

Task Oriented Practice
(TOP)

J5A006A-1 INPUT/OUTPUT FRAME

1B PROCESSOR

Developed by
Customer Information Development and Business Translations Organization

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Printed in U.S.A.

Issue 1	SEP 1993
234-351-020	TPG
TITLE PAGE	000

FIND YOUR JOB IN THE LIST BELOW THEN GO TO

Acceptance NTP-002

Alarm Test, Manual Power – SD-5A021-01 – Perform DLP-500

Automatic Power Monitor Test Failure – Clear TAP-124

Blown Fuse; +24VA – I/O Unit (SD-5A021-01) – Clear TAP-112

Blown Fuse; +24VB – I/O Unit (SD-5A021-01) – Clear TAP-114

Blown Fuse; +24VC or +24VD – I/O Unit (SD-5A021-01) – Clear TAP-116

Blown Fuse; –48VA Through –48VH – I/O Unit (SD-5A021-01) – Clear TAP-118

Blown Fuse; –48VI or –48VJ – I/O Unit (SD-5A021-01) – Clear TAP-120

Blown Fuse; –48VK – I/O Unit (SD-5A021-01) – Clear TAP-122

Blown Fuse; 24A0 or 24A1 – Peripheral Bus Unit (SD-5A023-01) – Clear TAP-102

Blown Fuse; 24B0 or 24B1 – Peripheral Bus Unit (SD-5A023-01) – Clear TAP-104

Blown Fuse; 24C0 or 24C1 – Peripheral Bus Unit (SD-5A023-01) – Clear TAP-106

Blown Fuse; 48A0 or 48A1, Peripheral Bus Unit (SD-5A023-01) – Clear TAP-108

Blown Fuse; 48B0, 48C0, 48B1, or 48C1 – Peripheral Bus Unit (SD-5A023-01) – Clear TAP-110

Circuit Pack (SD-5A021-01) – Replace NTP-003

DC-to-DC Converter (SD-5A021-01) – Replace NTP-004

Diagnostic Failure – By Analyzing Raw Data And Replacing Suspect Packs – Clear TAP-134

Diagnostic Failure – TLP Abort – Clear TAP-129

Diagnostic Failure – TLP Disk Queue Full – Clear TAP-126

Diagnostic Failure – TLP Inhibit – Clear TAP-128

Diagnostic Failure – TLP Queue Blockage – Clear TAP-127

Diagnostic Failure – By Replacing Packs on TLP Suspected Faulty Equipment List – Clear TAP-133

TASK INDEX LIST

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Diagnostic Failure – TLP Tape Acquisition Error – Clear TAP-131

Diagnostic Failure – TLP Tape Not Mounted – Clear TAP-132

Diagnostic Failure – TLP Tape Version X Does Not Match Version Y – Clear TAP-130

Lamps – Power Switch – Test DLP-505

Lighted LED; Converter – Fuse Not Blown – Clear TAP-123

Maintenance Philosophy TAD-100

Power Switch – Replace DLP-503

TLP Abort – Diagnostic Failure – Clear TAP-129

TLP Disk Queue Full – Diagnostic Failure – Clear TAP-126

TLP Inhibit – Diagnostic Failure – Clear TAP-128

TLP Queue Blockage – Diagnostic Failure – Clear TAP-127

TLP Tape Acquisition Error – Diagnostic Failure – Clear TAP-131

TLP Tape Not Mounted – Diagnostic Failure – Clear TAP-132

TLP Tape Version X Does Not Match Version Y – Diagnostic Failure – Clear TAP-130

TTY Printout – DGN:IOUS a,[{ IOUC b|IPUB c}]STF
 ANALY:TLPPFILE IOUS a,[{ IOUC b|IPUB c}] SUSPECTED FAULTY EQUIPMENT
 Note Column Does Not Contain NOTE 2 TAP-133

TTY Printout – DGN:IOUS a,[{ IOUC b|IPUB c}]d]STF
 ANALY:TLPPFILE IOUS a,[{ IOUC b|IPUB c}] SUSPECTED FAULTY EQUIPMENT
 Note Column Contains NOTE 2
 Fuse Blown See Blown Fuse Entries

FIND YOUR JOB IN THE LIST BELOW THEN GO TO

TTY Printout - DGN:IOUS a, [{ IOUC b | IPUB c }] STF
 ANALY:TLPFILE IOUS a, [{ IOUC b | IPUB c }] SUSPECTED FAULTY EQUIPMENT
 Note Column Contains NOTE 2
 No Fuses Blown TAP-124

TTY Printout - DGN:IOUS a, [{ IOUC b | IPUB c }] STF
 ANALY:TLPFILE IOUS a, [{ IOUC b | IPUB c }] NULL PACK TEST GENERATED
 SD-5A021-01 TAP-134

TTY Printout - DGN:IOUS a, [{ IOUC b | IPUB c }] STF
 ANALY:TLPFILE IOUS a, [{ IOUC b | IPUB c }] SUMMARY DATA
 QUEUE ACCESS DENIED:DATA NOT RETAINED:CODE 0001 TAP-126

TTY Printout - DGN:IOUS a, [{ IOUC b | IPUB c }] STF
 ANALY:TLPFILE IOUS a, [{ IOUC b | IPUB c }] SUMMARY DATA
 QUEUE ACCESS DENIED:DATA NOT RETAINED:CODE 0002 TAP-127

TTY Printout - DGN:IOUS a, [{ IOUC b | IPUB c }] STF
 ANALY:TLPFILE IOUS a, [{ IOUC b | IPUB c }] SUMMARY DATA
 QUEUE ACCESS DENIED:DATA NOT RETAINED:CODE 0004 TAP-128

TTY Printout - DGN:IOUS a, [{ IOUC b | IPUB c }] STF
 ANALY:TLPFILE IOUS a, [{ IOUC b | IPUB c }] ABORTED TAP-129

TTY Printout - DGN:IOUS a, [{ IOUC b | IPUB c }] STF
 ANALY:TLPFILE IOUS a, [{ IOUC b | IPUB c }]
 TLP PROGRAM ABORTED TAP-129

TTY Printout - DGN:IOUS a, [{ IOUC b | IPUB c }] STF
 ANALY:TLPFILE IOUS a, [{ IOUC b | IPUB c }] TLP
 WARNING:VERSION X DOES NOT MATCH EXPECTED VERSION Y TAP-130

TTY Printout - DGN:IOUS a, [{ IOUC b | IPUB c }] STF
 ANALY:TLPFILE IOUS a, [{ IOUC b | IPUB c }]
 TLP TAPE ACQUISITION ERROR
 MOUNT TAPE WITH FILE = f TAP-131

TTY Printout - DGN:IOUS a, [{ IOUC b | IPUB c }] STF
 REPT:TAPE MUST BE MOUNTED FOR FUNCTION TLP TAP-132

TASK INDEX LIST

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No acceptance test procedures are required for this frame.
Readiness of frame to become part of working system was
established by successful completion of Installation
Handbook test procedures.

ACCEPTANCE

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DO THE ITEMS BELOW IN THE ORDER LISTED FOR DETAILS, GO TO

1	Notify Users That Channels Are To Be Removed From Service	-
2	Replace Circuit Pack	DLP-502

DO THE ITEMS BELOW IN THE ORDER LISTED FOR DETAILS, GO TO

1	Notify Users That Channels Are To Be Removed From Service	-
2	Replace DC-to-DC Converter	DLP-501

GENERAL

The maintenance philosophy contained in this volume is based upon the design of equipment (hardware), diagnostic software and test equipment employed. Procedures are intended to aid personnel in performing trouble-clearing tasks. The degree to which these procedures accomplish this depends upon input and feedback from the user. Additions, corrections, and improvements to the data are encouraged. Manufacturer, engineering and software documentation such as I/O Manuals, SDs, PKs, PRs, etc, which are available to the operating telephone company offices are referenced where applicable rather than duplicating that information in the TOP. Some portions of those documents may be utilized in procedures but only as examples for the purpose of explanation. Test equipment (oscilloscopes, voltmeters, etc) and parameters involved in circuits being tested, adjusted, or checked are usually prescribed. However, the setup and method of operation is not described unless it is unusual or unique in some manner.

IXL PHILOSOPHY

The Task Index List (IXL-001) is structured to provide fast access to those procedures pertinent to the symptoms identified.

Power problems are sensed by scan points which generate a major or minor alarm. It is assumed that the user can locate the frame with the power fault which was automatically powered down (power switch with PWR OFF lamp lighted and OFF NORM lamp off) by following the aisle pilot lights or by reading the REPT:PA printout which would identify the frame with a power fault. The precise structure of the message is given in the Input/Output (I/O) message manuals. The symptoms described in the IXL reflect the assumptions above, and indicate other conditions that are observable at the frame that would enable the user to access the proper trouble-clearing procedure. These conditions are blown fuses, lighted LEDs on converters or power function circuit packs, etc.

In general, most logic circuit failures cause the fault recovery program to request a diagnostic program. This method of requesting the diagnostic program includes the TLP option. The IXL reflects this in the TTY messages listed. Outside of the first two supplementary messages (ANALY:TLPFILE:) all other supplementary messages pertain to problems in generating a SUSPECTED FAULTY EQUIPMENT list and reference to procedures (TAPs) which attempt to correct the problem. If successful in generating a SUSPECTED FAULTY EQUIPMENT list, those procedures reference to the appropriate procedure which indicates what to do with this list. If not successful, they reference the next level of trouble clearing, raw data analysis, which is an alternative to the first and most common trouble-clearing approach.

TAP PHILOSOPHY

When documenting a procedural approach to trouble clearing, certain assumptions are made. It is assumed that one fault is being cleared at a time. When directing the user to perform an action, it is assumed that the action is performed correctly. Similarly, when directed to make replacements, the replacement part is always assumed to be good and equipment used for testing, both built-in (hardware and software) and commercial, are assumed to be good. Only consistent fault signatures are covered.

The trouble-clearing TAPs provided for diagnostic failures are provided on three levels. The first level addresses what to do with a software-generated (TLP) **SUSPECTED FAULTY EQUIPMENT** list and provides a step-by-step procedure for replacing circuit packs one at a time, and analyzing the results. This level is straightforward and requires some familiarity with the equipment (Descriptive and Theory AT&T Practices), TTY techniques, and diagnostic printouts.

The second level of trouble clearing is accessed from the first level. This level is referenced when the **SUSPECTED FAULTY EQUIPMENT** list has been exhausted without clearing the problem or it can be accessed directly from the IXL or any of the **ANALY:TLPFILE:** TAPs which produce a **NULL PACK TEST GENERATED** response. This level of trouble clearing is known as raw data analysis and describes what to do with the summary and supplemental data printed either with or instead of the **SUSPECTED FAULTY EQUIPMENT** list. It is expected that this will lead to an identification of faulty circuits within the SD and possible additional suspected circuit packs not previously identified. This level of trouble clearing is more complex and requires knowledge of the equipment, TTY techniques and printouts, and SDs, PKs, PRs, etc.

MAINTENANCE PHILOSOPHY

The third level of trouble clearing is signal tracing using interactive diagnostics. This procedure is accessible only from the previous level and uses information derived in the performance of that procedure. This level of trouble clearing requires an increase in the capabilities cited in the first two levels and requires additional knowledge and skill in the setup and operation of test equipment (oscilloscopes, voltmeters, etc).

ALTERNATE METHODS

The more knowledgeable and experienced personnel may access TOP documents at a point in trouble clearing where analyzation is completed (the faulty component determined) and only repair or replacement is required. Access to trouble-clearing procedures must be obtained by locating procedural data provided in the Task Index List (IXL-001). Most DLPs are built to support TAPs and NTPs with preconditioning and system restoration steps covered in those level procedures (TAPs, NTPs). Therefore, access to data (DLPs) on a hunt-and-find basis is a threat to equipment operation and may compound trouble-clearing problems.

TERMINOLOGY

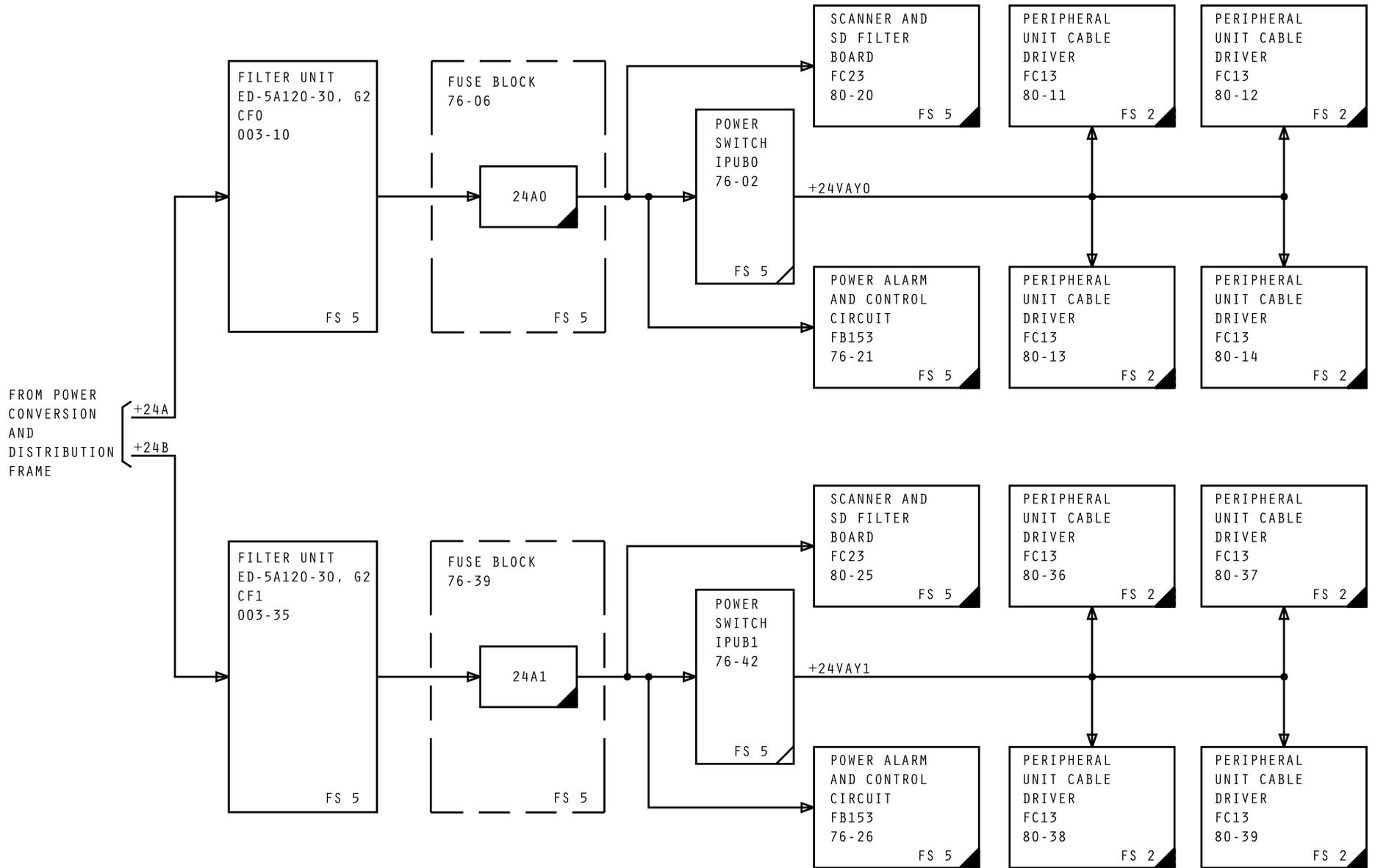
A component location given in TAPs and DLPs, such as 80/76-16, means that only the appropriate component, either at 80-16 or 76-16, is designated. The component location to be chosen is only on the unit that has been taken out of service.

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EQUIPMENT TEST LIST

This is a list of tasks recommended for routine preventive maintenance. Information on the list is arranged in the following order from left to right: Frequency, title, and procedure number.

12M	Perform Manual Power Alarm Test	DLP-500
6M	Test Power Switch Lamps	DLP-505



24A0 AND 24A1 FUSE POWER DISTRIBUTION, PERIPHERAL BUS UNIT (SD-5A023-01)

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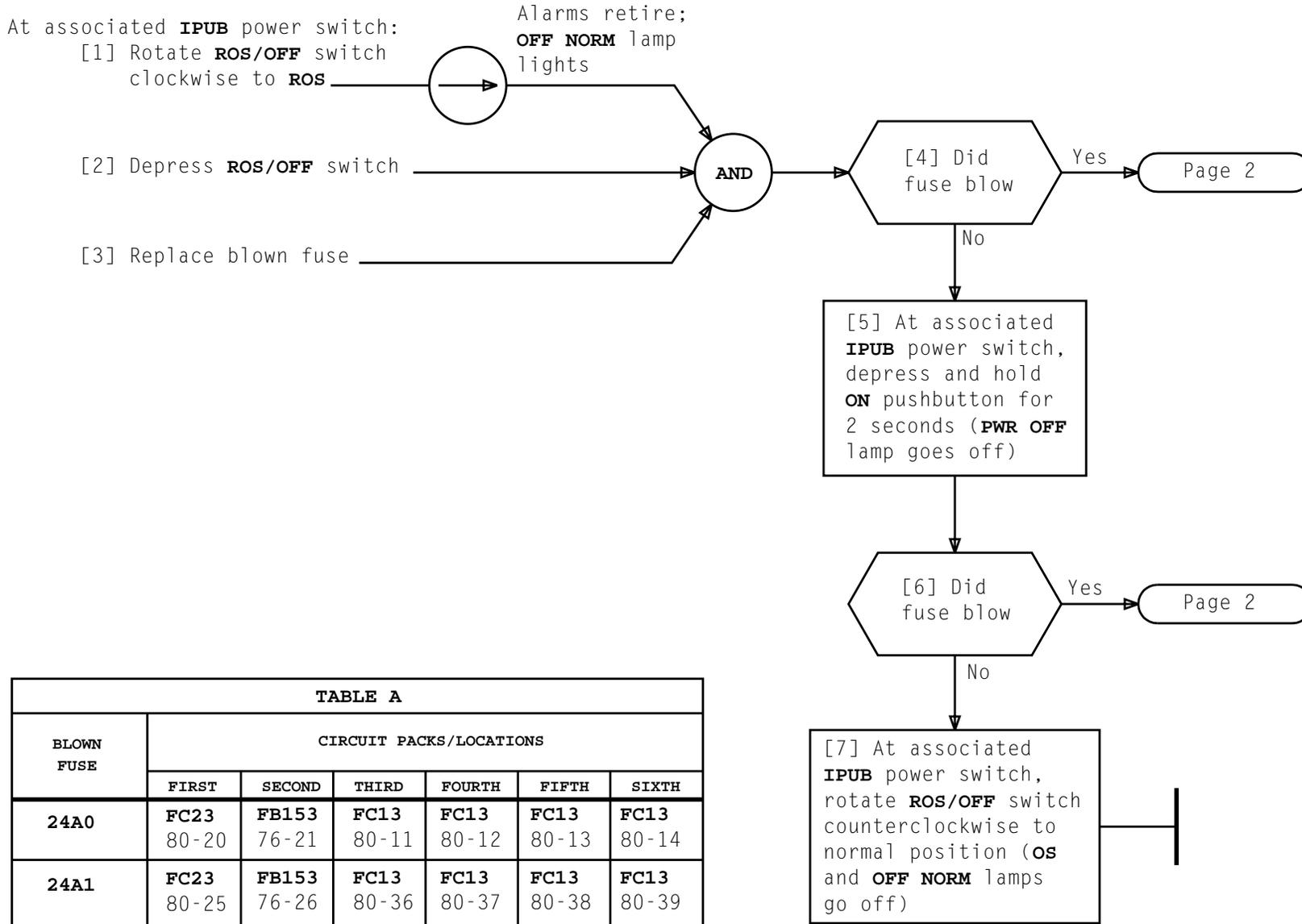


TABLE A						
BLOWN FUSE	CIRCUIT PACKS/LOCATIONS					
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH
24A0	FC23 80-20	FB153 76-21	FC13 80-11	FC13 80-12	FC13 80-13	FC13 80-14
24A1	FC23 80-25	FB153 76-26	FC13 80-36	FC13 80-37	FC13 80-38	FC13 80-39

**CLEAR BLOWN 24A0 OR 24A1 FUSE, PERIPHERAL BUS UNIT
 (SD-5A023-01)**

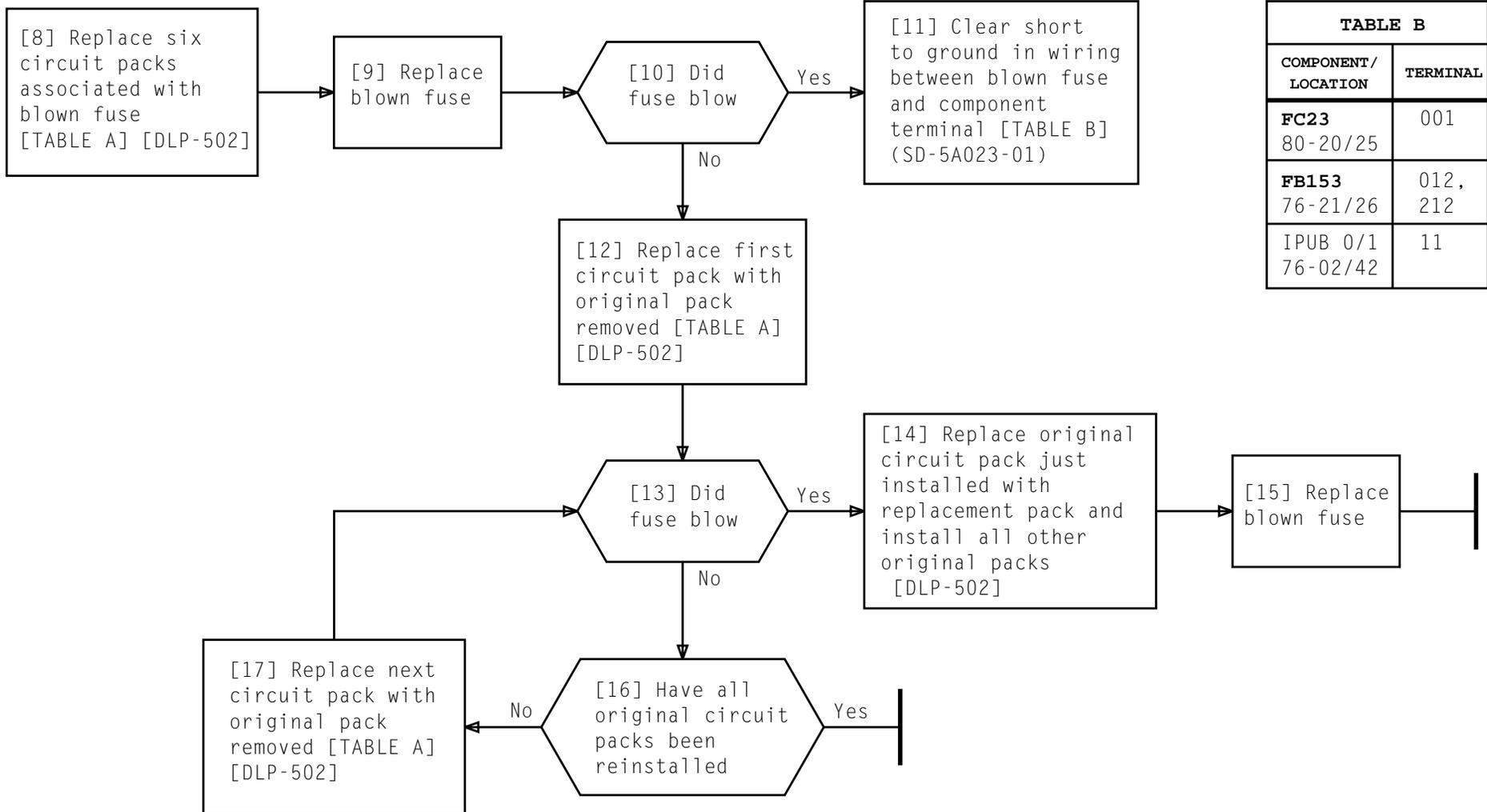
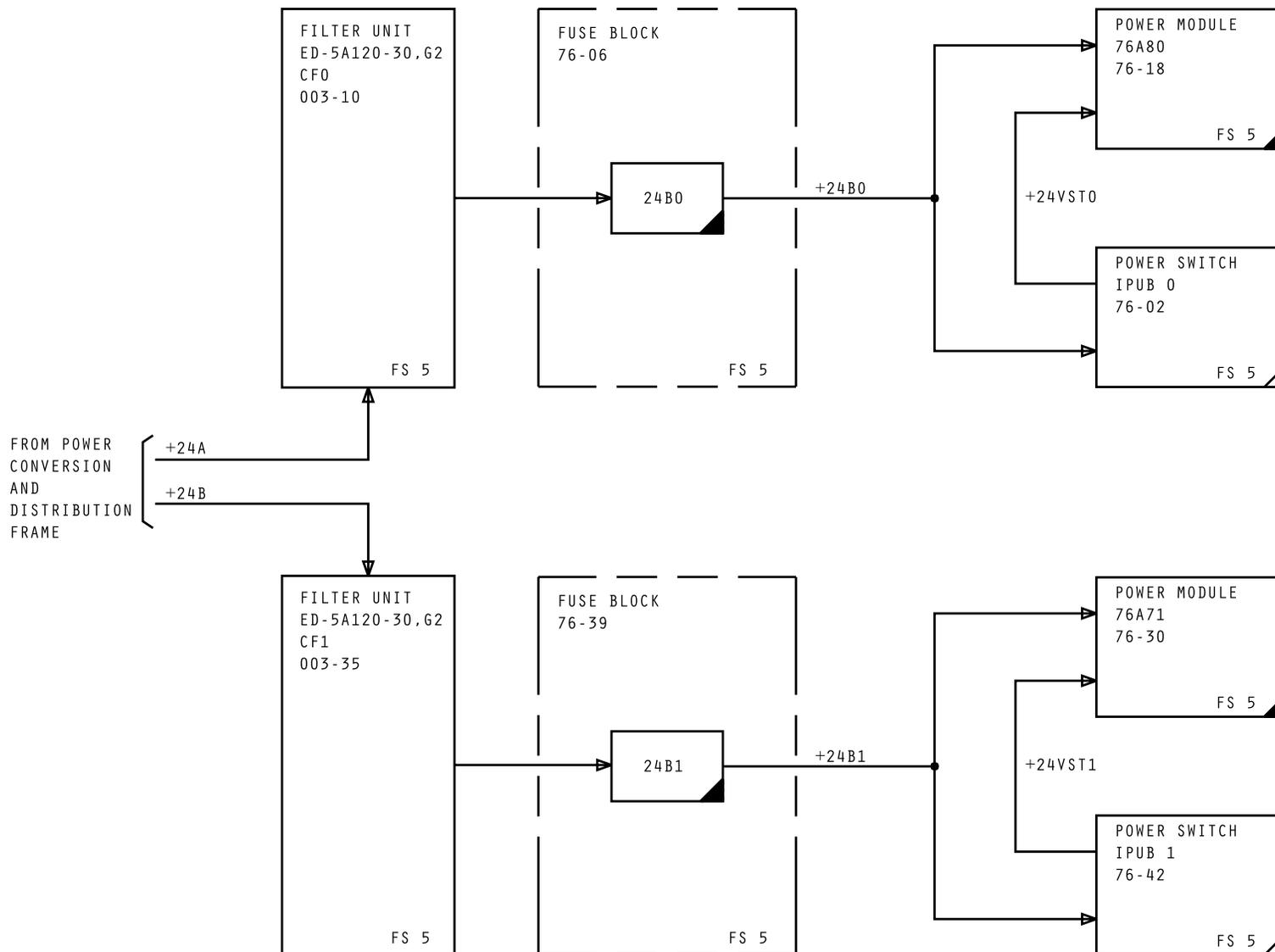


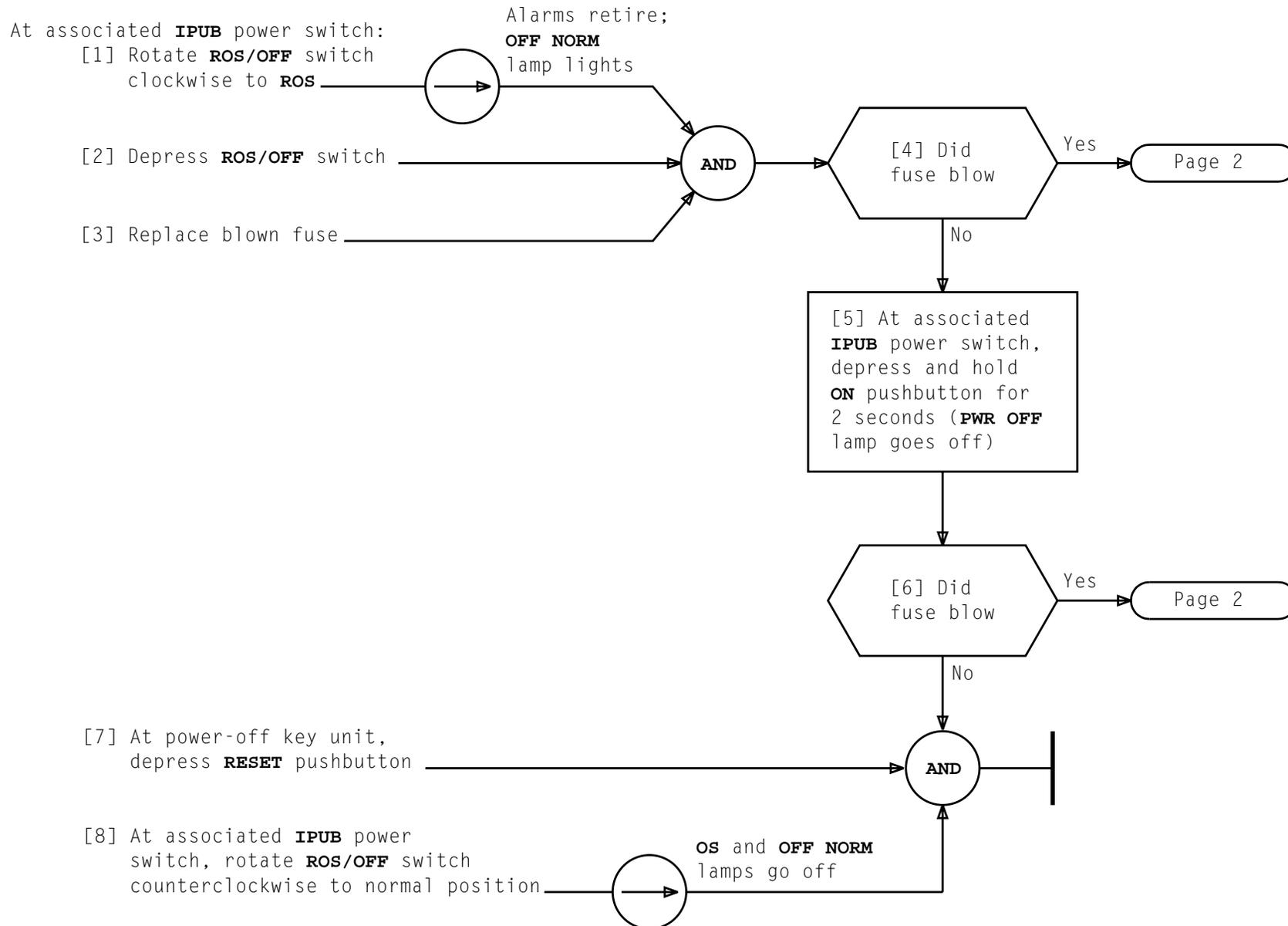
TABLE B	
COMPONENT/LOCATION	TERMINAL
FC23 80-20/25	001
FB153 76-21/26	012, 212
IPUB 0/1 76-02/42	11

**CLEAR BLOWN 24A0 OR 24A1 FUSE, PERIPHERAL BUS UNIT
(SD-5A023-01)**



**24B0 AND 24B1 FUSE POWER DISTRIBUTION, PERIPHERAL
BUS UNIT (SD-5A023-01)**

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CLEAR BLOWN 24B0 OR 24B1 FUSE, PERIPHERAL BUS UNIT (SD-5A023-01)

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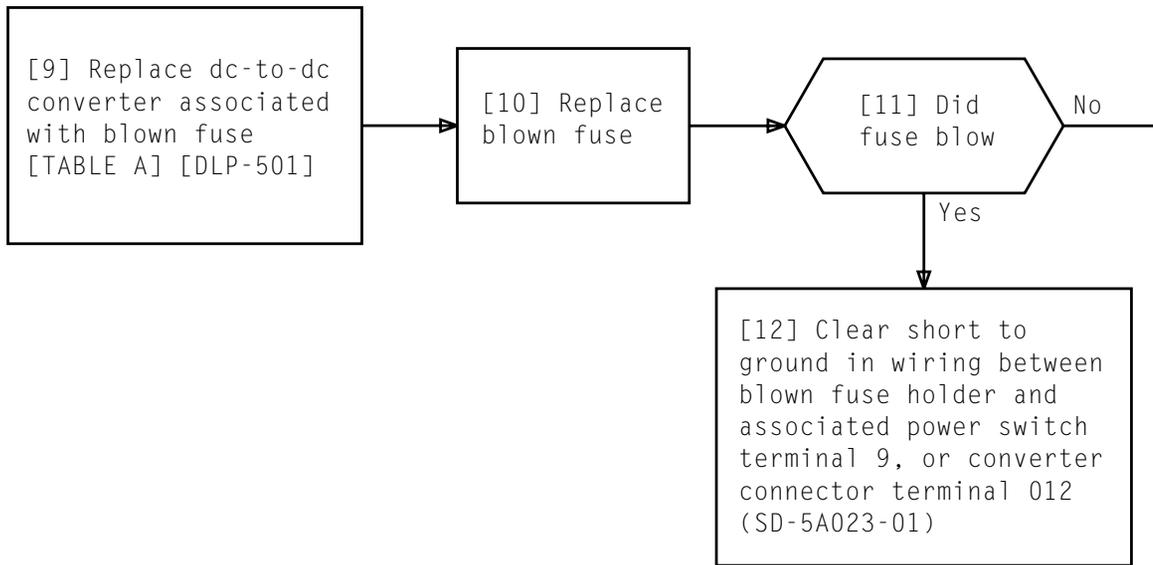
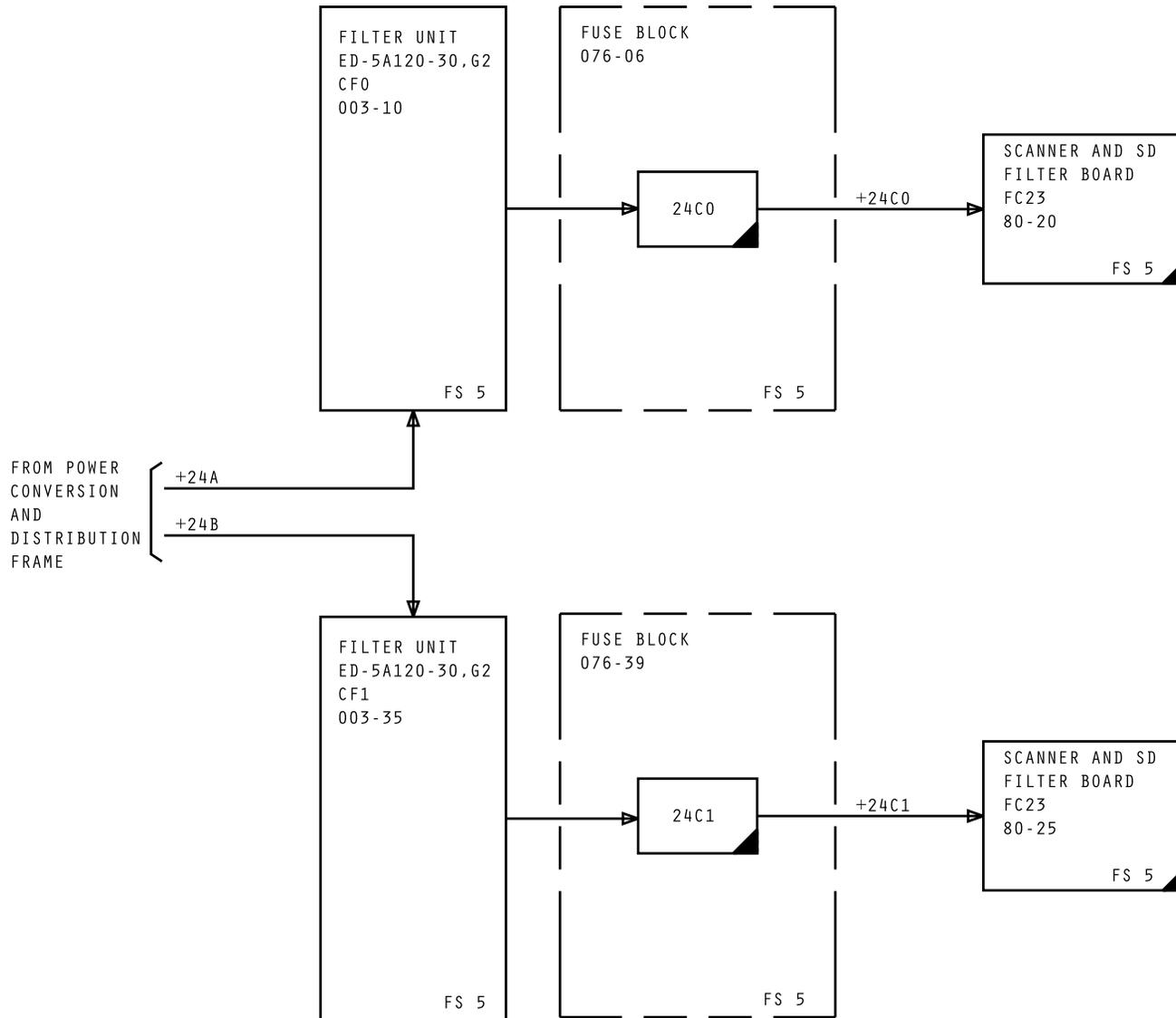


TABLE A	
BLOWN FUSE	CONVERTER LOCATION
24B0	076-18
24B1	076-30

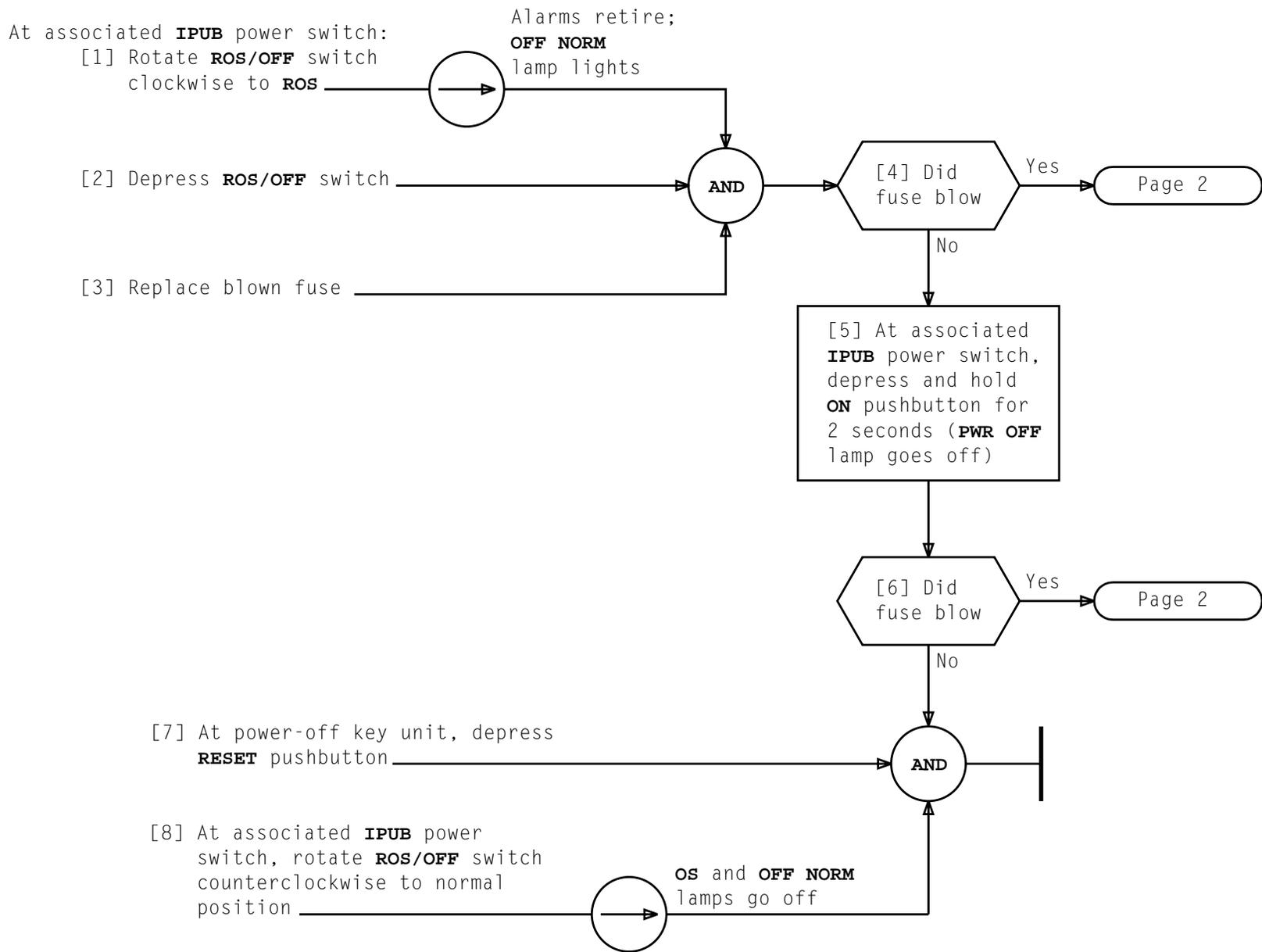
CLEAR BLOWN 24B0 OR 24B1 FUSE, PERIPHERAL BUS UNIT (SD-5A023-01)

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**24C0 AND 24C1 FUSE POWER DISTRIBUTION, PERIPHERAL BUS UNIT
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CLEAR BLOWN 24C0 OR 24C1 FUSE, PERIPHERAL BUS UNIT (SD-5A023-01)

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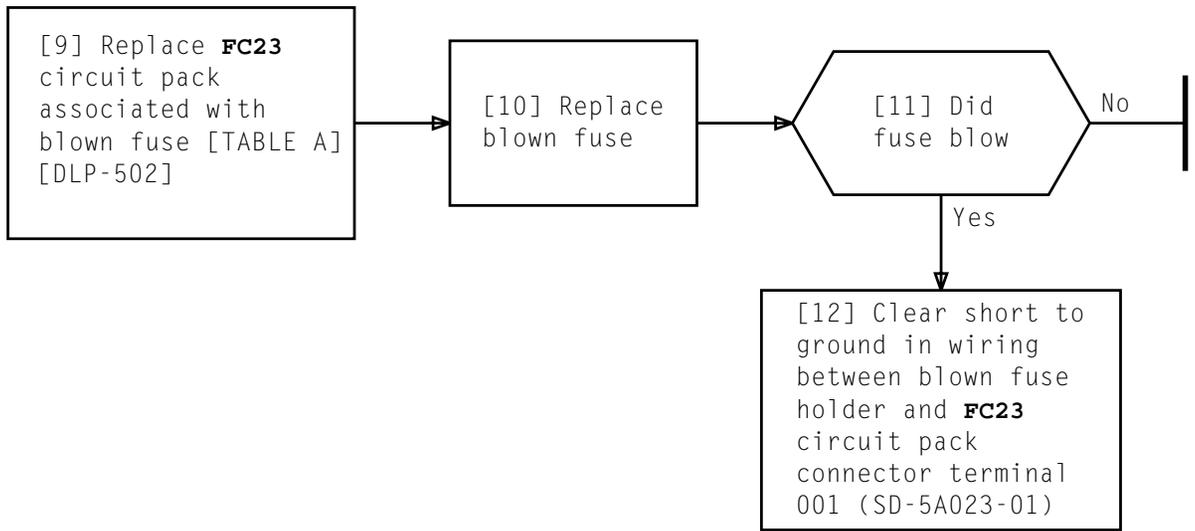
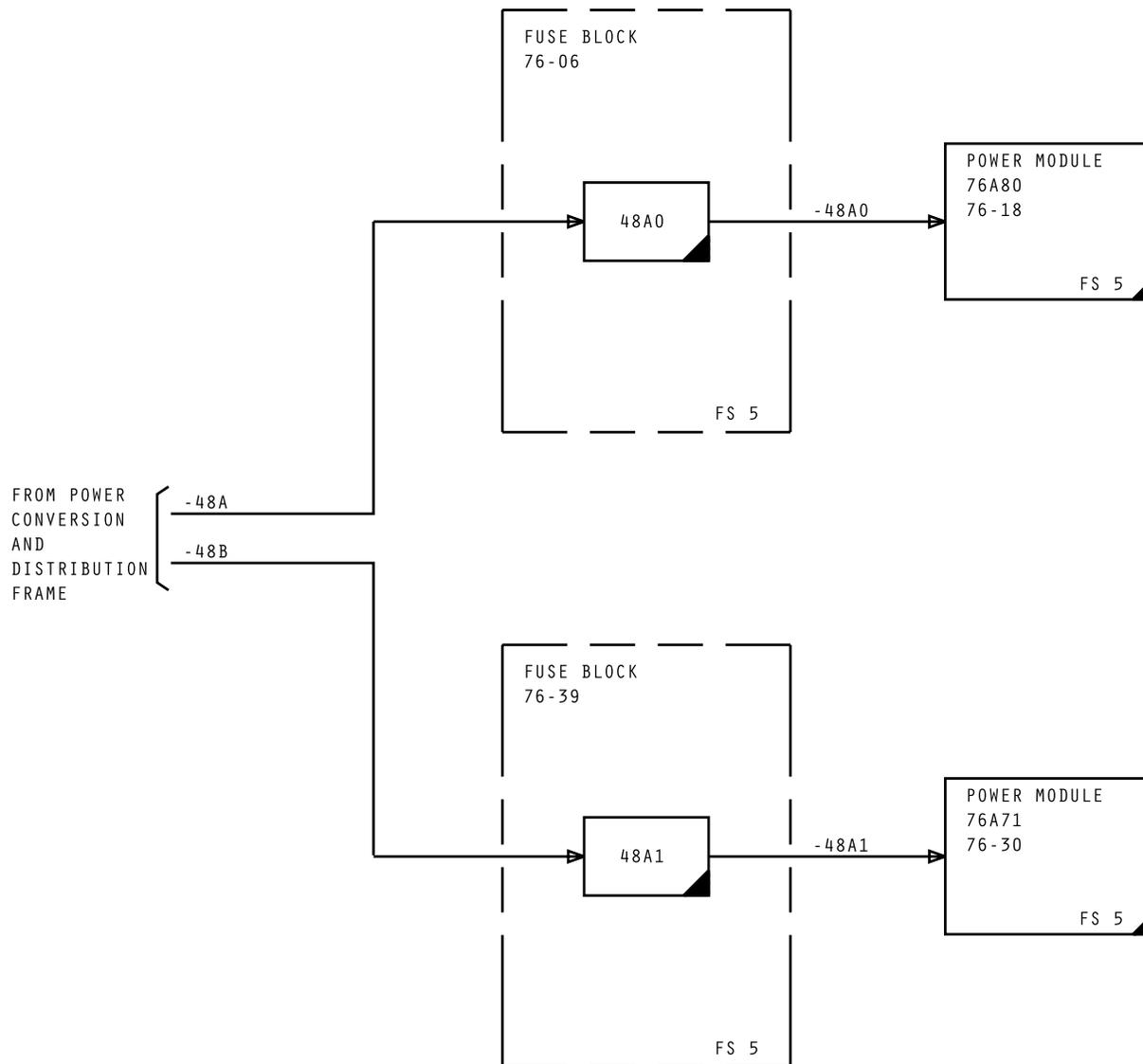


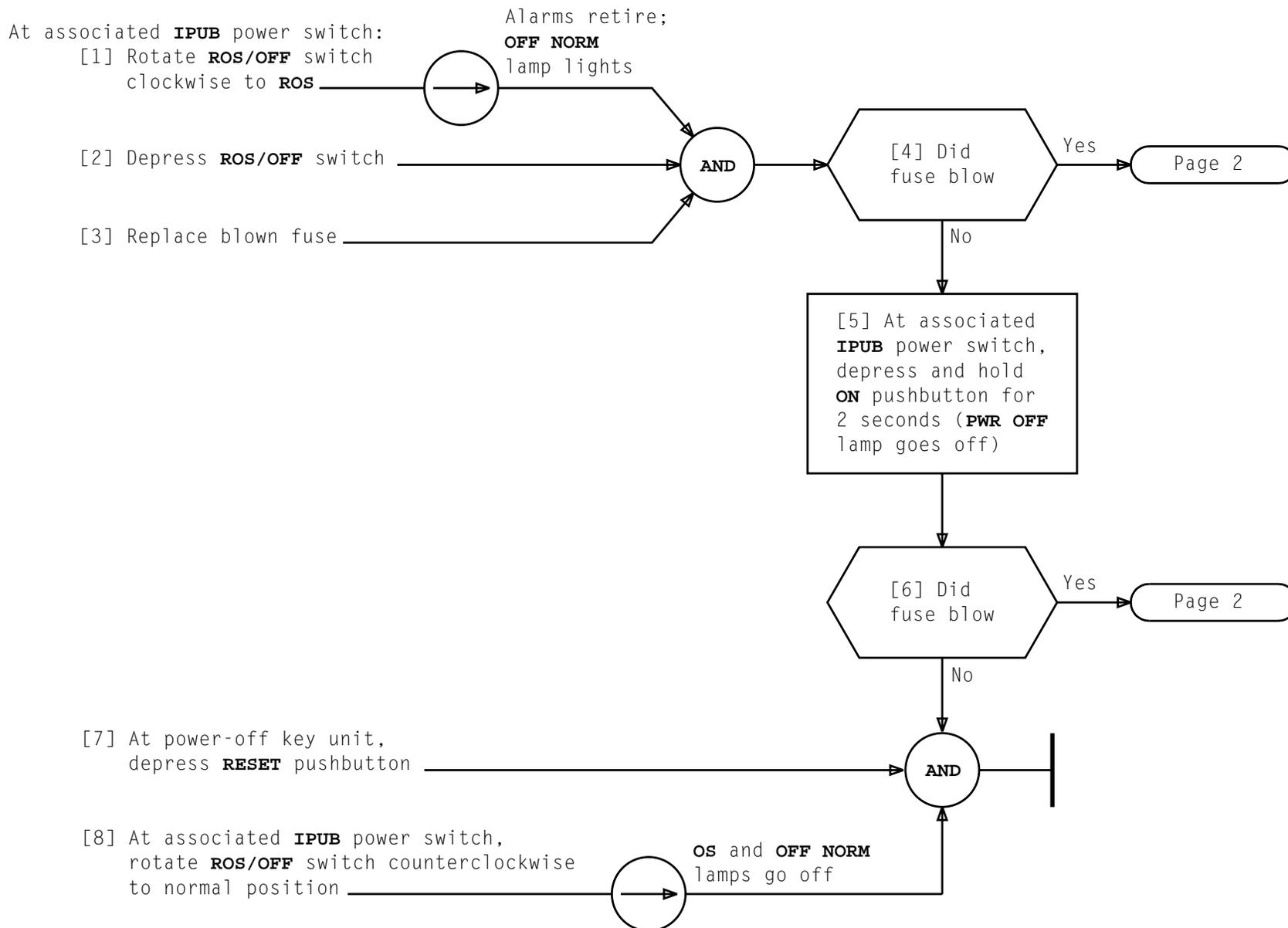
TABLE A	
BLOWN FUSE	CIRCUIT PACK LOCATION
24C0	80-20
24C1	80-25

CLEAR BLOWN 24C0 OR 24C1 FUSE, PERIPHERAL BUS UNIT (SD-5A023-01)



**48A0 AND 48A1 FUSE POWER DISTRIBUTION, PERIPHERAL BUS UNIT
(SD-5A023-01)**

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**CLEAR BLOWN 48A0 OR 48A1 FUSE, PERIPHERAL BUS UNIT
 (SD-5A023-01)**

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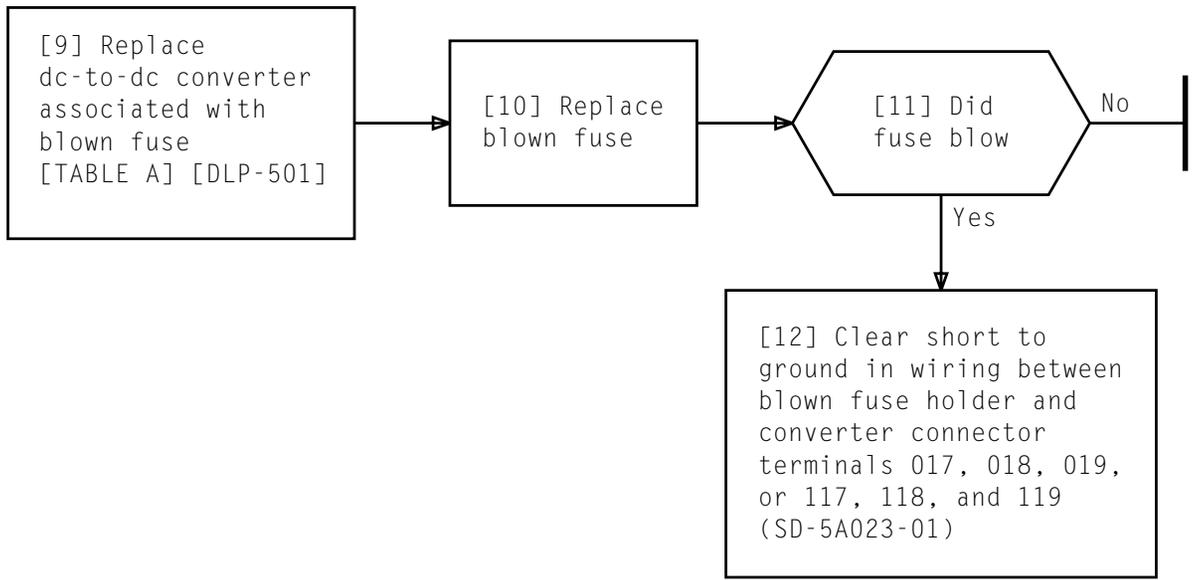
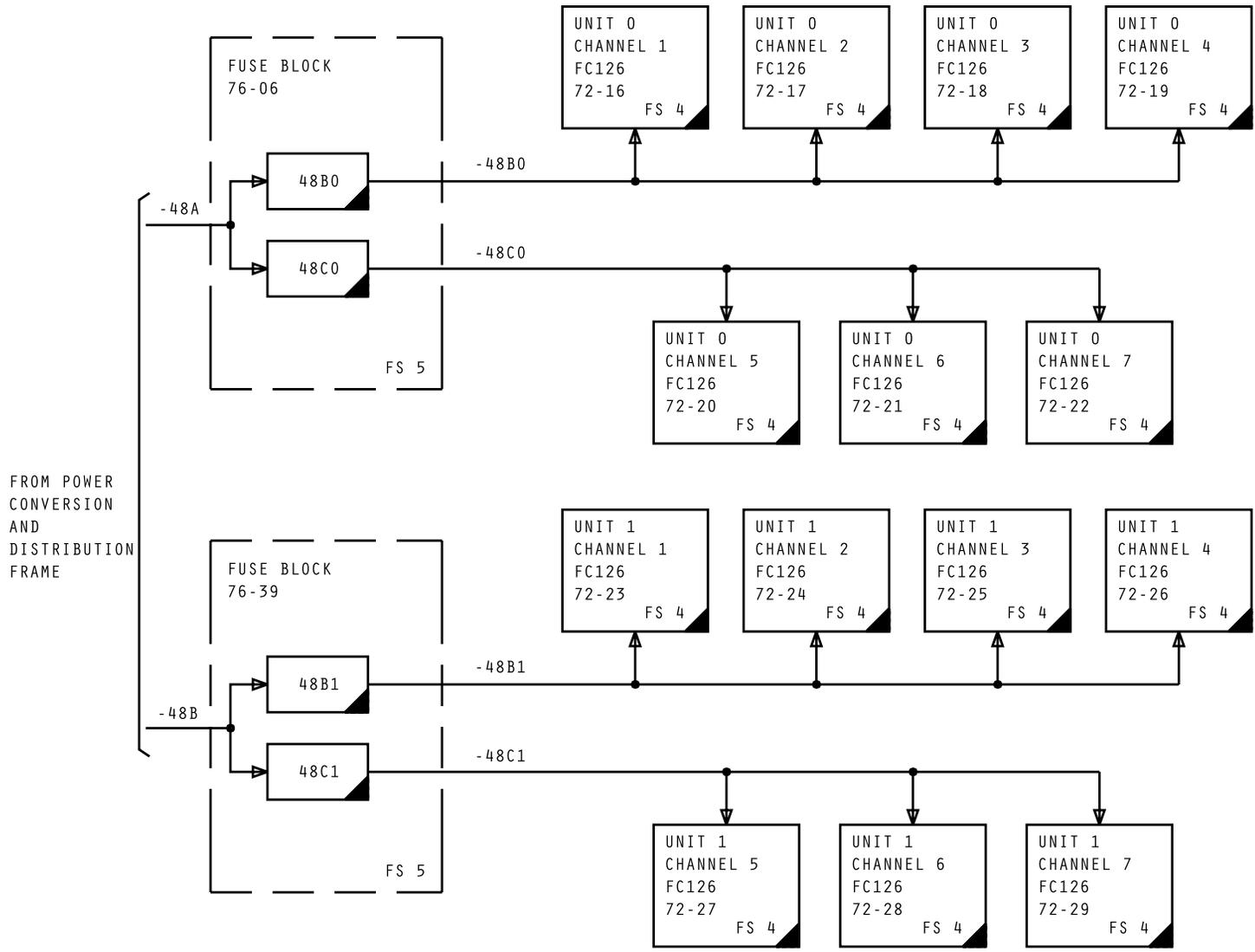


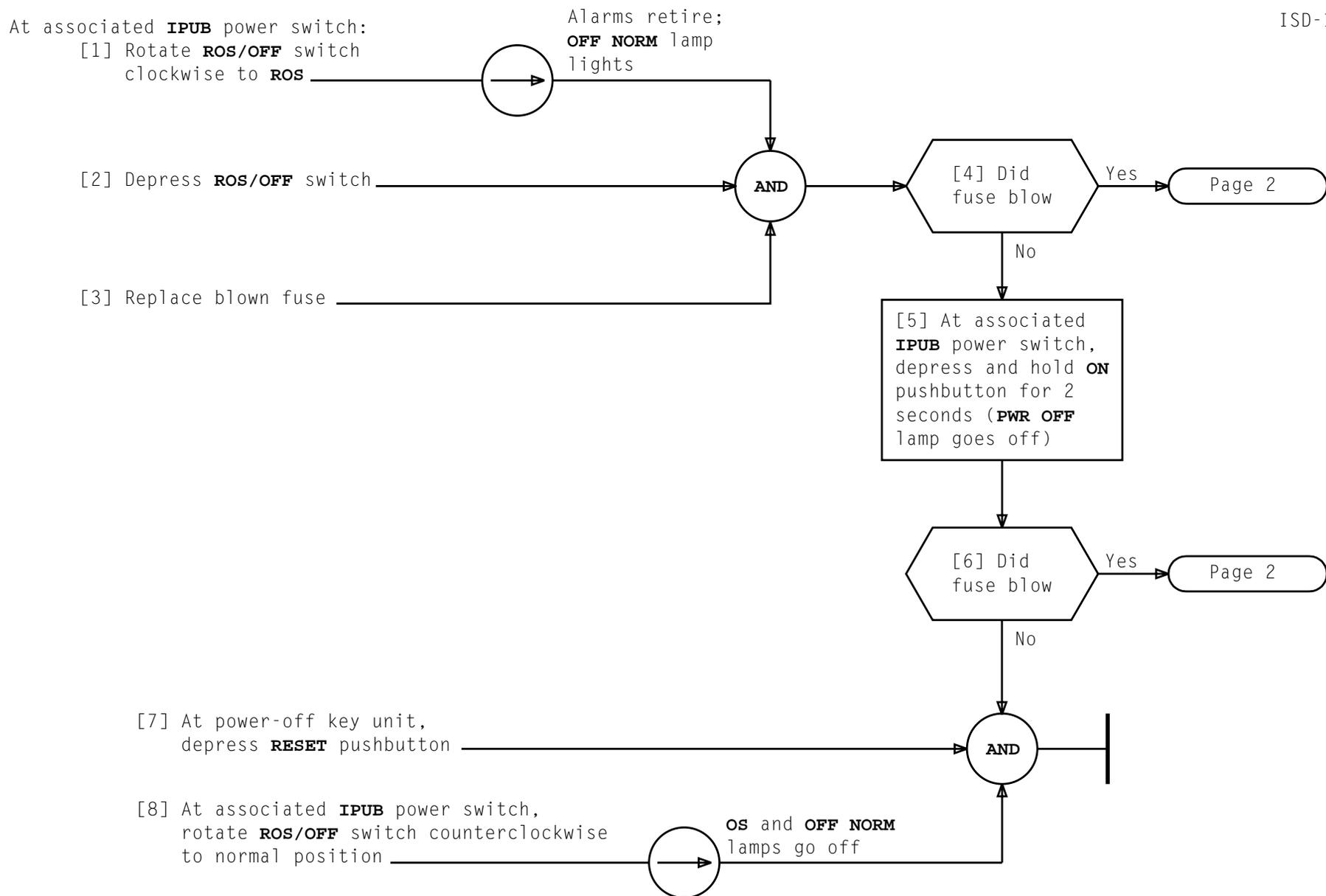
TABLE A	
BLOWN FUSE	CONVERTER LOCATION
48A0	076-18
48A1	076-30

CLEAR BLOWN 48A0 OR 48A1 FUSE, PERIPHERAL BUS UNIT (SD-5A023-01)



**48B0, 48C0, 48B1 AND 48C1 FUSE POWER DISTRIBUTION,
PERIPHERAL BUS UNIT (SD-5A023-01)**

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**CLEAR BLOWN 48B0, 48C0, 48B1 OR 48C1 FUSE,
 PERIPHERAL BUS UNIT (SD-5A023-01)**

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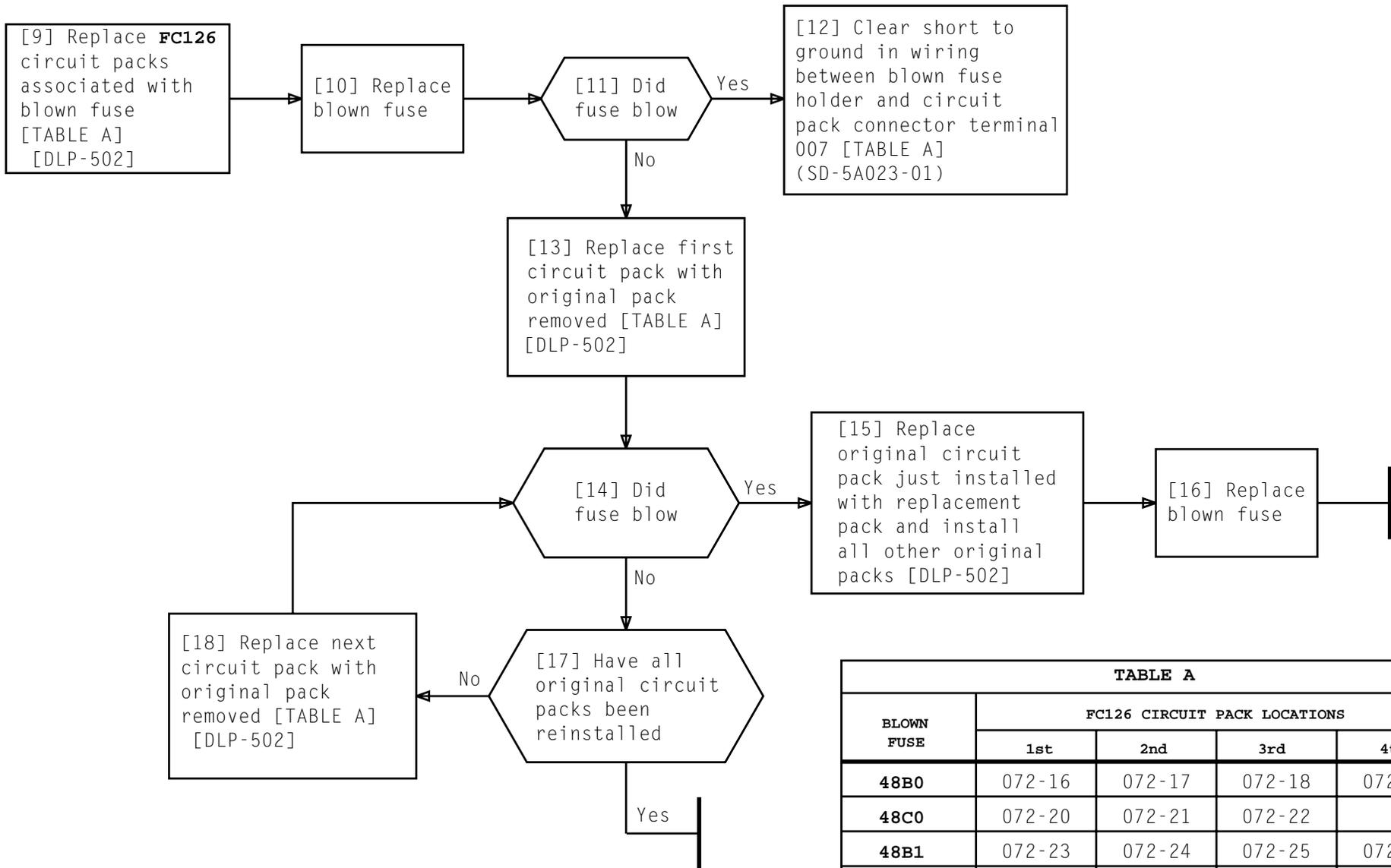
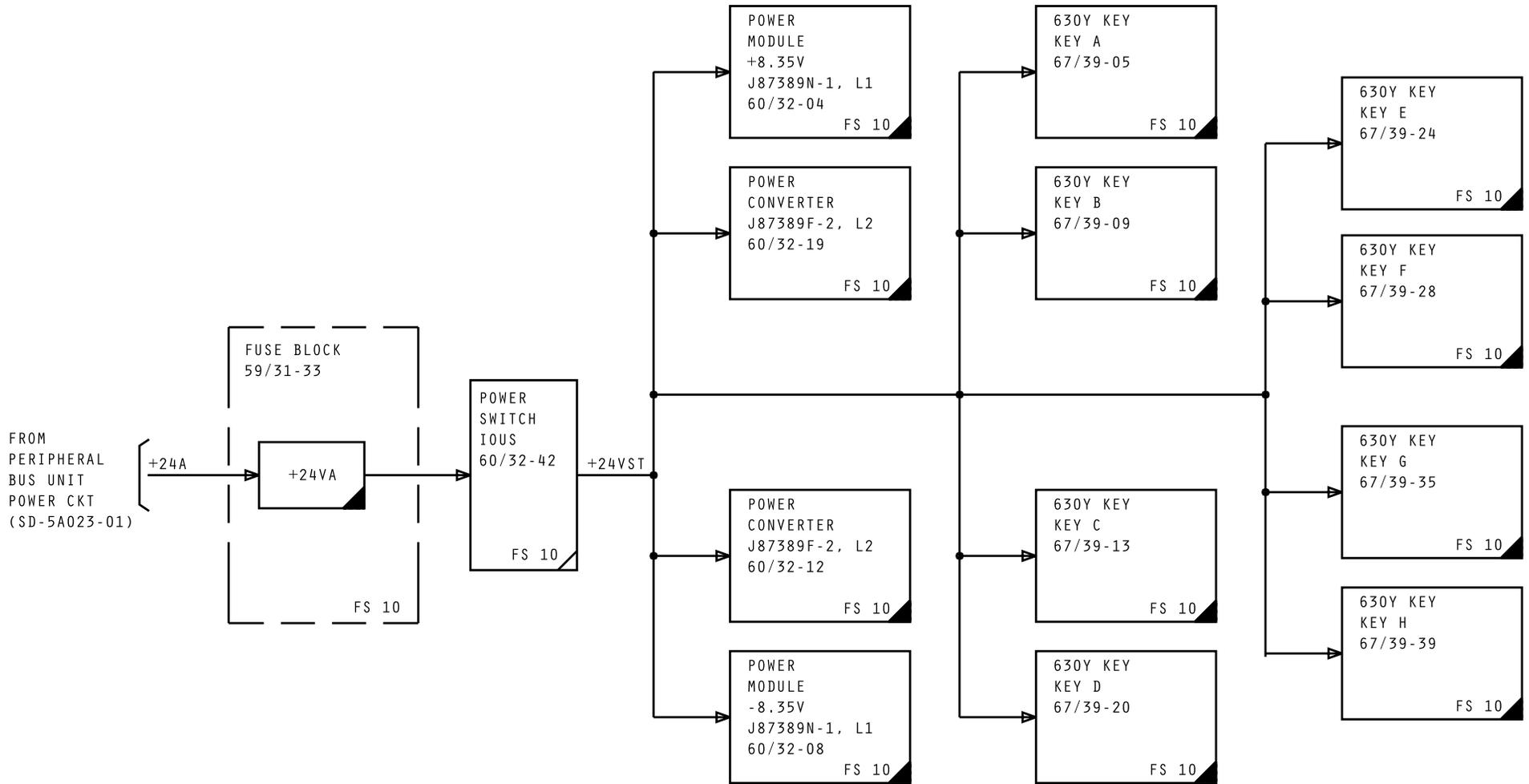


TABLE A				
BLOWN FUSE	FC126 CIRCUIT PACK LOCATIONS			
	1st	2nd	3rd	4th
48B0	072-16	072-17	072-18	072-19
48C0	072-20	072-21	072-22	—
48B1	072-23	072-24	072-25	072-26
48C1	072-27	072-28	072-29	—

CLEAR BLOWN 48B0, 48C0, 48B1 OR 48C1 FUSE, PERIPHERAL BUS UNIT (SD-5A023-01)



+24VA FUSE POWER DISTRIBUTION, I/O UNIT (SD-5A021-01)

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At I/O unit power switch:

[1] Rotate **ROS/OFF** switch clockwise to **ROS**

Alarms retire;
OFF NORM lamp lights

[2] Depress **ROS/OFF** switch

[3] Replace blown **+24VA** fuse

[5] See NOTE 1. Remove all **-48V** fuses and unseat associated power modules/converters for faulty unit [TABLE A]

[6] Replace **+24VA** fuse

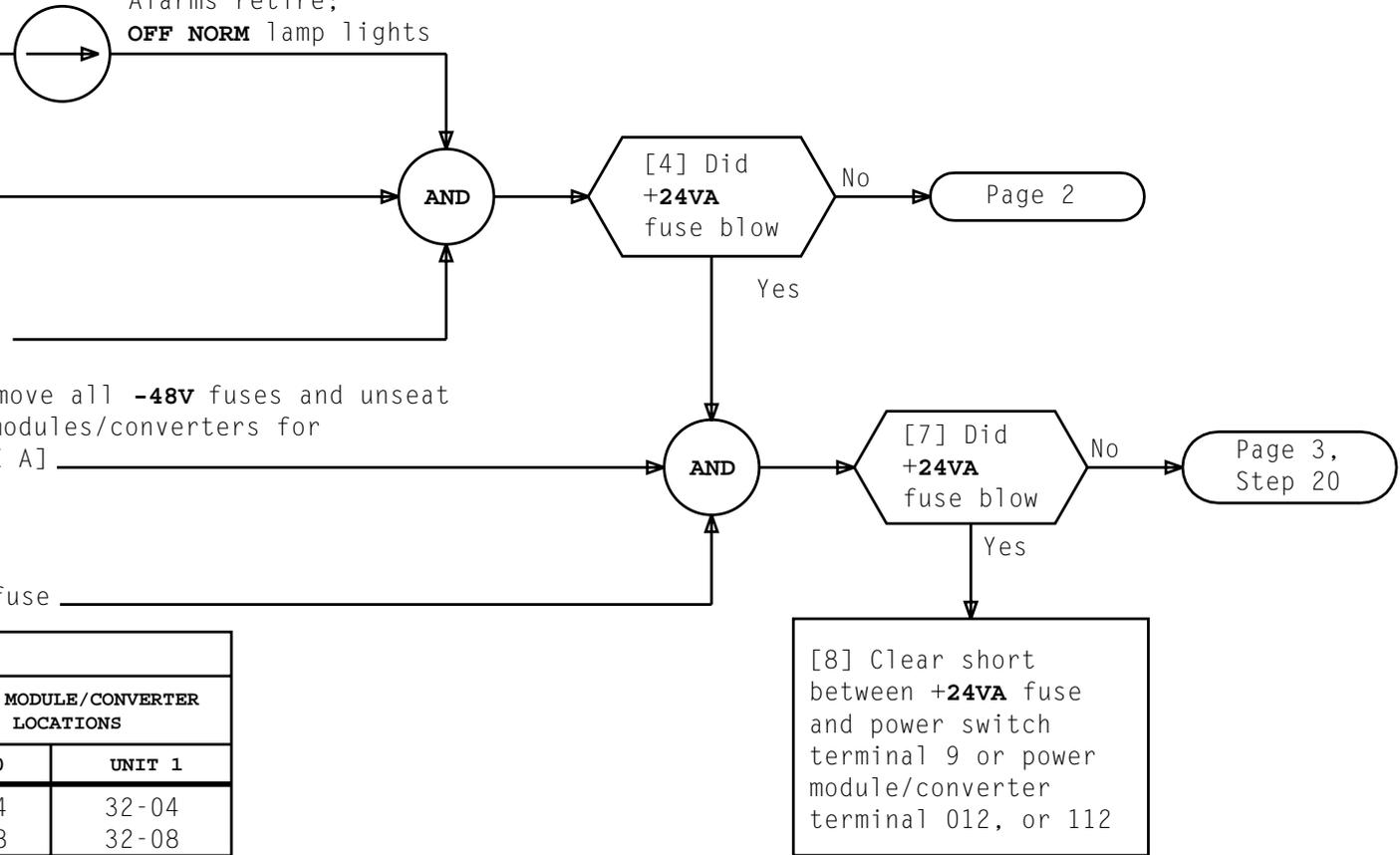


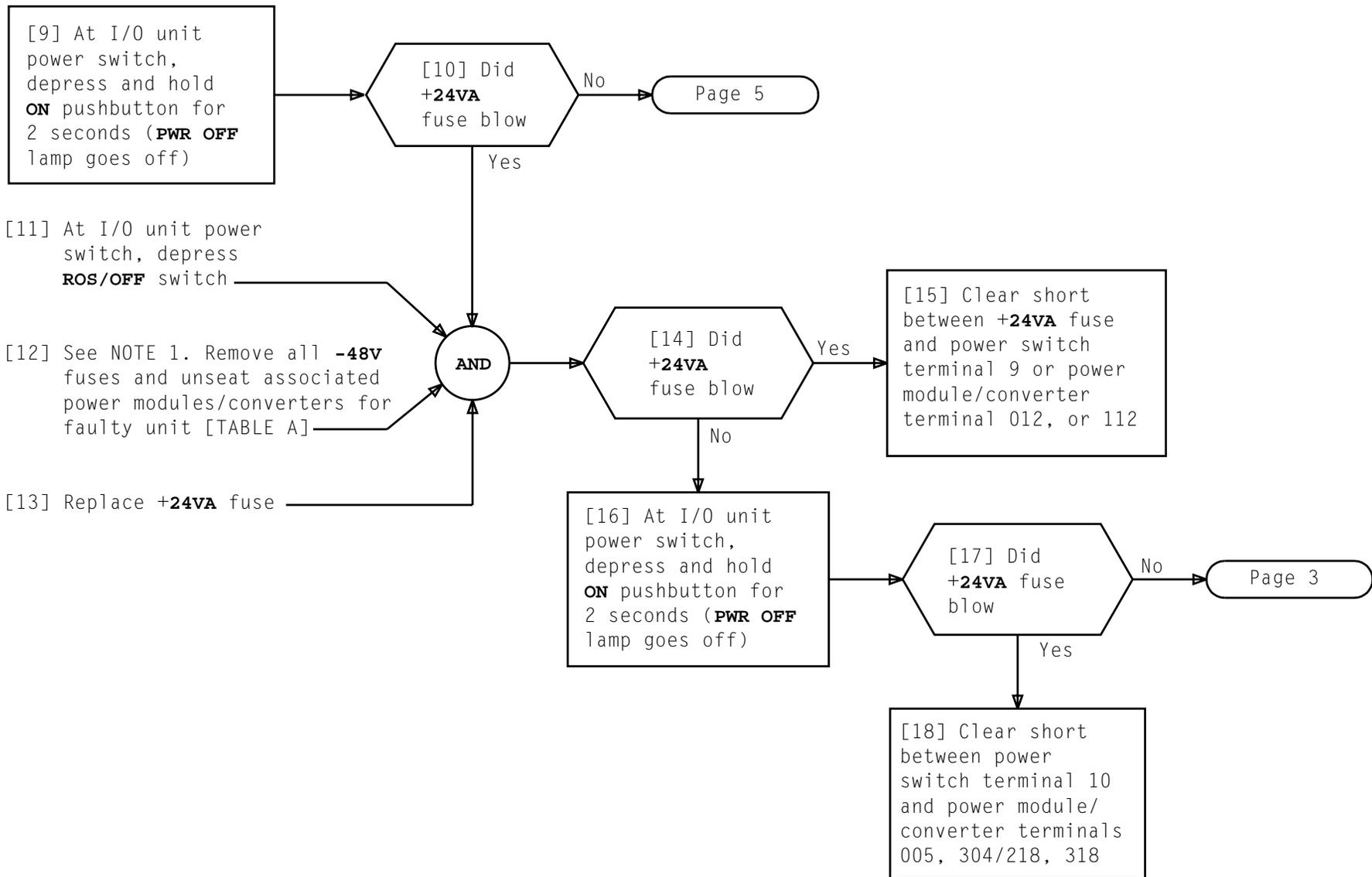
TABLE A				
NAME	FUSE		POWER MODULE/CONVERTER LOCATIONS	
	BLOCK LOCATION		UNIT 0	UNIT 1
	UNIT 0	UNIT 1		
-48VK	59-33	31-33	60-04 60-08	32-04 32-08
-48VJ	59-33	31-33	60-19	32-19
-48VI	59-33	31-33	60-12	32-12
-48VA	61-33	33-33	64-05	36-05
-48VB	61-33	33-33	64-09	36-09
-48VC	61-33	33-33	64-13	36-13
-48VD	61-33	33-33	64-20	36-20
-48VE	61-33	33-33	64-24	36-24
-48VF	61-33	33-33	64-28	36-28
-48VG	61-33	33-33	64-35	36-35
-48VH	61-33	33-33	64-39	36-39

[8] Clear short between **+24VA** fuse and power switch terminal 9 or power module/converter terminal 012, or 112

NOTE 1
Proper procedures should be used for seating and unseating power modules/converters

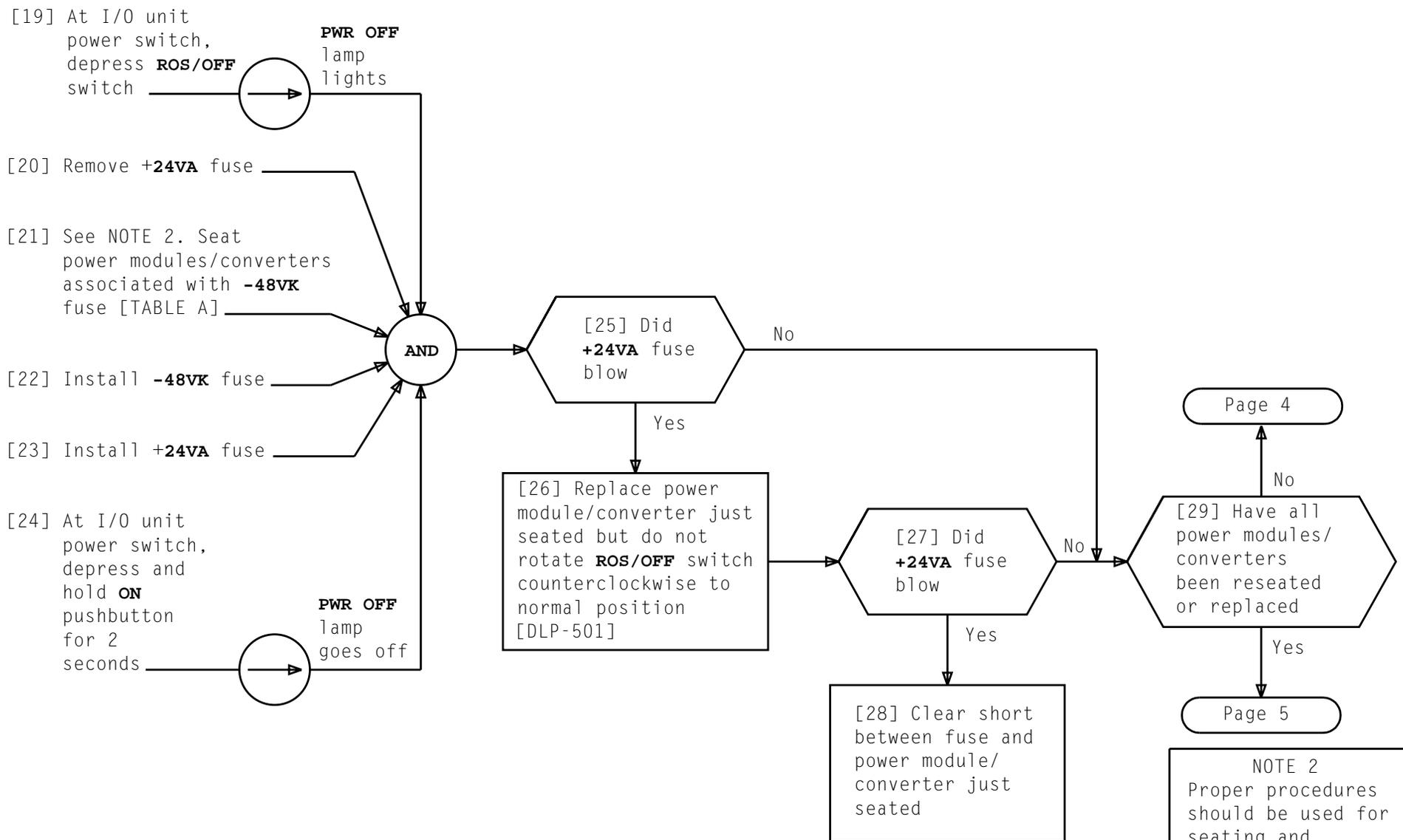
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CLEAR BLOWN +24VA FUSE, I/O UNIT (SD-5A021-01)



CLEAR BLOWN +24VA FUSE, I/O UNIT (SD-5A021-01)

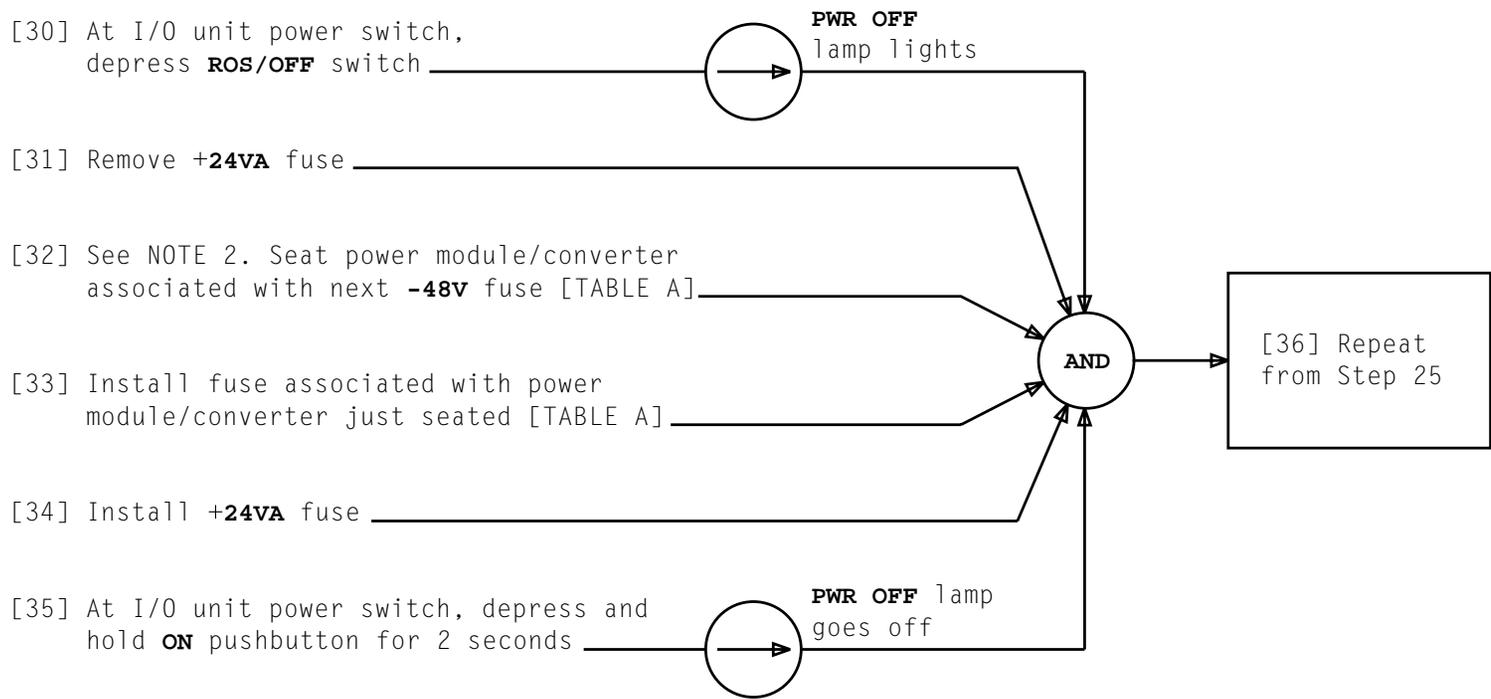
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NOTE 2
 Proper procedures should be used for seating and unseating power modules/converters

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CLEAR BLOWN +24VA FUSE, I/O UNIT (SD-5A021-01)



CLEAR BLOWN +24VA FUSE, I/O UNIT (SD-5A021-01)

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[37] Depress **CHANNEL POWER OFF 0** pushbutton to **ON**

[38] Did **+24VA** fuse blow

[39] Replace power module/ converter associated with **CHANNEL POWER OFF** pushbutton [TABLE B] but do not rotate **ROS/OFF** switch counterclockwise to normal position [DLP-501]

[40] Replace **+24VA** fuse

[41] Are all **CHANNEL POWER OFF** lamps off

[42] Depress next **CHANNEL POWER OFF** pushbutton to **ON** [TABLE B]

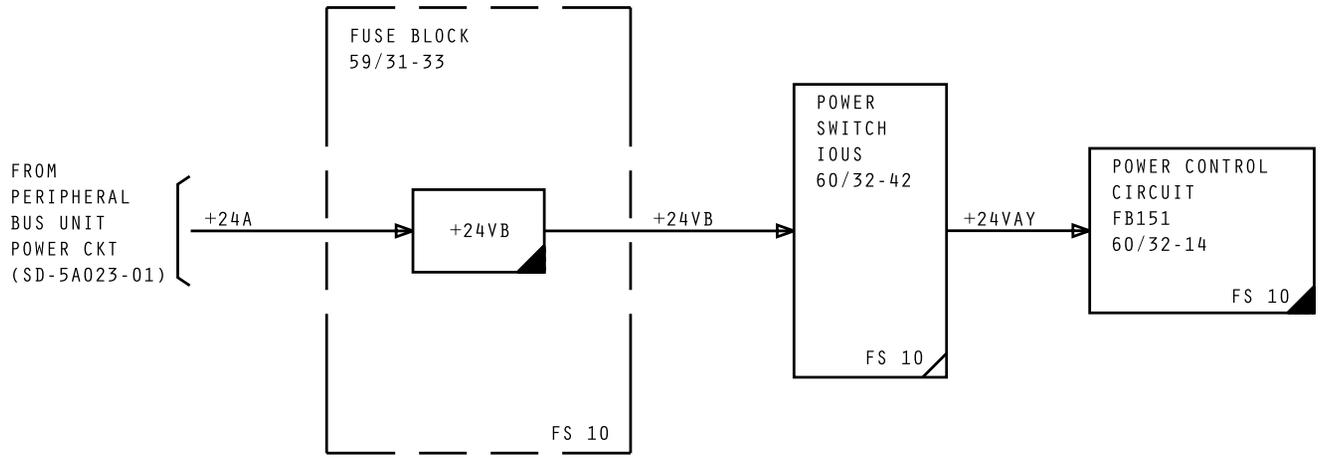
[43] At power-off key unit, depress **RESET** pushbutton

[44] At I/O unit power switch, rotate **ROS/OFF** switch counterclockwise to normal position

OS and **OFF NORM** lamps go off

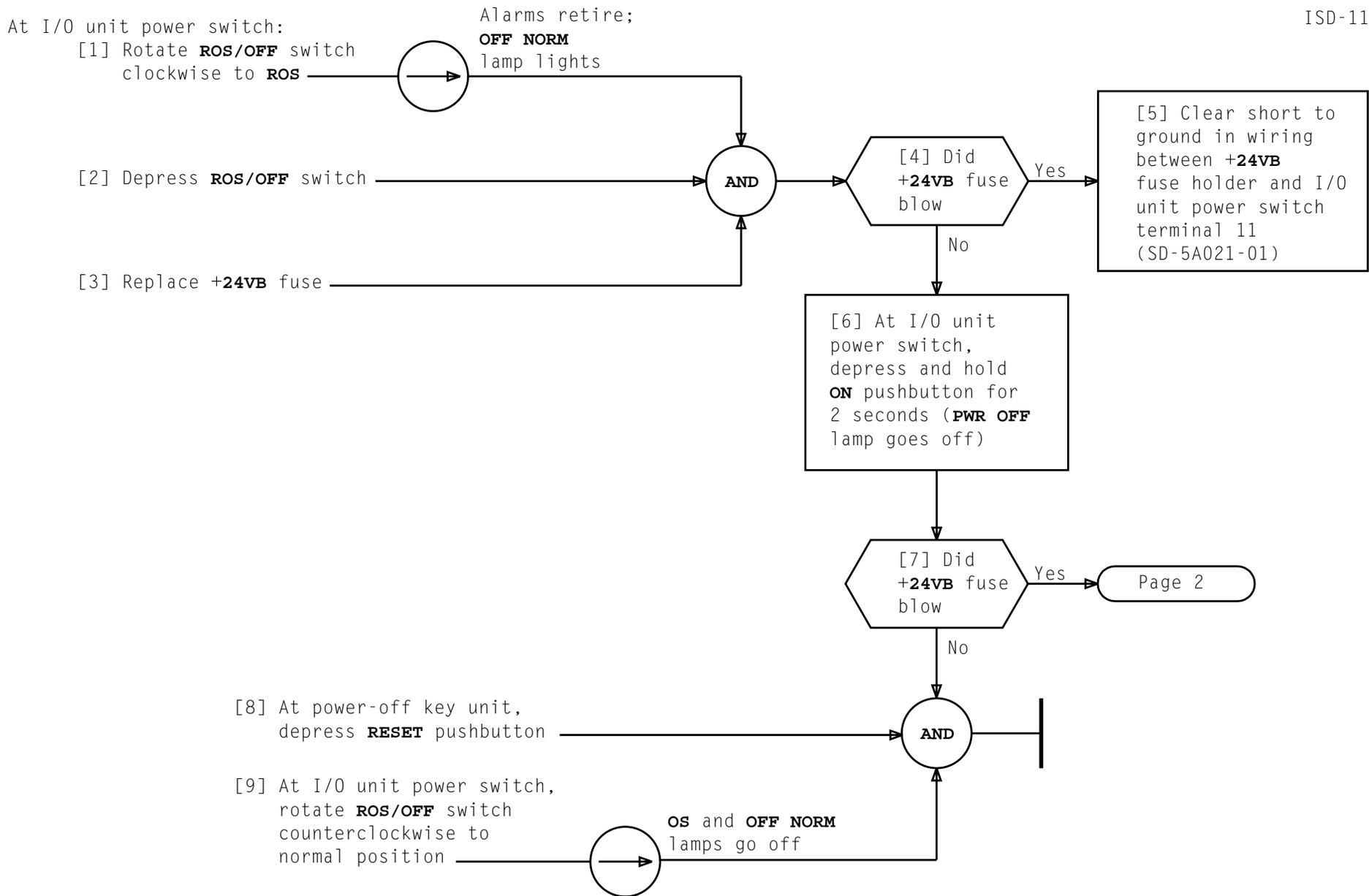
TABLE B		
CHANNEL POWER OFF PUSHBUTTON	POWER MODULE/CONVERTER LOCATION	
	UNIT 0	UNIT 1
0	64-05	36-05
1	64-09	36-09
2	64-13	36-13
3	64-20	36-20
4	64-24	36-24
5	64-28	36-28
6	64-35	36-35
7	64-39	36-39

CLEAR BLOWN +24VA FUSE, I/O UNIT (SD-5A021-01)



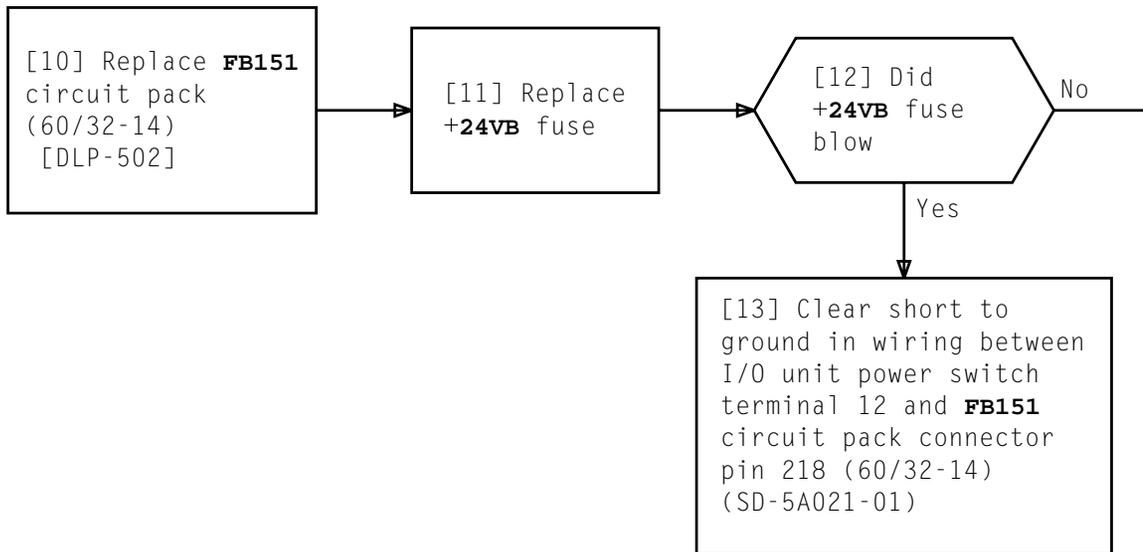
+24VB FUSE POWER DISTRIBUTION, I/O UNIT (SD-5A021-01)

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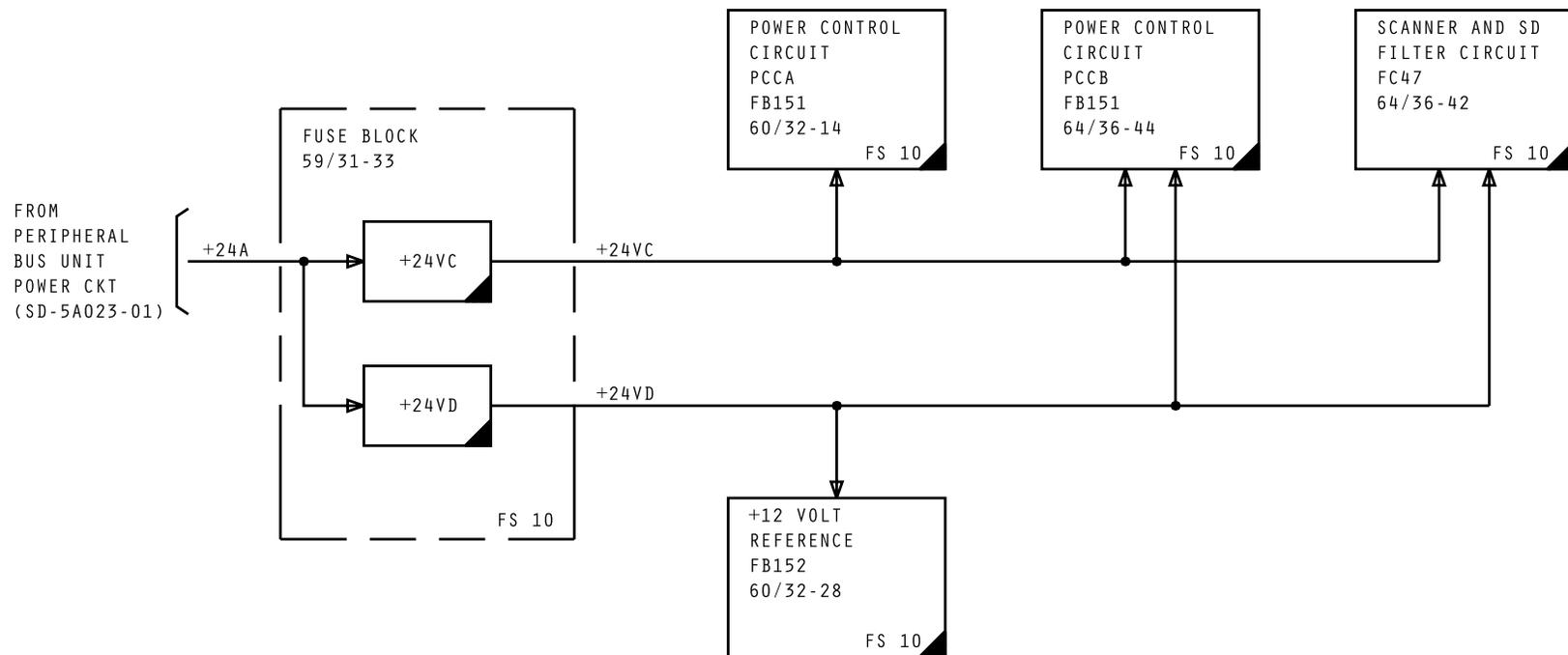
CLEAR BLOWN +24VB FUSE, I/O UNIT (SD-5A021-01)

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CLEAR BLOWN +24VB FUSE, I/O UNIT (SD-5A021-01)

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+24VC AND +24VD FUSE POWER DISTRIBUTION, I/O UNIT (SD-5A021-01)

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At I/O unit power switch:

[1] Rotate **ROS/OFF** switch clockwise to **ROS**

[2] Depress **ROS/OFF** switch

[3] Replace blown fuse

[4] Depress and hold **ON** pushbutton for 2 seconds

Alarms retire;
OFF NORM lamp lights

PWR OFF lamp goes off

[6] At power-off key unit, depress **RESET** pushbutton

[7] At I/O unit power switch, rotate **ROS/OFF** switch counterclockwise to normal position

OS and **OFF NORM** lamps go off

[5] Did fuse blow

[8] Replace three circuit packs associated with blown fuse
[TABLE A]
[DLP-502]

[9] Replace blown fuse

Page 2

TABLE A	
BLOWN FUSE	CIRCUIT PACK/LOCATION
+24VC	FB151 64/36-44
	FB151 60/32-14
	FC47 64/36-42
+24VD	FB151 64/36-44
	FB152 60/32-28
	FC47 64/36-42

CLEAR BLOWN +24VC OR +24VD FUSE, I/O UNIT (SD-5A021-01)

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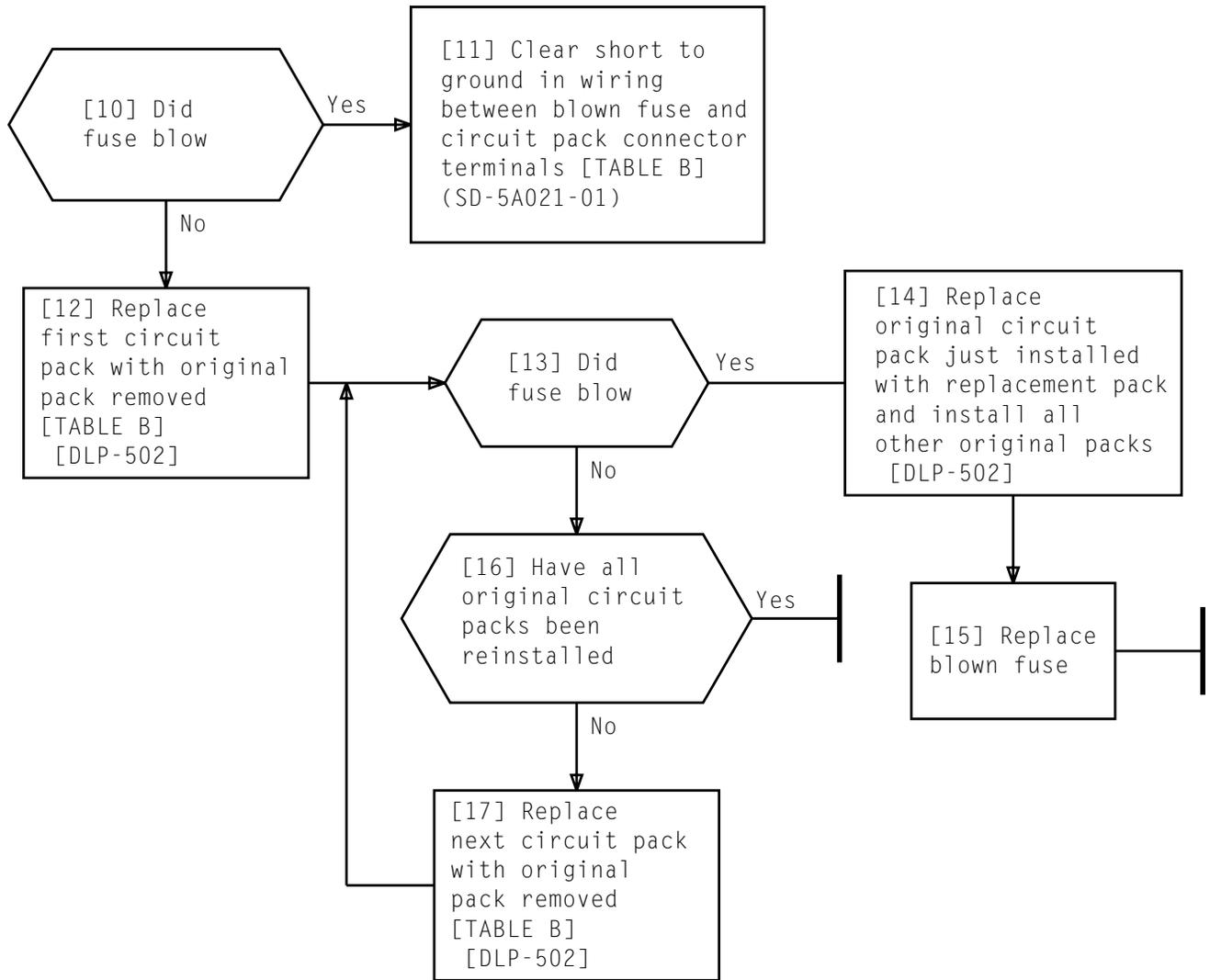
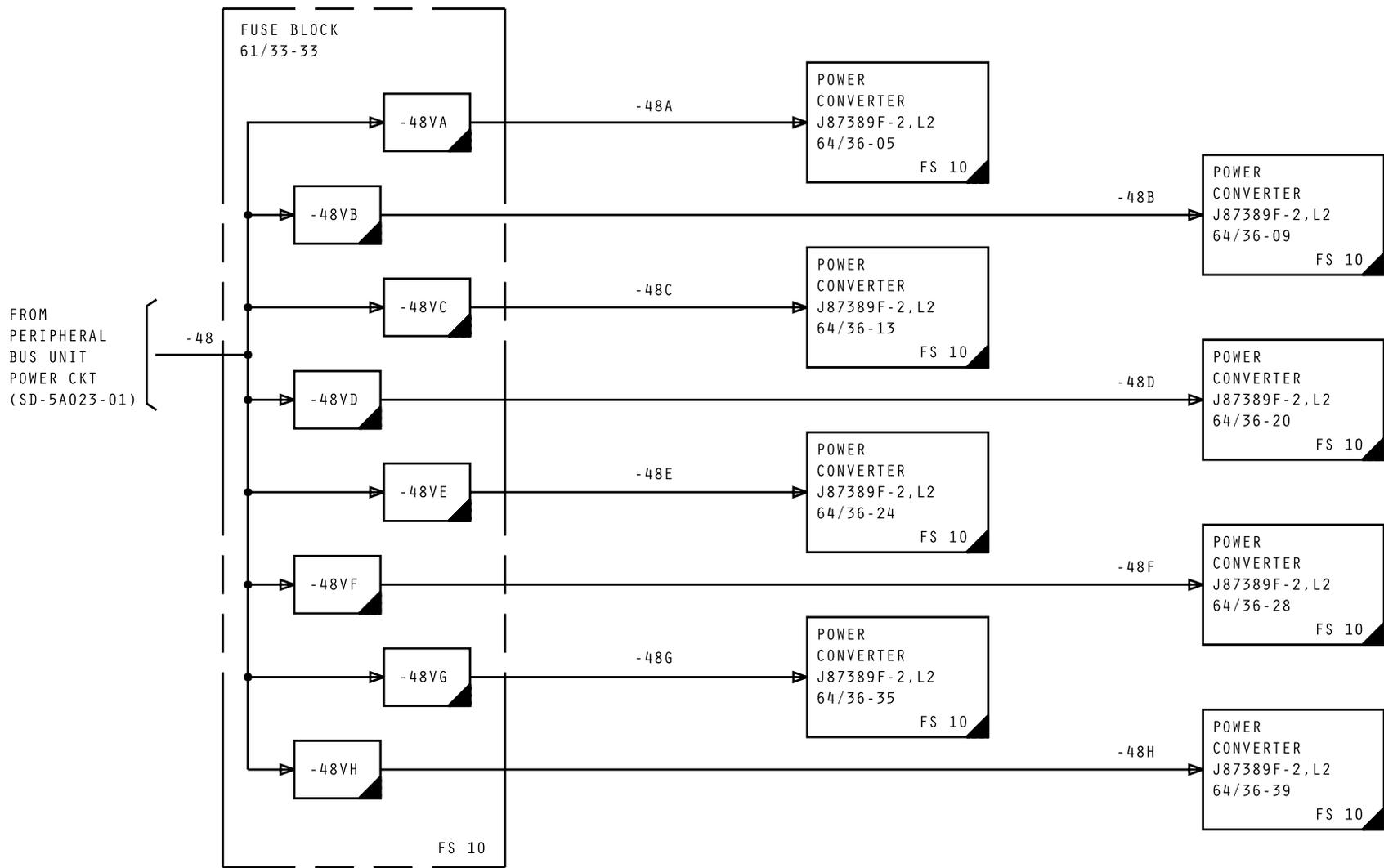


TABLE B		
BLOWN FUSE	CIRCUIT PACK/ LOCATION	CIRCUIT PACK CONNECTOR TERMINAL
+24VC	FB151 64/36-44	218
	FB151 60/32-14	013
	FC47 64/36-42	001
+24VD	FB151 64/36-44	013
	FB152 60/32-28	218
	FC47 64/36-42	100

CLEAR BLOWN +24VC OR +24VD FUSE, I/O UNIT (SD-5A021-01)

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**-48VA THROUGH -48VH FUSE POWER DISTRIBUTION,
I/O UNIT (SD-5A021-01)**

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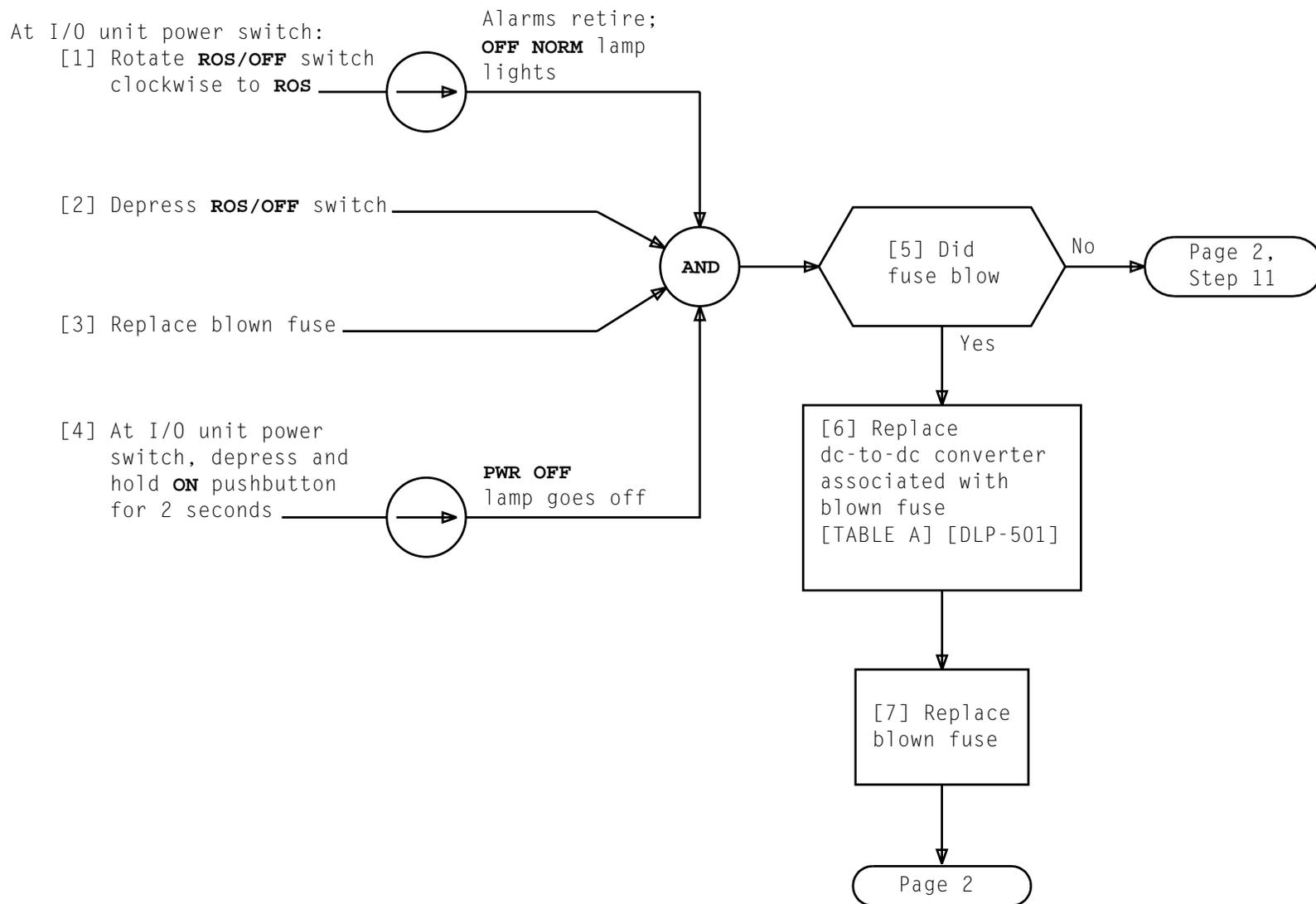
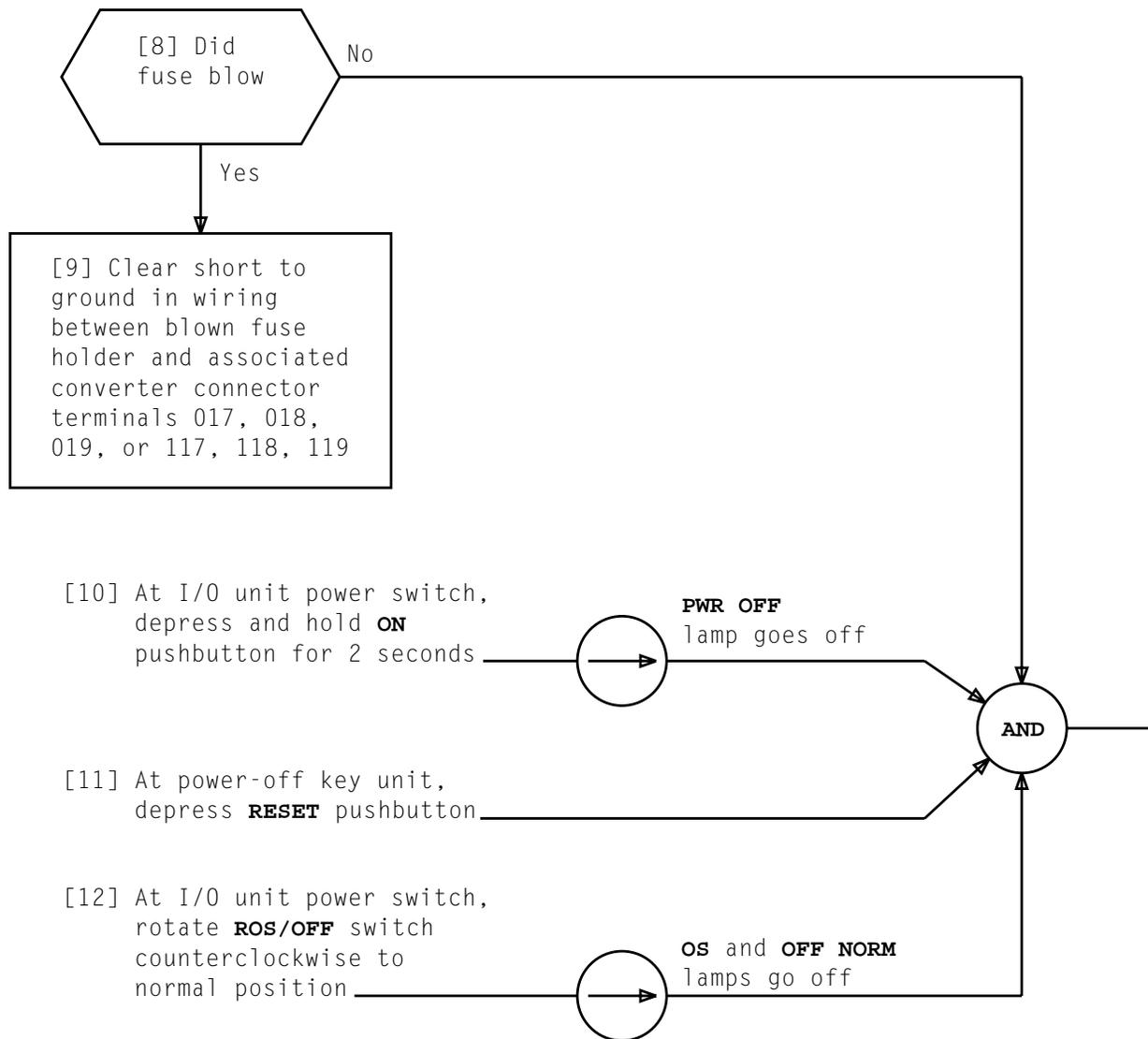


TABLE A	
BLOWN FUSE	CONVERTER LOCATION
-48VA	64/36-05
-48VB	64/36-09
-48VC	64/36-13
-48VD	64/36-20
-48VE	64/36-24
-48VF	64/36-28
-48VG	64/36-35
-48VH	64/36-39

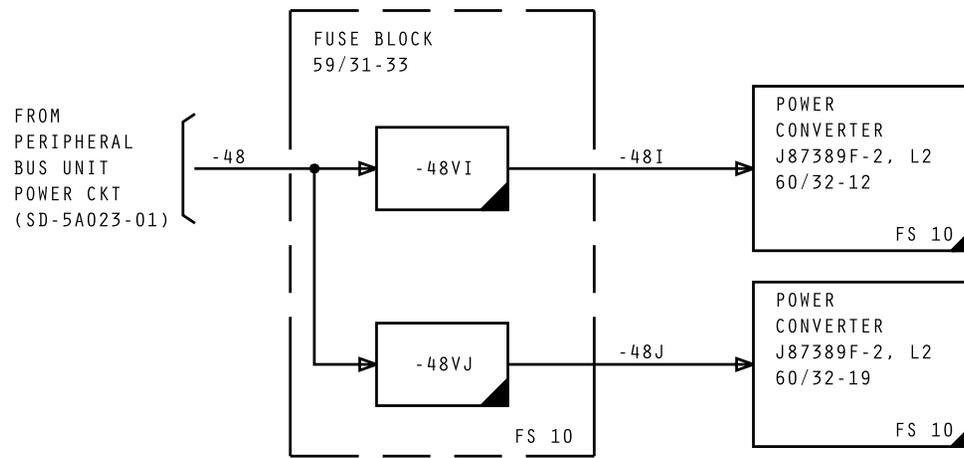
CLEAR BLOWN -48VA THROUGH -48VH FUSE, I/O UNIT (SD-5A021-01)

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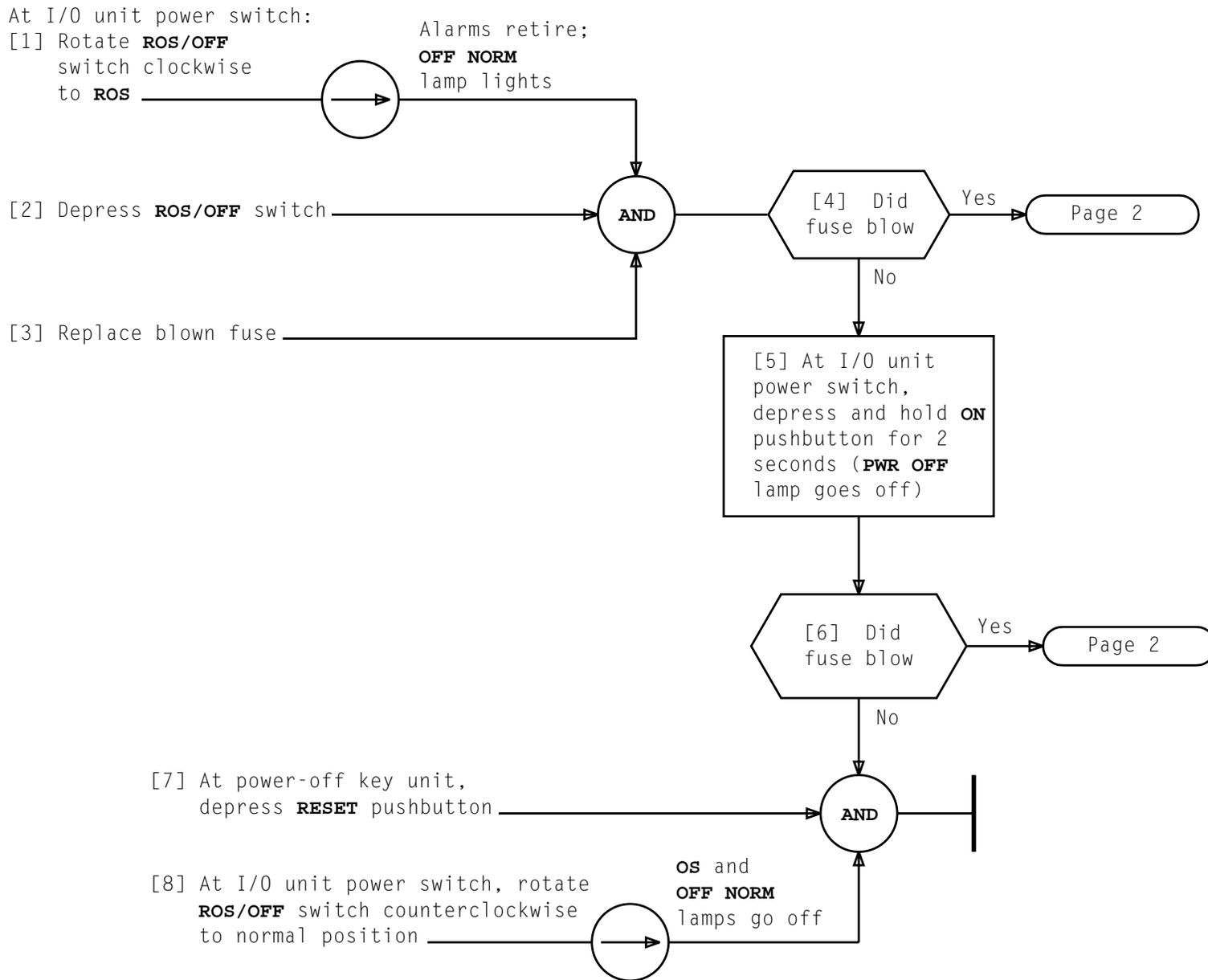
CLEAR BLOWN -48VA THROUGH -48VH FUSE, I/O UNIT (SD-5A021-01)

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-48VI AND -48VJ FUSE POWER DISTRIBUTION, I/O UNIT (SD-5A021-01)

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CLEAR BLOWN -48VI OR -48VJ FUSE, I/O UNIT (SD-5A021-01)

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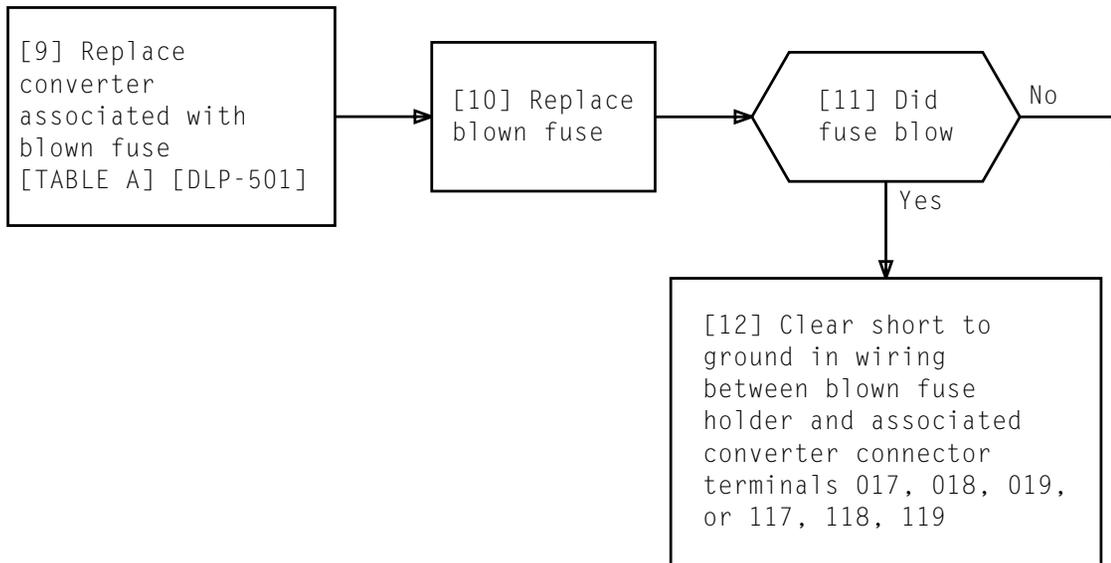
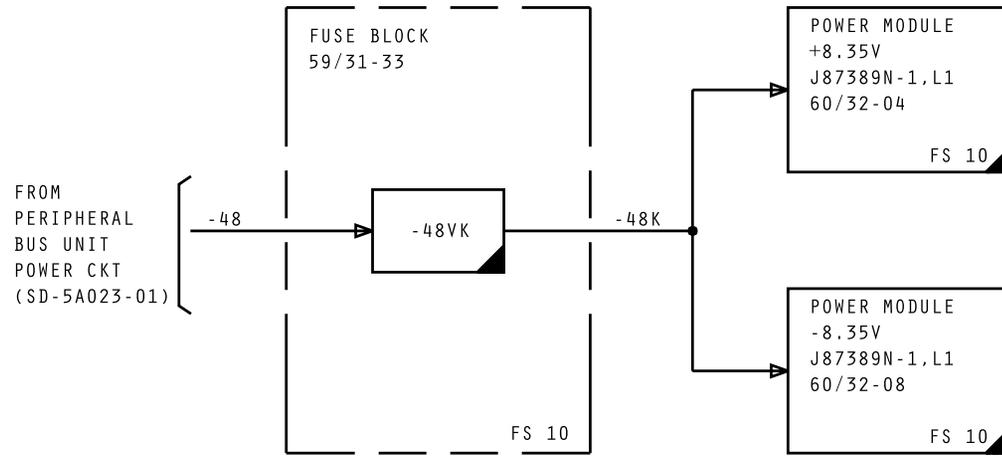


TABLE A	
BLOWN FUSE	CONVERTER LOCATION
-48VI	60/32-12
-48VJ	60/32-19

CLEAR BLOWN -48VI OR -48VJ FUSE, I/O UNIT (SD-5A021-01)

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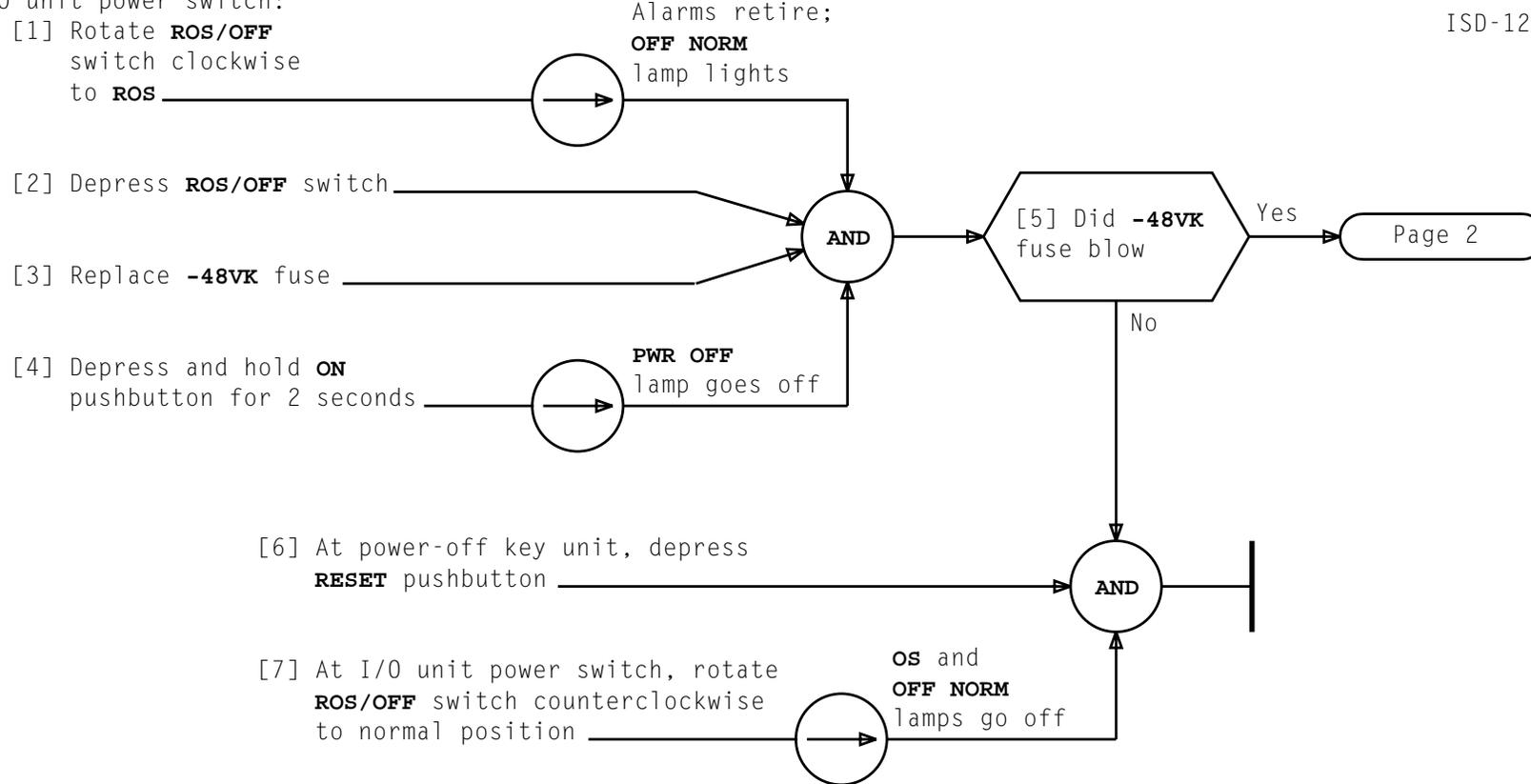


-48VK FUSE POWER DISTRIBUTION, I/O UNIT (SD-5A021-01)

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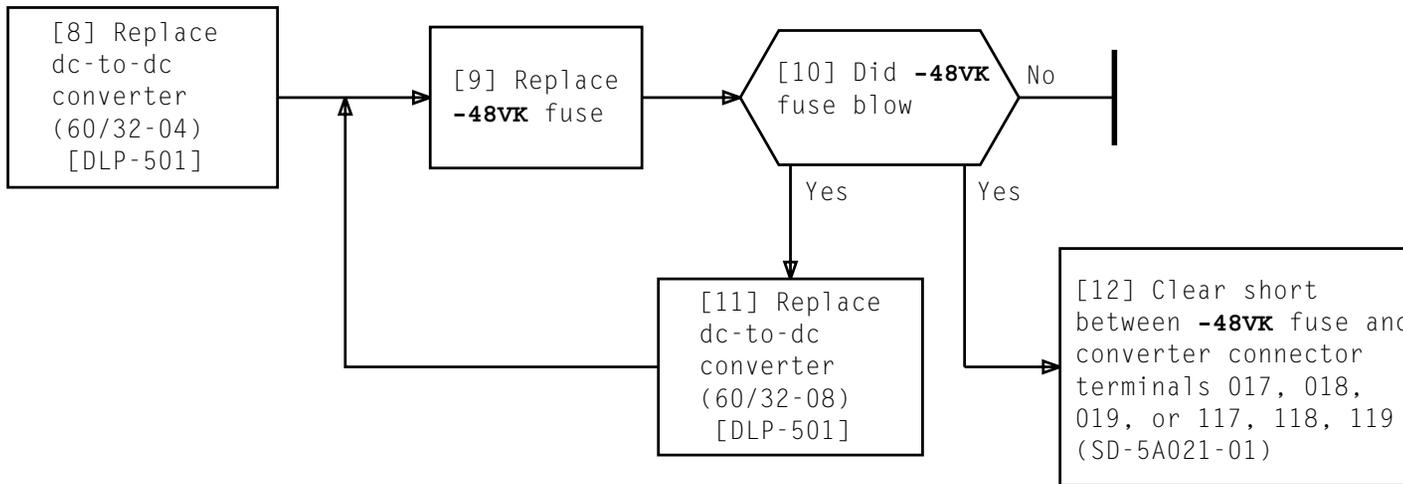
At I/O unit power switch:

ISD-121



CLEAR BLOWN -48VK FUSE, I/O UNIT (SD-5A021-01)

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CLEAR BLOWN -48VK FUSE, I/O UNIT (SD-5A021-01)

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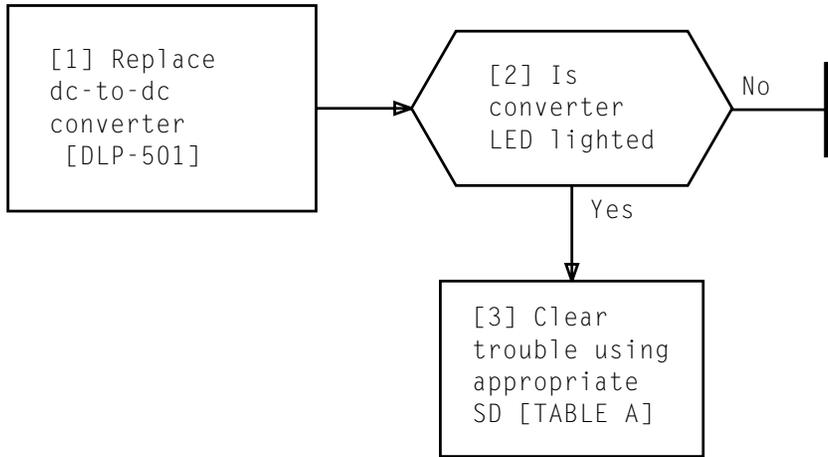
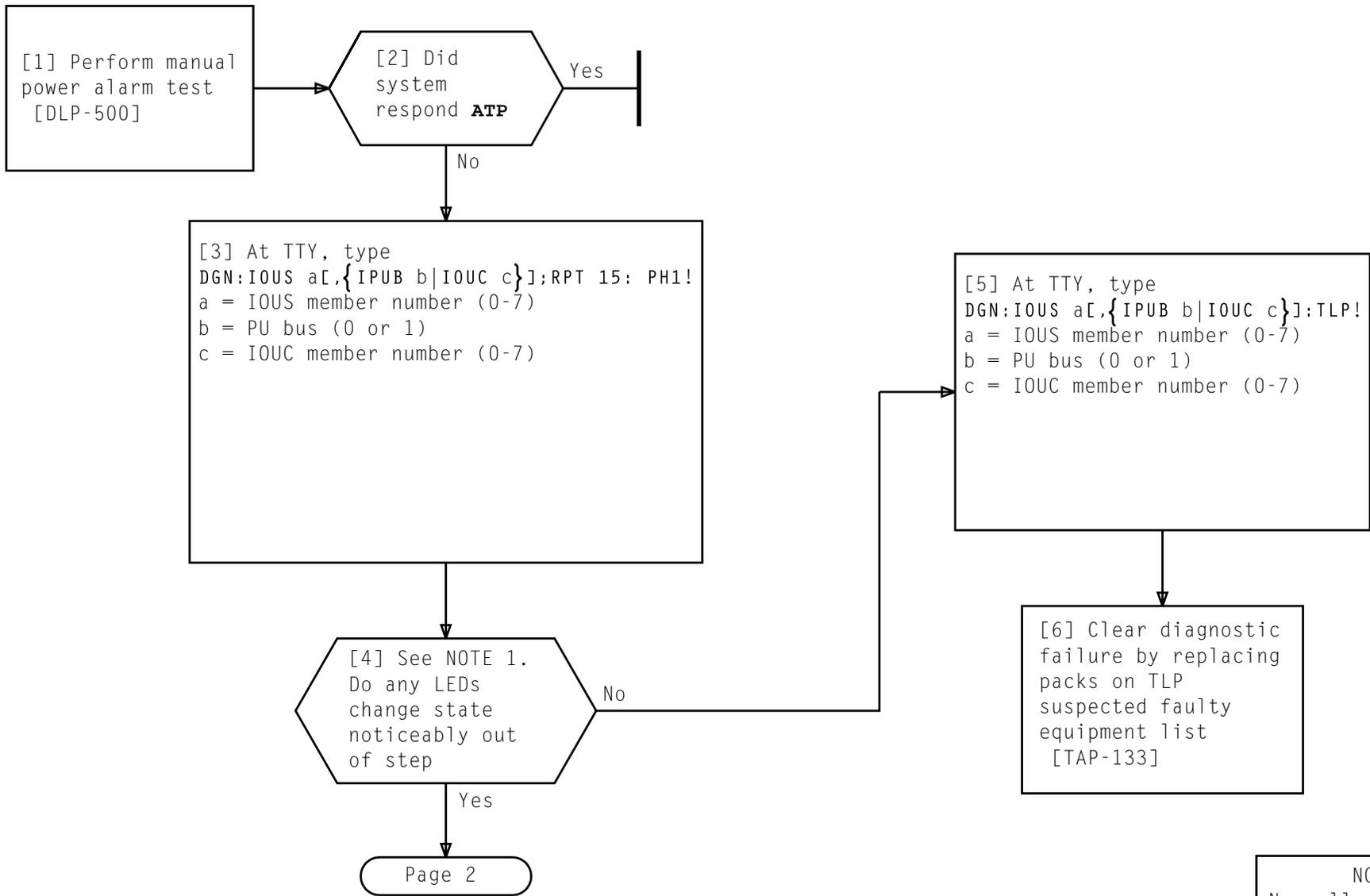


TABLE A	
UNIT	UNIT SD
I/O peripheral bus unit	SD-5A023-01
I/O unit	SD-5A021-01

CLEAR LIGHTED CONVERTER LED, FUSE NOT BLOWN



NOTE 1
 Normally, all LEDs will not change state simultaneously

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CLEAR AUTOMATIC POWER MONITOR TEST FAILURE

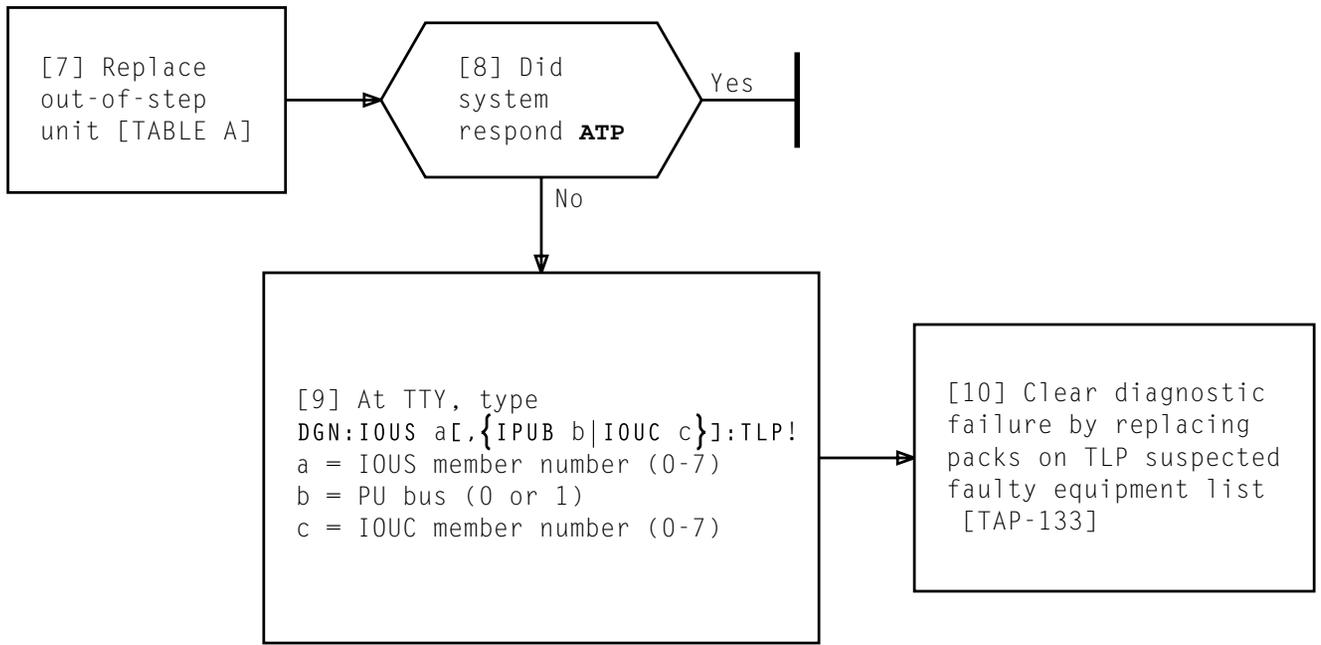
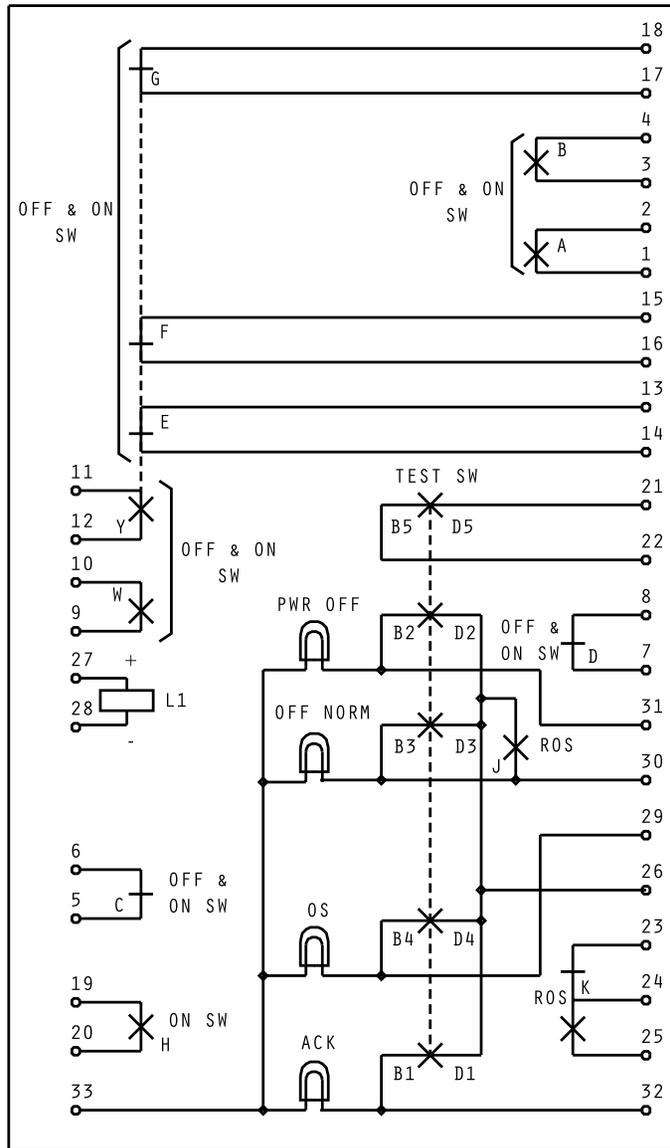
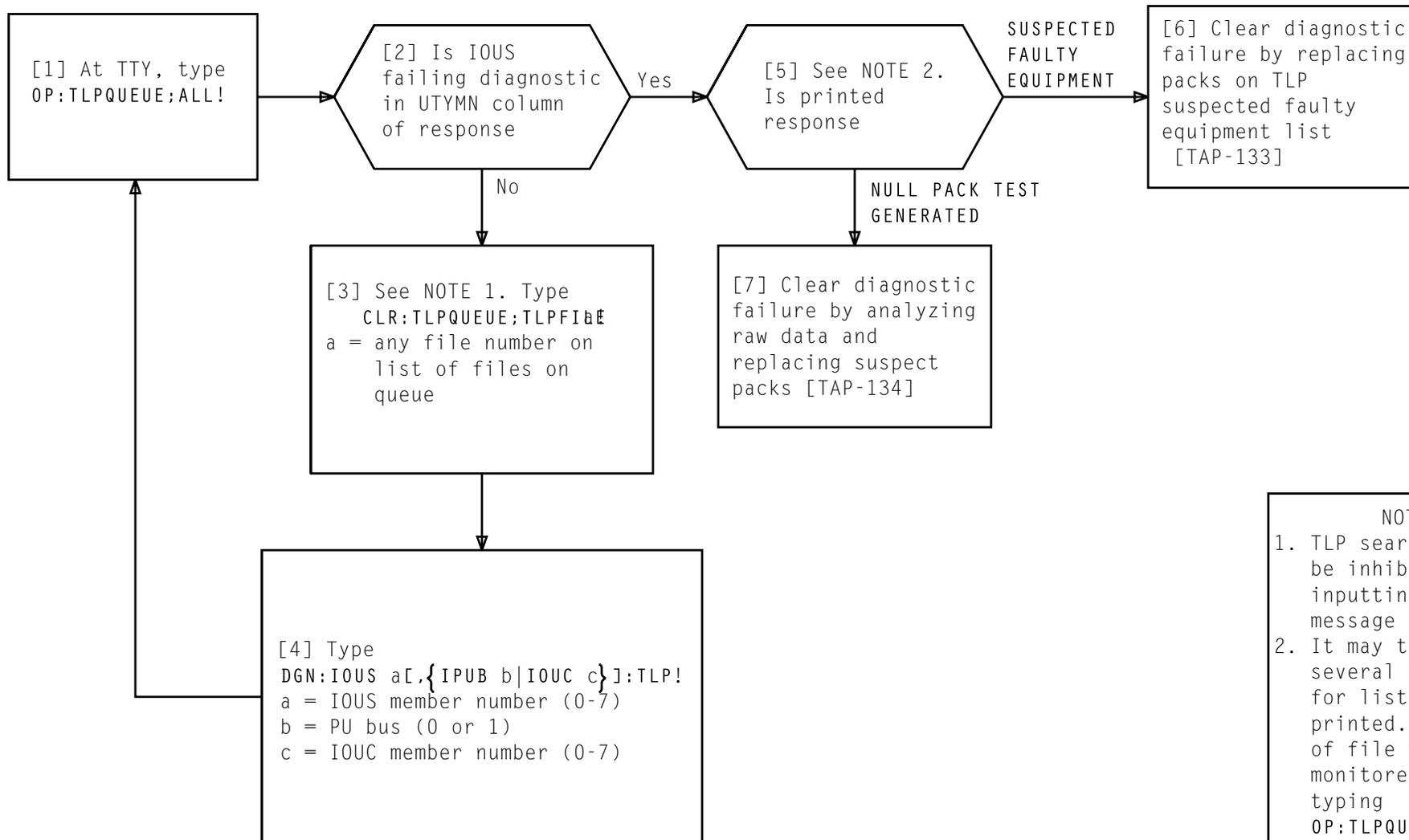


TABLE A	
UNIT	PROCEDURE
Circuit pack	DLP-502
Converter	DLP-501



POWER SWITCH (KS-20738)

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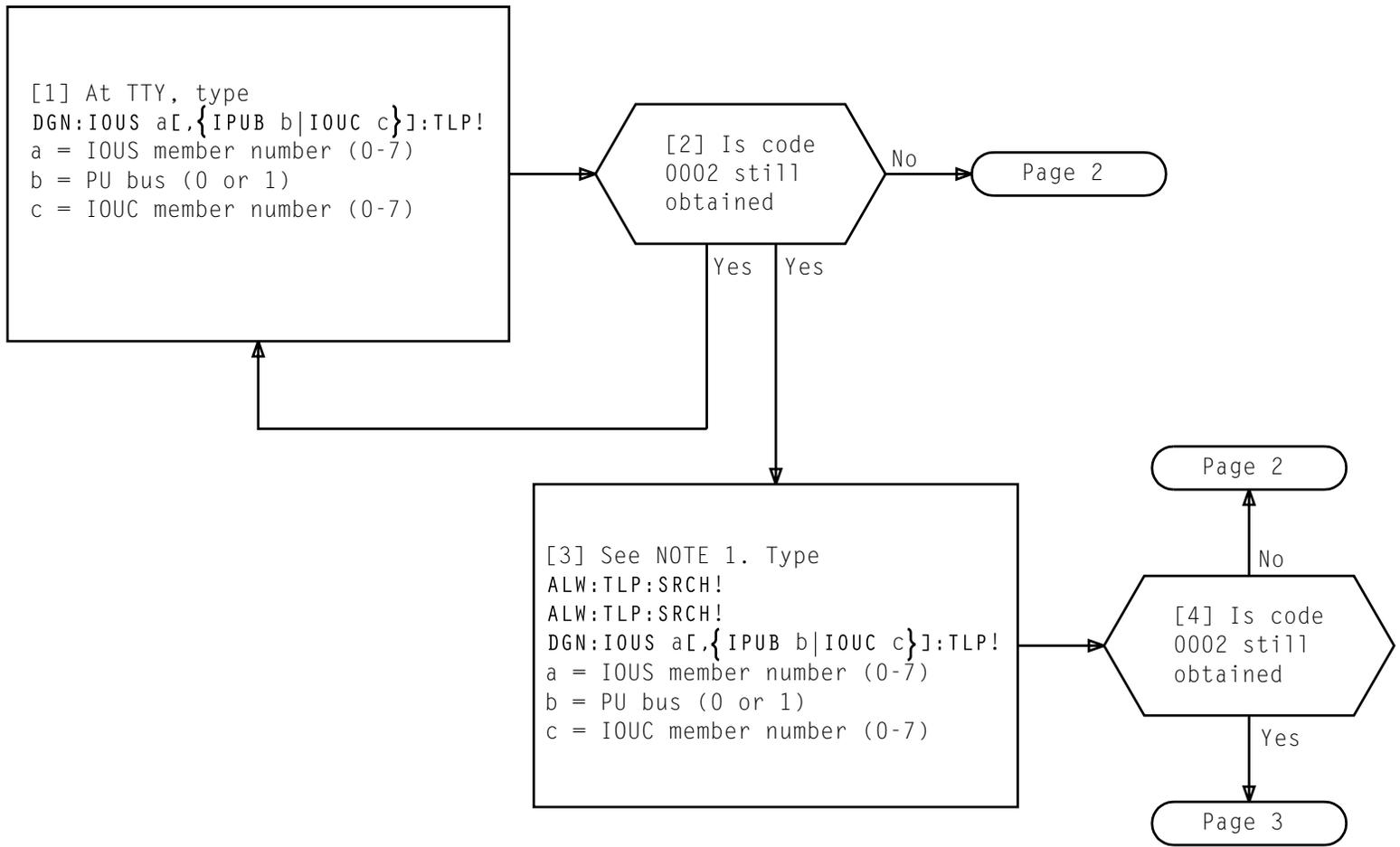


NOTES

1. TLP searches may be inhibited after inputting this message
2. It may take several minutes for list to be printed. Status of file may be monitored by typing
OP:TLPQUEUE;ALL!
TLP file currently being processed is indicated by asterisk in priority column

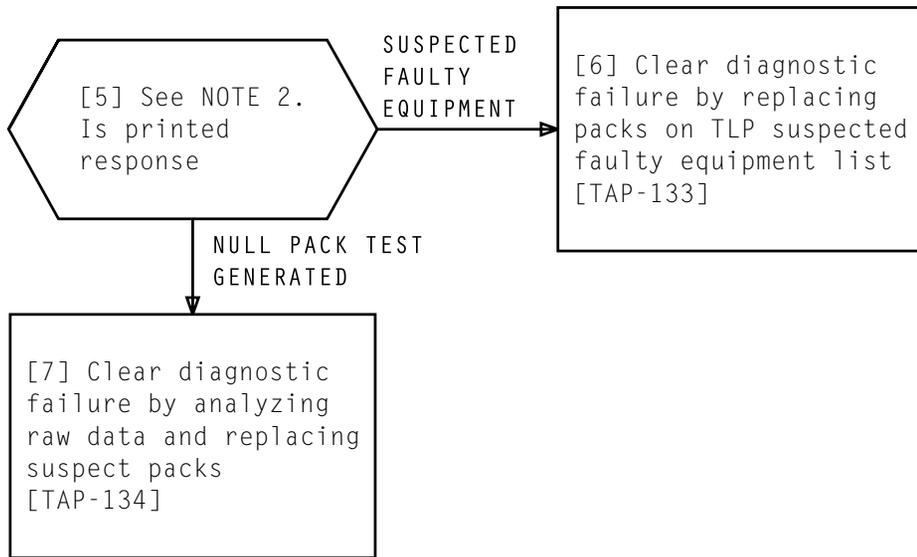
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CLEAR DIAGNOSTIC FAILURE, TLP DISK QUEUE FULL



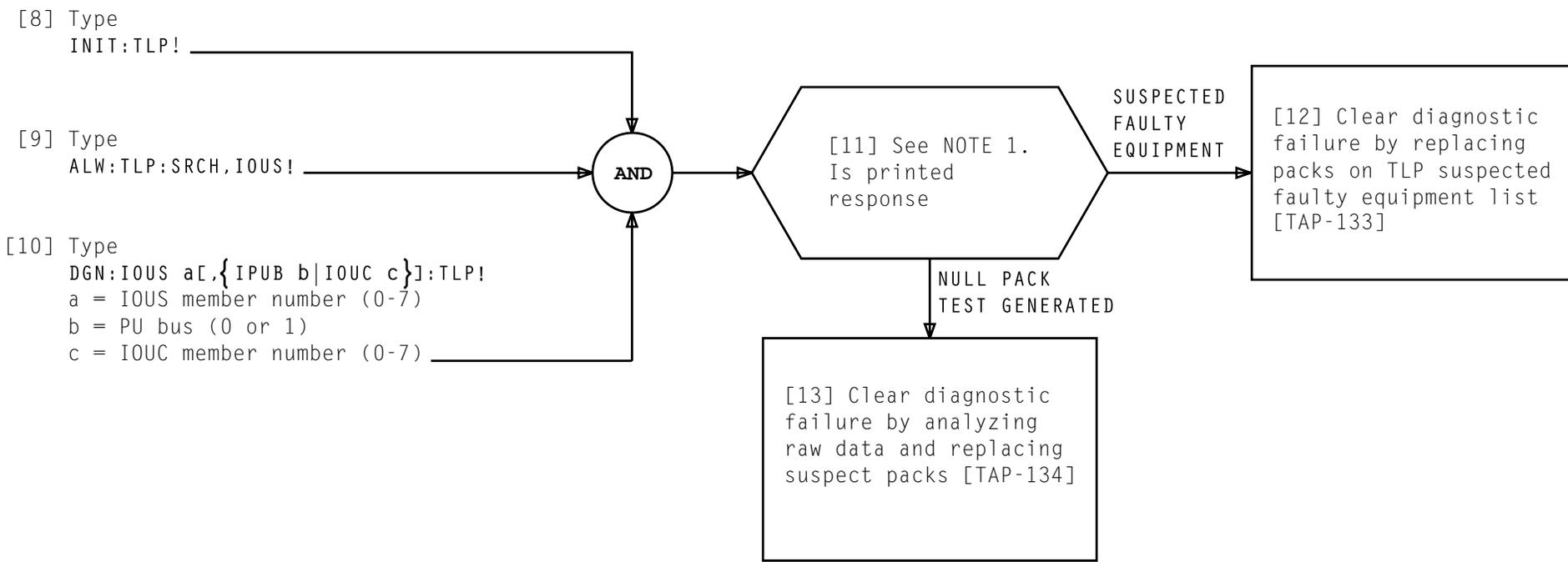
NOTE 1	
Using SRCH on this message will block following input messages until TLP search process has been enabled: OP:TLPQUEUE CLR:TLPQUEUE ALW:TLP:SRCH TLP search process can be manually inhibited using INH:TLP:SRCH input message	
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CLEAR DIAGNOSTIC FAILURE, TLP QUEUE BLOCKAGE



NOTE 2	
It may take several minutes for list to be printed. Status of file may be monitored by typing OP:TLPQUEUE;ALL! TLP file currently being processed is indicated by asterisk in priority column	
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CLEAR DIAGNOSTIC FAILURE, TLP QUEUE BLOCKAGE



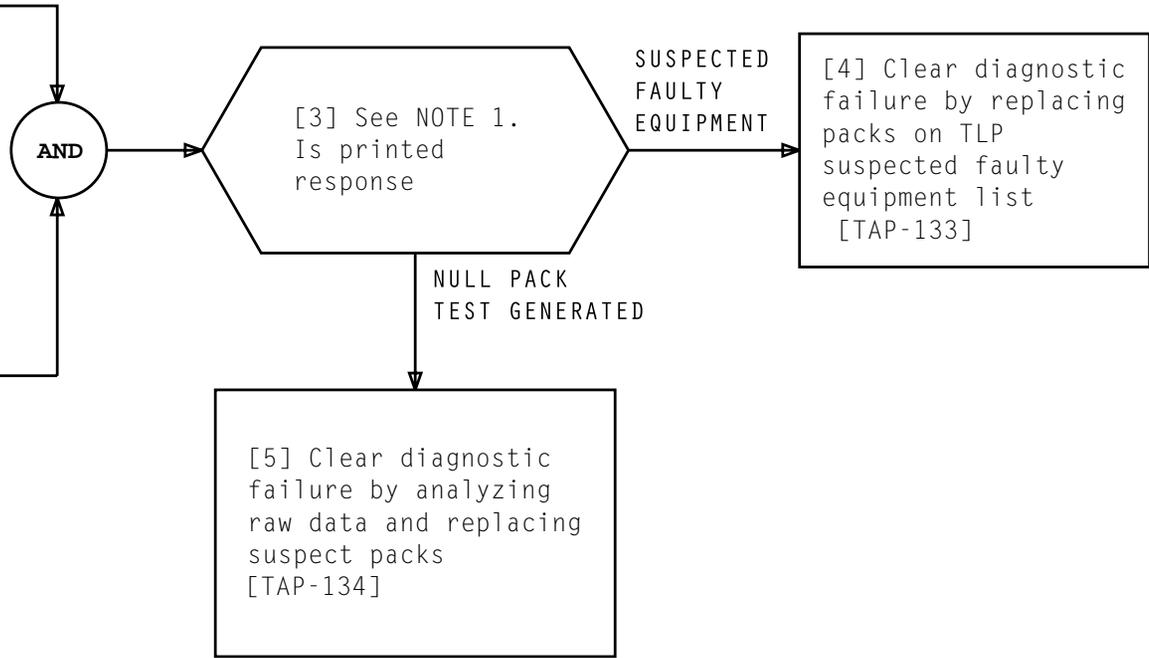
NOTE 1
 It may take several minutes for list to be printed. Status of file may be monitored by typing
 OP:TLPQUEUE;ALL!
 TLP file currently being processed is indicated by asterisk in priority column

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CLEAR DIAGNOSTIC FAILURE, TLP QUEUE BLOCKAGE

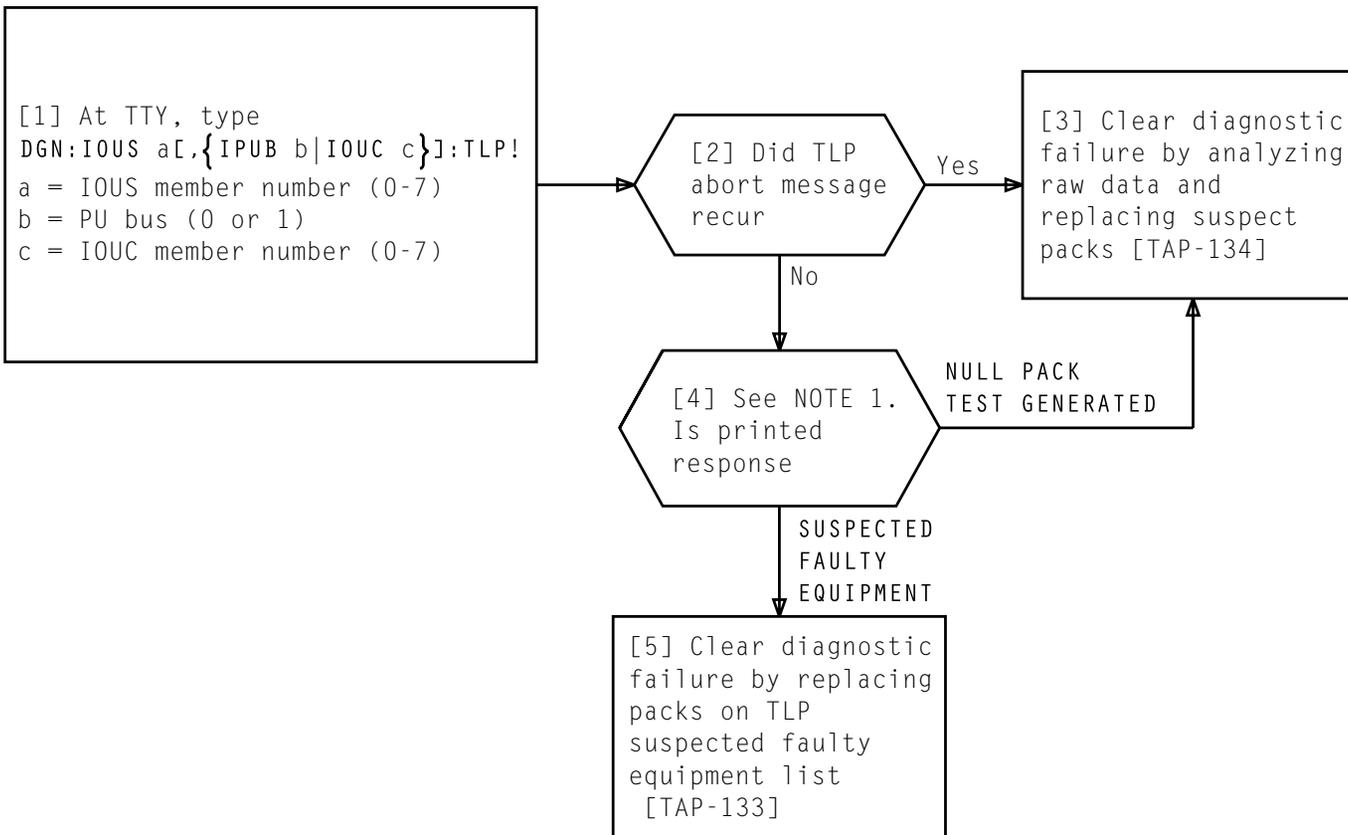
[1] At TTY, type
ALW:TLP:SRCH,IOUS!

[2] Type
DGN:IOUS a[,{IPUB b|IOUC c}]:TLP!
a = IOUS member number (0-7)
b = PU bus (0 or 1)
c = IOUC member number (0-7)



NOTE 1
It may take several minutes for list to be printed. Status of file may be monitored by typing
OP:TLPQUEUE;ALL!
TLP file currently being processed is indicated by asterisk in priority column

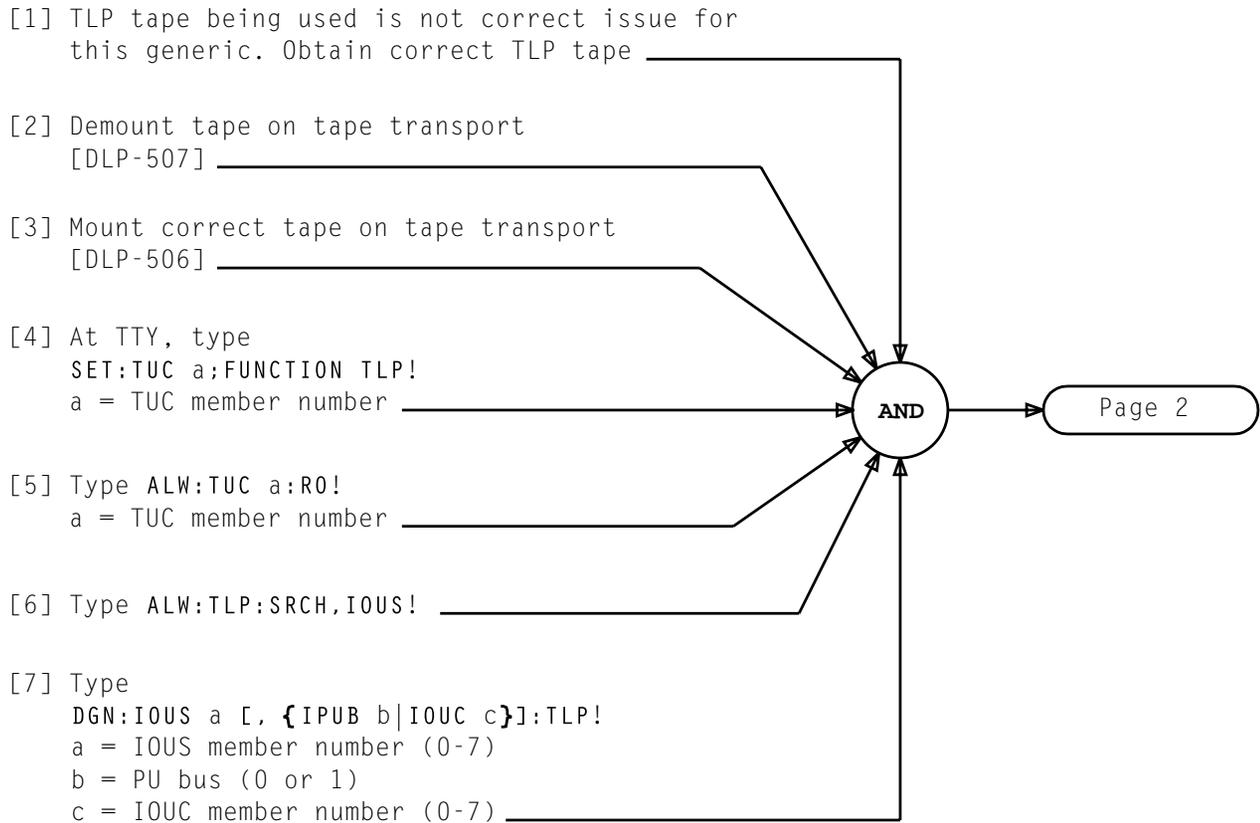
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NOTE 1
It may take several minutes for list to be printed. Status of file may be monitored by typing
OP:TLPQUEUE;ALL!
TLP file currently being processed is indicated by asterisk in priority column

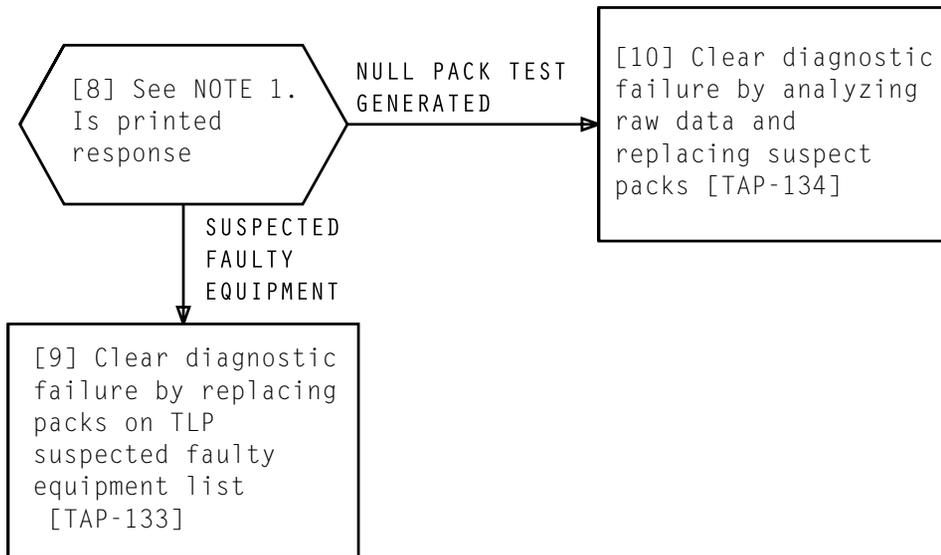
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CLEAR DIAGNOSTIC FAILURE, TLP ABORT



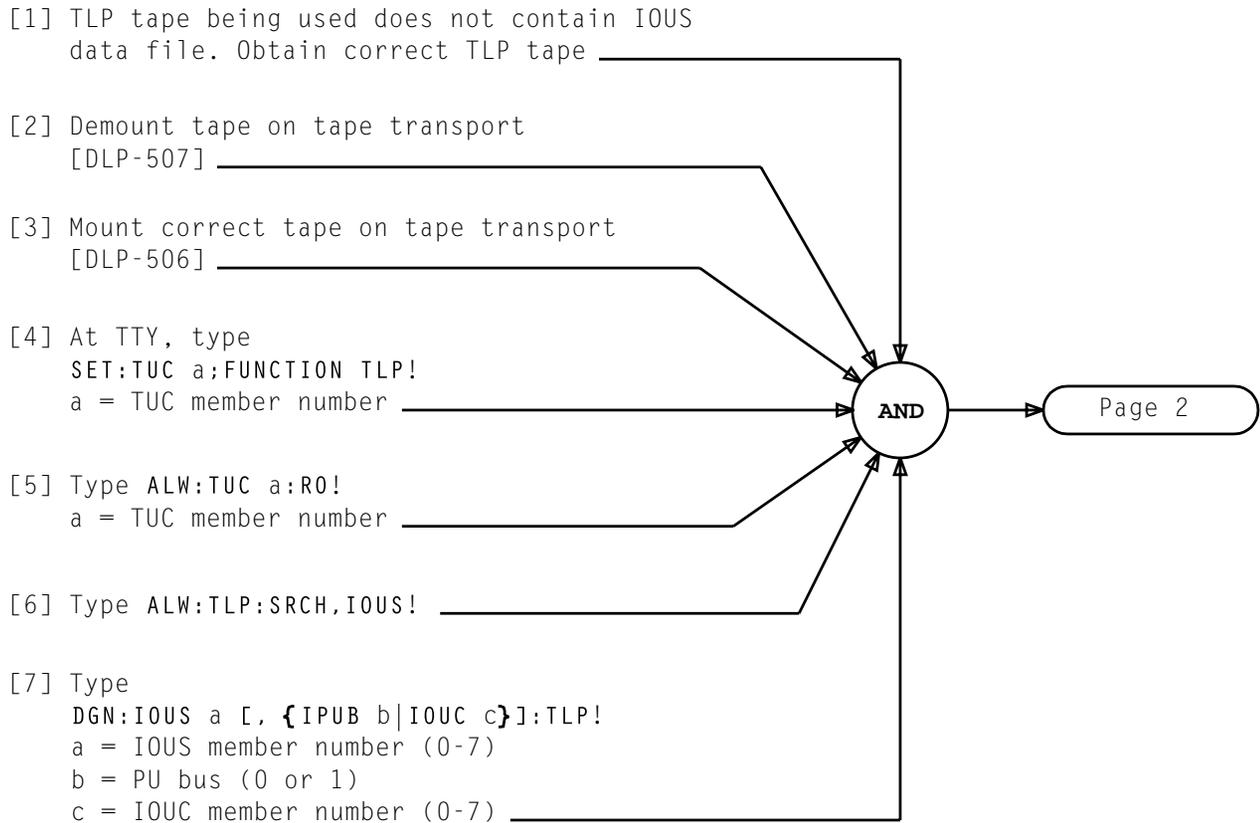
**CLEAR DIAGNOSTIC FAILURE, TLP TAPE VERSION X DOES NOT MATCH
VERSION Y**

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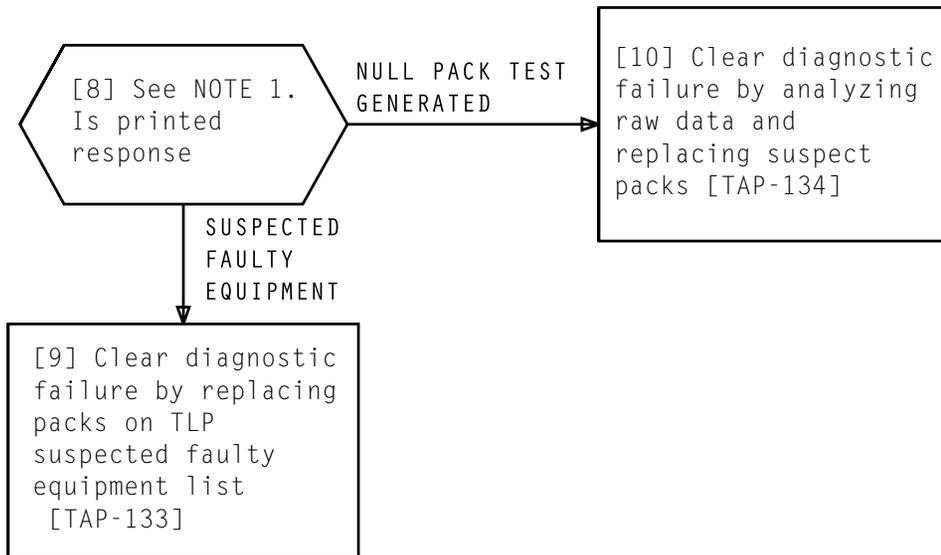
CLEAR DIAGNOSTIC FAILURE, TLP TAPE VERSION X DOES NOT MATCH VERSION Y

NOTE 1 It may take several minutes for list to be printed. Status of file may be monitored by typing OP:TLPQUEUE;ALL! TLP file currently being processed is indicated by asterisk in priority column	
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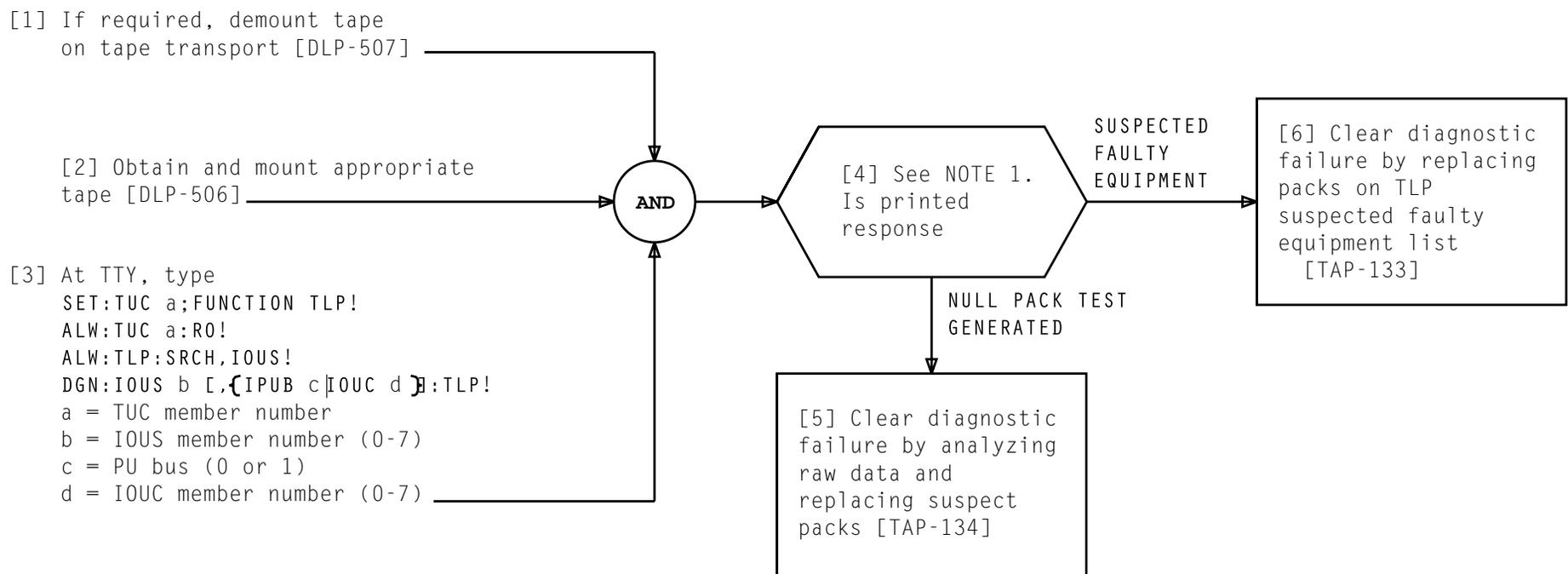


CLEAR DIAGNOSTIC FAILURE, TLP TAPE ACQUISITION ERROR

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NOTE 1	
It may take several minutes for list to be printed. Status of file may be monitored by typing OP:TLPQUEUE;ALL! TLP file currently being processed is indicated by asterisk in priority column	
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NOTE 1
It may take several minutes for list to be printed. Status of file may be monitored by typing
OP:TLPQUEUE;ALL!
TLP file currently being processed is indicated by asterisk in priority column

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CLEAR DIAGNOSTIC FAILURE, TLP TAPE NOT MOUNTED

[1] See NOTE 1.

Notify users that channels are to be removed from service

[2] At TTY, type

RMV:IOUS a[,{IPUB b|IOUC c}]!

a = IOUS member number (0-7)

b = PU bus (0 or 1)

c = IOUC member number (0-7)

[3] Identify most suspect circuit pack on TLP list

[4] Replace circuit pack [DLP-502]

[5] Type

DGN:IOUS a[,{IPUB b|IOUC c}]:TLP!

a = IOUS member number (0-7)

b = PU bus (0 or 1)

c = IOUC member number (0-7)

AND

[6] Is diagnostic result

STF

Page 2

ATP/
CATP

[7] Type

DGN:IOUS a[,{IPUB b|IOUC c}]!

a = IOUS member number (0-7)

b = PU bus (0 or 1)

c = IOUC member number (0-7)

NOTE 1

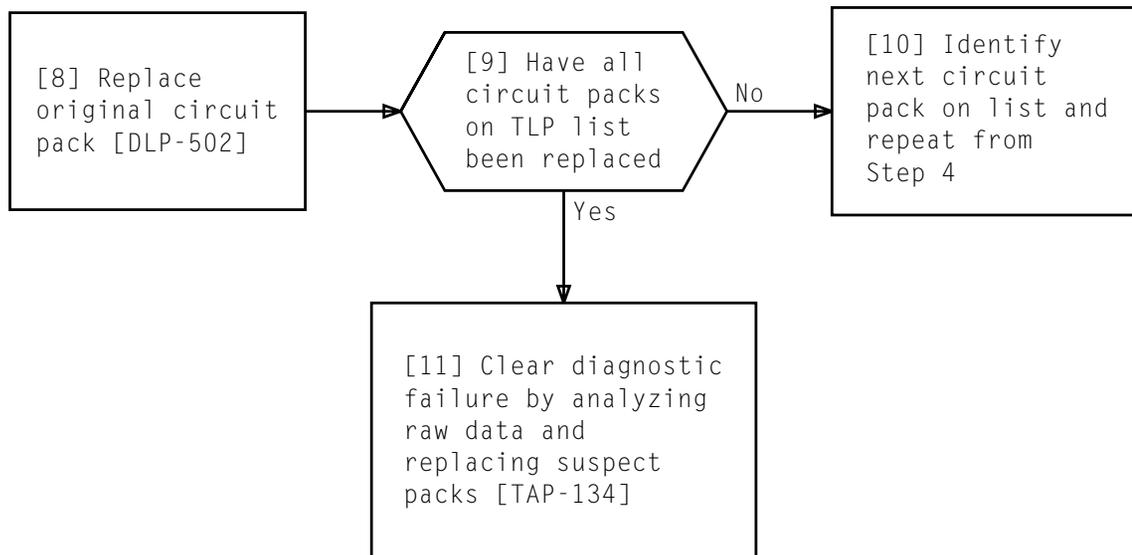
Input/Output (IO) channel assignments for IO frame 0 are listed in TABLE D of office record drawing T-XXXX-3880. IO channel assignments for other IO frames are listed in office record drawing T-XXXX-3800

CLEAR DIAGNOSTIC FAILURE BY REPLACING PACKS ON TLP SUSPECTED FAULTY EQUIPMENT LIST

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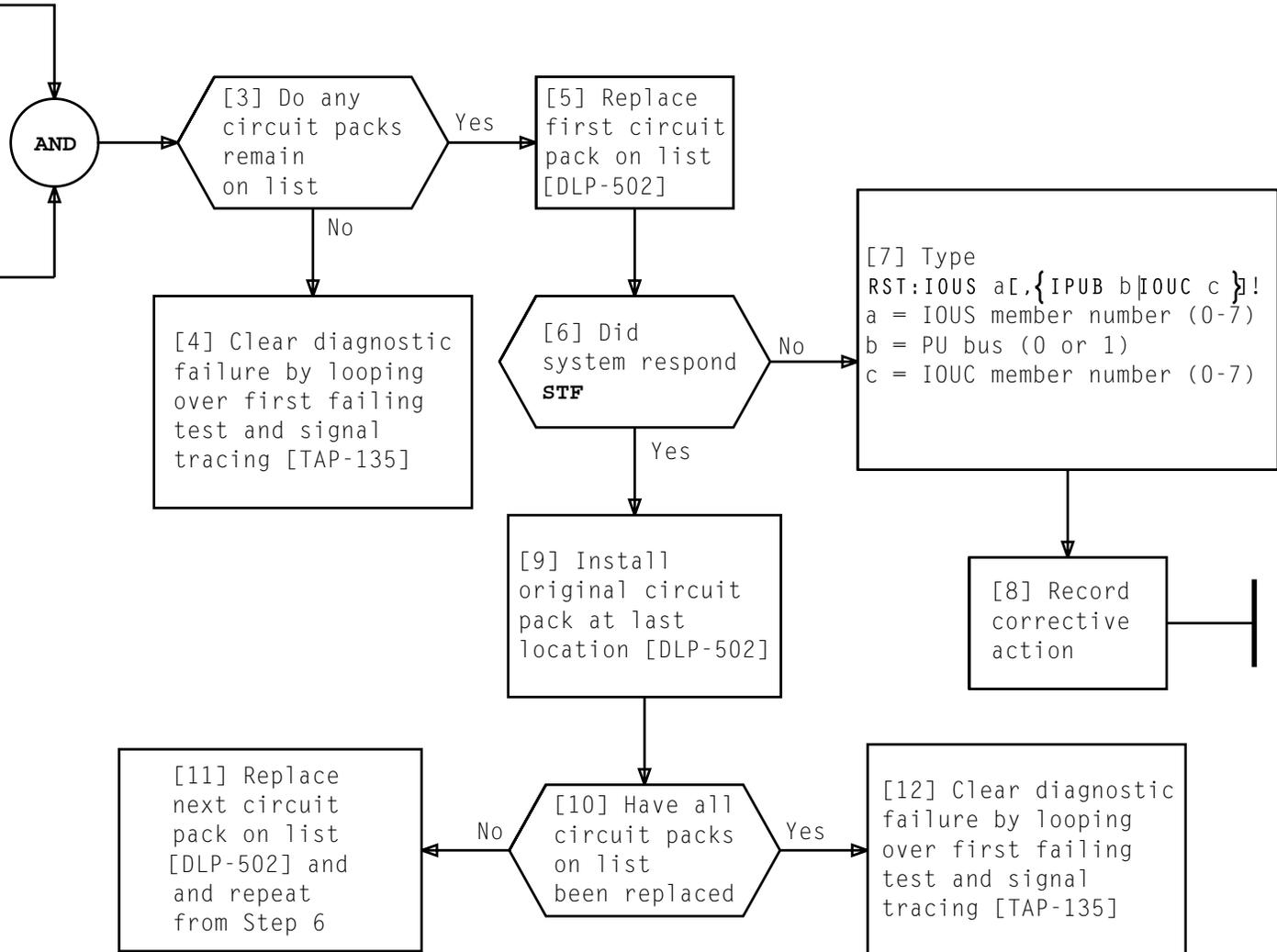


CLEAR DIAGNOSTIC FAILURE BY REPLACING PACKS ON TLP SUSPECTED FAULTY EQUIPMENT LIST

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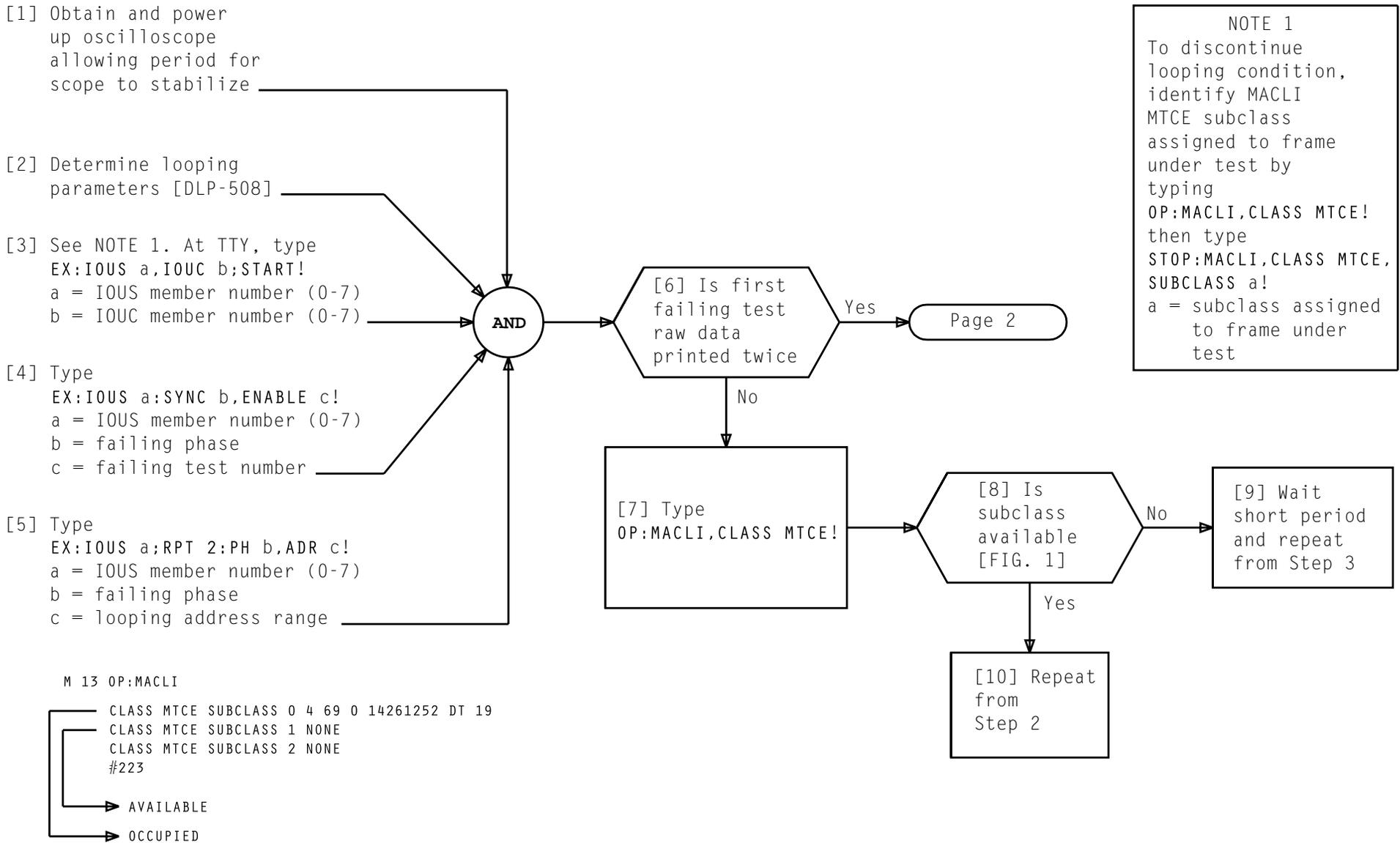
[1] Identify list of circuit packs and locations using diagnostic information [DLP-504]

[2] Delete circuit packs from list which have previously been replaced



CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS

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**FIG. 1 - Example of Output Message
Showing Status of MACLI
CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER FIRST FAILING TEST
AND SIGNAL TRACING**

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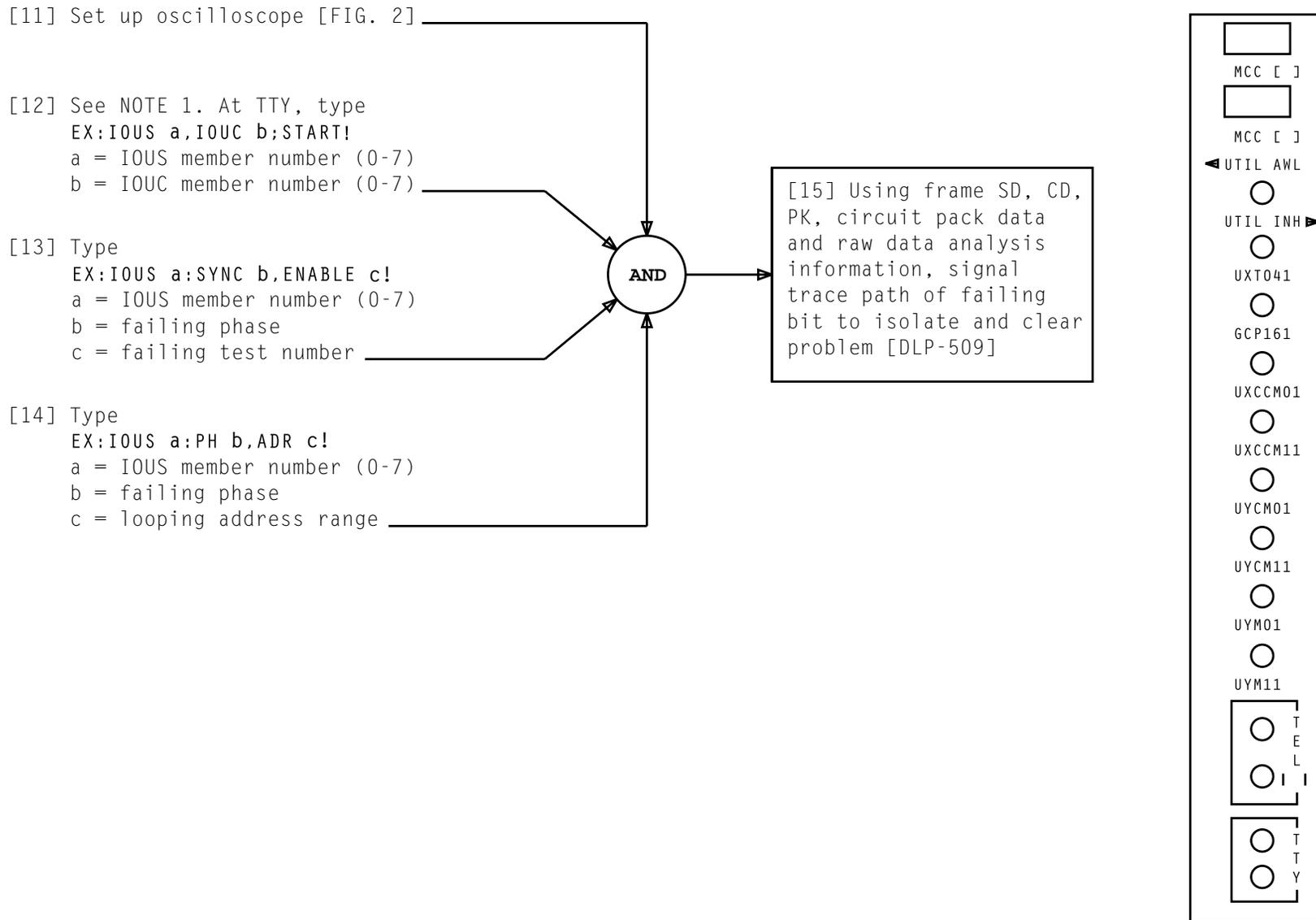
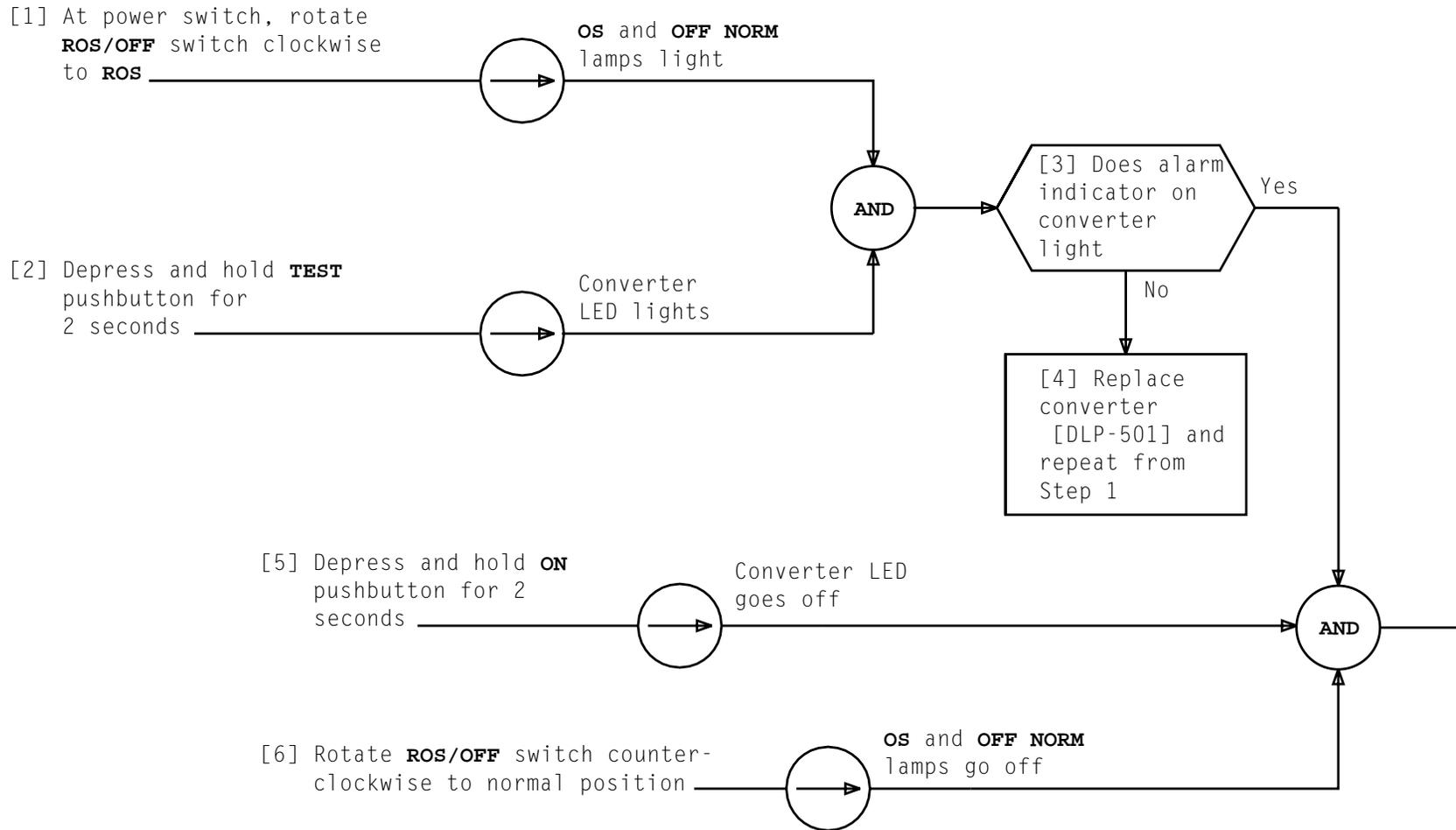


FIG. 2 - Sample Layout of MCC Terminal Connectors

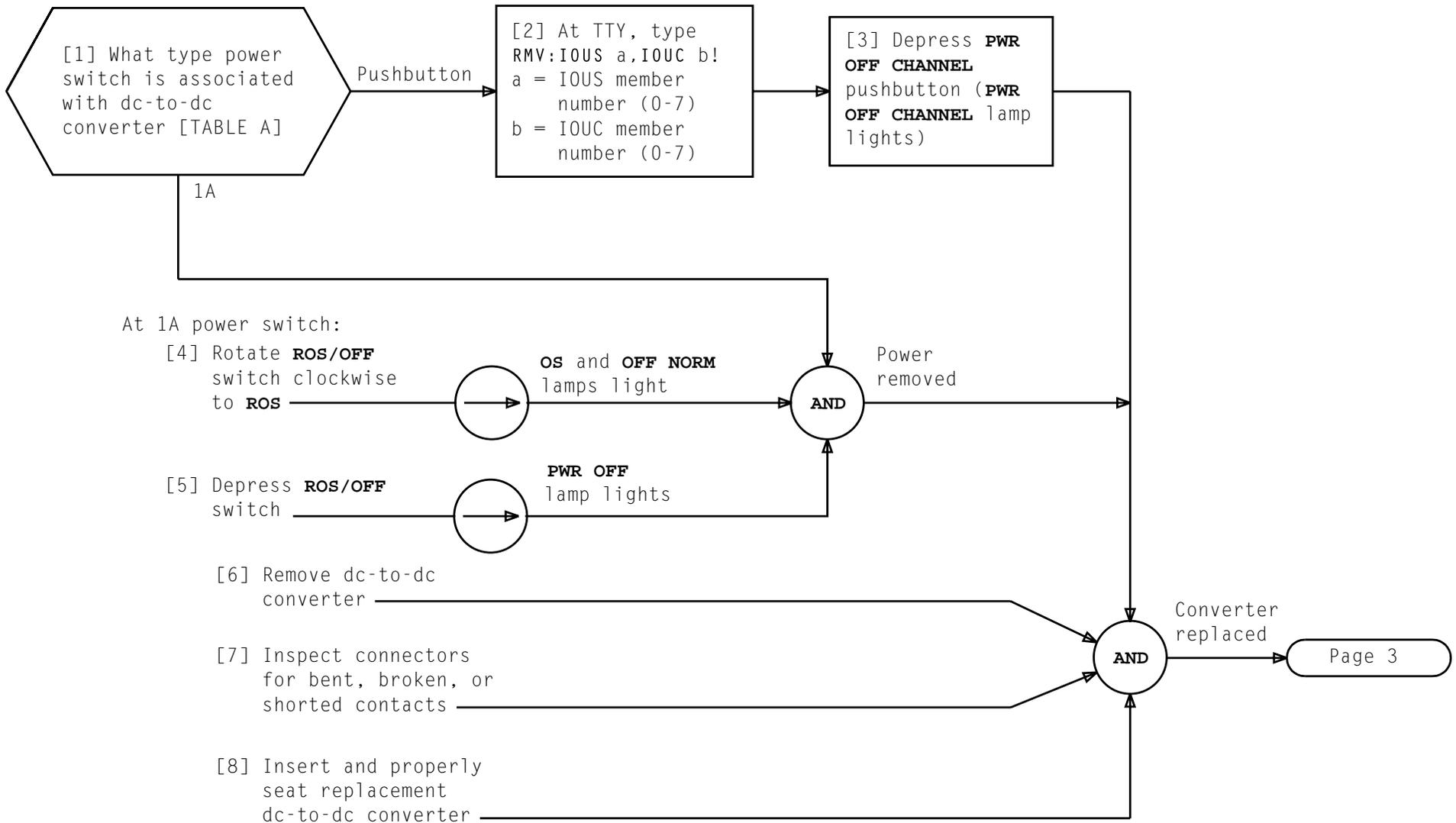
CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER FIRST FAILING TEST AND SIGNAL TRACING

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PERFORM MANUAL POWER ALARM TEST (SD-5A021-01)

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REPLACE DC-TO-DC CONVERTER

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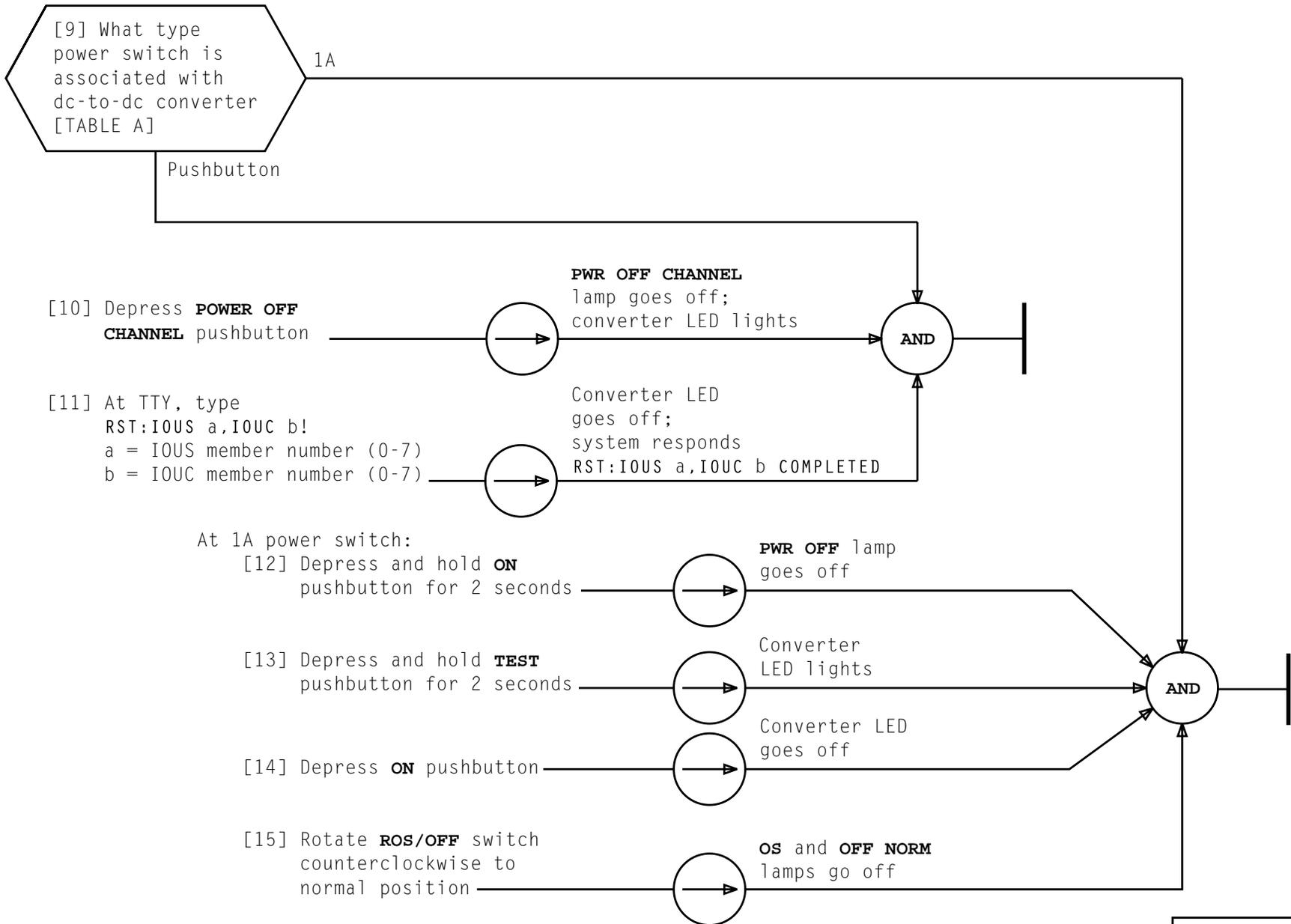
TABLE A

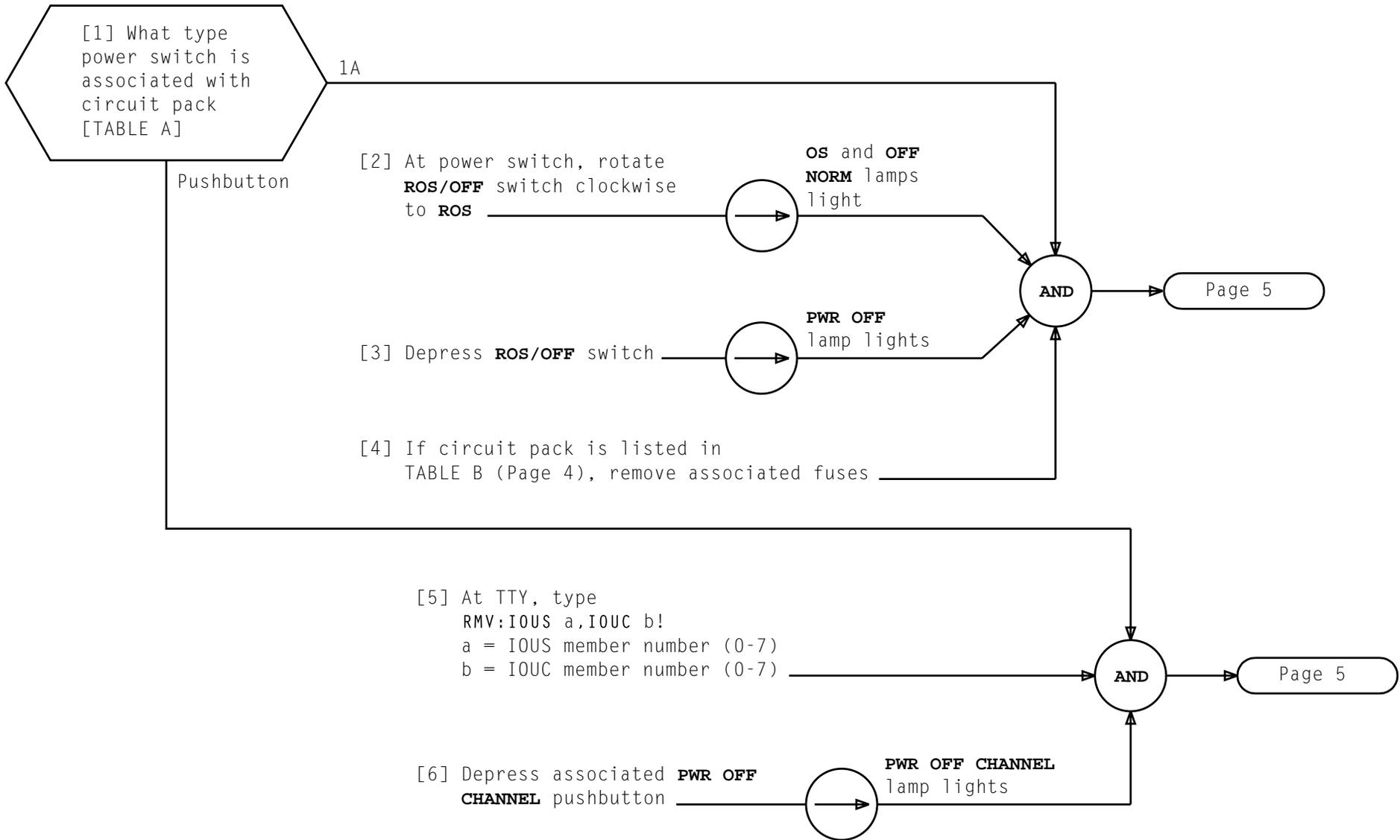
DC-TO-DC CONVERTER LOCATION (VERT-HOR)	POWER SWITCH			DC-TO-DC CONVERTER LOCATION (VERT-HOR)	POWER SWITCH		
	LOCATION (VERT-HOR)	TYPE	NAME		LOCATION (VERT-HOR)	TYPE	NAME
76-17	76-02	1A	IPUB 0	60-02	60-42	1A	IOUS 0*
76-28	76-42	1A	IPUB 1	36-03	39-05	Pushbutton	PWR OFF CHANNEL 0
64-03	67-05	Pushbutton	PWR OFF CHANNEL 0	36-07	39-09	Pushbutton	PWR OFF CHANNEL 1
64-07	67-09	Pushbutton	PWR OFF CHANNEL 1	36-11	39-13	Pushbutton	PWR OFF CHANNEL 2
64-11	67-13	Pushbutton	PWR OFF CHANNEL 2	36-18	39-20	Pushbutton	PWR OFF CHANNEL 3
64-18	67-20	Pushbutton	PWR OFF CHANNEL 3	36-22	39-24	Pushbutton	PWR OFF CHANNEL 4
64-22	67-24	Pushbutton	PWR OFF CHANNEL 4	36-26	39-28	Pushbutton	PWR OFF CHANNEL 5
64-26	67-28	Pushbutton	PWR OFF CHANNEL 5	36-33	39-35	Pushbutton	PWR OFF CHANNEL 6
64-33	67-35	Pushbutton	PWR OFF CHANNEL 6	36-37	39-39	Pushbutton	PWR OFF CHANNEL 7
64-37	67-39	Pushbutton	PWR OFF CHANNEL 7	32-02, 06, 10, 17	32-42	1A	IOUS 1*

* IOUS units are numbered starting with 0. Some offices may have more than one I/O frame.

REPLACE DC-TO-DC CONVERTER

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REPLACE CIRCUIT PACK

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TABLE A			
POWER SWITCHES			
CIRCUIT PACK LOCATION	POWER SWITCH		
	TYPE	LOCATION	NAME
80-2...80-20	1A	76-2	IPUB 0
80-25...80-41	1A	76-42	IPUB 1
76-21	1A	76-2	IPUB 0
76-26	1A	76-42	IPUB 1
72-16...72-19	Pushbutton	67-09...67-24	PWR OFF CHANNEL 1,2,3,4
72-20...72-22	Pushbutton	67-28...67-38	PWR OFF CHANNEL 5,6,7
72-23...72-26	Pushbutton	39-09...39-24	PWR OFF CHANNEL 1,2,3,4
72-27...72-29	Pushbutton	39-28...39-38	PWR OFF CHANNEL 5,6,7
60-14...64-44	1A	60-42	IOUS (even*)
56-1...56-14	Pushbutton	67-5	PWR OFF CHANNEL 0
56-16	1A	60-42	IOUS (even*)
56-17...56-26	Pushbutton	67-20	PWR OFF CHANNEL 3
56-31...56-44	Pushbutton	67-28	PWR OFF CHANNEL 5
52-1...52-11	Pushbutton	67-9	PWR OFF CHANNEL 1
52-12...52-33	1A	60-42	IOUS (even*)
52-34...52-44	Pushbutton	67-35	PWR OFF CHANNEL 6
48-1...48-14	Pushbutton	67-13	PWR OFF CHANNEL 2
48-16	1A Power	60-42	IOUS (even*)

(Continued on Next Page)

REPLACE CIRCUIT PACK

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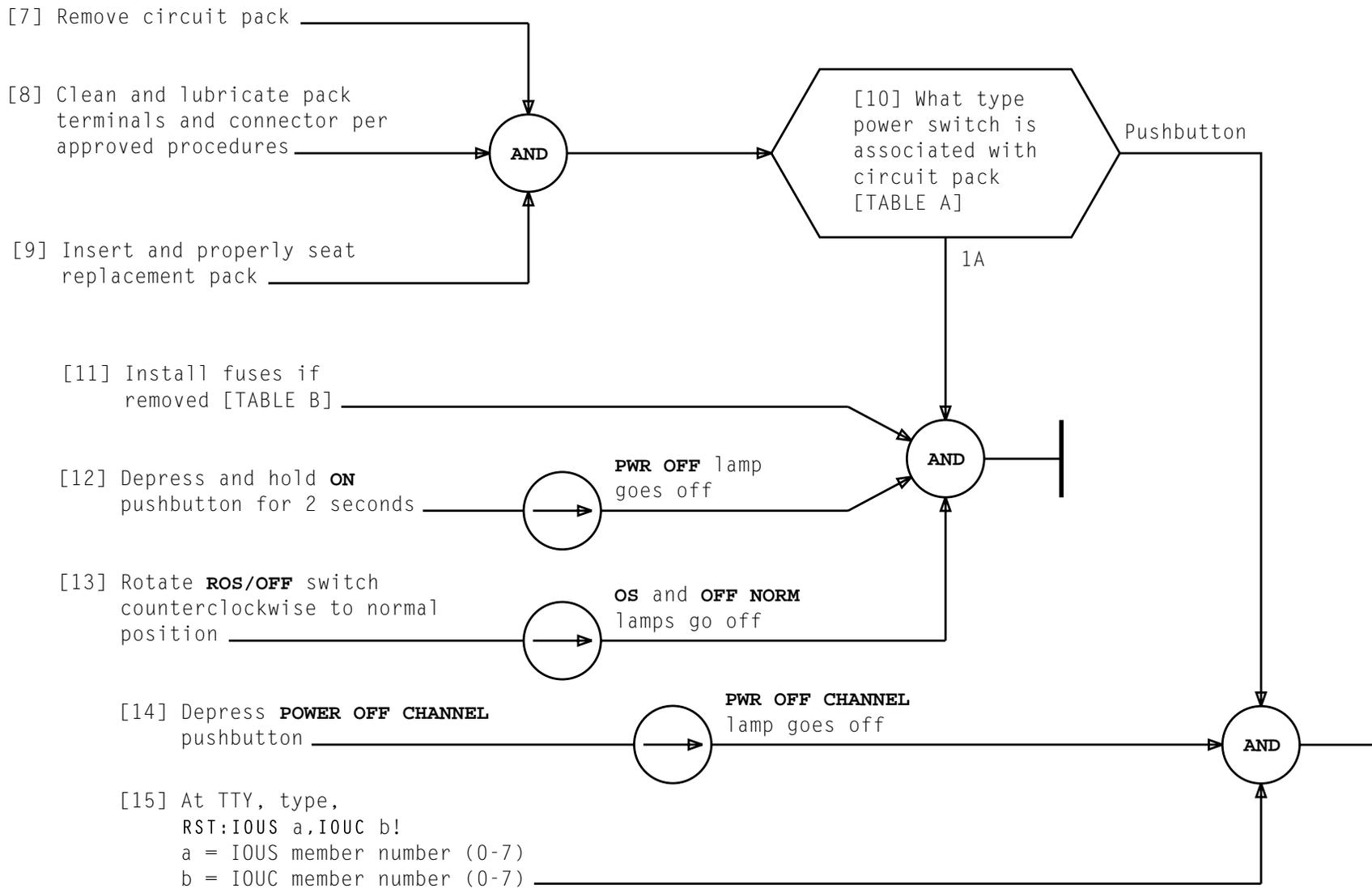
TABLE A (Contd)			
POWER SWITCHES			
CIRCUIT PACK LOCATION	POWER SWITCH		
	TYPE	LOCATION	NAME
48-17...48-26	Pushbutton	67-24	PWR OFF CHANNEL 4
48-31...48-44	Pushbutton	67-39	PWR OFF CHANNEL 7
32-14...36-44	1A	32-42	IOUS (odd*)
28-1...28-14	Pushbutton	39-5	PWR OFF CHANNEL 0
38-16	1A	32-42	IOUS (odd*)
28-17...28-26	Pushbutton	39-20	PWR OFF CHANNEL 3
28-31...28-44	Pushbutton	39-28	PWR OFF CHANNEL 5
24-1...24-11	Pushbutton	39-9	PWR OFF CHANNEL 1
24-12...24-33	1A	32-42	IOUS (odd*)
24-34...24-44	Pushbutton	39-35	PWR OFF CHANNEL 6
20-1...20-14	Pushbutton	39-13	PWR OFF CHANNEL 2
20-16	1A	32-42	IOUS (odd*)
20-17...20-26	Pushbutton	39-24	PWR OFF CHANNEL 4
20-31...20-44	Pushbutton	39-39	PWR OFF CHANNEL 7

* An office may have four I/O frames, each containing two IOUS units.
Therefore the total number of IOUS can be 8, numbered 0-7.

TABLE B		
FUSES		
CIRCUIT PACK LOCATION	FUSE	
	LOCATION	NAME
80-20	76-6	+24V-A0 , +24V-C0
80-25	76-39	+24V-A1 , +24V-C1
76-21	76-6	+24V-A0
76-26	76-39	+24V-A1
72-16...72-19	76-6	48B0
72-20...72-22	76-6	48C0
72-23...72-26	76-39	48B1
72-27...72-29	76-39	48C1
64-42,64-44	59-33	+24V-C , +24V-D
60-14	59-33	+24V-C
60-28,60-29	59-33	+24V-D
36-42,36-44	31-33	+24V-C , +24V-D
32-14	31-33	+24V-C
32-28,32-29	31-33	+24V-D

REPLACE CIRCUIT PACK

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REPLACE CIRCUIT PACK

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[1] At TTY, type
 RMV:IOUS a,IPUB b!
 a = IOUS member number (0-7)
 b = PU bus (0 or 1)

System responds
 RMV:IOUS a,IPUB b COMPLETED

[2] At power switch, rotate **ROS/OFF**
 switch clockwise to **ROS**

OS and **OFF NORM** lamps light

[3] Depress **ROS/OFF** switch

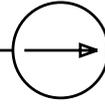
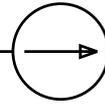
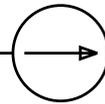
PWR OFF
 lamp lights

[4] Remove power switch fuses [TABLE A]

[5] Cover apparatus below switch with drop cloth

[6] See NOTE 1. Tag and remove frame wiring from
 switch terminals

[7] Remove four mounting screws and
 withdraw switch from front of frame



Defective
 switch
 removed

Page 2

NOTE 1	
Do not remove surface wiring on switch terminals. It will be used as guide to surface wire replacement switch	
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REPLACE POWER SWITCH

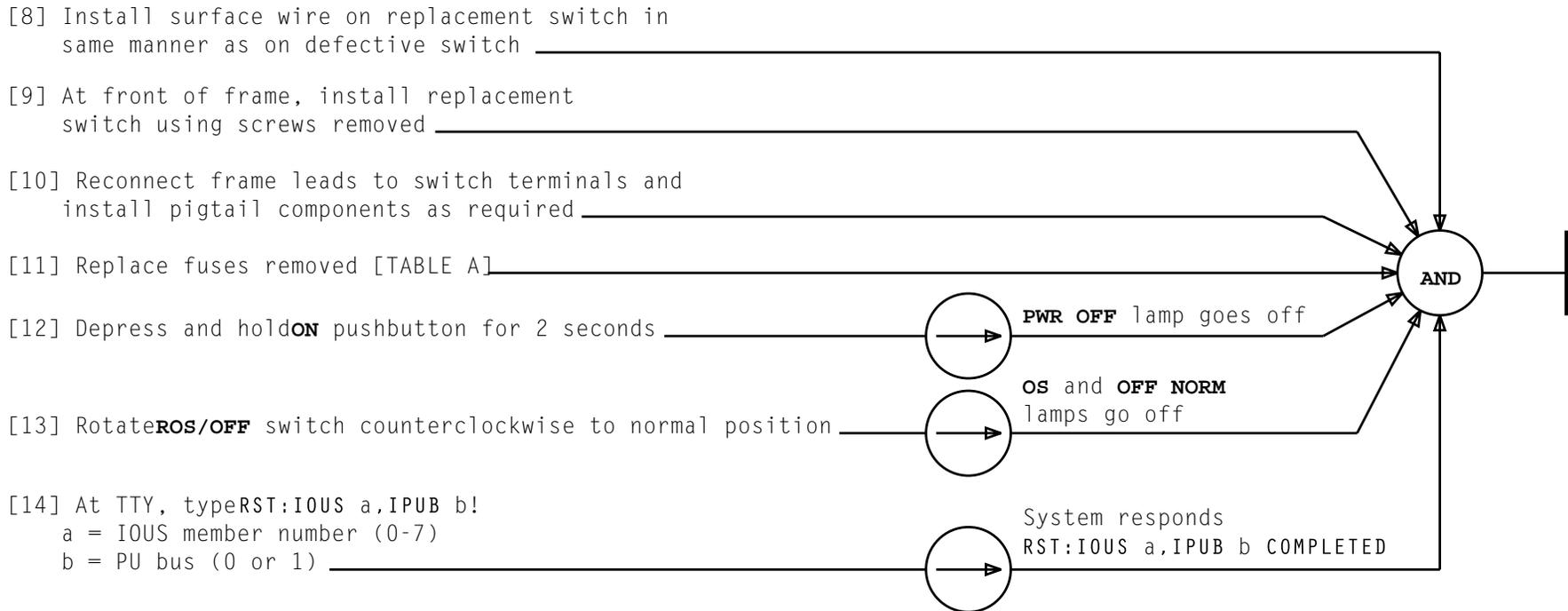


TABLE A		
SWITCH LOCATION	FUSE	
	BLOCK LOCATION	NAME
77-04	76-08	+24A0, +24B0
77-44	76-40	+24A1, +24B1
60-44	60-36	24A, 24B
32-44	32-36	24A, 24B

REPLACE POWER SWITCH

[1] Identify first failing phase on diagnostic printout [FIG. 1]

[2] Identify and obtain PR for first failing phase [TABLE A]

[3] Within PR, locate first failing test indicated on diagnostic printout [FIG. 1]

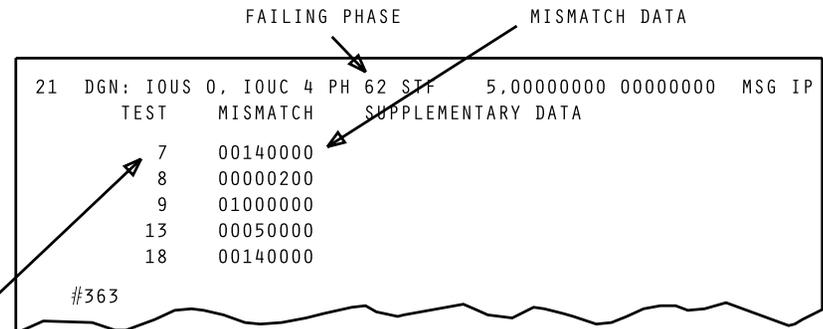
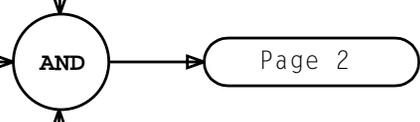


FIG. 1 - Sample Diagnostic Printout

TABLE A					
PHASE	PR NO.	PHASE	PR NO.	PHASE	PR NO.
00	5A635	34	5A647	71	5A658
01	5A636	41	5A648	72	5A659
12	5A637	42	5A649	73	5A660
13	5A638	44	5A650	74	5A661
14	5A639	51	5A651	81	5A662
15	5A640	53	5A652	82	5A663
22	5A641	54	5A742	83	5A664
23	5A642	61	5A653	84	5A743
24	5A643	62	5A654	95	5A749
25	5A644	63	5A655	99	5A669
31	5A645	64	5A656		
32	5A646	65	5A657		

IDENTIFY CIRCUIT PACKS AND LOCATIONS USING DIAGNOSTIC INFORMATION

[4] Using PR data, determine **MODE** and **ADDRESS** [FIG. 2]

[5] Locate **MISMATCH** data on diagnostic printout [FIG. 1]

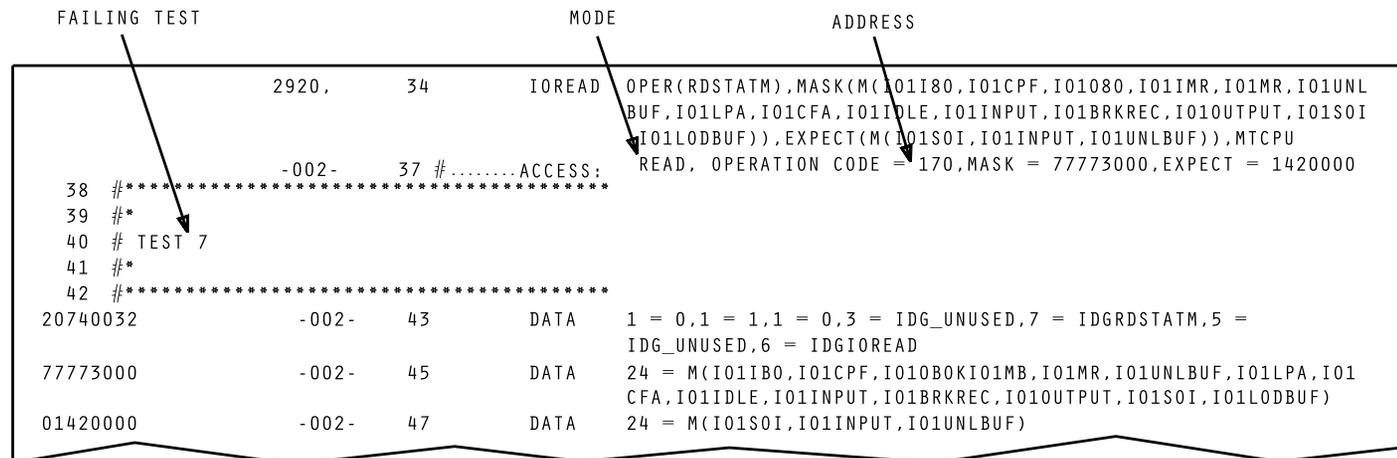
[6] Convert **MISMATCH** data to binary and determine failing bit (1 = failing bit)

[7] Obtain PK-5A021 and locate desired page using **MODE** and **ADDRESS** previously determined (upper left-hand corner) [FIG. 3]

[8] Using PK-5A021, identify SD, FS, and symbol using failing bit identified [FIG. 3]

[9] Using SD, convert FS and symbol to circuit pack

[10] Identify and record circuit packs that supply inputs to and receive outputs from circuit pack



FAILING TEST	MODE	ADDRESS
2920,	34	IOREAD
38 #*****	-002-	37 #.....ACCESS;
39 #*		
40 # TEST 7		
41 #*		
42 #*****		
20740032	-002-	43 DATA
77773000	-002-	45 DATA
01420000	-002-	47 DATA

FIG. 2 - Sample PR Data

IDENTIFY CIRCUIT PACKS AND LOCATIONS USING DIAGNOSTIC INFORMATION

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MODE AND ADDRESS: MODE=READ ADDRESS=170

IOUS AND IOUC STATUS REGISTER

22:15:39
07/23/76

COMPOOL MNEMONIC = ROSTATM
SD5A021-01
GATEOUT ENABLE = STE080

SD FS AND SYMBOL

BITS

BIT	OP	FUNCTION NAME	COMPOOL ALIAS	SD	FS/SYM	LEAD DESIG	CPS REG/GATE NAME	DESCRIPTION	NOTE
00		MAS		21	1/1	MASIO	MAS(B)	OVERALL IOUS MAINTENANCE	
01		RO		21	1/1	ROO	RO(B)	SPECIFIES RECEIVE BUS	
02		S0		21	1/1	S01	SND(B)	REPLY ON BUS 0	
03		S1		21	1/1	S11	SND(A)	REPLY ON BUS 1	
04								UNUSED RESPONSE	
05								UNUSED RESPONSE	
06								UNUSED RESPONSE	
07								UNUSED RESPONSE	
08								UNUSED RESPONSE	
09		CFA		21	2/4	CFAAO	CFA	CARRIER FAILURE ALARM	
10		LPA		21	2/4	LPAAO	LPA	LOW PAPER ALARM	
11		MA		21	2/5	BOBA	RC13(B)	INDIVIDUAL CHANNEL (IOUC) MAINTENANCE	
12		IDLE		21	2/5	IDLEAO	IDL	IDLE STATE	
13		INPUT		21	2/5	INPUTAO	INP	INPUT STATE	
14		OUTPUT		21	2/5	OUTPUTAO	OUT	OUTPUT STATE	
15		BRKREC		21	2/5	BRCGIOA	BRC(A)	BREAK RECEIVE STATE	
16		LOGBUF		21	2/5	A1BA	RC67A1B	LOAD BUFFER (ALMOST EMPTY)	
17		UNLBUF		21	2/5	B1BA	RC67B1B	UNLOAD BUFFER (ALMOST FULL)	
18		SCI		21	2/5	AOBA	RC45A0B	START OF INPUT MESSAGE	
19		MR		21	2/4	MROAO	P67(A)	MAINTENANCE REQUEST	
20		IMR		21	2/5	IMRAO	IMRO	INHIBIT MAINTENANCE REQUEST	
21		OBO		21	2/5	ST05AO	RC23(B)	OUTPUT BUFFER OVERFLOW	
22		CPF		21	2/5	ST06AO	RC01(A)	CHARACTER PARITY FAILURE	
23		IBO		21	2/5	ST07AO	RC01(B)	INPUT BUFFER OVERFLOW	

NOTE(S):
1. MAINT. READ

MODE=READ ADDRESS=170

INPUT/OUTPUT TEST ACCESS

ISSUE 1 PK-5A021-01-C6

IDENTIFY CIRCUIT PACKS AND LOCATIONS USING DIAGNOSTIC INFORMATION

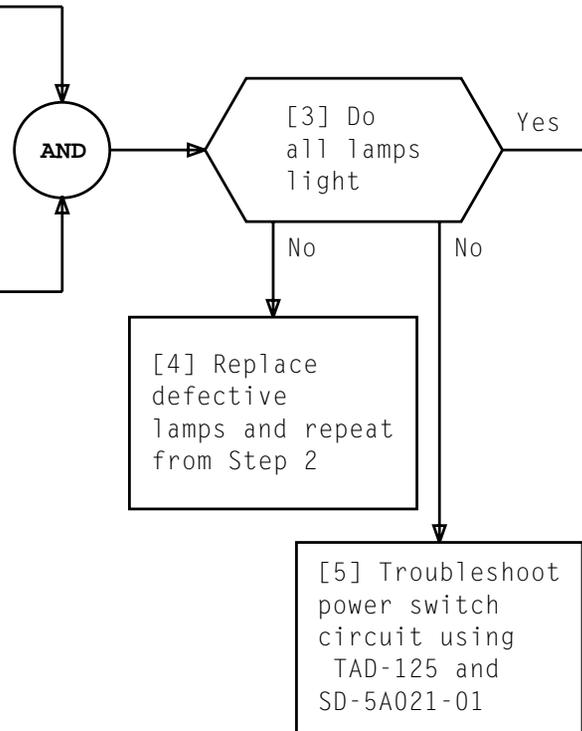
FIG. 3 - Sample Test Access Document (PK) Format

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At power switch:

[1] Ensure **ROS/OFF** switch is rotated counterclockwise to normal position

[2] Depress and hold **TEST** pushbutton while observing lamps



TEST POWER SWITCH LAMPS

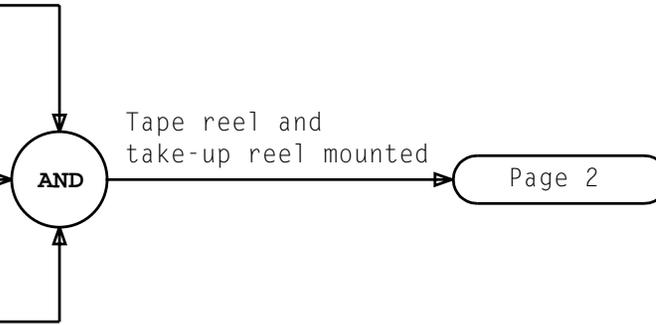
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At tape transport:

[1] Verify interlock switch plunger is in out position; **LOCAL/REMOTE** switch is in **LOCAL** lighted condition, and lower (take-up) reel is same size or larger than tape reel to be mounted

[2] With hub (knob) of upper reel holder in counterclockwise position, mount reel with tape on reel holder

[3] Rotate hub (knob) of upper reel holder clockwise to lock tape reel securely



[4] See WARNING 1. While depressing **BRAKE RELEASE** pushbutton, manually unwind approximately 5 feet of tape and release **BRAKE RELEASE** pushbutton

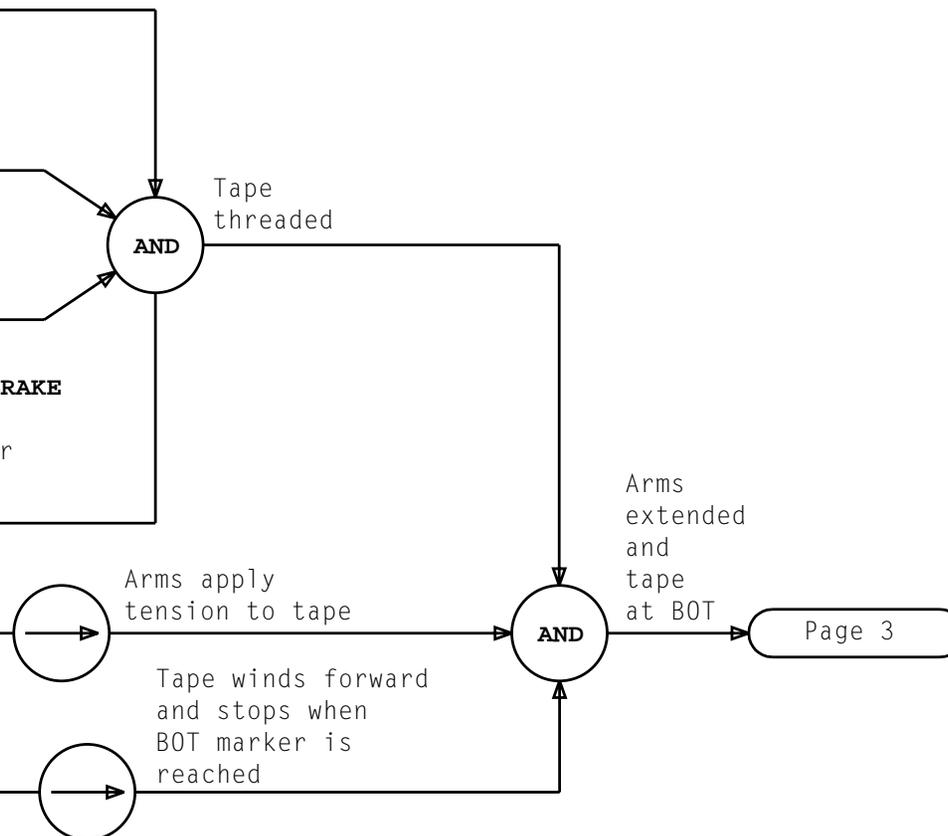
[5] See WARNING 2. Thread tape through tape path indicated on tape transport

[6] See NOTE 1. Start tape end on lower (take-up) reel making sure tape is not twisted

[7] See WARNING 3. While depressing **BRAKE RELEASE** pushbutton, manually wind lower (take-up) reel three or four turns and release **BRAKE RELEASE** pushbutton

[8] Depress **ARMS NORMAL** pushbutton

[9] See NOTE 2. Depress **FORWARD** pushbutton



NOTES

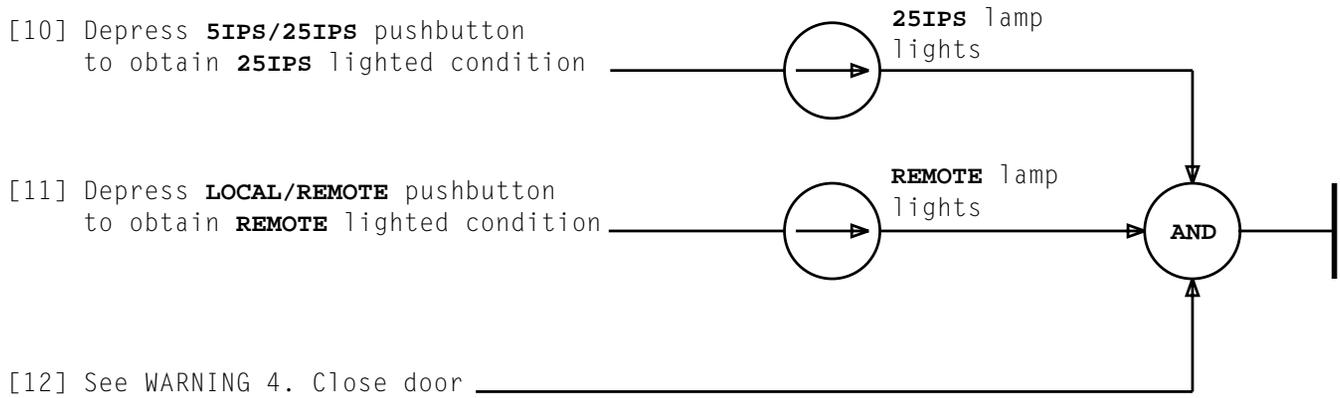
1. To start tape on take-up reel, it may help to moisten tape end (moistened fingers) and stick it to reel axle
2. Tape may not stop at BOT marker if fast forward is depressed

WARNINGS

1. Contamination of tape by contact with floor will damage tape heads
2. Do not touch tape head surfaces; body oils will contaminate tape
3. If tape is not properly aligned along rollers and guides, or is too loose, tape may be damaged

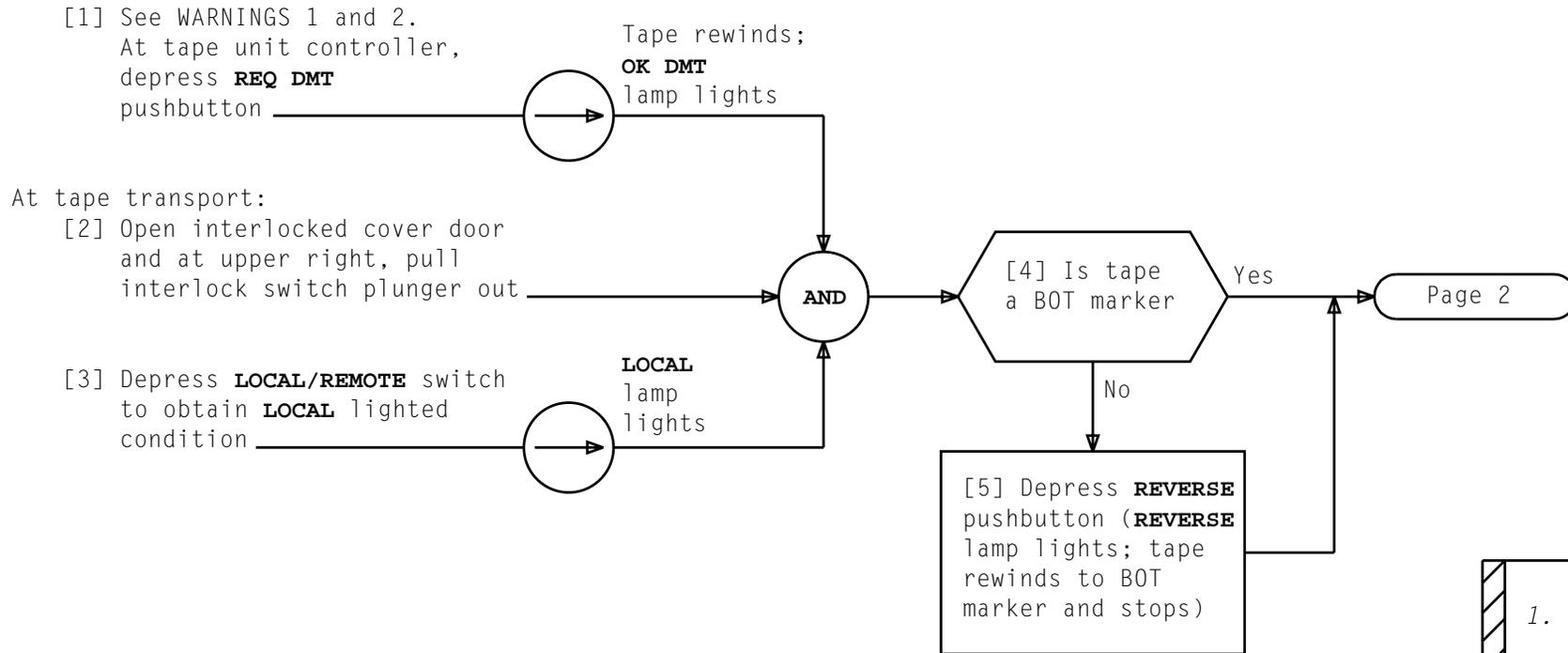
MOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT

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MOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT

<i>WARNING 4</i> <i>Closing tape transport door in harsh manner may upset alignment</i>	
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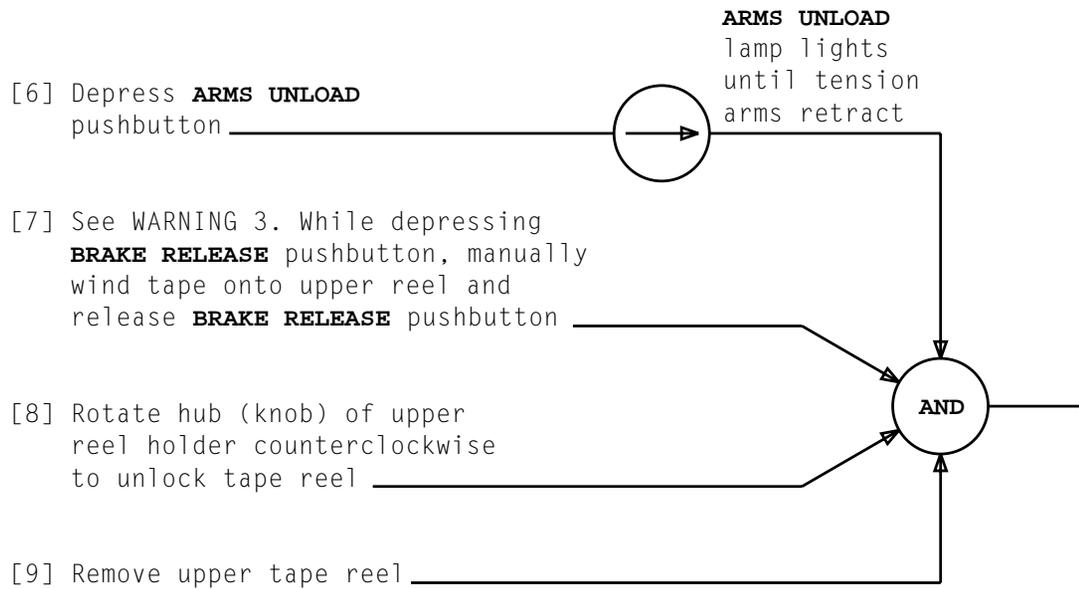


WARNINGS

1. Cycling tape transport or tape unit controller with tape over read/write heads may garbage tape
2. If tape is being demounted due to a faulty tape unit, the proper tape unit maintenance documentation should be used

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DEMOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT



<i>WARNING 3 Pulling or dragging last 2 feet of tape across heads may contaminate heads</i>	
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DEMOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT

1. Obtain PR for failing phase [TABLE A]
 2. Locate test number index page near end of PR [FIG. 1]
 3. Locate first failing test on test index page
 4. After failing test, locate and record location (LOC)
 5. After failing test, locate and record looping address (ADR)
- End of procedure

TABLE A							
PHASE	PR NO.	PHASE	PR NO.	PHASE	PR NO.	PHASE	PR NO.
0	5A635	25	5A644	54	5A742	74	5A661
1	5A636	31	5A645	61	5A653	81	5A662
12	5A637	32	5A646	62	5A654	82	5A663
13	5A638	34	5A647	63	5A655	83	5A664
14	5A639	41	5A648	64	5A656	84	5A743
15	5A640	42	5A649	65	5A657	95	5A749
22	5A641	44	5A650	71	5A658	99	5A669
23	5A642	51	5A651	72	5A659		
24	5A643	53	5A652	73	5A660		

DETERMINE LOOPING PARAMETERS

```

                                FAILING TEST
                                10DG83 18 01
-002- 01 # *****#
-002- 02 # *****#
-002- 03 #          DATA TABLE TEST LOCATION AND SEGMENT LOOP ADDRESS INDEX          #
-002- 04 # *****#
-002- 05 # *****#
-002- 06 # *****#
-002- 07 # TEST   LOC   LOOPING ADR   TEST   LOC   LOOPING ADR   TEST   LOC   LOOPING ADR   #
-002- 08 #          #          #          #          #          #          #          #          #          #
-002- 09 #          #          #          #          #          #          #          #          #          #
-002- 10 #          #          #          #          #          #          #          #          #          #
-002- 11 #          #          #          #          #          #          #          #          #          #
-002- 12 #          #          #          #          #          #          #          #          #          #
-002- 13 #          #          #          #          #          #          #          #          #          #
-002- 14 #          #          #          #          #          #          #          #          #          #
-002- 15 #          #          #          #          #          #          #          #          #          #
-002- 18 #          * - LOOP CONTAINS A CONDITIONAL DT JUMP AND MAY BE SENSITIVE TO RUN TIME VARIABLES

```

FAILING PHASE
 LOOPING ADDRESS
 LOC (LOCATION)

FIG. 1 - Sample PR Data

On Summary Data Printout [FIG. 1]:

1. Note monitor point address on first CD line under **v1** column
2. Convert octal failing bit in leftmost four octal digits of word under adjacent **v2** column to decimal

NOTE: In Test Access PK Document: Negative addresses eg, 77771510 precede positive addresses in PK. If address is not found, other addresses and bits may be investigated using other V column pairs (first CD line or other CD lines). The PK data for these addresses will be further removed from fault and PR data may be of greater value

3. Locate address and failing bit
4. Note pack type and gate name for failing bit

In CPS for Pack Type:

5. Locate component list section

NOTE: If A or B appears after gate name in test access PK, it indicates A or B half of register (gate)

6. Under column heading **DESIG**, locate gate name
7. In adjacent **SH LOC** column, use location indicated to locate gate in CPS
8. At gate, note lead name and terminal leaving gate to outside pack [FIG. 2]

In Test Access PK Document:

9. For failing bit, note FS, SD, and symbol name

In SD FS indicated:

10. Locate symbol number having same symbol name as indicated in Test Access PK for failing bit
 11. Locate lead interconnection section for this symbol
 12. Using terminal and lead name noted, locate corresponding SD lead name
- End of procedure

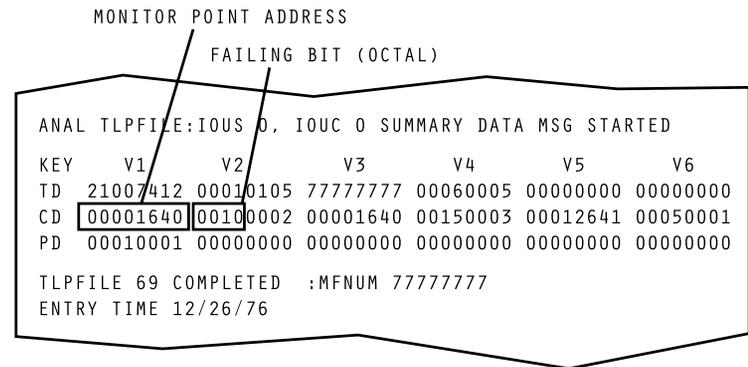


FIG. 1 - Example of Summary Data Printout

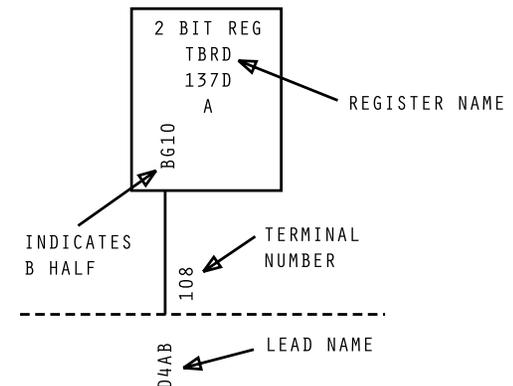


FIG. 2 - Example of Lead Leaving B Half of CPS Register

SIGNAL TRACE PATH OF FAILING BIT USING SUMMARY DATA PRINTOUT AND TEST ACCESS PK DOCUMENT

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ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE
• TPG-000 • IXL-001 • NTP-002 • NTP-003 • NTP-004		• TAP-130 • TAP-131 • TAP-132 • TAP-133 • TAP-134									
• TAD-100 • ISD-101 • TAP-102 • ISD-103 • TAP-104		• TAP-135 • DLP-500 • DLP-501 • DLP-502 • DLP-503									
• ISD-105 • TAP-106 • ISD-107 • TAP-108 • ISD-109		• DLP-504 • DLP-505 • DLP-506 • DLP-507 • DLP-508									
• TAP-110 • ISD-111 • TAP-112 • ISD-113 • TAP-114		• DLP-509 • CKL-891 • TNG-893 • DPL-895									
• ISD-115 • TAP-116 • ISD-117 • TAP-118 • ISD-119											
• TAP-120 • ISD-121 • TAP-122 • TAP-123 • TAP-124											
• TAD-125 • TAP-126 • TAP-127 • TAP-128 • TAP-129											

CHECKLIST