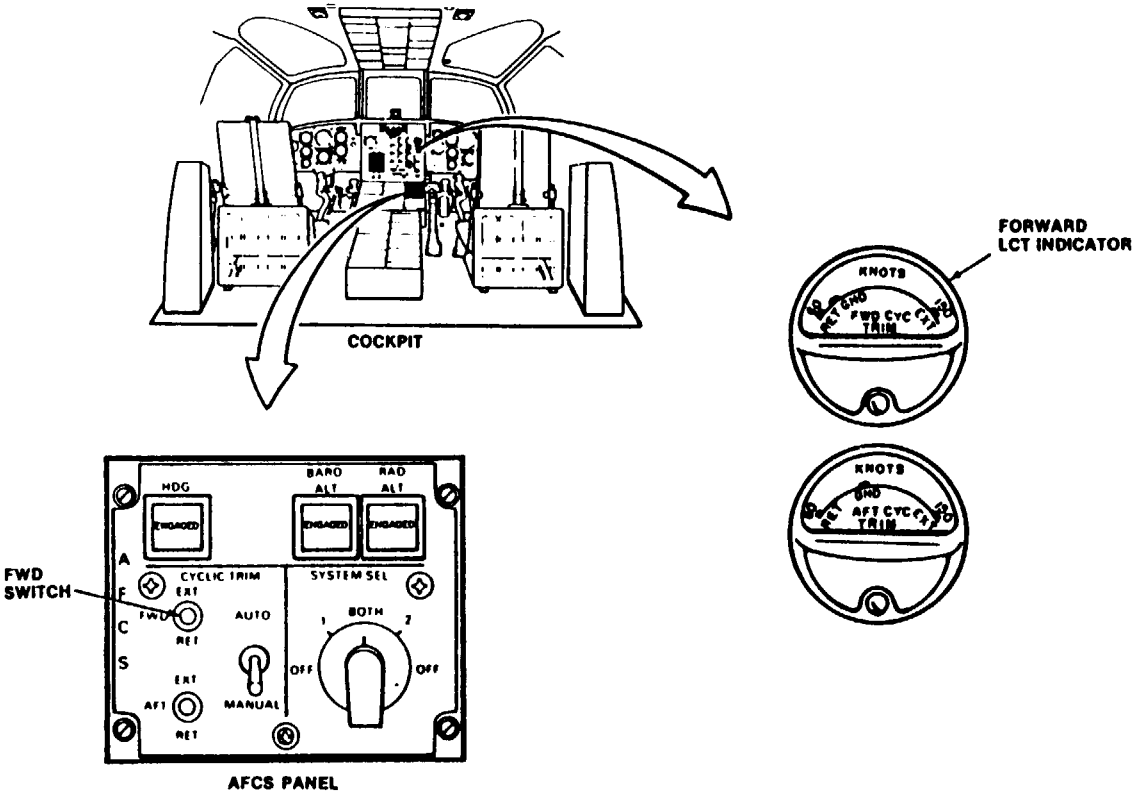
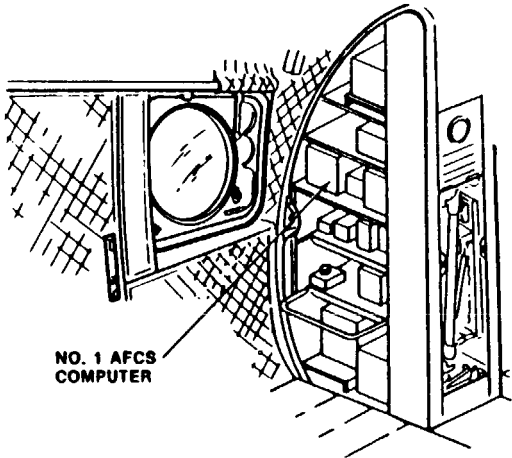
Avionic Mechanic  
Avionic Mechanic

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On



D145-11919-SPA

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11-3.34.1 FORWARD LCT ACTUATOR OPERATIONAL CHECK

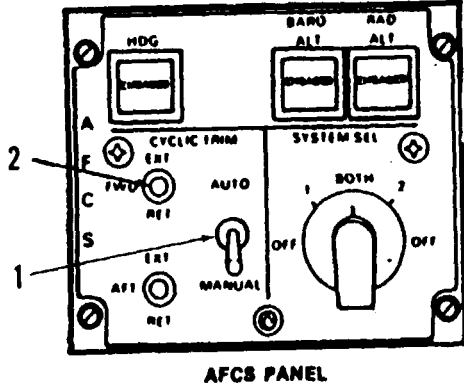
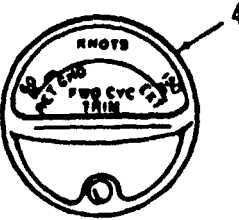
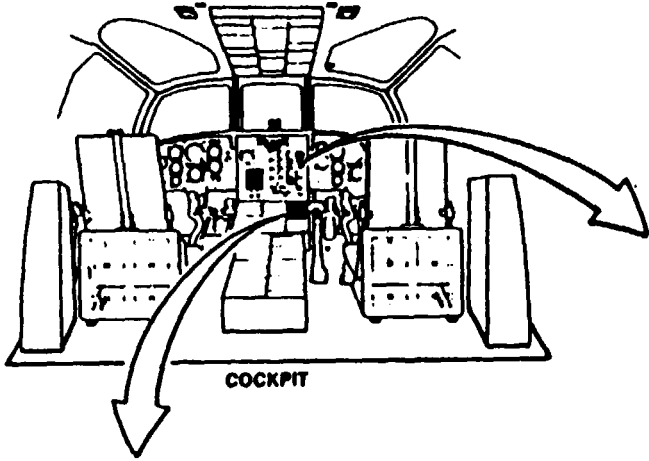
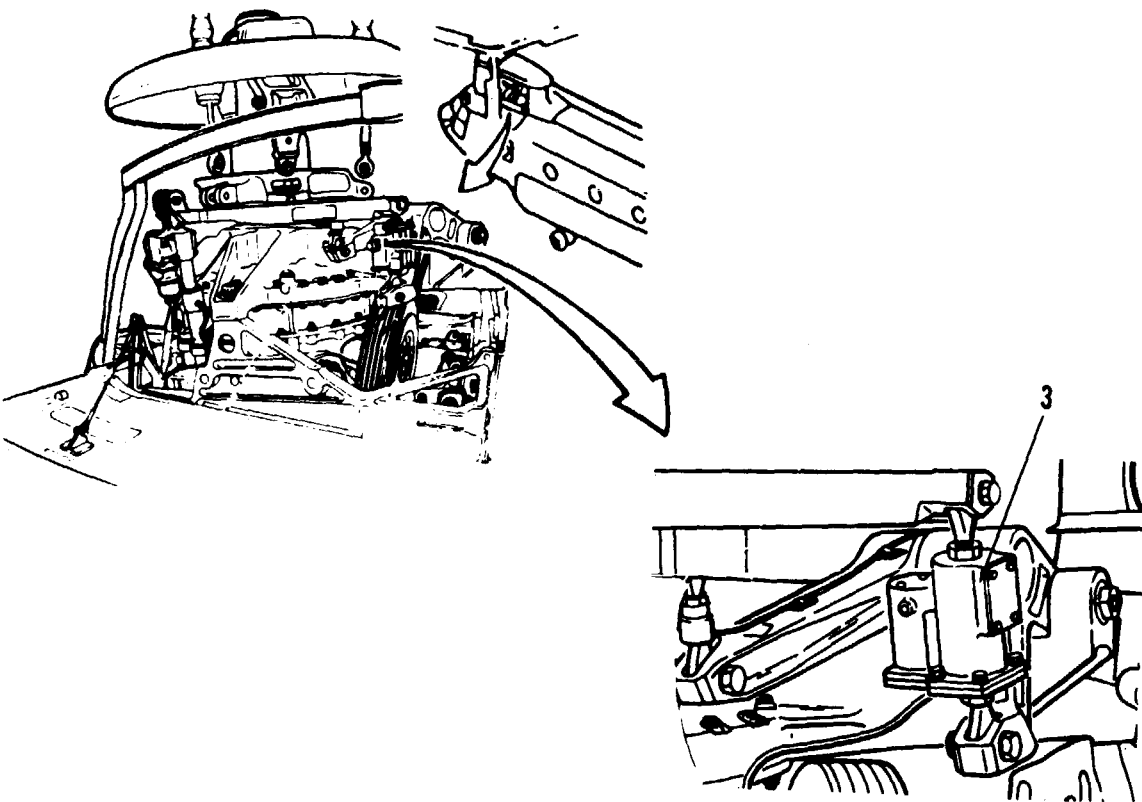
INITIAL SETUP	Personnel Required: Aircraft Electrician Medium Helicopter Repairer
Applicable Configurations: All	References: TM 55-1520-240-23
Tools: Digital Ohmmeter	Equipment Condition: TM 55-1520-240-23 Battery Connected Electrical Power On Hydraulic Power On Work Platform Open
Materials: None	

TASK	RESULT
1. Set cyclic trim switch (1) to MANUAL position.	
<div><div>CAUTION</div><div>Do not operate the LCT actuators manually without hydraulic power on the helicopter.</div></div>	
2. Using FWD (EXT-RET) switch (2), fully retract the FWD LCT actuator (3).	
3. Remove electrical power from the actuator and disconnect the connector.	
4. Using a digital ohmmeter, check pins A and C of FWD actuator connection (TASK 11-3.1).	Circuit should show open.
5. Reconnect the actuator and apply electrical power.	
6. Using FWD (EXT-RET) switch (2), fully extend the FWD LCT actuator (3).	
7. Remove electrical power from the actuator and disconnect the connector.	
8. Using a digital ohmmeter, check pins B and C of FWD actuator connection (TASK 11-3.1).	Circuit should show open.

TASK	RESULT
9. Reconnect the actuator and apply electrical power.	
10. Using FWD (EXT-RET) switch (2), operate the FWD actuator from full extend to full retract. Clock the travel time.	Time must not exceed 25 seconds.
11. Using FWD (EXT-RET) switch (2), operate the FWD actuator from full retract to full extend. Clock the travel time.	Time must not exceed 25 seconds.
12. Manually operate the actuator to full retract.	If acceptable FWD actuator operation is not obtained in all preceding steps, replace defective actuator (TM 55-1520-240-23).
13. Move cyclic trim switch (1) to AUTO.	Cockpit LCT indicator (4) should show GND.
14. Perform an AFCS BITE TEST on the No. 1 and No. 2 systems (TASK 11-3.3).	Failure of any AFCS BITE steps for LCT operation indicates possible actuator defects. Replace defective actuator (TM 55-1520-240-23).
15. Monitor the cockpit LCT indicator (4).	Erratic indicator movement indicates possible actuator defect. Replace defective actuator (TM 55-1520-240-23).

FOLLOW-ON MAINTENANCE

TM 55-1520-240-23  
Hydraulic Power Off  
Electrical Power Off  
Battery Disconnected  
Work Platform Closed



11-3.34.2 AFT LCT ACTUATOR OPERATIONAL CHECK

INITIAL SETUP

**Applicable Configurations:**  
All

**Tools:**  
Digital Ohmmeter

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician  
Medium Helicopter Repairer

**References:**  
TM 55-1520-240-23

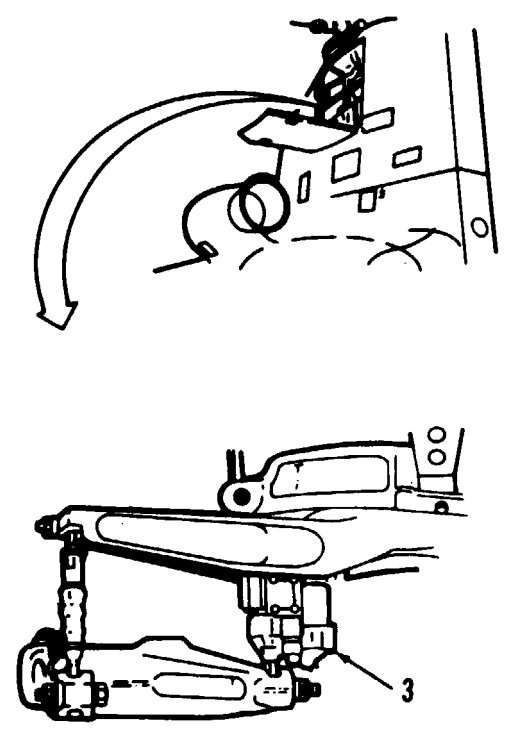
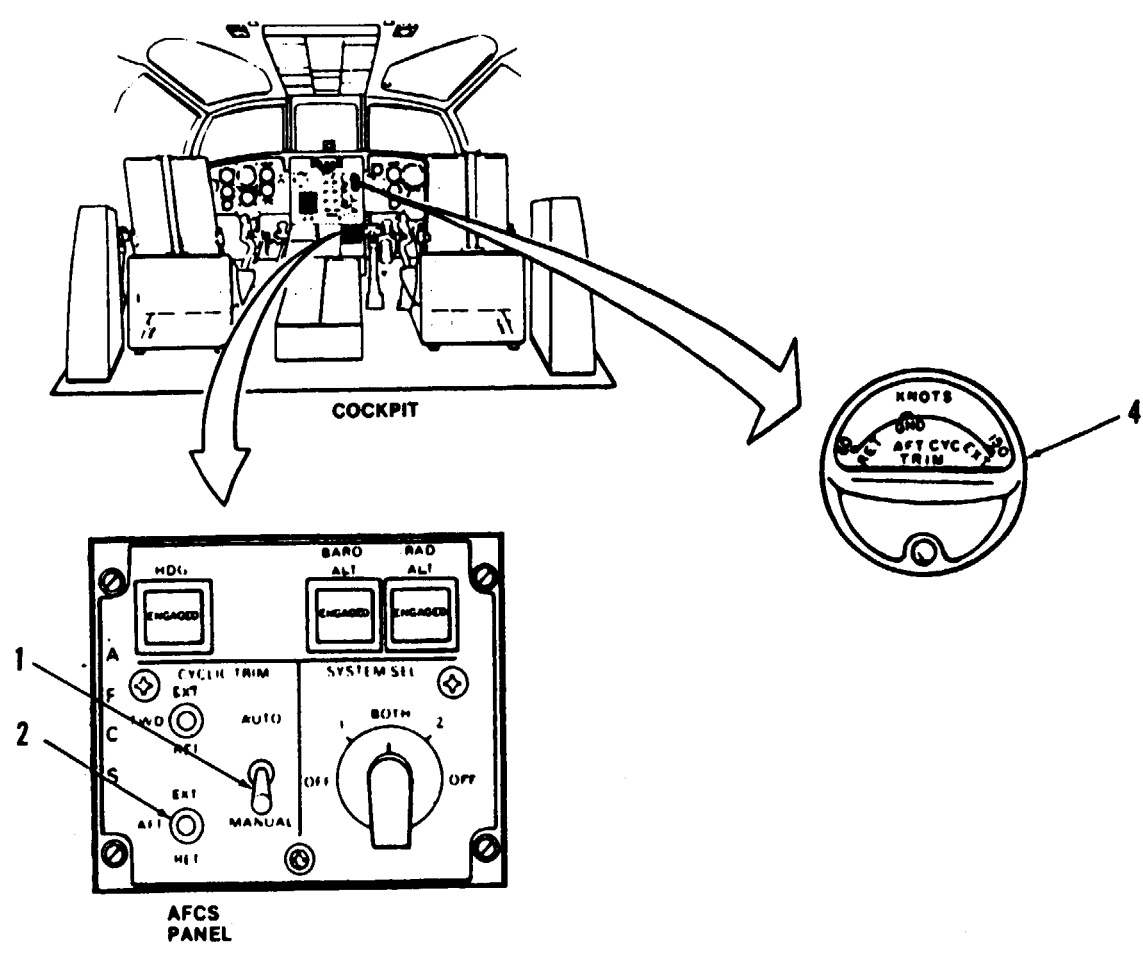
**Equipment Condition:**  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
Work Platform Open

TASK	RESULT
1. Set cyclic trim switch (1) to manual position.	
<div><div><div>CAUTION</div></div><div>Do not operate the LCT actuators manually without hydraulic power on the helicopter.</div></div>	
2. Using AFT (EXT-RET) switch (2), fully retract the AFT LCT actuator.	
3. Remove electrical power from the actuator and disconnect the connector.	
4. Using a digital ohmmeter, check pins A and C of AFT actuator connection (TASK 11-3.1).	Circuit should show open.
5. Reconnect the actuator and apply electrical power.	
6. Using AFT (EXT-RET) switch (2), fully extend the AFT LCT actuator (3).	
7. Remove electrical power from the actuator and disconnect the connector.	
8. Using a digital ohmmeter, check pins B and C of AFT actuator connection (TASK 11-3.1).	Circuit should show open.

TASK	RESULT
9. Reconnect the actuator and apply electrical power.	
10. Using AFT (RET-EXT) switch (2), operate the AFT actuator (3) from full extend to full retract. Clock the travel time.	Time must not exceed 25 seconds.
11. Using AFT (RET-EXT) switch (2), operate the AFT actuator (3) from full retract to full extend. Clock the travel time.	Time must not exceed 25 seconds.
12. Manually operate the actuator to full retract.	If acceptable AFT actuator operation is not obtained in all preceding steps, replace defective actuator (TM 55-1520-240-23).
13. Move cyclic trim switch (1) to AUTO.	Cockpit LCT indicator (4) should show GND.
14. Perform an AFCS BITE TEST on the No. 1 and No. 2 systems (TASK 11-3.3).	Failure of any AFCS BITE steps for LCT operation indicates possible actuator defect. Replace defective actuator (TM 55-1520-240-23).
15. Monitor the cockpit LCT indicator (4).	Erratic indicator movement indicates possible actuator defect. Replace defective actuator (TM 55-1520-240-23).

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23  
Hydraulic Power Off  
Electrical Power Off  
Battery Disconnected  
Work Platform Closed



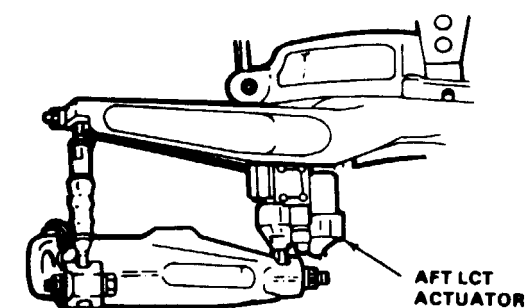
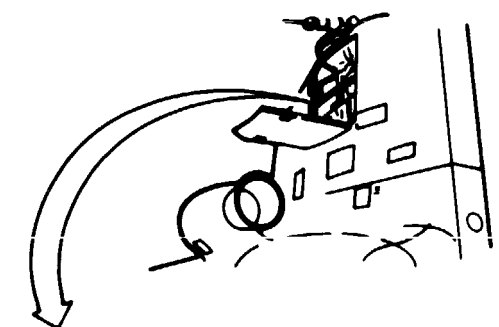
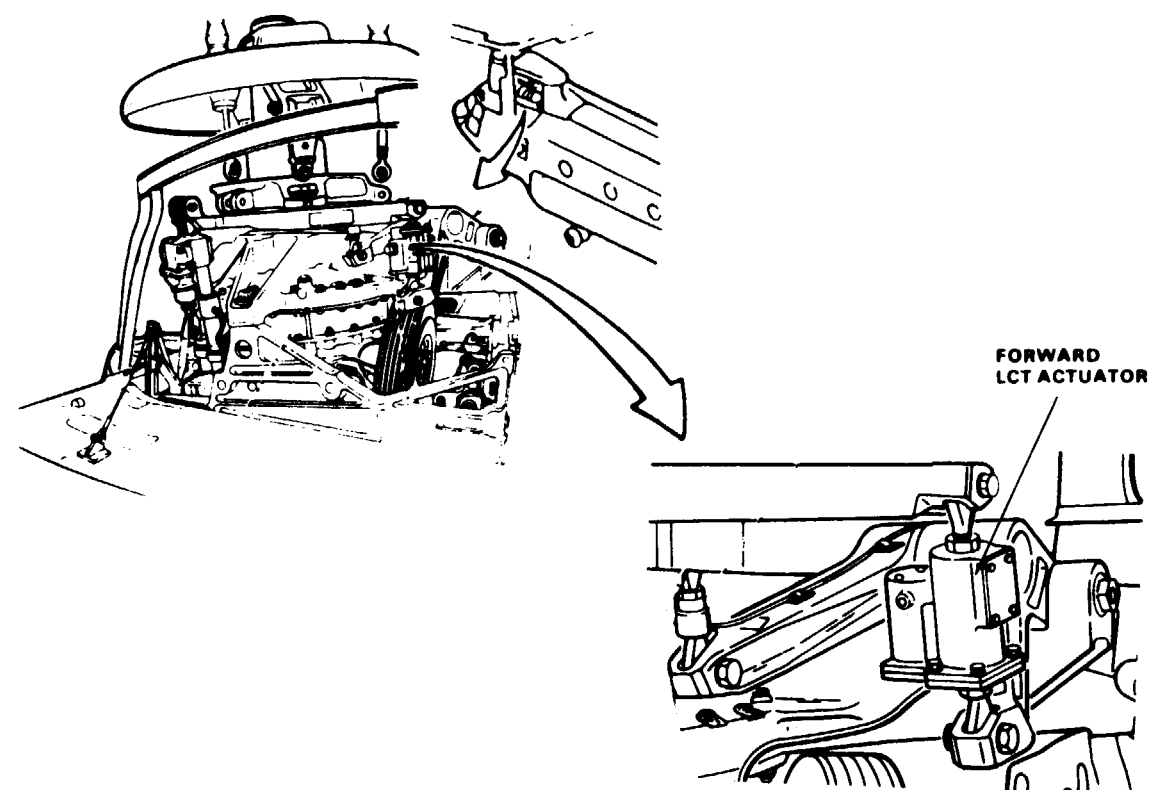
END OF TASK

11-3.34.3 LCT ACTUATOR CONTROL TRANSISTOR BVRNS OUT

INITIAL SETUP	<b>Personnel Required:</b> Aircraft Electrician Medium Helicopter Repairer
<b>Applicable Configurations:</b> All	<b>References:</b> TM 55-1520-240-23
<b>Tools:</b> None	<b>Equipment Condition</b> TM 55-1520-240-23 Buttery Disconnected Electrical Power Off Hydraulic Power Off Work Platform Open
<b>Materials:</b> None	

TASK	RESULT
1. Perform forward and aft LCT actuator operational checks (Tasks 11-3.34.1 and 11-3.34.2).	
2. Inspect forward and aft LCT actuators.	Replace LCT actuators as required (TM 55-1520-240-23).
3. Inspect helicopters wires and connectors for damage and contamination (TASK 11-3.1).	

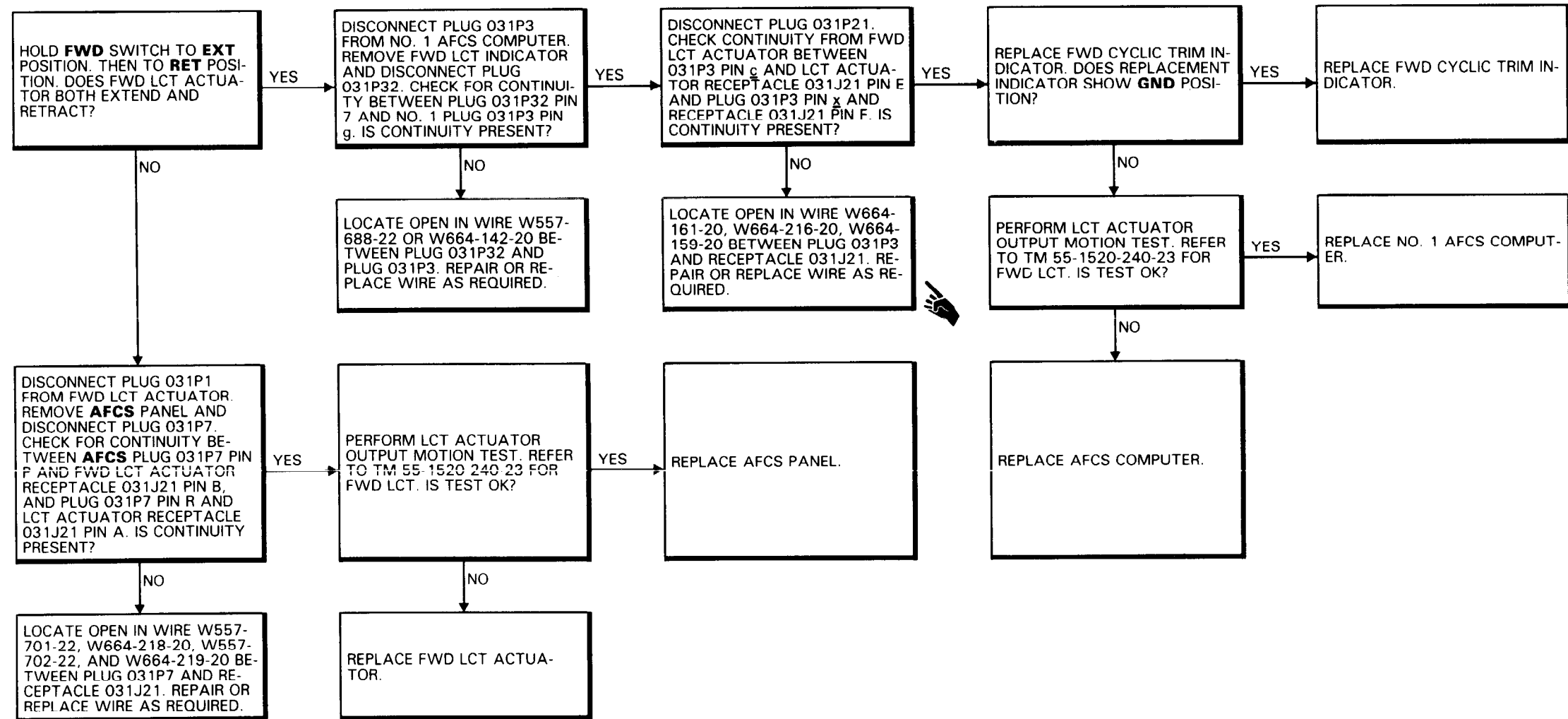




END OF TASK

11-3.35 FORWARD LCT INDICATOR DOES NOT INDICATE EXTEND OR RETRACT DURING MANUAL CONTROL (Continued)

11-3.35



11-3.36 AFT LCT INDICATOR DOES NOT INDICATE EXTEND OR RETRACT DURING MANUAL CONTROL

11-3.36

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Personnel Required:

- 38K10 Avionic Mechanic
- 35K20 Avionic Mechanic

Tools:

- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
- Multimeter

References:

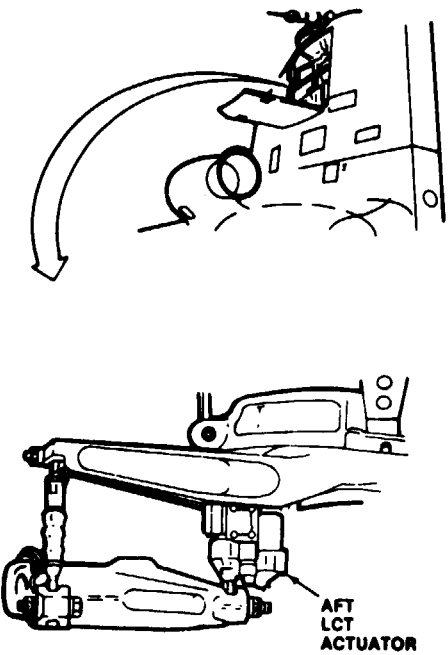
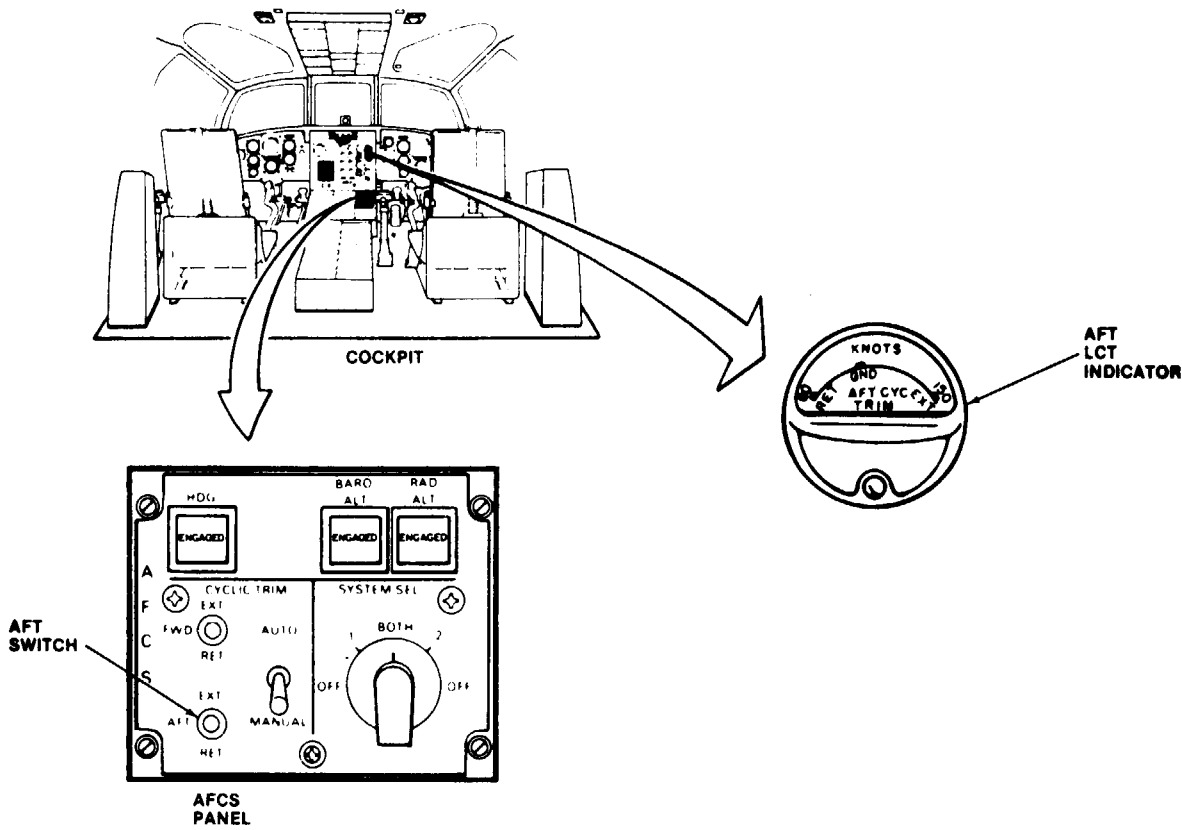
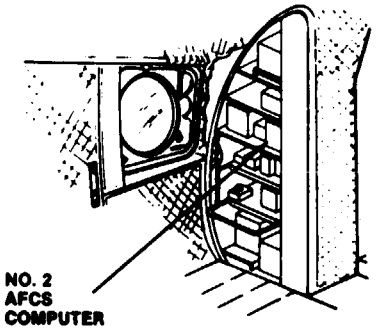
TM 55-1520-240-23

Equipment Condition:

- TM 55-1520-240-23
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

Materials:

None

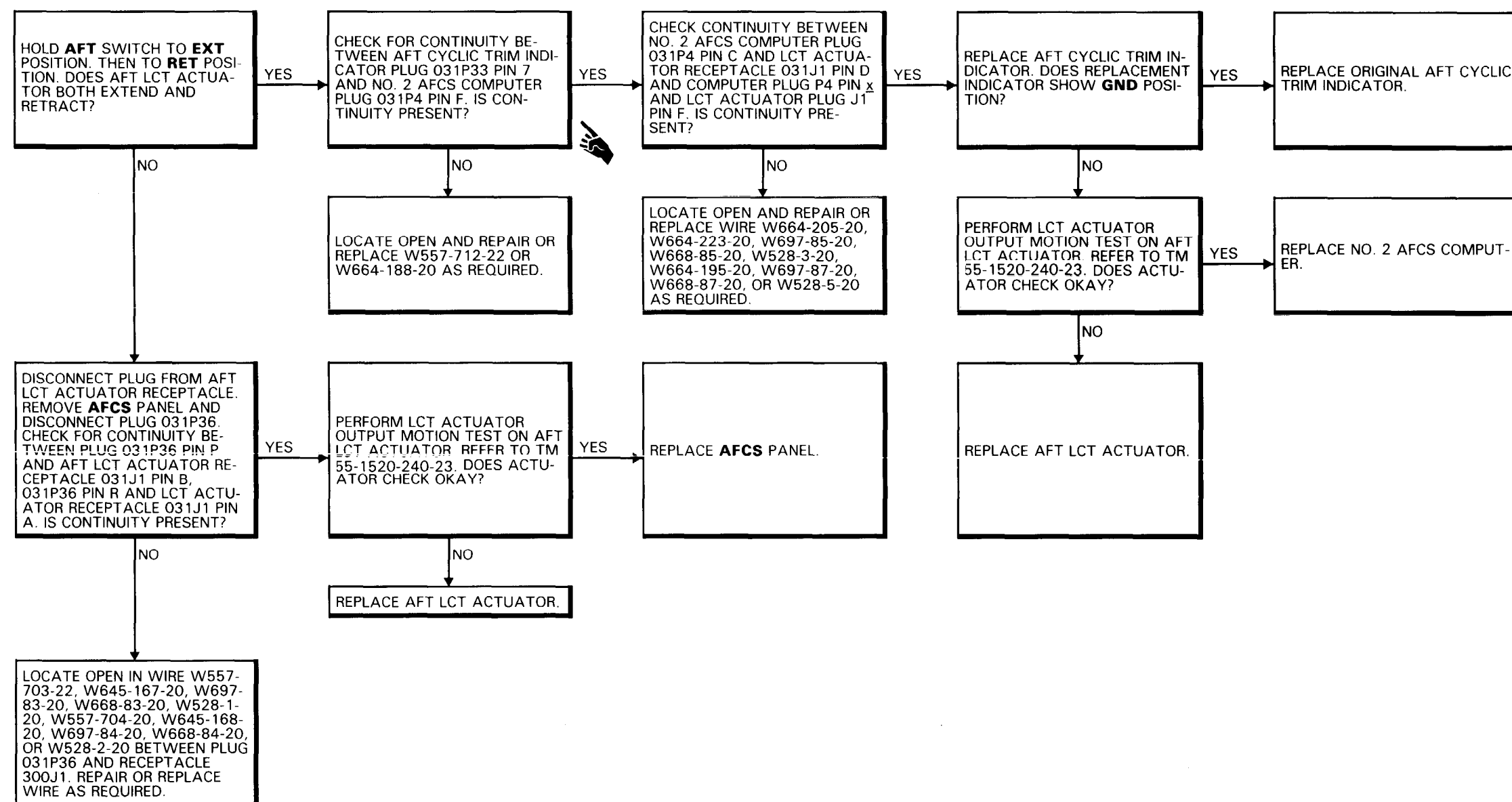


90-54

D145-11920-SPA

11-3.36 AFT LCT INDICATOR DOES NOT SHOW EXTENSION OR RETRACTION IN MANUAL CONTROL  
(Continued)

11-3.36



11-3.37 HDG SWITCH ENGAGED CAPTION DOES NOT LIGHT

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Personnel Required:

- 35K10 Avionic Mechanic
- 36K20 Avionic Mechanic

Tools:

- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
- Multimeter

References:

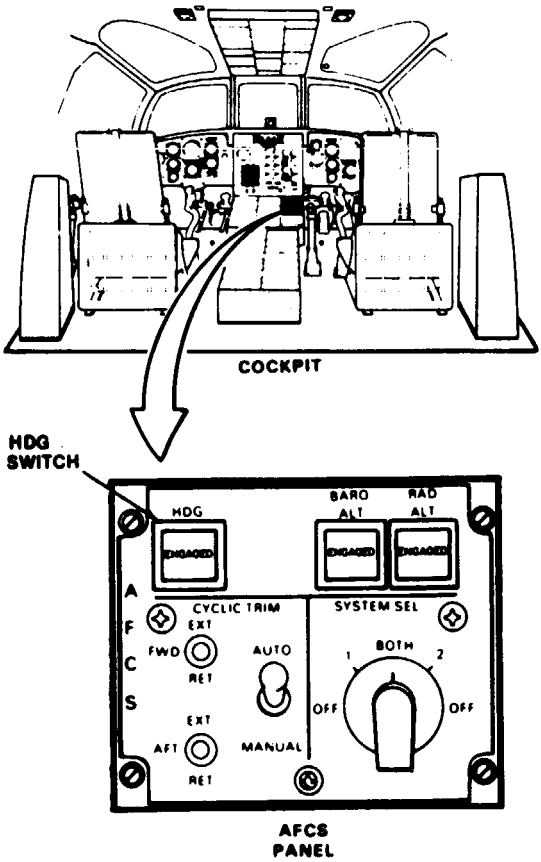
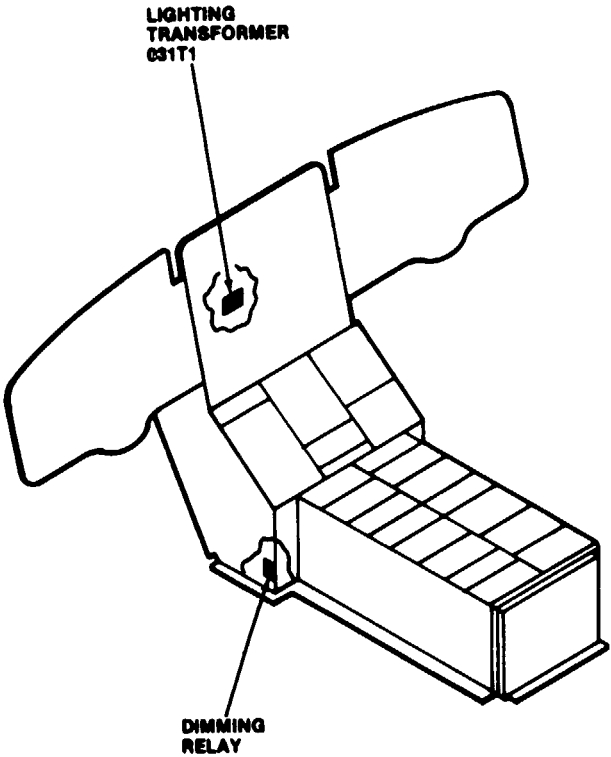
TM 55-1520-240-23

Equipment Condition

- TM 55-1520-240-23
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

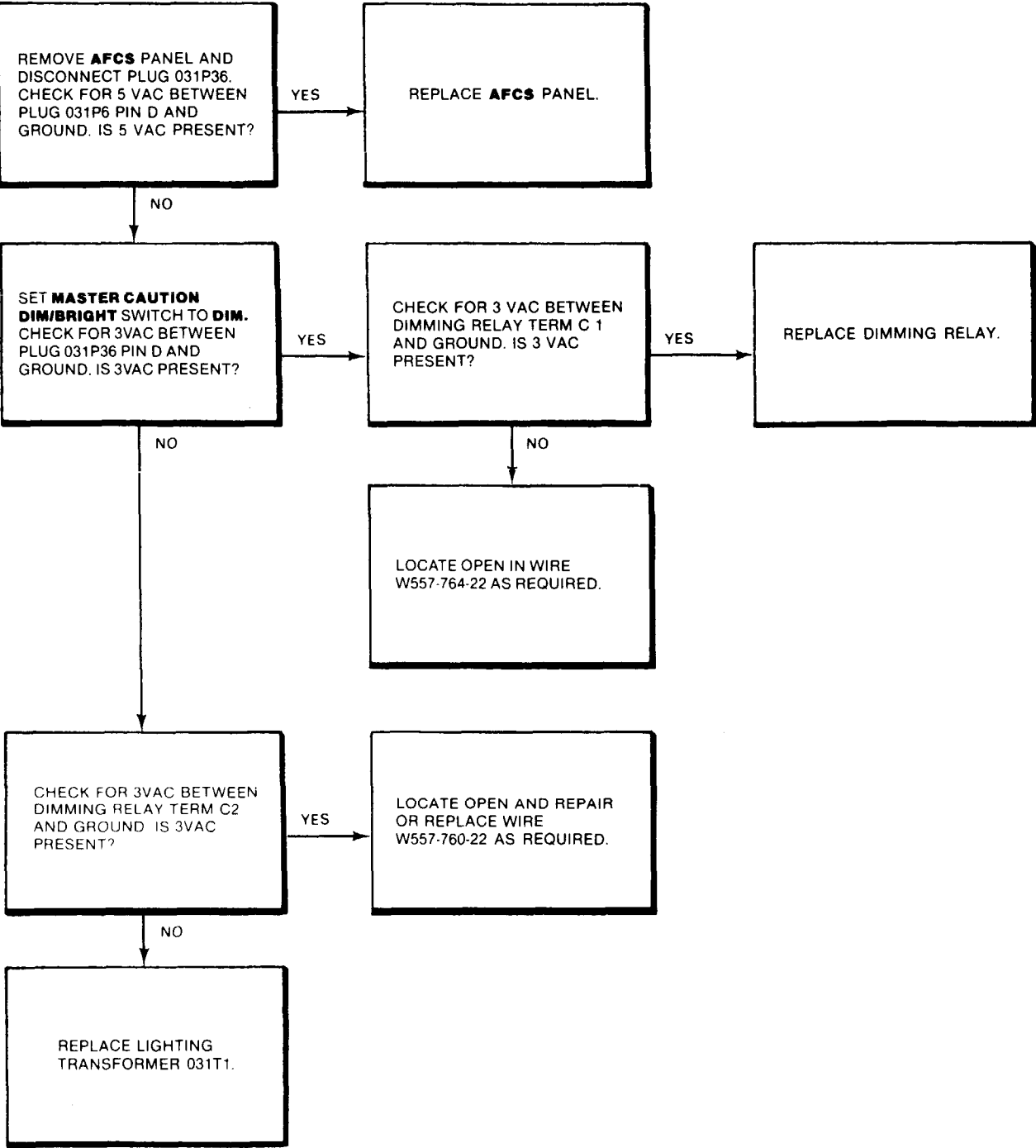
Materials:

None



11-3.37 HDG SWITCH ENGAGED CAPTION DOES NOT LIGHT (Continued)

11-3.37



END OF TASK

11-3.38 RADAR OR BARO ALT ENGAGED CAPTIONS DO NOT COME ON WHEN PRESSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

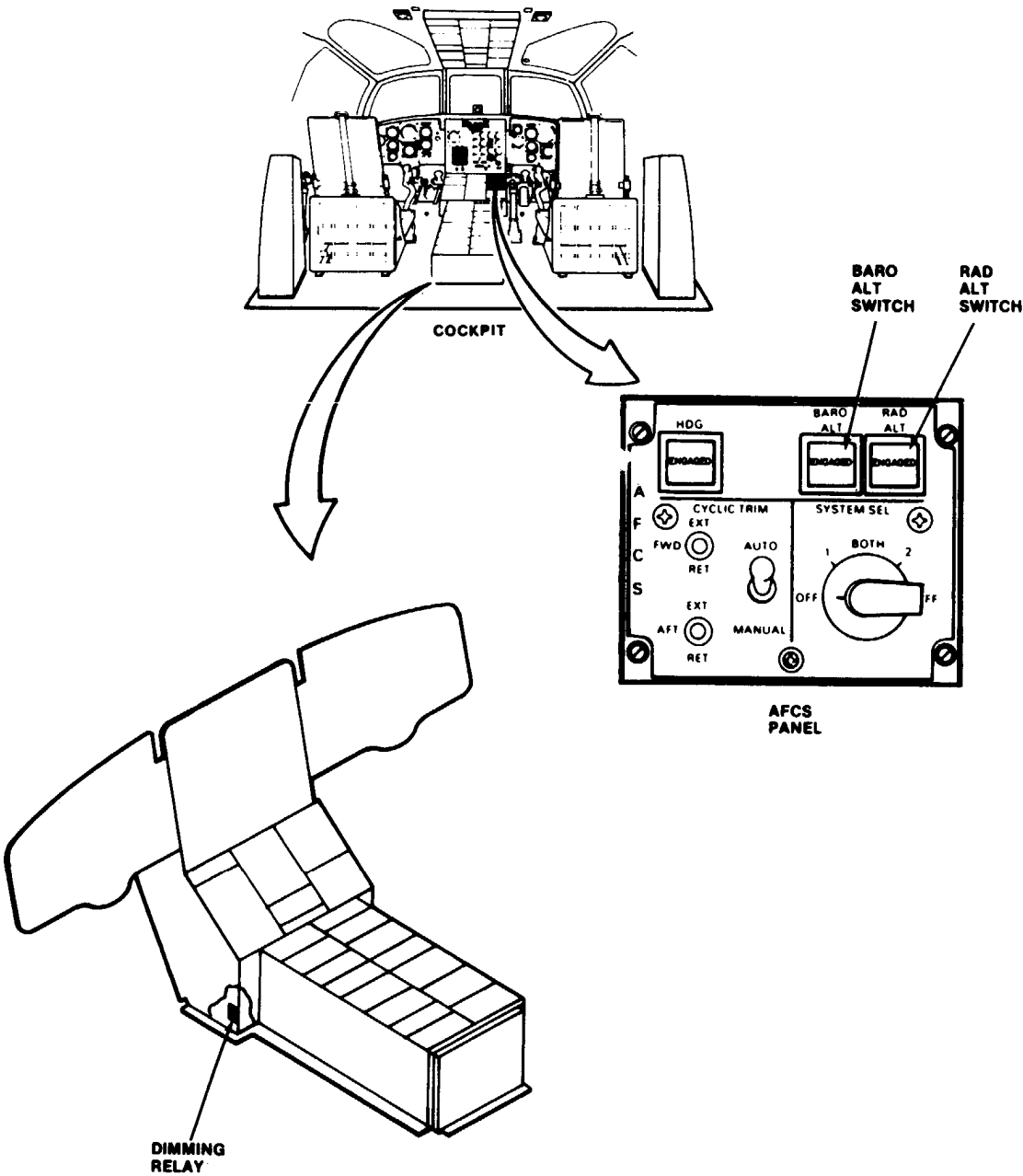
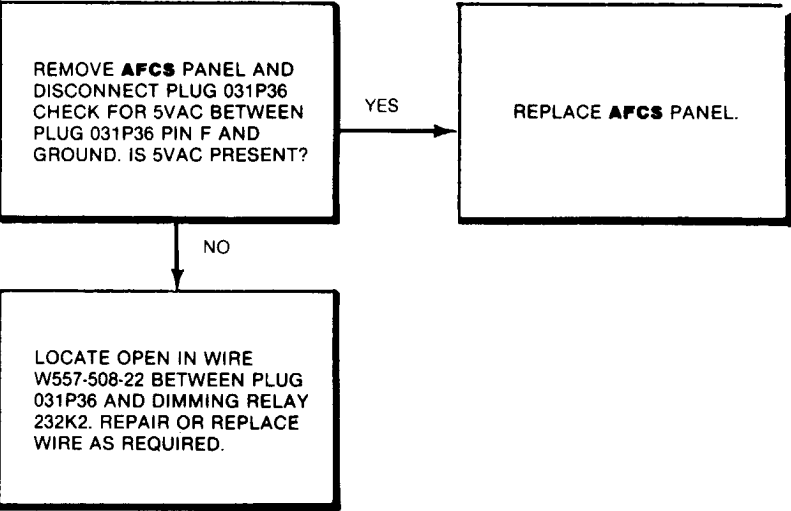
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

**Personnel Required:**  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



45X54

D145-11930-SPA

END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
- Multimeter

Materials:

None

Personnel Required:

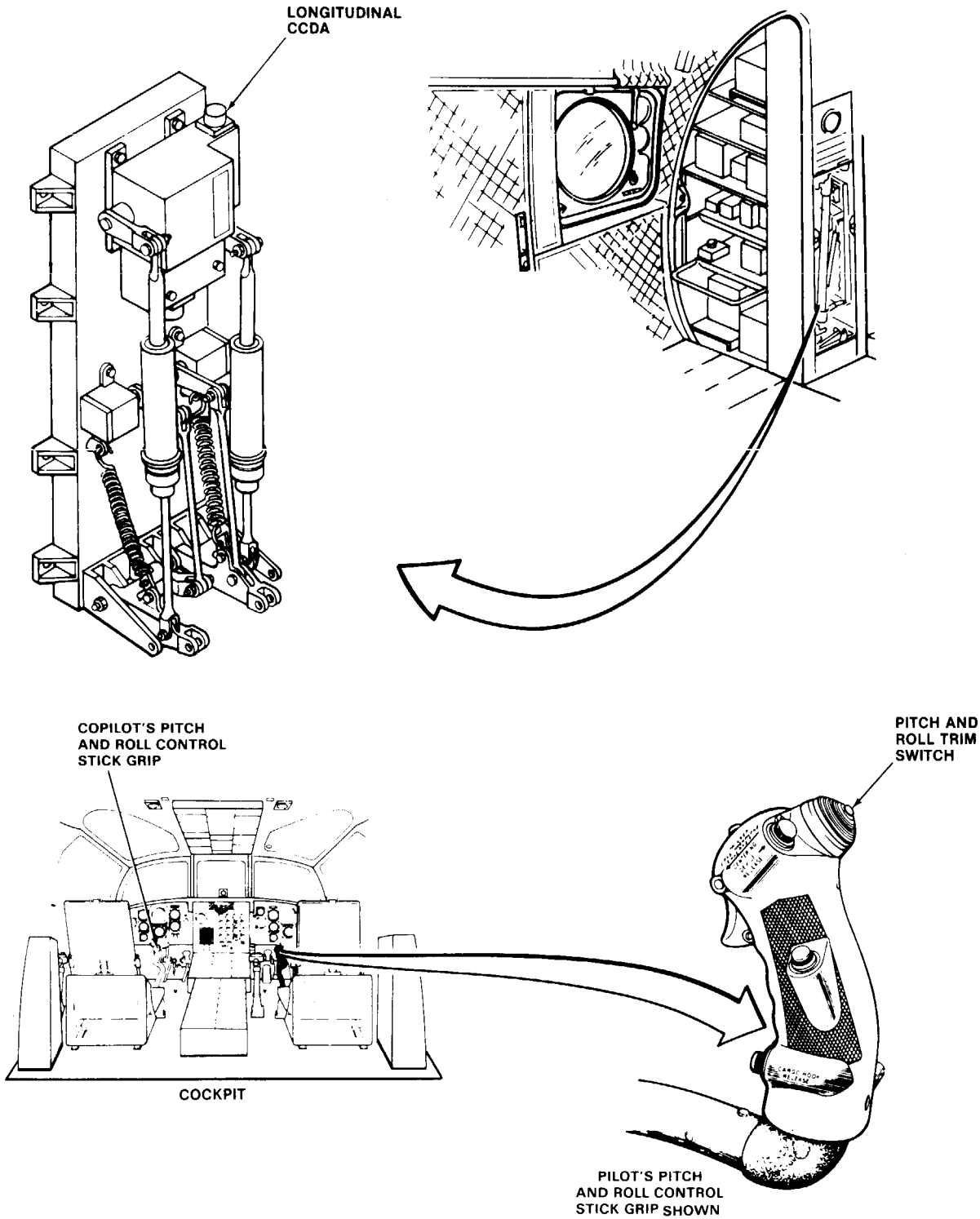
Avionic Mechanic (2)

References:

TM 55-1520-240-23

Equipment Condition:

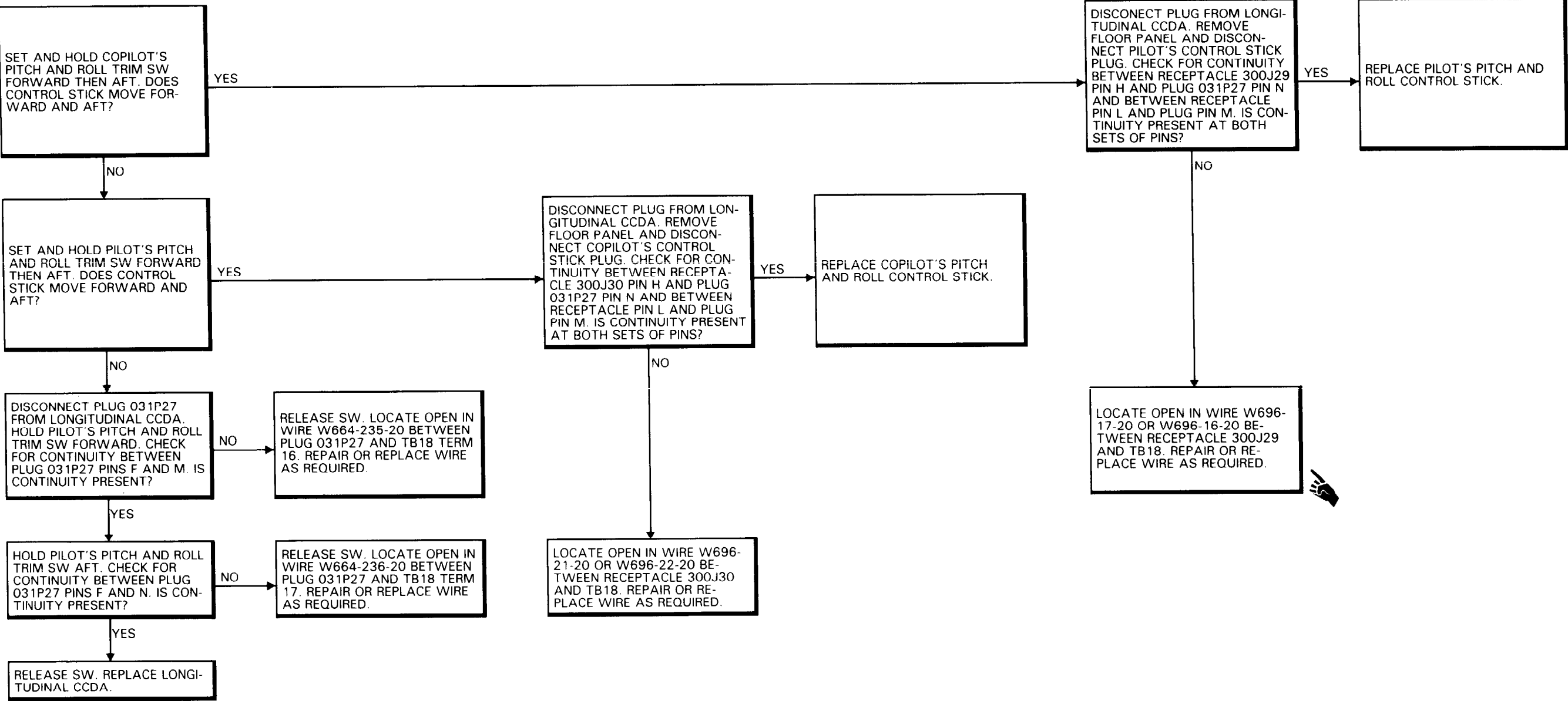
- TM 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off





11-3.39 PITCH AND ROLL CONTROL STICK DOES NOT MOVE FORWARD OR AFT WHEN PILOT'S OR COPILOT'S PITCH AND ROLL TRIM SWITCH IS MOVED FORWARD AND AFT (Continued)

11-3.39



FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

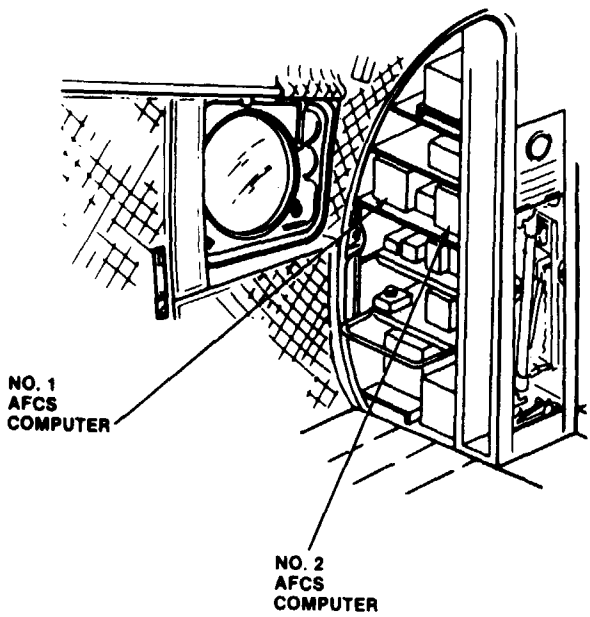
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

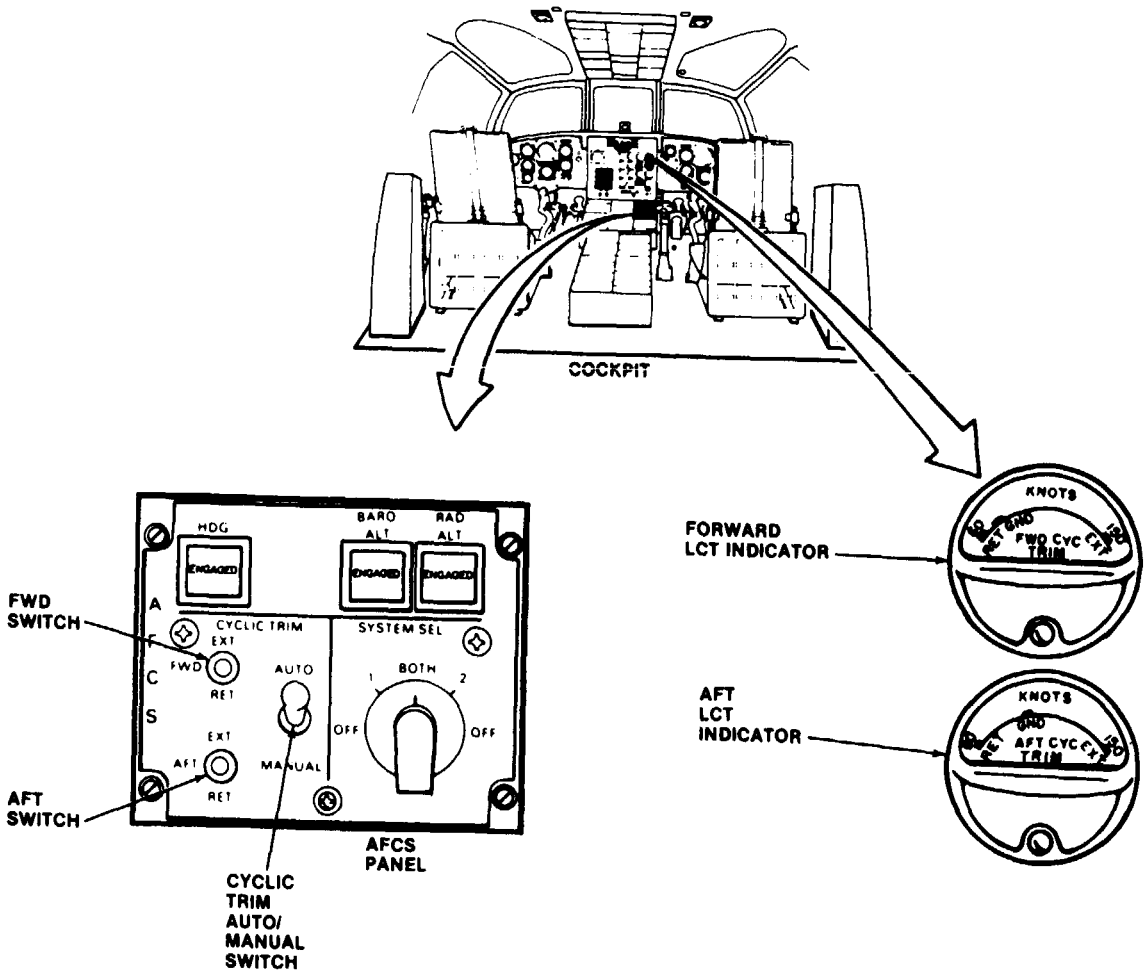
**Personnel Required:**  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On



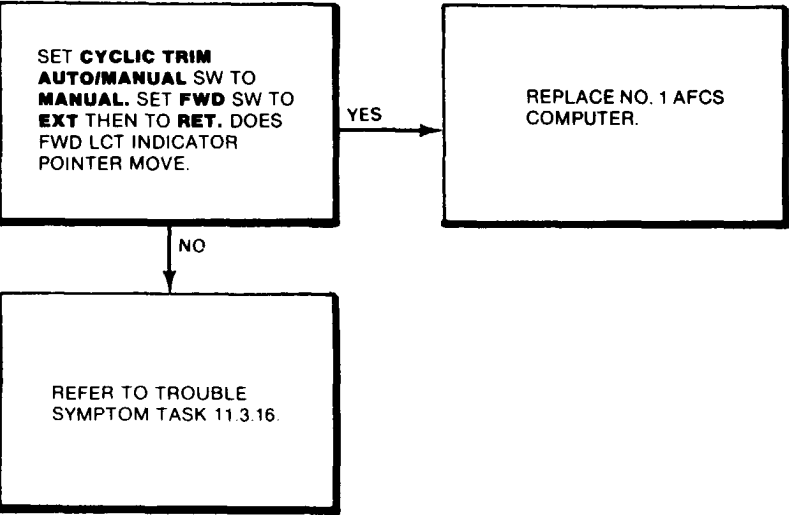
90 X 54



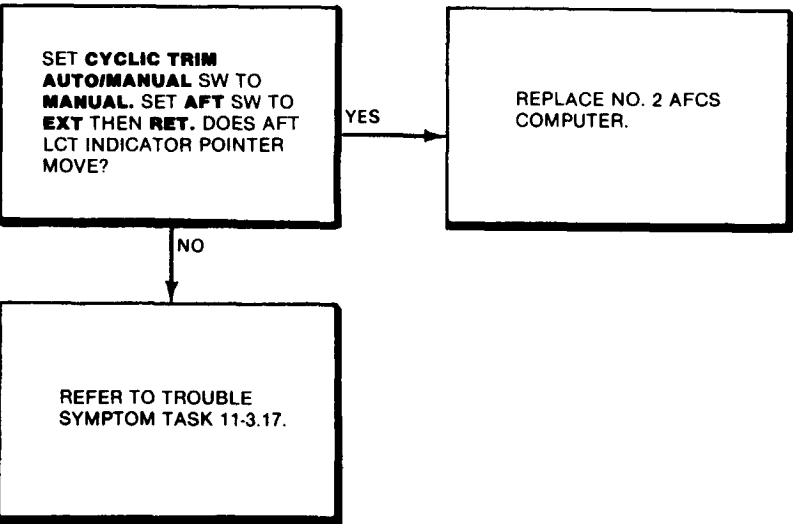
D145-11932-SPA

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NO. 1 AFCS COMPUTER BITE INDICATES 6, 9, OR 18.



NO. 2 AFCS COMPUTER BITE INDICATES 6, 9, OR 18.



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

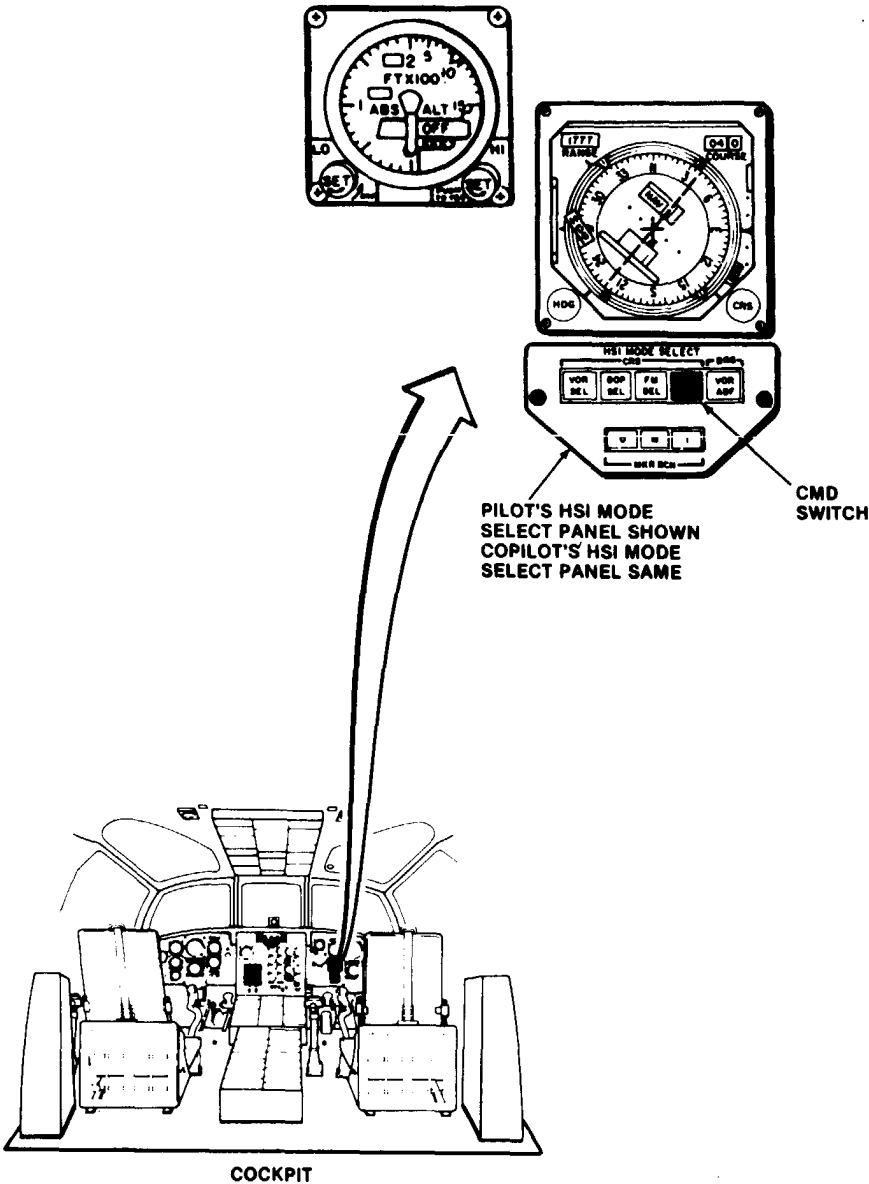
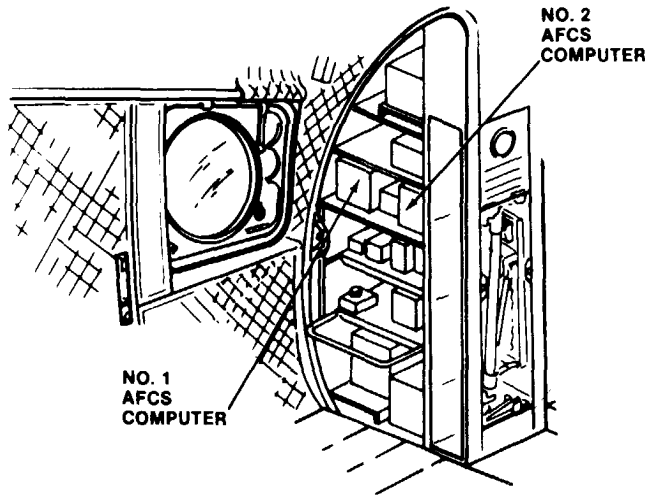
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

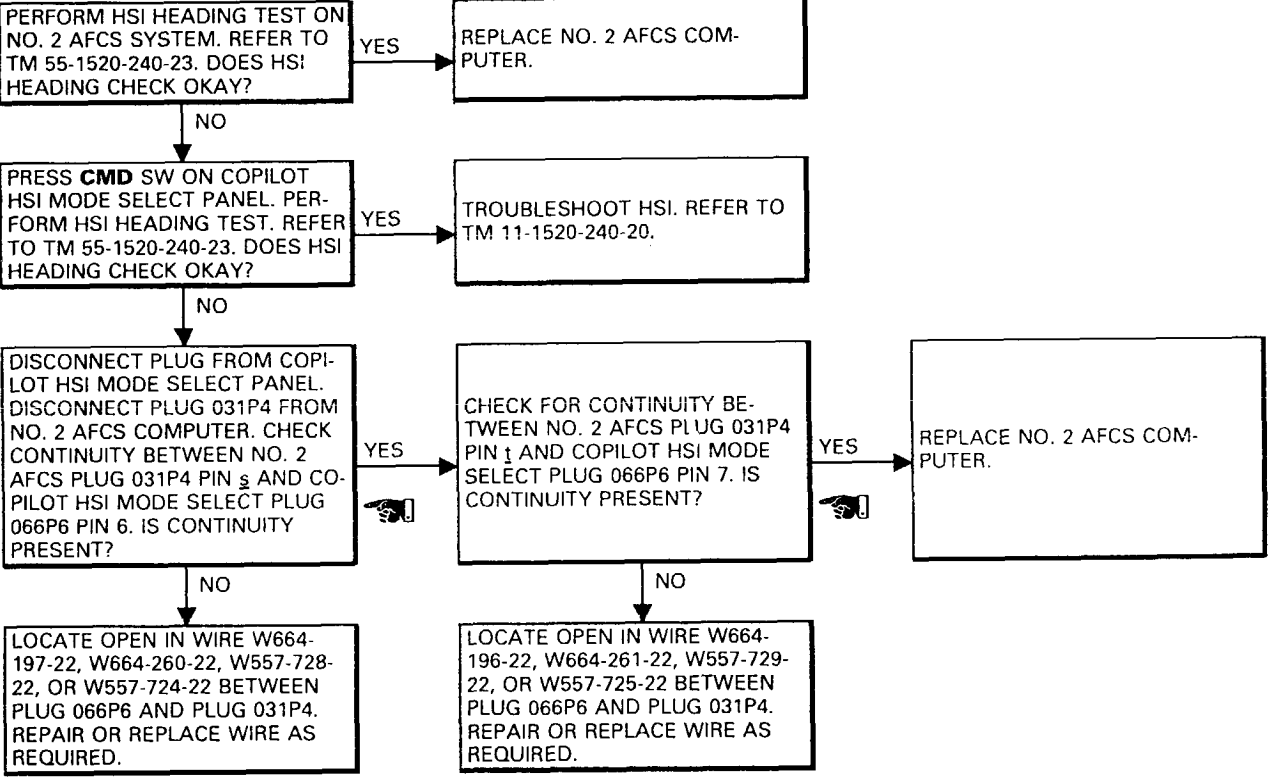
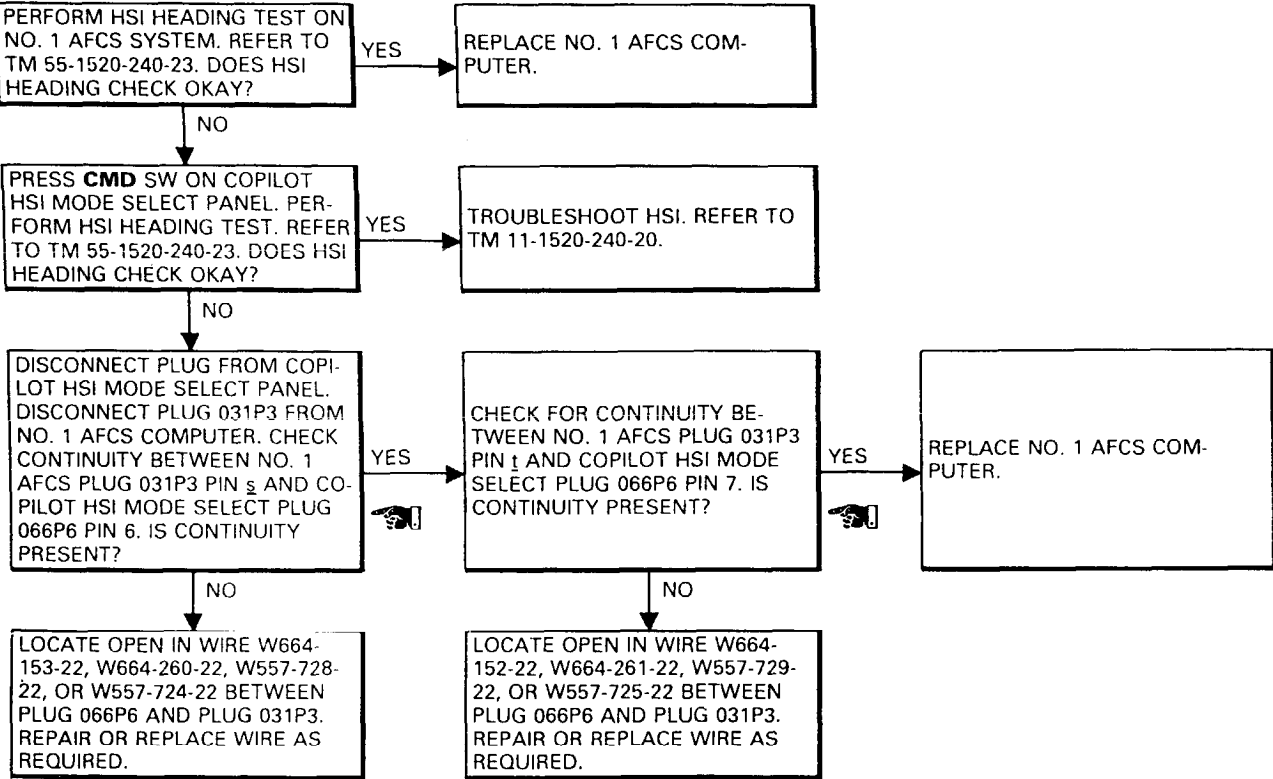
Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23  
TM 55-4920-429-13

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared for Use



NO. 1 AFCS COMPUTER BITE INDICATES 48



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

Tool:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

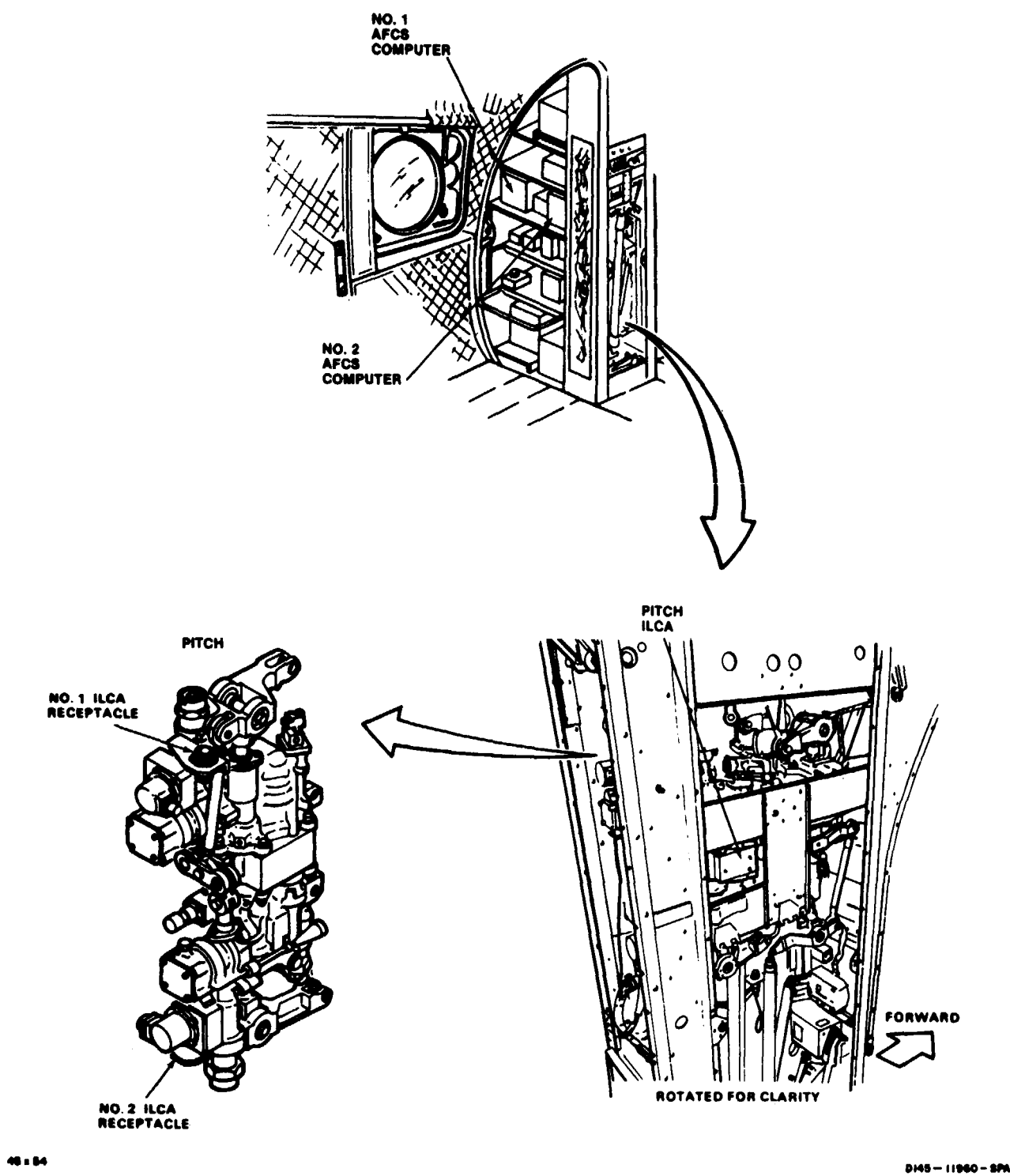
Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:

TM 55-1520-240-23  
TM 55-4920-429-13

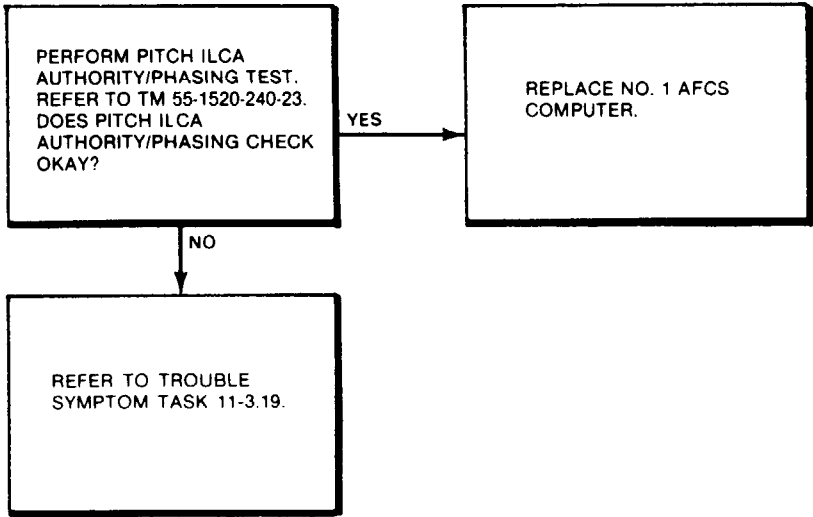
Equipment Condition:

TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared for Use

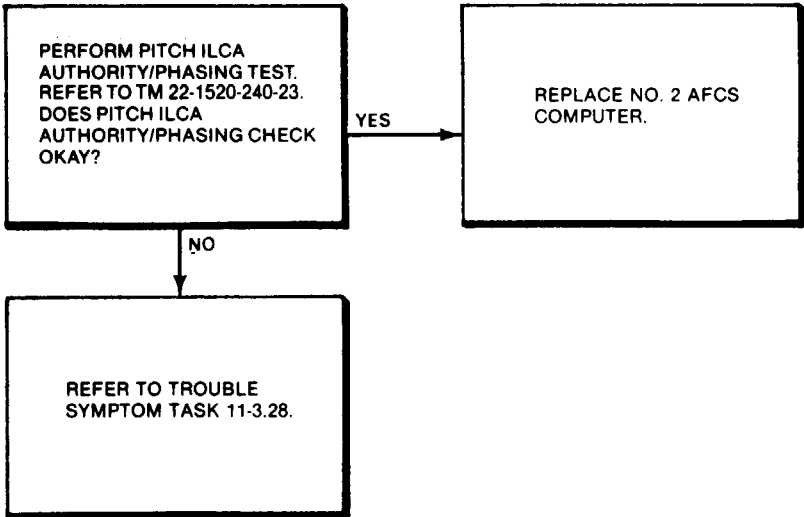


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NO. 1 AFCS COMPUTER BITE INDICATES 70-74.



NO. 2 AFCS COMPUTER BITE INDICATES 70-74.



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

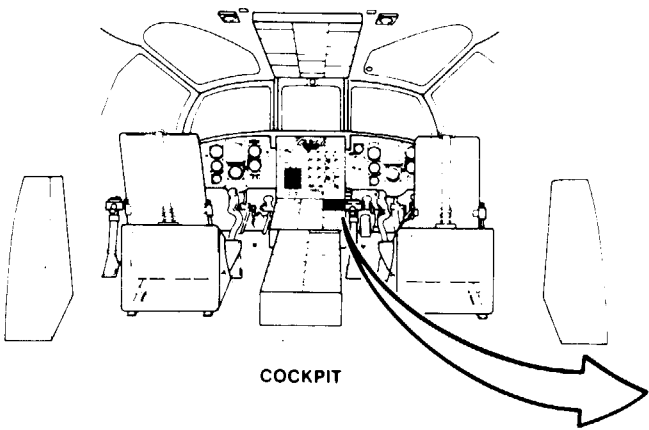
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

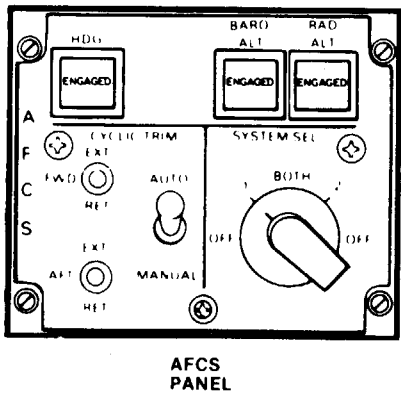
Personnel Required  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23  
TM 55-4920-429-13

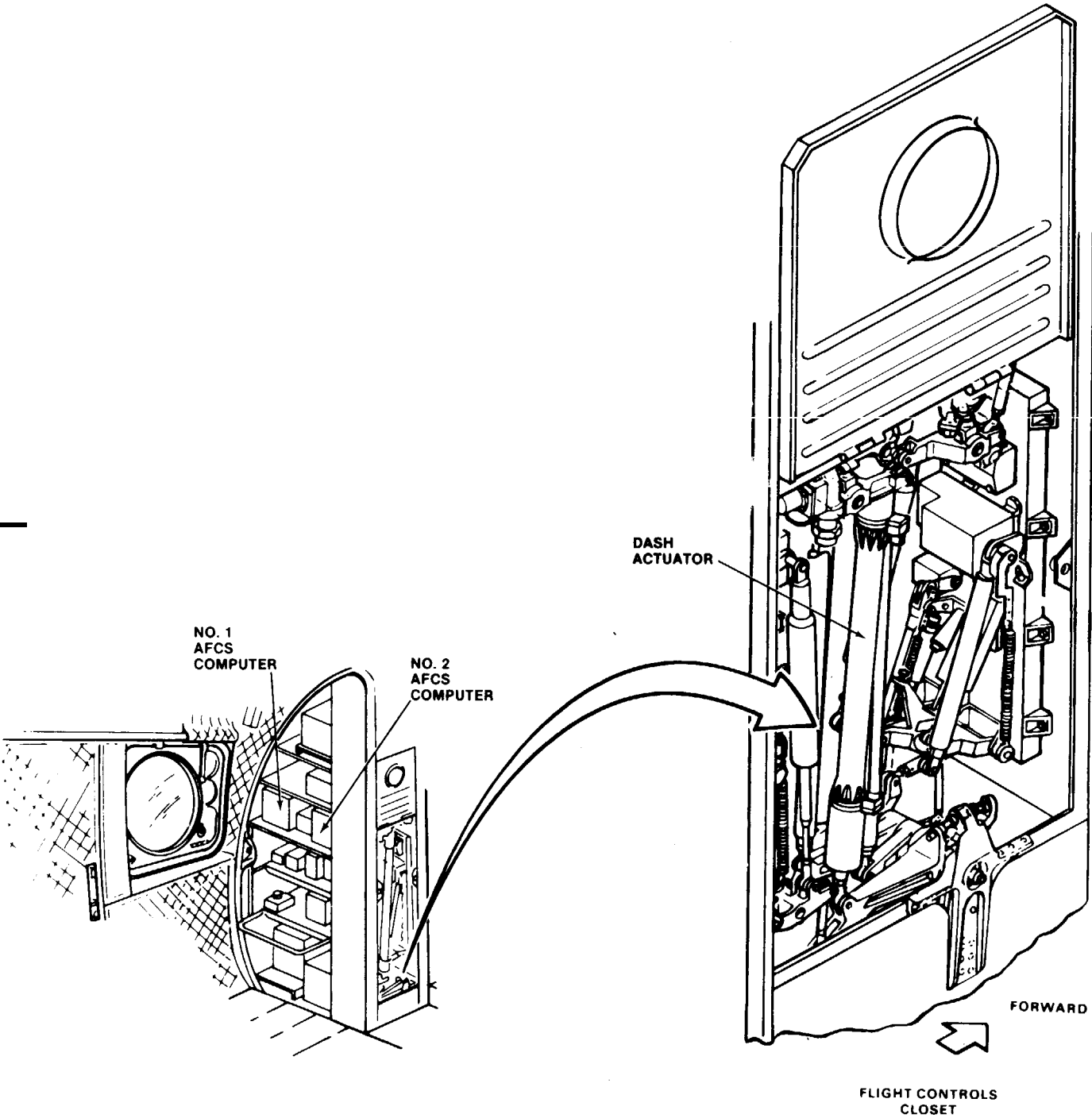
Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared for Use



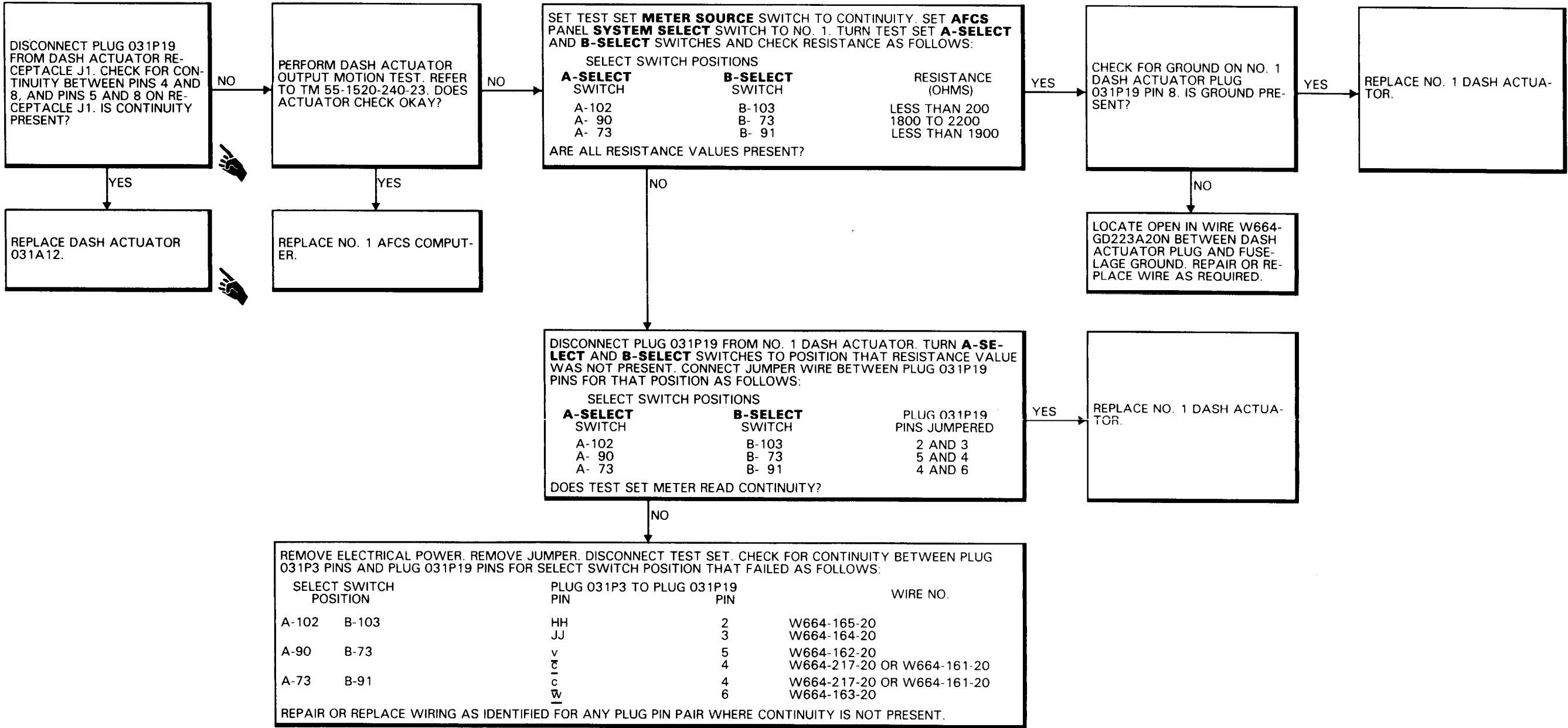
COCKPIT



AFCS  
PANEL







11-3.44 NO. 2 AFCS COMPUTER BITE INDICATES 85 OR 86

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

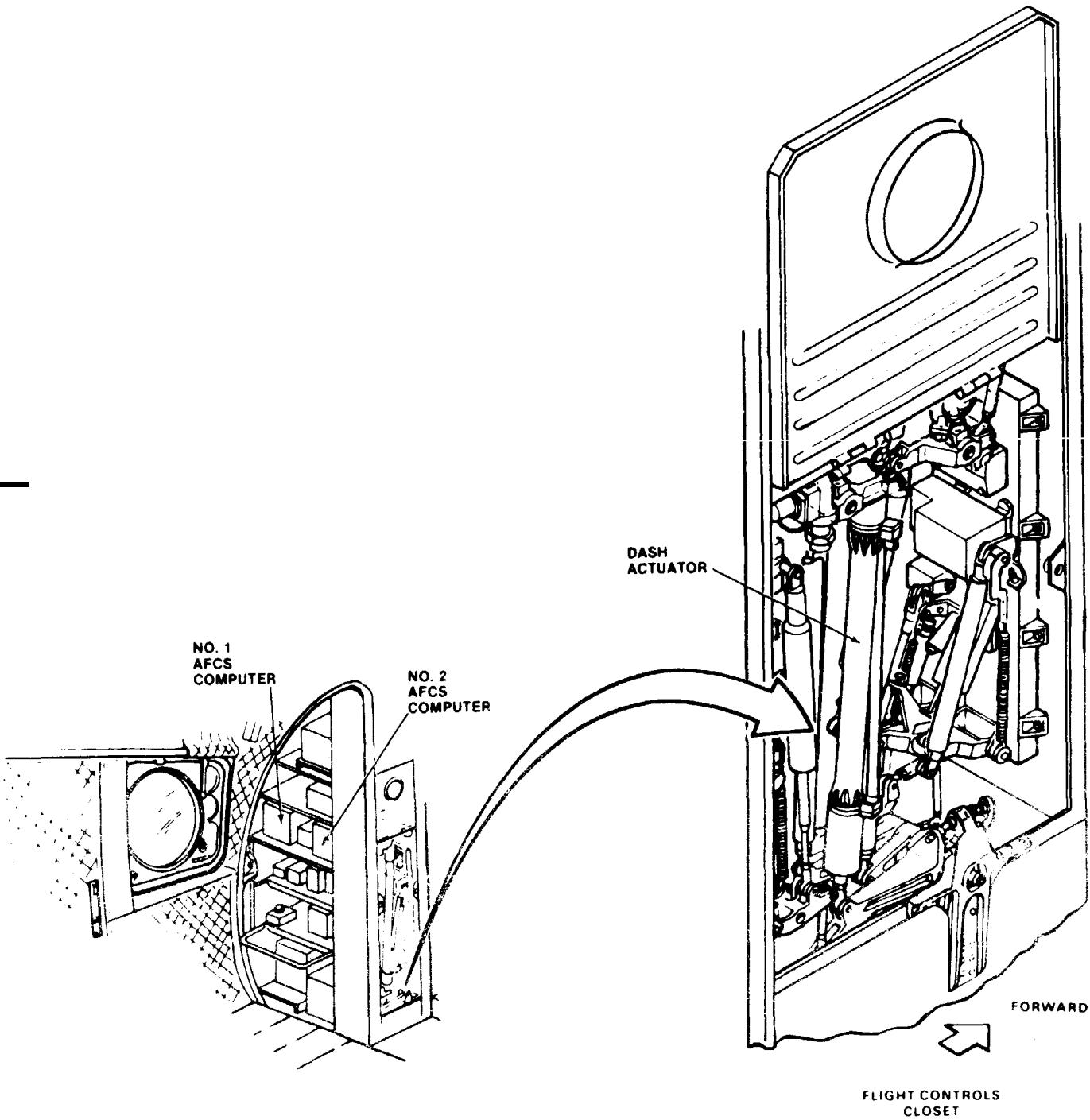
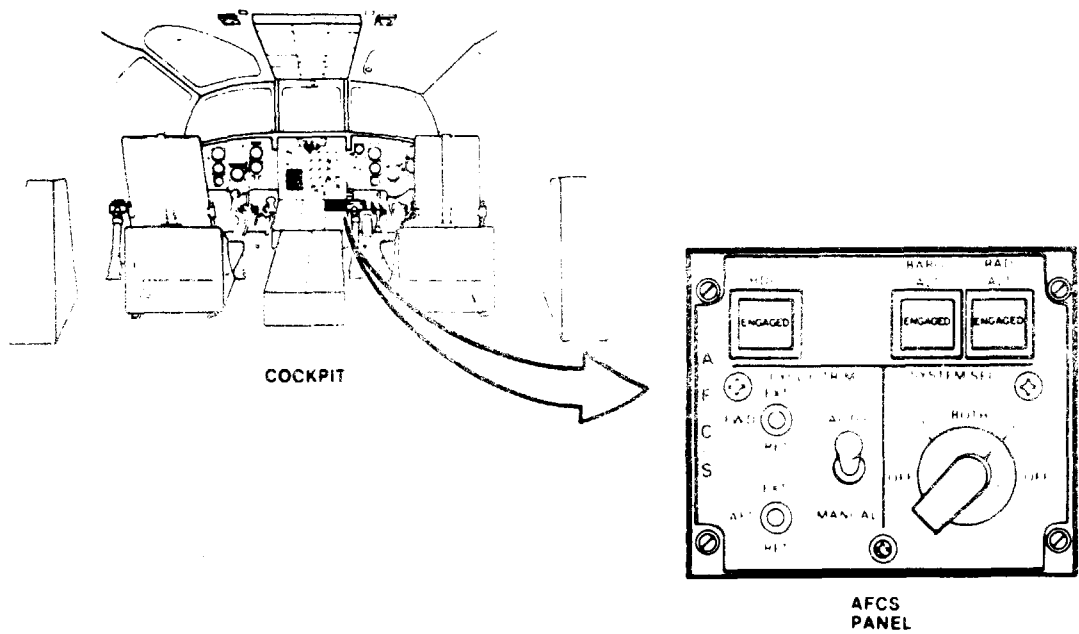
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:

TM 55-1520-240-23  
TM 55-4920-429-13

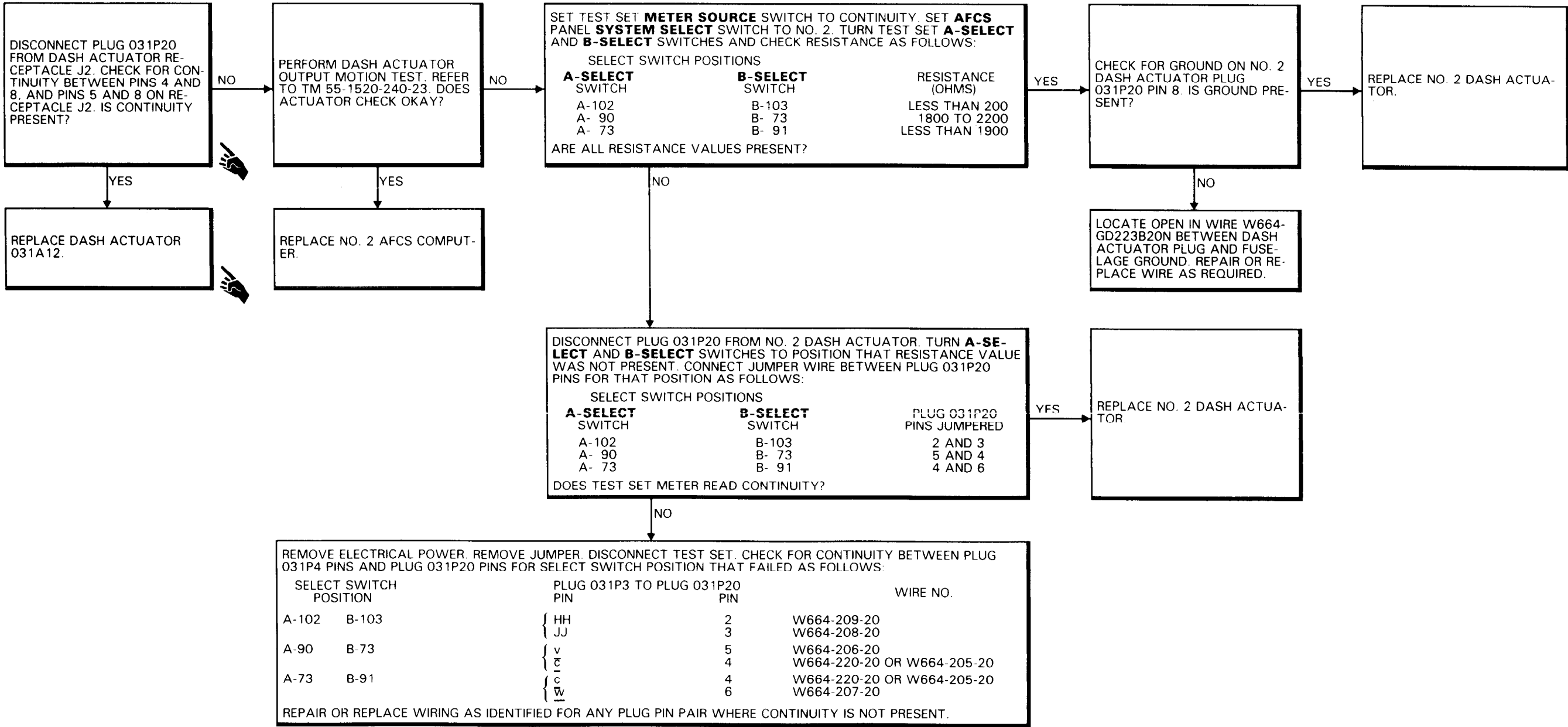
Equipment Condition:

TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared for Use



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FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

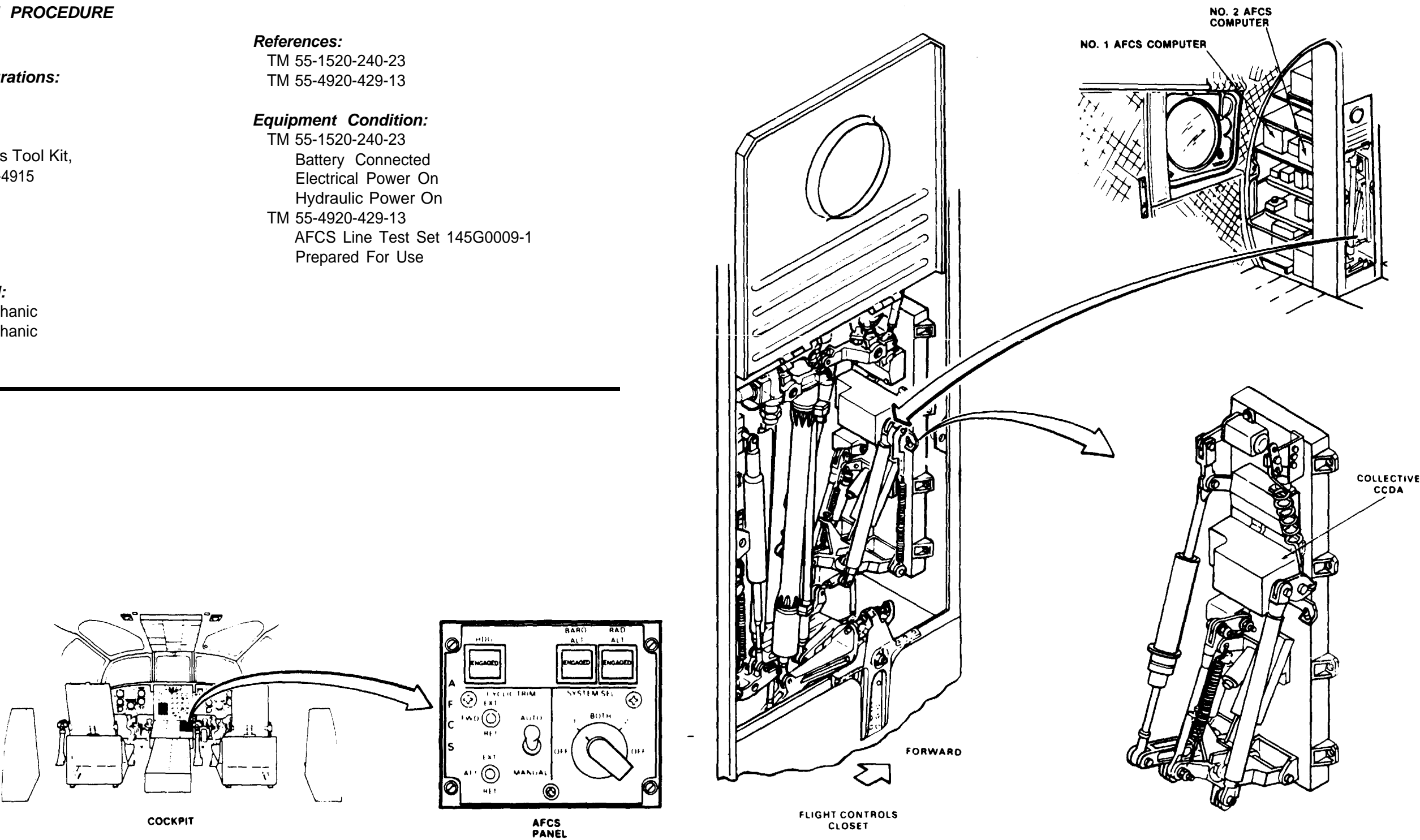
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

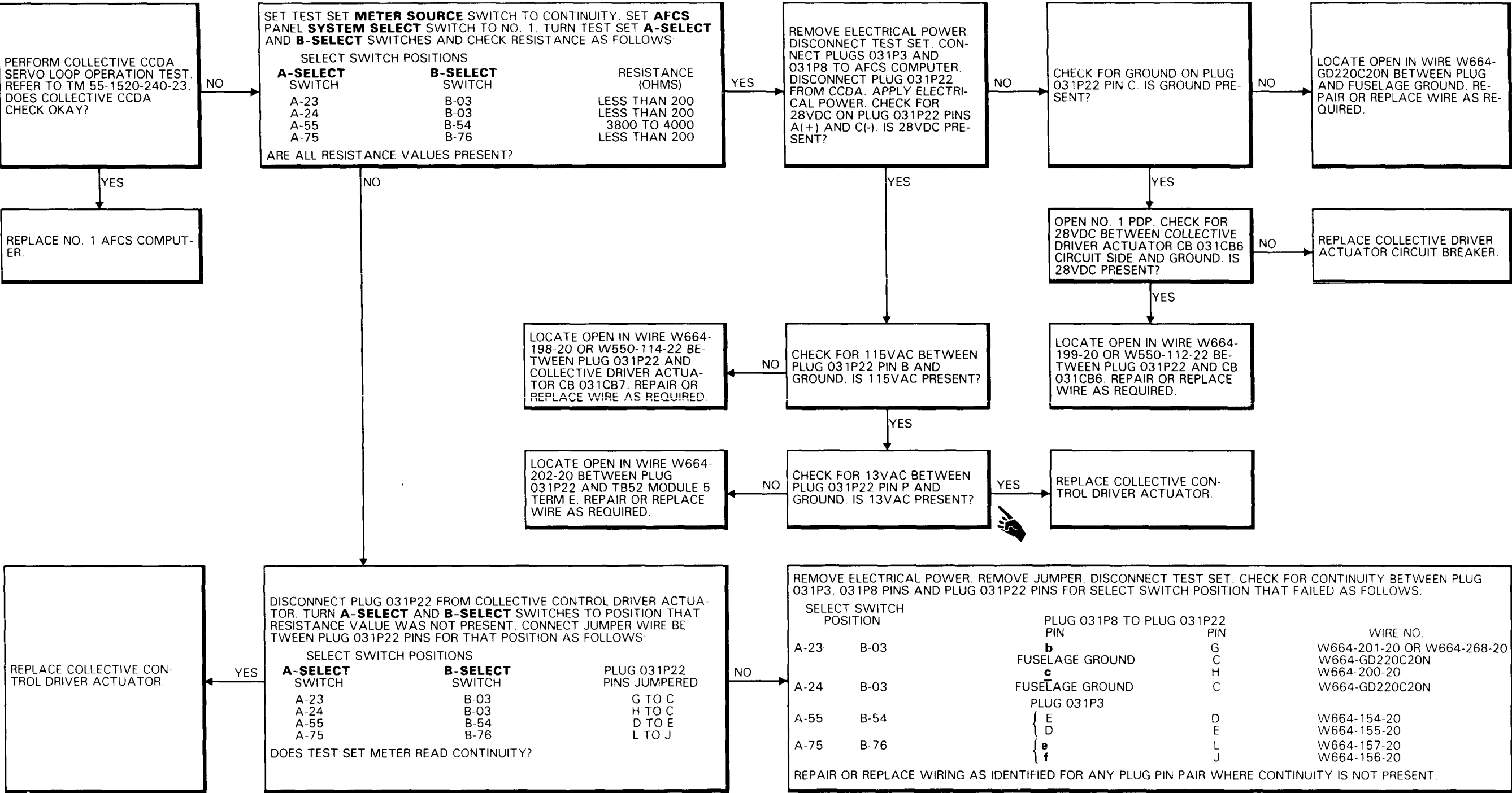
Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23  
TM 55-4920-429-13

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared For Use





FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

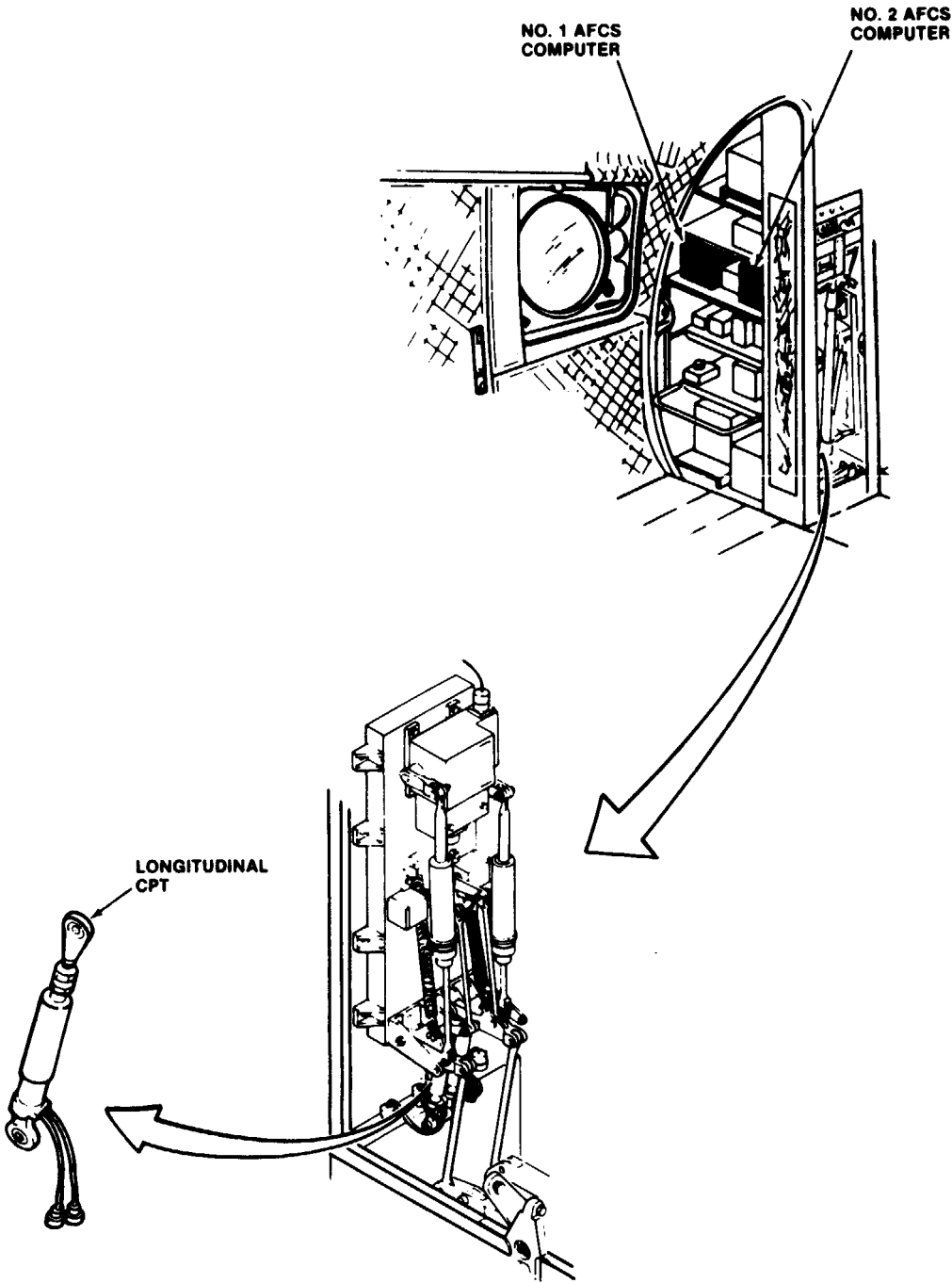
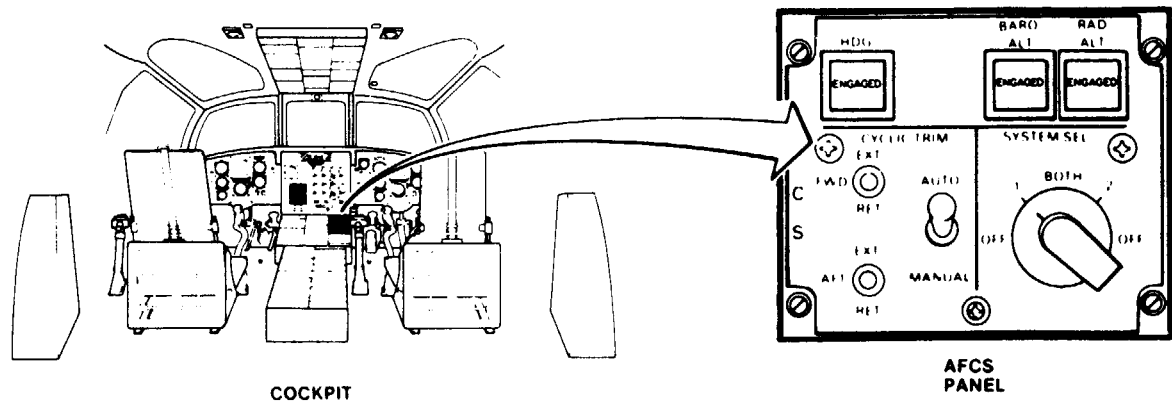
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

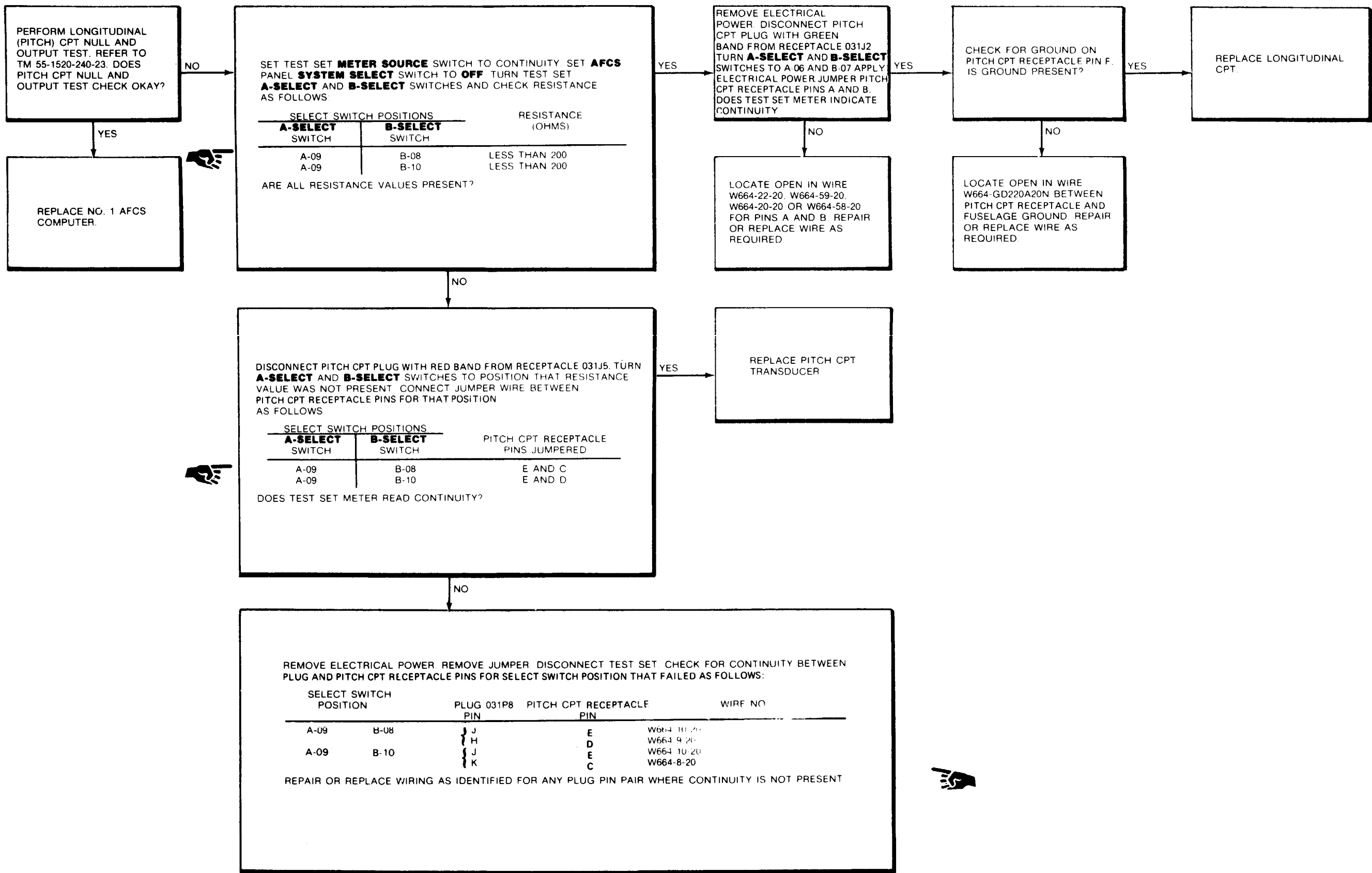
References:  
TM 55-1520-240-23  
TM 55-4920-429-13

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS. Line Test Set 145G0009-1  
Prepared for Use



11-3.46 NO. 1 AFCS COMPUTER BITE INDICATES 89 (Continued)

11-3.46



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

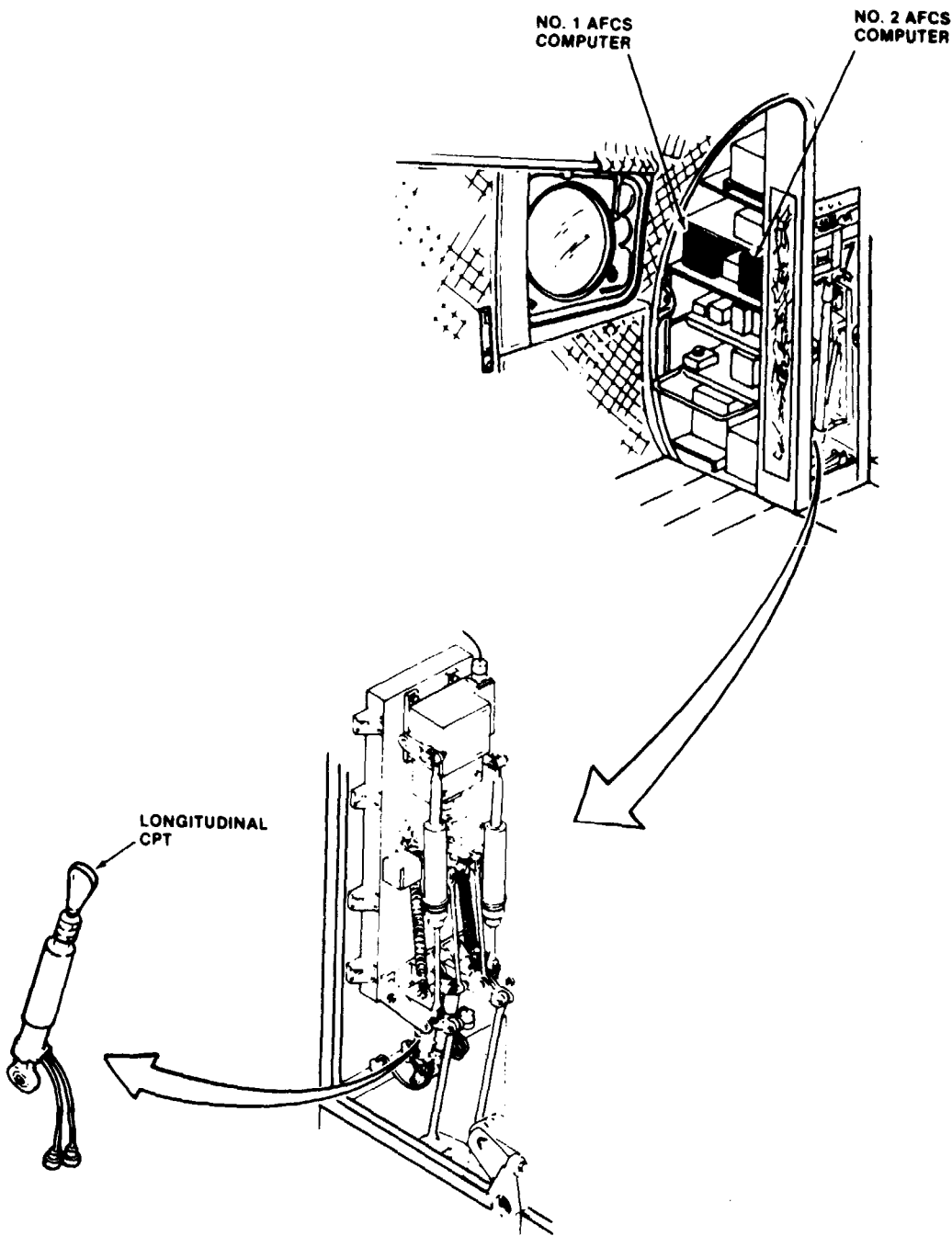
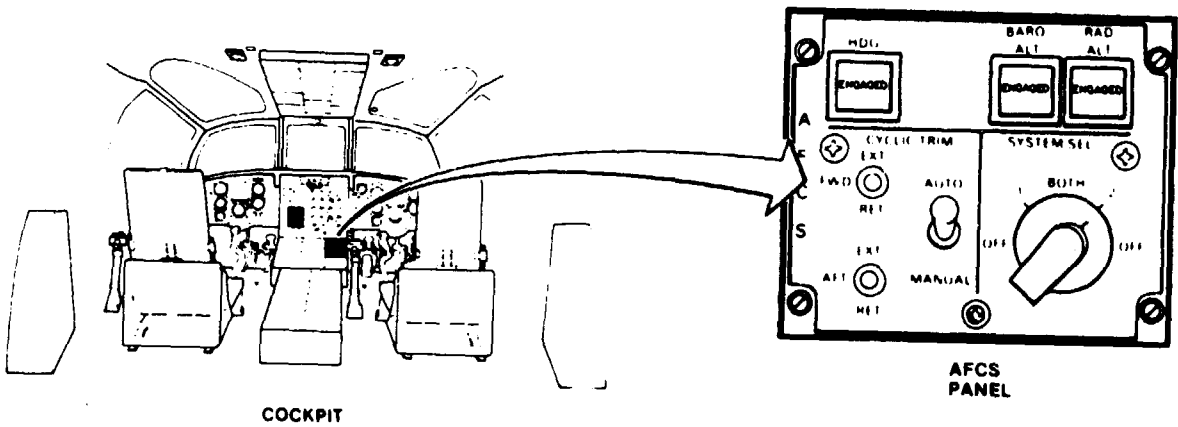
Too/s:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23  
TM 55-4920-429-13

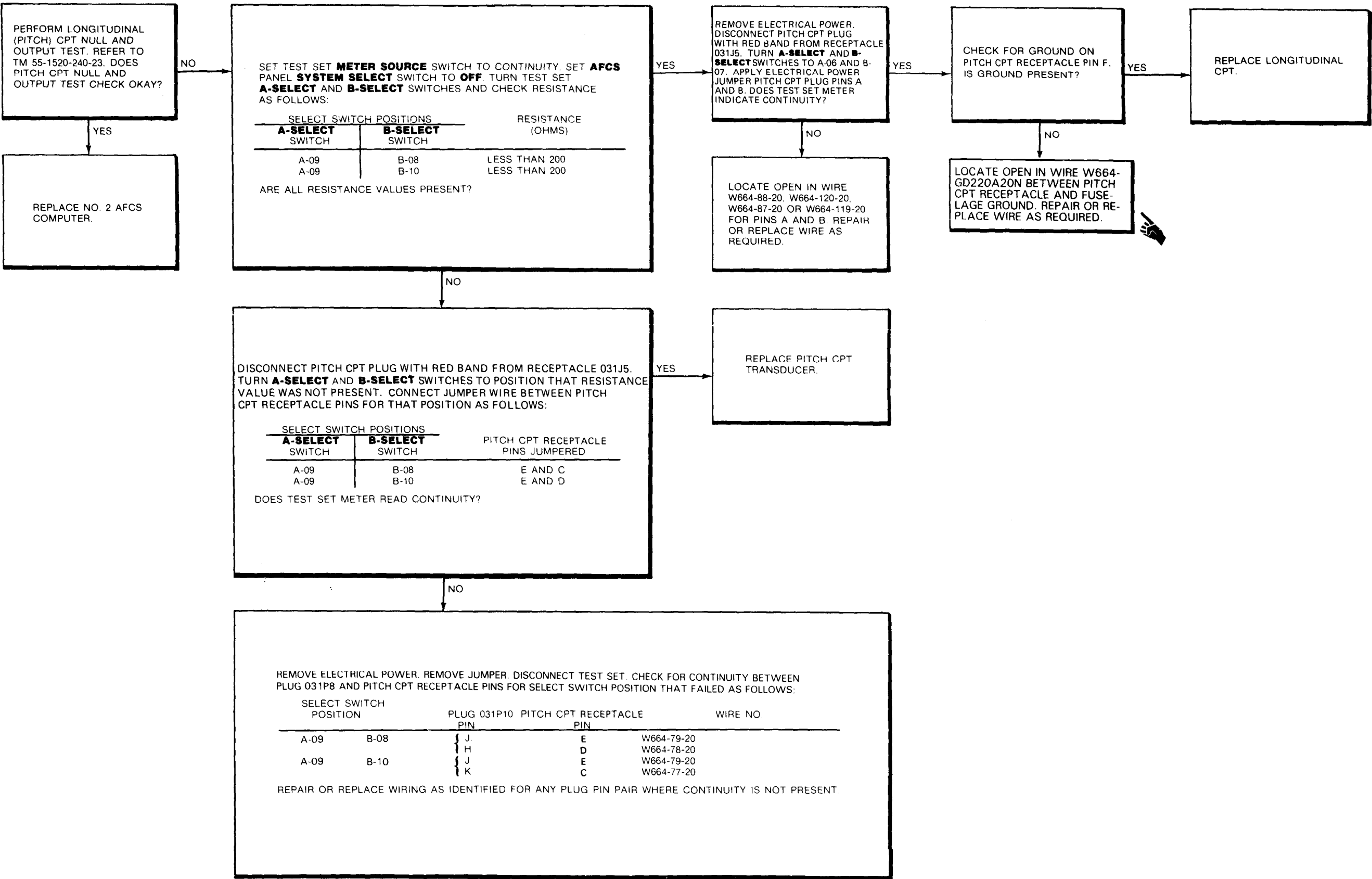
Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared for Use





11-3.47 NO. 2 AFCS COMPUTER BITE INDICATES 89 (Continued)

11-3.47



END OF TASK

11-3.48 AFCS COMPUTER BITE INDICATES 95

11-3.48

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

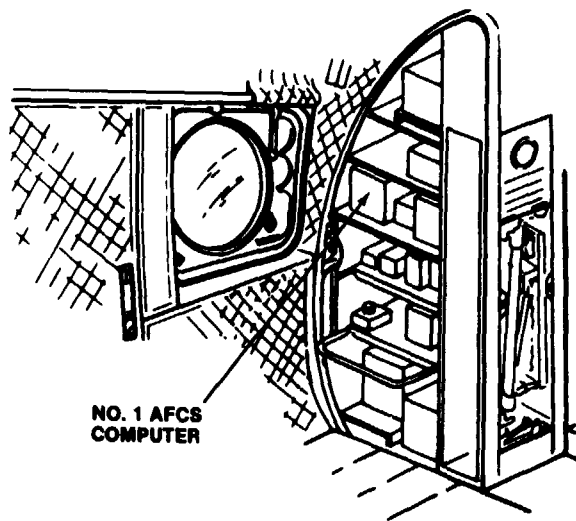
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

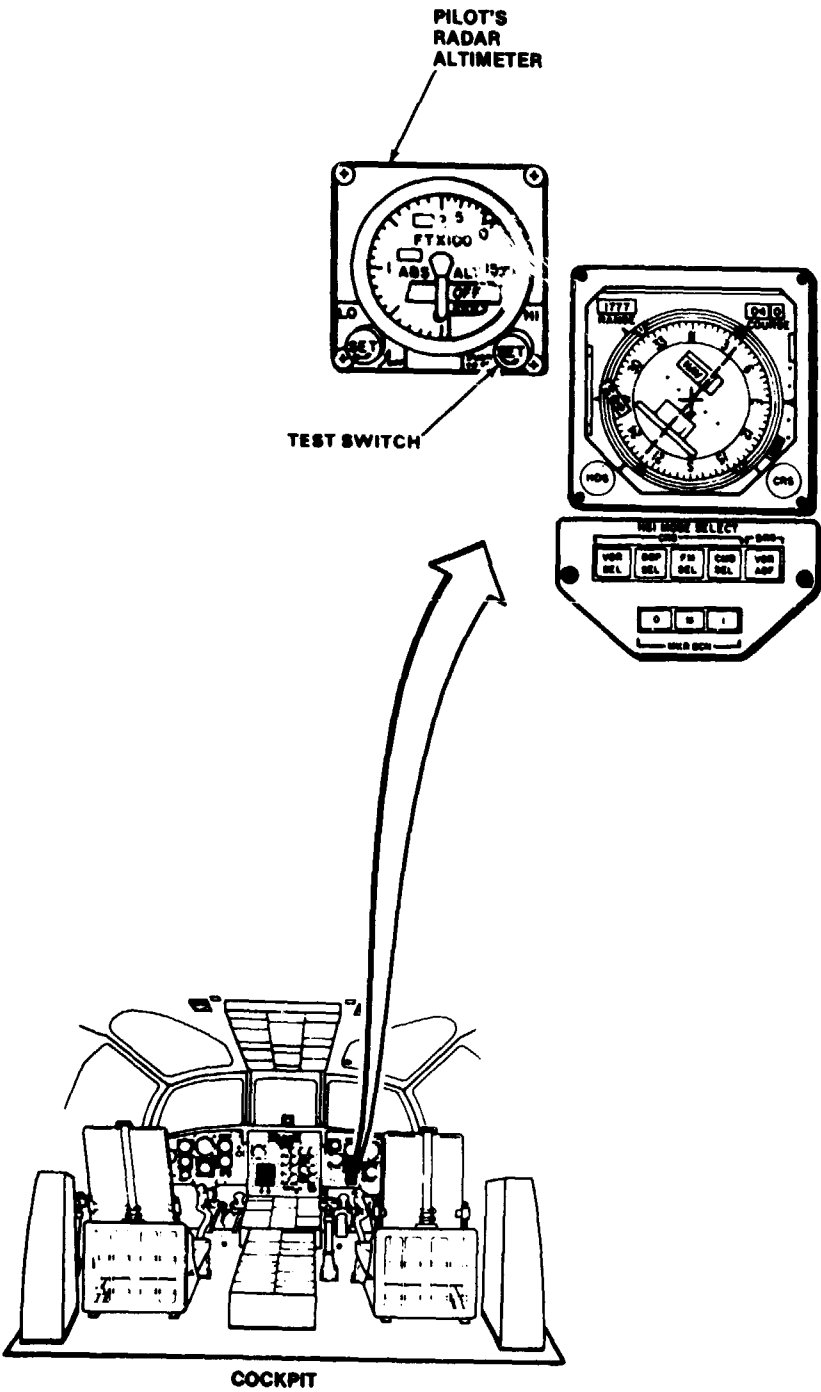
Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23

Equipment Condtn:  
TM 55-1520-240-23  
Battery connected  
Electrical Power On  
Hydraulic Power Off



90 x 54

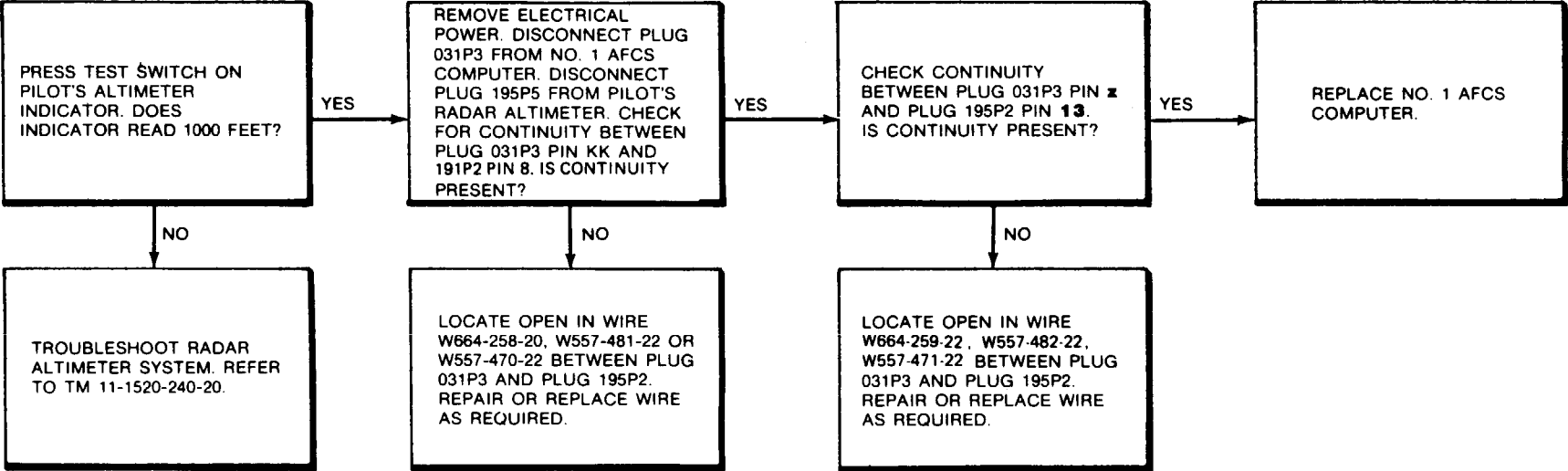


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11-3.48 AFCS COMPUTER BITE INDICATES 95 (Continued)

11-3.48



END OF TASK

11-3.49 AFCS PITCH STABILIZATION ERRATIC OR OSCILLATORY

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

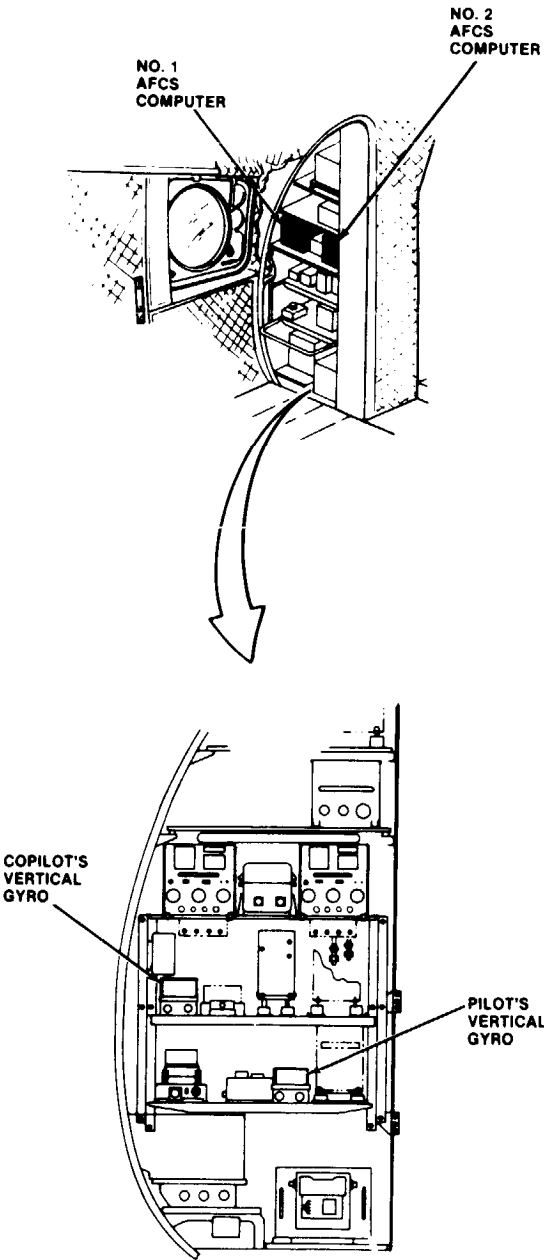
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

**Personnel Required:**  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

**References:**  
TM 55-1520-240-23  
TM 55-4920-429-13

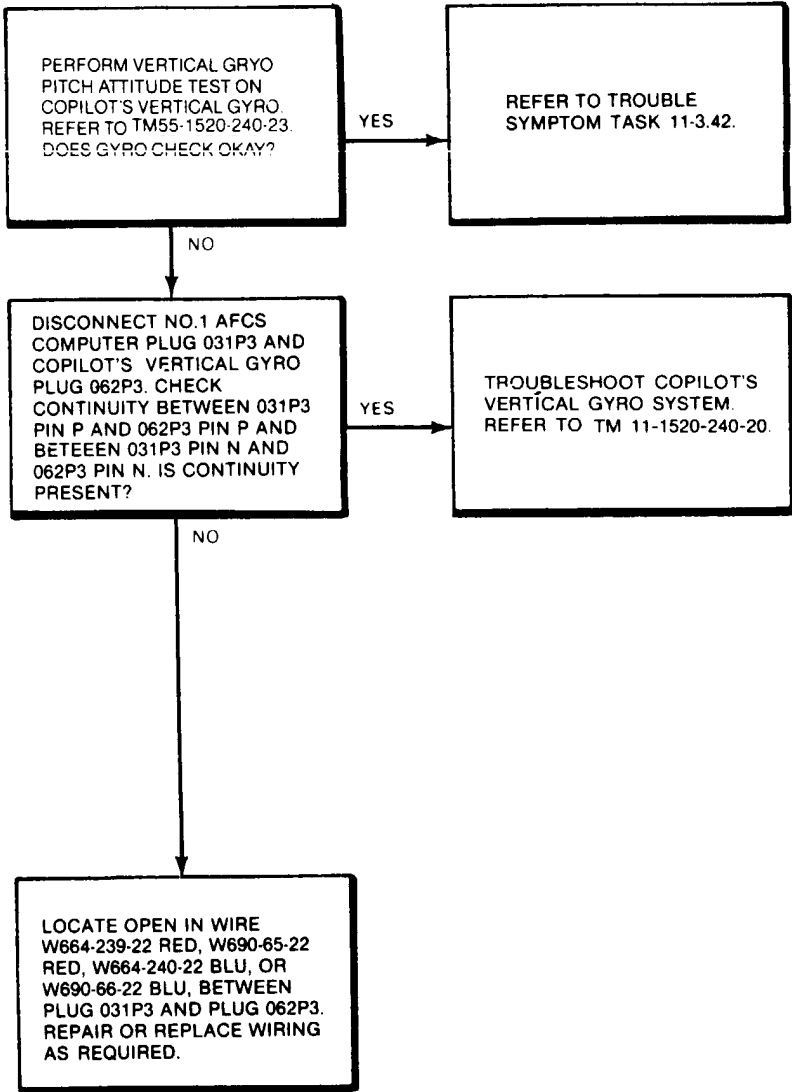
**Equipment Condition:**  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared for Use



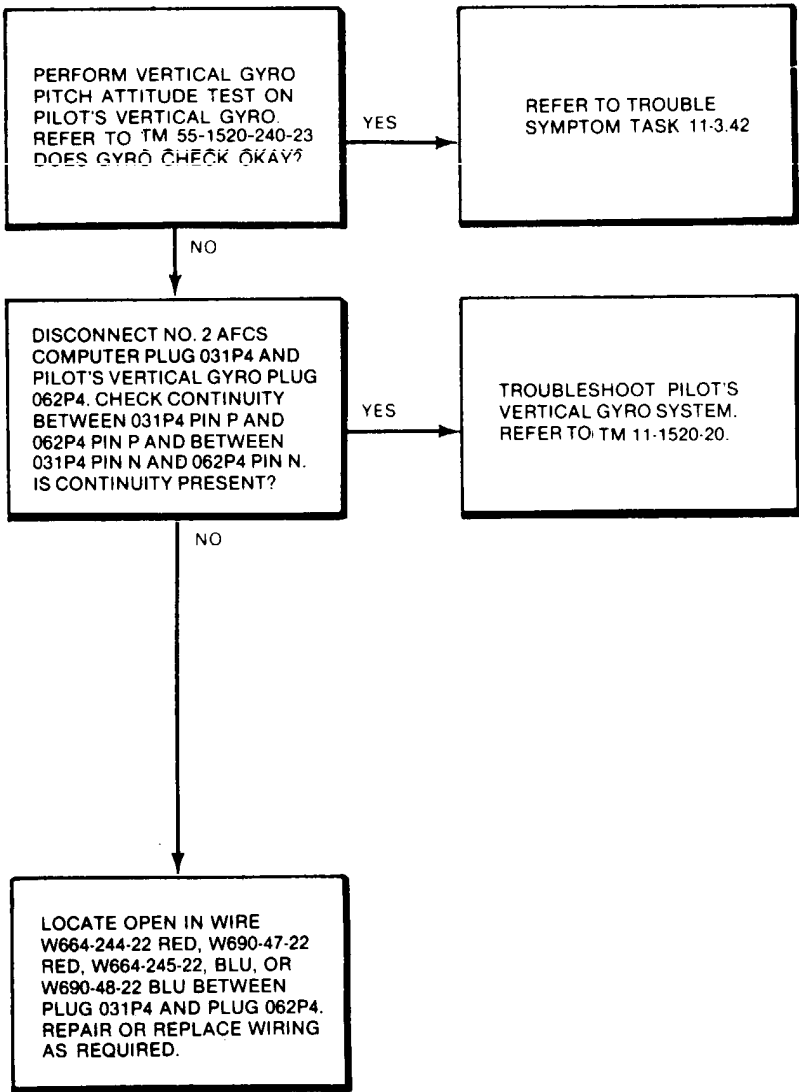
11-3.49 AFCS PITCH STABILIZATION ERRATIC OR OSCILLATORY  
(Continued)

11-3.49

NO. 1 AFCS PITCH STABILIZATION  
ERRATIC OR OSCILLATORY



NO. 2 AFCS PITCH STABILIZATION  
ERRATIC OR OSCILLATORY



END OF TASK

11-3.50 NO. 1 AFCS PITCH ATTITUDE/AIR SPEED HOLD WEAK OR INOPERATIVE

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
- Multimeter

Materials:

None

Personnel Required:

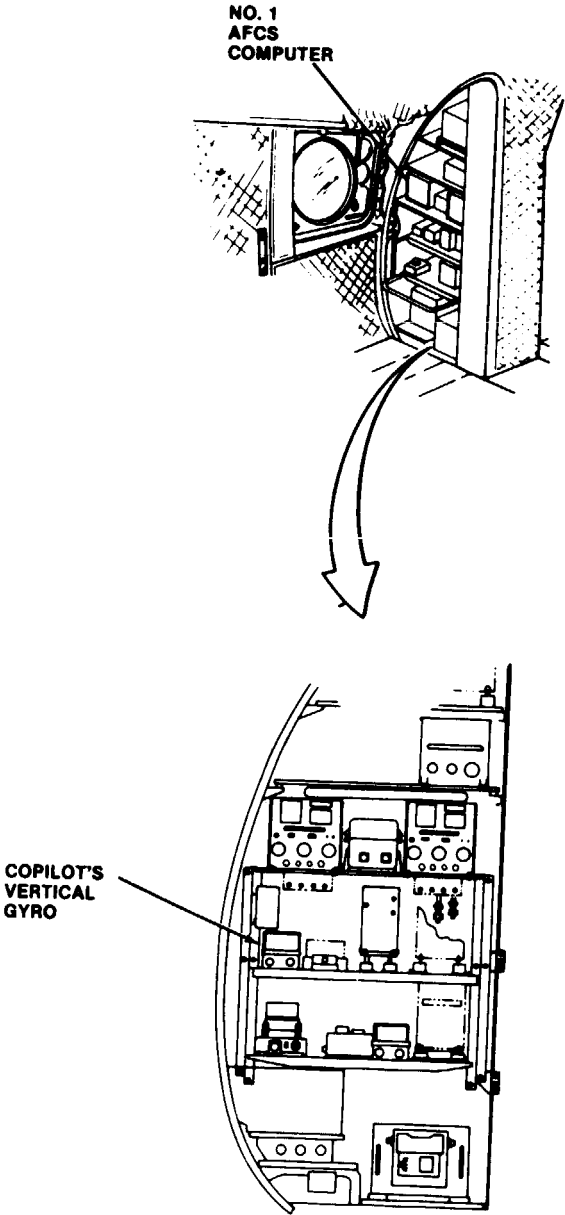
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

References:

- TM 55-1520-240-23
- TM 55-4920-429-13

Equipment Condition:

- TM 55-1520-240-23
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
- TM 55-4920-429-13
  - AFCS Line Test Set 145G0009-1
  - Prepared For Use



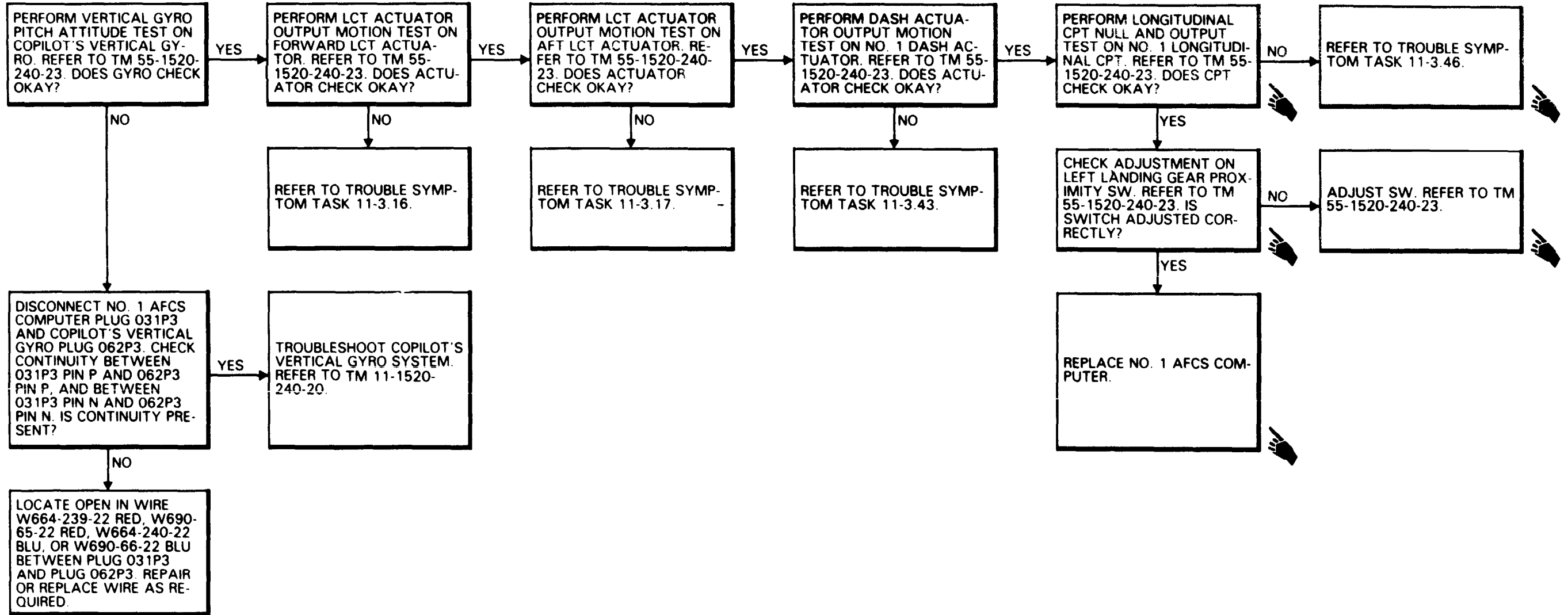
45X54

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11-3.50 NO. 1 AFCS PITCH ATTITUDE/AIR SPEED HOLD WEAK OR INOPERATIVE (Continued)

11-3.50



11-3.51 NO. 2 AFCS PITCH ATTITUDE/AIR SPEED HOLD WEAK OR INOPERATIVE

11-3.51

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

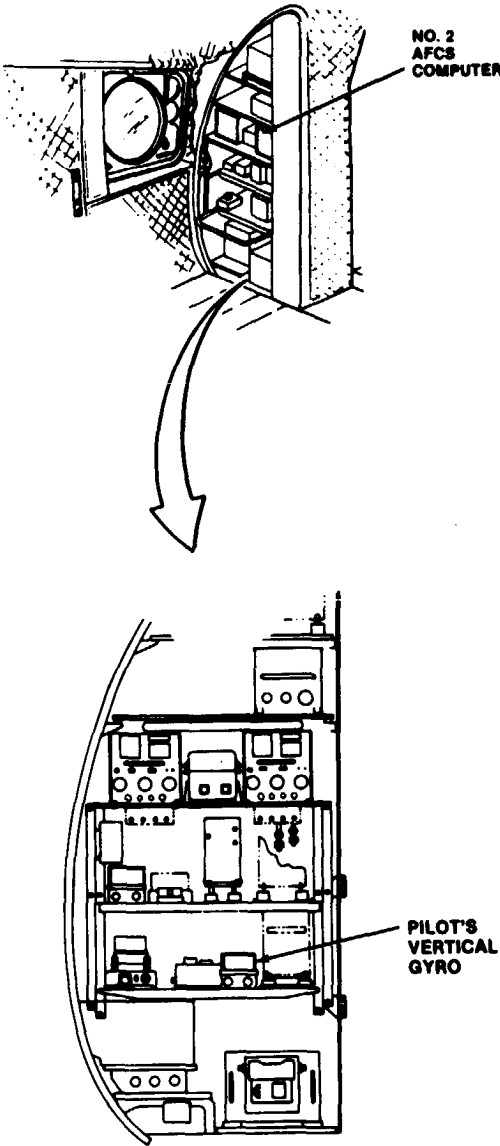
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

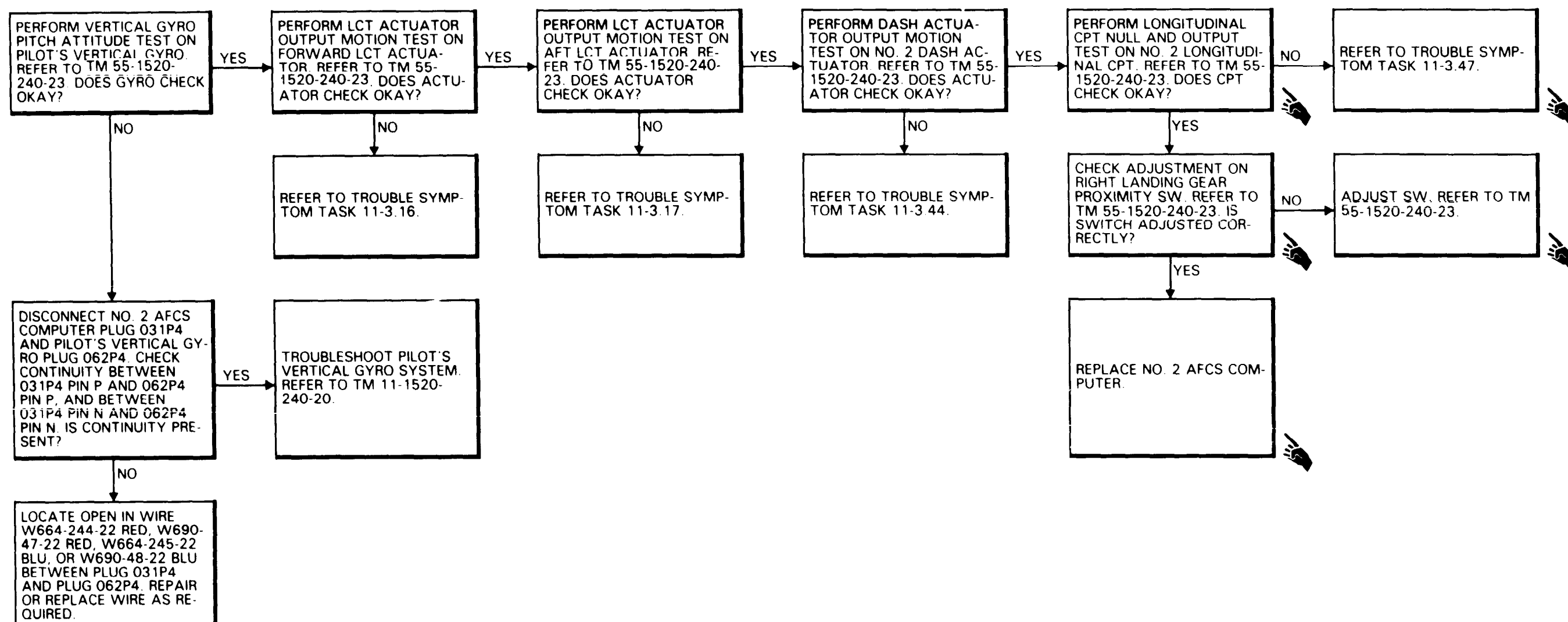
Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23  
TM 55-4920-429-13

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared For Use







11-3.52 AFCS LONGITUDINAL CONTROL POSITION OUT OF TRIM

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

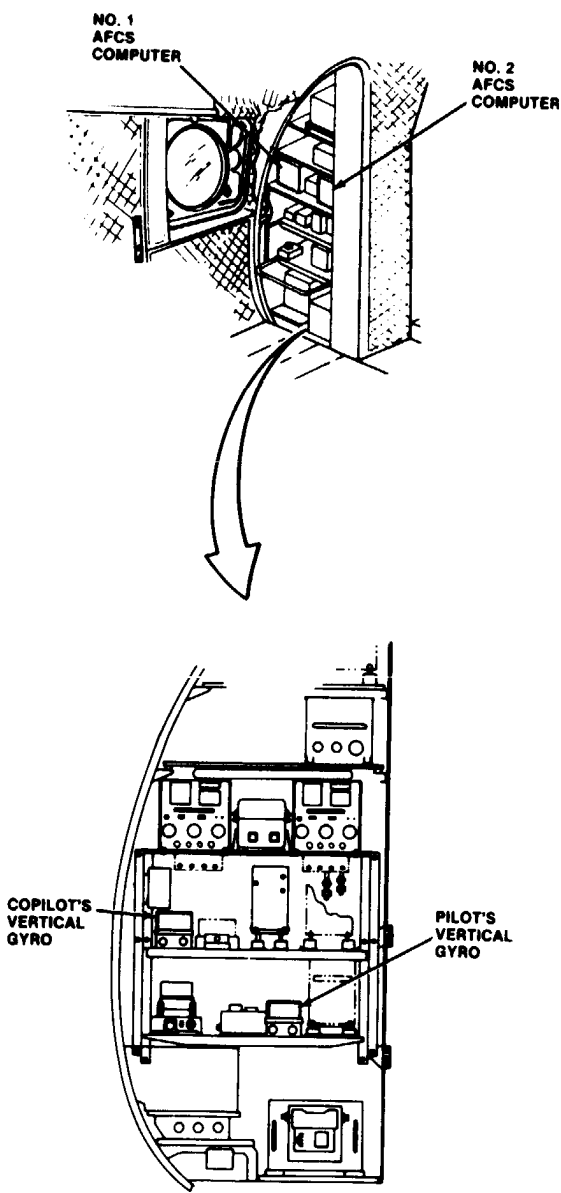
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

**Personnel Required:**  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

**References:**  
TM 55-1520-240-23  
TM 55-4920-429-13

**Equipment Condition:**  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared For Use



45X84

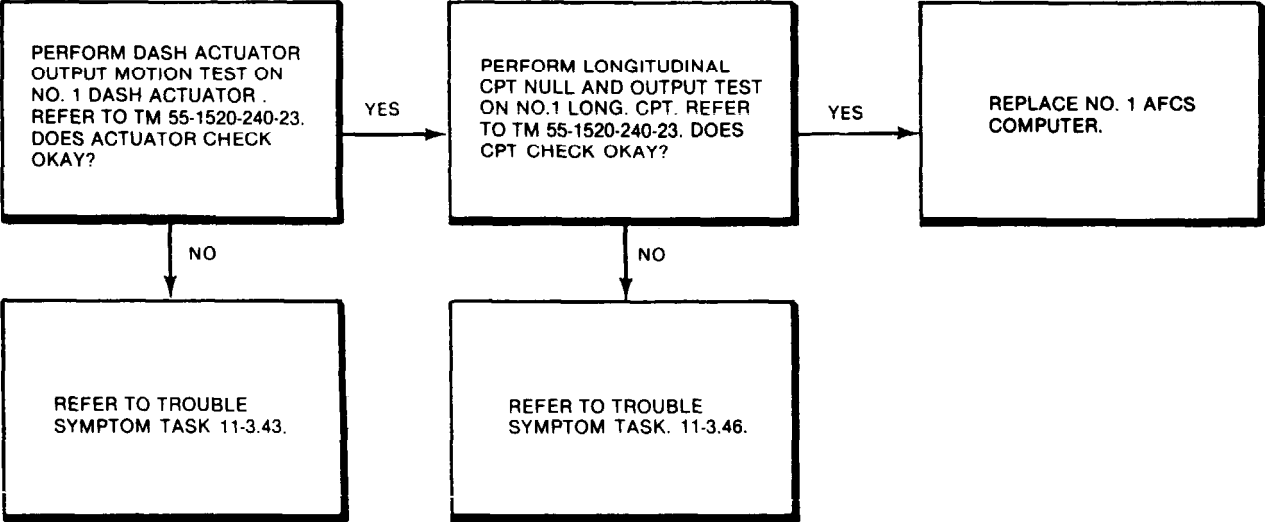
D145-11847-SPA

GO TO NEXT PAGE

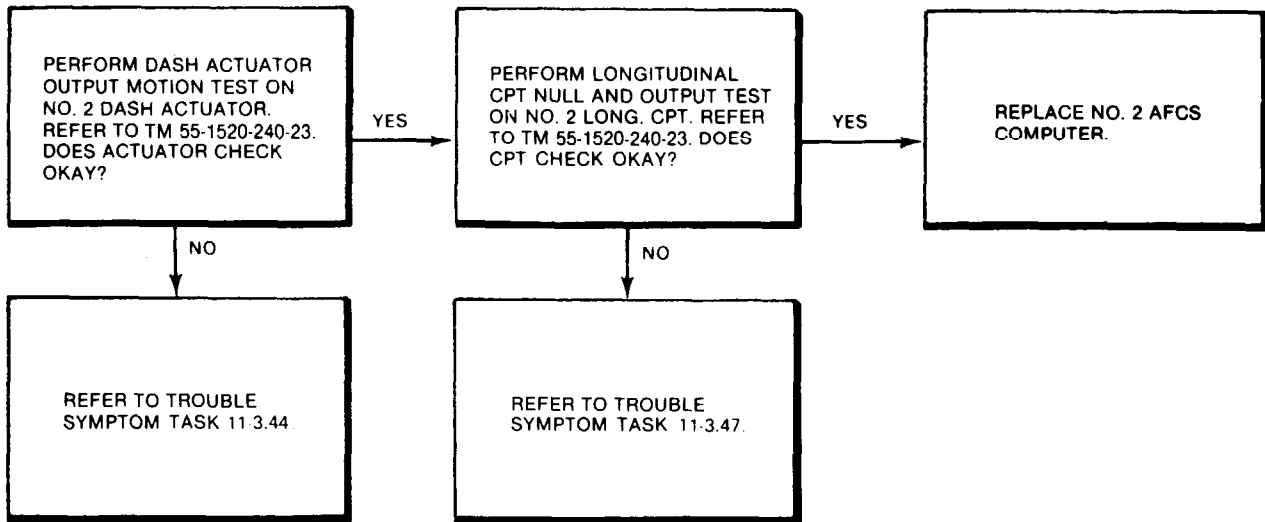
11-3.52 AFCS LONGITUDINAL CONTROL POSITION OUT OF TRIM  
(Continued)

11-3.52

NO. 1 AFCS LONGITUDINAL CONTROL POSITION OUT OF TRIM



NO. 2 AFCS LONGITUDINAL CONTROL POSITION OUT OF TRIM



END OF TASK

11-3.53 AFCS ROLL STABILIZATION ERRATIC/OSCILLATORY OR ROLL ATTITUDE HOLD WEAK OR INOPERATIVE

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

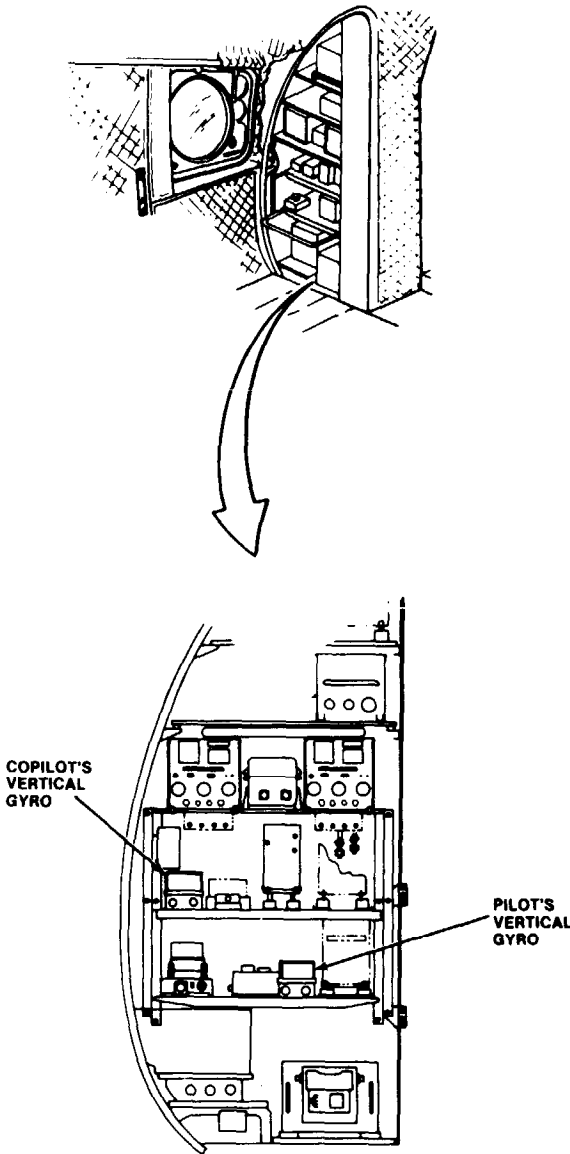
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23  
TM 55-4920-429-13

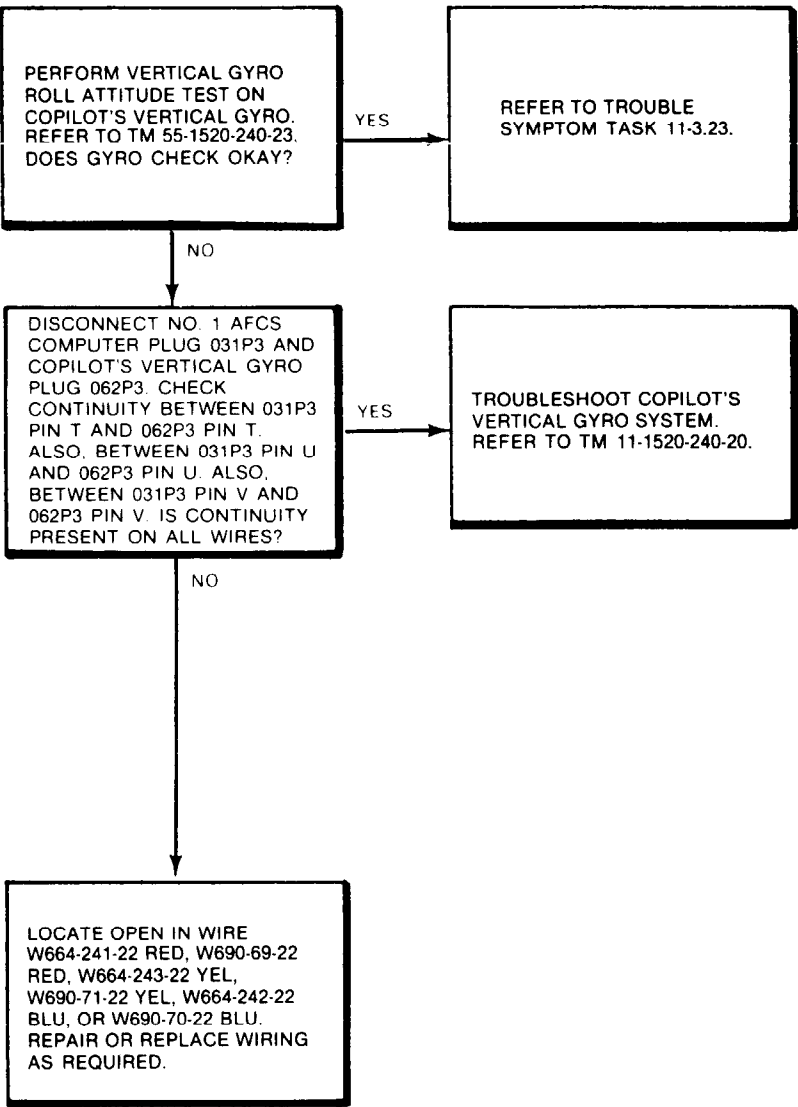
Equipment Condition:  
TM 55-1520-249-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared For Use



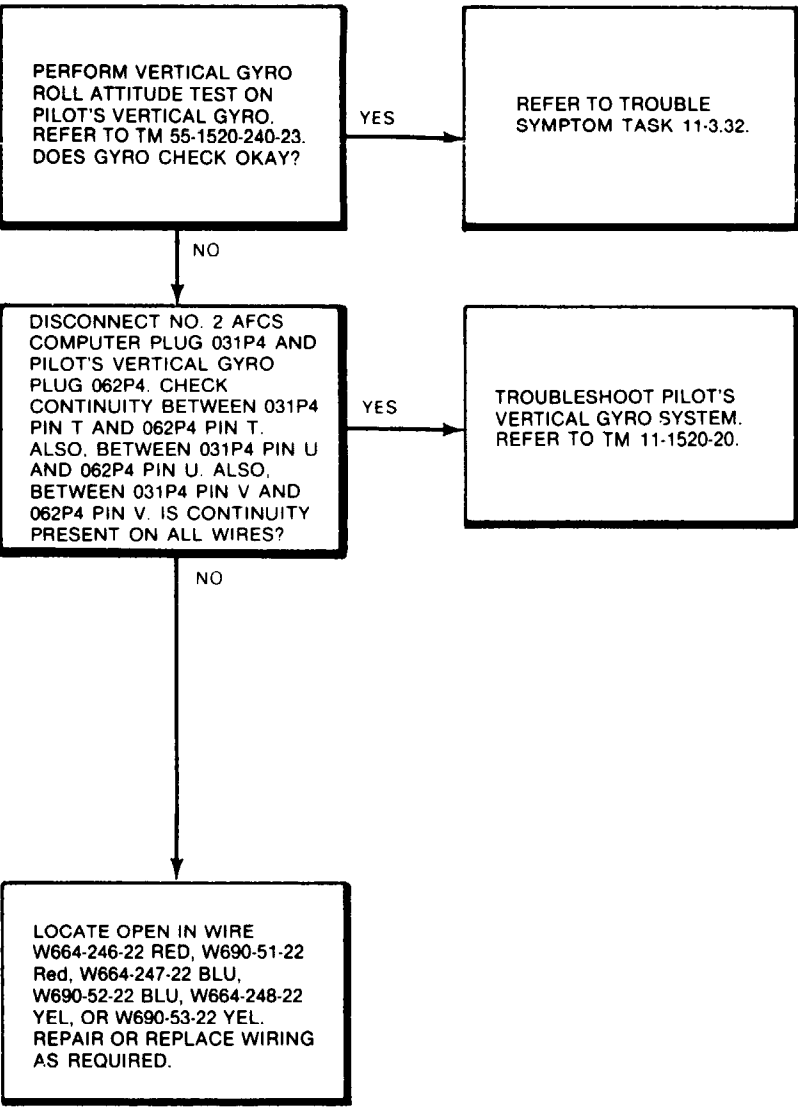
11-3.53 AFCS ROLL STABILIZATION ERRATIC/OSCILLATORY OR ROLL ATTITUDE HOLD WEAK OR INOPERATIVE (Continued)

11-3.53

NO. 1 AFCS ROLL STABILIZATION ERRATIC/OSCILLATORY OR ROLL ATTITUDE HOLD WEAK OR INOPERATIVE



NO. 2 AFCS ROLL STABILIZATION ERRATIC/OSCILLATORY OR ROLL ATTITUDE HOLD WEAK OR INOPERATIVE



END OF TASK

11-3.54 HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE  
(BOTH SYSTEMS)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

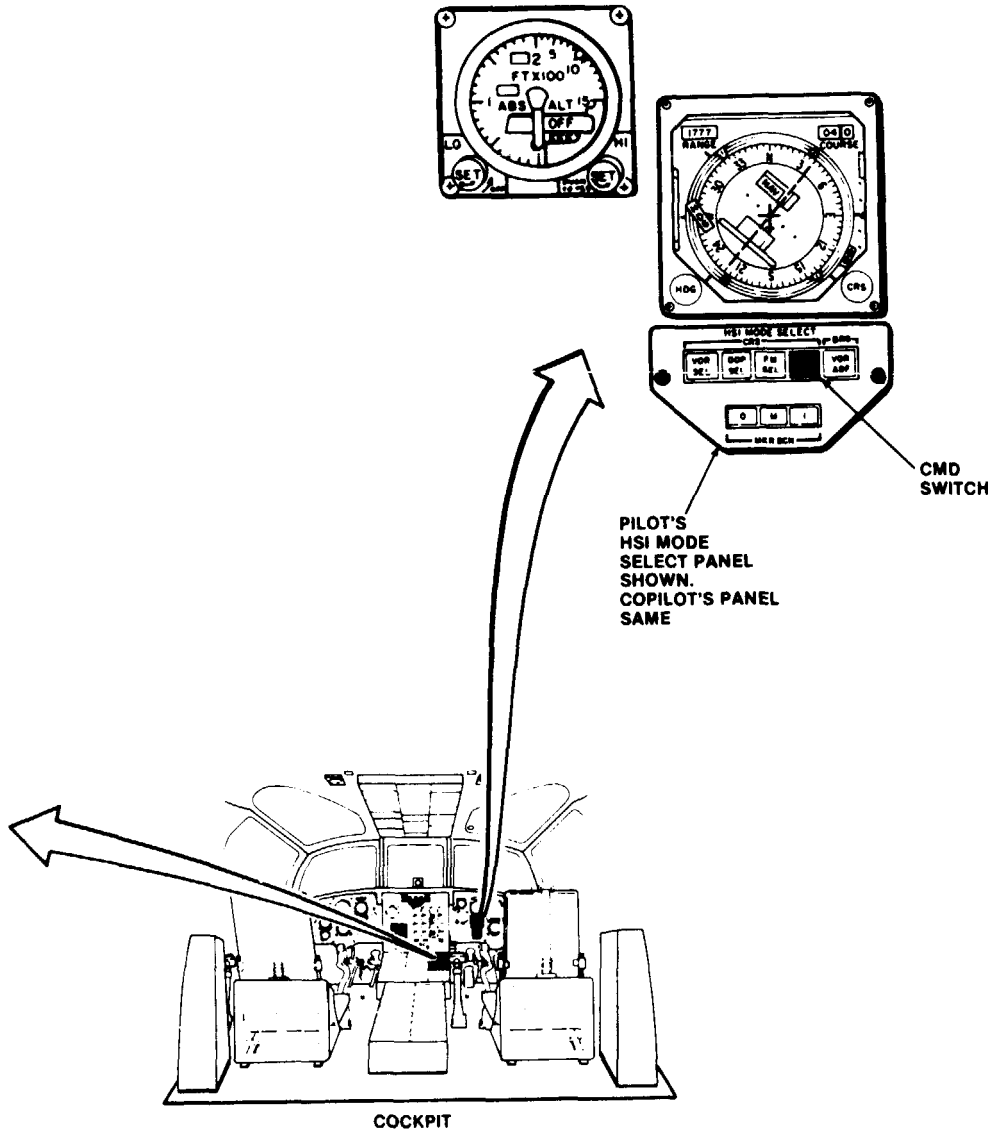
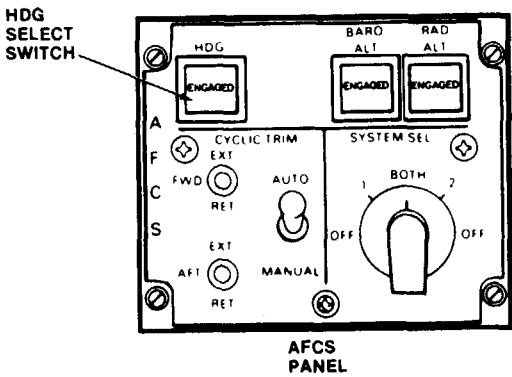
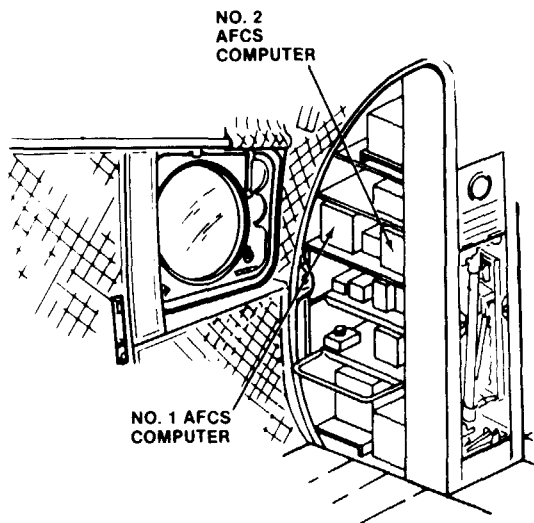
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:

TM 55-1520-240-23  
TM 55-4920-429-13

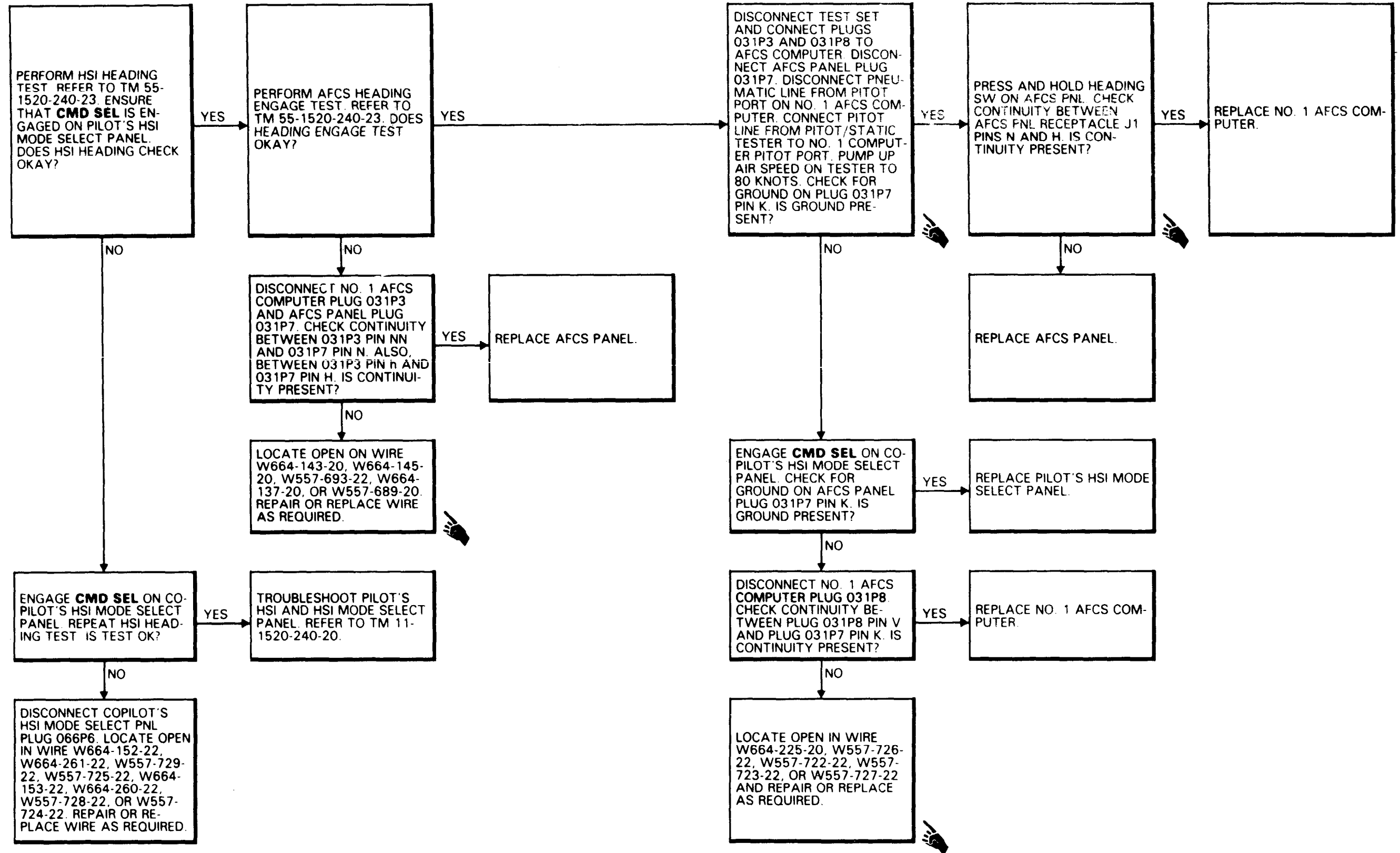
Equipment Condition:

TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared for Use



11-3.54 HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE (BOTH SYSTEMS) (Continued)

11-3.54



11-3.55 NO. 1 AFCS HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

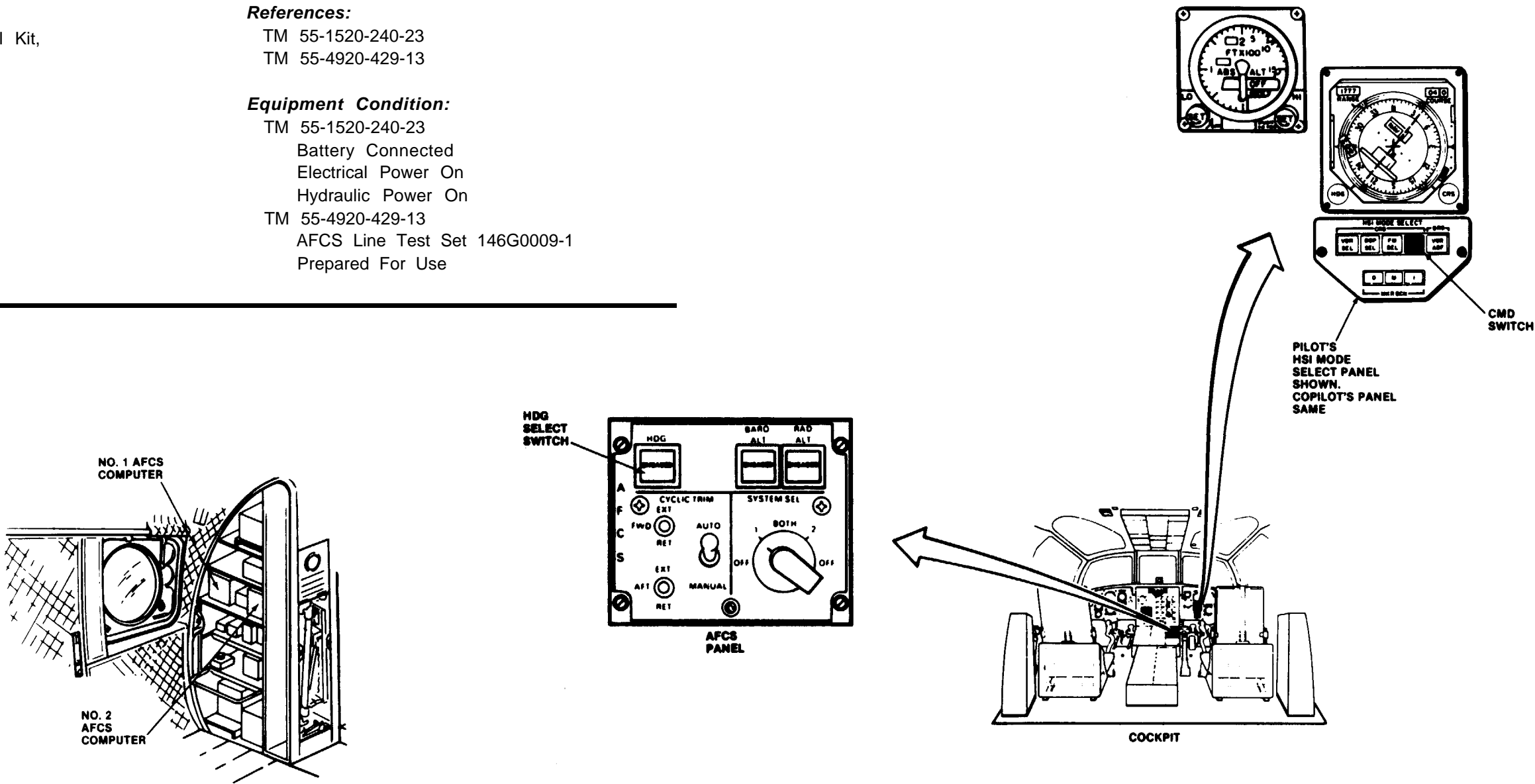
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

**Personnel Required:**  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

**References:**  
TM 55-1520-240-23  
TM 55-4920-429-13

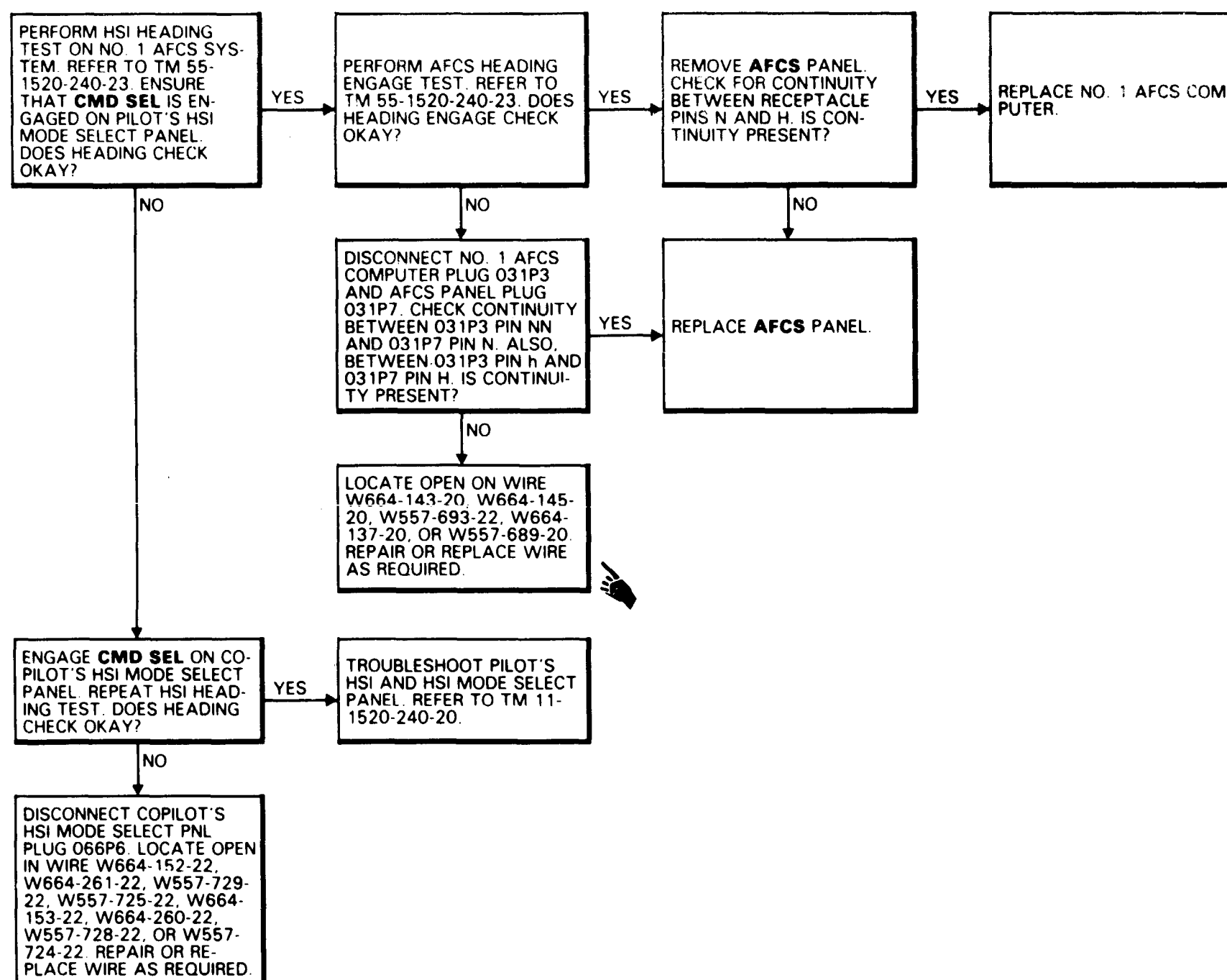
**Equipment Condition:**  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 146G0009-1  
Prepared For Use





## 11-3.55 NO. 1 AFCS HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE (Continued)

11-3.55



11-3.56 NO. 2 AFCS HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

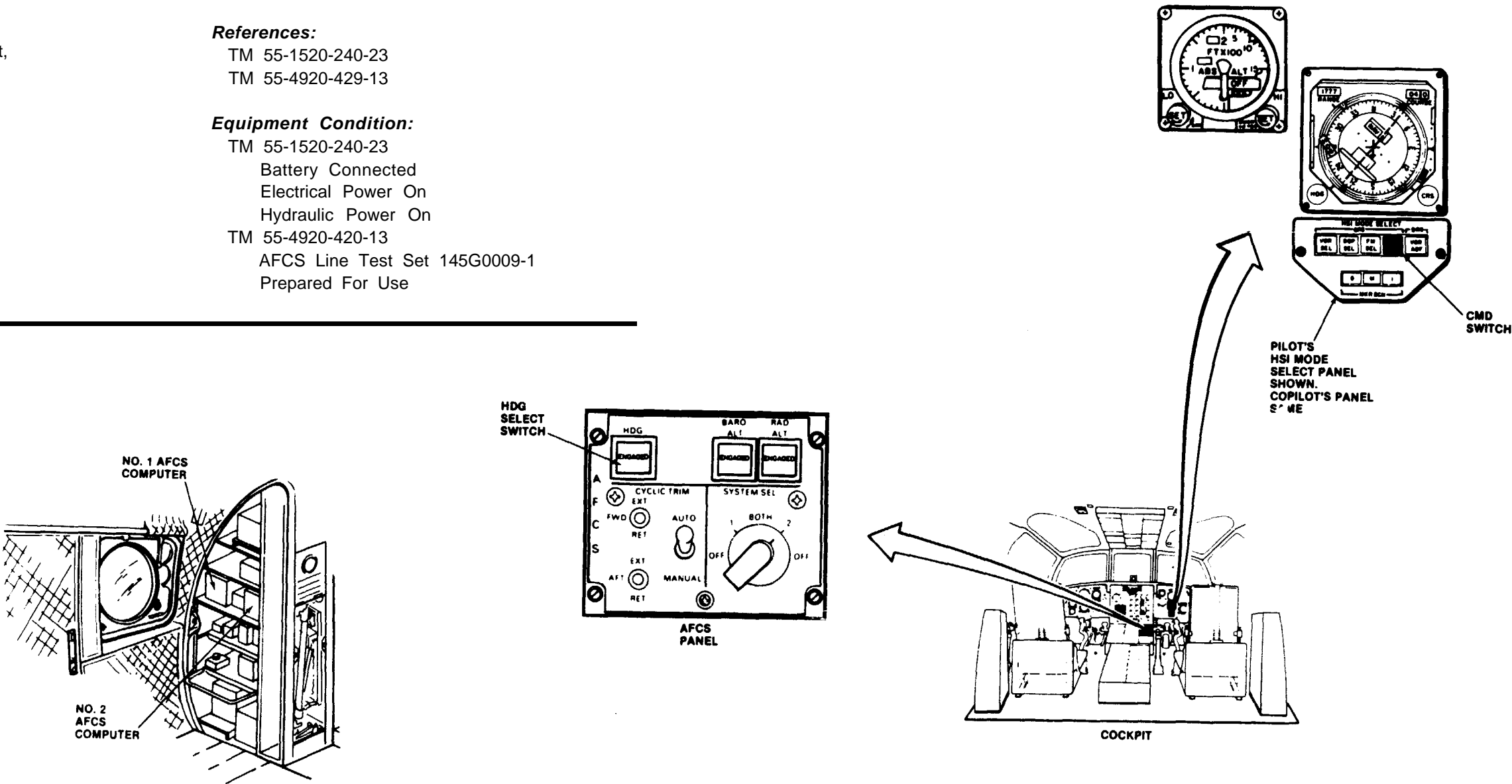
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

**Personnel Required:**  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

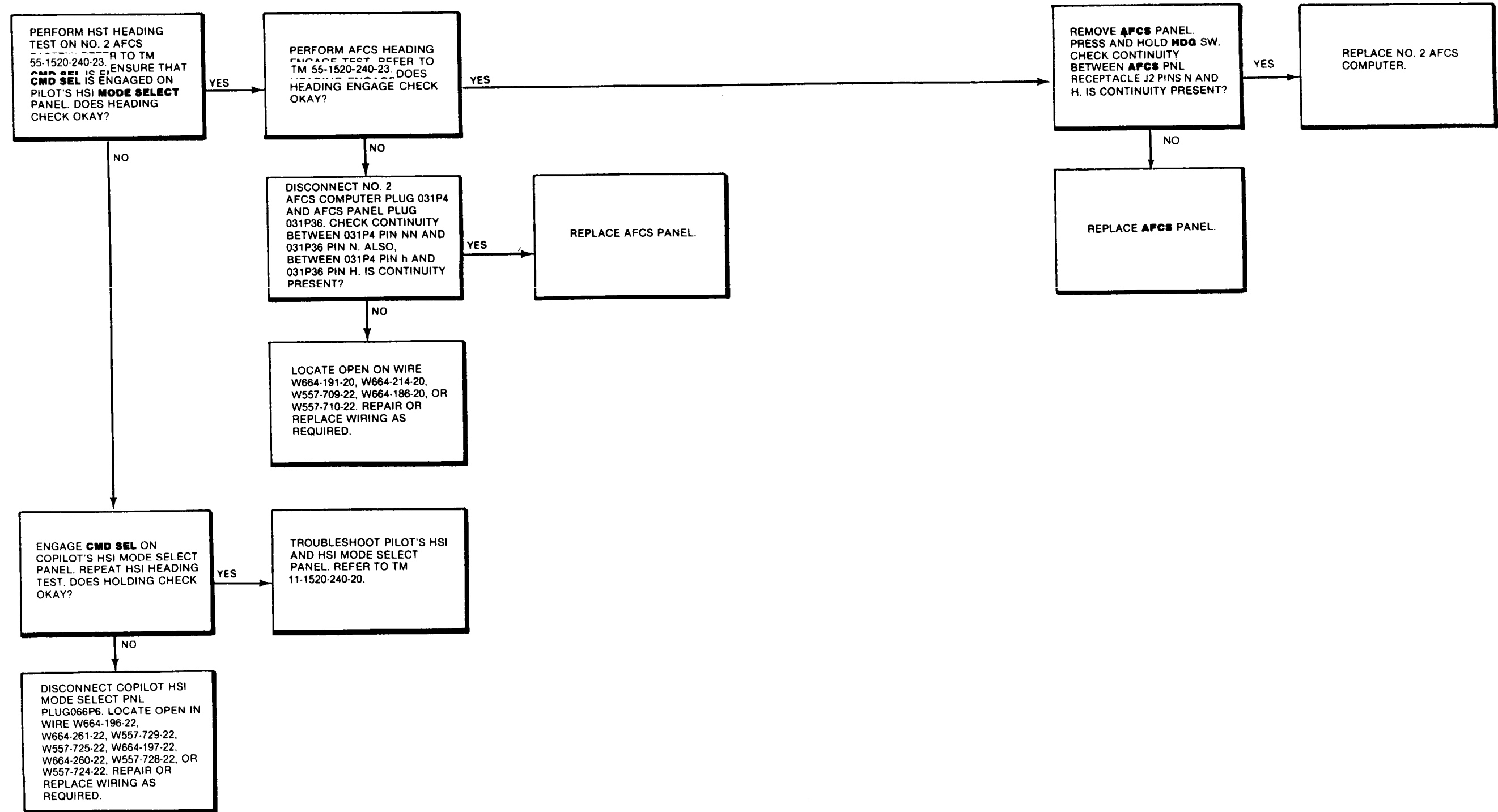
**References:**  
TM 55-1520-240-23  
TM 55-4920-429-13

**Equipment Condition:**  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-420-13  
AFCS Line Test Set 145G0009-1  
Prepared For Use



11-3.56 NO. 2 AFCS HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE (Continued)

11-3.56



END OF TASK

11-3.57 NO. 1 AFCS YAW STABILITY ERRATIC/OSCILLATORY

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
- Multimeter

Materials:

None

Personnel Required:

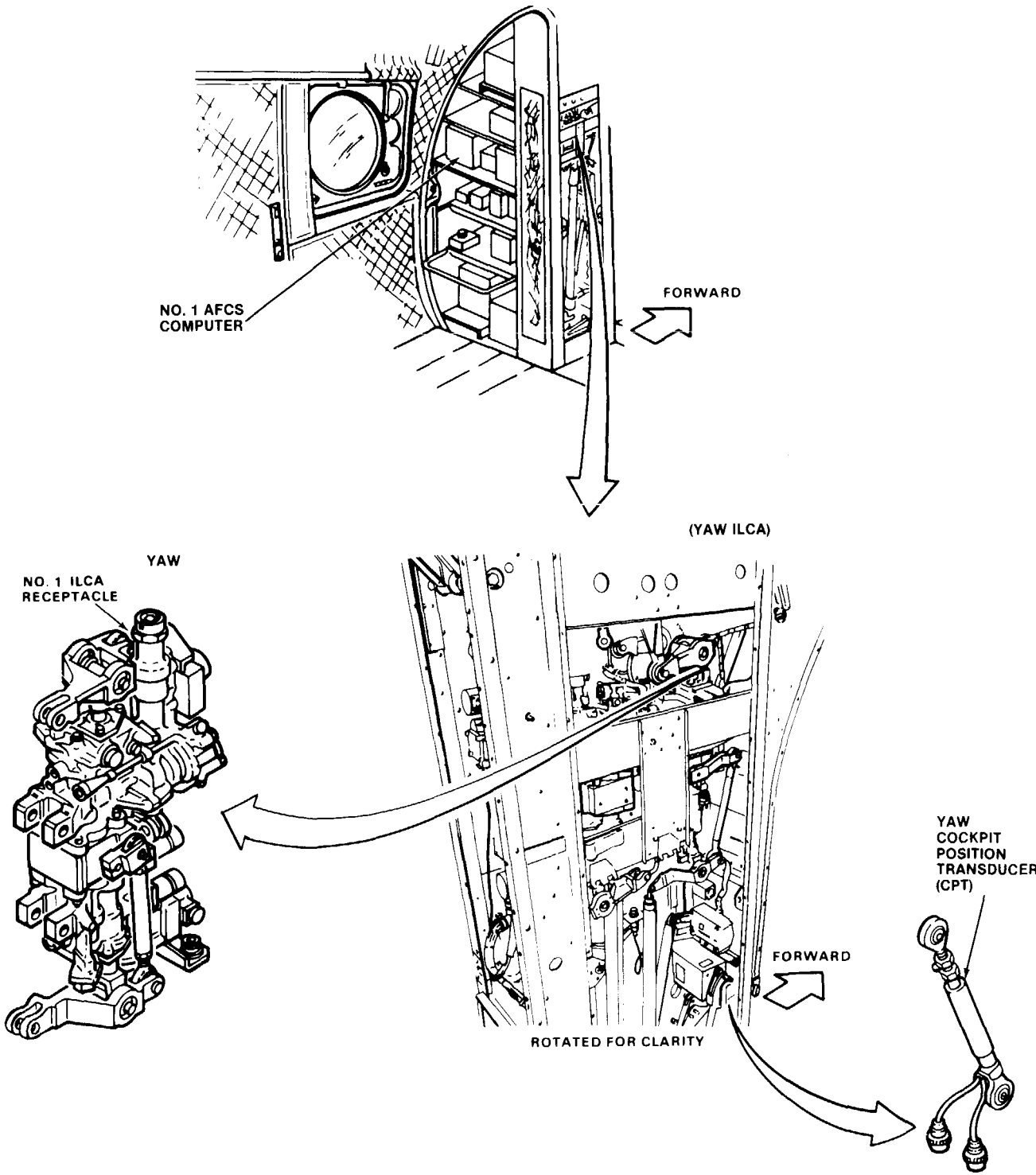
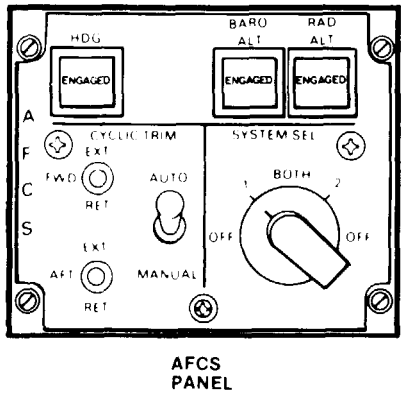
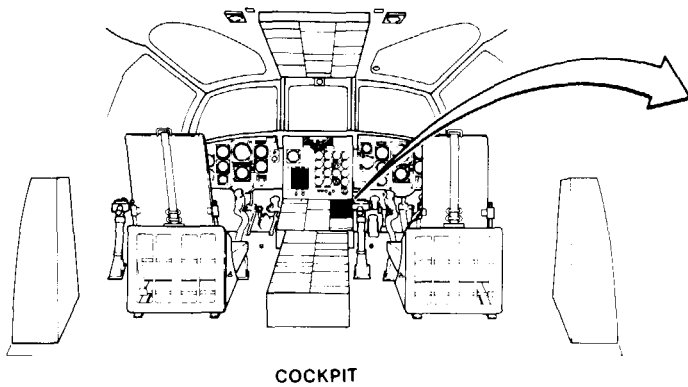
Avionic Mechanic (2)

References:

- TM 55-1520-240-23
- TM 55-4920-429-13

Equipment Condition:

- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
- TM 55-4920-429-13:
  - AFCS Line Test Set 145G0009-1 Prepared for Use

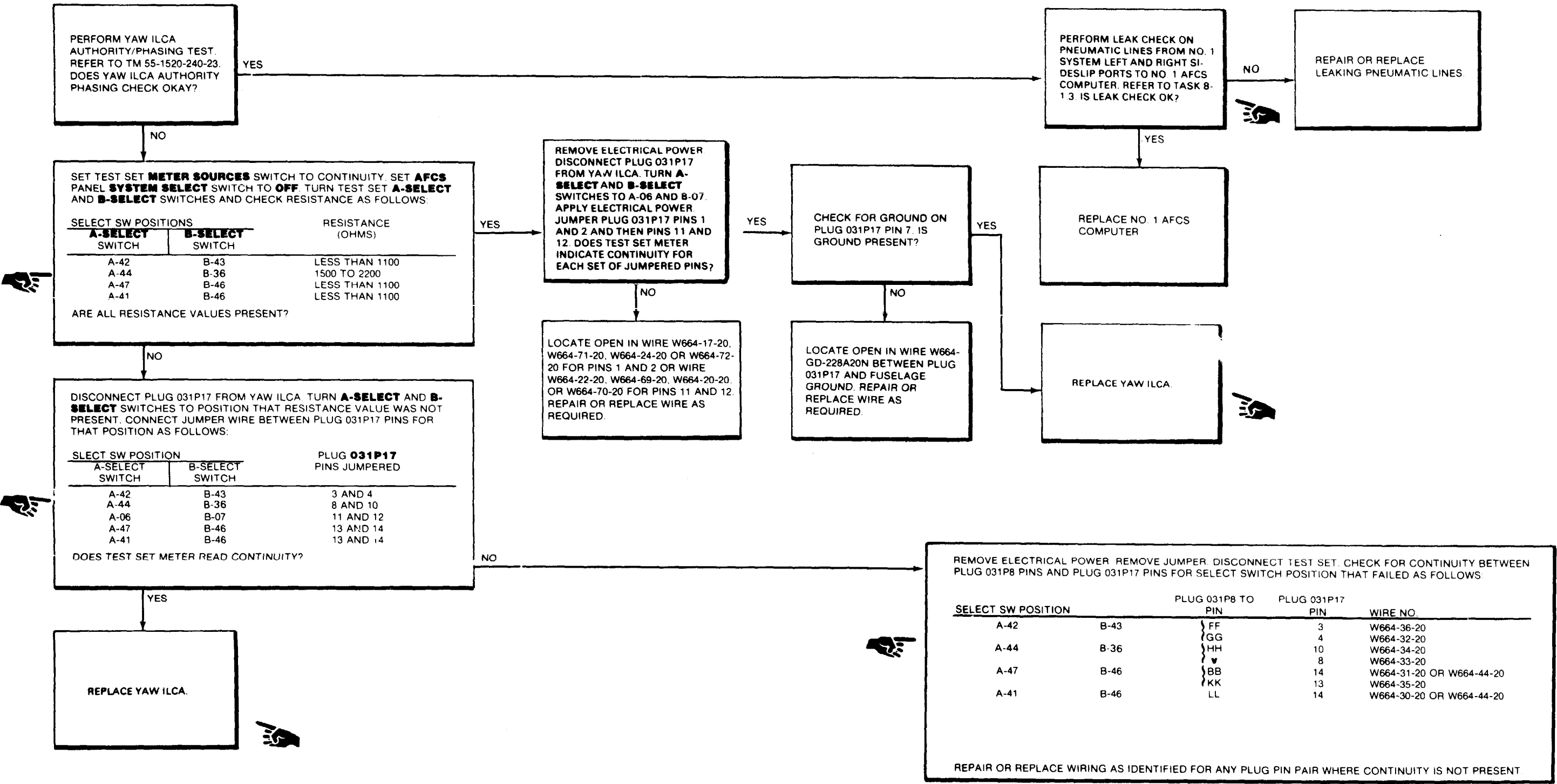


90 x 54

D145-11961-SPA

11-3.57 NO. 1 AFCS YAW STABILITY ERRATIC/OSCILLATORY  
(Continued)

11-3.57



END OF TASK

11-3.58 NO. 2 AFCS YAW STABILITY ERRATIC/OSCILLATORY

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

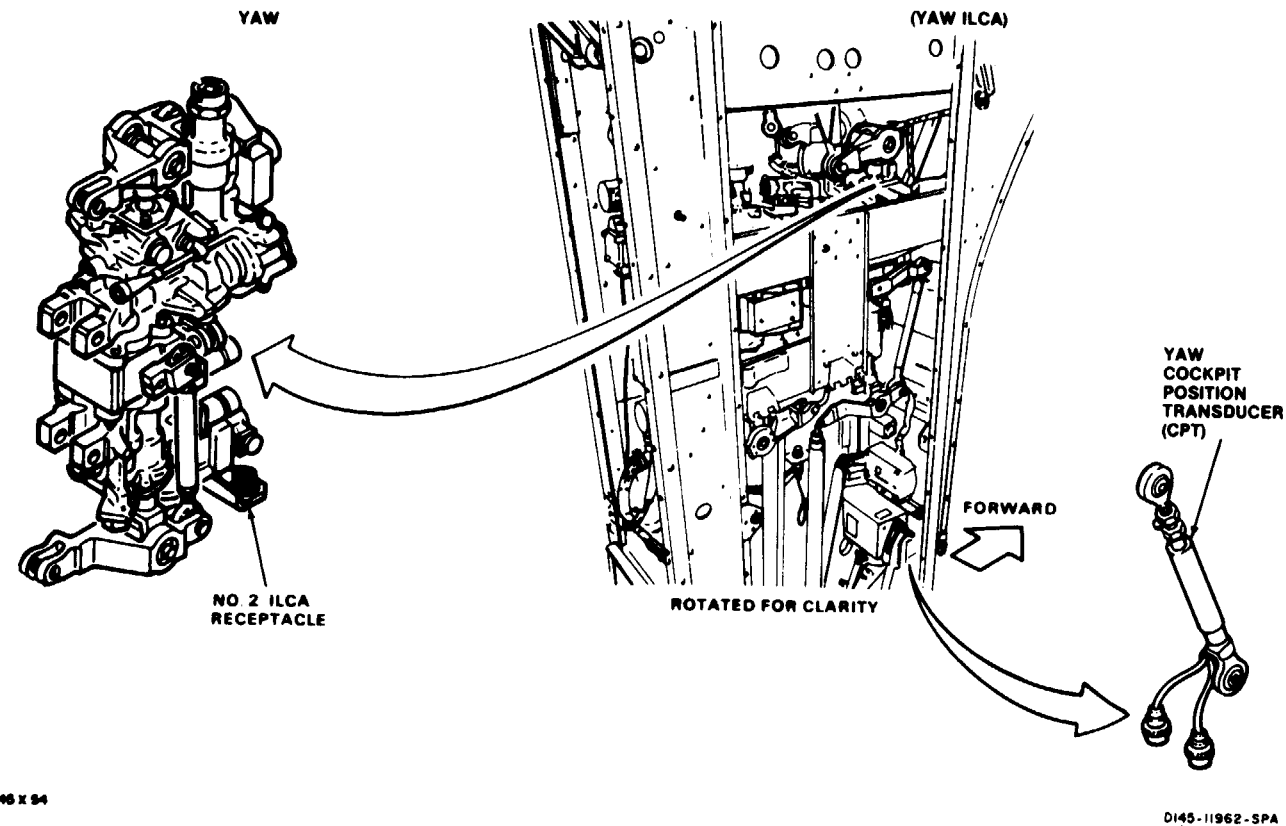
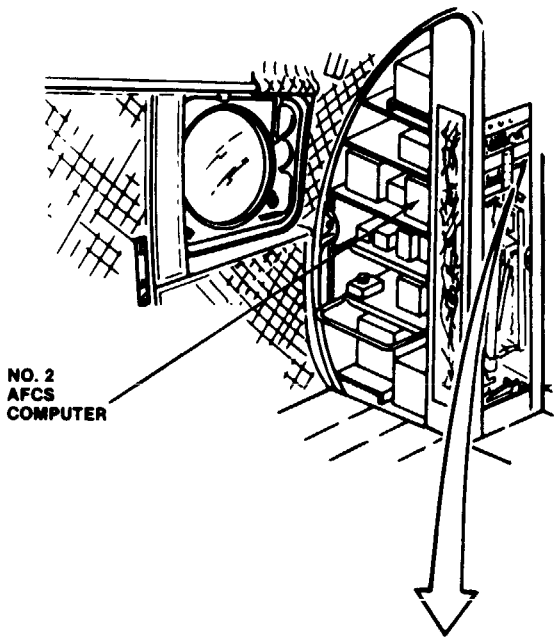
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23  
TM 55-4920-429-13

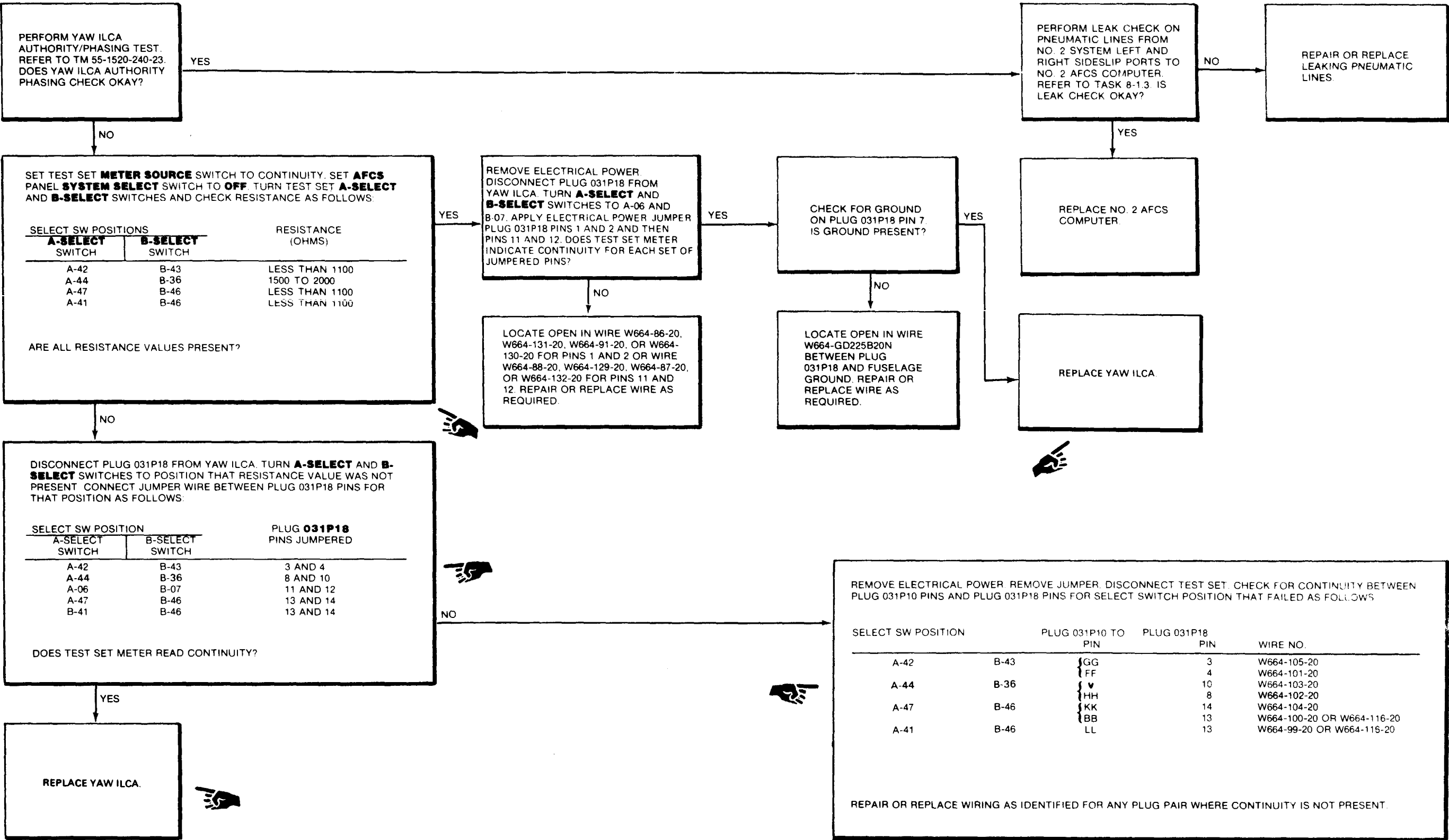
Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared For Use



GO TO NEXT PAGE

11-3.58 NO. 2 AFCS YAW STABILITY ERRATIC/OSCILLATORY  
(Continued)

11-3.58



END OF TASK

11-3.59 AFCS HEADING HOLD WEAK OR INOPERATIVE

11-3.59

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

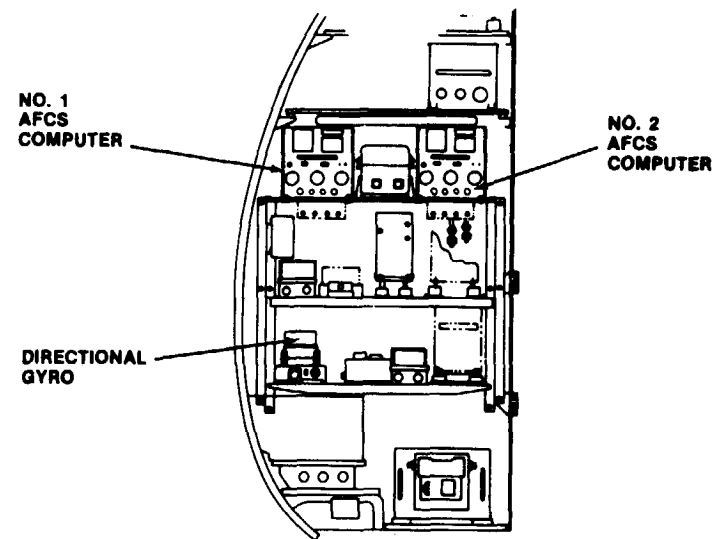
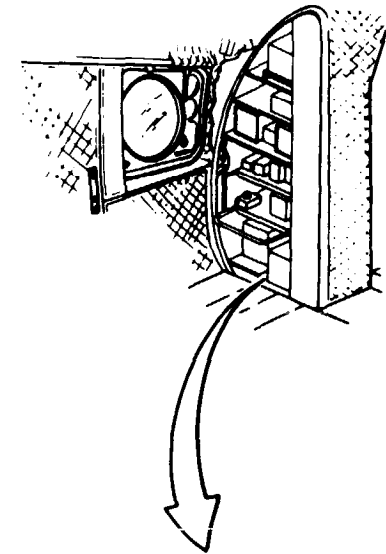
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
35k20 Avionic Mechanic

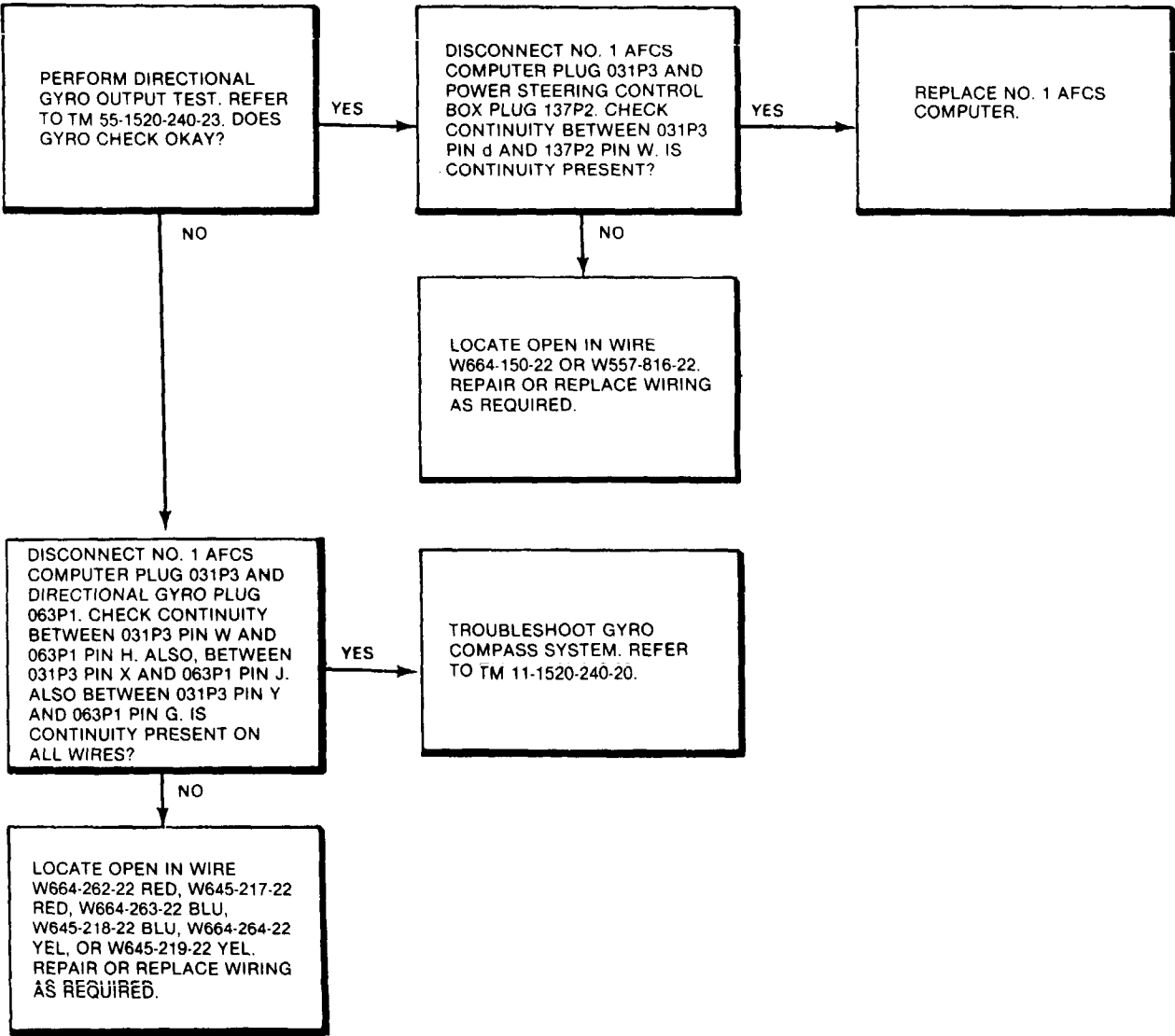
References:  
TM 55-1520-240-23  
TM 55-4920-429-13

Equipment Condition:  
TM 55-1520-249-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 146G0009-1  
Prepared For Use

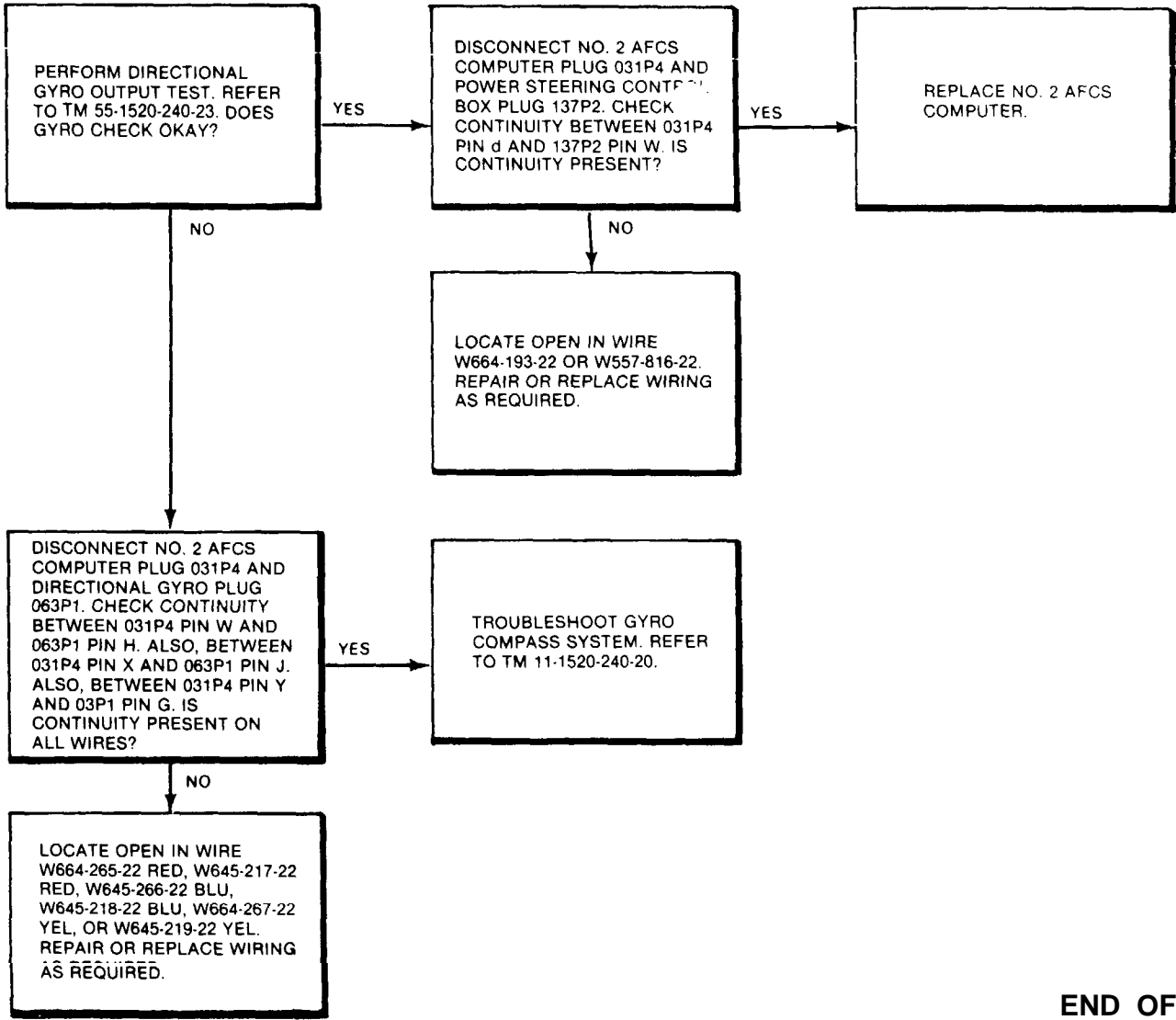




NO. 1 AFCS HEADING HOLD WEAK OR INOPERATIVE



NO. 2 AFCS HEADING HOLD WEAK OR INOPERATIVE



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

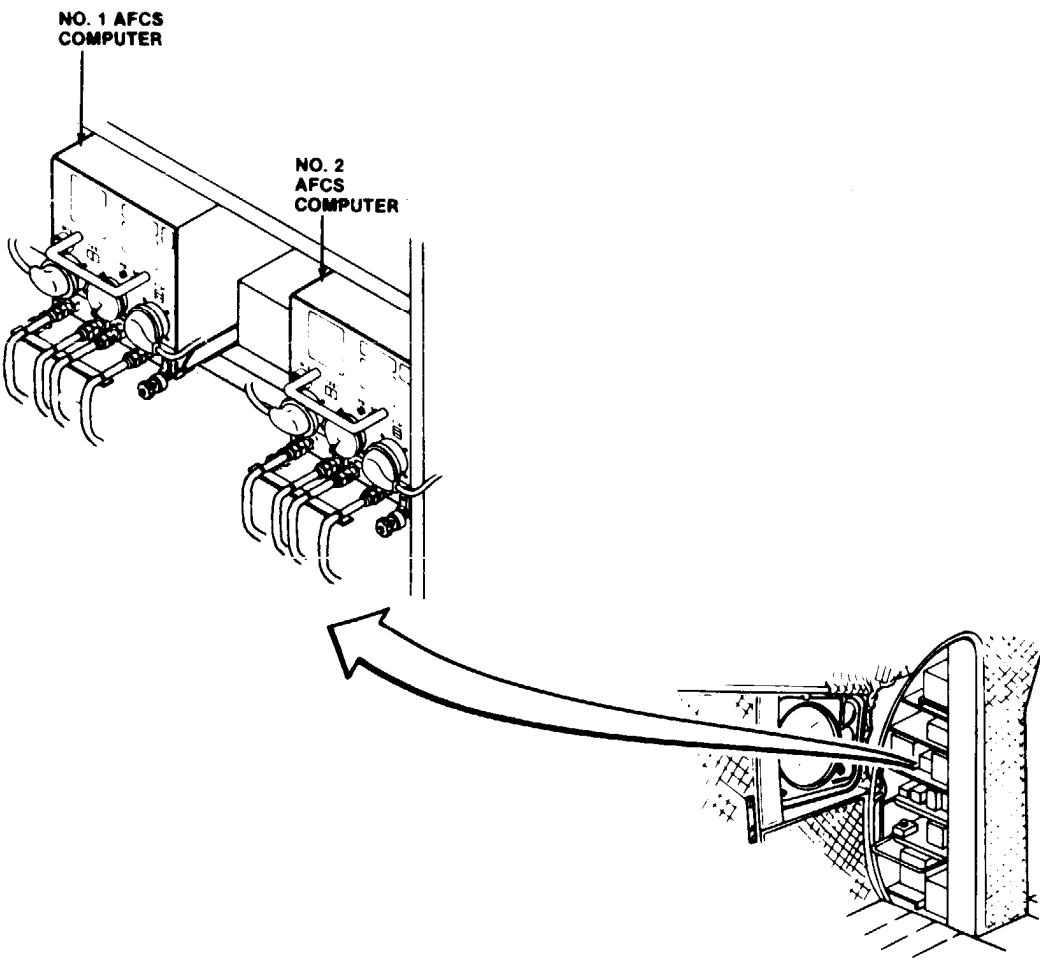
68F20 Aircraft Electrician

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



45X54

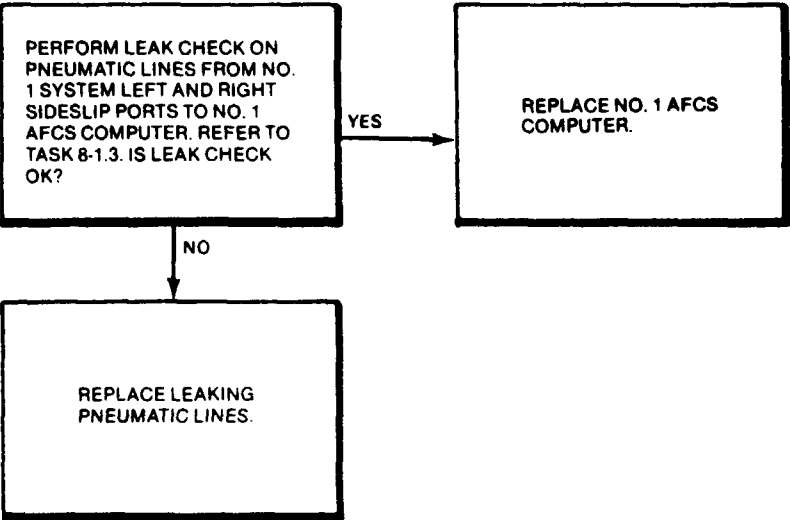
D145-11936-SPA

GO TO NEXT PAGE

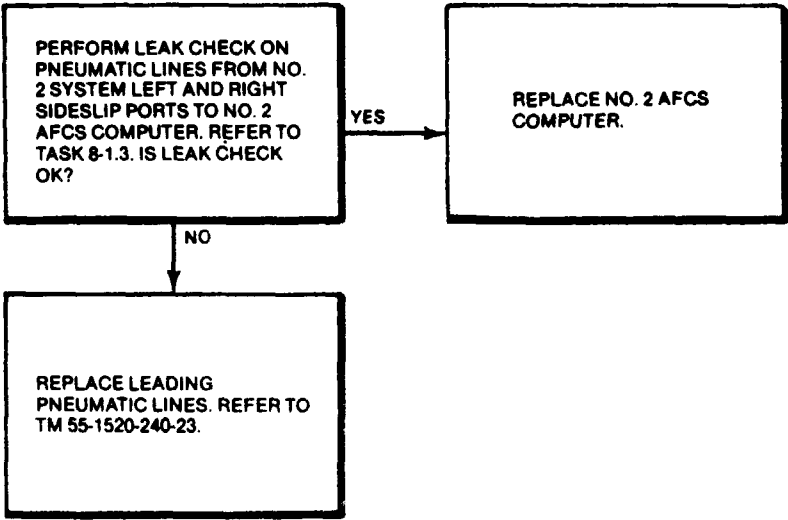
11-3.60 AFCS LATERAL STICK ONLY TURNS NOT COORDINATED  
(Continued)

11-3.60

NO. 1 AFCS LATERAL STICK ONLY TURNS  
NOT COORDINATED



NO. 2 AFCS LATERAL STICK ONLY TURNS  
NOT COORDINATED



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

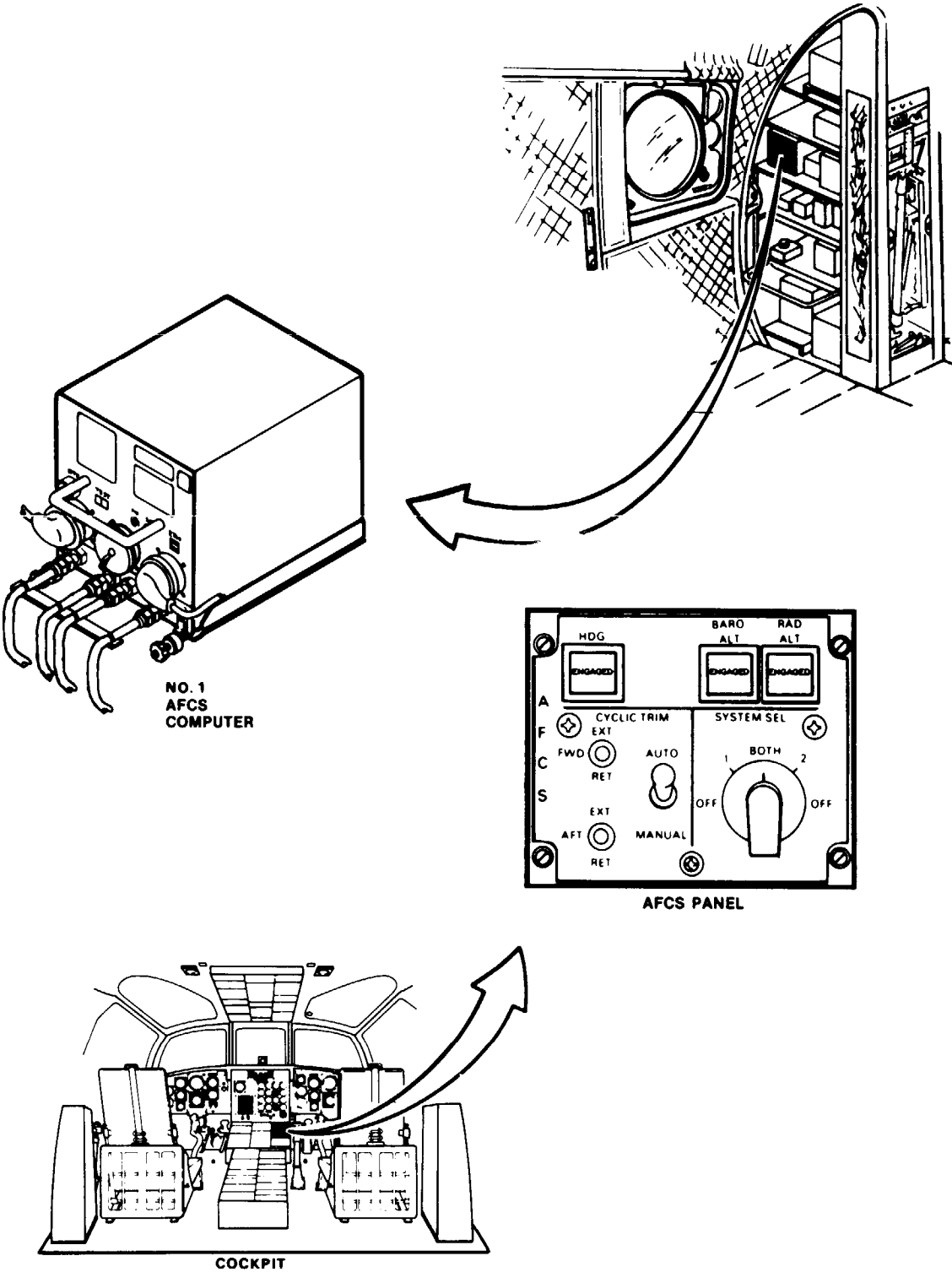
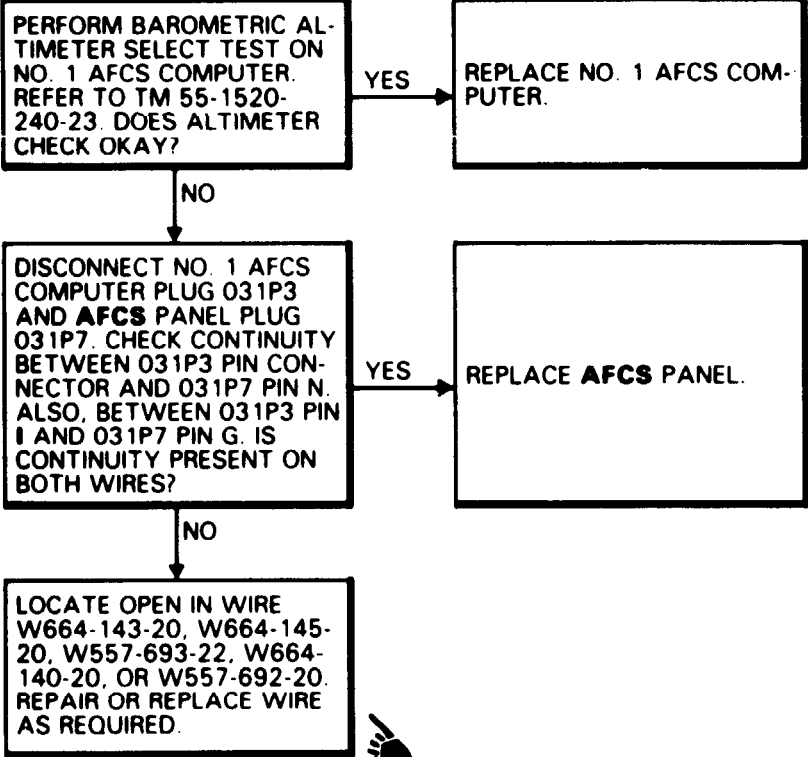
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

**Personnel Required:**  
Avionic Mechanic (2)

**References:**  
TM 55-1520-240-23  
TM 55-4920-429-13

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1 Prepared for Use



11-3.62 RADAR ALTITUDE HOLD INOPERATIVE OR RESPONSE ERRATIC  
(BAROMETRIC ALTITUDE HOLD OKAY)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

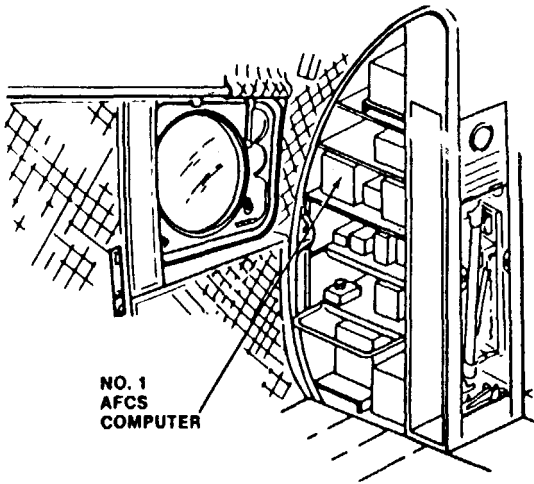
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

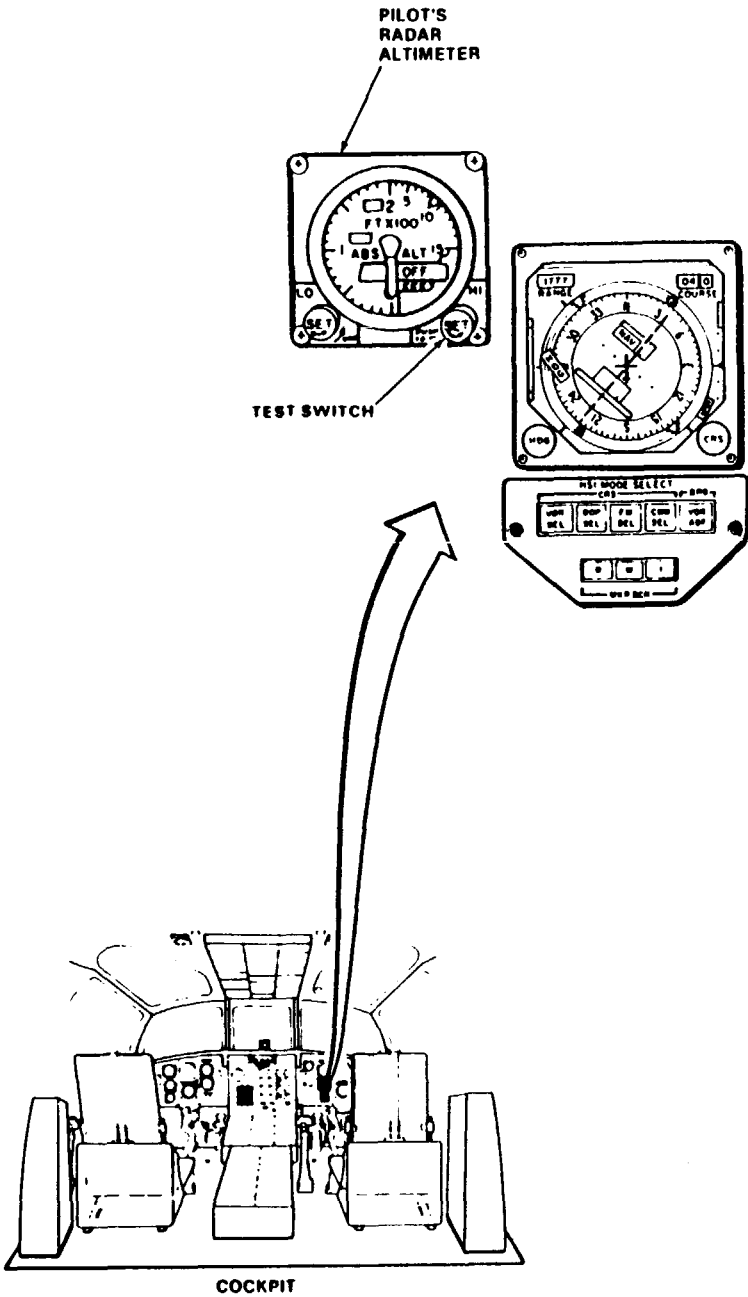
Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

References:  
TM 55-1520-240-23  
TM 55-4920-429-13

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared for Use.



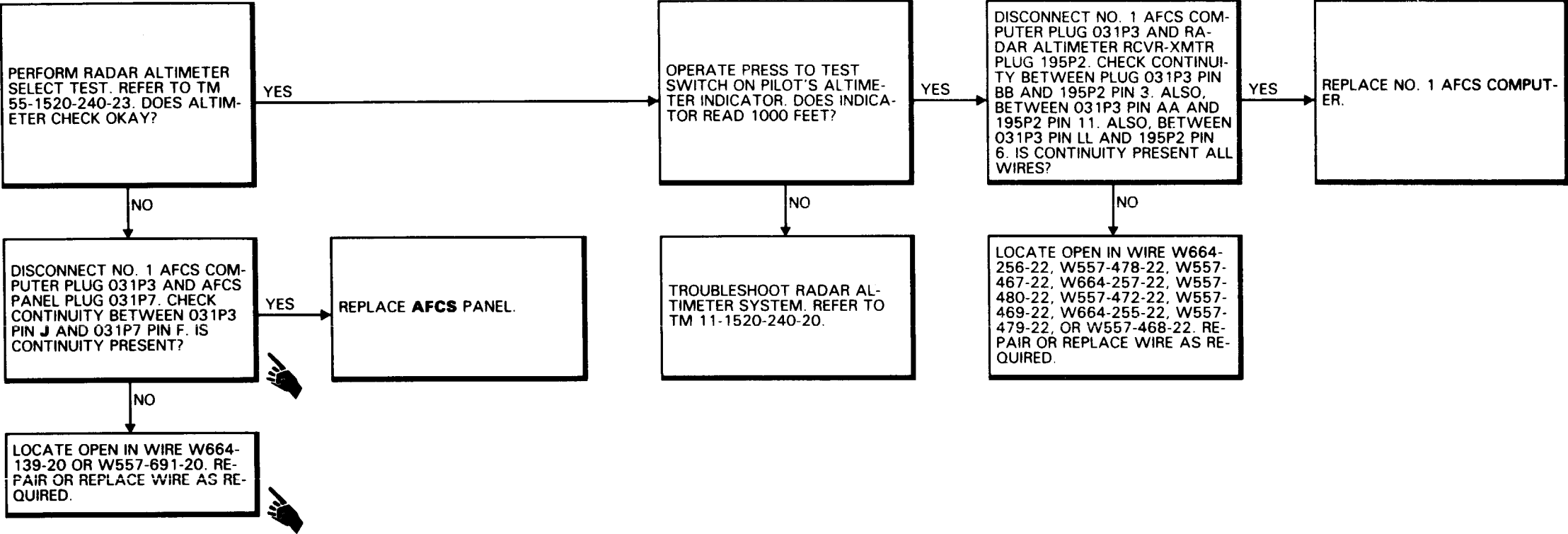
90 x 54



0145 - 11943 - SPA

11-3.62 RADAR ALTITUDE HOLD INOPERATIVE OR RESPONSE ERRATIC (BAROMETRIC ALTITUDE HOLD OKAY) (Continued)

11-3.62



11-3.63 BAROMETRIC AND RADAR ALTITUDE HOLD INOPERATIVE OR  
RESPONSE ERRATIC

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

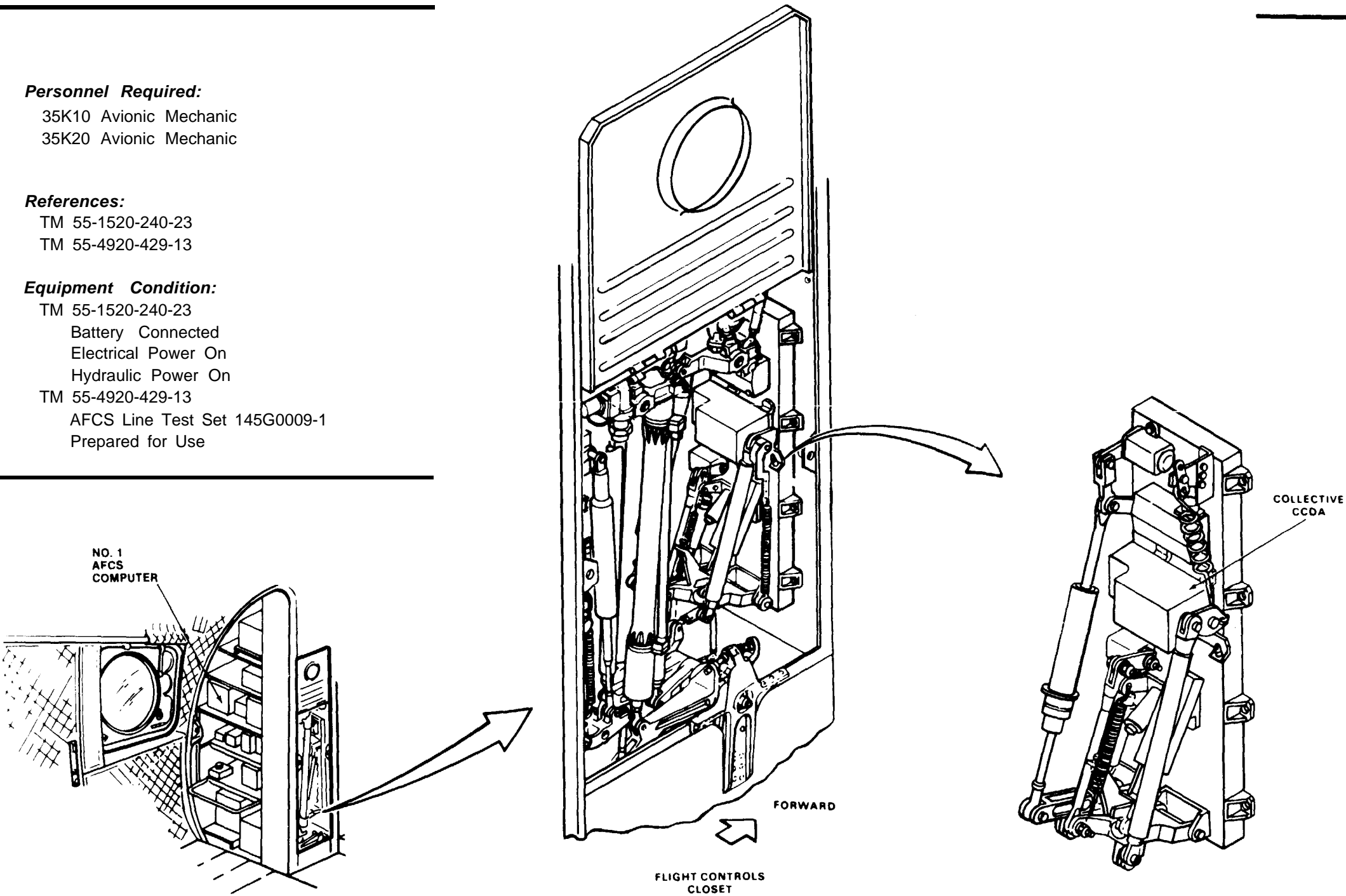
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
35K10 Avionic Mechanic  
35K20 Avionic Mechanic

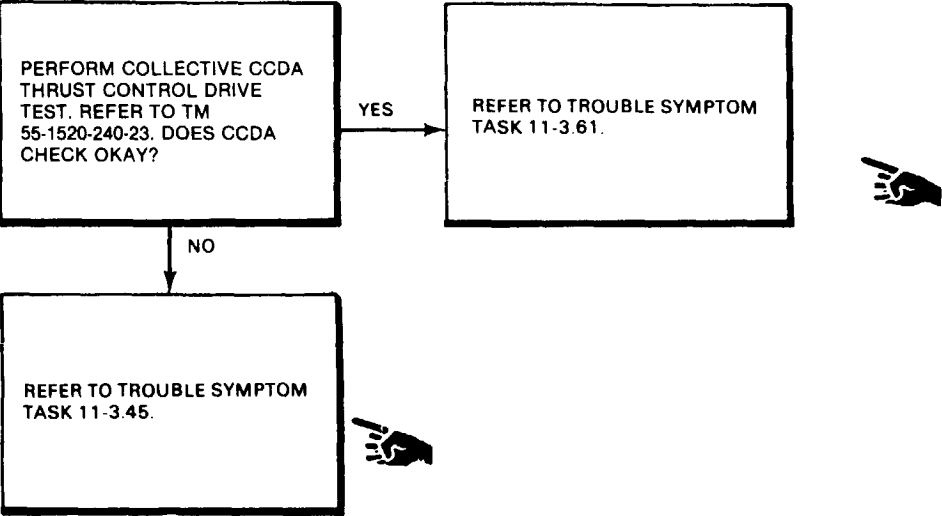
References:  
TM 55-1520-240-23  
TM 55-4920-429-13

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
TM 55-4920-429-13  
AFCS Line Test Set 145G0009-1  
Prepared for Use



11-3.63 BAROMETRIC AND RADAR ALTITUDE HOLD INOPERATIVE OR  
RESPONSE ERRATIC (Continued)

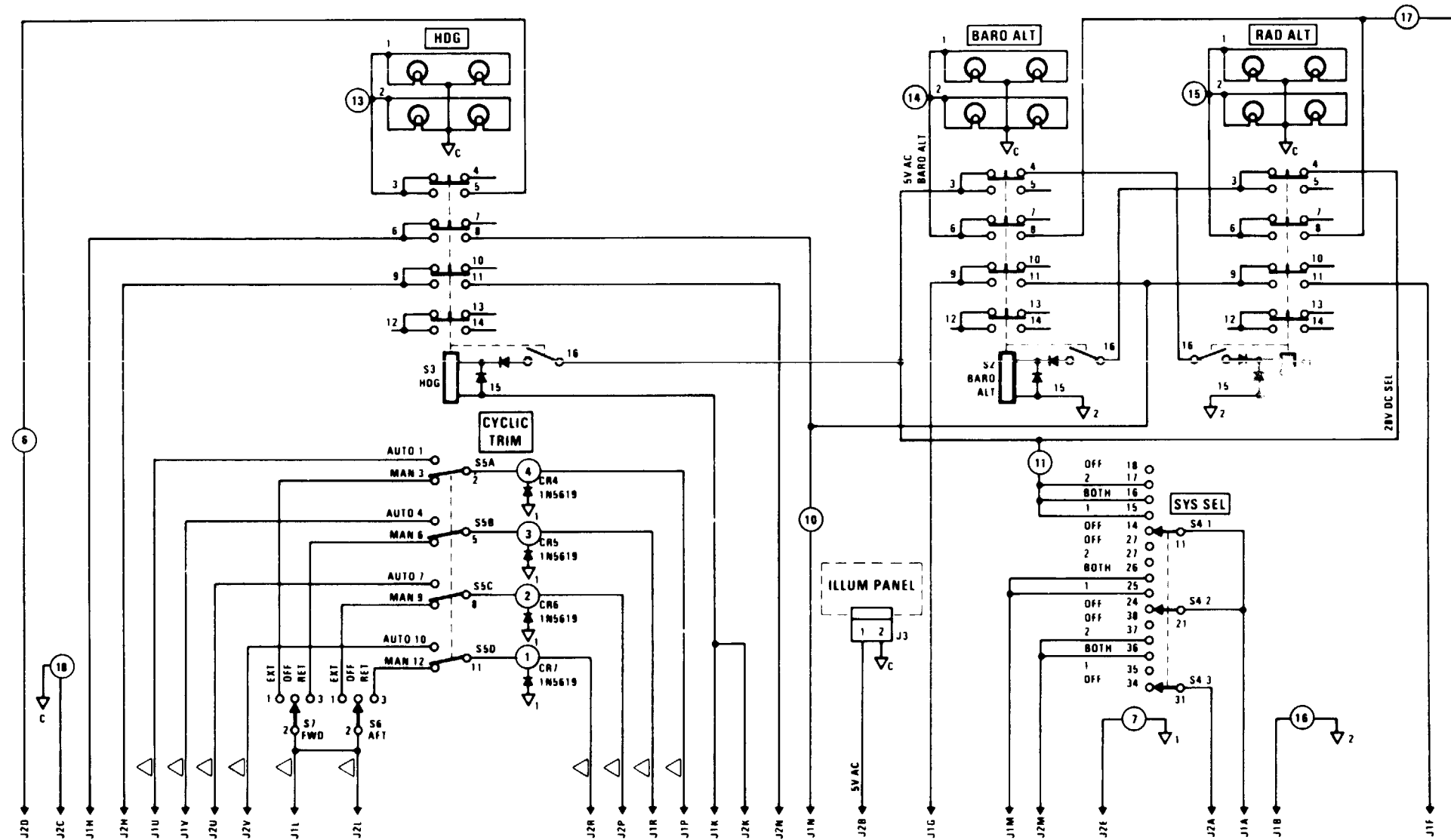
11-3.63




END OF TASK



## 11-4 AFCS CONTROL PANEL



### NOTE

1. INDICATES EQUIPMENT MARKING
2. INDICATES NUMBERED PAD ON PRINTED WIRING BOARD
3. ALL WIRE NO. 22 EXCEPT FOR  WHICH IS NO. 20

11-4.2 AFCS CONTROL PANEL VISUAL CHECK

11-4.2

INITIAL SETUP

**Applicable Configurations:**  
All

**Tools:**  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

**Materials:**  
None

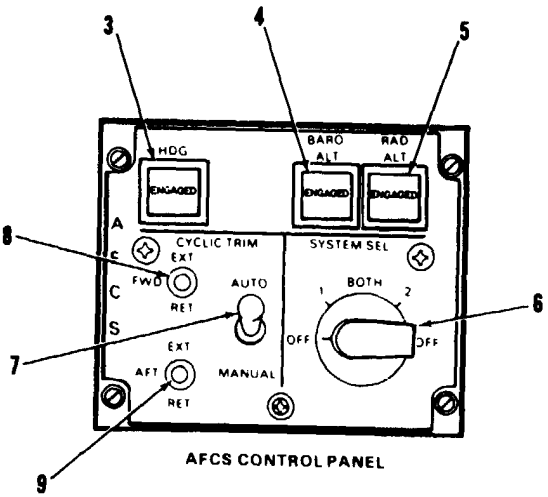
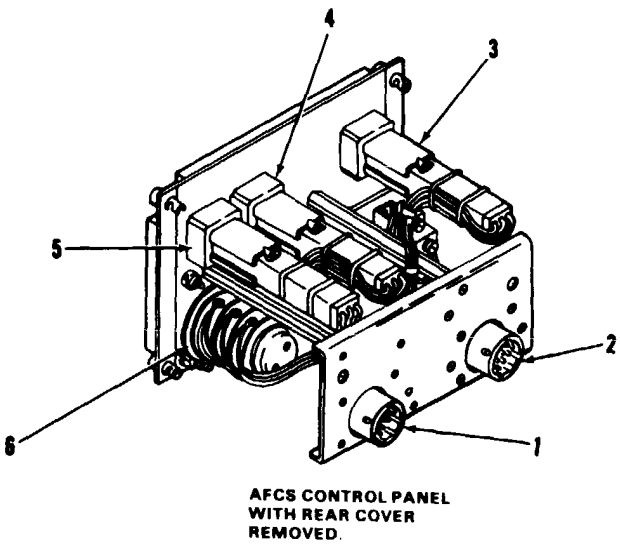
**Personnel Required:**  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
AFCS Control Panel Disconnected From AFCS  
Bench Test Set  
AFCS Control Panel Rear Cover Removed

TASK	RESULT
1. Check pins in receptacles (1 and 2).	If any pin is bent, straighten it. If any pin is broken, corroded, or burnt, replace it.
2. Check switches (3 thru 9).	If any switch is loose or damaged, tighten or replace it as required. If knob on switch (6) is loose, tighten or replace it.
3. Check panel wires.	If any wire termination is loose, tighten it. If any wire is damaged, replace it.

FOLLOW-ON MAINTENANCE:  
None



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

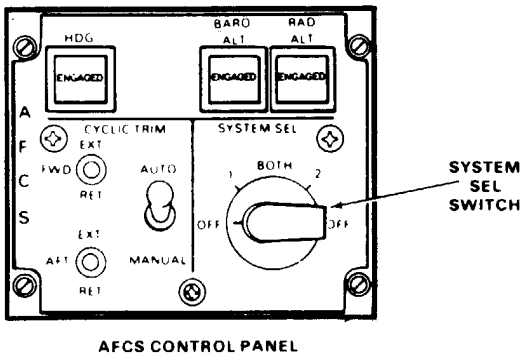
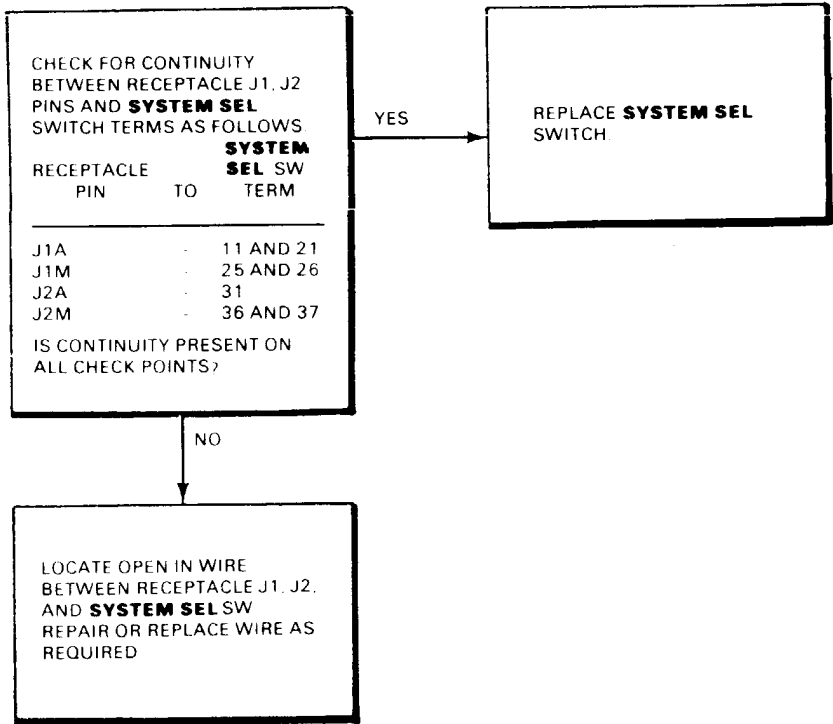
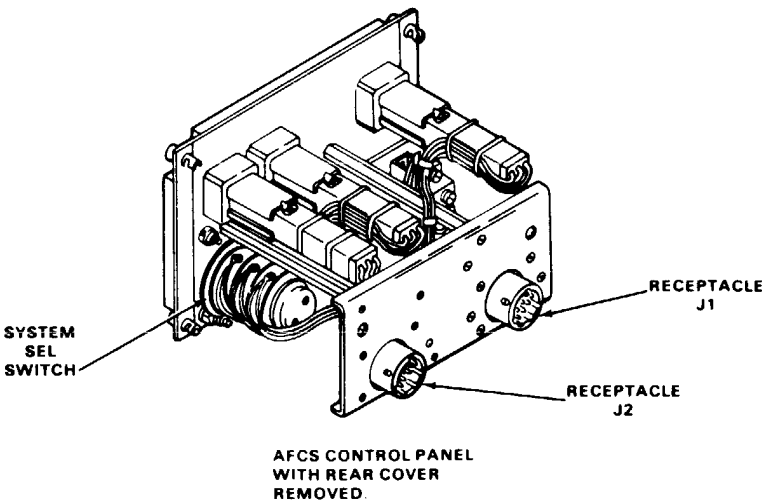
Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:  
TM 55-1520-240-23

Equipment Condition:  
Visual Check of AFCS Control Panel Performed  
(Task 11-4.2)



11-4.4 AFCS CONTROL PANEL FAILS RADAR ALTITUDE TESTS

11-4.4

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

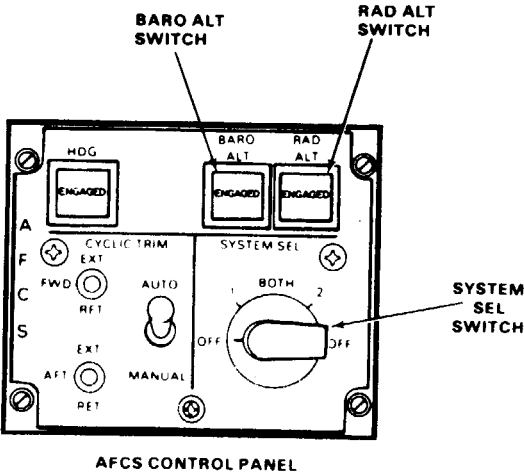
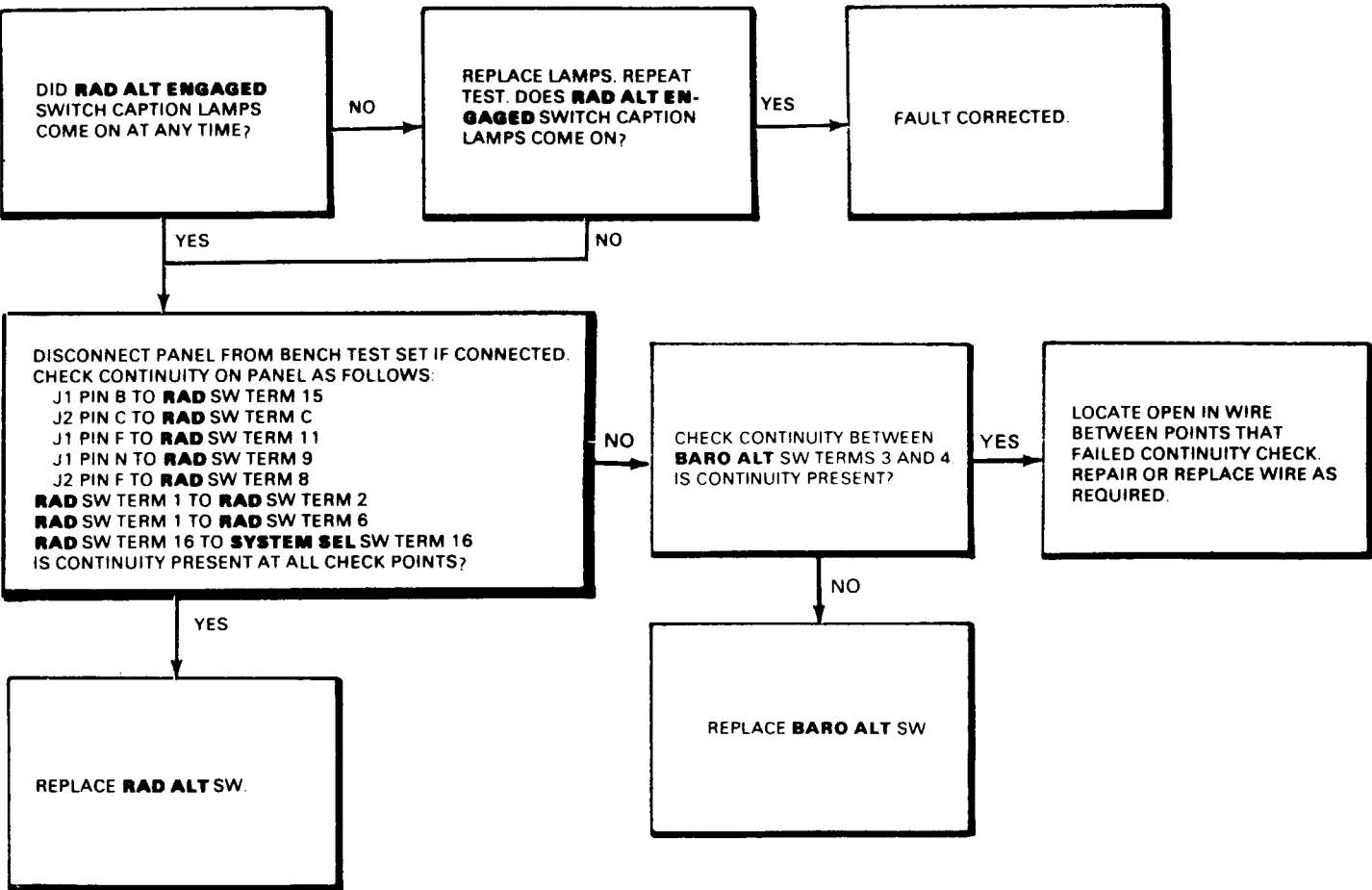
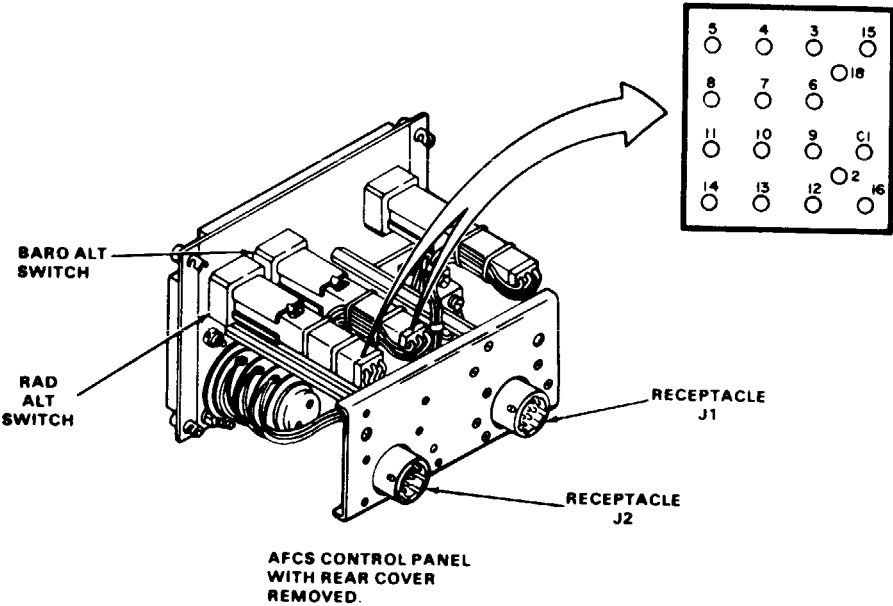
Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:  
TM 55-1520-240-23

Equipment Condition:  
Visual Check of AFCS Control  
Panel Performed (Task 11-4.2)



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:

None

Personnel Required:

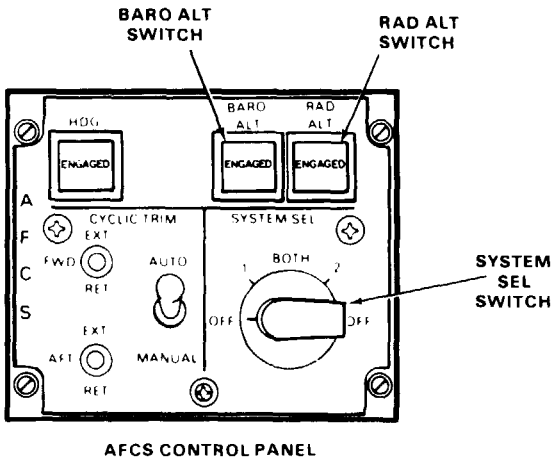
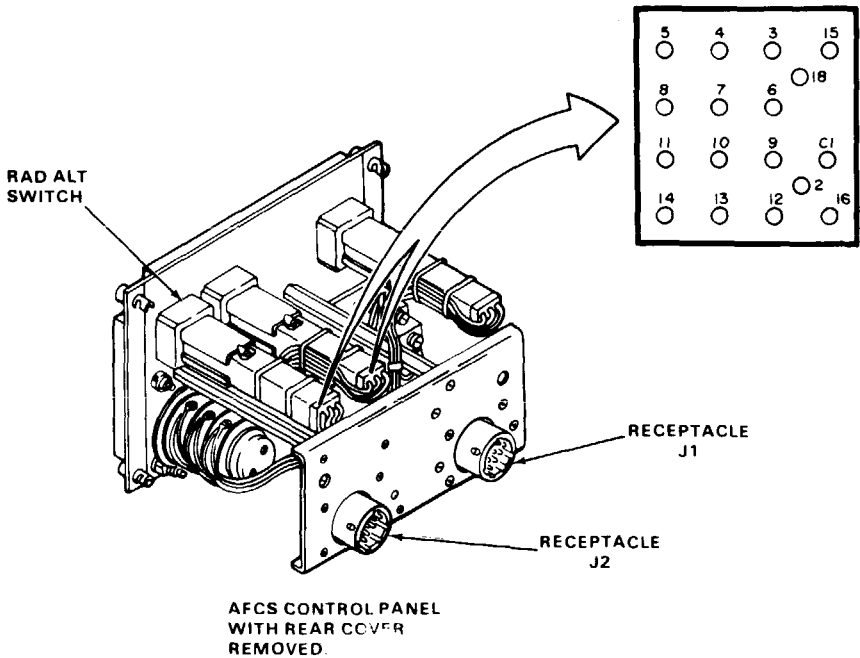
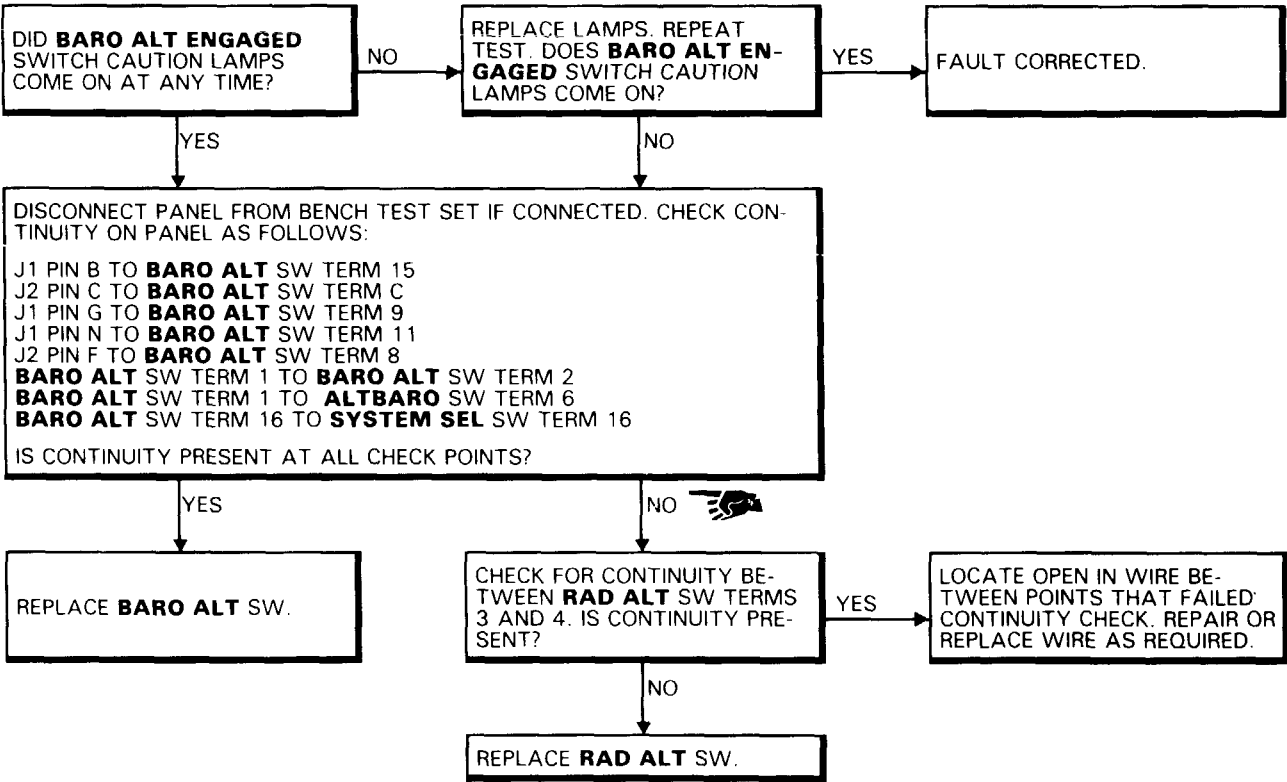
Avionic Navigation and Flight Control Equipment  
Repairer

References:

TM 55-1520-240-23

Equipment Condition:

Visual Check of AFCS Control Panel Performed



11-4.6 AFCS CONTROL PANEL FAILS HEADING TEST

11-4.6

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

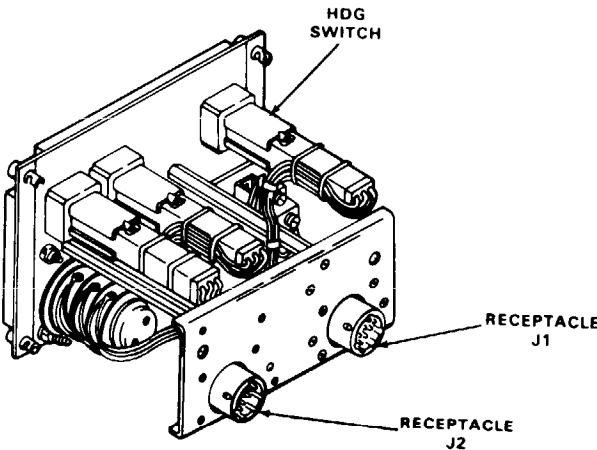
Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

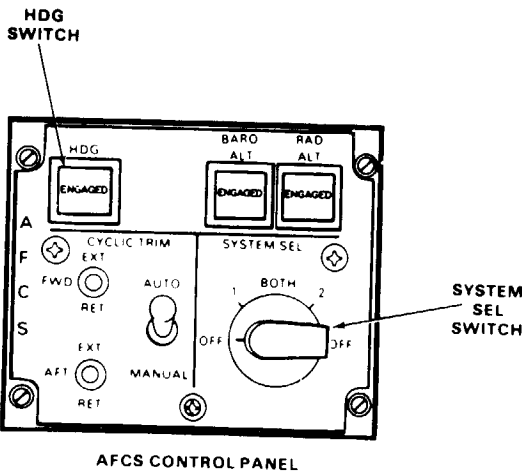
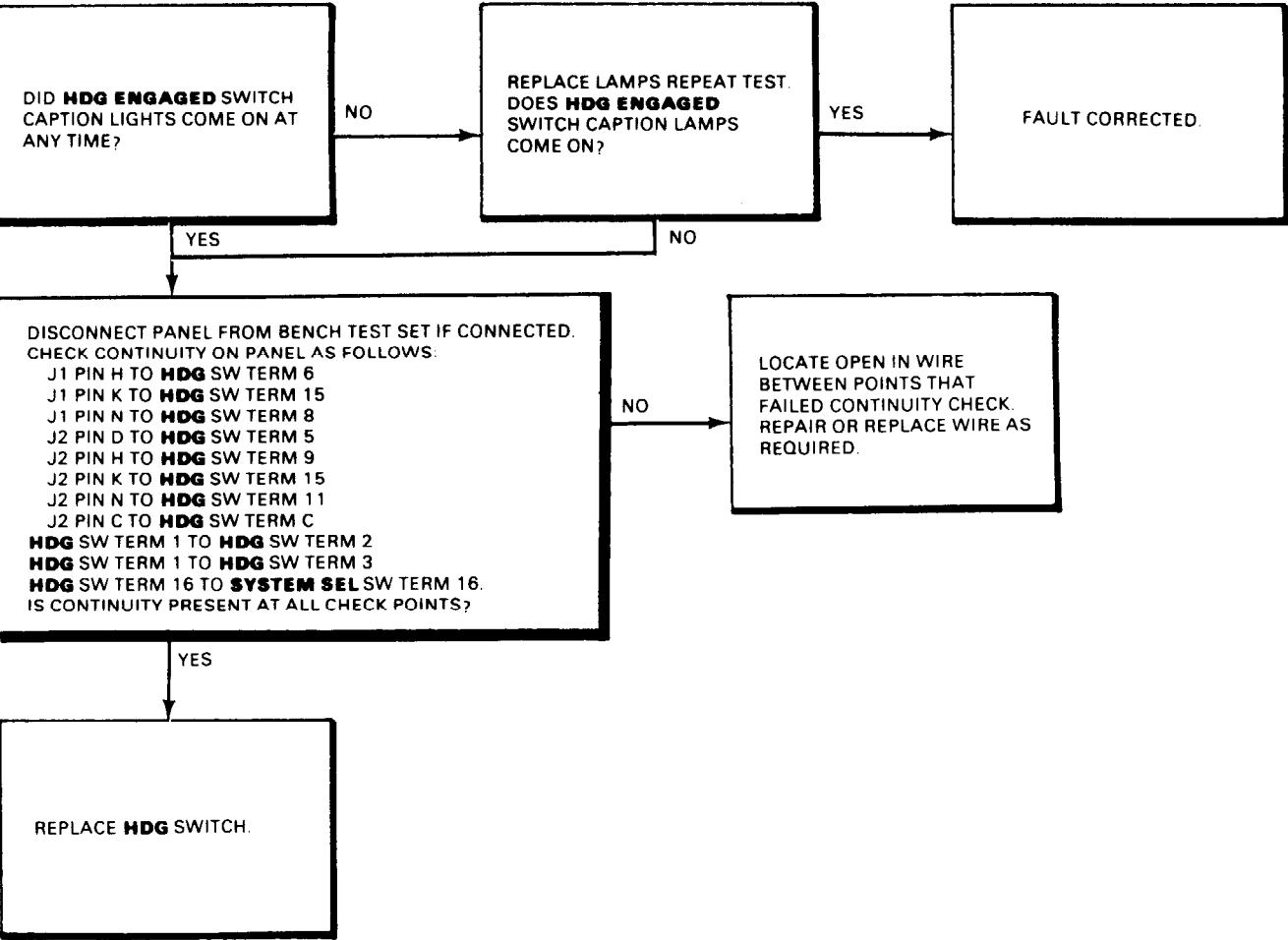
Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:  
TM 55-1520-240-23

Equipment Condition:  
Visual Check of AFCS Control  
Panel Performed (Task 11-4.2)



AFCS CONTROL PANEL  
WITH REAR COVER  
REMOVED.



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

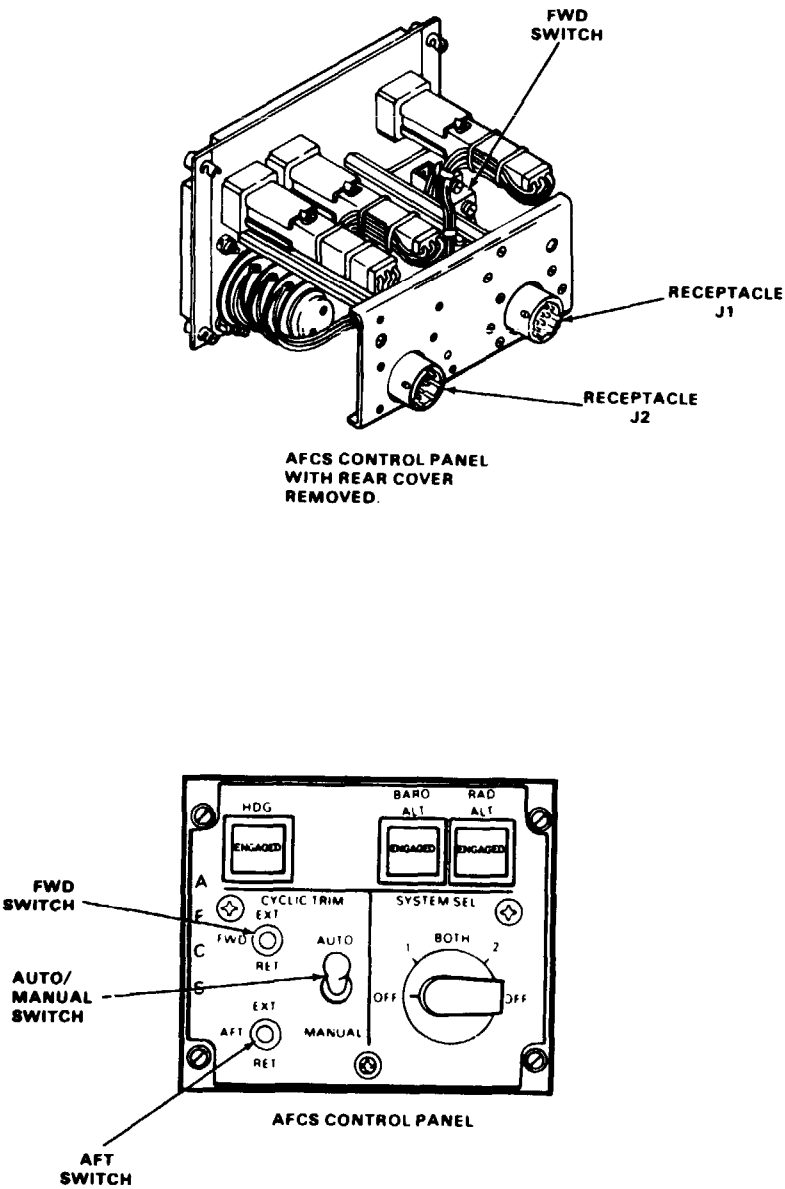
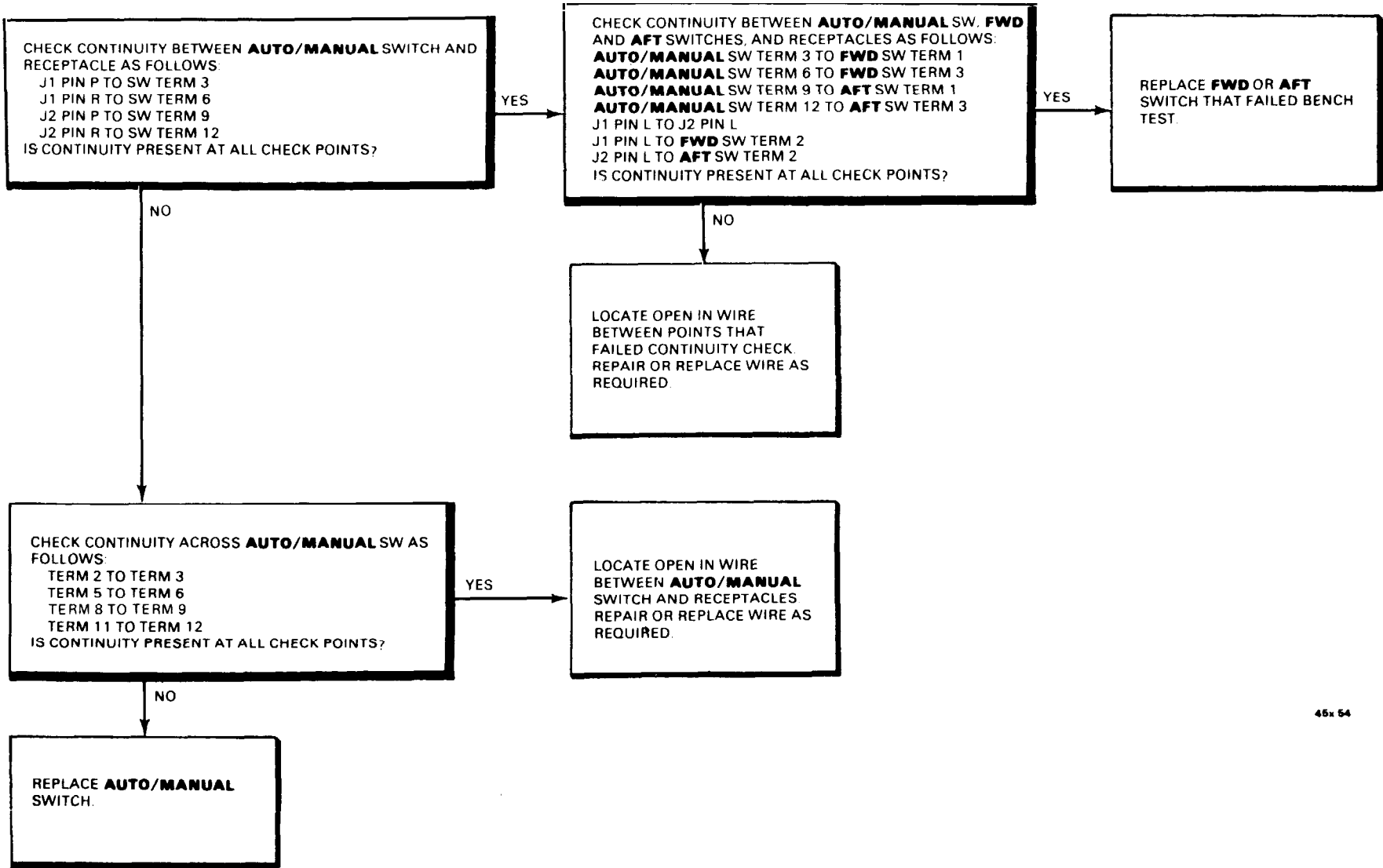
Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:  
TM 55-1520-240-23

Equipment Condition:  
Visual Check of AFCS Control  
Panel Performed (Task 11-4.2)



45x 54

D145-12442-SPA

END OF TASK



11-4.8 AFCS CONTROL PANEL FAILS CYCLIC TRIM - AUTOMATIC TEST

11-4.8

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

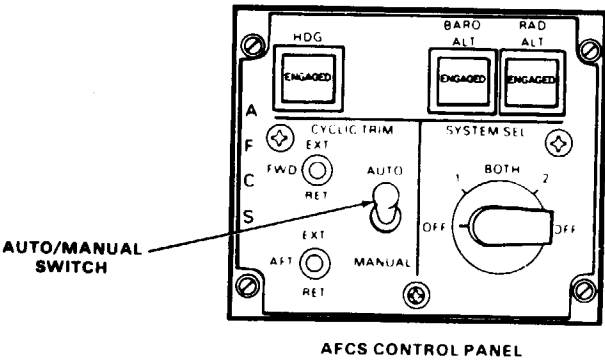
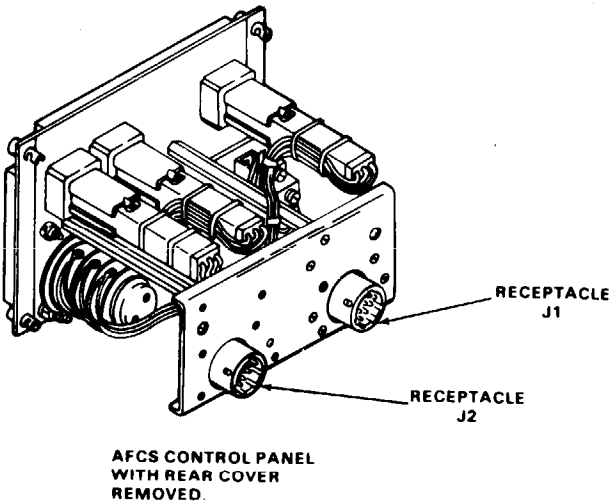
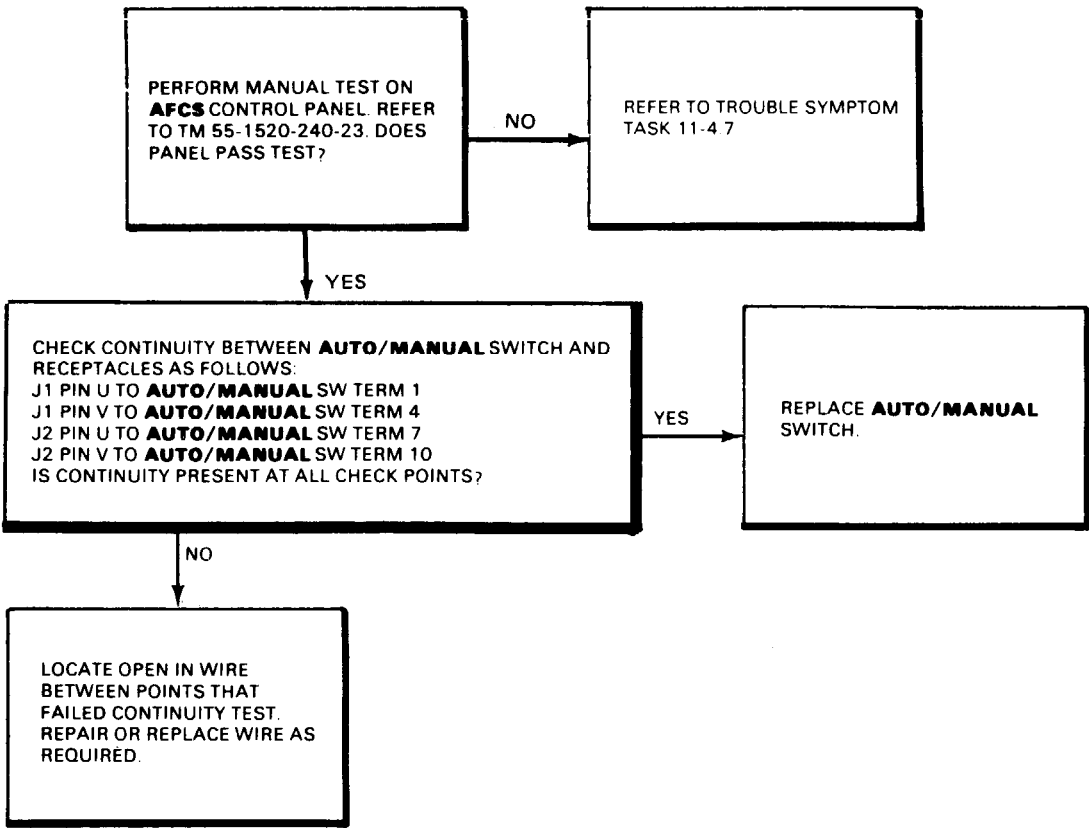
Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:  
TM 55-1520-240-23

Equipment Condition:  
Visual Check of AFCS Control  
Panel Performed (Task 11-4.2)



11-4.9 AFCS CONTROL PANEL FAILS PANEL ILLUMINATION TEST

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

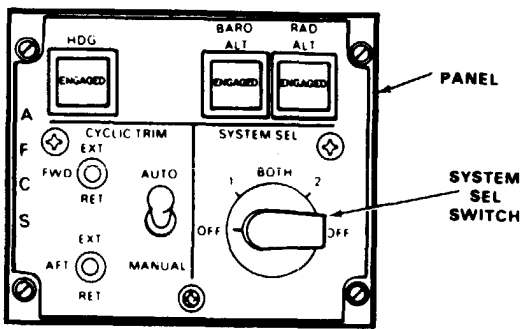
Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:  
TM 55-1520-240-23

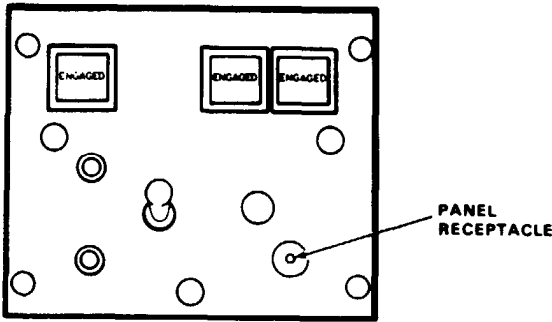
Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Equipment Condition:  
Visual Check of AFCS Control  
Panel Performed (Task 11-4.2)

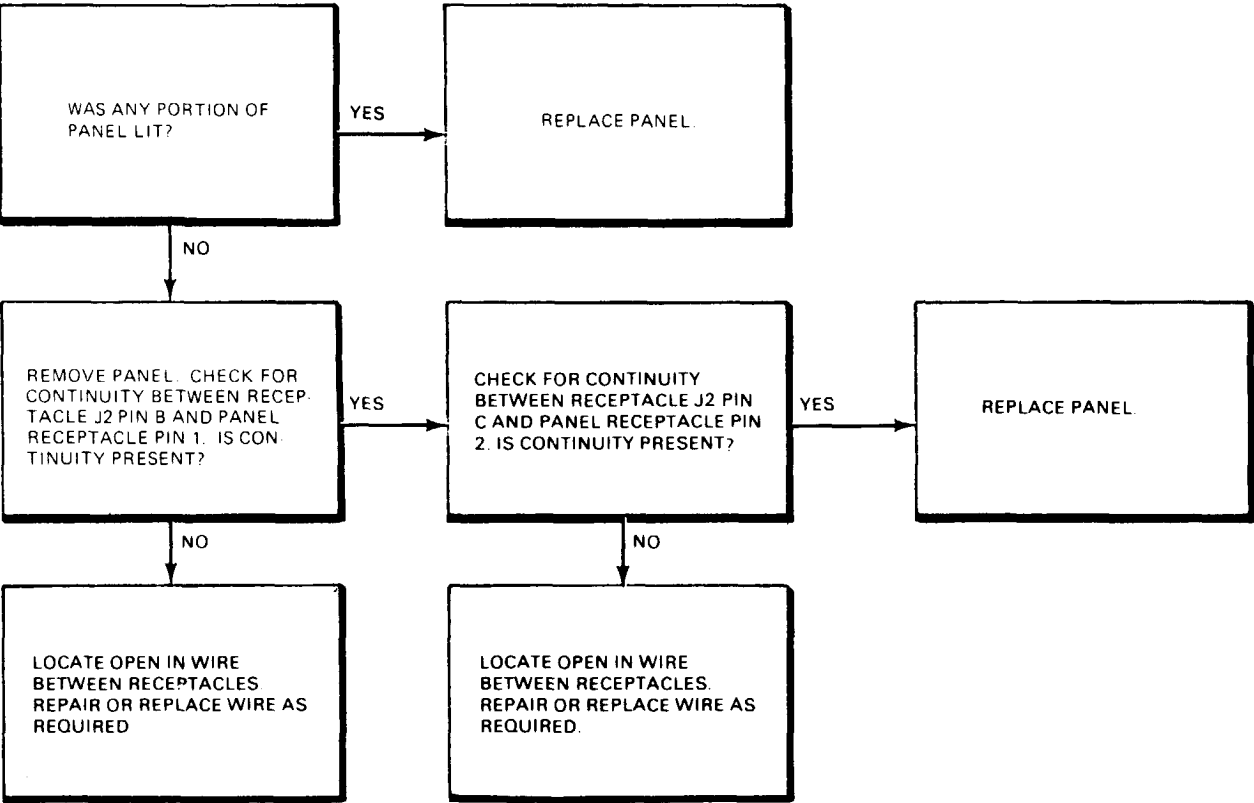
Materials:  
None



AFCS CONTROL PANEL



AFCS CONTROL PANEL



11-4.10 AFCS CONTROL PANEL FAILS DIODE TEST

11-4.10

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

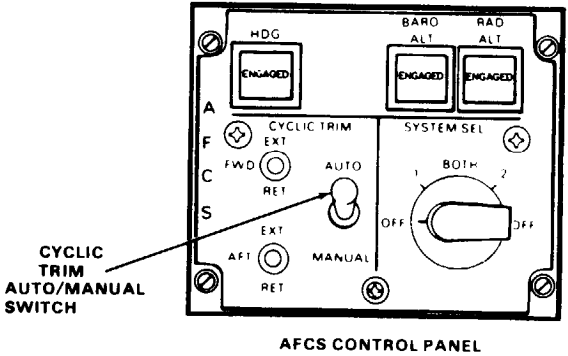
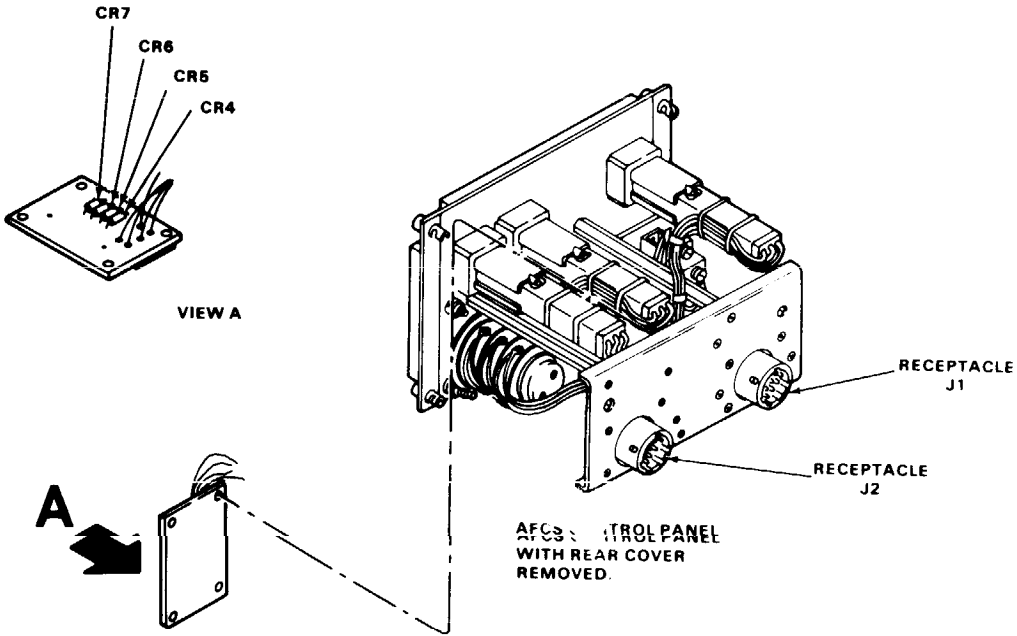
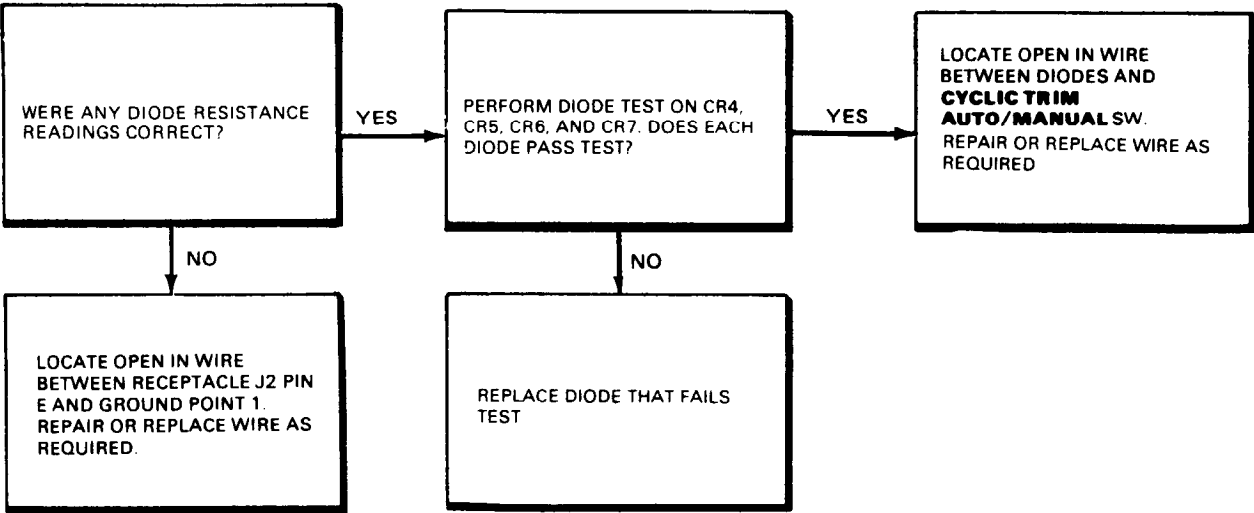
Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

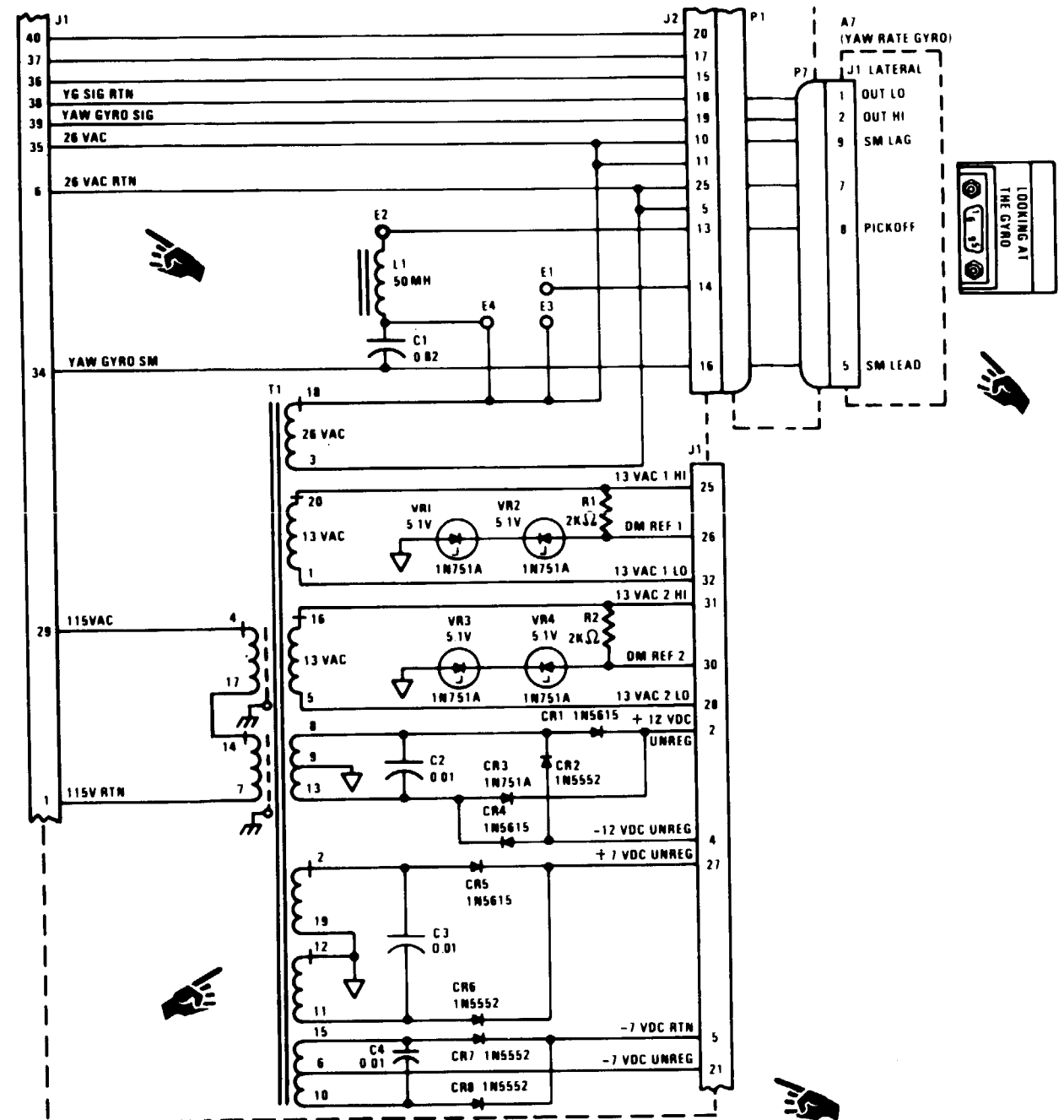
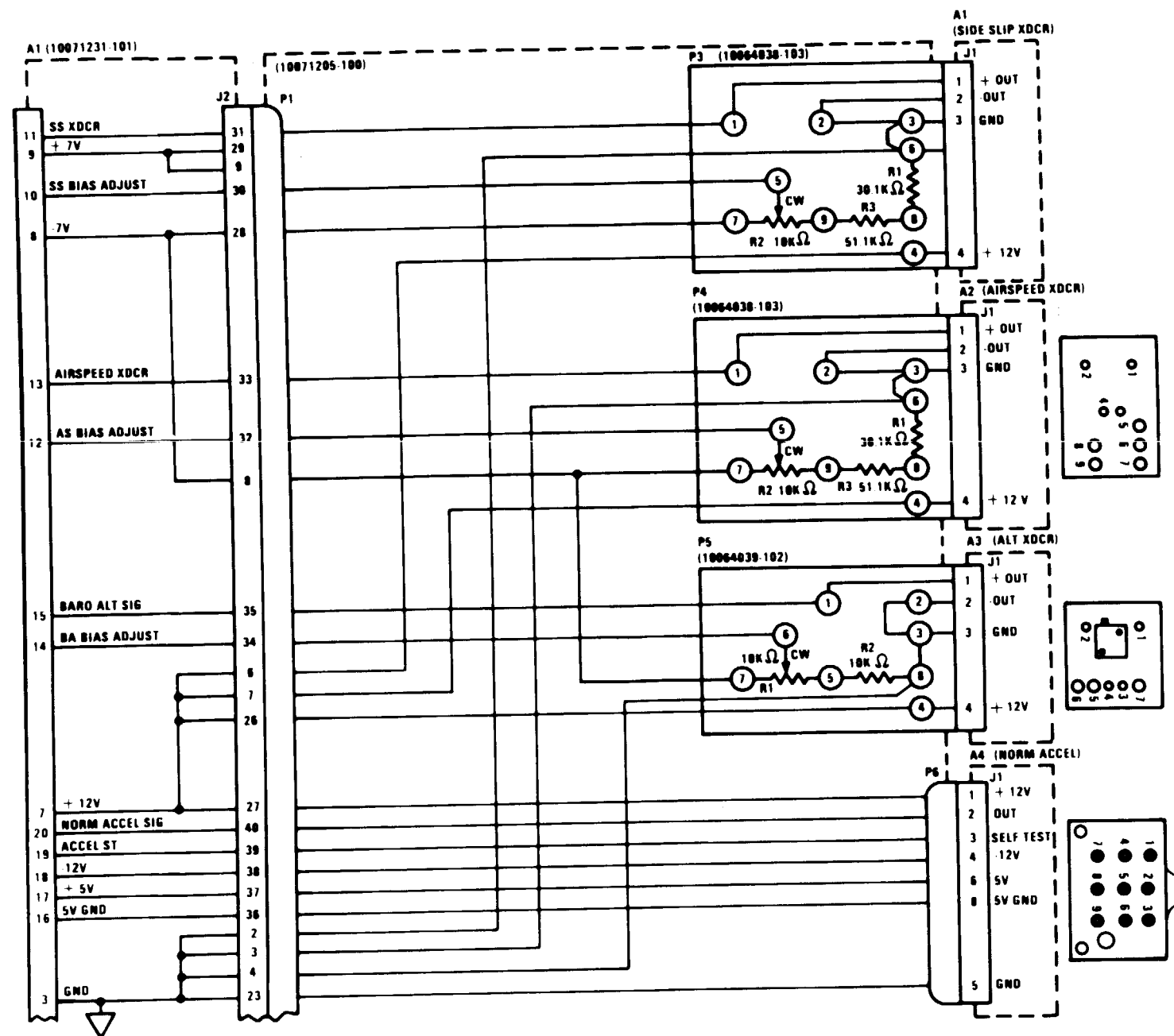
References:  
TM 55-1520-240-23

Equipment Condition:  
Visual Check of AFCS Control  
Panel Performed (Task 11-4.2)



END OF TASK

## 11-5 AFCS COMPUTER



AFCS COMPUTER BASE WIRING DIAGRAM

30886

END OF TASK

11-5.2 AFCS COMPUTER VISUAL CHECK

11-5.2

INITIAL SETUP

**Applicable Configurations:**  
All

**Tools:**  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178

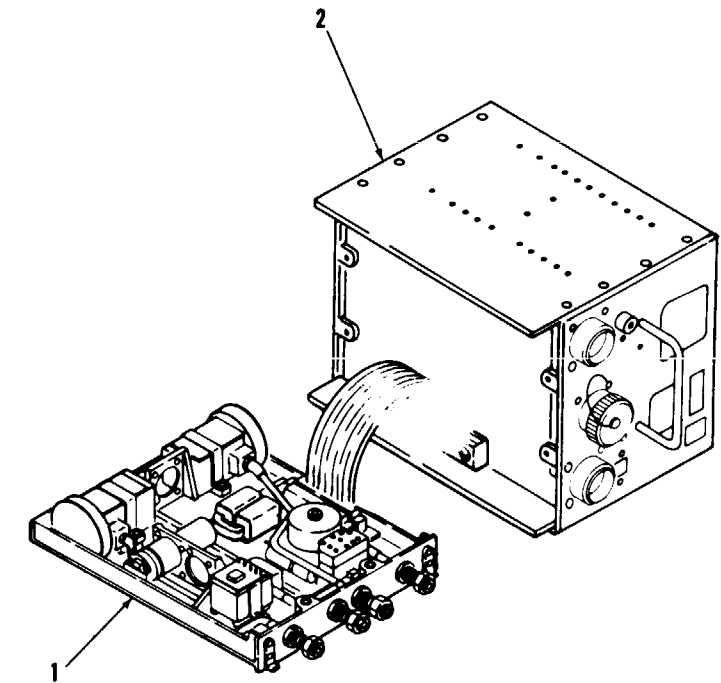
**Materials:**  
None

**Personnel Required:**  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
AFCS Computer Base Separated  
From AFCS Computer Box

TASK	RESULT
1. Check components on base (1).	If any component is loose or damaged, tighten or replace it as required. If wiring to any component is damaged, replace it.
2. Check wiring on bottom of box (2).	If any wire is broken, forward computer to depot for disposition.



FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:  
AFCS computer base connected to box.  
Test AFCS computer.

46 x 54

D145 12446 SPA

END OF TASK

11-5.3 AFCS COMPUTER FAILS TEST 1 (CONTINUITY TEST)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

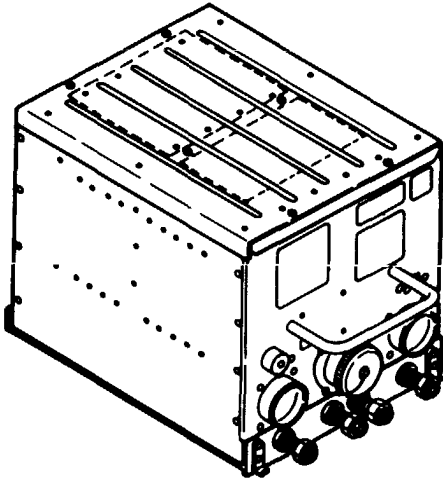
Tools:  
None

Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:  
TM 55-1520-240-23

Equipment Condition:  
None

RETURN AFCS COMPUTER TO  
DEPOT FOR DISPOSITION.



AFCS  
COMPUTER

11-5.4 AFCS COMPUTER FAILS TEST 2 (POWER SUPPLY TEST)

11-5.4

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

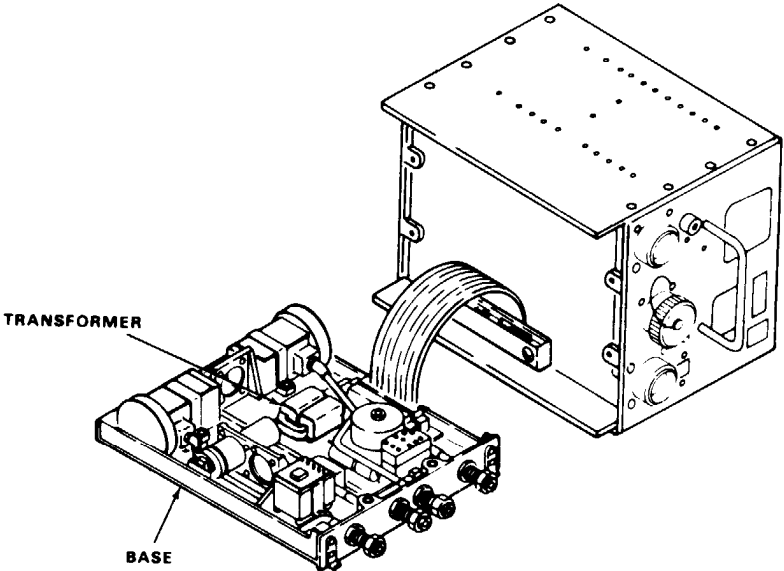
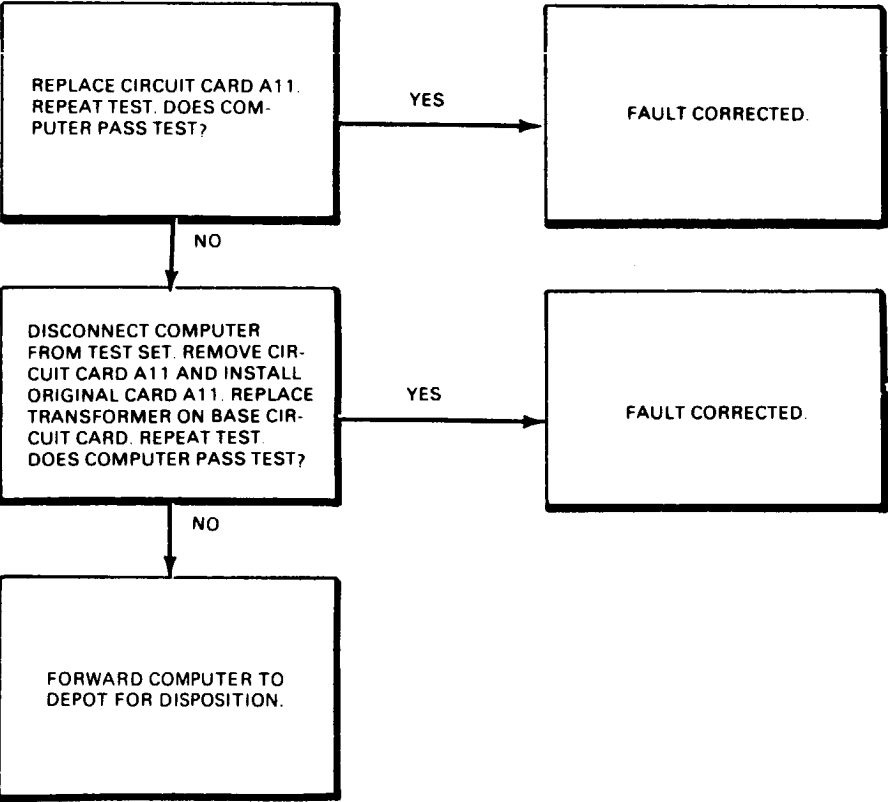
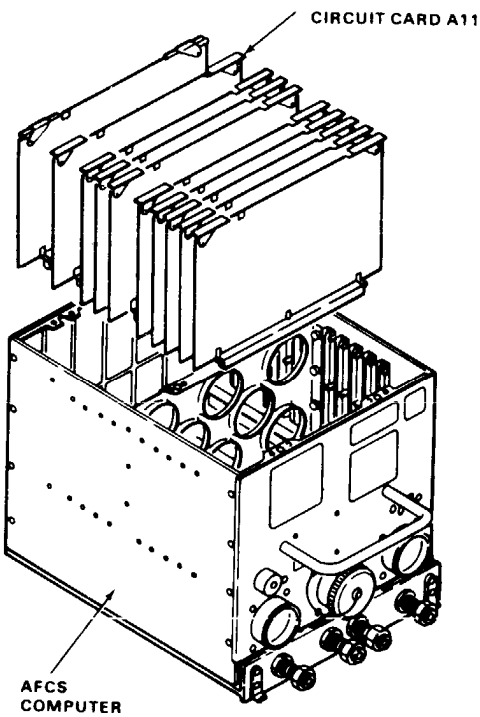
Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:  
TM 55-1520-240-23

Equipment Condition:  
Visual Check of AFCS Computer Performed  
(Task 11-5.2)  
TM 55-1520-240-23:  
AFCS Computer Cover Removed





FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178

Materials:

None

Personnel Required:

35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:

TM 55-1520-240-23

Equipment Condition:

Visual Check of AFCS Computer Performed  
(Task 11-5.2)  
TM 55-1520-240-23  
AFCS Computer Cover Removed

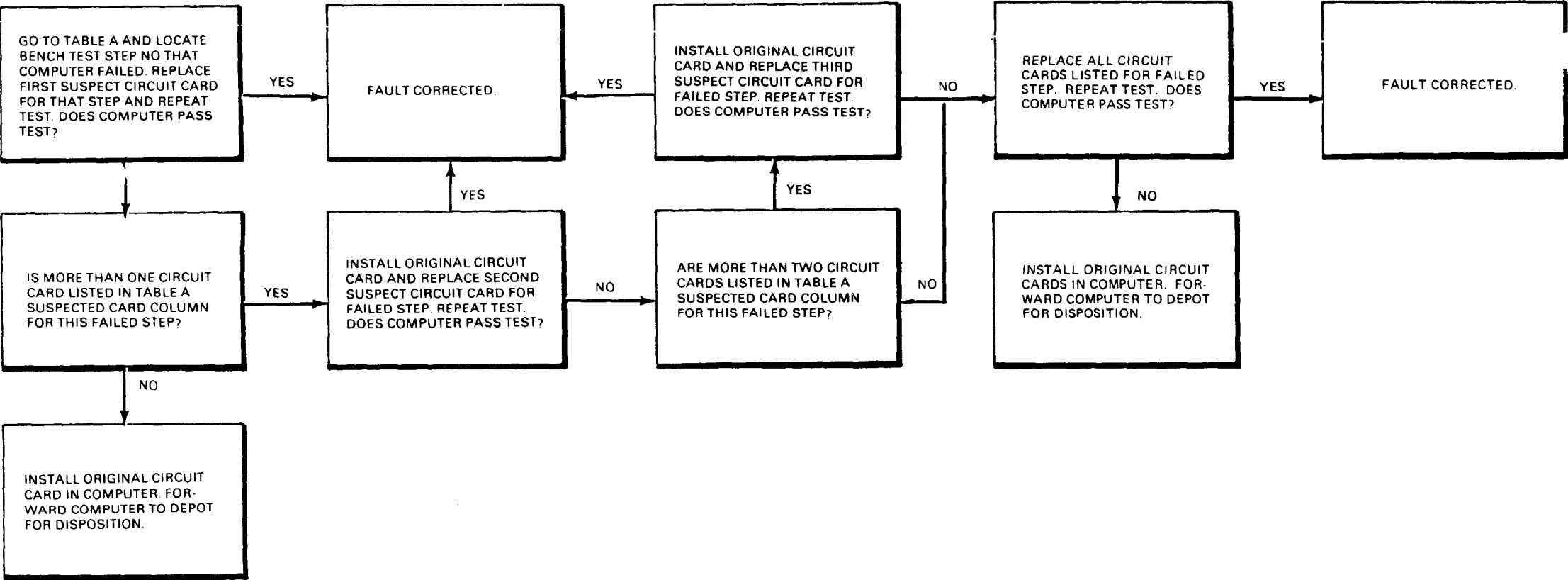
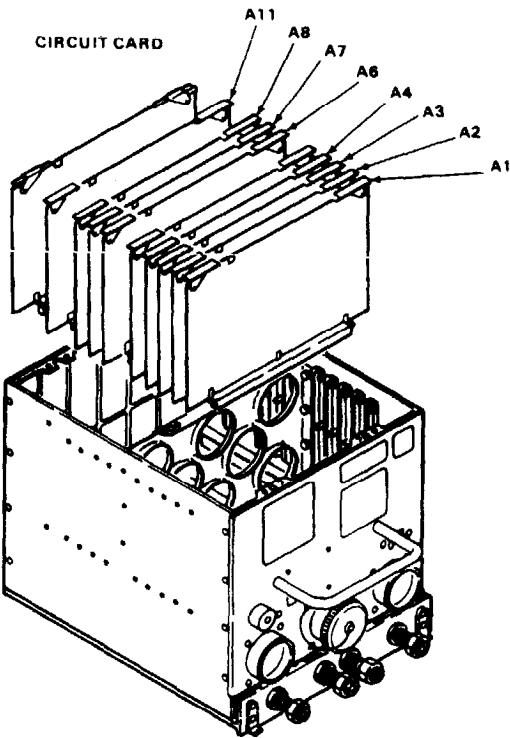


TABLE A. LOGIC TEST  
FAULT ANALYSIS

BENCH TEST STEP NO.	SUSPECT CIRCUIT CARD
34	A12, A6, A1
36-38	A12, A1 , A6
42-47	A1, A12
48-70	A1
73-80	A1 ,A2
83-85	A1, A4, A6
87	A1, A2
88-95	A1, A2, A6
102	A12, A7, A1
105-108	A1



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

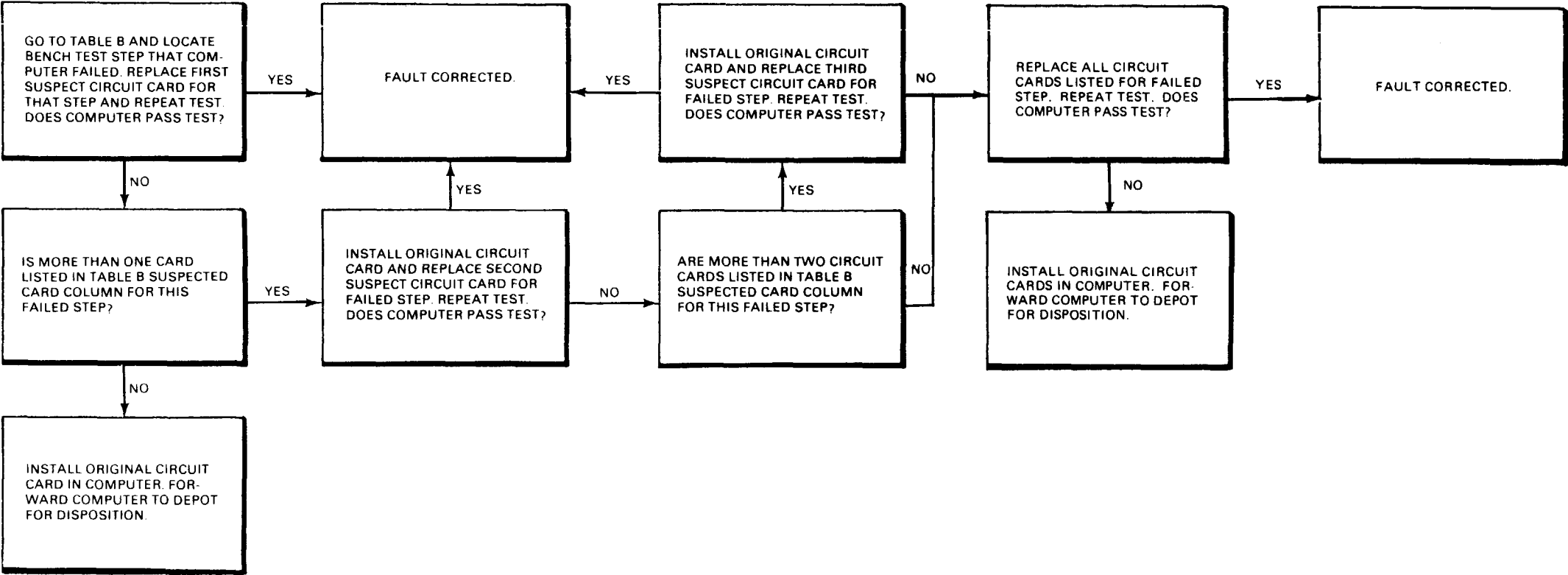
Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178

Materials:  
None

Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:  
TM 55-1520-240-23

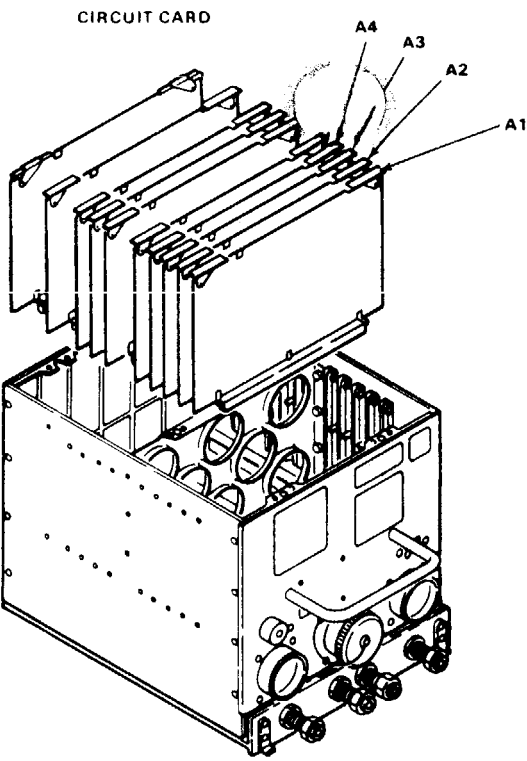
Equipment Condition:  
Visual Check of AFCS Computer Performed  
(Task 11-5.2)  
TM 55-1520-240-23:  
AFCS Computer Cover Removed



GO TO NEXT PAGE

TABLE B. PITCH AXIS TEST  
FAULT ANALYSIS

BENCH TEST STEP NO.	SUSPECT CIRCUIT CARD
113-137	A3
145	A3, A4, A2
147	A1
157-162	A3



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178

Materials:  
None

Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:  
TM 55-1520-240-23

Equipment Condition:  
Visual Check of AFCS Computer Performed  
(Task 11-5.2)  
TM 55-1520-240-23  
AFCS Computer Cover Removed

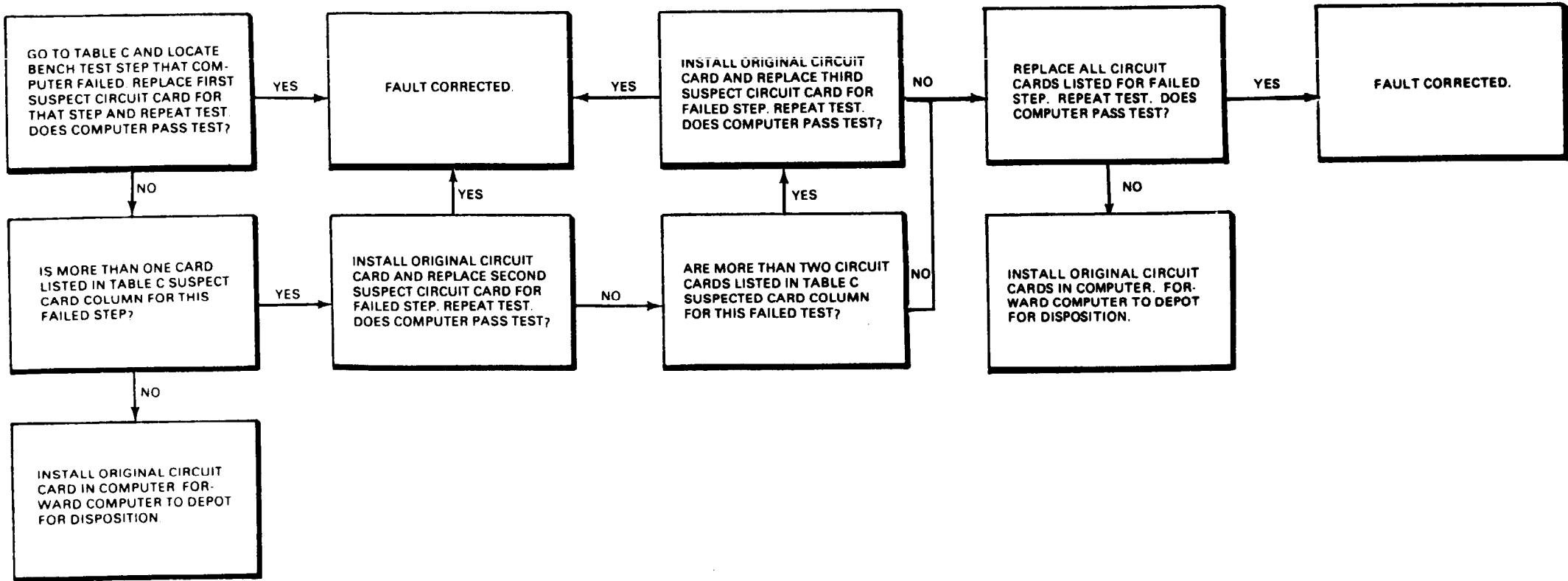
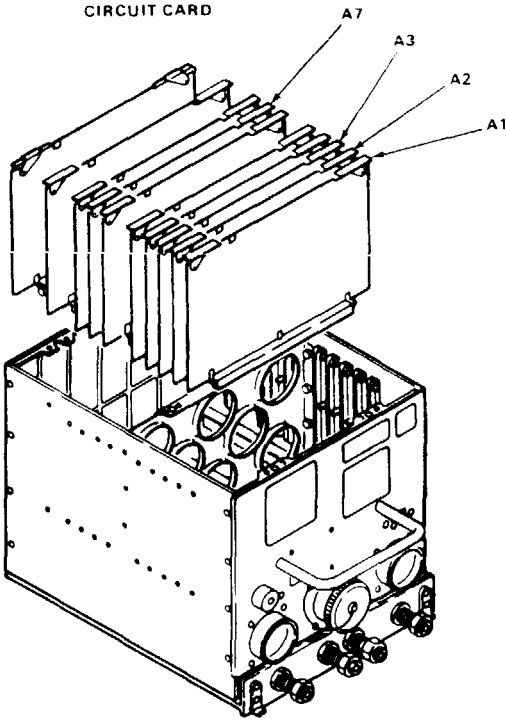


TABLE C. ROLL AXIS TEST  
FAULT ANALYSIS

BENCH TEST STEP NO.	SUSPECT CIRCUIT CARD
177-209	A2
216-219	A1, A2, A7
223-226	A1, A2
228-232	A2
234-236	A1, A2
243-247	A2
267-275	A7, A1
283	A7, A2
284-347	A2



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178

Materials:  
None

Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:  
TM 55-1520-240-23

Equipment Condition:  
Visual Check of AFCS Computer Performed  
(Task 11-5.2)  
TM 55-1520-240-23:  
AFCS Computer Cover Removed

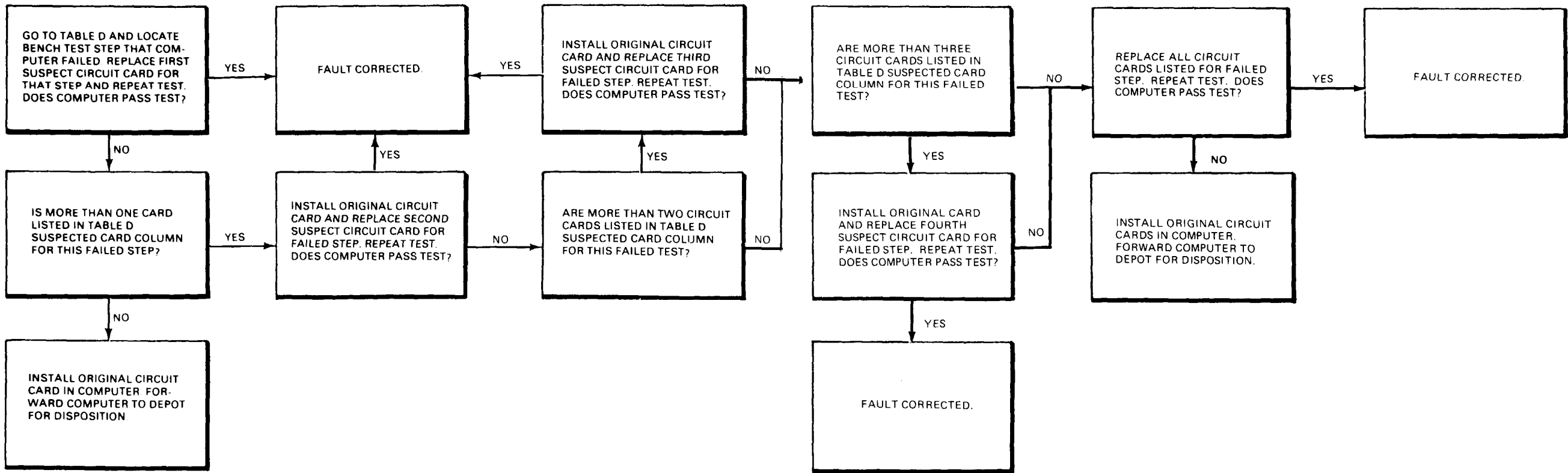
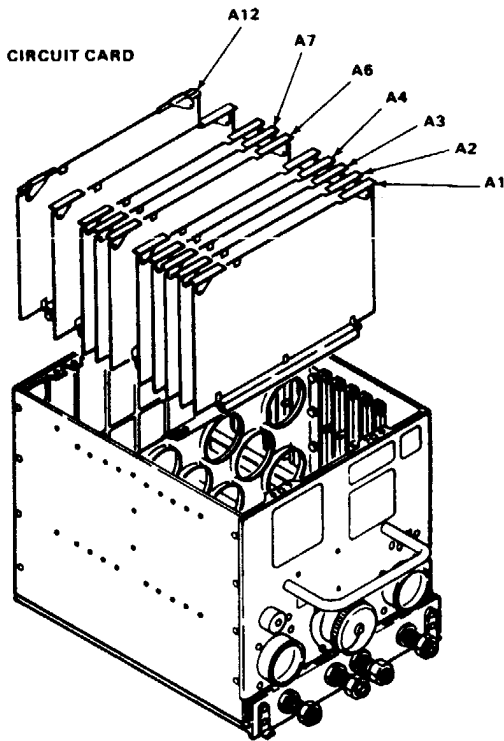


TABLE D. YAW AXIS TEST  
FAULT ANALYSIS

BENCH TEST STEP NO.	SUSPECT CIRCUIT CARD
352	A4, A14, A6
360	A4, A8
366-370	A4
378	A6, A8
390	A4, A7
398	A4, A2
404-407	A6, A1, A4
410-415	A4, A1
419-420	A4, A7
433	A4
435-445	A4, A8, A6
458-464	A4





FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178

Materials:

None

Personnel Required:

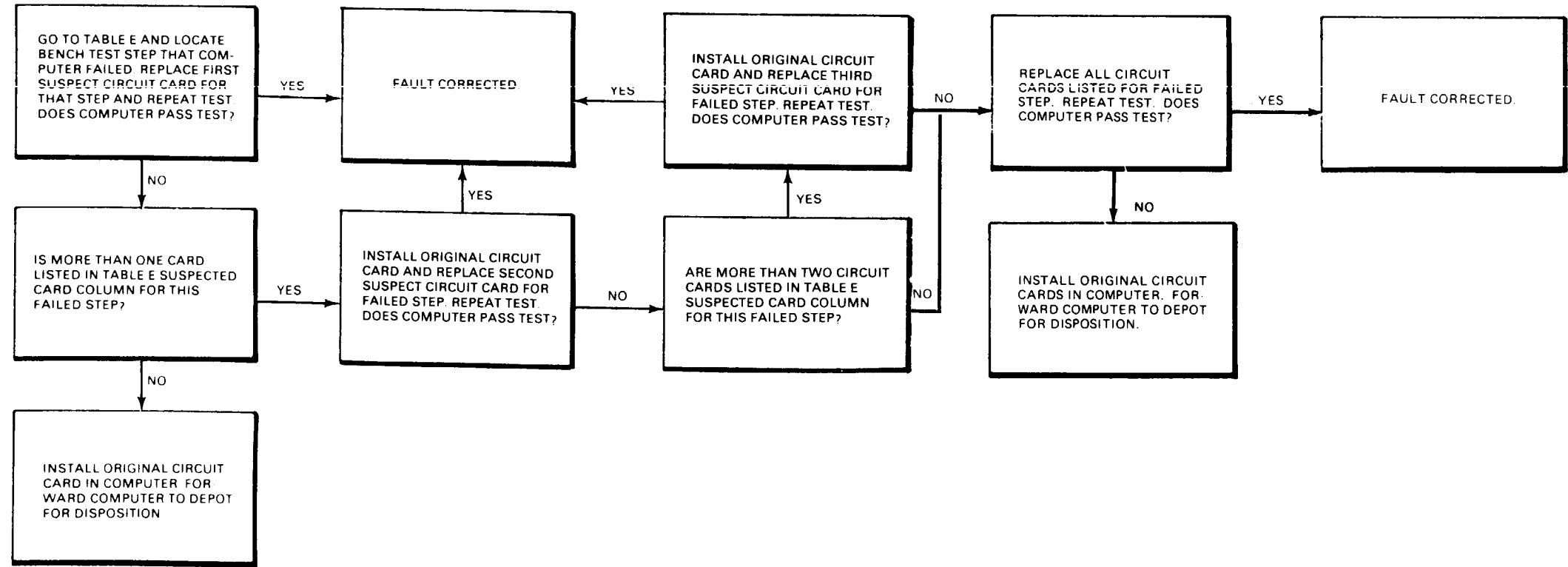
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:

TM 55-1520-240-23

Equipment Condition:

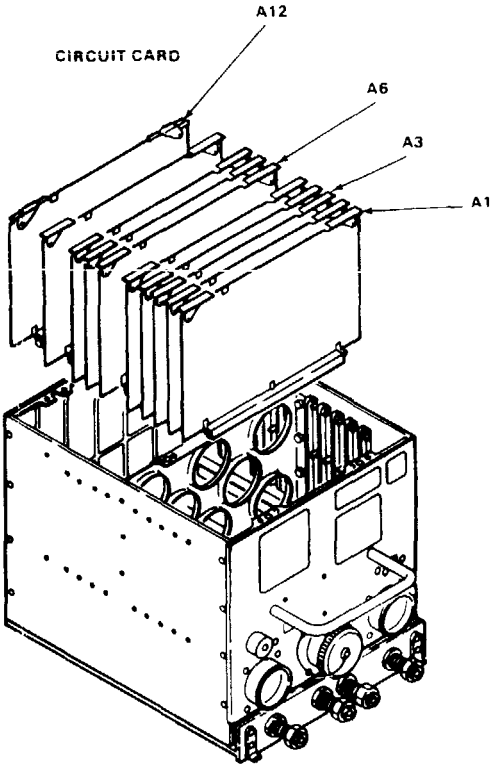
Visual Check of AFCS Computer Performed  
(Task 11-5.2)  
TM 55-1520-240-23:  
AFCS Computer Cover Removed



GO TO NEXT PAGE

TABLE E. DASH TEST  
FAULT ANALYSIS

BENCH TEST STEP NO.	SUSPECT CIRCUIT CARD
474	A6
490	A3
491	A3, A12
498, 503	A1, A6
500-506	A6, A3
511-524	A3
531	A1, A3
535-543	A3
551-570	A6, A12



11-5.10 AFCS COMPUTER FAILS TEST 8 (LONGITUDINAL CYCLIC TRIM (LCT) TEST)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

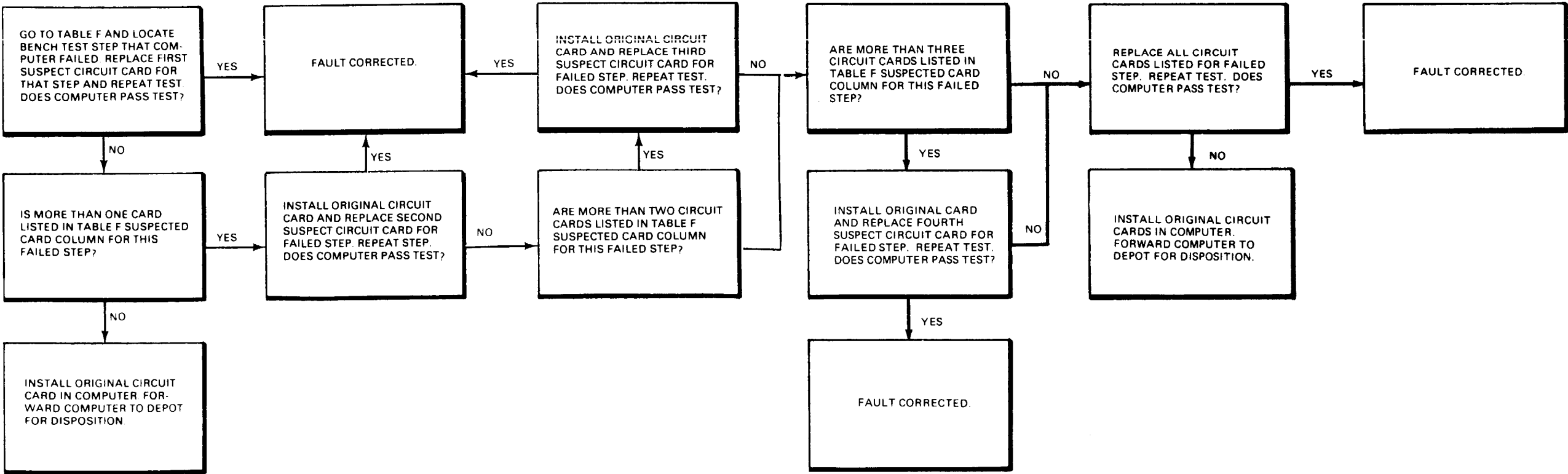
Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178

Materials:  
None

Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:  
TM 1520-240-23

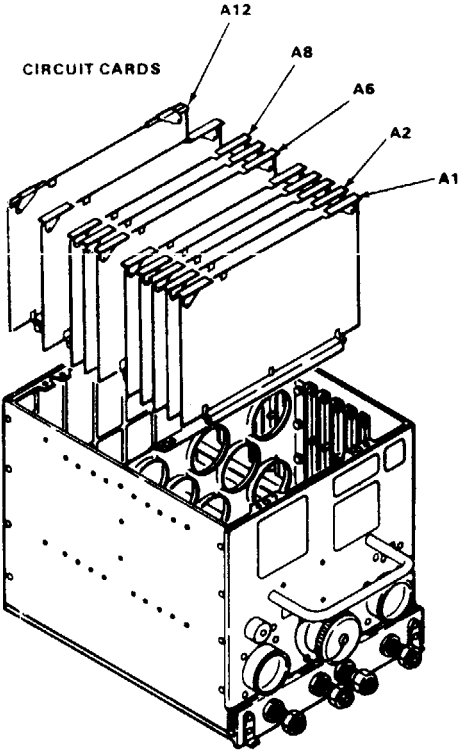
Equipment Condition:  
Visual Check of AFCS Computer Performed  
(Task 11-5.2)  
TM 55-1520-240-23:  
AFCS Computer Cover Removed



GO TO NEXT PAGE

TABLE F. LCT TEST  
FAULT ANALYSIS

BENCH TEST STEP NO.	SUSPECT CIRCUIT CARD
582	A8, A12, A6, A3
584-592	A8
594	A12
600-602	A8



11-5.11 AFCS COMPUTER FAILS TEST 9 (COLLECTIVE CONTROL DRIVER ACTUATOR (CCDA) TEST)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

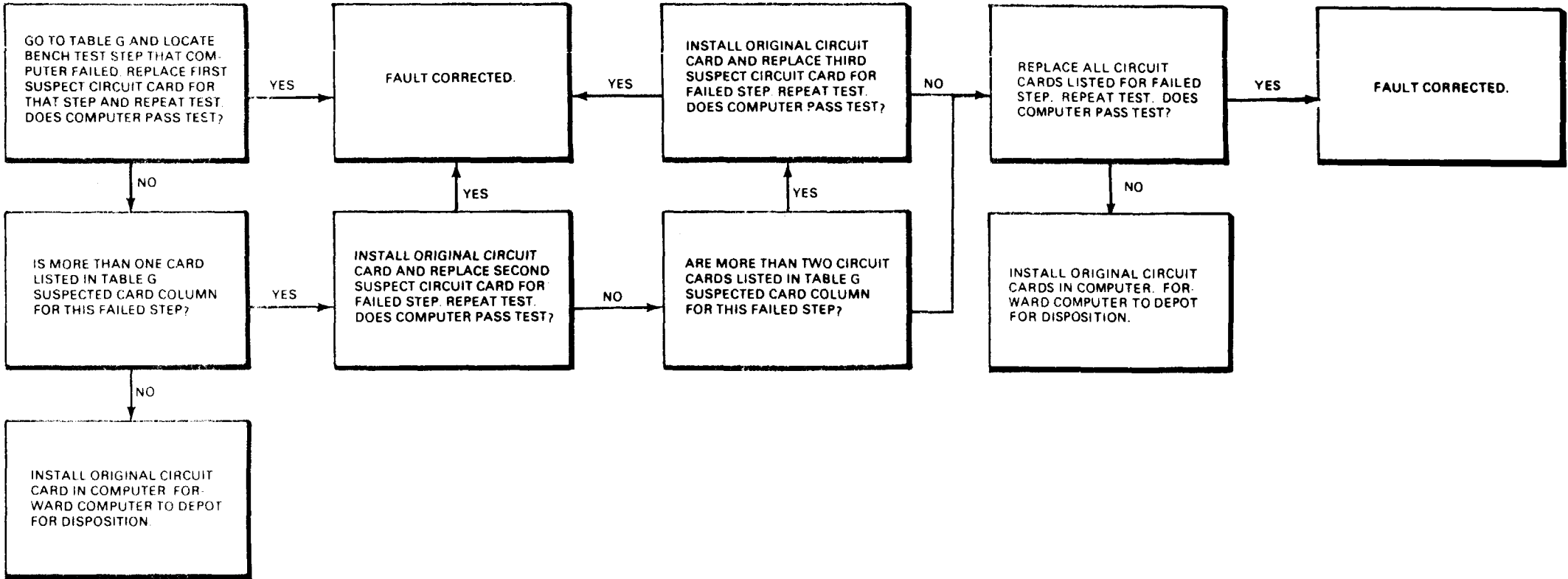
Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178

Materials:  
None

Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:  
TM 55-1520-240-23

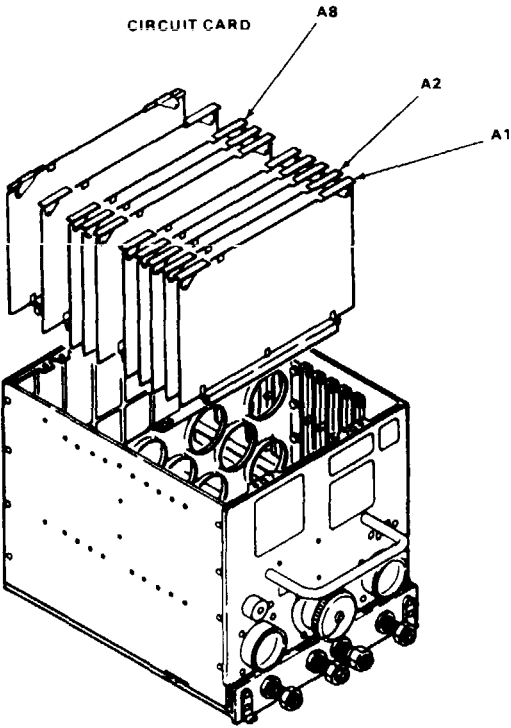
Equipment Condition:  
Visual Check of AFCS Computer Peformed  
(Task 11-5.2)  
TM 55-1520-240-23:  
AFCS Computer Cover Removed



GO TO NEXT PAGE

TABLE G. CCDA TEST  
FAULT ANALYSIS

BENCH TEST STEP NO.	SUSPECT CIRCUIT CARD
618-630	A8, A2
641-693	A8, A7



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178
- Multimeter

Materials:

None

Personnel Required:

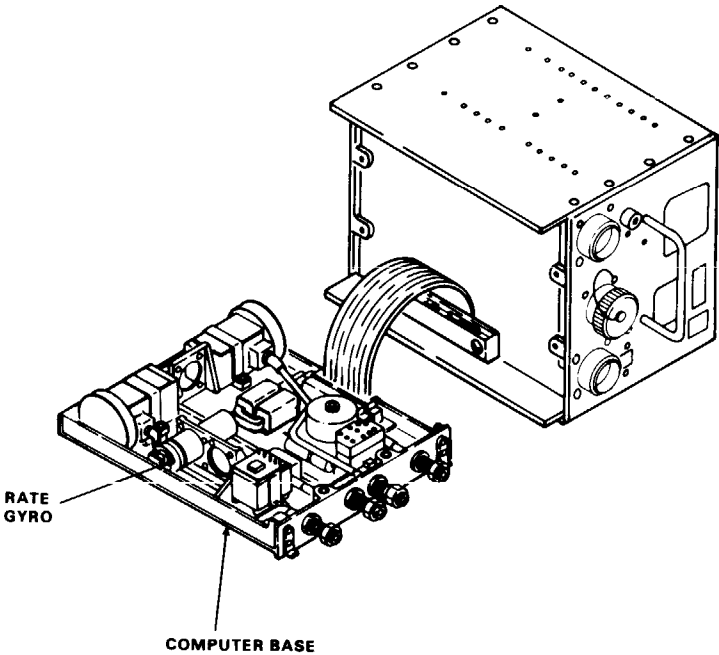
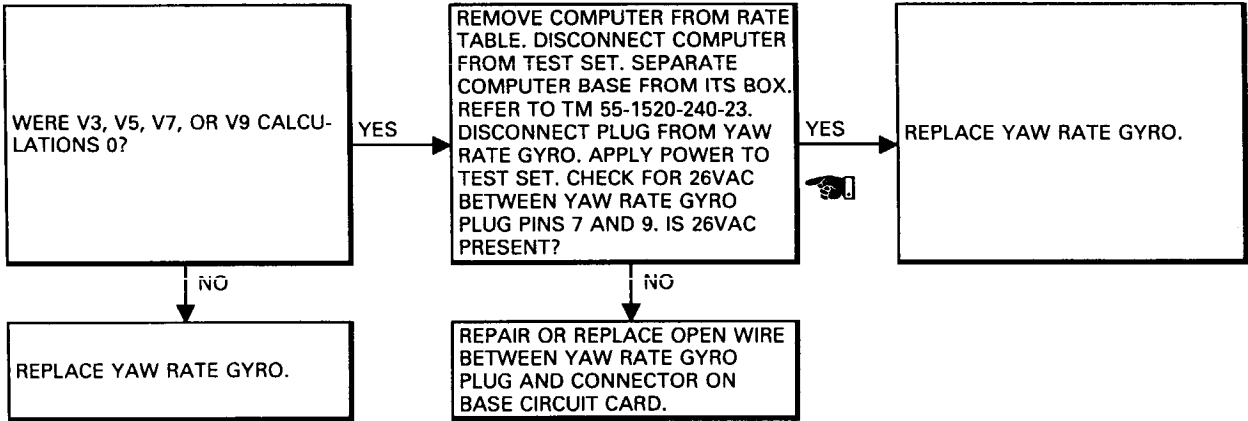
- Avionic Navigation and Flight Control
- Equipment Repairer.

References:

TM 55-1520-240-23

Equipment Condition:

- Visual Check of AFCS Computer Performed  
(Task 11-5.2)
- TM 55-1520-240-23



D145-12455-SPA

11-5.13 AFCS COMPUTER FAILS TEST 11 (NORMAL ACCELERATION TEST)

11-5.13

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:

None

Personnel Required:

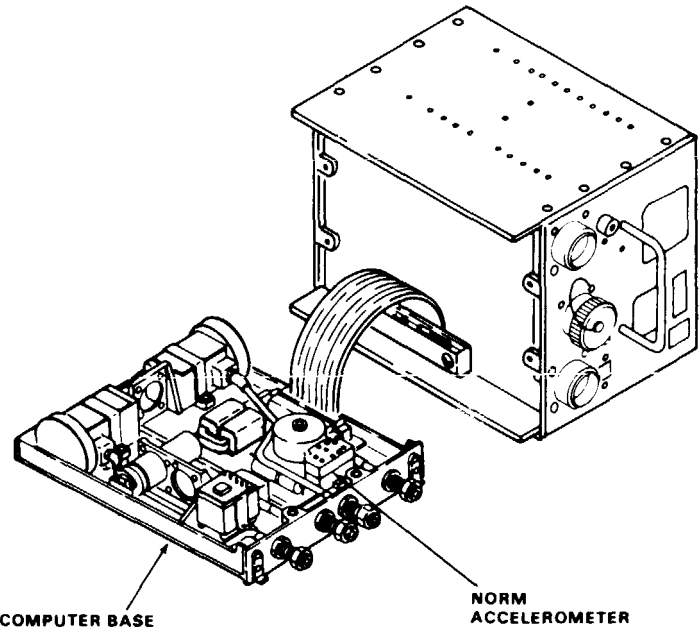
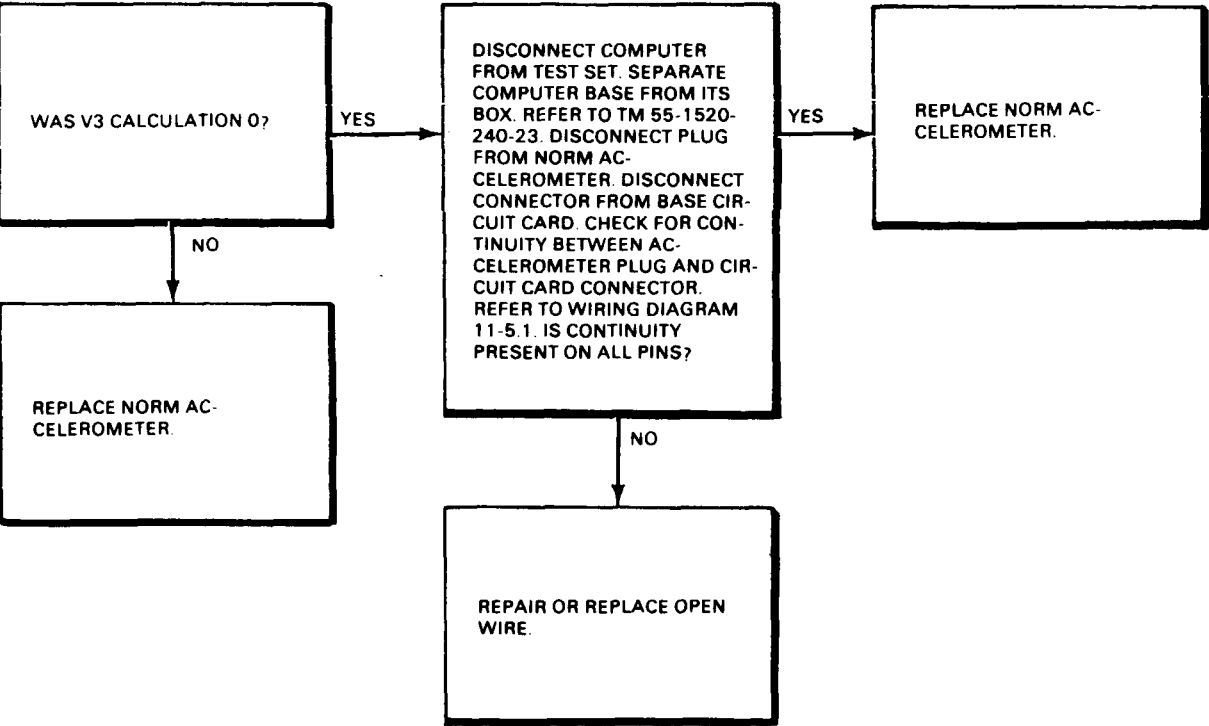
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:

TM 55-1520-240-23

Equipment Condition:

Visual Check of AFCS Computer Performed  
(Task 11-5.2)





11-5.14 AFCS COMPUTER FAILS TEST 12 (PRESSURE TRANSDUCERS TEST)

FAULT ISOLATION PROCEDURE  
INITIAL SETUP

Personnel Required:  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

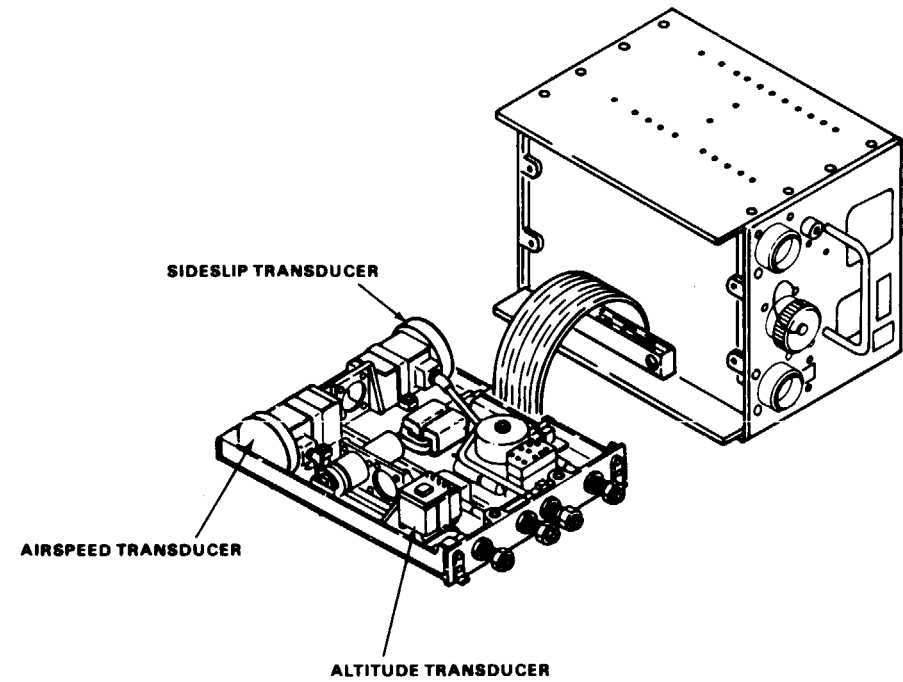
Applicable Configurations:  
All

References:  
TM 55-1520-240-23

Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

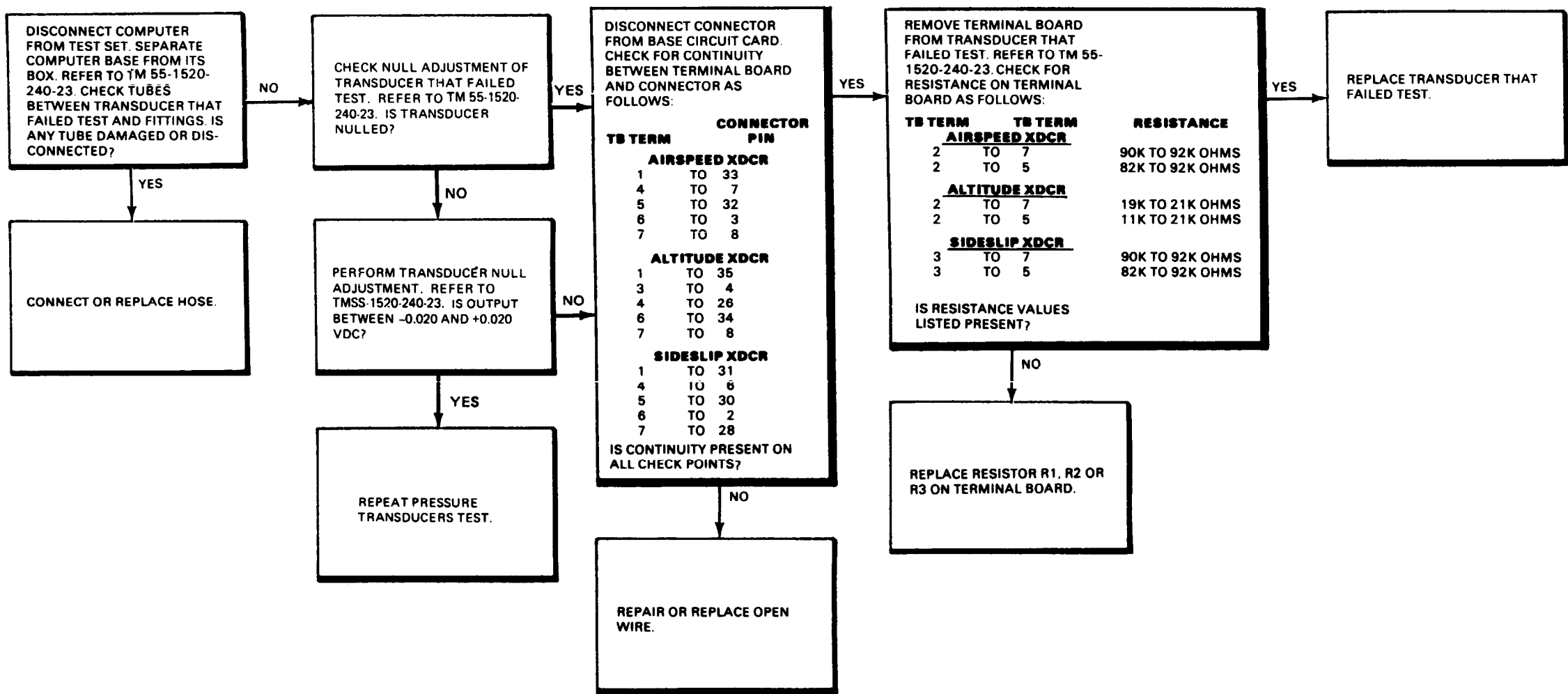
Equipment Condition:  
Visual Check of AFCS Computer Performed  
(Task 11-5.2)

Materials:  
None



11-5.14 AFCS COMPUTER FAILS TEST 12 (PRESSURE TRANSDUCERS TEST) (Continued)

11-5.14



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178

Materials:

None

Personnel Required:

35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

References:

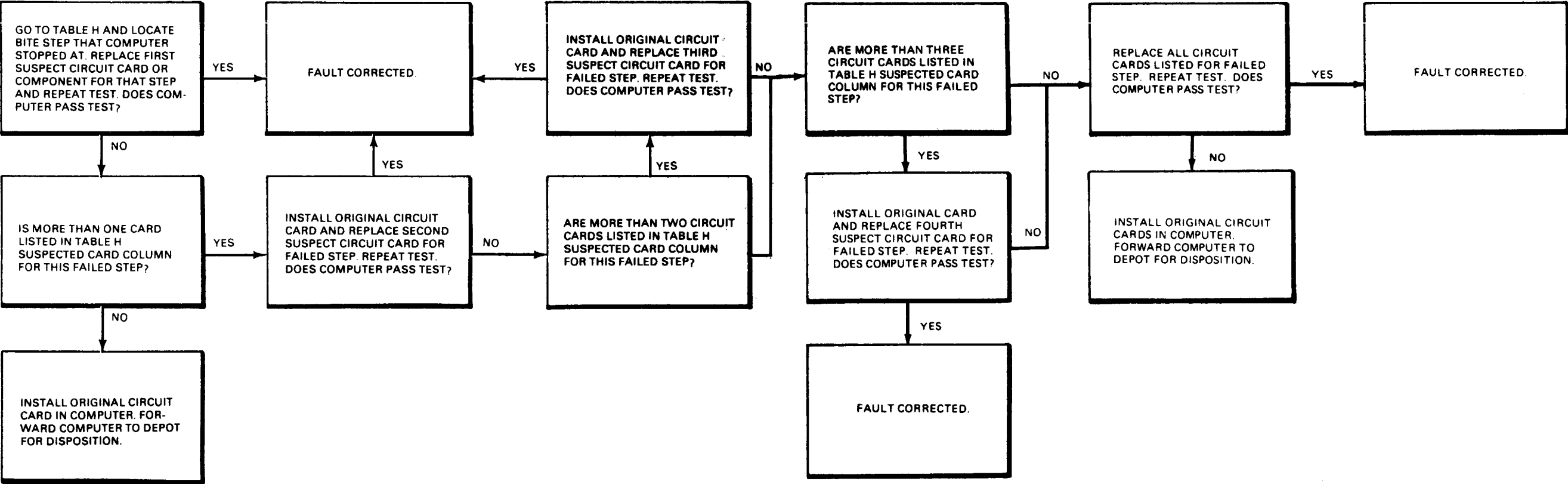
TM 55-1520-240-23

Equipment Condition:

Visual Check of AFCS Computer Performed  
(Task 11 -5.2)

TM 55-1520-240-23:

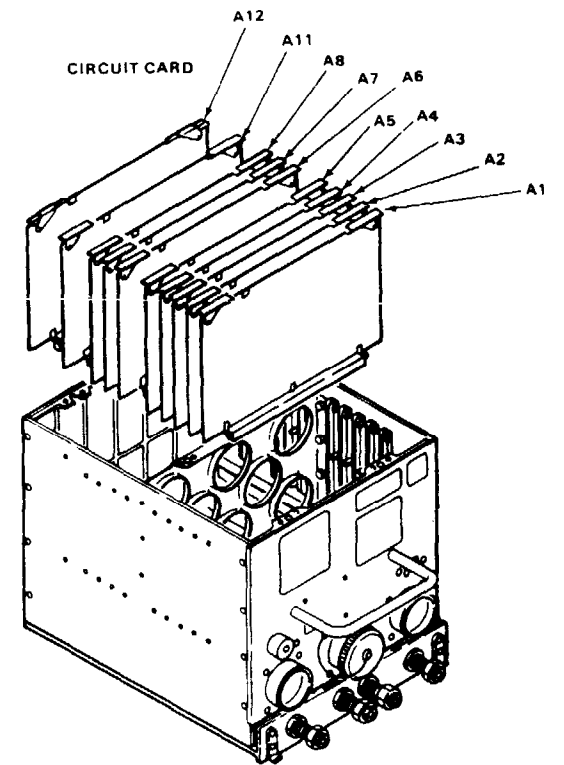
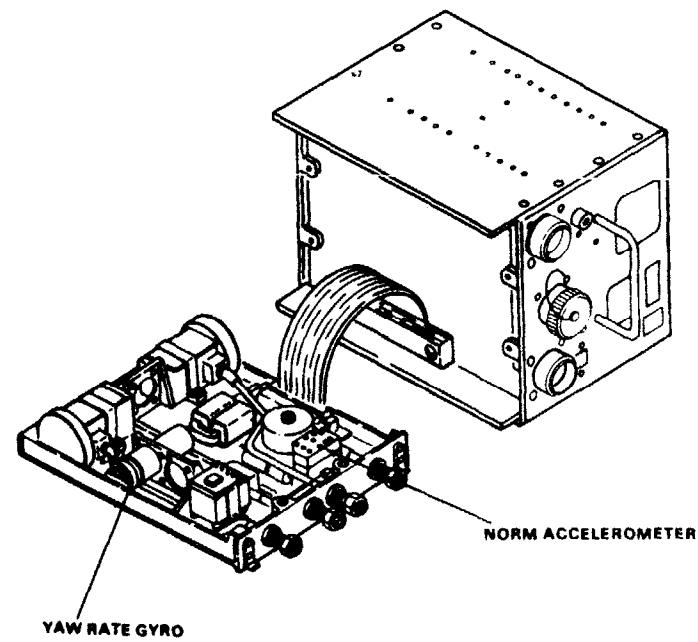
AFCS Computer Cover Required



GO TO NEXT PAGE

TABLE H. BITE TEST  
FAULT ANALYSIS

BITE STEP NO.	CIRCUIT CARD OR SUSPECT COMPONENT
0-3	A5, A6, A11
4,5	A3
6	A8, A12, /43, A6
7, 6	A3, A2, A4
9	A8, A12, A3, A6
11-16	A2, A1
17	A4, A2
18	A8, A12
19-25	A3, A12, A6, A1
26-31	A8, A1, A12
32-44	A4, A8, A1 , A7, A6, A14
45-52	A2, A7, A1
54	A8, A14, A2
56,57	A4, A1, A14
70,73	A3
75,76	A4
80,81	A2
85,86	A12
87	A8
89	A3
91	A4
93	A2
95	A8, A1



D145-12459-SPA

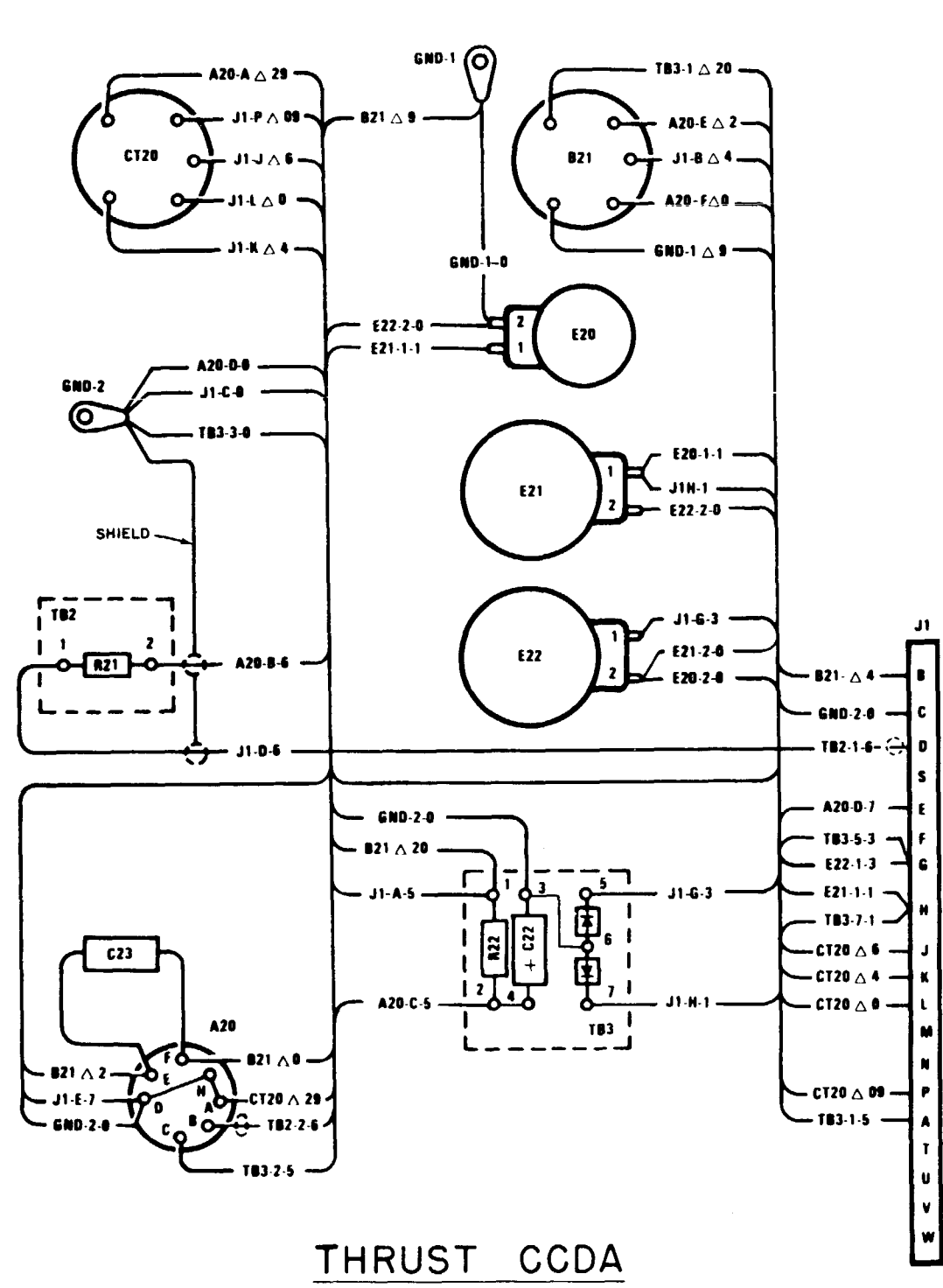
## **11-6** COCKPIT CONTROL DRIVE ACTUATOR (CCDA)

11-6 COCKPIT CONTROL DRIVER ACTUATOR (CCDA)

11-6

11-6.1 COCKPIT CONTROL DRIVE ACTUATOR DIAGRAM

11-6.1



THRUST CCDA

NOTES:

**EXAMPLE WIRE DESIGNATIONS**

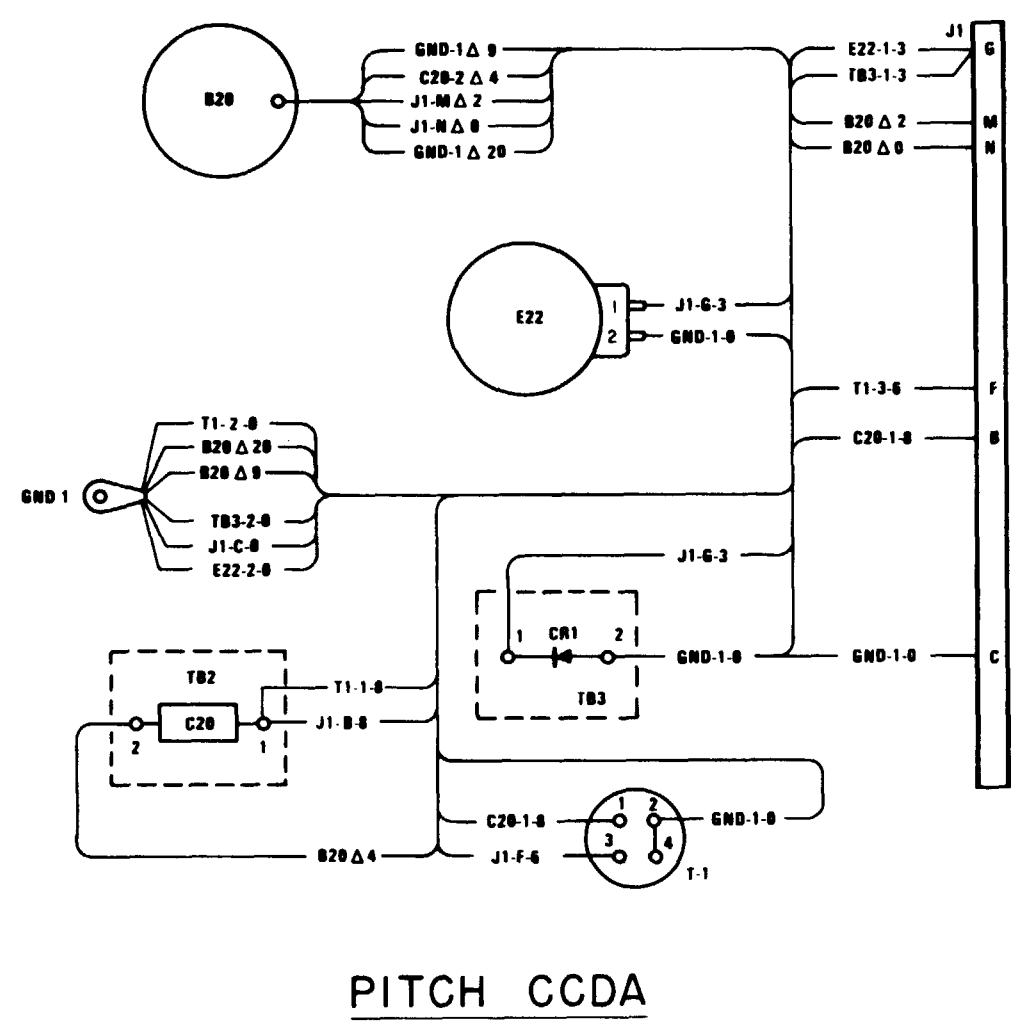
J1-G-3  
{ PART } { TERM } COLOR (ORANGE)

CT20 Δ 20  
{ PART } { TERM } COLOR (RED-WHITE)

PRE-WIRED LEAD

**EIA COLOR CODE**

0 - BLACK	5 - GREEN
1 - BROWN	6 - BLUE
2 - RED	7 - VIOLET
3 - ORANGE	8 - GREY
4 - YELLOW	9 - WHITE



PITCH CCDA

11-6.2 COCKPIT CONTROL DRIVE ACTUATOR (CCDA)  
VISUAL CHECK

INITIAL SETUP

**Applicable Configurations:**  
All

**Tools:**  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178

**Materials:**  
None

**Personnel Required:**  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

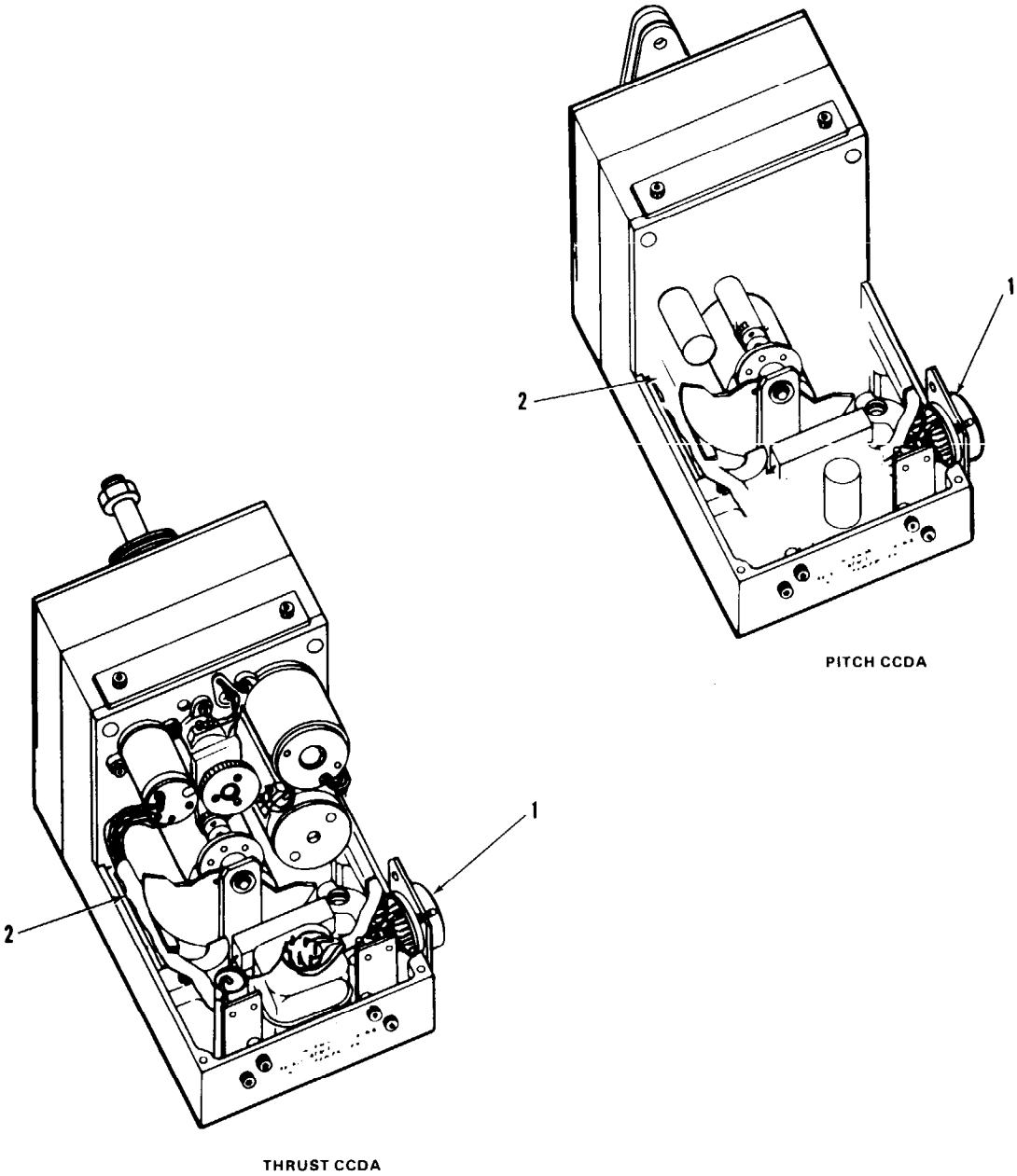
**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23  
CCDA Cover Removed.

TASK	RESULT
1. Check pins in receptacle (1).	If any pin is bent, straighten it. If any pin is burnt, broken, or corroded, replace receptacle (1).
2. Check parts mounted on inside of actuator (2).	If any part is loose, tighten it. If any part is burnt or damaged, replace it.

FOLLOW-ON MAINTENANCE

TM 55-1520-240-23:  
CCDA Cover Installed  
Test Pitch or Thrust Cockpit Control  
Drive Actuator (CCDA)



FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

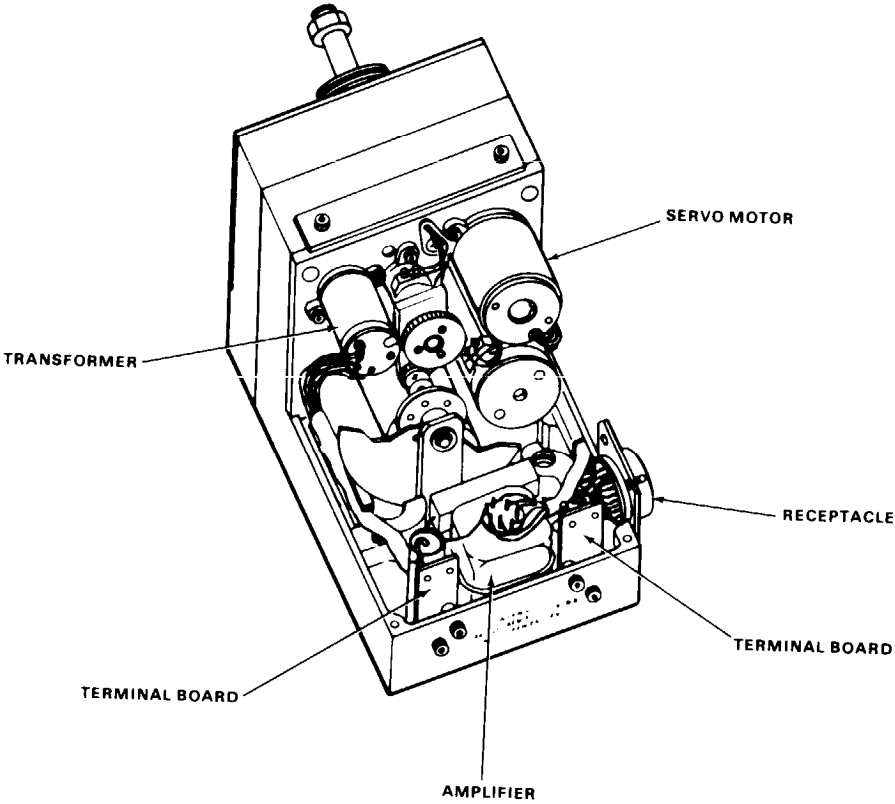
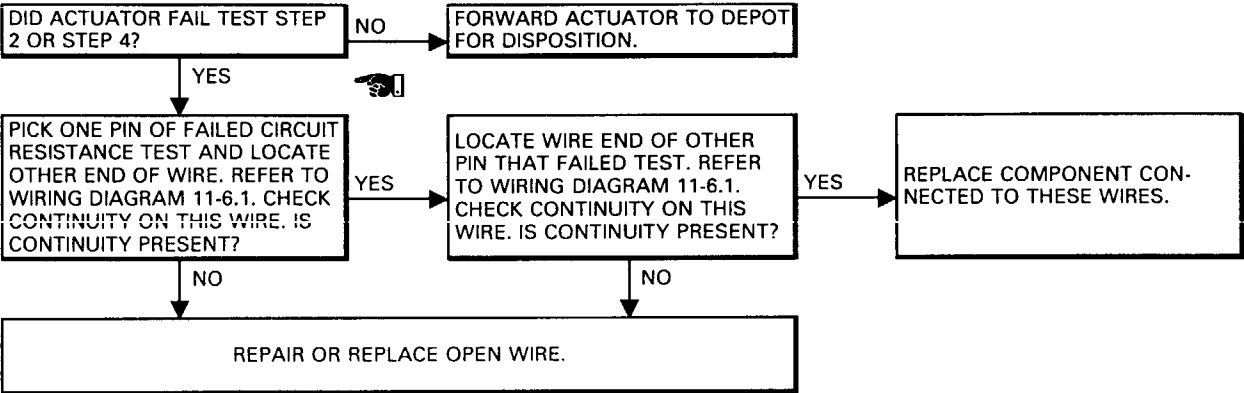
**Tools:**  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

**Materials:**  
None

**Personnel Required:**  
Avionic Navigation and Flight Control  
Equipment Repairer.

**Reference:**  
TM 55-1520-240-23

**Equipment Condition:**  
Visual Check of CCDA Performed (Task 11-6.2)



D145-12472-SPA



11-6.4 THRUST COCKPIT CONTROL DRIVE ACTUATOR FAILS  
BRAKE FUNCTION TEST

11-6.4

**FAULT ISOLATION PROCEDURE**

INITIAL STEP

**Applicable Configurations:**  
All

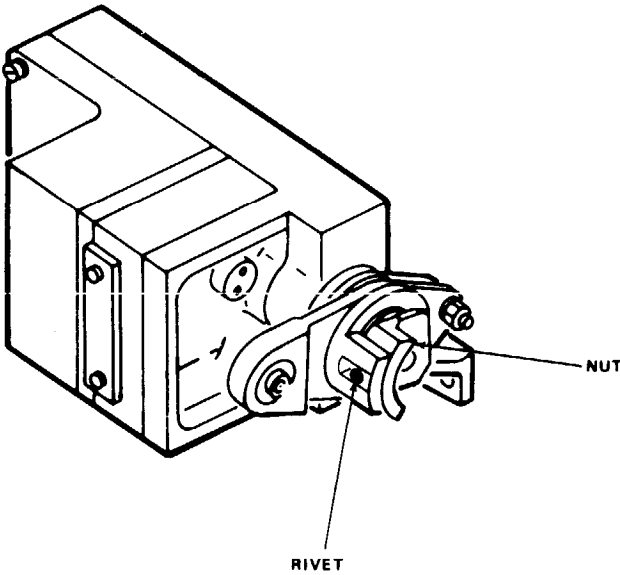
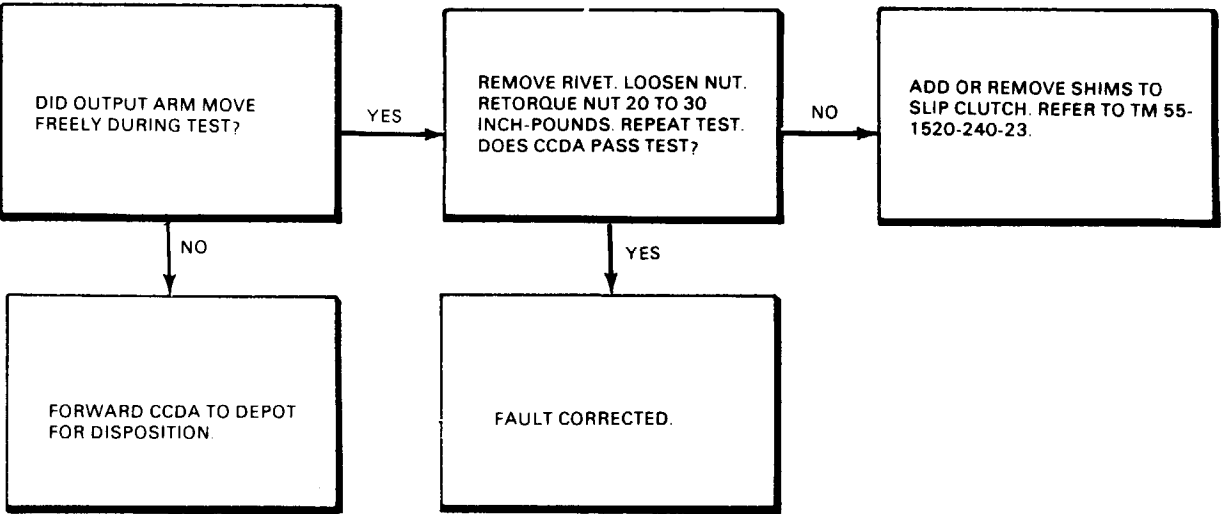
**Tools:**  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

**Materials:**  
None

**Personnel Required:**  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

**Reference:**  
TM 55-1520-240-23

**Equipment Condition:**  
Visual Check of CCDA performed (Task 11-6.2)



FAULT ISOLUTION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

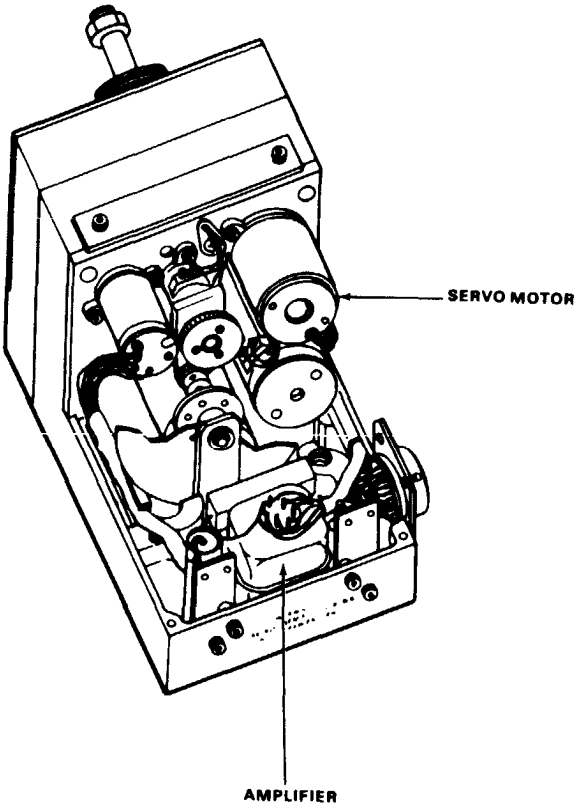
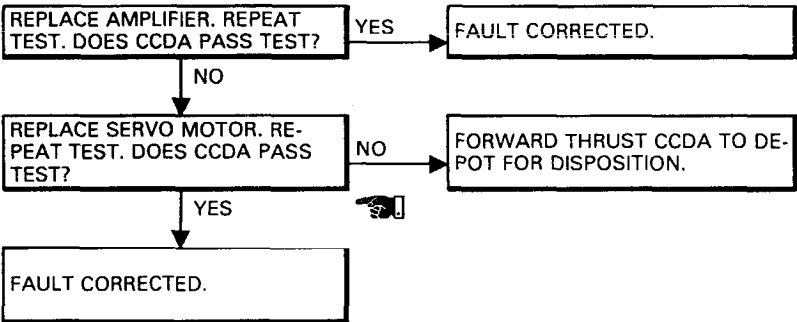
Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
Avionic Navigation and Flight Control  
Equipment Repairer.

Reference:  
TM 55-1520-240-23

Equipment Condition:  
Visual Check of CCDA Performed (Task 11-6.2)



D145-12474-SPA

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:

None

Personnel Required:

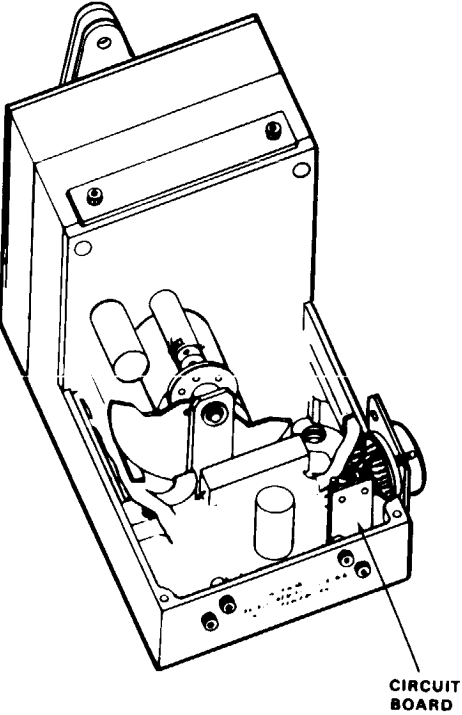
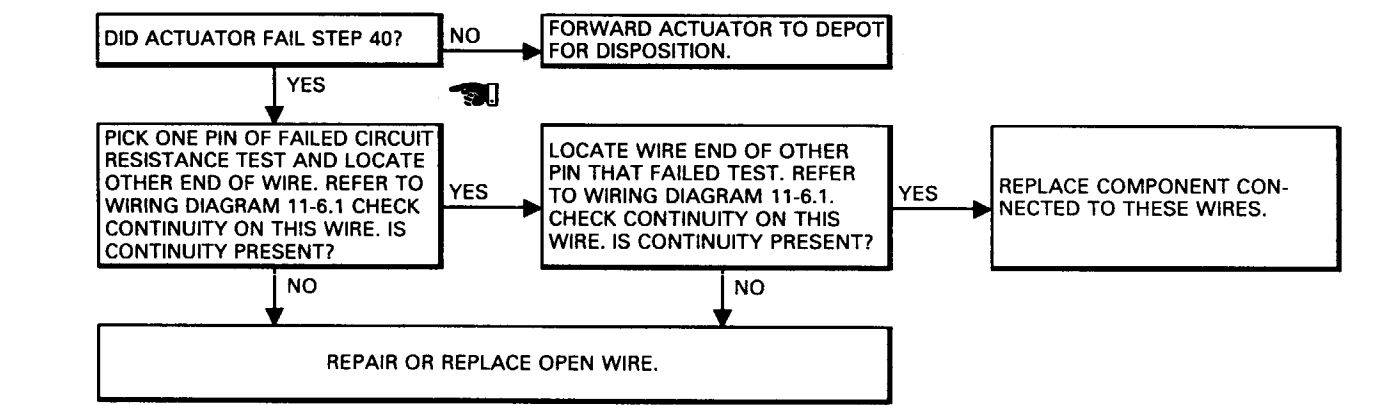
Avionic Navigation and Flight Control  
Equipment Repairer.

Reference:

TM 55-1520-240-23

Equipment Condition:

Visual Check of CCDA Performed (Task 11-6.2)



11-6.7 PITCH COCKPIT CONTROL DRIVE ACTUATOR  
FAILS BRAKE FUNCTION TEST

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

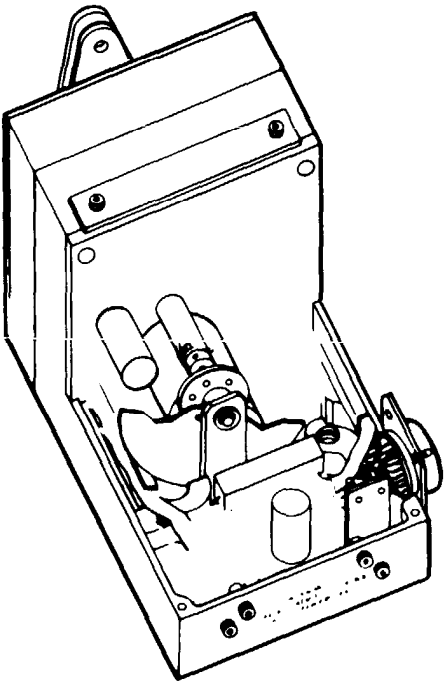
Materials:  
None

Personnel Required  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

Reference:  
TM 55-1520-240-23

Equipment Condition:  
Visual Check of CCDA Performed (Task 11-6.2)

FORWARD CCDA TO DEPOT  
FOR DISPOSITION



PITCH CCDA

END OF TASK

11-6.8 PITCH COCKPIT CONTROL DRIVE ACTUATOR  
FAILS TRIM MOTOR TEST

11-6.8

**FAULT ISOLATION PROCEDURE**

INITIAL SETUP

**Applicable Configurations:**  
All

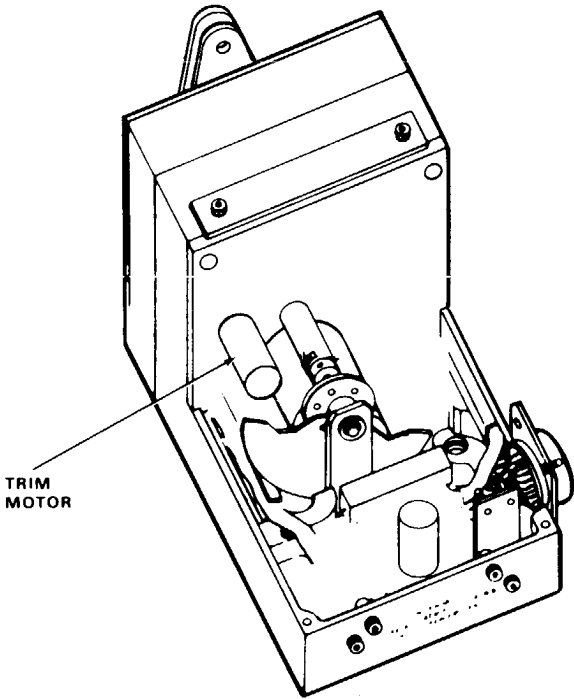
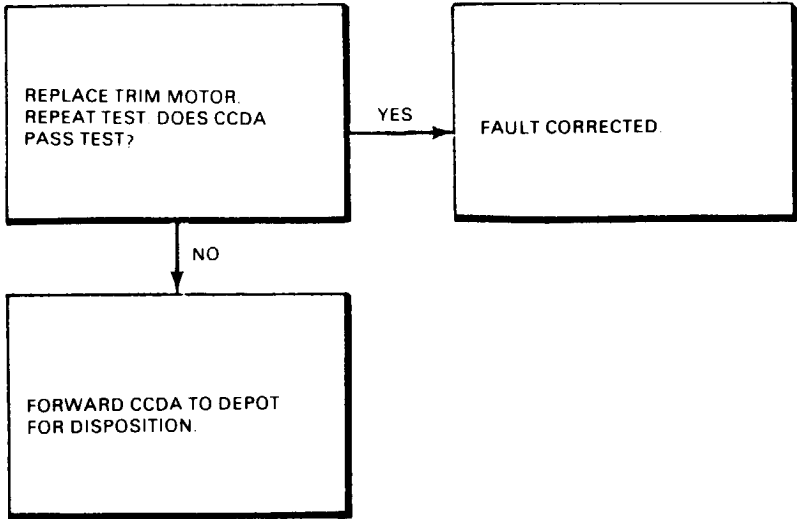
**Tools:**  
Electronic Repairer's Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

**Materials:**  
None

**Personnel Required:**  
35M20 Avionic Navigation and Flight Control  
Equipment Repairer.

**Reference:**  
TM 55-1520-240-23

**Equipment Condition:**  
Visual Check of CCDA Performed (Task 11-6.2)



## CHAPTER 12

# UTILITY SYSTEMS TROUBLESHOOTING

CHAPTER 12  
UTILITY SYSTEM TROUBLESHOOTING

CHAPTER OVERVIEW

Chapter 12 contains procedures for Utility System troubleshooting. Each system and failure symptom is listed below. Included in this chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for the Utility System

Refer to TM 55-1520-240-23 for required maintenance procedures.

SYSTEM	PARA	SYSTEM	PARA
WINDSHIELD ANTI-ICING	12-1	FIRE EXTINGUISHING	12-3
FIRE DETECTION	12-2	WINDSHIELD WIPERS	12-4

FAILURE SYMPTOM LIST

WINDSHIELD ANTI-ICING

SYMPTOM	TASK	SYMPTOM	TASK	SYMPTOM	TASK
CTR WSHLD ANTI-ICE CONT CIRCUIT BREAKER WILL NOT STAY CLOSED	12-1.3	COPLT WSHLD CONT CIRCUIT BREAKER WILL NOT STAY CLOSED	12-1.3	PILOT WSHLD ANTI-ICE CONT CIRCUIT BREAKER WILL NOT STAY CLOSED	12-1.3
CTR WSHLD ANTI-ICE HEAT CIRCUIT BREAKER WILL NOT STAY CLOSED	12-1.3	COPILOT'S WINDSHIELD CONTINUES TO HEAT WHEN CPLT WINDSHIELD ANTI-ICE SWITCH IS AT OFF	12-1.3	PILOT WSHLD ANTI-ICE HEAT CIRCUIT BREAKER WILL NOT STAY CLOSED	12-1.3
CENTER WINDSHIELD CONTINUES TO HEAT WHEN CTR WINDSHIELD SWITCH IS AT OFF	12-1.3	COPILOT'S WINDSHIELD DOES NOT GET WARM	12-1.3	PILOT'S WINDSHIELD CONTINUES TO HEAT WHEN PLT WINDSHIELD SWITCH IS AT OFF	12-1.3
CENTER WINDSHIELD DOES NOT GET WARM	12-1.3	COPLT WSHLD HEAT CIRCUIT BREAKER WILL NOT STAY CLOSED	12-1.3	PILOT'S WINDSHIELD DOES NOT GET WARM	12-1.3
FIRE DETECTION					
FIRE DET CIRCUIT BREAKER WILL NOT STAY CLOSED	12-2.4	NO. 1 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUT-OFF CAPTION DOES NOT LIGHT DURING TEST	12-2.4	NO. 2 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUT-OFF CAPTION DOES NOT LIGHT DURING TEST	12-2.4
NO. 1 ENGINE AND NO. 2 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF CAPTIONS DO NOT LIGHT DURING TEST	12-2.4	NO. 1 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUT-OFF CAPTION LIT	12-2.4	NO. 2 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUT-OFF CAPTION LIT	12-2.4

FAILURE SYMPTOM LIST (Continued)

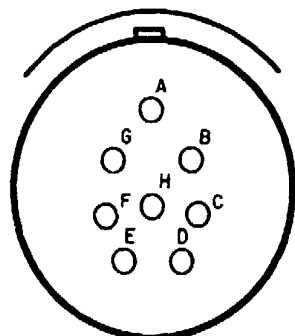
FIRE EXTINGUISHER		FIRE EXTINGUISHER		FIRE EXTINGUISHER	
SYMPTOM	TASK	SYMPTOM	TASK	SYMPTOM	TASK
FIRE EXT CIRCUIT BREAKER WILL NOT STAY CLOSED	12-3.4	MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 1 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 2	12-3.4	MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 2 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 2	12-3.4
MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 1 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 1	12-3.4	MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 2 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 1	12-3.4		
		WINDSHIELD WIPERS			
WINDSHIELD WIPERS ARE NOISY	12-4.3	WINDSHIELD WIPERS DO NOT RETURN TO PARK POSITION	12-4.3	WINDSHIELD WIPER OR WIPERS DO NOT OPERATE AT ONE SWITCH POSITION OR ANY SWITCH POSITION	12-4.3
WINDSHIELD WIPER CIRCUIT BREAKER WILL NOT STAY CLOSED	12-4.3				



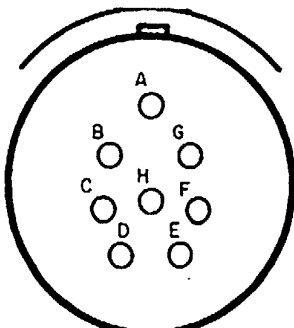
UTILITY SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST

				STATION LOCATION							STATION LOCATION		
REF	PART			FS	WL	BL	REF	PART			FS	WL	BL
DESIG	NUMBER	TYPE	MATE WITH/LOCATION				DESIG	NUMBER	TYPE	MATE WITH/LOCATION			
GD031		151	CONSOLE - FWD CTR INST PNL				300P4	M83723-75A2461N	43	NO. 1 PDP			
GD035		150	FWD AND ABOVE OVHD PNL	61	40	10L	300J5	M83723-74A2041N	40	NO. 2 PDP			
GD038		151	NOSE COMPARTMENT	40	0	0	300P5	M83723-75A2041N	40	NO. 2 PDP			
GD041		151	UNDER RH COCKPIT FLOOR	95	-25	30R	300J6	M83723-74A24616	43	NO. 2 PDP			
GD042		151	UNDER LH COCKPIT FLOOR	90	-20	35L	300P6	M83723-75A24616	43	NO. 2 PDP			
GD098		151	LH AFT CABIN	477	30	52L	300J8	M83723-74A2461N	42	NO. 2 PDP			
GD099		151	RH AFT CABIN	508	25	50R	300P8	M83723-75A2461N	42	NO. 2 PDP			
GD124		151	UNDER AFT PYLON	500	72	0	300J11	M83723-73A2255N	42	CONSOLE-UNDERFLOOR	85	-20	5R
GD125		151	UNDER AFT PYLON	500	72	0	300P11	M83723-76A2255N	42	CONSOLE-UNDERFLOOR	85	-20	5R
GD246		151	UNDER AFT PYLON	500	72	0	300J15	M83723-74A24617	43	CONSOLE-UNDERFLOOR	85	-20	10R
GD247		151	UNDER AFT PYLON	500	72	0	300P15	M83723-75A24617	43	CONSOLE-UNDERFLOOR	85	-20	10R
GD282		151	NOSE COMPARTMENT	40	0	0	300J18	M83723-73A2041N	40	OVERHEAD PANEL-COCKPIT			
GD284		151	NOSE COMPARTMENT	40	0	0	300P18	M83723-76A2041N	40	OVERHEAD PANEL-COCKPIT			
GD285		151	NOSE COMPARTMENT	40	0	0	300J19	M83723-73A2041N	40	OVERHEAD PANEL-COCKPIT			
TB 36			OVERHEAD PANEL-COCKPIT	80	40	12R	300P19	M83723-76A2041N	40	OVERHEAD PANEL-COCKPIT			
TB 48			NOSE COMPARTMENT	50	-15	2L	300J20	M83723-74A2461N	43	OVERHEAD PANEL-COCKPIT			
TB 62			NO. 2 PDP SIDE PANEL	90	-15	30R	300P20	M83723-75A2461N	43	OVERHEAD PANEL-COCKPIT			
083K1	MS25035-1	110	NOSE COMPARTMENT	45	-10	8L	300J23	M83723-74A2255N	42	OVERHEAD PANEL-COCKPIT			
083K2	MS24149D1	106	NOSE COMPARTMENT	40	-17	2L	300P23	M83723-75A2255N	42	OVERHEAD PANEL-COCKPIT			
083K3	MS25035-1	110	NOSE COMPARTMENT	45	-10	5L	300J45	M83723-73A2461N	43	HEATER COMPARTMENT - OVHD	105	40	30R
083P1	MS3476W16-8S	22	CPLT WSHLD TEMP CONT-NOSE	45	-10	0	300P45	M83723-76A2461N	43	HEATER COMPARTMENT - OVHD	105	40	30R
083P2	MS3476W16-8SW	22	CTR WSHLD TEMP CONT-NOSE	45	-10	4L	300J48	M83723-74A2461N	43	ELECTRONICS COMPARTMENT - OVHD	120	40	20L
083P3	MS3476W16-8S	22	PLT WSHLD TEMP CONT-NOSE	45	-10	8L	300P48	M83723-75A2461N	43	ELECTRONICS COMPARTMENT - OVHD	120	40	20L
133P1	MS3456W10SL-3S	45	WSHLD WIPER MOTOR	61	50	0	300J51	M83723-74A2461N	43	AFT CROWN	460	45	20R
231P1	35303-11	FENWAL	NO. 1 ENG DISC.	484	45	52L	300P51	M83723-75A2461N	43	AFT CROWN	460	45	20R
231P2	35303-11	FENWAL	NO. 1 ENG DISC.	484	45	52L	300J52	M83723-74A2255N	42	AFT CROWN	460	45	30L
231P3	35303-11	FENWAL	NO. 2 ENG DISC.	484	45	52R	300P52	M83723-75A2255N	42	AFT CROWN	460	45	30L
231P4	35303-11	FENWAL	NO. 2 ENG DISC.	484	45	52R	300J58	M83723-73A22558	42	CONSOLE - UNDERFLOOR	85	-20	12L
231P5	MS3456W18-8S	53	FIRE DET CONT	492	20	52L	300P58	M83723-76A22558	42	CONSOLE - UNDERFLOOR	85	-20	12L
231P6	MS3456W18-8S	53	FIRE DET CONT	492	20	52R	300J61	M83723-73A24619	43	CONSOLE - UNDERFLOOR (WITHOUT 74)	85	-20	10L
300J1	M83723-74A2041N	40	NO. 1 PDP				300J61	M83723-73W24619	43	CONSOLE - UNDERFLOOR (WITH 74)	85	-20	10L
300P1	M83723-75A2041N	40	NO. 1 PDP				300P61	M83723-76A24619	43	CONSOLE - UNDERFLOOR (WITHOUT 74)	85	-20	10L
300J2	M83723-74A2255N	42	NO. 1 PDP				300P61	M83723-76W24619	43	CONSOLE - UNDERFLOOR (WITH 74)	85	-20	10L
300P2	M83723-75A2255N	42	NO. 1 PDP										
300J4	M83723-74A2461N	43	NO. 1 PDP										

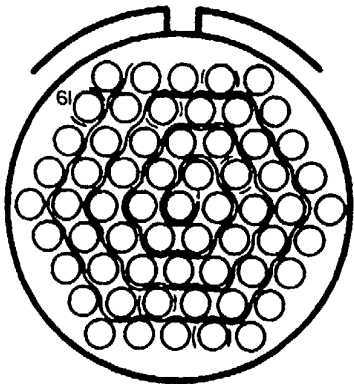
UTILITY SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)



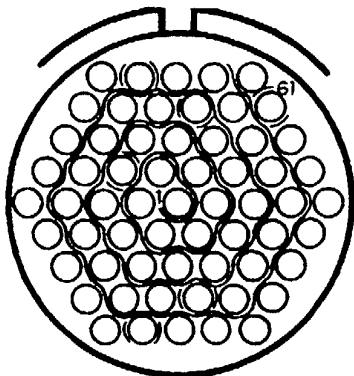
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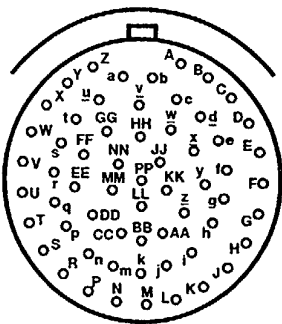
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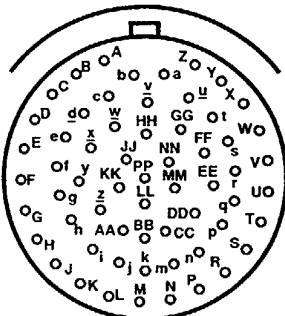
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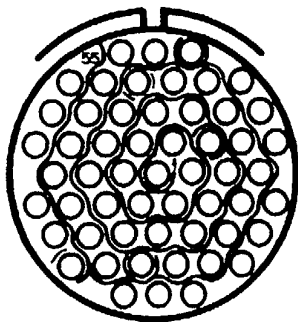
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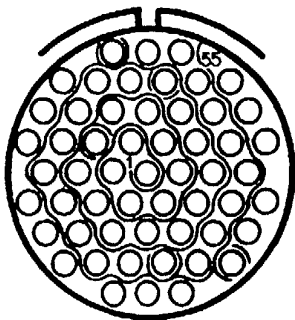
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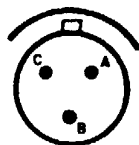
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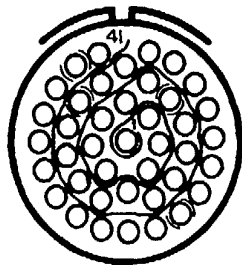
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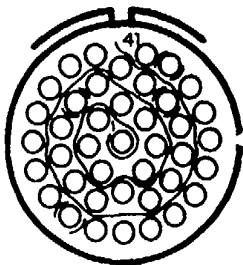
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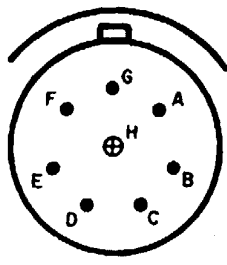
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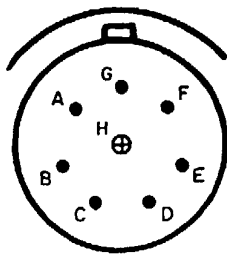
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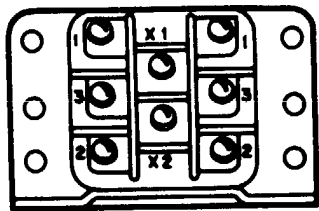
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53

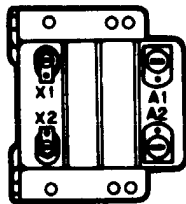
UTILITY SYSTEMS ELECTRICAL COMPONENT  
LOCATION AND CONFIGURATION LIST (Continued)

RELAY



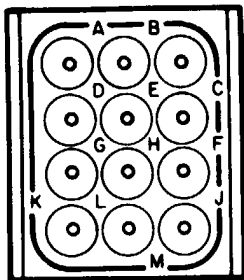
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RELAY



110

GND MODULE



150

GND STUD



151

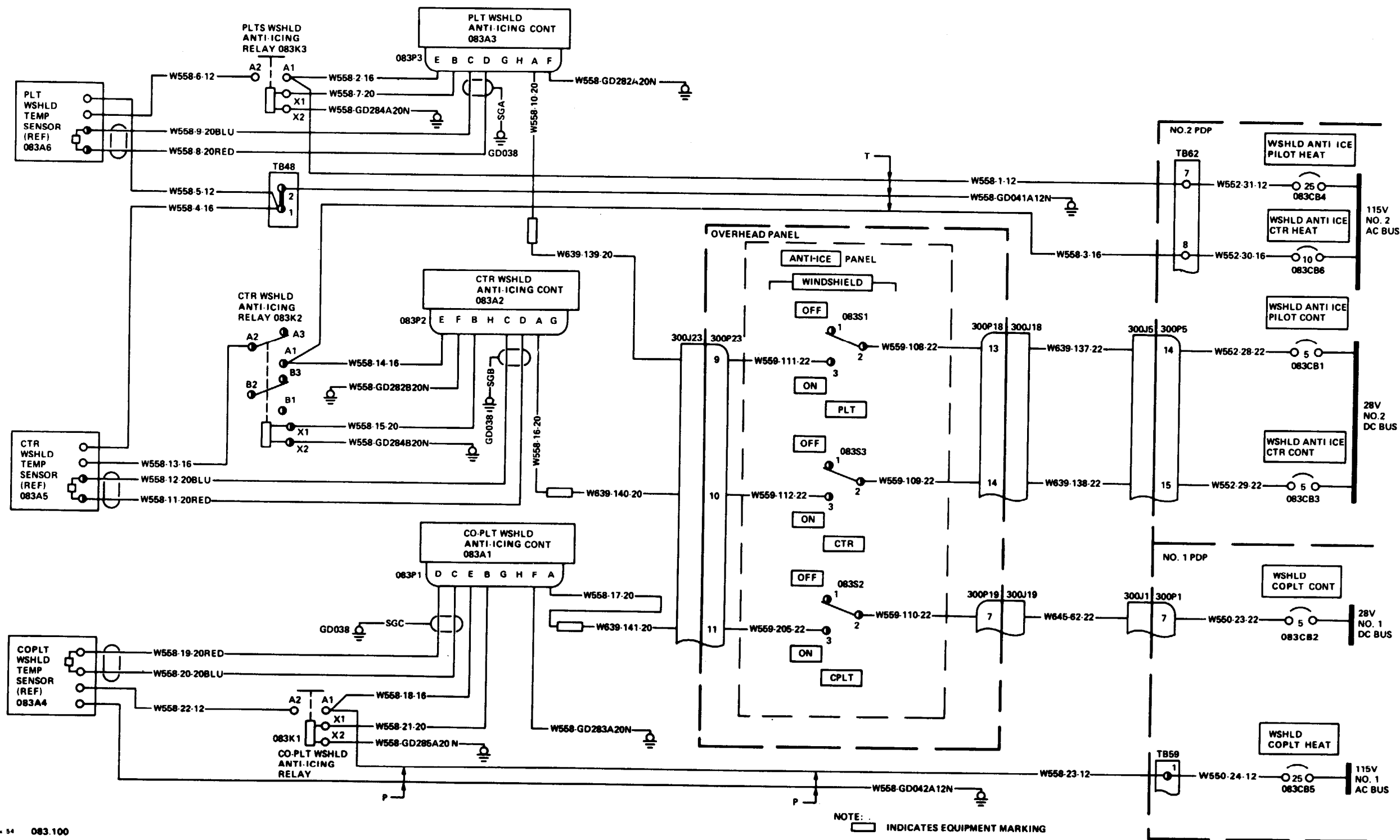
## 12-1 WINDSHIELD ANTI-ICING SYSTEM

12-1 WINDSHIELD ANTI-ICING SYSTEM

12-1.1 WINDSHIELD ANTI-ICING SYSTEM WIRING DIAGRAM

12-1

12-1.1



90 x 54 083.100

U145 4879 S/A

12-1.2 WINDSHIELD ANTI-ICING SYSTEM VISUAL CHECK

12-1.2

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

Materials:

None

Personnel Required:

67U10 Medium Helicopter Repairer

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

Battery Disconnected

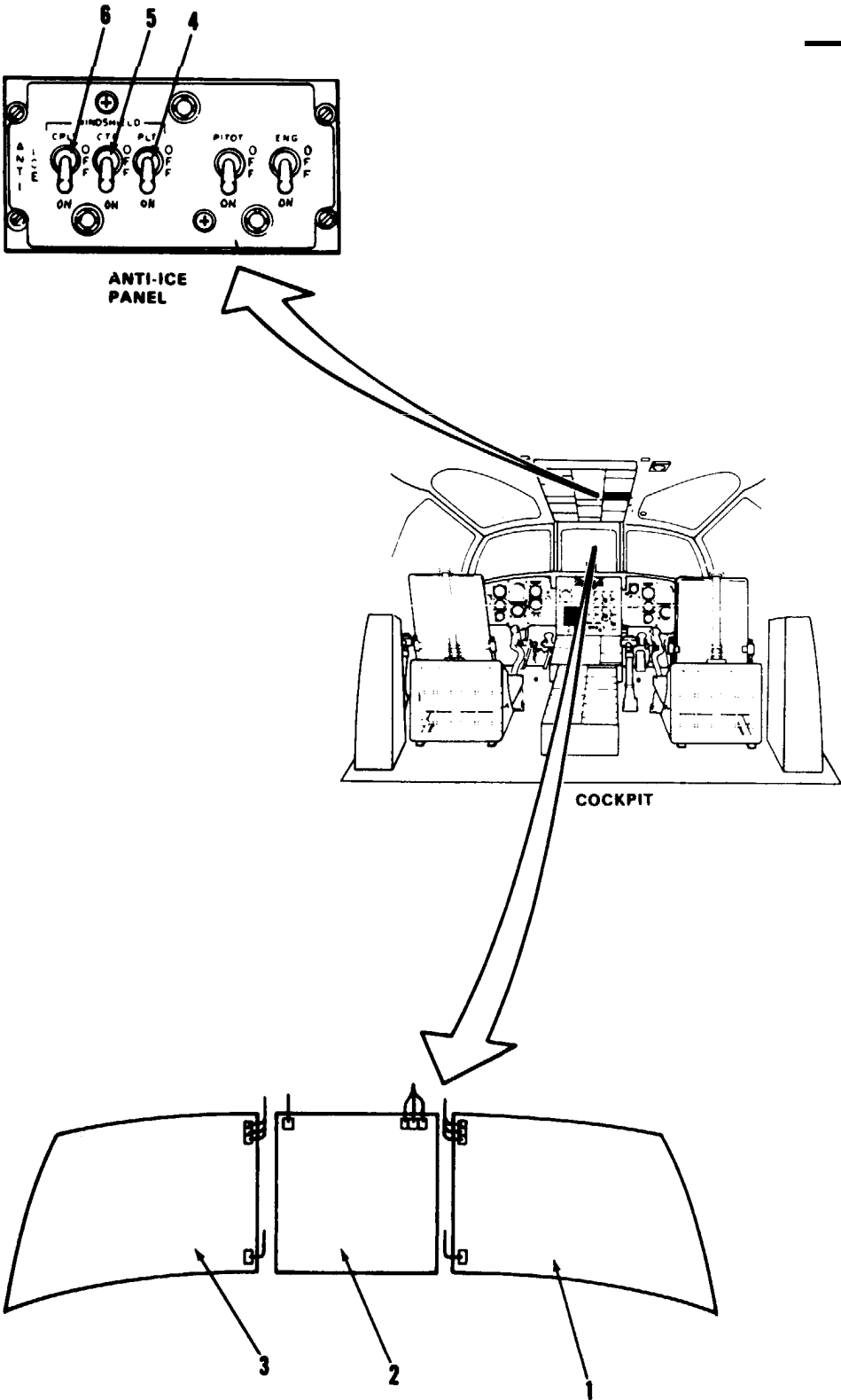
Electrical Power Off

Hydraulic Power Off

TASK	RESULT
1. Check pilot's, center, and copilot's windshields (1, 2, and 3).	If any windshield (1, 2, or 3) is damaged or discolored, replace it. If wiring to windshield terminals is loose or damaged, tighten terminals or repair or replace wire as required.
2. Check PLT, CTR, and CPLT WINDSHIELD anti-ice switches (4, 5, 6).	If any switch (4, 5, or 6) is loose or damaged, tighten or replace it as required.

FOLLOW-ON MAINTENANCE:

None



12-1.3 WINDSHIELD ANTI-ICING SYSTEM OPERATIONAL CHECK

12-1.3

INITIAL SETUP

**Applicable Configurations:**  
All

**Tools:**  
None

**Materials:**  
None

**Personnel Required:**  
68F20 Aircraft Electrician

**References:**

TM 55-1520-240-23

**Equipment Condition:**

TM 55-1520-240-23:

Battery Connected

Electrical Power On

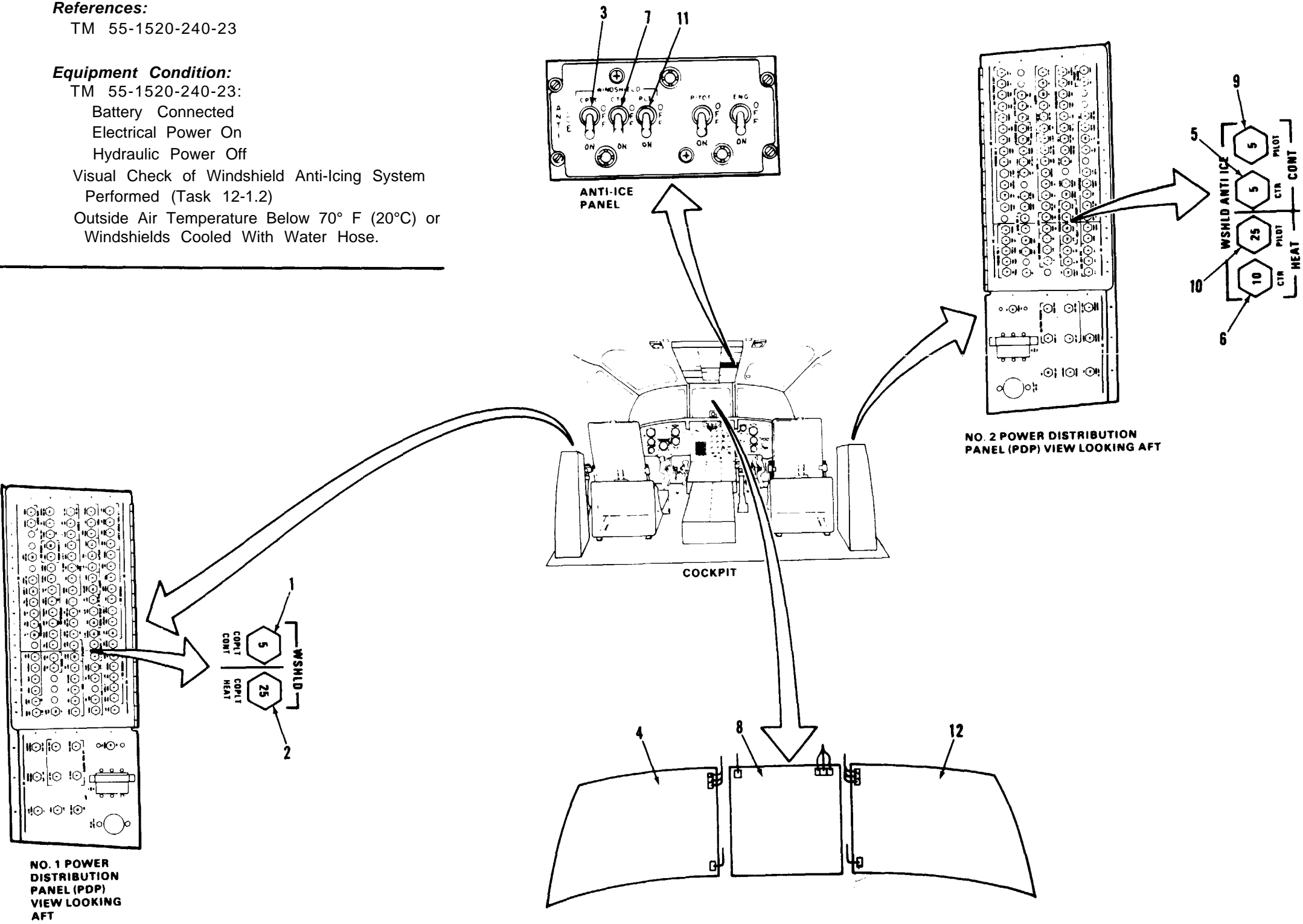
Hydraulic Power Off

Visual Check of Windshield Anti-Icing System

Performed (Task 12-1.2)

Outside Air Temperature Below 70° F (20°C) or

Windshields Cooled With Water Hose.



12-1.3 WINDSHIELD ANTI-ICING SYSTEM OPERATIONAL CHECK  
(Continued)

12-1.3

TASK	RESULT
<b>CHECK COPILOTS WINDSHIELD ANTI-ICING</b>	
1. Check that COPLT WSHLD CONT and COPLT WSH LD HEAT circuit breakers (1 and 2) are closed.	If COPLT WSHLD CONT or COPLT WSHLD HEAT circuit breaker (1 or 2) is open, close it. If COPLT WSHLD CONT circuit breaker opens again, go to task 12-1.4. If COPLT WSHLD HEAT circuit breaker opens again, go to task 12-1.5.
2. Set CPLT WINDSHIELD anti-ice switch (3) to ON. Touch copilot’s windshield (4).	Copilot’s windshield (4) shall begin to get warm and heat up before automatic heat cycling begins. If windshield does not get warm, go to task 12-1-6. If windshield temperature does not cycle replace copilot’s windshield anti-icing control box.
3. Set CPLT WINDSHIELD anti-ice switch (3) to OFF. Touch copilot’s windshield (4).	Copilot’s windshield (4) shall stop heating. If it continues to heat, go to task 12-1.7.
<b>CHECK CENTER WINDSHIELD ANTI-ICING</b>	
4. Check that CTR WSHLD ANTI-ICE CONT and CTR WSHLD ANTI-ICE HEAT circuit breakers (5 and 6) are closed.	If CTR WSHLD ANTI-ICE CONT or CTR WSHLD ANTI-ICE HEAT circuit breaker (5 or 6) is open, close it. If CTR WSHLD ANTI-ICE CONT circuit breaker opens again, go to task 12-1.8. If CTR WSHLD ANTI-ICE HEAT circuit breaker opens again, go to task 12-1.9.
5. Set CTR WINDSHIELD anti-ice switch (7) to ON. Touch center windshield (8).	Center windshield (8) shall begin to get warm and heat up before automatic heat cycling begins. If windshield does not get warm, go to task 12-1.10. If windshield temperature does not cycle, replace center windshield anti-icing control box.
6. Set CTR WINDSHIELD anti-ice switch (7) to OFF. Touch center windshield (8).	Center windshield (8) shall stop heating. If it continues to heat, go to task 12-1.11.

TASK	RESULT
<b>CHECK PILOT’S WINDSHIELD ANTI-ICING</b>	
7. Check that PILOT WSHLD ANTI-ICE CONT AND PILOT WSHLD ANTI-ICE HEAT circuit breakers (9 and 10) are closed.	If PILOT WSHLD ANTI-ICE CONT or PILOT WSHLD ANTI-ICE HEAT circuit breaker (9 or 10) is open, close it. If PILOT WSHLD ANTI-ICE CONT circuit breaker opens again, go to task 12-1.12. If PILOT WSHLD ANTI-ICE HEAT circuit breaker opens again, go to task 12-1.13.
8. Set PLT WINDSHIELD anti-ice switch (11) to ON. Touch pilot’s windshield (12).	Pilot’s windshield (12) shall begin to get warm and heat up before automatic heat cycling begins. If windshield does not get warm, go to task 17-7 14. If windshield temperature does not cycle, replace pilot’s windshield anti-icing control box.
9 Set PLT WINDSHIELD anti-ice switch (11) to OFF. Touch pilot’s windshield (12).	Pilot’s windshield (12) shall stop heating. If it continues to heat, go to task 12-1.15.

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:  
Electrical Power Off  
Battery Disconnected

END OF TASK



12-1.4 COPLT WSHLD CONT CIRCUIT BREAKER WILL NOT STAY CLOSED

12-1.4

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

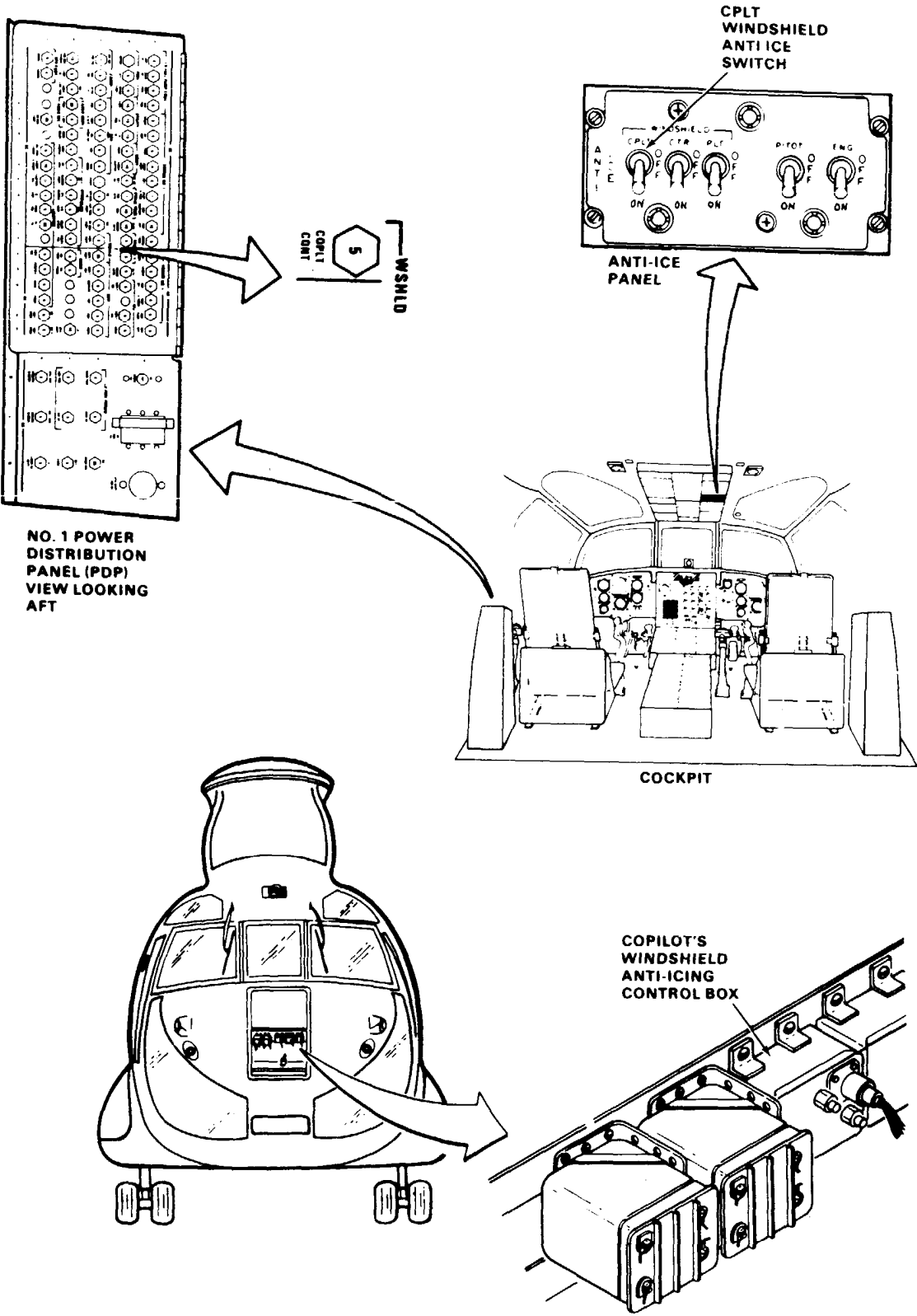
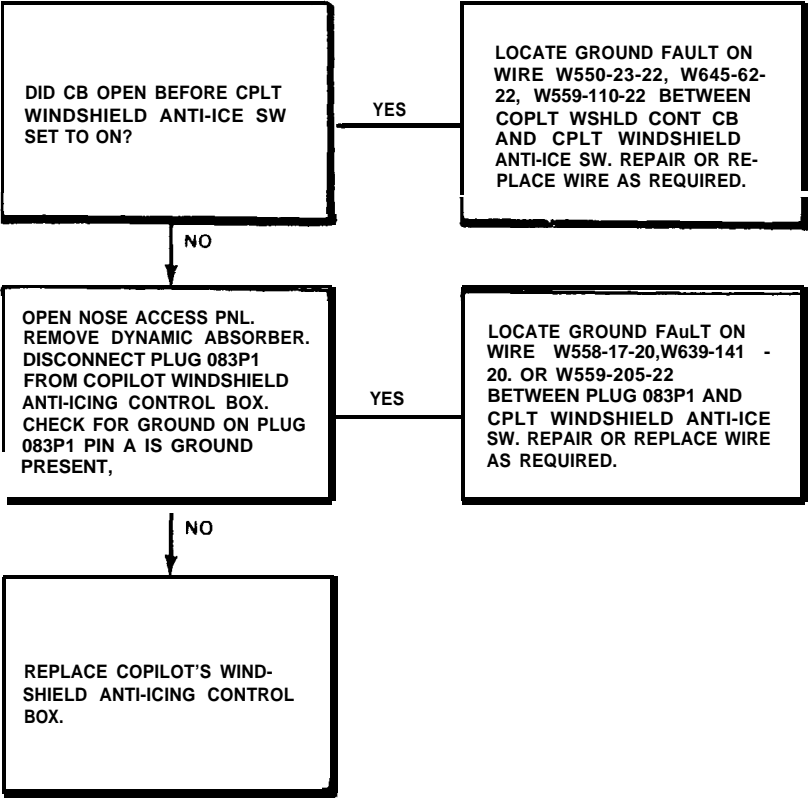
Took  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multi meter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



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0445-5371-SPA

END OF TASK

12-1.5 COPLT WSHLD HEAT CIRCUIT BREAKER WILL NOT STAY CLOSED

12-1.5

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

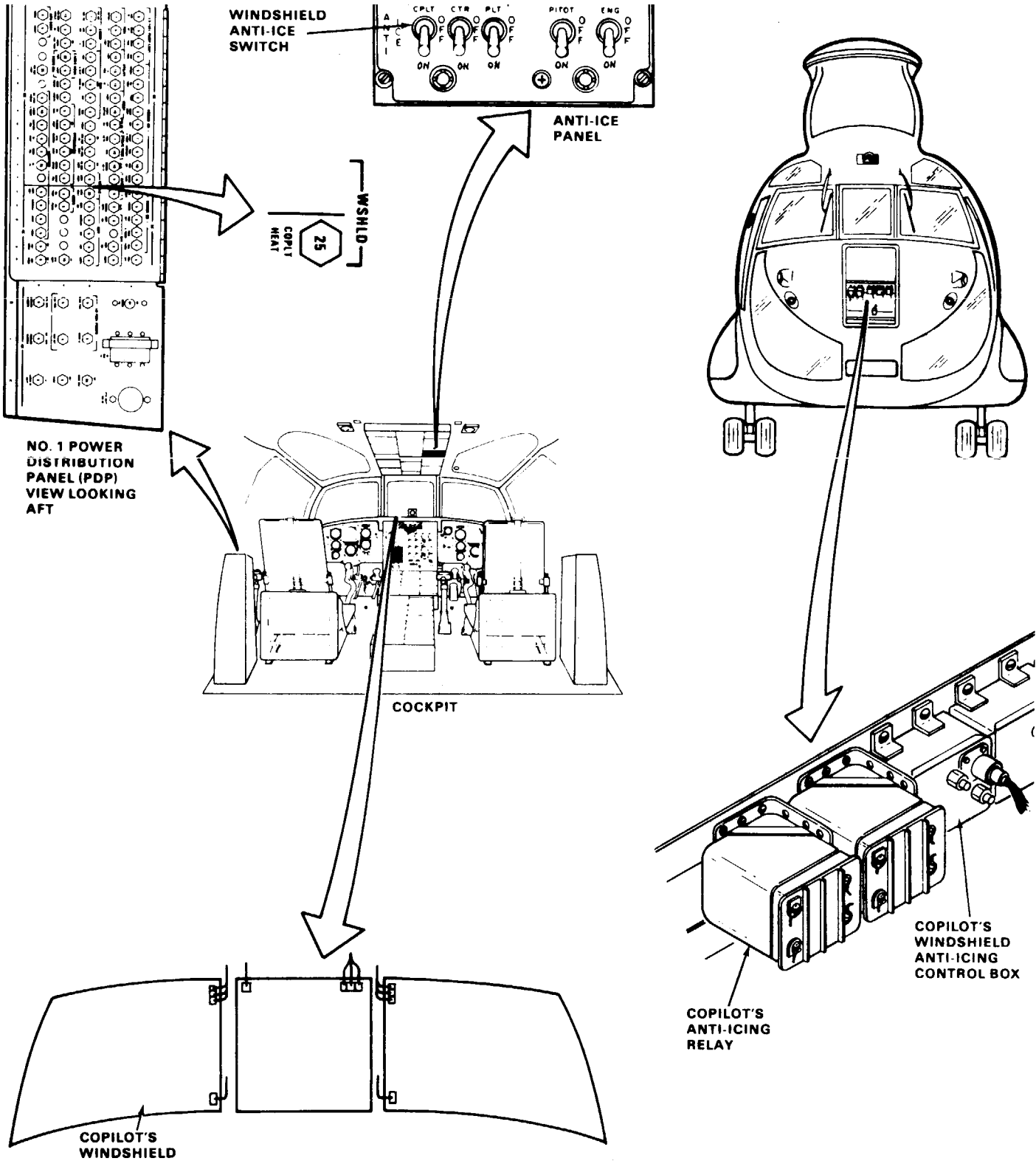
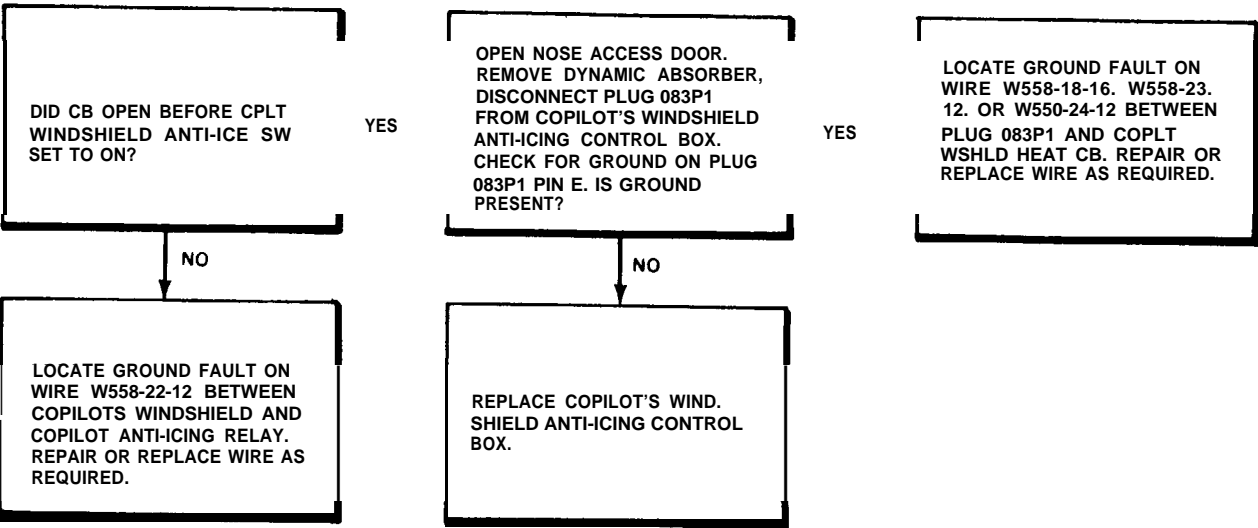
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



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END OF TASK

12-1.6 COPILOT'S WINDSHIELD DOES NOT GET WARM

12-1.6

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

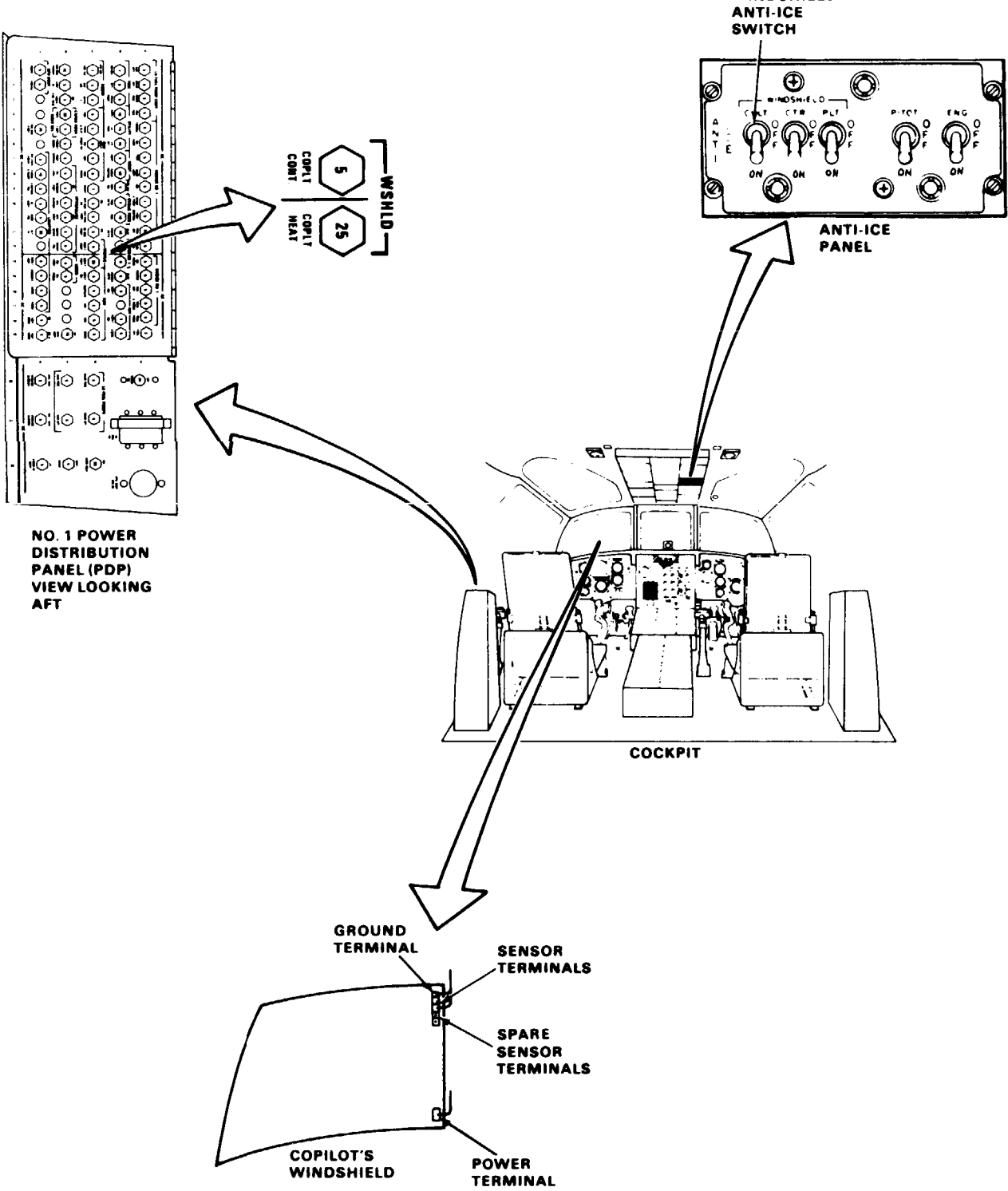
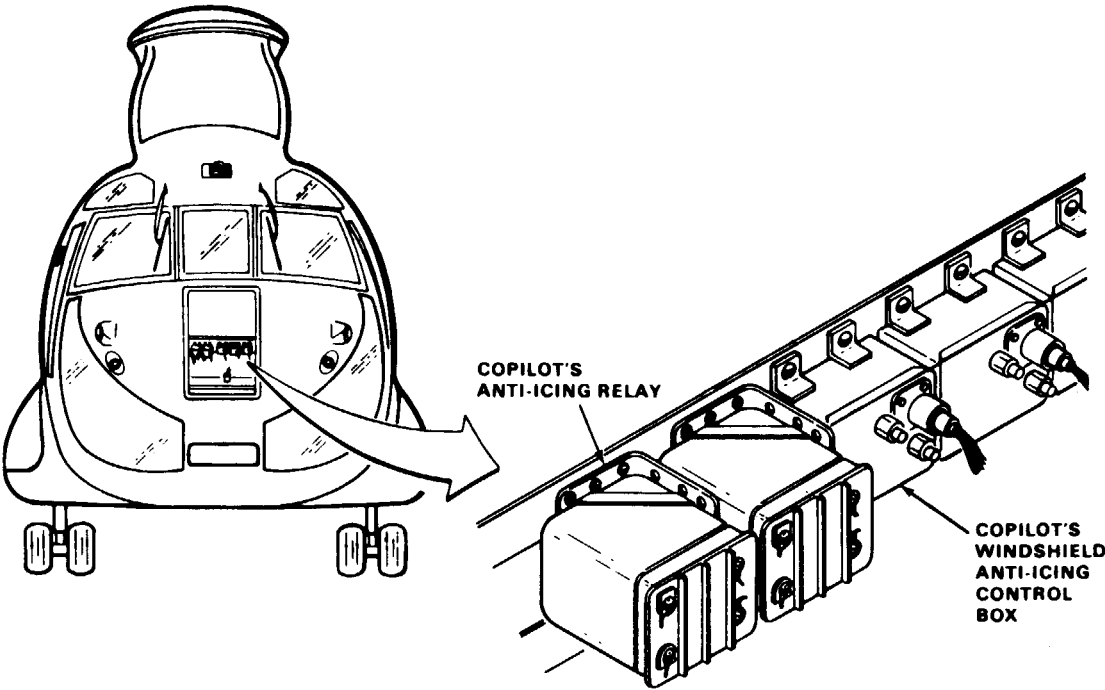
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

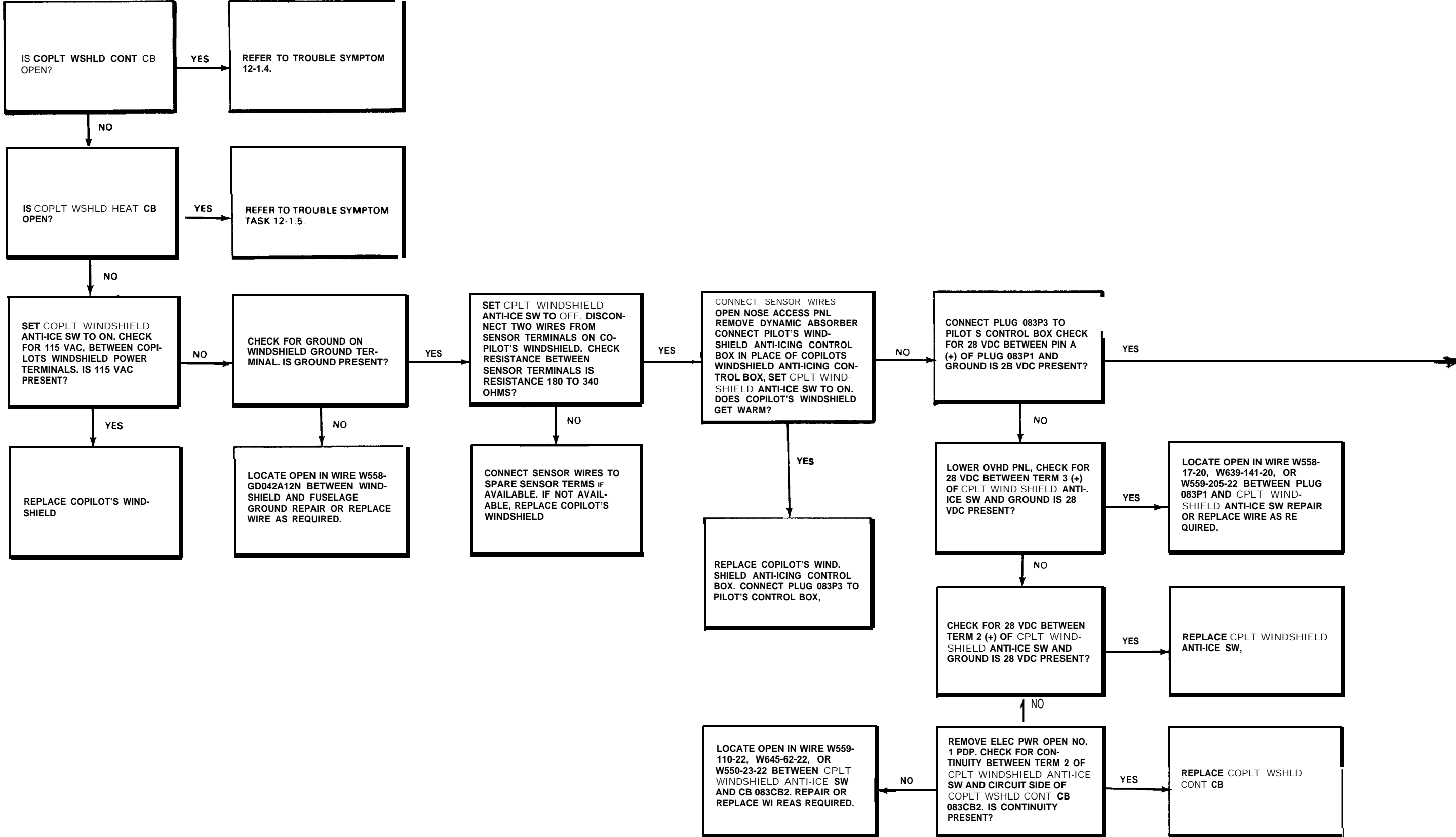
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

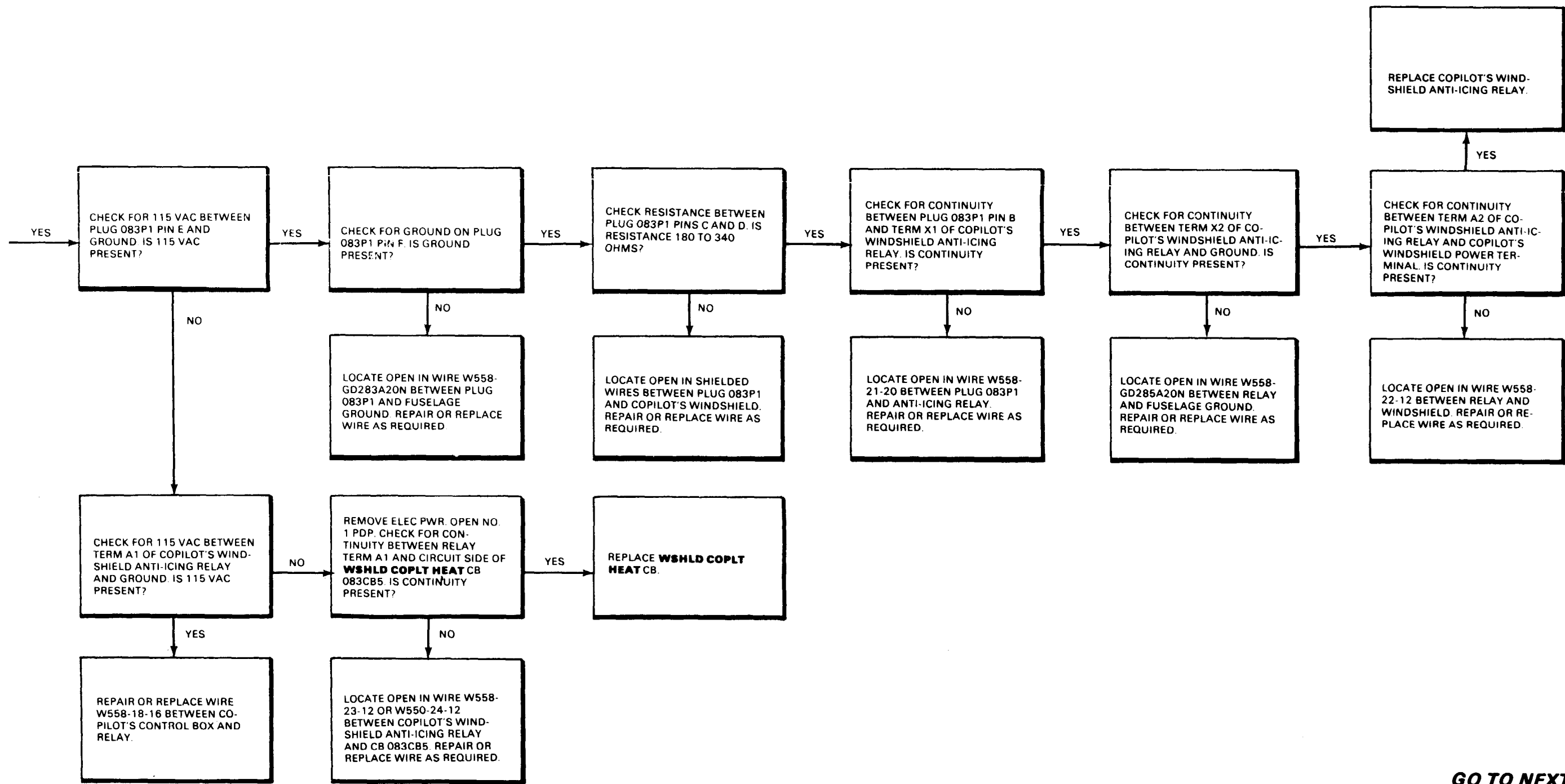


12-1.6 COPILOT'S WINDSHIELD DOES NOT GET WARM (Continued)

12-1.6

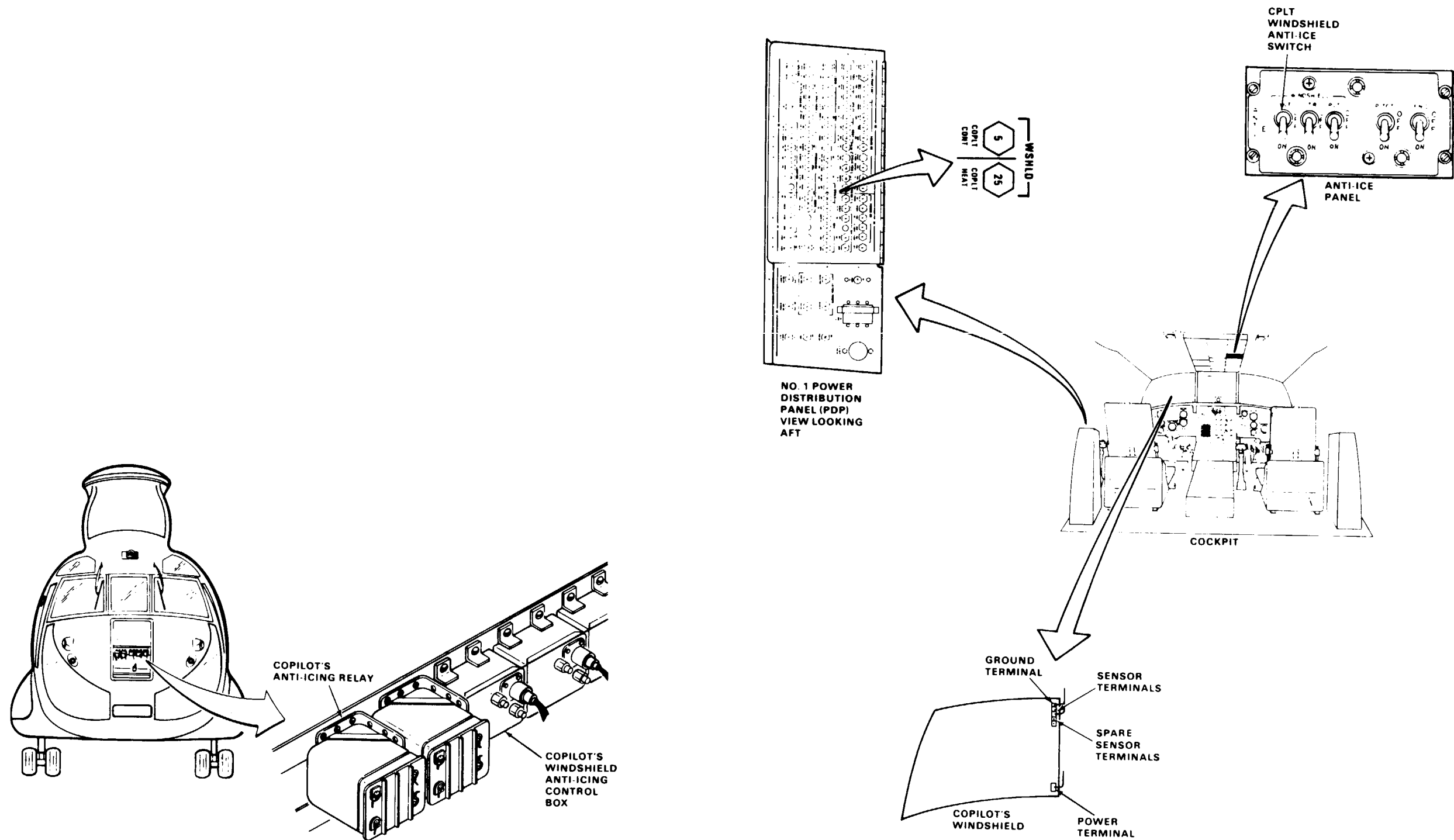


GO TO NEXT PAGE



12-1.6 COPILOT'S WINDSHIELD DOES NOT GET WARM (Continued)

12-1.6



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D145-111827-SPA

END OF TASK

12-1.7 COPILOT'S WINDSHIELD CONTINUES TO HEAT WHEN CPLT WINDSHIELD ANTI-ICE SWITCH IS AT OFF

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

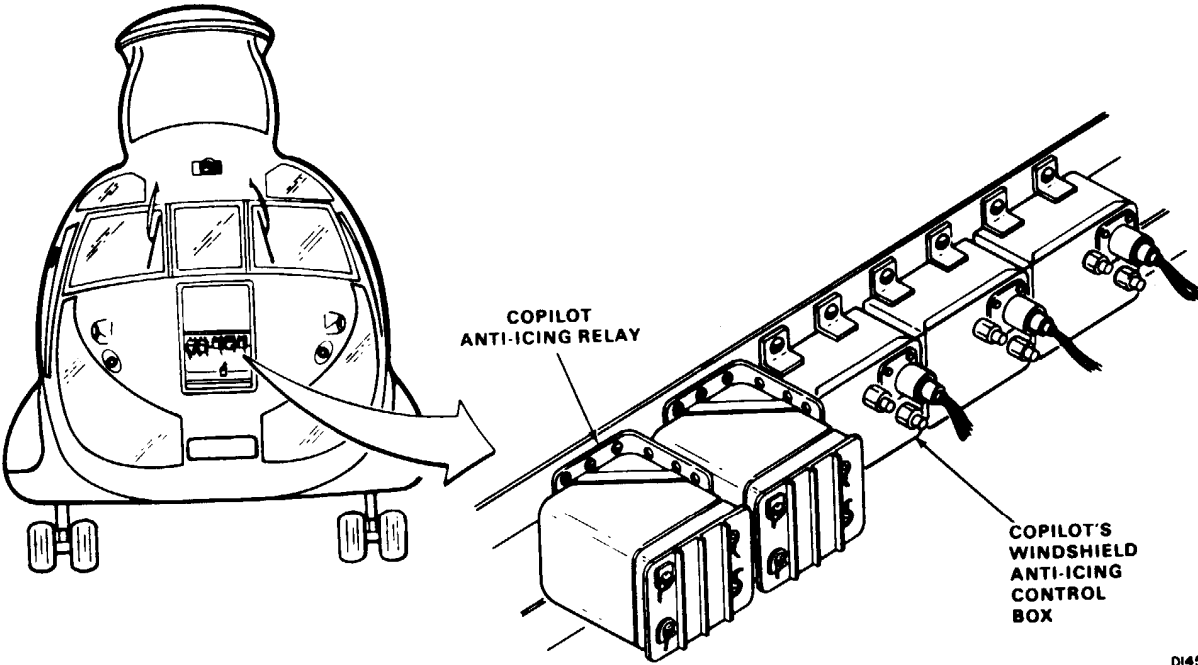
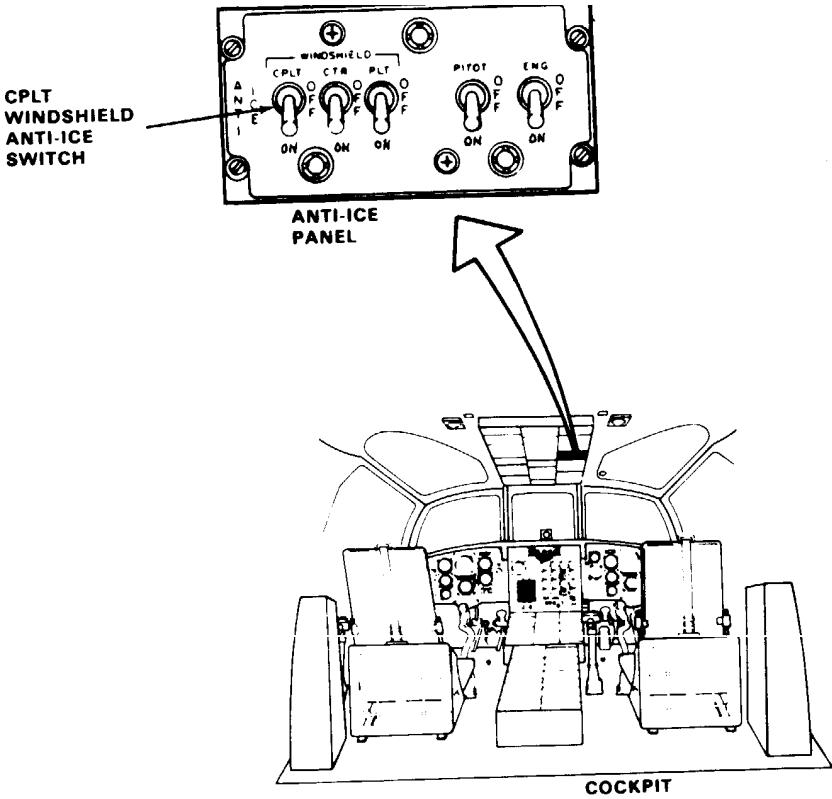
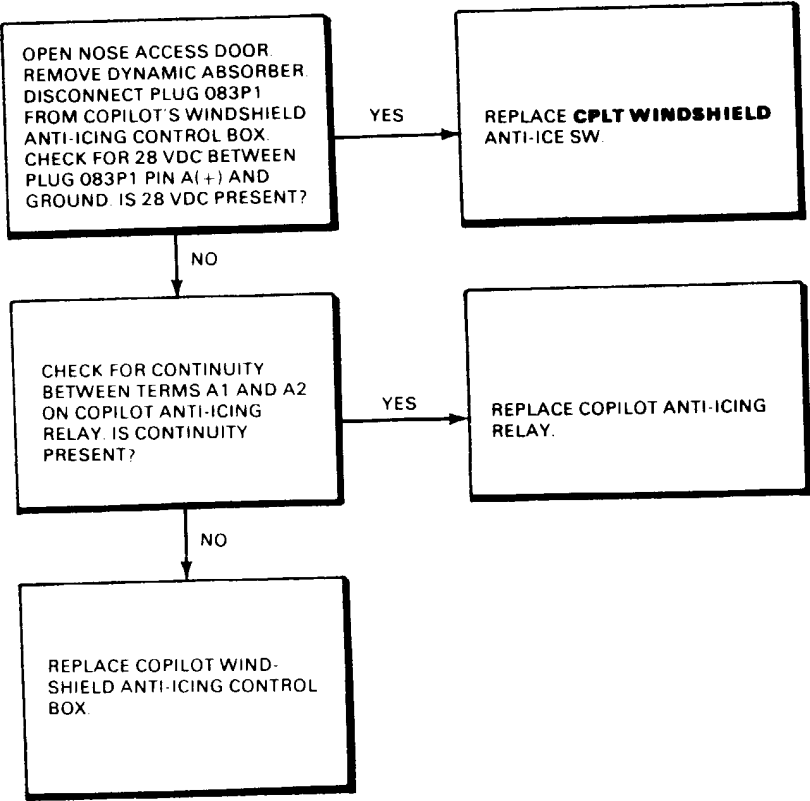
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



12-1.8 CTR WSHLD ANTI-ICE CONT CIRCUIT BREAKER WILL NOT STAY CLOSED

12-1.8

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

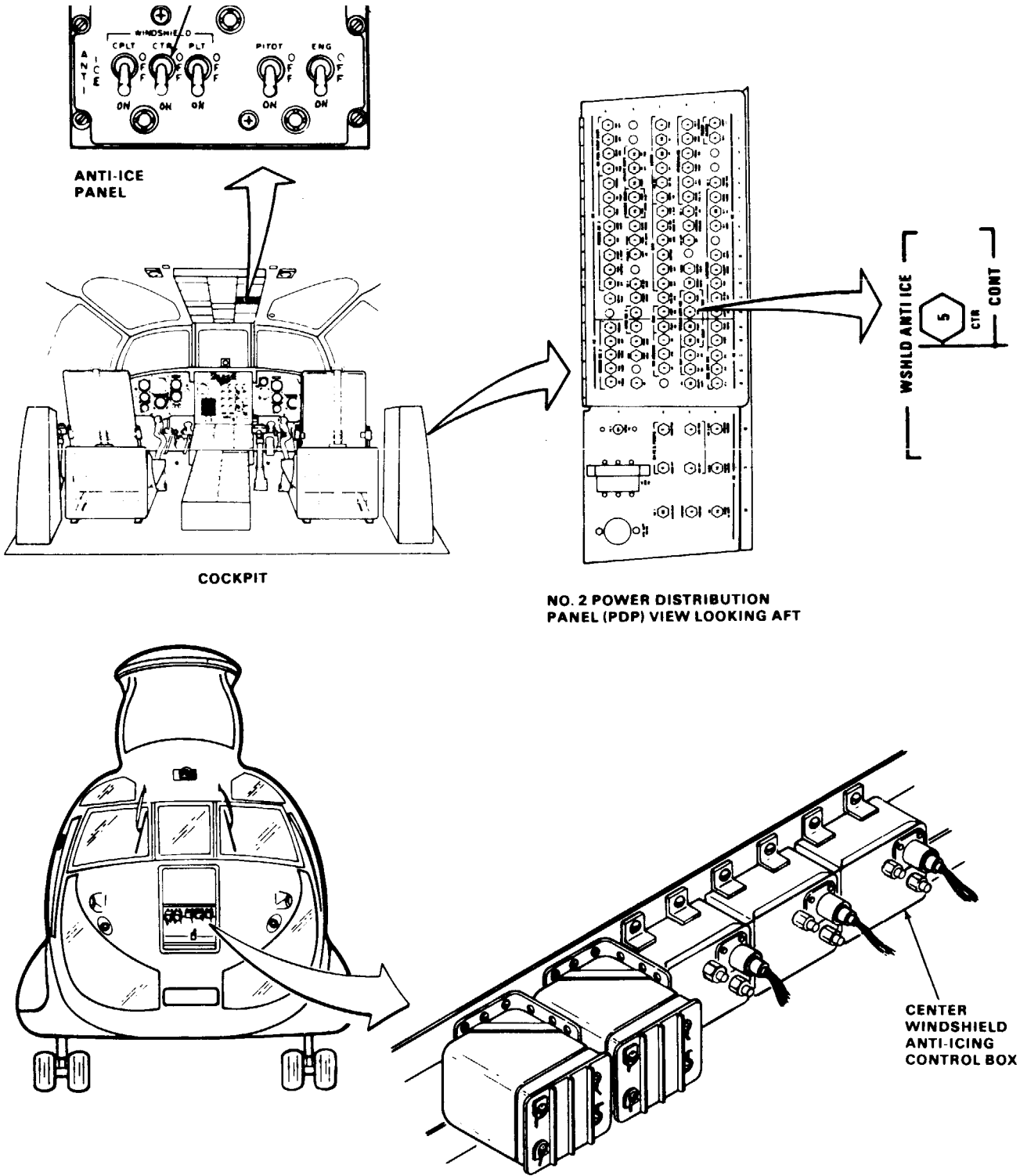
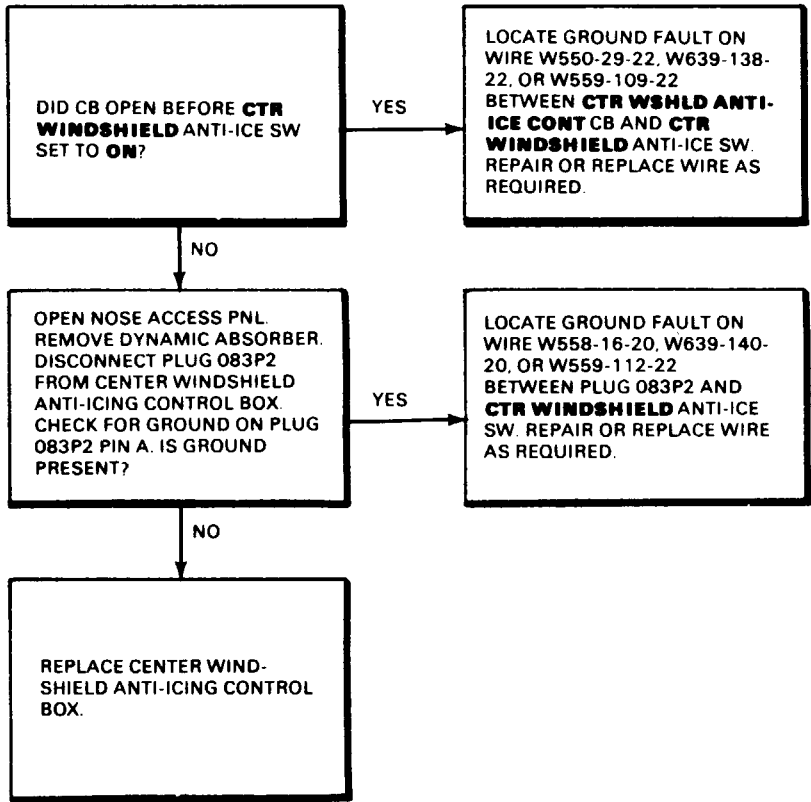
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off





12-1.9 CTR WSHLD ANTI ICE HEAT CIRCUIT BREAKER WILL NOT STAY CLOSED

12-1.9

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

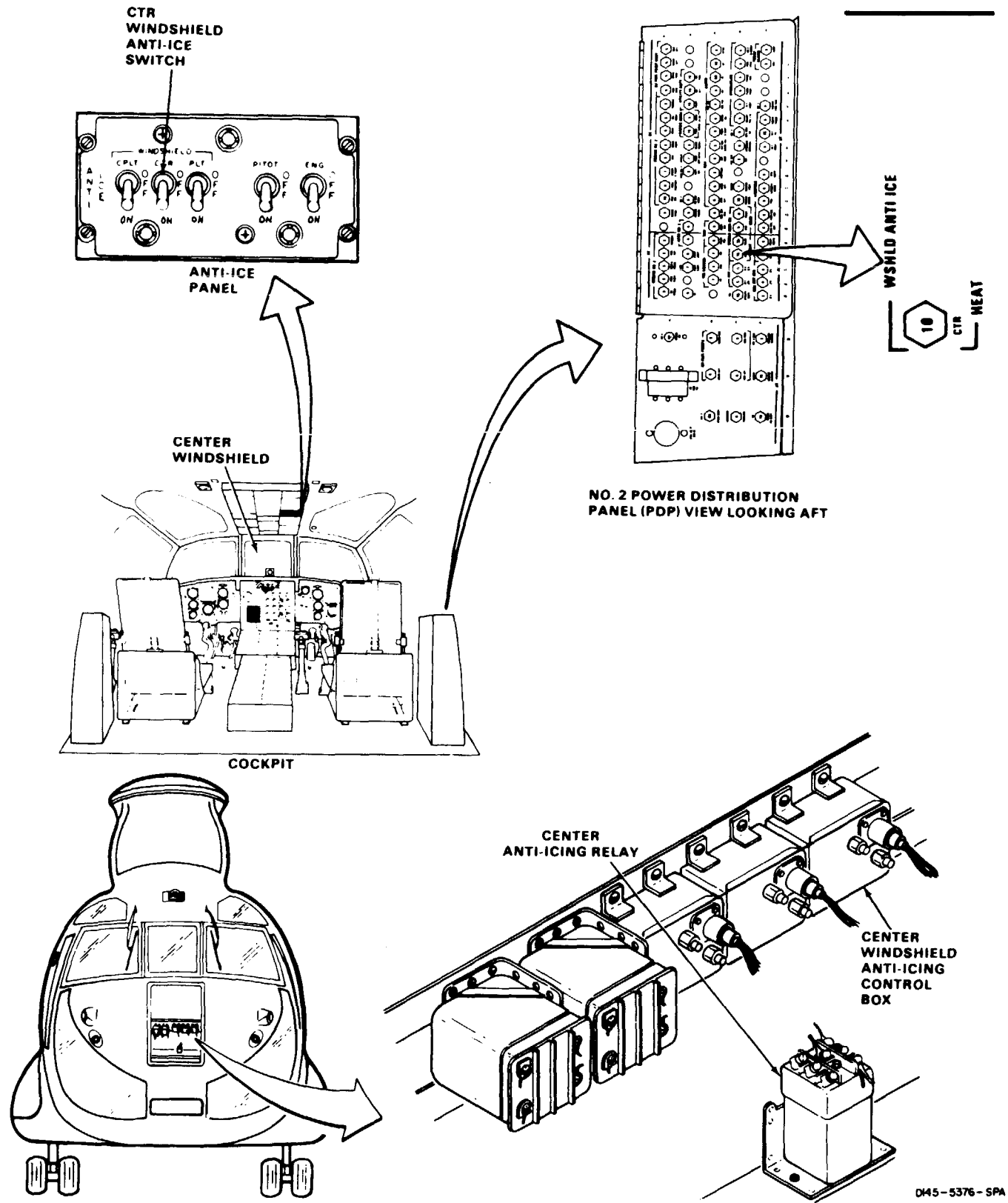
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



END OF TASK

12-1.10 CENTER WINDSHIELD DOES NOT GET WARM

12-1.10

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

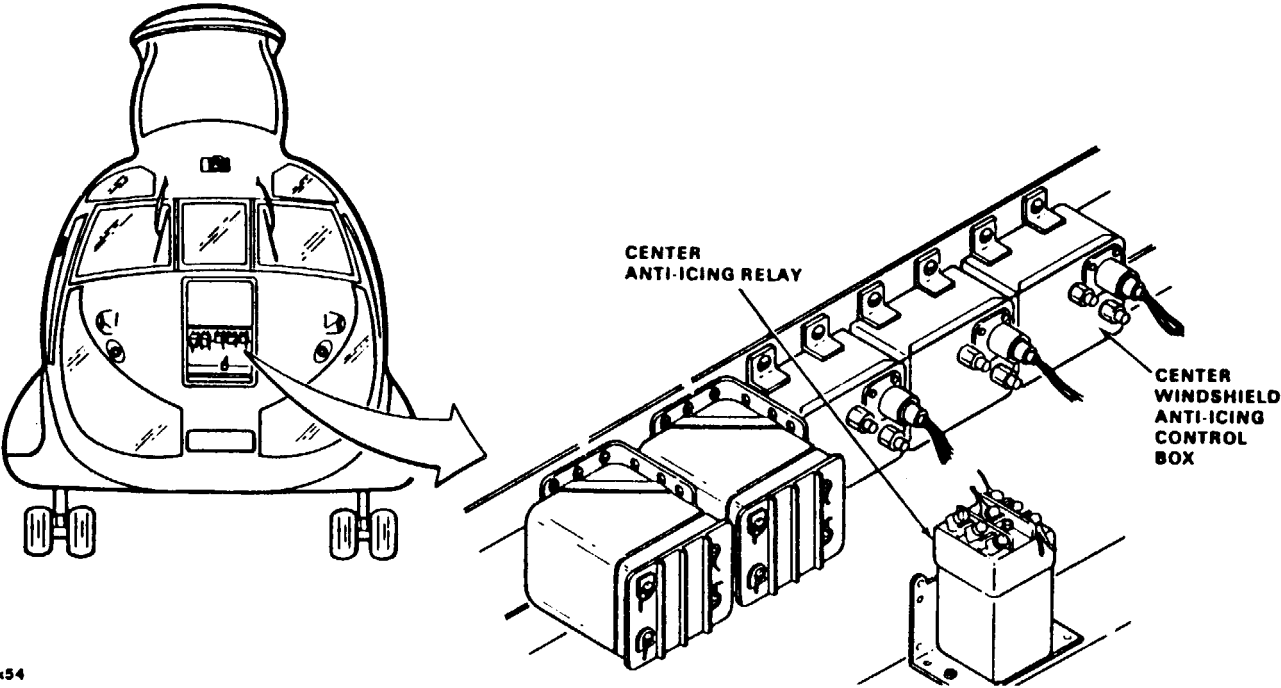
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

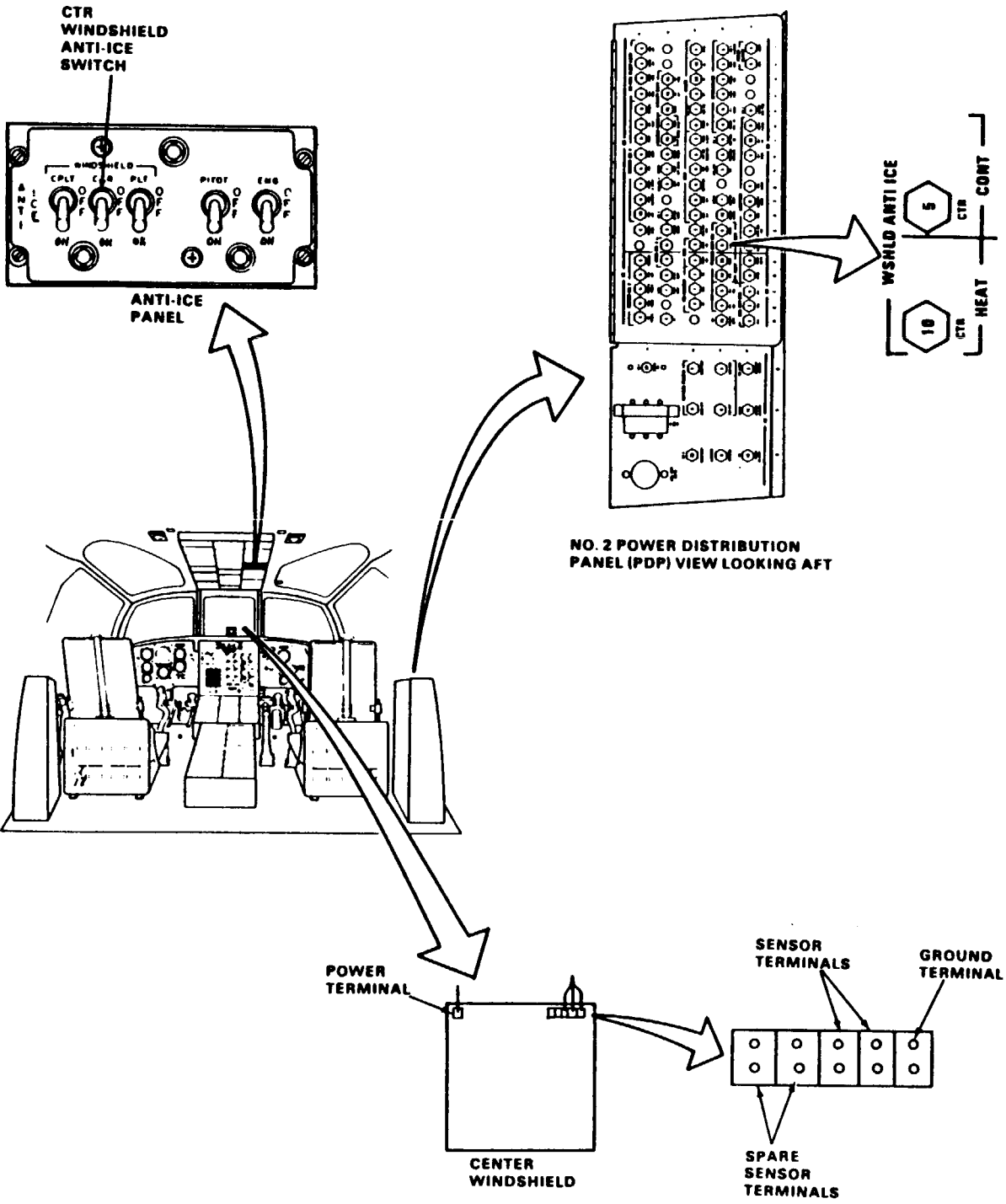
Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



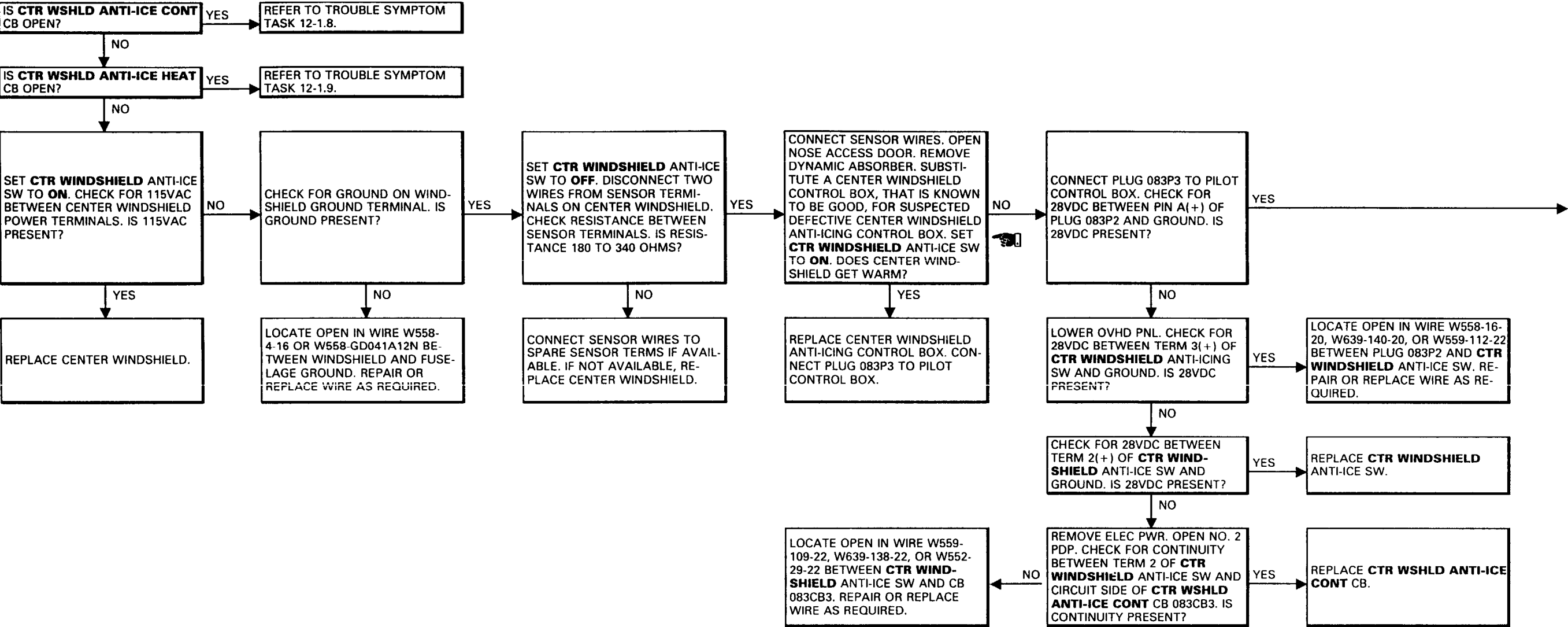
90-54

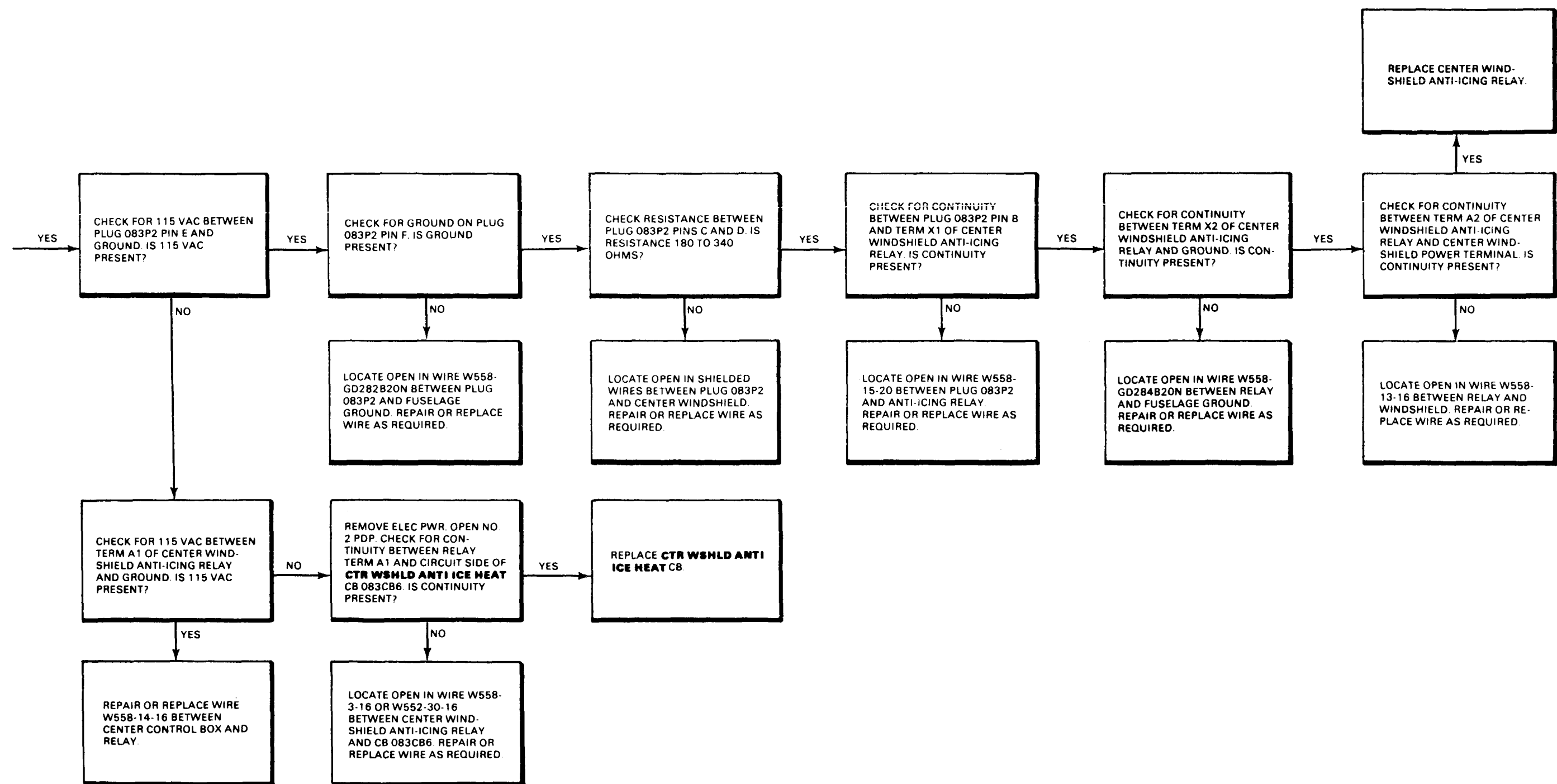


Page 12-15 is a blank page.

DM5-5377-SPA

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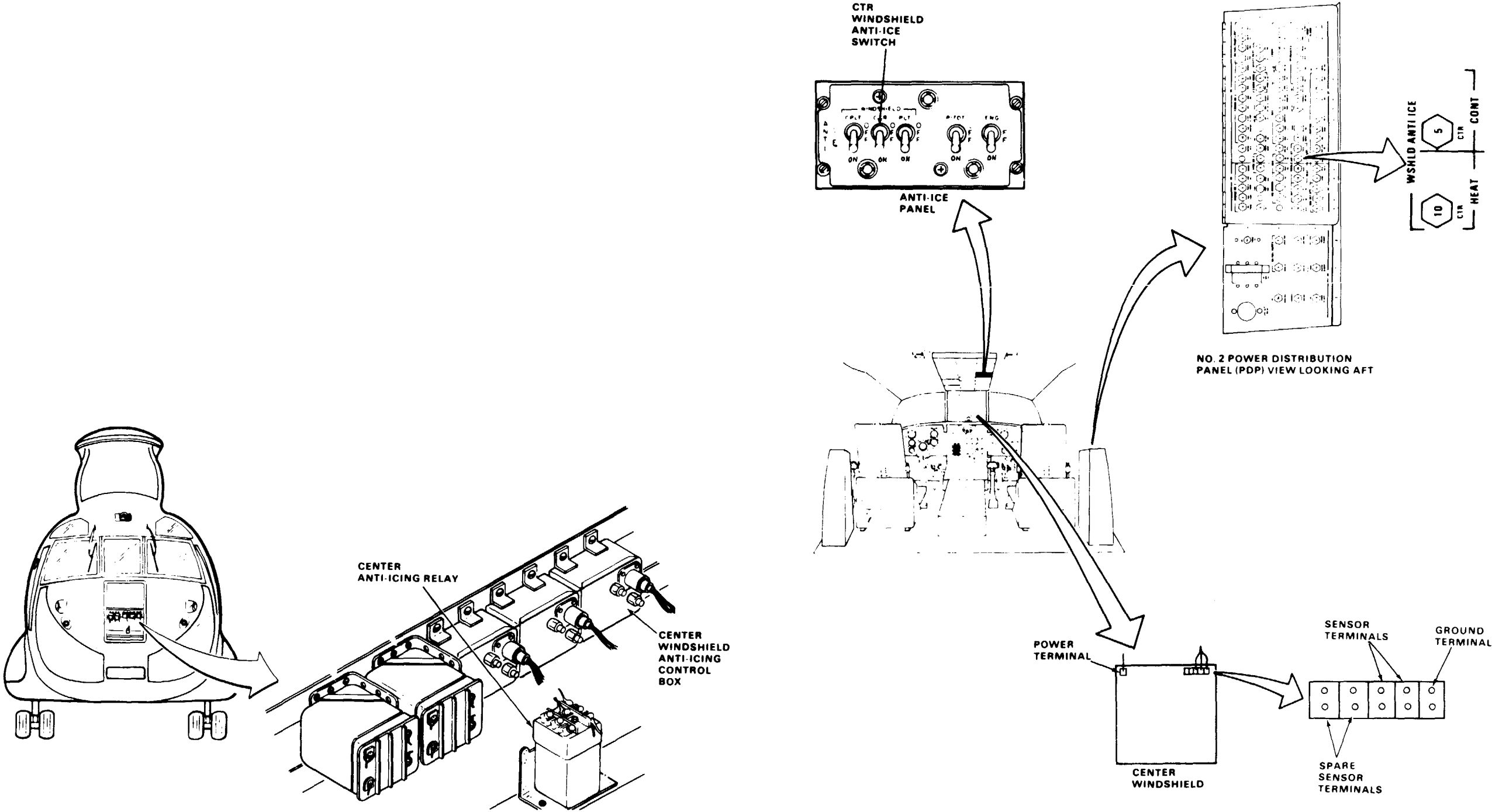




GO TO NEXT PAGE

12-1.10 CENTER WINDSHIELD DOES NOT GET WARM (Continued)

12-1.10



90 x 54

DI45-11826-SPA

END OF TASK

12-1.11 CENTER WINDSHIELD CONTINUES TO HEAT WHEN CTR WINDSHIELD SWITCH IS AT OFF

12-1.11

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

68F20 Aircraft Electrician

References:

TM 55-1520-240-23

Equipment Condition:

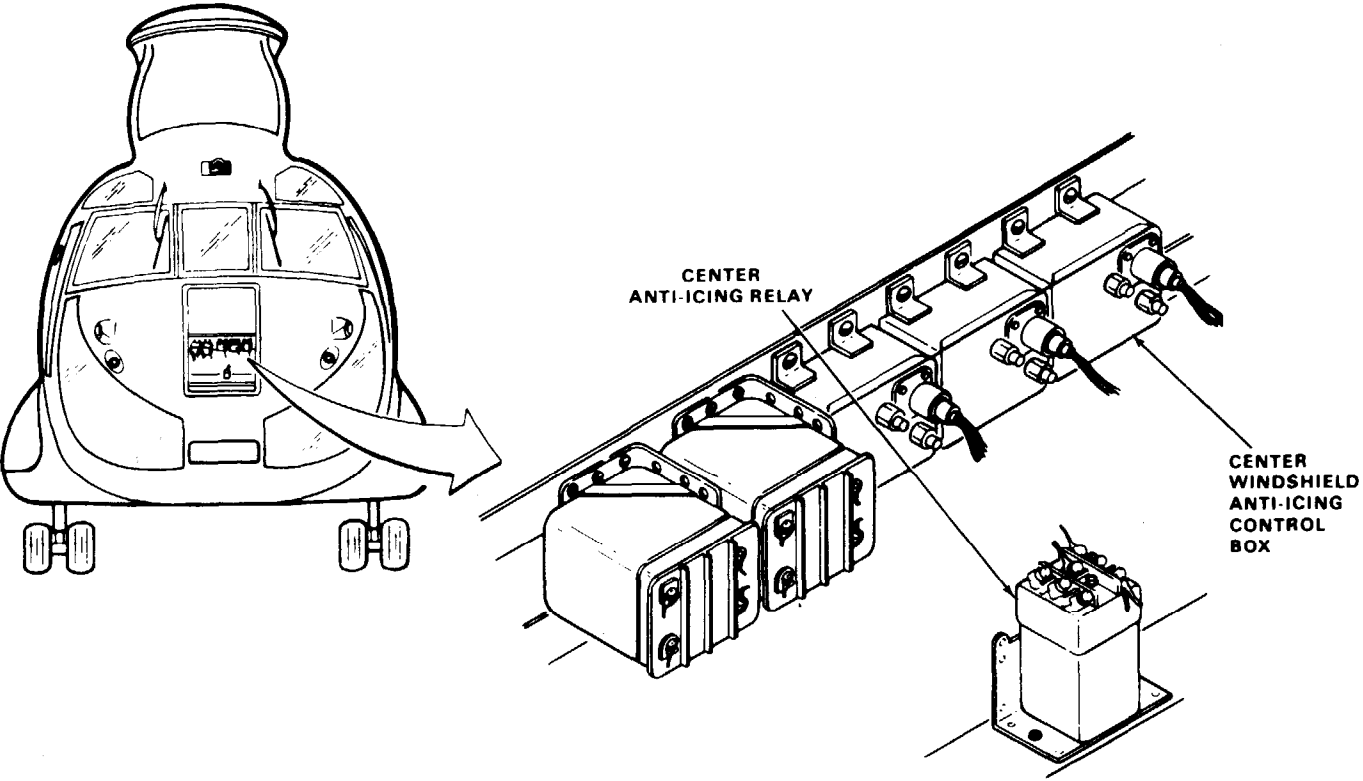
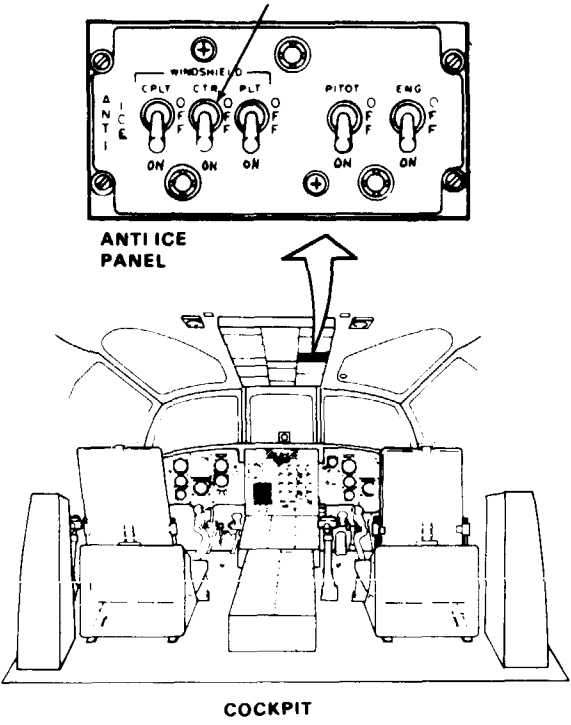
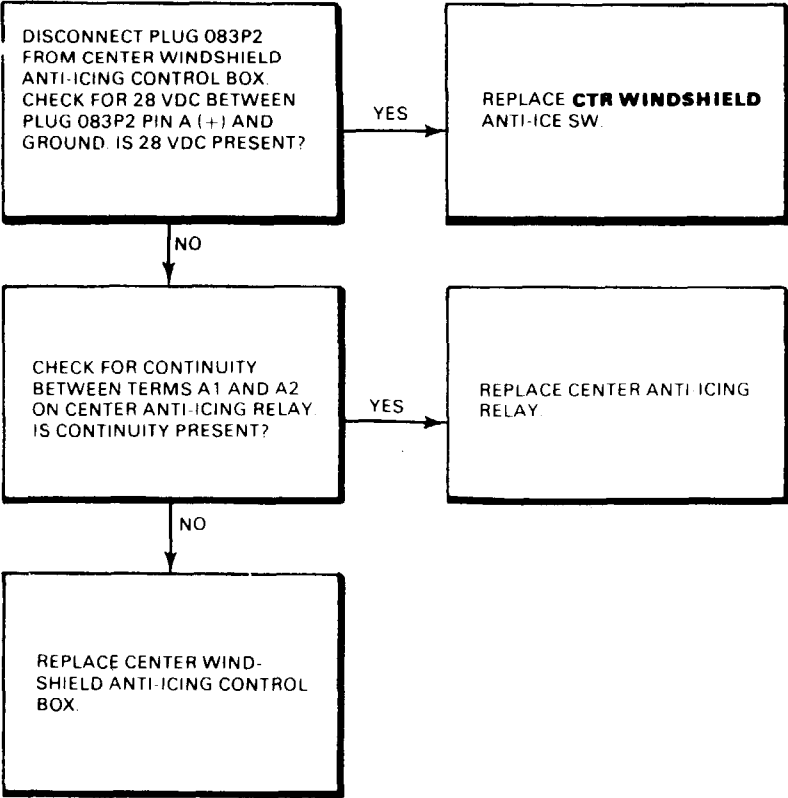
TM 55-1520-240-23:

Battery Connected

Electrical Power On

Hydraulic Power Off

Nose Dynamic Absorber Removed



12-1.12 PILOT WSHLD ANTI ICE CONT CIRCUIT BREAKER WILL NOT STAY CLOSED

12-1.12

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

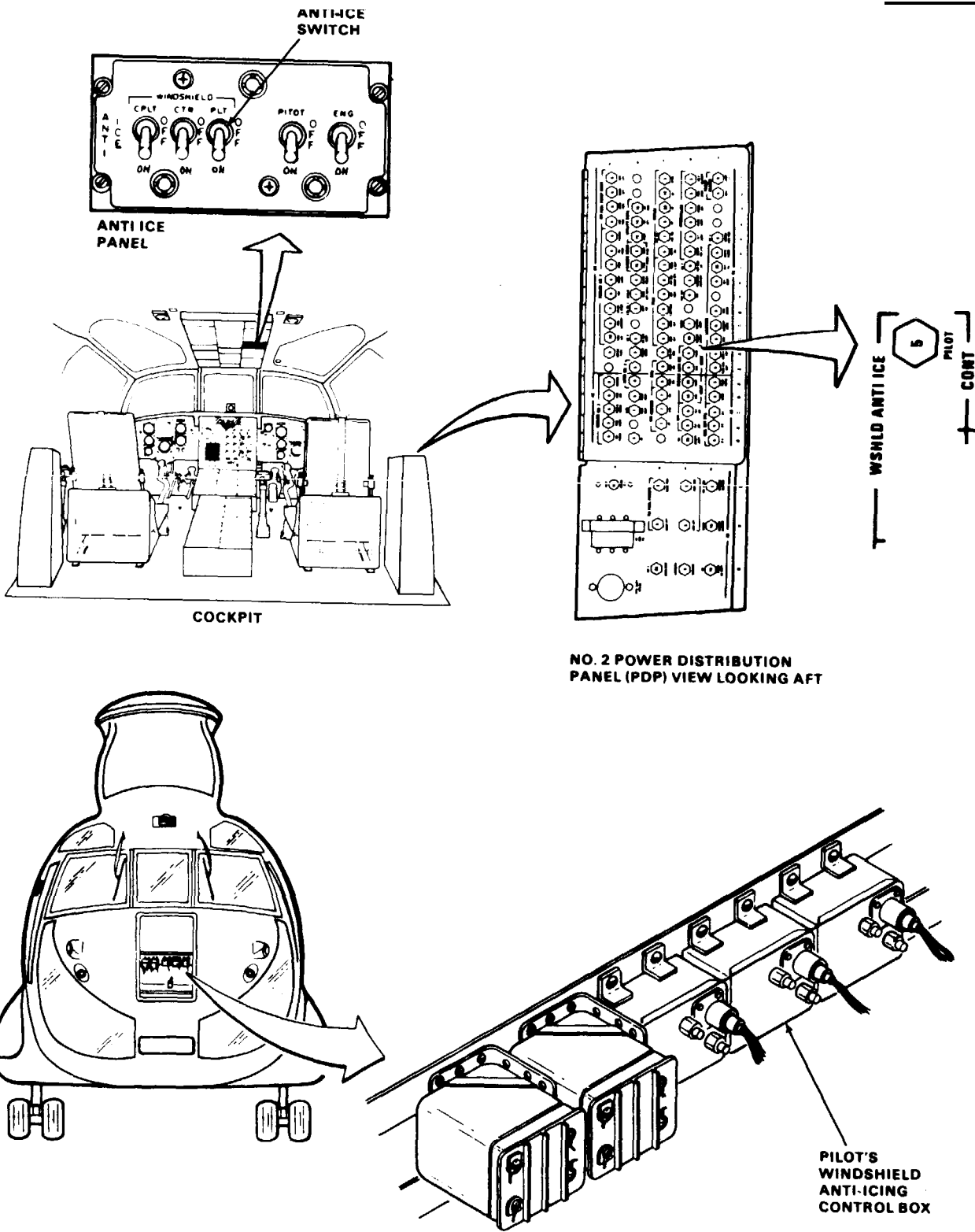
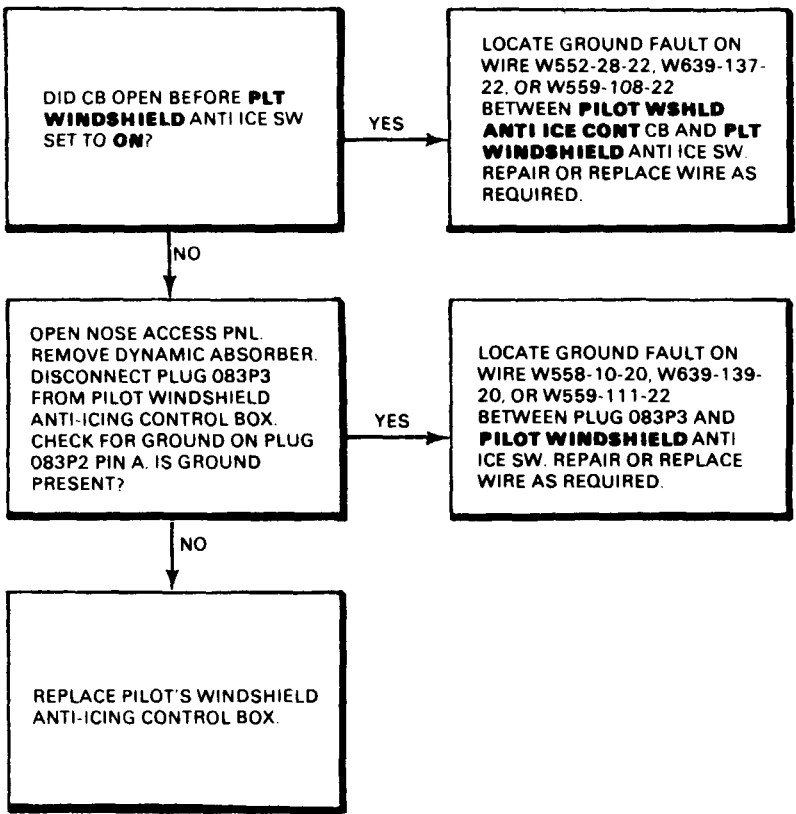
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23;  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



12-1.13 PILOT WSHLD ANTI ICE HEAT CIRCUIT BREAKER  
WILL NOT STAY CLOSED

12-1.13

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

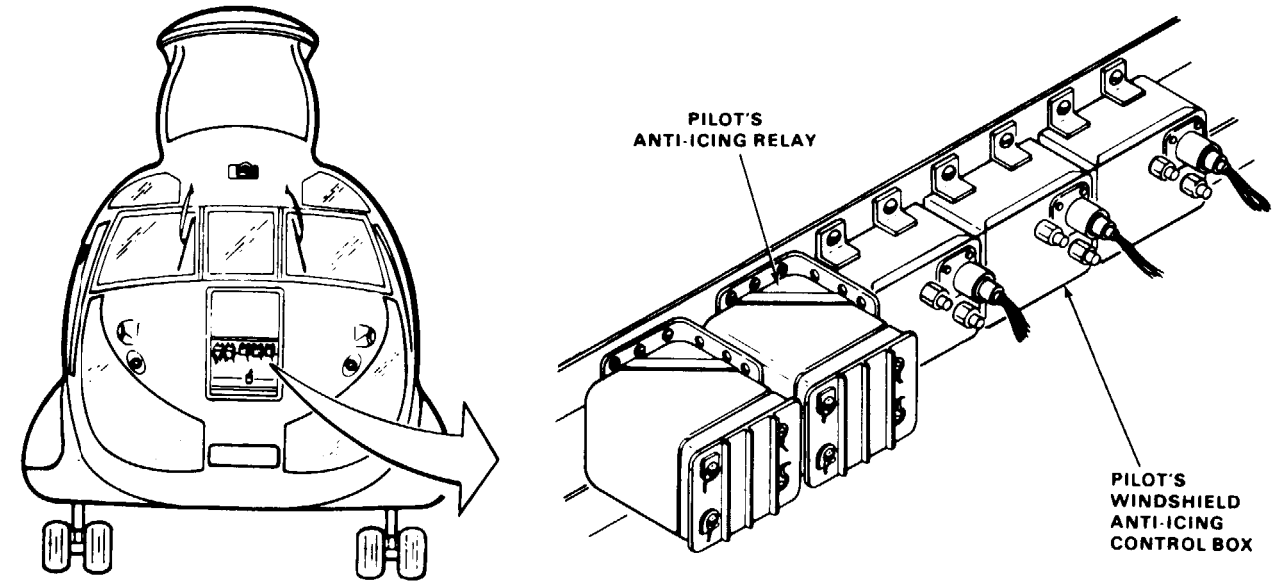
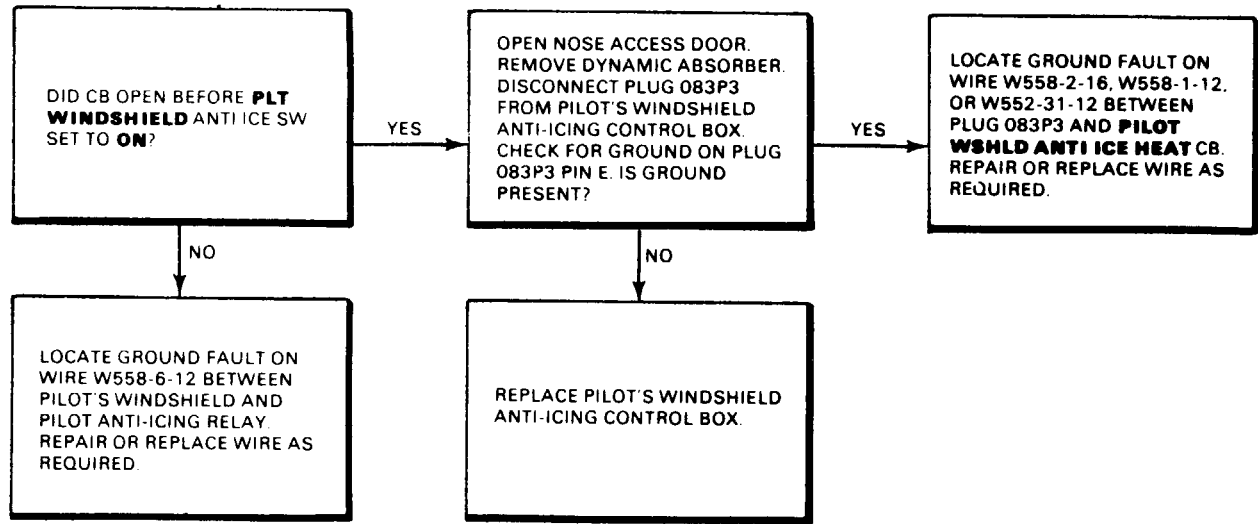
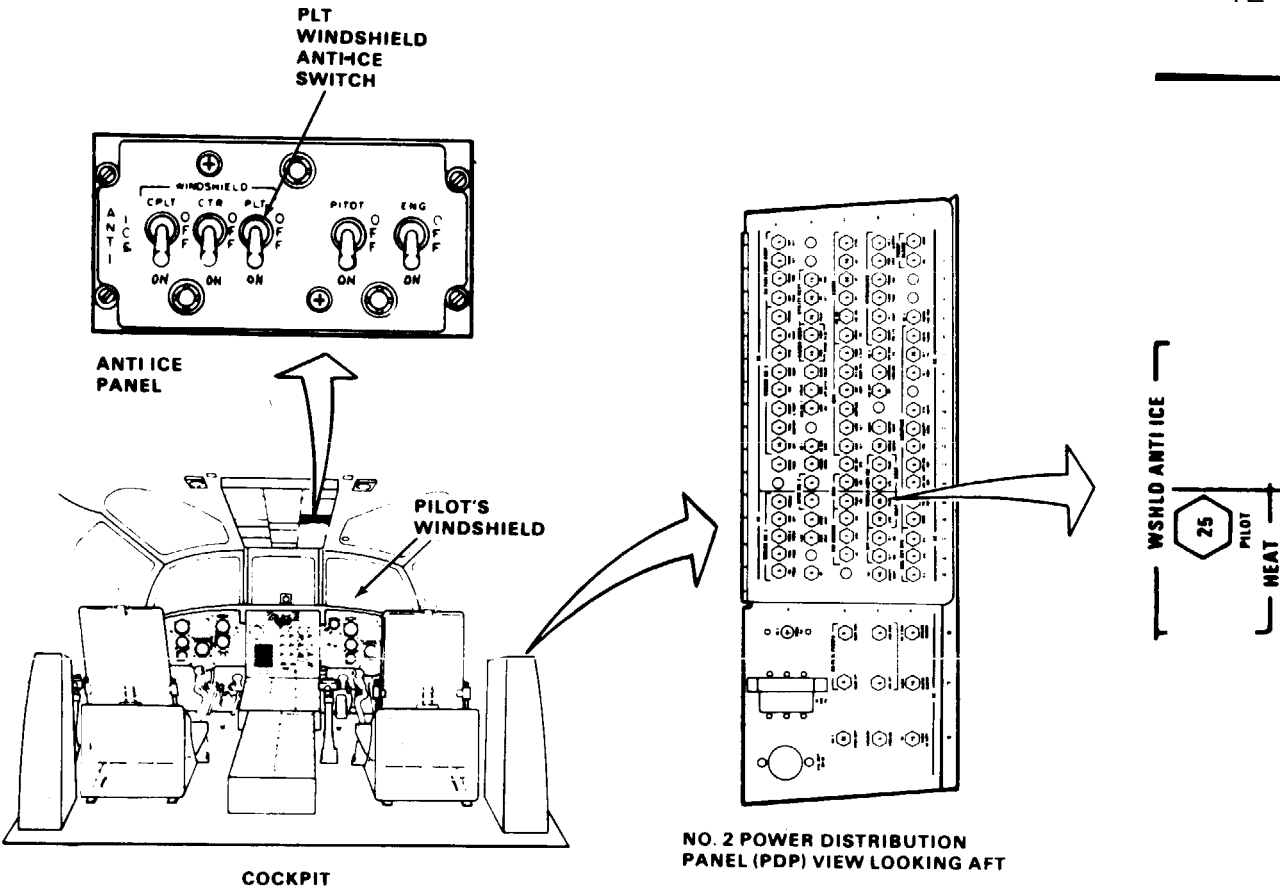
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
Note

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off





12-1.14 PILOT'S WINDSHIELD DOES NOT GET WARM

12-1.14

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

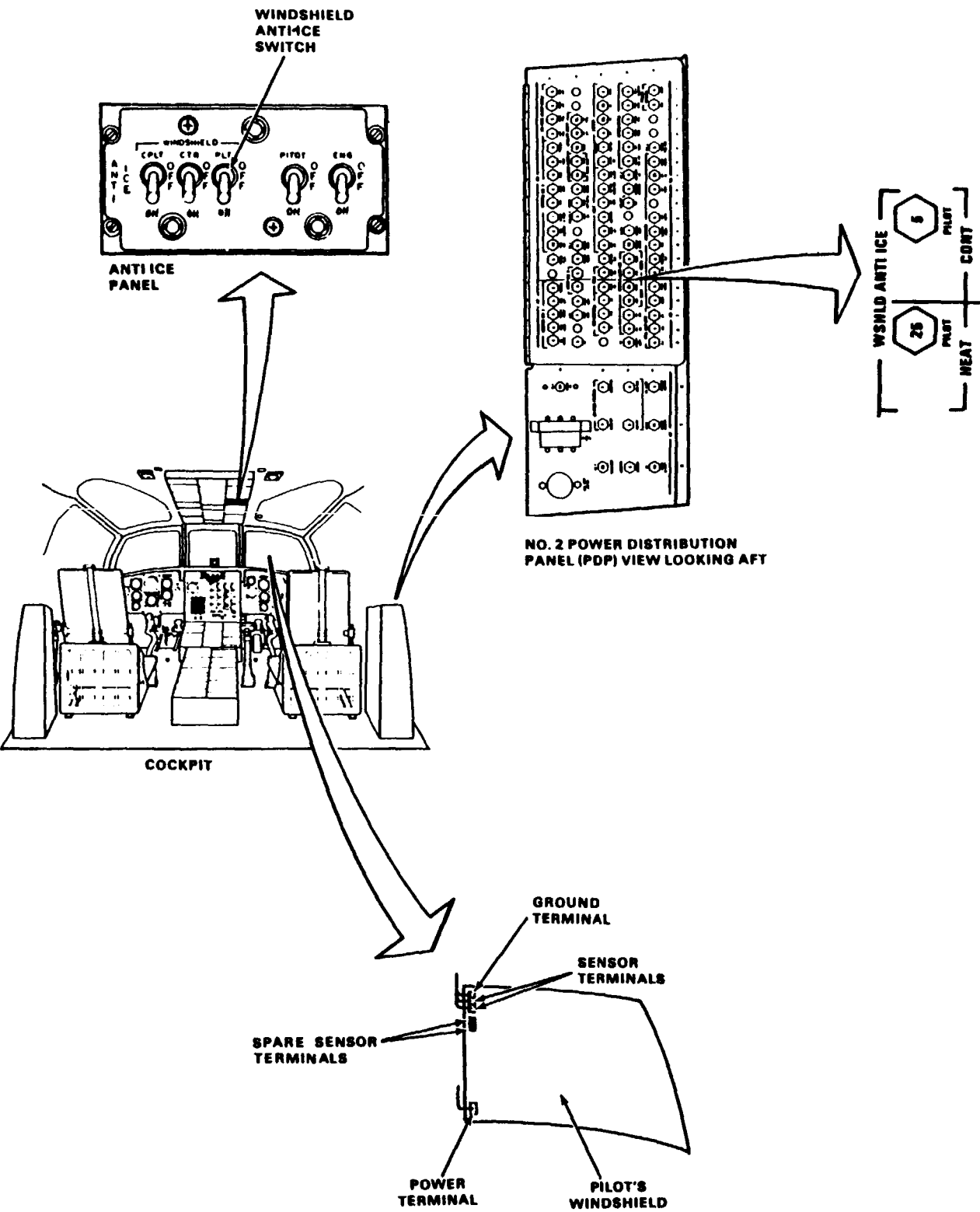
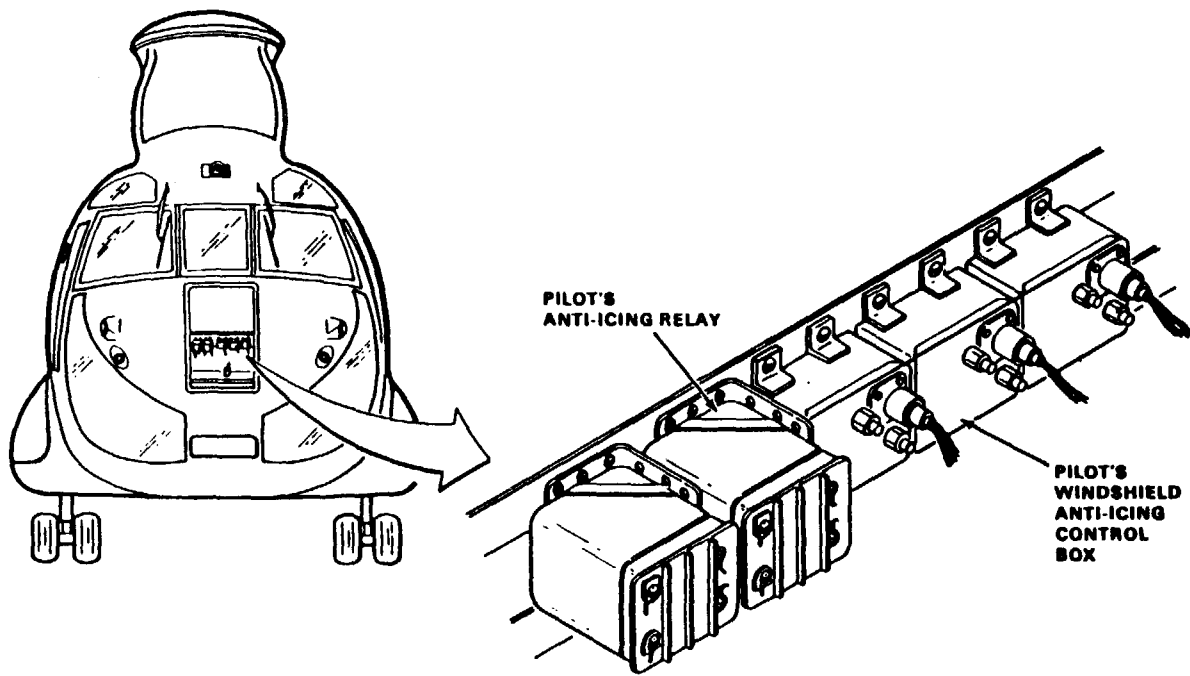
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

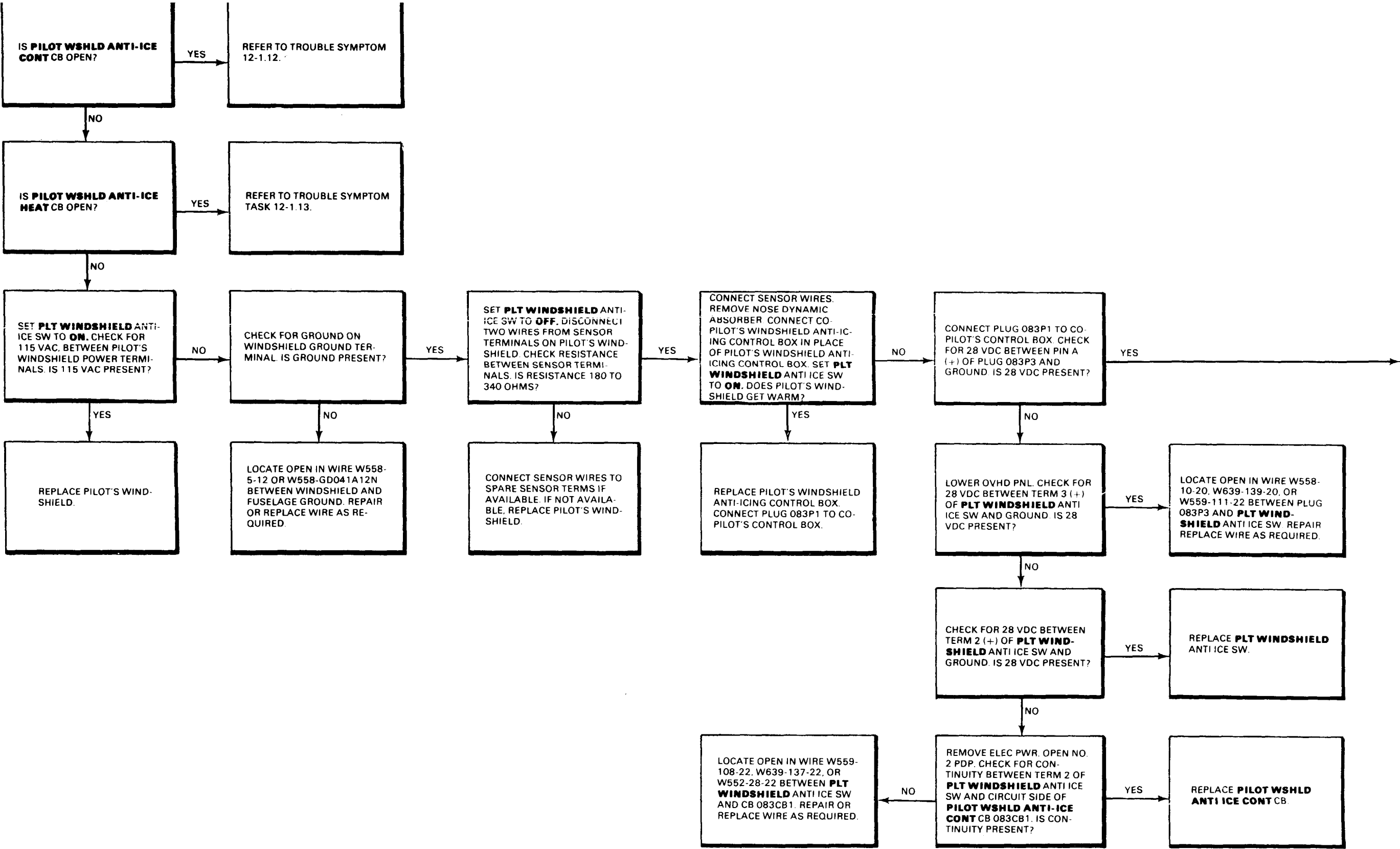
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

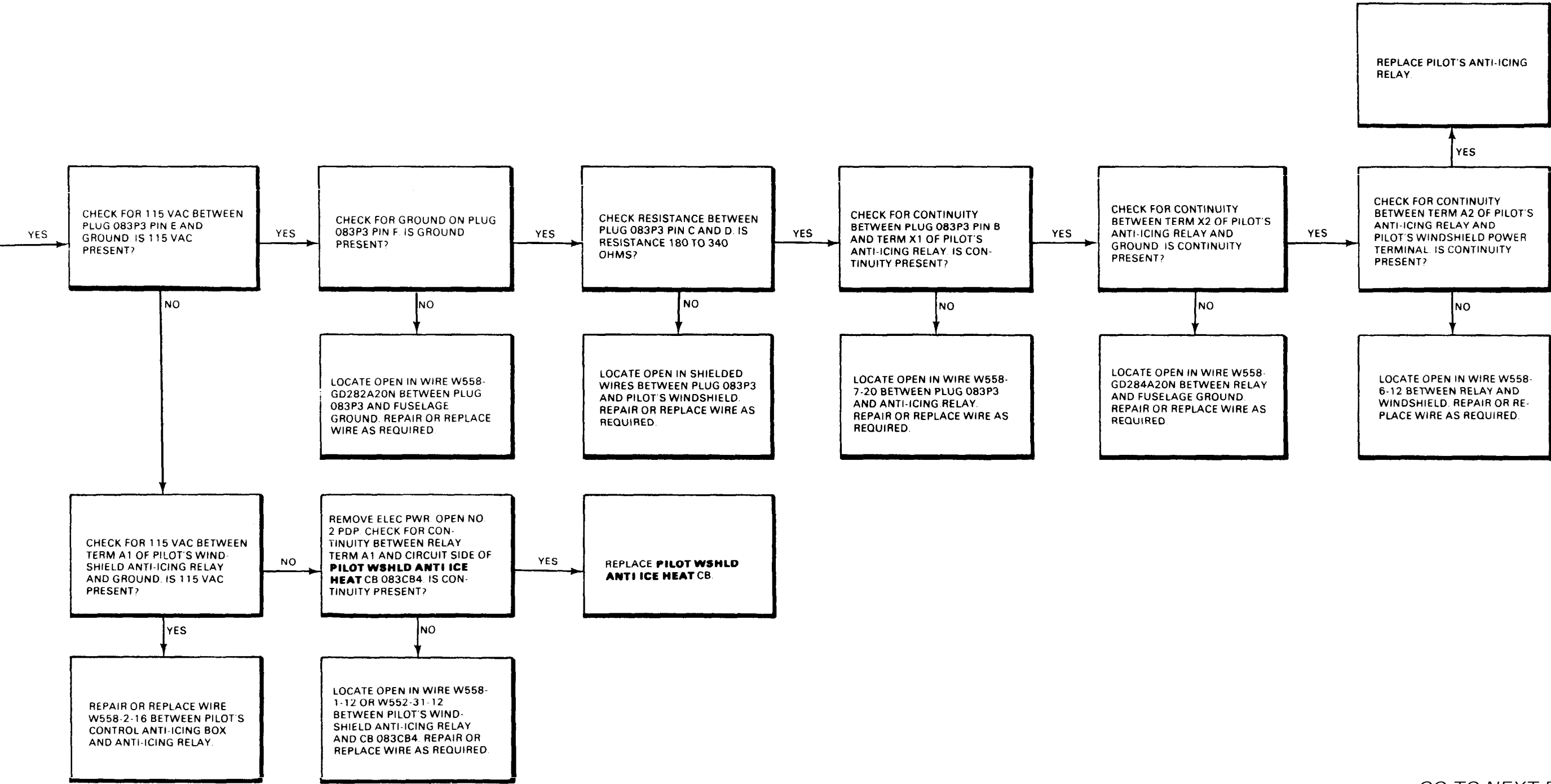


12-1.14 PILOT'S WINDSHIELD DOES NOT GET WARM (Continued)

12-1.14



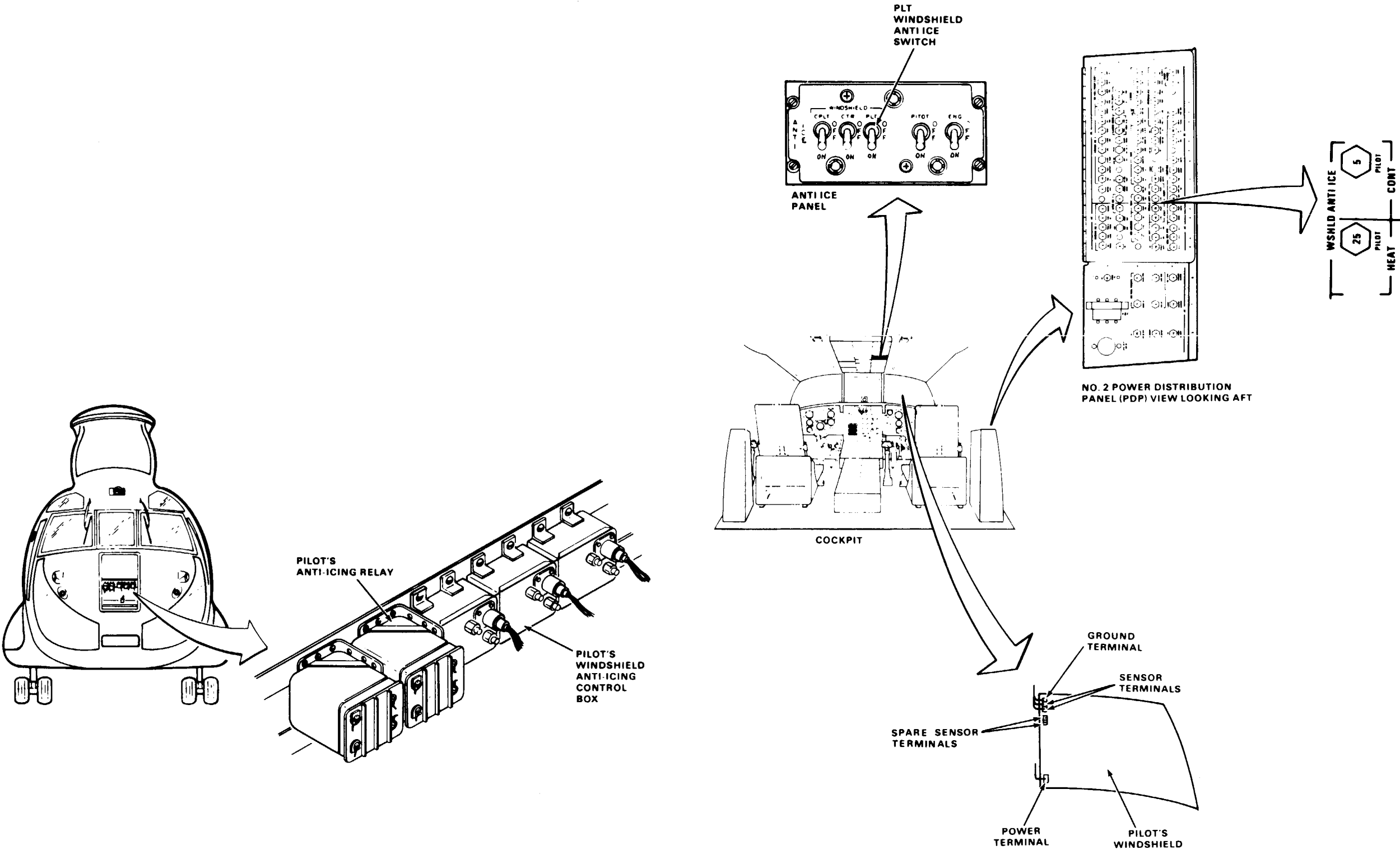
GO TO NEXT PAGE



GO TO NEXT PAGE

12-1.14 PILOT'S WINDSHIELD DOES NOT GET WARM (Continued)

12-1.14



END OF TASK

12-1.15 PILOT'S WINDSHIELD CONTINUES TO HEAT WHEN PLT WINDSHIELD SWITCH IS AT OFF

12-1.15

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

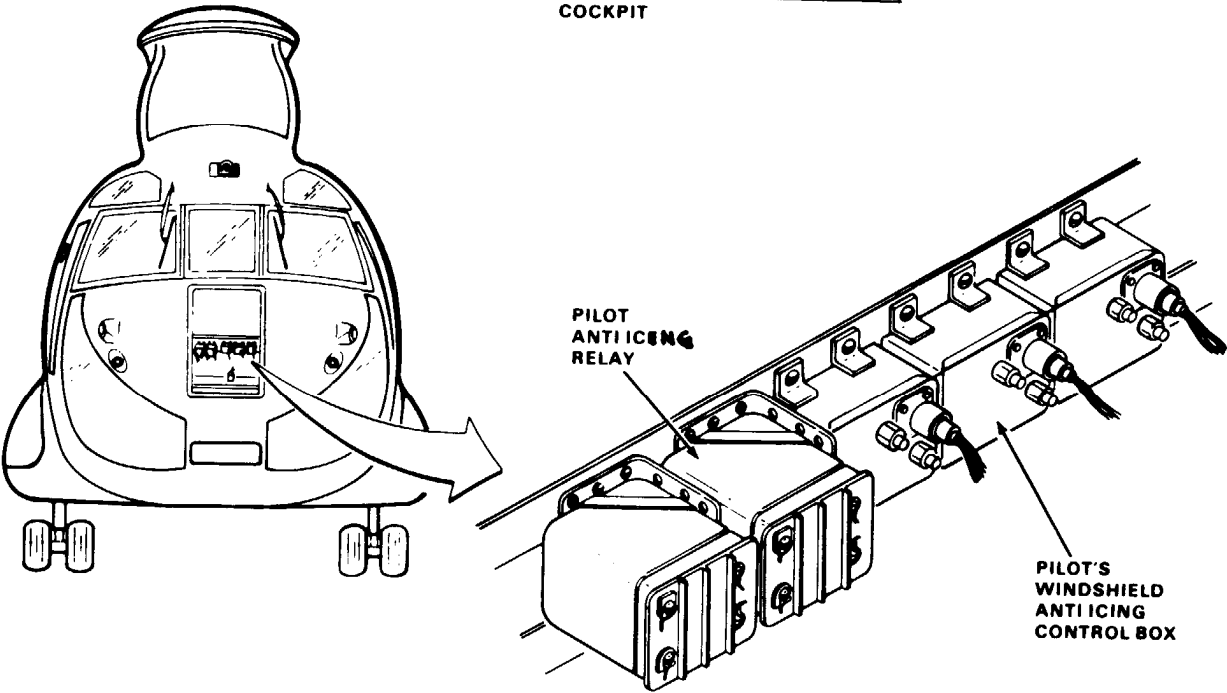
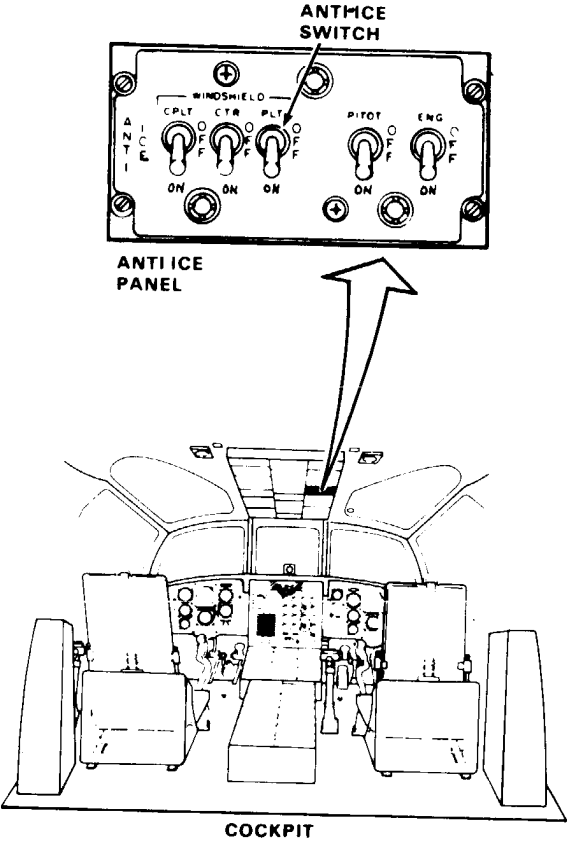
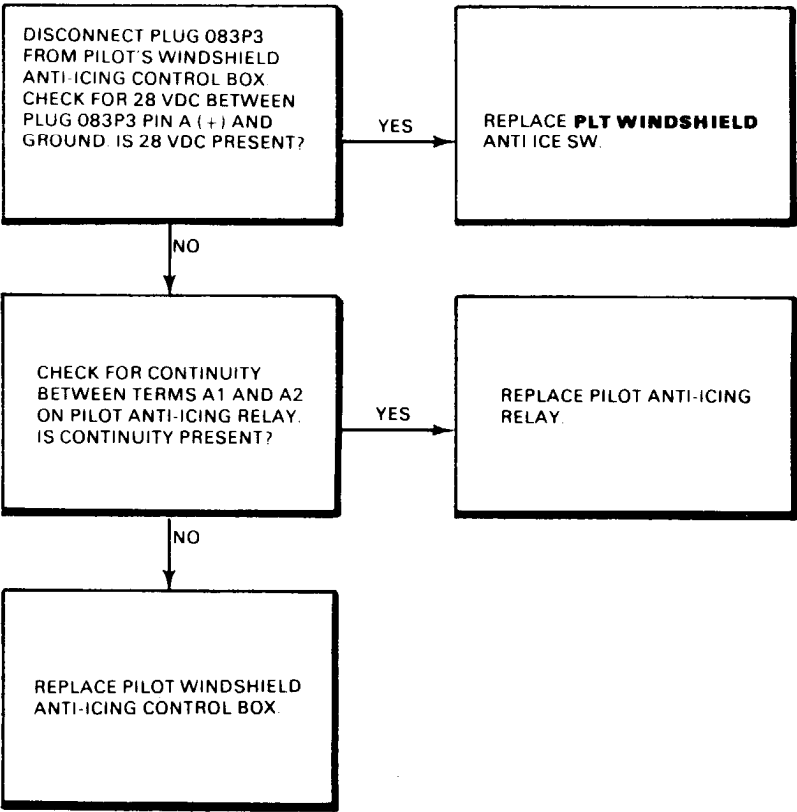
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Nose Dynamic Absorber Removed



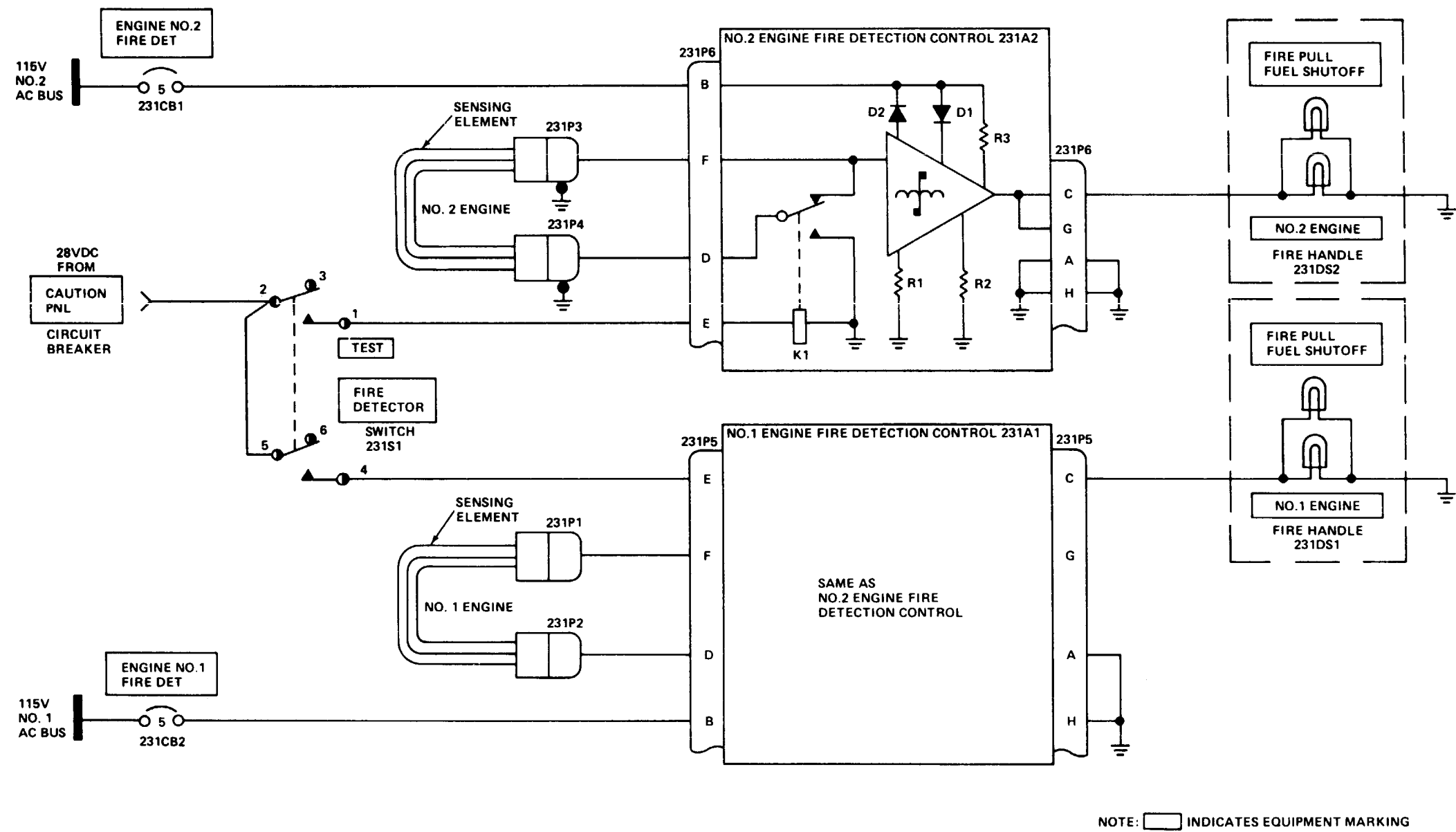
## 12-2 FIRE DETECTION SYSTEM

12-2 FIRE DETECTION SYSTEM

12-2

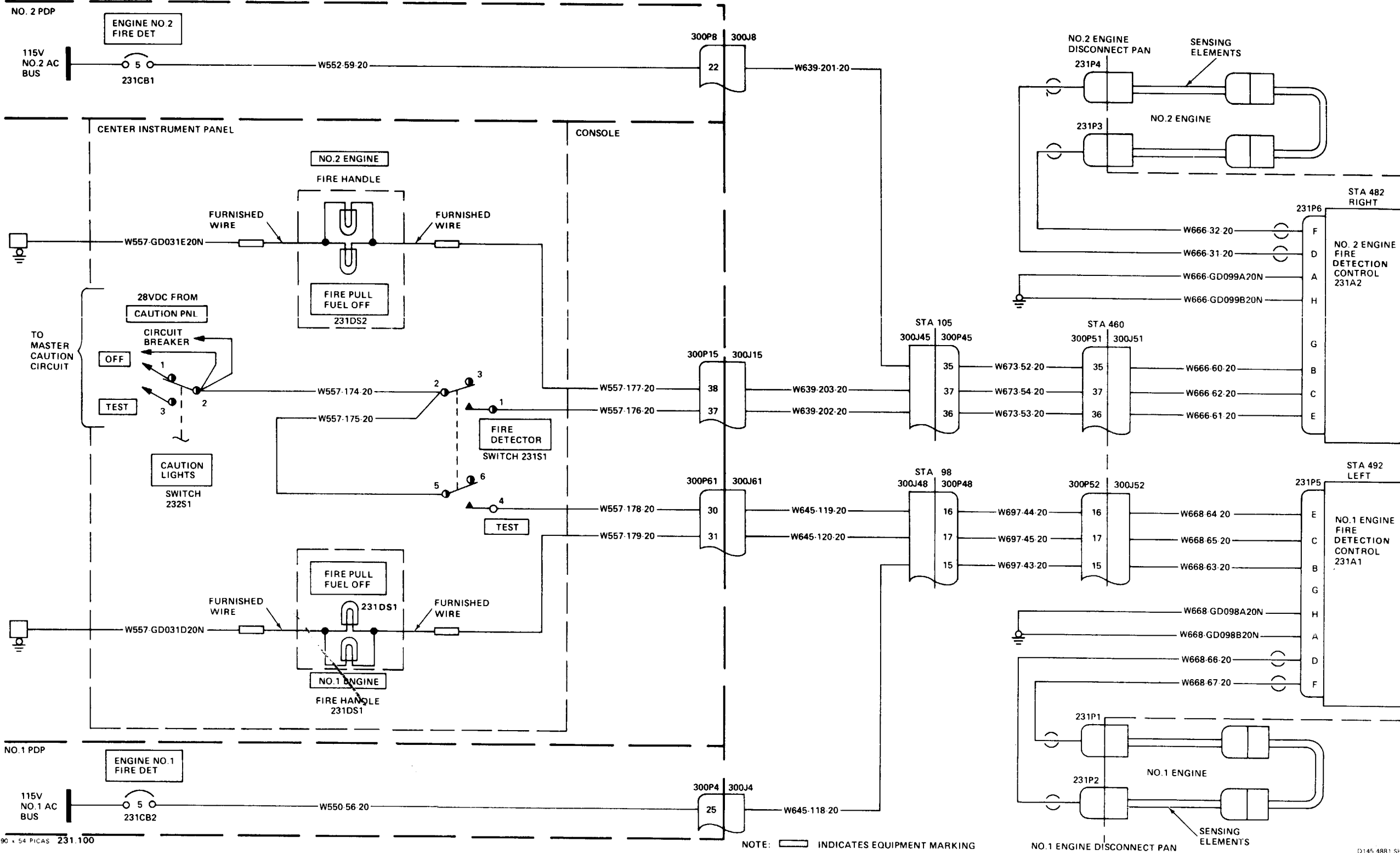
12-2.1 FIRE DETECTION SYSTEM SCHEMATIC

12-2.1



12-2.2 FIRE DETECTION SYSTEM WIRING DIAGRAM

12-2.2





12-2.3 FIRE DETECTION SYSTEM VISUAL CHECK

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23.  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off  
No. 1 and No. 2 Engine  
Access Covers Open

1. Check Fire Detector switch (1).
2. Check No. 1 engine and No. 2 engine fire handles (2).
3. Check No. 1 and No. 2 engine fire detection controls (4).
4. Check sensing elements (5) around No. 1 engine.
5. Check sensing elements (7) around No. 2 engine.

If switch (1) is loose or damaged, tighten or replace it as required.

If either fire handle (2) is loose or damaged, tighten or replace it as required, If any light (3) is loose or damaged, tighten or replace it as required.

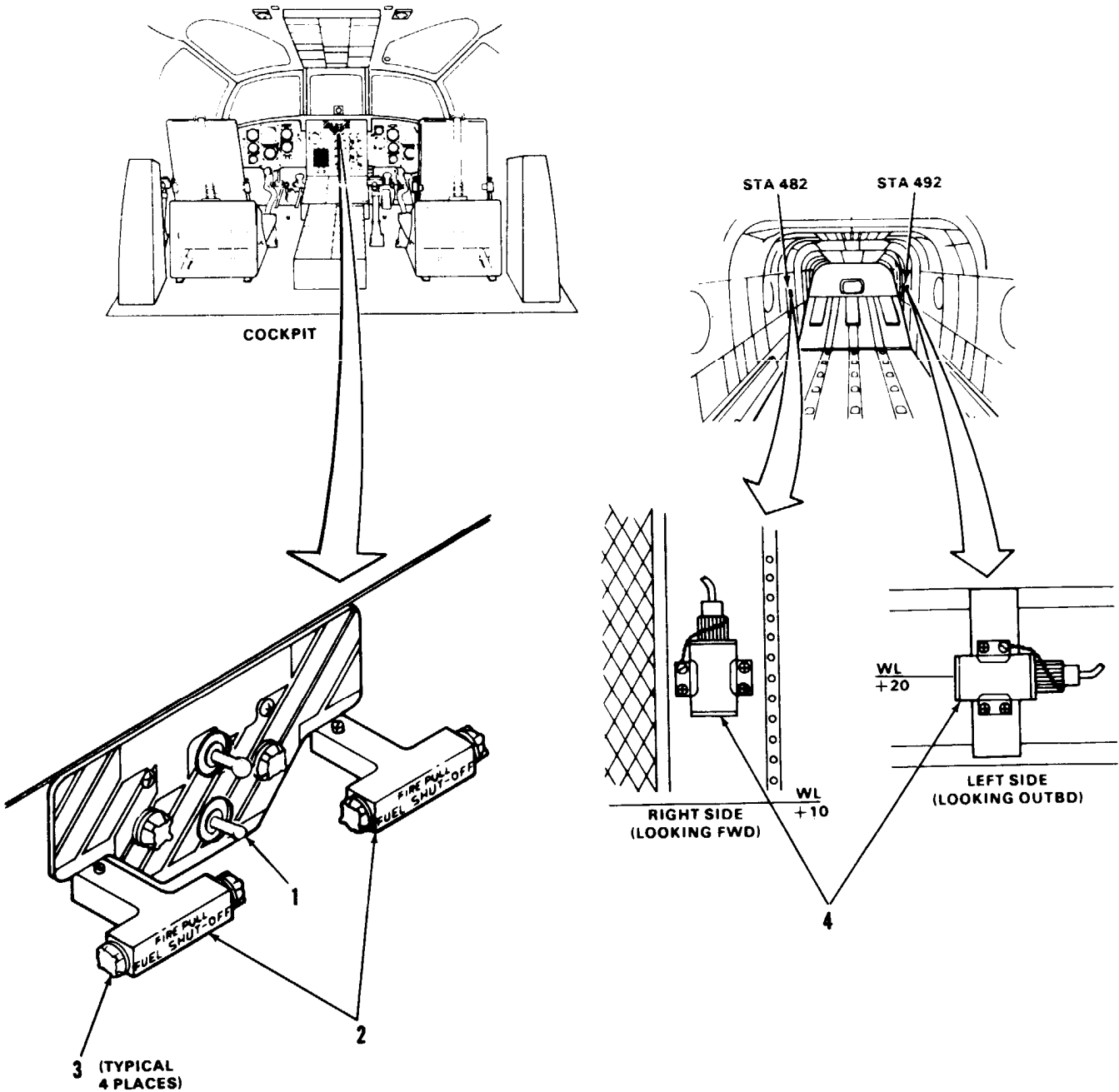
If either control (4) is loose or damaged, tighten or replace it as required. If wiring to either control is damaged, repair or replace it as required.

If any element (5) is damaged or kinked, replace it, If element connector (6) is loose, tighten it,

If any element (7) is damaged or kinked, replace it. If any element connector (6) is loose, tighten it.

FOLLOW-ON MAINTENANCE:

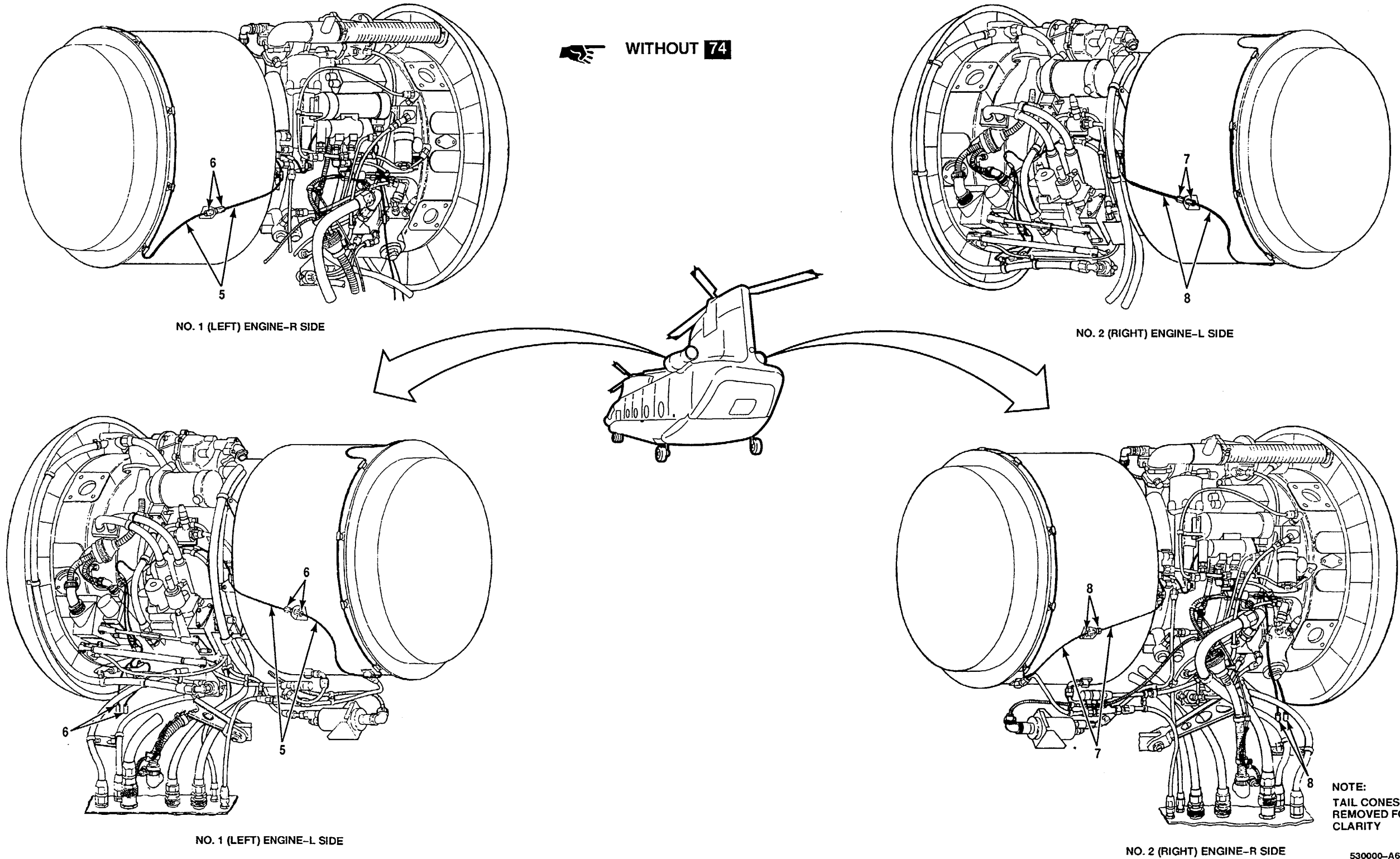
TM 55-1520-240-23:  
Close No. 1 and No. 2 engine access covers.

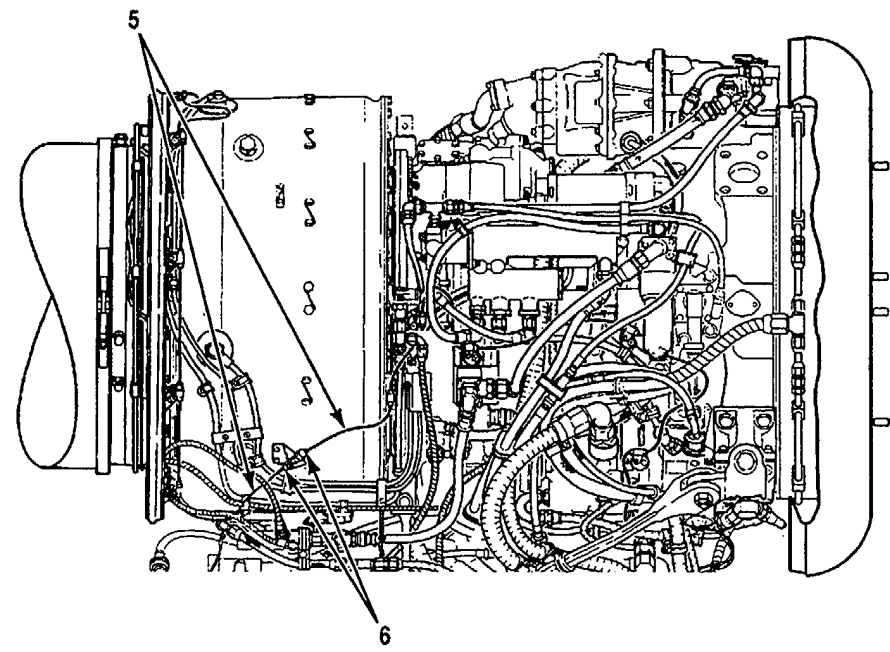


45x54

DI45-5028-SPA

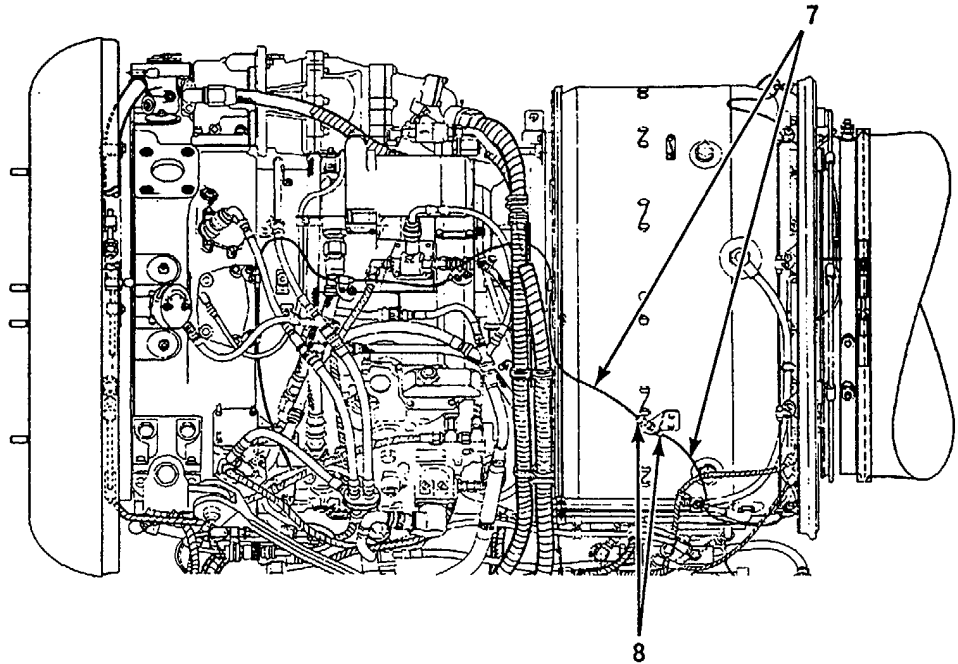
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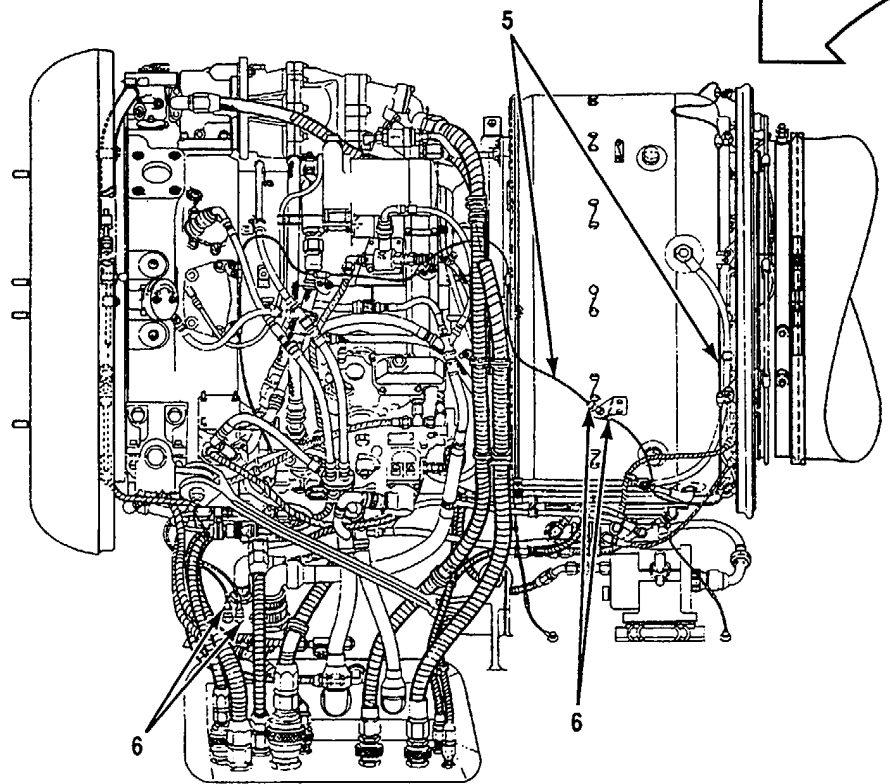


NO. 1 (LEFT) ENGINE - R SIDE

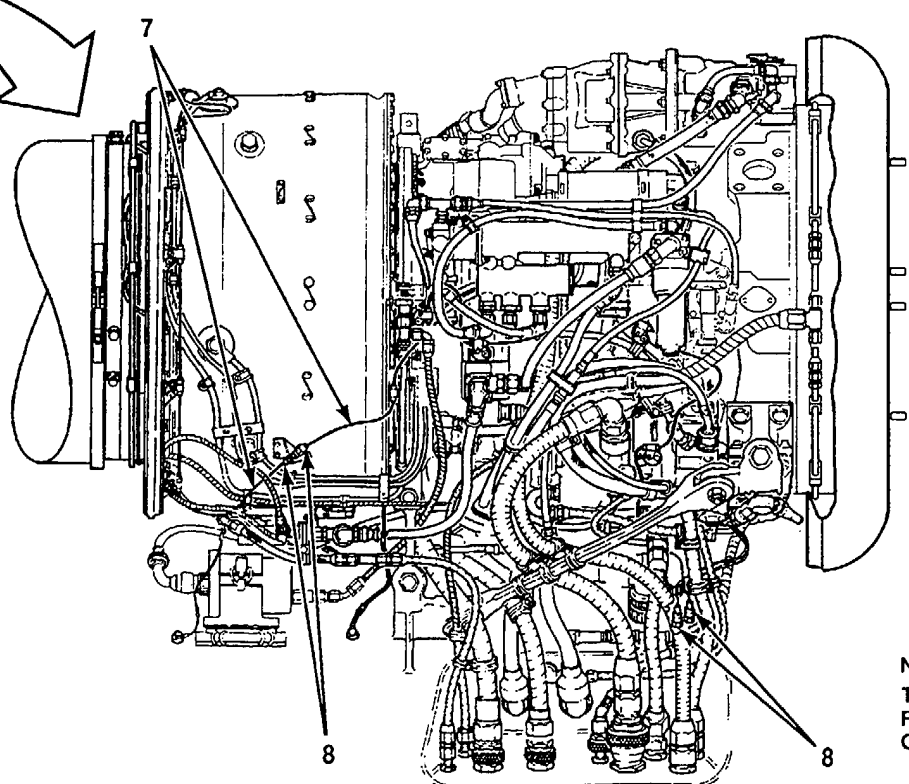
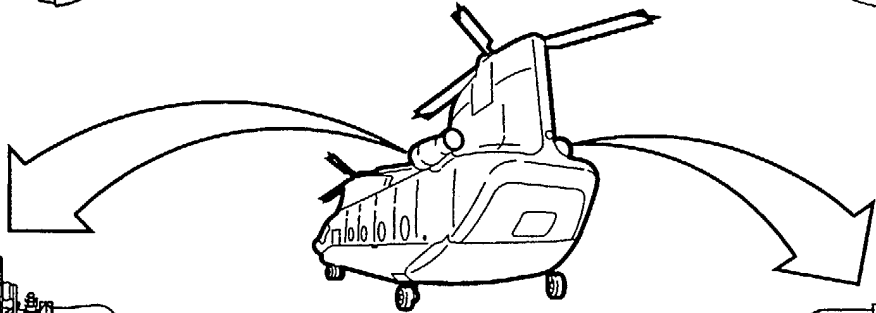
WITH 74



NO. 2 (RIGHT) ENGINE - L SIDE



NO. 1 (LEFT) ENGINE - L SIDE



NO. 2 (RIGHT) ENGINE - R SIDE

NOTE:  
TAIL CONES  
REMOVED FOR  
CLARITY

A65465

12-2.4 FIRE DETECTION SYSTEM OPERATIONAL CHECK

12-2.4

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
None

Materials:  
None

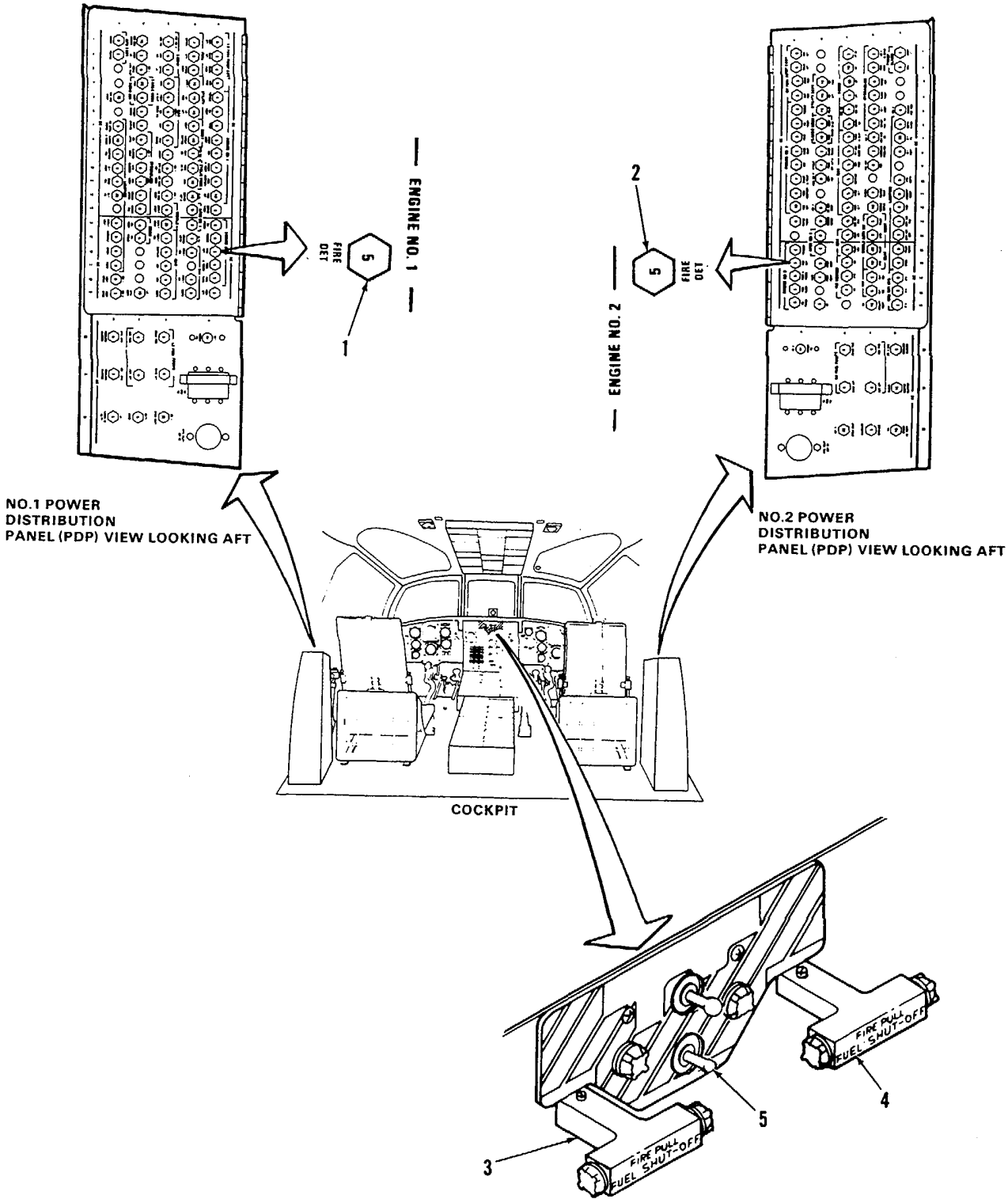
Personnel Required:  
Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Visual Check of Fire Detection System Performed  
(Task 12-2.3)

TASK	RESULT
1. Check that ENGINE NO. 1 FIRE DET circuit breaker (1) is closed.	If ENGINE NO. 1 FIRE DET circuit breaker (1) is open, close it. If it opens again, go to task 12-2.5.
2. Check that ENGINE NO. 2 FIRE DET circuit breaker (2) is closed.	If ENGINE NO. 2 FIRE DET circuit breaker (2) is open, close it. If it opens again, go to task 12-2.5.
3. Check NO. 1 ENGINE and NO. 2 ENGINE fire handles (3 and 4).	If either fire handle (3 or 4) caption FIRE PULL/FUEL SHUTOFF is lit, go to task 12-2.6 or 12-2.7.
4. Set and hold FIRE DETECTOR switch (5) to TEST.	FIRE PULL/FUEL SHUTOFF captions in NO. 1 ENGINE and NO. 2 ENGINE fire handle (3 and 4) shall light. If both captions do not come on, go to task 12-2.8. If either caption does not come on, go to task 12-2.9 or 12-2.10.
5. Release FIRE DETECTOR switch (5).	Both FIRE PULL/FUEL SHUTOFF captions in NO. 1 ENGINE and NO. 2 ENGINE fire handles (3 and 4) shall go out. If both captions do not go out, replace FIRE DETECTOR switch (5).

FOLLOW-ON MAINTENANCE:  
TM 55-1520-240-23:  
Electrical power off.  
Battery disconnected.



45 x 54

D145-5030-SPA

END OF TASK  
Change 23 12-34.1/(12-34.2 blank)

12-2.5 FIRE DET CIRCUIT BREAKER WILL NOT STAY CLOSED

12-2.5

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

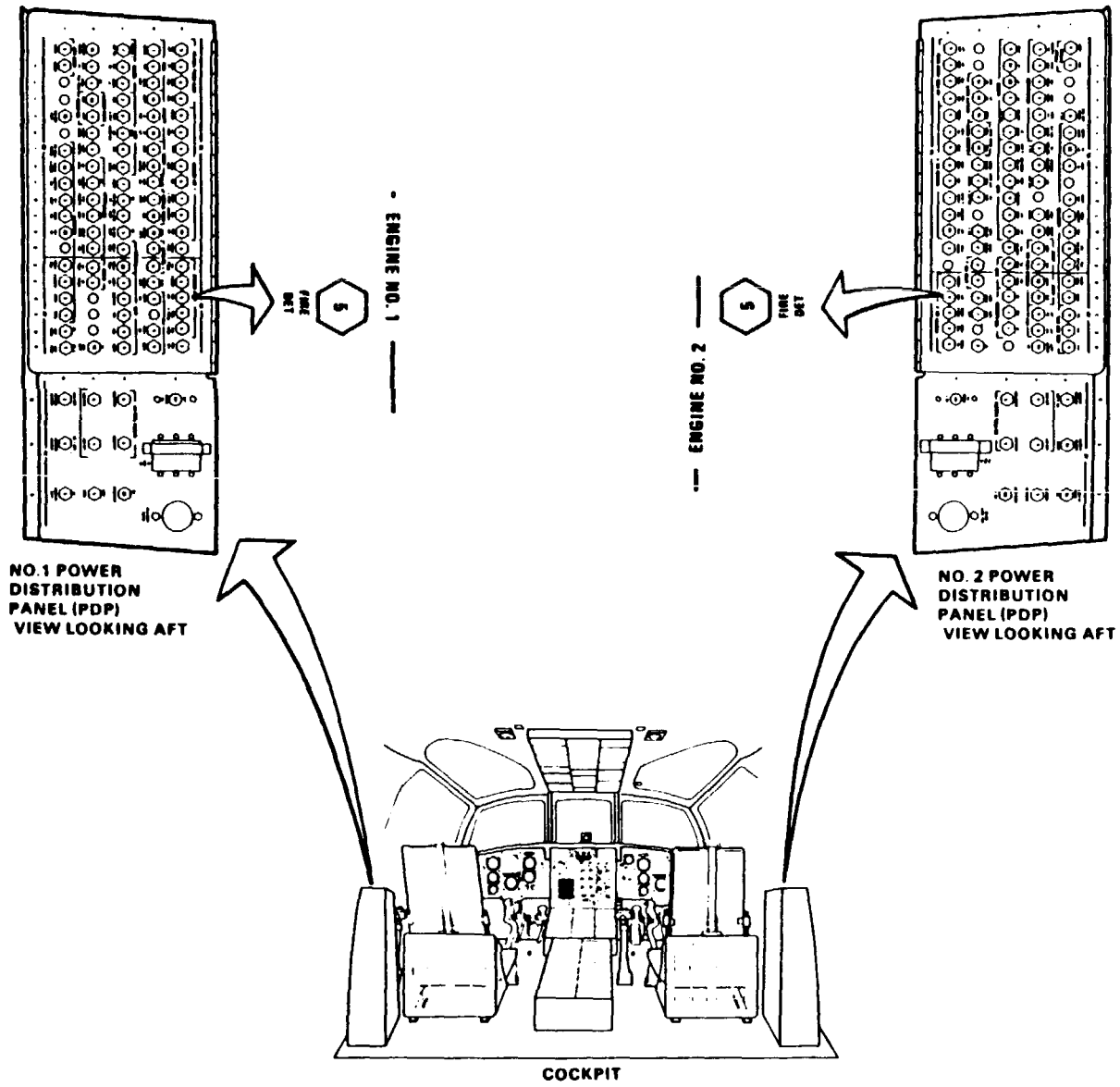
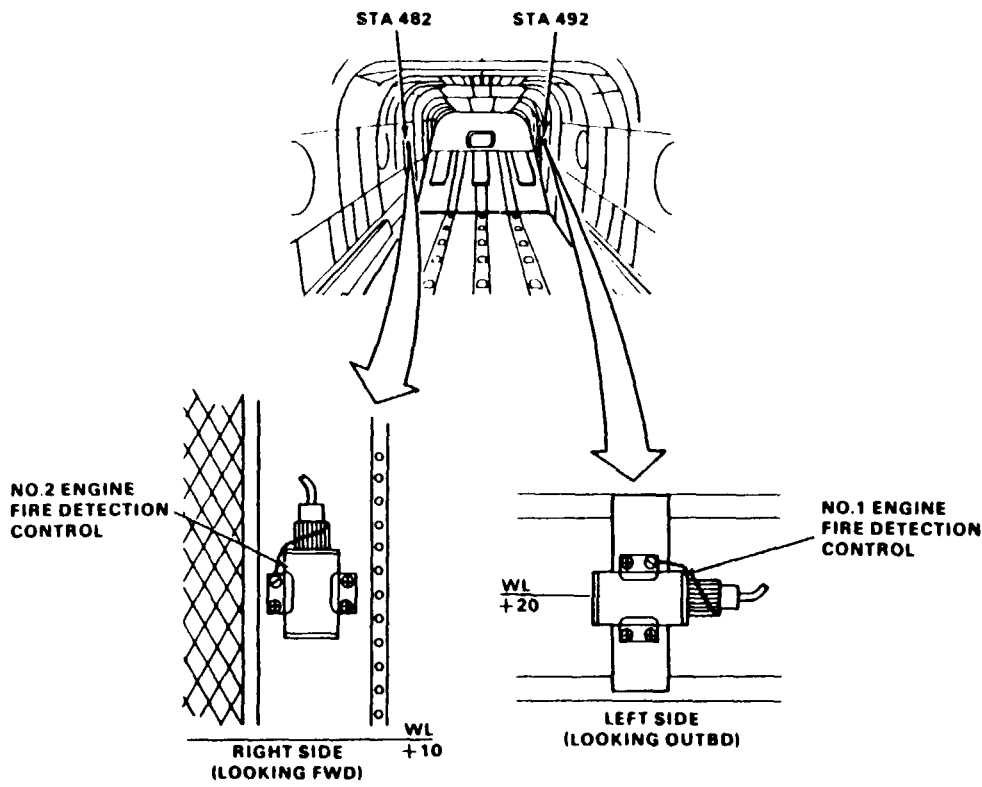
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

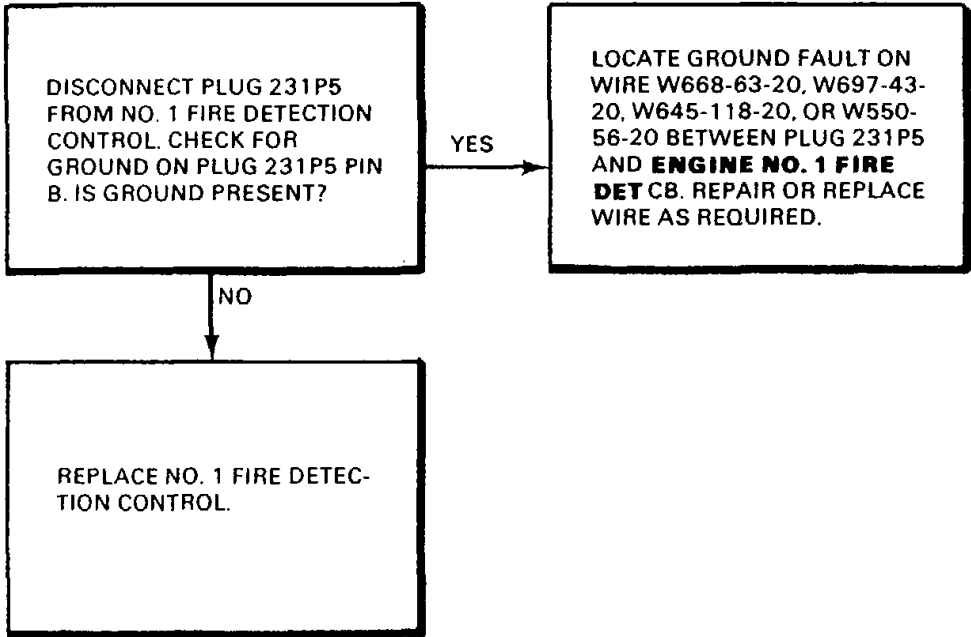
Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

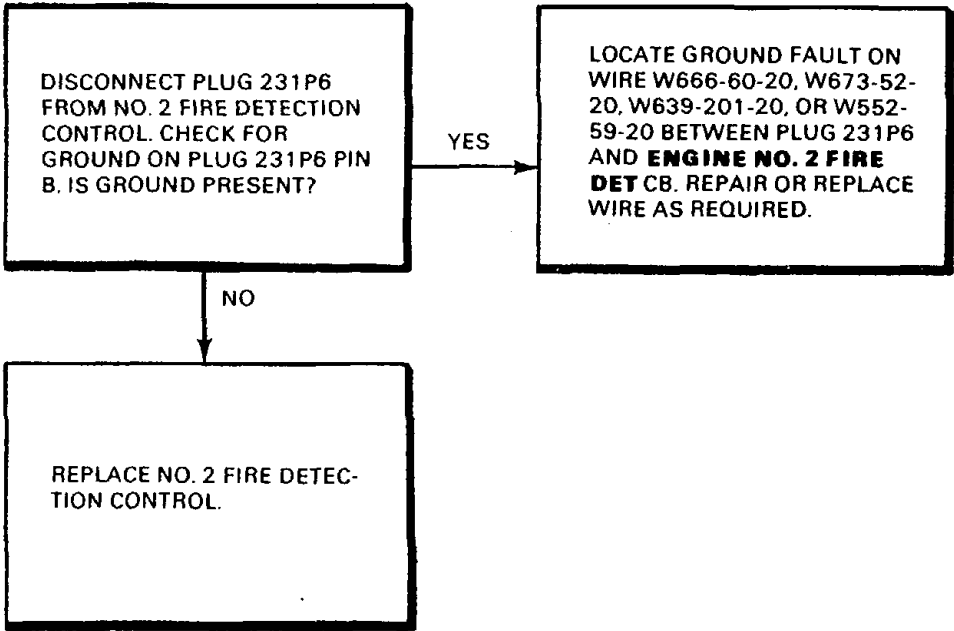
Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



ENGINE NO. 1 FIRE DET CIRCUIT BREAKER  
WILL NOT STAY CLOSED



ENGINE NO. 2 FIRE DET CIRCUIT BREAKER  
WILL NOT STAY CLOSED



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All References:

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

Cloth (E120)

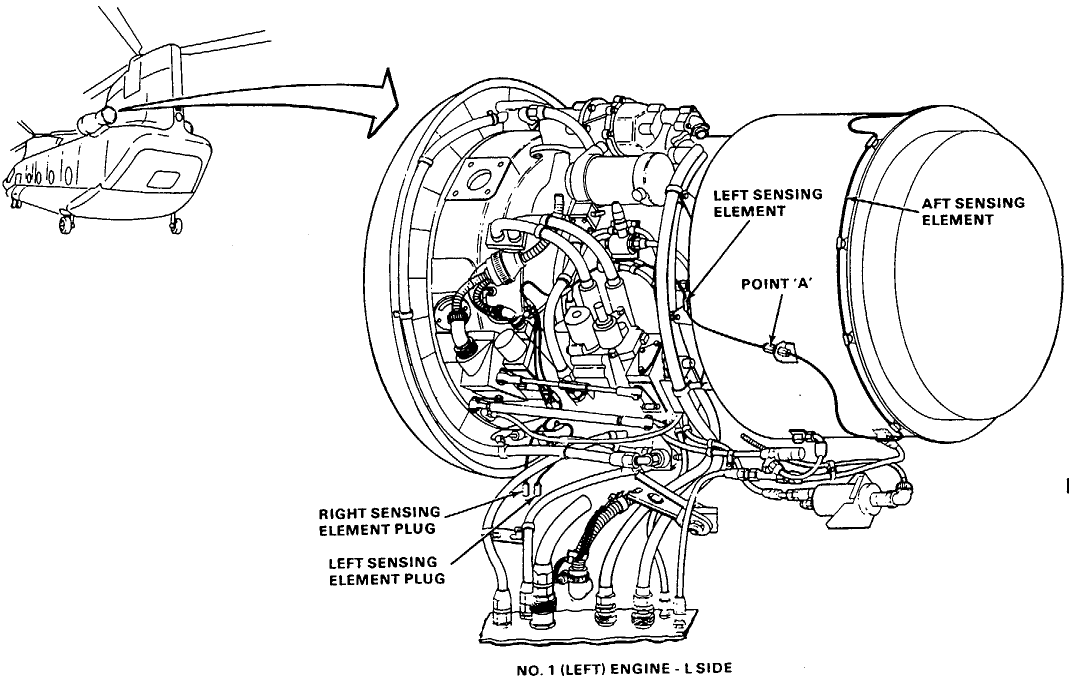
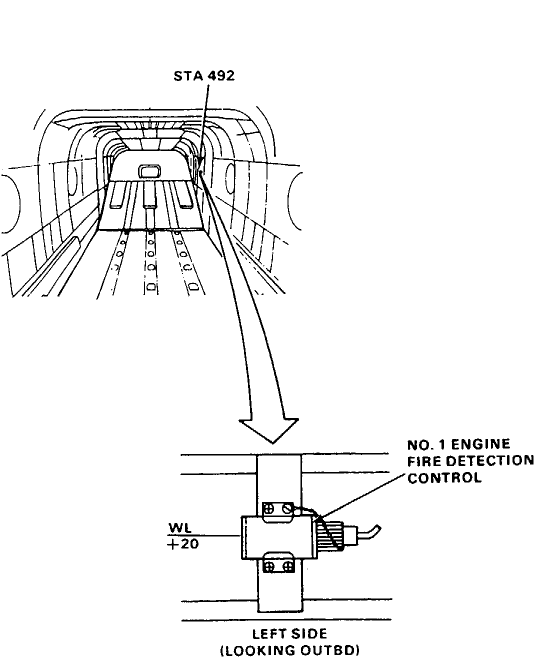
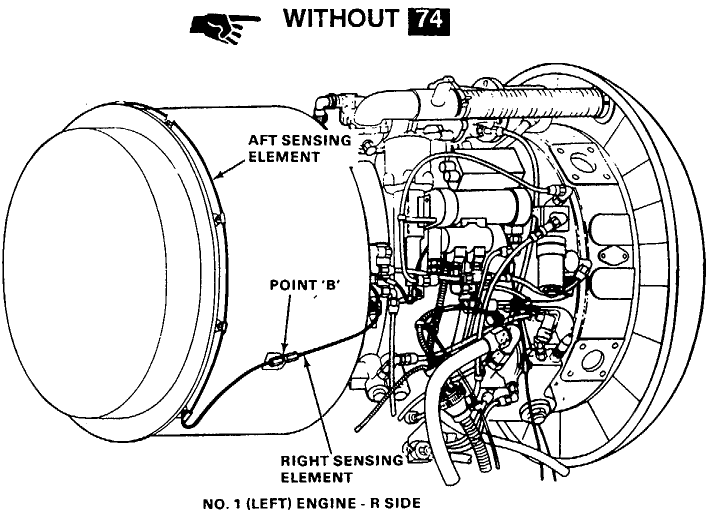
Personnel Required:

Aircraft Electrician

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

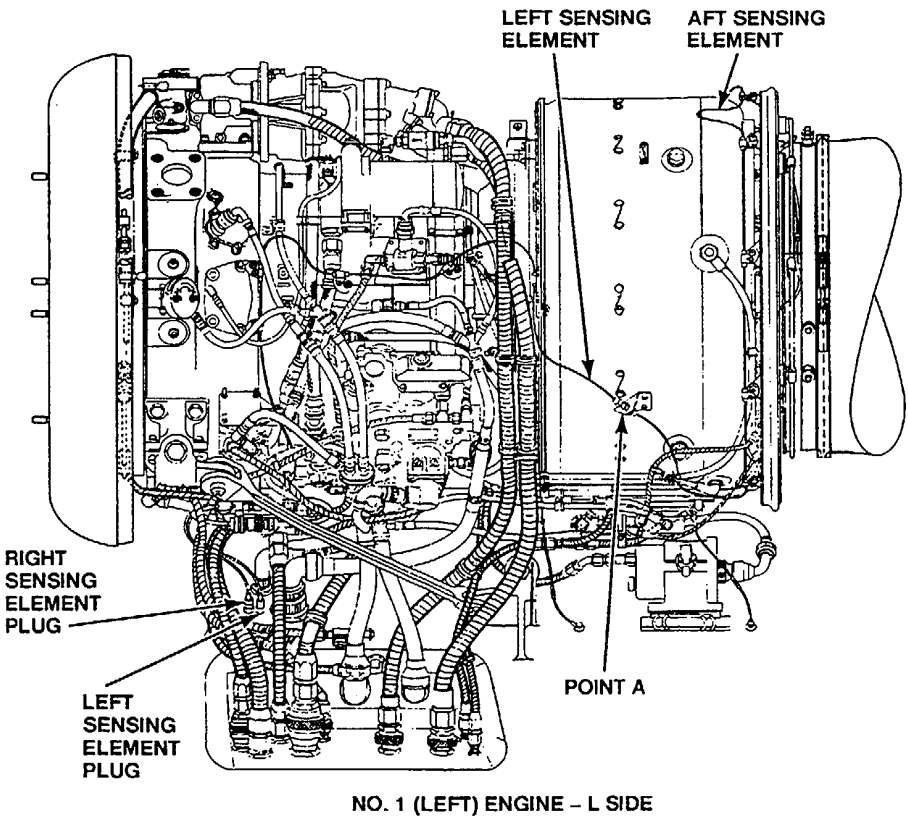
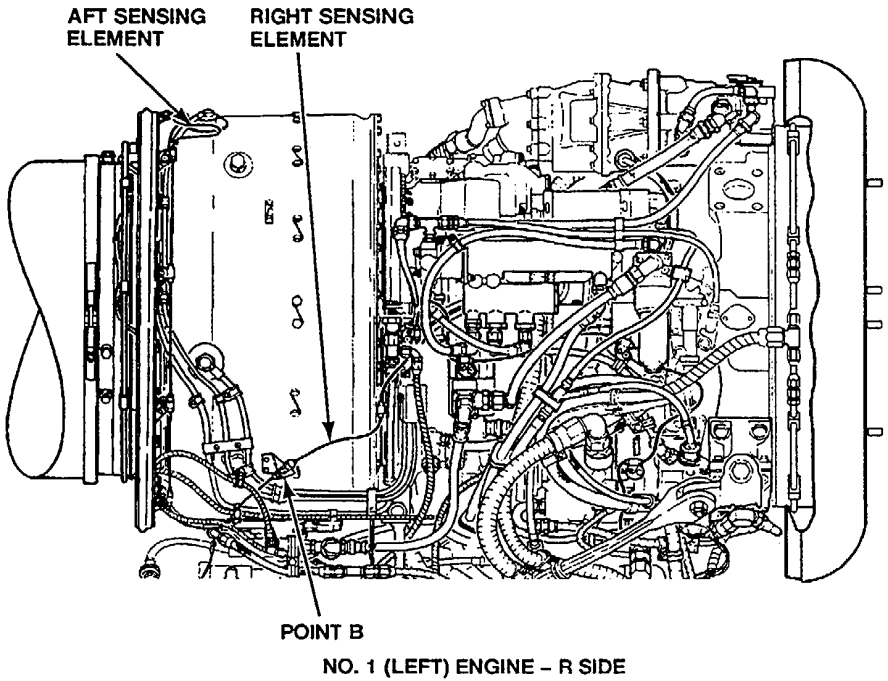
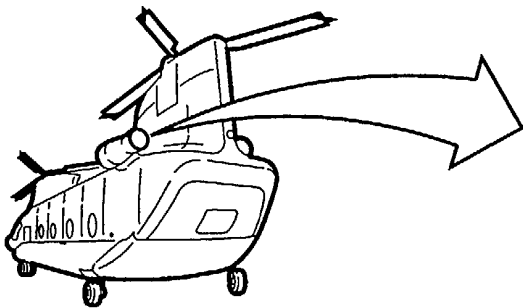
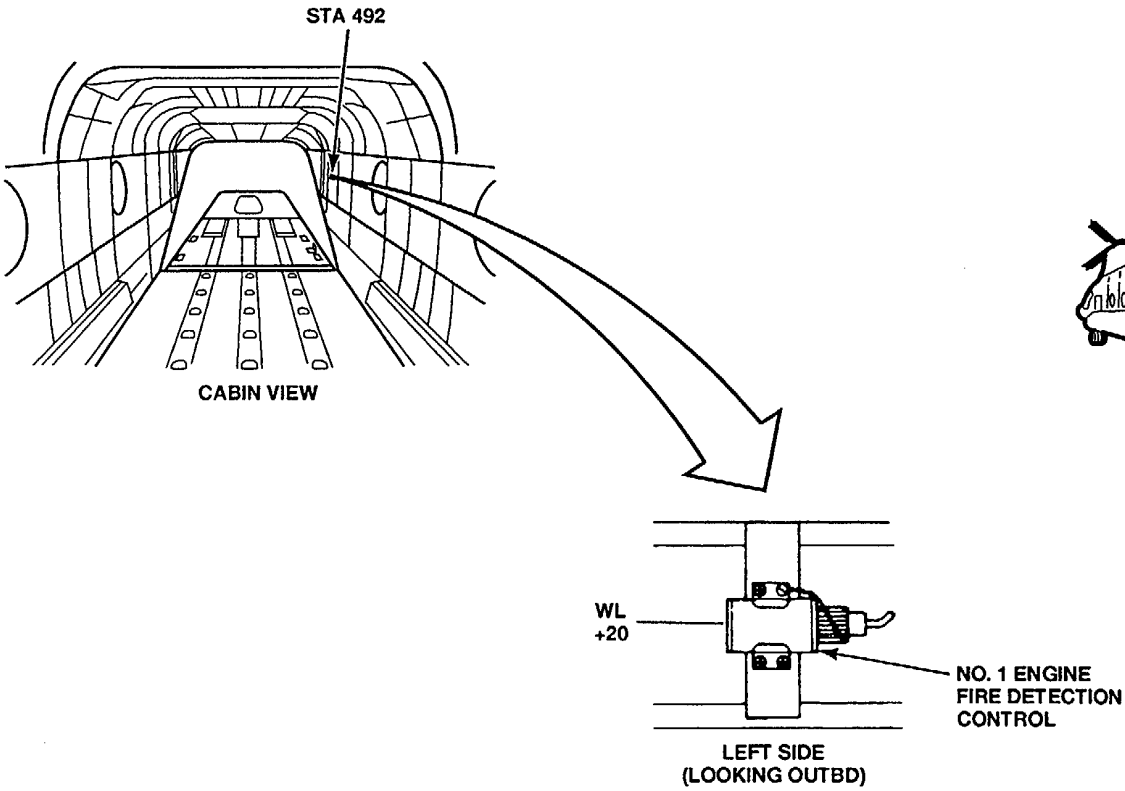


NOTE:  
TAIL CONE  
REMOVED FOR  
CLARITY

DI45-5032-SPA

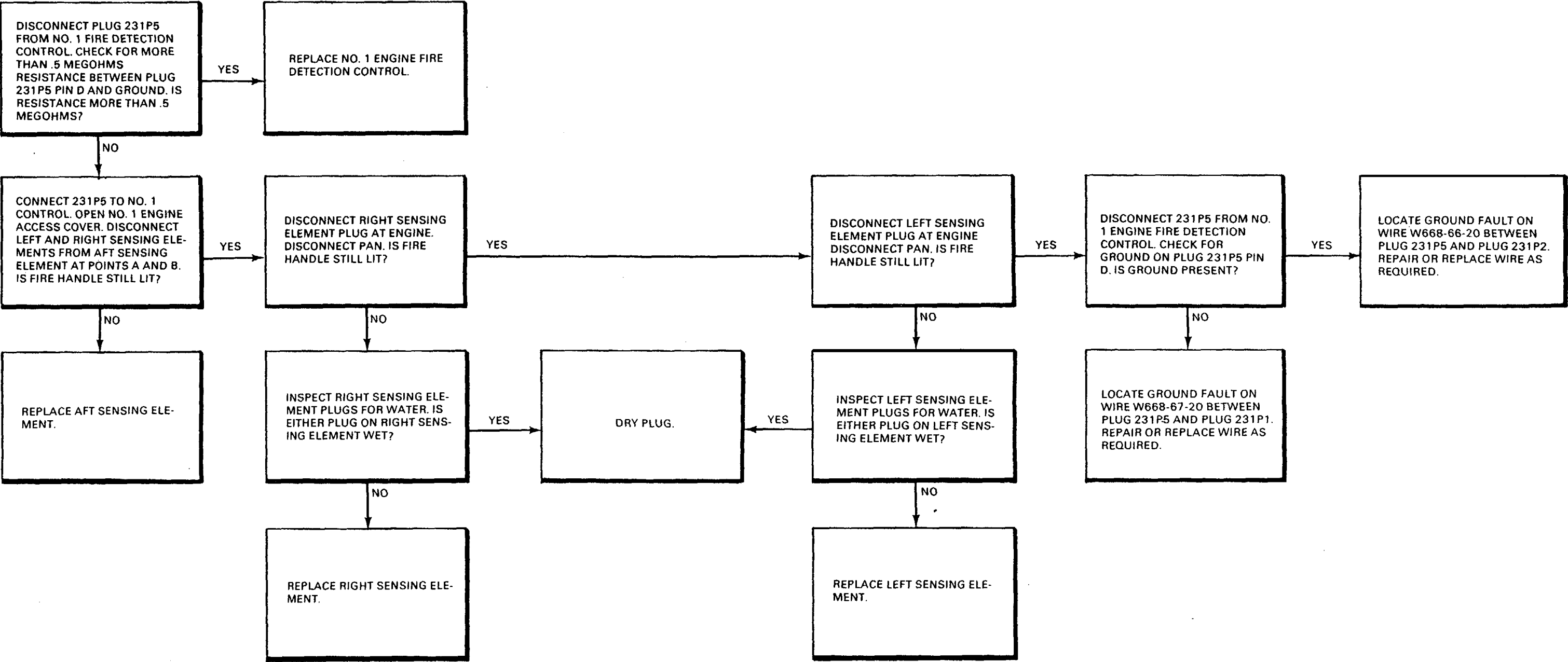
90x54

WITH 74



A65467





FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All References:

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

Cloth (E120)

Personnel Required:

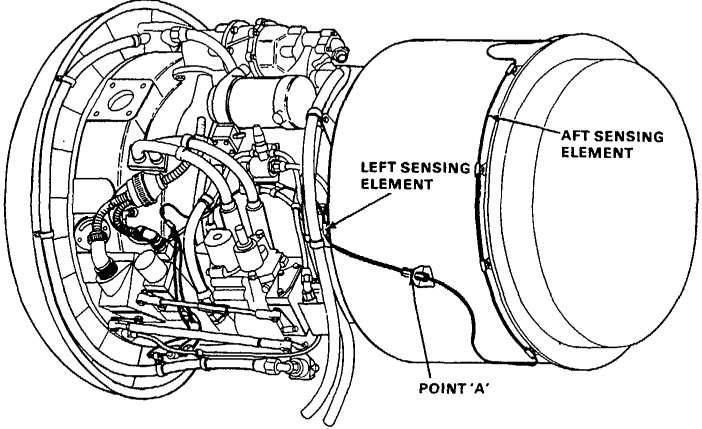
Aircraft Electrician

TM 55-1520-240-23

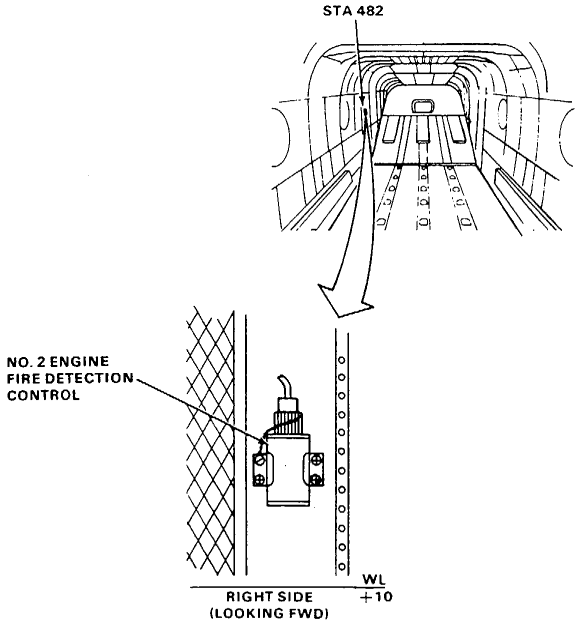
Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

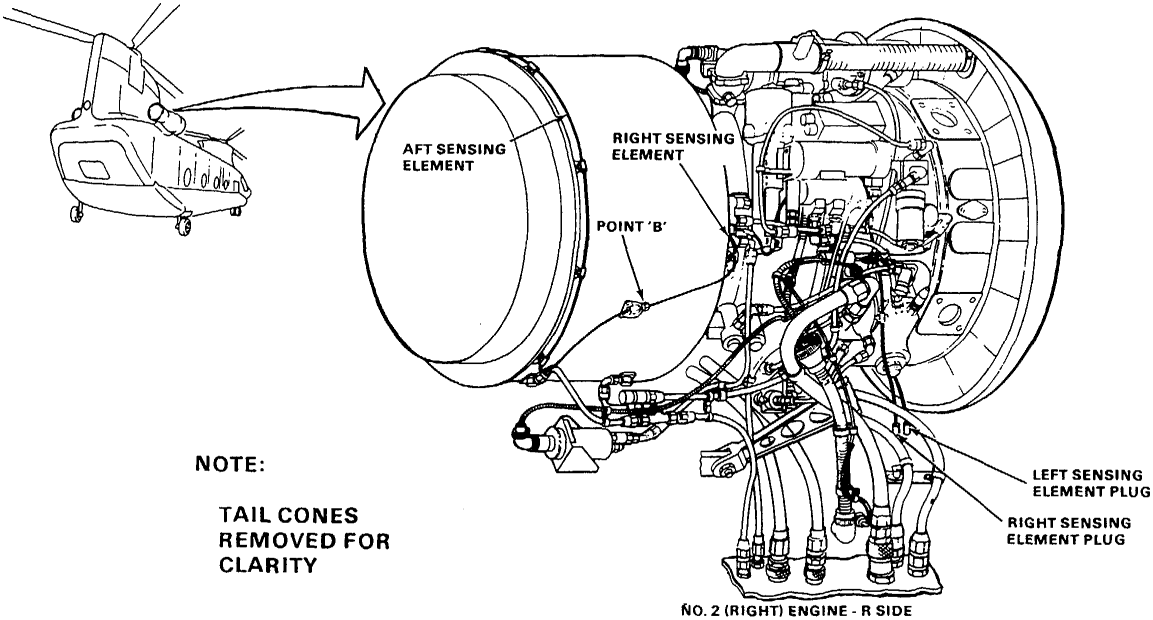
WITHOUT 74



NO. 2 (RIGHT) ENGINE - L SIDE



90+54



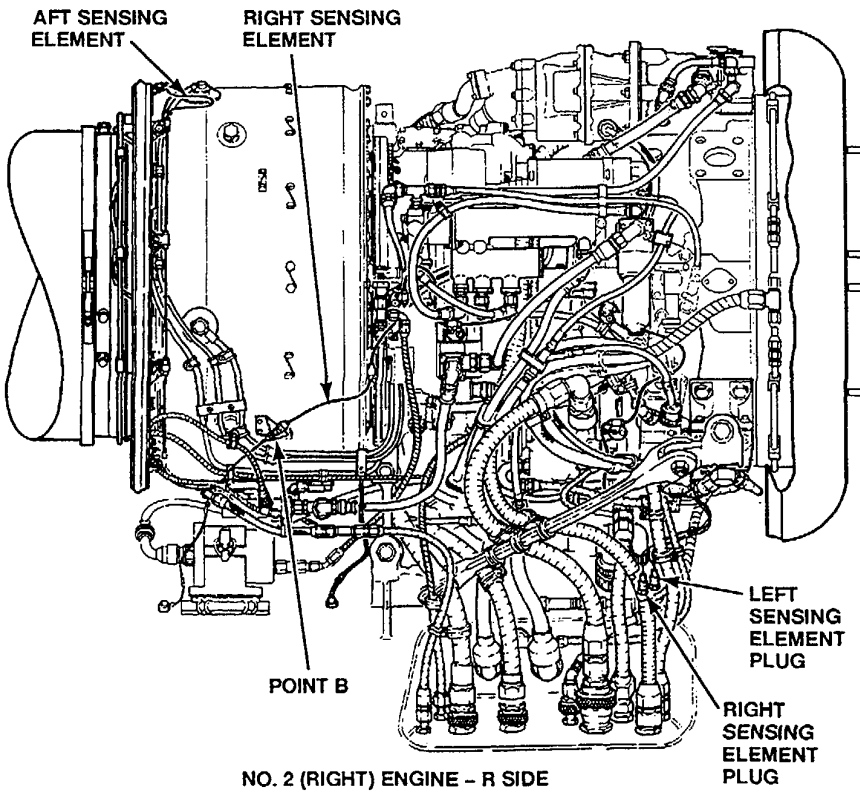
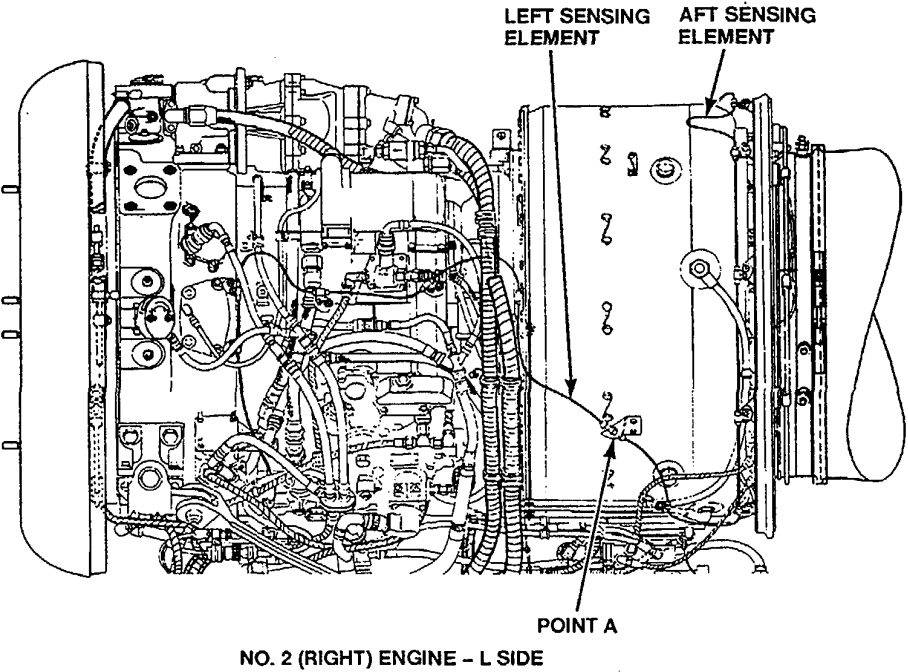
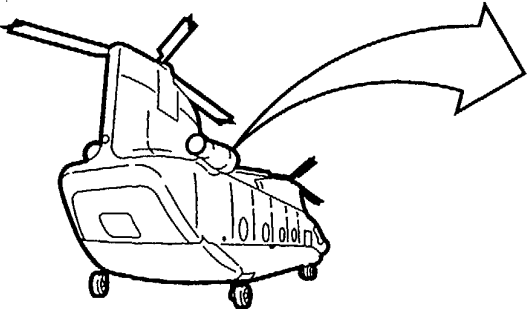
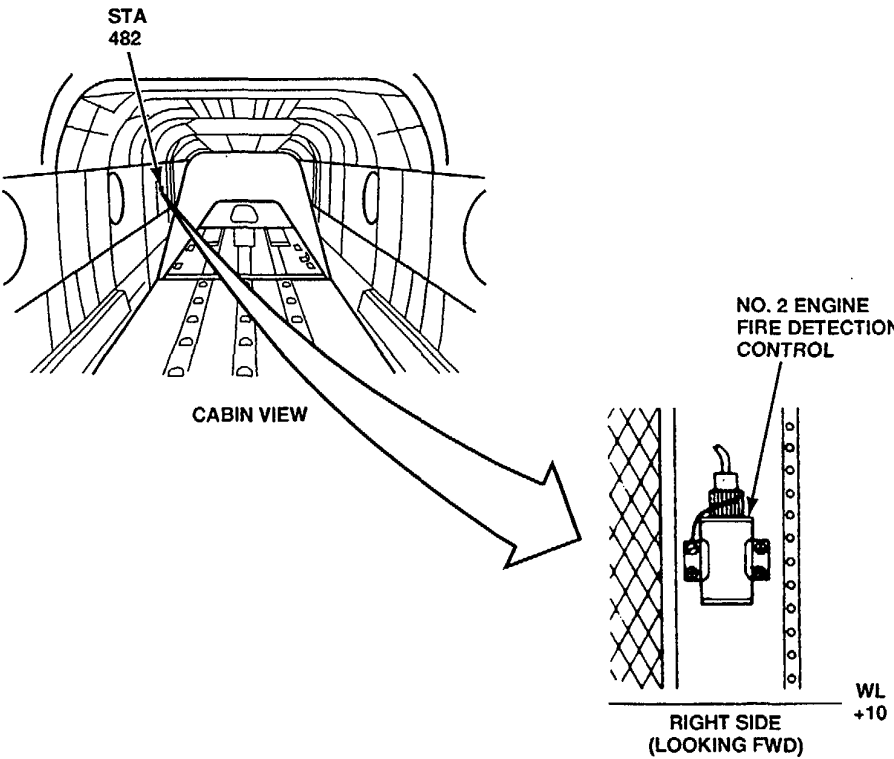
NOTE:

TAIL CONES  
REMOVED FOR  
CLARITY

NO. 2 (RIGHT) ENGINE - R SIDE

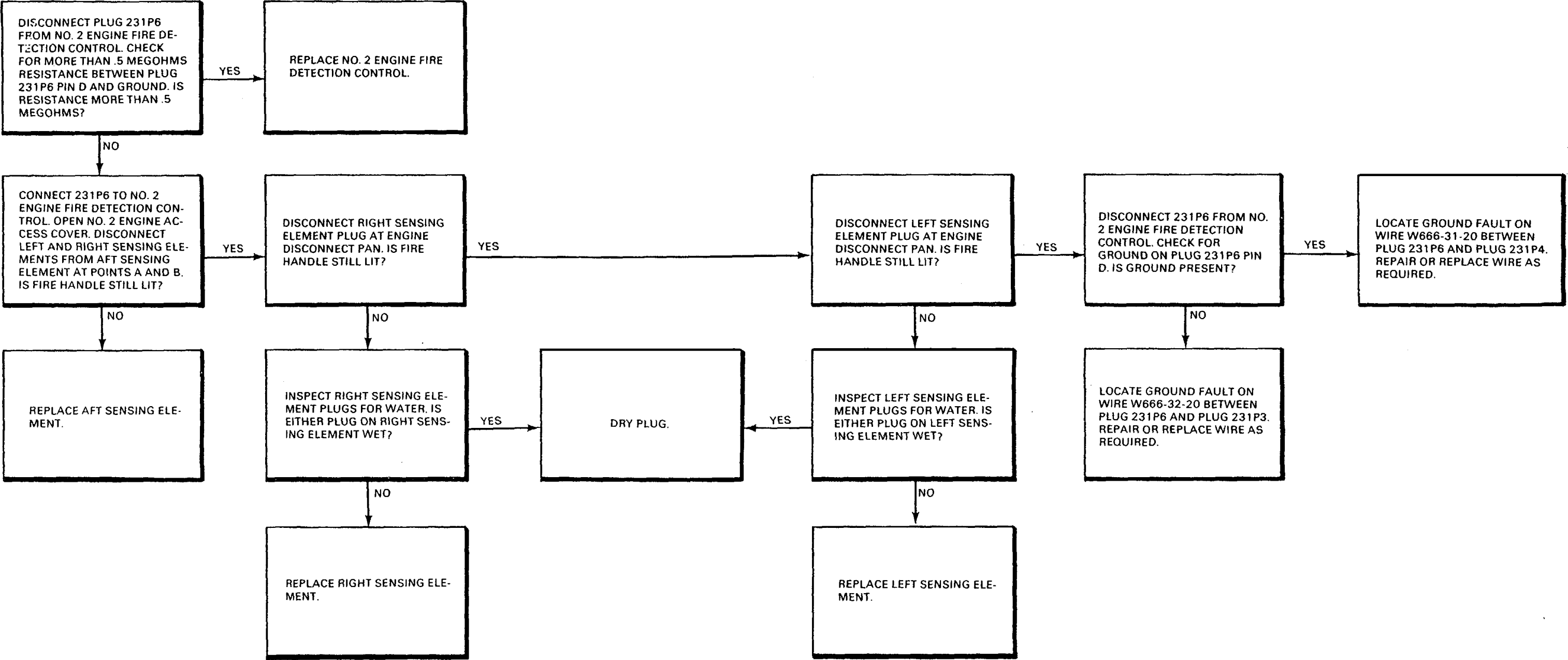
D145-5033-SPA

WITH 74



NOTE:  
TAIL CONES  
REMOVED FOR  
CLARITY

A65468



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations  
All

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

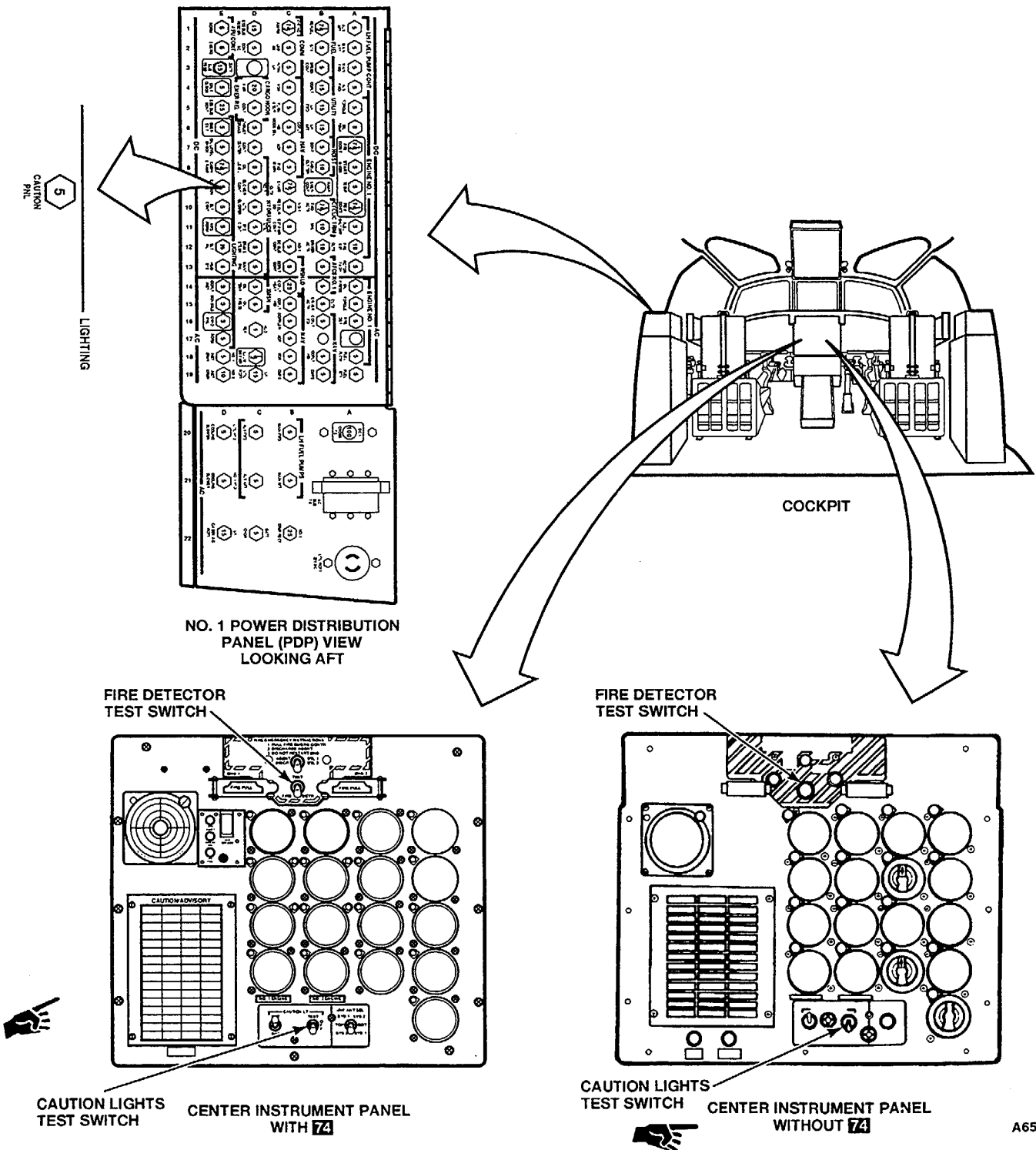
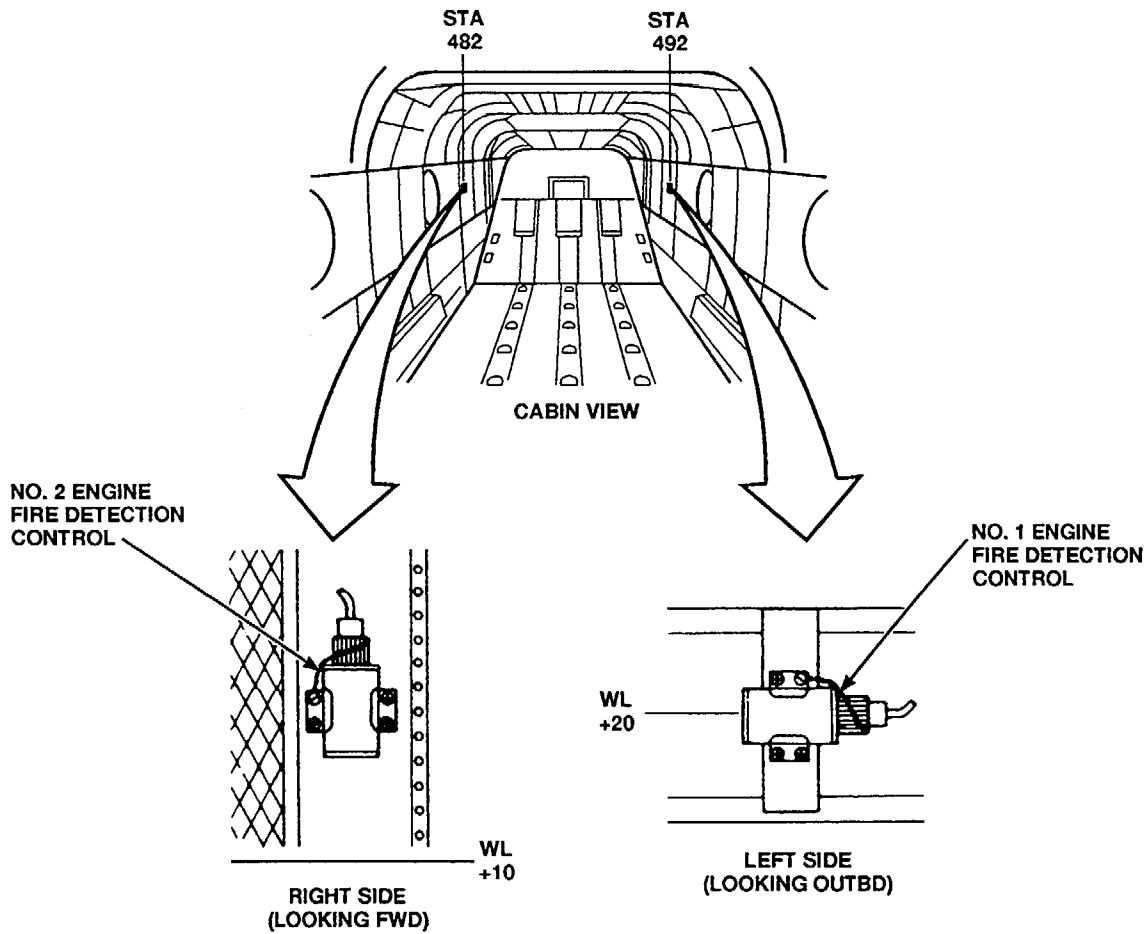
Materials:  
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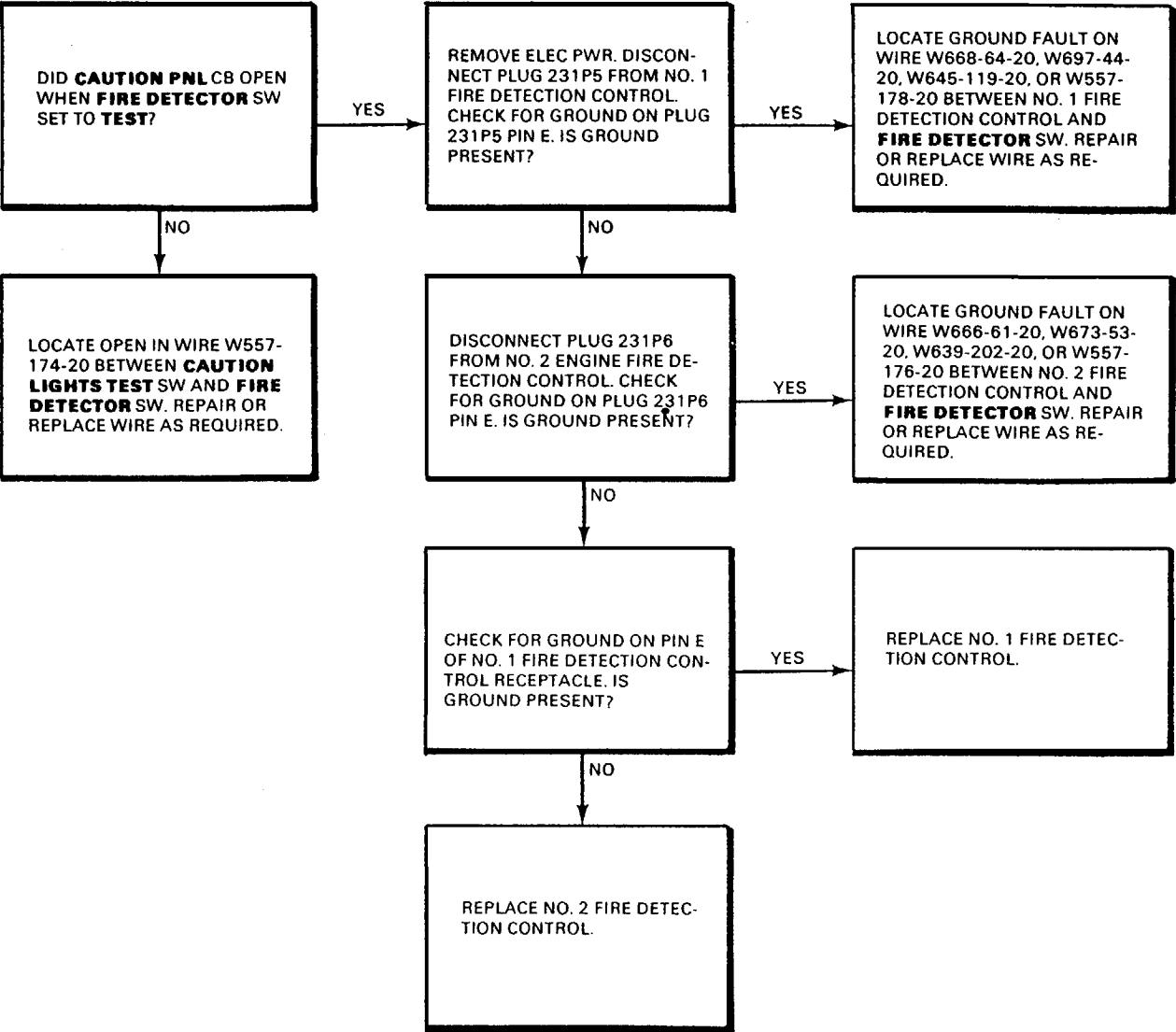
Personnel Required:

Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off





FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required

Aircraft Electrician

References:

TM 55-1520-240-23

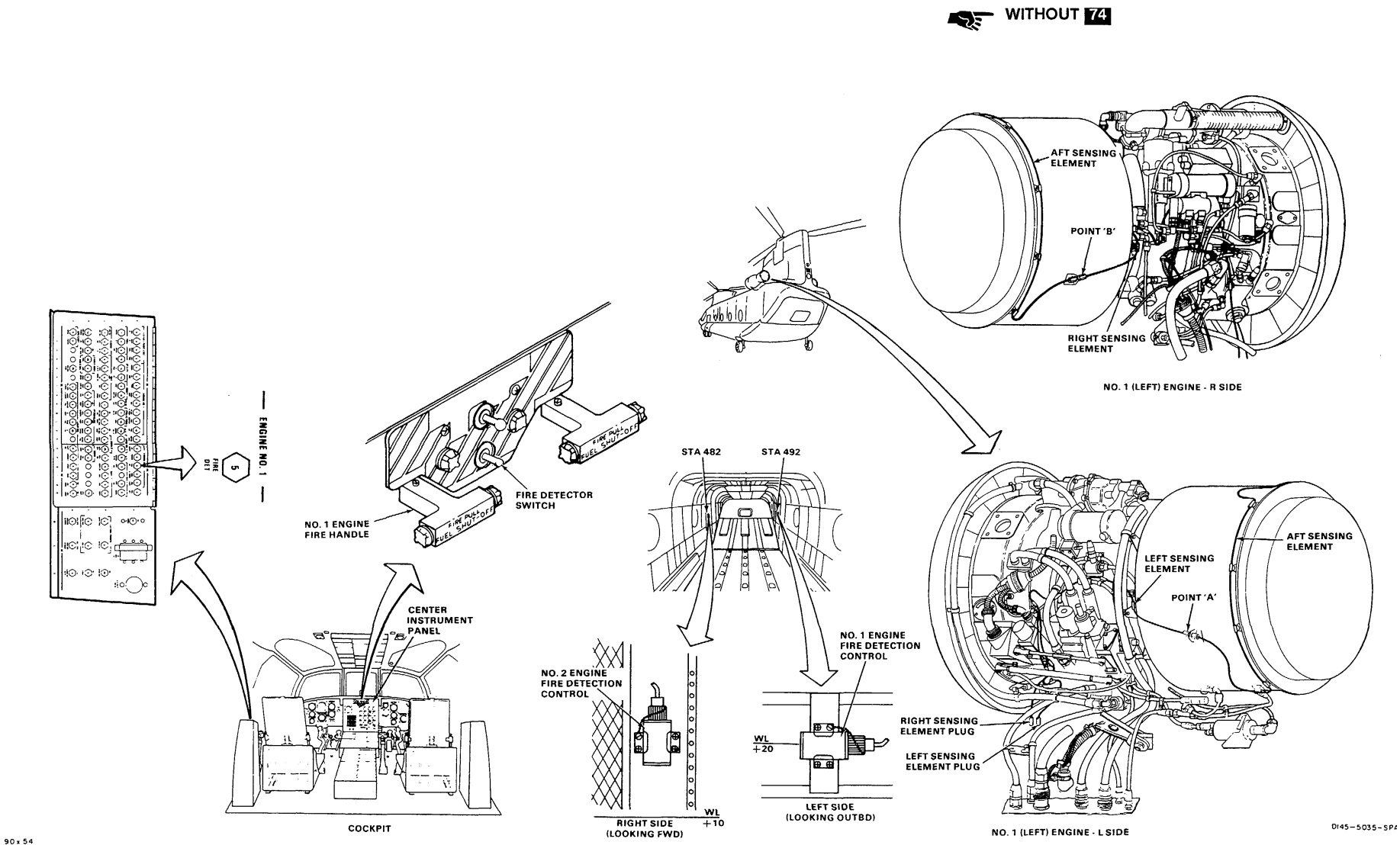
Equipment Condition:

TM 55-1520-240-23:

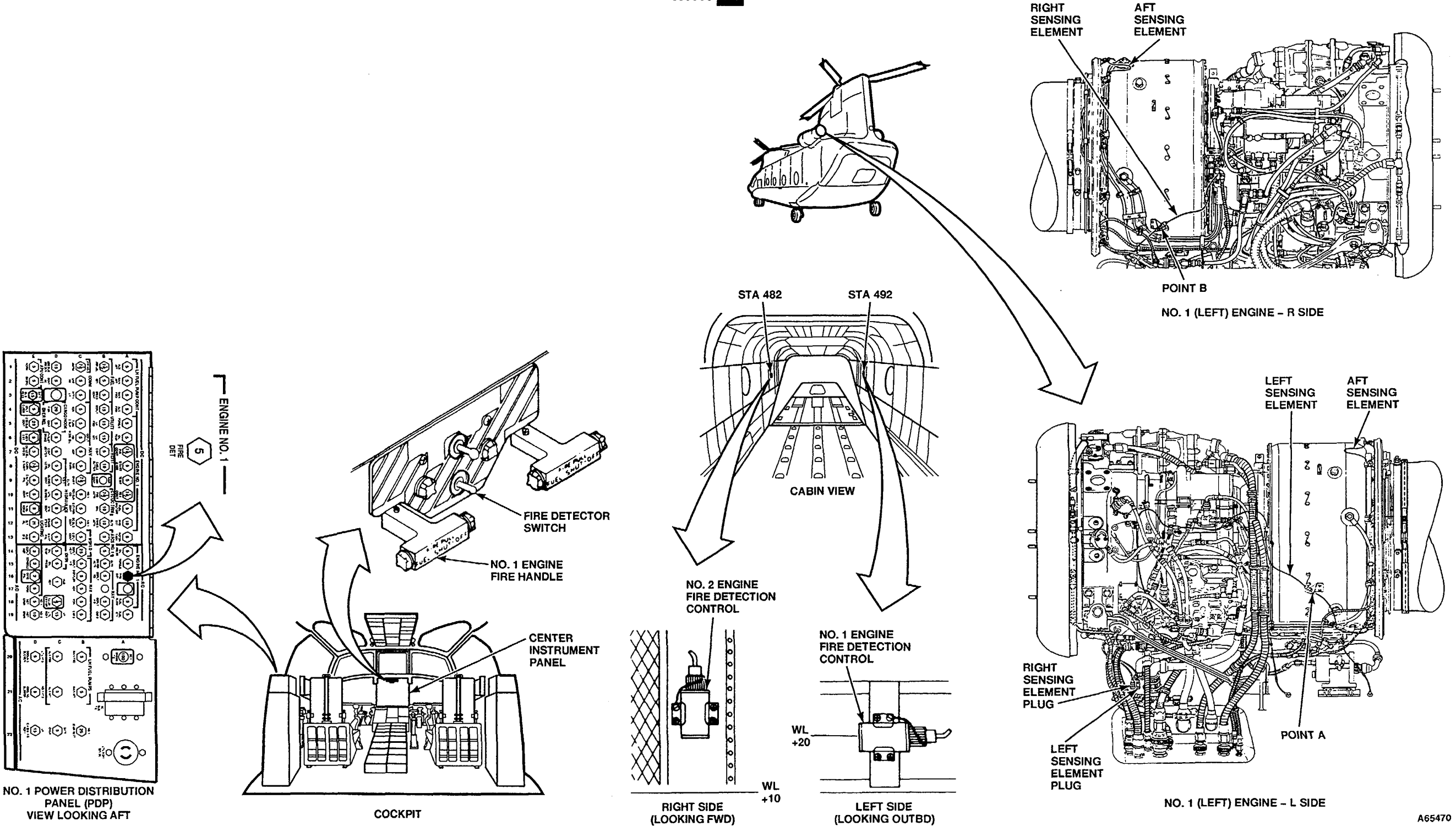
Battery Connected

Electrical Power On

Hydraulic Power Off

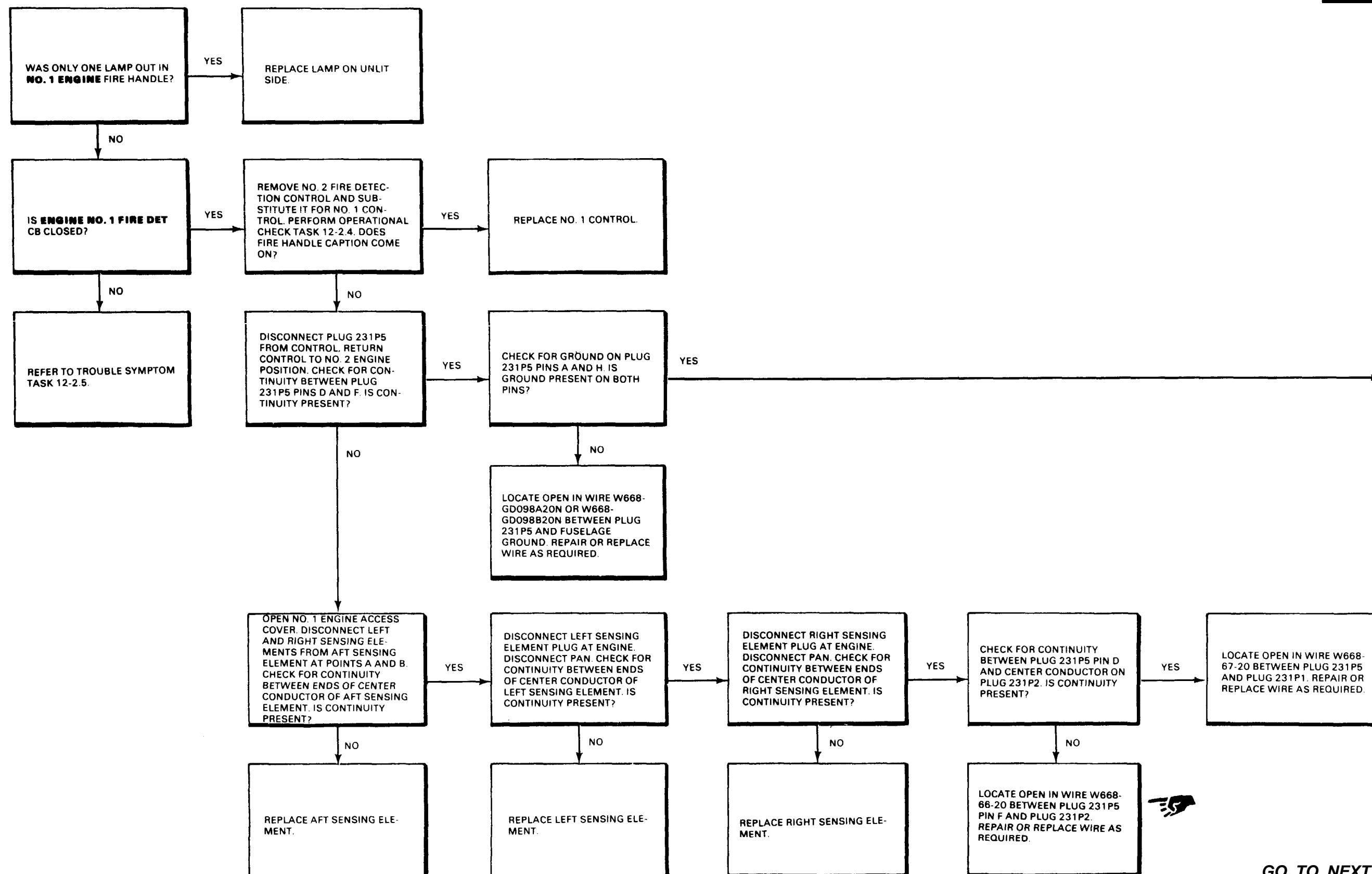


WITH 74



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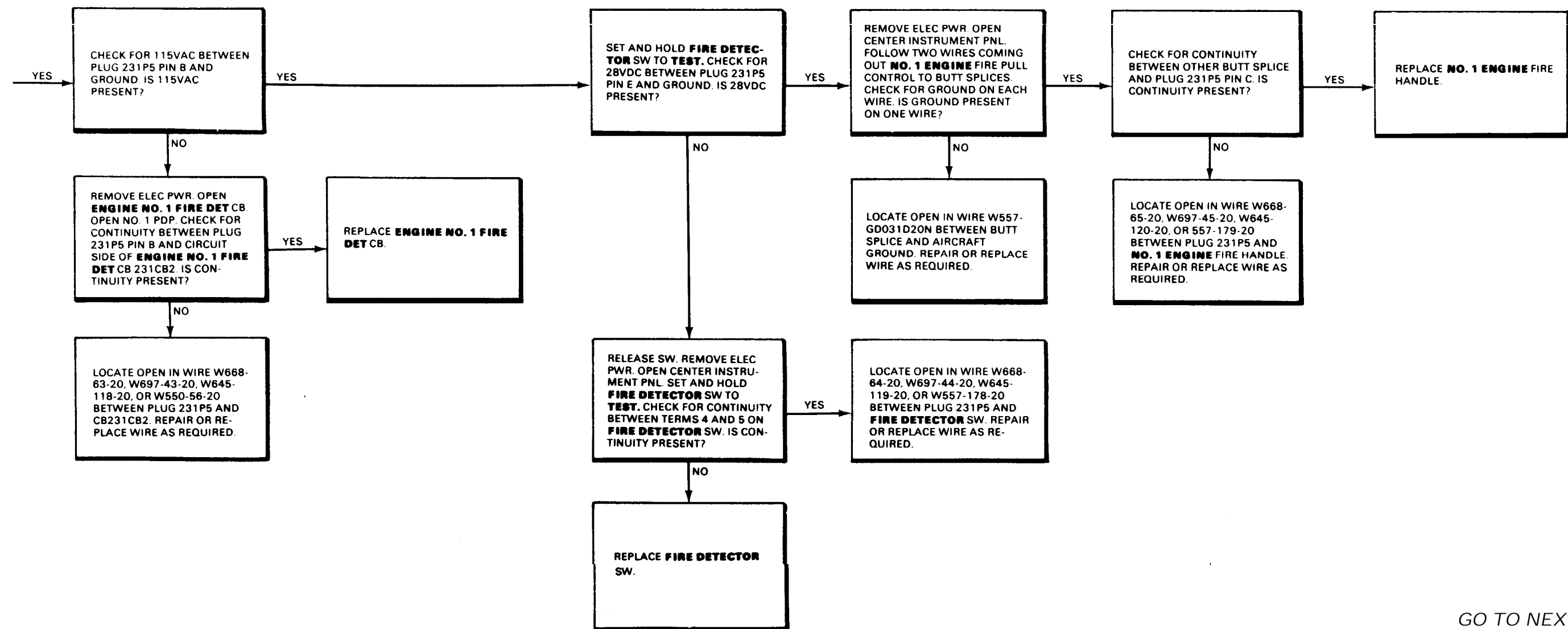


12-2.9 NO. 1 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF  
CAPTION DOES NOT LIGHT DURING TEST (Continued)

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12-2.9 NO. 1 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF  
CAPTION DOES NOT LIGHT DURING TEST (Continued)

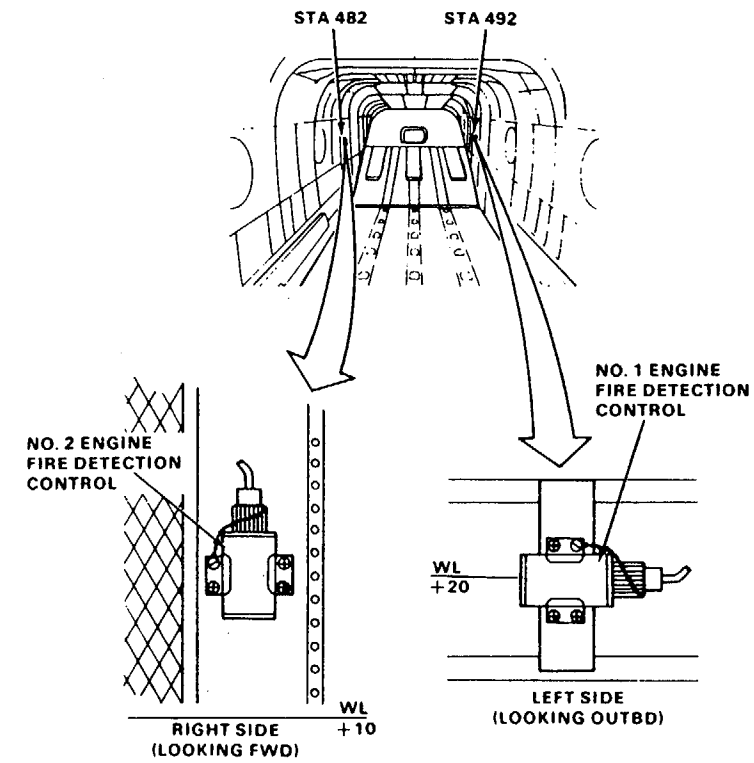
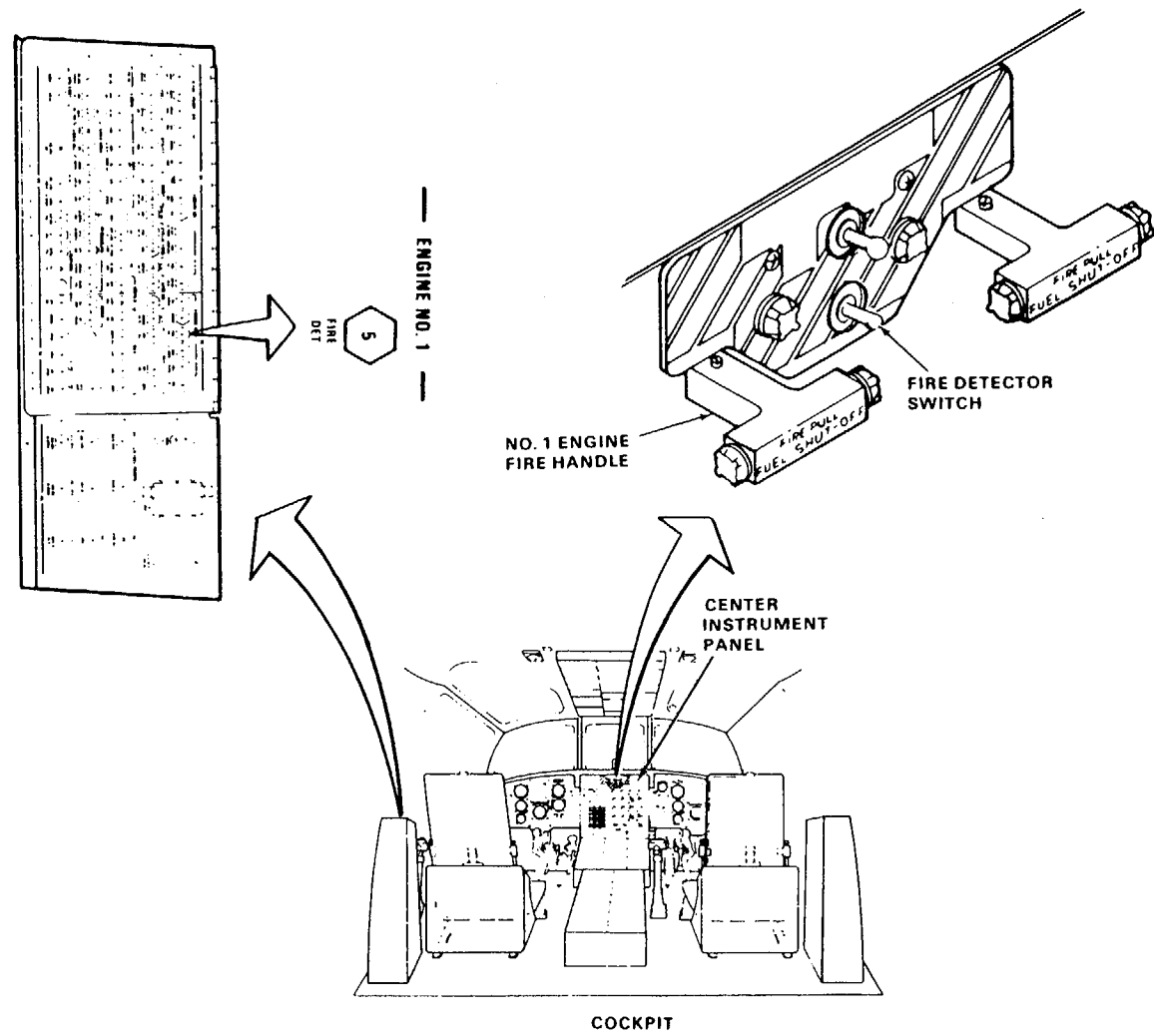
12-2.9



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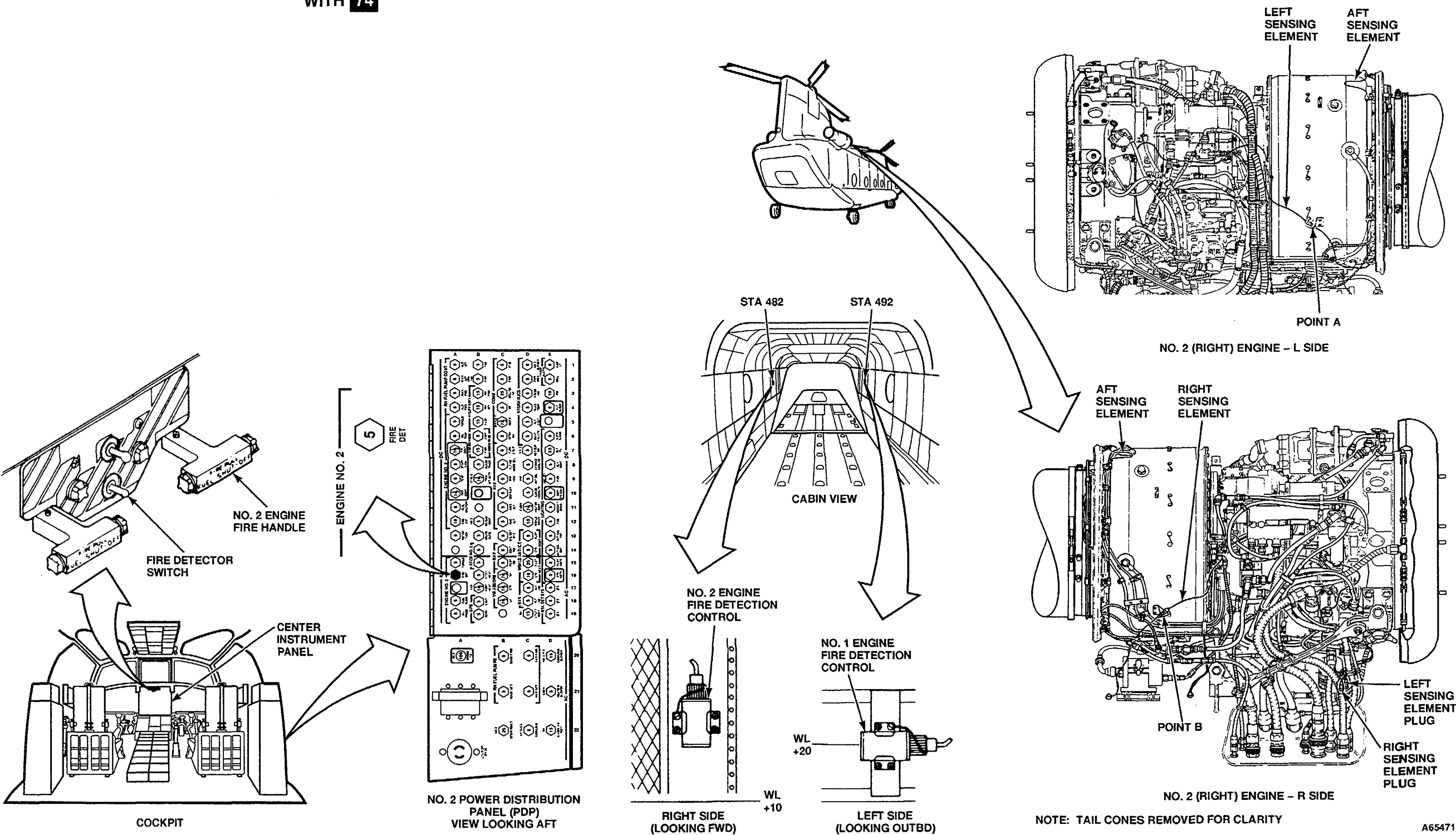
12-2.9 NO. 1 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF  
CAPTION DOES NOT LIGHT DURING TEST (Continued)

12-2.9



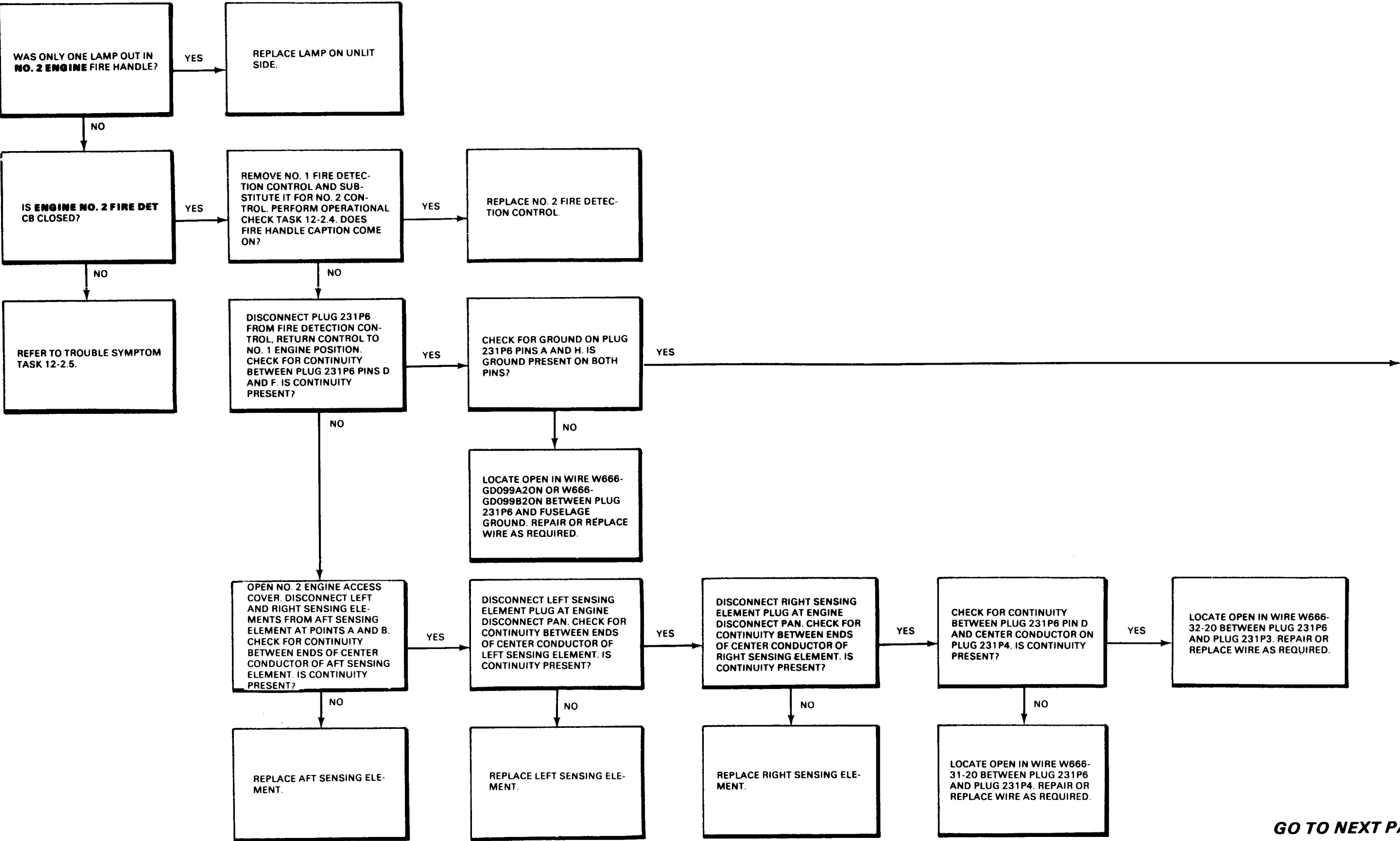


WITH 74



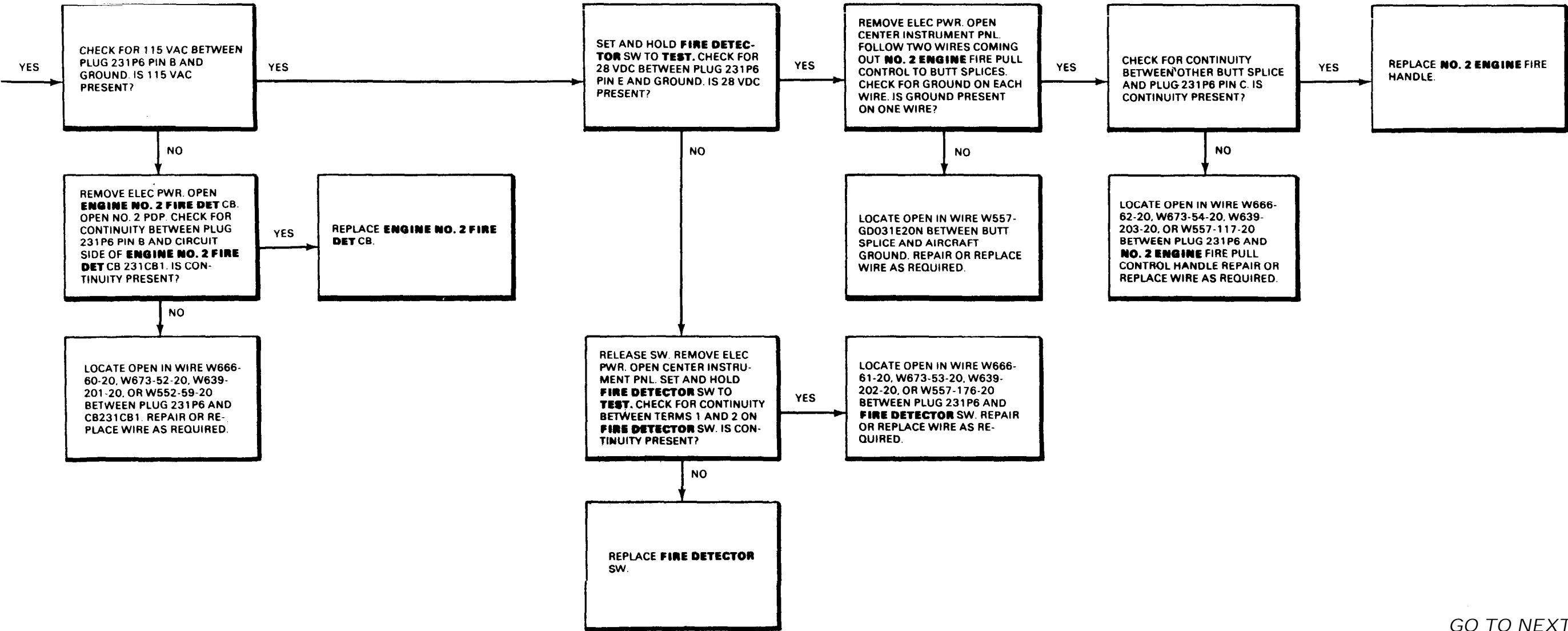
12-2.10 NO. 2 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF  
CAPTION DOES NOT LIGHT DURING TEST (Continued)

12-2.10



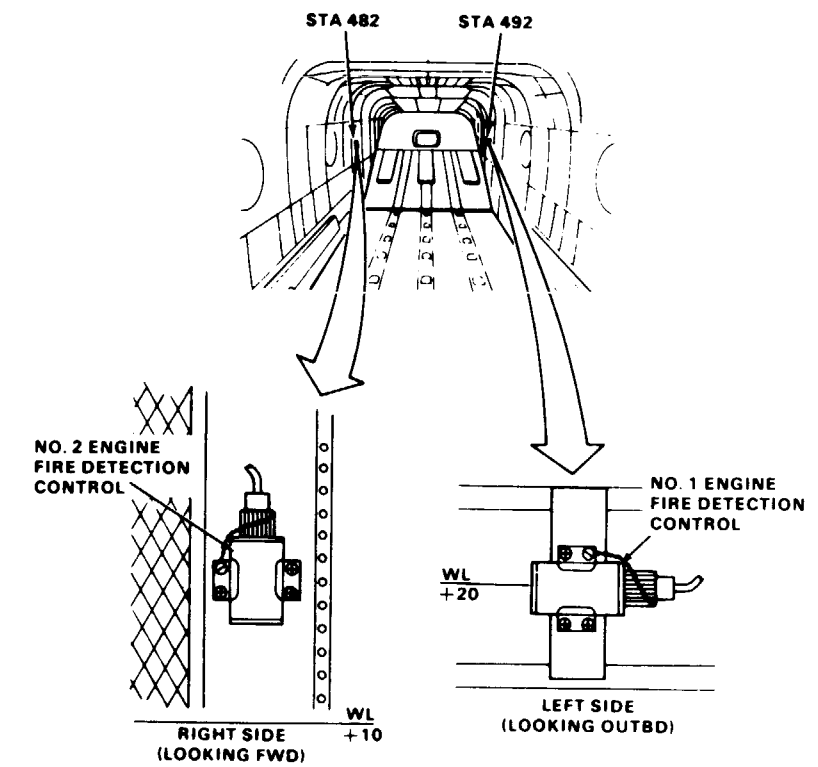
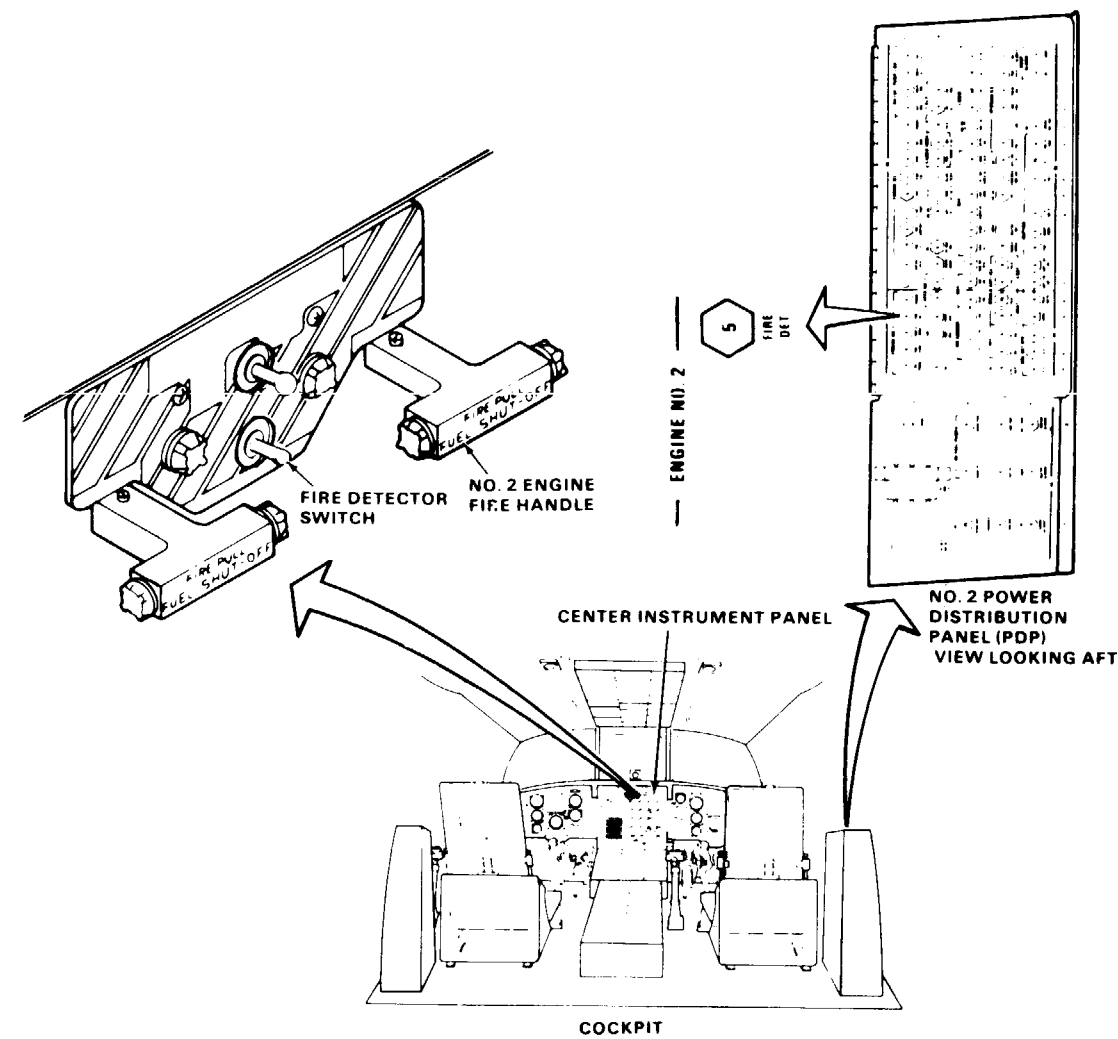
GO TO NEXT PAGE

12-2.10 NO. 2 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF  
CAPTION DOES NOT LIGHT DURING TEST (Continued)



12-2.10 NO. 2 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF  
CAPTION DOES NOT LIGHT DURING TEST (Continued)

12-2.10





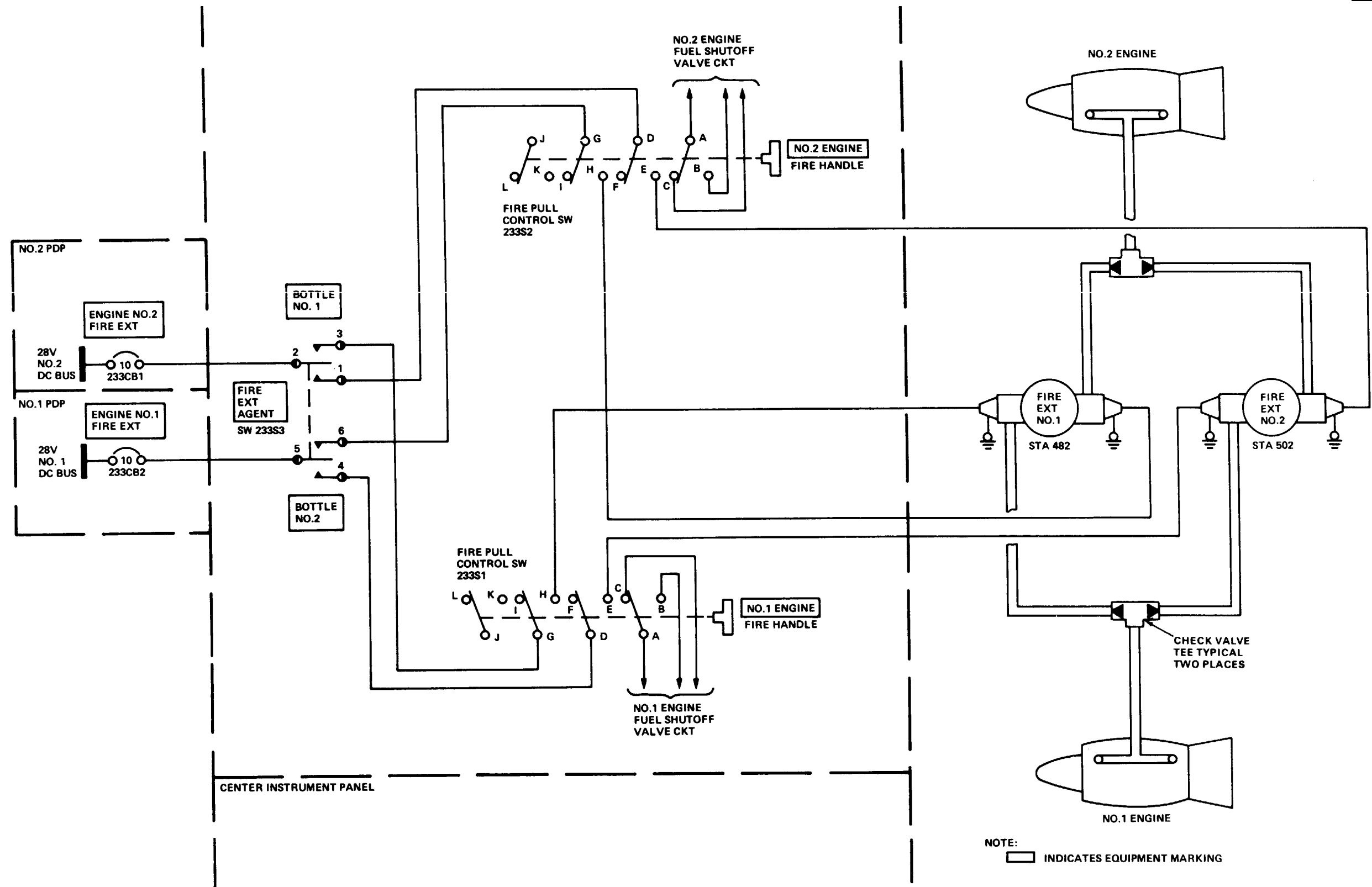
## 12-3 FIRE EXTINGUISHING SYSTEM

12-3 FIRE EXTINGUISHING SYSTEM

12-3.1 FIRE EXTINGUISHING SYSTEM SCHEMATIC DIAGRAM

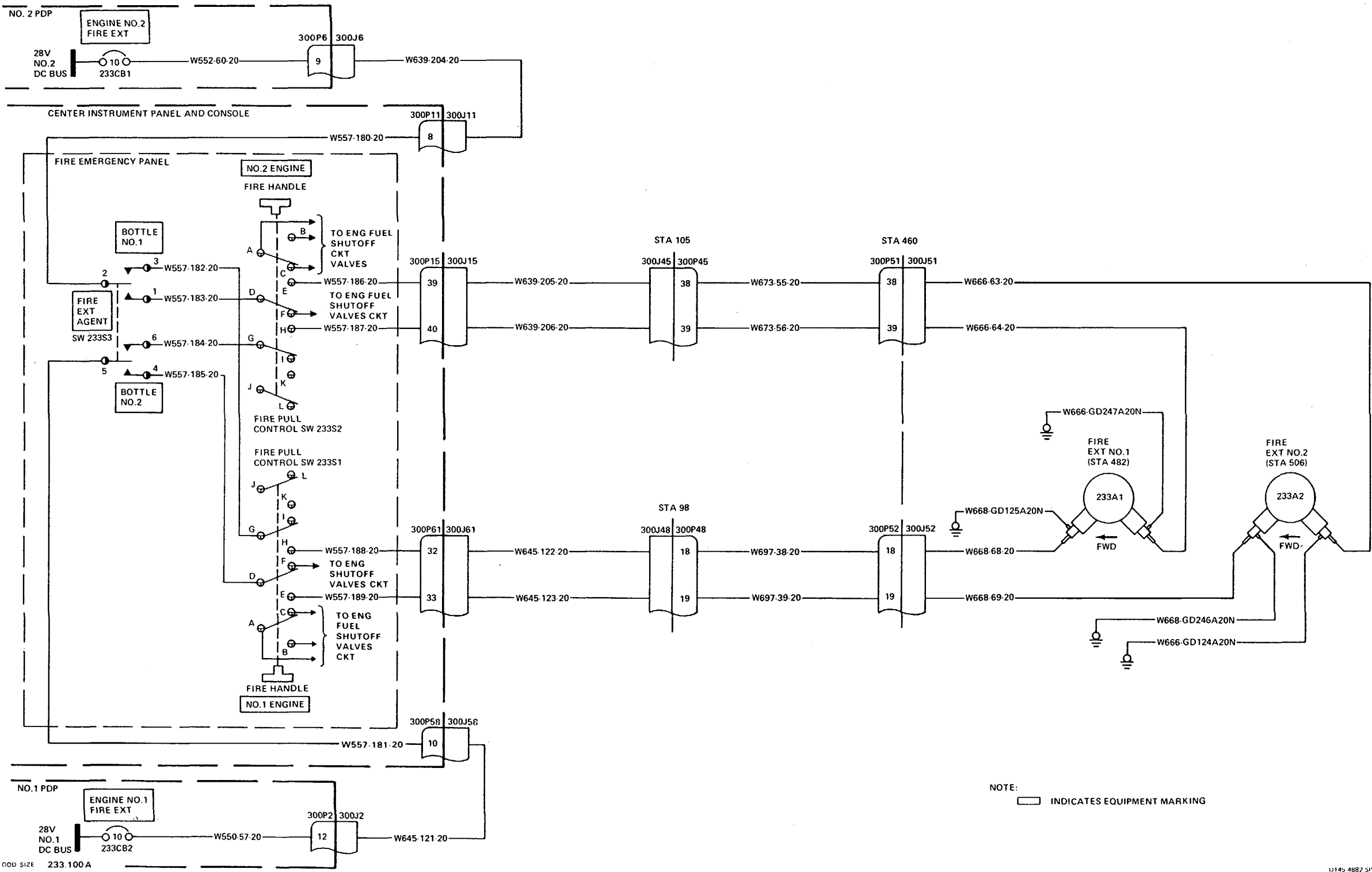
12-3

12-3.1



12-3.2 FIRE EXTINGUISHING SYSTEM WIRING DIAGRAM

12-3.2



U145 4887 S/A



12-3.4 FIRE EXTINGUISHING SYSTEM OPERATIONAL CHECK

12-3.4

INITIAL SETUP

Applicable Configurations

All

Tools:

Multimeter

Materials

Paper Tags (E264)

Personnel Required:

Aircraft Electrician

References:

TM 55-1520-240-23

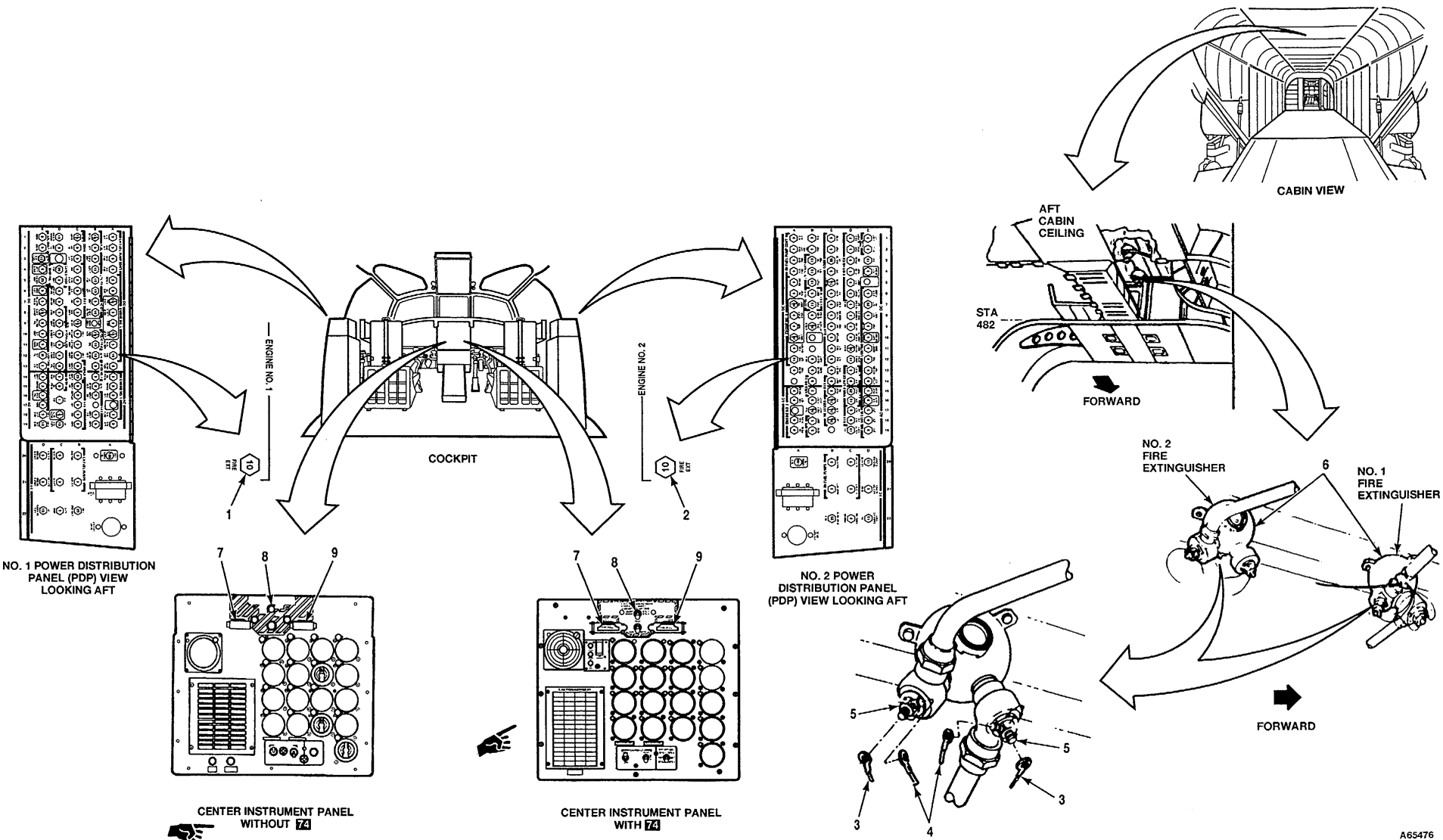
Equipment Condition:

TM 55-1520-240-23:

Battery Connected

Electrical Power On

Hydraulic Power Off



A65476

12-3.4 FIRE EXTINGUISHING SYSTEM OPERATIONAL CHECK (Continued)

12-3.4

TASK	RESULT	TASK	RESULT
<div><div>1. Check that <b>ENGINE NO. 1 FIRE EXT circuit breaker (1)</b> is closed.</div><div>2. Check that <b>ENGINE NO. 2 FIRE EXT circuit breaker (2)</b> is closed.</div><div>3. Tag and <b>disconnect two wires (3 and 4)</b> from each cartridge (5) on fire extinguishers (6). <b>CAUTION</b> Make sure wire terminal lugs do not touch cartridge terminals or fuse-lage. Aircraft damage or fire extinguisher discharge could occur. <b>CAUTION</b> Do not connect multimeter to cartridge. This could discharge extinguisher agent or reduce cartridge life.</div><div>4. Connect multimeter, set to measure <b>28 VDC</b>, between wires <b>W668-68-20(+)</b> and <b>W668-GD125A20N(-)</b> at forward cartridge (5) on No. 1 fire extinguisher (6).</div><div>5. Pull out <b>NO. 1 ENGINE fire handle (7)</b>.</div><div>6. Set and hold <b>FIRE EXT AGENT switch (8)</b> to <b>BOTTLE NO. 1</b>.</div><div>7. Release <b>FIRE EXT AGENT switch (8)</b>.</div><div>8. Disconnect multimeter. Connect multimeter to wires <b>W668-69-20 (+)</b> and <b>W668-GD246A20N (-)</b> at forward cartridge (5) on No. 2 fire extinguisher (6).</div><div>9. Set and hold <b>FIRE EXT AGENT switch (8)</b> to <b>BOTTLE NO. 2</b>.</div><div>10. Release <b>FIRE EXT AGENT switch (8)</b>.</div><div>11. Push in <b>NO. 1 ENGINE fire handle (7)</b>.</div><div>12. Pull out <b>NO. 2 ENGINE fire handle (9)</b>.</div><div>13. Disconnect multimeter. Connect multimeter to wires <b>W666-64-20 (+)</b> and <b>W666-GD247A20N</b> at aft cartridge (5) on No. 1 fire extinguisher (6).</div></div>	<div><div>If FIRE EXT circuit breaker (1) is open, close it. If it opens again, go to task 12-3.5.</div><div>If FIRE EXT circuit breaker (2) is open, close it. If it opens again, go to task 12-3.5.</div><div></div><div></div><div>Multimeter shall indicate <u>28 VDC</u>. If not, go to task 12-3.6. If voltage is present and trouble symptom, Fire extinguisher No. 1 did not discharge on No. 1 engine, was reported, replace forward cartridge (5) on No. 1 fire extinguisher (6).</div><div></div><div>Multimeter shall indicate <u>28 VDC</u>. If not, go to task 12-3.7. If voltage is present and trouble symptom, Fire extinguisher No. 2 did not discharge on No. 1 engine, was reported, replace forward cartridge (5) on No. 2 fire extinguisher (6).</div></div>	<div><div>14. Set and hold <b>FIRE EXT AGENT switch (8)</b> to <b>BOTTLE NO. 1</b>.</div><div>15. Release <b>FIRE EXT AGENT switch (8)</b>.</div><div>16. Disconnect multimeter. Connect multimeter to wire <b>W666-63-20 (+)</b> and <b>W666-GD124A20N</b> at aft cartridge (5) on No. 2 fire extinguisher (6).</div><div>17. Set and hold <b>FIRE EXT AGENT switch (8)</b> to <b>BOTTLE NO. 2</b>.</div><div>18. Release <b>FIRE EXT AGENT switch (8)</b>.</div><div>19. Push in <b>NO. 2 ENGINE fire handle (9)</b>. <b>CAUTION</b> Insure wires are connected to right terminals on cartridge. Reverse connections will prevent agent release when a fire occurs. Ground wire must be connected to terminal on side of cartridge.</div><div>20. Connect two wires (3 and 4) to each cartridge (5) on fire extinguishers (6). See tags and wiring diagram (12-3.2). Remove tags.</div></div>	<div><div>Multimeter shall indicate <u>28 VDC</u>. If not, go to task 12-3.8. If voltage is present and trouble symptom. Fire extinguisher No. 1 did not discharge on <b>No. 2</b> engine, was reported, replace aft cartridge (5) on No. 1 fire extinguisher (6).</div><div></div><div>Multimeter shall indicate <u>28 VDC</u>. If not, go to task 12-3.9. If voltage is present and trouble symptom. Fire extinguisher No. 2 did not discharge on No. 2 engine, was reported, replace aft cartridge (5) on No. 2 fire extinguisher (6).</div></div>
		FOLLOW-ON MAINTENANCE: Perform operational check of engine fuel shutoff valves. TM 55-1520-240-23: Battery Disconnected Electrical Power Off	

END OF TASK

12-3.5 FIRE EXT CIRCUIT BREAKER WILL NOT STAY CLOSED

12-3.5

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations  
All

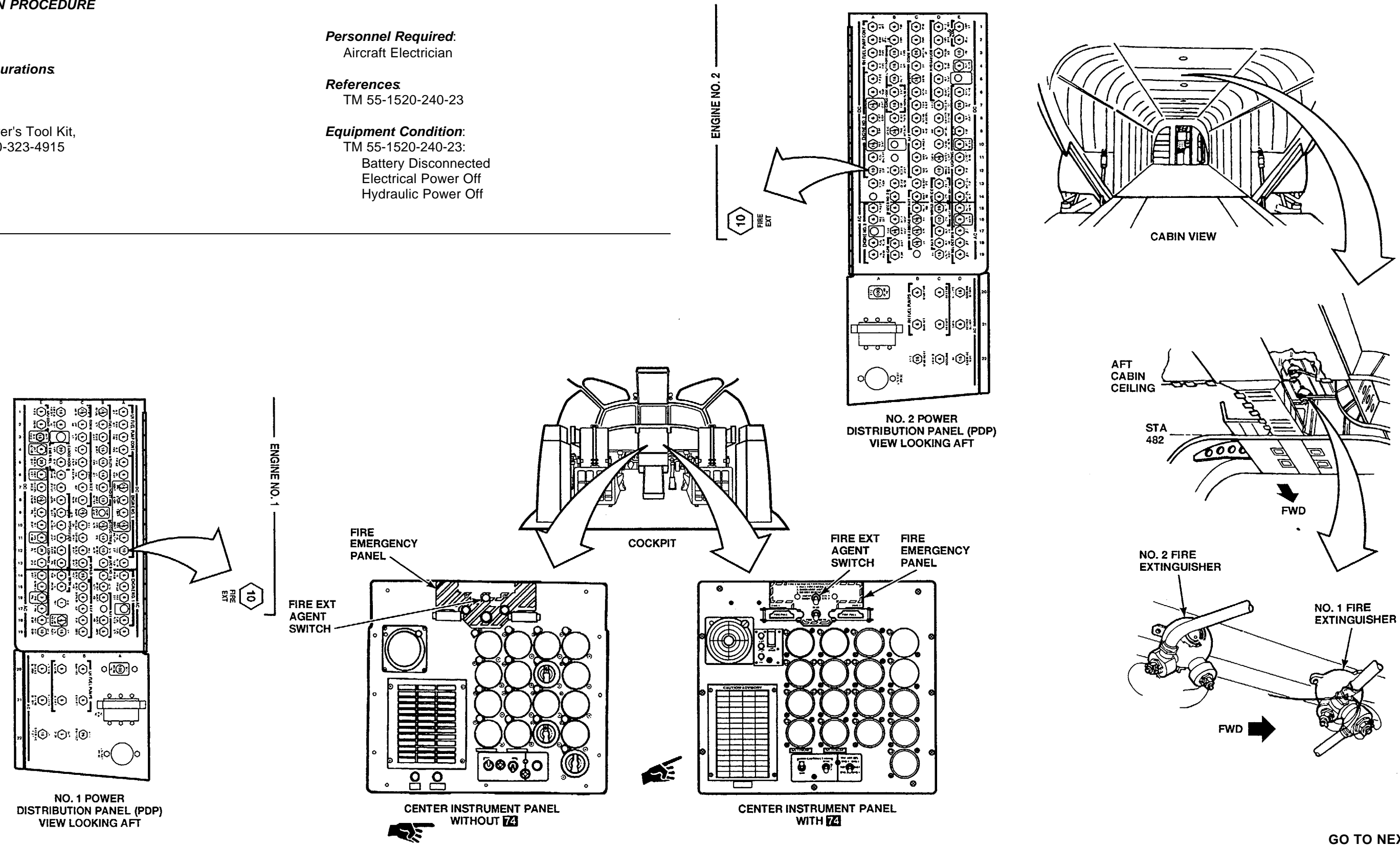
Tools  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials  
None

Personnel Required:  
Aircraft Electrician

References  
TM 55-1520-240-23

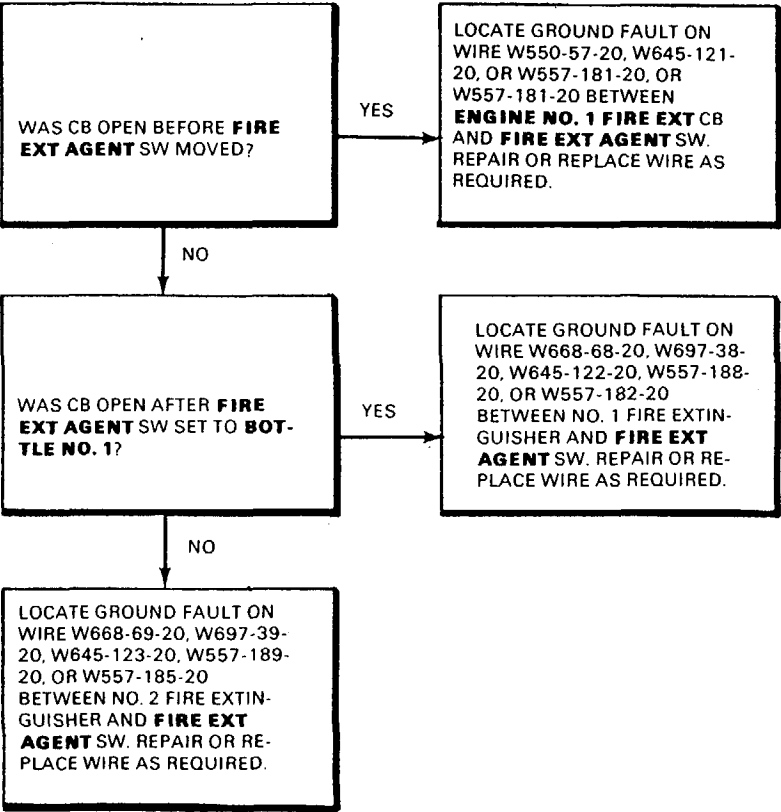
Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



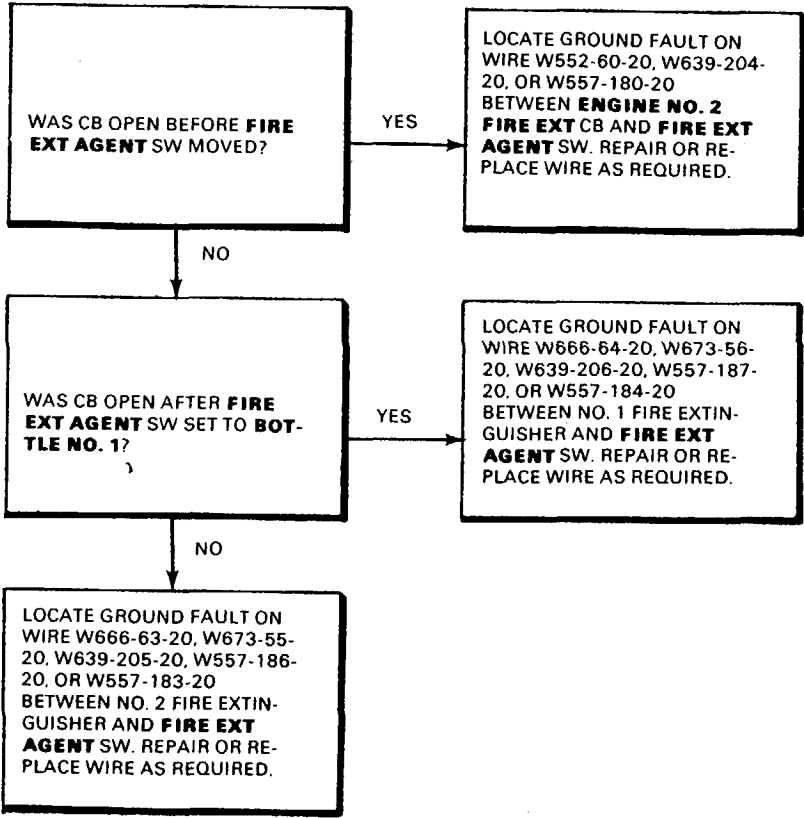
12-3.5 FIRE EXT CIRCUIT BREAKER WILL NOT STAY CLOSED  
(Continued)

12-3.5

ENGINE NO. 1 FIRE EXT CIRCUIT BREAKER  
WILL NOT STAY CLOSED



ENGINE NO. 2 FIRE EXT CIRCUIT BREAKER  
WILL NOT STAYED CLOSED



END OF TASK



12-3.6 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 1 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 1

12-3.6

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations

All

Tools

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

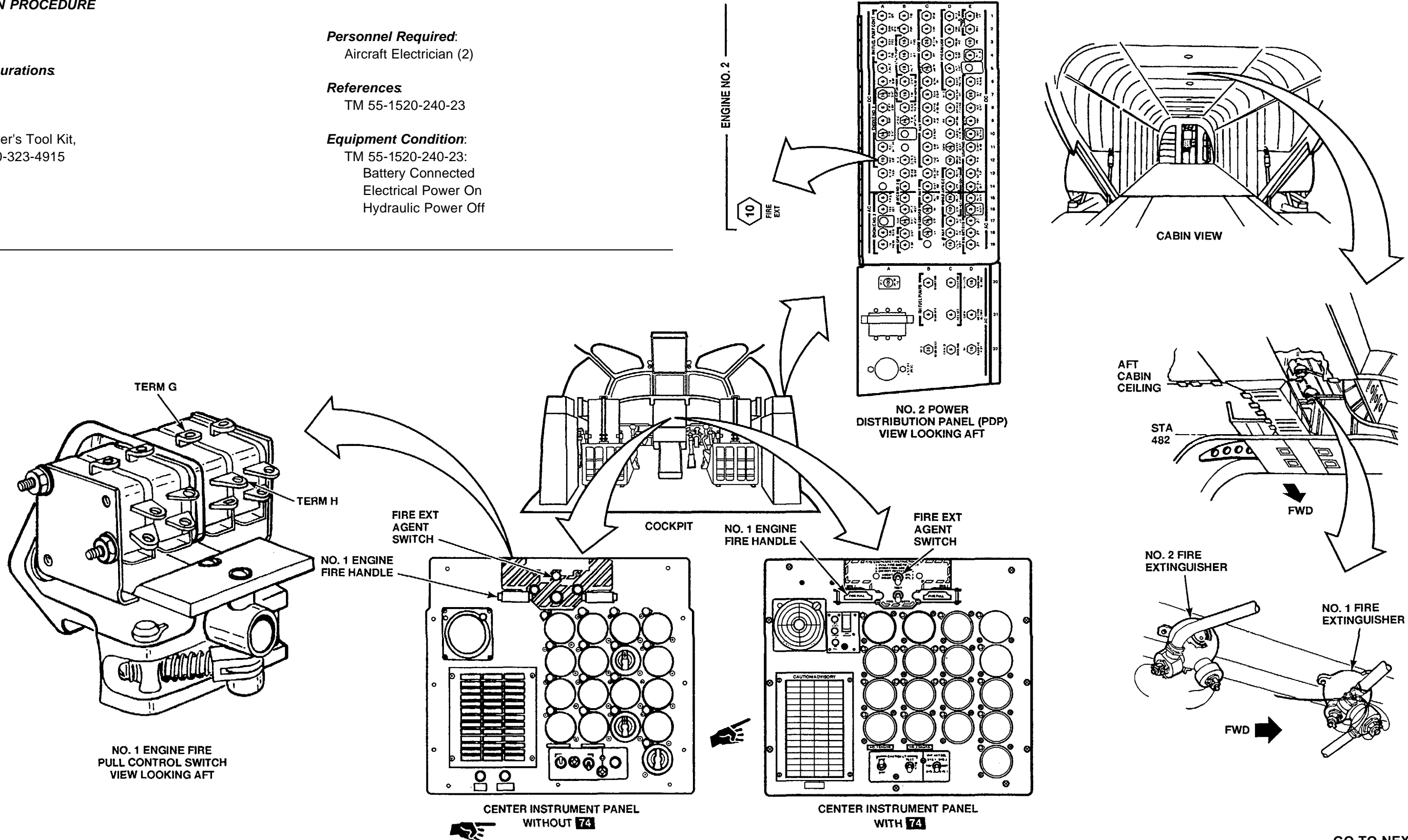
Materials

None

Personnel Required:  
Aircraft Electrician (2)

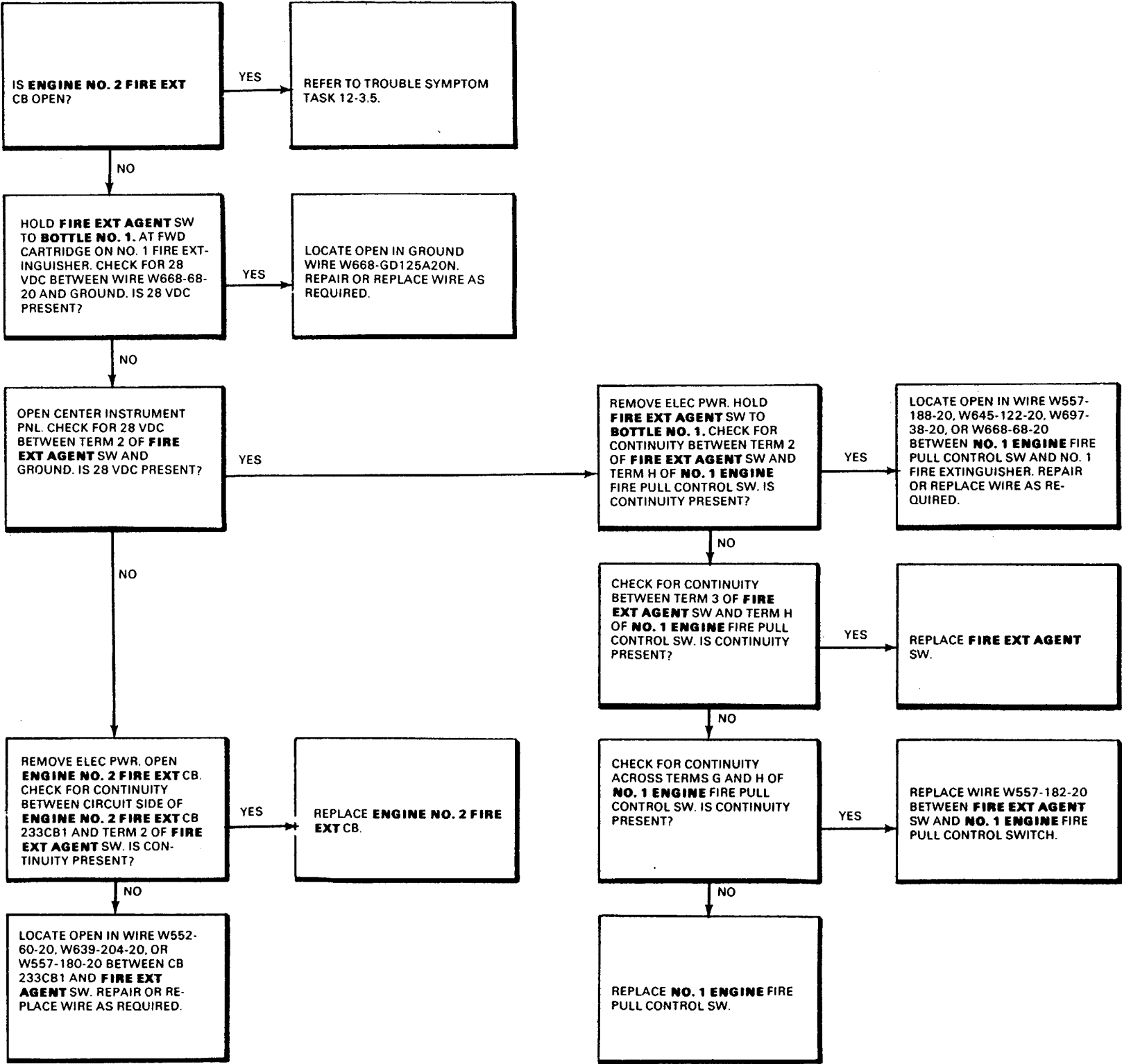
References  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



12-3.6 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 1  
ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT  
SWITCH AT BOTTLE NO. 1 (Continued)

12-3.6



END OF TASK

## FAULT ISOLATION PROCEDURE

## INITIAL SETUP

### Applicable Configurations

All

## Tools

Electrical Repairer's Tool Kit.

NSN 5180-00-323-4915

## Multimeter

## Materials

None

**Personnel Required:**

Aircraft Electrician (2)

## References.

TM 55-1520-240-23

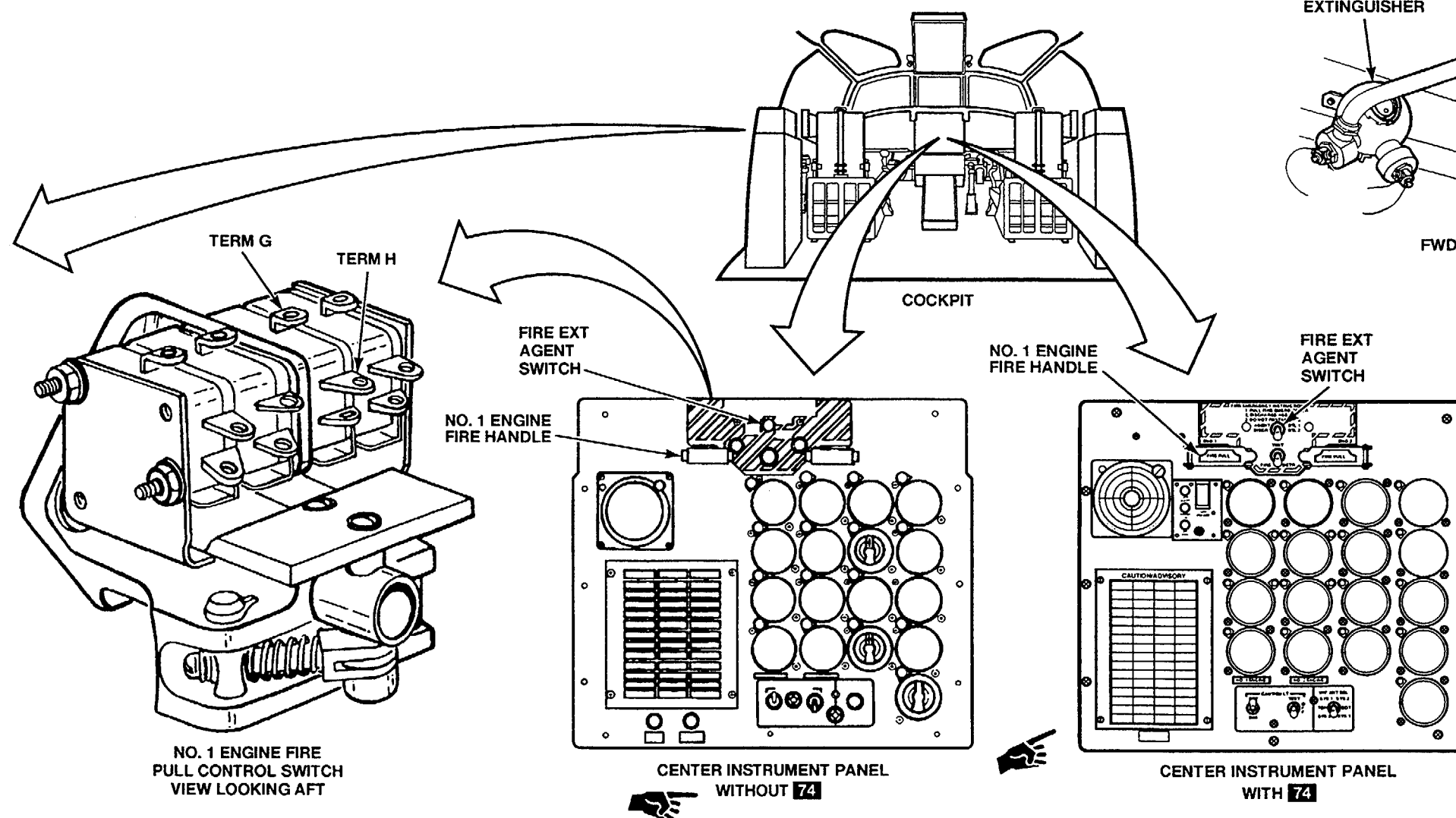
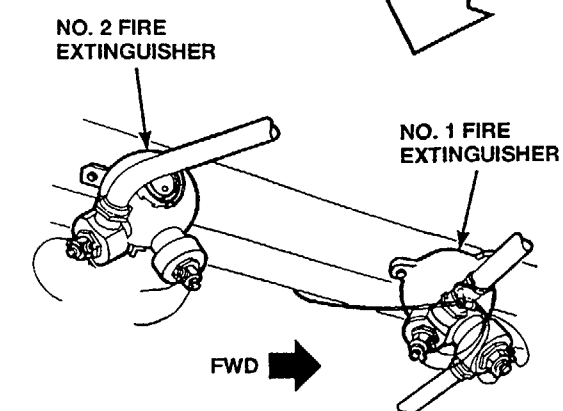
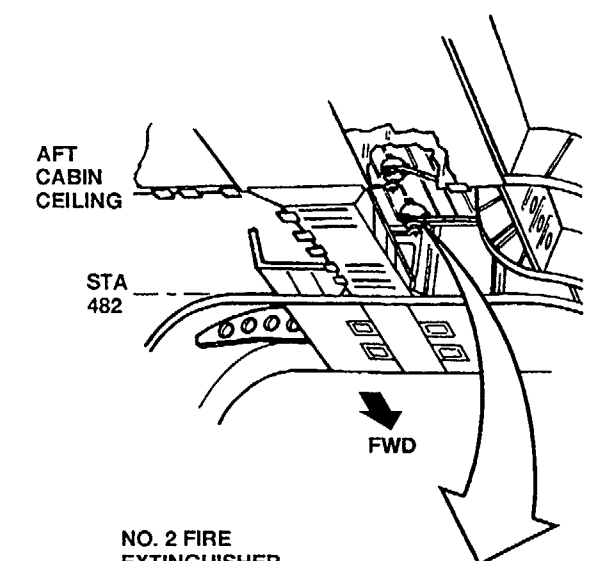
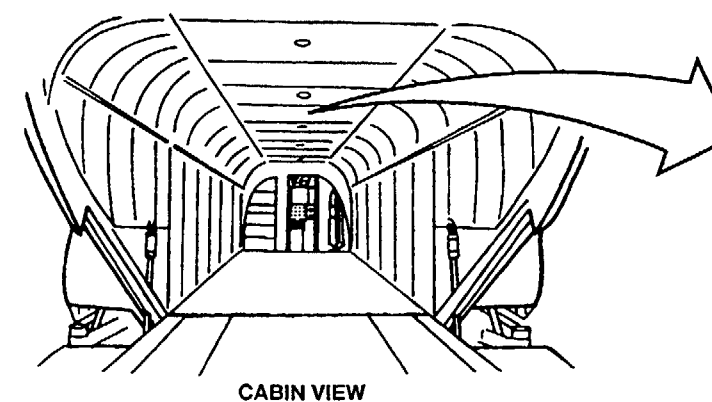
**Equipment Condition:**

TM 55-1520-240-23:

Battery Connected

Electrical Power On

Electrical Power On  
Hydraulic Power Off

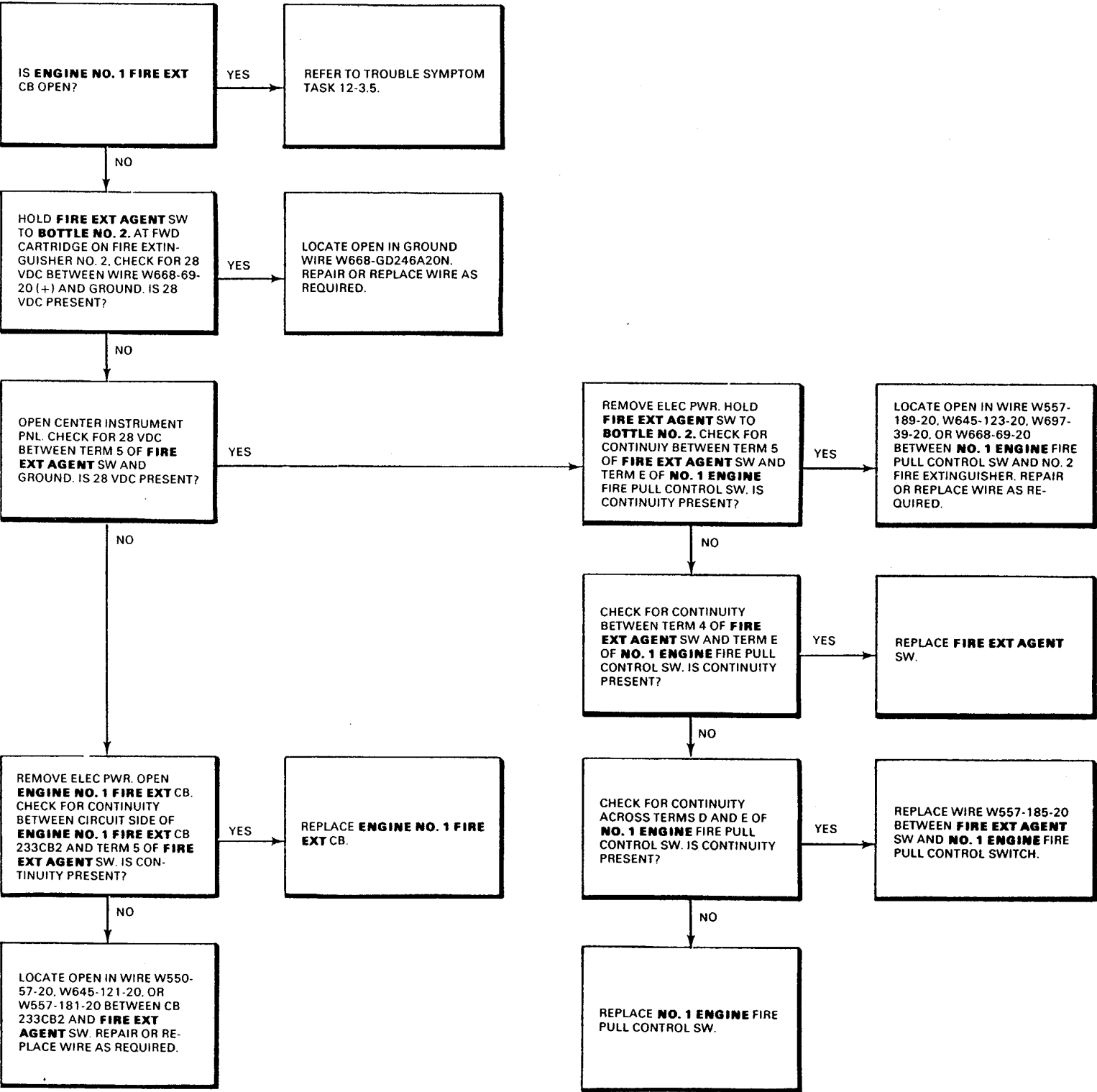


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12-3.7 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO.1  
ENGINE FIRE HANDLE OUTAND FIRE EXT AGENT  
SWITCH AT BOTTLE NO. 2 (Continued)

12-3.7



END OF TASK

12-3.8 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 2 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 1

12-3.8

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations  
All

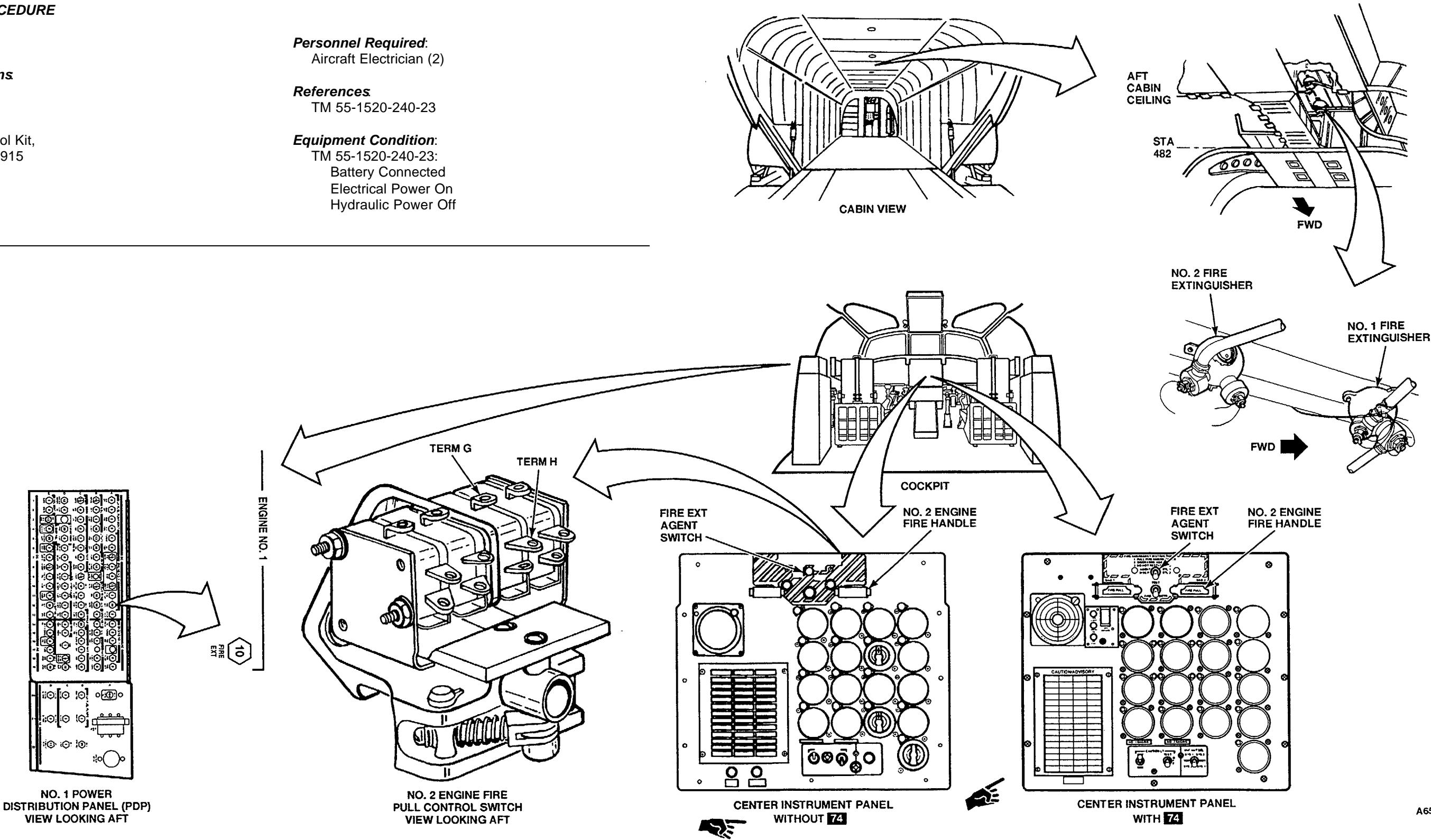
Tools  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials  
None

Personnel Required:  
Aircraft Electrician (2)

References  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

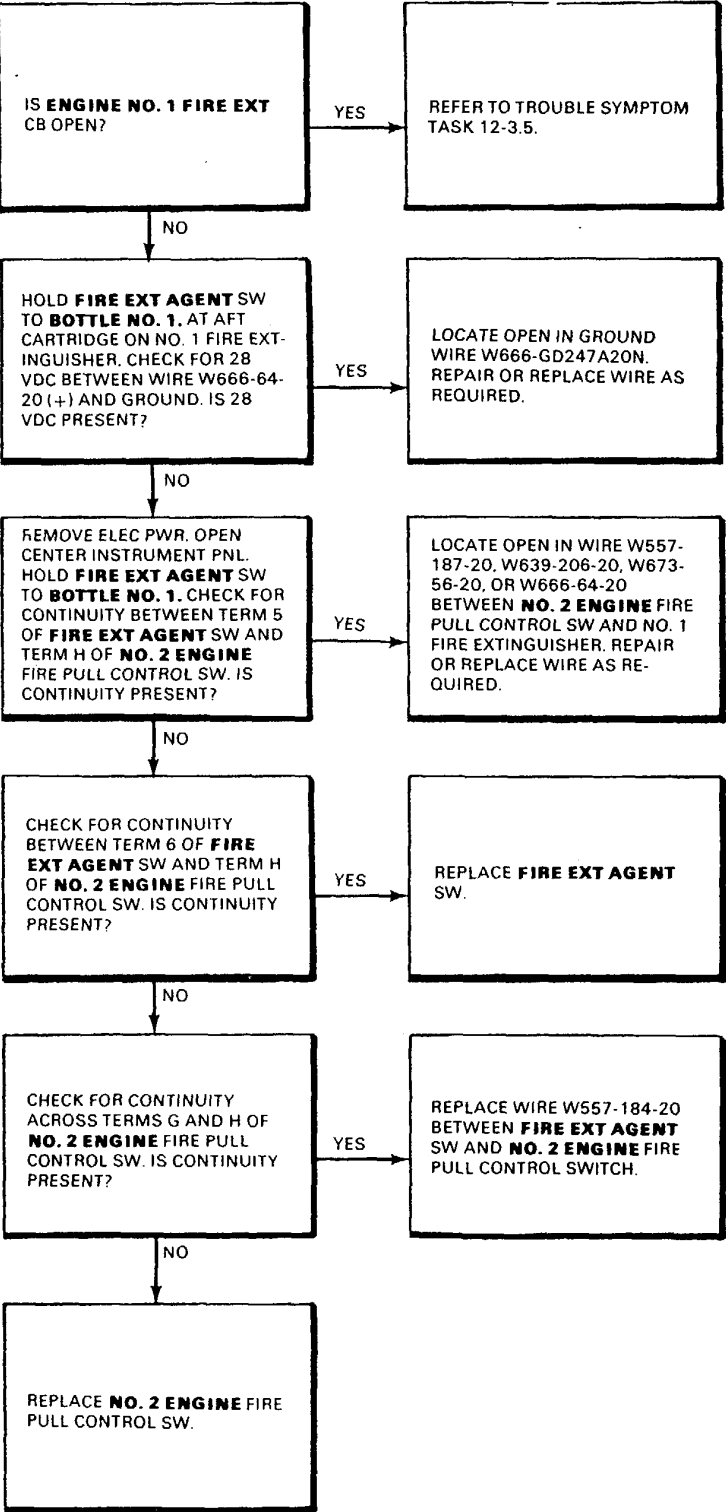


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12-3.8 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 2  
ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT  
SWITCH AT BOTTLE NO. 1 (Continued)

12-3.8



END OF TASK

12-3.9 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 2 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 2

12-3.9

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations  
All

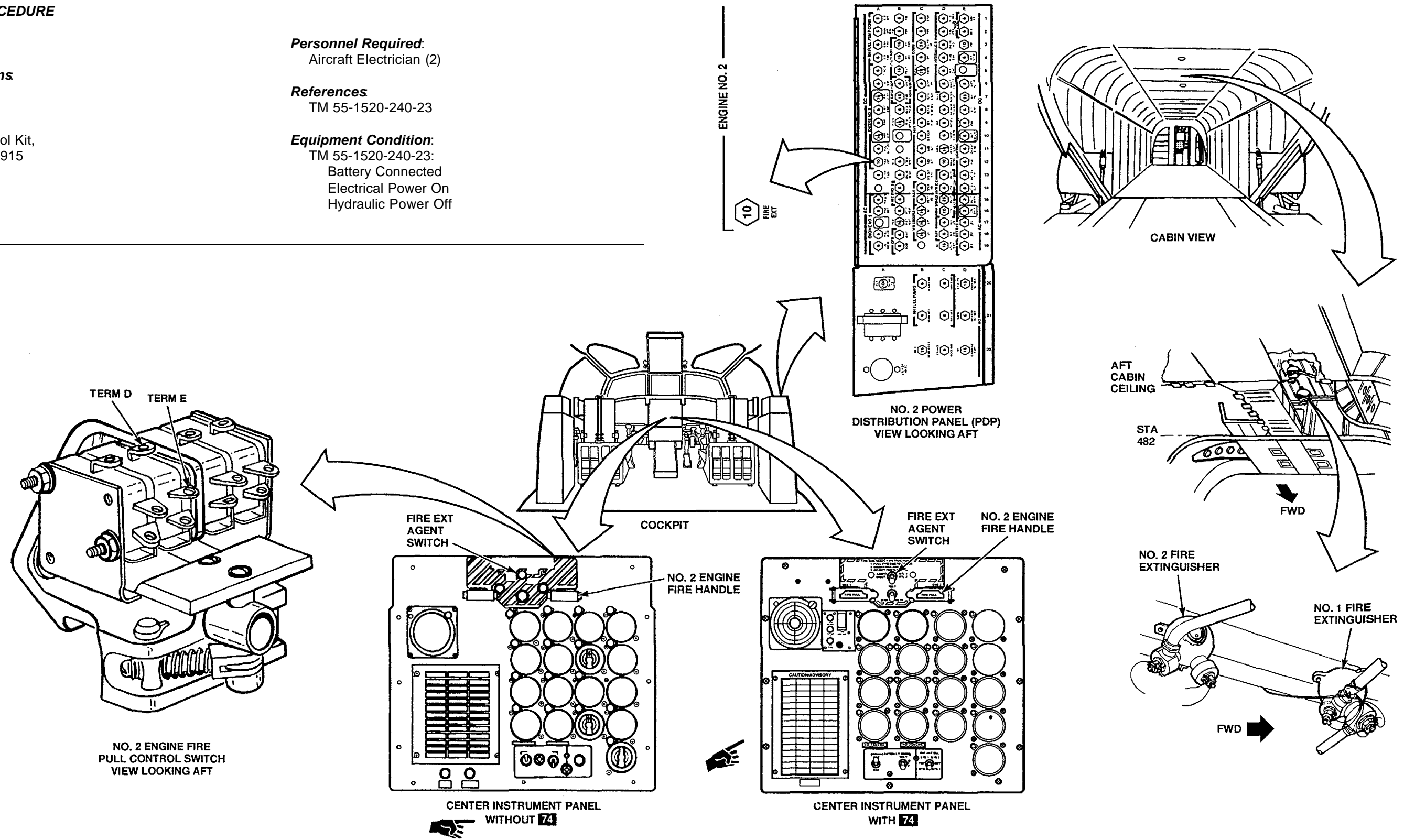
Tools  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials  
None

Personnel Required:  
Aircraft Electrician (2)

References  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

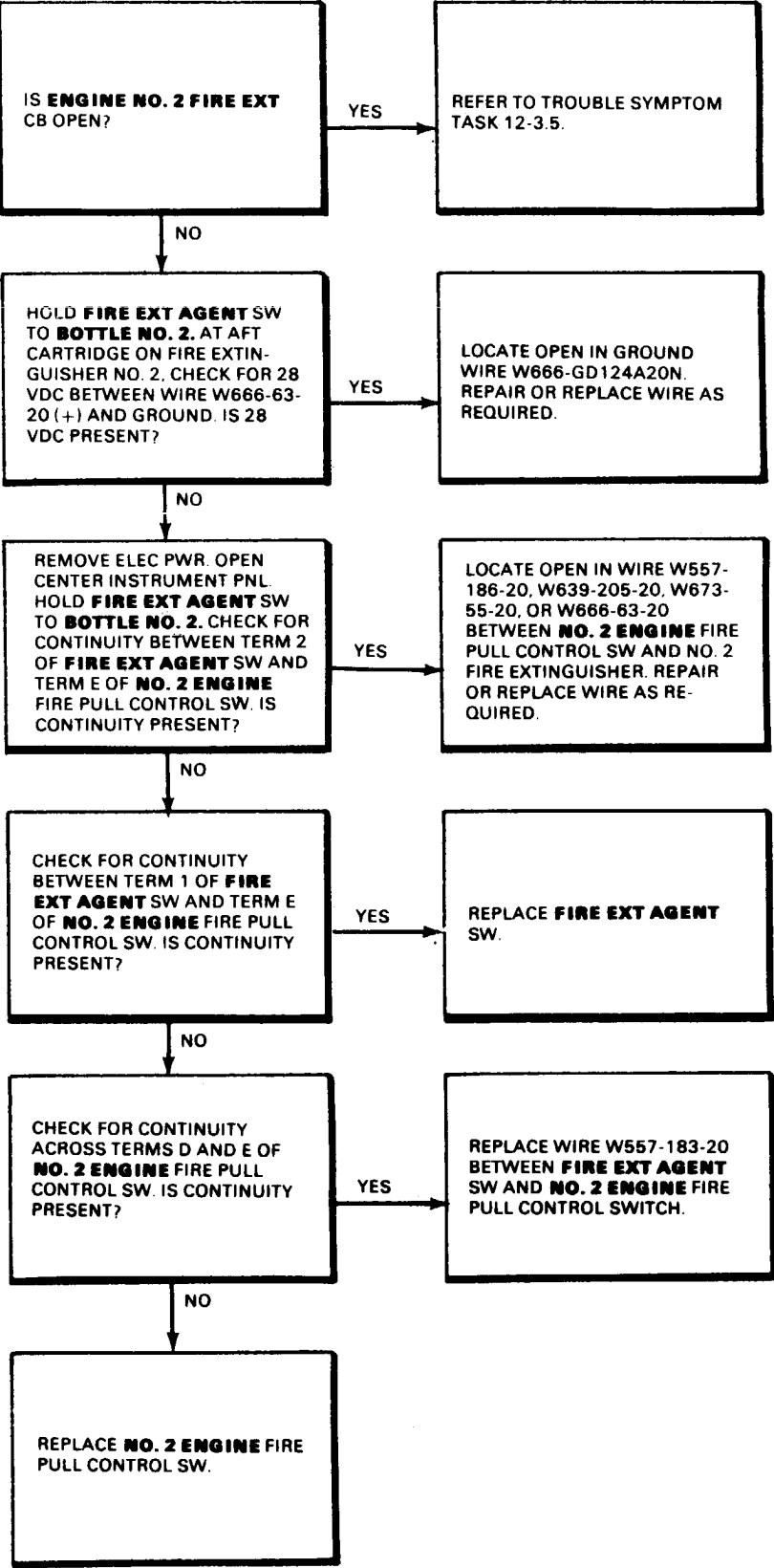


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12-3.9 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 2  
ENGINE FIRE HANDLE OUT AND FIRE EXTAGENT  
SWITCH AT BOTTLE NO. 2 (Continued)

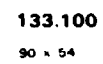
12-3.9



END OF TASK



## 12-4 WINDSHIELD WIPERS



12-4.2 WINDSHIELD WIPERS VISUAL CHECK

12-4.2

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692  
Work Stand

Materials:  
None

Personnel Required:  
67U10 Medium Helicopter Repairer

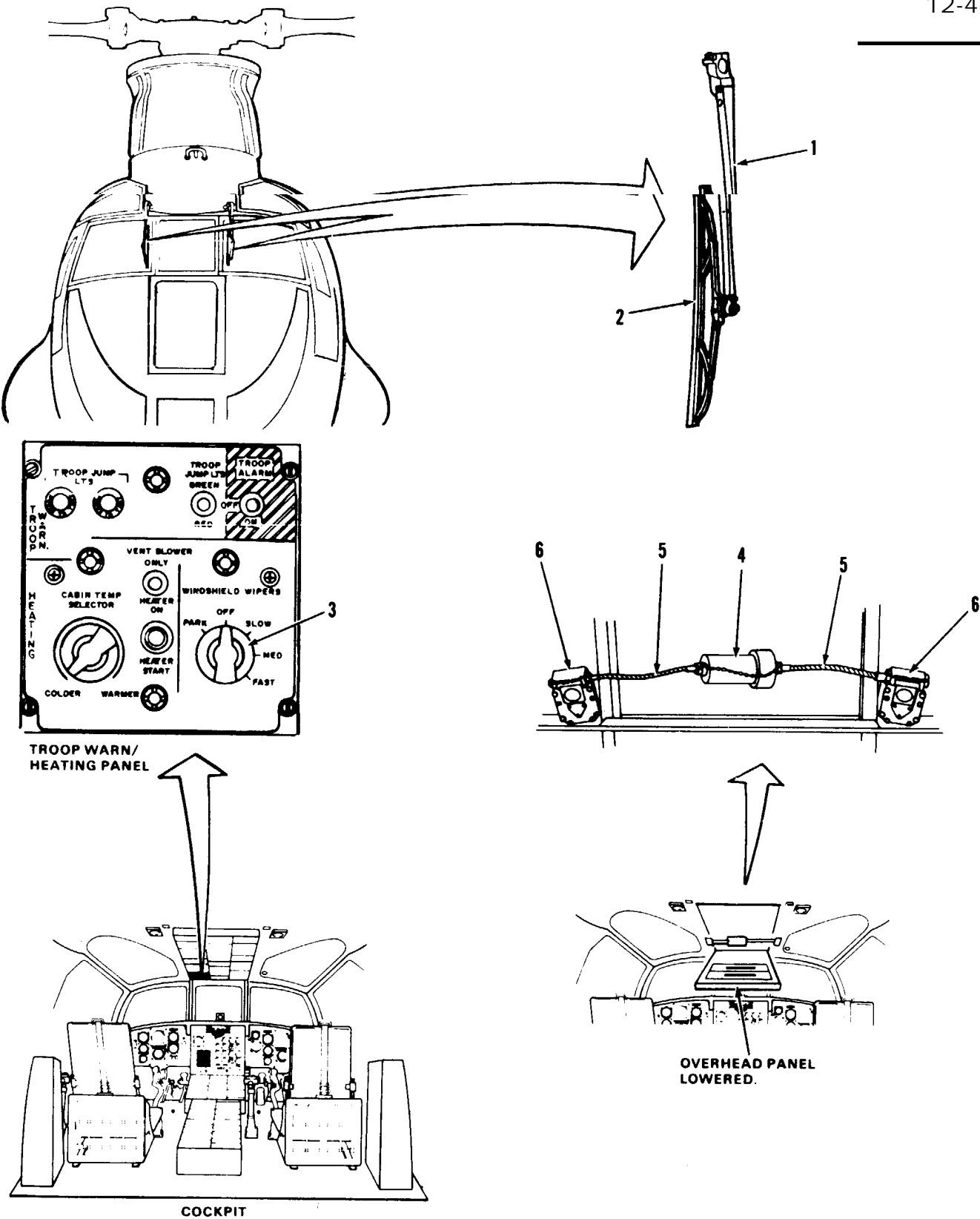
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Off

TASK	RESULT
1. Check windshield wiper arms (1) and wiper blades (2).	If either arm (1) is damaged, replace it. If either blade (2) is cracked, torn, or loose, replace it.
2. Check WINDSHIELD WIPERS switch (3).	If switch (3) is loose or damaged tighten or replace it as required.
3. Lower overhead panel.	
4. Check windshield wiper motor (4), shafts (5), and actuators (6).	If windshield wiper motor (4) is loose or damaged, tighten or replace it as required. If either shaft (5) is damaged, replace it. If either actuator (6) is loose or damaged, tighten or replace it as required.

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:  
Secure overhead panel



12-4.3 WINDSHIELD WIPERS OPERATIONAL CHECK

12-4.3

INITIAL SETUP

Applicable Configurations:

- All  
Tools:  
Water Hose  
Stop Watch

Materials:  
None

Personnel Required:

- 67U10 Medium Helicopter Repairer  
68F20 Aircraft Electrician

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23

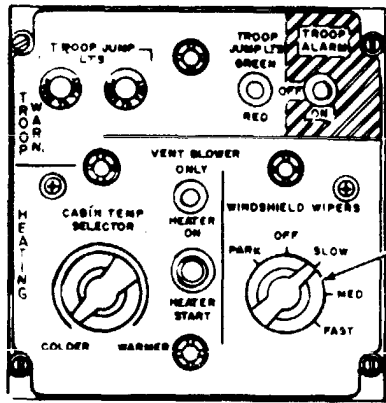
- Battery Connected  
Electrical Power On  
Hydraulic Power Off

Visual Check Of Windshleld Wipers Performed  
(Task 12-4.2)  
Hose Connected To Water Supply

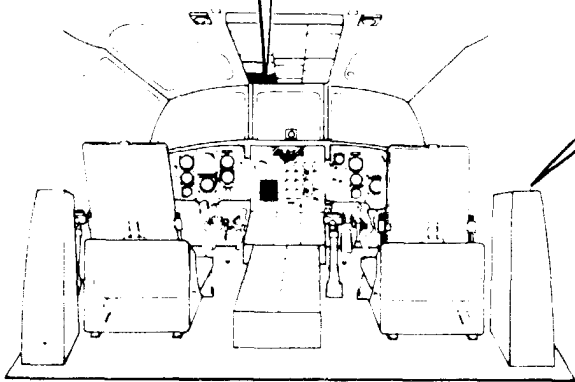
FOLLOW-ON MAINTENANCE:

- TM 55-1520-240-23:  
Electrical power off.  
Battery disconnected.  
Hose Disconnected

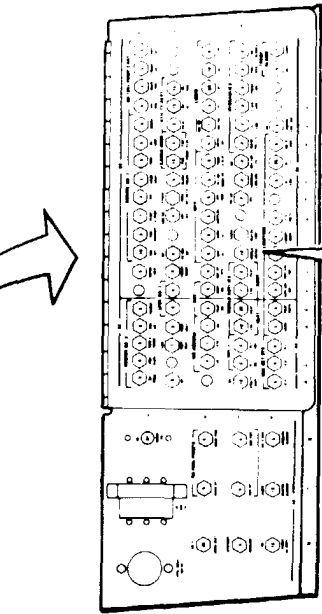
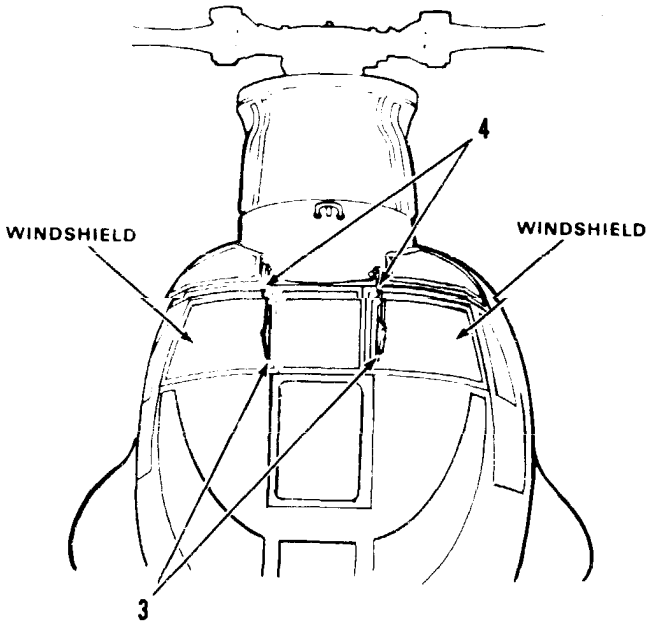
TASK	RESULT
1. Check that WSHLD WIPER circuit breaker (1) is closed.	If WSHLD WIPER clrcuit breaker (1) is open, close it. If it opens again, go to task 12-4.4.
<div>CAUTION</div> <p>Do not operate windshield wipers on dry or dirty windshield. Windshield can become scratched.</p>	
2. Spray pilot's and copilot's windshields with water. Continue spraying water until check is complete.	
3. Set WINDSHIELD WIPERS switch (2) to SLOW.	Both windshield wiper blades (3) shall move back and forth across pilot and copilot windshields approximately 80 times per minute without hitting windshield framing. If blades don't move or move too slow, go to task 12-4.5. If blades hit framing, adjust wiper arm (4) position.
4 Set WINDSHIELD WIPERS switch (2) to MED.	Both windshield wiper blades (3) shall move faster. If not, go to task 12-4.5.
5 Set WINDSHIELD WIPERS switch (2) to FAST.	Both wiper blades (3) shall move back and forth across windshields approximately 138 times per minute. If not, go to task 12-4.5. If excessive noise comes from direction of overhead panel, go to task 12-4.6
6. Set WINDSHIELD WIPERS switch (2) to OFF.	Both wiper blades (3) shall immediately stop. If not, replace WINDSHIELD WIPERS switch (2).
7. Set and hold WINDSHIELD WIPERS switch (2) to PARK.	Each wiper blade (3) shall move to inboard edge of it's windshield (park position). If not go to task 12-4.7.
8 Release WINDSHIELD WIPERS switch (2).	WINDSHIELD WIPERS switch (2) shall return to OFF position. If not, replace WINDSHIELD WIPERS switch.



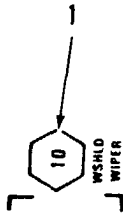
TROOP WARN/HEATING PANEL



COCKPIT



NO. 2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT



12-4.4 WSHLD WIPER CIRCUIT BREAKER WILL NOT STAY CLOSED

12-4.4

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

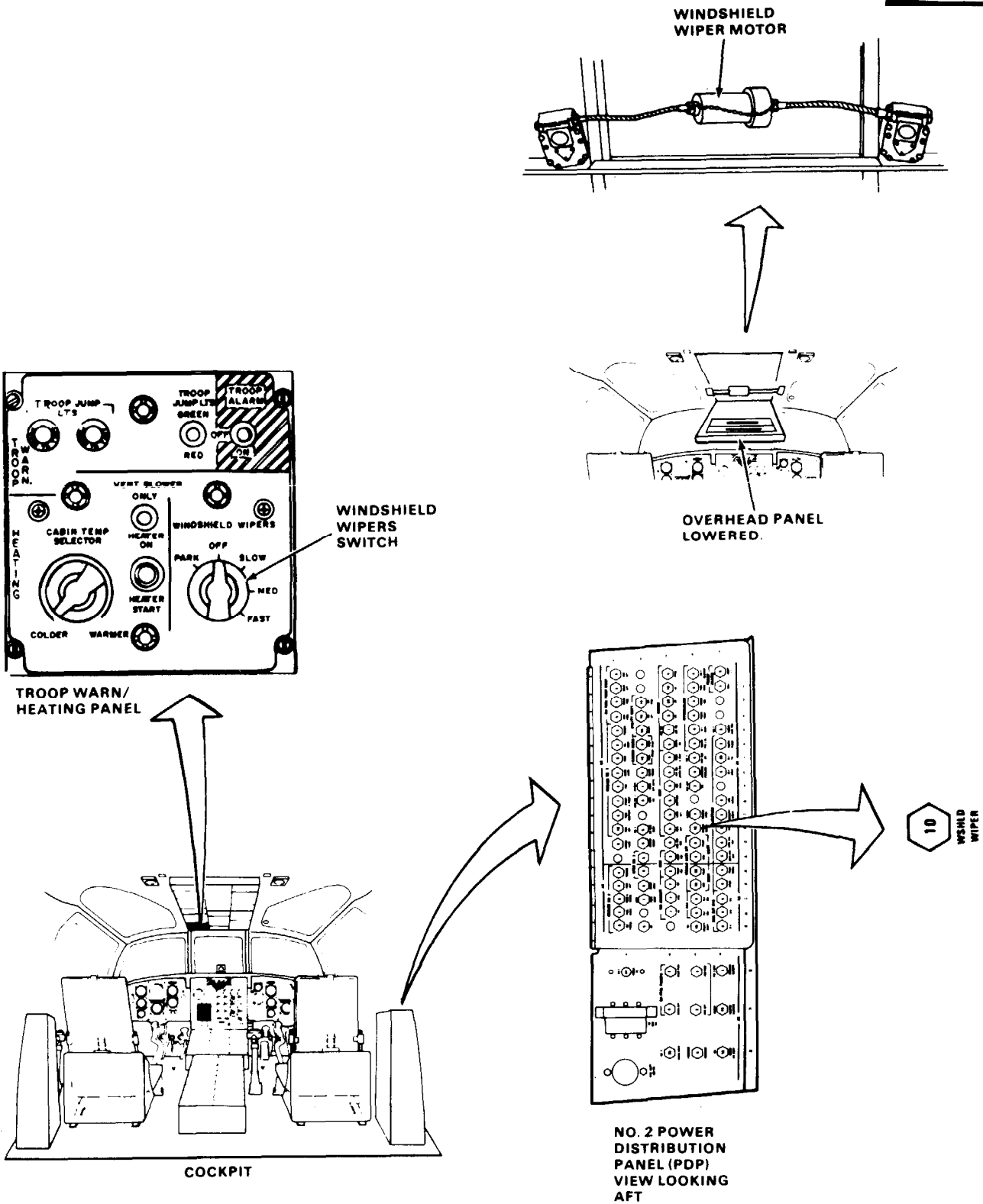
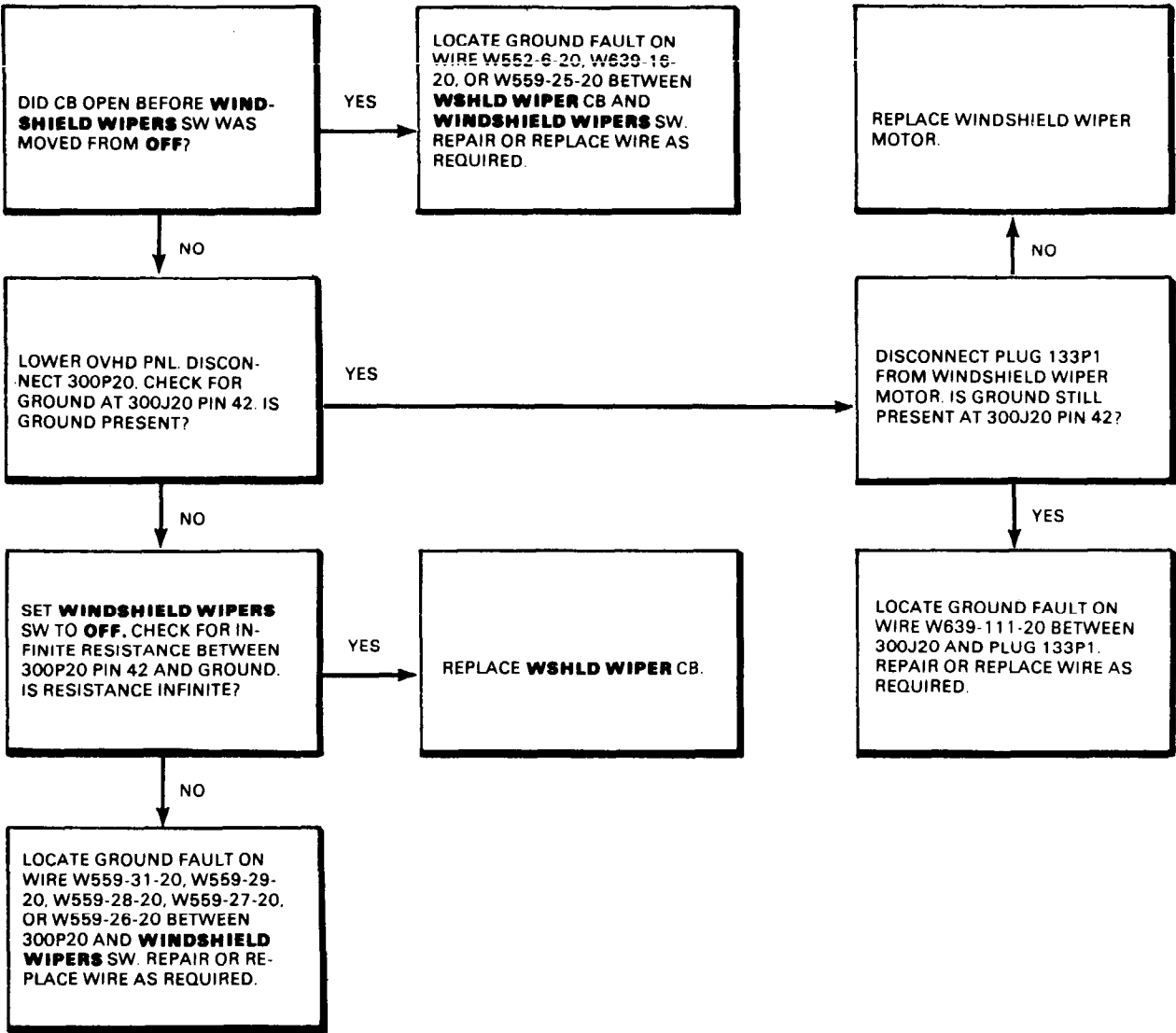
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



45x54

D145-4928-SPA

END OF TASK

12-4.5 WINDSHIELD WIPER OR WIPERS DO NOT OPERATE  
AT ONE SWITCH POSITION OR ANY SWITCH POSITION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

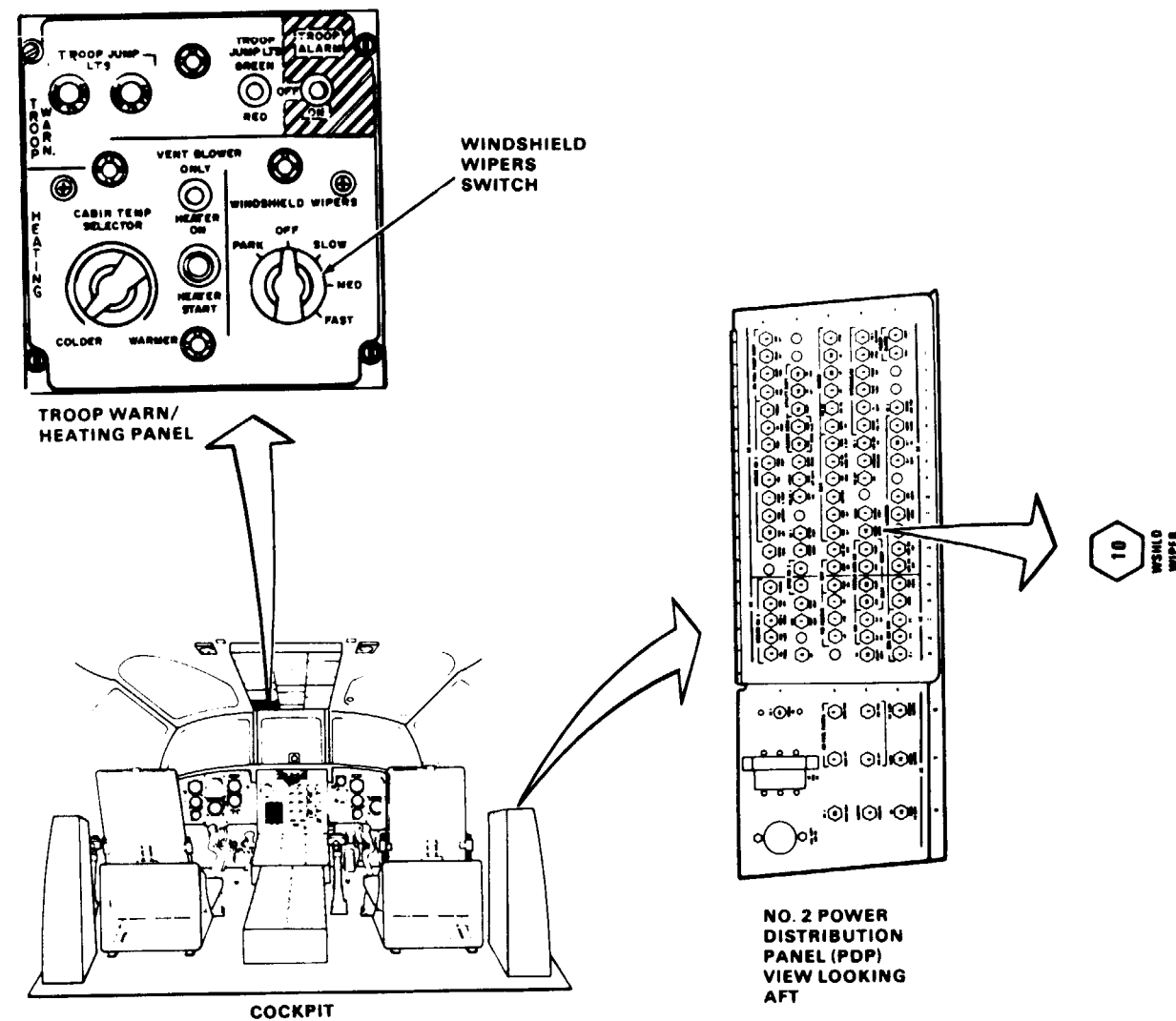
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

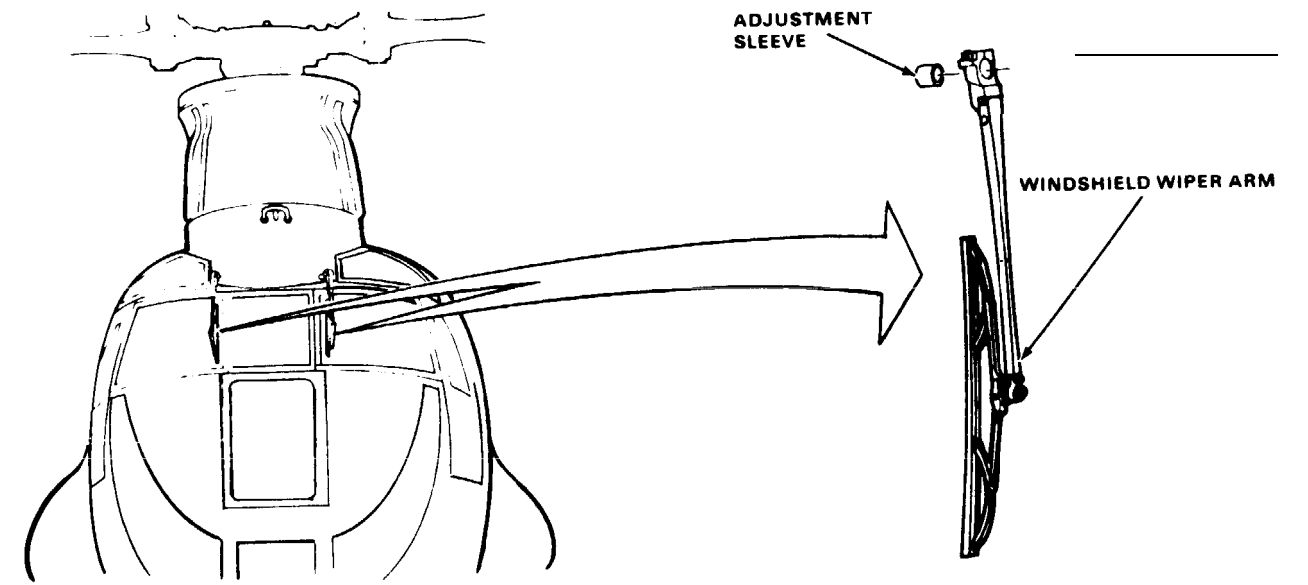
Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

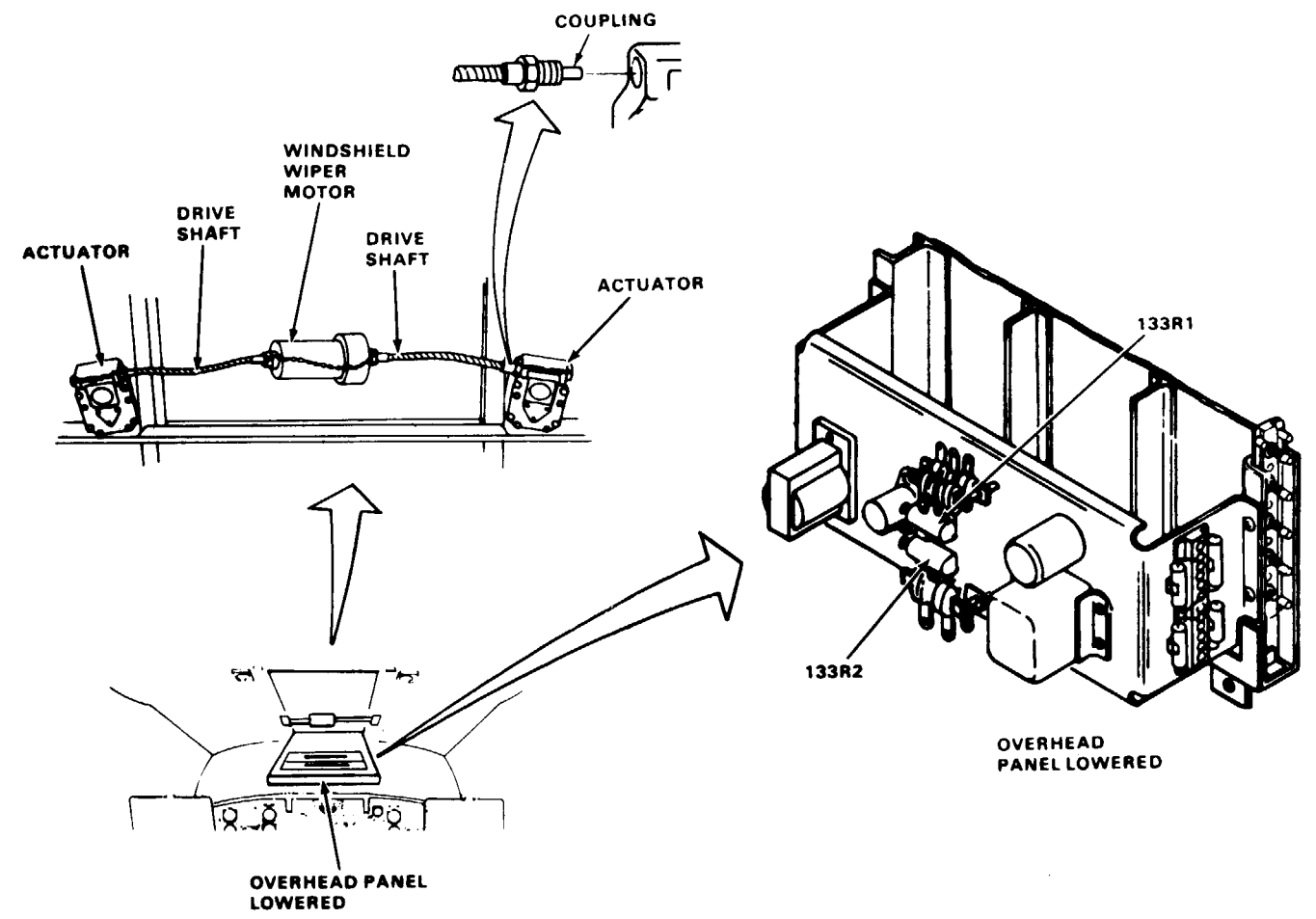
Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Windshields Clean And Wet



90154



12-4.5

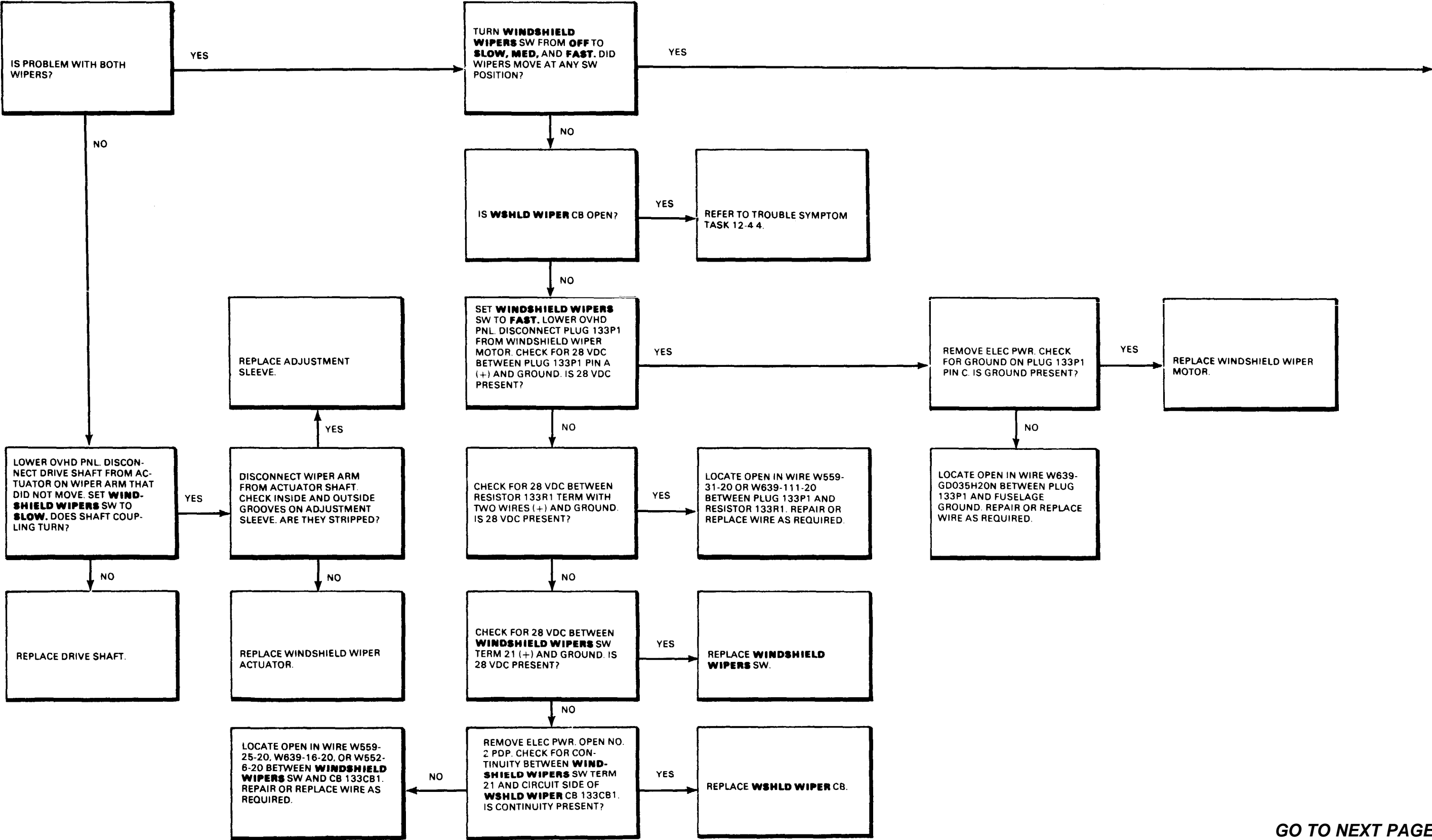


0145-4929-SPA

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12-4.5 WINDSHIELD WIPER OR WIPERS DO NOT OPERATE AT ONE SWITCH POSITION OR AT ANY SWITCH POSITION (Continued)

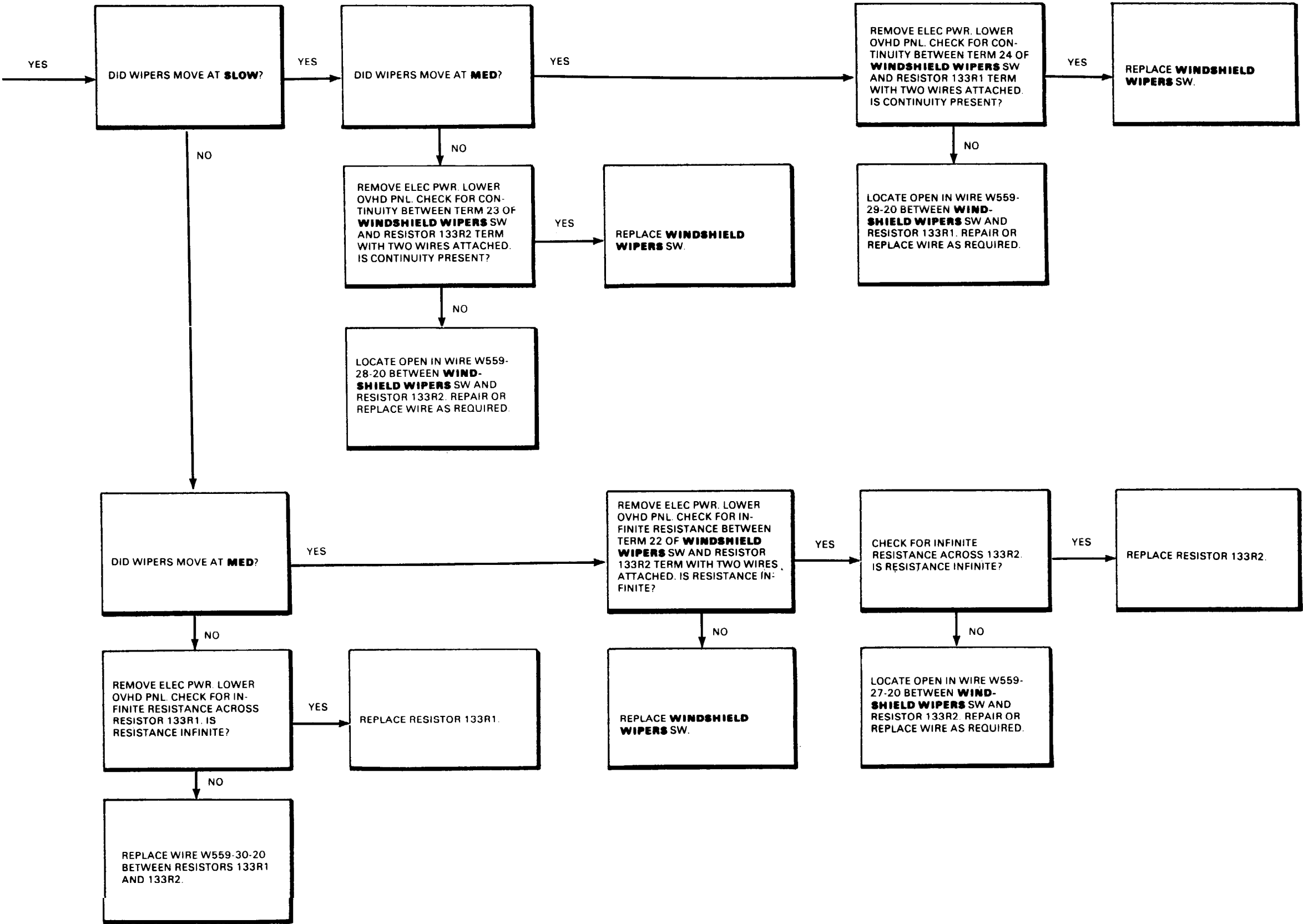
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12-4.5 WINDSHIELD WIPER OR WIPERS DO NOT OPERATE AT ONE SWITCH POSITION OR AT ANY SWITCH POSITION (Continued)

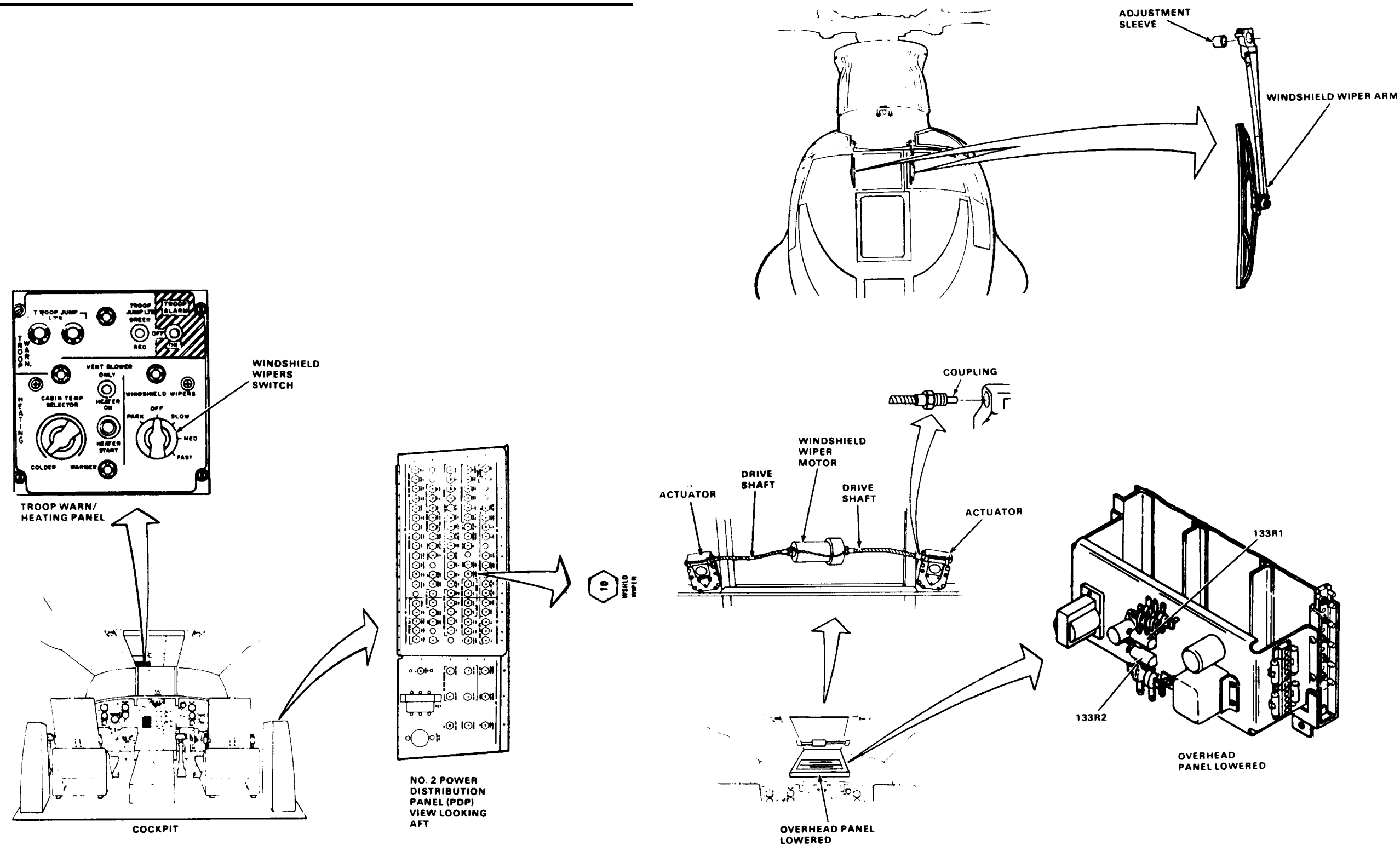
12-4.5





12-4.5 WINDSHIELD WIPER OR WIPERS DO NOT OPERATE AT ONE SWITCH POSITION OR AT ANY SWITCH POSITION (Continued)

12-4.5



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END OF TASK

12-4.6 WINDSHIELD WIPERS ARE NOISY

12-4.6

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

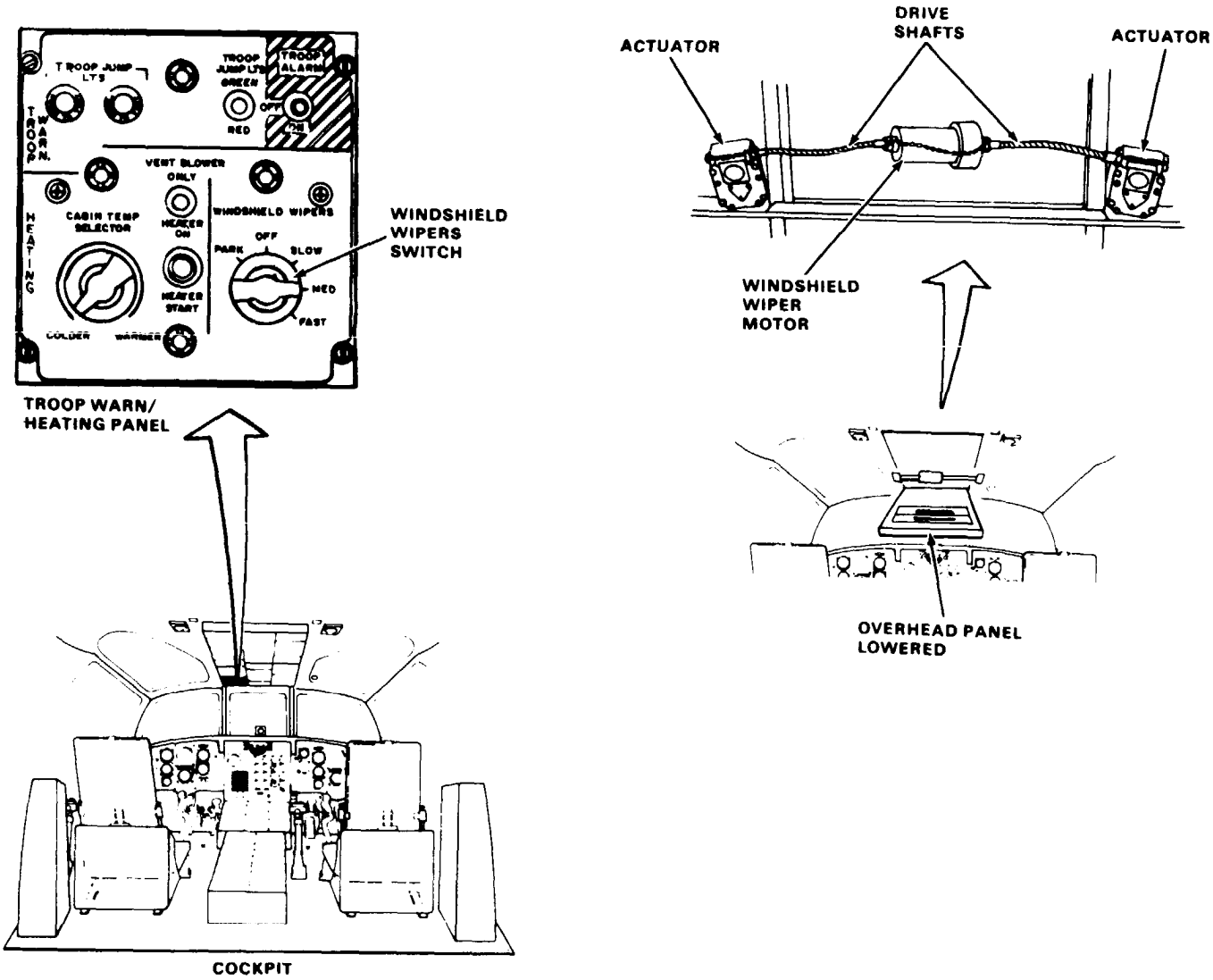
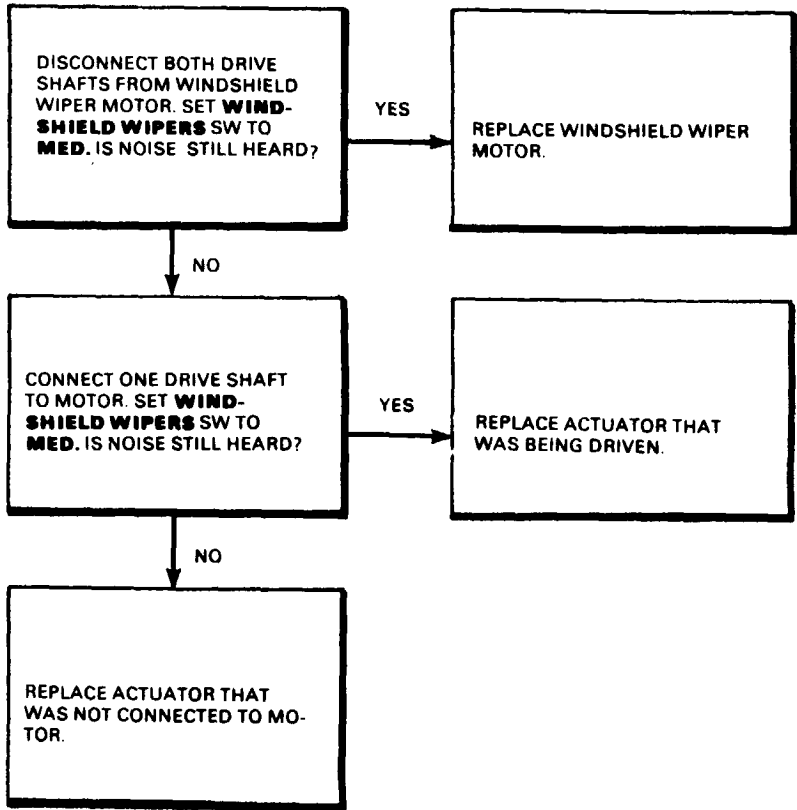
Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

Materials:  
None

Personnel Required:  
67U20 Medium Helicopter Repairer

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Overhead Panel Lowered  
Windshields Clean And Wet



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DI45-4930-SPA

END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

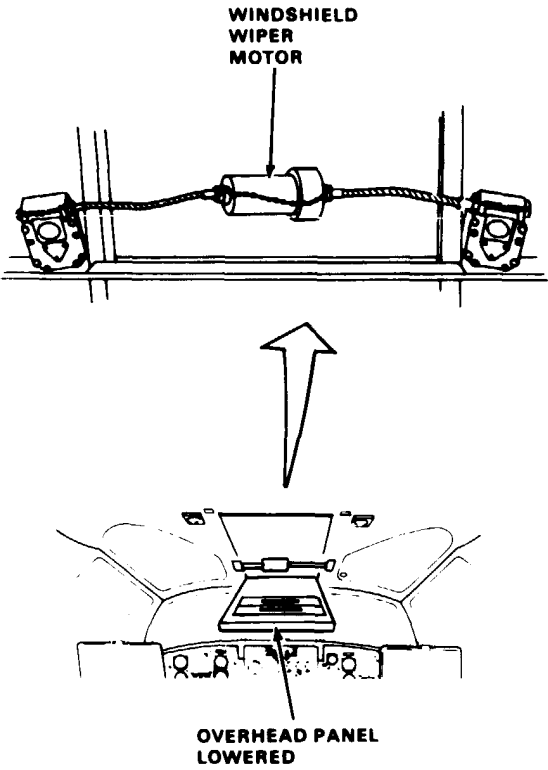
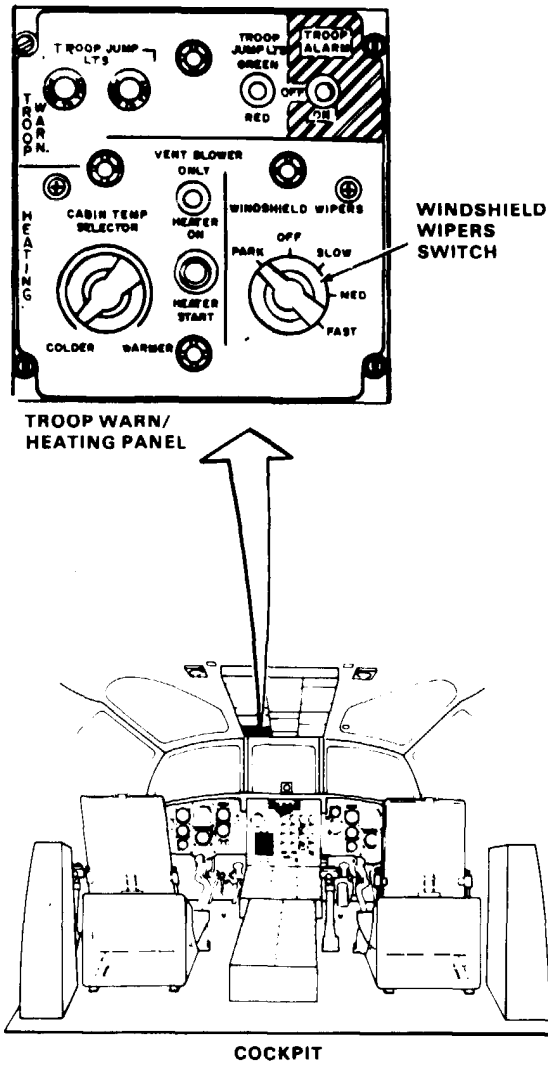
Applicable Configurations:

- Tools:
- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
  - Multimeter

Materials:

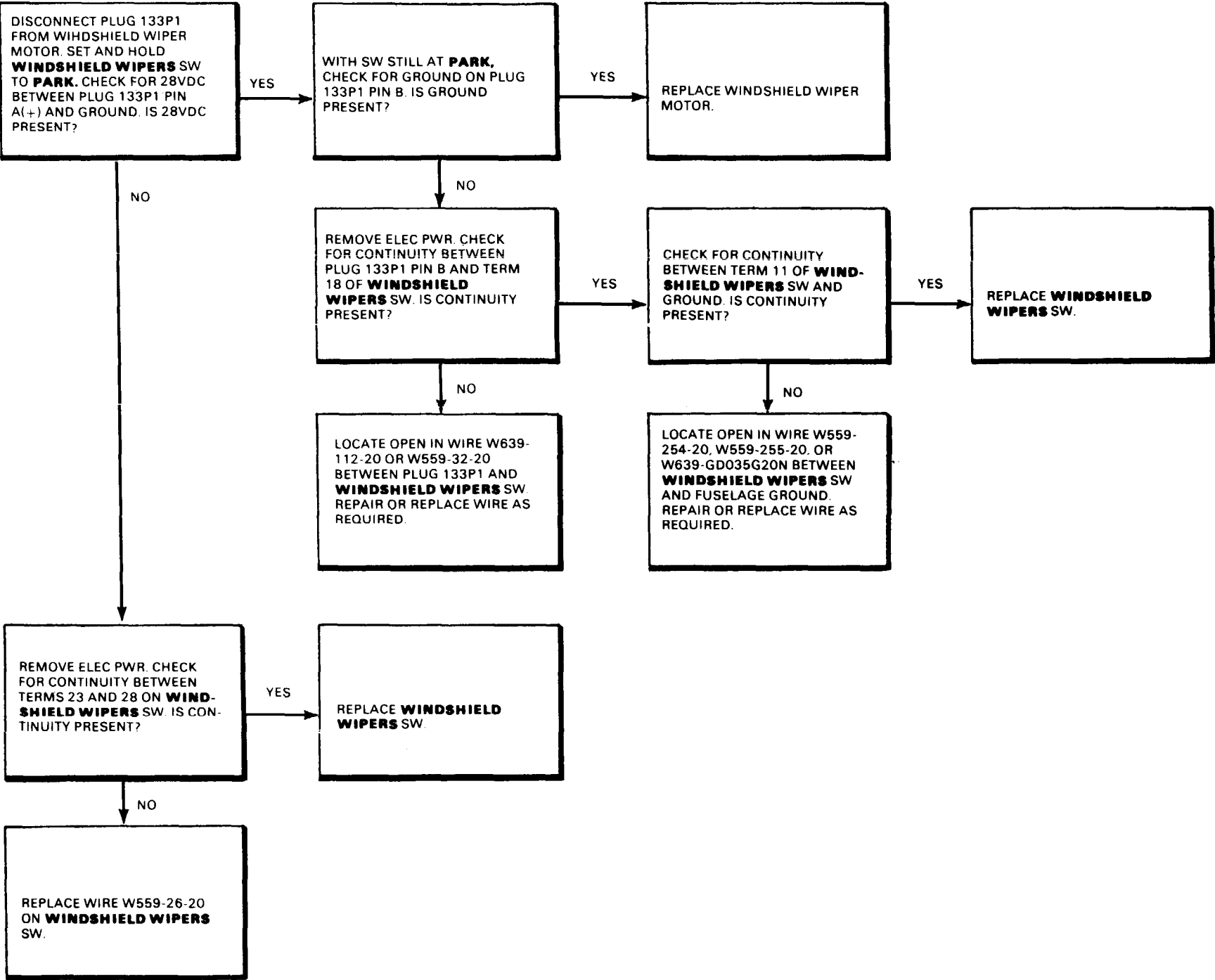
None

- Personnel Required:
- Aircraft Electrician
- References:
- TM 55-1520-240-23
- Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Overhead Panel Lowered



12-4.7 WINDSHIELD WIPERS DO NOT RETURN TO PARK POSITION  
(Continued)

12-4.7



END OF TASK

12-83/(12-84)

# CHAPTER 13

## ENVIRONMENTAL CONTROL SYSTEM TROUBLESHOOTING

CHAPTER 13  
ENVIRONMENTAL CONTROL SYSTEM TROUBLESHOOTING  
CHAPTER OVERVIEW

Chapter 13 contains procedures for Environmental Control System Troubleshooting. Each environmental control system failure symptom is listed below. Included in this Chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for the Environmental Control System. Refer to TM 55-1520-240-23 for required Environmental Control System maintenance procedures.

SYSTEM	PARA
HEATING AND VENTILATION	13-1

FAILURE SYMPTOM LIST

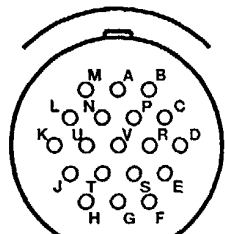
HEATING AND VENTILATION

SYMPTOM	TASK	SYMPTOM	TASK
AIR FLOW NOT FELT AT CABIN VENTS	13-1.4	HEATER DOES NOT PROVIDE WARM AIR	13-1.4
AIR FLOW NOT FELT AT JETTISONABLE DOOR DEFROSTER DUCTS OR NOSE BUBBLE VENTS	13-1.4	HEATER FAN CANNOT BE HEARD RUNNING	13-1.4
AIR FLOW NOT FELT AT PILOT OR COPILOT AIR OUTLET	13-1.4	HEATER FAN CANNOT BE HEARD RUNNING AFTER HEATER START SWITCH PRESSED AND RELEASED	13-1.4
CABIN HEATER BLOWER CIRCUIT BREAKER WILL NOT STAY CLOSED	13-1.4	HEATER FAN STOPS RUNNING IMMEDIATELY AFTER HEATER FAN SWITCH SET TO OFF	13-1.4
CABIN HEATER CONT CIRCUIT BREAKER WILL NOT STAY CLOSED	13-1.4	HEATER HOT (WITHOUT 74) HTR HOT (WITH 74) LIGHT COMES ON	13-1.4
		SYSTEM DOES NOT RESPOND TO CHANGES IN CABIN TEMP SELECTOR SETTING	13-1.4

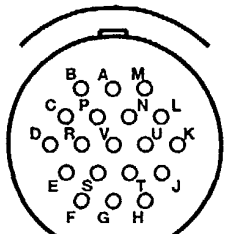
ENVIRONMENTAL SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST

REF DESIG	PART NUMBER	TYPE	MATE WITH/LOCATION	STATION LOCATION			REF DESIG	PART NUMBER	TYPE	MATE WITH/LOCATION	STATION LOCATION		
				FS	WL	BL					FS	WL	BL
GD007		150	HEATER COMPARTMENT	95	5	45R	174P6	MS3476W14-19P	21	AIRCRAFT SKIN - TANK SIDE	374	-10	50R
GD047		150	NO. 2 PDP SIDEWALL				232P1	MS3476W22-55S	161	CONSOLE - CTR INST PNL - MASTER			
GD104		151	HEATER COMPARTMENT	95	30	50R				CAUTION PANEL (WITH 74)			
GD107		151	HEATER RELAY BOX - INTERNAL	95	30	25R	232P2	MS3476W16-26S	24	CONSOLE - CTR INST PNL - MASTER			
GD108		151	HEATER COMPARTMENT	95	5	48R				CAUTION PANEL (WITHOUT 74)			
GD126		151	RH CABIN	330	30	50L	300J4	M83723-74A2461N	43	NO. 1 PDP			
GD160		151	LH CABIN	380	-10	50R	300P4	M83723-75A2461N	43	NO. 1 PDP			
TB17			WALKWAY- UNDERFLOOR	105	-30	18R	300J5	M83723-74A2041N	40	NO. 2 PDP			
082K1		77	NO. 2 PDP				300P5	M83723-75A2041N	40	NO. 2 PDP			
082K2		68	HEATER RELAY BOX INTERNAL	95	30	25R	300J15	M83723-74A24617	43	CONSOLE- UNDERFLOOR	85	-20	5R
082K3		68	HEATER RELAY BOX INTERNAL	95	30	25R	300P15	M83723-75A24617	43	CONSOLE- UNDERFLOOR	85	-20	5R
082K4		65	HEATER RELAY BOX INTERNAL	95	30	25R	300J18	M83723-73A2041N	40	OVERHEAD PANEL - COCKPIT			
082K5		66	HEATER RELAY BOX INTERNAL	95	30	25R	300P18	M83723-76A2041N	40	OVERHEAD PANEL -COCKPIT			
082P1	MS3456W10SL-4S	46	RH AFT POD INTRTANK BAY	374	-5	52R	300J20	M83723-74A2461N	43	OVERHEAD PANEL -COCKPIT			
082P2	MS3456W14S-2S	48	CABIN THERMOSTAT	350	20	50L	300P20	M83723-75A2461N	43	OVERHEAD PANEL -COCKPIT			
082P3	MS3456W14S-6S	50	HEATER TEMP CONT	95	30	25R	300J56	M83723-73A2255N	42	HEATER COMPARTMENT OVHD	105	40	30R
082P4	MS3456W14S-5S	49	HEATER FUEL CONT	115	20	45R	300P56	M83723-76A2255N	42	HEATER COMPARTMENT OVHD	105	40	30R
082P5	MS3456W10SL-4S	46	HEATER IGN ASSY	100	-10	45R	300J68	M83723-73A22556	42	HEATER COMPARTMENT OVHD	105	40	25R
082P6	MS3456W16-11S	52	HEATER DIFF PRES SW	95	5	20R	300P68	M83723-76A22556	42	HEATER COMPARTMENT OVHD	105	40	25R
082J7	MS3470W14-19P	21	HEATER RELAY BOX-- RECPT	95	30	25R							
082P7	MS3476W14-19S	21	HEATER RELAY BOX	105	30	40R							
082P8	MS3456W18-11S		HEATER FAN	105	30	40R							
174J6	MS3474W14-19S	21	AIRCRAFT SKIN - INSIDE	374	-10	50R							

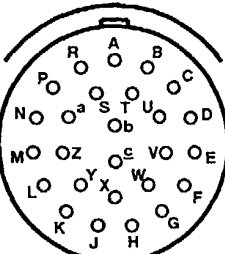
ENVIRONMENTAL SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)



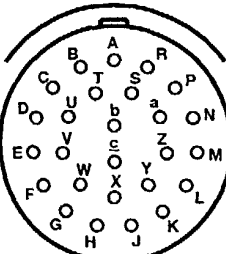
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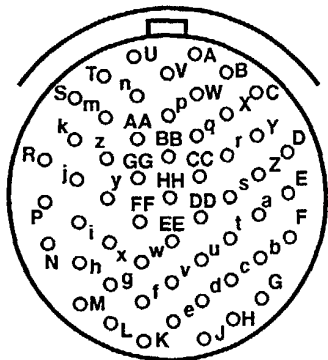
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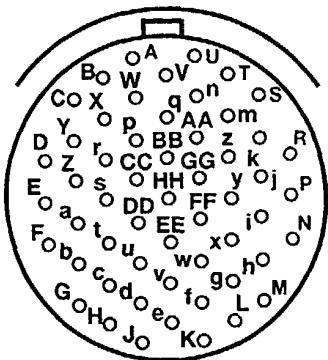
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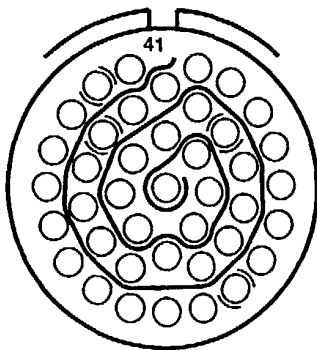
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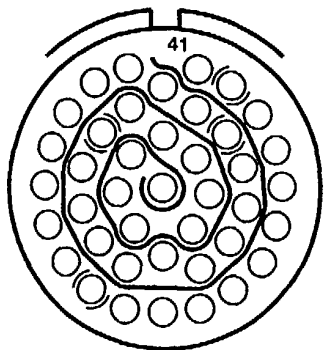
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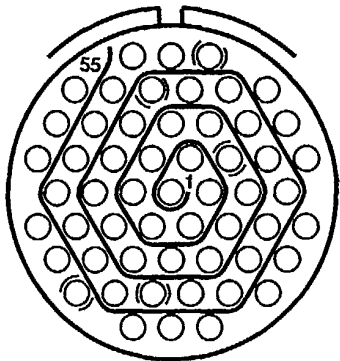
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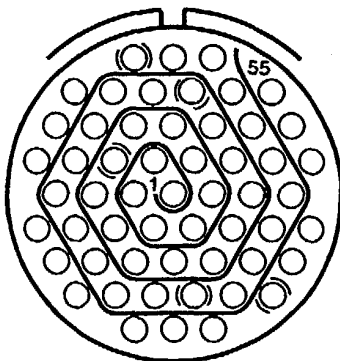


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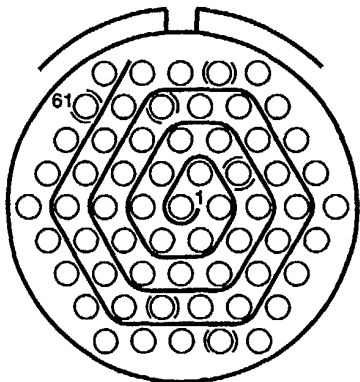
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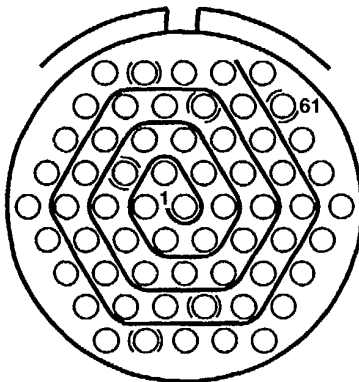


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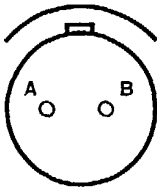
PLUG



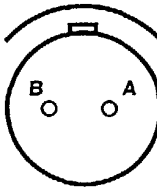
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43



46



46

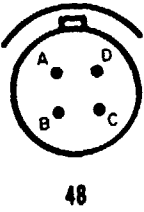


ENVIRONMENTAL SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

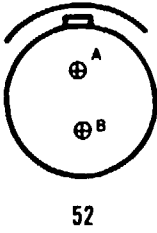
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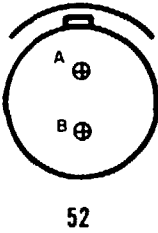
PLUG



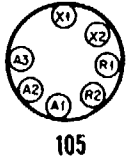
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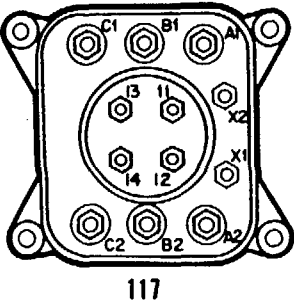
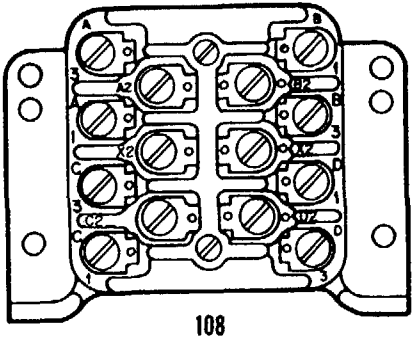
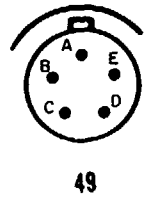
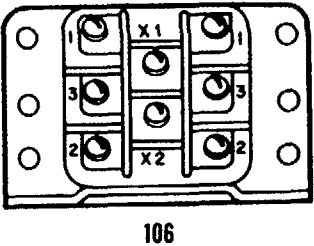
PLUG



RELAY

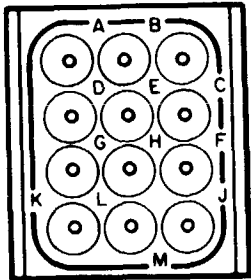


RELAY



ENVIRONMENTAL CONTROL SYSTEM ELECTRICAL COMPONENT  
LOCATION AND CONFIGURATION LIST (Continued)

GND MODULE



150

GND STUD

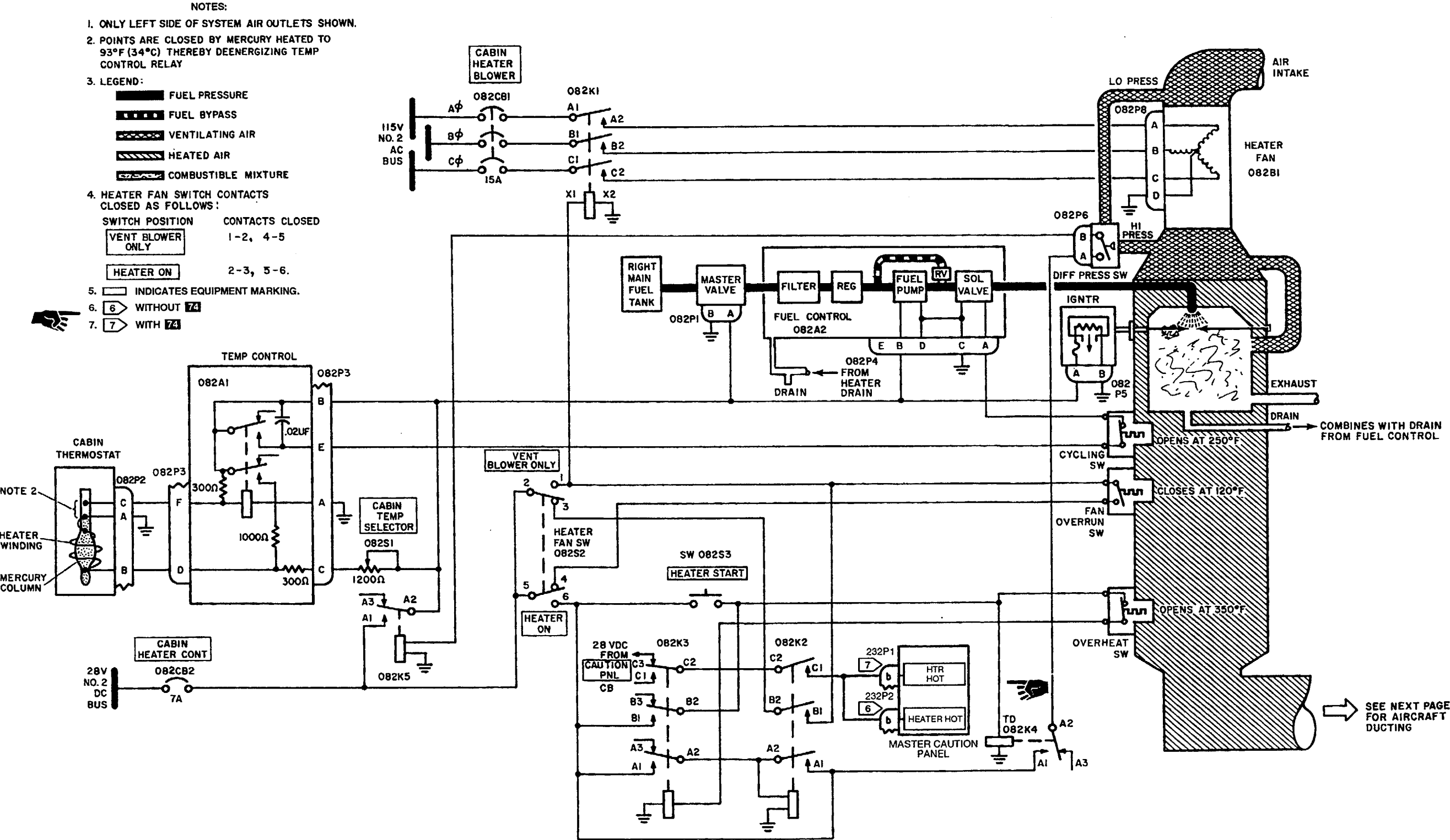


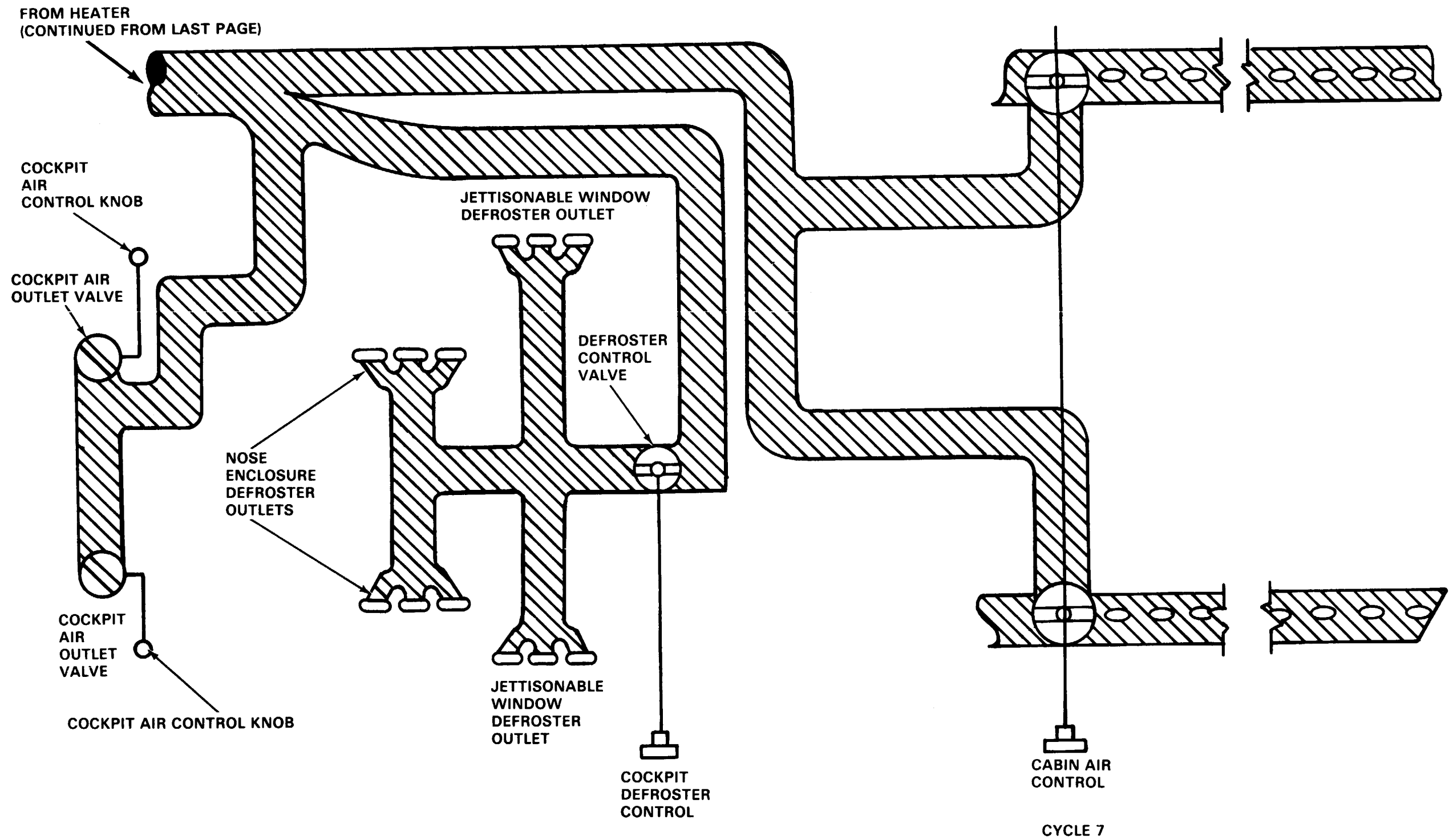
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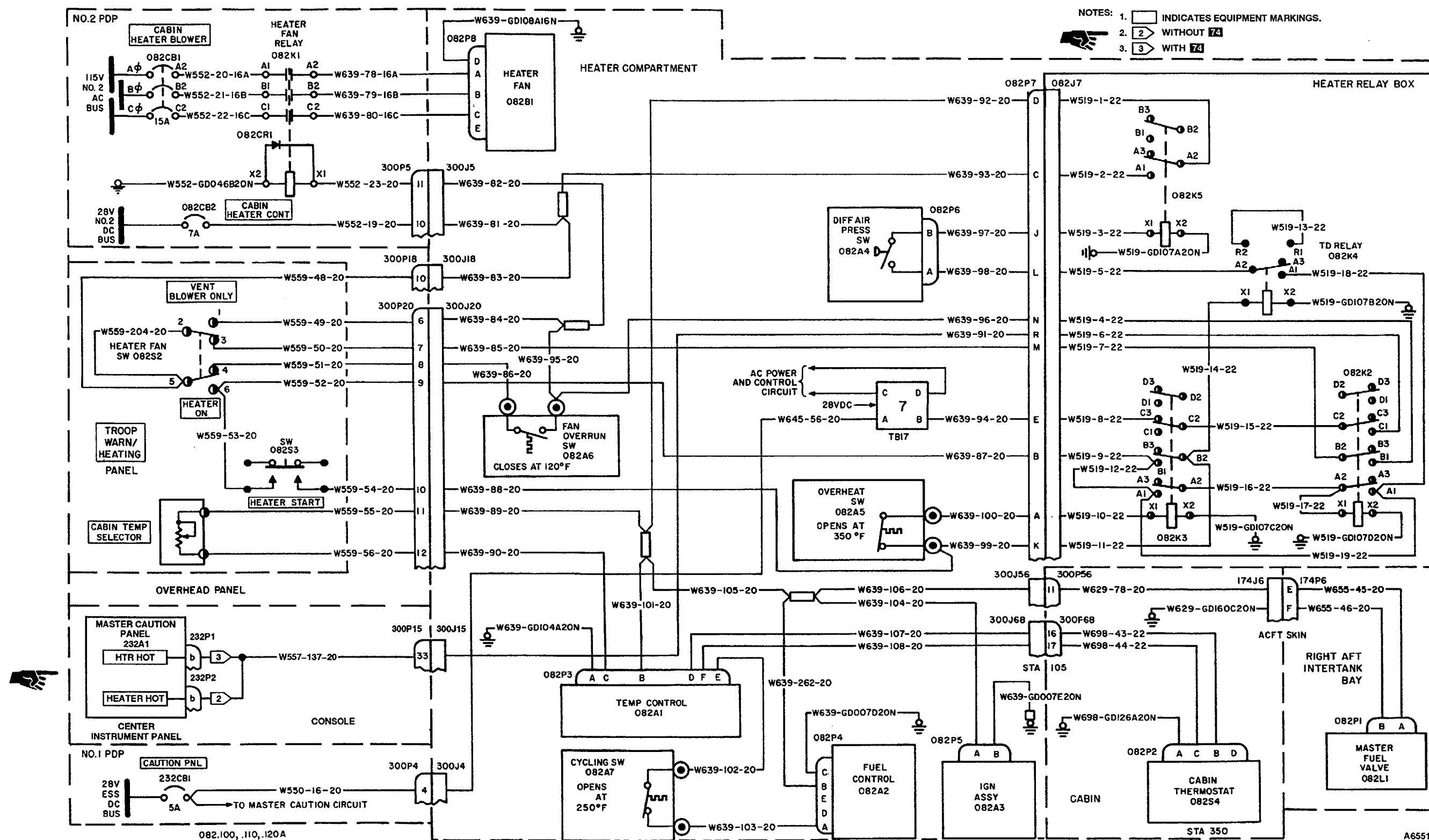
13-1 HEATING AND VENTILATING SYSTEM

13-1.1 HEATING AND VENTILATING SYSTEM SCHEMATIC

13-1.1







13-1.3 HEATING AND VENTILATING SYSTEM VISUAL CHECK

13-1.3

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

Materials:

None

Personnel Required:

67U10 Medium Helicopter Repairer

References:

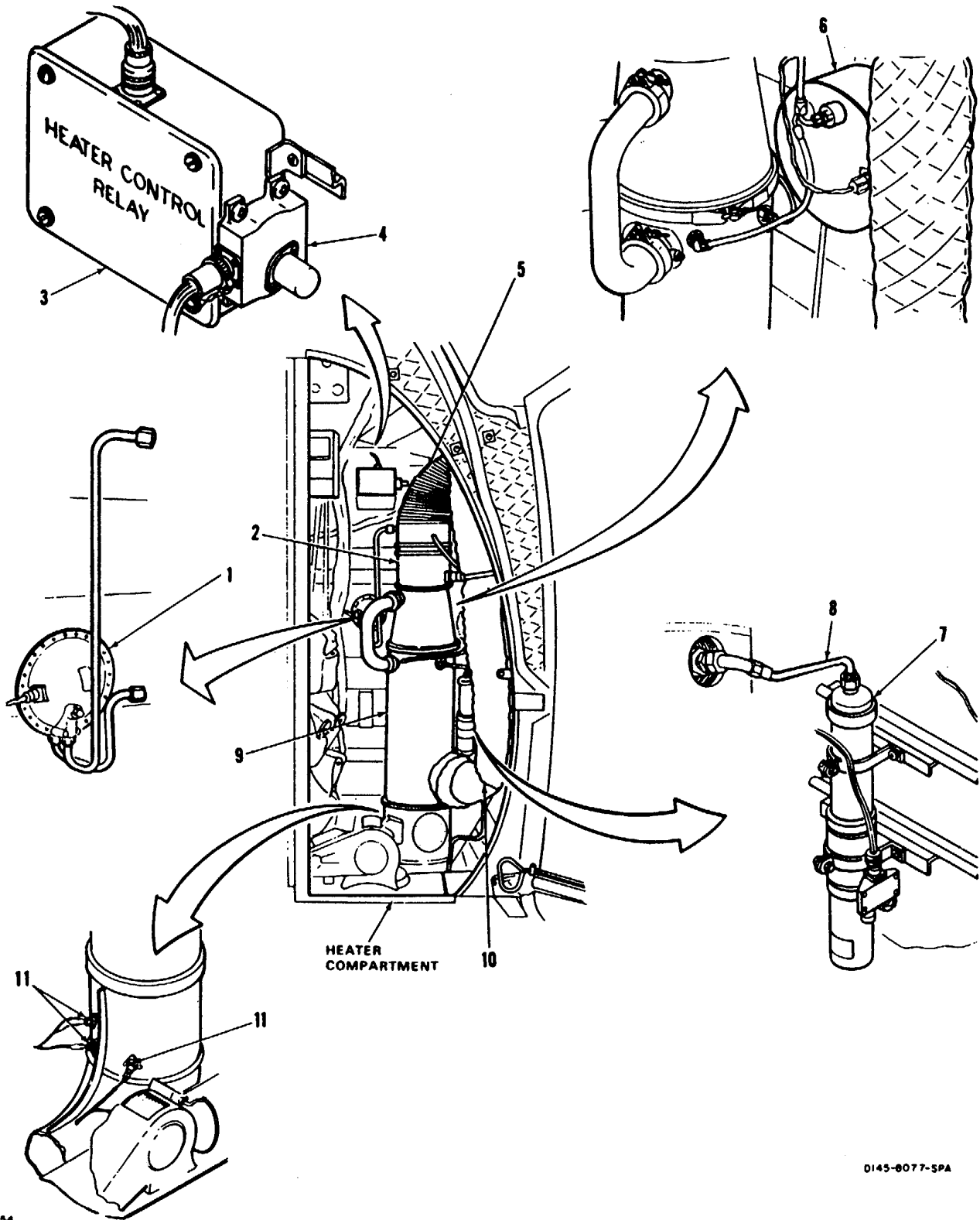
TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23

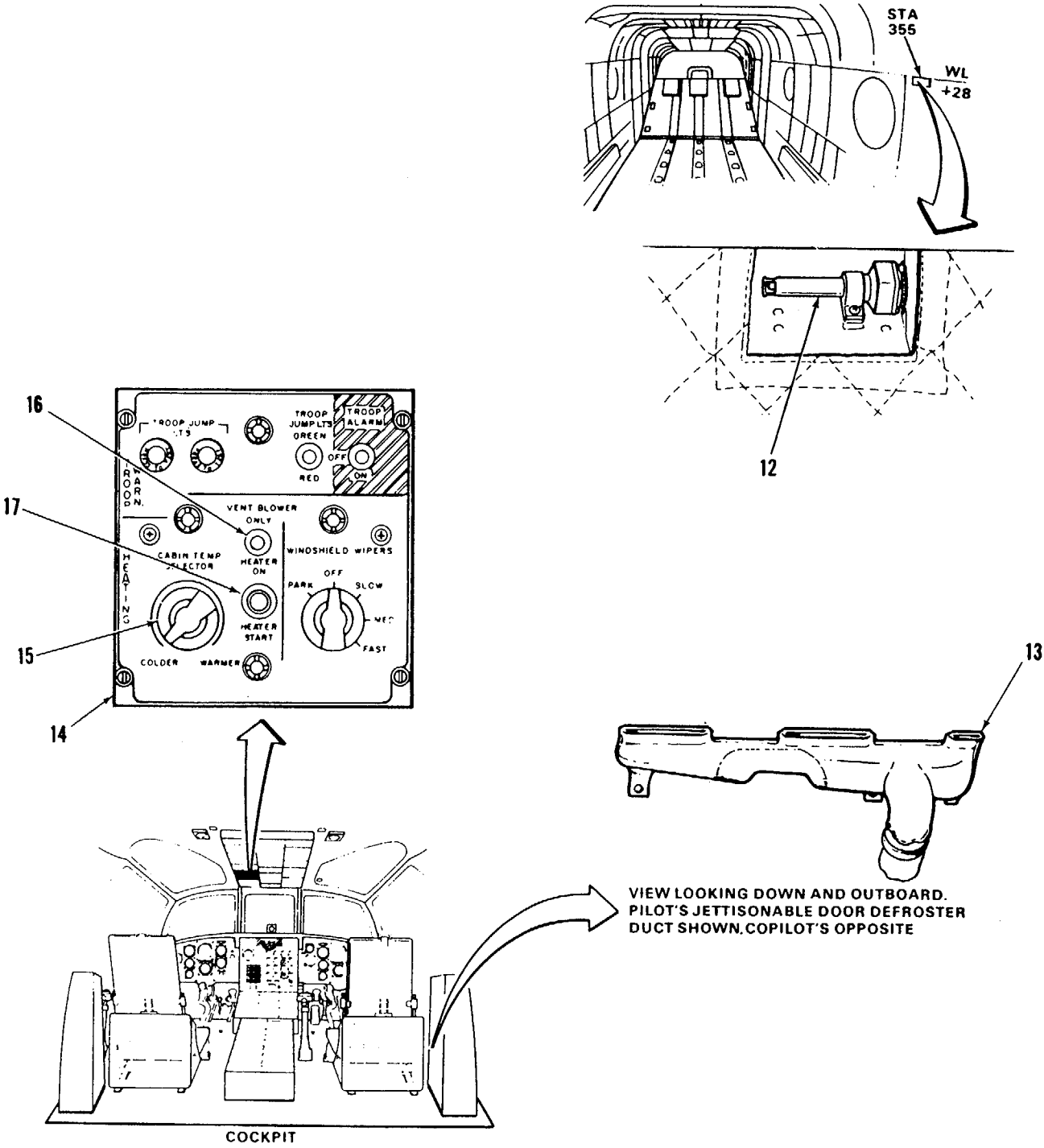
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off  
Heater Compartment Acoustic  
Blanket Removed

TASK	RESULT
1. Check air pressure switch (1).	If switch (1) is loose or damaged, tighten or replace it as required. If tubes, wiring, or electrical connector to switch are damaged, repair or replace them as required.
2. Check heater fan (2).	If fan (2) is loose or damaged, tighten or replace it as required. If wiring or electrical connector to fan is damaged, repair or replace it as required.
3. Check heater control relay box (3).	If box (3) is loose or damaged, tighten or replace it as required. If wiring or electrical connector to box is damaged, repair or replace it as required.
4. Check temperature controller (4).	If controller (4) is loose or damaged, tighten or replace it as required. If wiring or electrical connector to controller is damaged, repair or replace it as required.
5. Check air inlet duct (5).	If duct (5) is loose or torn, tighten or replace it as required.
6. Check heater fuel control (6).	If control (6) is loose or damaged, tighten or replace it as required. If fuel hoses, wiring or electrical connector to control is damaged. repair or replace it as required.
7. Check heater ignition unit (7).	If ignition unit (7) is loose or damaged, tighten or replace it as required. If wiring, electrical connector. or shielded lead (8) to ignition unit is damaged, repair or replace it as required.
8. Check boater (9).	If heater (9) is damaged, replace it.
9. Check exhaust shroud (10).	If shroud (10) is damaged, repair or replace it as required.
10. Check three temperature switches (11).	If any switch ( 1 ) is loose or damaged, tighten or replace it as required. If wiring to any switch is damaged, repair or replace it as required.



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TASK	RESULT
11. Check cabin thermostat (12).	If thermostat (12) is loose or damaged, tighten or replace it as required.
12. Check pilot's jettisonable door defroster (13).	If defroster (13) is damaged, repair or replace it as required.
13. Check copilot's jettisonable door defroster (13).	If defroster (13) is damaged, repair or replace it as required.
14. Check TROOP WARN/HEATING panel (14).	If knob (15) is loose, tighten or replace it as required. If switch (16 or 17) is damaged, replace it.

FOLLOW-ON MAINTENANCE:  
TM 55-1520-240-23  
Install heater compartment  
acoustic blanket.



13-1.4 HEATING AND VENTILATING SYSTEM OPERATIONAL CHECK

13-1.4

INITIAL SETUP	<b>Equipment Condition:</b>
<b>Applicable Configurations:</b>	TM 55-1520-240-23:
All	Battery Connected
<b>Tools:</b>	Electrical Power On
Stopwatch	Hydraulic Power Off
<b>Materials</b>	Heater Air Inlet Protective Shield Removed
None	Heater Exhaust Outlet Protective Shield Removed
<b>Personnel Required:</b>	Visual Check of Heating and Ventilating System
Medium Helicopter Repairer	Performed
<b>References:</b>	
TM 55-1520-240-23	

TASK	RESULT
1. Check that <b>CABIN HEATER CONT</b> circuit breaker (1) is closed.	If circuit breaker (1) is open, close it. If it opens again, go to Task 13-1.5.
2. Check that <b>CABIN HEATER BLOWER circuit breaker (2)</b> is closed.	If circuit breaker (2) is open, close it. If it opens again, go to Task 13-1.6.
<div>WARNING</div> <div>Cockpit vents must be closed before vent blower or heater is started. After blower or heater is started open vents slowly to prevent dirt and debris being blasted into air and eyes of personnel.</div>	
3. Check that <b>DEFOG or DEFROST AIR CONTROL handle (3)</b> is all way down.	If handle (3) is up, push it down.
4. Check that <b>PULL FOR COCKPIT AIR knob (4)</b> on pilot and copilot instrument panel is against panel.	If either knob (4) is out, push it in.
5. Set <b>RIGHT SIDE FWD and AFT MAIN FUEL PUMPS switches (5 and 6)</b> to ON.	R FUEL PRESS capsule (7) shall go out. If it stays on, go to Task 10-2.4.
6. Set heater fan switch (8) to VENT. Blower only.	Heater fan shall run. If it can not be heard, go to Task 13-1.7.
7. Slowly pull out <b>DEFOG or DEFROST AIR CONTROL handle (3)</b> .	Air shall be felt flowing from pilot and copilot jettisonable door defroster ducts (9) and nose bubble vents (10). If air flow is not felt at ducts or vents, go to Task 13-1.8.
8. Slowly pull out <b>PULL FOR COCKPIT AIR knob (4)</b> on pilot's instrument panel.	Air shall be felt flowing from pilot's outlet (11). If air flow is not felt, go to Task 13-1.9.
9. Slowly pull out <b>PULL FOR COCKPIT AIR knob (4)</b> on copilot's instrument panel.	Air shall be felt flowing from copilot's outlet (11). If air flow is not felt, go to Task 13-1.9.
10. Slowly pull out <b>CABIN AIR AIR CONTROL handle (12)</b> .	Air shall be felt flowing out cabin vents (13). If air flow is not felt, go to Task 13-1.10.
11. Set heater fan switch (8) to HEATER ON.	Heater fan shall stop.
12. Turn <b>CABIN TEMP SELECTOR knob (14)</b> to WARMER.	

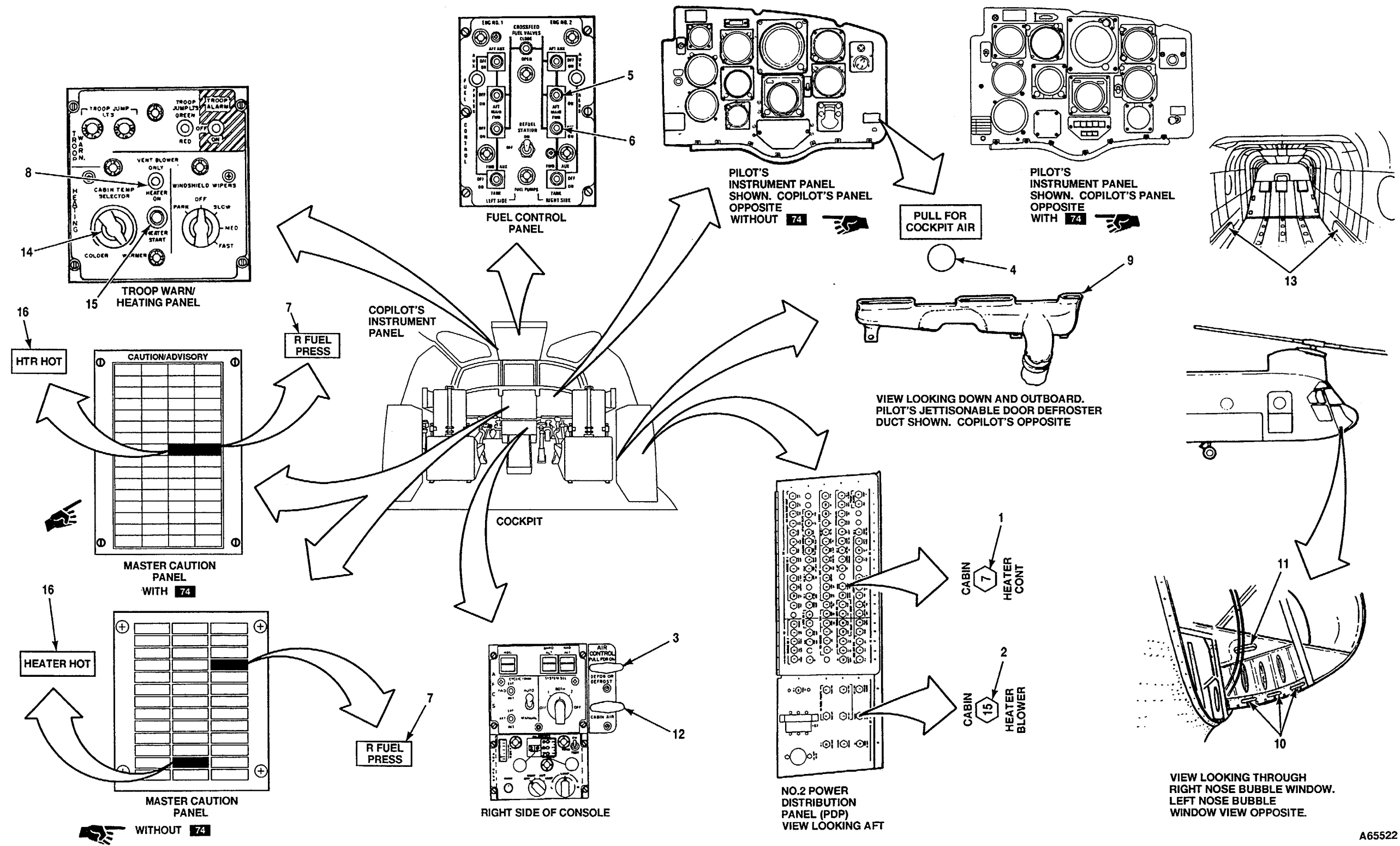
TASK	RESULT
13. Press and release <b>HEATER START switch (15)</b> . <div>NOTE</div> <div>Heater will not operate if cabin thermostat senses a temperature of <u>34°C (93°F)</u> or greater.</div>	Heater fan shall be heard. After about 10 seconds, combustion shall occur and warm air shall flow from all vents and ducts. If heater fan can not be heard, go to Task 13-1.11. If heater fan is running but warm air is not flowing from ducts or vents, go to Task 13-1.12. If <b>HEATER HOT (Without 74) HTR HOT (With 74) capsule (16)</b> comes on, go to Task 13-1.13.
14. Turn <b>CABIN TEMP SELECTOR (14)</b> to <b>COLDER position</b> .	Cooler air shall be felt flowing from ducts and vents. If air doesn't get cooler or air gets hotter, go to Task 13-1.14.
15. Set heater fan switch (8) to off (center).	Heater fan shall run until heater cools down. If fan is not running after heater is turned off, go to Task 13-1.15.
16. Set <b>RIGHT SIDE FWD and AFT MAIN FUEL PUMP switches (5 and 6)</b> to OFF.	

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:

Electrical power off.

Battery disconnected.



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13-1.5 CABIN HEATER CONT CIRCUIT BREAKER WILL NOT STAY CLOSED

13-1.5

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

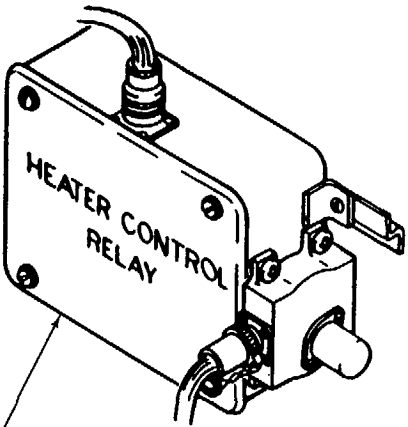
Tools:  
Electrical Repairer's Tool Kit.  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

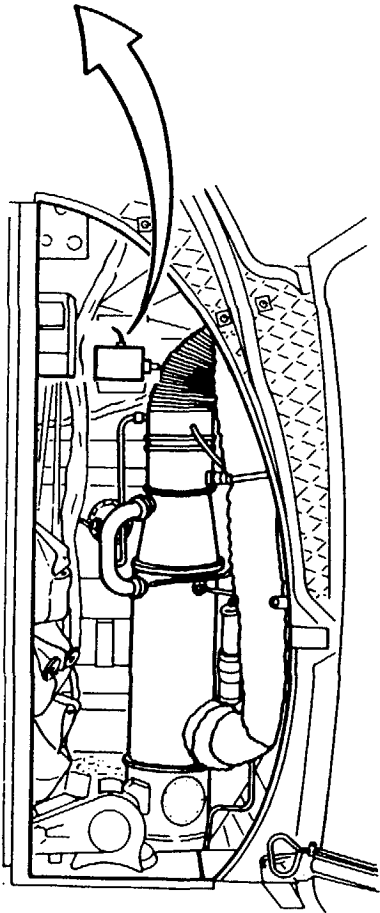
Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

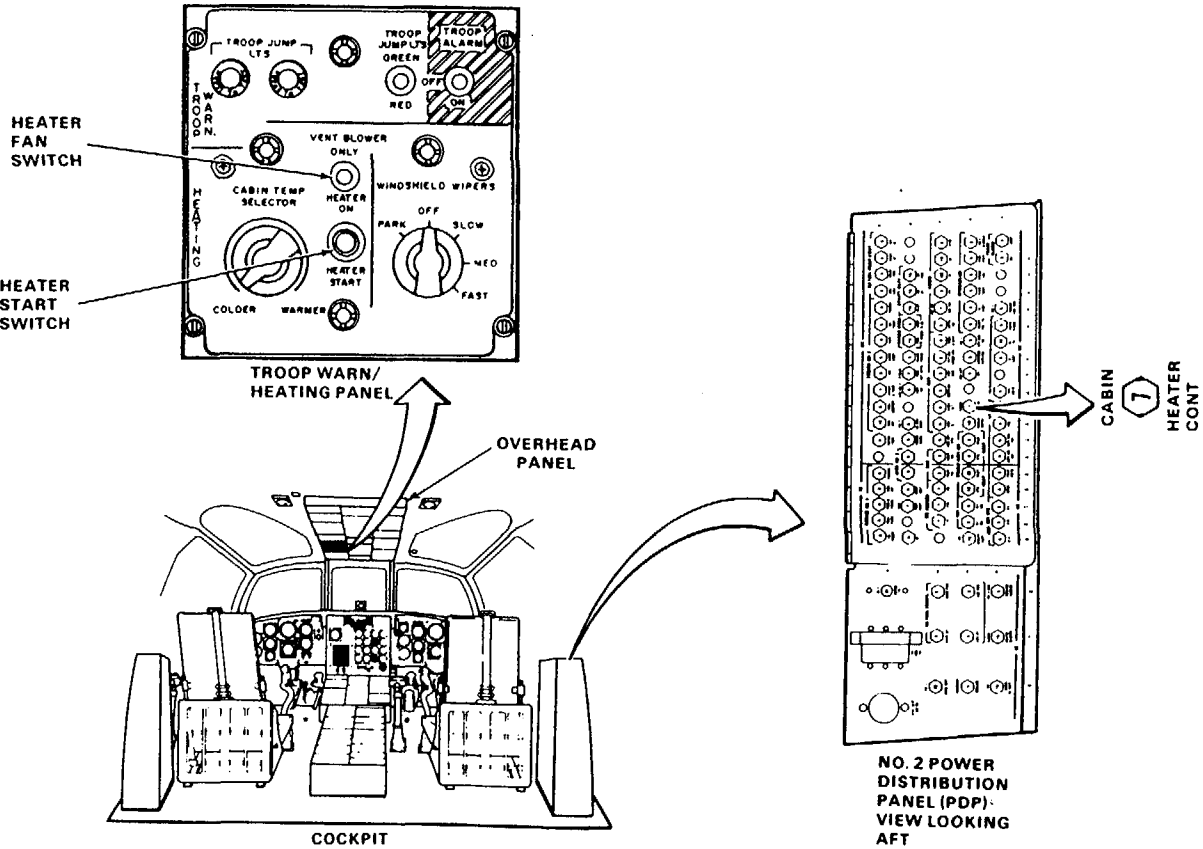
Equipment Condition:  
TM 55-1520-240-20:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off  
Heater Compartment Acoustic  
Blanket Removed



HEATER CONTROL RELAY BOX

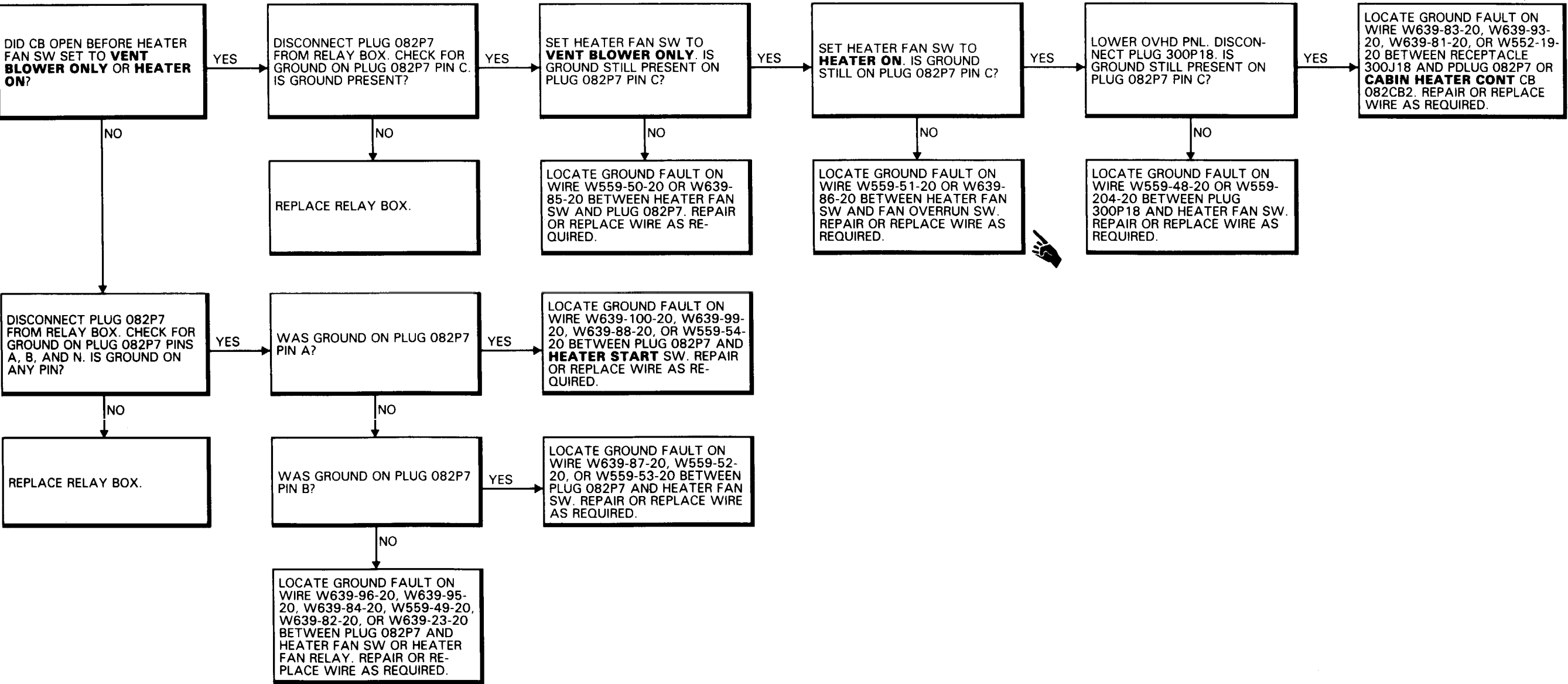


HEATER COMPARTMENT



13-1.5 CABIN HEATER CONT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

13-1.5



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Multimeter

Materials:

None

Personnel Required:

Aircraft Electrician

References:

TM 55-1520-240-23

Equipment Condition:

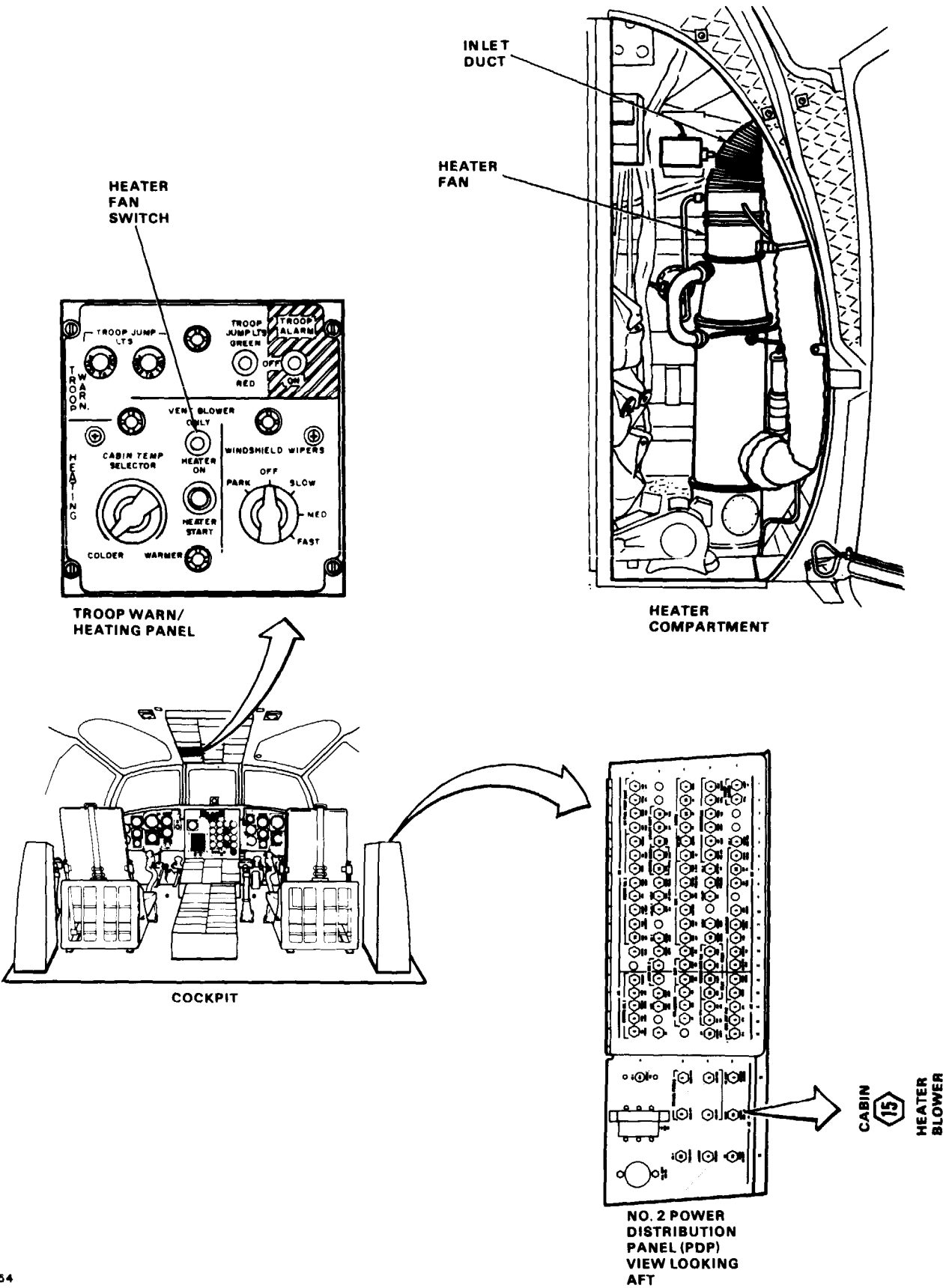
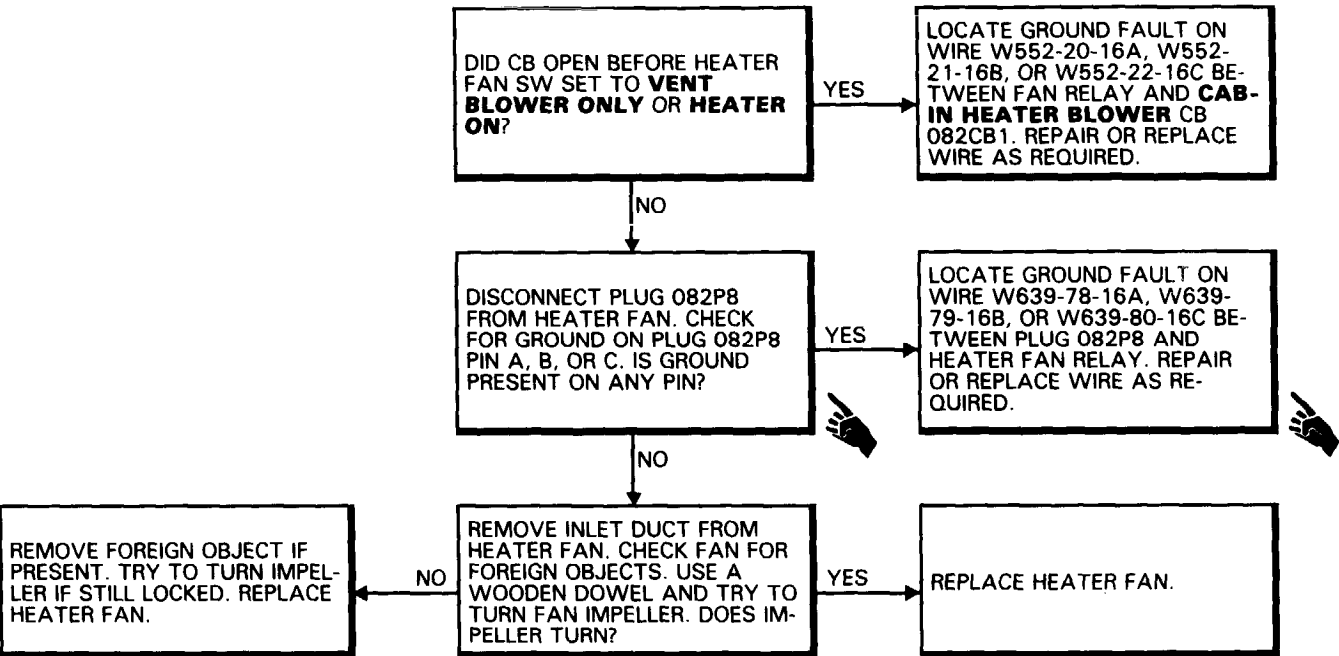
TM 55-1520-240-23:

Battery Disconnected

Electrical Power Off

Hydraulic Power Off

Heater Compartment Acoustic Blanket Removed



### 13-1.7 HEATER FAN CANNOT BE HEARD RUNNING

13-1.7

## FAULT ISOLATION PROCEDURE

## INITIAL SETUP

*Applicable Configurations:*  
**All**

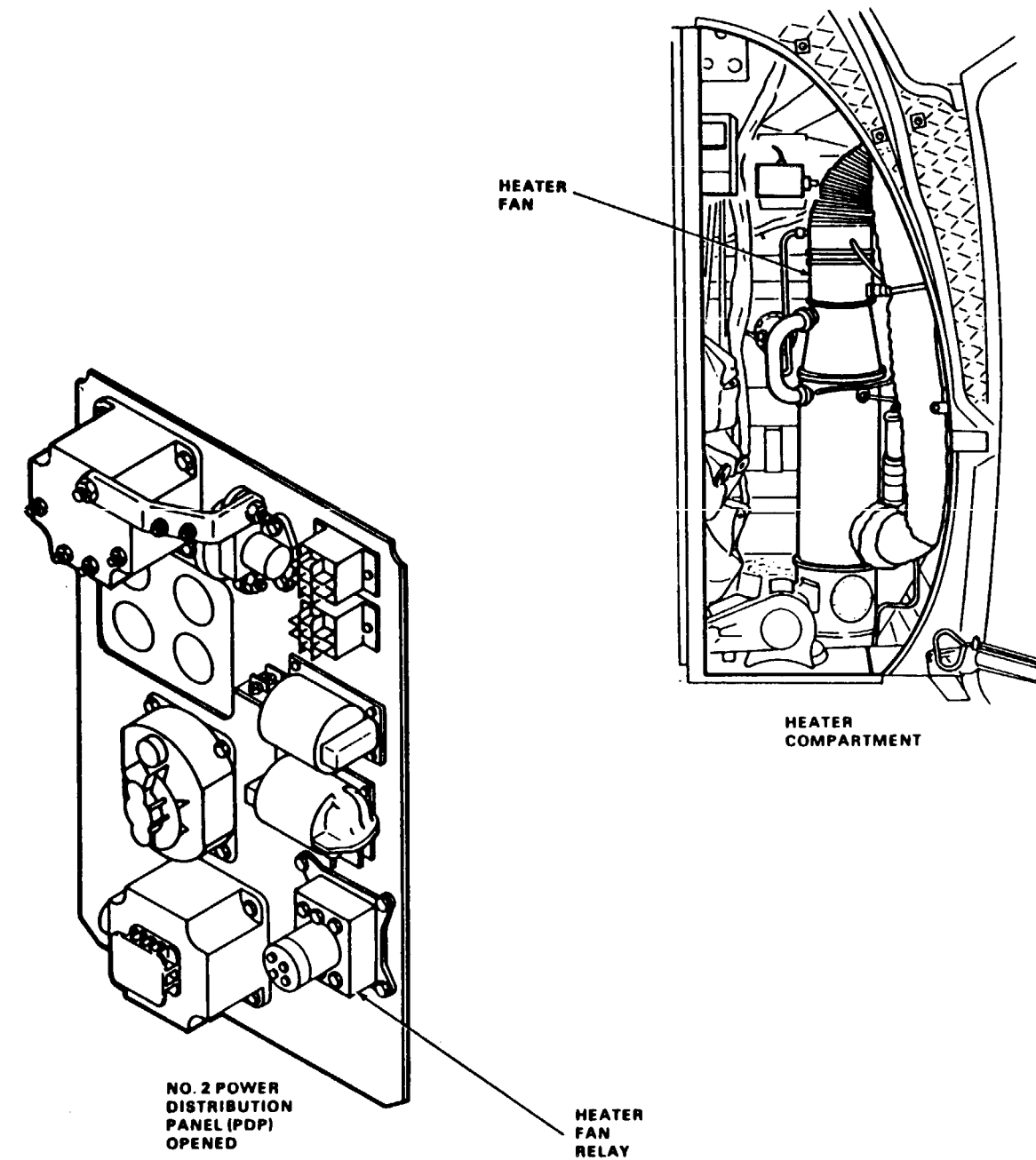
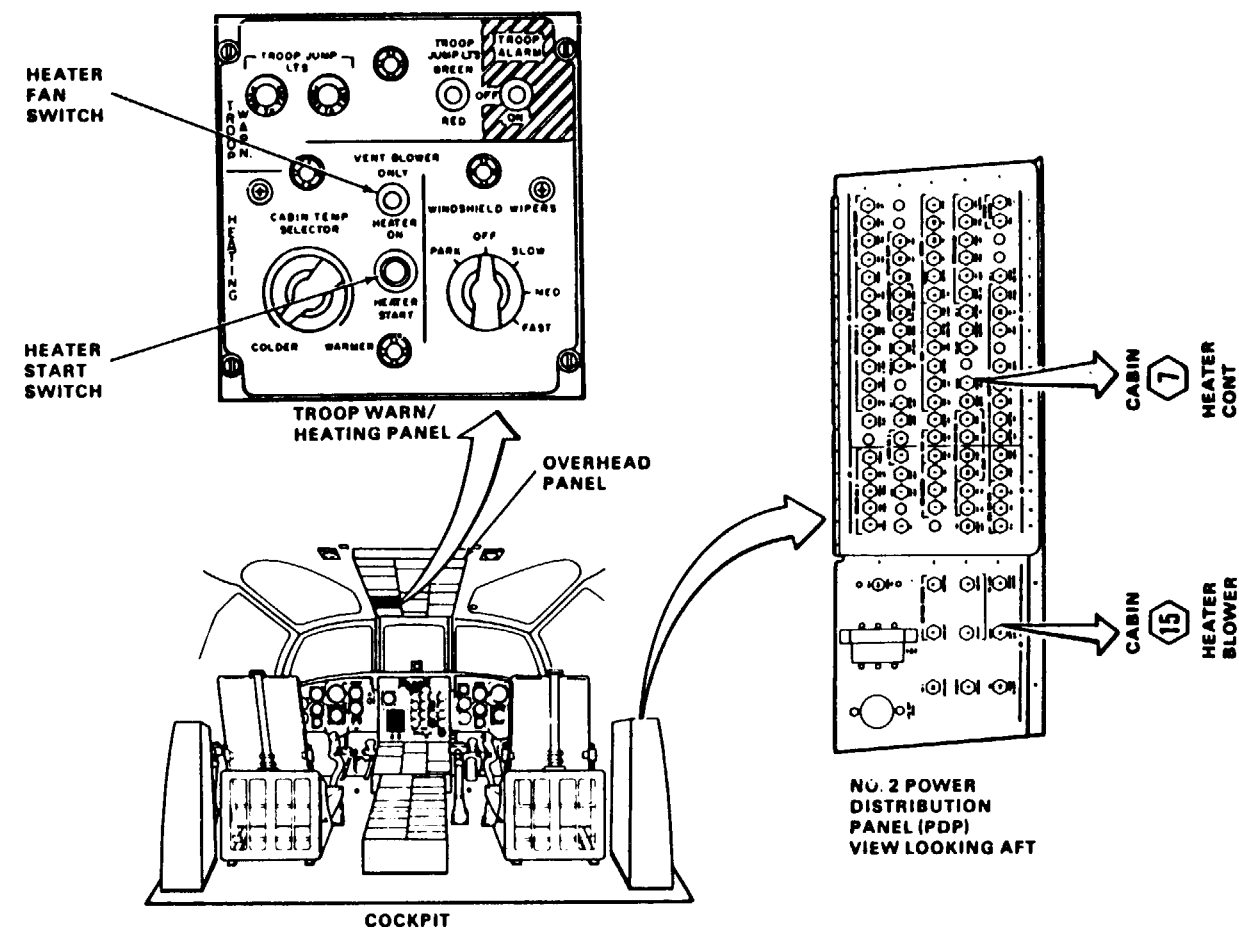
**Tools:**  
**Electrical Repairer's Tool Kit,**  
**NSN 5180-00-323-4915**  
**Multimeter**

*Materials:*  
**None**

*Personnel Required:*  
**68F10 Aircraft Electrician**  
**68F20 Aircraft Electrician**

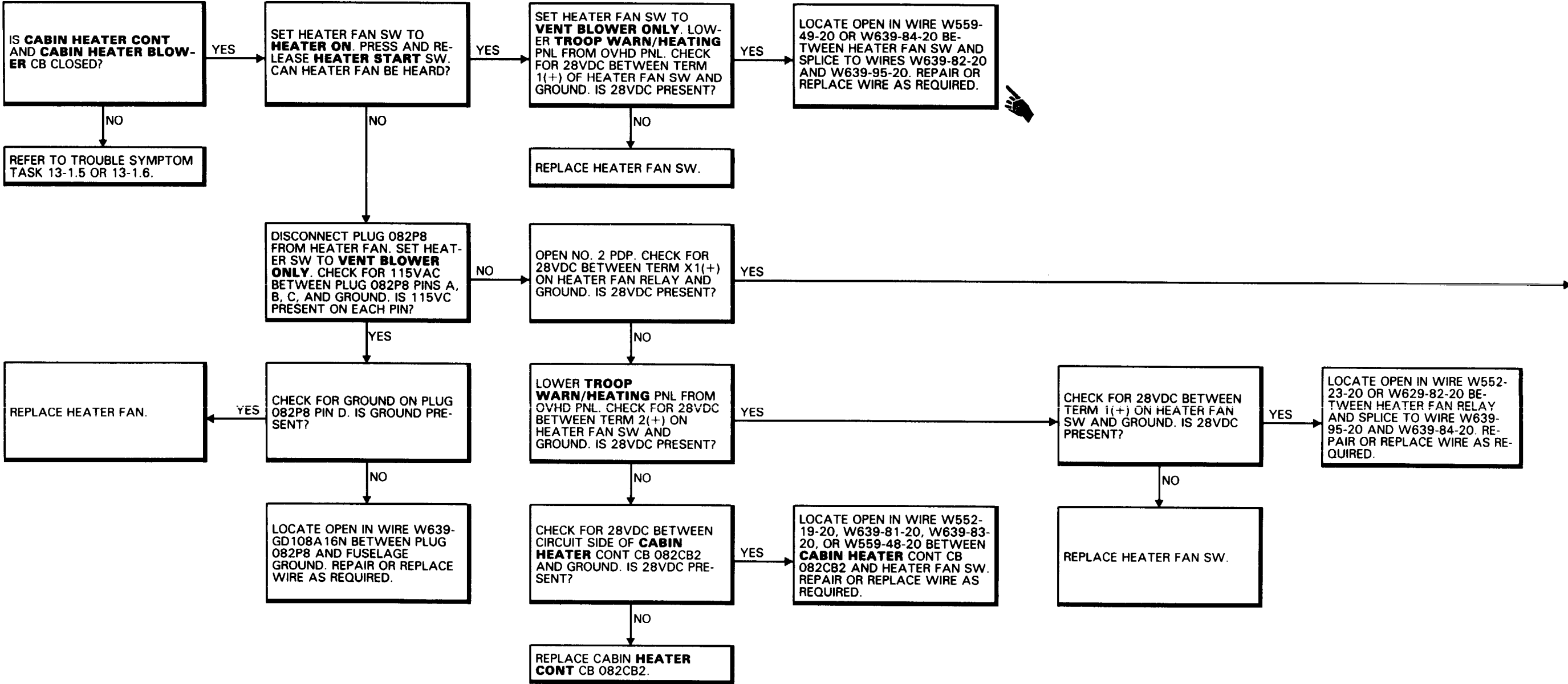
References:  
TM 55-1520-240-23

*Equipment Condition:*  
**TM 55-1520-240-23:**  
**Battery Connected**  
**Electrical Power On**  
**Hydraulic Power Off**  
**Heater Compartment Acoustic**  
**Blanket Removed**

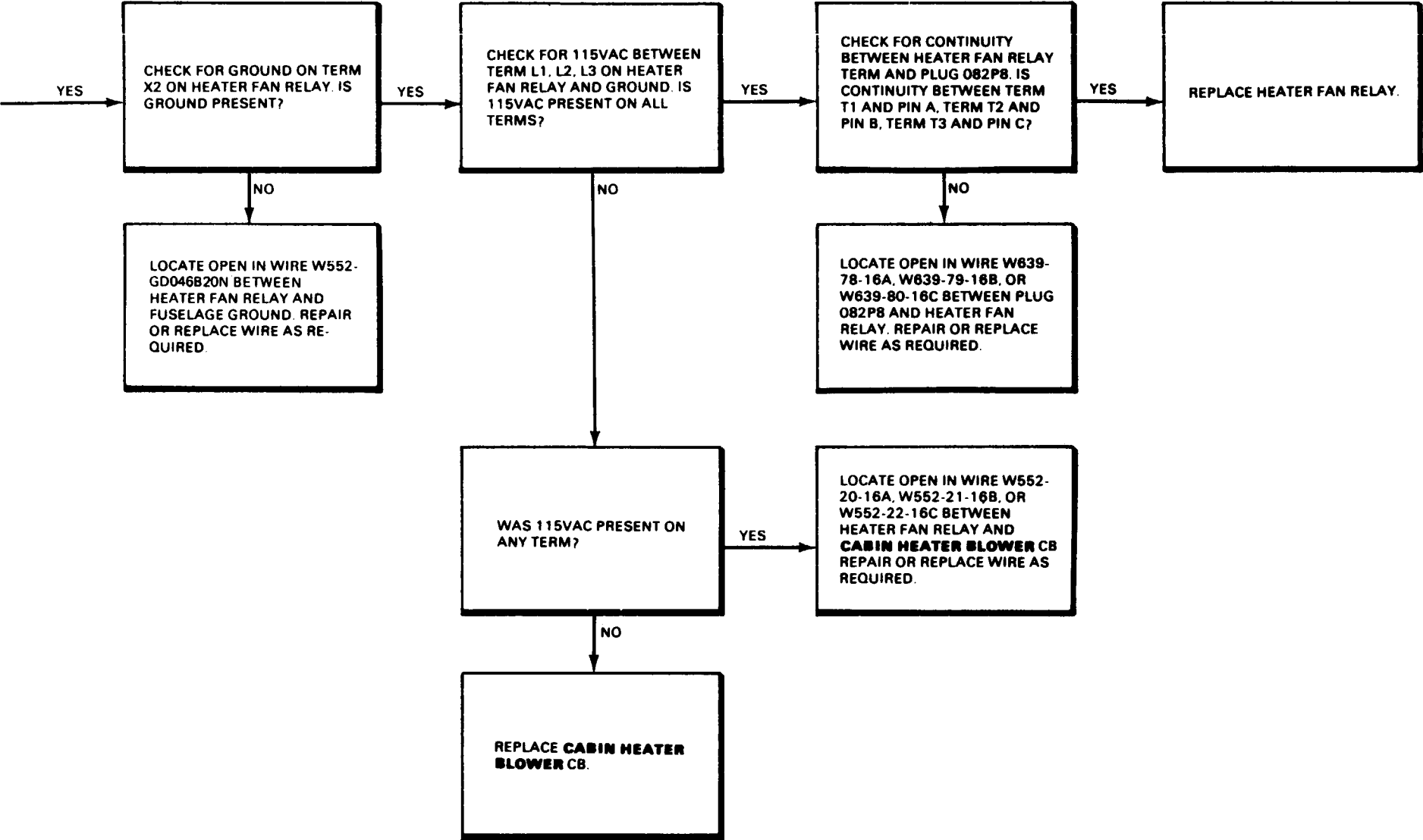


13-1.7 HEATER FAN CANNOT BE HEARD RUNNING (Continued)

13-1.7



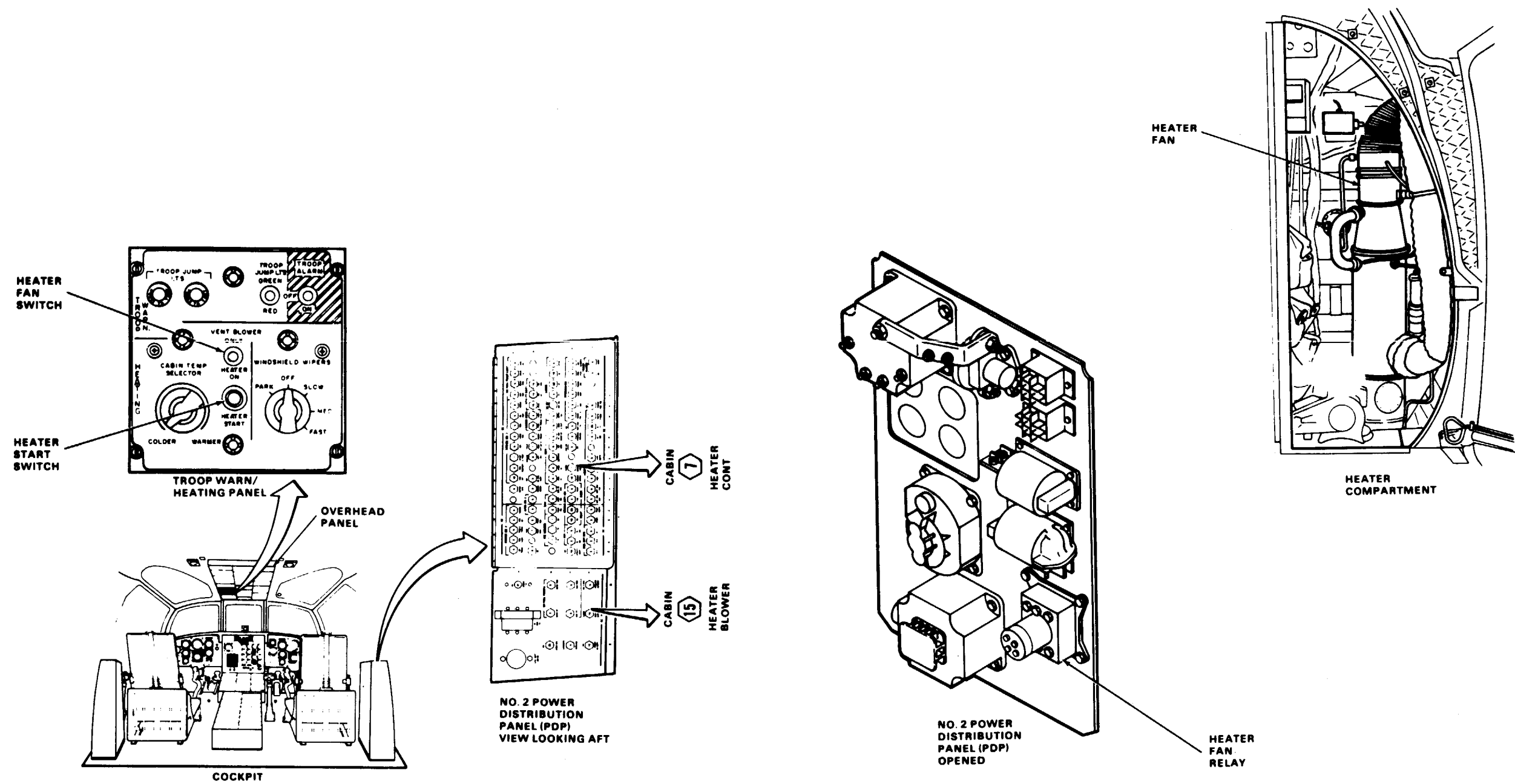
13-1.7 HEATER FAN CANNOT BE HEARD RUNNING (Continued)



GO TO NEXT PAGE



13-1.7 HEATER FAN CANNOT BE HEARD RUNNING (Continued)



13-1.8 AIR FLOW NOT FELT AT JETTISONABLE DOOR DEFROSTER DUCTS OR NOSE BUBBLE VENTS

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

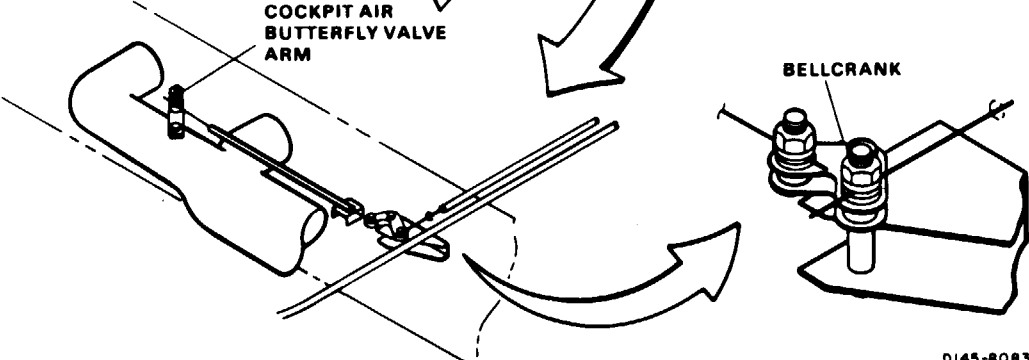
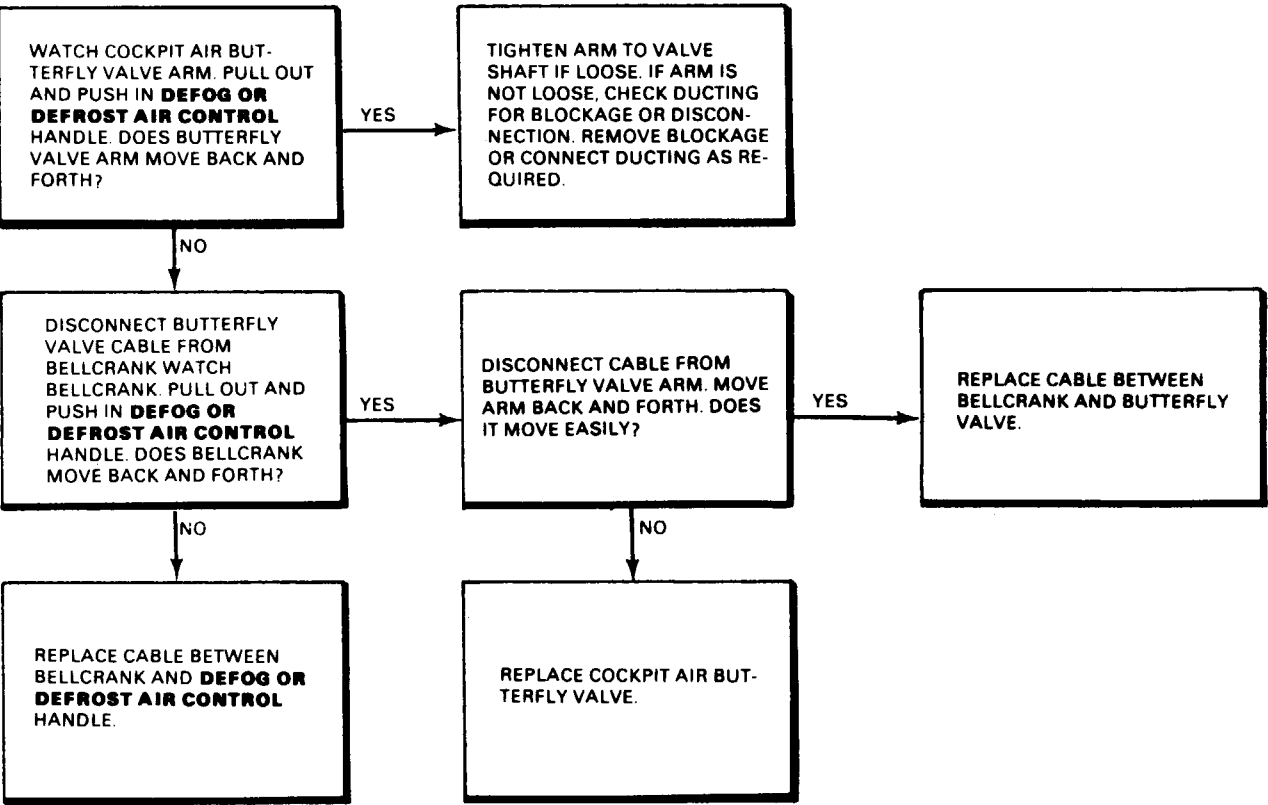
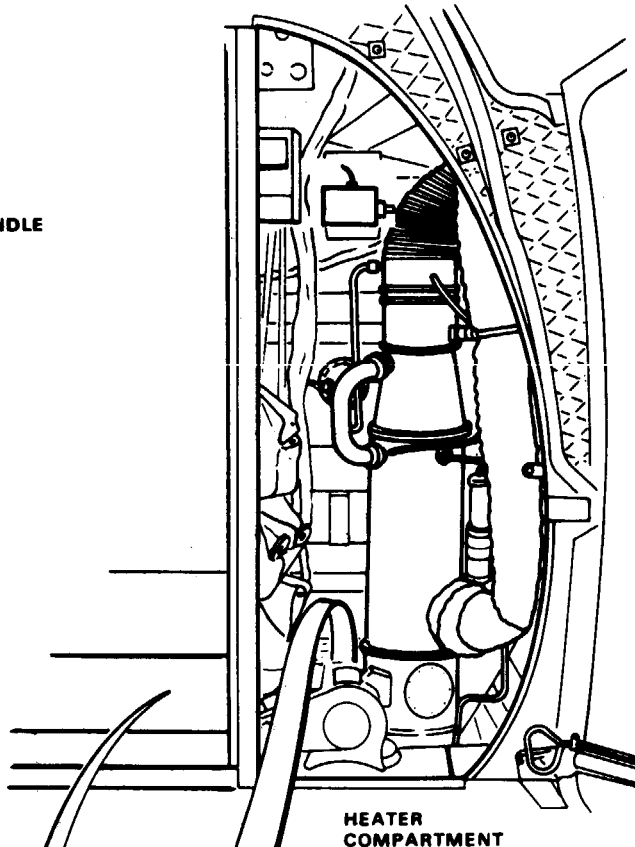
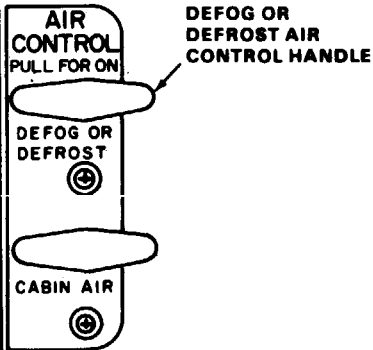
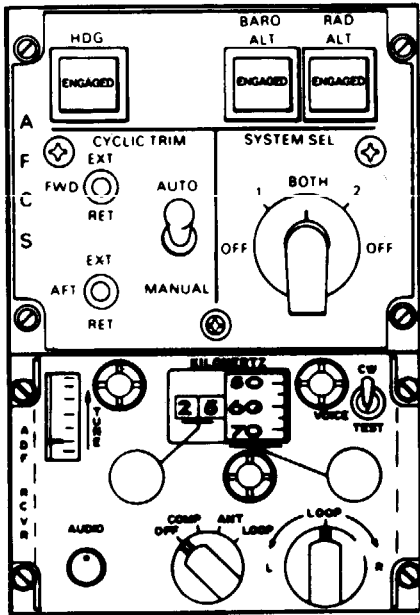
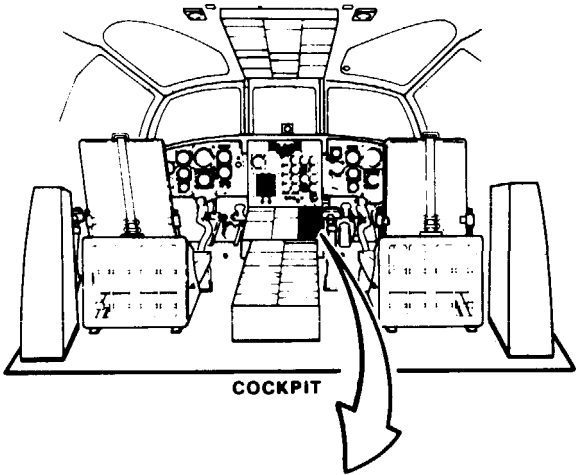
Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

Materials:  
None

Personnel Required:  
67U20 Medium Helicopter Repairer

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off  
Passageway Floor Removed  
Heater Compartment Acoustic Blanket  
Removed



END OF TASK

13-1.9 AIR FLOW NOT FELT AT PILOT OR COPILOT  
AIR OUTLET

13-1.9

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

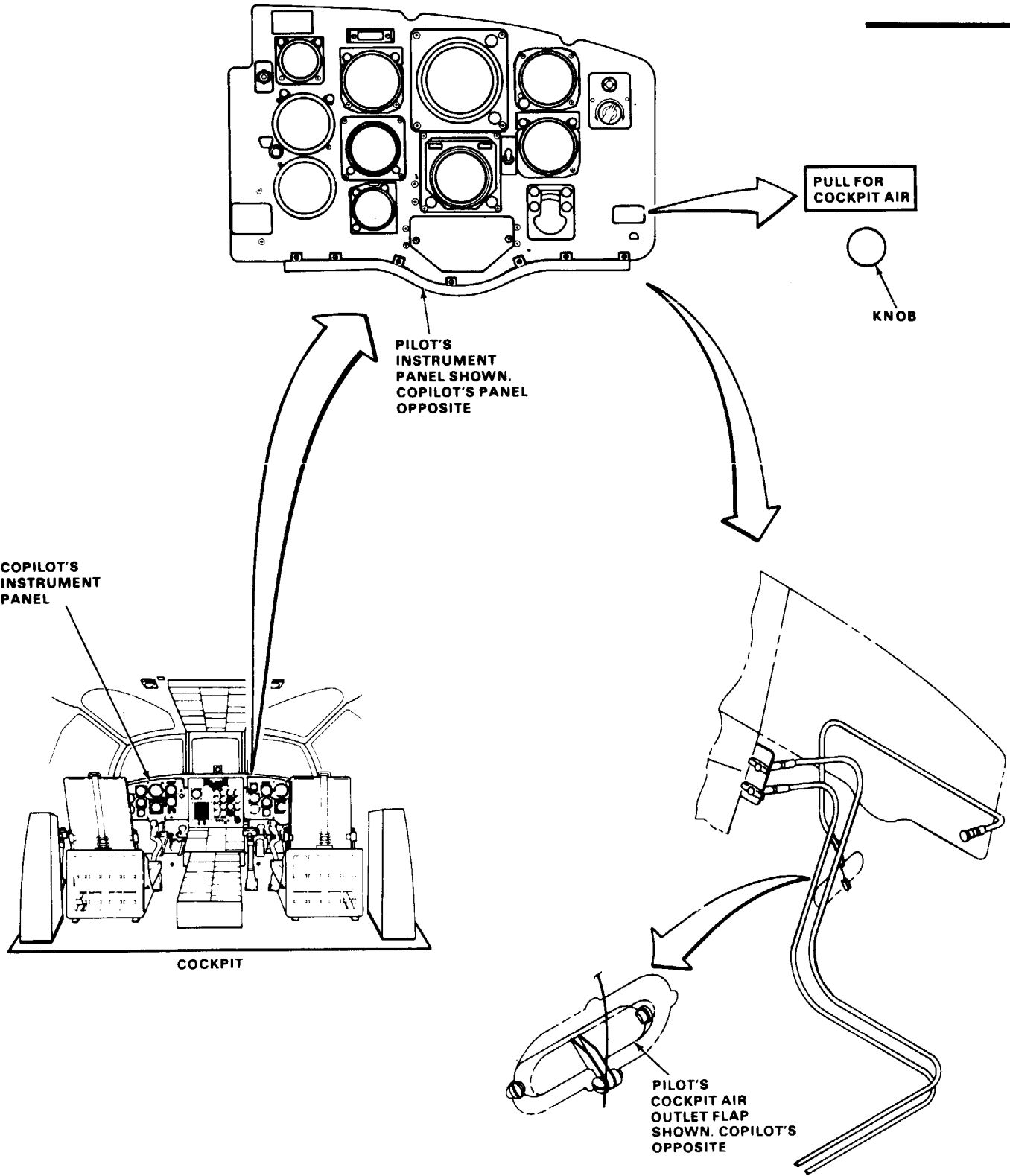
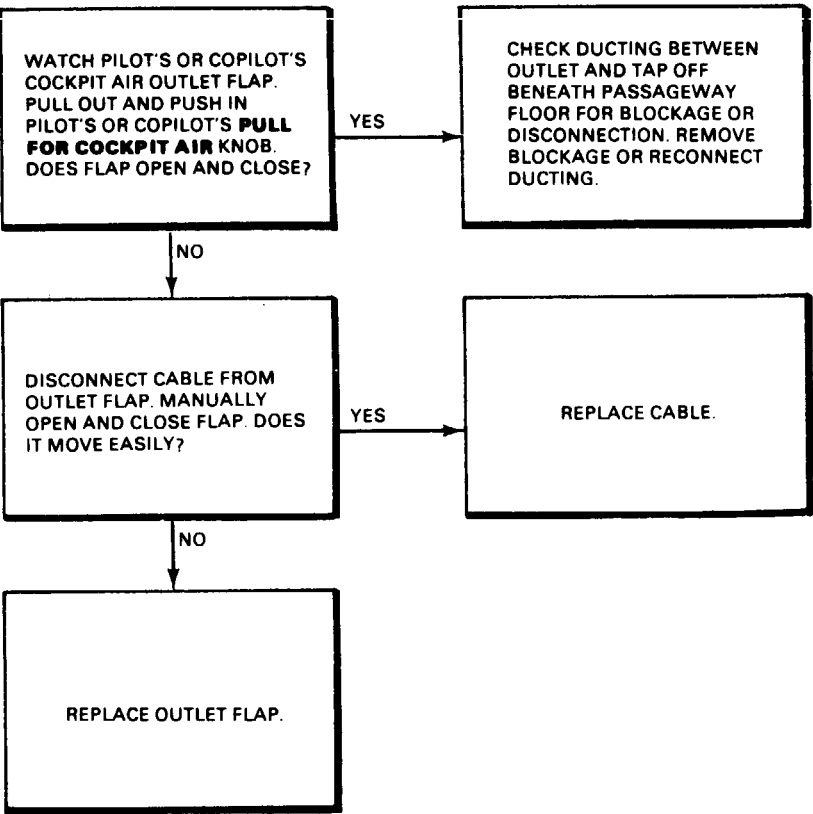
Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

Materials:  
None

Personnel Required:  
67U20 Medium Helicopter Repairer

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



13-1.10 AIR FLOW NOT FELT AT CABIN VENTS

13-1.10

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

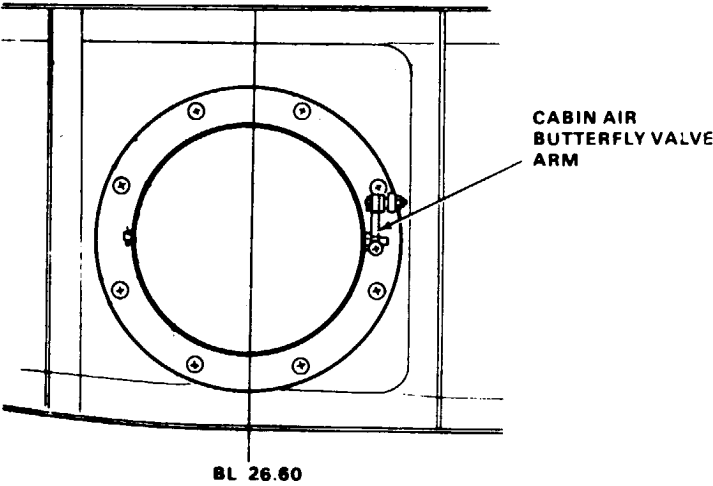
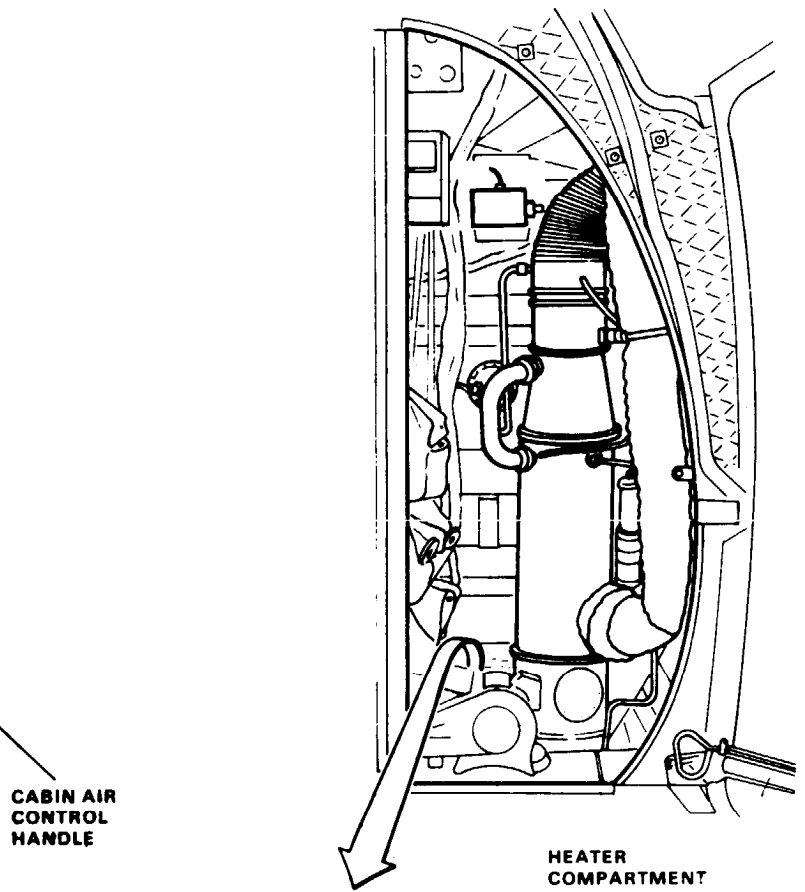
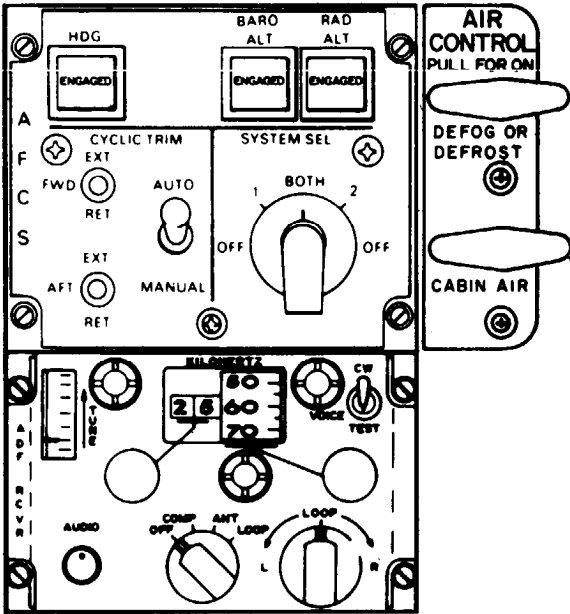
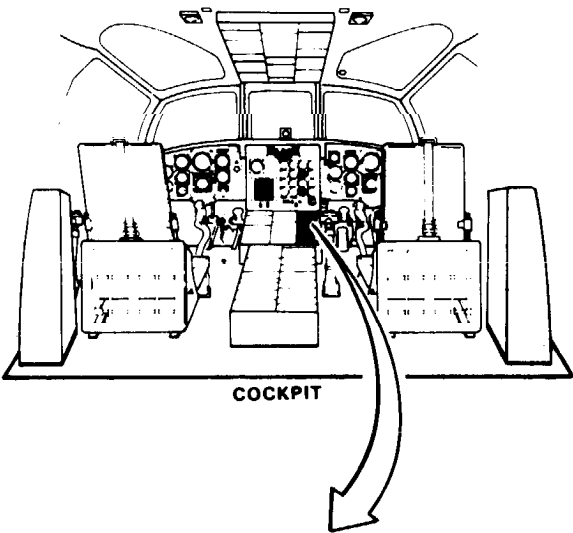
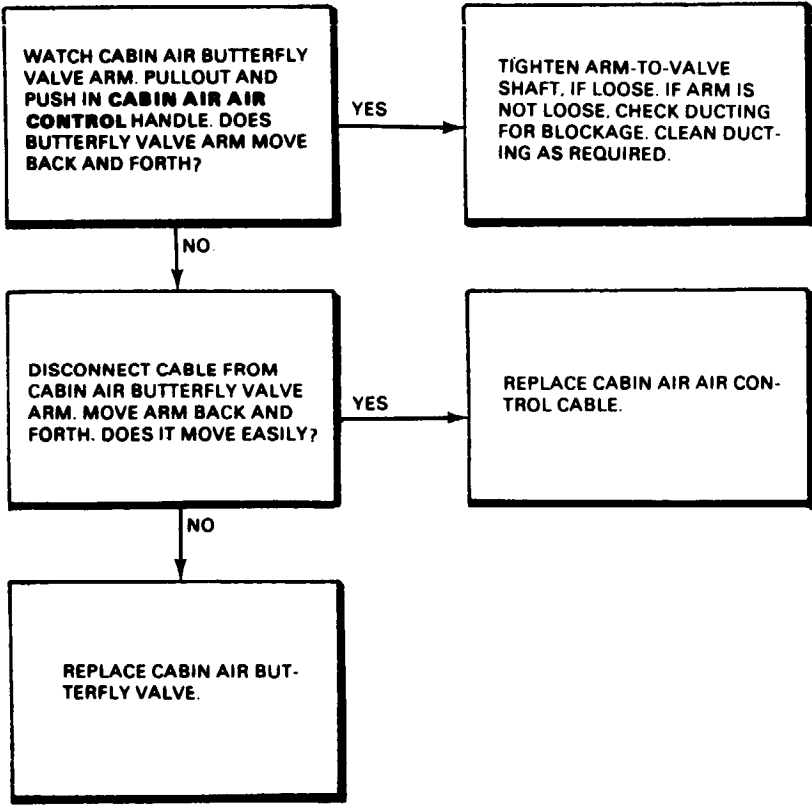
Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

Materials:  
None

Personnel Required:  
67U10 Medium Helicopter Repairer  
67U20 Medium Helicopter Repairer

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



BL 26.60

VIEW LOOKING AFT  
AT STA 120

END OF TASK

13-1.11 HEATER FAN CAN NOT BE HEARD RUNNING AFTER  
HEATER START SWITCH PRESSED AND RELEASED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

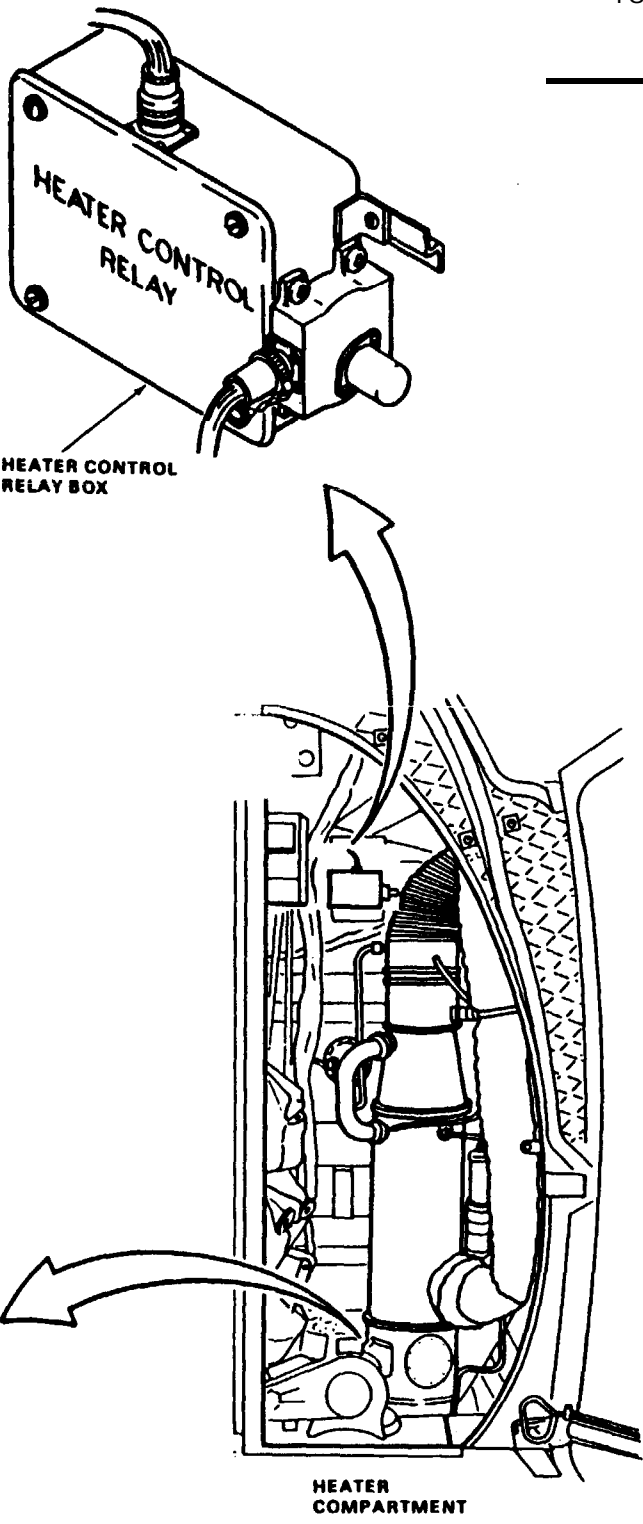
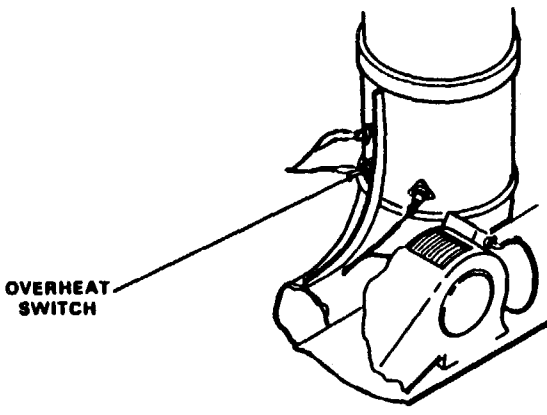
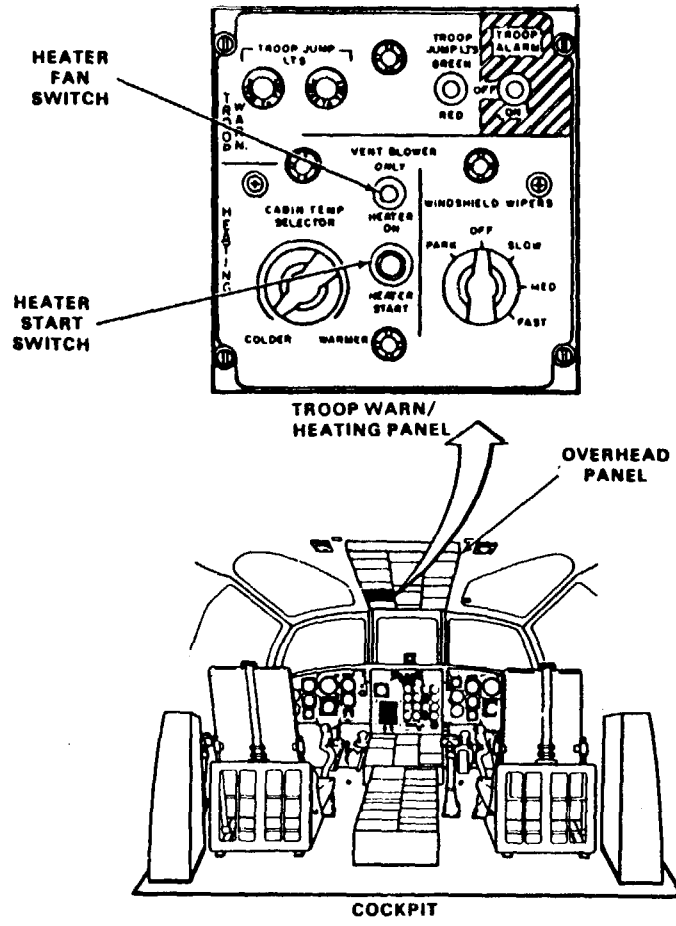
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

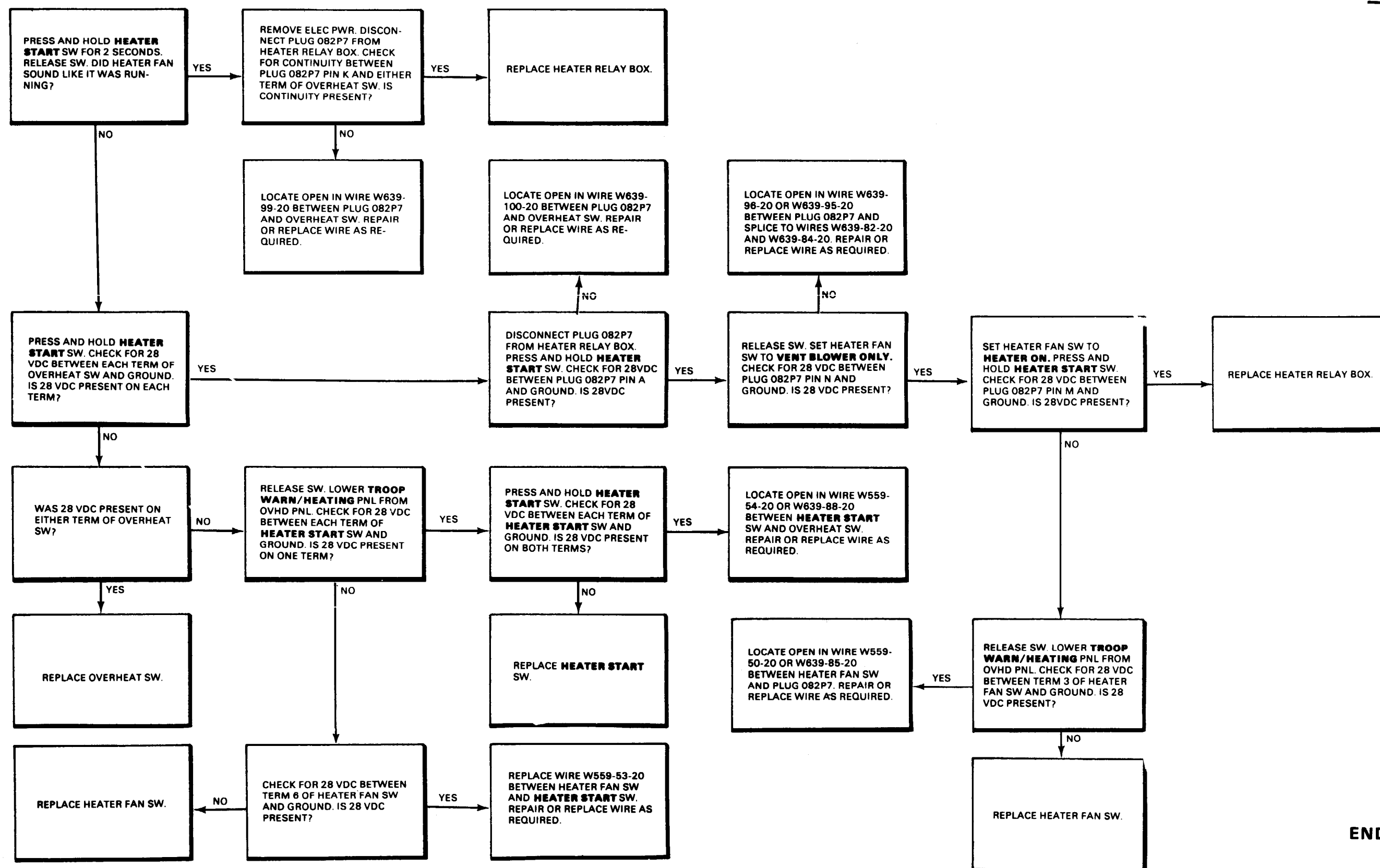
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Heater Compartment Acoustic Blanket  
Removed



13-1.11 HEATER FAN CAN NOT BE HEARD RUNNING AFTER  
HEATER START SWITCH PRESSED AND RELEASED  
(Continued)

13-1.11



END OF TASK

FAULT ISOLATION PROCEDURE  
INITIAL SETUP

Applicable Configurations:  
All

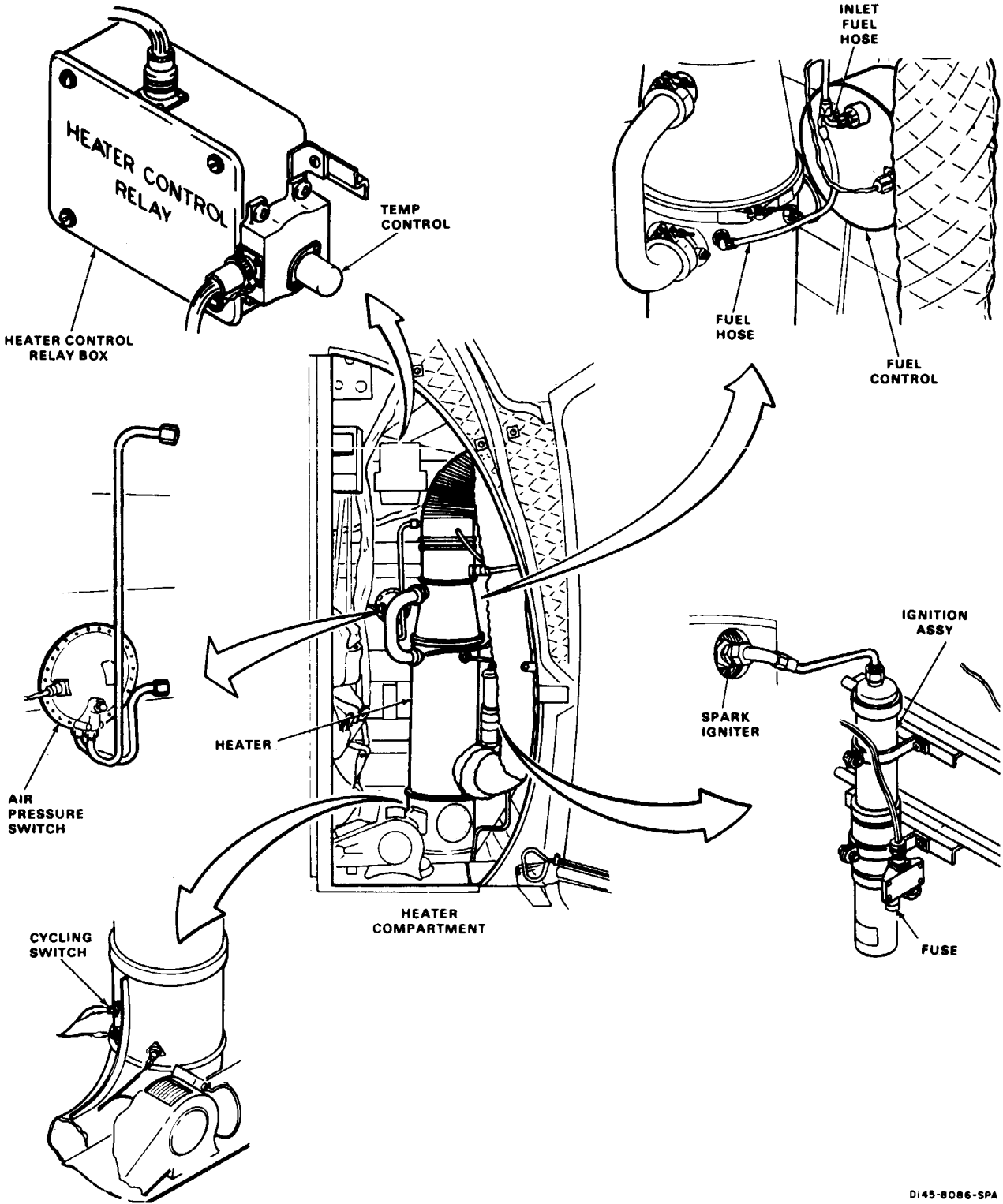
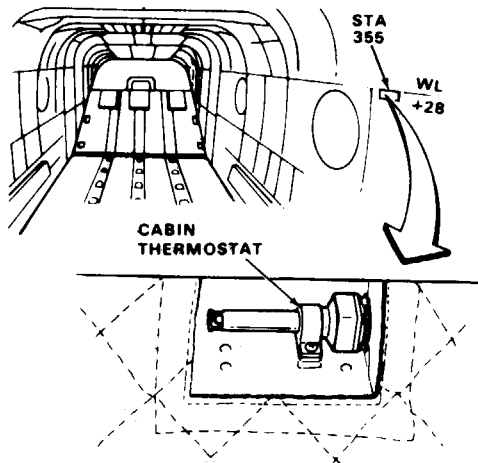
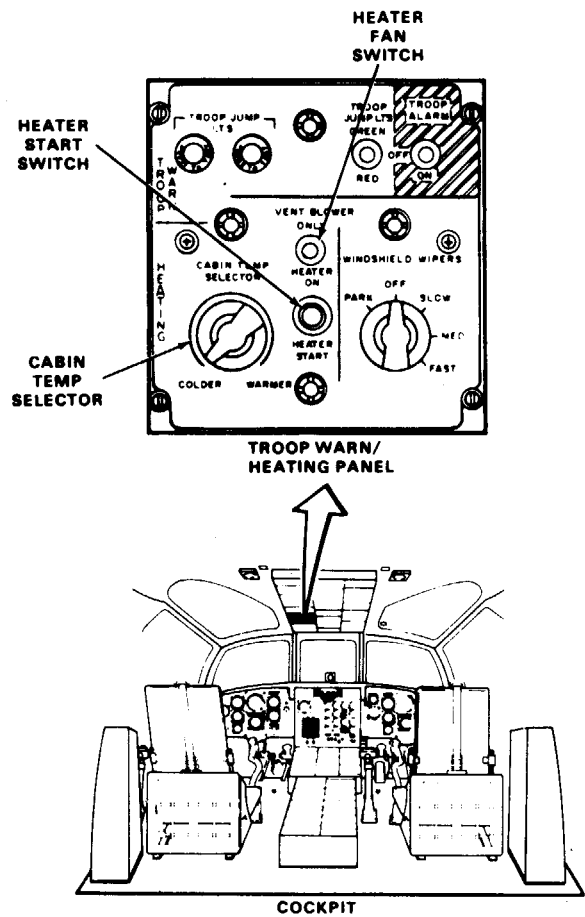
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter  
Stopwatch

Materials:  
None

Personnel Required:  
67U10 Medium Helicopter Repairer  
68F20 Aircraft Electrician

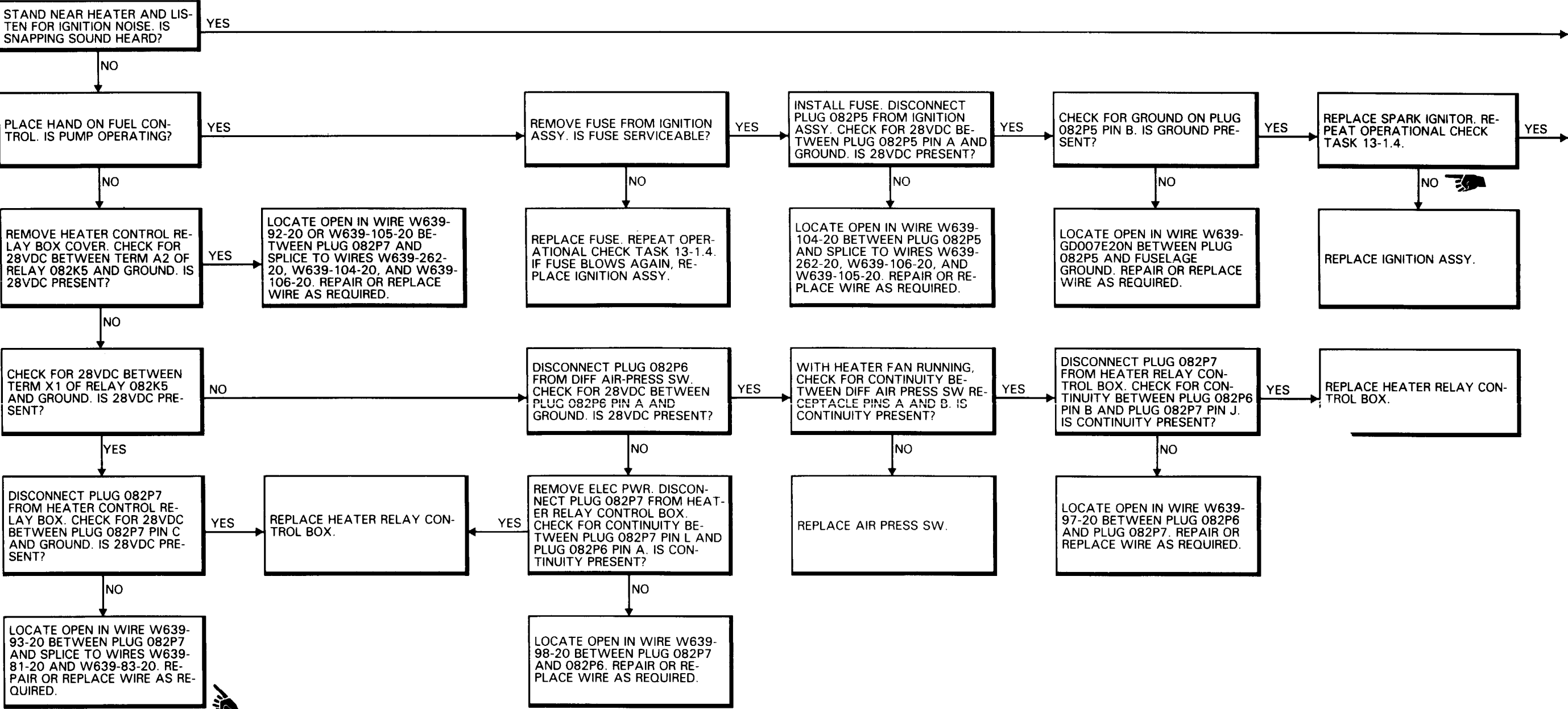
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Heater Compartment Acoustic Blanket  
Removed



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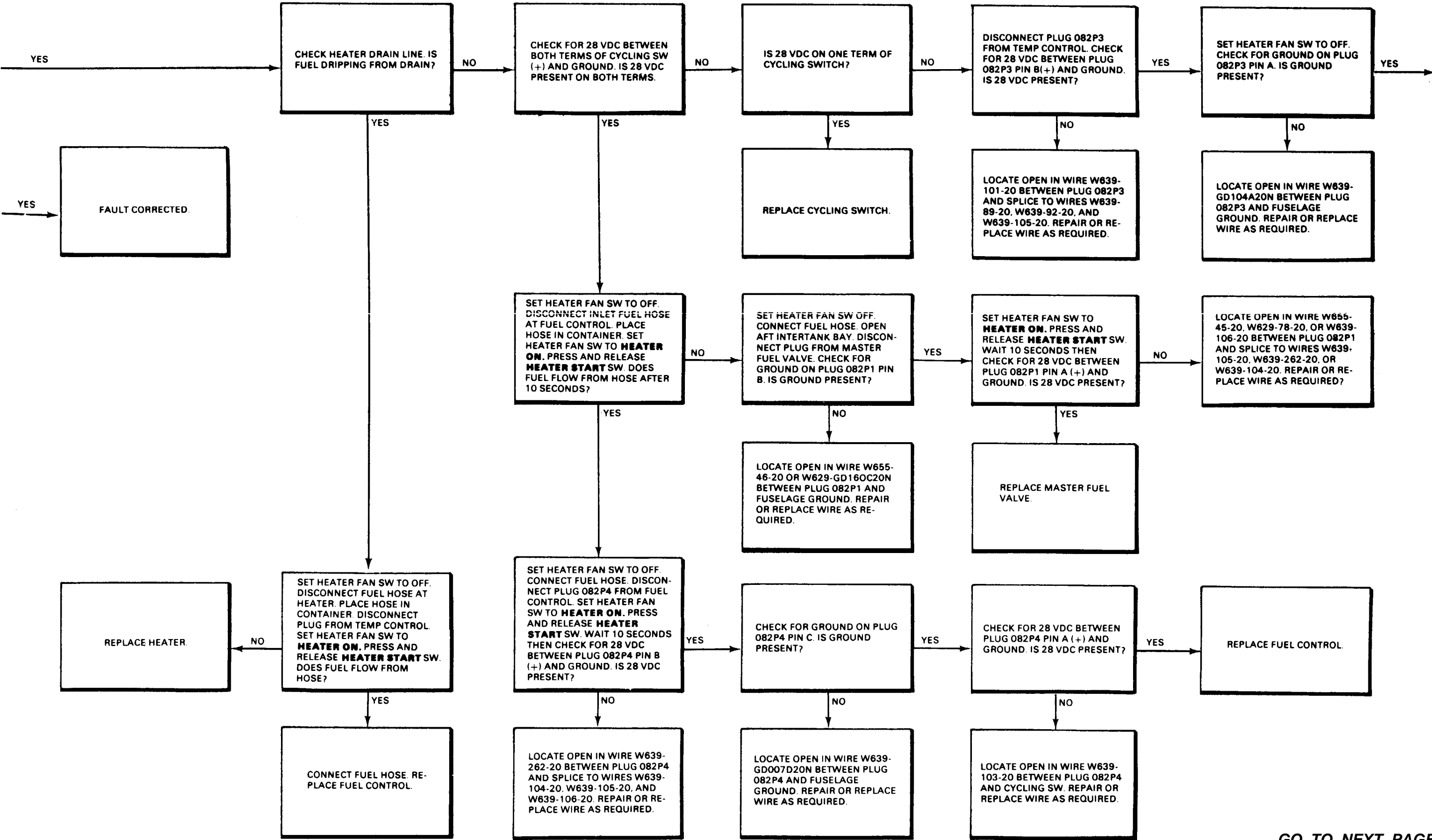
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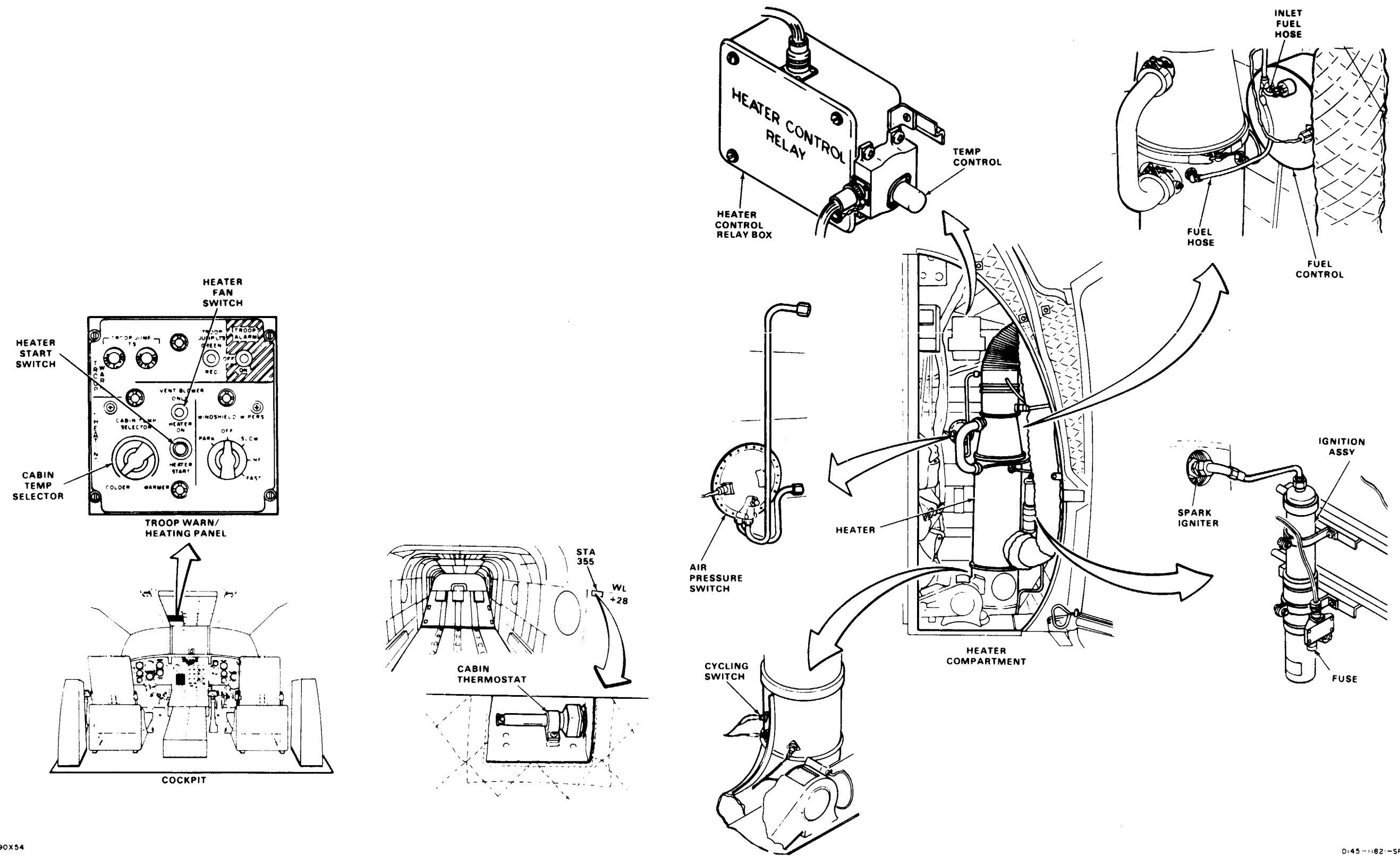


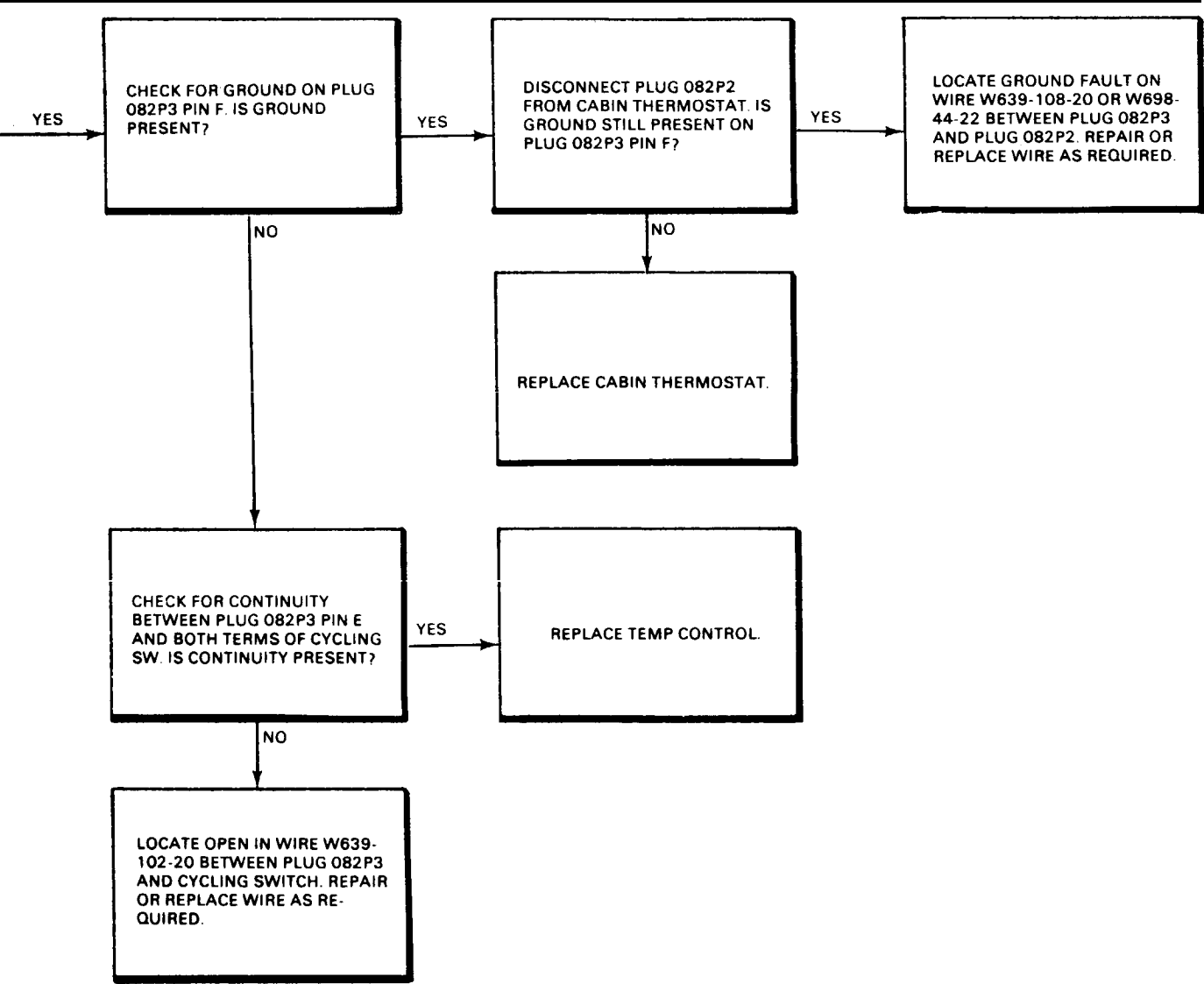


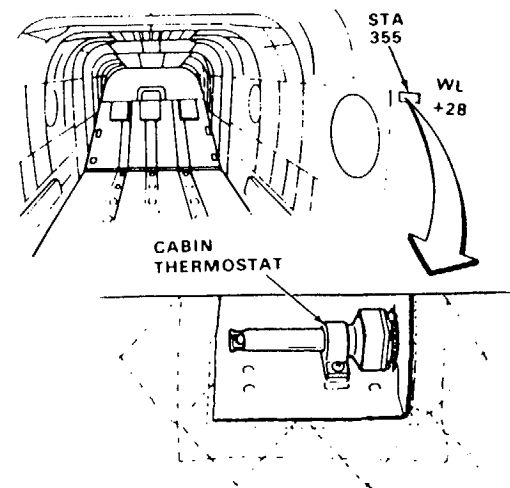
13-1.12 HEATER DOES NOT PROVIDE WARM AIR (Continued)

13-1.12

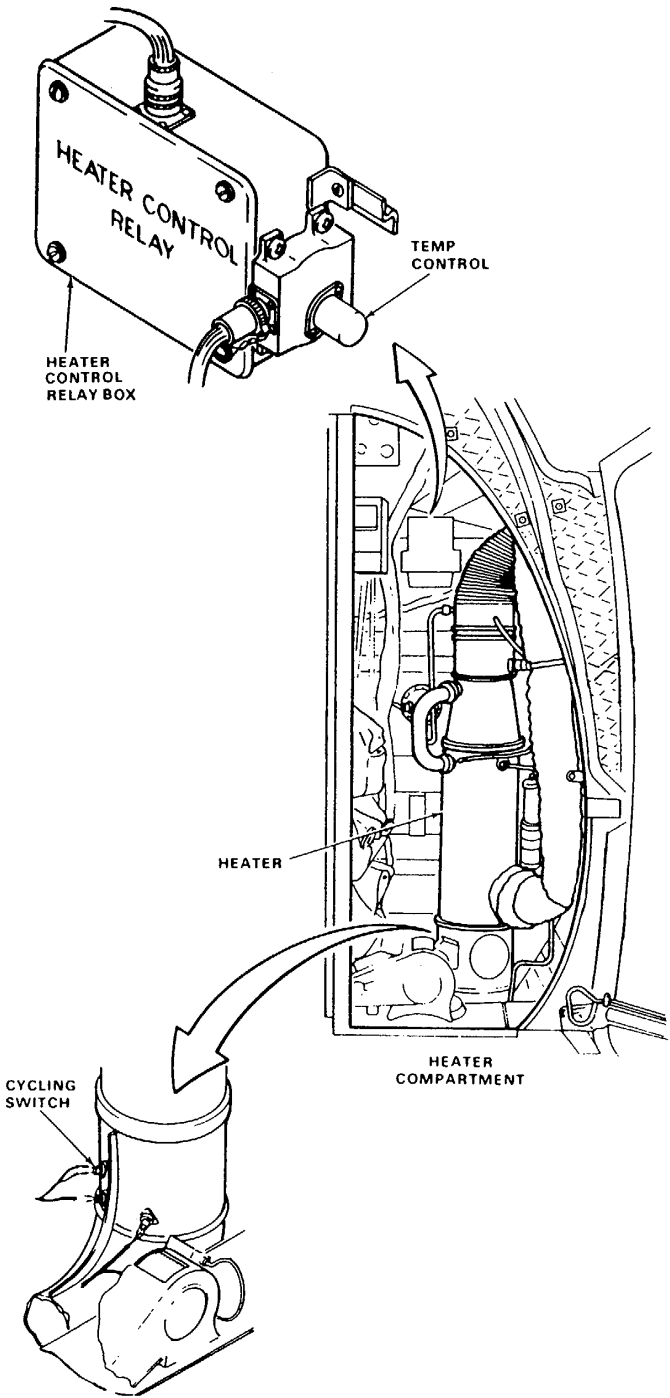








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D145-11819-5PA

END OF TASK

13-1.13 HEATER HOT (WITHOUT 74) HTR HOT 74 LIGHT COMES ON

13-1.13

FAULT ISOLATION PROCEDURE

INITIAL SETUP

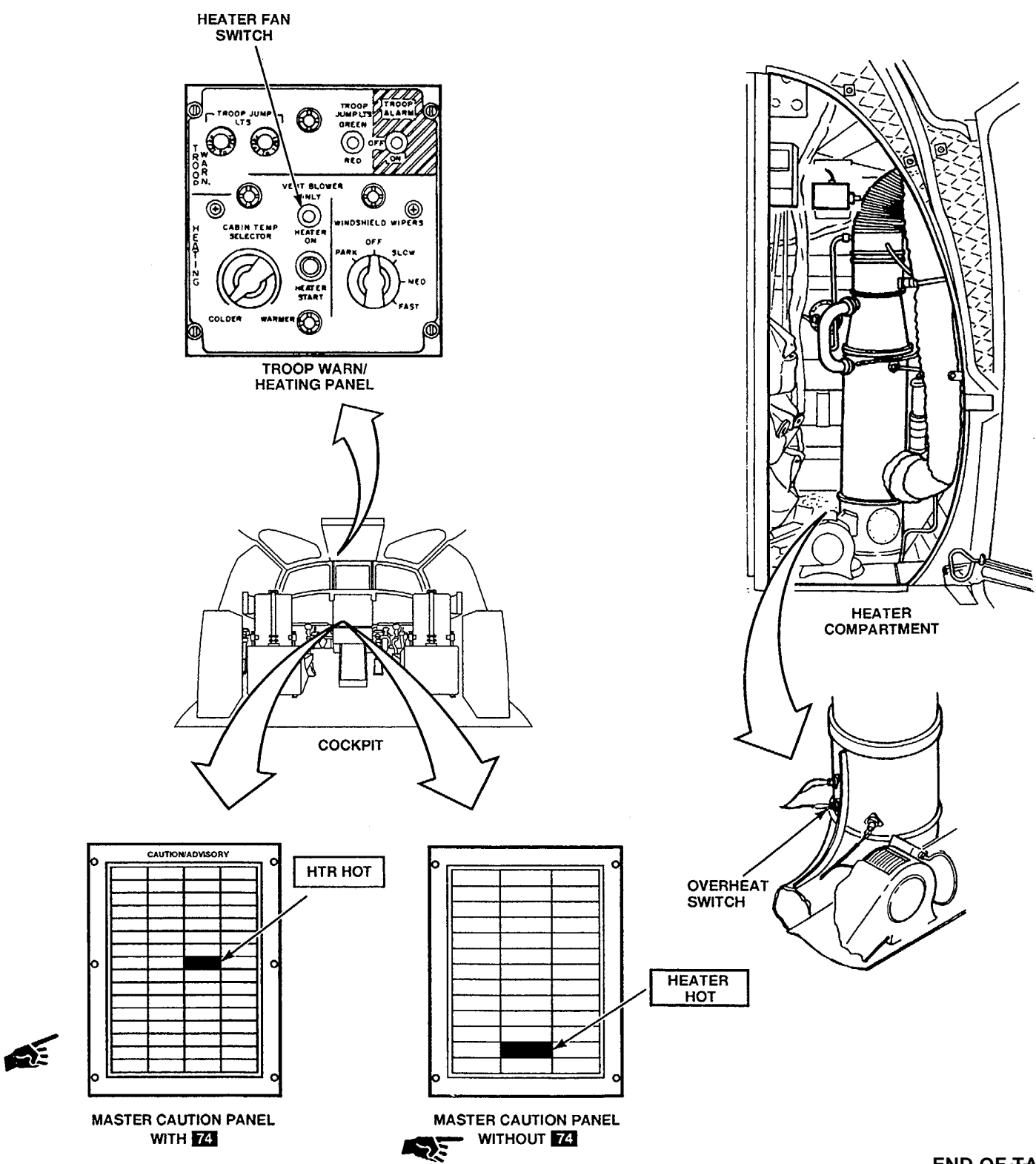
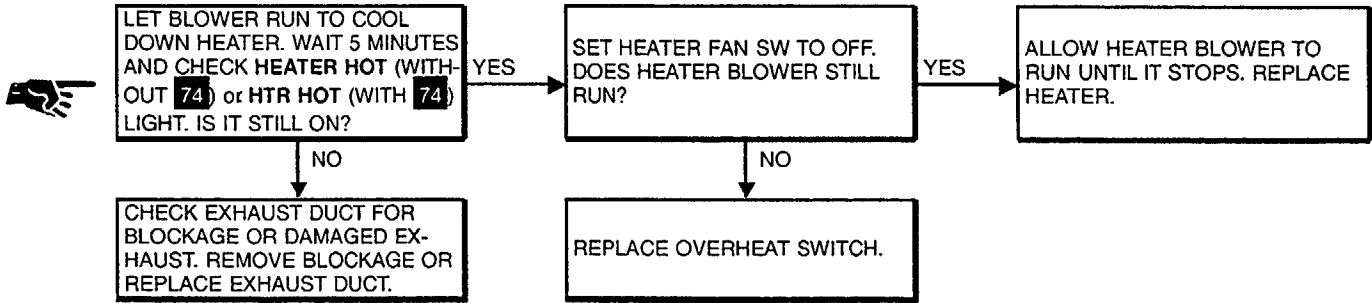
Applicable Configurations:  
All

Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
Medium Helicopter Repairer  
Aircraft Electrician

References:  
TM 55-1520-240-23  
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Heater Compartment Acoustic Blanket  
Removed



END OF TASK

13-1.14 SYSTEM DOES NOT RESPOND TO CHANGES IN CABIN TEMP SELECTOR SETTING

13-1.14

FAULT ISOLATION PROCEDURE

INITIAL SETUP

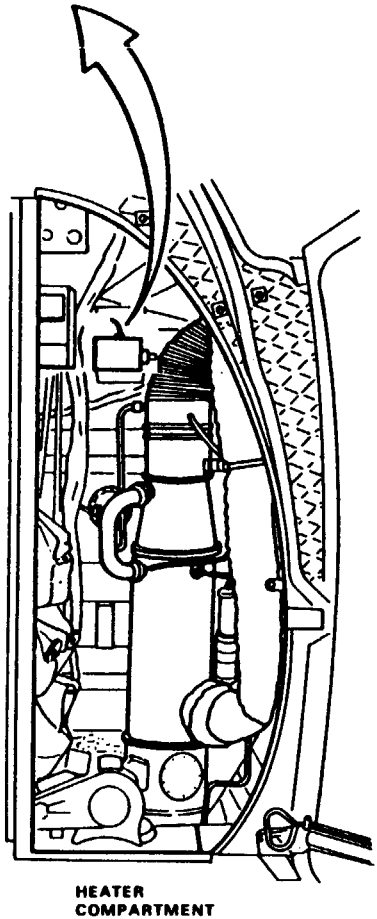
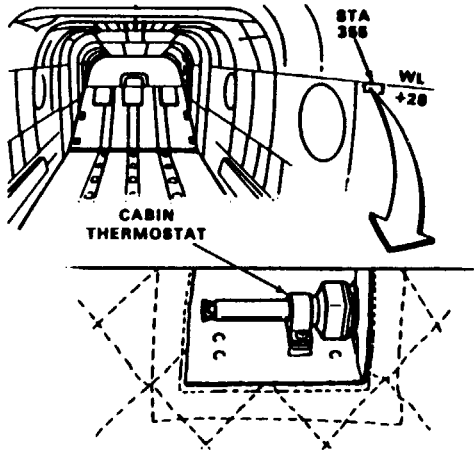
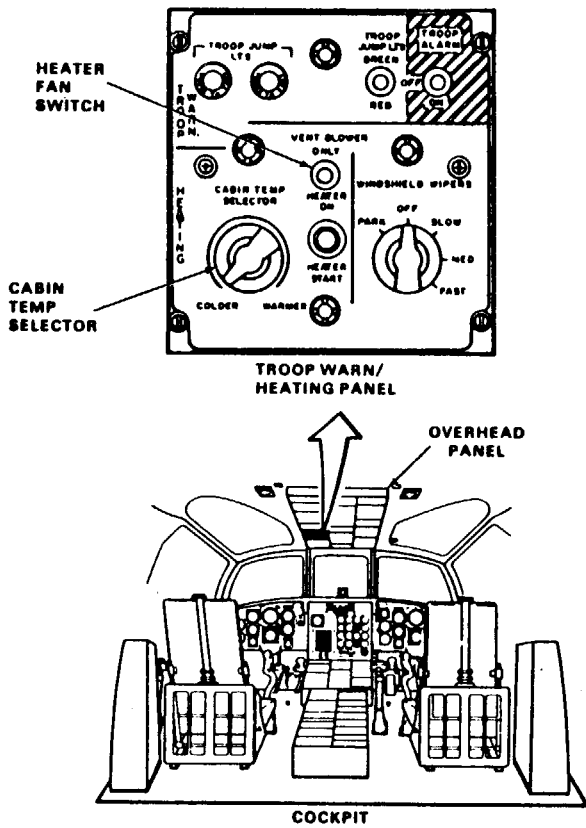
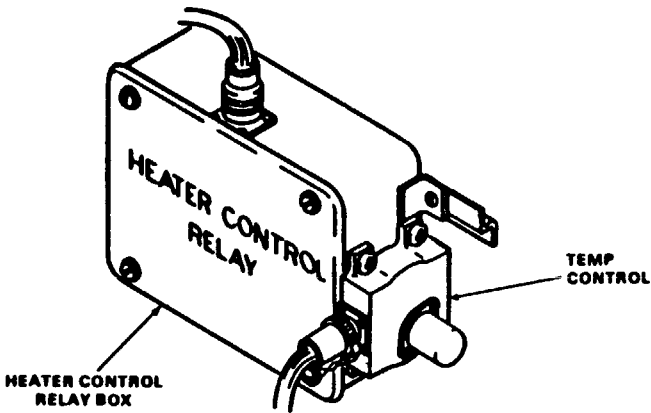
Applicable Configurations:  
All

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Heater Compartment Acoustic Blanket  
Removed



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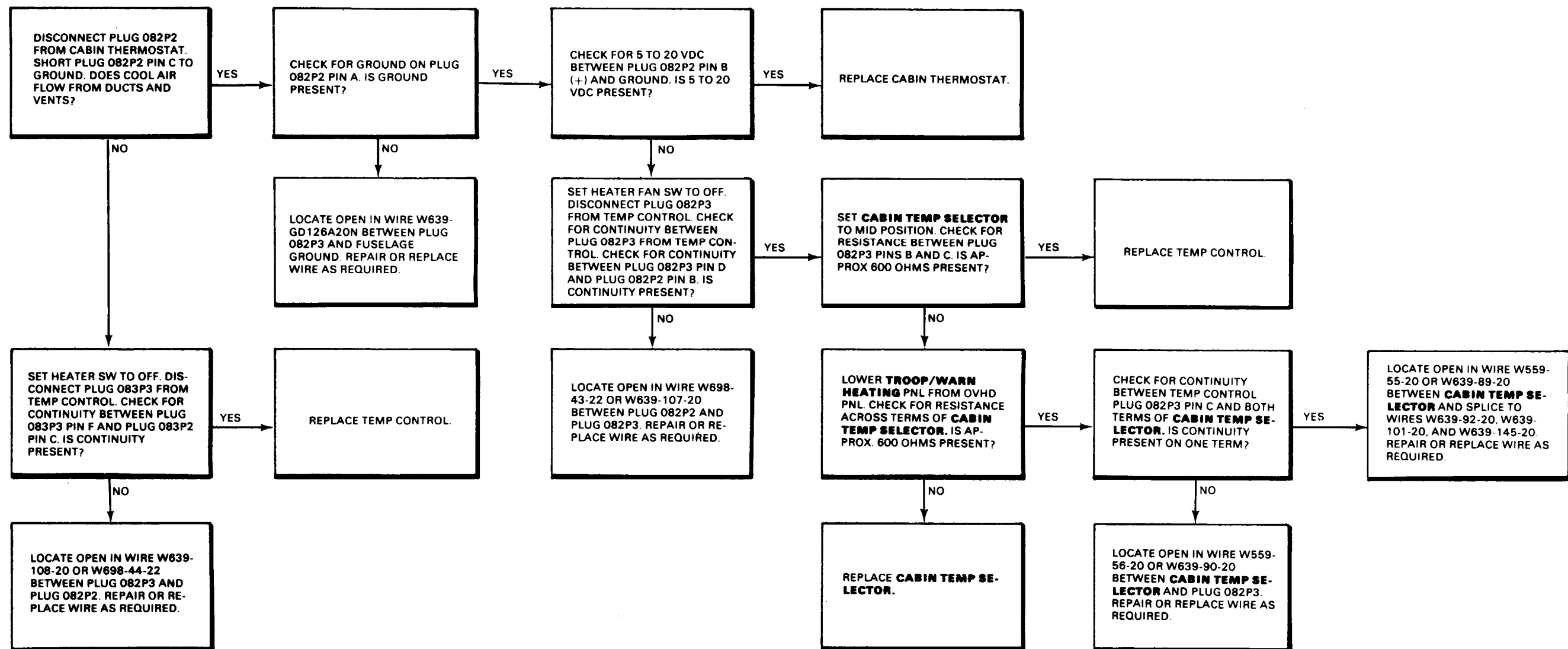
D143-8089-SPA

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13-1.14 SYSTEM DOES NOT RESPOND TO CHANGES IN CABIN  
TEMP SELECTOR SETTING (Continued)

13-1.14



END OF TASK

13-1.15 HEATER FAN STOPS RUNNING IMMEDIATELY AFTER  
HEATER FAN SWITCH SET TO OFF

FAULT ISOLATION PROCEDURE  
INITIAL SETUP

Applicable Configurations:  
All

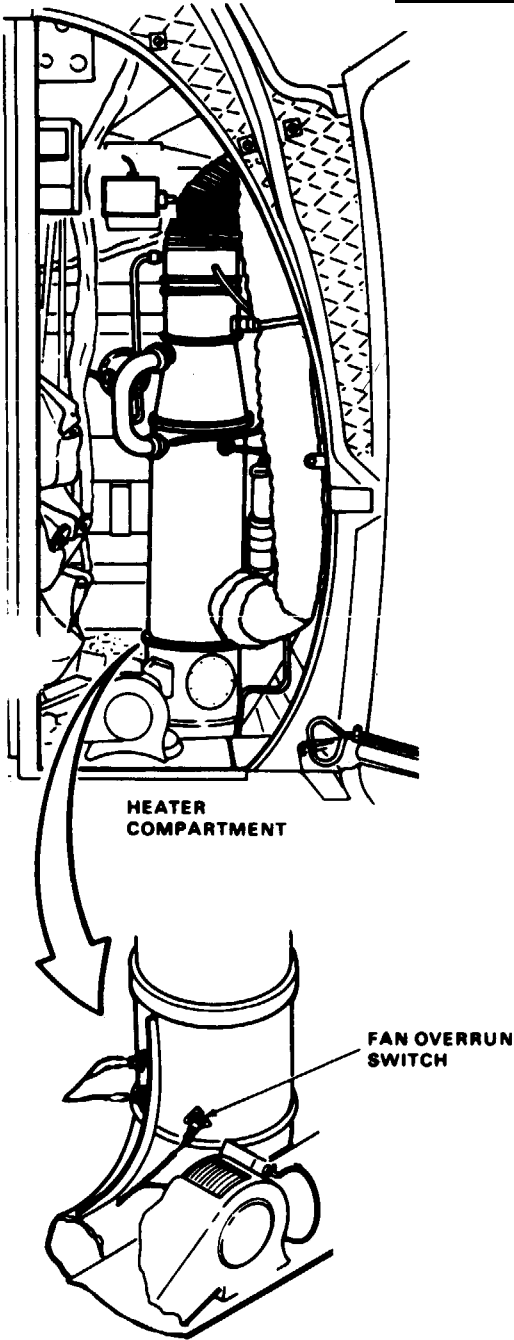
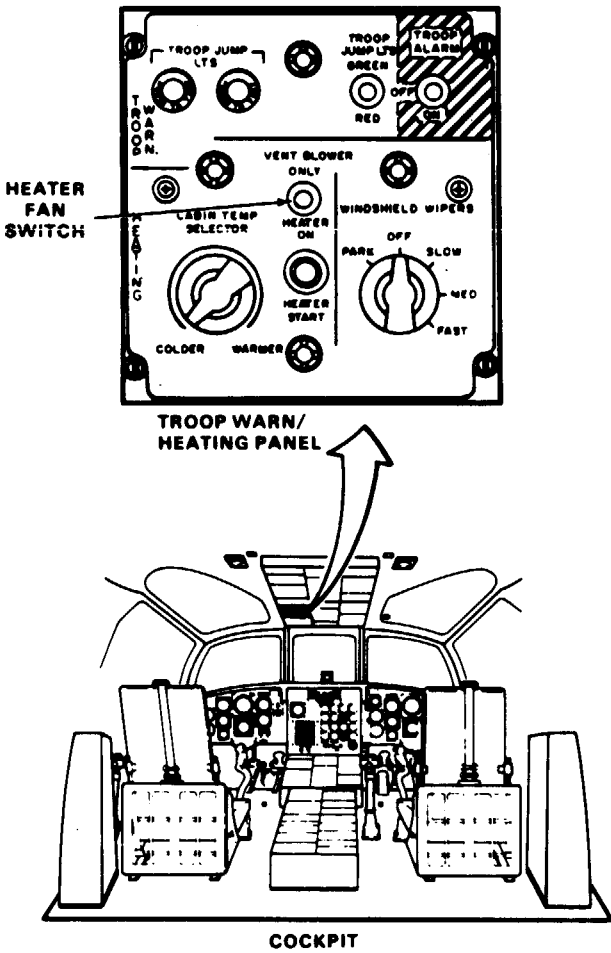
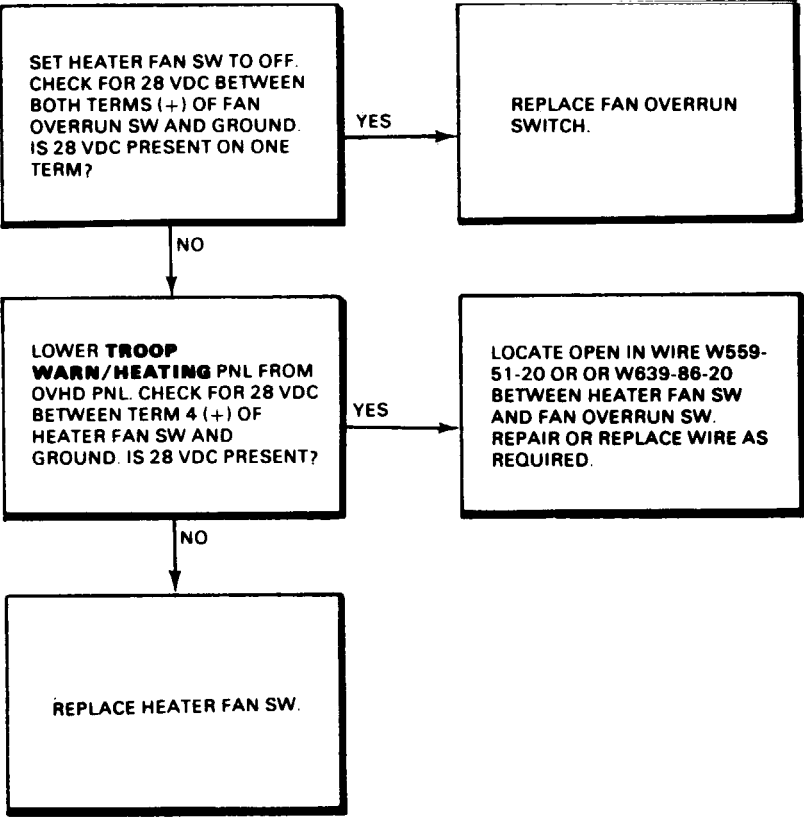
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multi meter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Heater Compartment Acoustic Blanket  
Removed





# CHAPTER 14

## HOIST AND WINCH TROUBLESHOOTING

CHAPTER 14  
HOIST AND WINCH TROUBLESHOOTING  
CHAPTER OVERVIEW

Chapter 14 contains procedures for Hoist and Winch System troubleshooting. Hoist and winch system failure symptoms are listed below. Included in this Chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for Hoist and Winch System.

Refer to TM 55-1520-240-23 for required Hoist and Winch maintenance procedures.

SYSTEM	PARA
CARGO/RESCUE WINCH SYSTEM	14-1

FAILURE SYMPTOM LIST

HOIST AND WINCH

SYMPTOM	TASK
CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED AT HOIST/CARGO HOOK PANEL	14-1.4
CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED BY WINCH GRIP AT STA 95 AUXILIARY PANEL	14-1.4
CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED BY WINCH GRIP AT STA 502 RECEPTACLE	14-1.4
CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED AT HOIST/CARGO HOOK PANEL	14-1.4
CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY WINCH CONTROL GRIP AT STA 95 AUXILIARY PANEL	14-1.4

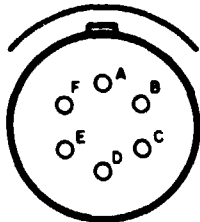
SYMPTOM	TASK
CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY WINCH GRIP AT HOIST OPERATORS STATION	14-1.4
HOIST CABLE CUTTER CIRCUIT BREAKER DOES NOT STAY CLOSED	14-1.4
HOIST CONT CIRCUIT BREAKER DOES NOT STAY CLOSED	14-1.4
28 VDC NOT MEASURED AT STA 340 CABLE CUTTER RECEPTACLE WHEN HOIST/CARGO HOOK PANEL CABLE CUTTER SWITCH IS SET TO ON	14-1.4
28 VDC NOT MEASURED AT STA 340 CABLE CUTTER RECEPTACLE WHEN WINCH GRIP CABLE CUTTER SWITCH PRESSED AT HOIST OPERATOR OR AUXILIARY PANEL	14-1.4

HOIST SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST

REF DESIG	PART NUMBER	TYPE	MATE WITH/LOCATION	STATION LOCATION			REF DESIG	PART NUMBER	TYPE	MATE WITH/LOCATION	STATION LOCATION		
				FS	WL	BL					FS	WL	BL
GD034		150	FWD AND ABOVE OVHD PNL	61	40	10L	300J1	M83723-74A2041N	40	NO. 1 PDP			
GD 194		151	HEATER COMPARTMENT	120	40	18R	300P1	M83723-75A2041N	40	NO. 1 PDP			
TB 17			WALKWAY - UNDERFLOOR	105	-30	18R	300J4	M83723-74A2461N	43	NO. 1PDP			
TB 27			RH CABIN	330	50	50R	300P4	M83723-75A2461N	43	NO. 1 PDP			
TB 36			OVERHEAD PANEL - COCKPIT	80	40	12R	300J19	M83723-73A2041N	40	OVERHEAD PANEL -COCKPIT			
TB 37			OVERHEAD PANEL - COCKPIT	80	40	12L	300P19	M83723-76A2041N	40	OVERHEAD PANEL -COCKPIT			
132P1	MS3476W10-6S	15	HOIST WINCH MOTOR	120	-25	30R	300J20	M83723-74A2461N	43	OVERHEAD PANEL -COCKPIT			
132P2	M83723-95A1005N	30	HOIST CONTROL VALVE	120	25	18R	300P20	M83723-75A2461N	43	OVERHEAD PANEL -COCKPIT			
132P3	M83723-95A0803N	29	BRAKE REL SOL	120	35	18R	300J22	M83723-73A20416	40	OVERHEAD PANEL -COCKPIT			
132P4	MS3456W10SL-3S	45	CABLE CUTTER, RECIP	340	50	0	300P22	M83723-76A20416	40	OVERHEAD PANEL -COCKPIT			
132P5	MS3456W10S-2S	44	CABLE CUTTER SOL	340	50	0	300J47	M83723-74A2461N	43	HEATER COMPARTMENT -OVHD	105	40	30R
132P6	MS3476W14-19P	21	HOIST, OPR PNL	340	50	50R	300P47	M83723-75A2461N	43	HEATER COMPARTMENT -OVHD	105	40	30R
132P7	MS3476W14-19S	21	HOIST OPR CONT GRIP	340	50	50R	300J48	M83723-74A2461N	43	ELECTRONICS COMPARTMENT OVHD	120	40	20L
132J8	MS3450W10SL-3P	45	CABLE CUTTER STOW RECIP	95	-10	25R	300P48	M83723-75A2461N	43	ELECTRONICS COMPARTMENT OVHD	120	40	20L
132J9	MS3470W14-19S	21	MATES WITH 132P6	110	-10	25R	300J52	M83723-74A2255N	42	AFT CROWN	460	45	30L
132J10	MS3450W10SL-3P	45	RECEPT-CABLE CUTTER	340	50	0	300P52	M83723-75A2255N	42	AFT CROWN	460	45	30L
132J11	MS3470W14-19S	21	132P6 AT HOIST OPR PNL	340	40	50R							
132J12	MS3470W14-19S	21	132P6 AT AFT HOIST OPR	502	-20	50L							
134P1	MS3476W14-19S	21	OVERHEAD PANEL - COCKPIT	80	40	10L							

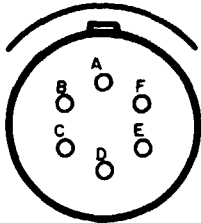
HOIST AND WINCH SYSTEM ELECTRICAL COMPONENT  
LOCATION AND CONFIGURATION LIST (Continued)

RECEPTACLE



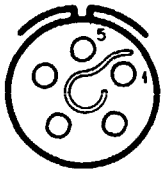
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PLUG



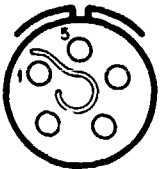
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RECEPTACLE

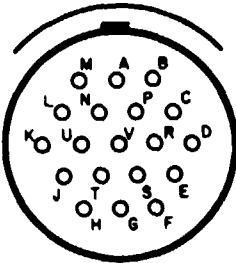


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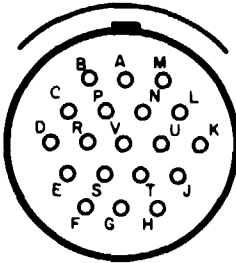
PLUG



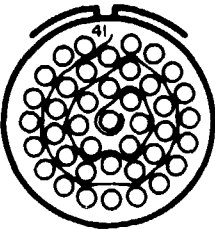
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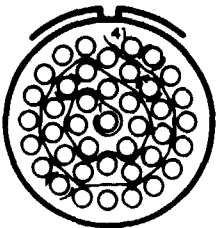
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21



40



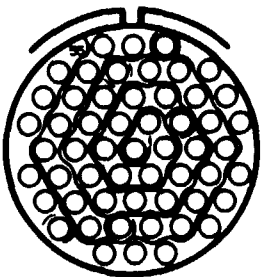
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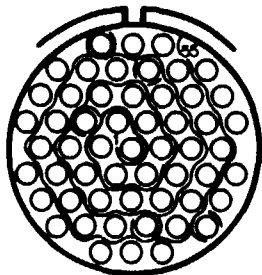
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29



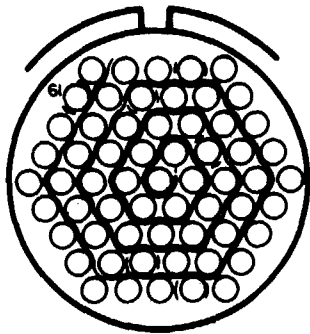
42



42

HOIST AND WINCH SYSTEM ELECTRICAL COMPONENT  
LOCATION AND CONFIGURATION LIST (Continued)

RECEPTACLE



43

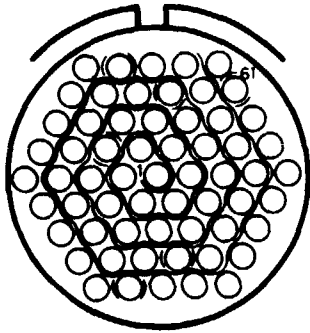


44



45

PLUG



43

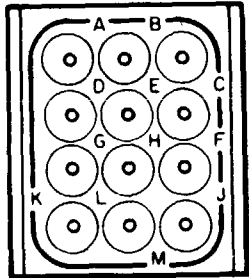


44



45

GND MODULE



150

GND STUD



151

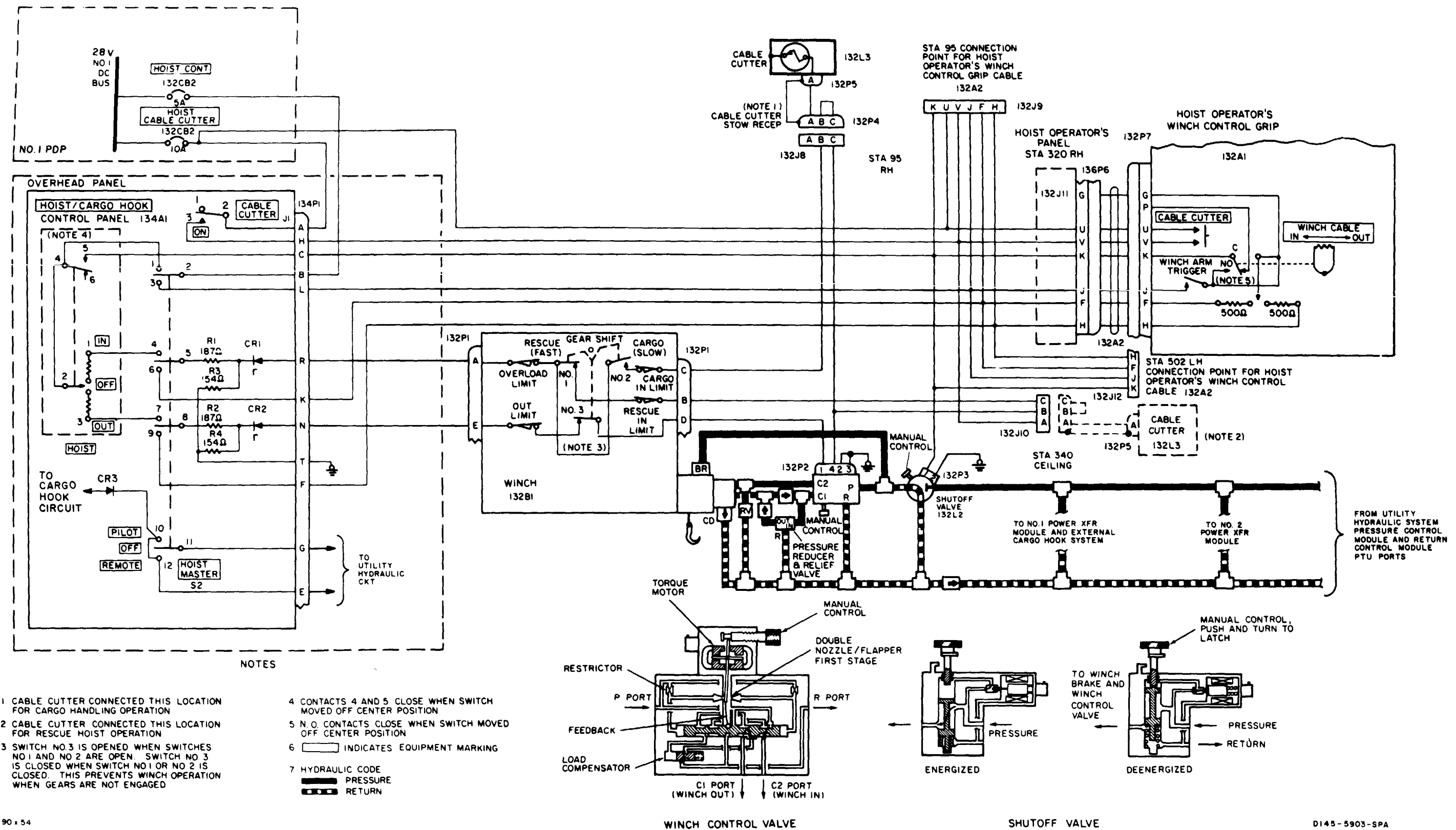
## 14-1 CARGO/RESCUE WINCH SYSTEM

14-1 CARGO/RESCUE WINCH SYSTEM

14-1

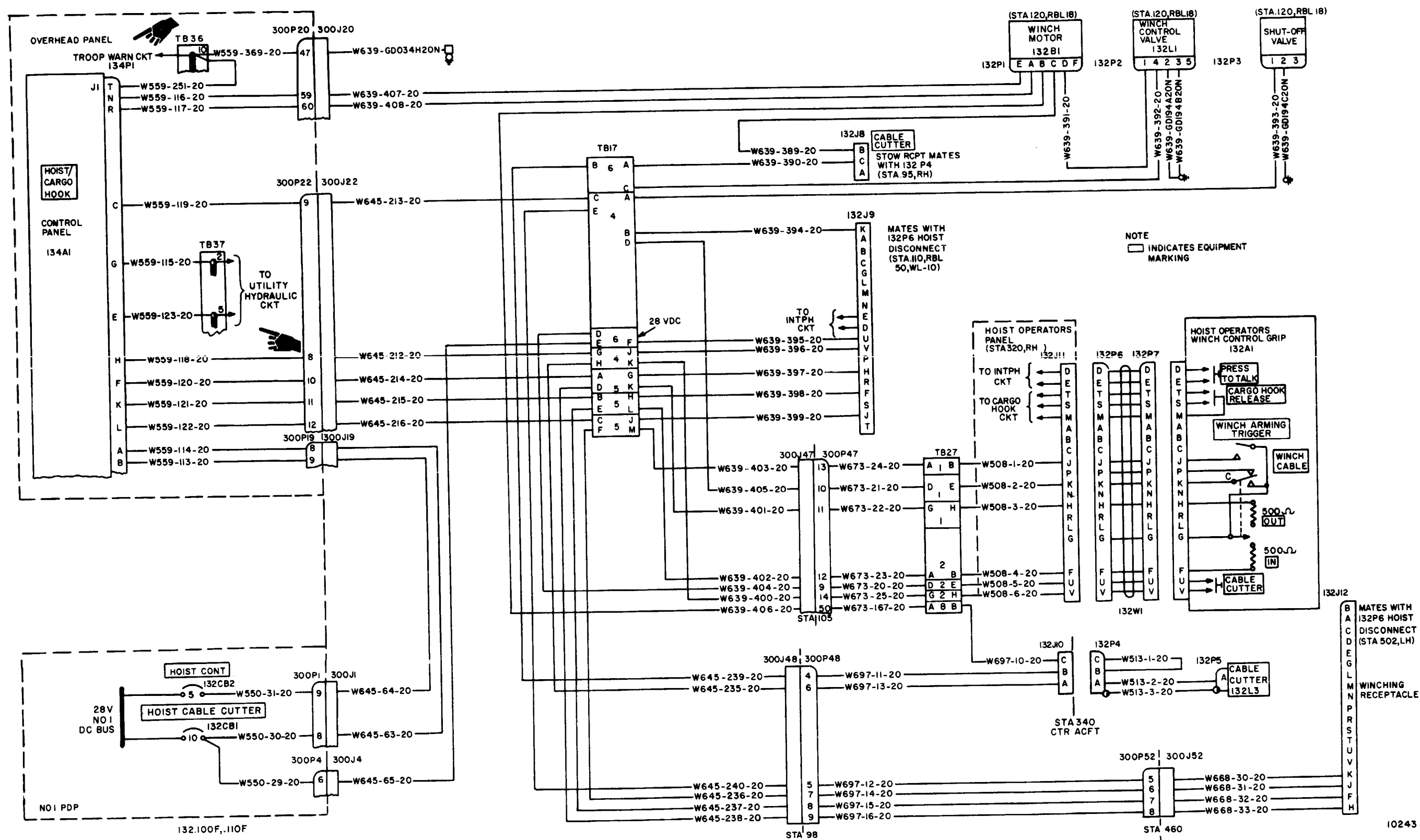
14-1.1 CARGO/RESCUE WINCH SYSTEM SCHEMATIC

14-1.1



14-1.2 CARGO/RESCUE WINCH SYSTEM WIRING DIAGRAM

14-1.2





14-1.3 CARGO/RESCUE WINCH SYSTEM VISUAL CHECK

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

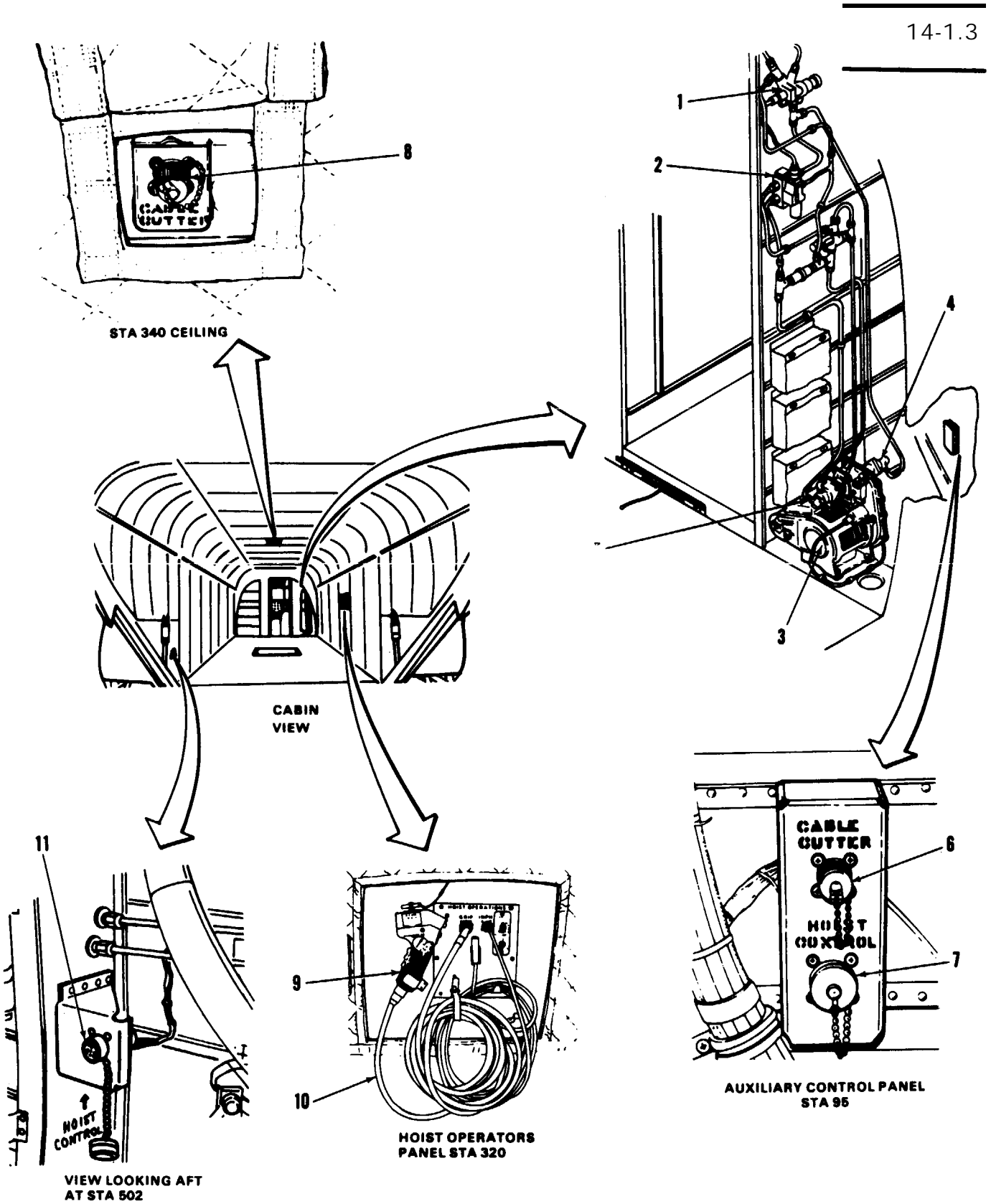
Materials:  
None

Personnel Required:  
67U10 Medium Helicopter Repairer

References:  
TM 55-1520-240-23

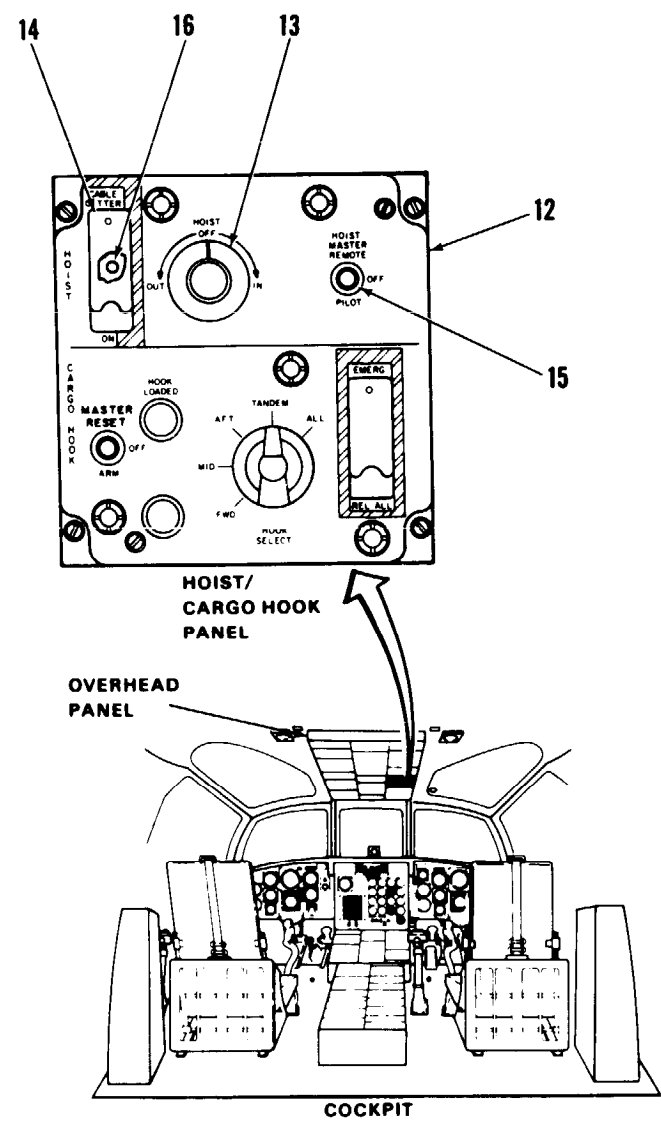
Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off  
Heater Compartment Acoustic  
Blanket Removed  
Cable Cutter Inspected

TASK	RESULT
1. Check shutoff valve (1).	If valve (1) is loose or damaged, tighten or replace it as required. If hydraulic tubes to valve are loose or damaged, tighten or replace them as required. If electrical connector or wires to valve are damaged, repair or replace as required.
2. Check winch control valve (2).	If valve (2) is loose or damaged, tighten or replace it as required. If hydraulic tubes to valve are loose or damaged, tighten or replace them as required. If electrical connector or wires to valve are damaged, repair or replace as required.
3. Check hydraulic tubes and components between winch control valve (2) and winch (3).	If any hydraulic tube or component is loose or damaged, repair or replace as required.
4. Check winch (3).	If winch (3) is loose or damaged, tighten or replace it. If brake (4) is loose or damaged, tighten or replace it as required. If winch motor (5) is loose or damaged, tighten or replace it as required. If connector or wires to winch are damaged repair or replace as required.



14-1.3 CARGO/RESCUE WINCH SYSTEM VISUAL CHECK (Continued)

14-1.3



TASK	RESULT
5. Check CABLE CUTTER and HOIST CONTROL receptacles (6 and 7).	If either receptacle or wiring to receptacle (6 or 7) is damaged, repair or replace as required,
6. Pull down cover and check CABLE CUTTER receptacle (8).	If receptacle (8) is damaged; replace it.
7. Check winch operator's grip (9) and cable (10).	If grip (9) is cracked or cable (10) is cut exposing wires, replace it.
8. Check HOIST CONTROL receptacle (11).	If receptacle (11) is damaged, replace it. If receptacle dust cover is damaged or missing, replace it,
9. Check HOIST/CARGO HOOK panel (12).	If knob (13) is loose or damaged, tighten or replace as required. If switchguard (14) is loose or damaged, tighten or replace as required. If switch (15 or 16) is loose or damaged, replace HOIST/CARGO HOOK panel (12).

FOLLOW-ON MAINTENANCE:

None

14-1.4 CARGO/RESCUE WINCH SYSTEM OPERATIONAL CHECK

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692  
Multi meter  
Asbestos Gloves (E187)  
Stopwatch  
Load, 600 pounds  
Load, 3100-3300 pounds

Materials:  
Lockwire (E228)

Personnel Required:  
68F10 Aircraft Electrician  
67U10 Medium Helicopter Repairer  
67U20 Medium Helicopter Repairer

References:

TM 55-1520-240-23  
TM 55-1520-240-10

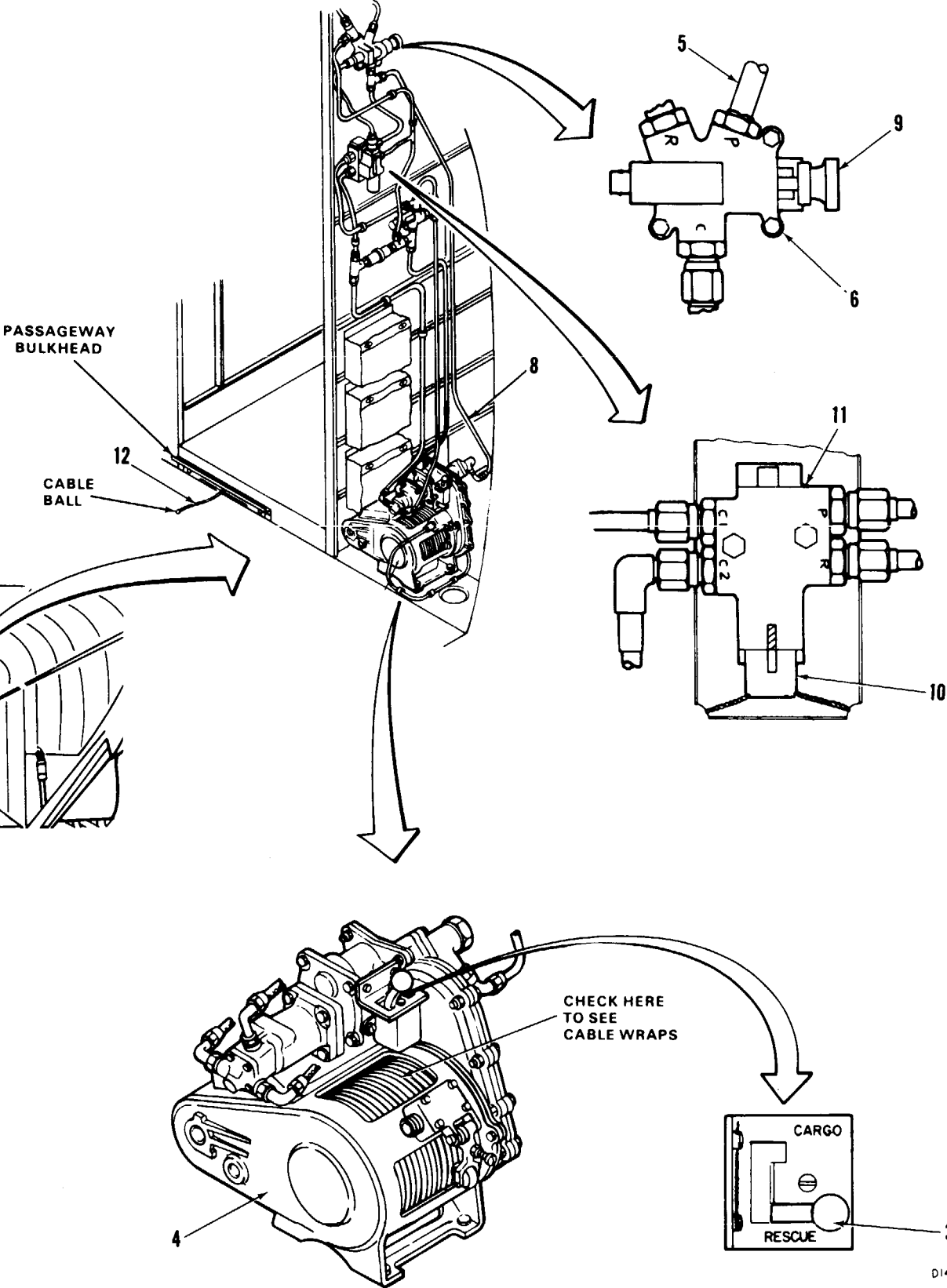
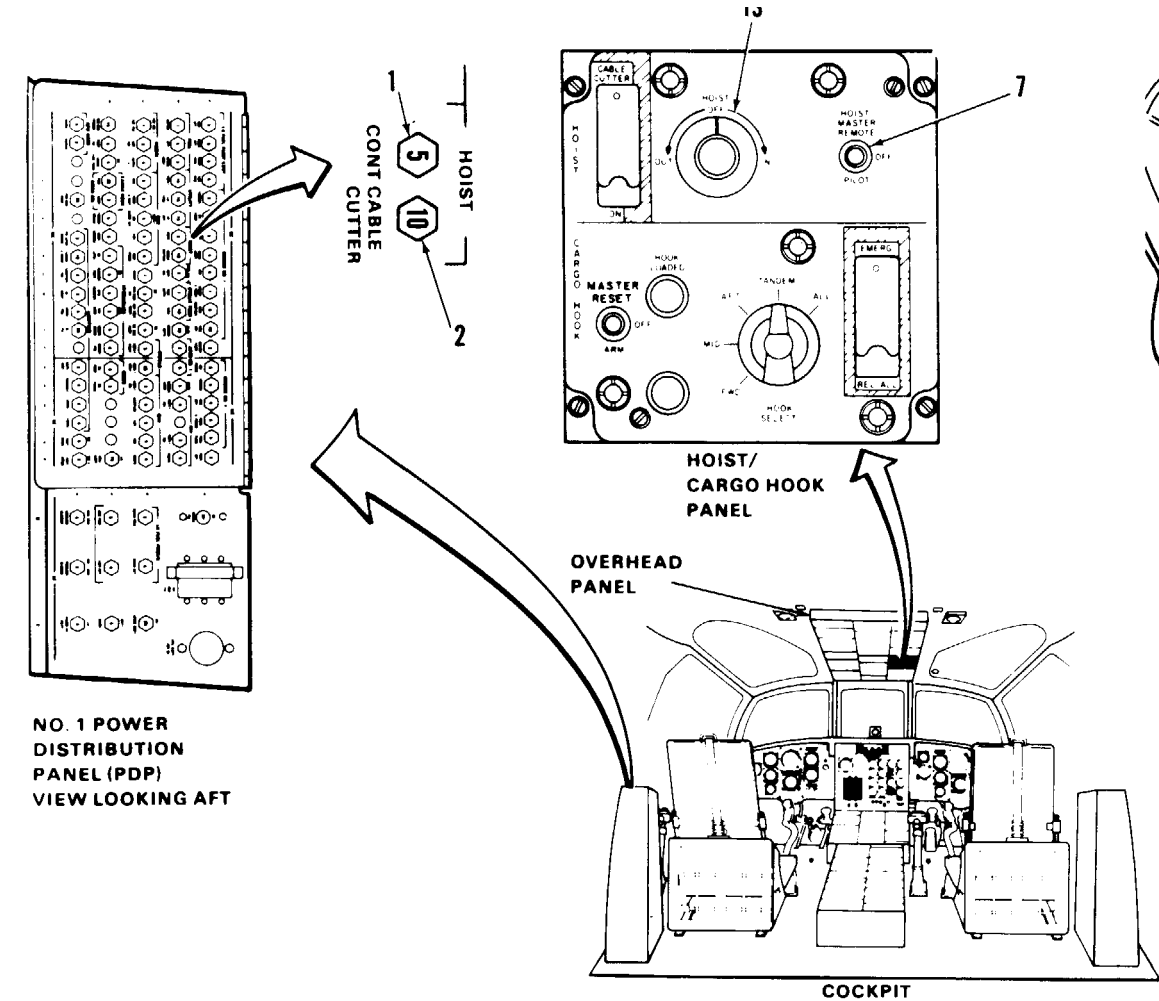
Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
Center Cargo Hook  
Removed  
Visual Check of Cargo/Rescue Winch System  
Performed (Task 14-1.3)

General Safety Instructions:

**WARNING**

Wear gloves when handling wire rope (cable). Otherwise, injury to hands can result.



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GO TO NEXT PAGE

14-1.4 CARGO/RESCUE WINCH SYSTEM OPERATIONAL CHECK  
(Continued)

14-1.4

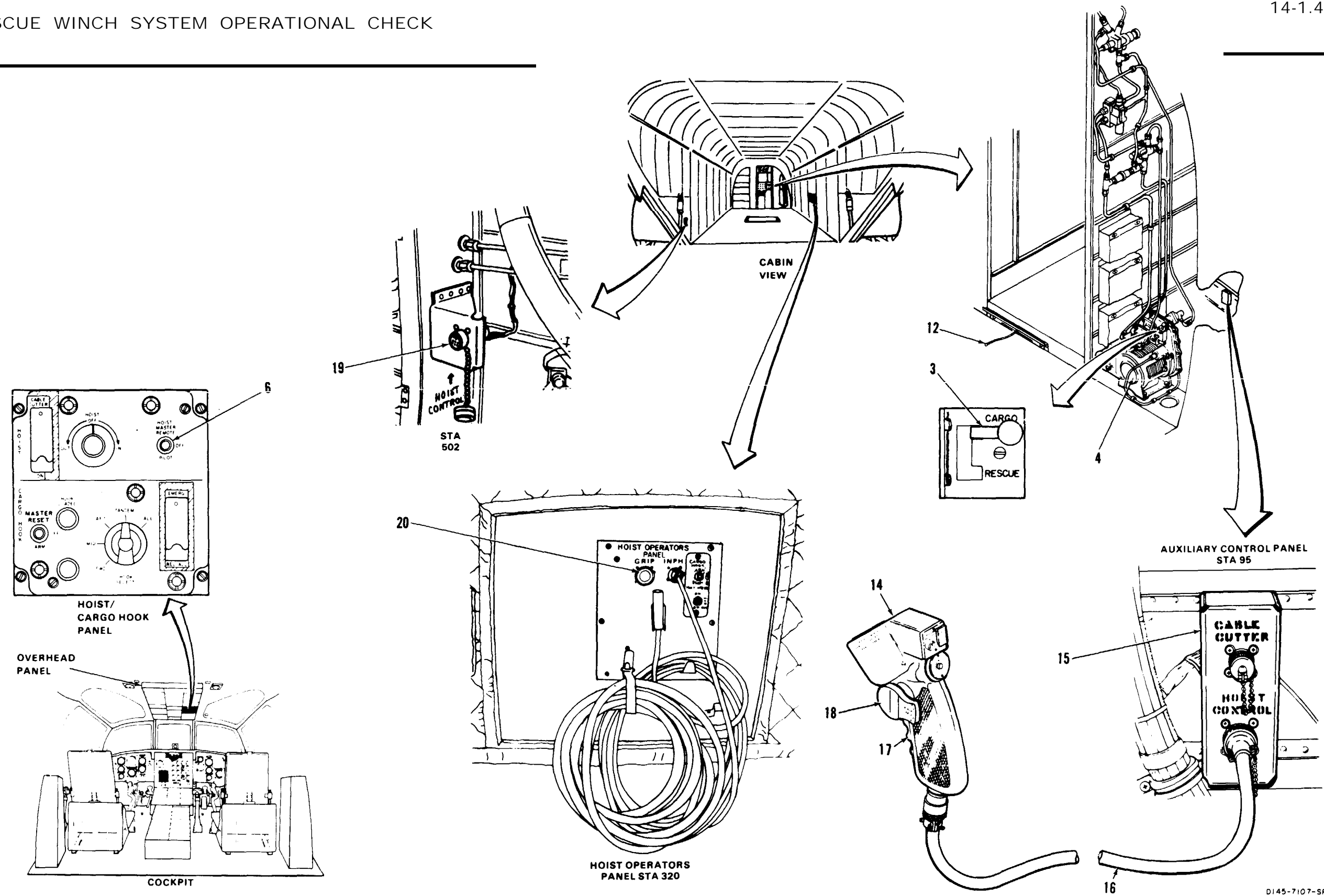
TASK	RESULT
NOTE	
Keep tension on wire rope (cable) when reeling cable. Cable will reel evenly and will not snarl.	
1. Check that HOIST CONT and HOIST CABLE CUTTER circuit breakers (1 and 2) are closed.	If either circuit breaker (1 or 2) is open, close it. If HOIST CONT circuit breaker (1) opens again, go to task 14-1.5. If HOIST CABLE CUTTER circuit breaker (2) opens again, go to task 14-1.6.
2. Check that winch shift lever (3) is set to RESCUE.	If lever (3) not at RESCUE, set it to RESCUE. If lever can not be set to RESCUE, replace winch (4),
3. Hold pressure line (5) to shutoff valve (6). Set HOIST MASTER switch (7) to PILOT.	Pressure surge should be felt on pressure line (5). If not, go to task 7-2.4.
4. Hold pressure line (8) to brake on winch (4). Push in and turn pushbutton (9) on shutoff valve (6). Release pushbutton.	Pressure surge should be felt on pressure line (8). If not, replace shutoff valve (6). Push button (9) shall remain locked when released. If it comes out, replace shutoff valve (6).
5. Remove lockwire from knob (10) on winch control valve (11).	
6. Turn knob (10) in one direction. Reel out enough wire rope (cable) (12) to rig. Release knob. Have helper keap slight dragon cable. Helper must wear gloves.	Cable (12) shall reel off winch (4), if it does not, turn knob (10) in opposite direction. If cable still does not reel off winch, replace winch,
7. Rig winch (4) for rescue mode (TM 56-1620-240-10).	
8. Turn and release pushbutton (9).	Pushbutton (9) shall come out. If it does not, replace shutoff valve (6).
9. Turn knob (10) in any direction. Release knob.	Winch (4) shall not operate. If it does, replace shutoff valve (6).
10. Turn HOIST control (13) to OUT. Release control to OFF when cable (12) stops reeling out .	Winch (4) shall reel out cable (12) within 90 seconds and stop when 2-1/2 wraps of first layer of cable remain on winch drum. If winch does not reel out cable, go to task 14-1.7. If cable takes longer than 90 seconds to reel out, replace winch. If winch does not stop when 2-1/2 wraps remain on drum, adjust winch out-limit switch, TM 55-1520-240-23. If switch can not be adjusted, replace winch.
NOTE	
With cable reeled out, an inspection for broken strands or definite bends can be performed.	

TASK	RESULT
CAUTION	
Do not allow cable end to reel in and jam in a pulley. Damage to winch, pulley, or airframe can occur.	
11. Turn HOIST control (13) to IN. Release control to OFF when cable (12) stops reeling in. Have helper keep slight drag on cable. Helper must wear gloves.	Winch (4) shall reel in cable (12) wltin 90 seconds and stop automatically when 26 to 26-1/2 feet of cable remain extended. Cable length is measured from sta 120 passageway bulkhead to cable ball end. If winch does not reel in cable, go to task 14-1.8. If cable takes longer than 90 seconds to reel in, or cable binds or spools unevenly, replace winch. If winch stops too soon or late, (26 - 26-1/2 feet of cable not reeled), adjust rescue in-limit switch, TM 55-1520-240-23. If switch can not be adjusted, replace winch,

GO TO NEXT PAGE

14-1.4 CARGO/RESCUE WINCH SYSTEM OPERATIONAL CHECK  
(Continued)

14-1.4



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14-1.4 CARGO/RESCUE WINCH SYSTEM OPERATIONAL CHECK  
(Continued)

14-1.4

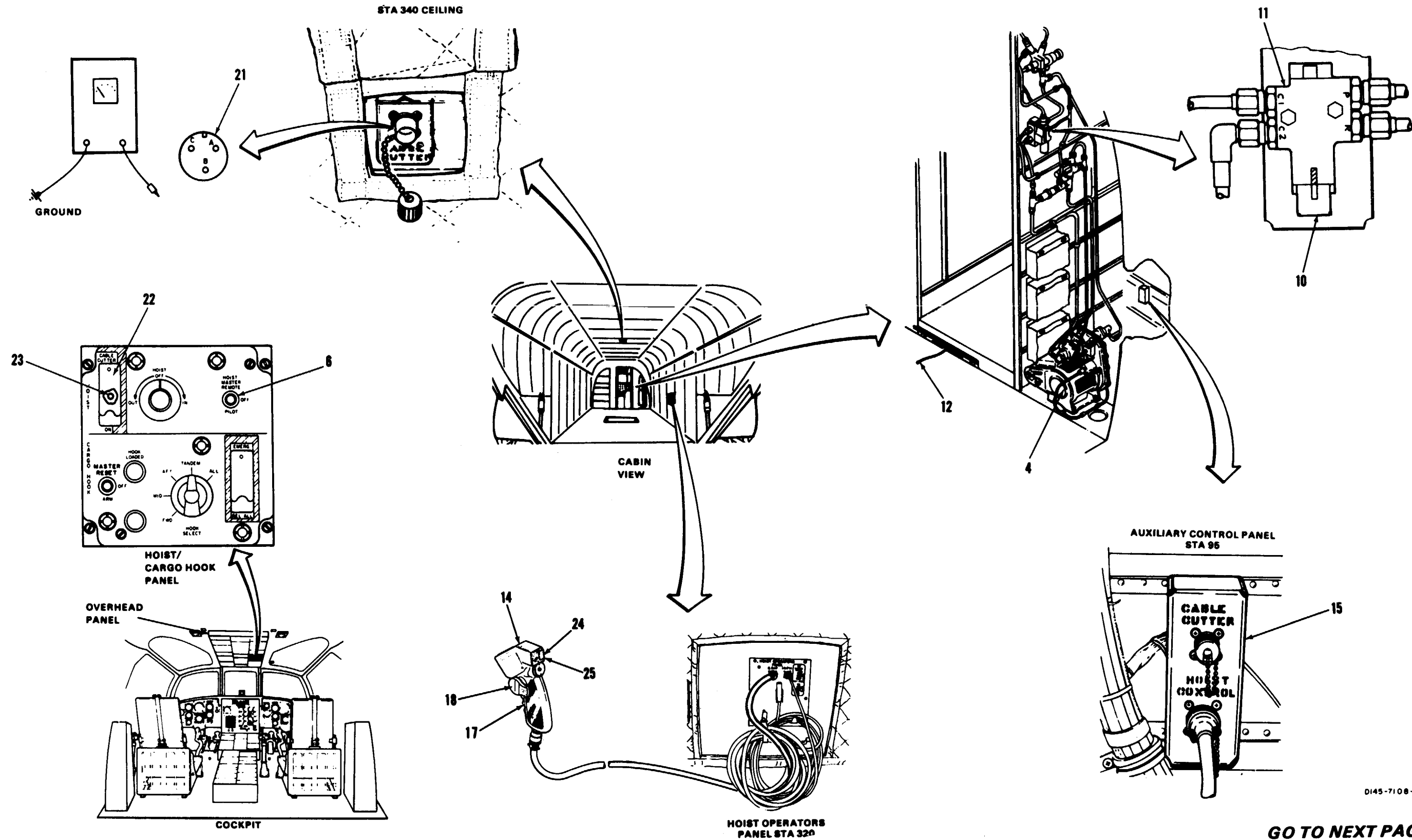
TASK	RESULT
12. Set HOIST MASTER switch (7) to RE-MOTE.	
13. <b>Connect winch control grip (14) to auxiliary panel (15) with cable (16).</b>	
14. <b>On winch control grip (14)</b> , press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to OUT. Reel out enough cable to hook up a load in rescue mode (TM 55-1520-240-10). Then release controls (17 and 18).	<b>Cable (12) shall reel off winch. If it does not, go to task 14-1.9.</b>
15. Connect 600-pound load to cable hook.	
16. <b>On winch control grip (14)</b> , press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to IN. Release controls (17 and 18) after load clears ground.	<b>Winch (4) shall raise load and hold it steady, If winch does not raise load, go to task 14-1.10. If winch sounded like it was beginning to operate but stopped, replace winch. If load creeps down after grip controls released, replace winch.</b>
17. <b>On winch control grip (14)</b> , press and hdd WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to OUT. Release controls (17 and 18) after tension is off cable. Disconnect 600-pound load.	
18. <b>On winch control grip (14)</b> , press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to OUT. Reel out enough cable to hookup an external load. Then release controls (17 and 18).	
19. Set winch shift lever (3) to CARGO.	
20. <b>Rig winch (4) for cargo mode (TM 55-1520-240-10).</b>	
21. Deleted.	
22. Connect winch control grip (14) to sta 502 HOIST CONTROL receptacle (19) with cable (16).	

TASK	RESULT
<div><div><b>WARNING</b></div><div>Cable failure during loading operations will result in cable whiplash within the cabin. This may result in personnel injury. Stand aft and to one side of load to avoid whiplash exposure.</div></div>	
23. <b>On winch control grip (14)</b> , press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to IN.	<b>Winch (4) shall reel in cable (12) and stop when second layer of cable starts on cable drum. If winch does not reel in cable, go to task 14-1.11. If winch continues to operate, release controls (17 and 18). Adjust overload limit switch. If switch is adjusted, repeat steps 18 thru 23. If winch still does not stop when second layer of cable wraps begins, replace winch.</b>
24. <b>On winch control grip (14)</b> , press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to OUT. Release controls (17 and 18) after tension is off cable (12). Disconnect load from cable hook.	<b>Cable (12) shall reel off winch (4), If winch does not operate, locate open in wire W668-33-20, W697-16-20, or W645-238-20 between receptacle 132J12 and TB17. Repair or replace wire as required.</b>
25. Connect winch control grip (14) to HOIST OPERATOR’S panel receptacle (20) with cable (16).	
<div><div>NOTE</div><div><b>If necessary, reel in several feet of cable to perform following step.</b></div></div>	
26. <b>On winch control grip (14)</b> , press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to OUT. Release controls (17 and 18) when several feet of cable (12) are reeled out. Have helper keep slight tension on cable. Helper must wear gloves.	<b>Cable (12) shall reel off winch (4). If it does not, go to task 14-1.12.</b>

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14-1.4 CARGO/RESCUE WINCH SYSTEM OPERATIONAL CHECK  
(Continued)

14-1.4



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GO TO NEXT PAGE

14-1.4 CARGO/RESCUE WINCH SYSTEM OPERATIONAL CHECK  
(Continued)

14-1.4

TASK	RESULT
<div>CAUTION</div> <p>Do not allow cable end to reel in and jam in a pulley. Damage to winch, pulley, or airframe can occur.</p>	
27. On winch control grip (14), press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to IN.	Winch (4) shall reel in cable (12) and stop when <u>12 to 20 inches</u> of cable remain out. If winch does not operate, locate open in wire W508-4-20, W673-23-20, or W639-402-20 between receptacle 132J11 and TB17. Repair or replace wire as required.  If more or less than <u>12 to 20 inches</u> of cable is out when winch stops, adjust cargo in-lmt switch, If switch is adjusted, repeat steps 18 thru 27. If more or less than <u>12 to 20 inches</u> of cable is out, replace winch.
28. Connect multimeter, set to measure 28 <u>vdc</u> between pin A (+) of CABLE CUTTER receptacle (21) and ground.	
29. Lift switch guard (22) and set and hold CABLE CUTTER switch (23) to ON.	Multimeter shall indicate <u>28vdc</u> . If it does not , go to task 14-1.13.
3.0 Release CABLE CUTTER switch (23) and close swltchguard (22).	
31. On winch control grip (14), lift switch guard (24) and press and hold CABLE CUTTER switch (25).	Multimeter shall indicate <u>28vdc</u> . If it does not, go to task 14-1.14.
32. Release CABLE CUTTER switch (25) and close swltchguard (24).	
33. Repeat steps 31 and 32 with winch control (14) connected to auxiliary panel (15) with cable (16). Then disconnect multimeter and proceed to step 34.	
34. Set HOIST MASTER switch (6) to OFF.	
35. Check that index on control valve knob (10) aligns with stripe on valve body. Lockwire knob to structure, Use lockwire (E228).	Align stripe if required

FOLLOW-ON MAINTENANCE:

- TM 55-1520-240-23
- Battery disconnected
  - Hydraulic power off
  - Electrical power off
  - Disconnect and stow winch control grip
  - Disconnect and stow cable cutter.
  - Install heater compartment acoustic blanket
  - Install center cargo hook.

END OF TASK



14-1.5 HOIST CONT CIRCUIT BREAKER DOES NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

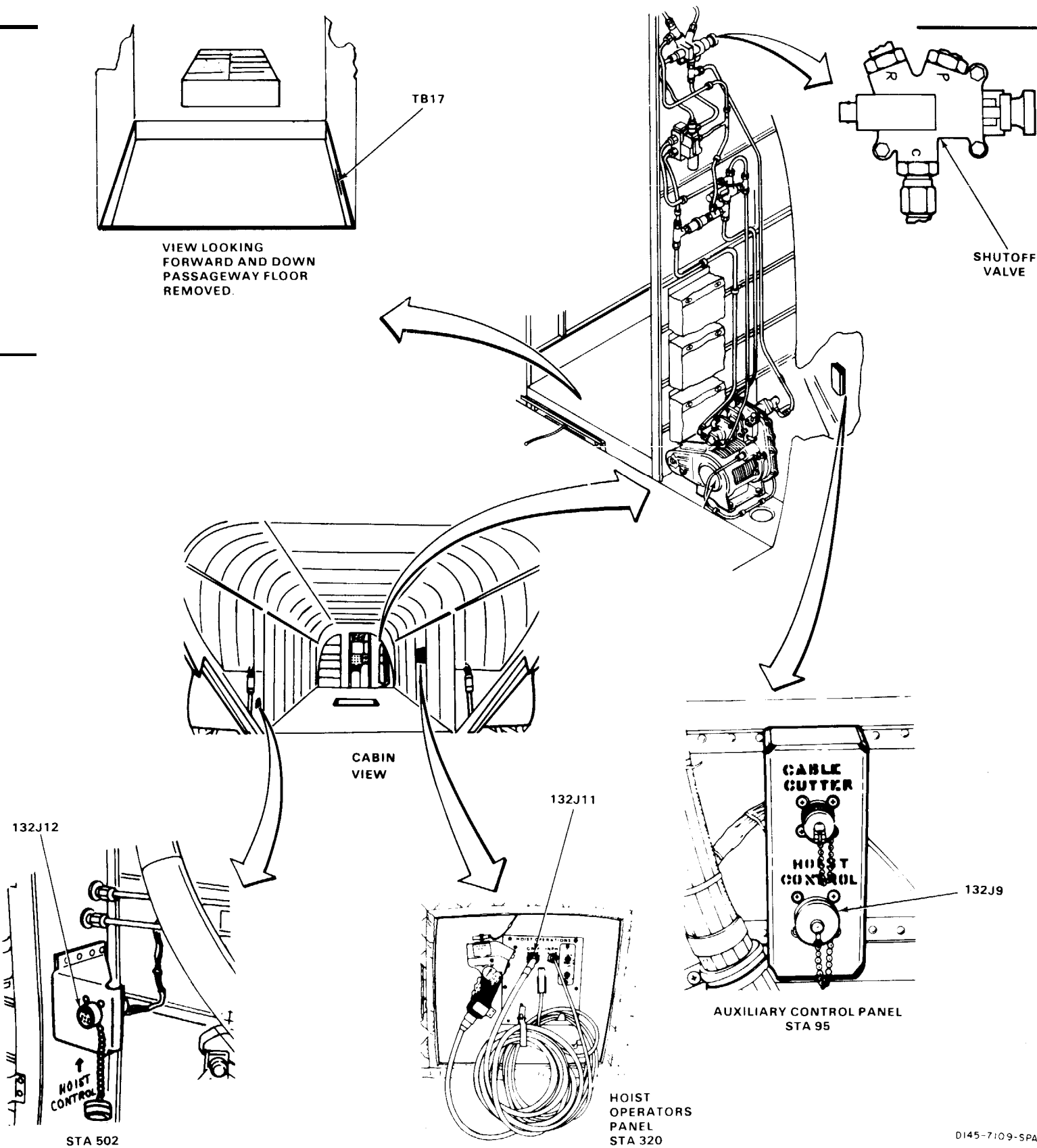
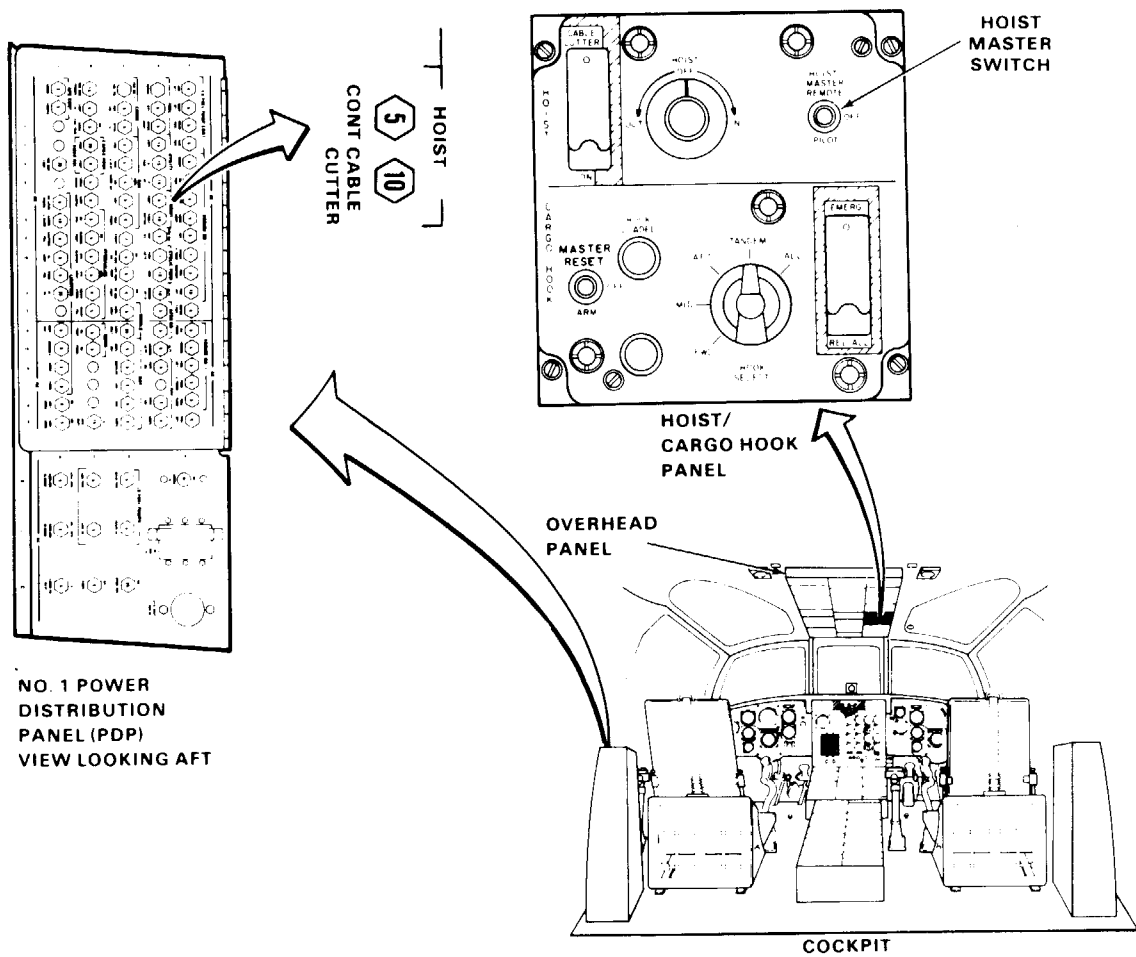
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multi meter

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

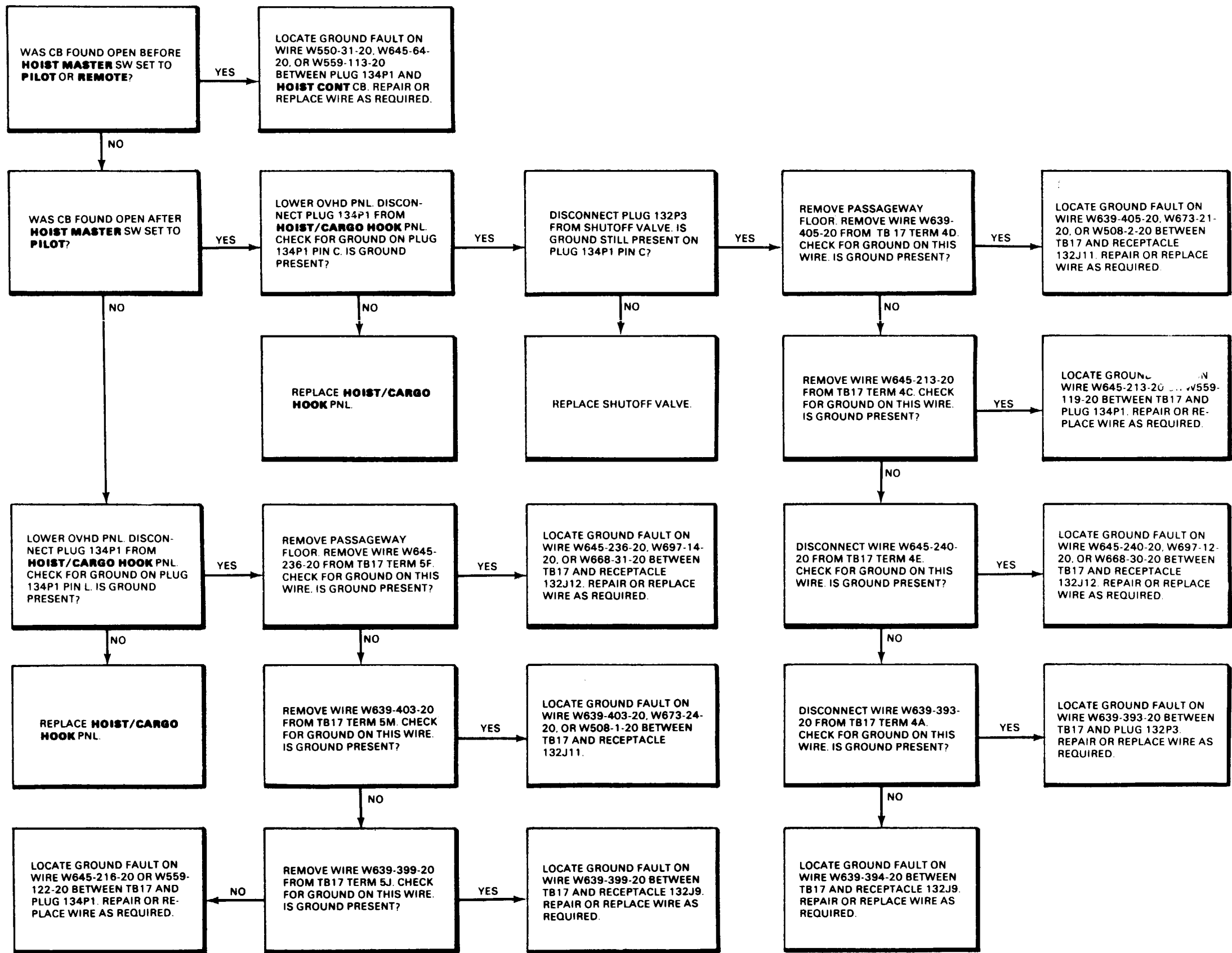
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



14-1.5 HOIST CONT CIRCUIT BREAKER DOES NOT  
STAY CLOSED (Continued)

14-1.5



END OF TASK

14-1.6 HOIST CABLE CUTTER CIRCUIT BREAKER DOES NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

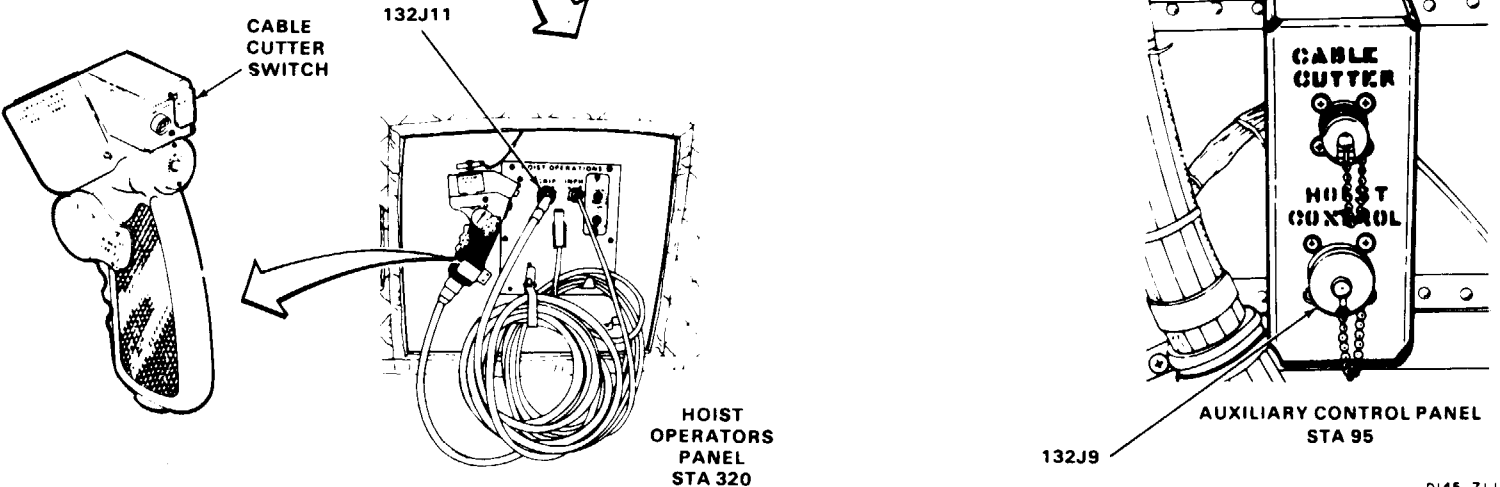
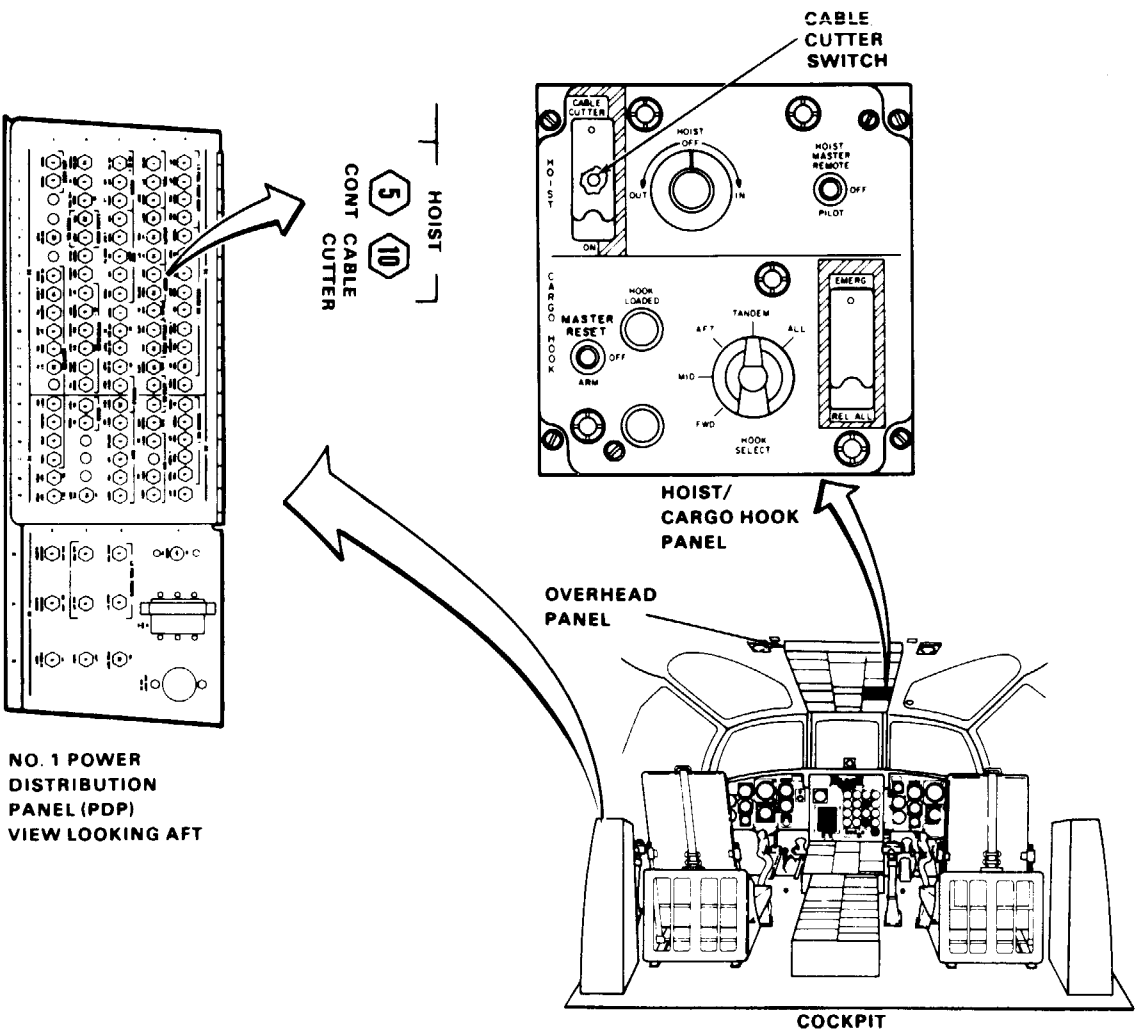
Applicable Configurations:  
All

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician  
  
References:  
TM 55-1520-240-23

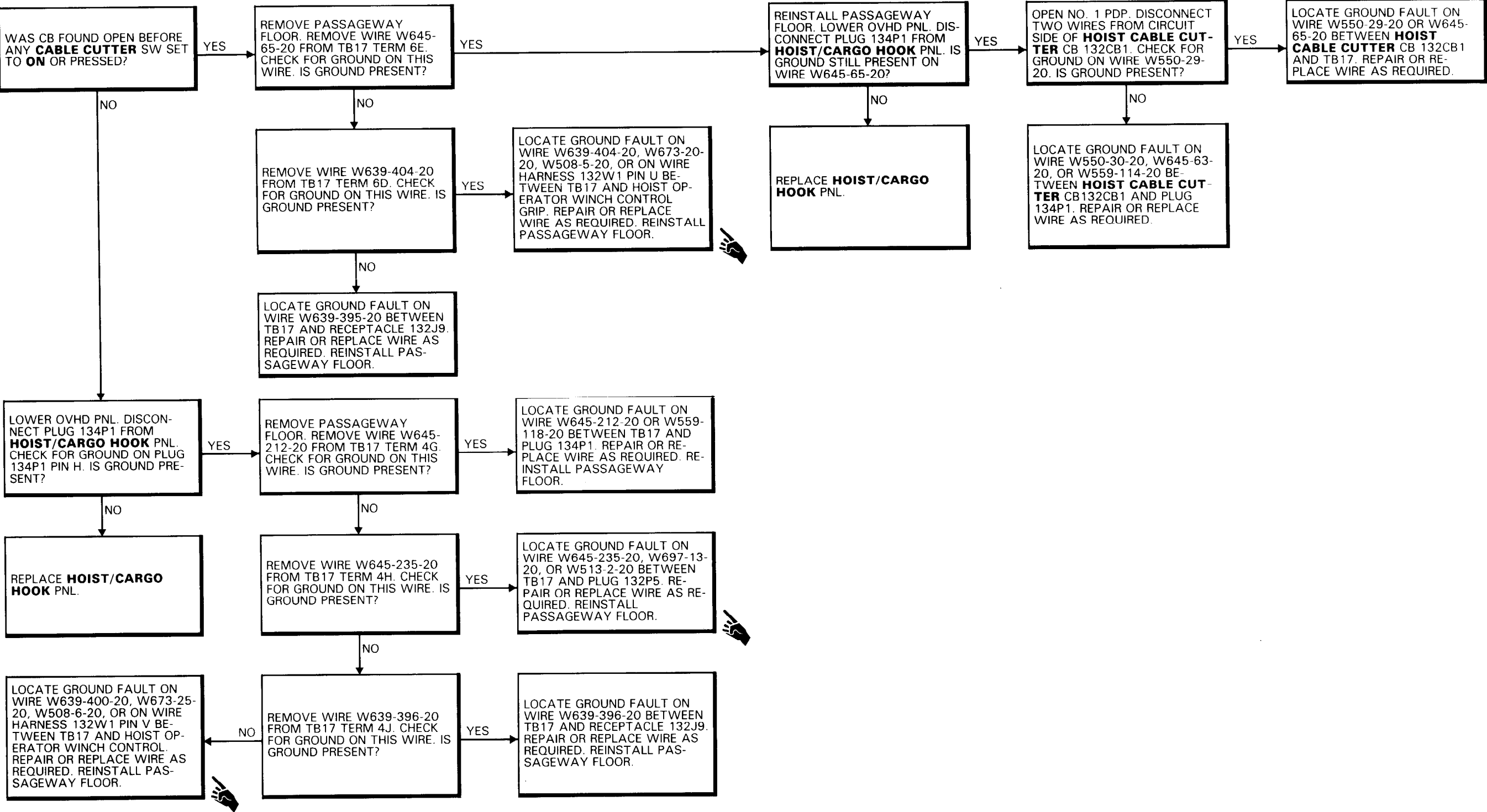
Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



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14-1.6 HOIST CABLE CUTTER CIRCUIT BREAKER DOES NOT STAY CLOSED (Continued)

14-1.6



#### 14-1.7 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED AT HOIST/CARGO HOOK PANEL

## FAULT ISOLATION PROCEDURE

## INITIAL SETUP

Applicable Configurations:  
**All**

Tools:

**Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915**

**Multimeter**  
**Abestos Gloves (E187)**

*Materials:*  
**None**

*Personnel Required:*  
**67U10 Medium Helicopter Repairer**  
**68F20 Aircraft Electrician**

References:  
TM 55-1520-240-23

*Equipment Condition:*

TM 55-1520-240-23:

**Battery Connected**

**Electrical Power On**

**Hydraulic Power On**

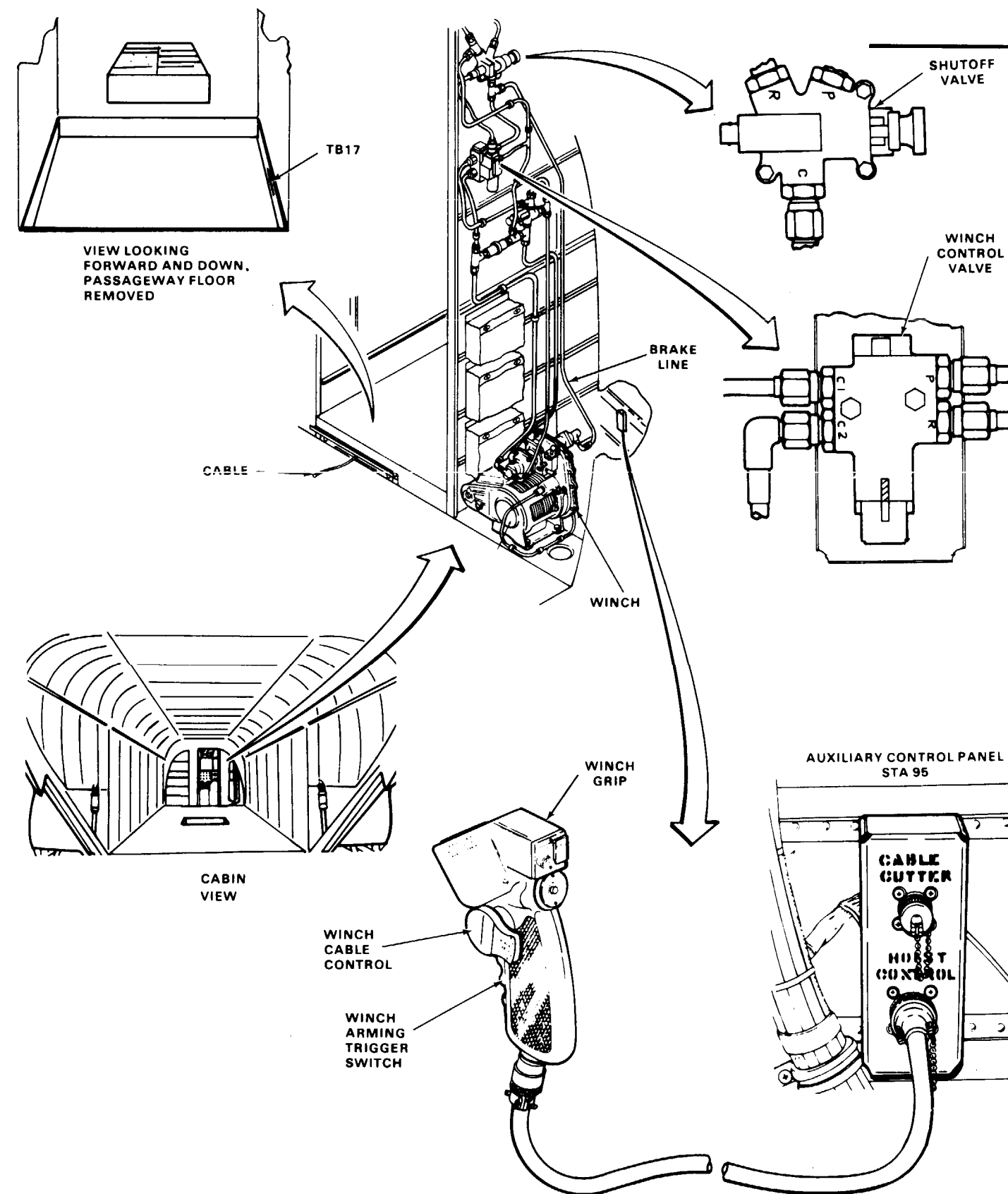
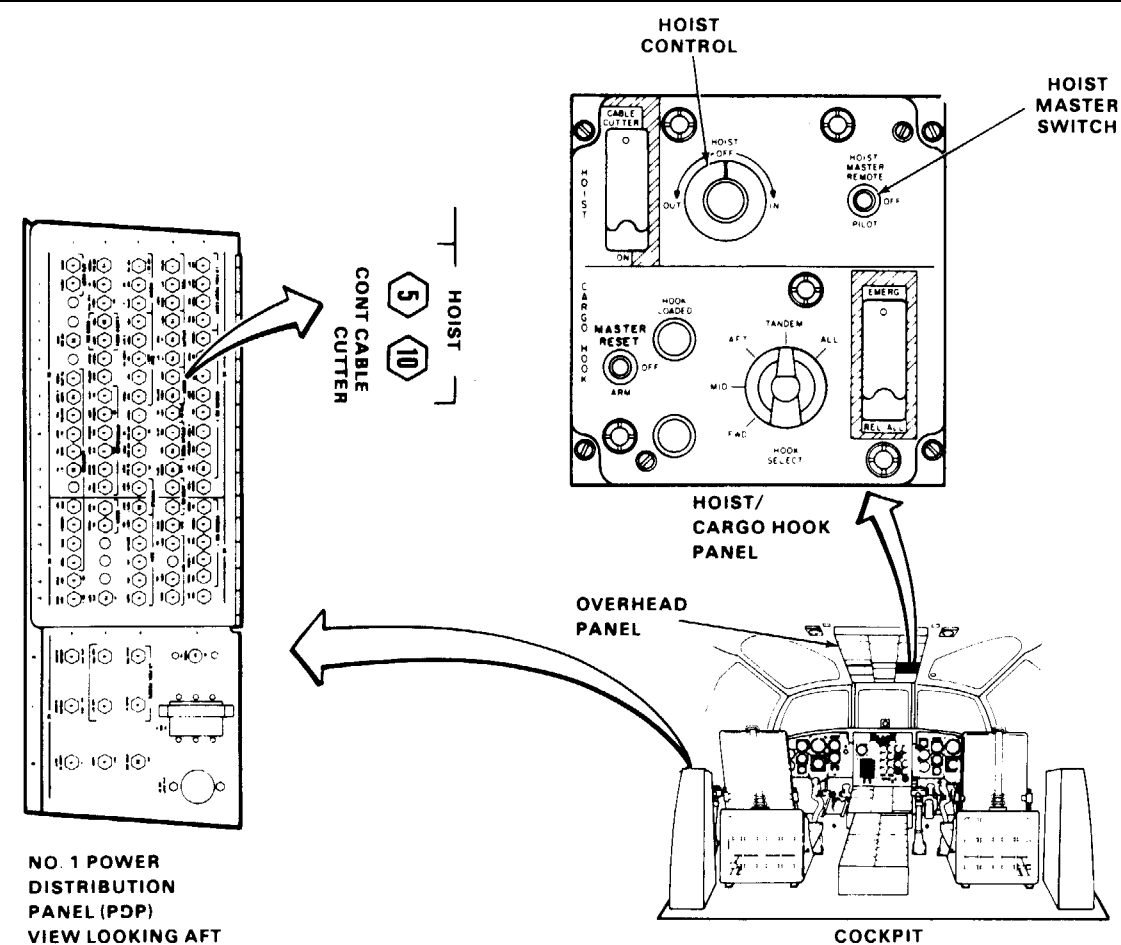
*General Safety Instructions:*

**WARNING**

Wear gloves when handling wire rope (cable). Otherwise, injury to hands can result.

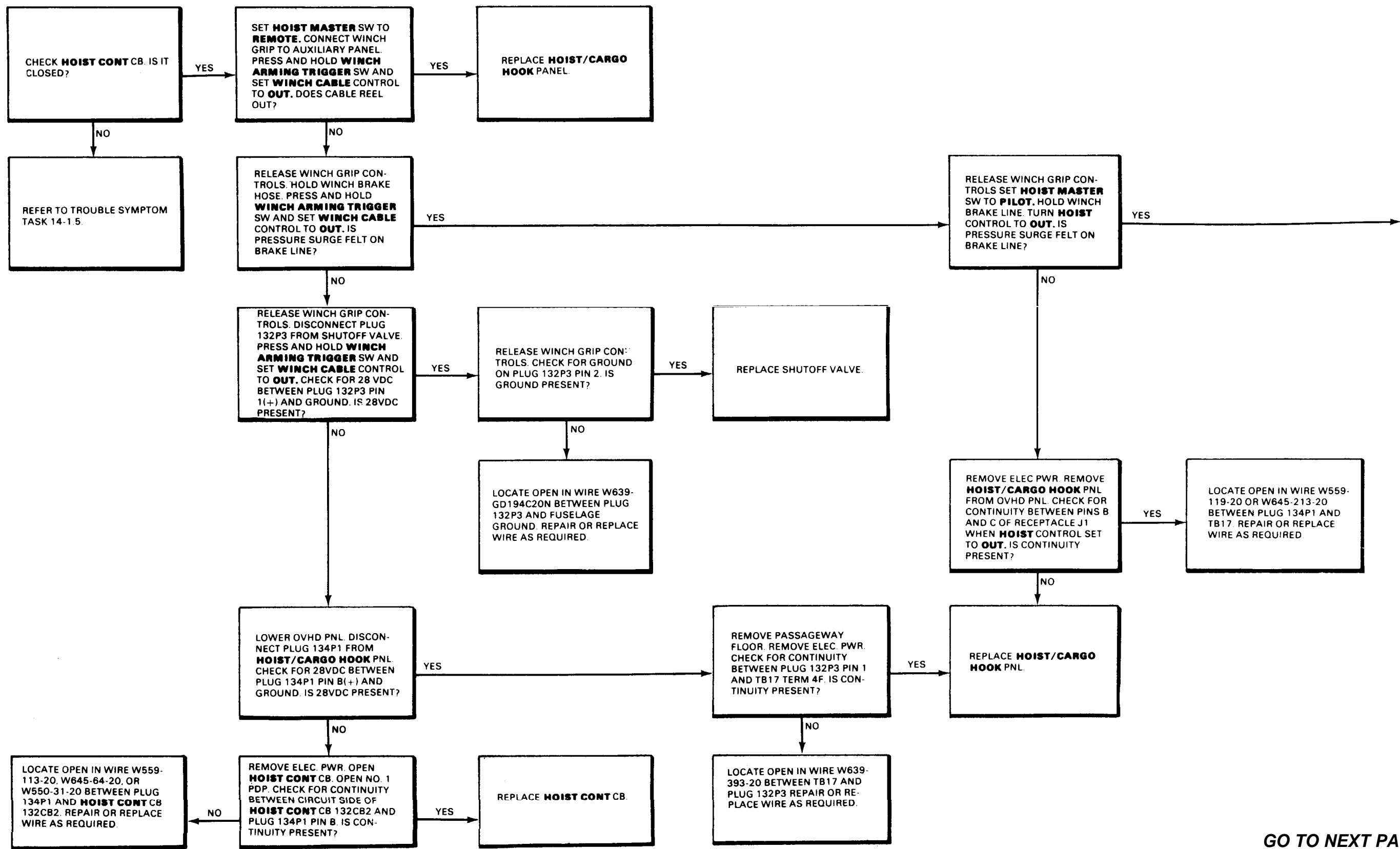
NOTE

Have helper keep tension on wire rope (cable) when reeling cable, Cable will reel evenly and will not snarl, Helper must wear gloves.



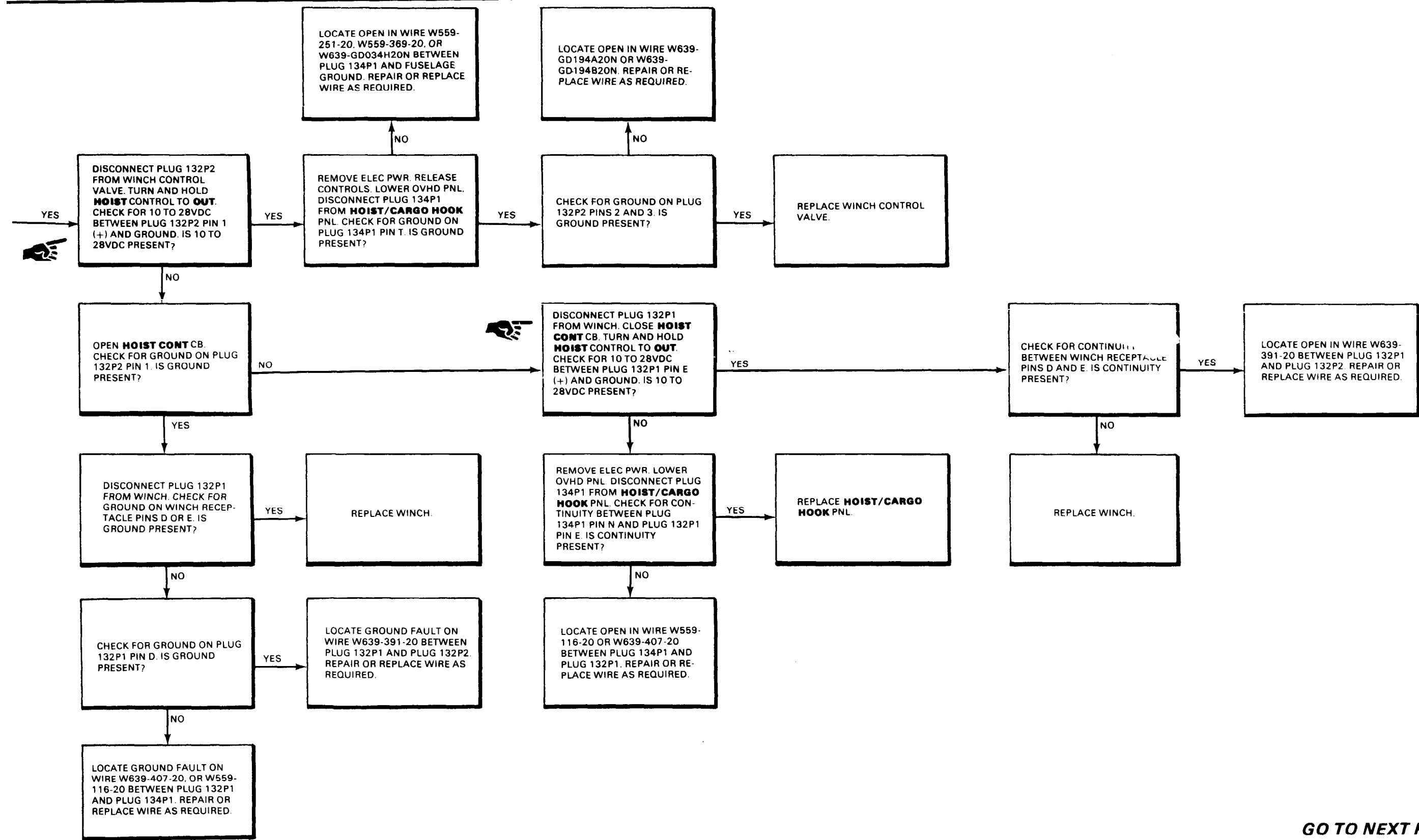
14-1.7 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED AT HOIST/CARGO HOOK PANEL (Continued)

14-1.7



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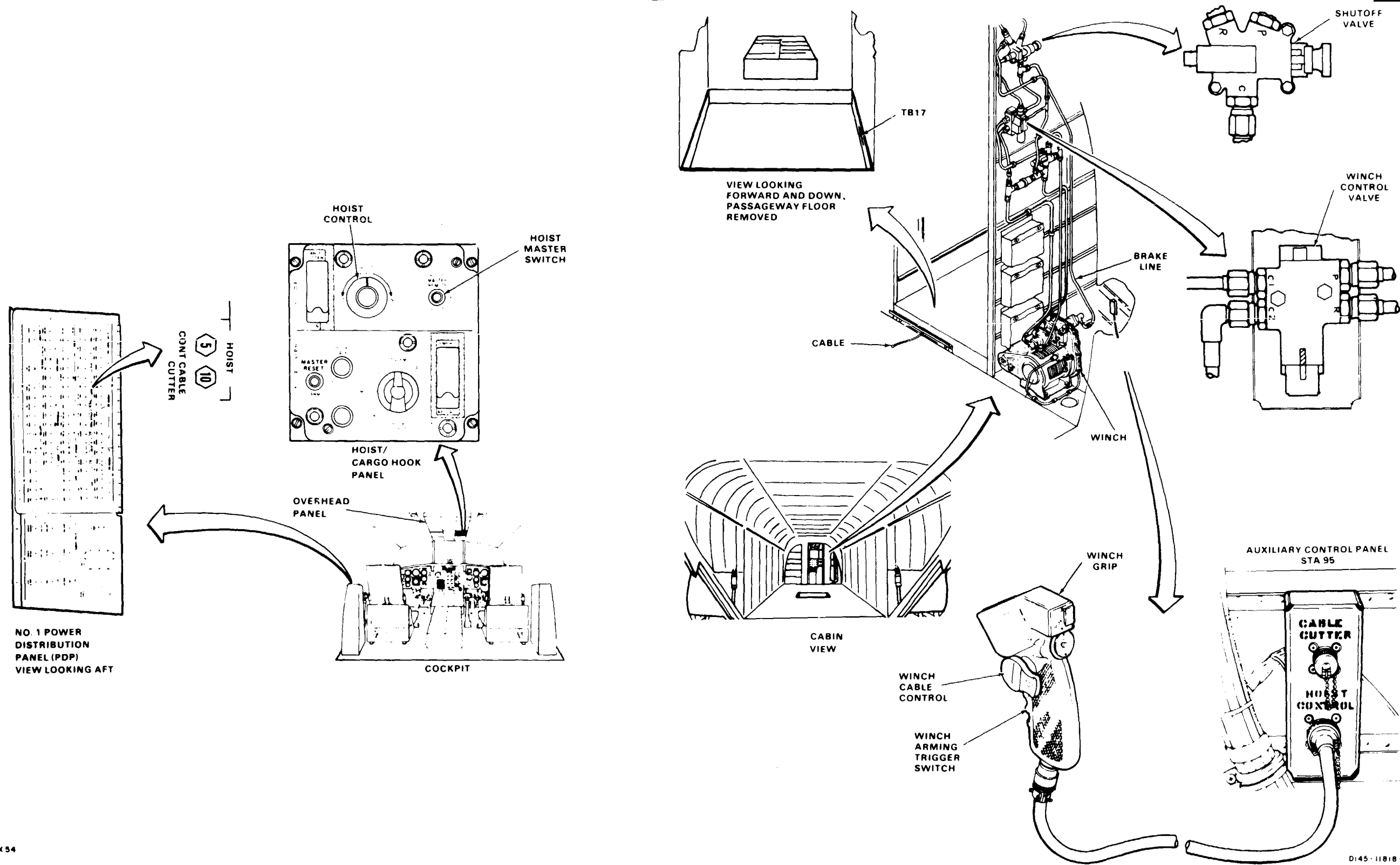
14-1.7 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED AT HOIST/CARGO HOOK PANEL (Continued)



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14-1.7 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED  
AT HOIST/CARGO HOOK PANEL (Continued)

14-1.7



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END OF TASK



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter  
Asbestos Gloves (E187)

Materials:  
None

Personnel Required:  
Aircraft Electrician (2)

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On

General Safety Instructions:

**WARNING**

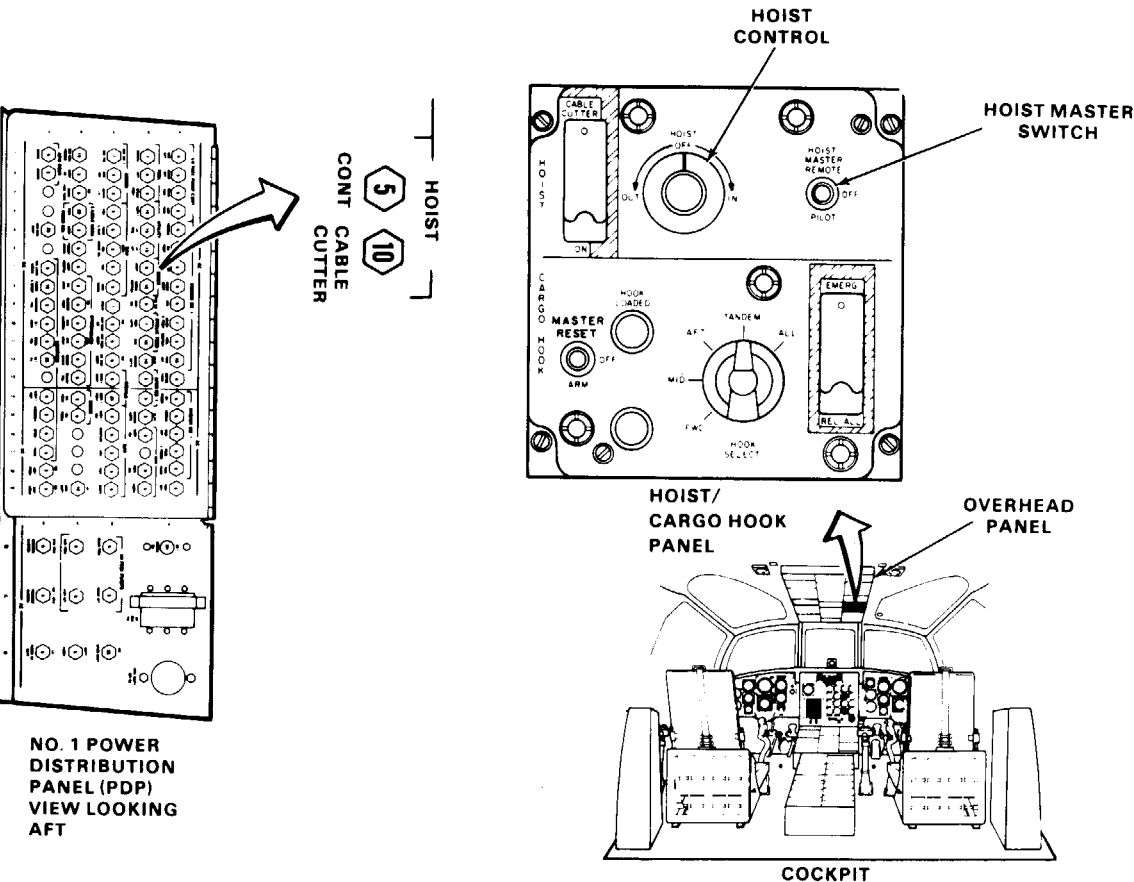
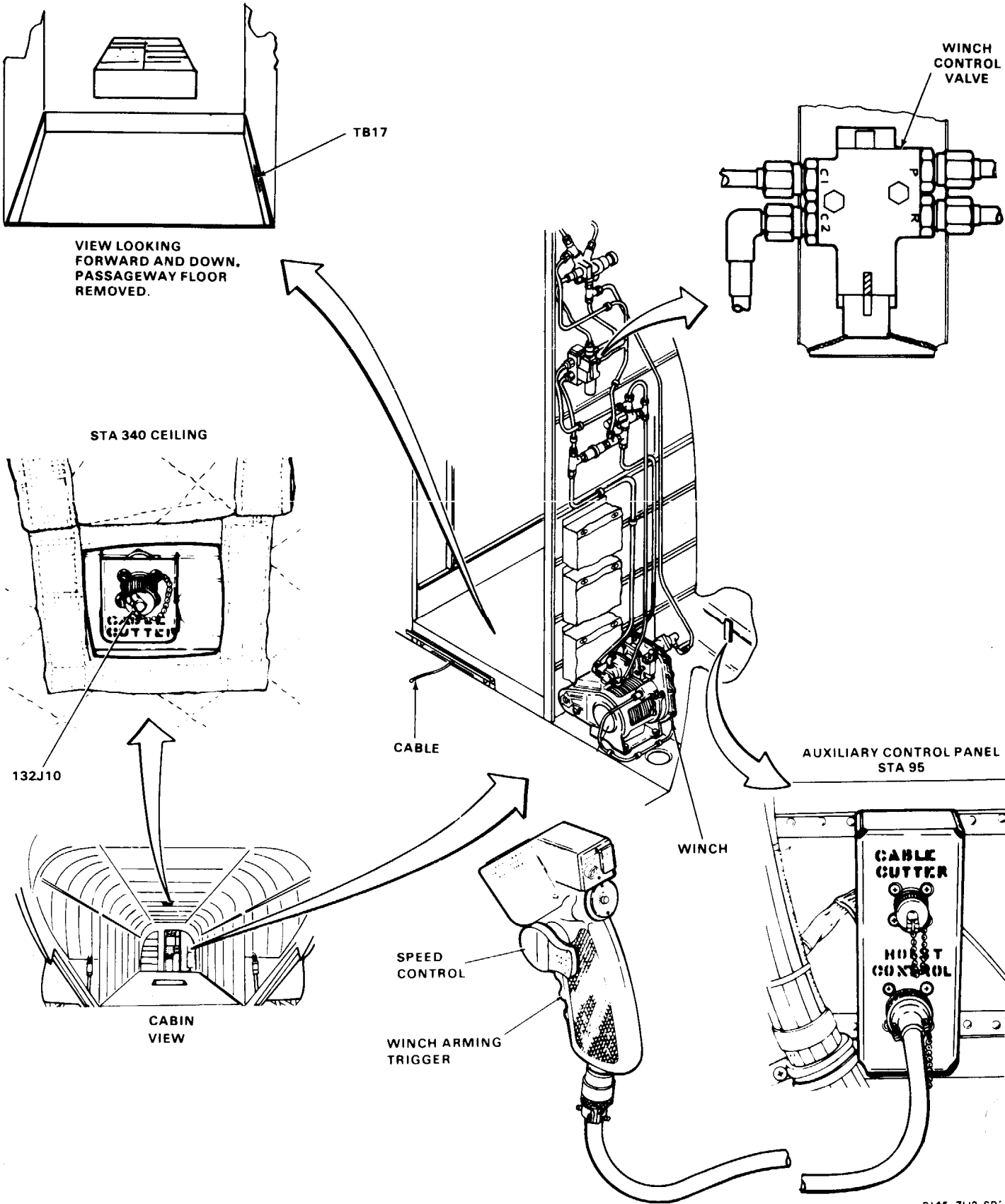
Cable cutter contains an electro explosive device (EED). Do not measure cutter resistance at plug pin A. Multimeter may fire EED resulting in personnel injury.

**WARNING**

Wear gloves when handling wire rope (cable). Otherwise injury to hands can result.

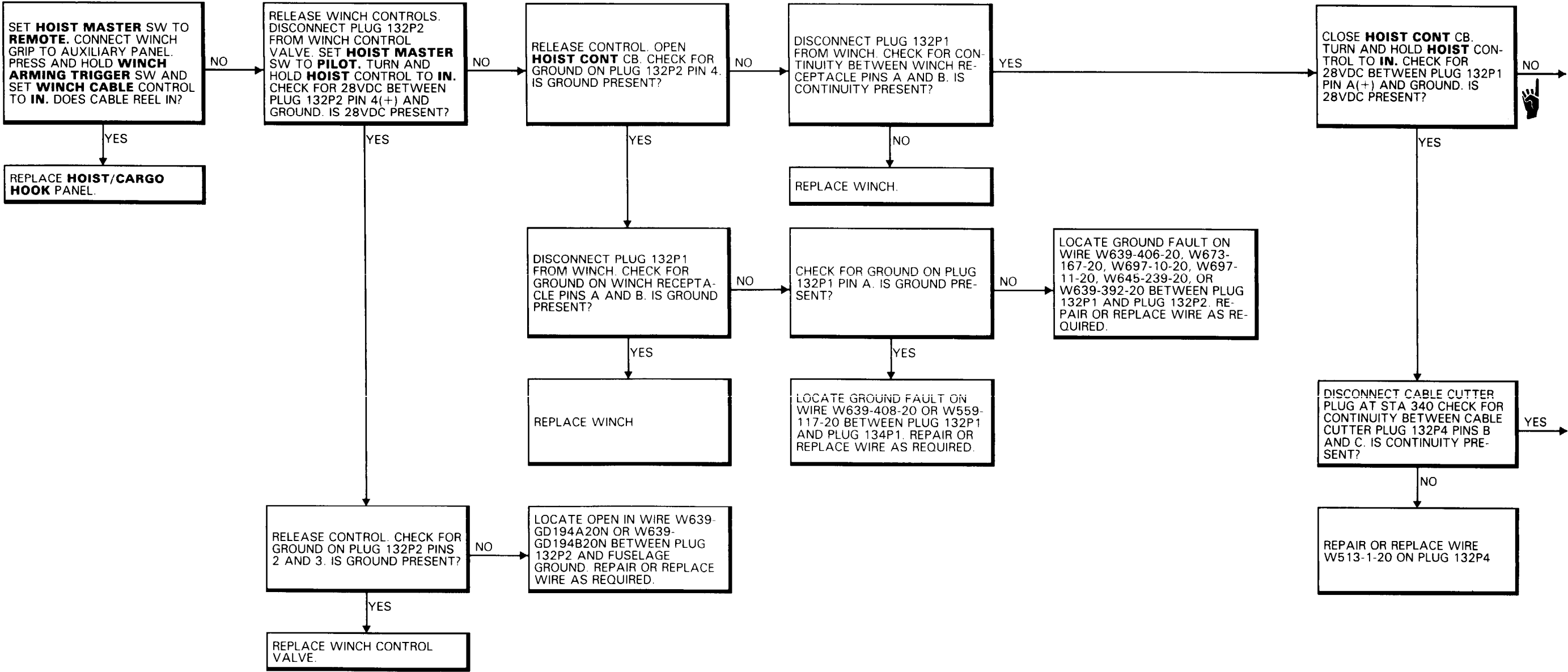
NOTE

Have helper keep tension on wire rope (cable) when reeling cable. Cable will reel evenly and will not snarl. Helper must wear gloves.



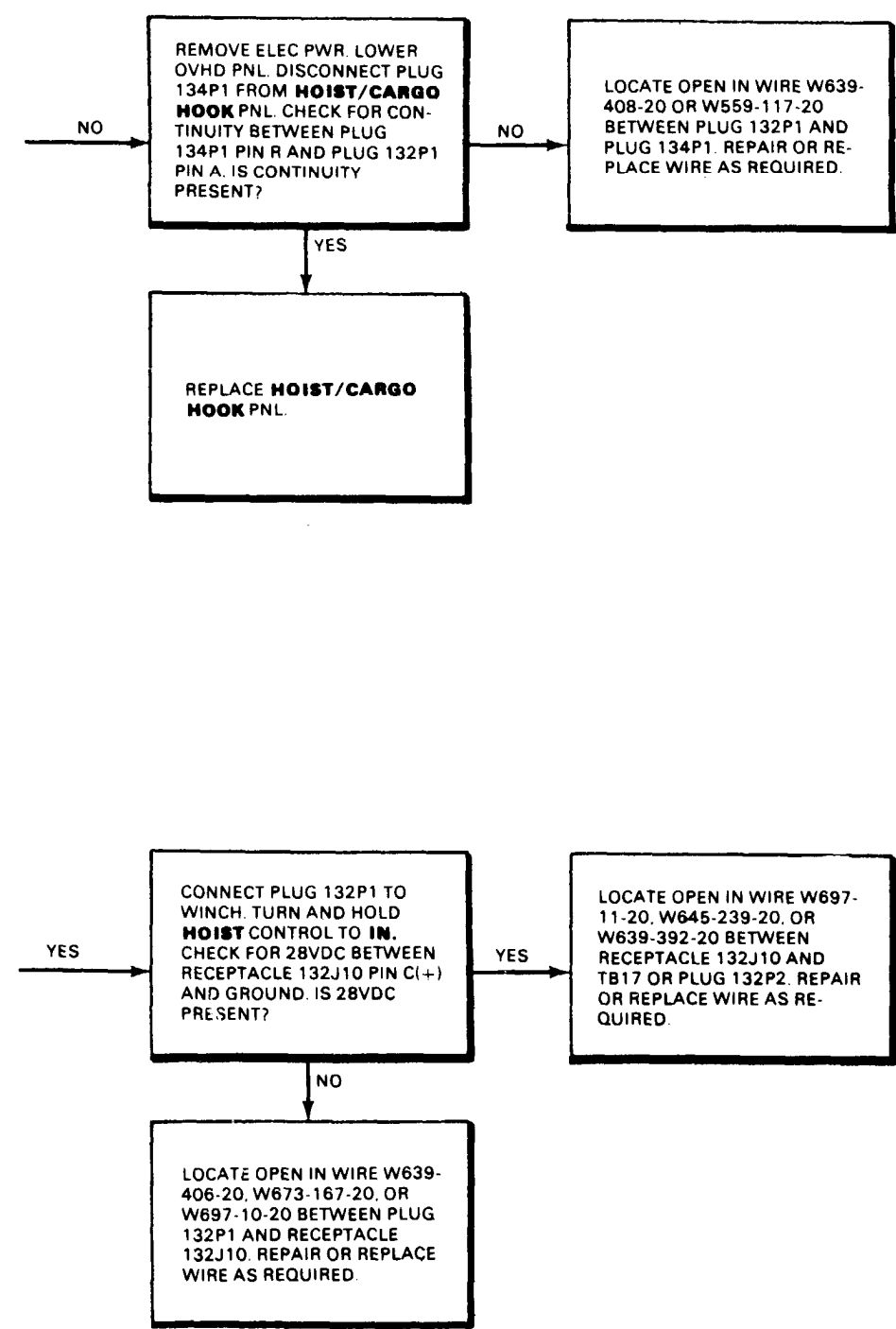
14-1.8 CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED AT HOIST/CARGO HOOK PANEL  
(Continued)

14-1.8



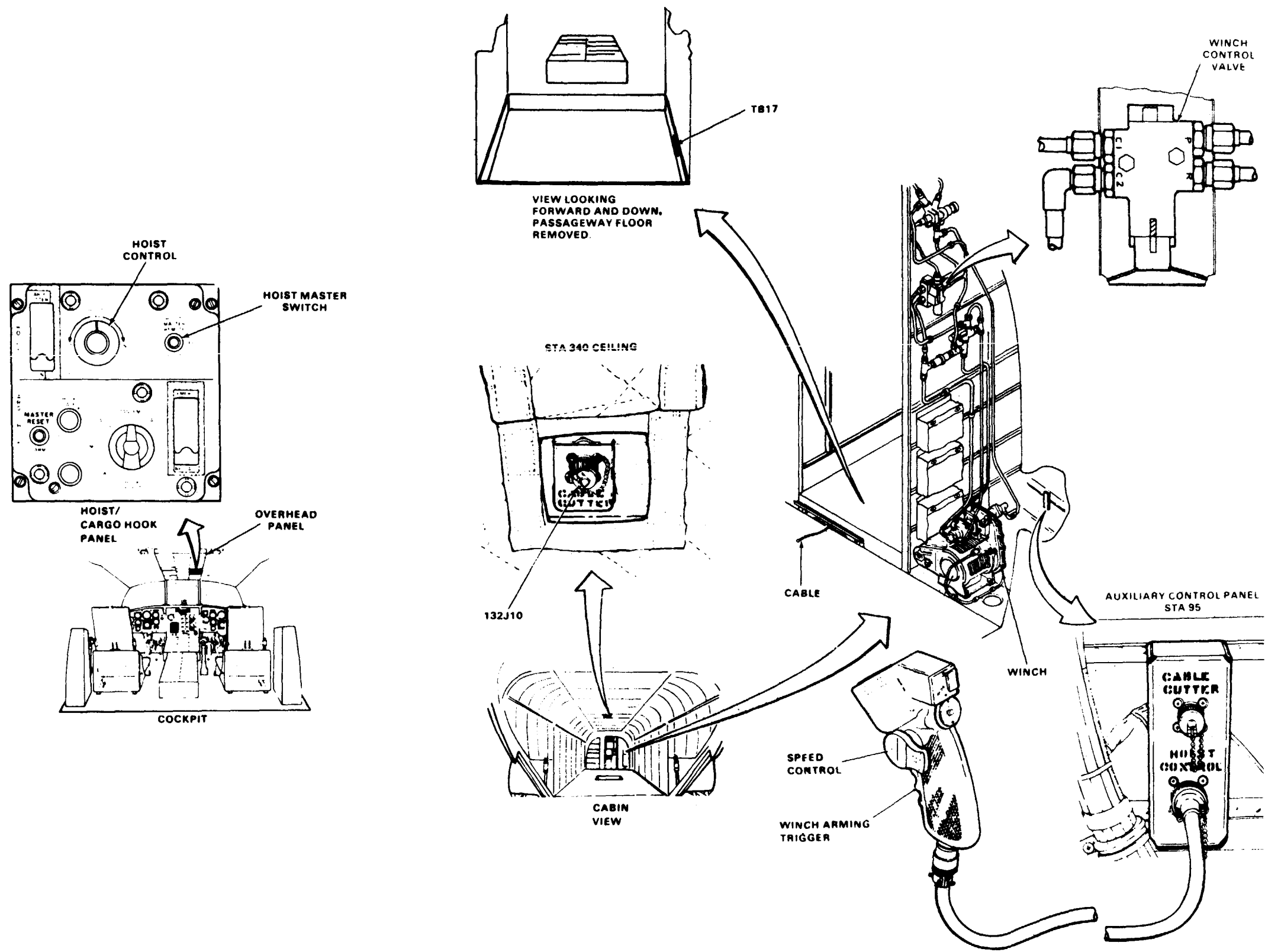
14-1.8 CABLE DOES NOT REEL IN WHEN WINCH IS  
CONTROLLED AT HOIST/CARGO HOOK PANEL (Continued)

14-1.8



14-1.8 CABLE DOES NOT REEL IN WHEN WINCH IS  
CONTROLLED AT HOIST/CARGO HOOK PANEL (Continued)

14-1.8



14-1.9 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY WINCH CONTROL GRIP AT STA 95 AUXILIARY PANEL

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter  
Asbestos Gloves (E187)

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On

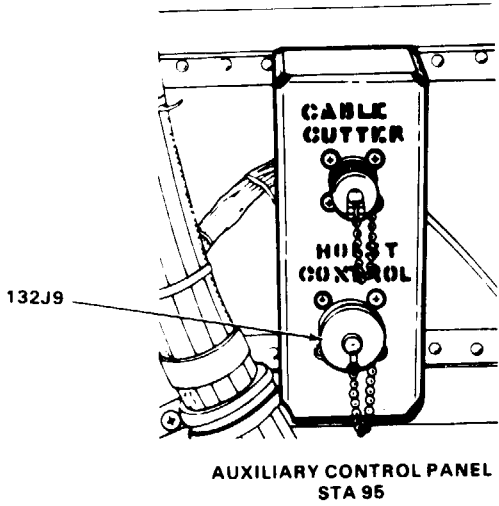
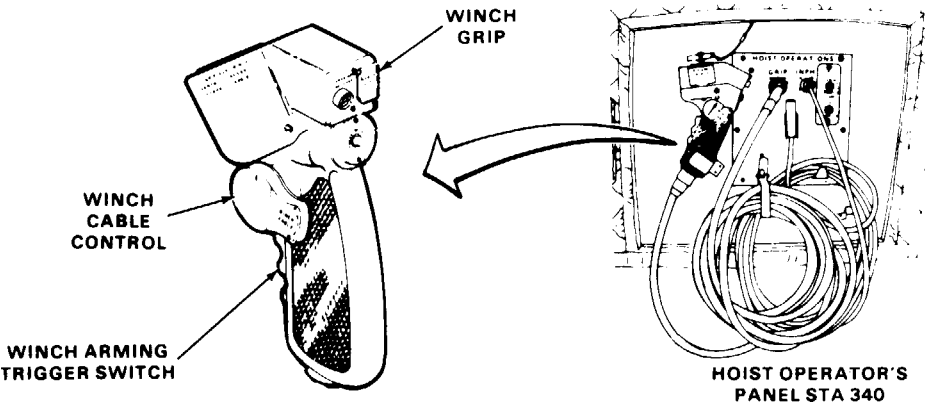
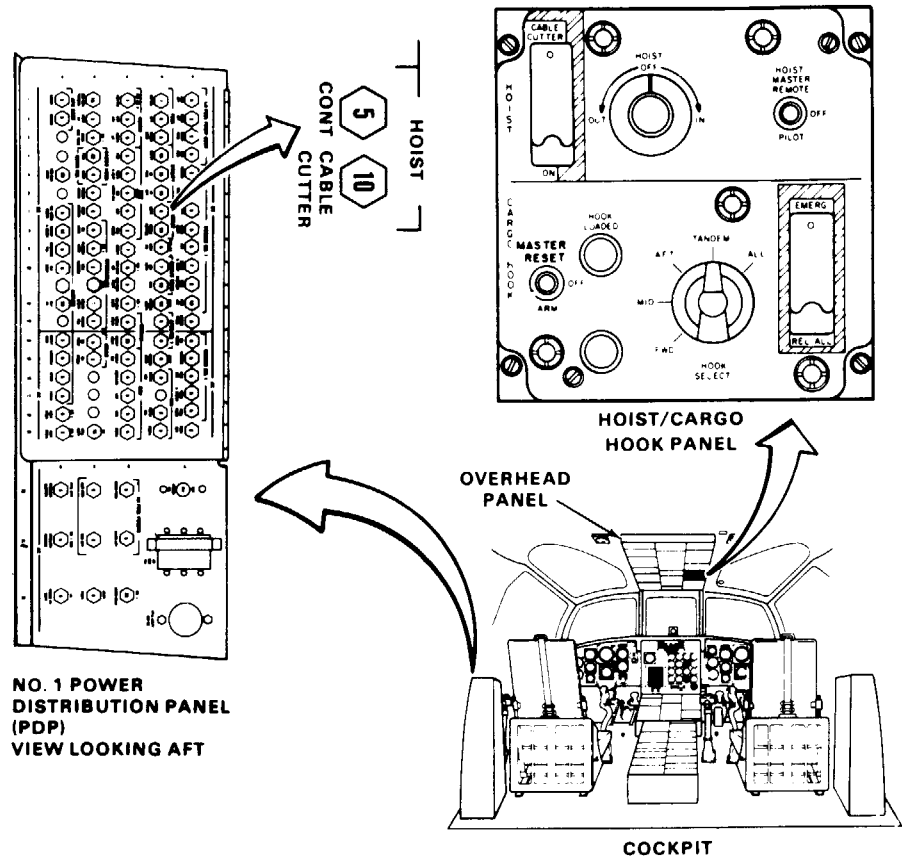
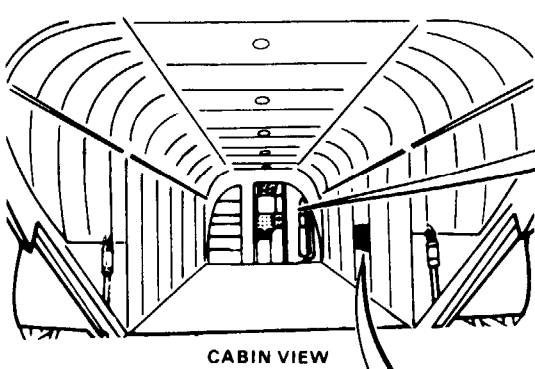
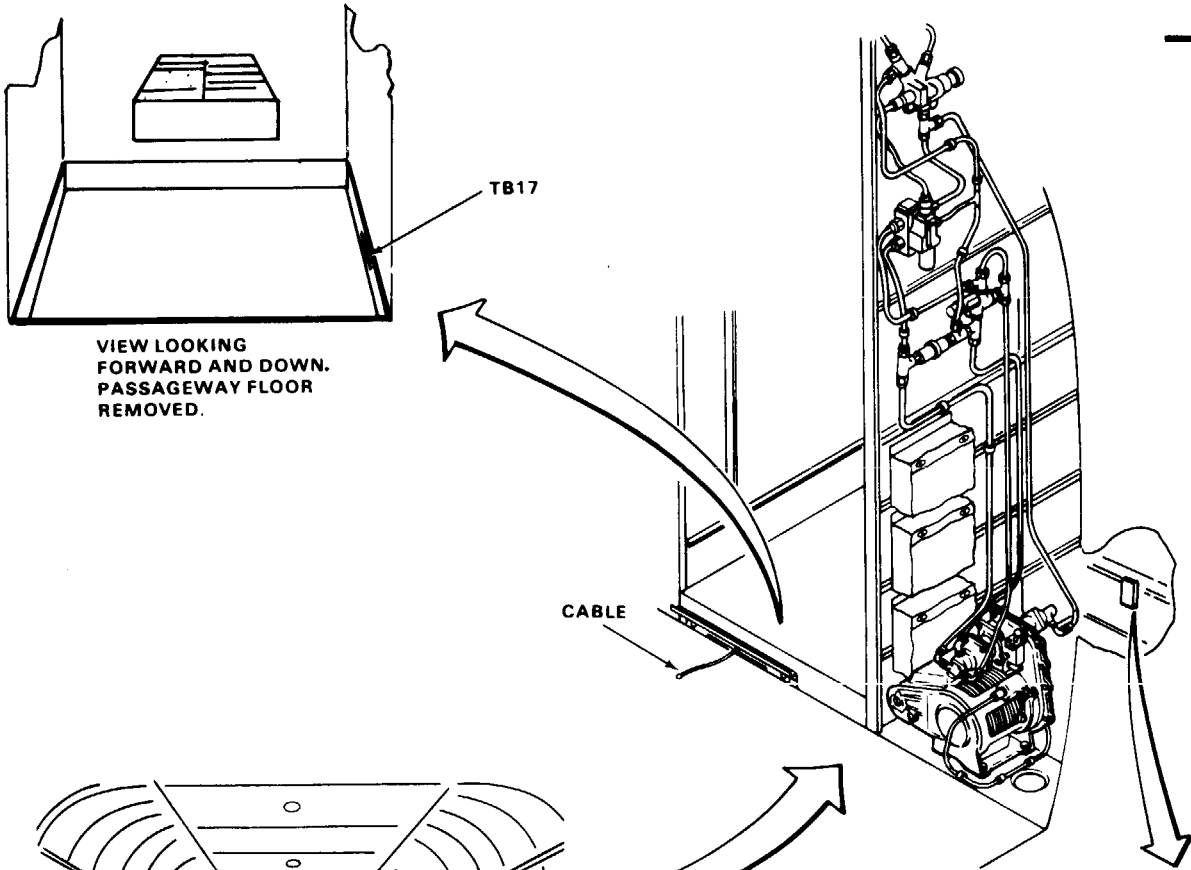
General Safety Instructions:

WARNING

Wear gloves when handling wire rope (cable). Otherwise injury to hands can result.

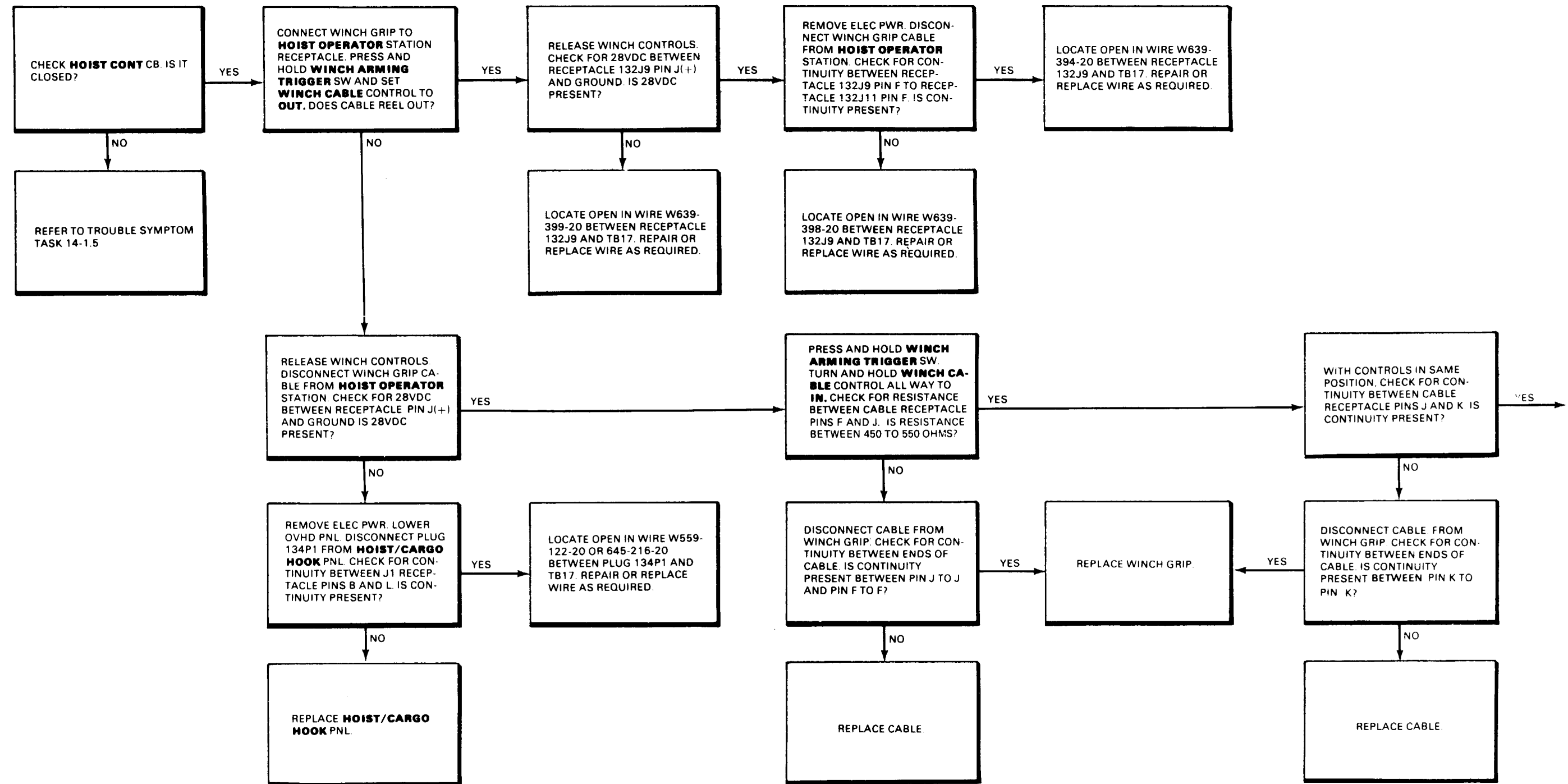
NOTE

Have helper keep tension on wire rope (cable) when reeling cable. Cable will reel evenly and will not snarl. Helper must wear gloves.



14-1.9 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY WINCH CONTROL GRIP AT STA 95 AUXILIARY PANEL (Continued)

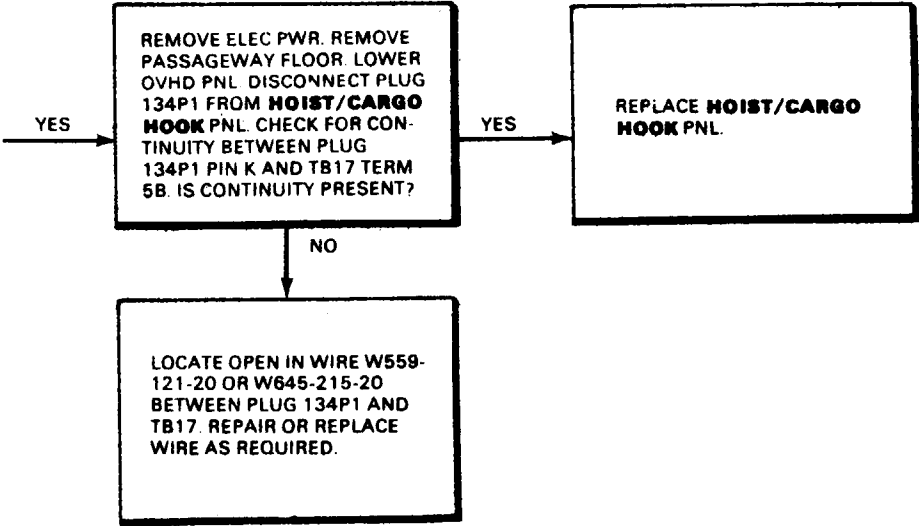
14-1.9



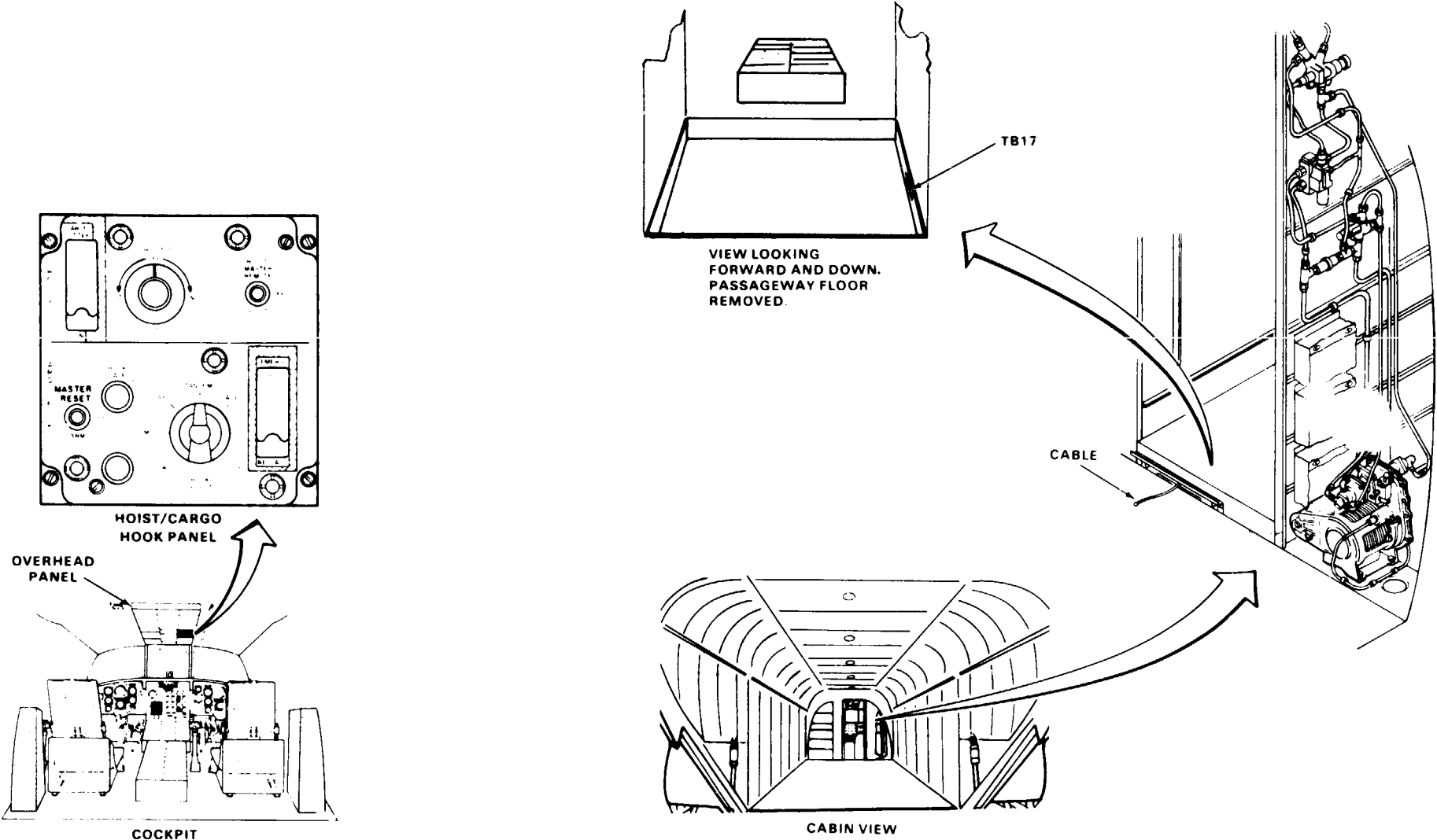
GO TO NEXT PAGE

14-1.9 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY  
WINCH CONTROL GRIP AT STA 95 AUXILIARY PANEL (Continued)

14-1.9



14-1.9 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY  
WINCH CONTROL GRIP AT STA 95 AUXILIARY PANEL (Continued)





14-1.10 CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED BY WINCH GRIP AT STA 95 AUXILIARY PANEL

14-1.10

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter  
Asbestos Gloves (E187)

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On

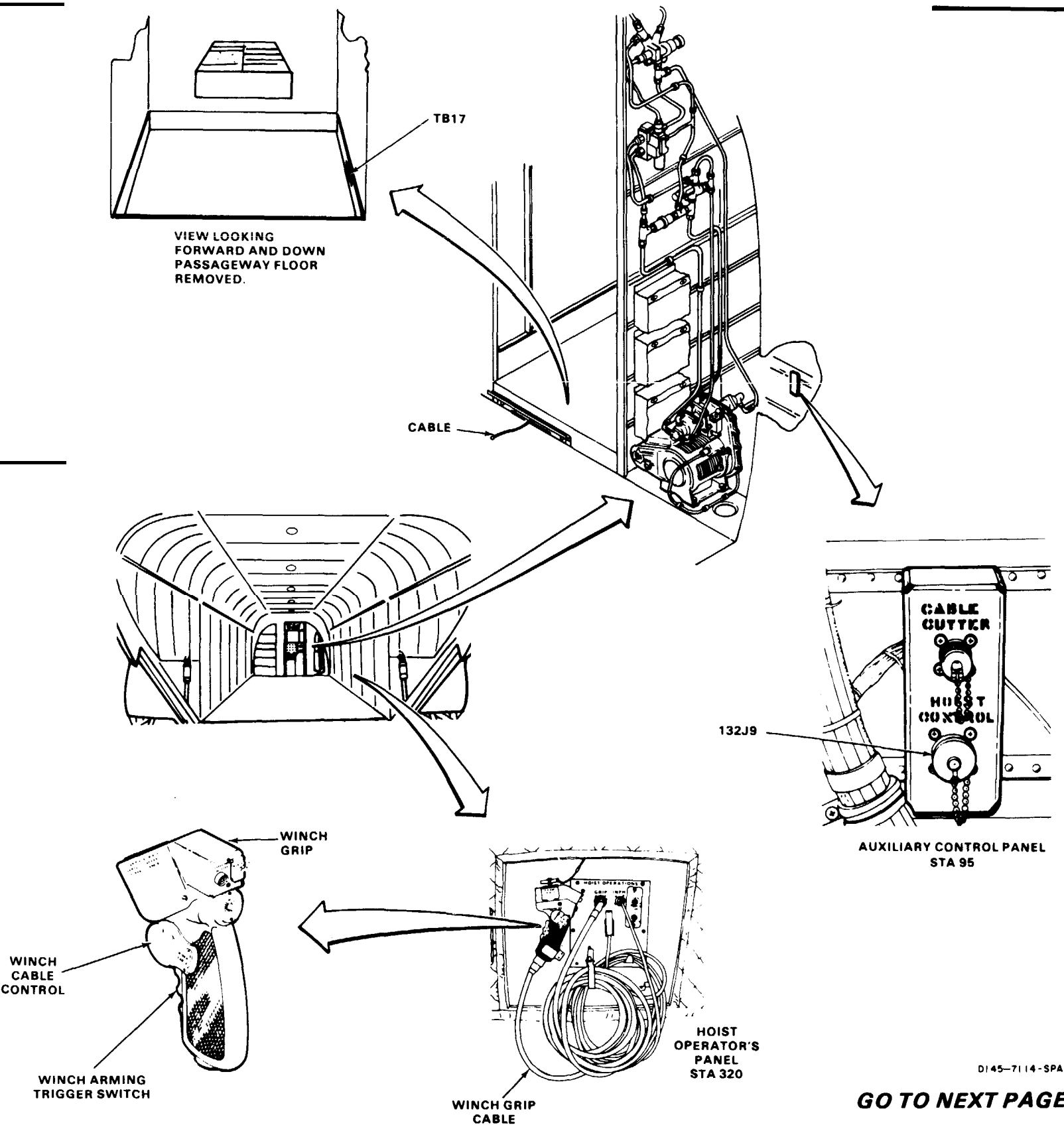
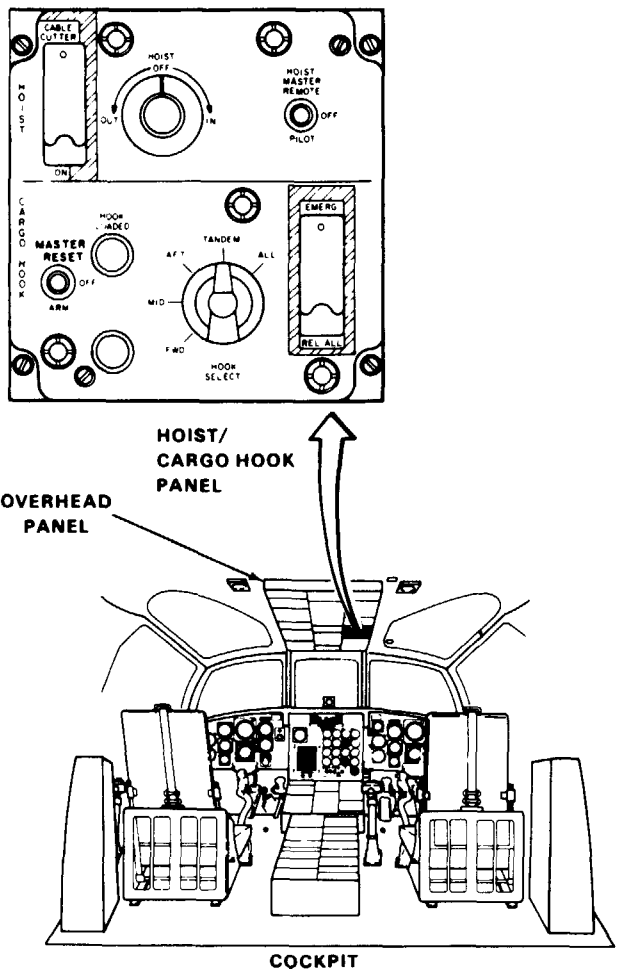
General Safety Instructions:

**WARNING**

Wear gloves when handling wire rope (cable). Otherwise injury to hands can result.

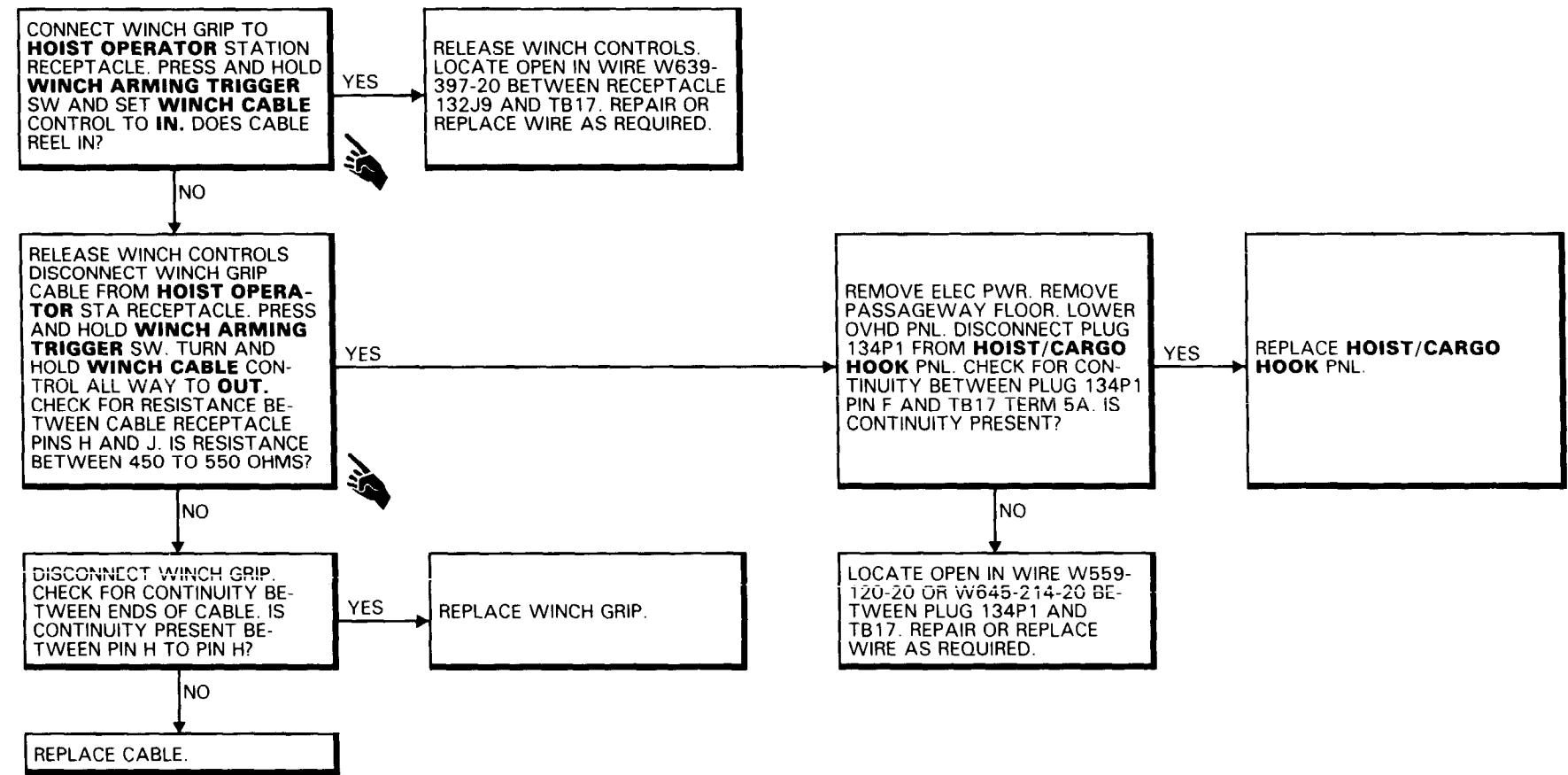
NOTE

Have helper keep tension on wire rope (cable) when reeling cable. Cable will reel evenly and will not snarl. Helper must wear gloves.



14-1.10 CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED BY WINCH GRIP AT STA 95 AUXILIARY  
PANEL (Continued)

14-1.10



14-1.11 CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED BY WINCH GRIP AT STA 502 RECEPTACLE

14-1.11

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

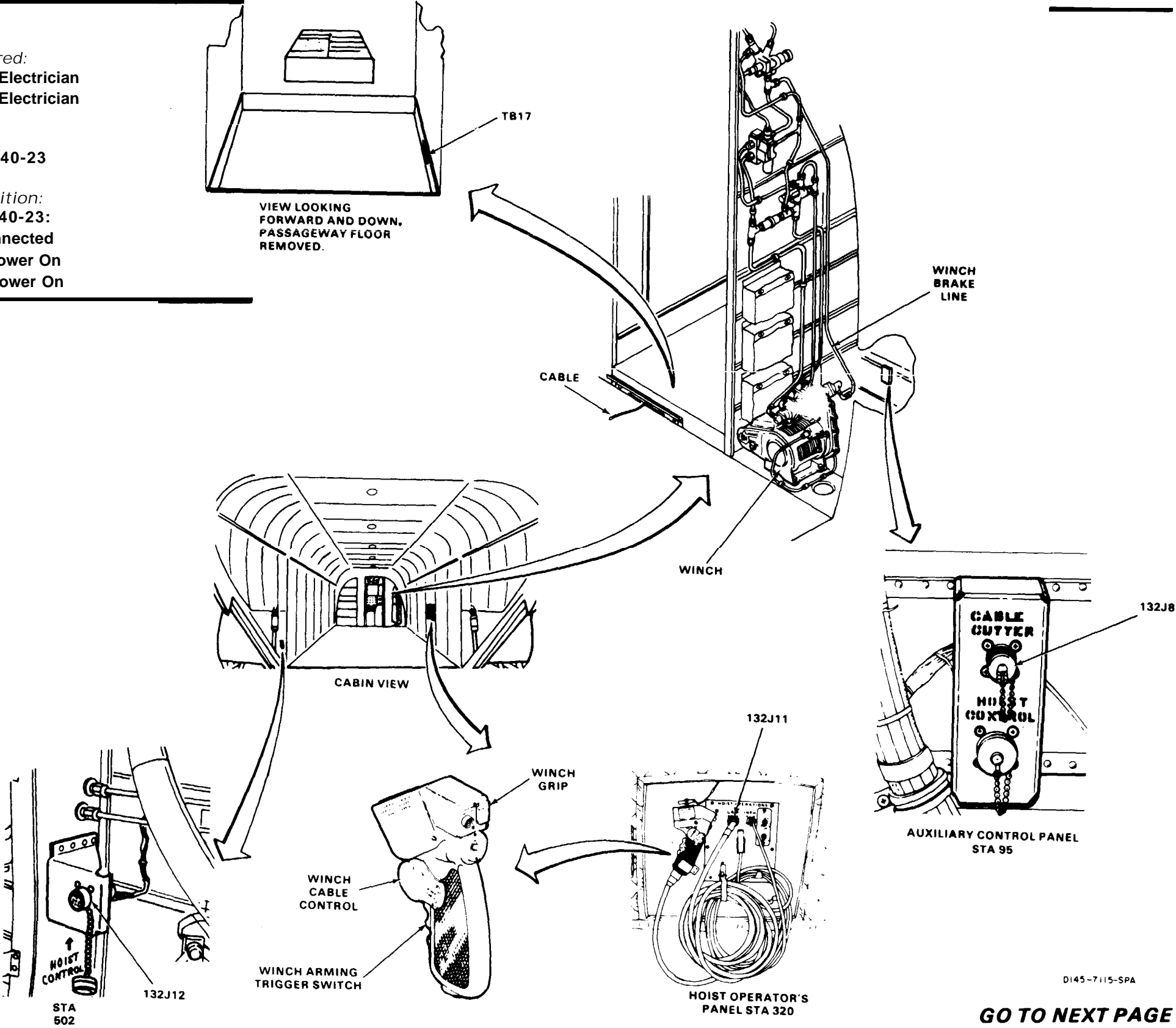
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On

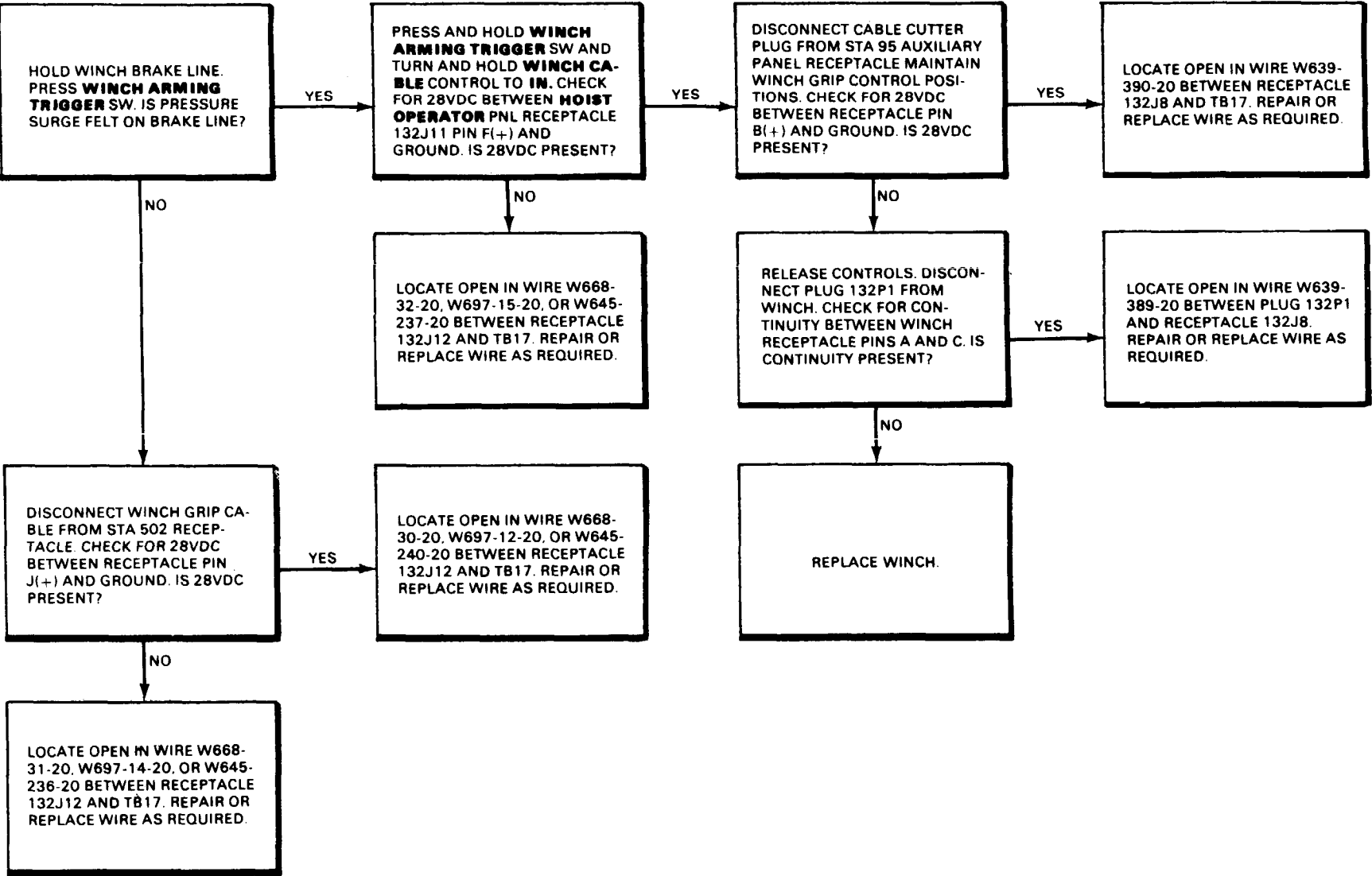


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14-1.11 CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED BY  
WINCH GRIP AT STA 502 RECEPTACLE (Continued)

14-1.11



END OF TASK

14-1.12 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY WINCH GRIP AT HOIST OPERATOR STATION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

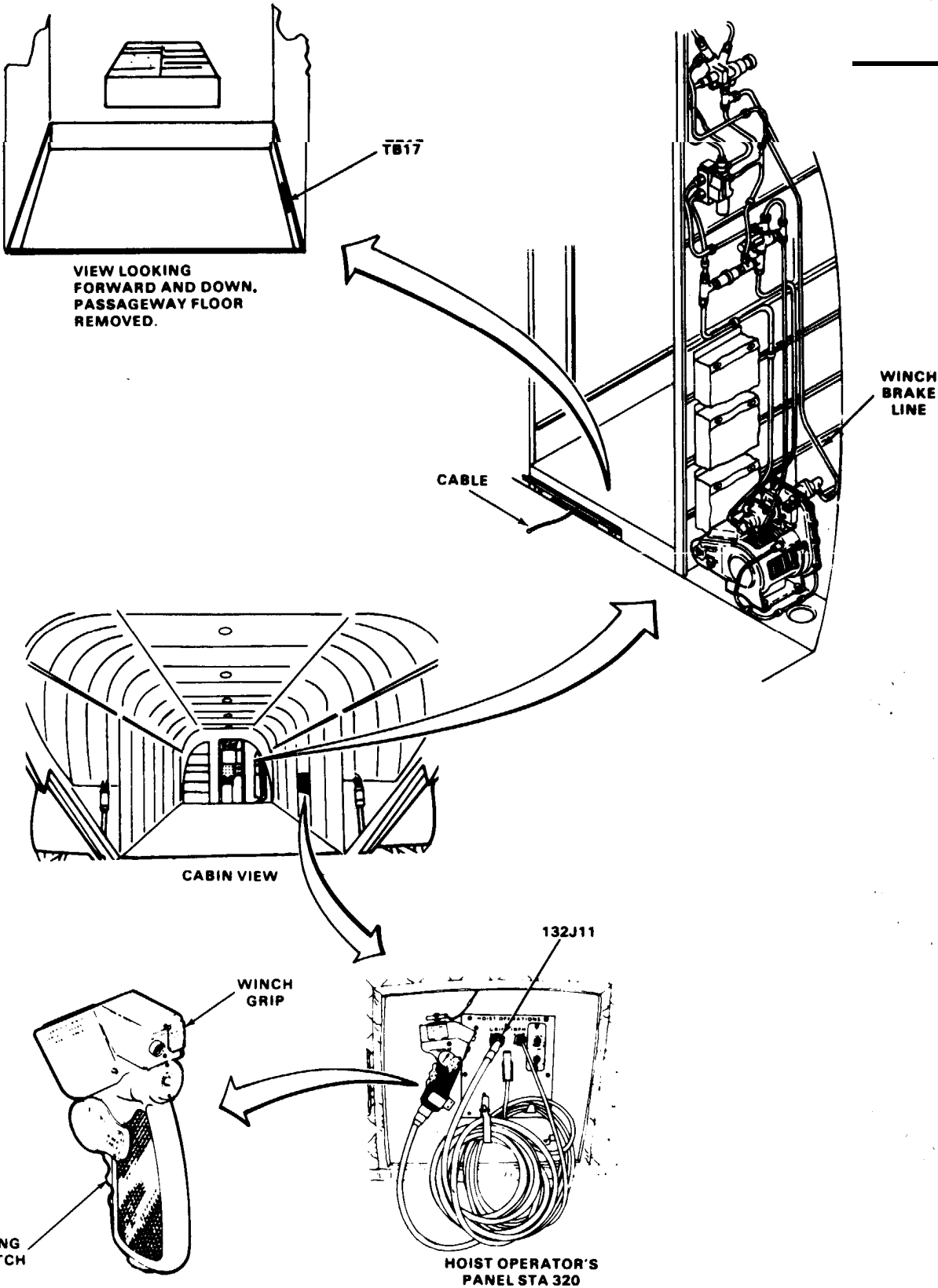
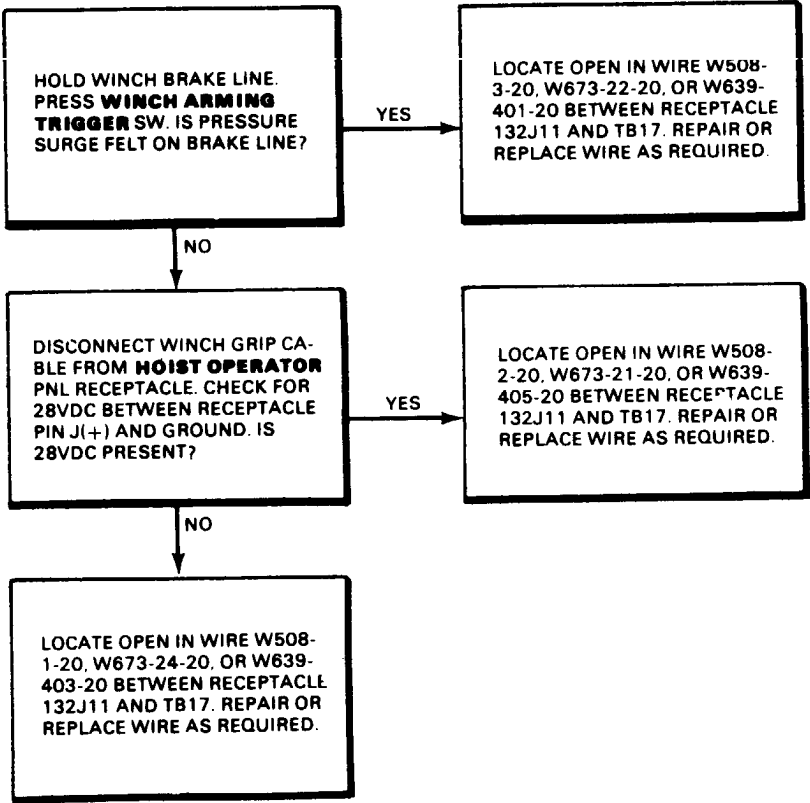
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On



14-1.13 28VDC NOT MEASURED AT STA 340 CABLE CUTTER  
RECEPTACLE WHEN HOIST/CARGO HOOK PANEL CABLE CUTTER  
SWITCH SET TO ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

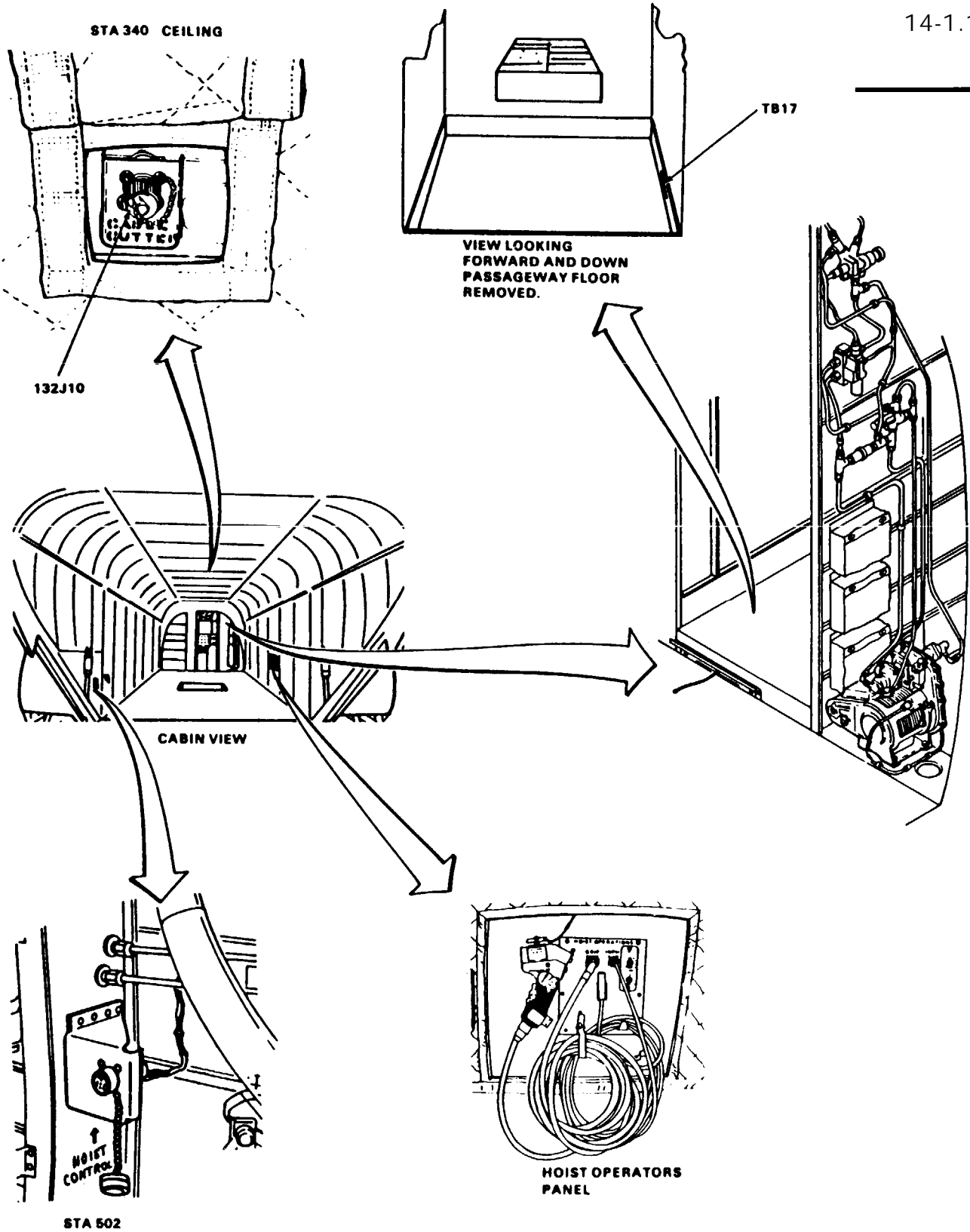
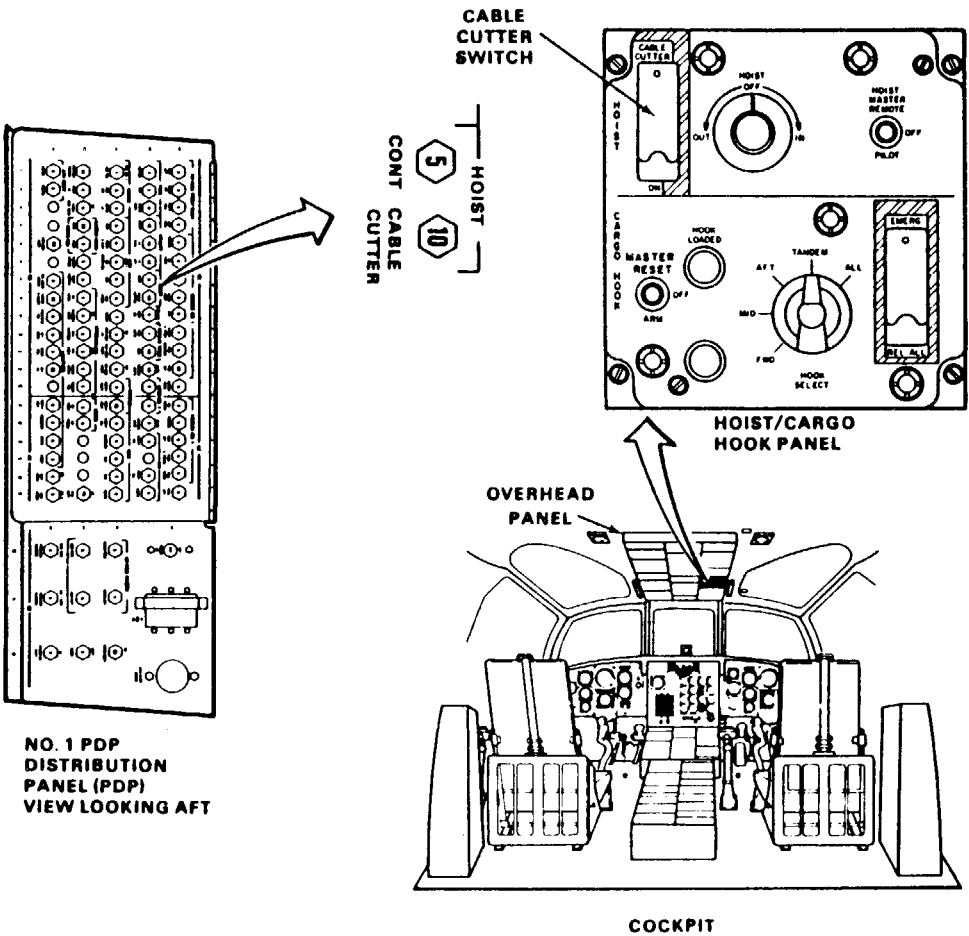
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

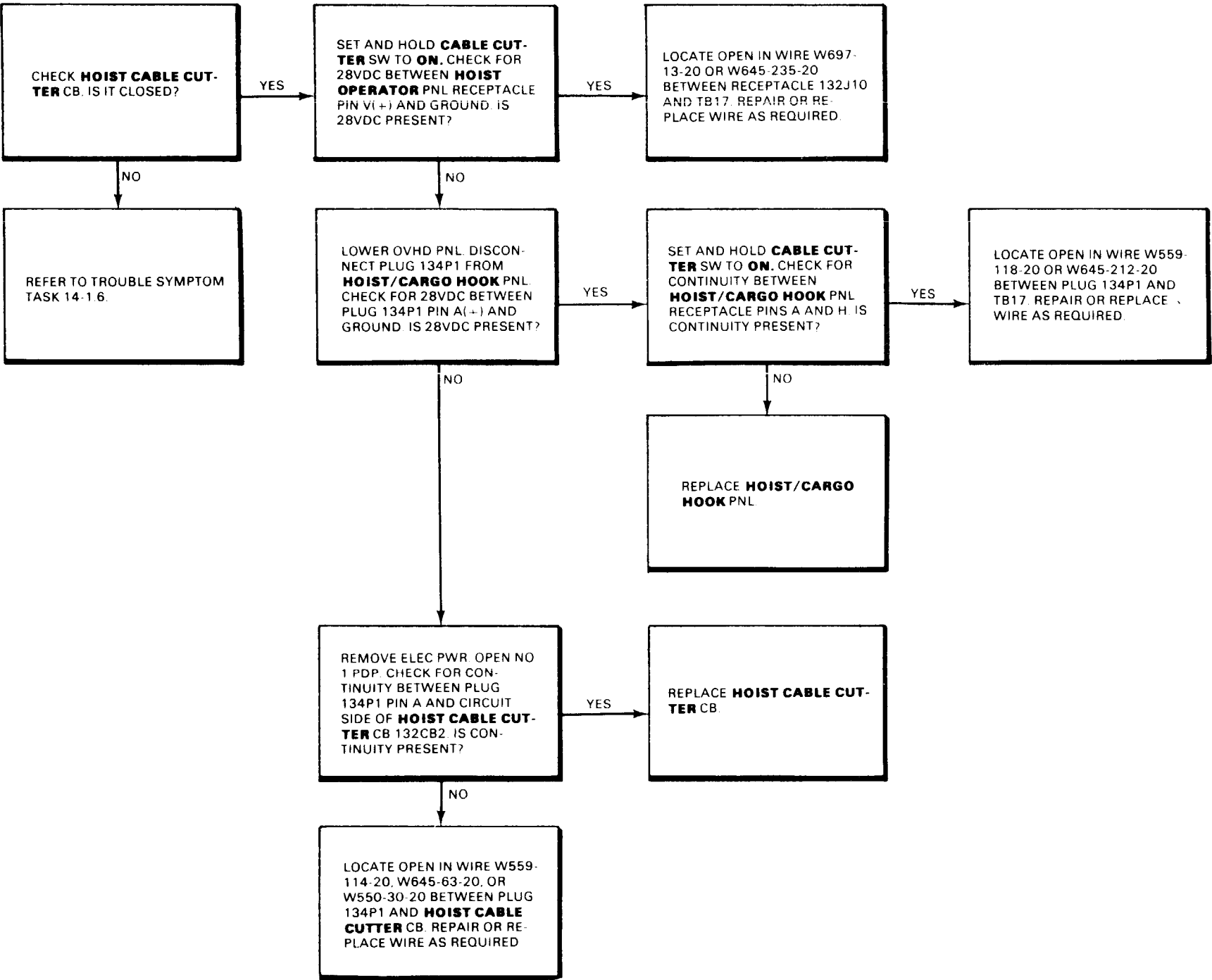
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On



14-1.13 28VDC NOT MEASURED AT STA 340 CABLE CUTTER  
RECEPTACLE WHEN HOIST/CARGO HOOK PANEL CABLE CUTTER  
SWITCH SET TO ON (Continued)

14-1.13



END OF TASK

14-1.14 28VDC NOT MEASURED AT STA340 CABLE CUTTER  
RECEPTACLE WHEN WINCH GRIP CABLE CUTTER SWITCH  
PRESSED AT HOIST OPERATOR OR AUXILIARY PANEL

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

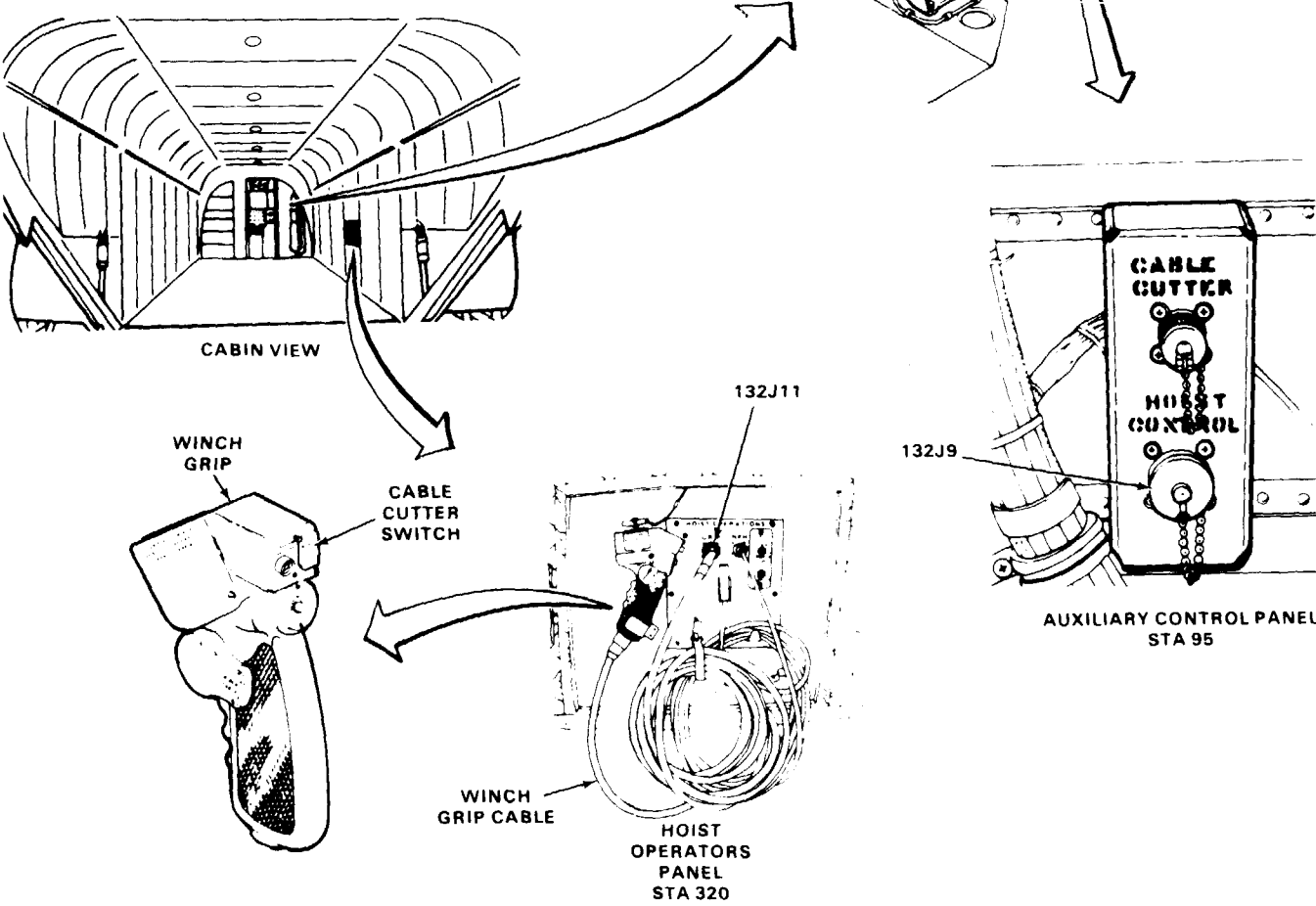
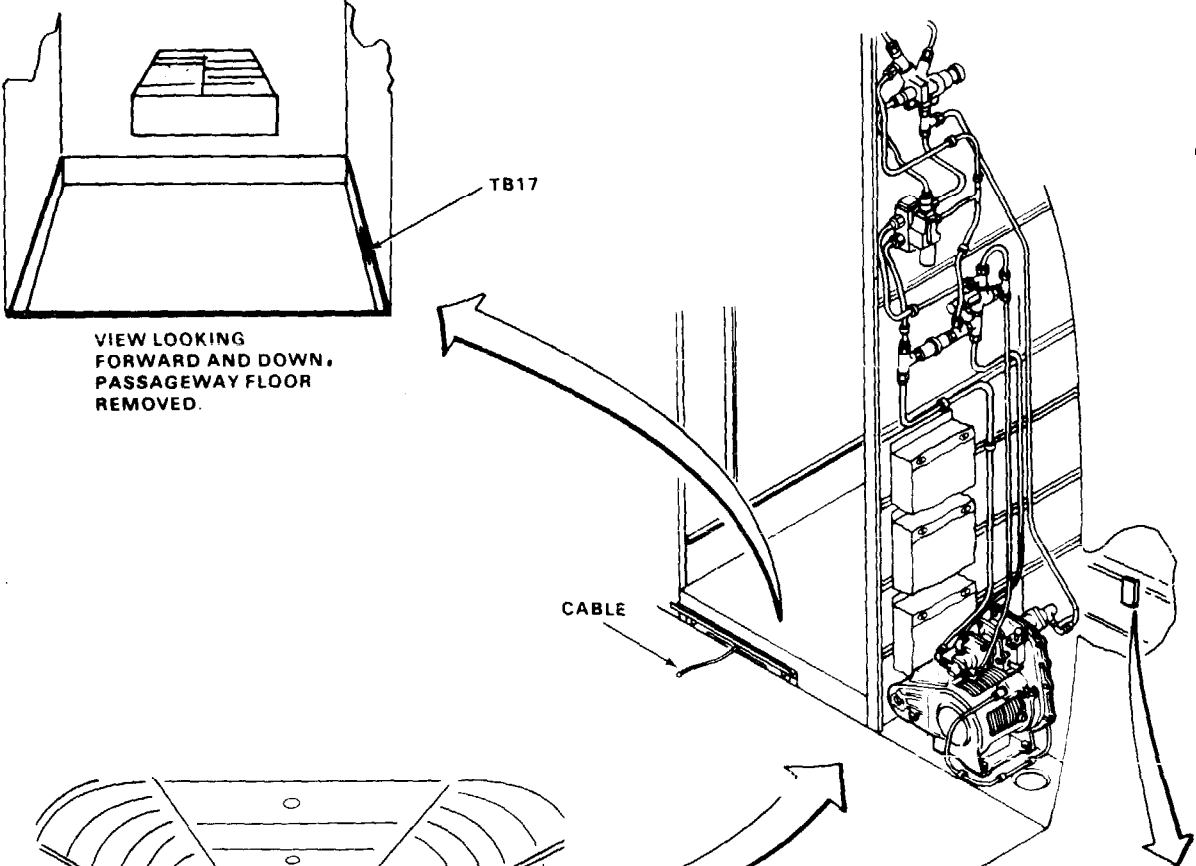
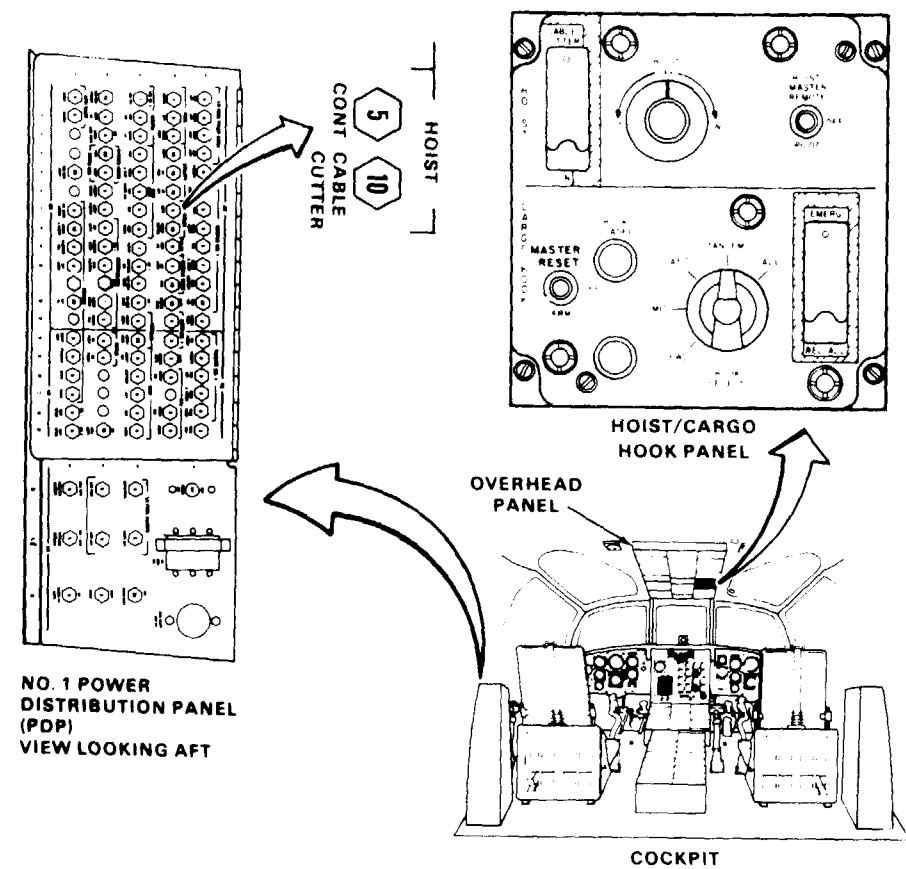
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

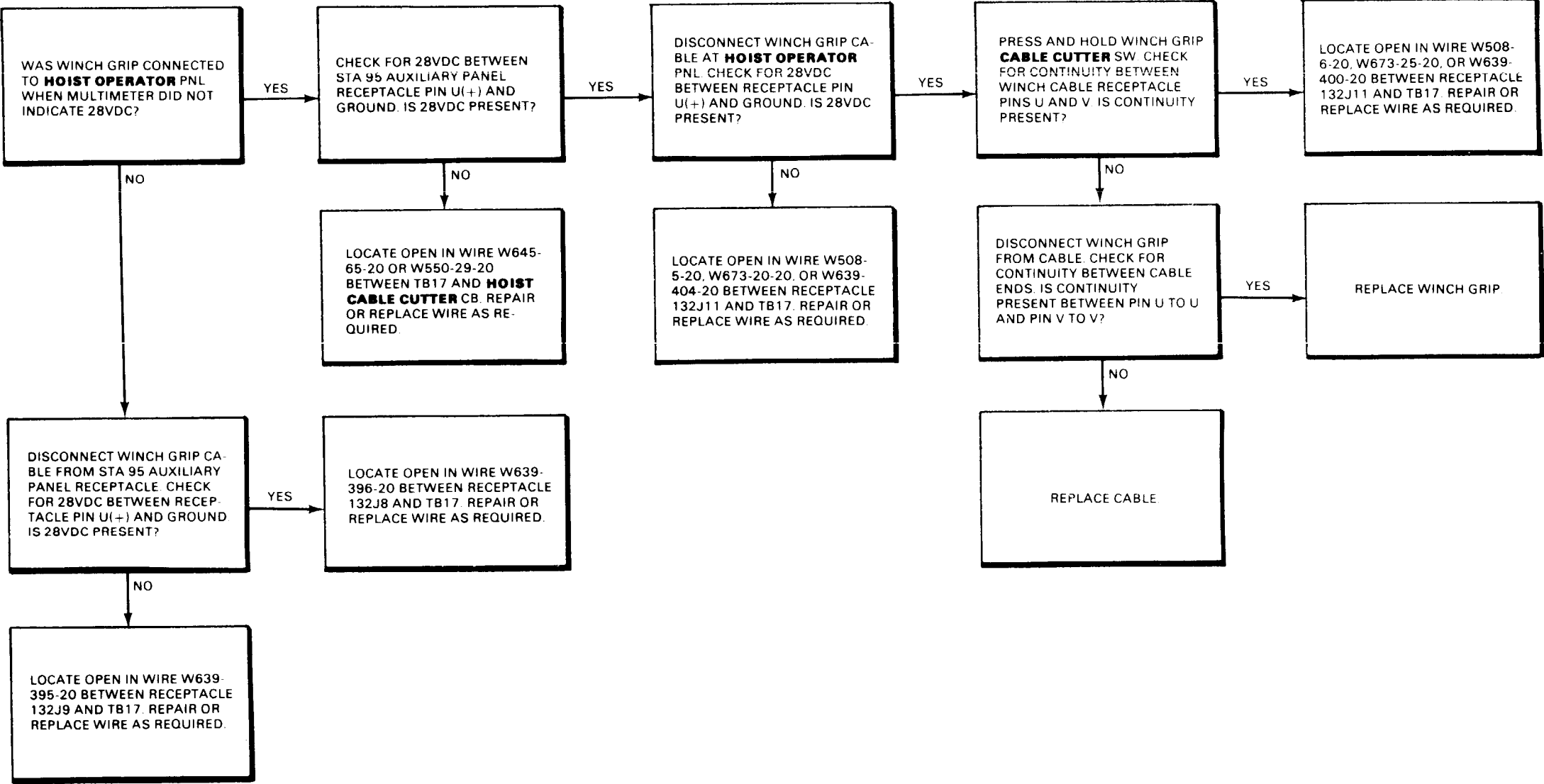
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off





14-1.14 28VDC NOT MEASURED AT STA 340 CABLE CUTTER  
RECEPTACLE WHEN WINCH GRIP CABLE CUTTER SWITCH  
PRESSED AT HOIST OPERATOR OR AUXILIARY PANEL (Continued)

14-1.14



END OF TASK

## CHAPTER 15

# AUXILIARY POWER UNIT TROUBLESHOOTING

CHAPTER 15  
AUXILIARY POWER UNIT SYSTEM TROUBLESHOOTING

CHAPTER OVERVIEW

Chapter 15 contains procedures for Auxiliary Power Unit System troubleshooting. Each system and failure symptom is listed below. Included in this chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for the Auxiliary Power Unit System.

Refer to TM 55-1520-240-23 for required maintenance procedures.

SYSTEM	PARA
AUXILIARY POWER UNIT	15-1

FAILURE SYMPTOM LIST

AUXILIARY POWER UNIT

SYMPTOM	TASK
APU CONT NORM OR APU CONT EMERG CIRCUIT BREAKER DOES NOT STAY CLOSED	15-1.4
APU DOES NOT MOTOR WHEN APU SWITCH IS SET TO START (WITHOUT 33)	15-1.4
APU DOES NOT MOTOR WHEN APU SWITCH IS SET TO START (WITH 33)	15-1.4
APU HAS HOT START	15-1.4
APU MOTORS BUT DOES NOT START, ESU BITE INDICATES 0000	15-1.4
APU MOTORS BUT DOES NOT START, ESU BITE INDICATES 0000 OR 0000 THEN 0000	15-1.4
APU MOTORS BUT DOES NOT START; ESU BITE INDICATES 0000 THEN 0000	15-1.4

SYMPTOM	TASK
APU ON CAPSULE GOES OUT (APU SHUTS DOWN) WHEN APU CONT CIRCUIT BREAKER OPENED	15-1.4
APU ON CAPSULE OUT WHEN APU OPERATING NORMALLY	15-1.4
APU SHUTS DOWN DURING START, ESU BITE INDICATES 0000	15-1.4
APU SHUTS DOWN WHEN APU GEN SWITCH IS SET TO OFF	15-1.4
APU STARTS AND RUNS BUT ESU BITE INDICATES 0000	15-1.4

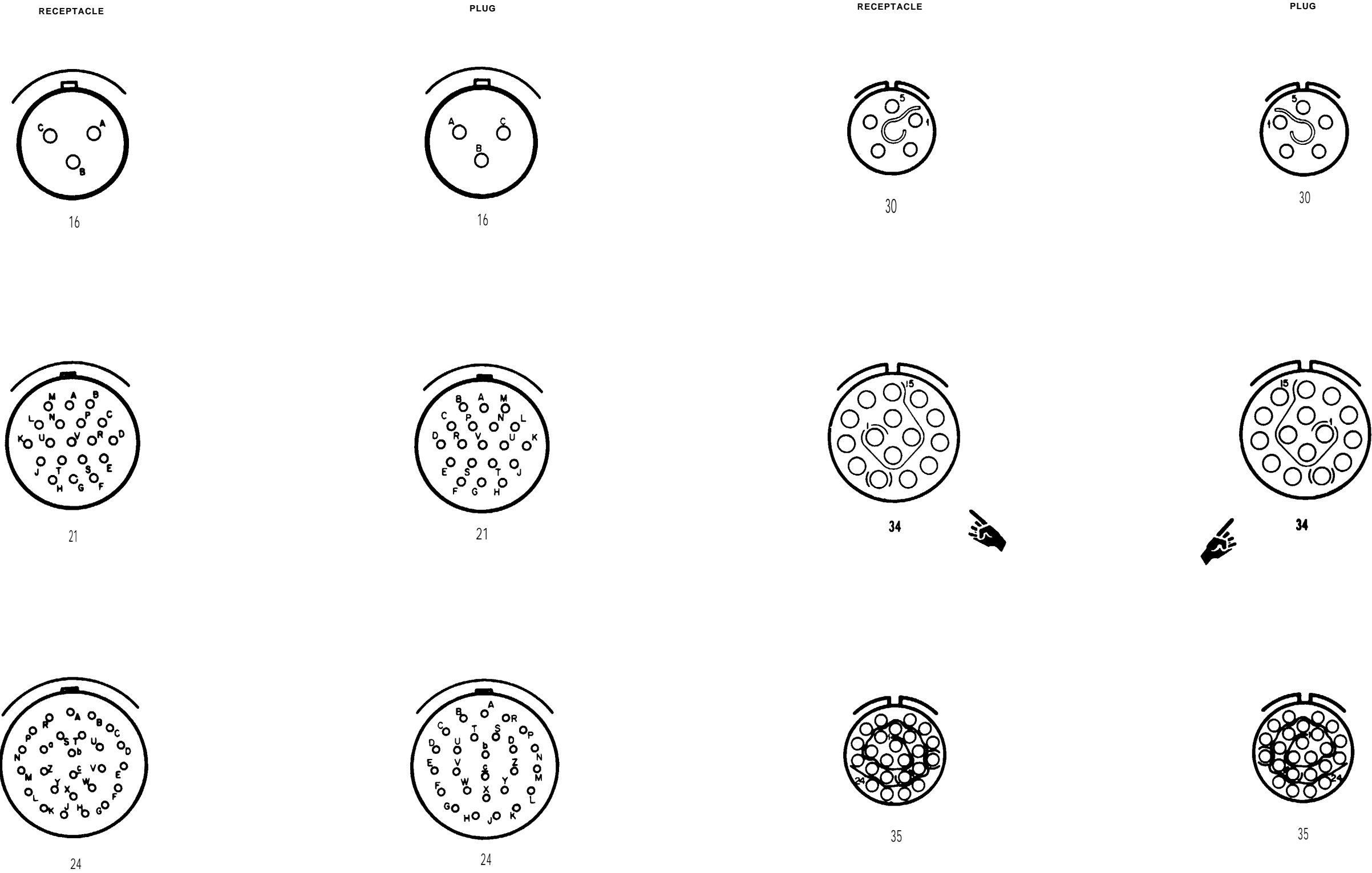
SYMPTOM	TASK
APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES 0000	15-1.4
APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES 0000	15-1.4
APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES 0000	15-1.4
ESU BITE INDICATORS ARE NOT BLACK OR APU FUEL BOOST PUMP CANNOT BE HEARD OPERATING BEFORE APU SWITCH SET TO START	15-1.4

AUXILIARY POWER UNIT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST

REF DESIG	PART NUMBER	TYPE	MATE WITH/LOCATION	STATION LOCATION		
				FS	WL	BL
GD 128		151	LH AFT CABIN	360	32	50L
GD 129		151	AFT AT APU AREA	594	60	20R
GO 130		151	LH AFT TAIL	510	50	45L
GO 153		151	LH AFT CABIN	380	-15	50L
TB-3			NO. 1 PDP	90	-15	30L
136K 1	MS24149-D1	106	APU FAULT RELAY	360	32	50L
136P1	M83723-96A1624N	35	J1 OF ESU	520	40	50L
136P2	M83723-95A1415N	34	J2 OF ESU	520	40	50L
136J3	MS3474W12-3S	16	AIRCRAFT SKIN – TANK SIDE-CABLE TO APU FUEL PUMP –LH POD	380	-5	50L
136P4	MS3456W10SL-4S	46	APU FUEL WAVE - LH POD	375	-20	54R
136P5	M83723-95A1005N	30	APU HYD START VALVE	575	50	30R
136P6	M83723-95A1624N	35	APU	594	65	8L
174J5	MS3474W14-19S	21	AIRCRAFT SKIN–INSIDE	385	-5	50L
174P5	MS3476W14-19P	21	AIRCRAFT SKIN – TANK SIDE	305	-5	50L

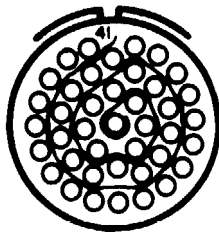
REF DESIG	PART NUMBER	TYPE	MATE WITH/LOCATION	STATION LOCATION		
				FS	WL	BL
232P1	MS3476W20-41S	24	CONSOLE-CTK INST PNL MASTER CAUTION PANEL			
300J1	M83723-74A2041N	40	NO. 1 POP			
300P1	M83723-75A2041N	40	NO. 1 POP			
300J19	M83723-73A2041N	40	OVERHEAD PANEL-COCKPIT			
300P19	M83723-76A2041N	40	OVERHEAD PANEL-COCKPIT			
300J21	M83723-74A2461N	43	OVERHEAD PANEL-COCKPIT			
300P21	M83723-75A2461N	43	OVERHEAD PANEL-COCKPIT			
300J50	M83723-73A2461N	43	ELECTRONICS COMPART- MENT-OVHD	120	40	20L
300P50	M83723-76A2461N	43	ELECTRONICS COMPART- MENT-OVHD	120	40	20L
300J54	M83723-74A2461N	43	AFT CROWN	460	50	20L
300P54	M83723-75A2461N	43	AFT CROWN	460	50	20L
300J61	M83723-73A24619	43	CONSOLE – UNDERFLOOR	85	-20	10L
300P61	M83723-76A24619	43	CONSOLE – UNDERFLOOR	85	-20	10L

AUXILIARY POWER UNIT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)



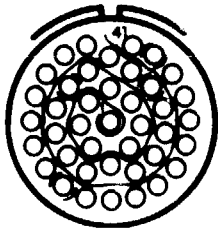
AUXILIARY POWER UNIT ELECTRICAL COMPONENT  
LOCATION AND CONFIGURATION LIST (Continued)

RECEPTACLE



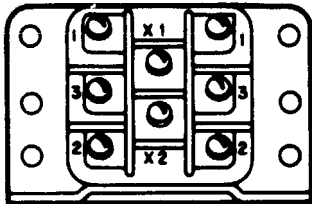
40

PLUG



40

RELAY

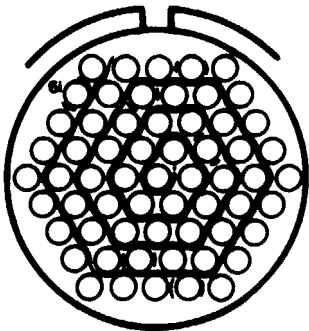


106

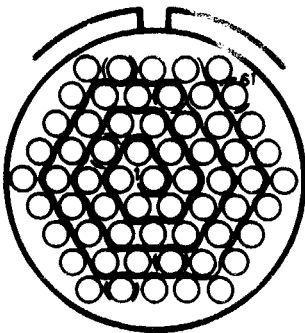
GND STUD



151



43



43

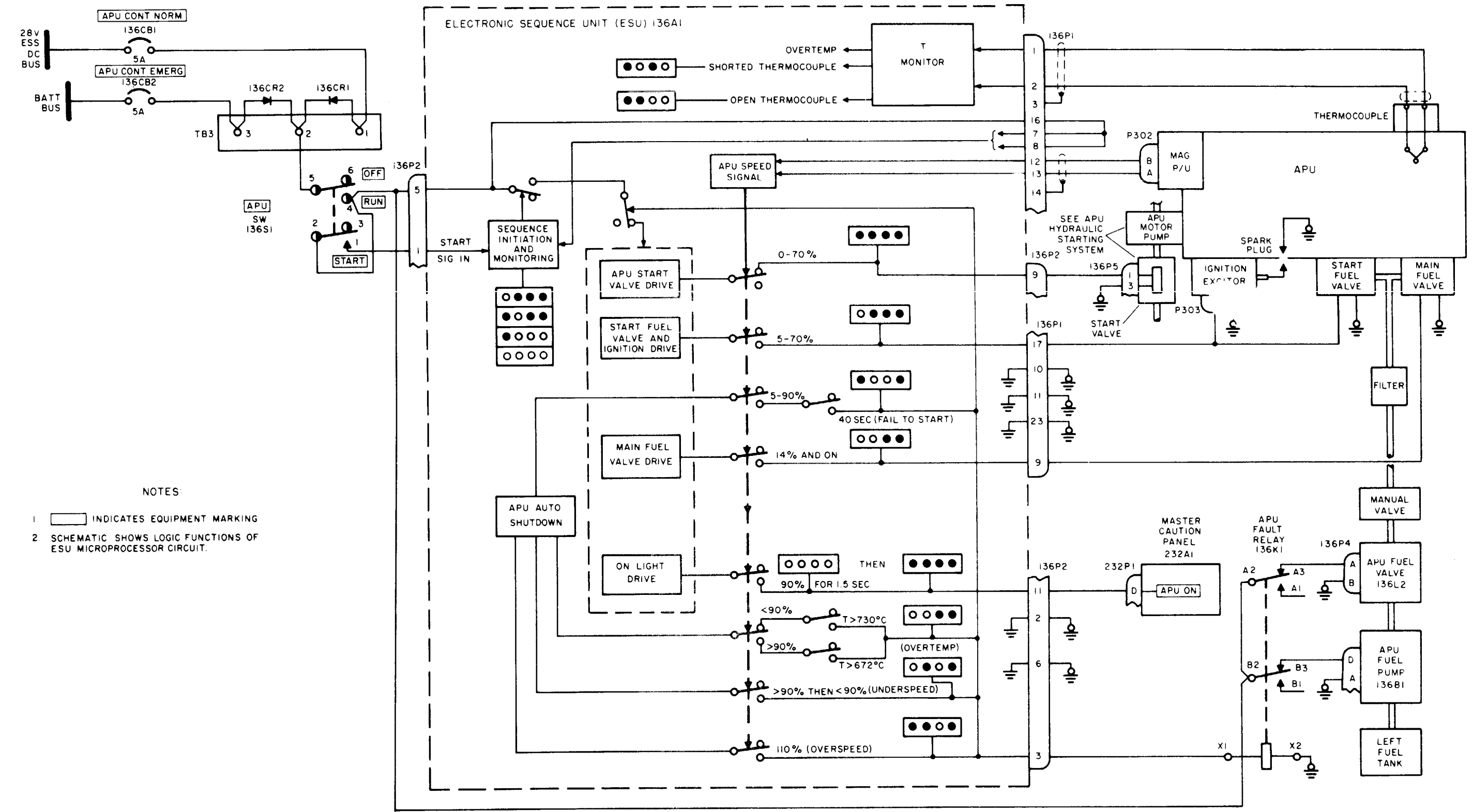


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46

## 15-1 APU





CHAPTER 15

AUXILIARY POWER UNIT SYSTEM TROUBLESHOOTING

CHAPTER OVERVIEW

Chapter 15 contains all procedures for the Auxiliary Power Unit Troubleshooting including the interface to the Main Engine Starter. The Auxiliary Power Unit failure symptoms are listed in Table No. 15-1. Included in this chapter are locations and views of all electrical connectors, receptacles, relays and ground connections for the Auxiliary Power Unit and the interface control systems of the Airframe. Refer to TM 55-1520-240-23 for required maintenance procedures.

DIAGRAMS AND ILLUSTRATIONS

Included in this chapter are block diagrams, illustrations, maintenance tables, schematic diagrams, wiring diagrams, piping diagrams and troubleshooting logic trees which are necessary to troubleshoot the APU system components including the interface to the Main Engine Starter components. All APU systems troubleshooting instructions are contained in this chapter and are listed in the seven (7) groups described in the order listed below. The application of the APU Field Tester is described in paragraph 15-7.

APU SYSTEMS MAJOR TITLES		PARA.	VISUAL CHECKS		PARA.	OPERATIONAL CHECKS		PARA.
APU TO AIRFRAME INTERFACE		15-1	APU VISUAL		15-1.4	APU NORMAL OPERATION		15-1.5
APU ELECTRICAL SYSTEM		15-2	APU HYDRAULIC		15-4.7	APU - HYDRAULIC STARTING		15-4.8
APU FUEL SYSTEM		15-3	ENGINE HYDRAULIC		15-5.4	ENGINE – HYDRAULIC STARTING		15-5.5
APU HYDRAULIC SYSTEM		15-4				APU TESTER OPERATION		15-7.3
APU / ENGINE HYDRAULIC STARTER		15-5						
APU MICROPROCESSOR ELECTRONIC SEQUENCE UNIT (ESU)		15-6						
APU TESTER		15-7						

TABLE 15-1 APU COMPOSITE FAILURE SYMPTOM LIST			
TEM NO.	SYMPTOM	APPLICABLE SYSTEM	TASK
1	APU DOES NOT MOTOR		
	APU DOES NOT MOTOR	ELECTRICAL	15-2.10
	APU DOES NOT MOTOR, ESU BITE INDICATES ○●●●	ELECTRICAL	15-2.10
	APU DOES NOT MOTOR, ESU BITE INDICATES ●○○●	ELECTRICAL	15-2.10
	APU DOES NOT MOTOR, ESU BITE INDICATES ●○○○	ELECTRICAL	15-2.10
	APU DOES NOT MOTOR, ESU BITE INDICATES ○○○○	ELECTRICAL	15-2.10
	APU DOES NOT MOTOR	HYDRAULIC	15-4.10

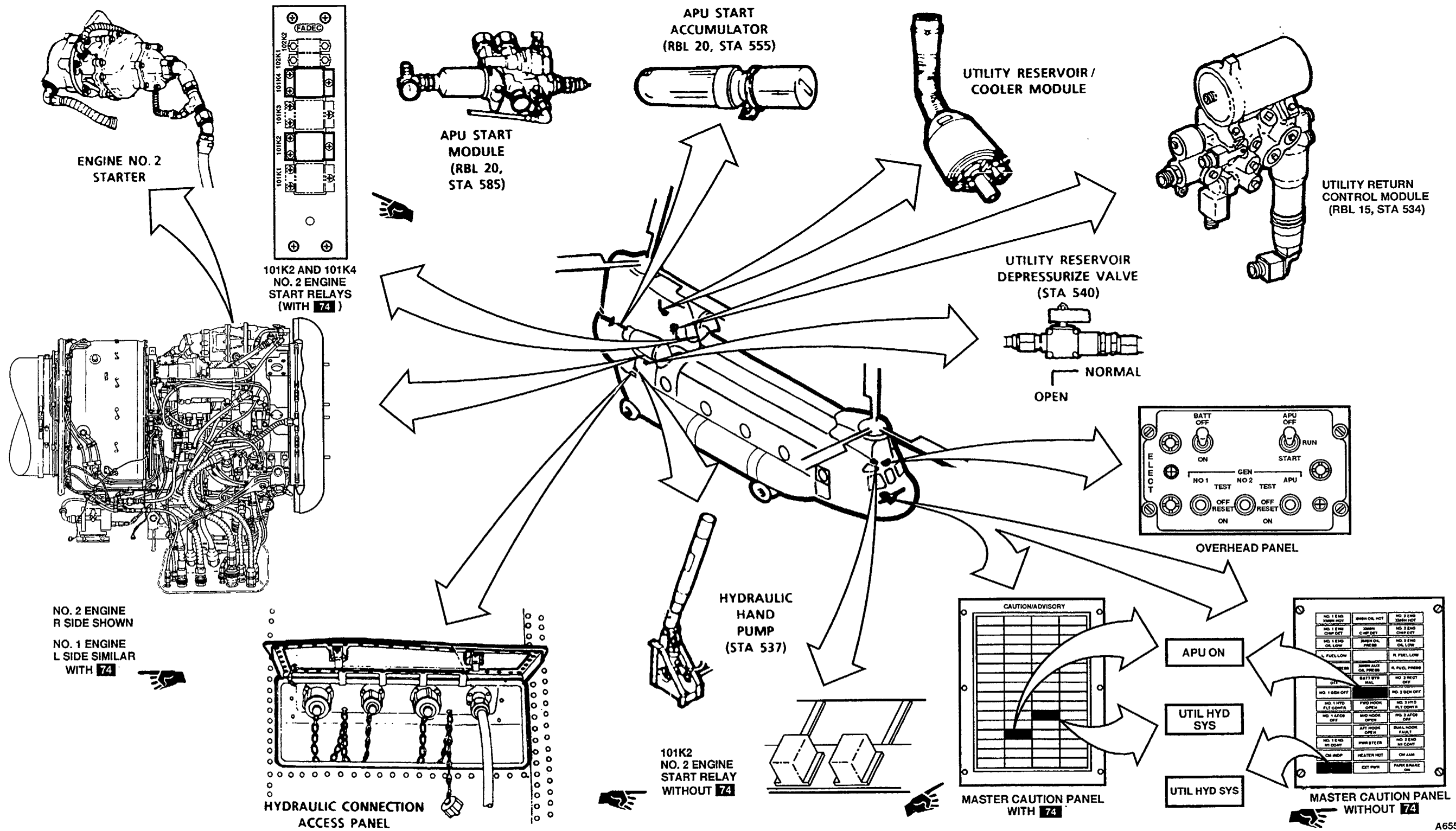
TABLE 15-1 APU COMPOSITE FAILURE SYMPTOM LIST (Continued)			
ITEM NO.	SYMPTOM	APPLICABLE SYSTEM	TASK
2	APU MOTORS BUT DOES NOT START		
	APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○○●● THEN ●○○●	FUEL - (APU)	15-3.6
	APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○○○● THEN ●○○●	FUEL - (APU)	15-3.7
	APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○●●● OR ○○●● THEN ●○○●	HYDRAULIC	15-4.11
	APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○●○○	ELECTRONIC	15-6.11
	APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○●●● OR ○○●● THEN ●○○●	ELECTRONIC	15-6.12
	APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○○○● THEN ●○○●	ELECTRONIC	15-6.13

TABLE 15-1 APU COMPOSITE FAILURE SYMPTOM LIST (Continued)			
ITEM NO.	SYMPTOM	APPLICABLE SYSTEM	TASK
3	<b>APU STARTS BUT SHUTS DOWN</b>  APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES THEN ○○○○ ●●○○	ELECTRONIC	15-6.14
	APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES THEN ○○○● ○●○○	ELECTRONIC	15-6.15
	APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES THEN ○○○● ○○●●	ELECTRONIC	15-6.16
	APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES THEN ○○●● ●●○○	ELECTRONIC	15-6.18
4	<b>APU STARTS AND RUNS</b>  APU STARTS AND RUNS THEN SHUTS DOWN, ESU BITE INDICATES THEN ○○○○ ○○●●	ELECTRONIC	15-6.17
	APU STARTS AND RUNS BUT ESU BITE INDICATES ●○○○	ELECTRONIC	15-6.19
5	<b>APU SHUTS DOWN</b>  APU SHUTS DOWN WHEN GEN APU SWITCH PLACED TO ON ESU BITE INDICATES ●●●●	ELECTRICAL	15-2.14
	APu SHUTS DOWN WHEN APU GEN SWITCH IS SET TO OFF	ELECTRICAL	15-2.15
6	<b>APU CIRCUIT BREAKERS</b>  APU <b>CONT NORM</b> OR APU <b>CONT EMERG</b> CIRCUIT BREAKER DOES NOT STAY CLOSED	ELECTRICAL	15-2.7
7	<b>ESU BITE INDICATORS</b>  ESU BITE INDICATORS DO NOT CYCLE AFTER APU SWITCH SET TO RUN	ELECTRICAL	15-2.8

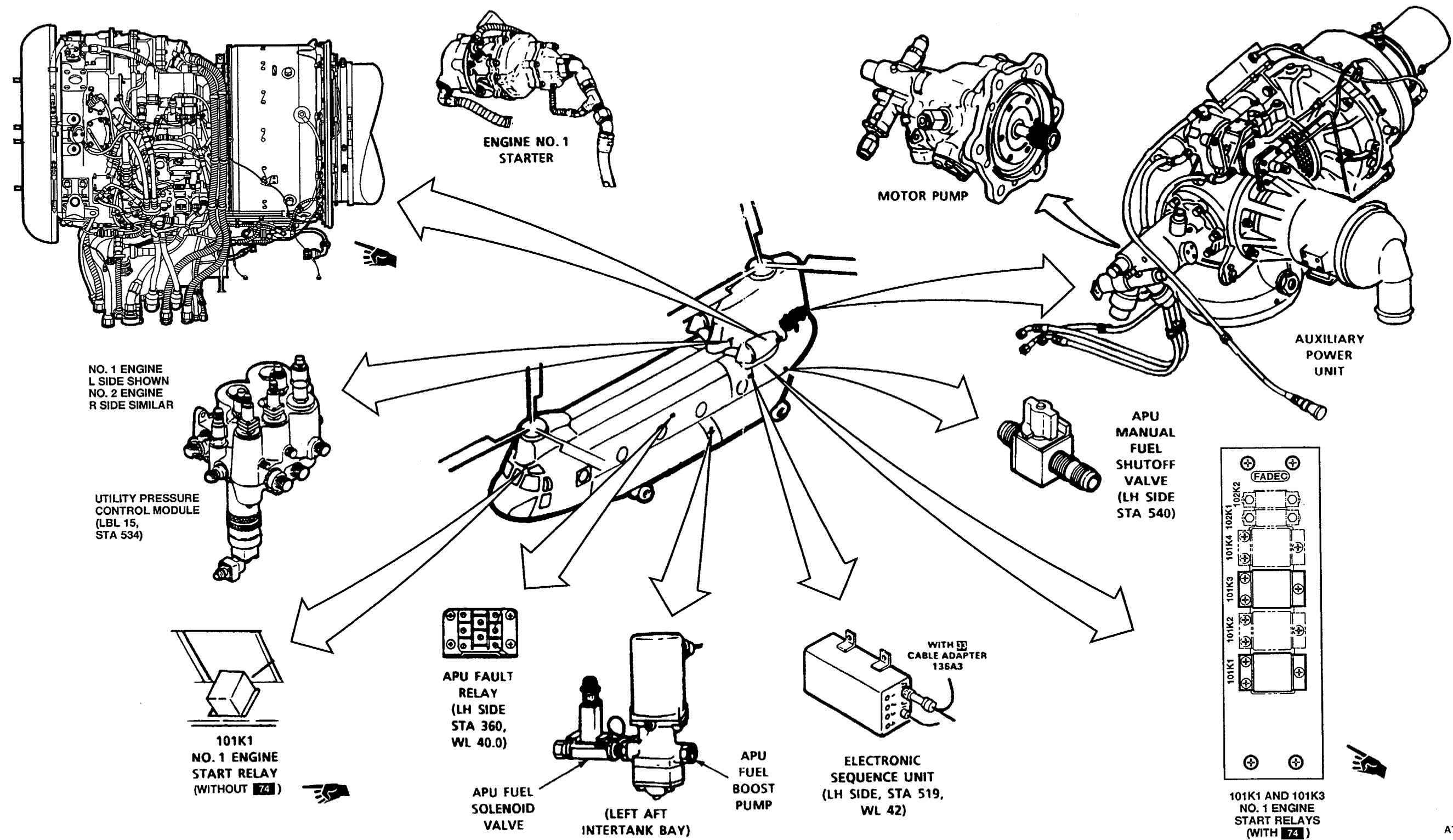
TABLE 15-1 APU COMPOSITE FAILURE SYMPTOM LIST (Continued)			
ITEM NO.	SYMPTOM	APPLICABLE SYSTEM	TASK
8	<b>APU FUEL BOOST PUMP</b>  APU FUEL BOOST PUMP CANNOT BE HEARD OPERATING BEFORE APU SWITCH SET TO <b>START</b>	ELECTRICAL	15-2.9
9	<b>APU ON CAPSULE GOES OUT</b>  <b>APU ON</b> CAPSULE GOES OUT (APU SHUTS DOWN) WHEN APU CONT CIRCUIT BREAKER OPENED	ELECTRICAL	15-211
	<b>APU ON</b> CASULE OUT WHEN APU OPERATING NORMALLY	ELECTRICAL	15-2.13
10	<b>APU DOES NOT STOP</b>  APU DOES NOT STOP, ESU INDICATORS ARE BLACK ●●●●	ELECTRICAL	15-2.12
11	<b>APU PUMP FAULT LIGHT</b>  APU PUMP FAULT LIGHT IS ON	HYDRAULIC	15-4.12
12	<b>NO. 1 OR NO. 2 ENGINE DOES NOT MOTOR</b>  NO 1 OR NO 2 ENGINE DOES NOT MOTOR (HYDRAULIC SYSTEM)	HYDRAULIC	15-5.6
13	<b>NO. 1 OR NO. 2 ENGINE KEEPS MOTORING</b>  NO 1 OR NO 2 ENGINE KEEPS MOTORING WHEN ENGINE START SWITCH SET TO OFF	HYDRAULIC	15-5.7
14	<b>APU START ACCUMULATOR GAGE</b>  APU START ACCUMULATOR GAGE DOES NOT INDICATE AT LEAST 2850 PSI	HYDRAULIC	15-4.9

## 15-1 APU TO AIRFRAME INTERFACE

PARAGRAPH 15-1			
TABLE OF CONTENTS			
APU TO AIRFRAME INTERFACE TROUBLESHOOTING			
PARAGRAPH	DESCRIPTION	FUNCTION	PAGE
15-1	APU TO AIRFRAME INTERFACE		15-5
15-1.1	APU SYSTEM COMPONENTS	DRAWING	15-8
15-1.2	OVERALL ELECTRICAL CABLING INTER- CONNECTIONS OF APU SYSTEM COMPONENTS, "INTERFACED" TO MAIN ENGINE "STARTER" COMPONENTS	DRAWING	15-10
15-1.3	OVERALL PIPING INTERRELATIONSHIP OF APU SYSTEM COMPONENTS, "INTERFACED" TO MAIN ENGINE "STARTER" COMPONENTS	DRAWING	15-13
15-1.4	APU VISUAL CHECK	TASK	15-14
15-1.5	APU OPERATIONAL CHECK	TASK	15-16

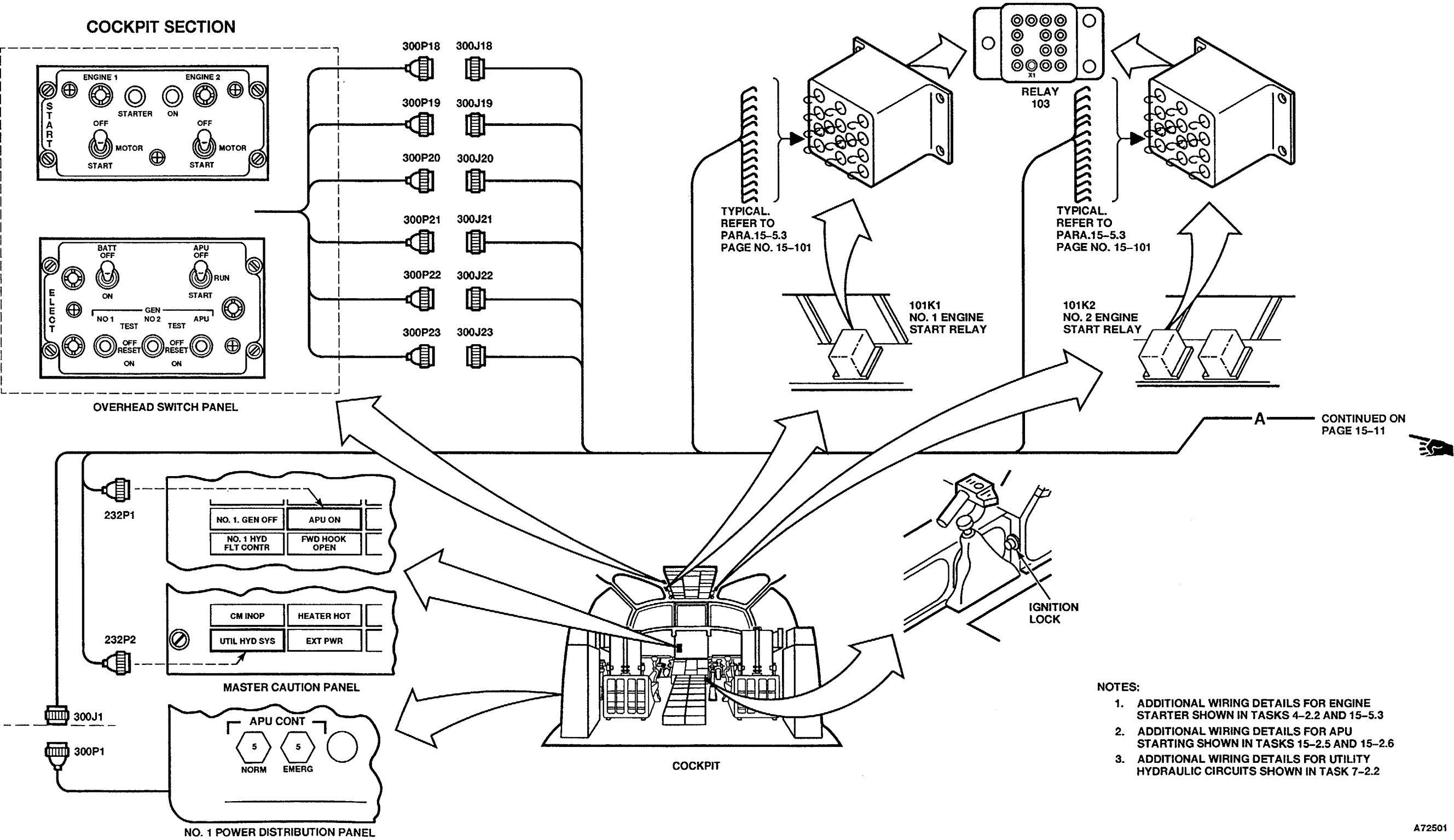


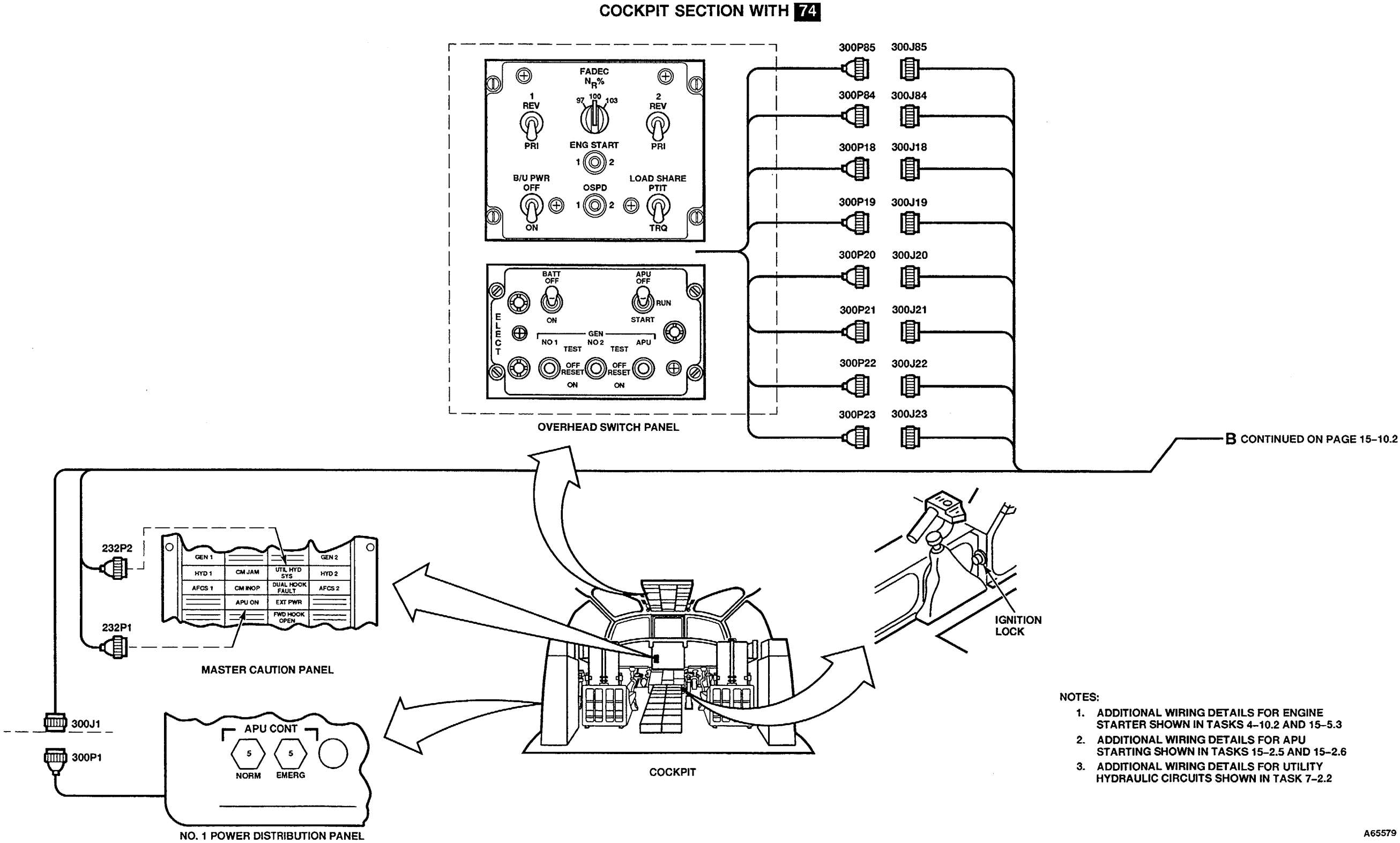
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COCKPIT SECTION WITHOUT 74





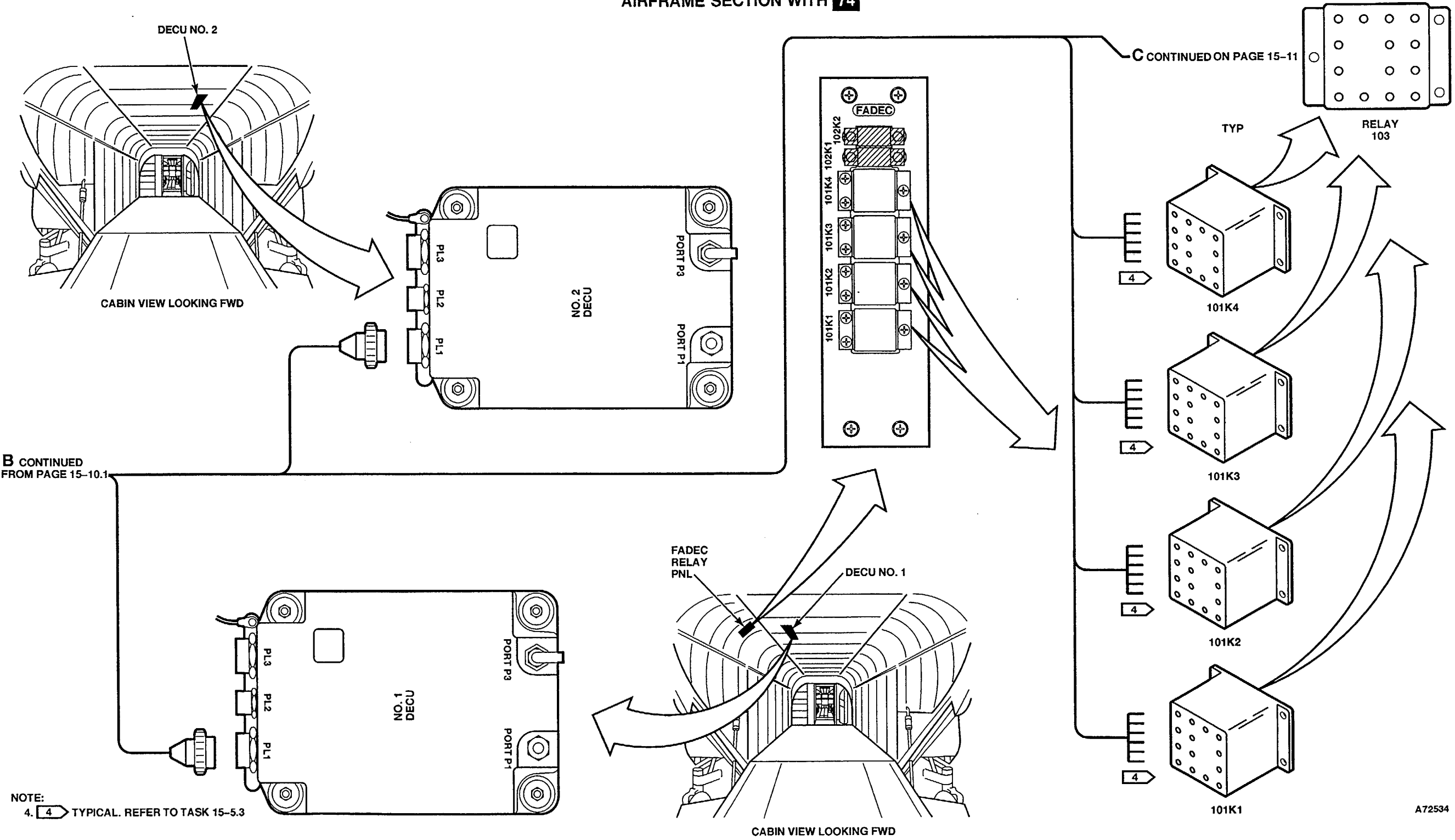
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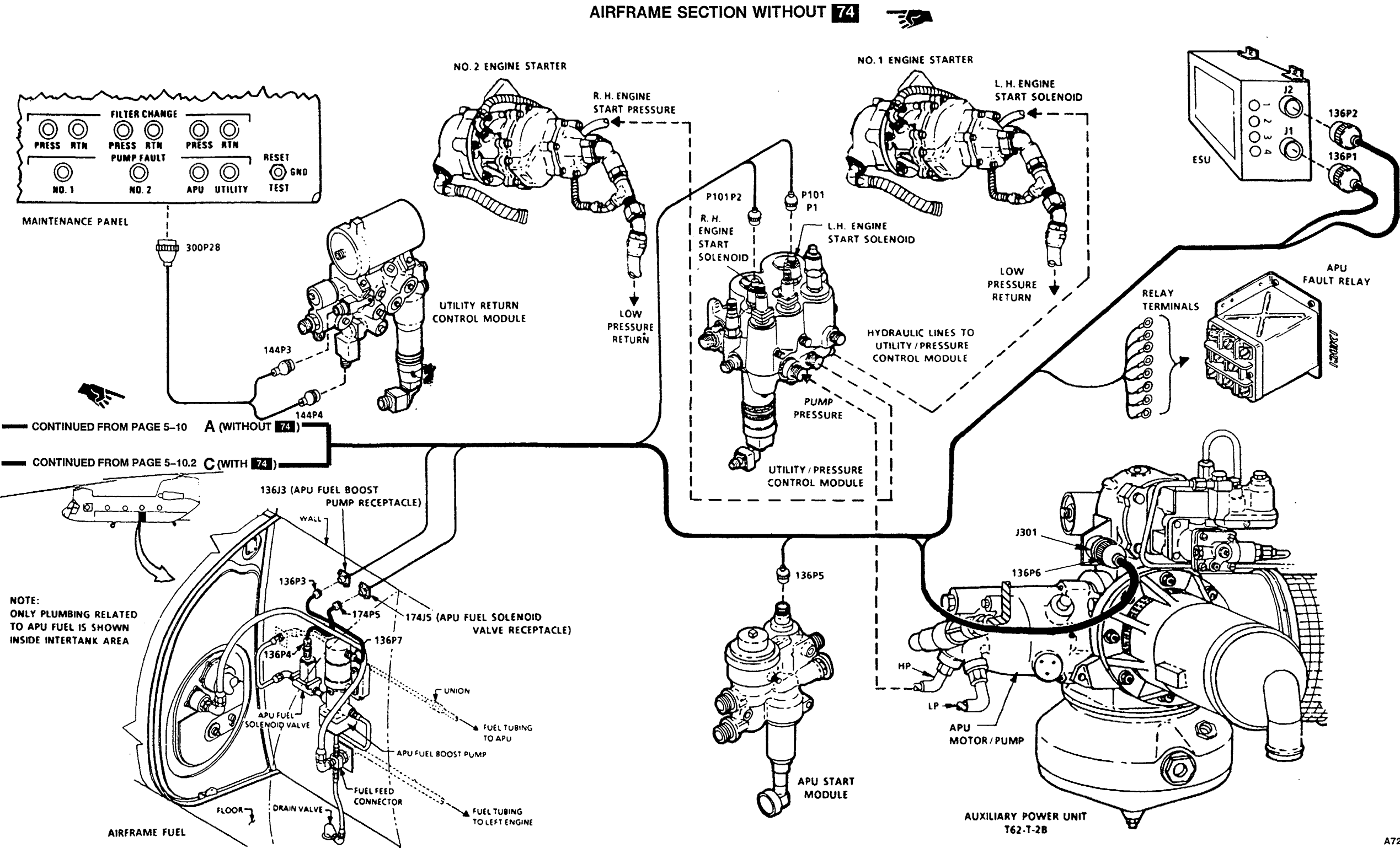
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Change 23 15-10.1



AIRFRAME SECTION WITH 74





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15-1.2 OVERALL ELECTRICAL CABLING INTERCONNECTIONS OF APU SYSTEM COMPONENTS, "INTERFACED" TO MAIN ENGINE "STARTER" COMPONENTS (Continued)

15-1.2

A. OVERVIEW - OF APU **INTERFACED** TO MAIN ENGINE STARTERS

The APU **Interfaced** to the Main Engine Starters includes the activation of the following components and interconnections as shown in paragraph 15-1.2.

1. Hydraulic STARTERS on each engine
2. Engine START valves
3. Solenoid-operated pilot valves on the Utility System Pressure Control Modules
4. Start switches and relays
5. Caution lights
6. Ignition LOCK switch
7. Start Fuel Solenoid Valve
8. APU Fuel Solenoid Valve
9. APU Fuel Boost Pump
10. APU Electronic Sequence Unit (ESU)
11. APU FAULT RELAY
12. APU Ignition Exciter
13. APU T62-T-2B Engine

B. BRIEF OPERATIONAL DESCRIPTION OF MAIN ENGINE START SYSTEM

On helicopters without **74**, when the Main Engine **START** switch is moved to **MOTOR**, the STARTER ON caution light comes "ON" and the Engine Start valve "OPENS". The START VALVE applies UTILITY SYSTEM PRESSURE from the **APU** to the Main Engine starter, thus rotating the Engine Starter and Compressor.

On helicopters with **74**, when the main **ENG START** switch is set to **1** or **2**, the engine start valve "OPENS". The START VALVE applies UTILITY SYSTEM PRESSURE from the **APU** to the Main Engine starter, thus rotating the Engine Starter and Compressor.

NOTE

For additional information, refer to task 15-5.5 - **ENGINE Hydraulic Starting System Operational Check** and tasks 4.4 - **Engine Start and Ignition System (Without **74**)** or 4.10- **Engine Start and Ignition System (With **74**)**.

C. BRIEF OPERATIONAL DESCRIPTION OF **APU SYSTEM**

The Gas Turbine Auxiliary Power Unit T62-T-2B (APU) is mounted in the aft cabin above the ramp. The basic components of the APU are the gas turbine engine, hydraulic motor-pump, fuel control, accessory drive, and ac generator. An APU control box, ESU, which monitors APU operation is on the left side of the cabin above the ramp. The motor-pump on the APU pressurizes the utility and flight control hydraulic systems for main engine starting and ground checks. The APU also drives an ac generator which supplies power to No. 1 and No. 2 electrical systems. The APU receives fuel from the left fuel system thru a booster pump, a manual fuel shutoff valve, and a solenoid valve.

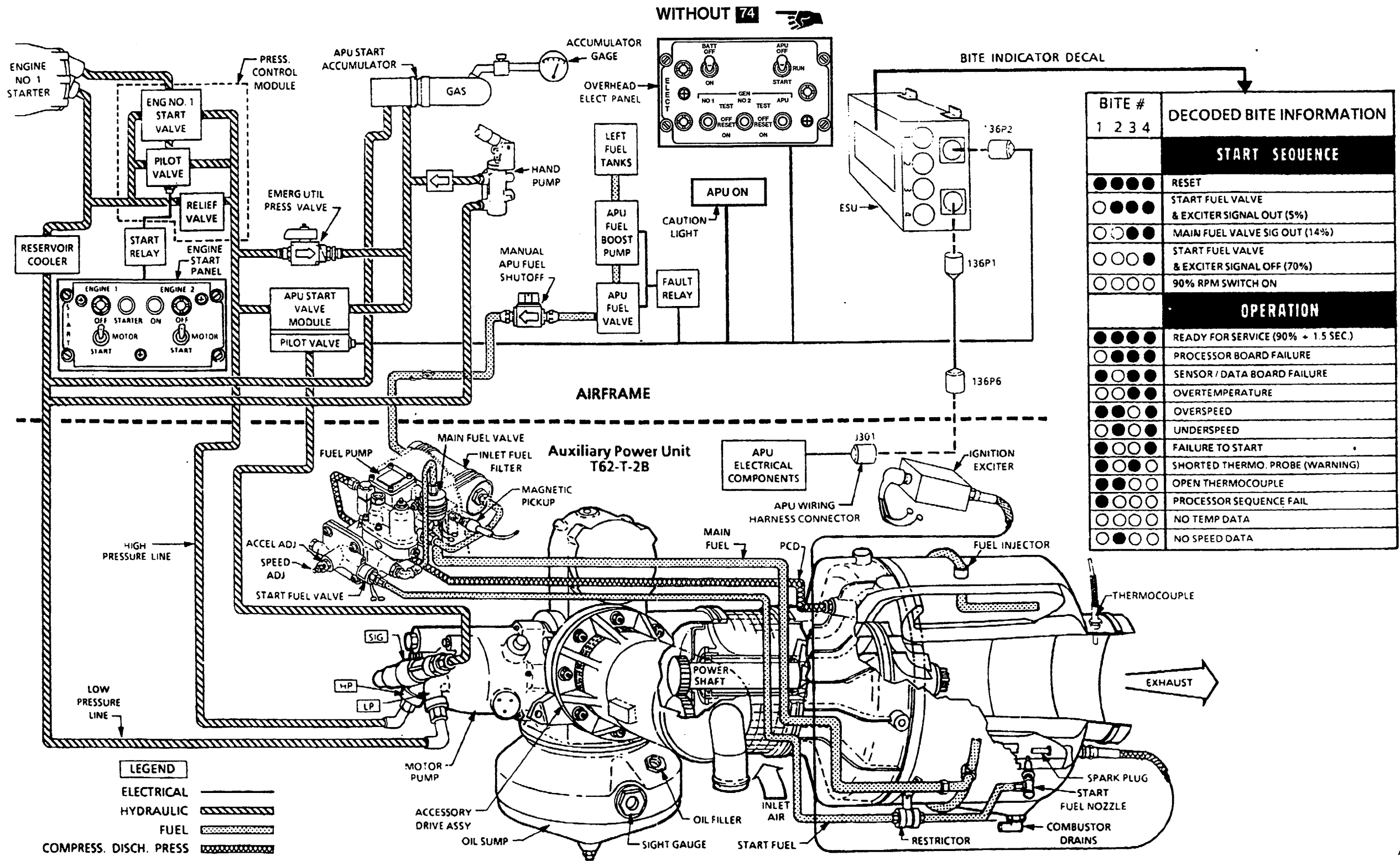
The APU control switch is on the electrical power panel on the overhead switch panel. It is a three-position switch marked APU OFF, RUN, and START. The switch is spring loaded from RUN to START. To start the APU, the switch is moved from OFF to RUN for 3 to 5 seconds, then set to START for 2 seconds, then released to RUN. APU start is then automatic and controlled by the control box. The APU ON caution light will come on in about 10 to 12 seconds.

NOTE

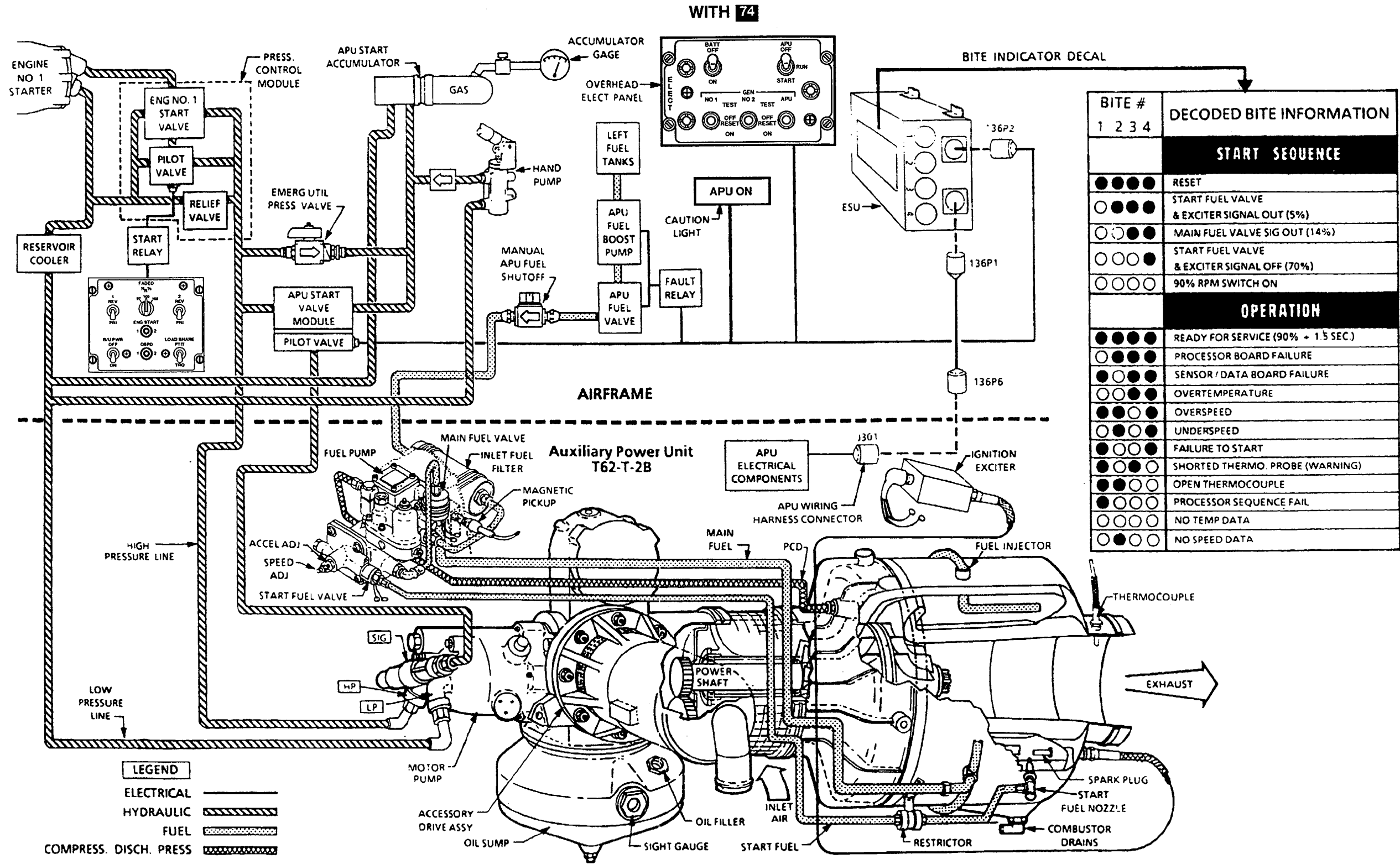
For additional information, refer to task 15-1.5, **APU Operational Check**.

15-1.3 OVERALL PIPING INTERRELATIONSHIP OF APU SYSTEM COMPONENTS, "INTERFACED" TO MAIN ENGINE STARTER COMPONENTS

15-1.3



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15-1.4 APU VISUAL CHECK

15-1.4

INITIAL SETUP

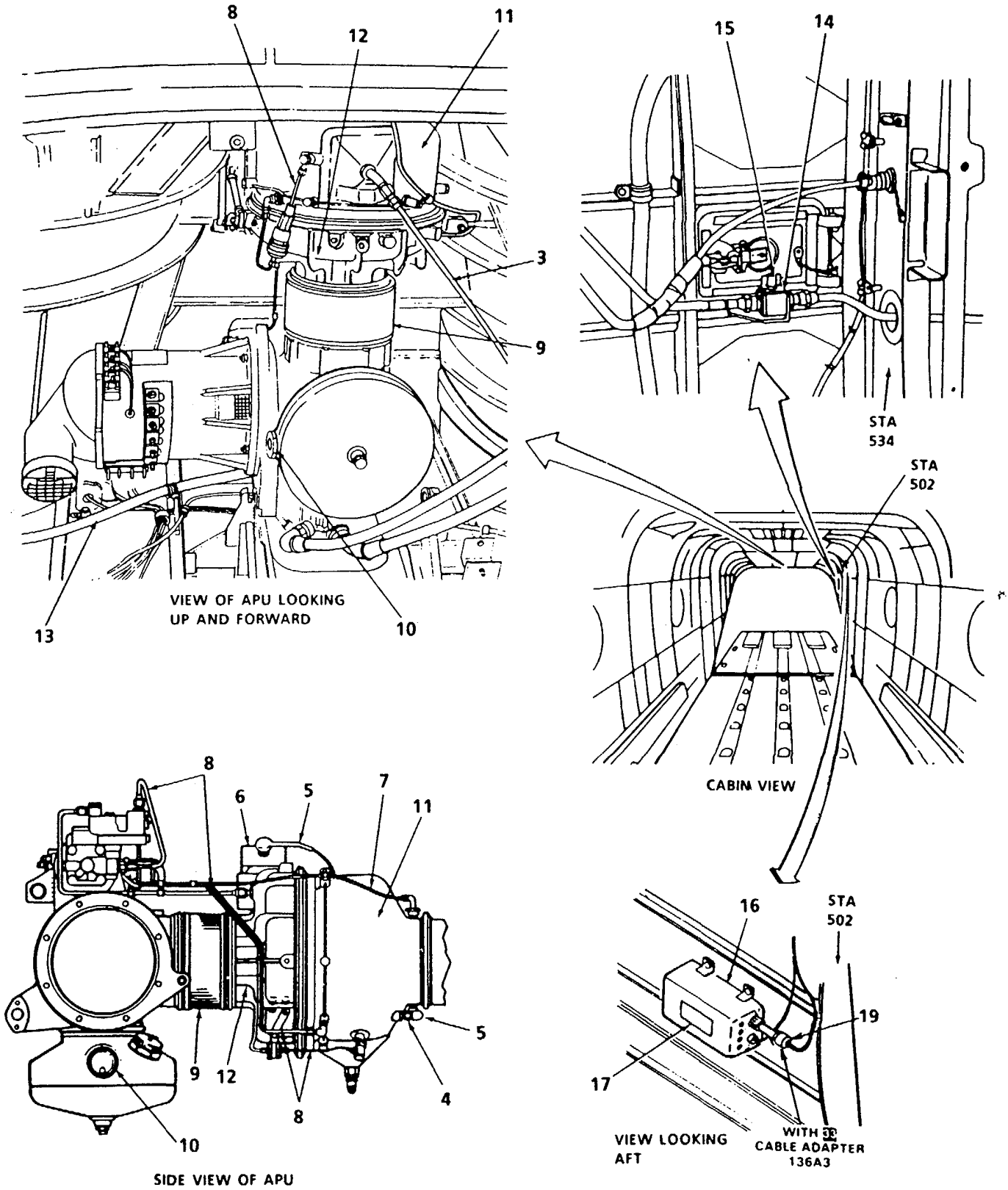
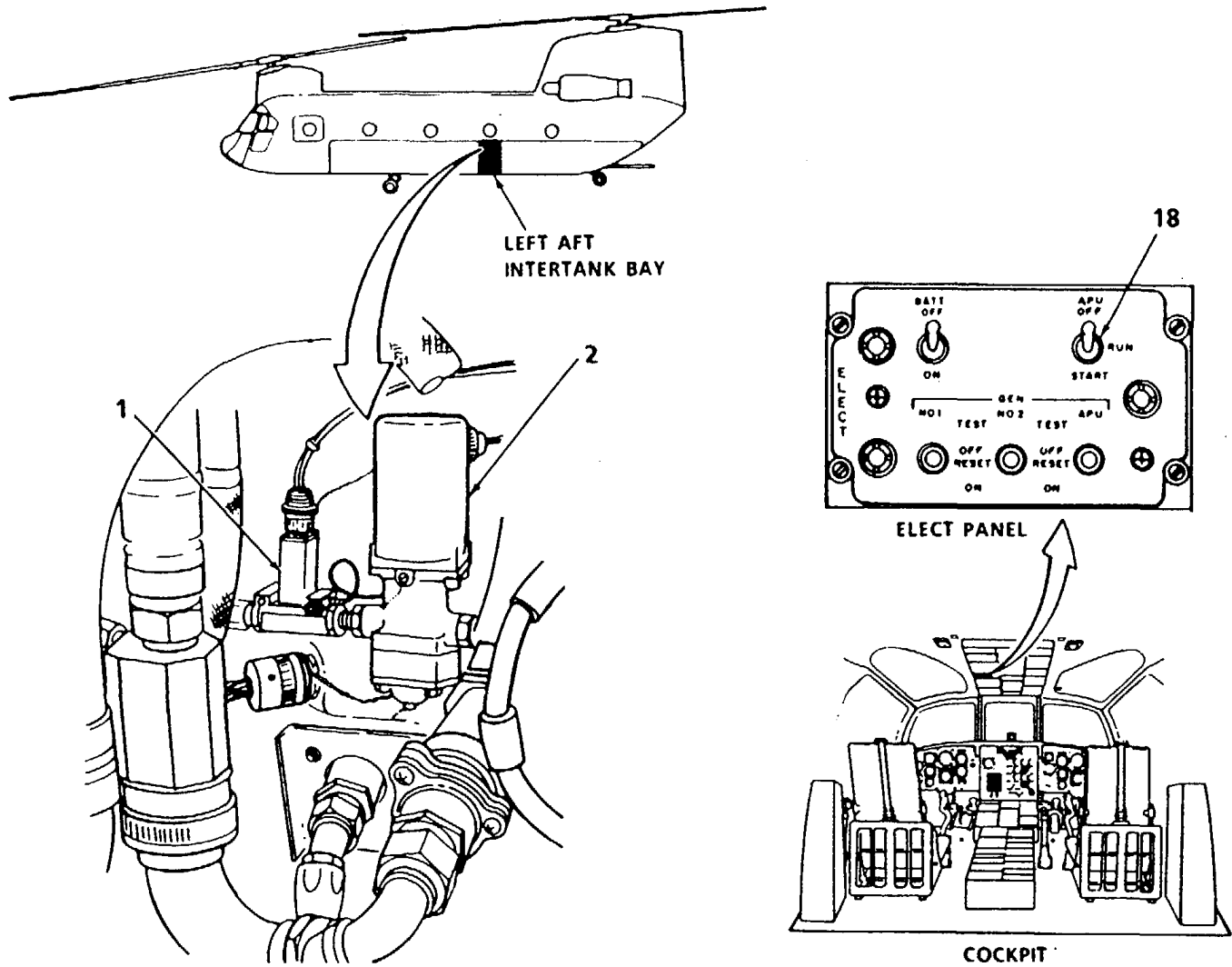
**Applicable Configurations:**  
All **Equipment Condition:**

**Tools:**  
Aircraft Mechanic's Tool Kit.  
NSN 5180-00-323-4692  
Work Stand

**Materials:**  
None  
**Personnel Required:**  
Medium Helicopter Repairer

**References:**  
TM 55-1520-240-23

TM 55-1520-240-23:  
Battery Disconnected  
Ext Electrical Power Off  
Ext Hydraulic Power Off  
Left Aft Intertank Bay  
Access Door Open  
APU Drip Pan Removed  
Ramp Opened and Level



15-1.4 APU VISUAL CHECK (CONTINUED)

15-1.4

TASK	RESULT
1. Check APU fuel valve (1).	If fuel valve (1) is loose or damaged, tighten or replace it as required. If electrical connector or wiring to valve is damaged, replace connector or repair or replace wiring as required.
2. Check APU fuel boost pump (2).	If fuel boost pump (2) is loose or damaged, tighten or replace it as required. If electrical connector or wiring to pump is damaged, replace connector or repair or replace wiring as required.
3. Check APU combustor drain line (3).	If drain line (3) is kinked or damaged, replace it. If it is loose, tighten it.
4. Check APU spark plug (4), exciter cable (5), and ignition exciter (6).	If spark plug (4), exciter cable (5), or ignition exciter (6) is loose or damaged, tighten or replace it as required.
5. Check APU thermocouple cable (7).	If cable (7) is loose or damaged, tighten or replace it as required.
6. Check two APU fuel lines (8).	If any fuel line (8) is damaged, replace it.
7. Check APU air inlet screen (9).	If screen (9) is clogged, clean it.
8. Check APU oil level sight gage (10).	If oil level is low, service APU.
9. Check APU combustor case (11) and turbine case (12).	If either case (11 or 12) is cracked or damaged, replace APU.
10. Check APU fuel line (13).	If fuel line (13) is kinked or damaged, replace it.
11. Check APU fuel shutoff manual valve (14).	If valve (14) is loose or damaged, tighten or place it as required. If valve handle (15) is not in ne with fuel line, set it in that position.
12. Check electronic sequence unit (ESU) (16).	If ESU (16) is loose or damaged, tighten or replace as required. If electrical connector or wiring to U is damaged, replace connector or repair or place wiring as required. If bite information art (17) is damaged, replace it.
13. Check APU switch (18).	If switch (18) is loose or damaged, tighten or place it as required.
14. On helicopter with 33 , check cable adapter (19).	If cable adapter (19) is loose or damaged, tighten or replace it as required.

FOLLOW-ON MAINTENANCE:  
TM 55-1520-240-23:  
Left aft intertank bay access door closed  
APU drip pan installed.

15-1.5 APU OPERATIONAL CHECK

15-1.5

INITIAL SETUP

Applicable Configurations:

All

Tools:

Stopwatch

Materials:

None **General Safety Instructions:**

Personnel Required:

Medium Helicopter Repairer (2)

Aircraft Electrician

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

Battery Connected

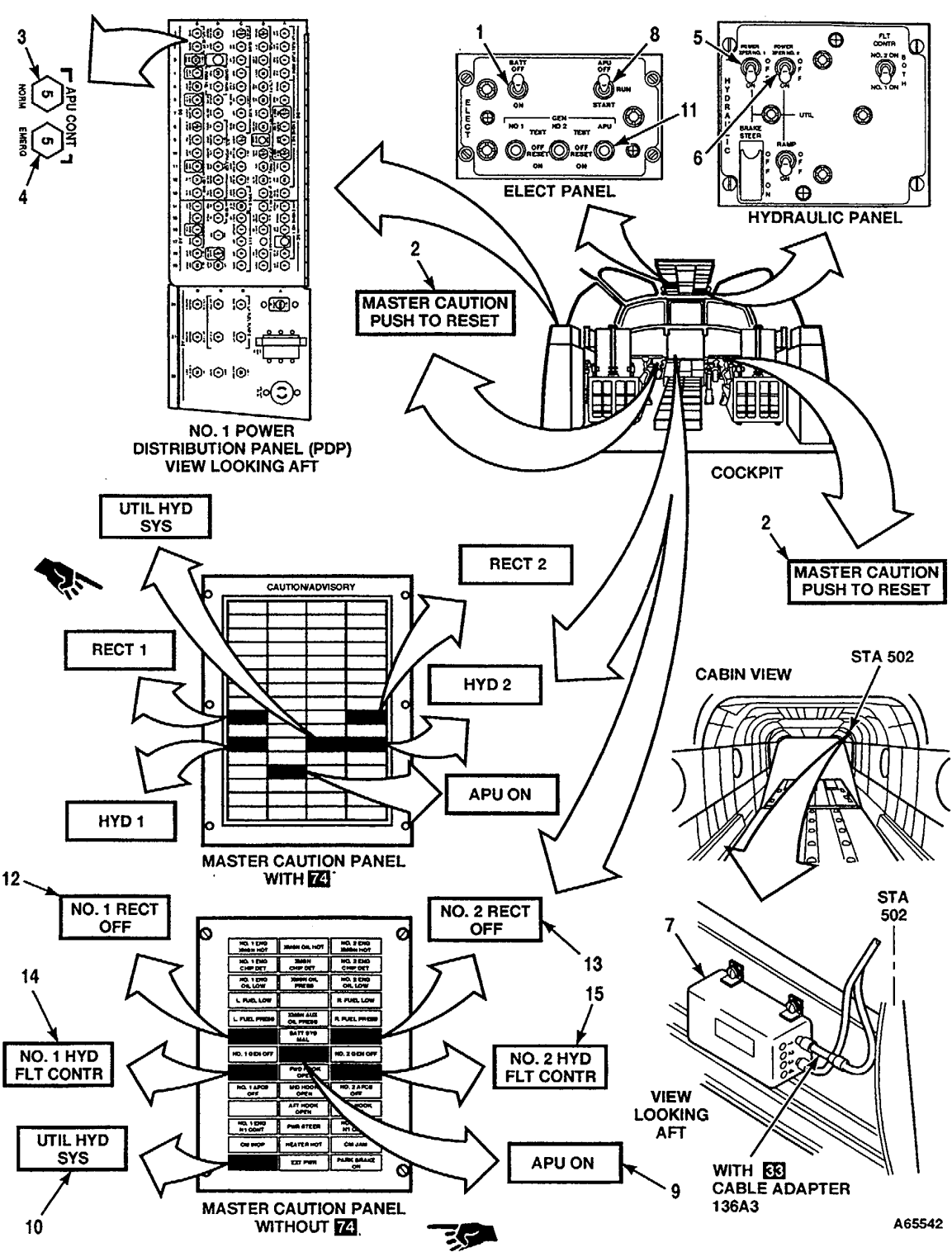
Ext Electrical Power Off

Ext Hydraulic Power Off  
APU Start Accumulator Charged to 2850 Psi  
APU Visual Check Performed (Task 15-1.4)  
Helicopter Positioned Nose into Wind  
Rotor Blades Positioned So That One Aft Blade is Behind and 30 Degrees Off Centerline

WARNING

Keep hands away from flight controls. Application of hydraulic power will cause flight controls to move and rotor blades to flap. Injury to personnel can occur.

TASK	RESULT
1. Set BATT switch (1) to ON.	MASTER CAUTION lights (2) shall come on. If not, go to task 9-1.4.
2. Press pilot's MASTER CAUTION light (2).	MASTER CAUTION lights (2) shall go out. If not, go to task 9-18.3.
3. Check that APU CONT NORM and EMERG circuit breakers (3 and 4) are closed.	If circuit breaker (3 or 4) is open, close it. If either circuit breaker opens again, go to task 15-2.7.
<p>NOTE</p> <p>Post fireguard at APU.</p>	
4. Check that POWER XFR NO. 1 and POWER XFR NO. 2 switches (5 and 6) are at OFF.	If switches (5 or 6) are ON, set them to OFF.
5. Position helper to observe bite indicators on ESU (7).	
6. Set APU switch (8) to RUN. Hold at RUN for a minimum of 3 seconds.	BITE indicator #1 on ESU (7) changes from black to white and then is reset to black. All other indicators remain black or are reset to black.
<p>NOTE</p> <p>If Bite #1 is already white, this task resets it to black, along with the other BITE indicators.</p>	





15-1.5 APU OPERATIONAL CHECK (Continued)

15-1.5

TASK	RESULT
<p>If BITE indicators do not remain black, go to task 15-2.8. If fuel boost pump cannot be heard operating, go to task 15-2.9.</p> <p><b>CAUTION</b></p> <p>If a roar is heard and a flame is seen at APU exhaust during APU start, shut down APU to prevent APU damage.</p> <p><b>CAUTION</b></p> <p>If there is no hydraulic pressure in <u>30 seconds</u> after APU switch is released to RUN, shut down APU.</p> <p><b>CAUTION</b></p> <p>If APU is to be restarted or another start attempt tried, wait at least 30 seconds after APU has stopped before setting APU switch to START. This allows residual fuel to drain from APU, thereby preventing overspeed or overtemp condition.</p> <p>7. Set APU switch (8) to START for a minimum of <u>2 seconds</u> then release it to RUN.</p> <p><b>NOTE</b></p> <p>Observe ESU bite indicators sequencing during start. Note last two sequences when automatic shutdown occurs. Do not move APU switch until bite indications are recorded unless hot start occurs.</p>	<p>APU shall begin to motor and accelerate to running speed within 30 seconds. ESU (7) BITE indicators shall sequence from all black to all white, then all black. APU ON capsule (9) shall come on. UTIL HYD SYS capsule (10) shall go out. If roar is heard and flame is seen at APU exhaust (hot start), shut down APU to prevent damage and go to task 15-6.17.</p> <p>If APU does not motor, go to task 15-2.10.</p> <p>If APU motors but does not start or starts and automatically shuts down, check ESU bite indicators and refer to table 15-2.2 for maintenance action. If APU runs and ESU bite is black but APU ON capsule is not on, go to task 15-2.13. If APU runs and UTIL HYD SYS capsule (10) does not go out, shut down APU and go to task 7-2.4.</p>

TASK	RESULT
8. Set APU GEN switch (11) to ON.	NO. 1 RECT OFF and NO. 2 RECT OFF (Without <b>74</b> ) and RECT 2 (With <b>74</b> ) capsules (12 and 13) shall go out. APU ON capsule (9) shall stay on. If capsules do not go out, go to task 9-1.4. If APU capsule goes out, check ESU bite indicators and refer to table 15-2.2 and/or task 15-2.14.
9. Set POWER XFR NO. 1 and POWER XFR NO. 2 switches (5 and 6) to ON.	NO. 1 HYD FLT CONTR and NO. 2 HYD FLT CONTR (Without <b>74</b> ) or RECT 1 and RECT 2 (With <b>74</b> ) capsules (14 and 15) shall go out. If not, go to task 7-2.15. APU ON capsule (9) shall stay on. If it goes out, check ESU bite indicators and refer to table 15-2.2.
10. Open then close APU CONT NORM circuit breaker (3).	APU ON capsule (9) shall stay on. If it goes out, go to task 15-2.11.
11. Open then close APU CONT EMERG circuit breaker (4).	APU ON capsule (9) shall stay on. If it goes out, go to task 15-2.11.
12. Set POWER XFR NO. 1 and POWER XFR NO. 2 switches (5 and 6) to OFF.	NO. 1 HYD FLT CONTR and NO. 2 FLT CONTR (Without <b>74</b> ) or RECT 1 and RECT 2 (With <b>74</b> ) capsules (14 and 15) shall come on.
13. Set APU GEN switch (11) to OFF.	NO. 1 RECT OFF and NO. 2 RECT OFF (Without <b>74</b> ) or RECT 1 and RECT 2 (With <b>74</b> ) capsules (12 and 13) shall come on. APU shall remain running. If APU shuts down, go to task 15-2.15.
14. Set APU switch (8) to OFF.	APU shall shut down. APU ON capsule (9) shall go out. If APU does not shut down, go to task 15-2.12.
<p><b>CAUTION</b></p> <p>Cycling of the APU switch during APU coastdown may cause the APU to restart with a possible overtemperature.</p>	
FOLLOW-ON MAINTENANCE: TM 55-1520-240-23: Battery disconnected. Electrical power off.	

## 15-2 APU ELECTRICAL SYSTEM

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15-2.4	APU ELECTRICAL CONTROL SYSTEM BLOCK DIAGRAM	DRAWING	15-29
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APU ELECTRICAL SYSTEM TROUBLESHOOTING

TABLE NO.	DESCRIPTION	PAGE NO.
15-2.1	APU STARTING SEQUENCE FAILURES	15-25
15-2.2	BITE INDICATION TABLE FOR APU SYSTEMS FAILURES	15-26

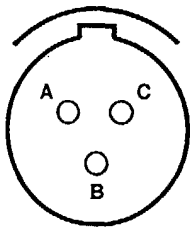
AUXILIARY POWER UNIT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST

REF							REF						
DESIG			PART				DESIG			PART			
			NUMBER	TYPE	MATE WITH/LOCATION	STATION LOCATION				NUMBER	TYPE	MATE WITH/LOCATION	STATION LOCATION
						FS WL BL							FS WL BL
GD128				151	LH AFT CABIN	360 32 50L	232P1			MS3476W22-55S	27	MASTER CAUTION PANEL-CENTER	
GD129				151	AFT AT APU AREA	594 60 20R						INST PNL (WITH 74)	
GD130				151	LH AFT TAIL	510 50 45L	232P3			MS3476W14-19S	21	MASTER CAUTION PANEL-CENTER	
GD153				151	LH AFT CABIN	380 -15 50L						INST PNL (WITH 74)	
P302	MS3456W10SL-4S		46		MAGNETIC PICKUP-APU	605 65 0L	300J1			M83723-74A2041N	40	NO. 1 PDP-COCKPIT	
P303	MS3456L10SL-3S		70		IGNITION EXCITER-APU	605 66 8R	300P1			M83723-75A2041N	40	NO. 1 PDP-COCKPIT	
TB3	MS27212-1-12		160		NO. 1 PDP-COCKPIT	90 -15 30L	300J19			M83723-73A2041N	40	OVERHEAD PANEL-COCKPIT	
TB301	MS27212-1-5		160		APU	605 65 6R	300P19			M83723-76A2041N	40	OVERHEAD PANEL-COCKPIT	
136K1	MS24149-D1		106		APU FAULT RELAY	360 40 50L	300J21			M83723-74A2461N	43	OVERHEAD PANEL-COCKPIT	
136P1	M83723-96A1624N		35		J1 OF ESU	520 40 50L	300P21			M83723-75A2461N	43	OVERHEAD PANEL-COCKPIT	
136P2	M83723-95A1415N		34		J2 OF ESU	520 40 50L	300J50			M83723-73A2461N	43	ELECTRONICS COMPARTMENT-OVHD	120 40 20L
136J3	MS3474W12-3S		16		AIRCRAFT SKIN-TANK SIDE-CABLE TO APU FUEL PUMP-LH POD	380 -5 50L	300P50			M83723-76A2461N	43	ELECTRONICS COMPARTMENT-OVHD	120 40 20L
							300J54			M83723-74A2461N	43	AFT CROWN	460 50 20L
136P4	MS3456W10SL-4S		46		APU FUEL VALVE-LH POD	375 -20 54L	300P54			M83723-75A2461N	43	AFT CROWN	460 50 20L
136P5	M83723-95A1005N		30		APU HYD START VALVE	575 50 30R	300J61			M83723-73A24619	43	CONSOLE-UNDERFLOOR (WITHOUT 74)	85 -20 10L
136P6	M83723-95A1624N		71		J301 OF APU	594 65 8L	300J61			M83723-73W24619	28	CONSOLE-UNDERFLOOR (WITH 74)	85 -20 10L
174J5	MS3474W14-19S		21		AIRCRAFT SKIN-INSIDE	385 -5 50L	300P61			M83723-76A24619	43	CONSOLE-UNDERFLOOR (WITHOUT 74)	85 -20 10L
174P5	MS3476W14-19P		21		AIRCRAFT SKIN-TANK SIDE	385 -5 50L	300P61			M83723-76W24619	28	CONSOLE-UNDERFLOOR (WITH 74)	85 -20 10L
232P1	MS3476W20-41S		24		MASTER CAUTION PANEL-CENTER INST PNL (WITHOUT 74)								

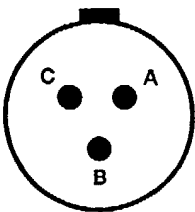
AUXILIARY POWER UNIT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

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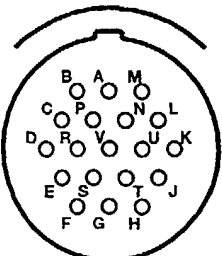
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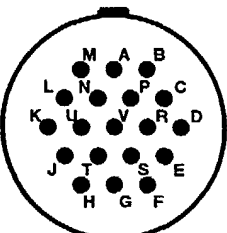
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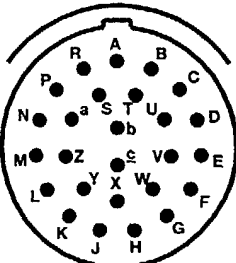
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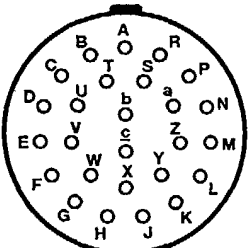
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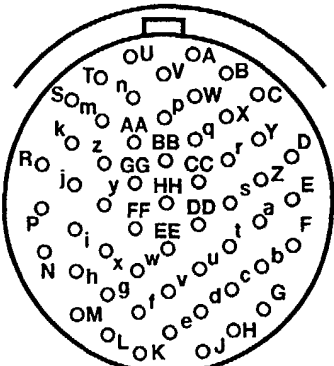
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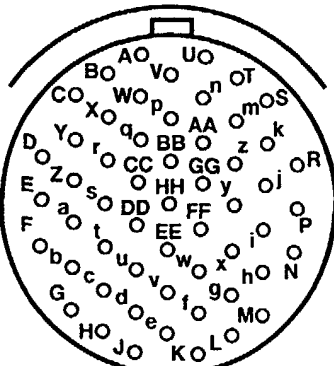
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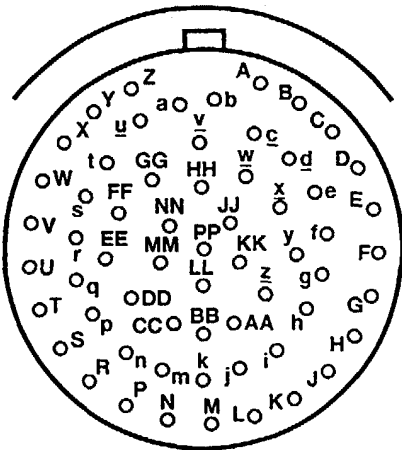
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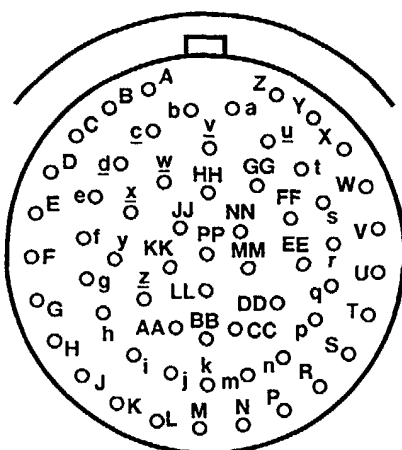
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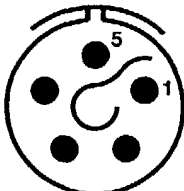
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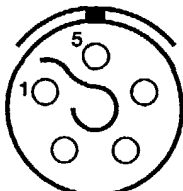
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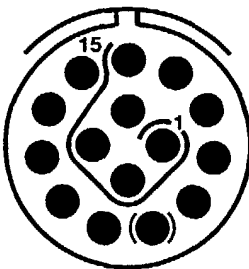
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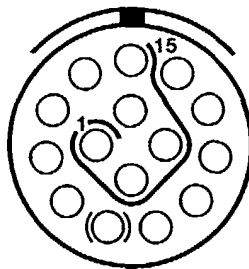
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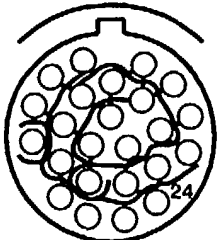
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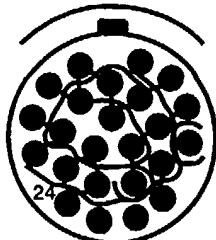
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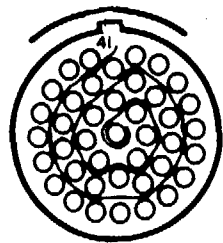


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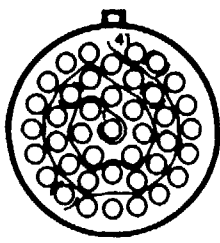
AUXILIARY POWER UNIT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

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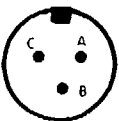
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PLUG



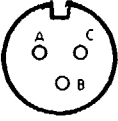
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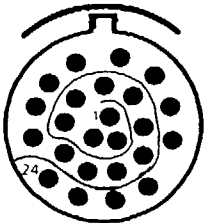


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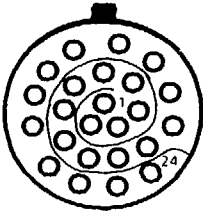
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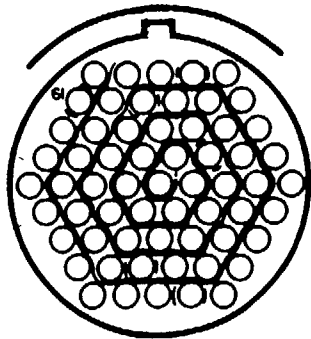
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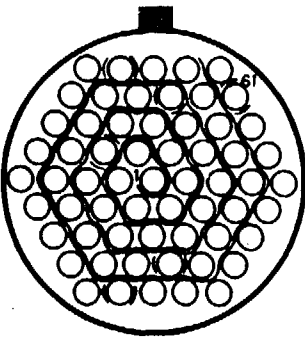
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71

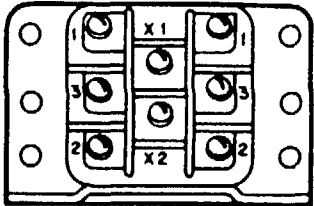


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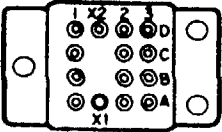
43

RELAY



106

RELAY



103

GND STUD



151

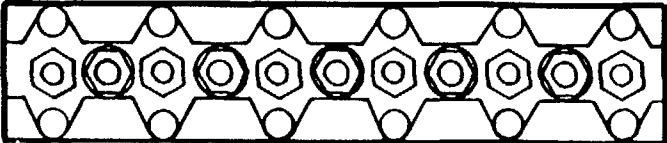


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46

TERMINAL BOARD



160

15-2 APU ELECTRICAL SYSTEM

15-2.1

15-2.1 APU STARTING SEQUENCE FAILURES

TABLE NO. 15-2.1 APU STARTING SEQUENCE FAILURES					
APU STARTING SEQUENCE	No.	SYMPTOM	BITE INDICATION	DECODED BITE INFORMATION	TASK
PRE START					
	1	APU DOES NOT MOTOR ESU Bite indicates	○○○○	NO TEMP DATA	15-2.10
MOTORING					
	2	APU MOTORS BUT DOES NOT START ESU Bite indicates	○●○○	NO SPEED DATA	15-6.11
	3	APU MOTORS BUT DOES NOT START ESU Bite indicates	○●●● or ○○●● then ●○○●	FAILURE TO START	15-6.12
	4	APU MOTORS BUT DOES NOT START ESU Bite indicates	○○○● then ●○○●	FAILURE TO START	15-6.13
STARTING					
	5	APU STARTS BUT SHUTS DOWN ESU Bite indicates	●●○●	OVERSPEED	15-6.14
	6	APU STARTS BUT SHUTS DOWN ESU Bite indicates	○●○●	UNDERSPEED	15-6.15
	7	APU STARTS BUT SHUTS DOWN ESU Bite indicates	●●○○	OPEN THERMOCOUPLE	15-6.18
HOT START					
	8	APU STARTS BUT SHUTS DOWN ESU Bite indicates	○○●●	OVERTEMPERATURE	15-6.17
STARTS AND RUNS					
	9	APU STARTS AND RUNS but ESU Bite indicates	●○●○	SHORTED THERMO. PROBE (warning)	15-6.19

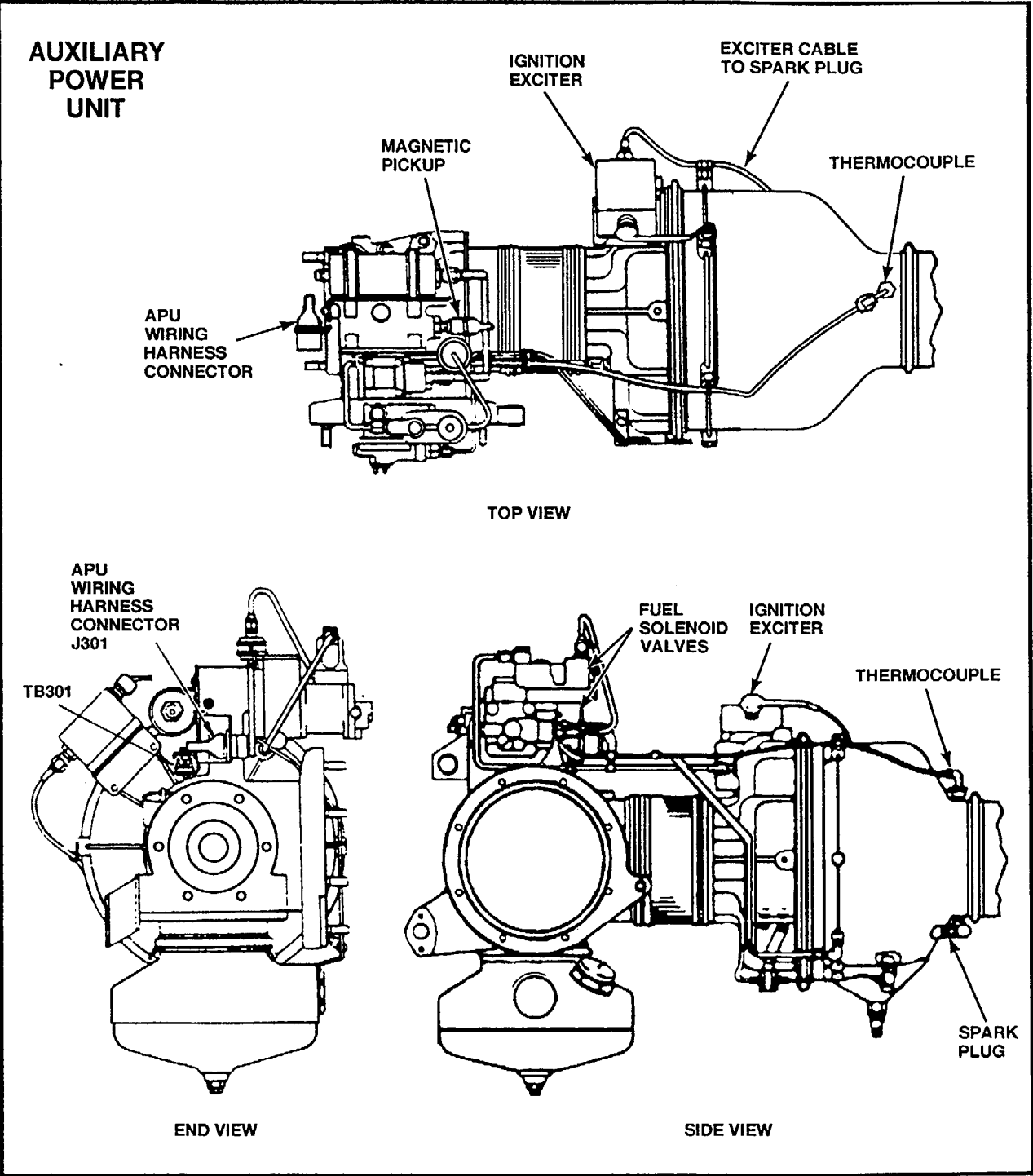
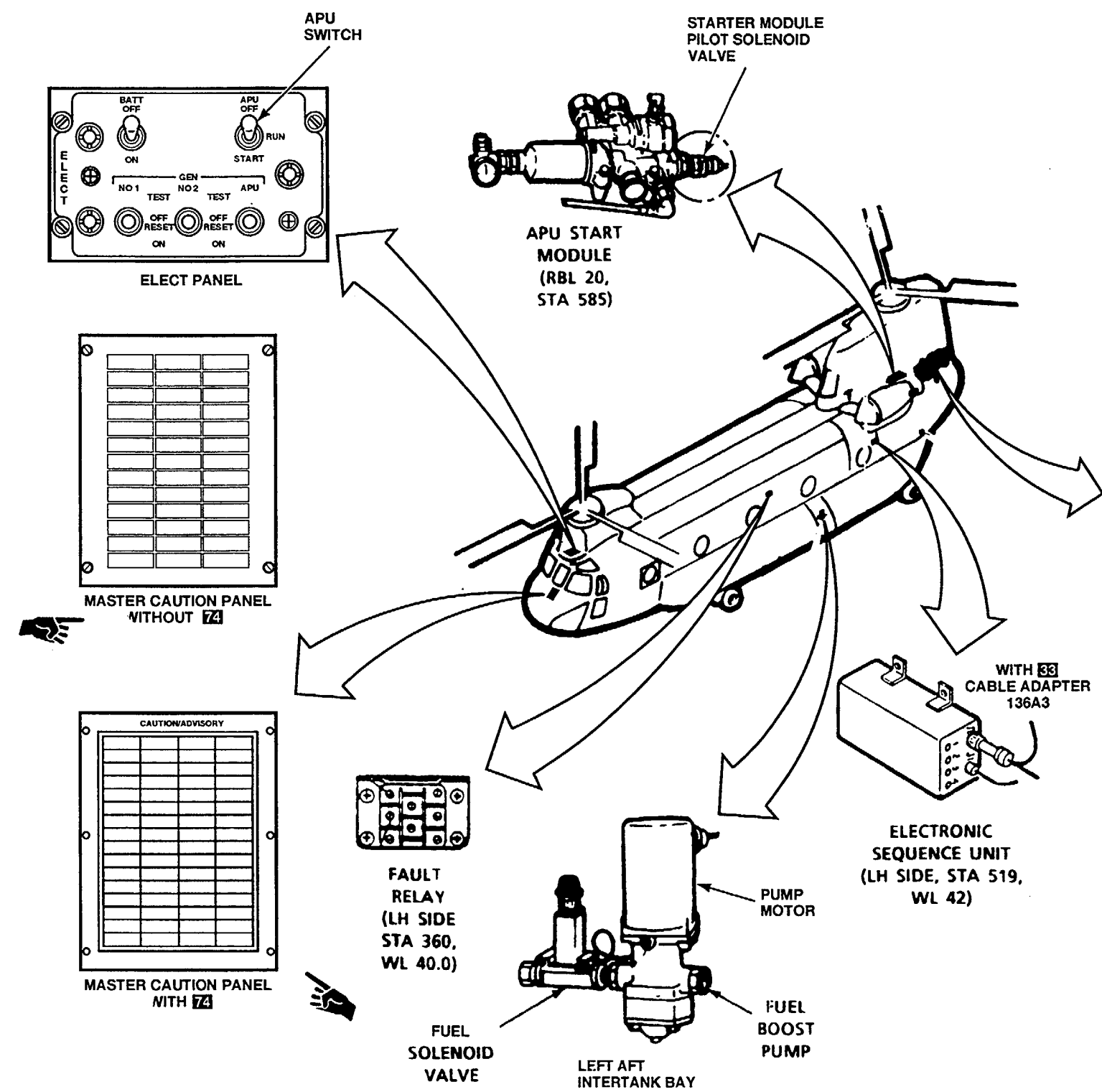
15-2.2 APU SYSTEMS BITE INDICATION FAILURE TABLE

TABLE NO. 15-2.2 BITE INDICATION TABLE FOR APU SYSTEMS FAILURES				
NO.	BITE INDICATION	SYMPTOM	DECODED BITE DESCRIPTION	Maintenance Action
				Task No.
	APU DOES NOT MOTOR:			
1	○●●●	ESU Bite indicates ○●●●	PROCESSOR BOARD FAILURE	15-2.10
2	●○●●	ESU Bite indicates ●○●●	SENSOR / DATA BOARD FAILURE	15-2.10
3	●○○○	ESU Bite indicates ●○○○	PROCESSOR SEQUENCE FAIL	15-2.10
4	○○○○	ESU Bite indicates ○○○○	NO TEMP DATA	15-2.10
	APU MOTORS BUT DOES NOT START:			
5	○○●● then ●○○●	ESU Bite indicates ●○○●	FAILURE TO START	15-3.6
6	○○○● then ●○○●	ESU Bite indicates ●○○●	FAILURE TO START	15-3.7
7	○●●● or ○○●● then ●○○●	ESU Bite indicates ●○○●	FAILURE TO START	15-4.11
8	○●○○	ESU Bite indicates ○●○○	NO SPEED DATA	15-6.11
9	○●●● or ○○●● then ●○○●	ESU Bite indicates ●○○●	FAILURE TO START	15-6.12
10	○○○● then ●○○●	ESU Bite indicates then ●○○●	FAILURE TO START	15-6.13

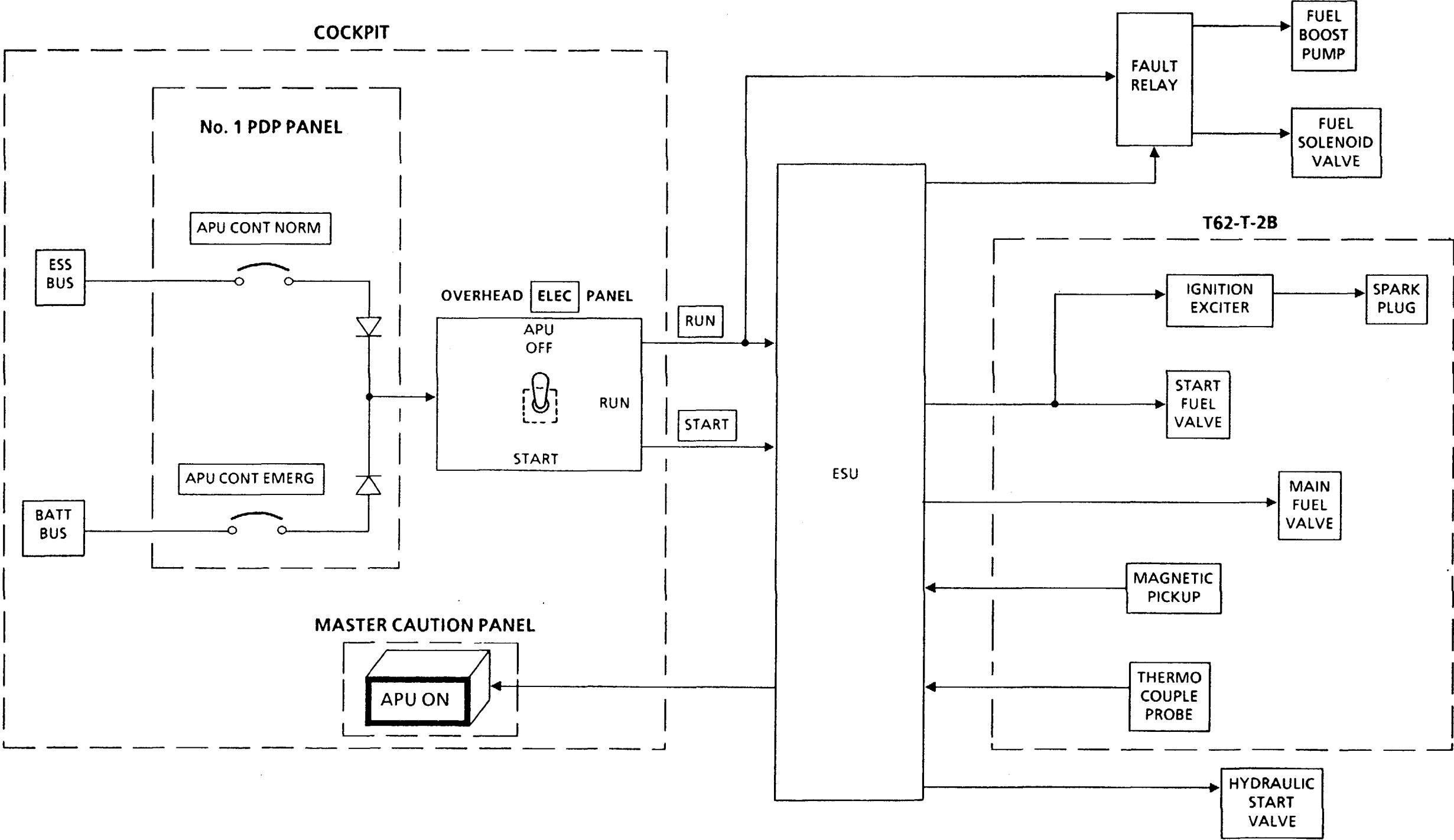


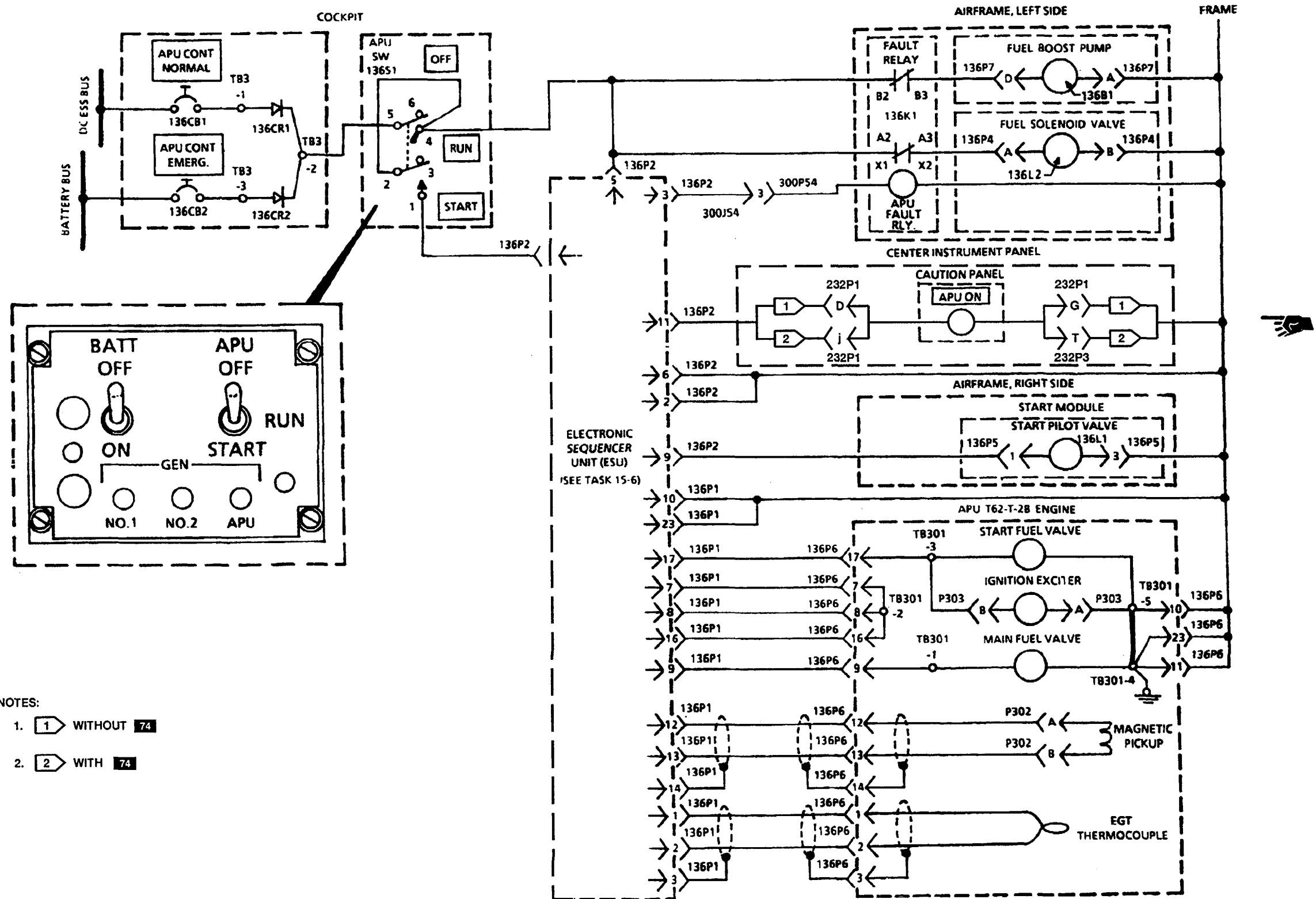
TABLE NO. 15-2.2 BITE INDICATION TABLE FOR APU SYSTEMS FAILURES (Continued)				
NO.	BITE INDICATION	SYMPTOM	DECODED BITE DESCRIPTION	Maintenance Action
				Task No.
	APU STARTS BUT SHUTS DOWN			
11	○○○○ then ●●○○	ESU Bite indicates ●●○○●	OVERSPEED	15-6.14
12	○○○● then ○●○○●	ESU Bite indicates ○●○○●	UNDERSPEED	15-6.15
13	○○○● then ○○●●	ESU Bite indicates ○○●●	OVERTEMPERATURE (HOT START)	15-6.16
14	○○●● then ●●○○	ESU Bite indicates ●●○○○	OPEN THERMOCOUPLE	15-6.18
	APU STARTS AND RUNS BUT SHUTS DOWN			
15	○○○○ then ○○●●	ESU Bite indicates ○○●●	OVERTEMPERATURE (HOT START)	15-6.17
	APU STARTS AND RUNS			
16	●○○○	ESU Bite indicates ●○○○	SHORTED THERMO. PROBE (WARNING)	15-6.19
	APU SHUTS DOWN WHEN GEN APU SWITCH PLACED TO ON			
17	●●●●	ESU Bite indicates ●●●●	READY FOR SERVICE	15-2.14
	APU SHUTS DOWN WHEN APU GEN SWITCH IS SET TO OFF			
18	●●●●	ESU Bite indicates ●●●●	READY FOR SERVICE	15-2.15
	APU DOES NOT STOP			
19	●●●●	ESU Bite indicates ●●●●	READY FOR SERVICE	15-2.12

END OF TASK

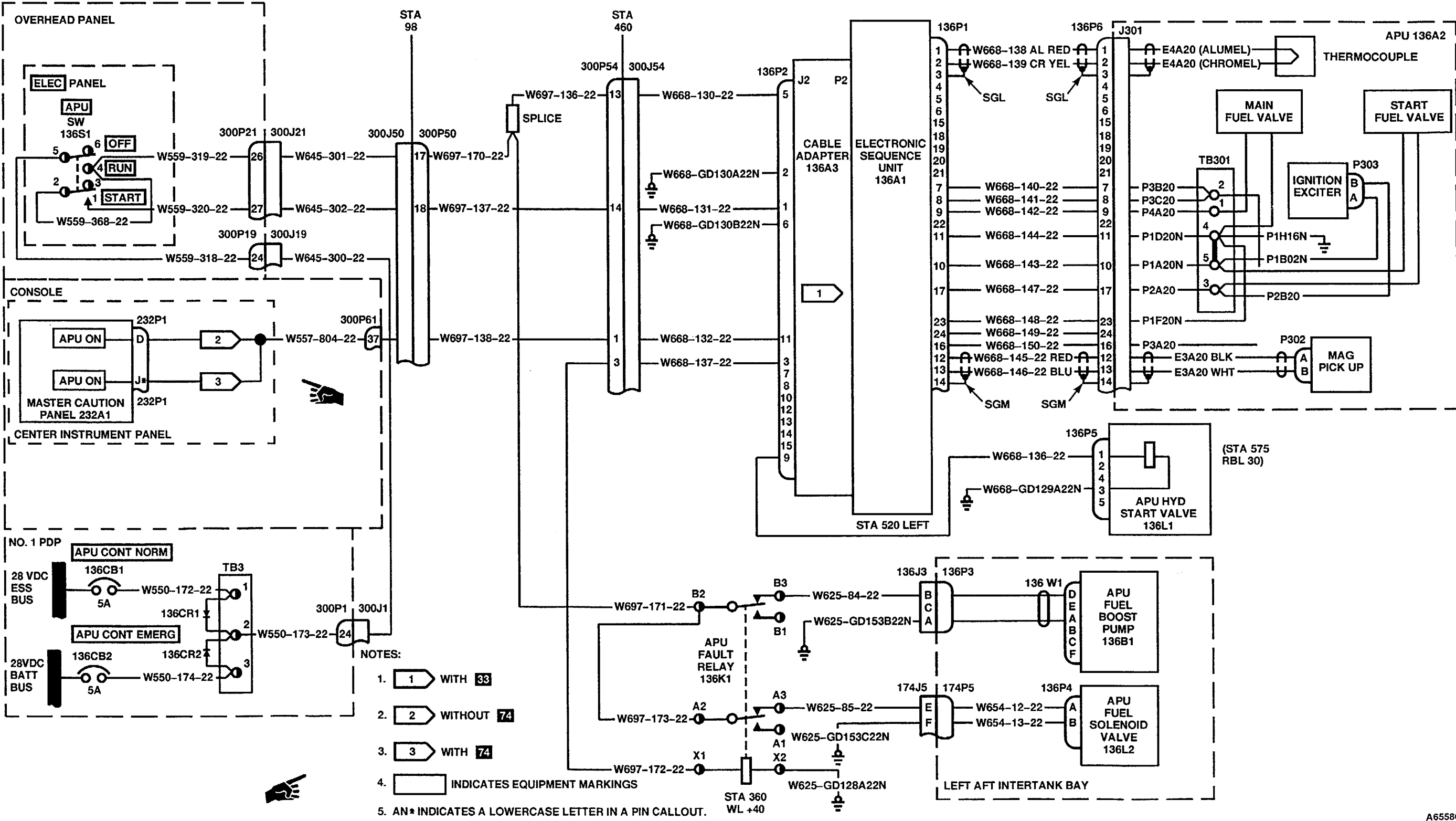


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END OF TASK  
Change 23 15-31

15-2.7 APU CONT NORM OR APU CONT EMERG CIRCUIT BREAKER DOES NOT STAY CLOSED

15-2.7

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit.  
NSN 5180-00-323-4915

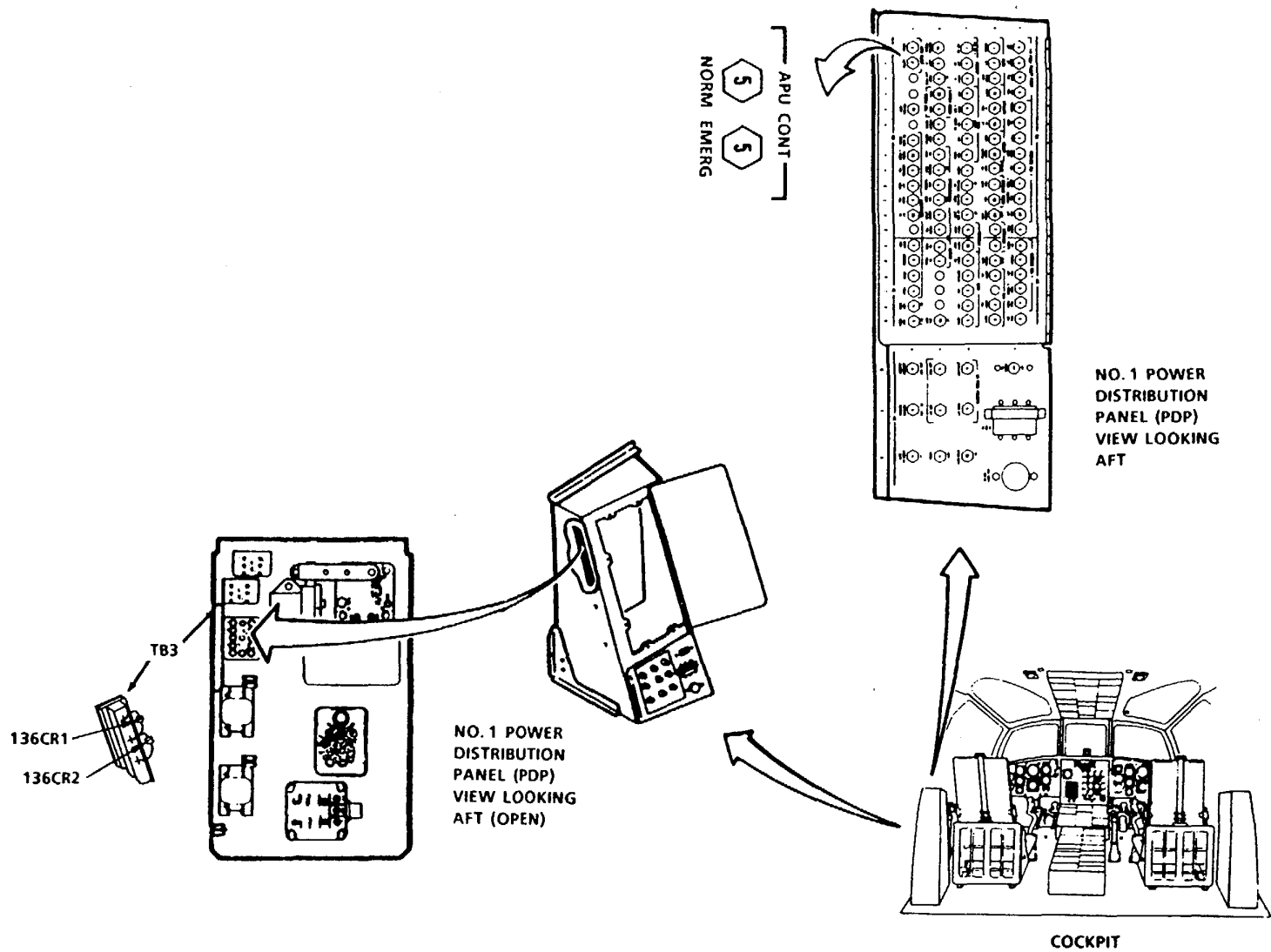
Materials:

None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

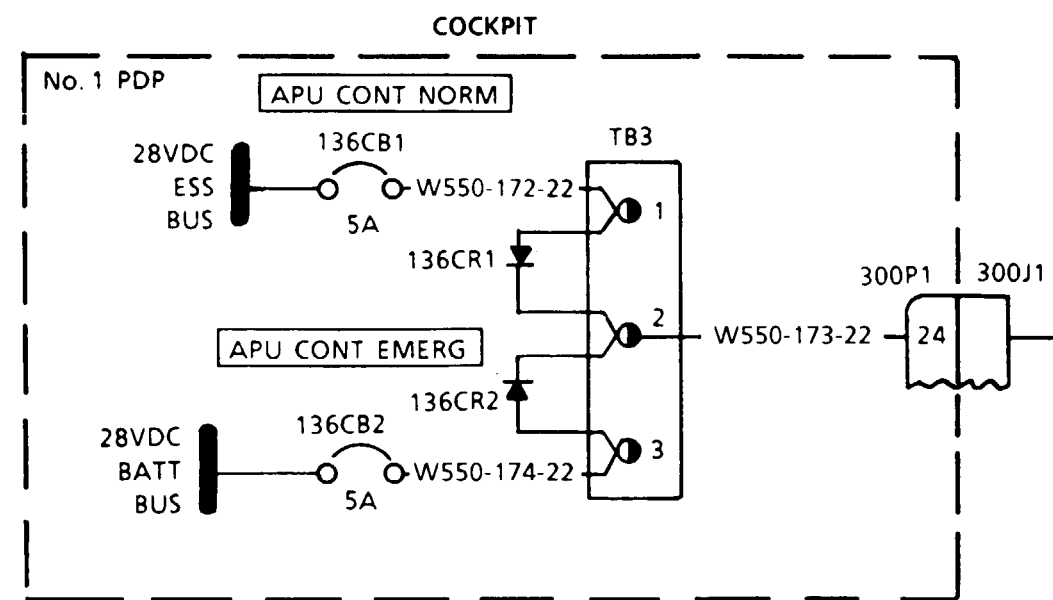
Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



GO TO NEXT PAGE

15-2.7 APU CONT NORM OR APU CONT EMERG CIRCUIT  
BREAKER DOES NOT STAY CLOSED (CONTINUED)

15-2.7



APU CONT "NORM" CIRCUIT BREAKER DOES NOT STAY CLOSED

REMOVE ELEC PWR. OPEN NO 1 PDP. LOCATE GROUND FAULT ON WIRE W550-172-22 BETWEEN **APU CONT NORM** CB 136CB1 AND TB3 TERM 1. REPAIR OR REPLACE WIRE AS REQUIRED.

APU CONT "EMERG" CIRCUIT BREAKER DOES NOT STAY CLOSED

REMOVE ELEC PWR. OPEN NO 1 PDP. LOCATE GROUND FAULT ON WIRE W550-174-22 BETWEEN **APU CONT EMERG** CB 136CB2 AND TB3 TERM 3. REPAIR OR REPLACE WIRE AS REQUIRED.

15-2.8 ESU BITE INDICATORS DO NOT CYCLE  
AFTER APU SWITCH SET TO RUN

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

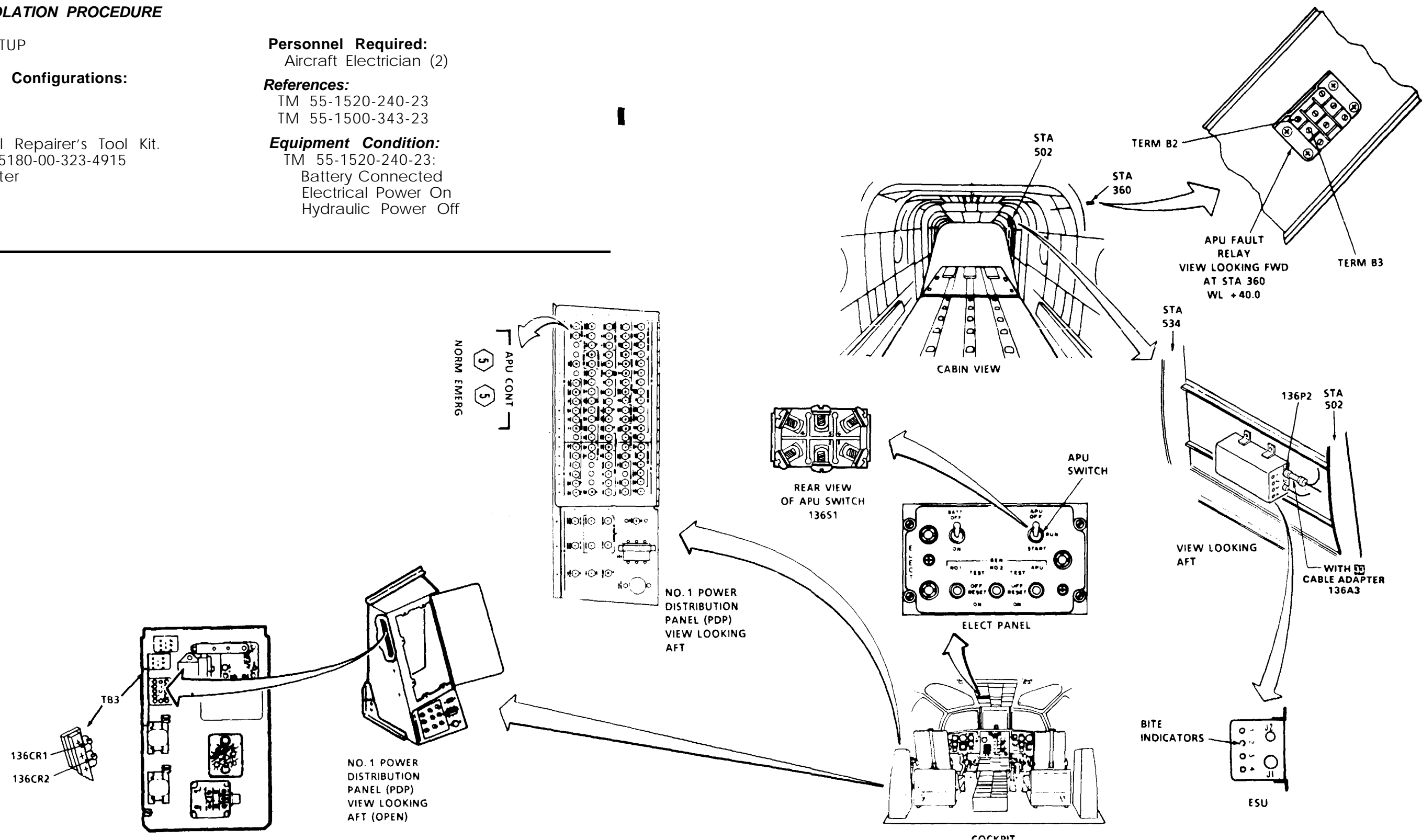
Tools:  
Electrical Repairer's Tool Kit.  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
Aircraft Electrician (2)

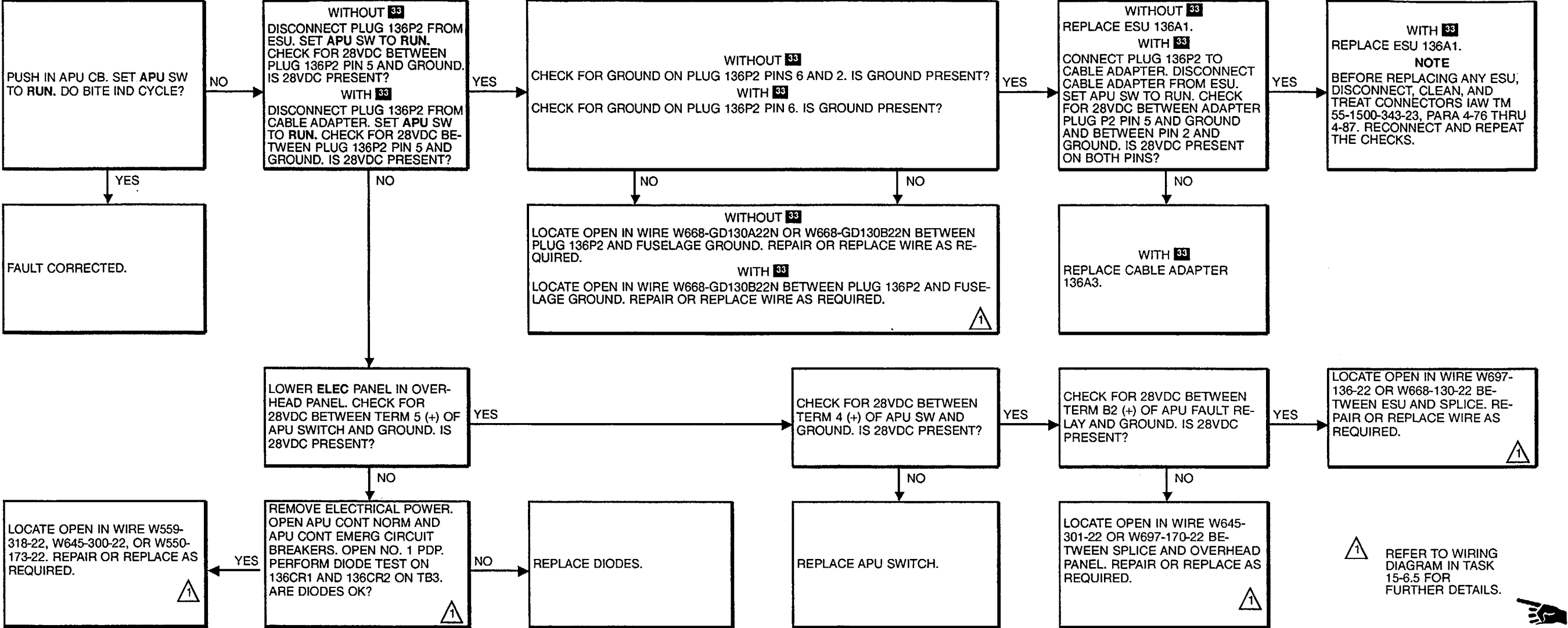
References:  
TM 55-1520-240-23  
TM 55-1500-343-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



GO TO NEXT PAGE

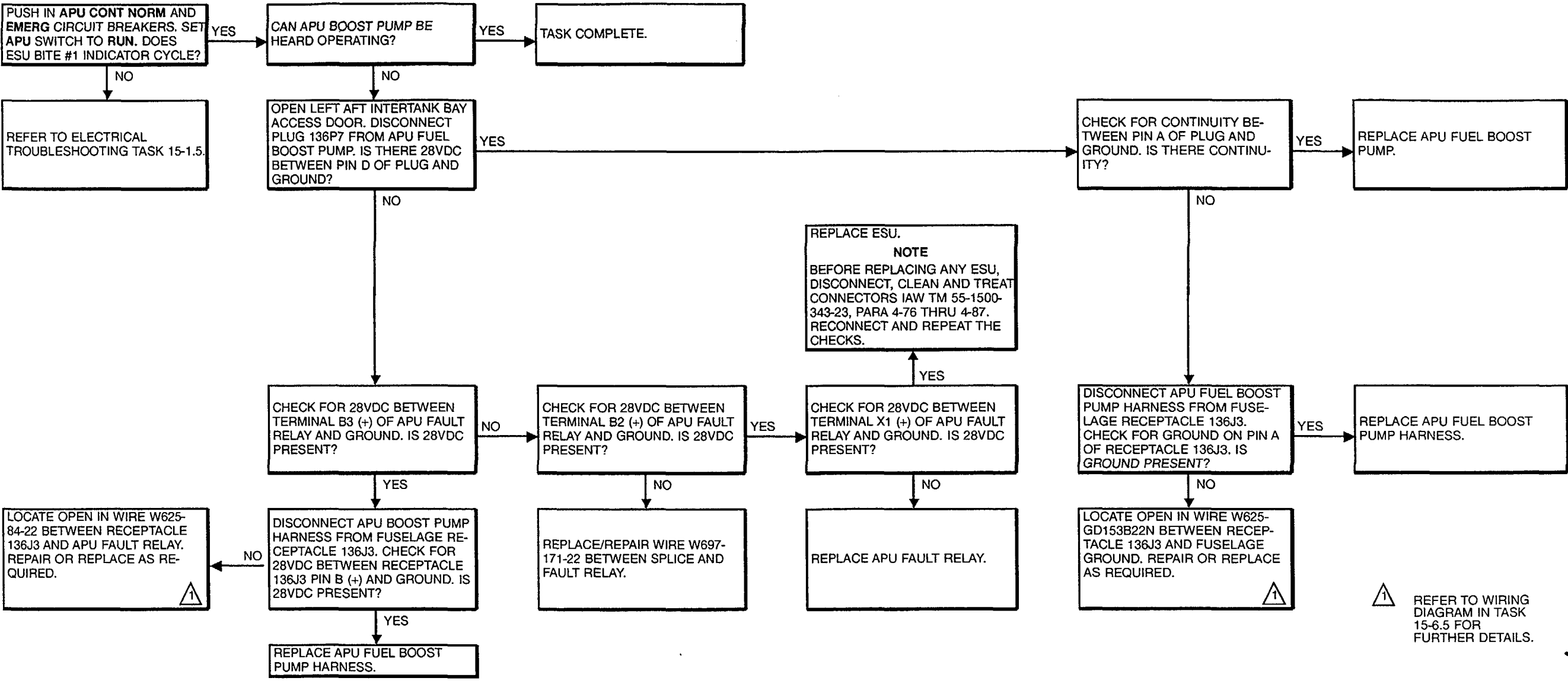






15-2.9 APU FUEL BOOST PUMP CANNOT BE HEARD OPERATING BEFORE APU SWITCH SET TO START (Continued)

15-2.9



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Personnel Required:**  
Aircraft Electrician (2)

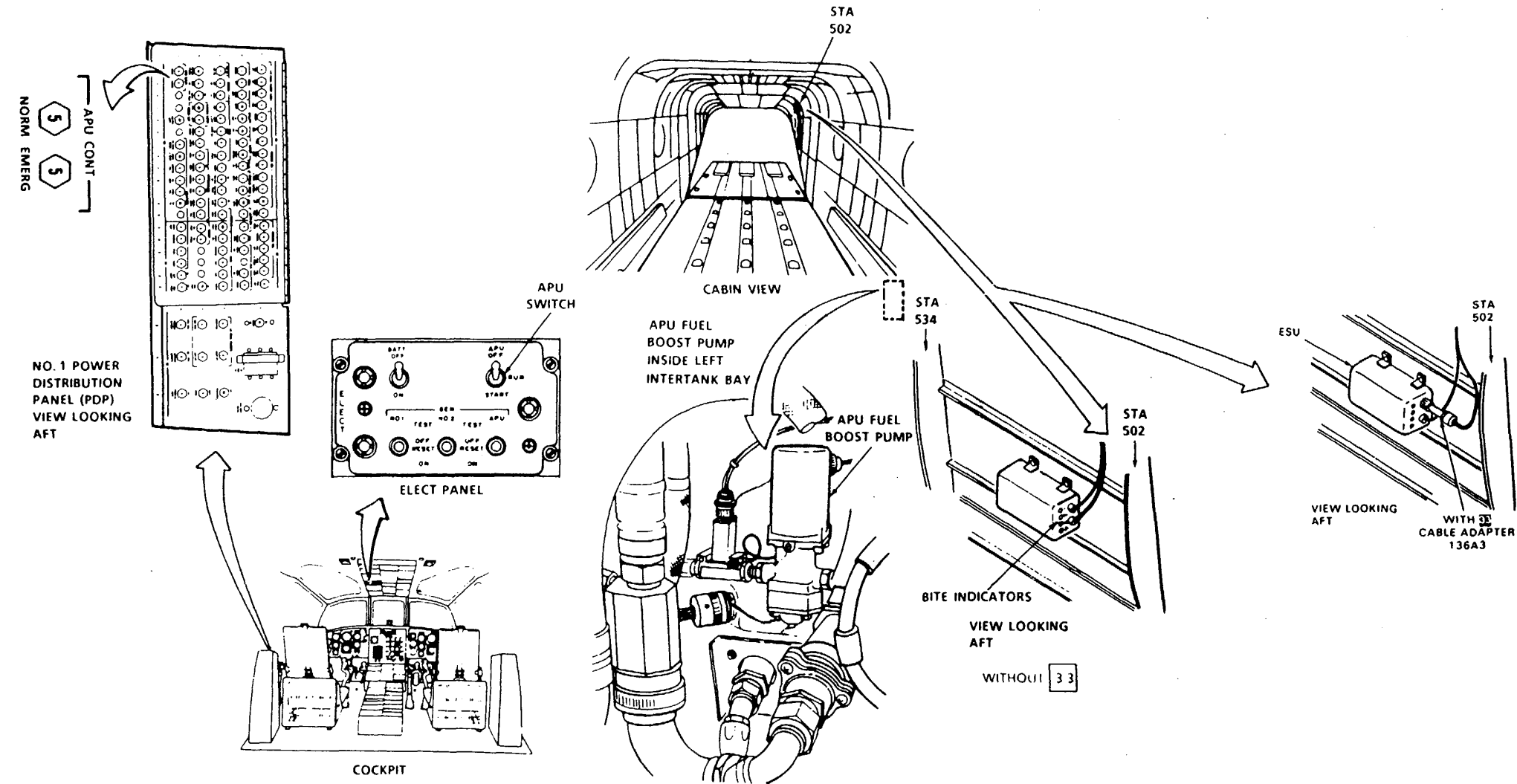
**Applicable Configurations:**  
All

**References:**  
TM 55-1520-240-23  
TM 55-1500-343-23

**Tools**  
Electrical Repairer's Tool Kit.  
NSN 5180-00-323-4915  
Multimeter

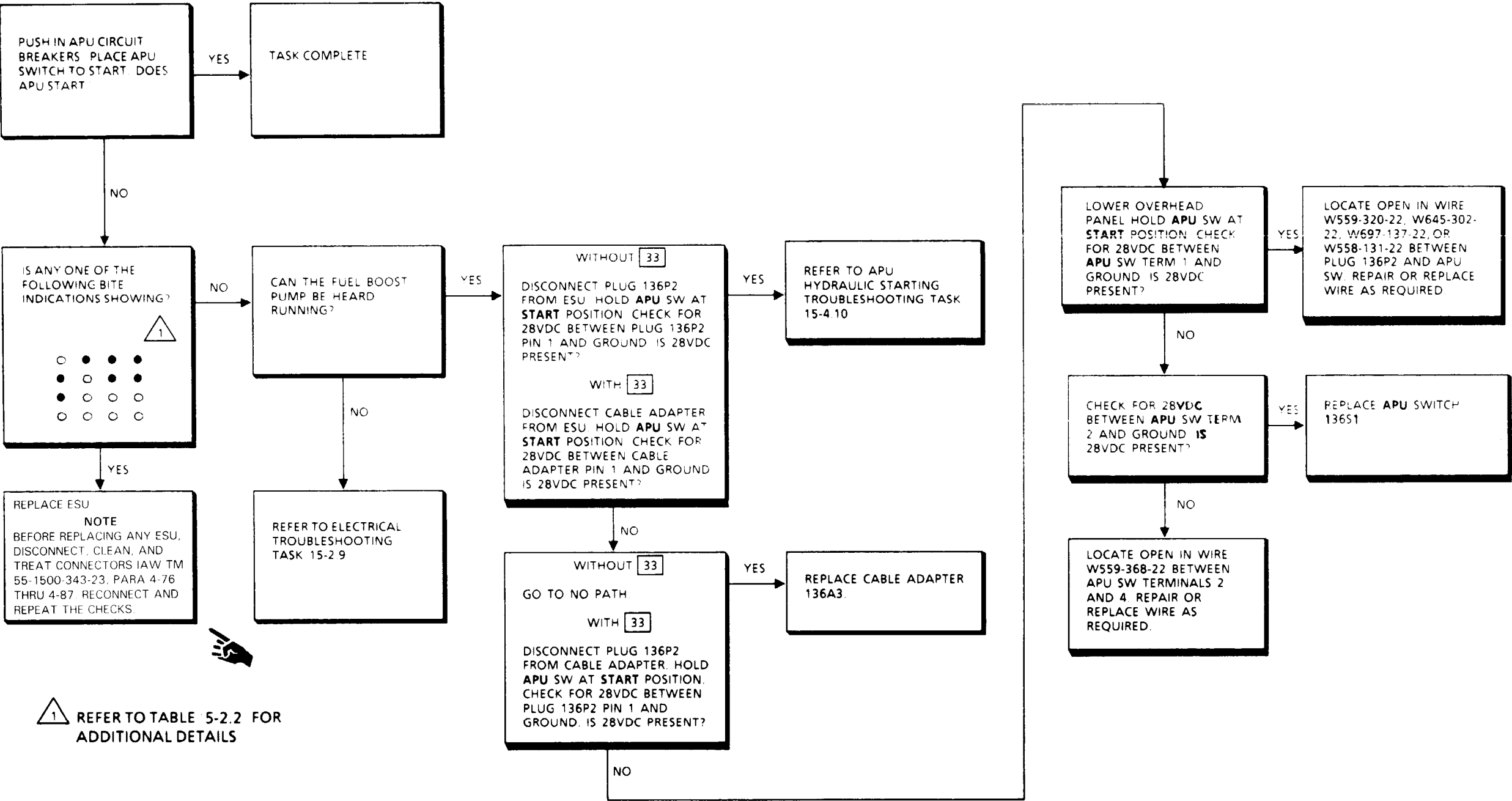
**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

**Materials:**  
None



15-2.10 APU DOES NOT MOTOR WHEN APU SWITCH IS SET TO START  
(CONTINUED)

15-2.10



END OF TASK

15-2.11 APU ON CAPSULE GOES OUT (APU SHUTS DOWN)  
WHEN APU CONT CIRCUIT BREAKER OPENED

15-2.11

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

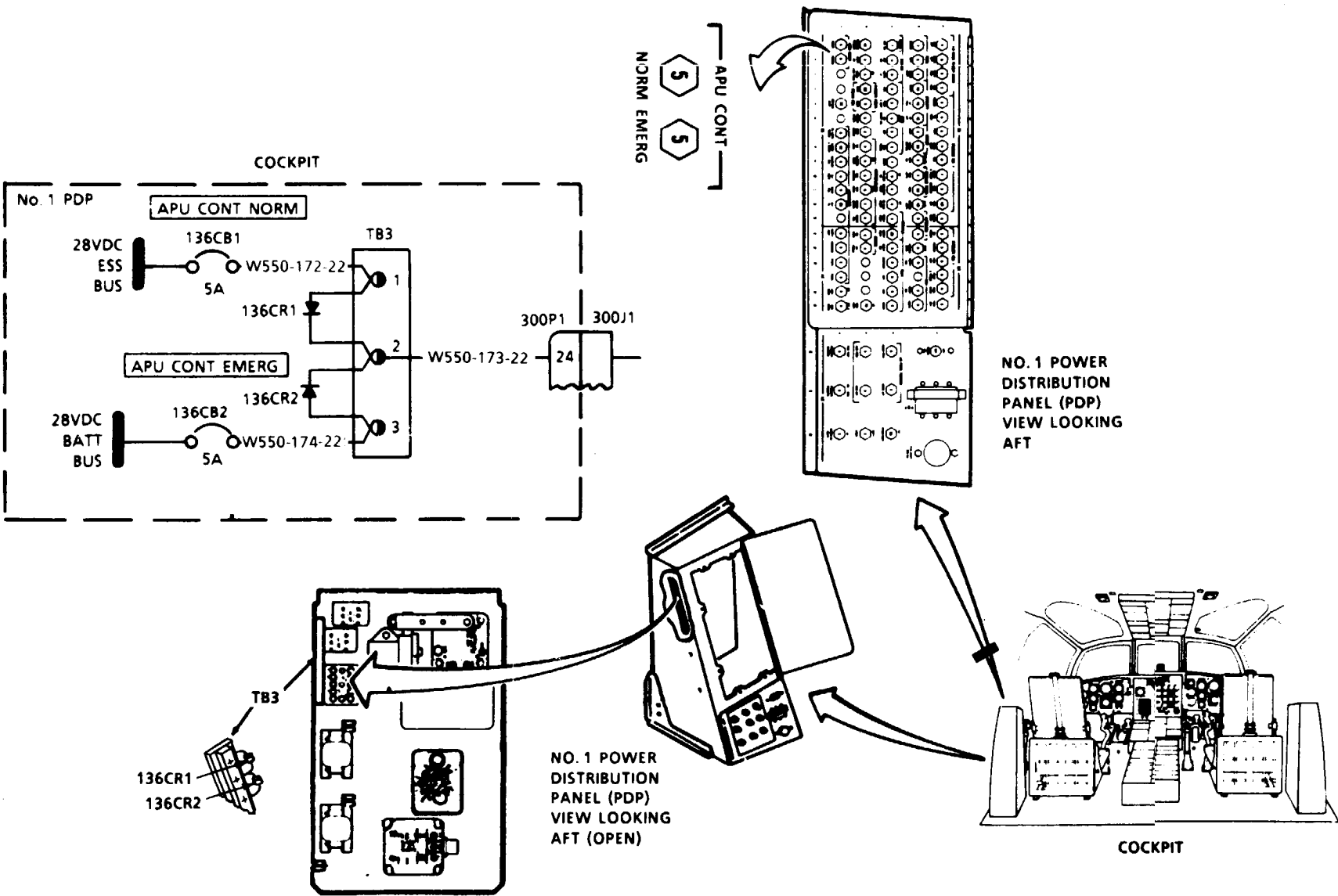
Tools:  
Electrical Repairer's Tool Kit.  
NSN 5180-00-323-4915  
Multi meter

Materials:  
None

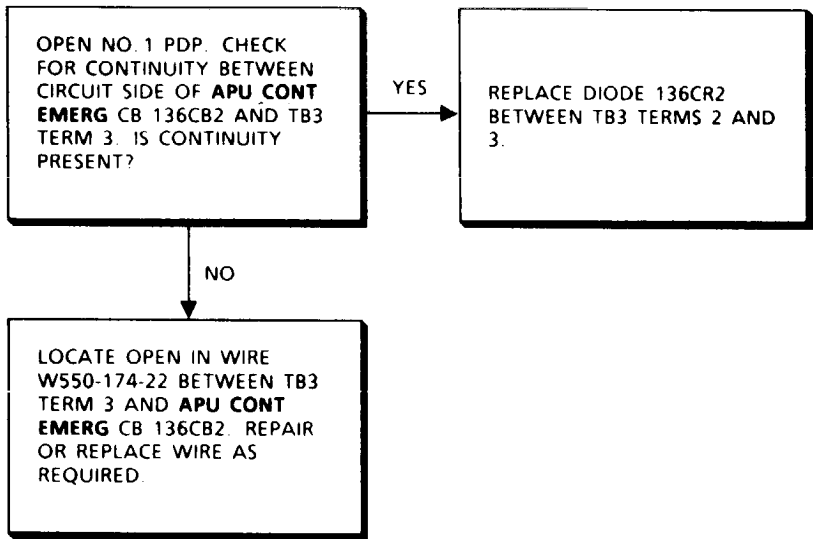
Personne/ Required:  
Aircraft Electrician

References:  
TM 55-1520-240-23

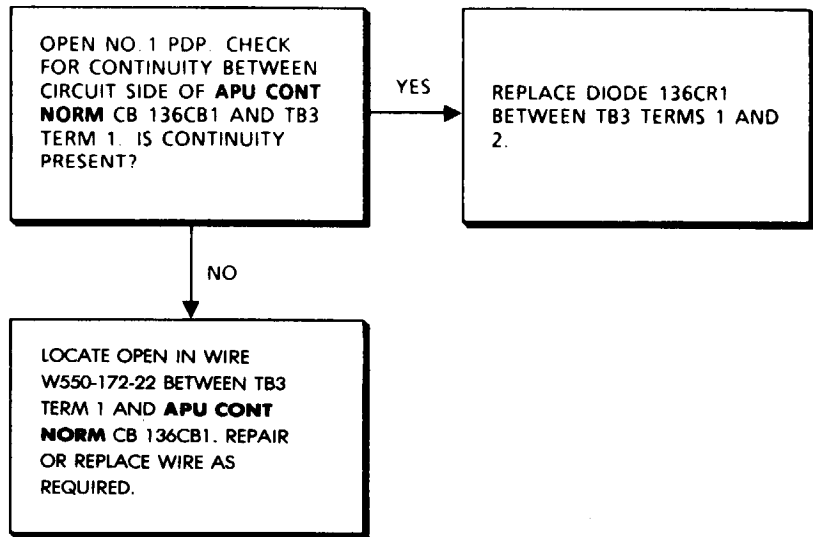
Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



APU ON CAPSULE GOES OUT (APU SHUTS DOWN)  
WHEN APU CONT "EMERG" CIRCUIT BREAKER OPENED



APU ON CAPSULE GOES OUT (APU SHUTS DOWN)  
WHEN APU CONT "NORM" CIRCUIT BREAKER OPENED



END OF TASK

15-2.12 APU DOES NOT STOP.  
ESU BITE INDICATES ● ● ● ●

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Aircraft Mechanic's Tool Kit.  
NSN 5180-00-323-4692  
Electrical Repairer's Tool Kit.  
NSN 5180-00-323-4915  
Multimeter

Materials:  
Cloth (E120)  
Tape (E385)

Personnel Required:  
Aircraft Electrician  
Medium Helicopter Repairer

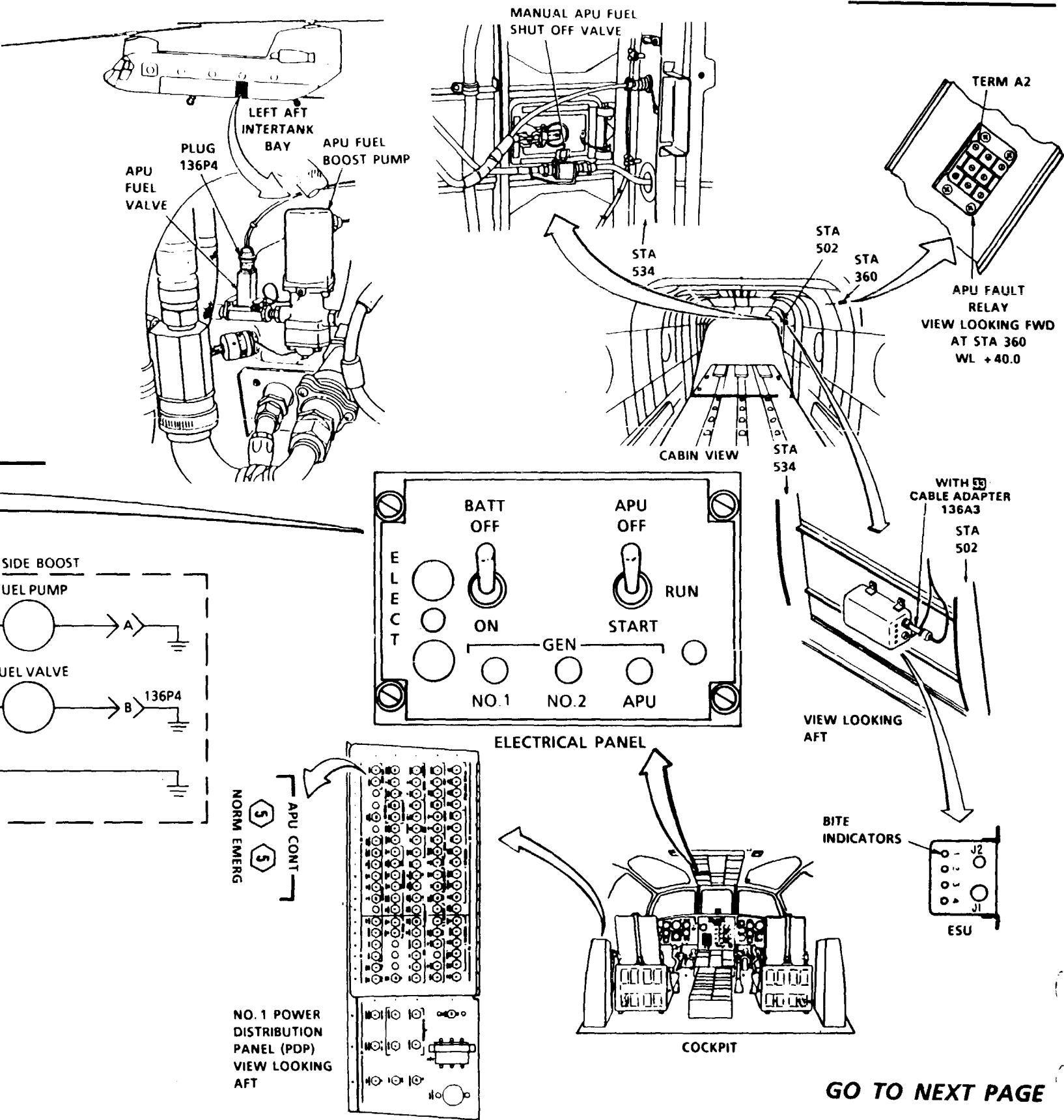
References:  
TM 55-1520-240-23  
TM 55-2835-205-23

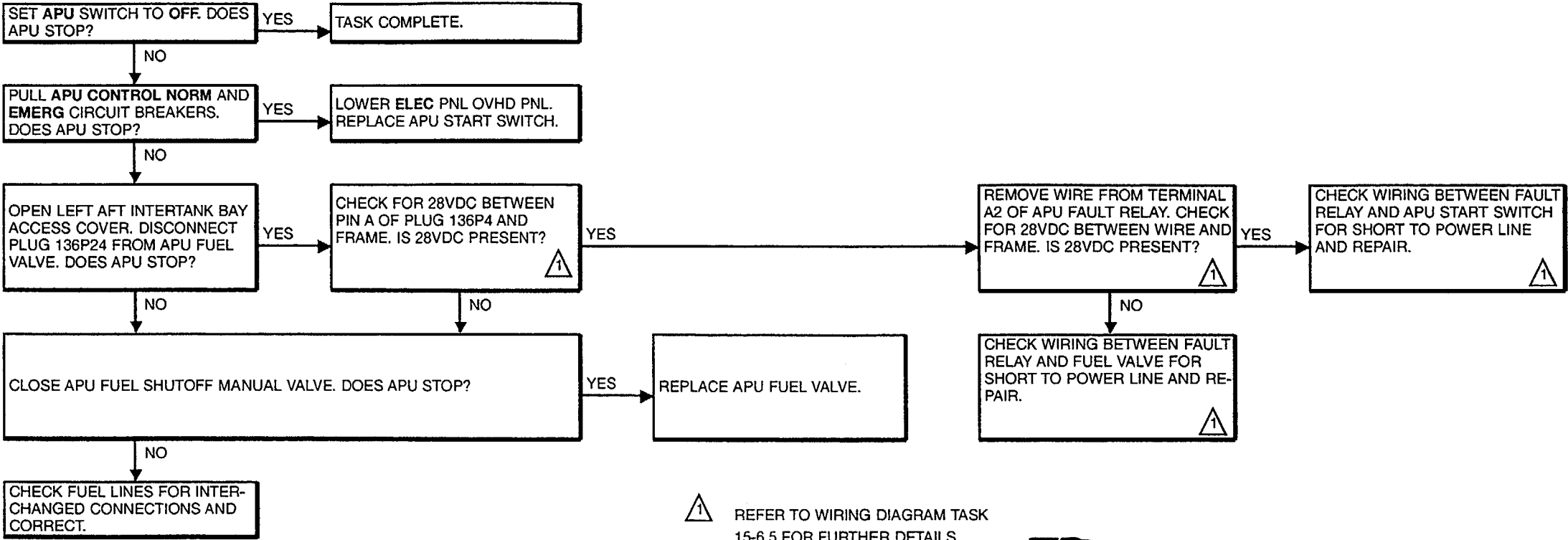
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

General Safety Instructions:

**WARNING**

All regulations and instructions for  
handling fuels shall be strictly  
observed.







15-2.13 APU ON CAPSULE OUT WHEN APU OPERATING NORMALLY

15-2.13

FAULT ISOLATION PROCEDURE

INITIAL SETUP  
Applicable Configurations:  
All

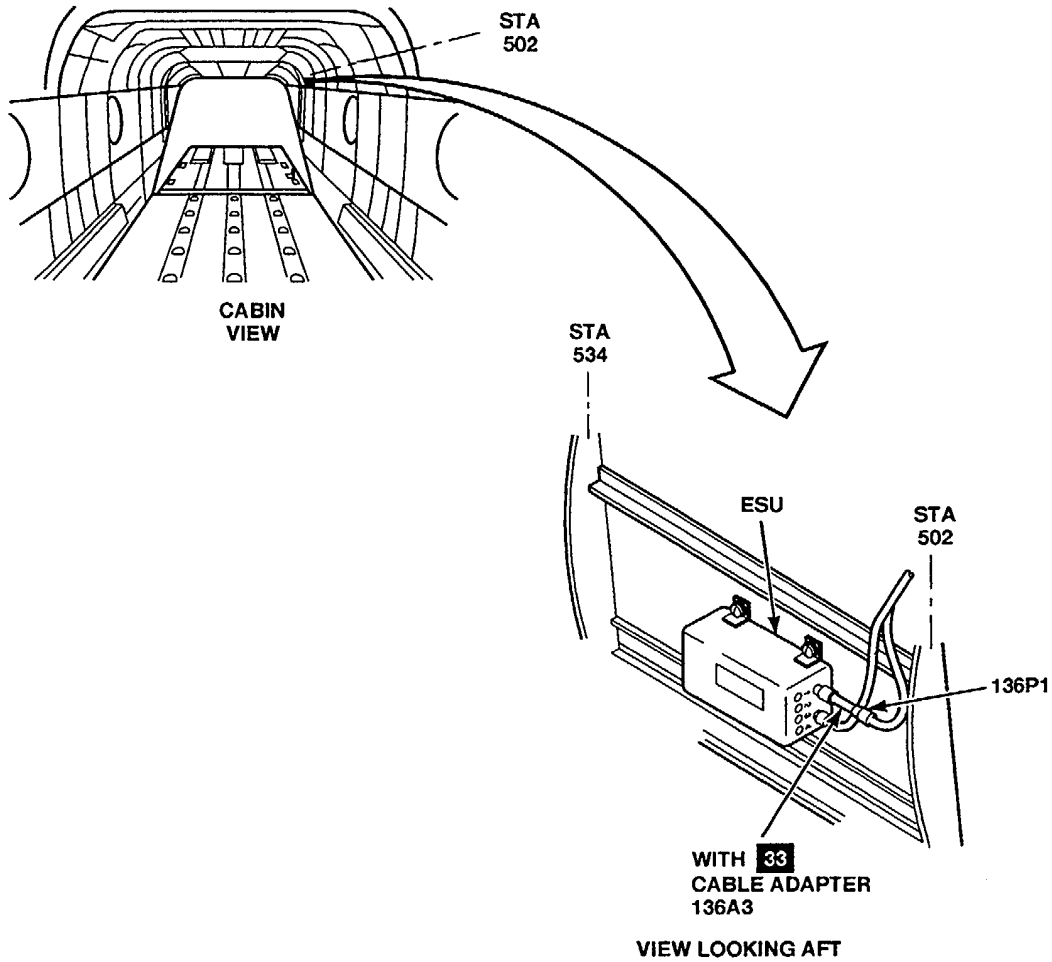
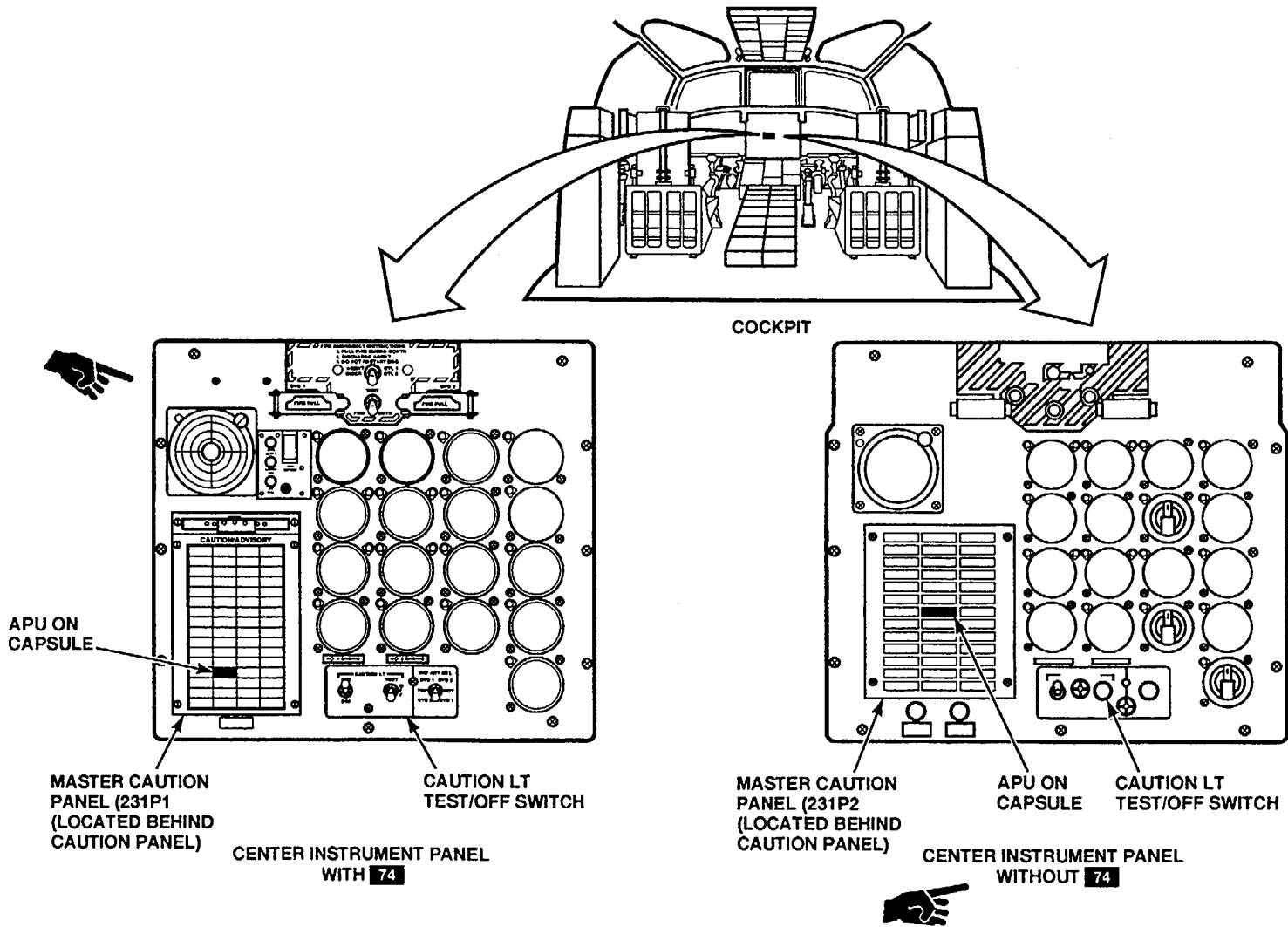
References:  
TM 55-1520-240-23  
TM 55-1500-343-23

Tools: Equipment Condition:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

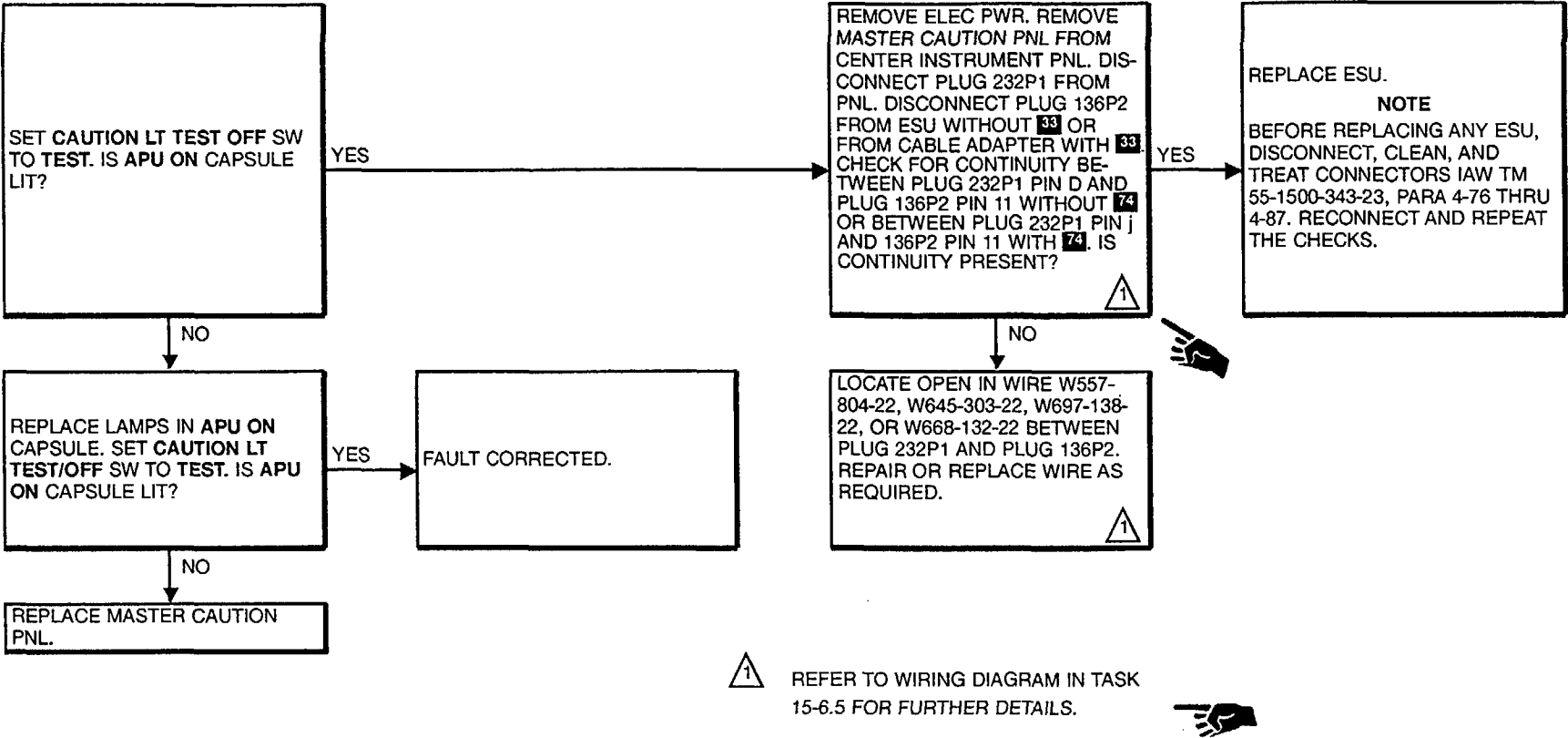
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

Materials  
None

Personnel Required:  
Aircraft Electrician (2)



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15-2.14 APU SHUTS DOWN WHEN GEN APU SWITCH PLACED TO ON.

15-2.14

ESU BITE INDICATES (READY FOR SERVICE)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

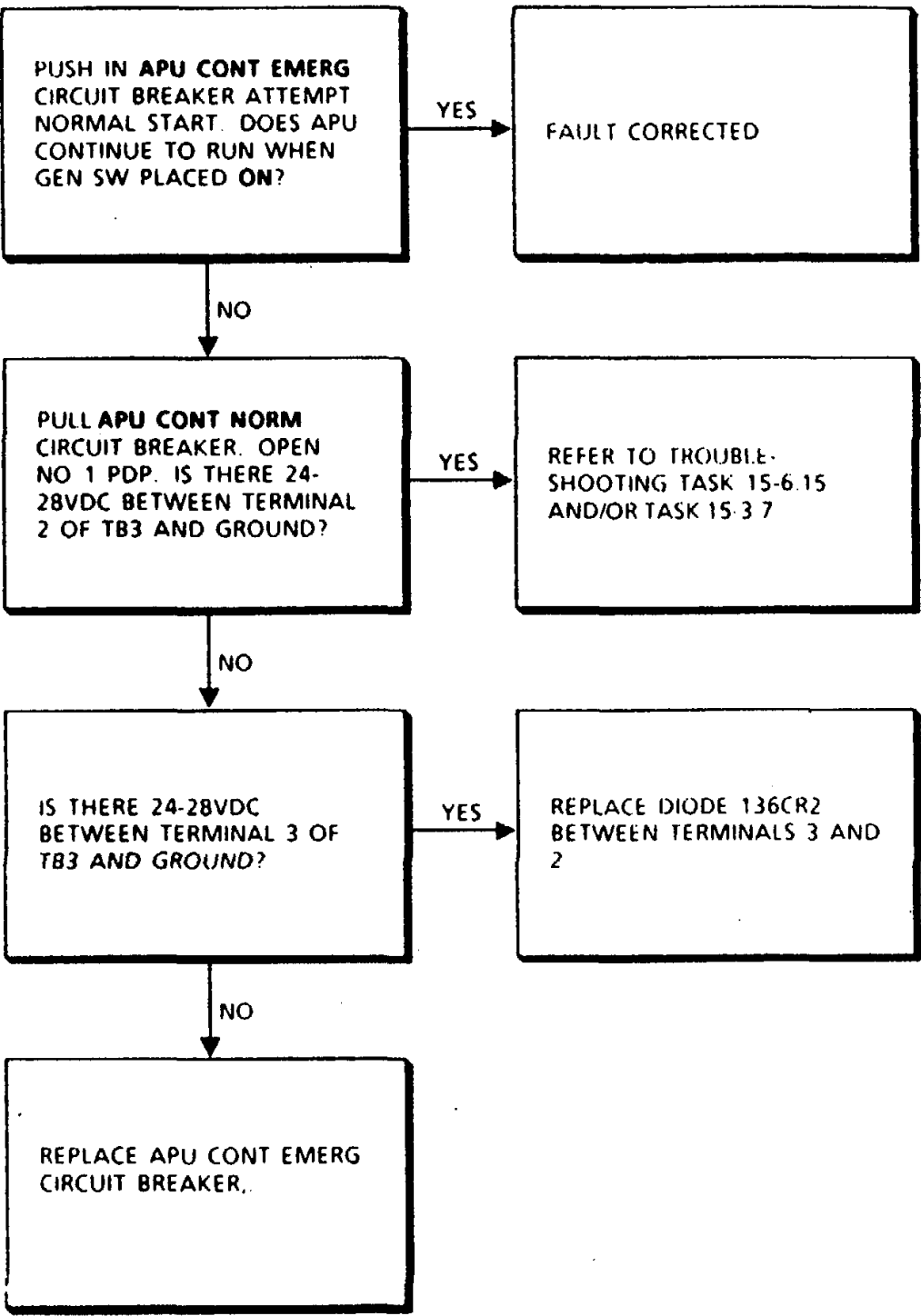
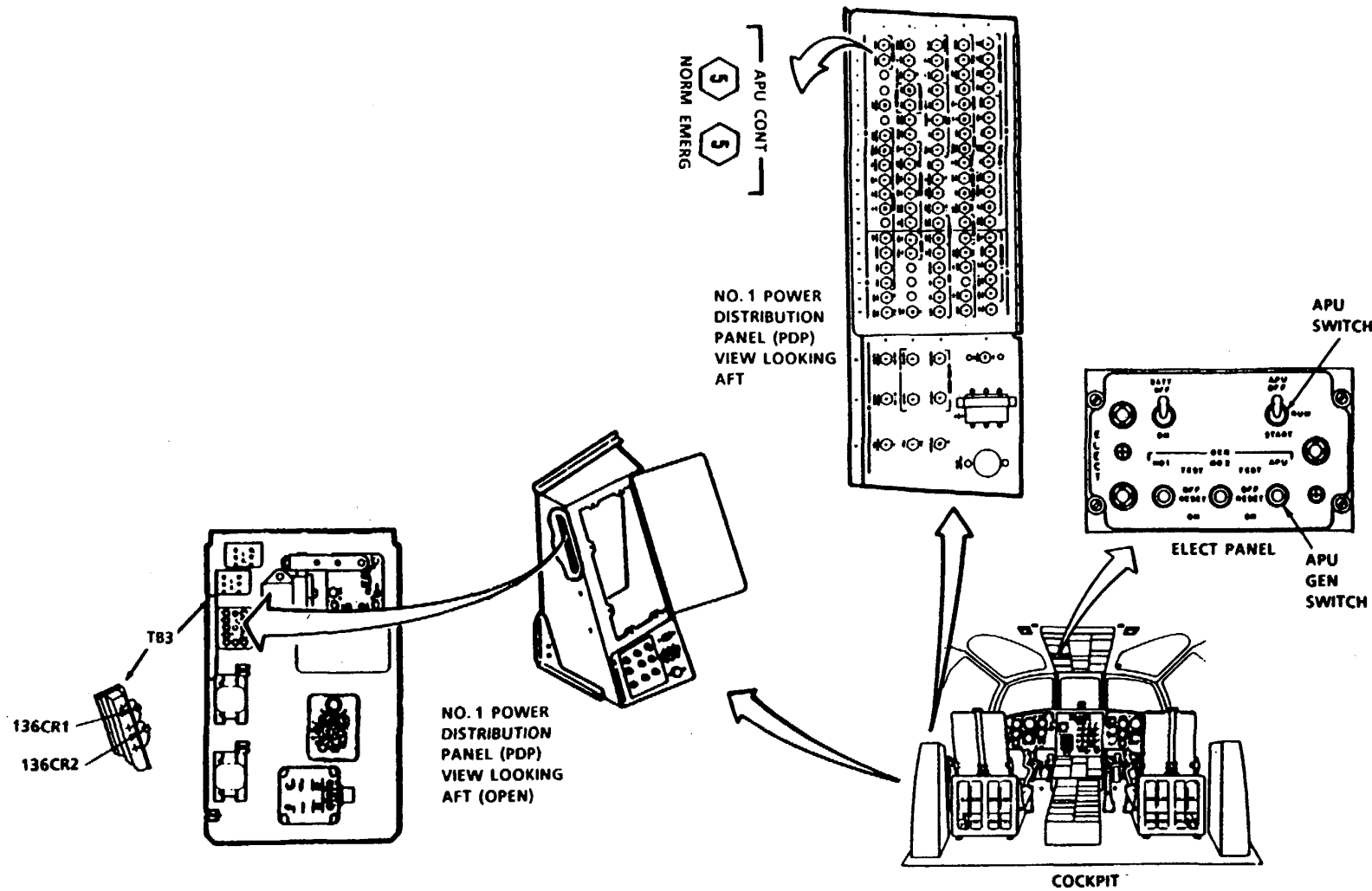
Tools:  
Electrical Repairer's Tool Kit.  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



END OF TASK

15-2.15 APU SHUTS DOWN WHEN APU GEN SWITCH IS SET TO OFF.  
ESU BITE INDICATES ● ● ● ●

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

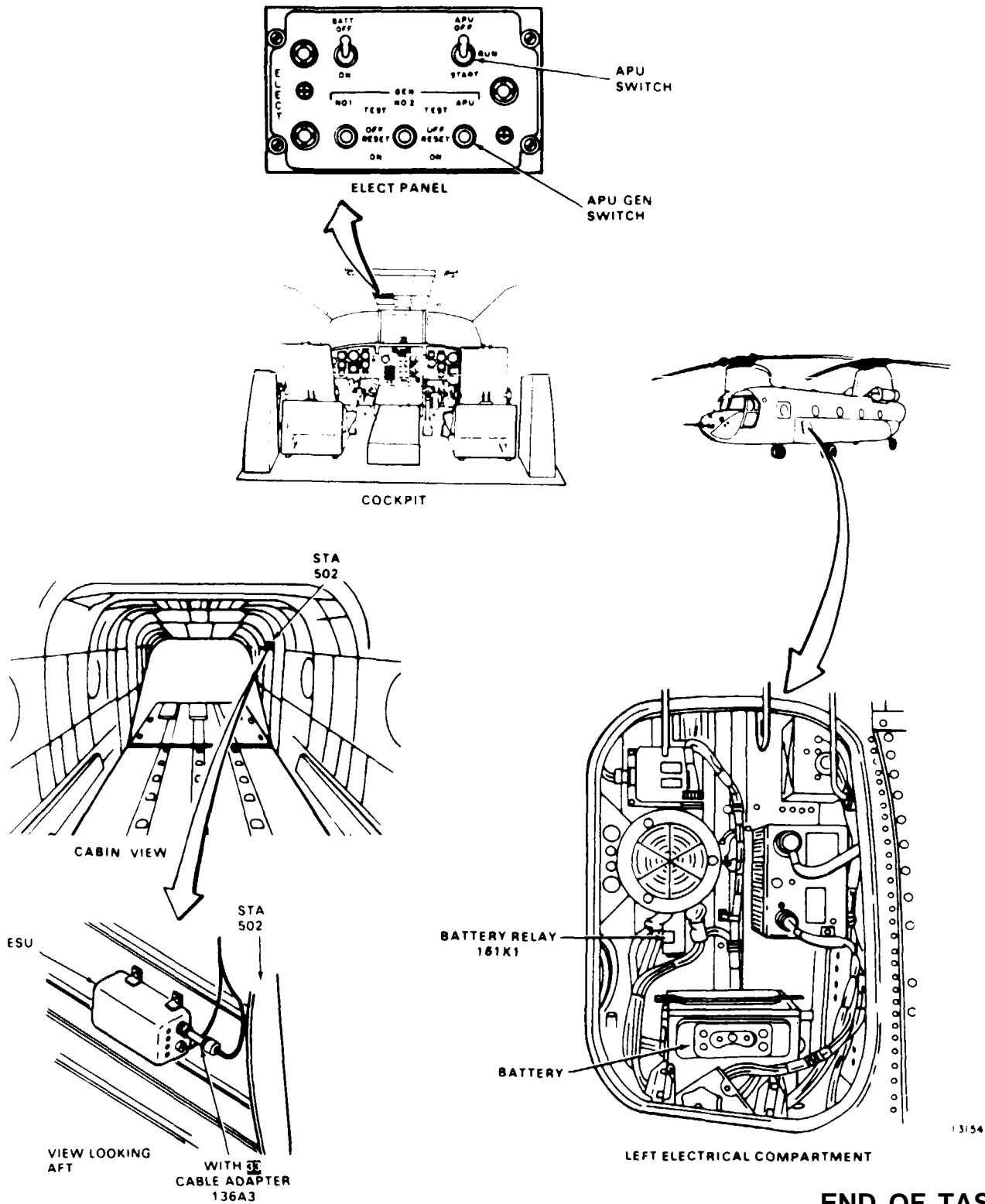
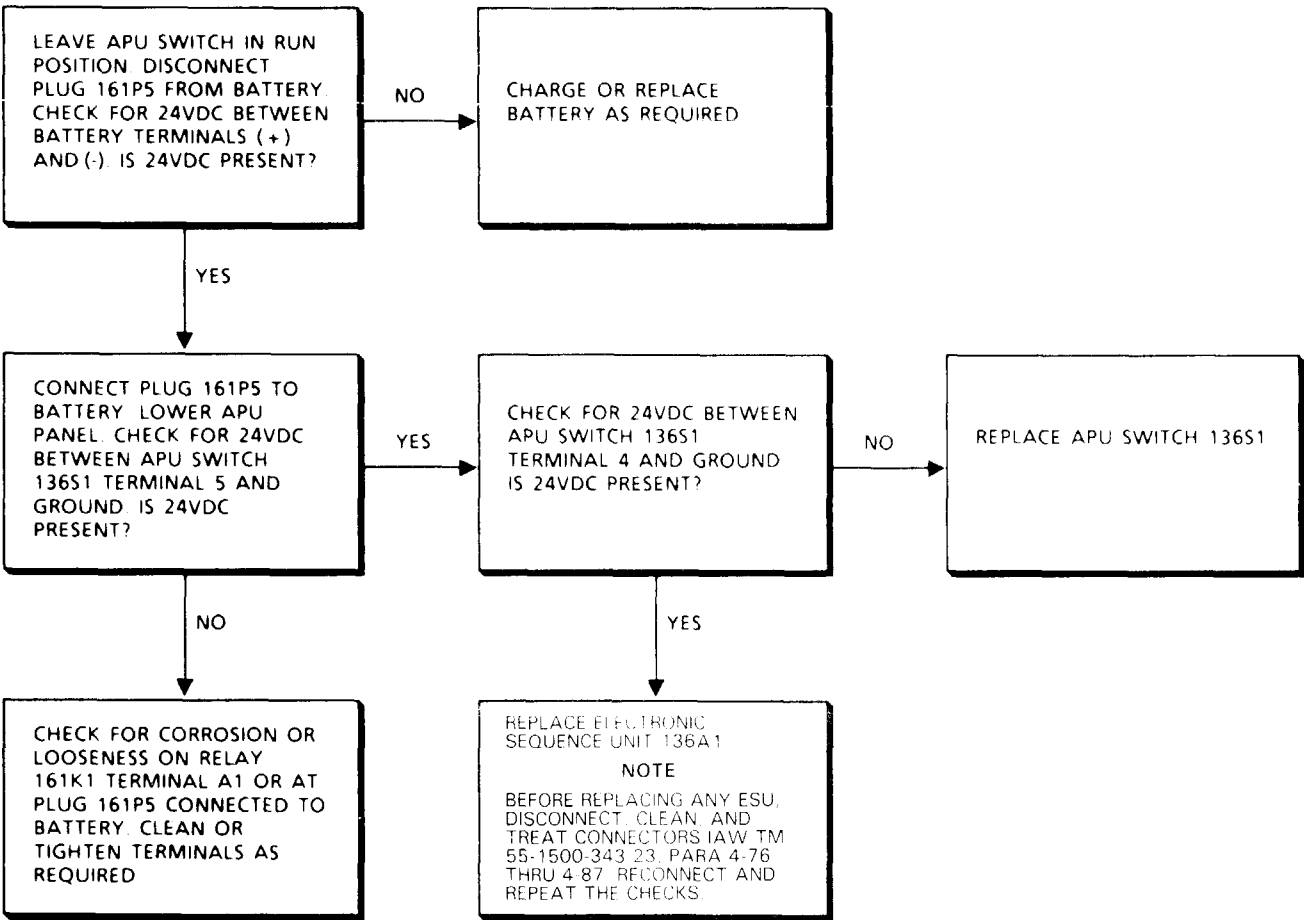
All  
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
Aircraft Electrician

References:  
TM 55-1520-240-23  
TM 55-1500-343-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



END OF TASK

# 15-3 APU FUEL SYSTEM

PARAGRAPH 15-3  
TABLE OF CONTENTS  
APU FUEL SYSTEM TROUBLESHOOTING

PARAGRAPH	DESCRIPTION	FUNCTION	PAGE
15-3	APU FUEL SYSTEM		15-49
15-3.1	APU FUEL SYSTEM COMPONENTS	DRAWING	15-53
15-3.2	APU FUEL SYSTEM BLOCK DIAGRAM	DRAWING	15-54
15-3.3	APU FUEL SYSTEM PIPING DIAGRAM	DRAWING	15-55
15-3.4	APU FUEL SYSTEM ELECTRICAL SCHEMATIC	DRAWING	15-56
15-3.5	APU FUEL SYSTEM WIRING DIAGRAM	DRAWING	15-57
15-3.6	APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○○●● THEN ●○○● (FAILURE TO START)	TASK	15-58
15-3.7	APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○○○● THEN ●○○● (FAILURE TO START)	TASK	15-60
15-3.8	APU FUEL BOOST PUMP AND FUEL VALVE ELECTRICAL TESTS	TABLE	15-62
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15-3.10	APU START FUEL AND MAIN FUEL VALVES ELECTRICAL TESTS	TABLE	15-64

LIST OF TABLES

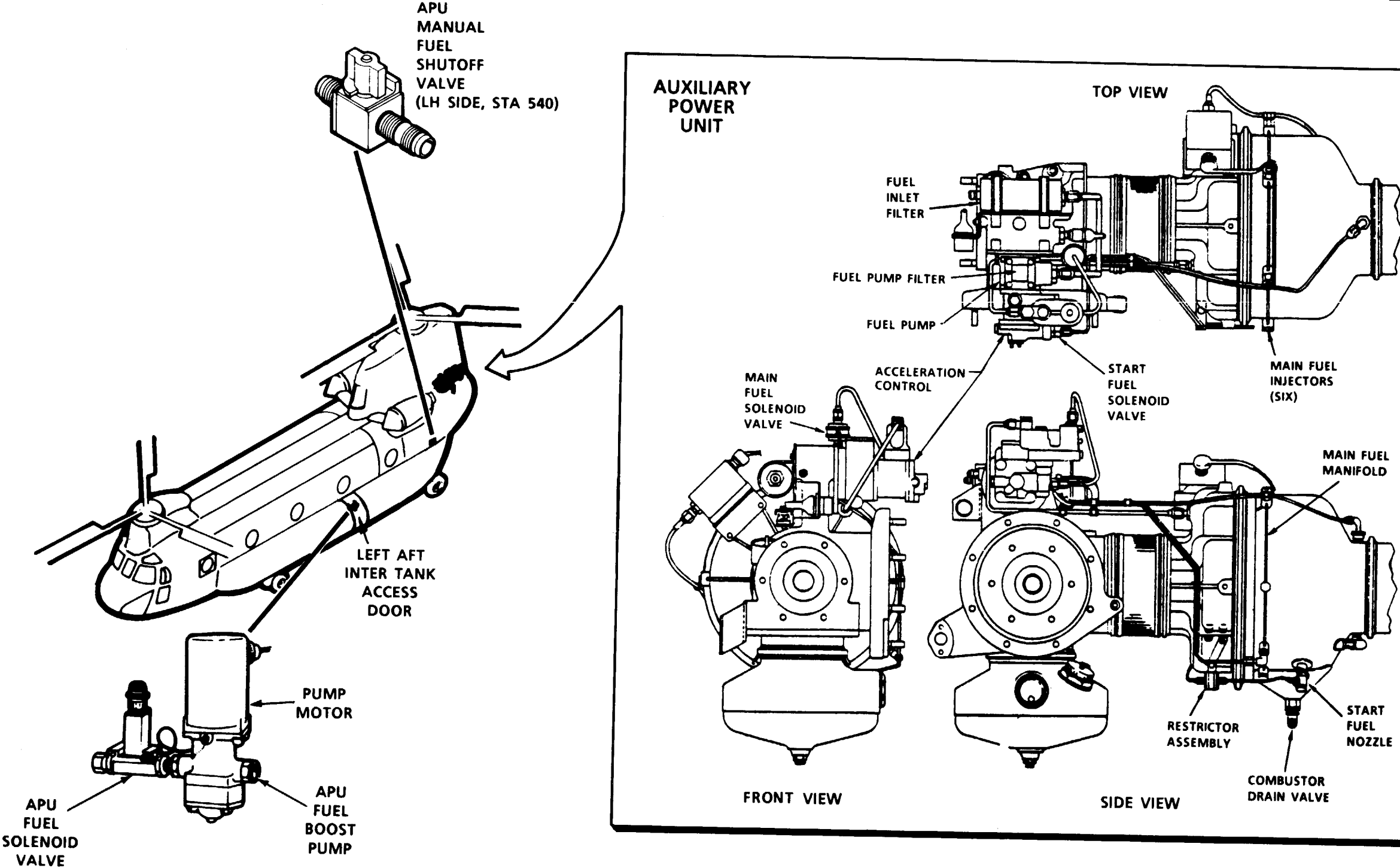
TABLE NO.	DESCRIPTION	PAGE NO.
15-3.1	APU FUEL BOOST PUMP AND FUEL SOLENOID VALVE – ELECTRICAL TESTS	15-62
15-3.2	APU FAULT RELAY – ELECTRICAL TESTS	15-63
15-3.3	APU START FUEL AND MAIN FUEL VALVES ELECTRICAL TESTS	15-64

15-3 APU FUEL SYSTEM

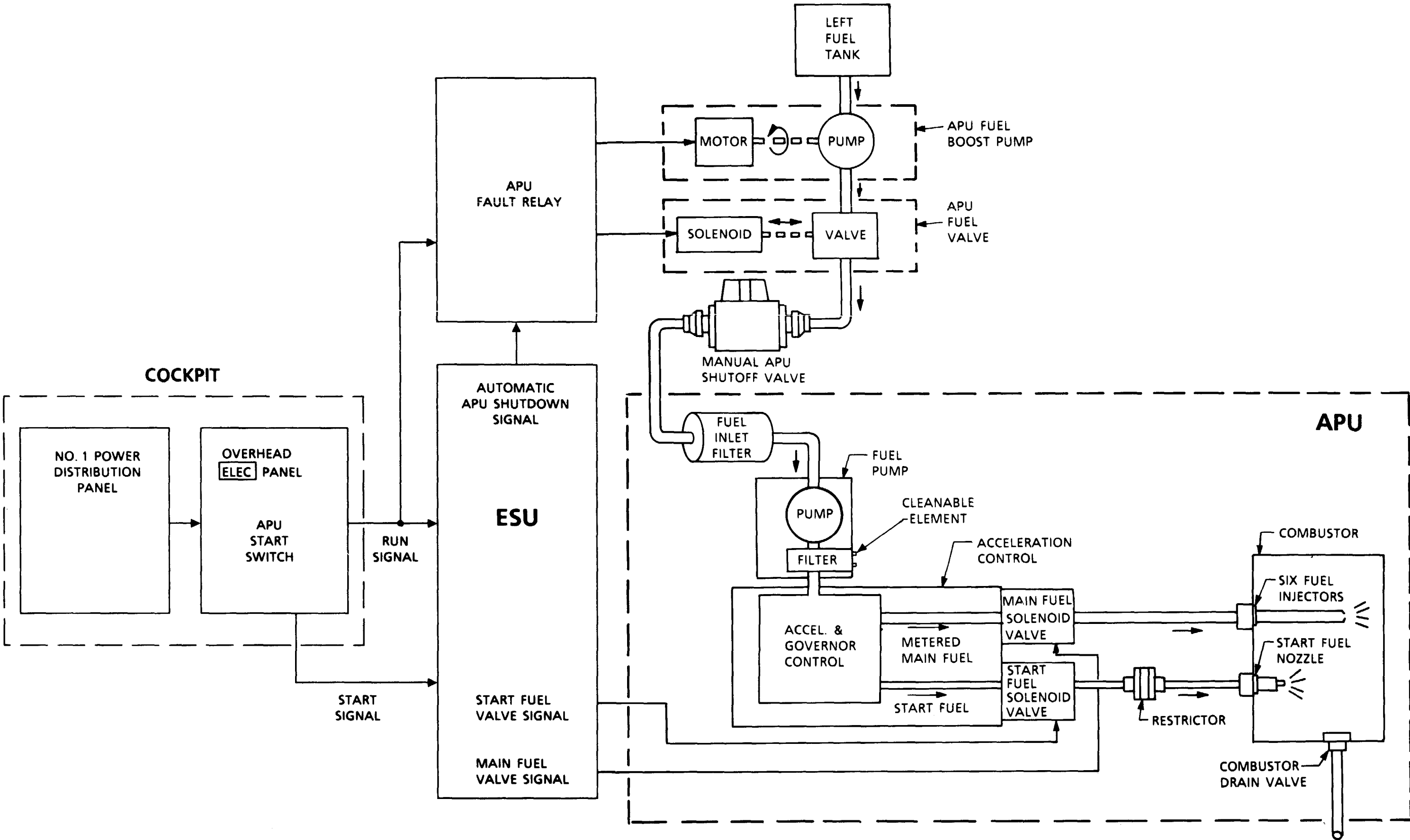
15-3

15-3.1 APU FUEL SYSTEM COMPONENTS

15-3.1

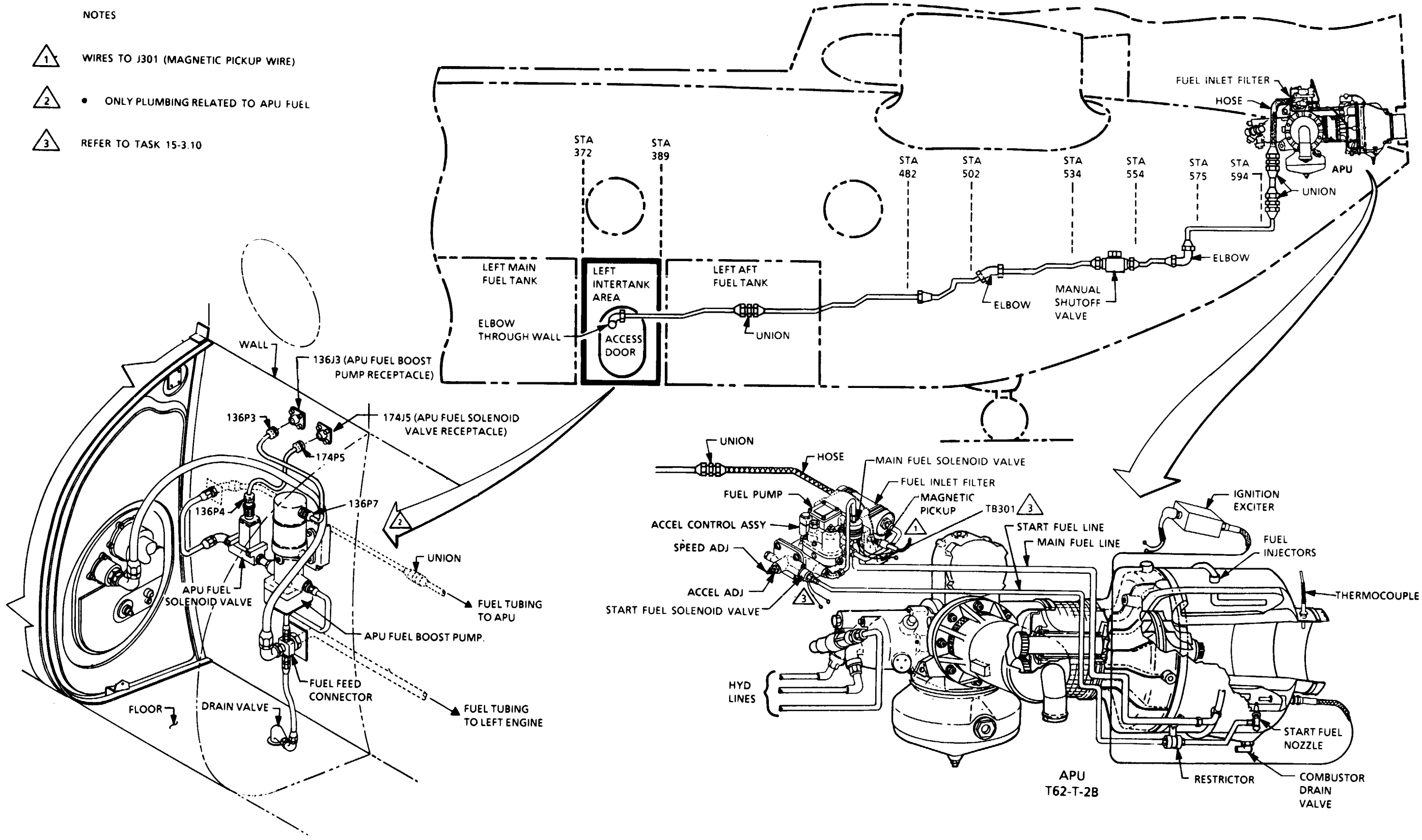






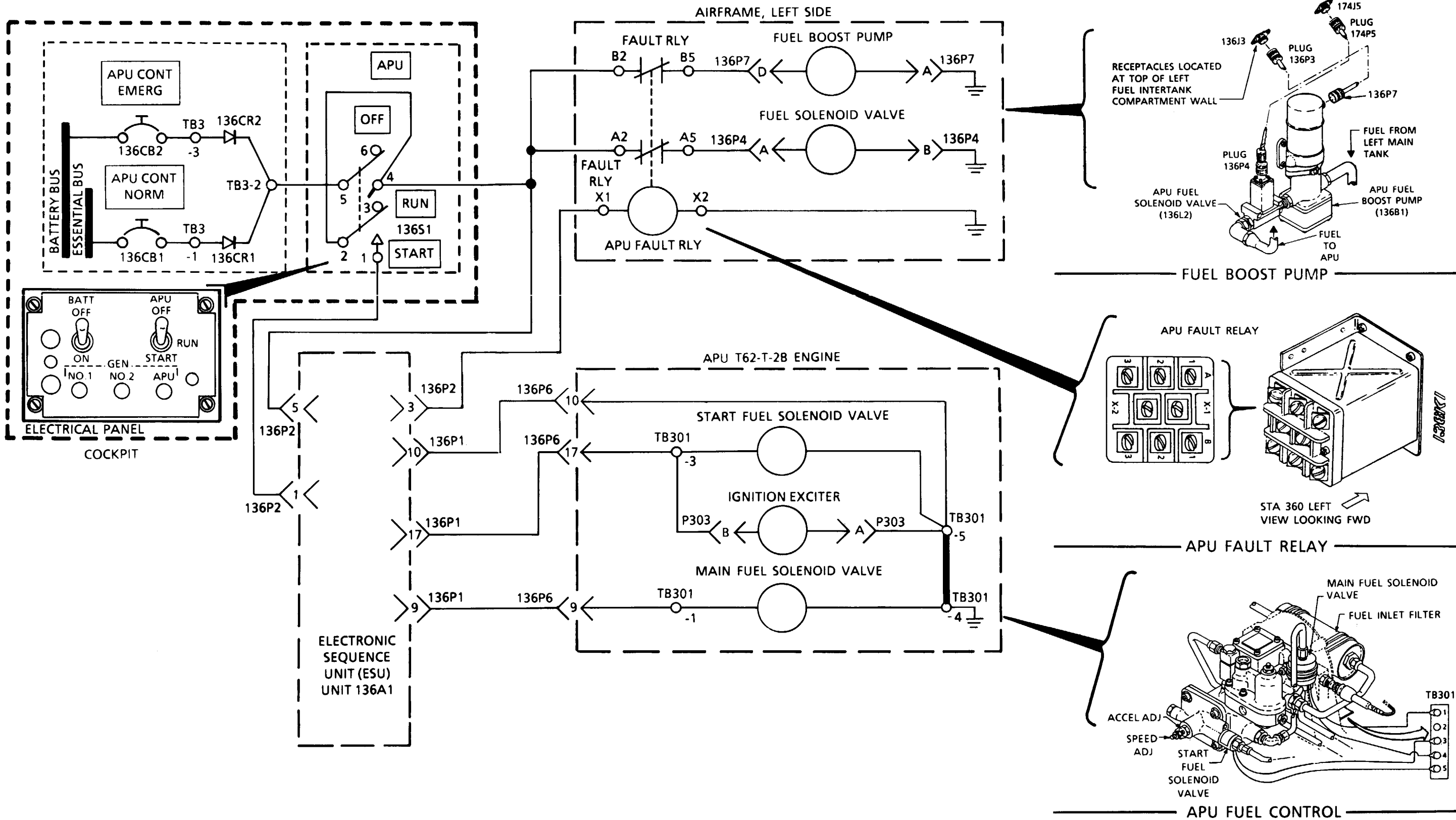
15-3.3 APU FUEL SYSTEM PIPING DIAGRAM

15-3.3



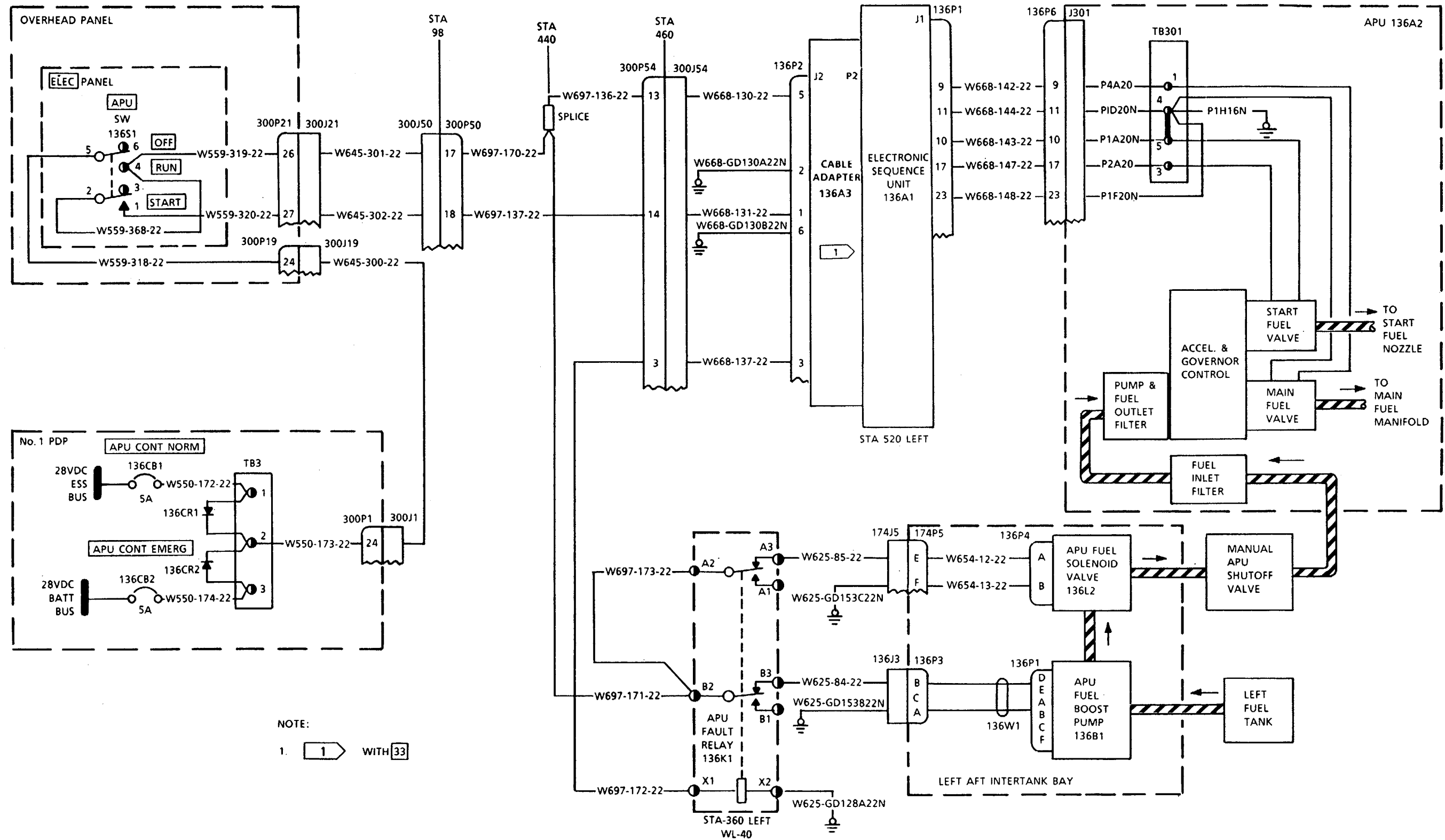
15-3.4 APU FUEL SYSTEM ELECTRICAL SCHEMATIC

15-3.4



15-3.5 APU FUEL SYSTEM WIRING DIAGRAM

15-3.5



15-3.6 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○ ○ ● ● THEN ● ○ ○ ● (FAILURE TO START; FUEL SYSTEM)

15-3.6

FAULT ISOLATION PROCEDURE

INITIAL SETUP

TM 55-2835-205-23

Applicable Configurations:

- All
- Tools:**
- Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
  - Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
  - Multimeter

Equipment Condition:

- TM 55-1520-240-23
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

General Safety Instructions

WARNING

All regulations and instructions for handling fuels shall be strictly observed.

Materials:

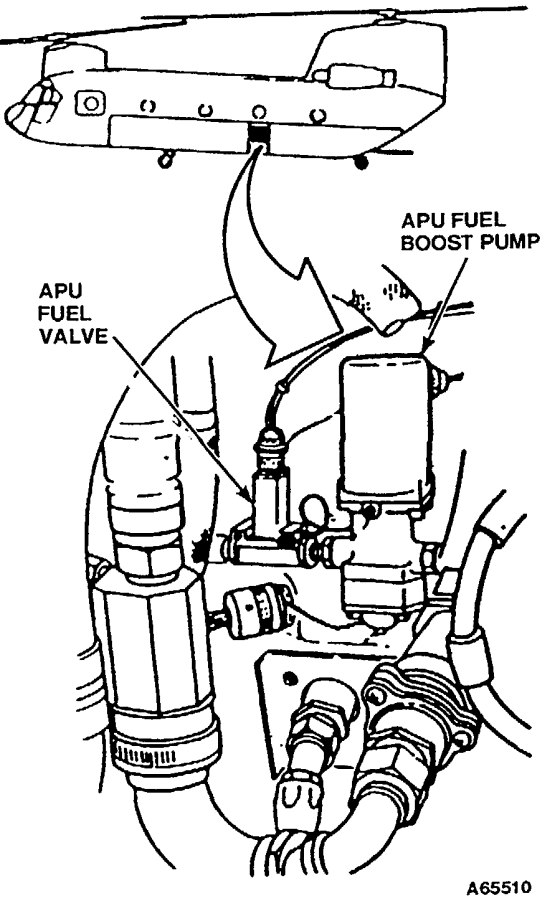
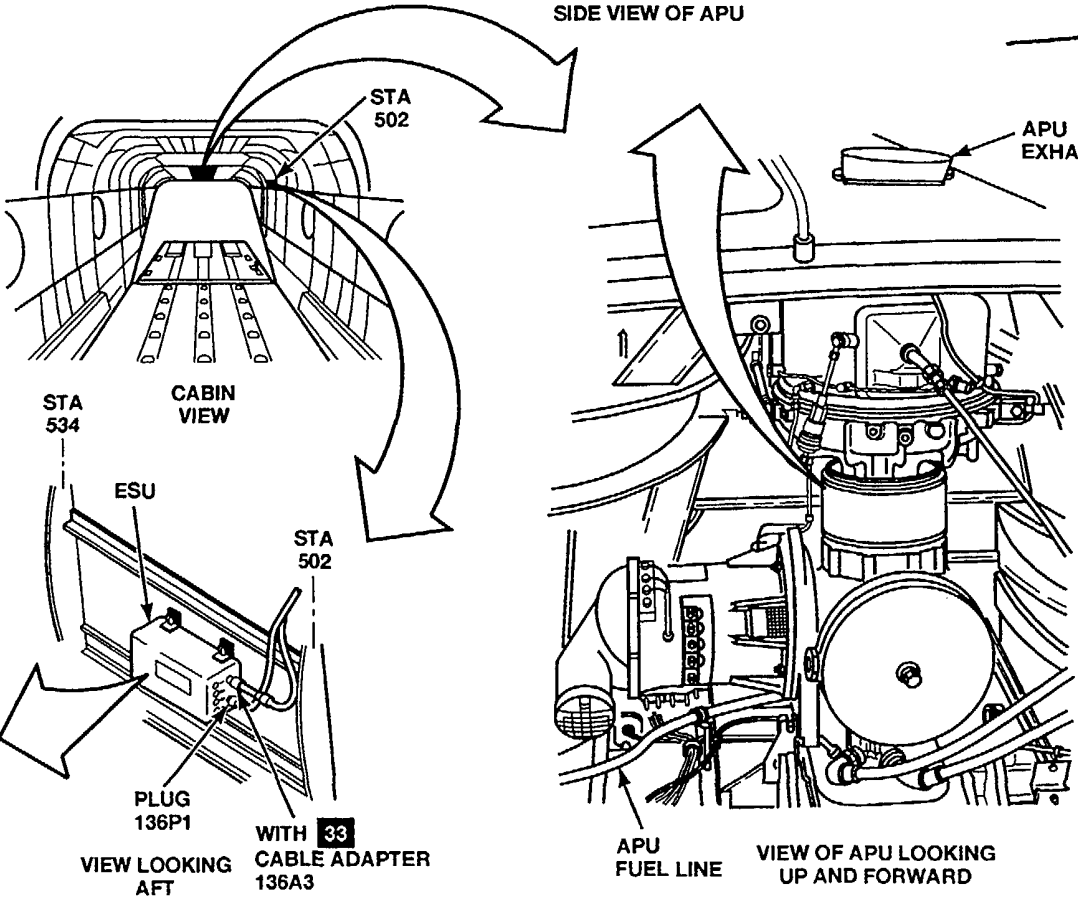
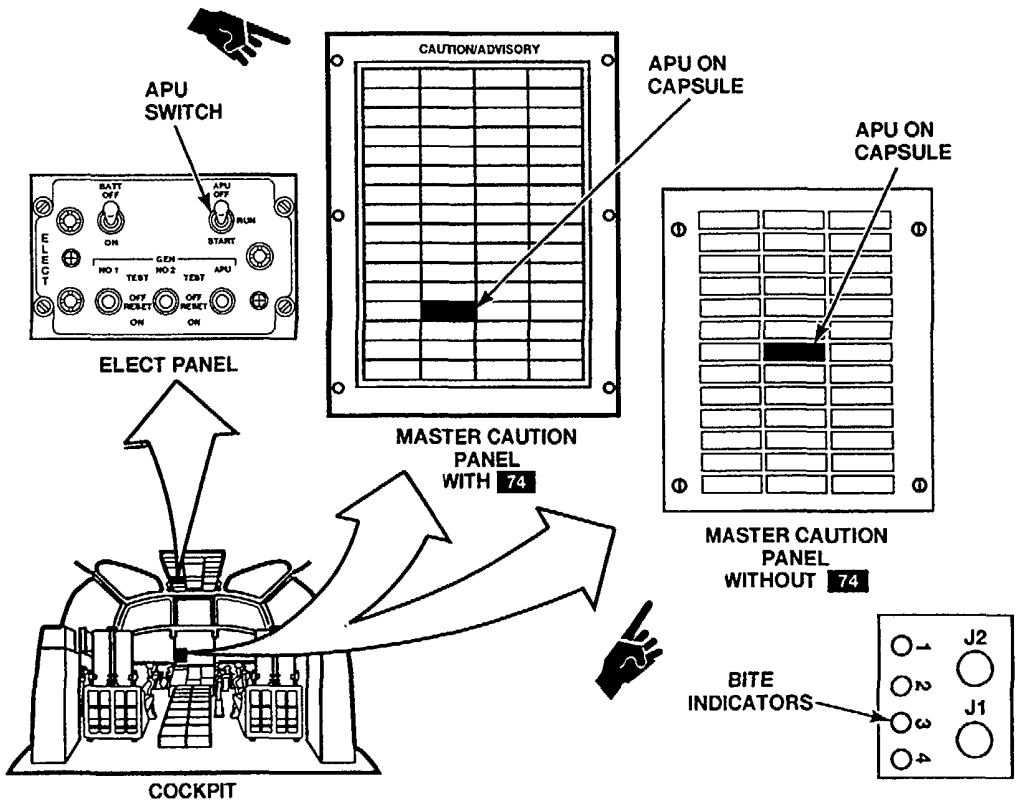
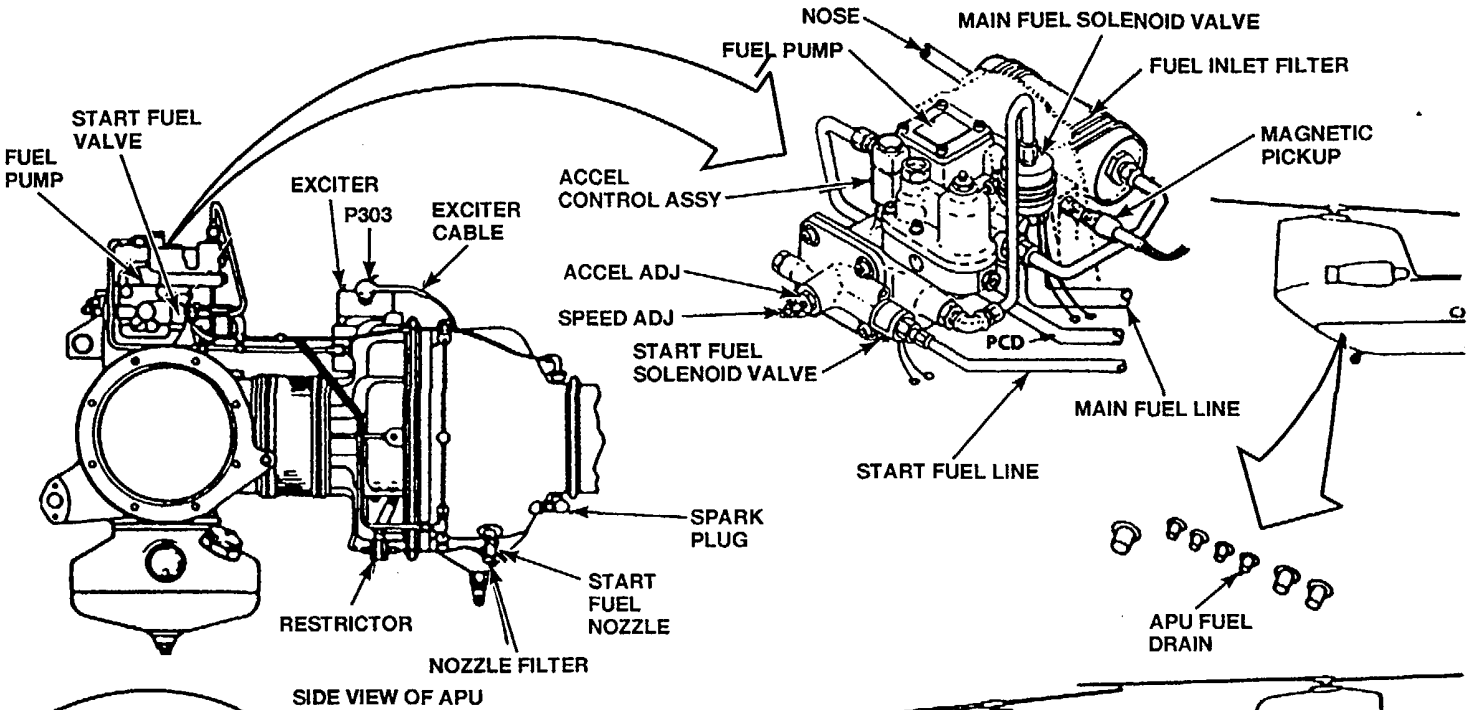
- Cloth (E120)
- Tape (E385)

Personnel Required:

- Aircraft Electrician
- Medium Helicopter Repairer

References:

TM 55-1520-240-23

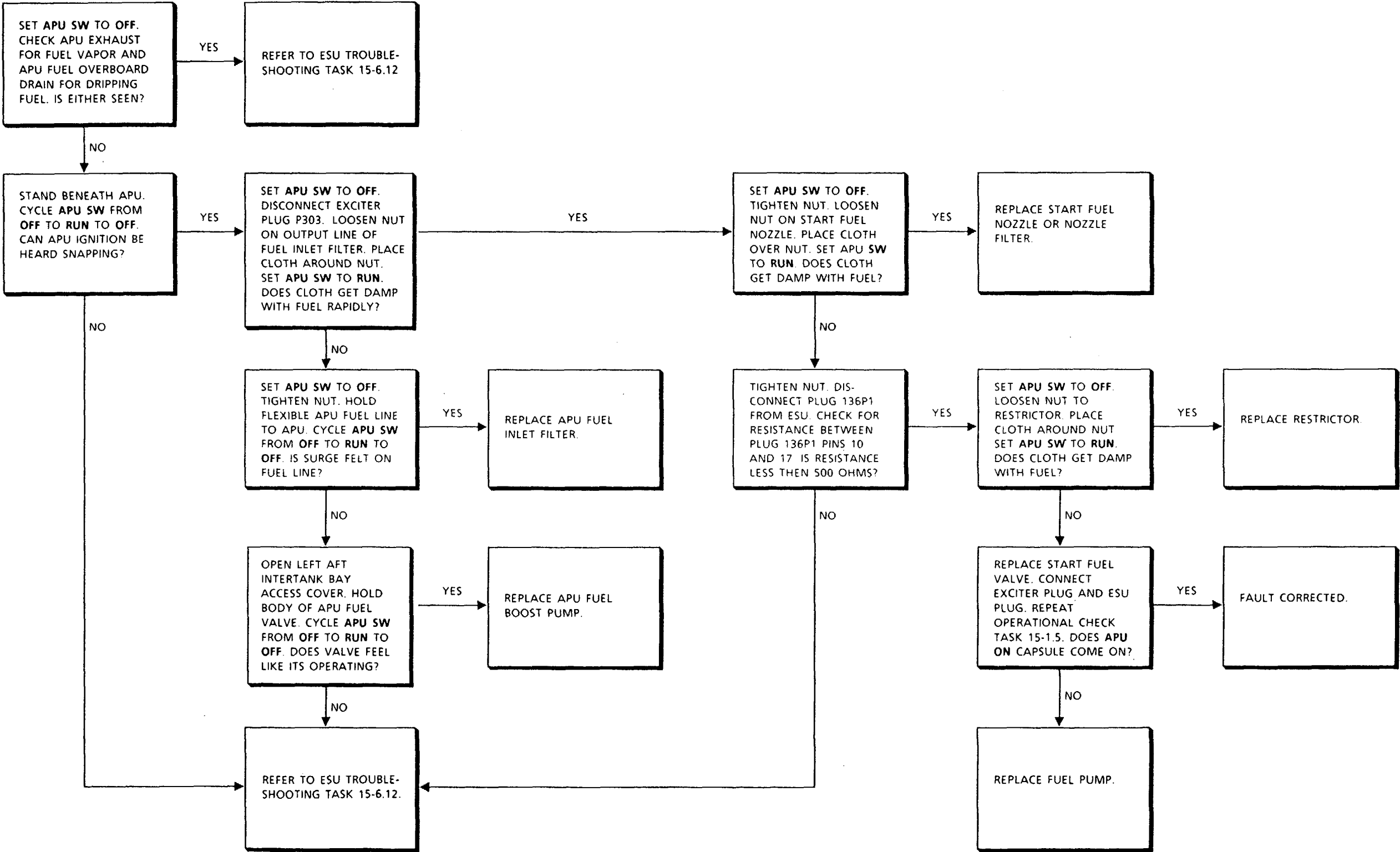


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15-3.6 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES

15-3.6

○ ○ ● ● THEN ● ○ ○ ● (CONTINUED ; FUEL SYSTEM)



15-3.7 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○ ○ ○ ● THEN ● ○ ○ ● (FAILURE TO START)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

TM 55-2835-205-23

Applicable Configurations

- All
- Tools:**
- Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
  - Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
  - Multimeter

- Equipment Condition:**
- TM 55-1520-240-23
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off

General Safety Instructions

Materials:

None

Personnel Required:

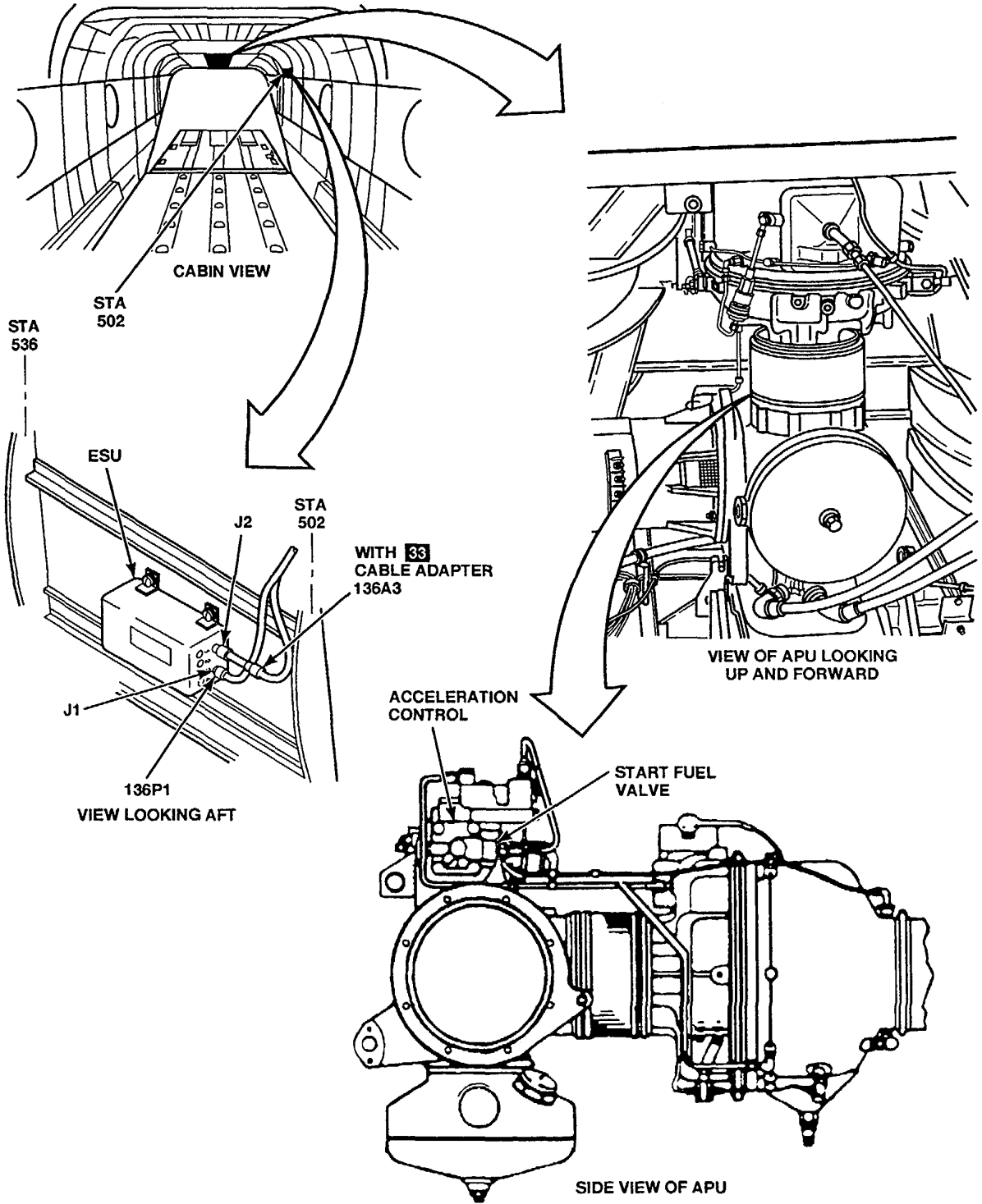
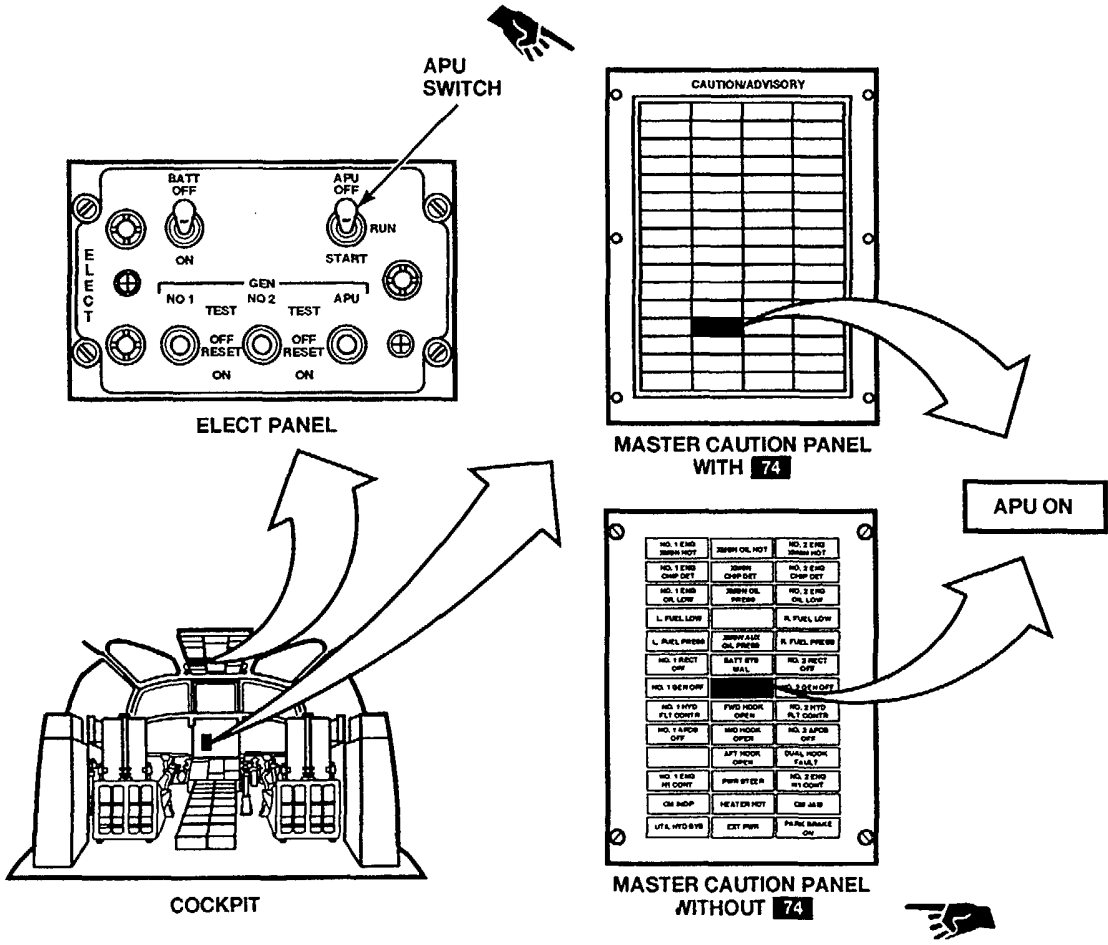
- Aircraft Electrician
- Medium Helicopter Repairer

References

TM 55-1520-240-23

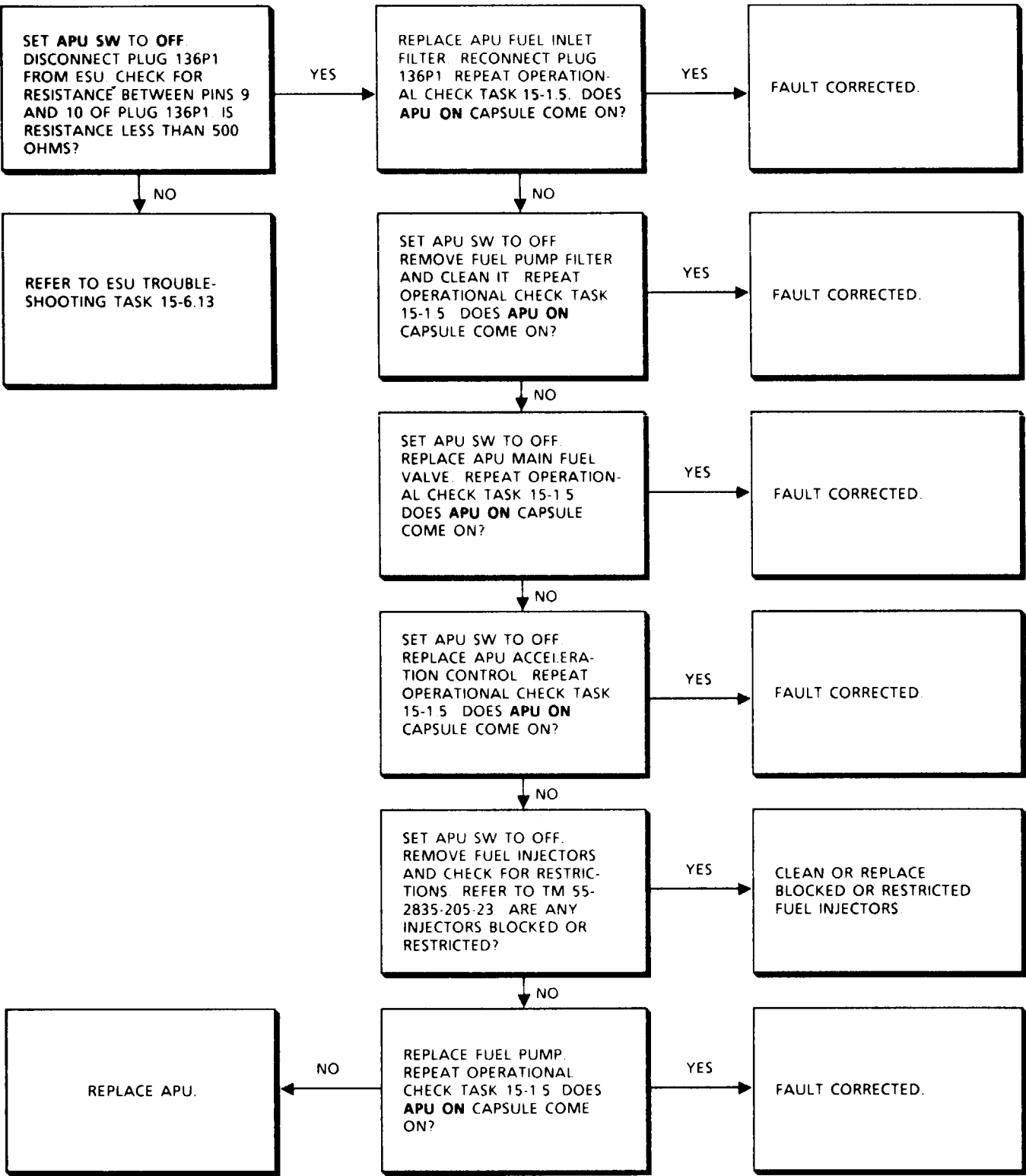
WARNING

All regulations and instructions for handling fuels shall be strictly observed.



15-3.7 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○ ○ ○ ● THEN ● ○ ○ ● (CONTINUED)

15-3.7



END OF TASK



### 15-3.8 APU FUEL BOOST PUMP AND FUEL VALVE ELECTRICAL TESTS

15-3.8

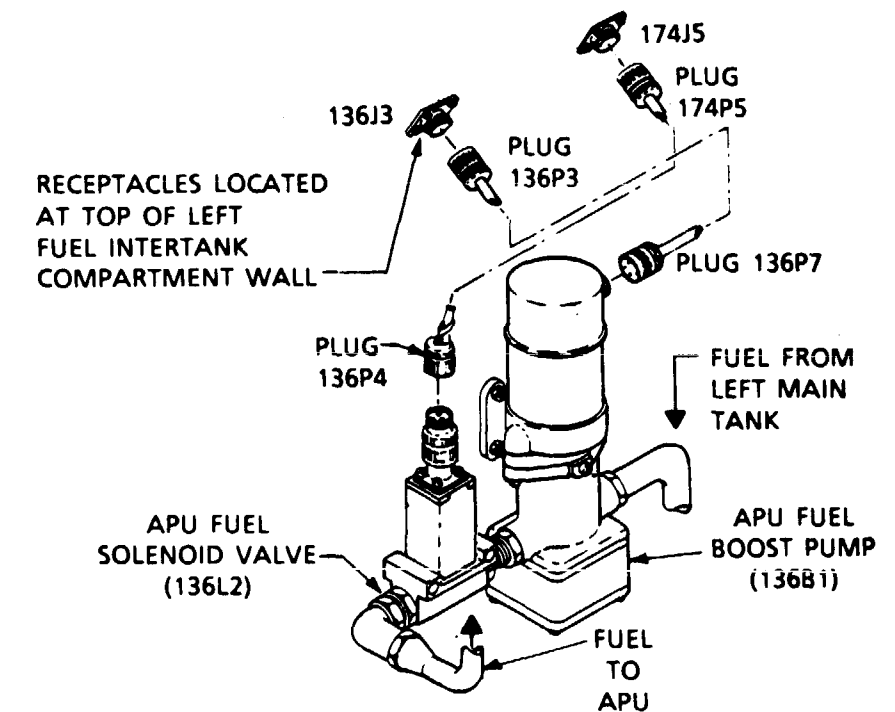
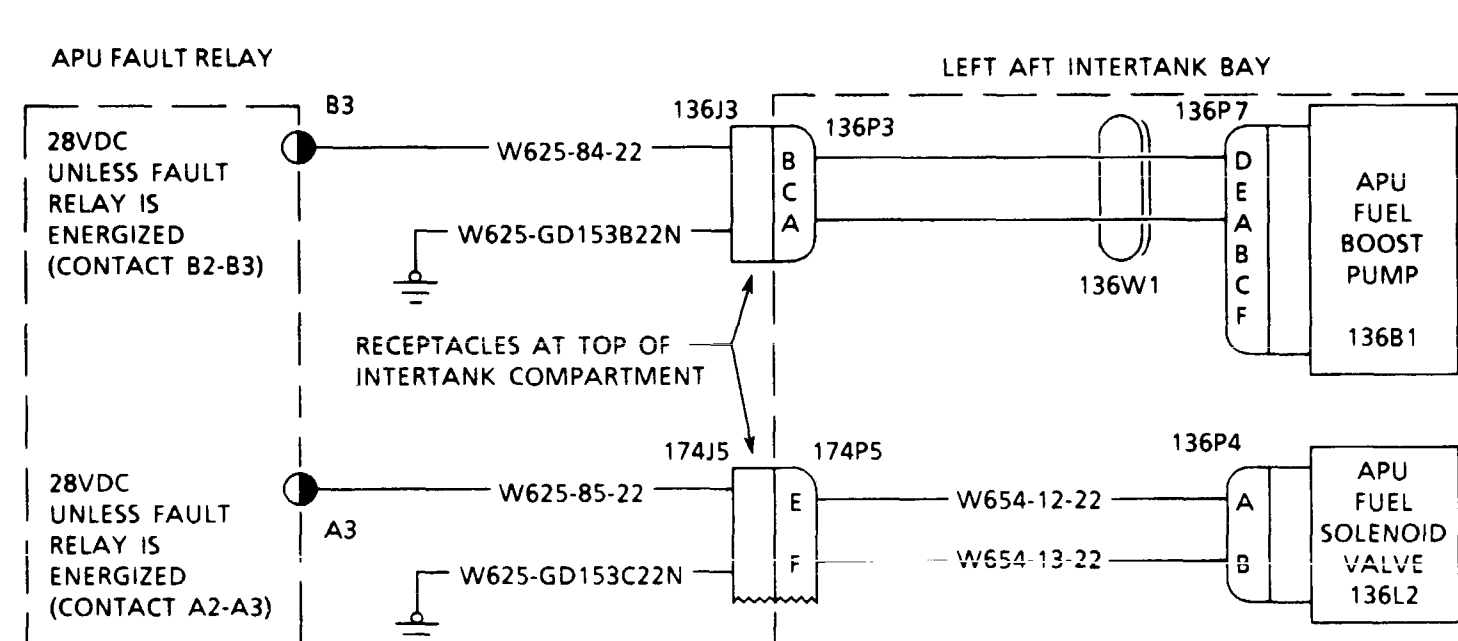


TABLE NO. 15-3.1 – APU FUEL BOOST PUMP AND FUEL SOLENOID VALVE – ELECTRICAL TESTS

TYPE OF TEST	TEST CONDITION	PROCEDURE	METER READING OR TEST RESULTS
RESISTANCE CHECK OF APU FUEL BOOST PUMP.	APU SWITCH TO OFF.	<ol style="list-style-type: none"> <li>1. OPEN AFT FUEL INTERTANK BAY DOOR.</li> <li>2. DISCONNECT PLUG 136P3 (AT TOP RIGHT SIDE OF COMPARTMENT).</li> <li>3. MEASURE RESISTANCE BETWEEN PINS A AND B ON 136P3.</li> <li>4. RECONNECT 136P3 TO 136J3.</li> </ol>	15 OHMS
RESISTANCE CHECK OF APU FUEL SOLENOID VALVE.	APU SWITCH TO OFF.	<ol style="list-style-type: none"> <li>1. OPEN AFT FUEL INTERTANK BAY DOOR.</li> <li>2. DISCONNECT PLUG 174P5 (AT TOP RIGHT SIDE OF COMPARTMENT).</li> <li>3. MEASURE RESISTANCE BETWEEN PINS E AND F ON 174P5.</li> <li>4. RECONNECT 174P5 TO 174J5.</li> </ol>	180-220 OHMS
VOLTAGE CHECK AT APU FUEL BOOST PUMP PLUG.	APU SWITCH TO RUN.	<ol style="list-style-type: none"> <li>1. BOOST PUMP SHOULD BE HEARD RUNNING AS APU SWITCH IS PLACED TO RUN POSITION. IF NOT, CHECK VOLTAGE.</li> <li>2. DISCONNECT PLUG AT BOOST PUMP AND MEASURE VOLTAGE BETWEEN PINS D AND A.</li> <li>3. RECONNECT PLUG TO BOOST PUMP.</li> </ol>	28VDC
VOLTAGE CHECK AT APU FUEL SOLENOID VALVE.	APU SWITCH TO RUN.	<ol style="list-style-type: none"> <li>1. DISCONNECT PLUG AT APU FUEL BOOST PUMP.</li> <li>2. DISCONNECT PLUG 136P4 AT APU FUEL SOLENOID VALVE.</li> <li>3. PLACE APU SWITCH TO RUN AND MEASURE VOLTAGE BETWEEN PINS A AND B OF 136P4.</li> <li>4. RECONNECT BOTH PLUGS.</li> </ol>	28VDC

15-3.9 APU FAULT RELAY ELECTRICAL TESTS

15-3.9

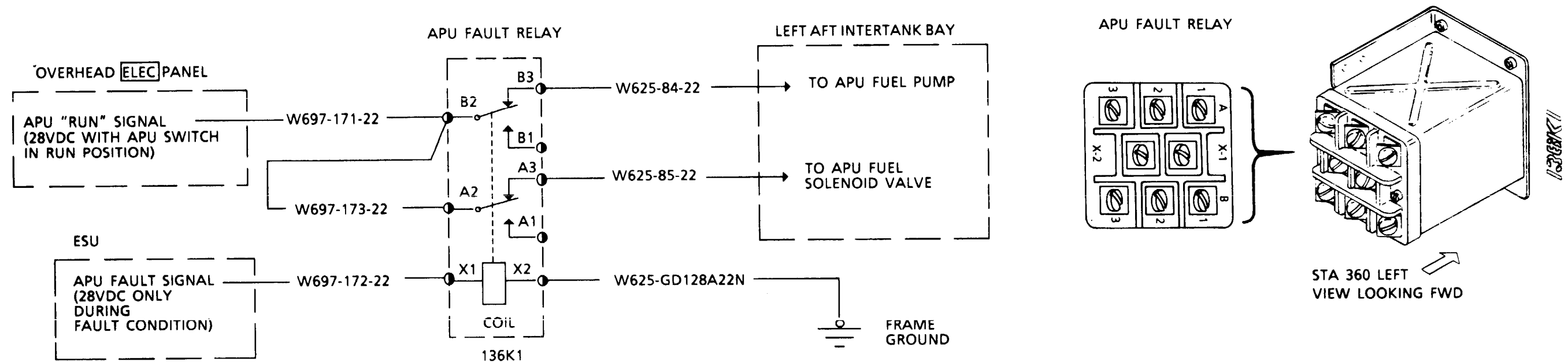


TABLE NO. 15-3.2 – APU FAULT RELAY – ELECTRICAL TESTS

TYPE OF TEST	TEST CONDITION	PROCEDURE	METER READING OR TEST RESULTS
INITIAL SET-UP.	APU SW. TO OFF	1. REMOVE WIRE W625-84-22 FROM B3. 2. REMOVE WIRE W625-85-22 FROM A3. 3. REMOVE WIRE W697-172-22 FROM X1. 4. REMOVE WIRE W697-171-22 FROM B2.	_____
B2-B3 CONTACT CHECK WITH ZERO VOLTS ON COIL.	APU SW. TO OFF	PLACE OHMMETER TEST LEADS ACROSS B2 AND B3 AND MEASURE RESISTANCE.	"0" OHMS
A2-B3 CONTACT CHECK WITH ZERO VOLTS ON COIL.	APU SW. TO OFF	PLACE OHMMETER TEST LEADS ACROSS A2 AND A3 AND MEASURE RESISTANCE.	"0" OHMS
COIL RESISTANCE CHECK.	APU SW. TO OFF	PLACE OHMMETER TEST LEADS ACROSS X1 AND X2 AND MEASURE RESISTANCE.	150 OHMS
VOLTAGE TO RELAY CONTACTS CHECK.	APU SW. TO ON	PLACE VOLTMETER TEST LEADS BETWEEN FRAME GROUND AND WIRE W697-171-22 (WHICH WAS REMOVED FROM B2).	28 VDC
RELAY COIL CHECK.	APU SW. TO ON	PLACE JUMPER CLIP LEADS BETWEEN WIRE W697-171-22 AND X1.	RELAY COIL "CLICK" SHOULD BE HEARD.
B2-B3 CONTACT CHECK WITH VOLTAGE ON COIL.	APU SW. TO ON	RETAIN JUMPER BETWEEN WIRE W697-171-22 AND X1. MEASURE RESISTANCE ACROSS B2 AND B3.	METER INDICATES "OPEN" CIRCUIT.
A2-B3 CONTACT CHECK WITH VOLTAGE ON COIL.	APU SW. TO ON	RETAIN JUMPER BETWEEN WIRE W697-171-22 AND X1. MEASURE RESISTANCE ACROSS A2 AND A3.	METER INDICATES "OPEN" CIRCUIT.
RETURN OF WIRES TO TERMINALS ON RELAY.	APU SW. TO OFF	1. REMOVE JUMPER. 2. REPLACE WIRE W625-84-22 ON B3. 3. REPLACE WIRE W625-85-22 ON A3. 4. REPLACE WIRE W697-172-22 ON X1. 5. REPLACE WIRE W697-171-22 ON B2. 6. USE WIRING DIAGRAM TO DOUBLE CHECK RELAY WIRING.	_____

15-3.10 APU START AND MAIN FUEL VALVES  
ELECTRICAL TESTS

15-3.10

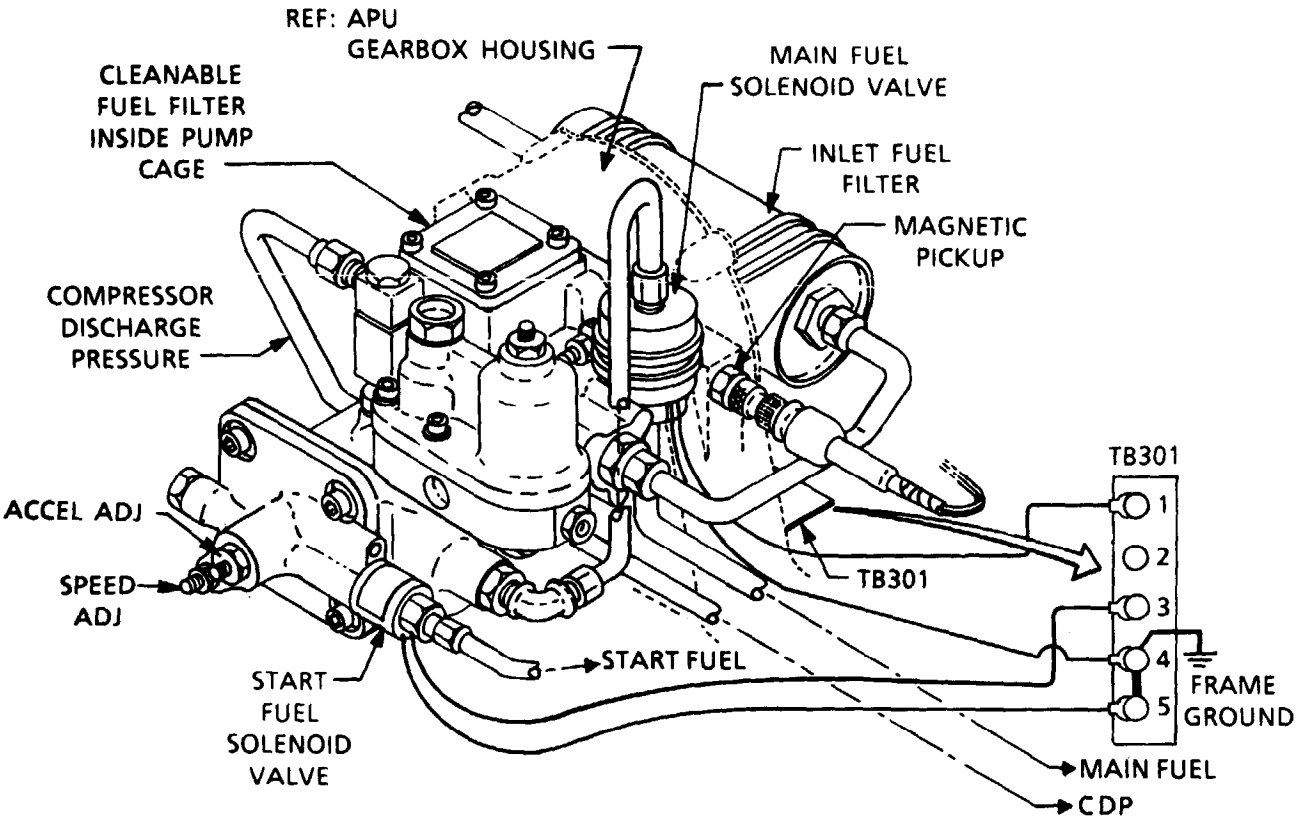



TABLE NO. 15-3.3 APU START AND MAIN FUEL VALVES ELECTRICAL TESTS

TEST CONDITIONS	COMPONENT	TEST POINTS	MULTIMETER READINGS	
			VOLTAGE	RESISTANCE
Connect Zeld Tester to ESU & APU. Refer to Para 15-6 for details.  Move Master switch and Start/Run Switches to UP position.	Start Fuel Solenoid Valve	Terminal Board Terminals 3 & GND	28 Volts Between 5% & 70% APU Speed	---
		Terminal Board Terminals 5 & GND	0 Volts At all Times	---
	Main Fuel Solenoid Valve	Terminal Board Terminals 1 & GND	28 Volts Above 15% APU Speed	---
Move Start/Run Switch to DOWN position.	Terminal Board Ground Connection	Terminal 4 and GND	---	Zero Ohms
		Terminal 5 and GND	---	Zero Ohms
Remove ESU Plug 136P1	Start Fuel Solenoid Valve	Terminals 3 and 5	---	40 Ohms 
	Main Fuel Solenoid Valve	Terminals 1 and 5	---	60 Ohms

NOTE:  IGNITION EXCITER IS ALSO CONNECTED TO TERMINAL 3. RESISTANCE READING WOULD INCREASE WITH IGNITION EXCITER DISCONNECTED.

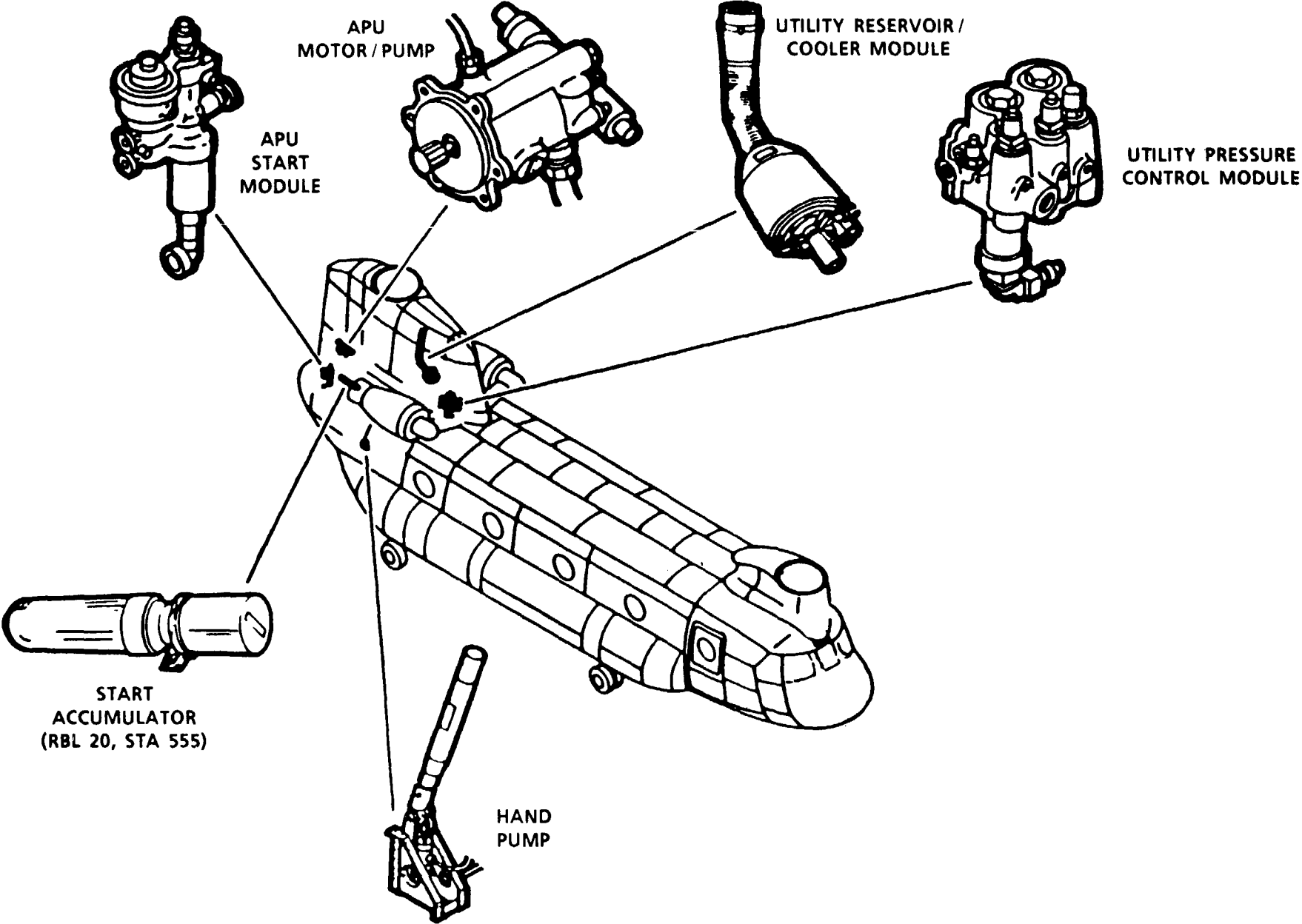
## 15-4 APU HYDRAULIC SYSTEM

PARAGRAPH 15-4  
TABLE OF CONTENTS  
APU HYDRAULIC SYSTEM TROUBLESHOOTING

PARAGRAPH	DESCRIPTION	FUNCTION	PAGE	PARAGRAPH	DESCRIPTION	FUNCTION	PAGE
15-4	APU HYDRAULIC SYSTEM		15-65	15-4.9	APU START ACCUMULATOR GAGE DOES NOT INDICATE AT LEAST 2850 PSI	TASK	15-78
15-4.1	APU HYDRAULIC SYSTEM COMPONENTS	DRAWING	15-68	15-4.10	APU DOES NOT MOTOR	TASK	15-80
15-4.2	OVERALL APU HYDRAULIC SYSTEM BLOCK DIAGRAM	DRAWING	15-69	15-4.11	APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○●●● OR ○○●● THEN ●○○● (HYDRAULIC FAULT)	TASK	15-82
15-4.3	MAJOR INTERCONNECTING APU HYDRAULIC SYSTEM SCHEMATIC	DRAWING	15-70	15-4.12	APU PUMP FAULT LIGHT IS ON	TASK	15-84
15-4.4	CHARGING ACCUMULATOR FLOW DIAGRAM	DRAWING	15-72	15-4.13	HYDRAULIC HANDPUMP SCHEMATIC	DRAWING	15-86
15-4.5	APU HYDRAULIC START MOTOR FLOW DIAGRAM	DRAWING	15-73				
15-4.6	APU HYDRAULIC PUMP FLOW DIAGRAM	DRAWING	15-74				
15-4.7	APU HYDRAULIC STARTING SYSTEM VISUAL CHECK	TASK	15-75				
15-4.8	APU HYDRAULIC STARTING SYSTEM OPERATIONAL CHECK	TASK	15-76				

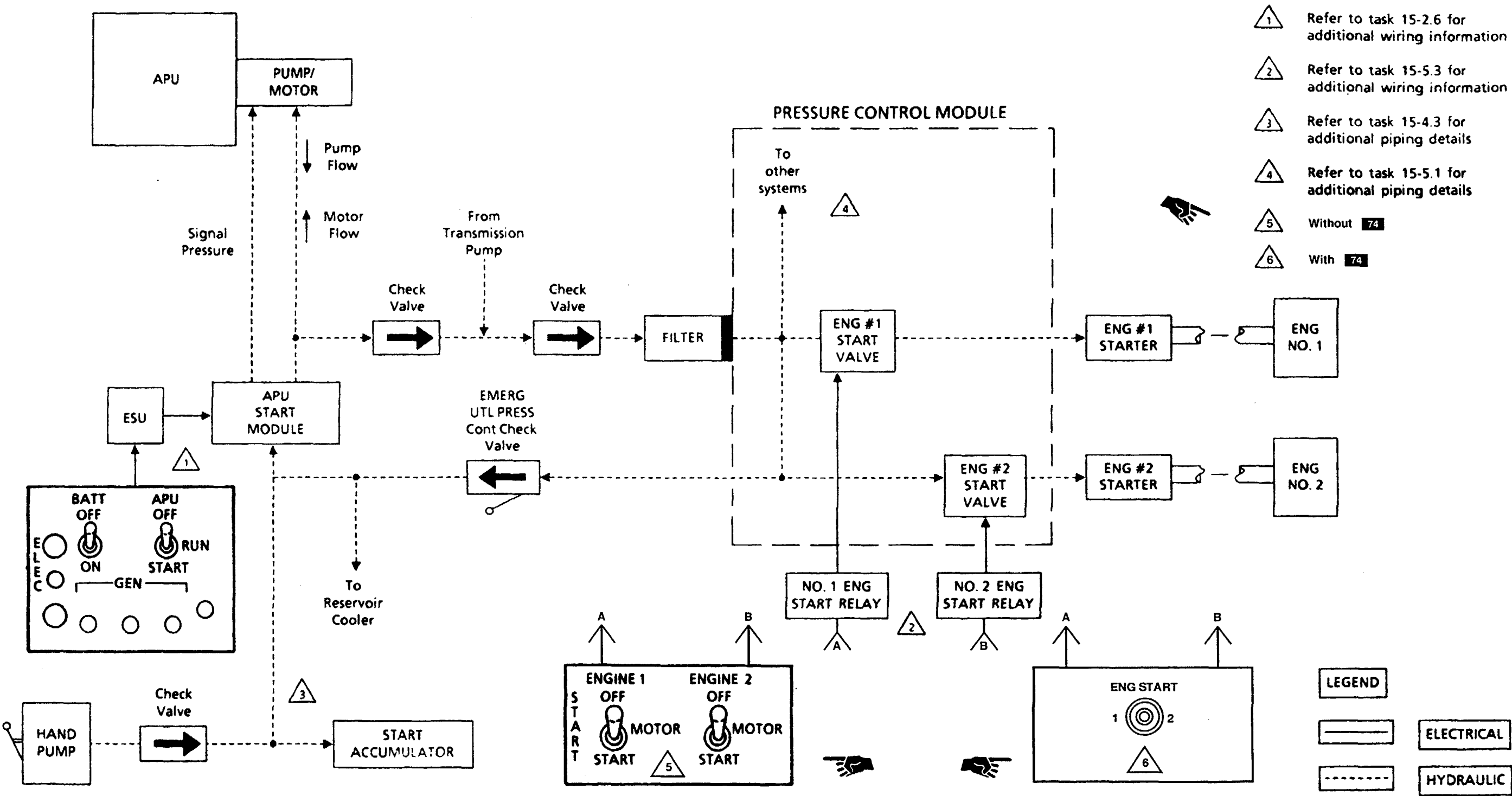
15-4	APU HYDRAULIC SYSTEM
15-4.1	APU HYDRAULIC SYSTEM COMPONENTS

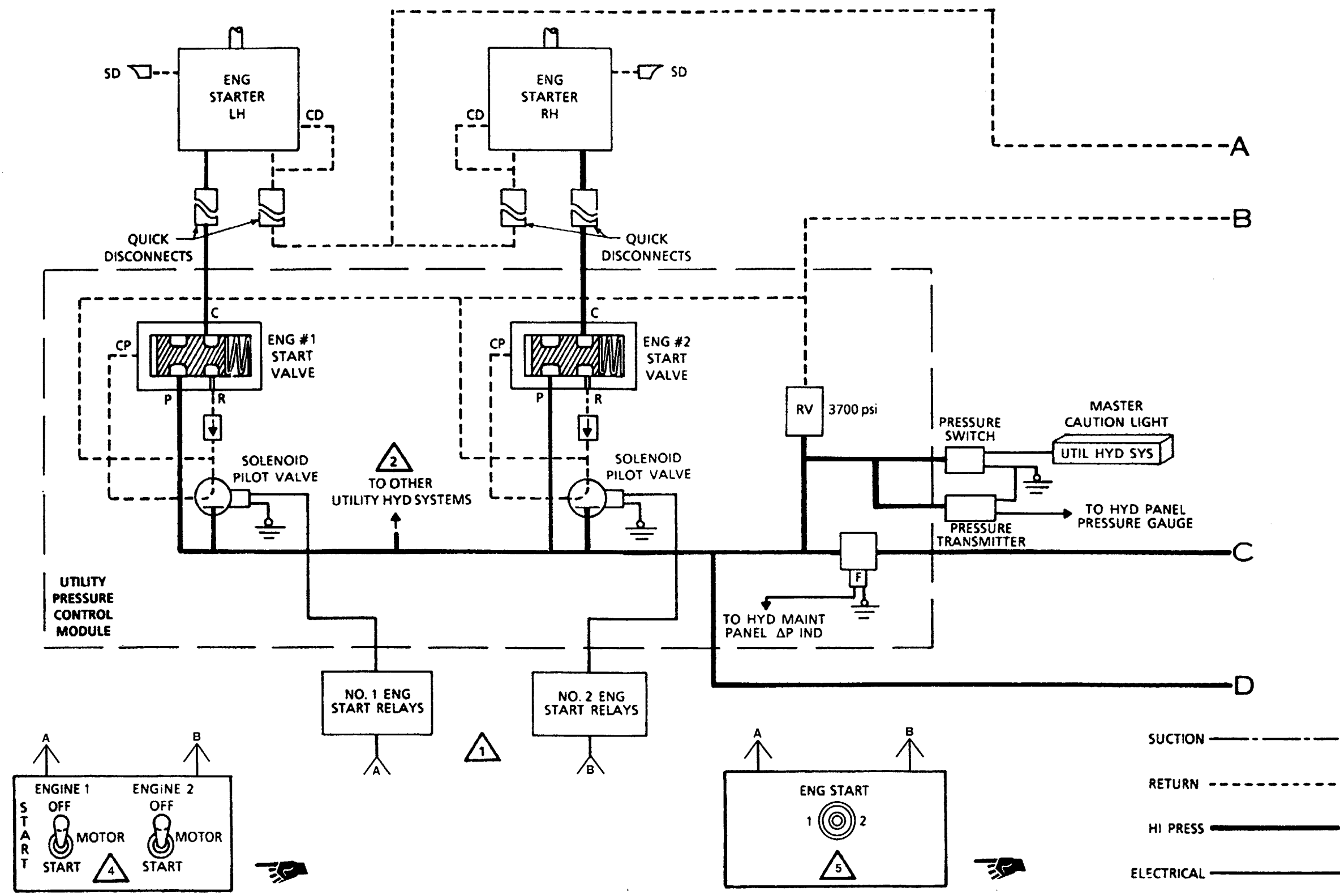
15-4
15-4.1



15-4.2 OVERALL APU HYDRAULIC SYSTEM BLOCK DIAGRAM

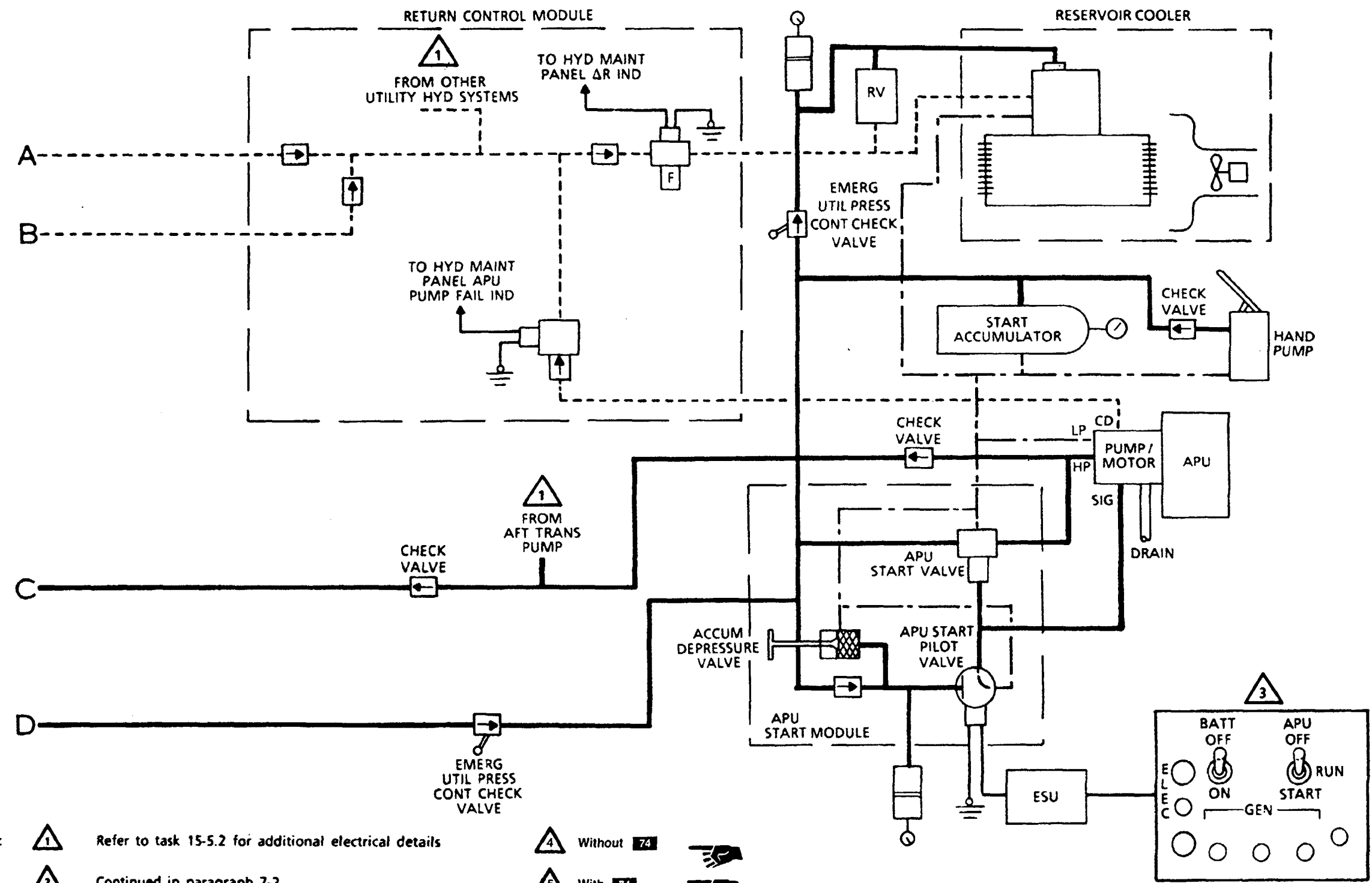
15-4.2



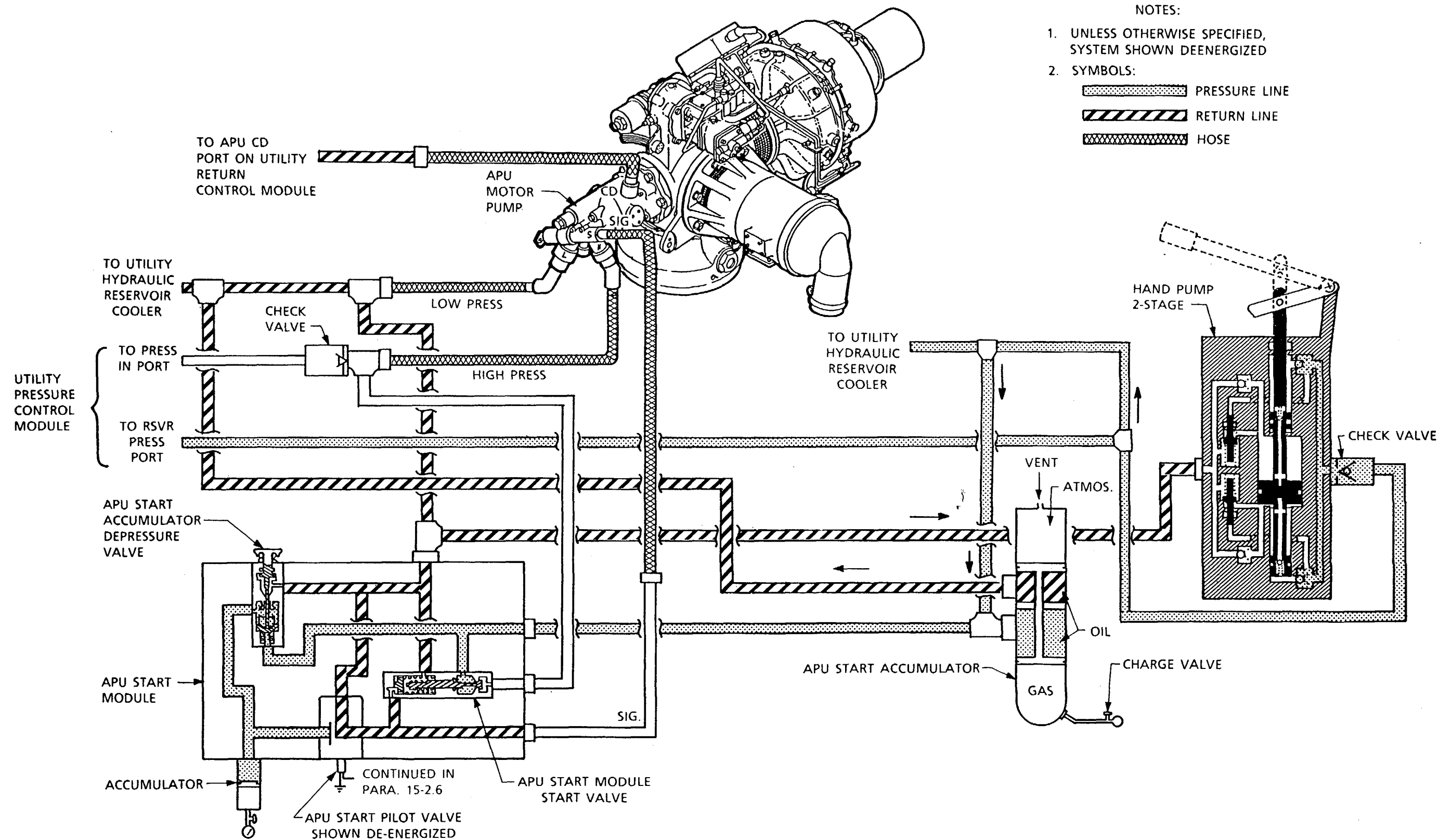


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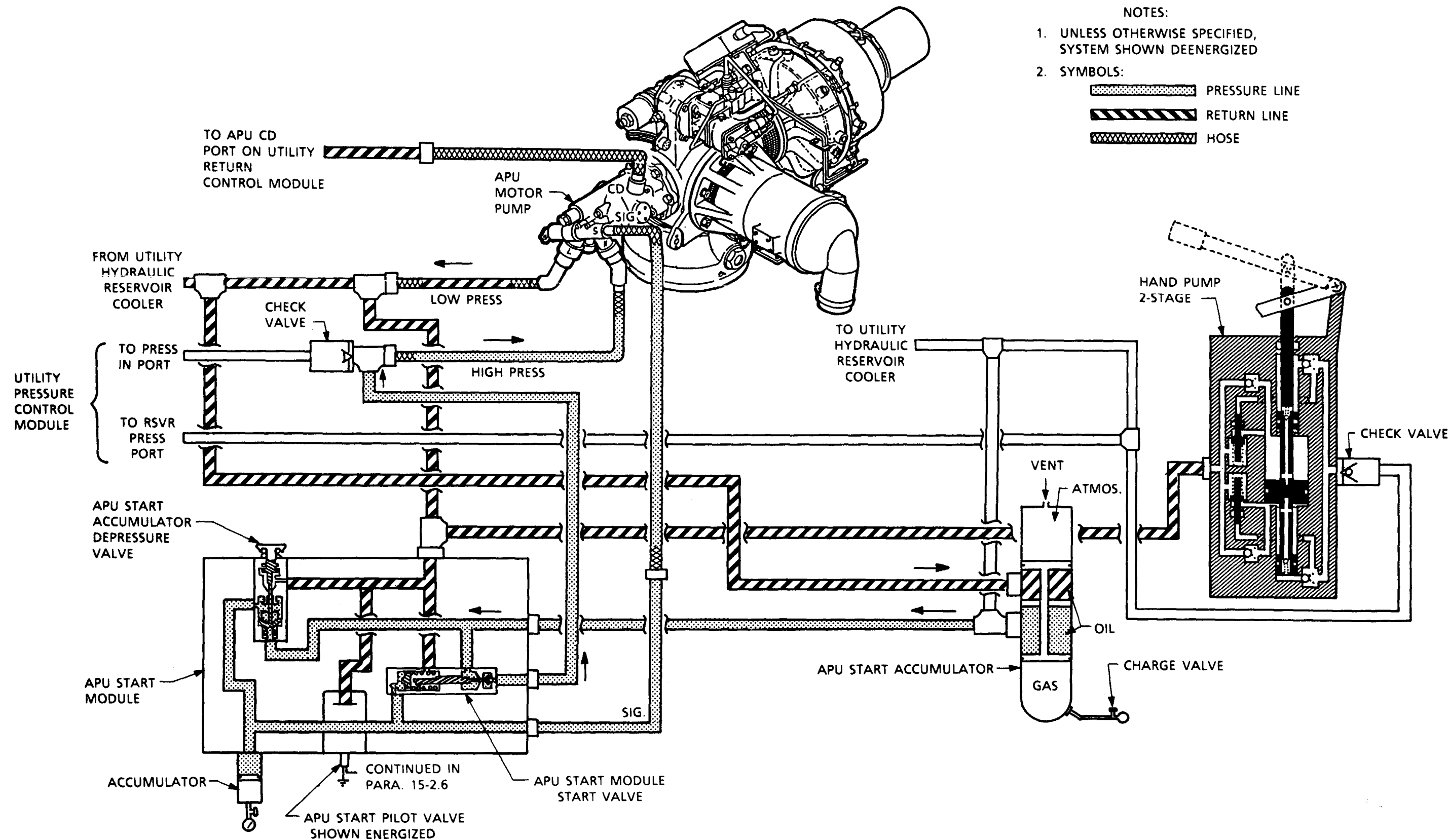


15-4.5 APU HYDRAULIC START MOTOR FLOW DIAGRAM

15-4.5

- NOTES:
1. UNLESS OTHERWISE SPECIFIED, SYSTEM SHOWN DEENERGIZED
  2. SYMBOLS:

 PRESSURE LINE  
 RETURN LINE  
 HOSE





15-4.7 APU HYDRAULIC STARTING SYSTEM VISUAL CHECK

15-4.7

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

Materials:  
None

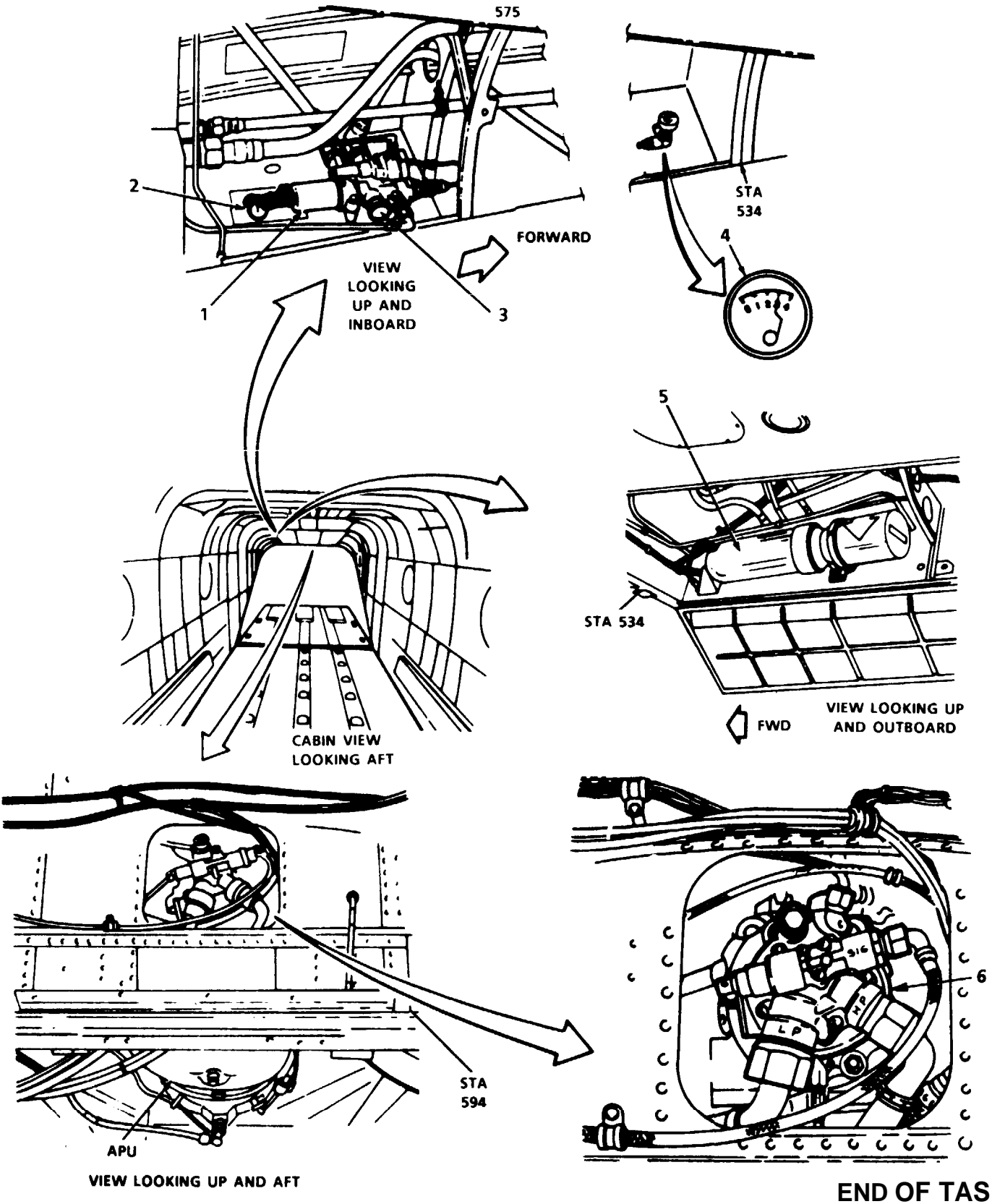
Personnel Required:  
Medium Helicopter Repairer

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Electrical Power Off  
Battery Disconnected  
Hydraulic Power Off  
Right Aft Transmission  
Baffle Open  
Cargo Ramp Operational Level  
(Task 7-3.4)

TASK	RESULT
1. Check APU start module accumulator (1).	If accumulator (1) or accumulator gage (2) is damaged, replace accumulator.
2. Check APU start module (3).	If any tube to module (3) is loose or damaged, tighten or replace it as required. If electrical connector to module is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.
3. Check APU start accumulator gage (4).	If gage (4) is loose or damaged, tighten or replace it as required.
4. Check APU start accumulator (5).	If accumulator (5) is loose or damaged, tighten or replace it as required. If any tube to accumulator is loose or damaged, tighten or replace it as required.
5. Check APU motor pump (6).	If pump (6) is loose or damaged, tighten or replace it as required. If any hose to pump is loose or damaged, tighten or replace it as required.

FOLLOW-ON MAINTENANCE:  
None



15-4.8 APU HYDRAULIC STARTING SYSTEM  
OPERATIONAL CHECK

INITIAL SETUP

*Applicable Configurations:*  
All

*References:*  
TM 55-1520-240-23

*Tools:*  
None

*Equipment Condition:*  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
Visual Check of Apu Hydraulic  
Starting System Performed (Task 15-4.7)

*Materials:*  
None

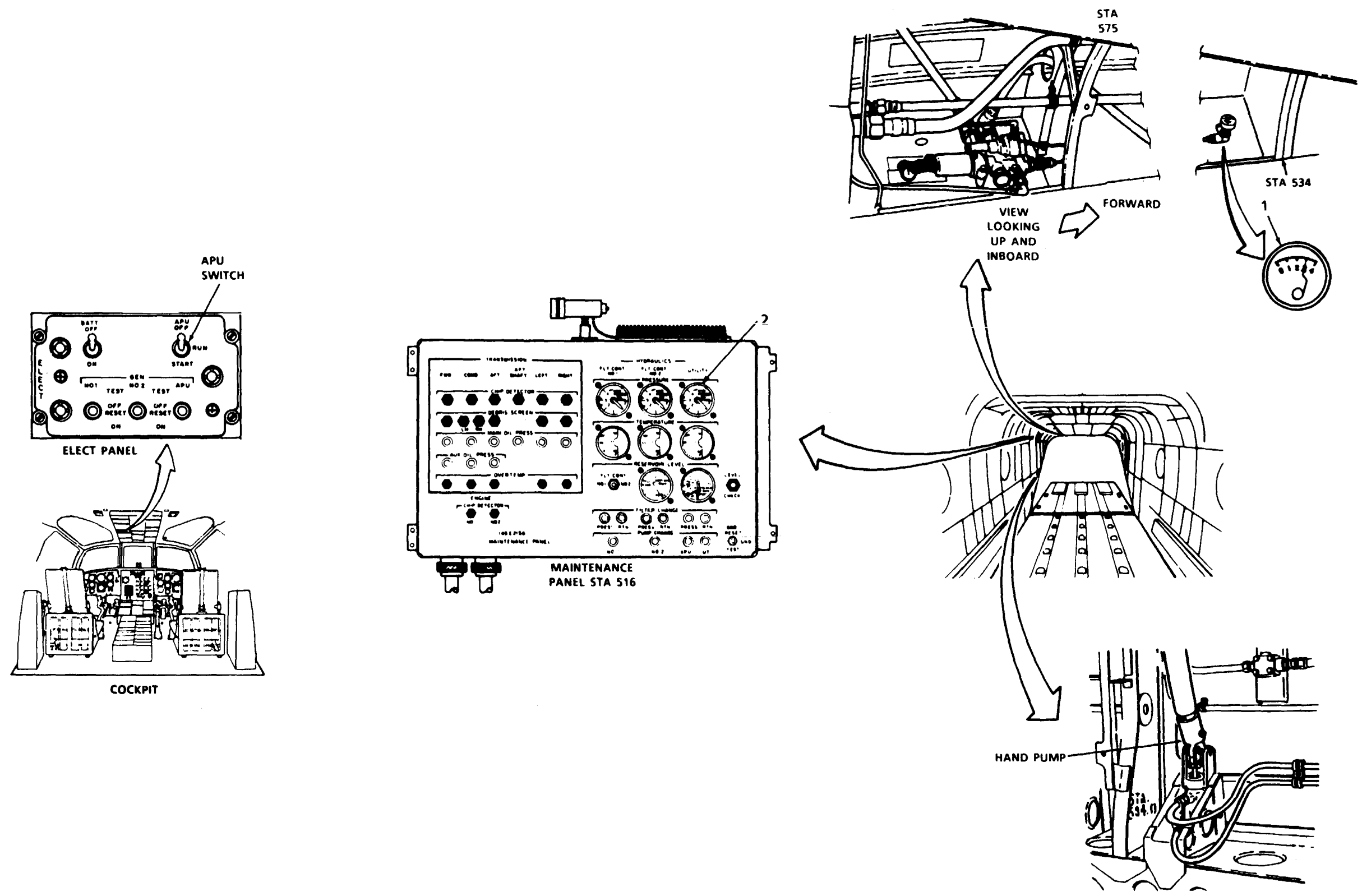
*Personnel Required:*  
Medium Helicopter Repairer (2)

TASK	RESULT
1. Check APU start accumulator gage (1).	Gage (1) shall indicate between 2850 and 3100 psi. If it does not, use hand pump to charge accumulator. If gage still does not indicate between 2850 and 3100 psi, go to task 15-4.9.
2. Start APU. Refer to task 15-1.5.	APU shall begin to motor and accelerate to running speed within 30 seconds. UTILITY HYDRAULICS indicator (2) shall indicate 3200 to 3500 psi. If indicator does not indicate 3200 to 3500 psi, stop apu and go to task 7-2.4. If APU does not motor, go to task 15-4.10. If APU motors but does not start and ESU bite indicates ○ ○ ○ ● then ● ○ ○ ● , go to task 15-4.11.
3. Stop APU. Refer to task 15-1.5.	

FOLLOW-ON MAINTENANCE:  
TM 55-1520-240-23

15-4.8 APU HYDRAULIC STARTING SYSTEM  
OPERATIONAL CHECK (CONTINUED)

15-4.8



END OF TASK

15-4.9 APU START ACCUMULATOR GAGE DOES NOT INDICATE  
AT LEAST 2850 PSI

15-4.9

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Personnel Required:  
Medium Helicopter Repairer (2)

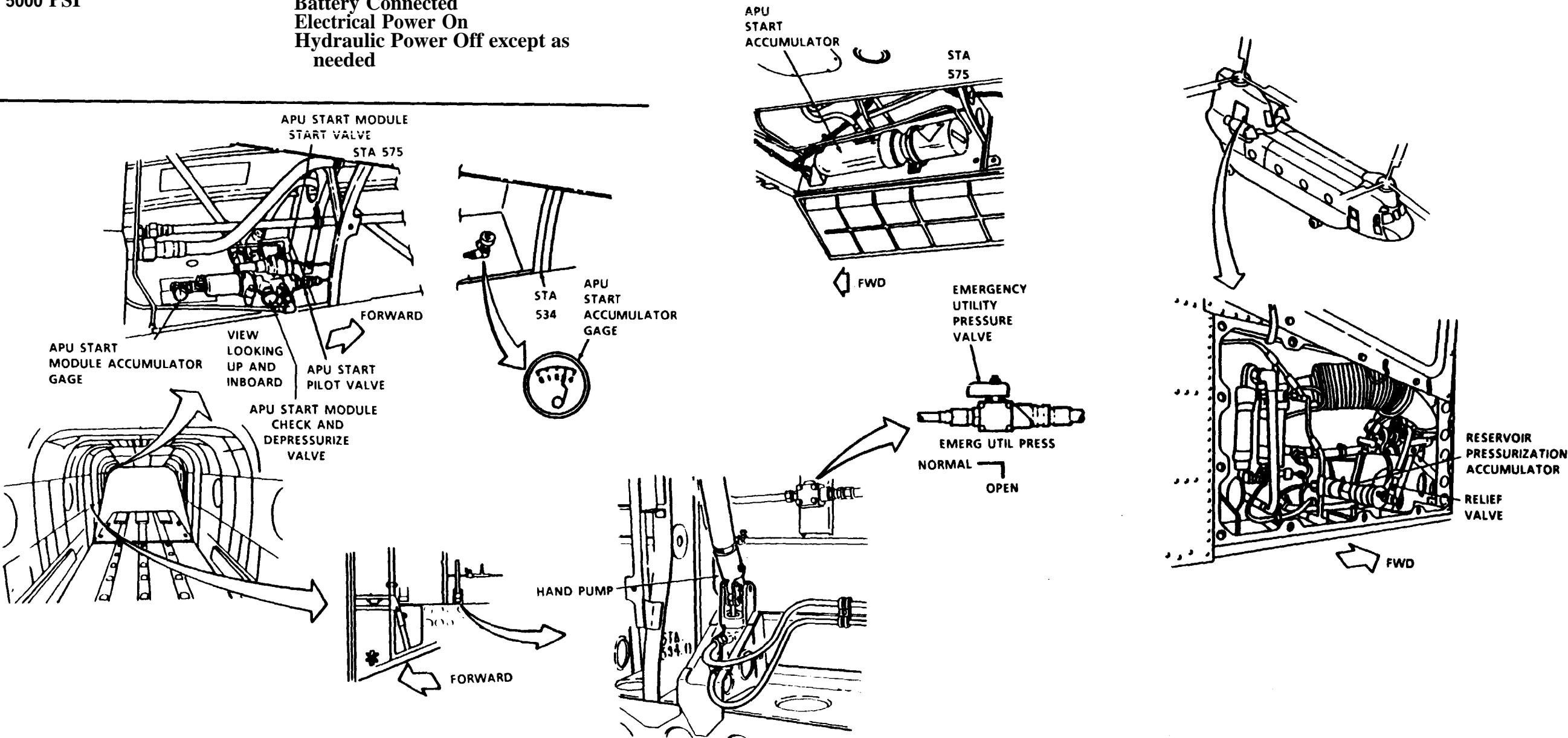
Applicable Configurations:  
All

Took:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692  
Hydraulic Power Source  
Pressure Gage 5000 PSI

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off except as  
needed

Materials:  
None

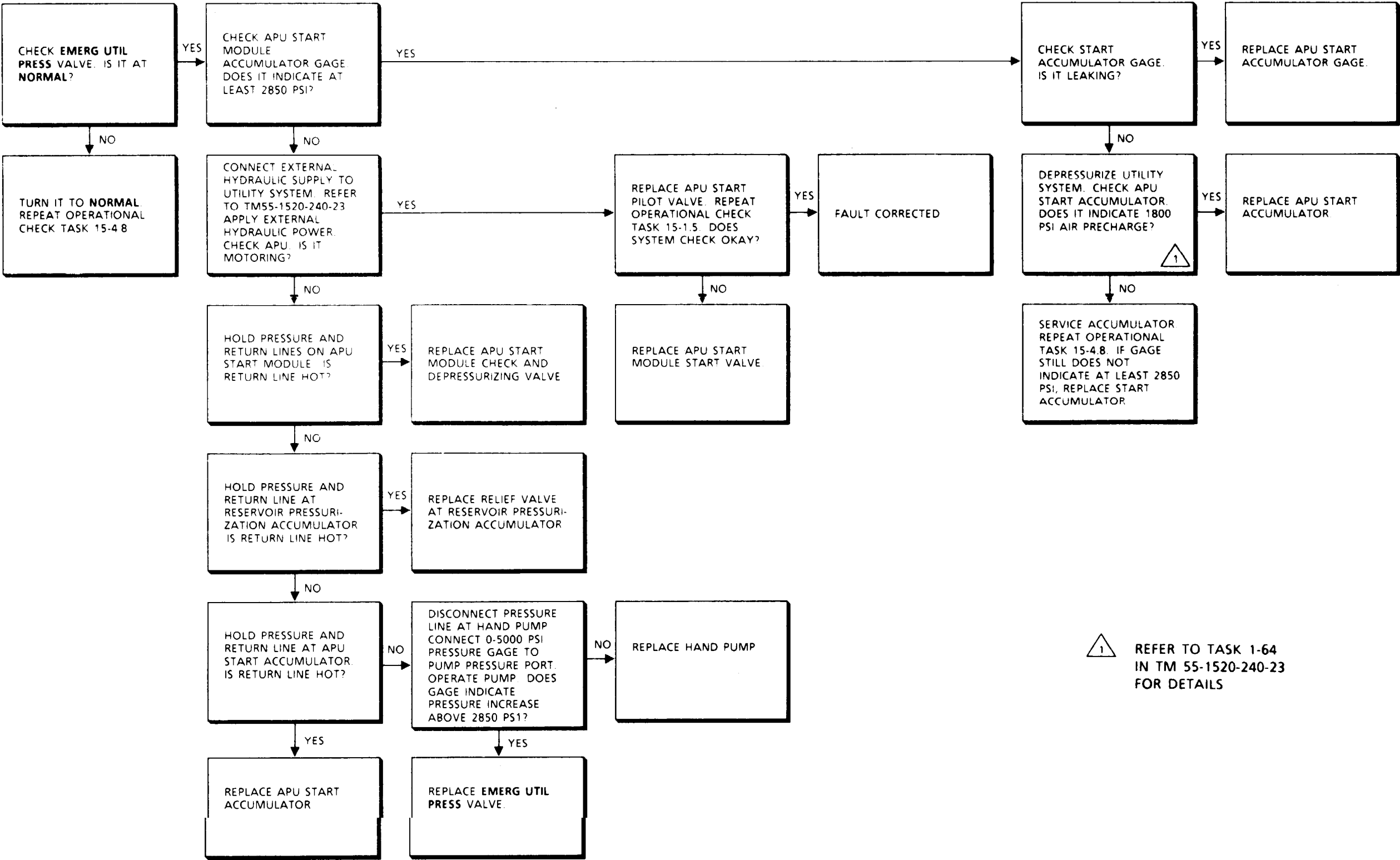


GO TO NEXT PAGE



15-4.9 APU START ACCUMULATOR GAGE DOES NOT INDICATE AT LEAST 2850 PSI (CONTINUED)

15-4.9



END OF TASK

15-4.10 APU DOES NOT MOTOR

15-4.10

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

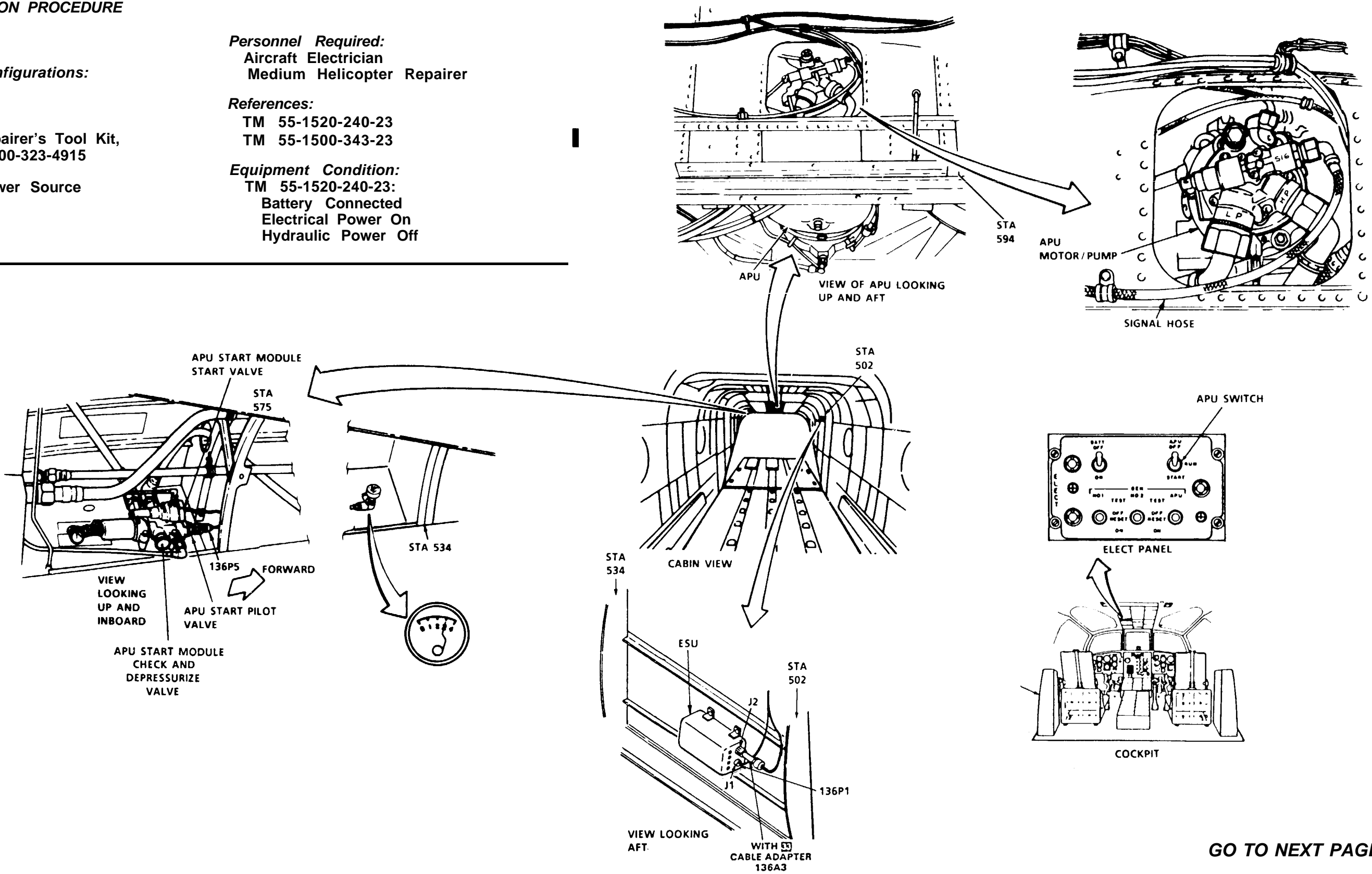
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter  
Hydraulic Power Source

Materials:  
None

Personnel Required:  
Aircraft Electrician  
Medium Helicopter Repairer

References:  
TM 55-1520-240-23  
TM 55-1500-343-23

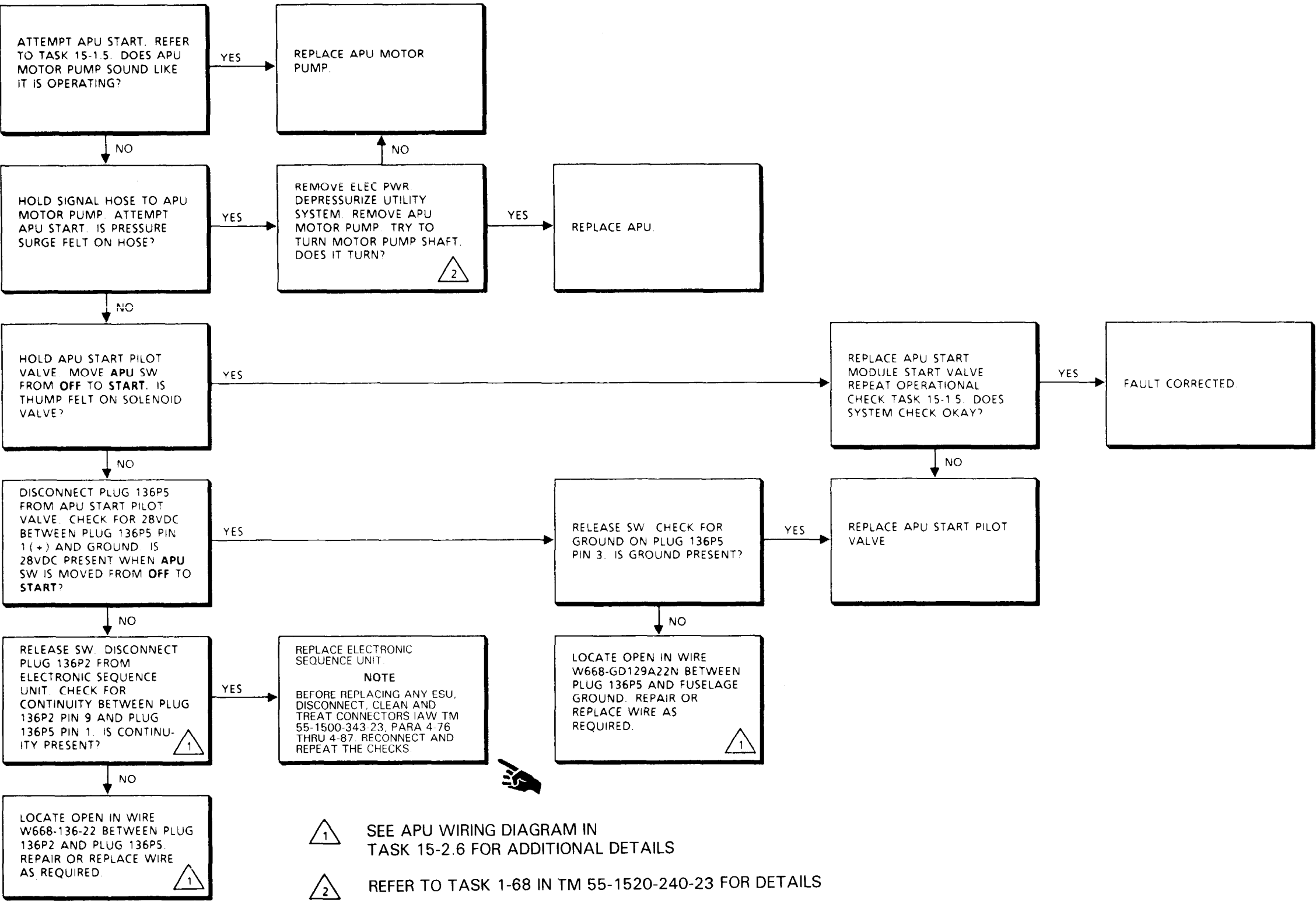
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



GO TO NEXT PAGE

15-4.10 APU DOES NOT MOTOR (CONTINUED)

15-4.10



END OF TASK

15-4.11 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○●●● OR ○○●● THEN ●○○● (HYDRAULIC FAULT)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

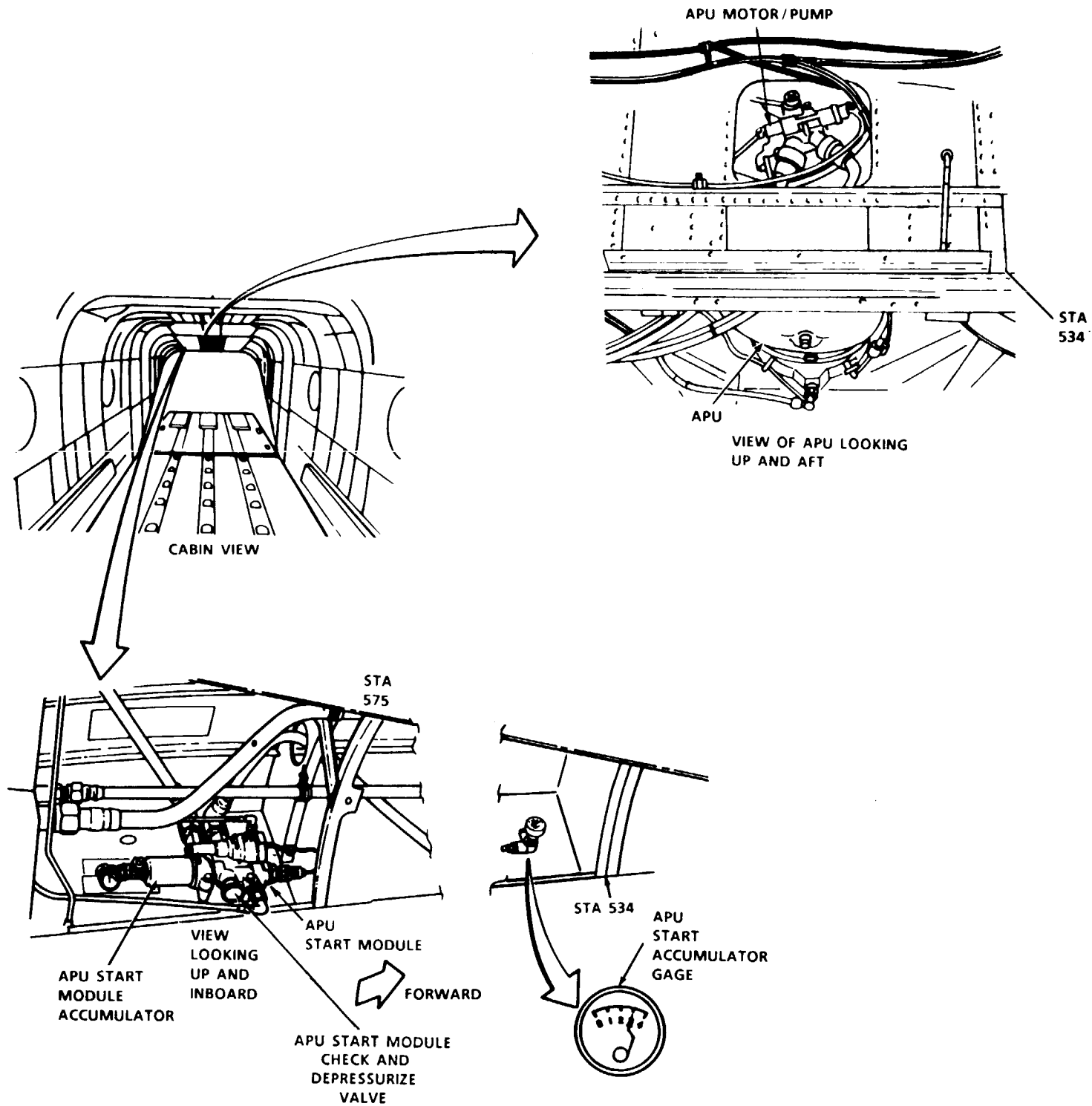
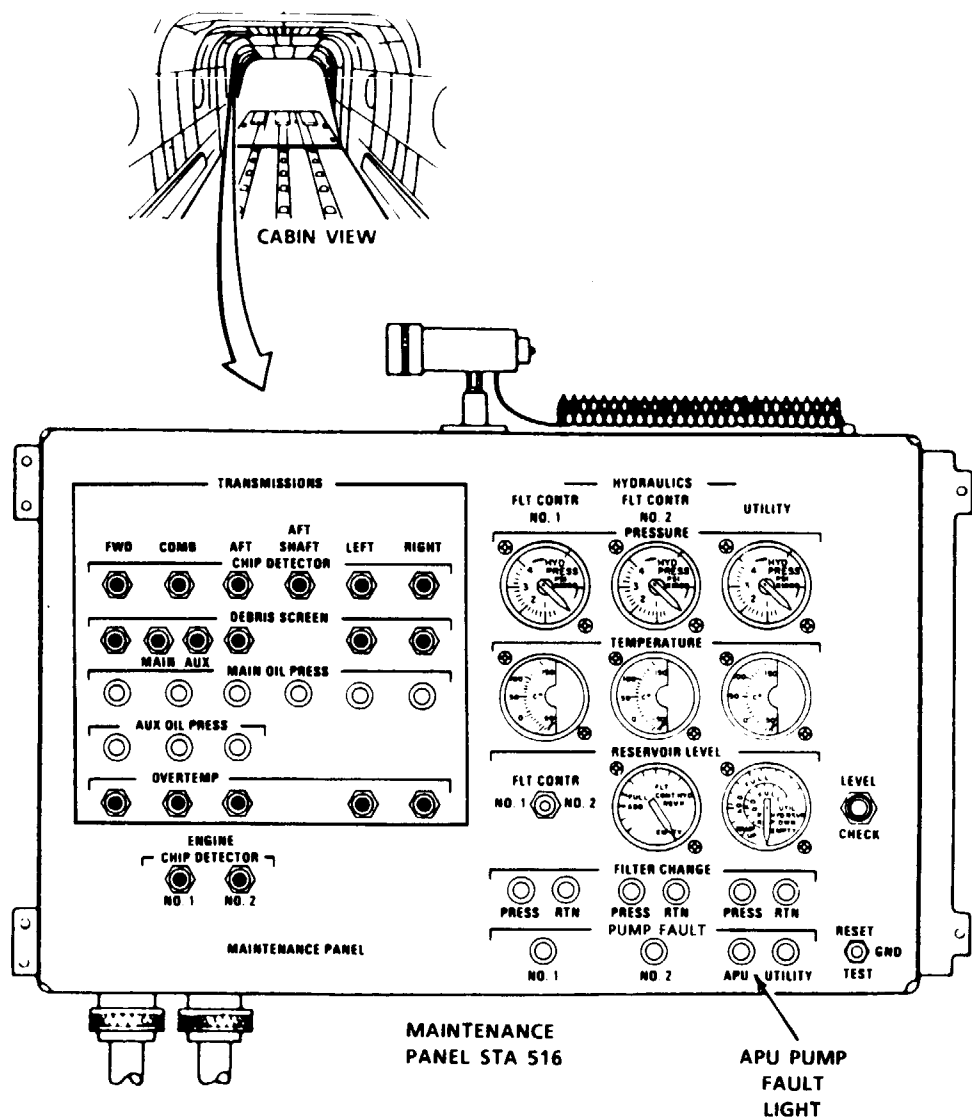
Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 6180-00-323-4692  
Hydraulic Power Source

Materials:  
None

Personnel Required:  
Medium Helicopter Repairer (2)

References:  
TM 55-1520-240-23

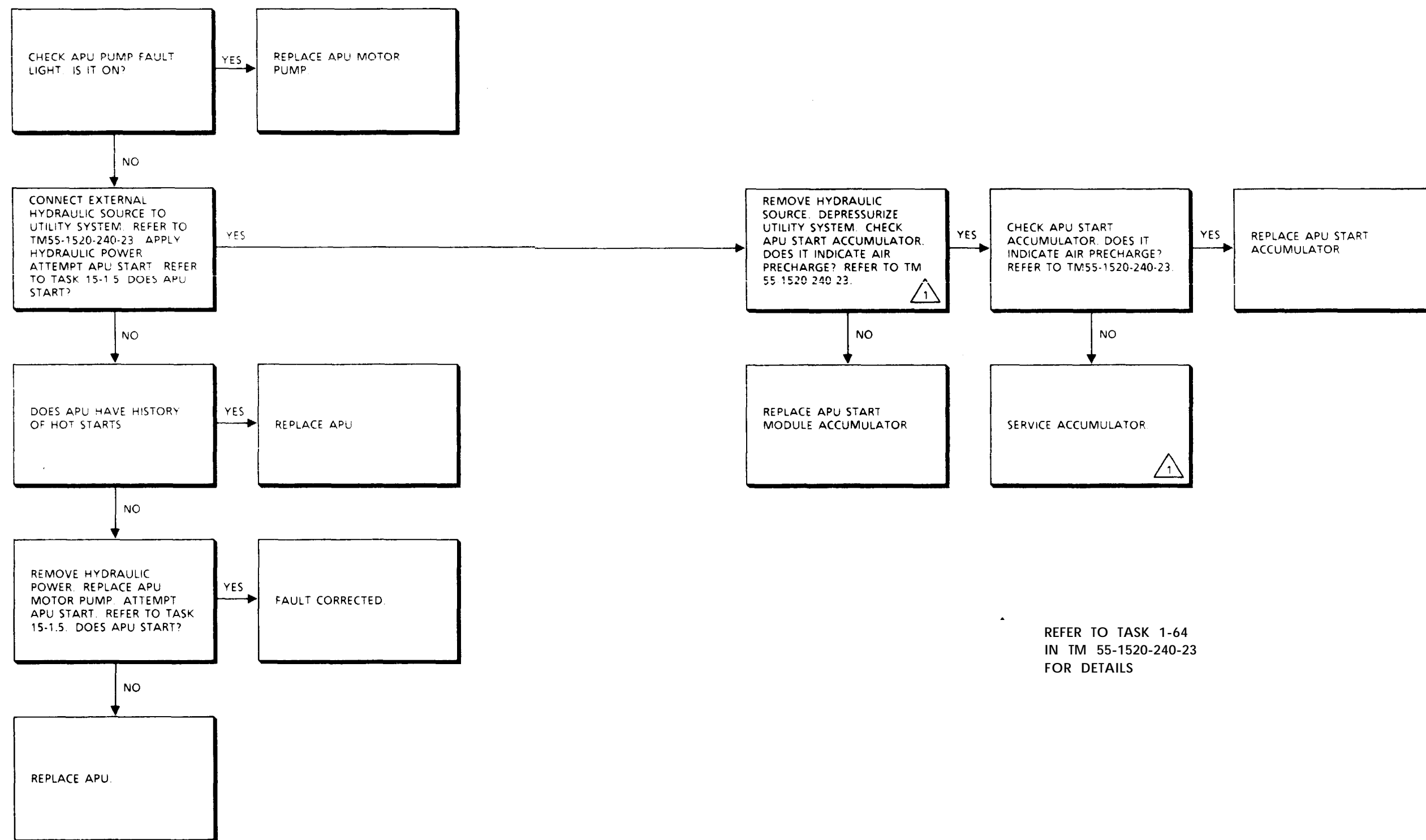
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



GO TO NEXT PAGE

15-4.11 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○ ● ● ● OR ○ ○ ● ●  
THEN ● ○ ○ (HYDRAULIC FAULT) (CONTINUED)

15-4.11



REFER TO TASK 1-64  
IN TM 55-1520-240-23  
FOR DETAILS

END OF TASK

Change 8 15-83

15-4.12 APU PUMP FAULT LIGHT IS ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

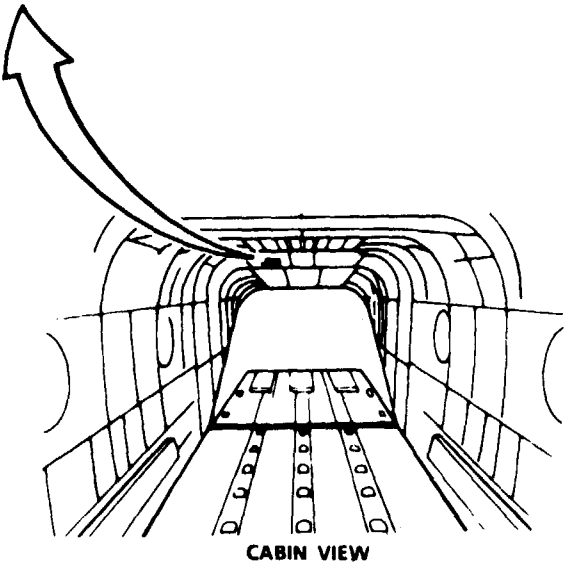
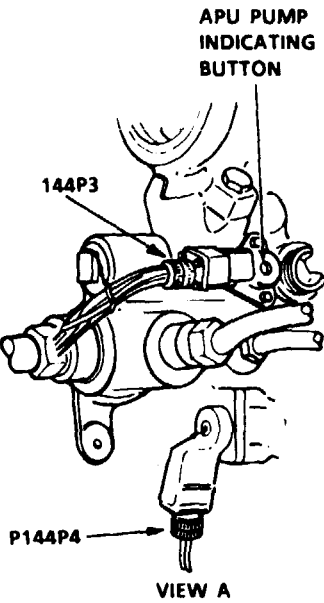
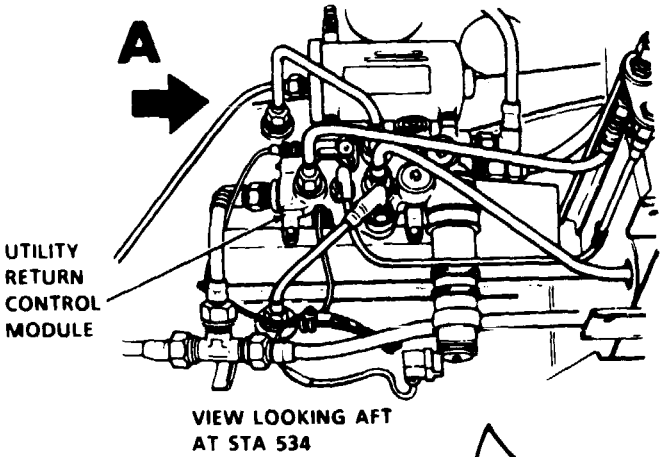
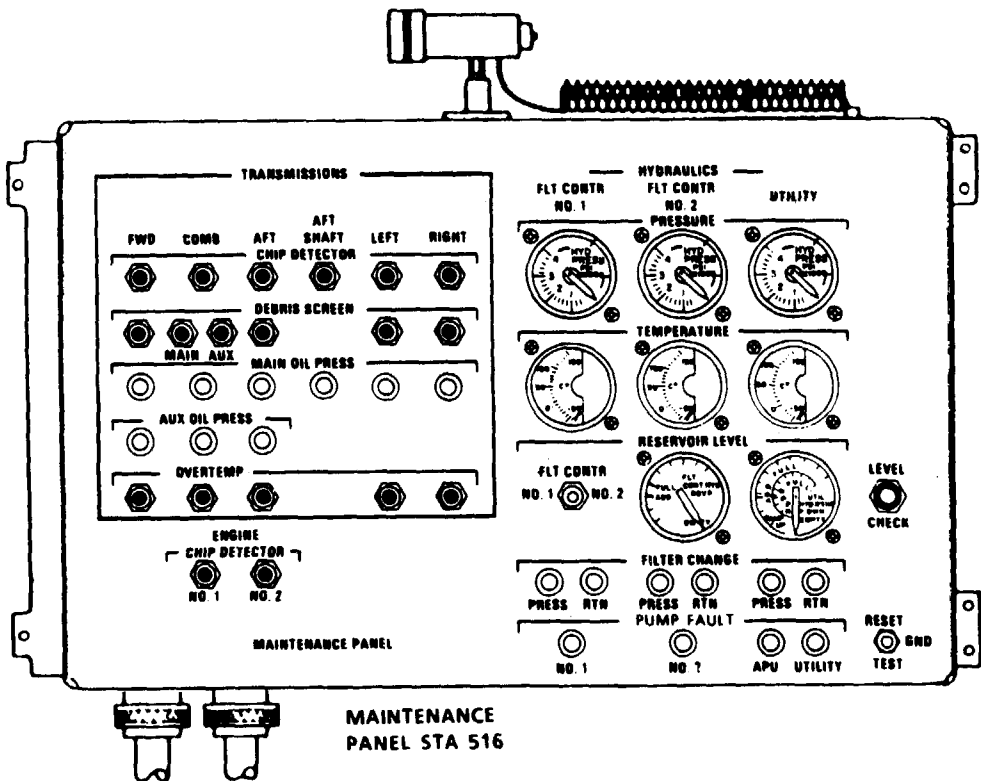
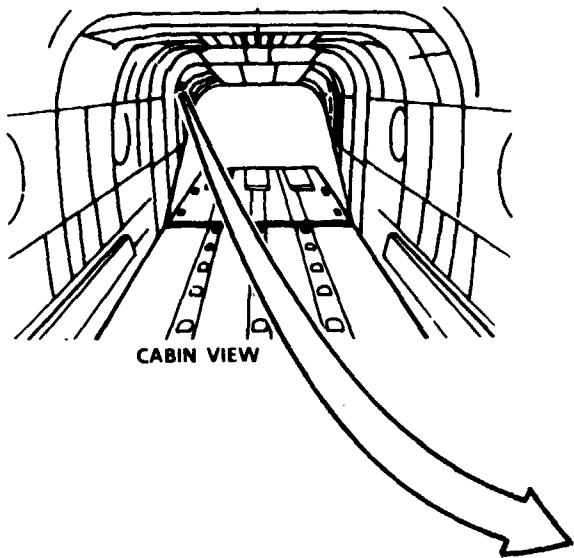
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692  
Multimeter

Materials:  
None

Personnel Required:  
Medium Helicopter Repairer  
Aircraft Electrician

References:  
TM 55-1520-280-23

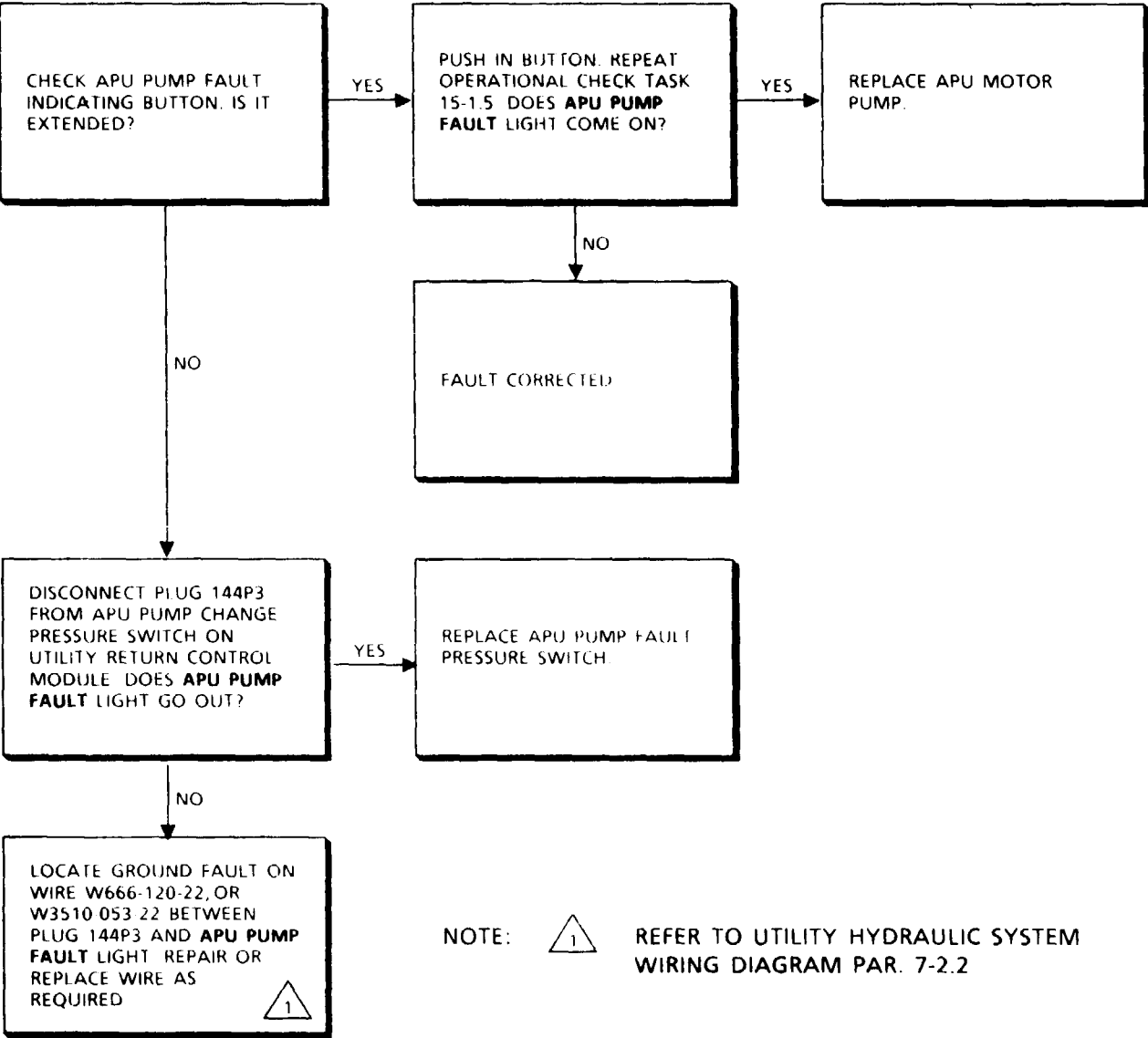
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On



GO TO NEXT PAGE

15-4.12 APU PUMP FAULT LIGHT IS ON (CONTINUED)

15-4.12



END OF TASK

## **15-5 APU / ENGINE HYDRAULIC STARTER SYSTEM**



PARAGRAPH 15-5

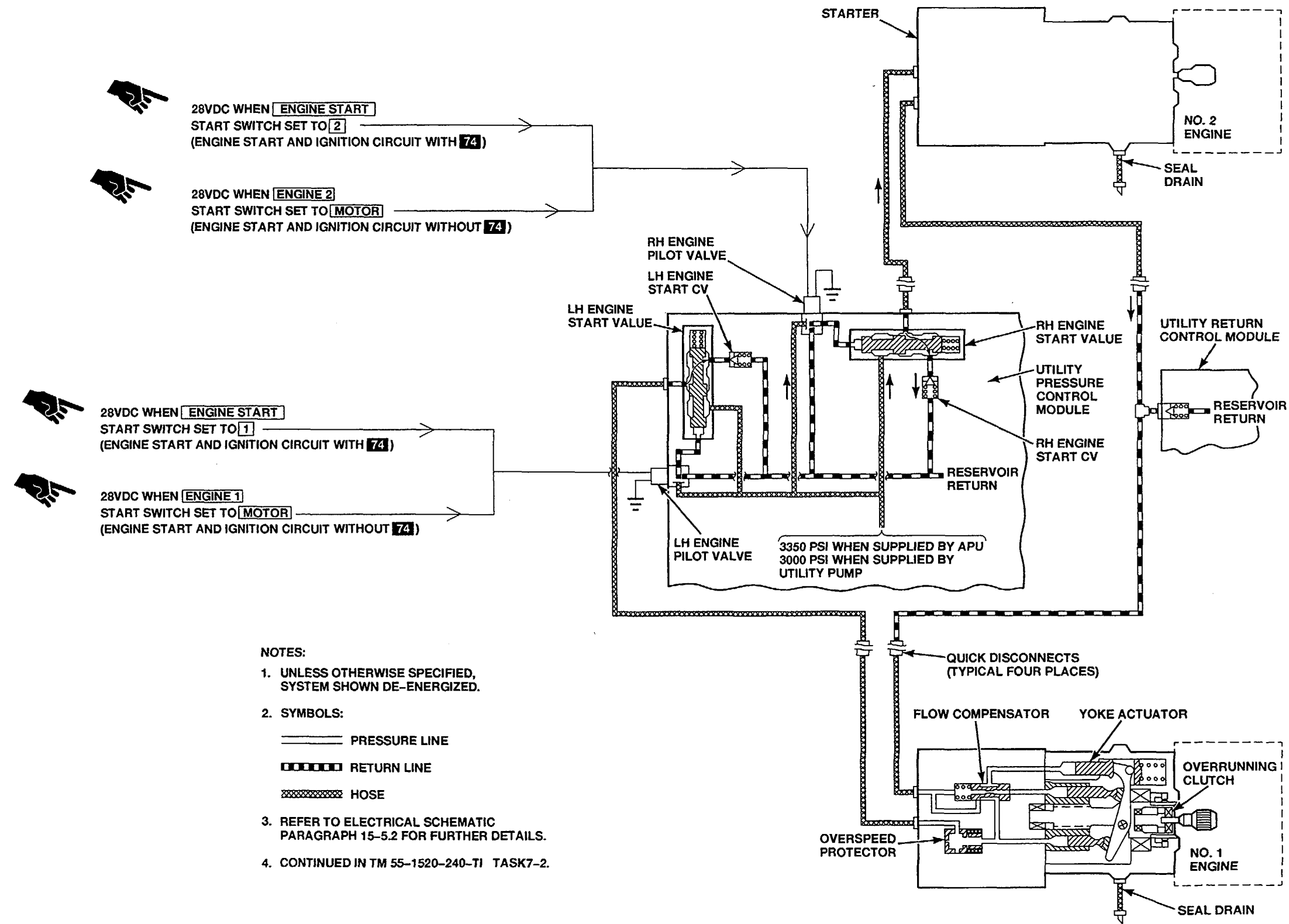
TABLE OF CONTENTS

APU/ENGINE HYDRAULIC STARTER SYSTEM TROUBLESHOOTING

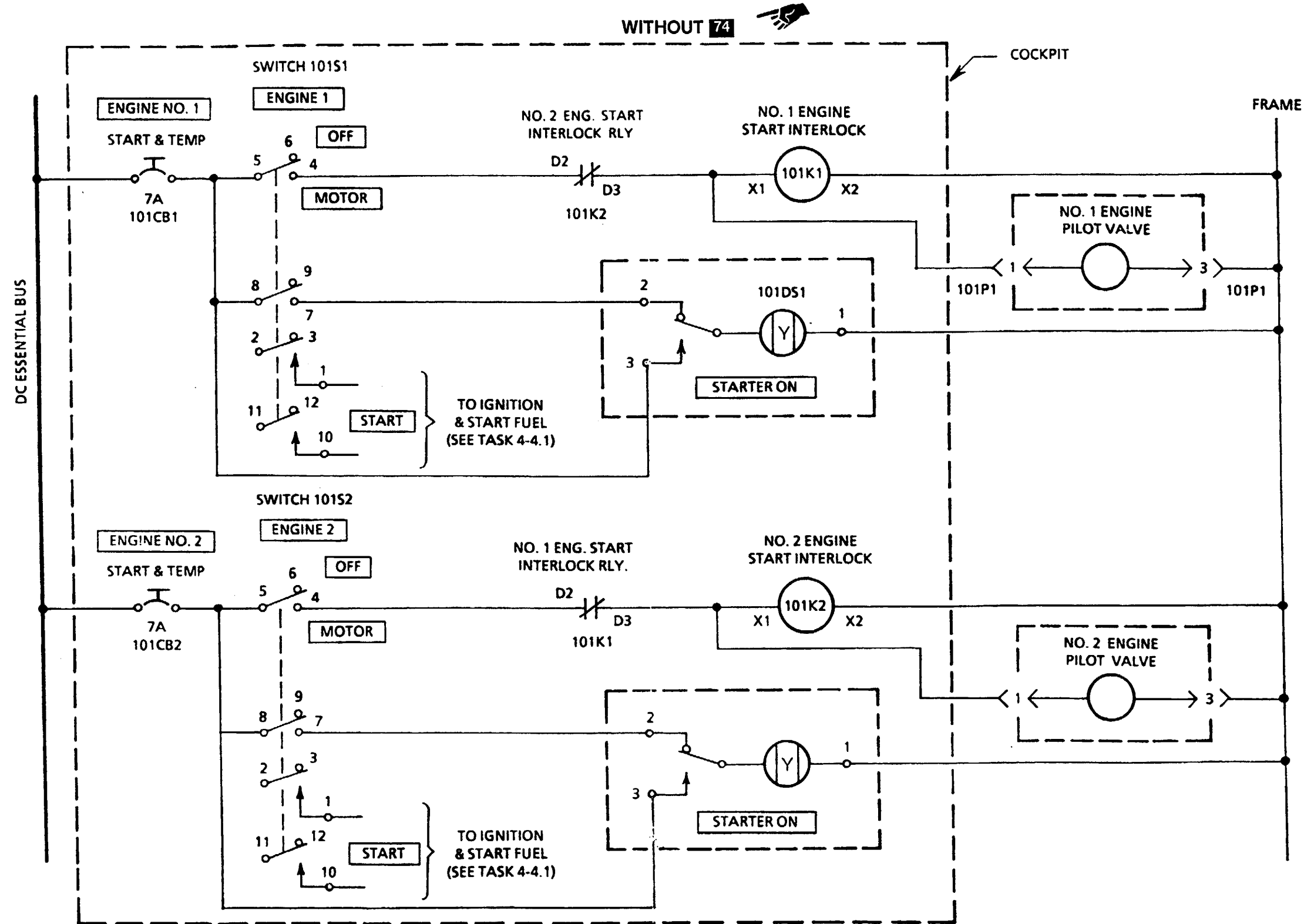
PARAGRAPH	DESCRIPTION	FUNCTION	PAGE
15-5	ENGINE HYDRAULIC STARTING SYSTEM		15-87
15-5.1	ENGINE HYDRAULIC STARTING SYSTEM SCHEMATIC	DRAWING	15-90
15-5.2	ENGINE START SYSTEM ELECTRICAL SCHEMATIC (HYDRAULIC PORTION)	DRAWING	15-91
15-5.3	ENGINE START SYSTEM WIRING DIAGRAM (HYDRAULIC PORTION)	TASK	15-92
15-5.4	ENGINE HYDRAULIC STARTING SYSTEM VISUAL CHECK	TASK	15-95
15-5.5	ENGINE HYDRAULIC STARTING SYSTEM OPERATIONAL CHECK (WITHOUT 74 )	TASK	15-96
15-5.5.1	ENGINE HYDRAULIC STARTING SYSTEM OPERATIONAL CHECK (WITH 74)	TASK	15-96.2
15-5.6	NO. 1 OR NO. 2 ENGINE DOES NOT MOTOR (HYDRAULIC SYSTEM) (WITHOUT 74 )	TASK	15-98
15-5.6.1	NO. 1 OR NO. 2 ENGINE DOES NOT MOTOR (HYDRAULIC SYSTEM) (WITH 74 )	TASK	15-98.2
15-5.7	NO. 1 OR NO. 2 ENGINE KEEPS MOTORING WHEN ENGINE START SWITCH SET TO OFF	TASK	15-100

15-5.1 ENGINE HYDRAULIC STARTING SYSTEM SCHEMATIC

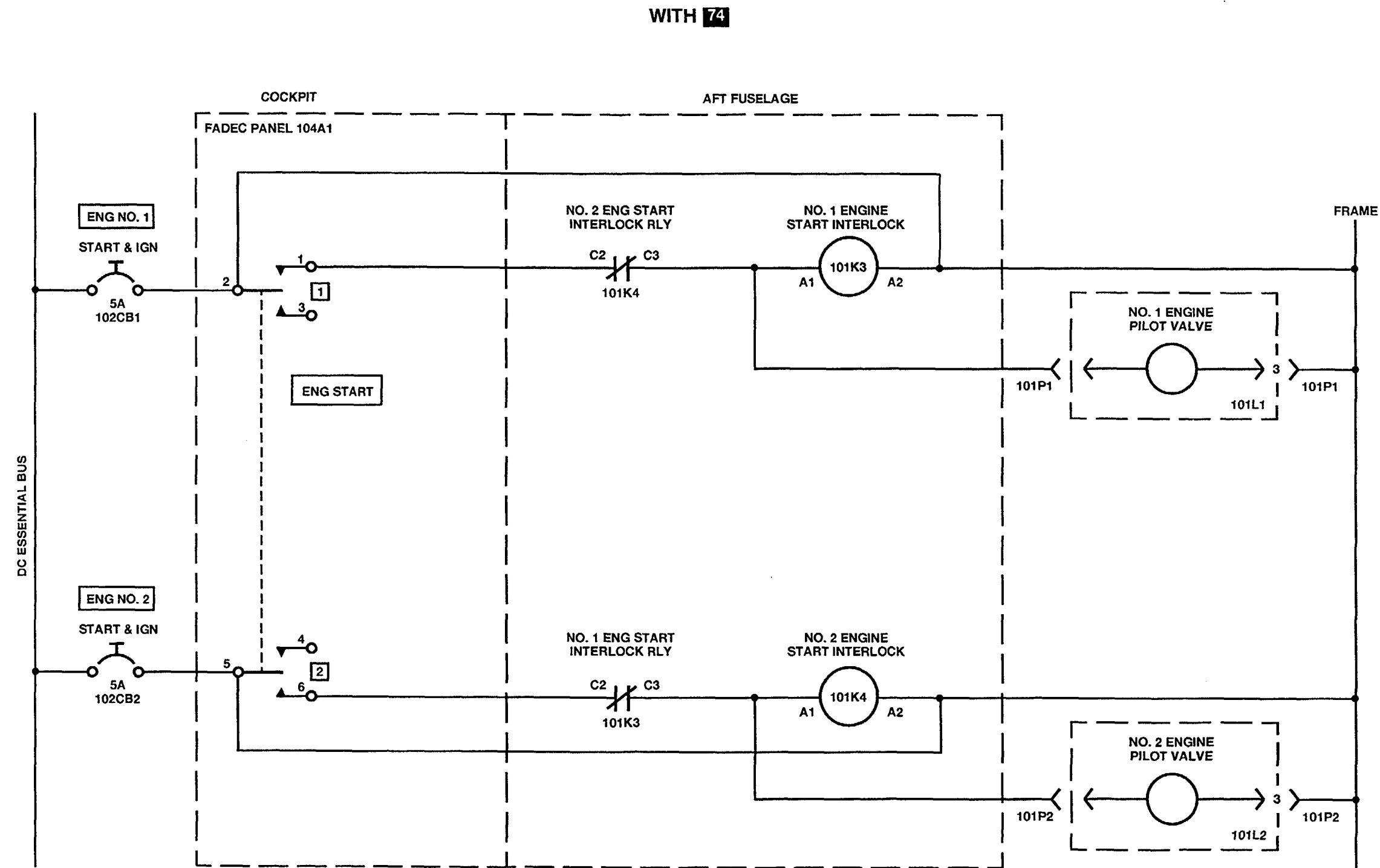
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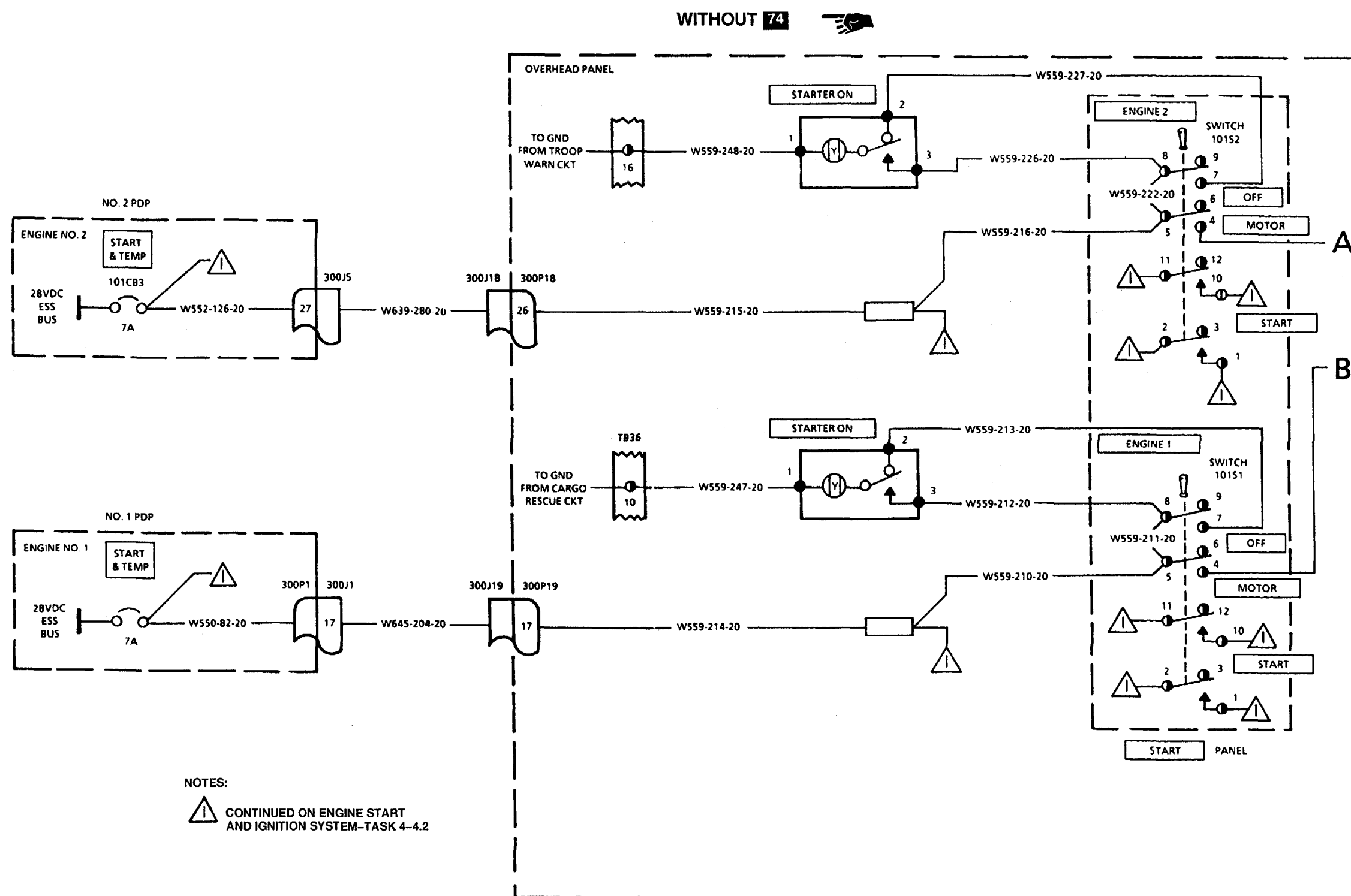
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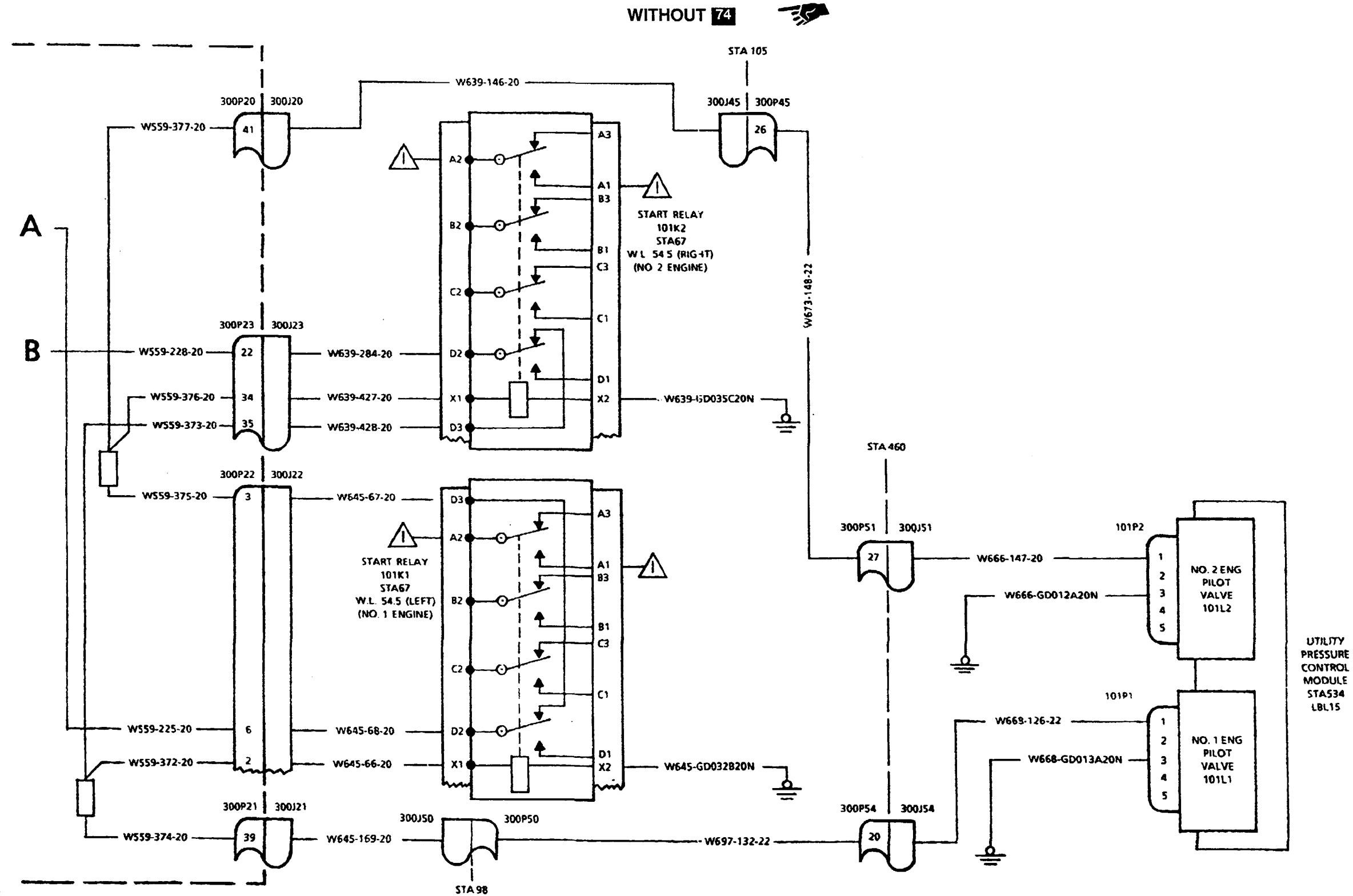
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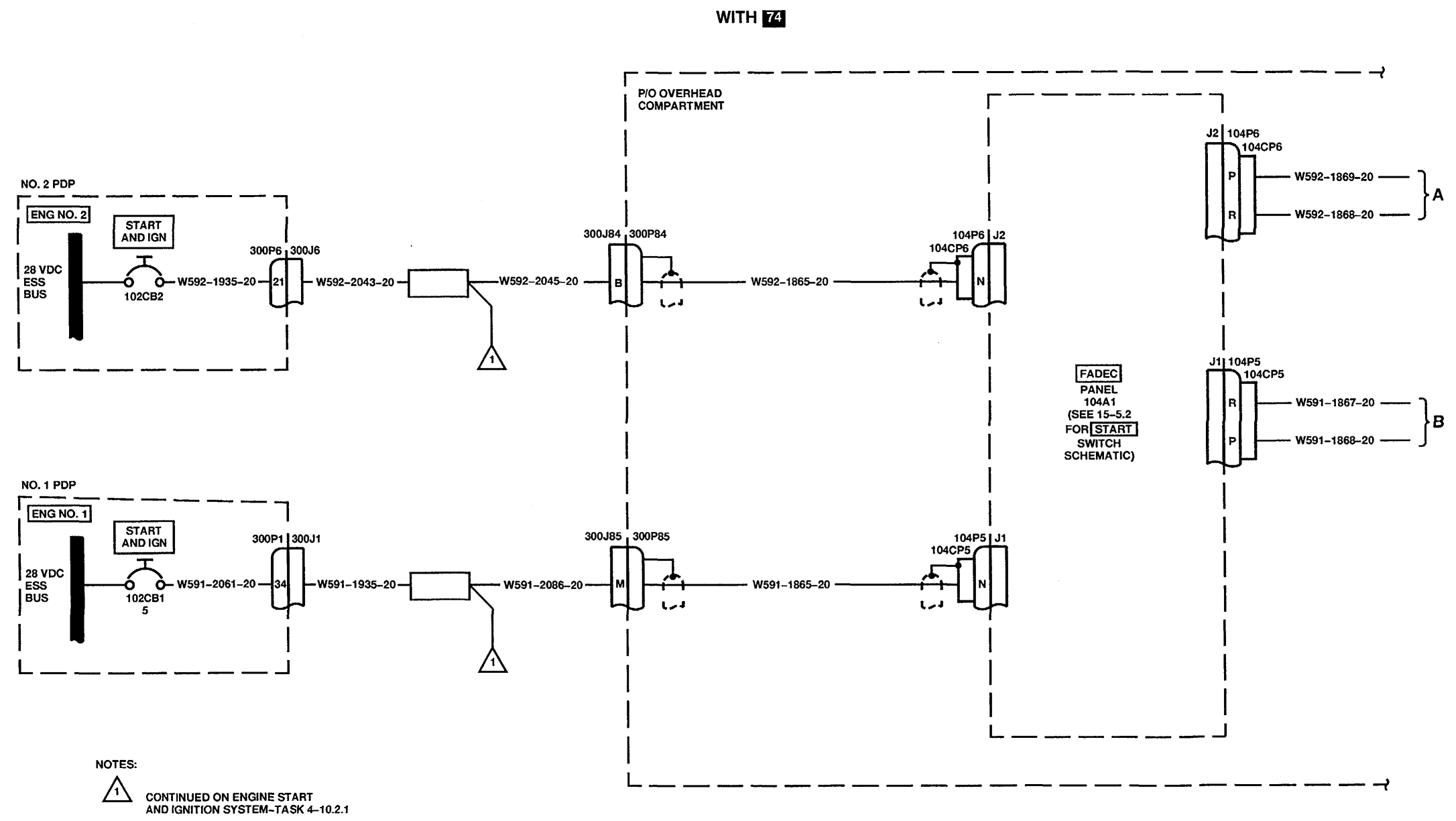
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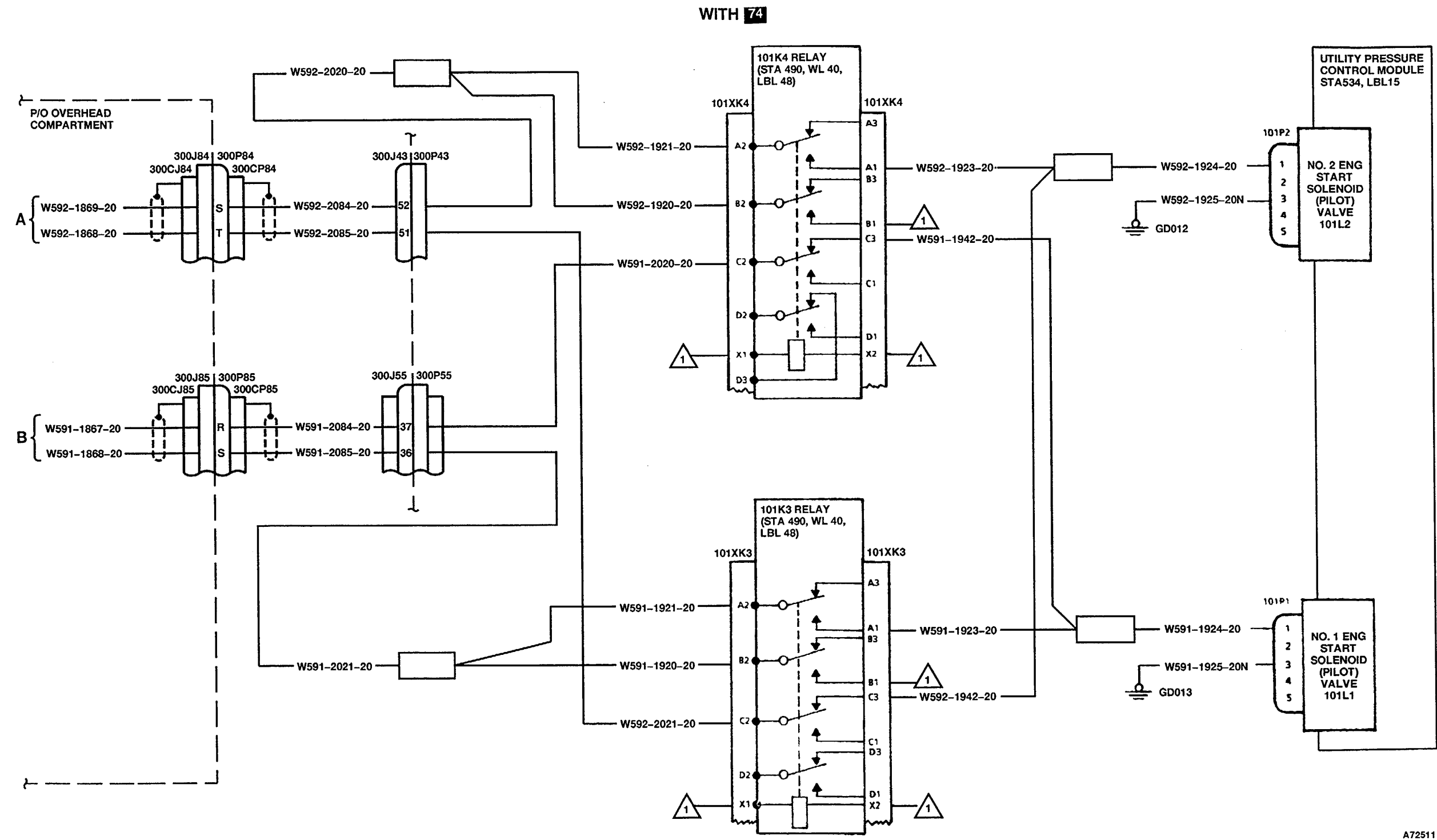
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A72510



END OF TASK  
Change 23 15-94.1



15-5.4 ENGINE HYDRAULIC STARTING SYSTEM VISUAL CHECK

15-5.4

INITIAL SETUP

Applicable Configurations:

All

Equipment Condition:

Tools:

Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

Materials:

None

Personnel Required:

Medium Helicopter Repairer

References:

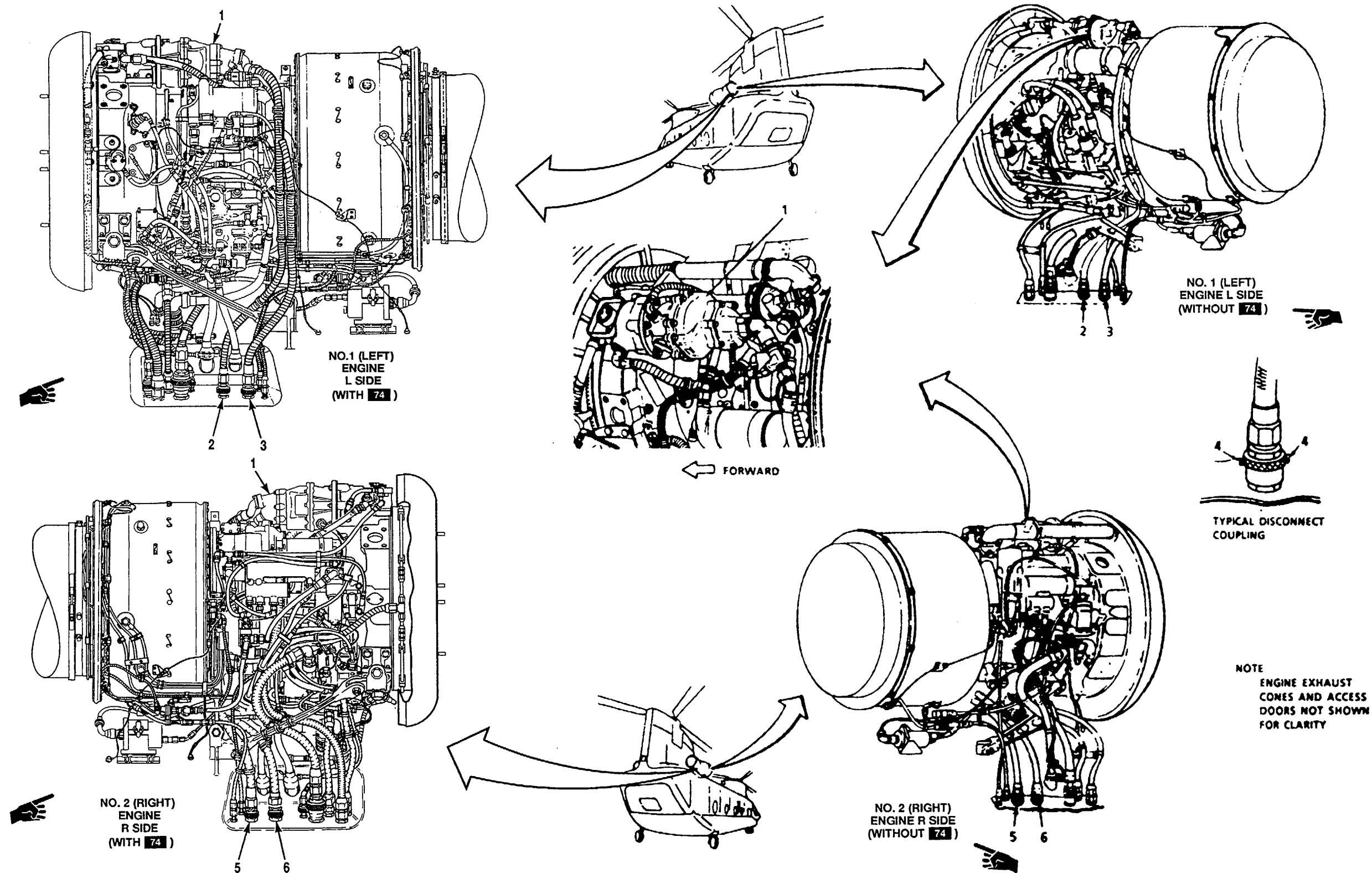
TM 551520-240-23

TM 55-1520-240-23:

Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off  
No. 1 or No. 2 Engine Work Platforms and  
Access Doors Open

TASK	RESULT
<b>CHECK NO. 1 ENGINE STARTER INSTALLATION</b>	
1. Check No. 1 engine starter (1).	If starter (1) is loose or damaged, tighten or replace it as required.
2. Check disconnect couplings (2 and 3) for extended buttons (4) or evidence of leaks.	If coupling (2 or 3) is not secured or buttons (4) are not extended, connect coupling. If buttons are still not extended, replace coupling. If buttons are extended and leaks are evident, repair or replace coupling or replace hose.
<b>CHECK NO. 2 ENGINE STARTER INSTALLATION</b>	
3. Check No. 2 engine starter (1).	If starter (1) is loose or damaged, tighten or replace it as required.
4. Check disconnect couplings (5 and 6) for extended buttons (4) or evidence of leaks.	If coupling (5 or 6) is not secured or buttons (4) are not extended, connect coupling. If buttons are still not extended, replace coupling. If buttons are extended and leaks are evident, repair or replace coupling or replace hose.

FOLLOW-ON MAINTENANCE:  
TM 55-1520-240-23:  
Close No. 1 or No. 2 engine work platform and access door.



A72522

15-5.5 ENGINE HYDRAULIC STARTING SYSTEM OPERATIONAL CHECK

15-5.5

INITIAL SETUP  
**Applicable Configurations:**  
■ Without 74

**Tools:**  
None

**Materials:**  
None

**Personnel Required:**  
Medium Helicopter Repairer (2)

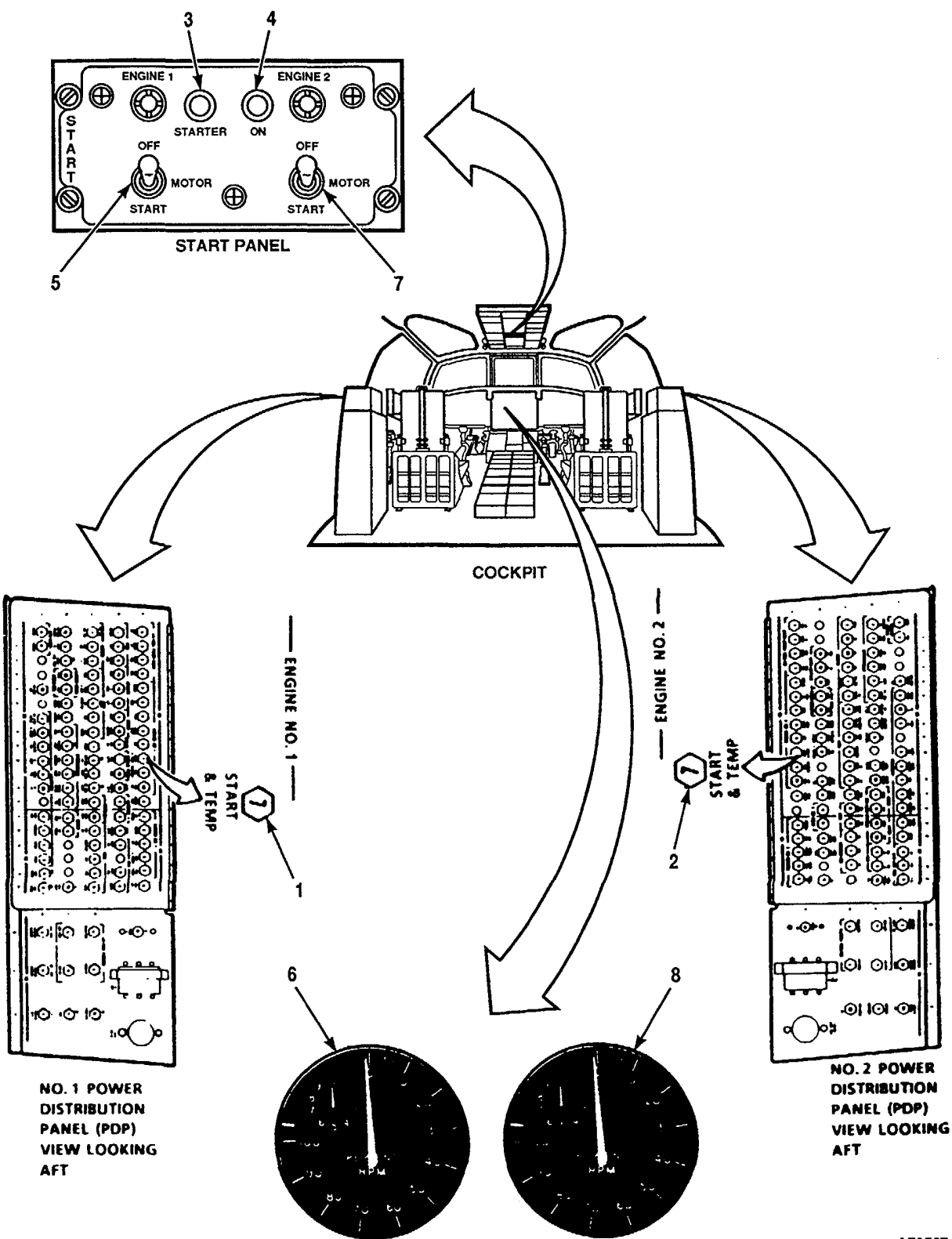
**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
Ignition Switch Key Removed

**General Safety Instructions:**

**WARNING**  
Make sure that rotor blades are clear of obstructions and that personnel are aware that rotor blades may turn during engine motoring. Turning blades can cause damage or serious injury to personnel.

TASK	RESULT
1. Check that ENGINE NO. 1 START & TEMP circuit breaker (1) is closed.	If START & TEMP circuit breaker (1) is open, close it. If it opens again, go to task 4-4.6.
2. Check that ENGINE NO. 2 START & TEMP circuit breaker (2) is closed.	If START & TEMP circuit breaker (2) is open, close it. If it opens again, go to task 4-4.8.
3. Press and release ENGINE 1 STARTER ON light (3).	Light (3) shall momentarily come on. If it does not light, go to task 4-4.9.
4. Press and release ENGINE 2 STARTER ON light (4).	Light (4) shall momentarily come on. If it does not light, go to task 4-4.10.
<b>MOTOR NO. 1 ENGINE</b>	
5. Set ENGINE 1 START switch (5) to MOTOR.	ENGINE 1 STARTER ON light (3) shall come on. NO. 1 ENGINE gas producer tachometer (6) shall indicate <u>10 to 15% N1</u> as starter motors engine. If ENGINE 1 STARTER light does not come on, go to task 4-4.9. If engine does not motor, go to task 15-5.6.



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TASK	RESULT
6. Set ENGINE 1 START switch (5) to OFF.	NO. 1 ENGINE gas producer tachometer (6) indication shall decrease to 0. If tachometer indication does not decrease or engine continues to motor, go to task 15-5.7.
MOTOR NO. 2 ENGINE	
7. Set ENGINE 2 START switch (7) to MOTOR.	ENGINE 2 STARTER ON light (4) shall come on. NO. 2 ENGINE gas producer tachometer (8) shall indicate 10 to 15% N1 as starter motors engine. If ENGINE 2 STARTER light does not come on, go to task 4-4.10. If engine does not motor, go to task 15-5.6.
8. Set ENGINE 2 START switch (7) to OFF.	NO. 2 ENGINE gas producer tachometer (8) indication shall decrease to 0. If tachometer indication does not decrease or engine continues to motor, go to task 15-5.7.

FOLLOW-ON MAINTENANCE:  
TM 55-1520-240-23:  
Battery disconnected.  
Electrical power off.  
Hydraulic power off.

15-5.5.1 ENGINE HYDRAULIC STARTING SYSTEM OPERATIONAL CHECK

15-5.5.1

INITIAL SETUP

Applicable Configurations:

With 74

Tools:

None

Materials:

None

Personnel Required:

Medium Helicopter Repairer (2)

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

Battery Connected

Electrical Power On

Hydraulic Power On

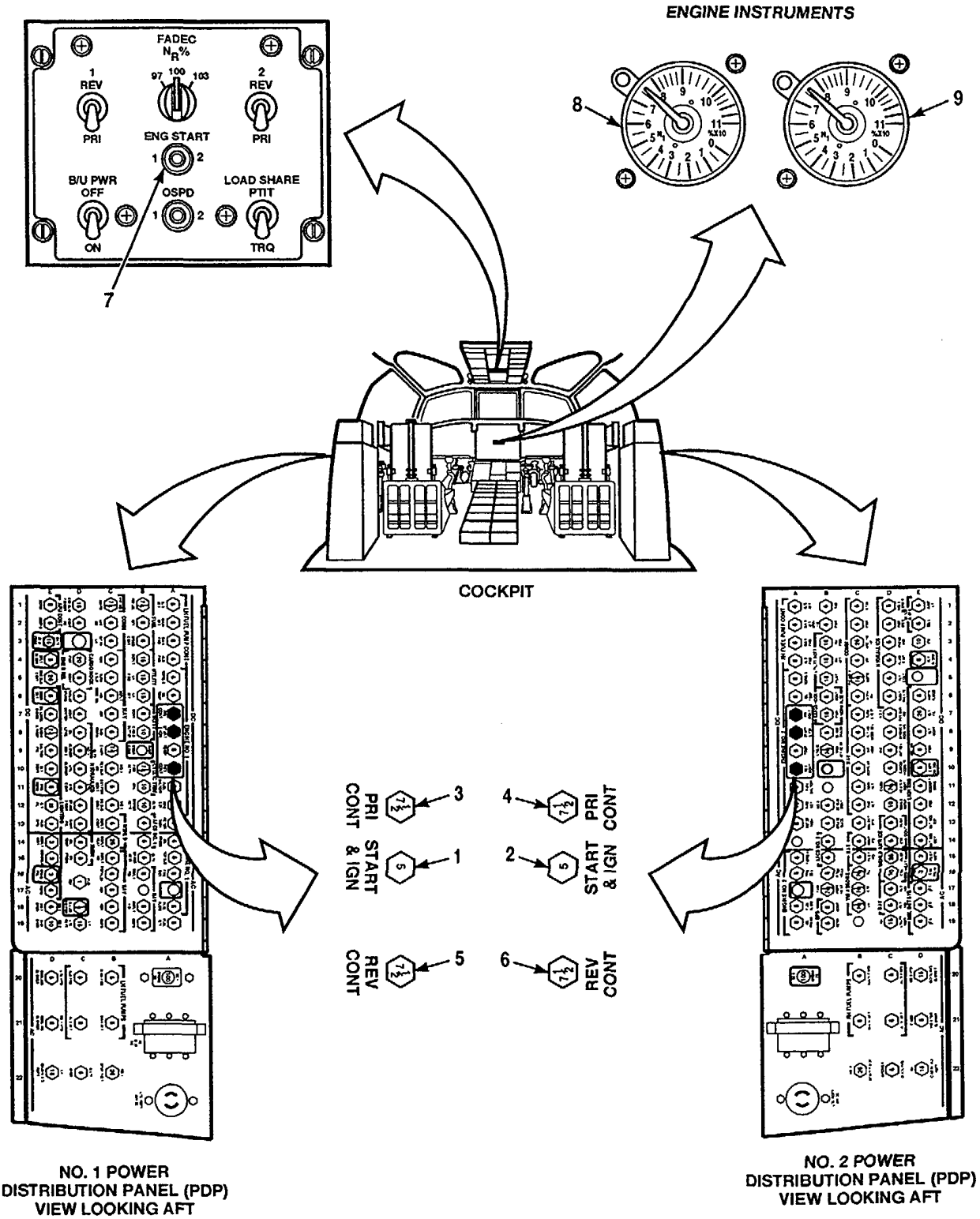
Ignition Switch Off (Key Removed)

General Safety Instructions:

WARNING

Make sure that rotor blades are clear of obstructions and that personnel are aware that rotor blades may turn during engine motoring. Turning blades can cause damage or serious injury to personnel.

TASK	RESULT
1. Check that ENGINE NO. 1 START & IGN circuit breaker (1) is closed.	If START & IGN circuit breaker (1) is open, close it. If it opens again, go to task 4-10.4.
2. Check that ENGINE NO. 2 START & IGN circuit breaker (2) is closed.	If START & IGN circuit breaker (2) is open, close it. If it opens again, go to task 4-10.4.
3. Check that ENGINE NO. 1 and ENGINE NO. 2 PRI CONT circuit breakers (3) and (4) are opened.	If PRI CONT circuit breakers (3) and (4) are closed, open them.
4. Check that ENGINE NO. 1 and ENGINE NO. 2 REV CONT circuit breakers (5) and (6) are opened.	IF REV CONT circuit breakers (5) and (6) are closed, open them.
<b>MOTOR NO. 1 ENGINE</b>	
5. On the FADEC panel, set and hold ENG START switch (7) to 1.	The NO. 1 ENGINE N1 tachometer (8) must indicate <u>10 to 15% N1</u> as starter motors engine. If the engine does not motor, go to task 15-5.6.1.
6. Release the ENG START switch (7) to its center position.	The NO. 1 ENGINE N1 tachometer (8) indication must decrease to <u>0% N1</u> . If the tachometer indication does not decrease or the engine continues to motor, go to task 15-5.7.



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TASK	RESULT
<b>MOTOR NO. 2 ENGINE</b>	
7. On the FADEC panel, set and hold ENG START switch (7) to 2.	The NO. 2 ENGINE 2 N1 tachometer (9) must indicate <u>10 to 15% N1</u> as starter motors engine. If the engine does not motor, go to task 15-5.6.1.
8. Release the ENG START switch (7) to its center position.	The NO. 2 ENGINE (9) indication must decrease to <u>0% N1</u> . If the tachometer indication does not decrease or the engine continues to motor, go to task 15-5.7.
FOLLOW-ON MAINTENANCE: TM 55-1520-240-23: Battery disconnected. Electrical power off. Hydraulic power off.	

15-5.6 NO. 1 OR NO. 2 ENGINE DOES NOT MOTOR (HYDRAULIC SYSTEM)

15-5.6

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

Without 74

Tools:

Aircraft Mechanic's Tool Kit,  
NSN 5180-00-3234692

Materials:

None

Personnel Required:

Medium Helicopter Repairer (2)

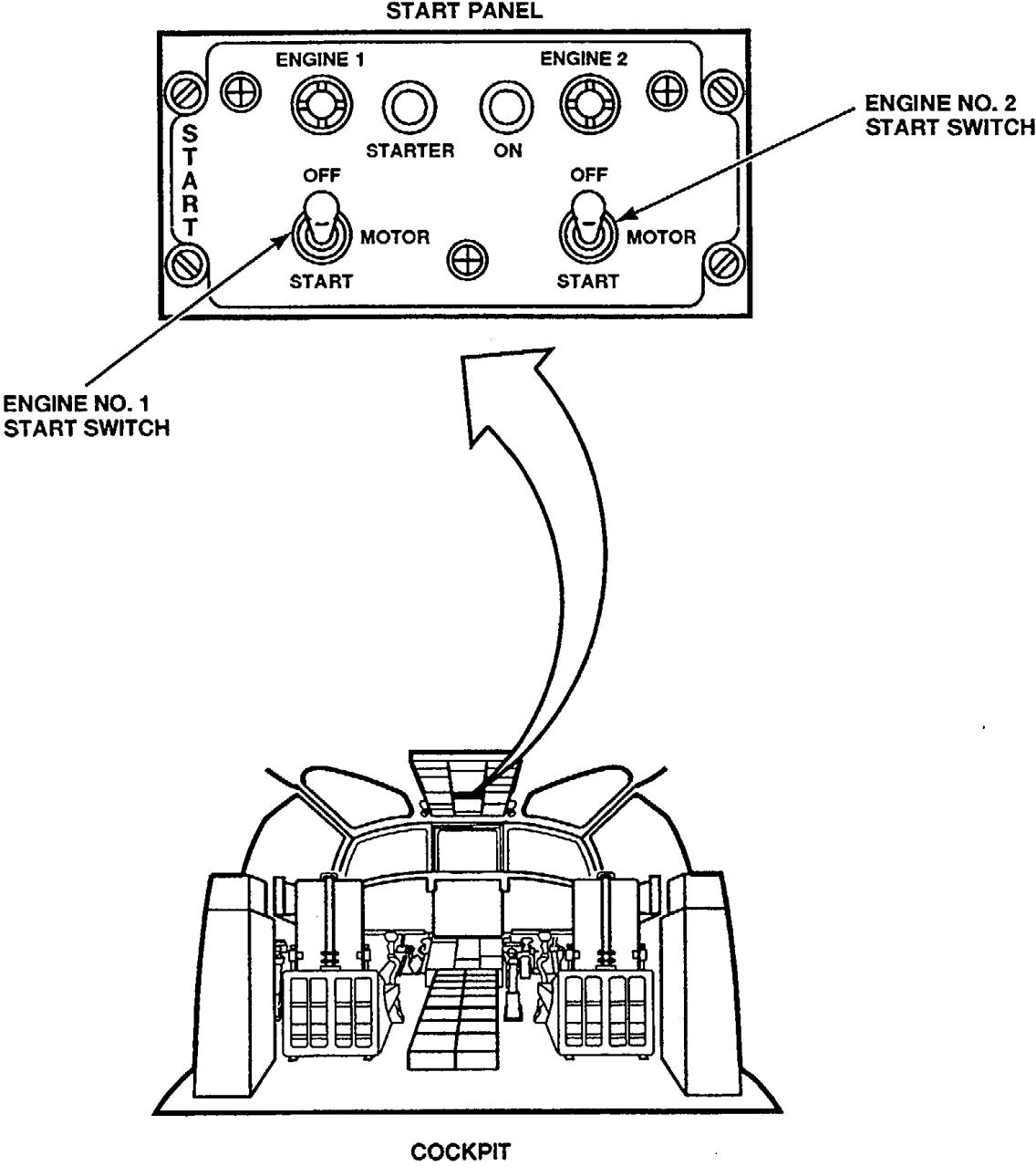
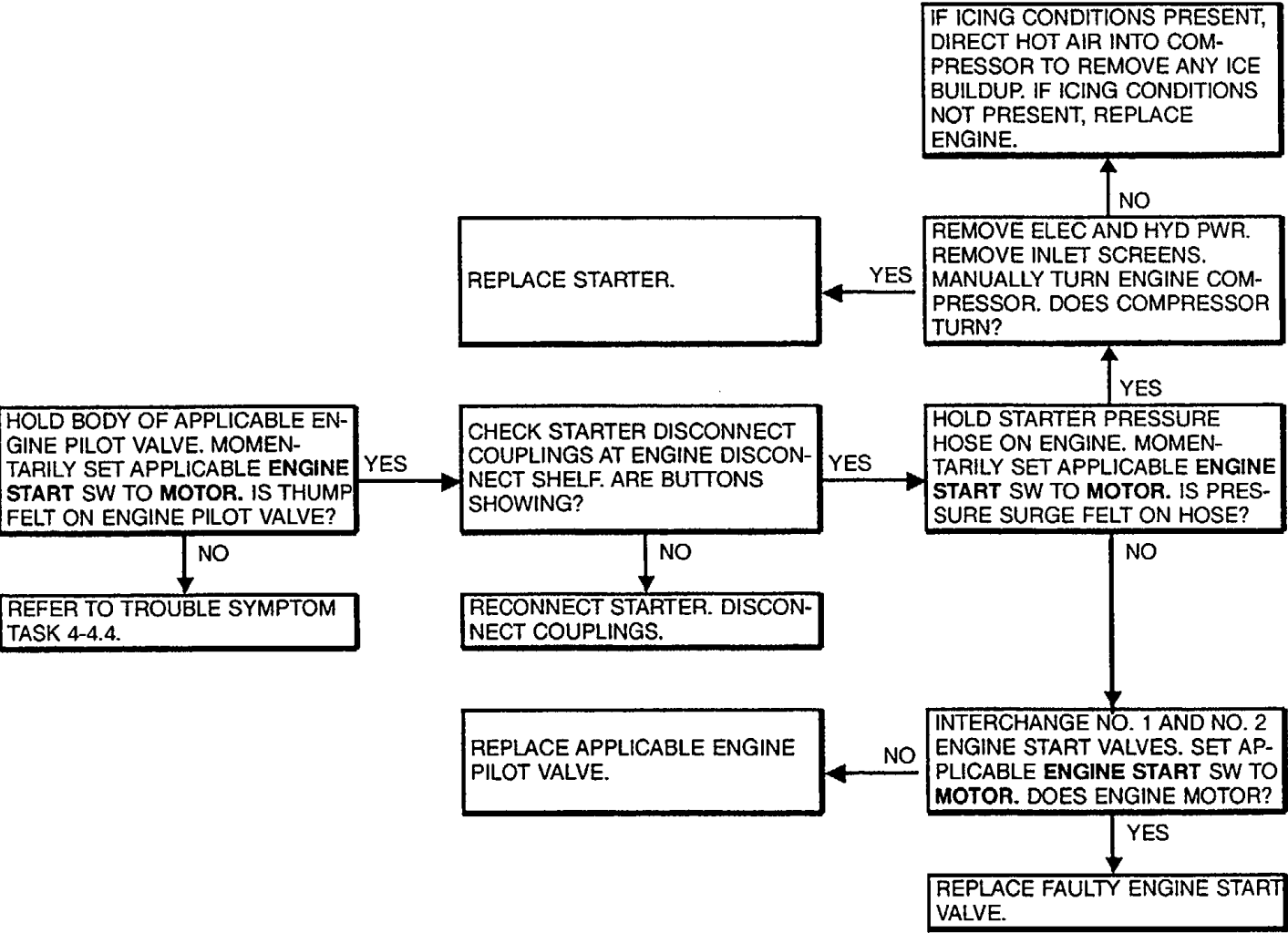
References:

TM 55-1520-240-23

Equipment Condition:

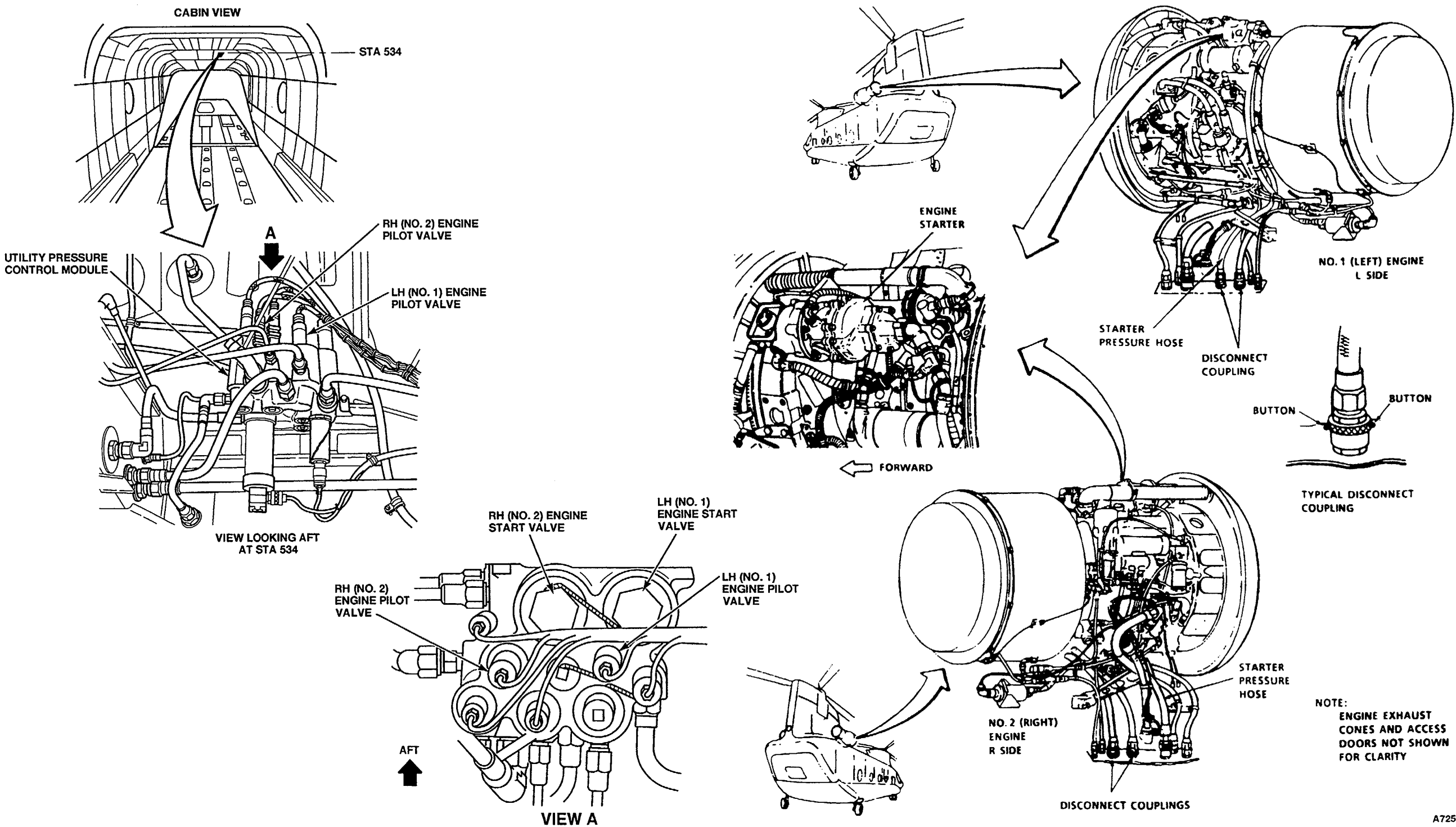
TM 55-1520-240-23:

Battery Connected  
Electrical Power On  
Hydraulic Power On  
No. 1 or No. 2 Engine Work Platforms and  
Access Doors Open



A72507

WITHOUT 74 





FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

With 74

Tools:

Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

Materials:

None

Personnel Required:

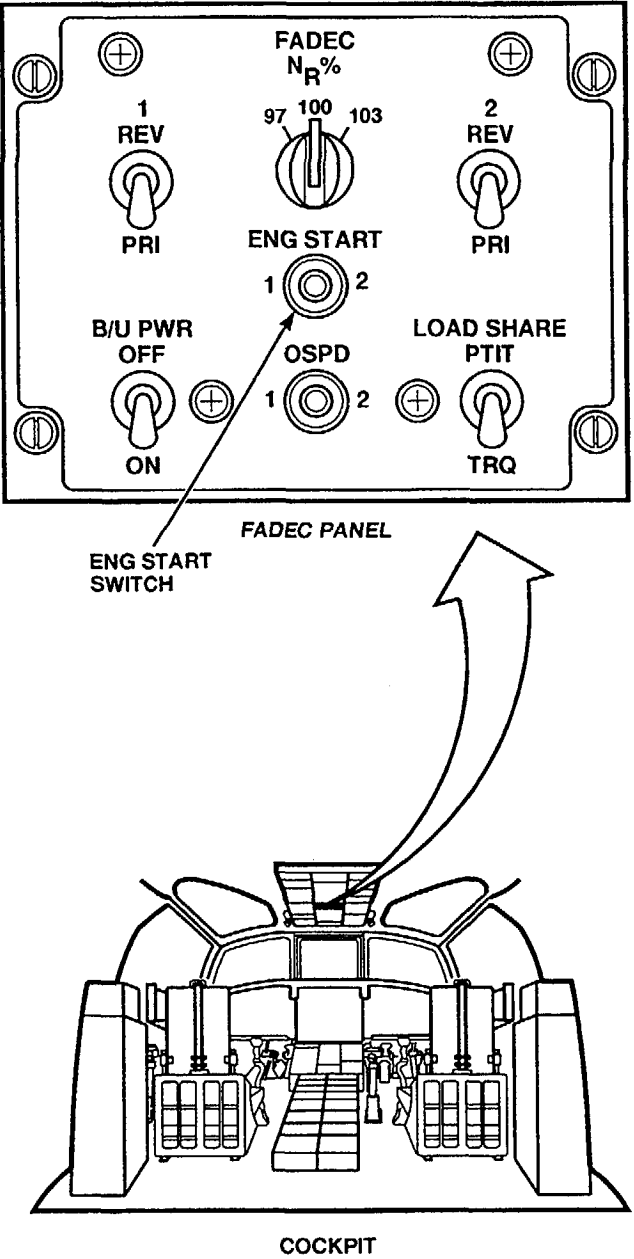
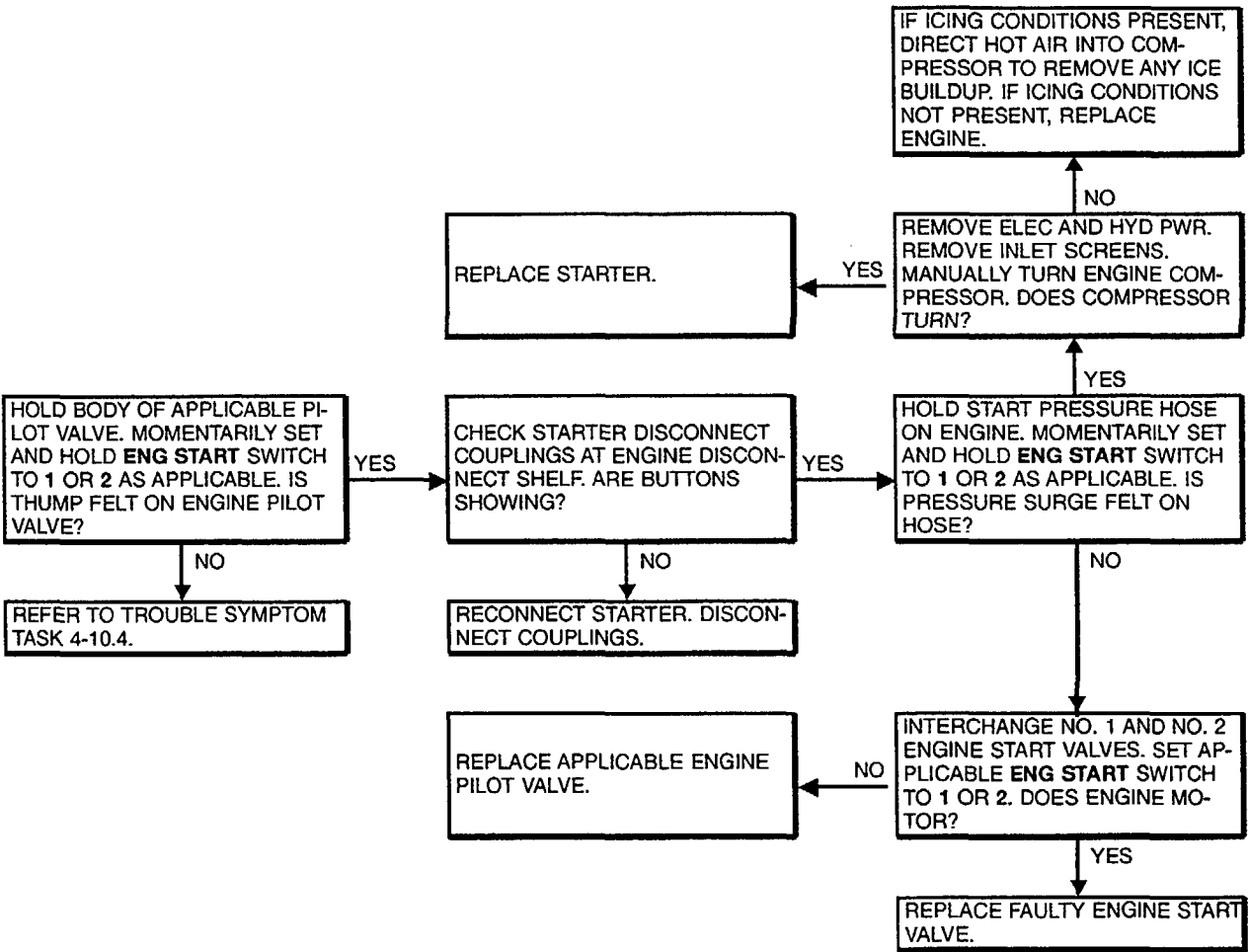
Medium Helicopter Repairer (2)

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
No. 1 or No. 2 Engine Work Platforms and  
Access Doors Open



**A72513**

15-5.7 NO. 1 OR NO. 2 ENGINE KEEPS MOTORING WHEN ENGINE START SWITCH SET TO OFF

15-5.7

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

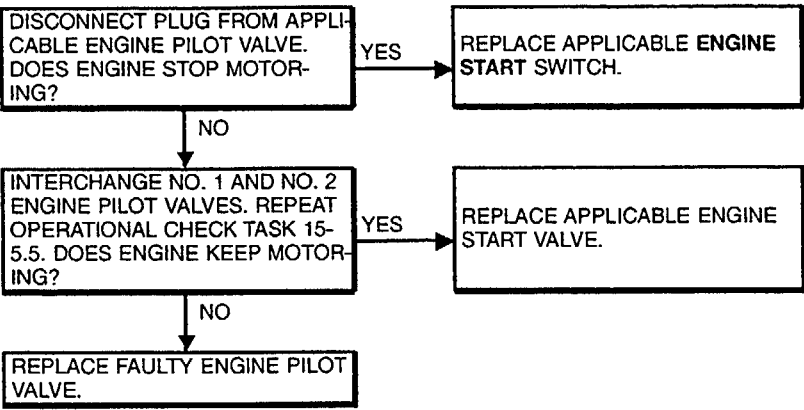
Materials:  
None

Personnel Required:  
Medium Helicopter Repairer (2)

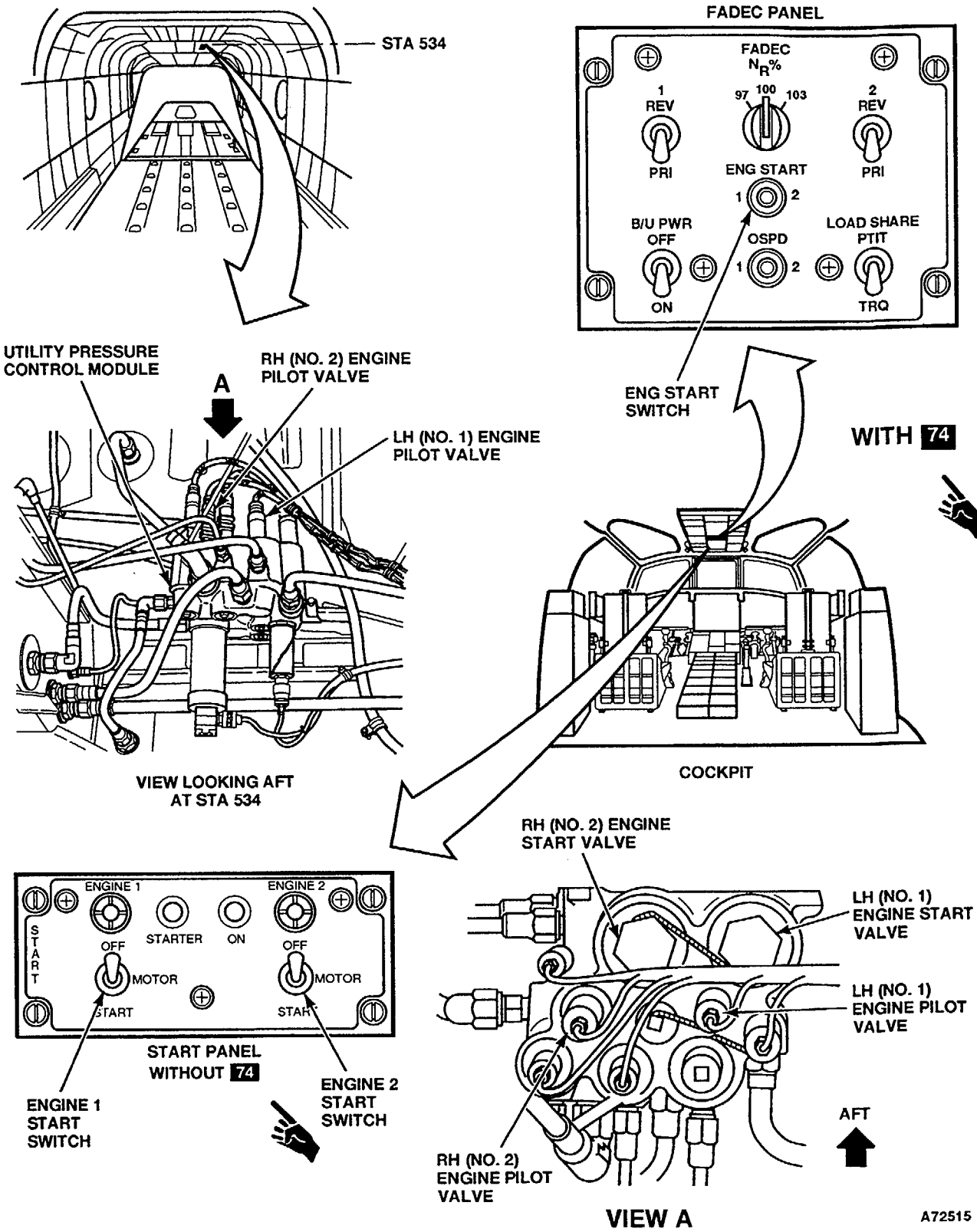
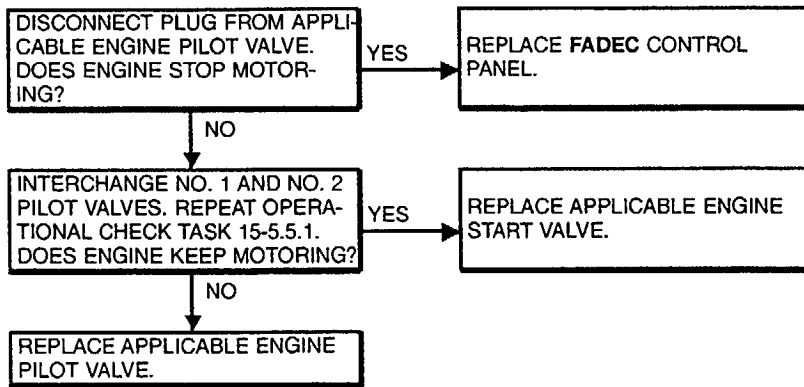
References:  
TM 5-1520-240-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On

WITHOUT 74:



WITHOUT 74:



## **15-6 MICROPROCESSOR ELECTRONIC SEQUENCE UNIT (ESU)**

PARAGRAPH 15-6  
TABLE OF CONTENTS  
APU MICROPROCESSOR ELECTRONIC SEQUENCE UNIT (ESU) TROUBLESHOOTING

PARAGRAPH	DESCRIPTION	FUNCTION	PAGE	PARAGRAPH	DESCRIPTION	FUNCTION	PAGE
15-6	<b>APU MICROPROCESSOR ELECTRONIC SEQUENCE UNIT (ESU)</b>		15-101	15-6.12	APU MOTORS BUT <b>DOES</b> NOT START,, ESU BITE INDICATES ○●●● OR ○○●● THEN ●○○● (FAILURE TO START)	TASK	15-119
15-6.1	ESU COMPONENTS	DRAWING	15-105	15-6.13	APU MOTORS BUT DOES NOT START,, ESU BITE INDICATES ○○○● THEN ●○○● (FAILURE TO START)	TASK	15-123
15-6.2	APU <b>SYSTEMS</b> BITE INDICATION FAILURE TABLE	TABLE	15-106	15-6.14	APU STARTS BUT SHUTS DOWN,, ESU BITE INDICATES ●●○○ (OVERSPEED)	TASK	15-127
15-6.3	APU <b>STARTING</b> SEQUENCE FAILURE AND ESU P.C. BOARDS FAILURE TABLES	TABLES	15-109	15-6.15	APU STARTS BUT SHUTS DOWN,, ESU BITE INDICATES ○○○● (UNDERSPEED)	TASK	15-129
15-6.4	ESU SYSTEM SCHEMATIC	DRAWING	15-110	15-6.16	APU STARTS BUT SHUTS DOWN,, ESU BITE INDICATES ○○○● (OVERTEMPERATURE)	TASK	15-131
15-6.5	ESU SYSTEM WIRING DIAGRAM	DRAWING	15-111	15-6.17	APU STARTS AND RUNS THEN SHUTS DOWN, ESU BITE INDICATES ○○○● (OVERTEMPERATURE) (HOT START)	TASK	15-133
15-6.6	ESU BLOCK DIAGRAM	DRAWING	15-112	15-6.18	APU STARTS BUT SHUTS DOWN,, ESU BITE INDICATES ●●○○ (OPEN THERMOCOUPLE)	TASK	15-135
15-6.7	INITIALIZING BITE LOGIC BLOCK DIAGRAM	DRAWING	15-113	15-6.19	APU STARTS AND RUNS BUT ESU BITE INDICATES ●○○○ (SHORTED THERMO. PROBE) (WARNING)	TASK	15-136
15-6.8	NORMAL START BITE LOGIC BLOCK DIAGRAM	DRAWING	15-114				
15-6.9	MALFUNCTION BITE LOGIC BLOCK DIAGRAM (BEFORE START)	DRAWING	15-115				
15-6.10	MALFUNCTION BITE LOGIC BLOCK DIAGRAM (DURING STARTING AND RUNNING)	DRAWING	15-116				
15-6.11	APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○●○○ (NO SPEED DATA)	TASK	15-117				

**PARAGRAPH 15-6**  
**LIST OF TABLES**  
**ELECTRONIC SEQUENCE UNIT (ESU) TROUBLESHOOTING**

TABLE NO.	DESCRIPTION	PAGE NO.
15-6.1	BITE INDICATION TABLE FOR APU SYSTEMS FAILURES	15-106
15-6.2	APU STARTING SEQUENCE FAILURES - BITE INDICATION TABLE	15-109
15-6.3	ESU PRINTED CIRCUIT BOARD FAILURES - BITE INDICATION TABLE	15-109

15-6 ELECTRONIC SEQUENCE UNIT (ESU)

15-6

15-6.1 ESU COMPONENTS

15-6.1

BITE				DECODED BITE INFORMATION	
1	2	3	4		
●	●	●	●	RESET	START SEQUENCE
○	●	●	●	START FUEL VALVE & EXCITER SIGNAL OUT (5%)	
○	○	●	●	MAIN FUEL VALVE SIGNAL OUT (14%)	
○	○	○	●	START FUEL VALVE & EXCITER SIGNAL OFF (70%)	
○	○	○	○	90% RPM SWITCH ON	
●	●	●	●	READY FOR SERVICE (90% + 1.5 SEC.)	OPERATION
○	●	●	●	PROCESSOR BOARD FAILURE	
●	○	●	●	SENSOR /DATA BOARD FAILURE	
○	○	●	●	OVERTEMPERATURE	
●	●	○	●	OVERSPEED	
○	●	○	●	UNDERSPEED	
●	○	○	●	FAILURE TO START	
●	○	●	○	SHORTED THERMOCOUPLE PROBE (WARNING)	
●	●	○	○	OPEN THERMOCOUPLE	
●	○	○	○	PROCESSOR SEQUENCE FAIL	
○	○	○	○	NO TEMP DATA	
○	●	○	○	NO SPEED DATA	

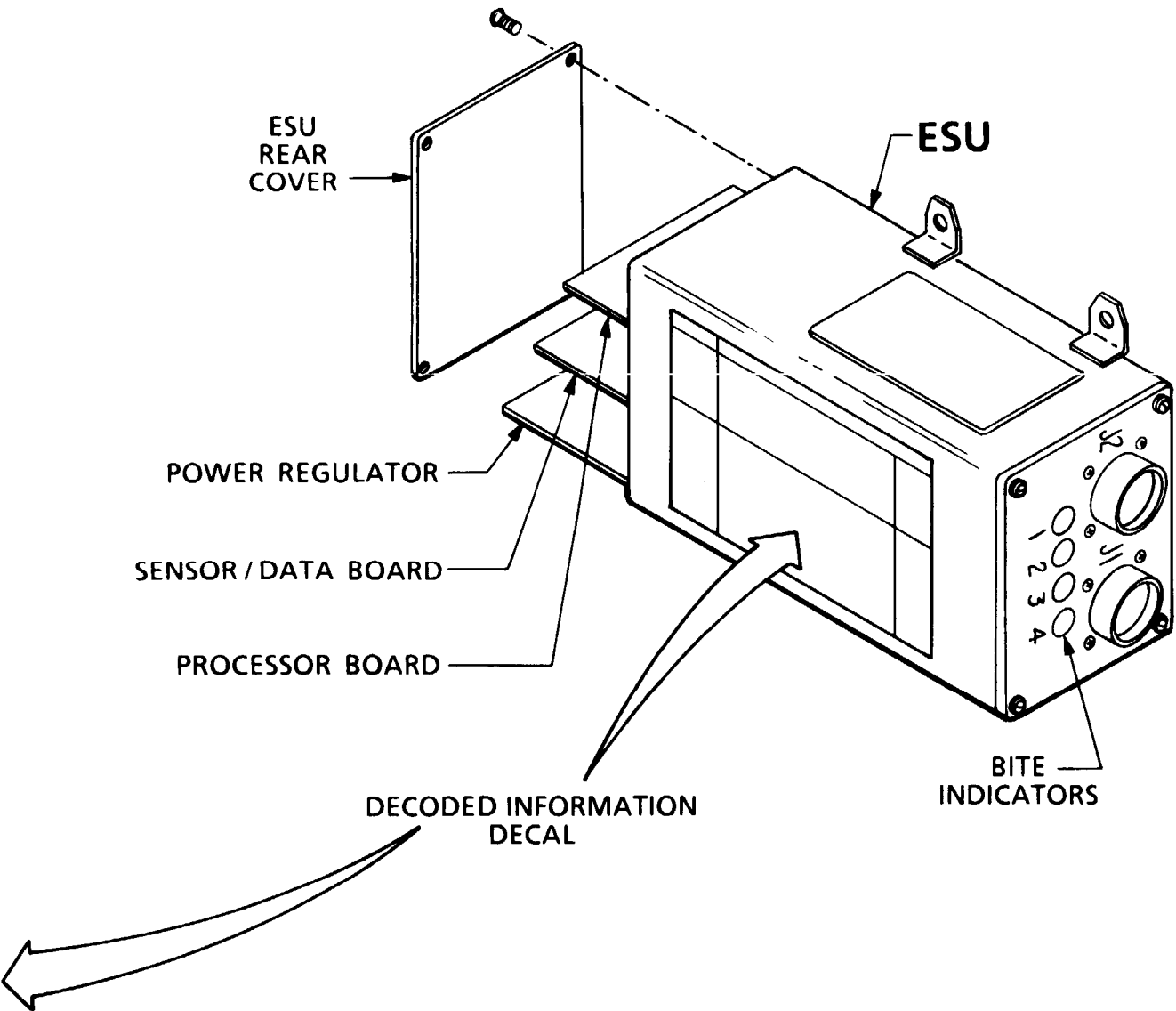


TABLE NO. 15-6.1 BITE INDICATION TABLE FOR APU SYSTEMS FAILURES				
NO.	BITE INDICATION	SYMPTOM	DECODED BITE DESCRIPTION	Maintenance Action
				Task No.
	APU DOES NOT MOTOR:			
1	○●●●	ESU Bite indicates ○●●●	PROCESSOR BOARD FAILURE	15-2.10
2	●○●●	ESU Bite indicates ●○●●	SENSOR / DATA BOARD FAILURE	15-2.10
3	●○○○	ESU Bite indicates ●○○○	PROCESSOR SEQUENCE FAIL	15-2.10
4	○○○○	ESU Bite indicates ○○○○	NO TEMP DATA	15-2.10
	APU MOTORS BUT DOES NOT START:			
5	○○●● then ●○○●	ESU Bite indicates ●○○●	FAILURE TO START	15-3.6
6	○○○● then ●○○●	ESU Bite indicates ●○○●	FAILURE TO START	15-3.7
7	○●●● or ○○●● then ●○○●	ESU Bite indicates ●○○●	FAILURE TO START	15-4.11
8	○●○○	ESU Bite indicates ○●○○	NO SPEED DATA	15-6.11
9	○●●● or ○○●● then ●○○●	ESU Bite indicates ●○○●	FAILURE TO START	15-6.12
10	○○○● then ●○○●	ESU Bite indicates then ●○○●	FAILURE TO START	15-6.13



15-6.2 APU SYSTEMS BITE INDICATION FAILURE TABLE (CONTINUED)

15-6.2

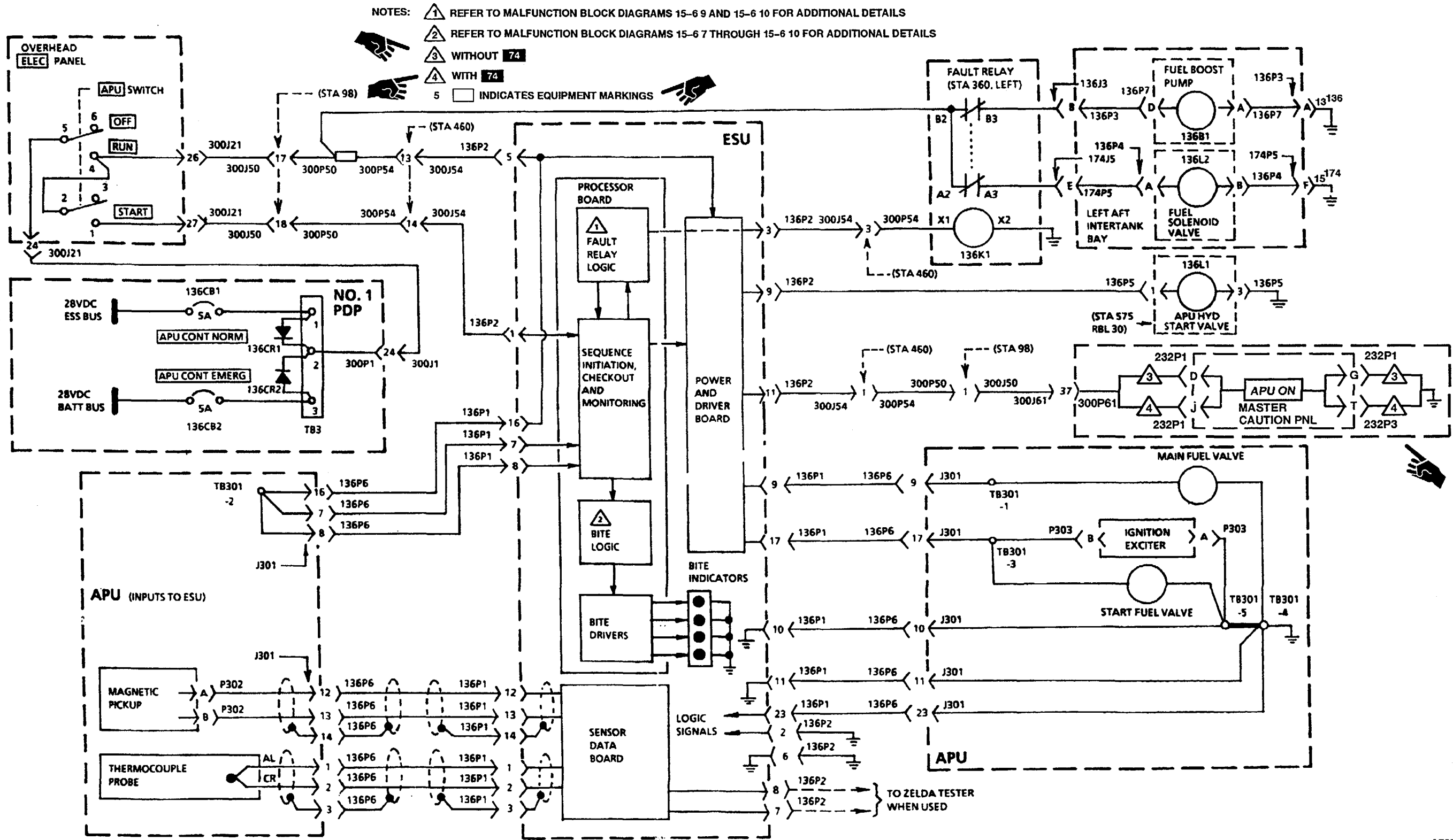
TABLE NO. 15-6.1 BITE INDICATION TABLE FOR APU SYSTEMS FAILURES (Continued)				
NO.	BITE INDICATION	SYMPTOM	DECODED BITE DESCRIPTION	Maintenance Action
				Task No.
	APU STARTS BUT SHUTS DOWN			
11	○○○○ then ●●○○	ESU Bite indicates ●●○○	OVERSPEED	15-6.14
12	○○○○● then ○●○○	ESU Bite indicates ○●○○	UNDERSPEED	15-6.15
13	○○○○● then ○○●●	ESU Bite indicates ○○●●	OVERTEMPERATURE (HOT START)	15-6.16
14	○○●● then ●●○○	ESU Bite indicates ●●○○	OPEN THERMOCOUPLE	15-6.18
	APU STARTS AND RUNS BUT SHUTS DOWN			
15	○○○○ then ○○●●	ESU Bite indicates ○○●●	OVERTEMPERATURE (HOT START)	15-6.17
	APU STARTS AND RUNS			
16	●○○○	ESU Bite indicates ●○○○	SHORTED THERMO. PROBE (WARNING)	15-6.19
	APU SHUTS DOWN WHEN GEN APU SWITCH PLACED TO ON			
17	●●●●	ESU Bite indicates ●●●●	READY FOR SERVICE	15-2.14
	APU SHUTS DOWN WHEN APU GEN SWITCH IS SET TO OFF			
18		ESU Bite indicates	READY FOR SERVICE	15-2.15
	APU DOES NOT STOP			
19	●●●●	ESU Bite indicates ●●●●	READY FOR SERVICE	15-2.12

15-6.3 APU STARTING SEQUENCE FAILURE AND ESU P.C. BOARDS FAILURE TABLES

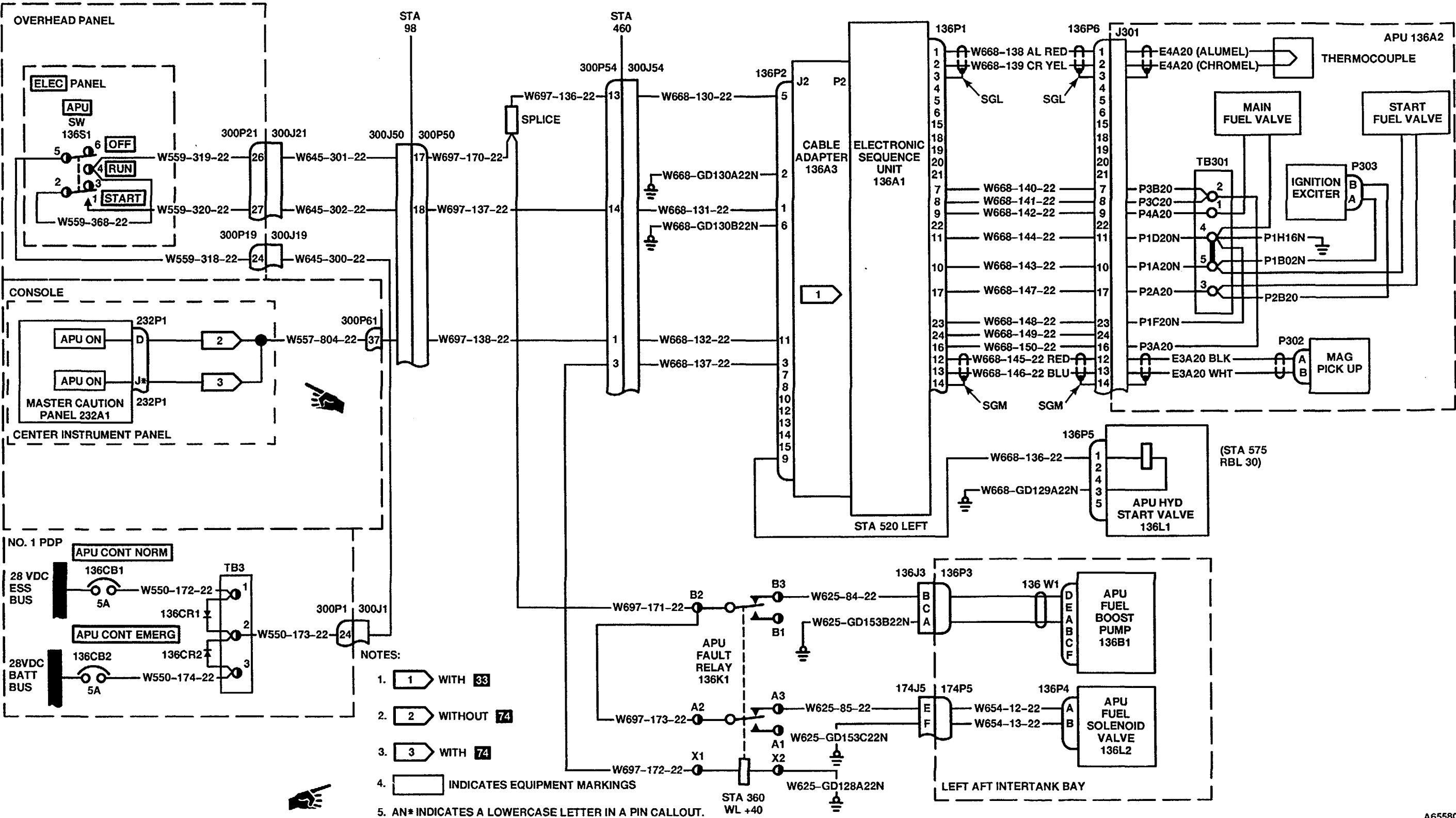
15-6.3

TABLE NO. 15-6.2 APU STARTING SEQUENCE FAILURES					
APU STARTING SEQUENCE	No.	SYMPTOM	BITE INDICATION	DECODED BITE INFORMATION	TASK
PRE START					
	1	APU DOES NOT MOTOR ESU Bite indicates	○ ○ ○ ○	<u>NO TEMP DATA</u>	15-2.10
MOTORING					
	2	APU MOTORS BUT DOES NOT START ESU Bite indicates	○ ● ○ ○	<u>NO SPEED DATA</u>	15-6.11
	3	APU MOTORS BUT DOES NOT START ESU Bite indicates	○ ● ● ● or then ○ ○ ● ● ● ○ ○ ●	<u>FAILURE TO START</u>	15-6.12
	4	APU MOTORS BUT DOES NOT START ESU Bite indicates	○ ○ ○ ● then ● ○ ○ ●	<u>FAILURE TO START</u>	15-6.13
STARTING					
	5	APU STARTS BUT SHUTS DOWN ESU Bite indicates	● ● ○ ●	<u>OVERSPEED</u>	15-6.14
	6	APU STARTS BUT SHUTS DOWN ESU Bite indicates	○ ● ○ ●	<u>UNDERSPEED</u>	15-6.15
	7	APU STARTS BUT SHUTS DOWN ESU Bite indicates	● ● ○ ○	<u>OPEN THERMOCOUPLE</u>	15-6.18
HOT START					
	8	APU STARTS BUT SHUTS DOWN ESU Bite indicates	○ ○ ● ●	<u>OVERTEMPERATURE</u>	15-6.17
STARTS AND RUNS					
	9	APU STARTS AND RUNS but ESU Bite indicates	● ○ ● ○	<u>SHORTED THERMO. PROBE (warning)</u>	15-6.19

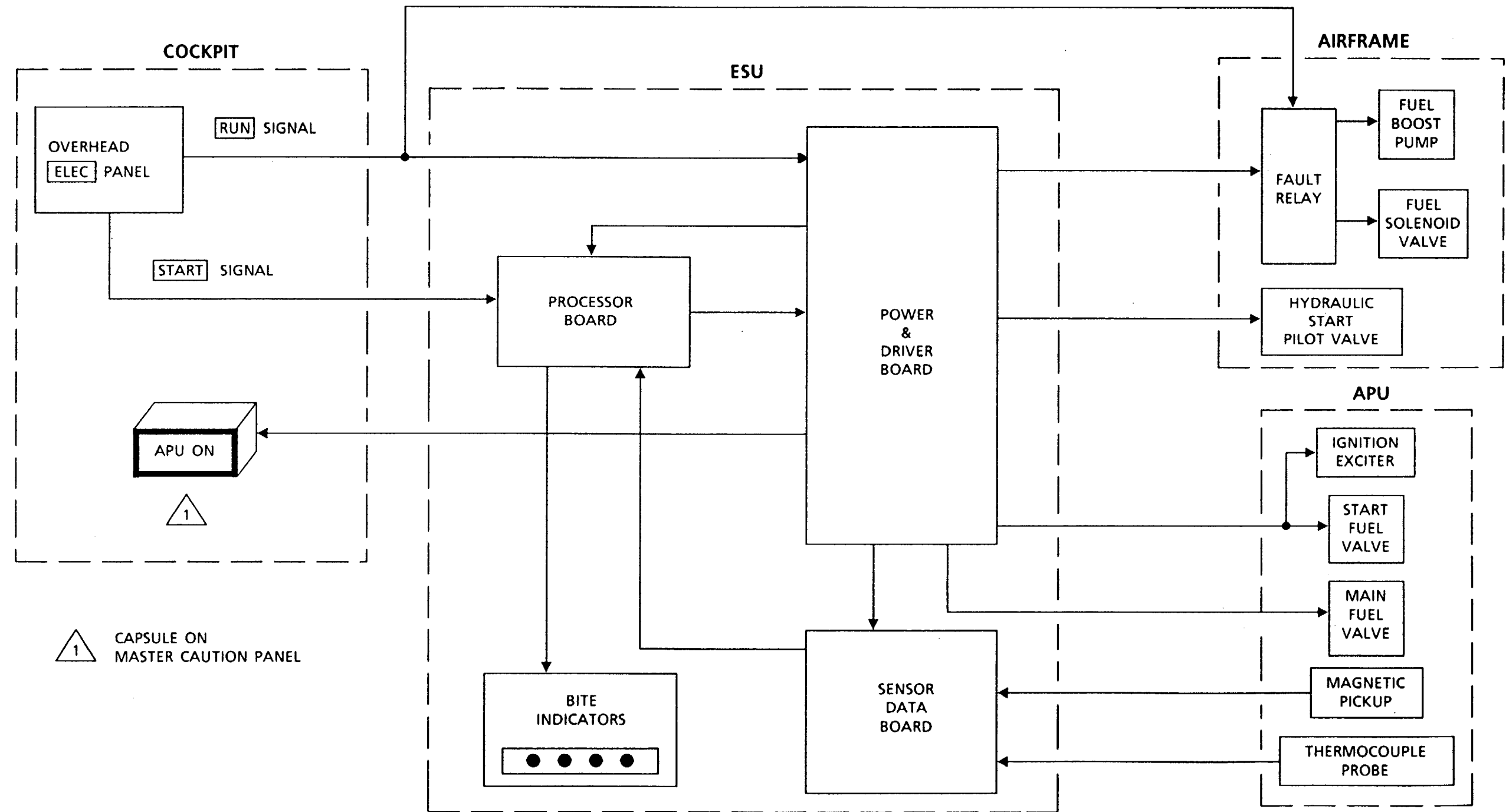
TABLE NO. 15-6.3 ESU PRINTED CIRCUIT BOARD FAILURES - BITE INDICATION TABLE	
BITE INDICATION	BITE INFORMATION
<div>○ ● ● ●</div>	PROCESSOR BOARD FAILURE.
<div>● ○ ● ●</div>	SENSOR/DATA BOARD FAILURE.
<div>● ○ ○ ○</div>	PROCESSOR SEQUENCE FAIL

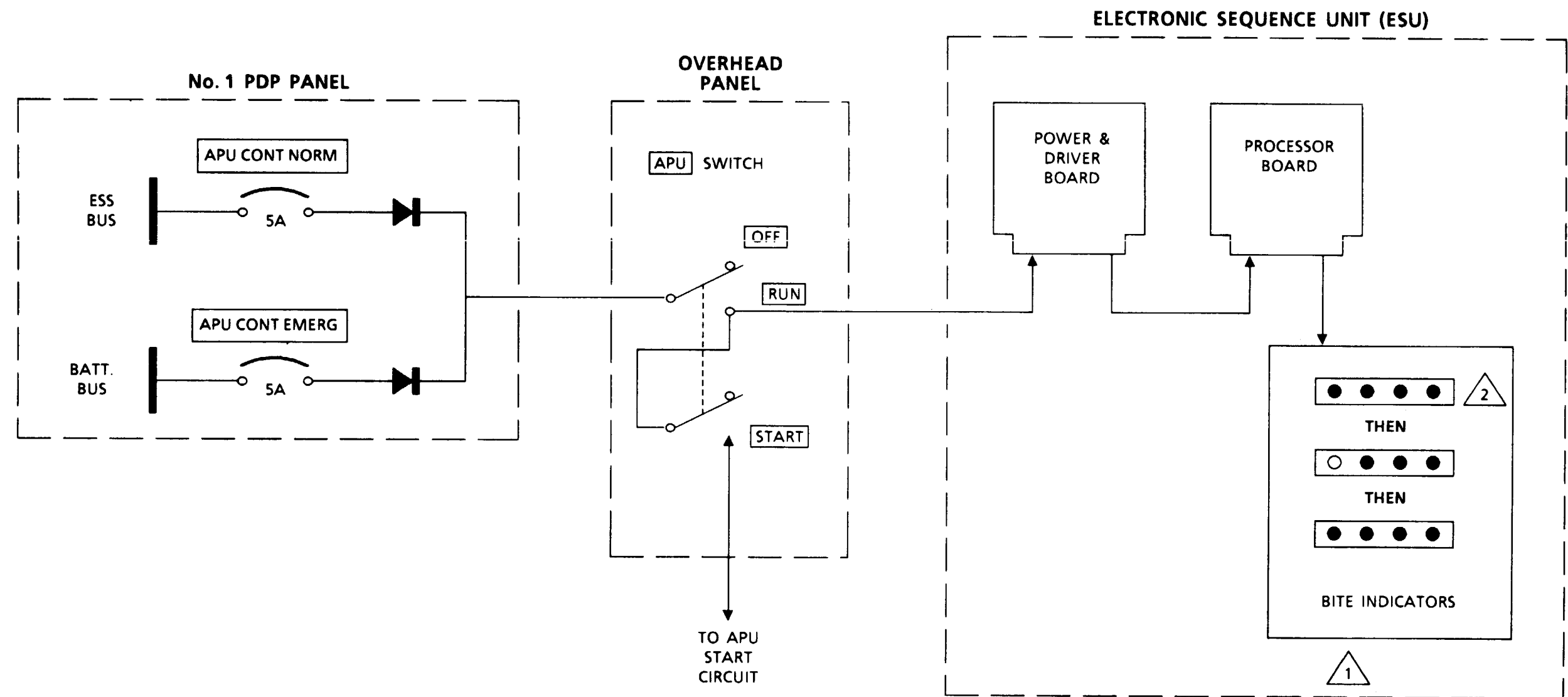


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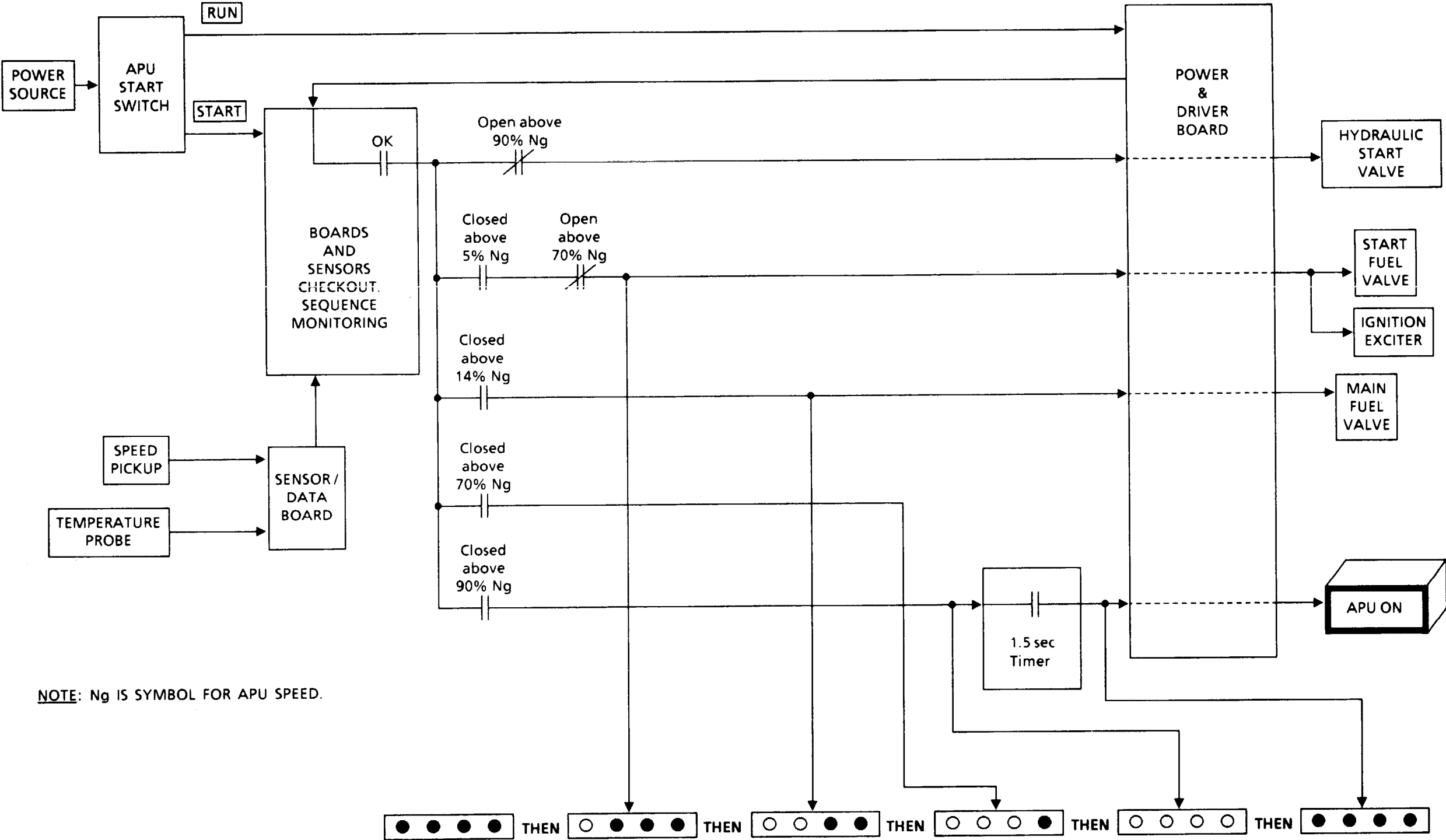


1 NORMAL BITE SEQUENCE WHEN APU IS MOVED FROM OFF TO RUN.

2 INITIAL INDICATION WILL SHOW A FAILURE CONDITION IF THE PREVIOUS APU SHUTDOWN WAS DUE TO A MALFUNCTION.

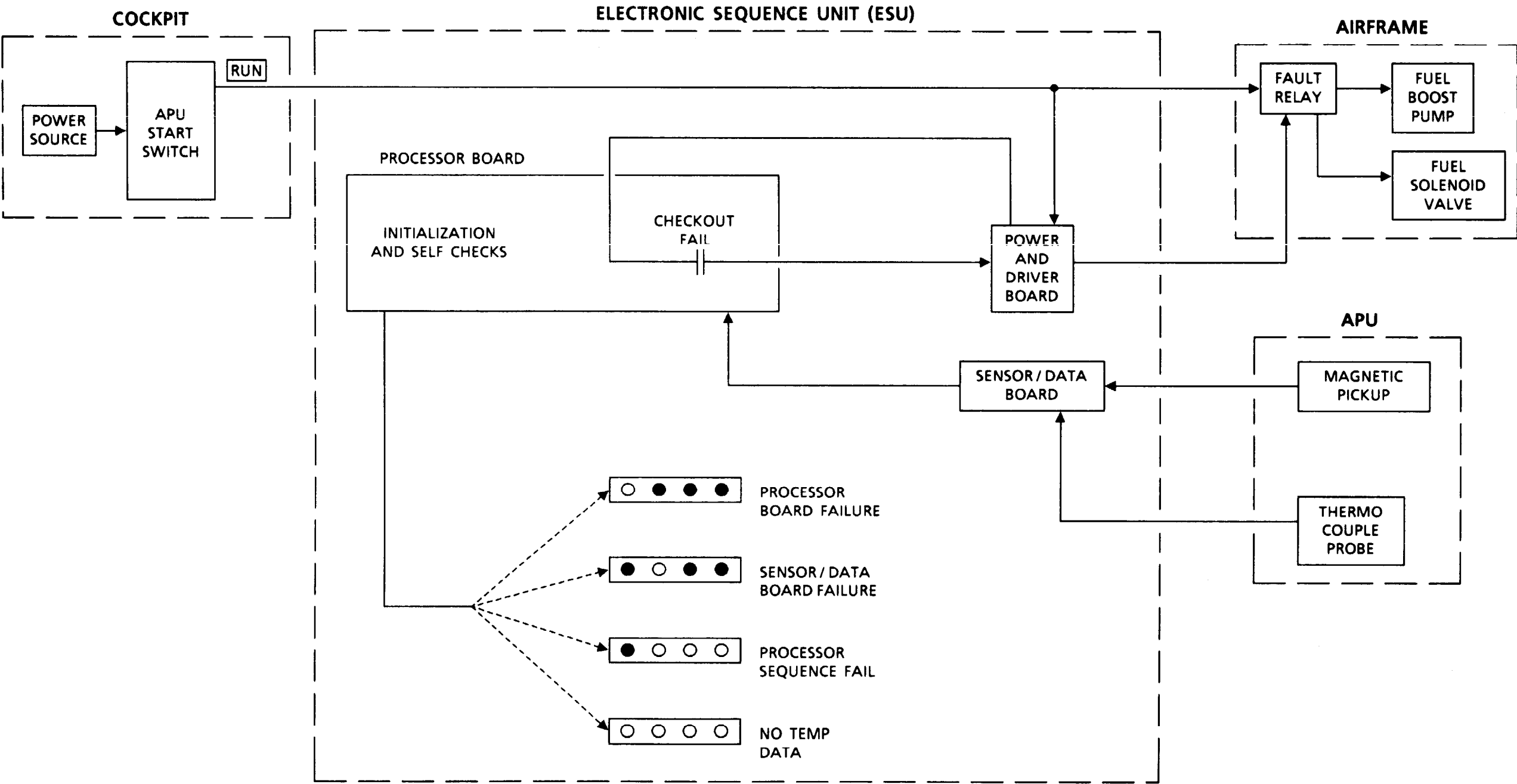
15-6.8 NORMAL START BITE LOGIC BLOCK DIAGRAM

15-6.8



15-6.9 MALFUNCTION BITE LOGIC BLOCK DIAGRAM (BEFORE START)

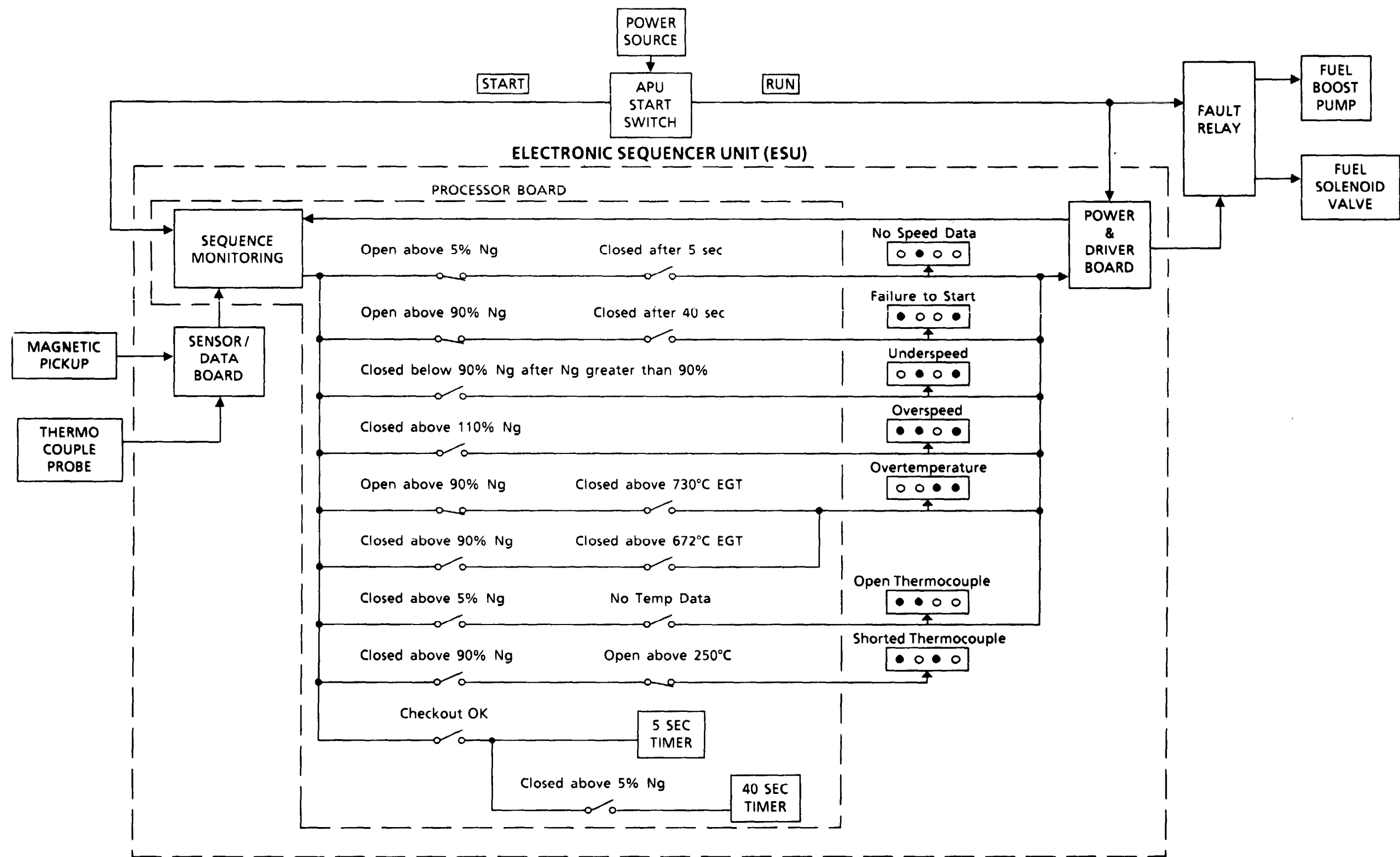
15-6.9





15-6.10 MALFUNCTION BITE LOGIC BLOCK DIAGRAM  
(DURING STARTING AND RUNNING)

15-6.10



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

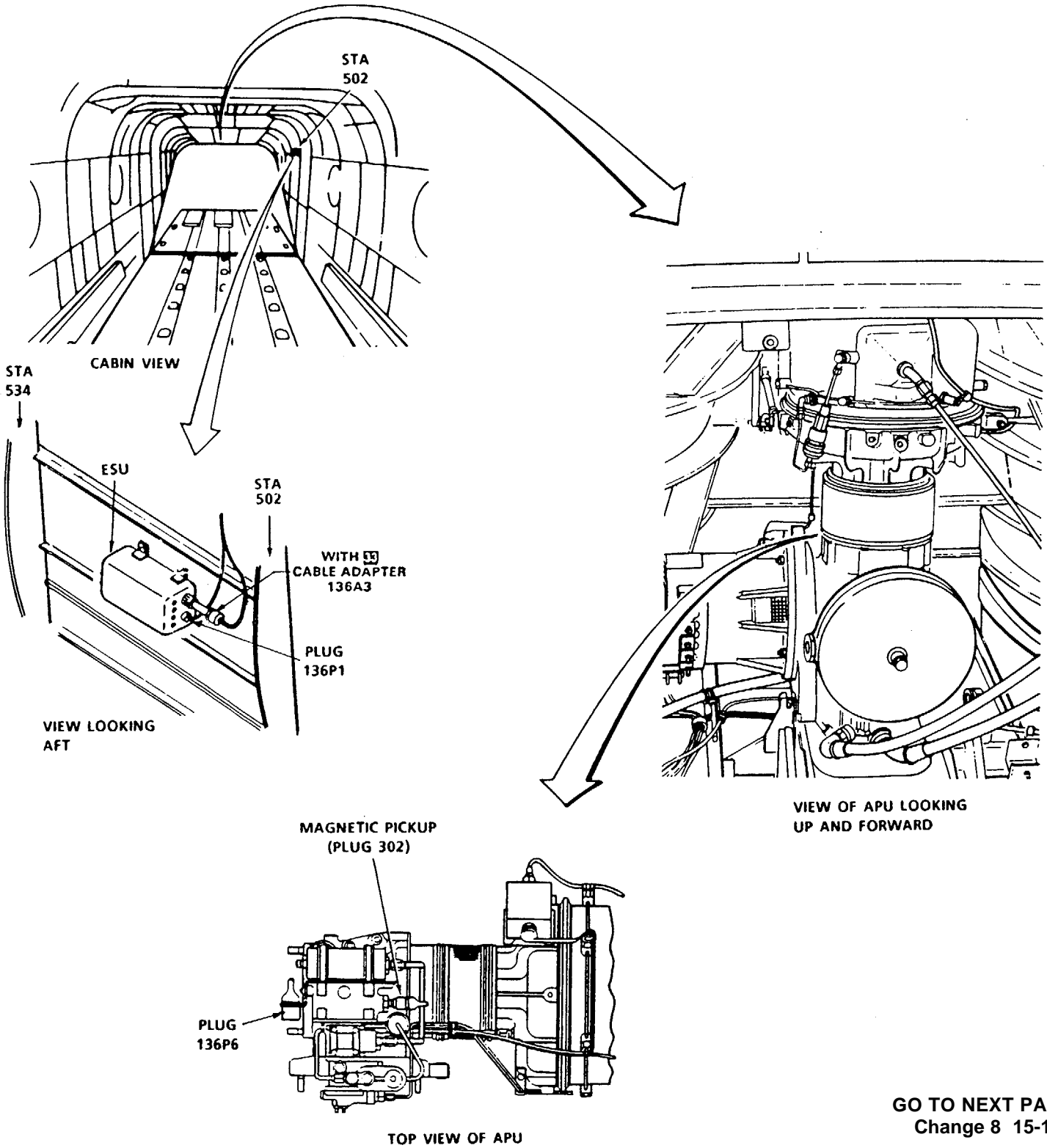
Tools:  
Electrical Repairer's Tool Kit.  
NSN 5180-00-329-4915  
Multimeter

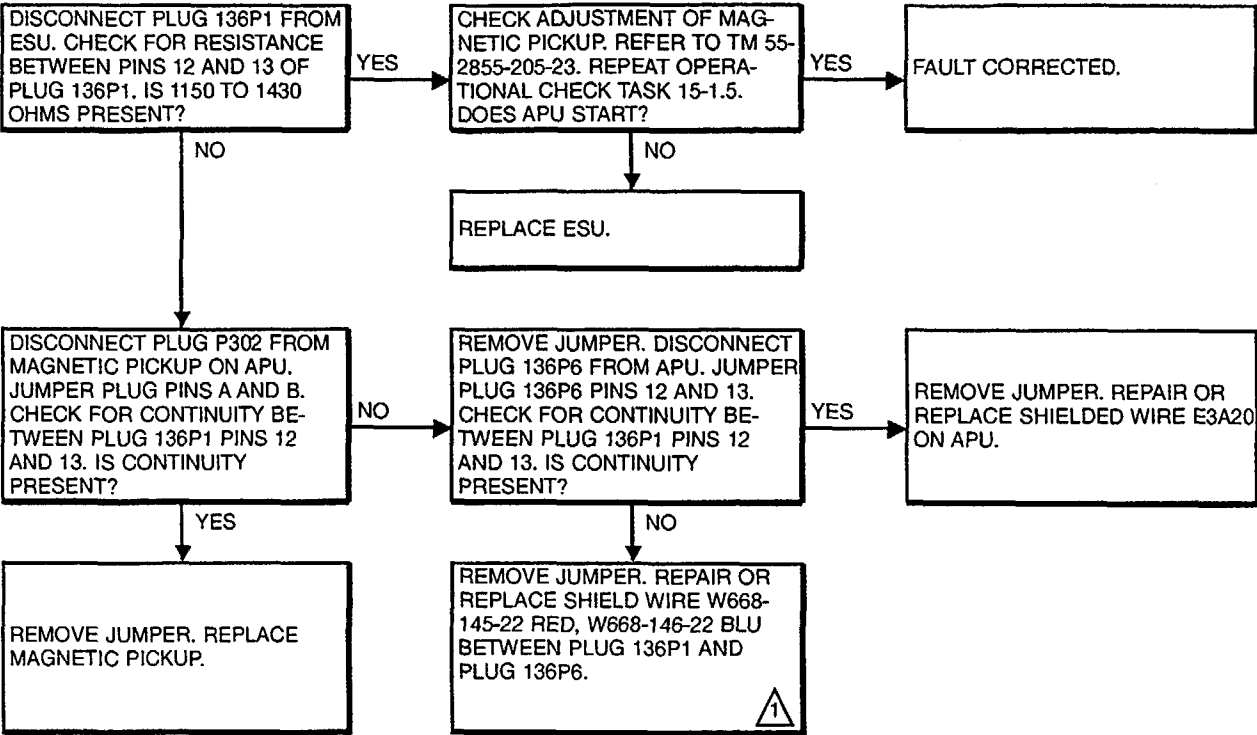
Materials:  
None



Personnel Required:  
Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off





 REFER TO WIRING DIAGRAM TASK 15-6.5 FOR FURTHER DETAILS. 

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

Tools:

- Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692
- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
- Multimeter
- APU Tester 161226-200

Materials:

- Cloth (E120)
- Tape (E385)

Personnel Required:

- Aircraft Electrician
- Medium Helicopter Repairer

References:

- TM 55-1520-240-23
- TM 55-2835-205-23
- TM 55-4920-431-13

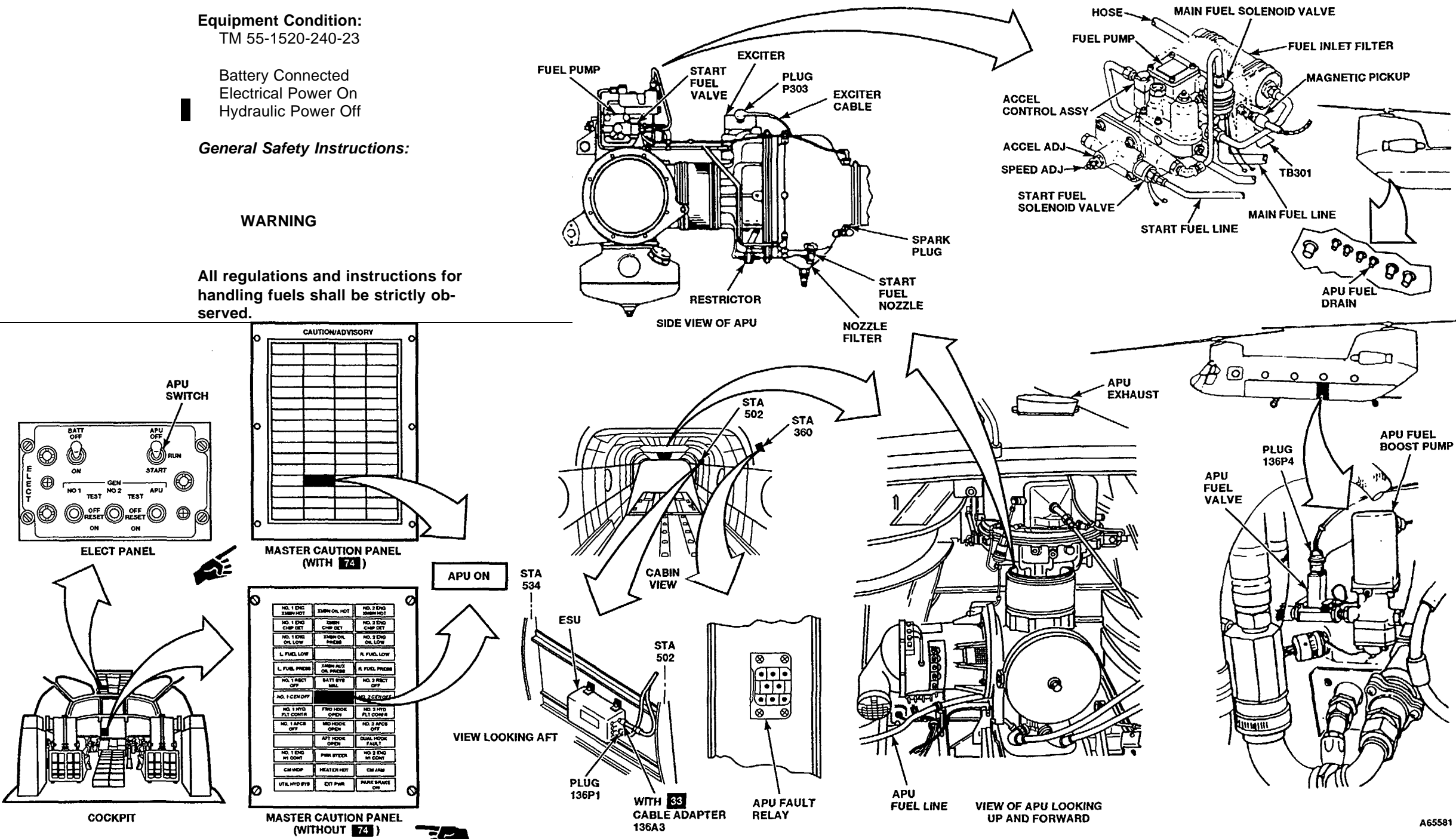
Equipment Condition:  
TM 55-1520-240-23

- Battery Connected
- Electrical Power On
- Hydraulic Power Off

General Safety Instructions:

WARNING

All regulations and instructions for  
handling fuels shall be strictly ob-  
served.



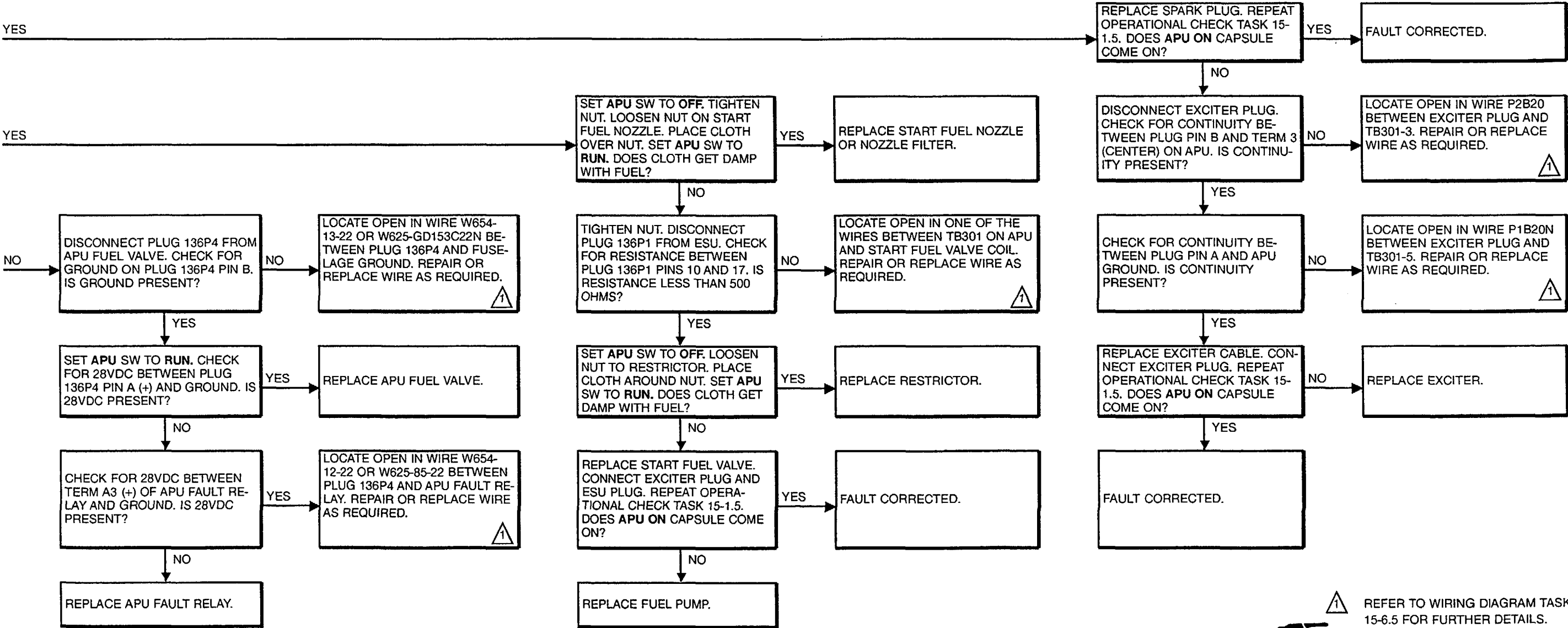
A65581

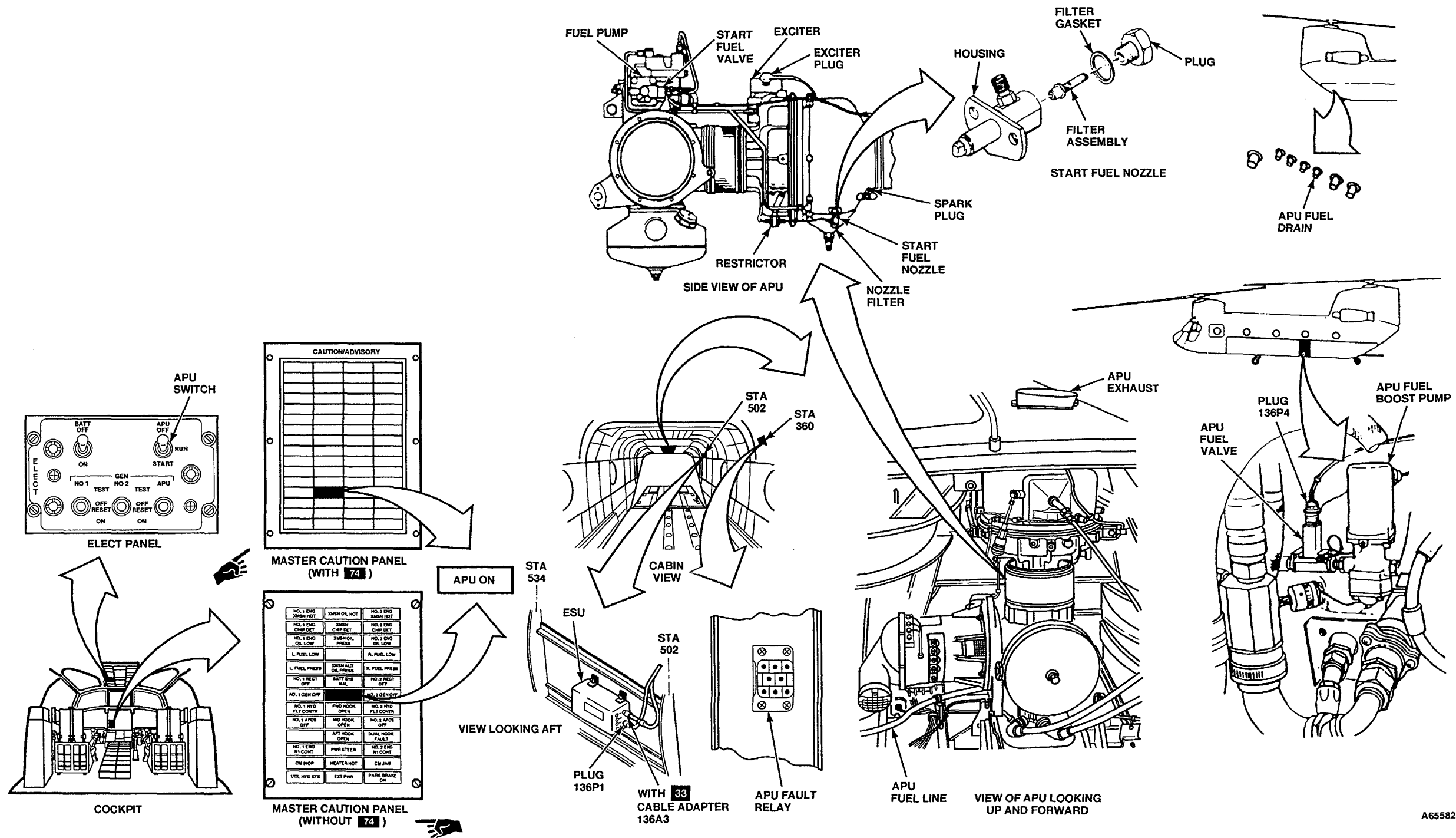
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graph TD
    Start([START]) --> Step1[SET APU SW TO OFF. CONNECT APU TESTER BETWEEN ESU AND AIRFRAME WIRING. SET ALL TESTER SWITCHES DOWN. SET APU SW TO RUN. SET APU TESTER MASTER AND LOCAL/REMOTE SWITCHES UP. WATCH TESTER SPEED INDICATOR AND MAIN FUEL AND OIL PRESSURE LIGHTS. SET TESTER START/RUN STOP SW UP. IS SPEED INDICATOR READING ABOVE 15%?]
    Step1 -- NO --> Step2[REFER TO APU HYDRAULIC TROUBLESHOOTING TASK 15-4.8.]
    Step1 -- YES --> Step3[CHECK APU EXHAUST FOR FUEL VAPOR AND APU FUEL OVERBOARD DRAIN FOR DRIPPING FUEL. IS EITHER SEEN?]
    Step3 -- YES --> Step2
    Step3 -- NO --> Step4[STAND BENEATH APU. SET TESTER START/RUN STOP SW DOWN AND THEN UP. CAN APU IGNITION BE HEARD SNAPPING?]
    Step4 -- YES --> Step5[SET APU SW TO OFF. LOOSEN NUT ON OUTPUT LINE OF FUEL INLET FILTER. PLACE CLOTH AROUND NUT. SET APU SW TO RUN. DOES CLOTH GET DAMP WITH FUEL RAPIDLY?]
    Step5 -- YES --> Step2
    Step5 -- NO --> Step6[SET APU SW TO OFF. TIGHTEN NUT. HOLD FLEXIBLE APU FUEL LINE TO APU. CYCLE APU SW FROM OFF TO RUN TO OFF. IS SURGE FELT ON FUEL LINE?]
    Step6 -- YES --> Step7[REPLACE APU FUEL INLET FILTER.]
    Step6 -- NO --> Step8[OPEN LEFT AFT INTERTANK BAY ACCESS COVER. HOLD BODY OF APU FUEL VALVE. CYCLE APU SW FROM OFF TO RUN TO OFF. DOES VALVE FEEL LIKE IT IS OPERATING?]
    Step8 -- YES --> Step9[REPLACE APU FUEL BOOST PUMP.]
    Step8 -- NO --> Step10[LOCATE OPEN IN WIRE W668-147-22 OR P2A20 BETWEEN PLUG 136P1 AND APU TB301-3. REPAIR OR REPLACE WIRE AS REQUIRED.]
    Step10 --> End([END])
    Step4 -- NO --> Step11[SET TESTER START/RUN STOP SW DOWN. CHECK THAT ACCUMULATOR IS CHARGED. WATCH TESTER SPEED INDICATOR AND START FUEL LT. SET TESTER START/RUN STOP SW UP. DOES START FUEL LT COME ON WHEN SPEED INDICATOR READING PASSES 5%?]
    Step11 -- YES --> Step12[SET TESTER SWITCHES DOWN AND DISCONNECT TESTER. CHECK FOR GROUND ON PLUG 136P1 PIN 10. IS GROUND PRESENT?]
    Step12 -- YES --> Step10
    Step12 -- NO --> Step13[LOCATE OPEN IN APU GROUND WIRE P1H16N BETWEEN TB301-4 ON APU AND APU FRAME. REPAIR OR REPLACE WIRE AS REQUIRED.]
    Step13 --> End
    Step11 -- NO --> Step14[SET TESTER SWITCHES DOWN AND DISCONNECT TESTER. REPLACE ESU.]
    Step14 --> End

```







A65582

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations**  
All I

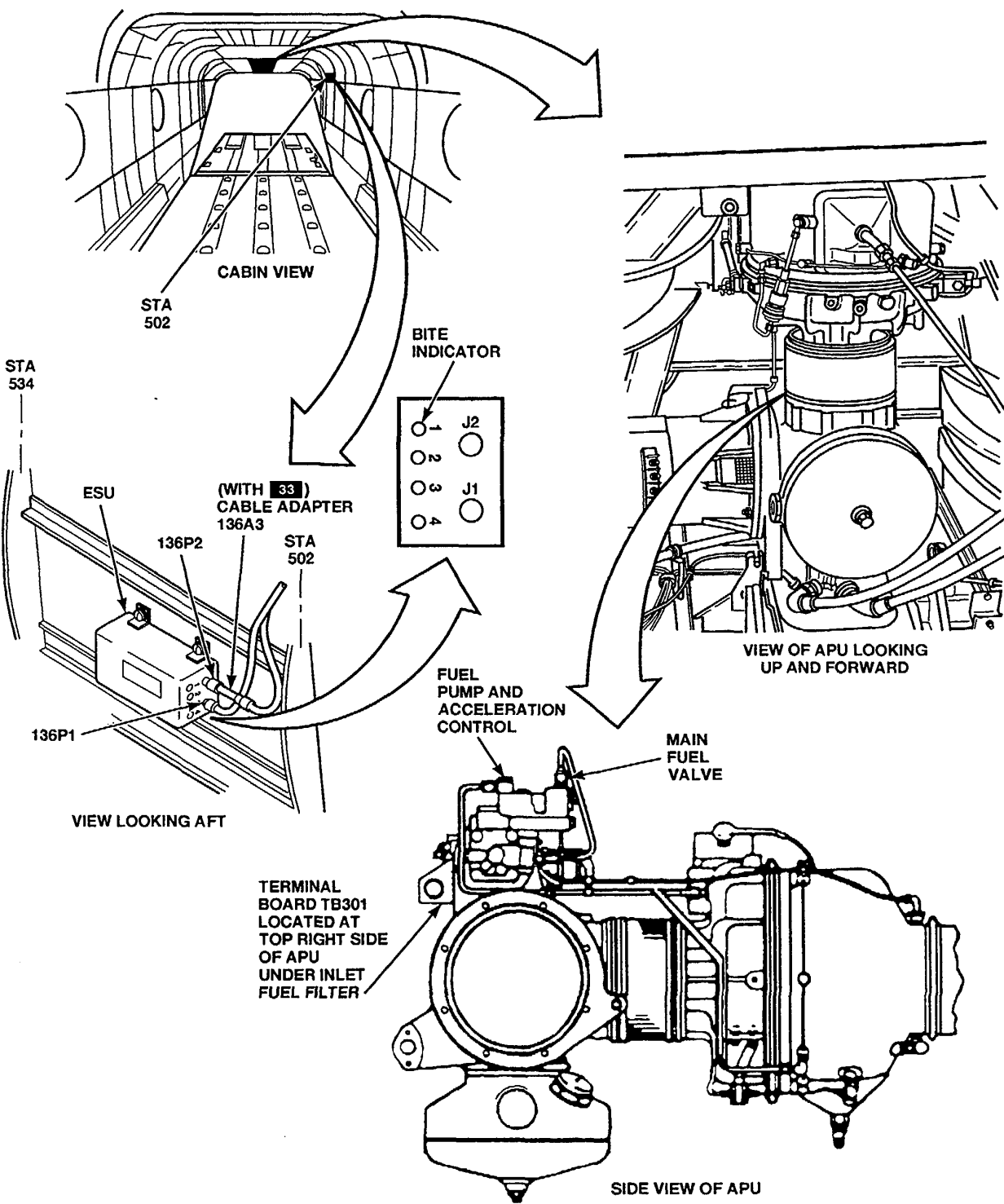
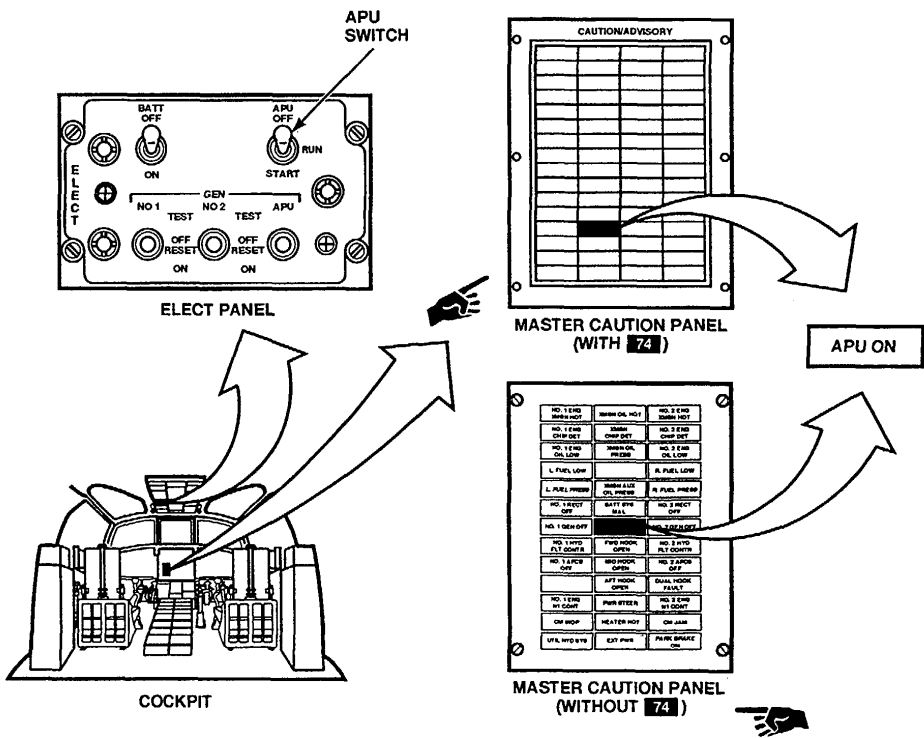
**Tools:**  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter  
APU Tester 161226-200

**Materials:**  
None I

**Personnel Required:**  
Aircraft Electrician  
Medium Helicopter Repairer

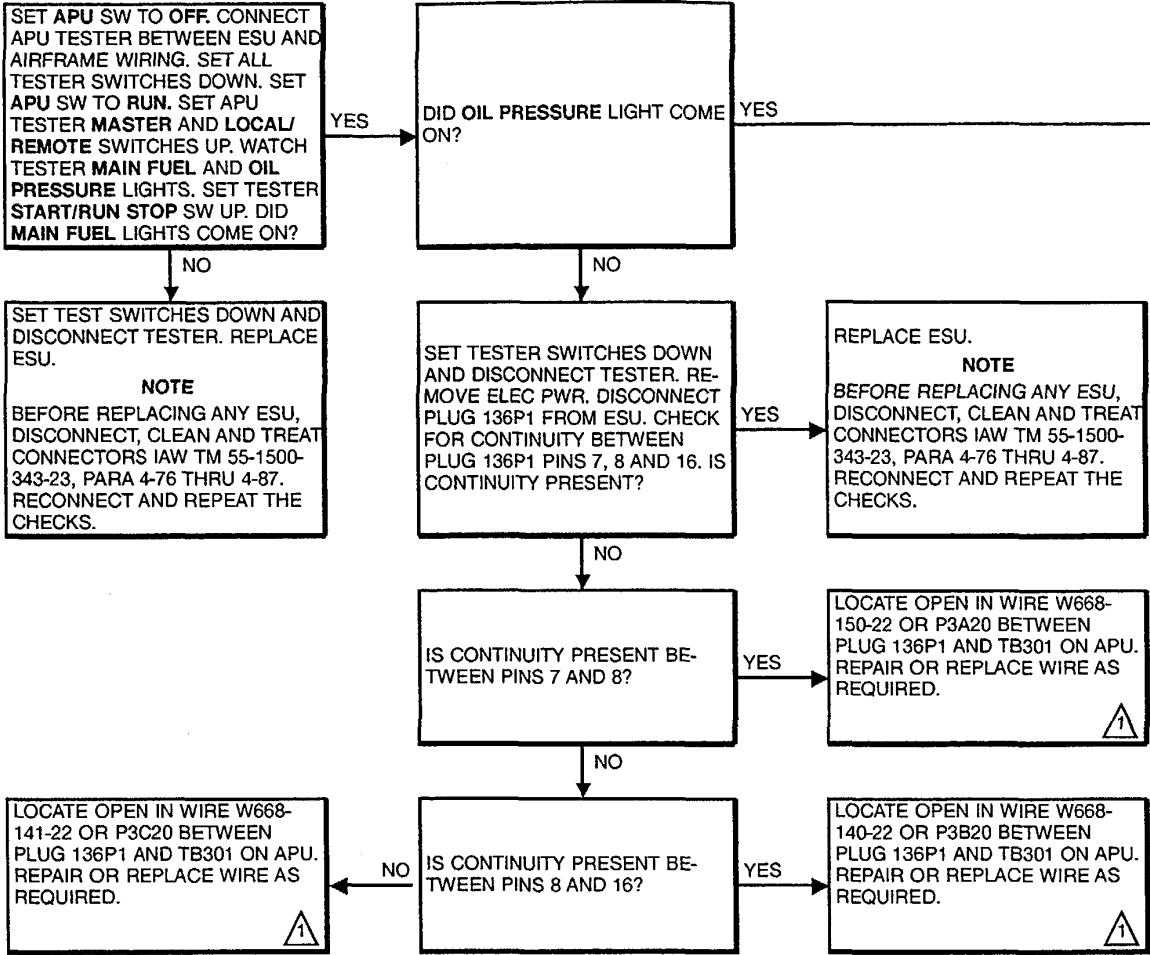
**References:**  
TM 55-1520-240-23  
TM 55-2835-203-23  
TM 55-2835-203-23  
TM 55-1500-343-23  
TM 55-4920-431-13

**Equipment Condition:**  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

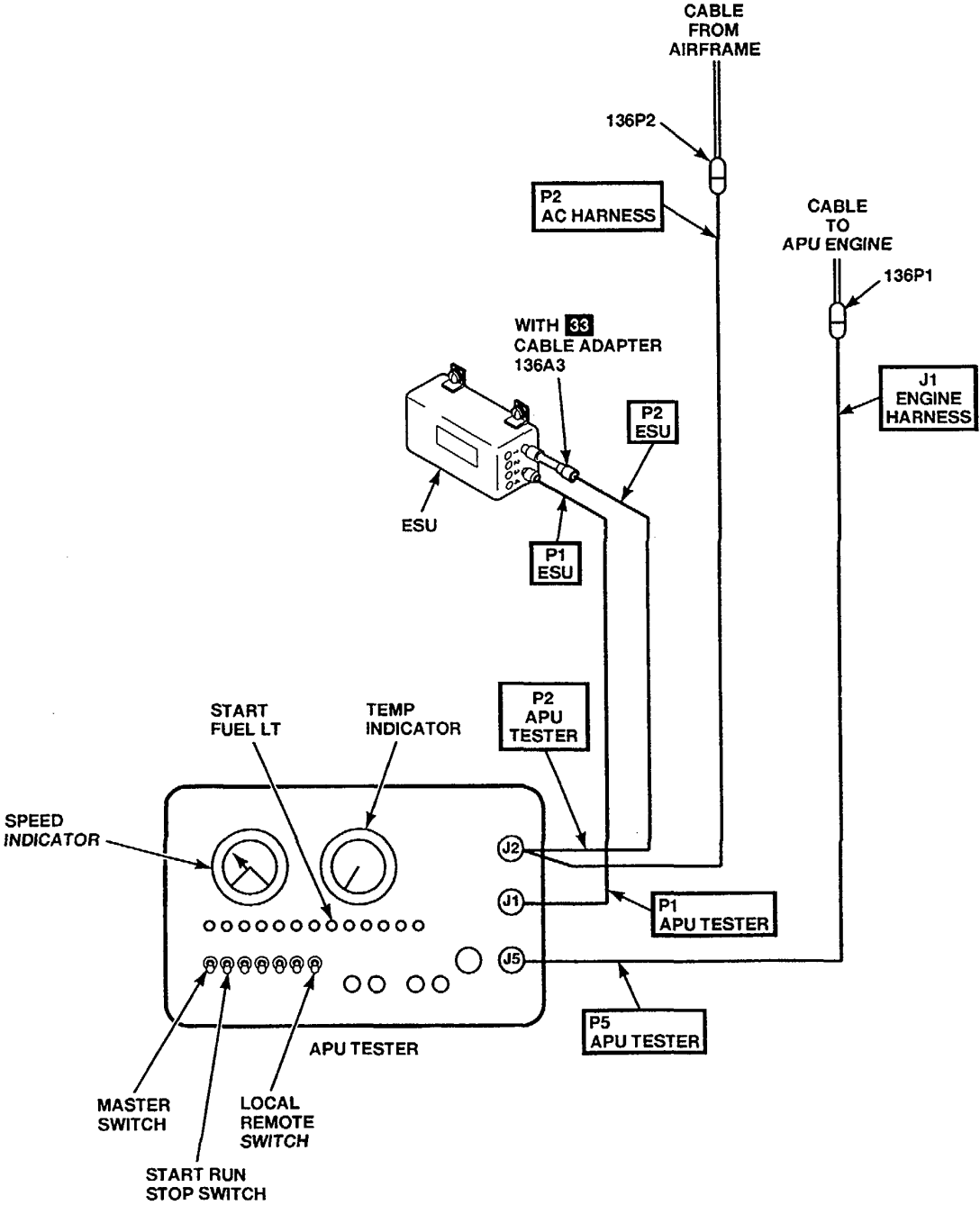


A65584

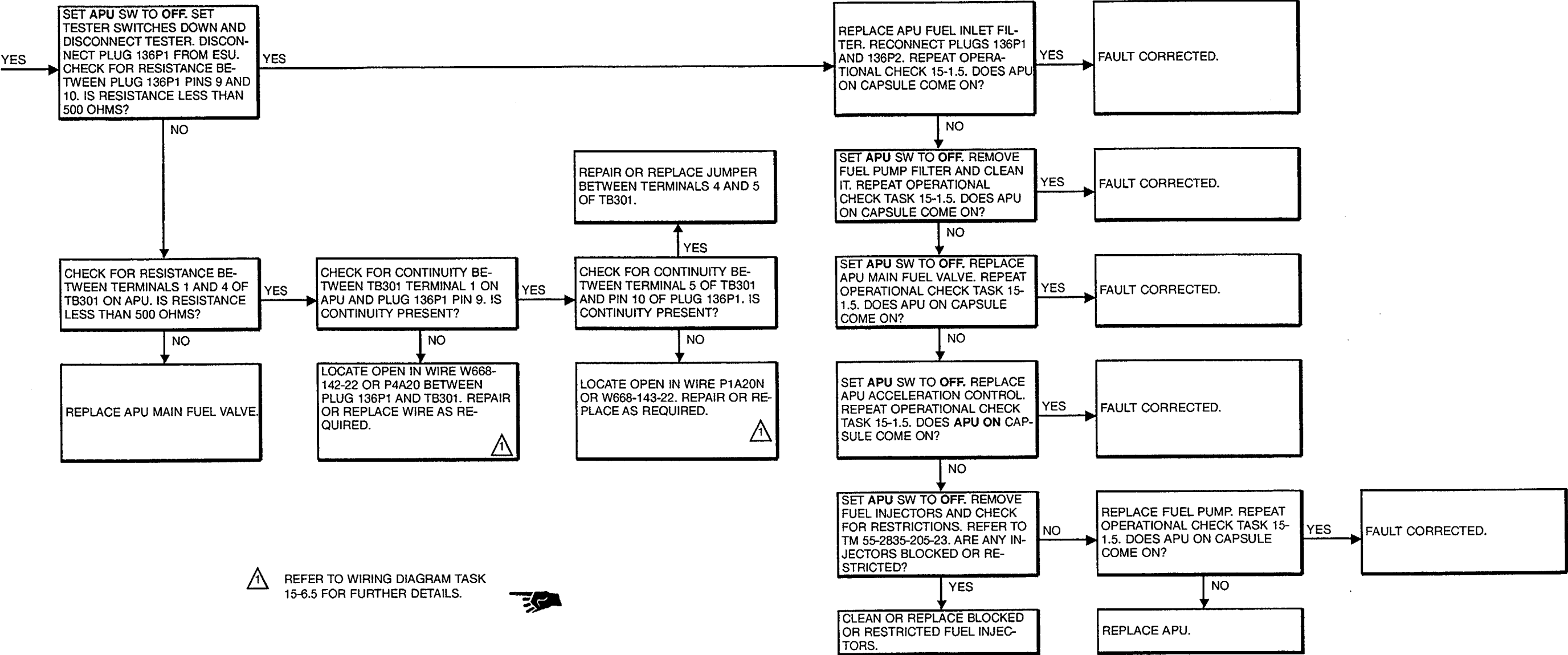


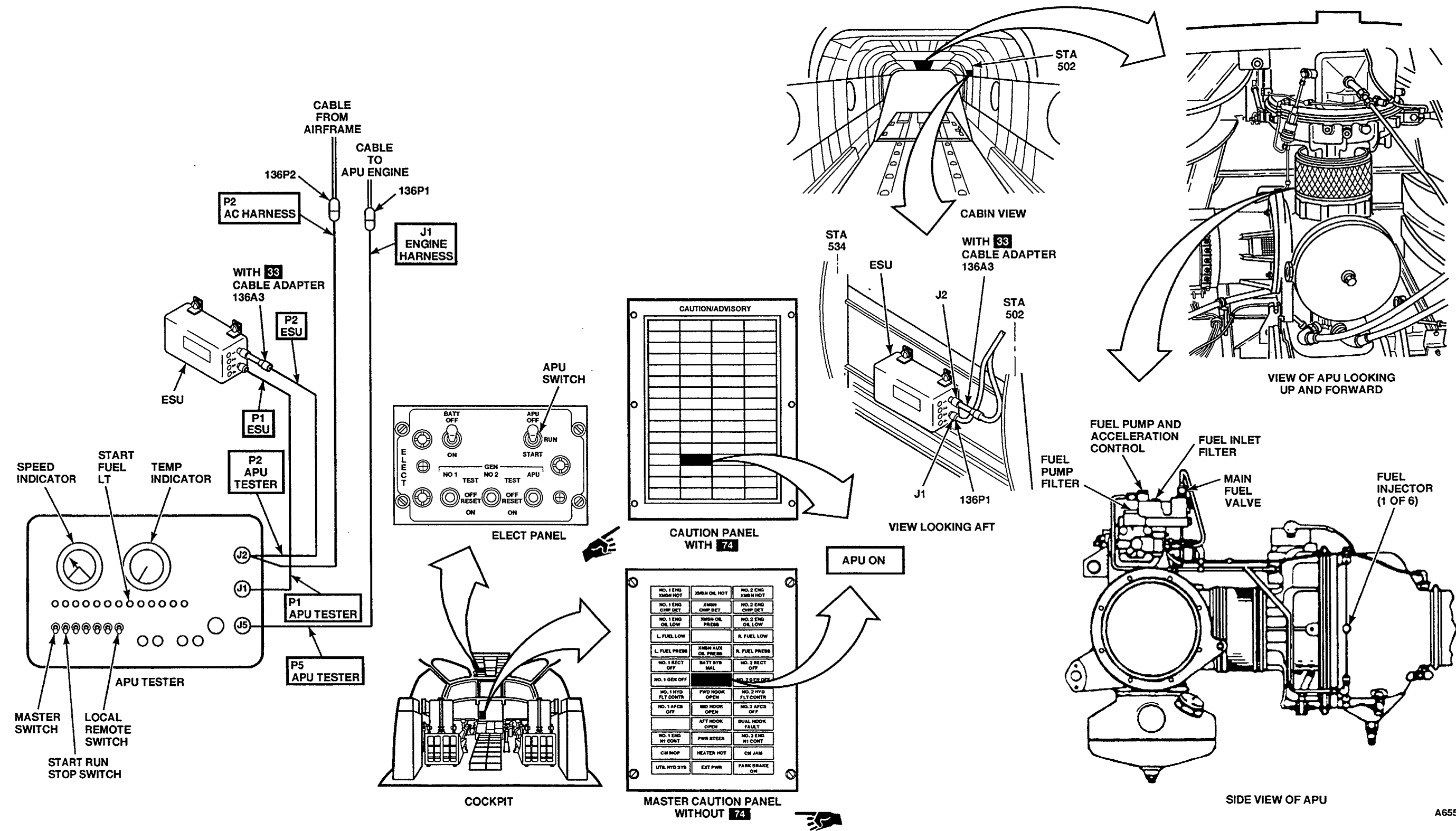


⚠ REFER TO WIRING DIAGRAM IN TASK 15-6.5 FOR FURTHER DETAILS.



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A65583

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

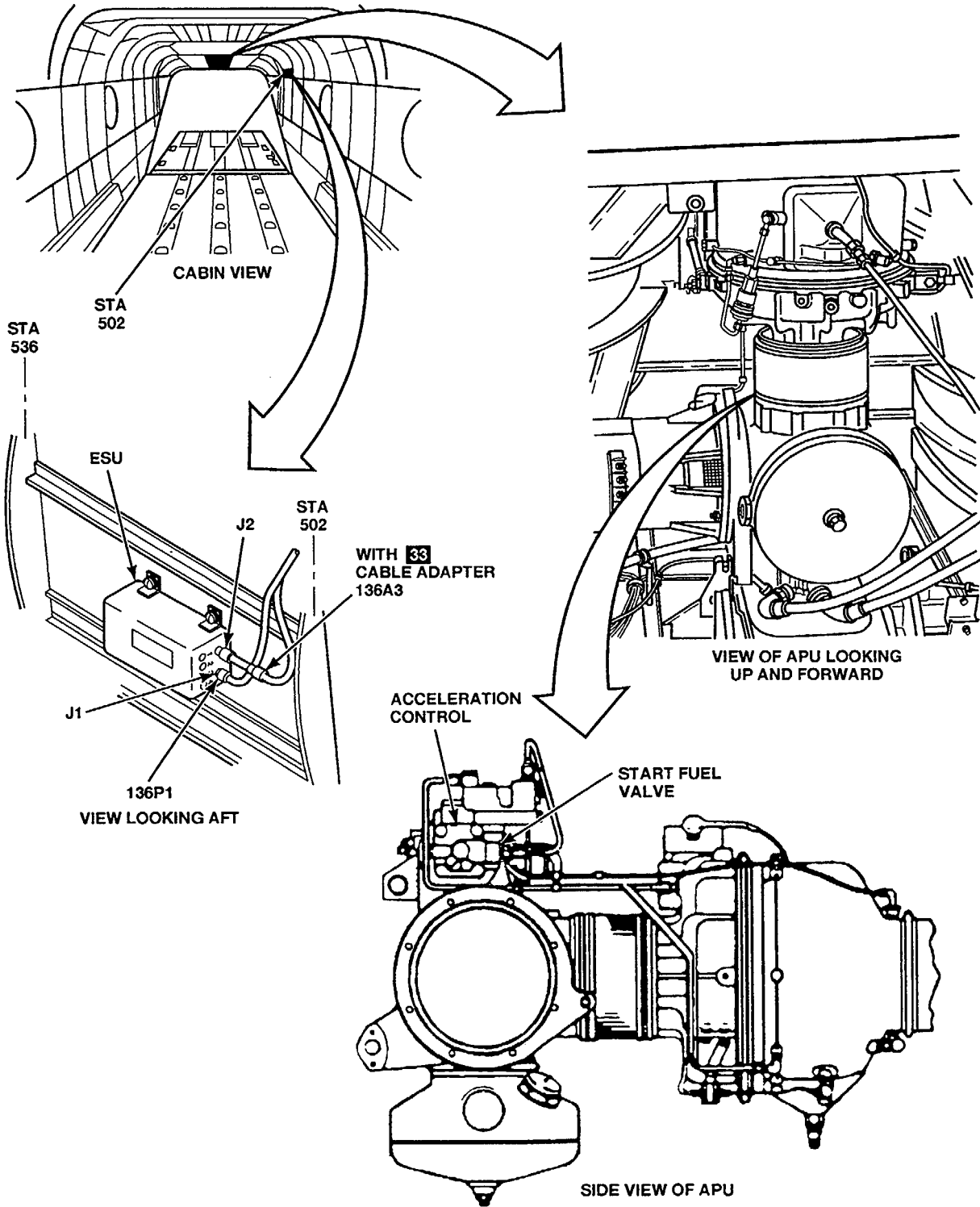
Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
APU Tester 161226-200

Materials:  
None

Personnel Required:  
Aircraft Electrician  
Medium Helicopter Repairer

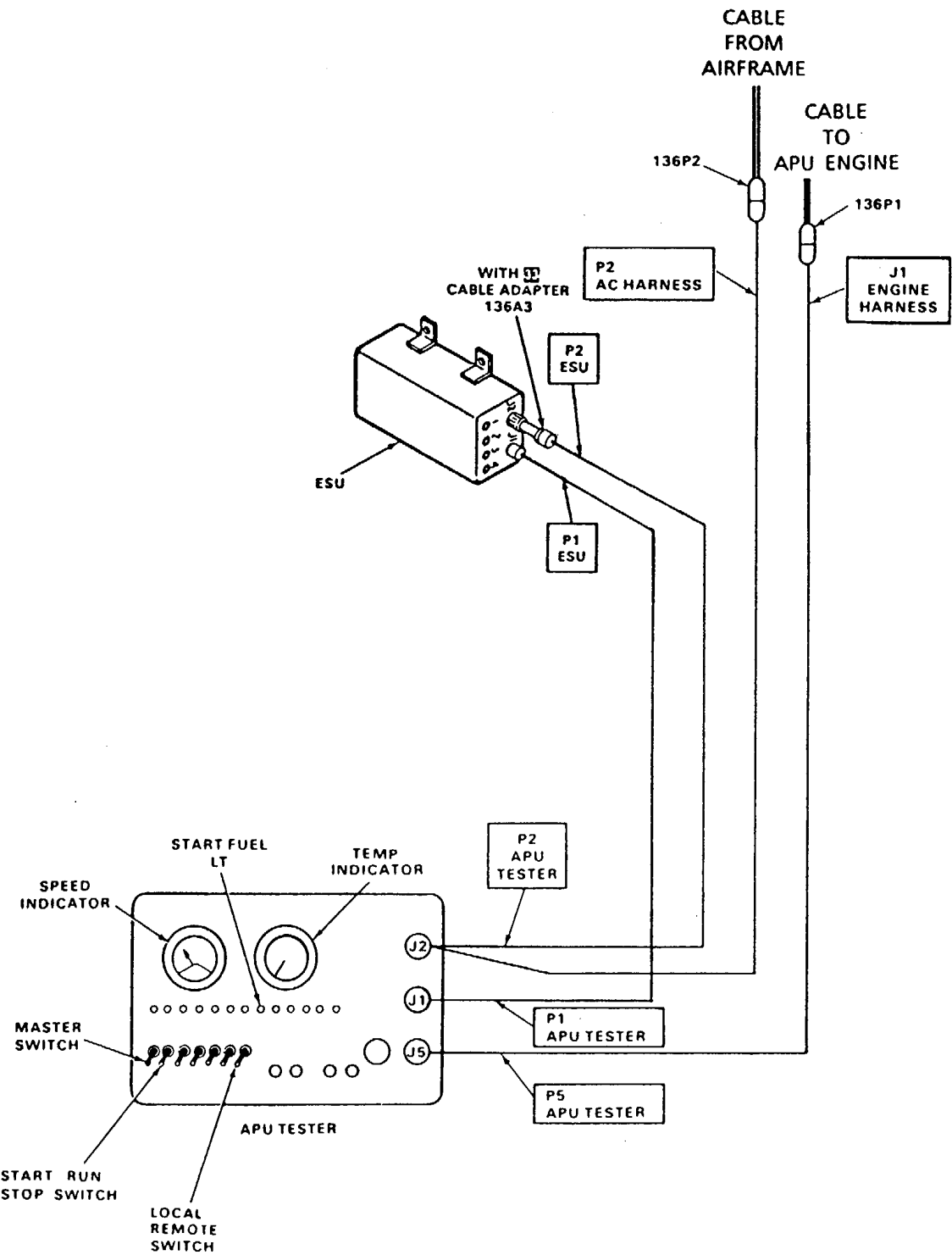
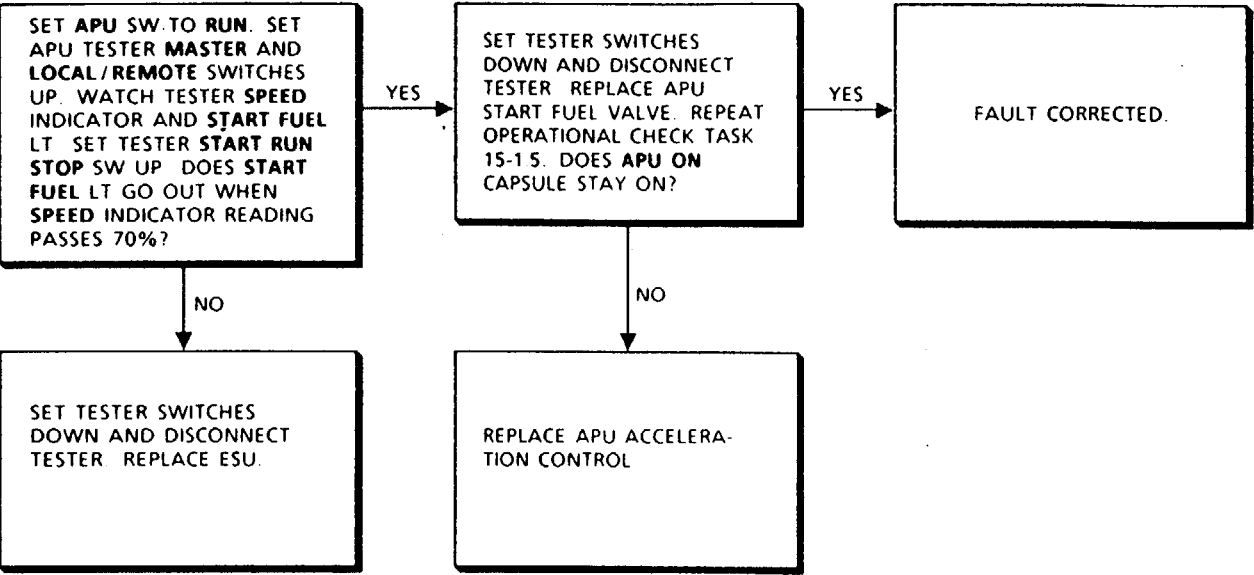
References  
TM 55-1520-240-23  
TM 55-2835-203-23  
TM 55-4920-431-13

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
APU Tester Connected Between ESU and  
Airframe  
Wiring. All Tester Switches Set Down



A65585

15-6.14 APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES (OVERSPEED) (CONTINUED)



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations  
All

Tools:  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692

Materials:  
Cloth (E120)  
Tape (E385)

Personnel Required:  
Medium Helicopter Repairer (2)

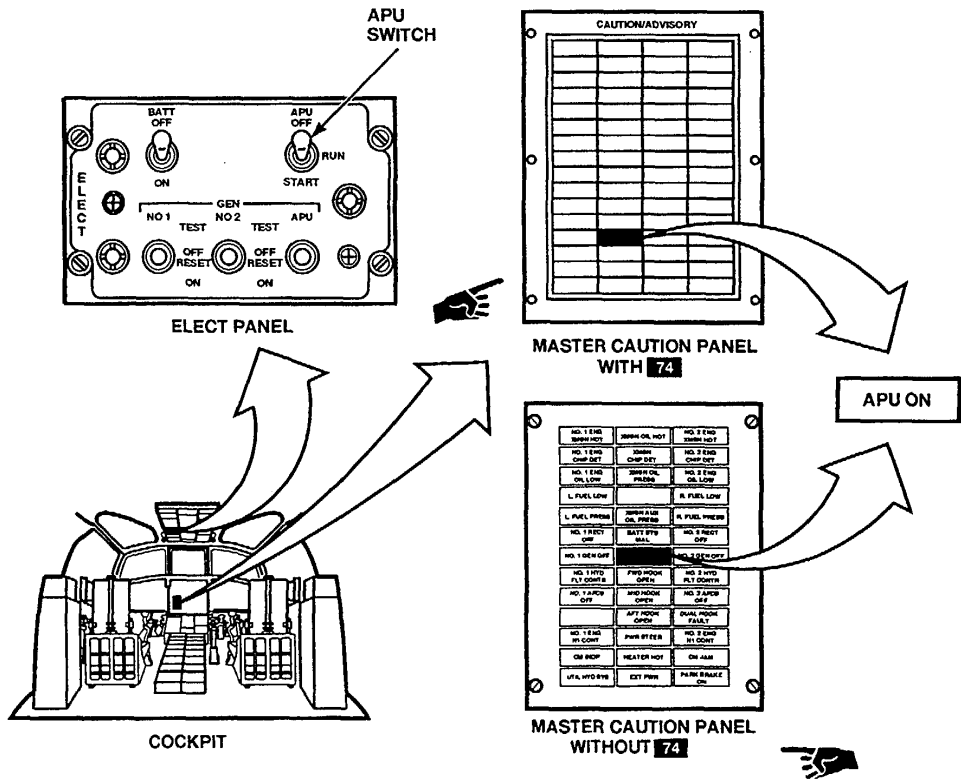
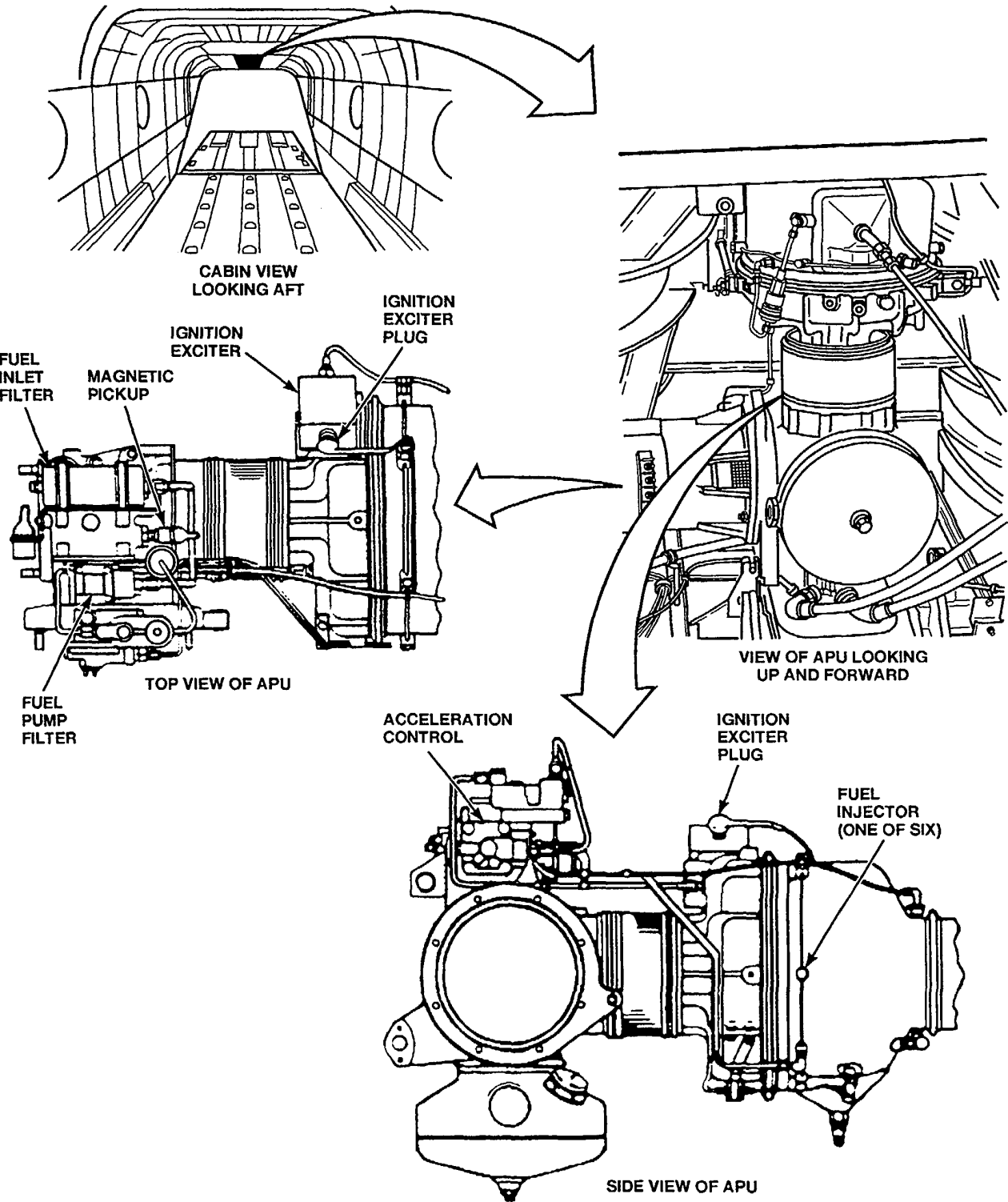
References:  
TM 55-1520-240-23  
TM 55-2835-203-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On

General Safety Instructions:

WARNING

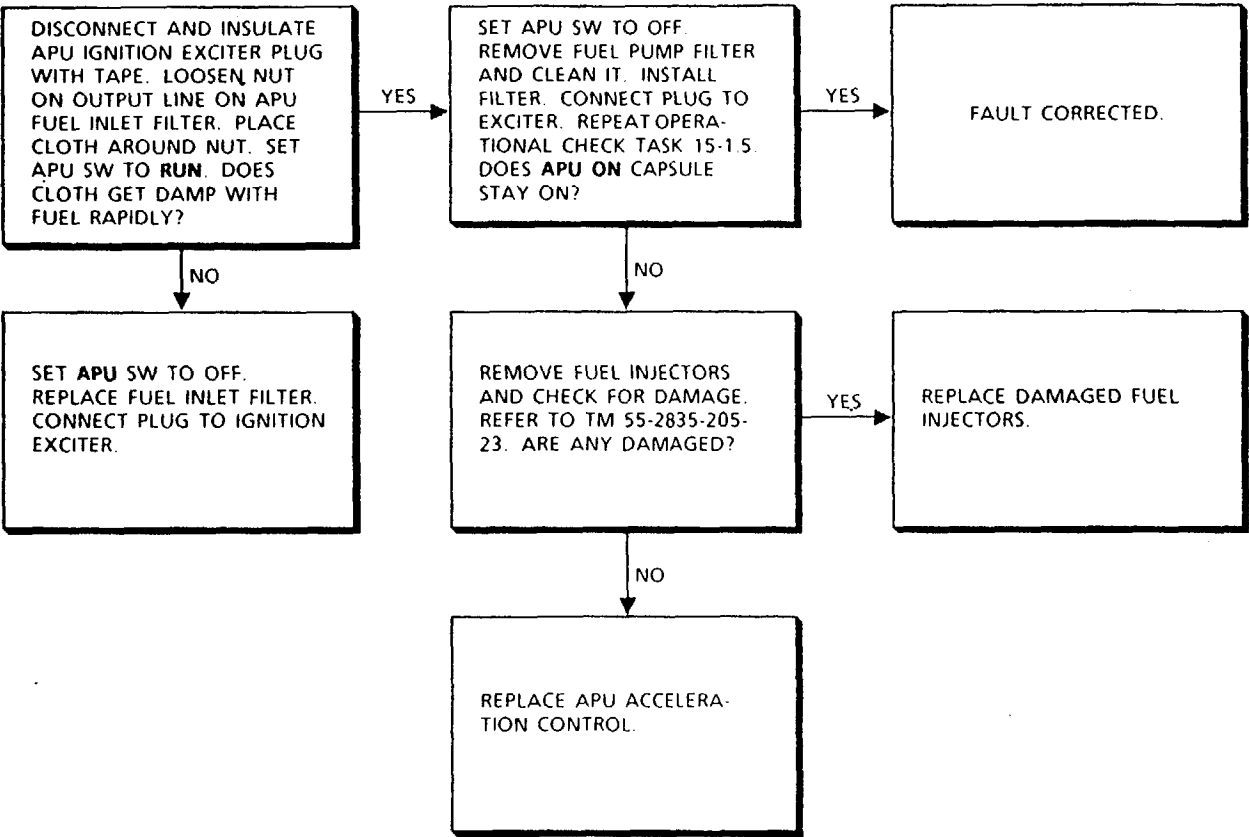
All regulations and instructions for  
handling fuels shall be strictly observed



A65586

15-6.15 APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES (UNDERSPEED) (CONTINUED) ○●○○●

15-6.15



END OF TASK

15-6.16 APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES ○ ○ ● ● (OVERTEMPERATURE)

15-6.16

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations  
All

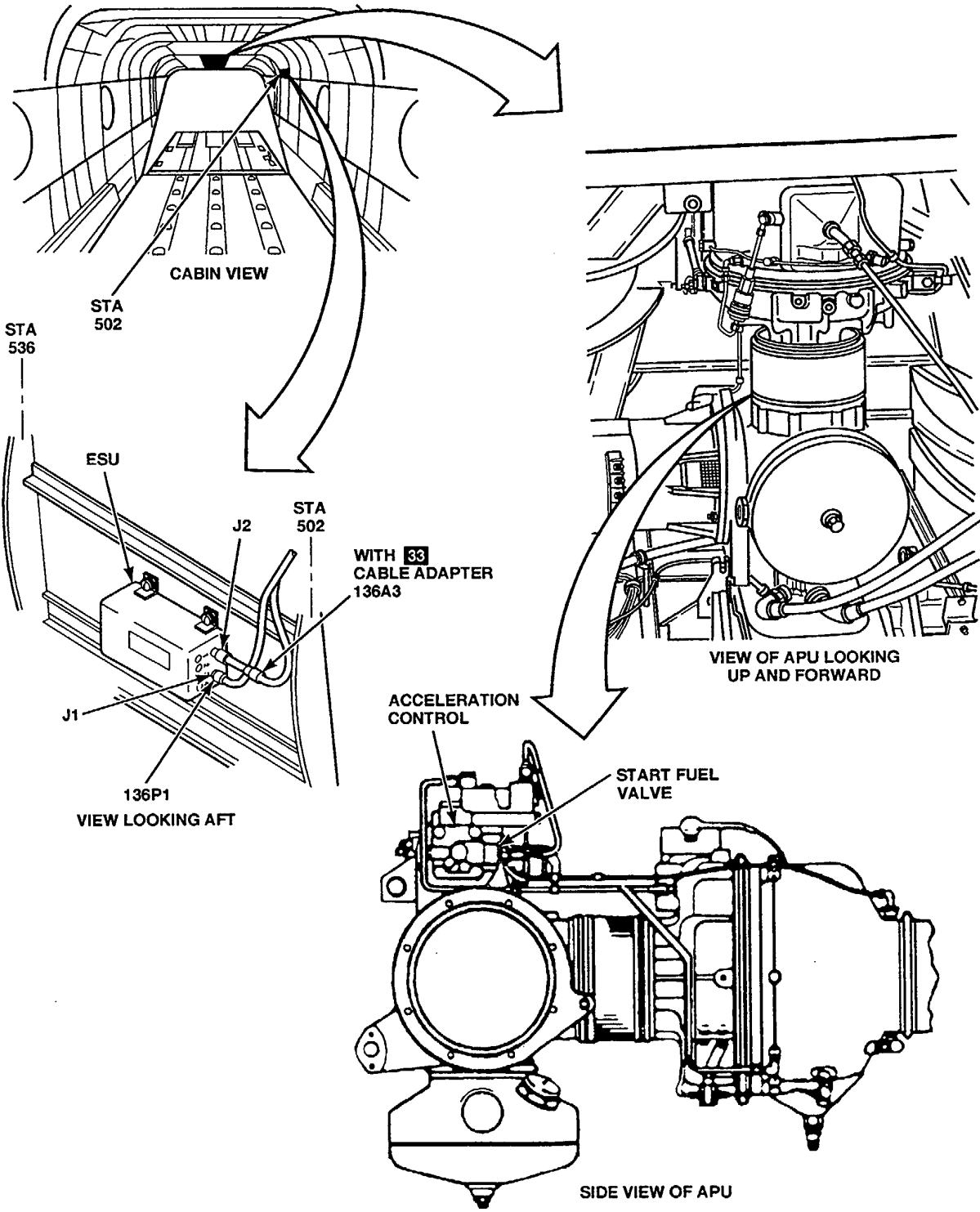
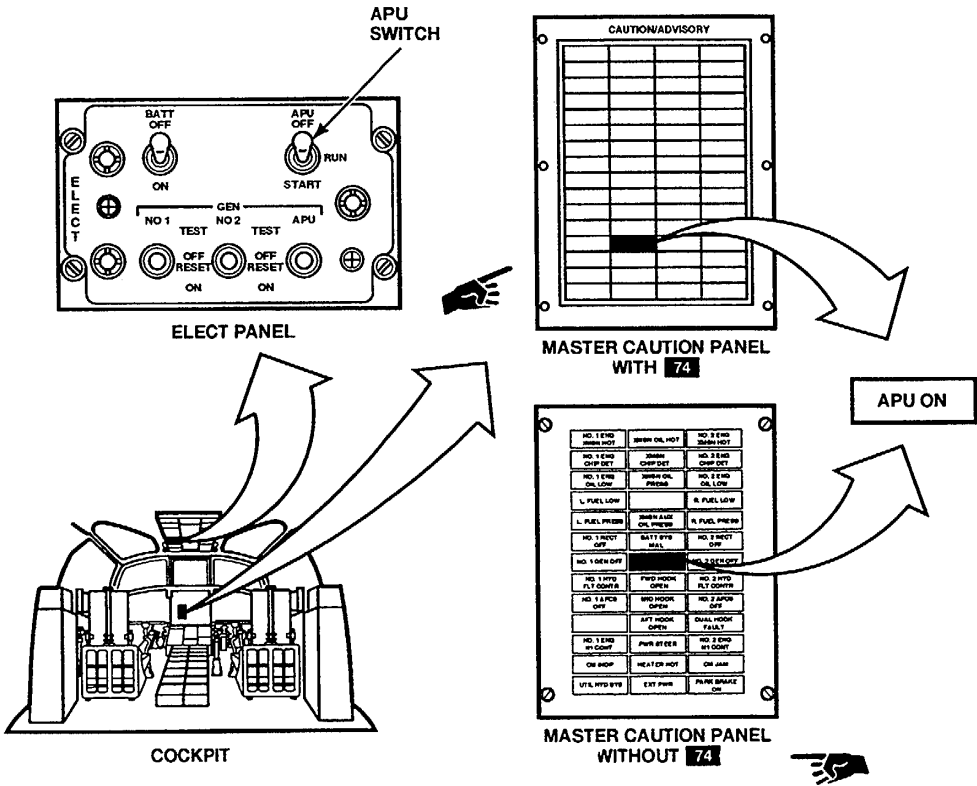
Tools  
Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
APU Tester 161226-200

Materials  
None

Personnel Required:  
Aircraft Electrician  
Medium Helicopter Repairer

References  
TM 55-1520-240-23  
TM 55-2835-203-23  
TM 55-1500-343-23  
TM 55-4920-431-13

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power On  
APU Tester Connected Between ESU and Airframe  
Wiring. All Tester Switches Set Down

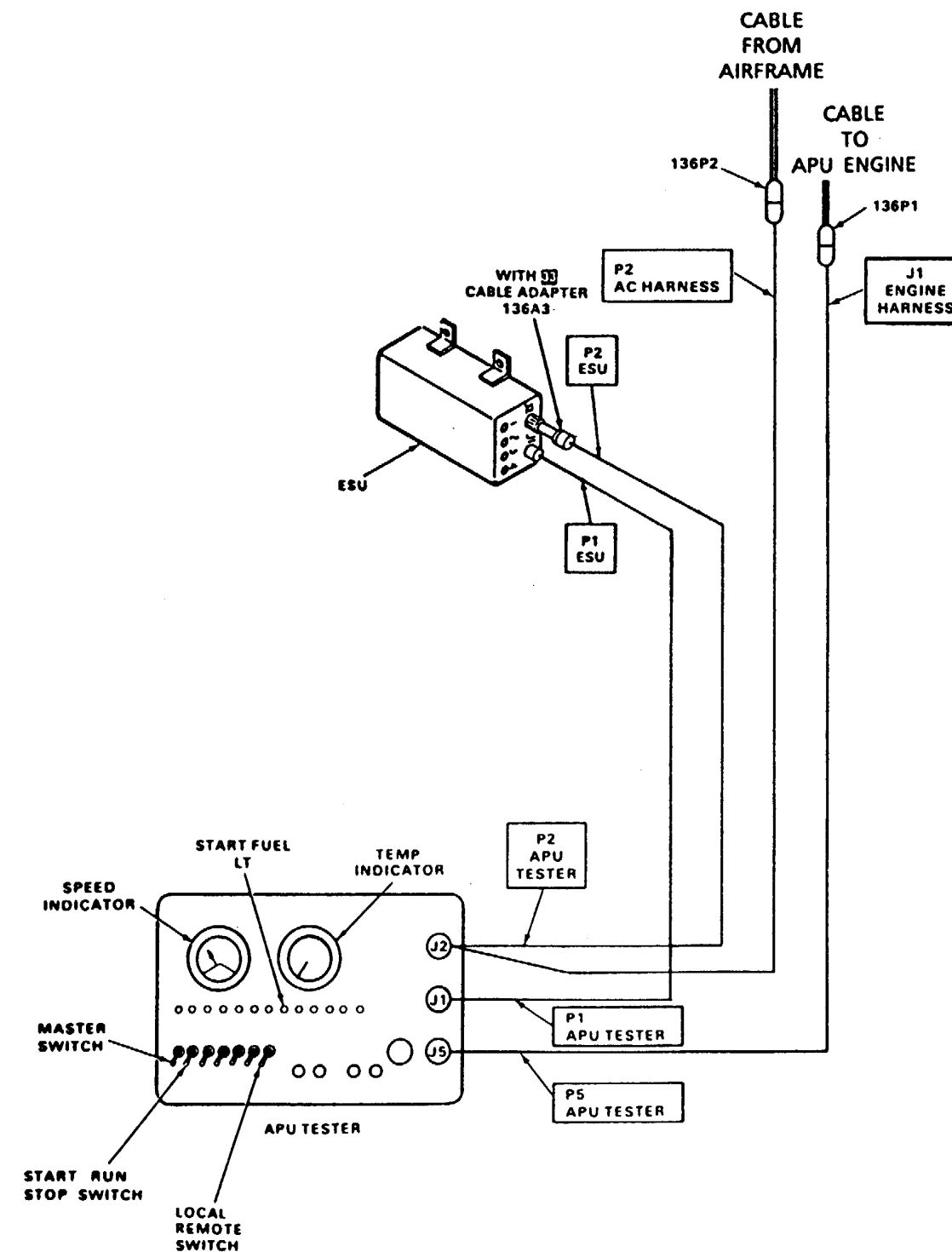


A65585

GO TO NEXT PAGE

Change 23 15-131





**END OF TASK**

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Aircraft Mechanic's Tool Kit,  
NSN 5180-00-323-4692
- APU Tester 161226-200
- Source Low Pressure Compressed Air
- Goggles

Materials:

None

Personnel Required:

Medium Helicopter Repairer

References:

TM 55-1520-240-23

TM 55-4920-431-13

Equipment Condition:

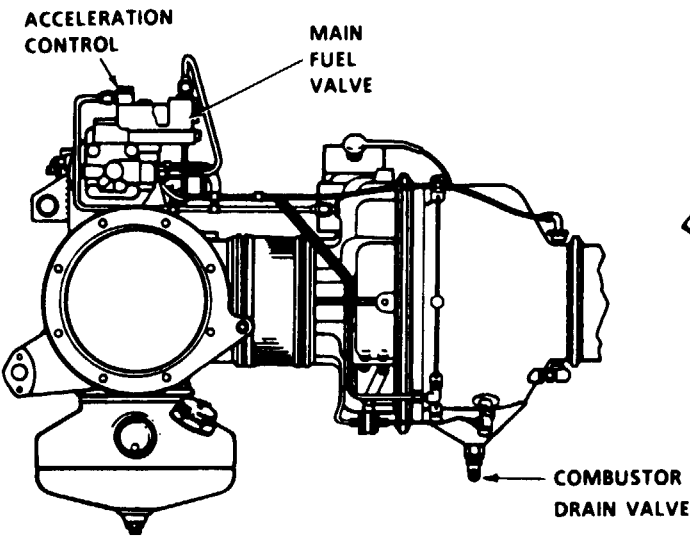
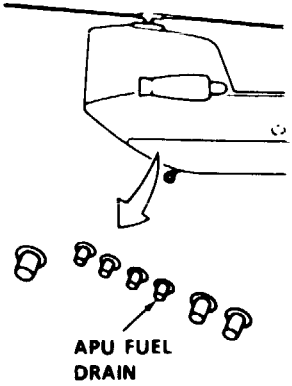
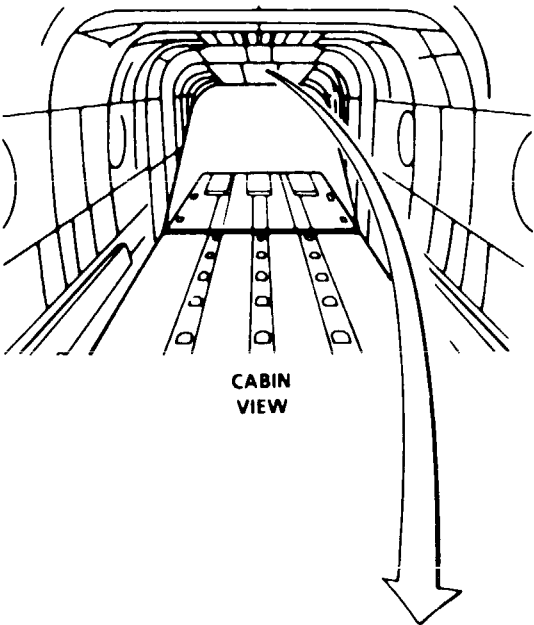
TM 55-1520-240-23

- Battery Disconnected
- Electrical Power Off
- Hydraulic Power Off

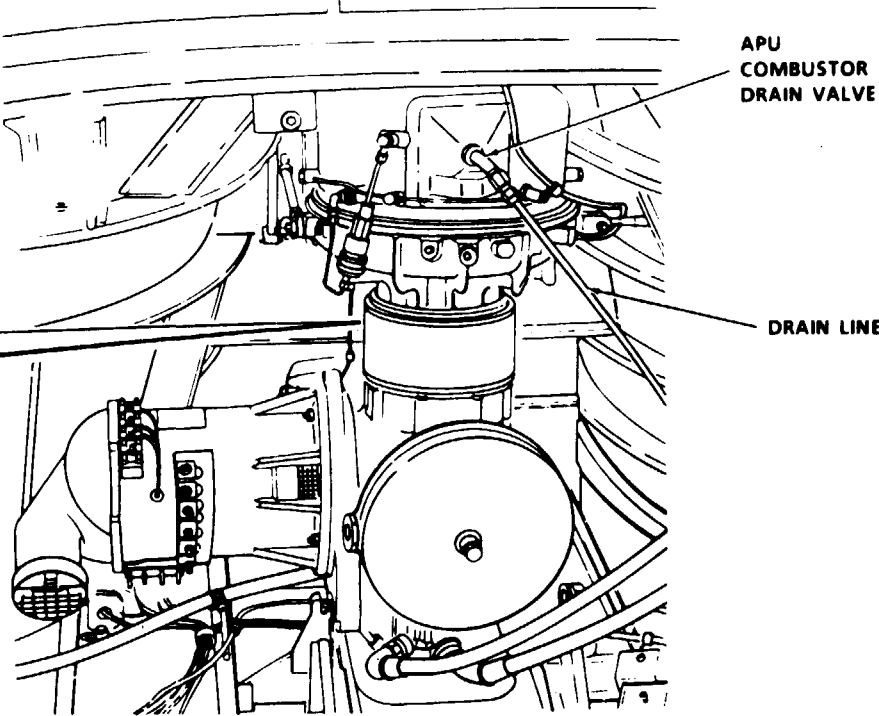
General Safety Instructions:

WARNING

Do not use more than 30 psi compressed air for cleaning purposes. Debris trajected under pressure can cause injury to eyes. Use source of compressed air under 30 psi and eye protection to prevent injury to personnel.



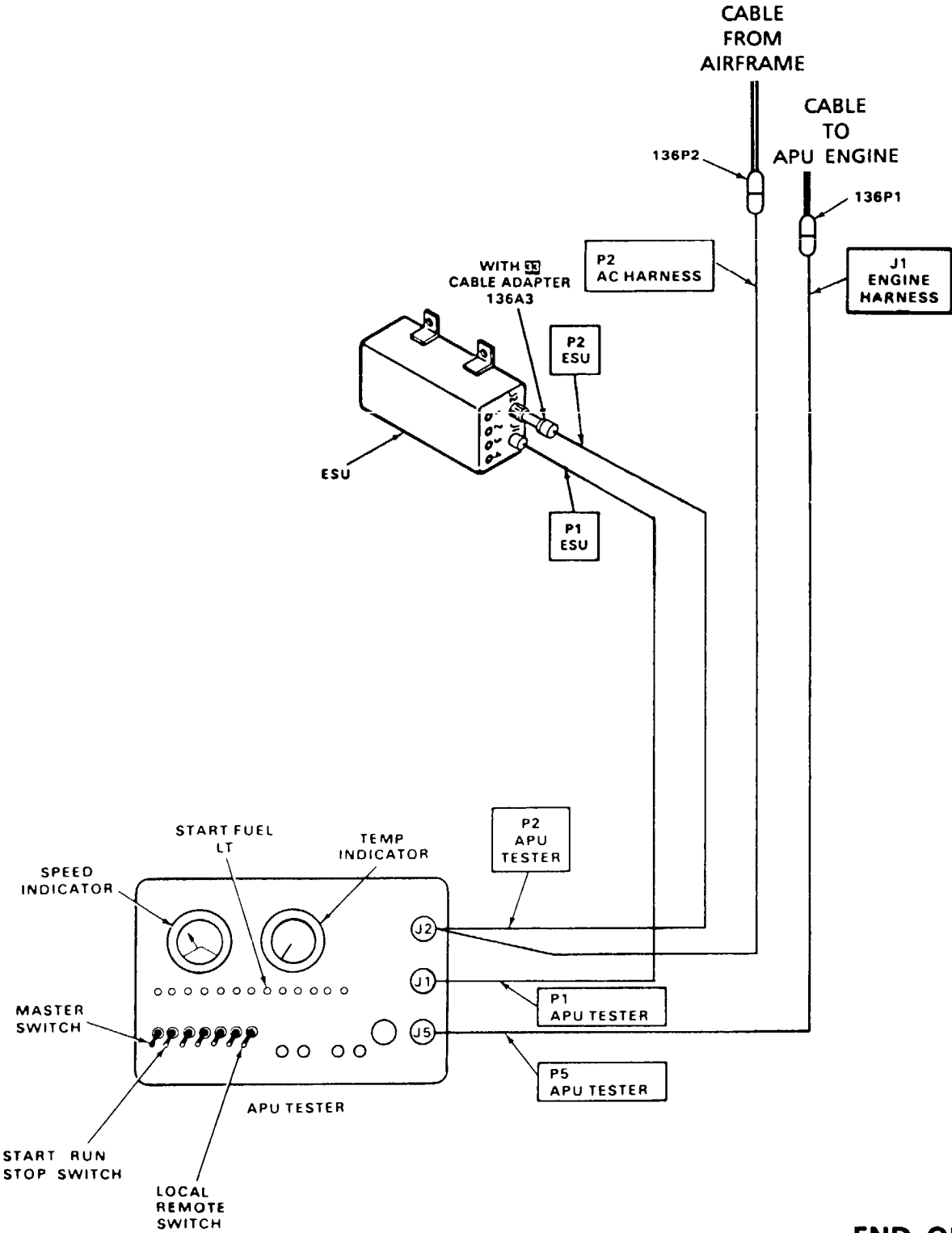
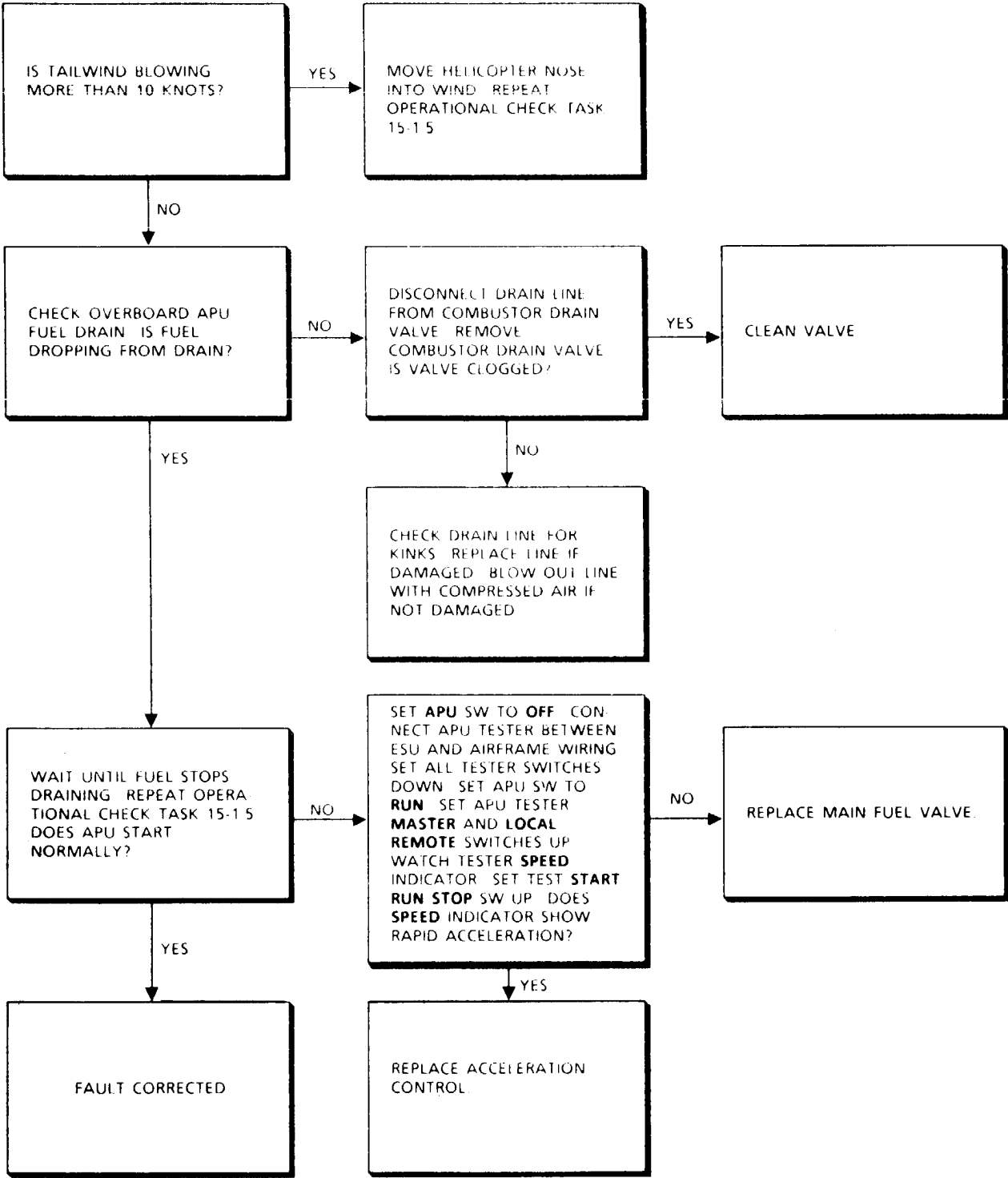
SIDE VIEW OF APU



VIEW OF APU LOOKING UP AND FORWARD

15-6.17 APU STARTS AND RUNS THEN SHUTS DOWN, ESU BITE INDICATES ○ ○ ● ● (OVERTEMPERATURE) (HOT START) (CONTINUED)

15-6.17



END OF TASK

15-6.18 APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES (OPEN THERMOCOUPLE)

15-6.18

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations  
All

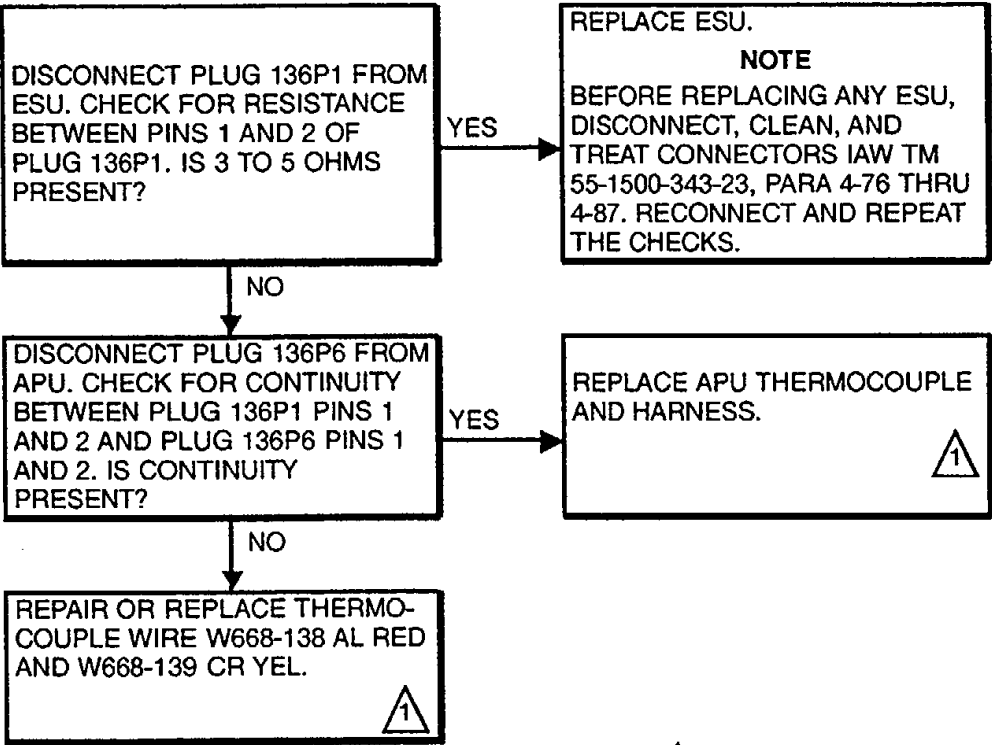
Tools  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials  
None

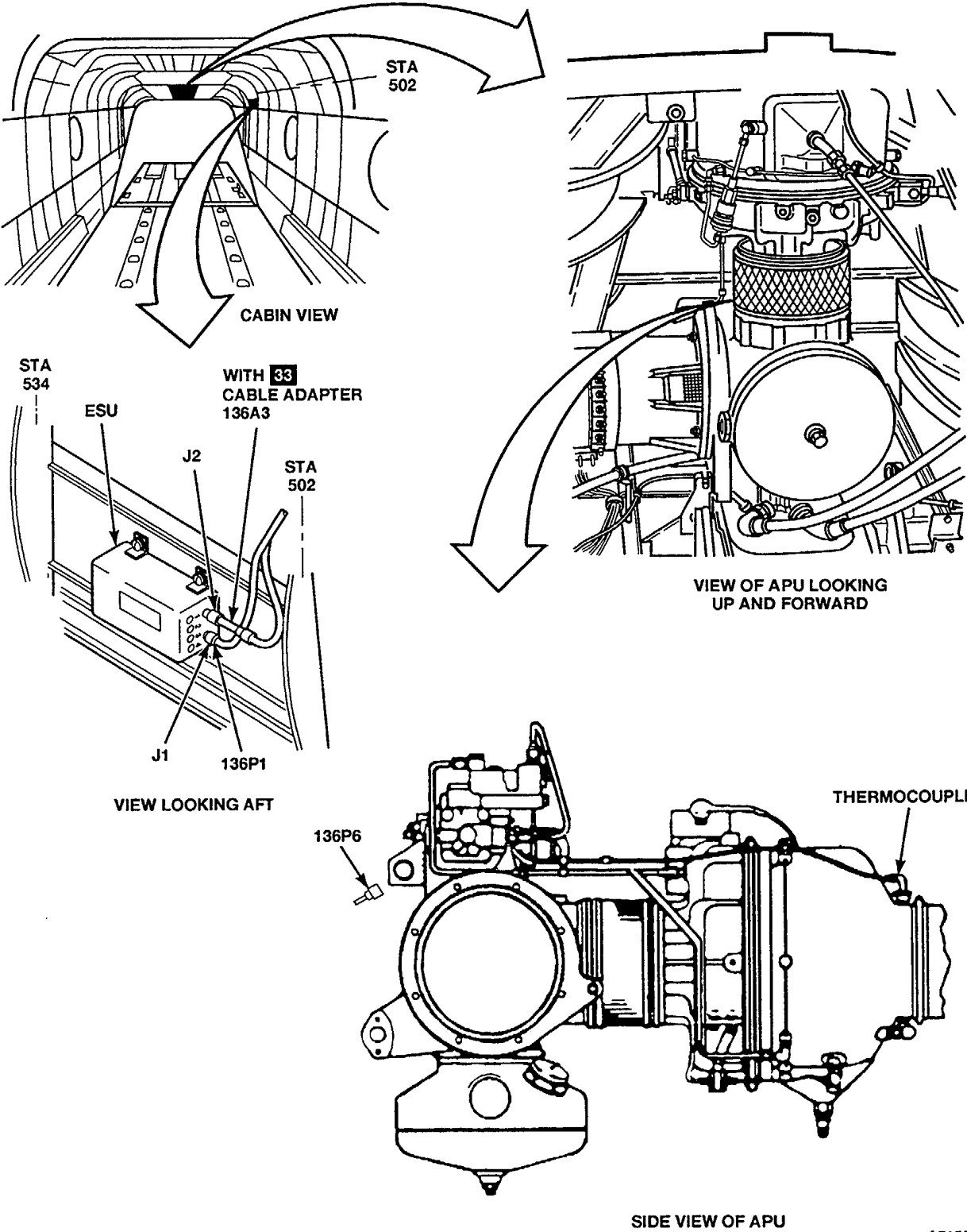
Personnel Required:  
Aircraft Electrician

References  
TM 55-1520-240-23  
TM 55-1500-343-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



1 REFER TO WIRING DIAGRAM IN TASK 15-6.5 FOR FURTHER DETAILS.



A72525  
END OF TASK

15-6.19 APU STARTS AND RUNS BUT ESU BITE INDICATES (SHORTED THERMO. PROBE) (WARNING)

15-6.19

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations  
All

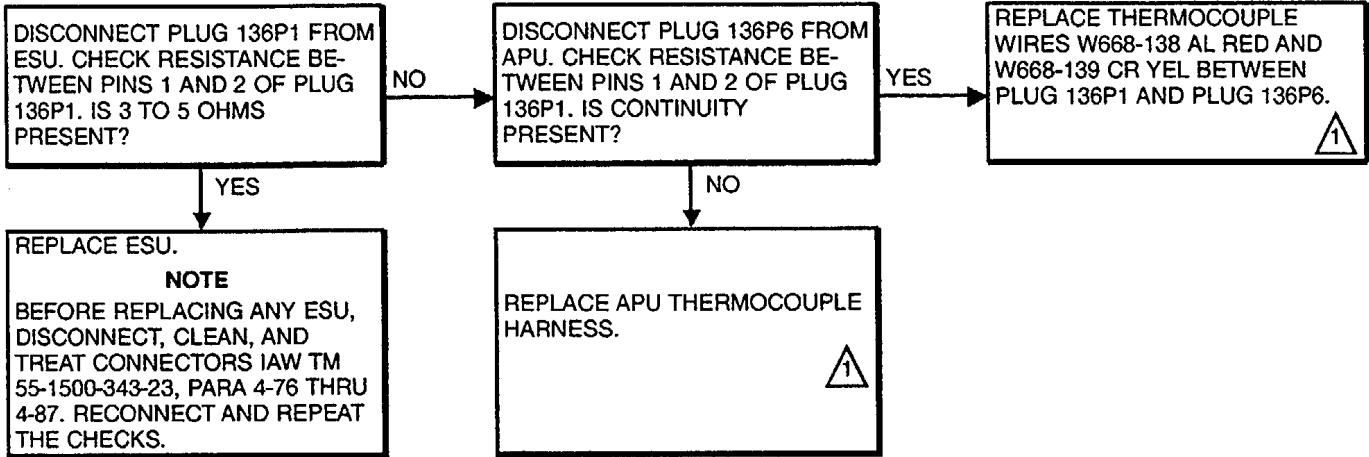
Tools  
Electrical Repairer's Tool Kit,  
NSN 5180-00-3234915  
Multimeter

Materials  
None

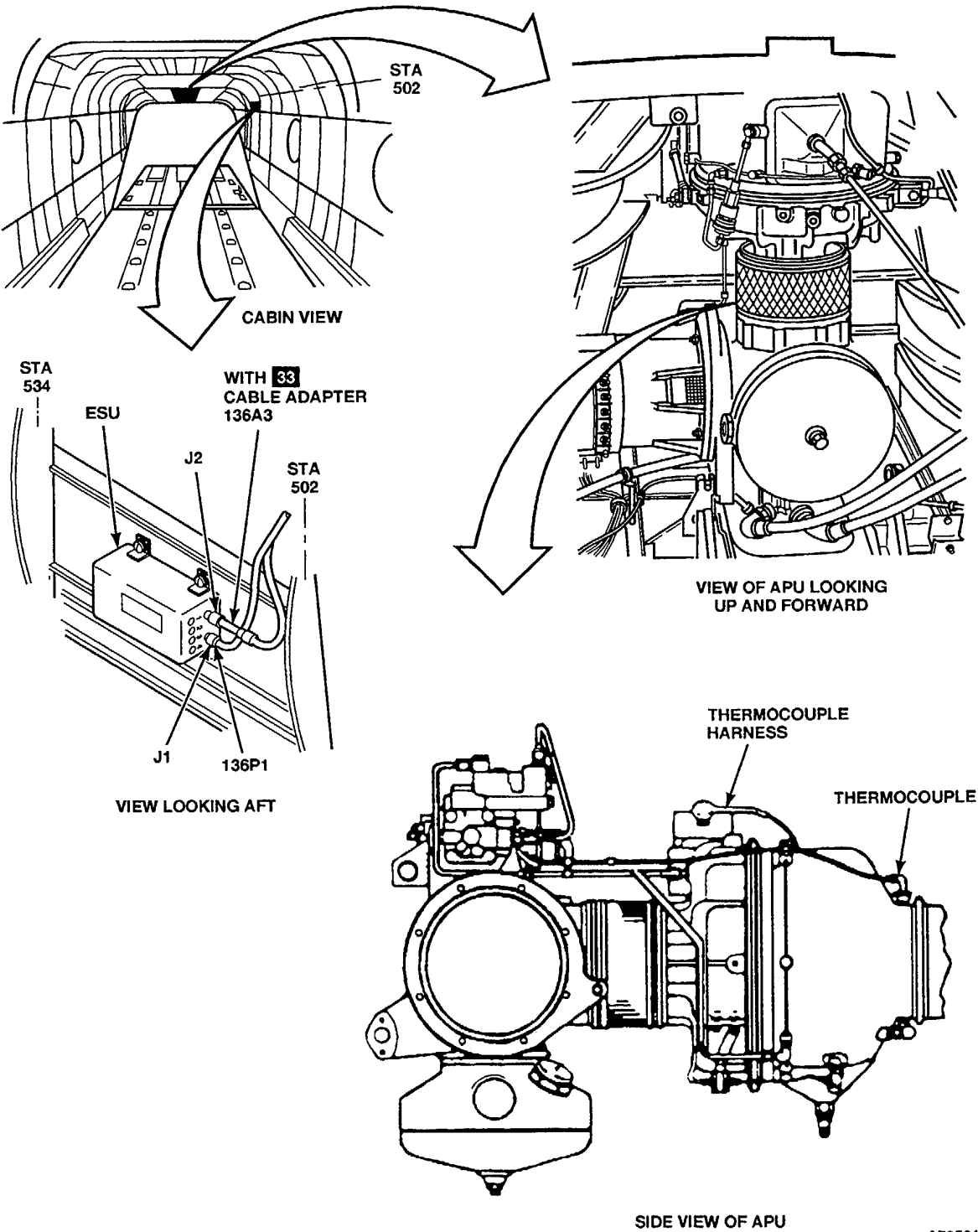
Personnel Required:  
Aircraft Electrician

References  
TM 55-1520240-23  
TM 55-1500-343-23

Equipment Condition:  
TM 55-1520-240-23  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



REFER TO WIRING DIAGRAM IN TASK 15-6.5 FOR FURTHER DETAILS.



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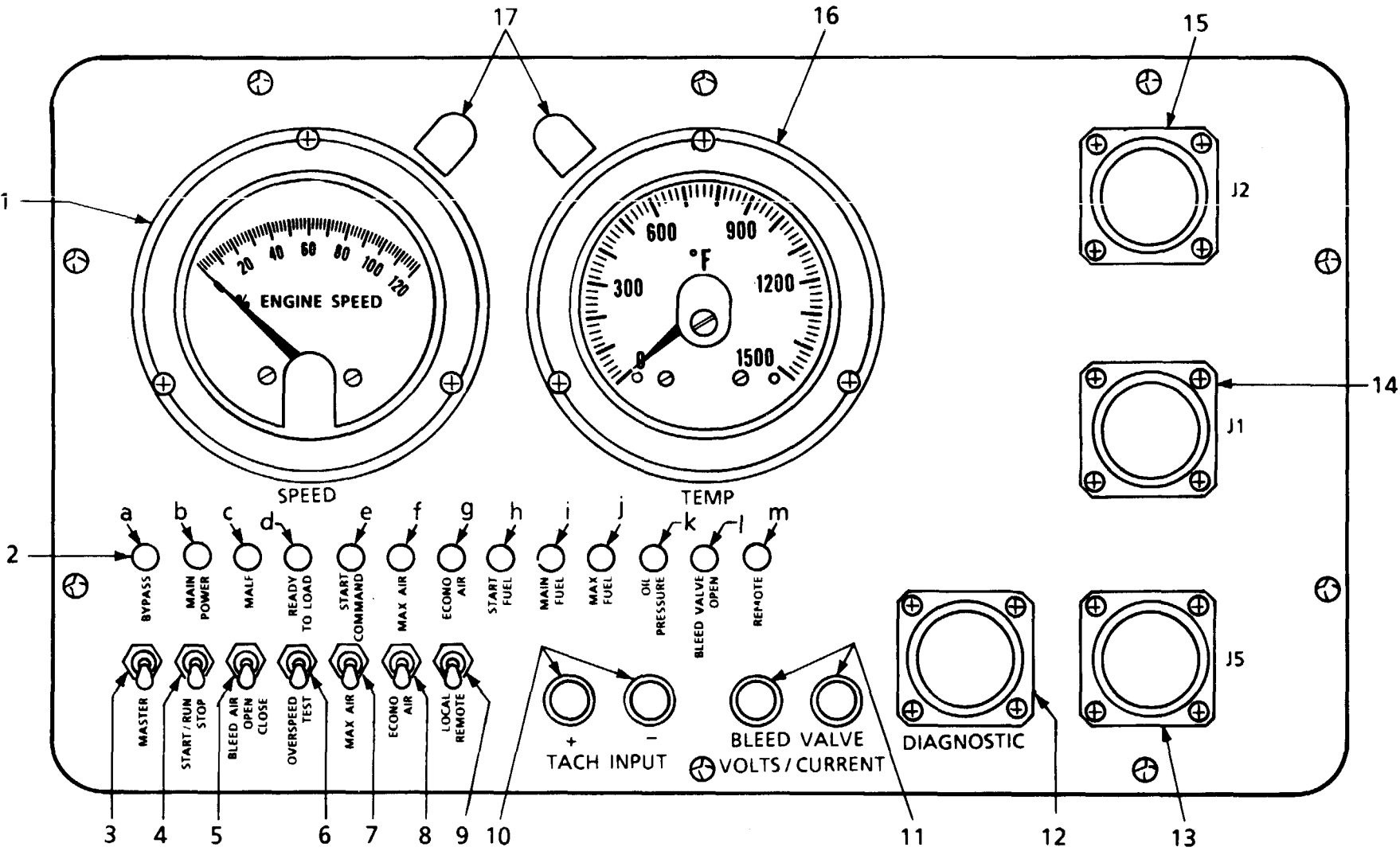
## 15-7 APU TESTER

PARAGRAPH 15-7  
TABLE OF CONTENTS  
APU TESTER

PARAGRAPH	DESCRIPTION	FUNCTION	PAGE
15-7	APU TESTER		15-137
15-7.1	PANEL LAYOUT	DRAWING	15-140
15-7.2	CONTROLS AND INDICATORS FUNCTIONS TABLE	TABLE	15-141
15-7.3	APU TESTER OPERATION	TASK	15-142

PARAGRAPH 15-7  
LIST OF TABLES  
ELECTRONIC SEQUENCE UNIT (ESU) TROUBLESHOOTING

TABLE NO.	DESCRIPTION	PAGE NO.
15-7.1	FUNCTION OF CONTROLS AND INDICATORS ON APU TESTER	15-141





15-7.2 CONTROLS AND INDICATORS FUNCTIONS TABLE

15-7.2

TABLE 15-7.1  
FUNCTION OF CONTROLS AND INDICATORS ON APU TESTER

ITEM 1	NOMENCLATURE	FUNCTION
1	SPEED meter	Displays % engine speed from 0 to 120.
2	Color coded LED indicators	
	a. BYPASS (grn)	Lighted - indicates voltage is applied to start bypass valve.
	b. MAIN POWER (red)	Lighted - indicates main power is on.
	c. MALF (red)	Lighted - indicates malfunction has occurred and unit is shutdown. Bite indication on ESU is checked for cause.
	d. READY TO LOAD (grn)	Lighted - indicates APU is ready to accept load.
	e. START COMMAND (grn)	Lighted - indicates start command is initiated,
	f. MAX. AIR (red)	(Not applicable)
	g. ECONO AIR (yel)	(Not applicable)
	h. START FUEL (yel)	Lighted - indicates start fuel valve voltage on approximately 5% RPM.
	i. MAIN FUEL (yel)	Lighted - indicates main fuel valve voltage on, approximately 14% RPM.
	j. MAX. FUEL (yel)	Lighted - indicates max. fuel voltage on, approximately 90% RPM + 5 sec. time out.
	k. OIL PRESSURE (yel)	Lighted when MAIN POWER is lit. Does NOT indicate Oil Pressure.
	l. BLEED VALVE OPEN (grn)	(Not applicable)
	m. REMOTE (red)	Lighted - indicates remote analog converter selected. (Actual magnetic pickup and thermocouple probe.)
3	MASTER switch	Controls 28 VDC power to Tester and ESU.

ITEM 1	NOMENCLATURE	FUNCTION
4	START/ RUN /STOP switch	Initiates start sequence of ESU and generates start signal input to tester.
5	BLEED AIR OPEN/CLOSE switch	(Not applicable)
6	OVERSPEED TEST switch	(Not applicable)
7	MAX. AIR switch	(Not applicable)
8	ECONO AIR switch	(Not applicable)
9	LOCAL/REMOTE switch	Selects local or remote analog converter. LOCAL (down position) selects analog converter in aircraft. REMOTE (up position) selects analog converter in tester. Always used in the REMOTE position.
10	TACH INPUT jacks	To monitor magnetic pickup input and input simulation signals.
11	BLEED VALVE VOLTS/ CURRENT jacks	(Not applicable)
12	DIAGNOSTIC connector	(Not applicable)
13	Connector J5	Output connector for harness connection to APU.
14	Connector J 1	Input connector for harness connection to ESU.
15	Connector J2	Input /Output connector for harness connection to ESU and Airframe harness.
16	TEMP meter	Displays exhaust gas temperature (EGT) in °F from 0 to 1500.
17	PANEL Lights	Lighted - indicates 28 VDC power is available to tester. Illuminates panel meters.

1 Refer to Paragraph 15-7.1 for location of items.

15-7.3 APU TESTER OPERATION

INITIAL SETUP

**Applicable Configurations:**  
All

**References:**  
TM 55-1520-240-23  
TM 55-4920-431-13

**Tools:**  
Electrical Repairer's Tool Kit.  
NSN 5180-00-329-4915  
APU Tester 161226-200

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
External Electrical Power Off

**Materials:**  
None

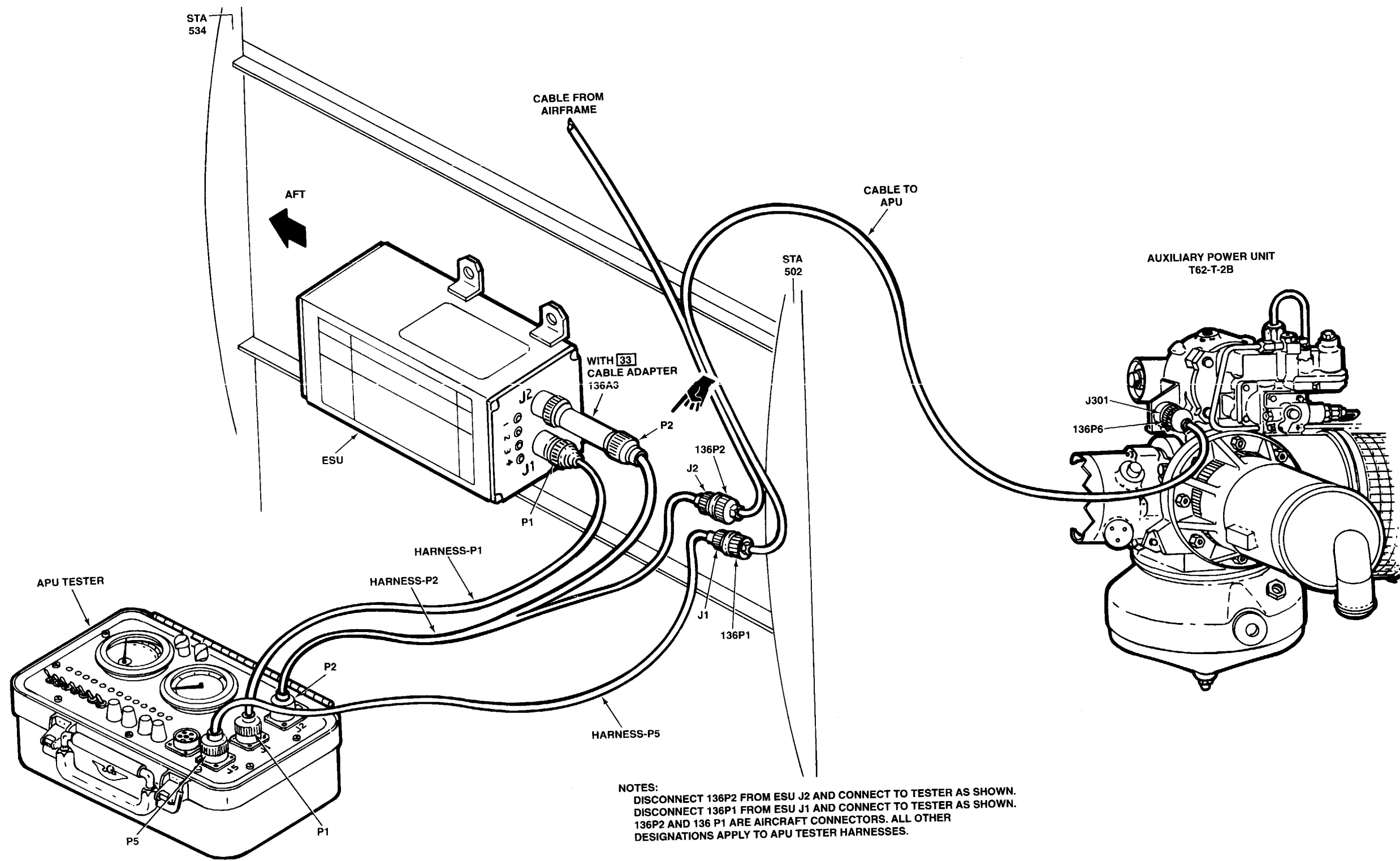
**Personnel Required:**  
Aircraft Electrician

TASK	RESULT
1. Turn pressure equalizer knob to OPEN.	Pressure on cover is released.
2. Open case.	
3. Remove P1, P2 and P5 harnesses.	
4. Inspect equipment for any physical damage.	Repair or replace as required.
5. Zero meters.	
6. Connect harnesses to the applicable J1, J2 and J5 connectors on test set.	
7. Remove 136P1 and 136P2 from ESU and connect to the corresponding cable connectors of harnesses.	
8. Connect the remaining harness plugs to J1 and J2 of ESU.	Wiring should be similar to that shown in accompanying diagram.
9. Perform test in accordance with applicable task.	

TASK	RESULT
NOTE	
During tests, leave BLEED AIR OPEN/CLOSE switch, MAX. AIR switch, and ECONO AIR switch in down position.	
10. After completion of task, return all tester switches to DOWN position.	
11. Disconnect harnesses and stow in cover.	
12. Close cover and rotate pressure equalizer knob to CLOSE.	Tester is secured.
13. Report any tester operation problems on proper form as described in DA Pam 738-751.	

FOLLOW-ON MAINTENANCE:  
TM55-4920-431-13  
REFER TO TASK BEING PERFORMED.

GO TO NEXT PAGE



33315

CHAPTER 16

MISSION EQUIPMENT TROUBLESHOOTING

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CHAPTER 16  
MISSION EQUIPMENT TROUBLESHOOTING

CHAPTER OVERVIEW

Chapter 16 contains procedures for Mission Equipment troubleshooting. Each system and failure symptom is listed below. Included in this chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for the Mission Equipment.

Refer to TM 55-1520-240-23 for required maintenance procedures.

SYSTEM	PARA
EXTERNAL CARGO HOOK SYSTEM	16-1
FLARE DISPENSER SYSTEM	16-2
ENGINE AIR PARTICLE SEPARATOR SYSTEM	16-3
HEADS UP DISPLAY SYSTEM	16-4

FAILURE SYMPTOM LIST

EXTERNAL CARGO HOOK SYSTEM

SYMPTOM	TASK	SYMPTOM	TASK	SYMPTOM	TASK
AFT CARGO HOOK DOES NOT OPEN	16-1.4	CARGO HOOK PWR EMER REL CIRCUIT BREAKER DOES NOT STAY CLOSED	16-1.4	FWD HOOK OPEN CAPSULE DOES NOT COME ON WHEN FORWARD CARGO HOOK OPENS	16-1.4
AFT HOOK OPEN CAPSULE DOES NOT COME ON WHEN AFT CARGO HOOK OPENS	16-1.4	CARGO HOOK PWR NORM RLSE CIRCUIT BREAKER DOES NOT STAY CLOSED	16-1.4	FWD HOOK OPEN CAPSULE LIT WHEN FORWARD CARGO HOOK CLOSED	16-1.4
AFT HOOK OPEN CAPSULE LIT WHEN AFT CARGO HOOK CLOSED	16-1.4	CENTER CARGO HOOK DOES NOT OPEN	16-1.4	FORWARD OR AFT CARGO HOOK DOES NOT OPEN WHEN TANDEM HOOK RELEASE LEVER IS PULLED	16-1.4
ARMED SW FAIL LIGHT DOES NOT COME ON WITH MASTER SWITCH AT ARM	16-1.4	CENTER CARGO HOOK DOES NOT STAY OPEN FOR 10 TO 14 SECONDS AFTER EMERG SWITCH RELEASED FROM REL ALL	16-1.4	FWD OR AFT HOOK LOADED LIGHT IS LIT WHEN CARGO HOOK IS UNLOADED	16-1.4
CARGO HOOK CONT EMER REL CIRCUIT BREAKER DOES NOT STAY CLOSED	16-1.4	DUAL HOOK FAULT CAPSULE LIT	16-1.4	FWD OR AFT HOOK LOADED LIGHT DOES NOT COME ON WHEN PRESSED	16-1.4
CARGO HOOK CONT NORM RLSE CIRCUIT BREAKER DOES NOT STAY CLOSED	16-1.4	DUAL HOOK FAULT LIGHT DOES NOT COME ON WITH HOOK DISCONNECTED	16-1.4	HOOK LOADED LIGHT DOES NOT COME ON WHEN FORWARD OR AFT CARGO HOOK IS LOADED	16-1.4
CARGO HOOK OR HOOKS DO NOT RELEASE WHEN EMERG SWITCH SET TO REL ALL	16-1.4	DUAL HOOK RELAY BOX LIGHT(S) DO NOT COME ON WHEN PRESSED	16-1.4		
		FORWARD CARGO HOOK DOES NOT OPEN	16-1.4		

FAILURE SYMPTON LIST (Continued)

EXTERNAL CARGO HOOK SYSTEM (Continued)

SYMPTOM	TASK
MID HOOK OPEN CAPSULE DOES NOT COME ON WHEN CENTER CARGO HOOK OPENS	16-1.4
MID HOOK OPEN CAPSULE LIT WHEN CENTER CAR-GO HOOK CLOSED	16-1.4

SYMPTOM	TASK
ARM LIGHT DOES NOT COME ON WHEN ARM SAFE SWITCH SET TO ARM	16-2.3
CHAFF CIRCUIT BREAKER WILL NOT STAY CLOSED	16-2.3
FLARE COUNTER DOES NOT INDICATE 00 WHEN RIPPLE FIRE SWITCH IS HELD UP	16-2.3
FLARE COUNTER OR TEST SET LIGHTS DO NOT CHANGE WHEN A CABIN FIRING SWITCH PRESSED AND RELEASED	16-2.3

SYMPTOM	TASK
CCU PANEL WILL NOT ILLUMINATE	16-4.4
FAIL LAMP ON CCU IS ON	16-4.5
ON AND/OR FAIL LAMPS WILL NOT ILLUMINATE	16-4.6
PILOT'S AND/OR COPILOT'S DISPLAY HAS NO DISPLAY	16-4.7
PILOT'S AND/OR COPILOT'S DISPLAY REMAINS AT MAXIMUM INTENSITY	16-4.8
PDU AND CPDU TEST DISPLAY INDICATES INCORRECT TYPE AIRCRAFT	16-4.9
SYMBOL DOES NOT STOP BLINKING	16-4.10
PILOT CANNOT SELECT DECLUTTER ON CCU	16-4.11
COPILOT CANNOT SELECT DECLUTTER ON CCU	16-4.12
CANNOT CYCLE THROUGH MODES AT PILOT'S THRUSTER GRIP	16-4.13
PILOT'S THRUSTER GRIP CANNOT CYCLE THROUGH DECLUTTER AT	16-4.14

SYMPTOM	TASK
RELEASE SW FAIL LIGHT OR GROUND RELAY ACTI-VATE LIGHT NOT ON WHEN COPILOT'S CARGO HOOK RELEASE SWITCH PRESSED	16-1.4
RELEASE SW FAIL LIGHT OR GROUND RELAY ACTI-VATE LIGHT NOT ON WHEN HOIST OPERATOR'S CARGO HOOK RELEASE SWITCH PRESSED	16-1.4

FLARE DISPENSER SYSTEM	
SYMPTOM	TASK
FLARE COUNTER OR TEST SET LIGHTS DO NOT CHANGE WHEN PILOT OR COPILOT FLARE DISP SWITCH PRESSED AND RELEASED	16-2.3
FLARE COUNTER SEQUENCES FROM 30 TO 00 WHEN DISP CONT PANEL ARM SAFE SWITCH SET TO ARM	16-2.3
LDG GR SW STATUS LIGHT DOES NOT COME ON	16-2.3
LDG GR SW STATUS LIGHT IS ON	16-2.3

HEAD UP DISPLAY SYSTEM	
SYMPTOM	TASK
PILOT'S BRT CONTROL ON THRUSTER DOES NOT VARY DISPLAY INTENSITY	16-4.15
PILOT DIM CONTROL ON THRUSTER DOES NOT VARY DISPLAY INTENSITY	16-4.16
CANNOT CYCLE THROUGH MODES AT COPILOT'S THRUSTER GRIP	16-4.17
CANNOT CYCLE THROUGH DECLUTTER AT COPILOT'S THRUSTER GRIP	16-4.18
COPILOT'S BRT CONTROL ON THRUSTER DOES NOT VARY DISPLAY INTENSITY	16-4.19
COPILOT'S DIM CONTROL ON THRUSTER DOES NOT VARY DISPLAY INTENSITY	16-4.20
CANNOT VARY PILOT'S DISPLAY LEFT/RIGHT	16-4.21
CANNOT VARY PILOT'S DISPLAY UP/DOWN	16-4.22

SYMPTOM	TASK
RELEASE SW FAIL LIGHT OR GROUND RELAY ACTI-VATE LIGHT NOT ON WHEN PILOT'S CARGO HOOK RELEASE SWITCH PRESSED	16-1.4

SYMPTOM	TASK
LDG GR SW STATUS, READY TO FIRE, AND LDG GR SW BYPASS LIGHTS DO NOT COME ON	16-2.3
LDG GR SW STATUS, READY TO FIRE, OR LDG GR SW BYPASS LIGHTS DO NOT COME ON WHEN PRESSED	16-2.3
READY TO FIRE LIGHT DOES NOT COME ON	16-2.3

SYMPTOM	TASK
CANNOT VARY COPILOT'S DISPLAY LEFT/RIGHT	16-4.23
CANNOT VARY COPILOT'S DISPLAY UP/DOWN	16-4.24
CANNOT CYCLE THROUGH PILOT'S MODE SELECTION AT CCU OR PILOTS THRUSTER GRIP HUD CONTROL SWITCH	16-4.25
CANNOT CYCLE THROUGH PILOT'S DECLUTTER AT CCU OR PILOT'S THRUSTER GRIP HUD CONTROL SWITCH	16-4.26
CANNOT CYCLE THROUGH COPILOT'S MODE SELECTION AT CCU OR COPILOT'S THRUSTER GRIP HUD CONTROL SWITCH	16-4.27
CANNOT CYCLE THROUGH COPILOT'S DECLUTTER AT CCU OR COPILOT'S THRUSTER GRIP HUD CONTROL SWITCH	16-4.28
NO OR IMPROPER ALTITUDE (MSL) OR AIRSPEED DISPLAYED	16-4.29
NO OR IMPROPER TRIM (SLIDE BALL) DISPLAYED	16-4.30

MISSION EQUIPMENT ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST

REF				STATION LOCATION			REF				STATION LOCATION		
DESIG	PART NUMBER	TYPE	MATE WITH/LOCATION	FS	WL	BL	DESIG	PART NUMBER	TYPE	MATE WITH/LOCATION	FS	WL	BL
GD005		150	CONSOLE-FWD CTR INSTR PNL				134P9		22	AFT CARGO HOOK	409	-37	12L
GD040		150	CONSOLE-FWD CTR INSTR PNL				134P10	M83723-95A0803N	29	CARGO HOOK NORM REL VALVE-IN TUNNEL AREA	332	51	17L
GD123		151	RH CABIN AFT	482	-5	50R	147P1	MS3476W14-19S	21	CONSOLE, DISP CONT			
GD189		151	RH CABIN	265	30	50R	147P2	MS3476W12-10S	17	RH CABIN, TIMER	300	30	52R
GD190		151	RH CABIN	265	30	50R	147P3		21	LHAFT, RAMPAREA	560	10	52L
GD191		151	LH CABIN	255	30	50L	147P4	MS3476W10-6S	15	LH AFT, RAMP AREA	536	40	52L
GD193		151	CABIN-UNDERFLOOR	330	-36	40L	147J5	M83723-84A1005N	30	LH AFT, CABIN	400	40	52L
GD259		151	CABIN-UNDERFLOOR	255	-36	30L	147J6	M83723-84A1005N	30	LH FWD, CABIN	200	40	52L
GD260		151	CABIN-UNDERFLOOR	410	-36	20L	147J7	M83723-84A1005N	30	RH AFT, CABIN	400	40	52L
GD289		151	LH CABIN-AFT	535	32	52L	147J8	M83723-84A1005N	30	RH FWD, CABIN	105	40	52R
GD308		151	RH CABIN	300	40	52R	202P4	MS3476W14-19S	21	CONSOLE, CONTROL IND			
GD309		151	RH CABIN	300	40	52R	232P1	MS3476W20-41S	26	CONSOLE - CTR INST PNL - MASTER CAUTION PANEL (WITHOUT 74)			
GD311		151	LH CABIN-AFT	570	20	52L							
GD323		151	LH CABIN-AFT	535	32	52L	232P1	MS3476W22-51S	161	CONSOLE - CTR INST PNL- MASTER CAUTION PANEL (WITH 74)			
TB6			CONSOLE-FWD FLOOR				232P2	MS3476W16-26S	24	CONSOLE - CTR INST PNL - MASTER CAUTION PANEL			
TB7			CONSOLE-FWD CTR INSTR PNL				232P3	MS3476W14-19S	21	CONSOLE - CTR INST PNL - MASTER CAUTION PANEL (WITH 74)			
TB18			COCKPIT UNDERFLOOR-COPILOT	87	-13	11L							
TB27			RH CABIN	332	-13	11L							
TB36			OVERHEAD PANEL-COCKPIT	80	40	12R							
TB59			NO. 1 PDP SIDE PANEL	90	-15	30L							
TB62			NO. 2 PDP SIDE PANEL	90	-15	30R	300J1	M83723-74A2041N	40	NO. 1 PDP			
TB401			RH CABIN-FLARE DISP	300	40	52R	300P1	M83723-75A2041N	40	NO. 1 PDP			
147K1	MS24149-D1	106	LH POD	185	-20	55L	300J4	M83723-74A2461N	43	NO. 1 PDP			
148K2	BACR13CR-2AB	103	RH AFT CABIN	482	22	50R	300P4	M83723-75A2461N	43	NO. 1 PDP			
232K2	BACR13CG-2AB	103	CONSOLE-FLOOR				300J5	M83723-74A2041N	40	NO. 2 PDP			
132J1II	MS3470W14-19S	21	HOIST OPR PNL	340	40	50R	300P5	M83723-75A2041N	40	NO. 2 PDP			
134P1	MS3476W14-19S	21	OVHD PNL-HOIST/CARGO PNL-J1				300J15	M83723-74A24617	43	CONSOLE-UNDERFLOOR	85	-20	
134P2	MS3476W14-19SW	21	OVHD PNL-HOIST/CARGO PNL-J2				300P15	M83723-75A24617	43	CONSOLE-UNDERFLOOR	85	-20	
134P3	MS3476W16-8S	22	DUAL HOOK RELAY BOX-J1	270	35	50R	300J18	M83723-73A2041N	40	OVERHEAD PANEL-COCKPIT			
134P4	MS3476W16-26S	24	DUAL HOOK RELAY BOX-J2	270	35	50R	300P18	M83723-76A2041N	40	OVERHEAD PANEL-COCKPIT			
134P5	MS3476W10-6S	15	EMERG HOOK REL RELAY BOX-J1	270	25	50L	300J19	M83723-73A2041N	40	OVERHEAD PANEL-COCKPIT			
134P6	MS3476W16-8S	22	EMERG HOOK REL RELAY BOX-J2	270	25	50L	300P19	M83723-76A2041N	40	OVERHEAD PANEL-COCKPIT			
134J7	MS3474W16-8S	22	FWD CARGO HOOK RCPT	248	-36	12L	300J20	M83723-74A2461N	43	OVERHEAD PANEL-COCKPIT			
134P7		22	FWD CARGO HOOK	248	-37	12L	300P20	M83723-75A2461N	43	OVERHEAD PANEL-COCKPIT			
134J8	MS3474W10-6S	15	CTR CARGO HOOK RCPT	331	-36	40L	300J23	M83723-74A2255N	42	OVERHEAD PANEL-COCKPIT			
134P8	MS3476W10-6P	15	CTR CARGO HOOK	331	-36	40L	300P23	M83723-75A2255N	42	OVERHEAD PANEL-COCKPIT			
134J9	MS3474W16-8S	22	AFT CARGO HOOK RCPT	409	-36	12L							

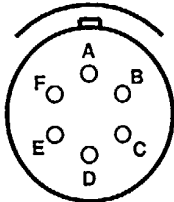
MISSION EQUIPMENT ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

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				FS	WL	BL					FS	WL	BL
300J29	MS3474W14-19S	21	COCKPIT-UNDERFLOOR-PILOT	65	-27	25R	300J64	M83723-73A24617	43	CONSOLE-UNDERFLOOR	85	-20	
300P29	MS3476W14-19P	21	COCKPIT-UNDERFLOOR-PILOT	65	-27	25R	300P64	M83723-76A24617	43	CONSOLE-UNDERFLOOR	85	-20	
300J30	MS3474W14-19S	21	COCKPIT-UNDERFLOOR-PILOT	70	-27	25L	300J68	M83723-73A22556	42	HEATER COMPARTMENT-OVHD	105	40	30R
300J48	M83723-74A2461N	43	ELECTRONICS COMPARTMENT-OVHD	120	40	20L	300P68	M83723-76A22556	42	HEATER COMPARTMENT-OVHD	105	40	30R
300P48	M83723-75A2461N	43	ELECTRONICS COMPARTMENT-OVHD	120	40	20L	P2000R	D38999/26WC98SN	160	LH ELECTRONICS BAY			
300J50	M83723-73A2461N	43	ELECTRONICS COMPARTMENT-OVHD	120	40	20L	P2001R	D38999/26WH35SA	162	LH ELECTRONICS BAY			
300P50	M83723-76A2461N	43	ELECTRONICS COMPARTMENT-OVHD	120	40	20L	P2002R	D38999/26WH35SN	162	LH ELECTRONICS BAY			
300J52	M83723-74A2255N	42	AFT CROWN	460	45	30L	P2003R	MS27505E13B35P	164	BULKHEAD 95 PILOTS SIDE			
300P52	M83723-75A2255N	42	AFT CROWN	460	45	30L	P2004R	MS27505E13B25P	164	BULKHEAD 95 COPILOTS SIDE			
300J53	M83723-74A2255N	42	AFT CROWN	460	45	20R	P2005R	D38999/26WD35SN	166	UPPER CONSOLE			
300P53	M83723-75A2255N	42	AFT CROWN	460	45	20R	P2008R	D38999/26WC98SN	160	LH ELECTRONICS BAY			
300J54	M83723-74A2461N	43	AFT CROWN	460	45	20L	P2009R	D38999/26WA35S N	168	LH ELECTRONICS BAY			
300P54	M83723-75A2461N	43	AFT CROWN	460	45	20L							



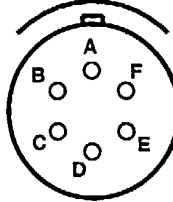
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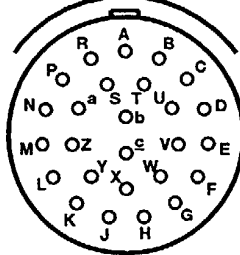
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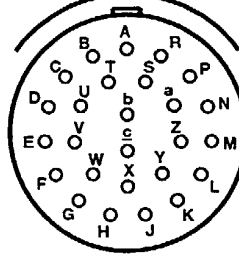
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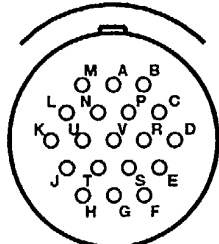


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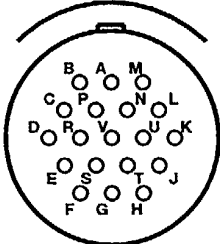
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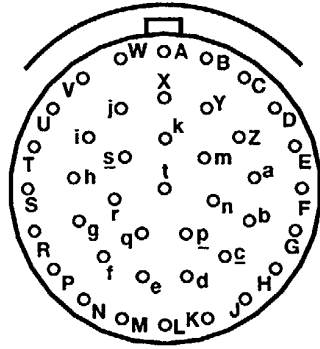
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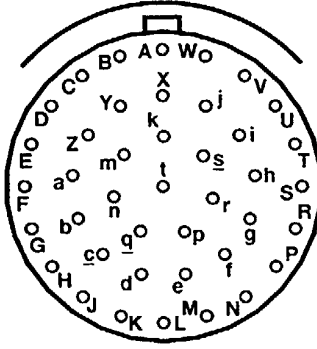
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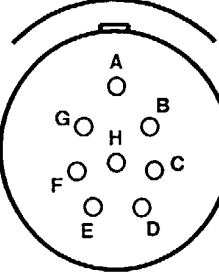
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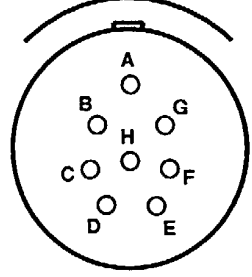
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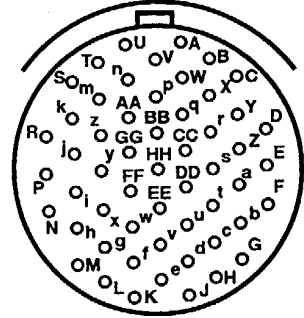
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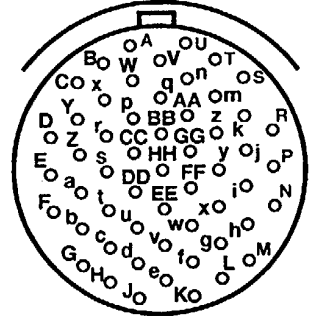
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22



27



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29



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Change 23 16-2.5

MISSION EQUIPMENT ELECTRICAL COMPONENT  
LOCATION AND CONFIGURATION LIST (Continued)

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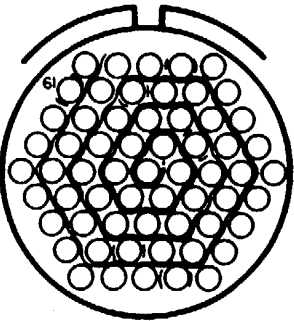
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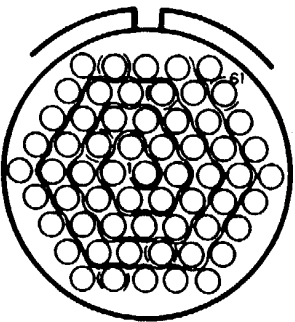
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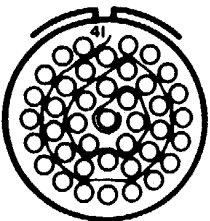


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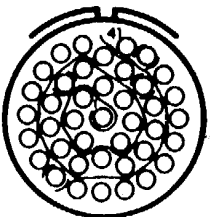
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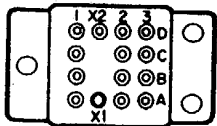


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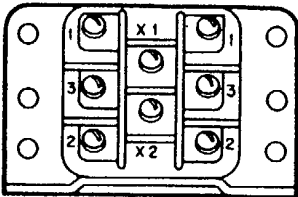
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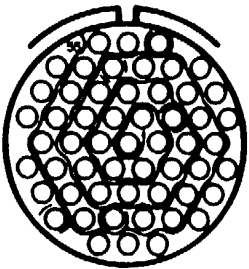


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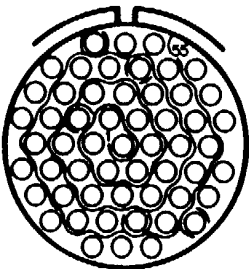
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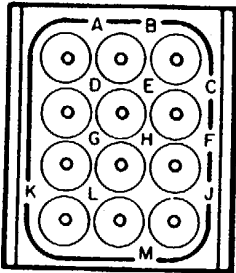


42



42

GND MODULE



150

GND STUD



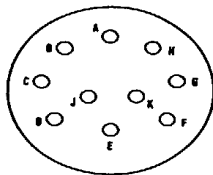
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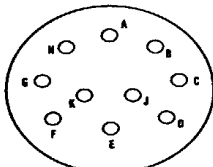
MISSION EQUIPMENT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

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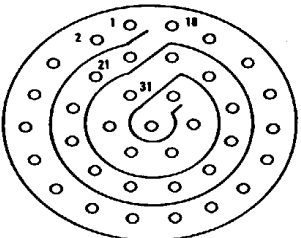
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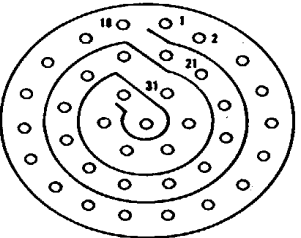
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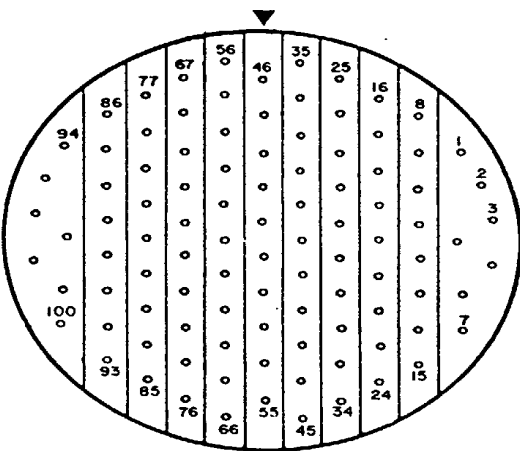


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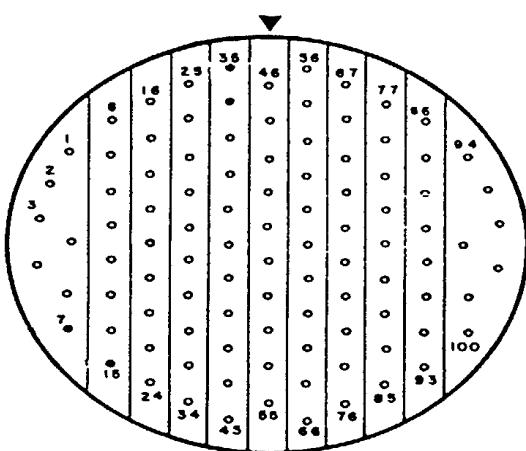
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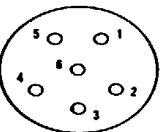
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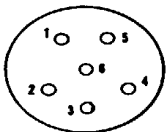
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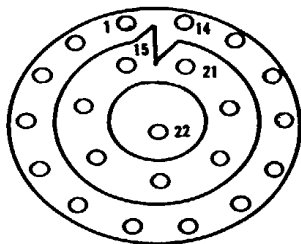
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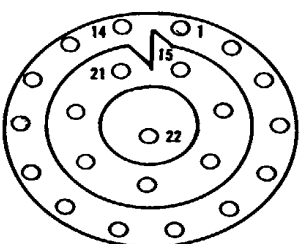
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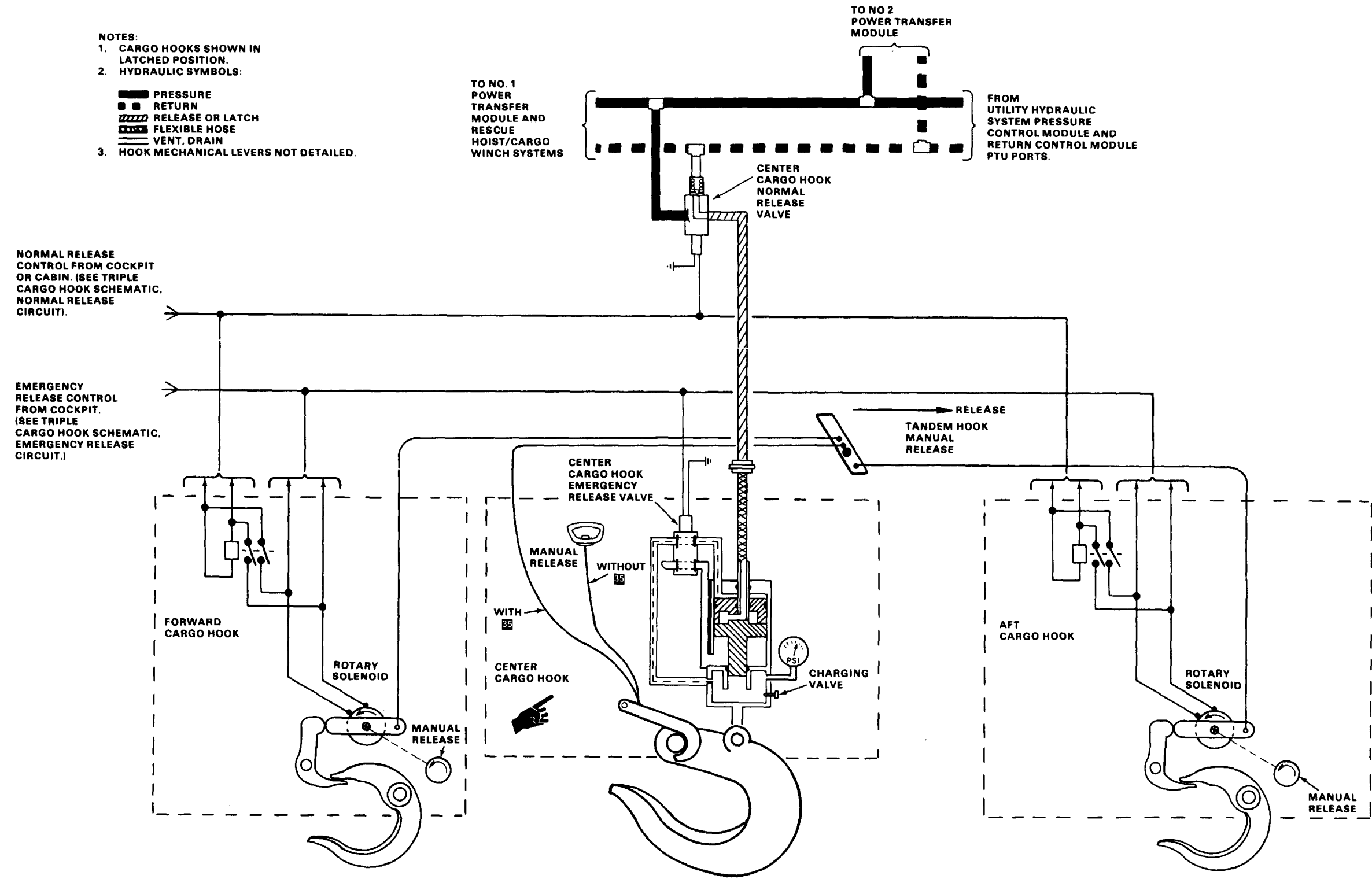


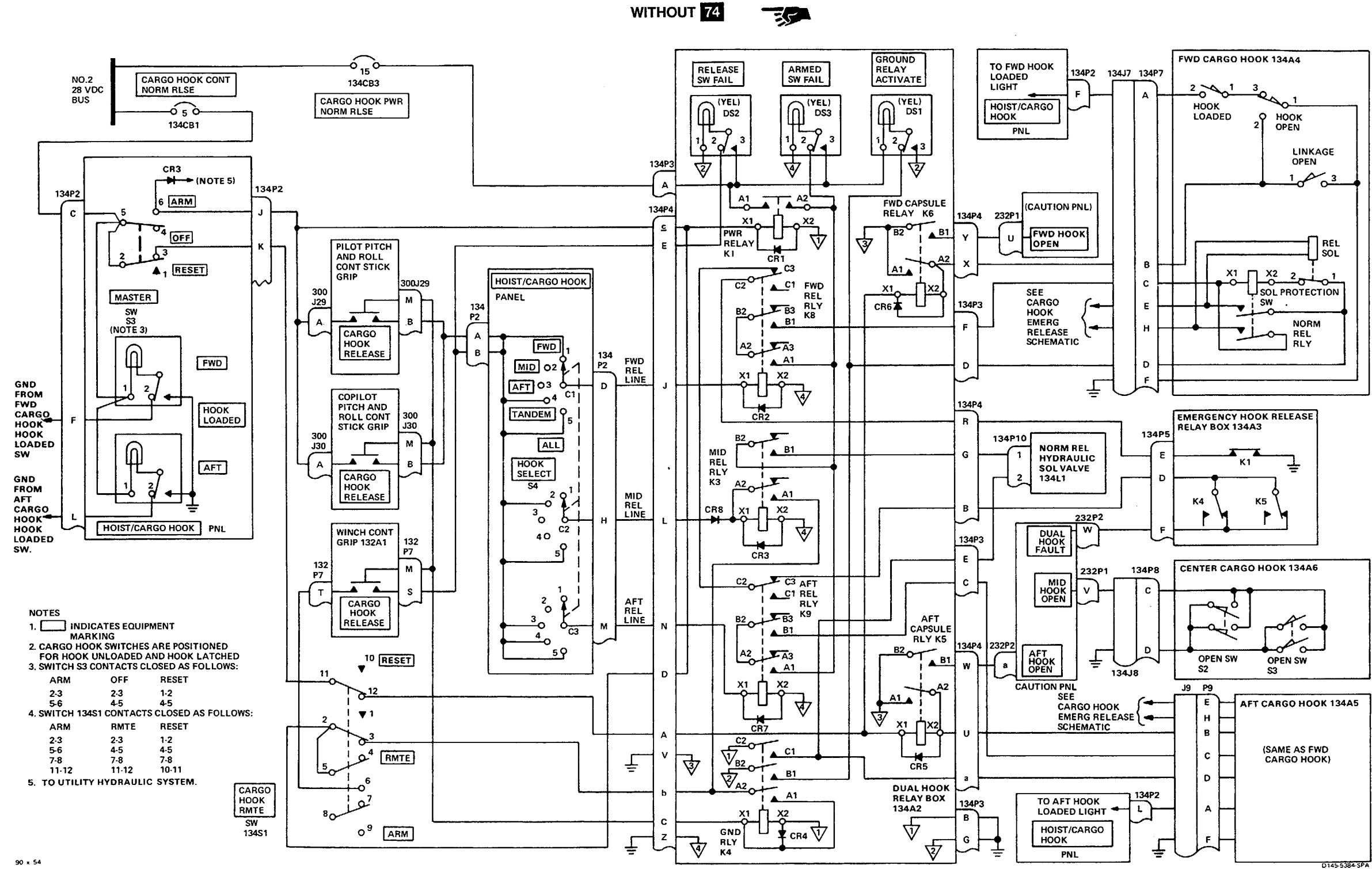
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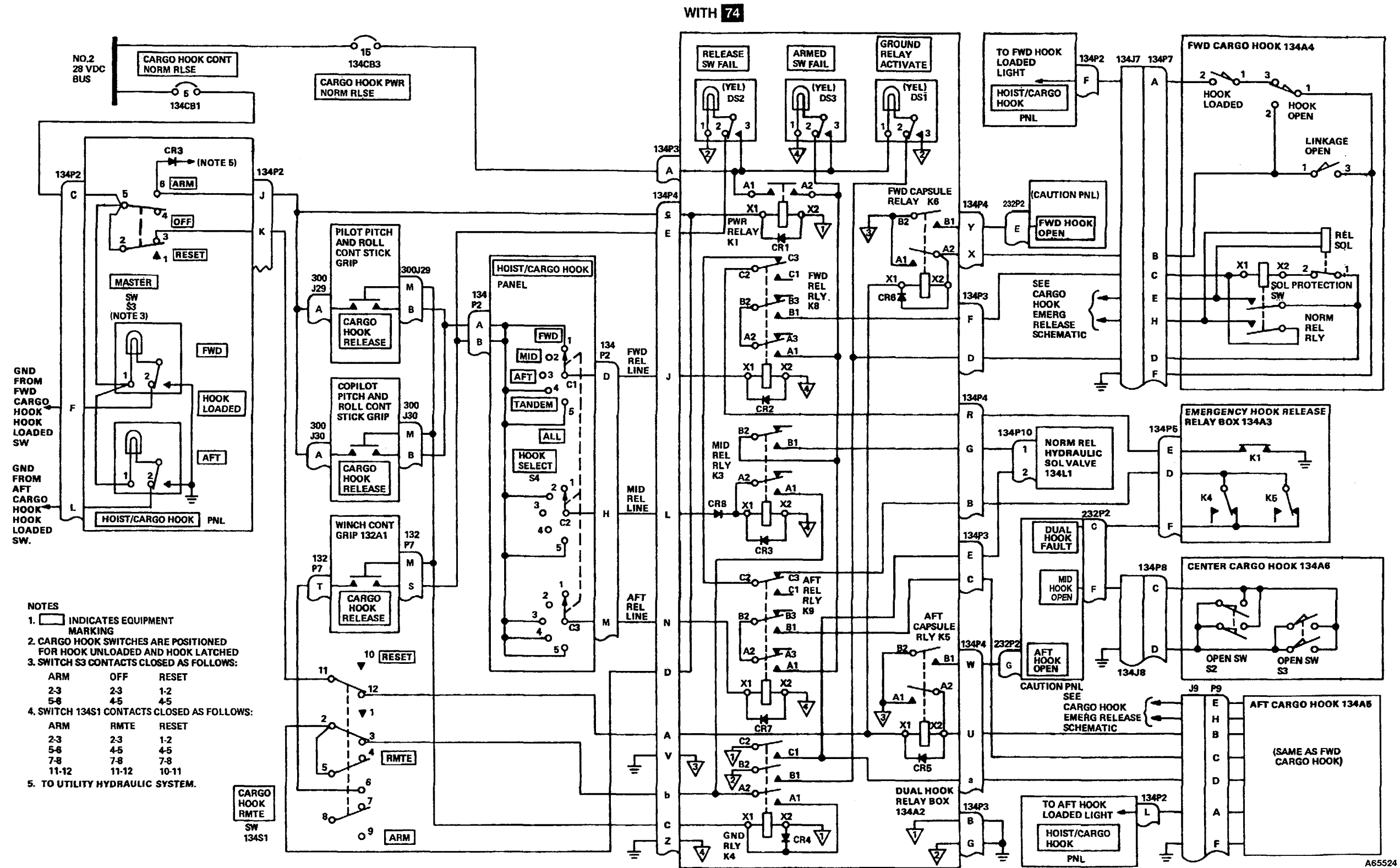
## 16-1 EXTERNAL CARGO HOOK SYSTEM

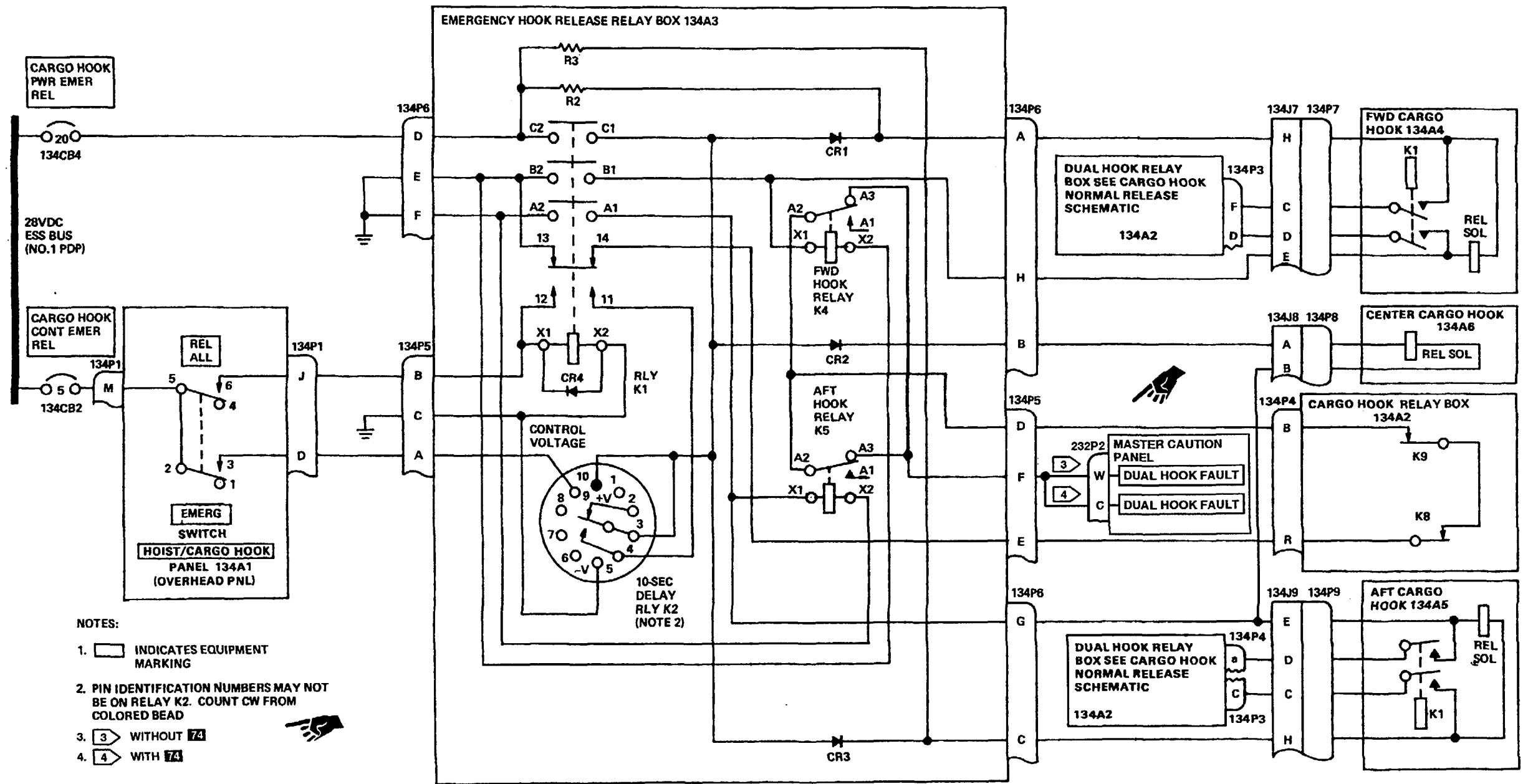




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Change 23 16-2.9



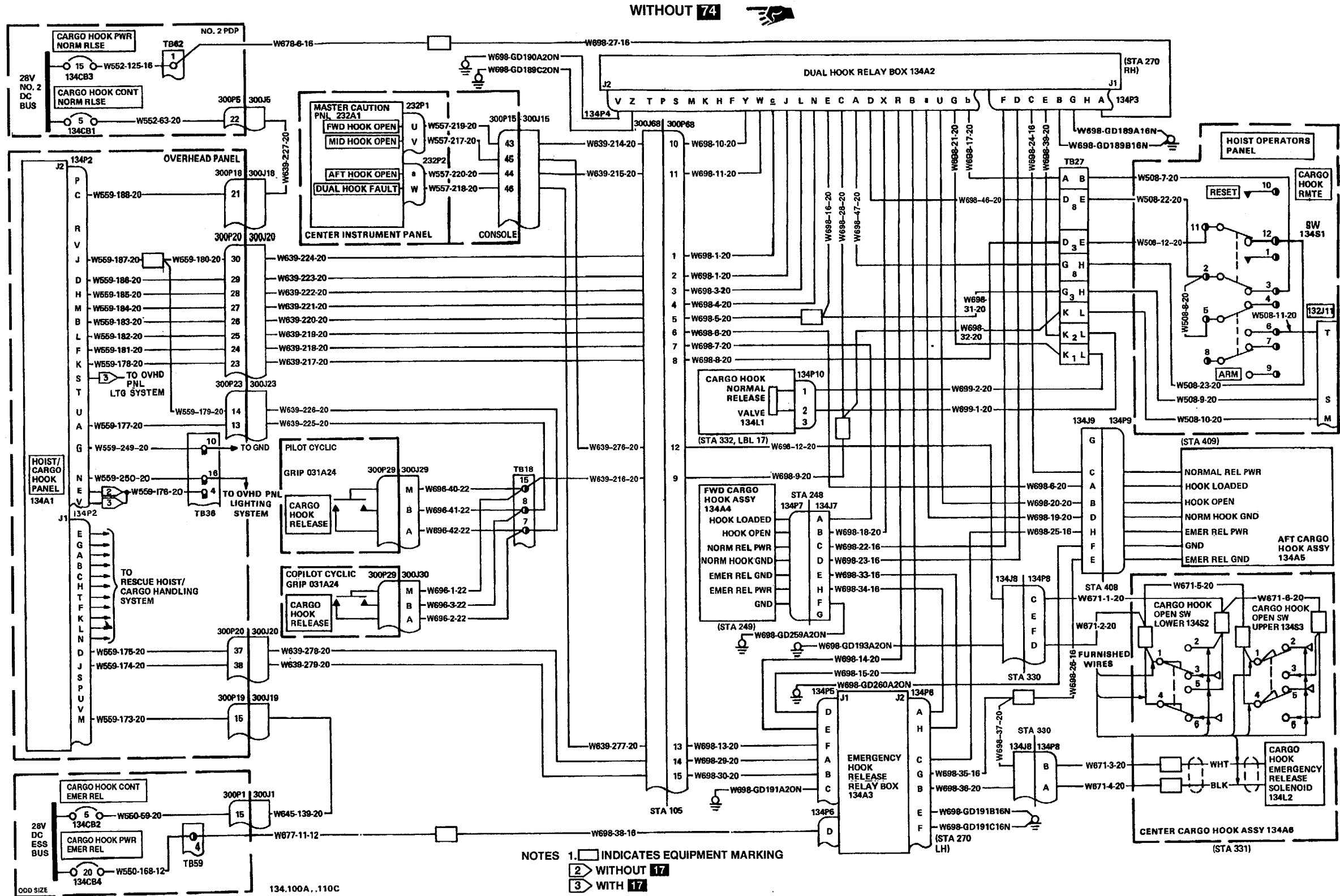


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16-1.2 EXTERNAL CARGO HOOK SYSTEM WIRING DIAGRAM

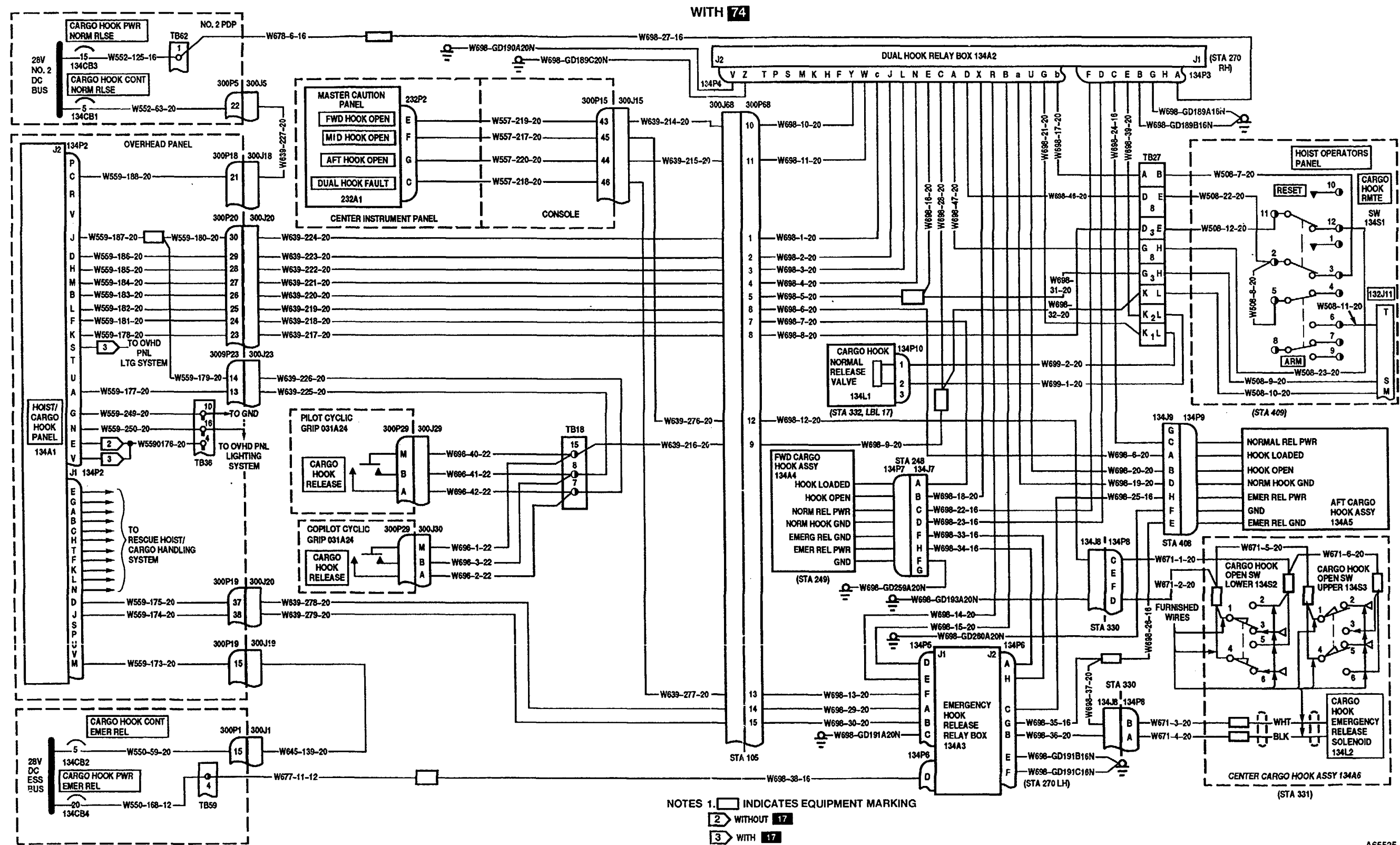
16-1.2



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16-1.2 EXTERNAL CARGO HOOK SYSTEM WIRING DIAGRAM (Continued)

16-1.2



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16-1.3 EXTERNAL CARGO HOOK SYSTEM VISUAL CHECK

16-1.3

INITIAL SETUP

Applicable Configurations:

All

Tools:

Aircraft Mechanic's Tool Kit.  
NSN 5180-00-323-4692

Materials:

None

Personnel Required:

67U20 Medium Helicopter Repairer

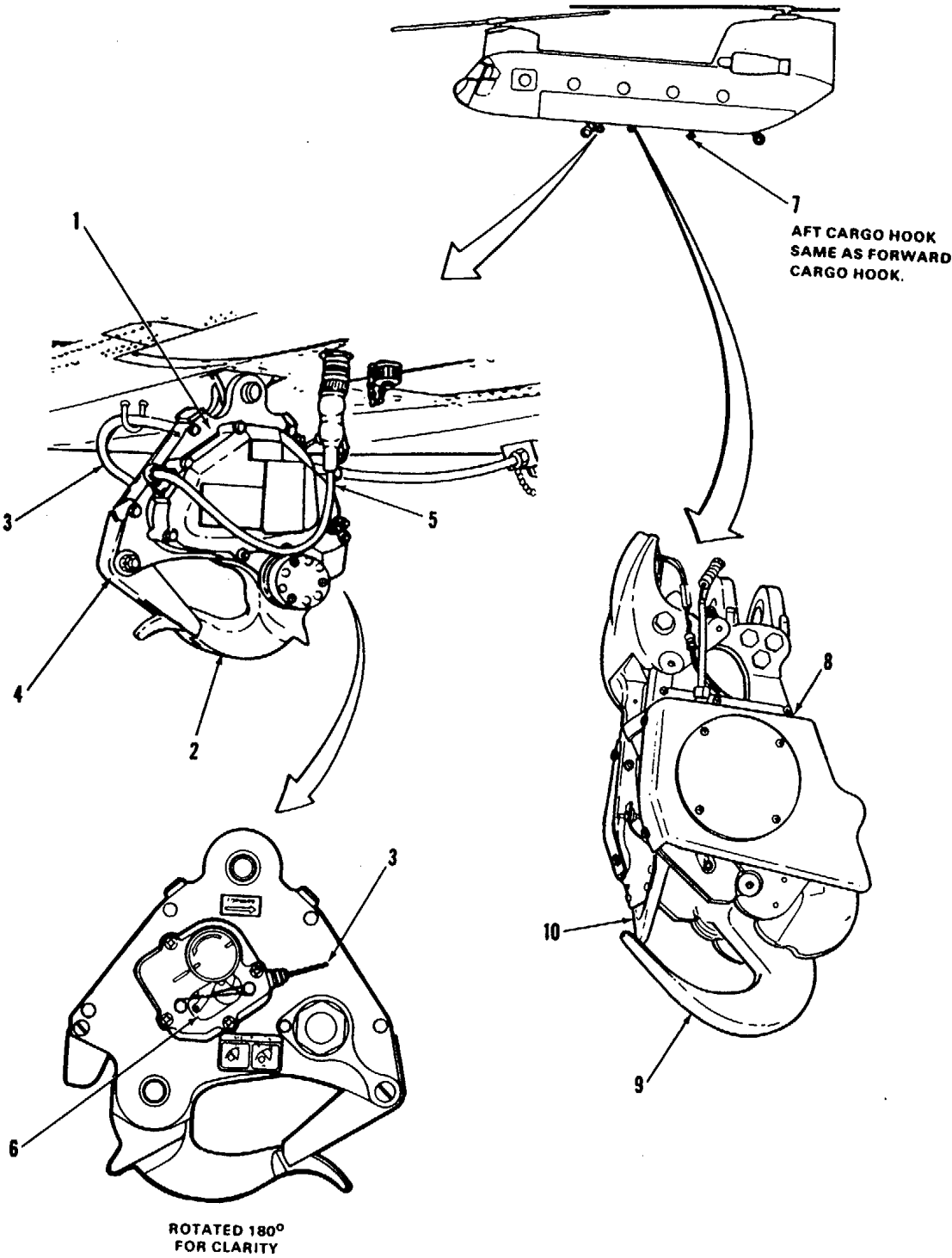
References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off  
Center Cargo Hook Access Panel Open  
Center Cargo Hook Unstowed  
Center Tunnel Cover Open

TASK	RESULT
1. Check forward cargo hook (1).	If load beam (2) is open, close it. If it does not stay closed check rigging of tandem hook release rigging. Adjust as required (TM 55-1520-240-23). If rigging is okay and load beam is still open, replace cargo hook. If control assembly (3) is damaged, replace it. If keeper (4) is damaged, replace it. If wire harness (5) is damaged replace it. If window (6) is damaged, replace it.
2. Repeat step (1) for aft cargo hook (7).	
3. Check center cargo hook (8).	If hook (9) is open, close it. If it does not stay closed service cargo hook actuator and check manual release cams (TM 55-1520-240-23). If hook still can not be closed, replace cargo hook (8). If keeper (10) is forward of hook (9) or damaged, adjust or replace it. If release mechanism (11) is damaged, replace it. If wire harness or hydraulic hose (12 or 13) is damaged. replace it.

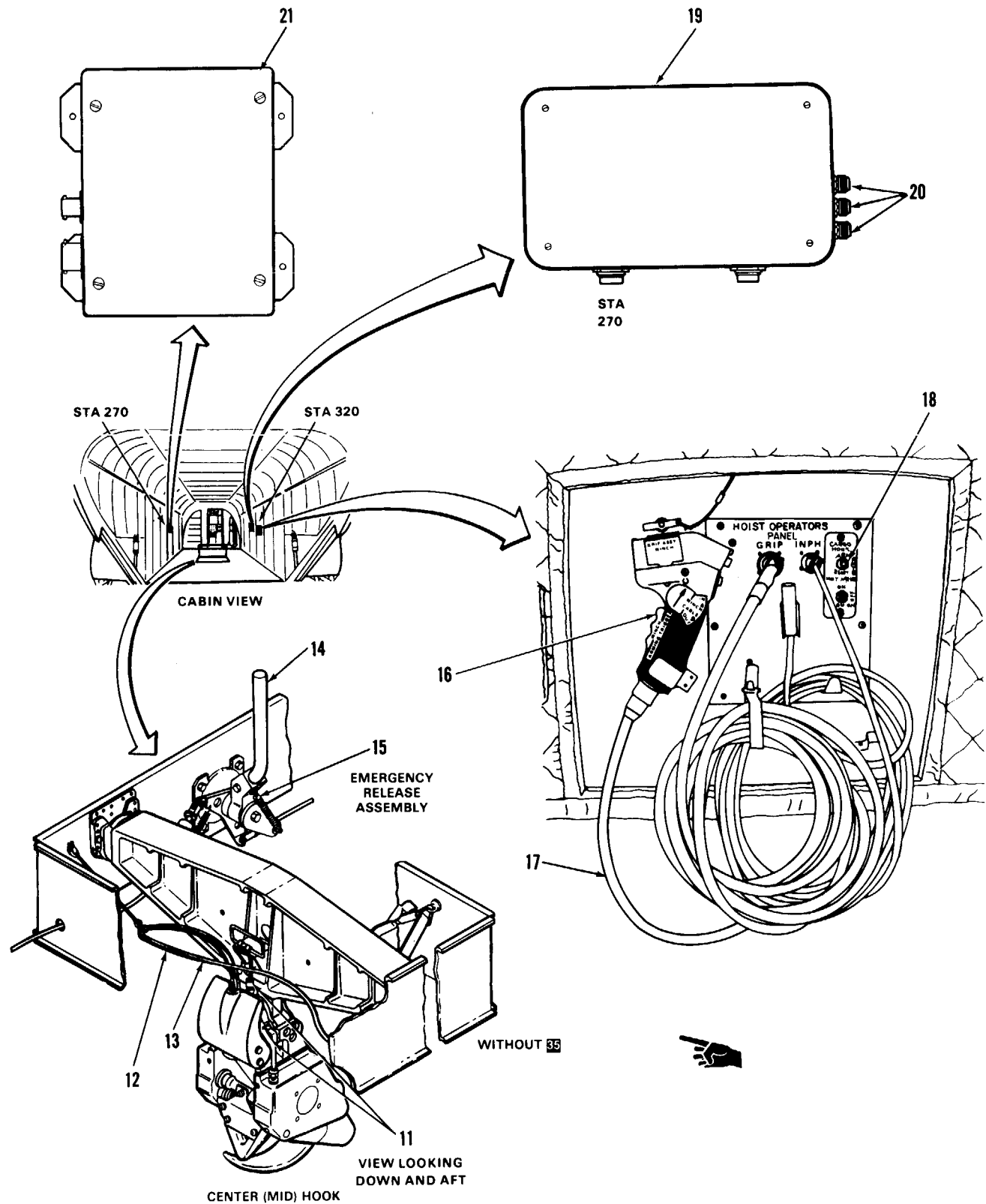


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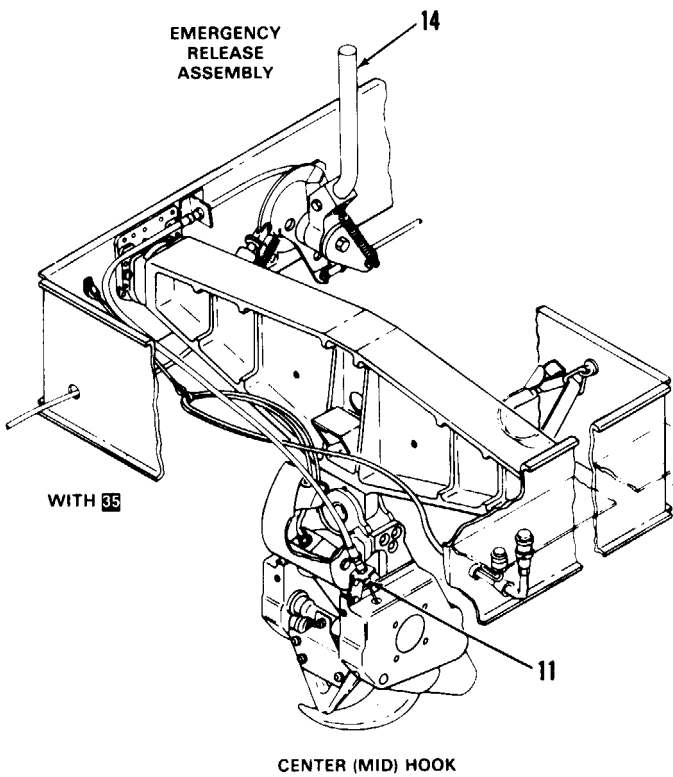
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16-1.3 EXTERNAL CARGO HOOK SYSTEM VISUAL CHECK  
(Continued)

16-1.3



TASK	RESULT
4. Lift emergency cargo hook release lever (14) from stowed position. Check lever mechanism (15).	If lever (14) or any part of mechanism (15) is loose or damaged, tighten or replace it as required
5. Check hoist operator's grip (16) and cable assembly (17).	If grip (16) is damaged, replace it. If cable assembly (17) is damaged, replace it.
6. Check CARGO HOOK switch (18).	If switch (18) is loose or damaged, tighten or replace it as required.
7. Check dual hook relay box (19).	If box (19) is loose or damaged, tighten or replace it as required. If wiring or connectors to box are damaged, repair or replace them as required. If any light (20) is damaged, replace box.
8. Check emergency hook release relay box (21).	If box (21) is loose or damaged, tighten or replace it as required. If wiring or connectors to box are damaged, repair or replace them as required,



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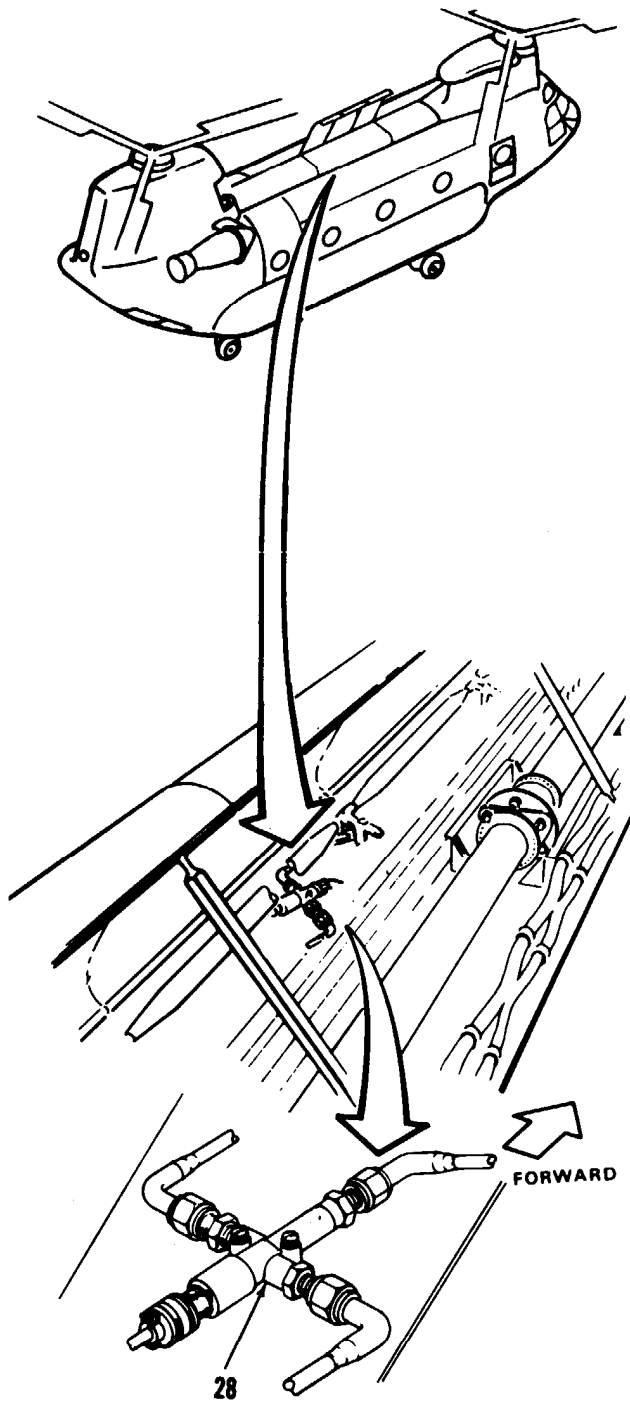
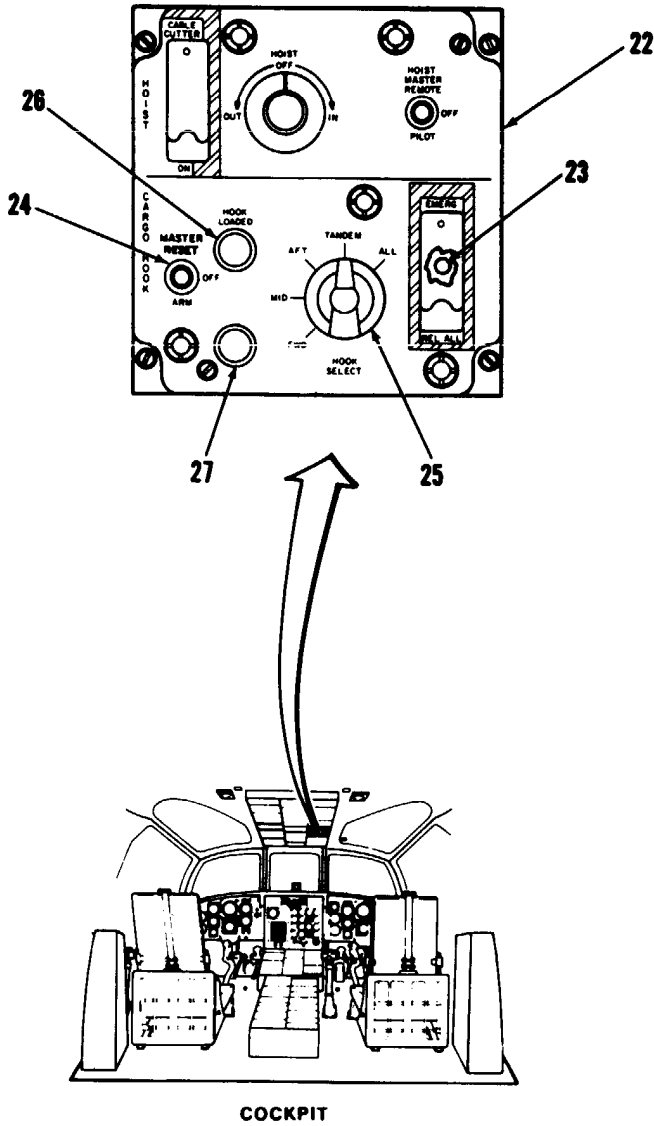
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16-1.3 EXTERNAL CARGO HOOK SYSTEM VISUAL CHECK  
(Continued)

TASK	RESULT
9. Check HOIST/CARGO HOOK panel (22).	If switch (23 or 24), knob (25), or light (26 or 27) is loose or damaged, replace panel (22).
10. Check cargo hook normal release valve (28).	If valve (28) is loose or damaged, tighten or replace it. If wiring or connector to valve is damaged, repair or replace it as required.

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:  
Close center tunnel cover.



16-1.4 EXTERNAL CARGO HOOK SYSTEM OPERATIONAL CHECK

16-1.4

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Rope, 15 Foot
- Without 35 Load 20-25 Pounds (3)
- With 35 Load, 20-25 Pounds (2) Fwd and Aft Hook
- Load, 45-50 Pounds (1) Center Hook
- Wood Plank, 2-Inches x 4-Inches x 4-Feet
- Dial Indicating Scale, 0 to 50 Pounds
- Stopwatch
- Inspection Mirror

Materials:

None

Personnel Required:

Medium Helicopter Repairer (2)

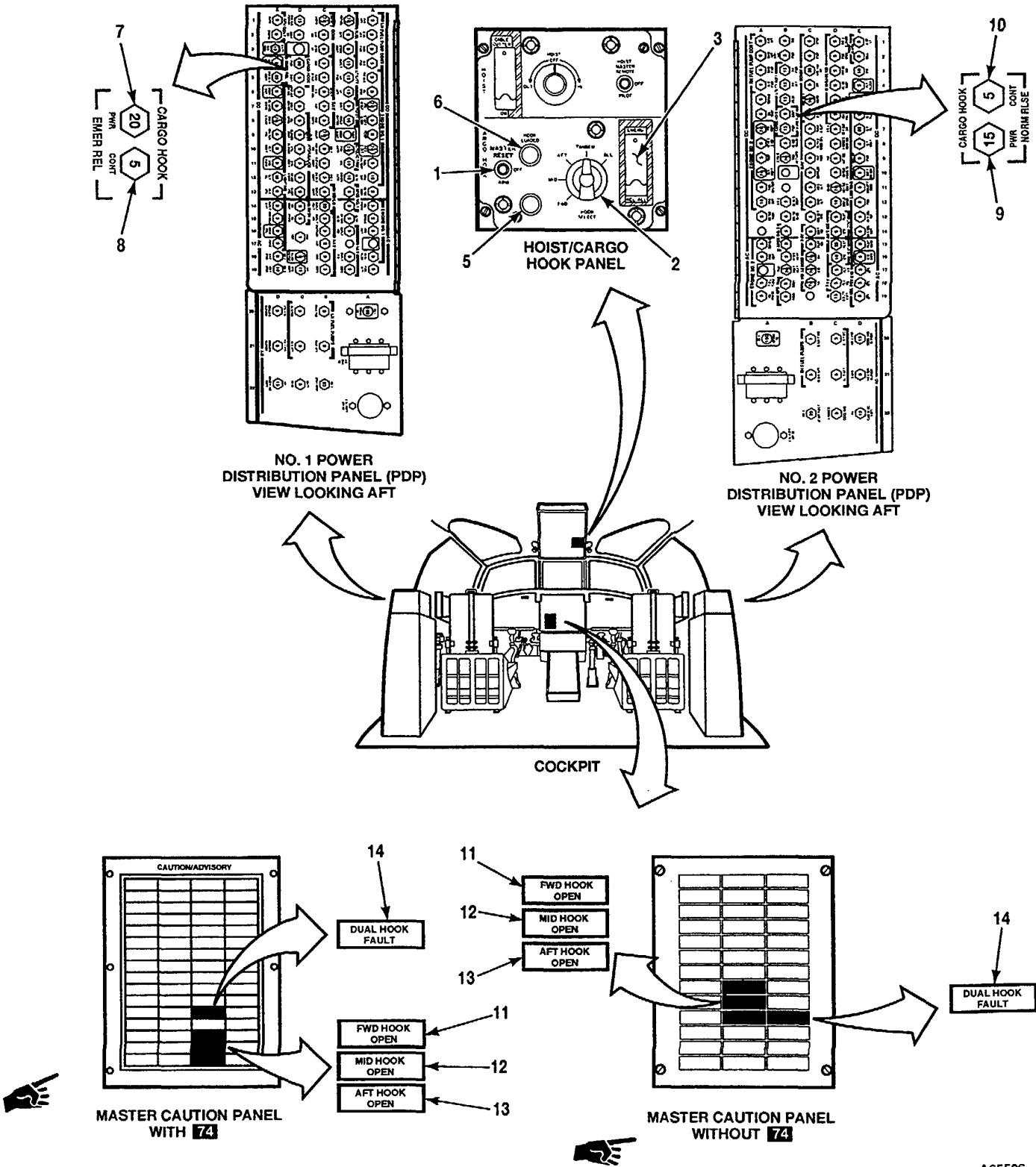
References:

TM 55-1520-240-23

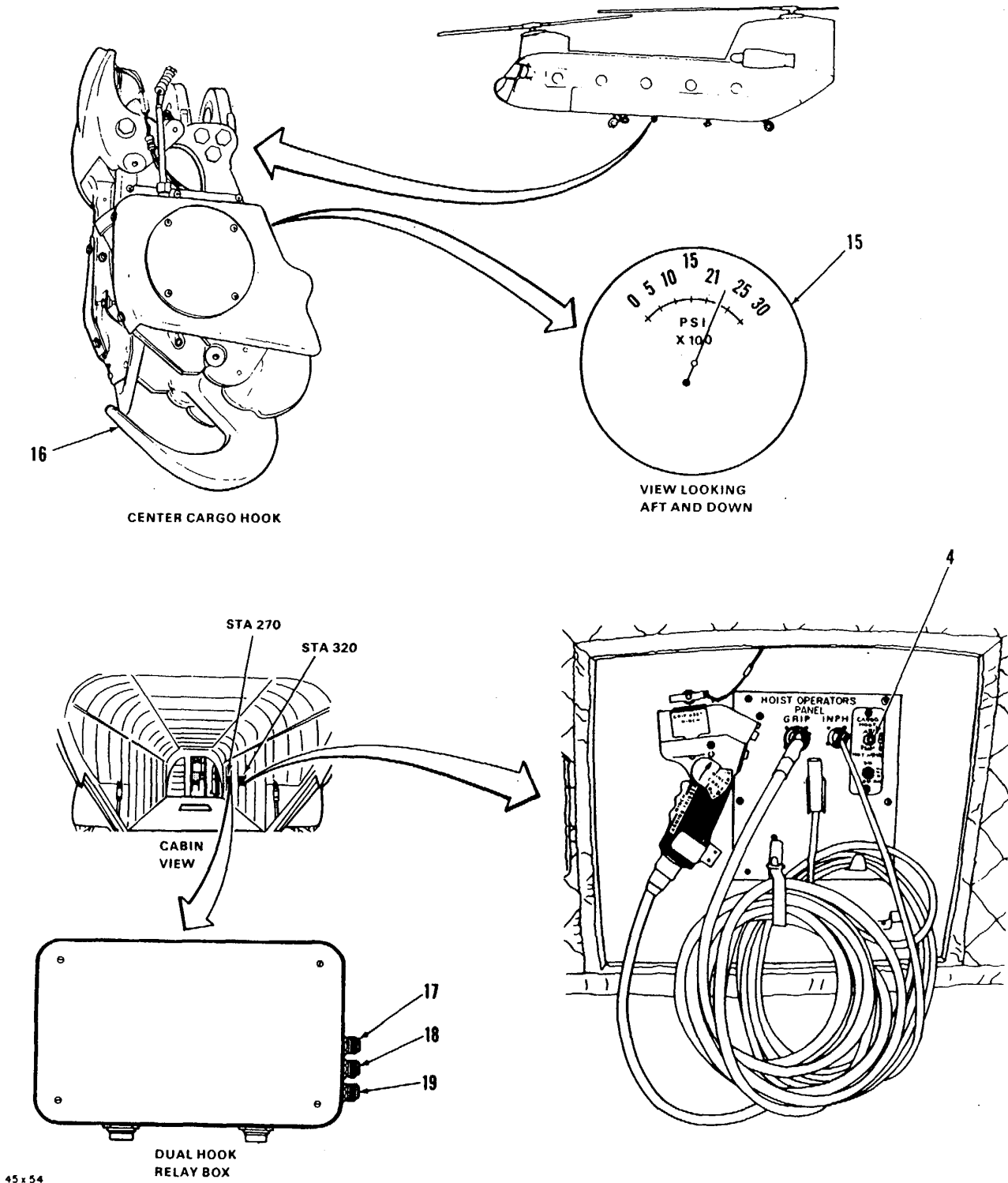
Equipment Condition:

- TM 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power On
- Visual Check Of External Cargo Hook System Performed (Task 16-1.3)
- Area Beneath Three Cargo Hooks Clear Of Obstructions

TASK	RESULT
1. Check that MASTER switch (1) is OFF.	If switch (1) is not OFF, set it to OFF.
2. Check that HOOK SELECT switch (2) is at FWD.	If switch (2) is not at FWD, set it to FWD.
3. Check that switch guard (3) over EMERG switch is down.	If switch guard (3) is up, close it.
4. Check that CARGO HOOK switch (4) is at RMTE.	If switch (4) is not at RMTE, set it to RMTE.
5. Check FWD and AFT HOOK LOADED LIGHT lights (5 and 6).	Both lights (5 and 6) shall be out. If either light is on, go to Task 16-1.5.
6. Press and release FWD HOOK LOADED light (5).	Light (5) shall momentarily come on. If it does not, go to Task 16-1.6.
7. Press and release AFT HOOK LOADED light (6).	Light (6) shall momentarily come on. If it does not, go to Task 16-1.6.
8. Check that CARGO HOOK EMR REL PWR and CONT circuit breakers (7 and 8) are closed.	If CARGO HOOK EMER REL PWR or CONT circuit breaker (7 or 8) is open, close it. If EMERG REL PWR circuit breaker (7) opens again, go to Task 16-1.7. If EMER REL CONT circuit breaker (8) opens again, go to Task 16-1.8.
9. Check that CARGO HOOK NORM RLSE PWR and CONT circuit breakers (9 and 10) are closed.	If CARGO HOOK NORM RLSE PWR or CONT circuit breaker (9 or 10) is open, close it. If NORM RLSE PWR circuit breaker (9) opens again, go to Task 16-1.9. If NORM RLSE CONT circuit breaker (10) opens again, go to Task 16-1.10.



A65526



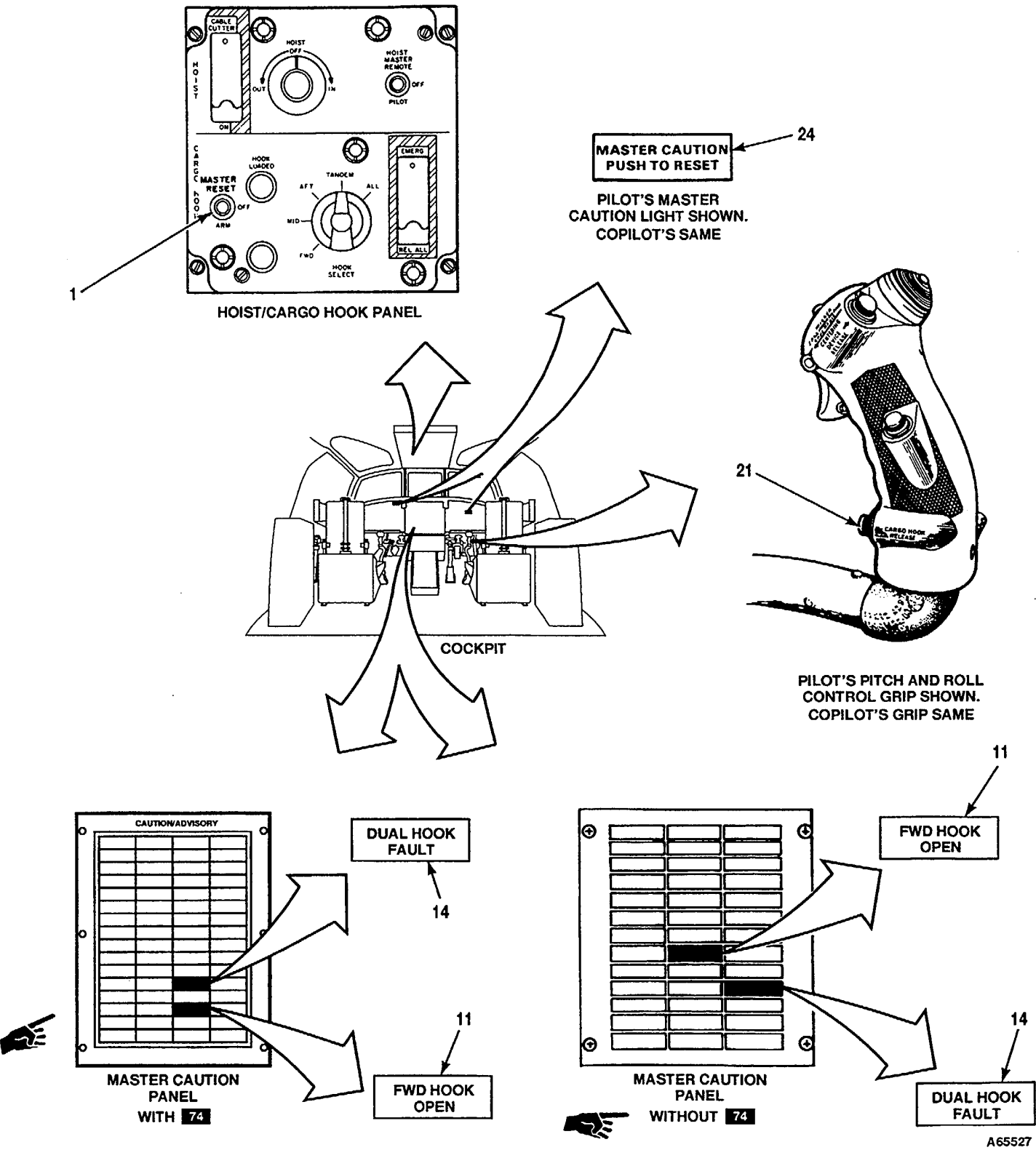
TASK	RESULT
10. Check FWD HOOK OPEN, MID HOOK OPEN, AFT HOOK OPEN, and DUAL HOOK FAULT capsules (11, 12, 13, and 14).	If FWD HOOK OPEN capsule (11) is lit, go to task 16-1.11. If MID HOOK OPEN capsule (12) is lit, go to task 16-1.12. If AFT HOOK OPEN capsule (13) is lit, go to task 16-1.13. If DUAL HOOK FAULT capsule (14) is lit, go to task 16-1.14.
11. Check center cargo hook gage (15).	Gage shall indicate at least 2100 psi. If it does not, service center cargo hook actuator (TM 55-1520-240-23).
<b>WARNING</b> If gage indication is below 2100 psi, inadvertent cargo hook operation could occur resulting in loss of external load. Injury or death can occur to personnel.	
12. Press down on hook (16) on center cargo hook. Use wood plank.	Hook (16) on center cargo hook shall not move to open position. If it does, replace center cargo hook.
<b>WARNING</b> If a status light is on, it indicates that a first failure has occurred in one of the redundant protective circuits. A second failure while the system is in this condition can result in loss of external loads, resulting in personnel injury or death.	
13. Check ARMED SW FAIL status light (17).	Light (17) shall be out. If it is on, replace HOIST/CARGO HOOK panel.
14. Press and release ARMED SW FAIL, RELEASE SW FAIL, and GROUND RE LAY ACTIVATE lights (17, 18 and 19).	Lights (17, 18 and 19) shall come on when pressed and go out when released. If any light does not come on, go to task 16-1.15.

DI45-6346-SPA

16-1.4 EXTERNAL CARGO HOOK SYSTEM OPERATIONAL CHECK (Continued)

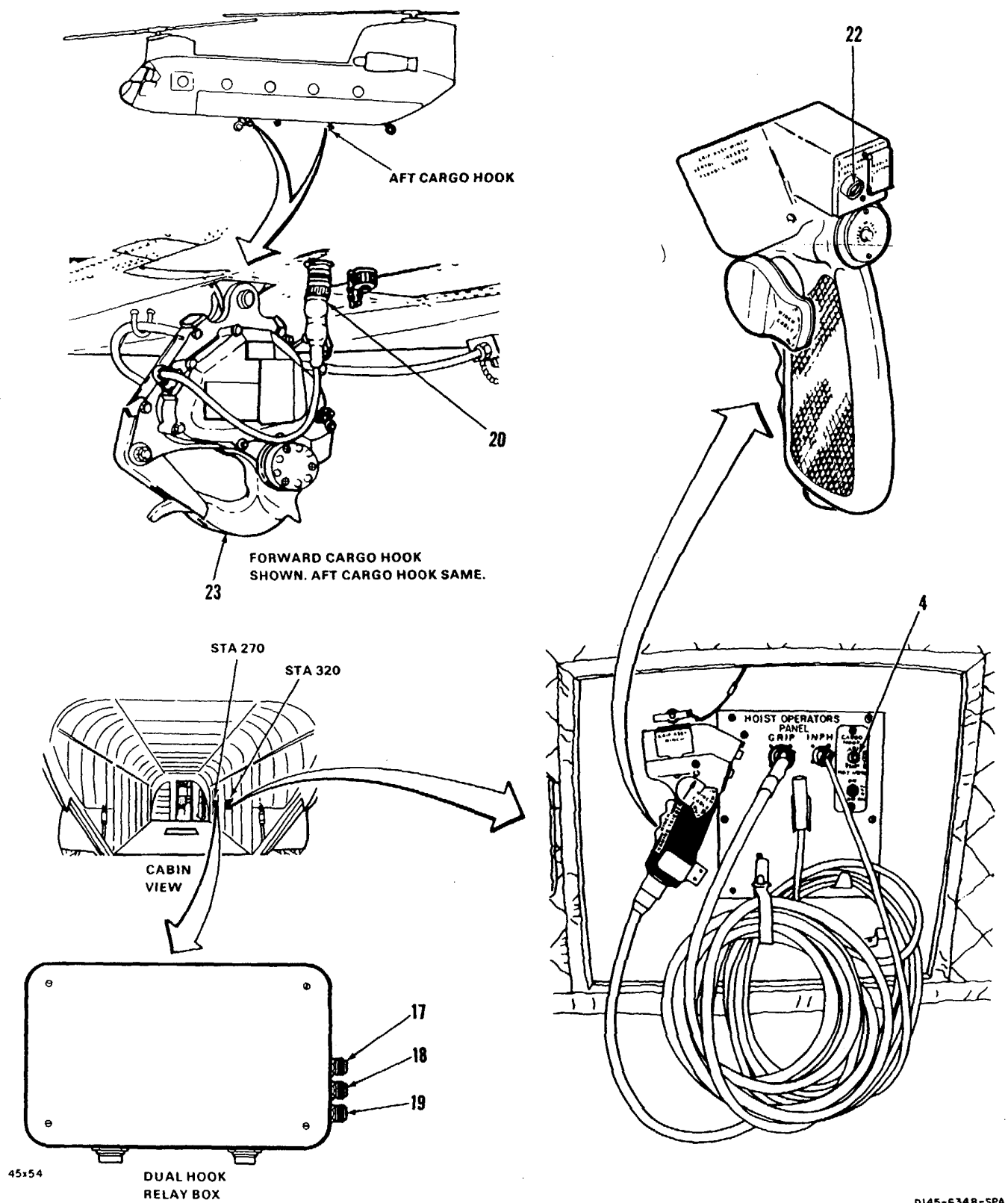
16-1.4

TASK	RESULT
15. Disconnect forward cargo hook connector (20).	DUAL HOOK FAULT capsule (14) shall come on. If it does not, go to Task 16-1.16.
16. Set MASTER switch (1) to ARM.	ARMED SW FAIL light (17) shall come on. If it does not, go to Task 16-1.17.
17. Press and release pilot's CARGO HOOK RELEASE switch (21).	RELEASE SW FAIL light (18) shall momentarily come on. GROUND RELAY ACTIVATE light (19) shall come on and stay on. If either or both lights do not come on, go to Task 16-1.18.
18. Set MASTER switch (1) to OFF and then back to ARM.	ARMED SW FAIL light (17) shall go out and come back on. GROUND RELAY ACTIVATE light (19) shall go out. If both lights stay on, replace HOIST/CARGO HOOK Panel.
19. Press and release CARGO HOOK RELEASE switch (21) on copilot's pitch and roll control grip.	RELEASE SW FAIL light (18) shall momentarily come on. GROUND RELAY ACTIVATE light (19) shall come on and stay on. If either light does not come on, go to Task 16-1.19.
20. Repeat step 18, then go to step 21.	
21. Press and release CARGO HOOK RELEASE switch (22).	RELEASE SW FAIL light (18) and GROUND RELAY ACTIVATE light (19) shall stay out. If either light comes on, replace CARGO HOOK switch (4).
22. Set CARGO HOOK switch (4) to ARM.	
23. Press and release CARGO HOOK RELEASE switch (22).	RELEASE SW FAIL light (18) shall momentarily come on. GROUND RELAY ACTIVATE light (19) shall come on and stay on. If either light does not come on, go to Task 16-1.20.
24. Set CARGO HOOK switch (4) to RESET then to RMTE.	GROUND RELAY ACTIVATE light (19) shall go out. If it does not, replace CARGO HOOK switch (4).





TASK	RESULT
25. Set MASTER switch (1) to RESET then to OFF.	
26. Connect forward cargo hook connector (20) to fuselage receptacle.	DUAL HOOK FAULT capsule (14) shall go out.
27. Disconnect aft cargo hook connector (20).	DUAL HOOK FAULT capsule (14) shall come on. If it does not, replace emergency hook release relay box.
28. Connect aft cargo hook connector (20) to fuselage receptacle.	DUAL HOOK FAULT capsule (14) shall go out.
29. Set MASTER switch (1) to ARM.	
30. Suspend one 20-25 pound load to each load beam (23) on forward and aft cargo hooks.	
31. Press and release pilot's CARGO HOOK RELEASE switch (21).	Forward cargo hook shall open and drop load then relatch closed. FWD HOOK OPEN capsule (11) shall come on. Pilot and copilot master caution lights (24) shall come on. If forward cargo hook does not open will go to task 16-1.21. If hook opens and FWD HOOK OPEN capsule does not come on, go to task 16-1.22.
<b>NOTE</b> If CARGO HOOK RELEASE switch is held pressed, a hammering sound be heard from forward cargo hook.	
32. Set MASTER switch (1) to RESET, then to ARM.	Forward cargo hook shall stay closed. FWD HOOK OPEN capsule (11) shall go out. Pilot and copilot master caution lights (24) shall go out. If capsule is still lit, go to task 16-1.11. If lights (24) are still lit, replace master caution panel.
33. Suspend one 20-25 pound load to load beam (23) on forward cargo hook.	

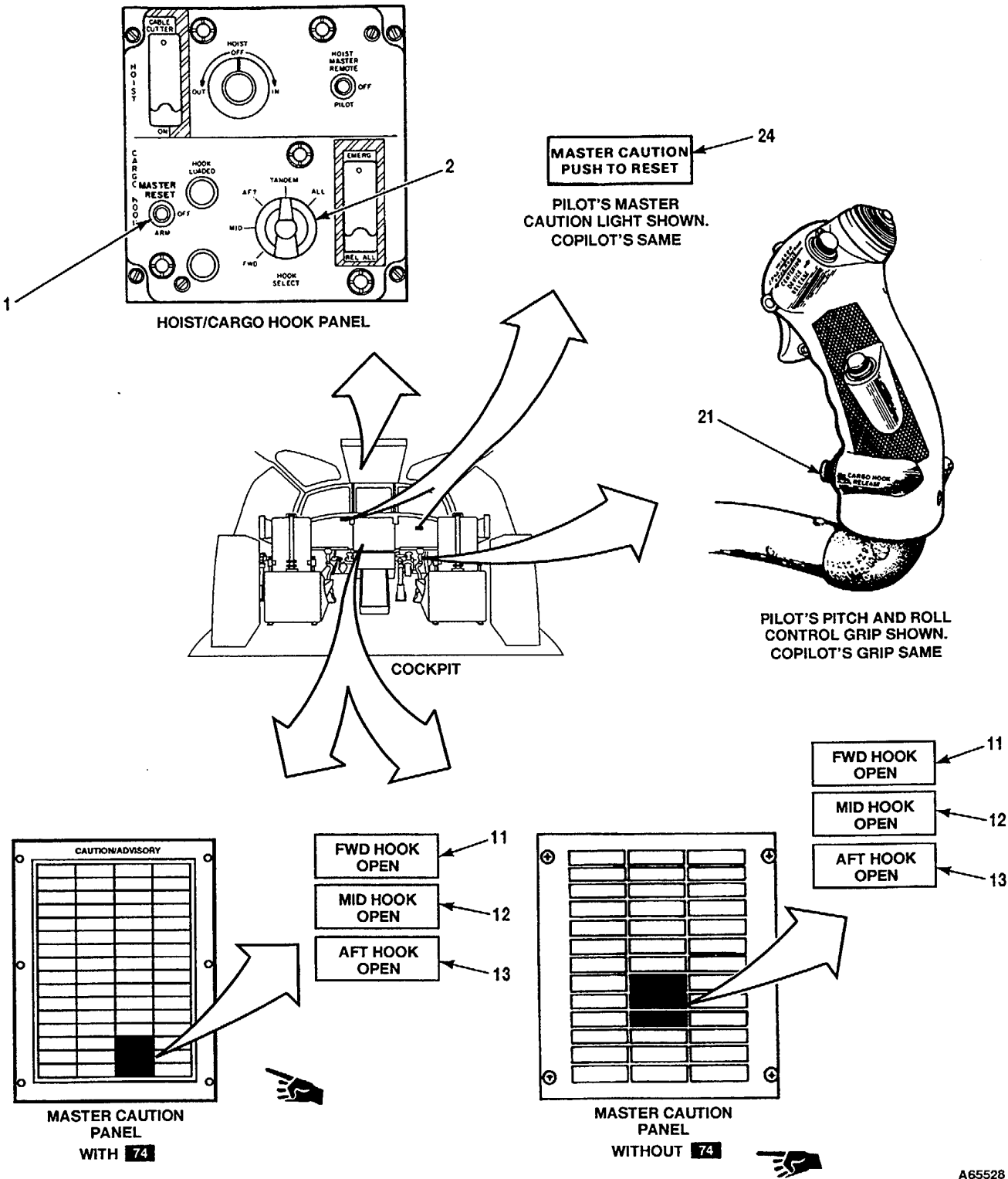


DI45-6348-SPA

16-1.4 EXTERNAL CARGO HOOK SYSTEM OPERATIONAL CHECK (Continued)

16-1.4

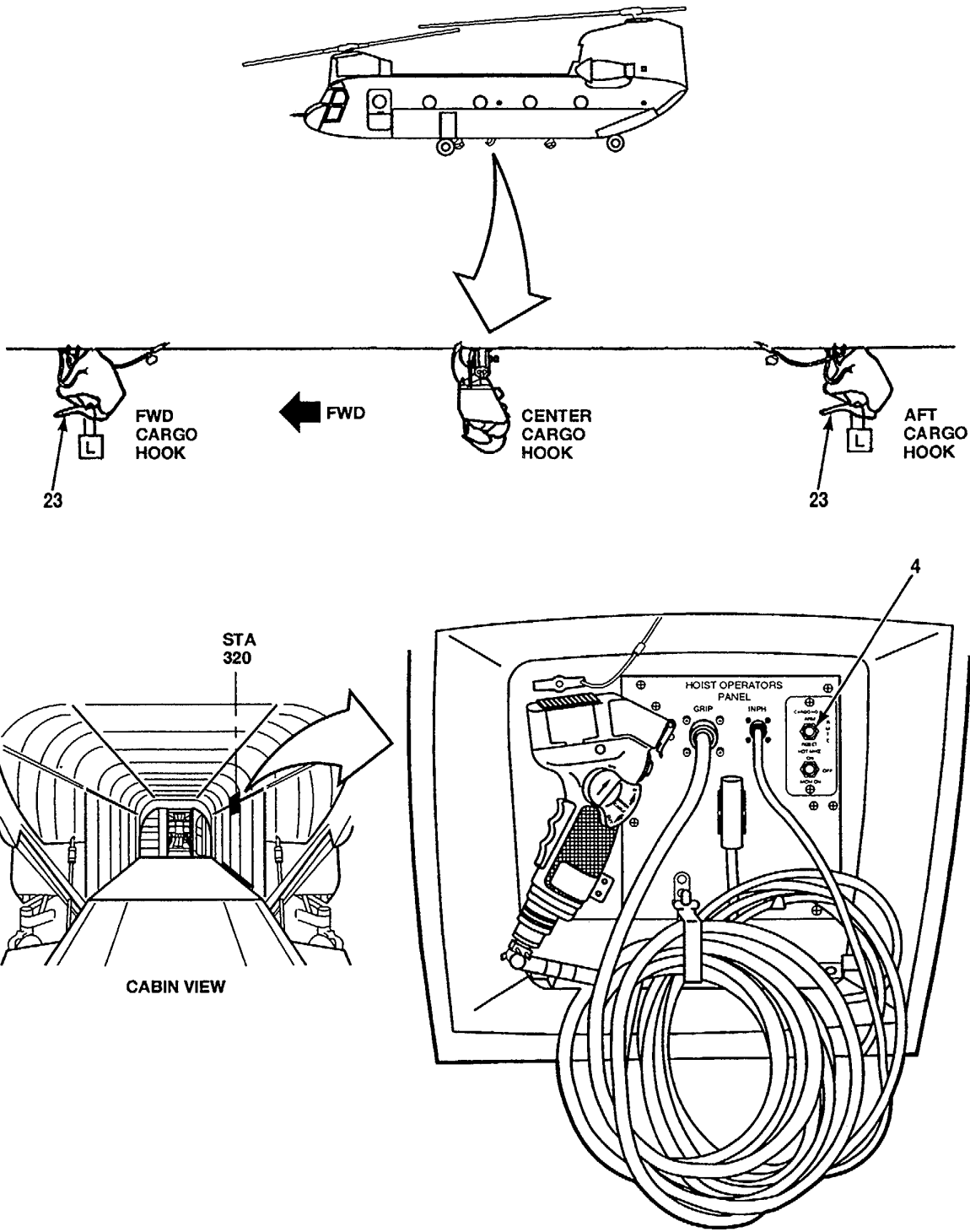
TASK	RESULT
34. Set HOOK SELECT switch (2) to MID.	
35. Press and release pilot's CARGO HOOK RELEASE switch (21).	Center cargo hook shall open and remain open. MID HOOK OPEN capsule (12) shall come on. Pilot and copilot master caution lights (24) shall come on. If center cargo hook does not open, go to Task 16-1.23. If hook opens and MID HOOK OPEN capsule does not come on, go to Task 16-1.24.
36. Set MASTER switch (1) to RESET then to ARM.	Center cargo hook shall close and remain closed. MID HOOK OPEN capsule (12) shall go out. Pilot and copilot master caution lights (24) shall go out. If center cargo hook does not close, replace it. If capsule is still lit when center cargo hook closed, go to Task 16-1.12.
37. Set HOOK SELECT switch (2) to AFT.	
38. Press and release pilot's CARGO HOOK RELEASE switch (21).	Aft cargo hook shall open and drop load then relatch closed. AFT HOOK OPEN capsule (13) shall come on. Pilot and copilot master caution lights (24) shall come on. If aft cargo hook does not open, go to Task 16-1.25. If hook opens and AFT HOOK OPEN capsule does not come on, go to Task 16-1.26.
39. Set MASTER switch (1) to RESET then to ARM.	Aft cargo hook shall stay closed. AFT HOOK OPEN capsule (13) shall go out. Pilot and copilot master caution lights (24) shall go out. If capsule is still lit, go to Task 16-1.13.



16-1.4 EXTERNAL CARGO HOOK SYSTEM OPERATIONAL CHECK (Continued)

16-1.4

TASK	RESULT
40. Suspend 20-25 pound load from load beam (23) on aft cargo hook.	
41. Set HOOK SELECT switch (2) to TANDEM.	
42. Press and release pilot's CARGO HOOK RELEASE switch (21).	Forward and aft cargo hooks shall open and drop load then relatch closed. FWD HOOK OPEN and AFT HOOK OPEN capsules (11 and 13) shall come on. Pilot and copilot's master caution lights (24) shall come on. If both hooks do not open, replace HOIST/CARGO HOOK panel.
43. Set CARGO HOOK switch (4) to RESET and then to RMTE.	Forward and aft cargo hooks shall stay closed. FWD HOOK OPEN and AFT HOOK OPEN capsules (11 and 13) shall go out. If capsules are still on, replace CARGO HOOK switch (4).
44. Suspend one 20-25 pound load from each load beam (23) on forward and aft cargo hooks.	
45. Set HOOK SELECT switch (2) to ALL.	
46. Press and release pilot's CARGO HOOK RELEASE switch (21).	Forward and aft cargo hooks shall open and drop loads then relatch closed. Center cargo hook shall open and stay open. FWD HOOK OPEN, MID HOOK OPEN, and AFT HOOK OPEN capsules (11, 12 and 13) shall come on. Pilot and copilot master caution lights (24) shall come on. If all hooks do not open, replace HOIST/CARGO HOOK panel.
<p><b>Note</b> It is normal for MID HOOK OPEN capsule to come on at <u>2 to 3 seconds</u> after FWD HOOK OPEN and AFT HOOK OPEN capsules come on.</p>	



A17324

16-1.4 EXTERNAL CARGO HOOK SYSTEM OPERATIONAL CHECK (Continued)

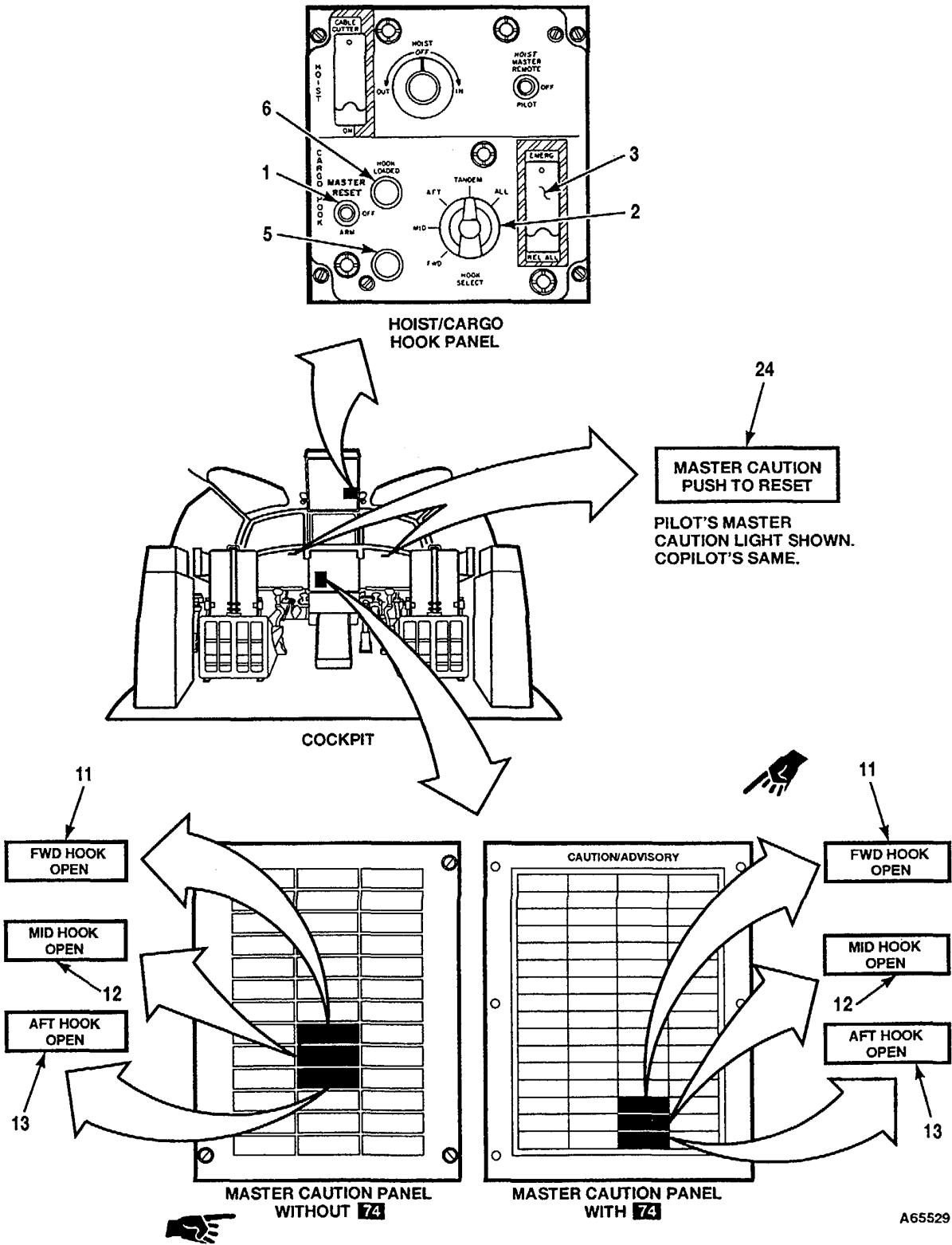
16-1.4

TASK	RESULT
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47. Set MASTER switch (1) to RESET, then to OFF.	Forward and aft cargo hooks shall remain closed. Center cargo hook shall close and remain closed. FWD HOOK OPEN, MID HOOK OPEN, and AFT HOOK OPEN capsules (11, 12 and 13) shall go out. Pilot and copilot master caution lights (24) shall go out.
48. Suspend one 20-25 pound load from each load beam (23) on forward and aft cargo hooks.	
49. Check center cargo hook gage (15). service center cargo hook actuator (TM 55-1520-240-23).	Gage (15) shall indicate at least <u>2100 psi</u> . If it does not,

WARNING

<ul style="list-style-type: none"><li>- If gage indication is below 2100 psi, inadvertent cargo hook operation could occur resulting in loss of external load. Injury or death to personnel can occur.</li><li>- Do not stand near center cargo hook when EMERG switch is set to REL ALL. High pressure air, possibly mixed with oil, will be vented from cargo hook. Injury to personnel can occur.</li></ul>	
50. Lift switchguard over EMERG switch (3). Momentarily set EMERG switch to REL ALL.	All cargo hooks shall open and following shall occur for <u>10 to 14 seconds</u> : Forward and aft cargo hook load beams (23) shall open, drop loads and then close. Center cargo hook shall remain open. FWD HOOK OPEN, MID HOOK OPEN, and AFT HOOK OPEN capsules (11, 12 and 13) shall come on and pilot and copilot master caution lights (24) shall come on. Center cargo hook shall close after <u>10 to 14 seconds</u> . The MID HOOK OPEN capsule (12) shall go out. If any cargo hook does not open, go to Task 16-1.27. If center cargo hook opens but does not stay open for <u>10 to 14 seconds</u> , go to Task 16-1.28. Capsules (11 and 13) and lights (24) shall go out.
50.1 Set MASTER switch (1) to RESET, then to OFF.	
51. Close switchguard over EMERG switch (3).	
52. Without <b>35</b> service center cargo hook actuator (TM 55-1520-240-23). Suspend 20-25 pound load to tongue (16) on center cargo hook.	



A65529

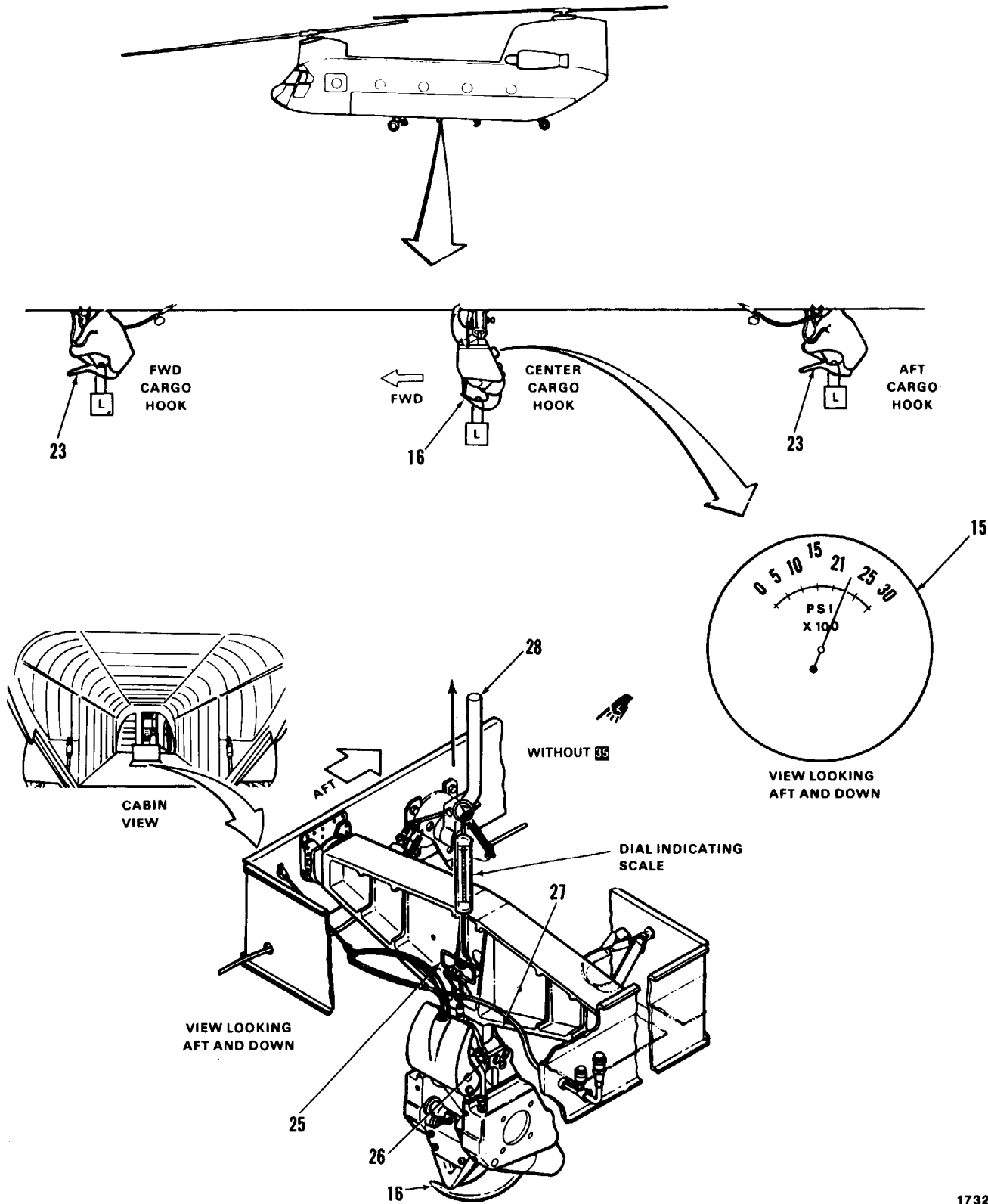
TASK	RESULT
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**CAUTION**

When manual release has been pulled, do not press any CARGO HOOK RELEASE switch or EMERG switch. Damage to cargo hook can occur.

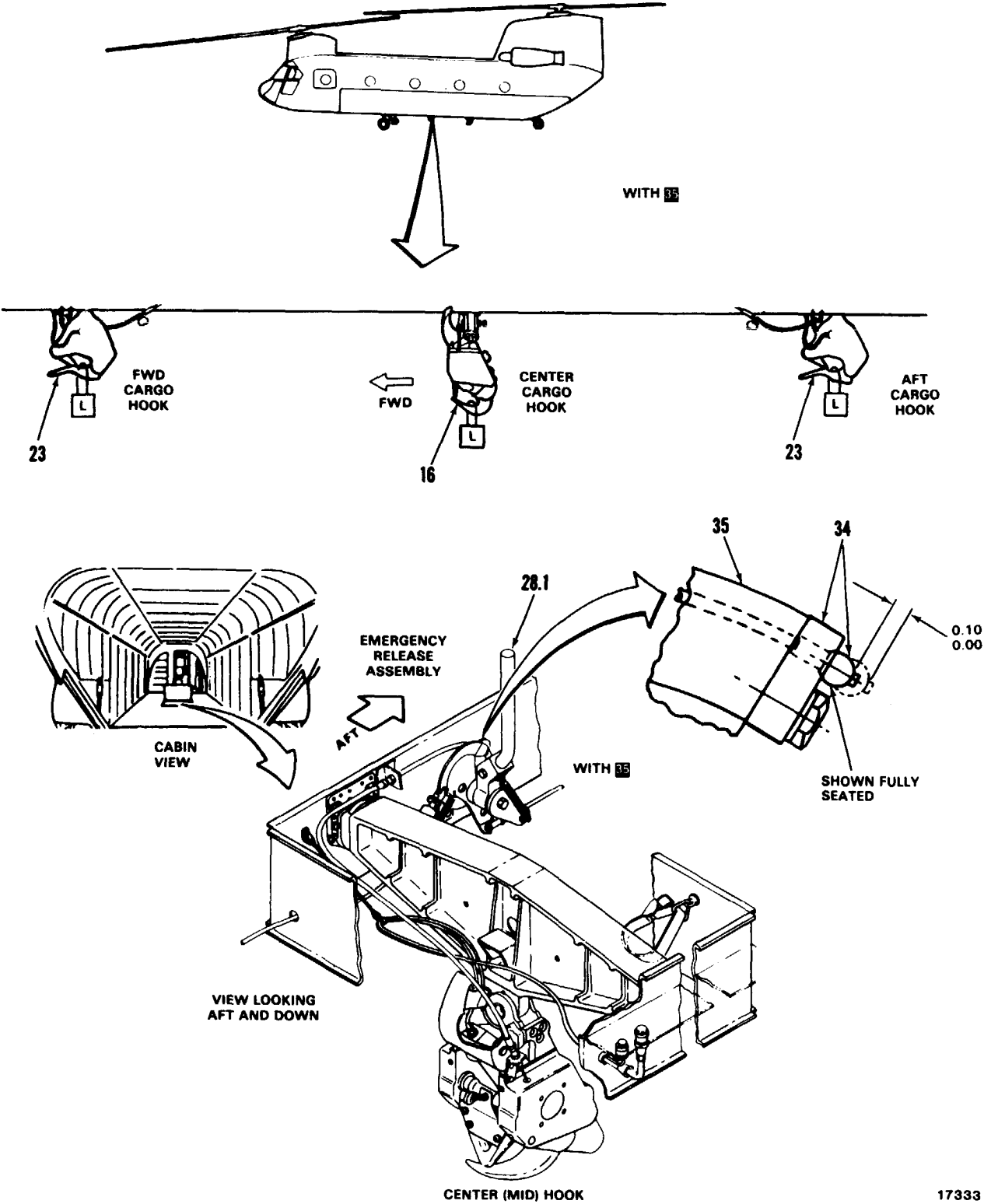
53. Without 35 connect dial indicating scale to center cargo hook manual release handle (26). Pull up dial indicating scale.

Center cargo hook shall open and drop load. Dial indicating scale shall indicate less than 20 pounds when center cargo hook opens. MID HOOK OPEN capsule (12) and both master caution lights (24) shall come on. If hook does not open or dial indicating scale reads more than 20 pounds before hook opens, go to task 16-1.29. If MID HOOK OPEN capsule (12) does not come on, go to task 16-1.24.



17325

TASK	RESULT
54. Remove dial indicating scale. Manually relatch center cargo hook (TM 55-1520-240-23).	MID HOOK OPEN capsule (12) and both master caution lights (24) shall go out.
55. Press down on hook (16) of center cargo hook. Use wood plank.	Center cargo hook shall not open. If it does, manually relatch center cargo hook (TM 55-1520-240-23), and repeat step 55. If hook opens again, replace center cargo hook.
56. Swing center cargo hook right until pivot block (26) contacts beam (27) and pull on hook (16).	Center cargo hook shall not open. If it does, check rigging of manual release mechanism (TM 55-1520-240-23). Repeat step 56.
57. Repeat step 56 to the left. Then go to step 58.	
58. Without 35 pull tandem hook release lever (28) aft then to vertical position.	Forward and aft cargo hooks shall open and latch closed. FWD HOOK OPEN and AFT HOOK OPEN capsules (11 and 13) and master caution lights (24) shall come on. If either or both hooks do not open, go to task 16-1.29.
59. Push lever (28) forward to stowed position.	
<div>CAUTION</div> <p>When manual release has been pulled, do not press any CARGO HOOK RELEASE switch or EMERG switch. Damage to cargo hook can occur.</p>	
59.1. With 35 suspend a weight of 20-25 pounds from the forward and aft cargo hooks (23). Suspend a weight of 45 to 50 pounds from the center cargo hook (16).	
59.2. Pull the triple hook manual release lever aft then back to the vertical position.	The forward, center, and aft cargo hooks shall open and drop loads. The forward and aft hook shall latch closed. FWD HOOK OPEN, MID HOOK OPEN, and AFT HOOK OPEN capsules (11, 12, and 13) and MASTER CAUTION lights (24) shall come on. If a cargo hook (or hooks) fails to open, go to task 16-1.29.
59.3. Push lever (28.1) forward to stowed position.	



17333

16-1.4 EXTERNAL CARGO HOOK SYSTEM OPERATIONAL CHECK  
(Continued)

16-1.4

- 60. Pull down on forward and aft cargo hook load beams (23).
- 61. Set MASTER switch (1) to RESET, then to OFF.
- 62. Turn forward cargo hook manual release (29) counterclockwise. Pull down and hold open load beam (23).
- 63. Slowly move forward cargo hook load beam (23) up towards closed position.
- 64. Manually relatch forward cargo hook. Pull down on load beam (23).
- 65. Set MASTER switch (1) to RESET, then to OFF.
- 66. Turn aft cargo hook manual release (29) counterclockwise. Pull down and hold open load beam (23).
- 67. Slowly move aft cargo hook load beam (23) up towards closed position.

Both hooks shall remain closed. If a hook opens, pull load beam (23) to full open position and release it. Hook should then relatch.

Capsules (11 and 13) and master caution lights (24) shall go out. Forward and aft cargo hooks shall remain closed.

FWD HOOK OPEN capsule (11) and both master caution lights (24) shall come on.

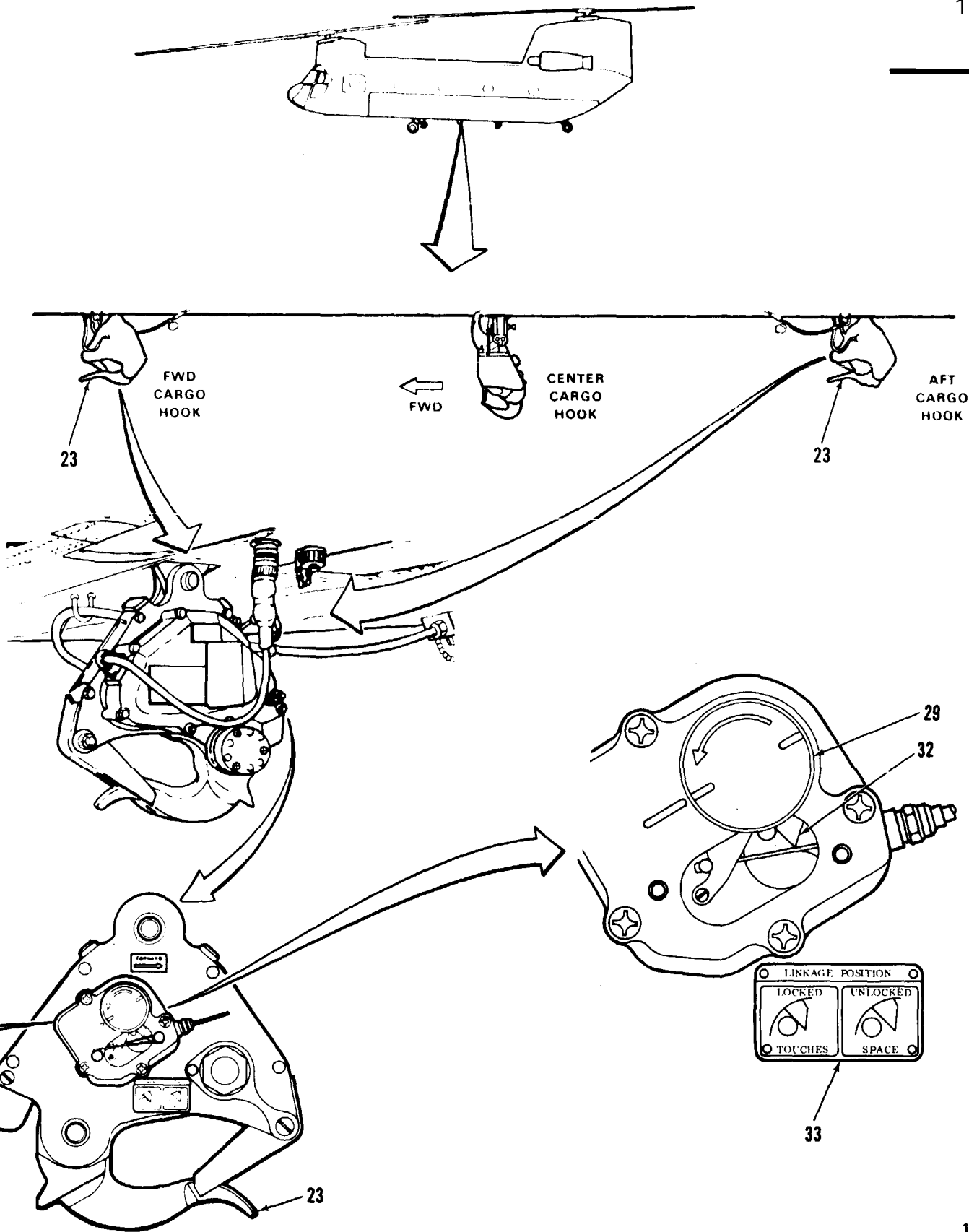
FWD HOOK LOADED light (5) shall flash on just before hook is fully closed. If it does not, go to task 16-1.30.

Forward cargo hook shall not open. If it does, relatch it.

FWD HOOK OPEN capsule (11) and master caution lights (24) shall go out.

AFT HOOK OPEN capsule (13) and both master caution lights (24) shall come on.

AFT HOOK LOADED light (6) shall flash on just before hook is fully closed. If it does not, go to task 16-1.30.



NOTE  
FORWARD AND AFT  
HOOK ADJUSTMENT WILL  
BE THE SAME.

LINKAGE POSITION  
LOCKED UNLOCKED  
TOUCHES SPACE

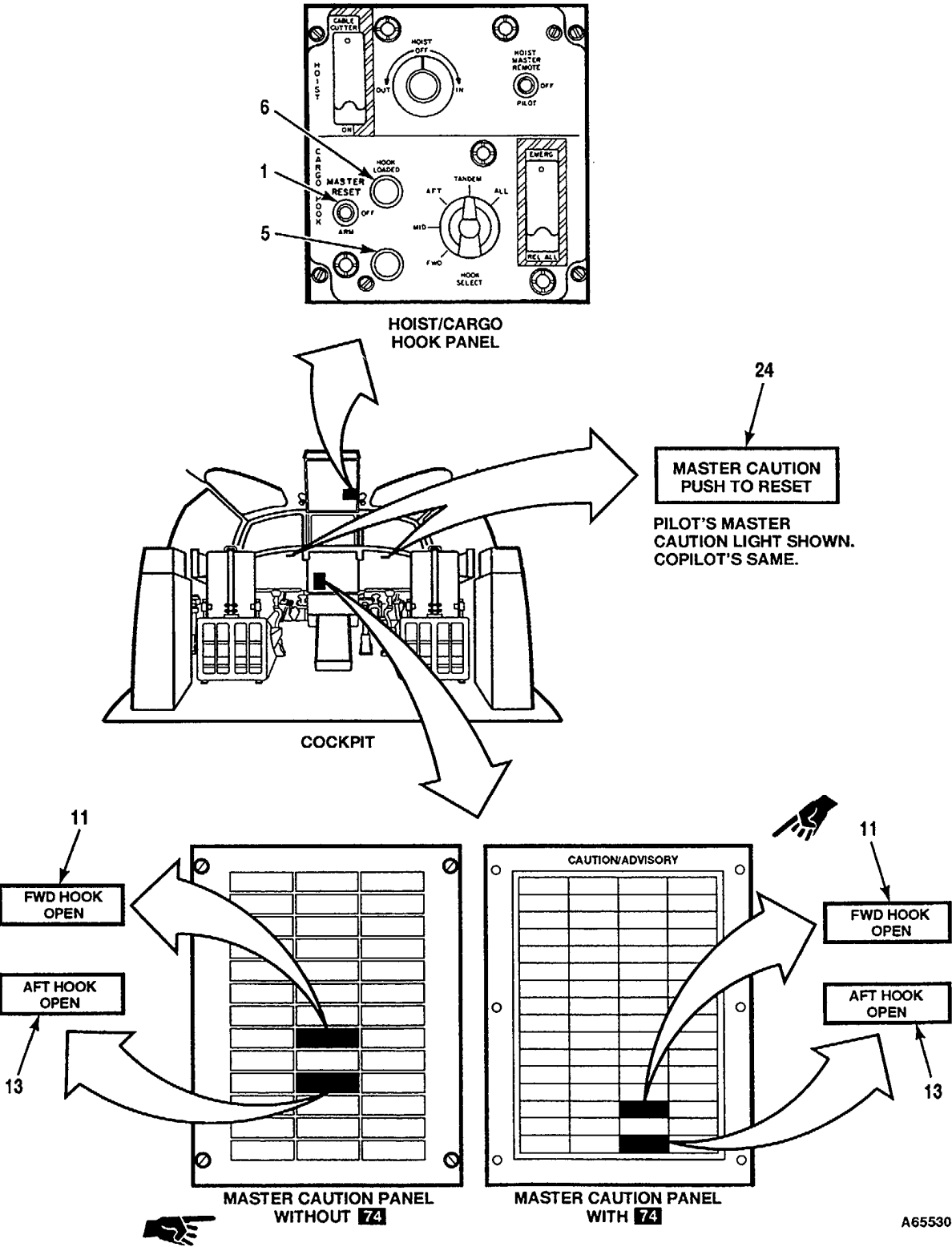
16-1.4 EXTERNAL CARGO HOOK SYSTEM OPERATIONAL CHECK (Continued)

16-1.4

TASK	RESULT
68. Manually relatch aft cargo hook. Pull down on load beam (23).	Aft cargo hook shall not open.
69. Set MASTER switch (1) to RESET, then to OFF.	AFT HOOK OPEN capsule (13) and master caution lights (24) shall go out.
70. Suspend one 20-25 pound load from each load beam (23) on forward and aft cargo hooks.	
71. Turn manual release (29) counter-clockwise on forward and aft cargo hooks and release it.	Each cargo hook shall open when its release (29) is turned and relatch closed. If load is not released, replace cargo hook.
72. Manually move forward cargo hook full forward. Visually check clearance between cable ball end (30) and arm (31). Move cargo hook full aft. Visually check clearance between cable ball end and arm. Release cargo hook.	Clearance between cable ball end (30) and arm (31) shall be 0 to 3/16 inch. If it is not, adjust clearance. (TM 55-1520-240-23.)
<div>WARNING</div> <div>Failure to perform following step can result in loss of external loads when lateral sway occurs resulting in personnel injury or death.</div>	
73. Attach 15-foot rope to forward cargo hook load beam (23). Pull hook full left, then full right. Visually check clearance between cable ball and arm at both extremes. Use inspection mirror. Remove rope. clearance (TM 55-1520-240-23).	Forward cargo hook shall not open. If it does, check tandem hook release rigging. Adjust as required. (TM 55-1520-240-23). Clearance between cable ball end (30) and arm (31) shall be 0 to 3/16 inch. If it is not, adjust
74. Visually check position of linkage (32), and compare it with placard (33).	If linkage position is UNLOCKED, replace cargo hook.
75. Repeat steps 71 through 74 on aft cargo hook.	
76. With 35 visually check clearance between center cargo hook control cable ball end and quadrant.	Clearance between cable ball end (34) and quadrant (35) shall be 0 to 3/32 inch. If it is not, adjust clearance (TM 55-1520-240-23).

FOLLOW-ON MAINTENANCE:

- TM 55-1520-240-23:
- Battery disconnected.
  - Electrical power off.
  - Hydraulic power off.
  - Center cargo hook serviced.
  - Center cargo hook stowed.
  - Center cargo hook access panel closed.



A65530



16-1.5 FWD OR AFT HOOK LOADED LIGHT IS LIT  
WHEN CARGO HOOK IS UNLOADED

16-1.5

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

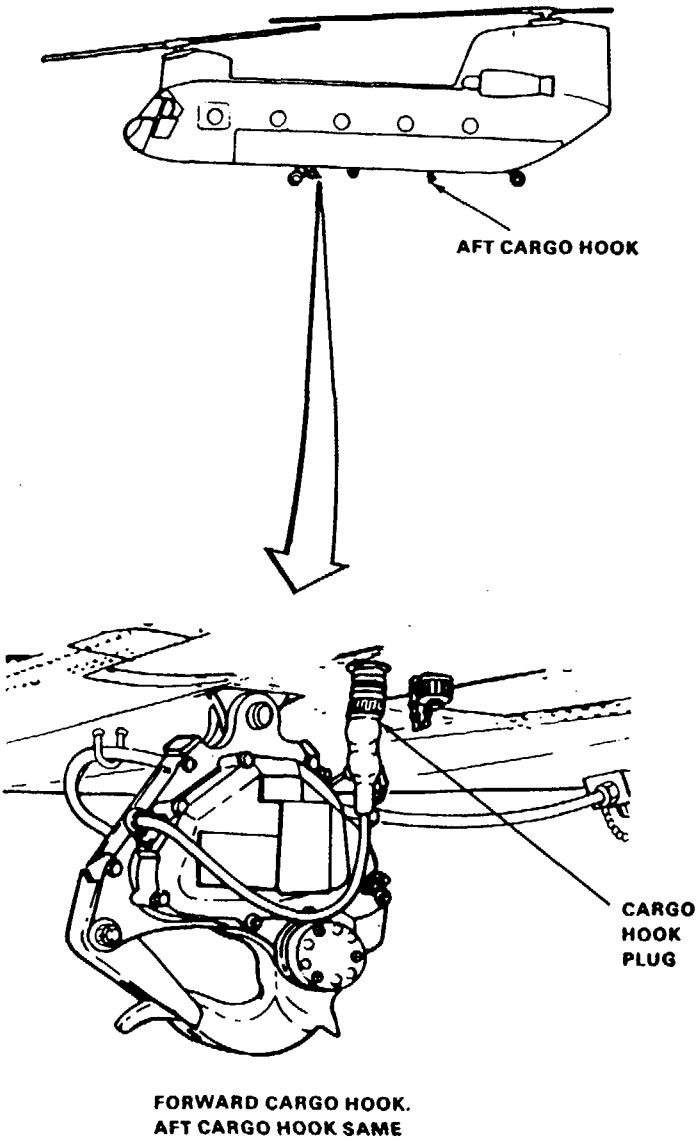
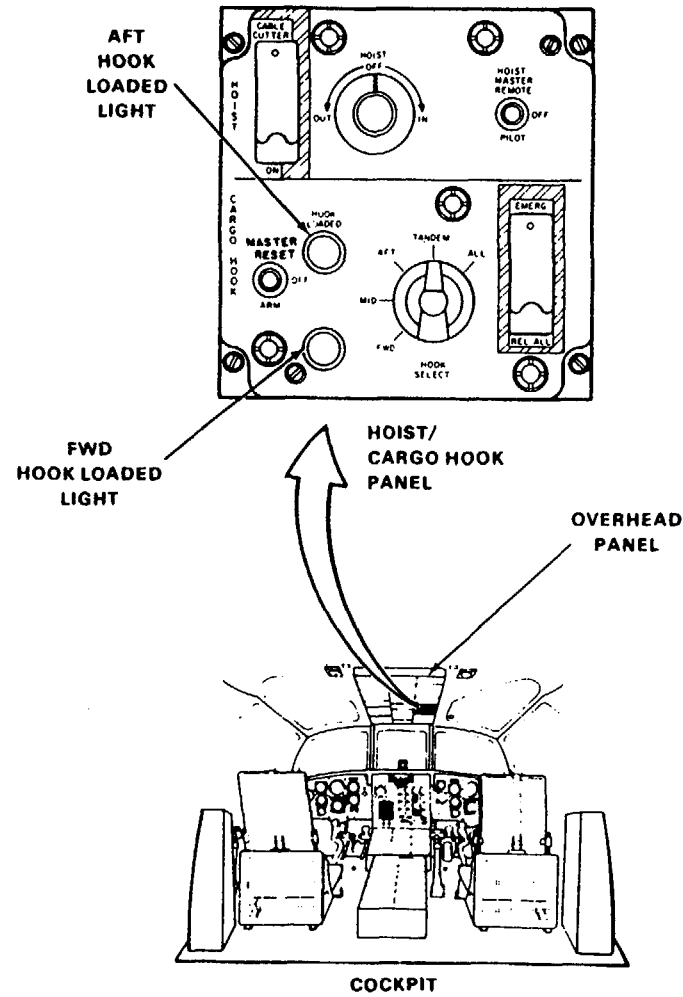
Tools:  
Electrical Repairer's Tool Kit  
NSN 5180-00-323-4915  
Multimeter

Materials  
None

Personnel Required:  
68F20 Aircraft Electrician

References  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



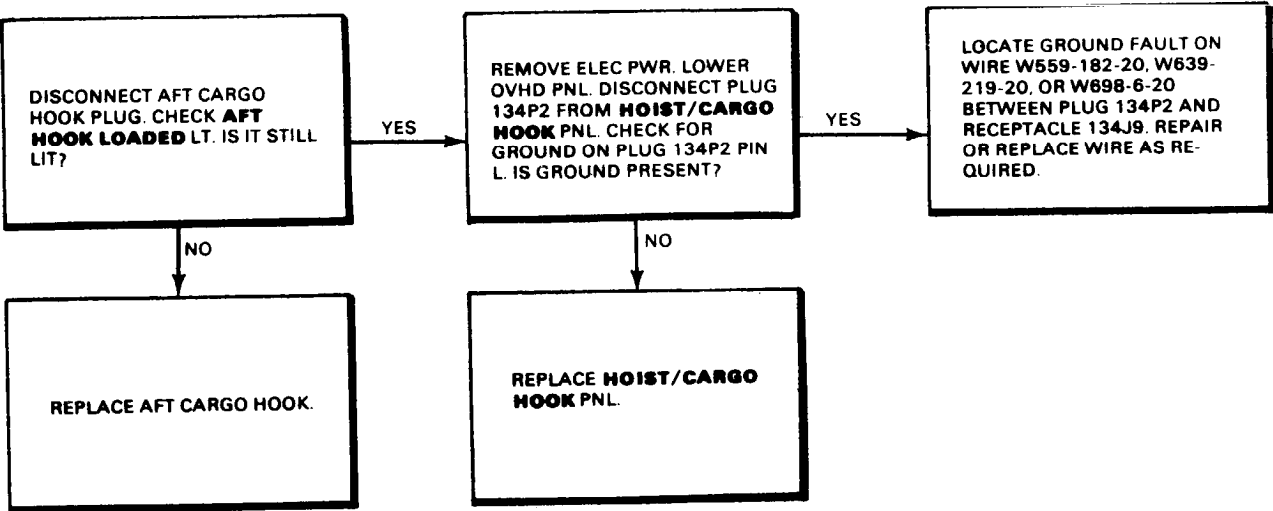
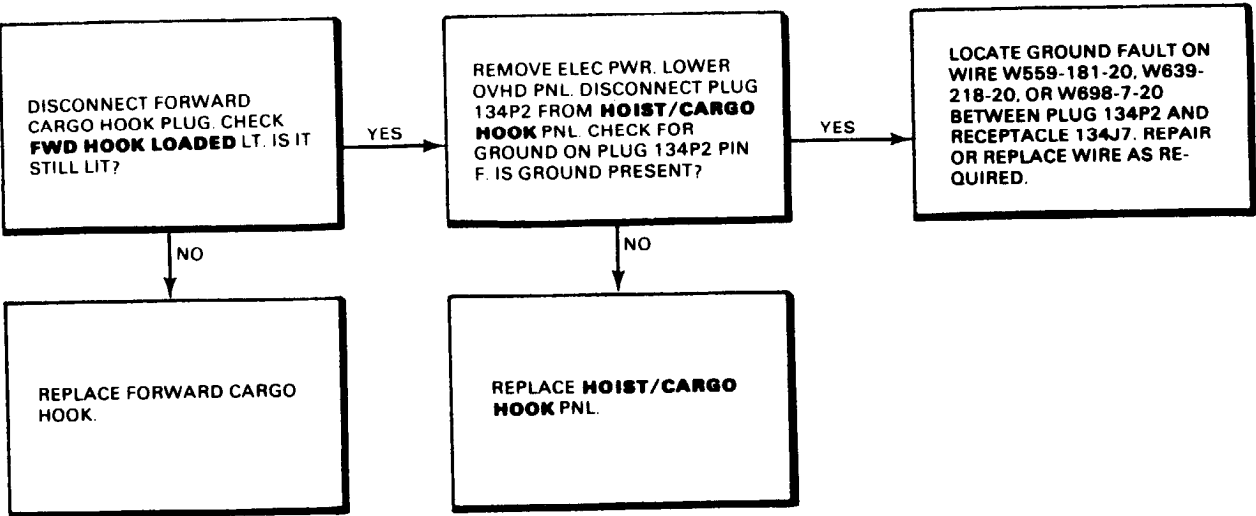
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16-1.5 FWD OR AFT HOOK LOADED LIGHT IS LIT WHEN CARGO HOOK IS UNLOADED (Continued)

16-1.5

FWD HOOK LOADED LIGHT IS LIT WHEN CARGO HOOK IS UNLOADED

AFT HOOK LOADED LIGHT IS LIT WHEN CARGO HOOK IS UNLOADED



16-1.6 FWD OR AFT HOOK LOADED LIGHT DOES NOT COME ON WHEN PRESSED

16-1.6

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

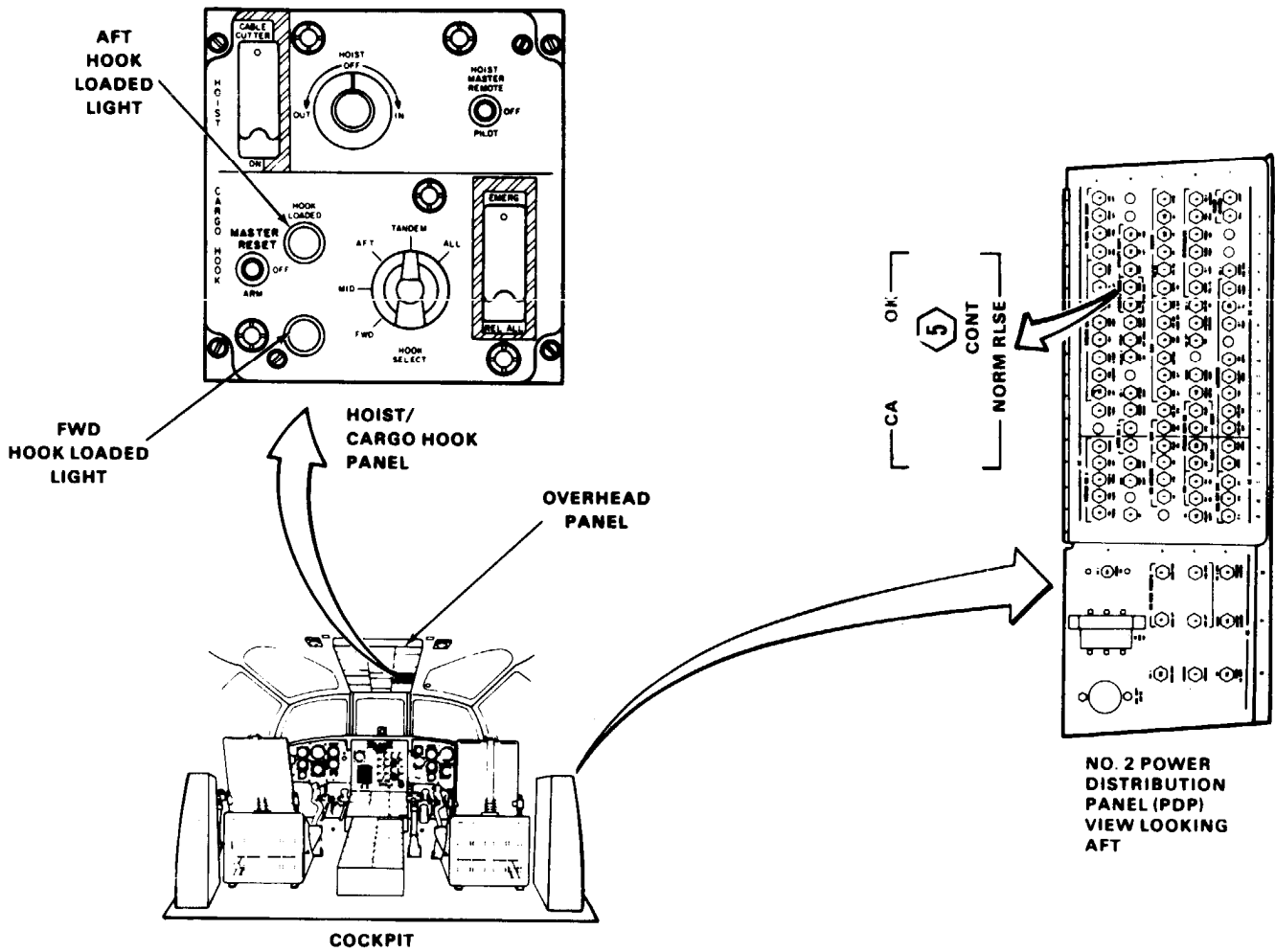
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

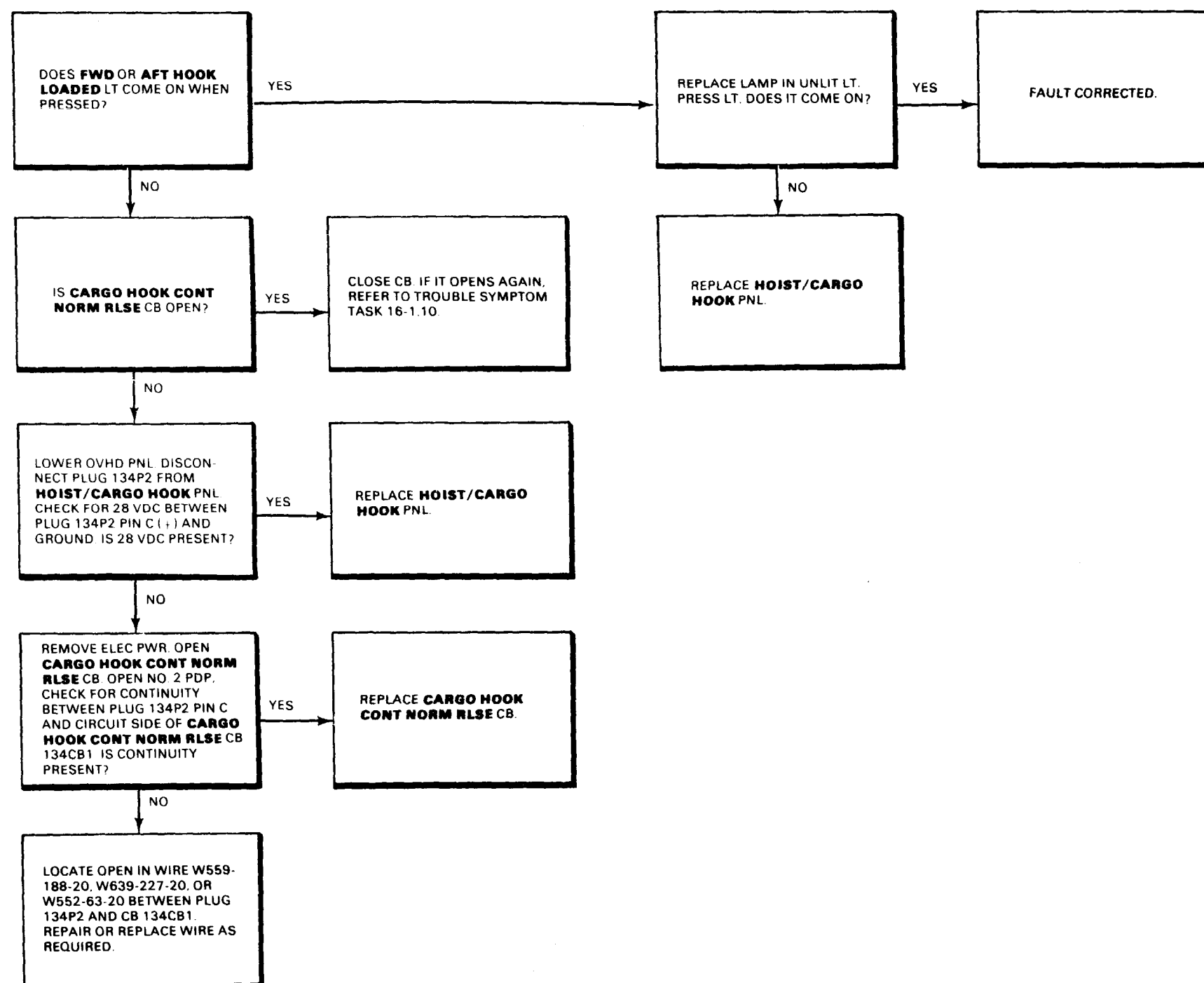
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



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16-1.6 FWD OR AFT HOOK LOADED LIGHT DOES NOT  
COME ON WHEN PRESSED (Continued)

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END OF TASK

16-1.7 CARGO HOOK PWR EMER REL CIRCUIT BREAKER  
DOES NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

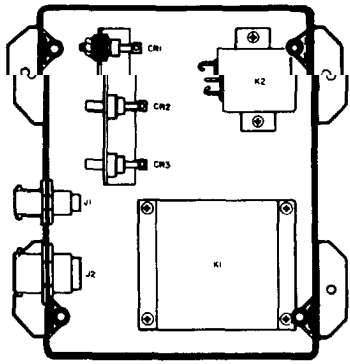
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

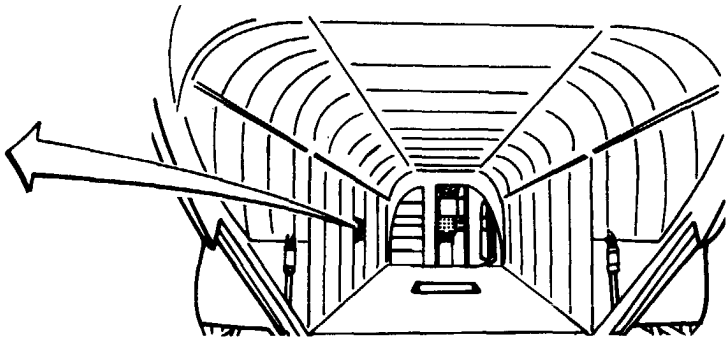
Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

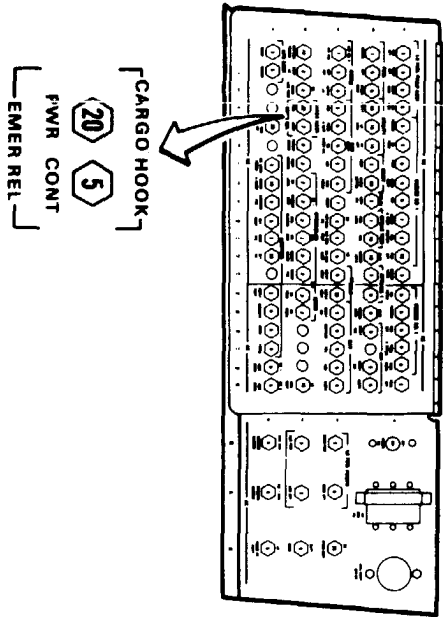
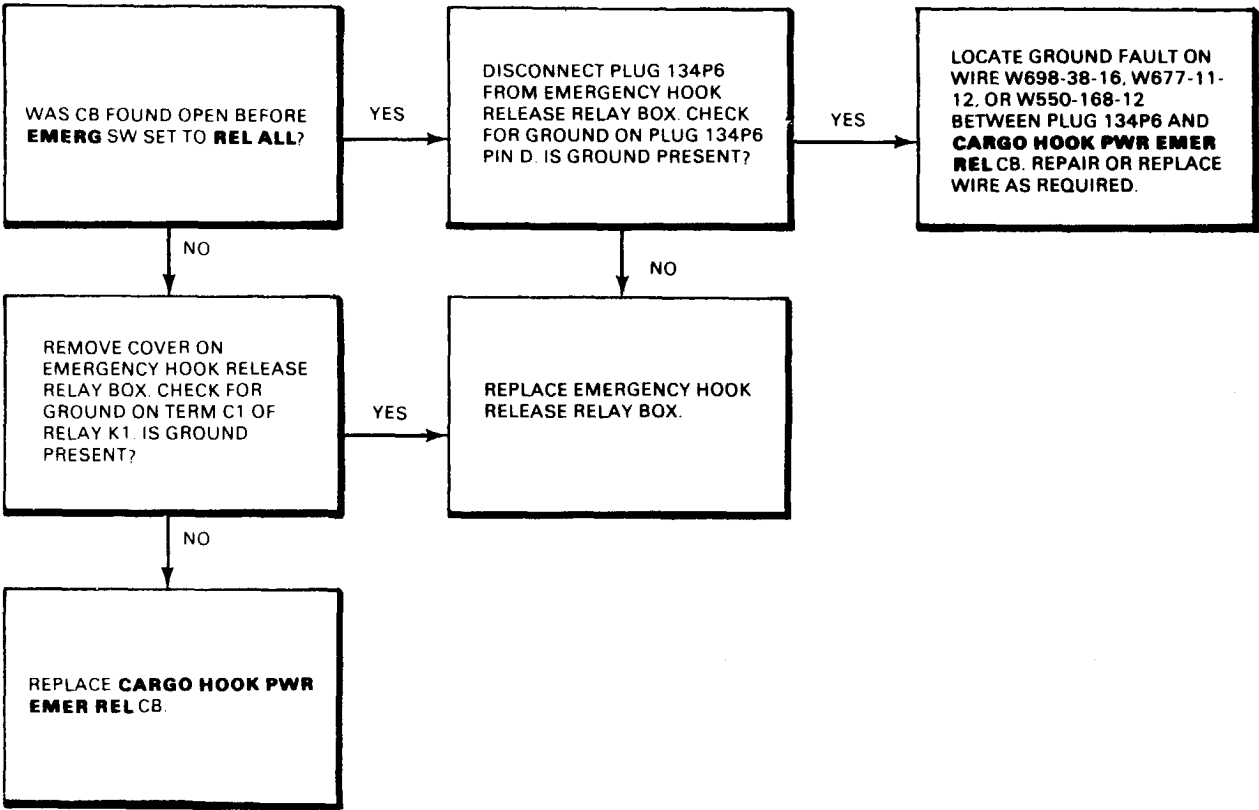
Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



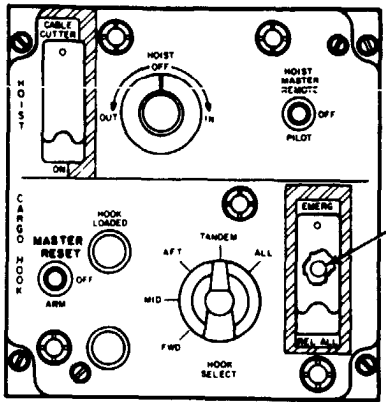
EMERGENCY HOOK  
RELEASE RELAY  
BOX STA 270



CABIN  
VIEW

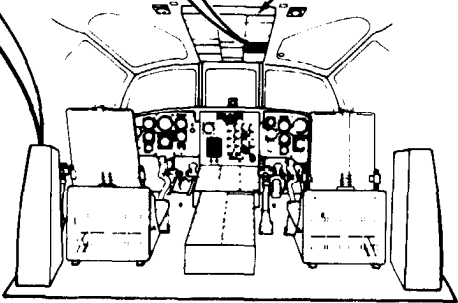


NO. 1 POWER  
DISTRIBUTION  
PANEL (PDP)  
VIEW LOOKING  
AFT



HOIST/  
CARGO HOOK  
PANEL

OVERHEAD  
PANEL



COCKPIT

16-1.8 CARGO HOOK CONT EMER RELCIRCUIT BREAKER  
DOES NOT STAY CLOSED

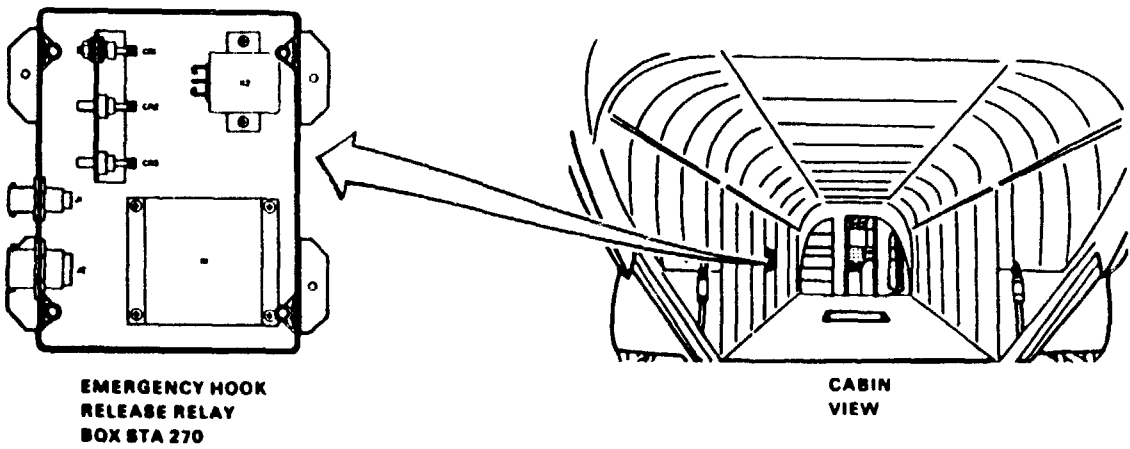
FAULT ISOLATION PROCEDURE

INITIAL SETUP

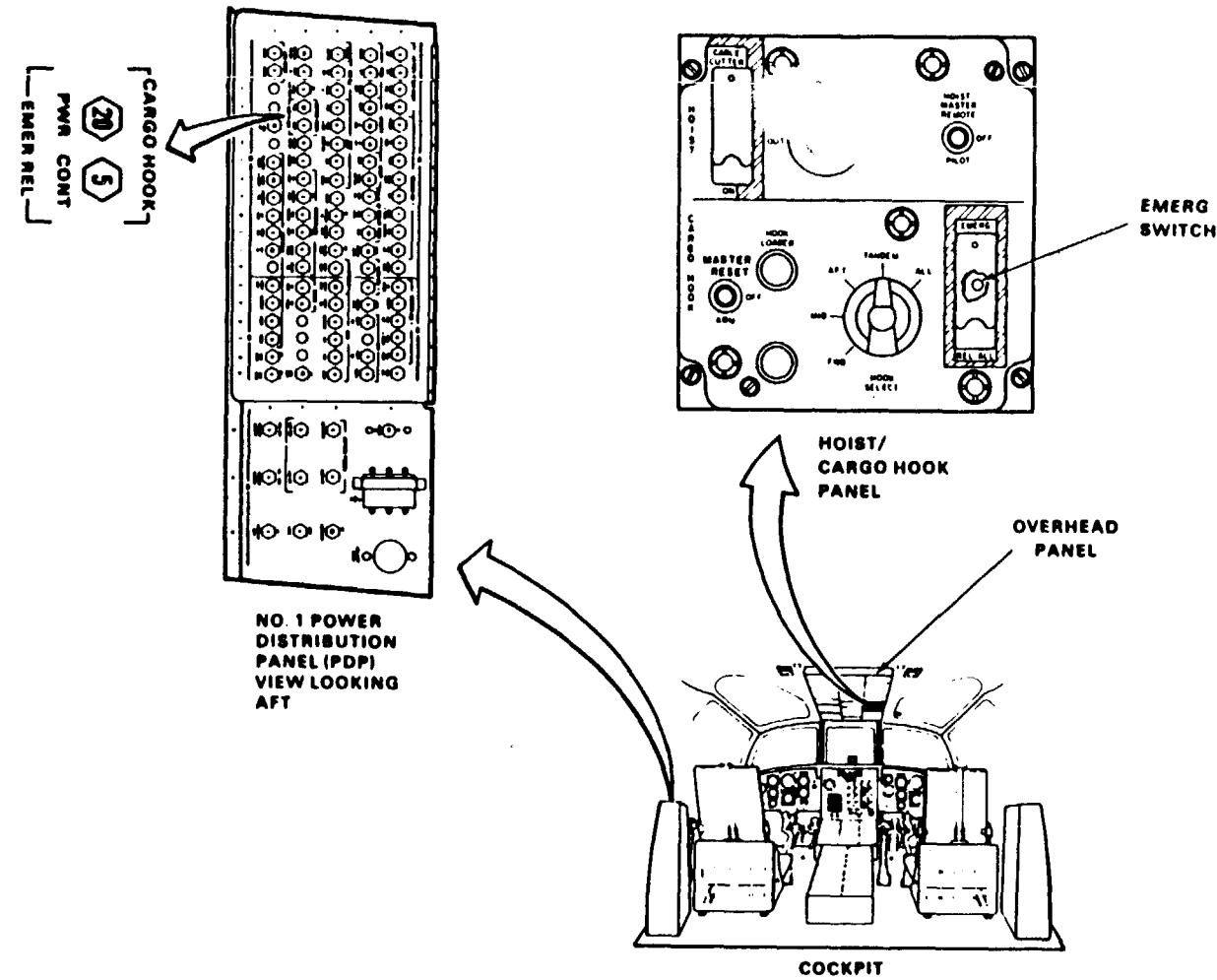
Applicable Configurations:  
All

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None  
Personnel Required:  
68F20 Aircraft Electrician  
References:  
TM 55-1520-240-23  
Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



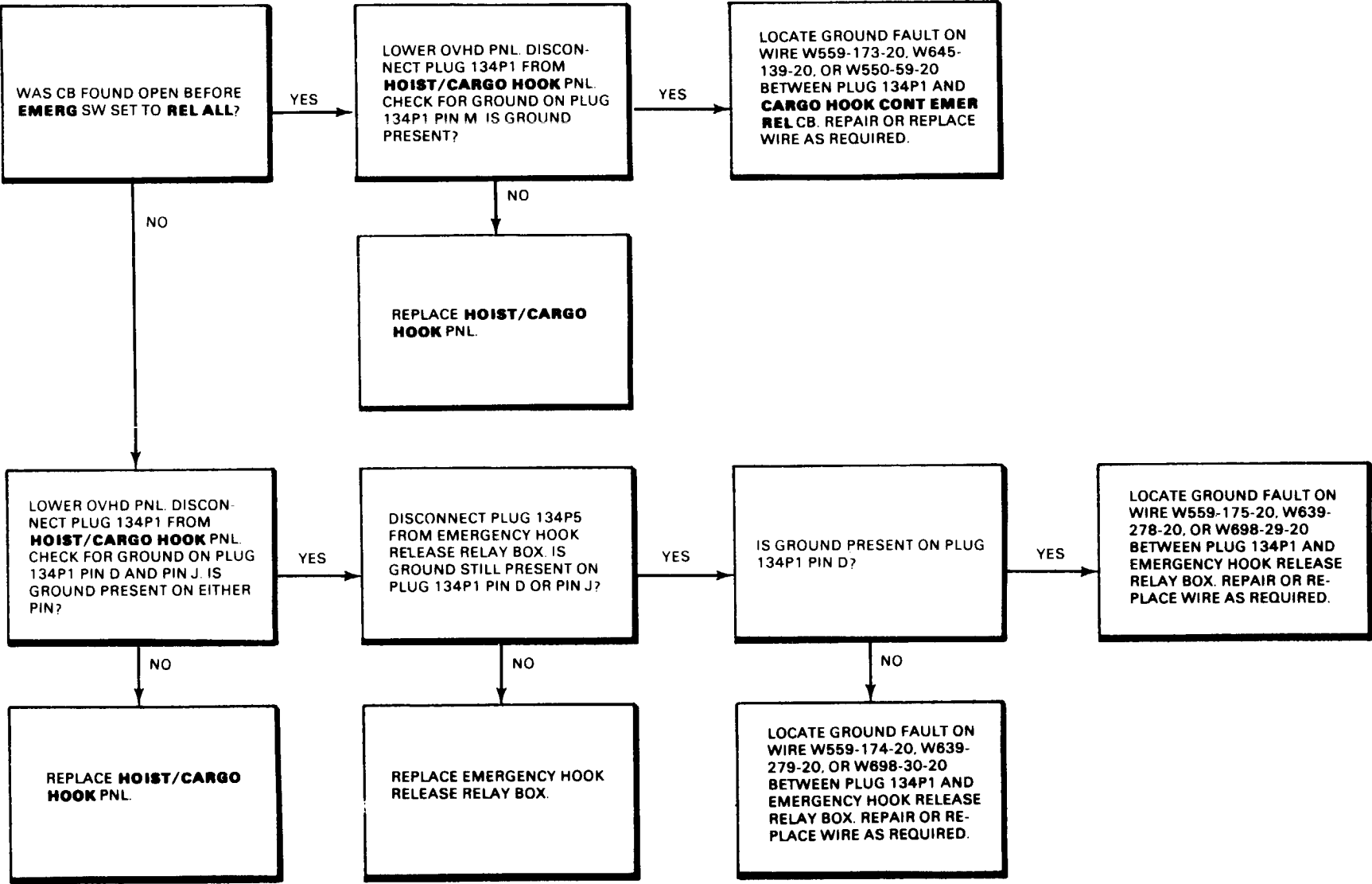
16-1.8



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16-1.8 CARGO HOOK CONT EMER RELCIRCUIT BREAKER  
DOES NOT STAY CLOSED (Continued)

16-1.8



END OF TASK

16-1.9 CARGO HOOK PWR NORM RLSE CIRCUIT BREAKER  
DOES NOT STAY CLOSED

FAULT ISOLATION PROCEDURE  
INITIAL SETUP

Applicable Configurations:  
All

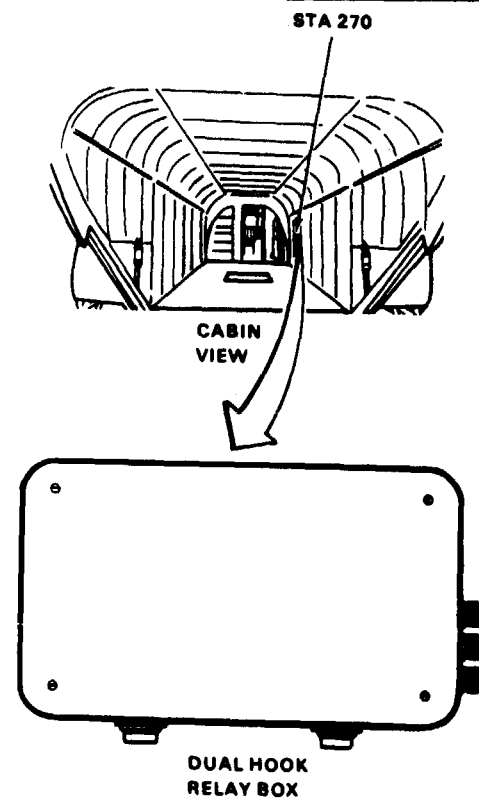
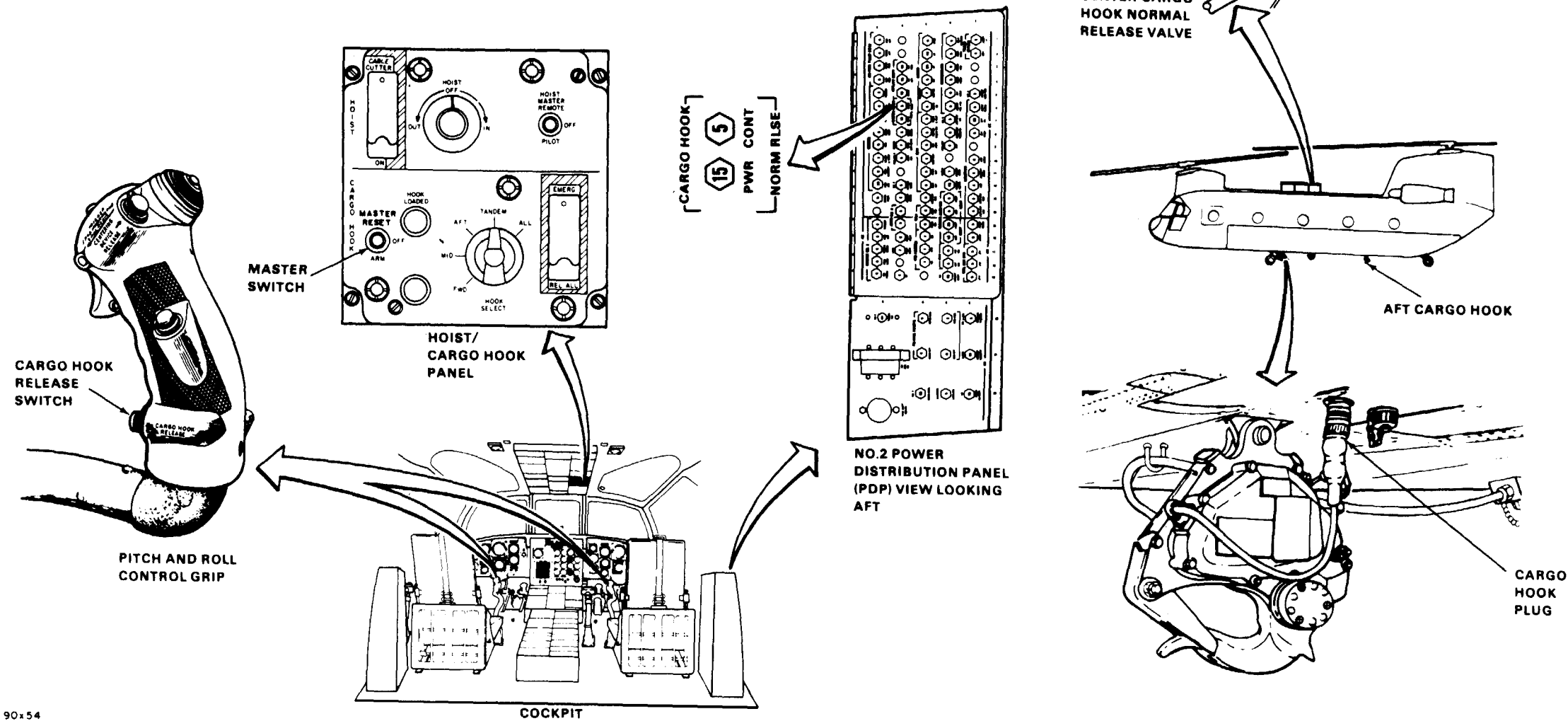
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

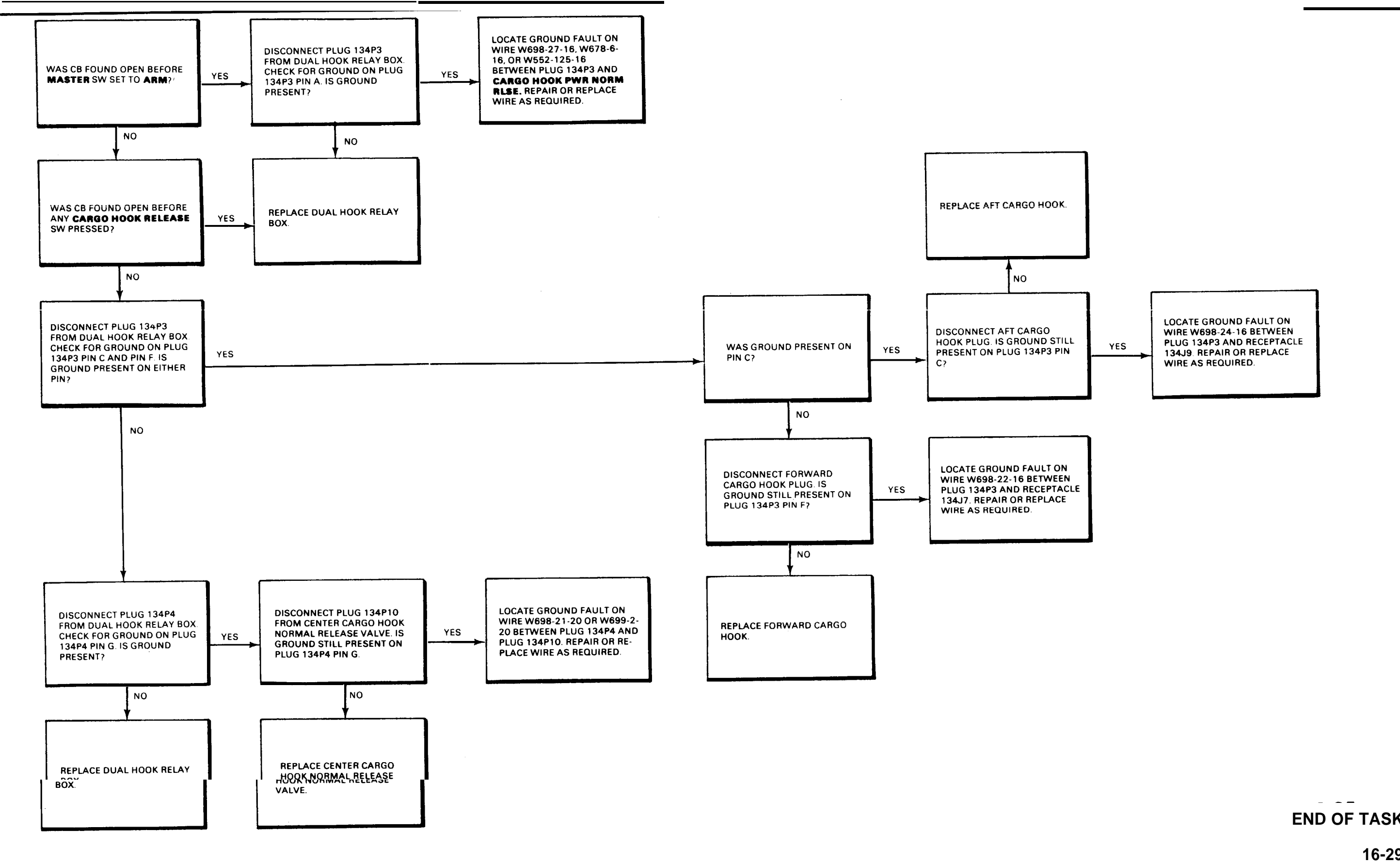
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off  
Tunnel Access Doors Opened





16-1.9 CARGO HOOK PWR NORM RLSE CIRCUIT BREAKER  
DOES NOT STAY CLOSED (Continued)



END OF TASK

16-1.10 CARGO HOOK CONT NORM RLSE CIRCUIT BREAKER  
DOES NOT STAY CLOSED

16-1.10

FAULT ISOLATION PROCEDURE  
INITIAL SETUP

Personnel Required:  
68F20 Aircraft Electrician

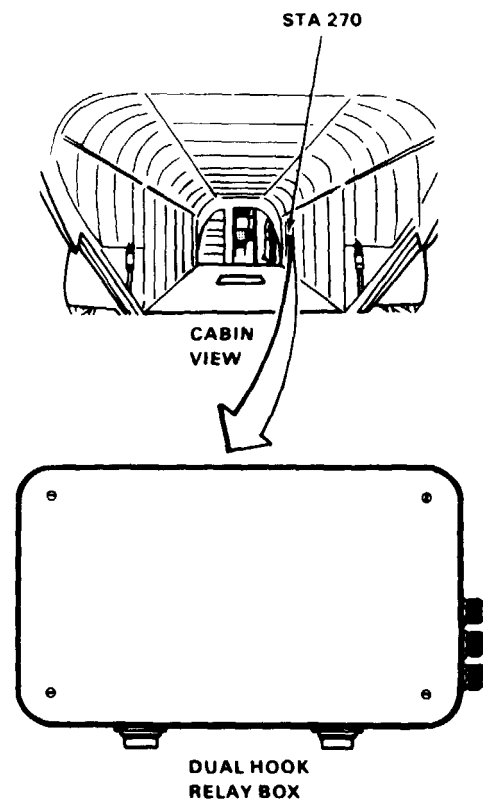
Applicable Configurations:  
All

References:  
TM 55-1520-240-23

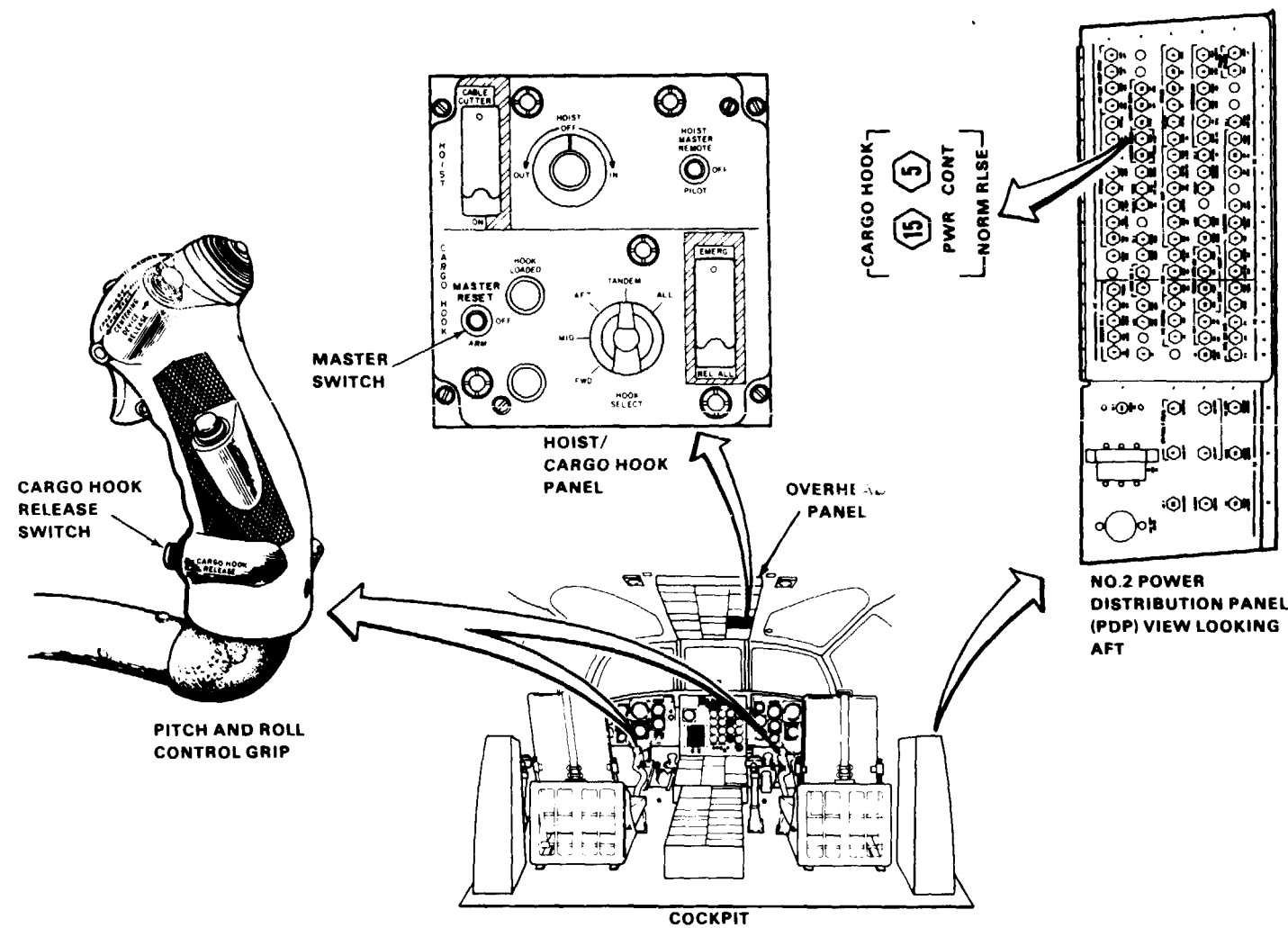
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Equipment Condition:  
TM 55-1520-240-23;  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off

Materials:  
None

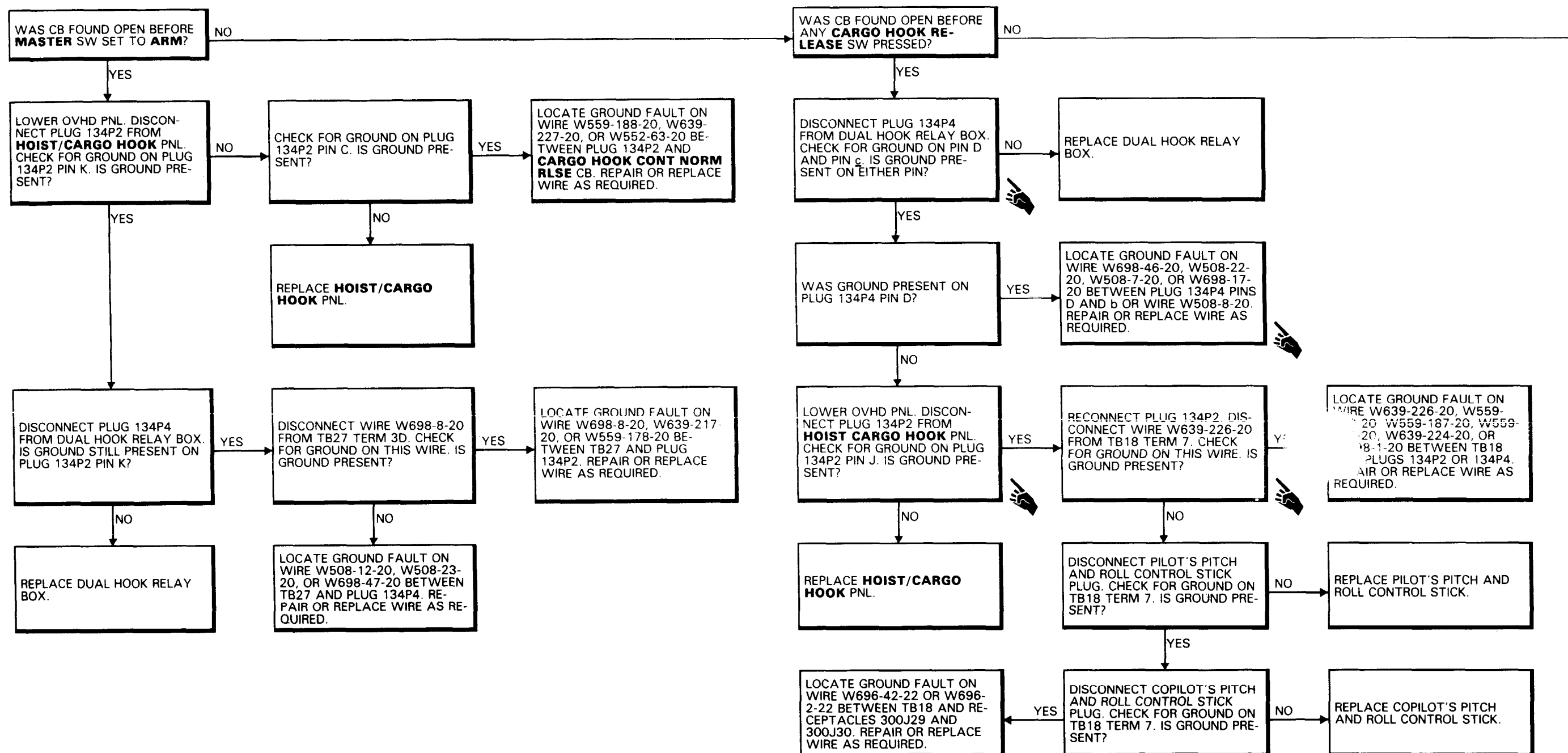


90x54



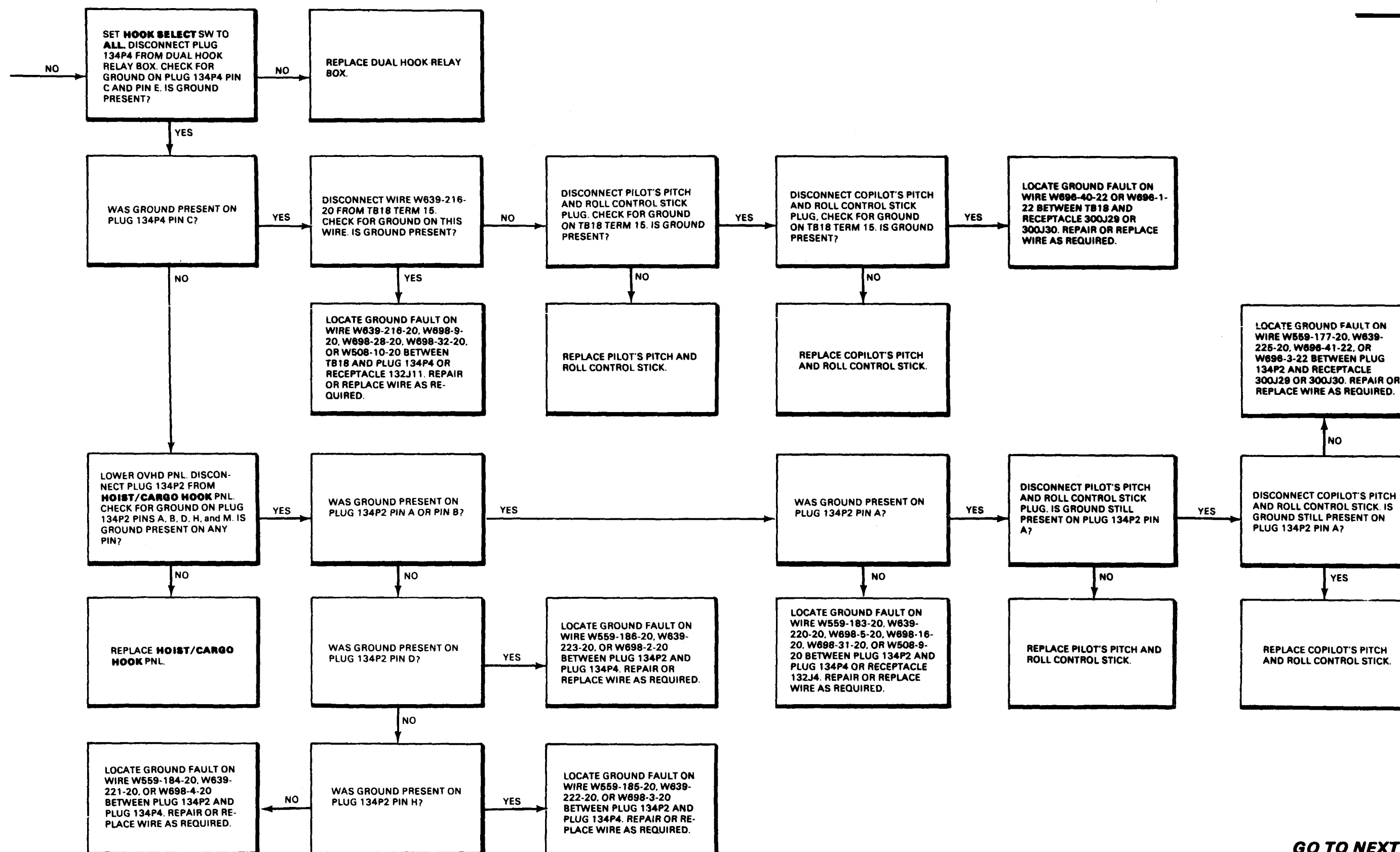
D145-6360-SPA

GO TO NEXT PAGE



# 16-1.10 CARGO HOOK CONT NORM RLSE CIRCUIT BREAKER DOES NOT STAY CLOSED (Continued)

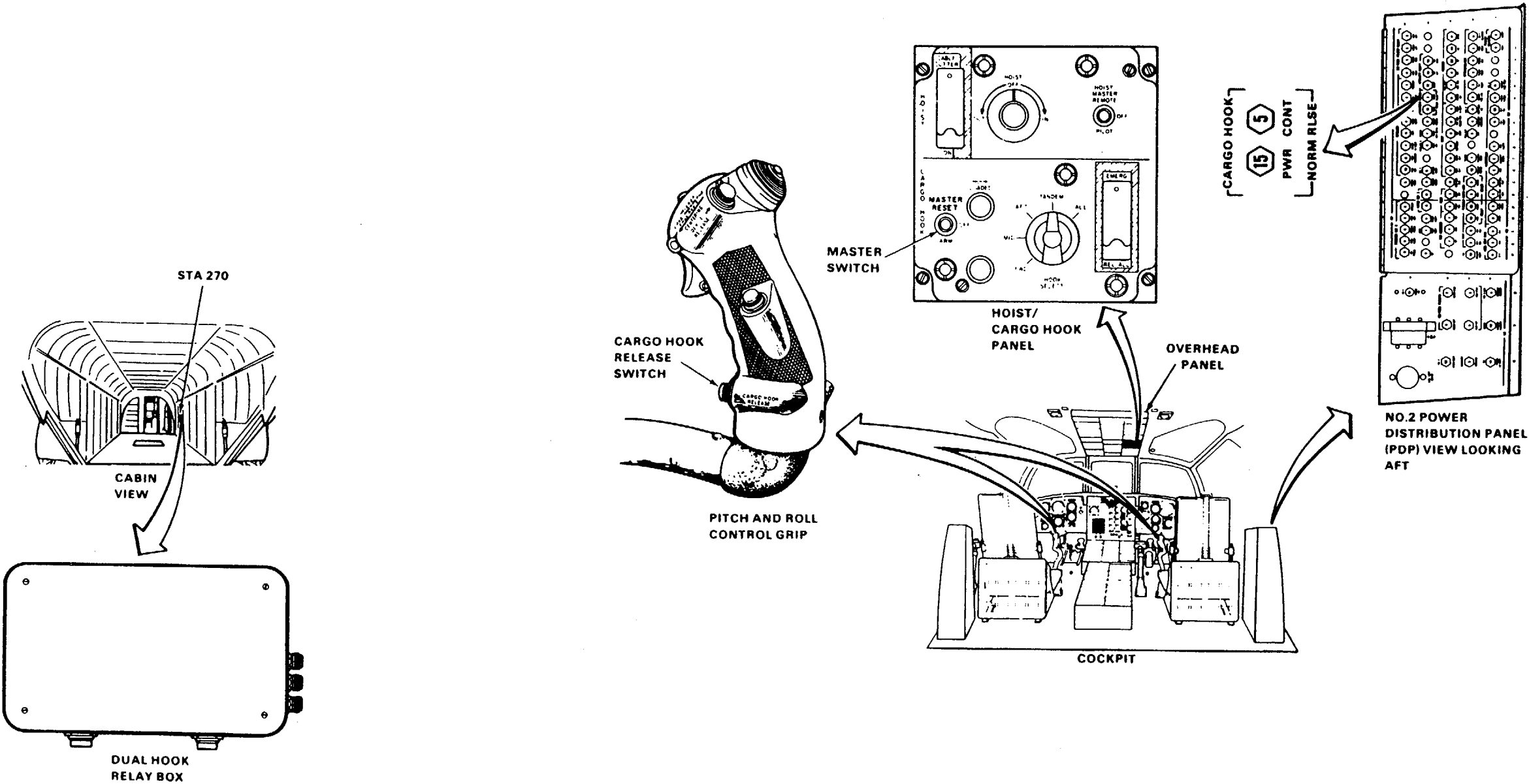
16-1.10



GO TO NEXT PAGE

16-1.10 CARGO HOOK CONT NORM RLSE CIRCUIT BREAKER  
DOES NOT STAY CLOSED (Continued)

16-1.10



90X54

D145-10853-SPA

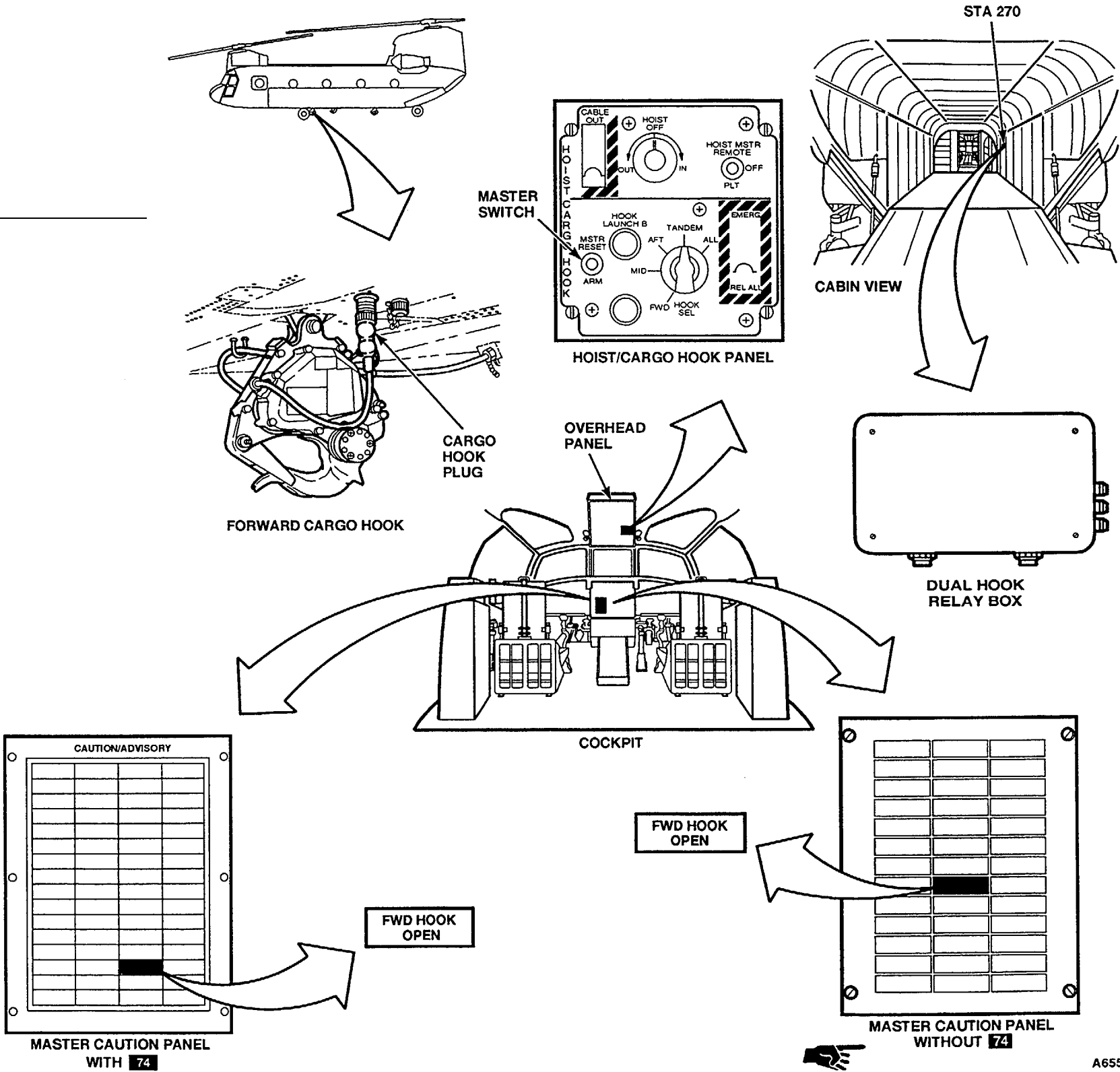
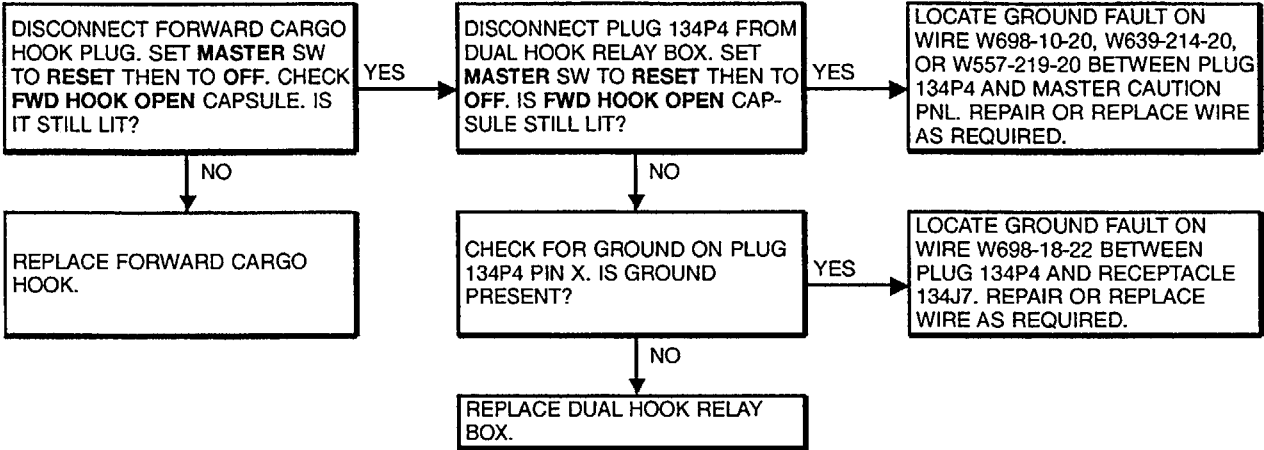
16-1.11 FWD HOOK OPEN CAPSULE LIT WHEN FORWARD CARGO HOOK CLOSED

16-1.11

FAULT ISOLATION PROCEDURE

INITIAL SETUP  
**Applicable Configurations**  
All  
**Tools**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter  
**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician  
**References:**  
TM 55-1520-240-23  
**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



16-1.12 MID HOOK OPEN CAPSULE LIT WHEN CENTER CARGO HOOK CLOSED

16-1.12

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations

All

Tools

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

Aircraft Electrician

References

TM 55-1520-240-23

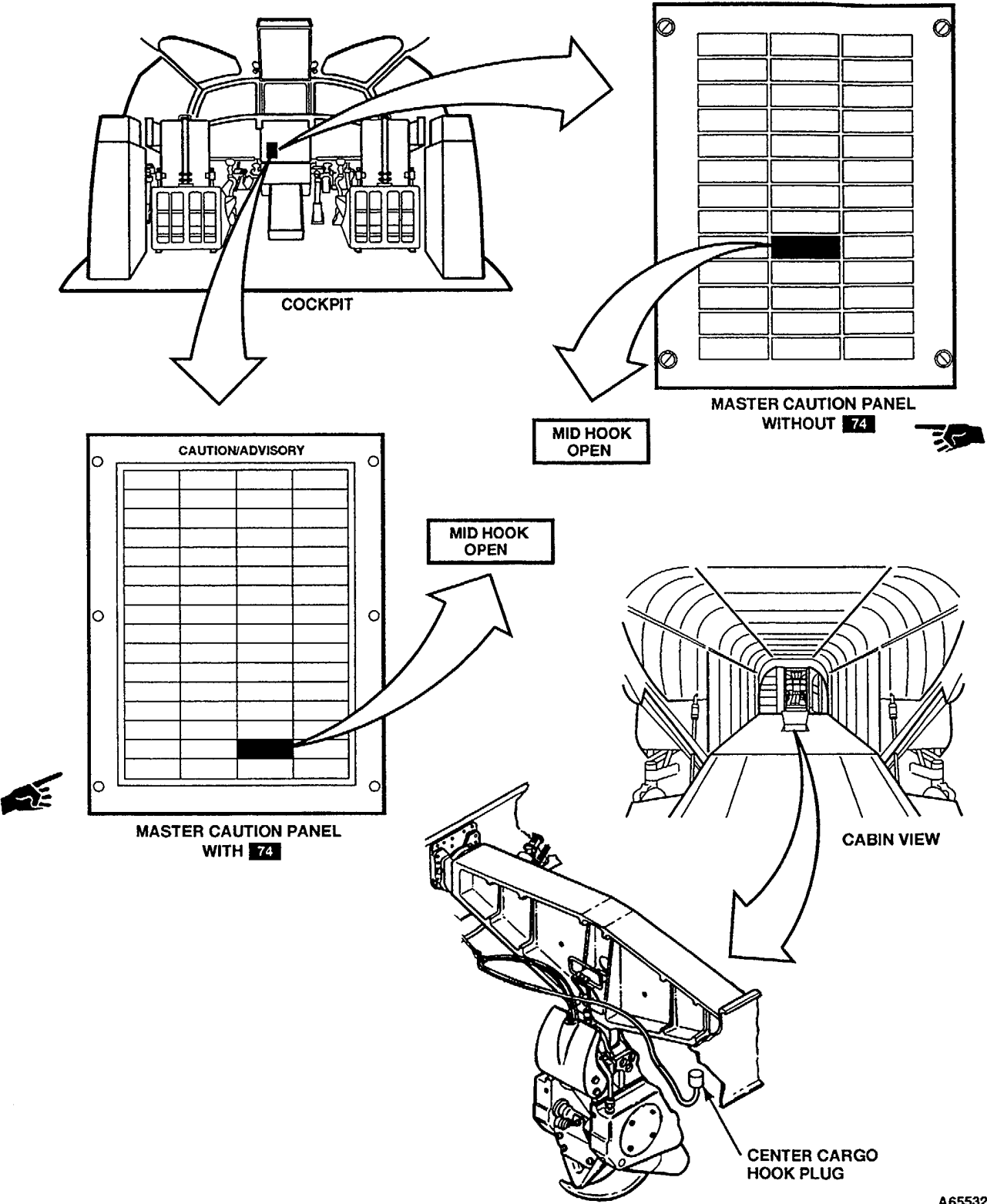
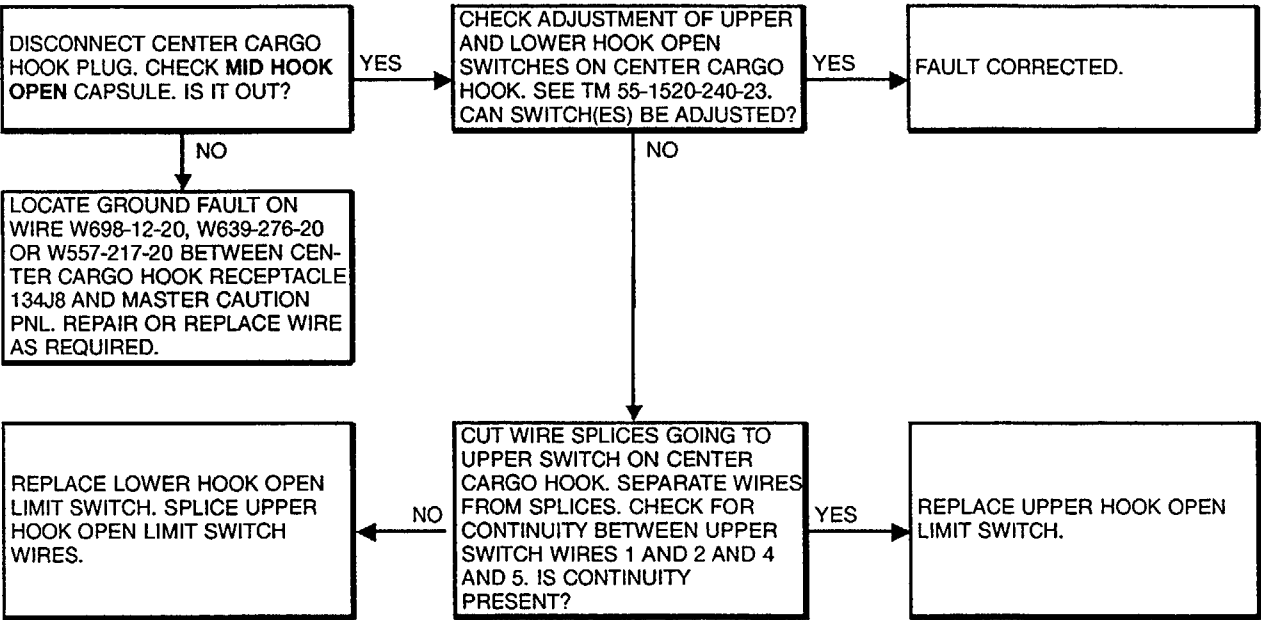
Equipment Condition:

TM 55-1520-240-23:

Battery Connected

Electrical Power On

Hydraulic Power Off



A65532

## FAULT ISOLATION PROCEDURE

## INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

Electrical Repairer's Tool Kit.

NSN 5180-00-323-4915

### Multimeter

**Materials:**

None

**Personnel Required:**

Aircraft Electrician

## References

TM 55-1520-240-23

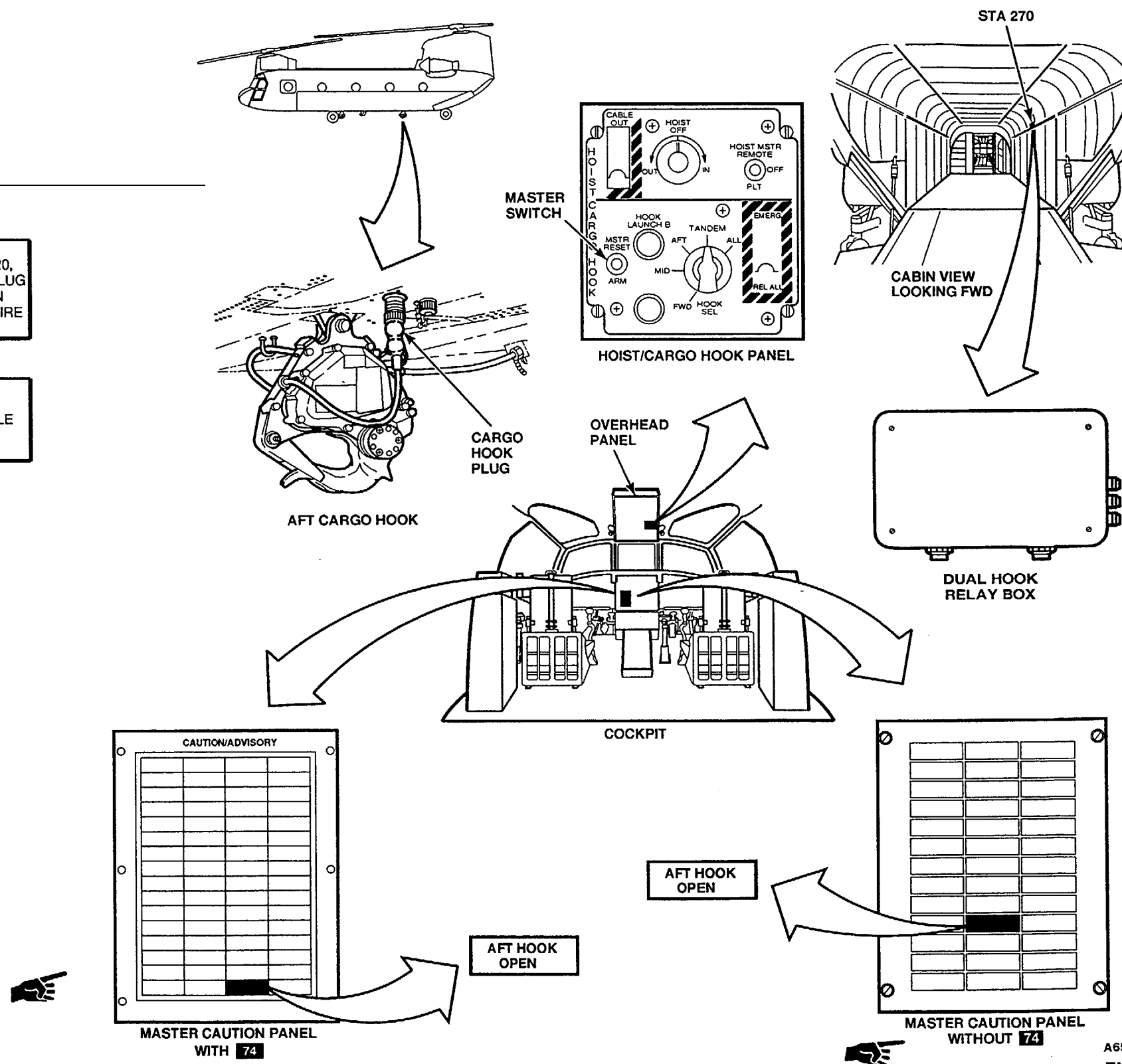
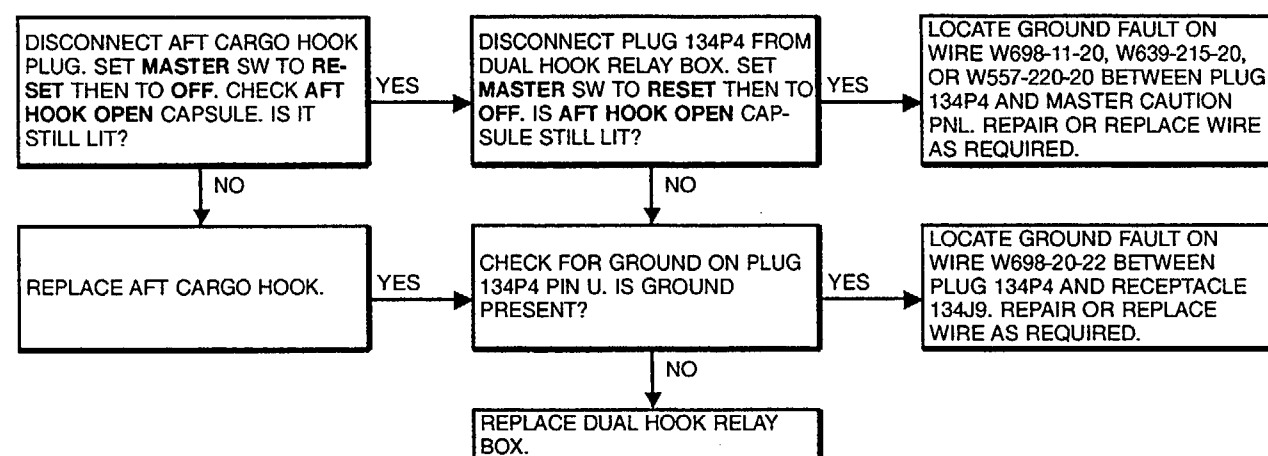
**Equipment Condition:**

TM 55-1520-240-23:

Battery Connected

Battery Connected  
Electrical Power On

Hydraulic Power Off





16-1.14 DUAL HOOK FAULT CAPSULE LIT

16-1.14

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations

All

Tools

Electrical Repairer's Tool Kit,  
NSN 5180-00-3234915  
Multimeter

Materials:

None

Personnel Required:

Aircraft Electrician

References

TM 55-1520-240-23

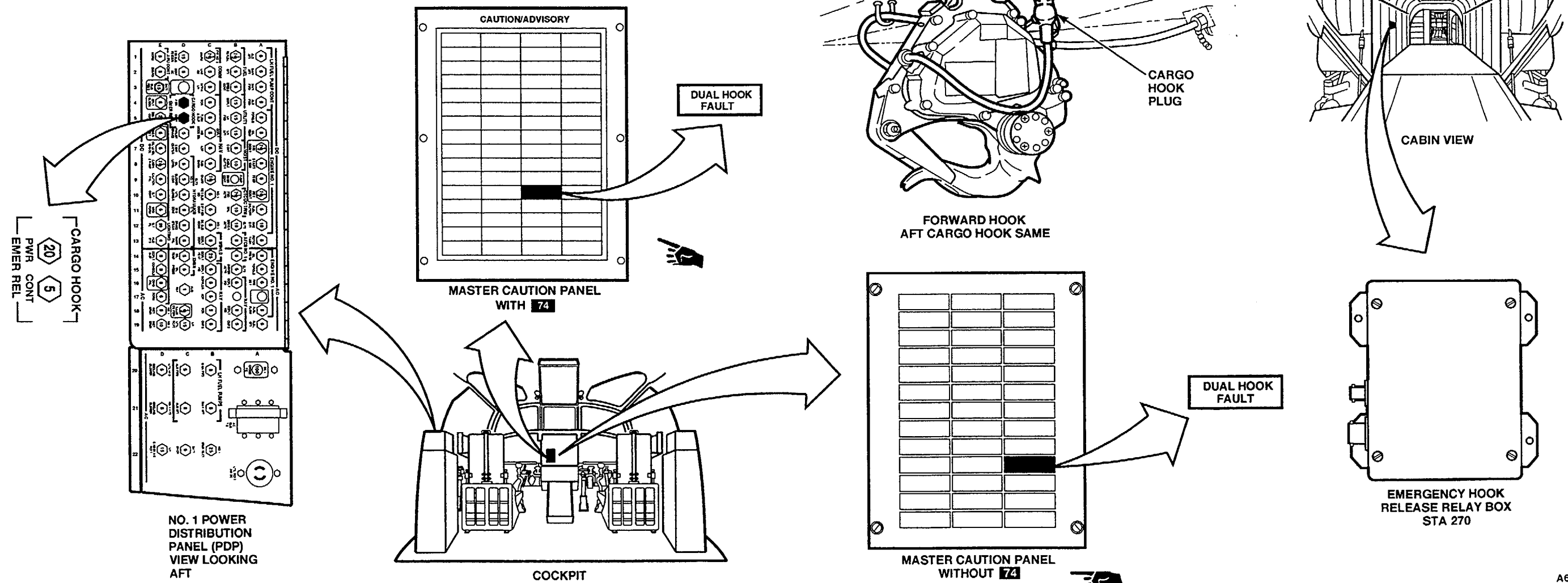
Equipment Condition:

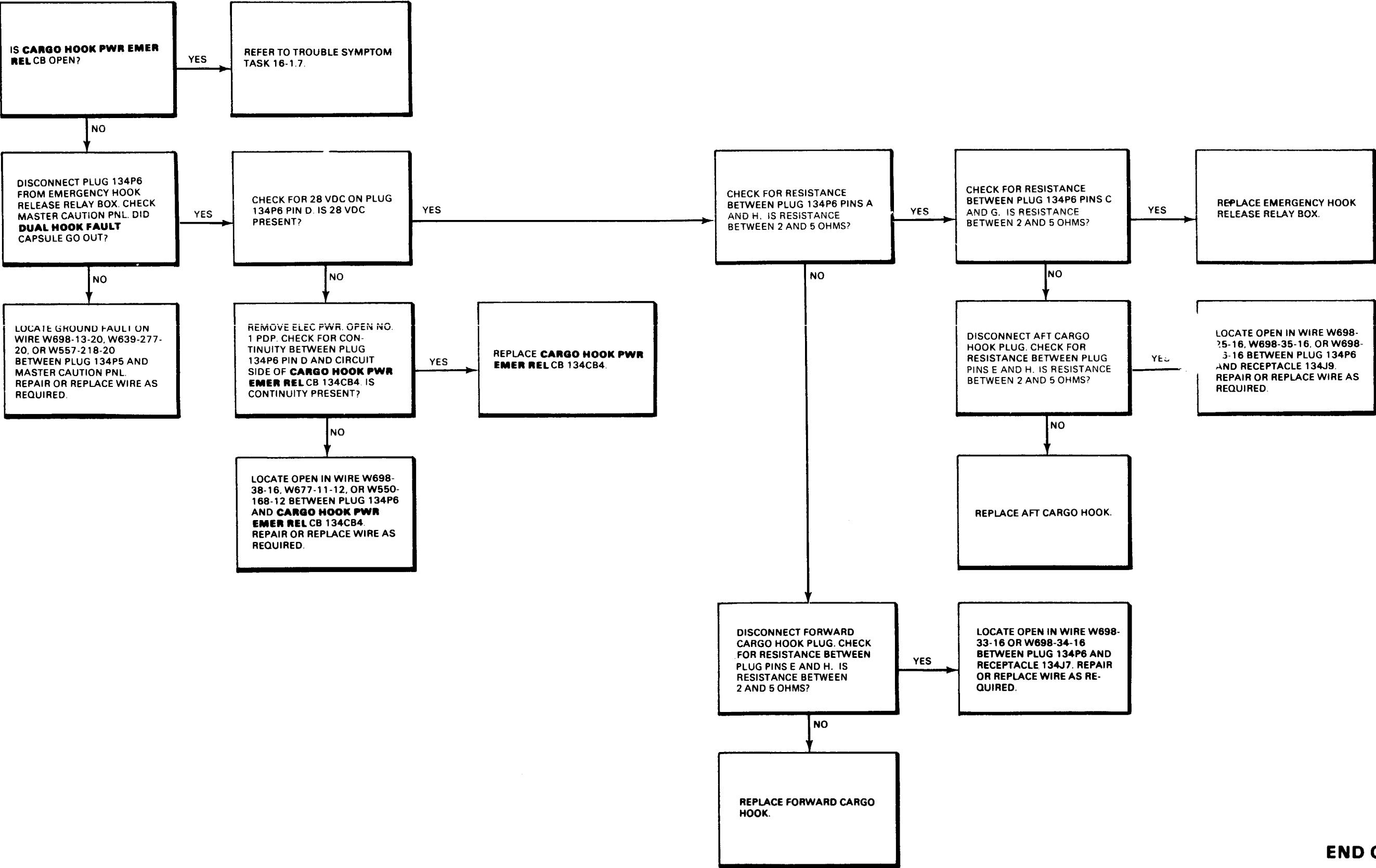
TM 55-1520-240-23:

Battery Connected

Electrical Power On

Hydraulic Power Off





END OF TASK

16-1.15 DUAL HOOK RELAY BOX LIGHT(S) DO NOT  
COME ON WHEN PRESSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

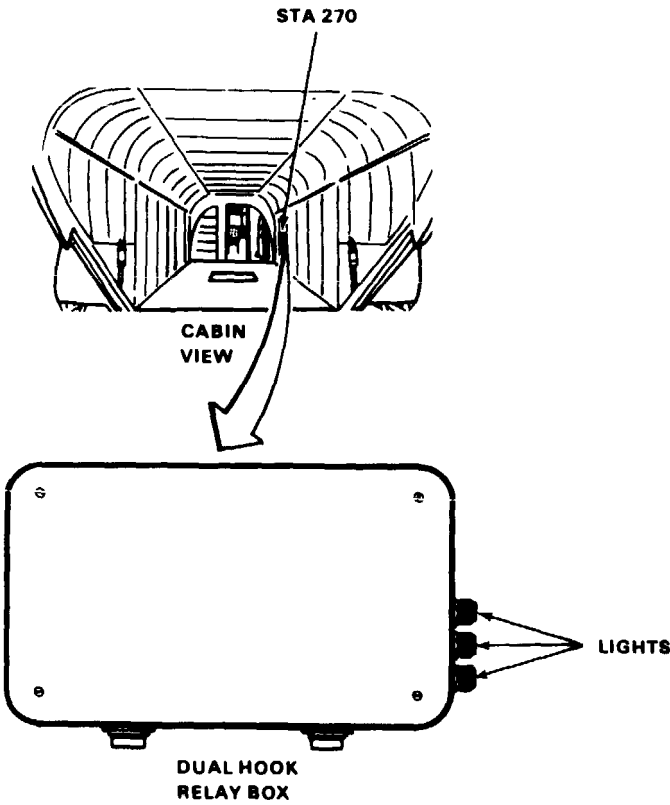
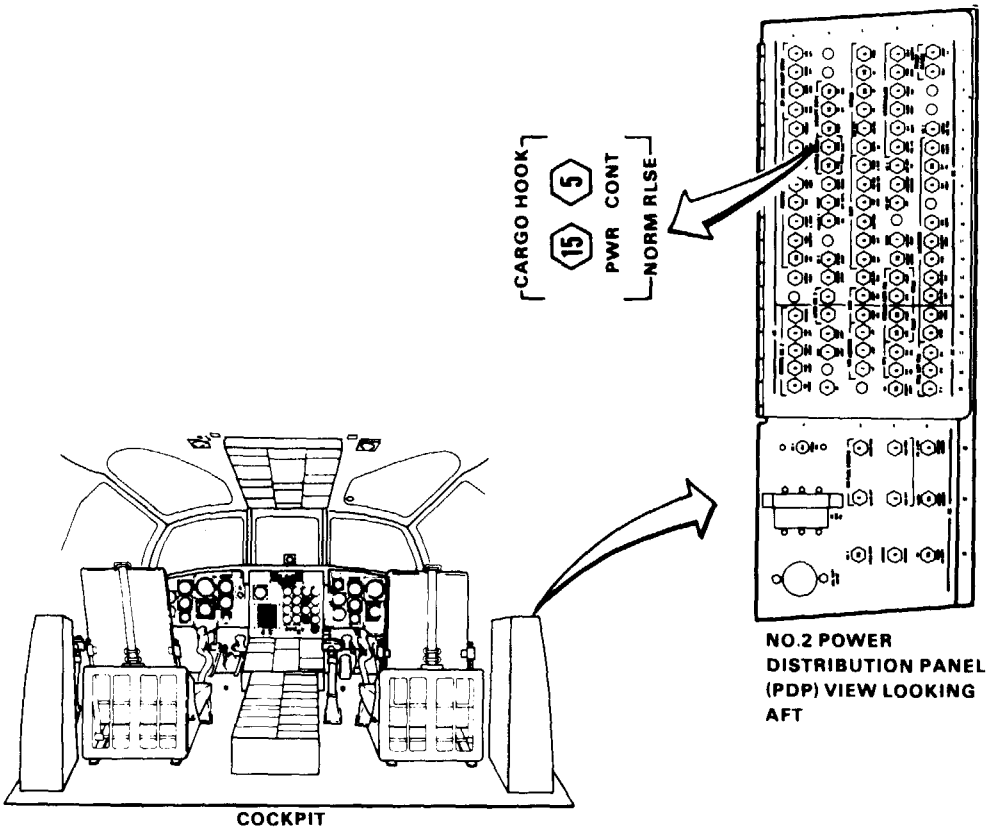
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

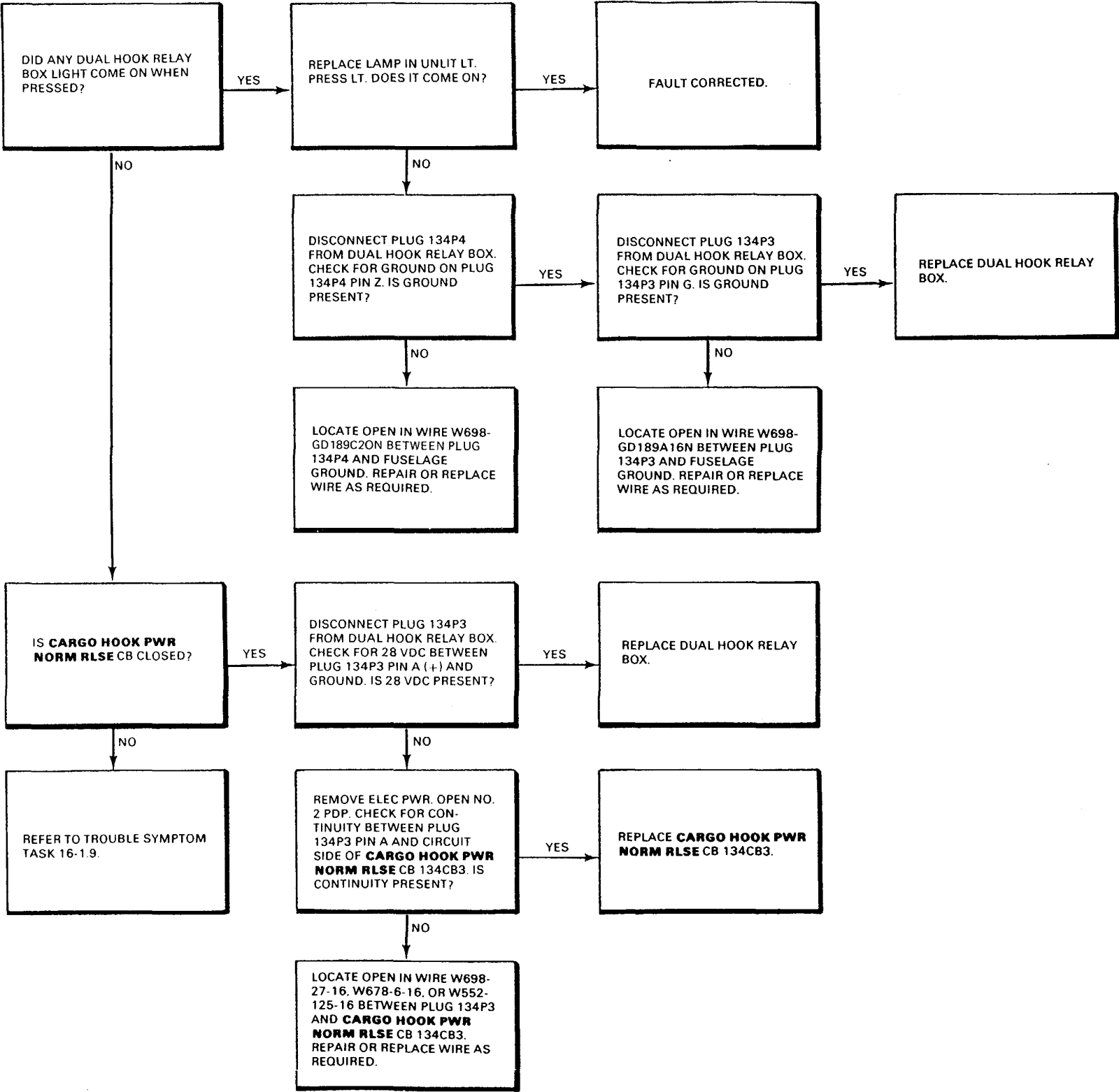
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



16-1.15 DUAL HOOK RELAY BOX LIGHT(S) DO NOT  
COME ON WHEN PRESSED (Continued)

16-1.15



END OF TASK

16-1.16 DUAL HOOK FAULT LIGHT DOES NOT COME ON WITH HOOK DISCONNECTED

16-1.16

**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

Applicable Configurations:

All

**Tools:** TM 55-1520-240-23

Electrical Repairer's Tool Kit,

NSN 5180-00-323-4915

Multimeter

**Materials:**

None

**Personnel Required:**

Aircraft Electrician

**References**

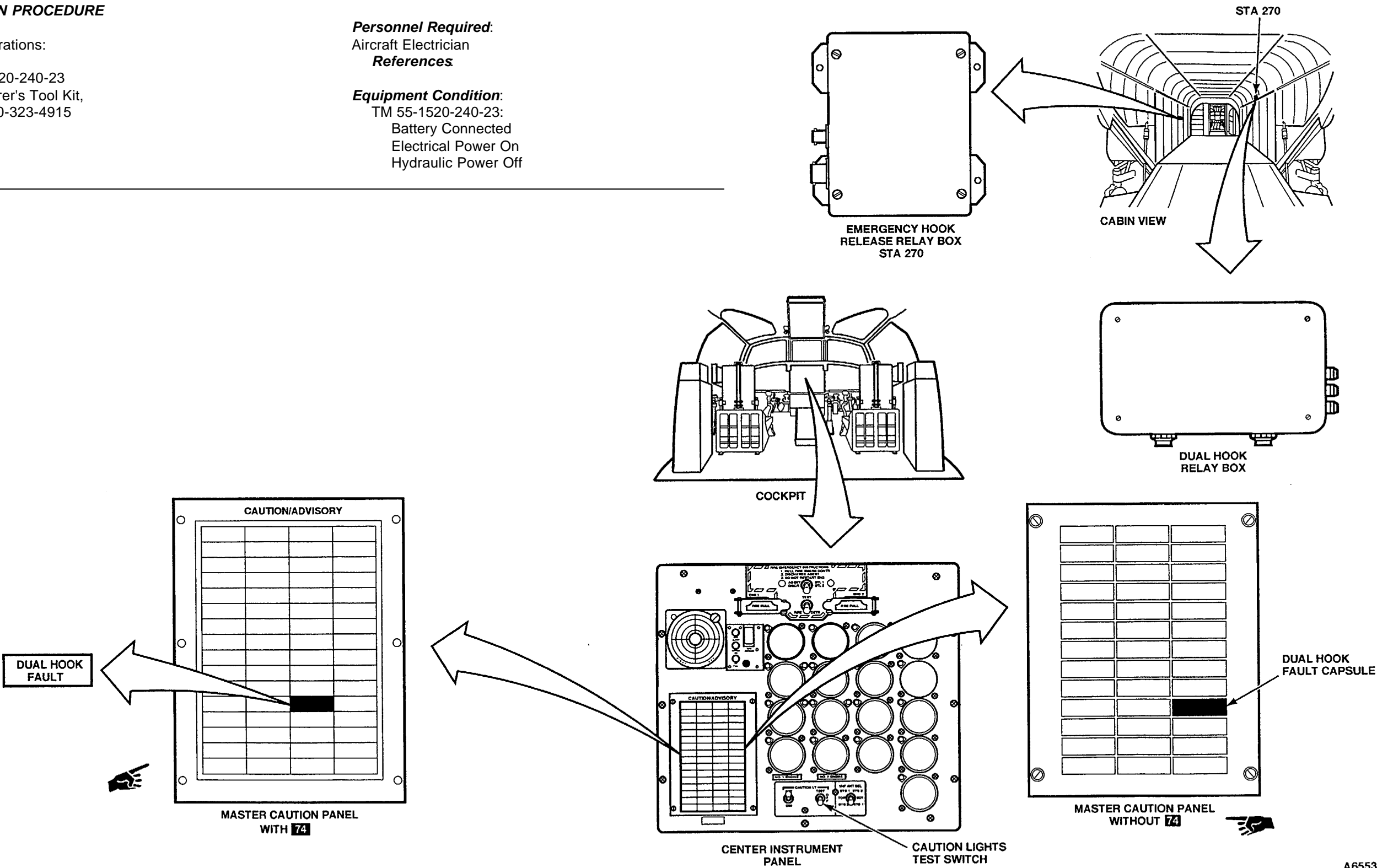
**Equipment Condition:**

TM 55-1520-240-23:

Battery Connected

Electrical Power On

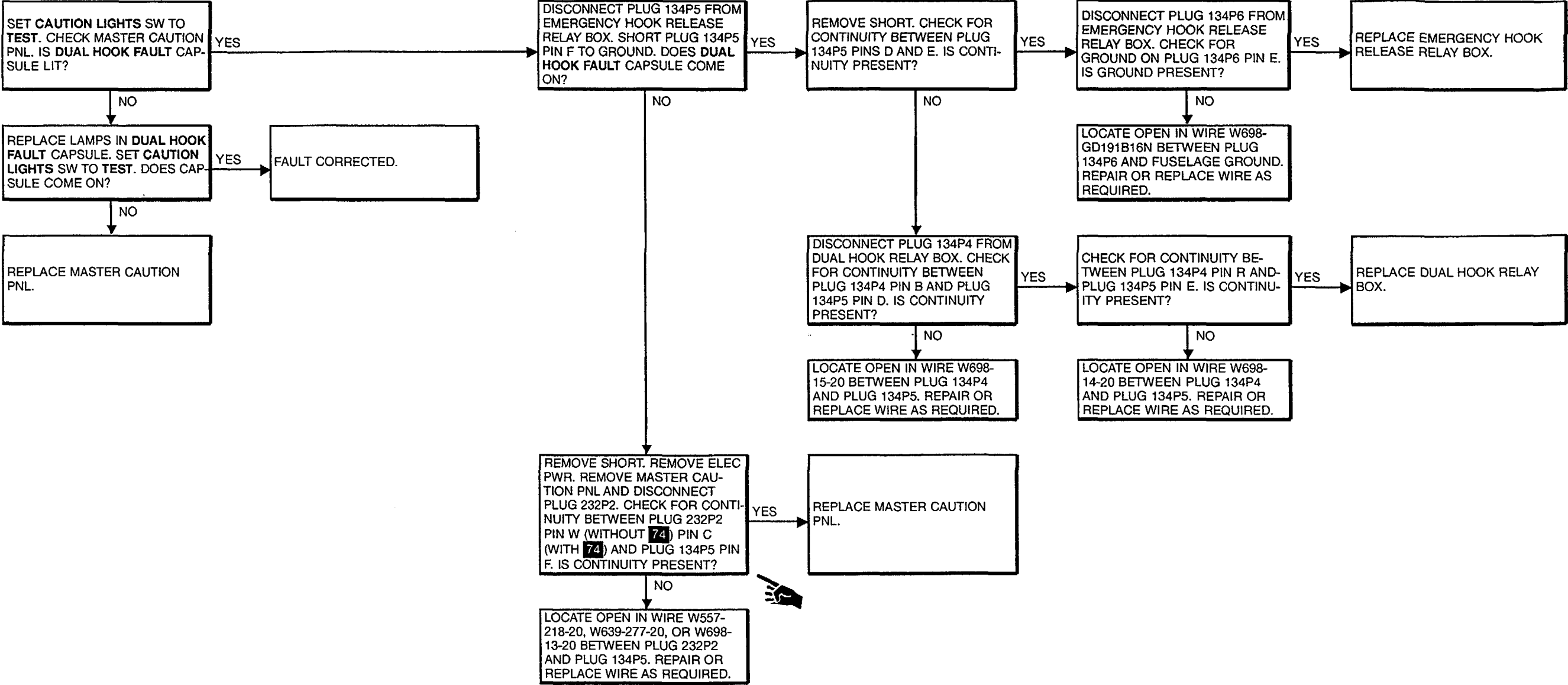
Hydraulic Power Off



A65535

16-1.16 DUAL HOOK FAULT LIGHT DOES NOT COME ON WITH HOOK DISCONNECTED (Continued)

16-1.16



END OF TASK

16-1.17 ARMED SW FAIL LIGHT DOES NOT COME ON WITH MASTER SWITCH AT ARM

16-1.17

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations  
All

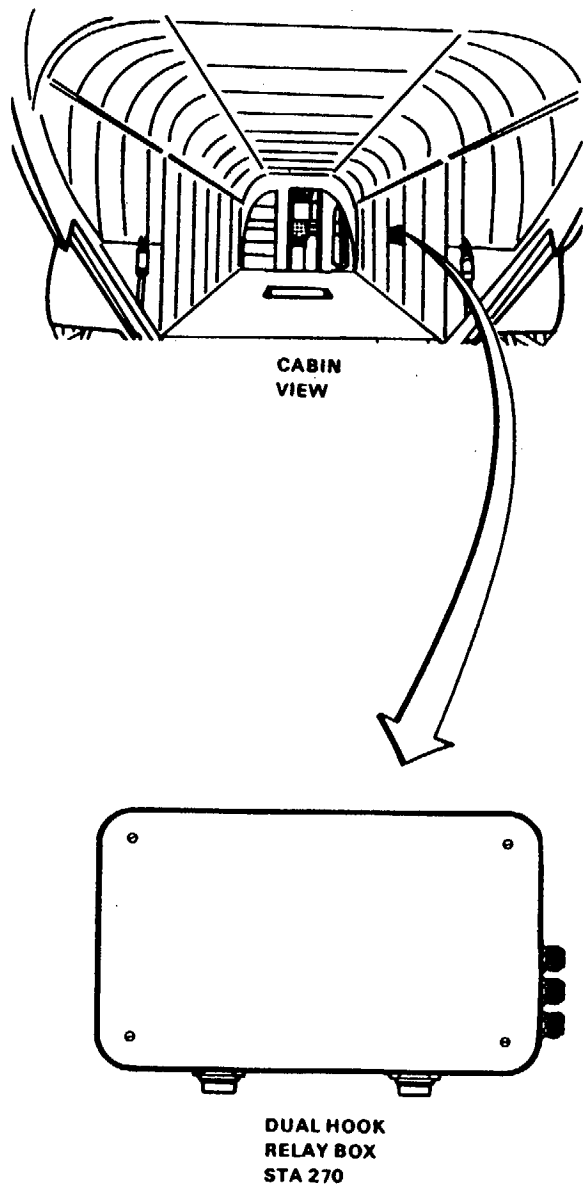
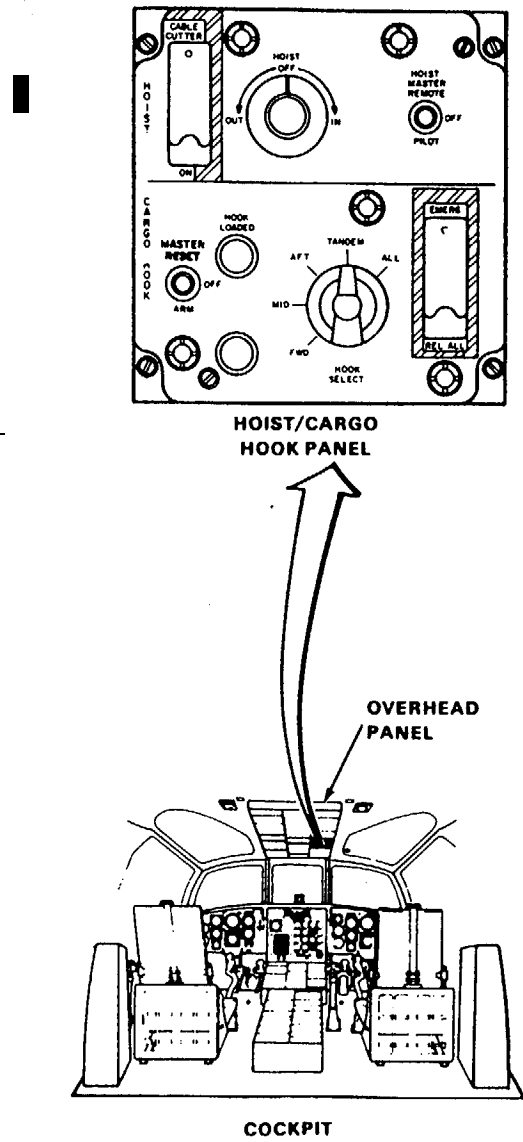
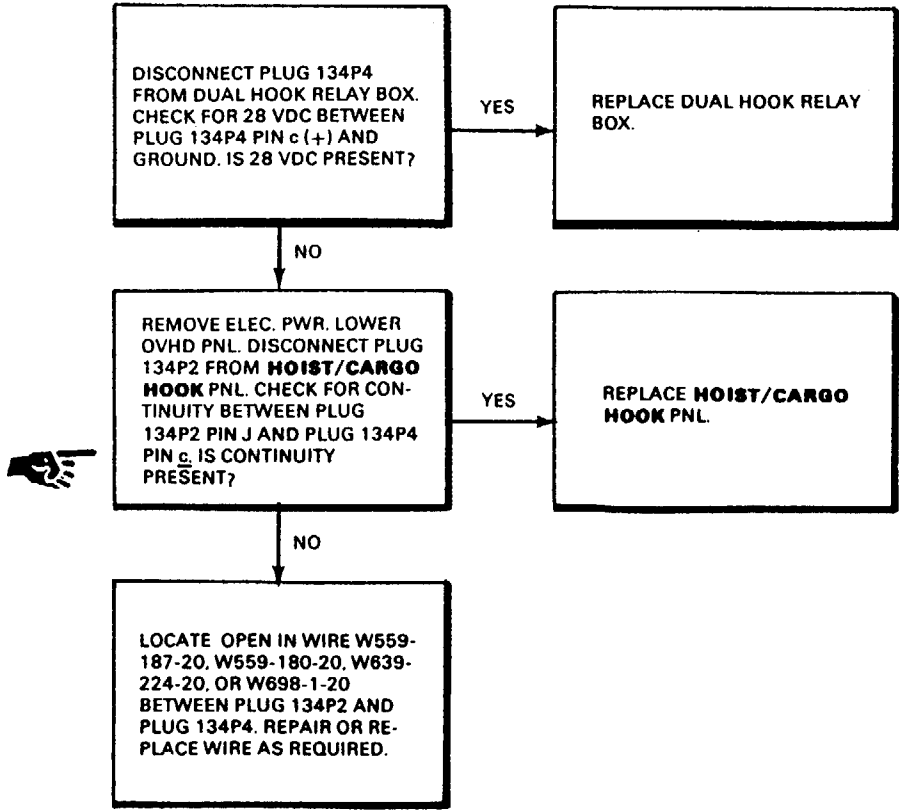
Tools  
Electrical Repairer's Tool Kit.  
NSN 5180-00-323-4915  
Multimeter

Materials  
None

Personnel Required:  
Aircraft Electrician

References  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



END OF TASK

16-1.18 RELEASE SW FAIL LIGHT OR GROUND RELAY ACTIVATE  
LIGHT NOT ON WHEN PILOT'S CARGO HOOK RELEASE  
SWITCH PRESSED

16-1.18

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

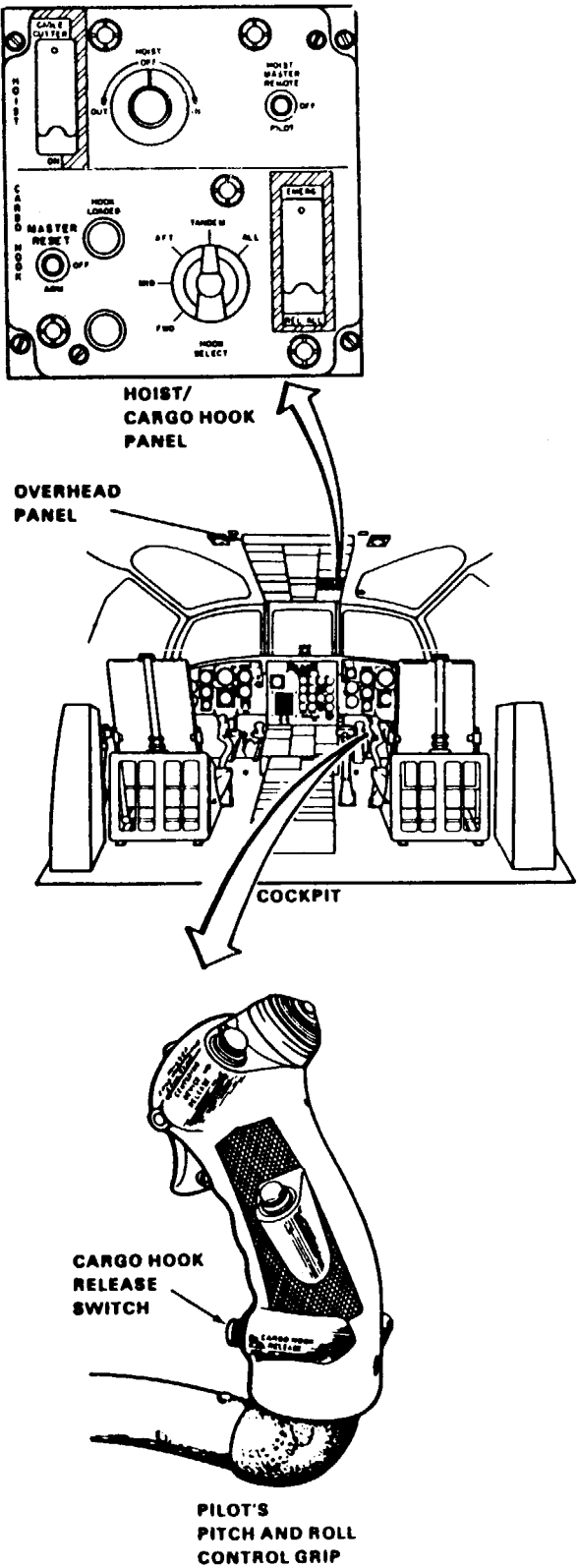
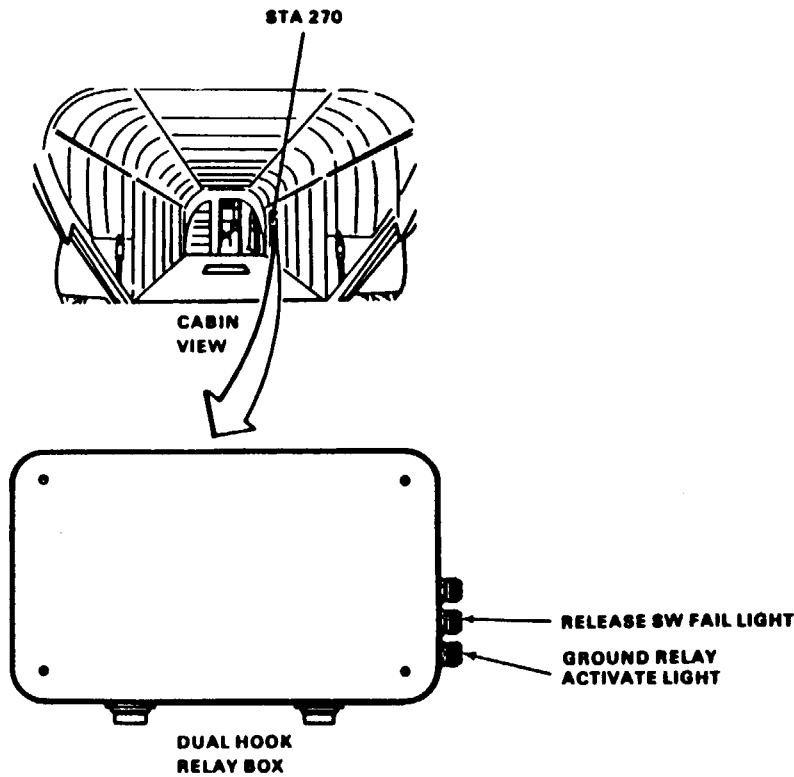
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

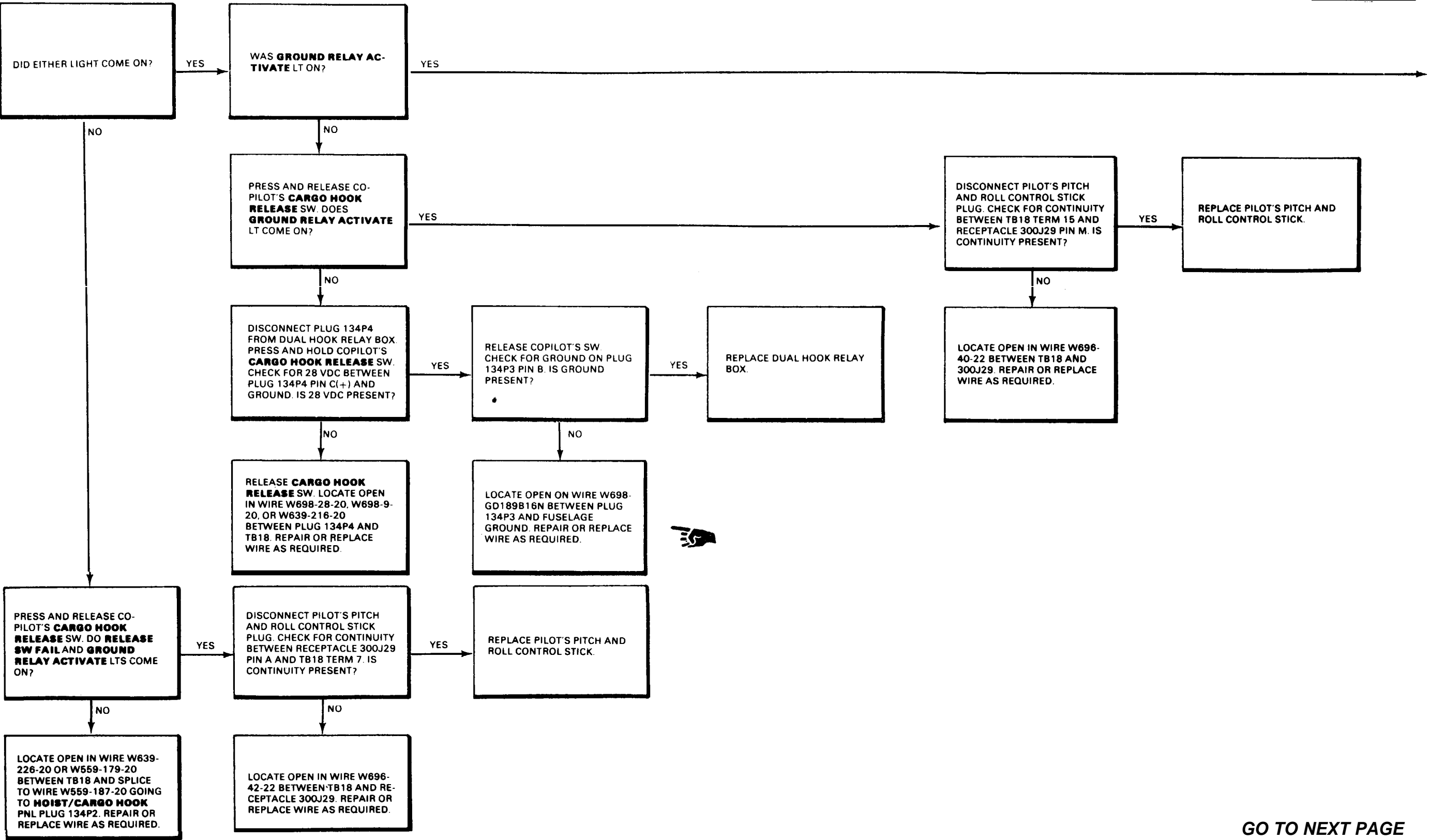
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off





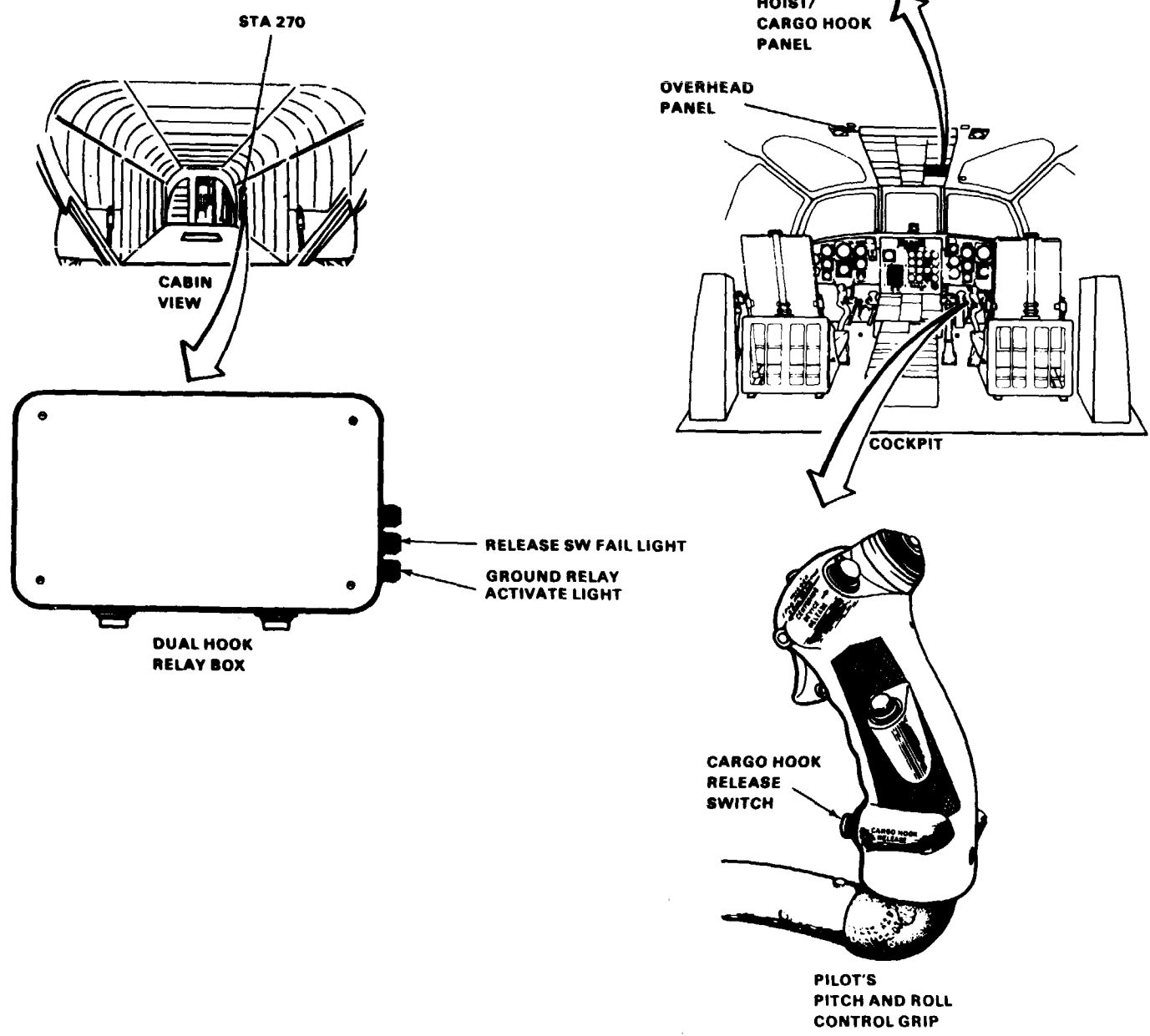
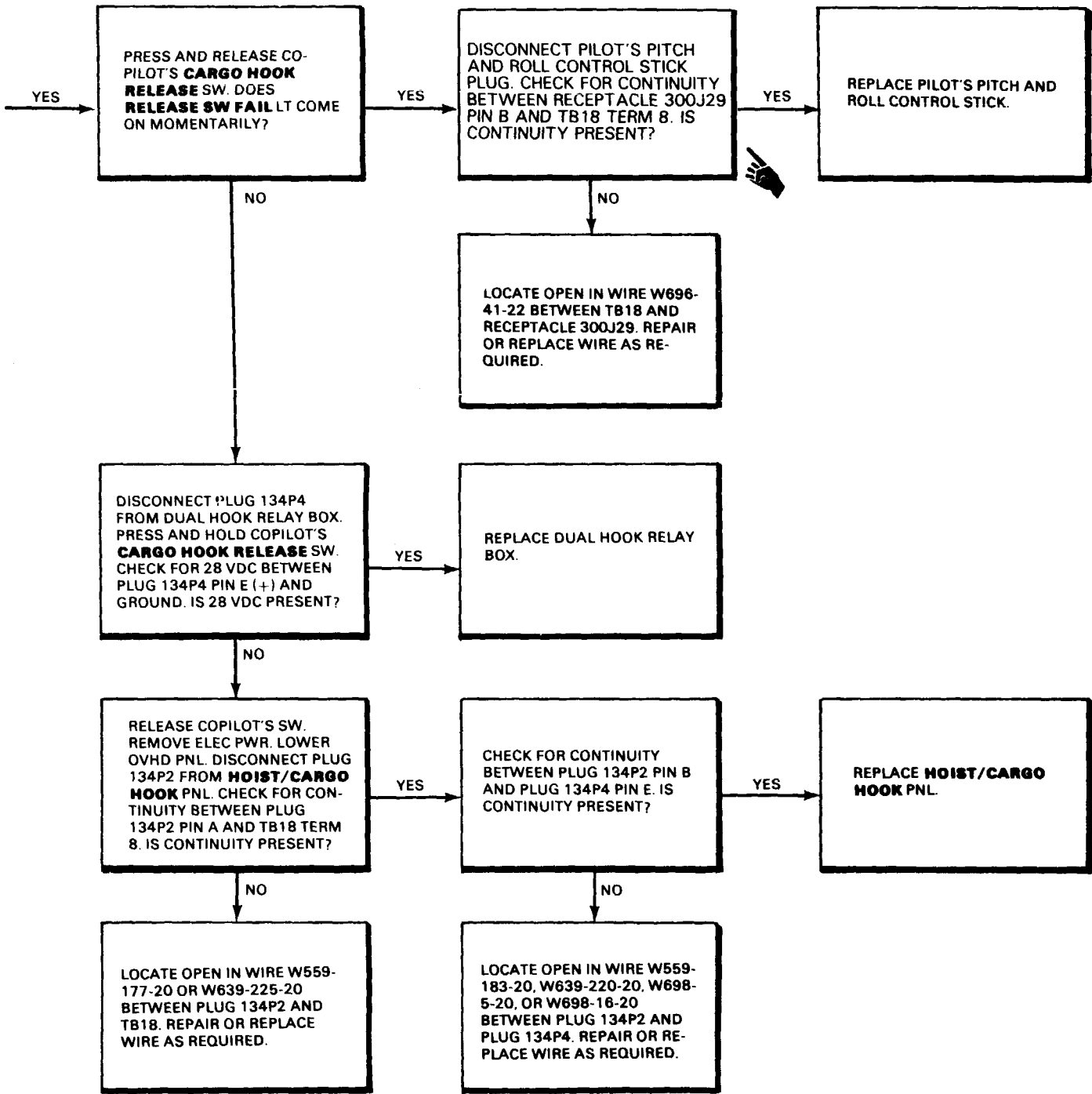
16-1.18 RELEASE SW FAIL LIGHT OR GROUND RELAY ACTIVATE  
LIGHT NOT ON WHEN PILOT'S CARGO HOOK RELEASE  
SWITCH PRESSED (Continued)

16-1.18



GO TO NEXT PAGE

16-1.18 RELEASE SW FAIL LIGHT OR GROUND RELAY ACTIVATE  
LIGHT NOT ON WHEN PILOT CARGO HOOK RELEASE  
SWITCH PRESSED (Continued)



16-1.18

16-1.19 RELEASE SW FAIL LIGHT OR GROUND RELAY  
ACTIVATE LIGHT NOT ON WHEN COPILOT'S CARGO  
HOOK RELEASE SWITCH PRESSED

16-1.19

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

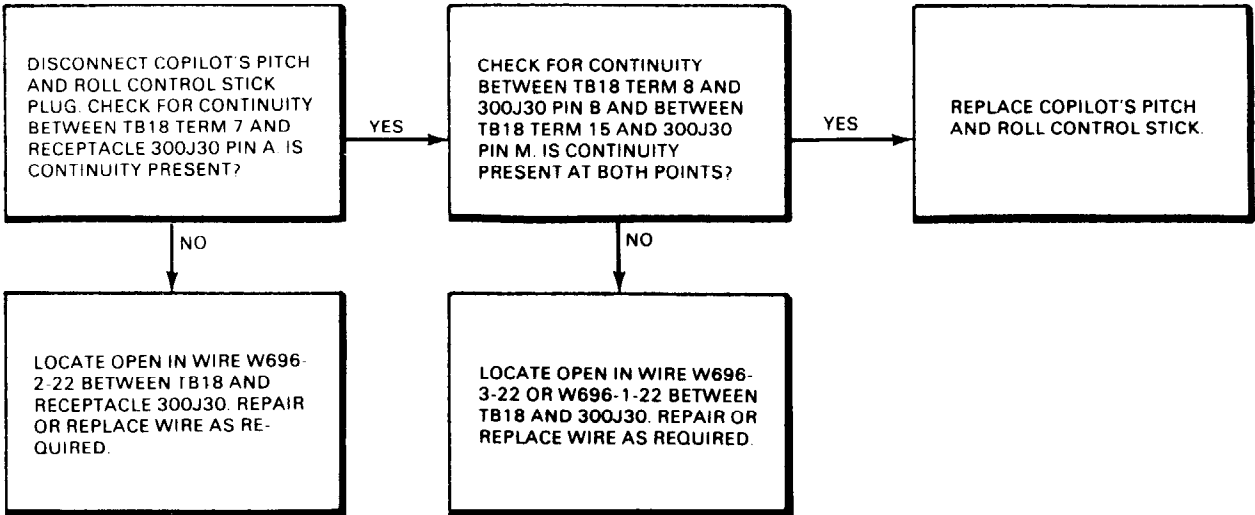
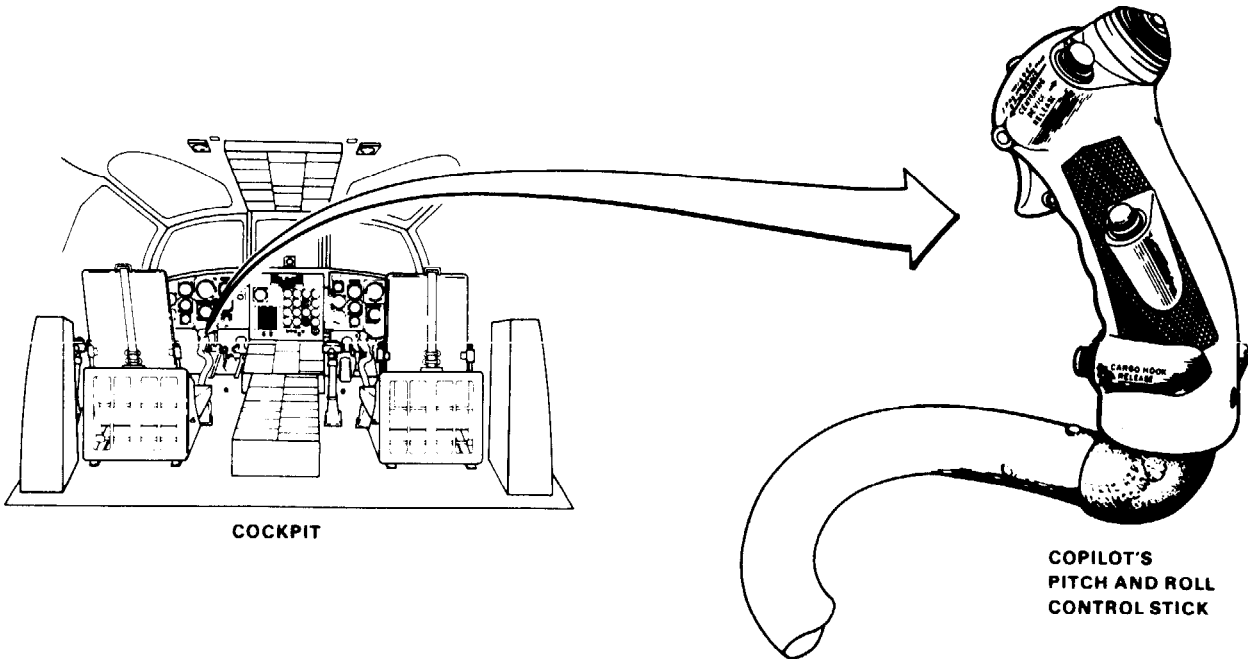
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off



45x 54

D145-6369-SPA

END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

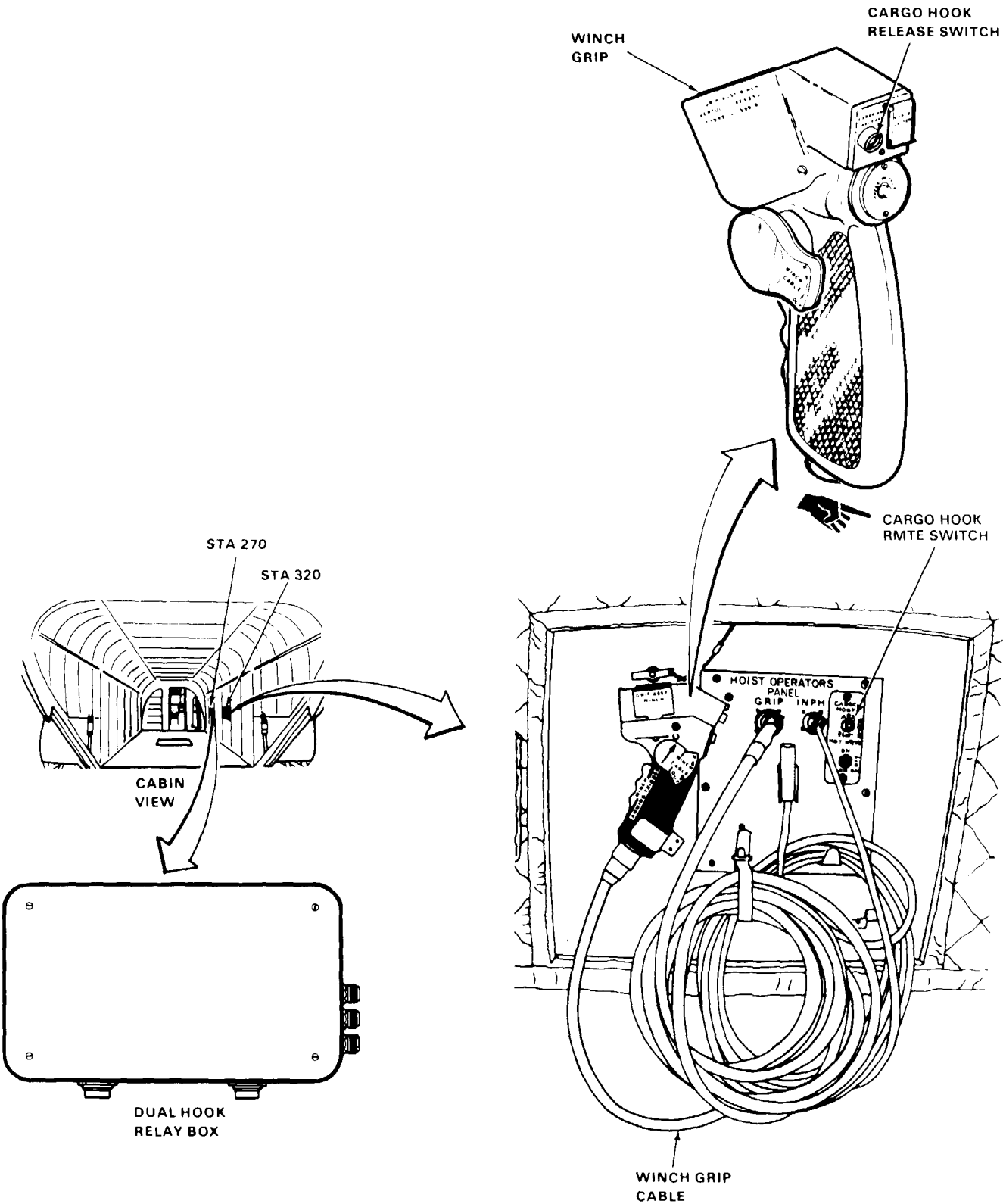
Aircraft Electrician

References:

TM 55-1520-240-23

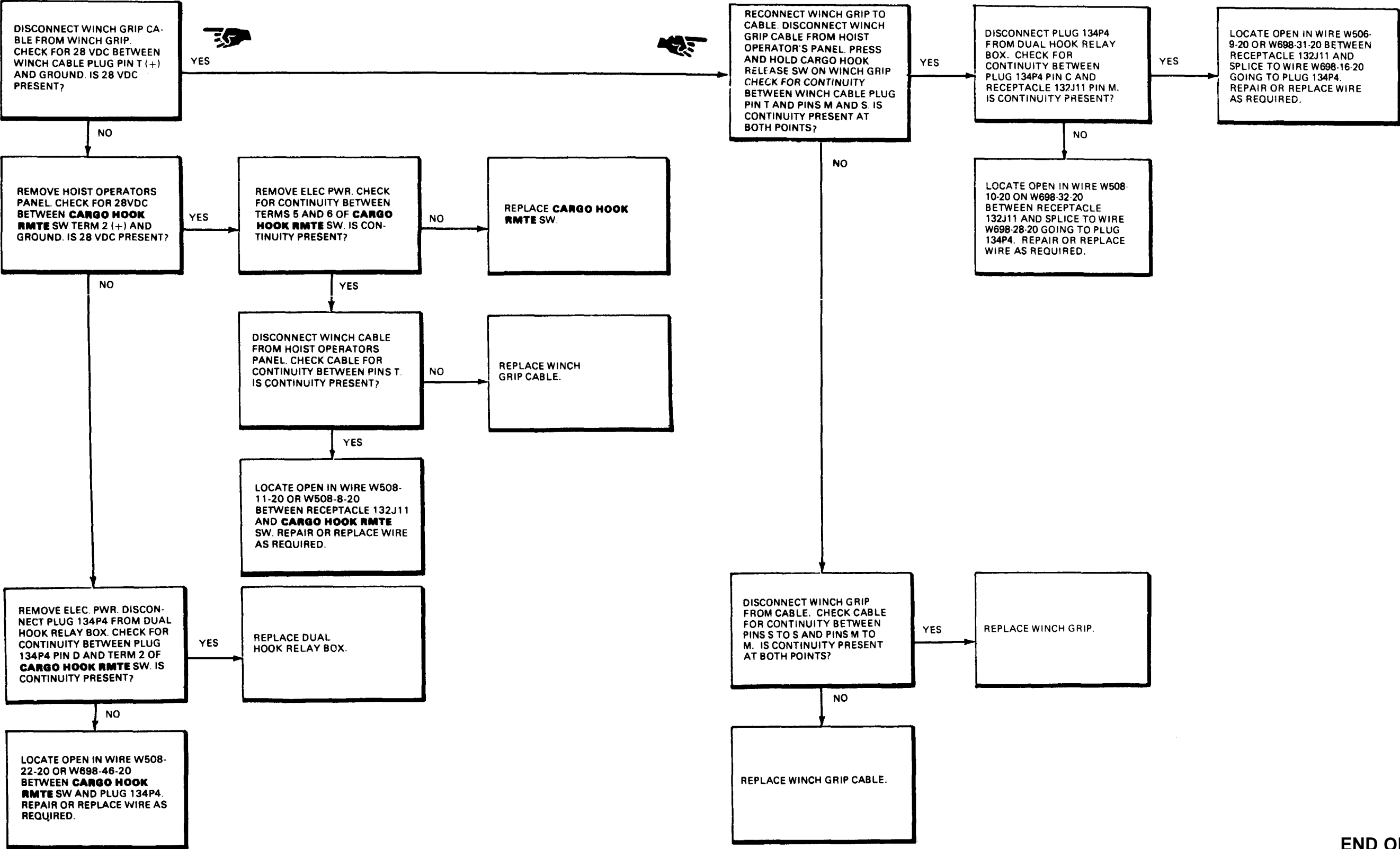
Equipment Condition:

**TM 55-1520-240-23:**  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



16-1.20 RELEASE SW FAIL LIGHT OR GROUND RELAY ACTIVATE  
LIGHT NOT ON WHEN HOIST OPERATOR'S CARGO HOOK  
RELEASE SWITCH PRESSED (Continued)

16-1.20



END OF TASK

16-1.21 FORWARD CARGO HOOK DOES NOT OPEN

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

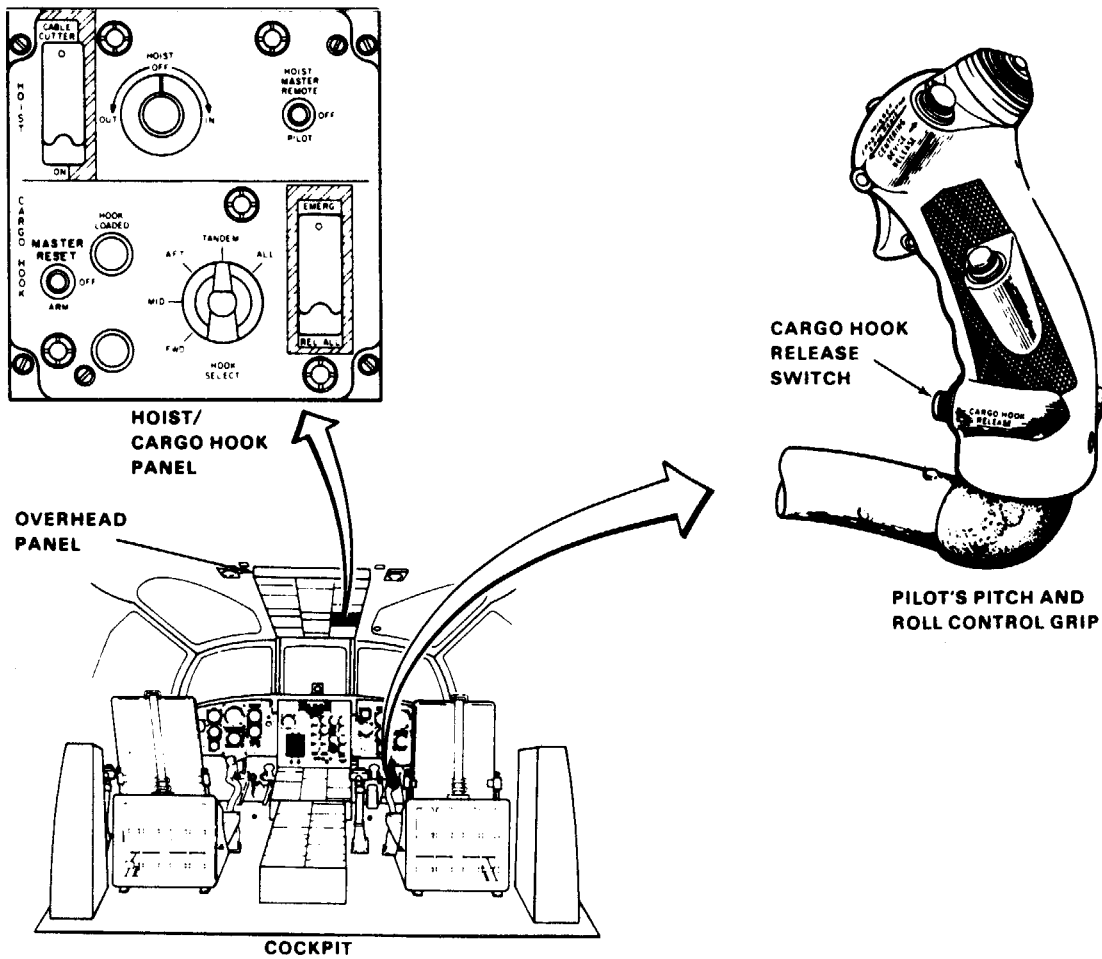
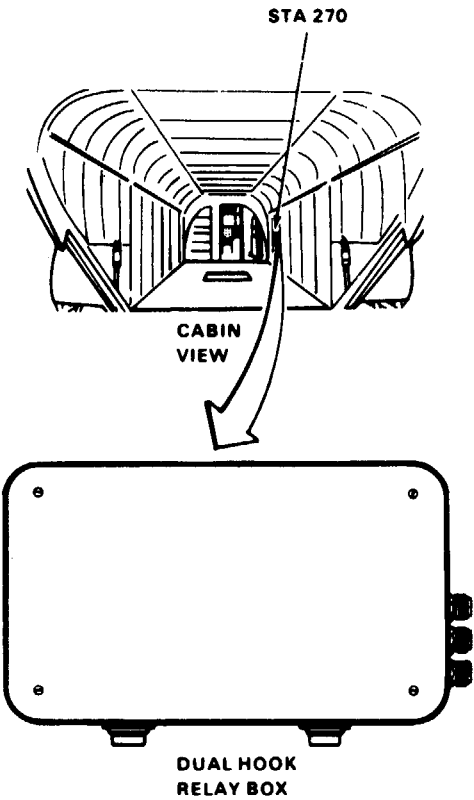
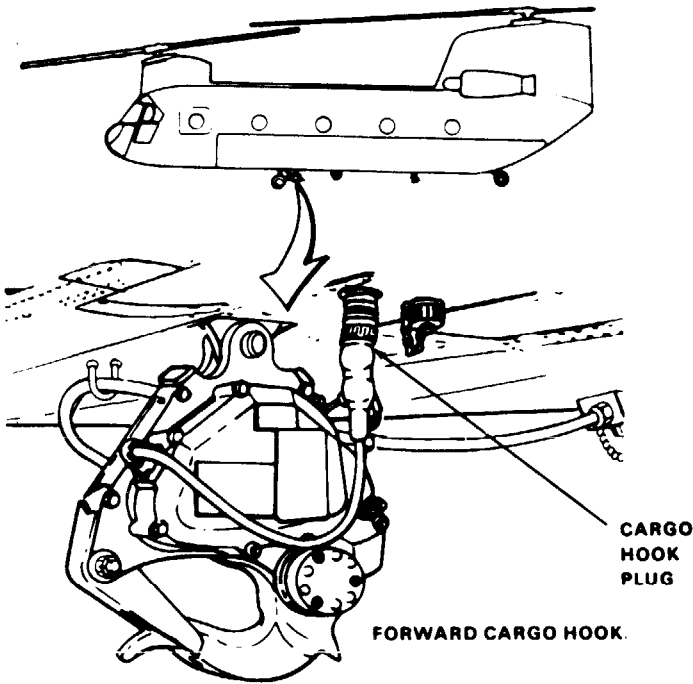
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

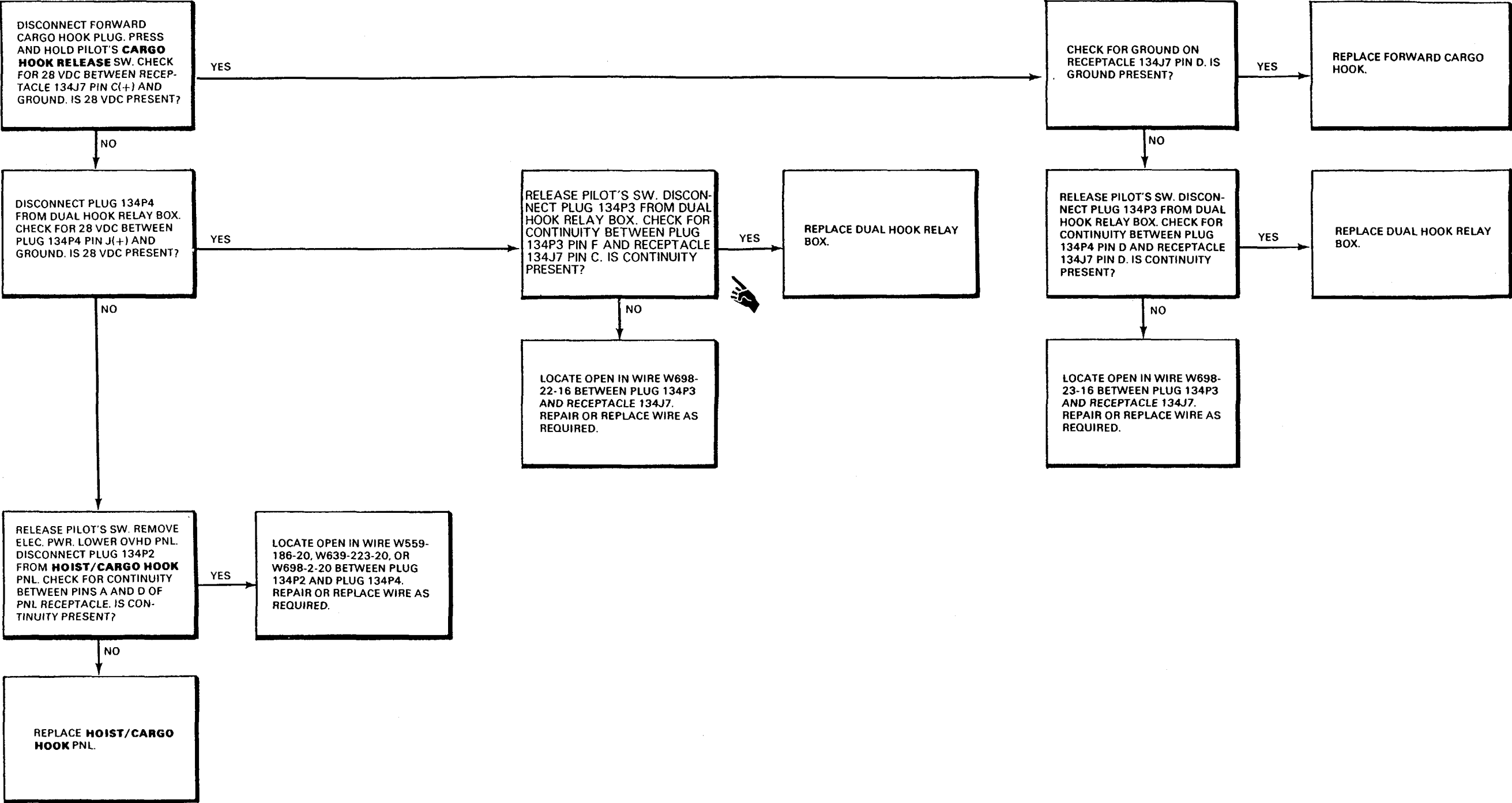
Materials:  
None

Personnel Required:  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off





## FAULT ISOLATION PROCEDURE

## INITIAL SETUP

### Applicable Configurations

All

## Tools

Electrical Repairer's Tool Kit.

NSN 5180-00-323-4915

## Multimeter

## Materials

None

**Personnel Required:**

Aircraft Electrician

## References

TM 55-1520-240-23

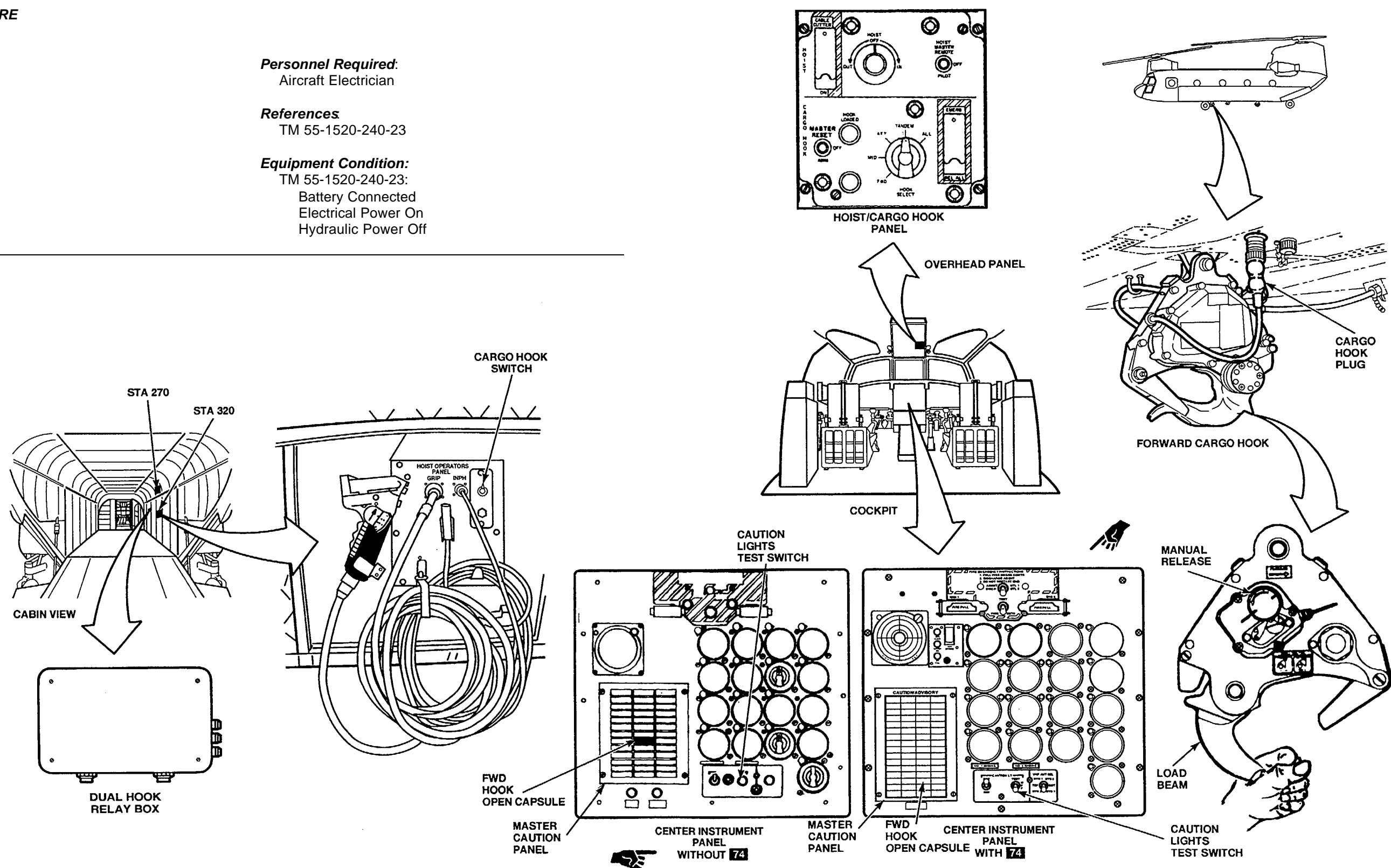
**Equipment Condition:**

TM 55-1520-240-23:

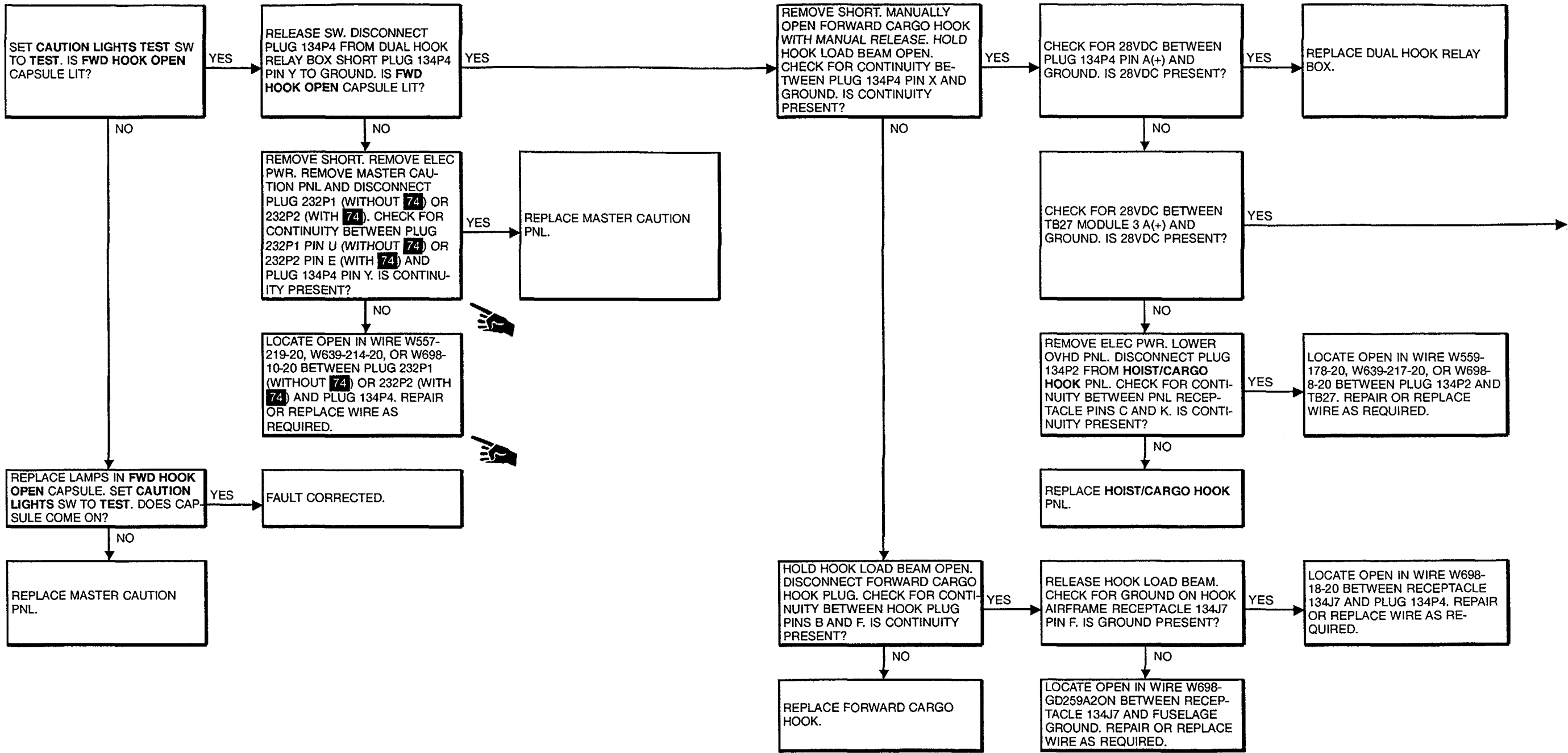
Battery Connected

Battery Connected  
Electrical Power On

Hydraulic Power Off

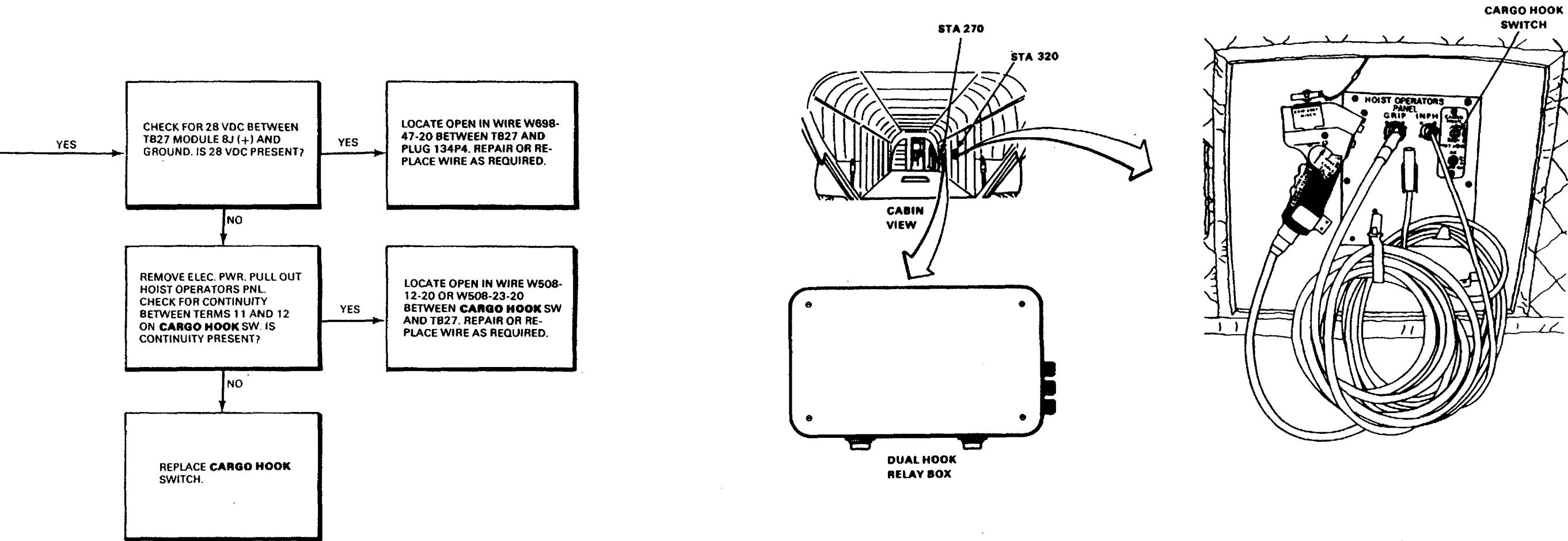






16-1.22 FWD HOOK OPEN CAPSULE DOES NOT COME ON  
WHEN FORWARD CARGO HOOK OPENS (Continued)

16-1.22



45x54

D145-10851-SPA

16-1.23 CENTER CARGO HOOK DOES NOT OPEN

16-1.23

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

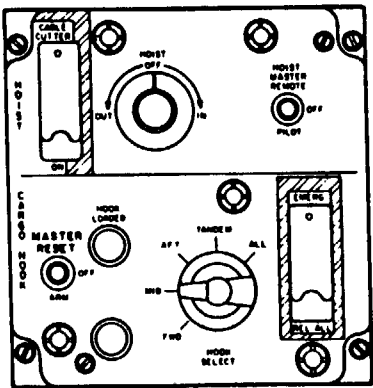
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
67U10 Medium Helicopter Repairer  
68F20 Aircraft Electrician

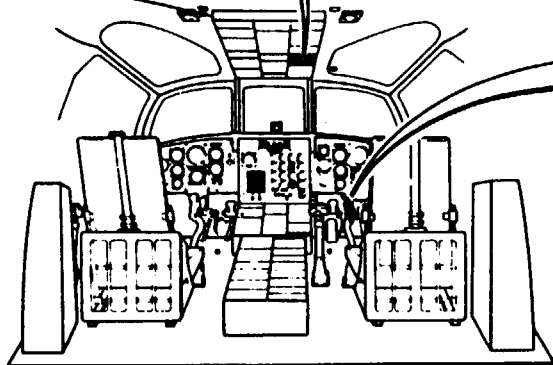
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On

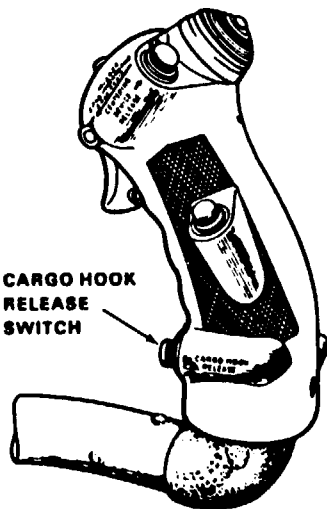


HOIST/  
CARGO HOOK  
PANEL

OVERHEAD  
PANEL

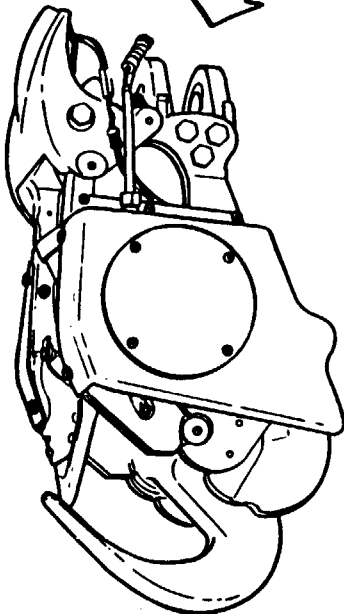


COCKPIT

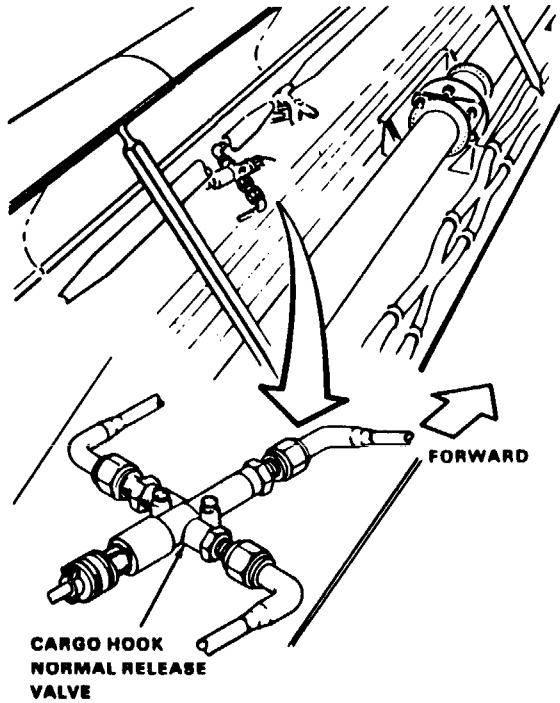


CARGO HOOK  
RELEASE  
SWITCH

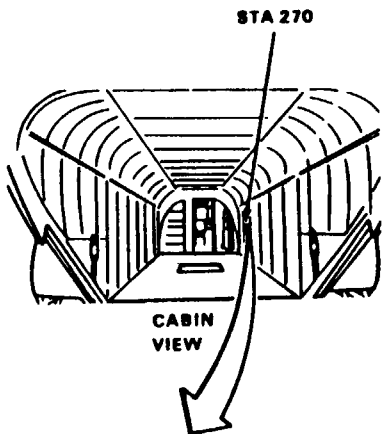
PILOT'S  
PITCH AND ROLL  
CONTROL GRIP



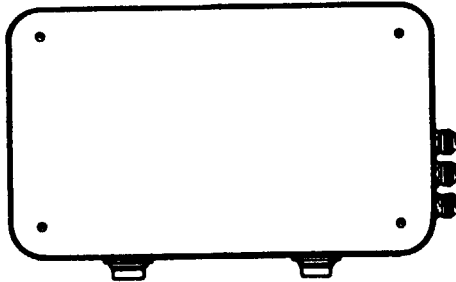
CENTER  
CARGO  
HOOK



CARGO HOOK  
NORMAL RELEASE  
VALVE



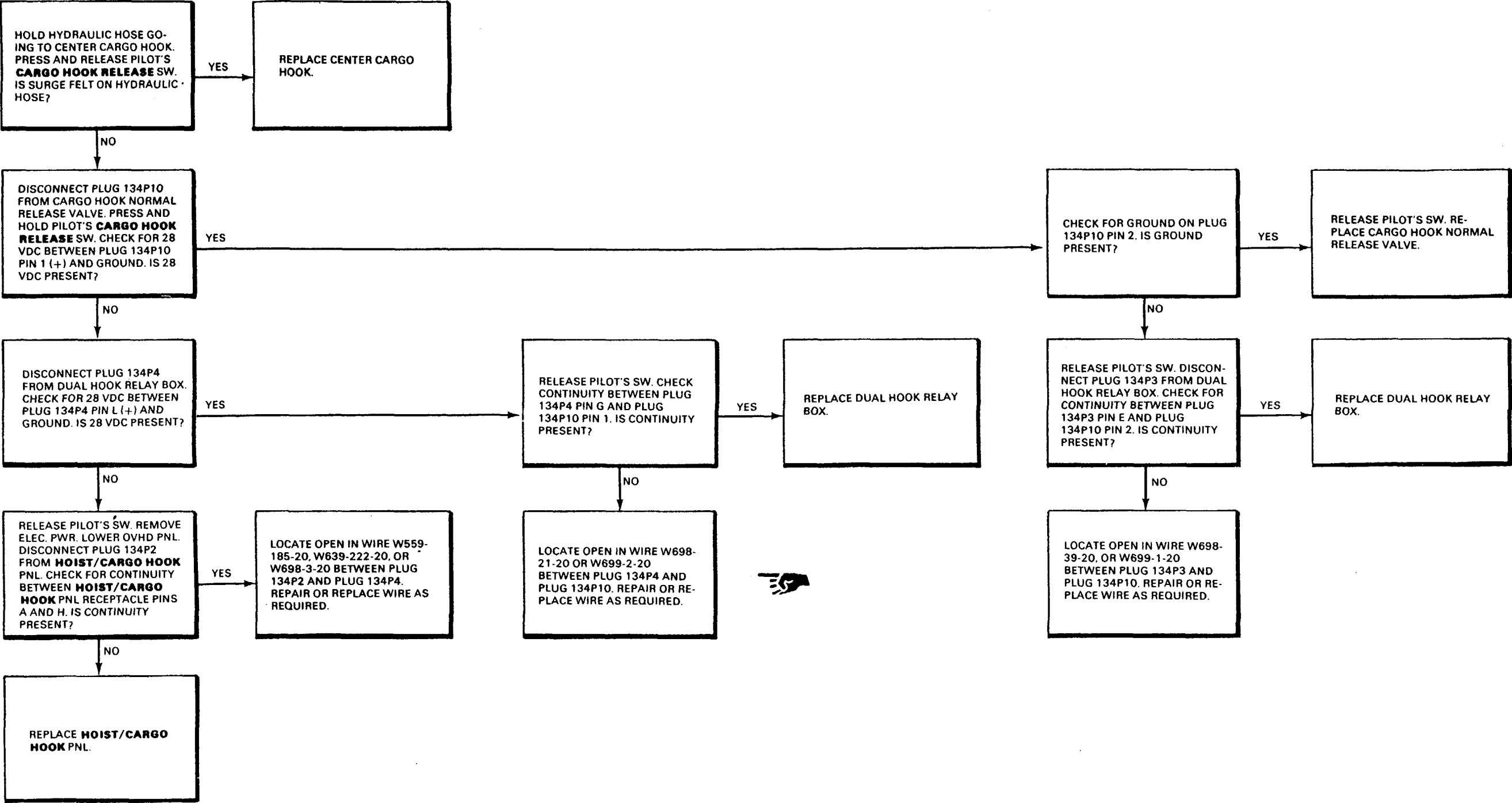
CABIN  
VIEW



DUAL HOOK  
RELAY BOX

DI45-6373-SPA

GO TO NEXT PAGE



16-1.24 MID HOOK OPEN CAPSULE DOES NOT COME ON WHEN CENTER CARGO HOOK OPENS

16-1.24

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations**  
All

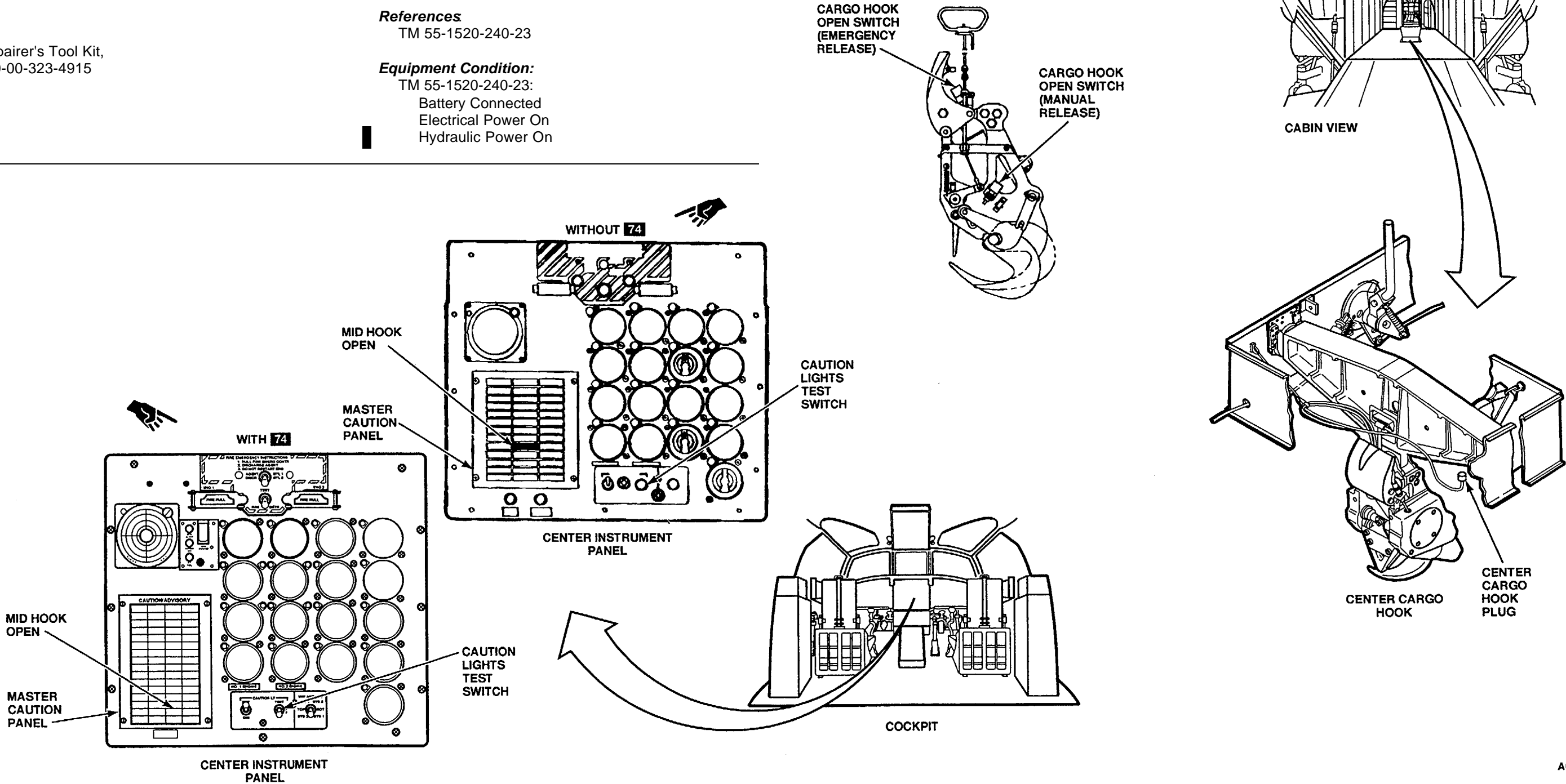
**Tools**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials**  
None

**Personnel Required:**  
Aircraft Electrician

**References**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power On

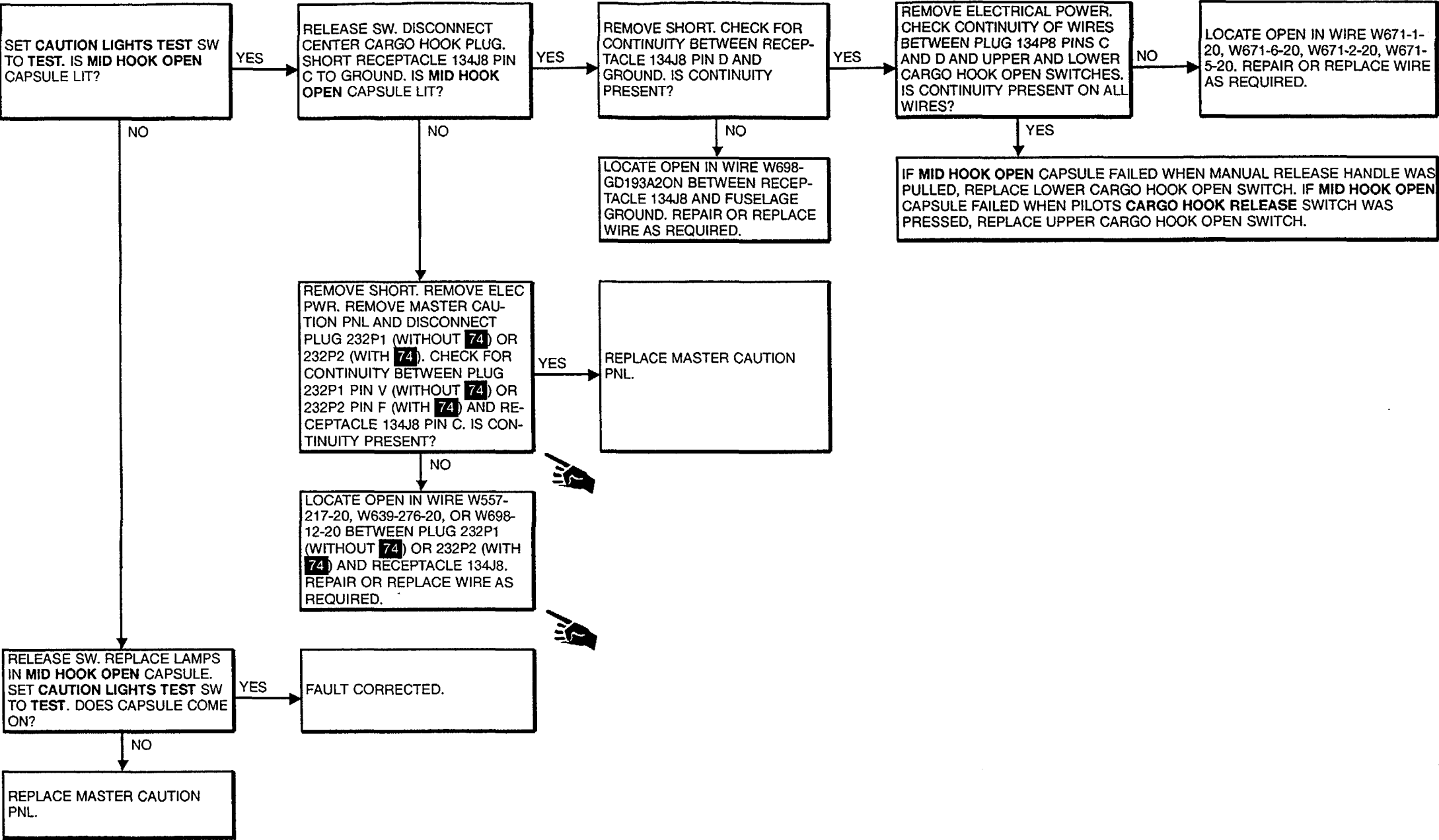


A65537

GO TO NEXT PAGE

16-1.24 MID HOOK OPEN CAPSULE DOES NOT COME ON WHEN CENTER CARGO HOOK OPENS (Continued)

16-1.24



END OF TASK

16-1.25 AFT CARGO HOOK DOES NOT OPEN

16-1.25

FAULT ISOLATION PROCEDURE

INITIAL SETUP

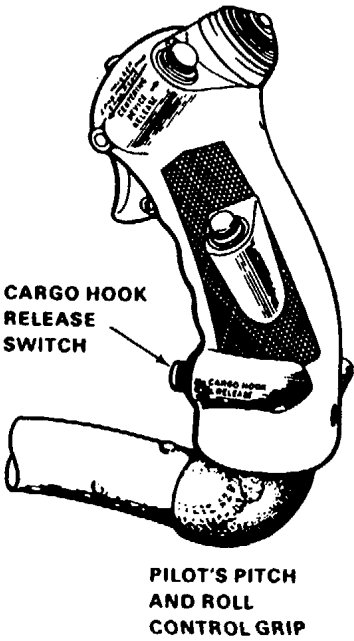
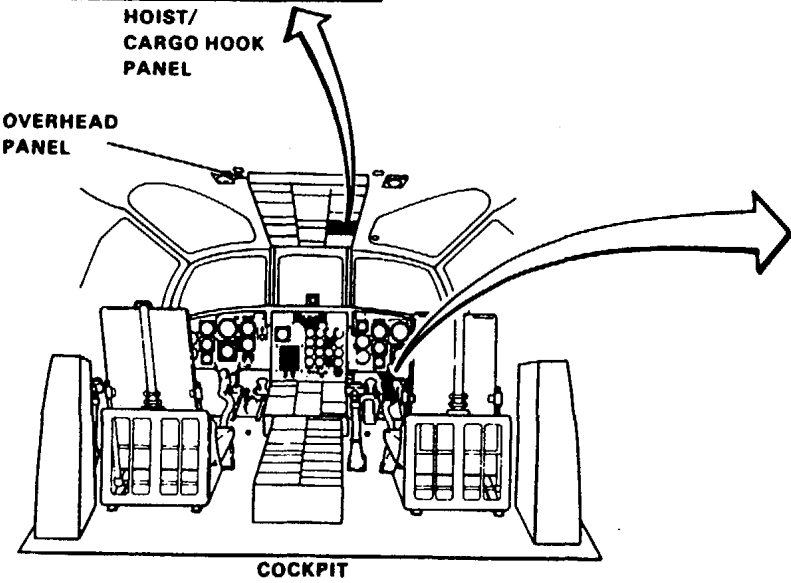
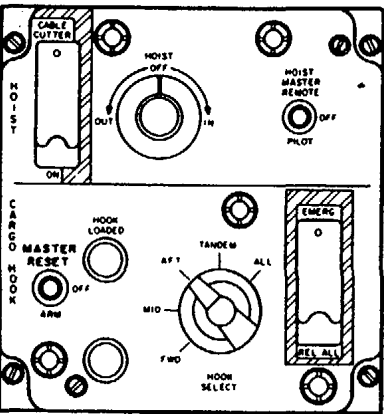
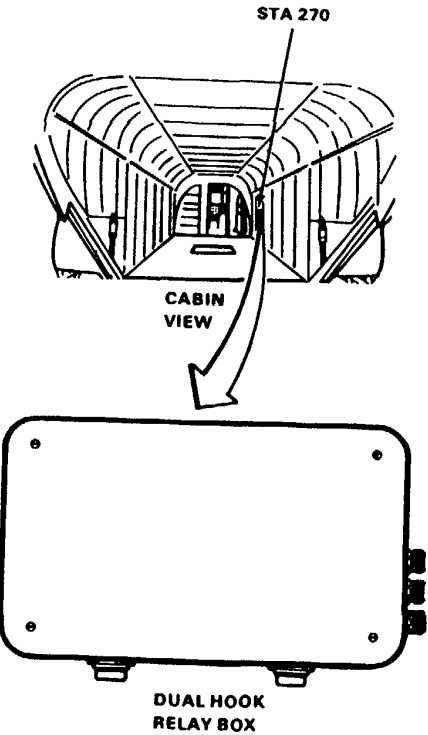
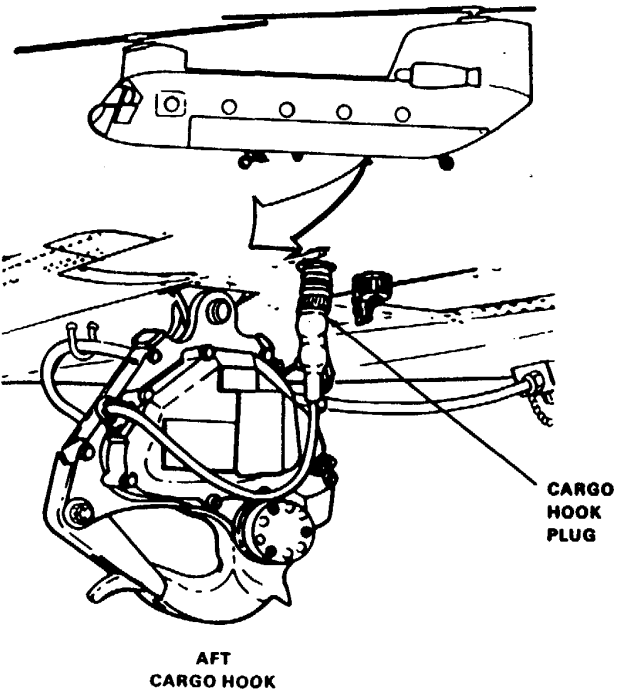
**Applicable Configurations**  
All

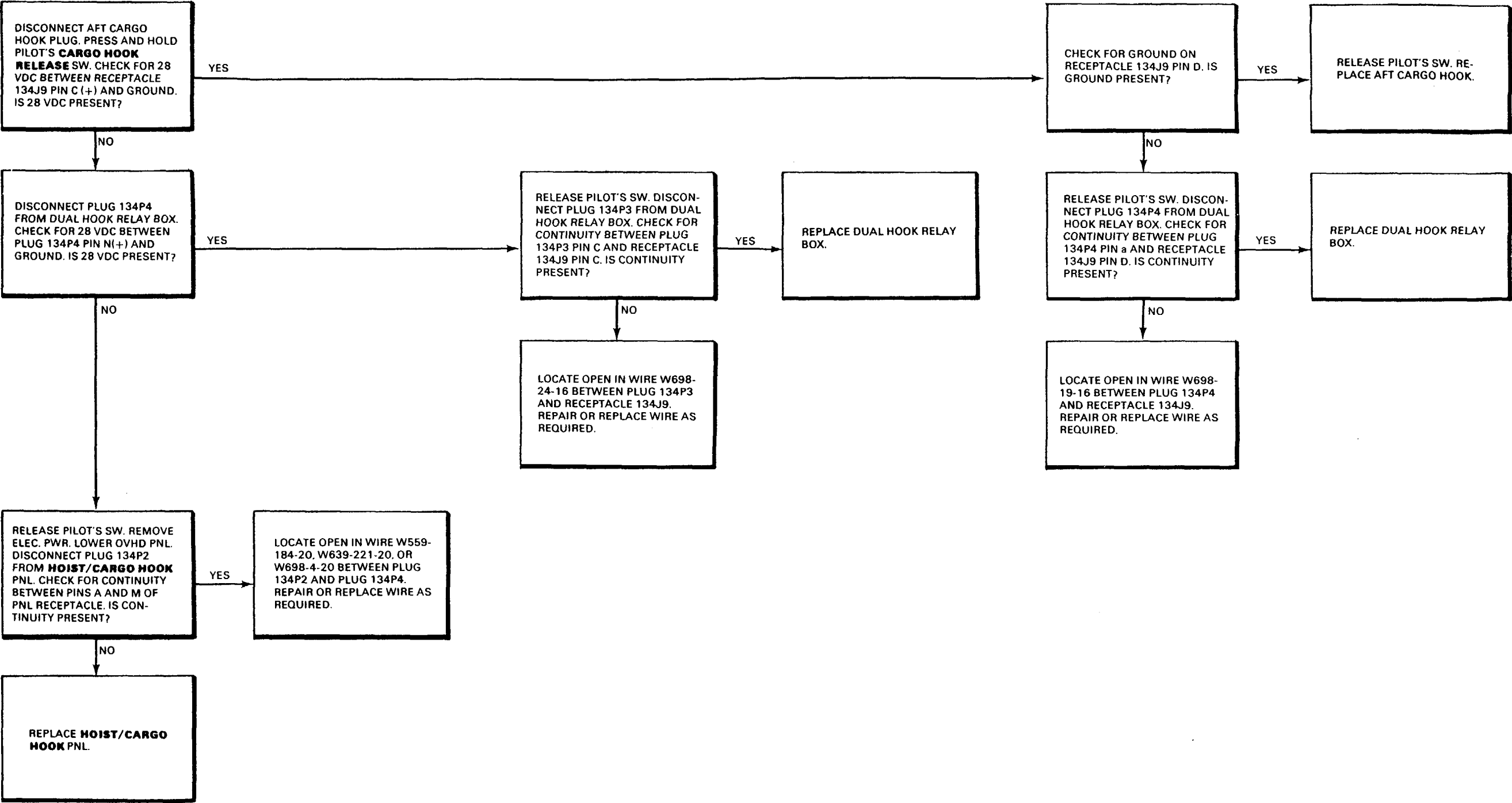
**Tools**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials**  
None

**Personnel Required:**  
68F10 Aircraft Electrician  
68F20 Aircraft Electrician  
**References**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off





END OF TASK



16-1.26 AFT HOOK OPEN CAPSULE DOES NOT COME ON WHEN AFT CARGO HOOK OPENS

16-1.26

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

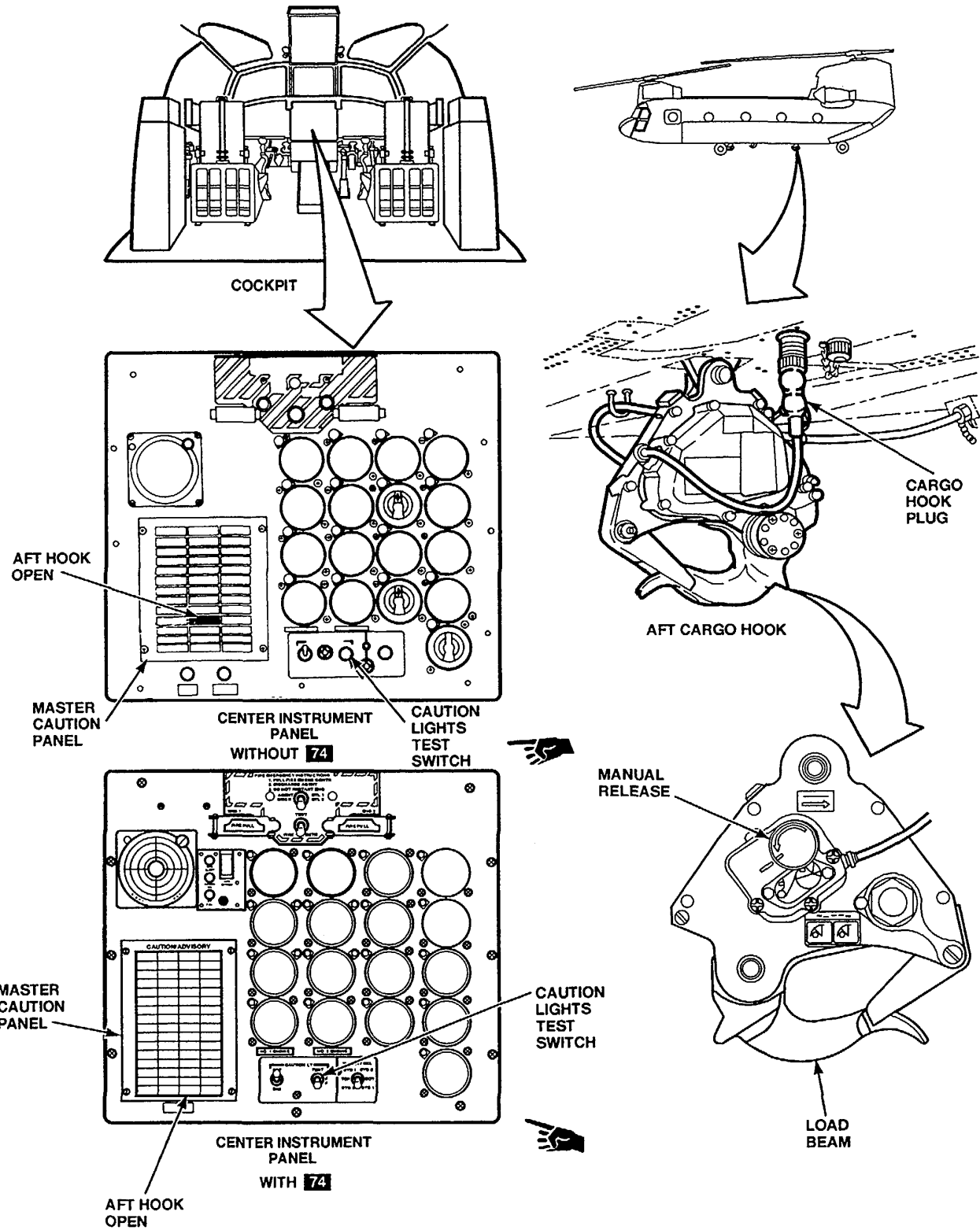
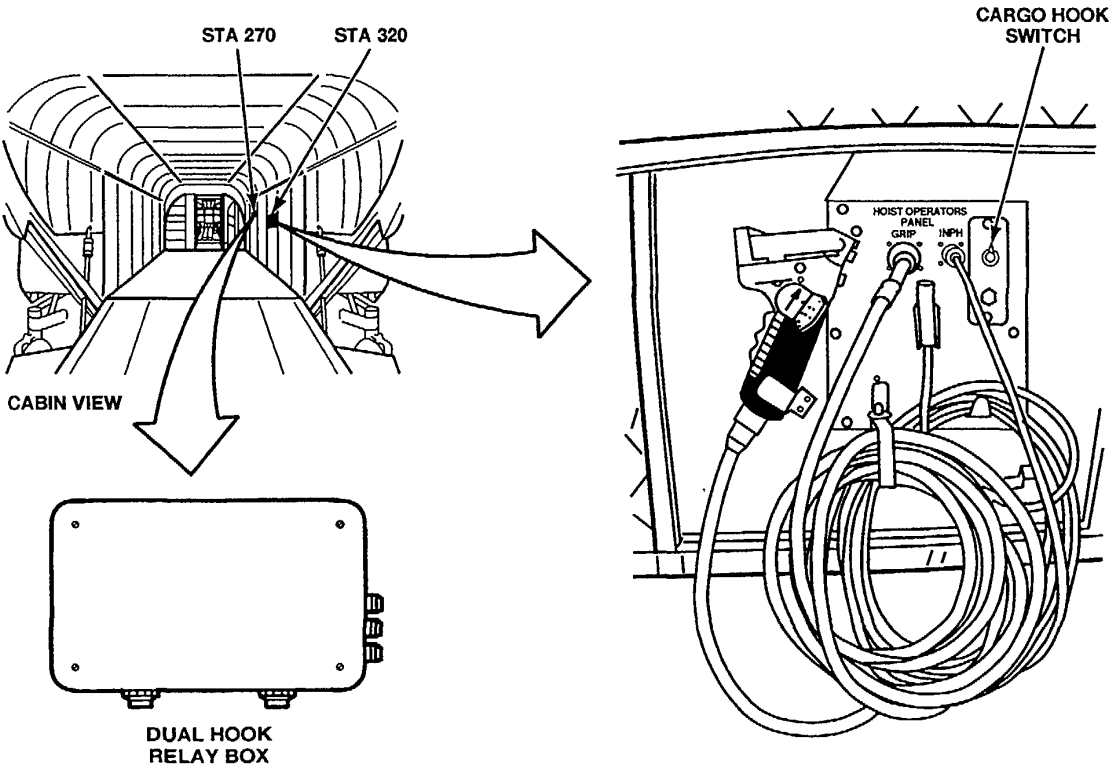
**Materials:**  
None

**Personnel Required:**

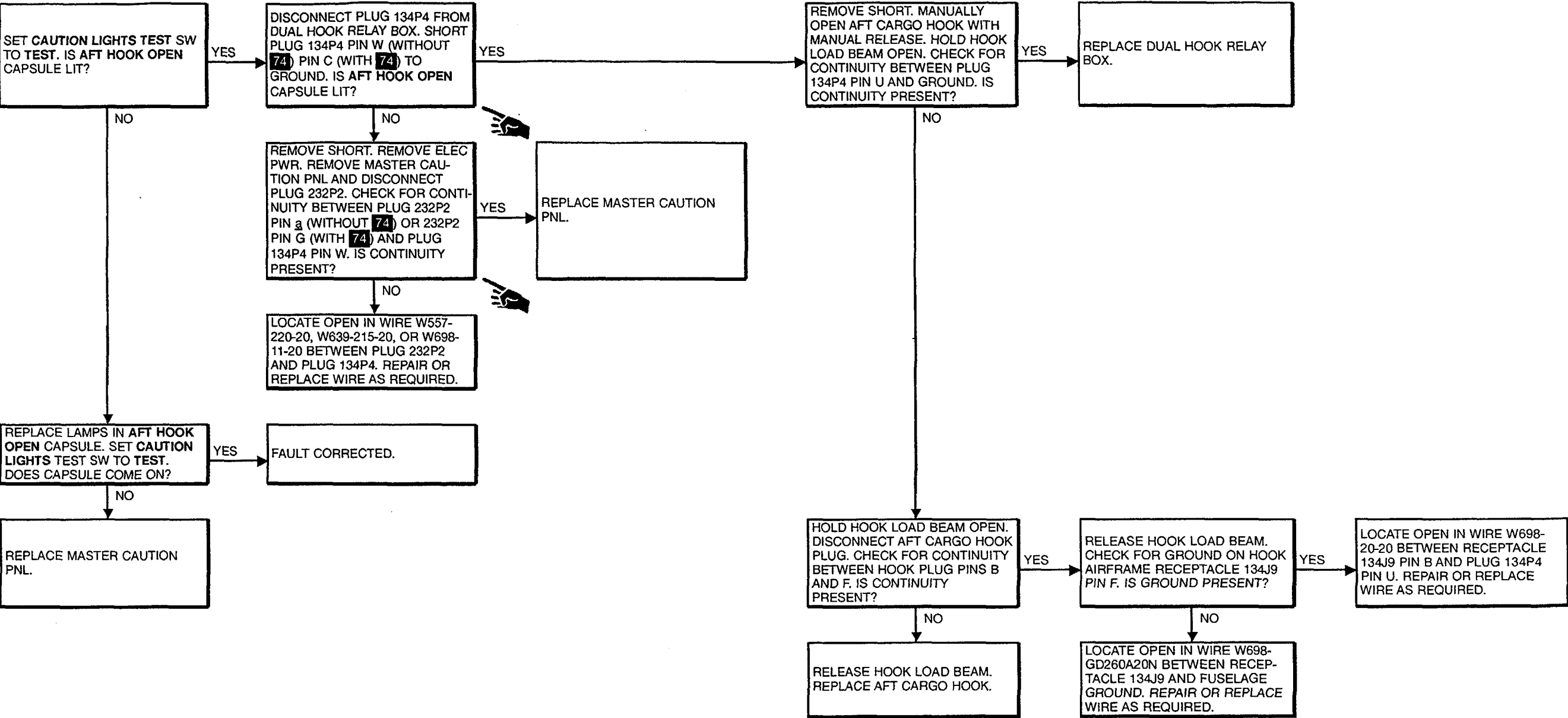
Aircraft Electrician

**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



A65538



END OF TASK

16-1.27 CARGO HOOK OR HOOKS DO NOT RELEASE WHEN EMERG SWITCH SET TO REL ALL

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

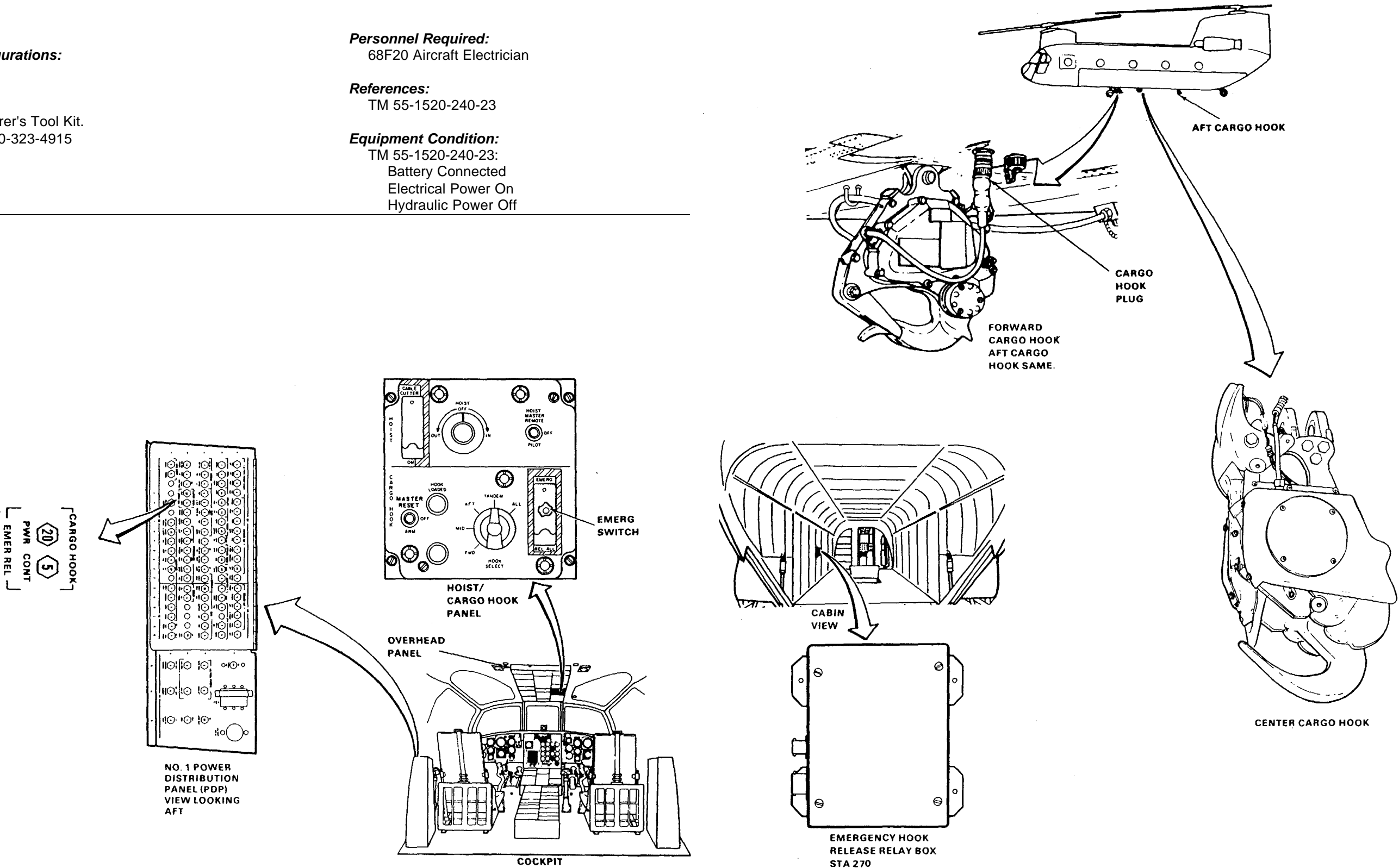
Tools:  
Electrical Repairer's Tool Kit.  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

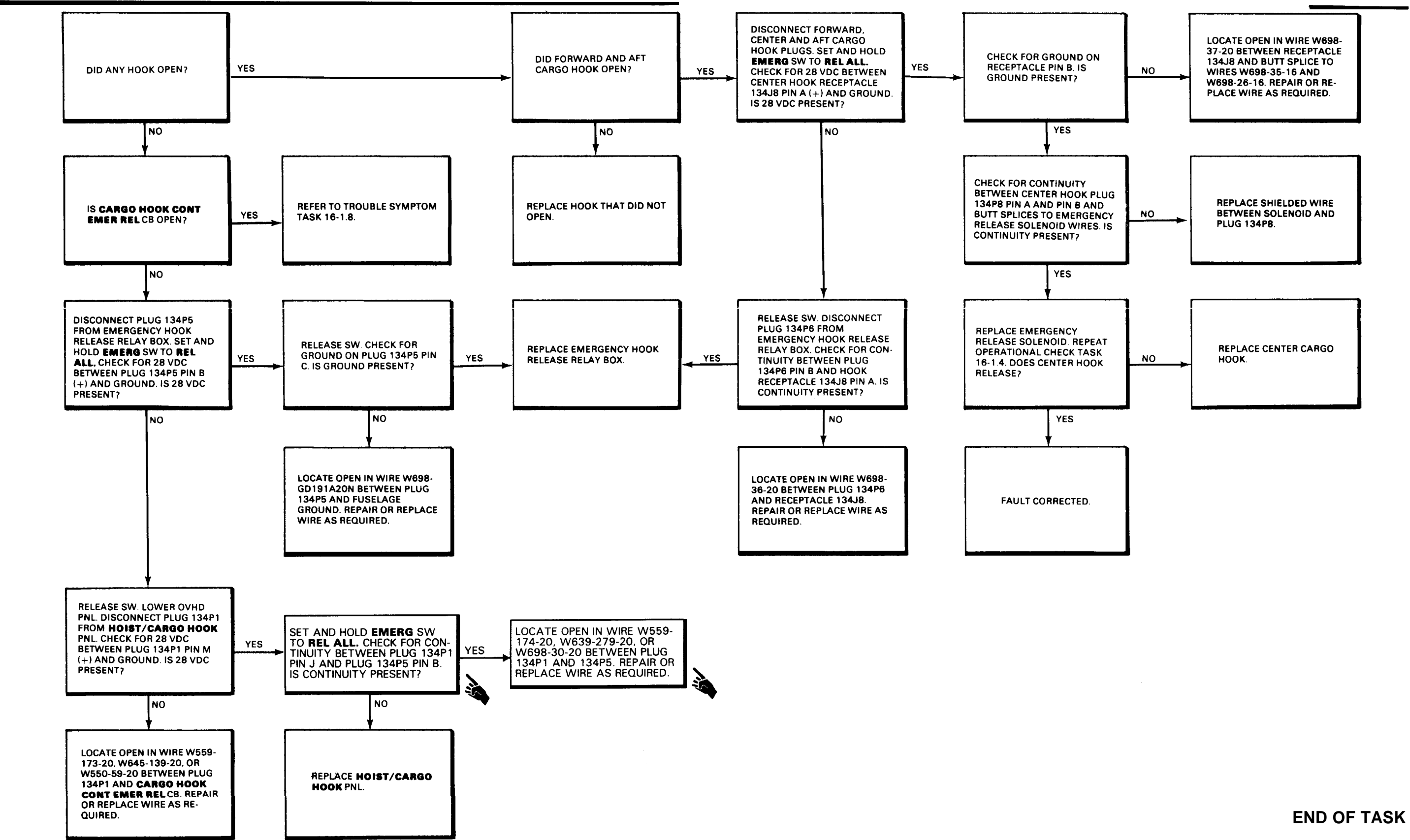
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



16-1.27 CARGO HOOK OR HOOKS DO NOT RELEASE WHEN EMERG SWITCH SET TO REL ALL (Continued)

16-1.27





FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer Tool Kit,  
NSN 5180-00-323-4915  
Aircraft Mechanic Tool Kit,  
NSN 5180-00-323-4692

Materials:

None

Personnel Required:

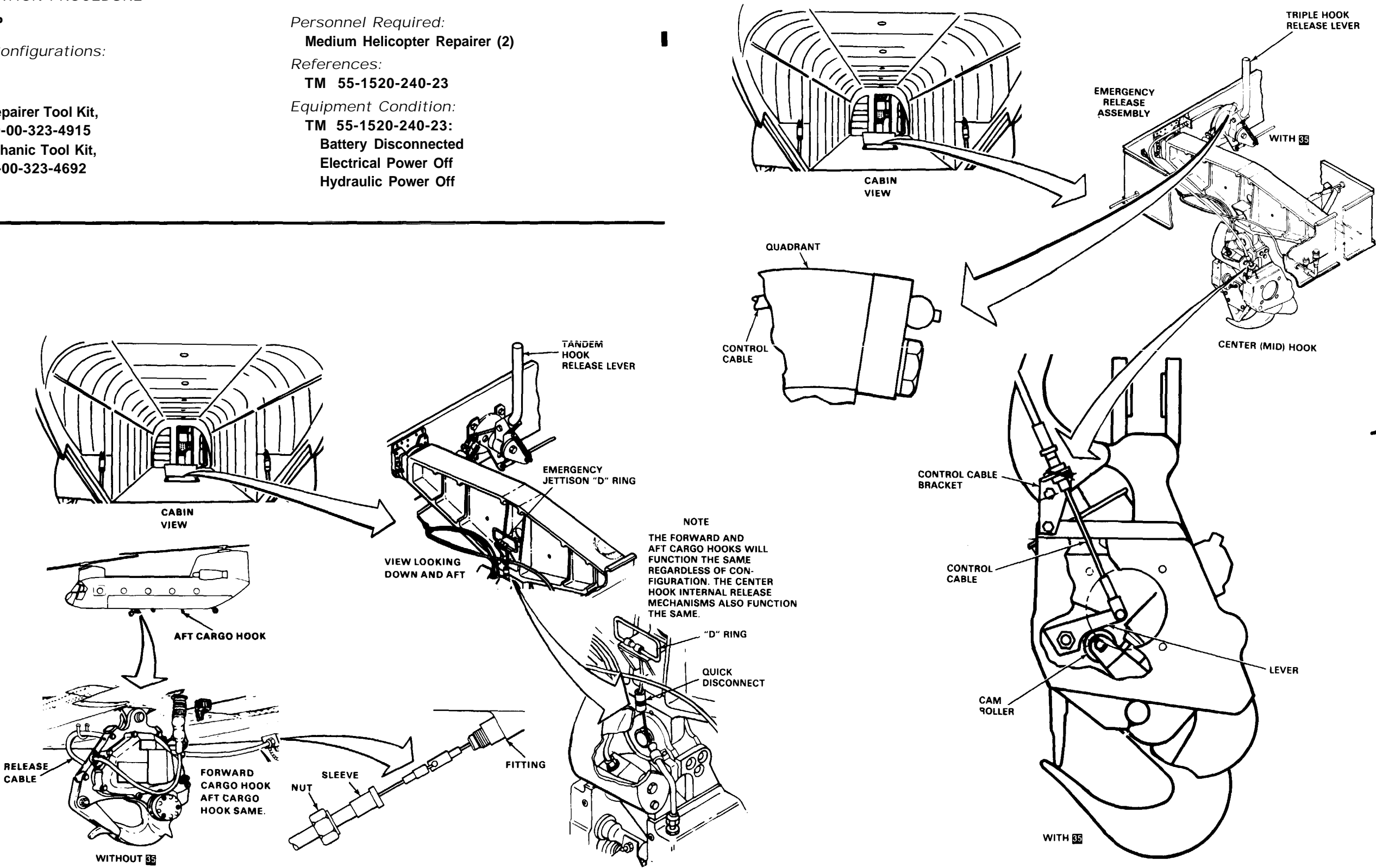
Medium Helicopter Repairer (2)

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off

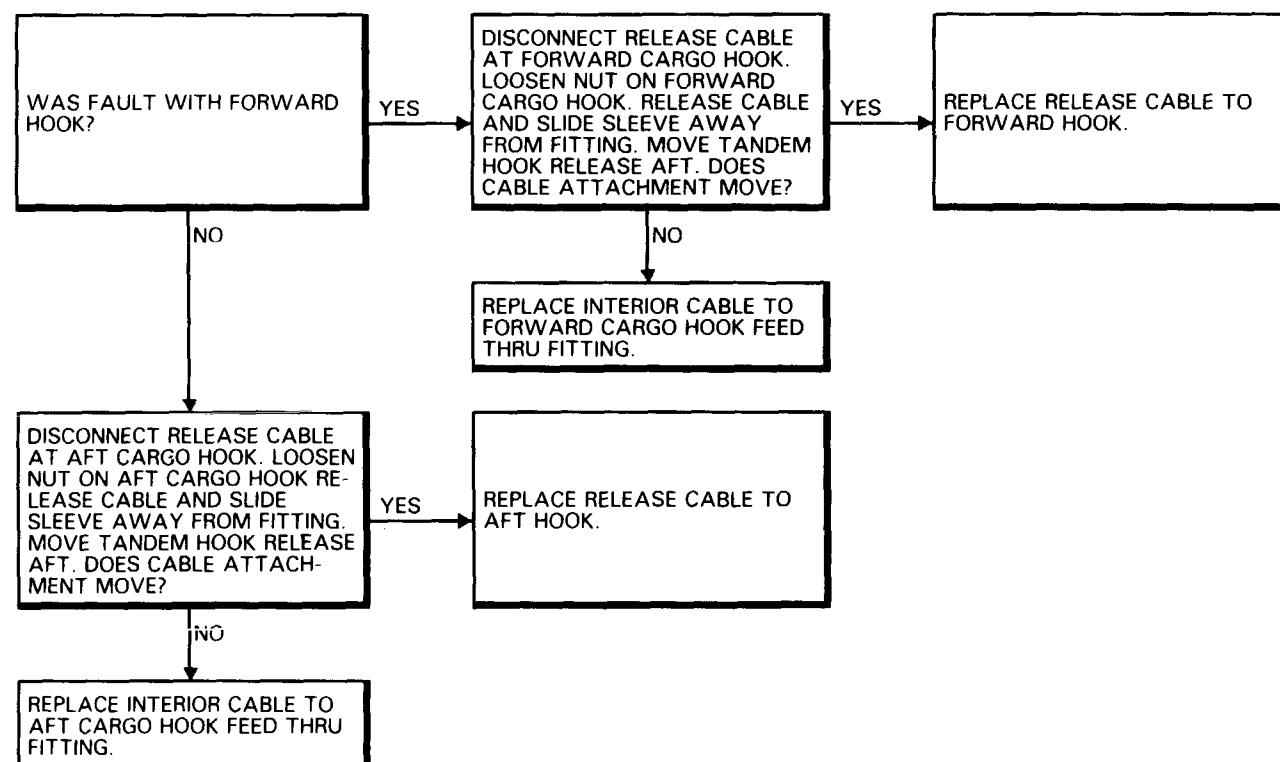


17327

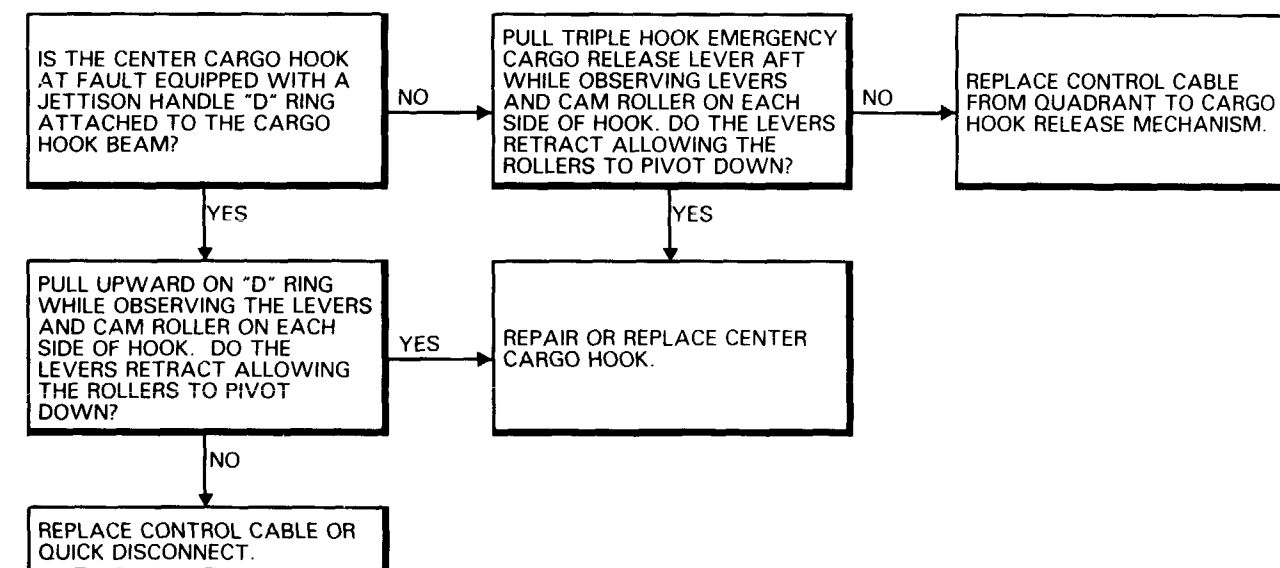
## 16-1.29 FORWARD CENTER OR AFT CARGO HOOK DOES NOT OPEN WHEN TRIPLE/TANDEM HOOK OR CENTER HOOK RELEASE LEVER IS PULLED (Continued)

16-1.29

## FORWARD OR AFT CARGO HOOK DOES NOT OPEN



## CENTER CARGO HOOK DOES NOT OPEN



16-1.30 HOOK LOADED LIGHT DOES NOT COME ON WHEN FORWARD OR AFT CARGO HOOK IS LOADED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

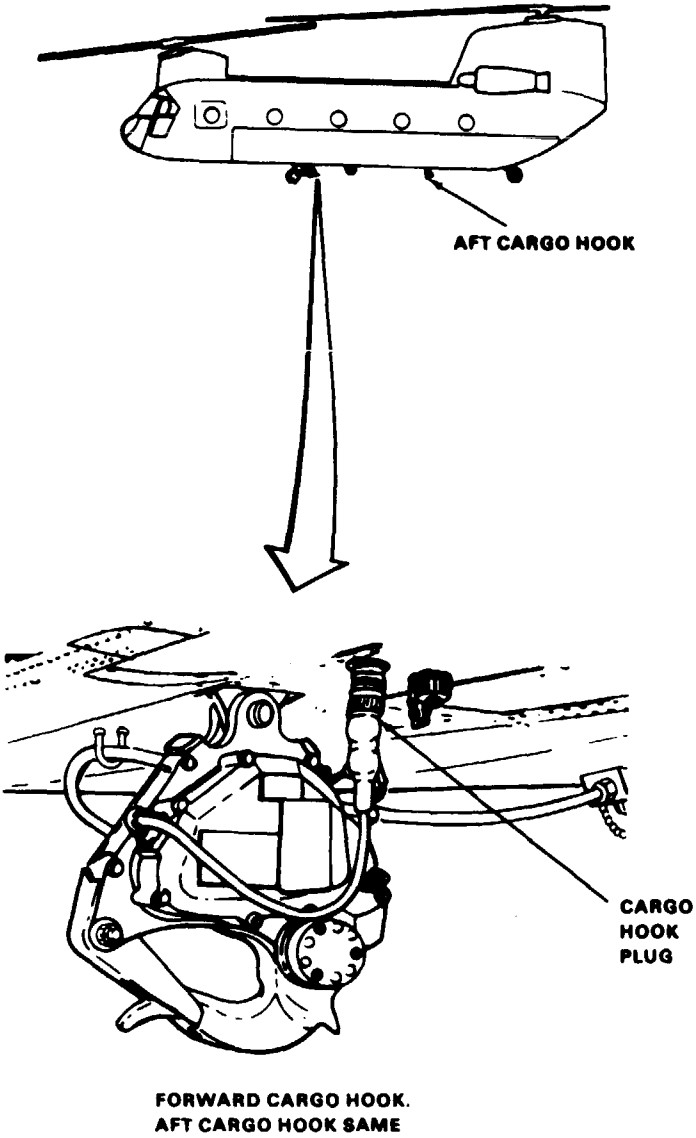
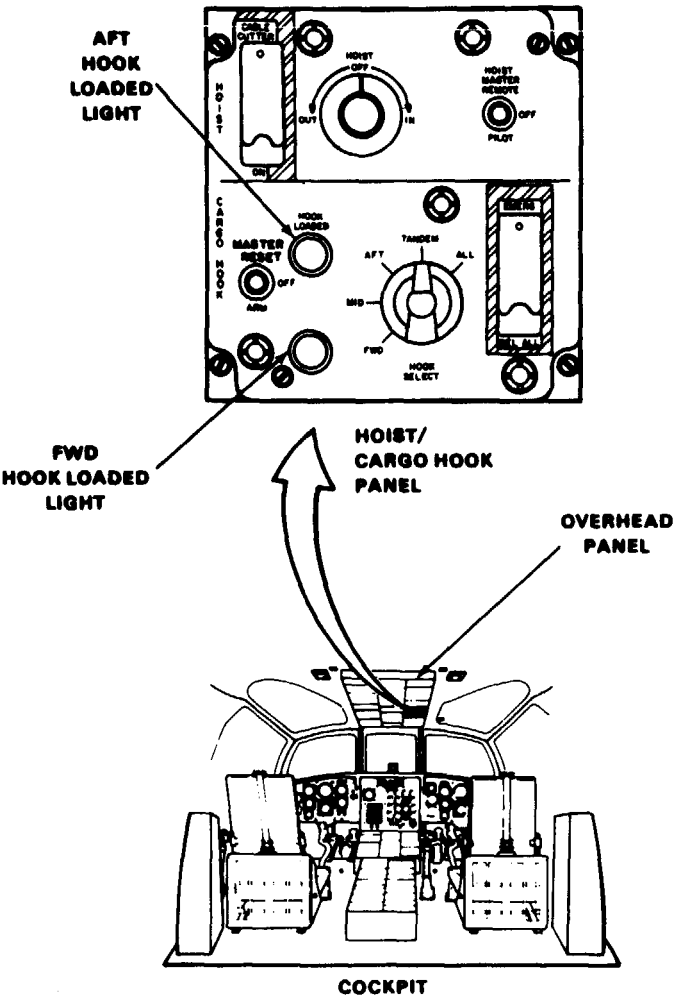
Tool:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:  
None

Personnel Required:  
68F20 Aircraft Electrician

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



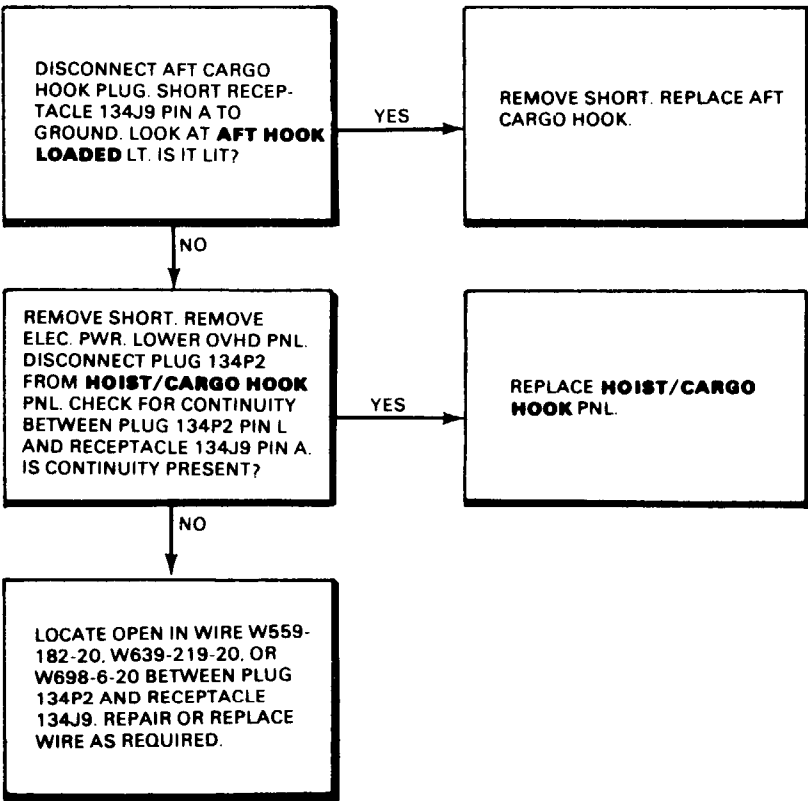
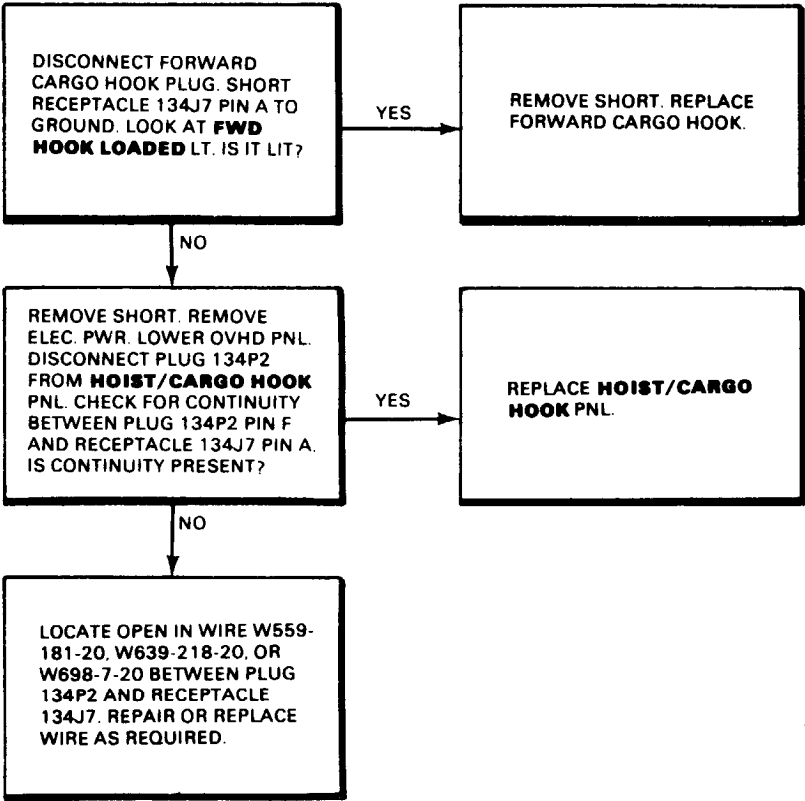


16-1.30 HOOK LOADED LIGHT DOES NOT COME ON WHEN FORWARD OR AFT CARGO HOOK IS LOADED (Continued)

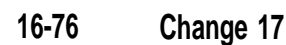
16-1.30

FWD HOOK LOADED LIGHT DOES NOT COME ON WHEN FORWARD CARGO HOOK IS LOADED

AFT HOOK LOADED LIGHT DOES NOT COME ON WHEN AFT CARGO HOOK IS LOADED



## 16-2 FLARE DISPENSER SYSTEM





16-2.2 FLARE DISPENSER SYSTEM VISUAL CHECK (Continued)

16-2.2

TASK	RESULT
1. Check DISP CONT panel (1).	If any switch, counter, or light on panel (1) is damaged, replace panel.
2. Check flare DISP switch (2) on pilot's and copilot's pitch and roll control grips (3 and 4).	If either switch (2) is damaged, replace grip (3 or 4).
3. Check four cable assemblies (5).	If any cable assembly (5) is damaged, repair or replace it as required. If any switch (6) in cable assembly (5) is damaged replace cable assembly.
4. Check timer (7).	If timer (7) is loose or damaged tighten or replace it as required. If connector to timer is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.
5. Check dispenser status panel (8).	If any light or switch on panel (8) is damaged, replace it. If connector to panel is loose or damaged, tighten or replace it as required. If wiring to connector is damaged repair or replace it as required.
6. Check flare dispenser viewing window (9).	If window (9) is clouded or broken, clean or replace it as required.
7. Check flare dispenser wiring and electrical plug and receptacle (10).	If plug or receptacle (10) is loose or damaged, tighten or replace it as required. If wiring to plug or receptacle is damaged, repair or replace it as required.
8. Check flare dispenser assembly (11).	If dispenser is loose or damaged, tighten or replace it as required.

FOLLOW-ON MAINTENANCE:

None

END OF TASK

INITIAL SETUP

Applicable Configurations:  
All

Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178

Materials:  
None

Personnel Required:  
Avionics Mechanic

References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Flare Dispenser Assembly Removed

Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Visual Check of Flare Dispenser System Performed  
(Task 16-2.2)

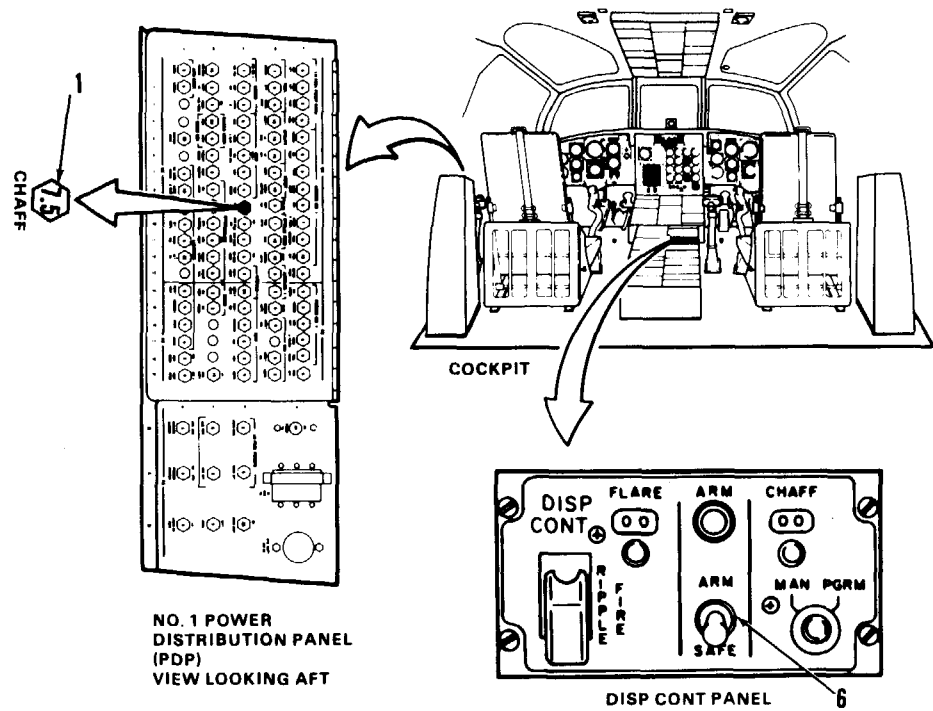
General Safety Instructions:

WARNING

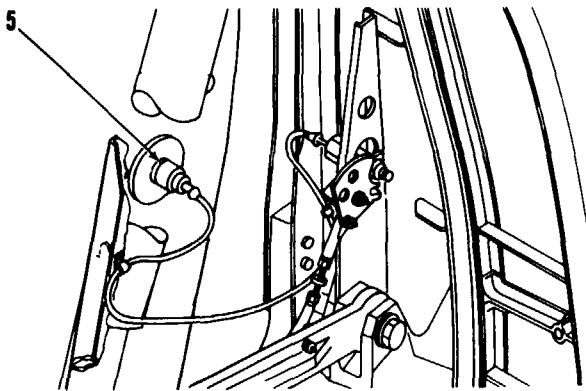
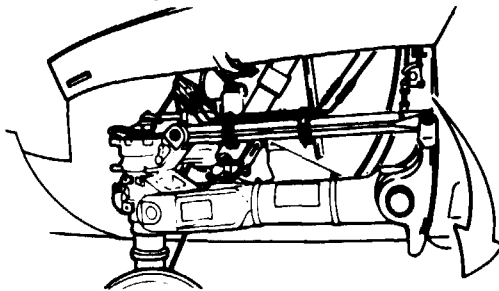
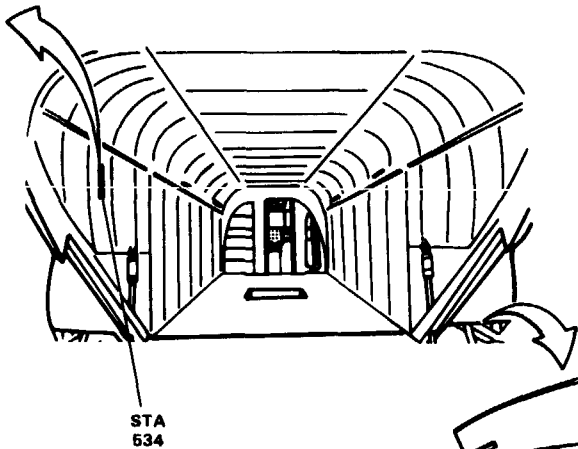
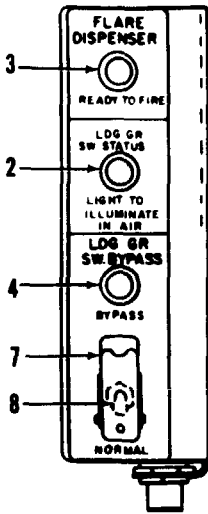
Do not perform test with flare dispenser assembly installed. System could fire resulting in damage injury or death.

WARNING

Keep personnel clear of flight controls.



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0145-11441-SPA

16-2.3 FLARE DISPENSER SYSTEM OPERATIONAL CHECK (Continued)

16-2.3

TASK	RESULT
1. Check that CHAFF circuit breaker (1) is closed.	If circuit breaker (1) is open, close it. If it opens again, go to task 16-2.4.
2. Check <b>that</b> LDG GR SW STATUS light (2) is out.	If light (2) is on, go to task 16-2.5.
3. Press and release LDG GR SW STATUS, READY TO FIRE and LDG GR SW BYPASS lights (2, 3, and 4).	Each light (2, 3, and 4) shall momentarily come on. If any light does not come on, go to task 16-2.6.
4. Disconnect right landing gear proximity switch plug (5).	LDG GR SW STATUS light (2) shall come on. If it does not come on, go to task 16-2.7.
5. Set DISP CONT panel ARM SAFE switch (6) to ARM.	READY TO FIRE light (3) shall come on. If light does not come on, go to task 16-2.8
6. Connect right landing gear proximity switch plug. (5).	LDG GR SW STATUS and READY TO FIRE light (2 and 3) shall go out.
7. Lift switchguard (7) and set LDG GR SW BYPASS switch (8) to BYPASS.	LDG GR SW STATUS, READY TO FIRE, and LDG GR SW BYPASS LIGHTS (2,3 and 4) shall come on. If they do not, go to task 16-2,10.
8. Set DISP CONT panel ARM SAFE switch (6) to SAFE.	READY TO FIRE light (3) shall go out.
9. Set LDG GR SW <b>BYPASS</b> switch (8) to NORMAL and <b>close</b> switchguard (7).	LDG GR SW STATUS light (2) and LDG GR SW BYPASS light (4) shall go out,
10. Perform functional test of flare dispenser system, Refer to TM 55-1520-240-23.	
NOTE	
If a problem occurs during functional test of flare dispenser system, refer to table 16-2.1 to locate trouble symptom task number.	

TABLE 16-2.1

TROUBLE SYMPTOM	TASK NUMBER
FLARE COUNTER SEQUENCES FROM 30 TO 00 WHEN DISP CONT PANEL ARM SAFE SWITCH SET TO ARM.	16-2.11
ARM LIGHT DOES NOT COME ON WHEN ARM SAFE SWITCH SET TO ARM.	16-2.12
FLARE COUNTER OR TEST SET LIGHTS 00 NOT CHANGE WHEN PILOT OR COPILOT FLARE DISP SWITCH PRESSED AND RELEASED.	16-2.13
FLARE COUNTER OR TEST SET LIGHTS DO NOT CHANGE WHEN A CABIN FIRING SWITCH PRESSED AND RELEASED,	16-2.14
FLARE COUNTER DOES NOT INDICATE 00 WHEN RIPPLE FIRE SWITCH IS HELD UP.	16-2.15

FOLLOW-ON MAINTENANCE:

- TM 55-1520-240-23:
- Remove Electrical Power
- Disconnect Battery
- Install Flare Dispensanser Assembly

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178

Materials:

None

Personnel Required:

Avionics Mechanic

References:

TM 55-1520-240-23

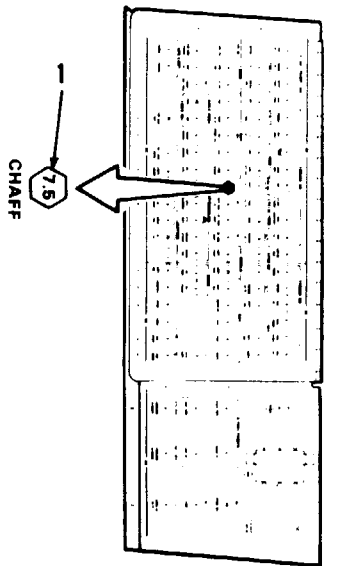
Equipment Condition:

TM 55-1520-240-23:

Battery Disconnected

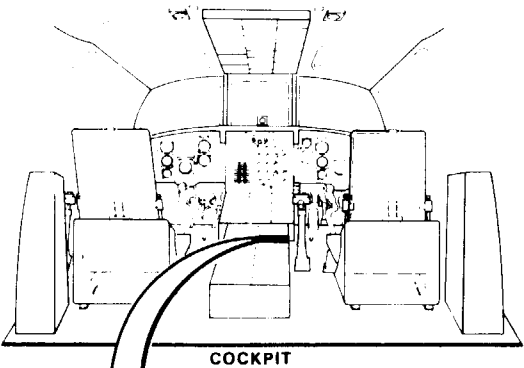
Electrical Power Off

Hydraulic Power Off

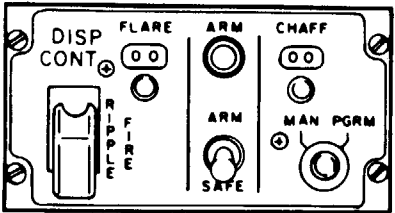


NO. 1 POWER  
DISTRIBUTION PANEL  
(PDP)  
VIEW LOOKING AFT

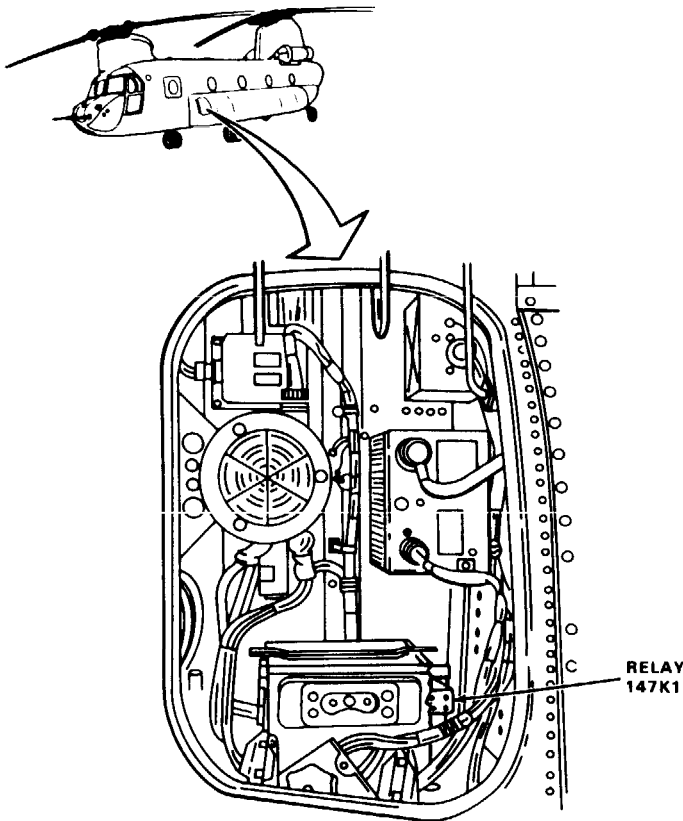
90X54



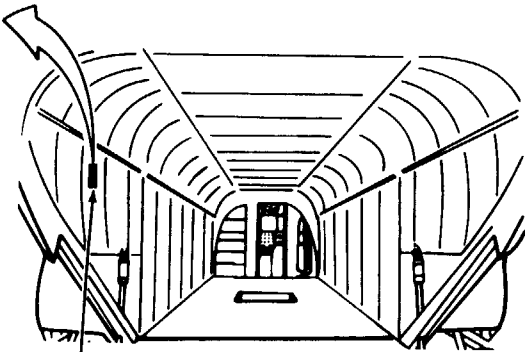
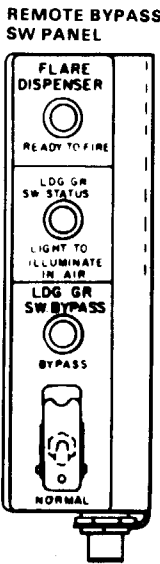
COCKPIT



DISP CONT PANEL



LEFT ELECTRICAL COMPARTMENT  
SHOWN WITH DOOR OFF FOR CLARITY



STA 534

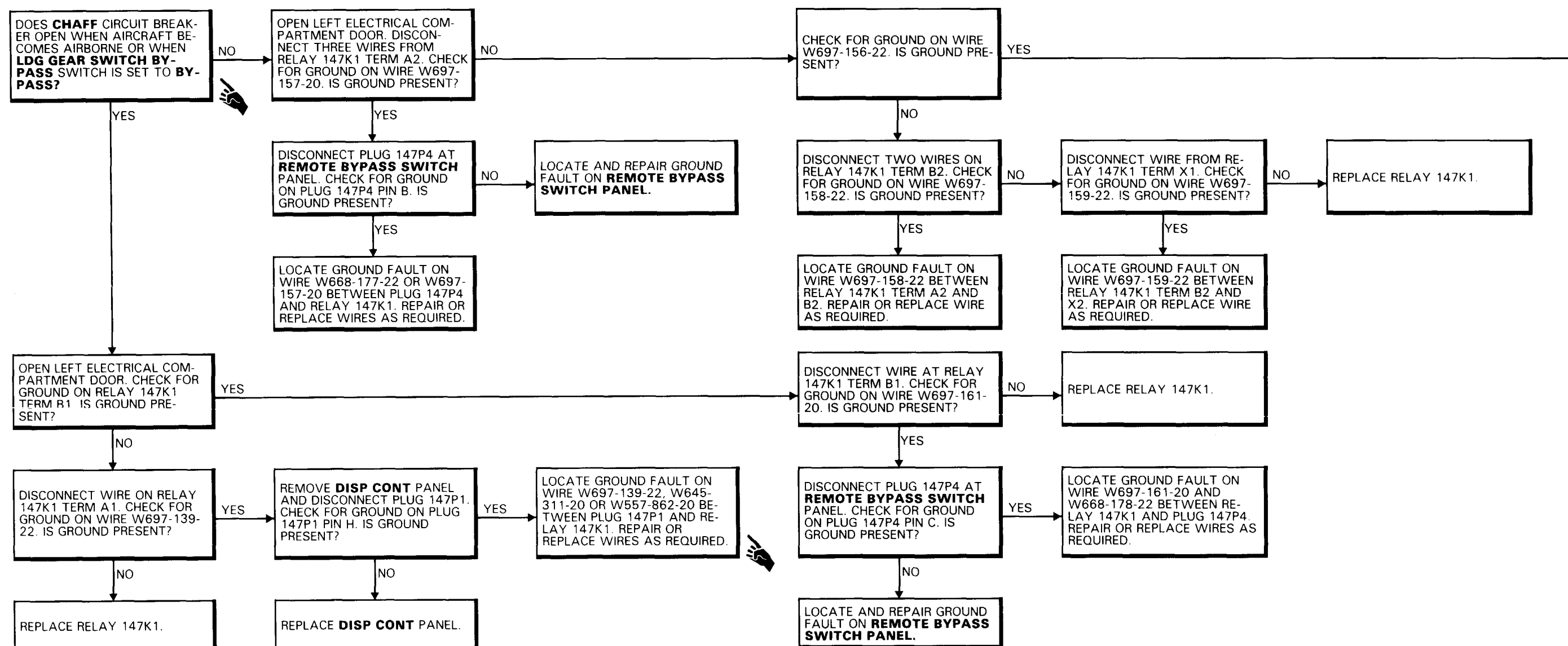
D145-12053-SPA

GO TO NEXT PAGE



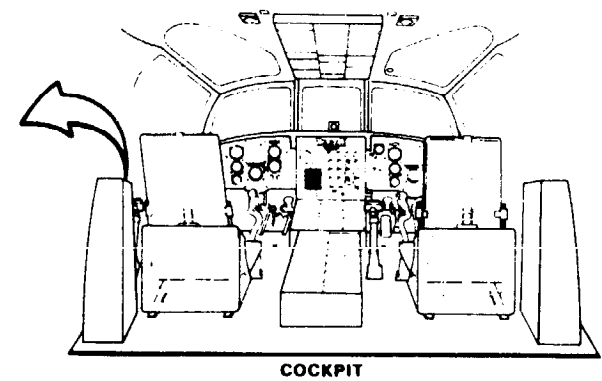
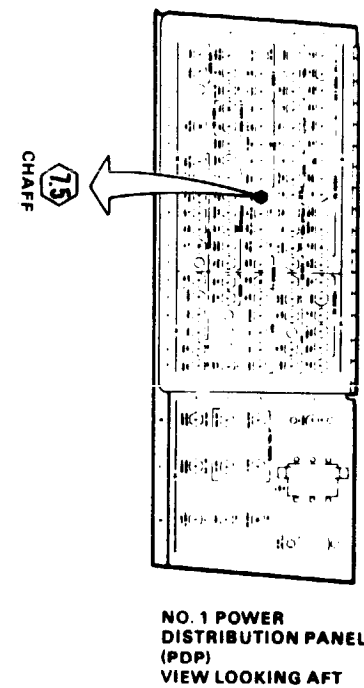
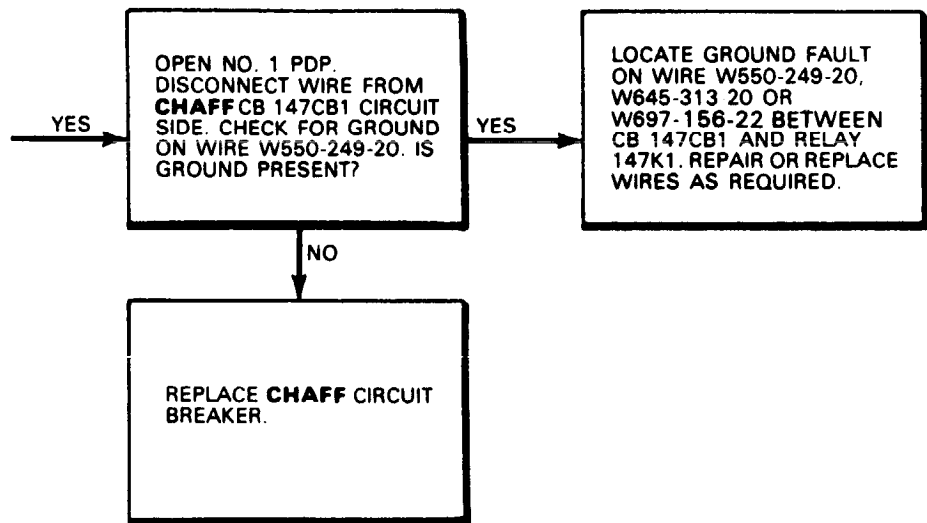
## 16-2.4 CHAFF CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

16-2.4



16-2.4 CHAFF CIRCUIT BREAKER WILL NOT STAY CLOSED  
(Continued)

16-2.4



45X54

0145-12054-SPA

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178

Materials:

None

Personnel Required:

- Avionics Mechanic (2)

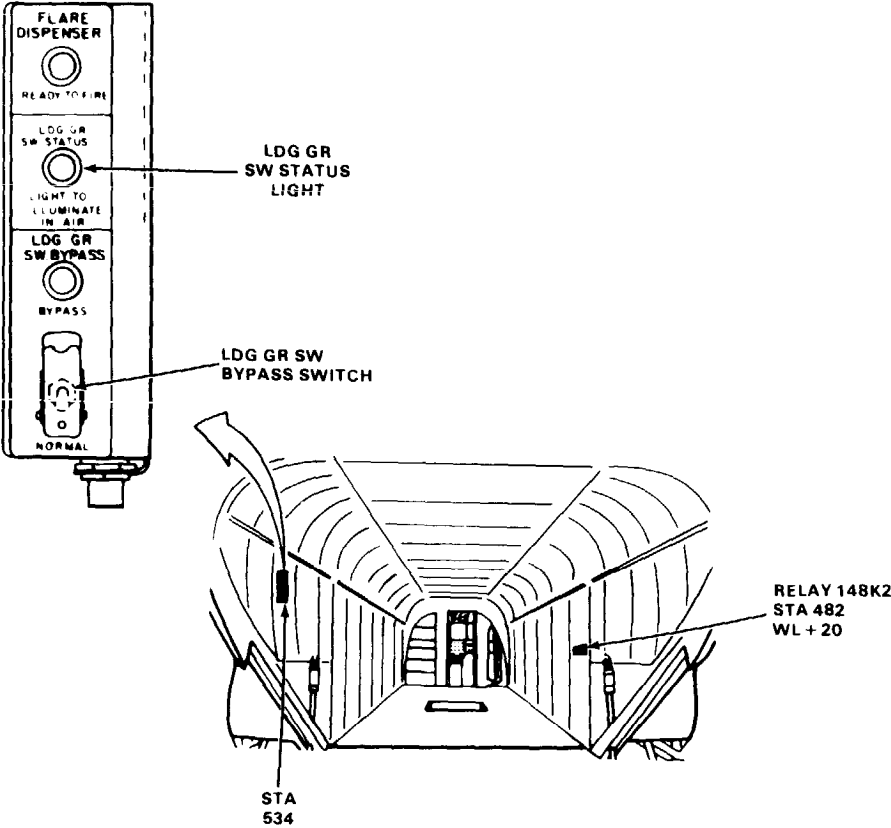
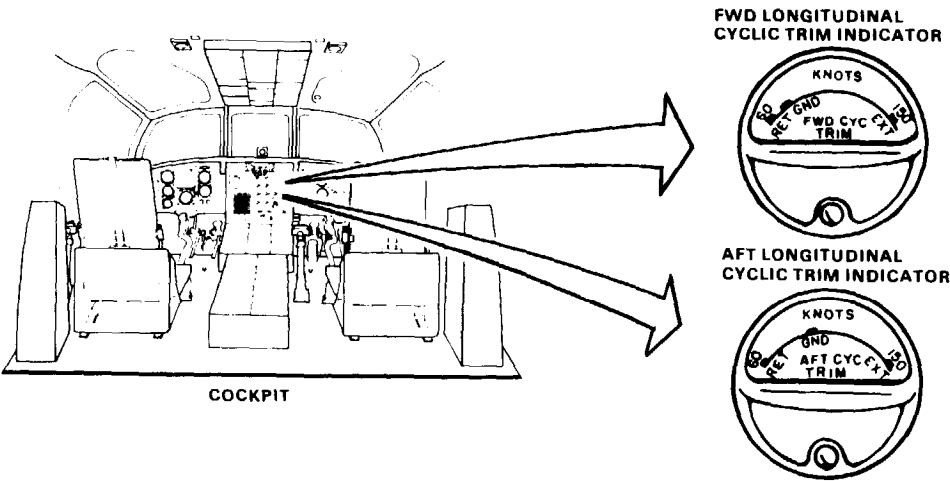
References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

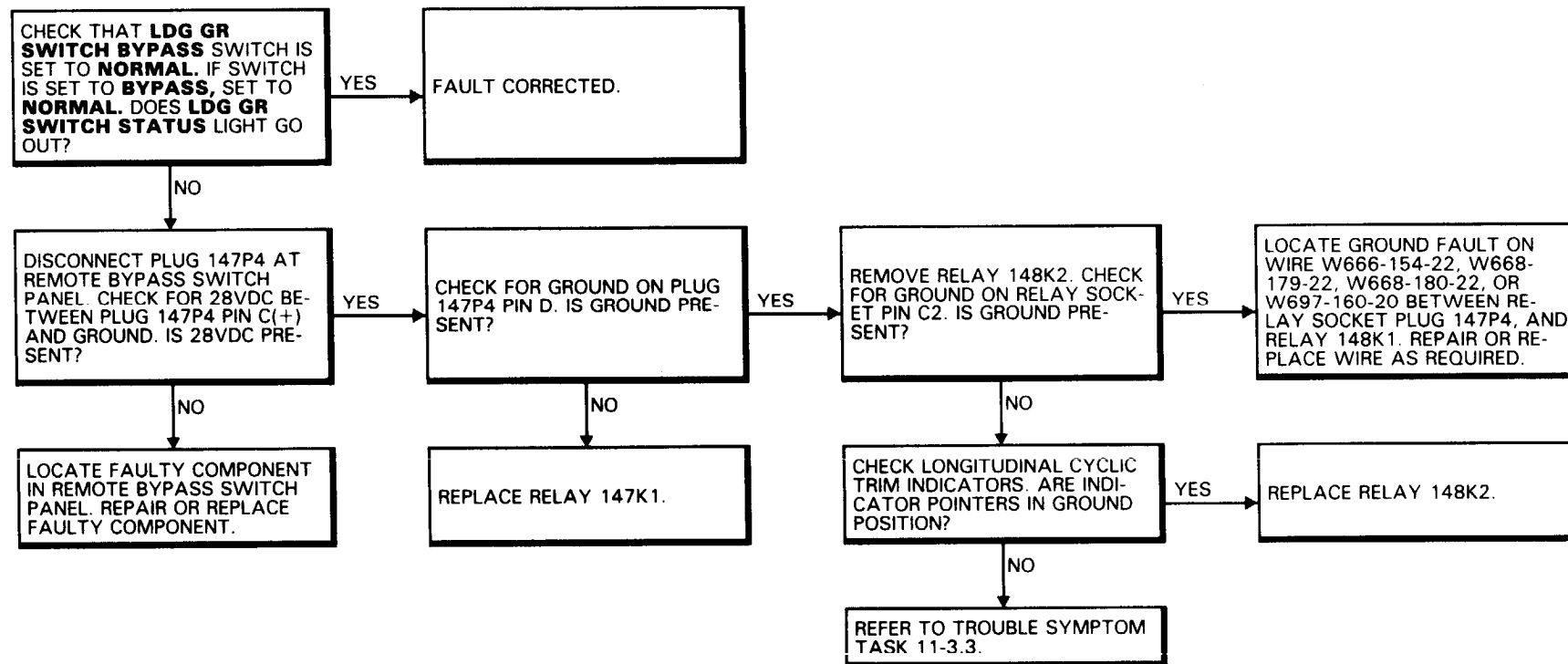
- Battery Connected
- Electrical Power On
- Hydraulic Power Off



90X54

16-2.5 LANDING GEAR SWITCH STATUS LIGHT IS ON (Continued)

16-2.51



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178

Materials:

None

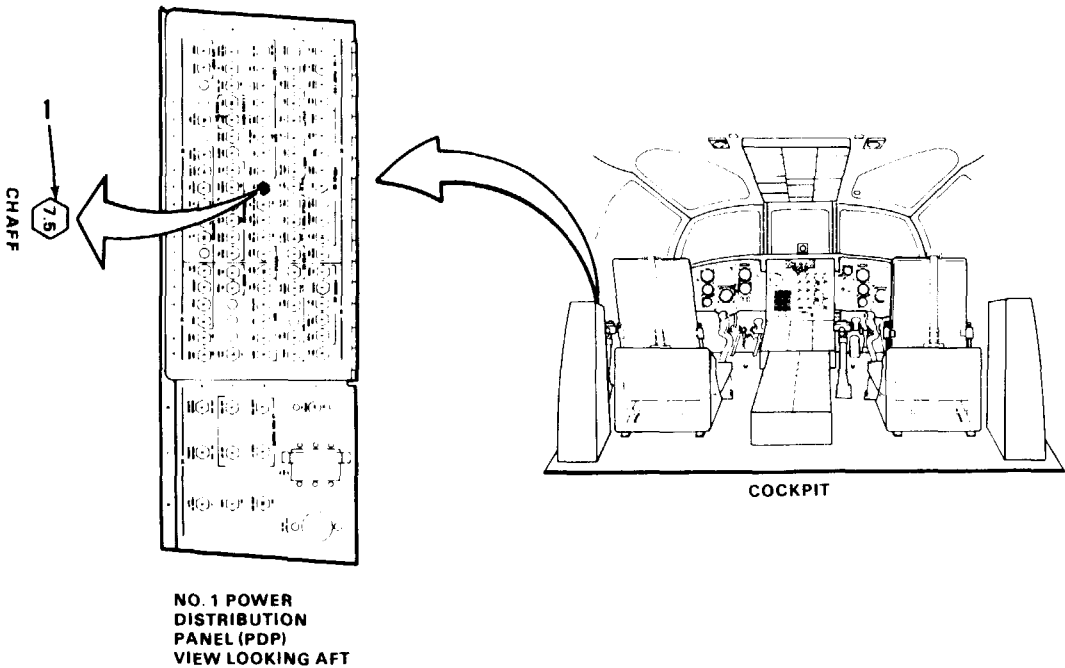
Personnel Required:  
Avionics Mechanic

References:

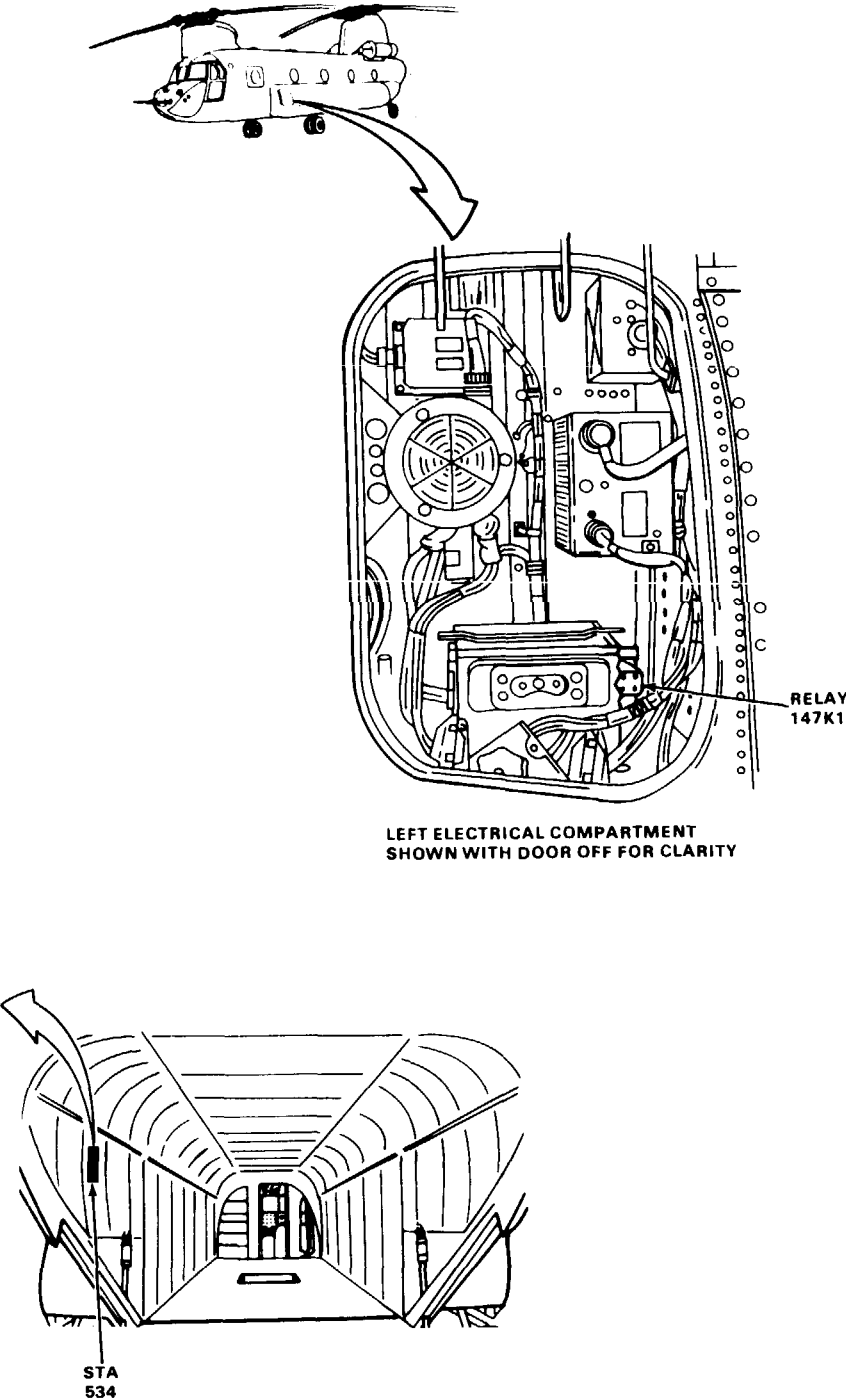
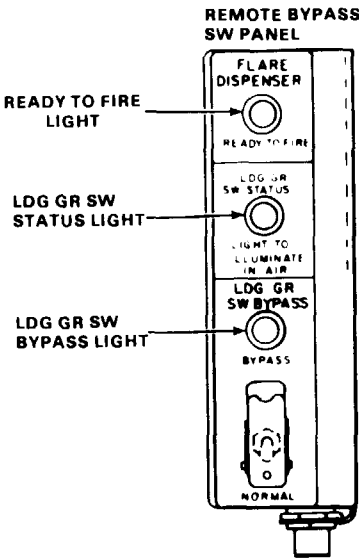
TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



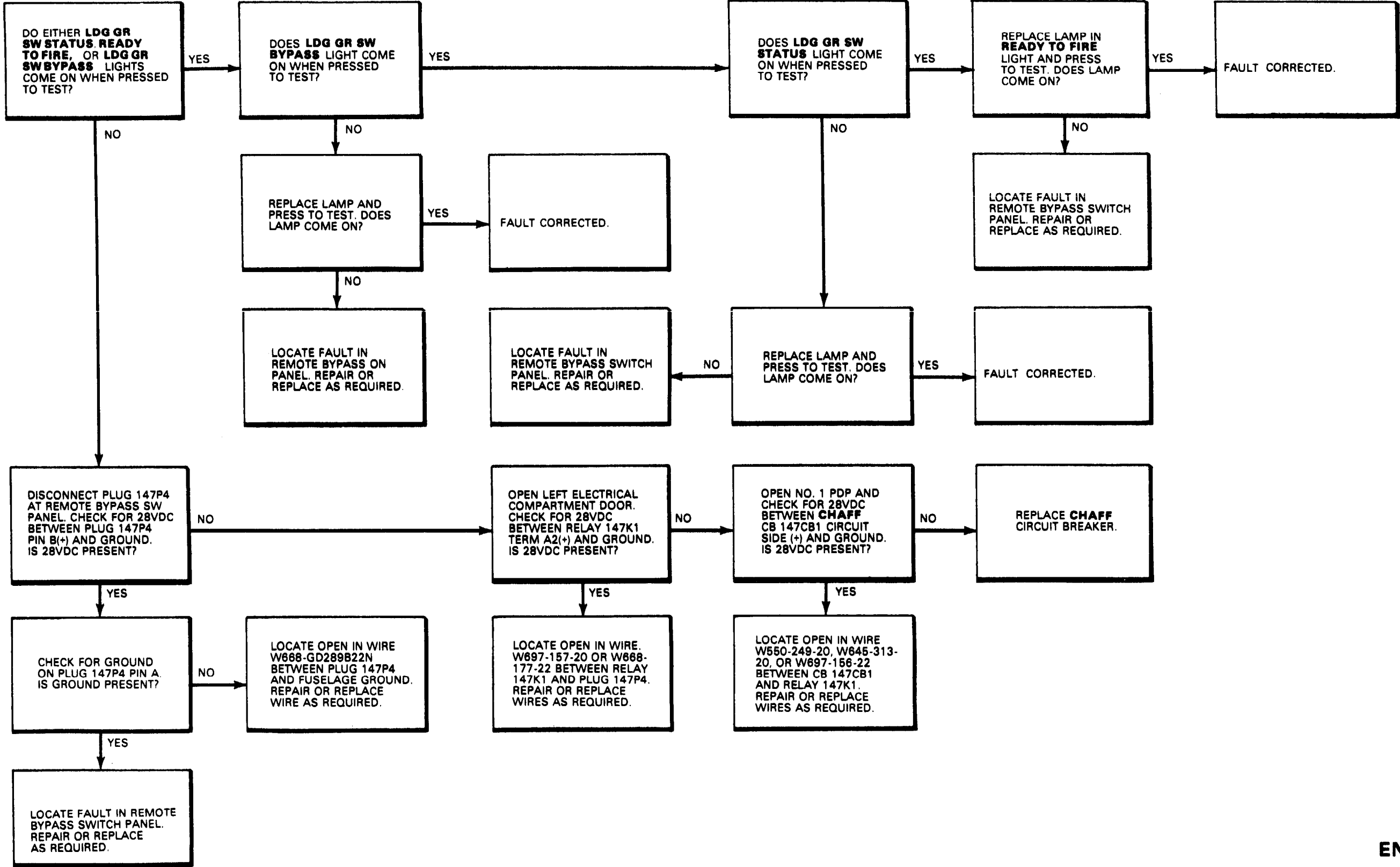
90X54



D145-12056-SPA

16-2.6 LDG GR SW STATUS, READY TO FIRE, OR LDG GR SW BYPASS LIGHTS DO NOT COME ON WHEN PRESSED (Continued)

16-2.6



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178

Materials:

None

Personnel Required:

Avionics Mechanic (2)

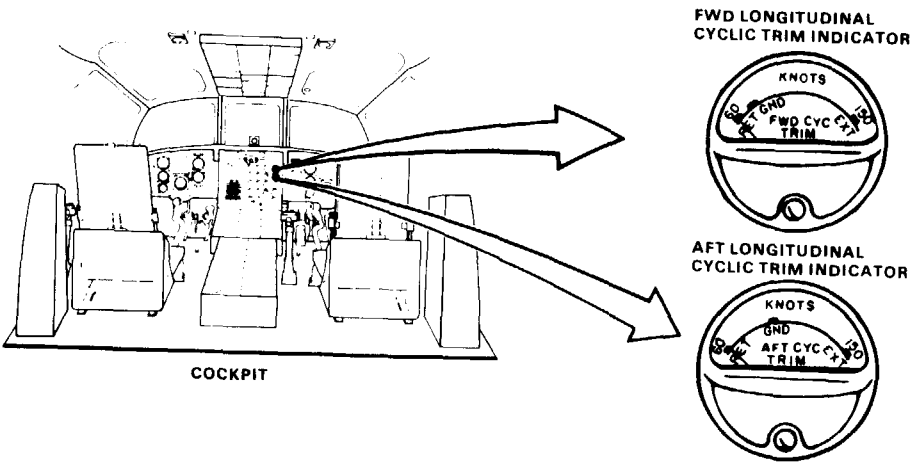
References:

TM 55-1520-240-23

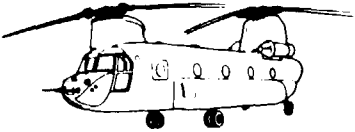
Equipment Condition:

TM 55-1520-240-23:

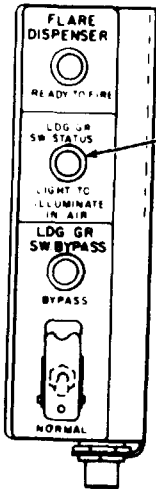
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Right Landing Gear Proximity Switch Plug Dis-  
connected



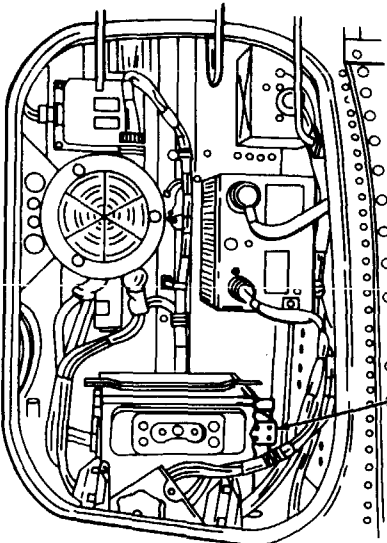
90X54



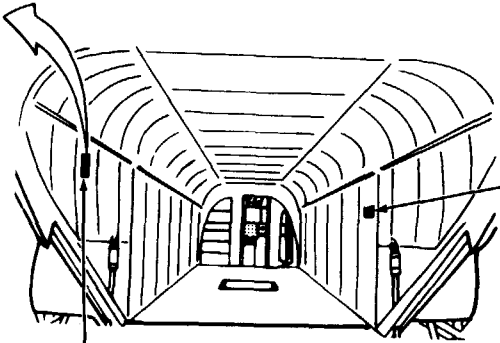
REMOTE BYPASS SW  
PANEL



LDG GR  
SW STATUS LIGHT



LEFT ELECTRONIC COMPARTMENT  
SHOWN WITH DOOR OFF FOR CLARITY



RELAY 148K2  
STA 482  
WL + 20

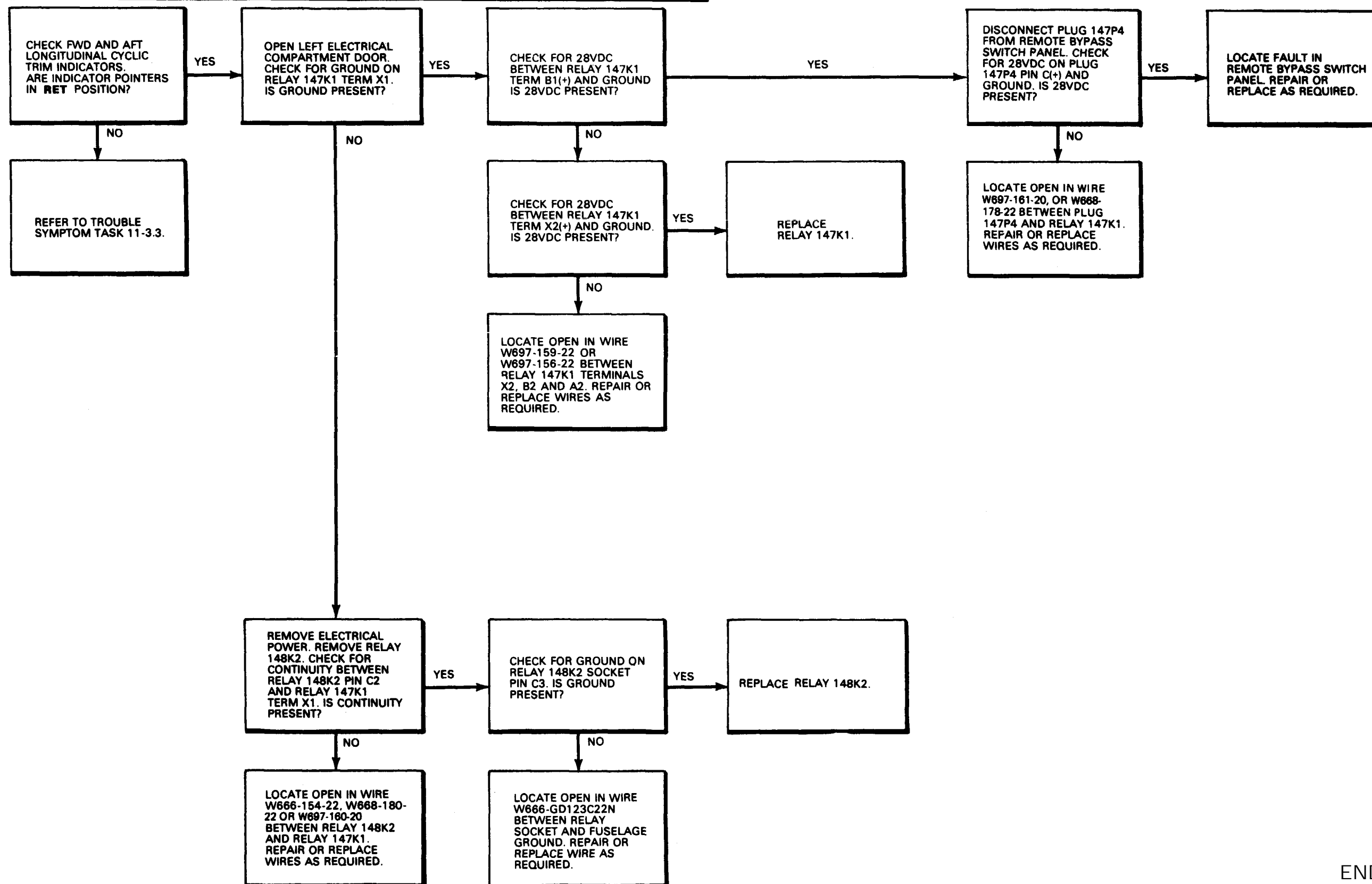
STA  
534

D145-12057-SPA

GO TO NEXT PAGE

# 16-2.7 LDG GR SW STATUS LIGHT DOES NOT COME ON (Continued)

16-2.7



END OF TASK



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178

Materials:

None

Personnel Required:

Avionics Mechanic (2)

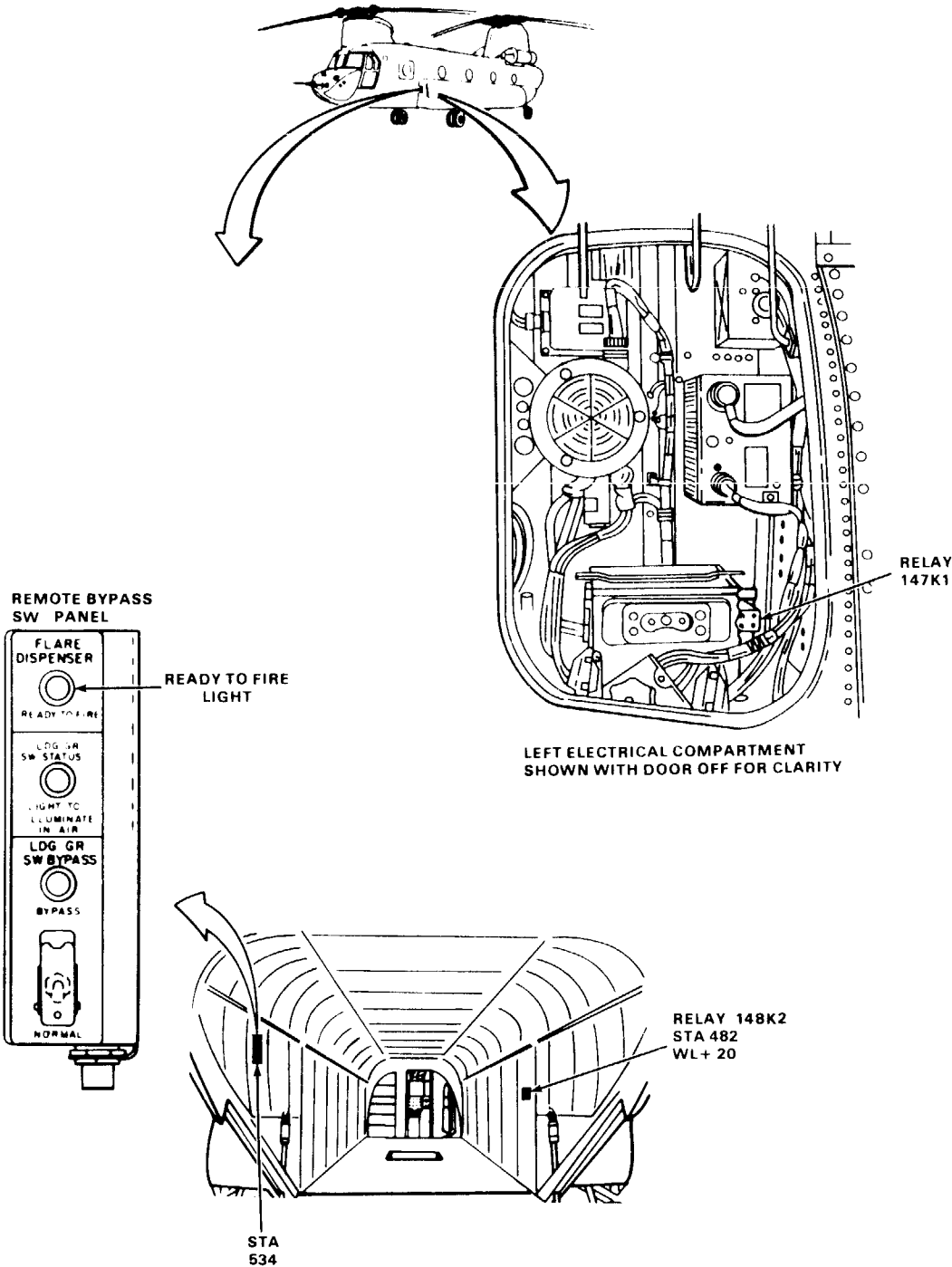
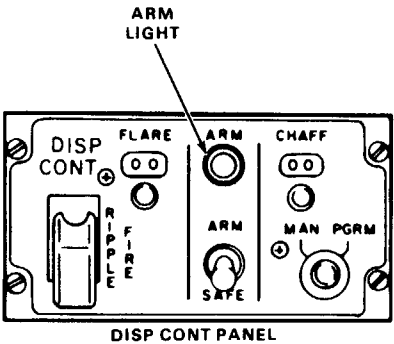
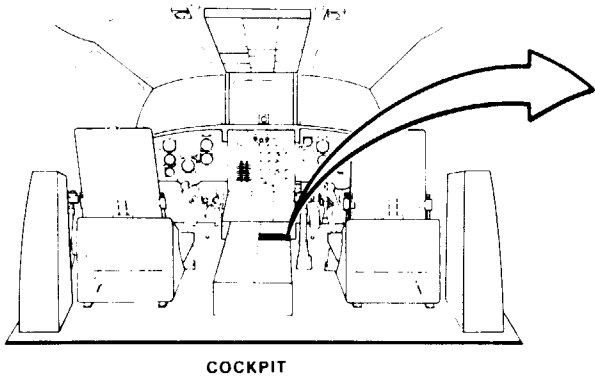
References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

Battery Connected  
Electrical Power On  
Hydraulic Power Off

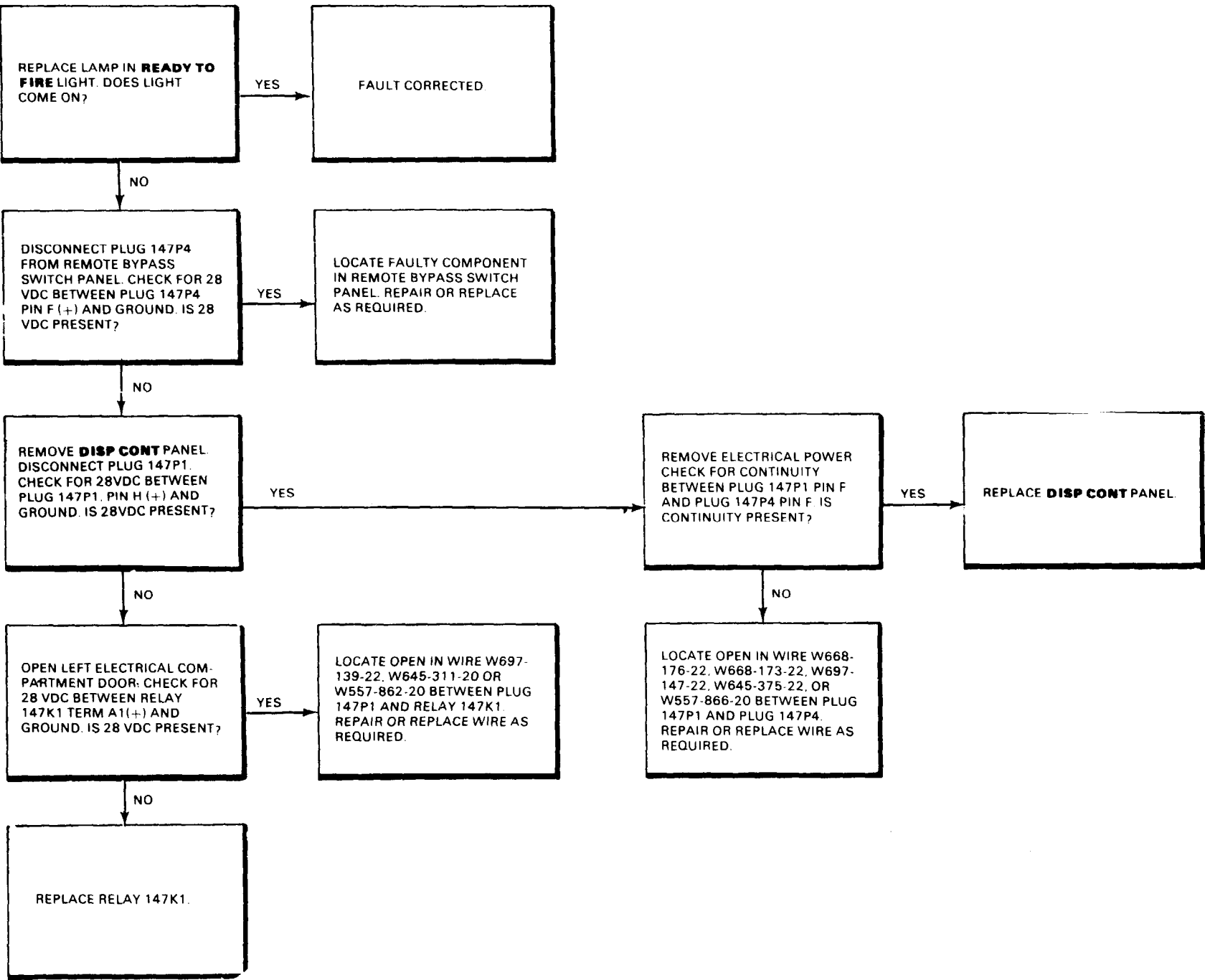


90X54

DI45-12058-SPA

16-2.8 READY TO FIRE LIGHT DOES NOT COME ON (Continued)

16-2.8



TASK 16-2.9 DELETED

END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178

Materials:

None

Personnel Required:

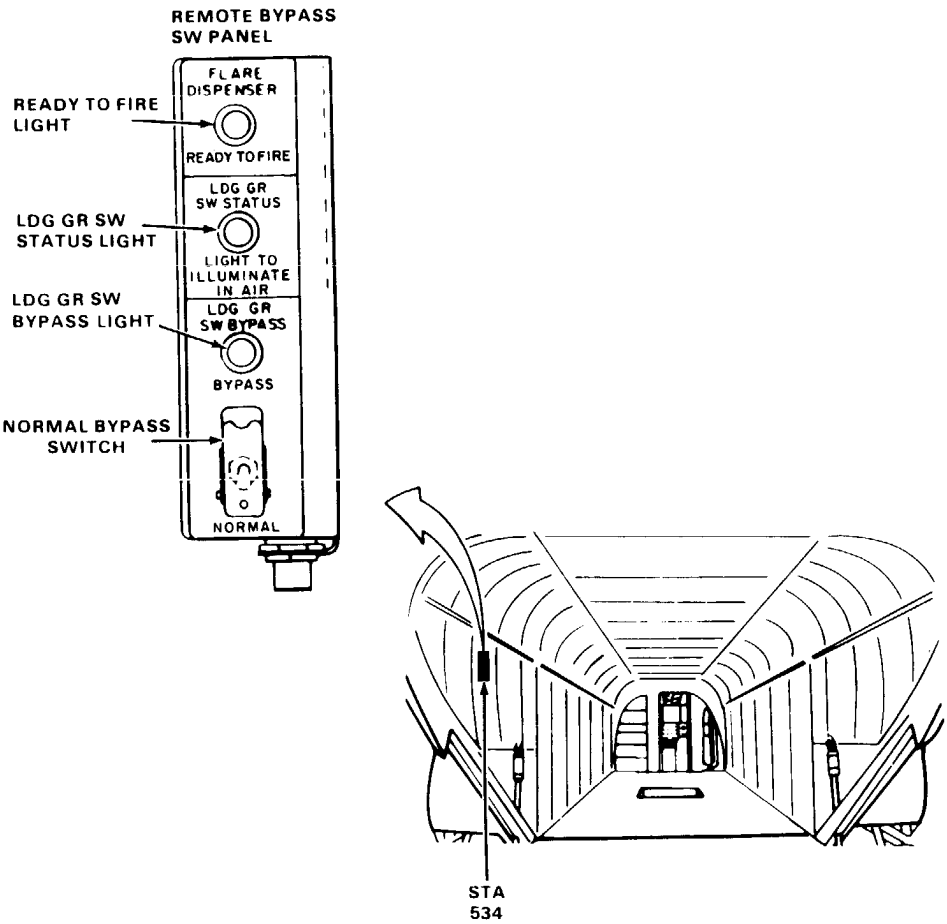
Avionics Mechanic (2)

References:

TM 55-1520-240-23

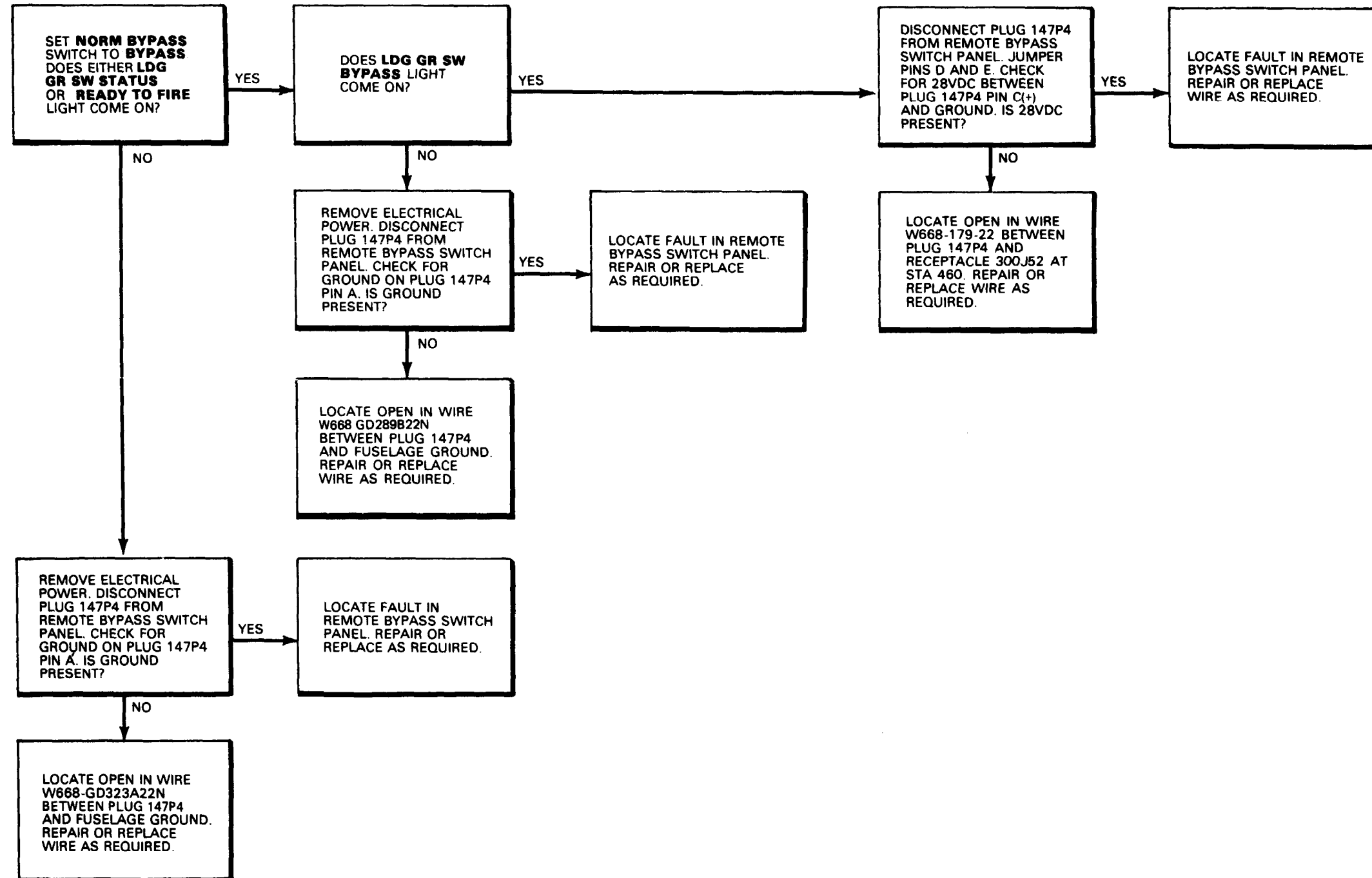
Equipment Condition:

- TM 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off



**16-2.10 LDG GR SW STATUS READY TO FIRE AND LDG GR SW BYPASS LIGHTS DO NOT COME ON (Continued)**

16-2.10



**END OF TASK**

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178
- Multimeter

Materials:

None

Personnel Required:

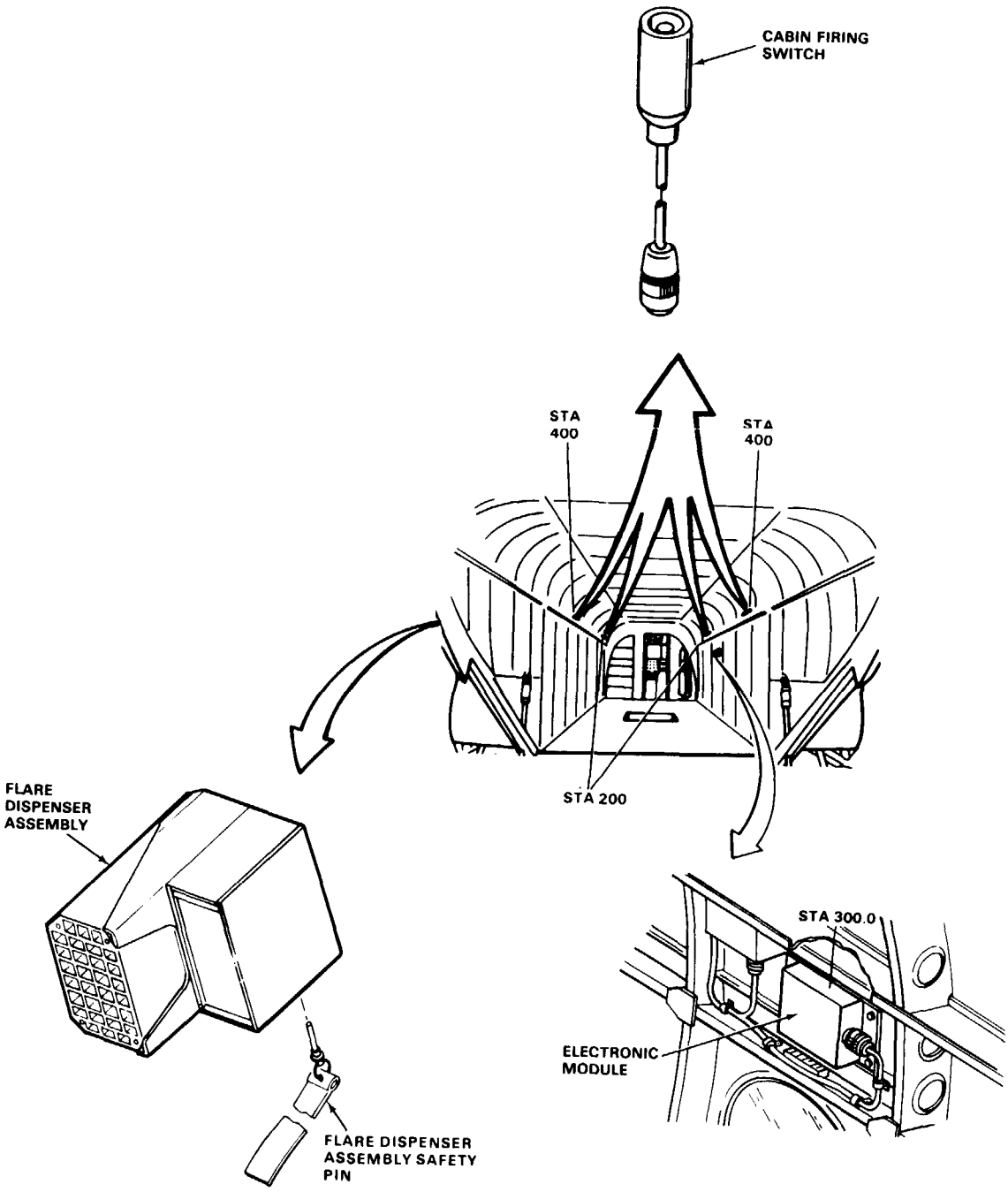
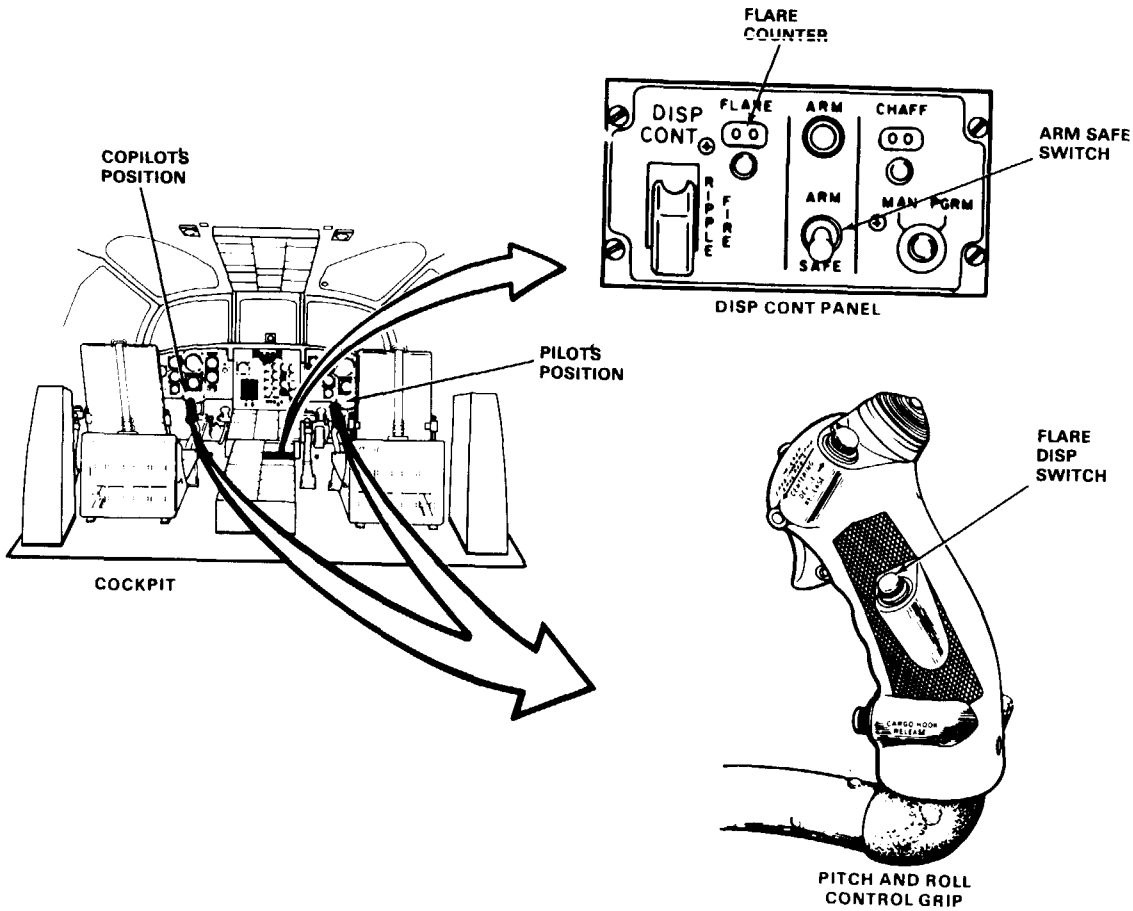
Avionics Mechanic (2)

References:

- TM 9-1095-206-13 & P
- TM 55-1520-240-23

Equipment Condition:

- TM 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

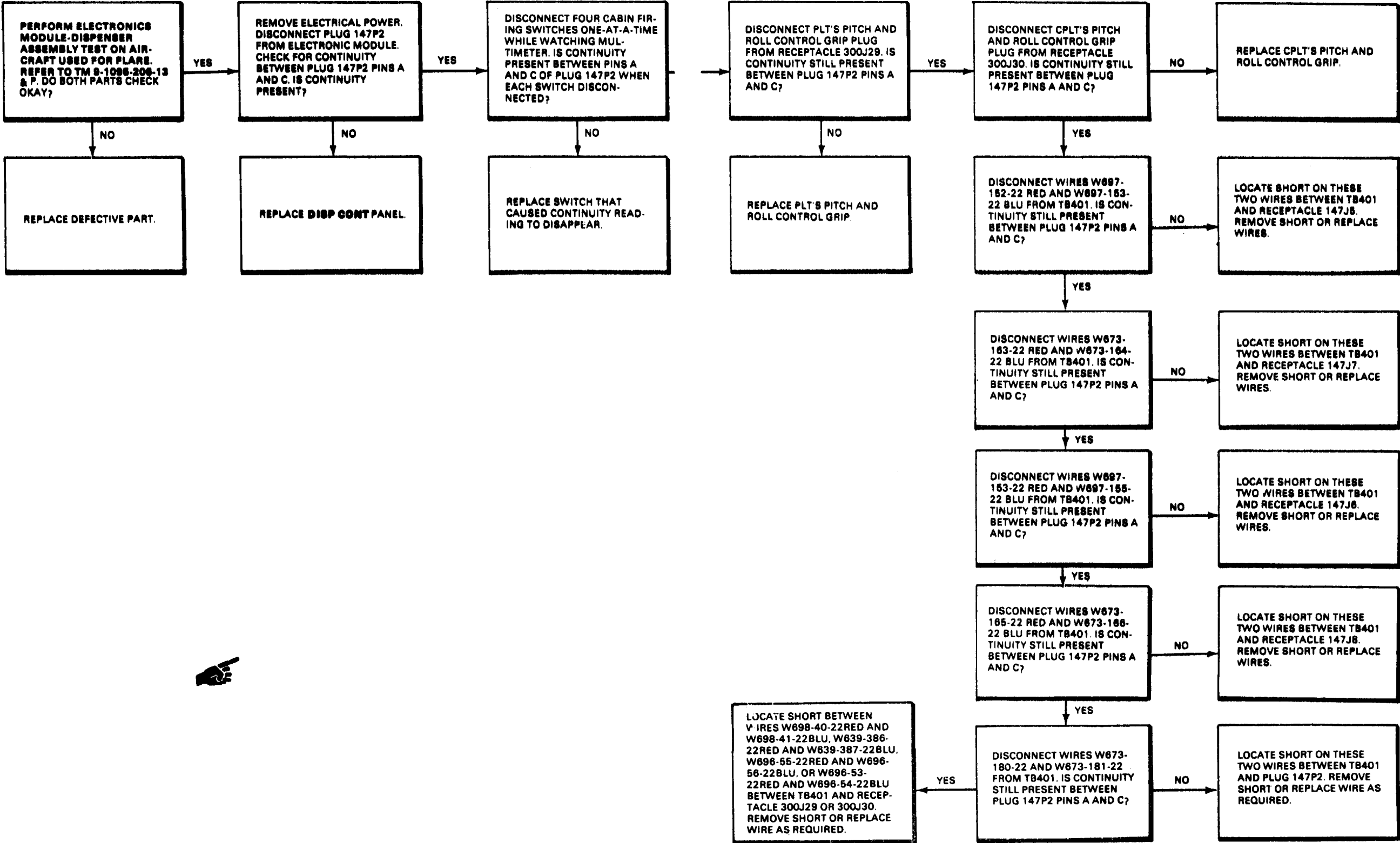


DI45-12725-SPA

GO TO NEXT PAGE

16-2.11 FLARE COUNTER SEQUENCES FROM 30 TO 00  
WHEN DISP CONT PANEL ARM SAFE SWITCH  
SET TO ARM (Continued)

16-2.11



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178
- Multimeter

Materials:

None

Personnel Required:

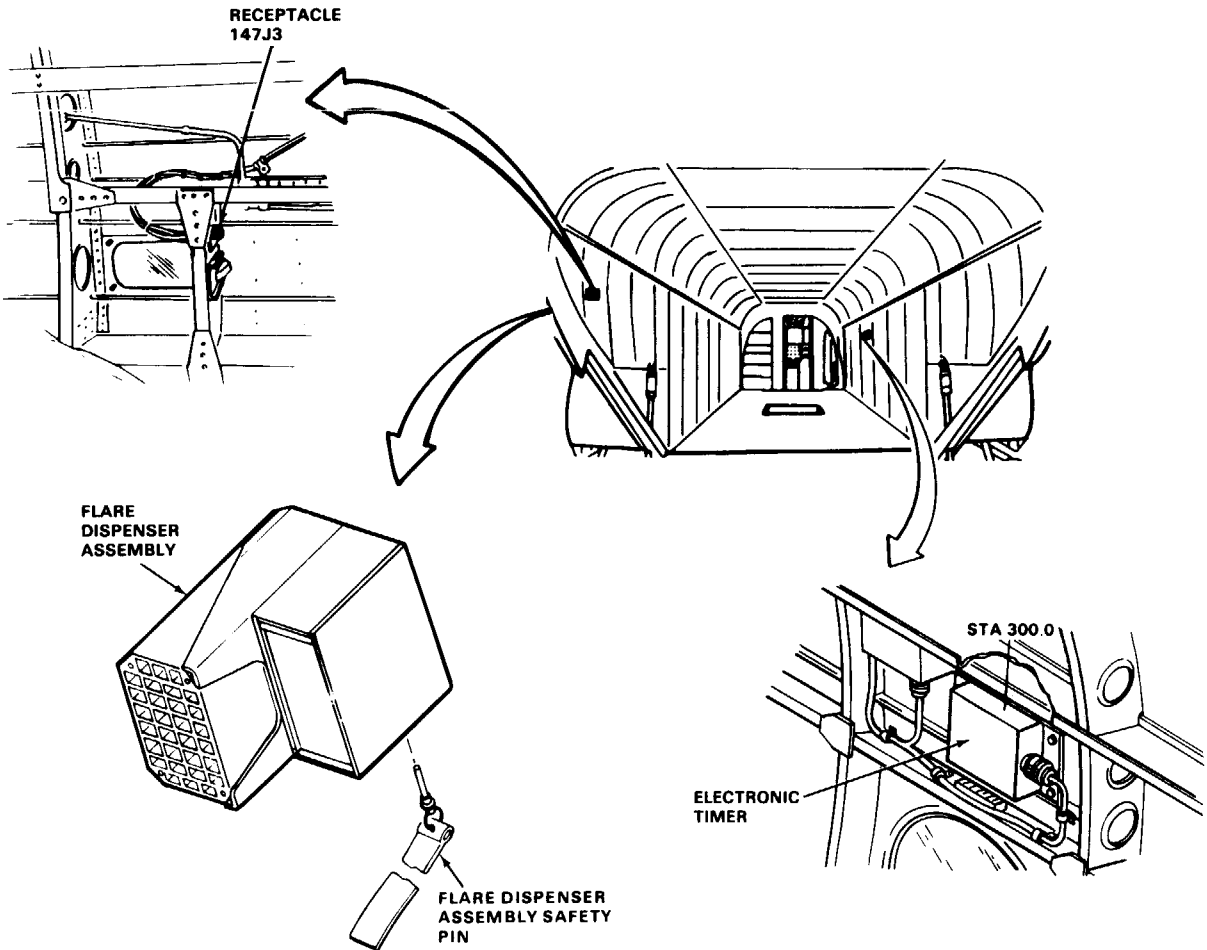
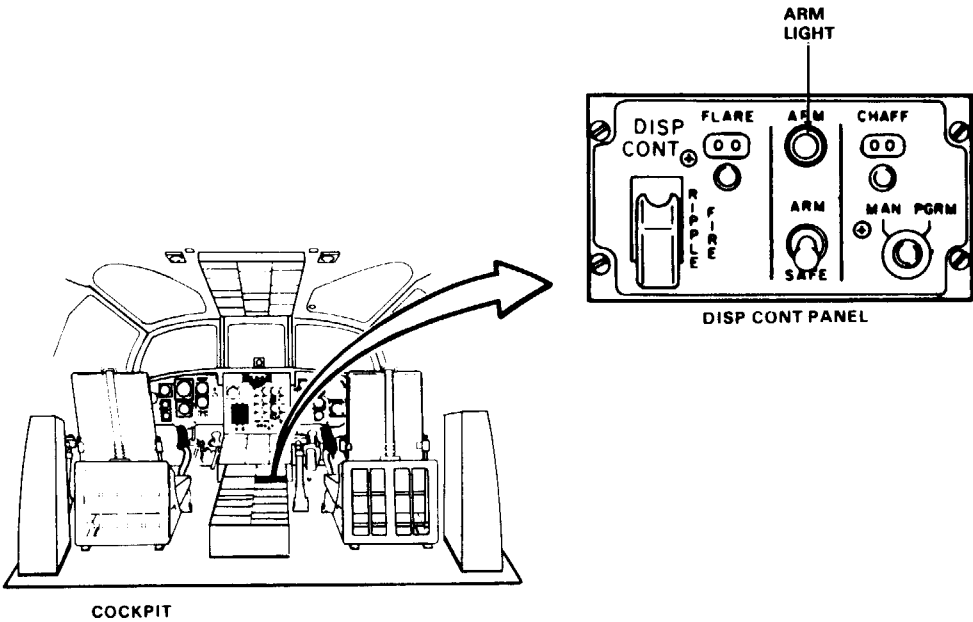
Avionics Mechanic (2)

References:

- TM 9-1095-206-13 & P
- TM 55-1520-240-23

Equipment Condition:

- TM 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

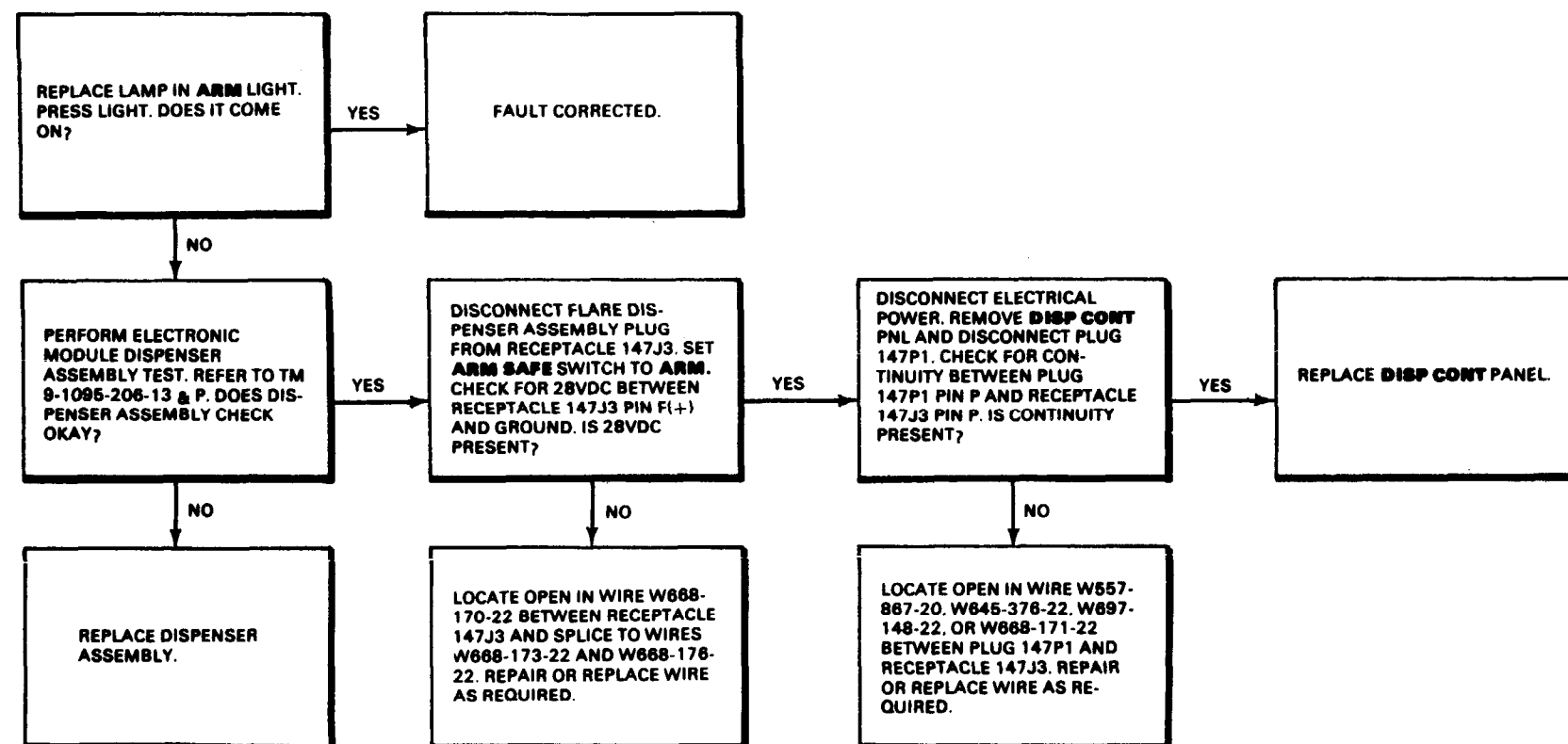


17329

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16-2.12 ARM LIGHT DOES NOT COME ON WHEN ARM SAFE  
SWITCH SET TO ARM (Continued)

16-2.12



END OF TASK

Change 2 16-99



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

- Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178
- Multimeter

Materials:

None

Personnel Required:

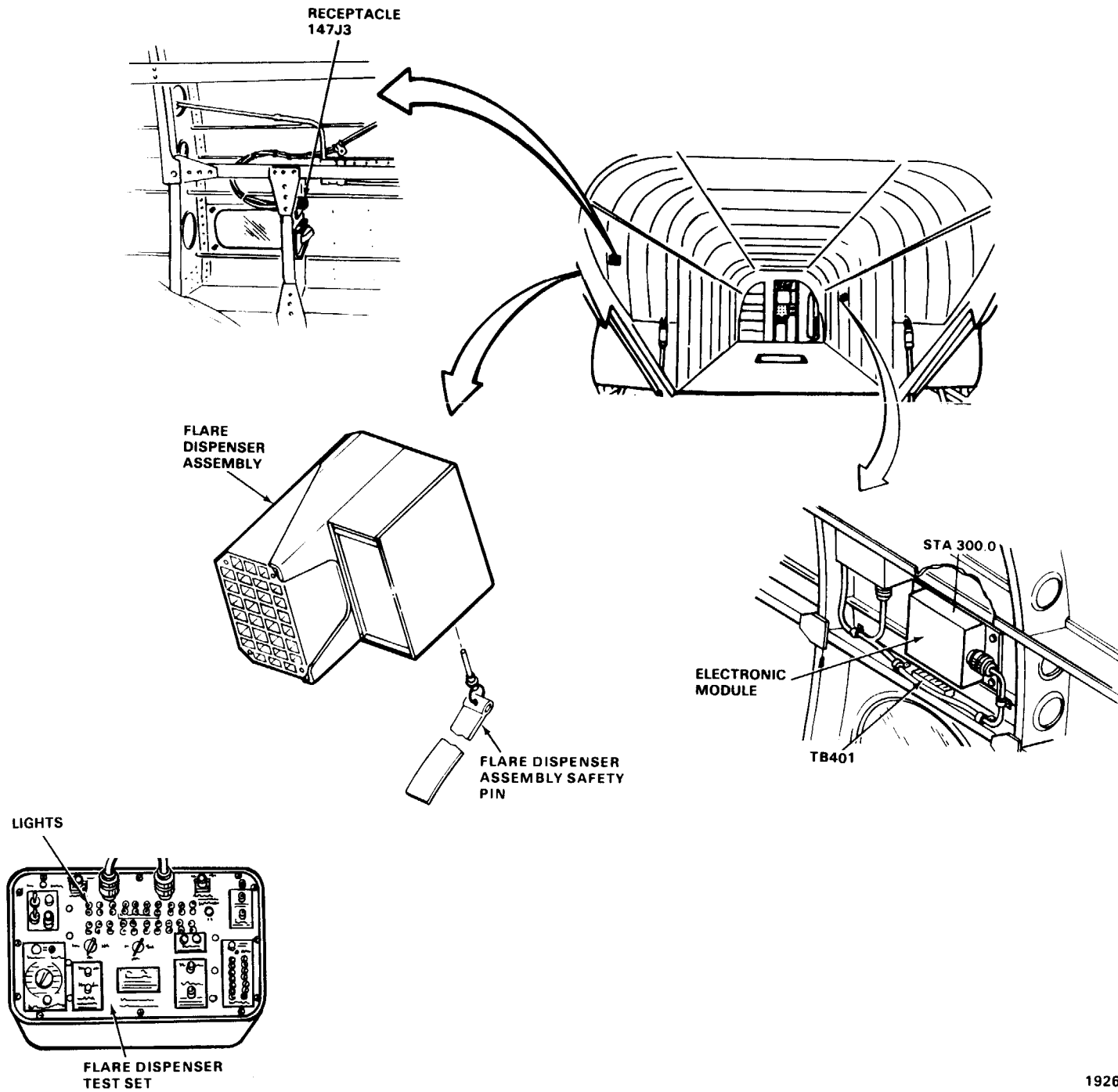
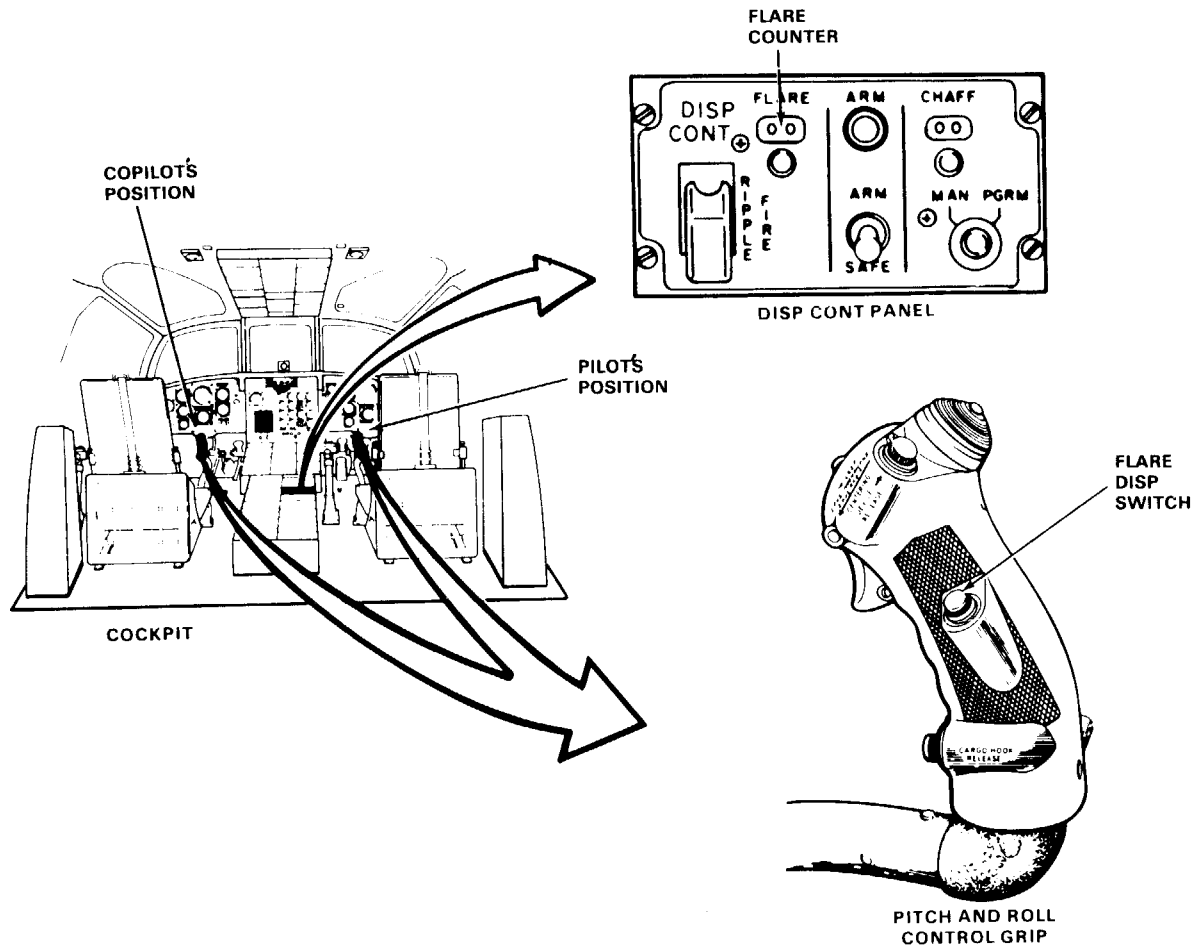
Avionics Mechanic (2)

References:

- TM 9-1095-206-13&P
- TM 55-1520-240-23

Equipment Condition:

- BH 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

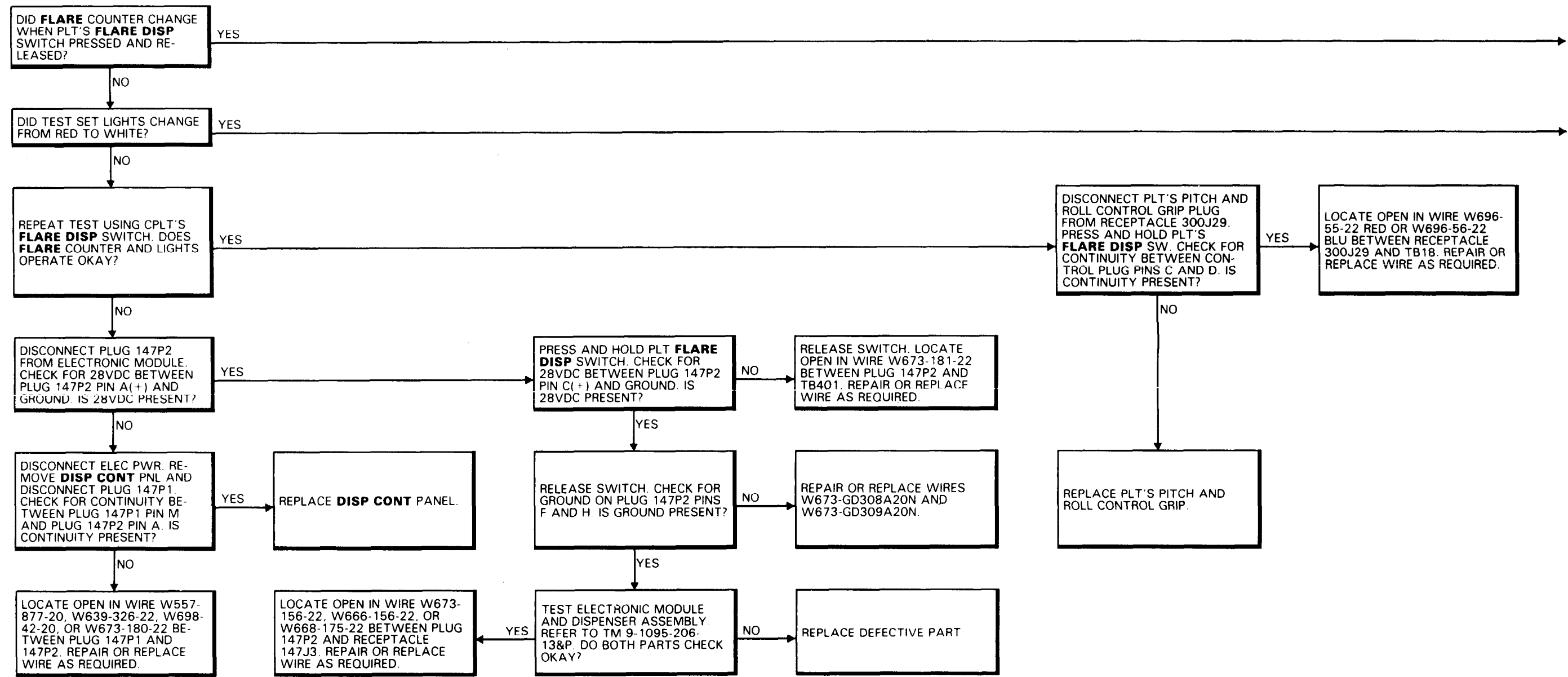


19265

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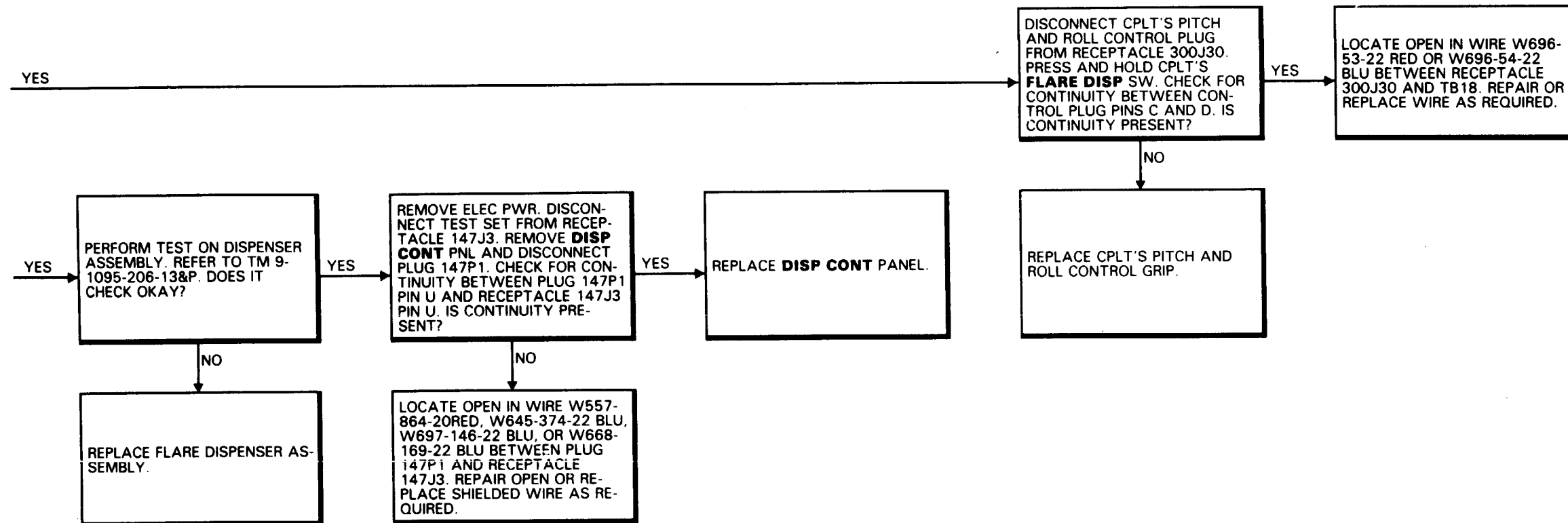
16-2.13 FLARE COUNTER OR TEST SET LIGHTS DO NOT CHANGE WHEN PILOT OR COPILOT FLARE DISP SWITCH PRESSED AND RELEASED (Continued)

16-2.13



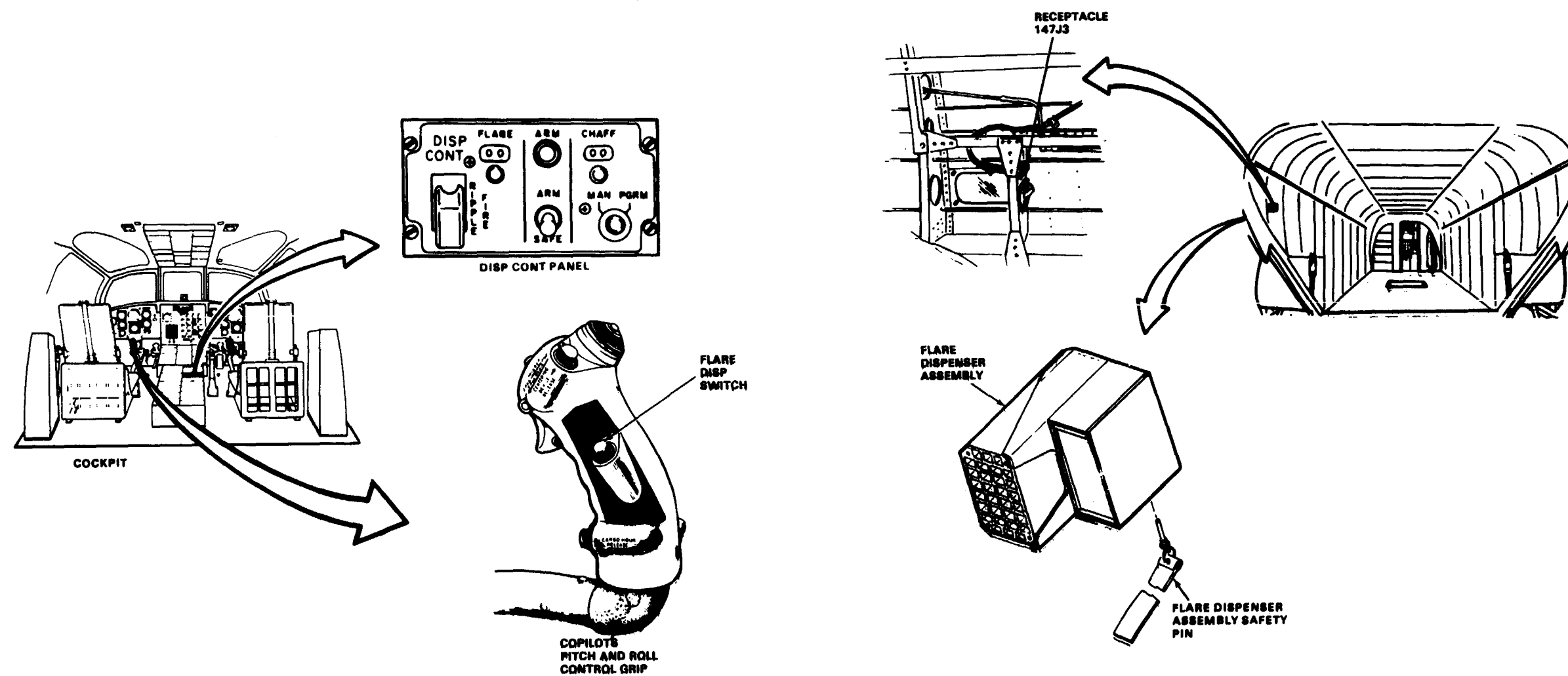
16-2.13 FLARE COUNTER OR TEST SET LIGHTS DO NOT CHANGE WHEN PILOT OR COPILOT FLARE DISP  
SWITCH PRESSED AND RELEASED (Continued)

16-2.13



**16-2.13 FLARE COUNTER OR TEST SET LIGHTS DO NOT CHANGE WHEN PILOT OR COPILOT FLARE  
DISP SWITCH PRESSED AND RELEASED (Continued)**

**16-2.13**



10228

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

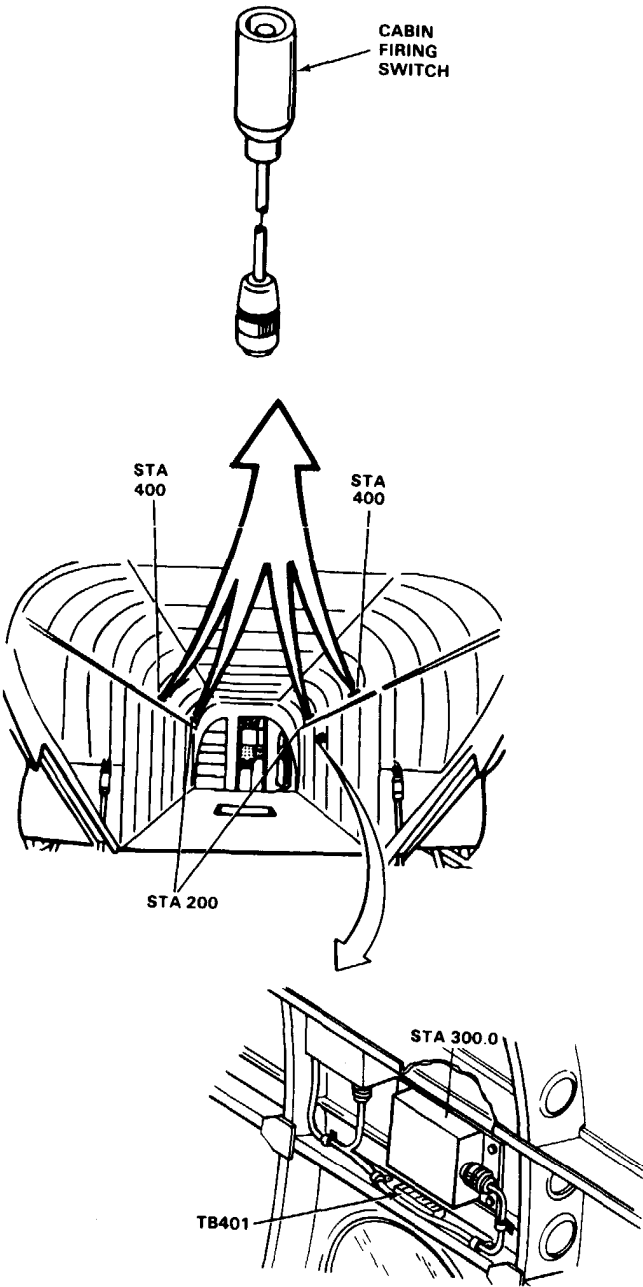
Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
Avionics Mechanic (2)

References:  
TM 9-1095-206-13&P  
TM 55-1520-240-23

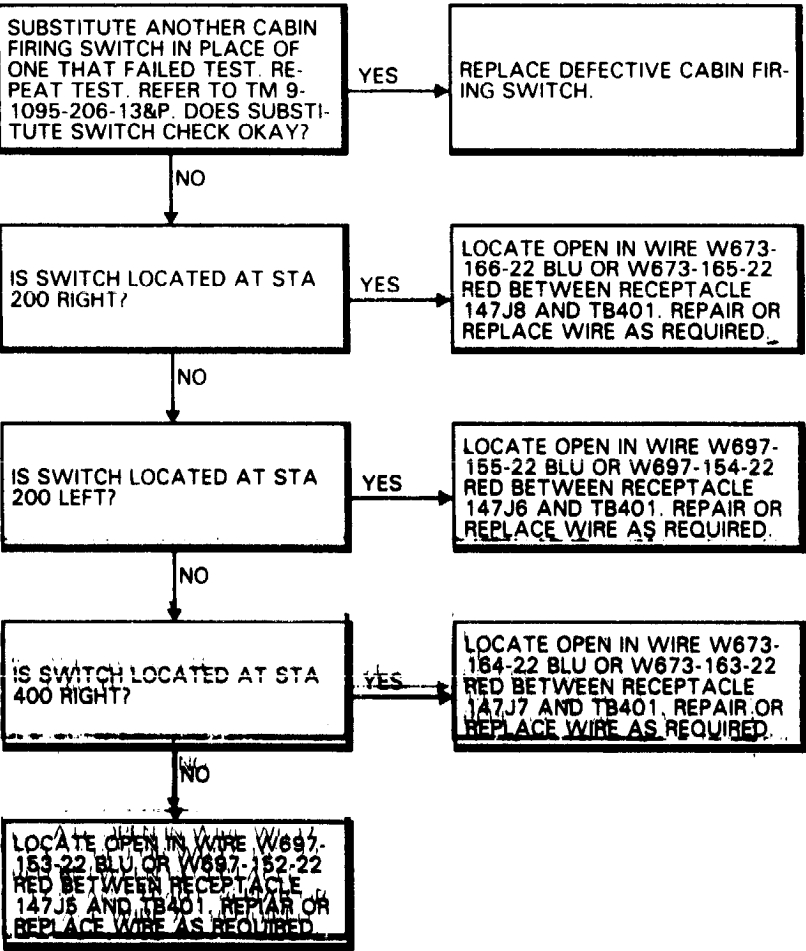
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



GO TO NEXT PAGE

16-2.14 FLARE COUNTER OR TEST SET LIGHTS DO NOT CHANGE WHEN A CABIN FIRING SWITCH  
PRESSED AND RELEASED (Continued)

16-2.14



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

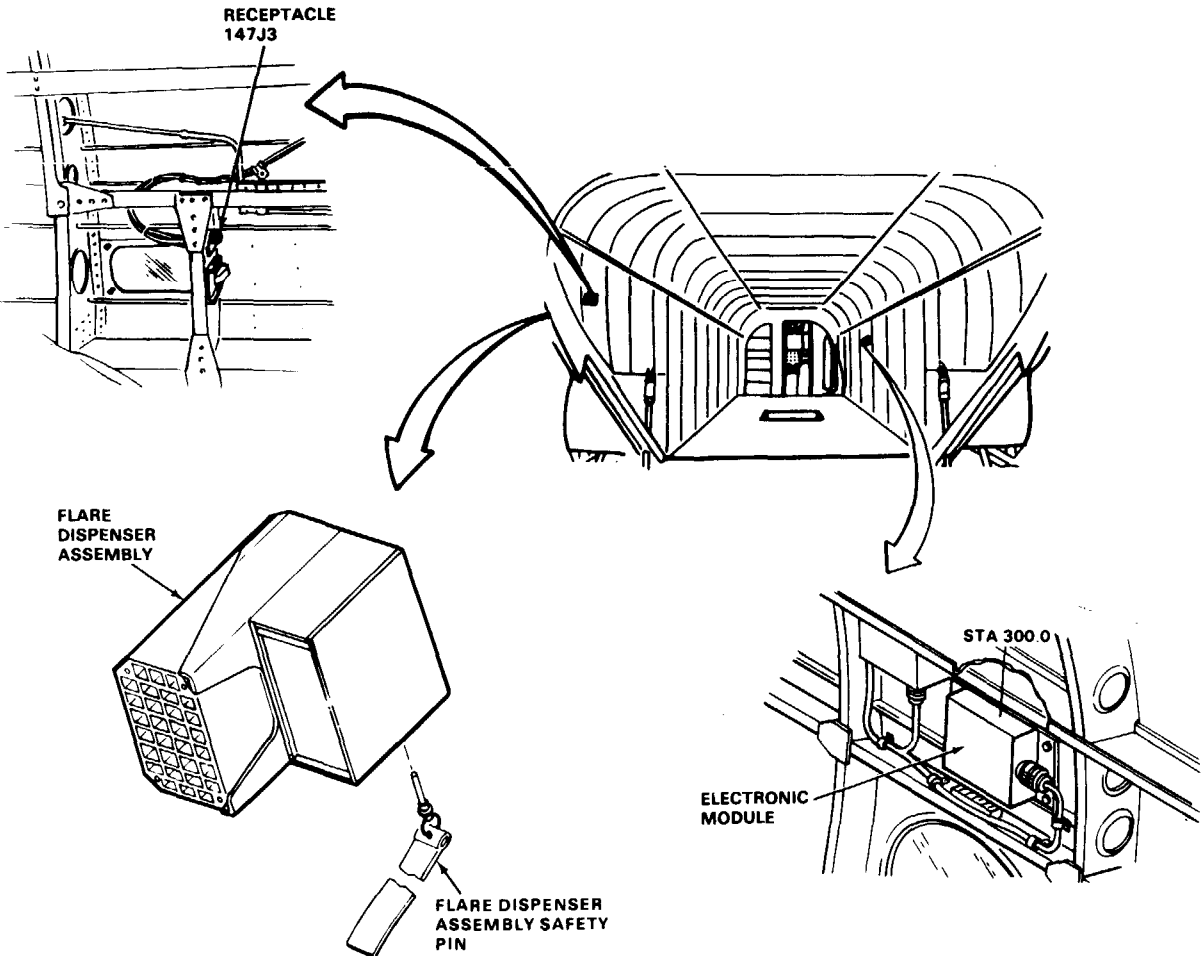
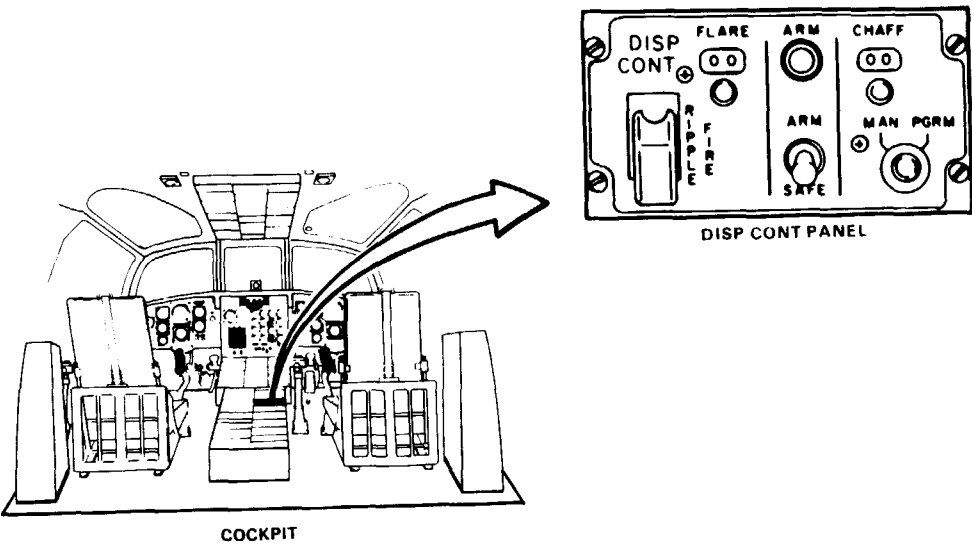
Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
Avionics Mechanic (2)

References:  
TM 9-1095-206-13&P  
TM 55-1520-240-23

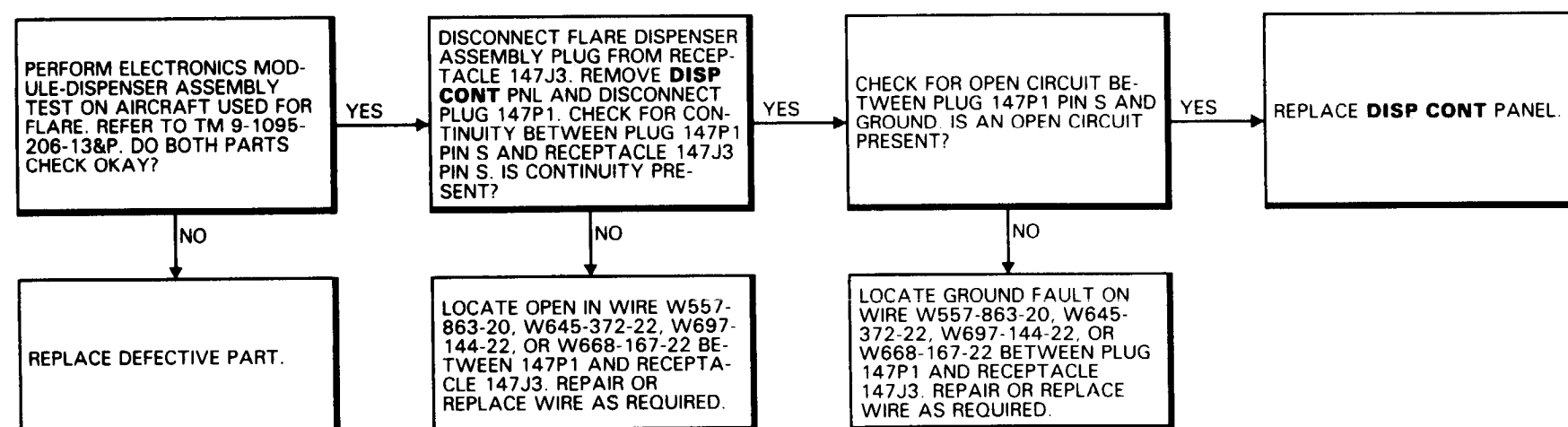
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



10224

## 16-2.15 FLARE COUNTER DOES NOT INDICATE 00 WHEN RIPPLE FIRE SWITCH IS HELD UP (Continued)

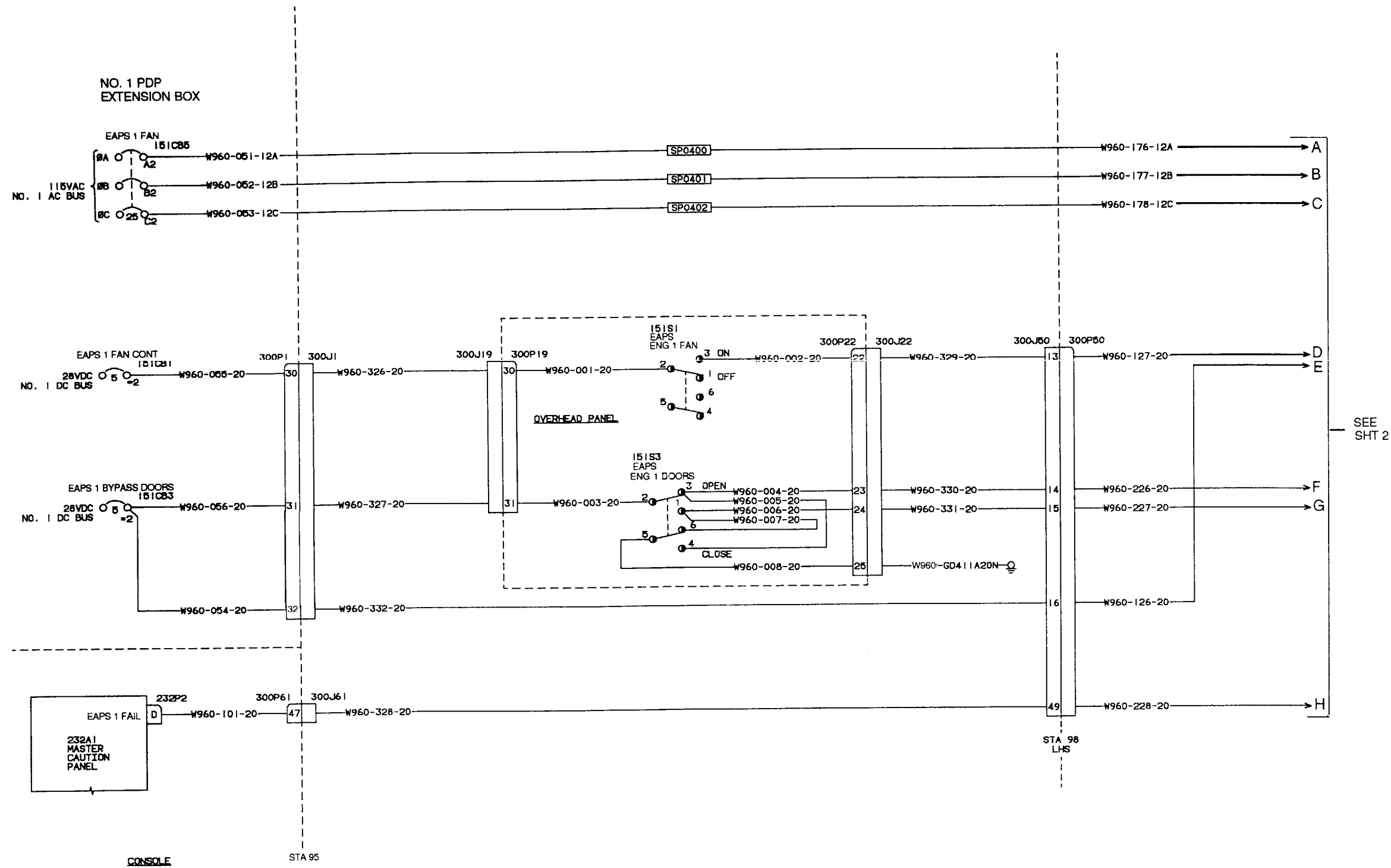
16-2.15





## 16-3 ENGINE AIR PARTICLE SEPARATOR SYSTEM

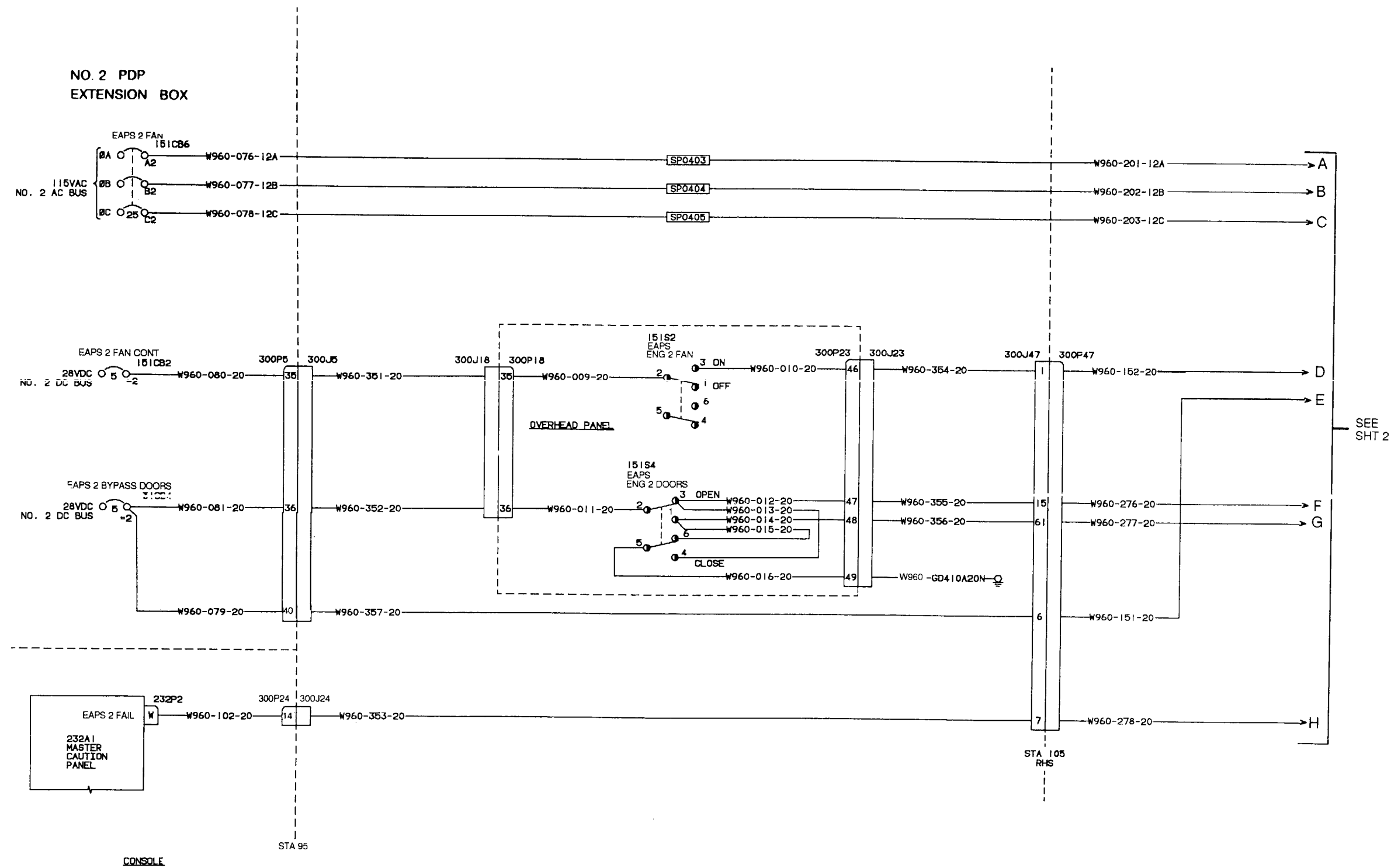




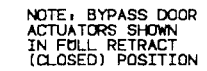


16-3.2 ENGINE NO. 2 AIR PARTICLE SEPARATOR WIRING DIAGRAM

16-3.2



## 6-3.2



INITIAL SETUP

Applicable Configurations”  
Helicopters with Engine Air  
Particle Separator Provisions

Took  
None

Materials  
None

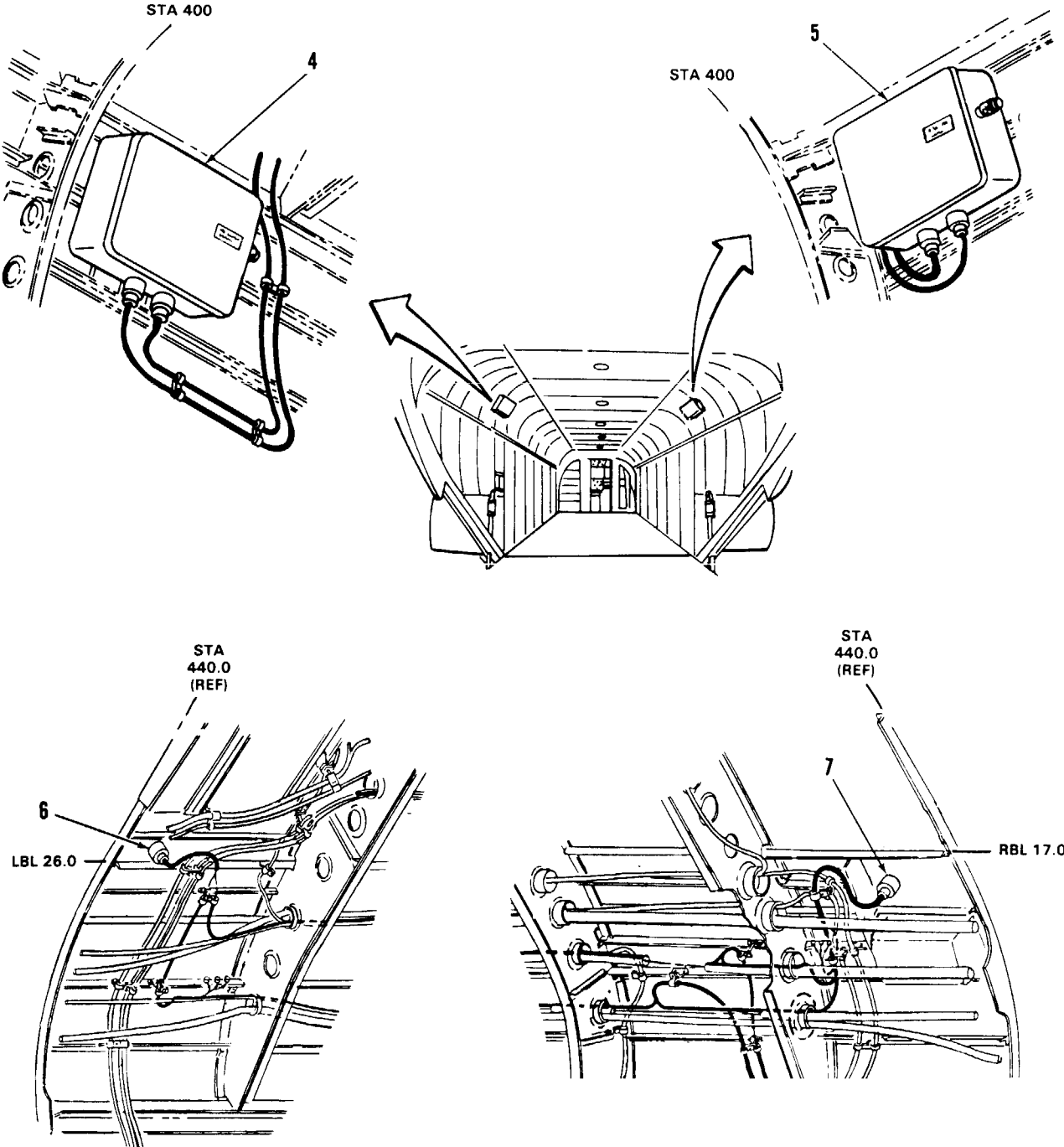
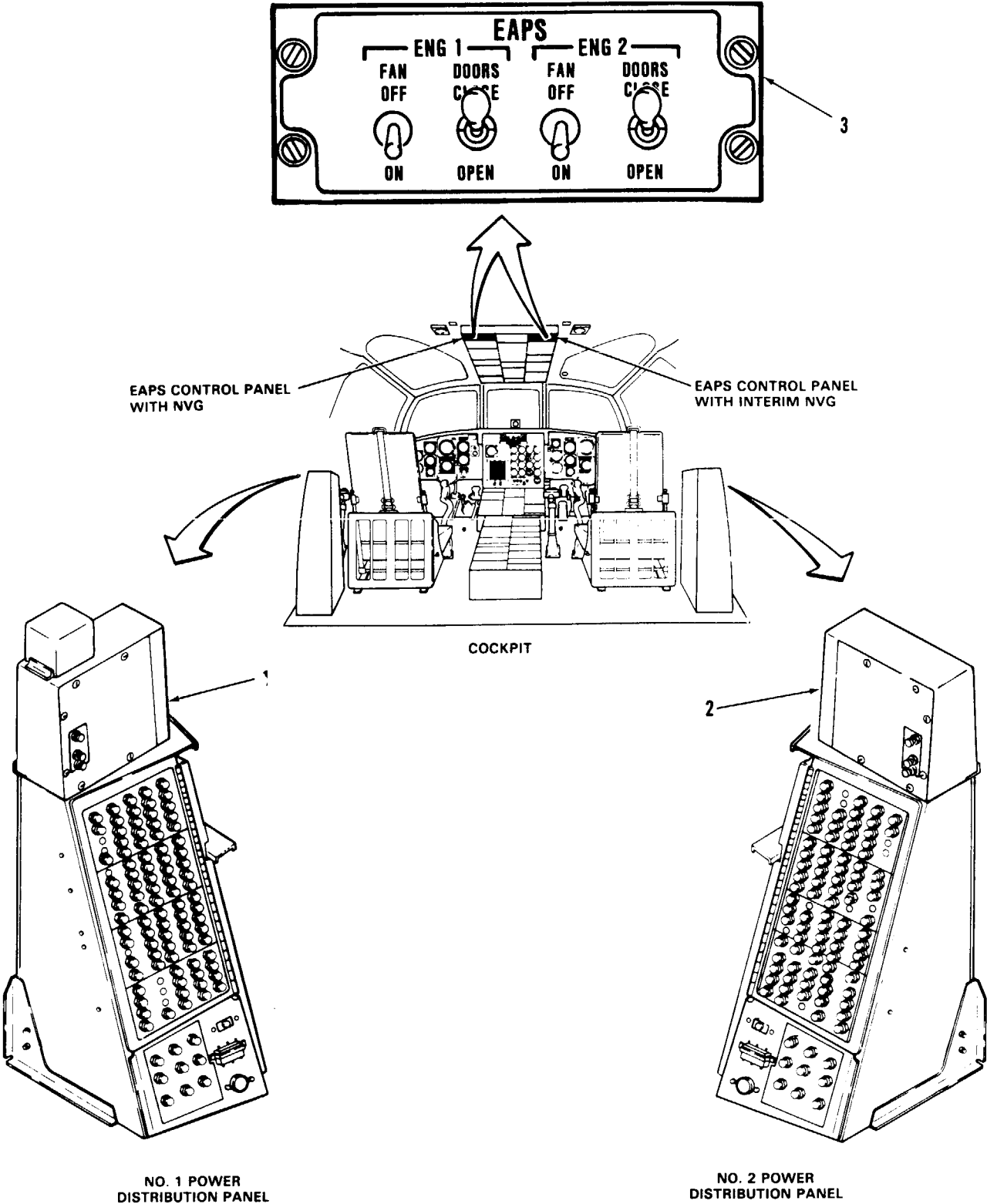
Personnel Required:  
Medium Helicopter Repairer

References  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off

TASK	RESULT
1. Check NO. 1 PDP extension box (1).	No. 1 PDP extension box (1) should be tightly secured and in good condition. If extension box (1) is loose or damaged, repair or replace it as required.
2. Check NO. 2 PDP extension box (2).	No. 2 PDP extension box (2) should be tightly secured and in good condition. If extension box (2) is loose or damaged, repair or replace it as required.
3. Check EAPS control panel (3).	EAPS control panel (3) and 4 switches should be in good condition If control panel (3) or switches are damaged, repair or replace them as required.
4. Check NO. 1 EAPS control box (4).	No. 1 EAPS control box (4) should be tightly secured and in good condition. If control box (4) is loose or damaged, repair or replace it as required.
5. Check NO. 2 EAPS control box (5).	No. 2 EAPS control box (5) should be tightly secured and in good condition. If control box. (5) is loose or damaged, repair or replace it as required.
6. Check receptacle 151J1 (6).	Receptacle (6) should be tightly secured to aircraft skin and in good condition. All receptacle pins should be in good condition and properly seated, If recepta- cle or pins are damaged, repair or replace them as required.
7. Check receptacle 151J2 (7).	Receptacle (7) should be tightly secured to aircraft skin and in good condition. All receptacle pins should be in good condition and properly seated. If recepta- cle or pins are damaged, repair or replace them as required.

FOLLOW-ON MAINTENANCE:  
None



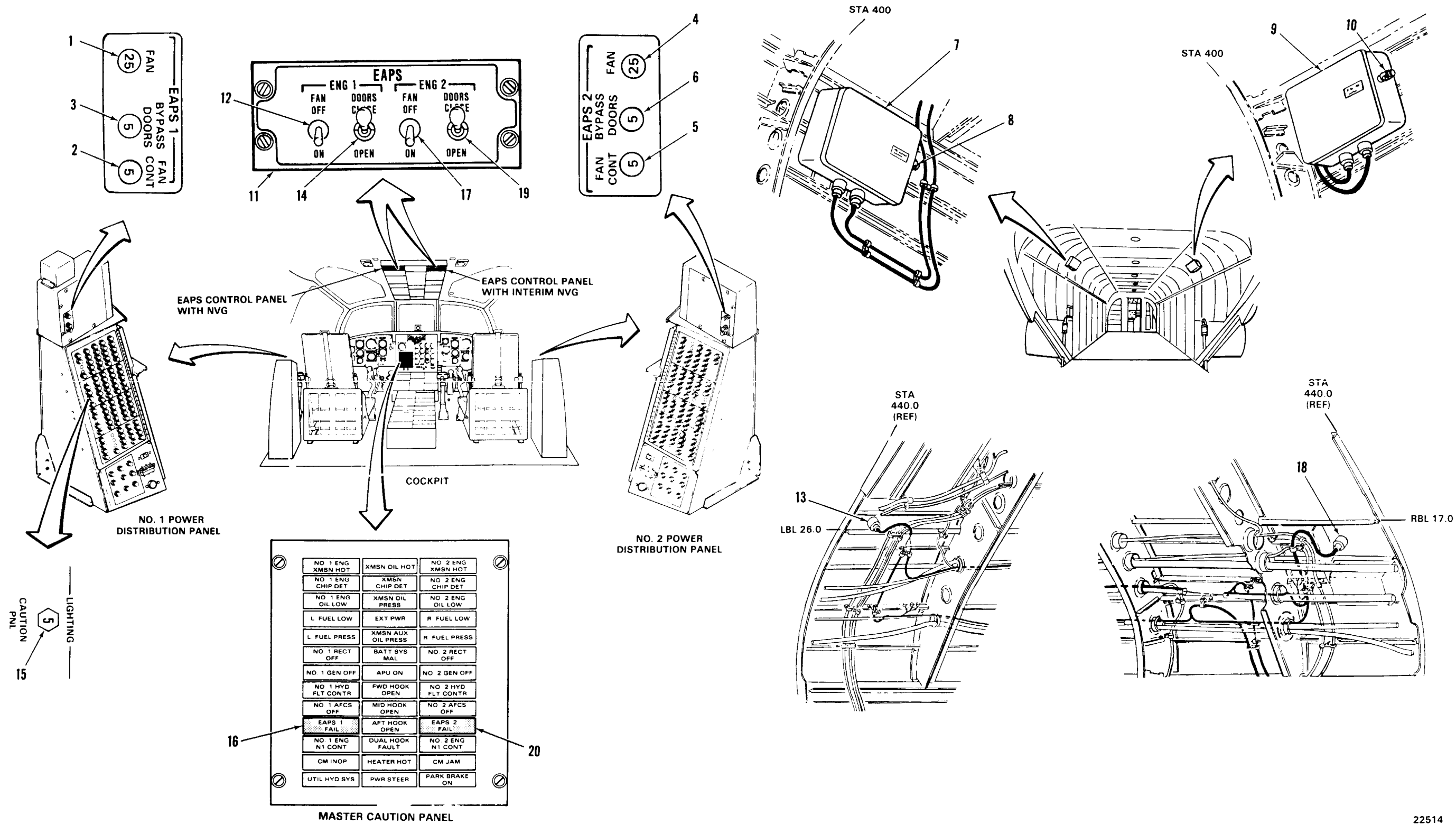
INITIAL SETUP	References: TM 55-1520-240-23
<b>Applicable Configurations:</b> Helicopters with Engine Air Particle Separator Provisions	
<b>Tools:</b> Electrical Repairer's Tool Kit, NSN 5180-00-323-4915 Multimeter	<b>Equipment Condition:</b> TM 55-1520-240-23: Battery Connected Electrical Power On Hydraulic Power Off Visual Check of Engine Air Particle Separator Provisions Performed
<b>Materials:</b> None	
<b>Personnel Required:</b> Aircraft Electrician (2)	

TASK	RESULT
CHECK CIRCUIT BREAKERS	
1. On NO. 1 PDP extension box, close the following circuit breakers: EAPS 1 FAN (1) EAPS 1 FAN CONT (2) EAPS 1 BYPASS DOORS (3)	If any circuit breaker opens, close it. If EAPS 1 FAN circuit breaker (1) opens again, go to task 4-5. If EAPS 1 FAN CONT circuit breaker (2) opens again, go to task 4-5. If EAPS 1 BYPASS DOORS circuit breaker (3) opens again, go to task 4-5.
2. On NO. 2 PDP extension box, close the following circuit breakers: EAPS 2 FAN (4) EAPS 2 FAN CONT (5) EAPS 2 BYPASS DOORS (6)	If any circuit breaker opens, close it. If EAPS 2 FAN circuit breaker (4) opens again, go to task 4-6. If EAPS 2 FAN CONT circuit breaker (5) opens again, go to task 4-6. If EAPS 2 BYPASS DOORS circuit breaker (6) opens again, go to task 4-6.
3. On NO. 1 Engine EAPS control box (7), press to test EAPS BYPASS DOORS OPEN light (8).	EAPS BYPASS DOORS OPEN light (8) shall come on momentarily. If it does not, replace bulb. Press to test light again. If light still does not come on, go to task 4-7.
4. On NO. 2 Engine EAPS control box (9), press to test EAPS BYPASS DOORS OPEN light (10).	EAPS BYPASS DOORS OPEN light (10) shall come on. If it does not, replace bulb. Press to test light again. If light still does not come on, go to task 16-3.7.
5. ON EAPS control panel (11) set EAPS ENG 1 FAN switch (12) to ON. At receptacle 151J1 (13) check for 115VAC between pin A and ground, pin B and ground, and pin P and ground.	115VAC should be present on pins A, B and P. If 115VAC is not present on any pin, go to task 16-3.8.
6. On EAPS control panel (11) set EAPS ENG 1 DOORS switch (14) to OPEN. At receptacle 151J1 (13) check for 28VDC between pin U and ground. Check for ground on pin a.	If 28VDC is not present on pin U, go to task 16-3.9. If ground is not present on pin a, go to task 16-3.10.
7. On EAPS control panel (11) set EAPS ENG 1 DOORS switch (14) to CLOSE. At receptacle 151J1 (13) check for 28VDC between pin a and ground. Check for ground on pin U.	If 28VDC is not present on pin a, go to task 16-3.11. If ground is not present on pin U, go to task 16-3.12.

TASK	RESULT
8. Check for ground on receptacle 151J1 pins G, D and V.	If ground is not present, repair or replace wire between receptacle and ground stud.
9. At receptacle 151J1 (13) place a jumper wire between pins F & G. On NO. 1 PDP, close CAUTION PNL LIGHTING circuit breaker (15).	On Master Caution Panel, EAPS 1 FAIL capsule (16) shall come on. If it does not, go to task 16-3.13.
10. On EAPS control panel (11), set EAPS ENG 2 FAN switch (17) to ON At receptacle 151J2 (18), check for 115VAC between pin A and ground, pin B and ground, and pin P and ground.	115VAC shall be present on pins A, B and P. If 115VAC is not present on any pin, go to task 16-3.14.
11. ON EAPS control panel (14) set EAPS ENG 2 DOORS switch (19) to OPEN. At receptacle 151J2 (18) check for 28VDC between pin U and ground. Check for ground on pin a.	If 28VDC is not present on pin U, go to task 16-3.15. If ground is not present on pin a, go to task 16-3.16.
12. On EAPS control panel (14) set EAPS ENG 2 DOORS switch (19) to CLOSE. At receptacle 151J2 (18) check for 28 VDC between pin a and ground. Check for ground on pin U.	If 28VDC is not present on pin a, go to task 16-3.17 If ground is not present on pin U, go to task 16-3.18.
13. Check for ground on receptacle 151J2 pins G, D and V.	If ground is not present, repair or replace wire between receptacle and ground stud,
14. At receptacle 151 J2 (18), place a jumper wire between pins F & G.	On master caution panel, EAPS 2 FAIL capsule (20) shall come on. If it does not, go to task 16-3.19.
15. Remove jumper wires from receptacles 151J1 and 151J2.	

FOLLOW ON MAINTENANCE:  
Turn Off Electrical Power  
Disconnect Battery





22514

16-3.5 EAPS 1 FAN, FAN CONT OR BYPASS DOORS CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

Helicopters with Engine Air Particle Separator Provisions

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

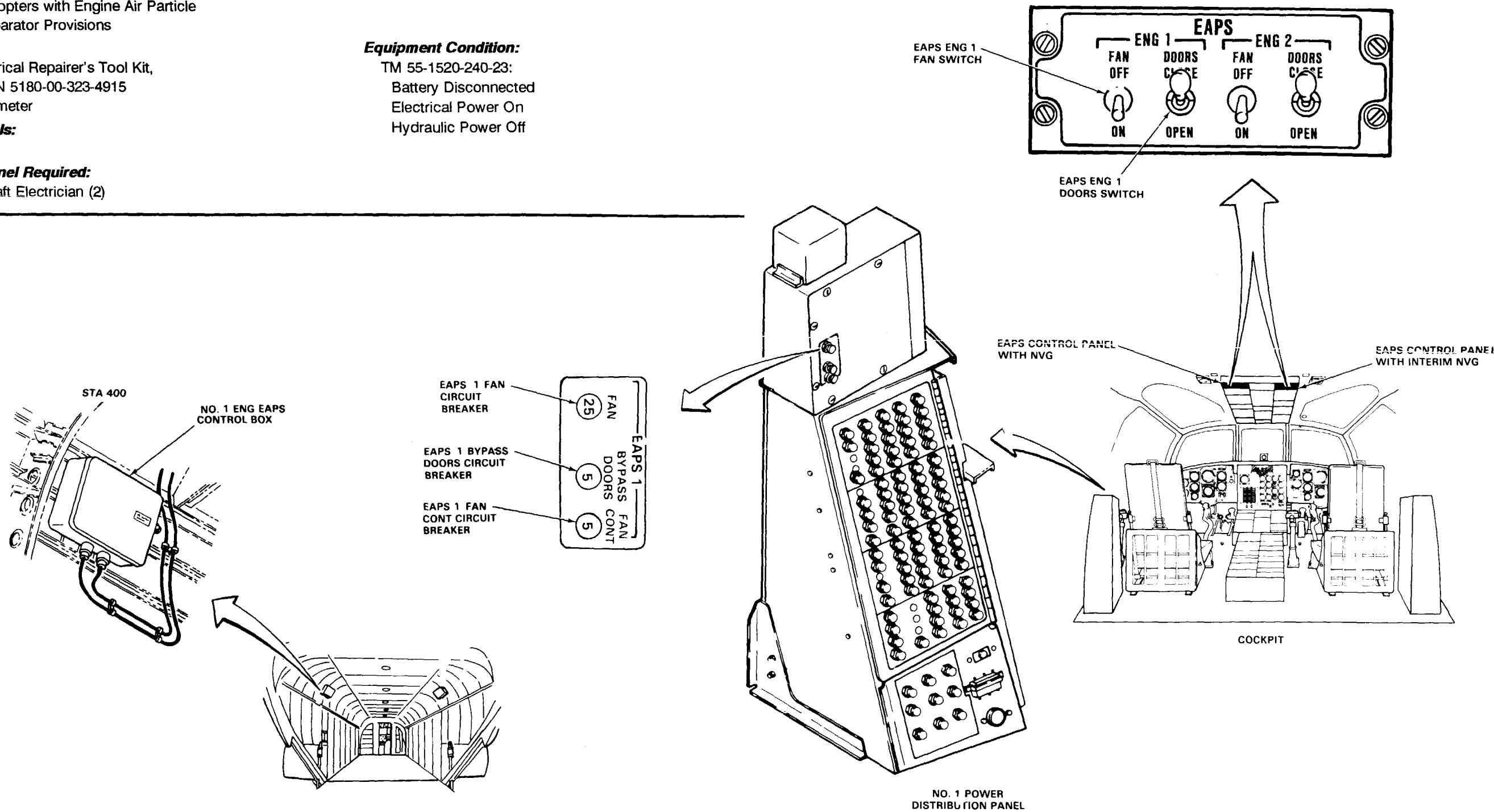
Aircraft Electrician (2)

References:

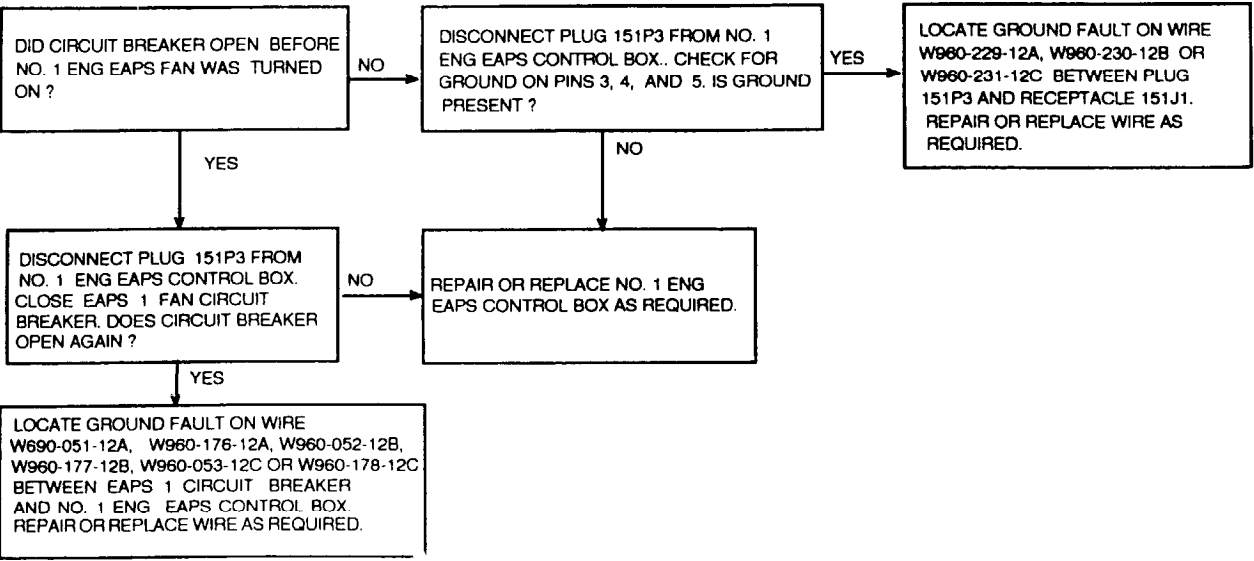
TM 55-1520-240-23

Equipment Condition:

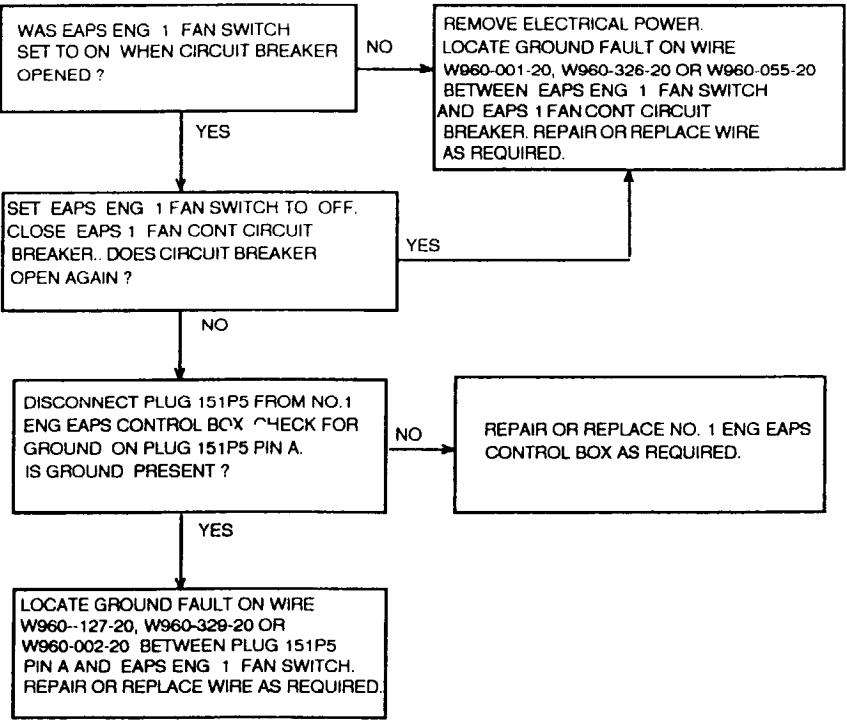
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power On  
Hydraulic Power Off



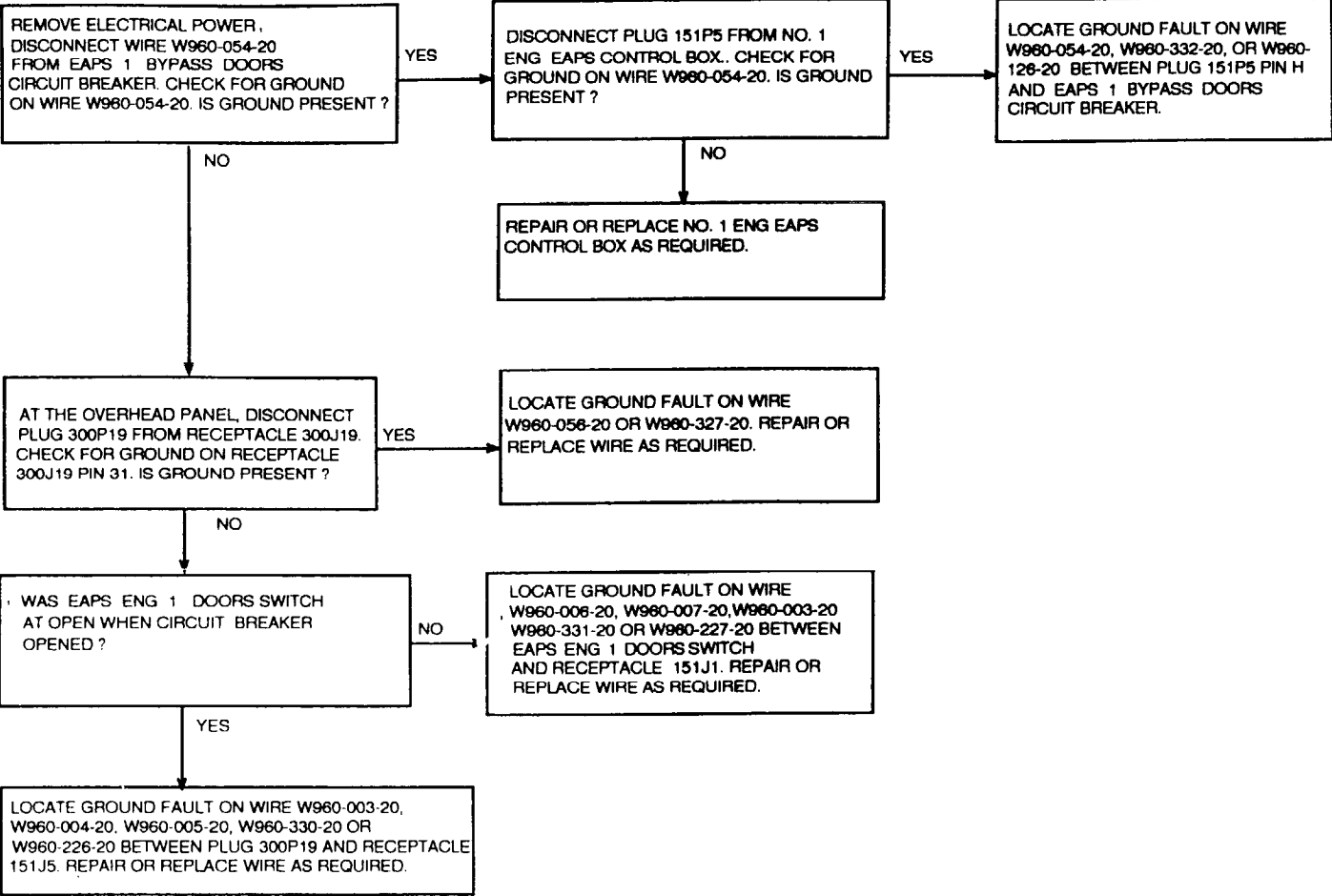
EAPS 1 FAN CB WILL NOT STAY CLOSED



EAPS 1 FAN CONT CB WILL NOT STAY CLOSED



EAPS 1 BYPASS DOORS CB WILL NOT STAY CLOSED



FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
Helicopters with Engine Air Particle Separator Provisions

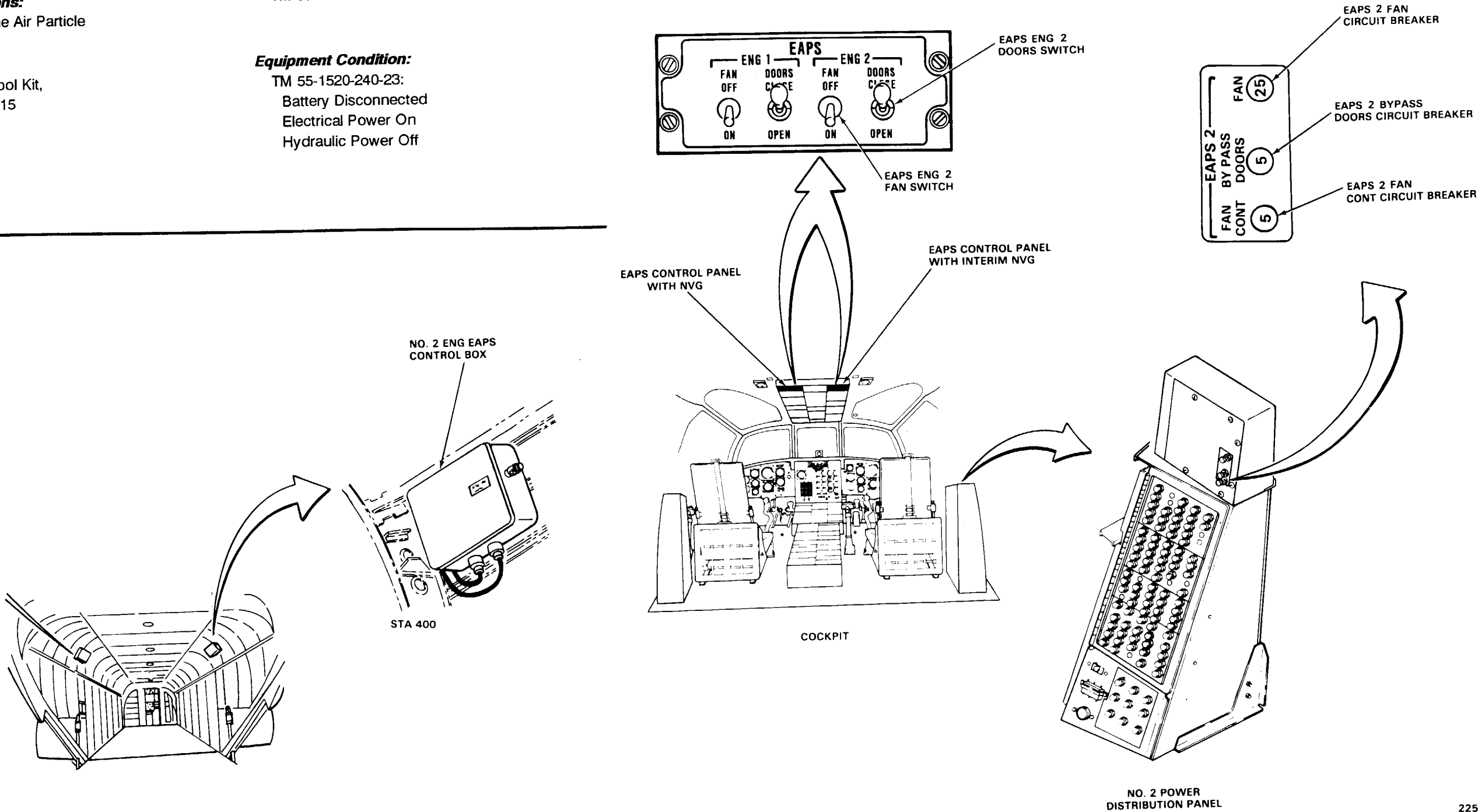
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician (2)

**References:**  
TM 55-1520-240-23

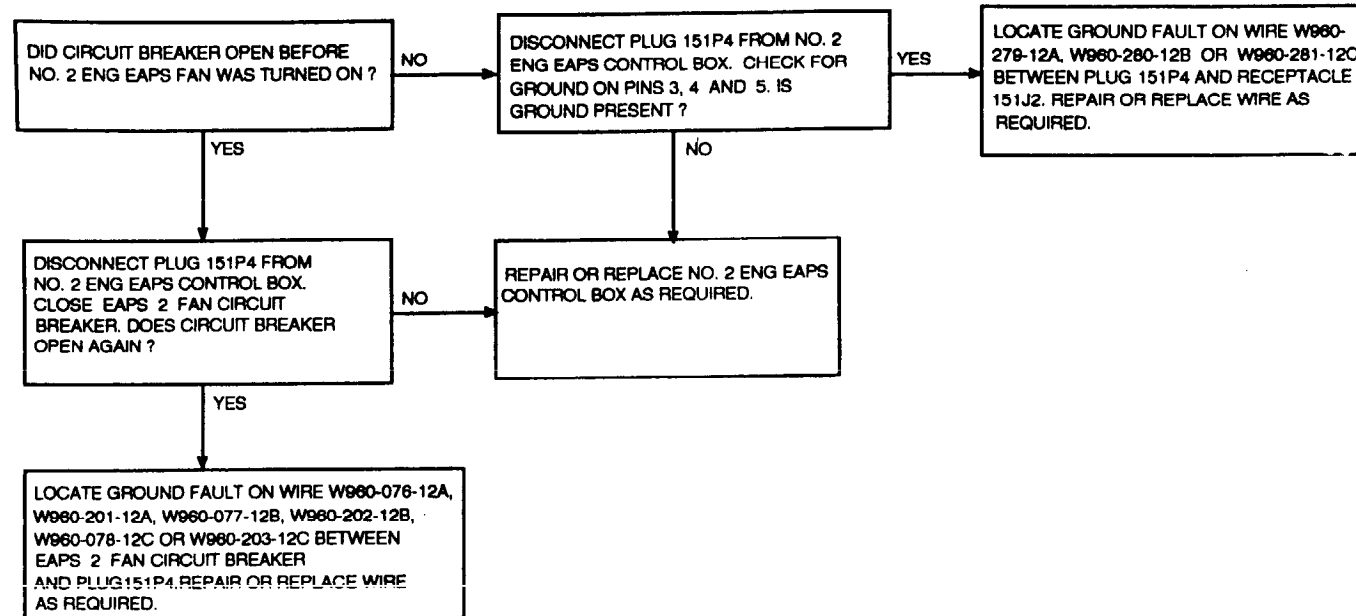
**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power On  
Hydraulic Power Off



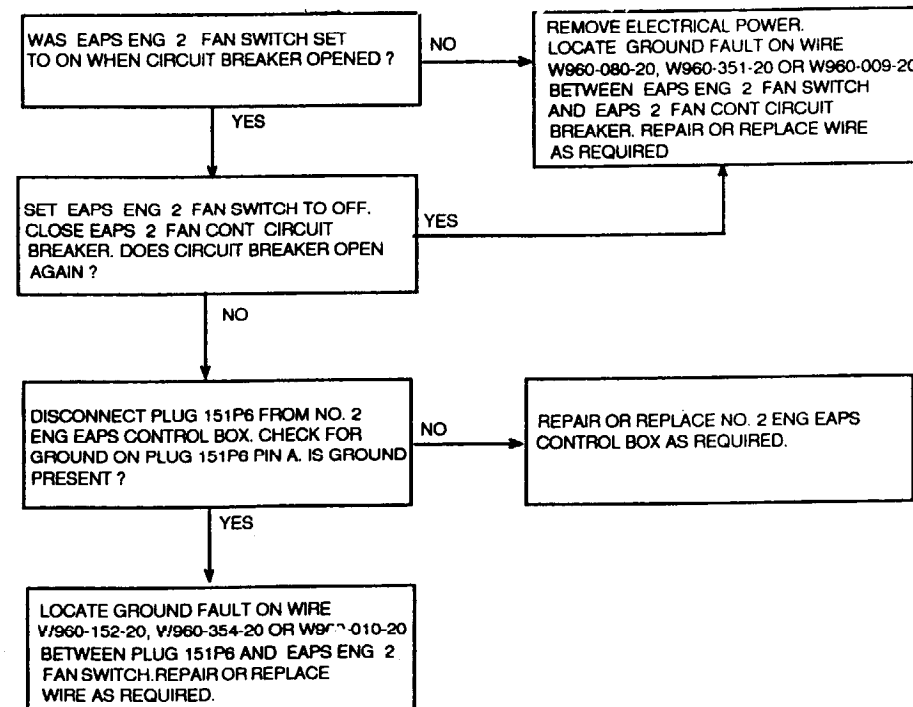
16-3.6 EAPS 2 FAN, FAN CONT OR BYPASS DOORS CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

16-3.6

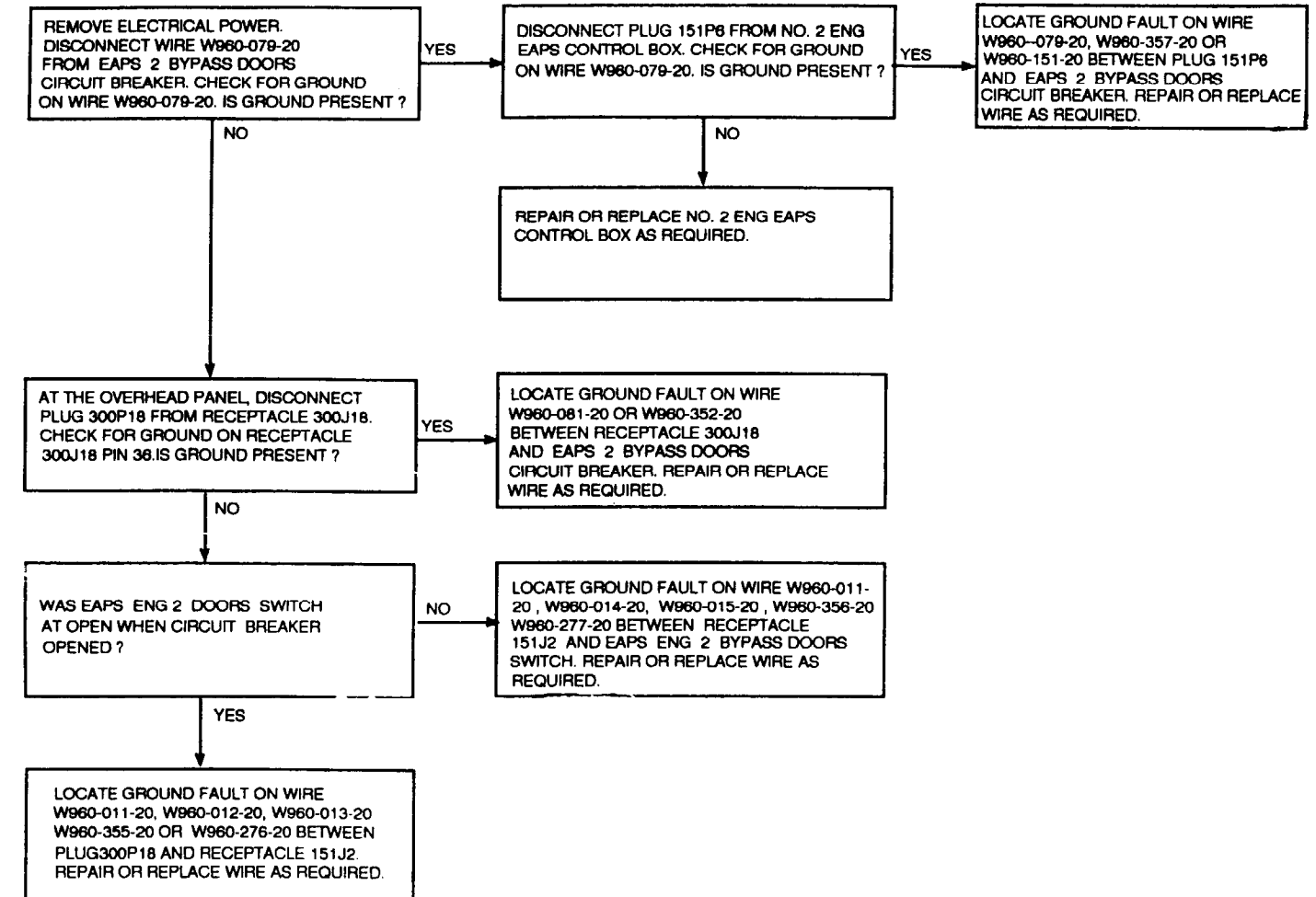
EAPS 2 FAN CB WILL NOT STAY CLOSED.



EAPS 2 FAN CONT CB WILL NOT STAY CLOSED.



EAPS 2 BYPASS DOORS CB WILL NOT STAY CLOSED



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

Helicopters with Engine Air Particle Separator Provisions

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

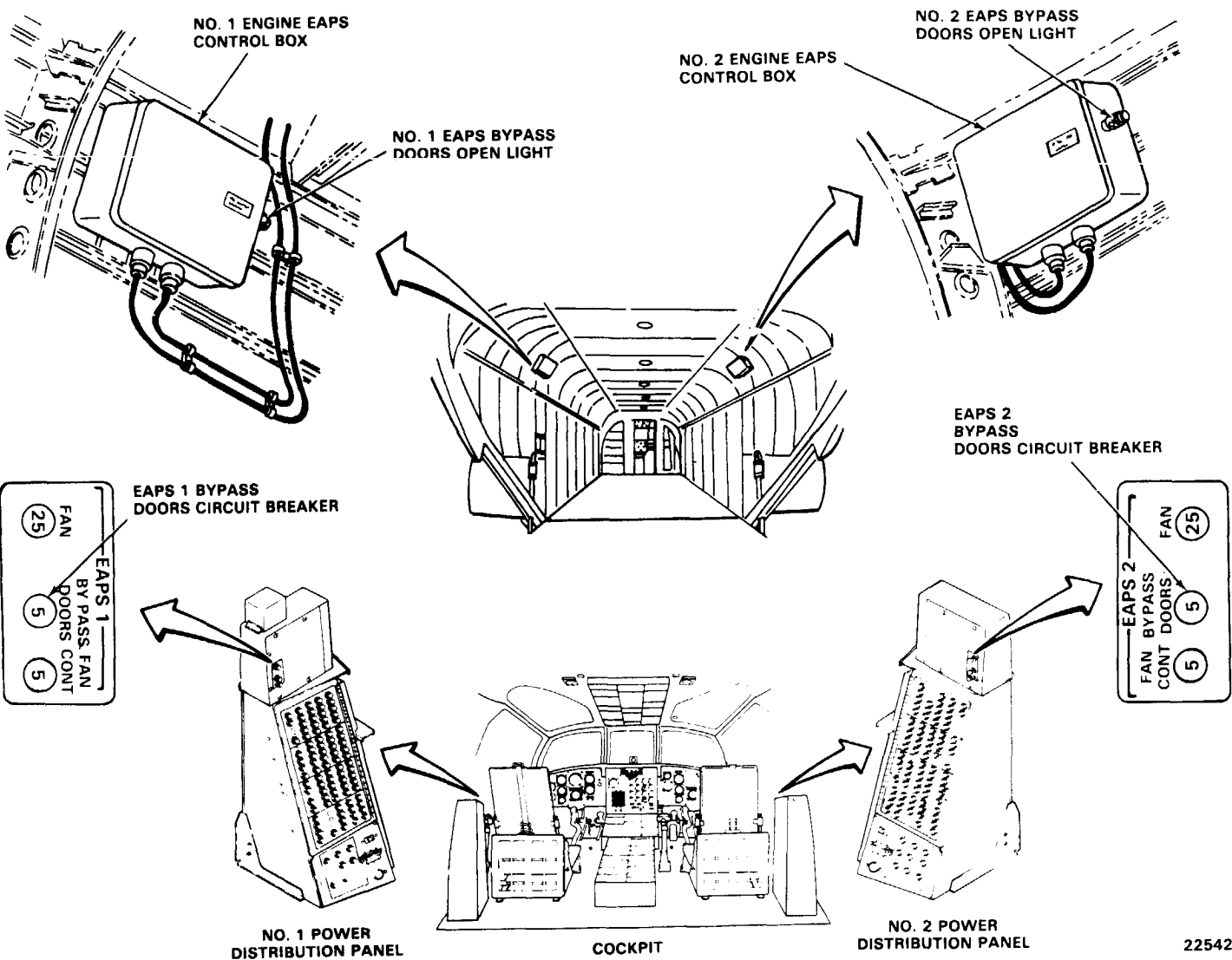
Aircraft Electrician (2)

References:

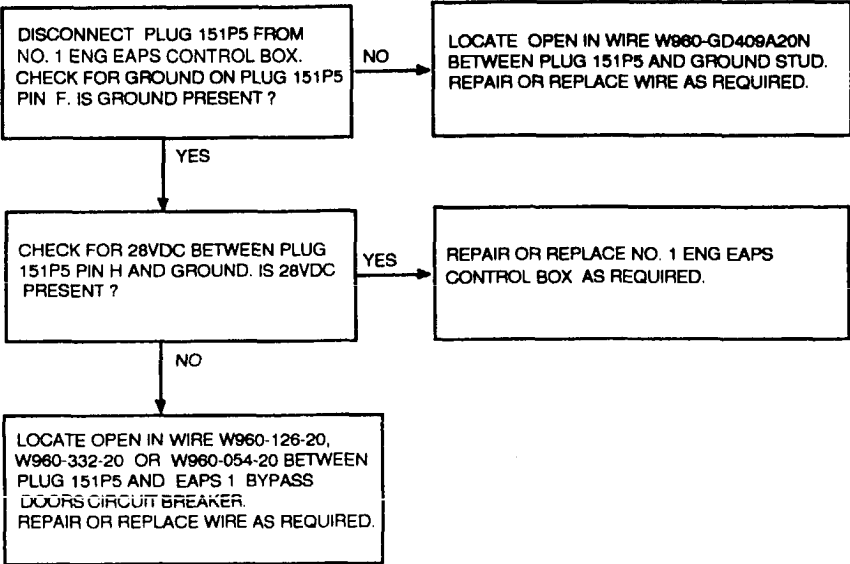
TM 55-1520-240-23

Equipment Condition:

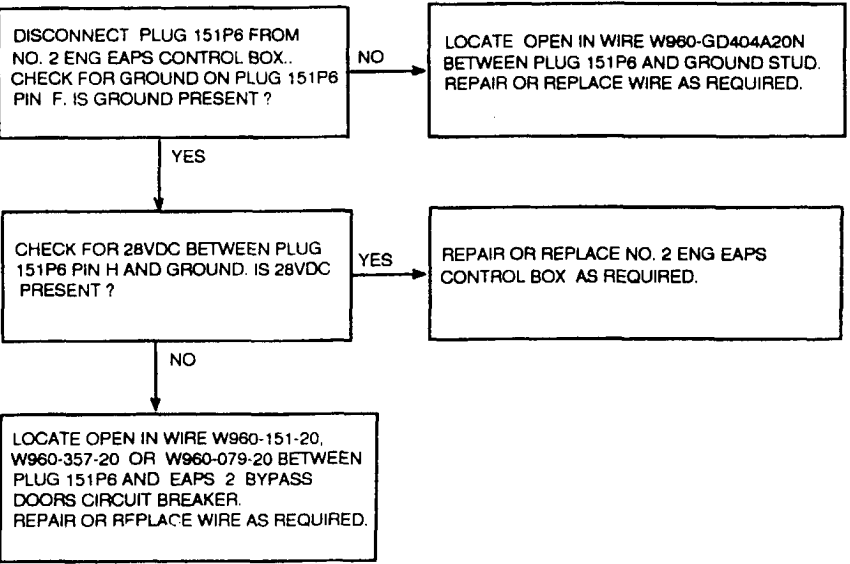
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



NO. 1 EAPS BYPASS DOORS OPEN LIGHT DOES NOT COME ON WHEN PRESSED TO TEST



NO. 2 EAPS BYPASS DOORS OPEN LIGHT DOES NOT COME ON WHEN PRESSED TO TEST



16-3.8 115 VAC IS NOT PRESENT WITH EAPS ENG 1 FAN SWITCH SET TO ON

INITIAL SETUP

**Applicable Configurations:**  
Helicopters with Engine Air Particle  
Separator Provisions

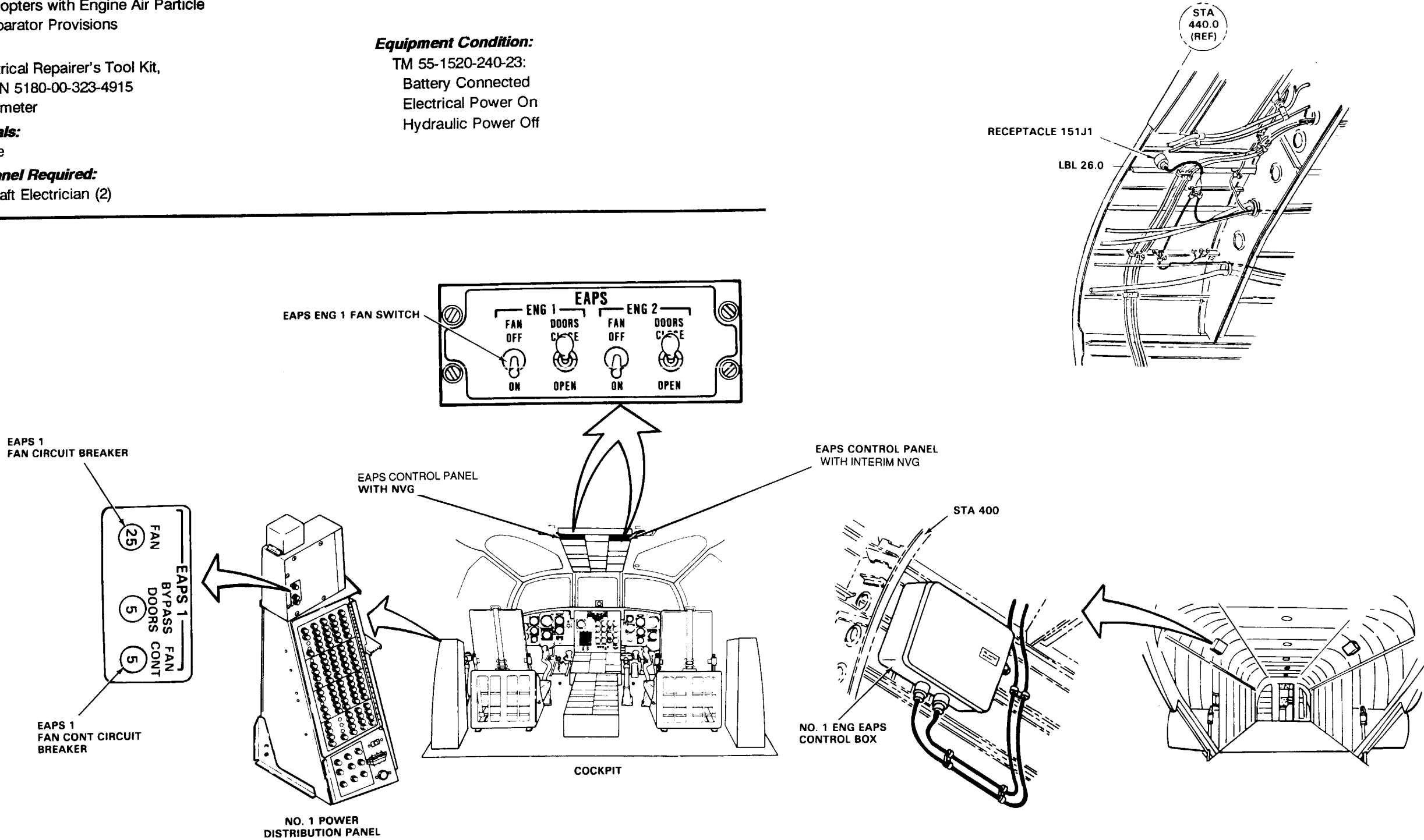
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

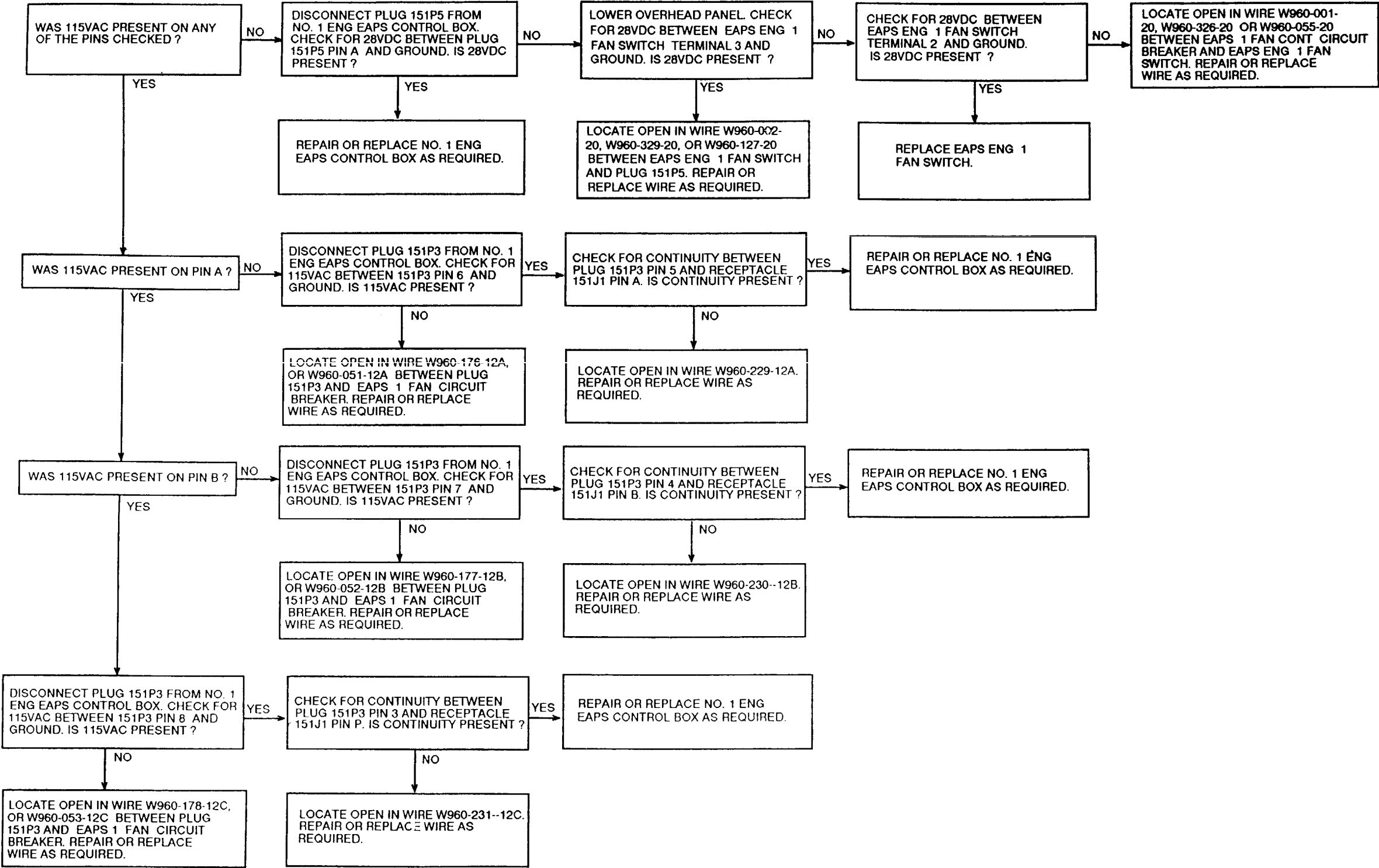
**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician (2)

**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off







# 16-3.9 28 VDC IS NOT PRESENT ON RECEPTACLE 151J1 PIN U WITH EAPS ENG 1 DOORS SWITCH AT OPEN

16-3.9

## INITIAL SETUP

### Applicable Configurations:

Helicopters with Engine Air Particle Separator Provisions

### Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

### Materials:

None

### Personnel Required:

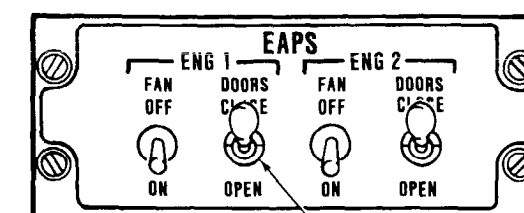
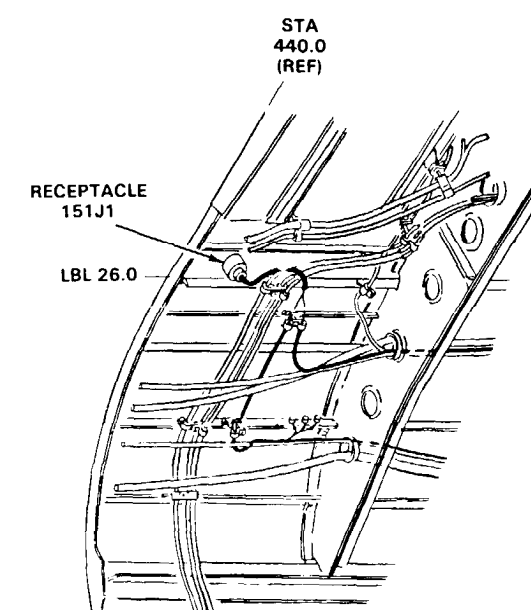
Aircraft Electrician (2)

### References:

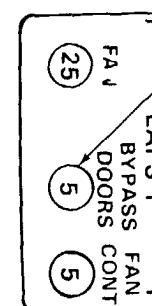
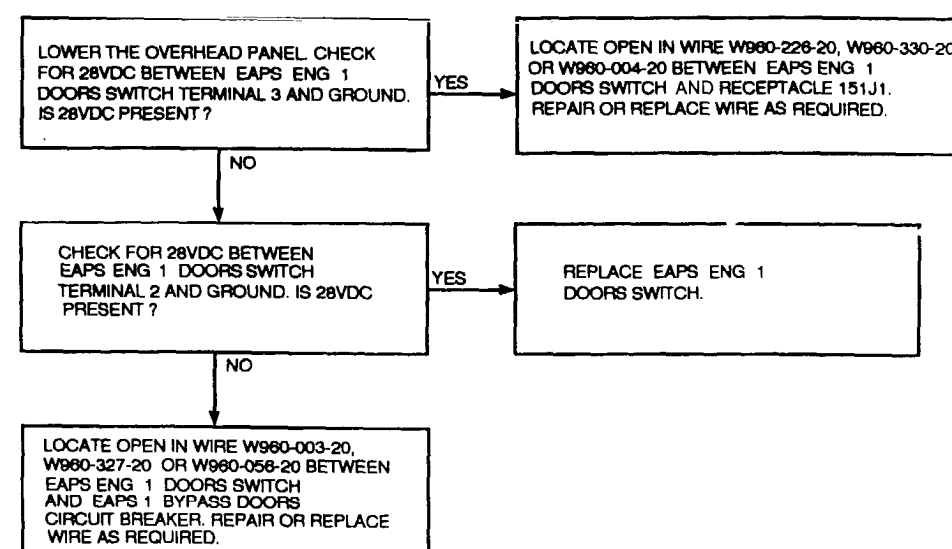
TM 55-1520 240-23

### Equipment Condition:

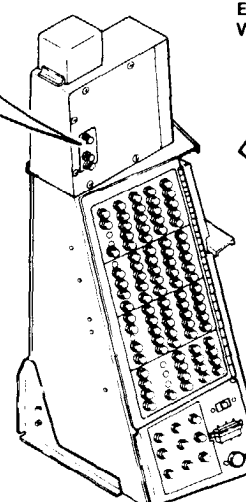
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



EAPS ENG 1 DOORS SWITCH

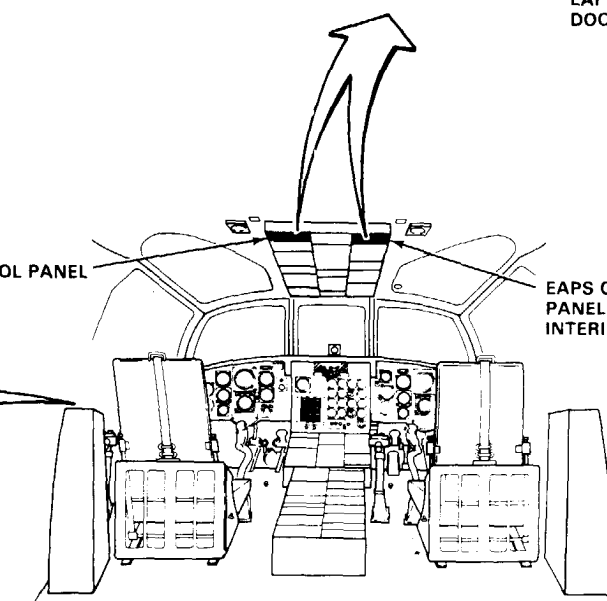


EAPS 1 BYPASS DOORS CIRCUIT BREAKER



NO. 1 POWER DISTRIBUTION PANEL

EAPS CONTROL PANEL WITH NVG



COCKPIT

22540

INITIAL SETUP

Applicable Configurations:

Helicopters with Engine Air Particle Separator Provisions

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

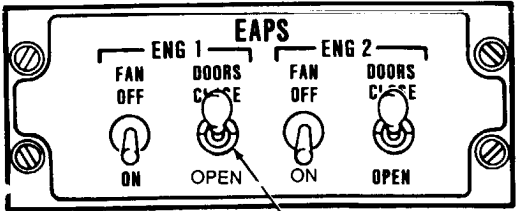
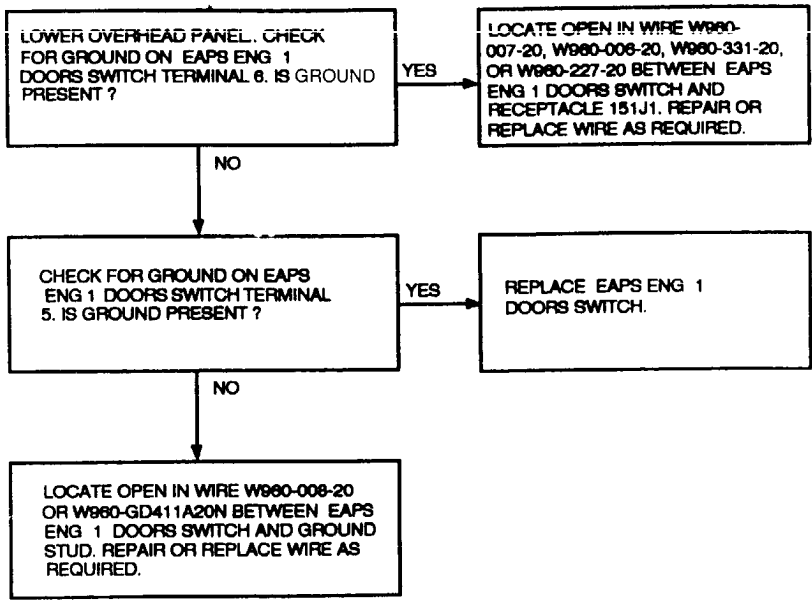
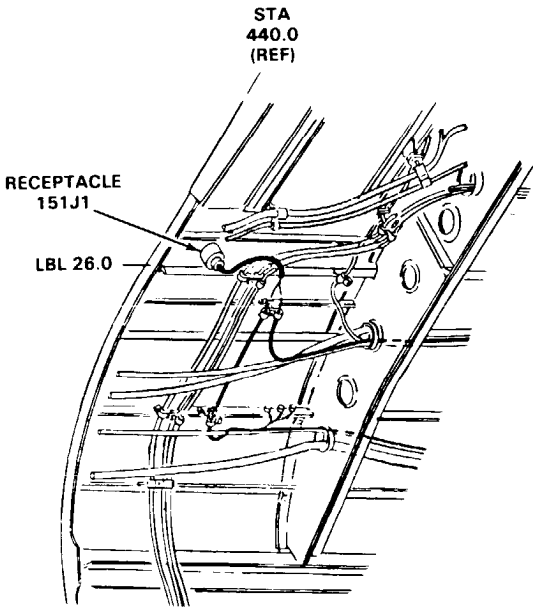
Aircraft Electrician (2)

References:

TM 55-1520-240-23

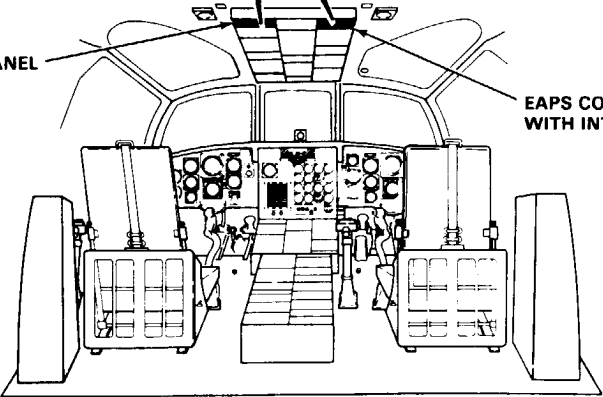
Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off



EAPS CONTROL PANEL WITH NVG

EAPS CONTROL PANEL WITH INTERIM NVG



COCKPIT

22539

16-3.11 28 VDC IS NOT PRESENT ON RECEPTACLE 151J1 PIN a WITH EAPS ENG 1 DOORS SWITCH AT CLOSE

INITIAL SETUP

Applicable Configurations:

- Helicopters with Engine Air Particle Separator Provisions

Tools:

- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:

- None

Personnel Required:

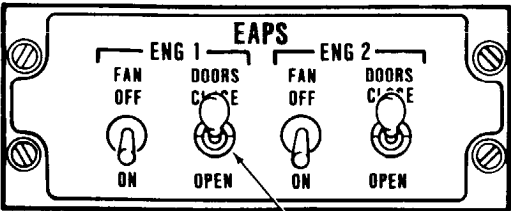
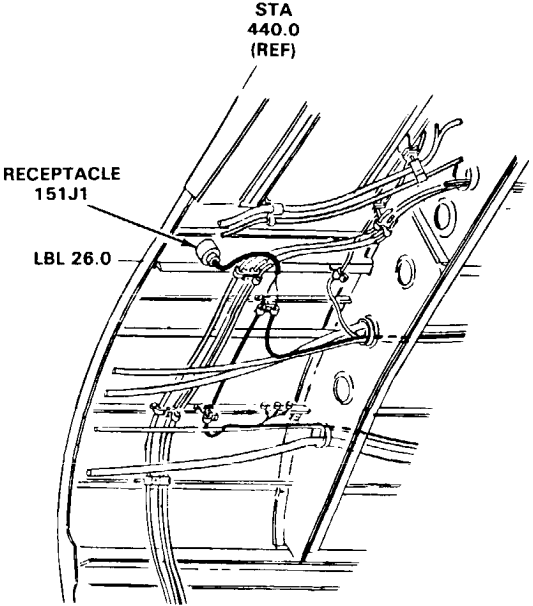
- Aircraft Electrician (2)

References:

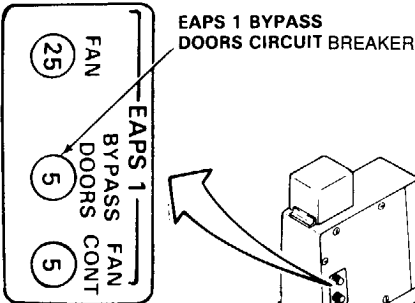
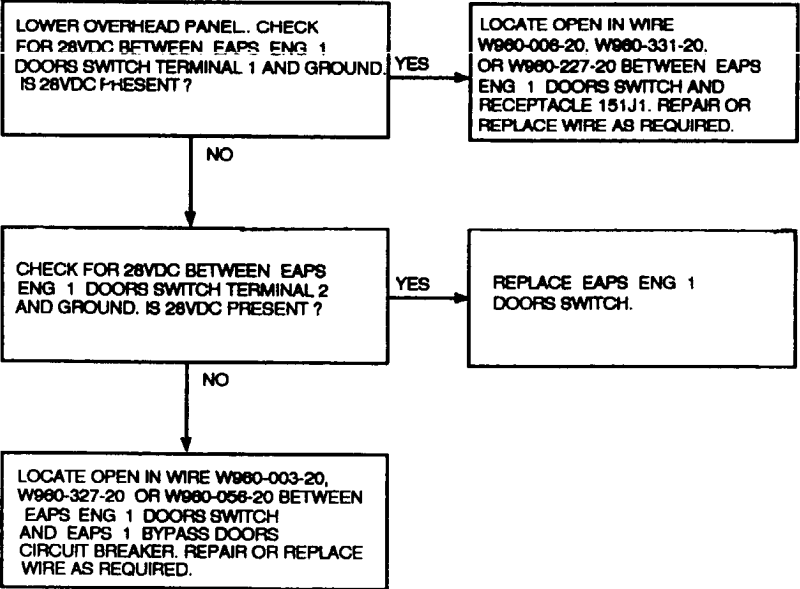
- TM 55-1520-240-23

Equipment Condition:

- TM 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off



EAPS ENG 1 DOORS SWITCH



EAPS CONTROL PANEL WITH NVG

EAPS CONTROL PANEL WITH INTERIM NVG

COCKPIT

NO. 1 POWER DISTRIBUTION PANEL

16-3.12 GROUND IS NOT PRESENT ON RECEPTACLE 151J1 PIN U WITH EAPS ENG 1 DOORS SWITCH AT CLOSE

INITIAL SETUP

**Applicable Configurations:**

Helicopters with Engine Air Particle  
Separator Provisions

**Tools:**

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**

None

**Personnel Required:**

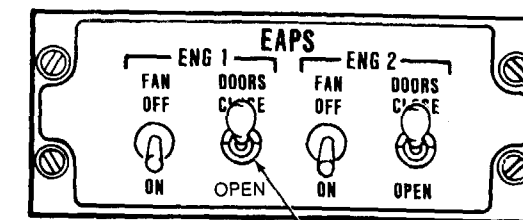
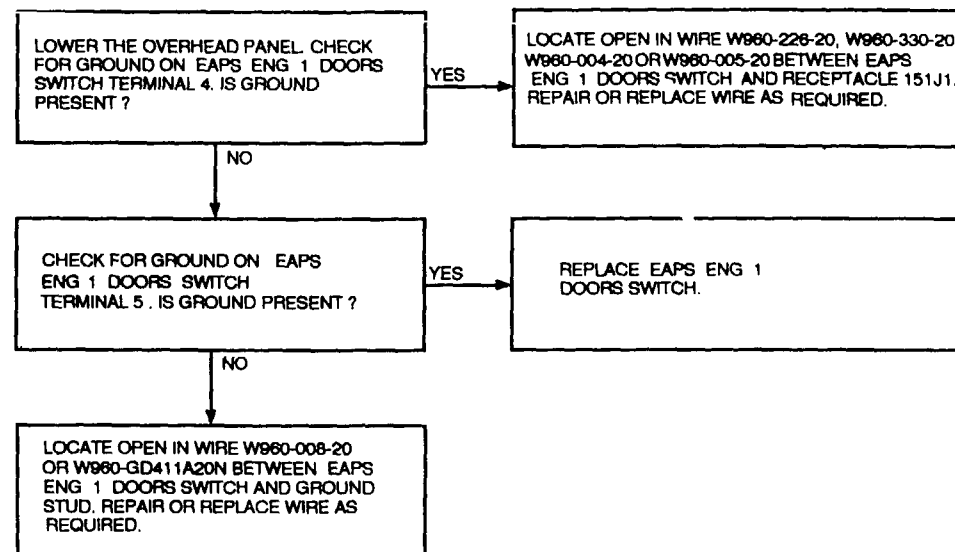
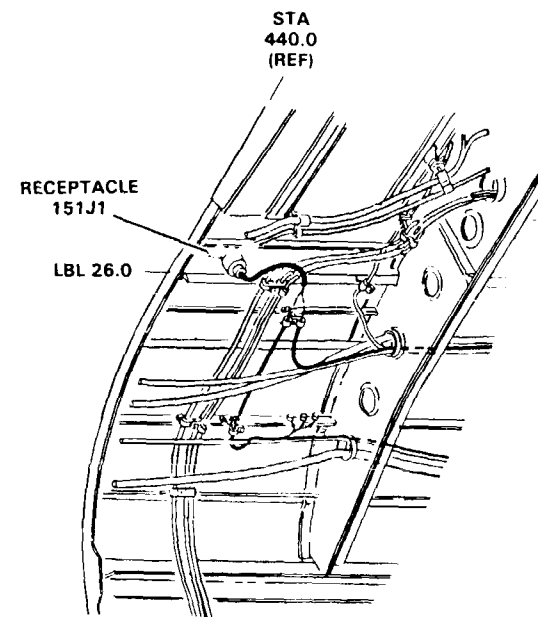
Aircraft Electrician (2)

**References:**

TM 55-1520-240-23

**Equipment Condition:**

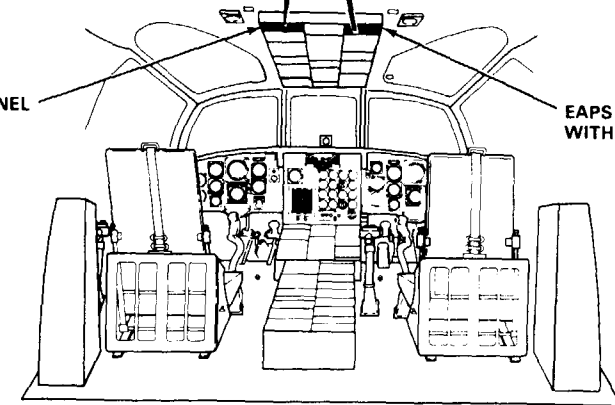
TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off



EAPS ENG 1 DOORS SWITCH

EAPS CONTROL PANEL WITH NVG

EAPS CONTROL PANEL WITH INTERIM NVG



COCKPIT

16-3.13 EAPS 1 FAIL CAPSULE DOES NOT COME ON

16-3.13

INITIAL SETUP

Applicable Configurations:

Helicopters with Engine Air Particle Separator Provisions

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

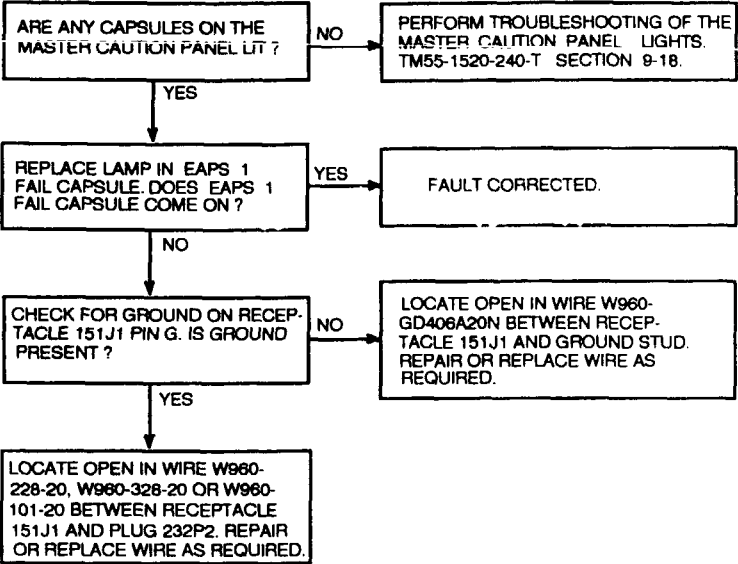
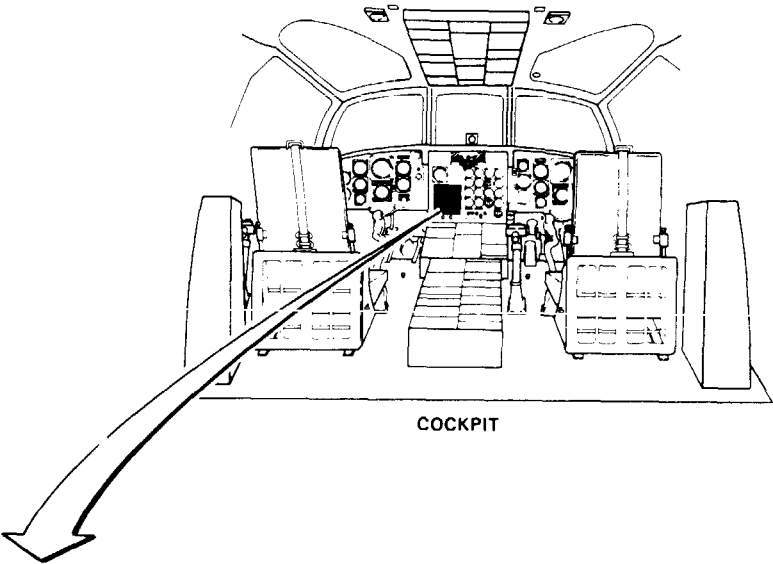
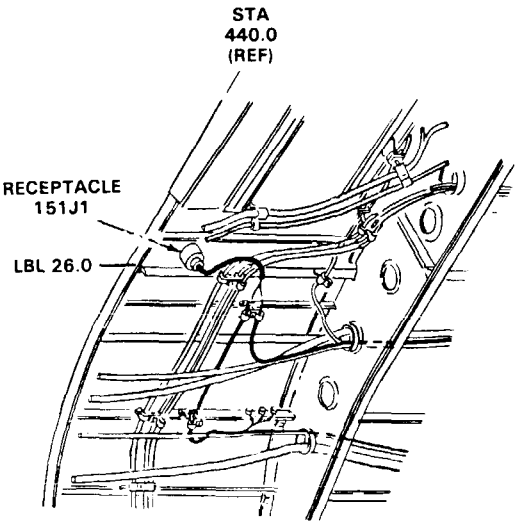
Aircraft Electrician (2)

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



EAPS 1 FAIL CAPSULE

NO 1 ENG XMSN HOT	XMSN OIL HOT	NO 2 ENG XMSN HOT
NO 1 ENG CHIP DET	XMSN CHIP DET	NO 2 ENG CHIP DET
NO 1 ENG OIL LOW	XMSN OIL PRESS	NO 2 ENG OIL LOW
L FUEL LOW	EXT PWR	R FUEL LOW
L FUEL PRESS	XMSN AUX OIL PRESS	R FUEL PRESS
NO 1 RECT OFF	BATT SYS MAL	NO 2 RECT OFF
NO 1 GEN OFF	APU ON	NO 2 GEN OFF
NO 1 HYD FLT CONTR	FWD HOOK OPEN	NO 2 HYD FLT CONTR
NO 1 AFCS OFF	MID HOOK OPEN	NO 2 AFCS OFF
EAPS 1 FAIL	AFT HOOK OPEN	EAPS 2 FAIL
NO 1 ENG N1 CONT	DUAL HOOK FAULT	NO 2 ENG N1 CONT
CM INOP	HEATER HOT	CM JAM
UTIL HYD SYS	PWR STEER	PARK BRAKE ON

16-3.14 115 VAC IS NOT PRESENT WITH EAPS ENG 2 FAN SWITCH SET TO ON

INITIAL SETUP

Applicable Configurations:

Helicopters with Engine Air Particle Separator Provisions

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
ultimeter

Materials:

None

Personnel Required:

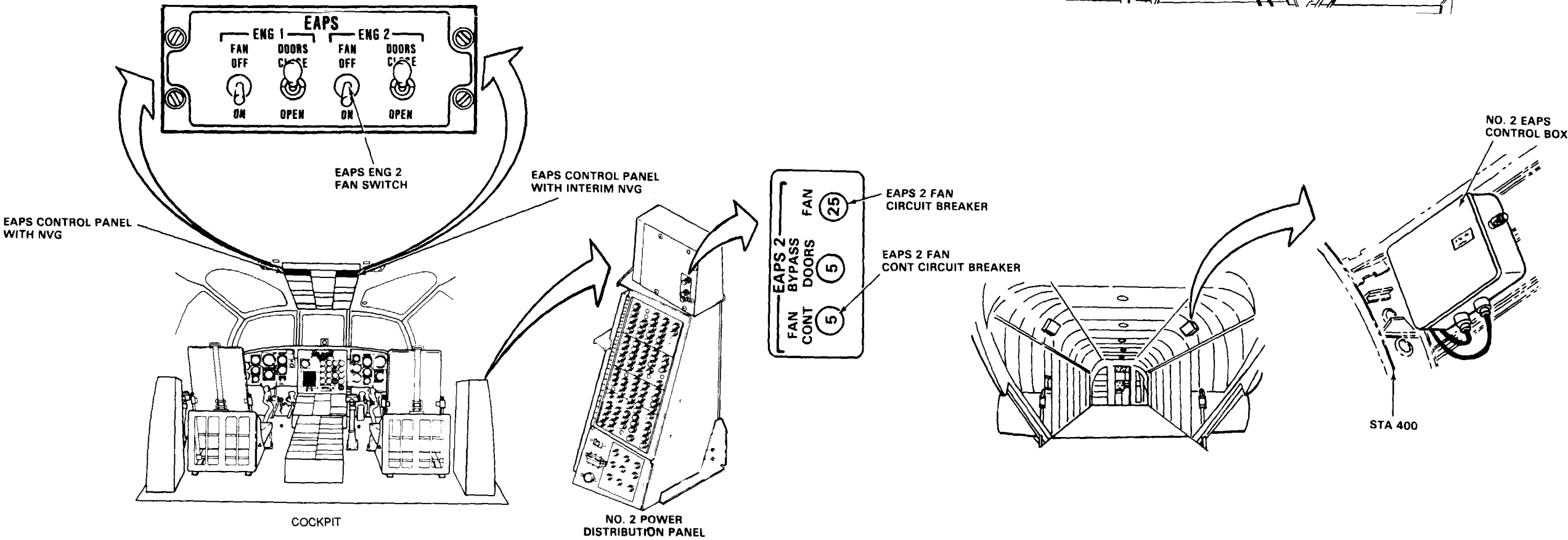
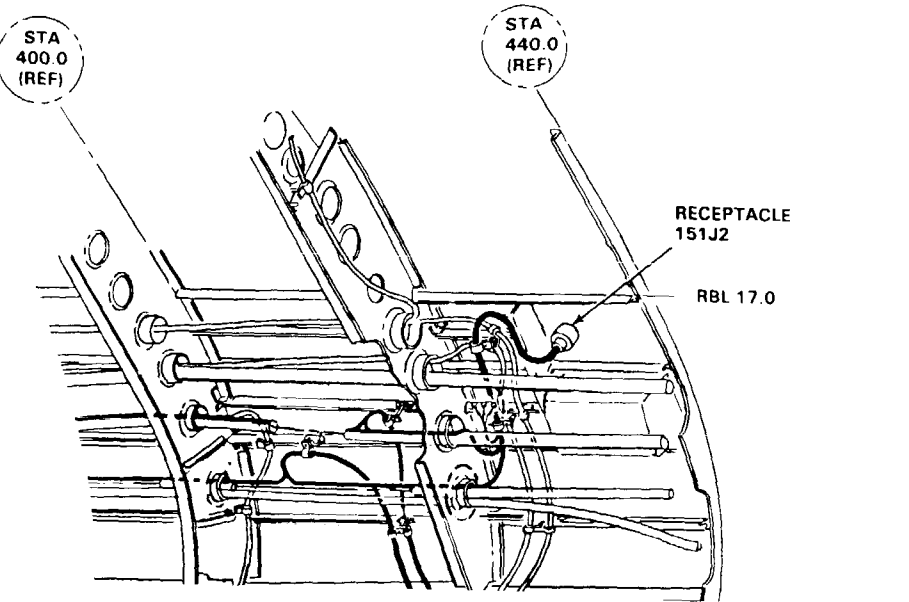
Aircraft Electrician (2)

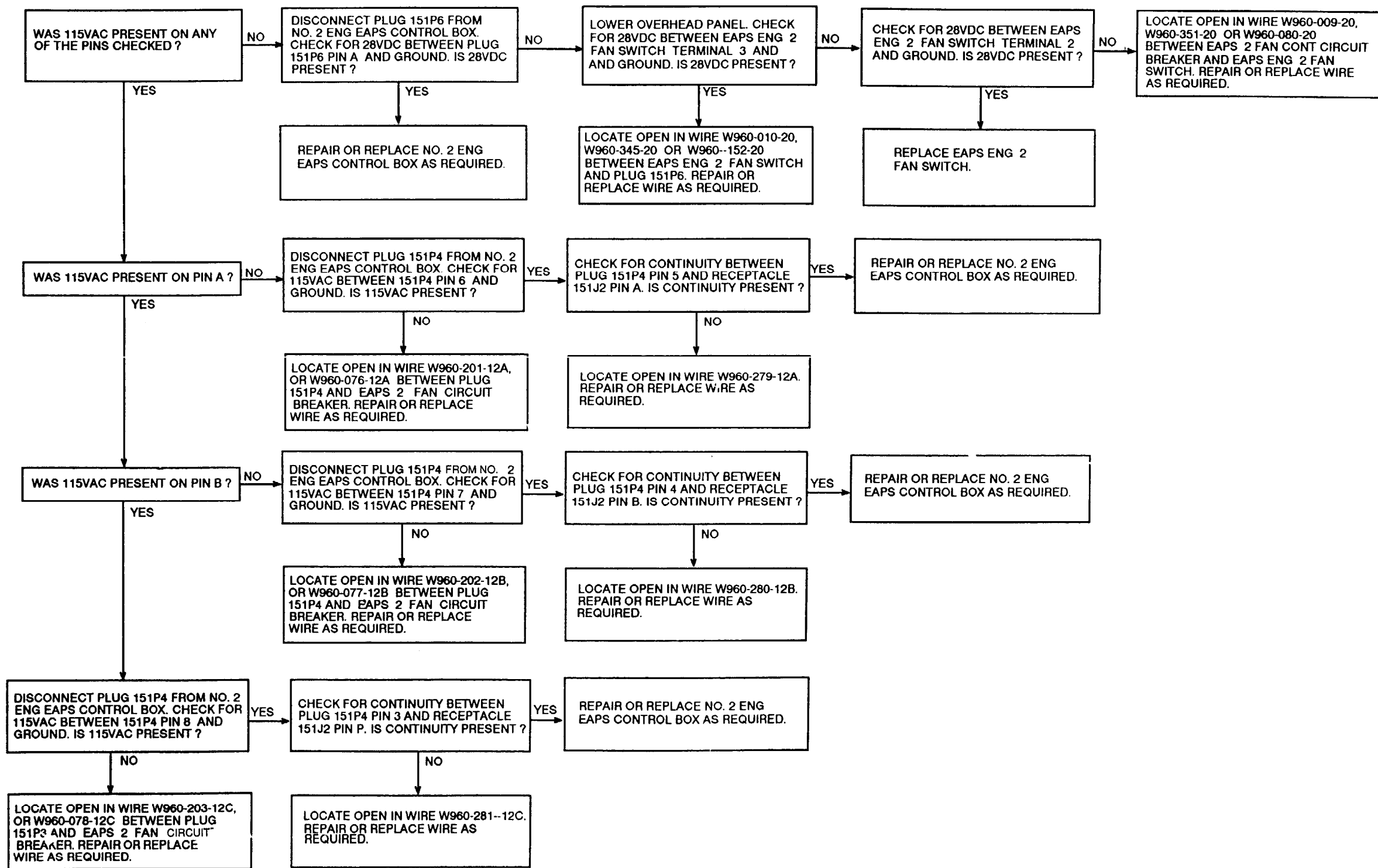
References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off





INITIAL SETUP

Reference:  
TM 55-1520-240-23

**Applicable Configurations:**

Helicopters with Engine Air Particle  
Separator Provisions

**Tools:**

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**

None

**Personnel Required:**

Aircraft Electrician (2)

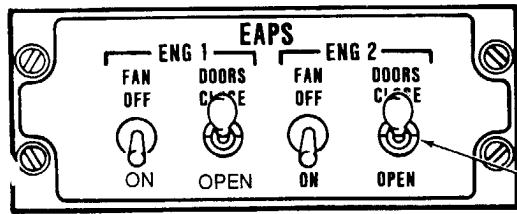
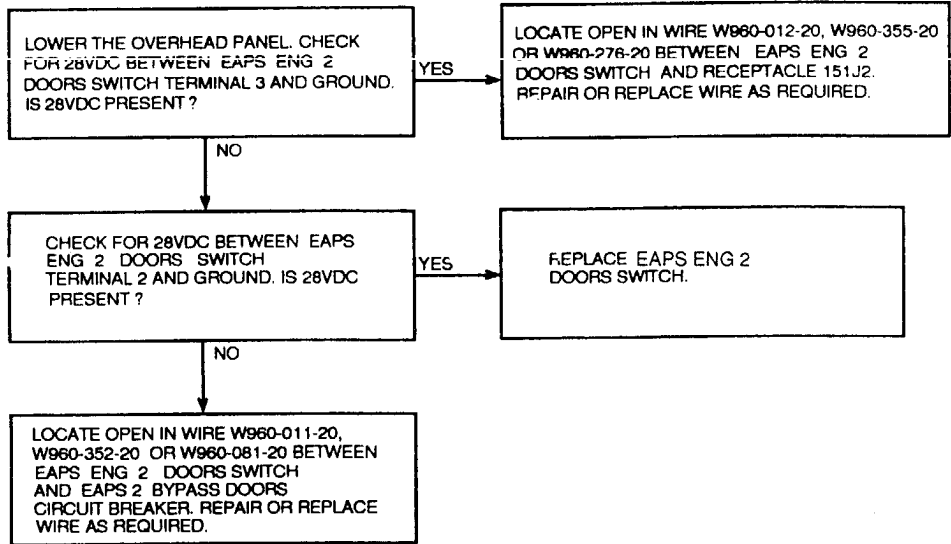
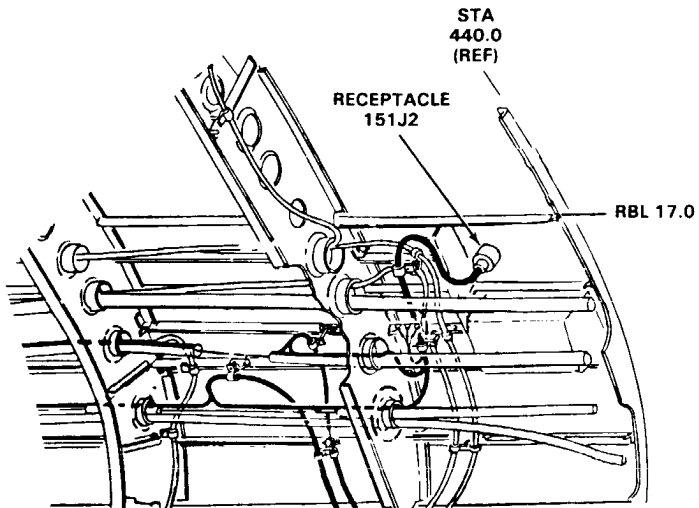
**Equipment Condition:**

TM 55-1520-240-23:

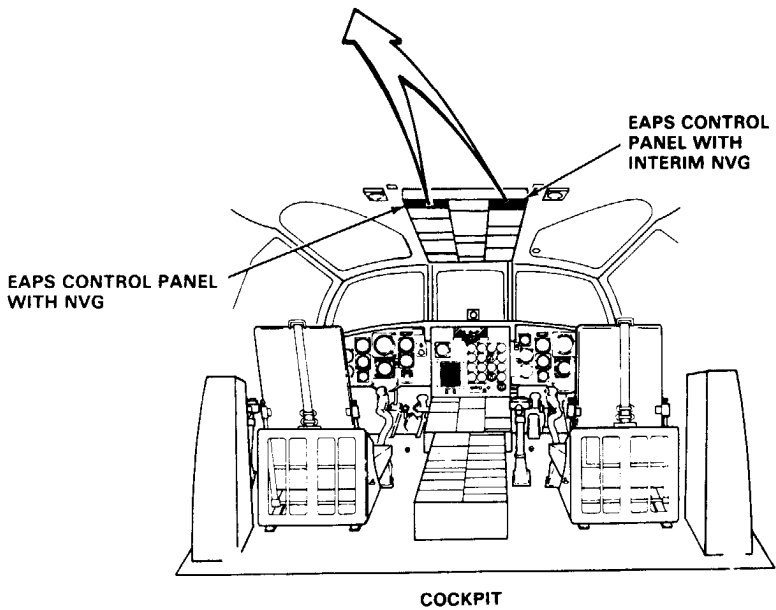
Battery Connected

Electrical Power On

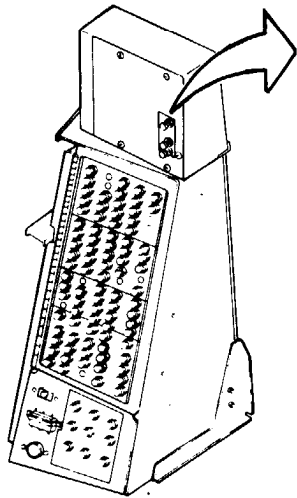
Hydraulic Power Off



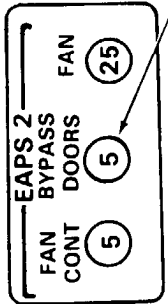
EAPS ENG 2 DOORS SWITCH



COCKPIT



NO. 2 POWER DISTRIBUTION PANEL



EAPS 2 BYPASS DOORS CIRCUIT BREAKER



INITIAL SETUP

**Applicable Configurations:**  
Helicopters with Engine Air Particle Separator Provisions

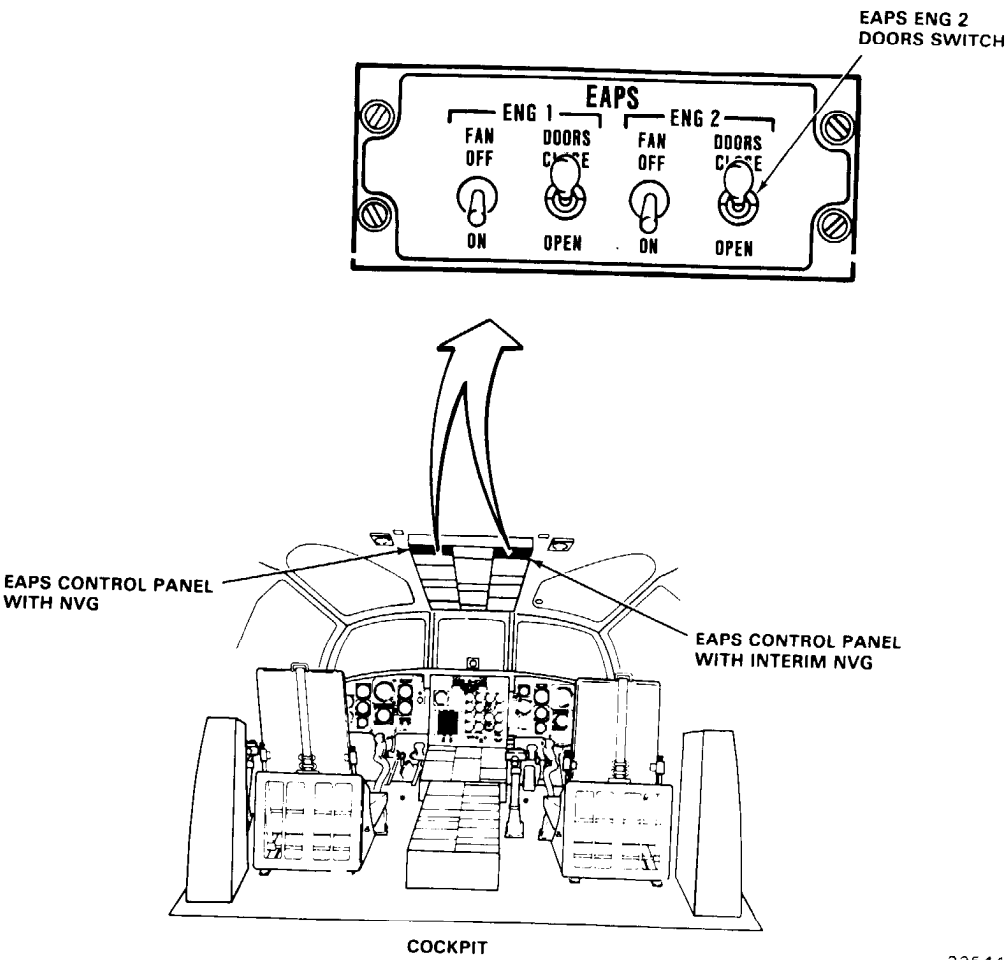
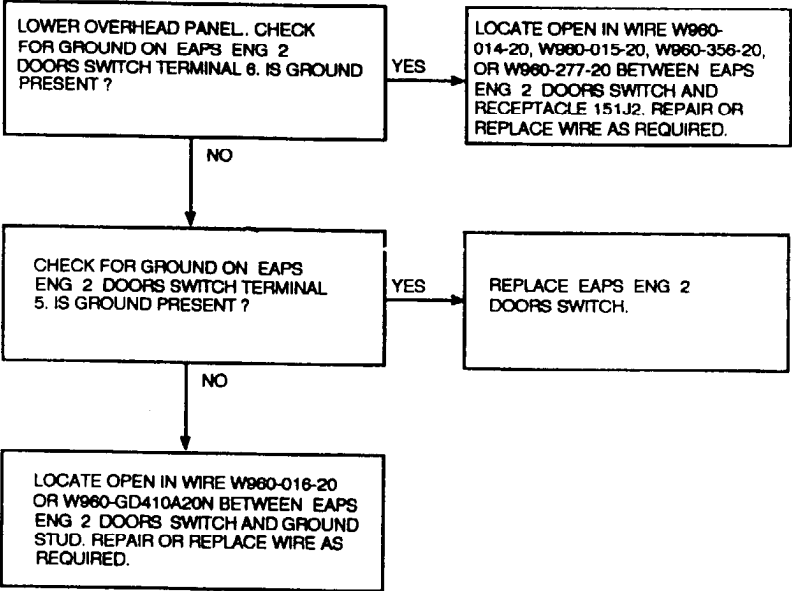
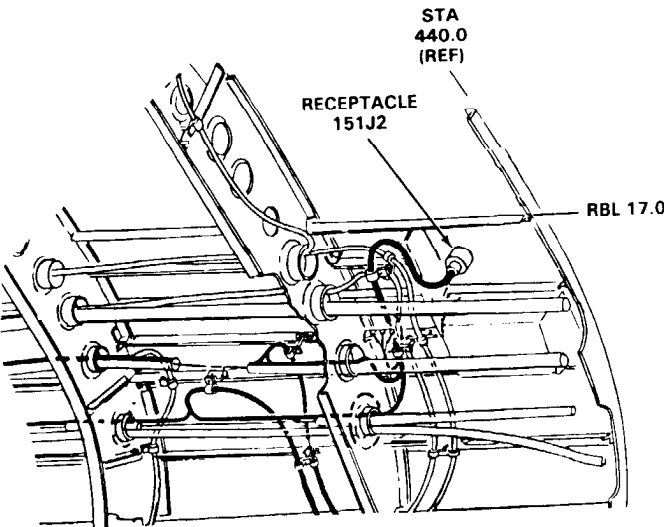
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician (2)

**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



INITIAL SETUP

Applicable Configurations:

Helicopters with Engine Air Particle  
Separator Provisions

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

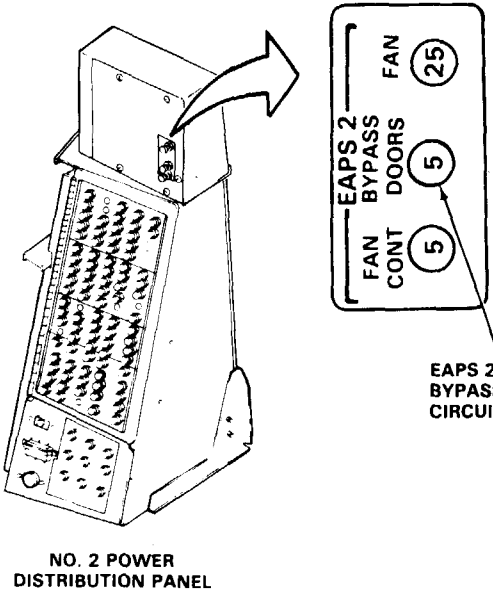
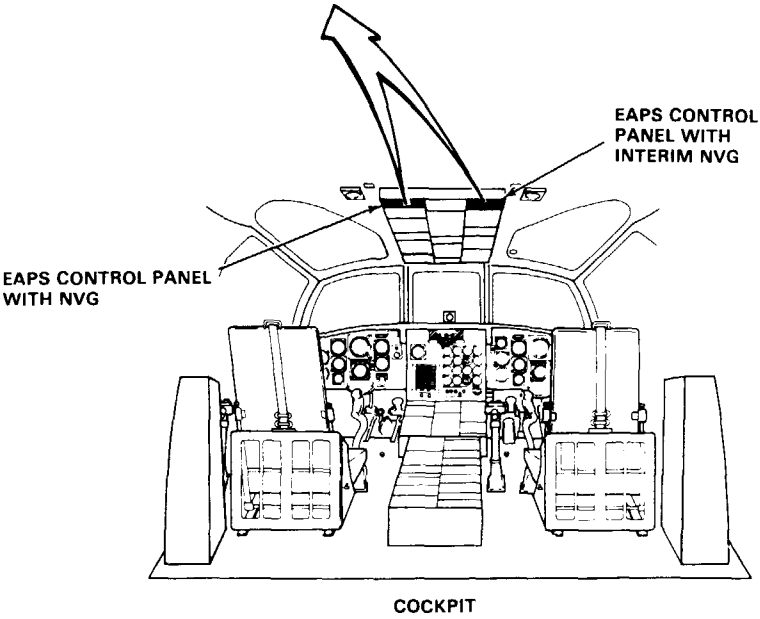
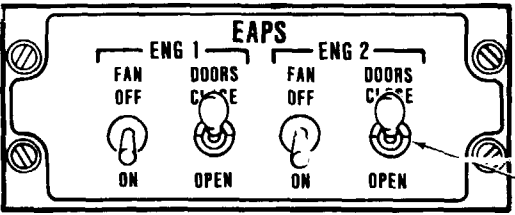
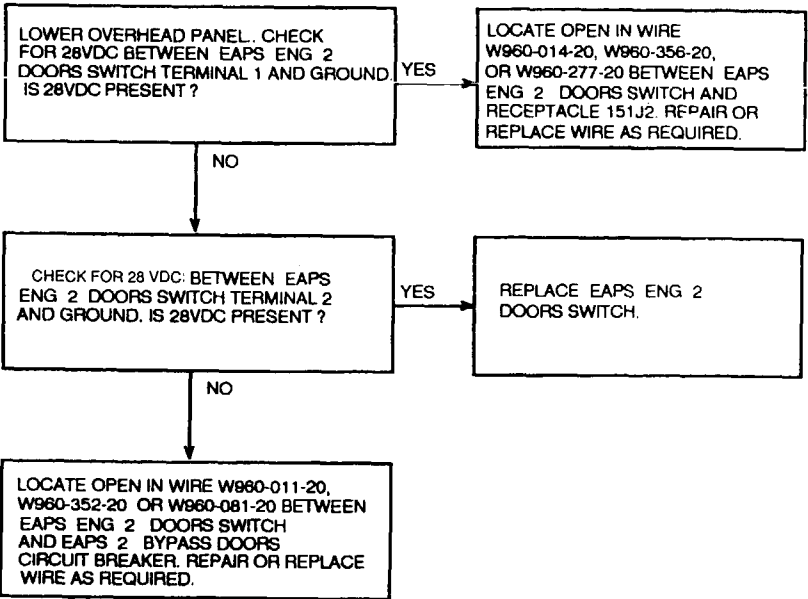
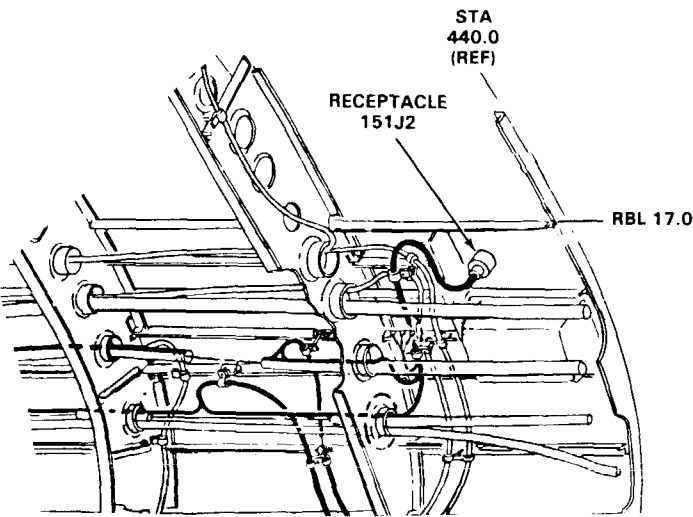
Aircraft Electrician (2)

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



16-3.18 GROUND IS NOT PRESENT ON RECEPTACLE 151J2 PIN U WITH EAPS ENG 2 DOORS SWITCH AT CLOSE

16-3.18

INITIAL SETUP

Applicable Configurations:

Helicopters with Engine Air Particle Separator Provisions

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

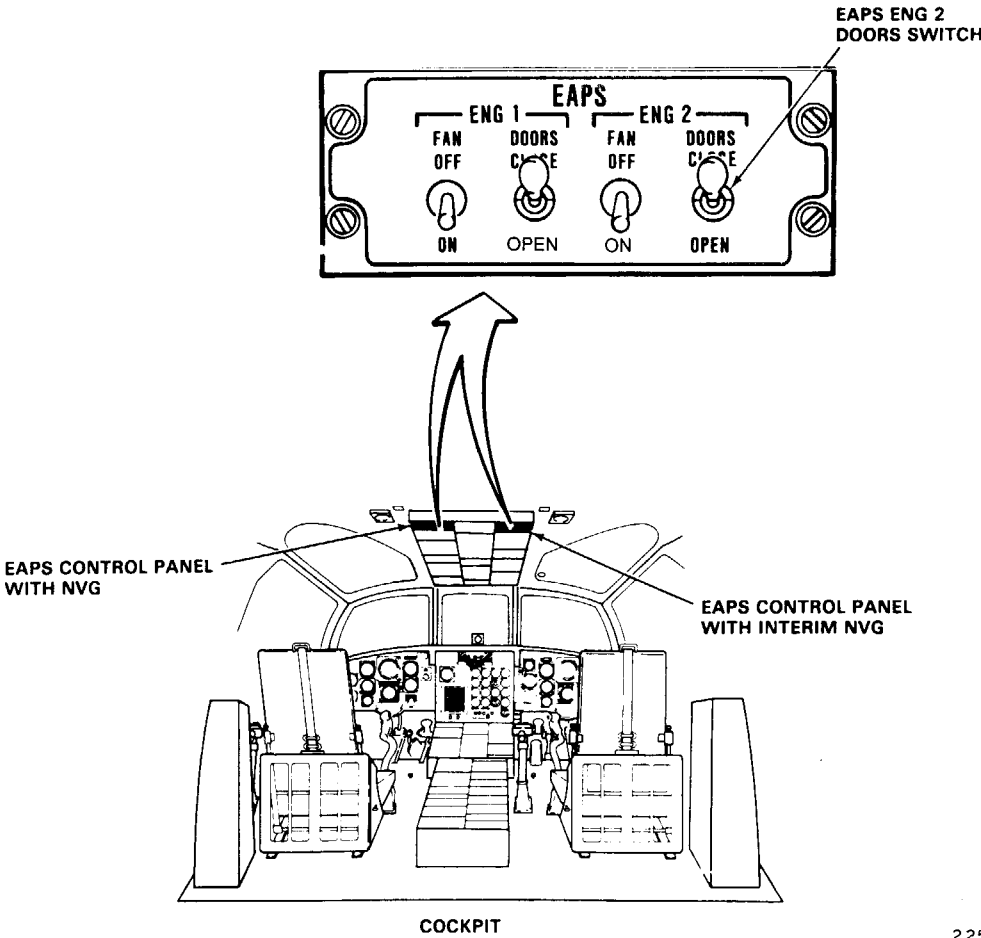
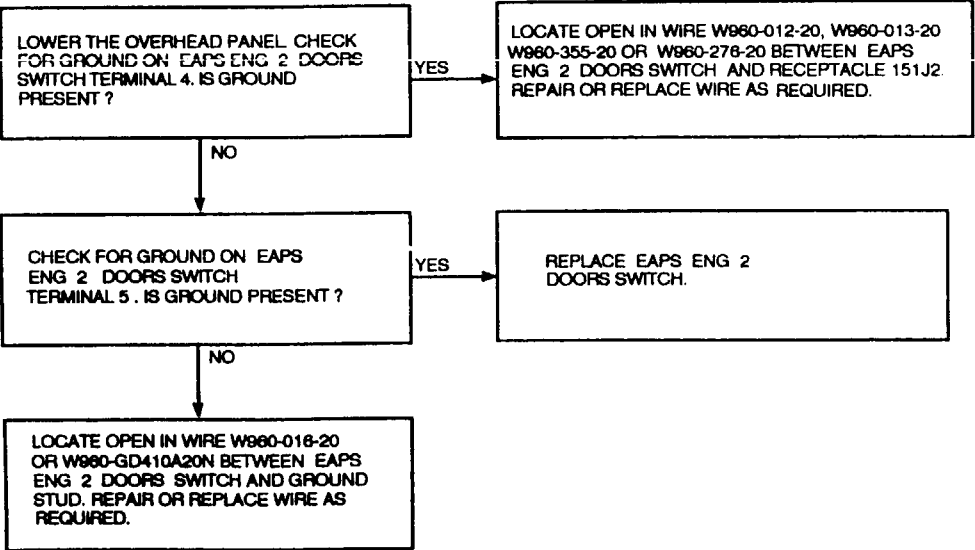
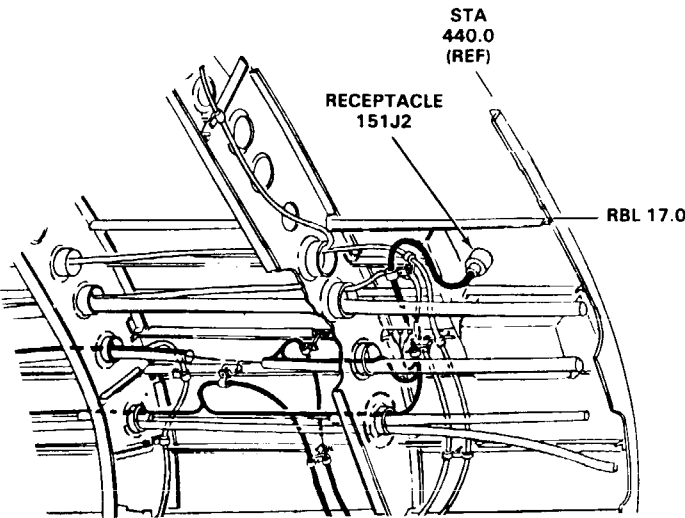
Aircraft Electrician (2)

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



22546

16-3.19 EAPS 2 FAIL CAPSULE DOES NOT COME ON

INITIAL SFTUP

**Applicable Configurations:**  
Helicopters with Engine Air Particle Separator Provisions

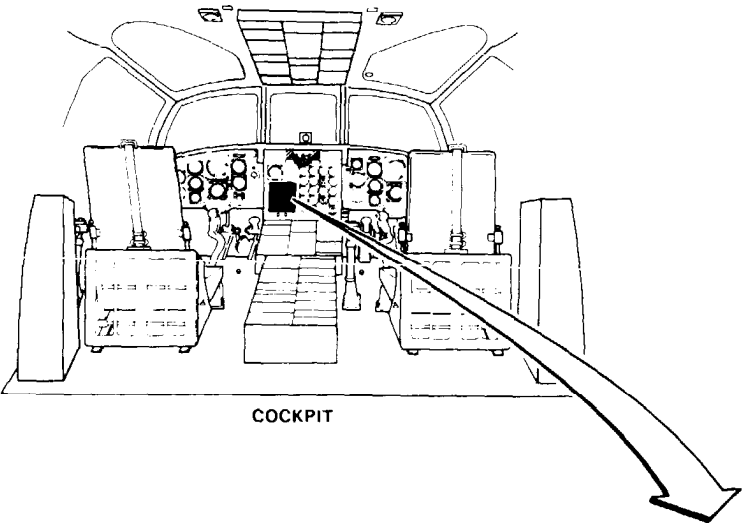
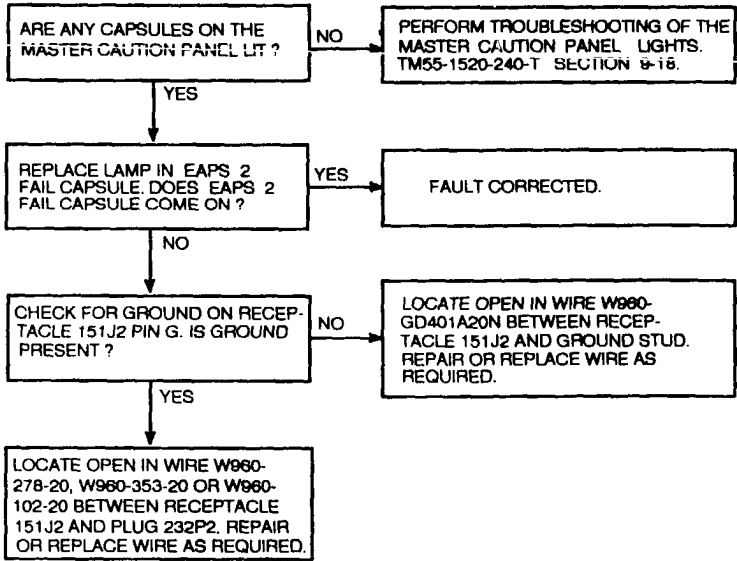
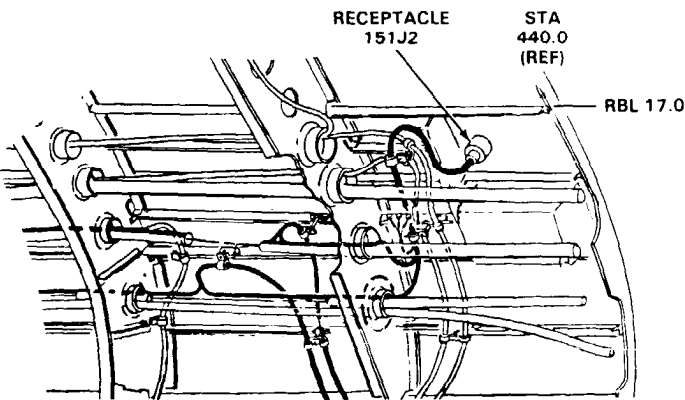
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician (2)

**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

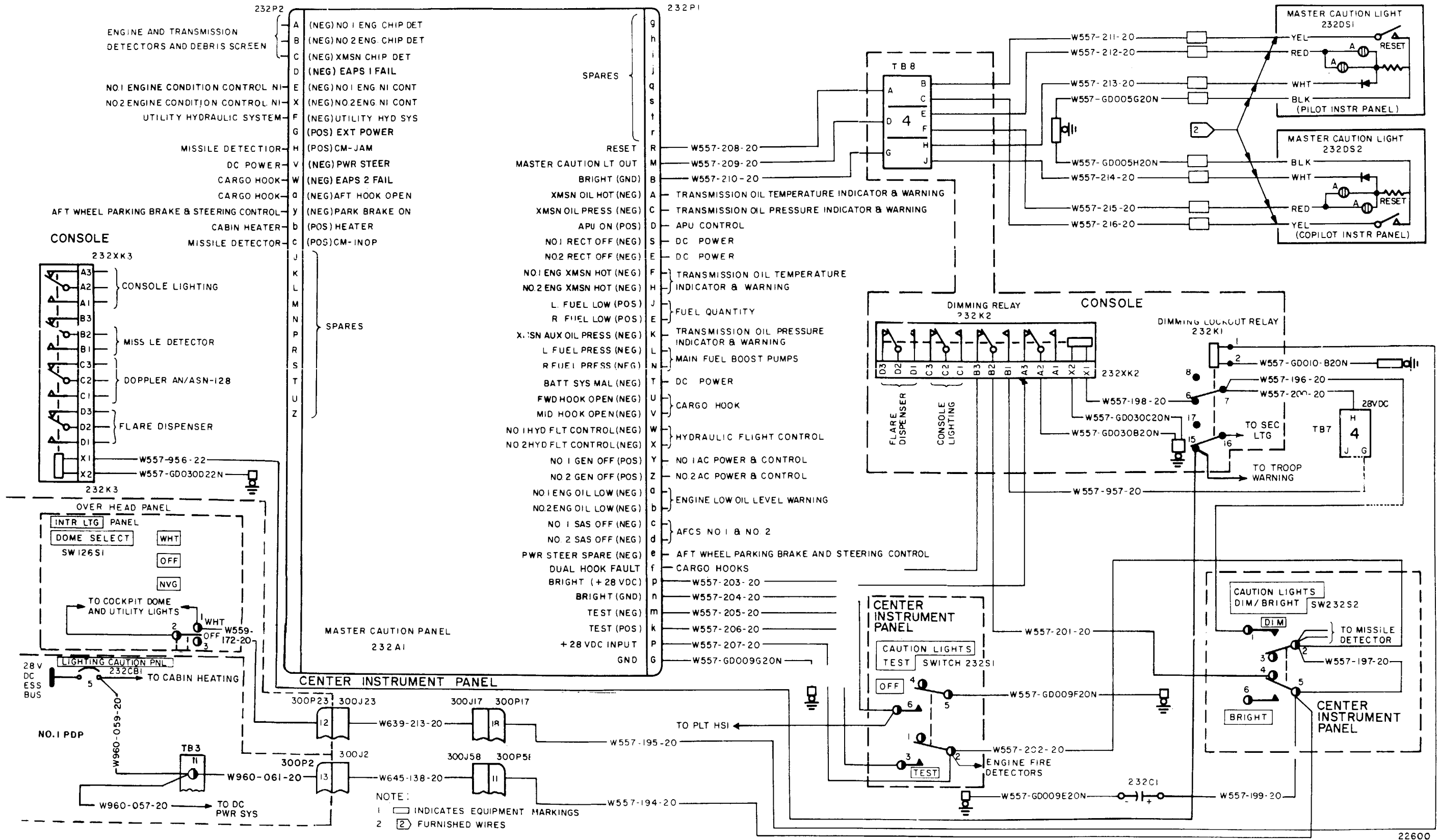


NO 1 ENG XMSN HOT	XMSN OIL HOT	NO 2 ENG XMSN HOT
NO 1 ENG CHIP DET	XMSN CHIP DET	NO 2 ENG CHIP DET
NO 1 ENG OIL LOW	XMSN OIL PRESS	NO 2 ENG OIL LOW
L FUEL LOW	EXT PWR	R FUEL LOW
L FUEL PRESS	XMSN AUX OIL PRESS	R FUEL PRESS
NO 1 REFT OFF	BATT SYS MAL	NO 2 REFT OFF
NO 1 GEN OFF	APU ON	NO 2 GEN OFF
NO 1 HYD FLT CONTR	FWD HOOK OPEN	NO 2 HYD FLT CONTR
NO 1 AFCS OFF	MID HOOK OPEN	NO 2 AFCS OFF
EAPS 1 FAIL	AFT HOOK OPEN	EAPS 2 FAIL
NO 1 ENG N1 CONT	DUAL HOOK FAULT	NO 2 ENG N1 CONT
CM INOP	HEATER HOT	CM JAM
UTIL HYD SYS	PWR STEER	PARK BRAKE ON

EAPS 2 FAIL CAPSULE

16-3.20 MASTER CAUTION LIGHTS WIRING DIAGRAM (Helicopters with Engine Air Particle Separator Provisions)

16-3.20



22600

INITIAL SETUP

Applicable Configurations:

Helicopters with Engine Air Particle Separator Provisions

Tools:

None

Materials:

None

Personnel Required:

Aircraft Electrician

References:

Refer to Task 9-18.3 (TM 55-1520-240-T)

TM 55-1520-240-23

Equipment Condition:

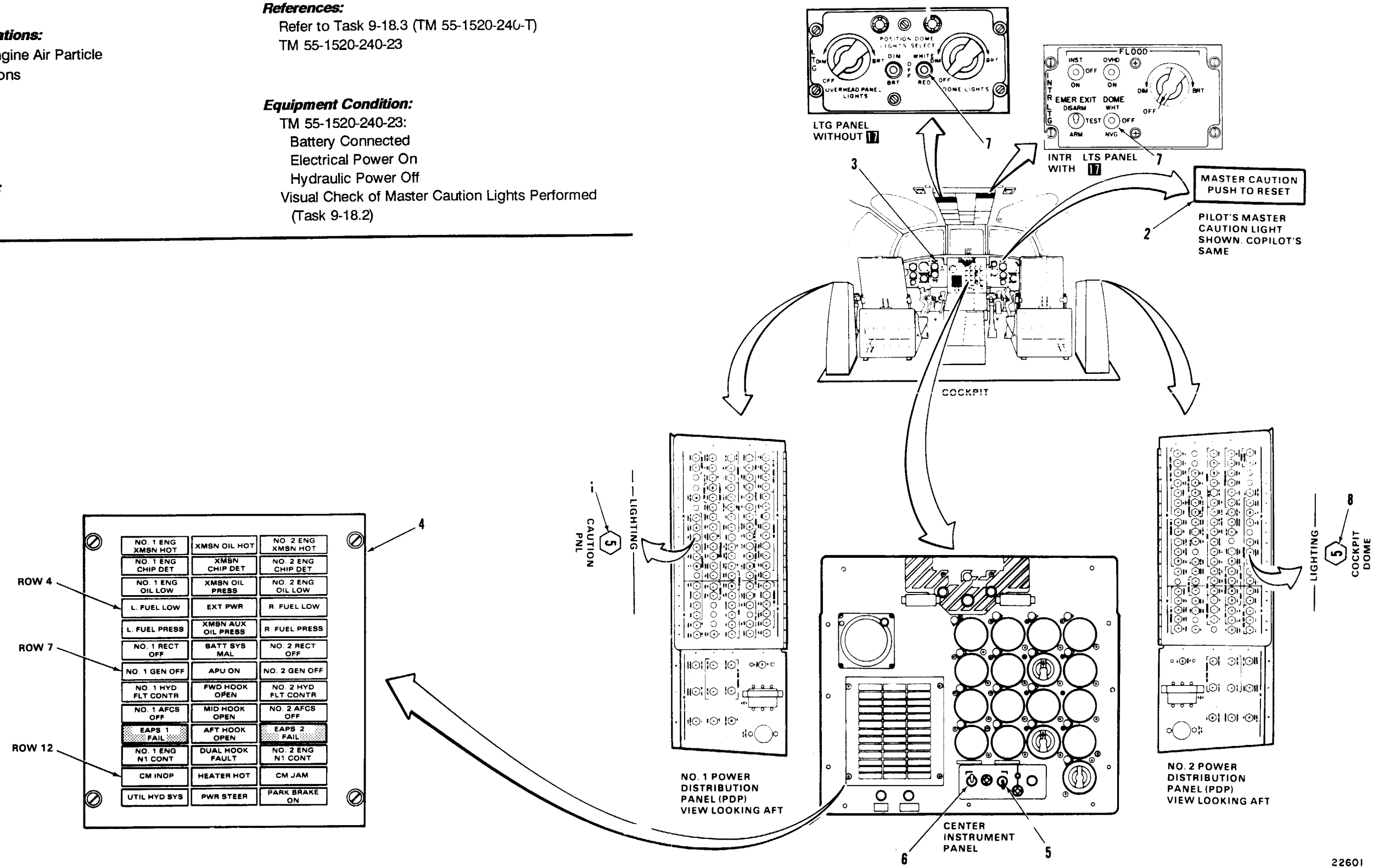
TM 55-1520-240-23:

Battery Connected

Electrical Power On

Hydraulic Power Off

Visual Check of Master Caution Lights Performed (Task 9-18.2)





INITIAL SETUP

**Applicable Configurations:**  
Helicopters with Engine Air  
Particle Separator Provisions

**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**  
None

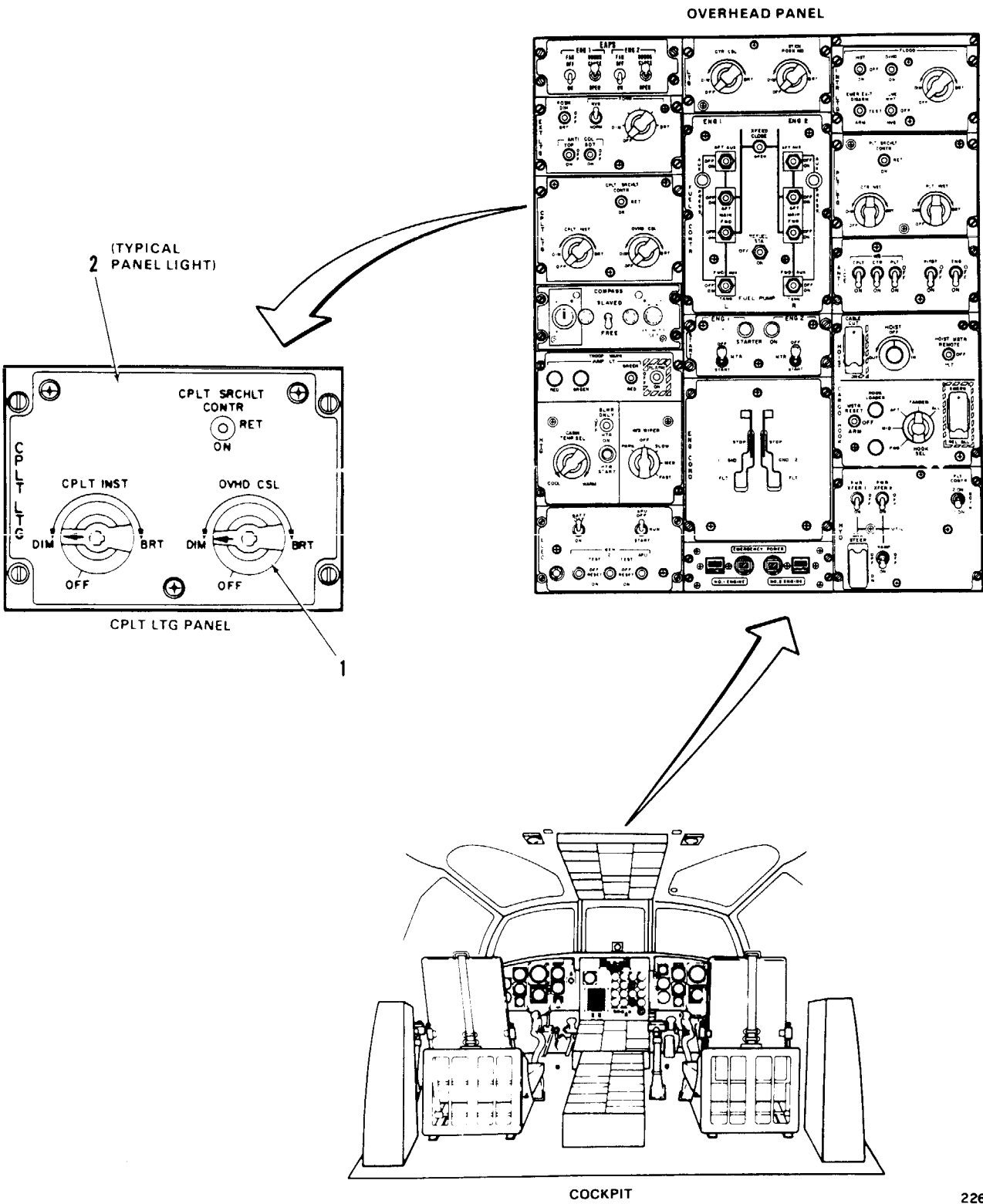
**Personnel Required:**  
Aircraft Electrician

**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off

TASK	RESULT
1. Check OVHD CSL lights control (1).	If control (1) is loose or damaged, tighten or replace it as required.
2. Check 16 lightplate panels (2).	If any lightplate panel (2) is loose or damaged, tighten or replace it as required.

FOLLOW-ON MAINTENANCE:  
None





INITIAL SETUP

Applicable Configurations:  
Helicopters with Engine Air  
Particle Separator Provisions

Tools:  
None

Materials:  
None

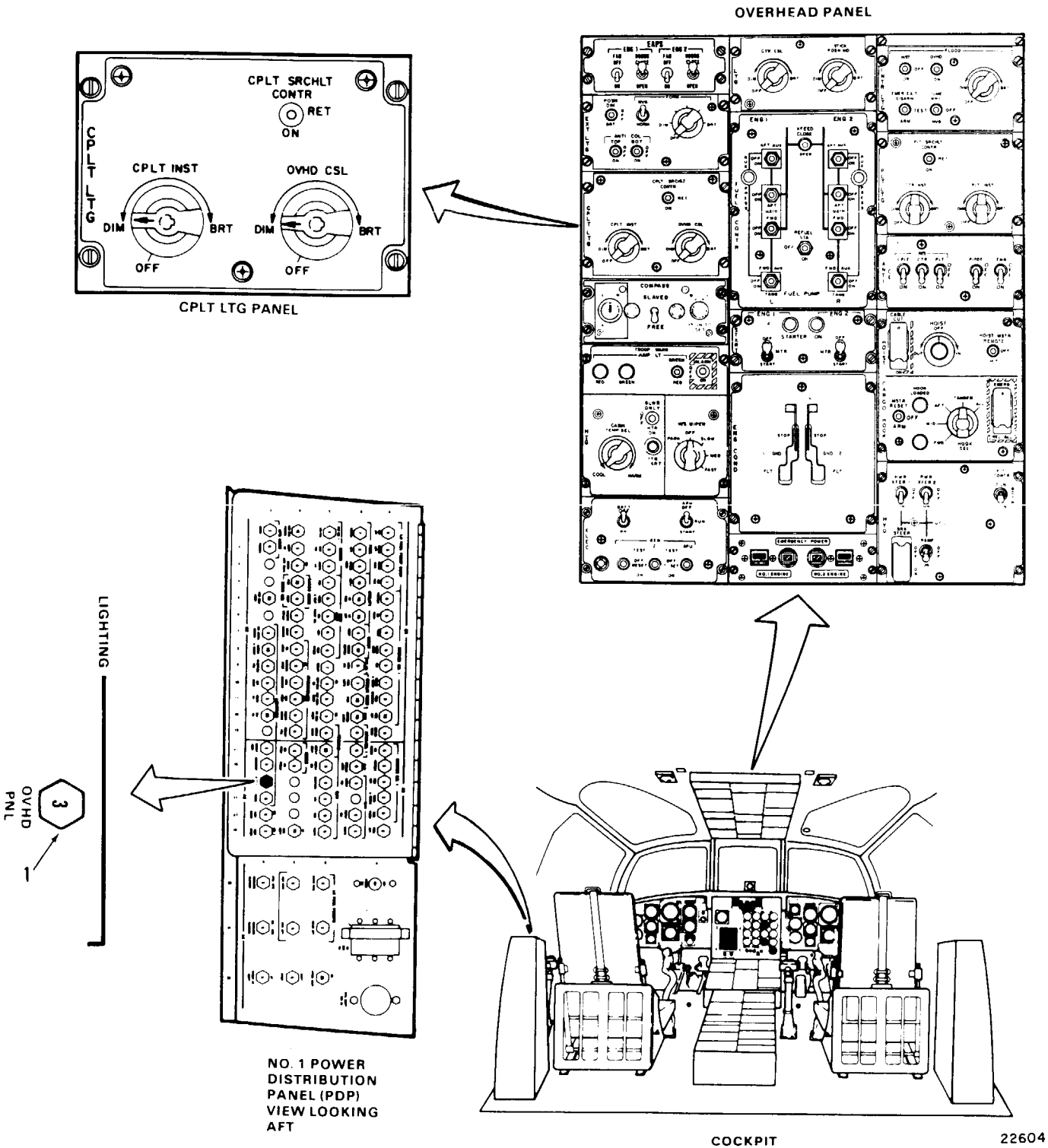
Personnel Required:  
Aircraft Electrician

References:  
TM 55-1520-240-23  
TM 55-1520-240-T

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Overhead Panel Lights Visual Check Performed  
Refer to Task 9-1.7 (TM 55-1520-240-T)

TASK	RESULT
1. Check that LIGHTING OVHD PNL circuit breaker (1) is closed.	If OVHD PNL circuit breaker (1) is open, close it. If it opens again, go to TM 55-1520-240-T, task 9-11.9.
2. Turn OVHD CSL lights control (2) from OFF through DIM to BRT.	All control panels in overhead panel shall light dim and increase in brightness as control (2) is turned to BRT. If any panel is not lit, go to task 9-11.10. If panel brightness does not increase as control is turned, replace OVHD CSL lights control.
3. Turn OVHD CSL lights control (2) to OFF.	All control panel lights in overhead panel shall go out. If not, replace OVHD CSL lights control.

FOLLOW-ON MAINTENANCE:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off



AND NO.2 DC POWER  
IES AND EXTERNAL

R

NO 2 XFMR RECT

115V 0 A 1  
NO 2 0 B 1  
AC 0 C 1  
BUS 25

161CB2

NO 2 DC BUS CONT

28V NO 2 DC BUS 5 161CB7

W552-151-20

DC 2 CROSS TIE

100 161CB8

W552-156-6 A2  
W552-157-6 A1

W552-149-20 B3  
W552-150-20 B1  
W552-153-20 A3  
W552-152-20 A1

W552-255-22 X1  
W552-GD046C20N X2

W552-256-10 X1  
W552-161-16 X2

NO 2 RECT. FAIL RELAY 161K6

NO 2 REV CUR CO 5 161CB6

W552-265-16

DC POWER (DISTRIBUTION) WIRING DIAG

CROSS TIE CROSS

161K8

161E2

BATT GEN

IND APP SW

NO 2 REVERSE CURRENT CUTOUT RELAY 161K4

W552-158-20

W680-1-12A  
W680-2-12B  
W680-3-12C  
W680-GD198D12N  
W680-8-16  
W680-4-16  
W678-GD210A6N  
W678-GD210B6N  
W678-GD210C6N  
W678-3-4ALUM  
W678-4-4ALUM  
W678-5-4ALUM

RIGHT ELECTRICAL COMPARTMENT

EXT PWR CONT

300P3 300J3 300J48 300P10

W550-161-20 5 161CB4

W550-148-20 30

W645-295-20 52

W697-123-20  
W677-5-4  
W677-6-4

DC EXTERNAL POWER RCPT

W677-GD213A6N  
W677-GD213B6N  
W677-GD213C6N

161J1

LEFT ELECTRICAL COMPARTMENT

W677-8-4ALUM  
W677-9-4ALUM  
W677-10-4ALUM  
W677-GD209A6N  
W677-GD209B6N  
W677-GD209C6N  
W679-29-16  
W679-30-16  
W679-26-12A  
W679-27-12B  
W679-28-12C  
W679-GD211B12N

NO 1 TRANSFORMER RECTIFIER 161TR1

161P3

NO 1 DC BUS CONT

28V NO 1 DC BUS 5 161CB5

SECONDARY COCKPIT LIGHTING CKT

W550-156-20  
W550-150-20  
W550-155-20  
W550-154-20  
W550-158-20  
W550-157-20  
W550-99-22  
W550-256-20  
W550-151-20  
W550-152-20  
W550-GD045H20N  
W550-165-20  
W550-GD045J20N  
W550-162-20  
W550-135-20  
W550-247-16

NO 1 RECT FAIL RELAY 161K5

NO 1 XFMR RECT

115V 0 A 1  
NO 1 0 B 1  
AC 0 C 1  
BUS 25

161CB1

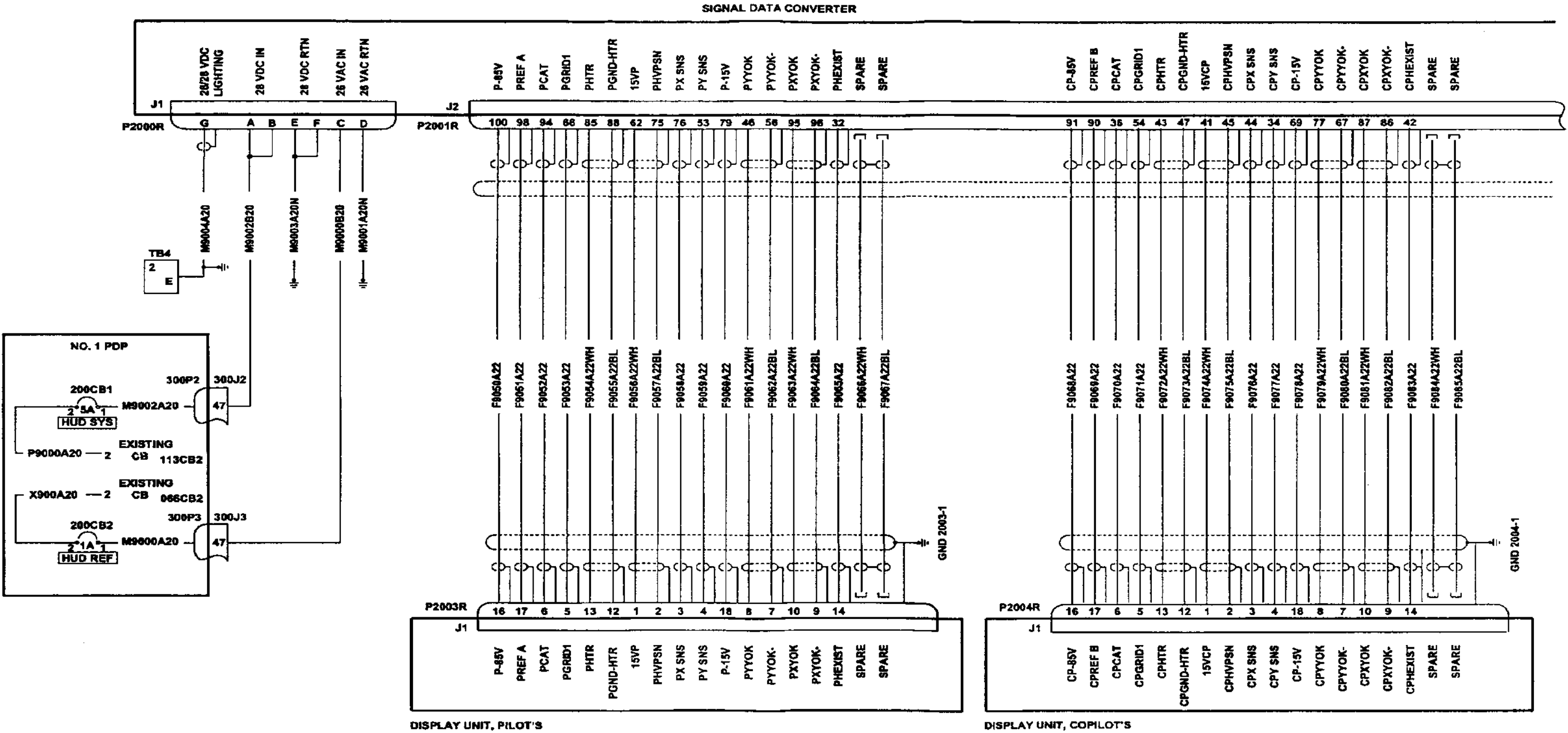
W550-244-12A  
W550-245-12B  
W550-246-12C

NO 1 PDP

NOTE:  
INDICATES EQUIPMENT MARKING

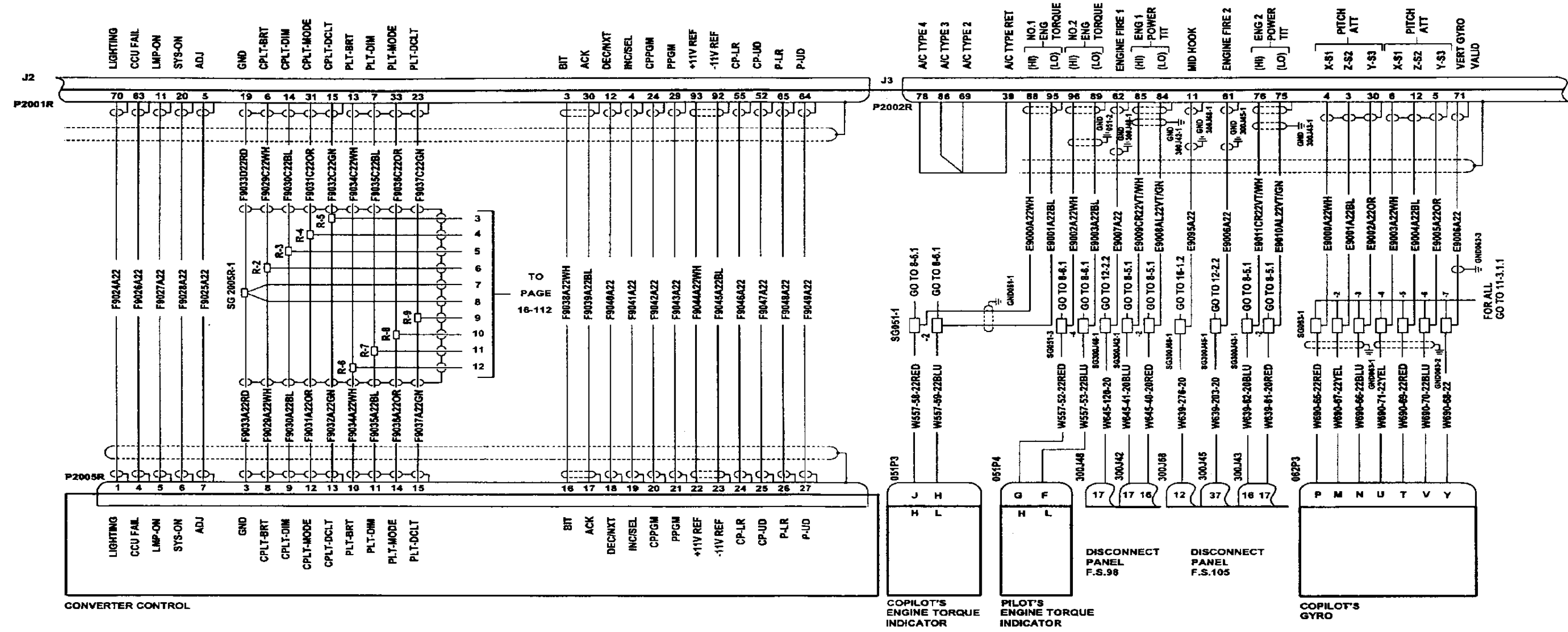
2260

16-4 HEADS UP DISPLAY SYSTEM



GO TO NEXT PAGE

SIGNAL DATA CONVERTER



GO TO NEXT PAGE

Change 18 16-145

- INITIAL SETUP:**

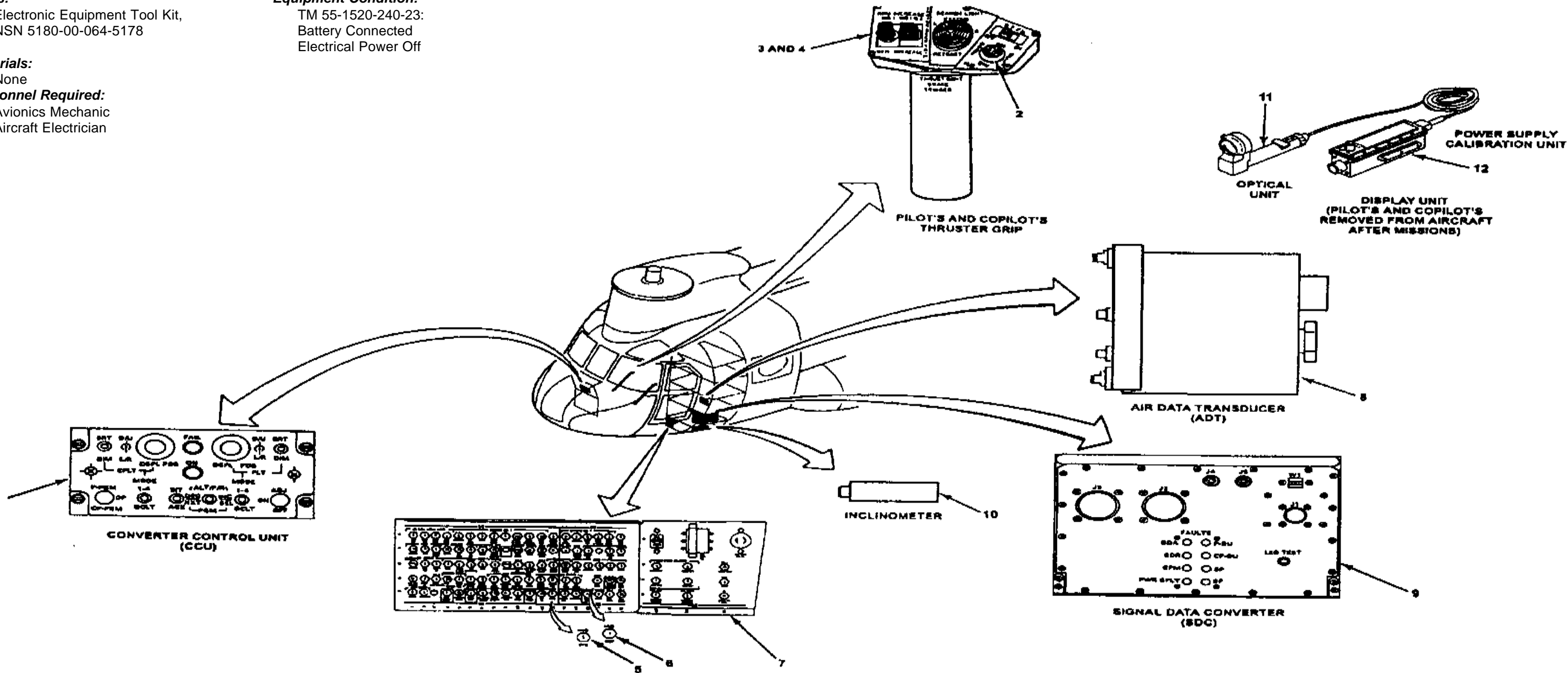
**Applicable Configurations:**  
All

**Tools:**  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178

**Materials:**  
None

**Personnel Required:**  
Avionics Mechanic  
Aircraft Electrician
- Reference:**  
TM 55-1520-240-33

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off



GO TO NEXT PAGE

16-4.2 HEADS UP DISPLAY SYSTEM VISUAL CHECK (Continued)

TASK		RESULT
1.	Check Converter Control Unit (1).	If any switch, indicator, or control panel (1) is damaged, replace item as required.
2.	Check HUD control switch (2) on pilot's (3) and copilot's (4) thruster grip.	If either switch (2) is damaged, replace HUD Control Switch.
3.	Check HUD SYS circuit breaker (5) and HUD REF circuit breaker (6) on copilot's circuit breaker panel (7).	If either circuit breaker (5 or 6) is damaged, replace circuit breaker.
4.	Check Air Data Transducer (8).	If transducer (8) is loose or damaged, tighten or replace it as required. If connector to transducer is loose or damaged, tighten or replace as required. If wiring to connector is damaged, repair or replace it as required.
5.	Check Signal Data Converter (9).	If converter (9) is damaged or any LED on the converter is defective, replace it. If converter is loose, tighten it. If any connector to converter is loose or damaged, tighten or replace it as required. If wiring to a connector is damaged, repair or replace it as required.
6.	Check Inclinometer (10).	If Inclinometer (10) is loose or damaged, tighten or replace it as required. If connector to Inclinometer is loose or damaged, tighten or replace it as required. If wiring to the connector is damaged, repair or replace it as required.
7.	Check pilot's or copilot's Display Unit's (if available) Optical Unit (11) and Power Supply Calibration Unit (12).	If either Optical Unit (11) or Power Supply Calibration Unit (12) is damaged, replace the Display Unit. If the cable between the units is damaged, repair or replace it as required.

FOLLOW-ON MAINTENANCE:  
If the Converter Control Unit (1), Air Data Transducer (8), Signal Data Converter (9), Inclinometer (10), or a Display Unit (11) and Power Supply Calibration Unit (12) is replaced, an operational check (16-4.3) must be performed.

INITIAL SETUP

**Applicable Configurations:**  
All

**Tools:**  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

**Materials:**  
None

**Personnel Required:**  
Avionics Mechanic  
Aircraft Electrician

**References:**  
TM 55-1520-240-23  
TM 11-5855-300-10  
TM 11-5855-300-23&P

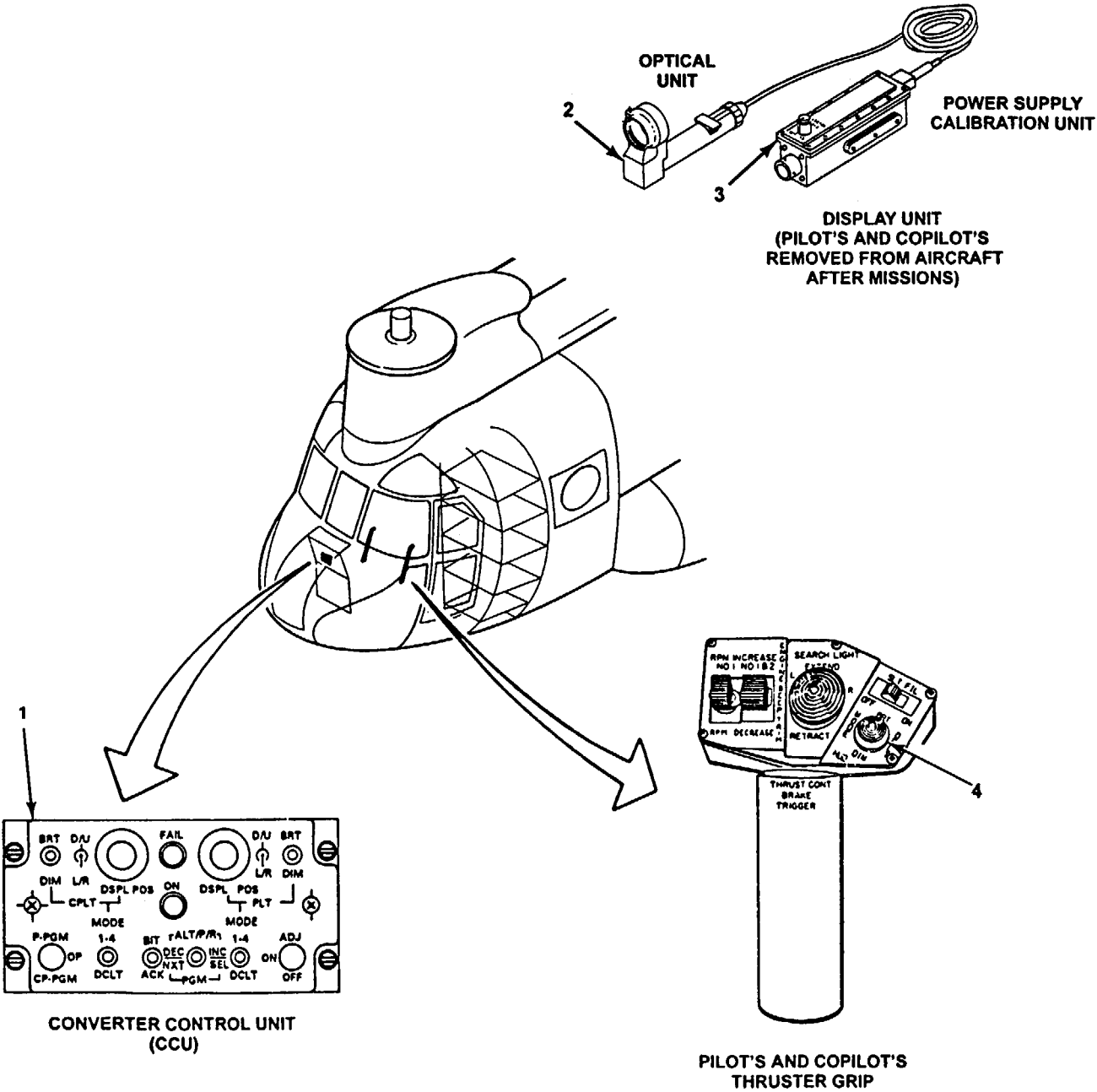
**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off  
Visual Check of Heads Up Display Performed  
(Task 16-3.2)

**General Safety Instructions:**

WARNING

Keep personnel clear of flight controls.

TASK	RESULT
1. With converter control unit (CCU) (1) off, connect heads up display (HUD) optical unit (2) and power supply calibration unit (3) to aircraft ANVIS system then turn on (push in) aircraft circuit breakers.	If CCU (1) panel is not illuminated, go to task 16-4.4.
2. Place CCU P-PGMIOPICP-PGM switch to OP and ADJ/ONIOFF switch to ON. CCU ON and FAIL lights illuminate and BIT proceeds automatically. After 10 seconds BIT is complete and FAIL light extinguishes.	If FAIL light does not extinguish, go to task 16-4.5. If ON and FAIL lights do not illuminate, go to task 16-4.6.
3. Place CCU PLT and CPLT BRT/DIM controls to full BRT.	If PLT and/or CPLT display has no display, go to task 16-4.7.
4. Place CCU PLT and CPLT BRT/DIM controls to full DIM.	If PLT and/or CPLT display remains at maximum intensity, go to task 16-4.8.





TASK RESULT

- 5

Press and hold CCU BIT/ACK switch to BIT, allow 20 seconds for BIT to run then note that pilot and copilot displays show symbol generator test mode. Release CCU BIT/ACK switch to return display units to operating mode.

If one test display is incorrect, replace that display unit. If both test displays are incorrect, replace the signal data converter. If both displays indicate incorrect type aircraft, go to task 16-4.9.
6.

Refer to TM 11-5855-300-10 and program the pilot's then the copilot's display. On completion of programming, return CPU P-PGM/OP/CP-PGM switch to OP.

If a symbol does not stop blinking when programmed, go to task 16-4.10. If PLT DCLT will not select, go to task 16-4.11. If CPLT DCLT will not select, go to task 16-4.12.
7.

Set pilot's/copilot's thruster grip HUD control switch (4) to cycle through four MODE/DCLT positions and check the BRT and DIM operation. are 16-4.17; 16-4.18; 16-4.19; or 16-4.20.

If the pilot thruster grip HUD switch will not cycle through all modes, through declutter, and brighten or dim display, go to tasks 16-4.13; 16-4.14; 16-4.15; or 16-4.16 respective tasks
8.

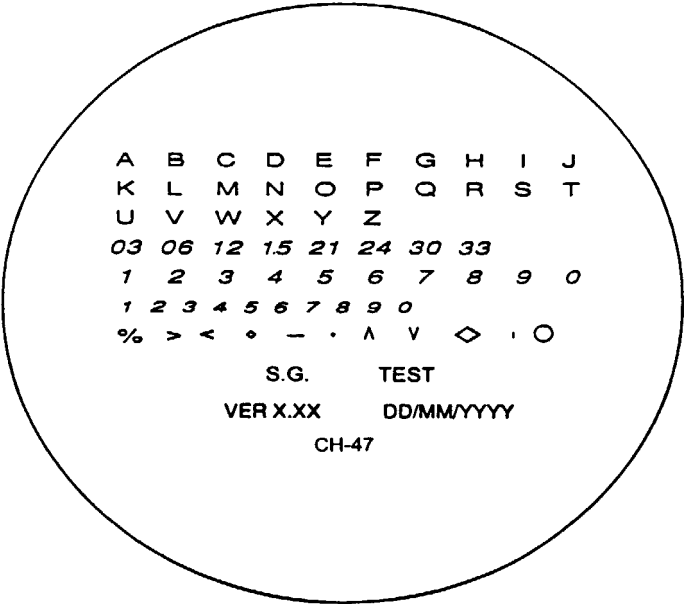
On the CCU, rotate pilot's/copilot's DISPL POS control to full LIR (left/right) then D/U (down/up) positions. Check that the display follows the control.

If the pilot's display will not follow the UR or the D/U control, go to task 16-4.21 or 16-4.22 respectively. For the copilot, go to tasks 16-4.23 or 16-4.24 respectively.
9.

With the CCU P-PGMIOPICP-PGM switch in OP, set the ADJIONIOFF switch to ADJ. Using the DEC/INC switch, check that the data can be changed then set to the required value. The MSL altitude, the pitch, then the roll are adjusted in turn.

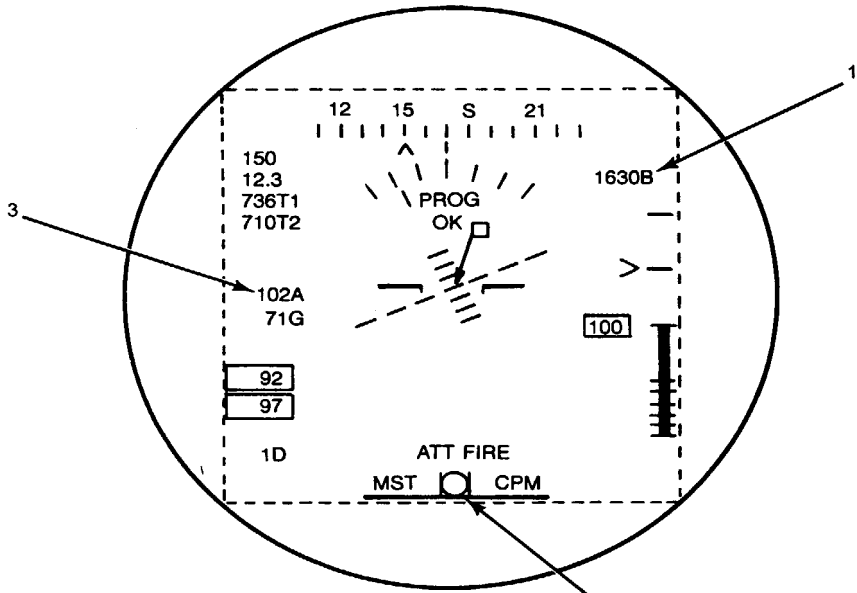
If the MSL altitude (1) or airspeed (3) is improperly displayed, go to task 16-4.29. If the trim (2) is improperly displayed, go to task 16-4.30. If any adjustment can be make, refer to TM 11-5855-30-23&P to troubleshoot the HUD.

FOLLOW-ON MAINTENANCE:  
TM 55-1520-240-23:  
Remove power from HUD system  
Remove Electrical Power  
Disconnect Battery



NOTE: VERSION NUMBER AND DATE WILL CHANGE AS SOFTWARE IS UPDATED.

Symbol Generator Test Mode



CH-47D HUD Master Mode Display

FAULT ISOLATION PROCEDURE

Personnel Required:  
Avionics Mechanic

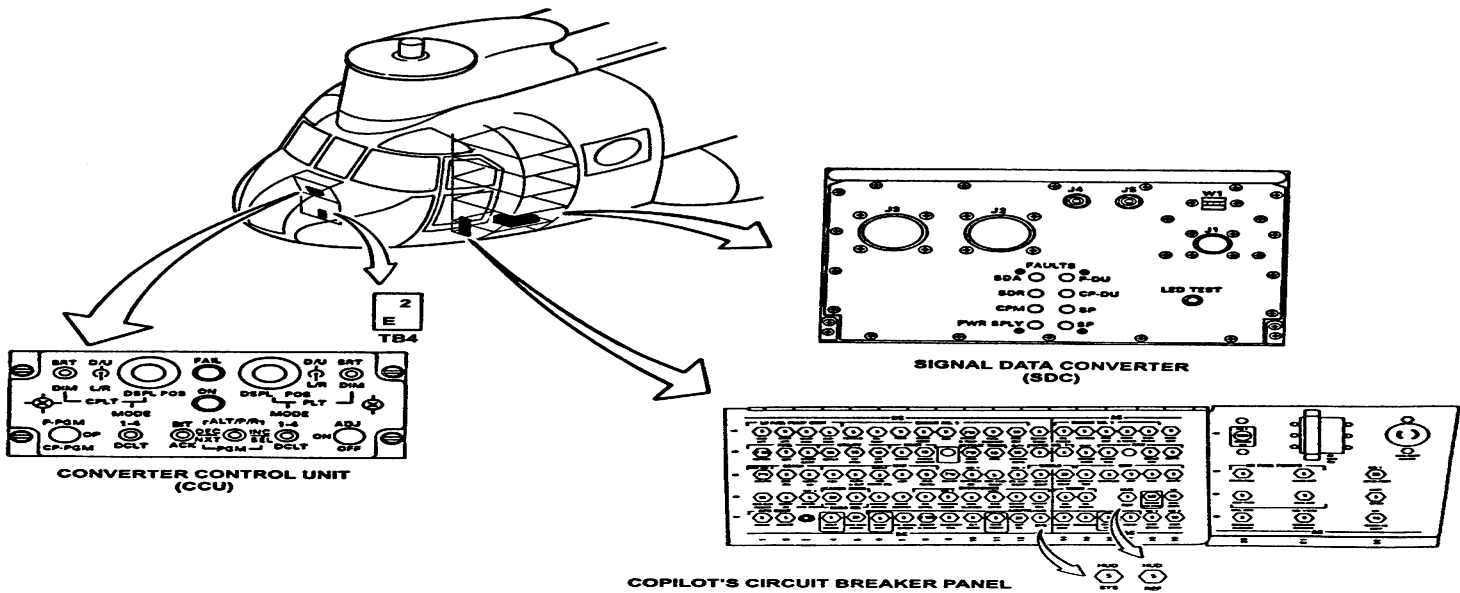
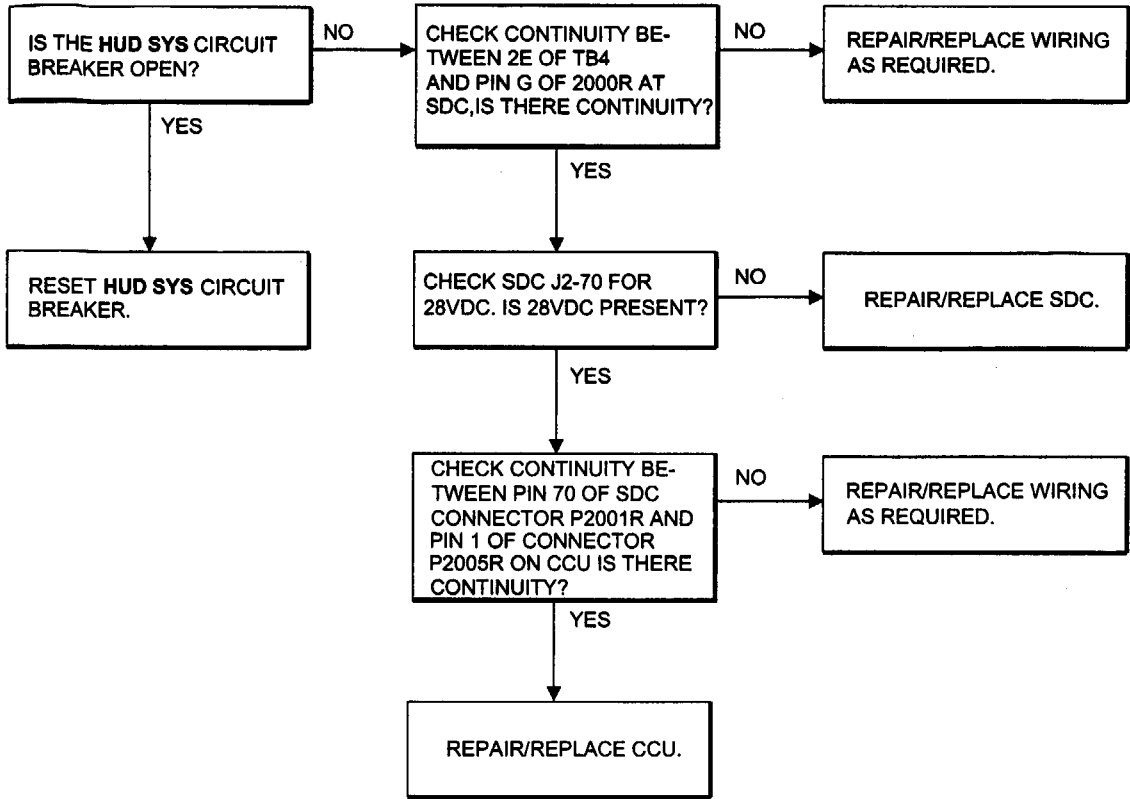
INITIAL SETUP  
Applicable Configurations:  
All

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On

Materials:  
None



FAULT ISOLATION PROCEDURE

Personnel Required:  
Avionics Mechanic

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

References:

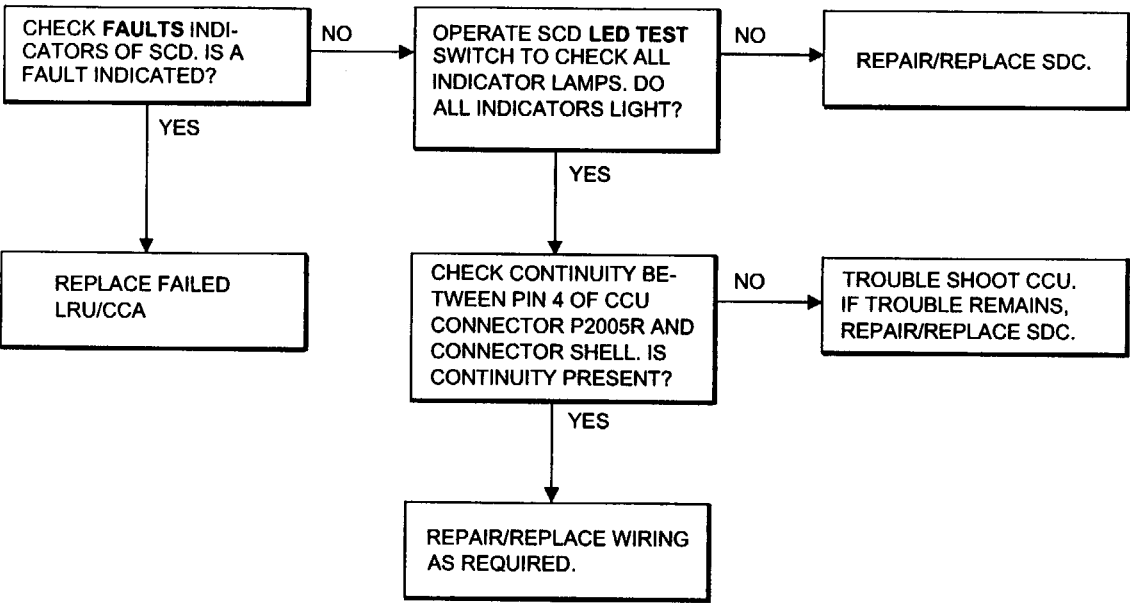
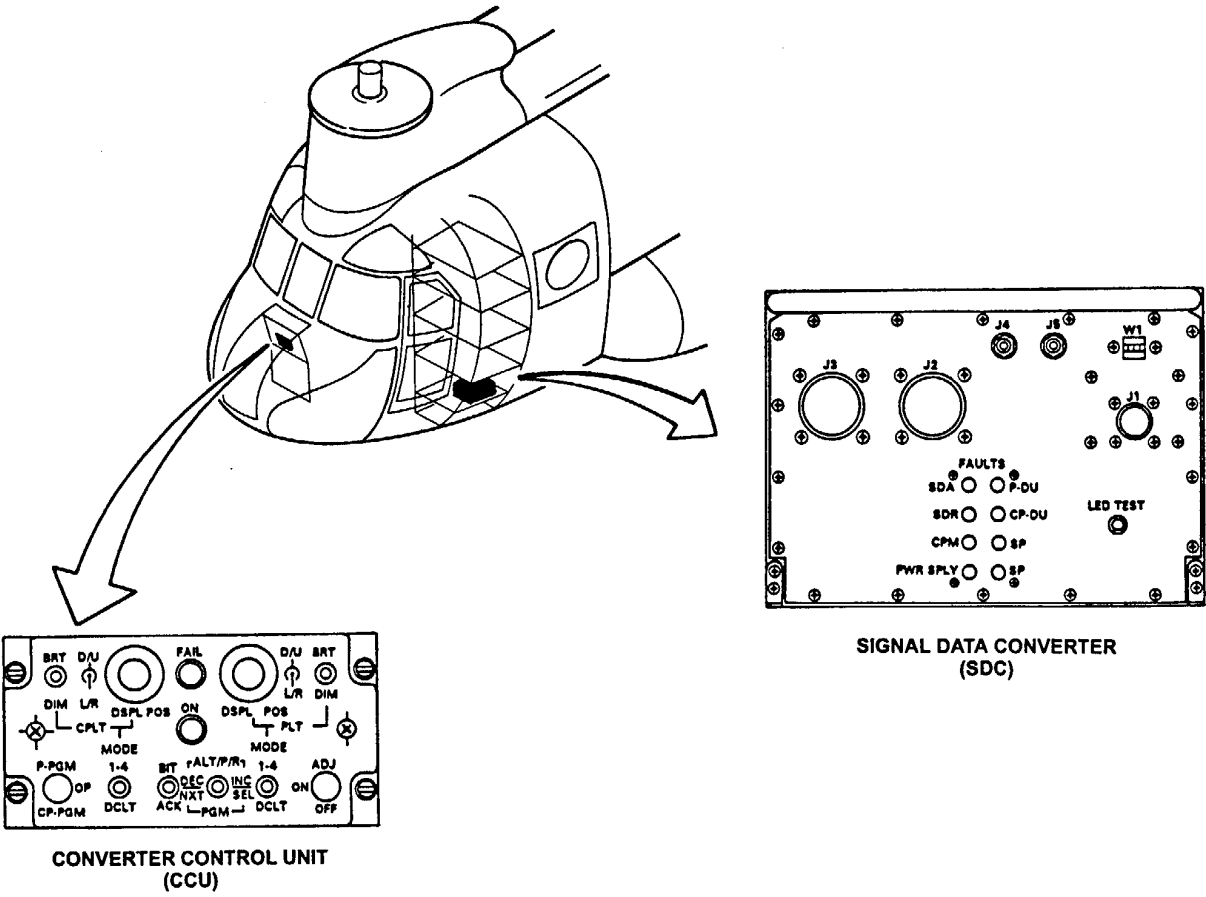
TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On

Materials:

None



FAULT ISOLATION PROCEDURE

Avionics Mechanic  
INITIAL SETUP

Applicable Configurations:  
All

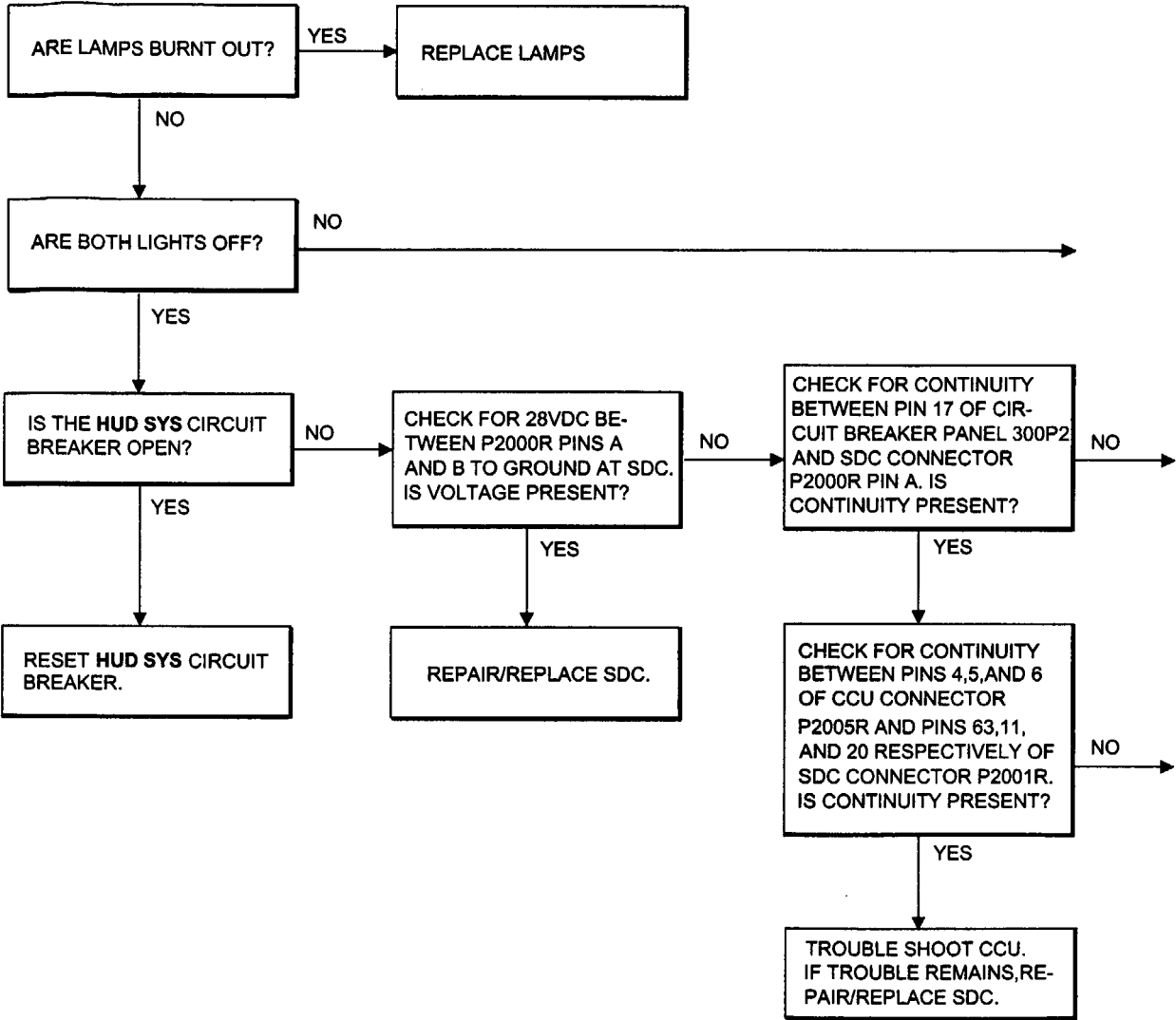
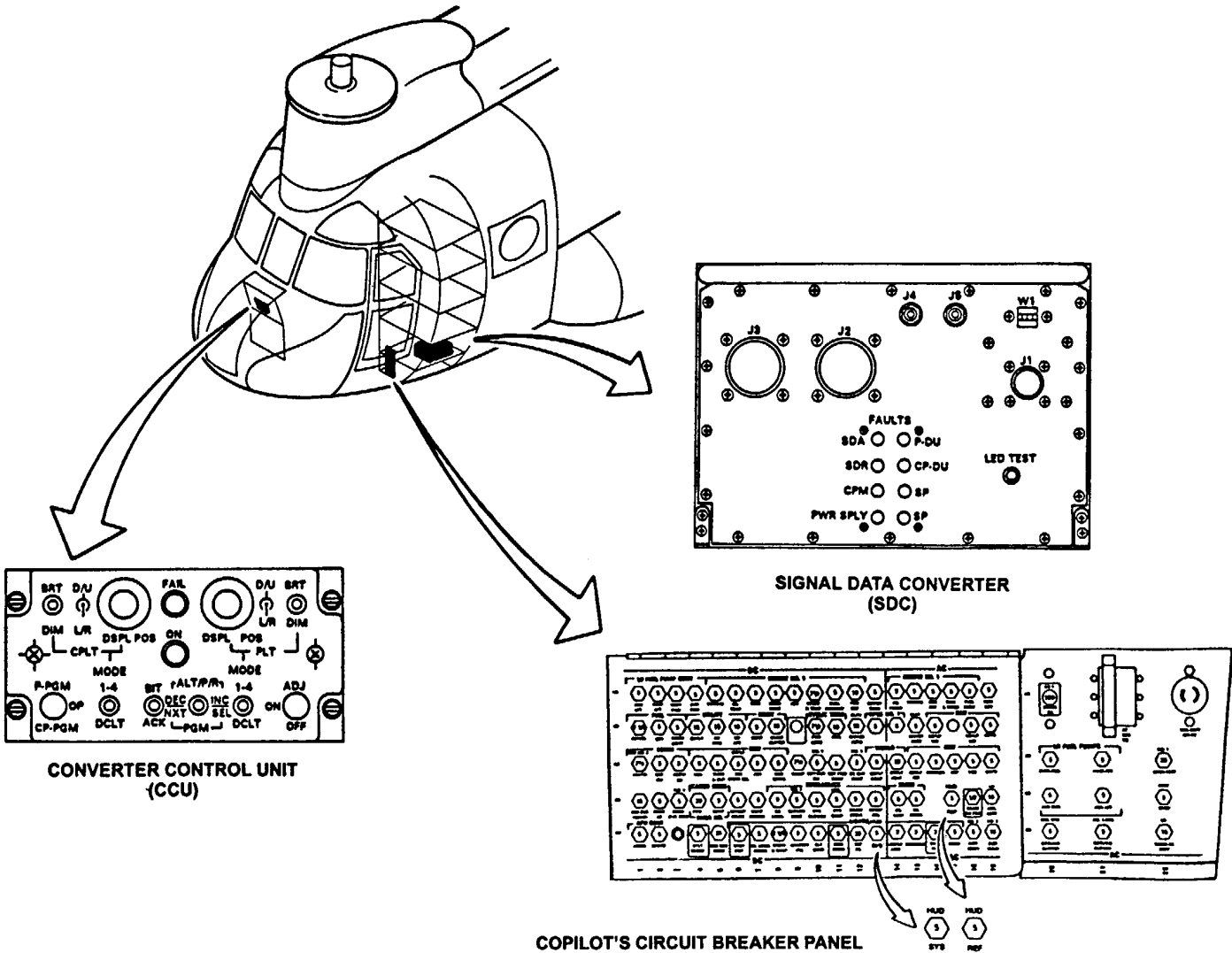
Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

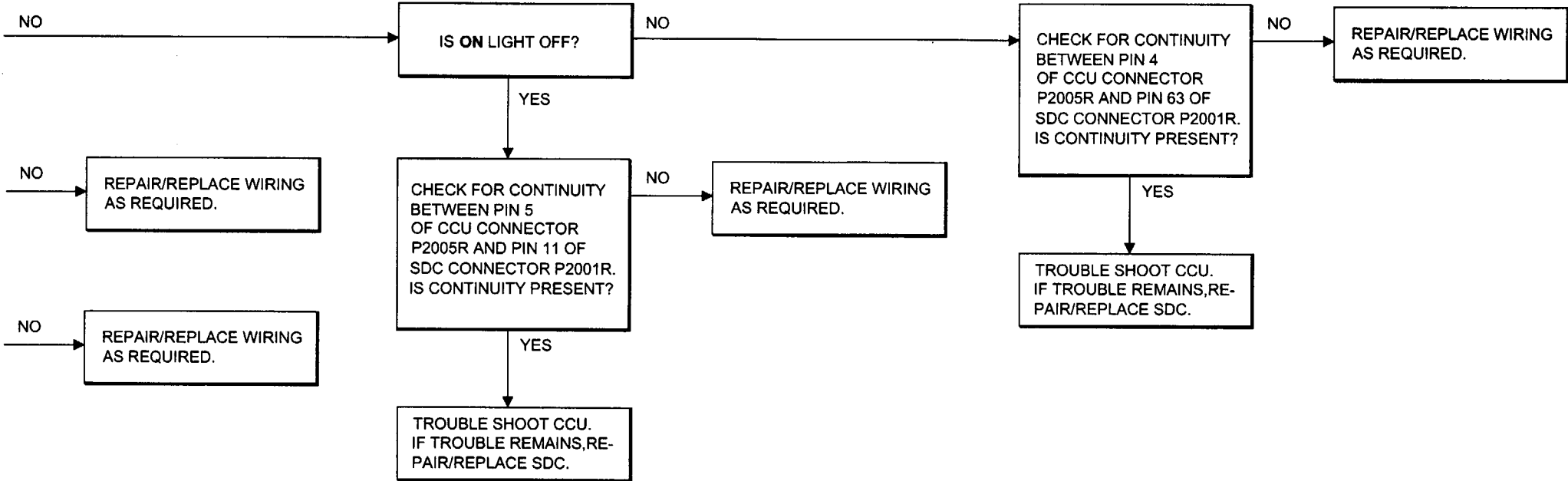
Materials:  
None

Personnel Required:

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On





FAULT ISOLATION PROCEDURE

Avionics Mechanic  
INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:

None

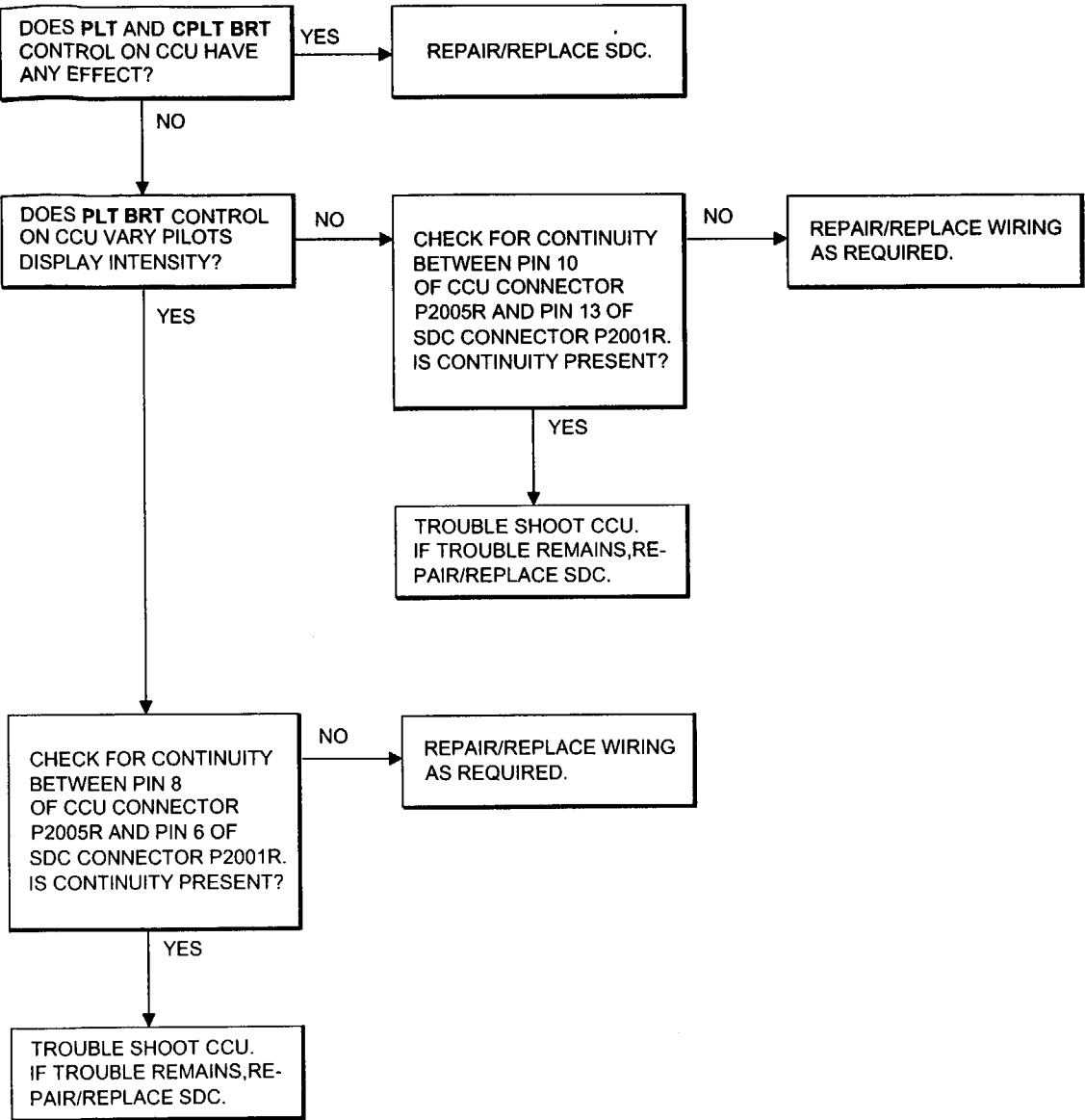
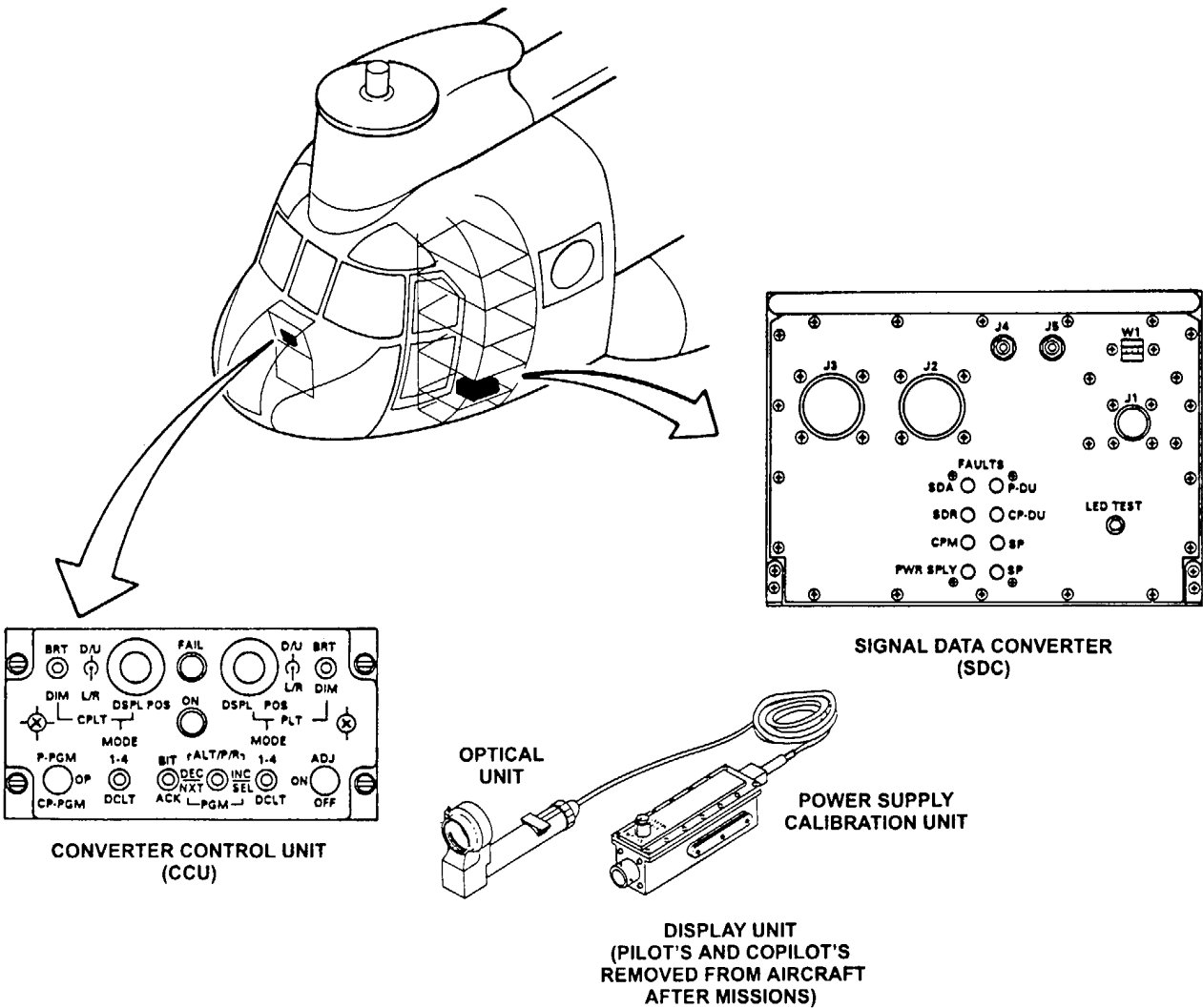
Personnel Required:

References:

TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On



16-4.8 PILOT'S AND/OR COPILOT'S DISPLAY REMAINS AT MAXIMUM INTENSITY

16-4.8

FAULT ISOLATION PROCEDURE

Avionics Mechanic  
INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:

None

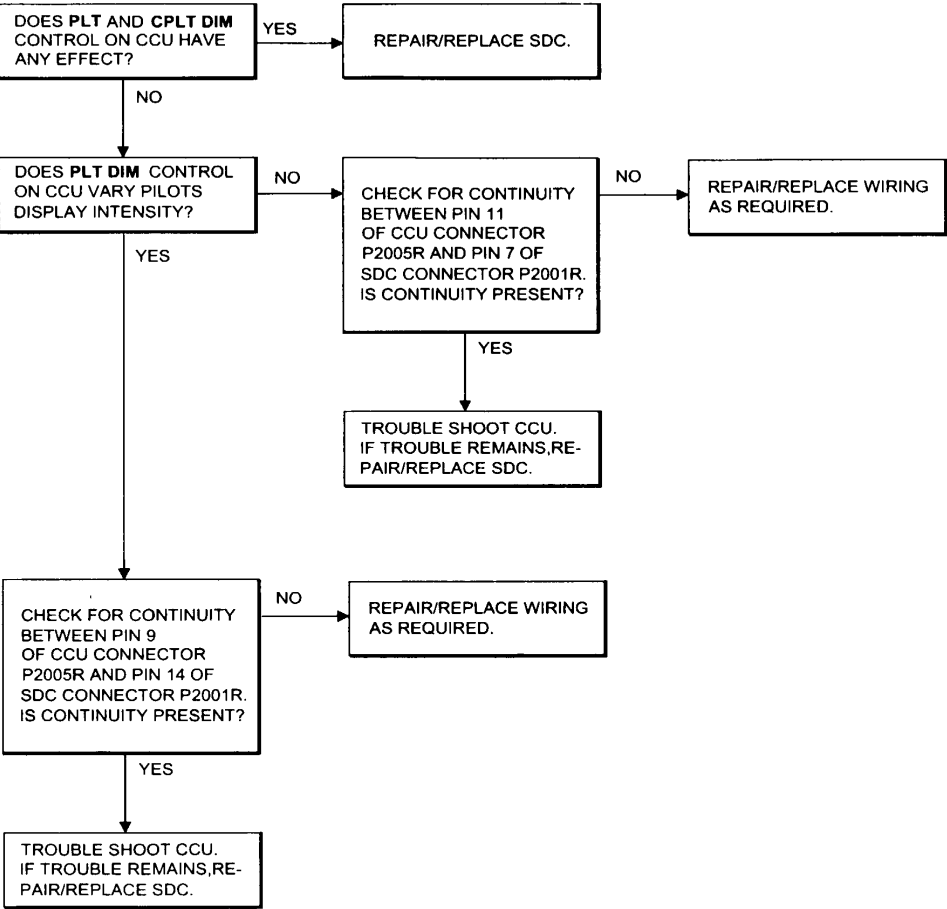
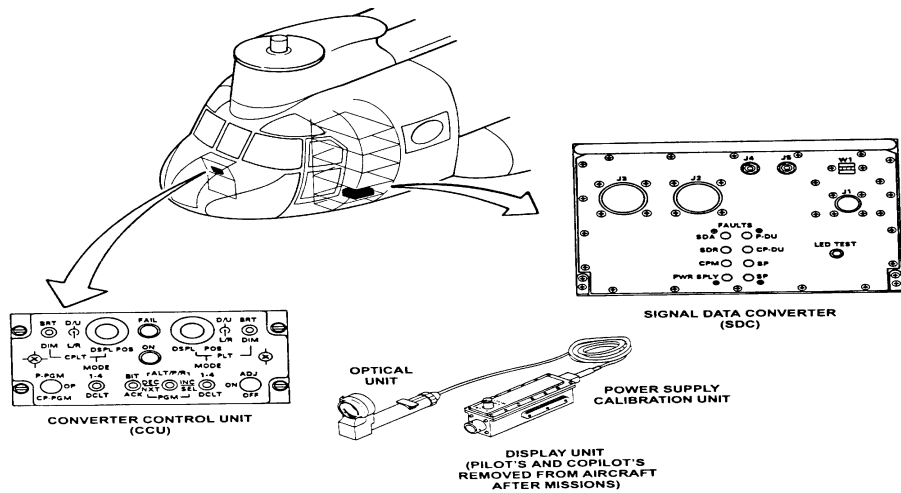
Personnel Required:

References:

TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power On



END OF TASK  
Change 18 16-157

FAULT ISOLATION PROCEDURE

Avionics Mechanic  
INITIAL SETUP

Applicable Configurations:  
All

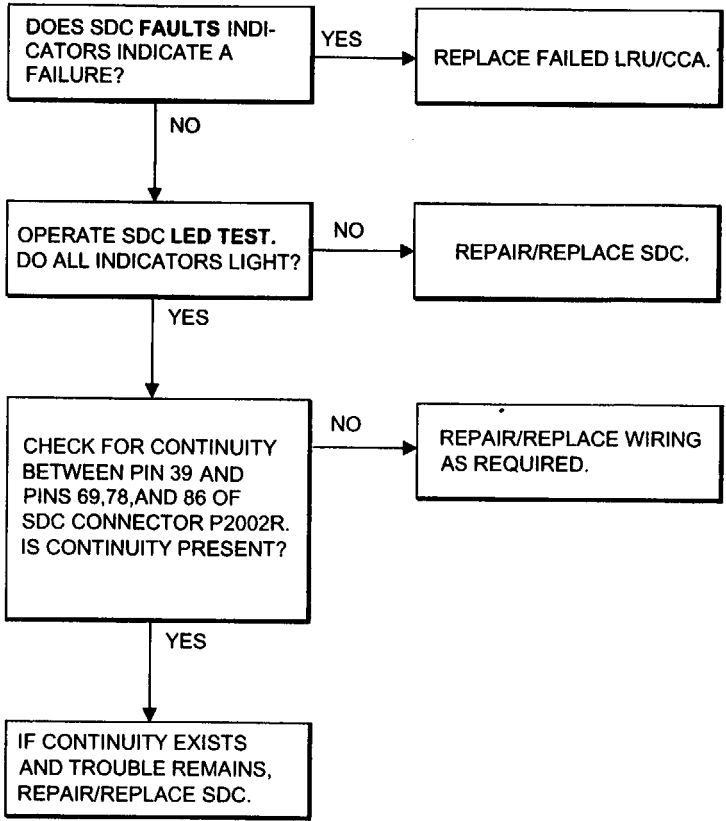
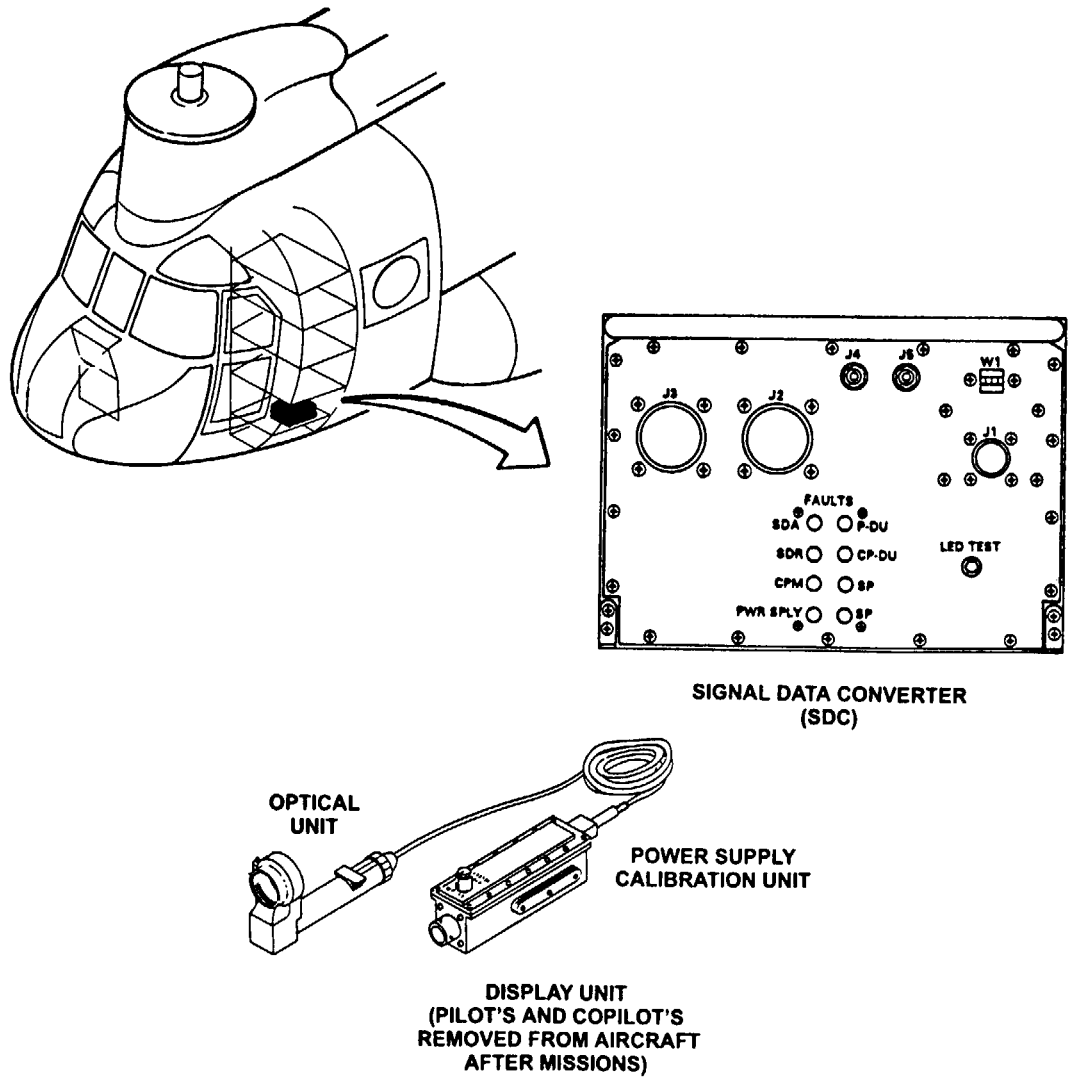
Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On





16-4.10 SYMBOL DOES NOT STOP BLINKING

16-4.10

FAULT ISOLATION PROCEDURE

Personnel Required:  
Avionics Mechanic

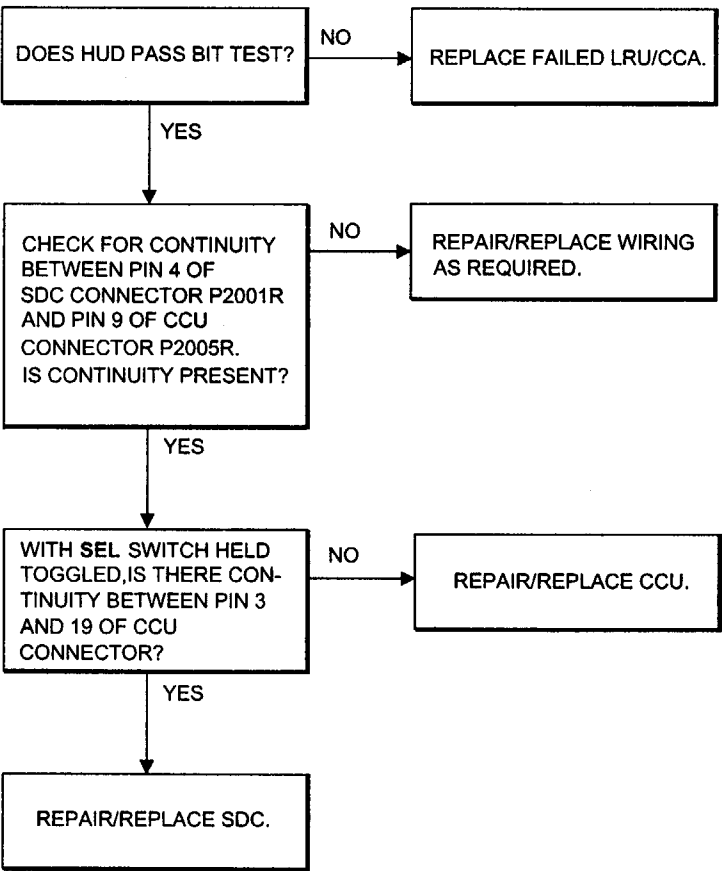
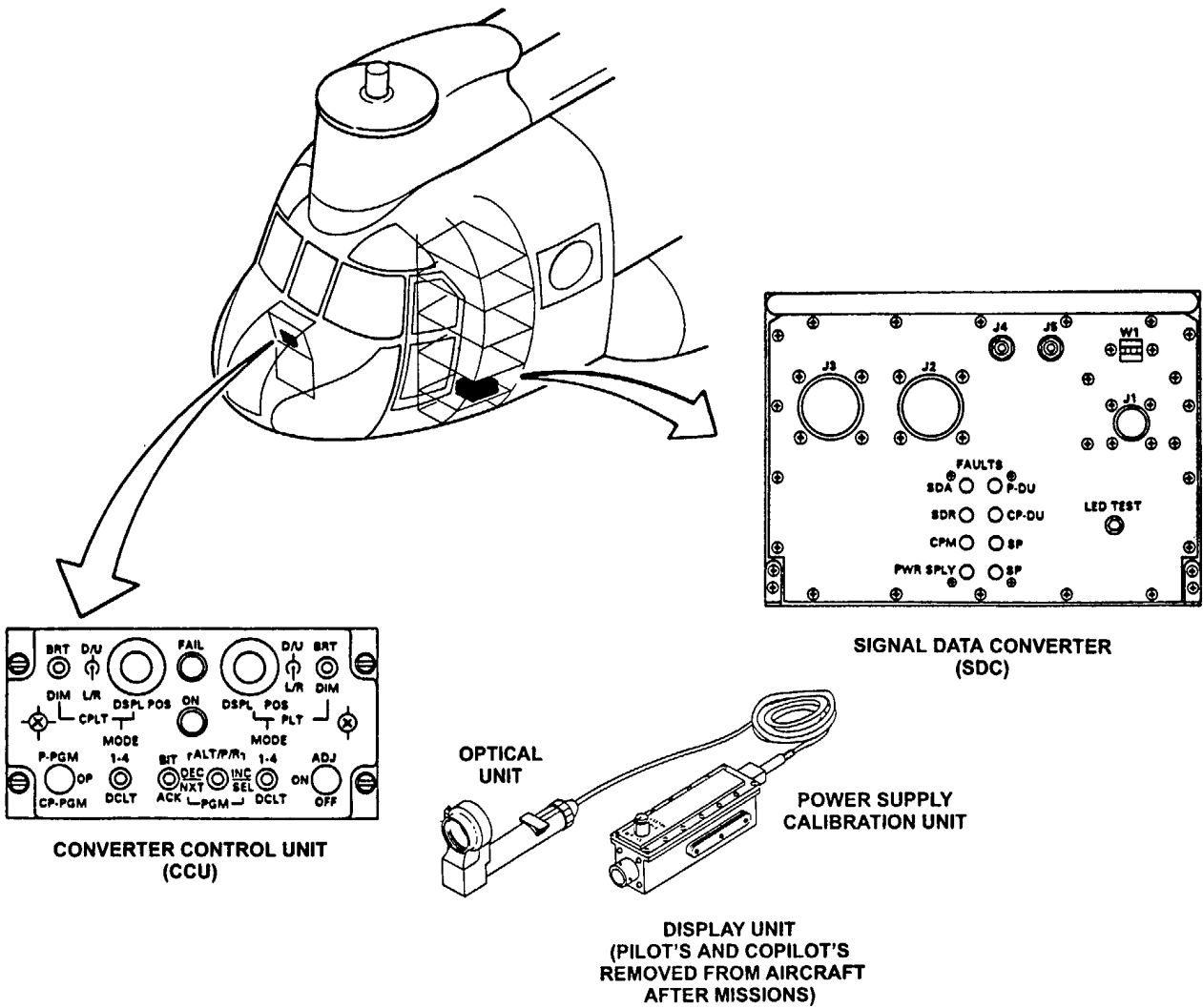
INITIAL SETUP  
Applicable Configurations:  
All

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On

Materials:  
None



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP  
Applicable Configurations:  
All

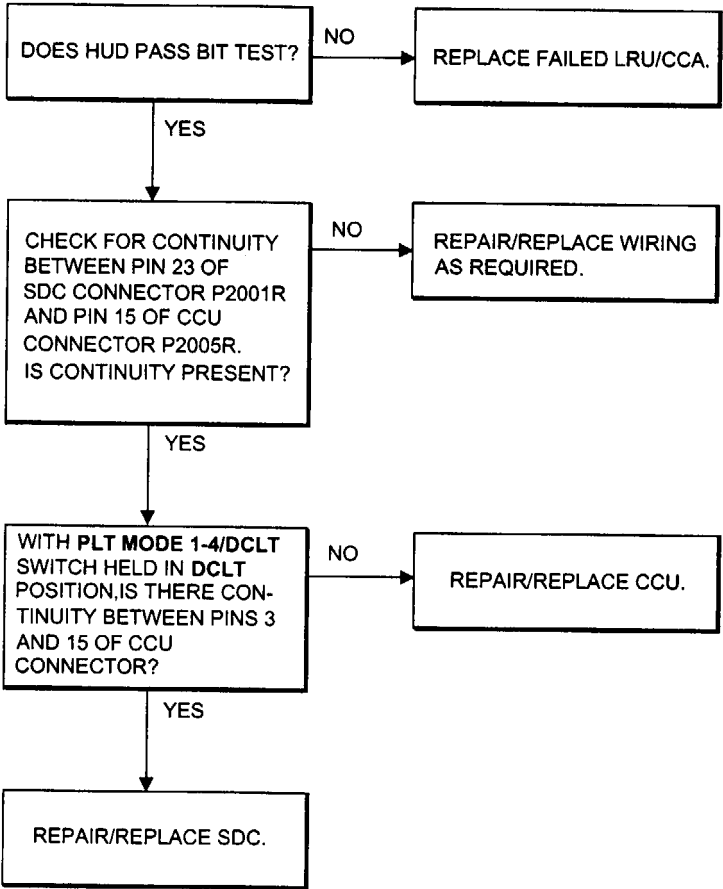
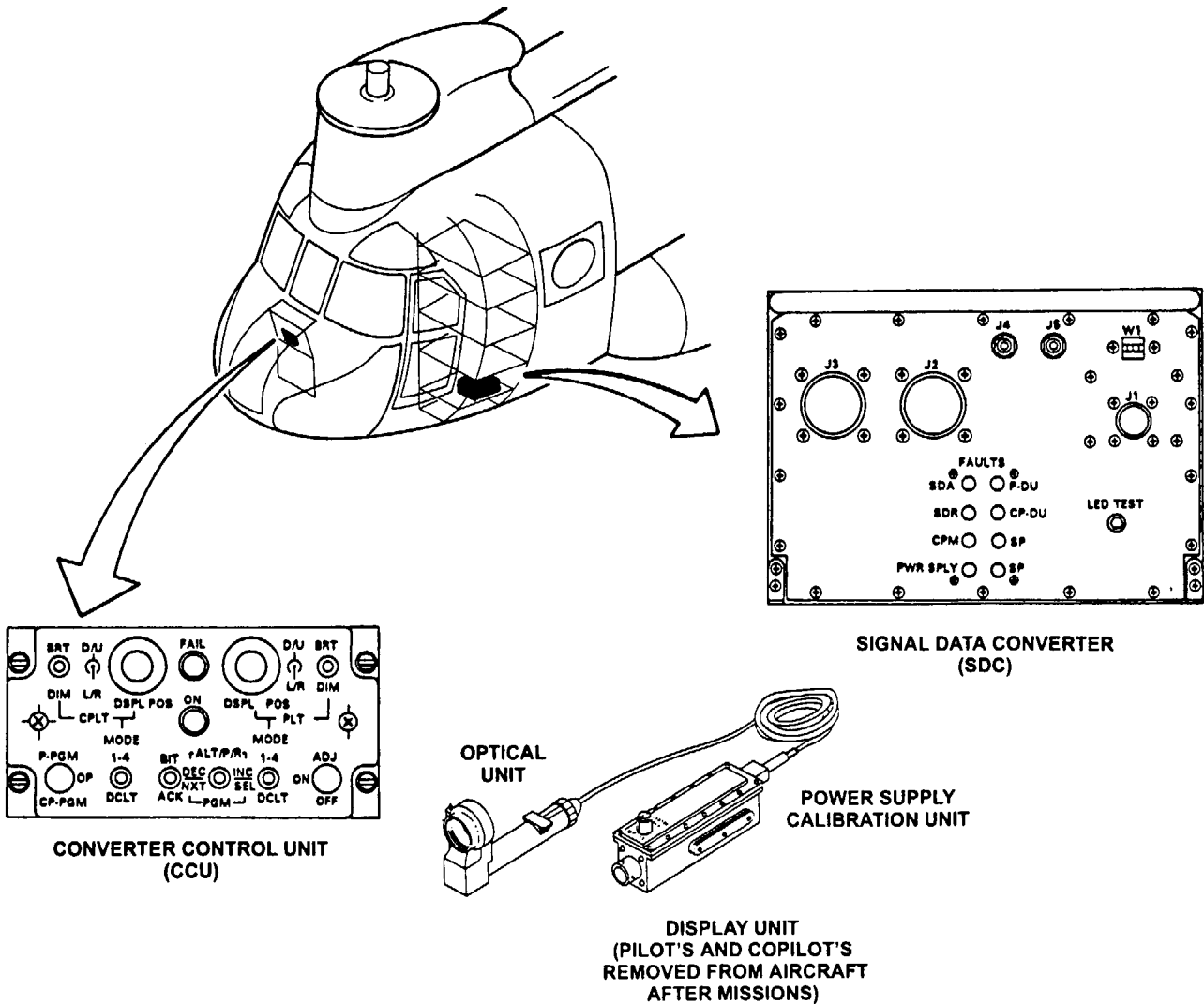
Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
Avionics Mechanic

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On



FAULT ISOLATION PROCEDURE

INITIAL SETUP  
**Applicable Configurations:**  
All

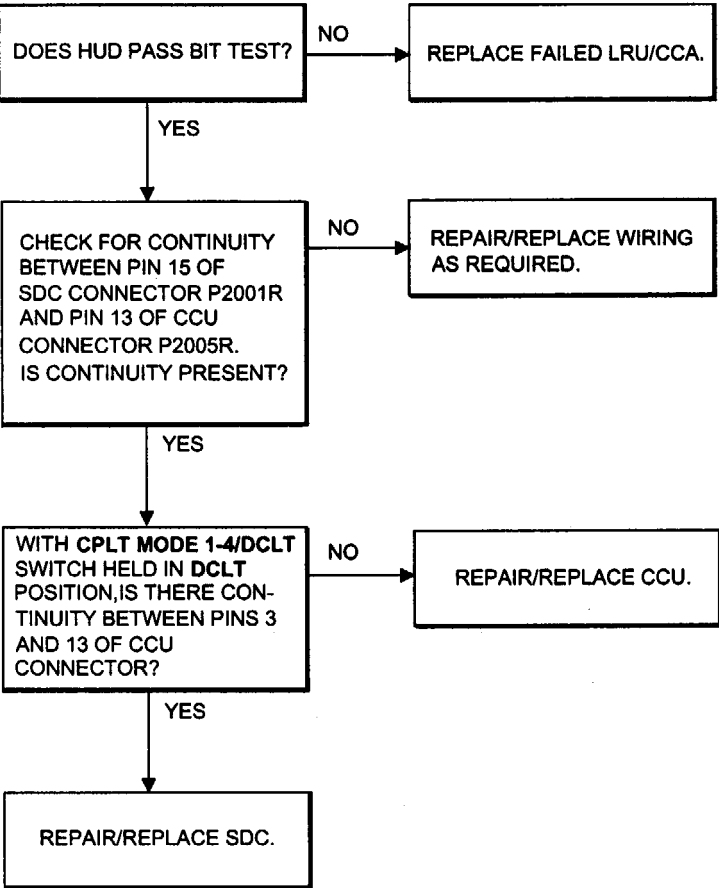
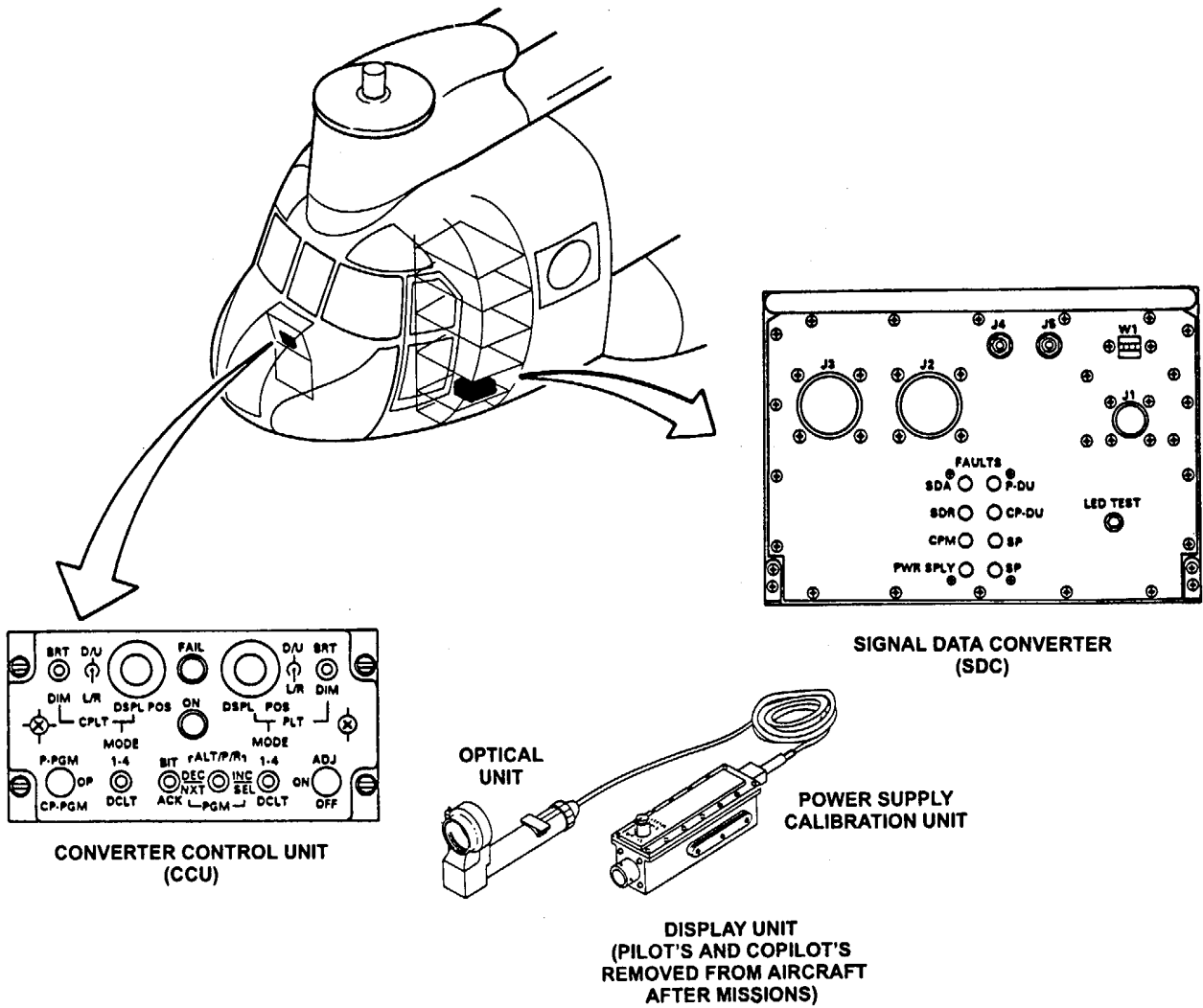
**Tools:**  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

**Materials:**  
None

**Personnel Required:**  
Avionics Mechanic

**References:**  
TM 55-1520-240-23  
TM 11-5855-300-23&P

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP  
Applicable Configurations:  
All

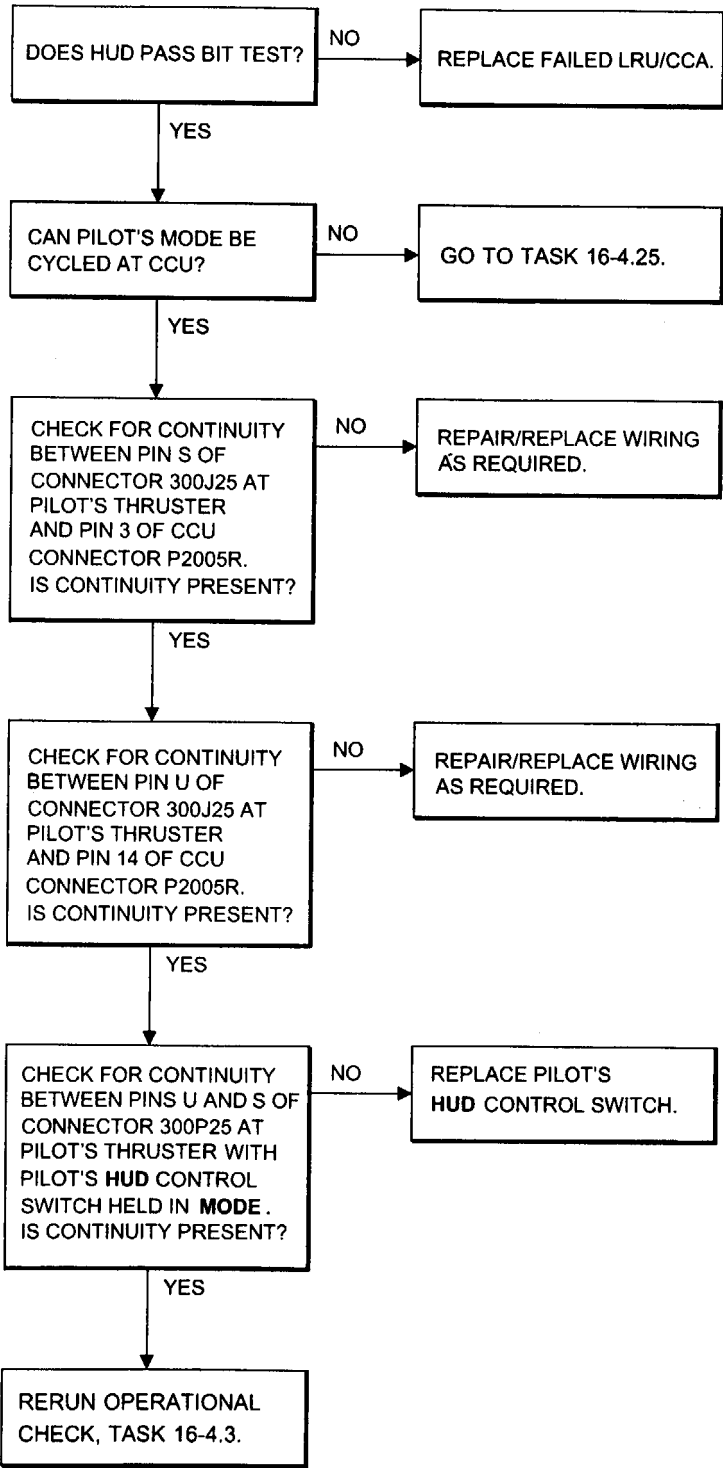
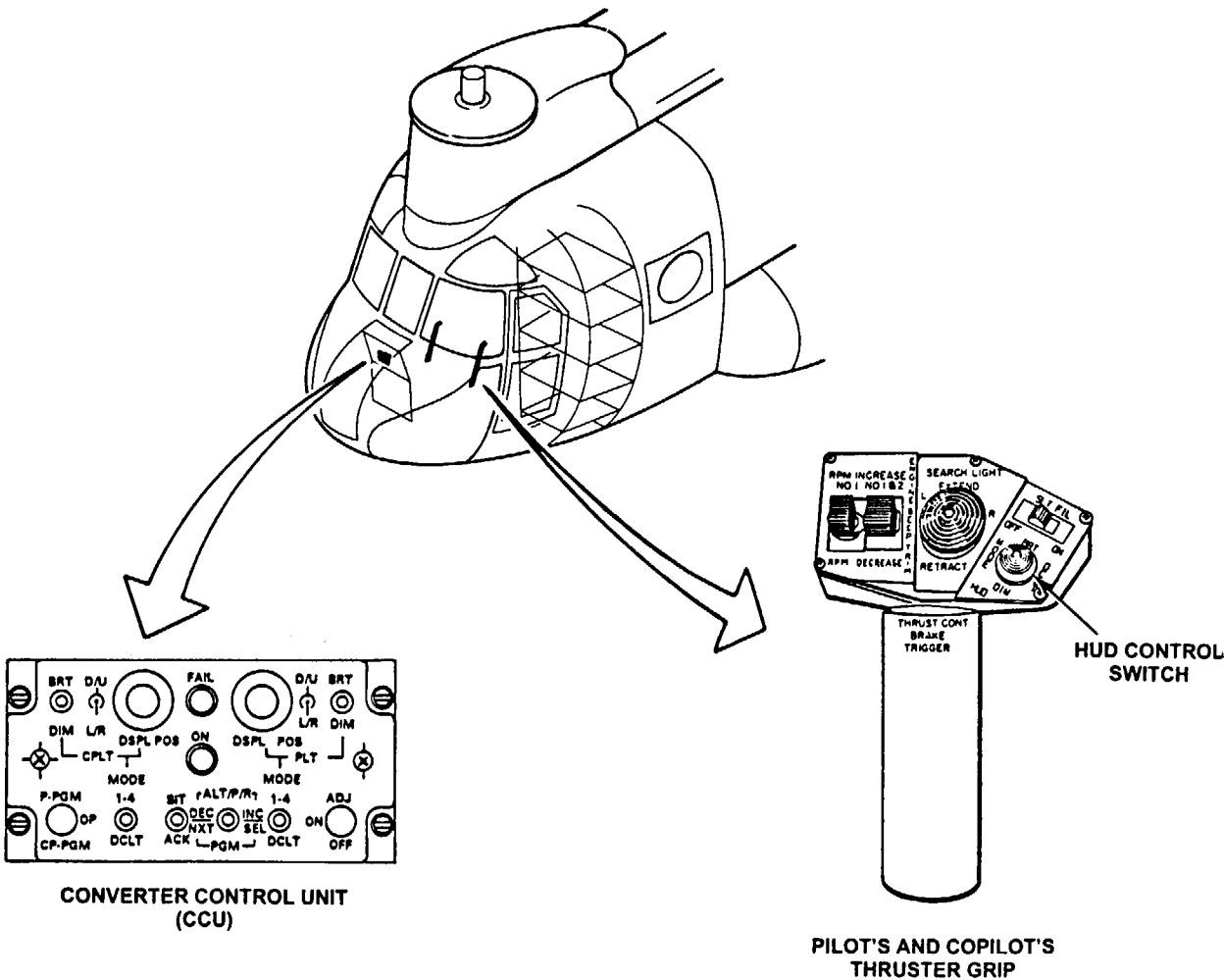
Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
Avionics Mechanic

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On



END OF TASK

16-4.14 CANNOT CYCLE THROUGH DECLUTTER AT PILOT'S THRUSTER GRIP

16-4.14

FAULT ISOLATION PROCEDURE

Personnel Required:  
Avionics Mechanic

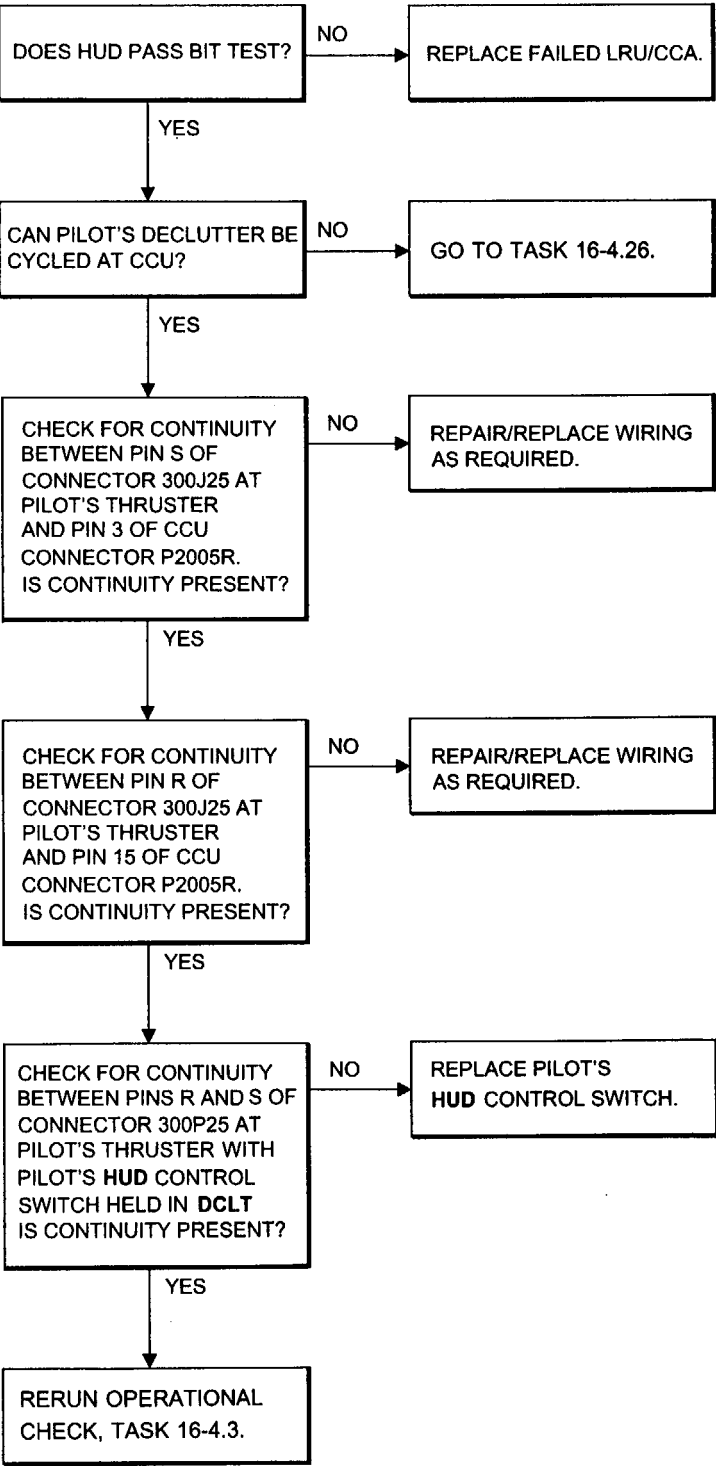
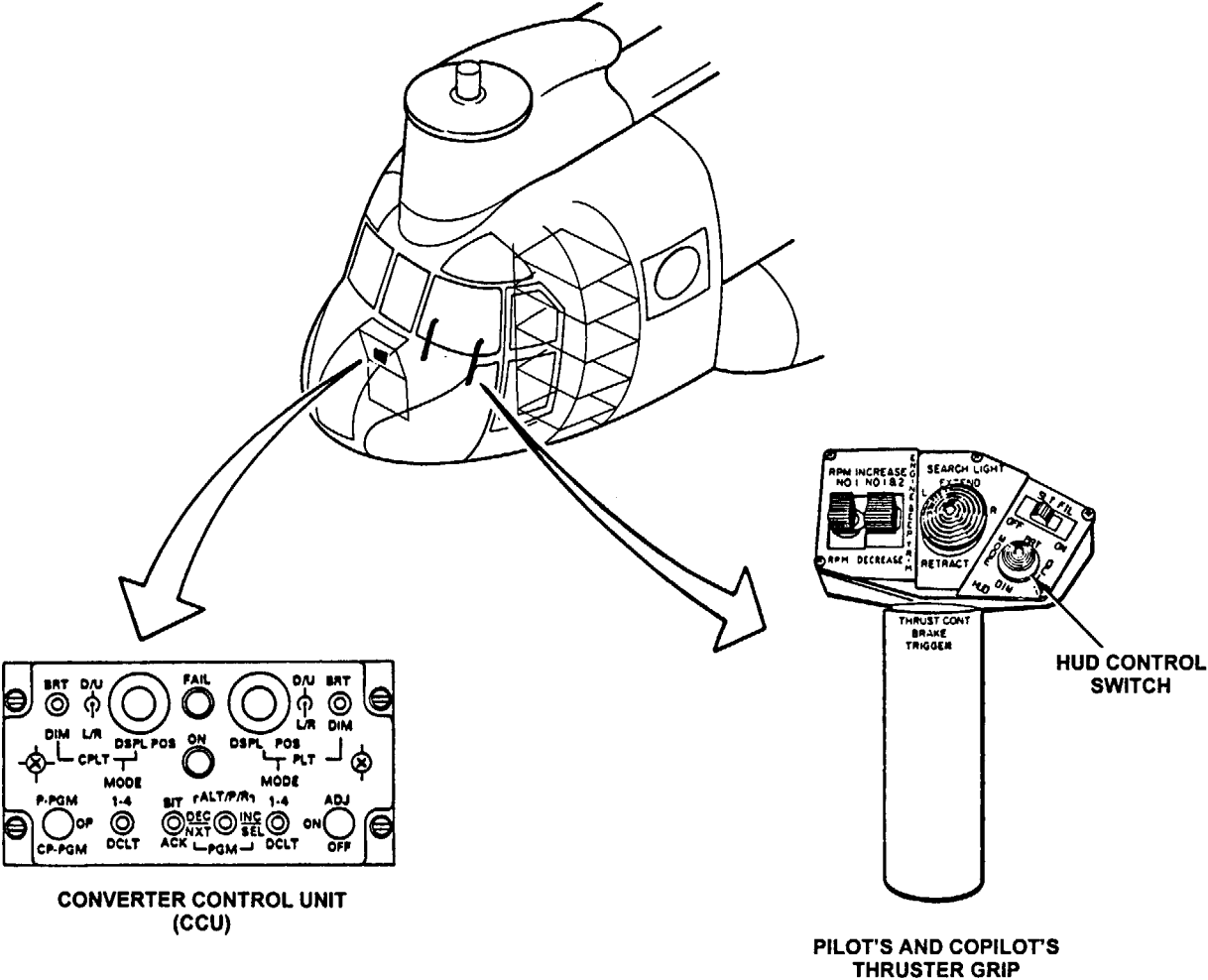
INITIAL SETUP  
Applicable Configurations:  
All

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On

Materials:  
None



END OF TASK

FAULT ISOLATION PROCEDURE

**Personnel Required:**  
Avionics Mechanic

INITIAL SETUP

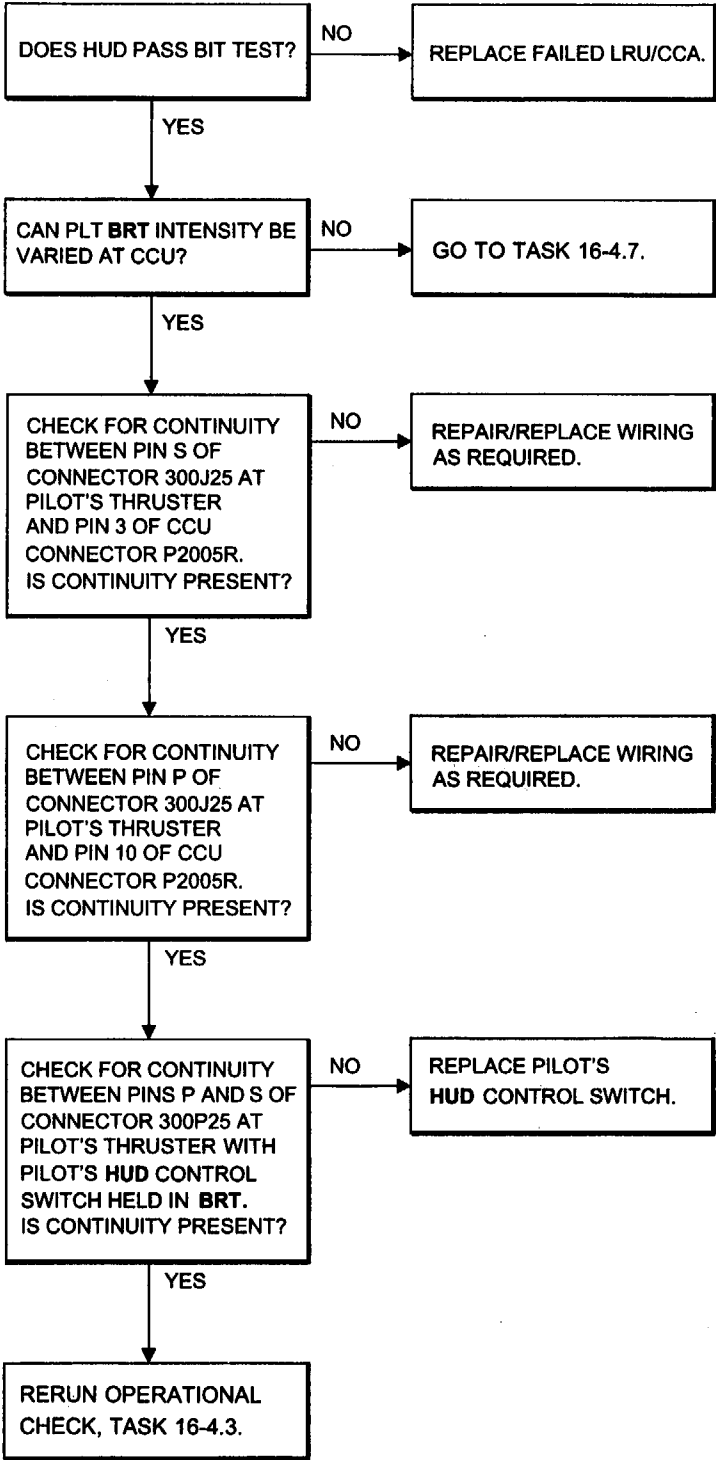
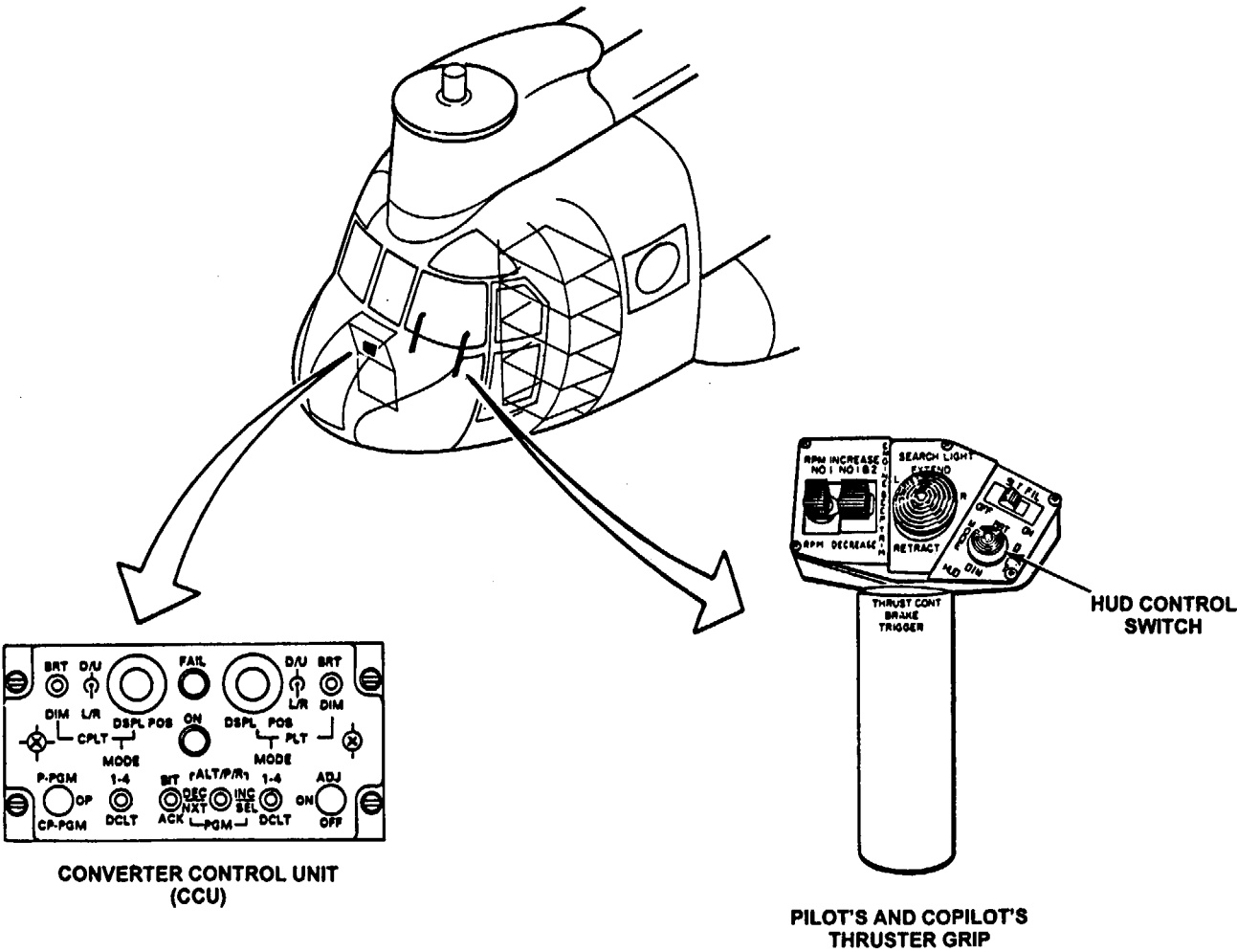
**Applicable Configurations:**  
All

**References:**  
TM 55-1520-240-23  
TM 11-5855-300-23&P

**Tools:**  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On

**Materials:**  
None



END OF TASK

16-4.16 PILOT'S DIM CONTROL ON THRUSTER DOES NOT VARY DISPLAY INTENSITY

16-4.16

FAULT ISOLATION PROCEDURE

**Personnel Required:**  
Avionics Mechanic

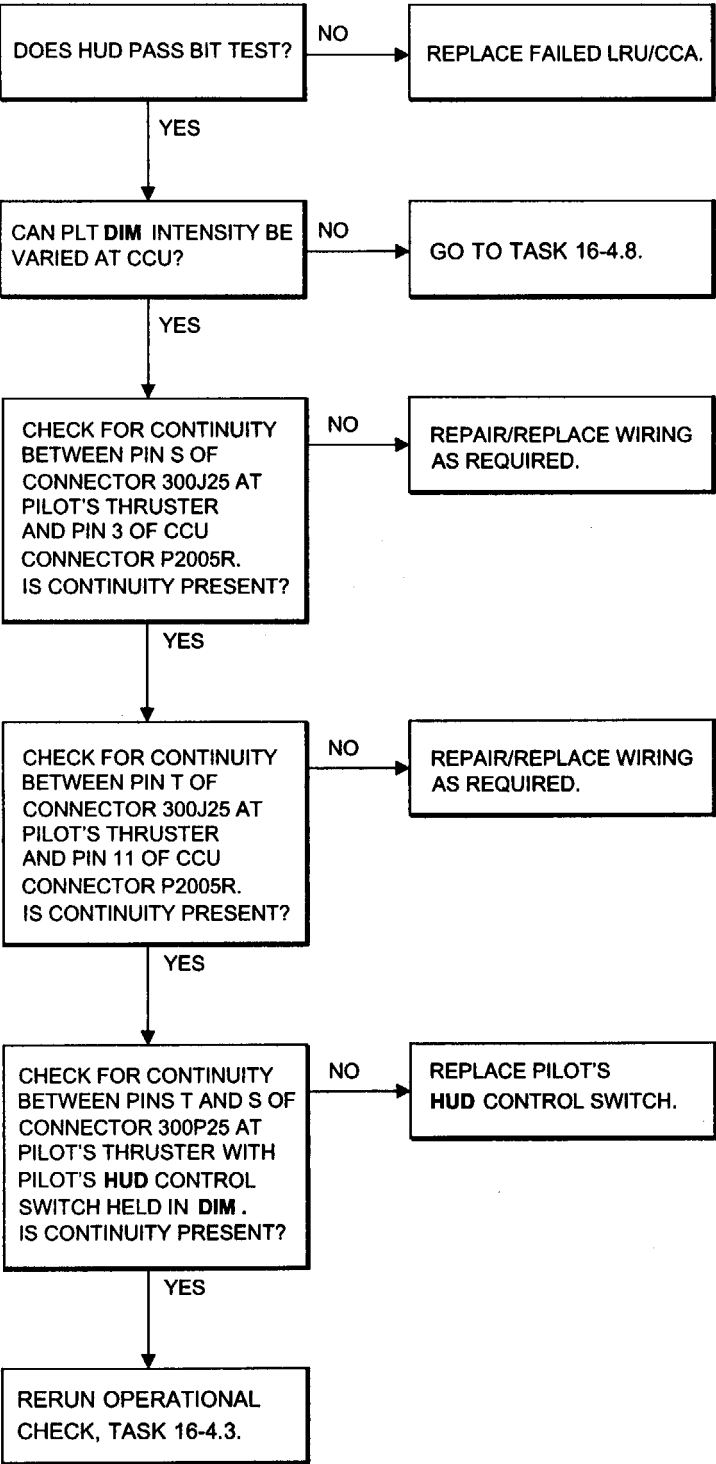
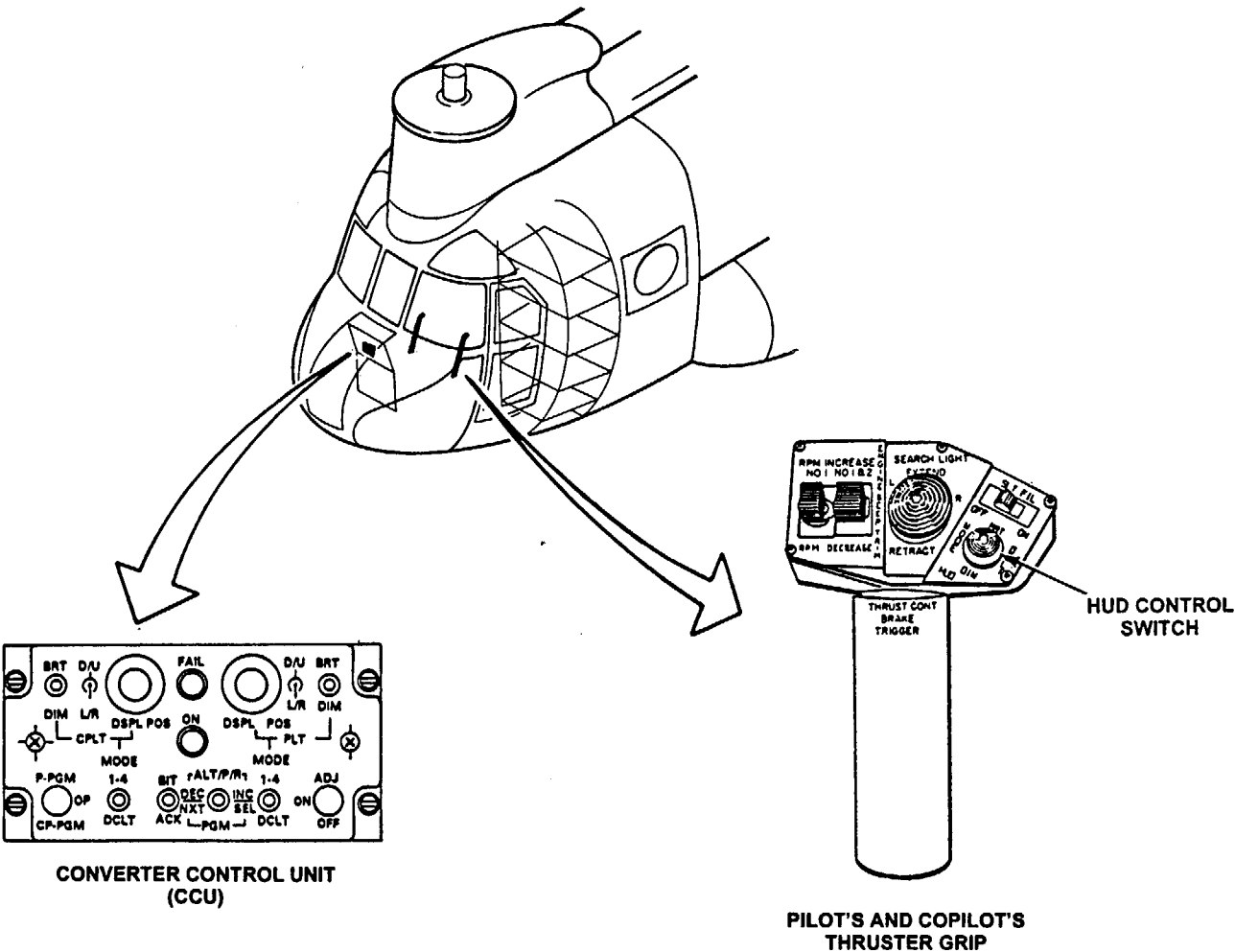
INITIAL SETUP  
**Applicable Configurations:**  
All

**References:**  
TM 55-1520-240-23  
TM 11-5855-300-23&P

**Tools:**  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On

**Materials:**  
None



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP  
Applicable Configurations:  
All

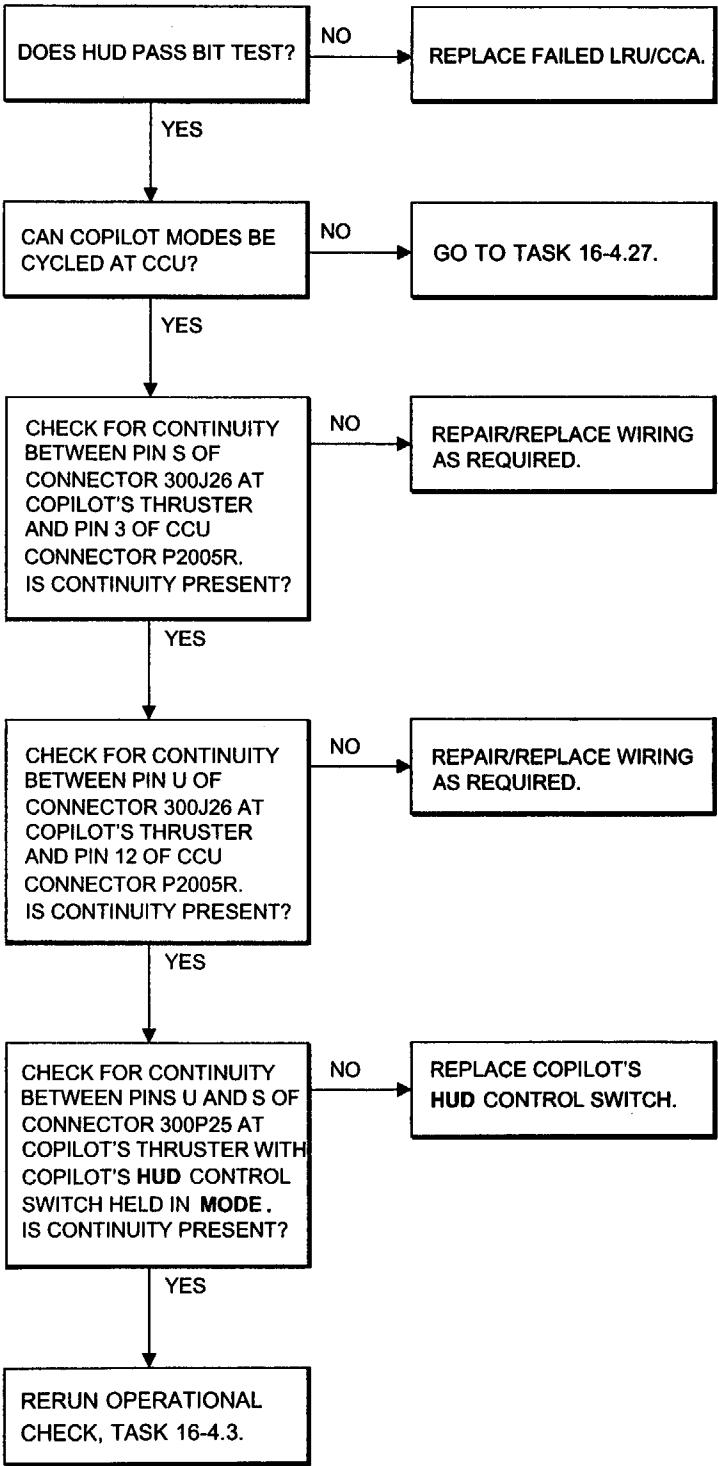
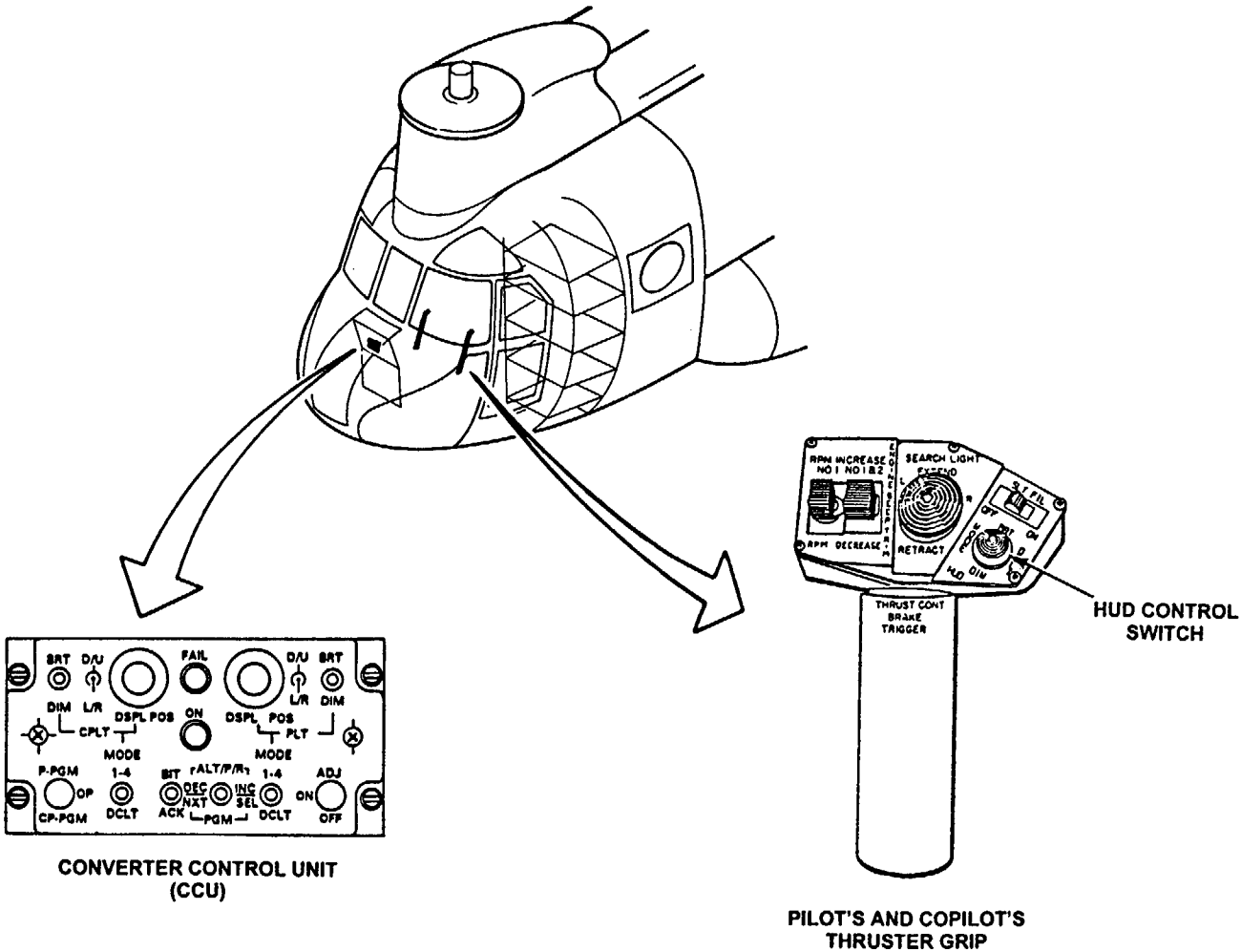
Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
Avionics Mechanic

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On



END OF TASK



16-4.18 CANNOT CYCLE THROUGH DECLUTTER AT COPILOT'S THRUSTER GRIP

16-4.18

FAULT ISOLATION PROCEDURE

**Personnel Required:**  
Avionics Mechanic

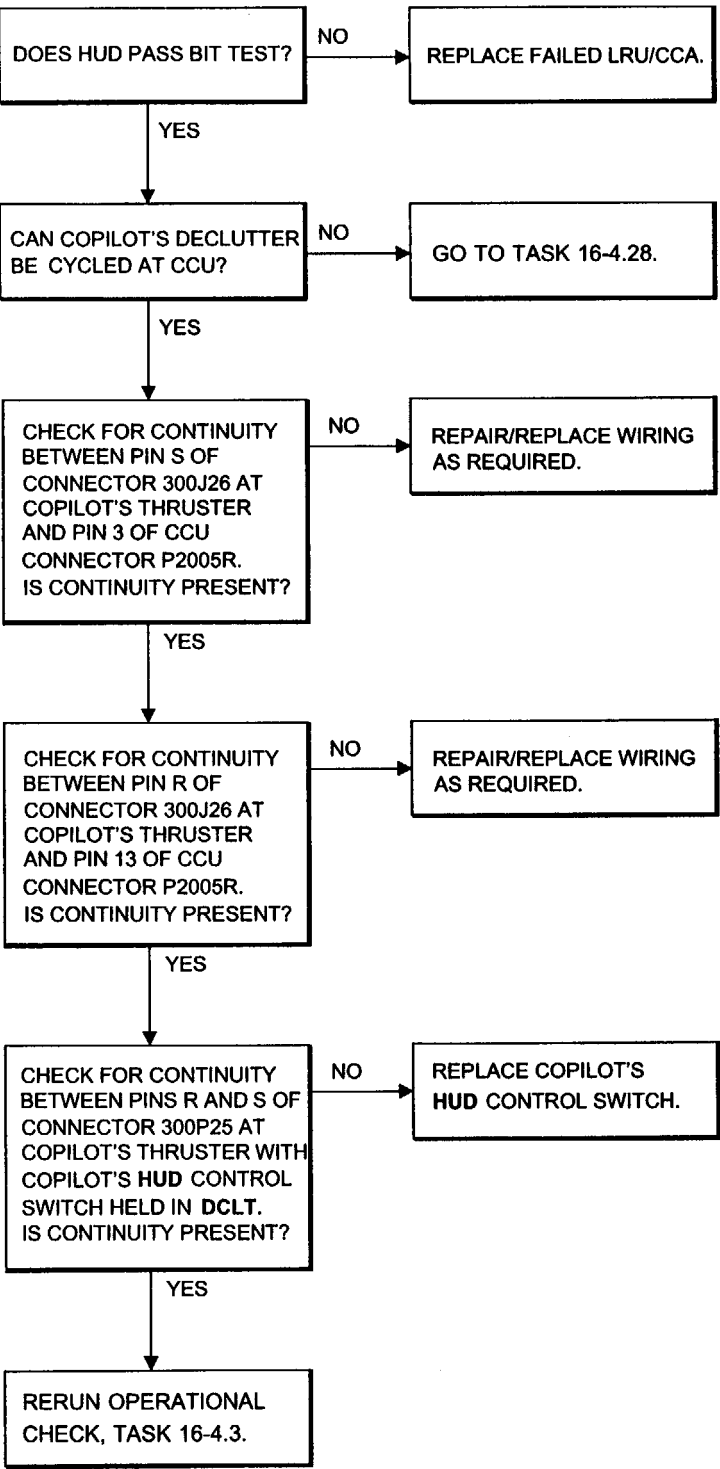
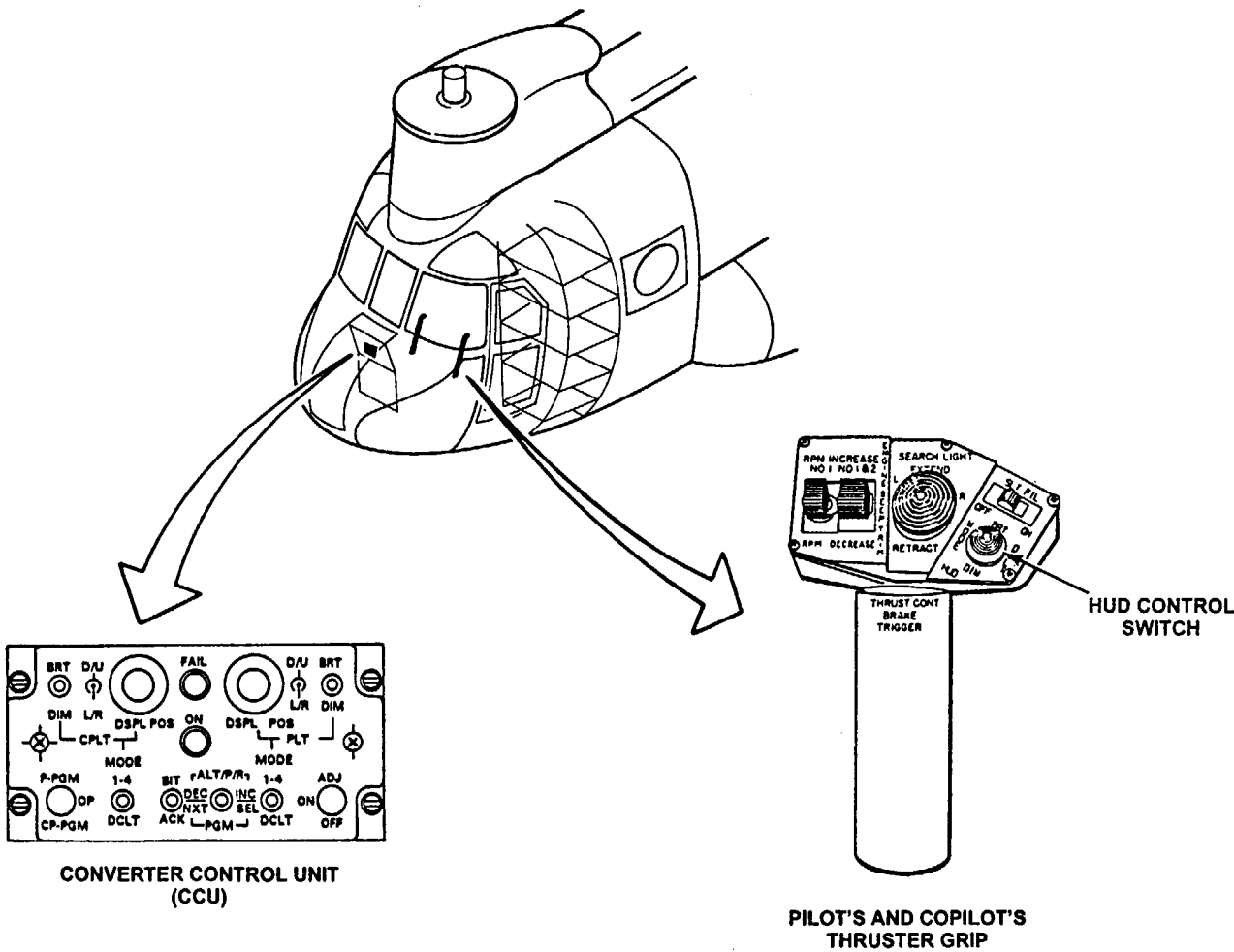
INITIAL SETUP  
**Applicable Configurations:**  
All

**References:**  
TM 55-1520-240-23  
TM 11-5855-300-23&P

**Tools:**  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On

**Materials:**  
None



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP  
Applicable Configurations:  
All

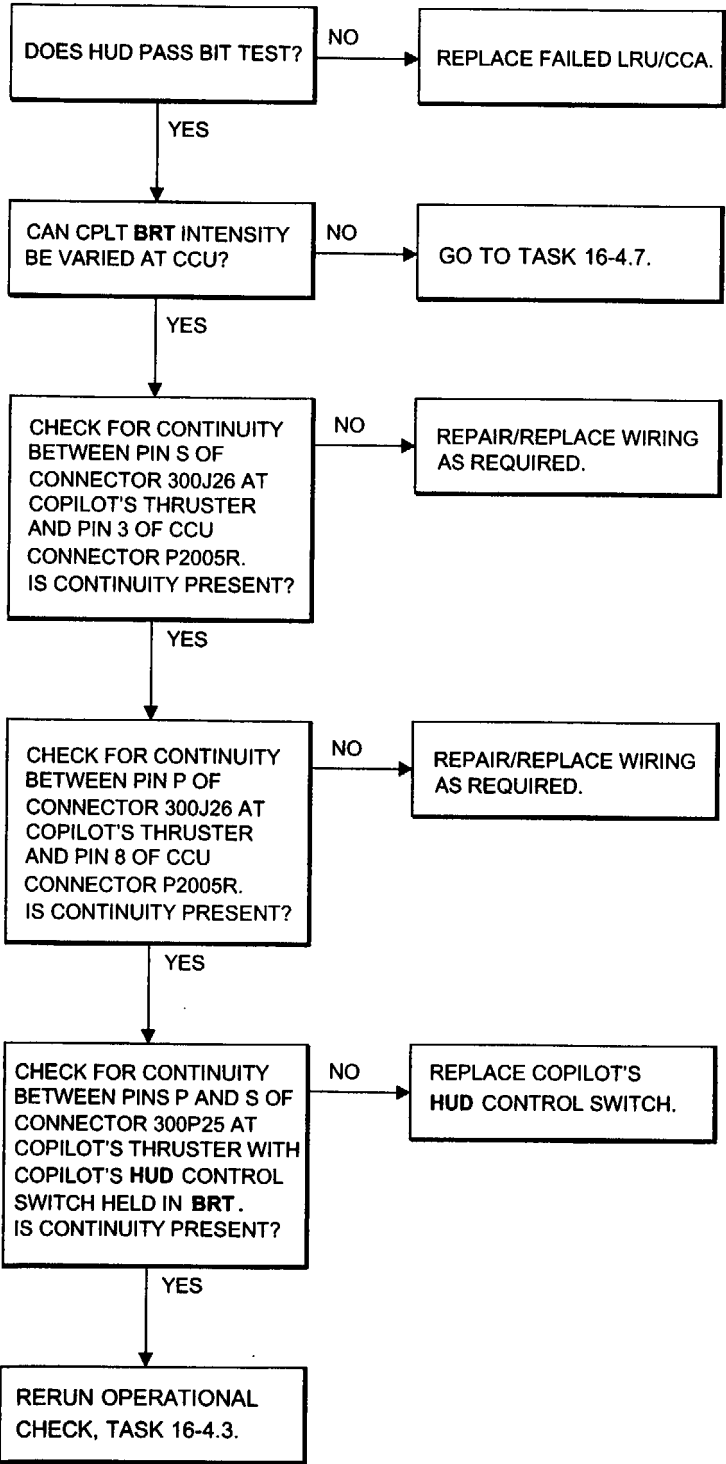
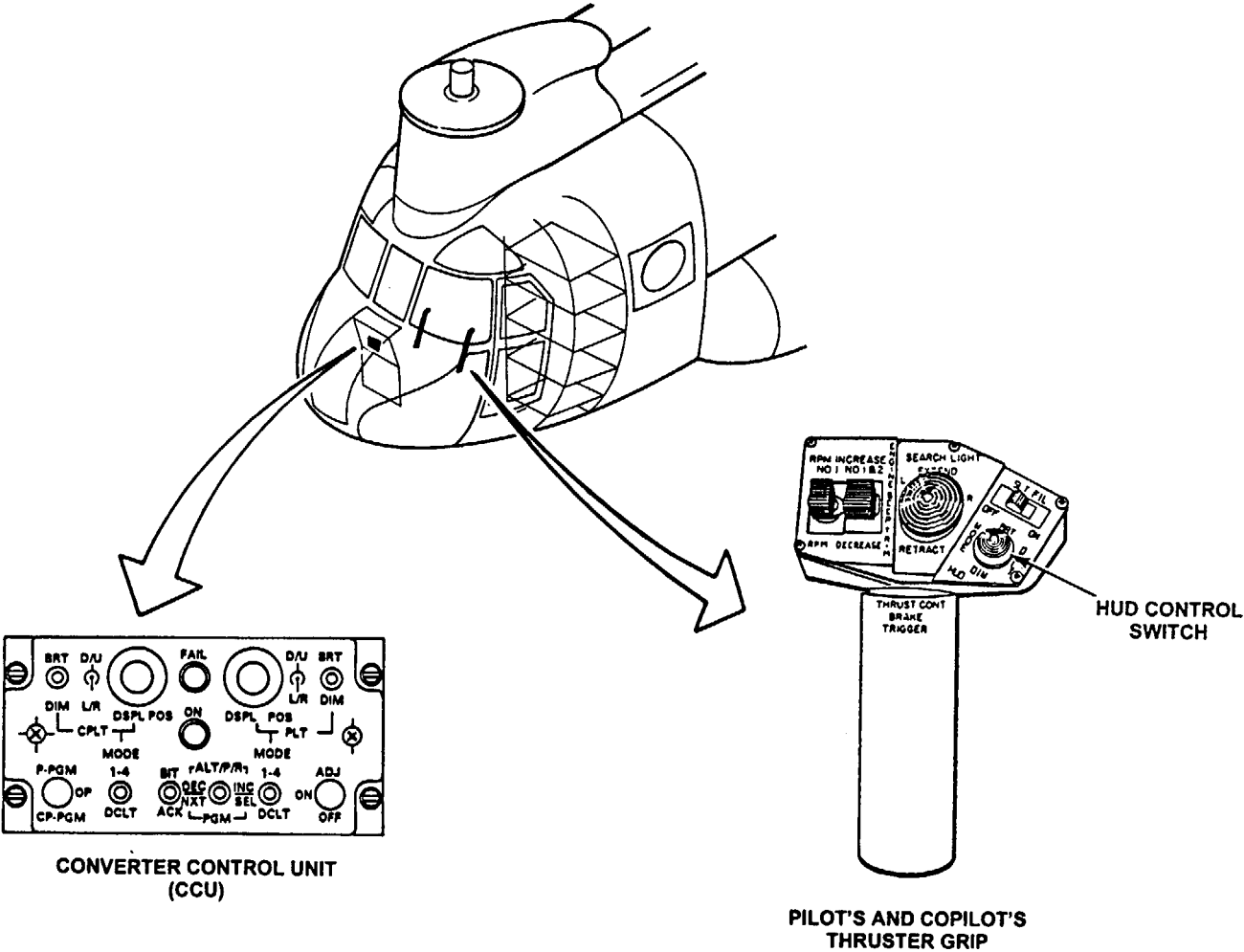
Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
Avionics Mechanic

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On



END OF TASK

16-4.20 COPILOT'S DIM CONTROL ON THRUSTER DOES NOT VARY DISPLAY INTENSITY

16-4.20

FAULT ISOLATION PROCEDURE

Personnel Required:  
Avionics Mechanic

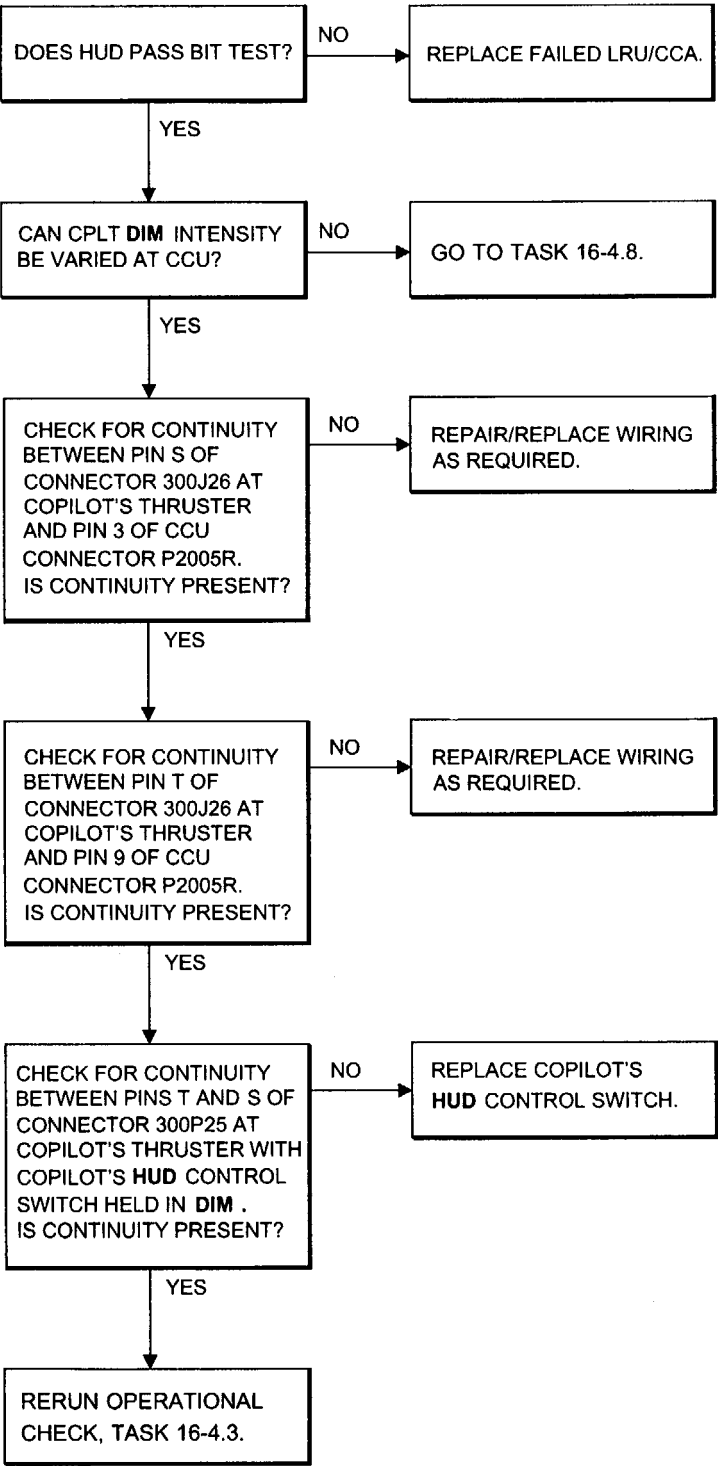
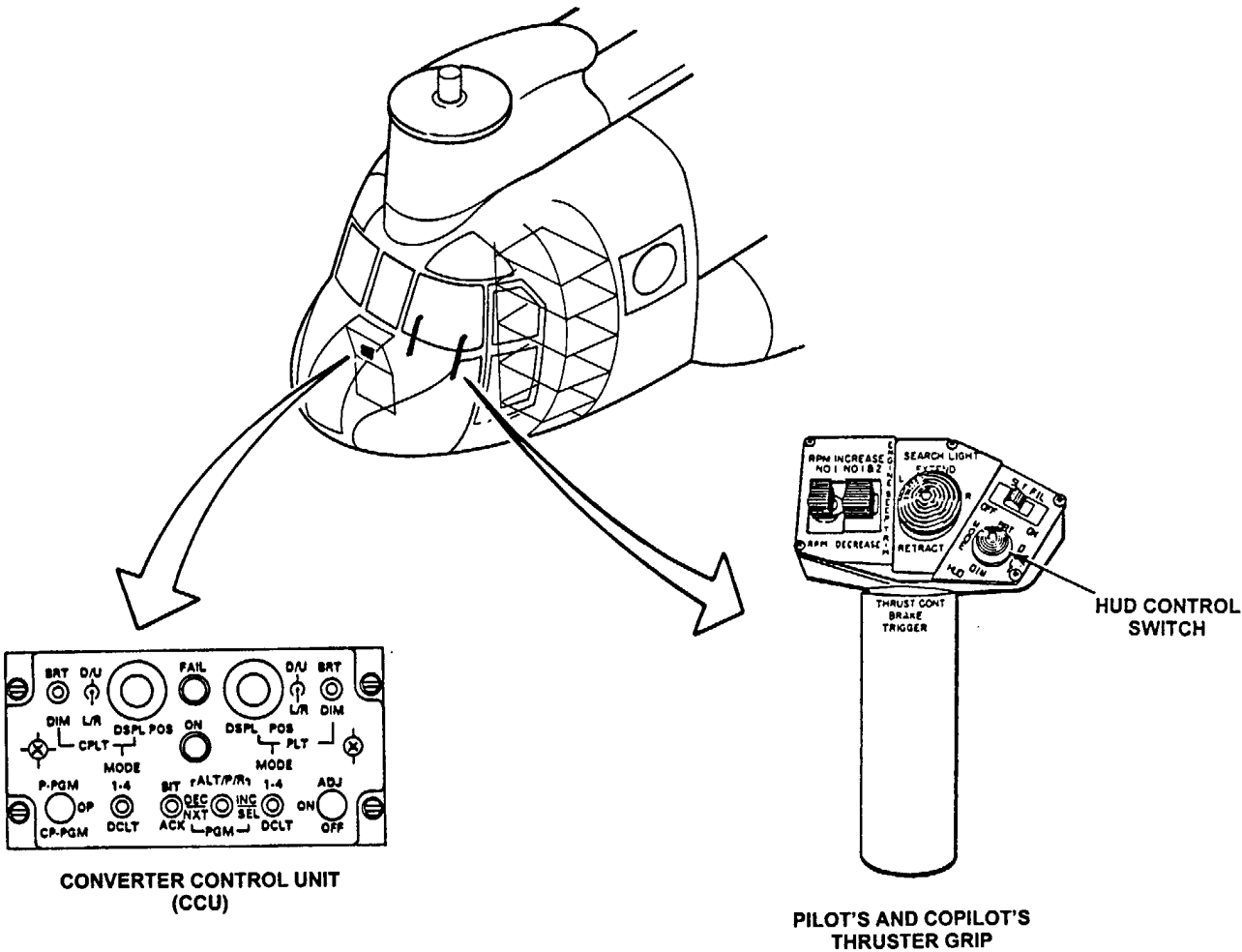
INITIAL SETUP  
Applicable Configurations:  
All

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On

Materials:  
None



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP  
**Applicable Configurations:**  
All

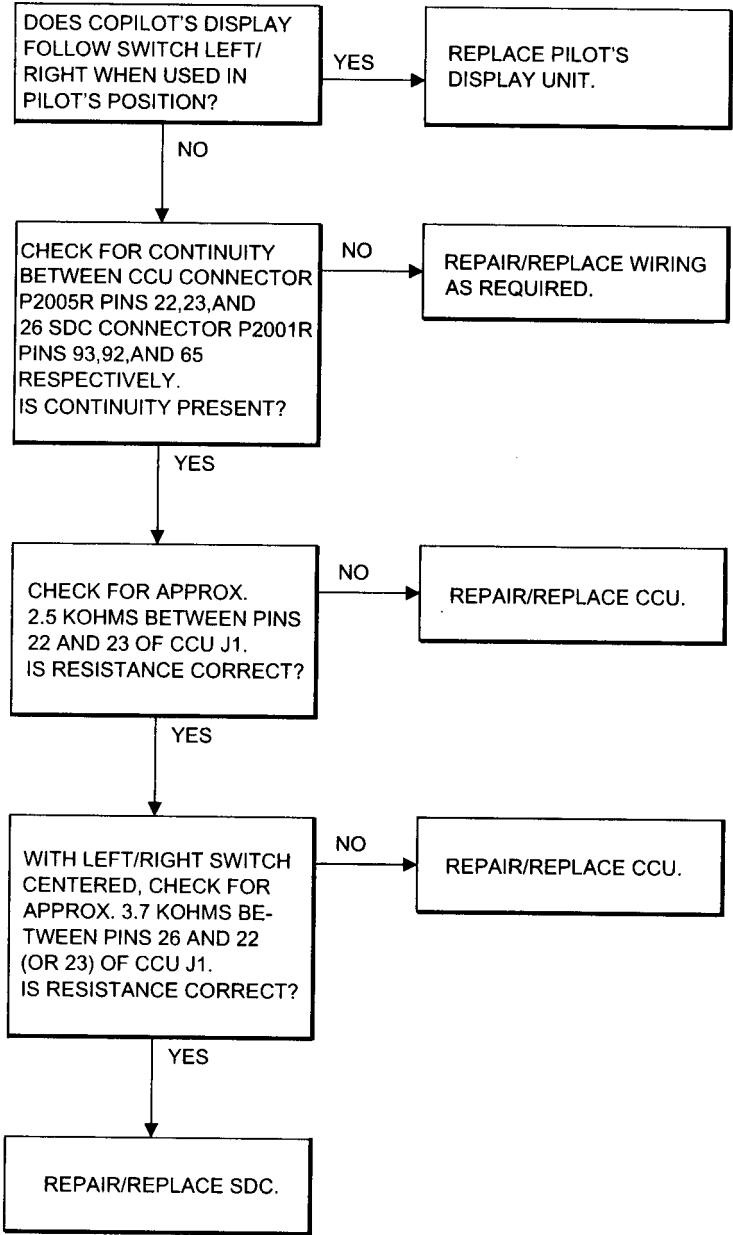
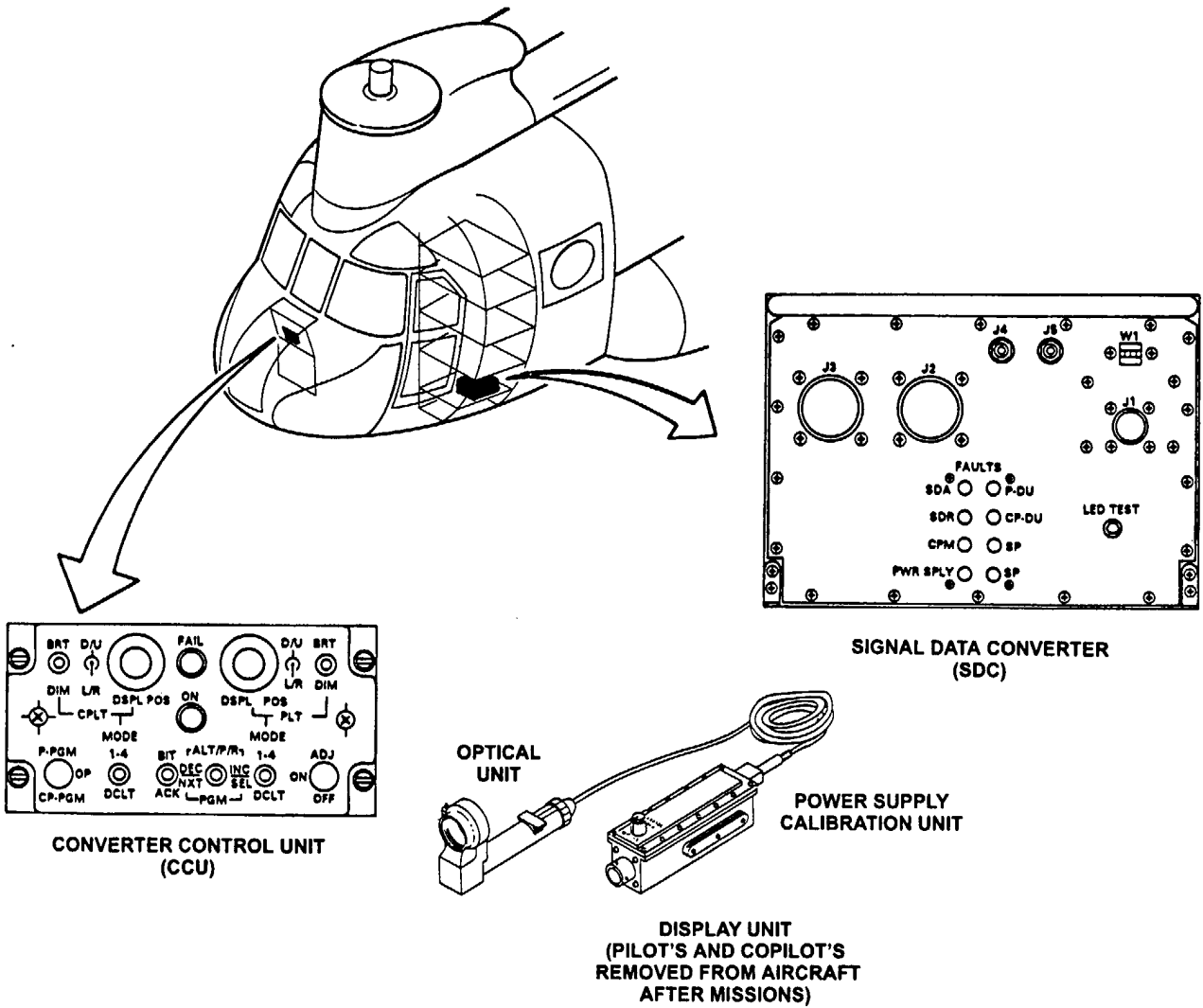
**Tools:**  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

**Materials:**  
None

**Personnel Required:**  
Avionics Mechanic

**References:**  
TM 55-1520-240-23  
TM 11-5855-300-23&P

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP  
Applicable Configurations:  
All

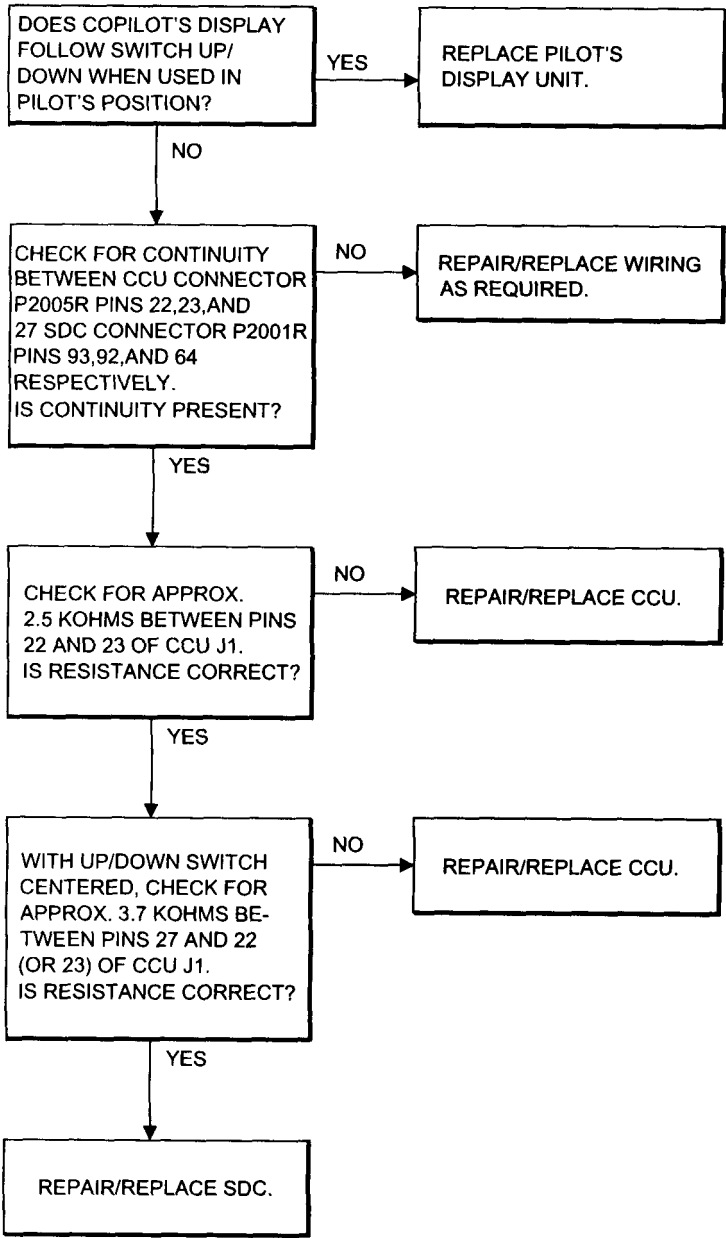
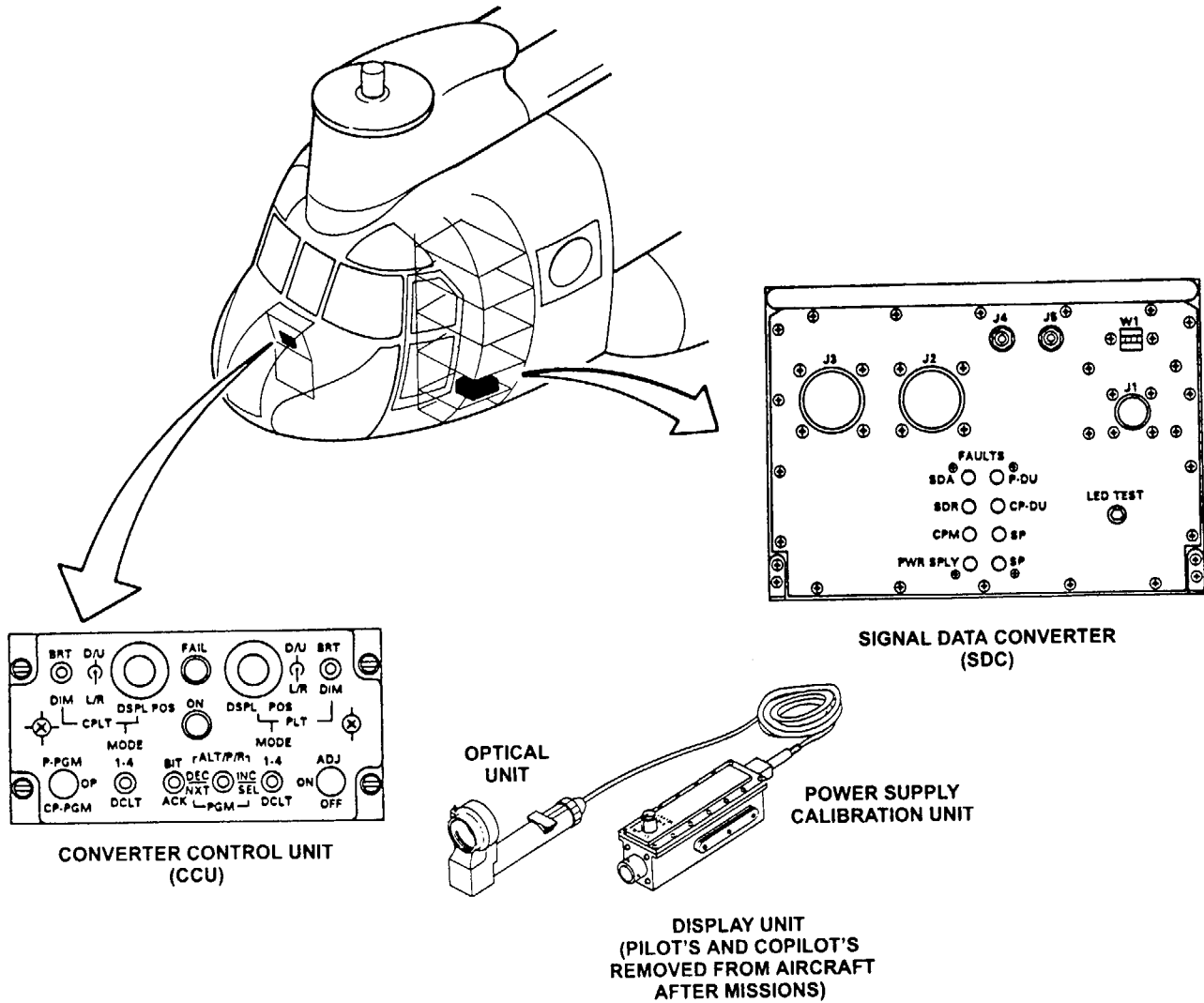
Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
Avionics Mechanic

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On



FAULT ISOLATION PROCEDURE

INITIAL SETUP  
Applicable Configurations:  
All

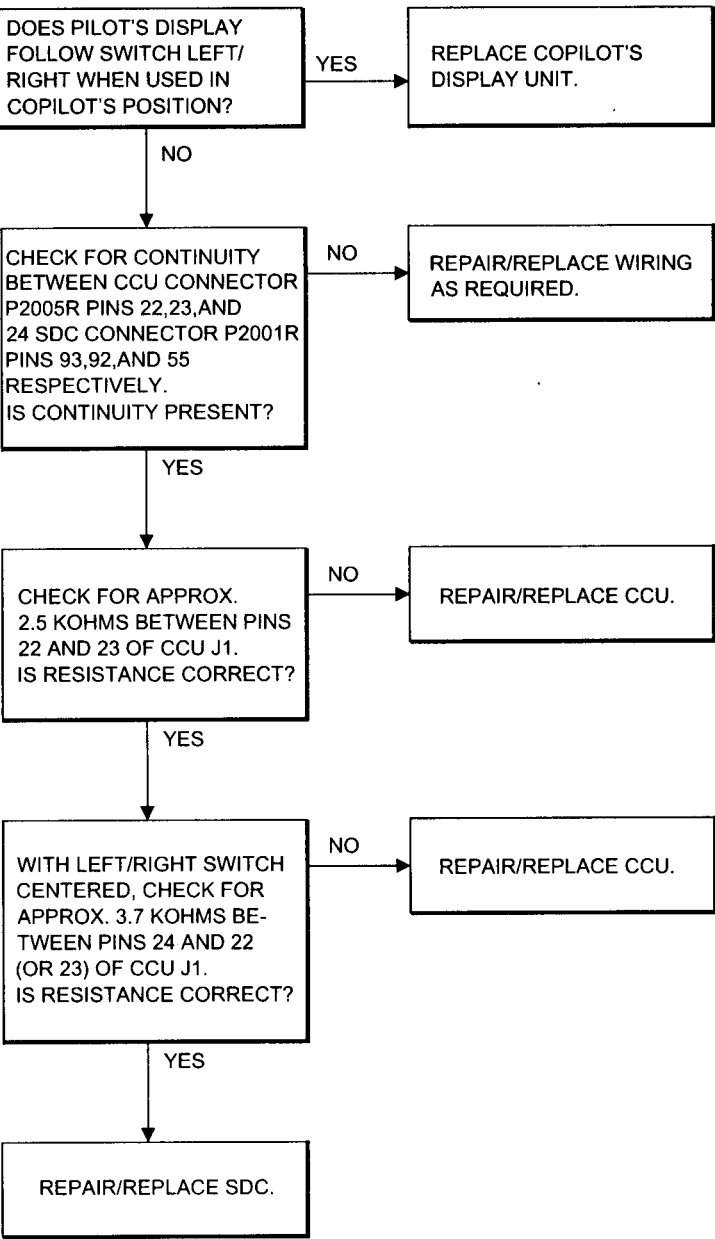
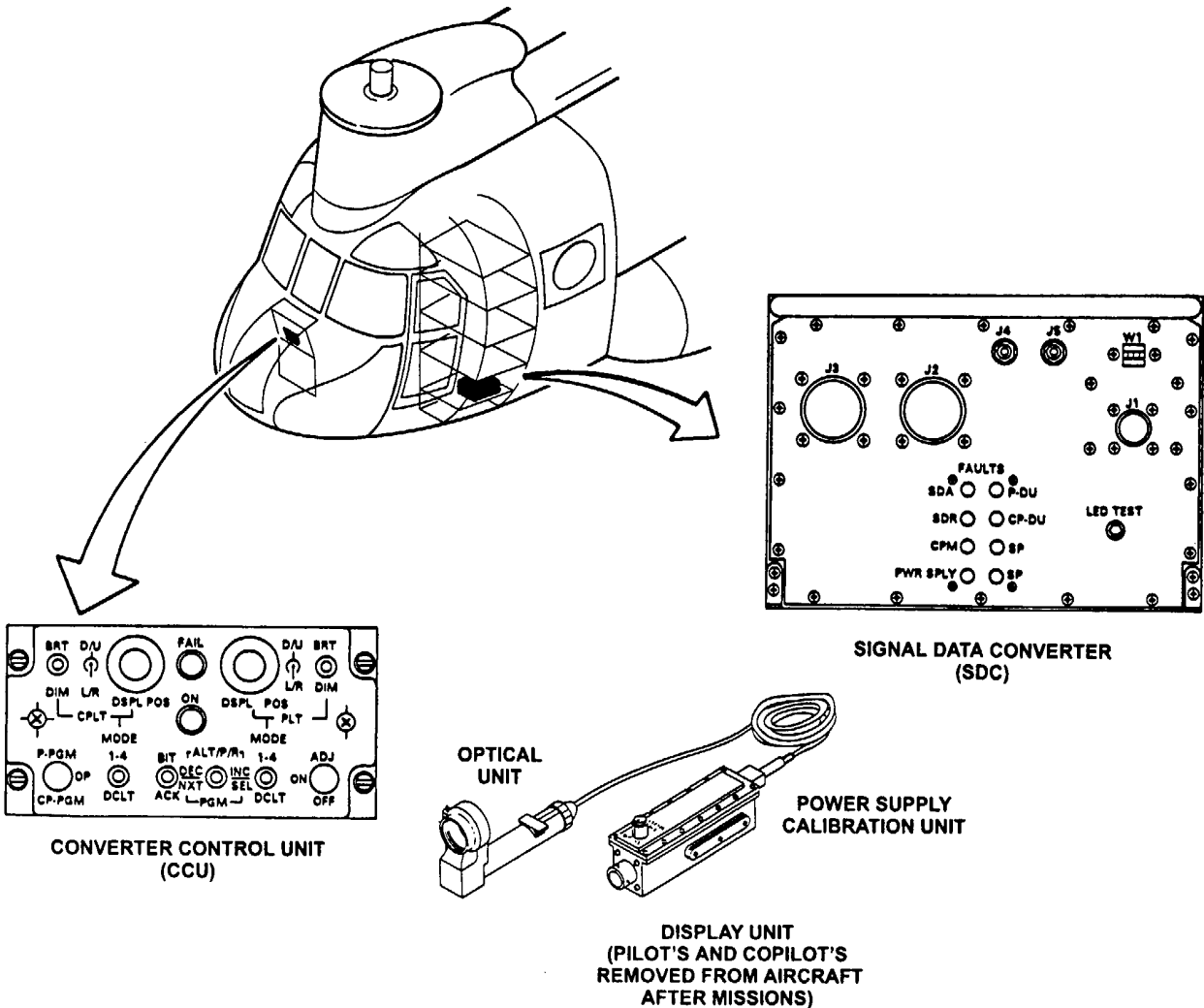
Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
Avionics Mechanic

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On



END OF TASK

16-4.24 CANNOT VARY COPILOT'S DISPLAY UP/DOWN

16-4.24

FAULT ISOLATION PROCEDURE

**Personnel Required:**  
Avionics Mechanic

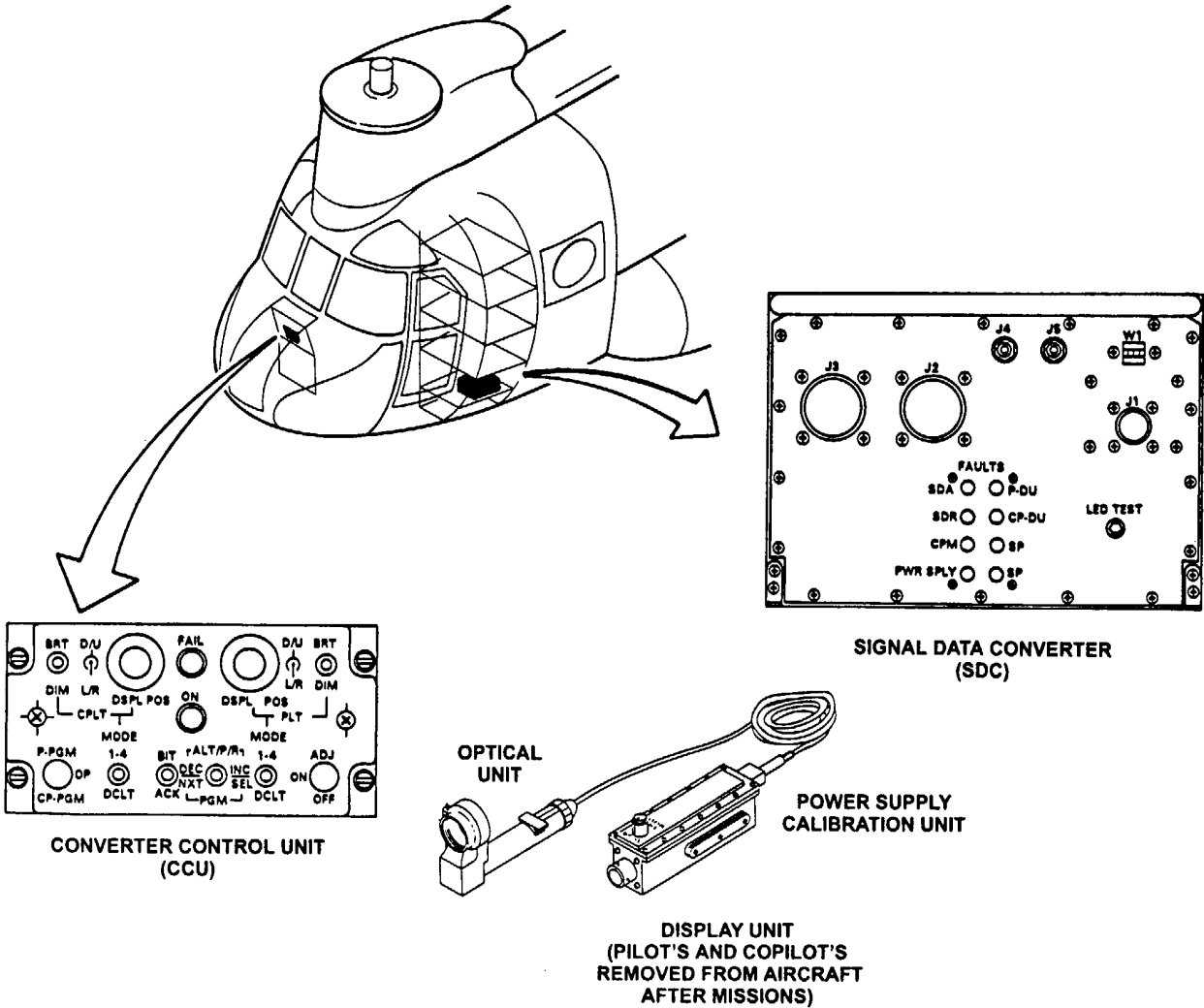
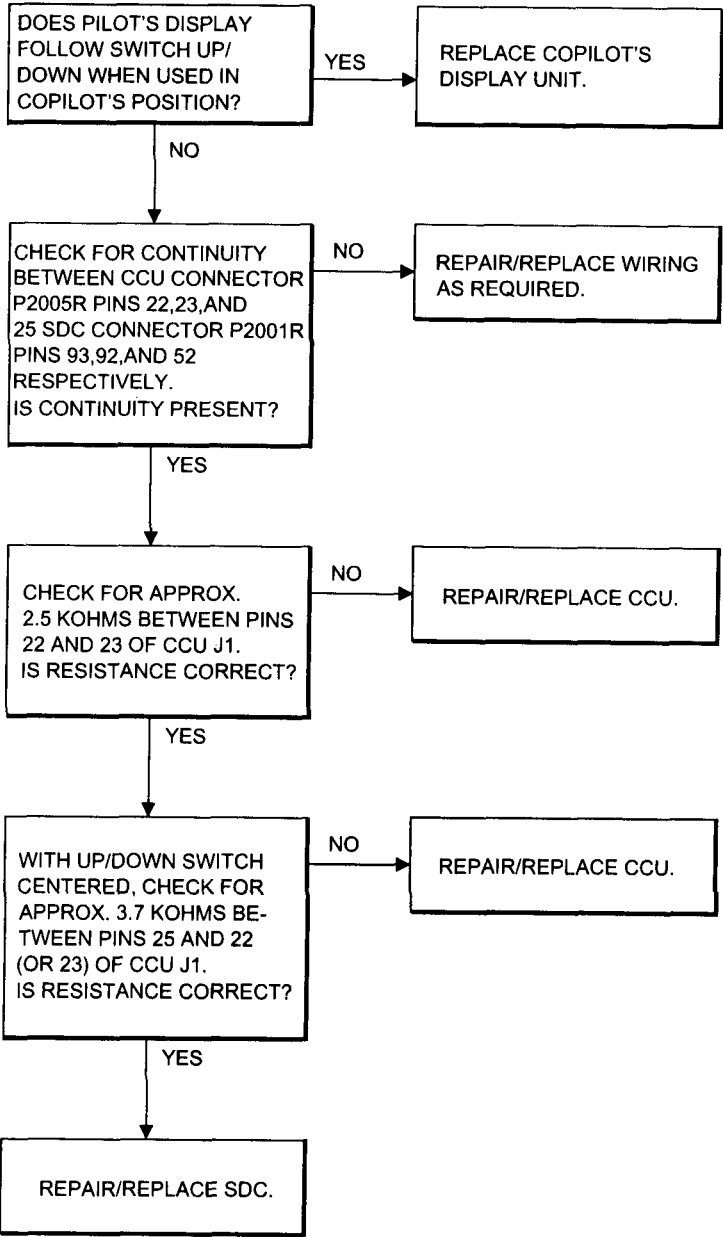
INITIAL SETUP  
**Applicable Configurations:**  
All

**References:**  
TM 55-1520-240-23  
TM 11-5855-300-23&P

**Tools:**  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On

**Materials:**  
None



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP  
Applicable Configurations:  
All

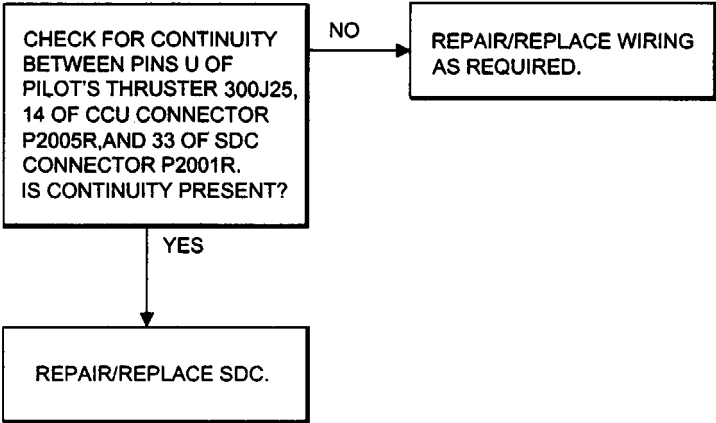
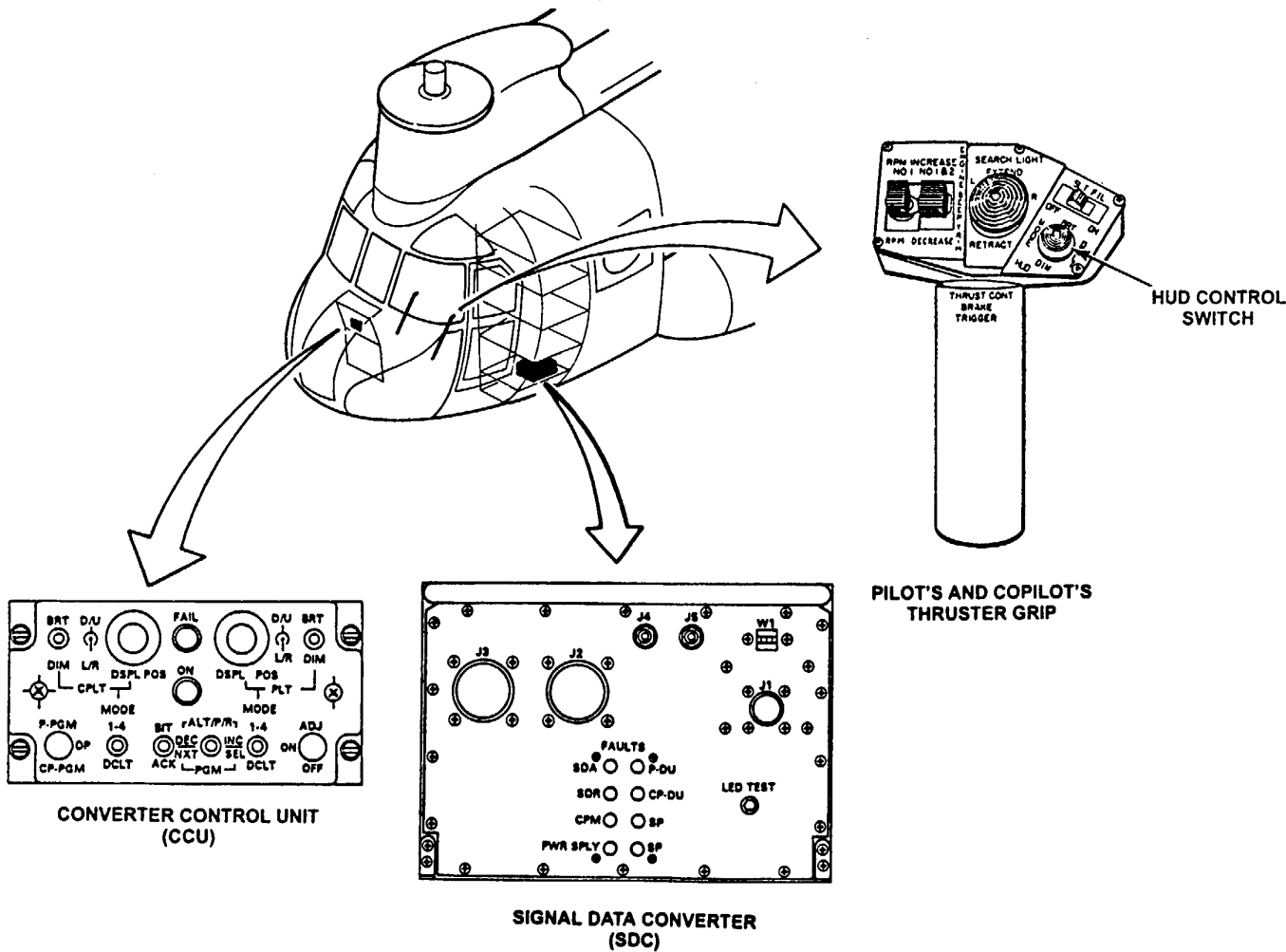
Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
Avionics Mechanic

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On





16-4.26 CANNOT CYCLE THROUGH PILOT'S DECLUTTER AT CCU OR PILOT'S THRUSTER GRIP HUD CONTROL SWITCH

16-4.26

FAULT ISOLATION PROCEDURE

Personnel Required:  
Avionics Mechanic

INITIAL SETUP

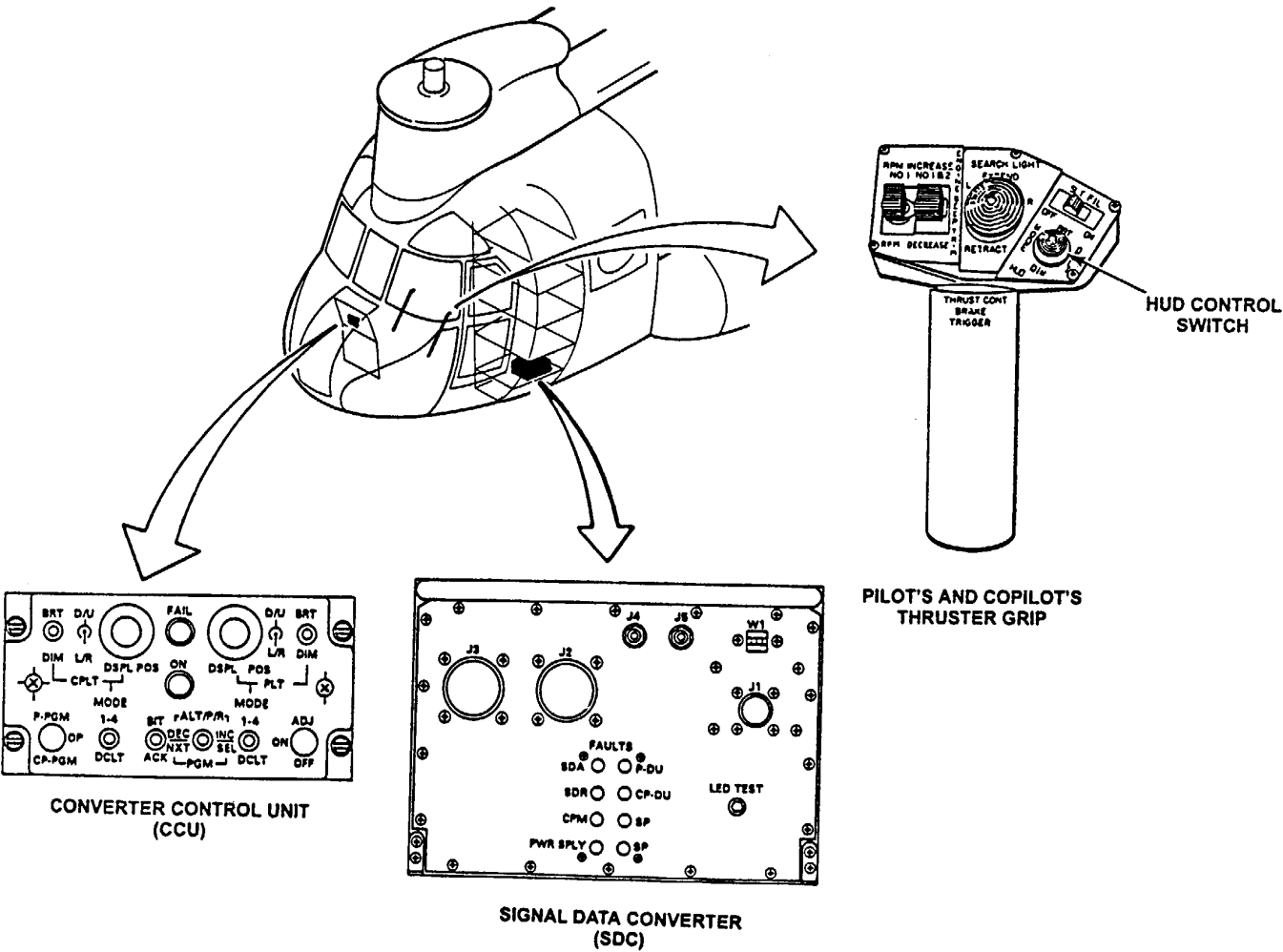
Applicable Configurations:  
All

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On

Materials:  
None



FAULT ISOLATION PROCEDURE

INITIAL SETUP  
Applicable Configurations:  
All

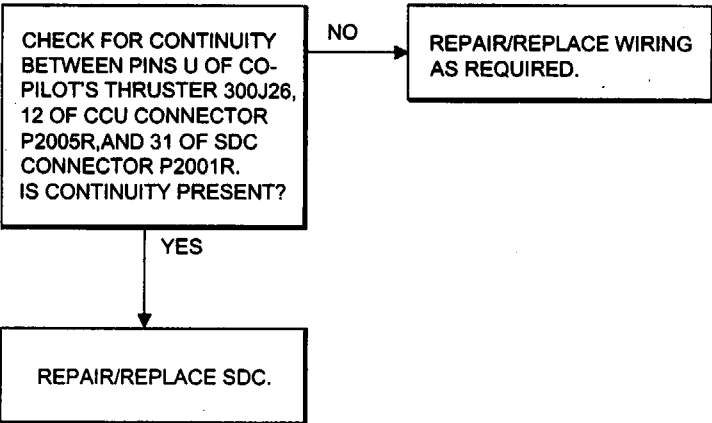
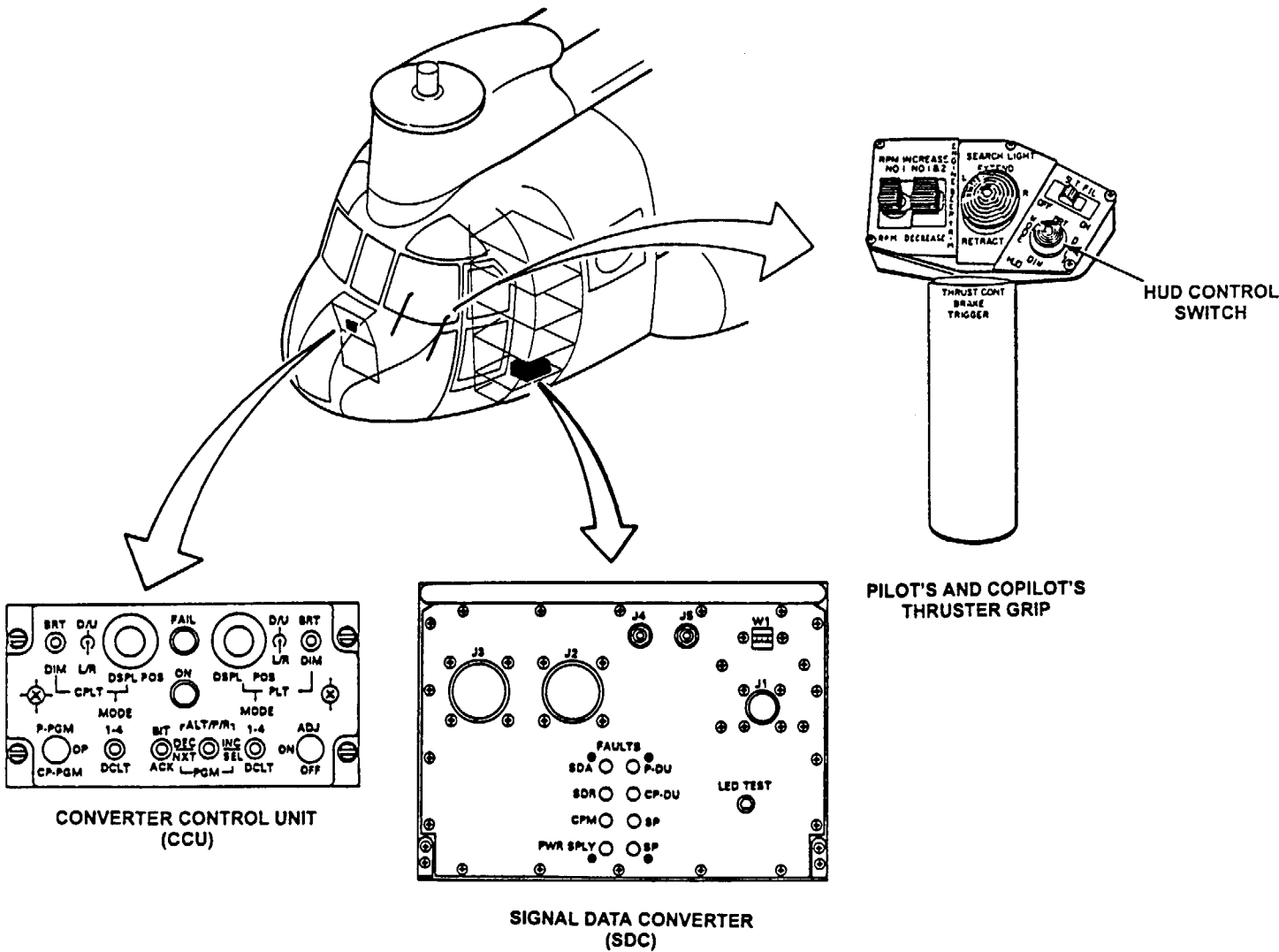
Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
Avionics Mechanic

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On



16-4.28 CANNOT CYCLE THROUGH COPILOT'S DECLUTTER AT CCU OR COPILOT'S THRUSTER GRIP HUD CONTROL SWITCH

16-4.28

FAULT ISOLATION PROCEDURE

Personnel Required:  
Avionics Mechanic

INITIAL SETUP

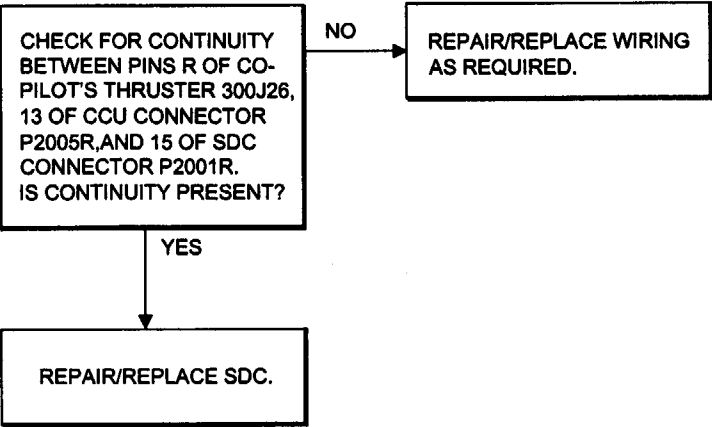
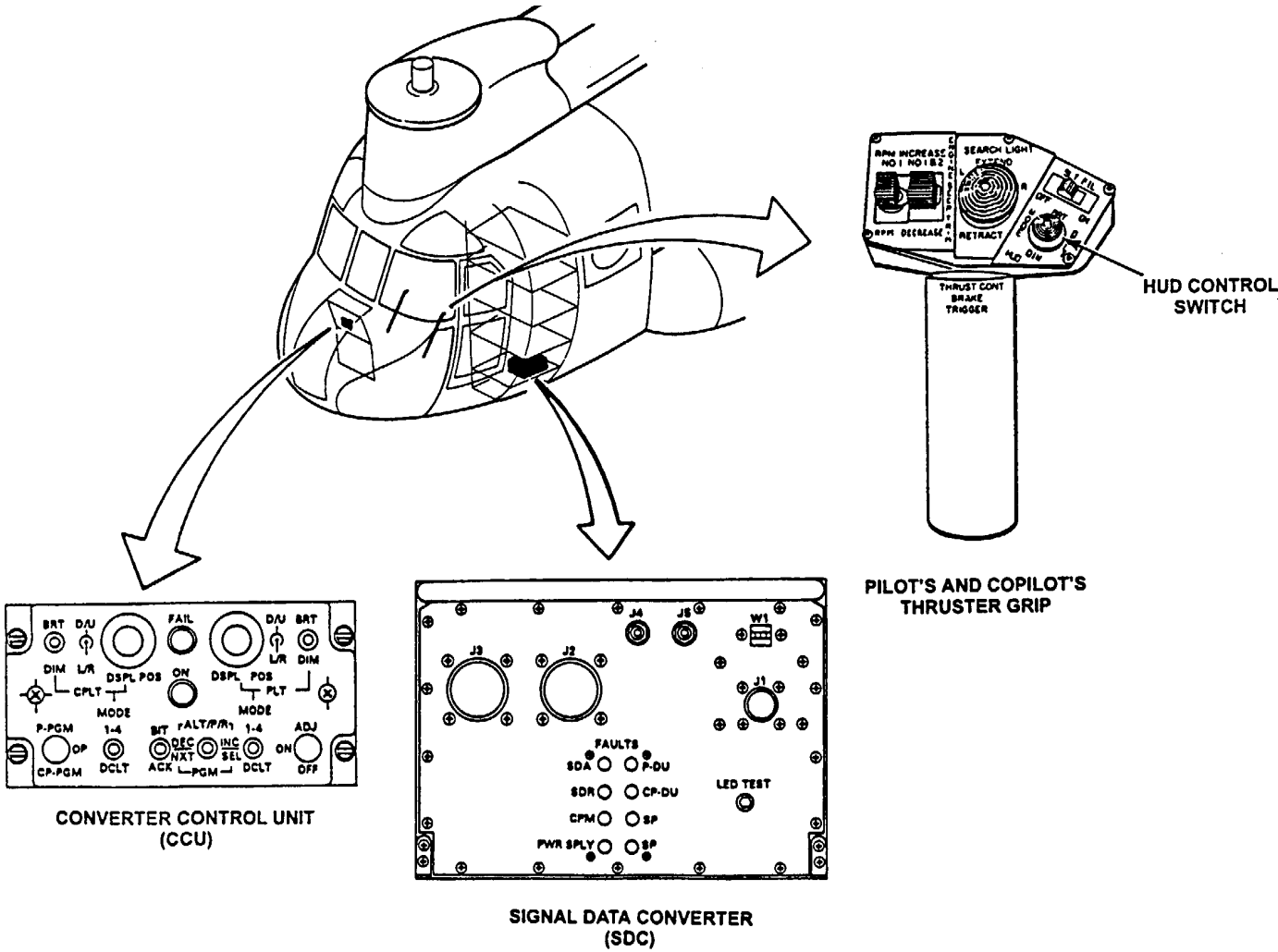
Applicable Configurations:  
All

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On

Materials:  
None



END OF TASK

FAULT ISOLATION PROCEDURE

INITIAL SETUP  
Applicable Configurations:  
All

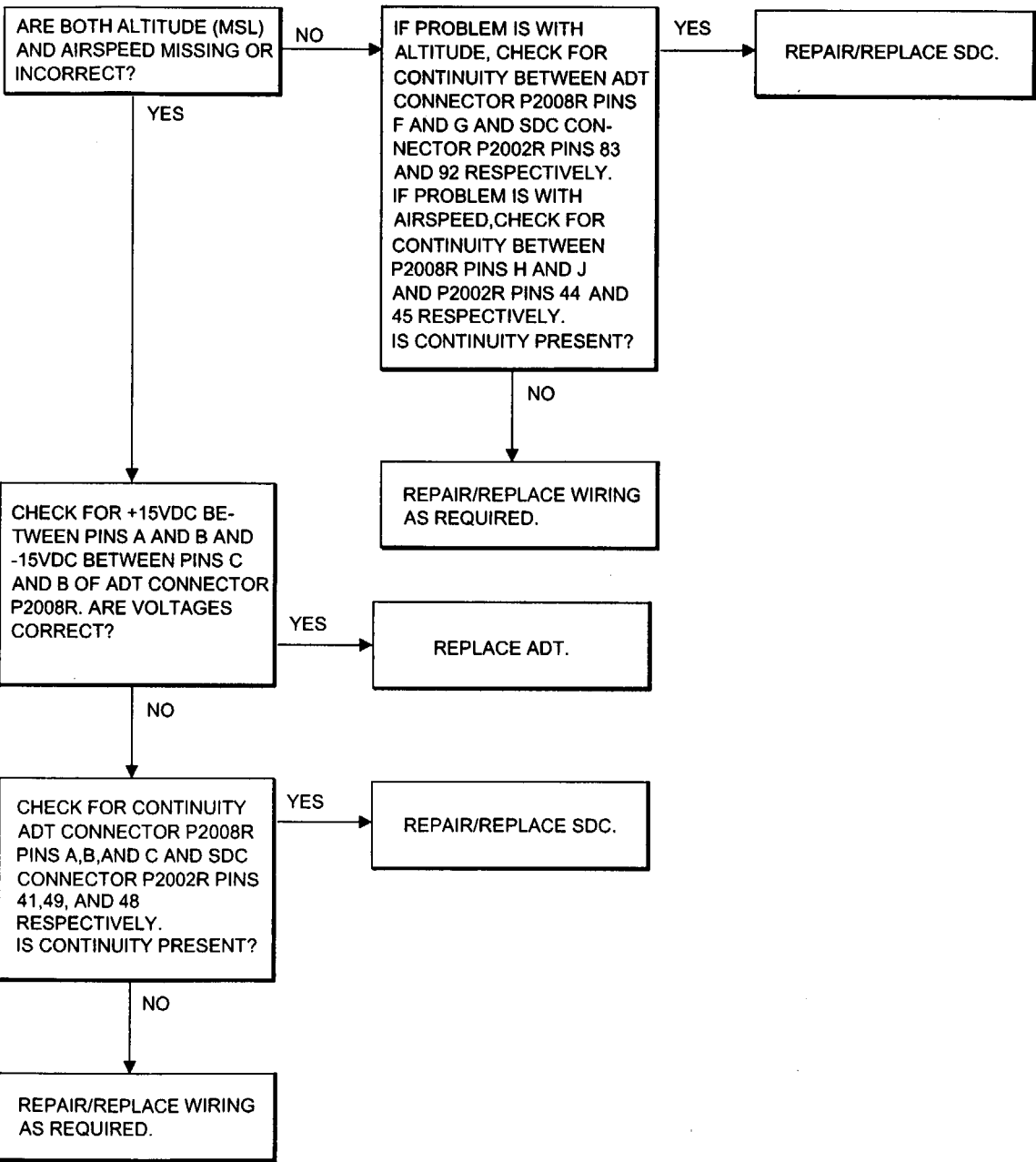
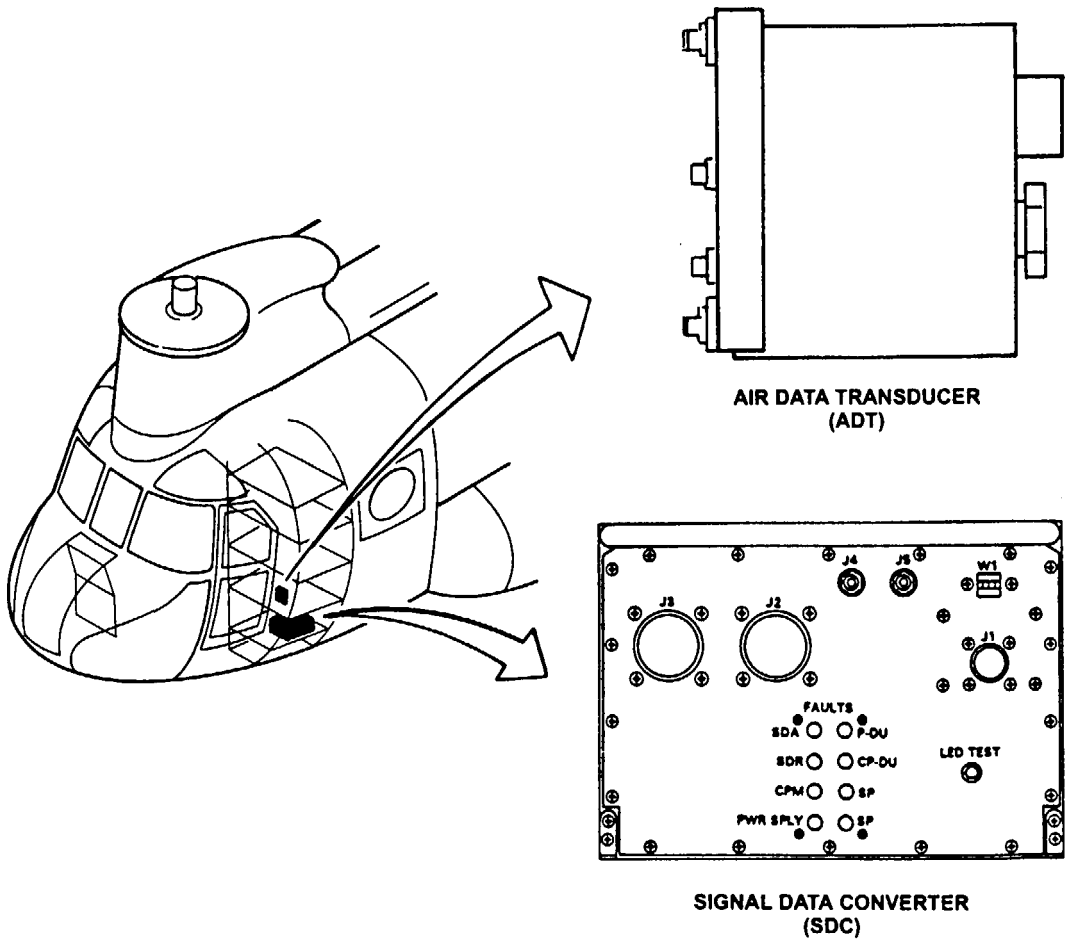
Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Materials:  
None

Personnel Required:  
Avionics Mechanic

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On



END OF TASK

16-4.30 NO OR IMPROPER TRIM (SLIDE BALL) DISPLAYED

16-4.30

FAULT ISOLATION PROCEDURE

Personnel Required:  
Avionics Mechanic

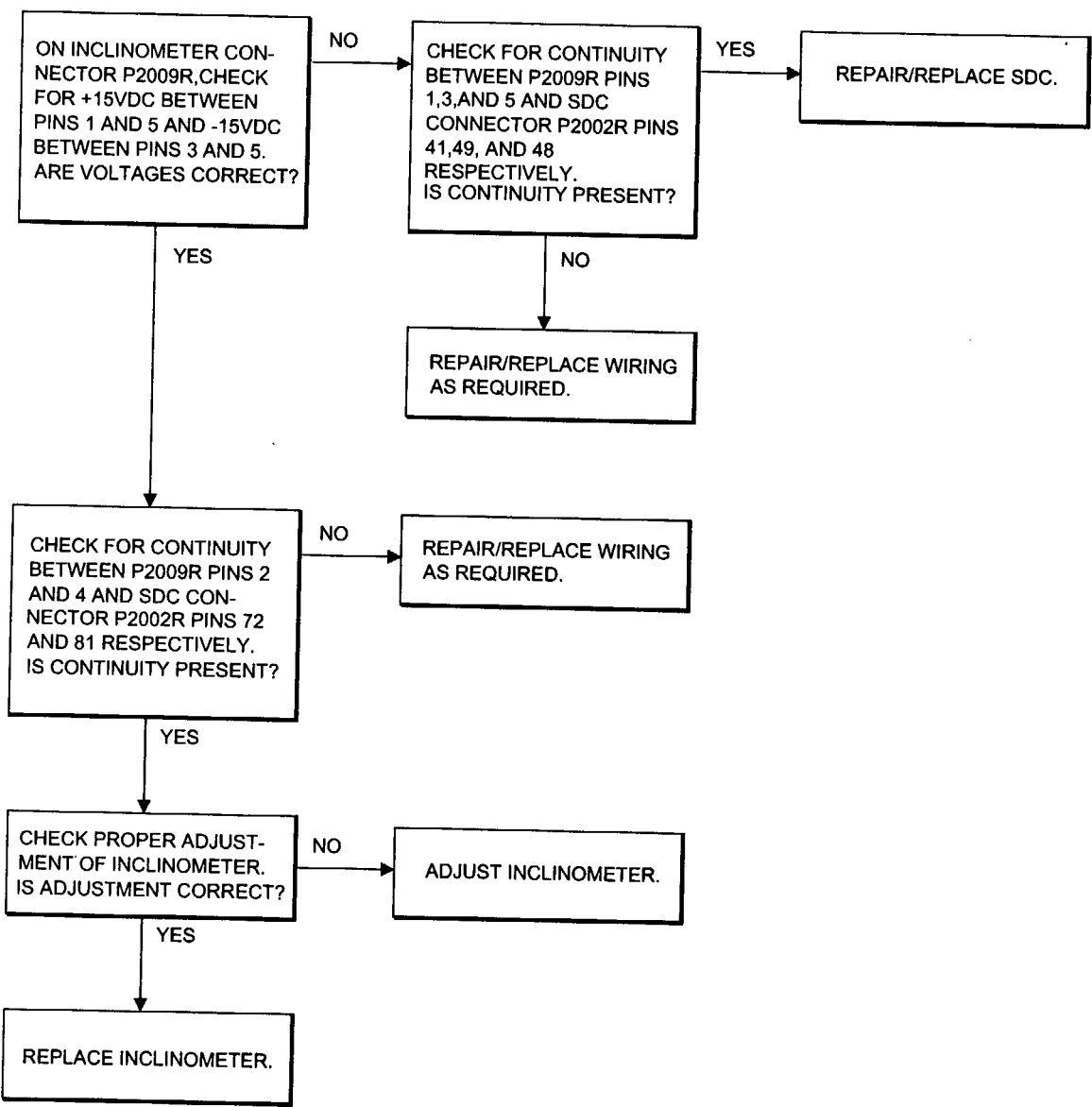
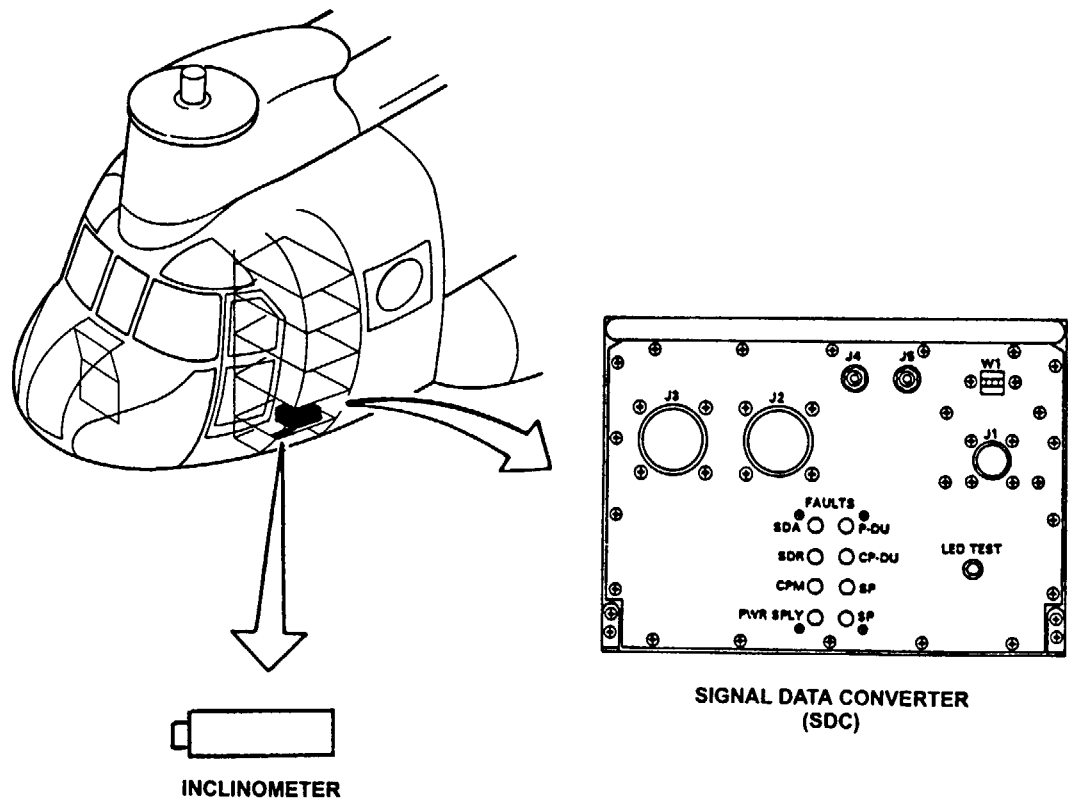
INITIAL SETUP  
Applicable Configurations:  
All

References:  
TM 55-1520-240-23  
TM 11-5855-300-23&P

Tools:  
Electronic Equipment Tool Kit,  
NSN 5180-00-064-5178  
Multimeter

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On

Materials:  
None



END OF TASK

**CHAPTER 17**  
**EMERGENCY EQUIPMENT TROUBLESHOOTING**

CHAPTER 17  
EMERGENCY EQUIPMENT TROUBLESHOOTING  
CHAPTER OVERVIEW

Chapter 17 contains procedures for Emergency Equipment troubleshooting. Emergency equipment system failure symptom is listed below. Included in this Chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for Emergency Equipment system.

Refer to TM 55-1520-240-23 for required Emergency Equipment system maintenance procedures.

SYSTEM	PARA
EMERGENCY EXIT LIGHTS	17-1

FAILURE SYMPTOM LIST  
EMERGENCY EXIT LIGHTS

SYMPTOM	TASK
CHARGE INDICATOR LAMPS ON ONE OR MORE EMERGENCY EXIT LIGHTS DO NOT COME ON WHEN SWITCH IS SET TO ARM	17-1.3
CHARGE INDICATOR LAMPS ON ONE OR MORE EMERGENCY EXIT LIGHTS DO NOT COME ON WHEN SWITCH IS AT DISARM	17-1.3
EMERGENCY EXIT LIGHT MAIN LAMPS COME ON WHEN SWITCH IS AT ARM	17-1.3

SYMPTOM	TASK
EMERGENCY EXIT LIGHT MAIN LAMPS DO NOT COME ON WHEN SWITCH IS AT TEST	17-1.3

SYMPTOM	TASK
ONE OR MORE EMERGENCY EXIT LIGHTS WILL NOT GO OUT WHEN SWITCH IS SET TO DISARM	17-1.3

GO TO NEXT PAGE

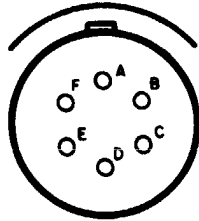
EMERGENCY SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST

REF DESIG	PART NUMBER	TYPE	MATE WITH/LOCATION	STATION LOCATION		
				FS	WL	BL
GD 119		151	AFT CROWN - RAMP	594	50	24L
GD 120		151	AFT CROWN	482	50	15R
GD 168		151	LH CABIN - ESCAPE HATCH	150	30	50L
GD 169		151	RH CABIN - CABIN DOOR	175	50	50R
129P1	MS3476W10-6S	15	INERTIA SWITCH	482	50	15R
300J1	M83723-74A2041N	40	NO. 1 PDP			
300P1	M83723-75A2041N	40	NO. 1 PDP			
300J19	M83723-73A2041N	40	OVERHEAD PANEL - COCKPIT			
300P19	M83723-76A2041N	40	OVERHEAD PANEL - COCKPIT			
300J20	M83723-74A2461N	43	OVERHEAD PANEL - COCKPIT			
300P20	M83723-75A2461N	43	OVERHEAD PANEL - COCKPIT			
300J45	M83723-73A2461N	43	HEATER COMPARTMENT - OVHD	105	40	30R
300P45	M83723-76A2461N	43	HEATER COMPARTMENT - OVHD	105	40	30R
300J47	M83723-74A2461N	43	HEATER COMPARTMENT - OVHD	105	40	30R
300P47	M83723-75A2461N	43	HEATER COMPARTMENT - OVHD	105	40	30R
300J51	M83723-74A2461N	43	AFT CROWN	460	45	20R
300P51	M83723-75A2461N	43	AFT CROWN	460	45	20R

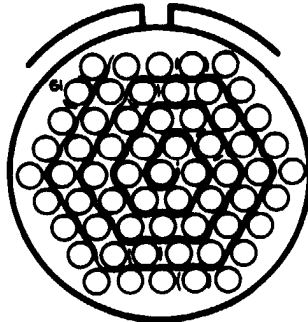


EMERGENCY EQUIPMENT ELECTRICAL COMPONENT  
LOCATION AND CONFIGURATION LIST (Continued)

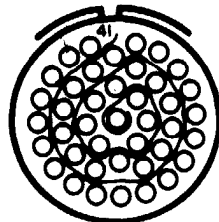
RECEPTACLE



15

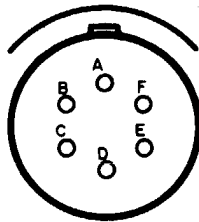


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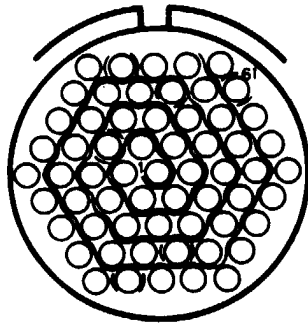


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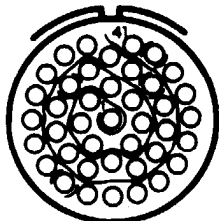
PLUG



15



43



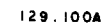
40

GND STUD



151

## 17-1 EMERGENCY EXIT LIGHTS



17-1.2 EMERGENCY EXIT LIGHTS VISUAL CHECK

17-1.2

INITIAL SETUP

Applicable Configurations:

All  
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:  
None

Personnel Required:

Aircraft Electrician

References:

TM 55-1520-240-23

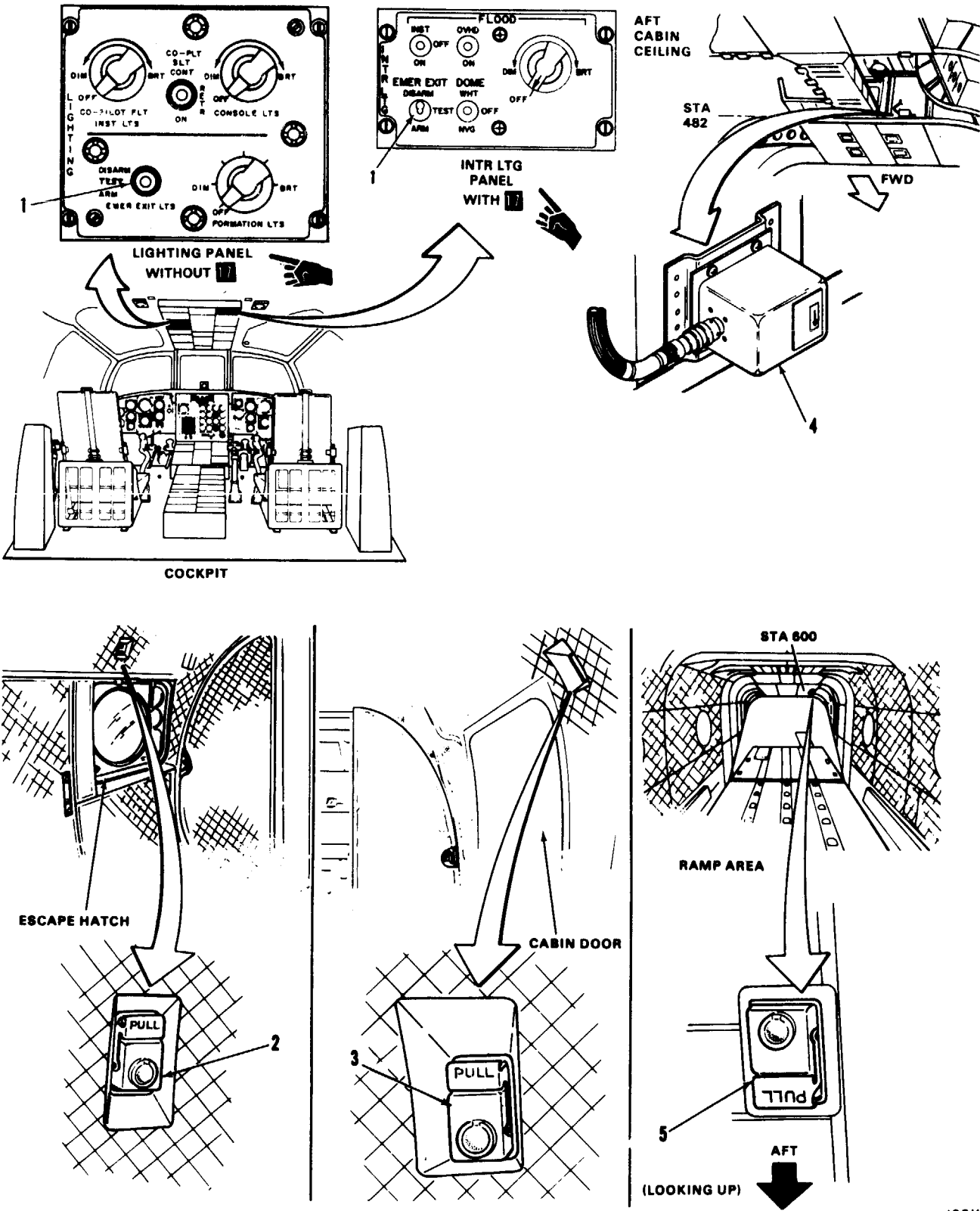
Equipment Condition:

TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off

TASK	RESULT
1. Check EMER EXIT LTS or EMER EXIT switch (1).	If switch (1) is loose or damaged, tighten or replace it as required.
2. Check escape hatch emergency exit light (2).	If emergency exit light (2) is loose or damaged, tighten or replace it as required.
3. Check cabin door emergency exit light (3).	If emergency exit light (3) is loose or damaged, tighten or replace it as required.
4. Check inertia switch (4) at sta 482, bl 15R.	If inertia switch (4) is loose or damaged, repair or replace it. If connector is loose or damaged, tighten or replace it. If wires to connector are broken or damaged, repair or replace wires as required.
5. Check ramp emergency exit light (5).	If emergency exit light (5) is loose or damaged, tighten or replace it as required.
6. Check emergency exit lights (2, 3, 4, and 5) PULL handles.	If PULL handles are not recessed into body of exit lights (2, 3, 4, and 5) remove and reinstall lights pushing PULL handles against light assembly.

FOLLOW-ON MAINTENANCE:

None



10211

## Aircraft Electrician

### Visual Check of Emergency Exit Lights Performed (Task 17-1.2)



17-1.3 EMERGENCY EXIT LIGHTS OPERATIONAL CHECK (Continued)

17-1.3

TASK	RESULT
1. Set EMER EXIT LTS or EMER EXIT switch (1) to DISARM.	
2. Connect battery. Refer to TM 55-1520-240-23.	
3. Without 17 check CABIN & RAMP lighting circuit breaker (2).	If breaker (2) is open, close it. If it opens again, go to task 9-15.4.
4. With 17 check EMER EXIT lighting circuit breaker (2. 1).	If breaker (2.1) is open, close it. If it opens again, go to task 17-1.8.
5. Check emergency exit lights (3, 4, and 5).	Main lamps on emergency exit lights (3, 4, and 5) shall be out. If not go to task 17-1.4. Charge indicator lamps on emergency exit lights (3, 4, and 5) shall be on. If not, go to task 17-1.8.
6. Set EMER EXIT LTS or EMER EXIT switch (1) to ARM.	Charge indicator lamps shall come on and main lamps shall be off at each emergency exit light (3, 4, and 5). If charge indicator lamps are not on, go to task 17-1.5. If main lamps are on, go to task 17-1.6.
7. Set EMER EXIT LTS or EMER EXIT switch (1) to TEST.	Main lamps shall come on and charge indicator lamps shall be off at each emergency exit light (3, 4, 5). If main lamps do not come on, go to task 17-1.7. If charge indicator lamps do not go out, replace EMER EXIT LTS or EMER EXIT switch.
8. Set EMER EXIT LTS or EMER EXIT switch (1) to ARM.	Main lamps on emergency exit lights (3, 4, and 5) shall go out. If not, go to task 17-1.4. Charge indicator lamps on emergency exit lights (3, 4, and 5) shall be on. If not go to task 17-1.5.

NOTE

Leave EMER EXIT LTS switch at ARM for 10 minutes before doing next step.

CAUTION

EMER EXIT LTS or EMER EXIT switch must be at DISARM when electrical power is removed. If switch is in ARM and battery switch is turned off, exit lights will come on and discharge internal batteries.

TASK	RESULT
9. Set EMER EXIT LTS or EMER EXIT switch (1) to DISARM.	Main lamps on emergency exit lights (3, 4, and 5) shall go out If not, go to task 17-1.4. Charge indicator lamps on emergency exit lights (3, 4, and 5) shall be on. If not, go to task 17-1.8.

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:  
Battery Disconnected

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

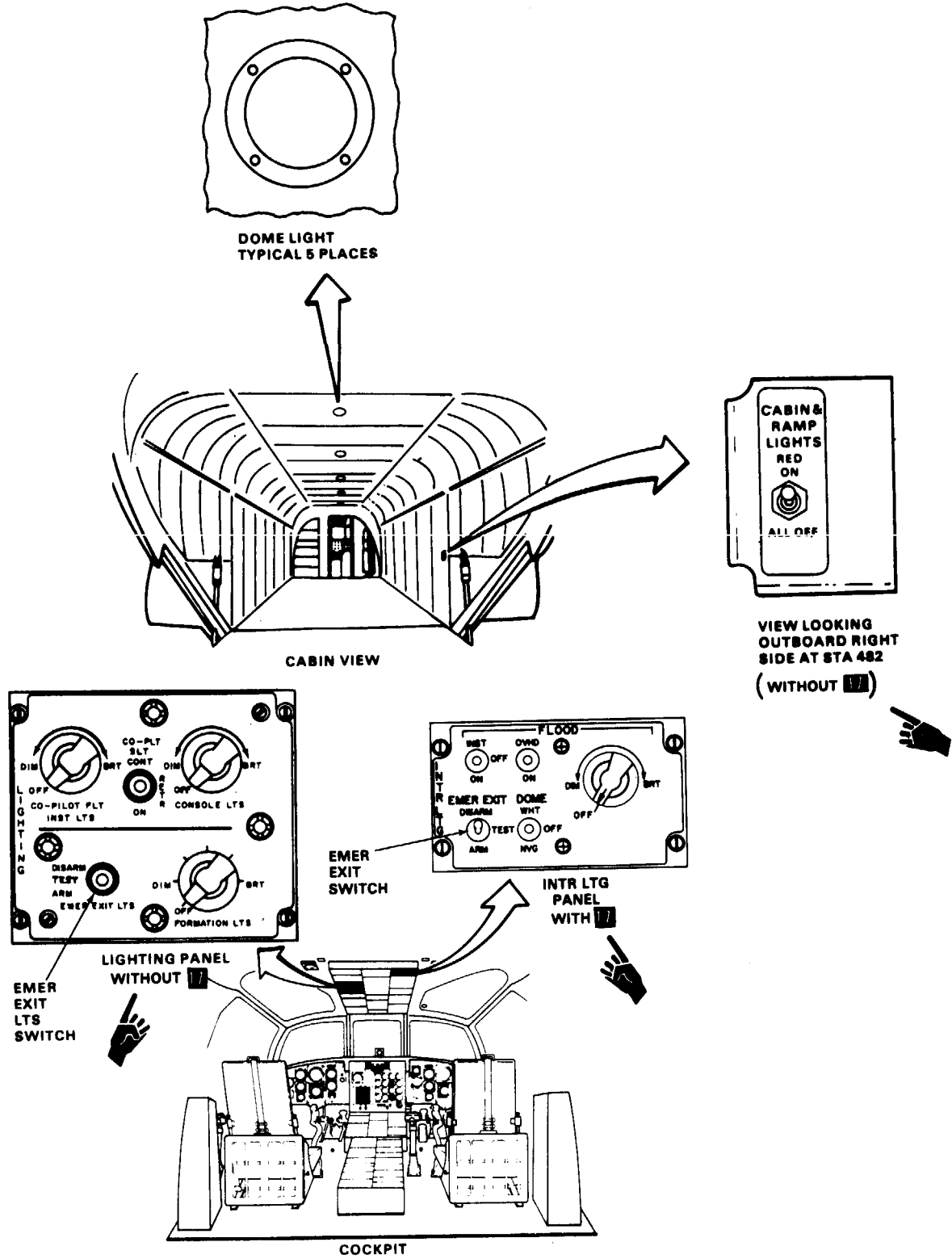
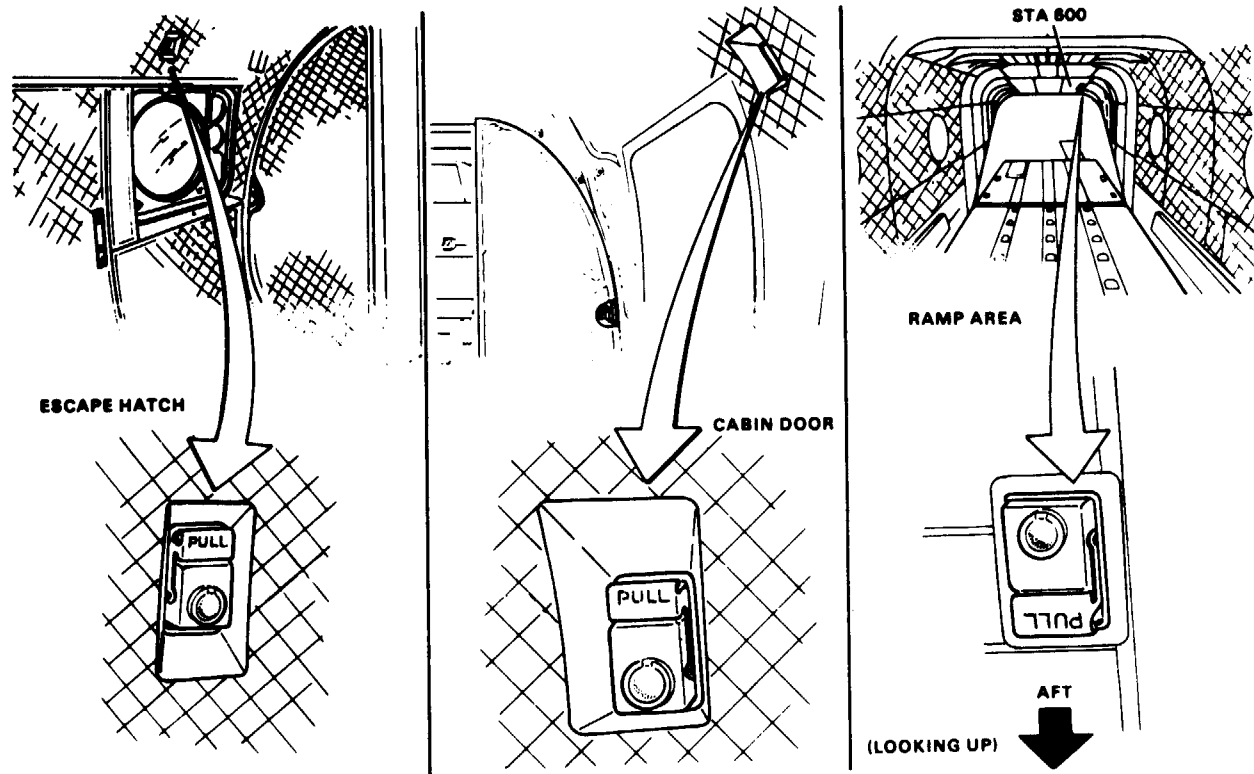
Materials:

None

Personnel Rquired:  
Aircraft Electrician

References:  
TM 55-1520-240-23

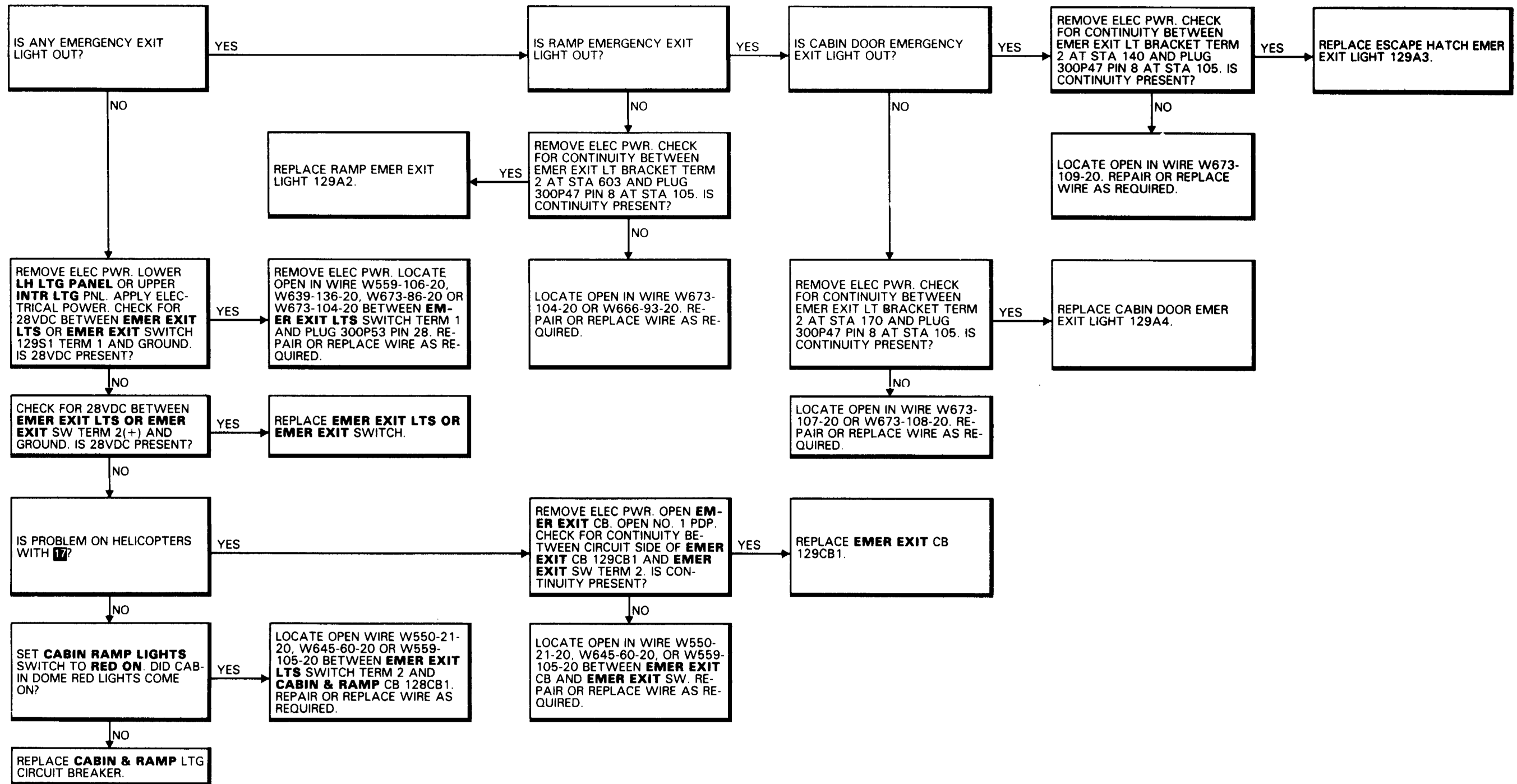
Equipment Condition:  
TM 55-1520-240-23:  
Electrical Power On  
Battery Connected



17-1.4 ONE OR MORE EMERGENCY EXIT LIGHTS WILL NOT GO OUT WHEN SWITCH IS SET TO DISARM

17-1.4

(Continued)





17-1.5 CHARGE INDICATOR LAMPS ON ONE OR MORE EMERGENCY EXIT LIGHTS DO NOT COME ON WHEN SWITCH IS SET TO ARM

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

Aircraft Electrician

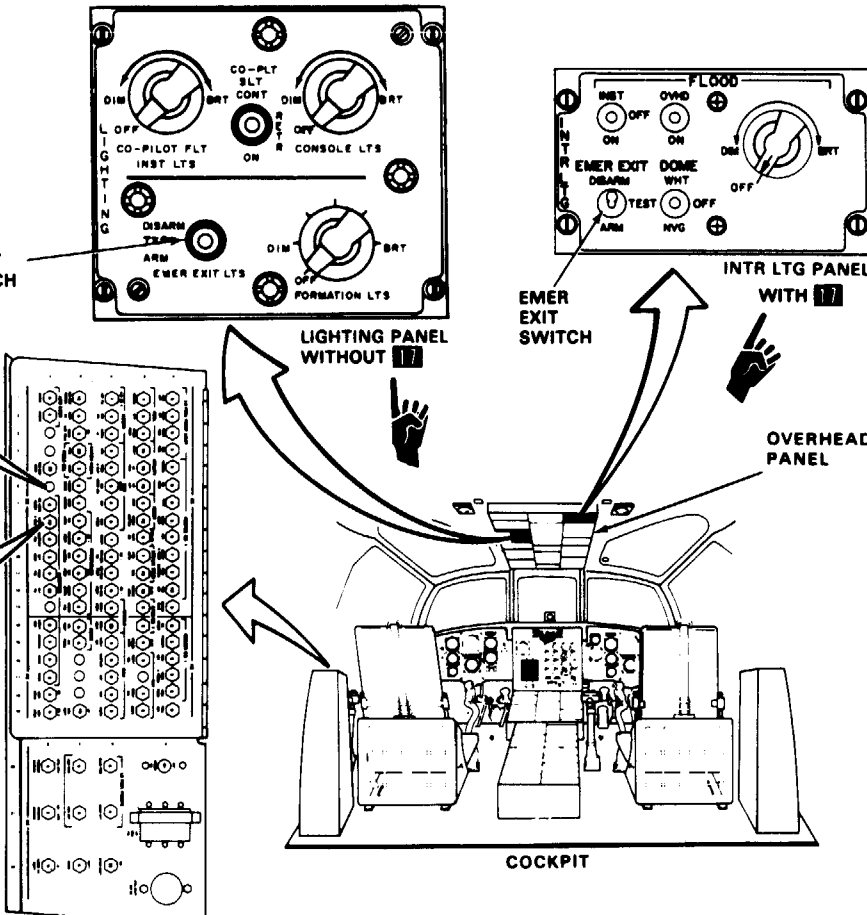
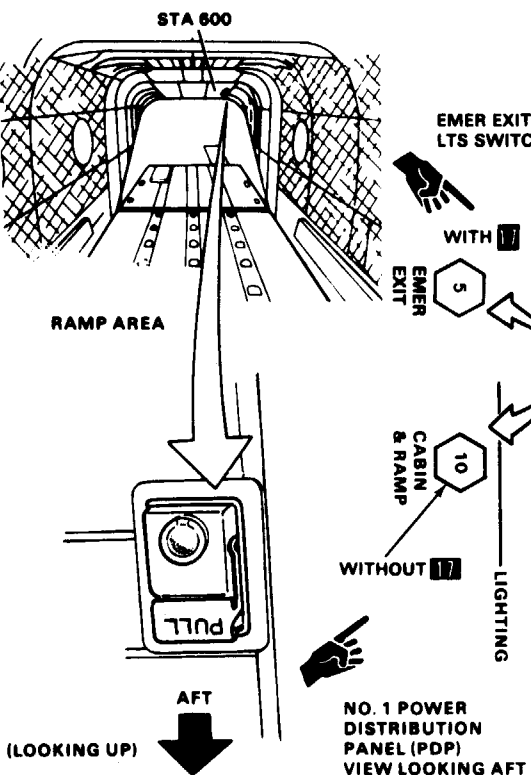
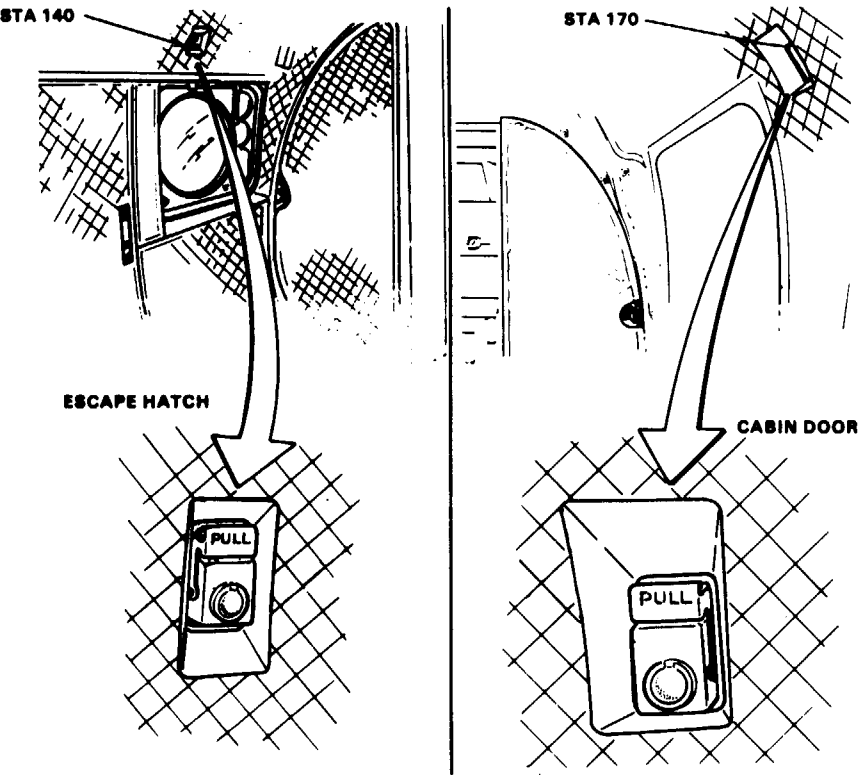
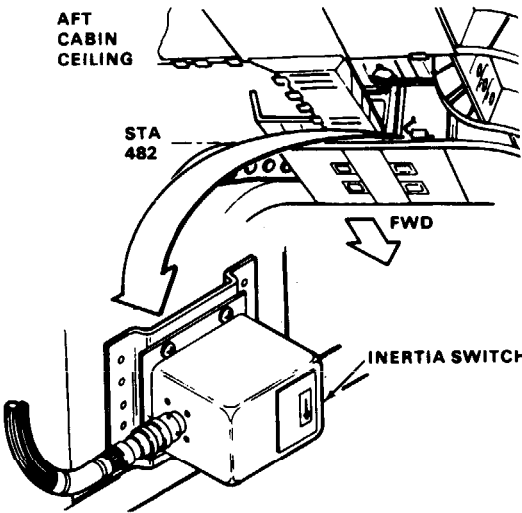
References:

TM 55-1520-240-23

Equipment Condition:

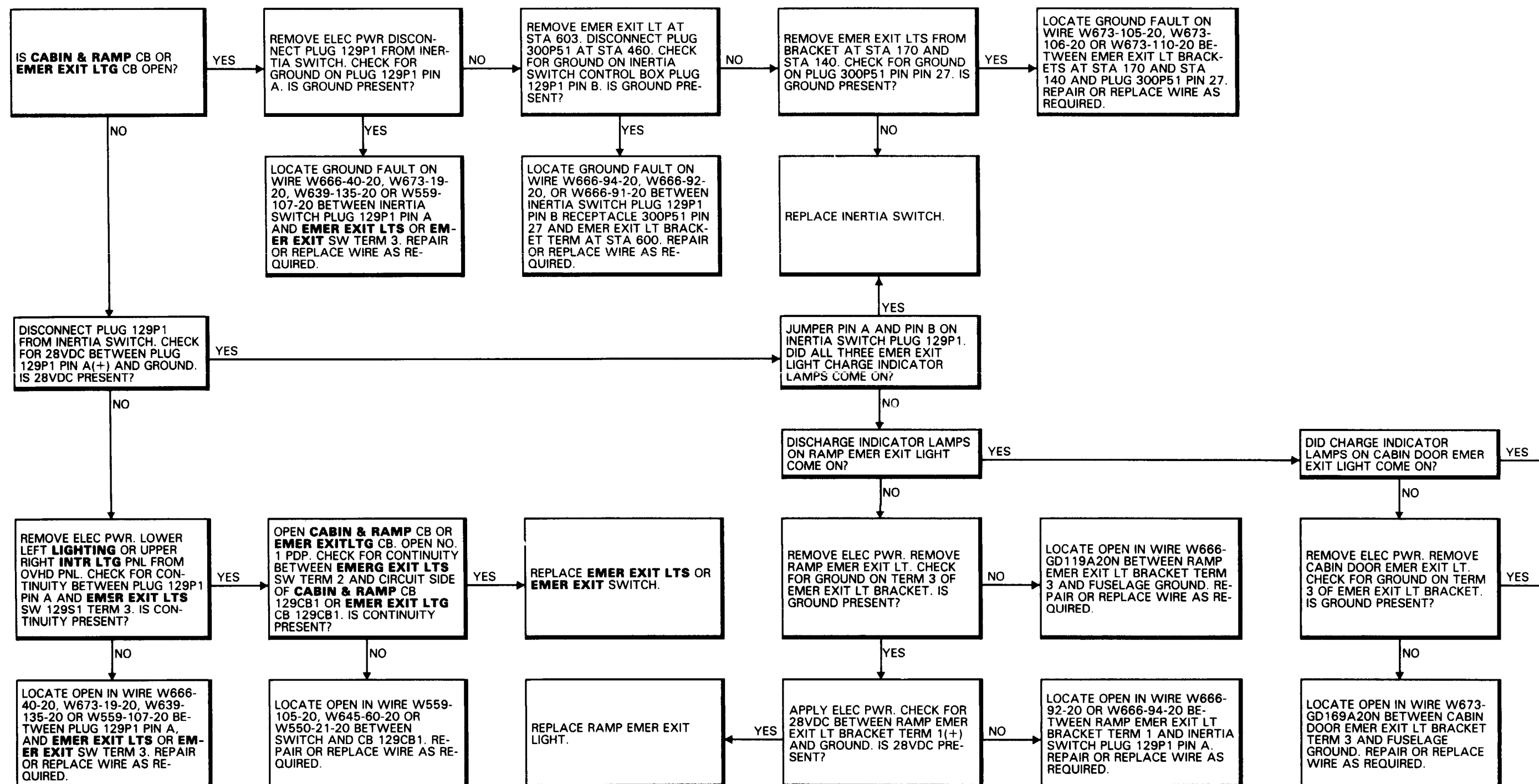
TM 55-1520-240-23:

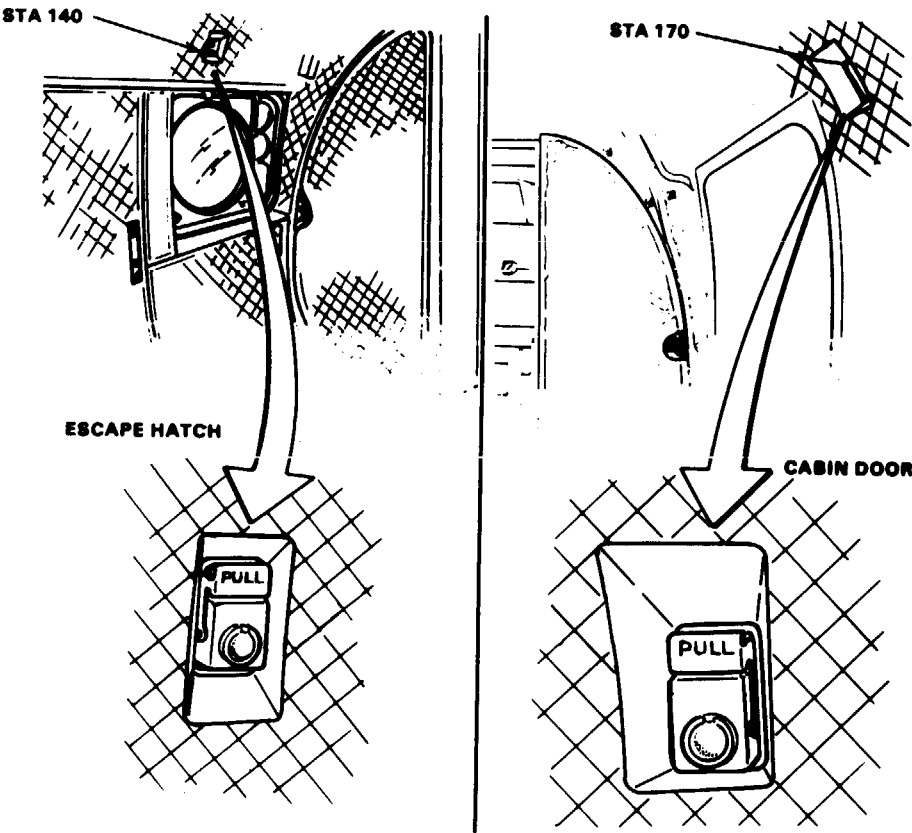
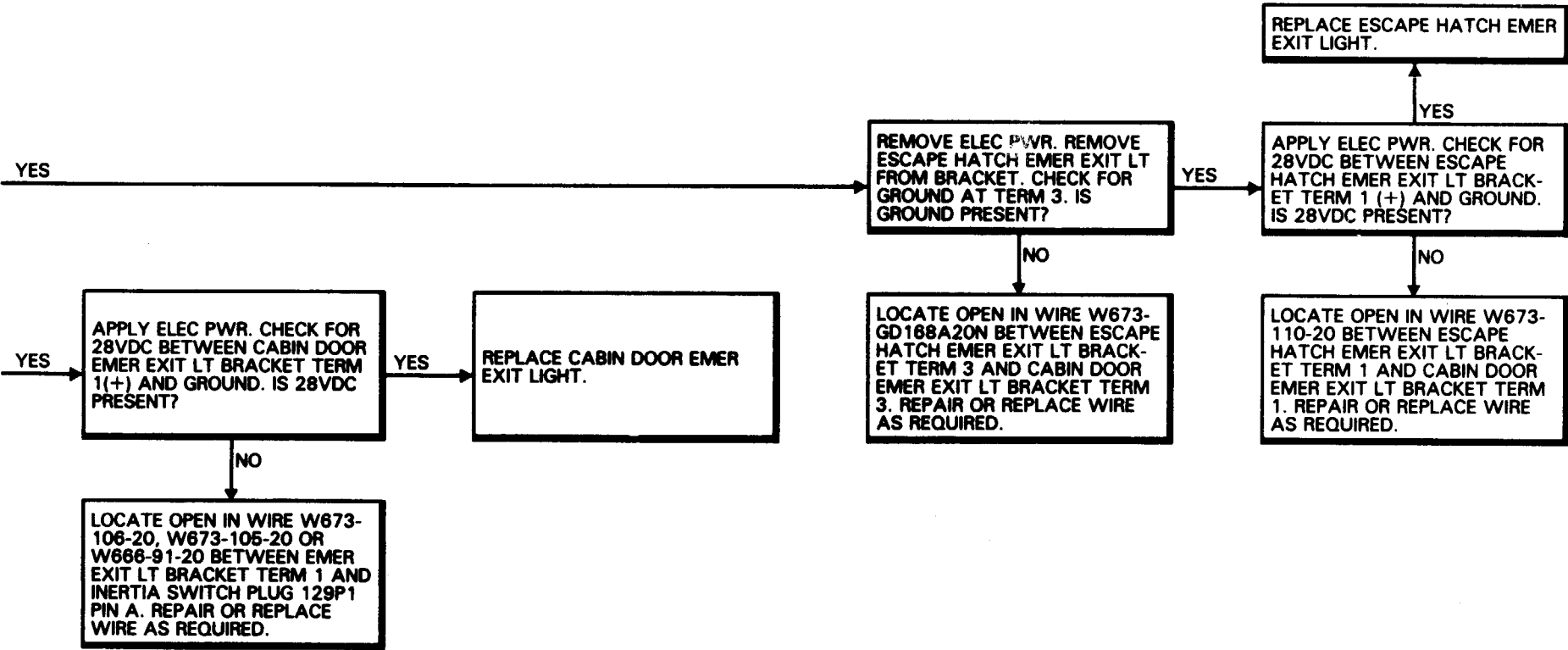
Electrical Power On  
Battery Power On  
Hydraulic Power Off



## 17-1.5 CHARGE INDICATOR LAMPS ON ONE OR MORE EMERGENCY EXIT LIGHTS DO NOT COME ON WHEN SWITCH IS SET TO ARM (Continued)

17-1.5





30 x 54

D145-11206-SPA

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

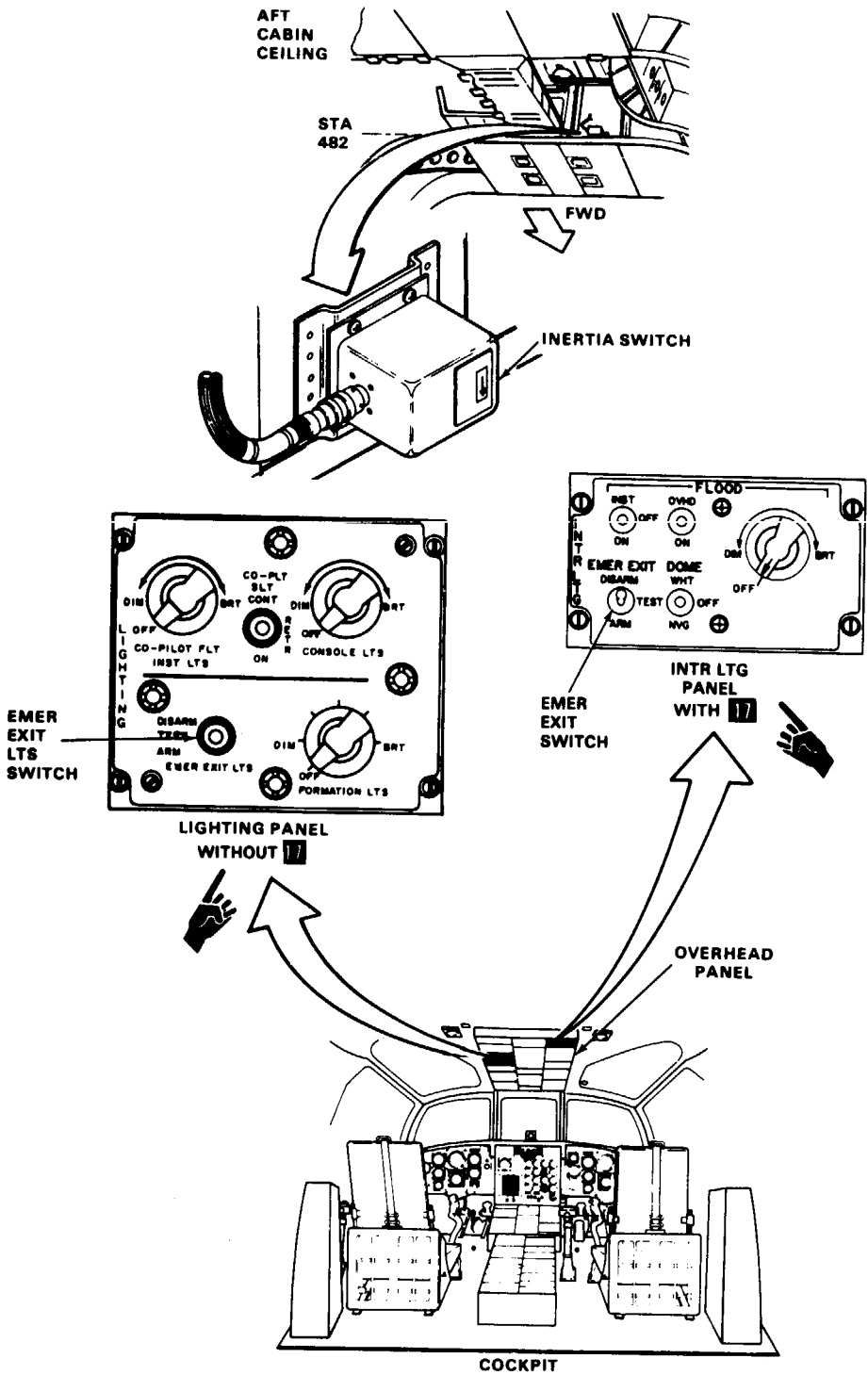
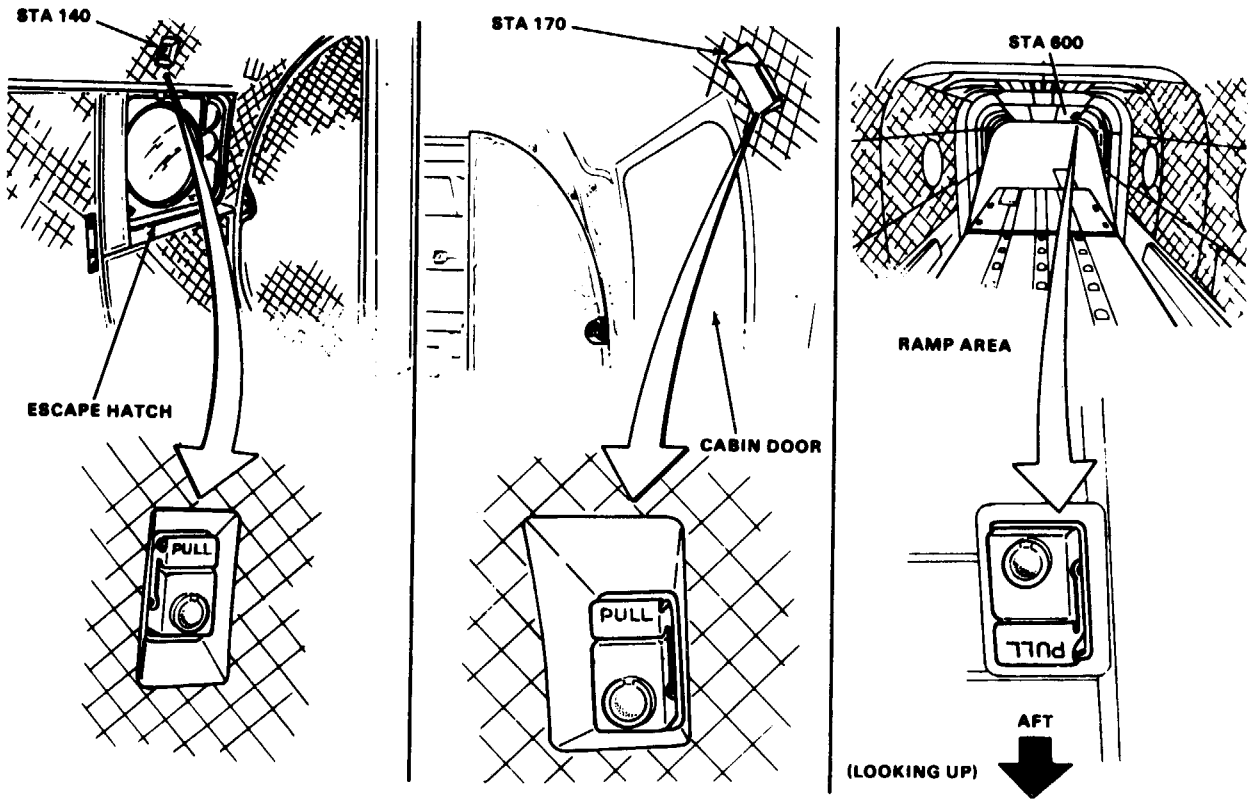
Materials:

None

Personnel Required:  
Aircraft Electrician

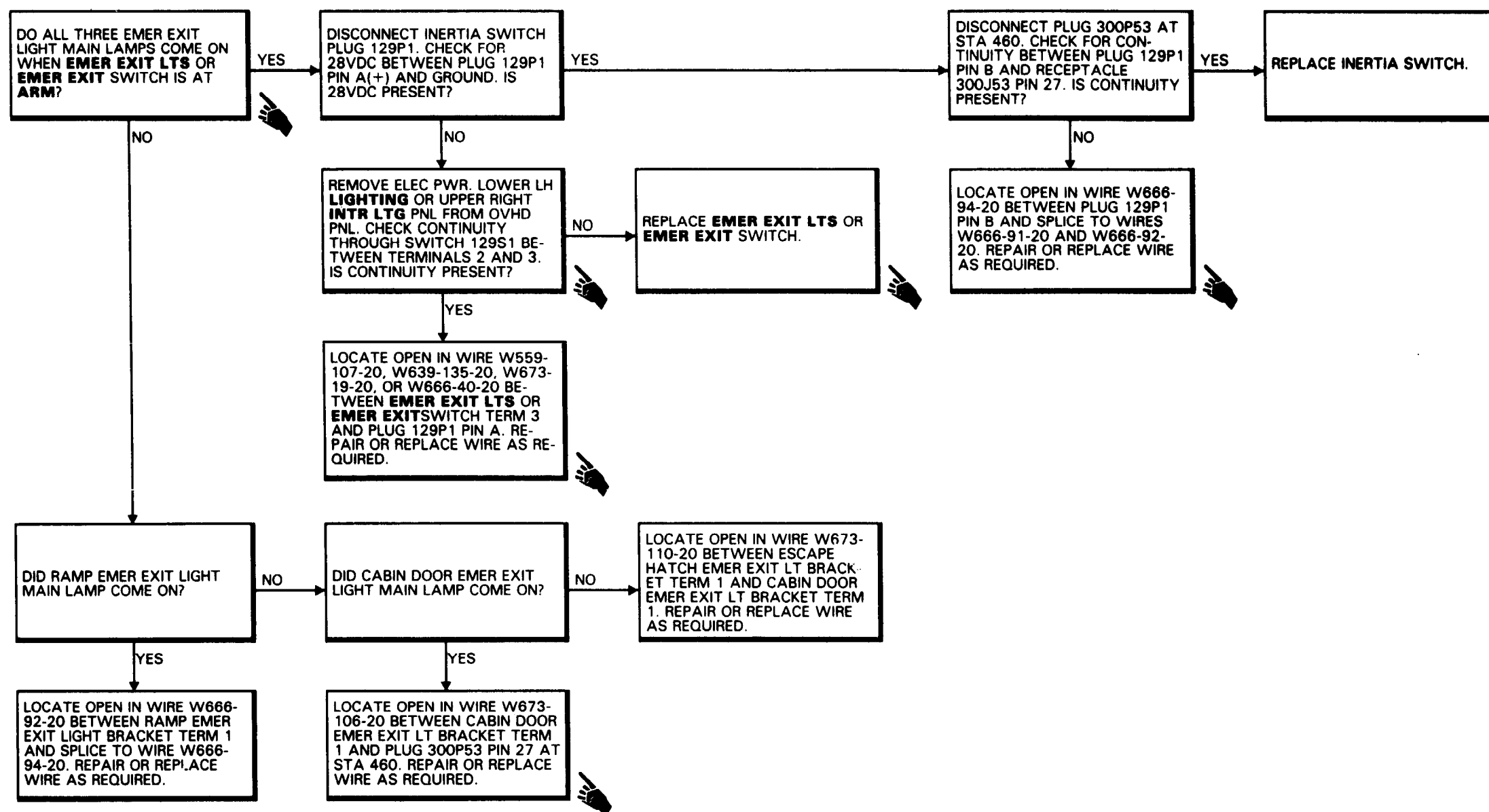
References:  
TM 55-1520-240-23

Equipment Condition:  
TM 55-1520-240-23:  
Battery Power On  
Electrical Power On  
Hydraulic Power Off



## 17-1.6 EMERGENCY EXIT LIGHT MAIN LAMPS COME ON WHEN SWITCH IS AT ARM (Continued)

17-1.6



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

- All
- Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915
- Multimeter

Materials  
None

Personnel Required:

Aircraft Electrician

References:

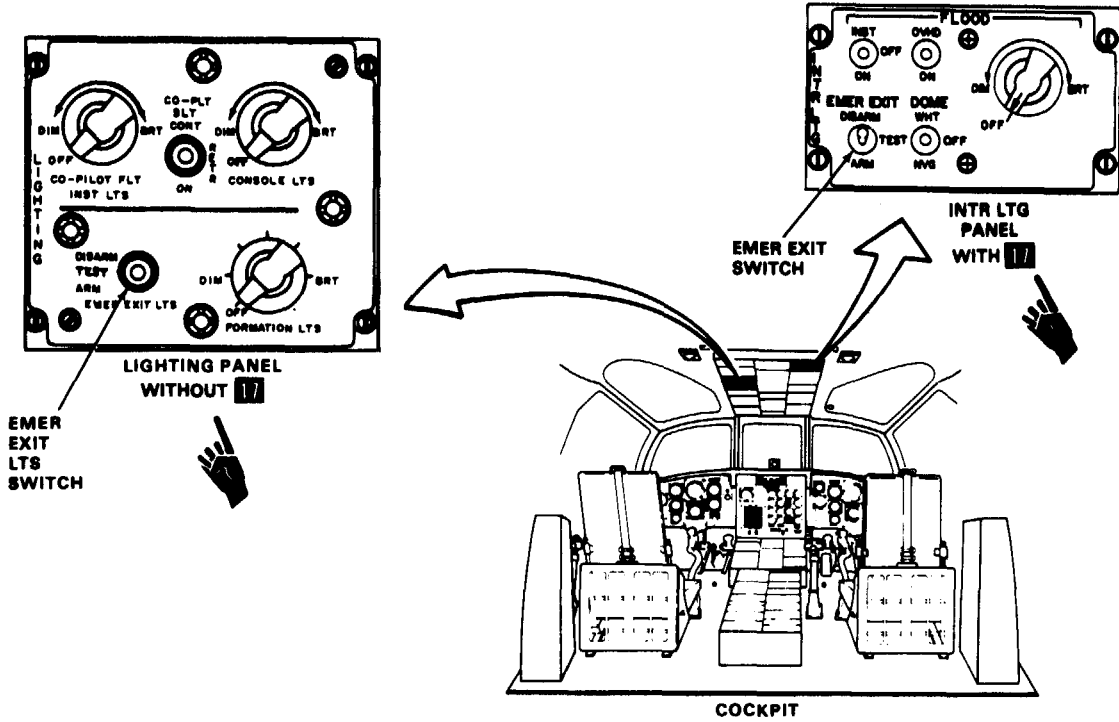
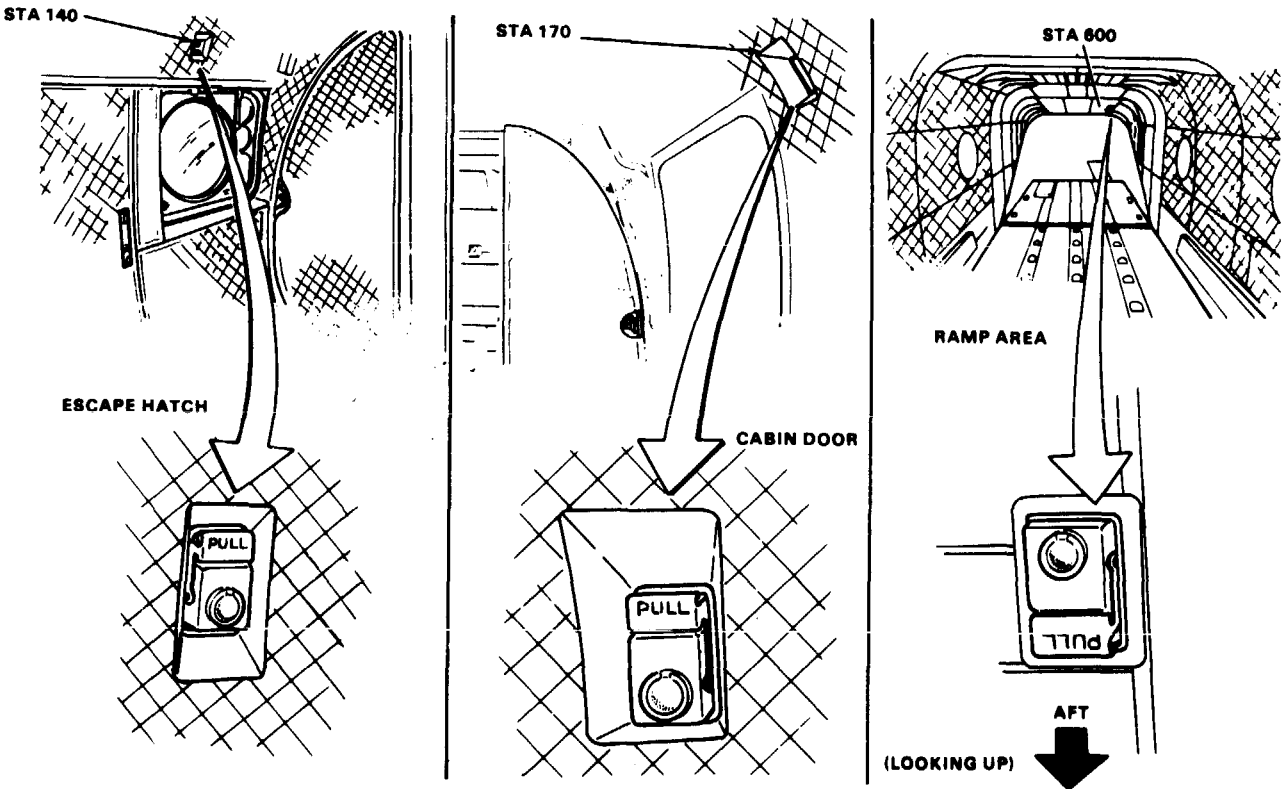
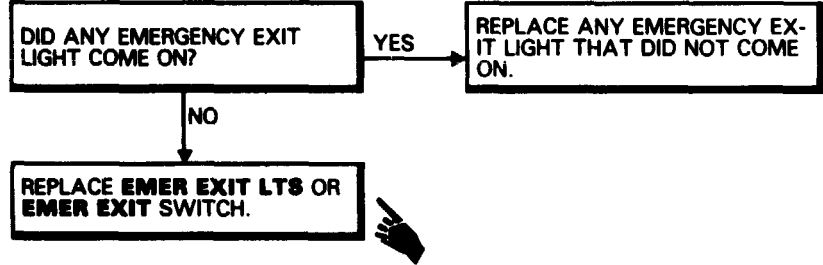
TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

Electrical Power On

Battery Power On



17-1.8 CHARGE INDICATOR LAMPS ON ONE OR MORE EMERGENCY EXIT LIGHTS DO NOT COME ON  
WHEN SWITCH IS AT DISARM

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter

Materials:

None

Personnel Required:

Aircraft Electrician

References:

TM 55-1520-240-23

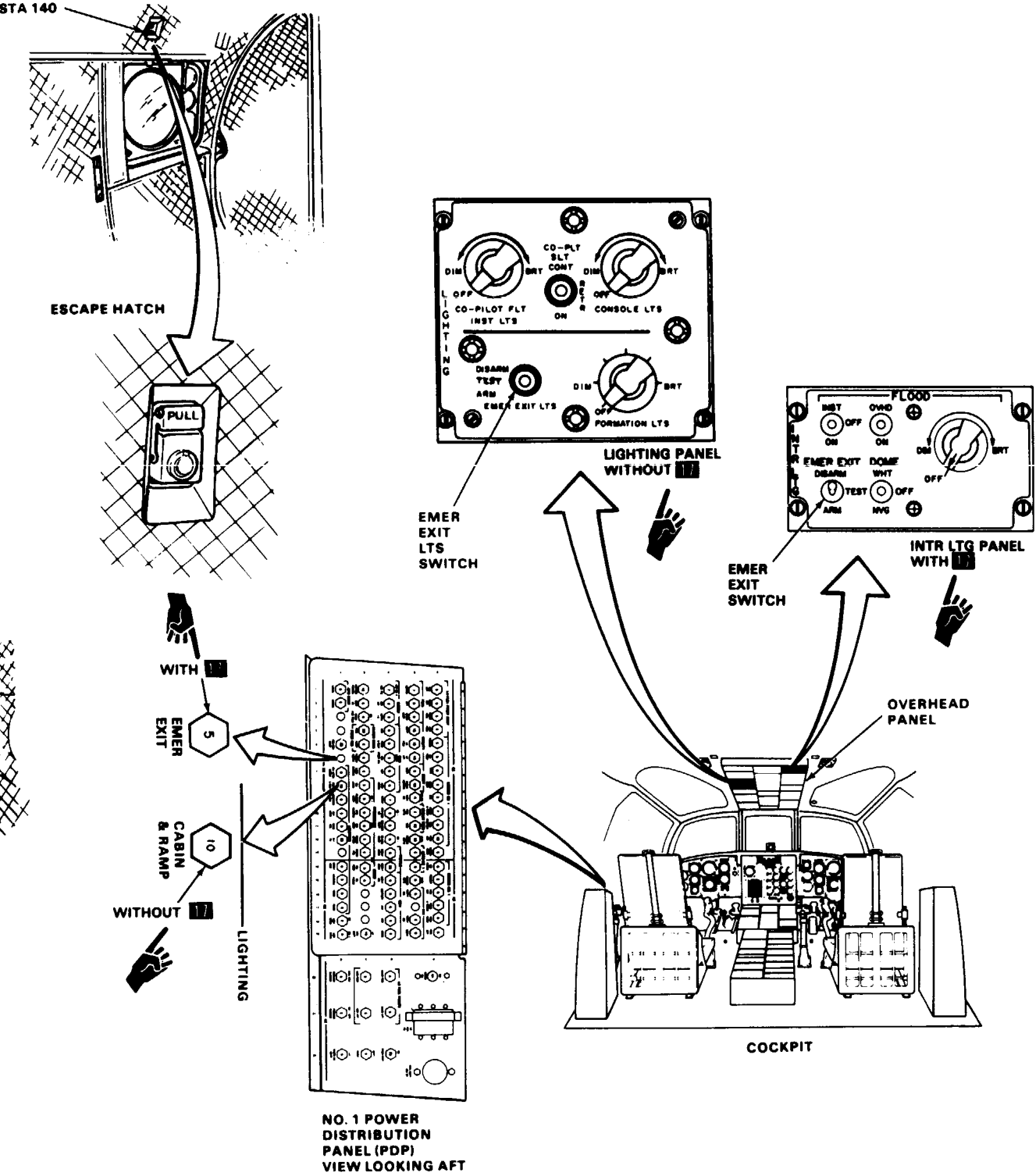
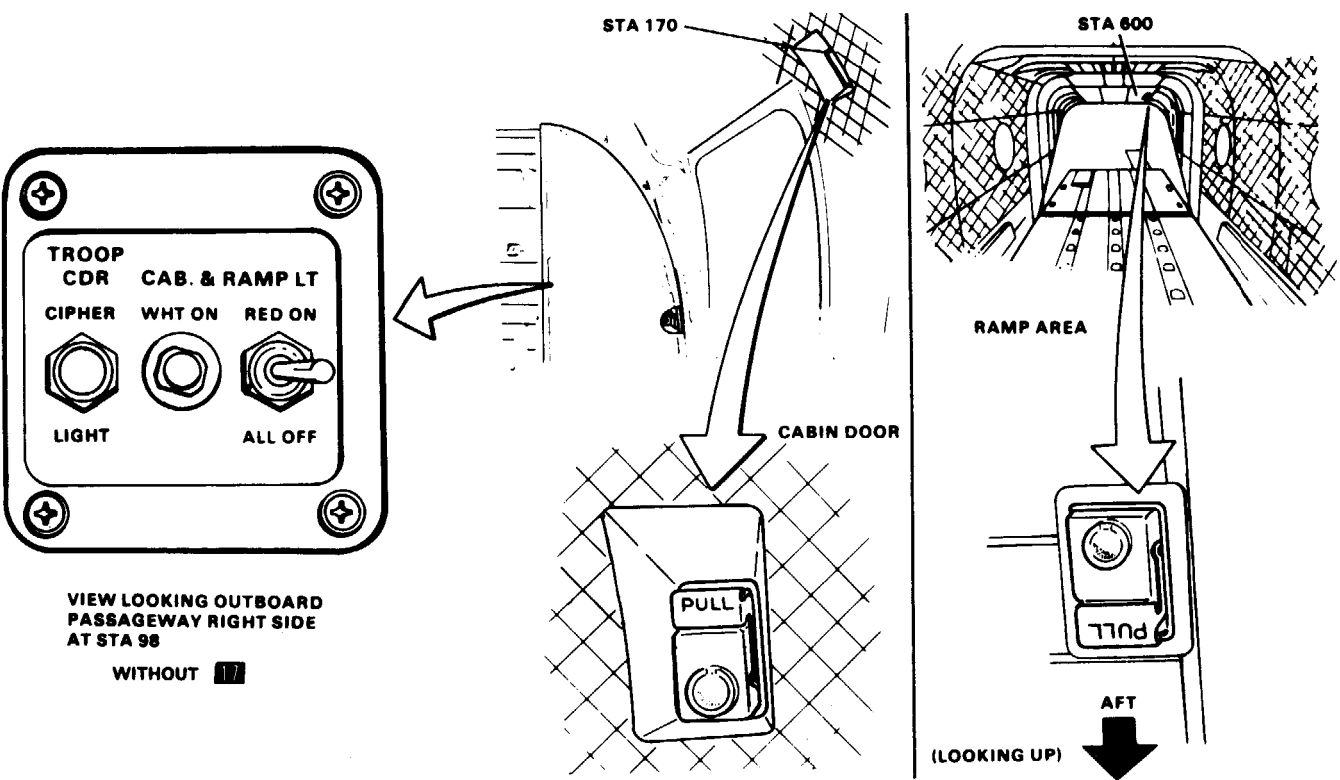
Equipment Condition:

TM 55-1520-240-23.

Electrical Power On

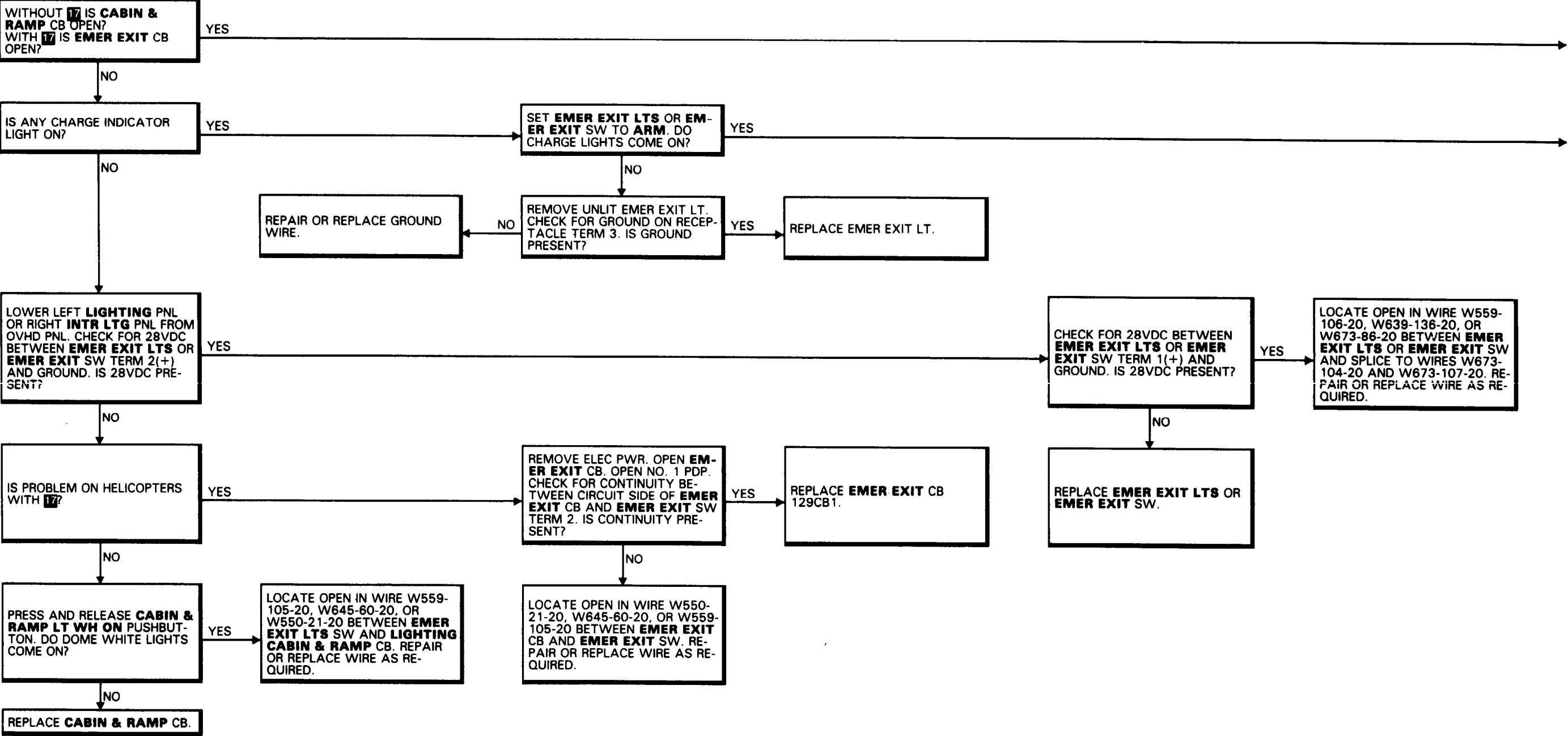
Battery Power On

Hydraulic Power Off

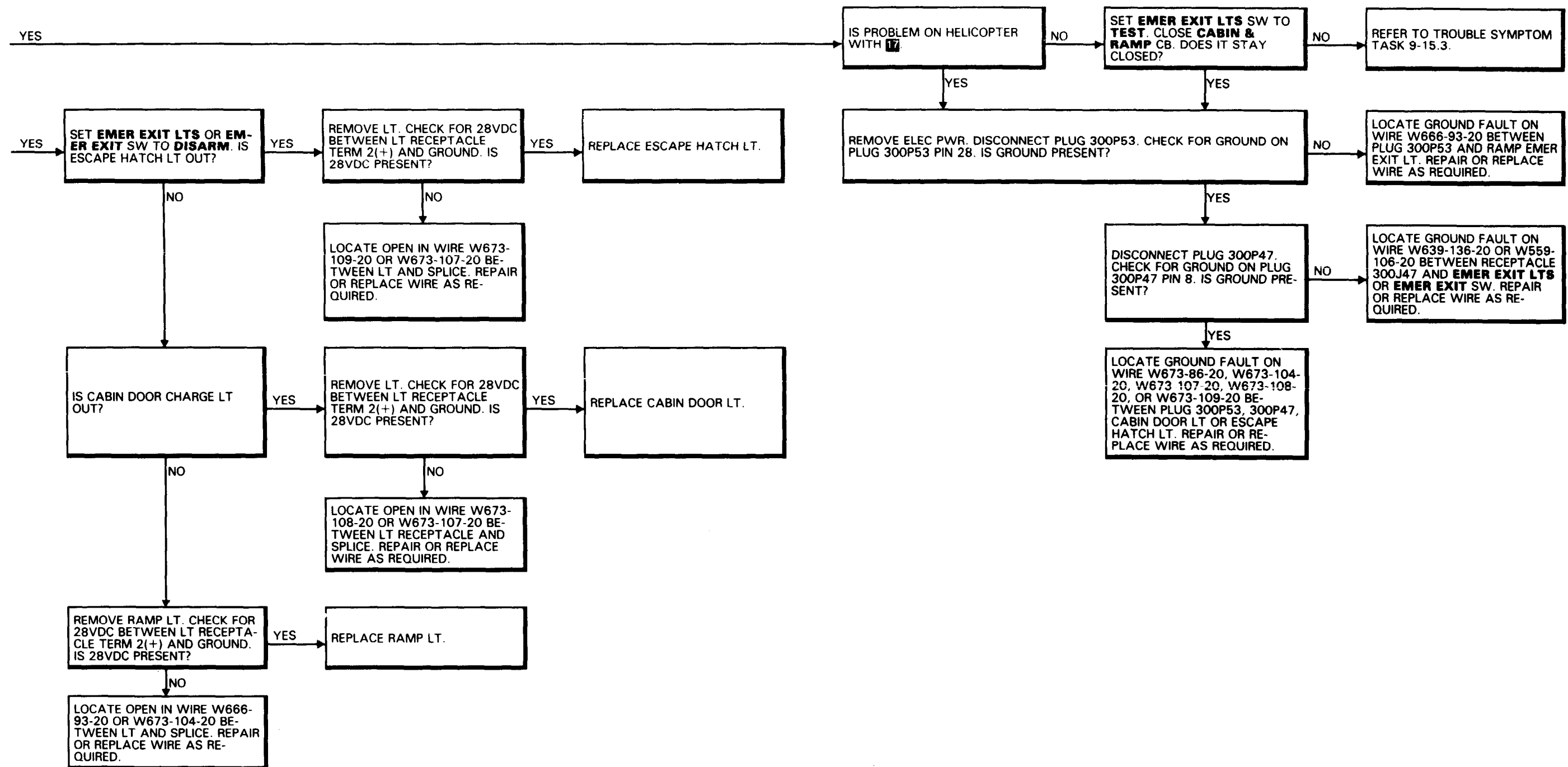


17-1.8 CHARGE INDICATOR LAMPS ON ONE OR MORE EMERGENCY EXIT LIGHTS DO NOT COME ON WHEN SWITCH IS AT DISARM (Continued)

17-1.8









CHAPTER 18  
INSTALLED AVIONIC EQUIPMENT



Change 18 18-1/(18-2 blank)

CHAPTER 18  
INSTALLED AVIONIC SYSTEMS TROUBLESHOOTING

CHAPTER OVERVIEW

Chapter 18 contains procedures for Installed Avionic Systems troubleshooting. Each avionic system and failure symptom is listed below. Included in this chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for each Installed Avionic System.

Refer to TM 55-1520-240-23 for required Avionic System maintenance procedures.

SYSTEM	PARA
GLOBAL POSITIONING	18-1
ALTITUDE VOICE WARNING SYSTEM (RADAR ALTIMETER	18-2
DOPPLER/GPS NAVIGATION SYSTEM (DGNS	18-3
HF LIAISON FACILITY	18-4

FAILURE SYMPTOM LIST

GLOBAL POSITIONING SYSTEM

SYMPTOM	TASK
GPS DISPLAY DOES NOT TURN ON OR VARY WITH CDU BRT CONTROL	18-1.4
NO MOVEMENT OF GPS RCVR TIME TOTALIZING METER	18-1.5
GPS CDU DISPLAYS "FAIL" MESSAGE	18-1.6

SYMPTOM	TASK
GPS SYSTEM TRACKS LESS THAN FOUR SATELLITES AND ESTIMATED POSITION ERROR (EPE) IS NOT WITHIN LIMITS OF THE SYSTEMS FIGURE OF MERIT (FM)	18-1.7
DATA LOADER MODULE INFORMATION DOES NOT LOAD INTO GPS SYSTEM BUT NO ERROR MESSAGE APPEARS ON CDU	18-1.8
KYK-13 KEY LOADING DISCREPANCIES	18-1.9

SYMPTOM	TASK
GPS ALERT INDICATOR DISCREPANCIES	18-1.10
PILOT/COPILOT HSI DISCREPANCIES	18-1.11
GPS SYSTEM WILL NOT ZEROIZE	18-1.12
GPS SYSTEM WILL NOT RETAIN LOADED DATA AFTER AIRCRAFT POWER IS REMOVED	18-1.13

GO TO THE NEXT PAGE

FAILURE SYMPTOM LIST (Continued)

ALTITUDE VOICE WARNING SYSTEM  
(RADAR ALTIMETER)

SYMPTOM	TASK
ALTITUDE VOICE WARNING MESSAGE NOT AUDIBLE IN PILOT, COPILOT, OR AFT STATION/ HOIST OPERATOR'S HEADSET WHEN PILOT'S RADAR ALTIMETER POINTER IS BELOW OR ABOVE PRESET ALTITUDE LIMITS	18-2.4
ALTITUDE VOICE WARNING MESSAGE VOLUME DOES NOT FLUCTUATE WHEN PRESS-TO-TEST KNOB IS MOMENTARILY DEPRESSED	18-2.5
ALTITUDE VOICE WARNING MESSAGE IS AUDIBLE WHEN ALTITUDE POINTER IS WITHIN THE HI/LO SET INDEX ENVELOPE	18-2.6

CHAPTER 18  
INSTALLED AVIONIC SYSTEMS TROUBLESHOOTING

CHAPTER OVERVIEW

FAILURE SYMPTOM LIST (Continued)

DOPPLER/GPS NAVIGATION SYSTEM (DGNS)

SYMPTOM	TASK
EDGE LIT PANEL DOES NOT LIGHT OR VARY	18-3.4
CDU MAL LAMP AND ALL LED SEGMENTS ARE NOT ILLUMINATED	18-3.5
CDU DISPLAY NOT GO ALL	18-3.6

SYMPTOM	TASK
GPS ALERT INDICATOR DOES NOT ILLUMINATE	18-3.7
PRESENT POSITION NOT DISPLAYED ON CDU	18-3.8
CDU DOES NOT DISPLAY DOWNLOAD WAYPTS DURING WAYPOINT LOADING	18-3.9

SYMPTOM	TASK
INDICATIONS ON THE FOUR-LINE DISPLAY AND HSI ARE NOT THE SAME	18.3.10
GPS DOES NOT ZEROIZE	18-3.11
GPS HAVEQUICK TIMING NOT WORKING	18-3.12

INSTALLED AVIONIC SYSTEMS ELECTRICAL COMPONENT  
LOCATION AND CONFIGURATION LIST

REF DESIG	TYPE	MATE WITH/LOCATION	STATION LOCATION		
			FS	WL	BL
ASN149GD002		CANTED CONSOLE - FWD FLOOR	53	-15	6L
ASN149GD003		CANTED CONSOLE - FWD FLOOR	53	-15	6L
GD306		HEATER COMPARTMENT	95	6	45R
GD319		AVIONICS COMPT - LEFT SIDE	118	6	50L
TB4		CONSOLE - FWD FLOOR	50	-17	0
TB6		CONSOLE - FWD FLOOR	50	-17	0

REF DESIG	PART NUMBER	TYPE	MATE WITH/LOCATION	STATION LOCATION		
				FS	WL	BL
181P6	MS27484518B32SA		CTR CONSOLE, RT-1167/ARC-164, UHF RCVR/XMTR			
185P1	MS27473T18B35S	60	CONSOLE, RT-2585/APX-100, IFF			
187P26	M28748/6-G30L1A	62	CONSOLE, CPLT INTPH CONT PNL			
187P27	M28748/6-G30L1A	62	CONSOLE, PLT INTPH CONT PNL			
187P31	M28748/6-G30L1A	62	CABIN, AFT INTPH CONT PNL	485	0	50L
195P2	MS27473T10B35SA		PLT INSTR PNL, RAD ALT RT IND			
196P2	MS3476W16-26S	24	PLT INSTR PNL, AIMS ALT			
197P6	MS27484T18B35P		CTR INSTR PNL; CDU, J2 - DOPPLER	50	-15	0
			CDU / 199J14 - GPS DISC			
199CR1	JTXM19500/51902		ELECTRONICS COMPARTMENT, GPS FILL PANEL	108	27	32L
199DS1	923-104-28-8		CTR INSTR PNL, GPS ALERT IND			
199P1	D38999/26FB98SN		ELECTRONICS COMPARTMENT, R-2400/A, GPS RCVR	108	28	29L
199S1	MS24523-23		CTR INSTR PNL, GPS ZEROIZE SWITCH			
199T1	M27/54-16B		CONSOLE - FWD FLOOR	50	-17	0
199P2	D38999/26FH35SN		ELECTRONICS COMPARTMENT, R-2400/A, GPS RCVR	108	27	29L
199S2	MS25089-1C		ELECTRONICS COMPARTMENT, GPS FILL PANEL	108	27	34L
199P3	D38999/26FG41SN		CONSOLE CANTED, C-11702/UR, GPS CONTROL DISPLAY UNIT			
199P4	MS27473T12F35S		ELECTRONICS COMPARTMENT, DATA LOADER RECEPTACLE	103	28	33L
199J5	ON241775-1		ELECTRONICS COMPARTMENT, KYK-13 RECEPTACLE	108	27	33L
199J6	M83723/73A2461N		CONSOLE, UNDERFLOOR DISC	80	-30	3R
199P6	M83723/76A2461N		CONSOLE, UNDERFLOOR DISC	79	-30	3R
199P7	M39012/26-0503		ELECTRONICS COMPARTMENT, R-2400/A, GPS RCVR	108	27	29L
199P8	M39012/01-0503		ELECTRONICS COMPARTMENT, R-2400/A, GPS RCVR	108	27	27L
199P9	M39012/26-0503		CABIN OVERHEAD, AM-7314/URN, AE-4 ANTENNA ELECTRONICS, GPS	229	50	17L
199P10	C02		CABIN OVERHEAD, AM-7314/URN, AE-4 ANTENNA ELECTRONICS, GPS	228	50	17L
	(per MIL-C-39012/27)					
199P11	M39012/01-0503		CABIN OVERHEAD, AM-7314/URN, AE-4 ANTENNA ELECTRONICS, GPS	227	50	17L
199P12	C11		NO. 2 TUNNEL COVER DOOR, AS-3922/URN FRPA-3, GPS ANTENNA	239	55	2L
	(per MIL-C-39012/30)					
199P13	MS27467T25B29P		ELECTRONICS COMPARTMENT, CV-3338/ASN-128, DOPPLER SDC	108	27	25L
199J14	MS27472T18B35S		CTR INSTR PNL, 197P6 - GPS DISC	50	-15	0
300J6	M83723-74A24616	40	NO. 2 PDP			
300P6	M83723-75A24616	43	NO. 2 PDP			

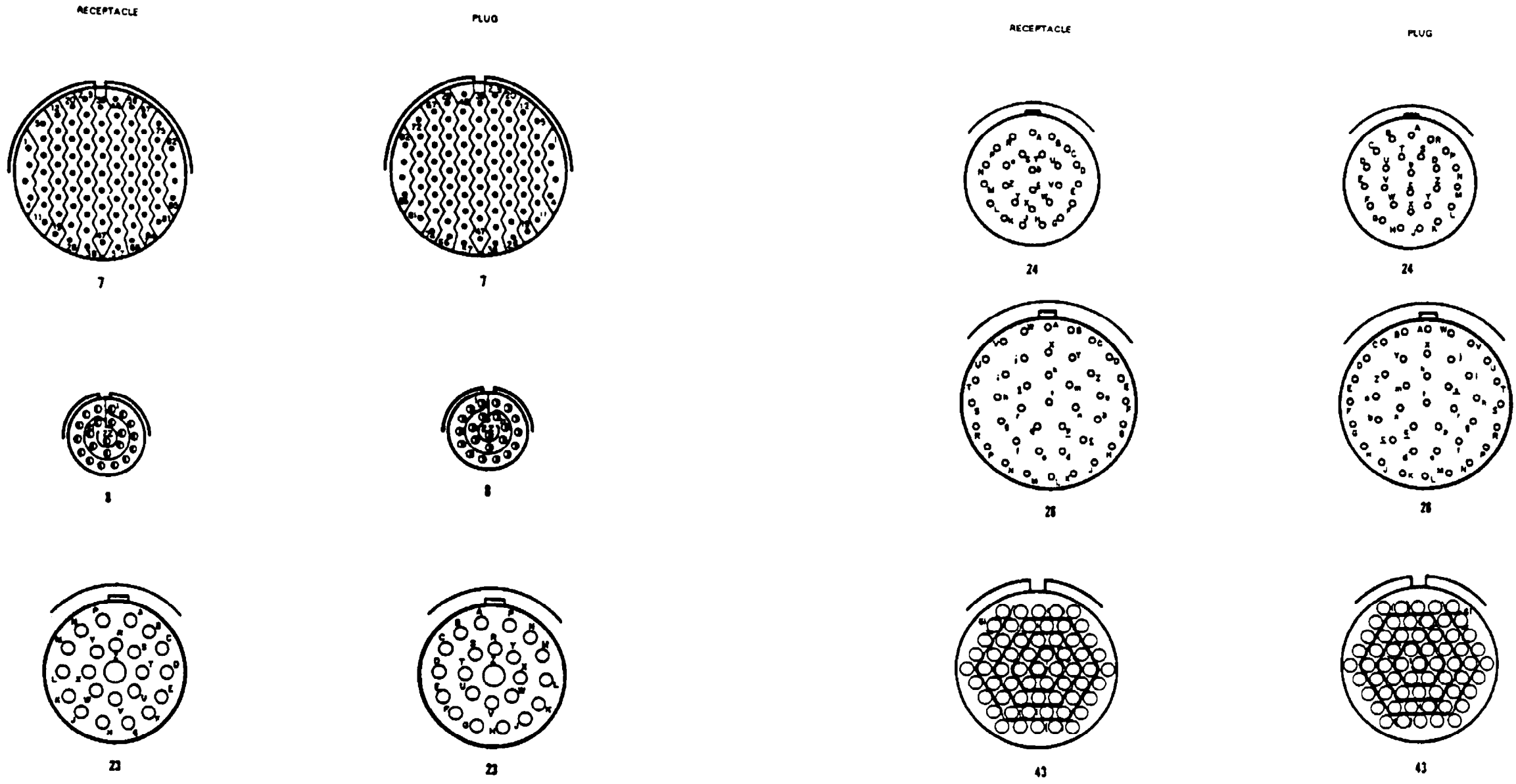
DOPPLER GPS/NAVIGATION SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST

REF DESG	PART NUMBER	TYPE	MATE WITH/LOCATION	STATION FS	LOCATION WL	BL
066P1	MS27473T22B2S	7	HSI-PLT	45	0	25R
066P2	MS27473T22B2S	7	HSI-CPLT	45	0	25L
181P6	MS27473T18B32SA	58	RT-1167C/ARC-164 UHF	65	-20	0
181P1	MS27473T18B32S	58	RT-1167C/ARC-164 UHF	65	-20	0
185P1	MS27473T18B35S	60	RT-2585/APX-100 IFF	52	-20	10L
186P4	MS27467T19B35S	60	RT-1749/URC			
			AN/ARC-220 HF R/T	118	-25	30L
196P2	MS3476W16-26S	24	AAU-32/A PILOT ALTIMETER	45	10	12L
197P8	2031-5011-00	COAX	ANTENNA 22433-40	239	55	3L
197P1	MS27484T14B35S	A	RCVR/XMTR ASSY			
			RT-1193A/ASN-128	110	-40	0
197P11	MS27473T12F35S	8	DATA LOADER RECEPTACLE	105	27	35L
197P2	MS27467T17B99S	23	SIG DATA CONVERTER	108	27	29L
			CV-3338A/ASN-128B			
197P3	MS27467T21B41P	26	SIG DATA CONVERTER	108	27	27L
			CV-3338A/ASN-128B			

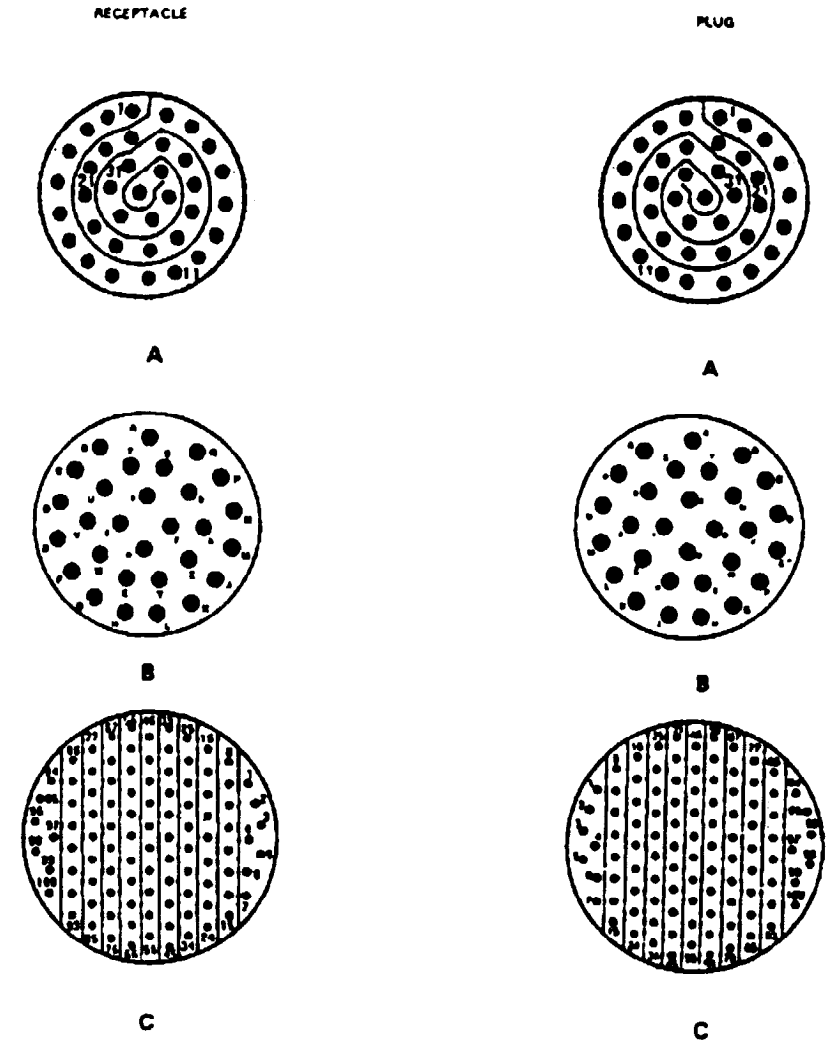
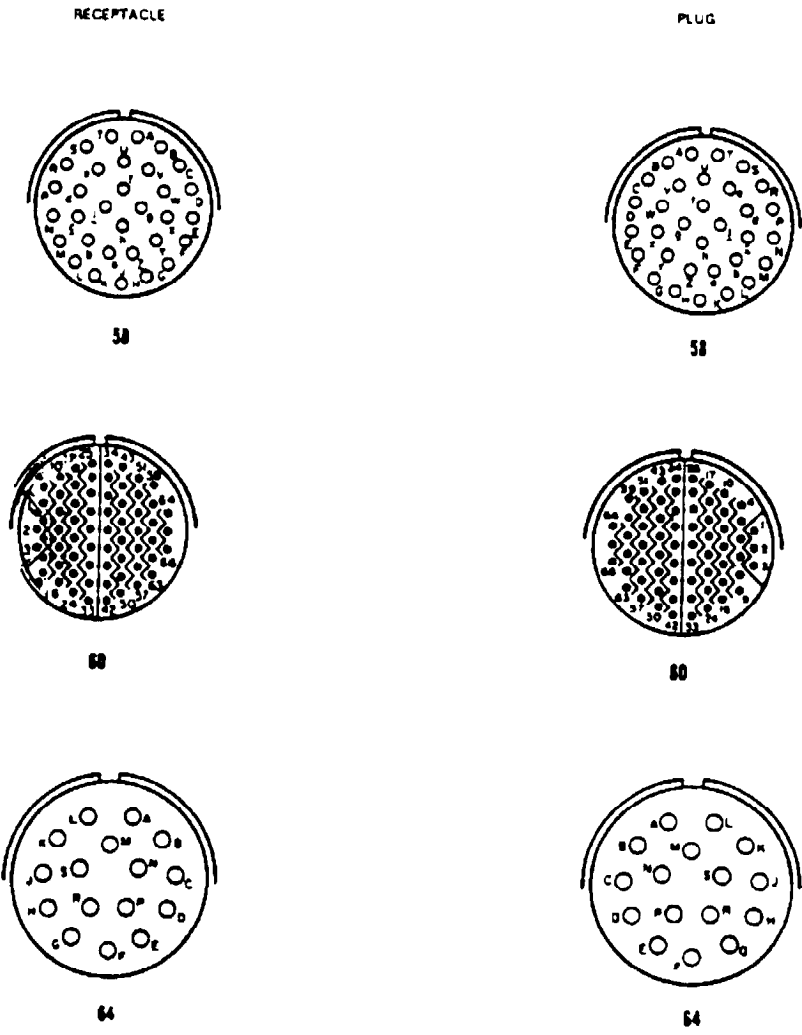
REF DESG	PART NUMBER	TYPE	MATE WITH/LOCATION	STATION FS	LOCATION WL	BL
197P4	MS27467T25B29P	B	SIG DATA CONVERTER	108	27	25L
			CV-3338A/ASN-128B			
197P5	MS27484T20B16S	64	COMP DIS UNIT (CDU)	52	-20	2R
			CP-1252C/ASN-128B			
197P6	MS27484T18B35P	60	COMP DIS UNIT (CDU)	52	-20	2L
			CP-1252C/ASN-128B			
197P7	2031-5011-00	COAX	SIG DATA CONVERTER	108	30	30L
			CV-3338A/ASN-128B			
197P9	MS27467T15B35S	B	SIG DATA CONVERTER	108	30	28L
			CV-3338A/ASN-128B			
P2002R	D38999/26WH35SN	C	ANVIS/HUD SIG DATA CONV			
			CV-4229/AVS-7	105	-10	29L
197J10	M83723/73A2461N	43	PEDESTAL DISCONNECT PANEL	80	-30	0
197P10	M83723/76A2461N	43	PEDESTAL DISCONNECT PANEL	80	-30	0



DOPPLER GPS/NAVIGATION SYSTEM ELECTRICAL COMPONENT LOCATION  
AND CONFIGURATION LIST (Continued)



DOPPLER GPS/NAVIGATION SYSTEM ELECTRICAL COMPONENT LOCATION  
AND CONFIGURATION LIST (Continued)



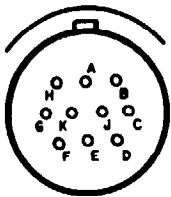
HF LIAISON FACILITY ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

RECEPTACLE

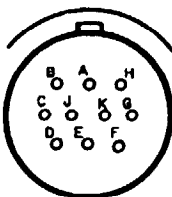
PLUG

RECEPTACLE

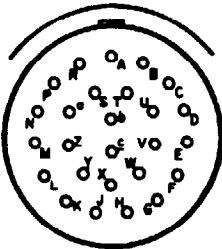
PLUG



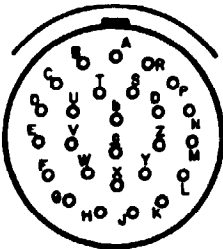
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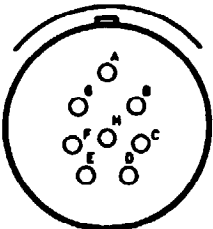
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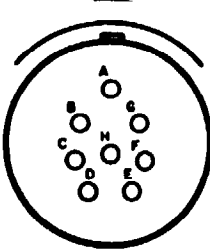
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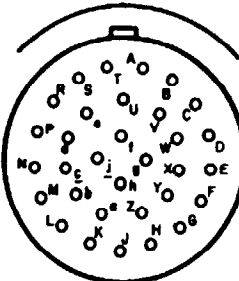
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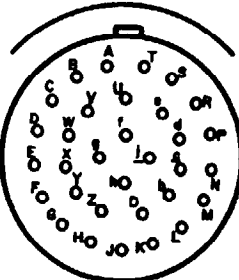
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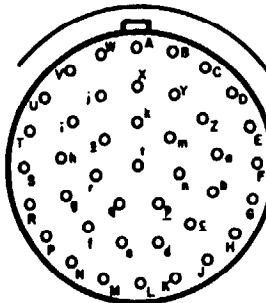
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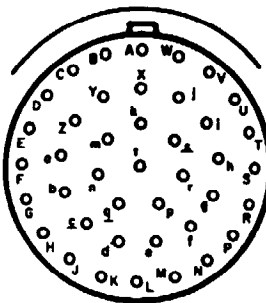
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25



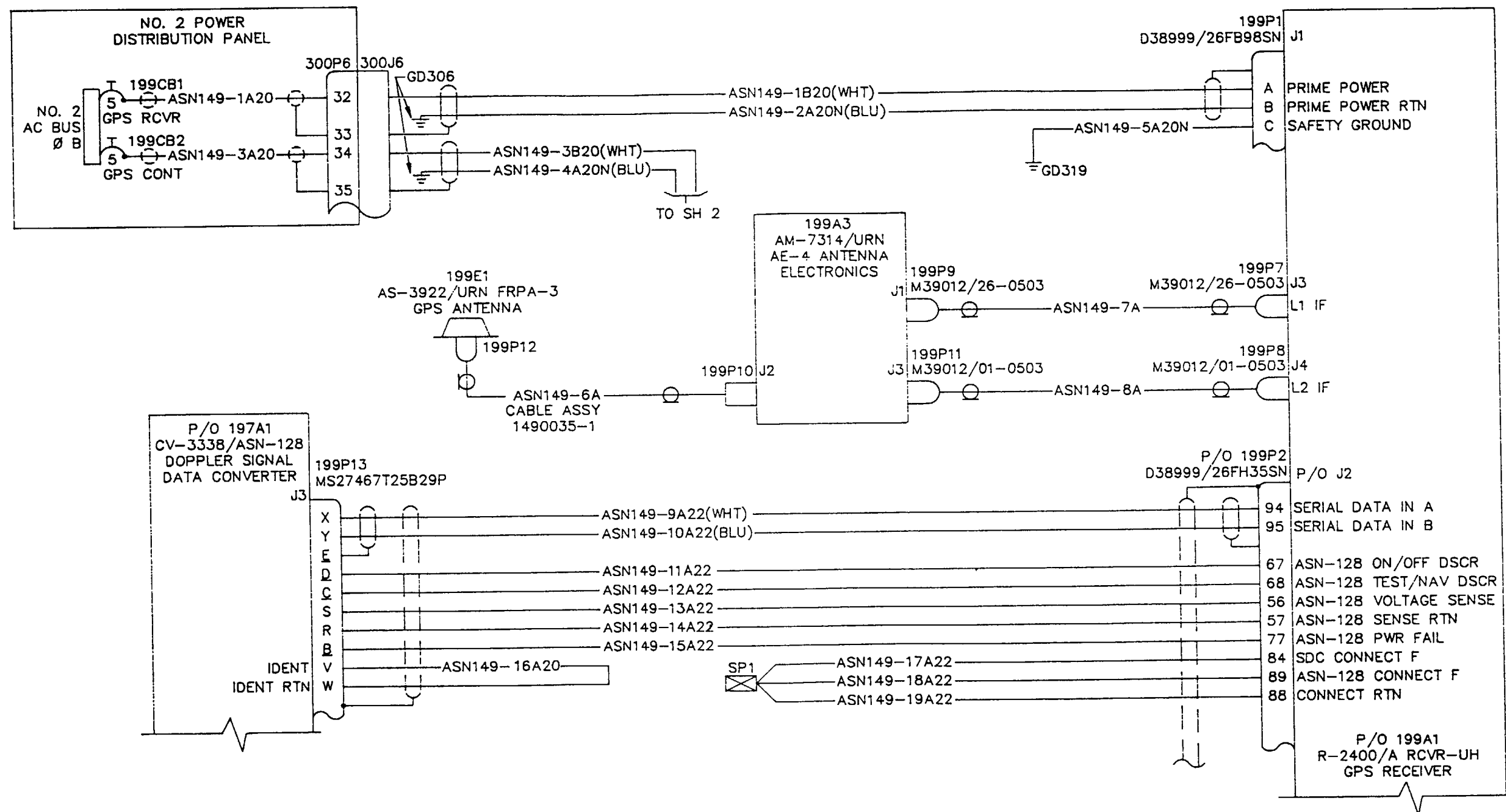
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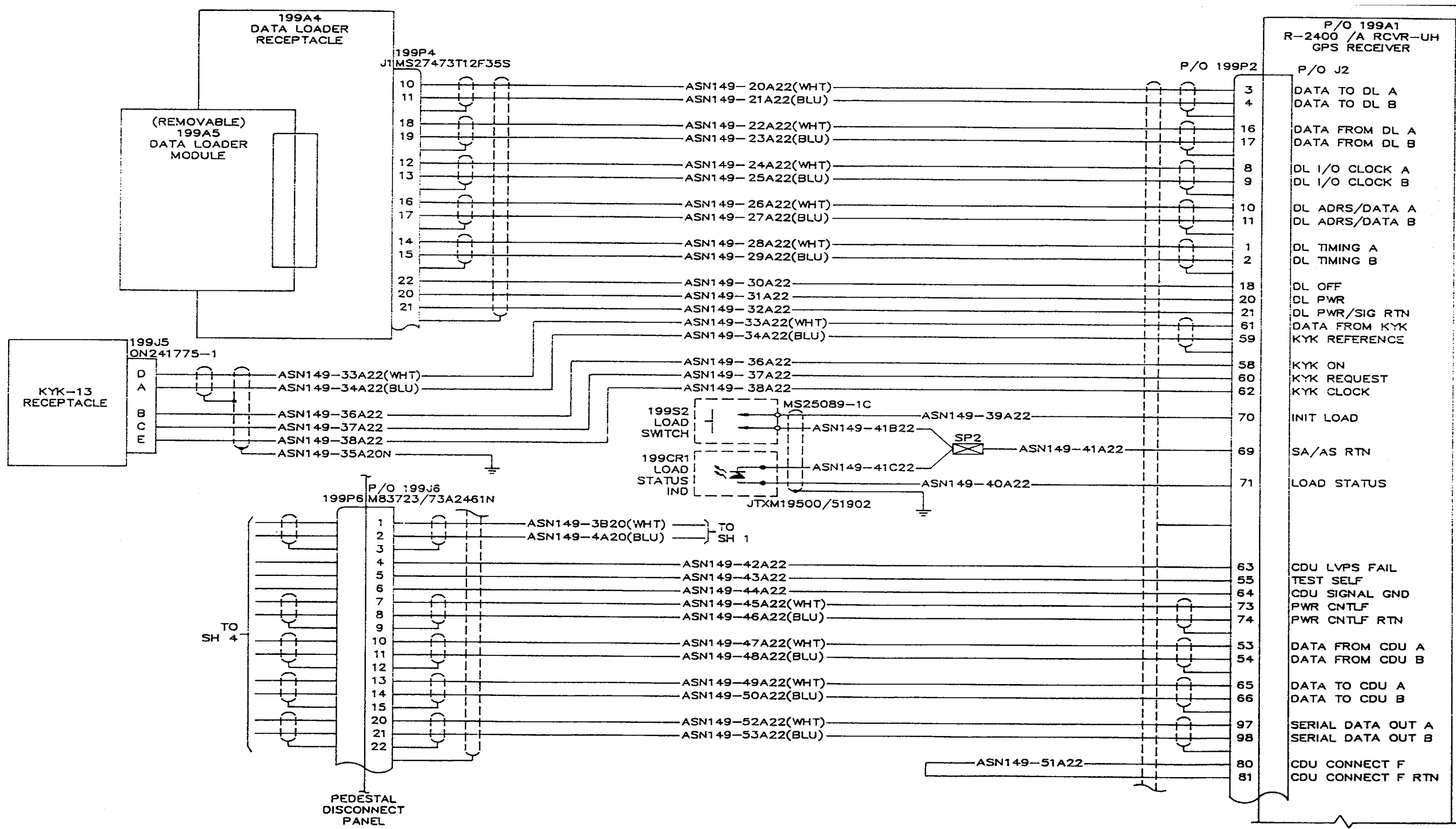
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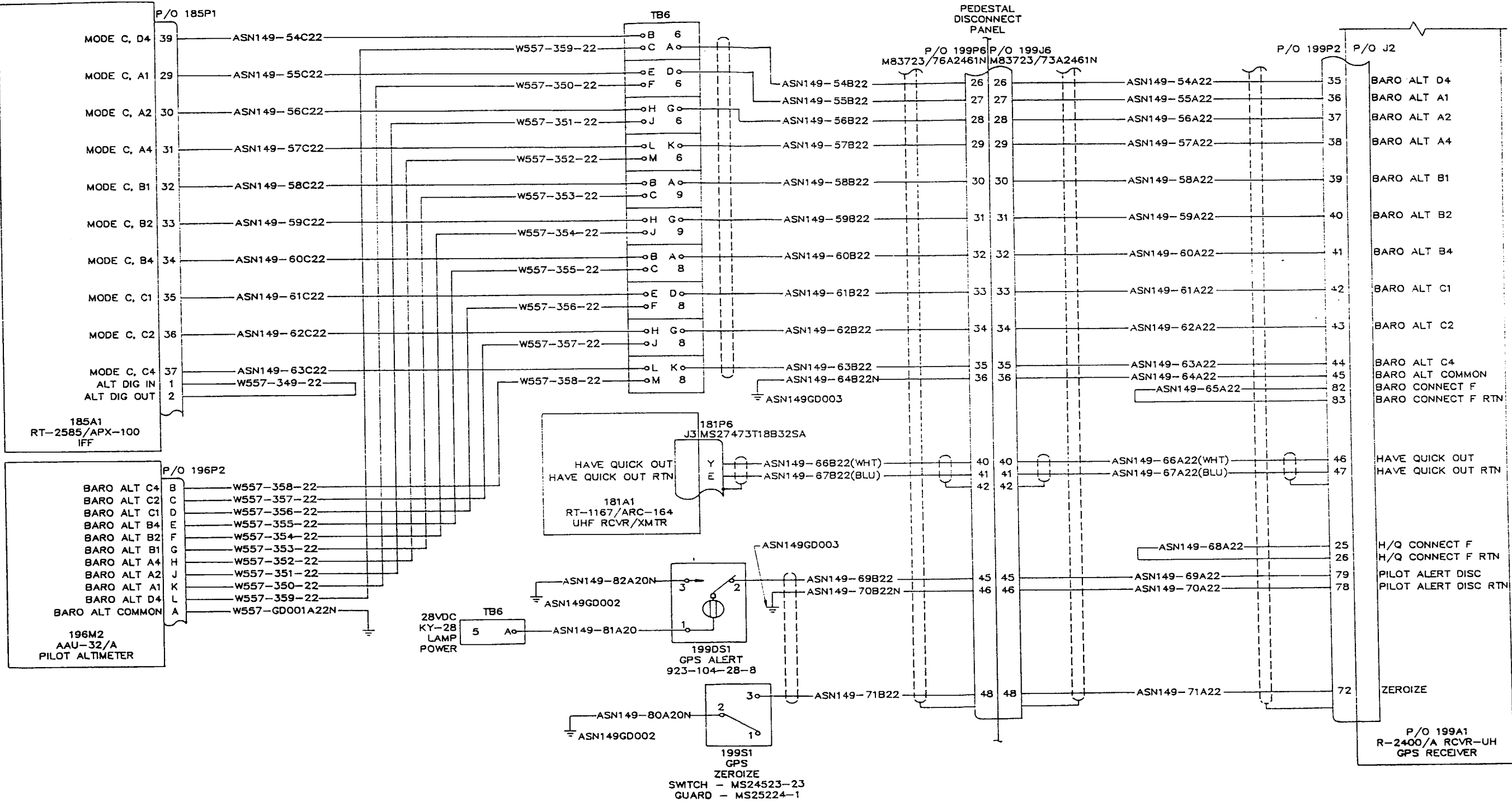
18-1 GLOBAL POSITIONING SYSTEM

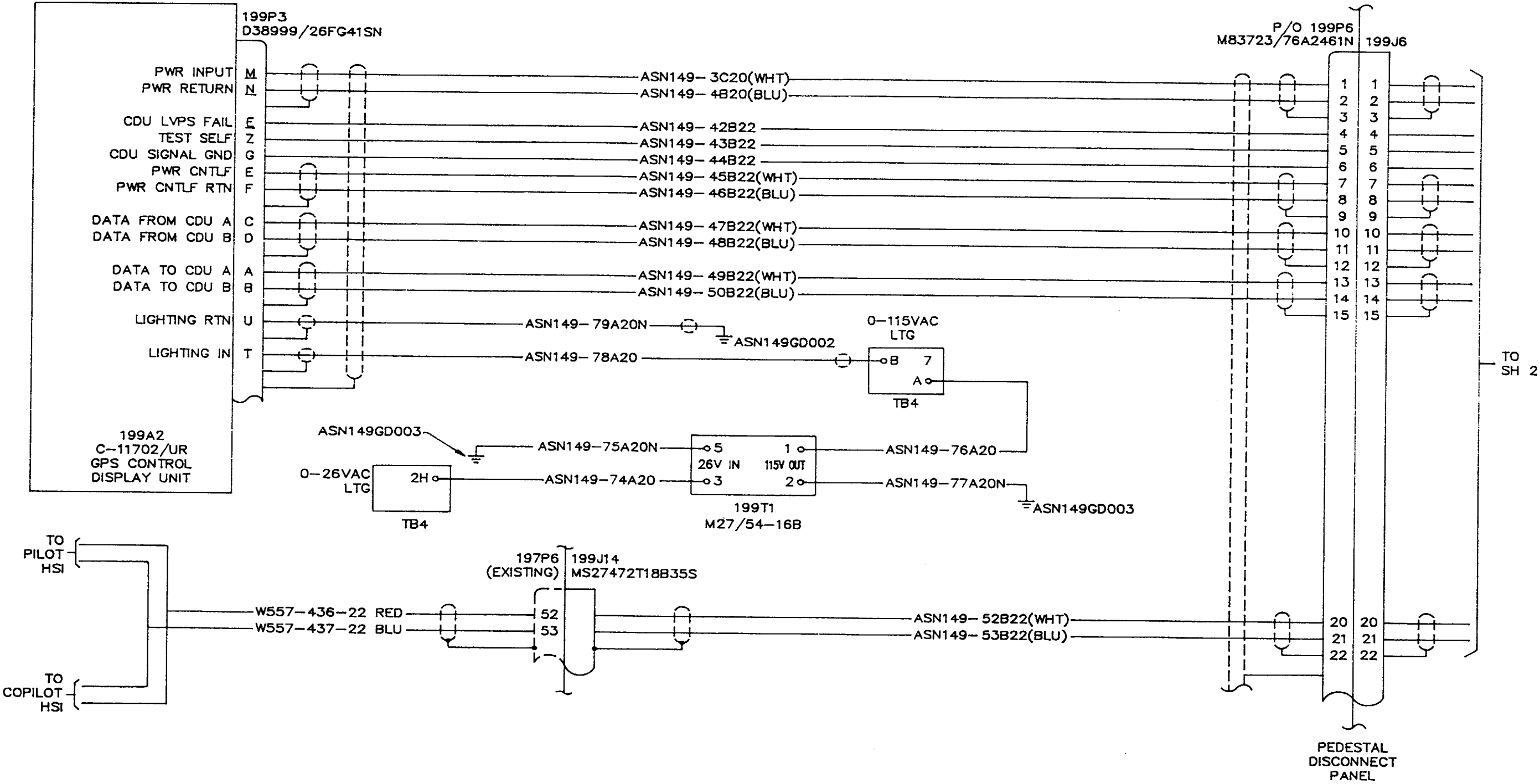
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GO TO NEXT PAGE









INITIAL SETUP

Applicable Configurations

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

68F10 Aircraft Electrician

References:

TM 55-1520-240-23

Equipment Condition:

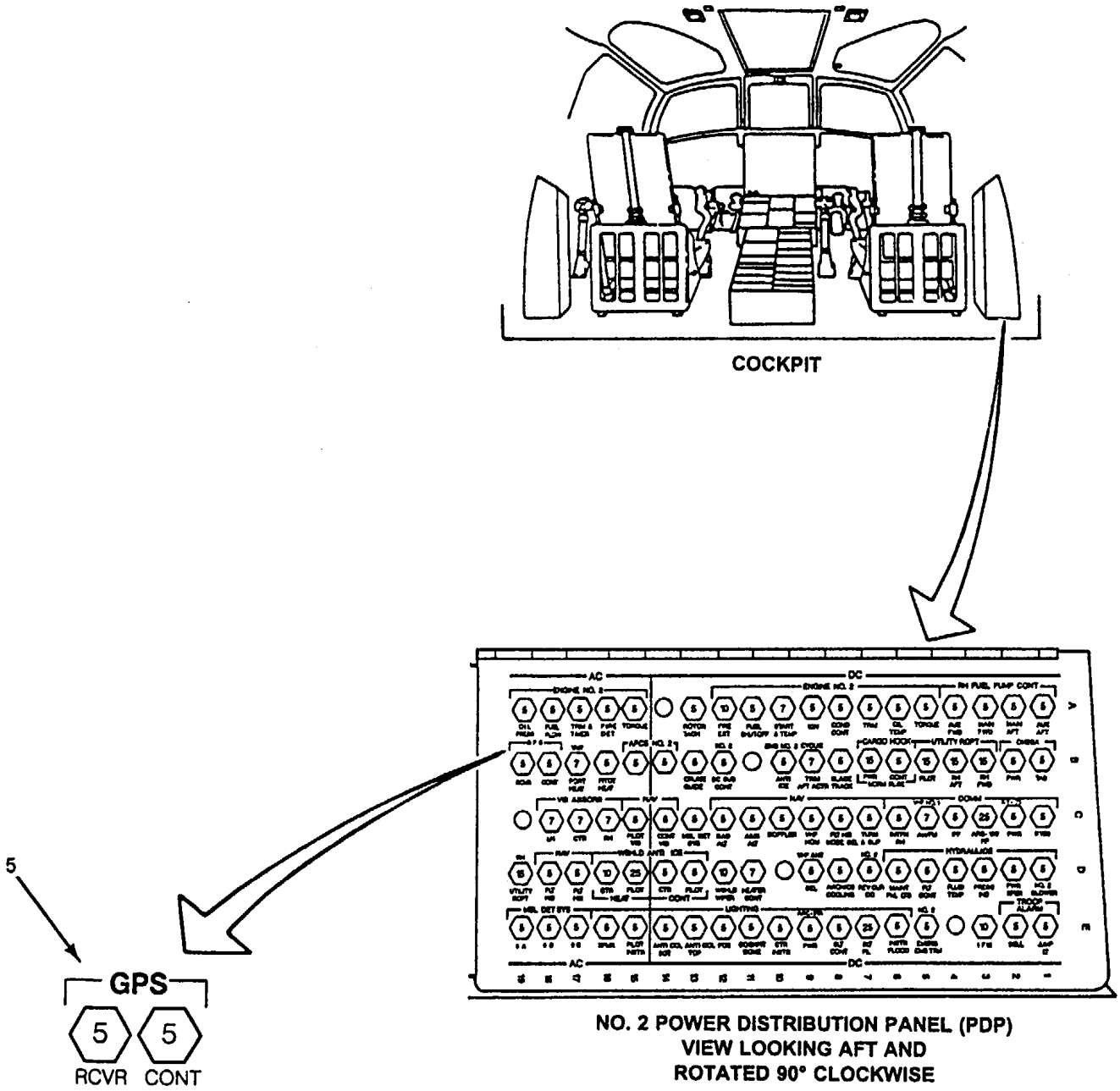
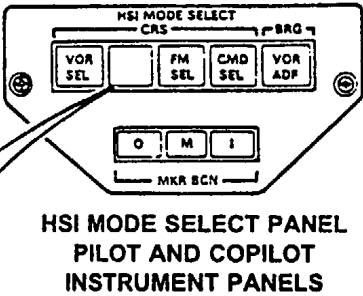
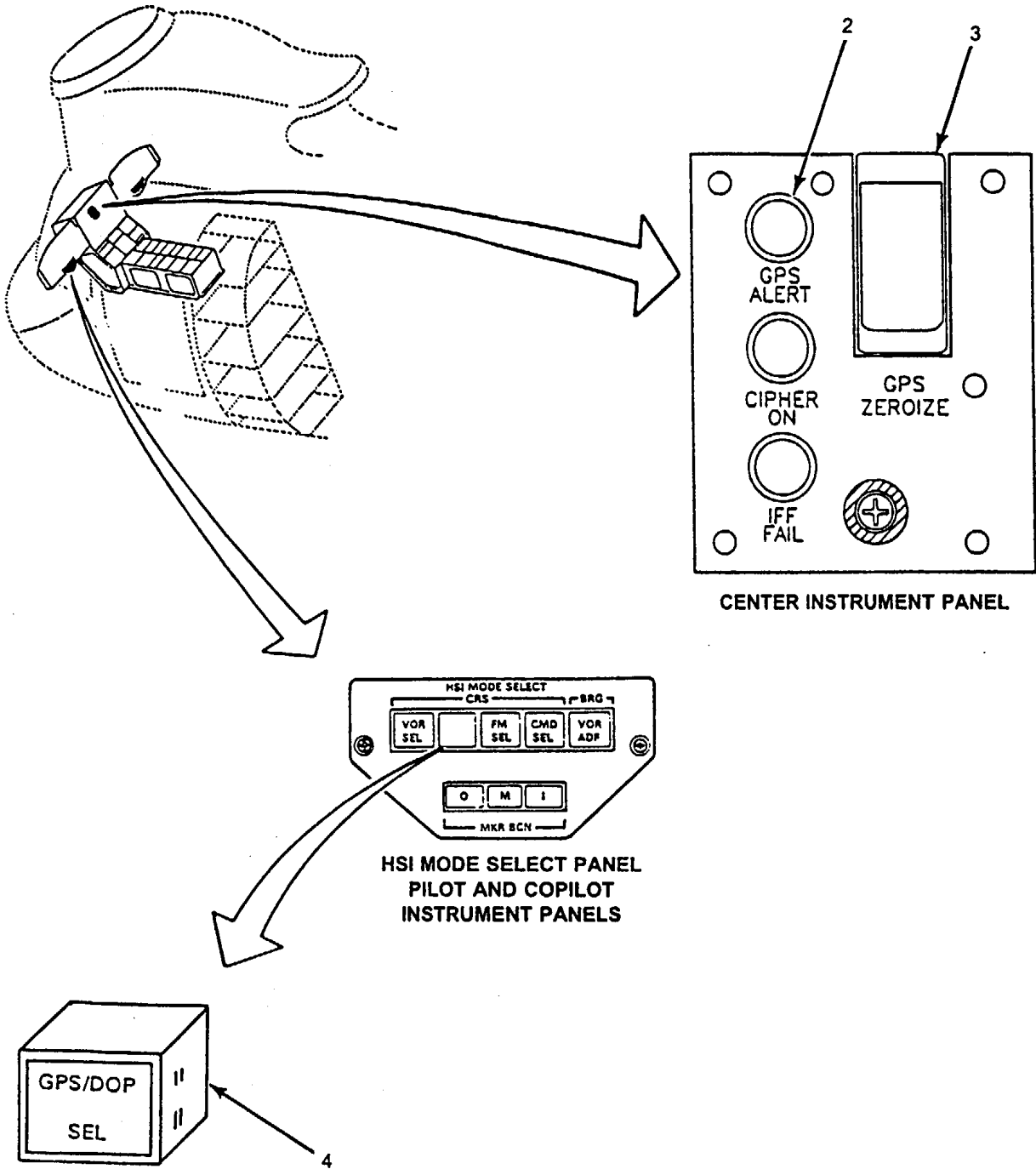
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
No. 2 Access Door (Tunnel Cover)  
Open

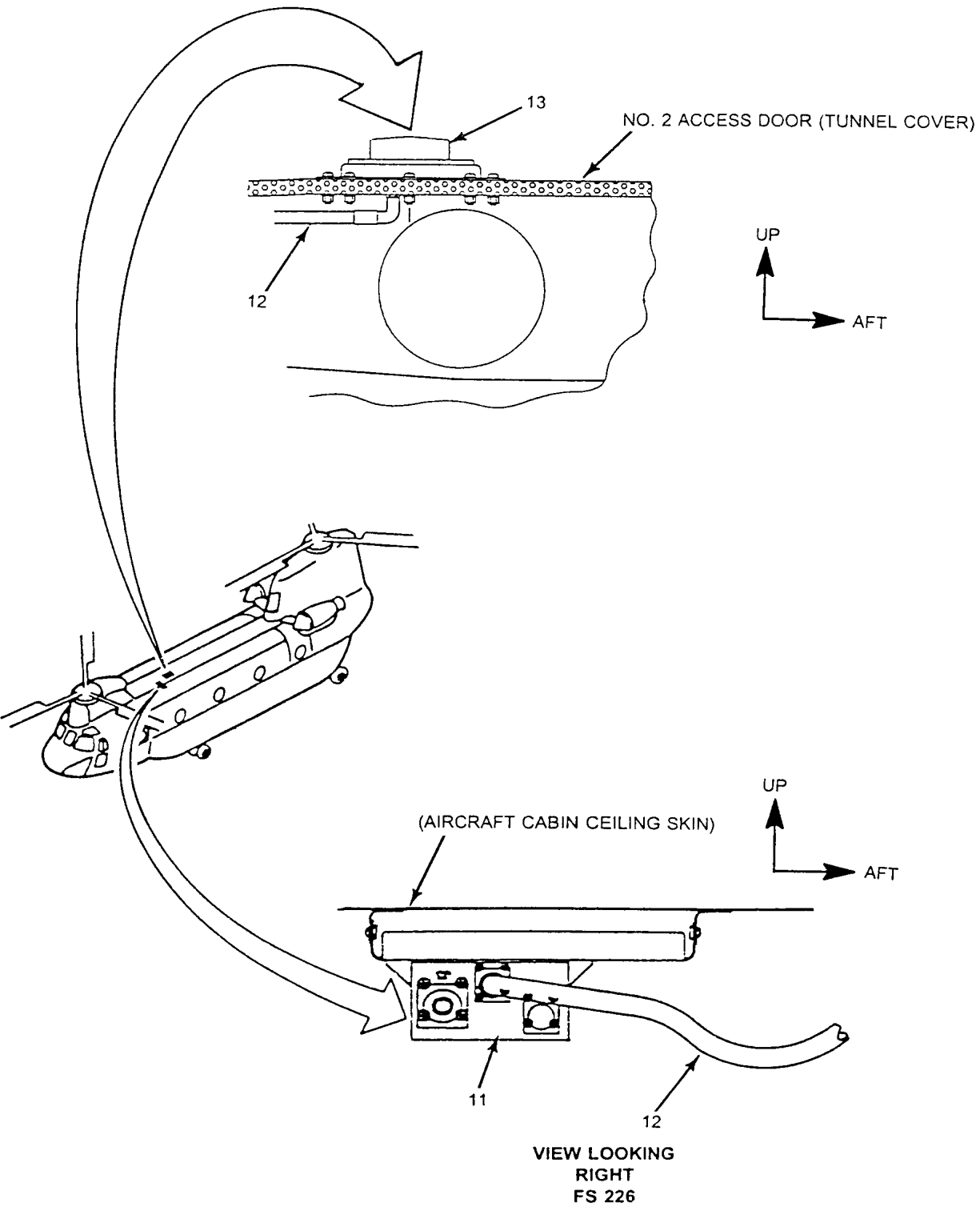
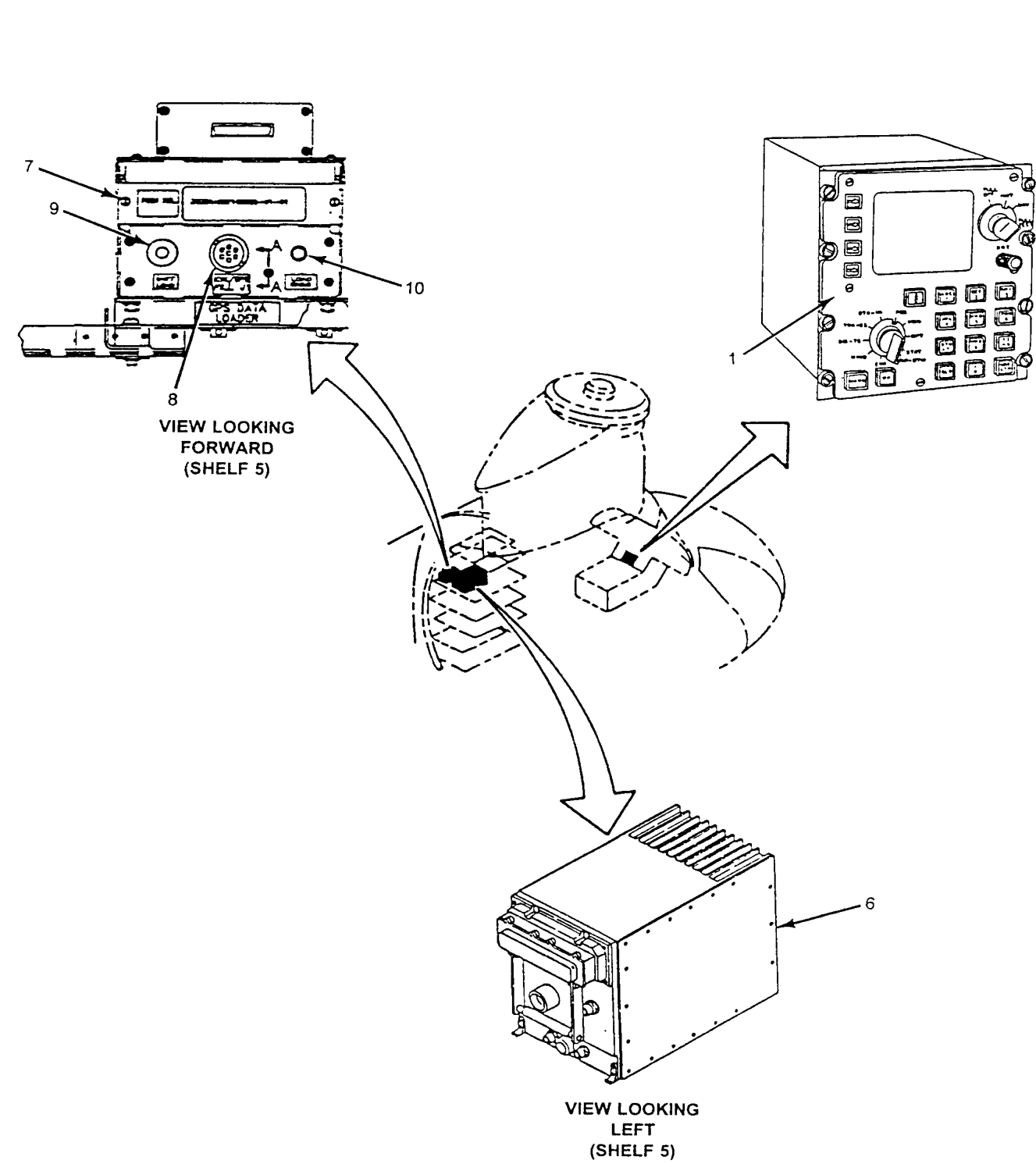
TASK	RESULT
1. Check GPS CDU (1).	Loosen Dzus fasteners and check connector of GPS CDU1). If connector is loose or damaged tighten or replace it as required. If wiring to connector is loose or damaged, tighten, repair, or replace it as required. If display screen is damaged in any way replace CDU (1). If knobs are loose or broken tighten or replace as required. If pushbuttons are damaged replace CDU (1). Reinstall CDU (1) in the canted console tightening the Dzus fasteners.
2. Check GPS Alert Light Indicator (2).	If indicator (2) is loose or damaged tighten or replace as required.
3. Check GPS Zeroize Switch/Cover (3).	If switch or cover (3) is loose or damaged tighten or replace as required. If wiring to switch is loose or broken tighten, repair, or replace as required.
4. Check GPSIDOP SEL Indicator (4).	If indicator lens (4) is damaged replace.
5. Check GPS RCVR and GPS CONT Circuit	If breaker(s) (5) is loose or damaged tighten or Breakers (5). replace as required. If wiring to breaker(s) is loose or broken tighten, repair, or replace as required.
6. Check GPS Radio Receiver R-2400( )A (6).	If receiver (6) is loose or damaged tighten or replace as required. If connectors to the receiver are loose or damaged tighten or replace as required. If wiring or cables to receiver are loose or damaged tighten, repair, or replace as required.

TASK	RESULT
7. Check GPS Data Loader Receptacle (7).	If receptacle (7) is loose or damaged tighten or replace as required. If pushbutton is loose or damaged replace Data Loader Receptacle. If the connector to the receptacle is loose or damaged tighten or replace as required If wiring to the connector is loose or damaged tighten, repair, or replace as required.
8. Check KYK/GPS Fill Connector (J1) (8).	If connector (8) is loose or damaged tighten or replace as required. If wiring to the connector is loose or damaged tighten, repair, or replace as required.
9. Check INIT Load Push Button Switch (9).	If switch (9) is loose or damaged tighten or replace as required. If wiring to the connector is loose or damaged tighten, repair, or replace as required.
10.Check Load Status LED (10).	If LED (10) is loose or damaged tighten or replace as required.
11.Check AE-4 Antenna Amplifier (11).	If amplifier (11) is loose or damaged tighten or replace as required. If connectors to the amplifier are loose or damaged tighten or replace as required. If cables to amplifier J1 and J3 are loose or damaged tighten, repair, or replace as required. If cable to J2 is loose tighten, if damaged replace ONLY, DO NOT REPAIR THIS LOW-LOSS CABLE GOING TO GPS ANTENNA (12).
12.Check GPS Antenna (13).	If antenna (13) is loose or damaged tighten or replace as required. If cable (12) to antenna is loose or broken tighten or replace as required. DO NOT REPAIR THIS CABLE.

FOLLOW-ON MAINTENANCE:  
Close No. 2 Access Door (Tunnel Cover)

GO TO NEXT PAGE





END OF TASK

INITIAL SETUP:

**Applicable Configurations:**  
All

**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician (2)

References:

TM 11-1520-240-23  
TM 11-5826-308-12  
TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected

Hydraulic Power Off  
Global Positioning System Visual Check Performed  
(Task 18-1.2)

TASK	RESULT
<b>CHECK CIRCUIT BREAKERS</b>	
1. Check that the following circuit breakers on No. 2 pdp are closed: GPS RCVR (1) GPS CONT (2)	If any circuit breaker (1 through 2) is open, close it.
2. Start APU. Refer to task 15-1.4.	APU ON capsule shall come on.
<b>CHECK GPS CDU C- 11702/UR</b>	
3. Turn aircraft CTR CSL LTG control (3) clockwise and counterclockwise while checking CDU (4) panel lighting.	CDU (4) panel light shall vary with the changing setting of the aircraft dimmer control (3). If CDU (4) panel light is not visible or intensity level does not vary with aircraft dimmer control (3) refer to TM 55-1520-240-T-2, Chapter 9.
4. Turn the CDU (4) BRT control (5) clockwise and counterclockwise while checking the CDU data display screen (6) intensity level.	CDU data display screen (6) intensity level shall vary with the changing setting of the CDU BRT control (5). If no display appears or intensity level does not vary, go to task 18-1.4.
5. Turn CDU Mode Switch (7) to TEST.	After a 30-second warm-up the CDU data display (6) shall display data. If failure data is displayed instead of TEST IN PROG, go to task 18-1.6. After the test is completed TEST COMPLETE shall be displayed on line 1 and TEST OK shall be displayed on line 2 of the CDU data display (6). If failure data is displayed, go to task 18-1.6.
<b>CHECK GPS RECEIVER R-2400( )/A</b>	
6. Check the time totalizing meter (8) on front panel of GPS receiver (9).	The pointer on the left side of the time totalizing meter window shall have an up/down movement.
	If no up/down movement, go to task 18-1.5.

TASK	RESULT
<b>CHECK GPS SYSTEM OPERA TION</b>	
<b>NOTE</b> Continue with the following checks only after the Start-up procedures given in TM 11-5826-30812 or local directives have been completed (for a COLD start) and the GPS System is tracking 4 satellites. The Mode switch (7) shall be positioned on NAV.	
7. With 4 satellites being tracked and the Figure of Merit (FM) being 5 or less, set the Data switch (10) on the CDU (4) to STAT. Slew (11) down to page 2 and write down the Almanac Age displayed on line 2 (ALM followed by numbers). Information will be needed later.	If 4 satellites cannot be tracked, go to task 18-1.7.
8. Depress the GPS Alert Indicator (18).	The GPS Alert Indicator (18) shall illuminate. If indicator does not illuminate, go to task 18-1.10.
9. With the Data switch (10) of the CDU set to MSN, slew (11) down to page 2. Press line select key two (12) until THRESH: ENRT is displayed. Enter a figure of merit on display (6) line three at least one level below the existing GPS system figure of merit (FM) displayed on line 1.	The GPS Alert Indicator (18) shall illuminate. If indicator does not illuminate, go to task 18-1.10.
10.Depress the GPS/DOP lenses (13) on each of the two HSI Mode Select Panels (14) (one each in pilot and copilot instrument panels).	The SEL indication at the lower half of each GPS/DOP (13) lens shall be illuminated. If SEL not illuminated, go to task 18-1.11.
11.Set the Data switch (10) of the CDU set to VARDTM. Enter at least one known waypoint. Set the Data switch (10) to POS and call up the waypoint previously entered.	The number one needle (20) of each HSI indicator (25) shall swing to show the bearing to the station with the course deviation bar (21) centered. The Range (22) and Course (23) readouts shall also be accurate. If the number one needle (20) does not swing to show bearing to the station or the Range (22) and Course (23) readouts are not accurate, go to task 18-1.11.
12.Connect a KYK-13 fill device to the KYK/GPS Fill J1 connector (15). Set the GPS CDU Data switch (10) to STAT. Set the fill device Address Select switch to desired setting and the Mode switch to ON. Press and release the aircraft's INIT LOAD switch (16).	Successful loading of keys shall be indicated by the flashing of the aircraft's LOAD STATUS indicator lamp (24) within approximately 5 seconds of pressing the aircraft's INIT LOAD switch. If lamp (24) does not flash, go to task 18-1.9. Observe the GPS CDU data display (6). If an error message is present, go to task 18-1.6.

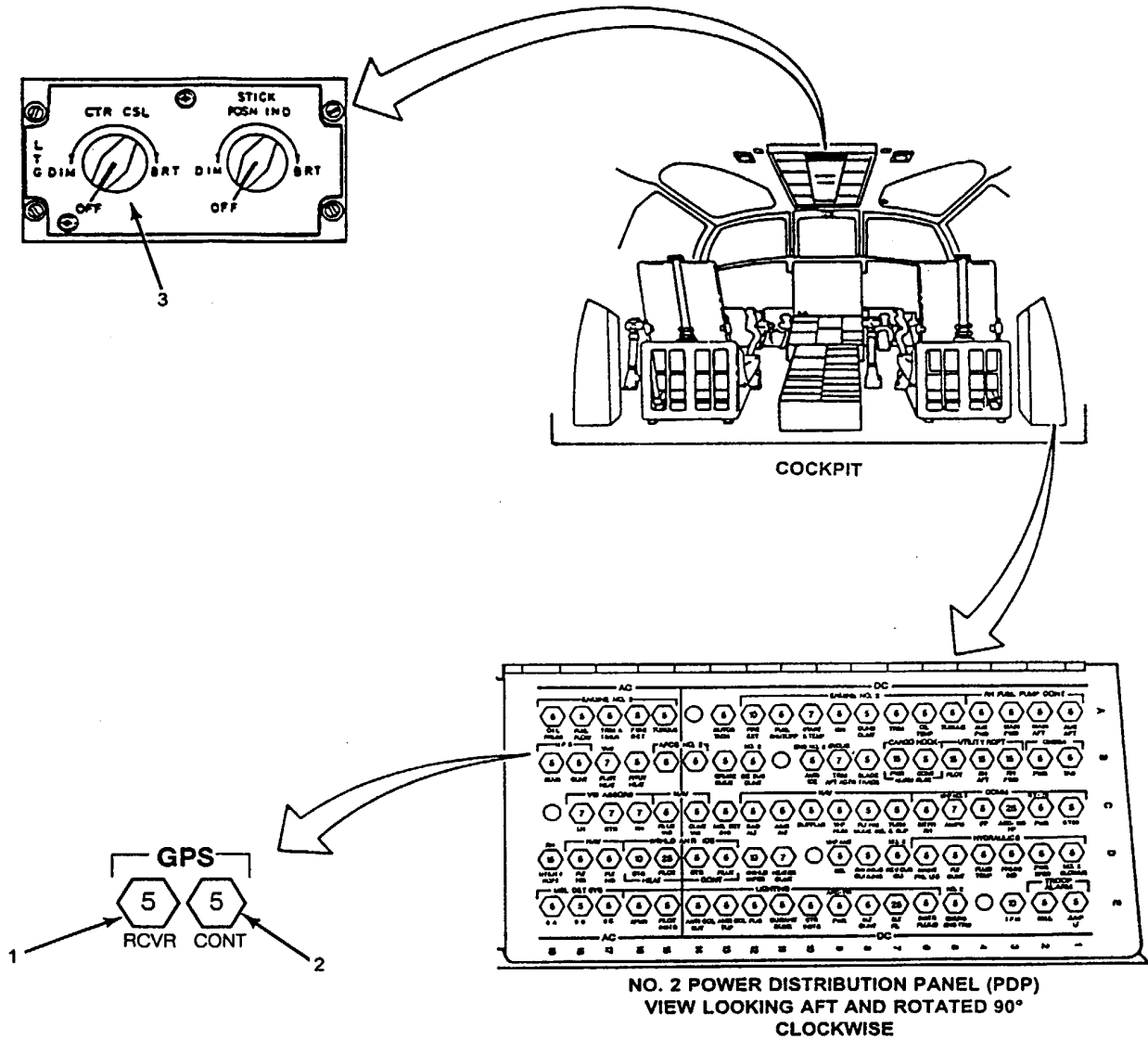
- 13.Set the GPS CDU Data switch (10) to STAT. Lift switch guard and toggle the Zeroize switch (17).
- 14.Set the GPS CDU DATA switch (10) to STAT. Insert a Data Loader Module which contains almanac information into the Data Loader Receptacle (19) located on shelf five of the cabin avionic/electronic compartment. Leave in for at least 20 seconds, then remove Data Loader Module.
- 15.With the GPS CDU Data switch (10) still at STAT, slew (11) down to page 2 and compare the Almanac Age located on display (6) line 2 with the age recorded earlier in step 7.
- 16.Turn the GPS CDU Mode switch (7) to OFF. Leave OFF for a few minutes then turn back ON with the Mode switch (7) in the NAV position.
17. Stop APU. Refer to task 15-1.4.

The CDU data display (6), line 2 shall display ZEROED. If ZERO FAIL is displayed, go to task 181.12.

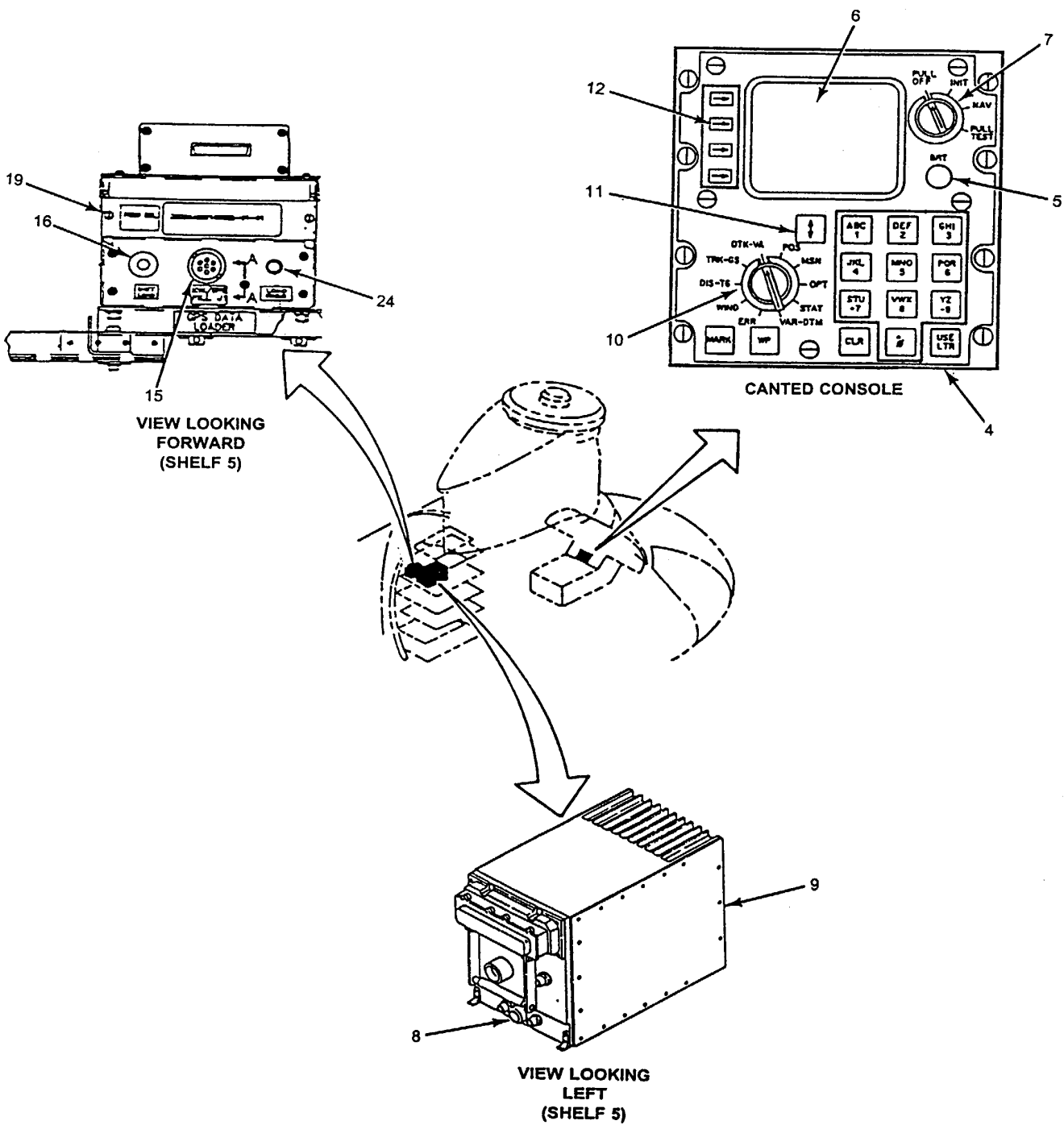
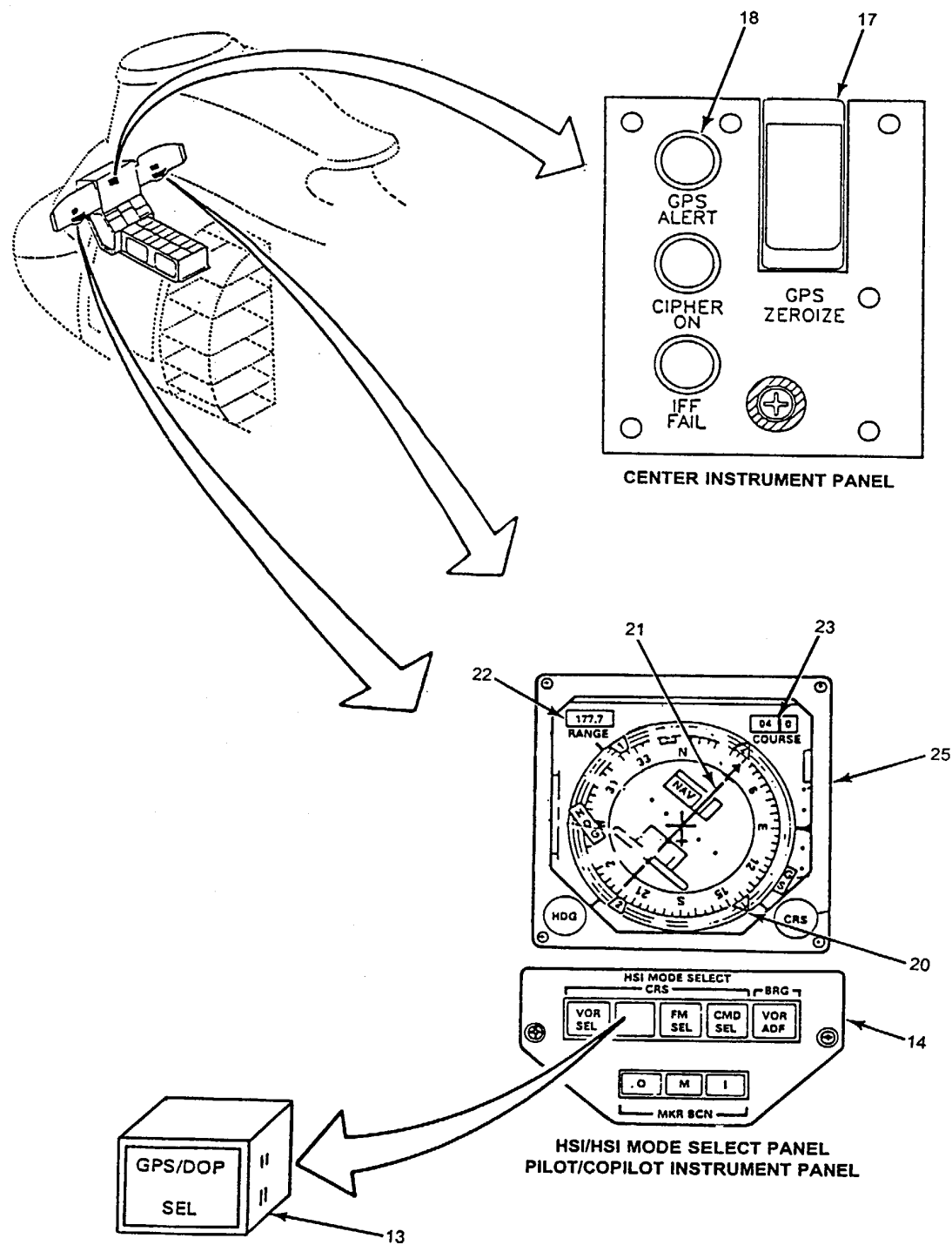
No error messages shall be displayed on the CDU data display (6). If an error message is displayed, go to task 18-1.6.

The two values shall be different if the Almanac stored in the Data Loader Module has been successfully loaded into the GPS system. If the Almanac Age is the same as before loading data with the Data Module, go to task 18-1.8.

After warmup and test completion, GNAV shall appear on CDU data display (6) line 1. This means that the previously loaded almanac has been stored by the GPS receiver (9). If COLD appears on CDU data display (6) line 1 instead, go to task 18-1.13.



FOLLOW-ON MAINTENANCE:  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off



## FAULT ISOLATION PROCEDURE

## INITIAL SETUP

Applicable Configurations:  
All

**Tools:**

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter, AN/USM-223,  
NSN 6625-00-999-7465

**References:**

TM 11-5826-308-12  
TM 55-1520-240-23

Equipment Condition:

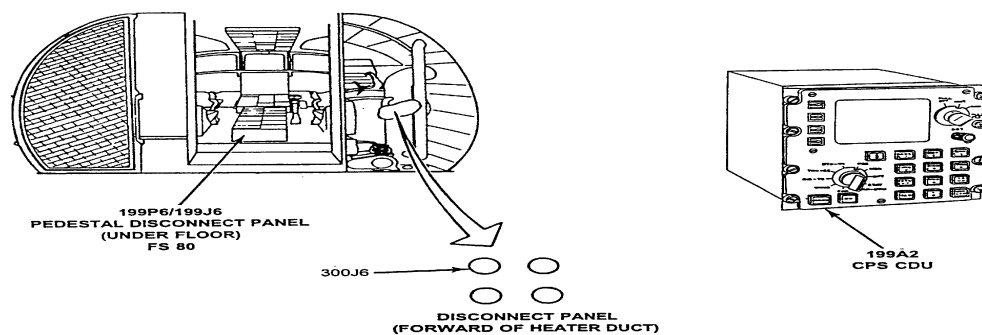
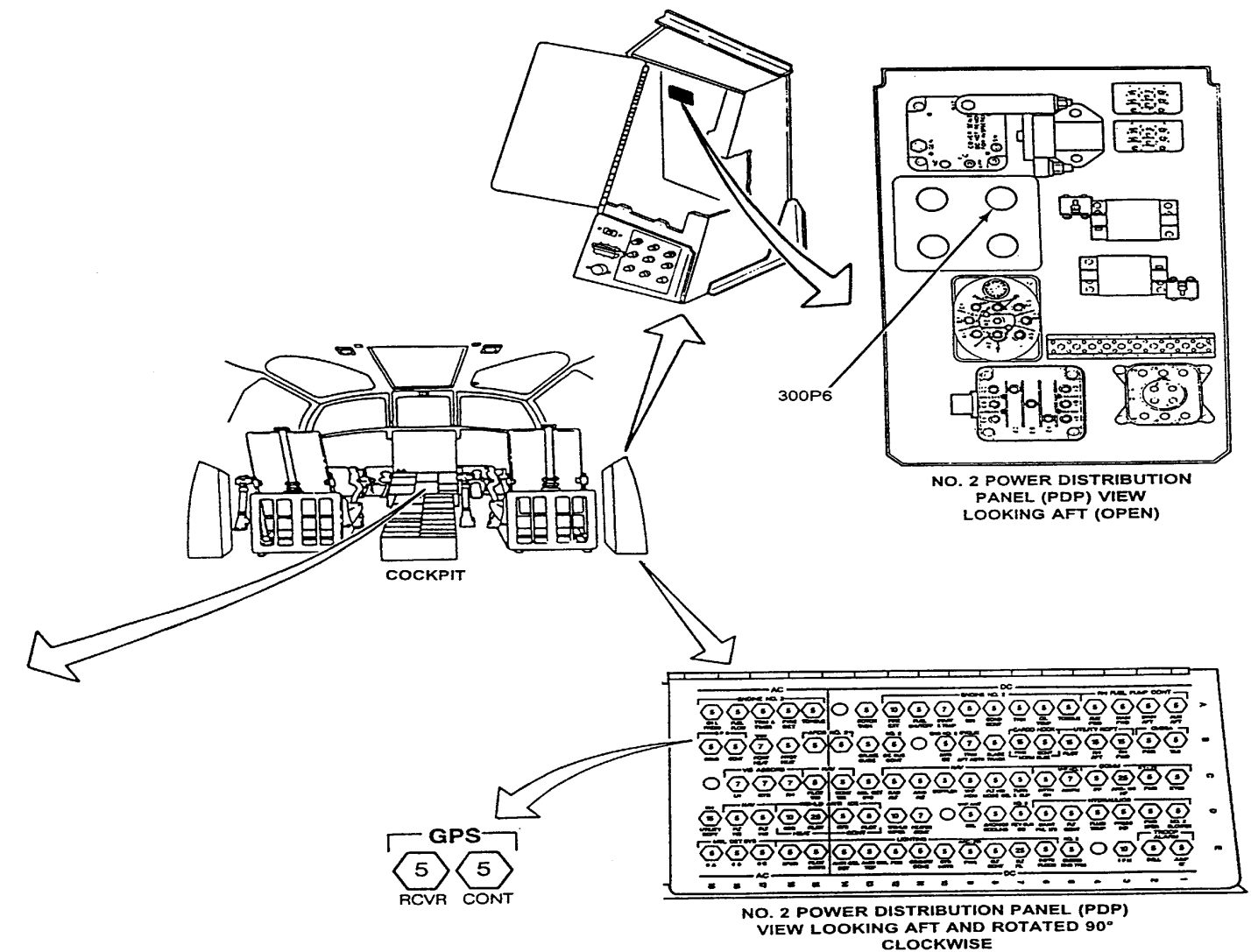
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

**Materials:**

None

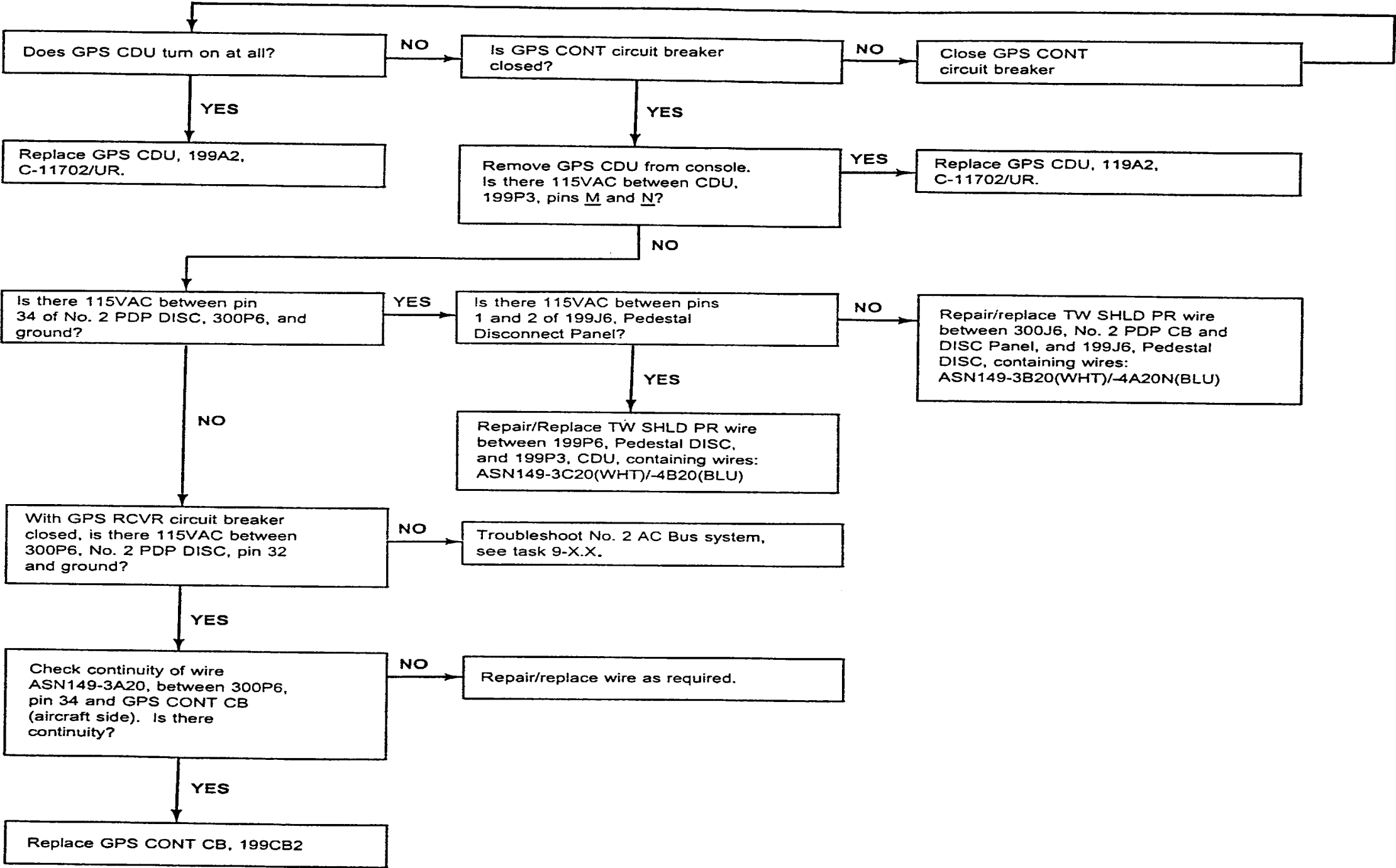
**Personnel Required:**

## Aircraft Electrician



18-1.4 GPS DISPLAY DOES NOT TURN ON OR INTENSITY DOES NOT VARY  
WITH CDU BRT CONTROL (Continued)

18-1





FA UL T ISOLA TION PROCEDURE

INITIAL SETUP

- Applicable Configurations:**  
All

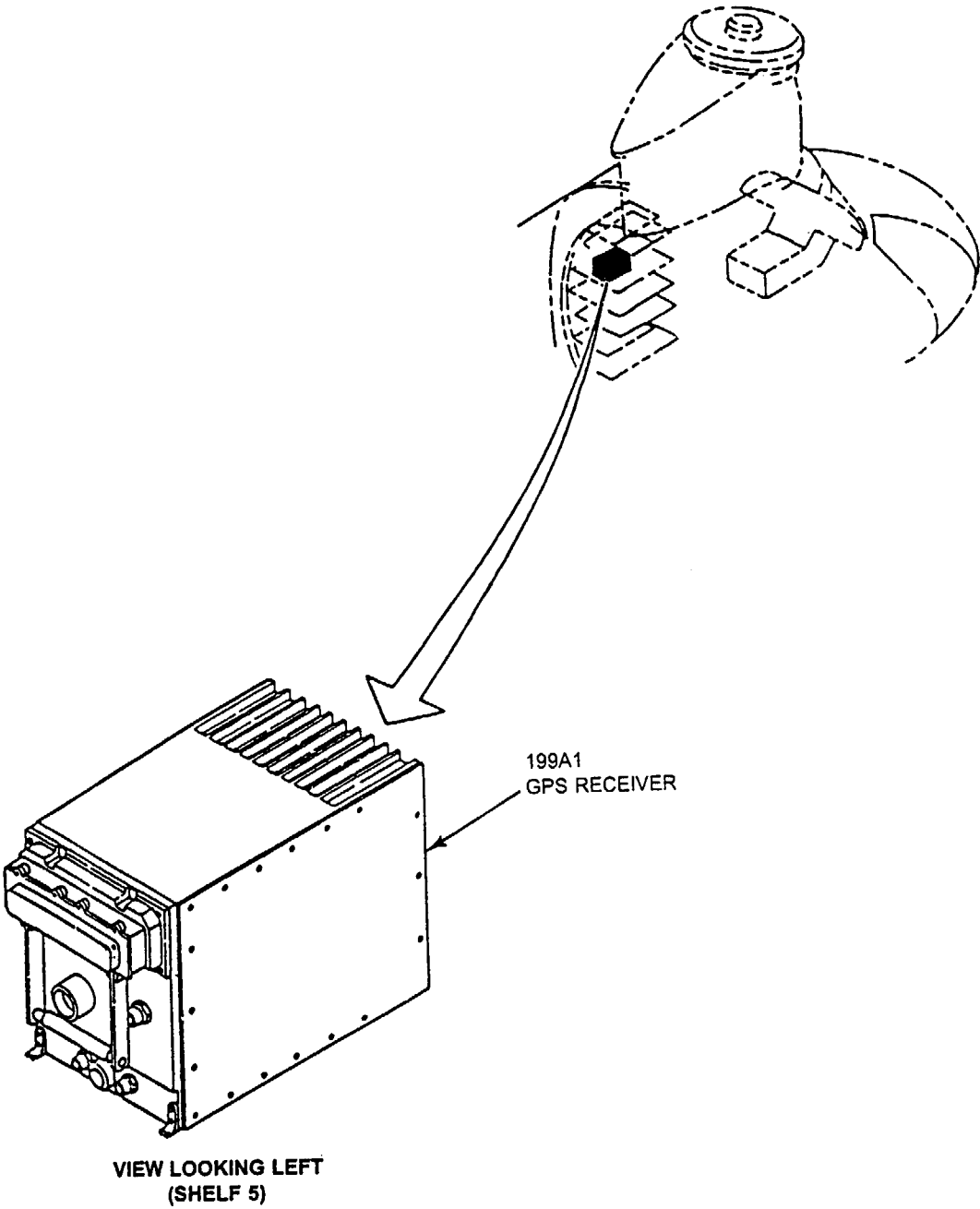
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician
- References:**  
TM 11-5826-308-12  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

Replace GPS RCVR R-2400( )/A.



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FA UL ISOLA TION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

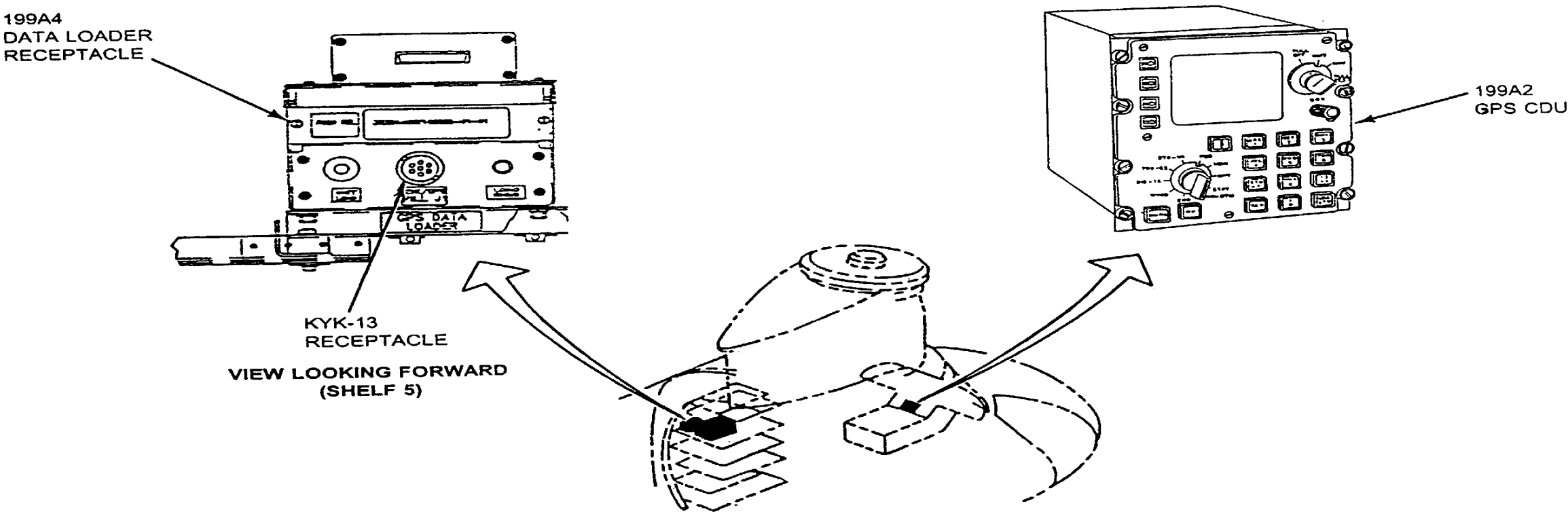
**References:**  
TM 11-5826-308-12  
TM 55-1520-240-23

**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

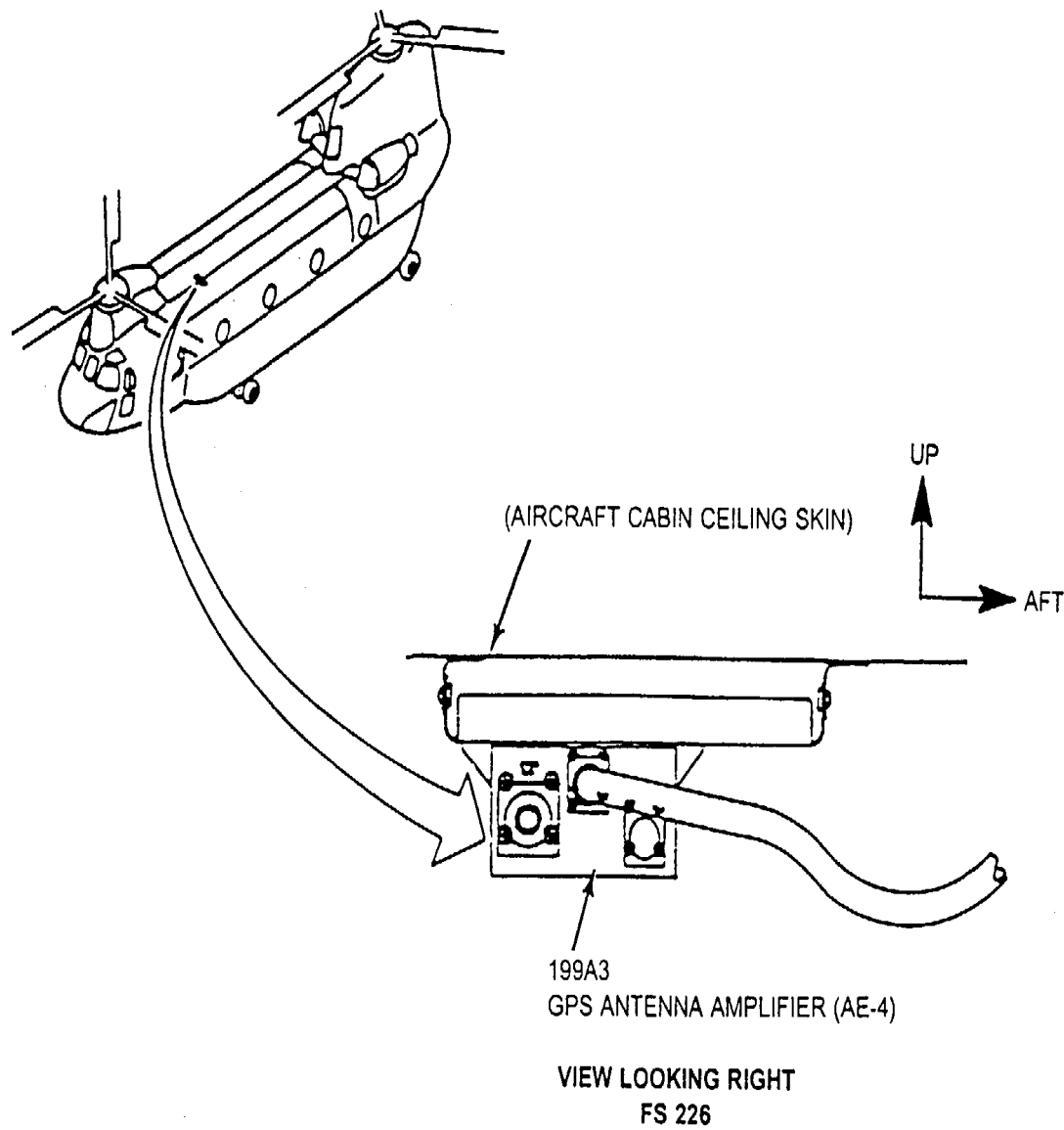
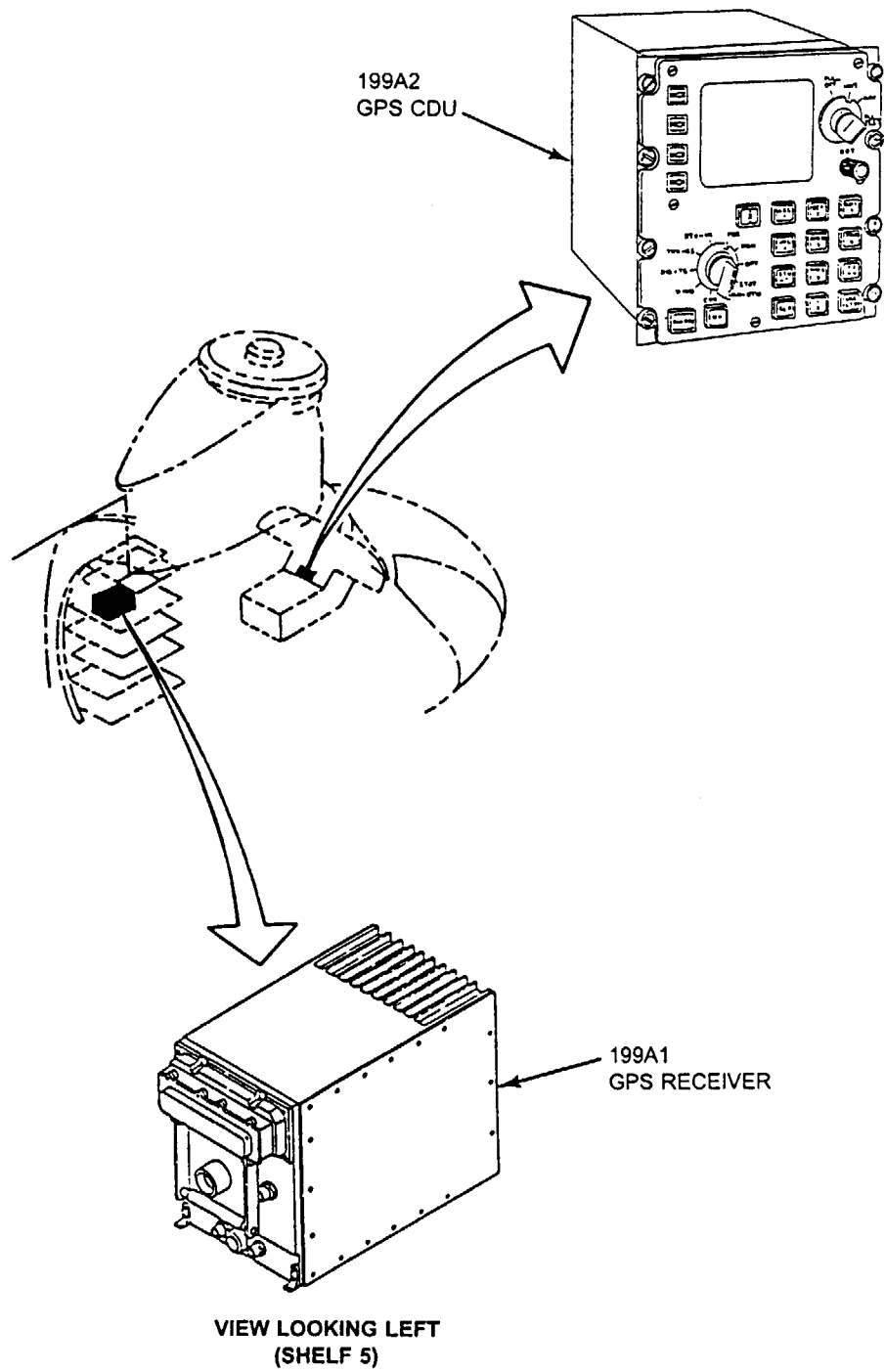
**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician

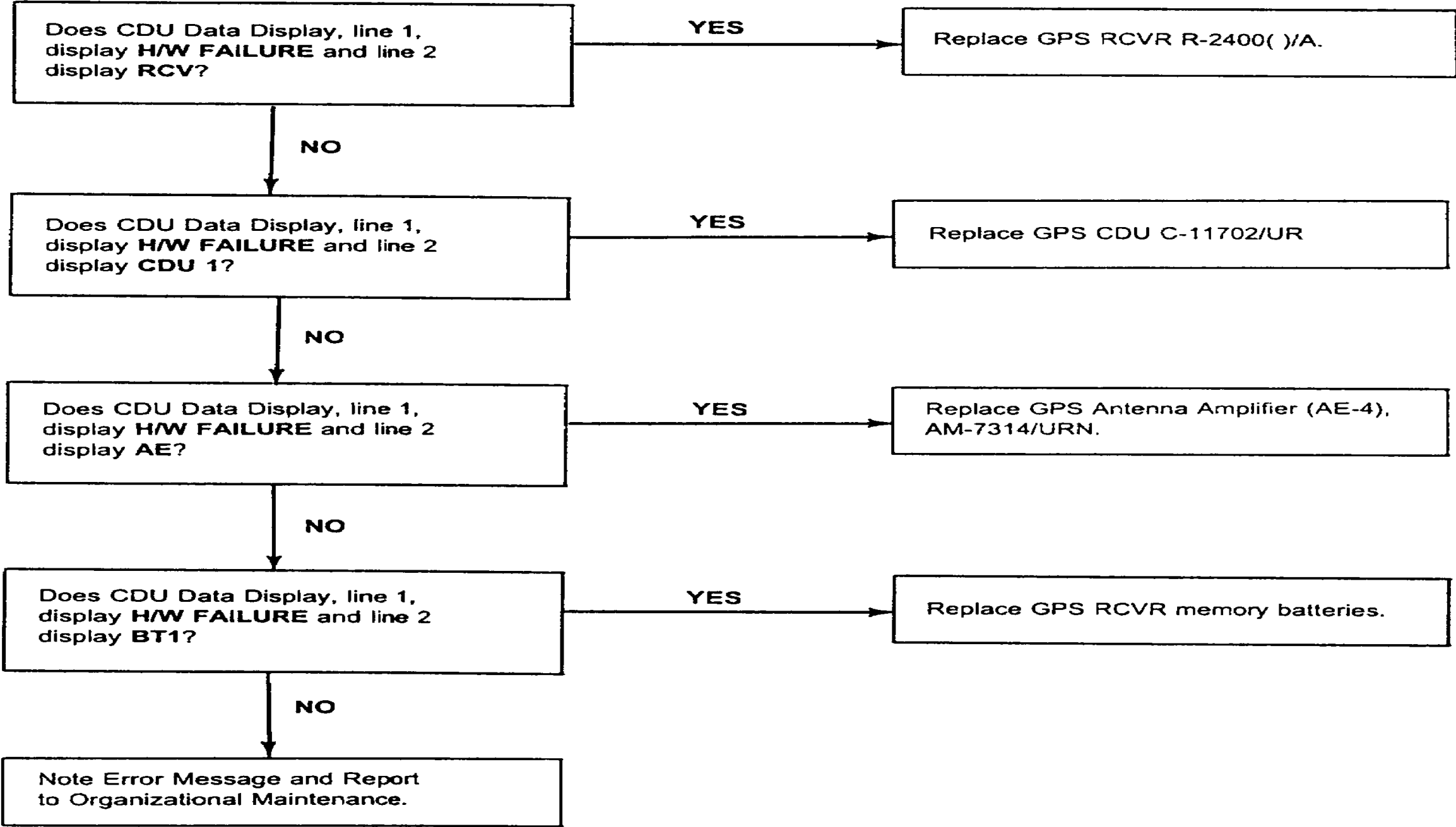


GPS CDU DISPLAYS "FAIL" MESSAGE WHEN ATTEMPTING TO LOAD KEYS  
USING DATA LOADER MODULE OR KYK-13 FILL DEVICE

Note Error Message and Report  
to Organizational Maintenance



GPS CDU DISPLAYS "FAIL" MESSAGE DURING TEST MODE



FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:  
All

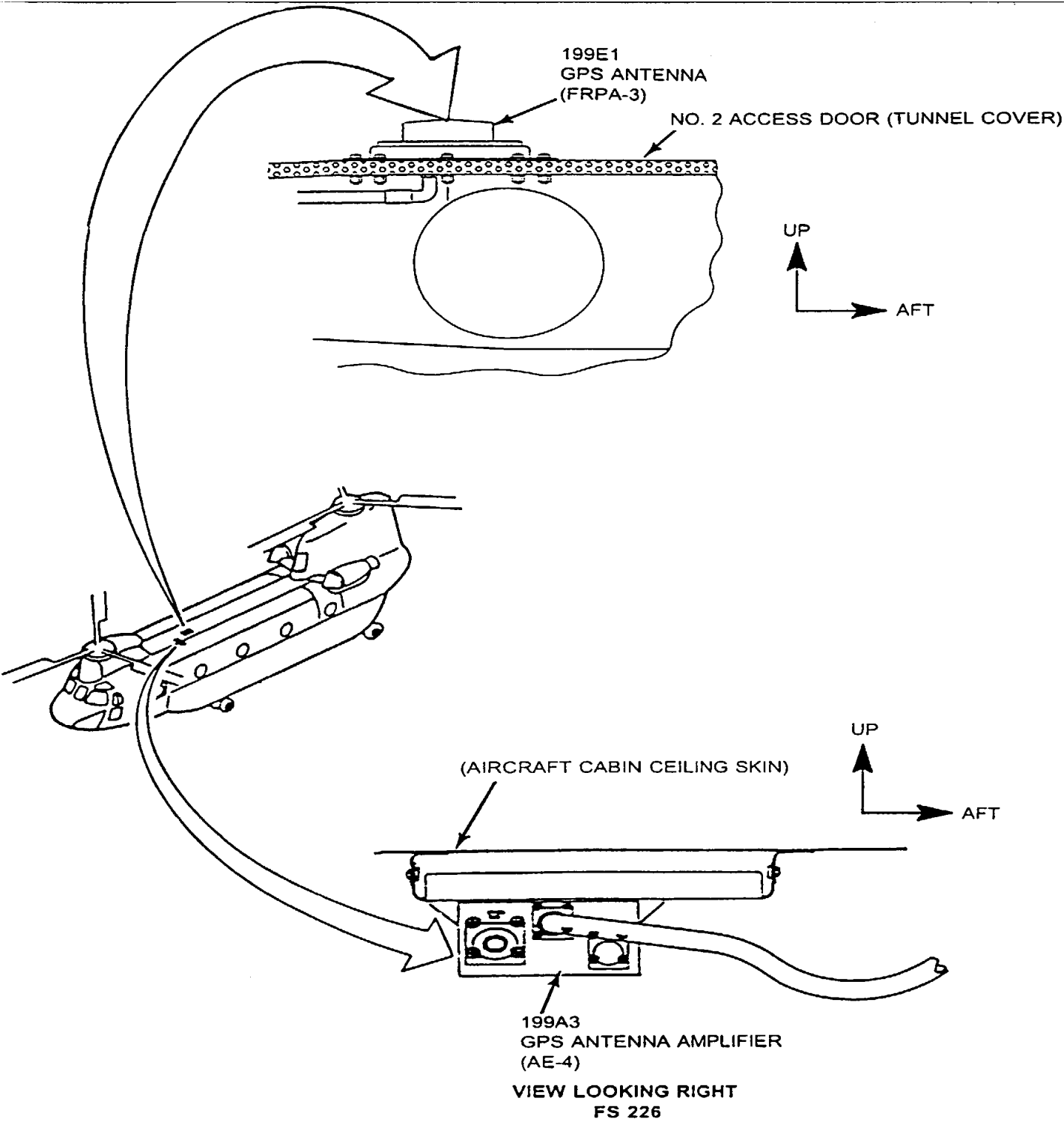
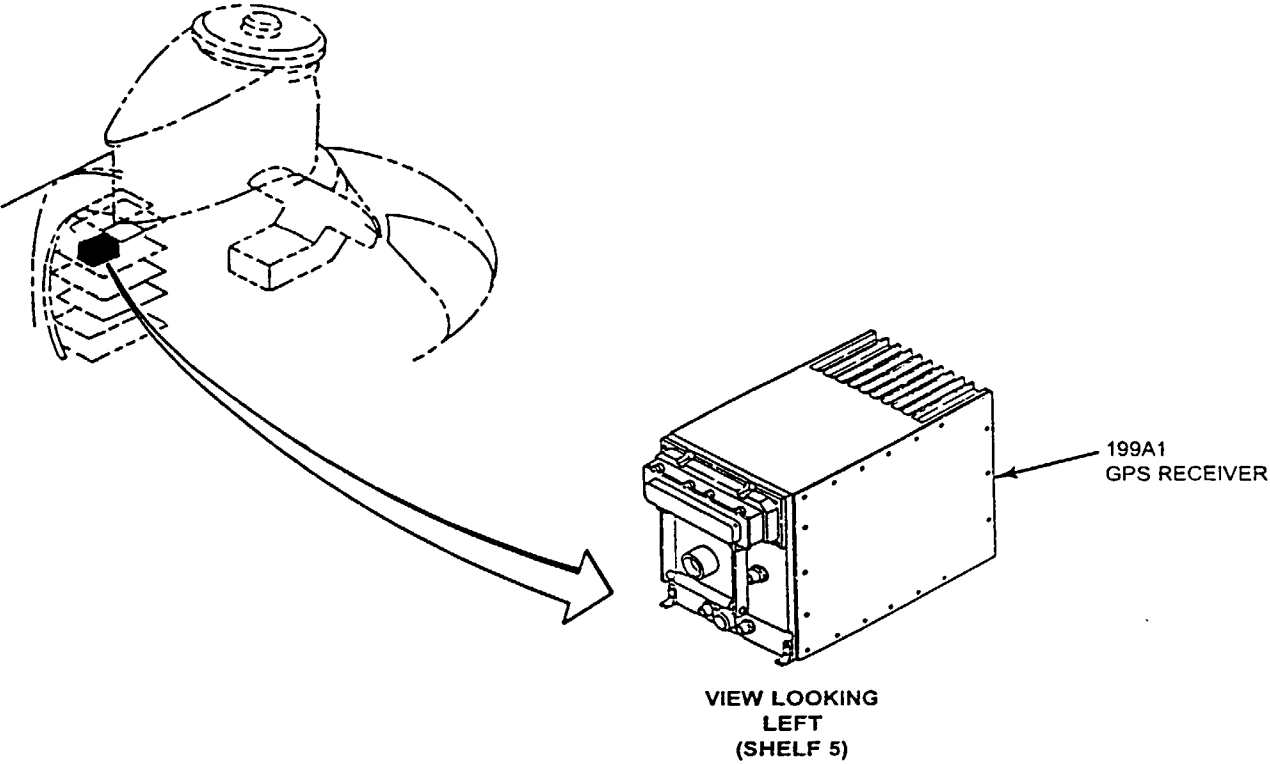
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter, AN/USM-223,  
NSN 6625-00-999-7465

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician

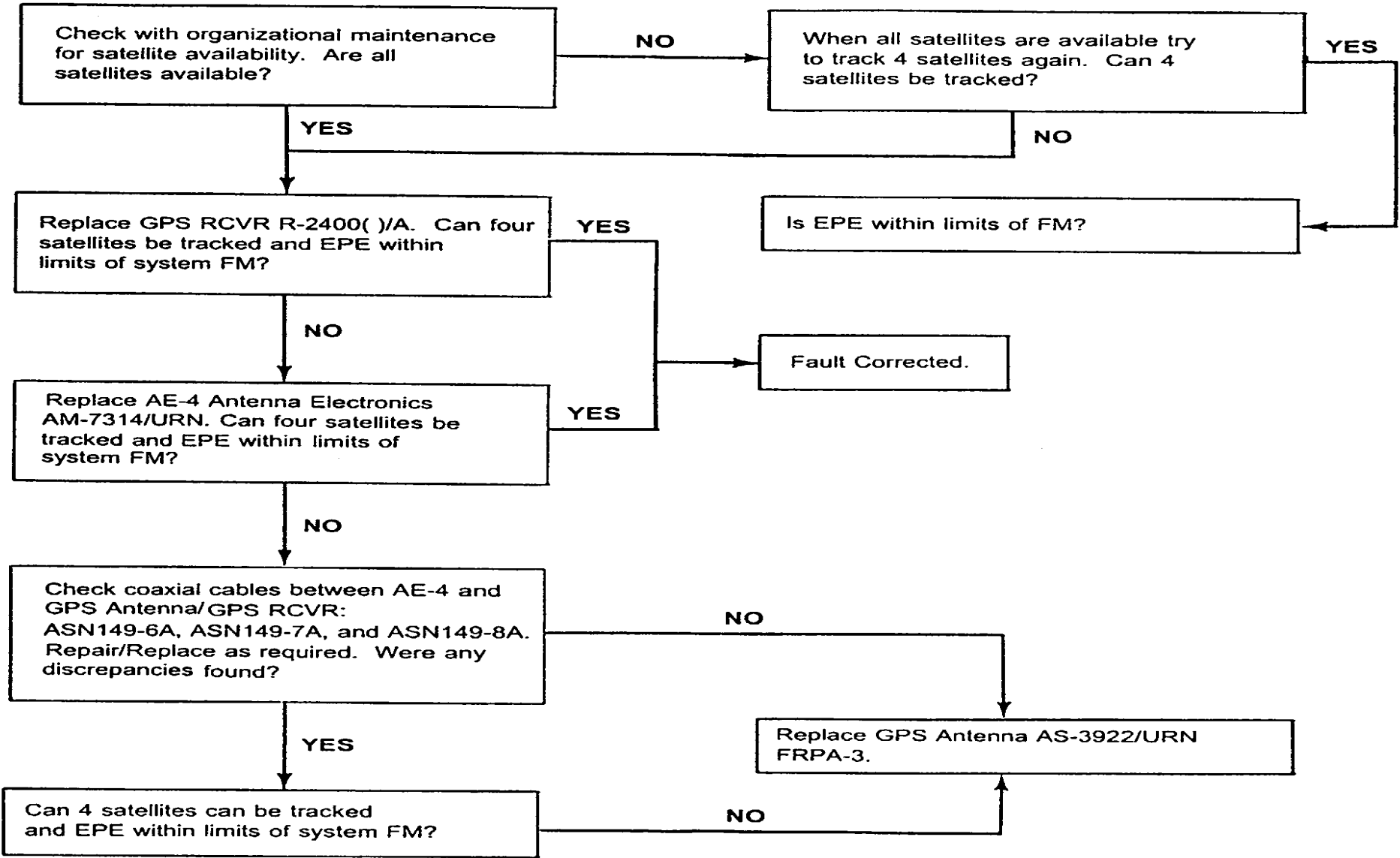
**References:**  
TM 11-5826-308-12  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



18-1.7 LESS THAN 4 SATELLITES CAN BE TRACKED AND ESTIMATED POSITION ERROR (EPE) IS NOT WITHIN LIMITS OF GPS SYSTEM'S FIGURE OF MERIT (FM)  
(Continued)

18-1.7





18-1.8 DATA LOADER MODULE INFORMATION DOES NOT LOAD INTO GPS SYSTEM  
BUT NO ERROR MESSAGE APPEARS ON CONTROL DISPLAY UNIT (CDU)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

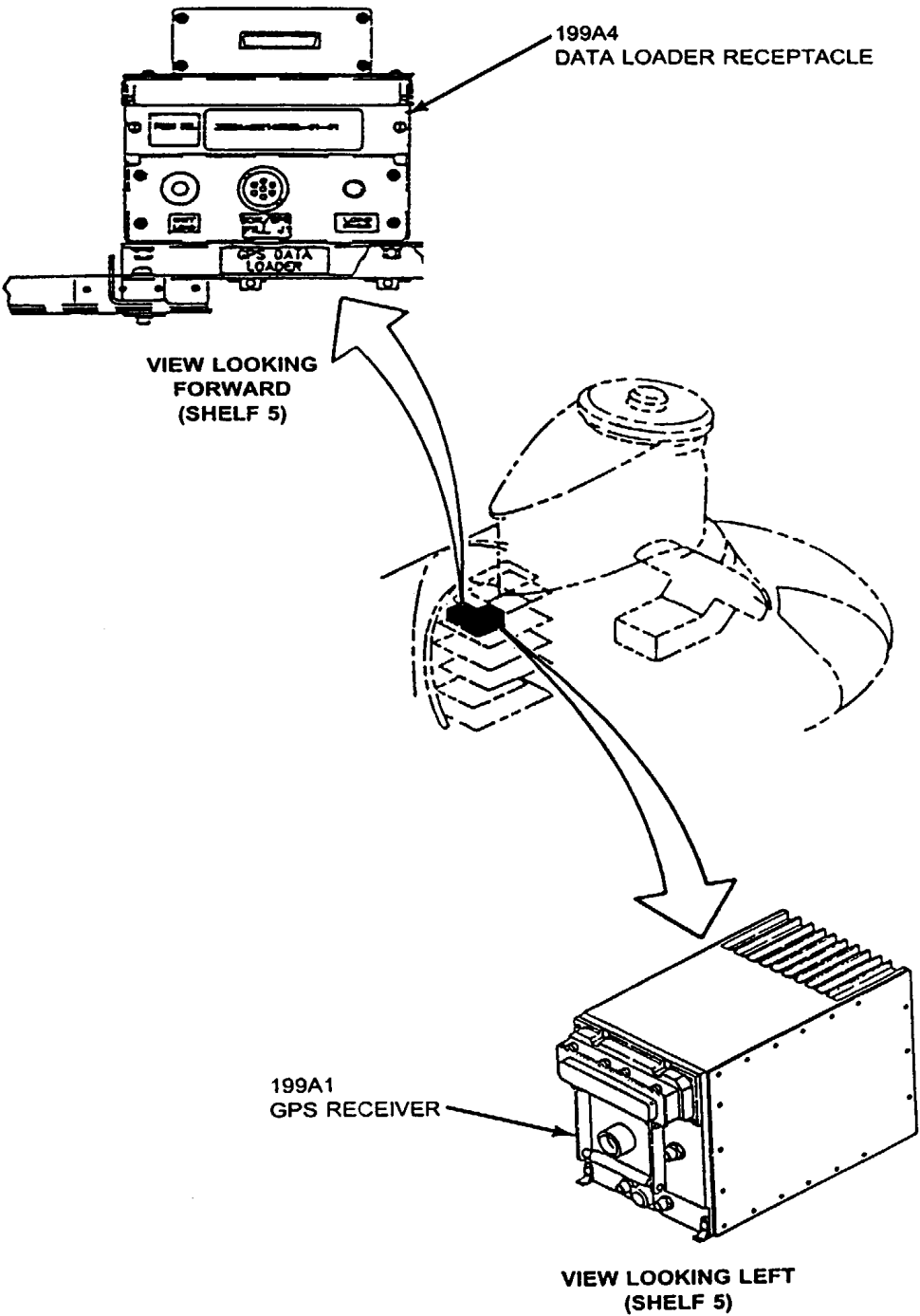
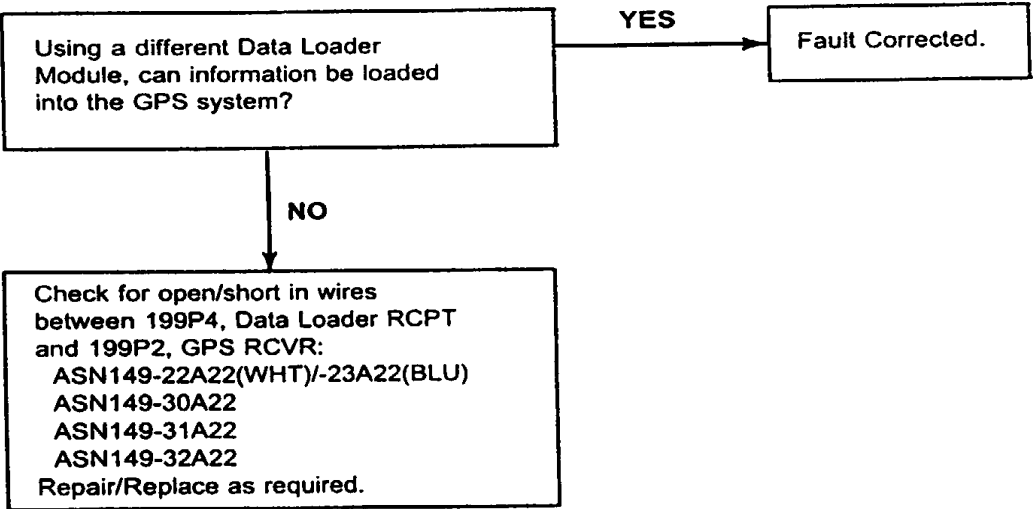
**References:**  
TM 11-5826-308-12  
TM 55-1520-240-23

**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter, AN/USM-223,  
NSN 6625-00-999-7465

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician



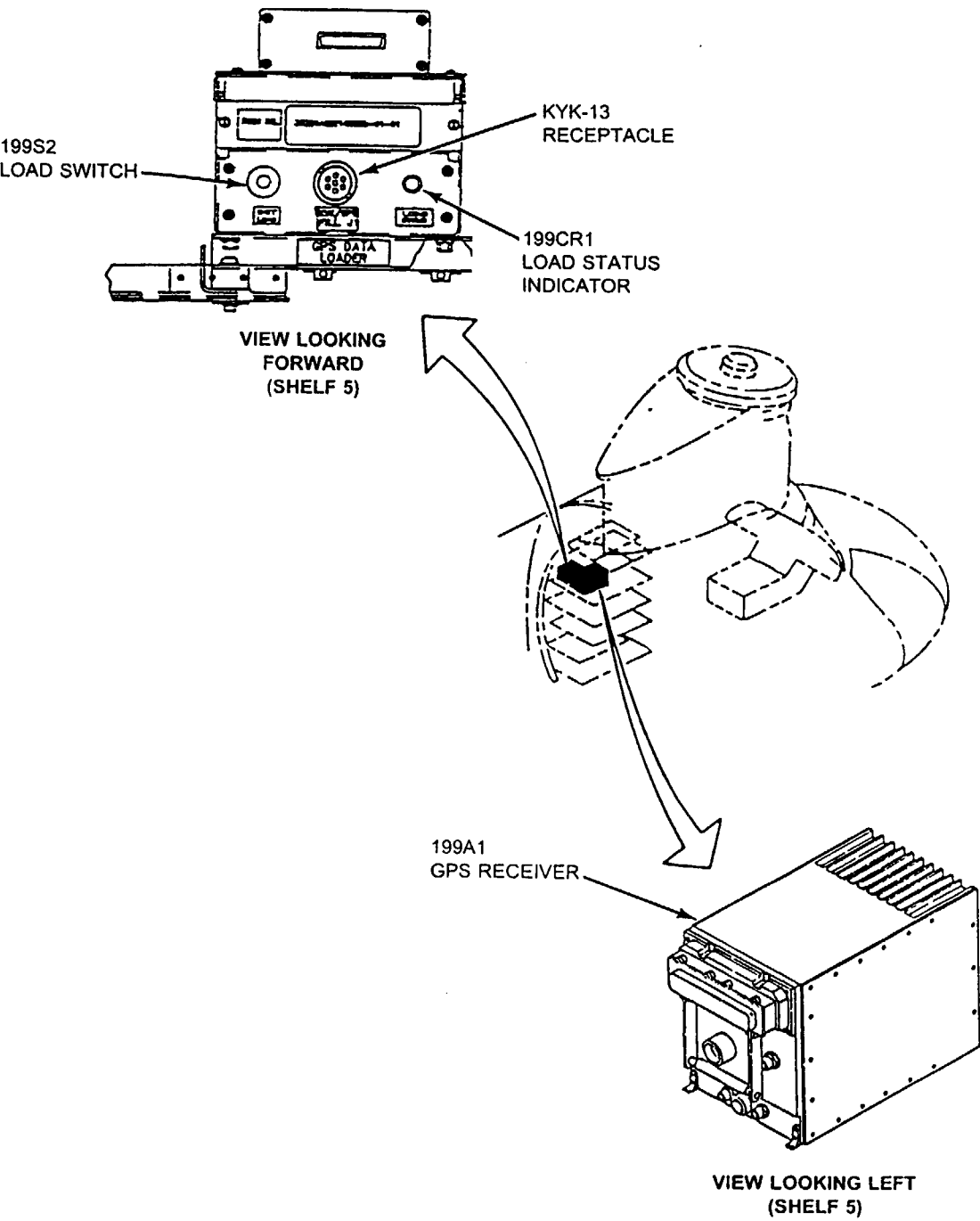
PAGE INTENTIONALLY LEFT BLANK



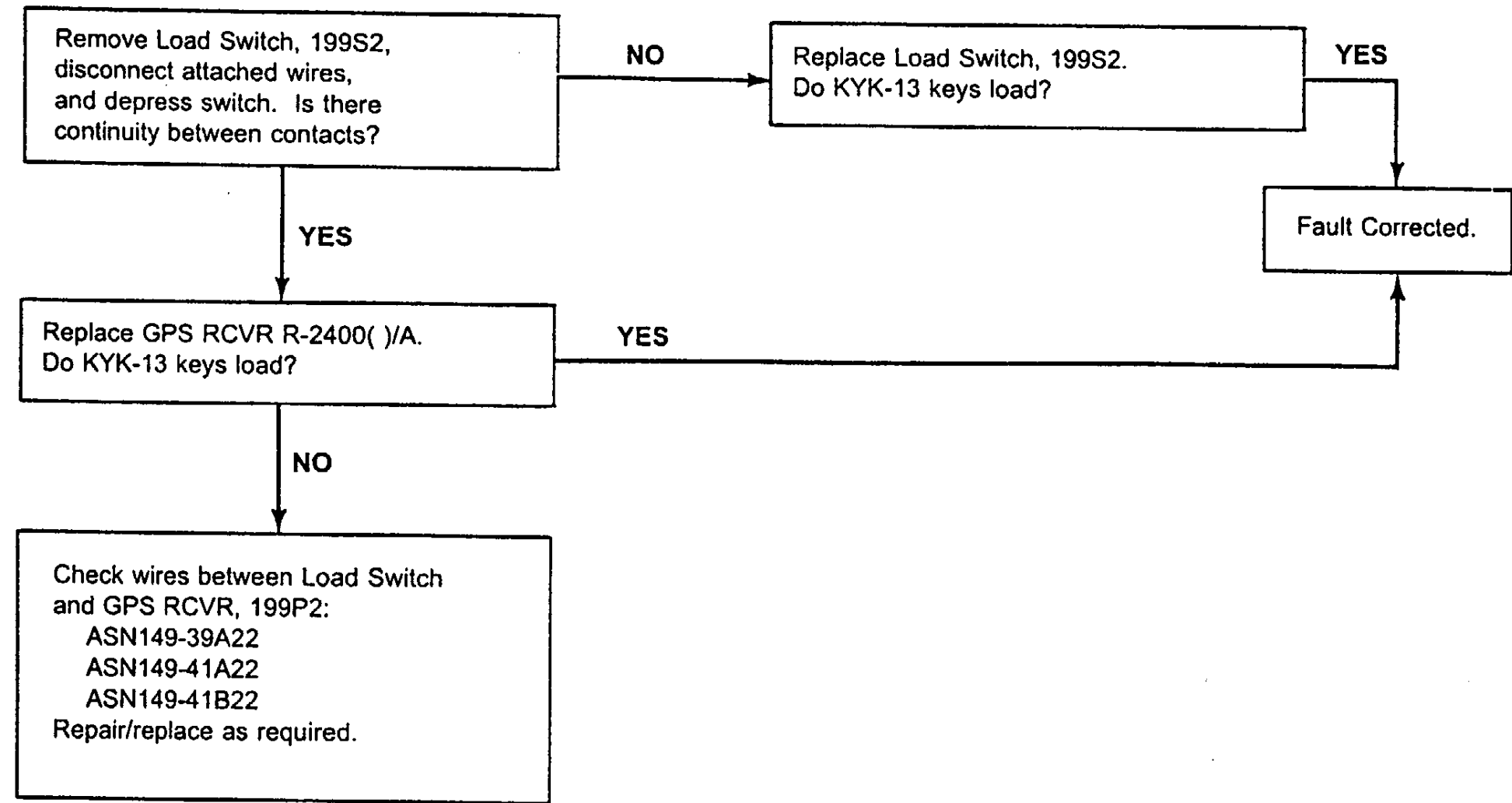
FAULT ISOLATION PROCEDURE

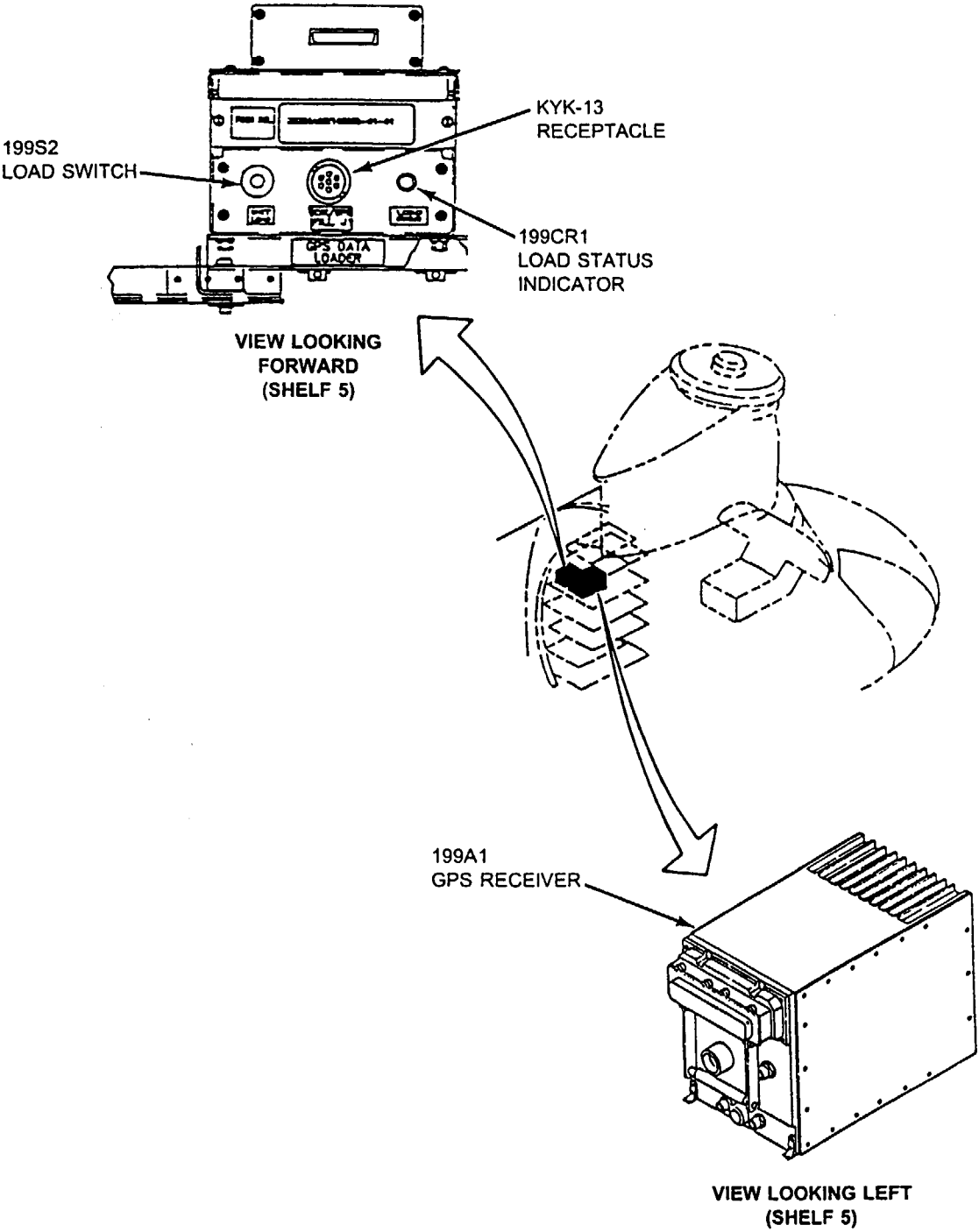
INITIAL SETUP

<b>Applicable Configurations:</b>		<b>References:</b>	
All		TM 11-5826-308-12	
		TM 55-1520-240-23	
<b>Tools:</b>		<b>Equipment Condition:</b>	
Electrical Repairer's Tool Kit, NSN 51 80-00-323-4915		TM 55-1520-240-23:	
Multimeter, AN/USM-223, NSN 6625-00-999-7465		Battery Connected	
		Electrical Power On	
		Hydraulic Power Off	
<b>Materials:</b>			
None			
<b>Personnel Required:</b>			
Aircraft Electrician			

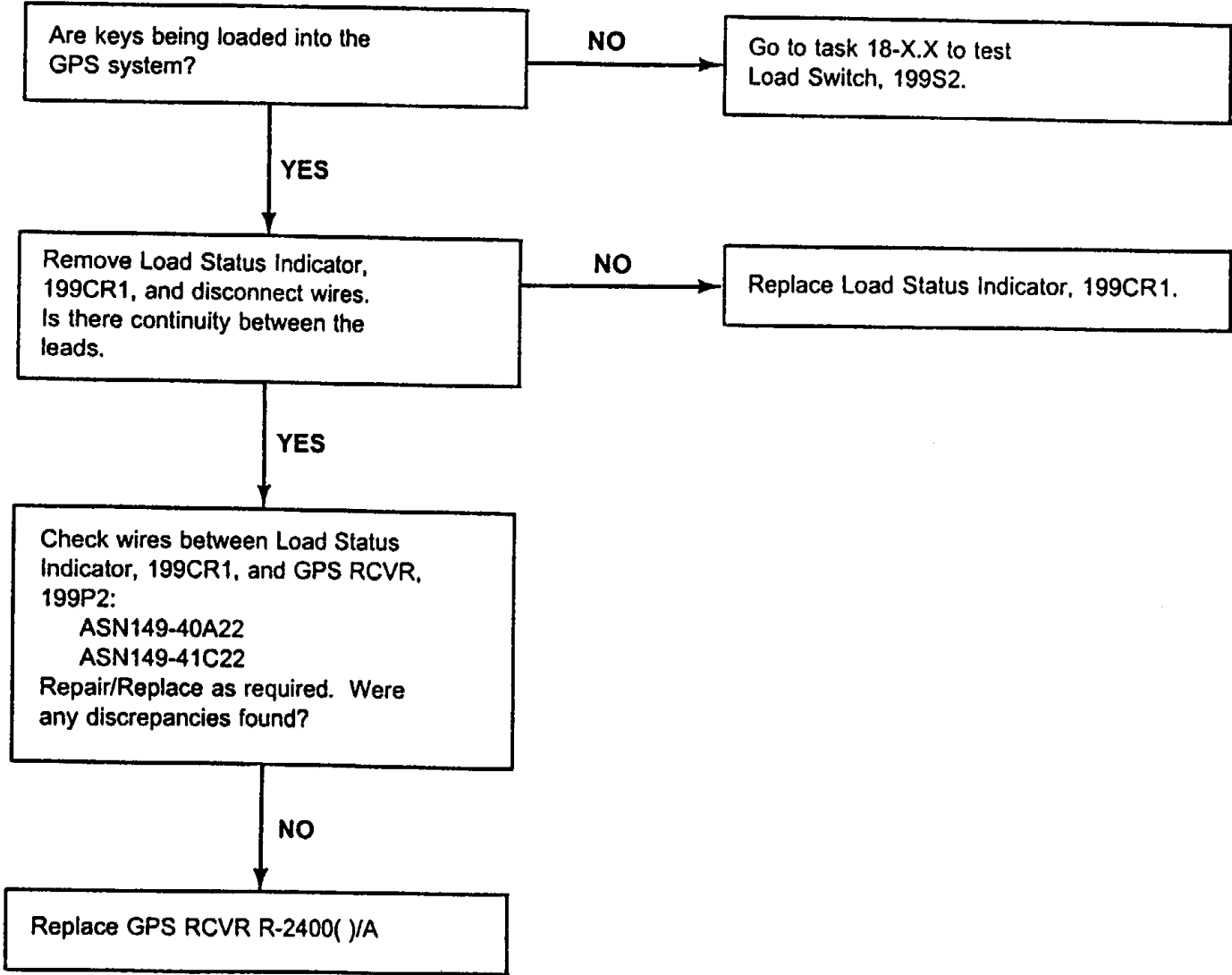


KYK-13 KEYS CANNOT BE LOADED INTO THE GPS SYSTEM





LOAD STATUS INDICATOR, 199CR1, DOES NOT FLASH WHEN LOADING KYK-13 KEYS



FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

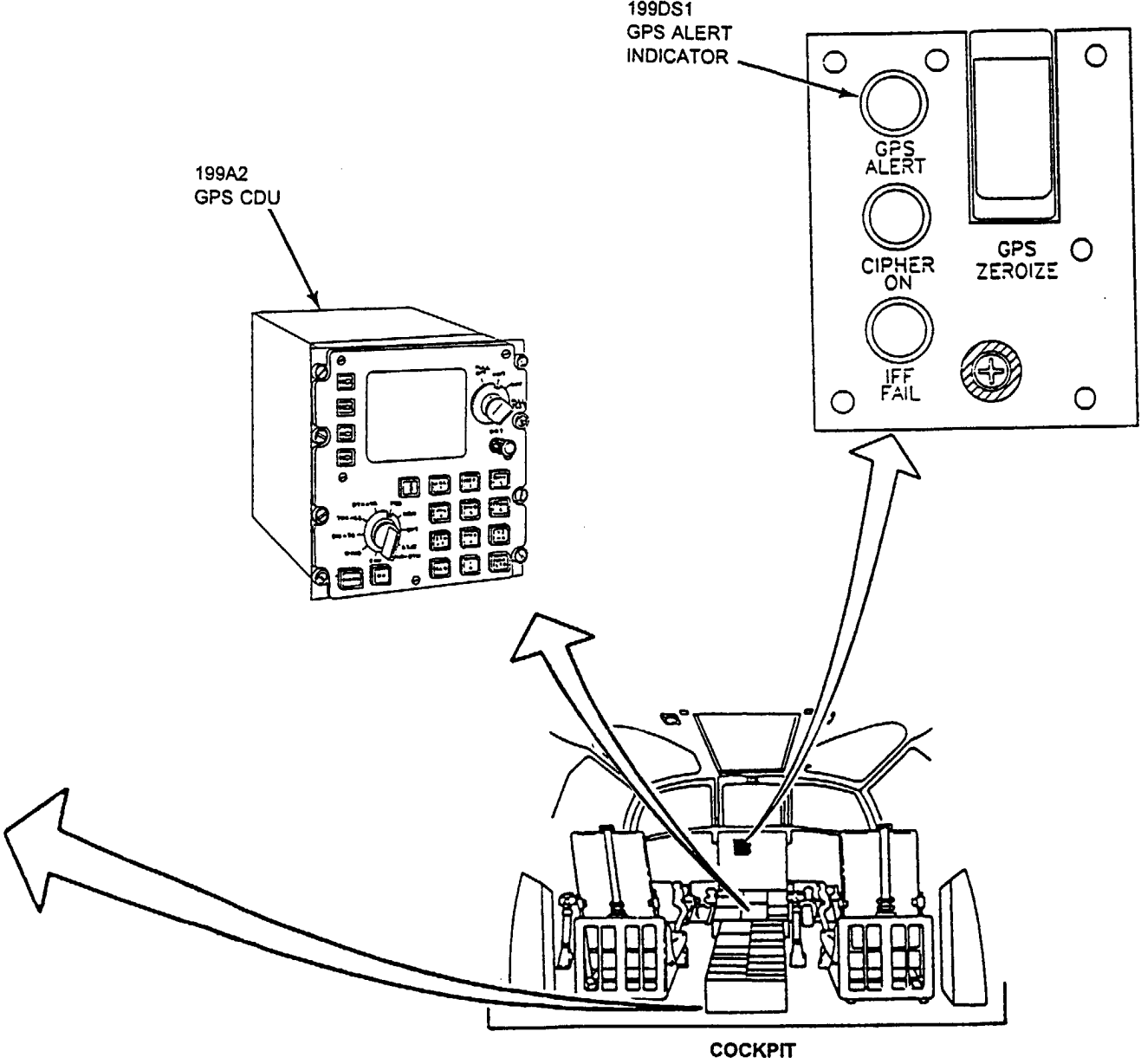
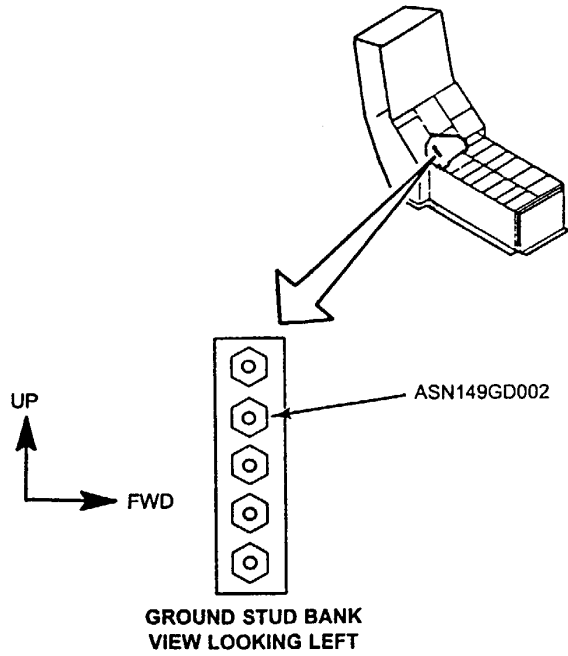
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter, AN/USM-223,  
NSN 6625-00-999-7465

**Materials:**  
None

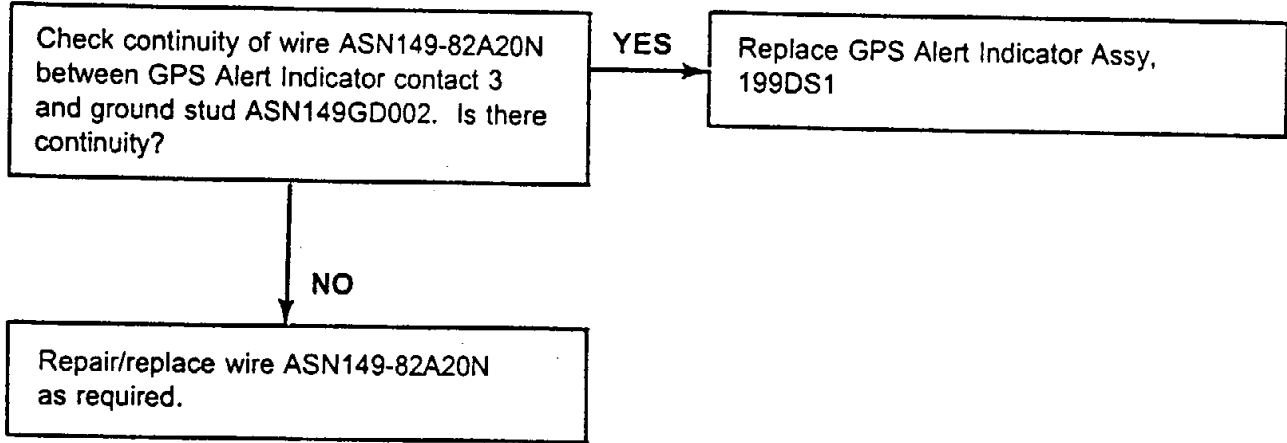
**Personnel Required:**  
Aircraft Electrician

**References:**  
TM 11 - 1520-240-23  
TM 11-5826-308-12  
TM 55-1520-240-23

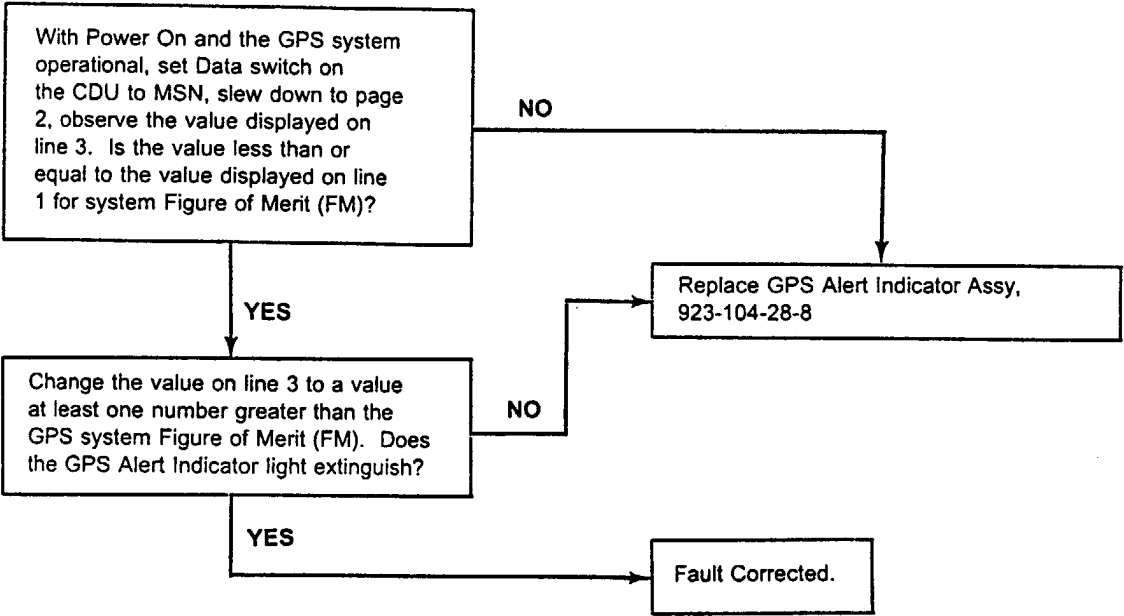
**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



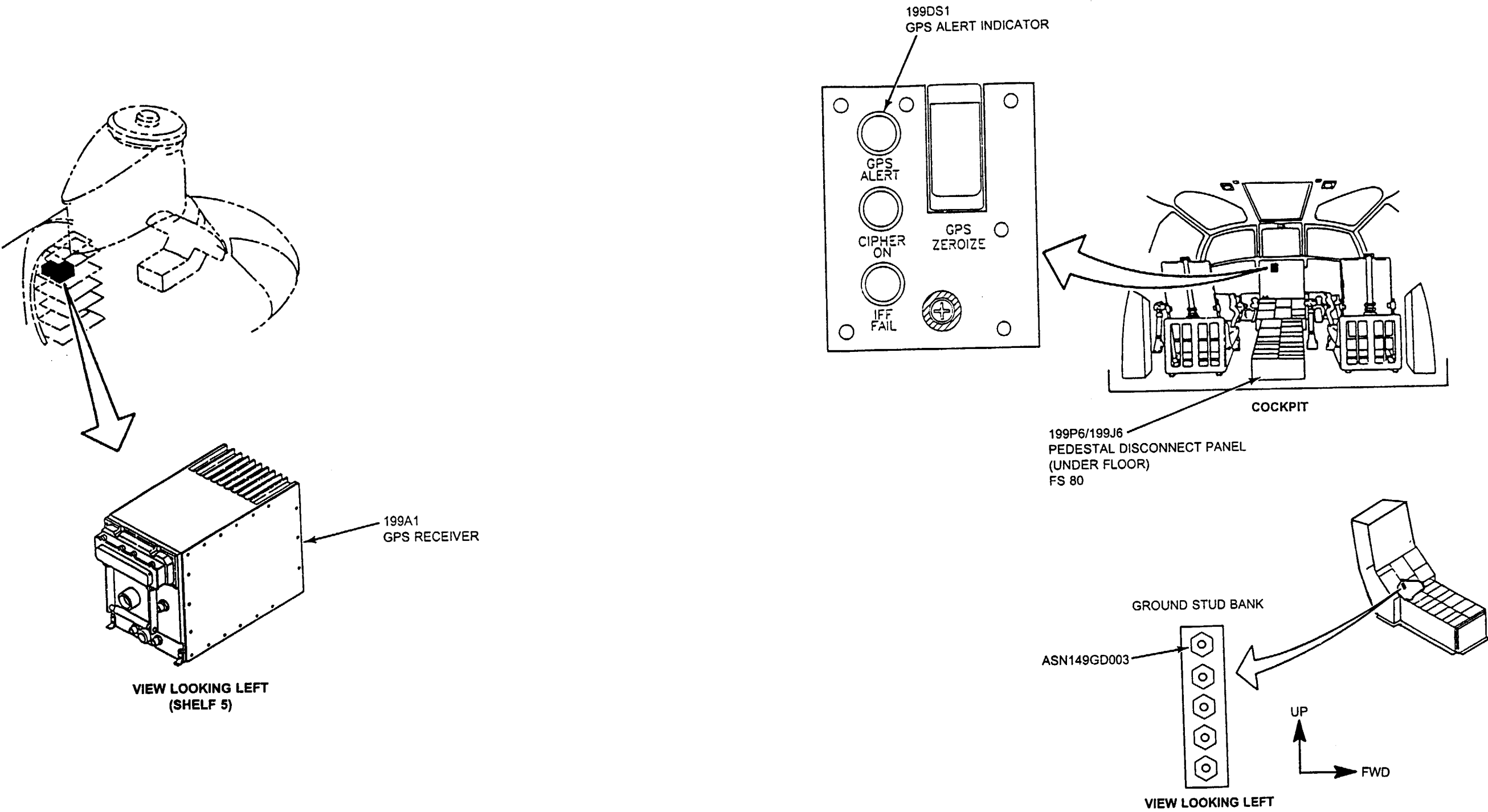
GPS ALERT INDICATOR, 199DS1, DOES NOT ILLUMINATE DURING SELF-TEST "ONLY"



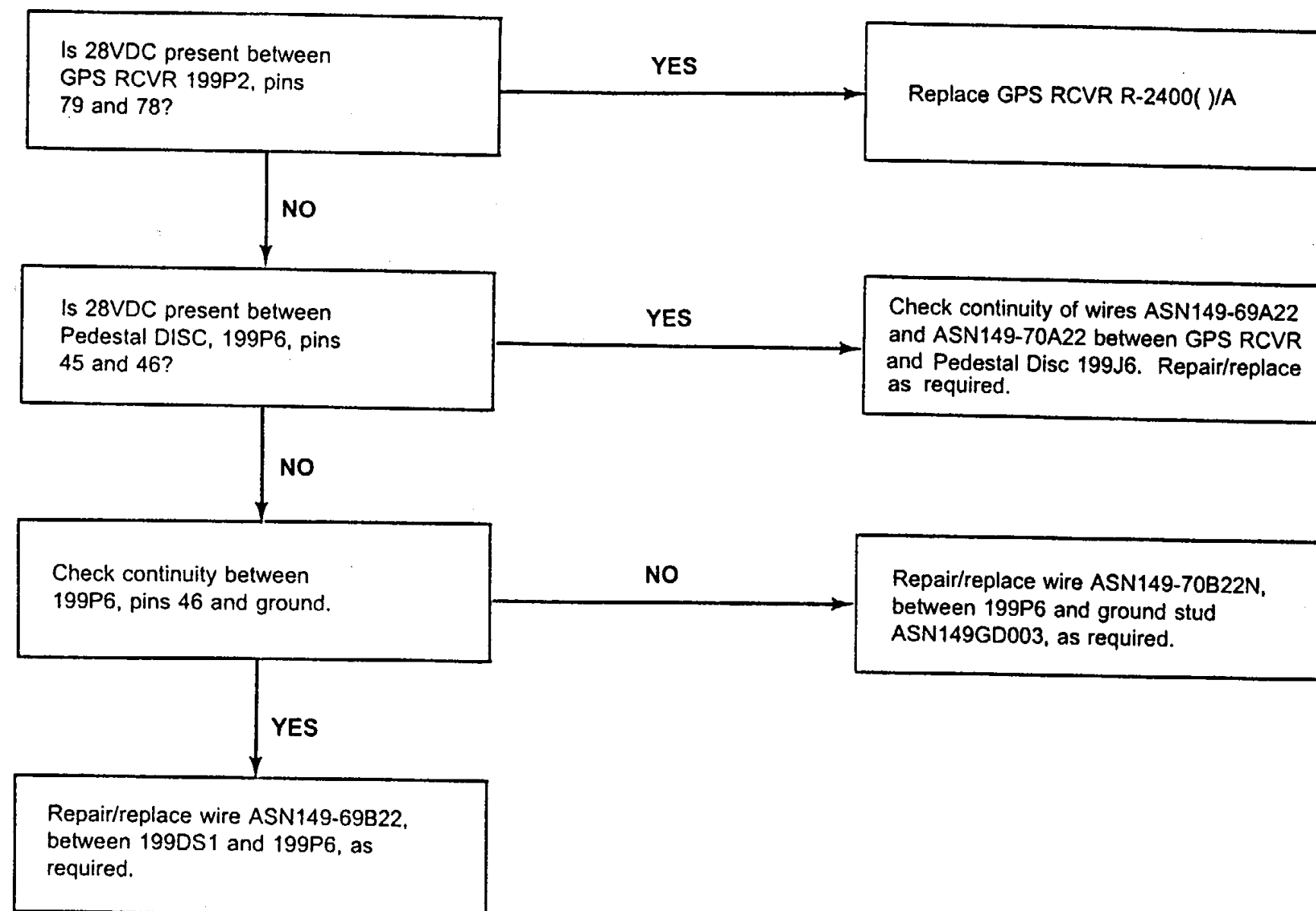
GPS ALERT INDICATOR, 199DS1, IS ALWAYS ON





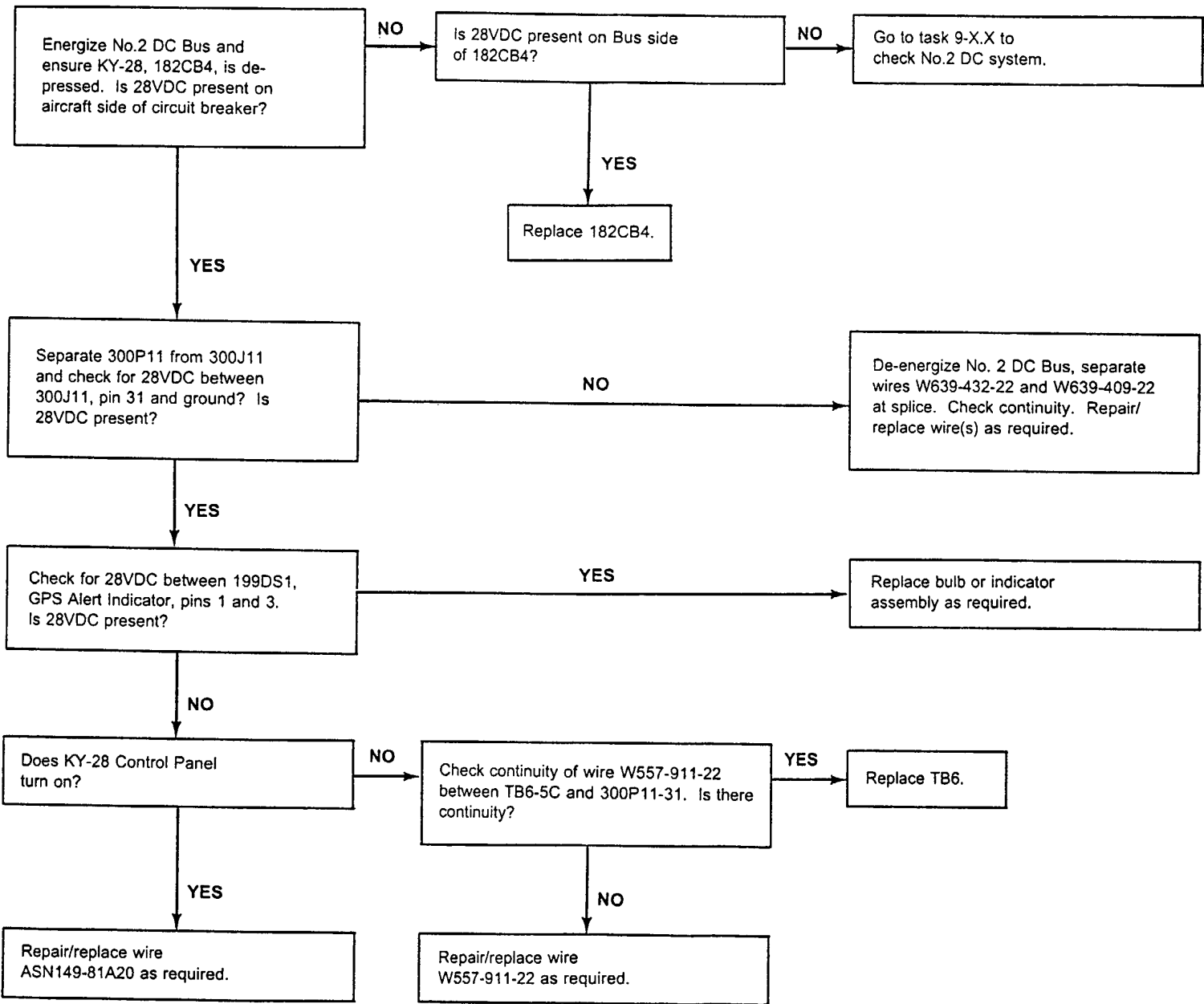


GPS ALERT INDICATOR, 199DS1, DOES NOT ILLUMINATE FOR  
GPS SYSTEM ALERT CONDITION "ONLY"





GPS ALERT INDICATOR, 199DS1, DOES NOT ILLUMINATE AT ALL



FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

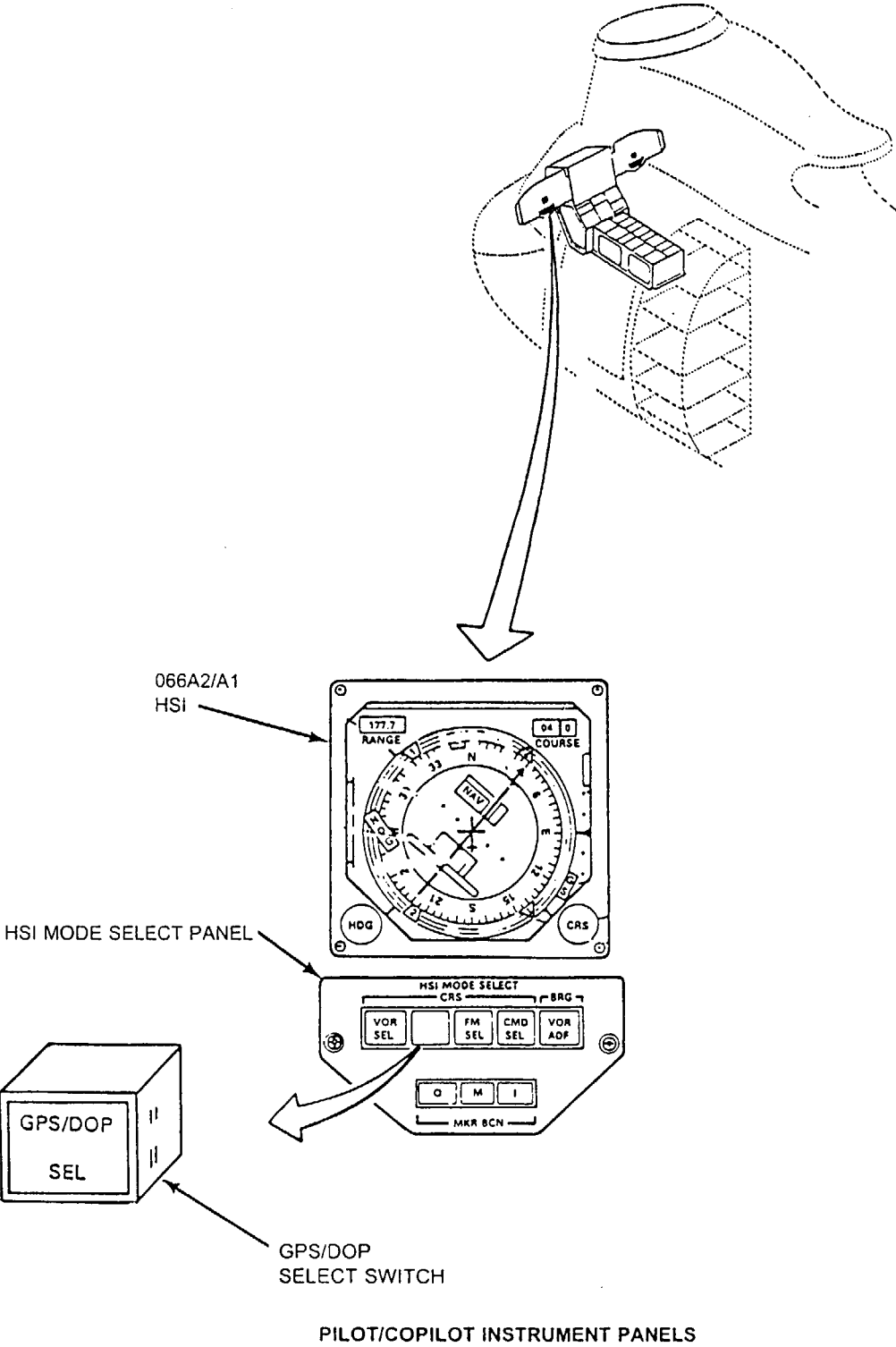
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-491 5  
Multimeter, AN/USM-223,  
NSN 6625-00-999-7465

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician

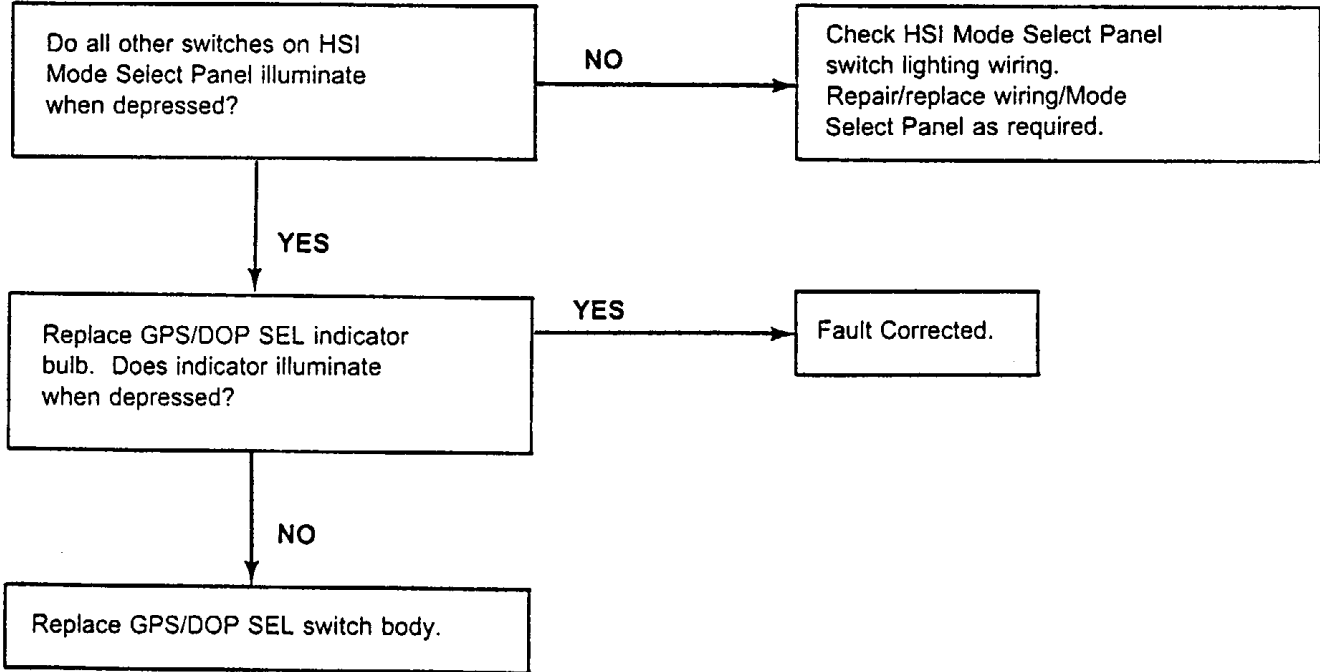
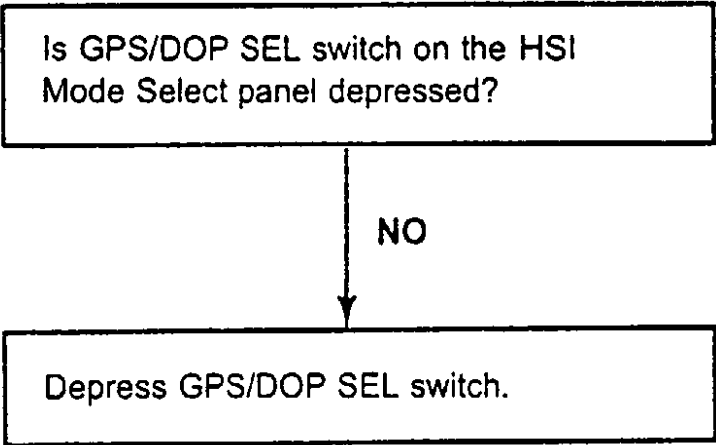
**References:**  
TM 11-1520-240-23  
TM 11-5826-308-12  
TM 55-1520-240-23

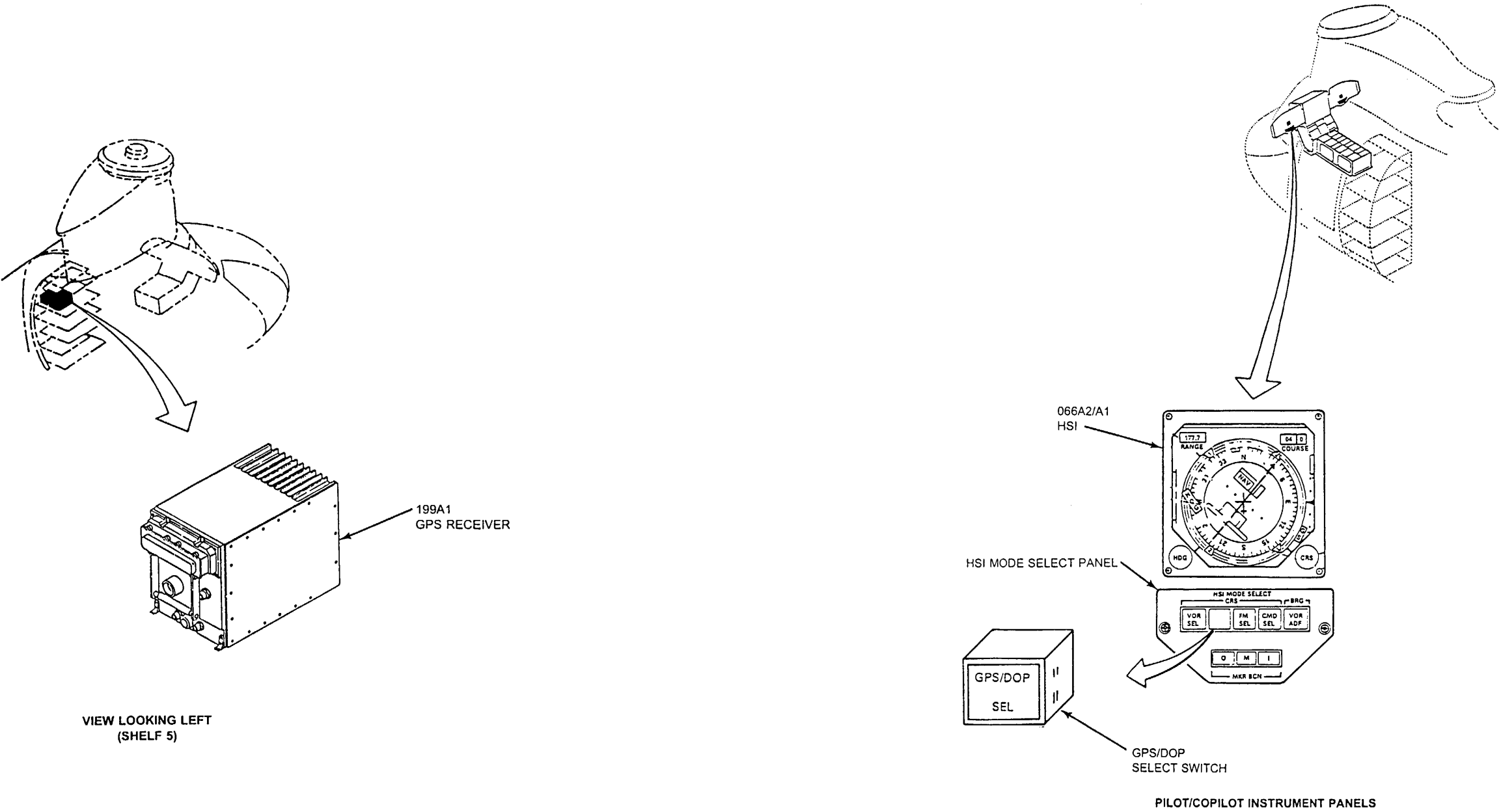
**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



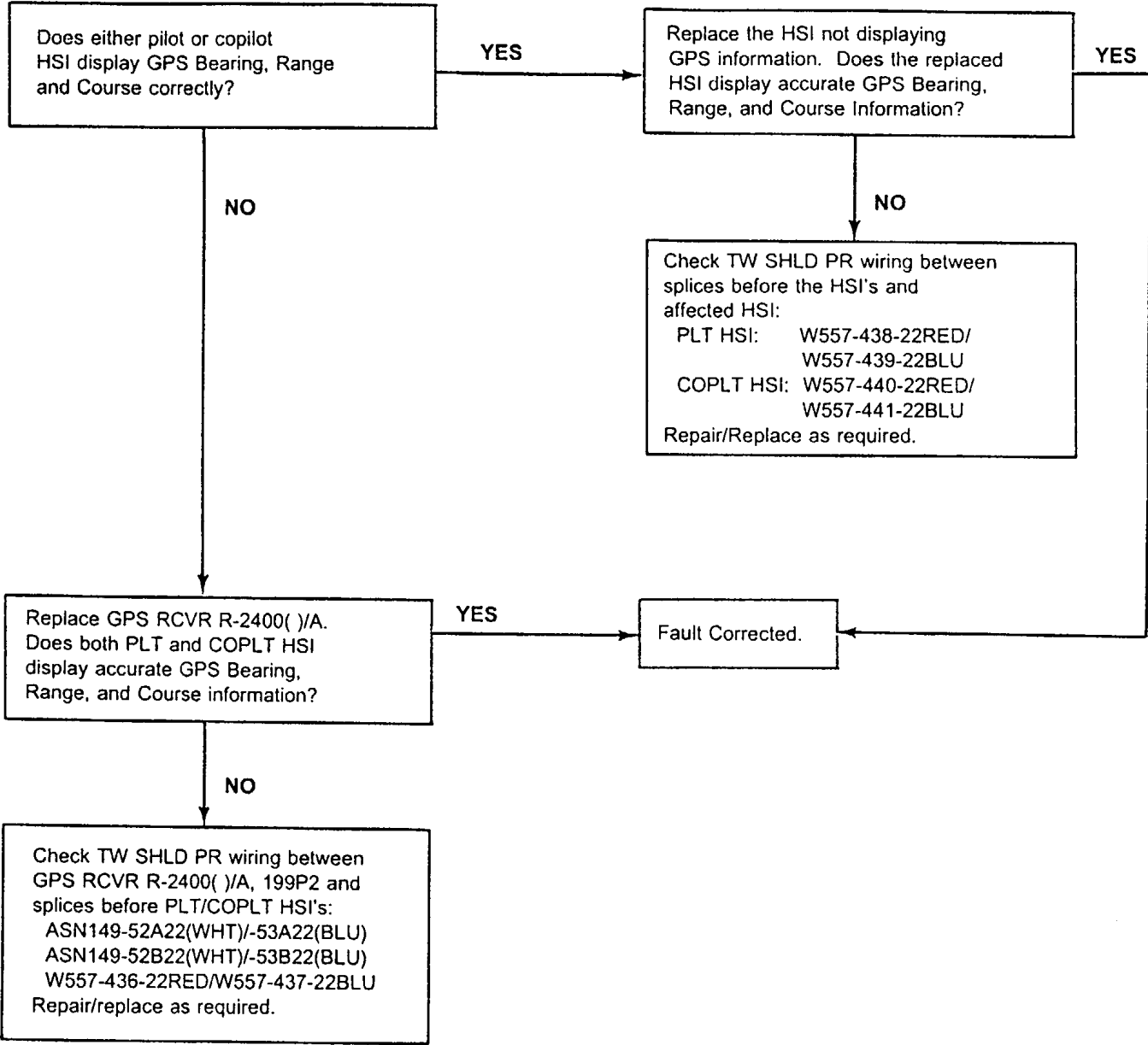
PILOT/COPILOT HSI DOES NOT DISPLAY GPS BEARING INFORMATION "ONLY"

GPS/DOP SEL LENS ON PILOT/COPILOT HSI MODE SELECT PANEL DOES NOT ILLUMINATE





PILOT/COPILOT HSI DOES NOT DISPLAY "ANY" GPS INFORMATION  
WHEN GPS/DOP SEL SWITCH IS DEPRESSED





FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

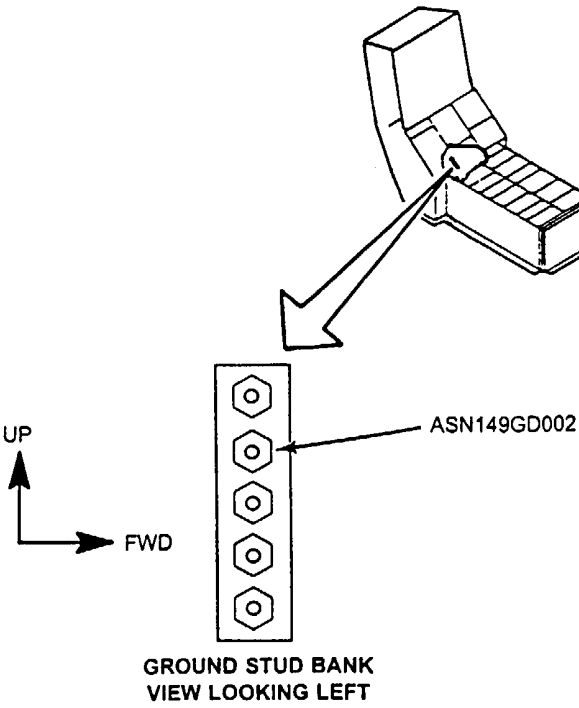
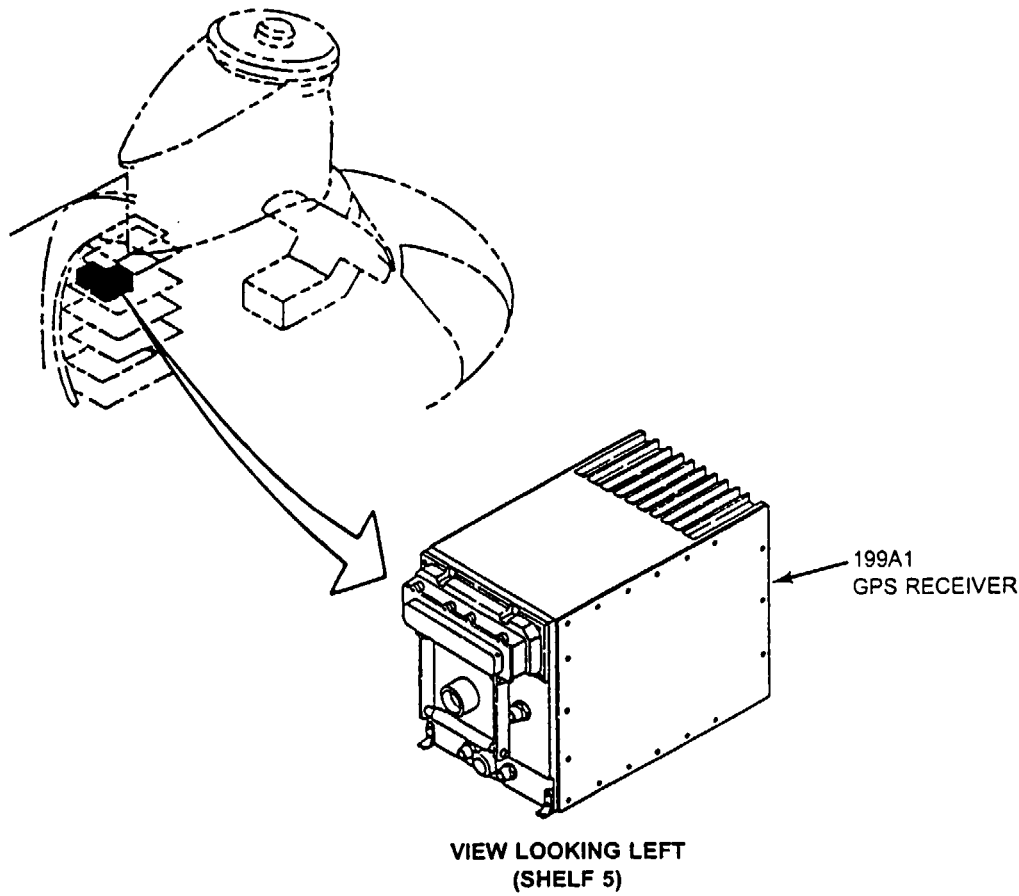
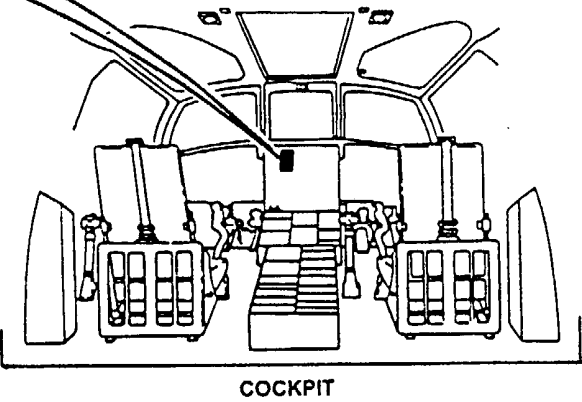
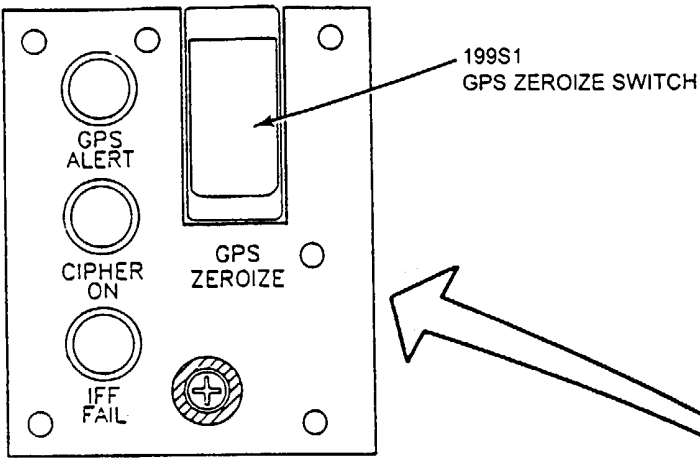
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter, AN/USM-223,  
NSN 6625-00-999-7465

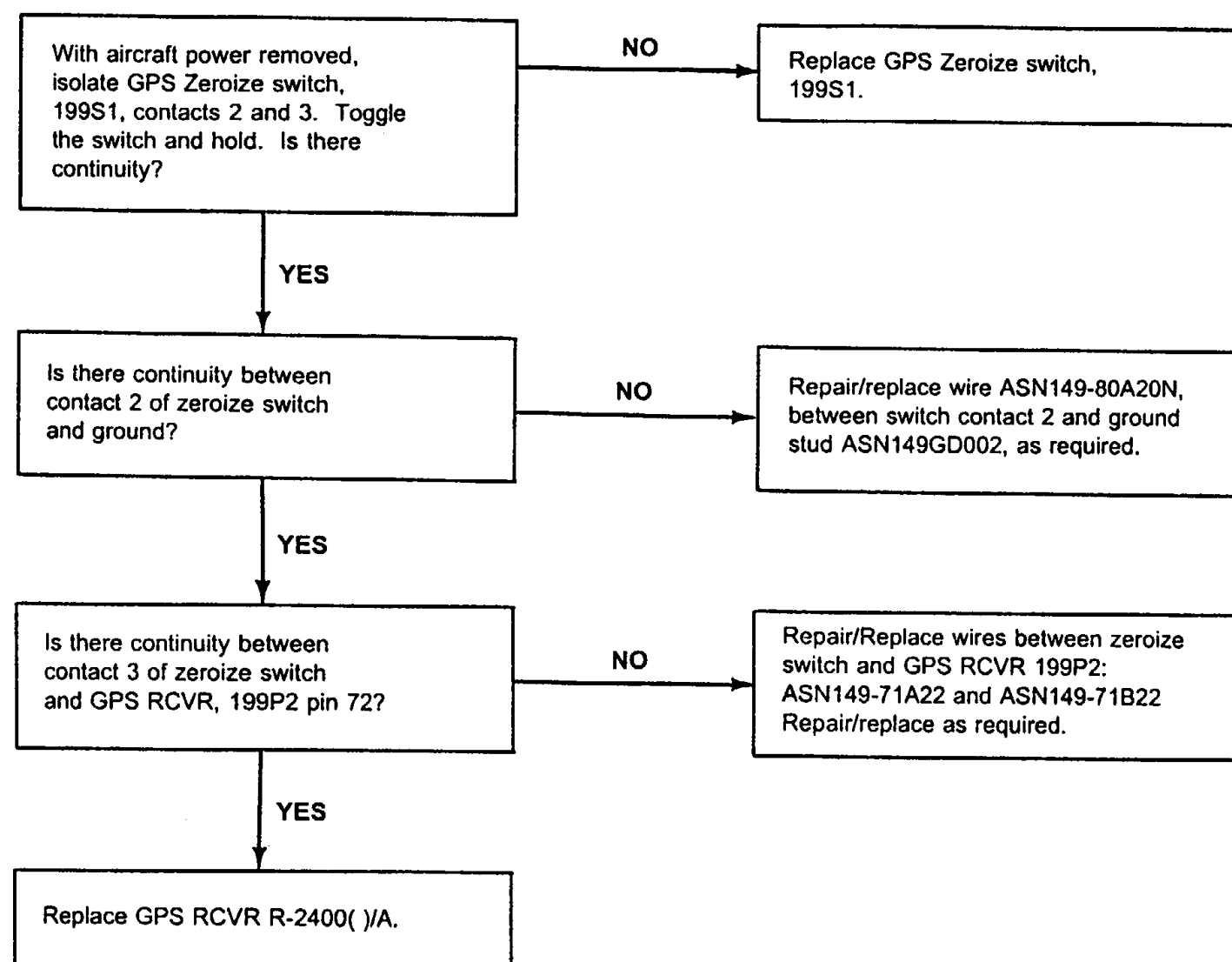
**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician

**References:**  
TM 11-5826-308-12  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
Hydraulic Power Off





FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

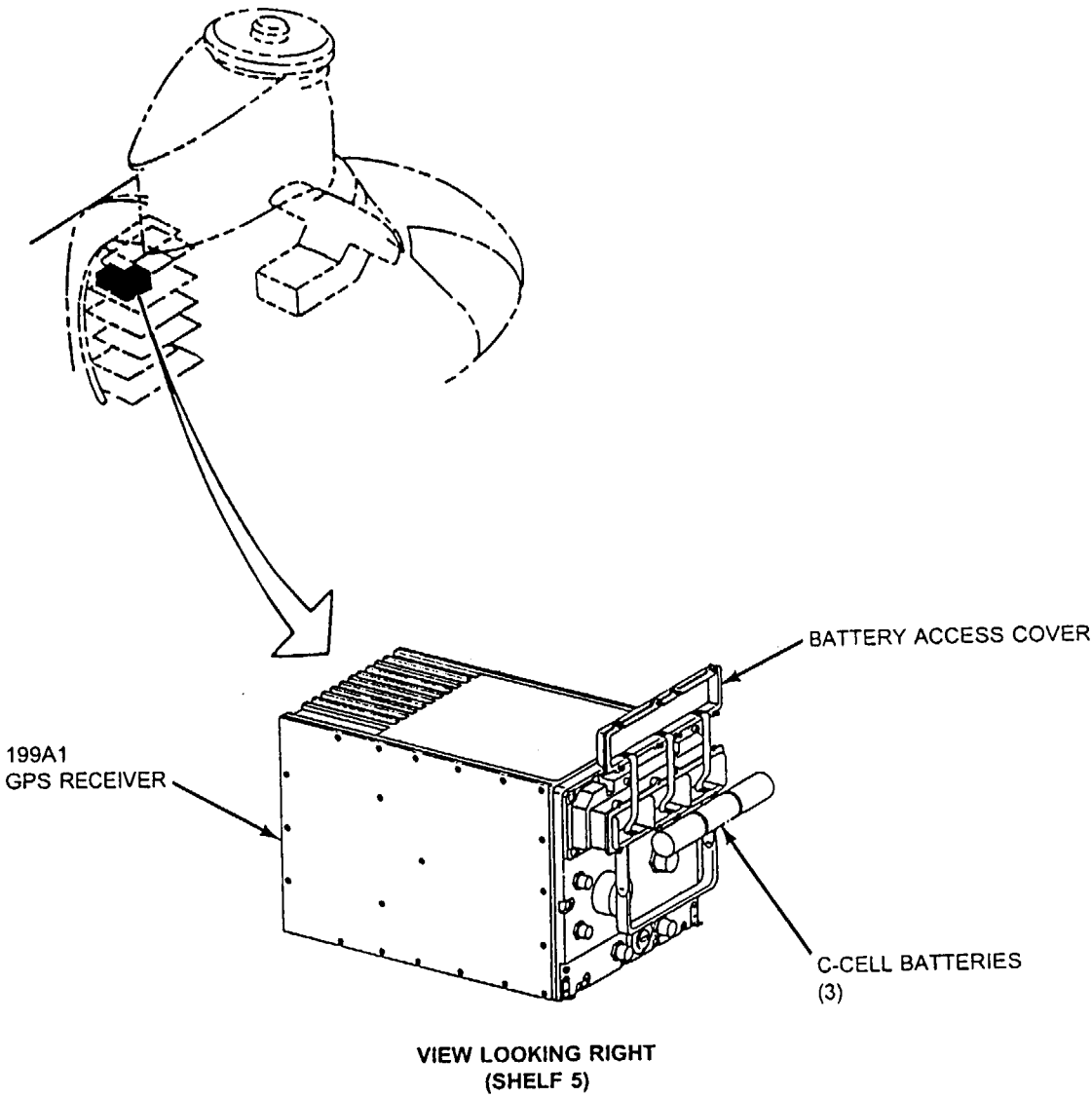
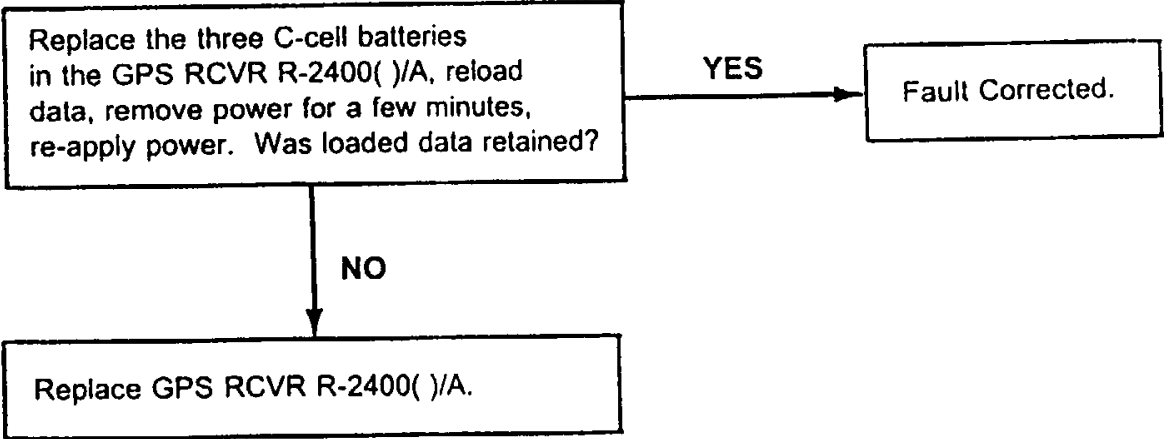
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician

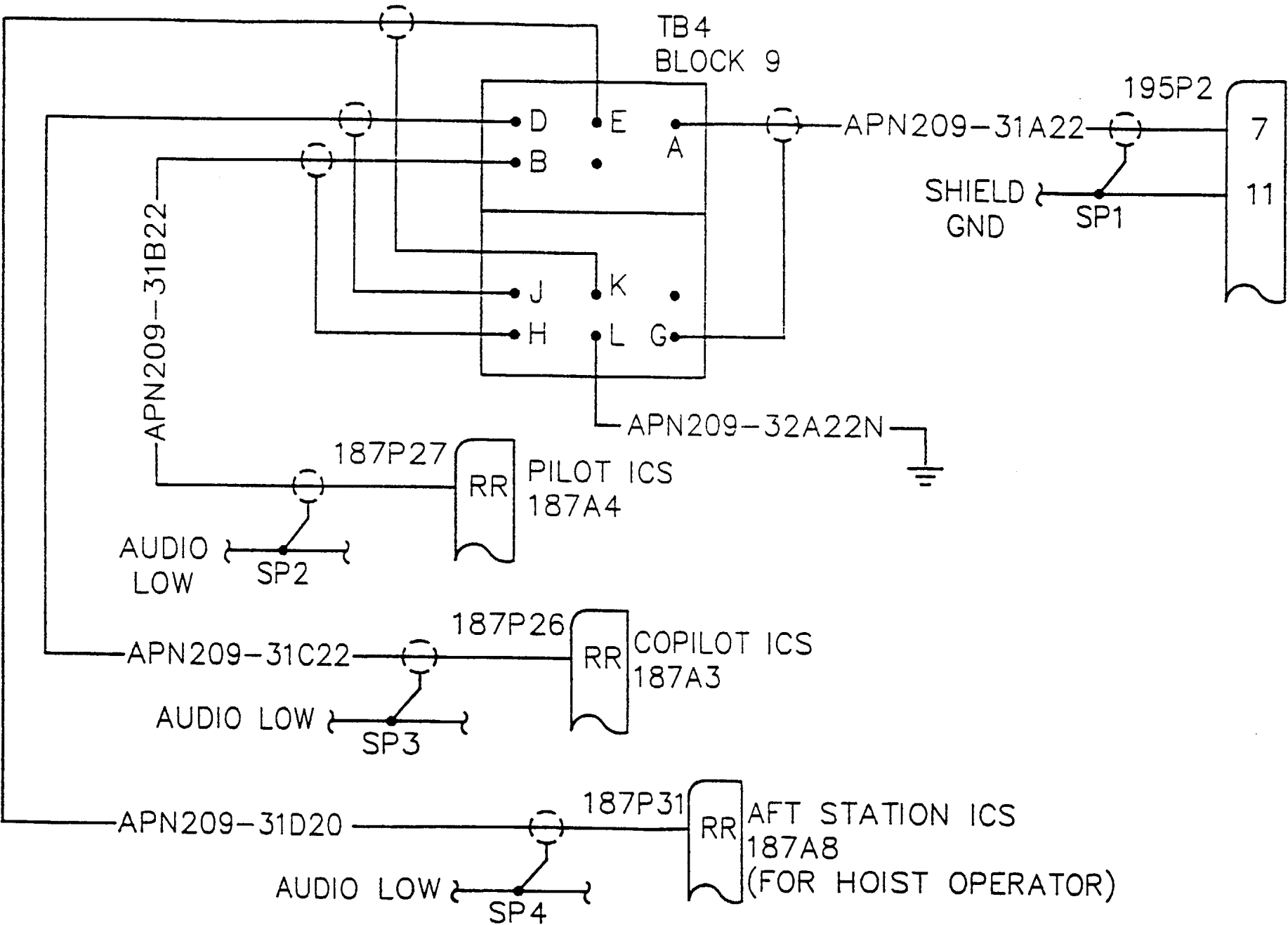
**References:**  
TM 11-5826-308-12  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



18-2 ALTITUDE VOICE WARNING SYSTEM  
(RADAR ALTIMETER)

18-2	ALTITUDE VOICE WARNING SYSTEM	18-2
18-2.1	ALTITUDE VOICE WARNING SYSTEM WIRING DIAGRAM	18-2.1



INITIAL SETUP

**Applicable Configurations:**  
All

**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**  
None

**Personnel Required:**  
68F10 Aircraft Electrician

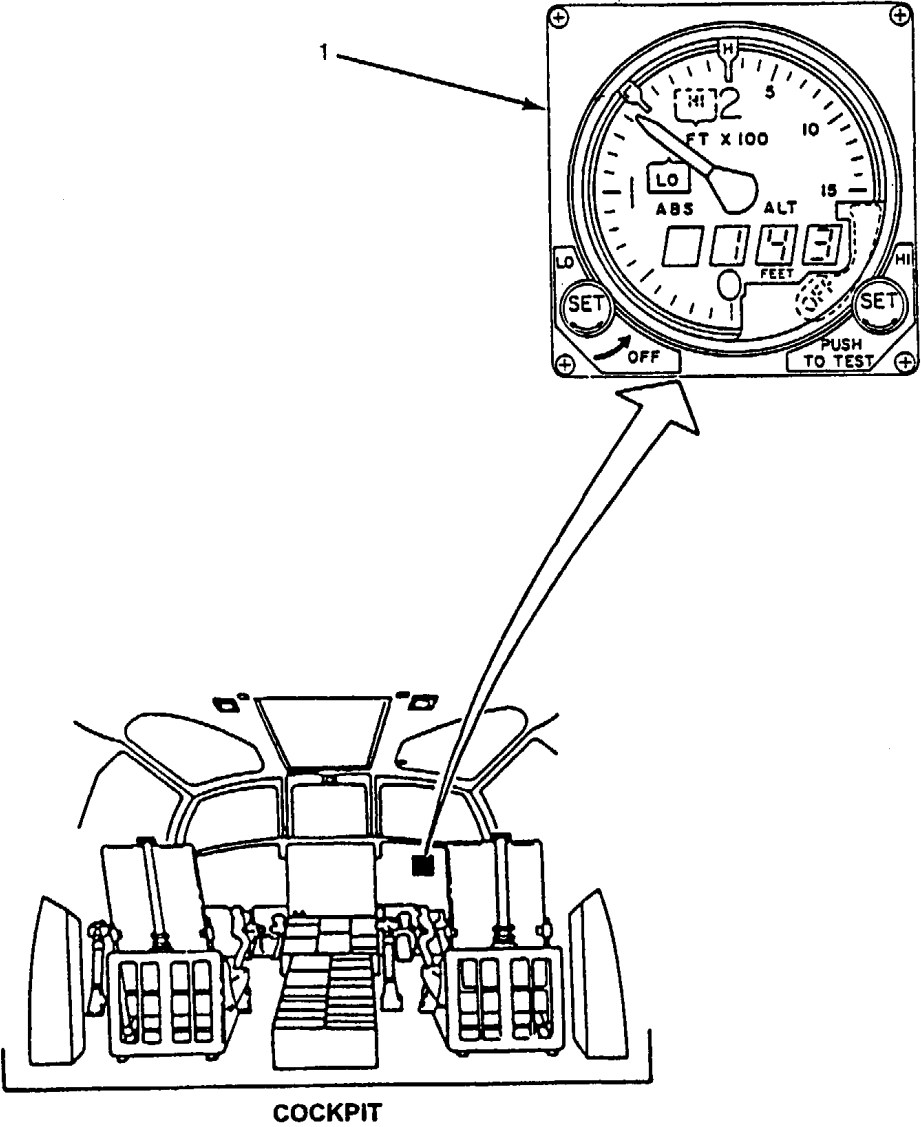
**References:**  
TM 11-1520-240-23  
TM 55-1520-240-23

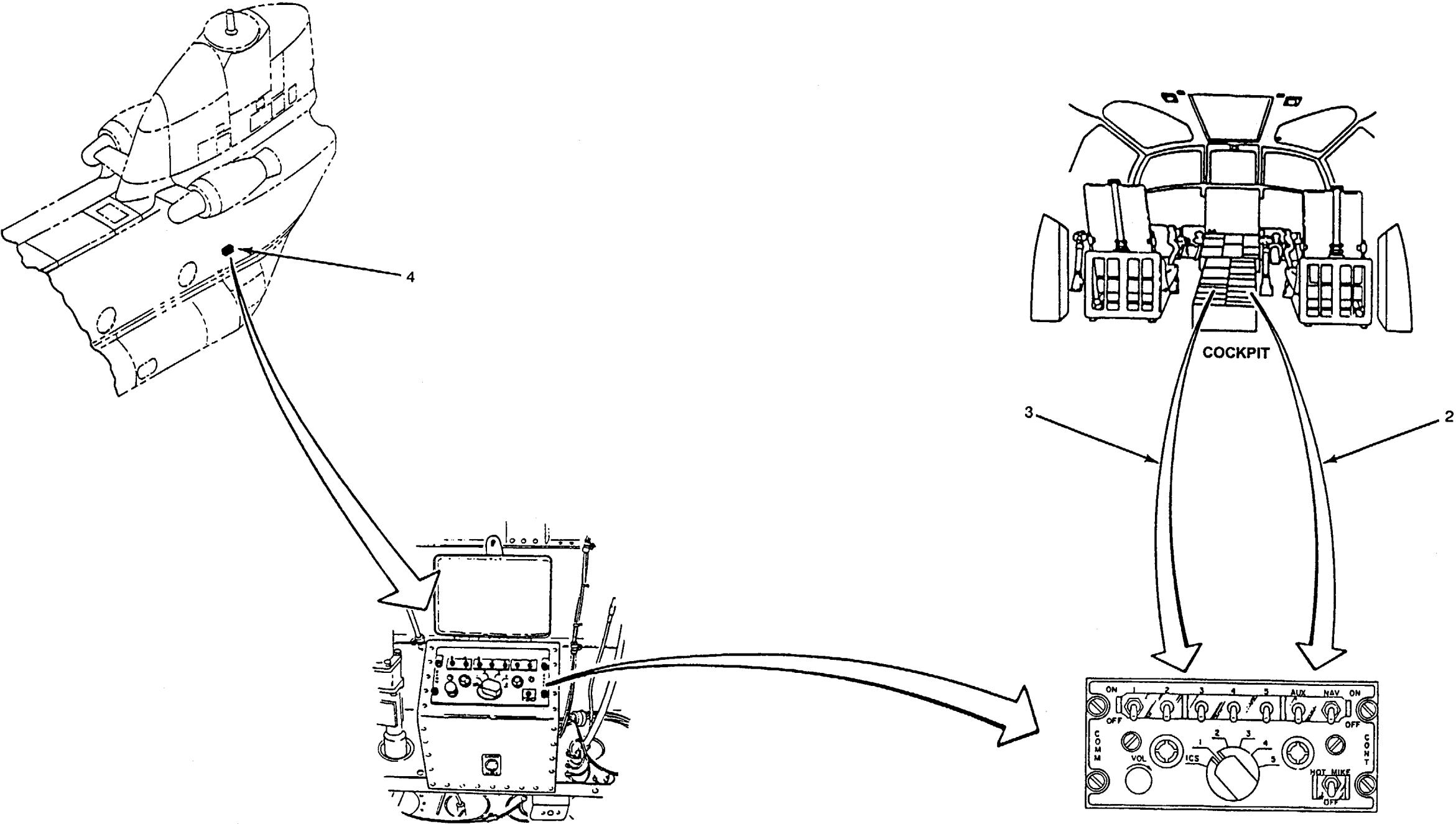
**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
No. 2 Access Door (Tunnel Cover)  
Open

TASK	RESULT
1. Check AVWS Radar Altimeter Indicator	Remove from Pilot's instrument panel and (AN/APN209) (1). check connector of AVWS Radar Altimeter Indicator (1). If connector is loose or damaged, tighten, repair, or replace as required. If wiring to connector is loose or damaged, tighten, repair, or replace it as required. If indicator glass is cracked or broken, or if pointers/indices are bent or broken replace altimeter. Check knobs for looseness or binding. Repair, replace, or adjust as required.
2. Check the following Interphone Control Panels: Pilot (2) Copilot (3) Aft Station (4).	Remove each panel and check connector. If connector is loose or damaged, tighten, repair, or replace as required. If wiring to connector is loose or damaged, tighten, repair, or replace as required. Check knobs for looseness or binding. Repair, replace, or adjust as required. Check switches for looseness or binding. Replace as required.

FOLLOW-ON MAINTENANCE:

None





INITIAL SETUP

*Applicable Configurations:*

All

*Tools:*

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

*Materials:*

None

*Personnel Required:*

Aircraft Electrician (2)

*References:*

TM 11-1520-240-23  
TM 55-1520-240-23

*Equipment Condition:*

TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
Altitude Voice Warning System Visual Check  
Performed (Task 18-2.2)

TASK	RESULT
------	--------

CHECK CIRCUIT BREAKERS

- |  |   |
|--|---|
| 1. Check that the following circuit breaker on No. 1 pdp are closed:<br>INTPH LH (1)                 | If circuit breaker is open (1), close it.           |
| 2. Check that the following circuit breakers on No. 2 pdp are closed:<br>INTPH RH (2)<br>RAD ALT (3) | If any circuit breaker is open (2 and 3), close it. |
| 3. Start APU. Refer to task 15-1.4   | APU ON capsule shall come on.                       |

CHECK AVWS OPERATION

NOTE

- The following checks will only cover the Altitude Voice Warning portion of the Radar Altimeter operation. For indication discrepancies, refer to TM 11-1520-240-23.
- Ensure that the pilot, copilot, and aft interphone stations are all operational.

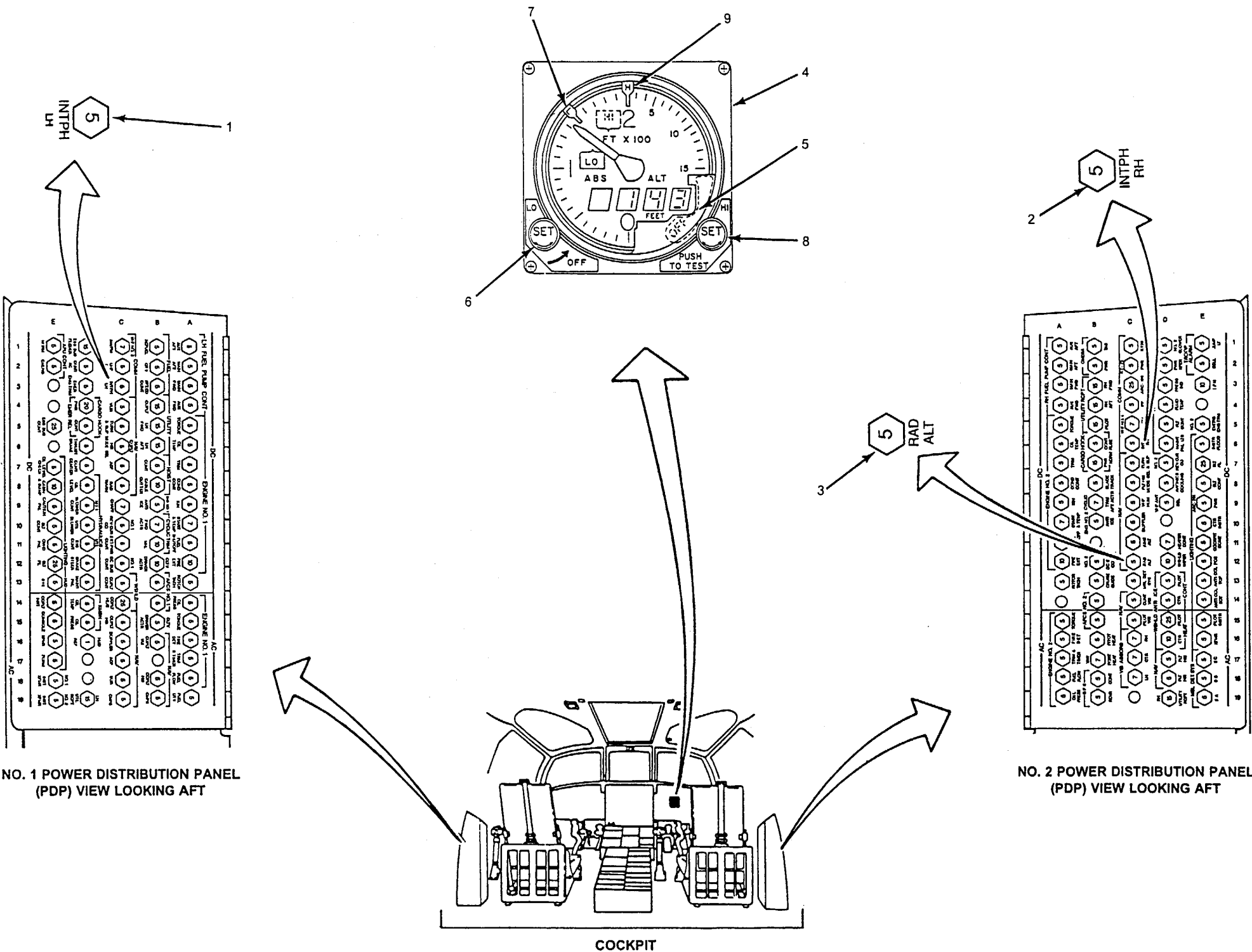
- |  |   |
|--|---|
| 4. With the pilot's <b>Radar Altimeter</b> (4) turned <b>ON</b> and the <b>OFF Flag</b> (5) not visible, and with a headset connected to the pilot's headset jack, rotate the <b>LO SET</b> knob (6) to position the <b>LO SET</b> Index (7.) just above the <b>OFF</b> detent. Adjust the <b>HI SET</b> knob (8) to position the <b>HI SET</b> Index (9) at 100 feet. | The warning message "ALTITUDE LOW, TOO LOW" should NOT be heard. If this message is heard, go to task 18-2.6. |
|--|---|

TASK	RESULT
5. Adjust the LO SET Index (7) to approximately the 10 foot position on the indicator.	The warning message "ALTITUDE LOW, TOO LOW" shall be heard at FULL volume. If this message is NOT heard or volume is NOT FULL, go to task 18-2.4.
6. Momentarily depress the PUSH-TO-TEST knob (6) once.	The volume of the low altitude warning message shall decrease by one-half (1/2). If volume stays full, or NOT heard at all, go to task 18-2.5.
7. Reset the LO SET Index (7) to a point just above the OFF detent, wait 11 seconds, and return LO SET index to the 10 feet mark.	The low altitude warning message shall be heard at FULL volume. If message is NOT heard at all, or if volume is NOT full, go to task 18-2.4.
8. Press and hold the PRESS-TO-TEST knob (8) to activate the self-test.	The warning message "ALTITUDE HIGH, CHECK ALTITUDE" shall be audible at FULL volume. If message is NOT heard, or if volume is NOT full, go to task 18-2.4.
9. Release the PUSH-TO-TEST knob.	The warning message "ALTITUDE LOW, TOO LOW" shall be again heard, at FULL volume. If message is NOT heard, or if volume is NOT full, go to task 18-2.4.
10. Repeat steps 4 thru 9 with a headset connected to the copilot's headset jack.	Results shall be as specified in steps 4 thru 9. If altitude warning messages are not audible, even after replacing Radar Altimeter (4), go to task 18-2.4.
11. Repeat steps 4 thru 9 with a headset connected to the hoist operator's headset jack.	Results shall be as specified in steps 4 thru 9. If altitude warning messages are not audible, even after replacing Radar Altimeter (4), go to task 18-2.4.

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off





18-2.4 ALTITUDE VOICE WARNING NOT AUDIBLE AT PILOT, COPILOT, OR AFT STATION/HOIST OPERATOR'S HEADSET WHEN PILOT'S RADAR ALTIMETER ALTITUDE POINTER IS BELOW OR ABOVE PRESET ALTITUDE LIMITS

18-2.4

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**  
All

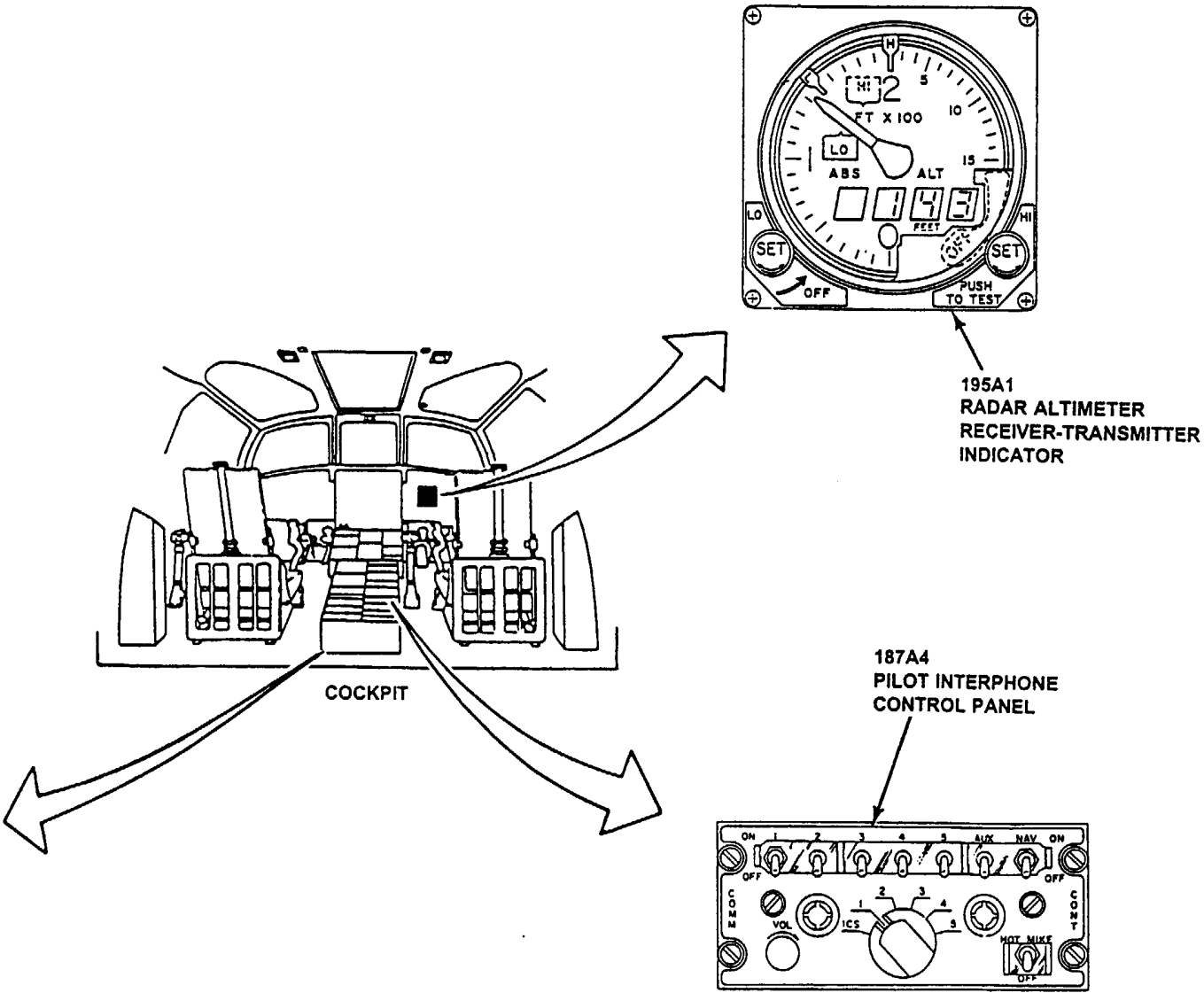
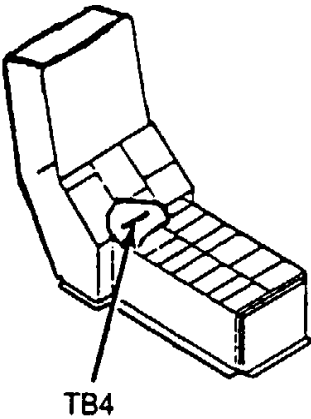
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915  
Multimeter, AN/USM-223,  
NSN 6625-00-999-7465

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician (2)

**References:**  
TM 11-1520-240-23  
TM 55-1520-240-23

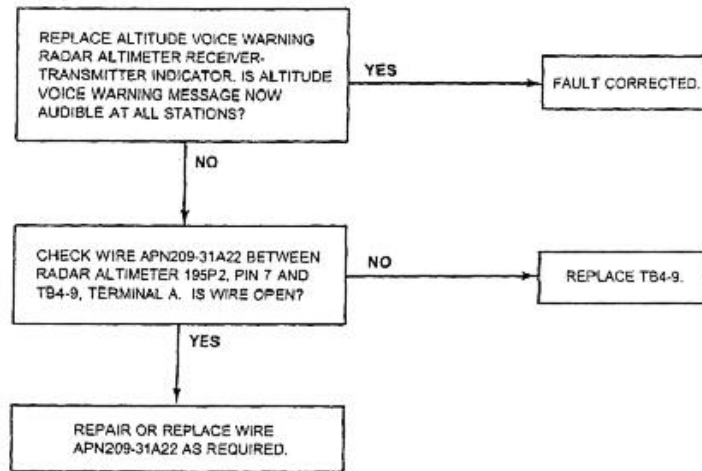
**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off



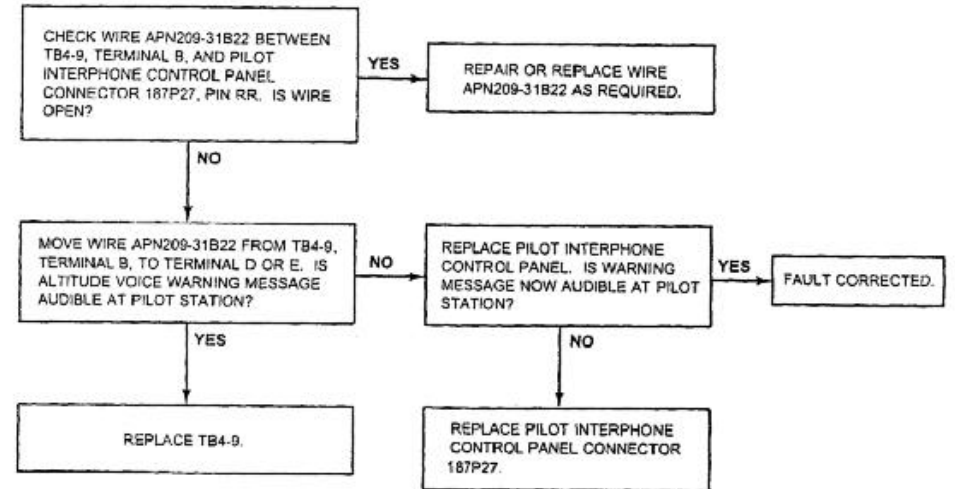
18-2.4 ALTITUDE VOICE WARNING NOT AUDIBLE AT PILOT, COPILOT, OR AFT STATION/HOIST OPERATOR'S HEADSET WHEN PILOT'S RADAR ALTIMETER ALTITUDE POINTER IS BELOW OR ABOVE PRESET ALTITUDE LIMITS (Continued)

18-2.4

ALTITUDE VOICE WARNING NOT AUDIBLE AT ALL INTERPHONE STATIONS (PILOT, COPILOT, AND AFT/HOIST OPERATOR)



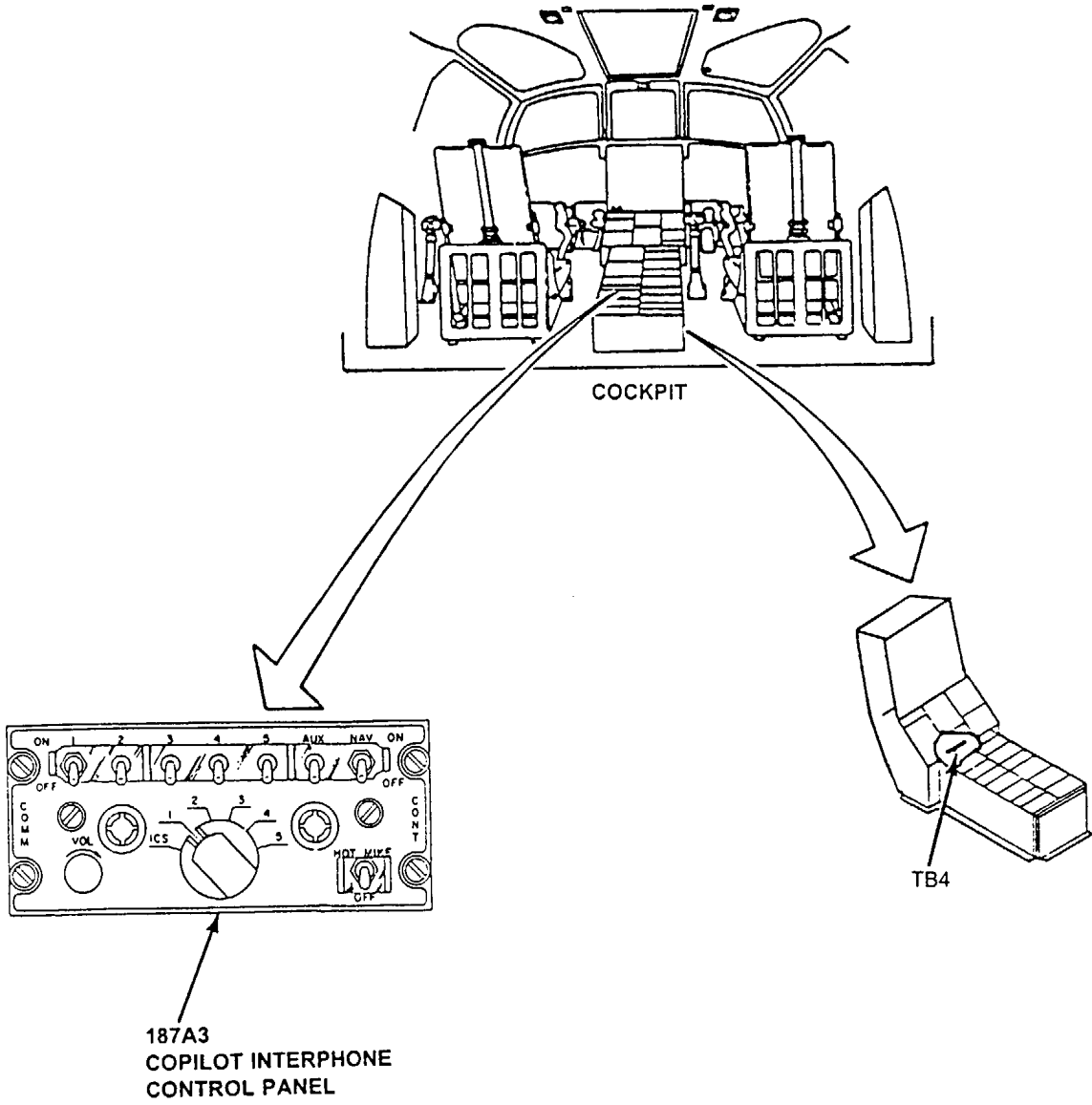
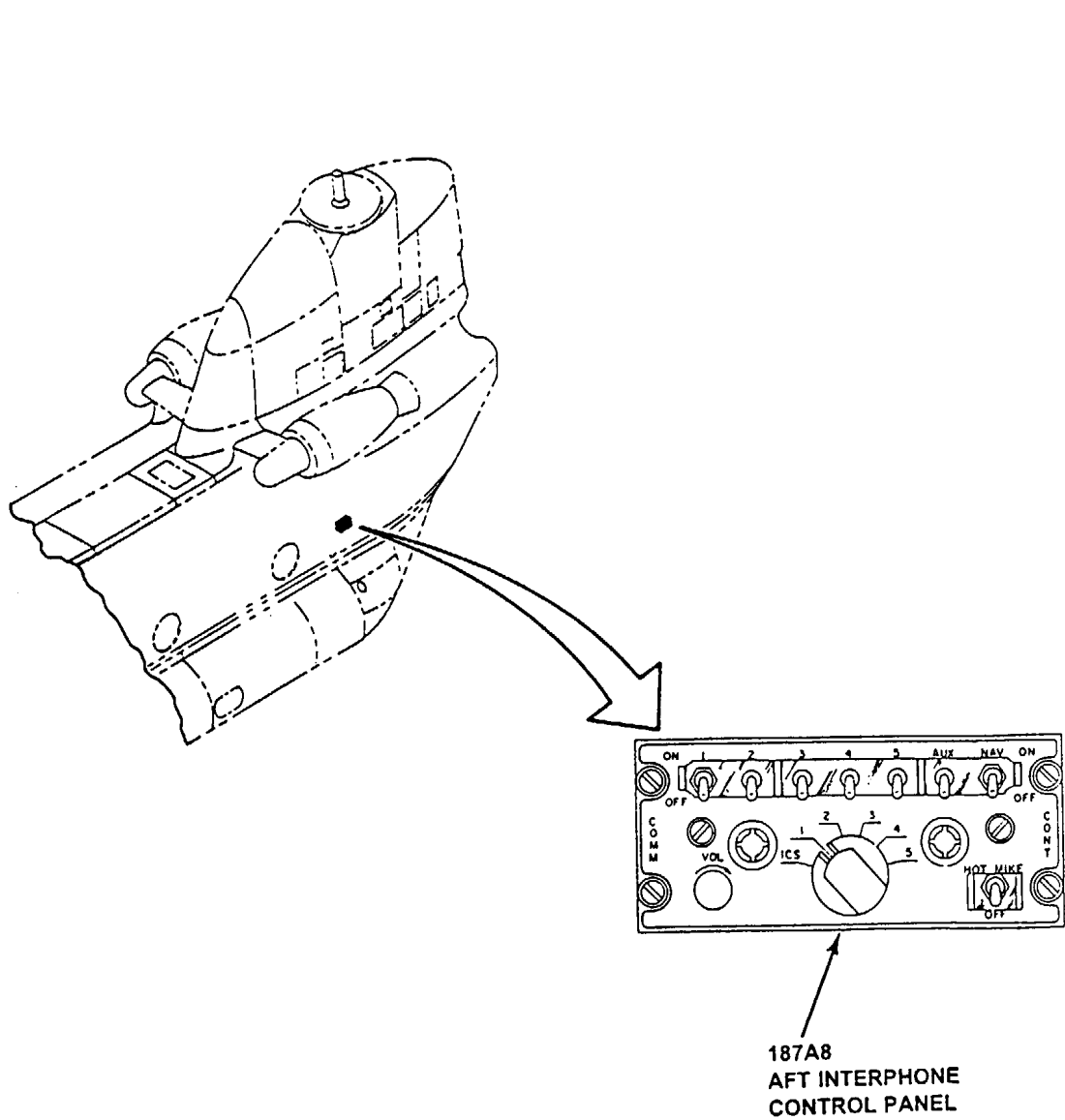
ALTITUDE VOICE WARNING NOT AUDIBLE AT PILOT STATION ONLY



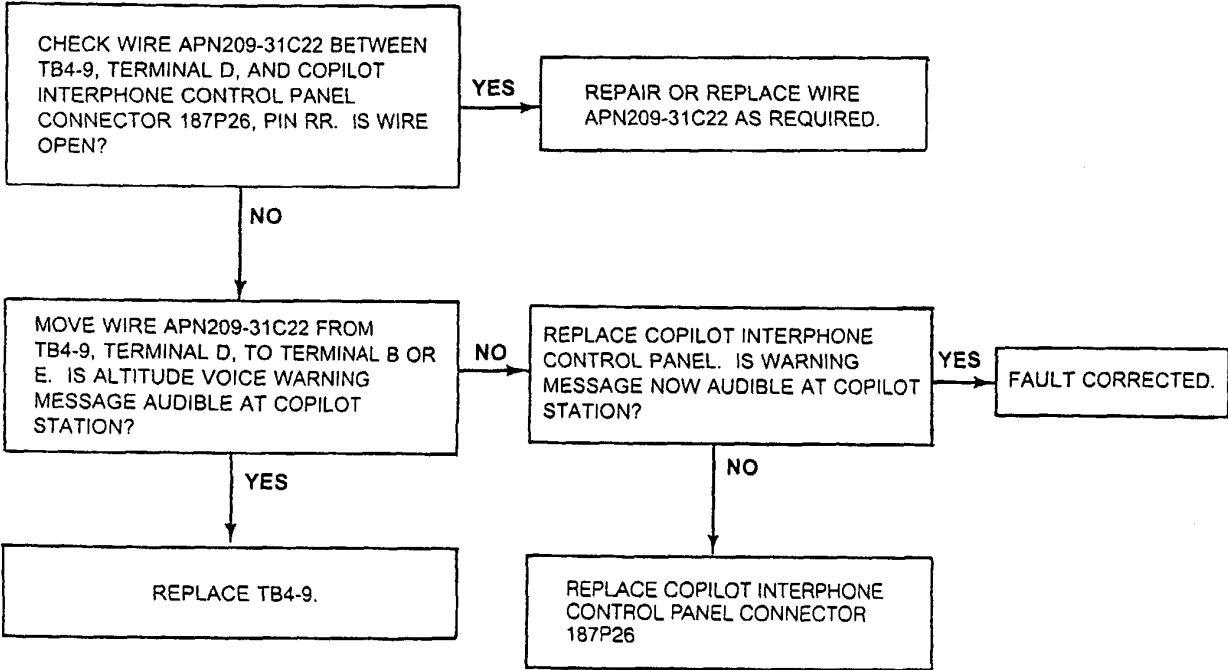
GO TO NEXT PAGE  
Change 18 18-55

18-2.4 ALTITUDE VOICE WARNING NOT AUDIBLE AT PILOT, COPILOT, OR  
AFT STATION/HOIST OPERATOR'S HEADSET WHEN PILOT'S RADAR  
ALTIMETER ALTITUDE POINTER IS BELOW OR ABOVE PRESET  
ALTITUDE LIMITS (Continued)

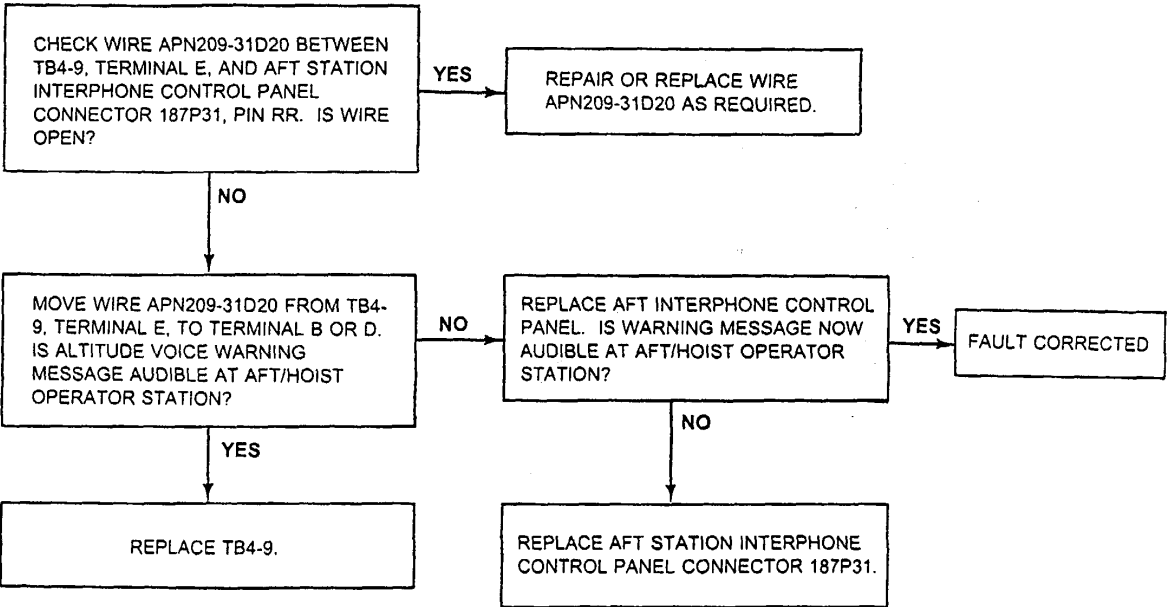
18-5.4



ALTITUDE VOICE WARNING NOT AUDIBLE AT COPILOT STATION ONLY.

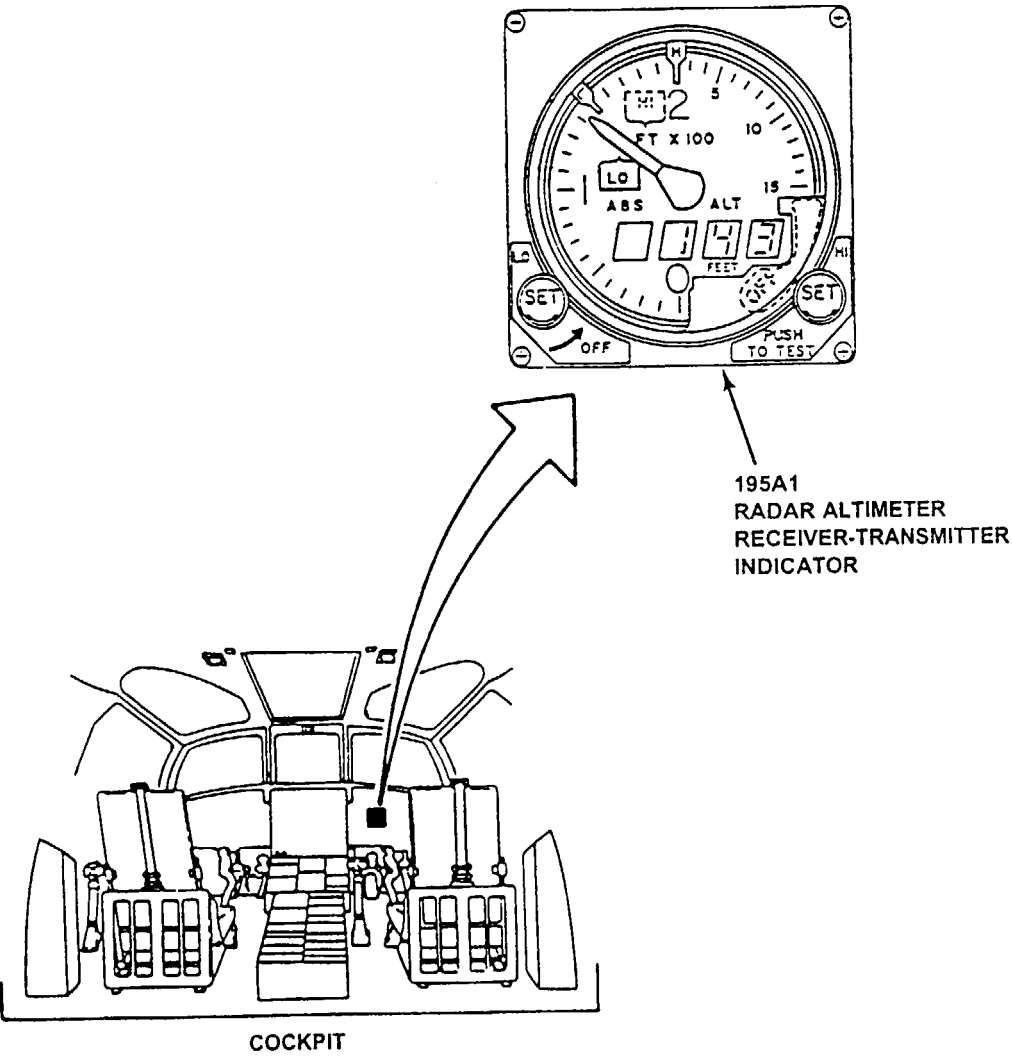


ALTITUDE VOICE WARNING NOT AUDIBLE AT AFT/HOIST OPERATOR STATION ONLY.



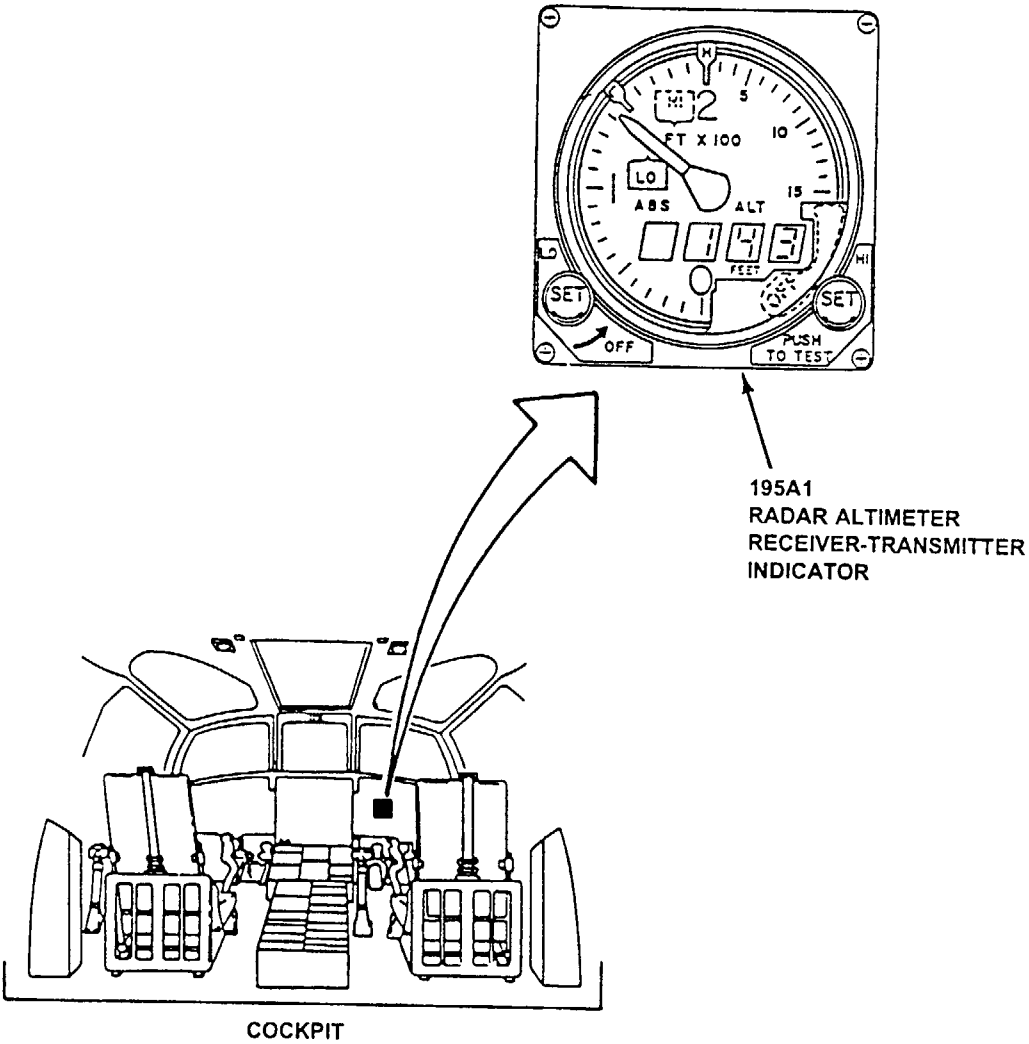
18-2.5	ALTITUDE VOICE WARNING MESSAGE VOLUME LEVEL DOES NOT FLUCTUATE WHEN PILOT RADAR ALTIMETER PRESS-TO-TEST KNOB IS MOMENTARILY DEPRESSED	18-2.5
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REPLACE PILOT'S ALTITUDE  
VOICE WARNING RADAR  
ALTIMETER



18-2.6	ALTITUDE VOICE WARNING MESSAGE IS AUDIBLE WHEN ALTITUDE POINTER IS WITHIN THE HI/LO SET INDEX ENVELOPE	18-2.6
--------	--	--------

REPLACE PILOT'S ALTITUDE  
VOICE WARNING RADAR  
ALTIMETER



**18-3 DOPPLER/GPS NAVIGATION SYSTEM**

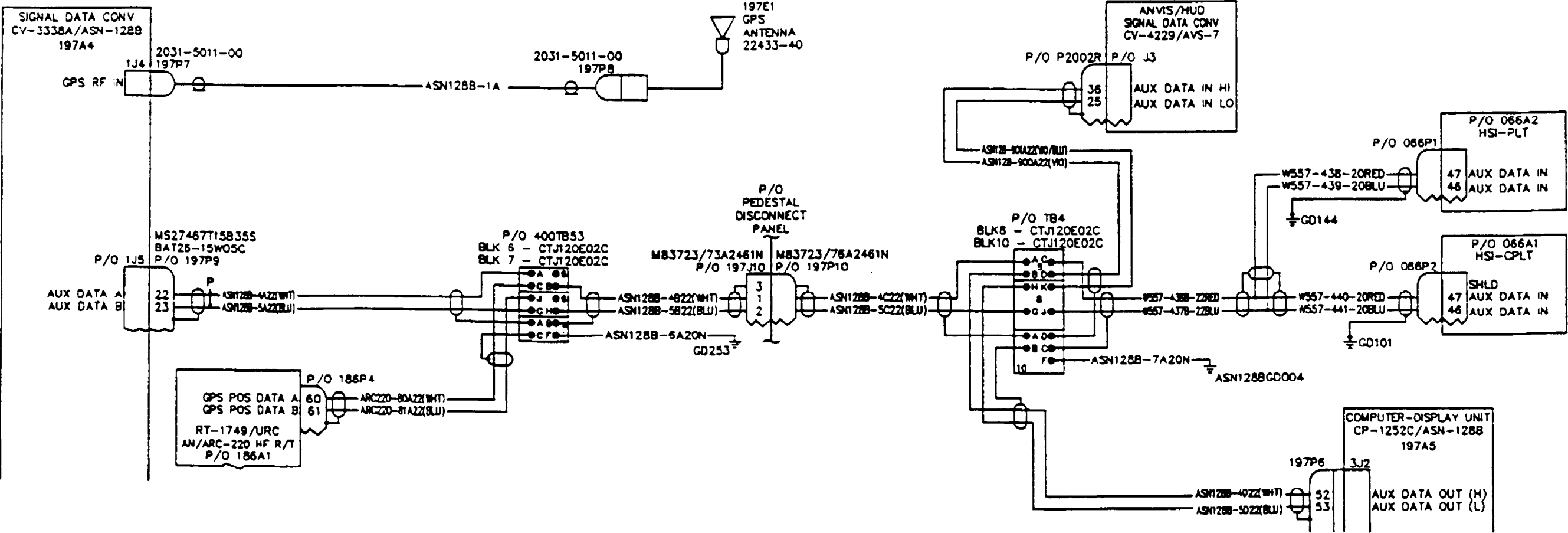


18-3 DOPPLER/GPS NAVIGATION SYSTEM

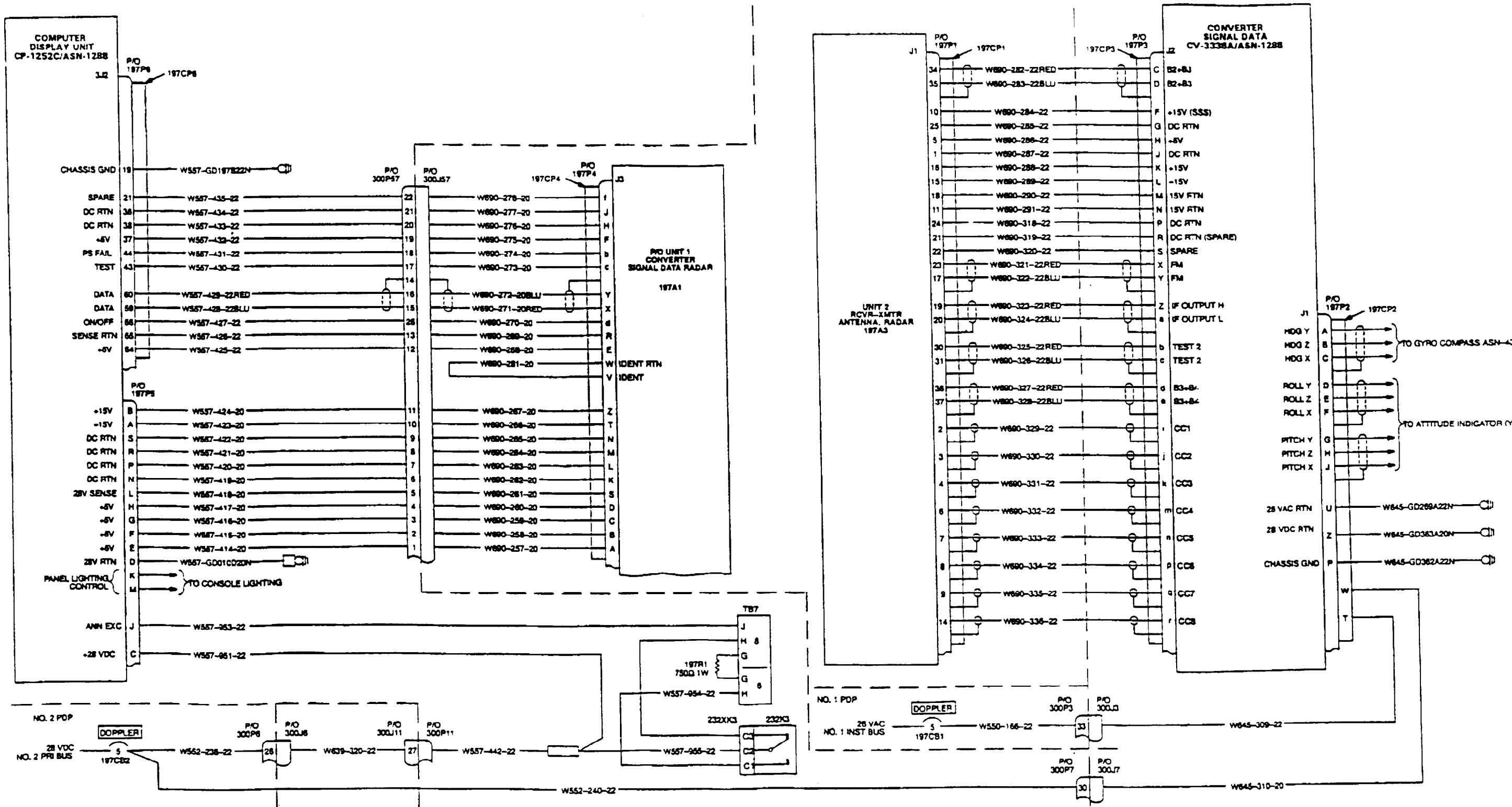
18-3

18-3.1 DOPPLER/GPS NAVIGATION SYSTEM WIRING DIAGRAM

18-3.1

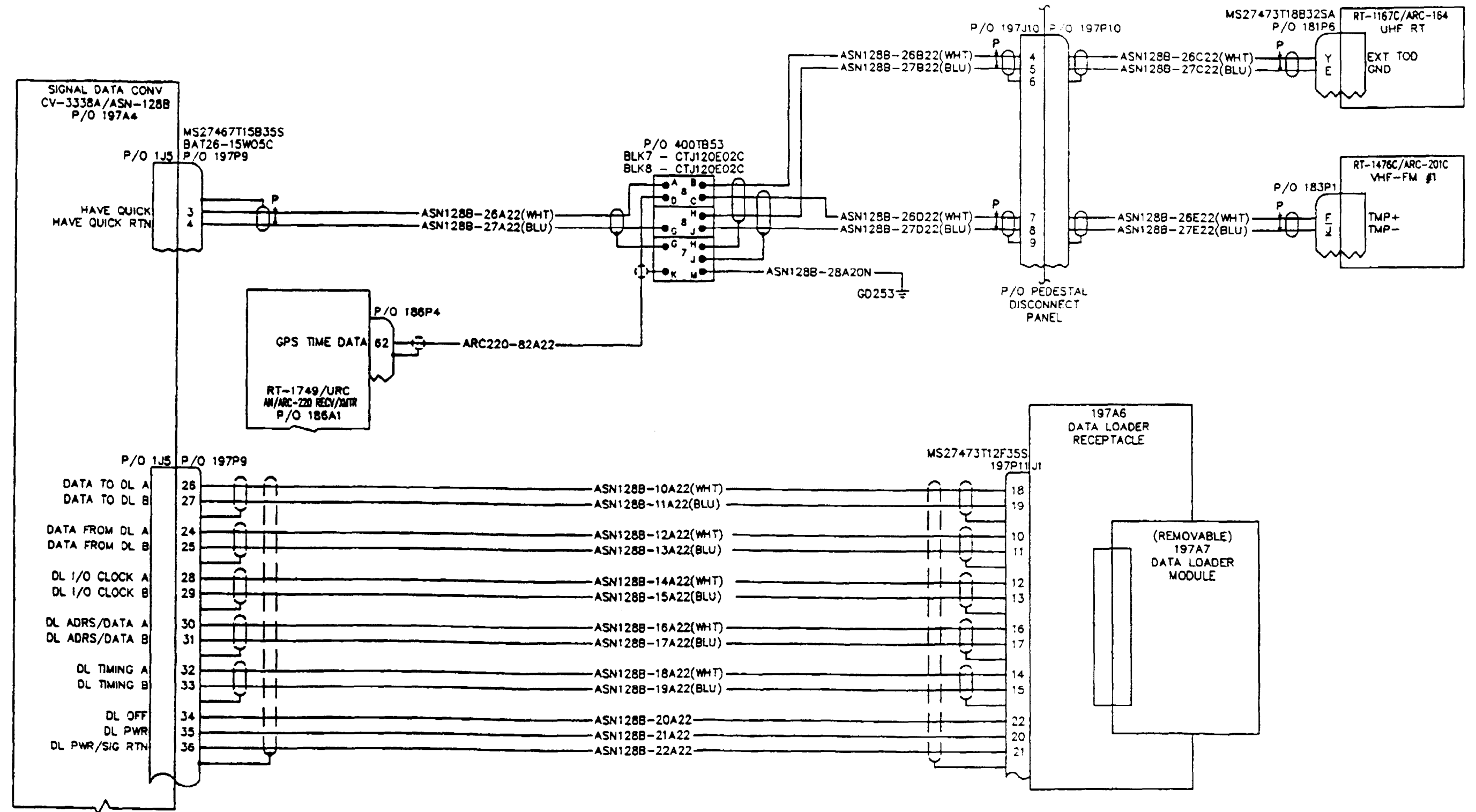


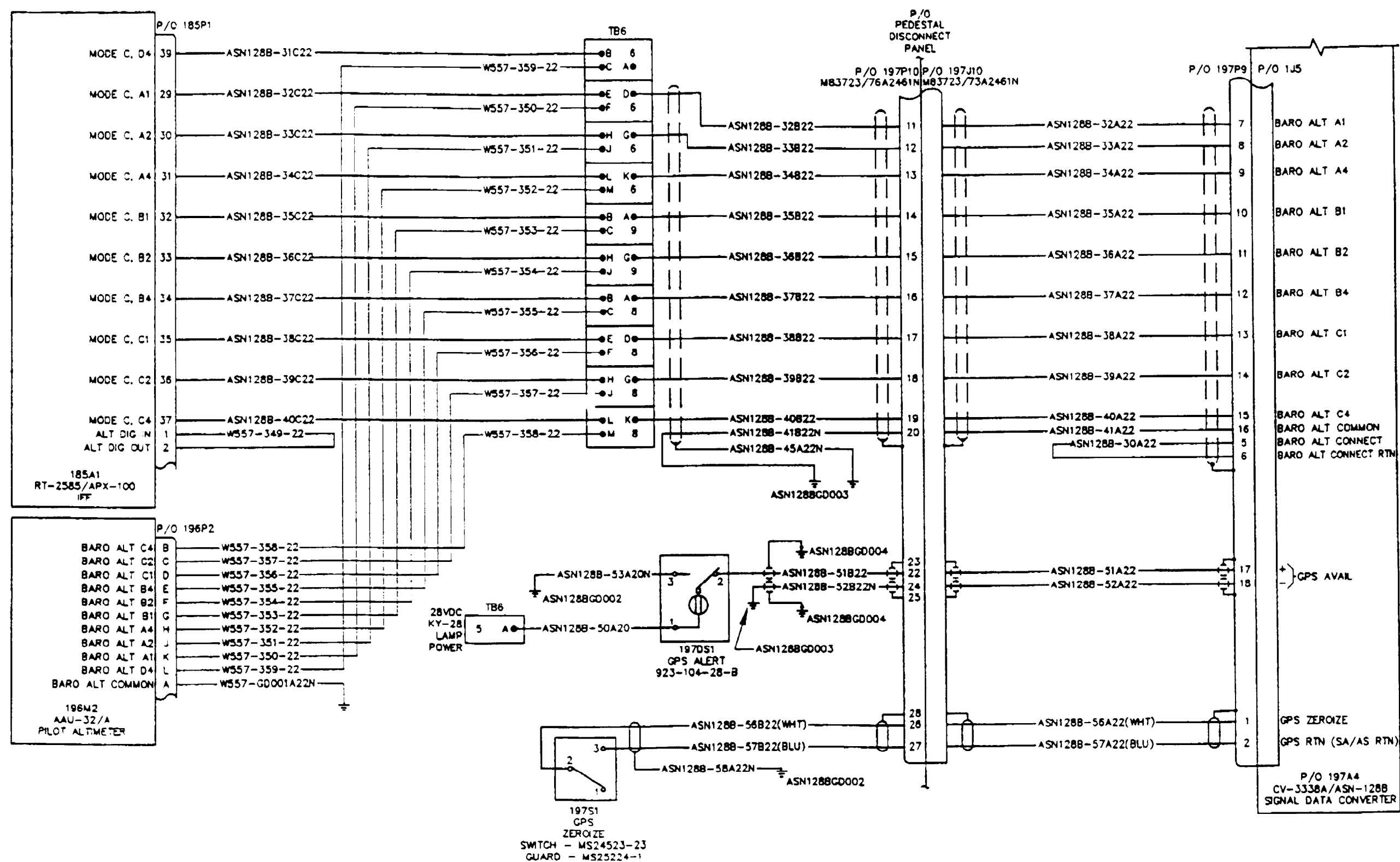
18-3.1 DOPPLER/GPS NAVIGATION SYSTEM WIRING DIAGRAM (Continued)





18-3.1 DOPPLER/GPS NAVIGATION SYSTEM WIRING DIAGRAM (Continued)





18-3.2 DOPPLER/GPS NAVIGATION SYSTEM VISUAL CHECK

INITIAL SETUP

**Applicable Configurations:**  
All

**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**  
None

**Personnel Required:**  
68F10 Aircraft Electrician

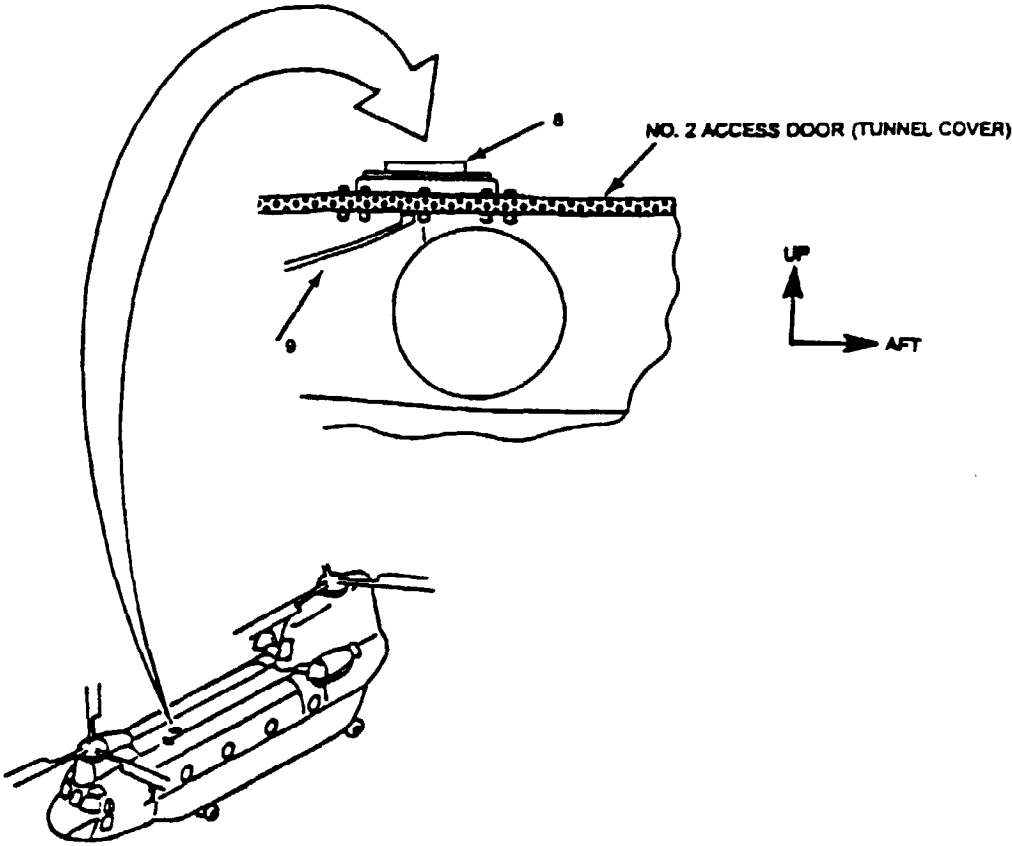
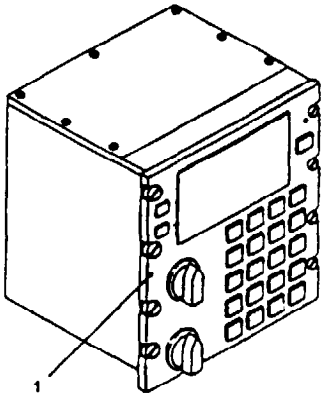
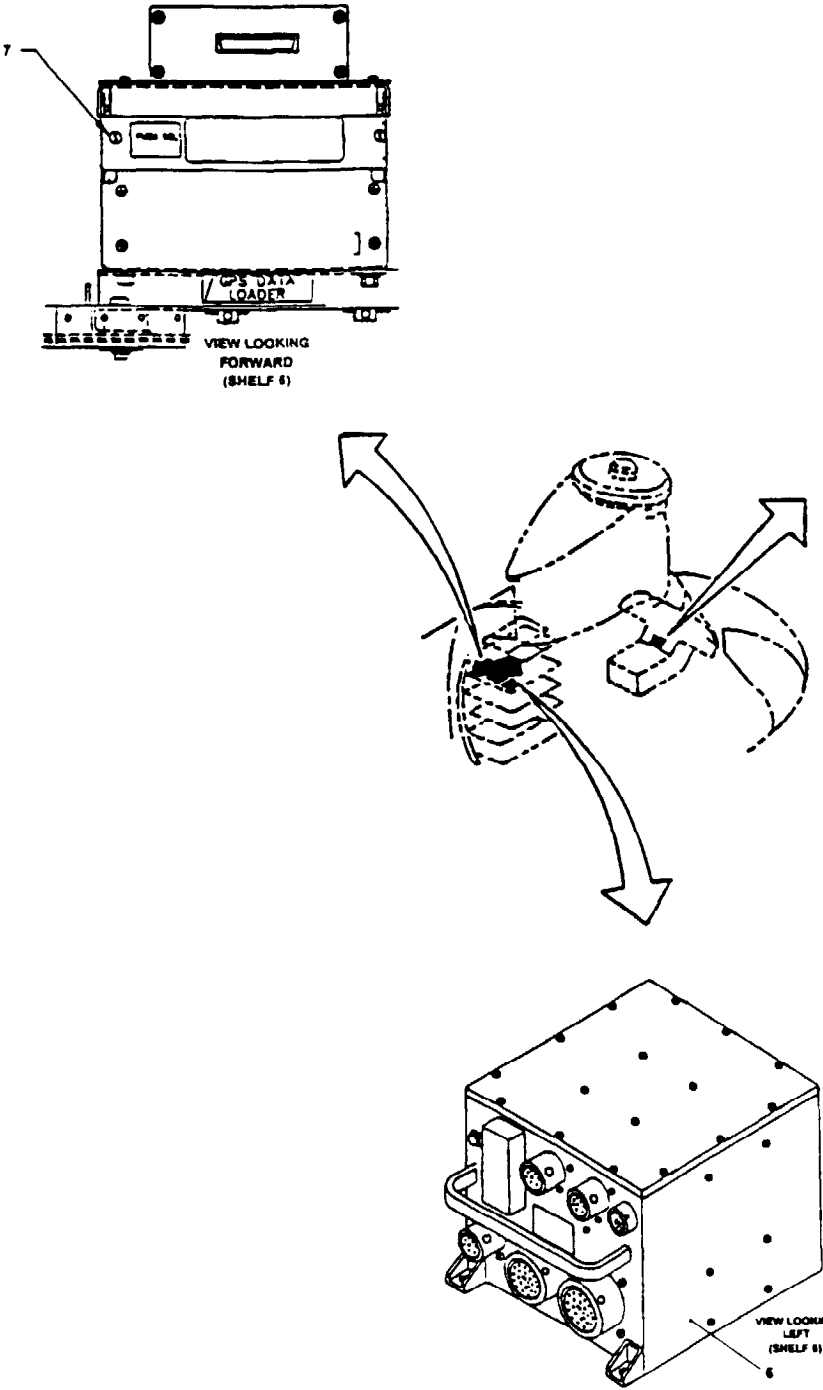
**References:**  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Disconnected  
Electrical Power Off  
No. 2 Access Door (Tunnel Cover)  
Open

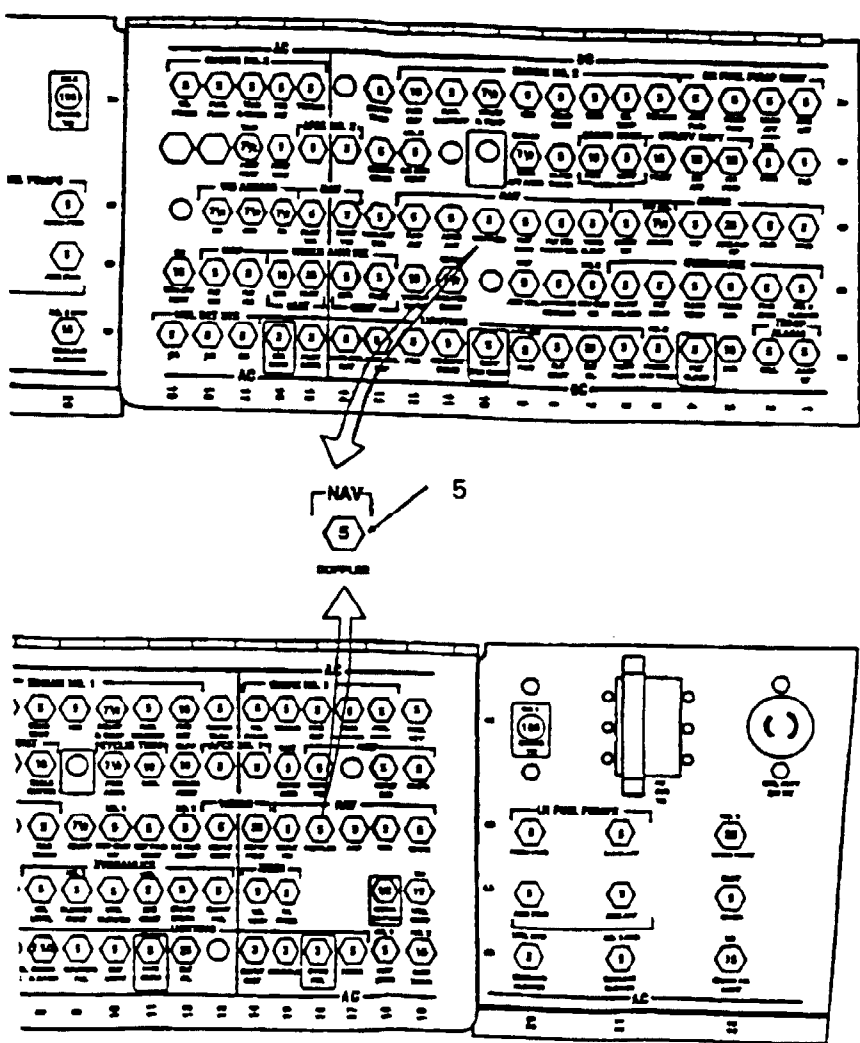
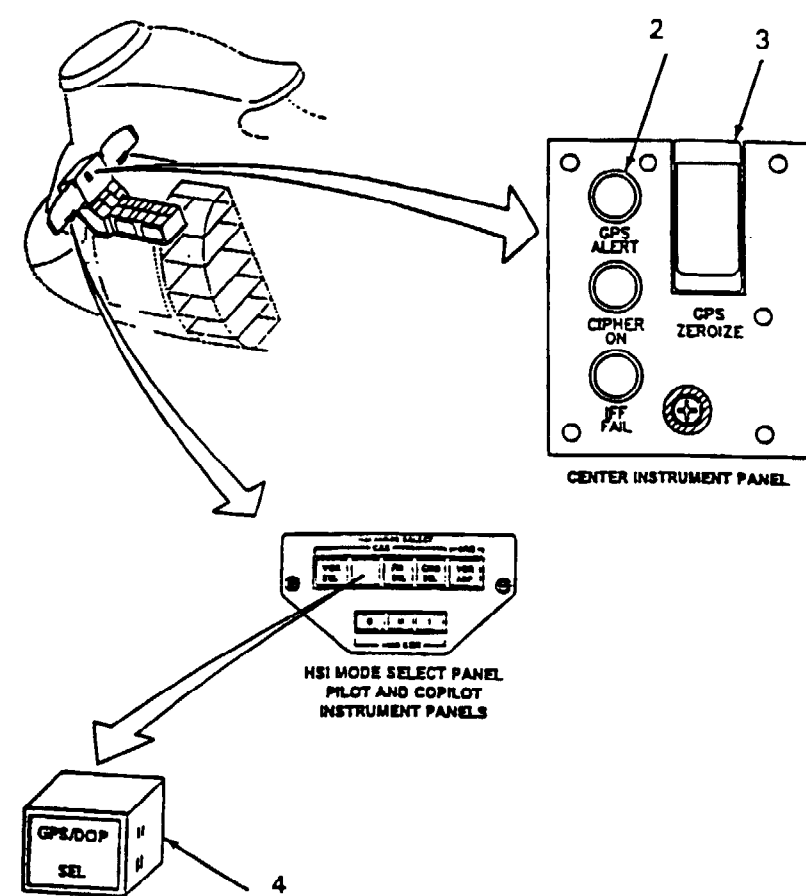
TASK	RESULT
1. Check DGNS CDU (1).	Loosen Dzus fasteners and check rear connectors of DGNS CDU (1). If connectors are loose or damaged tighten or replace it as required. If wiring to connector is loose or damaged, tighten, repair, or replace it as required. If display screen is damaged in any way replace CDU (1). If knobs are loose or broken tighten or replace as required. If pushbuttons are damaged replace CDU (1). Reinstall CDU (1) in the canted console tightening the Dzus fasteners.
2. Check GPS Alert Light Indicator (2).	If indicator (2) is loose or damaged tighten or replace as required.
3. Check GPS Zeroize Switch/Cover (3).	If switch or cover (3) is loose or damaged tighten or replace as required. If wiring to switch is loose or broken tighten, repair, or replace as required.
4. Check GPS/DOP SEL Indicator (4).	If indicator lens (4) is damaged replace.
5. Check DOPPLER Circuit Breakers (5).	If breakers (5) are loose or damaged tighten or replace as required. If wiring to breaker is loose or broken tighten, repair, or replace as required.
6. Check RADAR Signal Data Converter CV-3338A/ASN-128B (SDC) (6).	If SDC (6) is loose or damaged tighten or replace as required. If connectors to the SDC are loose or damaged tighten or replace as required. If wiring or cables to SDC are loose or damaged tighten, repair, or replace as required.

TASK	RESULT
7. Check GPS Data Loader Receptacle (7).	If receptacle (7) is loose or damaged tighten or replace as required. If pushbutton is loose or damaged replace Data Loader Receptacle. If the connector to the receptacle is loose or damaged tighten or replace as required If wiring to the connector is loose or damaged tighten, repair, or replace as required.
8. Check GPS Antenna (8).	If antenna (8) is loose or damaged tighten or replace as required. If cable (9) to antenna is loose or broken tighten or replace as required. <b>DO NOT REPAIR THIS CABLE.</b>

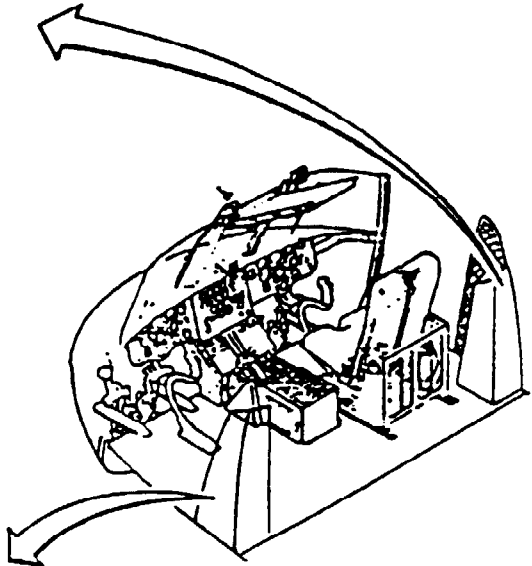
FOLLOW-ON MAINTENANCE:  
Close No. 2 Access Door (Tunnel Cover)



GO TO NEXT PAGE



NOTE: PDP'S ROTATED 90 DEGREES FOR CLARITY



END OF TASK



18-3.3 DOPPLER/GPS NAVIGATION SYSTEM OPERATIONAL CHECK

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

Aircraft Electrician (2)

References:

TM 11-1520-240-23  
TM 11-5841-305-12  
TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
Doppler/GPS Navigation System Visual  
Check Performed  
(Task 18-3.2)

TASK	RESULT
------	--------

NOTE

Remove aircraft from overhead cover.

CHECK CIRCUIT BREAKERS

1. Check that DOPPLER breakers (1) on No. 1 and 2 pdp are closed.

If circuit breakers are open, close them.
2. Start APU. Refer to task 15-1.4.

APU ON capsule shall come on.

CHECK DGNS LIGHTING

3. Turn aircraft CTR CSL LTG control (2) clockwise and counterclockwise while checking CDU (3) Edge lighting is illuminated and all keyboard keys are illuminated.

CDU (3) panel Edge light and all keyboard lights shall vary with the changing setting of the aircraft dimmer control (2). If CDU (3) panel Edge and keyboard lights are not visible or intensity level does not vary with aircraft dimmer control (2) go to task 18-3.4
4. Set CDU (3) MODE switch (4) to LAMP TEST. Enter GPS mode "M". Verify that MAL LAMP and ail LED segments on four-line display are illuminated.

CDU MAL LAMP and all LED segments on four-line display are illuminated. If CDU MAL LAMP and all LED segments are not illuminated go to task 18-3.5.
5. Press CDU (3) DIM (5) pushbutton several times, the BRT (6) pushbutton several times.

The LED display will grow dimmer then brighten. If the intensity of the LED display does not vary replace CDU.

TASK

RESULT

6. Set CDU (3) MODE switch (4) to TEST.

After Doppler and/or GPS self tests have been completed (approximately 15 seconds for Doppler, up to 2 minutes for GPS) one of the following indications will be observed in left and right displays. If the display is not GO ALL go to task 18-3.6.

NOTE

In the event TEST mode display is not GO ALL the system should be recycled through OFF to verify that the failure is not momentary one.

LEFT DISPLAY	RIGHT DISPLAY	REMARKS
GO		Doppler has completed Built In Test (BIT) and is operating satisfactorily, GPS is still performing BIT (GPS has a 2 minute BIT cycle maximum). Note that a rotating bar in the display indicates that the GPS is still performing self test.
GO	ALL	The entire system has completed BIT and is operating satisfactorily.
GO	P	Pitch or Roll data is missing or exceeds 90 degrees. In this case, pitch and roll in the computer are both set to zero and navigation in the Doppler mode continues with degraded operation. Problem may be in the vertical gyro or aircraft cabling.
NG	C, R, S or H followed by a numeric code	A failure has occurred in the Computer Display Unit or the Signal Data Converter Power Supply. The operator should not use the System.
DN	GPS failure code	GPS has failed but operator can use Doppler to perform all navigation.
DF	Doppler failure code	Doppler has failed. GPS is still performing self test.
GN	Doppler failure code	Doppler has failed but operator can use GPS to perform all code navigation.

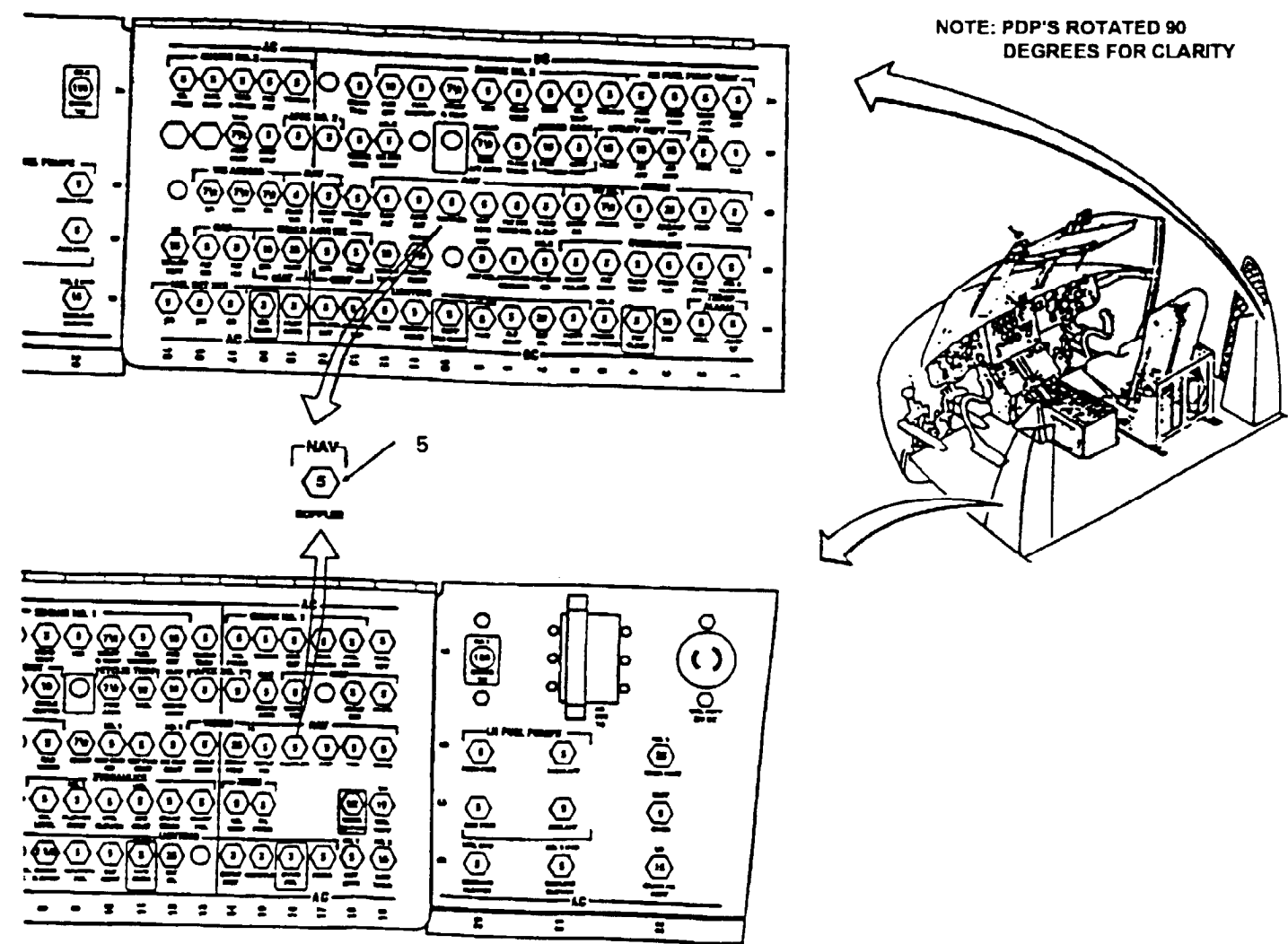
GO TO NEXT PAGE

18-3.3 DOPPLER/GPS NAVIGATION SYSTEM OPERATIONAL CHECK (Continued)

18-3.3

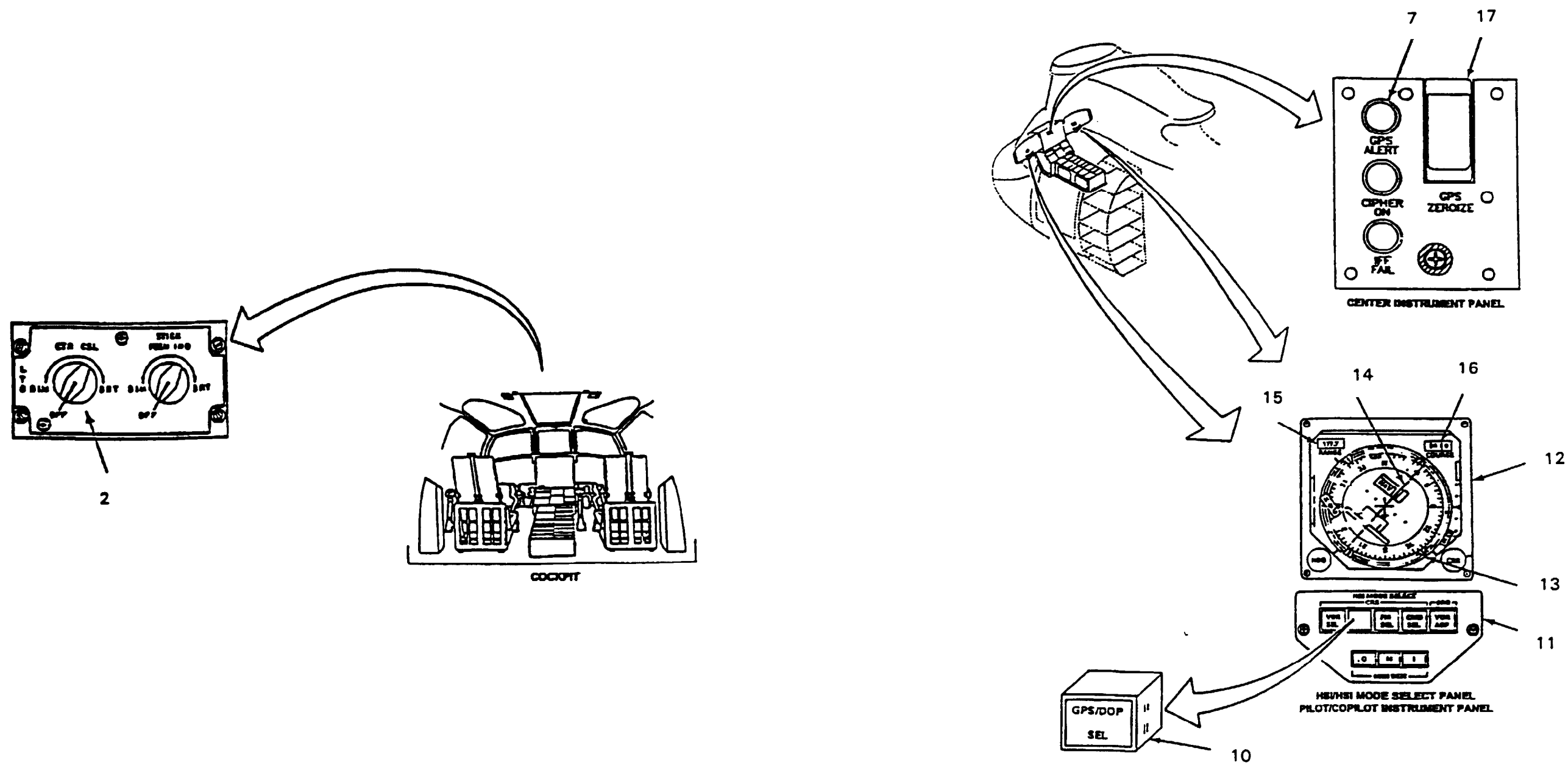
TASK	RESULT
7. Depress GPS Alert Indicator (7).	GPS Alert Indicator (6) illuminates. If indicator does not illuminate, go to task 18-3.7.
8. Place CDU DISPLAY switch (9) to PP.	Present position is displayed. If present position is not displayed, go to task 18-3.8.
9. Perform the following for downloading of waypoints from Data Loader Cartridge: <div><div>a. Place CDU (3) MODE switch (4) to OFF</div><div>b. Insert a programmed Data Loader in Receptacle (8).</div><div>c. Set CDU Mode switch to MGRS.</div><div>d. Make sure Mode of the GPS is in M.</div><div>e. Set CDU Display switch to WIND UTC/DATA.</div><div>f. Depress ENT twice to display the selection menu.</div><div>g. Enter 4 to select the data load page.</div><div>h. To begin downloading, depress KYBD and enter "Y" (yes).</div></div>	CDU (3) displays DOWNLOAD WAYPTS IN PROCESS and WAIT ACK during waypoint loading and DOWNLOAD WAYPTS COMPLETE within one minute to indicate that waypoint loading is complete. If display is incorrect go to task 18-3.9.
10. Turn CDU (3) MODE switch (4) to OFF, remove Data loader cartridge from the receptacle and turn the MODE switch (4) to MGRS.	
11. Turn CDU (3) DISPLAY switch to (9) DIST/ BRG/TIME and select several waypoints.	The four-line display will display distance, bearing and time information for each waypoint. If any four-line display is incorrect, replace the CDU.
12. Depress the GPS/DOP lenses (10) on each of the two HSI Mode Select Panels (11) (one each in pilot and copilot Instrument panels).	The SEL indication at the lower half of each GPS/DOP (8) lens shall be illuminated. If SEL not illuminated, go to TM 11-1520-240-23.
13. Observe each HSI (12).	The number one needle (13) of each HSI indicator (12) shall swing to show the bearing to the station with the course deviation bar (14) centered. The Range (15) and Course (16) readouts shall also be accurate. If the number one needle (13) does not swing to show bearing to the station or the Range (15) and Course (16) readouts are not accurate, go to TM 11-1520-240-23.

TASK	RESULT
14. Observe each HSI (12) and four-line display on the CDU (3).	The indications on the four-line display and each HSI are the same. If the indications are not the same, go to task 18-3.10.
15. In the center instrument panel switch GPS ZEROIZE switch (17) up then down. On the CDU (3) set DISPLAY switch to DIST/BRG/TIME and observe the four-line display.	All waypoints have disappeared. If waypoints have not disappeared, go to task 18-3.11.
16. Reperform steps 8, 9 and 10 above.	This task shows that the system is functional and ready. If waypoints could not be downloaded, go to task 18-3.9.
17. Perform HAVEQUICK checks on the HF, UHF and SINCGARS Radio Sets.	The Radio Sets have HAVEQUICK Timing. If any or all Radio Sets do not have HAVEQUICK Timing go to task 18-3.12
18. Turn CDU (3) MODE switch (4) to OFF.	The Doppler/GPS Navigation System is off.
19. Stop APU. Refer to task 15-1.4.	
FOLLOW-ON MAINTENANCE: <div>TM 55-1520-240-23:<div>Battery Disconnected</div>Electrical Power Off</div>	

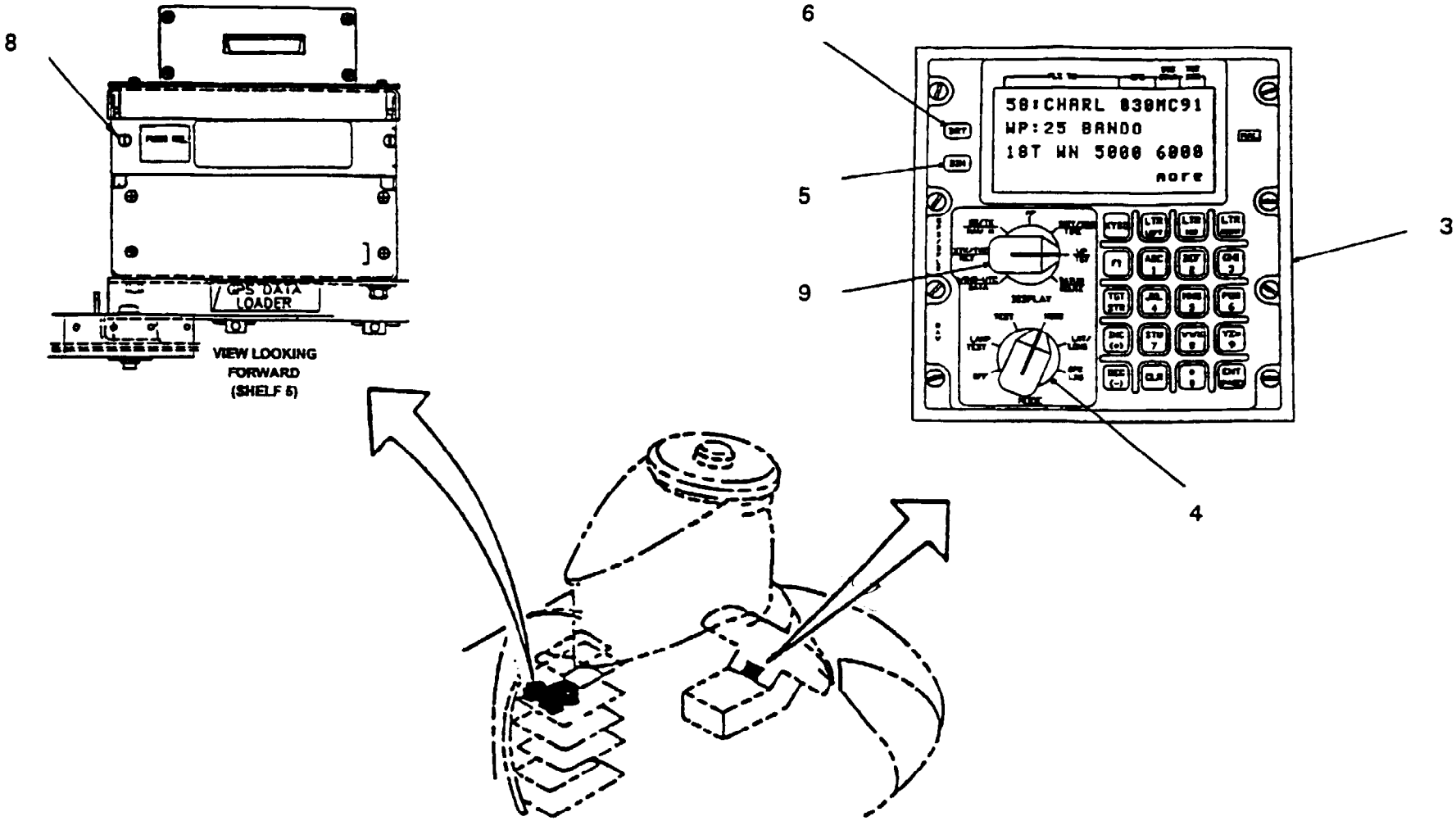


18-3.3 DOPPLER/GPS NAVIGATION SYSTEM OPERATIONAL CHECK (Continued)

18-3.3



GO TO NEXT PAGE



END OF TASK

18-3.4

EDGE LIT PANEL DOES NOT LIGHT OR VARY

FAULT ISOLATION PROCEDURES

INITIAL SETUP

**Applicable Configurations:**

All

**References:**

TM 11-1520-240-23  
TM 11-5841-305-12  
TM 55-1520-240-23

**Tools:**

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Equipment Condition:**

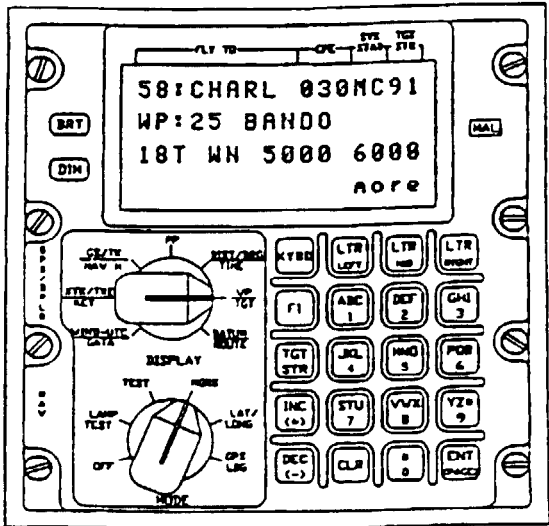
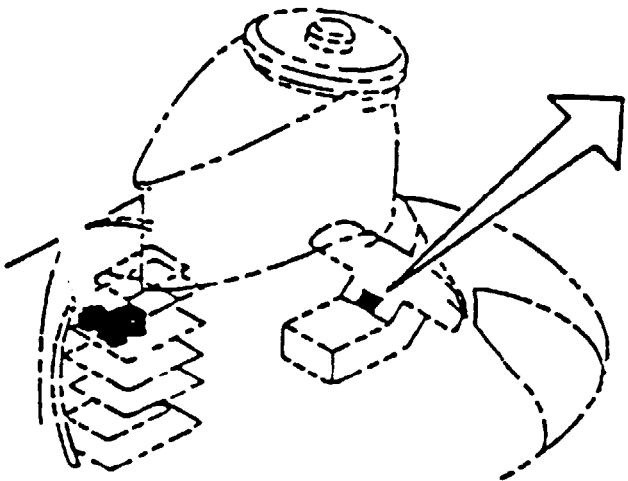
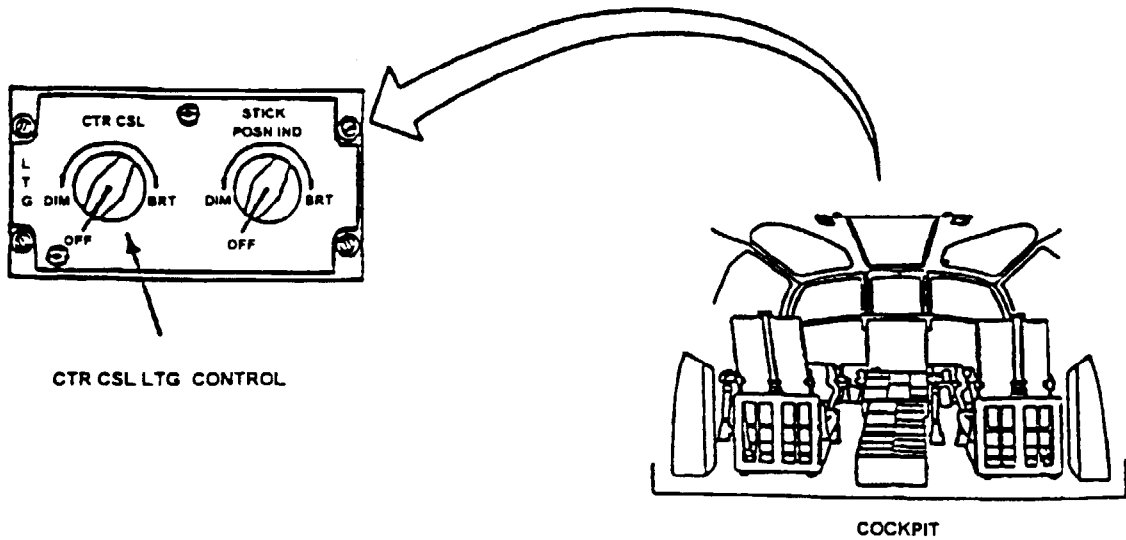
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

**Materials:**

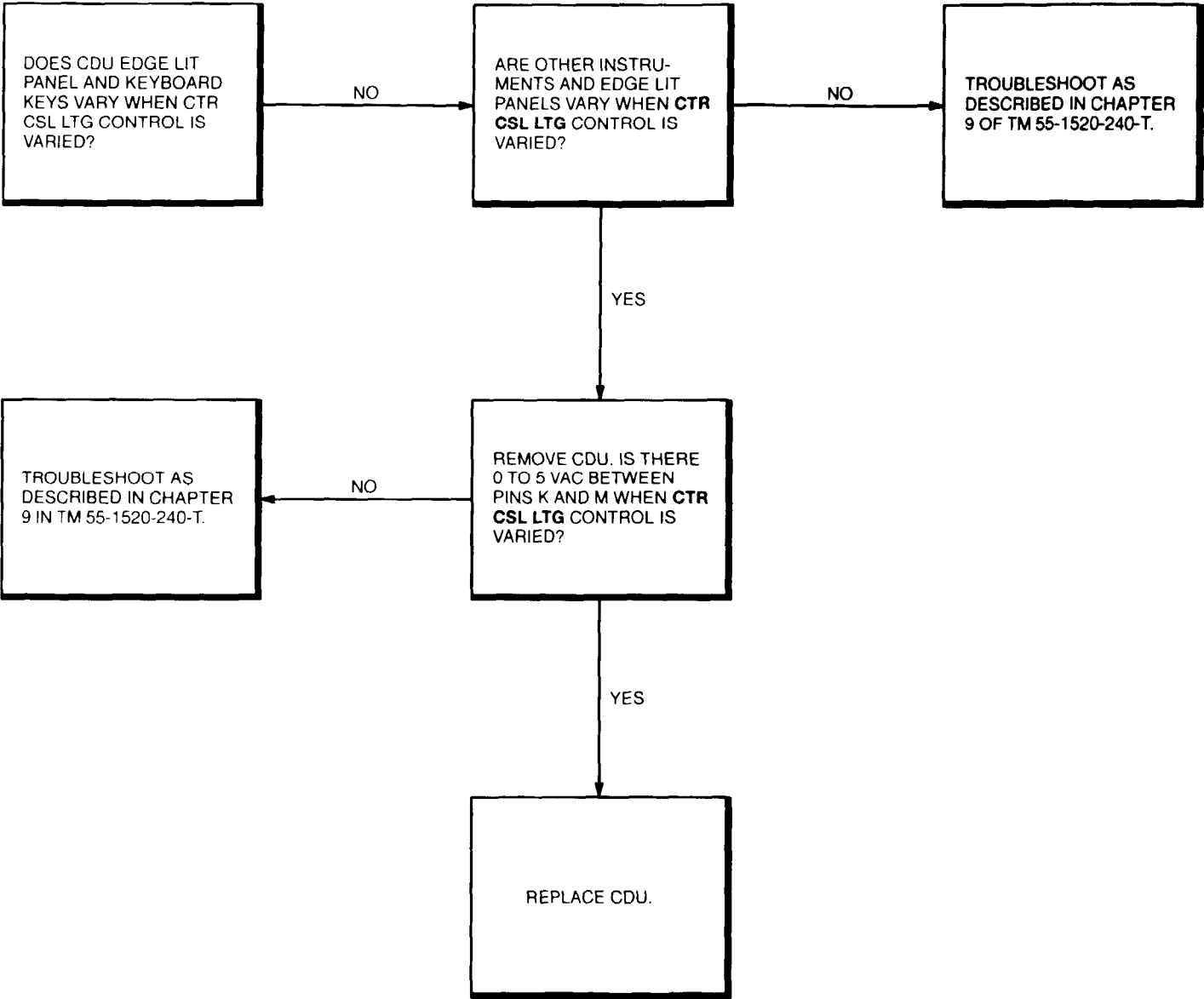
None

**Personnel Required:**

Aircraft Electrician



GO TO NEXT PAGE



END OF TASK

18-3.5 CDU MAL LAMP AND ALL LED SEGMENTS ARE NOT ILLUMINATED

FAULT ISOLATION PROCEDURES

INITIAL SETUP

Applicable Configurations:  
All

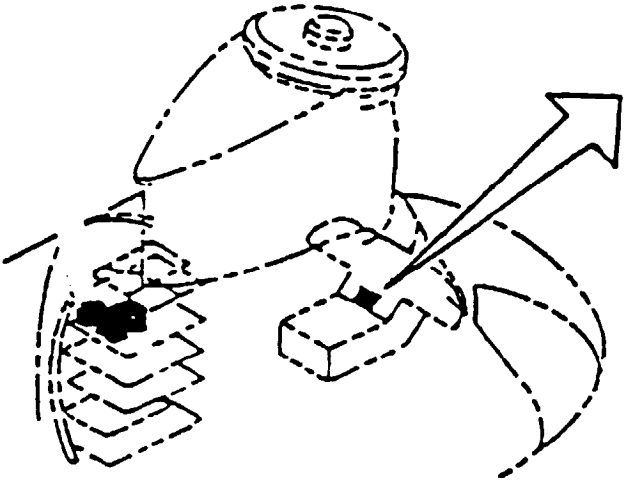
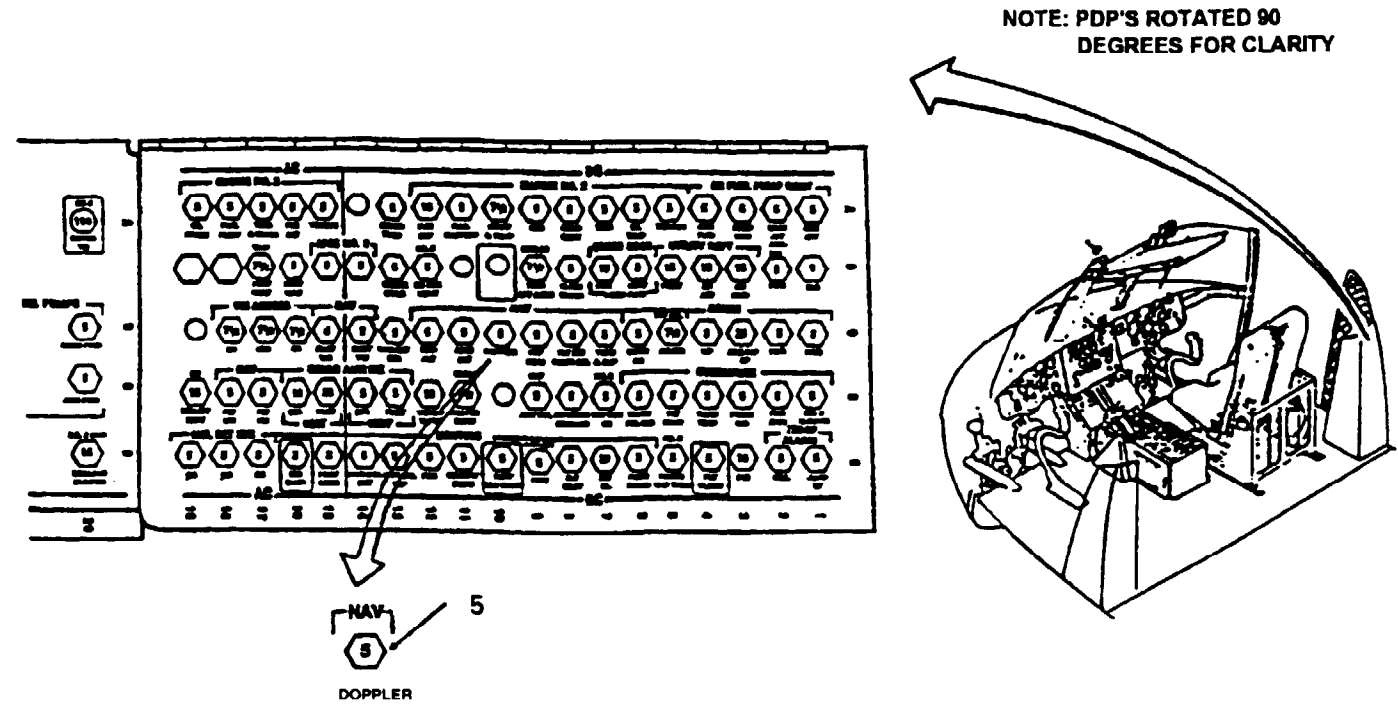
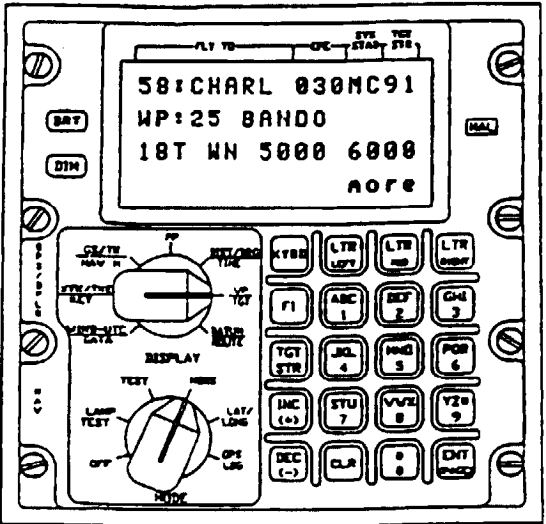
References:  
TM 11-1520-240-23  
TM 11-5841-305-12  
TM 55-1520-240-23

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

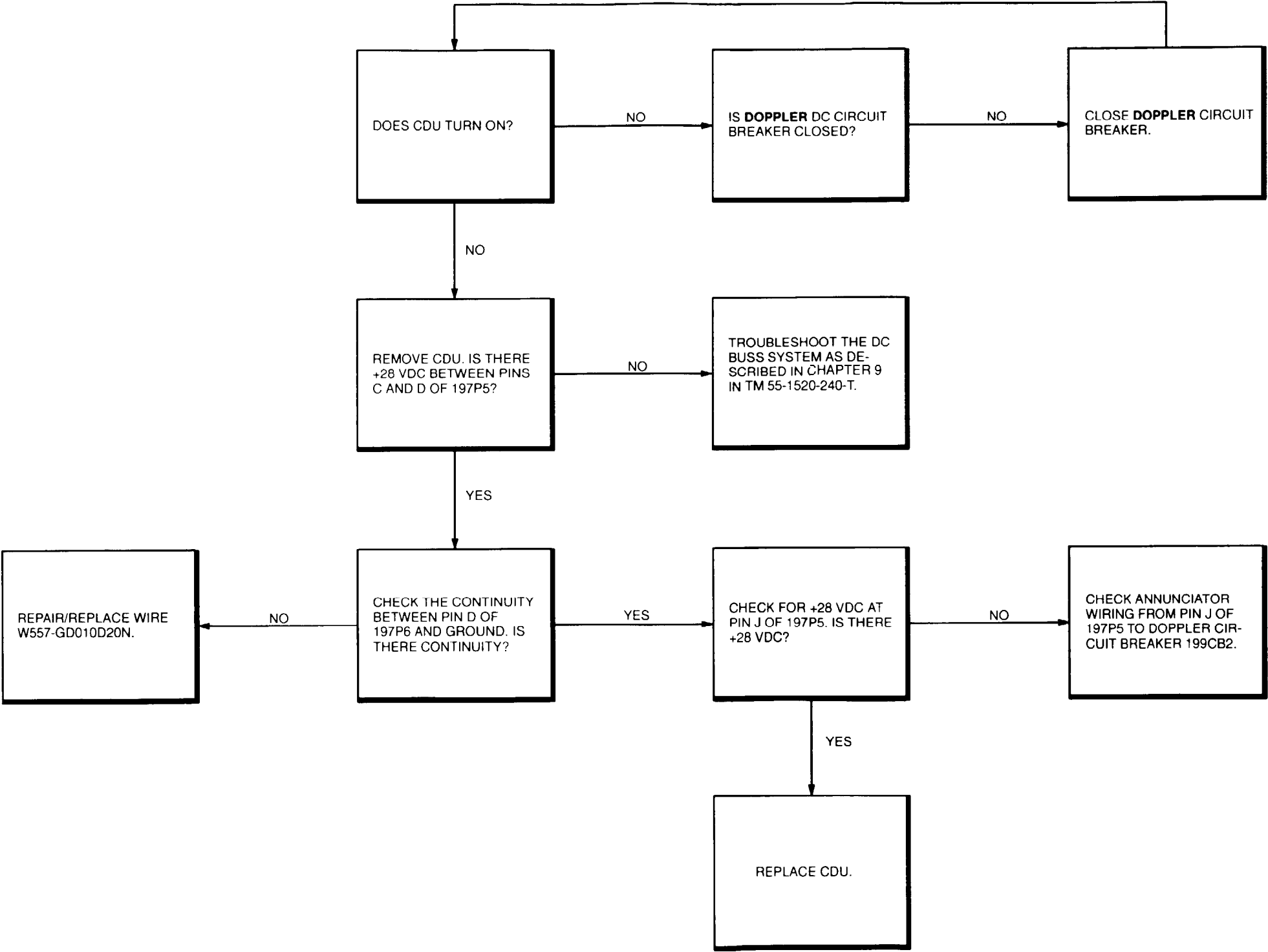
Materials:  
None

Personnel Required:  
Aircraft Electrician



GO TO NEXT PAGE





END OF TASK

18-3.6 CDU DISPLAY IS NOT GO ALL

FAULT ISOLATION PROCEDURES

INITIAL SETUP

Applicable Configurations:

All

References:

- TM 11-1520-240-23
- TM 11-5841-305-12
- TM 55-1520-240-23

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Equipment Condition:

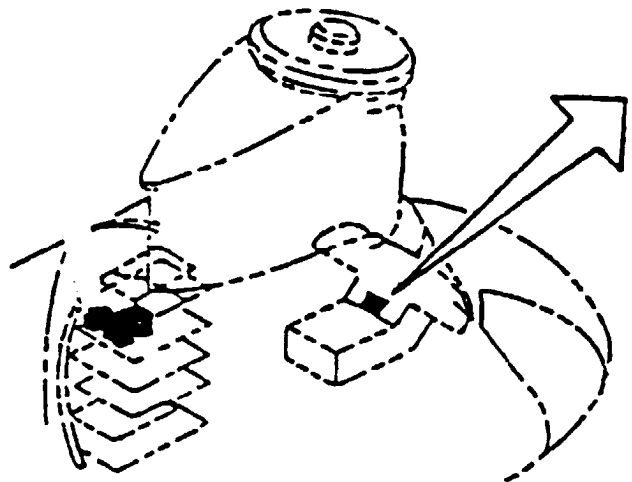
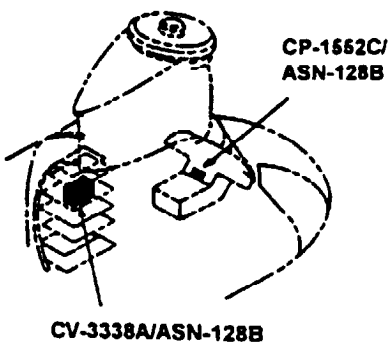
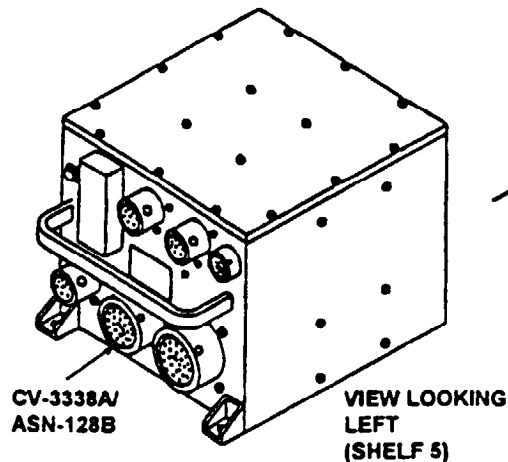
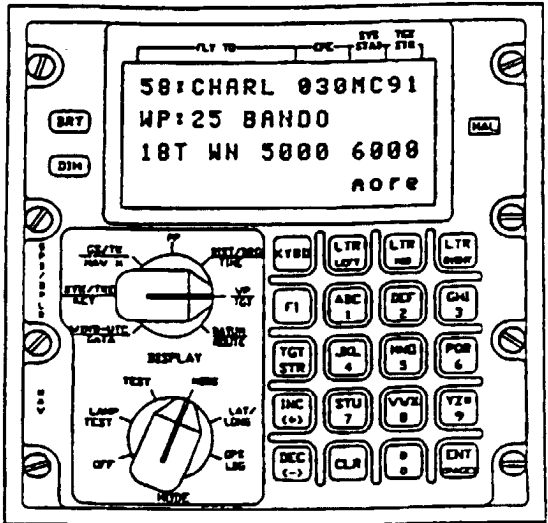
- TM 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

Materials:

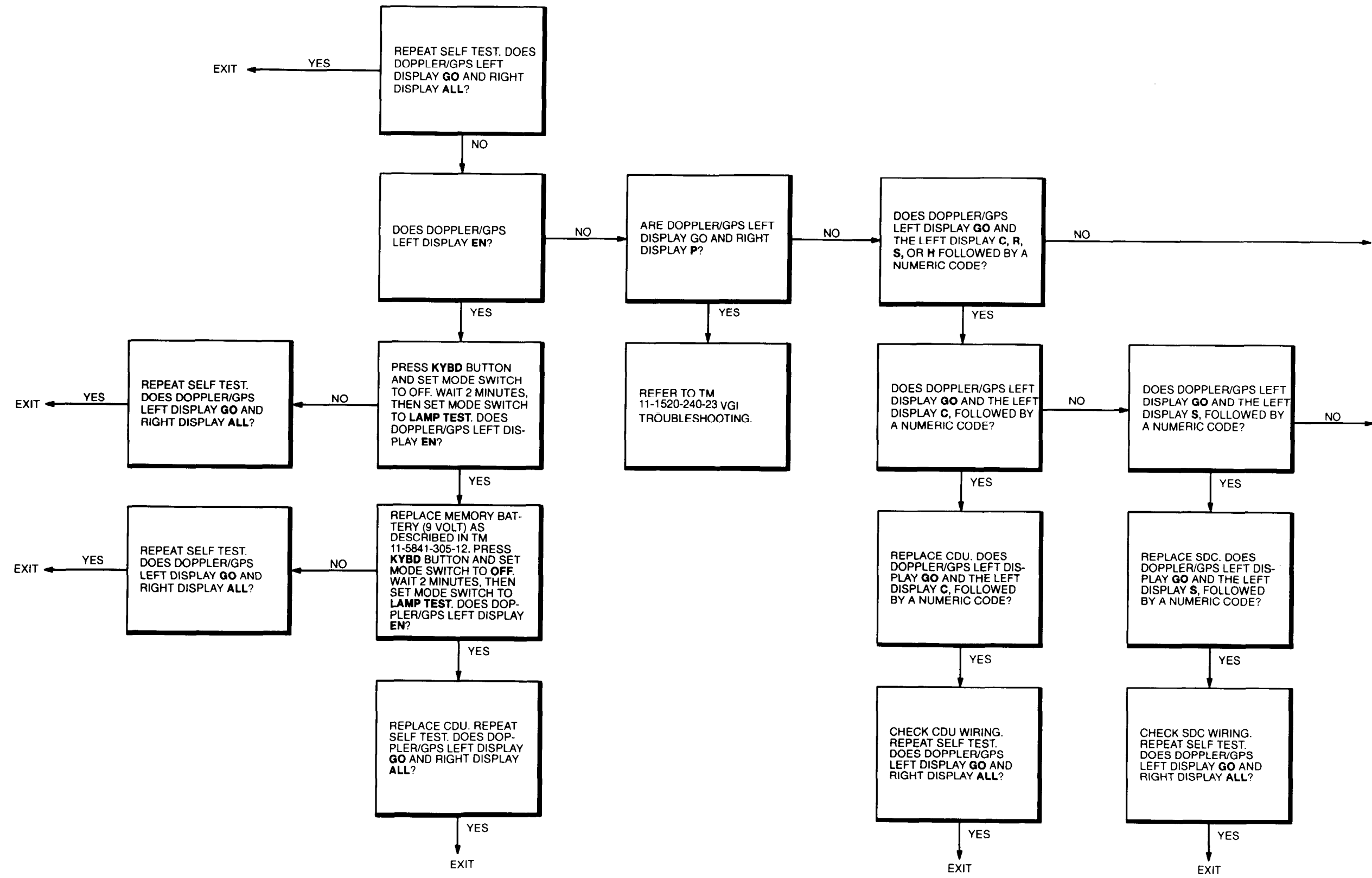
None

Personnel Required:

Aircraft Electrician



GO TO NEXT PAGE



GO TO NEXT PAGE

### 18-3.6 CDU DISPLAY IS NOT GO ALL

## FAULT ISOLATION PROCEDURES

## INITIAL SETUP

### Applicable Configurations:

All

### References:

TM 11-1520-240-23

TM 11-5841-305-12

TM 55-1520-240-23

### Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Equipment Condition:**

TM 55-1520-240-23:

Battery Connected

Electrical Power On

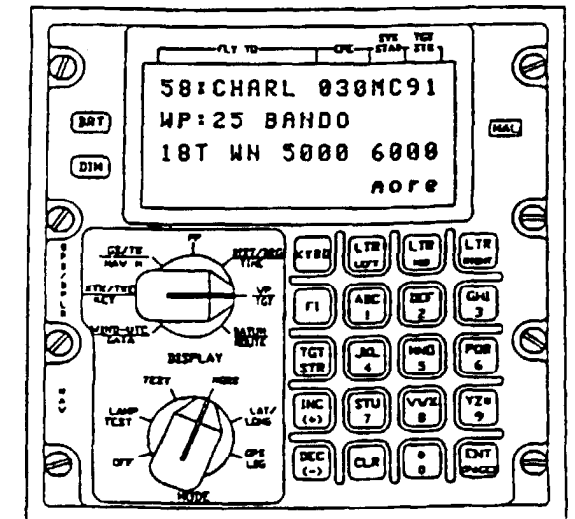
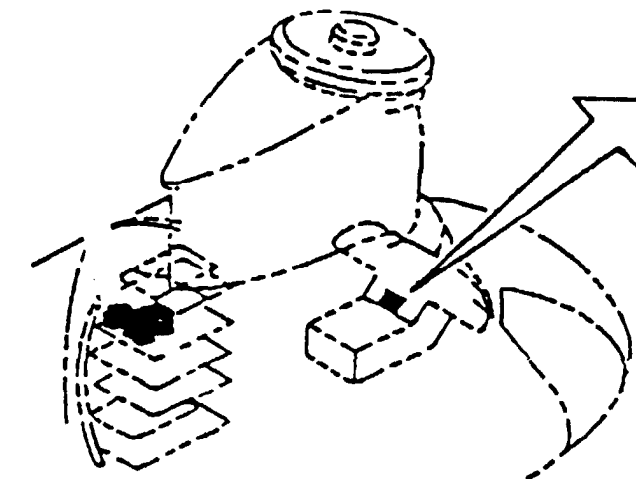
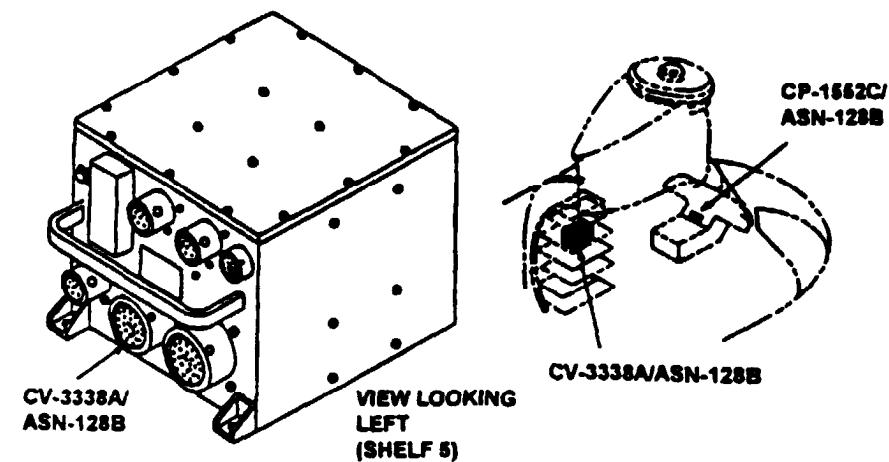
Hydraulic Power Off

**Materials:**

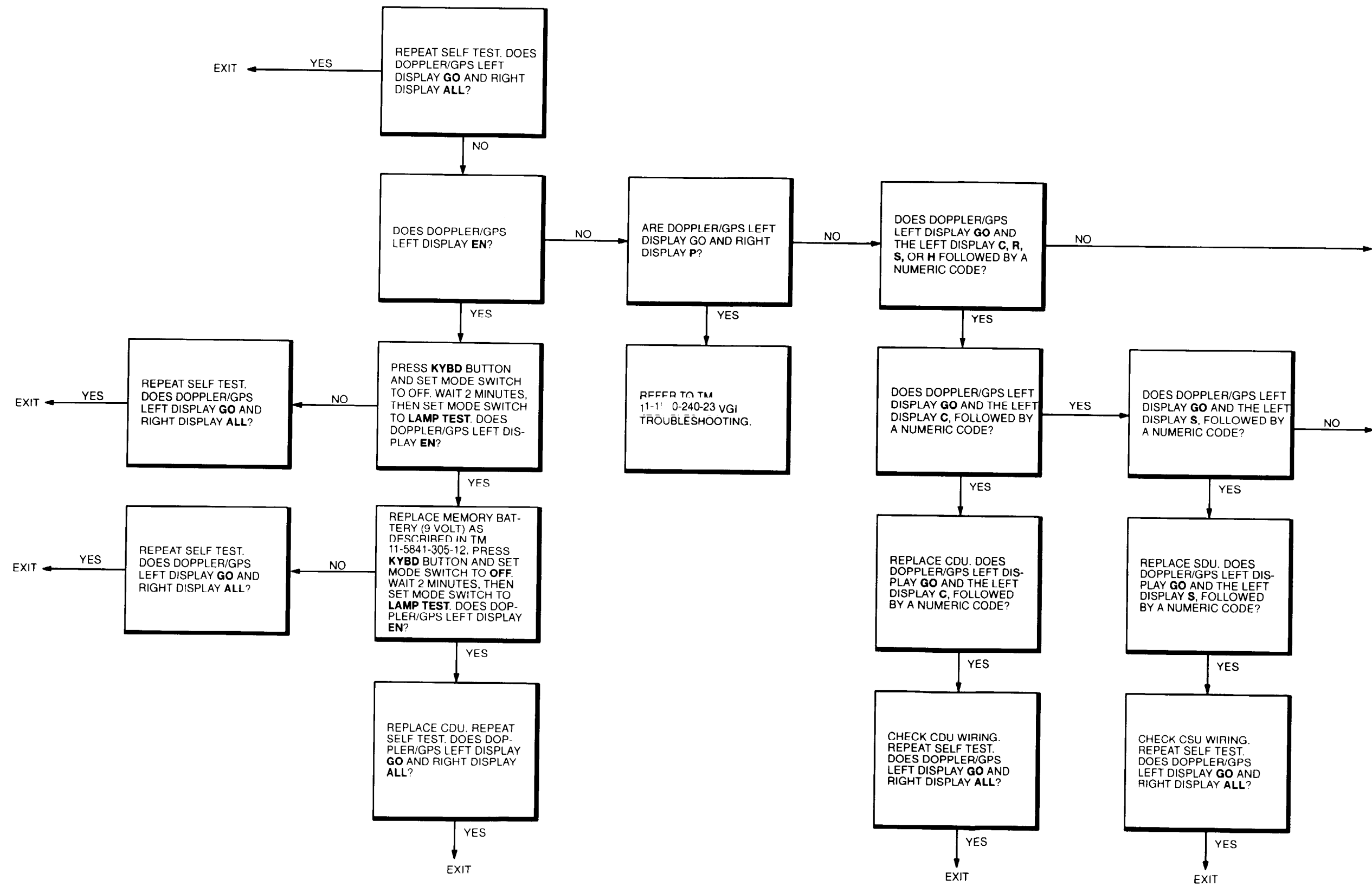
None

**Personnel Required:**

Aircraft Electrician

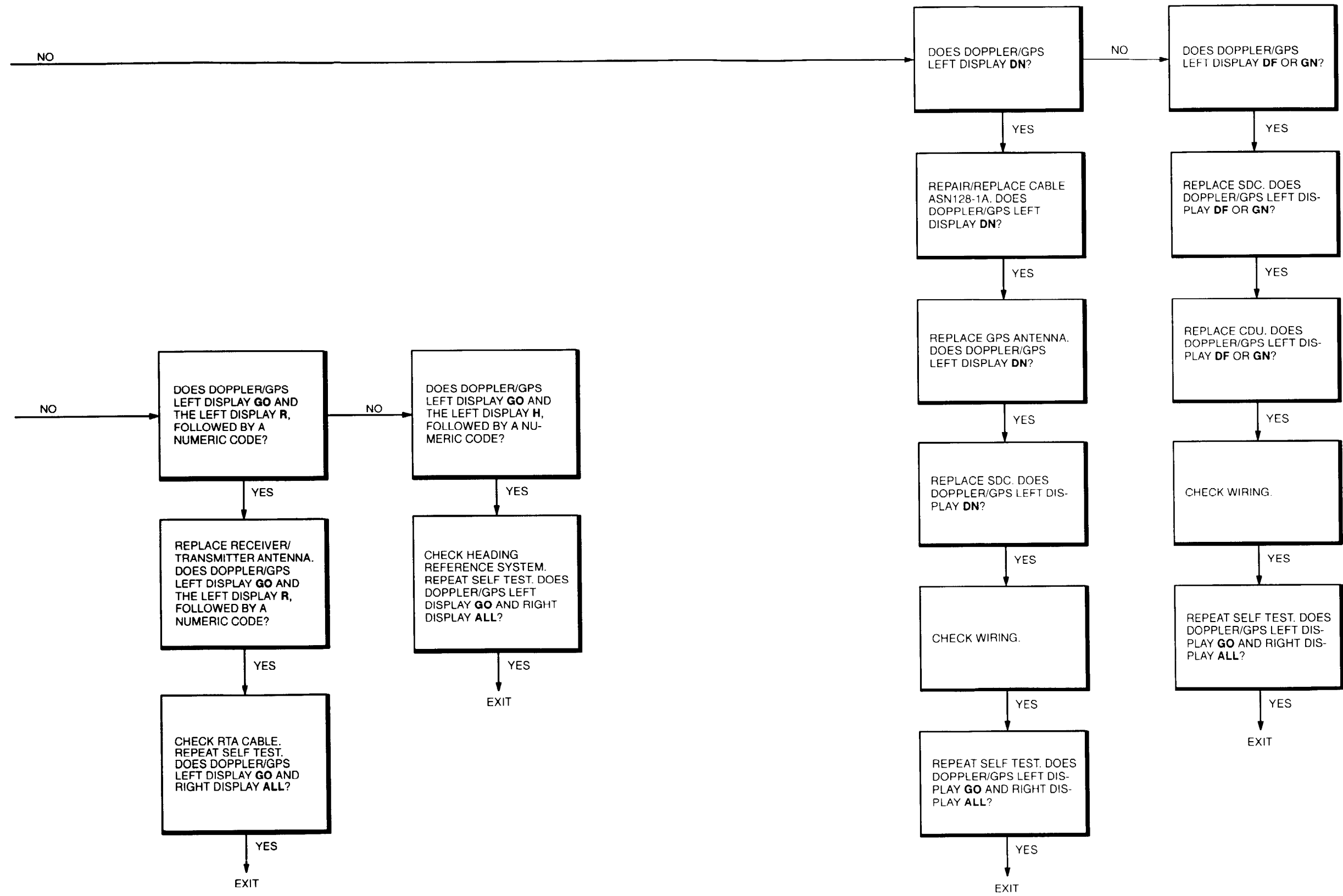


**GO TO NEXT PAGE**



GO TO NEXT PAGE

18-3.6 CDU DISPLAY IS NOT GO ALL (Continued)



END OF TASK

18-3.7 GPS ALERT INDICATOR DOES NOT ILLUMINATE

FAULT ISOLATION PROCEDURES

INITIAL SETUP

Applicable Configurations:

All

References:

TM 11-1520-240-23

TM 11-5841-305-12

TM 55-1520-240-23

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Equipment Condition:

TM 55-1520-240-23:

Battery Connected

Electrical Power On

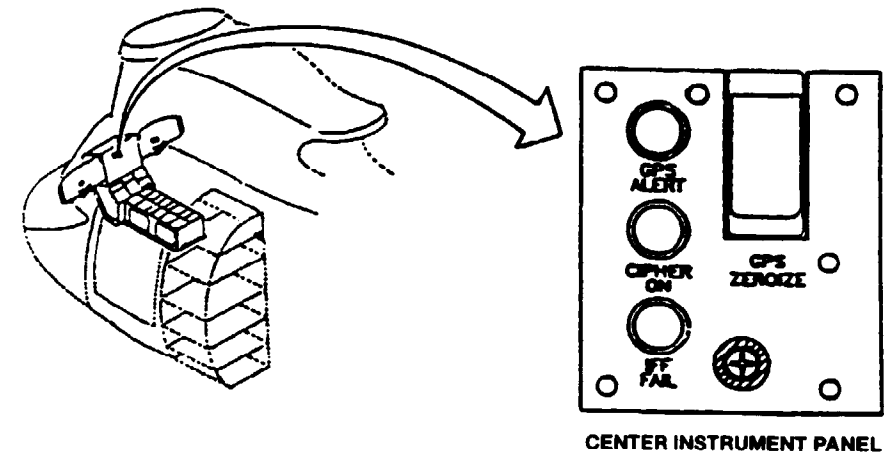
Hydraulic Power Off

Materials:

None

Personnel Required:

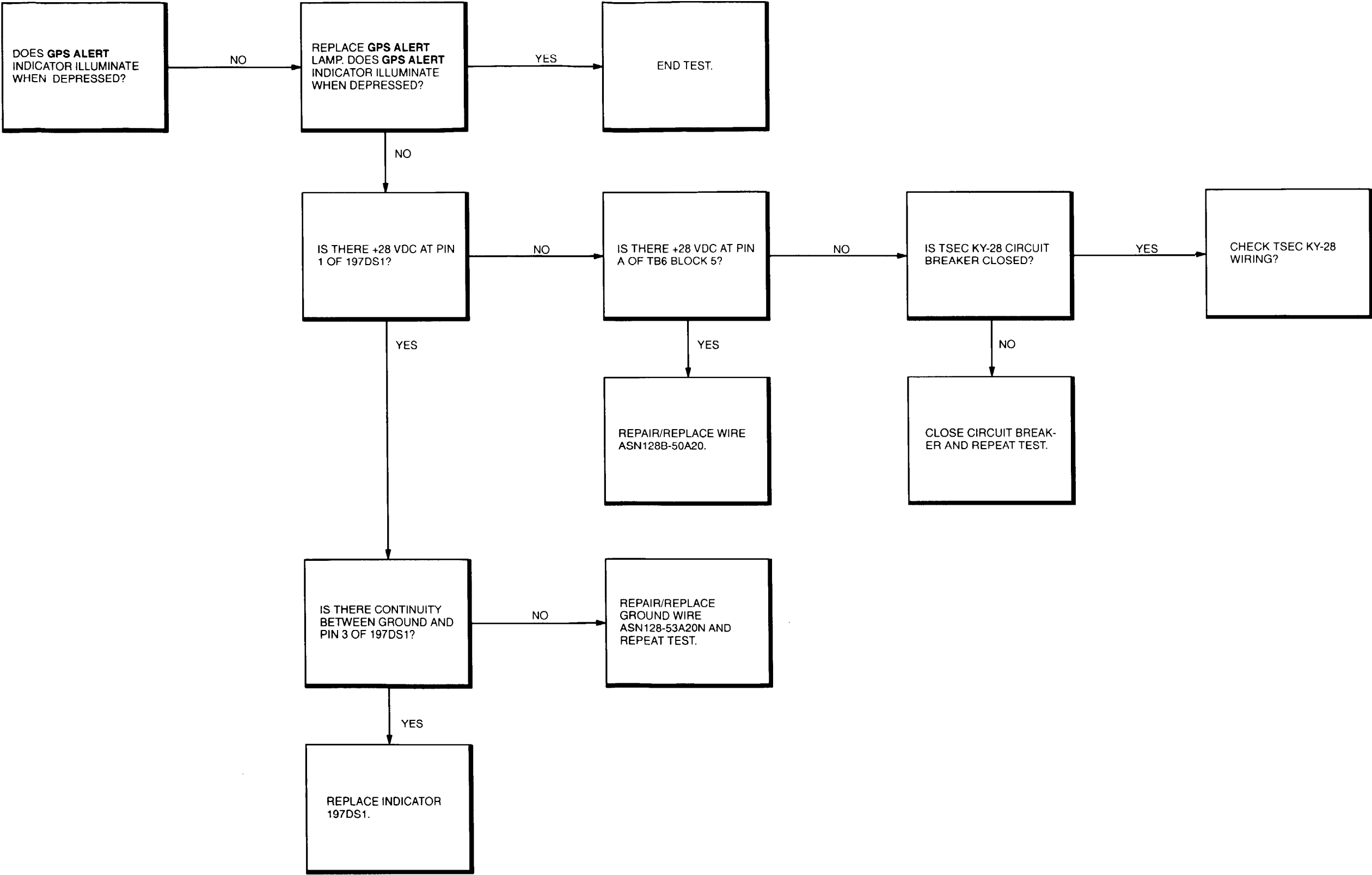
Aircraft Electrician



GO TO NEXT PAGE

18-3.7 GPS ALERT INDICATOR DOES NOT ILLUMINATE (Continued)

18-3.7



END OF TASK



18-3.8 PRESENT POSITION NOT DISPLAYED ON CDU

FAULT ISOLATION PROCEDURES

INITIAL SETUP

Applicable Configurations:  
All

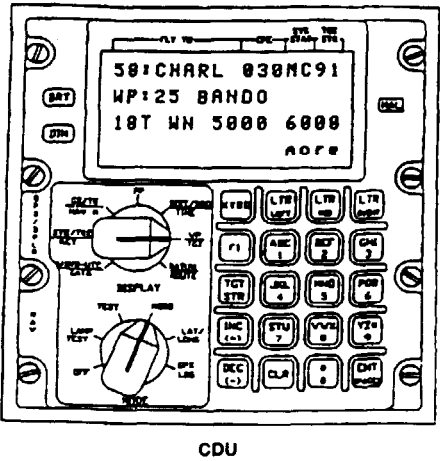
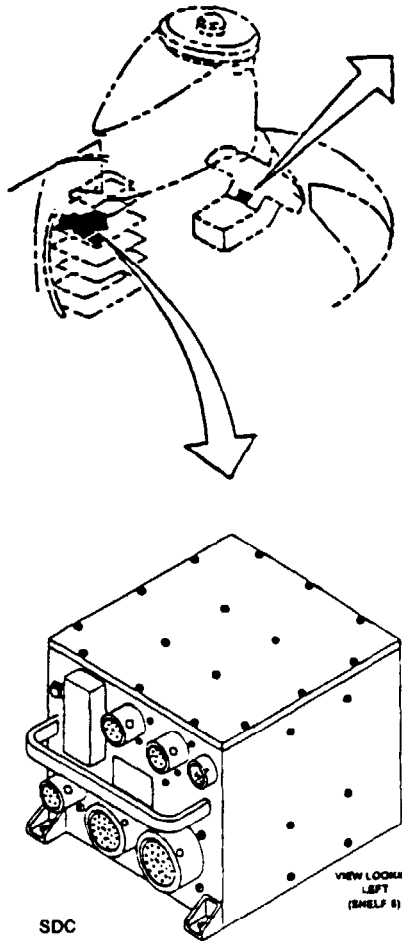
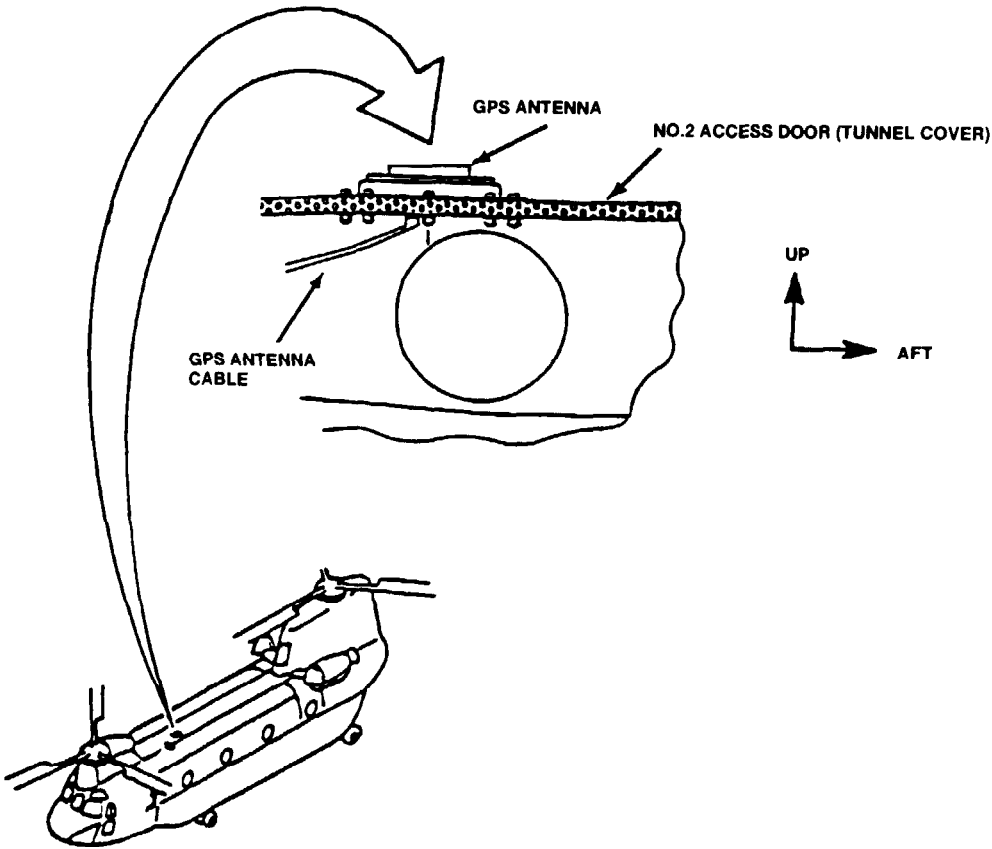
References:  
TM 11-1520-240-23  
TM 11-5841-305-12  
TM 55-1520-240-23

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

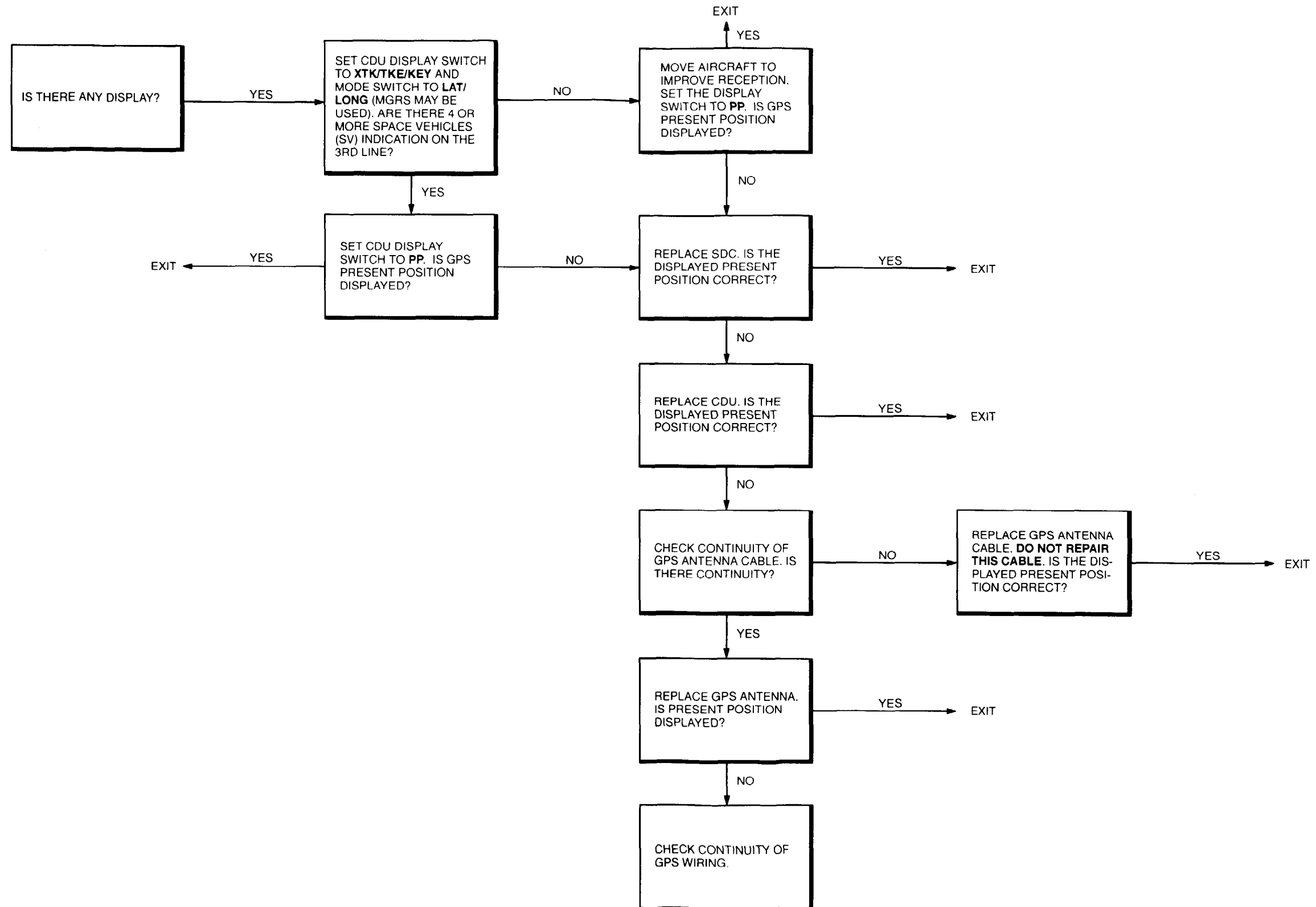
Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

Materials:  
None

Personnel Required:  
Aircraft Electrician



## 18-3.8 PRESENT POSITION NOT DISPLAYED ON CDU (Continued)



END OF TASK

18-3.9 CDU DOES NOT DISPLAY DOWNLOAD WAYPTS IN PROCESS  
DURING WAYPOINT LOADING

FAULT ISOLATION PROCEDURES

INITIAL SETUP

Applicable Configurations:  
All

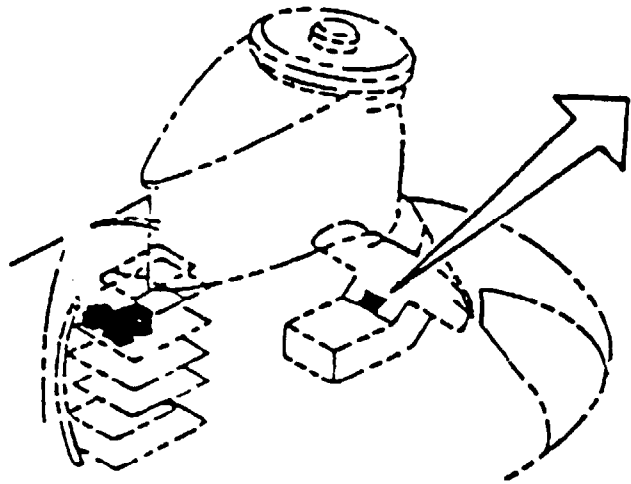
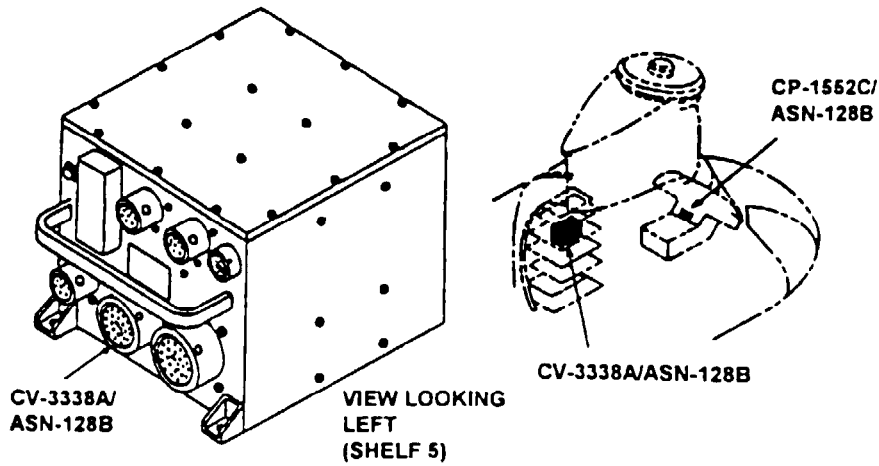
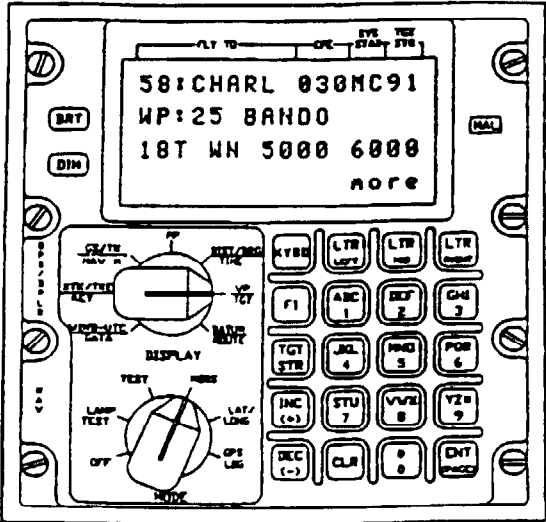
References:  
TM 11-1520-240-23  
TM 11-5841-305-12  
TM 55-1520-240-23

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

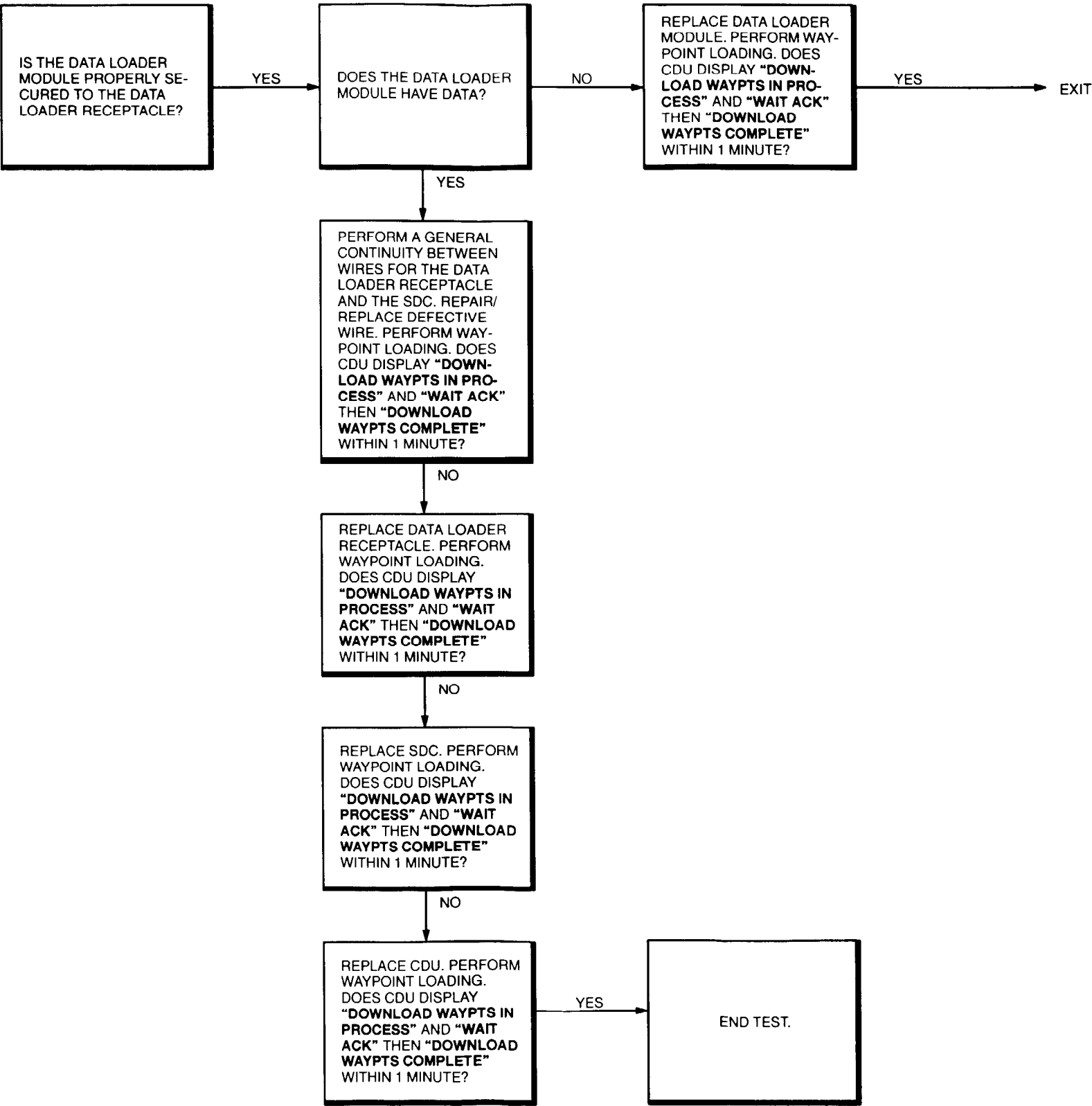
Materials:  
None

Personnel Required:  
Aircraft Electrician



GO TO NEXT PAGE

18-3.9 CDU DOES NOT DISPLAY DOWNLOAD WAYPTS IN PROCESS DURING  
WAYPOINT LOADING (Continued)



END OF TASK

18-3.10 INDICATIONS ON THE FOUR-LINE DISPLAY AND HSI ARE NOT THE SAME

FAULT ISOLATION PROCEDURES

INITIAL SETUP

Applicable Configurations:  
All

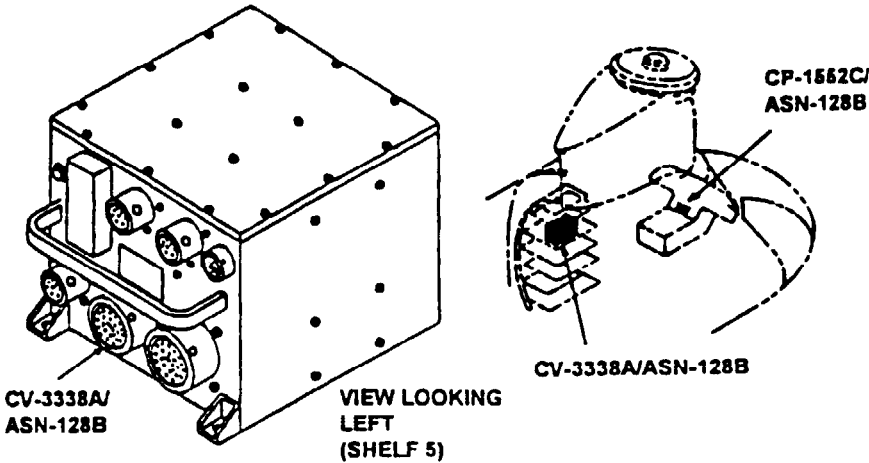
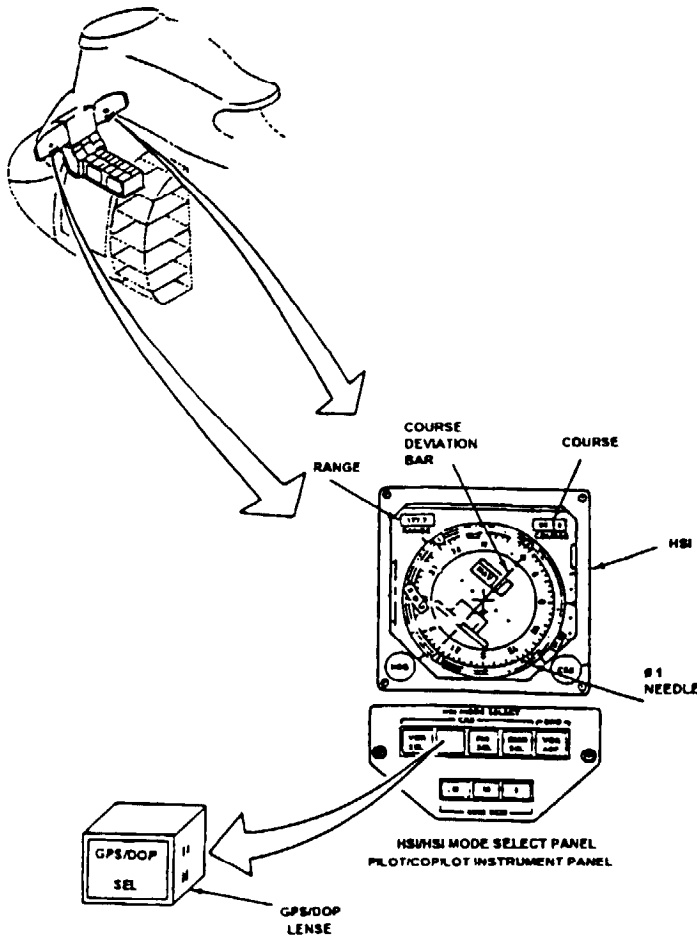
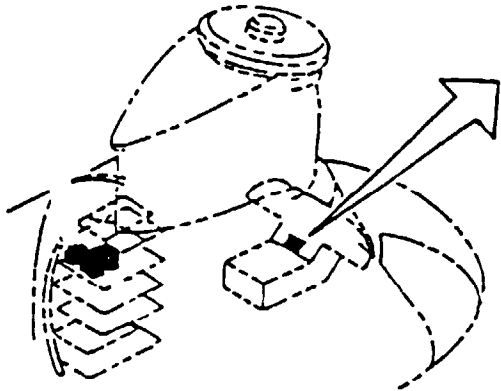
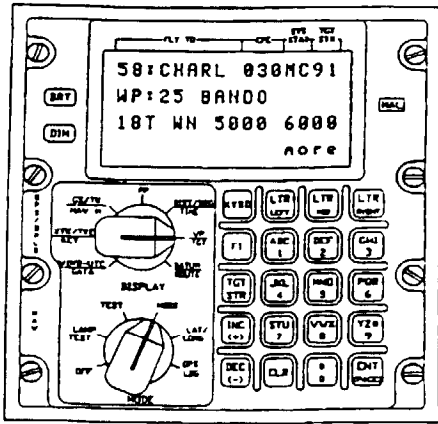
References:  
TM 11-1520-240-23  
TM 11-5841-305-12  
TM 55-1520-240-23

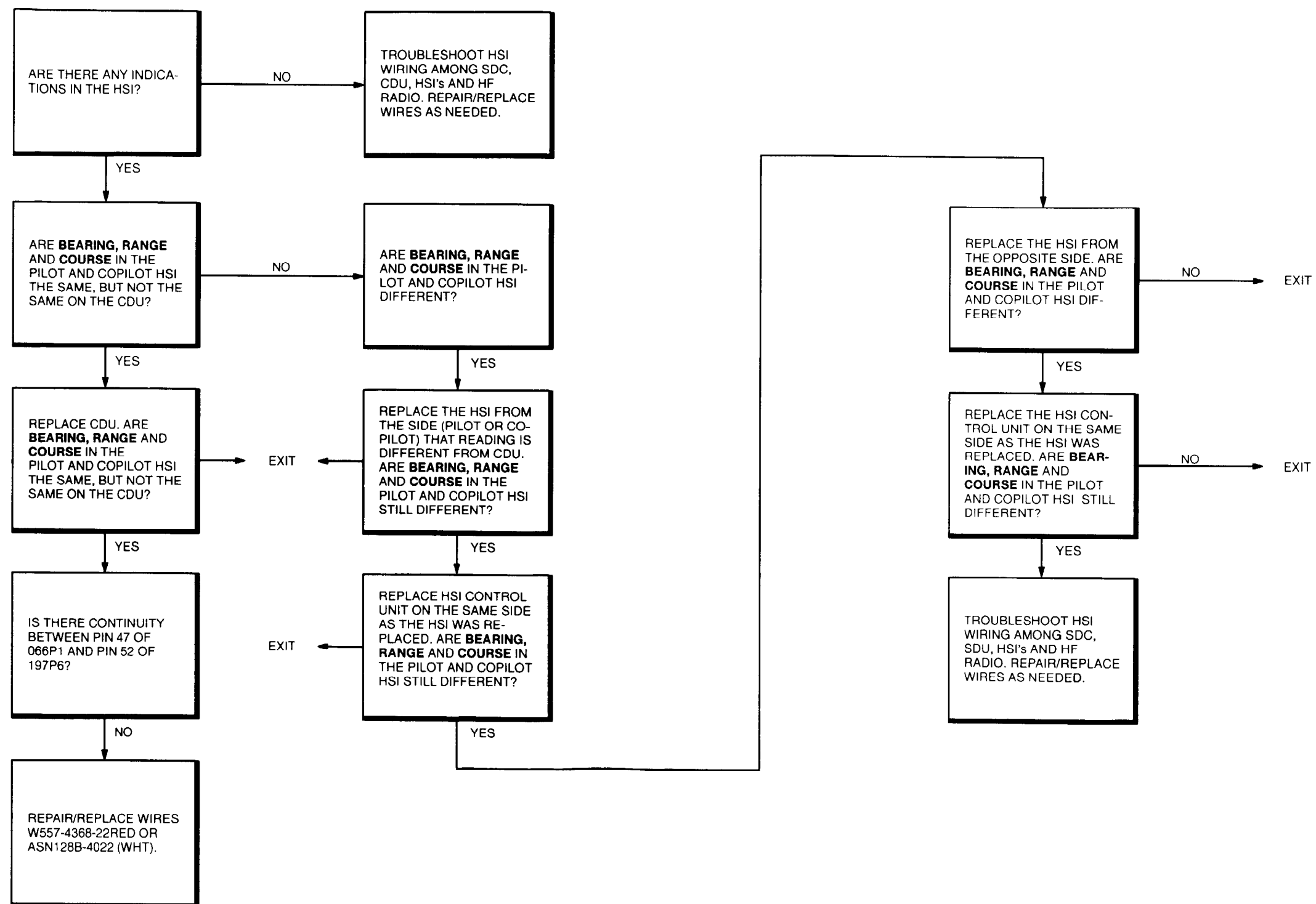
Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

Materials:  
None

Personnel Required:  
Aircraft Electrician





END OF TASK

FAULT ISOLATION PROCEDURES

INITIAL SETUP

Applicable Configurations:

All

References:

- TM 11-1520-240-23
- TM 11-5841-305-12
- TM 55-1520-240-23

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Equipment Condition:

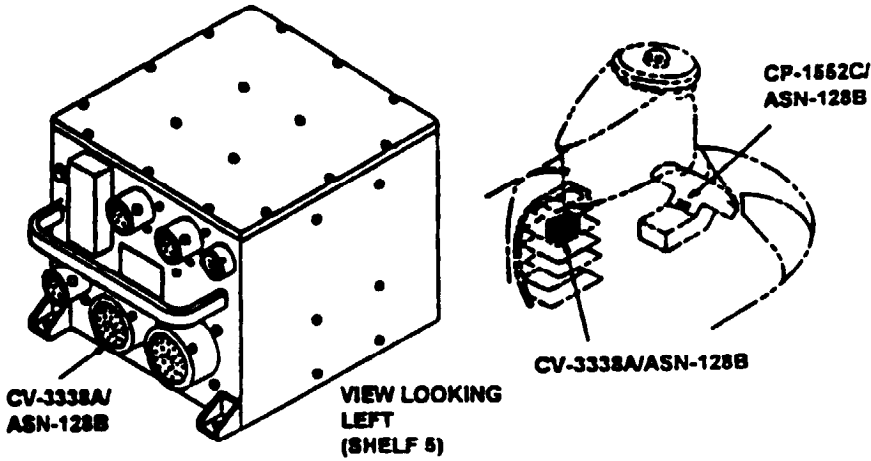
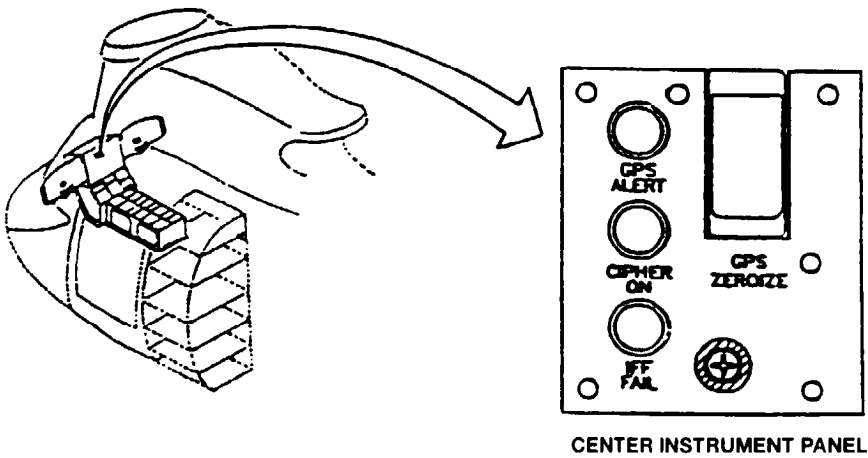
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off

Materials:

None

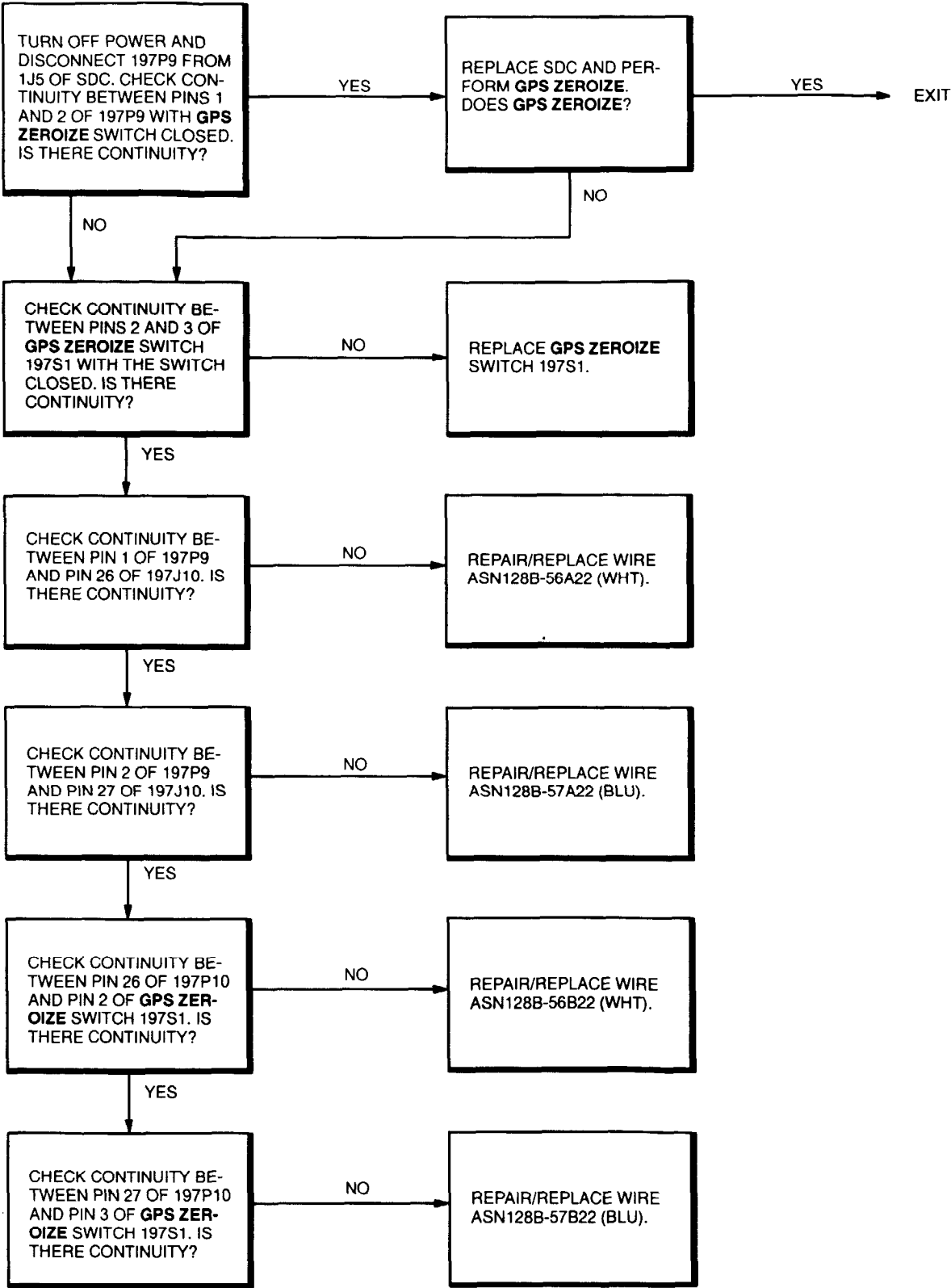
Personnel Required:

Aircraft Electrician



GO TO NEXT PAGE

18-3.11 GPS DOES NOT ZEROIZE (Continued)



END OF TASK



FAULT ISOLATION PROCEDURES

INITIAL SETUP

Applicable Configurations:  
All

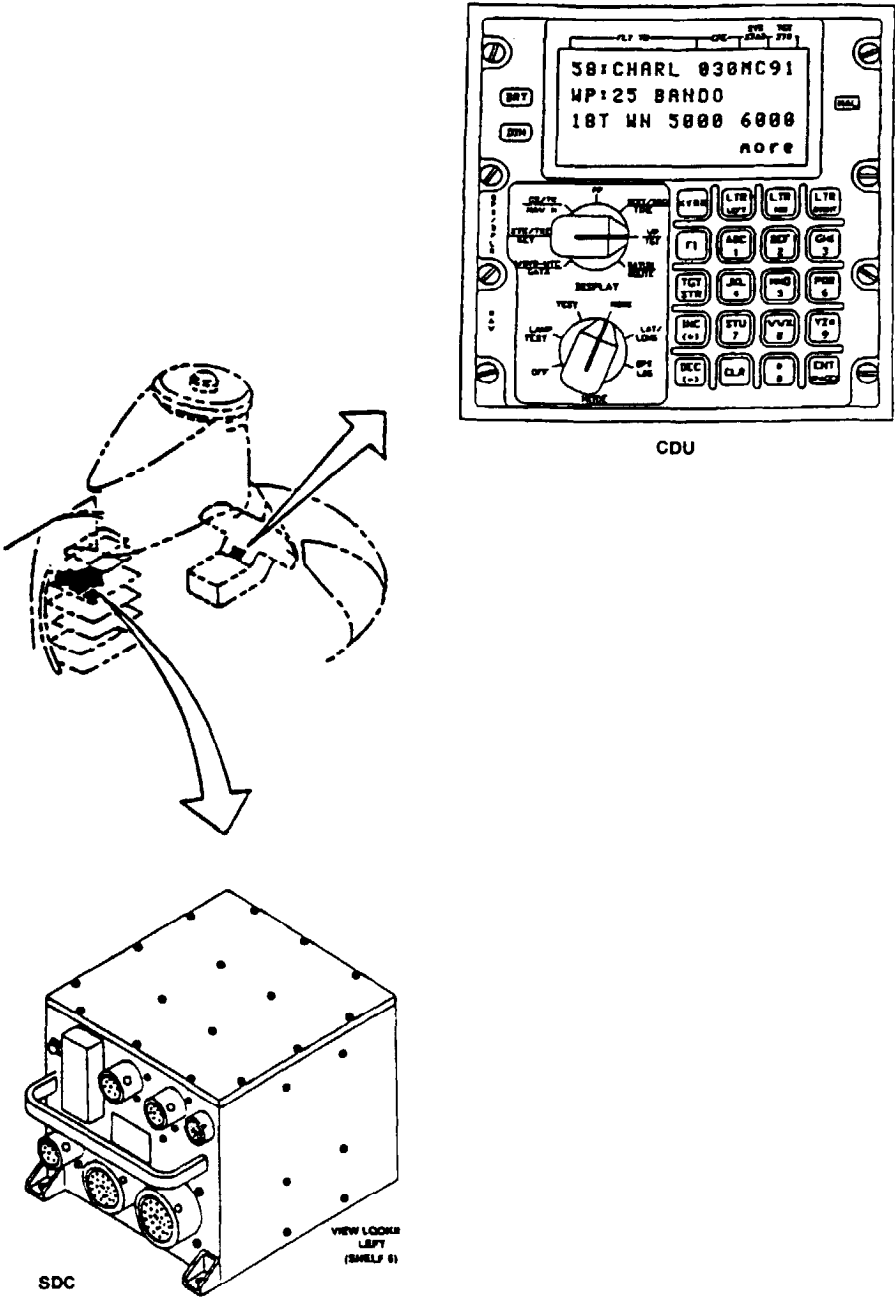
References:  
TM 11-1520-240-23  
TM 11-5841-305-12  
TM 55-1520-240-23

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Equipment Condition:  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power On  
Hydraulic Power Off

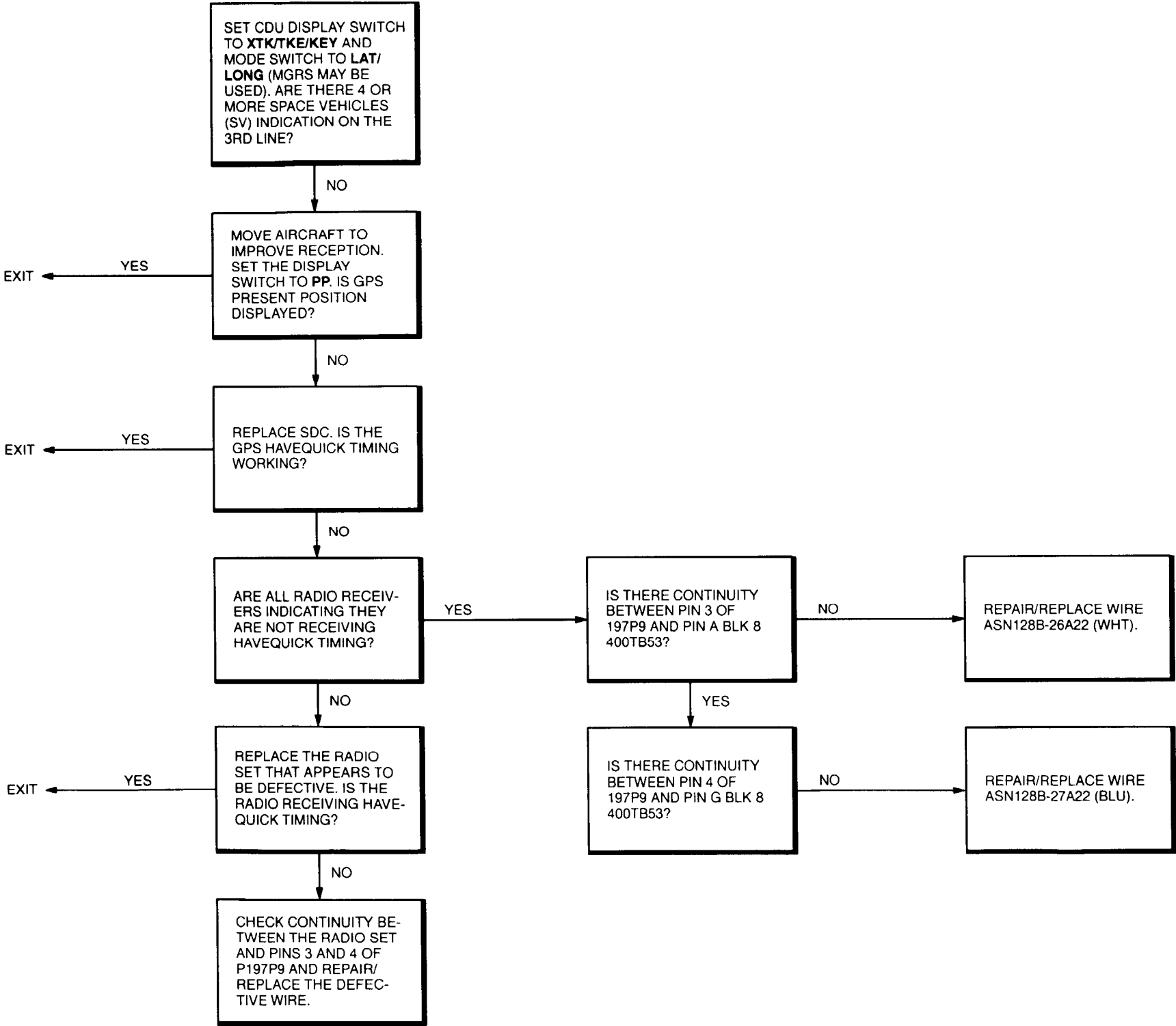
Materials:  
None

Personnel Required:  
Aircraft Electrician



GO TO NEXT PAGE

18-3.12 GPS HAVEQUICK TIMING NOT WORKING (Continued)

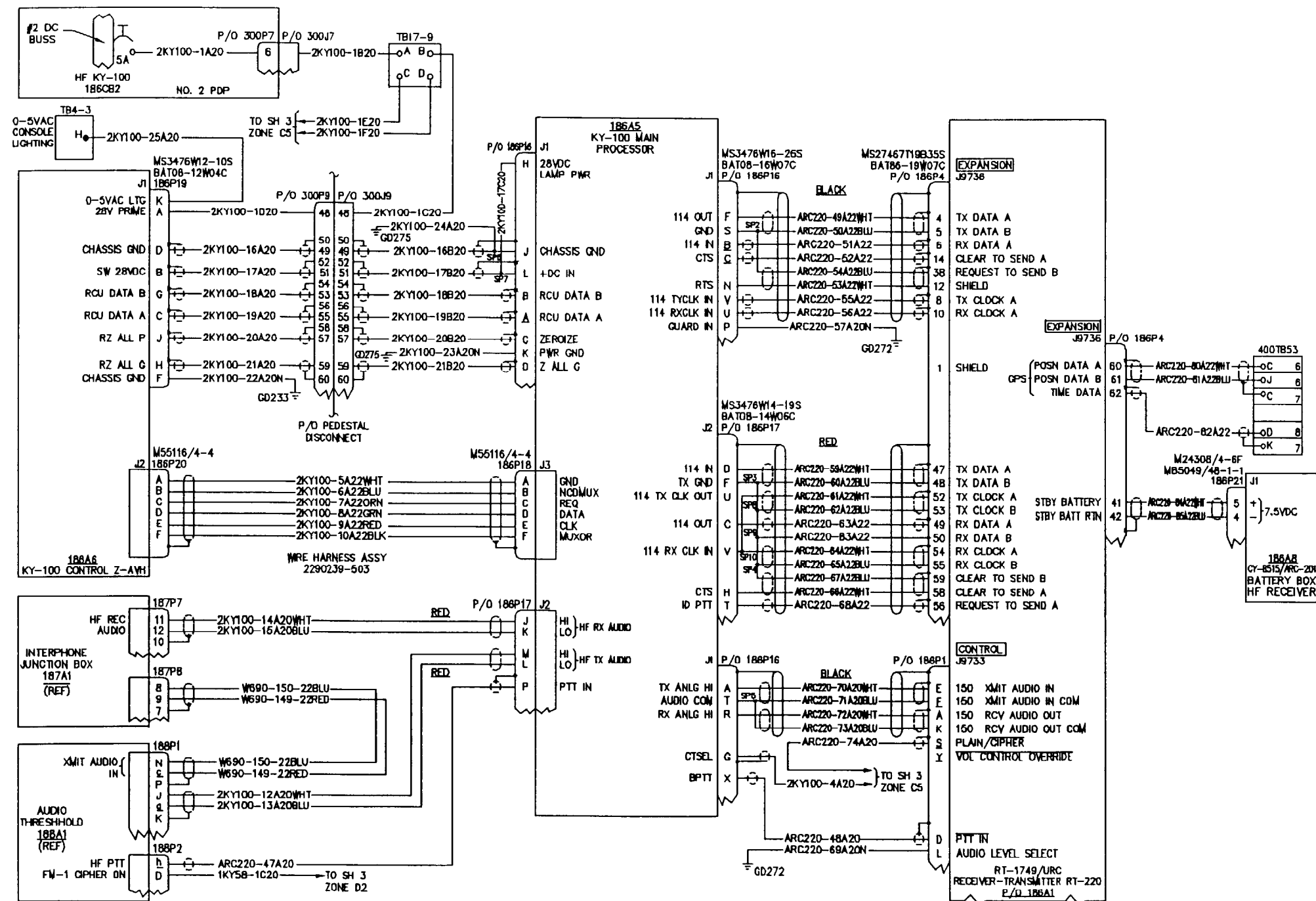


END OF TASK

#### 18-4 HF LIAISON FACILITY

### 18-4.1 HF LIAISON FACILITY WIRING DIAGRAM (CONTINUED)

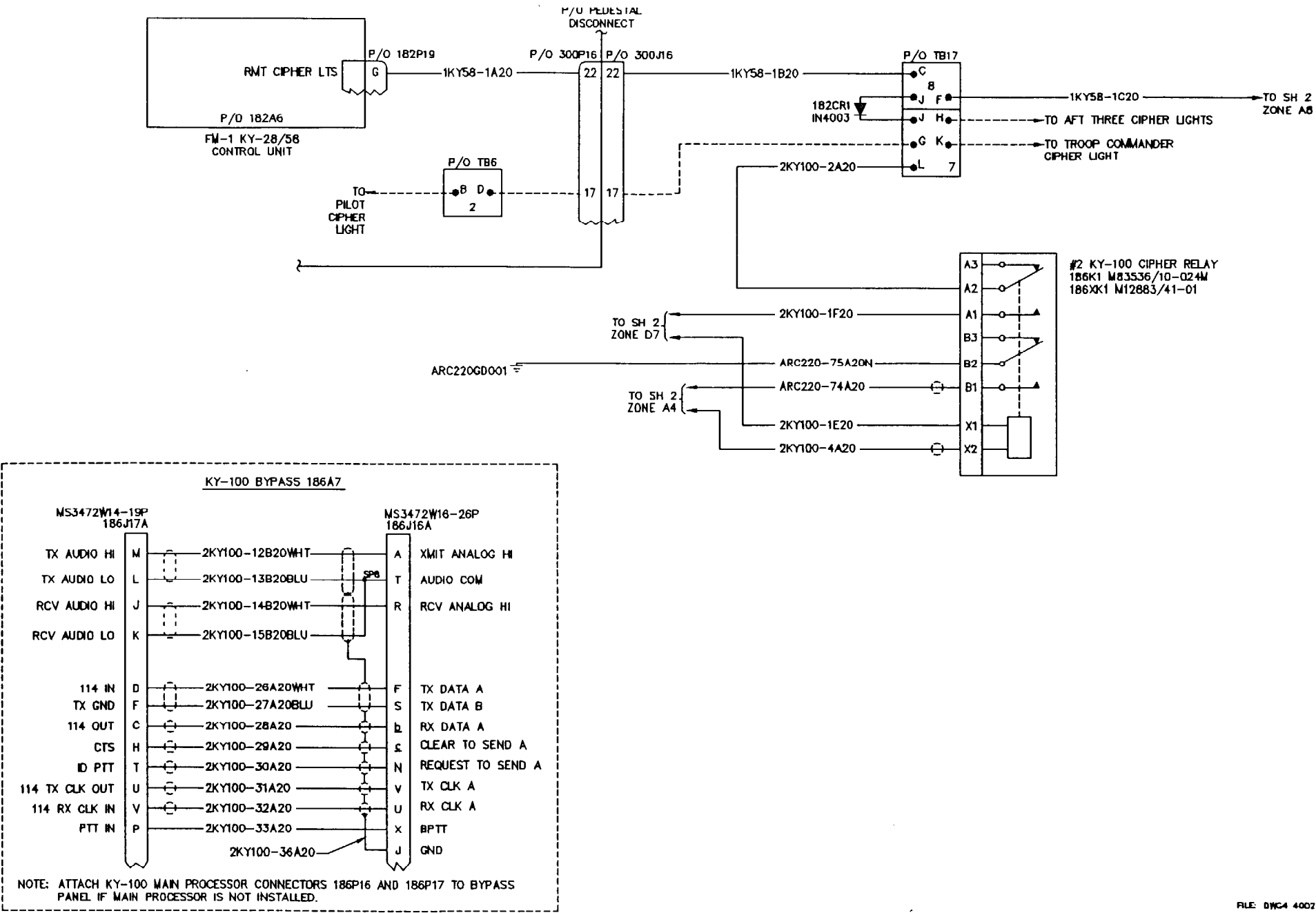
## 18-4.1



**GO TO THE NEXT PAGE**

18-4.1 HF LIAISON FACILITY WIRING DIAGRAM (CONTINUED)

18-4.1



FILE: 01M4 4002173

END OF TASK

18-4.2 HF LIAISON FACILITY VISUAL CHECK

18-4.2

INITIAL SETUP	
Applicable Configurations:	References:
All	TM 55-1520-240-23
Tools:	Equipment Condition:
Electrical Repairer's Tool Kit, NSN 5180-00-323-4915	TM 55-1520-240-23:
	Battery Disconnected
	Electrical Power Off
	Avionics Equipment Rack Cover - Cabin Off
Materials:	
None	
Personnel Required:	
68F10 Aircraft Electrician	

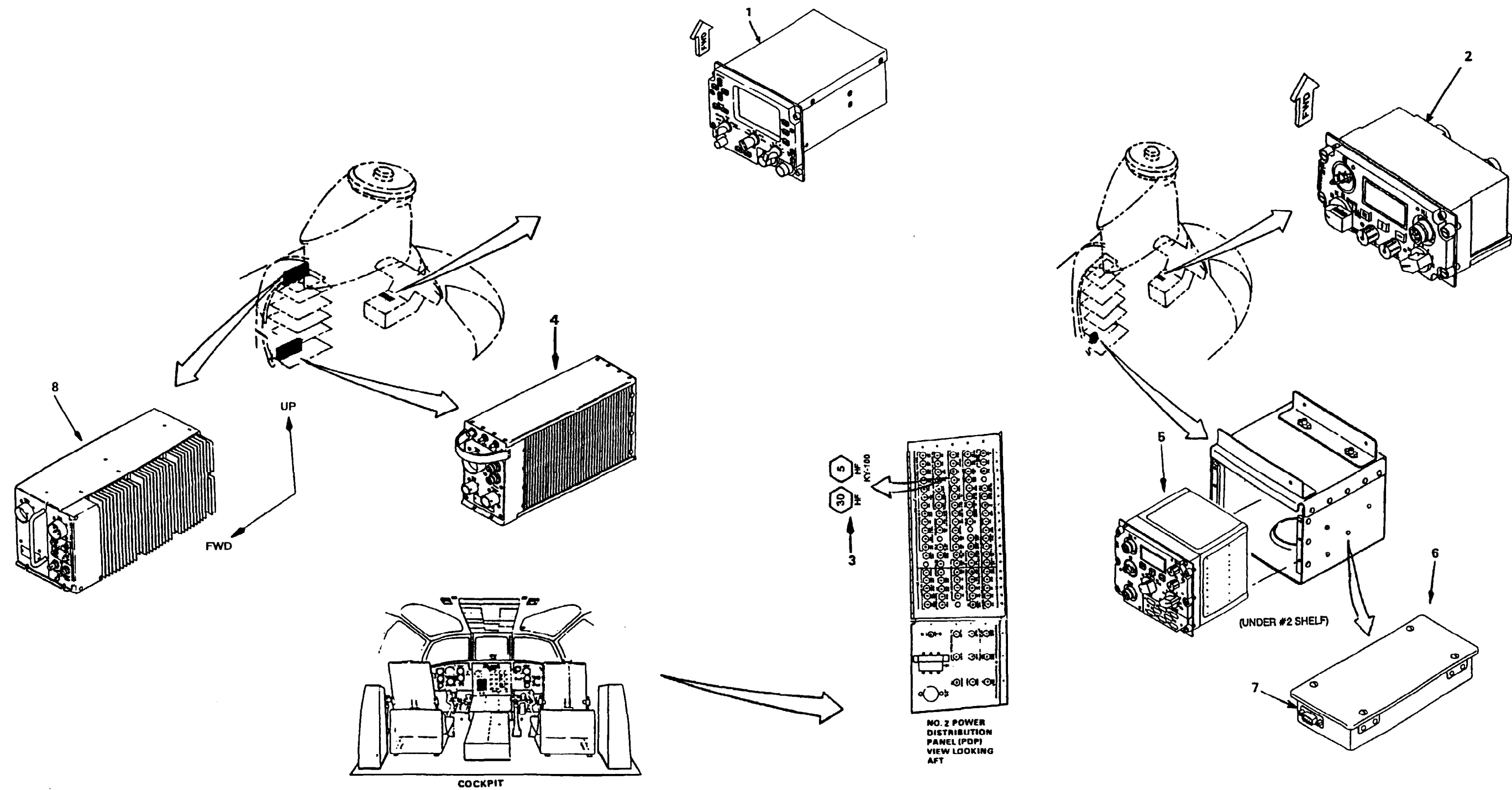
TASK	RESULT
1. Check HF Control (1).	Loosen Dzus fasteners and check connector of HF Control (1). If connector is loose or damaged tighten or replace it as required. If wiring to connector is loose or damaged, tighten, repair, or replace it as required. If display screen is damaged in any way replace HF Control (1). If knobs are loose or broken tighten or replace as required. If pushbuttons are damaged replace HF Control (1). Reinstall HF Control (1) in center console tightening the Dzus fasteners.
2. Check KY-100 Control (2).	Loosen Dzus fasteners and check connector of KY-100 Control (2). If connector is loose or damaged tighten or replace it as required. If wiring to connector is loose or damaged, tighten, repair, or replace it as required. If display screen is damaged in any way replace KY-100 Control (2). If knobs are loose or broken tighten or replace as required. If pushbuttons are damaged replace KY-100 Control (2). Reinstall KY-100 Control (2) in center console tightening the Dzus fasteners.
3. Check HF and KY-100 HF COMM Circuit Breakers (3).	If breaker(s) (3) are loose or damaged tighten or replace as required. If wiring to breaker(s) are loose or broken tighten, repair, or replace as required.

TASK	RESULT
4. Check HF Receiver-Transmitter RT-1749(URC) (4).	If receiver (4) is loose or damaged tighten or replace as required. If connectors to the receiver are loose or damaged tighten or replace as required. If wiring or cables to receiver are loose or damaged tighten, repair, or replace as required.
5. Check TSEC/KY-100 Processor (5).	Loosen Dzus fasteners and check connector of KY-100 Processor (5). If connector is loose or damaged tighten or replace it as required. If wiring to connector is loose or damaged, tighten, repair, or replace it as required. If display screen is damaged in any way replace KY-100 Processor (5). If knobs are loose or broken tighten or replace as required. If pushbuttons are damaged replace KY-100 Processor (5). Reinstall KY-100 Processor (5) in bracket under shelf number 2 tightening the Dzus fasteners.
6. Check HF Receiver/Transmitter Battery Box, CY-8515/ARC-201 (6).	If Battery Box (6) is loose or damaged tighten or replace as required. If connector (7) is loose or damaged tighten or replace as required. If wiring to the connector is loose or damaged tighten, repair, or replace as required.
7. Check Power Amplifier-Coupler AM-7531/URC (9).	If Amplifier-Coupler (9) is loose or damaged tighten or replace as required. If connectors to the amplifier are loose or damaged tighten or replace as required. If cables to Amplifier-Coupler J9724, J9721 and J9726 are loose or damaged tighten, repair, or replace as required. If cable to J9725 is loose tighten, if damaged replace ONLY, DO NOT REPAIR THIS CABLE GOING TO ANTENNA.

FOLLOW-ON MAINTENANCE:

Replace Avionics Equipment Rack Cover - Cabin.

GO TO THE NEXT PAGE



END OF TASK

18-4.3 HF LIAISON FACILITY OPERATIONAL CHECK

8-4.3

INITIAL SETUP	References:
	TM 11-1520-240-23
Applicable Configurations:	TM 11-5821-357-12
All	TM 55-1520-240-10
	TM 55-1520-240-23
Tools:	Equipment Condition:
Electrical Repairer's Tool Kit, NSN 5180-00-323-4915	TM 55-1520-240-23:
	Battery Connected
Materials:	Electrical Power Off
None	Hydraulic Power Off
Personnel Required:	HF Liaison Facility Visual Check Performed (Task 18-4.2)
Aircraft Electrician (2)	

TASK	RESULT
CHECK CIRCUIT BREAKERS	
1. Check that the following circuit breakers on No. 2 pdp (1) are closed: HF (COMM) HF KY-100 (COMM)	If any circuit breaker is open, close it.
2. Start APU. Refer to task 15-1.5.	APU ON capsule shall come on.
CHECK HF CONTROL C-12436/UR	
3. Turn aircraft CTR CSL LTG control (2) clockwise and counterclockwise while checking HF Control (4) panel lighting.	HF Control (4) panel light shall vary with the changing setting of the aircraft dimmer control (3). If HF Control (4) panel light is not visible or intensity level does not vary with aircraft dimmer control (3), go to task 18-4.4.
4. Turn HF Control (4) Function Switch (7) to T/R and press the HF Control (4) upper and lower brightness switches (6) while checking the HF Control (4) Display (8) Intensity level.	HF Control display screen (8) intensity level shall vary with the changing setting of the brightness switches (6). If no display appears or intensity level does not vary, go to task 18-4.5.
CHECK TSEC/KY-100 CONTROL (RCU)	
5. Turn KY-100 Control (5) BRT PNL Knob (21) clockwise half-way to full-bright. Turn aircraft CTR CSL LTG control (2) clockwise and counterclockwise while checking KY-100 Control (5) panel lighting. Turn CTR CSL LTG Control (2) so KY-100 Control (5) panel lighting is at a comfortable level. Rotate KY-100 Control (5) BRT PNL Knob (21) clockwise and counterclockwise while checking KY -100 Control (5) Display Screen (10) intensity level.	KY-100 Control (5) panel light shall vary with the changing setting of the aircraft dimmer control (2). If KY-100 Control (5) panel light is not visible or intensity level does not vary with KY-100 Control (5) BRT PNL Knob (21), and or if intensity level does not vary with aircraft dimmer control (3) go to task 18-4.6.

TASK	RESULT
6. Turn KY-100 Control (5) Mode Switch (9) to OFFLINE and press the HF Control (4) upper brightness switch (6) and turn the KY-100 Control (5) BRT DISPL knob (24) clockwise and counterclockwise while checking the display screen (10) intensity level.	KY-100 Control display screen (10) intensity level shall vary with the changing setting of the brightness control knob (8). If no display appears or intensity level does not vary, go to task 18-4.6.
CHECK HF RECEIVER-TRANSMITTER RT-1749/URC	
7. Turn HF Control (4) Mode Switch (7) to STBY.	After a 30-second warm-up the HF Control Display (5) shall display SYSTEM TESTING while power-up BIT (P-BIT) is in process. After the test is complete SYSTEM-GO is displayed if all checked good. If a fault is detected, SYSTEM-NO GO is displayed. Go to task 18-4.7 if SYSTEM-NO GO is displayed.
8. While still in STBY mode, depress the line-select switch (3) which points to TEST then depress BIT line-select switch (3) to initiate RCV BIT.	Wait 90 seconds. Upon successful completion of RCV BIT, RCV BIT GO is displayed. If any other message is displayed, go to task 18-4.8.
9. Upon successful completion of RCV BIT and after KEY HF FOR TRANSMIT TEST or PTT FOR XMT BIT is displayed on HF Control (4) Display (8) depress and hold headset PTT switch to Initiate XMT BIT. Release PTT switch.	Wait 90 seconds. Upon successful completion of XMT BIT, XMT BIT GO is displayed. If any other message is displayed, go to task 18-4.8.
10. While still in STBY mode, press FILL line-select switch (3). Use HF Control (4) VALUE switches (12) to select DATA In TYPE: field on line 1 of HF Control Display (8).	The HF Receiver-Transmitter is now ready to receive data from a Data Transfer Device (DTD). Connect DTD to HF Control (4) DATA connector (13) and initiate datafill from DTD. LOADING is displayed during datafill. LOAD COMPLETE is displayed if datafill is successful. If LOAD FAIL is displayed, go to task 18-4.9.
11. While still in STBY mode, press FILL line-select switch (3). Use HF Control (4) VALUE switches (12) to select KEY In TYPE: field on line 1 of HF Control Display (8).	The HF Receiver-Transmitter is now ready to receive secure keys from a Data Transfer Device (DTD). Connect DTD to HF Control (4) KEY connector (20) and initiate keyfill from DTD. LOADING is displayed during fill. LOAD COMPLETE is displayed if keyfill is successful. If LOAD FAIL is displayed, go to task 18-4.9.

GO TO THE NEXT PAGE



18-4.3 HF LIAISON FACILITY OPERATIONAL CHECK (CONTINUED)

18-4.3

TASK	RESULT
12. Turn HF Control (4) Function Switch (7) to T/R, Mode Switch (11) to MAN, Channel/Net Selector (14) to 1, and press the Edit line-select switch (3). Using the cursor keys (23), move cursor to beginning of RCV field and use the Value switches (12) to enter frequency of 2.5 MHz, AM mode. Press RTN line-select switch (3).	This tests reception of a distant station which broadcasts time and frequency primary standards. If reception is not clear, go to task 18-4.10.
13. While still tuned to 2.5MHz, AM, set SQUELCH to minimum by depressing SQL pushbuttons (16). Adjust VOL control (15) to a comfortable listening level. Note pitch of audio tone received. Then change to USB then to LSB mode. Also, vary squelch setting by depressing SQL pushbuttons (16) to verify audio can be muted and unmuted.	If the pitch of the audio tone received changes significantly, go to next task. If squelch does not vary while depressing SQL pushbuttons (16) or audio cannot be muted or unmuted, replace HF Control C-12436/URC.
14. Repeat steps 12 and 13 for the following frequencies: 3.334, 5.0, 7.335, 10.0, 15.0 and 20.0 MHz.	Results should be the same as steps 12 and 13.
15. Using either a preset or manually entered authorized test frequency establish communications with a known properly functioning ground station (NOTE: If ground station is on the same field, set the output power to LOW so communications will not be distorted).	Ensure selected channel is heard loud and clear without undesirable chirps, squeals, or hums, thru both aircraft and ground station radios. If not refer to task 18-4.10.
<b>NOTE</b>  Ensure Keys and Data are loaded into ARC-220 (steps 10 and 11) before performing step 16.	
16. Set HF Control (4) Function Switch (7) to T/R, and Mode Switch (11) to ALE. Establish communication with a known properly functioning ground station with a compatible ALE fill. Set Channel/Net selector (14) of aircraft radio to call address of ground station. Place a call from aircraft HF radio to ground station. After a link is established and a call made to the ground station, allow the link to be broken by not using the radio for a period of time (normally around 30 seconds, but the exact time is programmed in the fill). Set the Channel/Net selector of ground station to called address of the aircraft radio under test and place a call to aircraft radio.	The radio the call is being generated from should display CALLING on HF Control Display line 3. After an appropriate delay a short gong tone is heard in the headset and LINKED is displayed on display line 3. If CALL FAIL is displayed on display line 3, go to task 18-4.11. Communication can begin after link is established. Headset audio is muted until a link is established. If headset audio is not muted or communications cannot be established or is not clear, go to task 18-4.10. After a period of inactivity the link should be broken. If link does not break, replace HF Receiver-Transmitter RT-1749/URC. The radio receiving an ALE call, will have INCOMING CALL displayed on HF Control display line 3 and the address fields will change to the caller's.

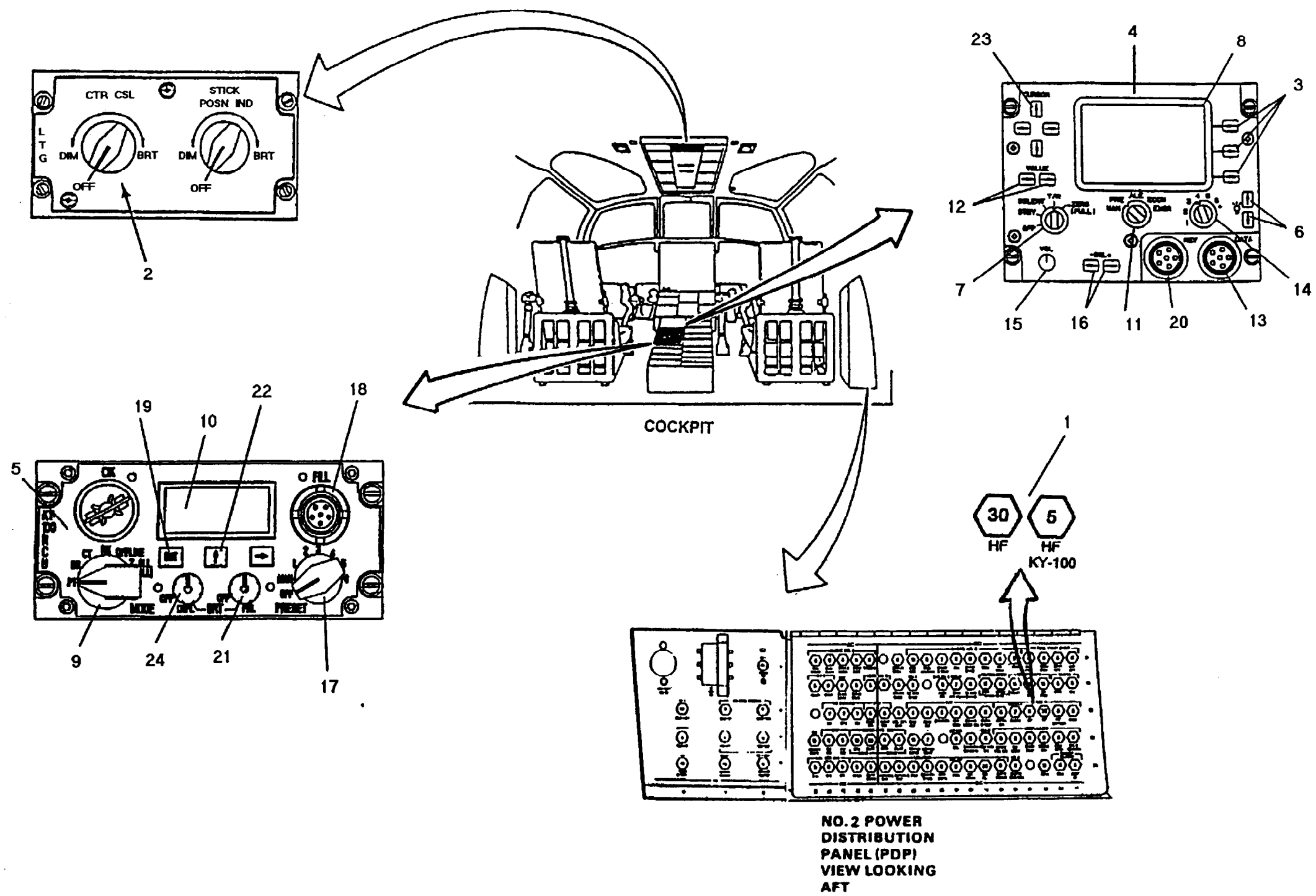
TASK	RESULT
<b>NOTE</b>  Ensure Keys and Data are loaded into ARC-220 (steps 10 and 11) before performing step 17.	
17. Set HF Control (4) Function Switch (7) to T/R, and Mode Switch (7) to ECCM. Establish communication with a known functional ground station with a compatible ECCM fill. Set Channel/Net selector (14) of aircraft radio to ECCM net of ground station. Place a call from aircraft HF radio to ground station. After a link is established and a call made to the ground station, allow the link to be broken by not using the radio for a period of time (normally around 30 seconds, the exact time is programmed in the fill). Set the Channel/Net selector of ground station to ECCM net of the aircraft radio under test and place a call to aircraft radio.	ALE address. When a link is established, a short gong tone is heard in the headset and LINKED is displayed on display line 3. Communication should then be generated by the calling station. If reception is not clear, go to task 18-4.10.  If the HF Control displays UNTUNED or UNSYNCH after an ECCM net is chosen, either press TUNE line-select switch or microphone PTT switch. HF Control (4) will display TUNING followed by SYNCHING while the process is occurring. When SYNCHING is no longer displayed, the system is ready for ECCM operation. If system cannot be tuned or synched, go to task 18-4.12. The radio from which a call is initiated the following will occur: preamble tones will be heard, wait until they cease before communicating; when link is established a short gong tone sounds in headset, LINKED is displayed and headset audio is restored. If this calling sequence does not occur, go to tasks 18-4.13 and 18-4.14. If after a period of inactivity the link is not broken, go to task 18-15. When a call is being received RCVING PREAMBLE is displayed before communications from the calling station is heard. If RCVING PREAMBLE is not displayed go to task 18-4.16. If communications is not received from calling station, go to task 18-4.10.
<b>NOTE</b>  Perform the following step after all checks are complete and just before shutdown.	
18. Gently pull and turn HF Control (4) Function Switch (7) to ZERO position.	All preprogrammed information, including datafill and keyfill data, will be erased. The HF Control (4) will display ZEROIZED. If ZEROIZED is not displayed, go to task 18-4.17.

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18-4.3 HF LIAISON FACILITY OPERATIONAL CHECK (CONTINUED)	
TASK	RESULT
<i>CHECK TSEC/KY-100 PROCESSOR</i>	
19. Turn KY-100 Control (5) MODE switch (9) to OFFLINE and PRESET switch (17) to MAN. Connect a fill device to KY-100 Control (5) fill connector (18). Push up arrow (22) until KEY OPS is displayed on display (10). Push INIT button (19) to display LOAD KEY. Push INIT button (19), LOAD N with a flashing N will be shown on KY-100 Control (5) display (IO), where the N indicates currently selected key location, which can be changed by pressing the up or right arrow as needed. Press INIT button (19). The entire LOAD N message will now be flashing. Turn on fill device and select key to be loaded. Press the INIT button (19) on KY-100 control (5). When keyfill is complete, turn off and disconnect the fill device from KY-100 control (5). Rotate KY-100 Control (5) Mode switch out of OFFLINE to exit key load.	Upon completion of a successful load, a pass tone will be heard and the display (10) will momentarily indicate KEY N, where N is the key location loaded. If this does not occur, go to task 18-4.18. The display (10) will then display, LOAD N with N flashing. This step can be repeated to load additional keys.
<b>NOTE</b> Perform the following step after all checks are complete and just before shutdown.	
20. Pull the KY-100 Control (5) Mode Switch (9) and rotate it to Z ALL position.	All keys stored in locations 1 thru 6 and U will be erased. The KY Control (5) will display ZEROED and a tone will be audible in headset. When MODE switch is rotated out of Z ALL position, PUSH INIT will be displayed meaning a COLD START is needed (a keyfill is necessary). If ZEROED is not seen on KY-100 Control (5) display (10), tone is not heard in headset, or PUSH INIT is not displayed when rotated out of Z ALL position, go to task 18-4.19.
<i>SECURE VOICE CHECK - RT-17429/URC AND TSEC/KY-100</i>	
<b>NOTE</b> Ensure both KY-100 and HF Radio have appropriate keys loaded for mode used.	
21. Utilizing a known functional ground station with compatible HF and KY-100 keys loaded and an appropriate test frequency, turn aircraft KY-100 Control (5) Mode switch (9) to CT. Go into CT menu and set to CT. Set ground station KY-100 Control Mode switch to PT. Transmit from ground station to aircraft HF system.	The PT annunciator should be lit on the KY-100 Control (5) Display (10) and plaintext should be heard in the headset. If neither occur, go to task 18-4.20.

GO TO THE NEXT PAGE

TASK	RESULT
22. Utilizing a known functional ground station with compatible HF and KY-100 keys loaded and an appropriate test frequency, turn the aircraft KY-100 Control (5) Mode switch (9) to CT. Go into the CT menu and set to CT. Set the ground station KY-100 Control Mode switch to CT. Transmit from the ground station to aircraft HF system.	The RX and V annunciators should be lit on the KY-100 Control (5) Display (10) and plaintext should be heard in the headset. If neither occur, go to task 18-4.21.
23. Utilizing a known functional ground station with compatible HF and KY-100 keys loaded and an appropriate test frequency, turn the aircraft KY-100 Control (5) Mode switch (9) to CT. Go into the CT menu and set to CT. Set the ground station KY-100 Control Mode switch to CT. Transmit from the aircraft HF system to the ground station.	The TX and V annunciators should be lit on the KY-100 Control (5) Display (10) in the aircraft and plaintext communication should be heard at ground station. If neither occur, go to task 18-4.21.
24. Utilizing a known functional ground station with compatible HF and KY-100 keys loaded and an appropriate test frequency, turn the aircraft KY-100 Control (5) Mode switch (9) to CT. Go into the CT menu and set to CT ONLY. Set the ground station KY-100 Control Mode switch to PT. Transmit from the ground station to aircraft HF system.	No communication should be audible in the aircraft headset. If communication does come thru, go to task 18-4.21.
25. Utilizing a known functional ground station with compatible HF and KY-100 keys loaded and an appropriate test frequency, turn the aircraft KY-100 Control (5) Mode switch (9) to PT. with the CT menu set to CT. Set the ground station KY-100 Control Mode switch to CT. Transmit from the ground station to aircraft HF system.	No communication should be audible in the aircraft headset. If communication does come thru, go to task 18-4.21.
<i>SYSTEM SHUTDOWN</i>	
26. Rotate HF Control (4) Function Switch (7) and KY-100 Control (5) Mode Switch (9) to OFF. Pull HF (COMM) and HF KY-100 (COMM) circuit breakers on No. 2 pdp.	
27. Stop APU. Refer to task 15-1.5.	APU ON capsule shall go out.
<b>FOLLOW-ON MAINTENANCE:</b> TM 55-1520-240-23: Electrical Power Off Battery Disconnected	



END OF TASK

18-4.4 AN/ARC-220 CONTROL - DISPLAY SCREEN INTENSITY LEVEL DOES NOT VARY WITH BRIGHTNESS SWITCHES:

18-4.4

INITIAL SETUP

**Applicable Configurations:**  
All

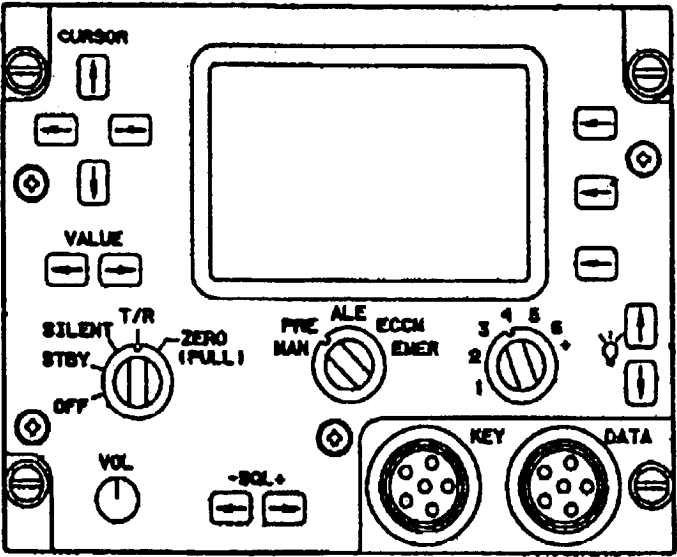
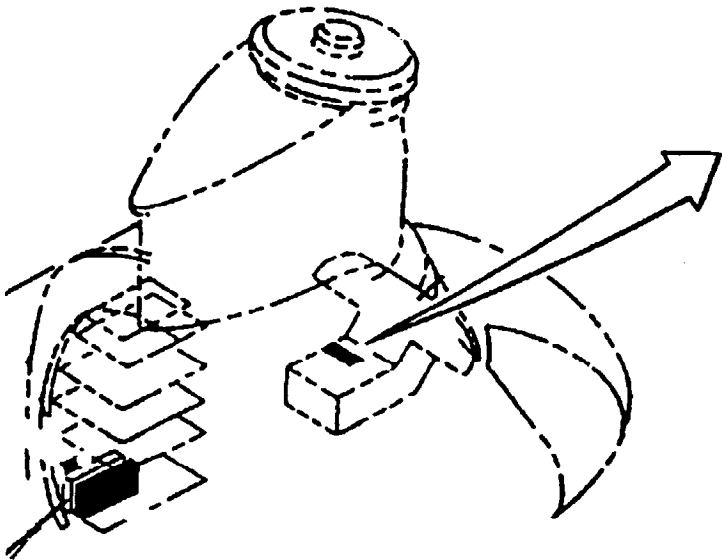
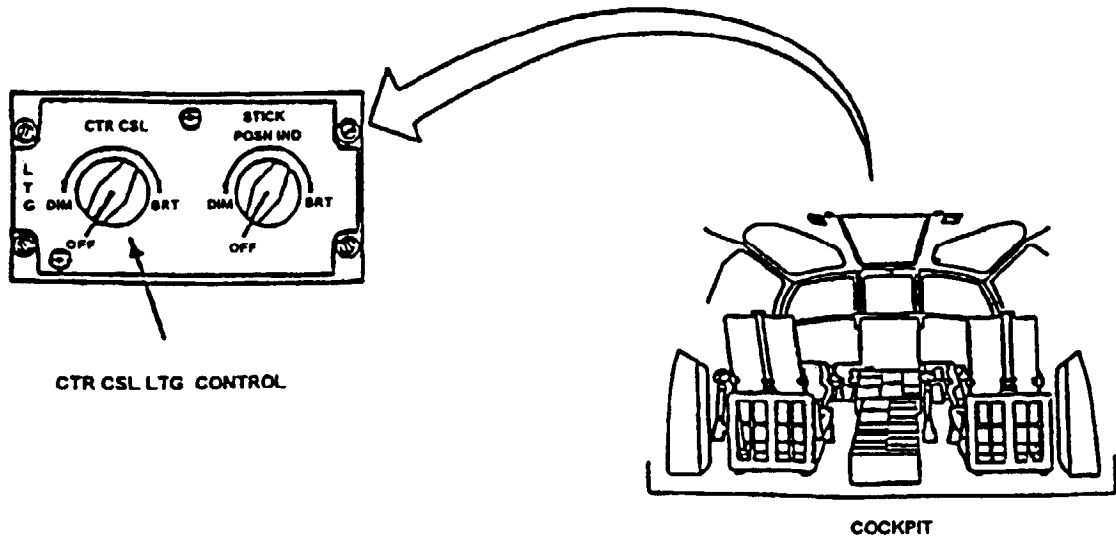
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician (2)

**References:**  
TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)



GO TO THE NEXT PAGE

18-4.5 AN/ARC-220 CONTROL - ND DISPLAY VISIBLE

18-4.5

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

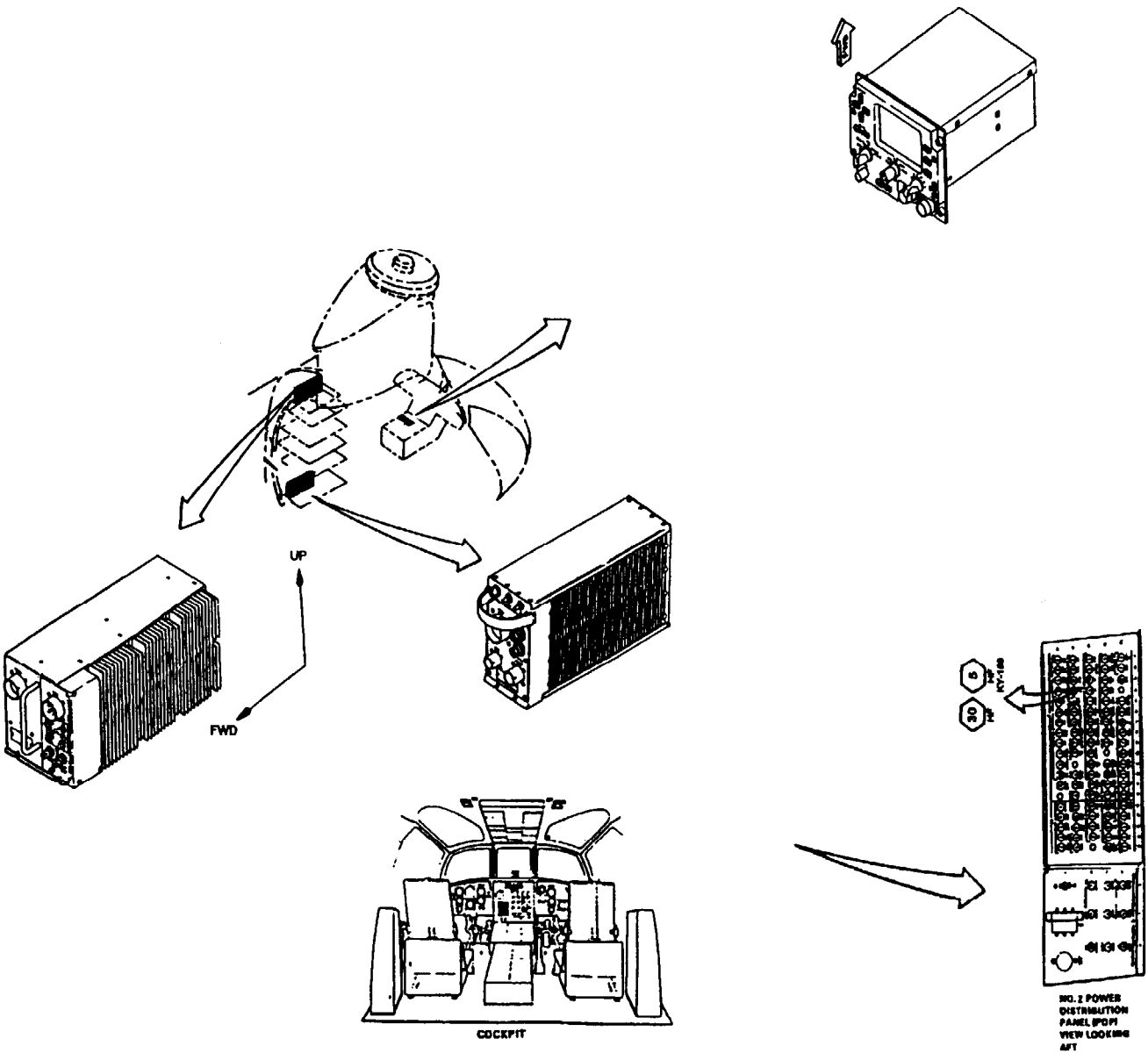
Aircraft Electrician (2)

References:

- TM 11-1520-240-23
- TM 11-5821-357-12
- TM 55-1520-240-10
- TM 55-1520-240-23

Equipment Condition:

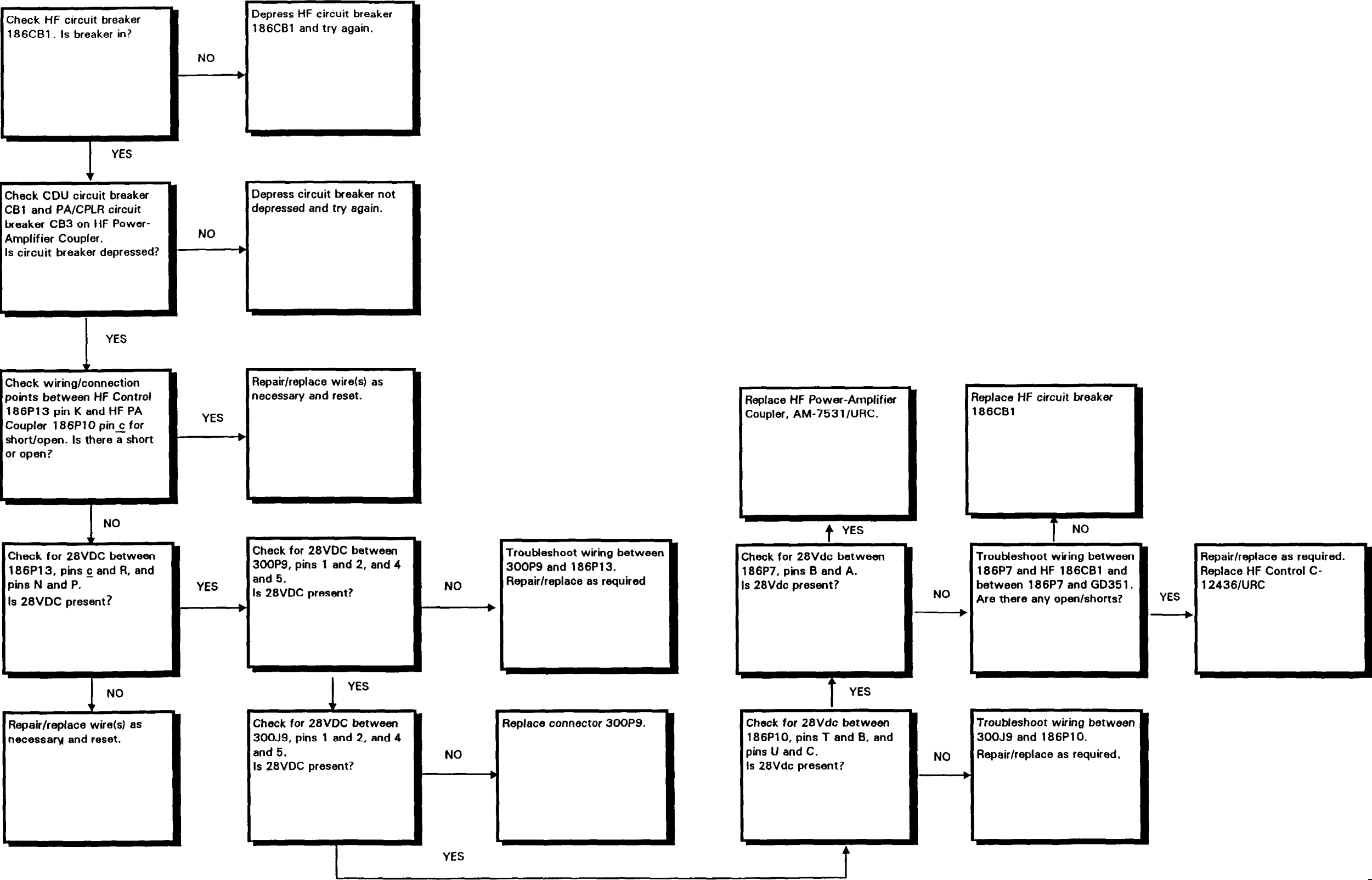
- TM 55-1520-240-23:
- Battery Connected
- Electrical Power Off
- Hydraulic Power Off
- HF Liaison Facility Visual Check Performed (Task 18-4.2)



GO TO THE NEXT PAGE

18-4.5 AN/ARC-220 CONTROL - NO DISPLAY VISIBLE (CONTINUED)

18-4.5



END OF TASK

18-4.6 TSEC/KY-100 CONTROL RCU - NO DISPLAY.

18-4.6

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

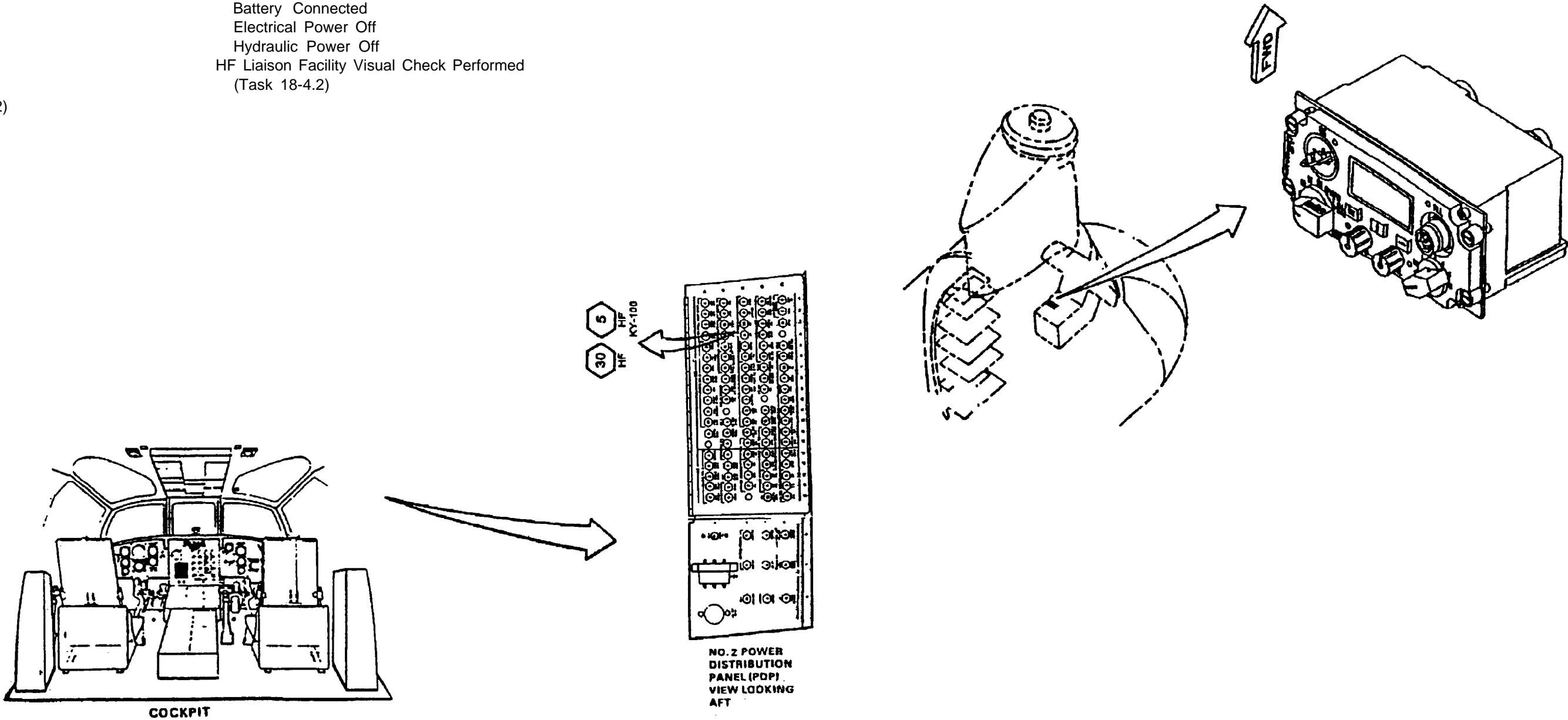
Aircraft Electrician (2)

References:

TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

Equipment Condition:

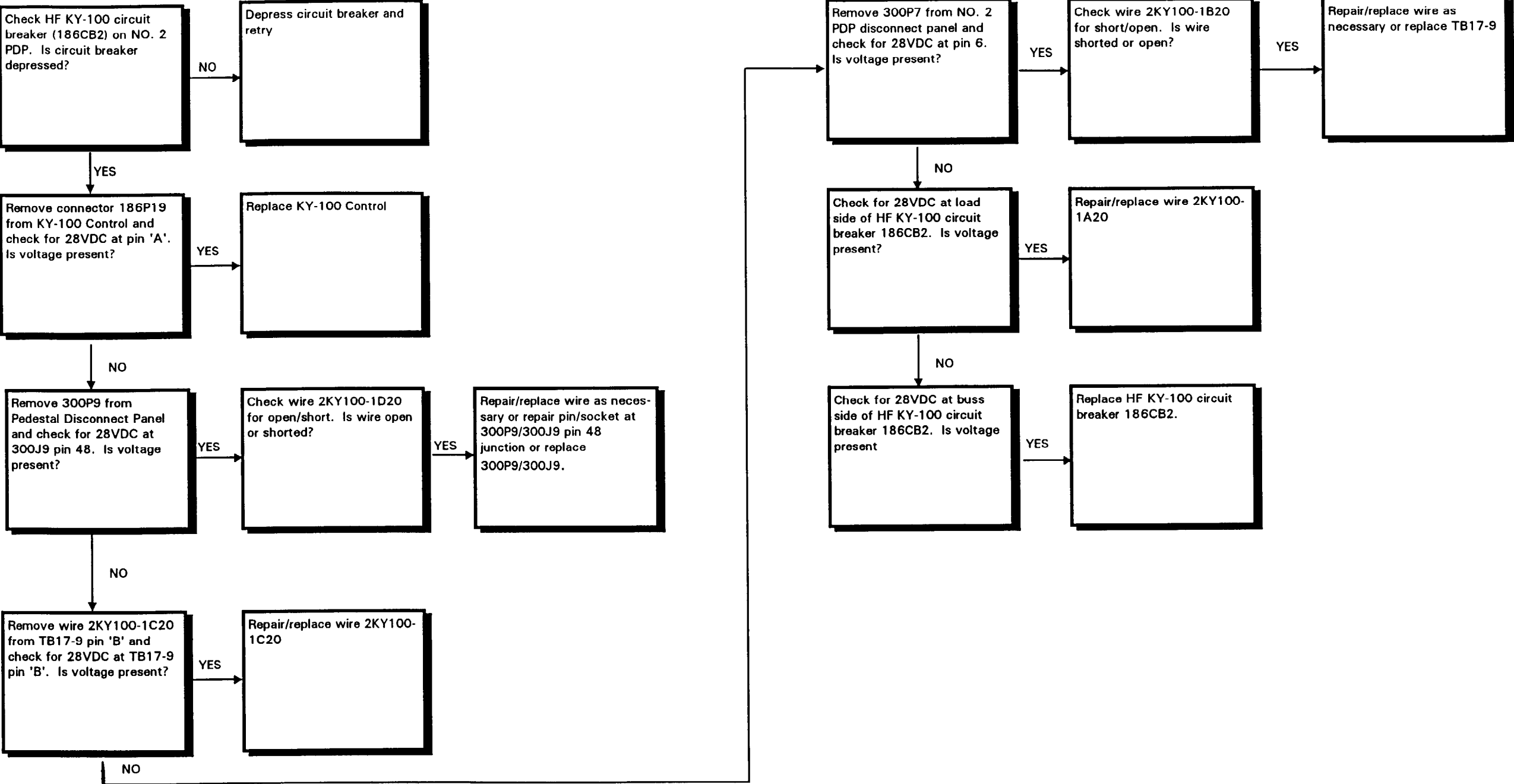
TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)



GO TO THE NEXT PAGE

18-4.6 TSEC/KY-100 CONTROL RCU - NO DISPLAY (CONTINUED).

18-4.6



END OF TASK



18-4.7 AN/ARC-220 CONTROL DISPLAYS ‘SYSTEM-NOGO’ AFTER POWER UP BIT (P-BIT TEST).

18-4.7

INITIAL SETUP

- References:** 18-4.7  
TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

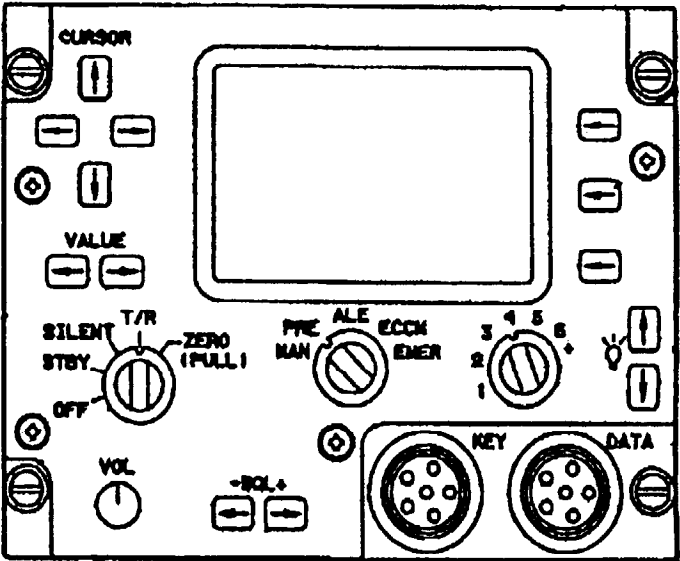
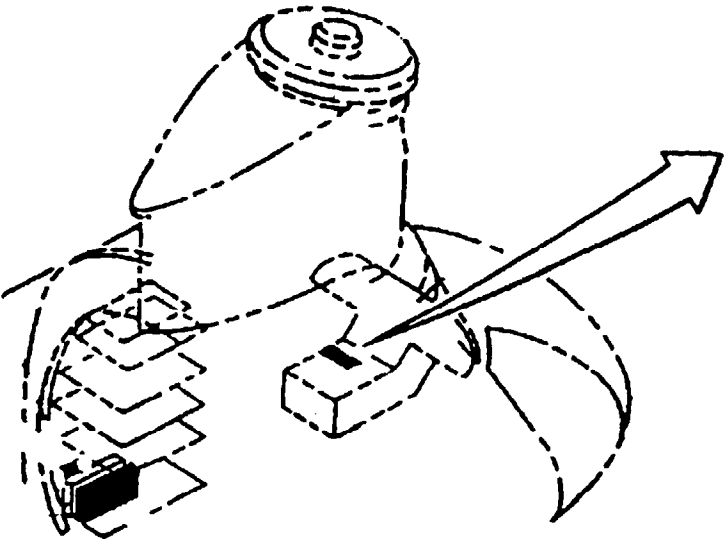
**Applicable Configurations:**  
All

**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**  
None

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)

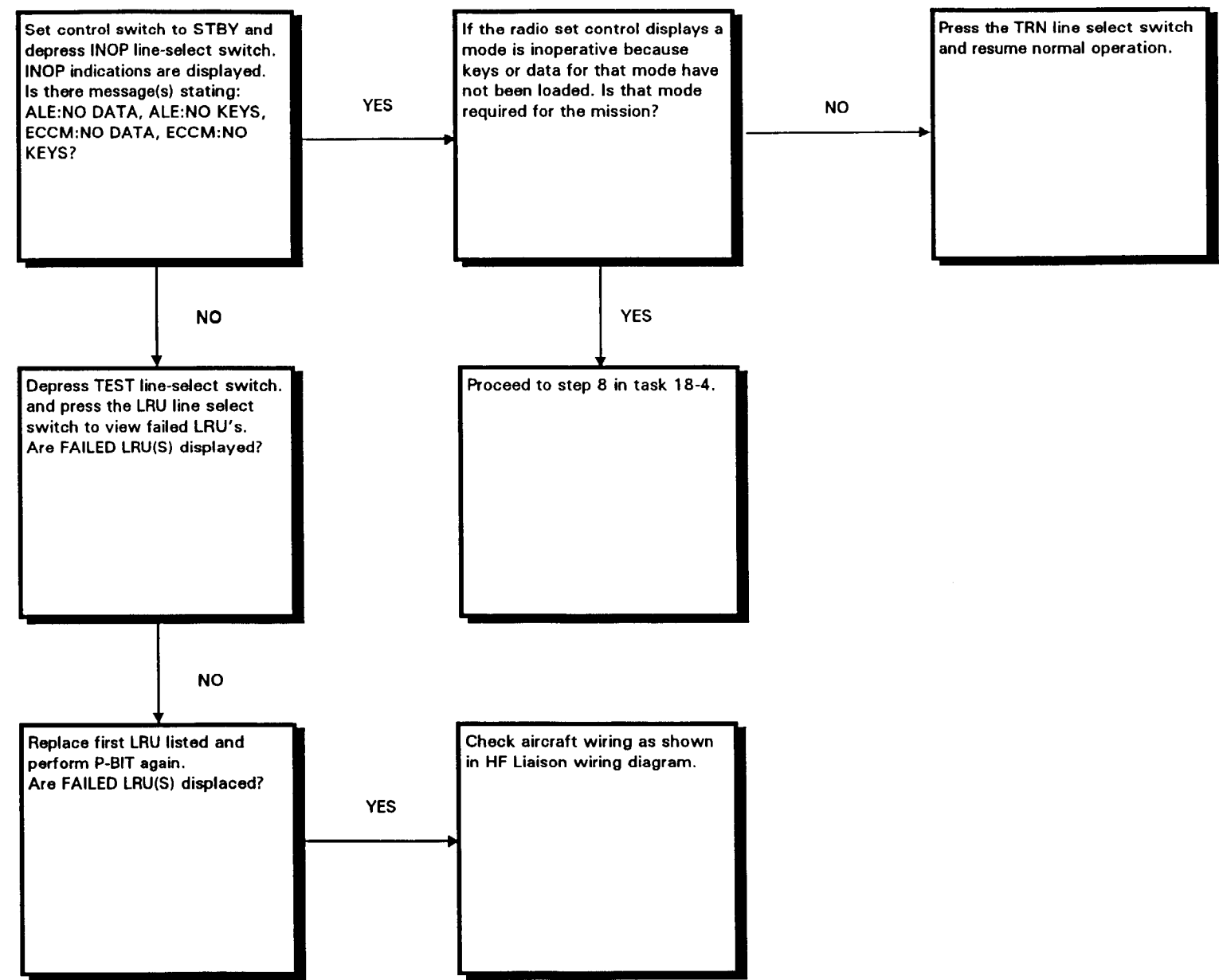
**Personnel Required:**  
Aircraft Electrician (2)



GO TO THE NEXT PAGE

18-4.7 AN/ARC-220 CONTROL DISPLAYS "SYSTEM-NOGO" AFTER POWER UP BIT (P-BIT TEST)  
(CONTINUED).

18-4.7



END OF TASK

18-4.8

18-4.8 AN/ARC-220 CONTROL DISPLAYS "SYSTEM-NOGO RT-CDU COMM FAIL"  
DURING RCV OR XMT TEST).

18-4.8

INITIAL SETUP

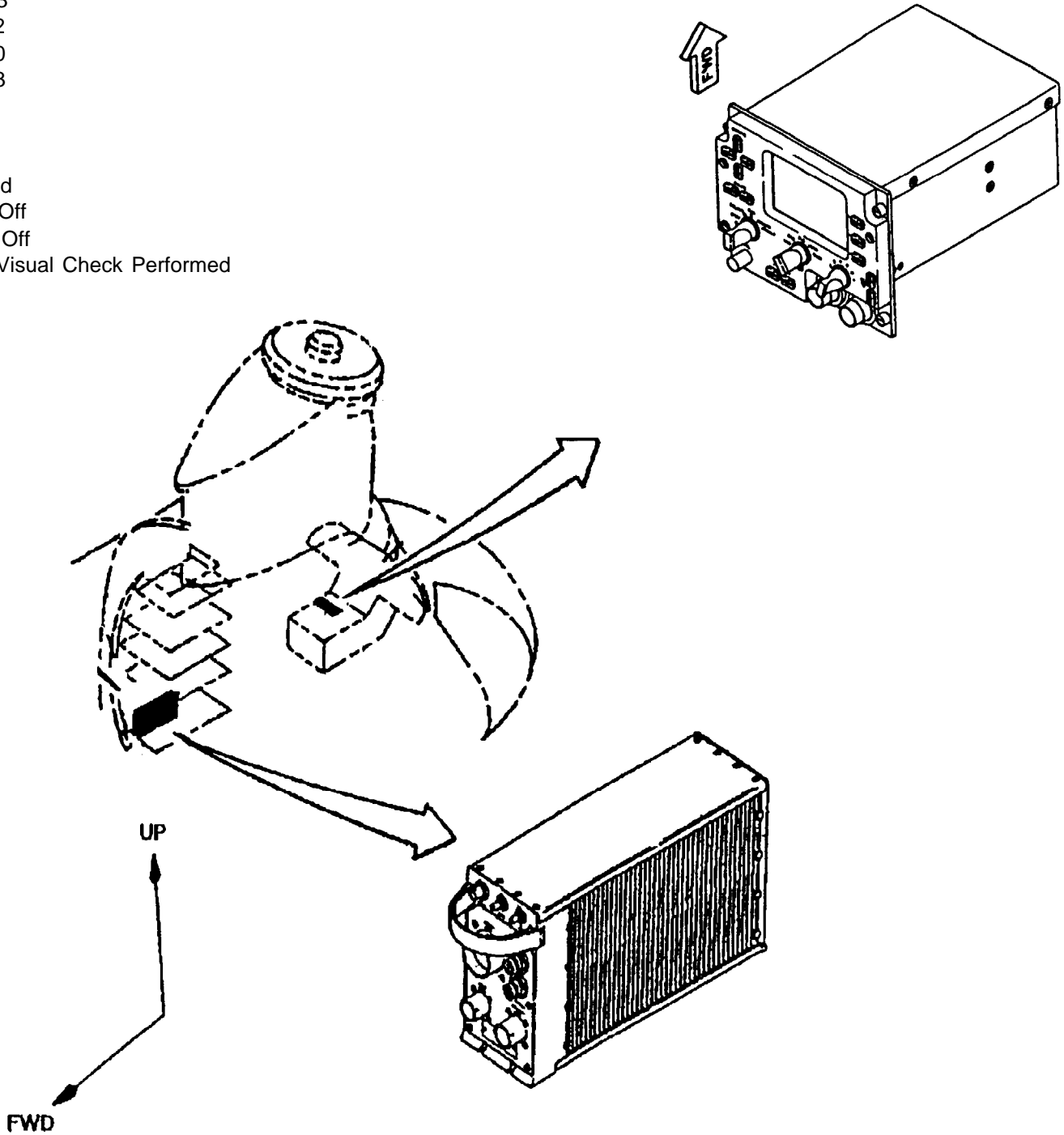
-Applicable Configurations:  
All

Tools:  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:  
None

Personnel Required:  
Aircraft Electrician (2)

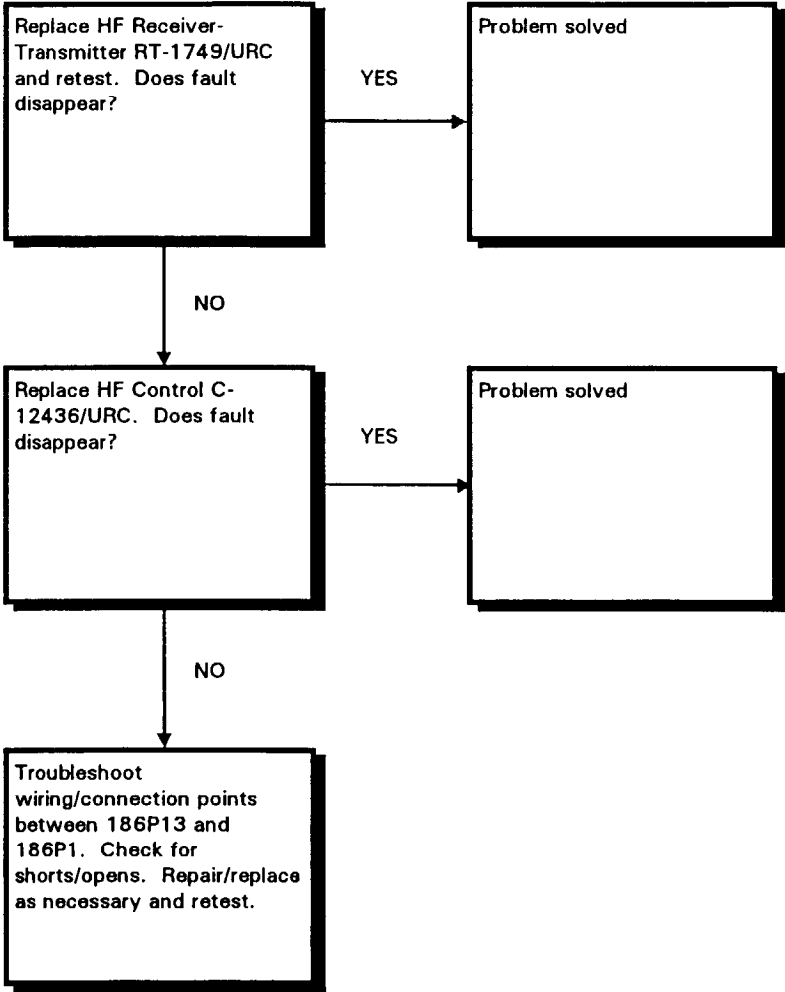
- References:
- TM 11-1520-240-23
  - TM 11-5821-357-12
  - TM 55-1520-240-10
  - TM 55-1520-240-23
- Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power Off
  - Hydraulic Power Off
  - HF Liaison Facility Visual Check Performed (Task 18-4.2)



GO TO THE NEXT PAGE

18-4.8 AN/ARC-220 CONTROL DISPLAYS “SYSTEM-NOGO RT-CDU COMM FAIL” DURING RCV OR XMT TEST (CONTINUED).

18-4.8



END OF TASK

## INITIAL SETUP

## All

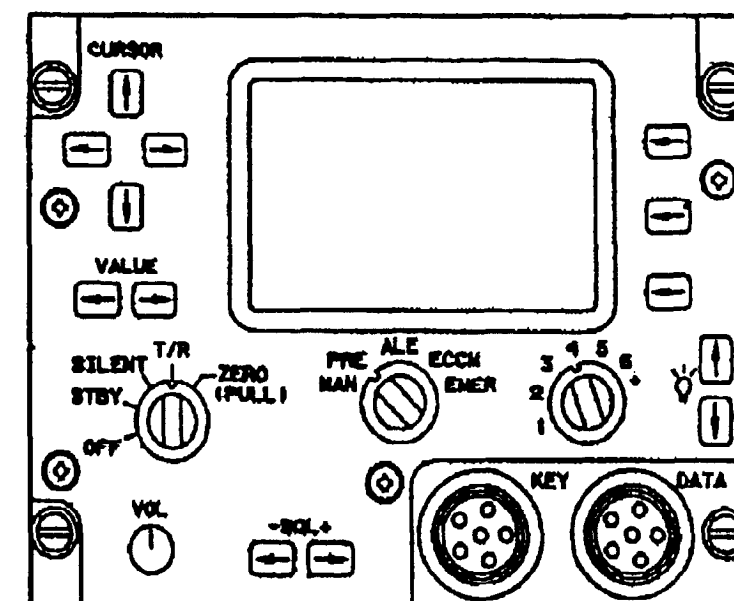
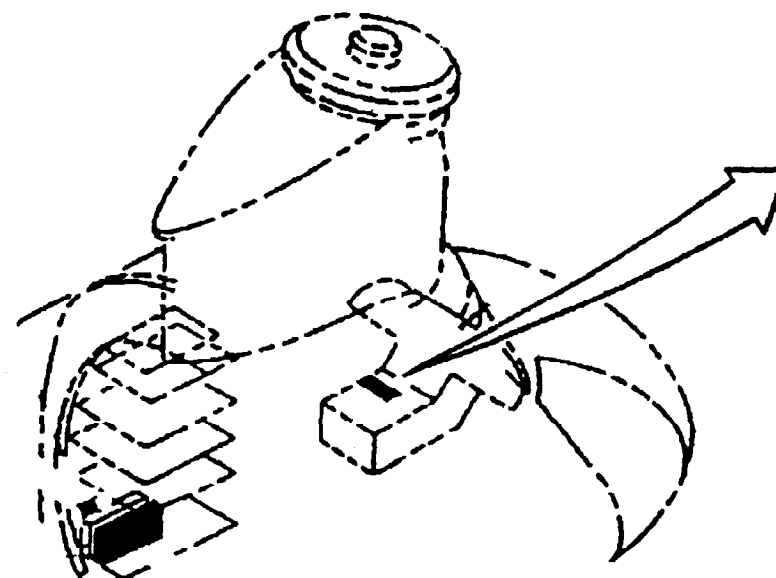
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

## None

Aircraft Electrician (2)

TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

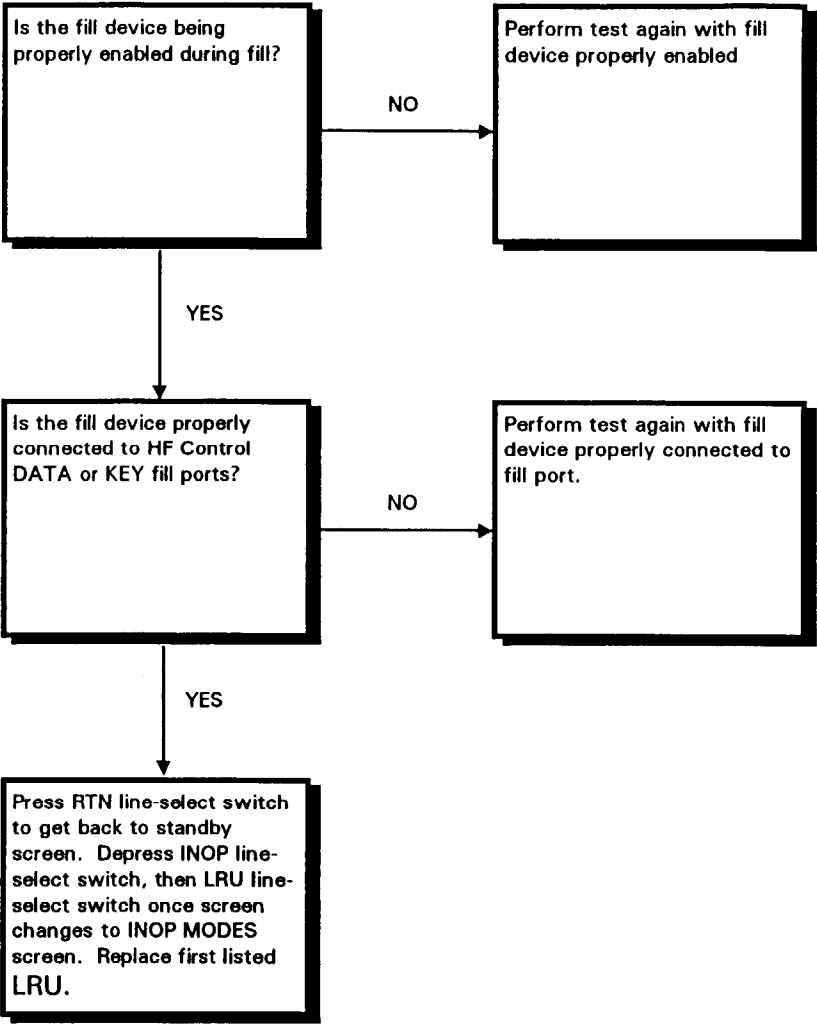
TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)



**Change 21 18-117**

18-4.9 AN/ARC-220 CONTROL "LOAD FAIL" DURING DATA/KEY FILL (CONTINUED).

18-4.9



END OF TASK

18-4.10 AN/ARC-220 RECEIVER TRANSMITTER RECEPTION/TRANSMISSION NOT CLEAR  
OR MISSING IN ALL MODES.

18-4.10

INITIAL SETUP

References:

-Applicable Configurations:  
All

- TM 11-1520-240-23
- TM 11-5821-357-12
- TM 55-1520-240-10
- TM 55-1520-240-23

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Equipment Condition:

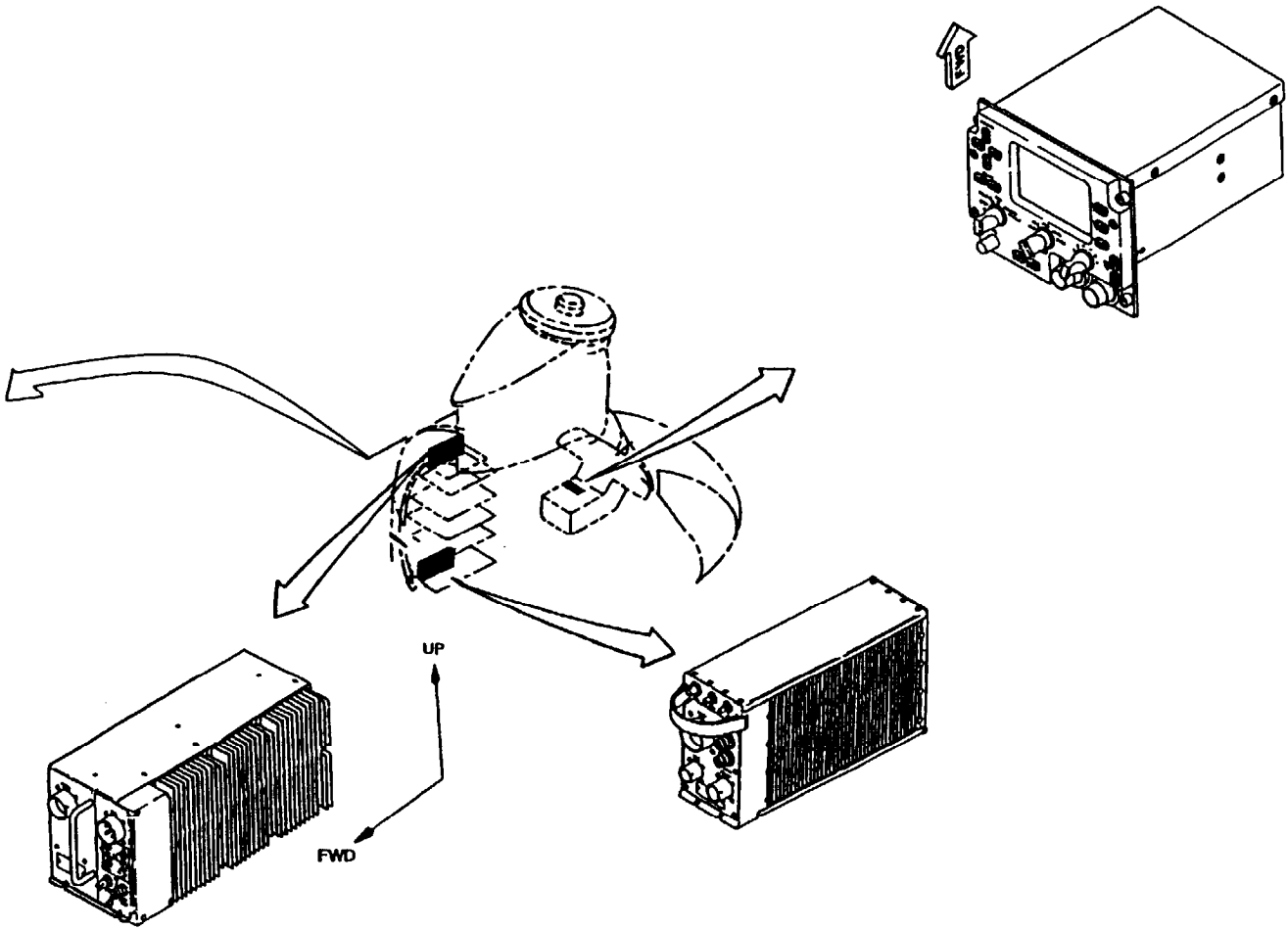
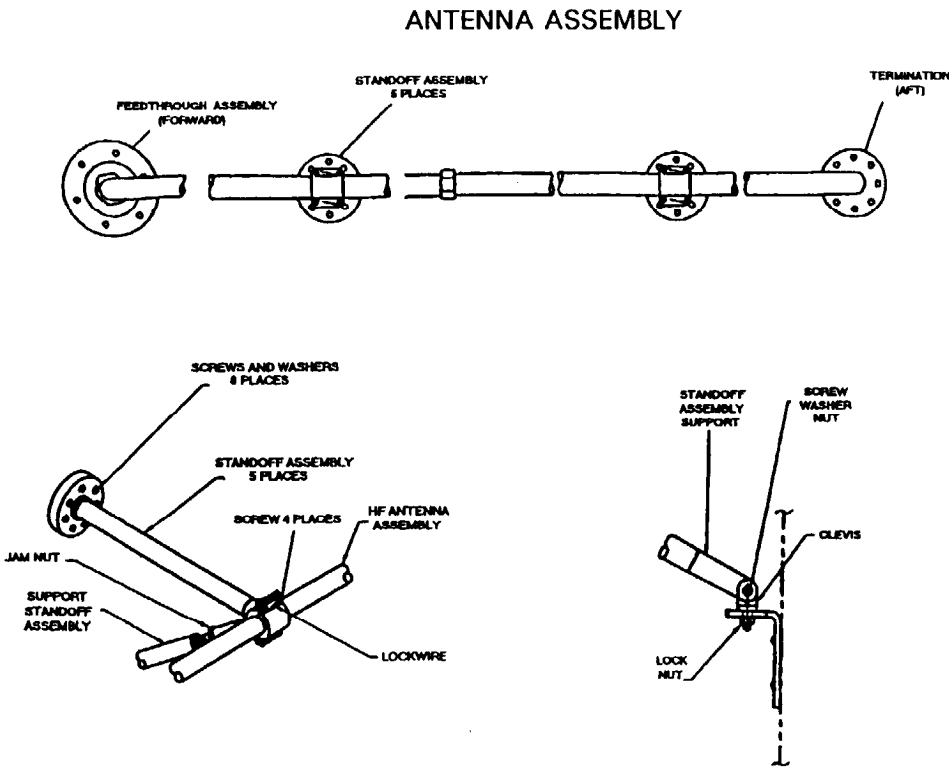
- TM 55-1520-240-23:
- Battery Connected
- Electrical Power Off
- Hydraulic Power Off
- HF Liaison Facility Visual Check Performed  
(Task 18-4.2)

Materials:

None

Personnel Required:

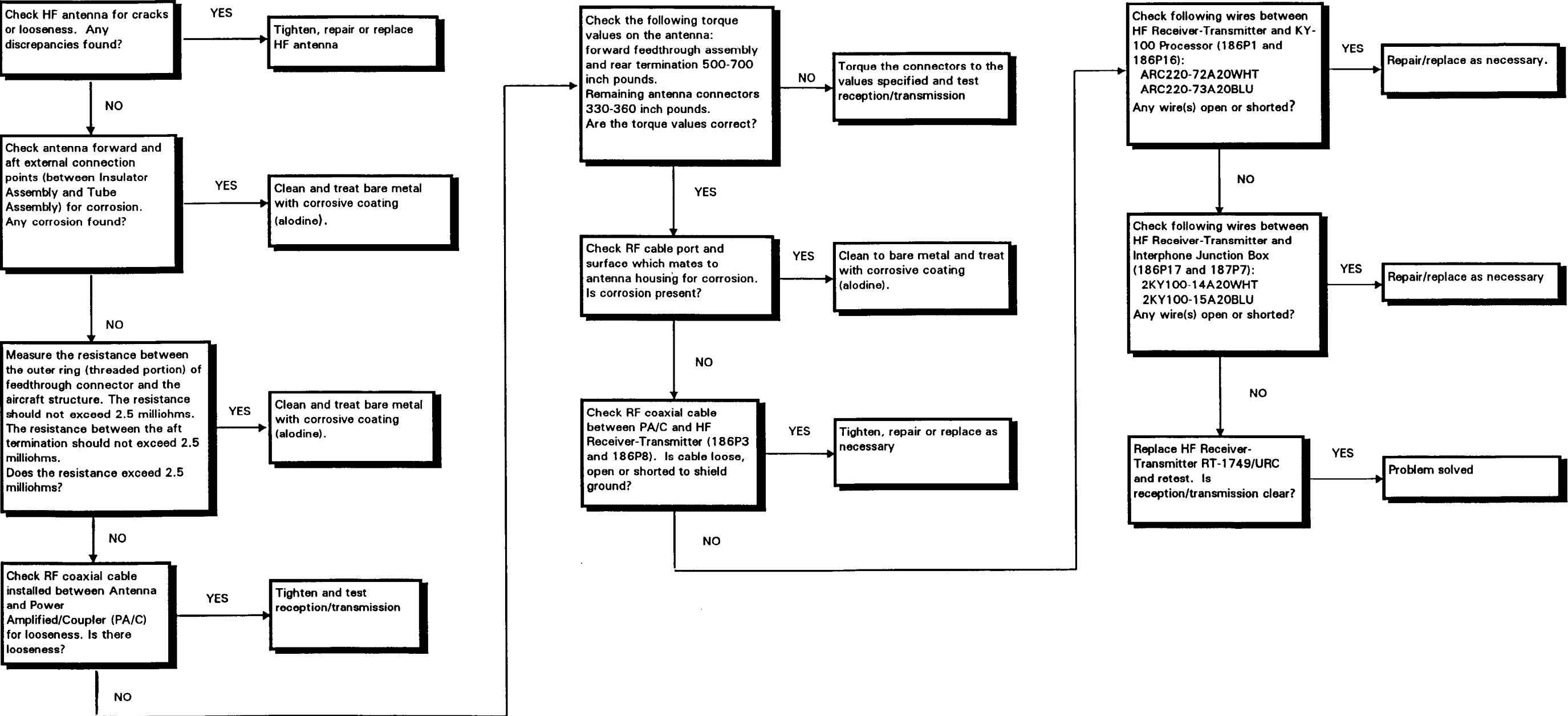
Aircraft Electrician (2)



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18-4.10 AN/ARC-220 RECEIVER TRANSMITTER RECEPTION/TRANSMISSION NOT CLEAR OR MISSING IN ALL MODES (CONTINUED).

18-4.10



END OF TASK



18-4.11 HF LIAISON FACILITY- “CALL FAIL” DISPLAYED WHEN PLACING ALE OR ECCM CALL

18-4.11

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

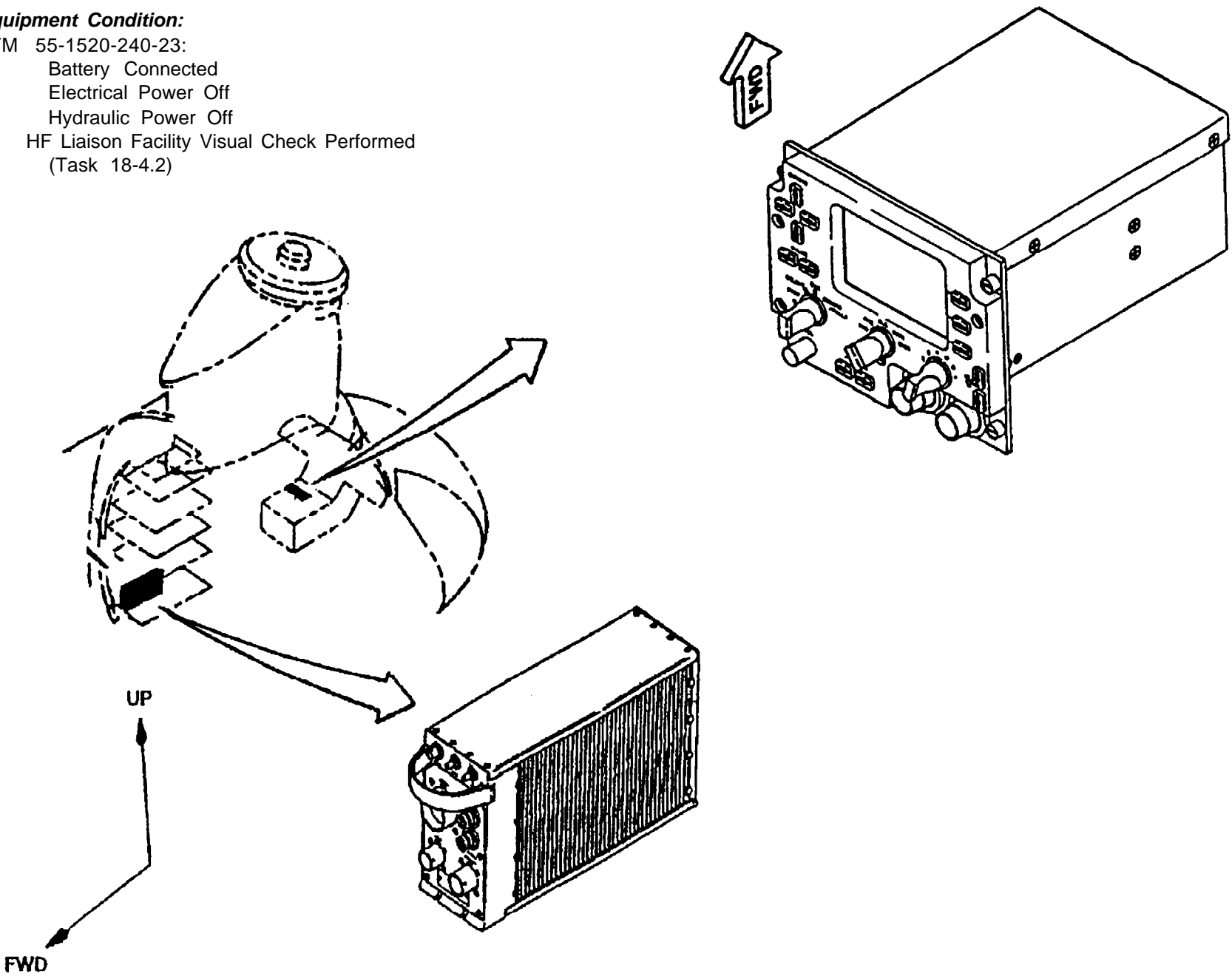
Aircraft Electrician (2)

References:

TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)



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18-4.12 HF LIAISON FACILITY-SYSTEM CANNOT BE TUNED OR SYNCHED DURING ECCM OPERATION

8-4.12

INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**

None

**Personnel Required:**

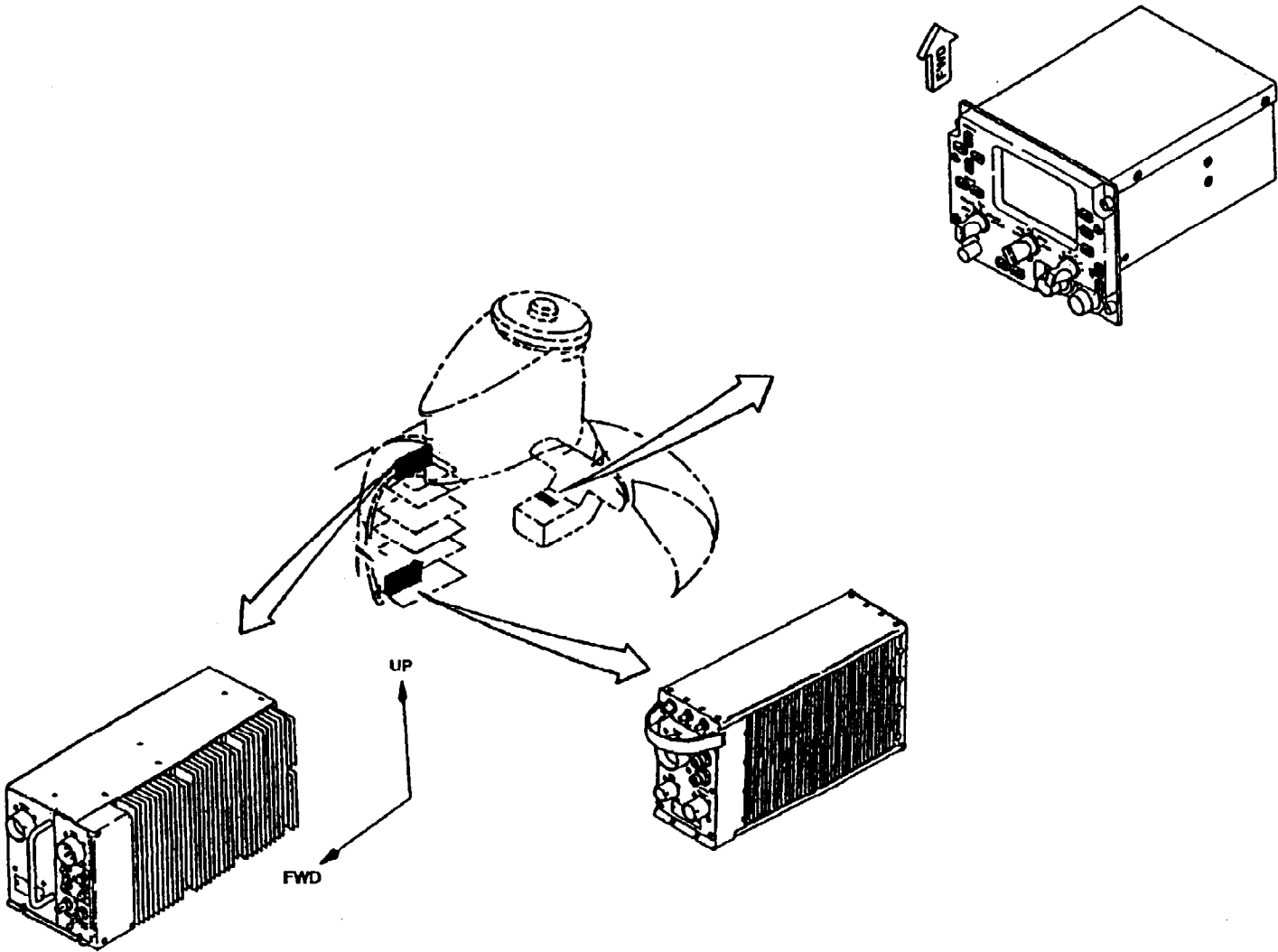
Aircraft Electrician (2)

**References:**

TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

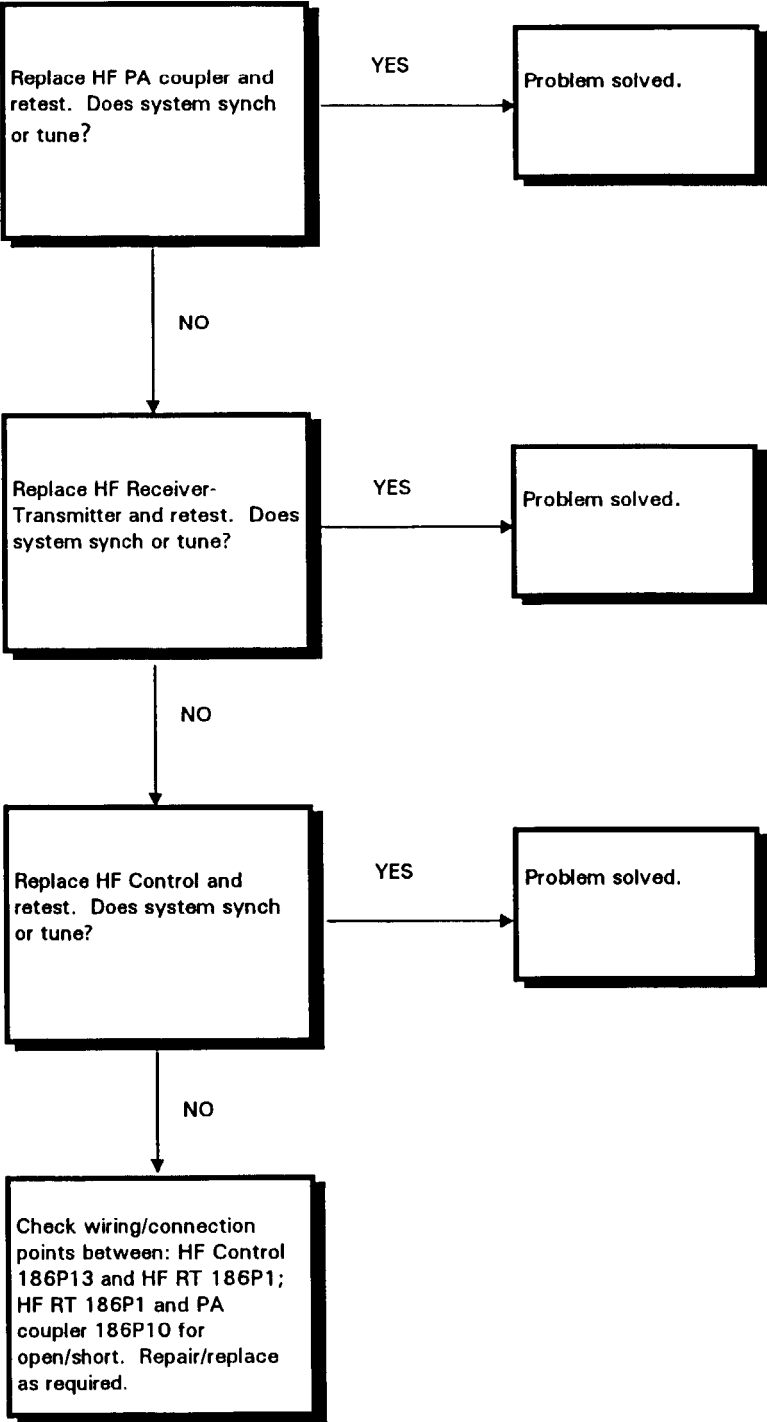
**Equipment Condition:**

TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)



GO TO THE NEXT PAGE

18-4.12 HF LIAISON FACILITY-SYSTEM CANNOT BE TUNED OR SYNCHED DURING ECCM OPERATION (CONTINUED)



END OF TASK

18-4.13 HF LIAISON FACILITY-PREAMBLE TONES NOT HEARD WHEN PLACING A CALL IN ECCM MODE

18-4.13

INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**

None

**Personnel Required:**

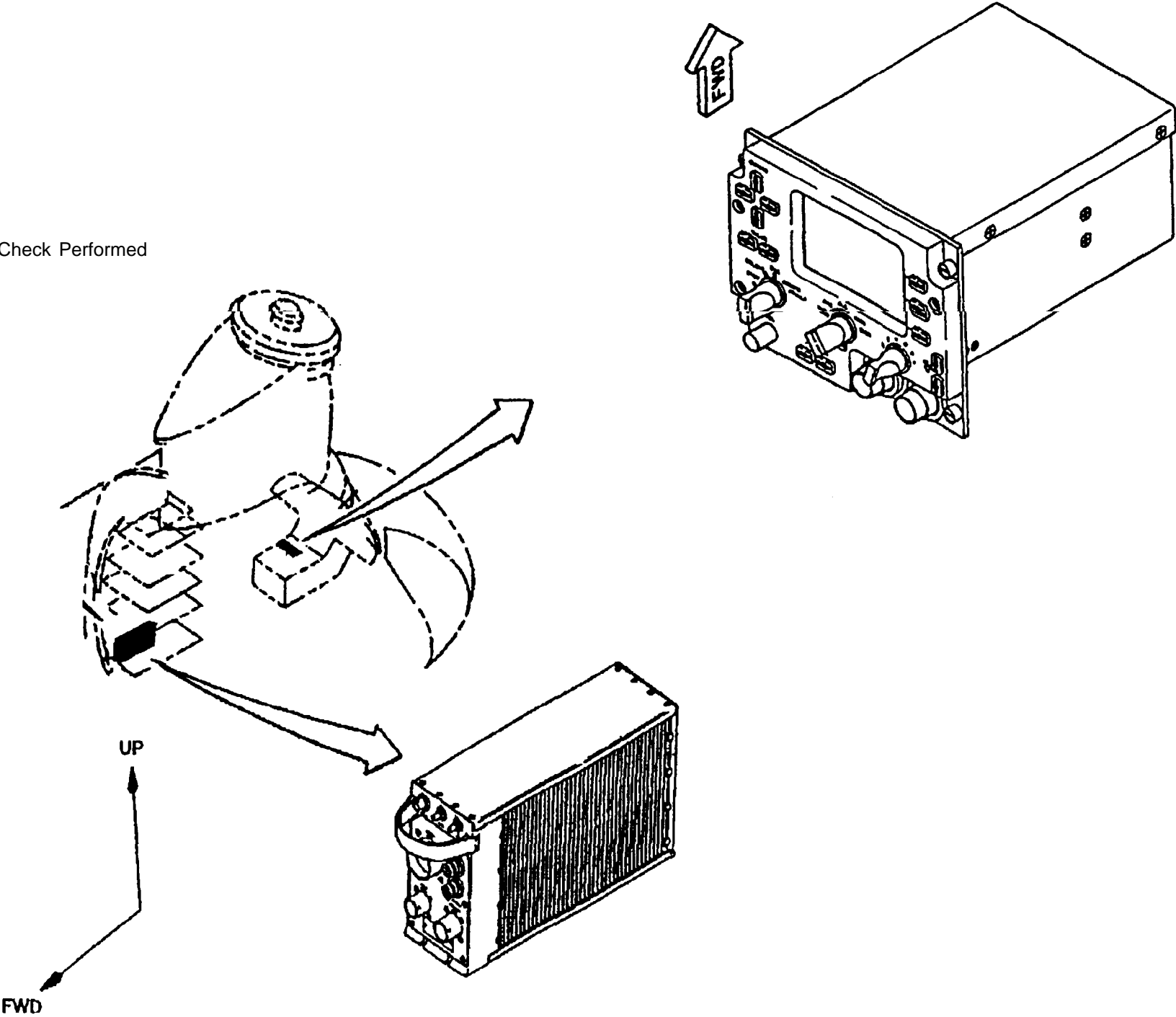
Aircraft Electrician (2)

**References:**

TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

**Equipment Condition:**

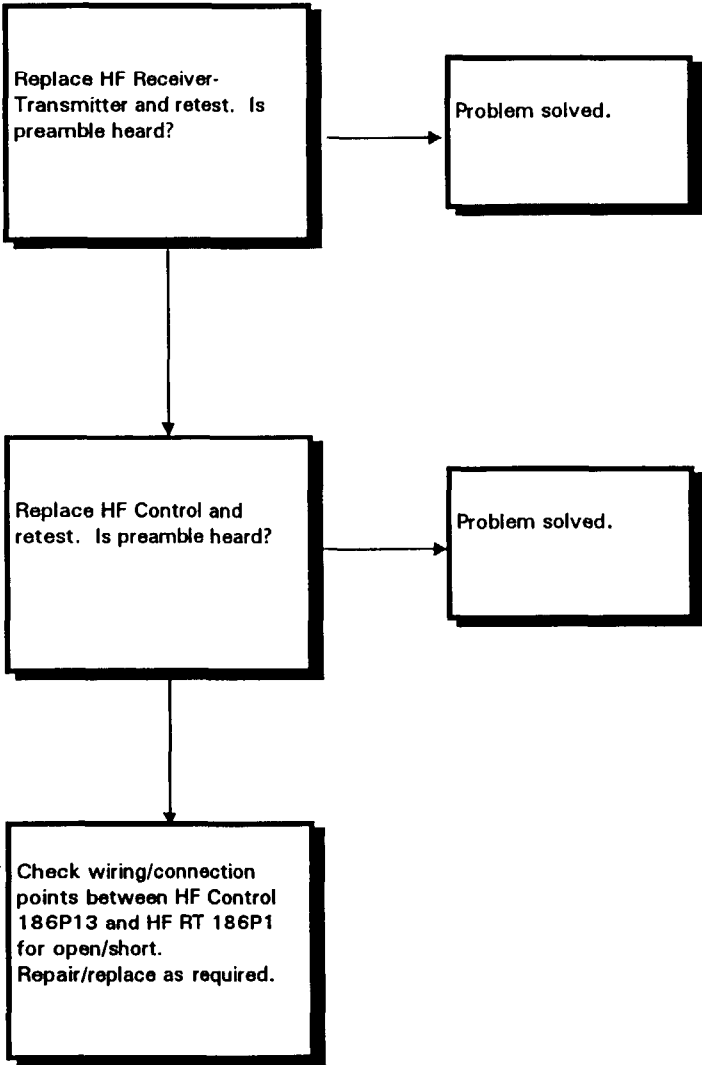
TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)



GO TO THE NEXT PAGE

18-4.13 HF LIAISON FACILITY-PREAMBLE TONES NOT HEARD WHEN PLACING A CALL IN ECCM MODE (CONTINUED)

18-4.13



END OF TASK

18-4.14 HF LIAISON FACILITY-“LINKED” IS NOT DISPLAYED ON HF CONTROL WHEN  
PLACING ALE OR ECCM CALL

8-4.14

INITIAL SETUP

Applicable Configurations:

All

Tools:

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

Materials:

None

Personnel Required:

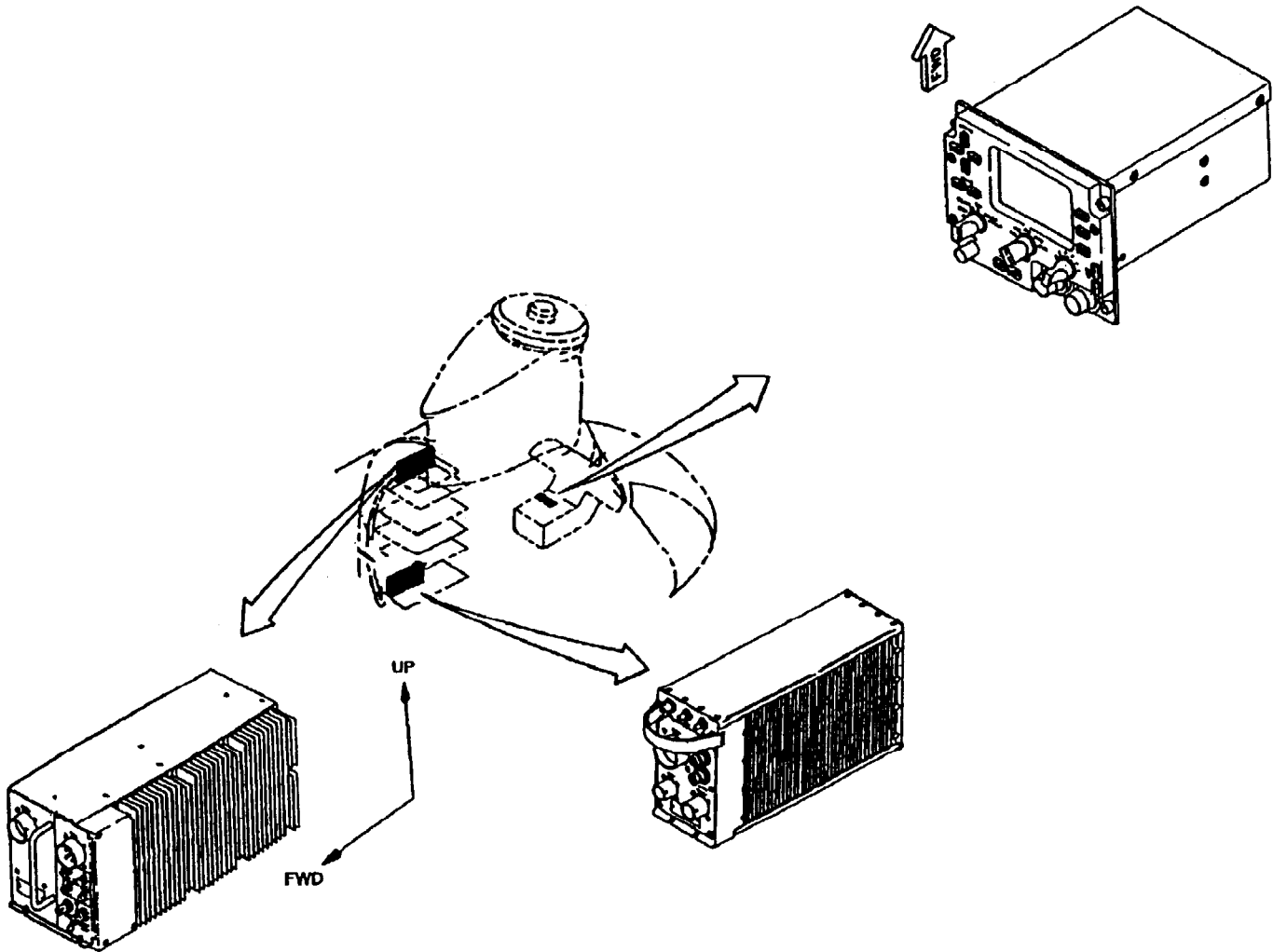
Aircraft Electrician (2)

References:

- TM 11-1520-240-23
- TM 11-5821-357-12
- TM 55-1520-240-10
- TM 55-1520-240-23

Equipment Condition:

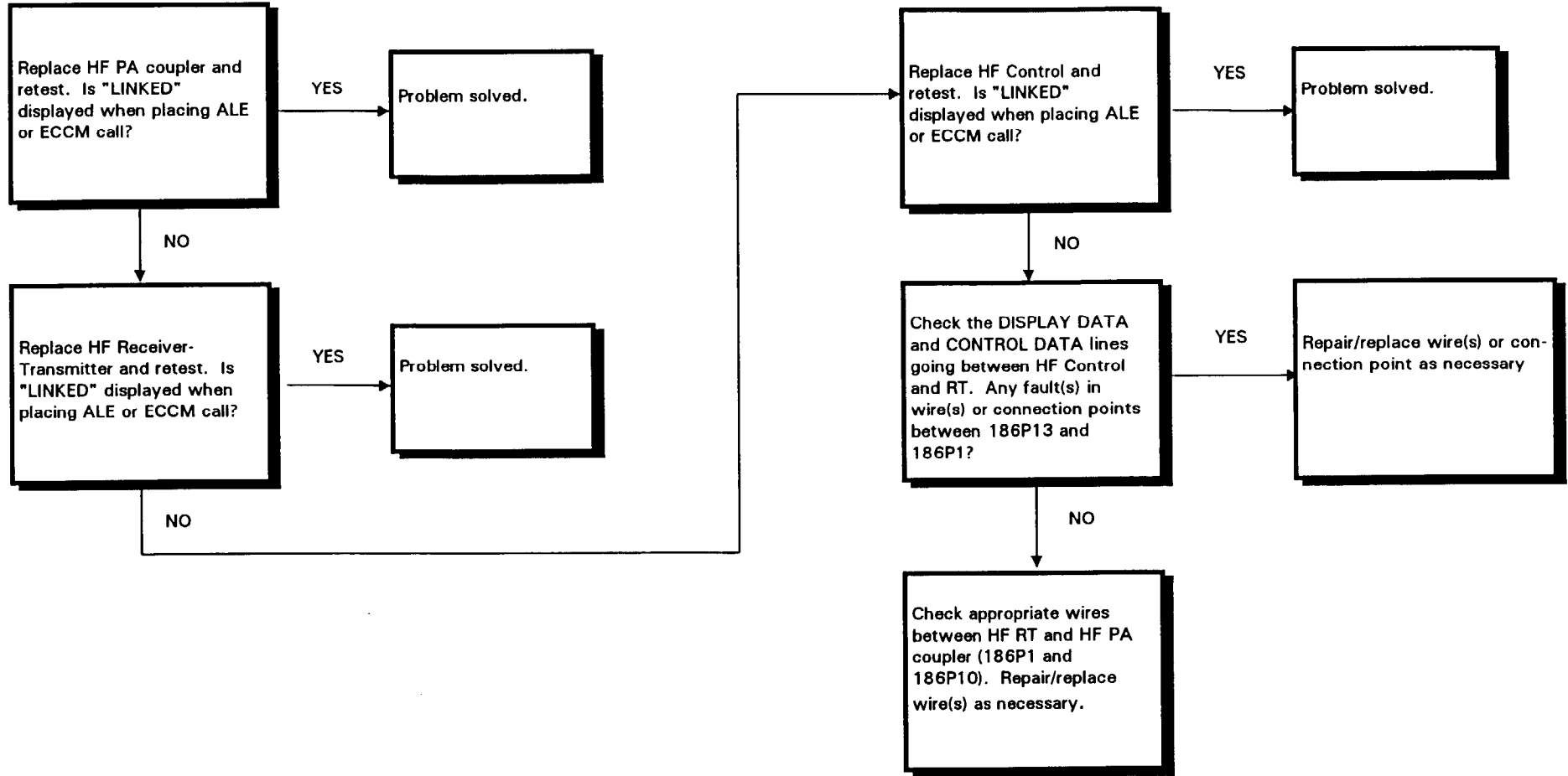
- TM 55-1520-240-23:
- Battery Connected
- Electrical Power Off
- Hydraulic Power Off
- HF Liaison Facility Visual Check Performed  
(Task 18-4.2)



GO TO THE NEXT PAGE

18-4.14 HF LIAISON FACILITY--LINKED" IS NOT DISPLAYED ON HF CONTROL WHEN PLACING ALE OR ECCM CALL (CONTINUED)

18-4.14



END OF TASK

**18-4.15 HF LIAISON FACILITY-HEADSET AUDIO IS NOT RESTORED AFTER LINK  
ESTABLISHED WHEN PLACING ALE OR ECCM CALL**

18-4.15

**INITIAL SETUP**

**Applicable Configurations:**  
All

**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**  
None

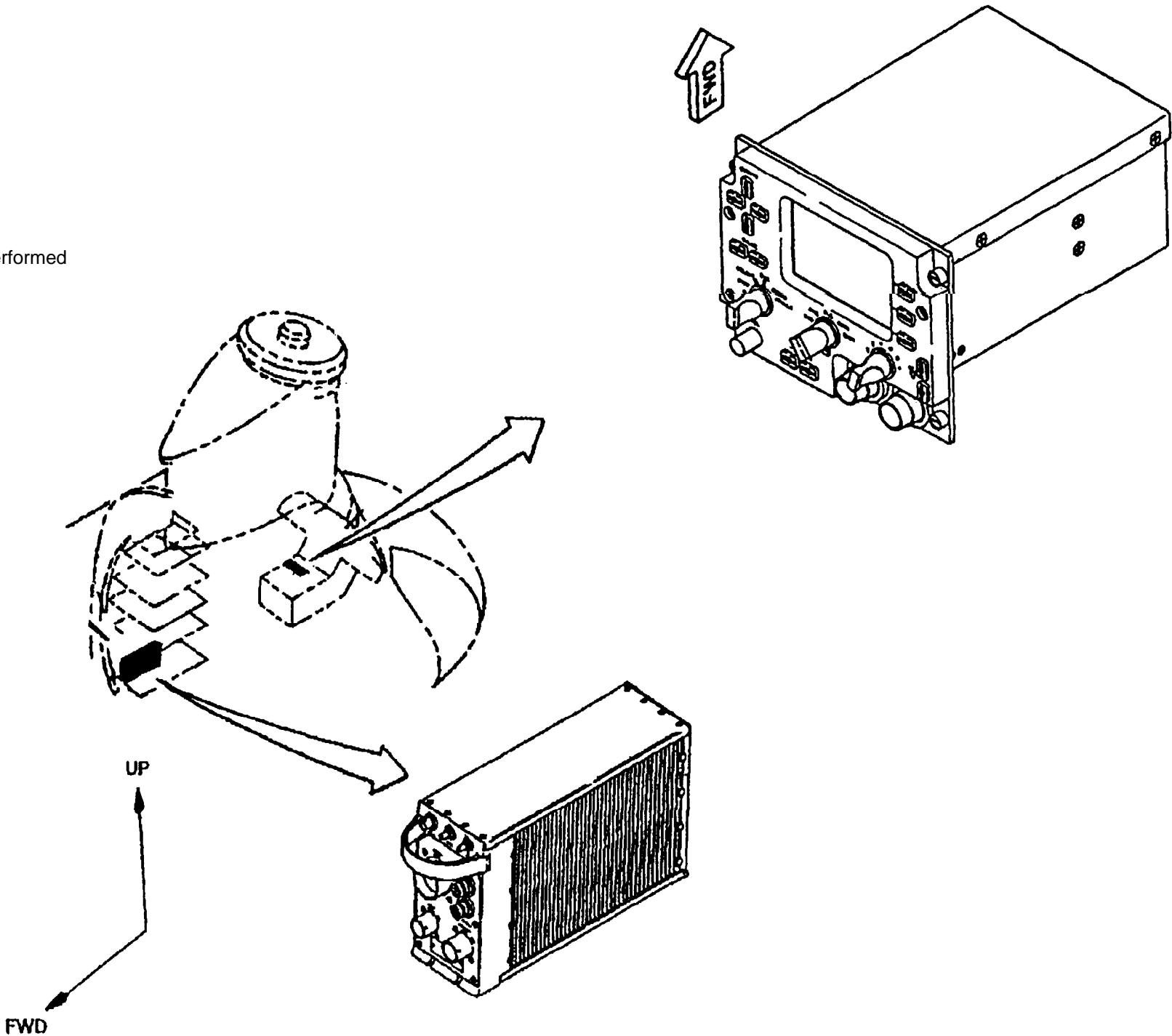
**Personnel Required:**  
Aircraft Electrician (2)

**References:**

TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

**Equipment Condition:**

TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)

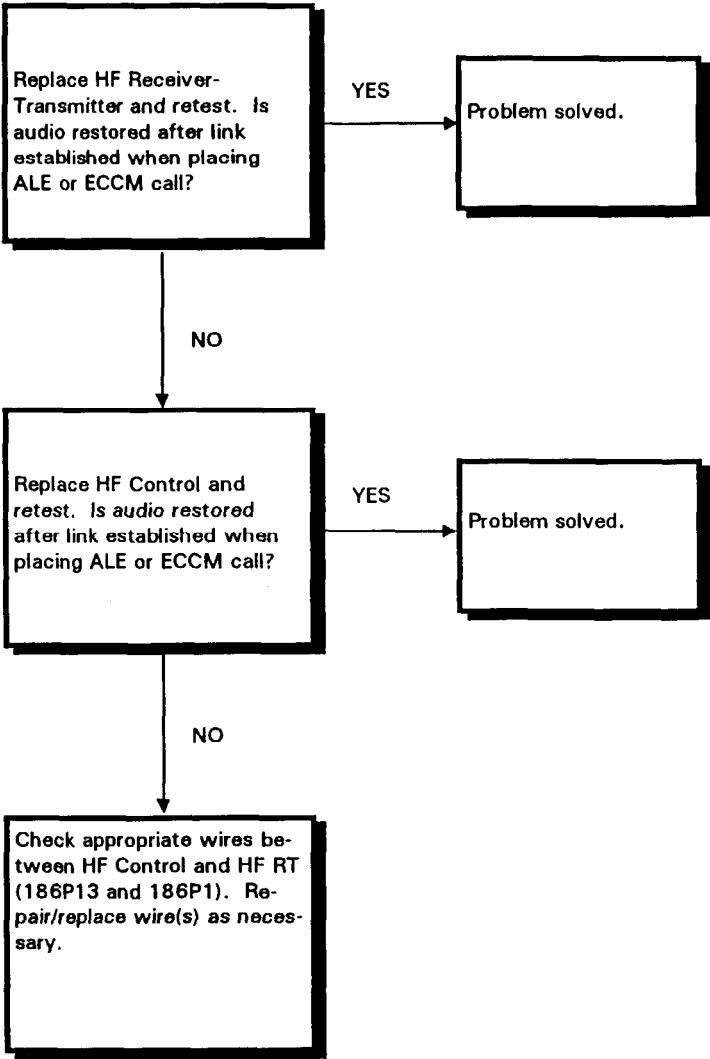


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18-4.15 HF LIAISON FACILITY-HEADSET AUDIO IS NOT RESTORED AFTER LINK ESTABLISHED WHEN PLACING ALE OR ECCM CALL (CONTINUED)

18-4.15



END OF TASK

18-4.16 HF LIAISON FACILITY “RECEIVING PREAMBLE” NOT DISPLAYED BEFORE AN  
ECCN CALL IS RECEIVED

18-4.16

INITIAL SETUP

**Applicable Configurations:**  
All

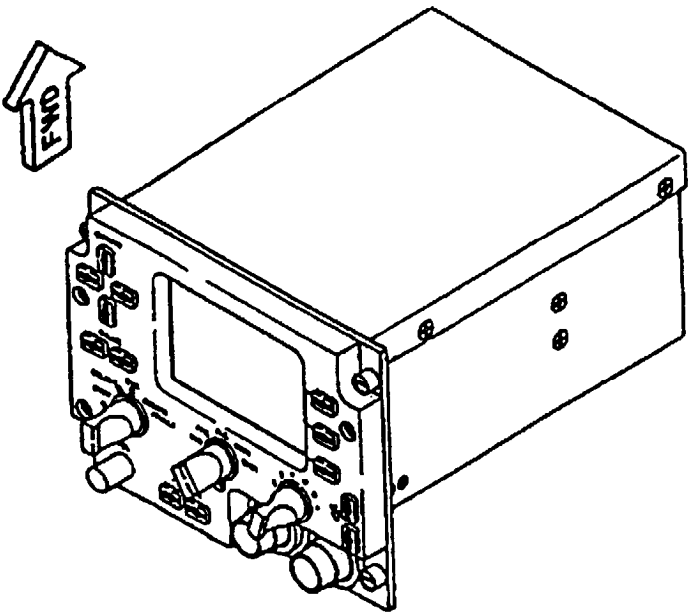
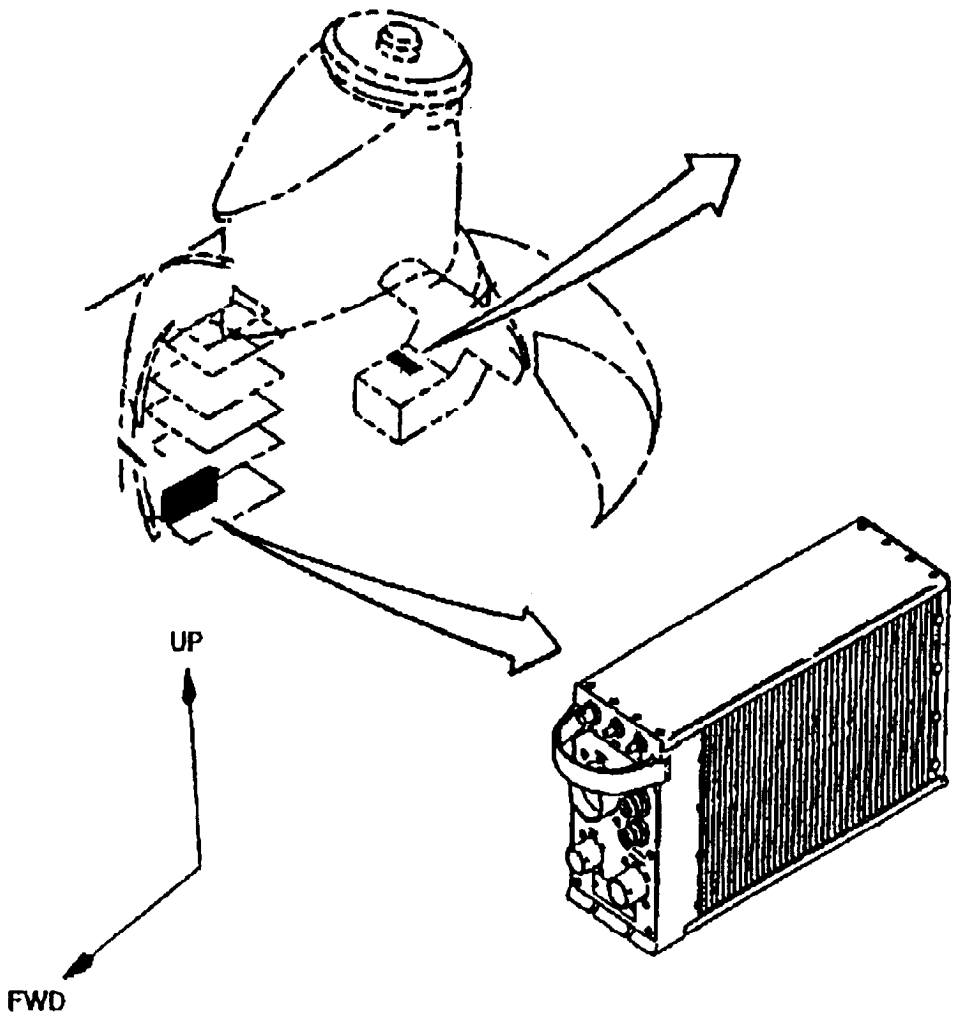
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician (2)

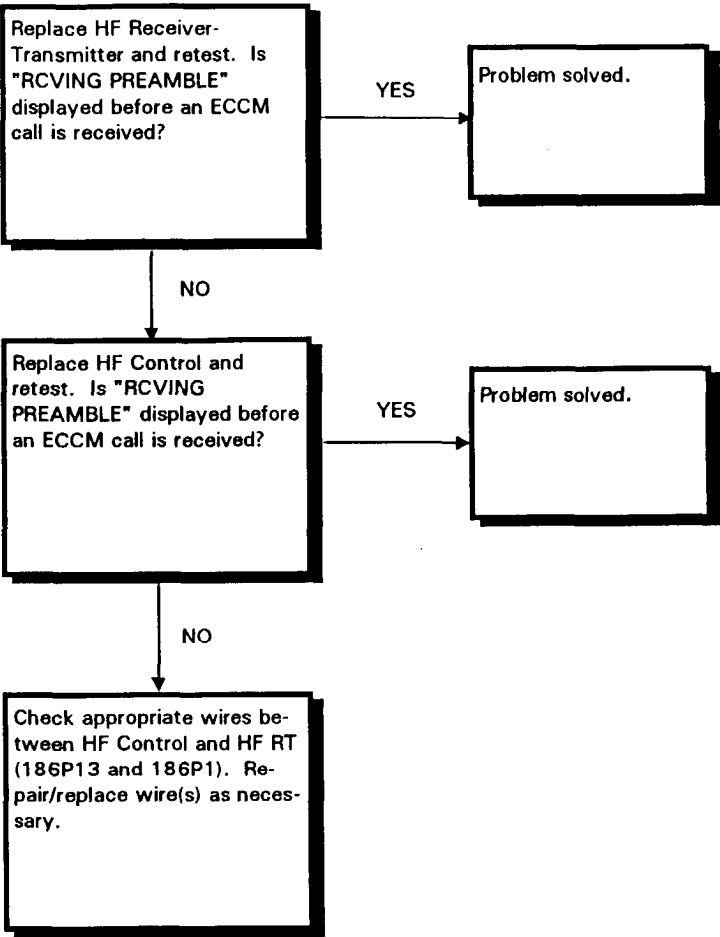
**References:**  
TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)



GO TO THE NEXT PAGE

18-4.16 HF LIAISON FACILITY "RECEIVING PREAMBLE" NOT DISPLAYED BEFORE AN ECCN CALL IS RECEIVED (CONTINUED)



END OF TASK

18-4.17 HF LIAISON FACILITY - PREPROGRAMED INFORMATION CANNOT BE ZEROIZED

18-4.17

INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**

None

**Personnel Required:**

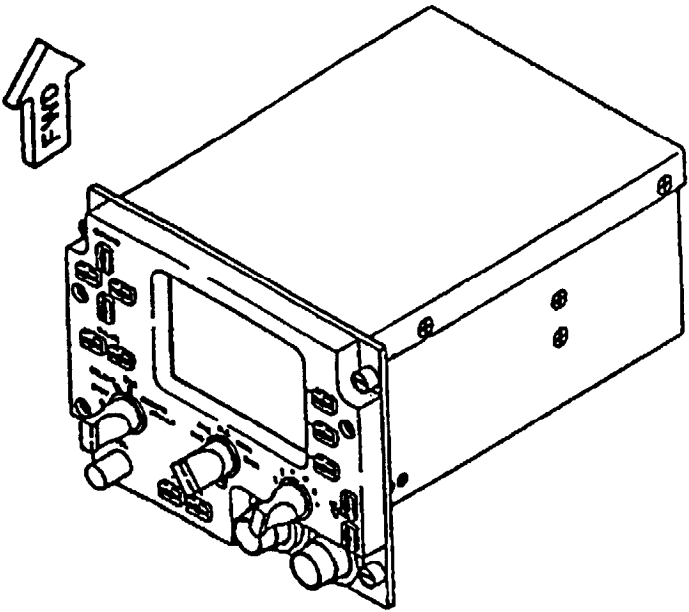
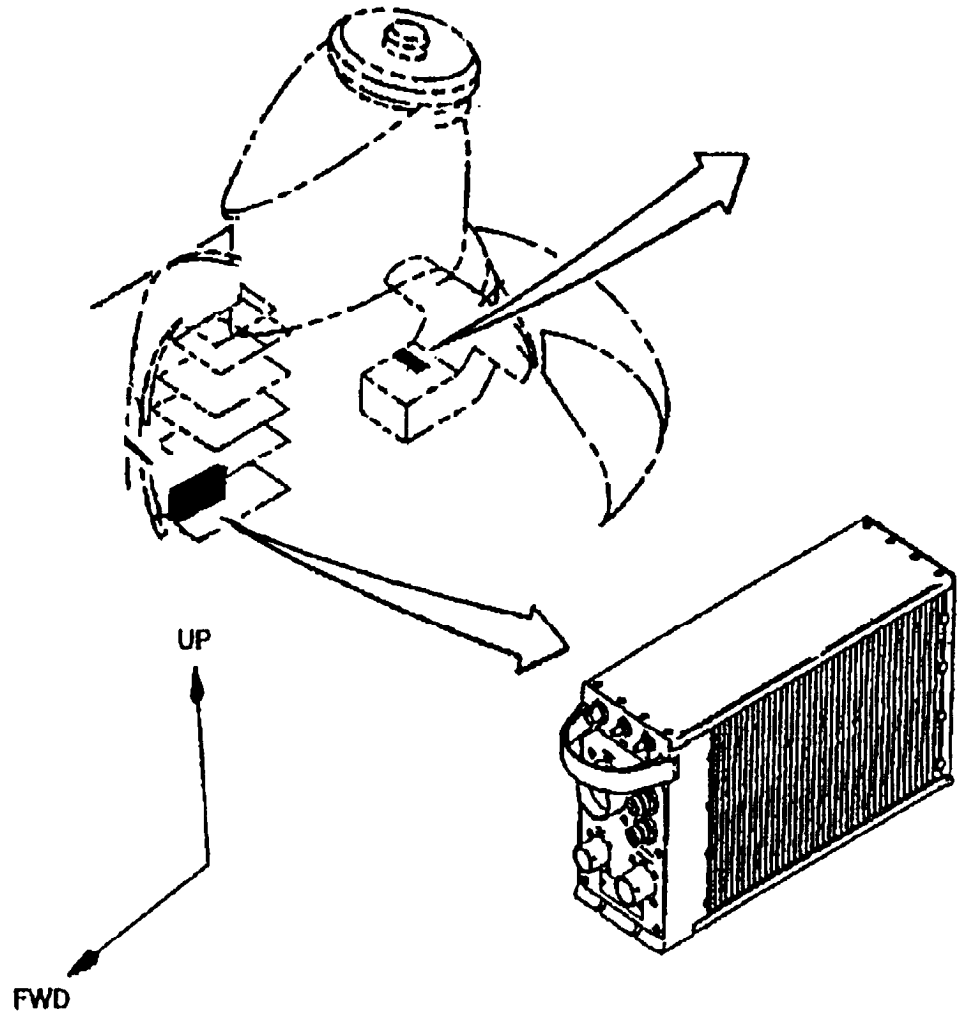
Aircraft Electrician (2)

**References:**

TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

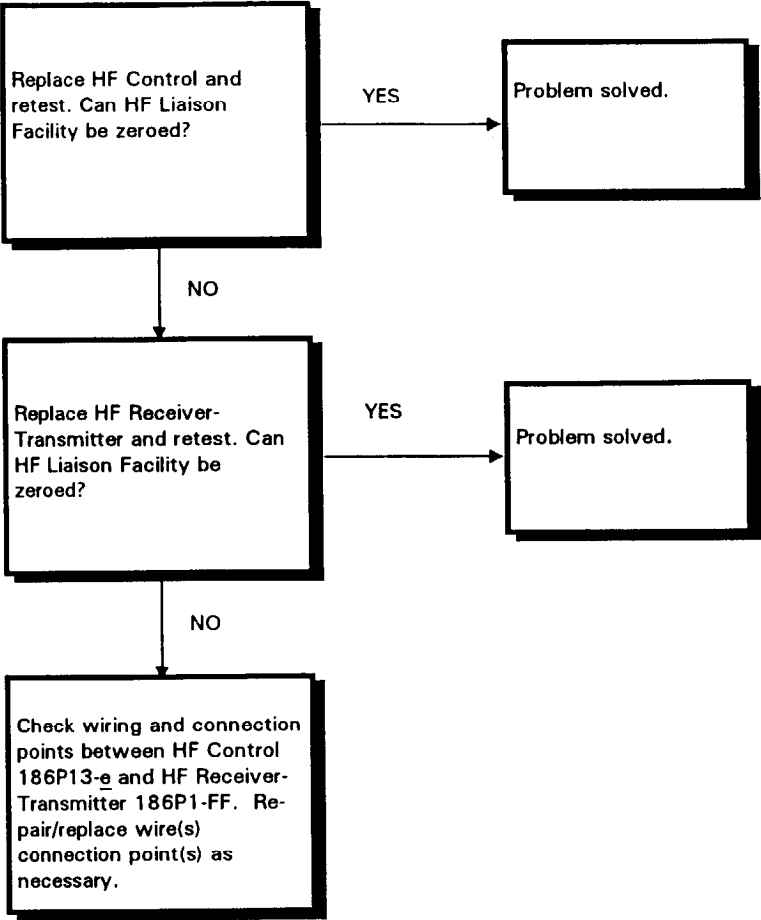
**Equipment Condition:**

TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)



GO TO THE NEXT PAGE

18-4.17 HF LIAISON FACILITY - PREPROGRAMED INFORMATION CANNOT BE ZEROIZED  
(CONTINUED)



END OF TASK

18-4.18 TESC/KY-100 CONTROL RCU CANNOT KEY FILL FROM KEY FILL DEVICE

8-4.18

INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**

None

**Personnel Required:**

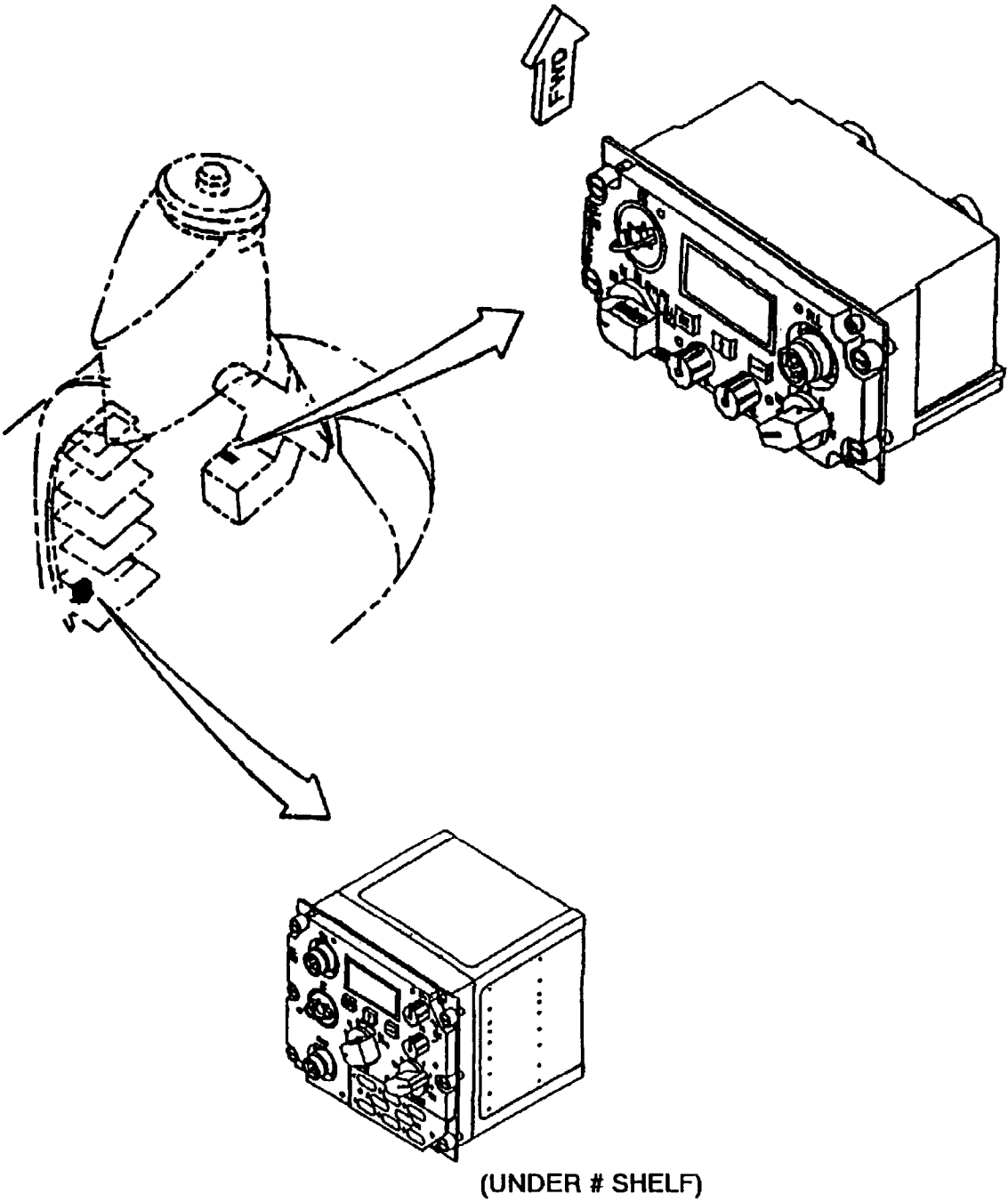
Aircraft Electrician (2)

**References:**

TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

**Equipment Condition:**

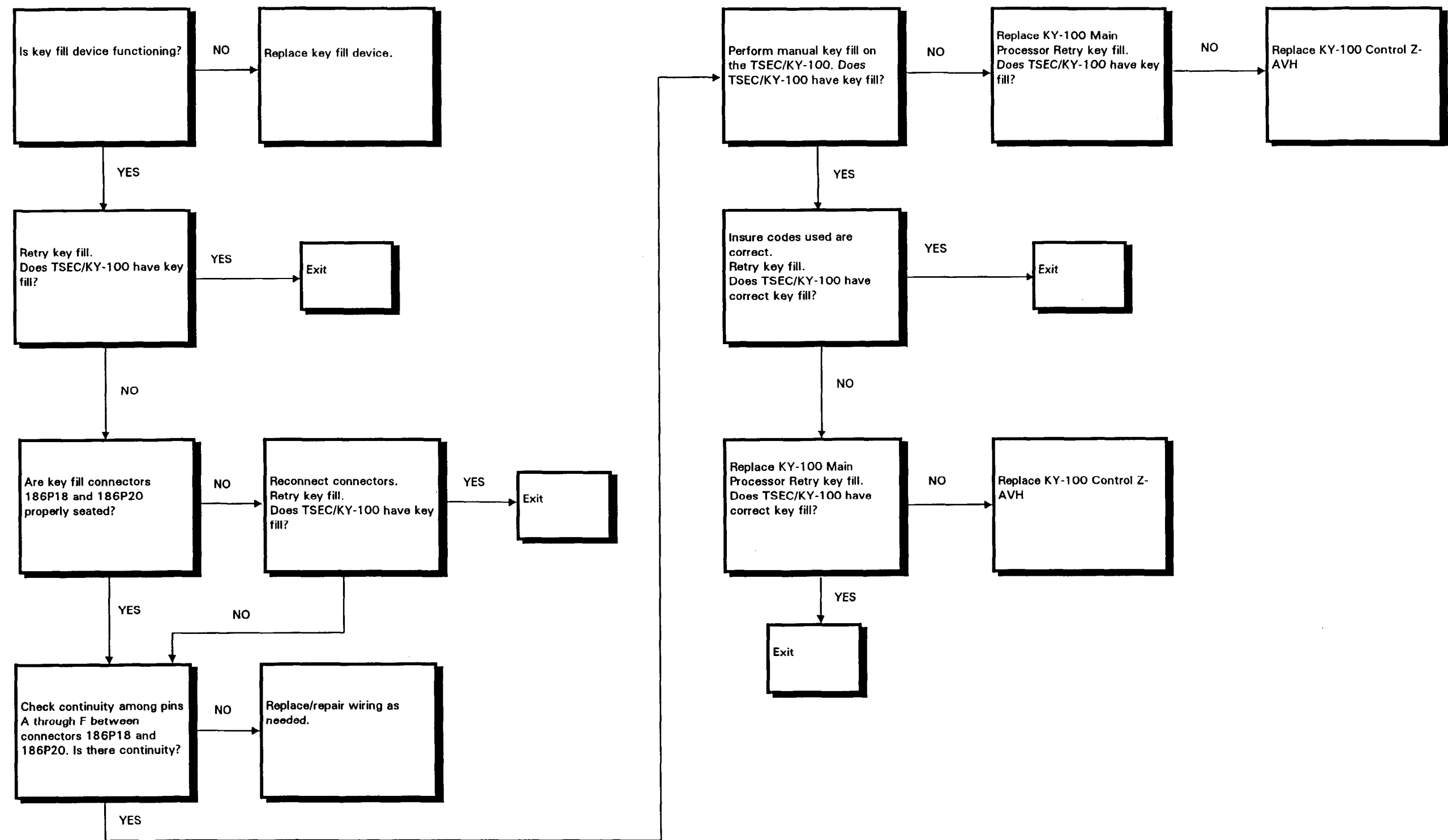
TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)



GO TO THE NEXT PAGE

18-4.18 TSEC/KY-100 CONTROL RCU CANNOT KEY FILL FROM KEY FILL DEVICE  
(CONTINUED)

18-4.18



END OF TASK

18-4.19 TESC/KY-100 CONTROL RCU CANNOT KEYS CANNOT BE ZEROED

18-4.19

INITIAL SETUP

**Applicable Configurations:**  
All

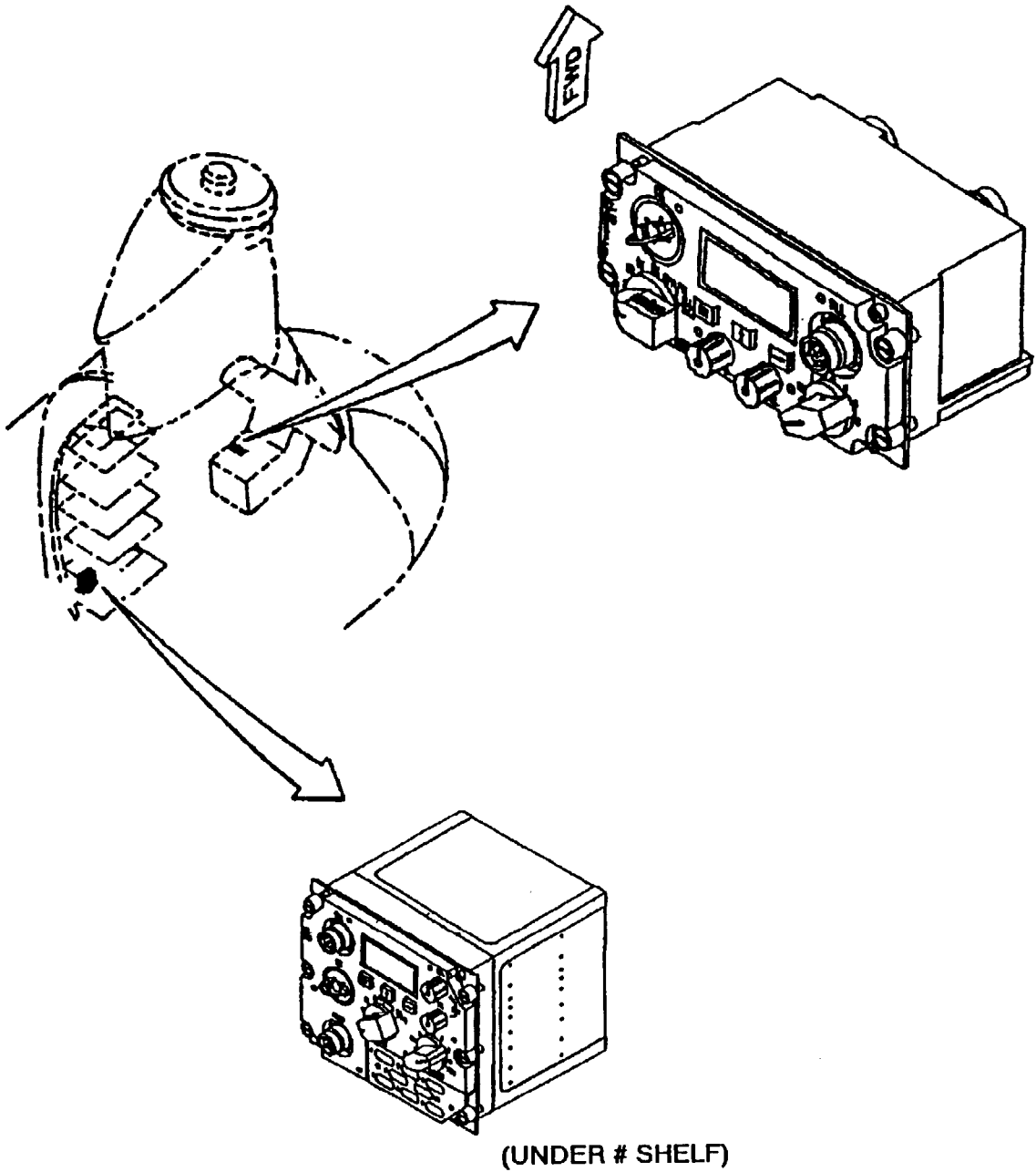
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**  
None

**Personnel Required;**  
Aircraft Electrician (2)

**References:**  
TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

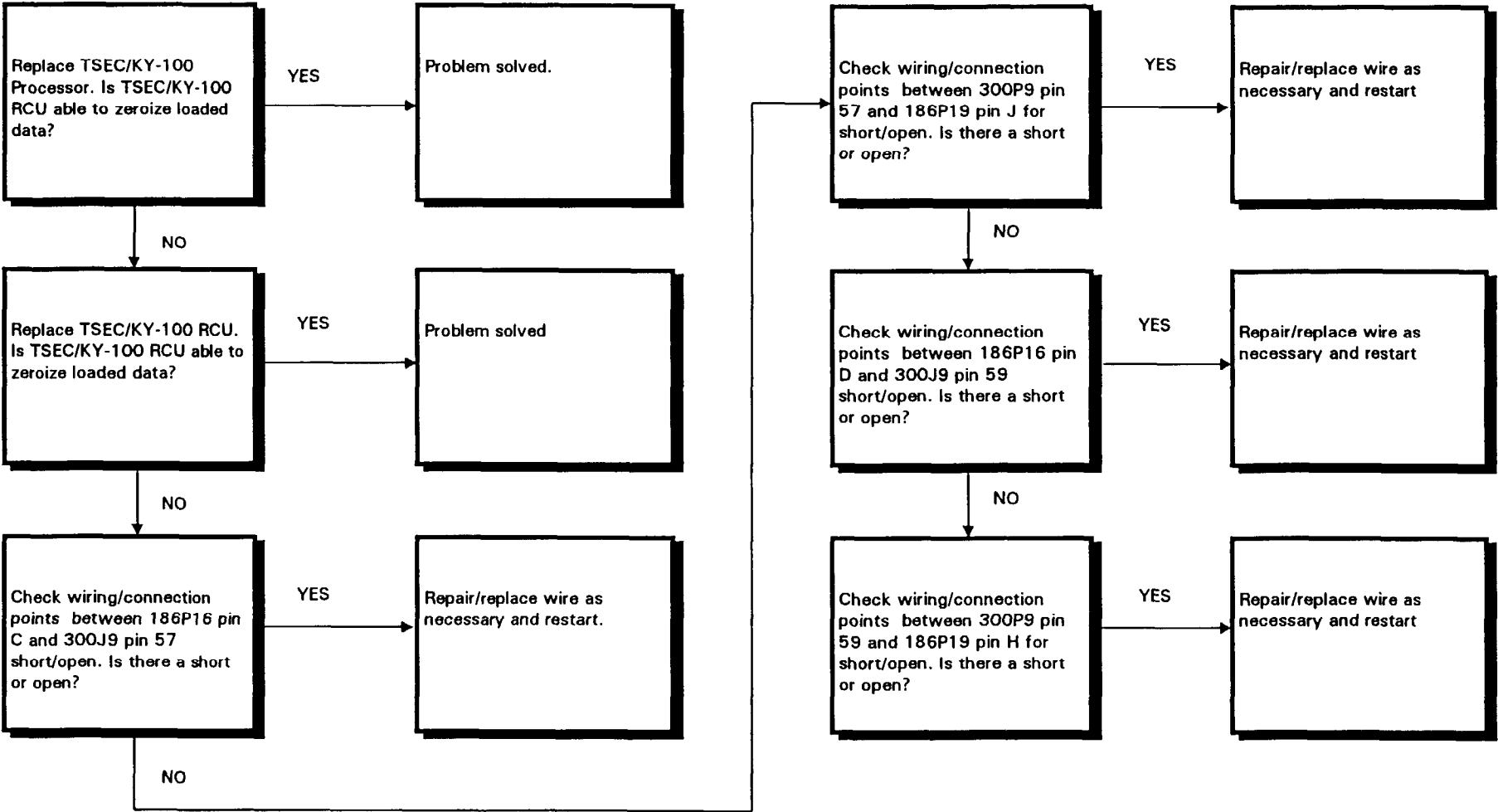
**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)



GO TO THE NEXT PAGE



18-4.19 TESC/KY-100 CONTROL RCU CANNOT KEYS CANNOT BE ZEROED (CONTINUED)



END OF TASK

18-4.20 SECURE VOICE OPERATION - WITH KY-100 CONTROL SET TO CT MODE AND PLAINTEXT TRANSMITTED TO RADIO UNDER TEST, COMMUNICATION NOT HEARD

8-4.20

INITIAL SETUP

**Applicable Configurations:**  
All

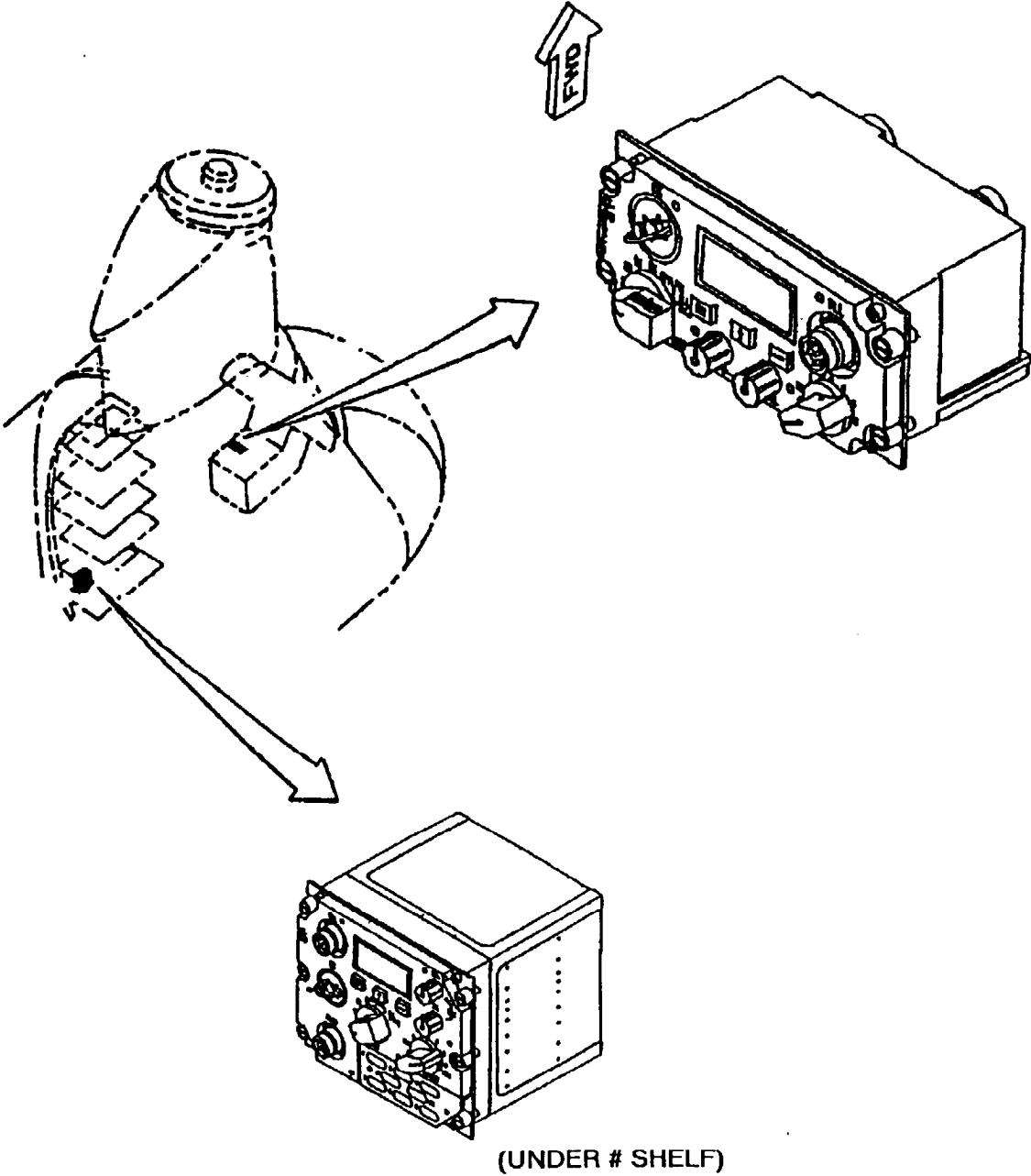
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician (2)

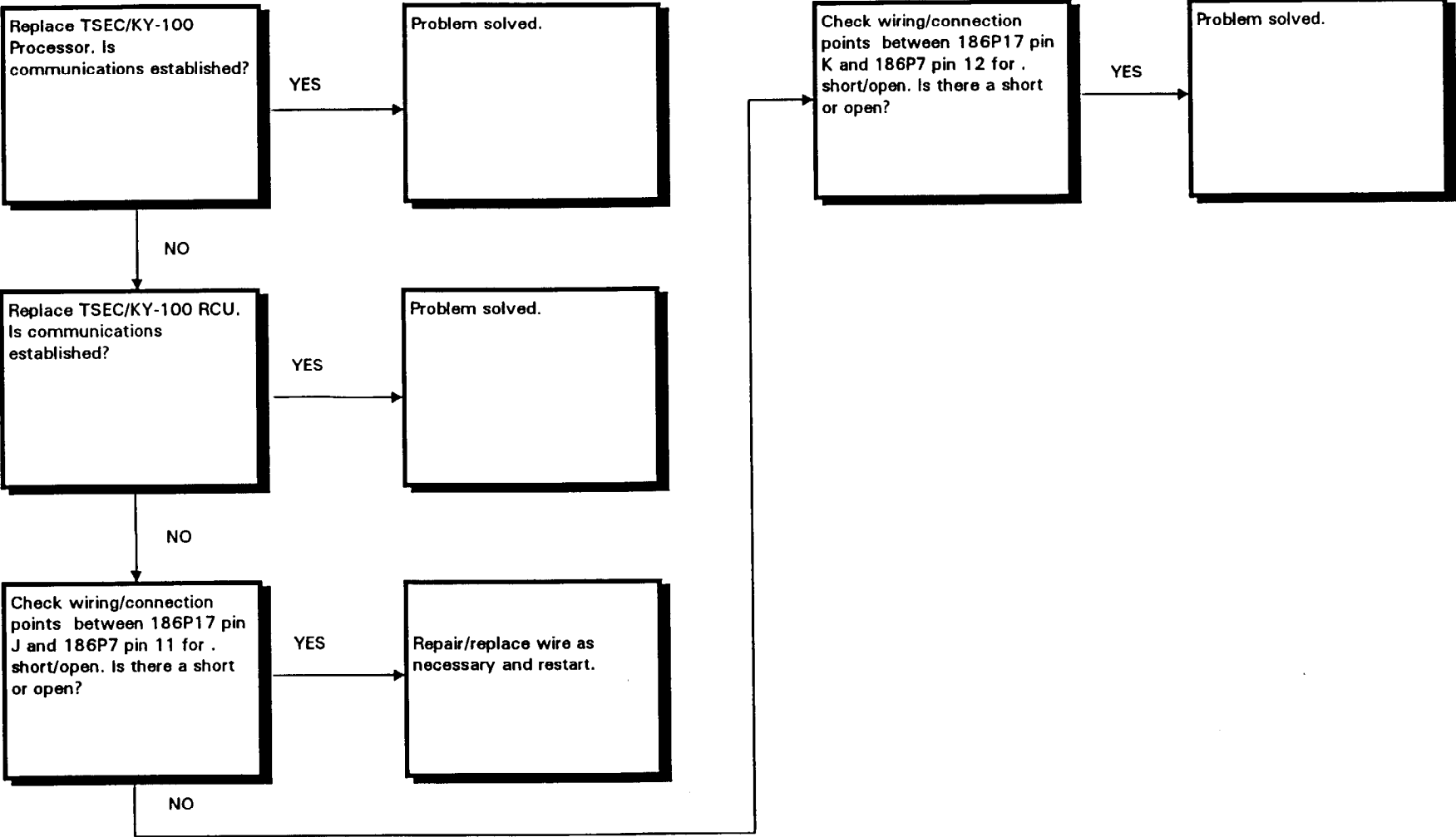
**References:**  
TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)



GO TO THE NEXT PAGE

18-4.20 SECURE VOICE OPERATION - WITH KY-100 CONTROL SET TO CT MODE AND PLAINTEXT TRANSMITTED TO RADIO UNDER TEST, COMMUNICATION NOT HEARD (CONTINUED)



END OF TASK

18-4.21 SECURE VOICE OPERATION - WITH KY-100 CONTROL SET TO VARIOUS POSITIONS AND BOTH CIPHERTEXT AND PLAINTEXT TRANSMITTED TO RADIO UNDER TEST ABNORMAL COMMUNICATIONS AND ANNUNCIATOR OCCUR

18-4.21

INITIAL SETUP

**Applicable Configurations:**  
All

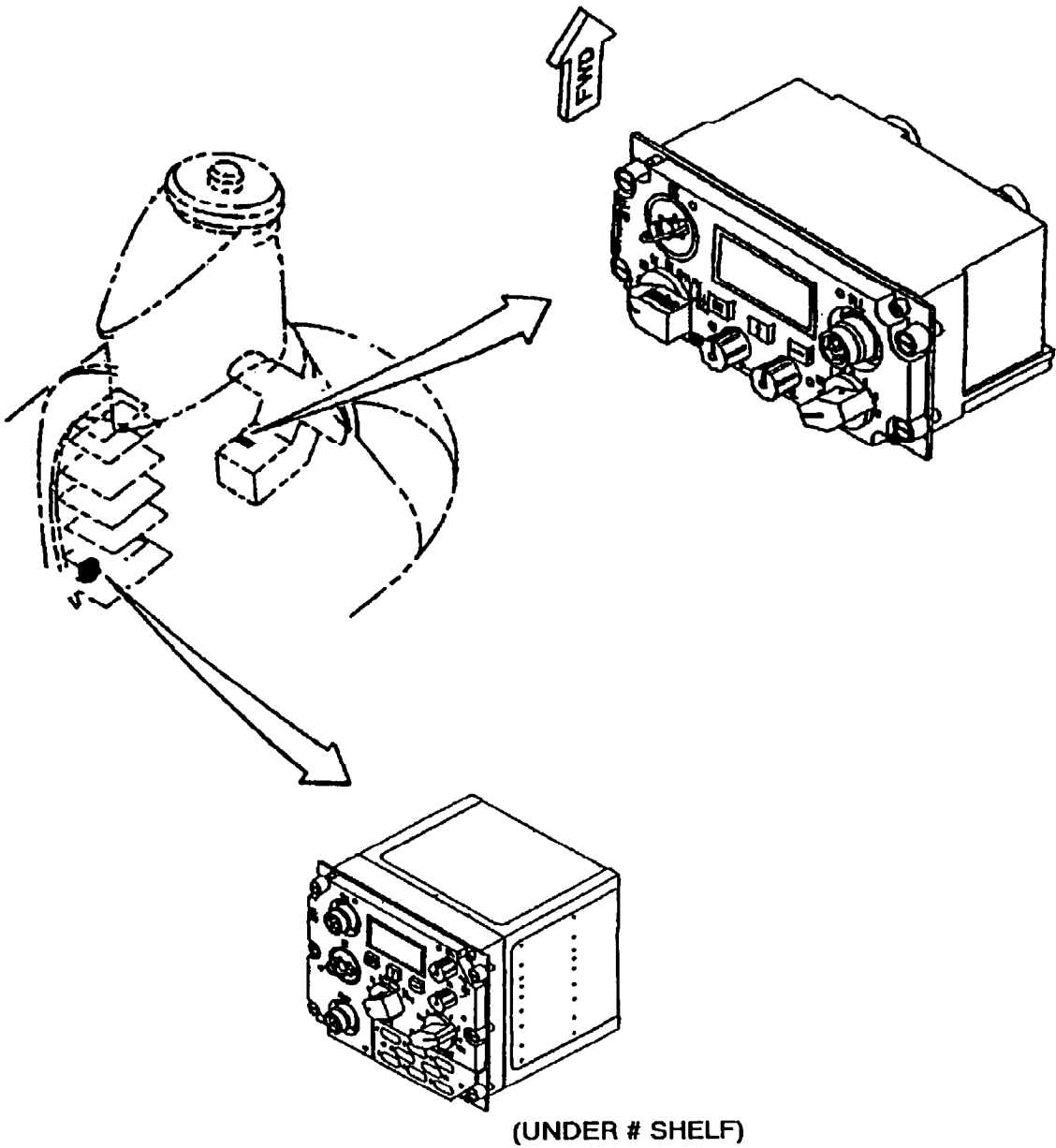
**Tools:**  
Electrical Repairer's Tool Kit,  
NSN 5180-00-323-4915

**Materials:**  
None

**Personnel Required:**  
Aircraft Electrician (2)

**References:**  
TM 11-1520-240-23  
TM 11-5821-357-12  
TM 55-1520-240-10  
TM 55-1520-240-23

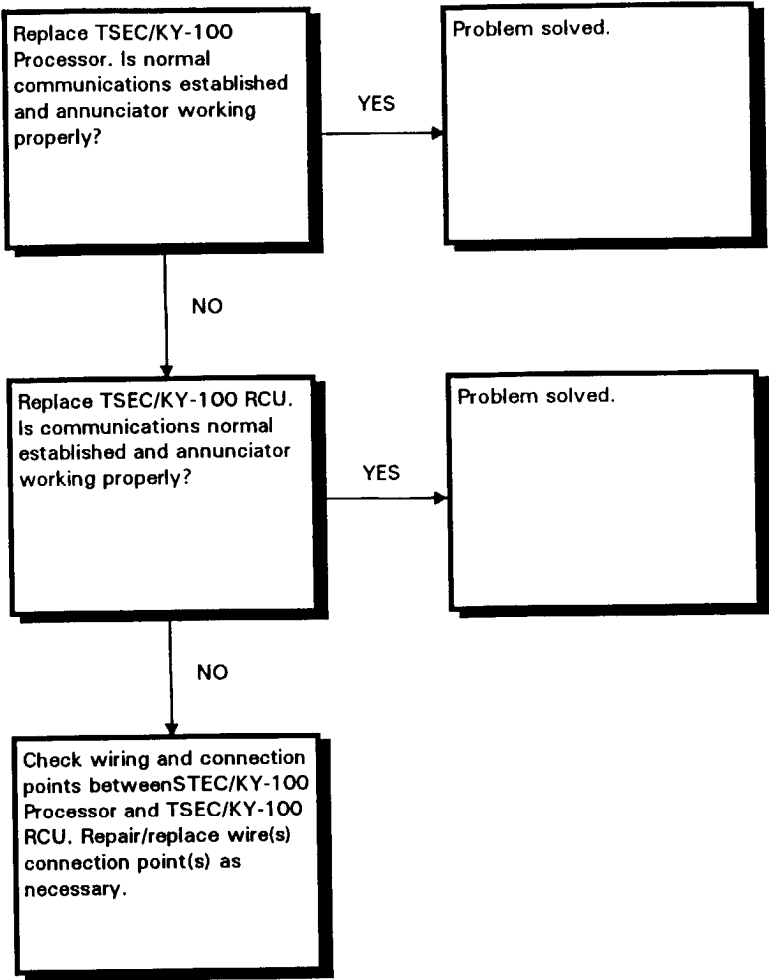
**Equipment Condition:**  
TM 55-1520-240-23:  
Battery Connected  
Electrical Power Off  
Hydraulic Power Off  
HF Liaison Facility Visual Check Performed  
(Task 18-4.2)



GO TO THE NEXT PAGE

18-4.21 SECURE VOICE OPERATION - WITH KY-100 CONTROL SET TO VARIOUS POSITIONS AND BOTH CIPHERTEXT AND PLAINTEXT TRANSMITTED TO RADIO UNDER TEST ABNORMAL COMMUNICATIONS AND ANNUNCIATOR OCCUR (CONTINUED)

18-4.21



END OF TASK

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**By Order of the Secretary of the Army:**

**E. C. MEYER**  
*General, United States Army*  
*Chief of Staff*

**Official:**

**ROBERT M. JOYCE**  
*Major General, United States Army*  
*The Adjutant General*

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The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however, only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whoever" <whoever@avma27.army.mil>

To: ls-lp@redstone.army.mil

Subject: DA Form 2028

1. **From:** Joe Smith
2. Unit: home
3. **Address:** 4300 Park
4. **City:** Hometown
5. **St:** AL
6. **Zip:** 77777
7. **Date Sent:** 19-OCT-93
8. **Pub No:** 55-2840-229-23
9. **Pub Title:** TM
10. **Publication Date:** 04-JUL-85
11. Change Number: 7
12. Submitter Rank: MSG
13. **Submitter Fname:** Joe
14. Submitter Mname: T
15. **Submitter Lname:** Smith
16. **Submitter Phone:** 123-123-1234
17. **Problem:** 1
18. Page: 2
19. Paragraph: 3
20. Line: 4
21. NSN: 5
22. Reference: 6
23. Figure: 7
24. Table: 8
25. Item: 9
26. Total: 123
27. **Text:**

This is the text for the problem below line 27.



## RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN... JOT DOWN THE  
DOPE ABOUT IT ON THIS  
FORM. CAREFULLY TEAR IT  
OUT, FOLD IT AND DROP IT  
IN THE MAIL!

## SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)

PFC JOHN DOE  
COA, 3d ENGINEER BN  
FT. LEONARDWOOD, MG 63108

DATE SENT

PUBLICATION NUMBER

TM 55-1520-240-T-3

PUBLICATION DATE

10 May 83

PUBLICATION TITLE

Troubleshooting, CH-47D Helicopter

BE EXACT. PIN-POINT WHERE IT IS

PAGE NO	PARA- GRAPH	FIGURE NO	TABLE NO
6	2-1 a		
B1		4-3	
125	line 20		

IN THIS SPACE TELL WHAT IS WRONG  
AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.

Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please correct one or the other.

I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered, so the NSN is wrong. Please give me a good NSN.

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

JOHN DOE, PFC (268) 317.7111

SIGN HERE

JOHN DOE

DA FORM 2028-2  
1 JUL 79PREVIOUS EDITIONS  
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DRSTS-M Overprint 1, 1 Nov 80

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TEAR ALONG PERFORATED LINE

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**FILL IN YOUR  
UNIT'S ADDRESS**



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**COMMANDER  
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ATTN AMSAM-MMC-LS-LP  
REDSTONE ARSENAL AL 35898-5230**

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PAGE  
NO

PARA-  
GRAPH

FIGURE  
NO

TABLE  
NO

IN THIS SPACE TELL WHAT IS WRONG  
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ATTN AMSAM-MMC-LS-LP  
REDSTONE ARSENAL AL 35898-5230**

# The Metric System and Equivalents

## Linear Measure

1 centimeter = 10 millimeters = .39 inch  
 1 decimeter = 10 centimeters = 3.94 inches  
 1 meter = 10 decimeters = 39.37 inches  
 1 dekameter = 10 meters = 32.8 feet  
 1 hectometer = 10 dekameters = 328.08 feet  
 1 kilometer = 10 hectometers = 3,280.8 feet

## Weights

1 centigram = 10 milligrams = .15 grain  
 1 decigram = 10 centigrams = 1.54 grains  
 1 gram = 10 decigrams = .035 ounce  
 1 dekagram = 10 grams = .35 ounce  
 1 hectogram = 10 dekagrams = 3.52 ounces  
 1 kilogram = 10 hectograms = 2.2 pounds  
 1 quintal = 100 kilograms = 220.46 pounds  
 1 metric ton = 10 quintals = 1.1 short tons

## Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce  
 1 deciliter = 10 centiliters = 3.38 fl. ounces  
 1 liter = 10 deciliters = 33.81 fl. ounces  
 1 dekaliter = 10 liters = 2.64 gallons  
 1 hectoliter = 10 dekaliters = 26.42 gallons  
 1 kiloliter = 10 hectoliters = 264.18 gallons

## Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch  
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches  
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet  
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet  
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres  
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

## Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch  
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches  
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

# Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

# Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
----	------------------------	----------------------------	---------------------	----

