

Task Oriented Practice
(TOP)

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TERMINAL INTERFACE EQUIPMENT

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Developed by
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FIND YOUR JOB IN THE LIST BELOW THEN GO TO

Acceptance NTP-002

Automatic Power Monitor Failure – Clear TAP-133

Blown Fuse (Circuit Pack Associated) – Control Frame – Clear TAP-118

Blown Fuse (Converter Associated) – Control Frame – Clear TAP-119

Blown Fuse (Converter Associated) – Supplementary Matrix Frame – Clear TAP-125

Blown Fuse (**FB230/FB228** Associated) – Supplementary Matrix Frame – Clear TAP-123

Blown Fuse (J87407A Converter/**FC78** Associated) – Supplementary Matrix Frame – Clear TAP-132

Blown Fuse (Power Switch Associated) – Control Frame – Clear TAP-126

Blown ST Fuse – Supplementary Matrix Frame – Clear TAP-128

Circuit Pack – Control Frame – Replace NTP-005

Circuit Pack – Supplementary Matrix Frame – Replace NTP-006

Diagnostic Failure – Clear Replacing Circuit Packs TAP-103

Diagnostic Failure – TLP Abort – Clear TAP-109

Diagnostic Failure – TLP Disk Queue Full – Clear TAP-106

Diagnostic Failure – TLP Inhibit – Clear TAP-108

Diagnostic Failure – TLP Queue Blockage – Clear TAP-107

Diagnostic Failure – TLP Tape Acquisition Error – Clear TAP-111

Diagnostic Failure – TLP Tape Not Mounted – Clear TAP-112

Diagnostic Failure – TLP Tape Version X Does Not Match Expected Version Y – Clear TAP-110

Faulty Matrix Point – Clear TAP-134

F-Level Interrupt – Analyze AT&T 234-151-003 (with 1A Processor) or AT&T 234-351-003 (with 1B Processor)

FIND YOUR JOB IN THE LIST BELOW THEN GO TO

Lamps; Power Switch – Test	DLP-516
LED Lighted – Converter – Clear	TAP-124
LED Lighted – Circuit Pack – Clear	TAP-135
Maintenance Philosophy	TAD-100
Matrix Maintenance Limit Switch – Replace	NTP-004
Power Converter – Control Frame – Replace	NTP-007
Power Converter – Supplementary Matrix Frame – Replace	NTP-008
Power Monitor Failure – Automatic – Clear	TAP-133
Power Switch Lamps – Test	DLP-516
Power Switch – Replace	NTP-003
ST Fuse; Blown – Supplementary Matrix Frame – Clear	TAP-128
TLP Abort – Diagnostic Failure – Clear	TAP-109
TLP Disk Queue Full – Diagnostic Failure – Clear	TAP-106
TLP Inhibit – Diagnostic Failure – Clear	TAP-108
TLP Queue Blockage – Diagnostic Failure – Clear	TAP-107
TLP Tape Acquisition Error – Diagnostic Failure – Clear	TAP-111
TLP Tape Not Mounted – Diagnostic Failure – Clear	TAP-112
TLP Tape Version X Does Not Match Expected Version Y – Diagnostic Failure – Clear	TAP-110
TTY Printout – DGN:SP a,{IPUB b CONTR c}:PH d STF ANALY:TLPFILE:SP a,{IPUB b CONTR c}ABORTED	TAP-109
TTY Printout – DGN:SP a,{IPUB b CONTR c}:PH d STF ANALY:TLPFILE:SP a,{IPUB b CONTR c} NULL PACK TEST GENERATED	TAP-104

FIND YOUR JOB IN THE LIST BELOW THEN GO TO

TTY Printout - DGN:SP a,{IPUB b|CONTR c}:PH d STF
 ANALY:TLPFILE:SP a,{IPUB b|CONTR c}SUMMARY DATA
 QUEUE ACCESS DENIED:DATA NOT RETAINED:CODE 0001 TAP-106

TTY Printout - DGN:SP a,{IPUB b|CONTR c}:PH d STF
 ANALY:TLPFILE:SP a,{IPUB b|CONTR c}SUMMARY DATA
 QUEUE ACCESS DENIED:DATA NOT RETAINED:CODE 0002 TAP-107

TTY Printout - DGN:SP a,{IPUB b|CONTR c}:PH d STF
 ANALY:TLPFILE:SP a,{IPUB b|CONTR c}SUMMARY DATA
 QUEUE ACCESS DENIED:DATA NOT RETAINED:CODE 0004 TAP-108

TTY Printout - DGN:SP a,{IPUB b|CONTR c}:PH d STF
 ANALY:TLPFILE:SP a,{IPUB b|CONTR c}TLP
 CURRENT TLP SEARCH ABORTED TAP-109

TTY Printout - DGN:SP a,{IPUB b|CONTR c}:PH d STF
 ANALY:TLPFILE:SP a,{IPUB b|CONTR c}
 TLP PROGRAM ABORTED TAP-109

TTY Printout - DGN:SP a,{IPUB b|CONTR c}:PH d STF
 ANALY:TLPFILE:SP a,{IPUB b|CONTR c}TLPSRCH
 SUSPECTED FAULTY EQUIPMENT
 Note Column Contains NOTE 2, 20, or 21 SEE BLOWN
 Fuse Blown FUSE ENTRIES

TTY Printout - DGN:SP a,{IPUB b|CONTR c}:PH d STF
 ANALY:TLPFILE:SP a,{IPUB b|CONTR c}TLPSRCH
 SUSPECTED FAULTY EQUIPMENT
 Note Column Contains NOTE 2, 20, or 21
 No Fuse Blown TAP-133

TTY Printout - DGN:SP a,{IPUB b|CONTR c}:PH d STF
 ANALY:TLPFILE:SP a,{IPUB b|CONTR c}TLPSRCH
 SUSPECTED FAULTY EQUIPMENT
 Note Column Does Not Contain NOTE 2, 20, or 21 TAP-103

FIND YOUR JOB IN THE LIST BELOW THEN GO TO

TTY Printout - DGN:SP a,{IPUB b|CONTR c}:PH d STF
 ANALY:TLPFILE:SP a,{IPUB b|CONTR c}
 TLP TAPE ACQUISITION ERROR
 MOUNT TAPE WITH FILE ID = f TAP-111

TTY Printout - DGN:SP a,{IPUB b|CONTR c}:PH d STF
 ANALY:TLPFILE:SP a,{IPUB b|CONTR c}TLP
 WARNING: VERSION X DOES NOT MATCH VERSION Y TAP-110

TTY Printout - DGN:SP a,{IPUB b|CONTR c}:PH d STF
 REPT:TAPE MUST BE MOUNTED FOR FUNCTION TLP TAP-112

No acceptance test procedures are required for this frame. Readiness of this 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	Determine if SP Is Equipped With Pulse Points and Remove	DLP-524
2	At TTY, Type RMV:SP a,CONTR b! (a = Member Number, b = Controller 0 or 1)	-
3	Wait for System Response RMV:SP a,CONTR b COMPLETED	-
4	Rotate ROS/OFF Switch Clockwise to ROS	-
5	Observe ACK Lamp Flashes Off and On, and OS and OFF NORM Lamps Light	-
6	Condition Power Control Switch and Replace Power Switch	DLP-514
7	Rotate ROS/OFF Switch Counterclockwise to Normal Position	-
	NOTE: If OS lamp flashes and remains lighted, diagnostic passed	-
8	Observe OFF NORM Lamp Goes Off	-
9	At TTY, Type RST:SP a,CONTR b! (a = Member Number, b = Controller 0 or 1)	-
10	Wait for System Response RST:SP a,CONTR b COMPLETED (os Lamp Goes Off)	-
11	Restore Pulse Points if Removed in Item 1	DLP-525

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

1	Determine if SP Is Equipped With Pulse Points and Remove	DLP-524
2	At TTY, Type RMV:SP a,CONTR b! (a = Member Number, b = Controller 0 or 1)	-
3	Rotate RML/ALM RETIRE Switch Clockwise to RML	-
4	Observe ACK Lamp Flashes, and OFF NORM and MTCE LIMIT Lamp Lights	-
5	Replace Matrix Maintenance Limit Switch	DLP-515
6	Rotate RML/ALM RETIRE Switch Counterclockwise to Normal Position	-
7	Observe OFF NORM and MTCE LIMIT Lamps Go Off	-
8	At TTY, Type RST:SP a,CONTR b! (a = Member Number, b = Controller 0 or 1)	-
9	Restore Pulse Points if Removed in Item 1	DLP-525

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

1	Determine if SP Is Equipped With Pulse Points and Remove	DLP-524
2	At TTY, Type RMV:SP a,CONTR b! (a = Member Number, b = Controller 0 or 1)	-
3	Wait for System Response: RMV:SP a,CONTR b COMPLETED	-
4	Condition Power Control Switch and Replace Circuit Pack	DLP-501
5	At TTY, Type RST:SP a,CONTR b! (a = Member Number, b = Controller 0 or 1)	-
6	Wait for System Response: RST:SP a,CONTR b COMPLETED (os Lamp Goes Off)	-
7	Restore Pulse Points if Removed in Item 1	DLP-525

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

1	Determine if SP Is Equipped With Pulse Points and Remove	DLP-524
2	At TTY, Type: RMV:SP a,CONTR b! (a = Member Number, b = Controller 0 or 1)	-
3	Wait for System Response: RMV:SP a,CONTR b COMPLETED	-
4	Condition Power Control Switch, and Replace Circuit Pack:	-
	A. Vertical Level 62 or 66 (Access Circuits)	DLP-501
	B. FA605 or FB230	DLP-502
	C. FB229 , FA610 , or FB231	DLP-503
	D. FC78 (Vertical Level 46 and 52)	DLP-503
	E. FC78 (Vertical Level 58 and 70)	DLP-502
	F. FB228	DLP-504
5	At TTY, Type: RST:SP a,CONTR b! (a = Member Number, b = Controller 0 or 1)	-
6	Wait for System Response: RST:SP a,CONTR b COMPLETED (os Lamp Goes Off)	-
7	Restore Pulse Points if Removed in Item 1	DLP-525

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

1	Determine if SP Is Equipped With Pulse Points and Remove	DLP-524
2	At TTY, Type: RMV:SP a,CONTR b! (a = Member Number, b = Controller 0 or 1)	-
3	Wait for System Response: RMV:SP a,CONTR b COMPL	-
4	Test Power Monitor Circuits	DLP-521
5	Condition Power Switch, and Replace Power Converter:	-
	A. +3V Converter (J87399A, or J89407A)	DLP-519
	B. -3V Converter (J87407B)	DLP-523
6	At TTY, Type: DGN:SP a,CONTR b!	-
7	Wait for System Response: DGN:SP a,CONTR b CATP	-
8	At TTY, Type: RST:SP a,CONTR b!	-
9	Wait for System Response: RST:SP a,CONTR b COMPLETED (os Lamp Goes Off)	-
10	Restore Pulse Points if Removed in Item 1	DLP-525

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

1	Determine if SP Is Equipped With Pulse Points and Remove	DLP-524
2	At Matrix Maintenance Limit Switch, Rotate RML - ALM RETIRE Switch Clockwise	
3	Observe MTCE LIMIT and OFF NORM Lamps Light	
4	Depress ALM RETIRE Pushbutton (Silences Audible Office Alarms)	
5	Test Power Monitor Circuits	DLP-521
6	Condition Power Control Switch and Replace Power Converter	
	A. 98A-Type Converter	DLP-520
	B. CONTR 0/1 Switch Is Power Control Associated With Converter	DLP-519
	C. PPL Switch Is Power Control Associated With Converter	DLP-519
	D. MML Switch Is Power Control Associated With Converter	DLP-518
7	At Matrix Maintenance Limit Switch, Depress ALM ENAB Pushbutton	
8	Rotate RML - RETIRE Switch Counterclockwise	
9	Observe MTCE LIMIT and OFF NORM Lamps Go Off	
10	Restore Pulse Points if Removed in Item 1	DLP-525

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, PRs, etc) which are available to the operating telephone company offices, are referenced where applicable. Some portions of those documents may be utilized in procedures, but only as examples. Test equipment (oscilloscopes, voltmeters, etc) and parameters involved in circuits being tested, adjusted, or checked are usually prescribed. The setup and method of use are not described unless it is unusual in some manner.

In an effort to increase network reliability and reduce service-effected incidents, a preconditioning process has been added to this document. The preconditioning process requires a determination if the Signal Processor being repaired is a base or supplementary Signal Processor (for example, is this frame equipped with pulse points). If the Signal Processor being repaired is equipped with pulse points, the pulse points associated with the Signal Processor being repaired are powered down prior to the replacement of any apparatus.

IXL PHILOSOPHY [IXL-001]

The IXL is structured to provide fast access to those procedures pertinent to symptoms identified. As an example, see the TTY printout
DGN:SP a,{IPUB b|CONTR c}:PH d STF message on the IXL.

It would require a lengthy procedure (TAP) to cover all possibilities. The identification of secondary indications or messages provides some trouble sorting.

The primary message "DGN:SP a,..." is followed by various secondary messages which define the problem further. Most are related to problems which prevent generation of a suspected faulty equipment list. Where secondary message ANALY:TLPFILE:SPa, { IPUB b|CONTR c } TLPSRCH SUSPECTED FAULTY EQUIPMENT is generated. It is necessary to determine if the printout (ANALY:TLPFILE) has a NOTE 2 as stipulated. If not, the third line statement that "Note Column Does Not Contain NOTE 2" identifies the correct procedure reference. If NOTE 2 does appear in the NOTE column of the ANALY:TLPFILE: message printout, it is necessary to go to a fourth level indication. The fourth level indications are "Fuse Blown" and "No Fuses Blown", and appropriate procedures are referenced. Procedures unique to a particular modification of a frame are identified by the SD number of that frame. If not so identified, the procedure would apply to all modifications.

Power problems are sensed by scan points which generate a major or minor alarm. It is assumed that the user can locate the frame which was automatically powered down (1A power switch with **PWR OFF** lamp lighted and **OFF NORM** lamp off) due to the power fault. The user can follow the aisle pilot lights or read the **REPT:PA** printout which will identify the frame with the power fault. The precise structure of the message is given in input/output (I/O) message manuals. The symptoms described in the IXL reflect the previous assumptions and indicate other conditions, observable at the frame,

that would enable the user to access the proper trouble-clearing procedure. These conditions are a fuse blown or lighted LEDs on converters, or power-function circuit packs.

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 trouble-locating program TLP option. The IXL reflects this in TTY printouts listed. Other than the **ANALY:TLPFILE** supplementary messages which include the phrases **"SUSPECTED FAULTY EQUIPMENT"** or **"NULL PACK TEST GENERATED"**, all **ANALY:TLPFILE:** supplementary messages pertain to problems in generating a suspected faulty equipment list; and refer to procedures (TAPs) which attempt to correct the problem. If successful in generating a suspected faulty equipment list, these procedures refer to the appropriate procedure [TAP-103] which tells the user what to do with this list. If a **SUSPECTED FAULTY EQUIPMENT** list is not successfully generated, the TTY messages refer to the next level of trouble-clearing, raw data analysis [TAP-104] ; this 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 user performs that action correctly. Similarly, when the user is directed to make replacements, the replacement part is always assumed to be good and the equipment used for testing both built-in and commercial hardware and software is assumed to be good. These assumptions and the fact that the trouble-clearing procedures are designed for faults with consistent fault signatures provide procedures with a clean straightline approach to trouble-clearing. It is possible

that some faults will not present a consistent fault signature or TLP pack list. If this occurs, then the diagnostic DGN should be repeated a number of times, and the most consistent signature and list should be used following the same general approach provided in the procedures. This repetitive DGN method should be used each time to determine if there is any change in the fault signature when any corrective action is taken unless that action results in clearing the problem.

The trouble-clearing TAPs, provided for diagnostic failures, are provided on three levels. The first level [TAP-103] is addressed to what to do with a software-generated TLP suspected faulty equipment list. Also, it 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 BSPs), TTY techniques, and diagnostic printouts.

The second level of trouble-clearing is accessed from the first level TAP when the TLP-generated 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 [TAP-104] is known as raw data analysis. Raw data analysis 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 possibly additional suspect 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, PRs, etc.

TAP PHILOSOPHY (Contd)

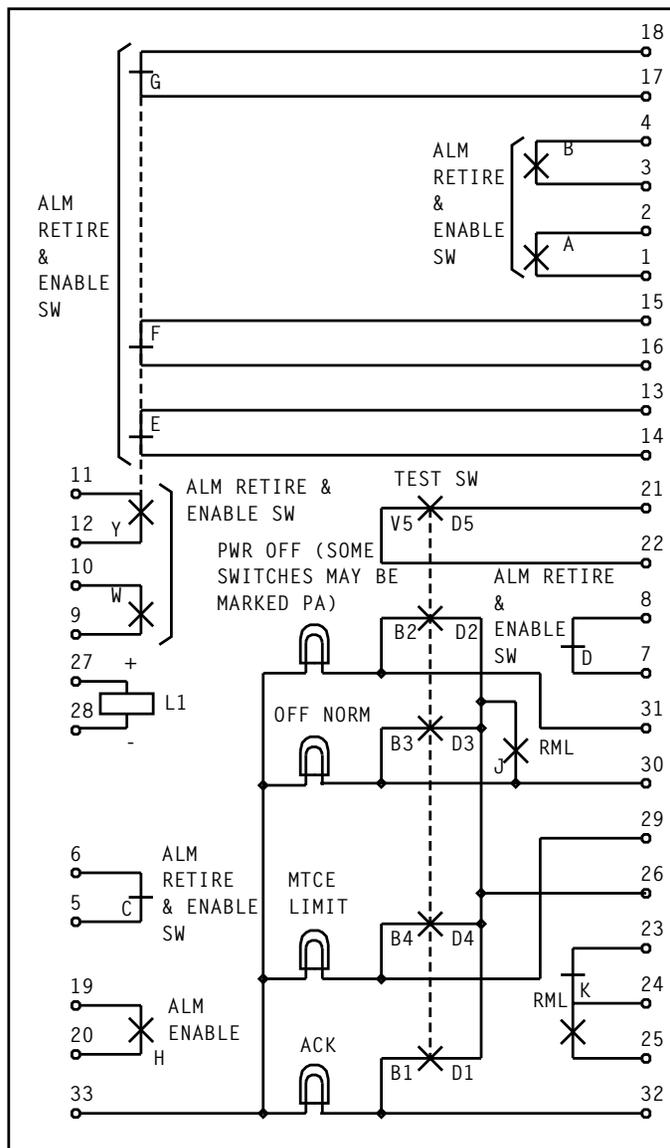
The third level of trouble-clearing is signal tracing that uses interactive diagnostics [TAP-105]. This procedure is accessible only from the previous level [TAP-104] and uses information derived in the performance of that procedure. This level of trouble-clearing requires an increase in the capabilities cited in the first two levels with additional knowledge and skill in the setup and use 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 (faulty component determined); and only repair or replacement required. In many instances, access to these procedures may be obtained by locating procedural data provided on the Task Index List. Most DLPs are built to support TAPs; and Non-Trouble Procedures (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.

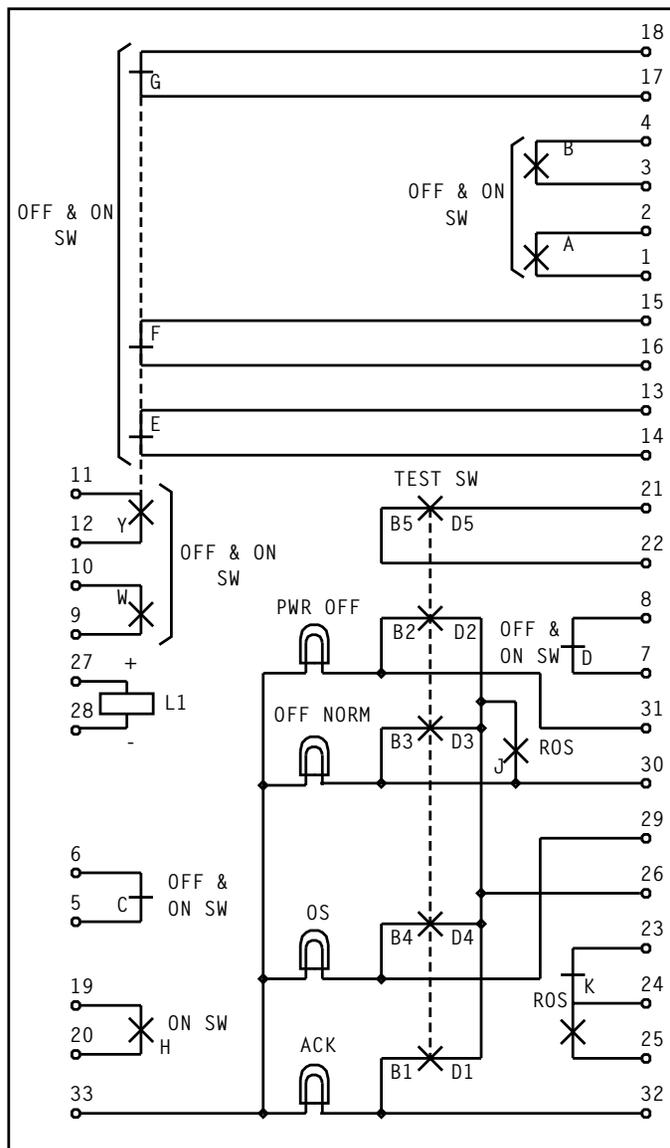
Another method of trouble-clearing that may be utilized is interrupt analysis. Interrupt analysis may produce a list of circuit packs that could cause a particular interrupt. Refer to AT&T 234-151-003 (with 1A Processor) or AT&T 234-351-003 (with 1B Processor) for interrupts. Prior to changing the circuit packs, a DGN should be run with ATP expected. If the DGN produces an ATP or STF, do the following:

- **ATP:** The first circuit pack found in the interrupt analysis should be changed. Should this be the wrong circuit pack, the probability is high that the interrupt will occur again with the same symptom at this time, will occur again with the same symptom. At this time, the next identified pack should be changed.
- **STF:** The most suspect circuit pack is the pack that appears on both the TLP pack list and the list generated from the interrupt analysis.



MATRIX MAINTENANCE LIMIT SWITCH

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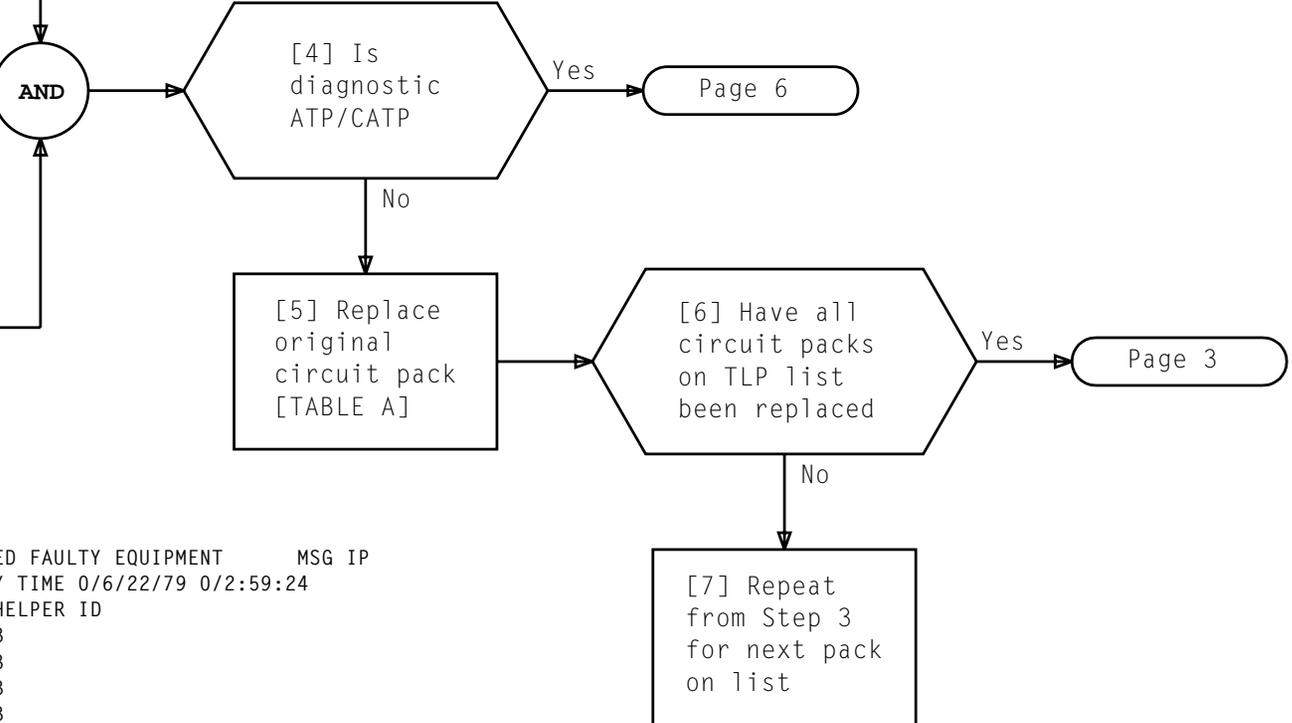
POWER SWITCH

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[1] Determine if SP is equipped with pulse points and remove [DLP-524]

[2] On TLP list, delete packs located in mate controller [FIG. 1]

[3] See NOTE 1. Using DLP associated with circuit pack location [TABLE A], replace circuit pack listed on TLP list



```

M 0/1 ANALY TLPFILE: SP 0/, CONTR 0/ SUSPECTED FAULTY EQUIPMENT      MSG IP
TLPFILE 30/42      :MFNUM 77777777 ENTRY TIME 0/6/22/79 0/2:59:24
EQPT LOC  CODE  NOTE WT  FS SYM  SD  HELPER ID
372-17  FA0/594      8   3 10/M 4A0/13
356-35  FA0/575      8   9  4   4A0/13
356-31  FA0/575      8   9  2   4A0/13
356-32  FA0/575      8   9  1   4A0/13
356-33  FA0/575      8   9  3   4A0/13
472-17  FA0/594      8  19 39M 4A0/13  :SP 0/, CONTR 1
380/-0/7 FC00//12    8   2  5   4A0/13
364-25  FA0/588      8   6 21M 4A0/13
480/-0/7 FC00//12    8   3  5   4A0/13
356-34  FA0/588      8   9 14M 4A0/13
372-21  FA0/583      8  16  5M 4A0/13
464-25  FA0/588      8   6 21M 4A0/13  :SP 0/, CONTR 1
364-23  FA0/588      8  14  1M 4A0/13
373-19  FA0/595      16  3M 4A0/13
  
```

MATE CONTROLLER
CIRCUIT PACKS

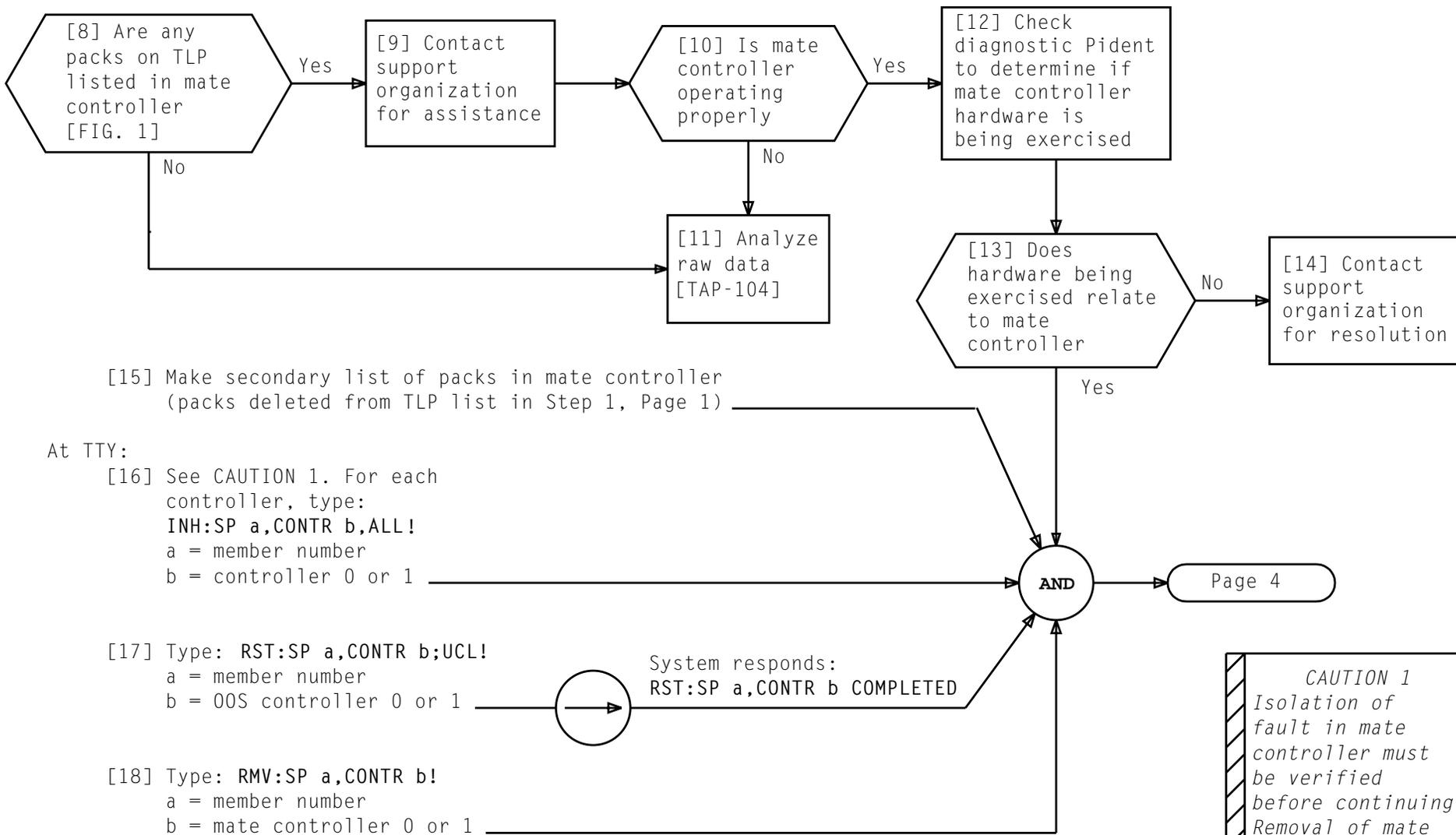
NOTE 1
Circuit packs are listed on TLP printout in order of fault-causing probability, and should be replaced one at a time in that order

FIG. 1 - Example of TLP List With Suspect Packs in Mate Controller

TABLE A				
CIRCUIT PACK LOCATION				REPLACE CIRCUIT PACK PROCEDURE
FRAME	BAY	VERTICAL	HORIZONTAL OR TYPE	
Control	1, 2	All	All	DLP-501
Supplementary matrix	0	58, 70	FA610	DLP-503
			ALL OTHERS	DLP-502
	0	62, 66	All	DLP-501
	0	46, 52	FB229, FB231, or FC78	DLP-503
		35, 40, 46, 52	FB228	DLP-504

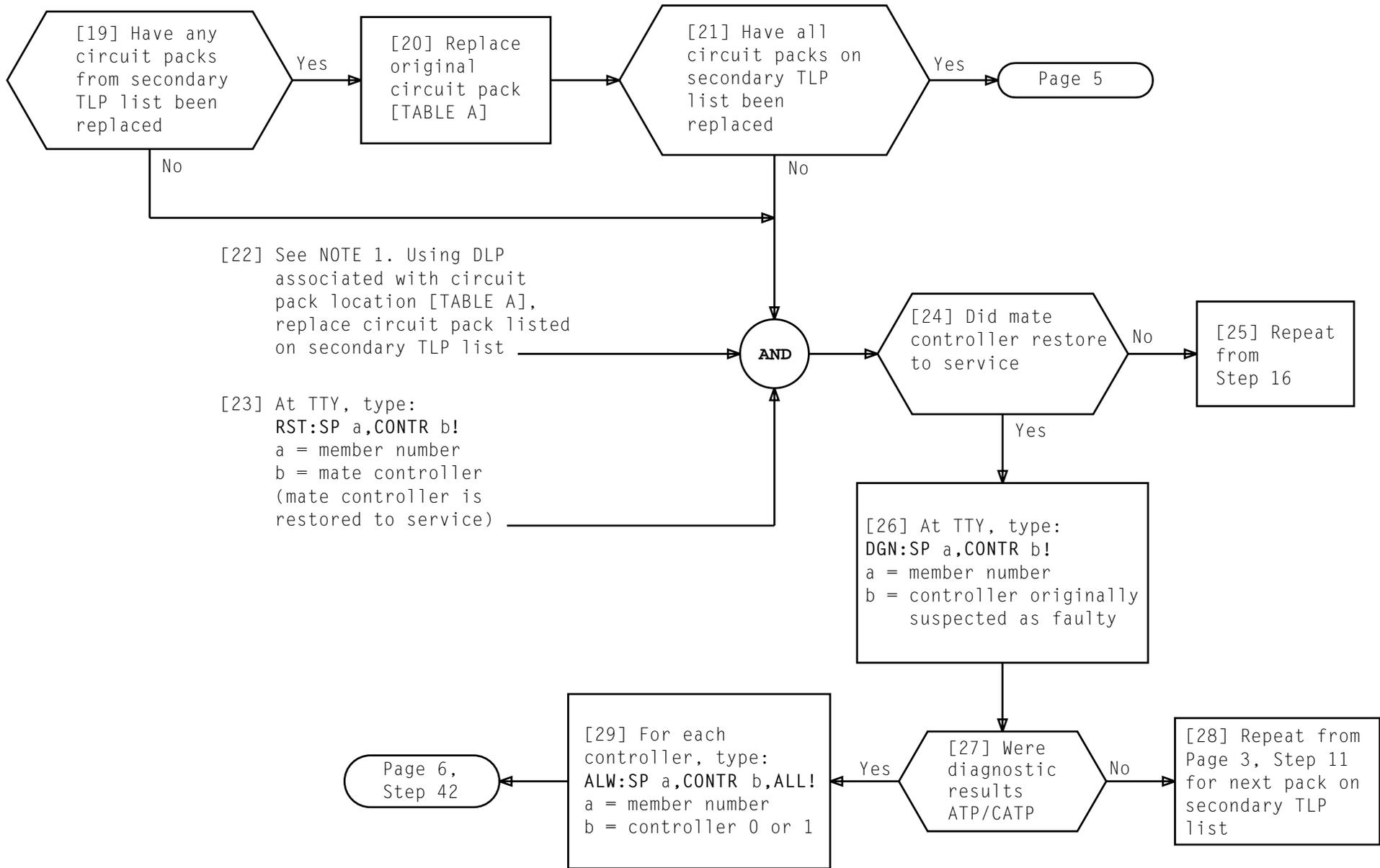
CLEAR DIAGNOSTIC FAILURE BY REPLACING CIRCUIT PACKS

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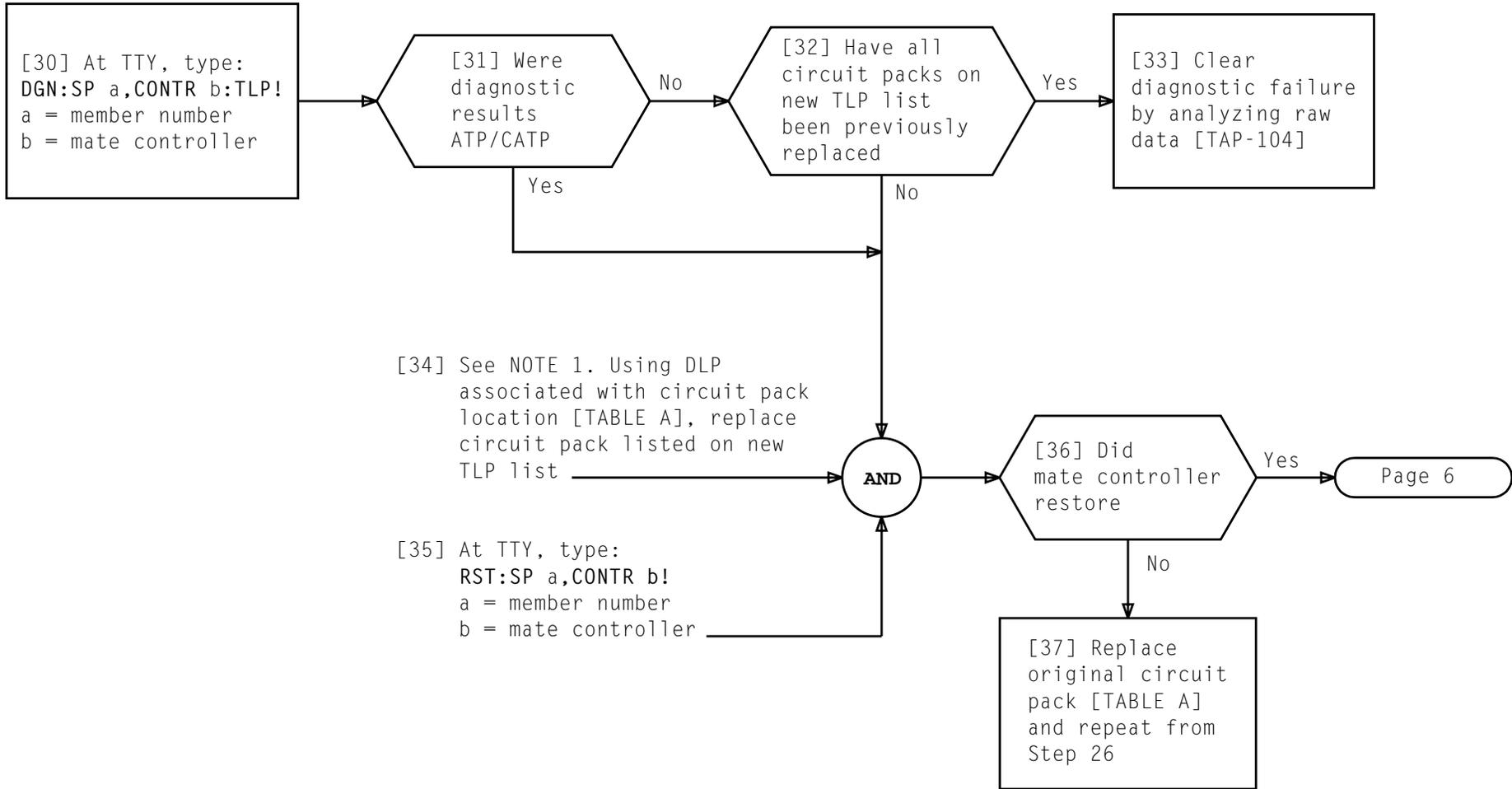


CAUTION 1
Isolation of fault in mate controller must be verified before continuing. Removal of mate controller may cause duplex failure and loss of service

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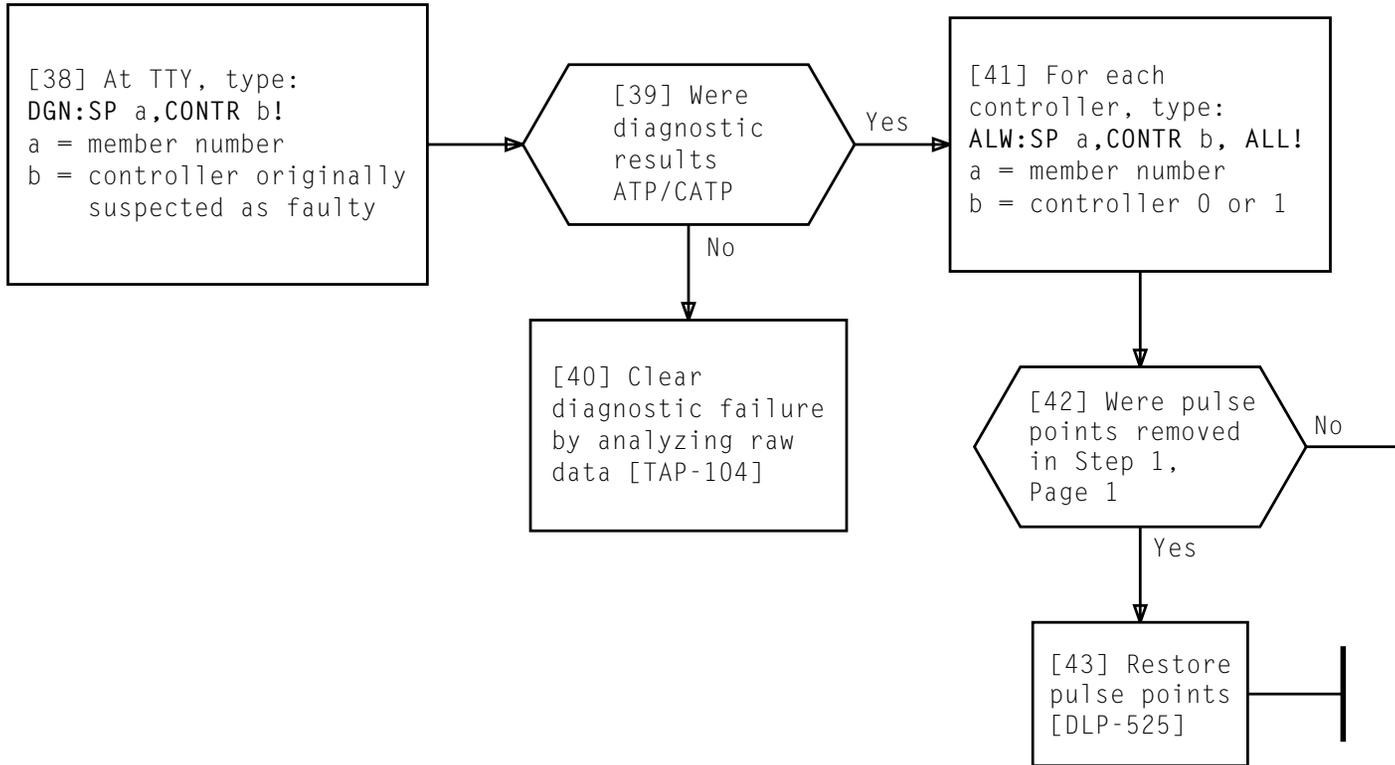


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CLEAR DIAGNOSTIC FAILURE BY REPLACING CIRCUIT PACKS

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CLEAR DIAGNOSTIC FAILURE BY REPLACING CIRCUIT PACKS

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[1] Determine if SP is equipped with pulse points and remove [DLP-524]

[2] See NOTE 1. Obtain diagnostic pident for first failing phase and read prologue [TABLE A]

[3] On raw data printout, locate first failing test raw data [FIG. 1]

[4] In fifth data word following MISMATCH data word, locate sixth digit from right

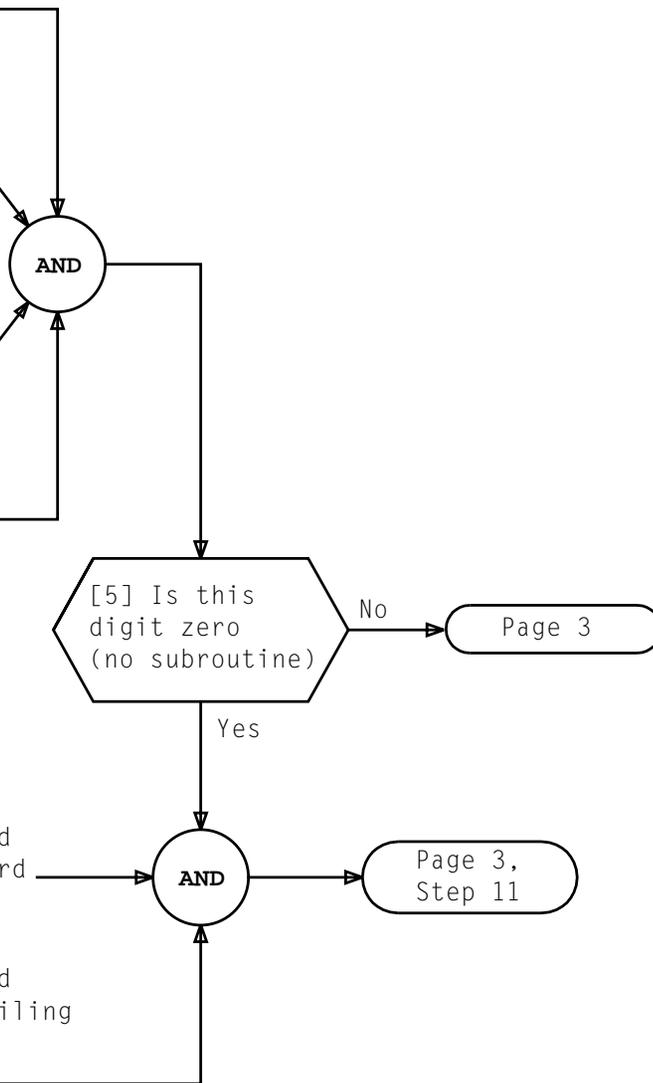


TABLE A DIAGNOSTIC DOCUMENTATION	
PHASE	PIDENT
Member type=SP,XL4UMTSP=1 (MT=1)	
CONTR 1-21	PUDGSP01-PUDGSP21
IPUB 99	PUDGSP99
Member type=SP2,XL4UMTSP=2 (MT=2)	
CONTR 1-22	PUDGDP01-PUDGDP22
IPUB 99	PUDGSP99
Member type=CRMTX,XL4UMTSP=4 (MT=4)	
CONTR 1	PUDGSP27
2,3	PUDGSP02,PUDGSP03
4	PUDGSP28
5-14	PUDGSP05-PUDGSP14
15	PUDGSP29
16	PUDGSP16
17-19	PUDGSP30-PUDGSP32
20	PUDGSP21
IPUB 99	PUDGSP99

NOTES

1. Refer to troubleshooting hints in pident prologue section of SD diagnostic listing for phase 1
2. Phase pident may consist of more than one strip with this address appearing in more than one strip. Be sure address located has EXPR data for your test

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CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING ANY SUSPECT PACKS

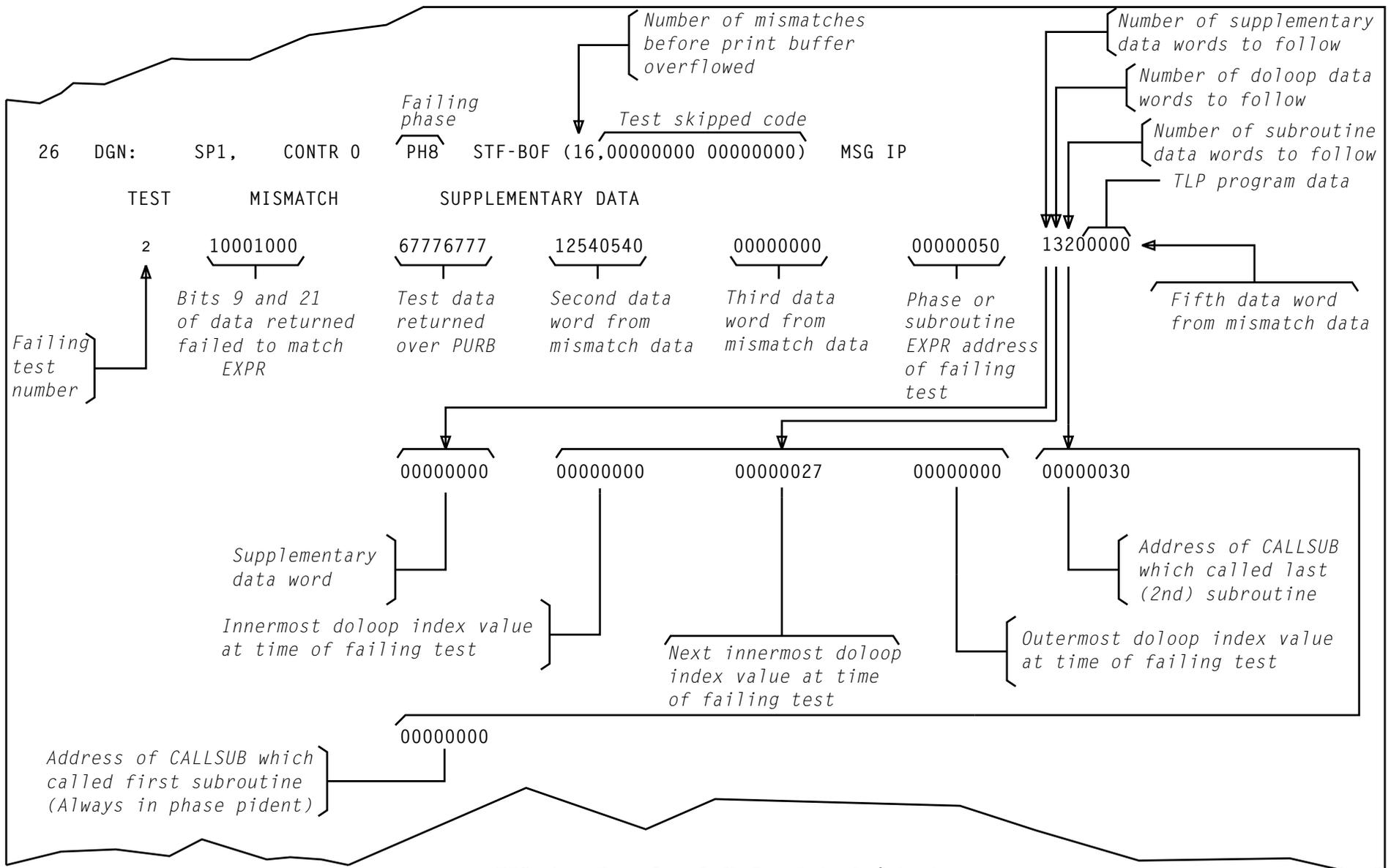
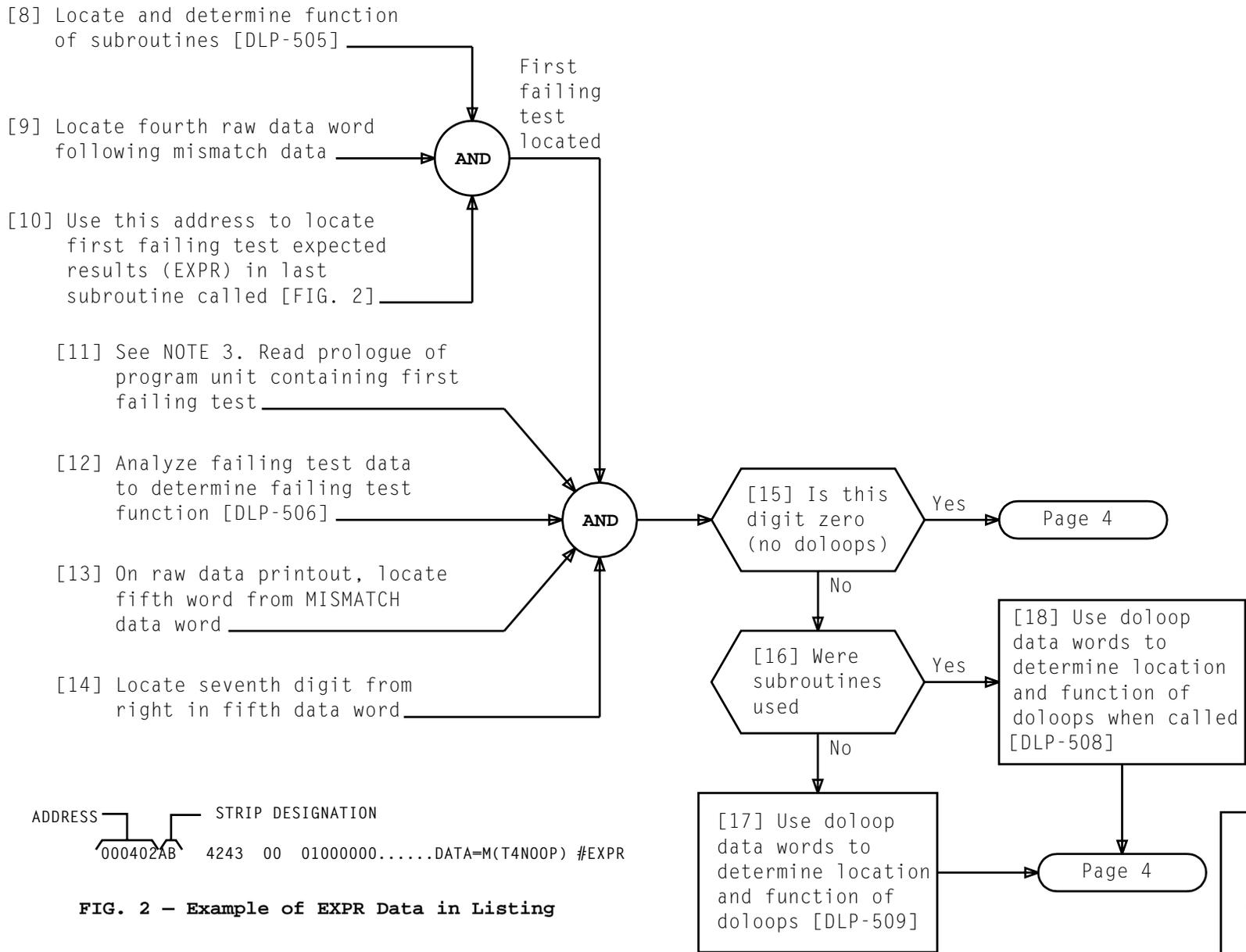


FIG. 1 - Example of SP Raw Data Printout

CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING ANY SUSPECT PACKS

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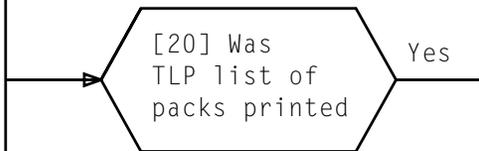
ADDRESS STRIP DESIGNATION
 000402AB 4243 00 0100000.....DATA=M(T4N00P) #EXPR

FIG. 2 - Example of EXPR Data in Listing

NOTE 3	
Program unit name is indicated in upper left of each listing page	
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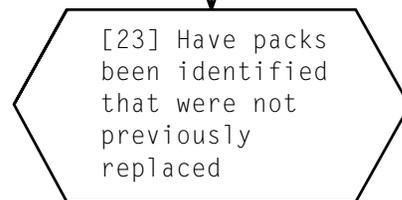
CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING ANY SUSPECT PACKS

[19] Using summary data printout and Issue 2 or later test access PK document, attempt to identify SD lead in path of failing bit SP-PK4A028-01/02 [DLP-507]



[21] See NOTE 4. Using PR prologue data, knowledge of failing test function, failing bits indicated by mismatch data, lead information and appropriate SDs, identify suspect packs not previously replaced

[22] See NOTE 4. Using PR prologue data, knowledge of failing test function, failing bits indicated by mismatch data, lead information, and appropriate SDs, identify suspect packs

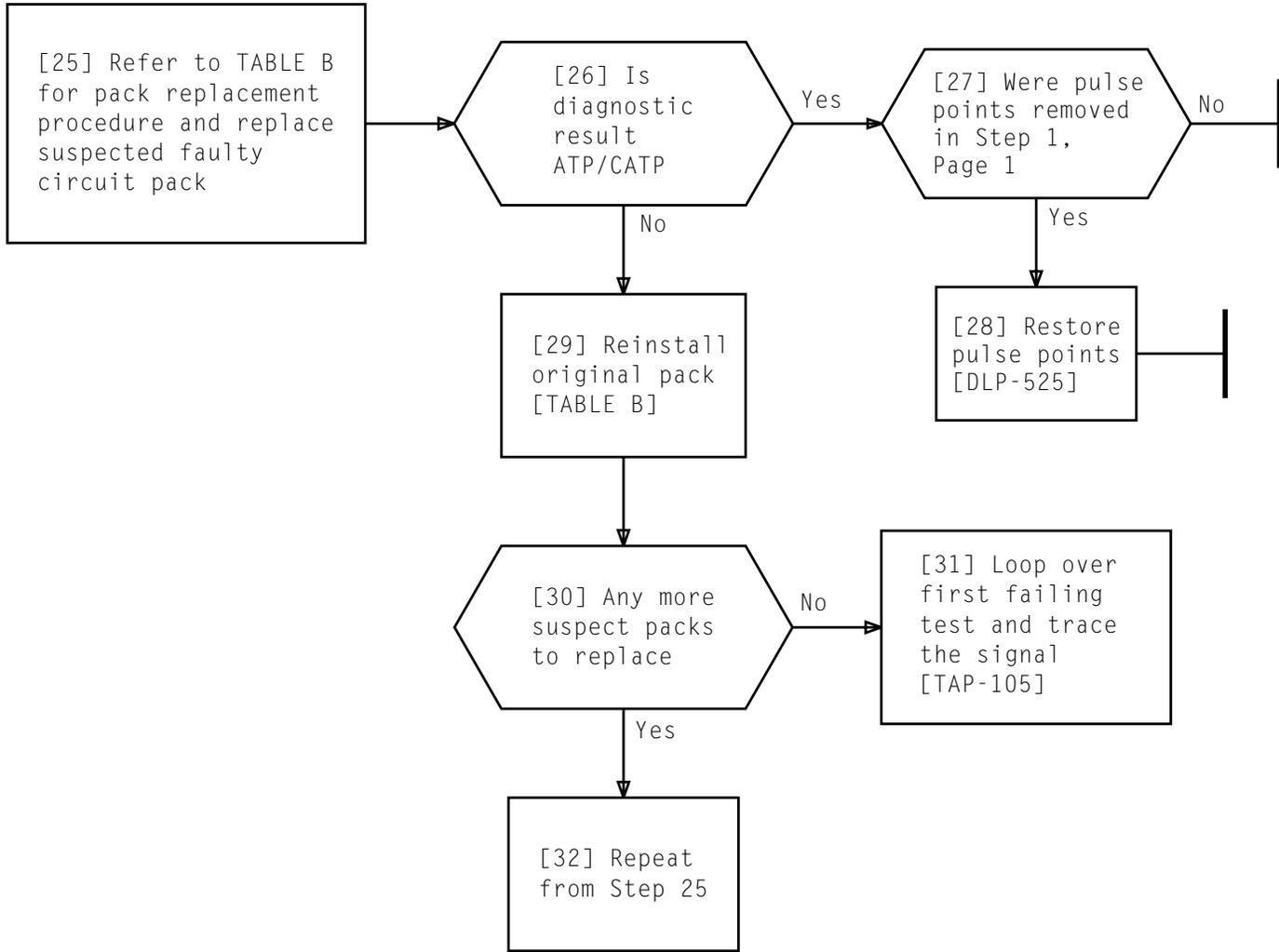


[24] Loop over first failing test and trace signal to locate fault [TAP-105]

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NOTE 4	
A test often fails as result of read of memory or register. Fault could be in path of read or in path of write that set up read	
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CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING ANY SUSPECT PACKS



CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING ANY SUSPECT PACKS

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TABLE B				
CIRCUIT PACK LOCATION				REPLACE CIRCUIT PACK PROCEDURE
FRAME	BAY	VERTICAL	HORIZONTAL OR TYPE	
Control	1,2	A11	A11	DLP-501
Supplementary matrix	0	58, 70	FA610	DLP-503
			ALL OTHERS	DLP-502
	0	62, 66	A11	DLP-501
	0	46, 52	FB229, FB231 or FC78	DLP-503
		35, 40, 46, 52	FB 228	DLP-504

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING ANY
SUSPECT PACKS**

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SUMMARY

Type TABLE A messages. Verify first failing test raw data printed twice. Resend last TABLE A message with RPT option deleted for infinite loop. Set up scope. If SYNC option is used, attach external sweep trigger to terminal indicated in TABLE B. Using raw data analysis information obtained in TAP-104, SDs/CDs, and circuit pack SDs, trace signal path of failing bits to isolate and clear fault. If looping is

not successful, check for any packs on TLP list located in mate. If mate packs are listed, take down loop and replace mate packs. If mate pack replacement is not successful or if no mate packs are indicated on TLP list, perform further signal tracing using loop. For F-level interrupt, see AT&T 234-151-003 (with 1A Processor) or AT&T 234-351-003 (with 1B Processor)

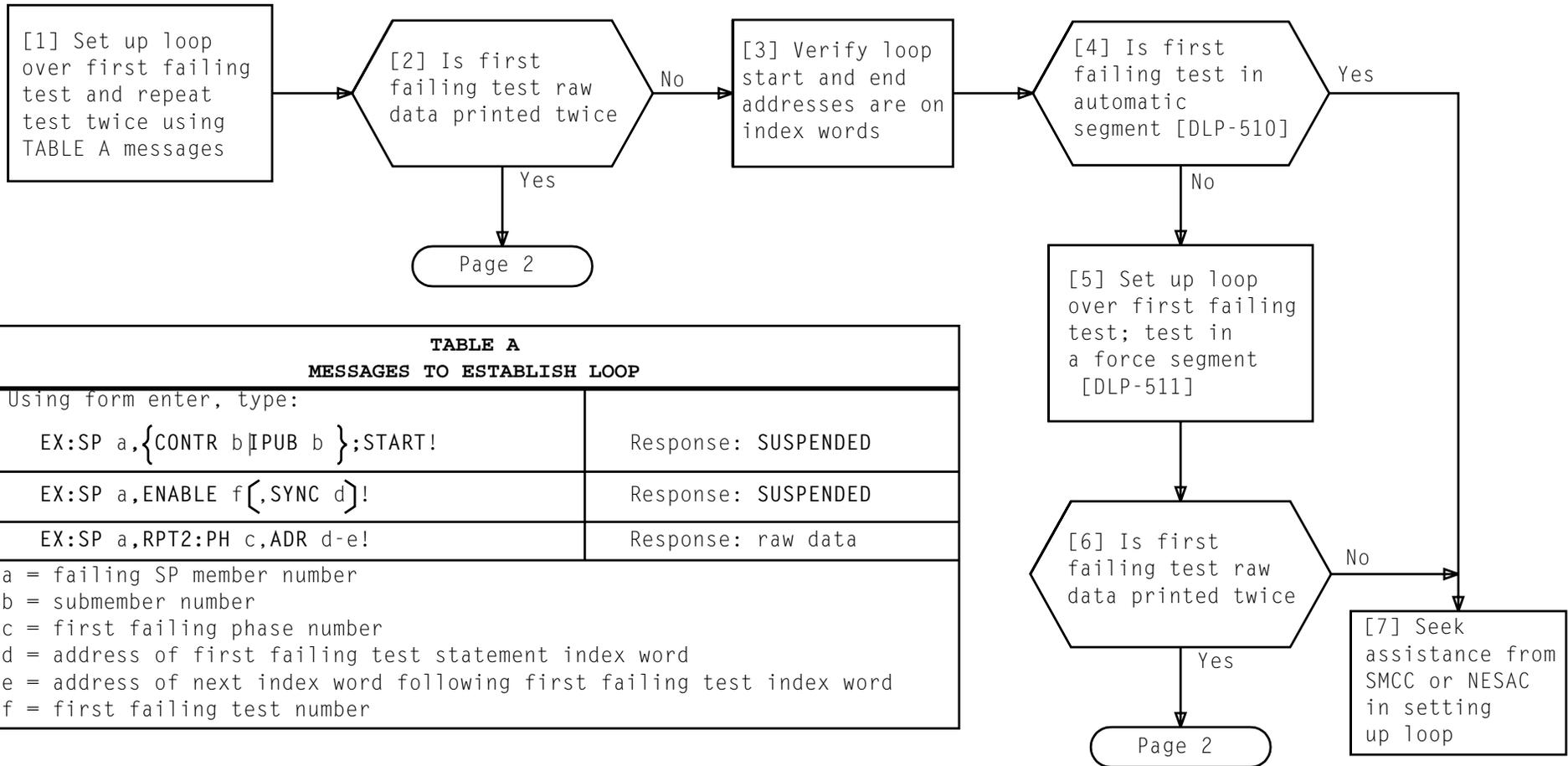


TABLE A MESSAGES TO ESTABLISH LOOP	
Using form enter, type:	
EX:SP a,{CONTR b[PUB b }];START!	Response: SUSPENDED
EX:SP a,ENABLE f[,SYNC d]!	Response: SUSPENDED
EX:SP a,RPT2:PH c,ADR d-e!	Response: raw data
a = failing SP member number b = submember number c = first failing phase number d = address of first failing test statement index word e = address of next index word following first failing test index word f = first failing test number	

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

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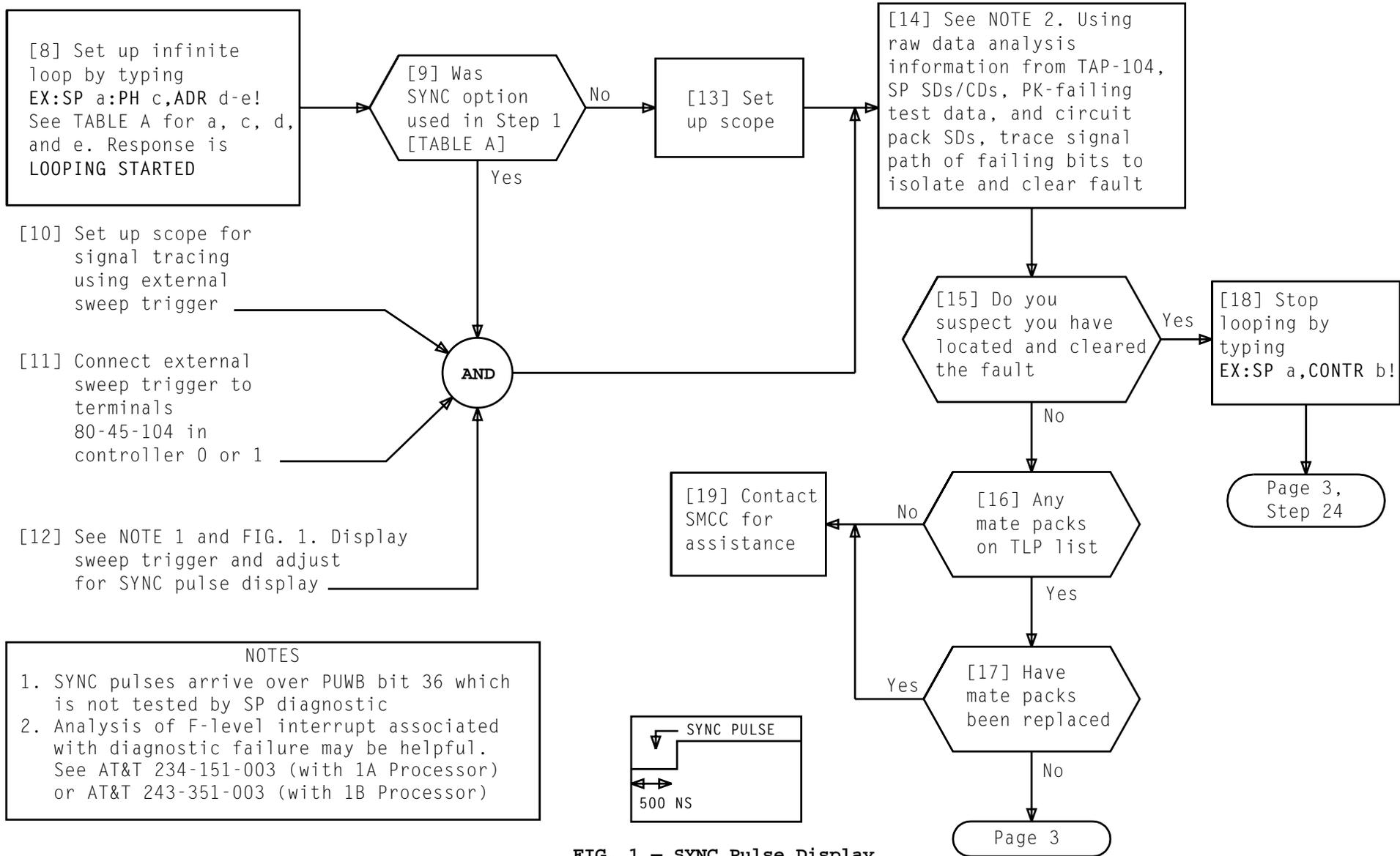
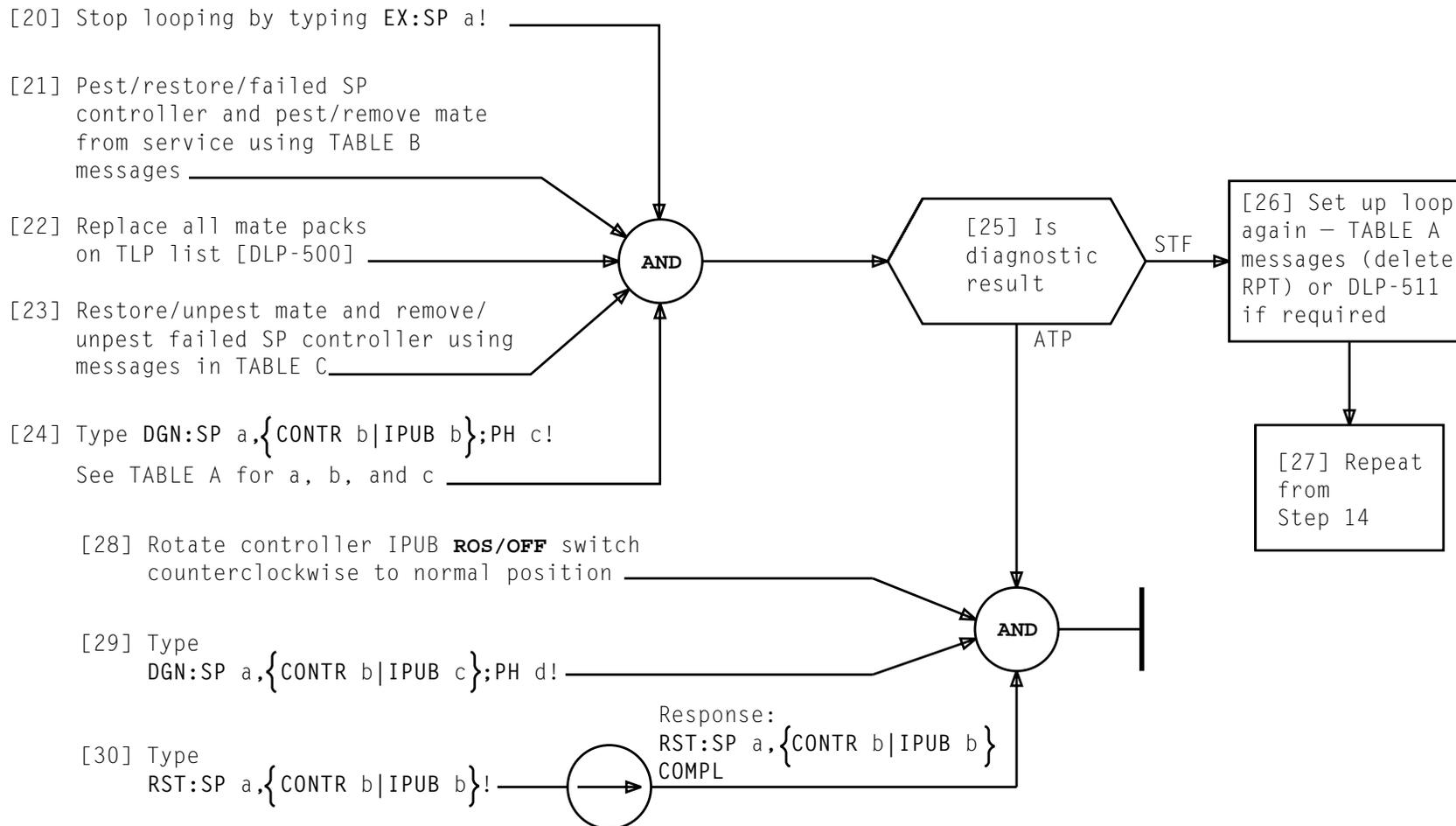


FIG. 1 - SYNC Pulse Display

**CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER
FIRST FAILING TEST AND TRACING SIGNAL TO LOCATE FAULT**

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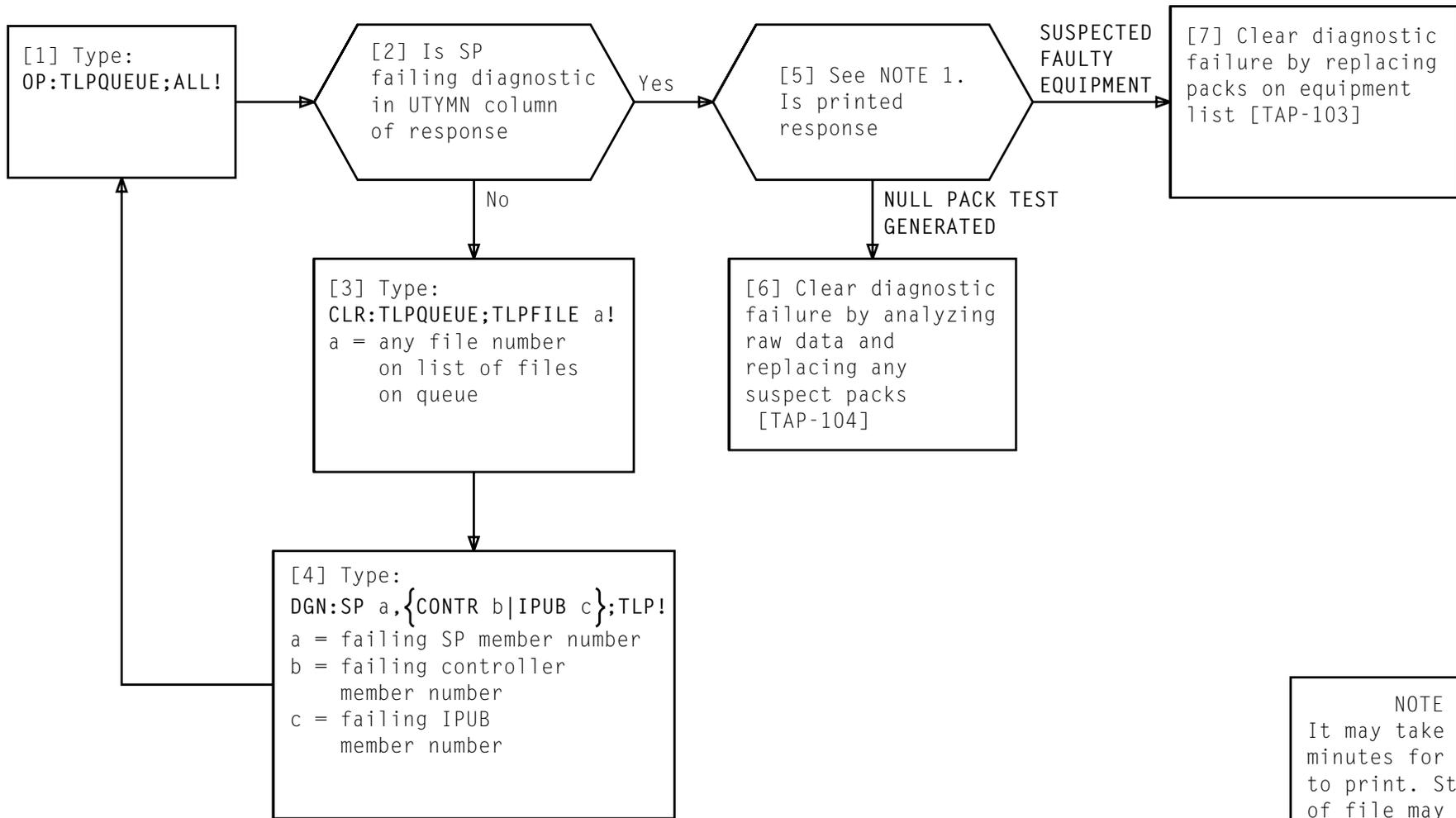
**CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER
FIRST FAILING TEST AND TRACING SIGNAL TO LOCATE FAULT**

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TABLE B	
INH:SP a, CONTR b SPEC!	Response: (message repeated)
INH:SP a, CONTR d SPEC!	Response: (message repeated)
RST:SP a, {CONTR b IPUB c};UCL!	Response: COMPL
RMV:SP a, {CONTR b IPUB c}!	Response: COMPL
a = failing SP member number b = failing controller member number c = failing IPUB member number d = mate controller member number e = mate IPUB member number	

TABLE C	
DGN:SP a, {CONTR b IPUB c};PH d!	Response: COMPL
DGN:SP a, {CONTR b IPUB c};PH d!	Response: COMPL
ALW:SP a, CONTR d SPEC!	Response: (message repeated)
ALW:SP a, CONTR b SPEC!	Response: (message repeated)
a = failing SP member number b = failing controller member number c = failing IPUB member number d = mate controller member number e = mate IPUB member number	

**CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER
FIRST FAILING TEST AND TRACING SIGNAL TO LOCATE FAULT**



NOTE 1
It may take several minutes for list to print. 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

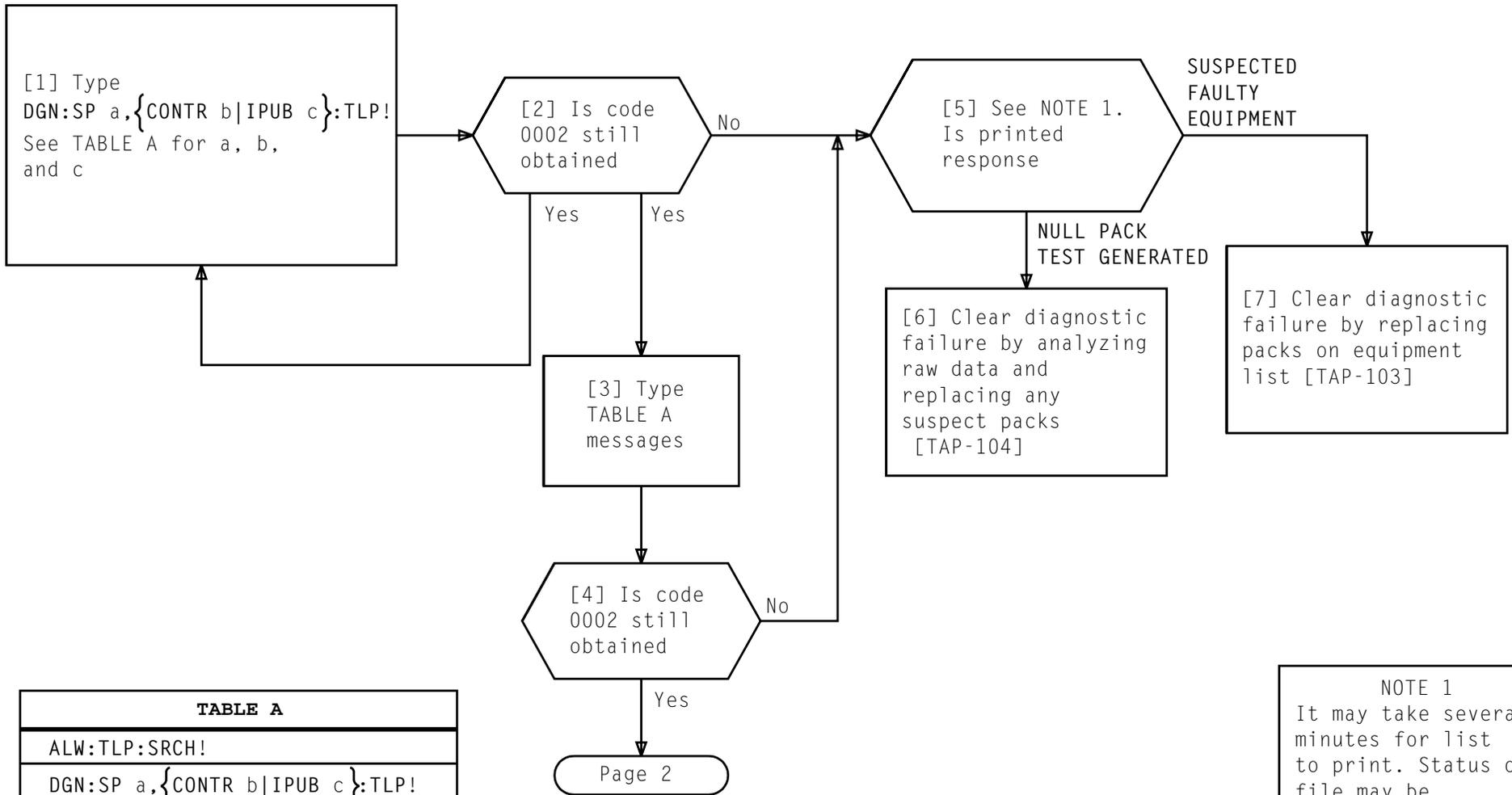
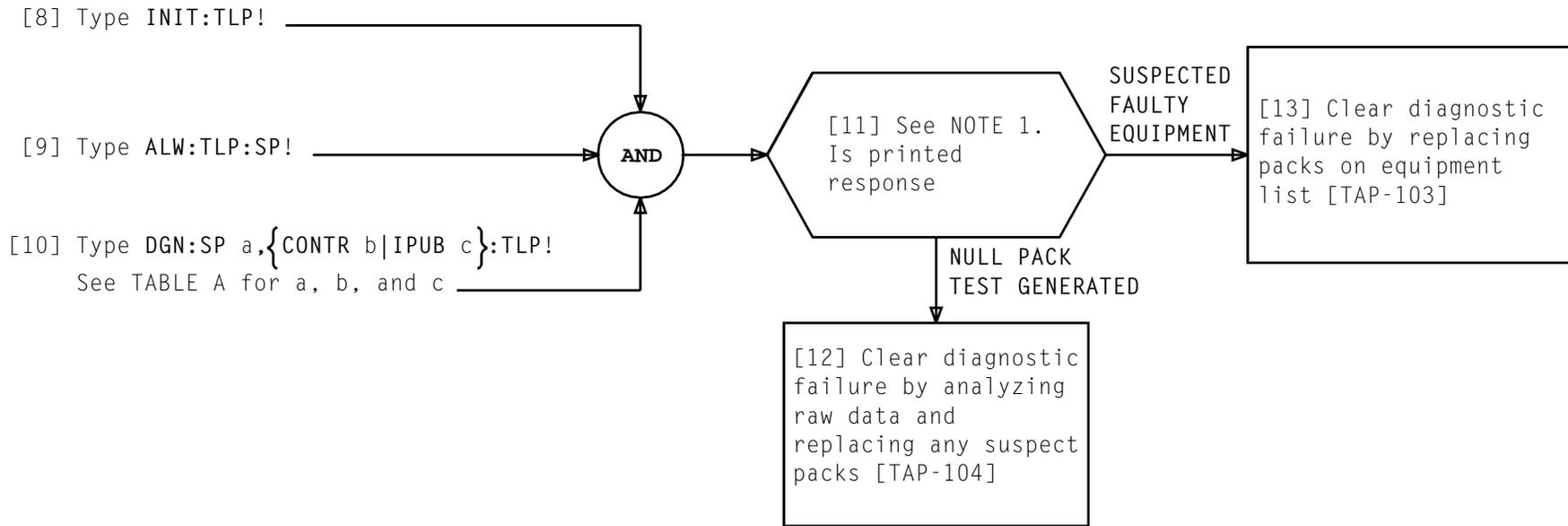


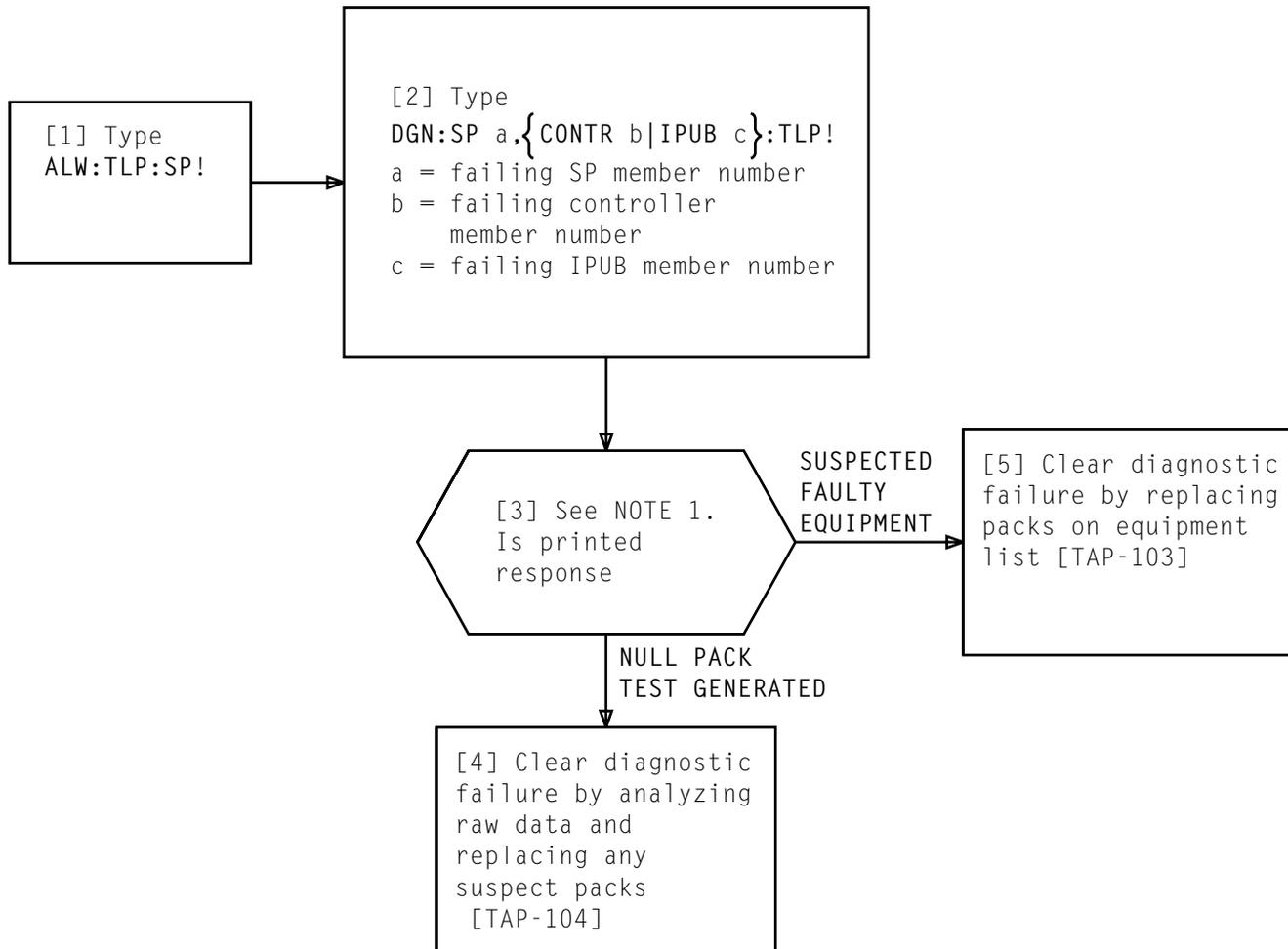
TABLE A
ALW:TLP:SRCH!
DGN:SP a, {CONTR b IPUB c}:TLP!
a = failing SP member number b = failing controller member number c = failing IPUB member number

NOTE 1 It may take several minutes for list to print. 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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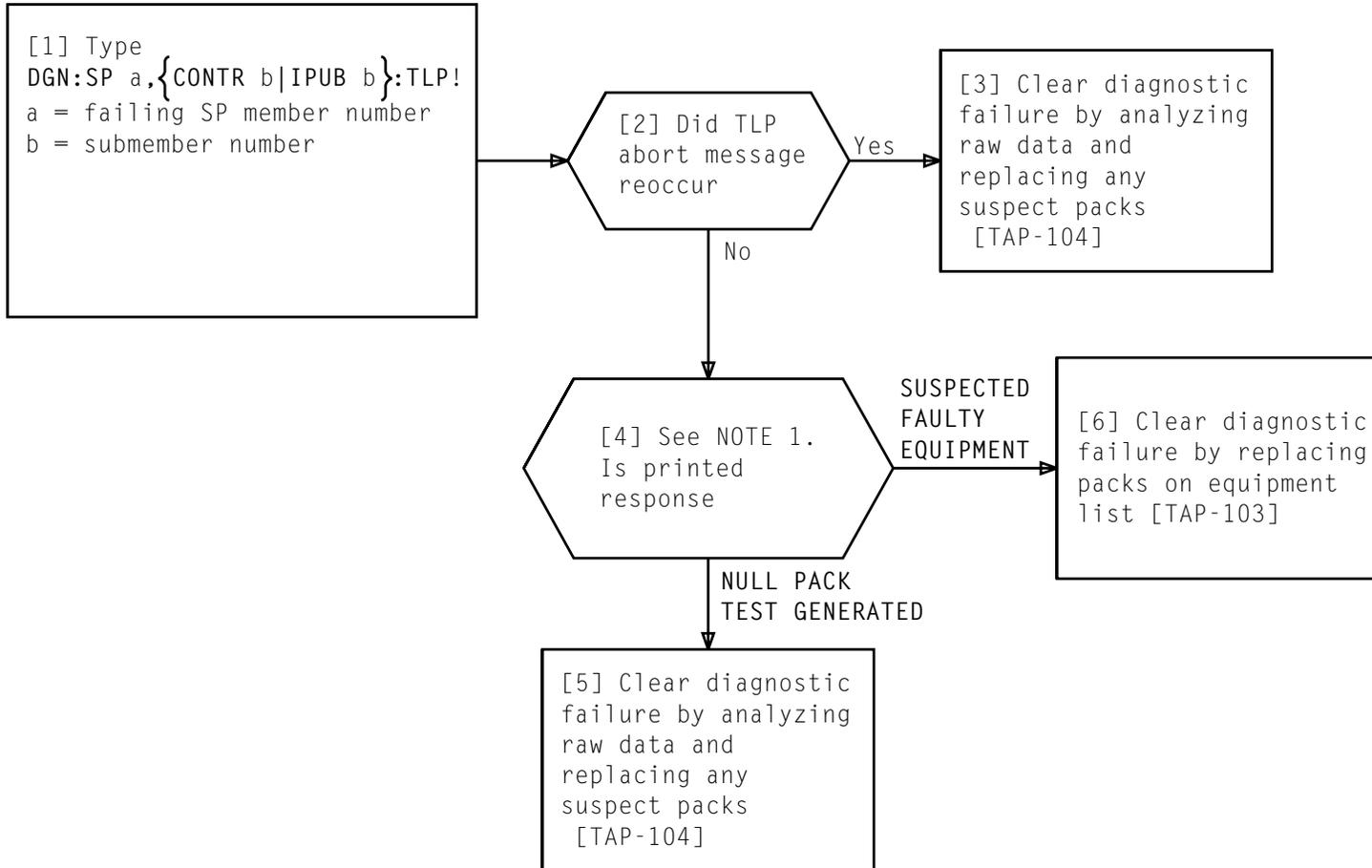


CLEAR DIAGNOSTIC FAILURE, TLP QUEUE BLOCKAGE

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NOTE 1	
It may take several minutes for list to print. 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 print. 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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[1] TLP tape being used is not correct issue for this generic. Obtain correct TLP tape

[2] Demount tape on tape transport [DLP-522]

[3] Mount correct TLP tape on tape transport [DLP-517]

[4] Type TABLE A messages

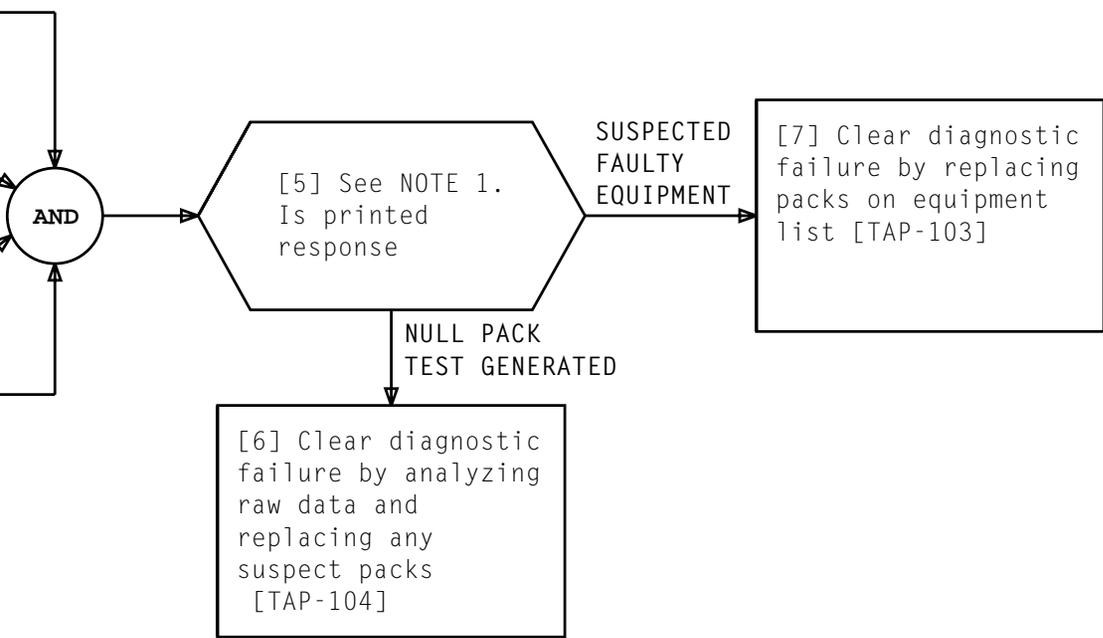


TABLE A
SET:TUC a:FUNCTION TLP!
ALW:TUC a:RO!
ALW:TLP:SRCH, SP!
DGN:SP b,{CONTR c IPUB c}:TLP!
a = member number of TUC using TLP tape mounted b = failing SP member number c = submember number

NOTE 1 It may take several minutes for list to print. 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 VERSION X DOES NOT MATCH EXPECTED VERSION Y

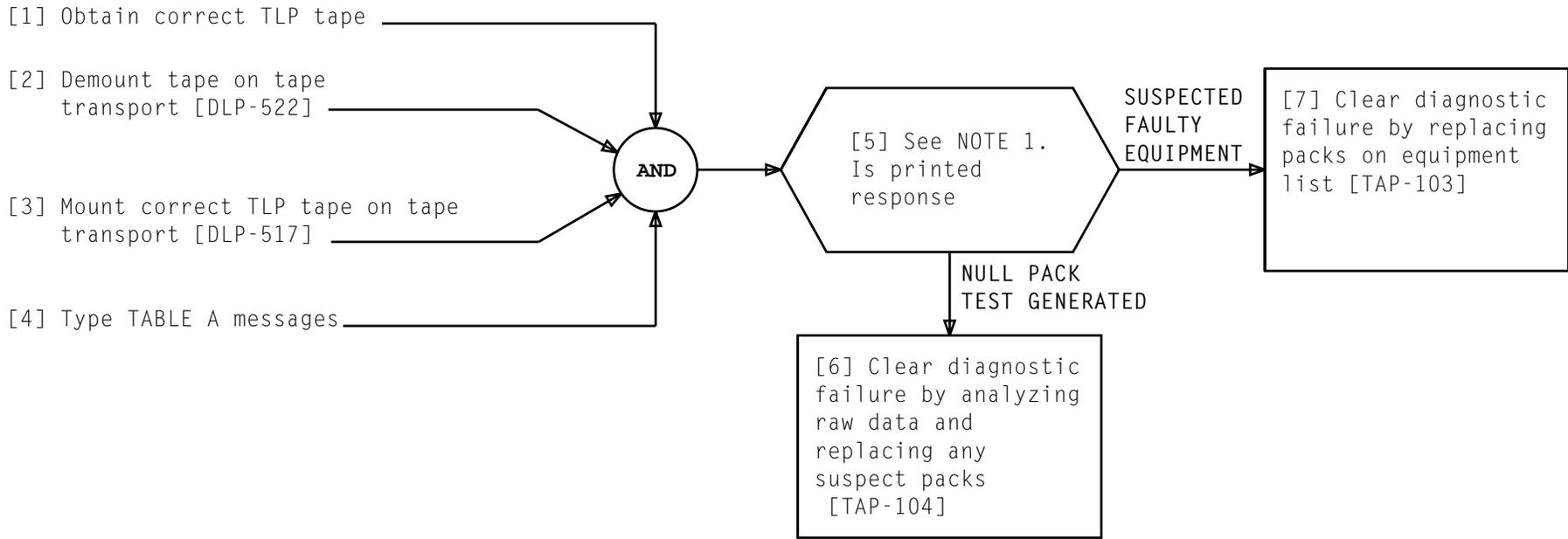


TABLE A
SET:TUC a;FUNCTION TLP!
ALW:TUC a: R0!
ALW:TLP:SRCH,SP!
DGN:SP b,{ CONTR c IPUB c }:TLP!
a = member number of TUC using TLP tape mounted
b = failing SP member number
c = submember number

NOTE 1	
It may take several minutes for list to print. 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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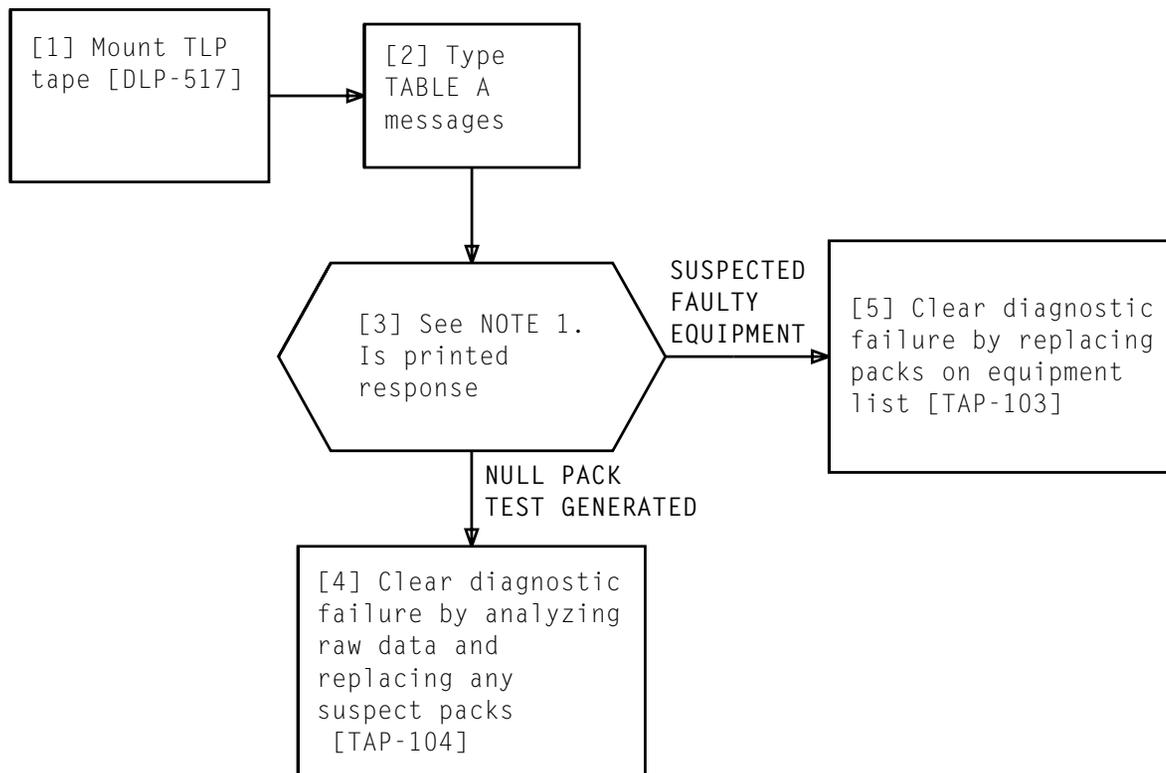
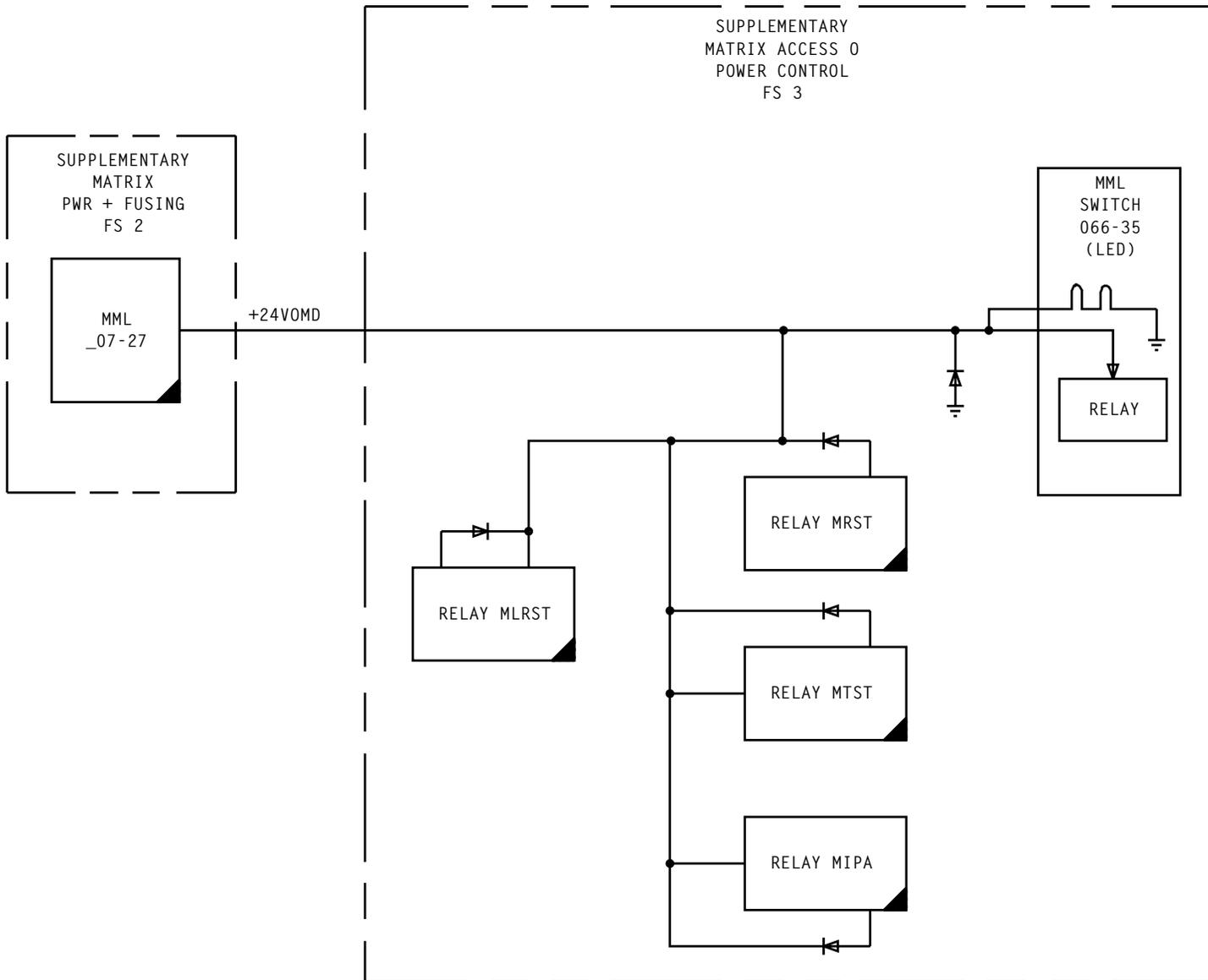
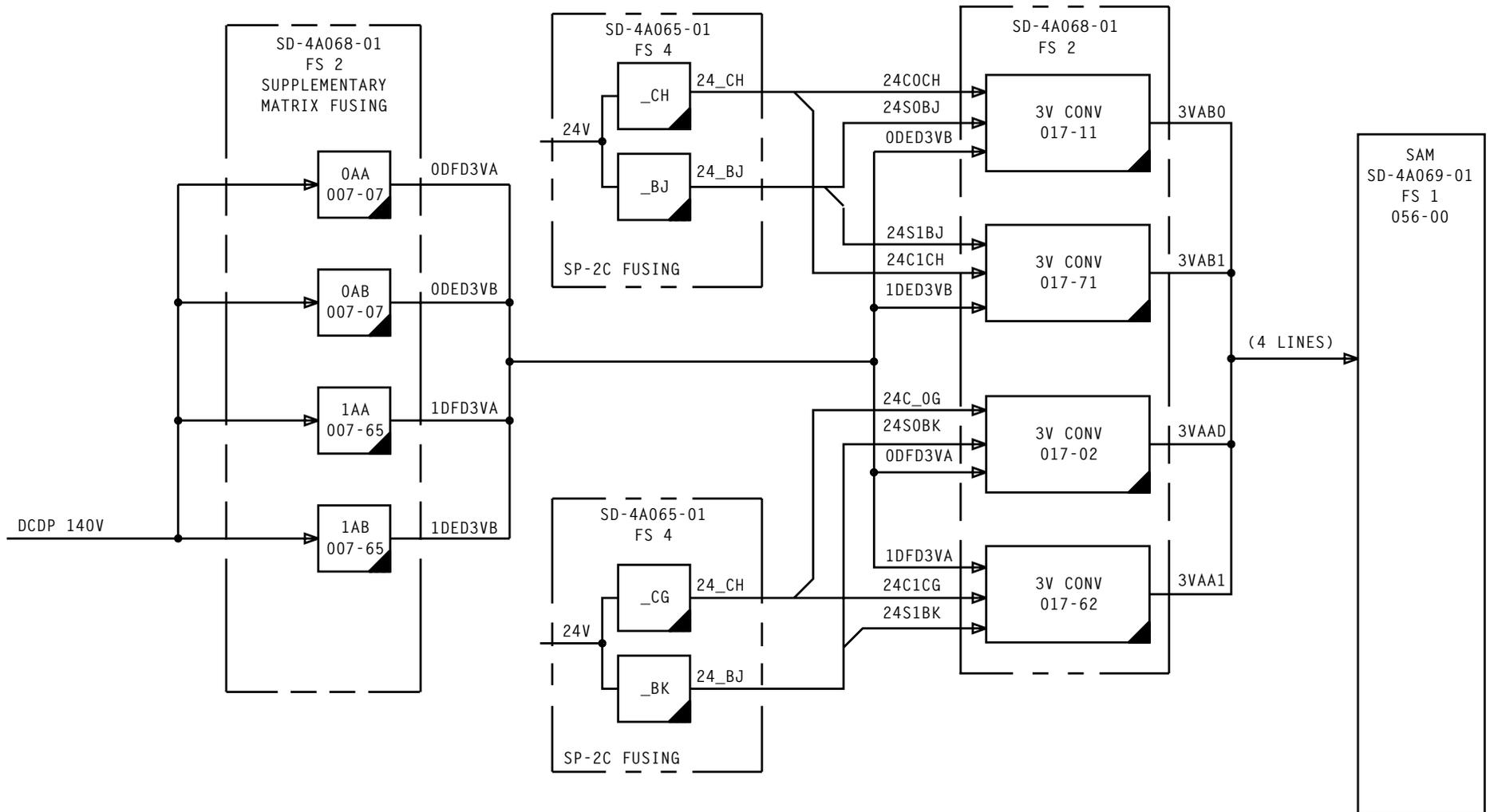


TABLE A	
SET:TUC	a;FUNCTION TLP!
ALW:TUC	a:RO!
ALW:TLP:SRCH,SP!	
DGN:SP	b,{CONTR c IPUB c}:TLP!
a = member number of TUC using TLP tape mounted	
b = failing SP member number	
c = submember number	

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

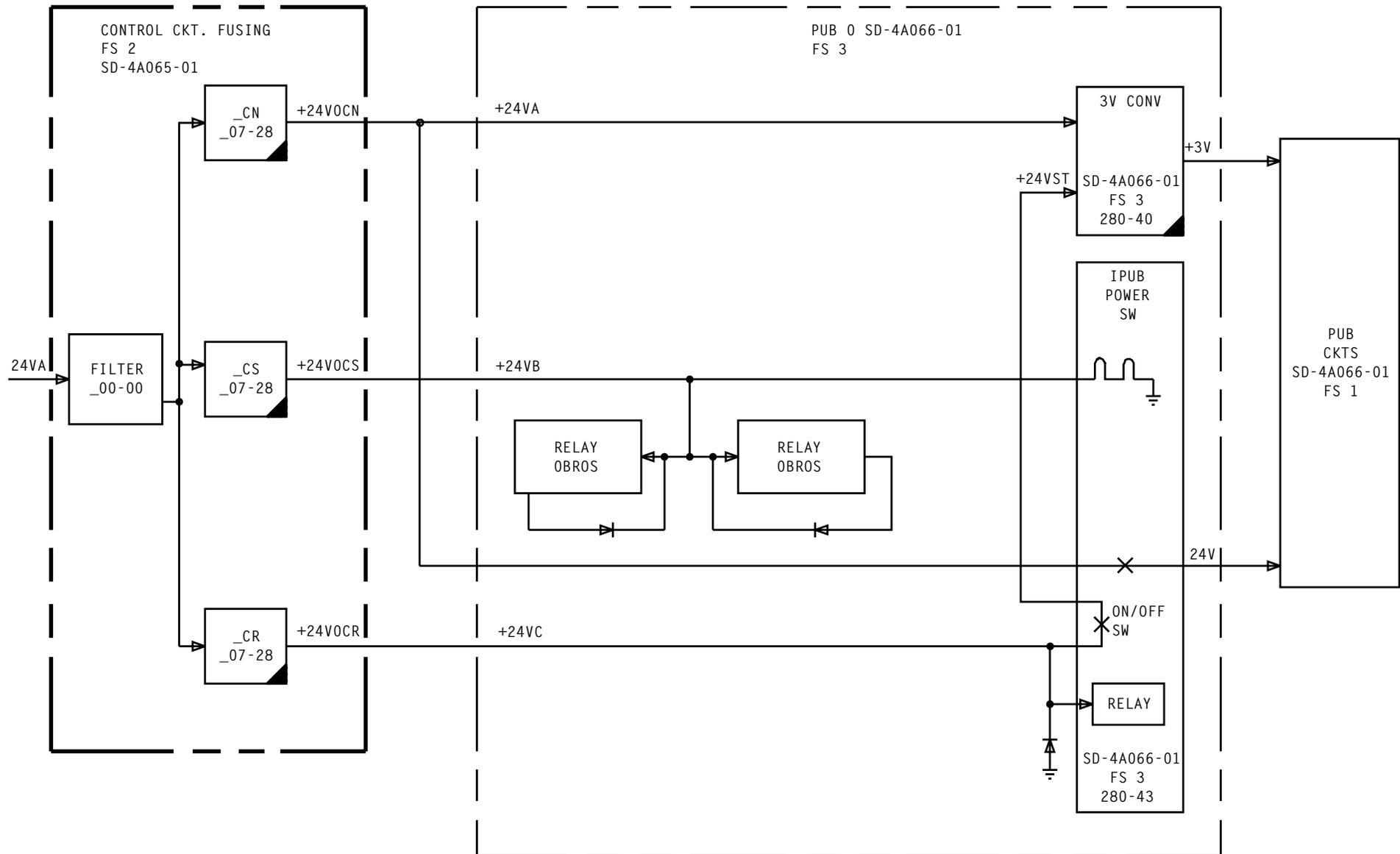
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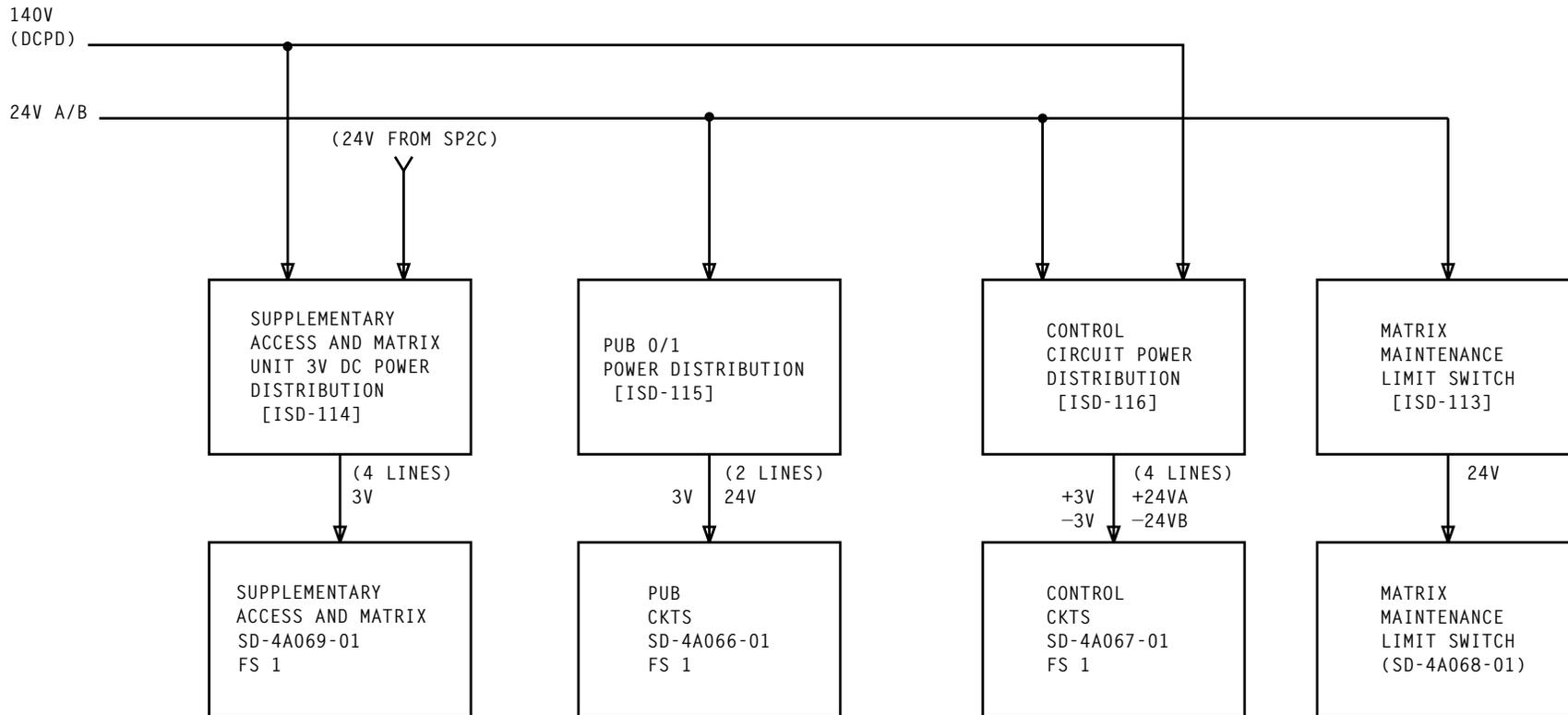
SUPPLEMENTARY ACCESS AND MATRIX UNIT +3V POWER DISTRIBUTION

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PUB 0/1 POWER DISTRIBUTION

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CONTROL FRAME POWER DISTRIBUTION

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[1] Determine if SP is equipped with pulse points and remove [DLP-524]

[2] At 1A 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] Replace blown fuse

[5] At 1A power switch, depress **ON** pushbutton

PWR OFF
lamp goes off

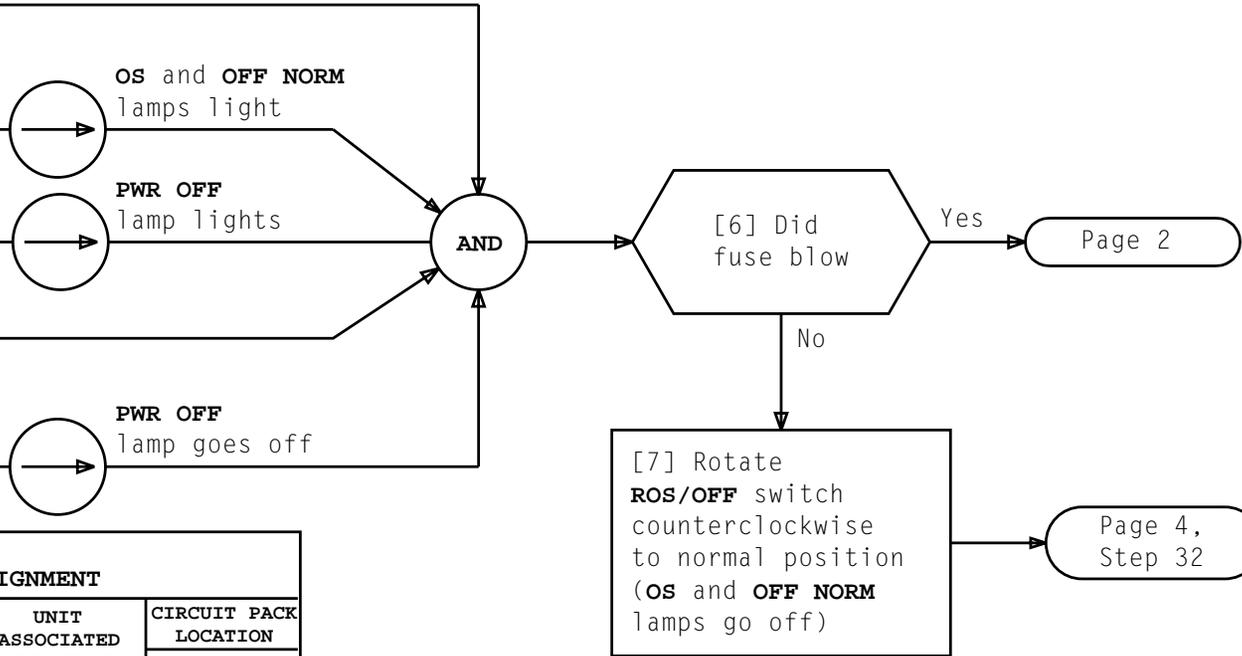
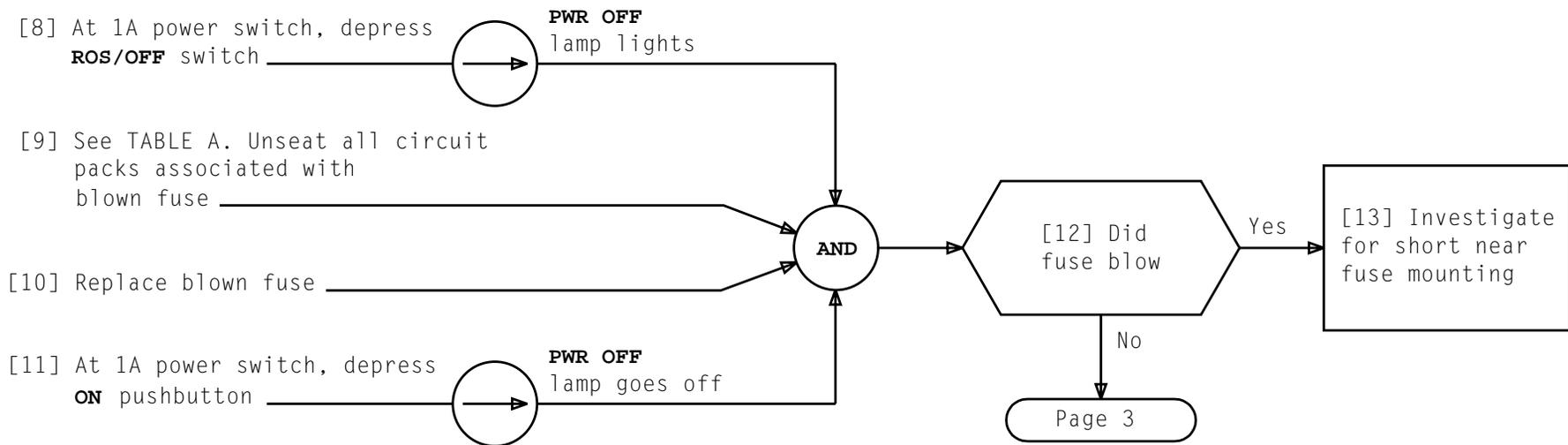


TABLE A FUSE TO CIRCUIT ASSIGNMENT				
FUSE		FUSE LOCATION	UNIT ASSOCIATED WITH FUSE	CIRCUIT PACK LOCATION
BAY 1	BAY 2			BAY 1/2
0BN	1BN	07-43	CC CKT	62-11
				62-12
				66-10
				46-03
0CJ	1CJ	07-28	CC CKT	62-04
				62-08
				66-67
0CN	1CN	07-28	PUB ACC CKT	80-15 through 80-18
BAY 0				
0CG		07-21	+12V	62-11
	1CG	07-21	Ref/Filter	62-46

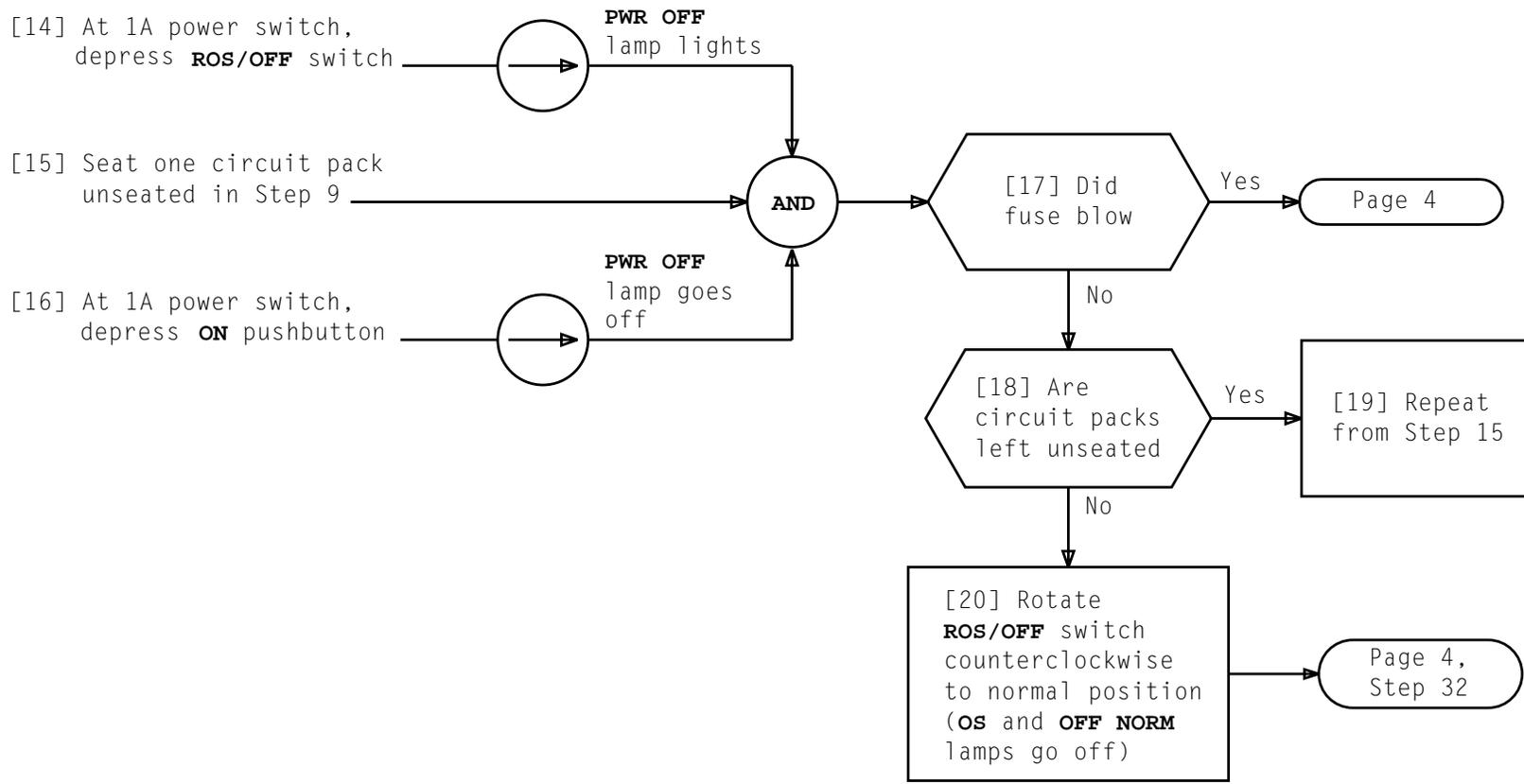
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CLEAR BLOWN FUSE (CIRCUIT PACK ASSOCIATED), CONTROL FRAME



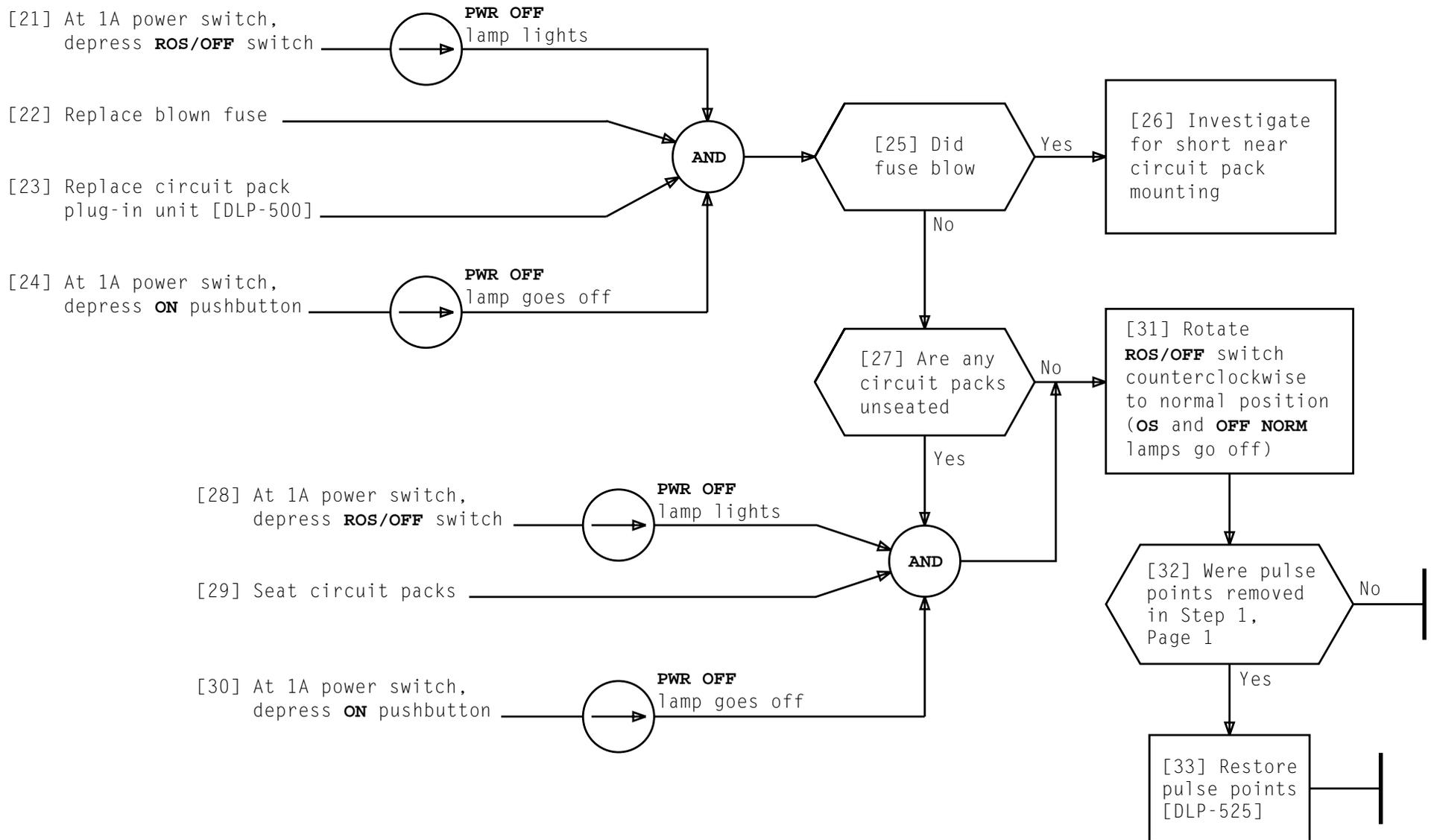
CLEAR BLOWN FUSE (CIRCUIT PACK ASSOCIATED), CONTROL FRAME

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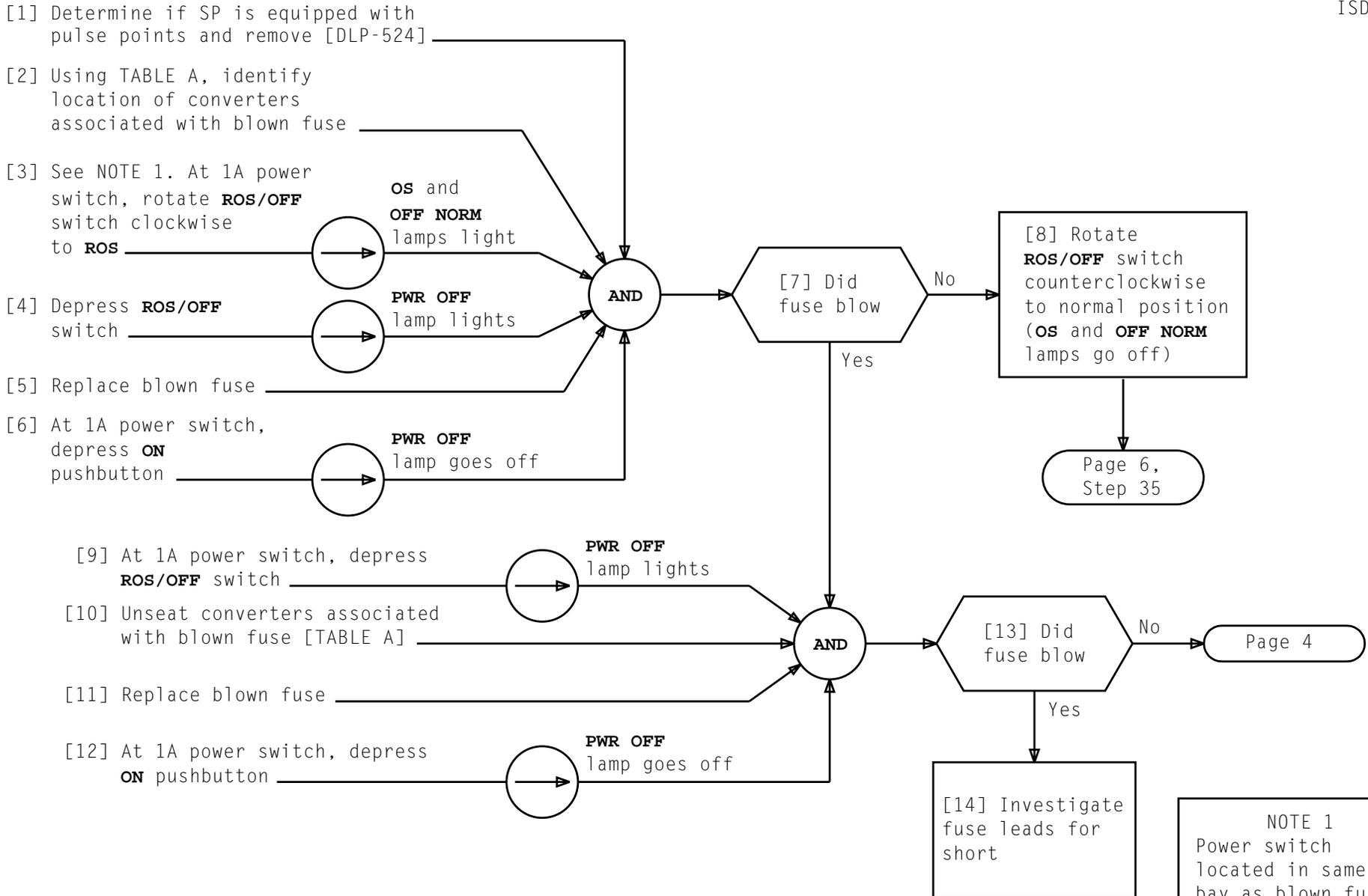
CLEAR BLOWN FUSE (CIRCUIT PACK ASSOCIATED), CONTROL FRAME

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CLEAR BLOWN FUSE (CIRCUIT PACK ASSOCIATED), CONTROL FRAME

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NOTE 1 Power switch located in same bay as blown fuse	
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CLEAR BLOWN FUSE (CONVERTER ASSOCIATED), CONTROL FRAME

TABLE A									
FUSE		FUSE LOCATION BAY 1/2	UNIT ASSOCIATED WITH FUSE	CONVERTER LOCATION BAY 1/2	FUSE		FUSE LOCATION BAY 1/2	UNIT ASSOCIATED WITH FUSE	CONVERTER LOCATION BAY 1/2
BAY 1	BAY 2				BAY 1	BAY 2			
0AA	1AA	07-12	+3V DC-DC CONV	12-02 12-08 17-08 17-02	0AC	1AC	07-12	3V DC-DC CONV	17-26 12-26 17-32 (See CAUTIONS 1 & 2)
0CA	1CA	07-21	+3V DC-DC CONV	12-02 12-08 17-08 17-02	0CC	1CC	07-21	+3V DC-DC CONV	17-26 12-26 17-32 (See CAUTIONS 1 & 2)
0BA	1BA	07-36	+3V DC-DC CONV	12-02 12-08 17-08 17-02	0BC	1BC	07-36	3V DC-DC CONV	17-26 12-26 17-32 (See CAUTIONS 1 & 2)
0AB	1AB	07-12	+3V DC-DC CONV	17-20 17-14 12-20 12-14	0AE	1AE	07-12	3V DC-DC CONV	12-56 17-50 17-59

CAUTIONS

1. Strict adherence to the converter sequence must be followed for reinsertion. Failure to do so may result in SP duplex failure.
2. If converter installed is -3V (J87407B), check for -3V at location *58-01 (* = 1 or 2) before repeating from Step 14

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CLEAR BLOWN FUSE (CONVERTER ASSOCIATED), CONTROL FRAME

TABLE A (Contd)									
FUSE		FUSE LOCATION BAY 1/2	UNIT ASSOCIATED WITH FUSE	CONVERTER LOCATION BAY 1/2	FUSE		FUSE LOCATION BAY 1/2	UNIT ASSOCIATED WITH FUSE	CONVERTER LOCATION
BAY 1	BAY 2				BAY 1	BAY 2			
0CB	1CB	07-21	+3V DC-DC CONV	17-20 17-14 12-20 12-14	0CE	1CE	07-21	3V DC-DC CONV	12-56 17-50 17-59
0BB	1BB	07-36	+3V DC-DC CONV	17-20 17-14 12-20 12-14	0BE	1BE	07-36	3V DC-DC CONV	12-56 17-50 17-59
0AF	1AF	07-12	+3V DC-DC CONV	12-68 12-62 17-68	-	1CG	07-21	3V DC-DC CONV	017-62
0CF	1CF	07-21	+3V DC-DC CONV	12-68 12-62 17-68	-	1CH	07-21	3V DC-DC CONV	017-71
0CR	1CR	07-28	3V DC-DC CONV	80-40	0BK	-	07-43	3V DC-DC CONV	017-02
0BF	1BF	07-36	+3V DC-DC CONV	12-68 12-62 17-68	0BJ	-	07-43	3V DC-DC CONV	112-26 112-56 017-11

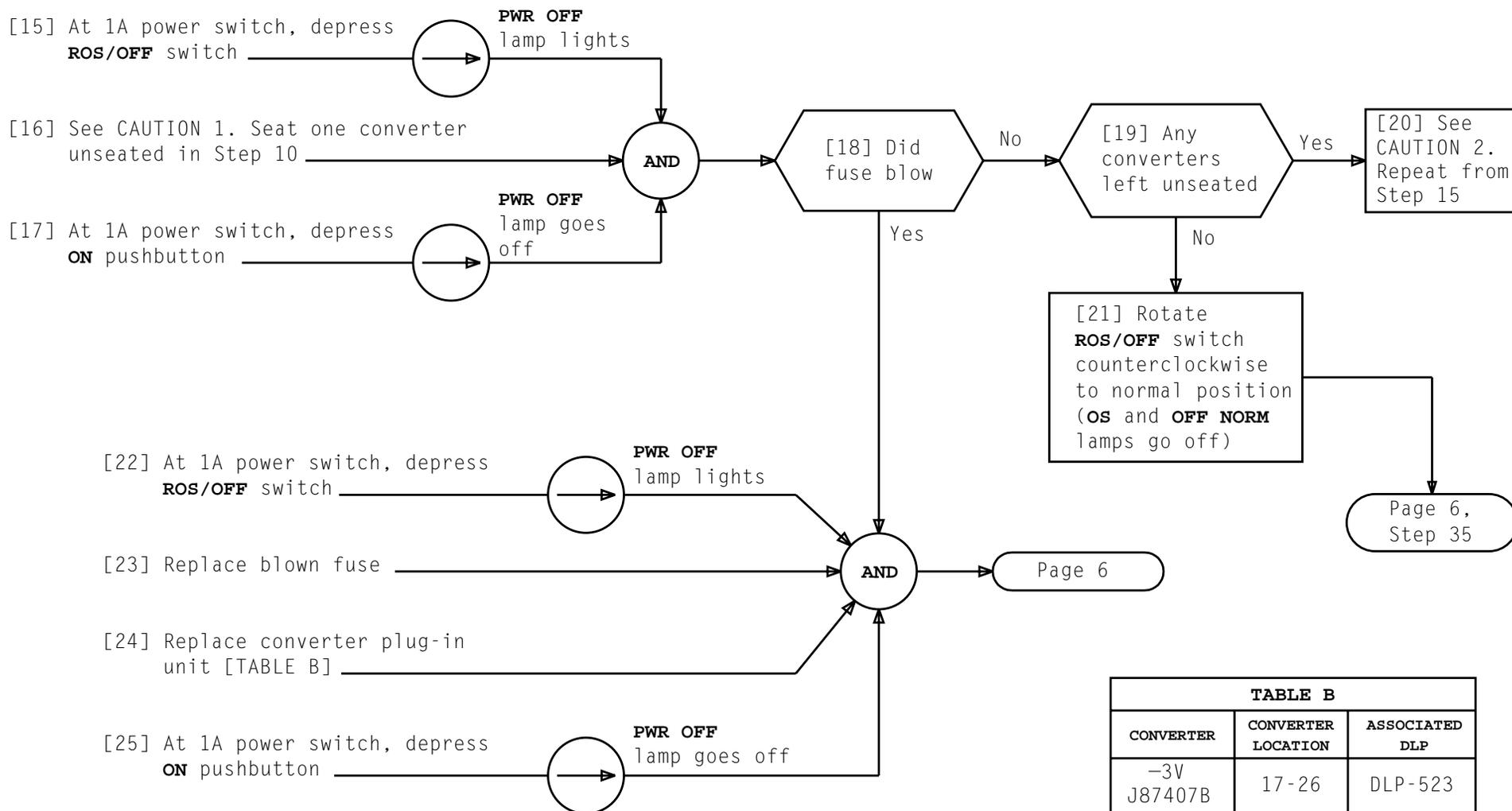
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CLEAR BLOWN FUSE (CONVERTER ASSOCIATED), CONTROL FRAME

TABLE A (Contd)									
FUSE		FUSE LOCATION BAY 1/2	UNIT ASSOCIATED WITH FUSE	CONVERTER LOCATION BAY 1/2	FUSE		FUSE LOCATION BAY 1/2	UNIT ASSOCIATED WITH FUSE	CONVERTER LOCATION
BAY 1	BAY 2				BAY 1	BAY 2			
OCG	-	07-21	3V DC-DC CONV	017-02	-	1BK	07-43	3V DC-DC CONV	017-62
OCH	-	07-21	3V DC-DC CONV	017-11	-	1BJ	07-43	3V DC-DC CONV	017-71
OAF	1AF	07-12	+3V DC-DC CONV	12-68 12-62 17-68	-	1CG	07-21	3V DC-DC CONV	017-62
OCF	1CF	07-21	+3V DC-DC CONV	12-68 12-62 17-68	-	1CH	07-21	3V DC-DC CONV	017-71
OCR	1CR	07-28	3V DC-DC CONV	80-40	0BK	-	07-43	3V DC-DC CONV	017-02
OBF	1BF	07-36	+3V DC-DC CONV	12-68 12-62 17-68	0BJ	-	07-43	3V DC-DC CONV	112-26 112-56 017-11
OCG	-	07-21	3V DC-DC CONV	017-02	-	1BK	07-43	3V DC-DC CONV	017-62
OCH	-	07-21	3V DC-DC CONV	017-11	-	1BJ	07-43	3V DC-DC CONV	017-71

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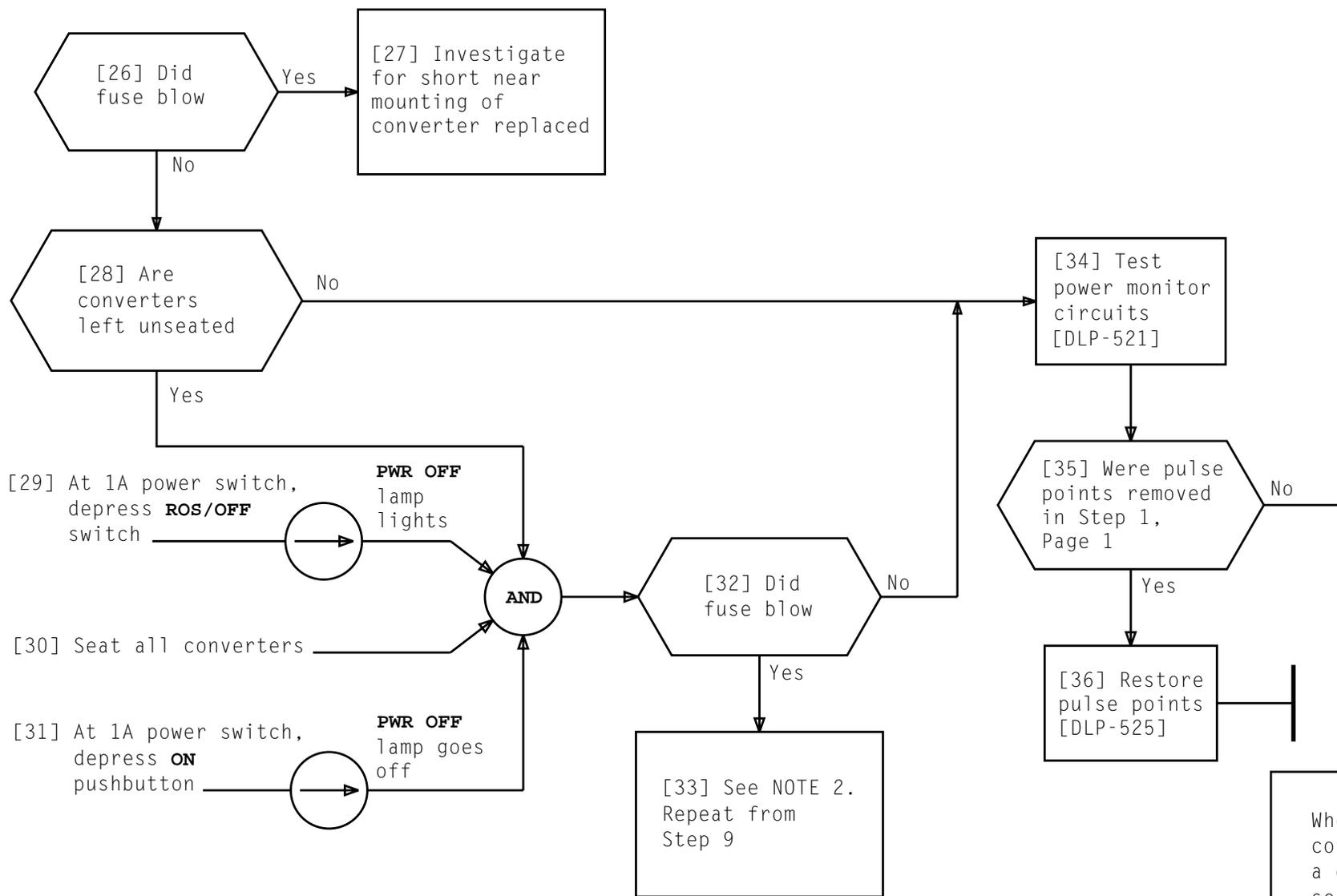
CLEAR BLOWN FUSE (CONVERTER ASSOCIATED), CONTROL FRAME



CONVERTER	CONVERTER LOCATION	ASSOCIATED DLP
-3V J87407B	17-26	DLP-523
+3V J87399A	12-26	DLP-500
+3V J87399A	17-32	DLP-500

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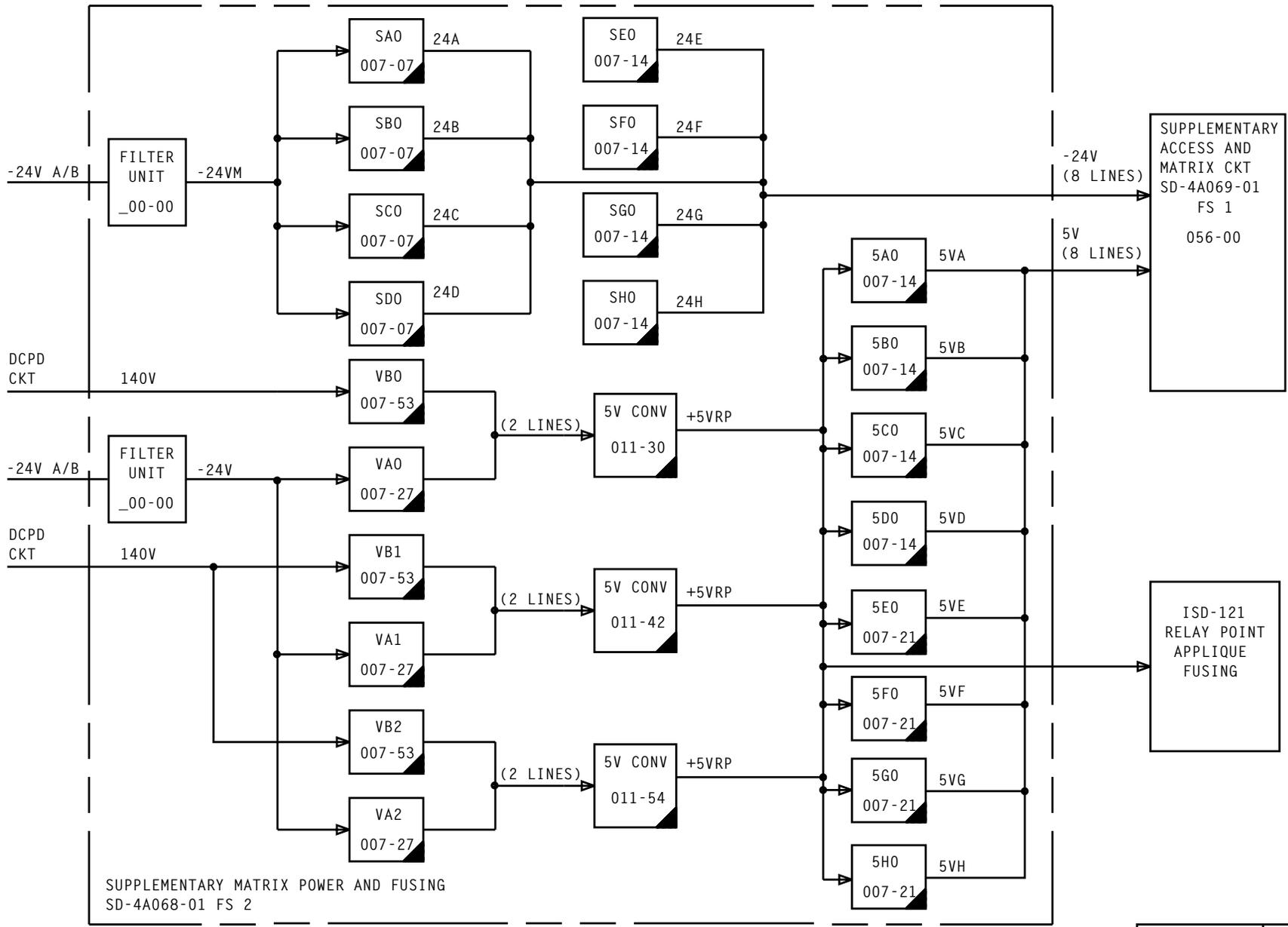
CLEAR BLOWN FUSE (CONVERTER ASSOCIATED), CONTROL FRAME



NOTE 2
When reseating converters, use a different sequence of seating than previously used

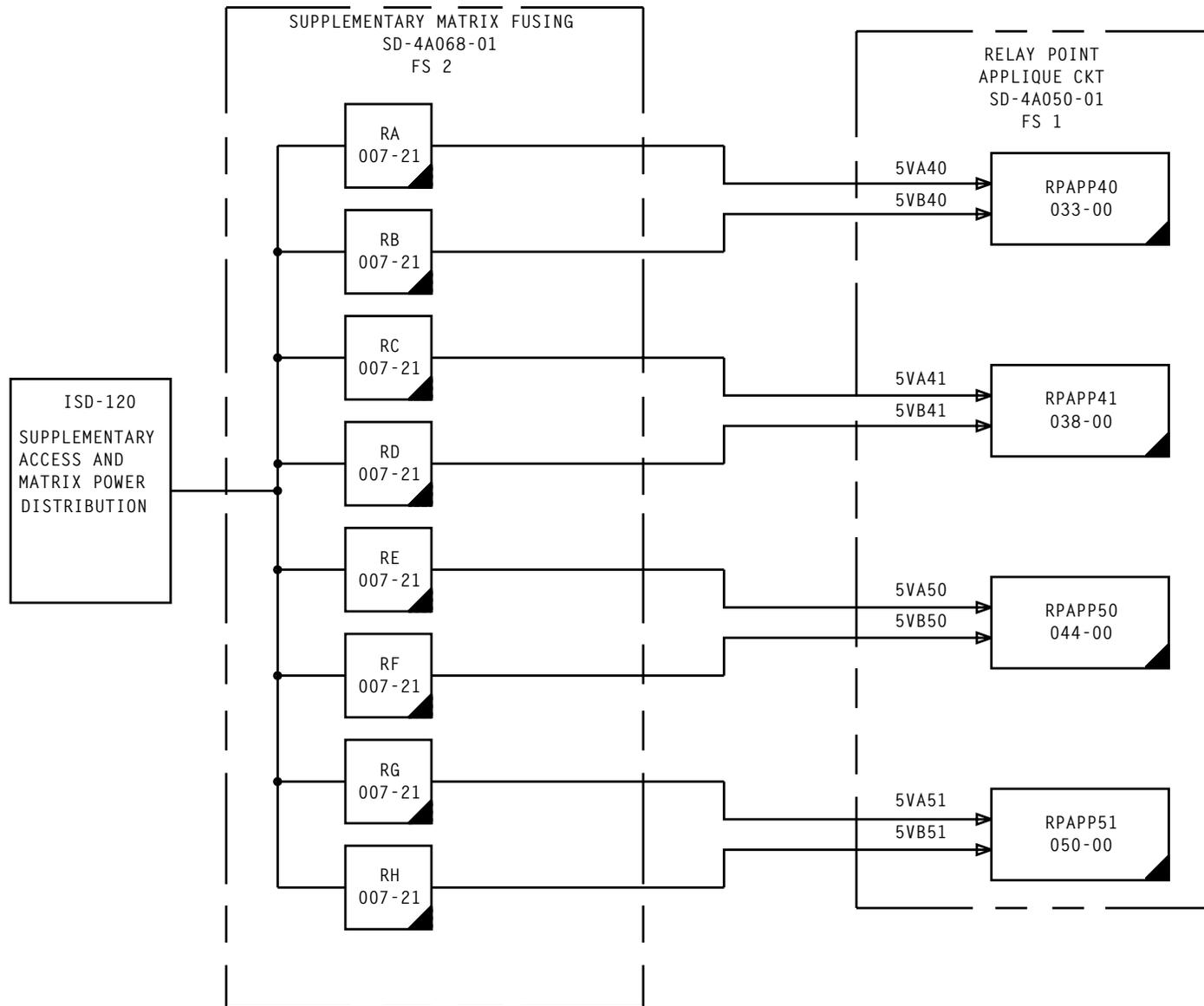
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CLEAR BLOWN FUSE (CONVERTER ASSOCIATED), CONTROL FRAME



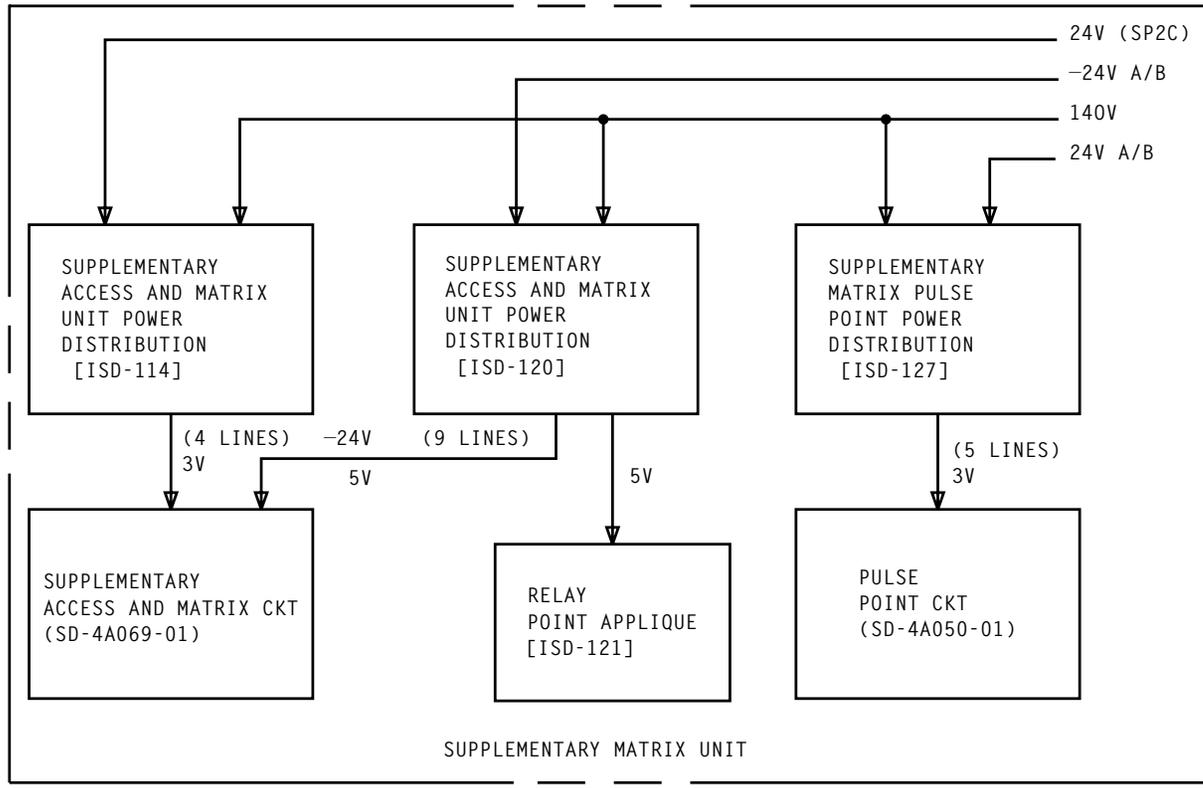
SUPPLEMENTARY ACCESS AND MATRIX UNIT
+5V AND -24V POWER DISTRIBUTION

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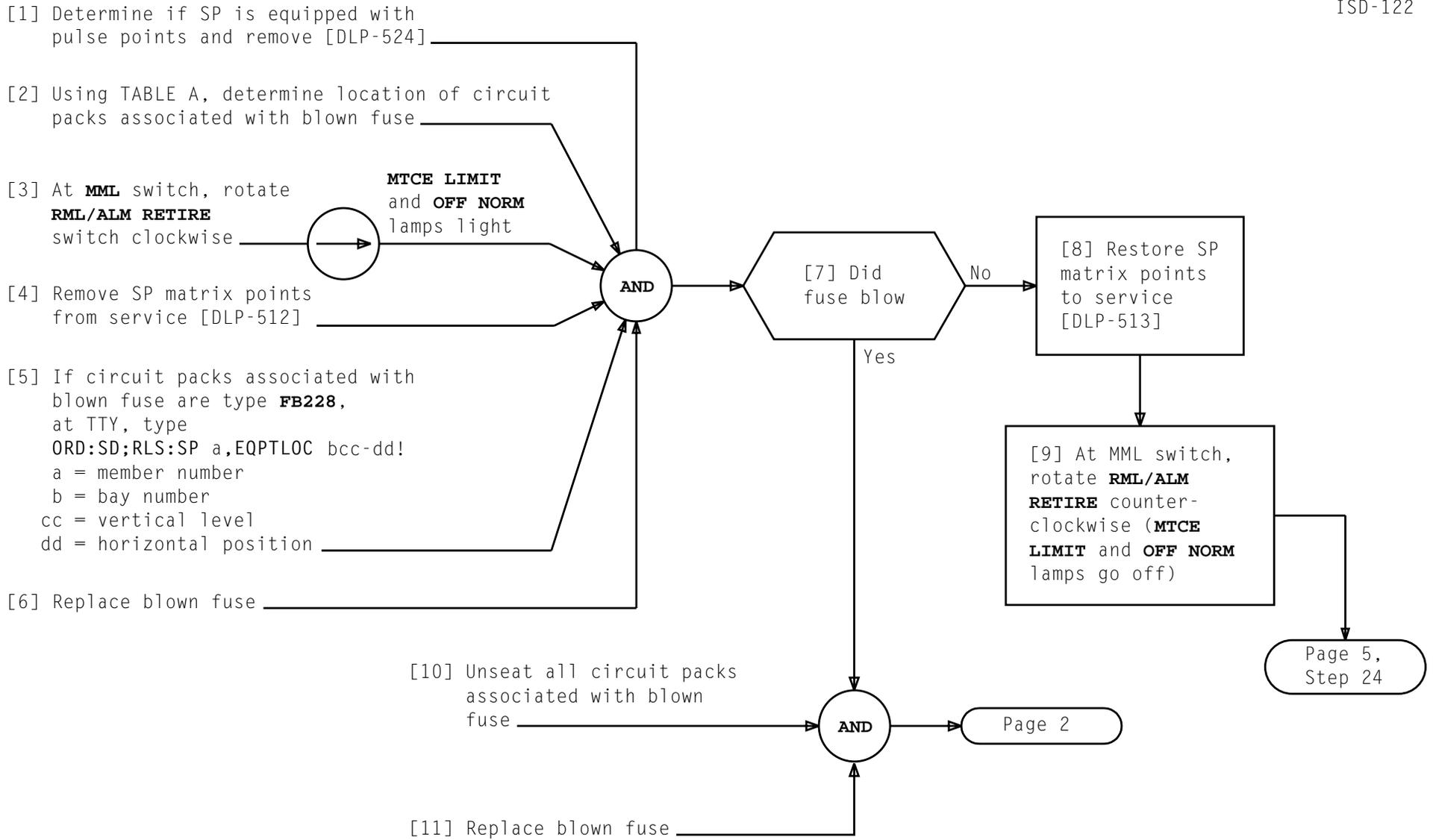
**SUPPLEMENTARY MATRIX FRAME, RELAY POINT APPLIQUE
CIRCUIT POWER DISTRIBUTION**

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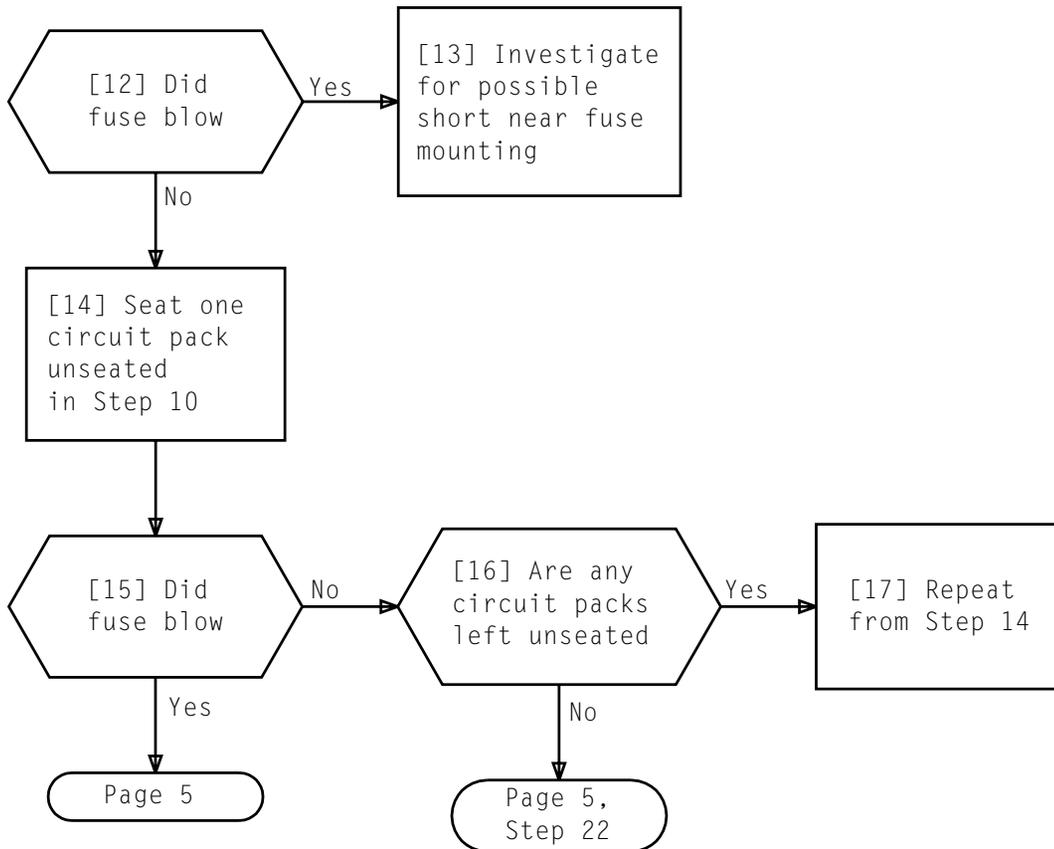
SUPPLEMENTARY MATRIX FRAME POWER DISTRIBUTION

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**CLEAR BLOWN FUSE (FB230/FB228 ASSOCIATED),
 SUPPLEMENTARY MATRIX FRAME**

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**CLEAR BLOWN FUSE (FB230/FB228 ASSOCIATED),
SUPPLEMENTARY MATRIX FRAME**

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TABLE A SUPPLEMENTARY MATRIX FRAME							
FUSE BAY 0	FUSE LOCATION BAY 0	UNIT ASSOCIATED WITH FUSE	CIRCUIT PACK LOCATION BAY 0	FUSE BAY 0	FUSE LOCATION BAY 0	UNIT ASSOCIATED WITH FUSE	CIRCUIT PACK LOCATION BAY 0
SFO	07-14	SAM* CKT	70-38,40,42,44 46,48,50,52	5DO	07-14	SAM* CKT	70-19,21,23,25, 27,29,31,33
SGO	07-14	SAM CKT	70-55,57,59,61, 63,65,67,69	5EO	07-14	SAM CKT	70-37,39,41,43, 45,47,49,51
SHO	07-14	SAM CKT	70-54,56,58,60, 62,64,66,68	5FO	07-14	SAM CKT	70-38,40,42,44, 46,48,50,52
5AO	07-14	SAM CKT	70-02,04,06,08, 10,12,14,16	5GO	07-14	SAM CKT	70-55,57,59,61, 63,65,67,69
5BO	07-14	SAM CKT	70-03,05,07,09, 11,13,15,17	5HO	07-14	SAM CKT	70-54,56,58,60, 62,64,66,68
5CO	07-14	SAM CKT	70-20,22,24,26, 28,30,32,34	RA	07-14	SAM CKT	035-02P,04,05P,07, 08P,10,11P,13, 21P,23,24P,26, 27P,29,30P,32
* Supplementary Access and Matrix							

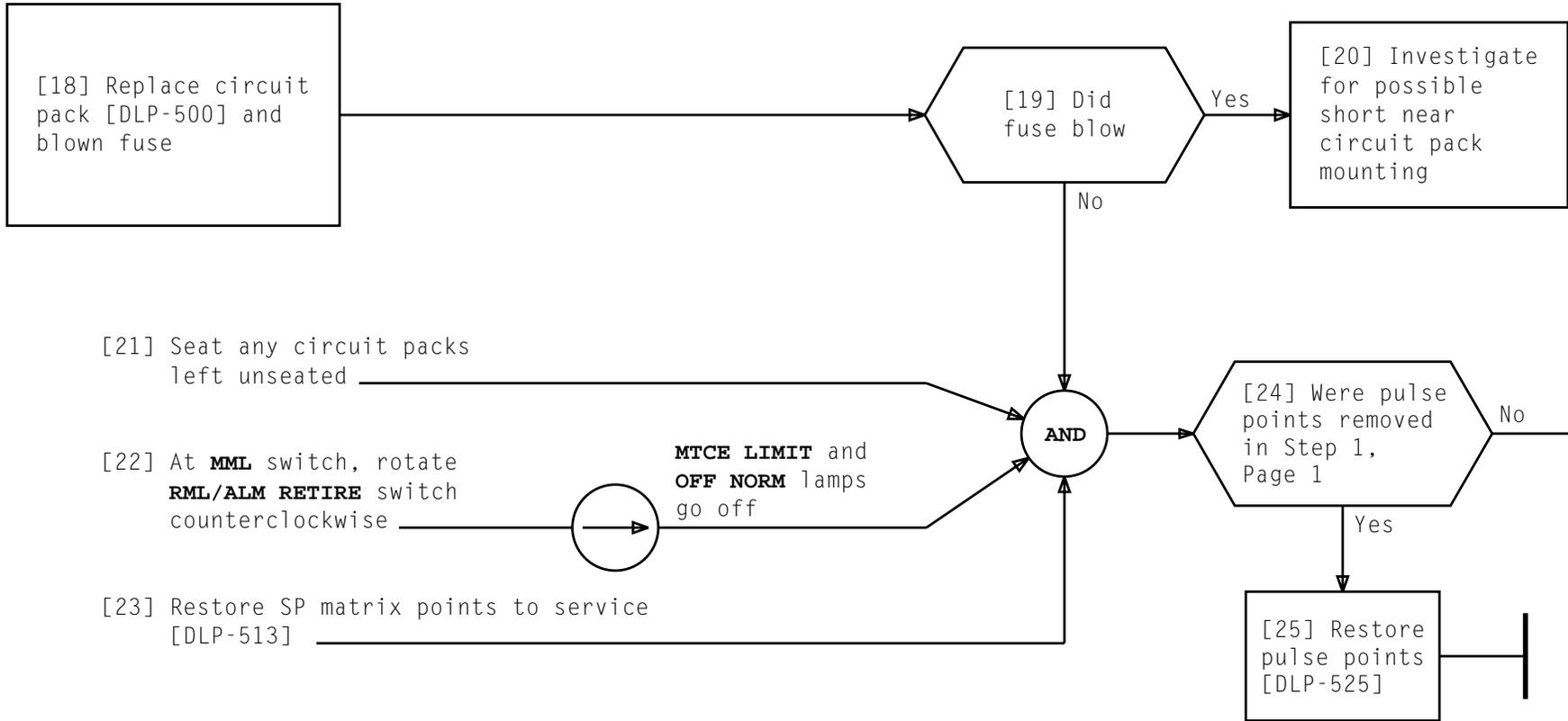
**CLEAR BLOWN FUSE (FB230/FB228 CIRCUIT PACK ASSOCIATED),
SUPPLEMENTARY MATRIX FRAME**

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TABLE A SUPPLEMENTARY MATRIX FRAME (Contd)							
FUSE BAY 0	FUSE LOCATION BAY 0	UNIT ASSOCIATED WITH FUSE	CIRCUIT PACK LOCATION BAY 0	FUSE BAY 0	FUSE LOCATION BAY 0	UNIT ASSOCIATED WITH FUSE	CIRCUIT PACK LOCATION BAY 0
RB	07-21	RPAPP CKT	35-38P,40,41P,43, 44P,46,47P,49, 57P,59,60P,62, 63P,65,66P,68	RG	07-27	RPAPP CKT	52-02P,04,05P,07, 08P,10,11P,13, 21P,23,24P,26, 27P,29,30P,32
RC	07-21	RPAPP CKT	40-02P,04,05P,07, 08P,10,11P,13, 21P,23,24P,26, 27P,29,30P,32	RH	07-27	RPAPP CKT	52-38P,40,41P,43, 44P,46,47P,49, 57P,59,60P,62, 63P,65,66P,68
RD	07-21	RPAPP CKT	40-38P,40,41P,43, 44P,46,47P,49, 57P,59,60P,62, 63P,65,66P,68	SAO	07-07	SAM CKT	70-02,04,06,08 10,12,14,16
				SBO	07-07	SAM CKT	70-03,05,07,09, 11,13,15,17
RE	07-27	RPAPP CKT	46-02P,04,05P,07, 08P,10,11P,13, 21P,23,24P,26, 27P,29,30P,32	SCO	07-07	SAM CKT	70-20,22,24,26, 28,30,32,34
				SDO	07-07	SAM CKT	70-19,21,23,25, 27,29,31,33
RF	07-27	RPAPP CKT	46-38P,40,41P,43, 44P,46,47P,49, 57P,59,60P,62, 63P,65,66P,68	SEO	07-14	SAM CKT	70-37,39,41,43, 45,47,49,51

**CLEAR BLOWN FUSE (FB230/FB228 ASSOCIATED),
SUPPLEMENTARY MATRIX FRAME**

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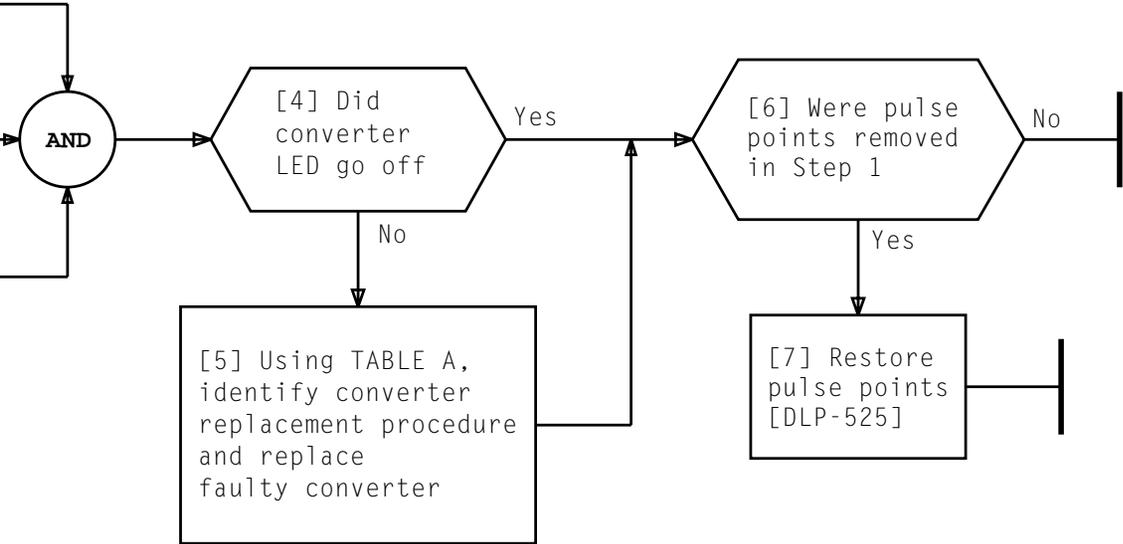
**CLEAR BLOWN FUSE (FB230/FB228 ASSOCIATED),
SUPPLEMENTARY MATRIX FRAME**

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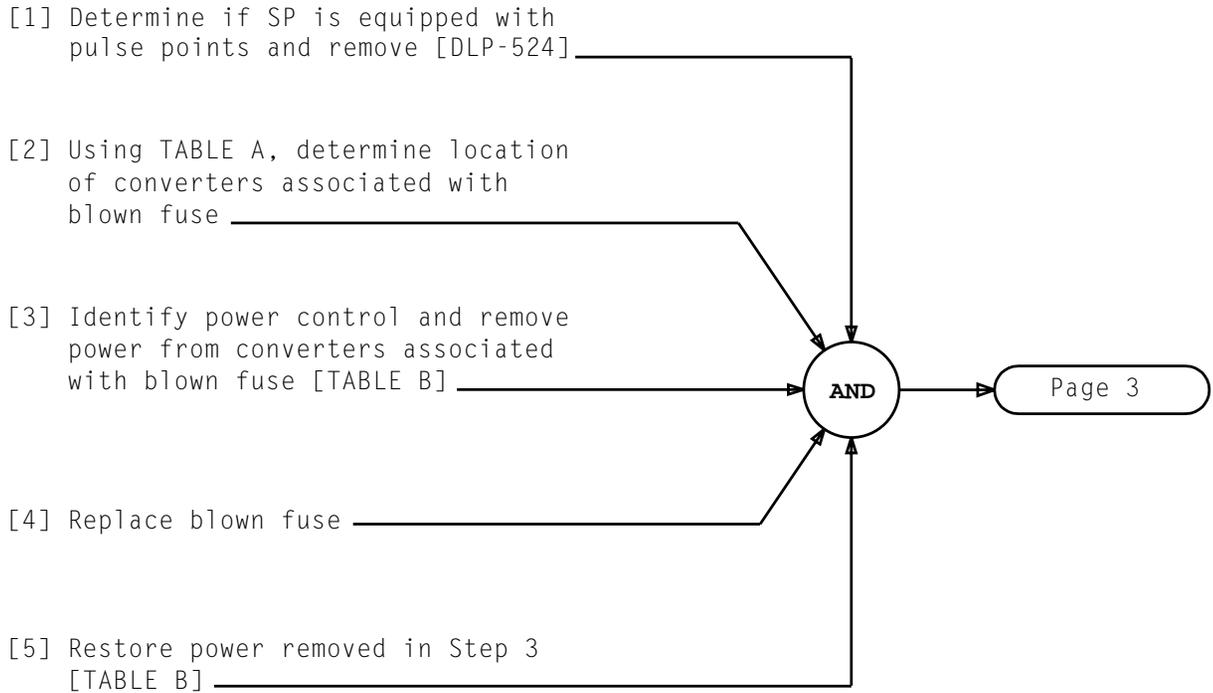
[1] Determine if SP is equipped with pulse points and remove [DLP-524]

[2] Using TABLE A, identify name of power control associated with converter having LED lamp lighted

[3] Test power monitor circuits [DLP-521]



CONVERTER LOCATION				POWER CONTROL SWITCH			CONVERTER REPLACEMENT PROCEDURE	
FRAME	BAY	VERTICAL	HORIZONTAL	NAME	LOCATION			
					BAY	VERTICAL		HORIZONTAL
Control	1/2	80	40	IPUB 0/1	1	80	42	DLP-519
	1/2	All others		CONTR 0/1	1/2	46	03	DLP-519
Supplementary matrix	0	12	02,05,08,11,14,17,20,23	MML	0	66	36	DLP-518
	0	12	62,65,68,71	PPL/PPR	0	52	72	DLP-519
	0	12	30,42,54	TOGGLE	On converter			DLP-520
	0	17	02,11	CONTR 0	1	46	03	DLP-519
	0	17	62,71	CONTR 1	2	46	03	DLP-519



**CLEAR BLOWN FUSE (CONVERTER ASSOCIATED),
SUPPLEMENTARY MATRIX FRAME**

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TABLE A SUPPLEMENTARY MATRIX FRAME							
FUSE	FUSE LOCATION	UNIT ASSOC W/FUSE	CONVERTER LOCATION	FUSE	FUSE LOCATION	UNIT ASSOC W/FUSE	CONVERTER LOCATION
BAY 0	BAY 0		BAY 0	BAY 0	BAY 0		BAY 0
VA0	07-27	3V DC-DC CONV	11-30	PPA1	007-59	3V DC-DC CONV	12-65
VB0	07-53	3V DC-DC CONV	11-30	PPB2	007-45	3V DC-DC CONV	12-68
VA1	07-27	3V DC-DC CONV	11-42	PPA2	07-65	3V DC-DC CONV	12-68
VB1	07-53	3V DC-DC CONV	11-42	PPB3	07-45	3V DC-DC CONV	12-71
VB2	07-53	3V DC-DC CONV	11-54	PPA3	07-65	3V DC-DC CONV	12-71
VA2	07-27	3V DC-DC CONV	11-54	OAB	07-07	3V DC-DC CONV	17-11
PPB0	007-45	3V DC-DC CONV	12-62	OAA	07-07	3V DC-DC CONV	17-02
PPA0	007-59	3V DC-DC CONV	12-62	1AA	07-65	3V DC-DC CONV	17-62
PPB1	007-45	3V DC-DC CONV	12-65	1AB	07-65	3V DC-DC CONV	17-71

**CLEAR BLOWN FUSE (CONVERTER ASSOCIATED),
SUPPLEMENTARY MATRIX FRAME**

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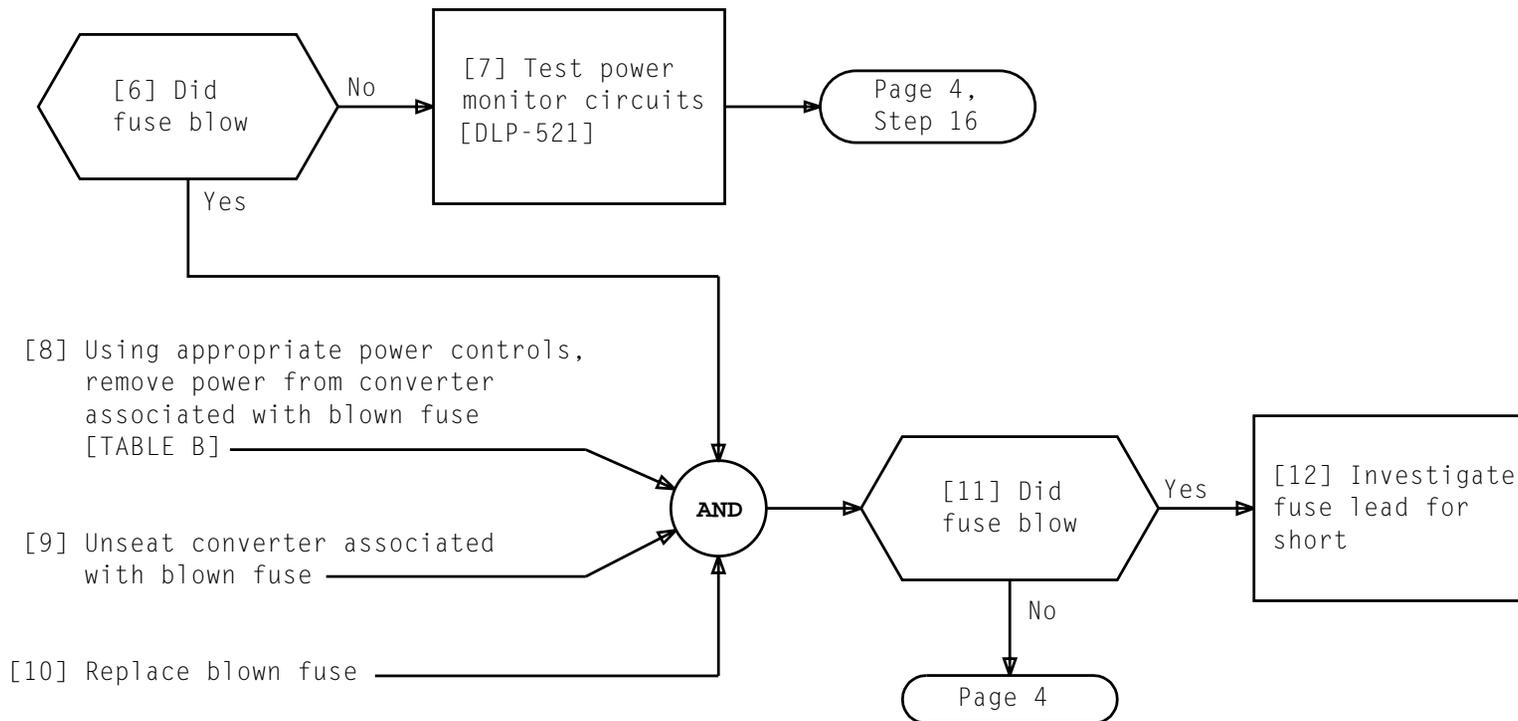
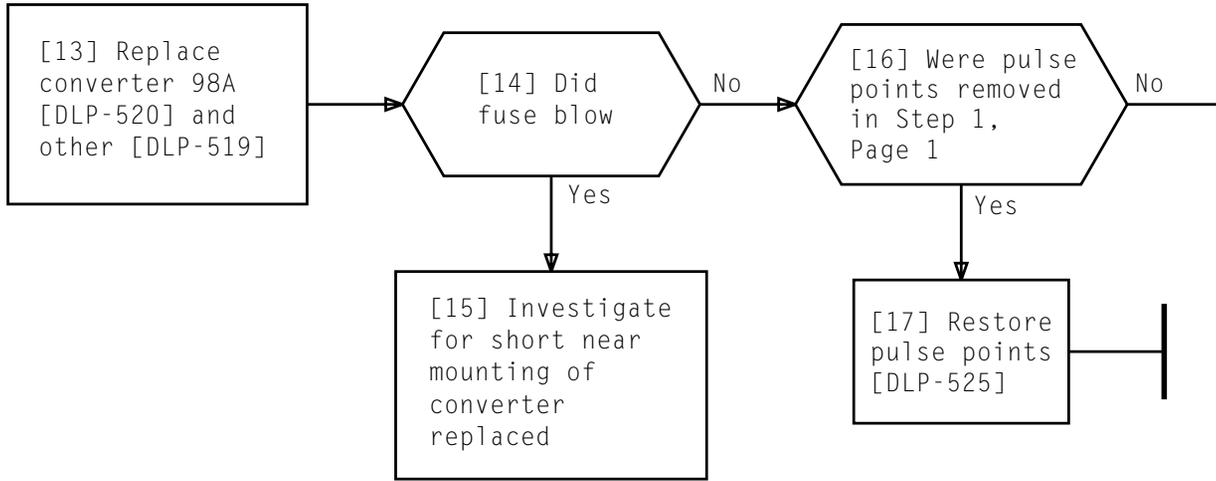


TABLE B CONVERTER POWER SEQUENCE			
CONVERTER LOCATION	POWER CONTROL TYPE	POWER REMOVAL	POWER RESTORAL
17-02,11,62,71	CONTR 0/1 Power switch	Ensure ROS/OFF switch rotated to ROS	Depress ON switch
12-62,65,68,71	PPL Power switch	Depress ROS/OFF switch	
11-30,42,54	Toggle switch (98A converter)	Position ON/OFF toggle switch to OFF	Position ON/OFF toggle switch to ON

**CLEAR BLOWN FUSE (CONVERTER ASSOCIATED),
SUPPLEMENTARY MATRIX FRAME**

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**CLEAR BLOWN FUSE (CONVERTER ASSOCIATED),
SUPPLEMENTARY MATRIX FRAME**

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[1] Determine if SP is equipped with pulse points and remove [DLP-524]

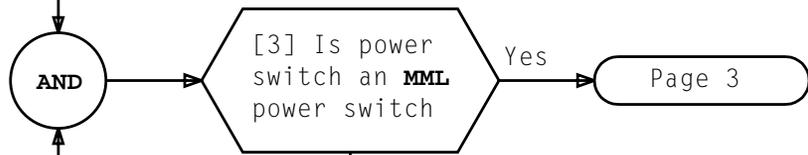
[2] Using TABLE A, determine location of power switch associated with blown fuse

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

[5] At power switch, depress **ROS/OFF** switch

[6] Replace blown fuse

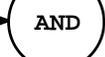
[7] At power switch, depress **ON** pushbutton



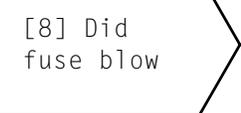
OS and **OFF NORM** lamps light

PWR OFF lamp lights

PWR OFF lamp goes off



Blown fuse replaced



[9] Investigate for short in power switch using SD-4A068-01, FS 4

[10] Rotate **ROS/OFF** switch counterclockwise to normal position (**OS** and **OFF NORM** lamps go off)

Page 3, Step 19

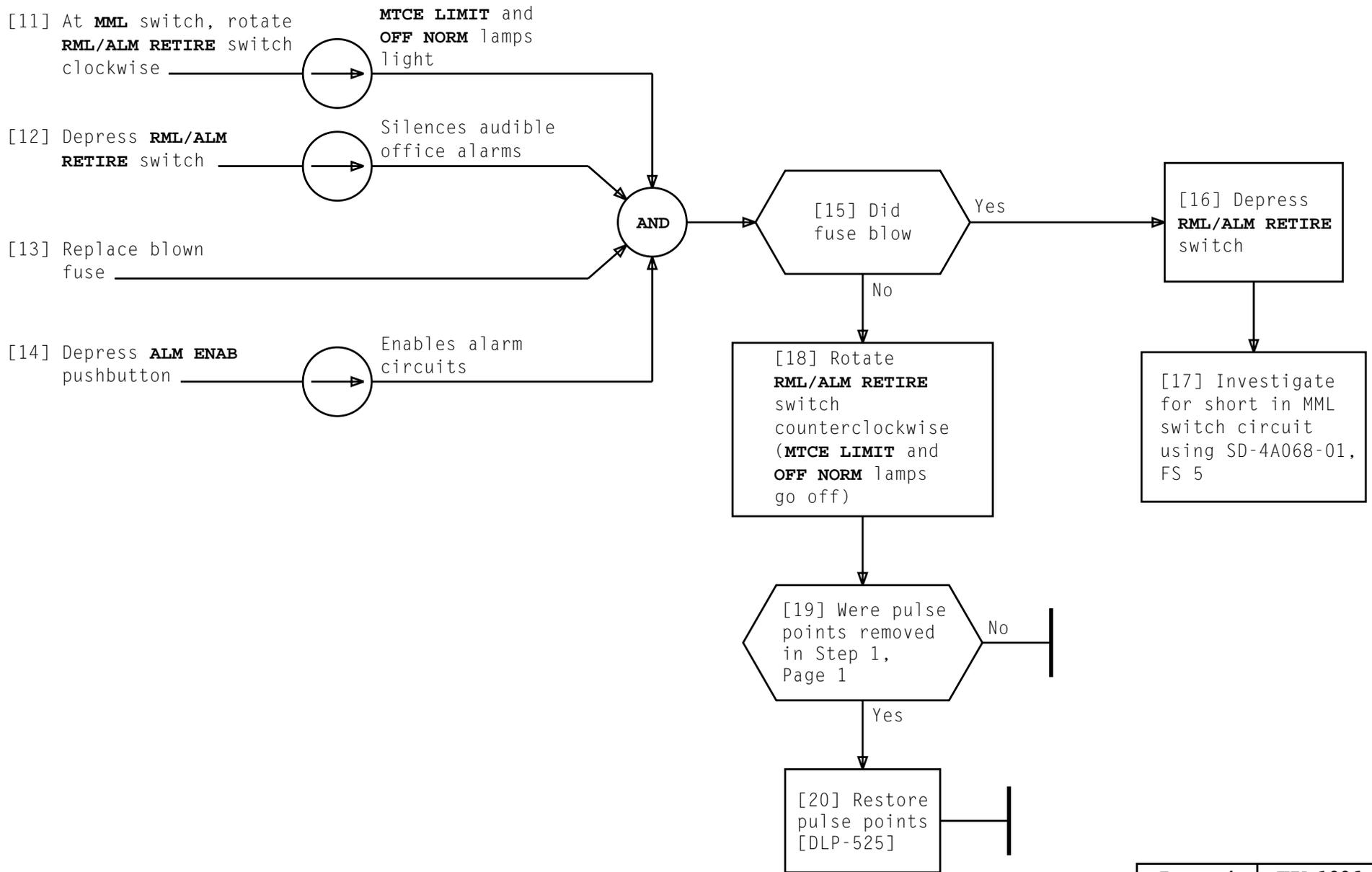
CLEAR BLOWN FUSE (POWER SWITCH ASSOCIATED), CONTROL FRAME

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TABLE A FUSE TO POWER SWITCH ASSIGNMENT				
FUSE		FUSE LOCATION	UNIT ASSOCIATED W/FUSE	POWER SWITCH LOCATION
BAY 1	BAY 2			
0CK	1CK	07-28	Power control circuit	-46-03
0CL	1CL	07-28	Power control circuit	-46-03
0CS	1CS	07-28	IPUB power control	-80-43
(BAY 0) FAT	-	007-45	PPL switch circuit	066-69
(BAY 0) MML	-	007-27	MML switch circuit	066-25

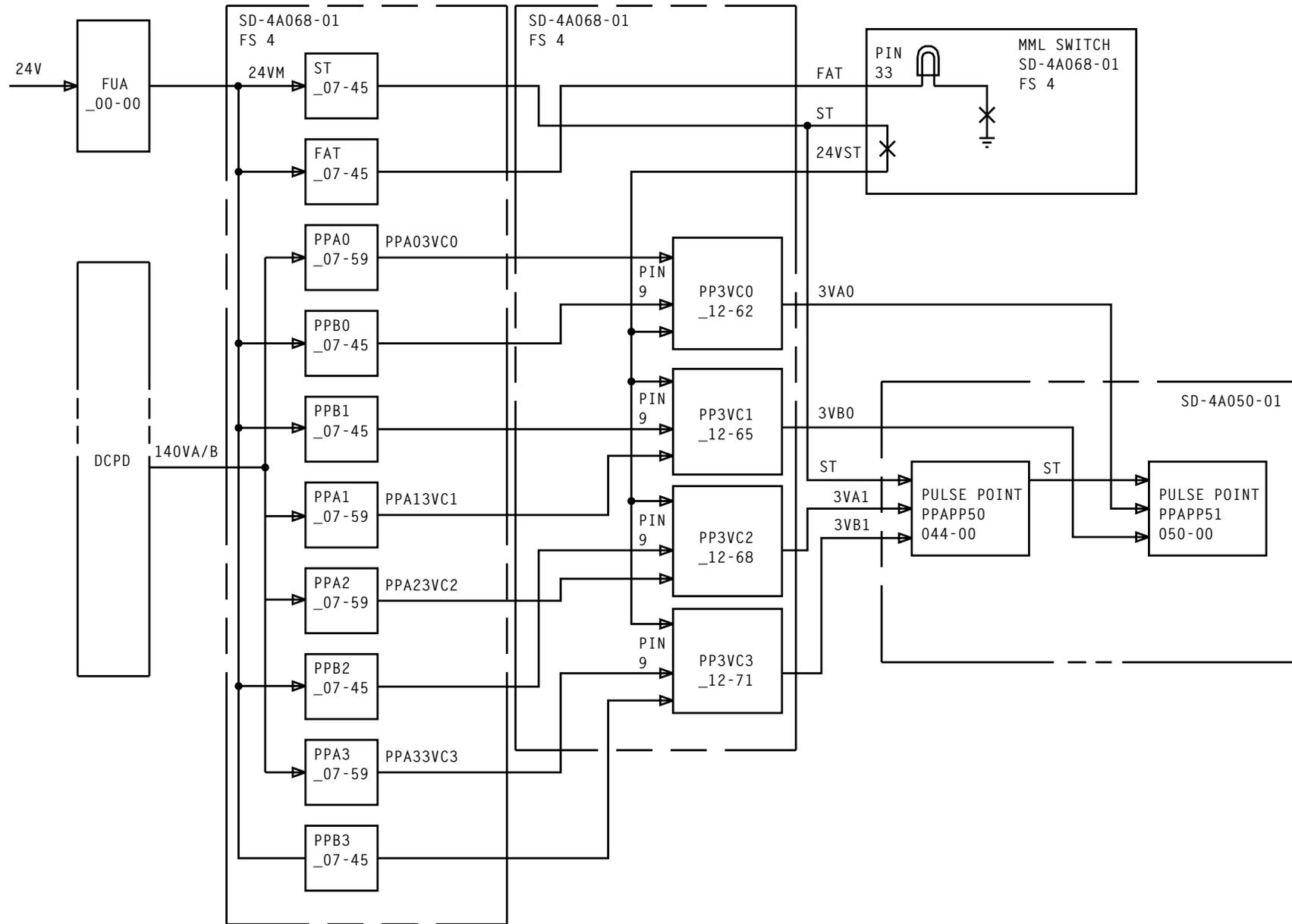
CLEAR BLOWN FUSE (POWER SWITCH ASSOCIATED), CONTROL FRAME

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CLEAR BLOWN FUSE (POWER SWITCH ASSOCIATED), CONTROL FRAME

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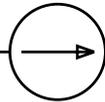
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SUPPLEMENTARY MATRIX PULSE POINT POWER DISTRIBUTION

[1] Determine if SP is equipped with pulse points and remove [DLP-524]

[2] Replace blown **ST** fuse

[3] Depress **ON** pushbutton



PWR OFF lamp goes off



Yes

[6] Using TABLE A, determine location of converters and circuit packs associated with blown fuse

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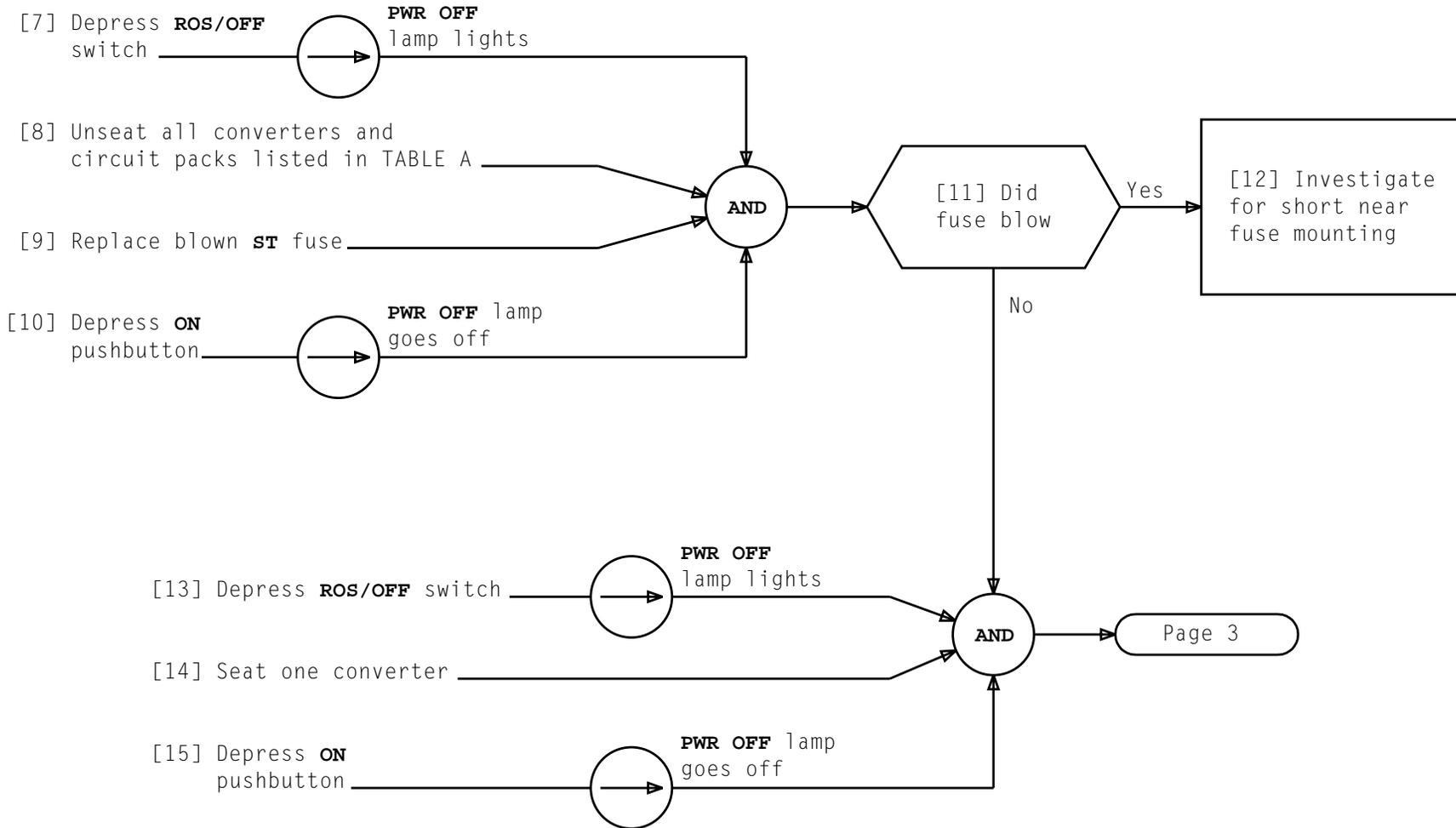
[5] Rotate **ROS/OFF** switch counterclockwise (**OS** and **OFF NORM** lamps go off)

Page 5, Step 41

TABLE A			
FUSE	FRAME ASSOCIATED W/BLOWN FUSE	FUSE LOCATION	CONV/CP LOCATION ASSOCIATED W/BLOWN FUSE
ST	Supplementary matrix	007-45	012-62, 65, 68, 71 *046-ALL *052-ALL
* Circuit packs			

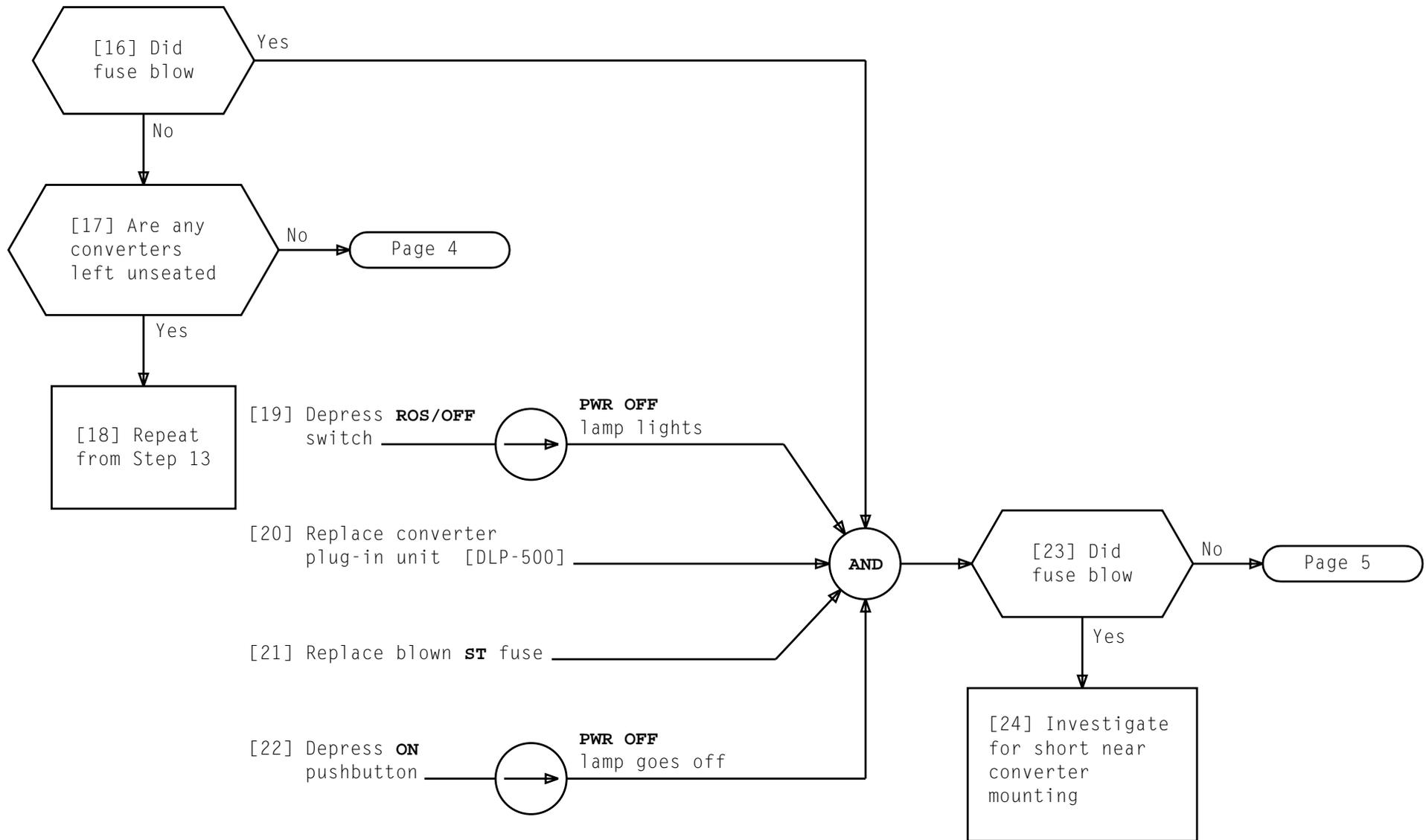
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CLEAR BLOWN ST FUSE, SUPPLEMENTARY MATRIX FRAME



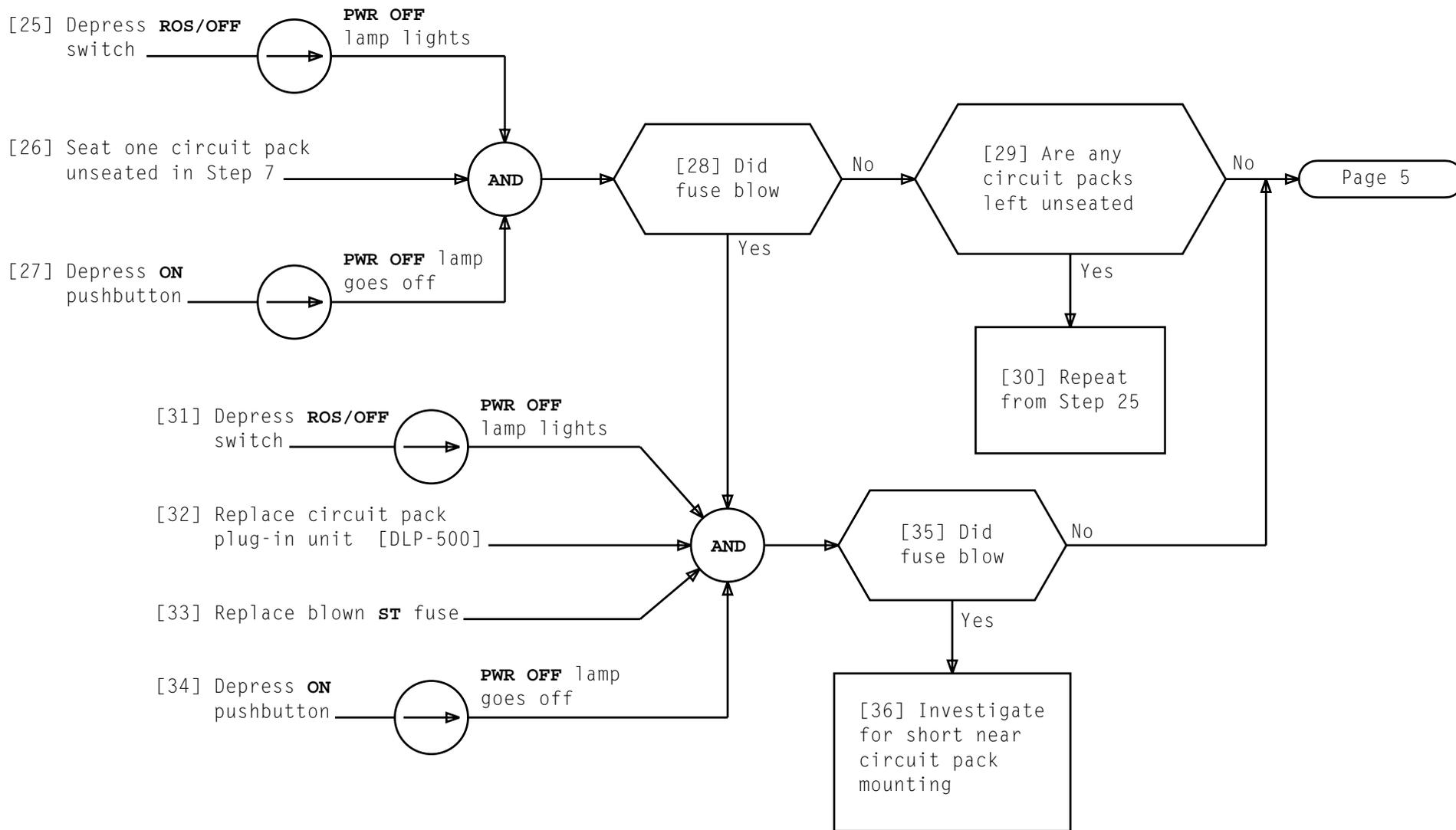
CLEAR BLOWN ST FUSE, SUPPLEMENTARY MATRIX FRAME

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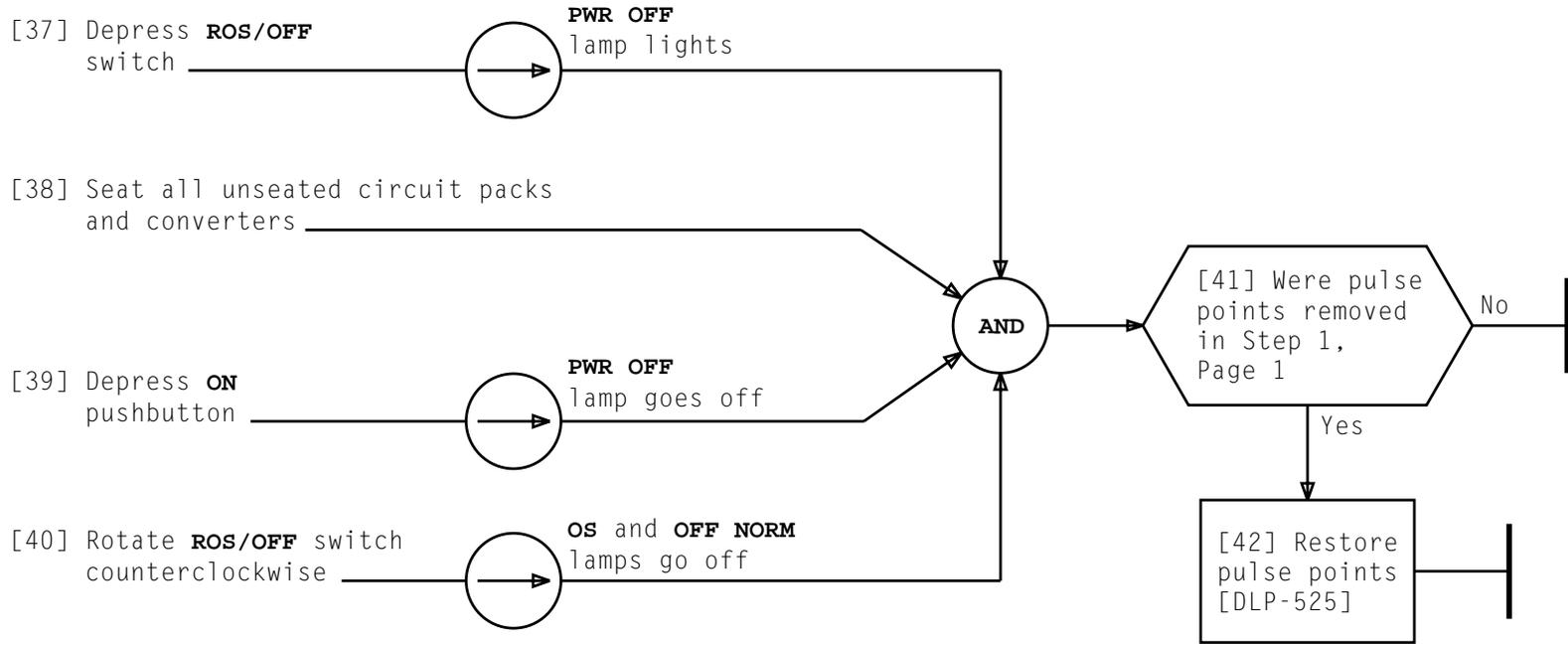
CLEAR BLOWN ST FUSE, SUPPLEMENTARY MATRIX FRAME

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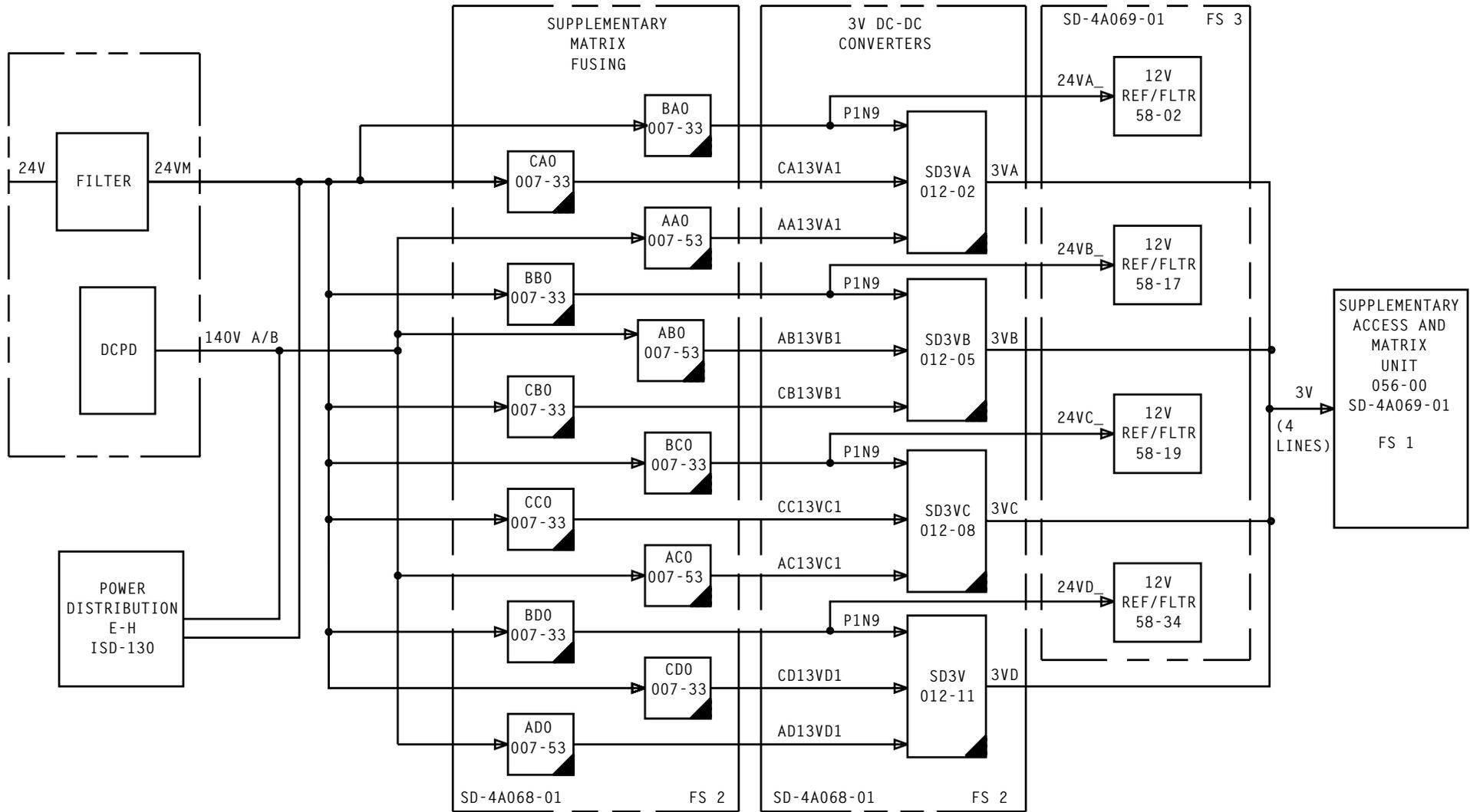
CLEAR BLOWN ST FUSE, SUPPLEMENTARY MATRIX FRAME

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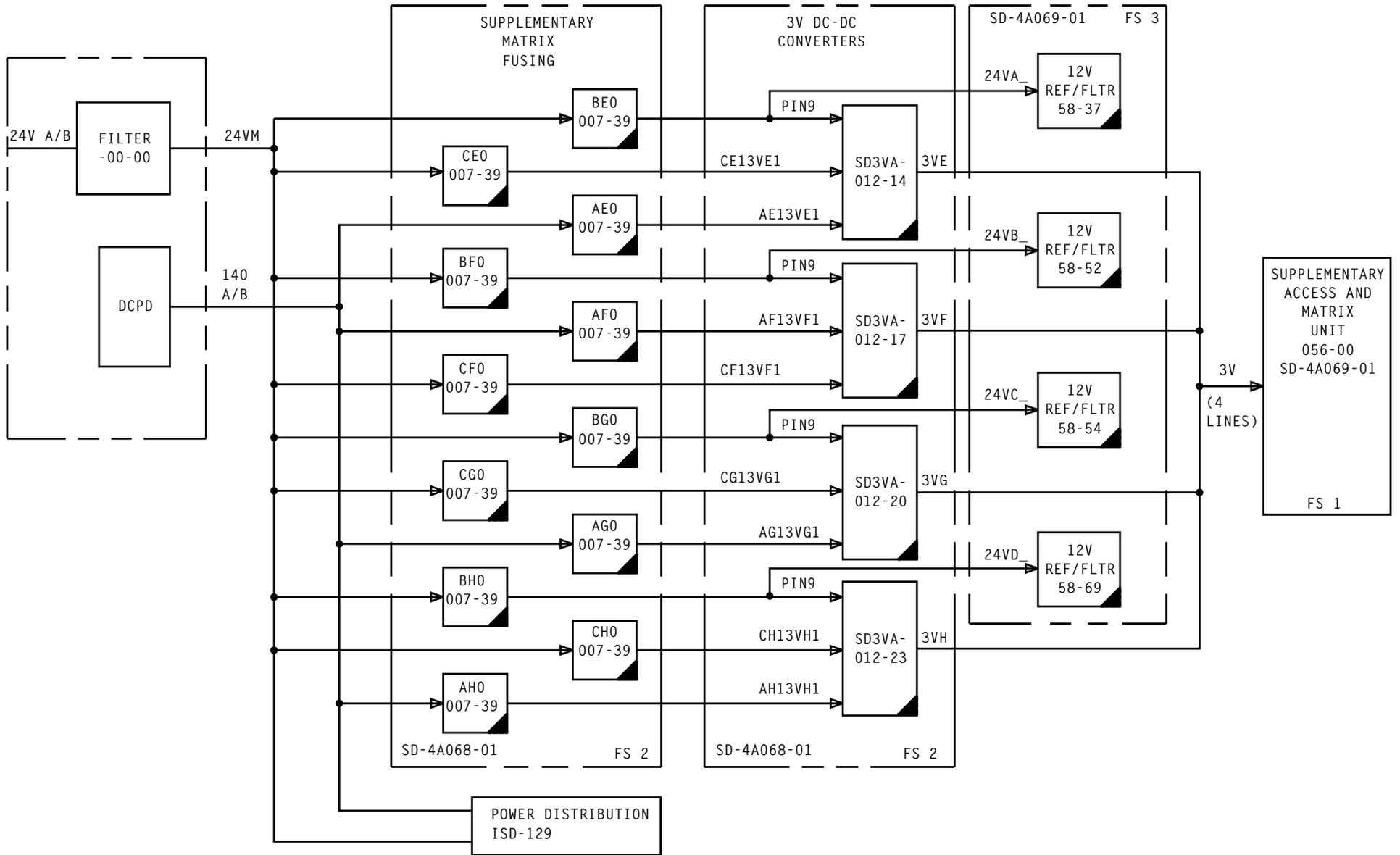
CLEAR BLOWN ST FUSE, SUPPLEMENTARY MATRIX FRAME

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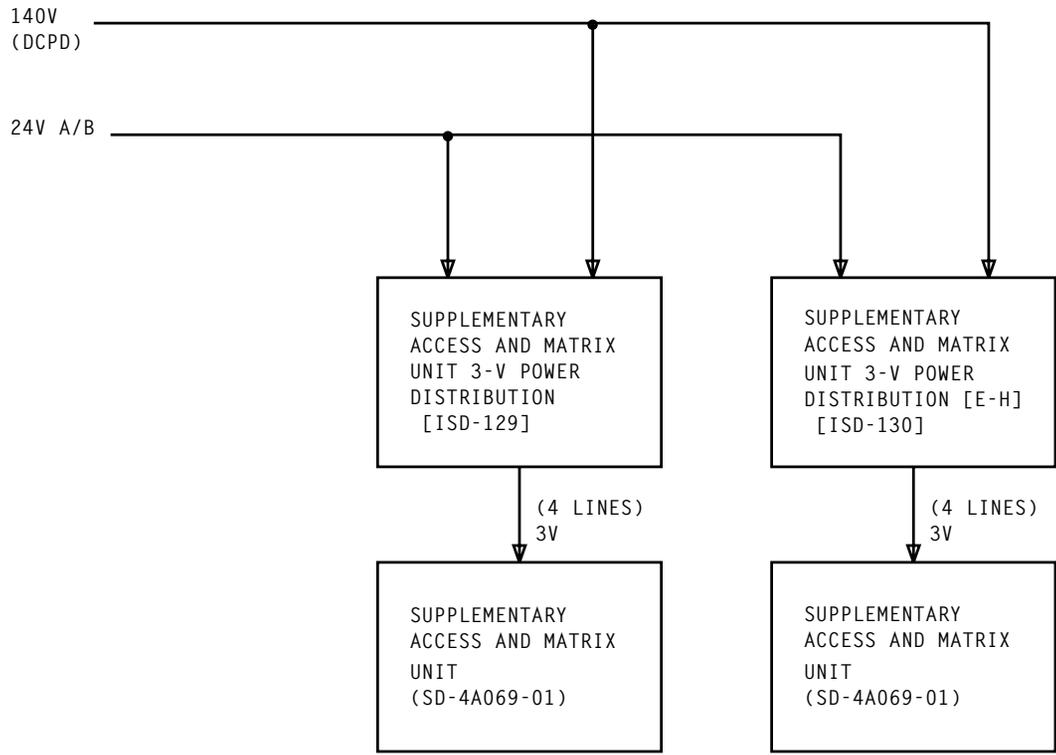
SUPPLEMENTARY ACCESS AND MATRIX UNIT 3-V POWER DISTRIBUTION A-D

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SUPPLEMENTARY ACCESS AND MATRIX UNIT 3-V POWER DISTRIBUTION E-H

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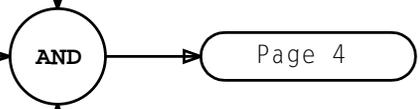
SUPPLEMENTARY MATRIX 3-V POWER DISTRIBUTION

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[1] Determine if SP is equipped with pulse points and remove [DLP-524]

[2] Using TABLE A, determine location of converter/circuit packs associated with blown fuse

[3] Identify and note power control fuses associated with converter [TABLE B]



CLEAR BLOWN FUSE (J87407A CONVERTER/FC78 CIRCUIT PACK ASSOCIATED), SUPPLEMENTARY MATRIX FRAME

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TABLE A SUPPLEMENTARY MATRIX FRAME							
FUSE BAY 0	FUSE LOCATION BAY 0	UNIT ASSOCIATED WITH FUSE	CP/CONV LOCATION BAY 0	FUSE BAY 0	FUSE LOCATION BAY 0	UNIT ASSOCIATED WITH FUSE	CP/CONV LOCATION BAY 0
CB0	007-33	+3V DC-DC CONV	12-05	CD0	007-33	+3V DC-DC CONV	12-11
AC0	007-53	+3V DC-DC CONV	12-05	BE0	007-39	+3V DC-DC CONV circuit pack	12-14 58-37*
BC0	007-33	+3V DC-DC CONV circuit pack	12-08 59-19*	AE0	007-59	+3V DC-DC CONV	12-14
CC0	007-33	+3V DC-DC CONV	12-08	CE0	007-39	+3V DC-DC CONV	12-14
AD0	007-53	+3V DC-DC CONV	12-11	AF0	007-59	+3V DC-DC CONV	12-17
BD0	007-33	+3V DC-DC CONV circuit pack	12-11 58-34*	BF0	007-39	+3V DC-DC CONV circuit pack	12-17 58-52*
* Circuit Pack							

CLEAR BLOWN FUSE (J87407A CONVERTER/FC78 CIRCUIT PACK ASSOCIATED), SUPPLEMENTARY MATRIX FRAME

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TABLE A SUPPLEMENTARY MATRIX FRAME (Contd)							
FUSE BAY 0	FUSE LOCATION BAY 0	UNIT ASSOCIATED WITH FUSE	CP/CONV LOCATION BAY 0	FUSE BAY 0	FUSE LOCATION BAY 0	UNIT ASSOCIATED WITH FUSE	CP/CONV LOCATION BAY 0
CF0	07-39	+3V DC-DC CONV	12-17	CH0	07-39	+3V DC-DC CONV	12-23
AG0	07-59	+3V DC-DC CONV	12-20	BA0	07-33	+3V DC-DC CONV circuit pack	12-02 58-02*
BG0	07-39	+3V DC-DC CONV circuit pack	12-20 58-54*	CA0	07-33	+3V DC-DC CONV	12-02
CG0	07-39	+3V DC-DC CONV	12-20	AA0	07-53	+3V DC-DC CONV	12-02
AH0	07-59	+3V DC-DC CONV	12-23	AB0	07-53	+3V DC-DC CONV	12-05
BH0	07-39	+3V DC-DC CONV circuit pack	12-23 58-69* 62-46*	BB0	07-33	+3V DC-DC CONV circuit pack	12-05 58-17* 62-11*
* Circuit Pack							

CLEAR BLOWN FUSE (J87407A CONVERTER/FC78 CIRCUIT PACK ASSOCIATED), SUPPLEMENTARY MATRIX FRAME

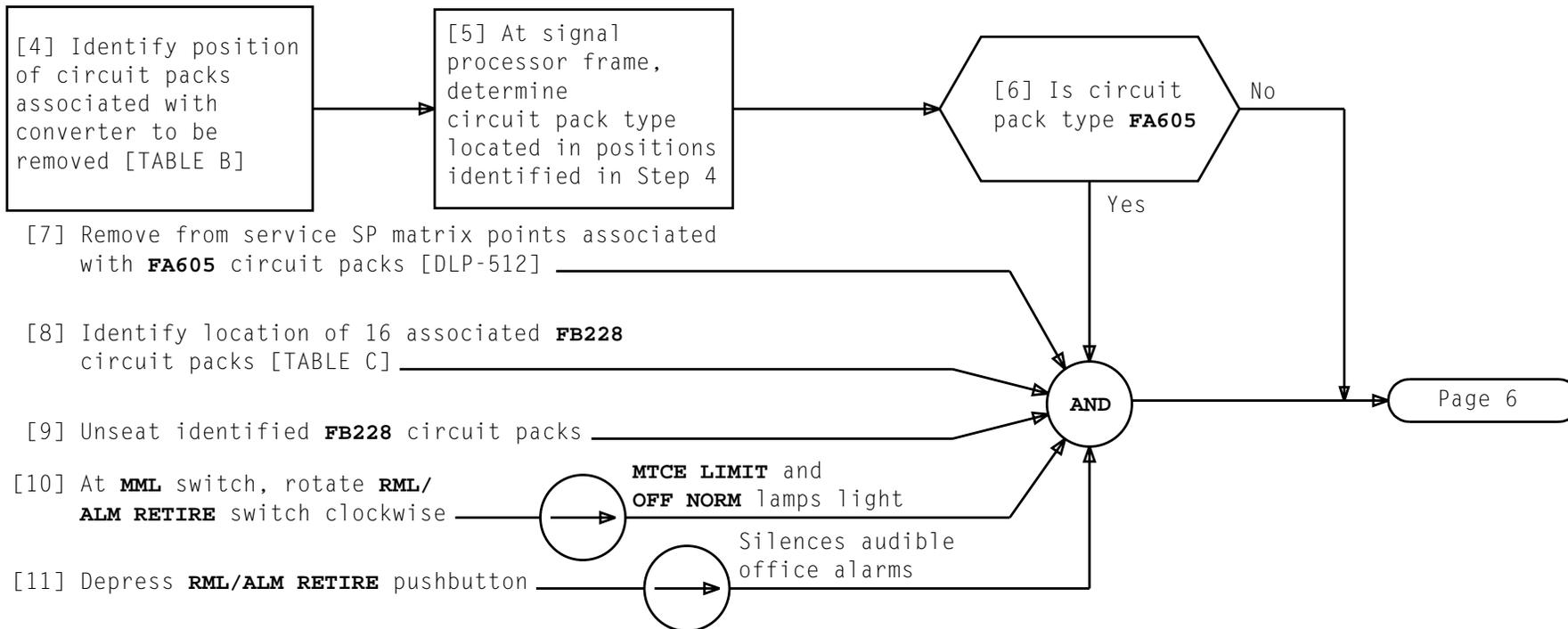


TABLE B - SUPPLEMENTARY MATRIX UNIT POWER (BAY 0)

CONVERTER LOCATION	ASSOCIATED PACK		CONTROL FUSE		START FUSE		140V FUSE	
	VERT	HORIZONTAL	LOCATION	NAME	LOCATION	NAME	LOCATION	NAME
12-02	58	04,05,07,08	07-33	BA0	07-33	CA0	07-53	AA0
12-05	58	11,12,14,15	07-33	BB0	07-33	CB0	07-53	AB0
12-08	58	21,22,24,25	07-33	BC0	07-33	CC0	07-53	AC0
12-11	58	28,29,31,32	07-33	BD0	07-33	CD0	07-53	AD0
12-14	58	39,40,42,43	07-39	BE0	07-39	CE0	07-59	AE0
12-17	58	46,47,49,50	07-39	BF0	07-39	CF0	07-59	AF0
12-20	58	56,57,59,60	07-39	BG0	07-39	CG0	07-59	AG0
12-23	58	63,64,66,67	07-39	BH0	07-39	CH0	07-59	AH0

CLEAR BLOWN FUSE (J87407A CONVERTER/FC78 CIRCUIT PACK ASSOCIATED), SUPPLEMENTARY MATRIX FRAME

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TABLE C

FRAME	FA605 LOCATION			ASSOCIATED FA228 PACK LOCATION			FRAME	FA605 LOCATION			ASSOCIATED FB228 PACK LOCATION						
	BAY	VERT	HOR	BAY	VERT	HOR		BAY	VERT	HOR	BAY	VERT	HOR				
Supplementary matrix	0	58	04	0	33	02P, 04, 05P, 07	Supplementary matrix	0	58	39	0	44	02P, 04, 05P, 07				
			05			08P, 10, 11P, 13				40			08P, 10, 11P, 13				
			07			21P, 23, 24P, 26				42			21P, 23, 24P, 26				
			08			27P, 29, 30P, 32				43			27P, 29, 30P, 32				
			11			38P, 40, 41P, 43				46			38P, 40, 41P, 43				
			12			44P, 46, 47P, 49				47			44P, 46, 47P, 49				
			14			57P, 59, 60P, 62				49			57P, 59, 60P, 62				
			15			0				33			63P, 65, 66P, 68	50	0	44	63P, 65, 66P, 68
			21			0				38			02P, 04, 05P, 07	56	0	50	02P, 04, 05P, 07
			22										08P, 10, 11P, 13	57			08P, 10, 11P, 13
			24										21P, 23, 24P, 26	59			21P, 23, 24P, 26
			25										27P, 29, 30P, 32	60			27P, 29, 30P, 32
			28										38P, 40, 41P, 43	63			38P, 40, 41P, 43
			29										44P, 46, 47P, 49	64			44P, 46, 47P, 49
			31										57P, 59, 60P, 62	66			57P, 59, 60P, 62
32	0	58	32	0	38	63P, 65, 66P, 68	67	0	58	67	0	50	63P, 65, 66P, 68				

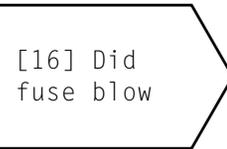
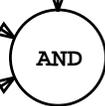
CLEAR BLOWN FUSE (J87407A CONVERTER/FC78 CIRCUIT PACK ASSOCIATED), SUPPLEMENTARY MATRIX FRAME

[12] Identify power control fuses [TABLE B] and remove fuses using sequence listed in TABLE D

[13] Unseat converter associated with blown fuse

[14] If blown fuse was name B_ __, unseat circuit packs associated with blown fuse [TABLE A]

[15] Install power control fuses, replacing any blown fuses [TABLE D]



No

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Yes

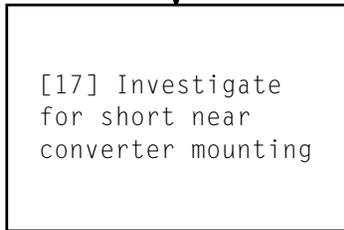
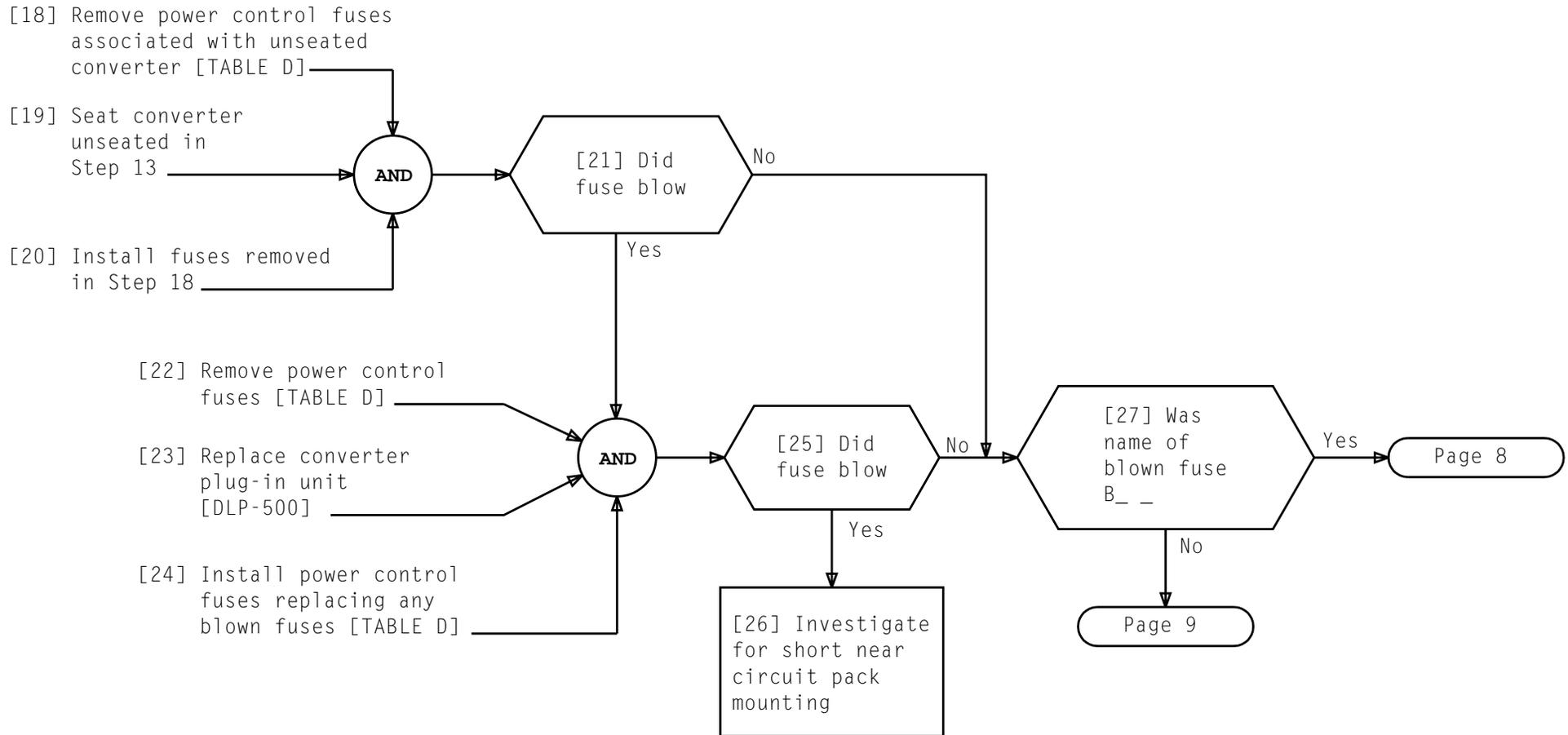


TABLE D CONVERTER/CIRCUIT PACK POWER SEQUENCE		
FUSE NAME	POWER REMOVAL	POWER RESTORAL
A_ __ , B_ __ and C_ __	Remove START fuse (C_ __) first; then remove CONTROL fuse (B_ __); remove 140V fuse (A_ __) last	Install 140V fuse (A_ __) first, install CONTROL fuse (B_ __); then install START fuse (C_ __) last

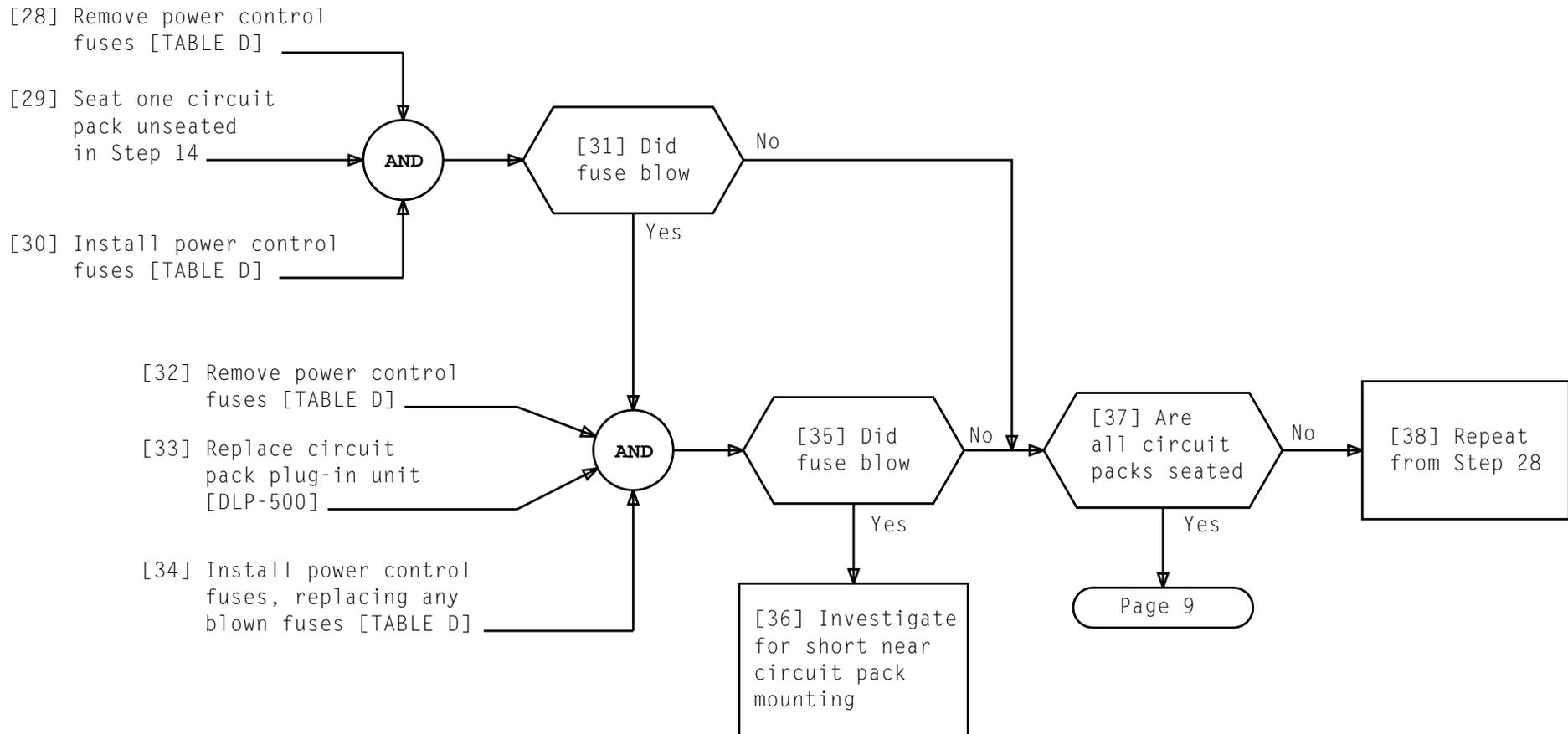
CLEAR BLOWN FUSE (J87407A CONVERTER/FC78 CIRCUIT PACK ASSOCIATED), SUPPLEMENTARY MATRIX FRAME

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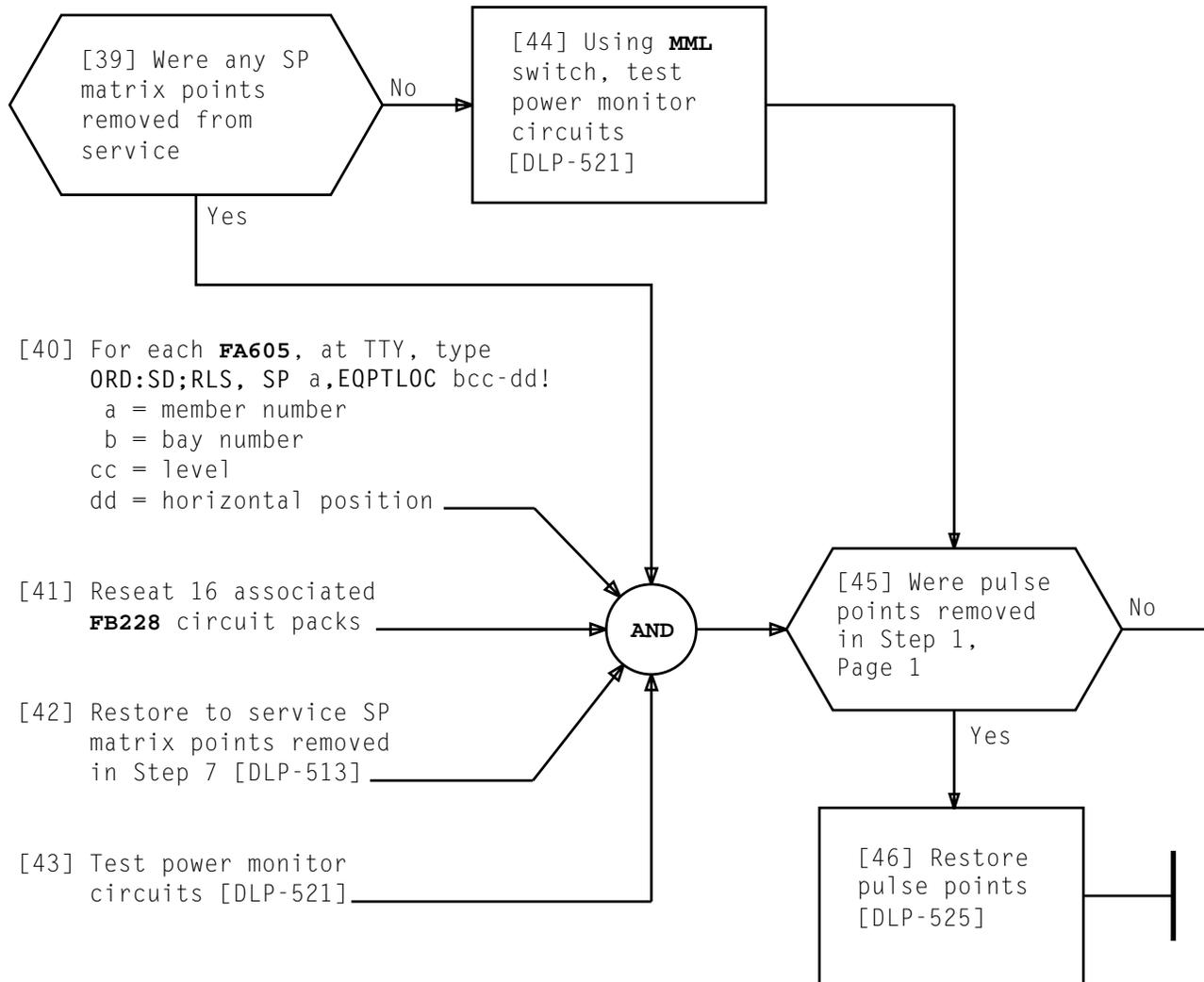
CLEAR BLOWN FUSE (J87407A CONVERTER/FC78 CIRCUIT PACK ASSOCIATED), SUPPLEMENTARY MATRIX FRAME

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CLEAR BLOWN FUSE (J87407A CONVERTER/FC78 CIRCUIT PACK ASSOCIATED), SUPPLEMENTARY MATRIX FRAME

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CLEAR BLOWN FUSE (J87407A CONVERTER/FC78 CIRCUIT PACK ASSOCIATED), SUPPLEMENTARY MATRIX FRAME

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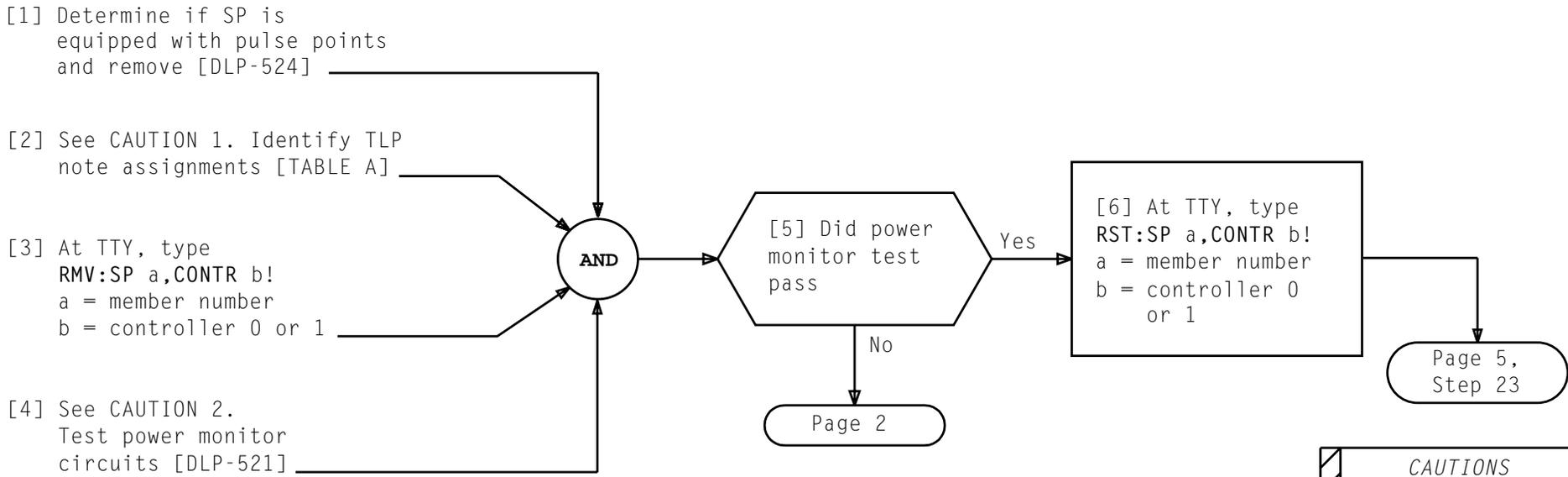


TABLE A
TLP NOTE ASSIGNMENTS

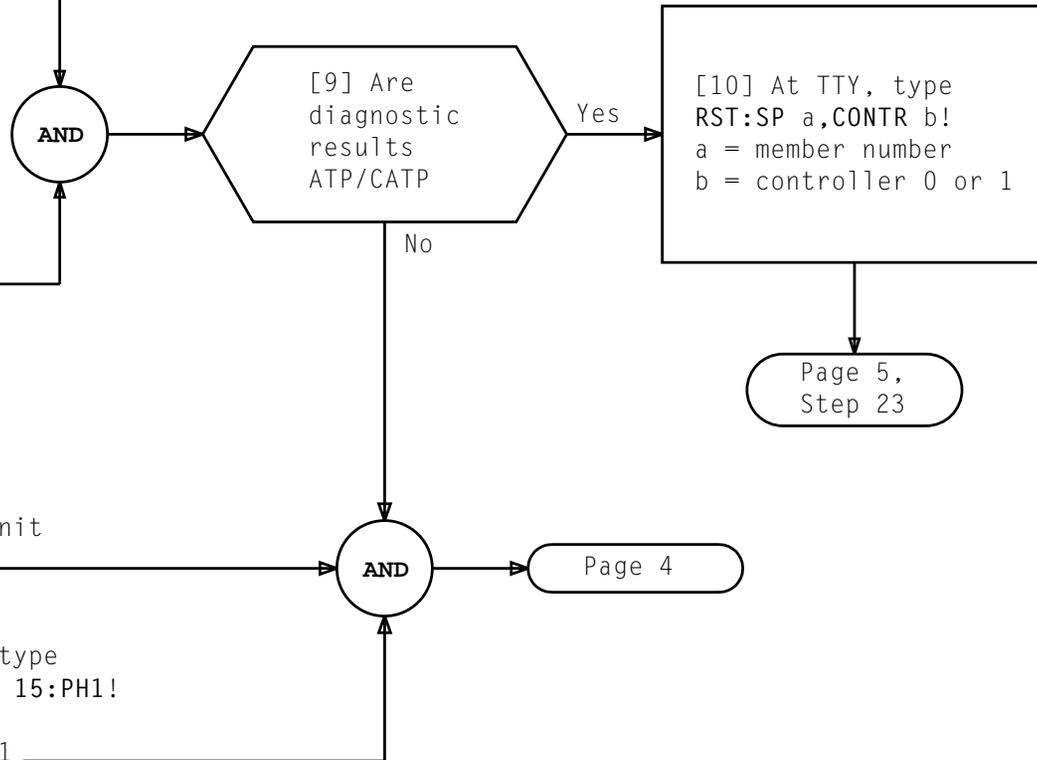
UNIT	NOTE NUMBER	DESCRIPTION
General	2	Automatic power monitor test has failed
Signal processor	20	Equipment locations listed with this note indicate location of power switch which can be used to manually test the group of power converters which have failed diagnostic. TLP resolution on these converters is poor; therefore, manual test procedures should be followed to identify faulty circuit pack
	21	TLP unable to resolve fault to one converter; therefore, manual test procedures should be followed to identify faulty converter. Equipment locations listed with this note refer to a base frame location which holds the six 5-V converters implicated by the diagnostic power test. The TLP prints location 000-00 for bays 0 and 1, and converters 500-00 for bays 5 and 6

CAUTIONS

1. Clearing power monitor failures when NOTE 21 is listed in TLP NOTE column and no 98A converter LED is lighted may result in service interruptions
2. Testing 98A converter with any other converter in same bay out of service may cause service interruptions

[7] Identify replacement procedure and replace unit failing power monitor test [TABLE B – converter, and TABLE C – circuit pack]

[8] If power control switch associated with replacement unit is toggle switch, at TTY, type
 DGN:SP a,CONTR b!
 a = member number
 b = controller 0 or 1



[11] Reinstall original unit removed in Step 6

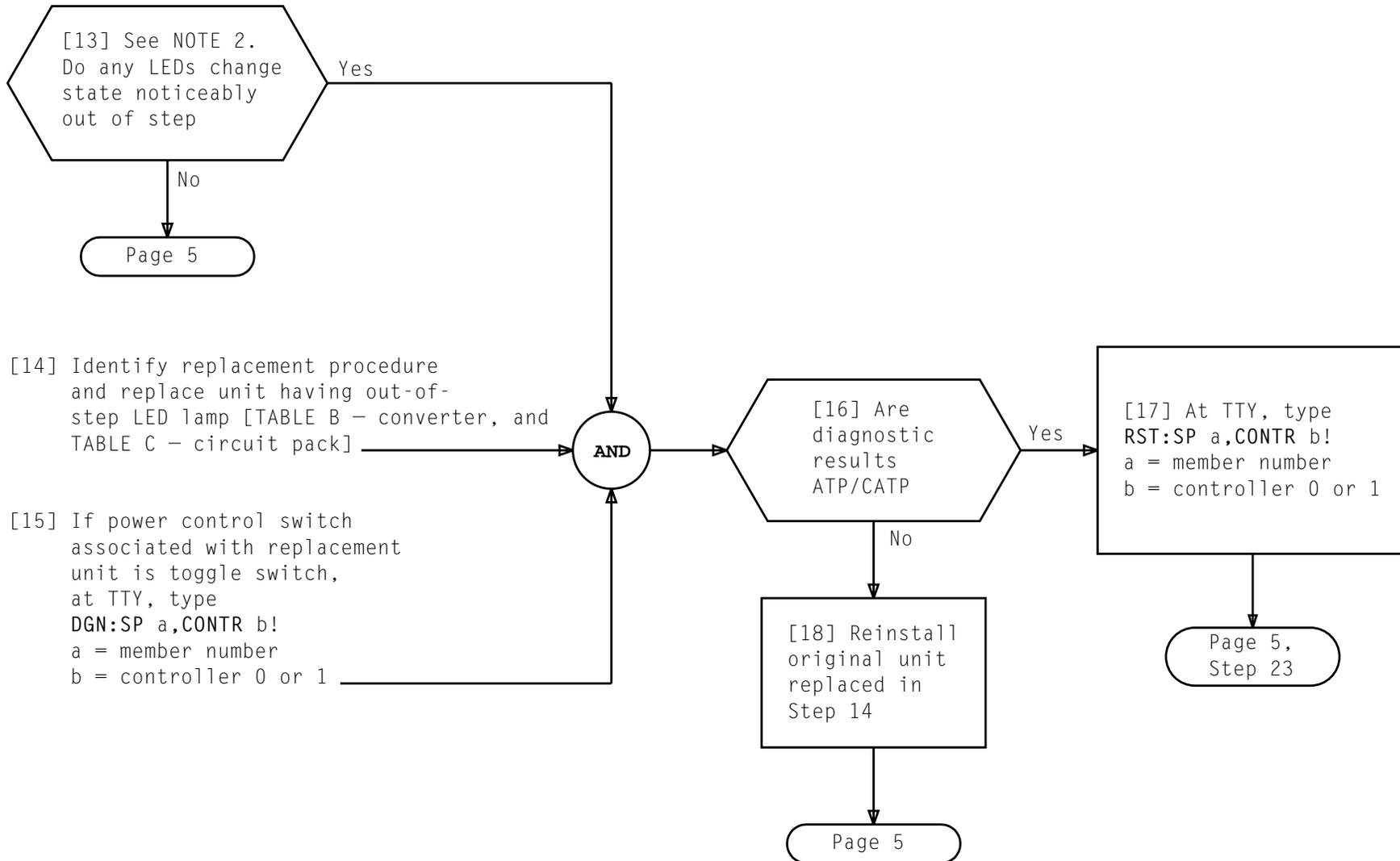
[12] See NOTE 1. At TTY, type
 DGN:SP a,CONTR b,RPT 15:PH1!
 a = member number
 b = controller 0 or 1

NOTE 1	
This test is to check the power monitor sequence circuits for slow response. Look for LED lamps that are noticeably out of step with others	
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TABLE B								
CONVERTER LOCATION				POWER CONTROL SWITCH				CONVERTER REPLACEMENT PROCEDURE
FRAME	BAY	VERTICAL	HORIZONTAL	NAME	LOCATION			
					BAY	VERTICAL	HORIZONTAL	
Control	1/2	80	40	IPUB 0/1	1	80	42	DLP-519
	1/2	All others		CONTR 0/1	1/2	46	03	DLP-519
Supplementary matrix	0	12	02,05,08,11,14,17,20,23	MML	0	66	36	DLP-518
	0	12	62,65,68,71	PPL/PPR	0	52	72	DLP-519
	0	12	30,42,54	TOGGLE	On converter			DLP-520
	0	17	02,11	CONTR 0	1	46	03	DLP-519
	0	17	62,71	CONTR 1	2	46	03	DLP-519

TABLE C				
CIRCUIT PACK LOCATION				REPLACE CIRCUIT PACK PROCEDURE
FRAME	BAY	VERTICAL	HORIZONTAL OR TYPE	
Control	1,2	All	All	DLP-501
Supplementary matrix	0	58, 70	FA610	DLP-503
			All Others	DLP-502
	0	62, 66	All	DLP-501
	0	46, 52	FB229, FB231, or FC78	DLP-503
FB228			DLP-504	

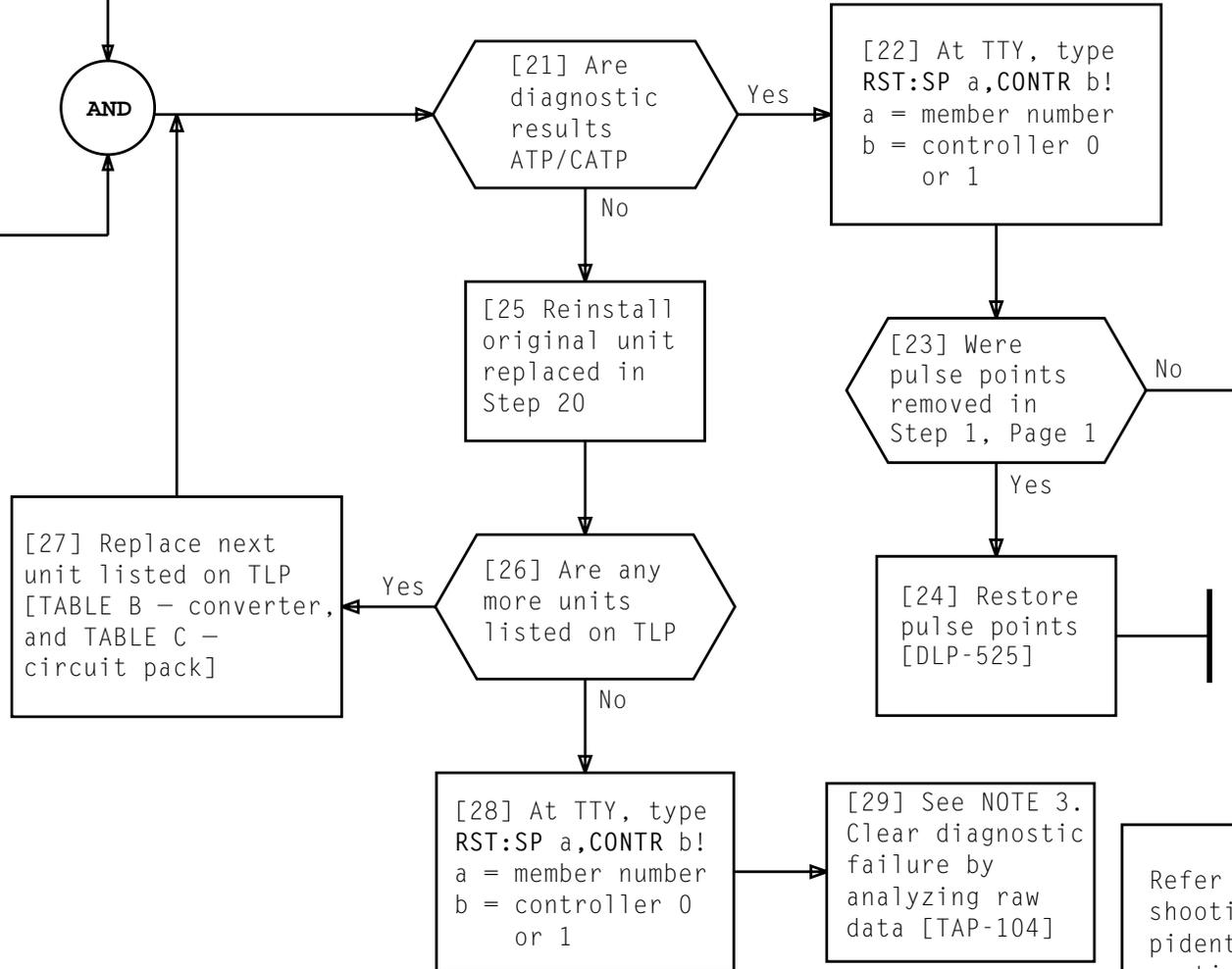
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NOTE 2 Normally, LEDs will not all change state simultaneously	
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[19] At TTY, type
 DGN:SP a,CONTR b:TLP!
 a = member number
 b = controller 0 or 1

[20] Identify replacement
 procedure and replace
 first unit on TLP list
 [TABLE B – converter,
 and TABLE C – circuit
 pack]



NOTE 3
 Refer to trouble-shooting hints in pident prologue section of SD diagnostic listing phase 1

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SUMMARY

Ensure both controllers are in service; then diagnose both controllers using the MATRIX MEMORY option with TLP. If diagnostic comes back STF, refer to TAP-103. If ATP, input VER:SPMTXPK using appropriate pack-type option and matrix

point indentification number. Replace circuit pack in location identified by VER:SPMTXPK message. If matrix point is still in trouble, identify and replace the associated matrix flip-flop circuit pack which operated the matrix point.

- [1] Determine if SP is equipped with pulse points and remove [DLP-524]

At TTY:

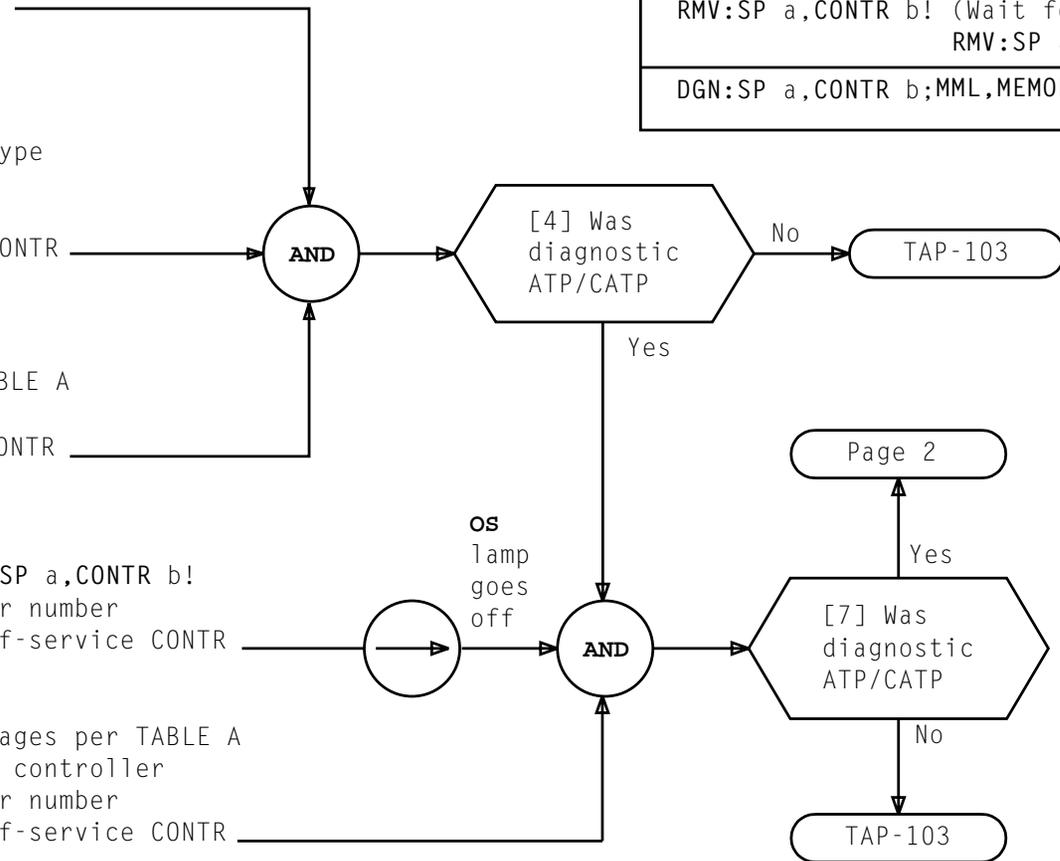
- [2] If either controller is out of service, type RST:SP a,CONTR b!
a = member number
b = out-of-service CONTR

- [3] See CAUTION 1. Type messages per TABLE A
a = member number
b = out-of-service CONTR

At TTY:

- [5] Type RST:SP a,CONTR b!
a = member number
b = out-of-service CONTR
- [6] Type messages per TABLE A for other controller
a = member number
b = out-of-service CONTR

TABLE A
RMV:SP a,CONTR b! (Wait for system response RMV:SP a, CONTR b COMPLETED)
DGN:SP a,CONTR b;MML,MEMORY,TLP!



CAUTION 1
Ensure both controllers are in service before continuing to prevent service interruption

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CLEAR FAULTY MATRIX POINT

[8] At TTY, type appropriate message per TABLE B

[9] See FIG. 1. Using VER:SPMTXPK response message, identify location of circuit pack associated with faulty matrix point

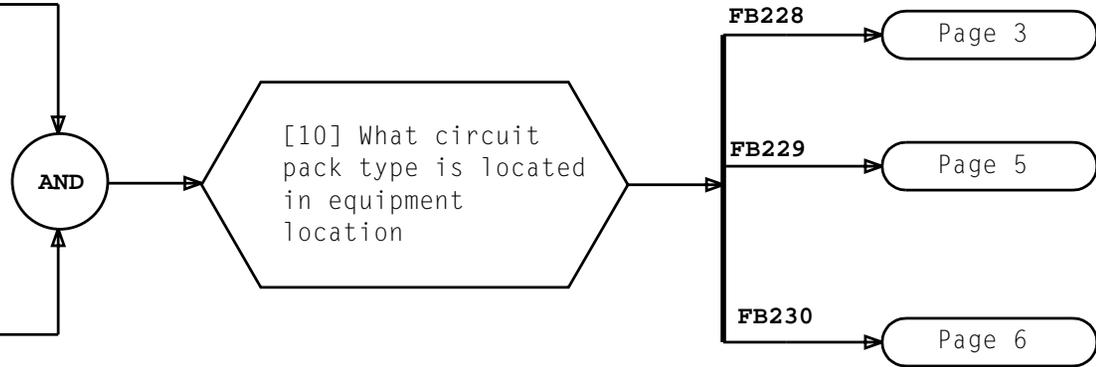


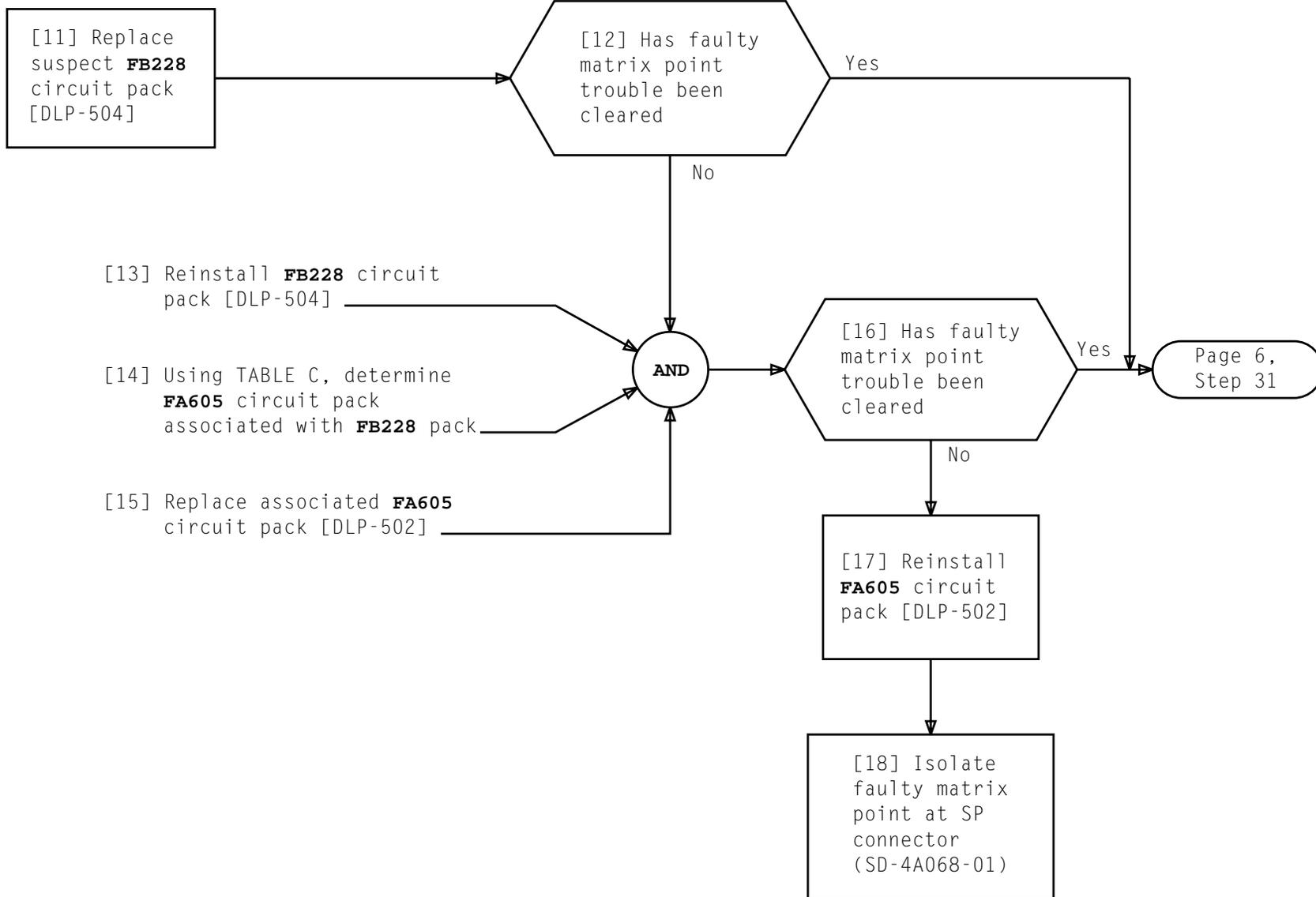
TABLE B	
FAULTY MATRIX POINT TYPE	MESSAGE
Scan	VER:SPMTXPK:SCP,{ CIN e TAN f OTAN g TSN h TDN i MSN j }!
Distributor	VER:SPMTXPK:{ SDM SDP },{ CIN e TAN f OTAN g TSN h TDN i MDN k }!

```

VER:SPMTXPK: SCP,TSN 0000001! PF
M 37 VER:SPMTXPK:SCP,TSN 0000001
UNIV SCAN MATRIX /PACK IOC: SP 0 EQPTLOC 150 -0 4 FIN 01002.01
TSN UTMN,NTPI/CIN PK REPAIR REF
0000000 UNASSIGNED POINT
0000001 UNASSIGNED POINT
0000002 UNASSIGNED POINT
0000003 CIN 0 TLDO OH GL 4AT 4ES 07 NOTIFY TOC-RMV CKT
0000100 CIN 73 DLLS TX TA 4AT 4ES 07 NOTIFY TOC-RMV CKT
0000101 CIN 72 STLS MO 09 4AT 4ES 07 NOTIFY TOC-RMV CKT
0000102 CIN 73 STLS MO 09 4AT 4ES 07 NOTIFY TOC-RMV CKT
0000103 CIN 96 STLS MO 09 4AT 4ES 07 NOTIFY TOC-RMV CKT
  
```

CIRCUIT PACK
EQUIPMENT
LOCATION

FIG. 1 - Example of VER:SPMTXPK Response Message

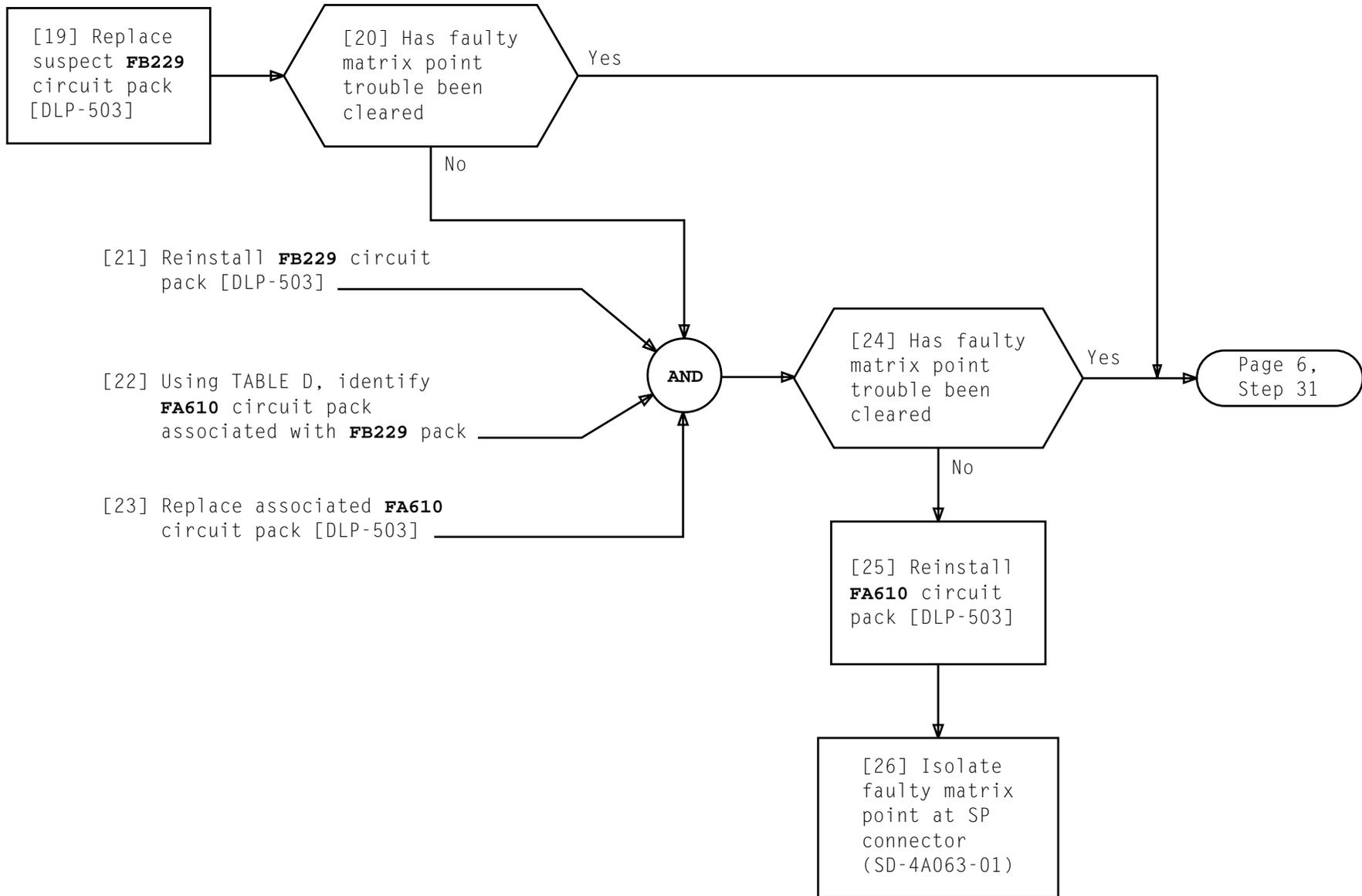


CLEAR FAULTY MATRIX POINT

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TABLE C

FRAME	FA605 LOCATION			ASSOCIATED FB228 PACK LOCATION			FRAME	FA605 LOCATION			ASSOCIATED FB228 PACK LOCATION		
	BAY	VERT	HOR	BAY	VERT	HOR		BAY	VERT	HOR	BAY	VERT	HOR
Supplementary matrix	0	58	04	0	33	02P, 04, 05P, 07	Supplementary matrix	0	58	39	0	44	02P, 04, 05P, 07
			05			08P, 10, 11P, 13				40			08P, 10, 11P, 13
			07			21P, 23, 24P, 26				42			21P, 23, 24P, 26
			08			27P, 29, 30P, 32				43			27P, 29, 30P, 32
			11			38P, 40, 41P, 43				46			38P, 40, 41P, 43
			12			44P, 46, 47P, 49				47			44P, 46, 47P, 49
			14			57P, 59, 60P, 62				49			57P, 59, 60P, 62
			15	0	33	63P, 65, 66P, 68				50	0	44	63P, 65, 66P, 68
			21	0	38	02P, 04, 05P, 07				56	0	50	02P, 04, 05P, 07
			22			08P, 10, 11P, 13				57			08P, 10, 11P, 13
			24			21P, 23, 24P, 26				59			21P, 23, 24P, 26
			25			27P, 29, 30P, 32				60			27P, 29, 30P, 32
			28			38P, 40, 41P, 43				63			38P, 40, 41P, 43
			29			44P, 46, 47P, 49				64			44P, 46, 47P, 49
			31			57P, 59, 60P, 62				66			57P, 59, 60P, 62
0	58	32	0	38	63P, 65, 66P, 68	0	58	67	0	50	63P, 65, 66P, 68		



CLEAR FAULTY MATRIX POINT

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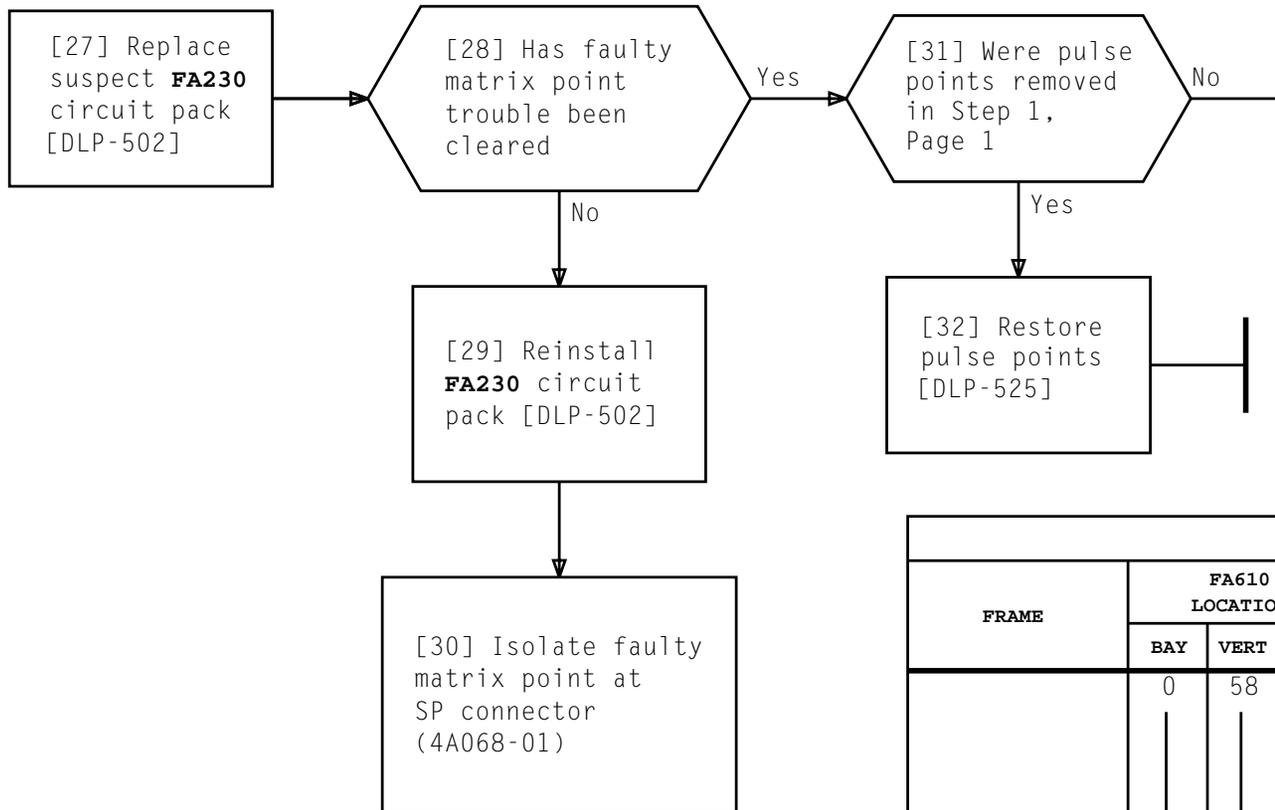


TABLE D										
FRAME	FA610 LOCATION			ASSOCIATED FB229 PACK LOCATION						
	BAY	VERT	HOR	BAY	VERT	HOR				
Supplementary matrix	0	58	39	0	44	02P, 04, 05P, 07				
			40			08P, 10, 11P, 13				
			42			17P, 19, 20P, 22				
			43			23P, 25, 26P, 28				
			46			33P, 35, 36P, 38				
			47			39P, 41, 42P, 44				
			49			48P, 50, 51P, 53				
			50			0	44	54P, 56, 57P, 59		
							56	0	50	02P, 04, 05P, 07
							57			08P, 10, 11P, 13
							59			17P, 19, 20P, 22
							60			23P, 25, 26P, 28
							63			33P, 35, 36P, 38
							64			39P, 41, 42P, 44
							66			48P, 50, 51P, 53
			0			58	67			0

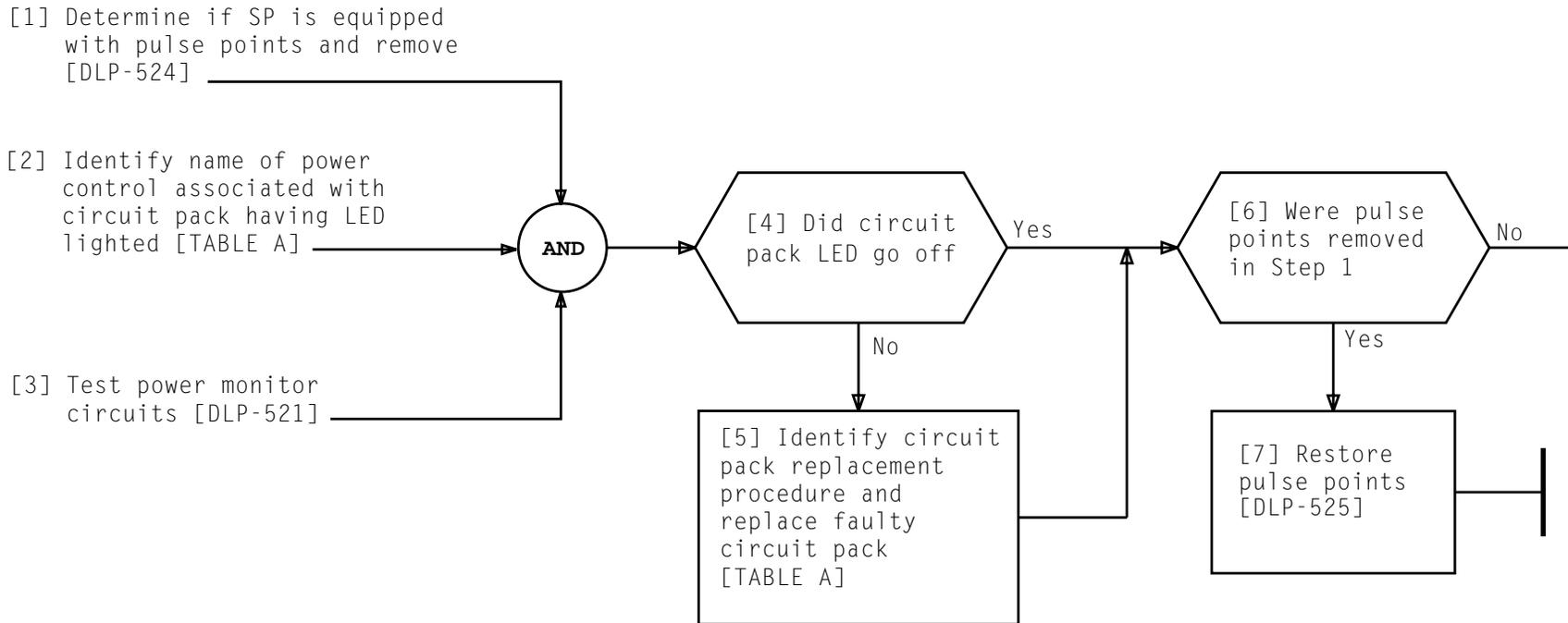
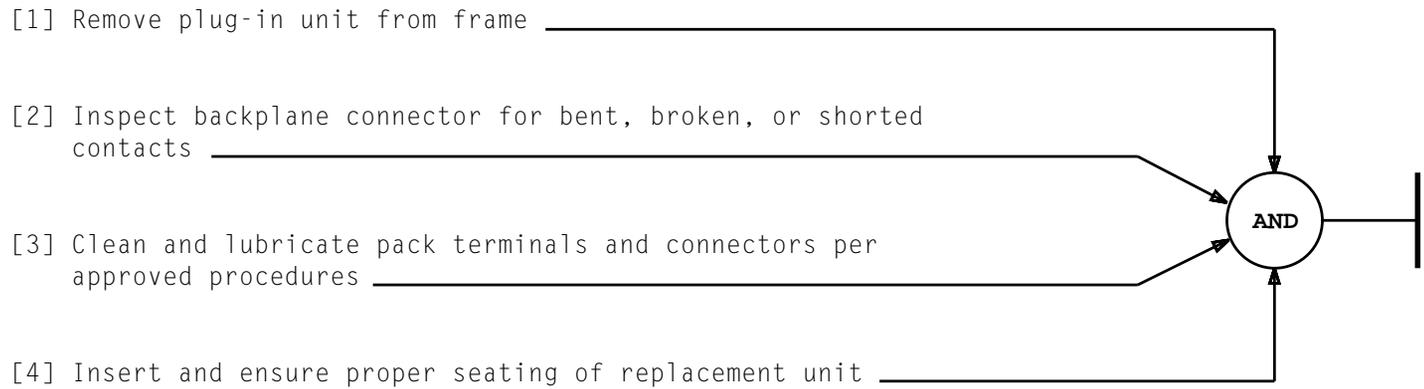


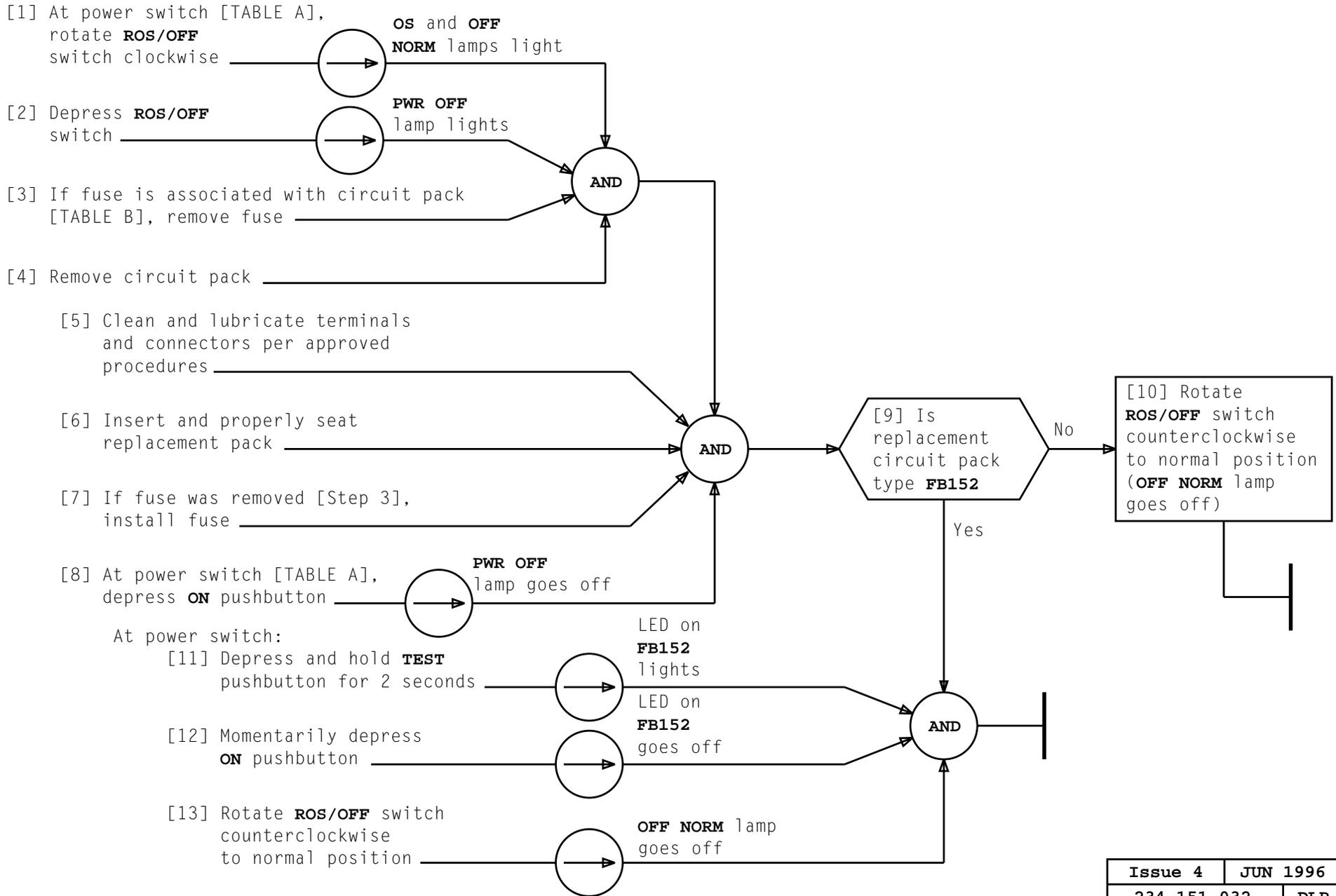
TABLE A CIRCUIT PACKS CONTAINING LEDs								
CIRCUIT PACK LOCATION				SWITCH				REPLACE CIRCUIT PACK PROCEDURE
FRAME	BAY	VERT	HORIZONTAL	NAME	LOCATION			
					BAY	VERT	HOR	
Control	1/2	62 66	4 67	Control 0/1	1/2	46	03	DLP-501
Supplementary matrix	0	58	2, 17, 19 34, 37, 62, 54, 69	MTX MTCE LIMIT	0	66	36	DLP-502
			14, 29, 45, 60					
	52	14, 29 45, 60						

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REPLACE PLUG-IN UNIT

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REPLACE CIRCUIT PACK, POWER CONTROLLED BY POWER SWITCH

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TABLE A							
CIRCUIT PACK LOCATION				SWITCH			
FRAME	BAY	VERT	HOR OR TYPE	NAME	LOCATION		
					BAY	VERT	HOR
Control	1/2	80	All	PUB 0/1	1/2	80	43
	1/2		All others	CONTR 0/1	1/2	46	03
Supplementary matrix (See CAUTION 1)	0	62	11-24	CONTR 0	1	46	03
	0	66	11-24	CONTR 0	1	46	03
	0	62	46-59	CONTR 1	2	46	03
	0	66	46-59	CONTR 1	2	46	03

TABLE B							
CIRCUIT PACK LOCATION				FUSE			
FRAME	BAY	VERT	HOR	DESIG	BLOCK LOCATION		
					BAY	VERT	HOR
Control	1/2	66	67	0CJ/1CJ	1/2	07	28
	1/2	62	4,8	0CJ/1CJ	1/2	07	28
	1/2	62	11,12	0BN/1BN	1/2	07	43
	1/2	66	10	0BN/1BN	1/2	07	43
Supplementary matrix	0	62	11	0CG	1	07	21
	0	62	46	1CG	2	07	21

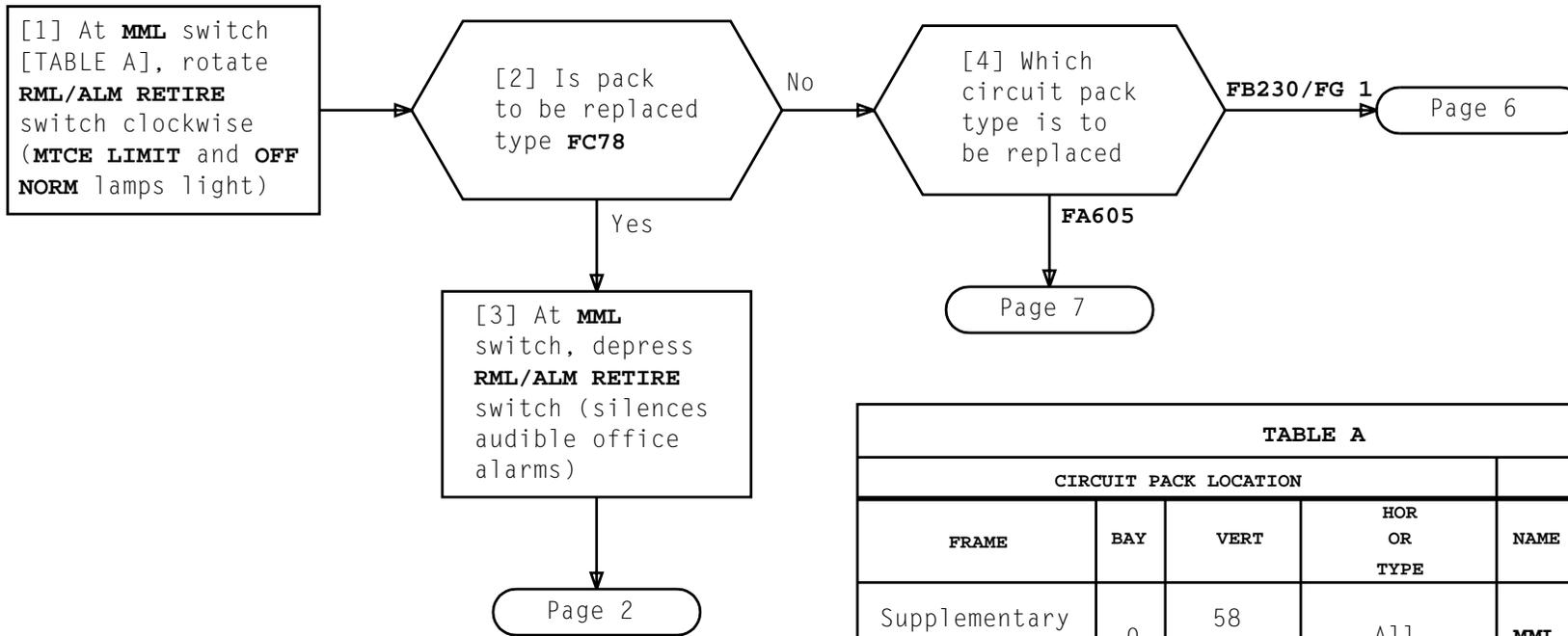
CAUTION 1
Verify pack to be replaced corresponds to the associated out-of-service controller.

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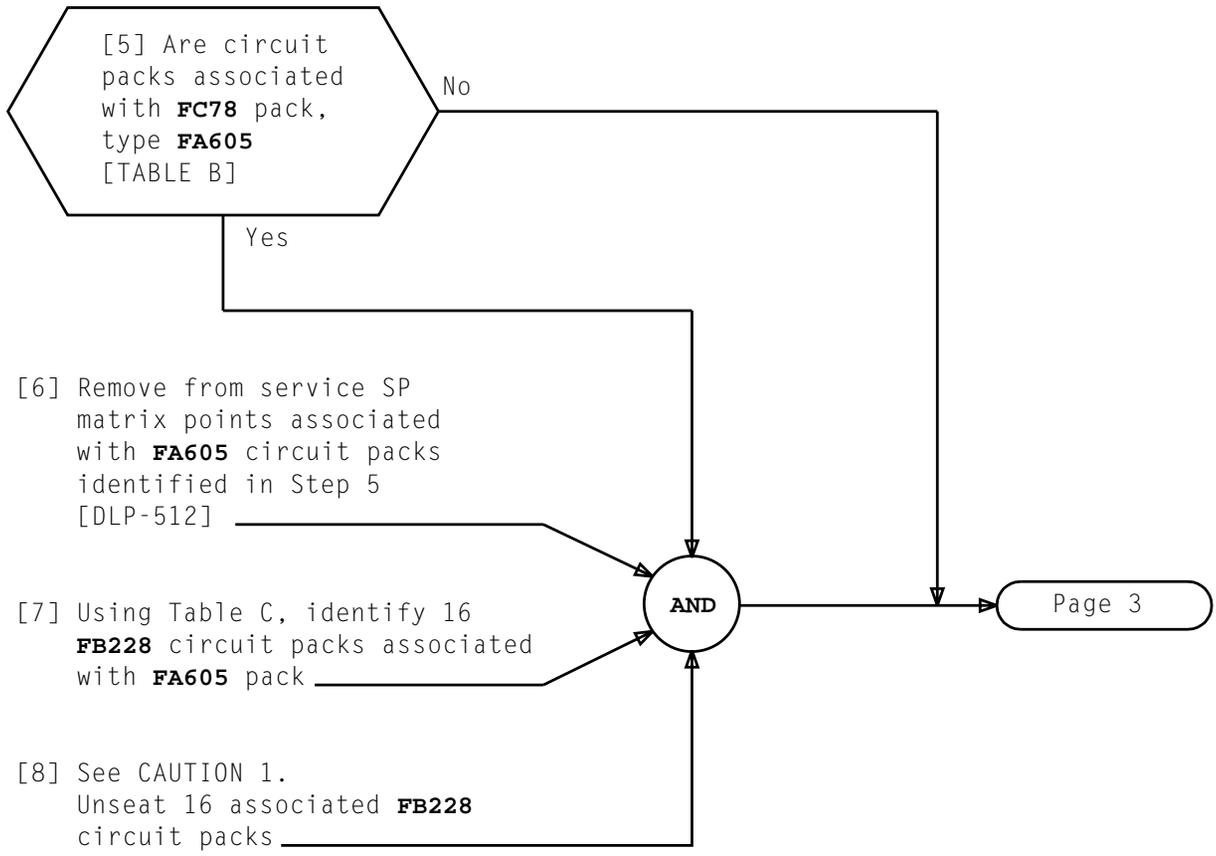
REPLACE CIRCUIT PACK, POWER CONTROLLED BY POWER SWITCH



CIRCUIT PACK LOCATION				SWITCH			
FRAME	BAY	VERT	HOR OR TYPE	NAME	LOCATION		
					BAY	VERT	HOR
Supplementary matrix	0	58 70	All	MML	0	66	36

REPLACE CIRCUIT PACK, ALARMS RETIRED WITH MATRIX MAINTENANCE LIMIT SWITCH

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*CAUTION 1
If OS lamp does not light, delay pack replacement until duplicate pulse points are returned to service*

REPLACE CIRCUIT PACK, ALARMS RETIRED WITH MATRIX MAINTENANCE LIMIT SWITCH

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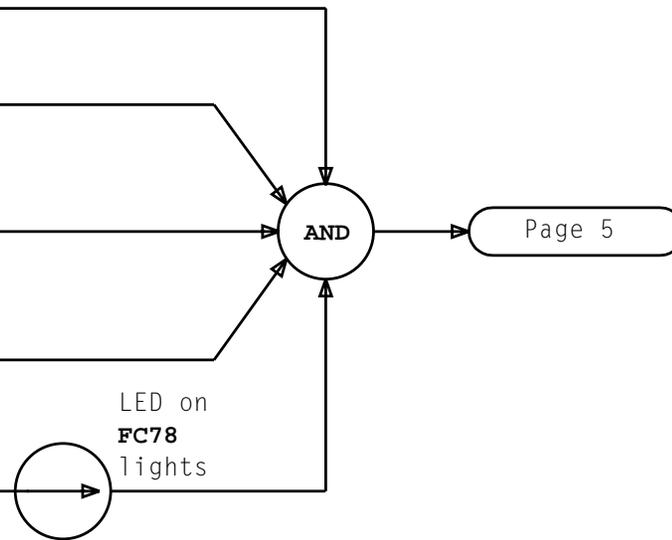
[9] Remove fuses associated with **FC78** [TABLE B]
in following sequence: remove **START** fuse
(C_ _); then **CONTROL** fuse (B_ _)

[10] Remove **FC78** circuit pack

[11] Clean and lubricate terminals and
connectors per approved procedures

[12] Insert and properly seat
replacement pack

[13] Install fuses in following
sequence: install **CONTROL**
fuse (B_ _); then **START** fuse (C_ _)



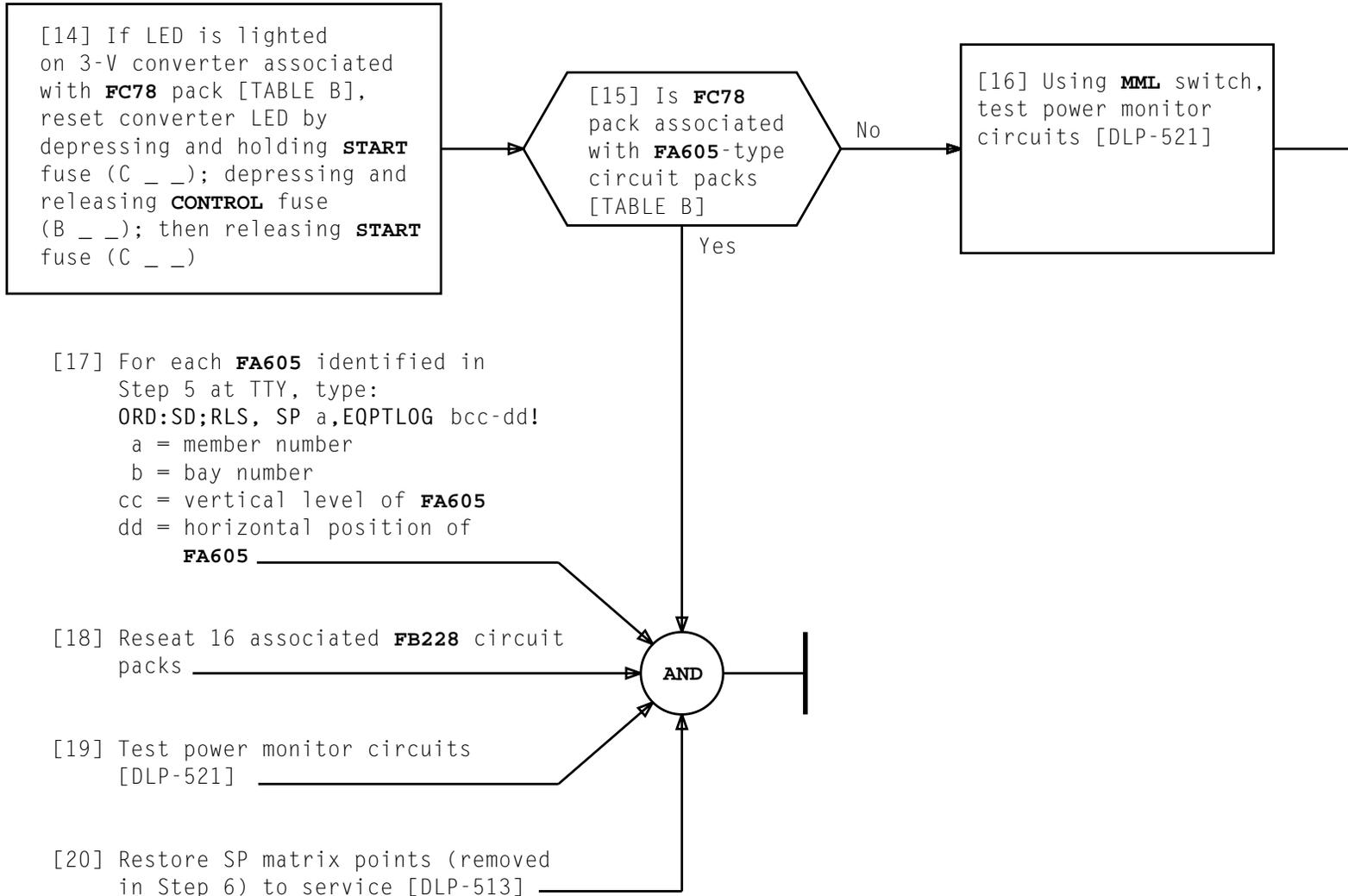
**REPLACE CIRCUIT PACK, ALARMS RETIRED WITH MATRIX MAINTENANCE
LIMIT SWITCH**

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TABLE B																	
FRAME	FC78 PACK LOCATION			ASSOCIATED PACK LOCATION			START FUSE			CONTROL FUSE			ASSOCIATED CONVERTER LOCATION				
	BAY	VERT	HOR	BAY	VERT	HOR	NAME	BLOCK LOCATION			NAME	BLOCK LOCATION			BAY	VERT	HOR
								BAY	VERT	HOR		BAY	VERT	HOR			
Supplementary matrix	0	58	02	0	58	04, 05, 07, 08	CA0	0	07	33	BA0	0	07	33	0	12	02
			17			11, 12, 14, 15	CBO				BBO						05
			19			21, 22, 24, 25	CC0				BC0						08
			34			28, 29, 31, 32	CDO			33	BDO			33			11
			37			39, 40, 42, 43	CEO			39	BEO			39			14
			52			46, 47, 49, 50	CFO				BFO						17
			54			56, 57, 59, 60	CG0				BGO						20
	0	58	69	0	58	63, 64, 66, 67	CHO	0	07	39	BHO	0	07	39	0	12	23

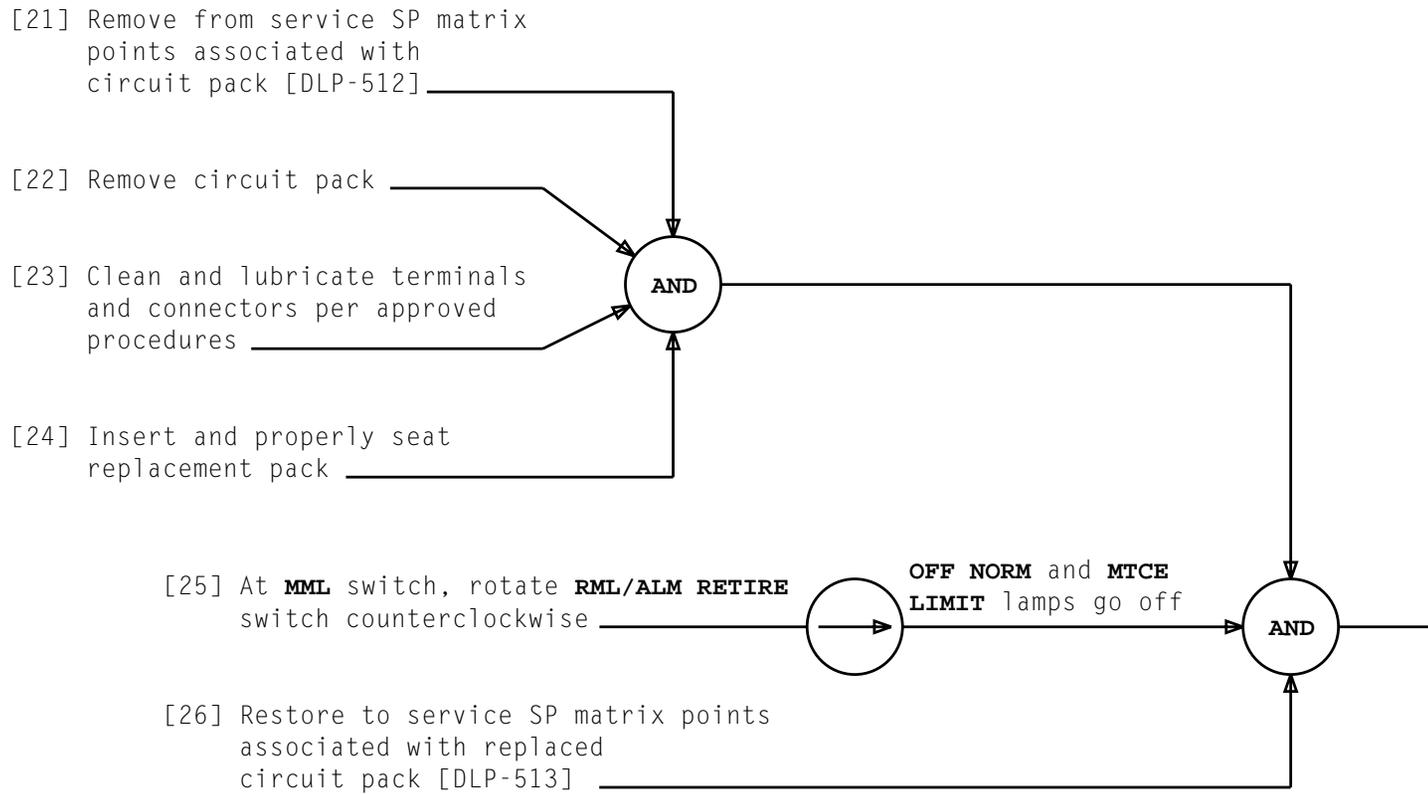
TABLE C														
FRAME	FA605 LOCATION			ASSOCIATED FB228 PACK LOCATION			FRAME	FA605 LOCATION			ASSOCIATED FB228 PACK LOCATION			
	BAY	VERT	HOR	BAY	VERT	HOR		BAY	VERT	HOR	BAY	VERT	HOR	
Supplementary matrix	0	58	04	0	33	02P, 04, 05P, 07	Supplementary matrix	0	58	39	0	44	02P, 04, 05P, 07	
			05			08P, 10, 11P, 13				40			08P, 10, 11P, 13	
			07			21P, 23, 24P, 26				42			21P, 23, 24P, 26	
			08			27P, 29, 30P, 32				43			27P, 29, 30P, 32	
			11			38P, 40, 41P, 43				46			38P, 40, 41P, 43	
			12			44P, 46, 47P, 49				47			44P, 46, 47P, 49	
			14			57P, 59, 60P, 62				49			57P, 59, 60P, 62	
			15	0	33	63P, 65, 66P, 68				50	0	44	63P, 65, 66P, 68	
			21	0	38	02P, 04, 05P, 07				56	0	50	02P, 04, 05P, 07	
			22			08P, 10, 11P, 13				57			08P, 10, 11P, 13	
			24			21P, 23, 24P, 26				59			21P, 23, 24P, 26	
			25			27P, 29, 30P, 32				60			27P, 29, 30P, 32	
			28			38P, 40, 41P, 43				63			38P, 40, 41P, 43	
			29			44P, 46, 47P, 49				64			44P, 46, 47P, 49	
			31			57P, 59, 60P, 62				66			57P, 59, 60P, 62	
0	58	32	0	38	63P, 65, 66P, 68			67	0	50	63P, 65, 66P, 68			

REPLACE CIRCUIT PACK, ALARMS RETIRED WITH MATRIX MAINTENANCE
LIMIT SWITCH



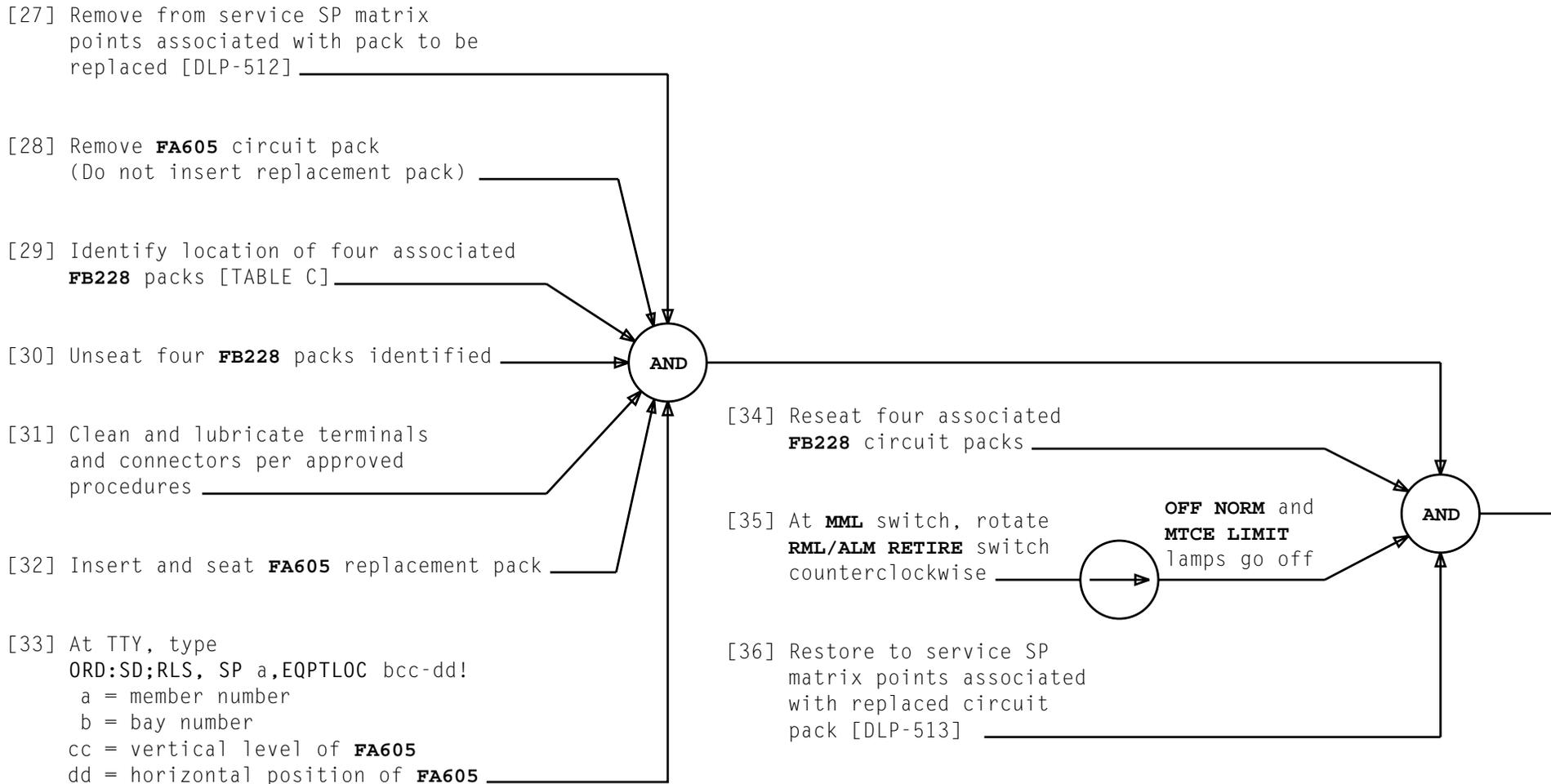
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LIMIT SWITCH**

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REPLACE CIRCUIT PACK, ALARMS RETIRED WITH MATRIX MAINTENANCE LIMIT SWITCH

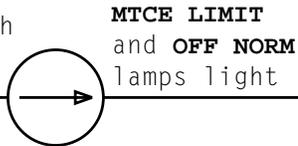
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**REPLACE CIRCUIT PACK, ALARMS RETIRED WITH MATRIX MAINTENANCE
 LIMIT SWITCH**

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[1] If circuit pack type is **FA610** or **FG 2**, at **MML** switch rotate **RML/ALM RETIRE** switch clockwise



[2] If circuit pack is listed in **TABLE A**, remove associated fuse

[3] Remove SP matrix points from service [DLP-512]

[4] See **CAUTION 1**. Remove circuit pack

[5] Inspect and lubricate pack connectors and terminals

[6] Install circuit pack

[7] If fuse was removed in Step 2, install fuse

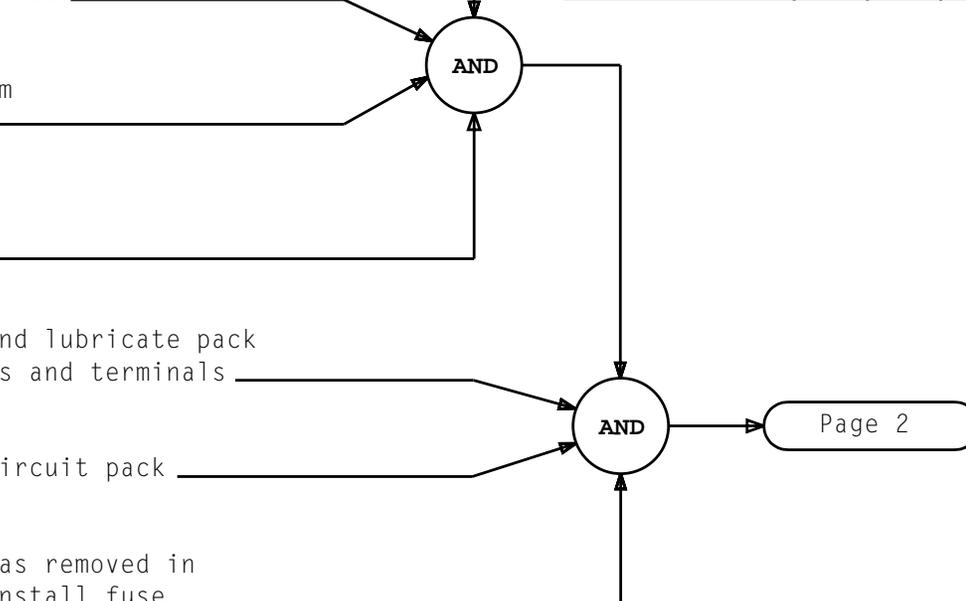
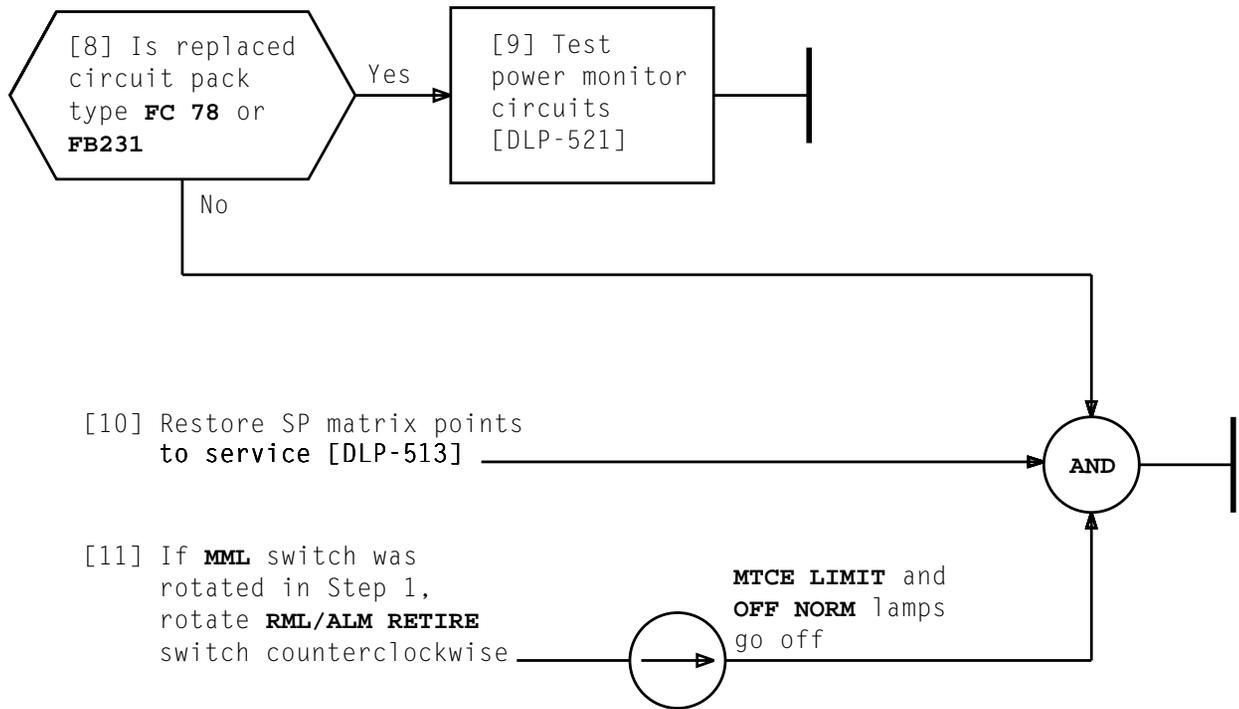


TABLE A							
CIRCUIT PACK LOCATION				FUSE			
FRAME	BAY	VERT	HOR	DESIG	BLOCK LOCATION		
					BAY	VERT	HOR
Supplementary matrix	0	52	14P	PPB2	0	07	14
	0	52	45P	PPB3	0	07	14
	0	46	14P	PPB0	0	07	14
	0	46	45P	PPB1	0	07	14

CAUTION 1
If OS lamp does not light, delay pack replacement until duplicate pulse points are returned to service

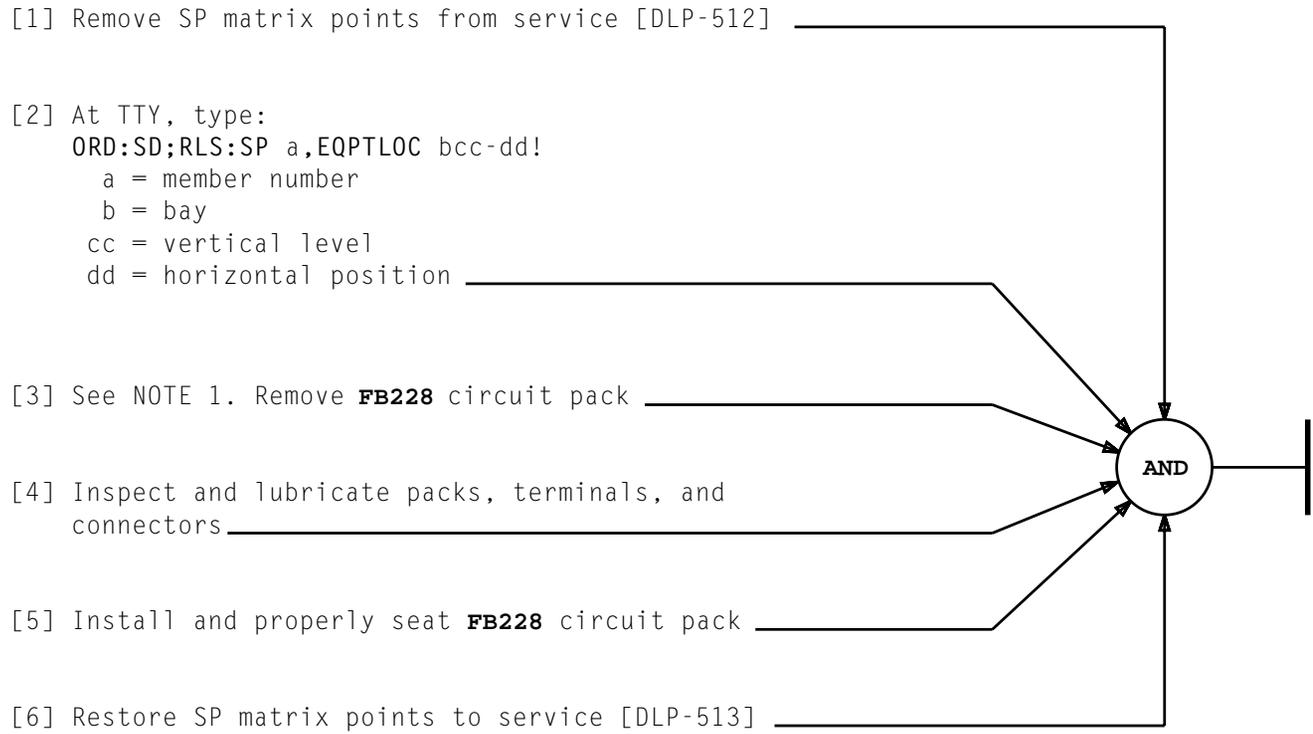
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REPLACE CIRCUIT PACK



REPLACE CIRCUIT PACK

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[1] Remove SP matrix points from service [DLP-512]

[2] At TTY, type:
 ORD:SD;RLS:SP a,EQPTLOC bcc-dd!
 a = member number
 b = bay
 cc = vertical level
 dd = horizontal position

[3] See NOTE 1. Remove **FB228** circuit pack

[4] Inspect and lubricate packs, terminals, and connectors

[5] Install and properly seat **FB228** circuit pack

[6] Restore SP matrix points to service [DLP-513]

NOTE 1	
Circuit pack should be removed with supplementary matrix frame powered up	
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REPLACE FB228 CIRCUIT PACKS

[1] See FIG. 1. On raw data printout for first failing test, locate last data word printed

In first failing phase pident:

[2] Use last data word address to locate where first subroutine was called

[3] Read any comments at CALLSUB statement located

[4] Note name of subroutine called in CALLSUB statement label item

[5] Locate and read prologue of program unit containing CALLSUB statement

In loader map symbols section:

[6] Locate name of subroutine called in symbol column (name noted in Step 4)

[7] In PIDENT column, note pident that contains this subroutine and obtains this pident

In pident containing subroutine:

[8] Locate subroutine using pident reference section

[9] Read subroutine prologue

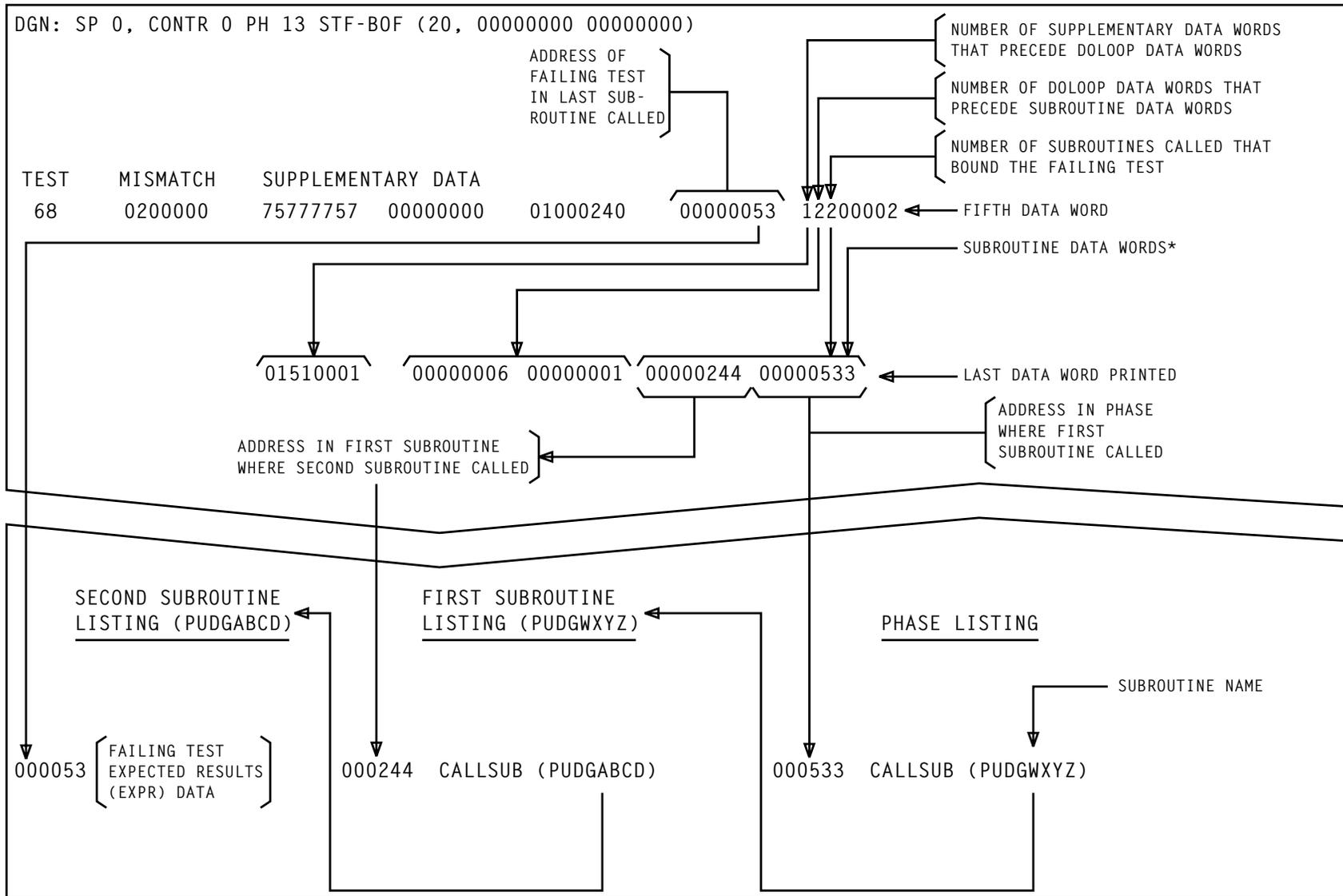
AND

AND

Page 3

DETERMINE LOCATION AND FUNCTION OF SUBROUTINES CALLED

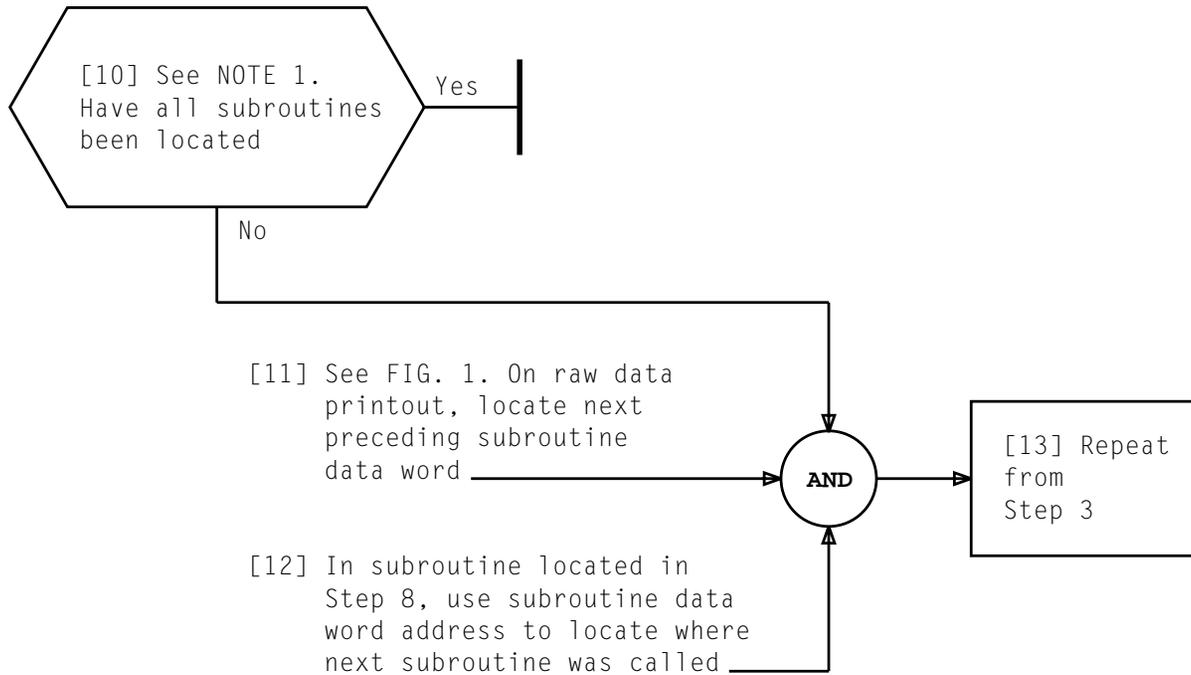
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* SUBROUTINE DATA WORDS PRECEDING LAST ONE PRINTED ARE FOR THE 2ND, 3RD, ETC, SUBROUTINES CALLED (RIGHT TO LEFT)

FIG. 1 - Relationship of Subroutine Data Words to Phase and Subroutine Listings

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NOTE 1	
On raw data printout, the sixth digit in fifth data word following mismatch data indicates number of subroutines called	
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NOTE: AT&T 234-180-020 contains a description of DIAL statements

1. Read several DIAL statements just before failing test to determine what was occurring prior to test failing
2. Read failing test DIAL statement and any comments
3. Note "asterisk data" that follows failing test number in listing
4. Note relationship of asterisk line data to first five raw data printout words that follow mismatch data [FIG. 1]

5. In TABLE A, locate failing DIAL statement; and use description column to determine meaning of data contained in second and third raw data words following mismatch data

NOTE: For scan point, SD point, and SP point addresses, the third data word breaks down as follows:
 23-17 = Don't care
 16-12 = SP number
 11-10 = Matrix
 09-04 = Row
 03-00 = Column

6. Use TABLE B to obtain additional information with respect to second and third data words

End of procedure

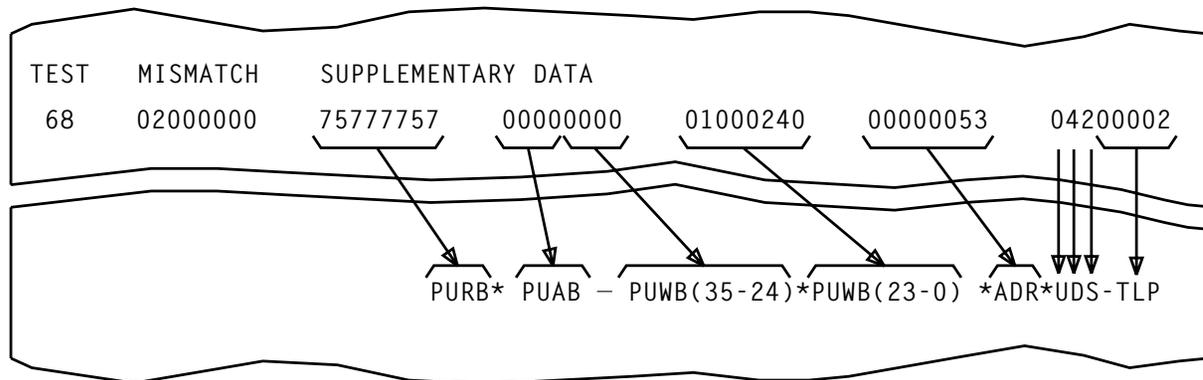


FIG. 1 - Example of Raw Data Printout Relationship to Asterisk Line at Failing Test

TABLE B	
SECOND AND/OR THIRD DATA WORD	LOCATION OF INFORMATION
OPAD/OPCODE	SD-4A067-01
SD point address	VER:SPMTXPK:SDP,MDN 0' a! a = SD point address
Scan point address	VER:SPMTXPK:SCP,MSN 0' a! a = scan point address

ANALYZE FAILING TEST DATA TO DETERMINE TEST FUNCTION

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On summary data printout [FIG. 1]:

1. Note monitor point address on first CD line under V1 column
2. Convert to decimal the octal failing bit in leftmost four octal digits of word under adjacent V2 column.

In test access PK document:

3. Find address and failing bit

NOTE: 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 the fault and PR data may be of greater value

4. Note pack type and gate name for failing bit

In CPS for pack type:

5. Locate component list section

6. Look in each DESIG column for gate name

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

7. In adjacent SH LOC column, use location indicated to find gate in CPS

8. At gate, note lead name and terminal leaving the gate to outside the 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. Find lead interconnection section for this symbol

12. Using terminal and lead name noted in Step 8, find corresponding SD lead name

End of procedure

**IDENTIFY LEAD IN PATH OF FAILING BIT USING SUMMARY DATA PRINTOUT
AND TEST ACCESS PK DOCUMENT**

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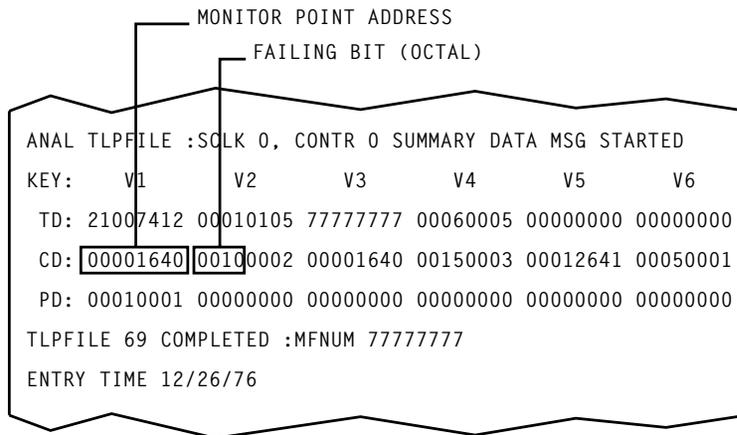


FIG. 1 - Example of Summary Data Printout

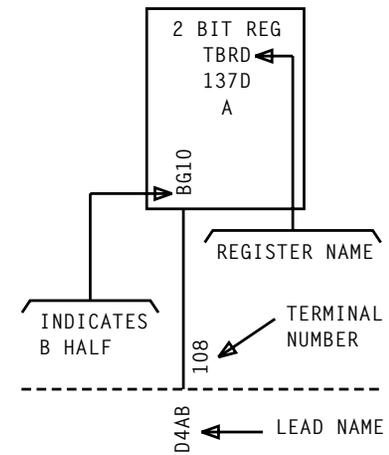


FIG. 2 - Example of Lead Leaving B Half of a CPS Register

IDENTIFY LEAD IN PATH OF FAILING BIT USING SUMMARY DATA PRINTOUT AND TEST ACCESS PK DOCUMENT

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SUMMARY

Locate failing test in last subroutine called. Look past failing test for endloop statements. For each endloop statement located in subroutine, use endloop label variable to identify location of associated doloop statements. Locate each doloop statement. Obtain doloop index values from raw data printout and determine

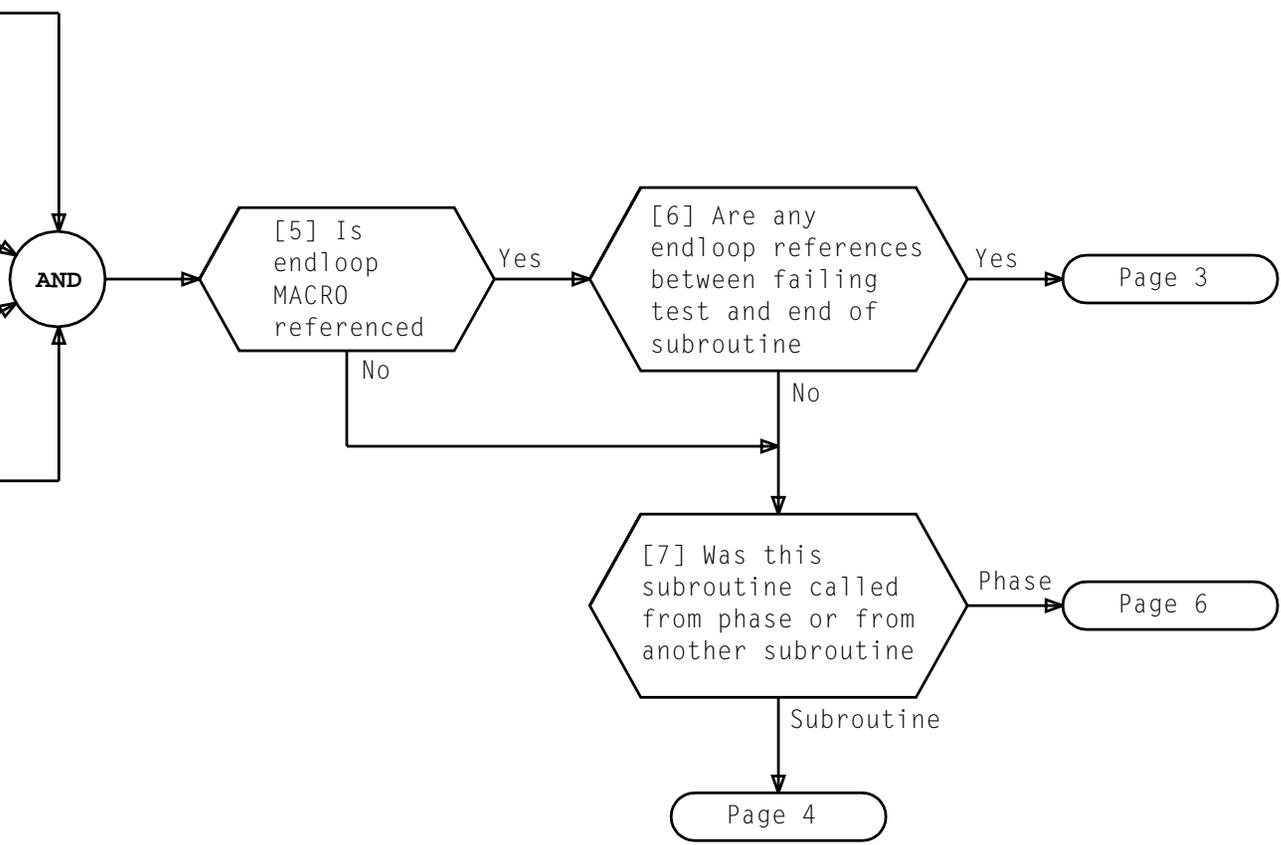
meaning for each doloop [FIG. 1]. If endloop statement was not found in subroutine, go where subroutine was called and look for endloop statements after CALLSUB statement. Continue to look for endloop statements after CALLSUB statements until all doloops indicated on raw data printout for first failing test are located. Read any comments at the doloop statements

[1] Refer to FIG. 1 and DIAL statement definitions in AT&T 234-180-020, as necessary

[2] Locate failing test in last subroutine called, and note page and line number of expected results (EXPR)

[3] Locate last address in this subroutine, and note page and line number

[4] Locate subroutine pident reference section



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M52 DGN: SP 0 CONTR 0 PH2 STF-BOF (13,00000000 00000000) MSG STARTED

TEST MISMATCH SUPPLEMENTARY DATA

68 02000000 75777757 00000000 01000240 00000053 03200002

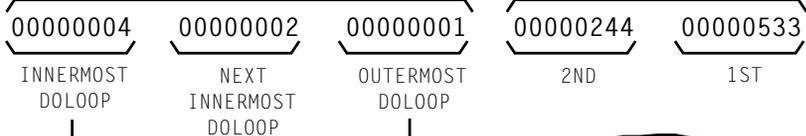
EXPR ADDRESS IN
LAST SUB. CALLED

NUMBER OF DOLOOPS THAT BOUND FAILING TEST

NUMBER OF SUBROUTINES CALLED

DOLOOP INDEX
VALUES WHEN TEST FAILED

SUBROUTINE
CALLSUB ADDRESSES



SECOND SUBROUTINE LISTING (PUDGABCD)

FIRST SUBROUTINE LISTING (PUDGWXYZ)

FIRST FAILING PHASE LISTING

ABCD400 DOLOOP INDEX ()...

WXYZ300 DOLOOP INDEX ()...

STM500 DOLOOP INDEX ()...

000053 ABCD500 EXPR DATA

000244 WXYZ700 CALLSUB (PUDGABCD)

000533 STM700 CALLSUB (PUDGWXYZ)

ABCD800 ENDOLOOP LABEL (ABCD400)

WAYZ900 ENDOLOOP LABEL (WAYZ300)

STM1100 ENDOLOOP LABEL (STM500)

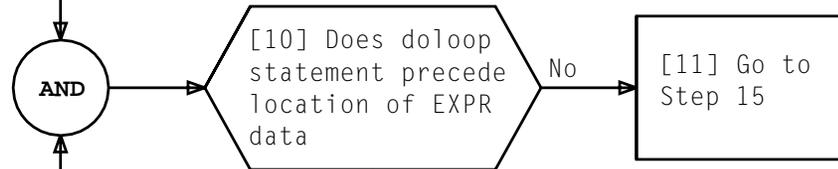
FIG. 1 - Example of Doloop Raw Data Relationship to Listings When Subroutines Called

[8] Locate referenced endloop statement closest to, but beyond EXPR data noted in Step 2

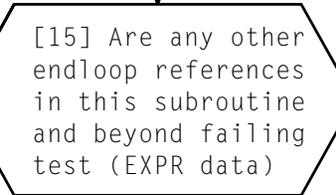
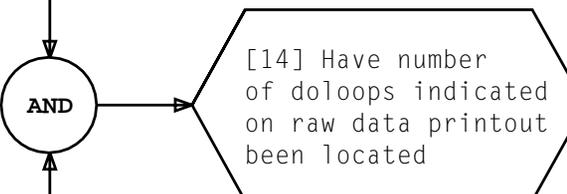
[9] Locate doloop statement using label (in parentheses) at endloop statement

[12] Read any comments at doloop statement

[13] Obtain doloop index value from raw data printout and note its meaning for this doloop [FIG. 1, NOTES 1 and 2]

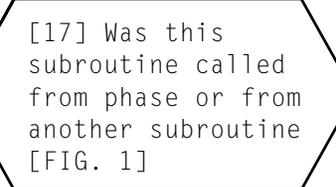


[11] Go to Step 15



Page 4

Subroutine



Phase

Page 6

NOTES
 1. First doloop located is innermost; next doloop located is next innermost, etc.
 2. Doloop values often indicate unit under test, memory, etc

DETERMINE LOCATION AND FUNCTION OF DOLOOPS, SUBROUTINES CALLED

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[18] In subroutine that called last subroutine checked for doloops, locate CALLSUB statement that called the subroutine

[19] Note page and line number of CALLSUB statement

[20] Locate last address in this subroutine, and note its page and line number

[21] Locate subroutine pident reference section

AND

[22] Is endloop MACRO referenced

Yes

[23] Are any endloop references between failing test and end of subroutine

Yes

Page 5

No

No

[24] Was this subroutine called from phase or from another subroutine

Phase

Page 6

Subroutine

[25] Locate subroutine that called this subroutine and repeat from Step 18

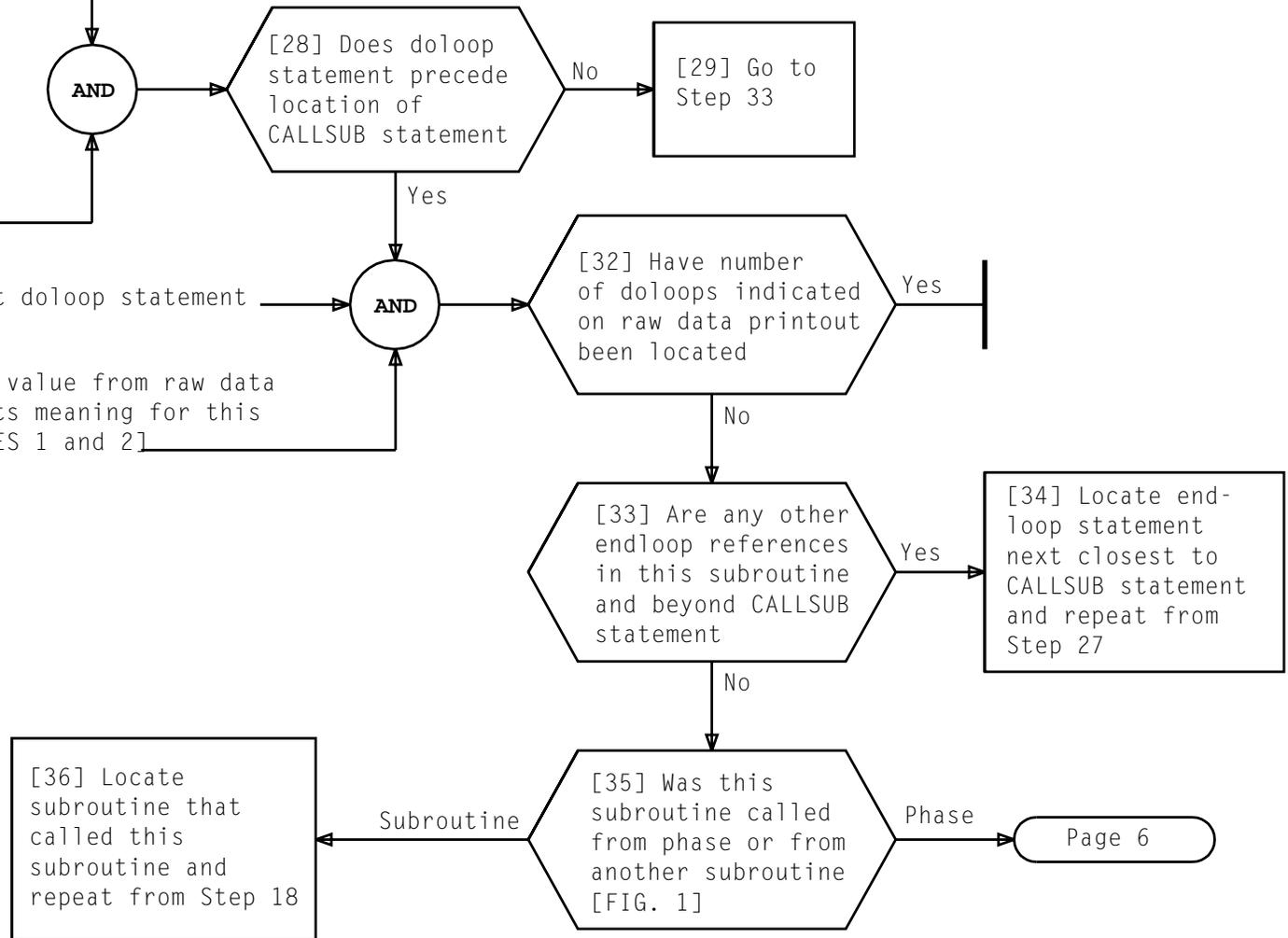
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[26] Locate referenced endloop statement closest to, but beyond CALLSUB statement noted in Step 19

[27] Locate doloop statement using label (in parentheses) at endloop statement

[30] Read any comments at doloop statement

[31] Obtain doloop index value from raw data printout and note its meaning for this doloop [FIG. 1, NOTES 1 and 2]



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In first failing phase pident:

[37] Locate CALLSUB statement that called last subroutine checked for doloops [FIG. 1]

[38] Note page and line number of CALLSUB statement

[39] Locate endloop MACRO in pident reference section

[40] Note endloop reference that is closest to, but beyond CALLSUB statement

[41] Locate endloop statement noted in Step 40

[42] Locate doloop statement using label (in parentheses) at endloop statement

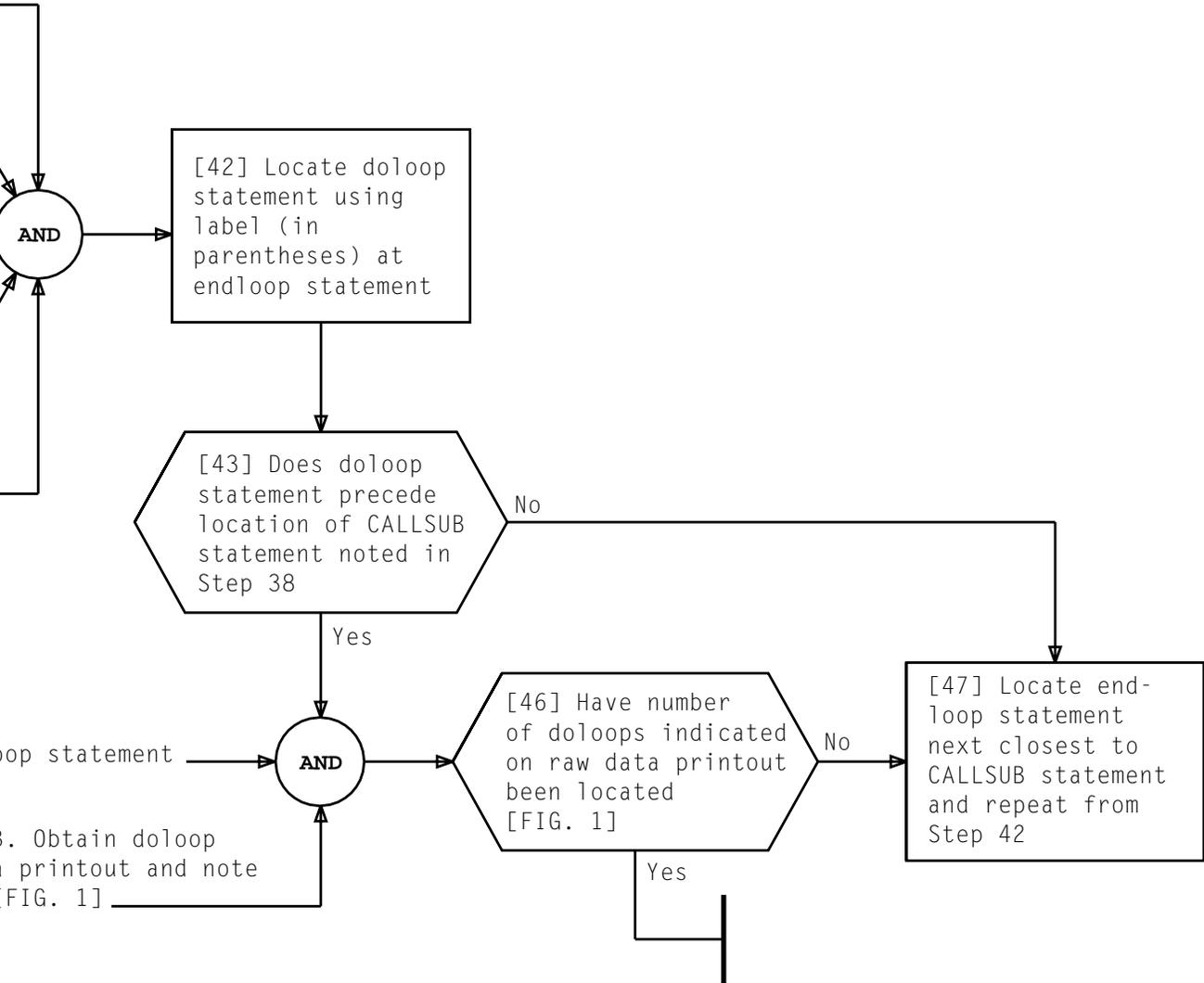
[43] Does doloop statement precede location of CALLSUB statement noted in Step 38

[44] Read any comments at doloop statement

[45] See NOTES 1 and 2, Page 3. Obtain doloop index value from raw data printout and note meaning for this doloop [FIG. 1]

[46] Have number of doloops indicated on raw data printout been located [FIG. 1]

[47] Locate end-loop statement next closest to CALLSUB statement and repeat from Step 42



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In first failing phase pident:

[1] Locate first failing test using EXPR address on raw data printout [FIG. 1]

[2] Note page and line number of EXPR data

[3] Locate endloop MACRO in pident reference section

[4] Note endloop reference that is closest to, but beyond EXPR data

[5] Locate endloop statement noted in Step 4

[8] Read any comments at doloop statement

[9] Obtain doloop index value from raw data printout and note meaning for this doloop [FIG. 1, NOTES 1 and 2]

[6] Locate doloop statement using label (in parentheses) at endloop statement

[7] Does doloop statement precede location of EXPR data noted in Step 2

[11] Locate endloop statement next closest to failing test and repeat from Step 6

[10] Have number of doloops indicated on raw data printout been located [FIG. 1]



NOTES	
1. First doloop located is innermost; next doloop located is next innermost, etc	
2. Doloop values often indicate unit under test, memory, etc	
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DETERMINE LOCATION AND FUNCTION OF DOLOOPS, NO SUBROUTINES CALLED

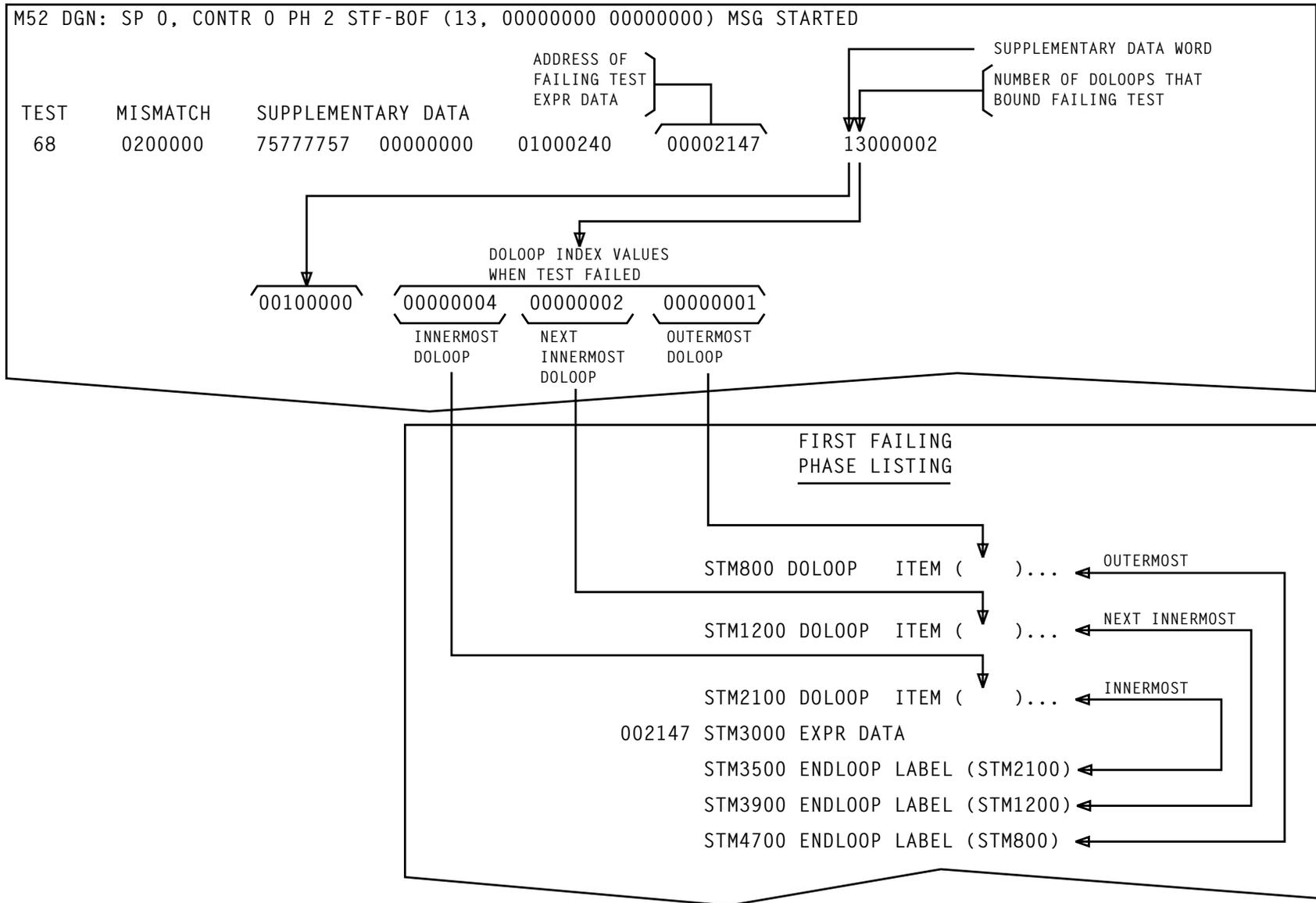
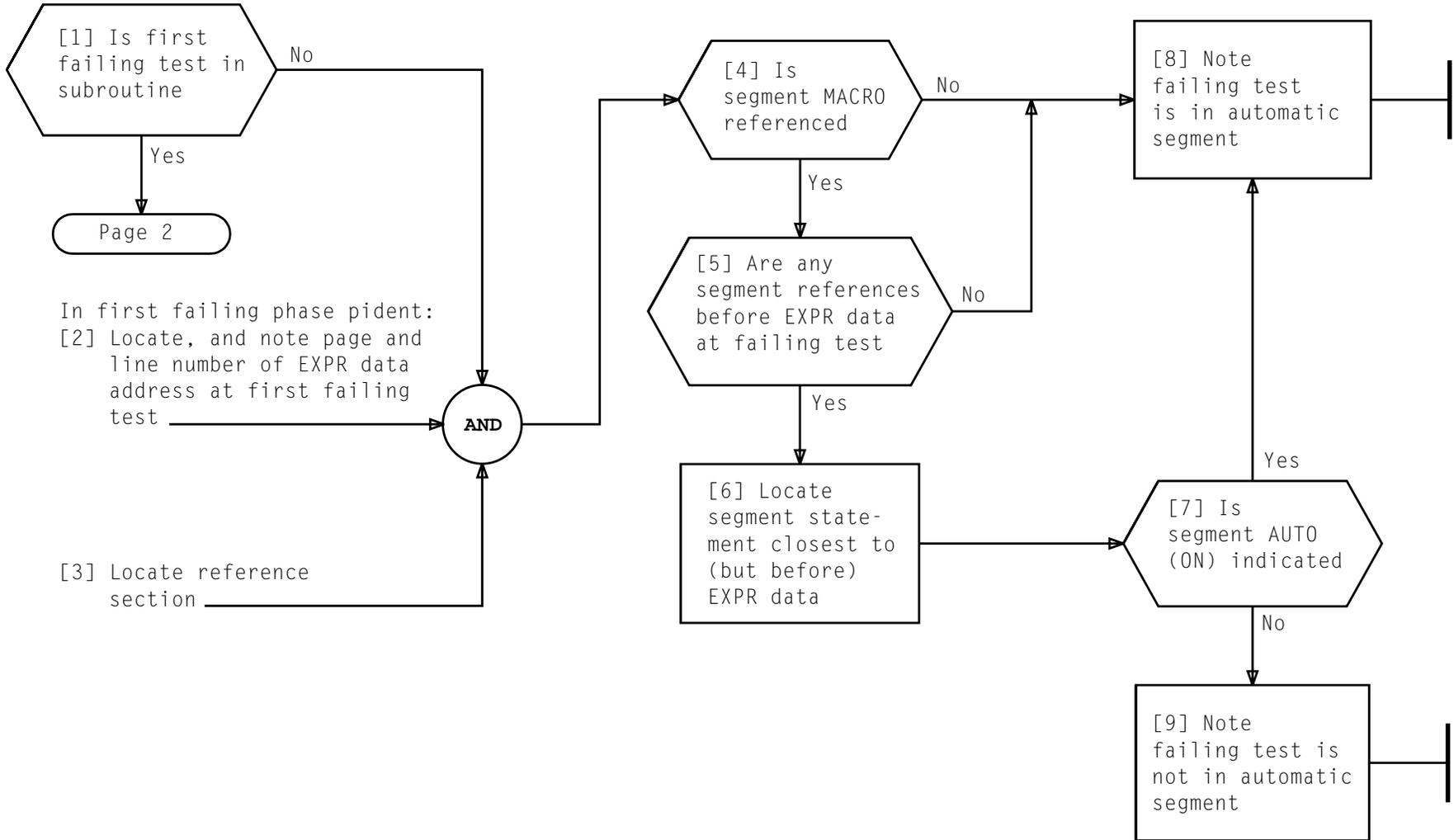


FIG. 1 - Example of Raw Data Doloop Word Relationship to Phase Listing

DETERMINE LOCATION AND FUNCTION OF DOLOOPS, NO SUBROUTINES CALLED

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<p style="text-align: center;">SUMMARY</p> <p>Locate first segment statement before first failing test. If segment statement has AUTO (ON) indicated, the failing test is in an automatic segment. If AUTO (ON) is not indicated,</p>	<p>the failing test is not an automatic segment. If no segment statement is found before the first failing test, the failing test is in an automatic segment.</p>
---	---



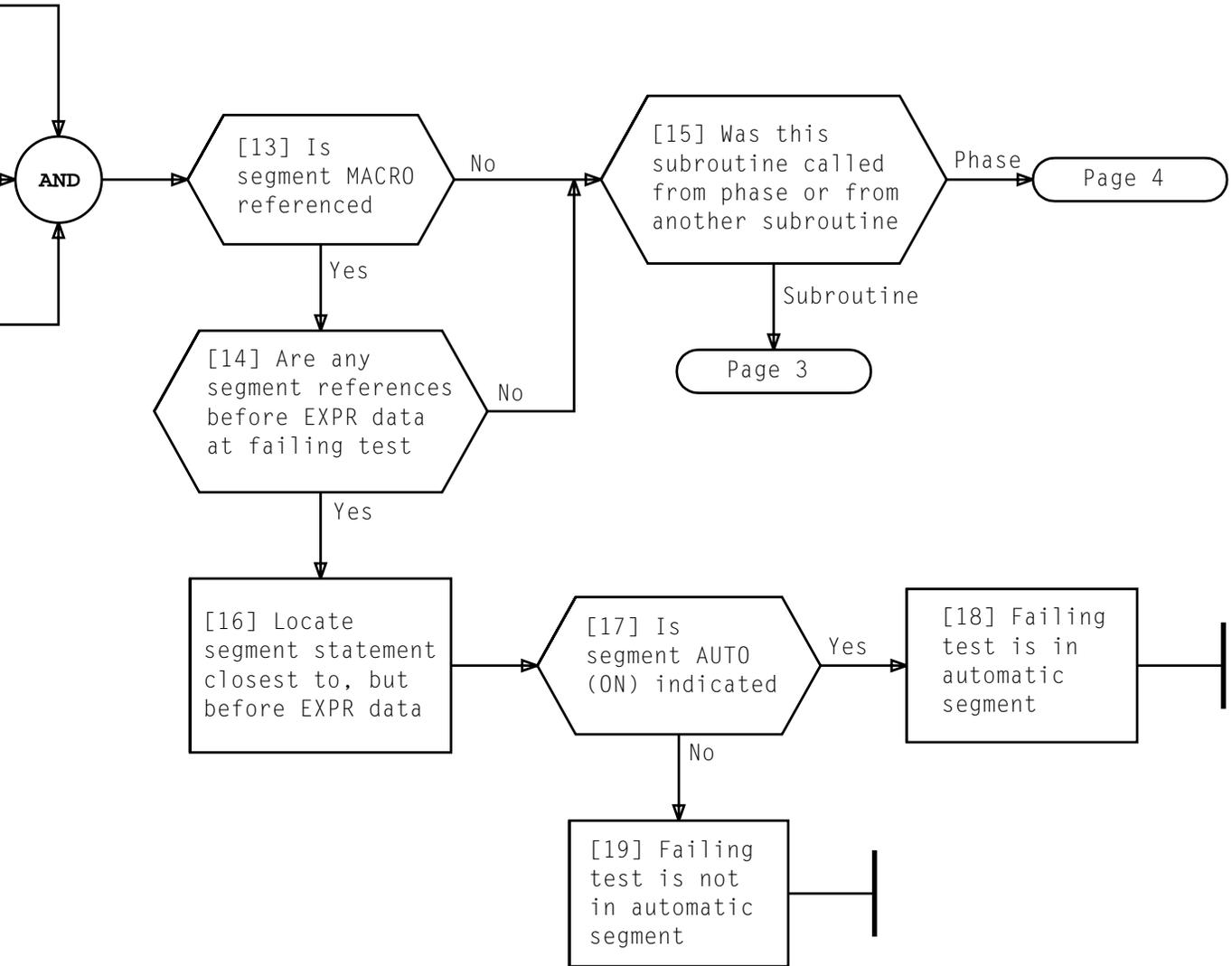
DETERMINE IF FAILING TEST IS IN AUTOMATIC SEGMENT

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In subroutine where first failing test is located:
 [10] Locate, and note page and line number of first address in subroutine (000000)

[11] Locate, and note page and line number of first failing test EXPR data

[12] Locate pident reference section



DETERMINE IF FAILING TEST IS IN AUTOMATIC SEGMENT

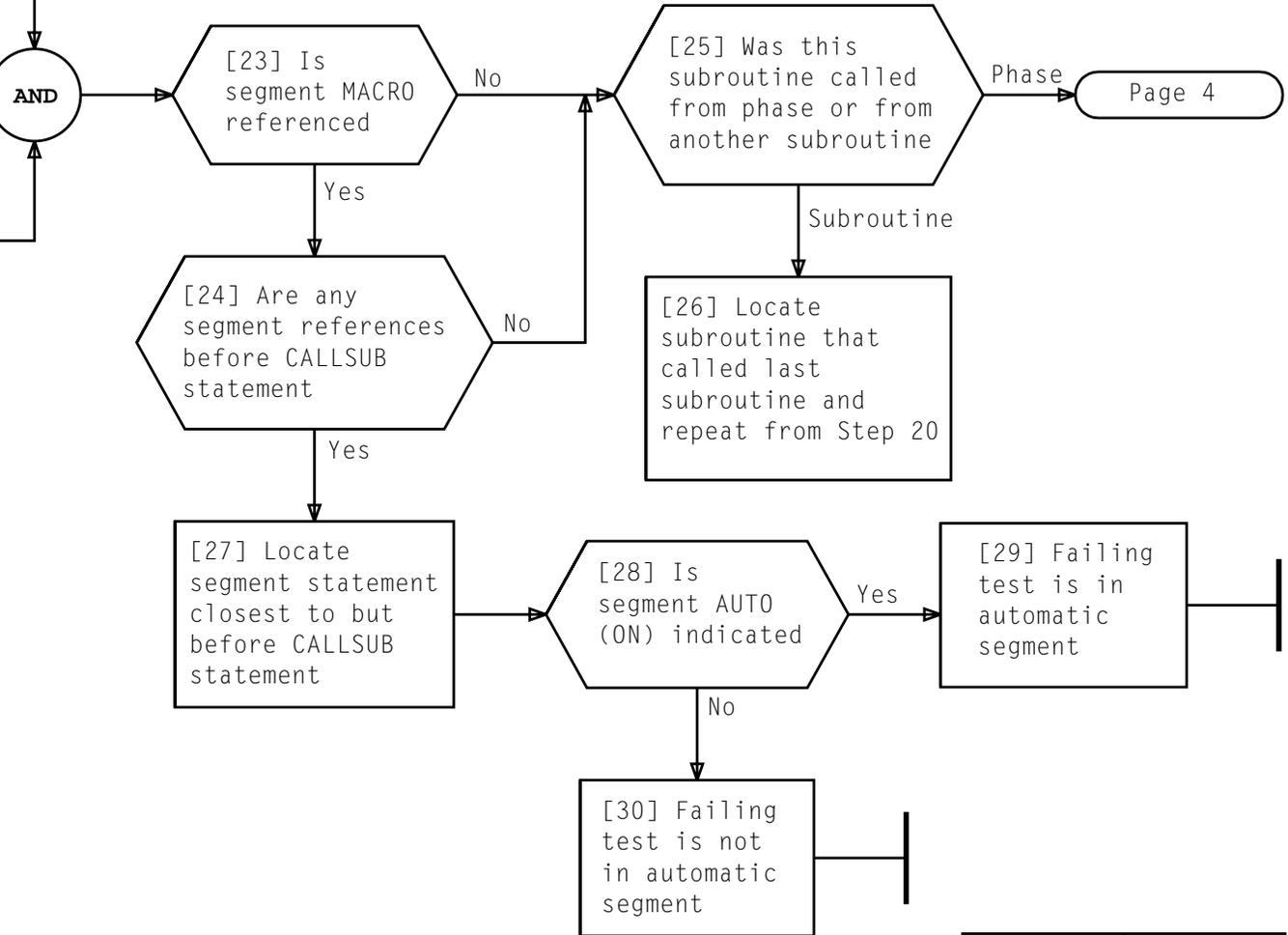
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In subroutine that called last subroutine
checked for segment statement:

[20] Locate, and note page and
line number of first address
in subroutine (000000)

[21] Locate, and note page
and line number of
CALLSUB statement
that called last
subroutine

[22] Locate pident reference
section

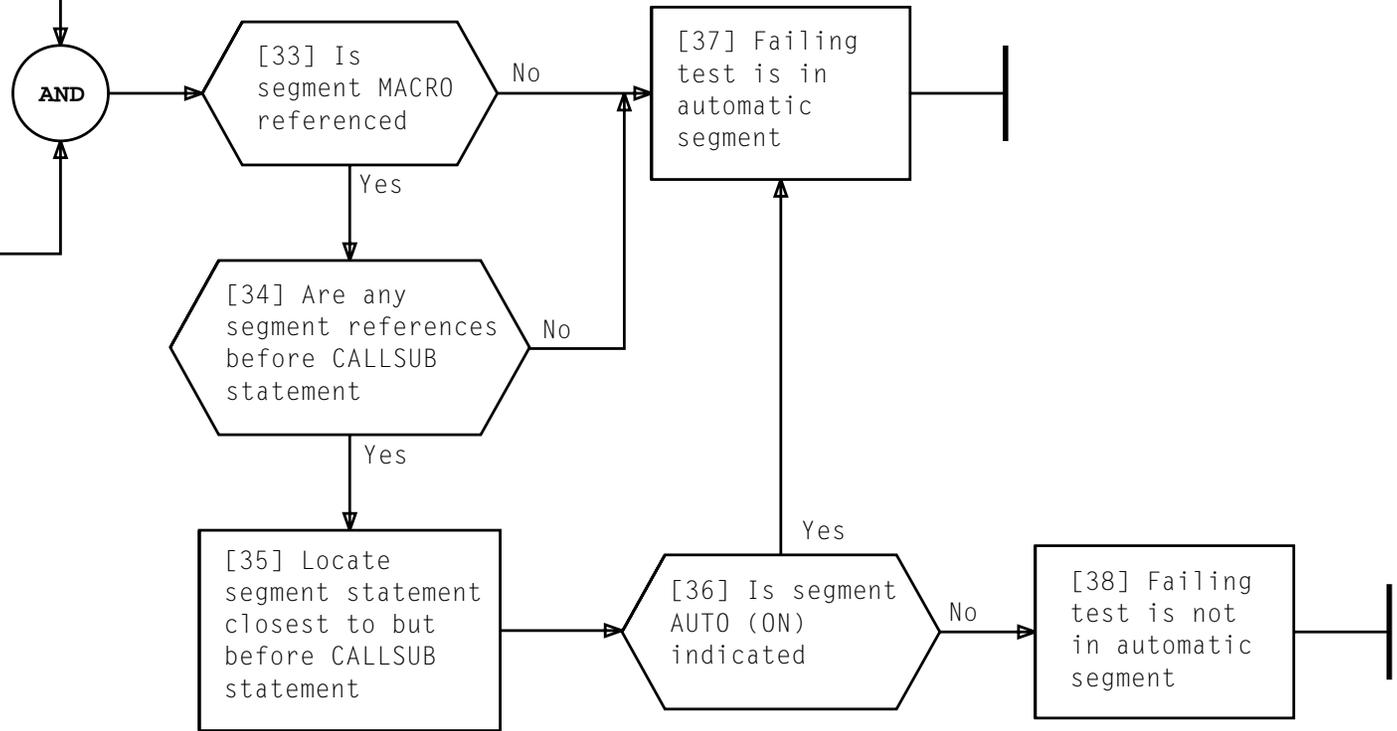


DETERMINE IF FAILING TEST IS IN AUTOMATIC SEGMENT

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In first failing phase pident:
 [31] Locate, and note page
 and line number of
 CALLSUB statement that
 called last subroutine
 checked for segment
 statement

[32] Locate
 reference section



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DETERMINE IF FAILING TEST IS IN AUTOMATIC SEGMENT

[1] Locate segment statement that determined failing test was not in automatic segment _____

[2] Note segment statement index word address for later use (loop start address) _____

[3] Locate first segment statement after first failing test _____

[4] Note index word address of DIAL statement that follows segment statement located in Step 3 (loop end address) _____

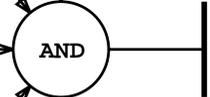
[5] Type EX:SP a;RPT 2:PH b,ADR c-d!

a = failing SP member number

b = first failing phase

c = loop start address [Step 2]

d = loop end address [Step 4] _____



SET UP LOOP OVER FIRST FAILING TEST WHEN TEST IS IN FORCE SEGMENT

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<p style="text-align: center;">SUMMARY</p> <p>When SP frame does not contain combined distributor and scanner matrix frame, and both controllers are in service, remove only points identified in suspect pack. When either controller is OOS, remove all points on associated packs</p>	<p>from service. On all frames, use SET:TRKSTAT MTC. DSA,CIN e:SDM! to remove TSN or TDN points on a pack. Use TABLE C to identify required action to remove affected MDN points on a pack.</p>
--	--

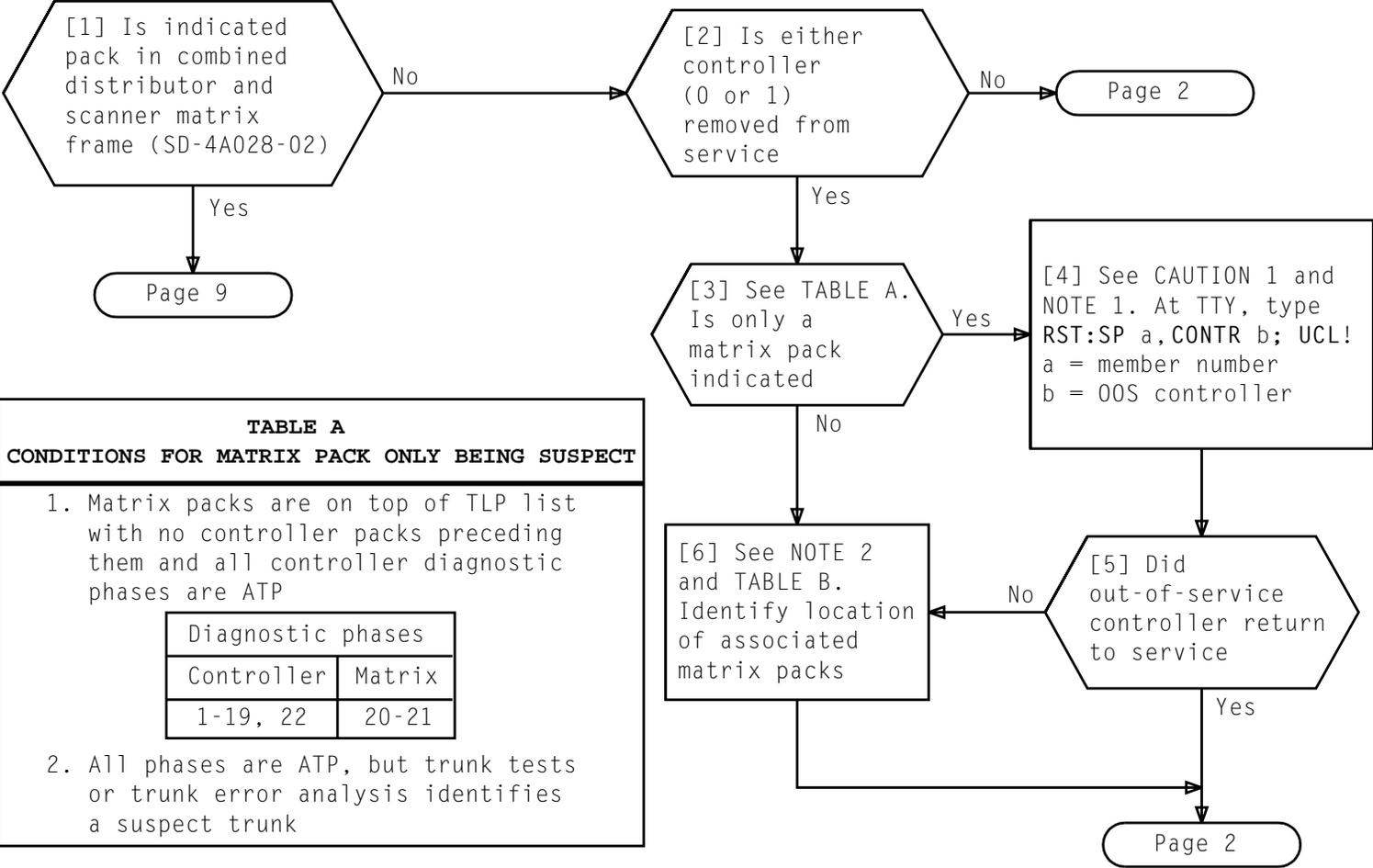


TABLE A
CONDITIONS FOR MATRIX PACK ONLY BEING SUSPECT

- Matrix packs are on top of TLP list with no controller packs preceding them and all controller diagnostic phases are ATP

Diagnostic phases	
Controller	Matrix
1-19, 22	20-21
- All phases are ATP, but trunk tests or trunk error analysis identifies a suspect trunk

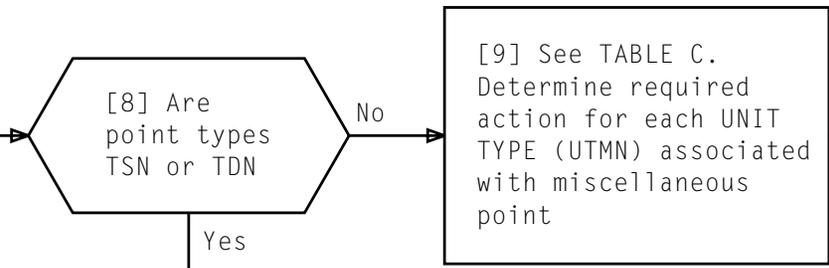
NOTES

- Unconditional restoration of associated controller could eliminate time-consuming process of removing from service other matrix packs. If restoration fails, F-level will occur and associated packs must be removed from service
- Points on associated matrix packs must also be removed from service before removal of suspect matrix pack

CAUTION 1

Take extreme care to ensure that these procedures are used. Restoration of a bad controller with the matrix pested can affect all matrix points depending on fault location

[7] Identify matrix point types associated with matrix pack by typing
 VER:SPMTXPK: SP a,EQPTLOC bcc-dd!
 a = member number
 b = bay number
 cc = level
 dd = horizontal position



[9] See TABLE C. Determine required action for each UNIT TYPE (UTMN) associated with miscellaneous point

[10] See NOTE 3. Request TOC to type
 OP:TRKSTAT,CIN e:SDM!
 and note status of each trunk

[11] See NOTE 3. Notify TOC to type
 SET:TRKSTAT,MTC.DSA,CIN e:SDM!
 CIN e = each trunk on verify message
 [Step 7]

[12] See NOTE 3. Request TOC to type
 OP:TRKSTAT,CIN e:SDM!
 ;and verify each trunk is MTC, DSA,
 and TRAF (OOSI)

TABLE B		
TYPE OF PACK	TABLE	PAGE
Scan point packs	D	6-7
SD point packs	E	8

NOTE 3
 If CINs are associated with **FB228** circuit pack, each matrix point must be removed on a per-CIN basis. (SDM option will not work)

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REMOVE SP MATRIX POINTS FROM SERVICE

TABLE C	
UNIT TYPE	REQUIRED ACTION
Alarm grid (miscellaneous A and B frame)	<p>1. Miscellaneous SD points (MDN) associated with GRID unit type in miscellaneous A or B frame – MOC and TEC work centers should be notified. They should retire any existing alarms, remove any alarm transfers or grouping between maintenance centers, and remove any foreign alarm transfers which exist. These can be reestablished when SP repair work is completed.</p> <p>2. Miscellaneous scan points associated with GRID unit type in miscellaneous A or B frame – Office alarm system will not work to full capacity when the scan pack is removed. The MOC (and TECs) should be notified that GRID is disabled during repair activity. Effects could be loss of grid report messages (but retention of frame alarm messages when provided), inability to retire alarms via alarm retire keys (but OK via TTY), and loss of alarm messages from a foreign alarm system. Audible and visual indicators will still be present. Remove any transfer grouping or foreign alarm for each point involved At TTY, for transfers type: STOP:CFR;ALMGRP[MC a]! (a = maintenance center) At TTY, type for stopping alarm routing: STOP:RTE;ALM [MC a]! (a = maintenance center)</p>
Ring and tone	Miscellaneous scan and SD points associated with the ringing and tone plant – MOC and TEC work centers should be notified giving them unit type and member number information. When pack replacement is complete, audit 20 should be requested (AUD: NUM). Obtain unit status and retain for restoral. At TTY, type OP:TONESTAT!
51-A test position	Miscellaneous scan and SD points associated with 51A test positions (TPOS) – Loss of scan or SD points at the test position will disable some of the testing capabilities. Notify TOC to suspend testing and place the position in the "position unattended" state to prevent incoming 101 calls at the positions involved until the SP repair work is complete. Request TOC to suspend tests and verify MTC DSA and TRAF (OOSI). At TTY, for each trunk involved, type OP:TRKSTAT, CIN e! (e = Trunk identity)
DOCT or NMDR power	Miscellaneous scan points associated with power for DOCT and NMDR units – MOC, MAC, and NMC work centers should be notified that acknowledgment failures on DOC transmitters may be caused by SP repair activity. These work centers should evaluate the need for manual action while SP repair activity is in progress

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TABLE C (Contd)	
UNIT TYPE	REQUIRED ACTION
TTF frame	Miscellaneous scan points associated with TTF frames – TEC should be notified that alarm TTY messages will not be printed for units involved if an alarm sounds for the frame. Aisle pilot lamps will have to be used to locate the trouble
Network management	Miscellaneous scan and SD points related to network management units – for SD points, DOC signals and acknowledgments cannot be sent; for scan points, DOC signals and acknowledgments cannot be received. Notify MAC and NMC work centers giving them the unit type and member number involved, and MSN or MDN number so he can determine the CIN of the affected TSG. (This determination can be done from paper records or via verification of unit-type translator, and DOCT to TSG and DOCR to TSG translators.)
Recorded announcement	<ol style="list-style-type: none"> 1. Miscellaneous SD points associated with the recorded announcement frame – the MOC and TEC work centers should be notified. When the pack replacement work is complete, audit 47 should be requested (AUD: NUM). 2. Miscellaneous scan points associated with the RA frame – the recorded announcement frame should be removed if scan pack replacement is being done. A 100-ms closure required every 4 seconds for the message phase update function may be missing and will cause customers to be connected to the wrong phase of a message. The MOC should be notified that RA frame needs to be taken out of service in connection with an SP matrix repair procedure. Obtain unit status and retain for restoral. At TTY, type OP:RASTAT a! (a = member number)
Signal processor	Associated with all duplicated pulse points (MDNs) – the only action required is to remove the pulse points from service and power unit down via PPL 0 or PPR 0 switch. If the mate pulse cannot be accessed (ie, by VIF), out-of-service request will be denied.
Trunk and service circuits	On all universal scan and SD points, and on miscellaneous scan SD or pulse points associated with circuits – CIN of the circuit should be identified and all circuits should be turned down (maintenance disabled) by TOC or MOC before any packs are removed. At TTY, for each trunk involved, type SET:TRKSTAT MTC,DSA,CIN e! (e = trunk identity) and verify MTC DSA and TRAF (00SI) OP:TRKSTAT, CIN e!

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REMOVE SP MATRIX POINTS FROM SERVICE

TABLE C (Contd)	
UNIT TYPES	REQUIRED ACTION
DOC transmitter and NMDC frame	Only for miscellaneous scan points associated with the peripheral unit report, ignore NTPI, for DOC transmitter and NMDC frame – MOC should be notified that SP repair activity may affect status of units involved. Unit type and member number information should be passed to the MOC
Automatic Distribution Group (International Operator Center)	Automatic Distribution Group (ADG) is associated with International Operator Center (IOC) for gateway offices. If this is a scan point, notify ADG management for the DG member number specified. ADG distribution must not be changed during repair procedures since changes will not be processed by the 4ESS™ switch during that time. Obtain the base scan point for this unit-type member number from the unit-type translator. Set the T-bits for the base point to ignore using ORD:TBITS;IGNORE:MSH ---! After pack has been replaced, set T-bits for the base point to NORM. If this is an SD point, then the ADG management should be notified that acknowledgments will not be sent during the repair process time
Unit types other than above	The MOC and TEC work centers should be notified of the sort of SP repair procedure being performed, and should be given the unit type and member number of each unit implicated. At TTY, type INH:AUD:NUM 28! for each MSN involved; type ORD:TBITS;IGNORE:MSN e! e = scan number identity. While MSNs are set to ignore, any state changes on these scan points will not be acknowledged until MSNs are set back to normal If this is a base SP and these points are associated with the ACK/OS/OFF switch on peripheral unit frames, there are no T-bits to set. For base SP, see WARNING 1.

WARNING 1

*If this is a base SP and the points associated with the FA605 pack or power converter are for **ACK/OS/OFF** switches on peripheral units, you will receive REPT POWER ALARM FAILURES on removal. This is a normal condition.*

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**TABLE D
SCAN POINTS**

SCAN PT MATRIX PACK LOCATION	CONTROLLER 0 ACTIVE AND CONTR 1 00S	CONTROLLER 1 ACTIVE AND CONTR 0 00S	SCAN PT MATRIX PACK LOCATION	CONTROLLER 0 ACTIVE AND CONTR 1 00S	CONTROLLER 1 ACTIVE AND CONTR 0 00S
070-02	070-04 070-08 058-05		070-27	070-29 070-33 058-25	
070-03	070-05 070-09 058-12		070-28	070-30 070-34 058-32	
070-04		070-02 070-06 058-04	070-29		070-27 070-31 058-24
070-05		070-03 070-07 058-11	070-30		070-28 070-32 058-31
070-06	070-08 070-04 058-05		070-31	070-33 070-29 058-25	
070-07	070-09 070-05 058-12		070-32	070-34 070-30 058-32	
070-08		070-06 070-02 058-04	070-33		070-31 070-27 058-24
070-09		070-07 070-03 058-11	070-34		070-32 070-28 058-31
070-10	070-12 070-16 058-08				
070-11	070-13 070-17 058-15		070-37	070-39 070-43 058-40	
070-12		070-10 070-14 058-07	070-38	070-40 070-44 058-47	
070-13		070-11 070-15 058-14	070-39		070-37 070-41 058-39
070-14	070-16 070-12 058-08		070-40		070-38 070-42 058-46
070-15	070-17 070-13 058-15		070-41	070-43 070-39 058-40	
070-16		070-14 070-10 058-07	070-42	070-44 070-40 058-47	
070-17		070-15 070-11 058-14	070-43		070-41 070-37 058-39
			070-44		070-42 070-38 058-46
070-19	070-21 070-25 058-22		070-45	070-47 070-51 058-43	
070-20	070-22 070-26 058-29		070-46	070-48 070-52 058-50	
070-21		070-19 070-23 058-21	070-47		070-45 070-49 058-42
070-22		070-20 070-24 058-28	070-48		070-46 070-50 058-49
070-23	070-25 070-21 058-22		070-49	070-51 070-47 058-43	
070-24	070-26 070-22 058-29		070-50	070-52 070-48 058-50	
070-25		070-23 070-19 058-21	070-51		070-49 070-45 058-42
070-26		070-24 070-20 058-28	070-52		070-50 070-46 058-49

REMOVE SP MATRIX POINTS FROM SERVICE

TABLE D SCAN POINTS (Contd)						
SCAN PT MATRIX PACK LOCATION	CONTROLLER 0 ACTIVE AND CONTR 1 00S			CONTROLLER 1 ACTIVE AND CONTR 0 00S		
070-54	070-56	070-60	058-57			
070-55	070-57	070-61	058-64			
070-56				070-54	070-58	058-56
070-57				070-55	070-59	058-63
070-58	070-60	070-56	058-57			
070-59	070-61	070-57	058-64			
070-60				070-58	070-54	058-56
070-61				070-59	070-55	058-63
070-62	070-64	070-68	058-60			
070-63	070-65	070-69	058-67			
070-64				070-62	070-66	058-59
070-65				070-63	070-67	058-66
070-66	070-68	070-64	058-60			
070-67	070-69	070-65	058-67			
070-68				070-66	070-62	058-59
070-69				070-67	070-63	058-66

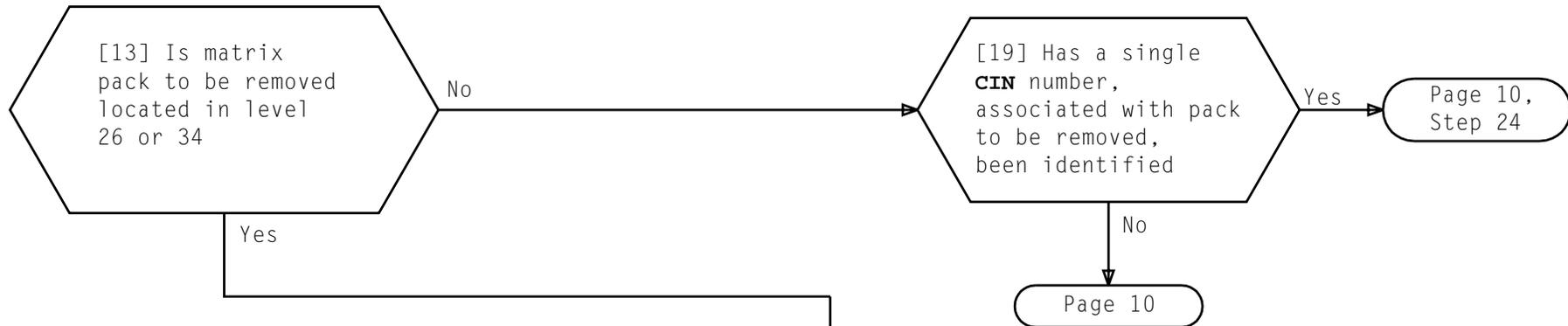
REMOVE SP MATRIX POINTS FROM SERVICE

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TABLE E					
SD POINTS					
SD PT MATRIX PACK LOCATION	CONTROLLER 0 ACTIVE AND CONTROLLER 1 00S			CONTROLLER 1 ACTIVE AND CONTROLLER 0 00S	
	SD MATRIX		SCAN MATRIX	SD MATRIX	SCAN MATRIX
058-04	058-05	058-07	070-04,08,10,14		
058-11	058-14	058-12	070-15,11,05,09		
058-05	058-08		070-12,16	058-04	070-02,06
058-12	058-15		070-17,13	058-11	070-03,07
058-07	058-08		070-12,16	058-04	070-02,06
058-14	058-15		070-17,13	058-11	070-03,07
058-08				058-05	070-04,08,10,14
058-15				058-14 058-12	070-05,09,11,15
058-21	058-22	058-24	070-21,25,27,31		
058-28	058-31,29		070-28,32,22,26		
058-22	058-25		070-29,33	058-21	070-19,23
058-29	058-32		070-30,34	058-28	070-20,24
058-24	058-25		070-29,33	058-21	070-19,23
058-31	058-32		070-30,34	058-28	070-20,24
058-25				058-22 058-24	070-21,25,27,31
058-32				058-31,29	070-22,26,28,32
058-39	058-40	058-42	070-39,43,45,49		
058-46	058-49	058-47	070-46,50,40,44		
058-40	058-43		070-47,51	058-39	070-37,41
058-47	058-50		070-48,52	058-46	070-38,42
058-42	058-43		070-47,51	058-39	070-37,41
058-49	058-50		070-48,52	058-42,46	070-45,49,38,42
058-43				058-40,42	070-39,43,45,49
058-50				058-49,47	070-46,50,40,44
058-56	058-57,59		070-56,50,62,66		
058-63	058-66		070-63,67		
058-57	058-60		070-64,68	058-56	070-54,58
058-64	058-67		070-65,69	058-63	070-55,59
058-59	058-60		070-63,67	058-56	070-54,58
058-66	058-67		070-65,69	058-63	070-55,59
058-60				058-57,59	070-56,60,62,66
058-67				058-66,640	070-63,67,57,61

REMOVE SP MATRIX POINTS FROM SERVICE

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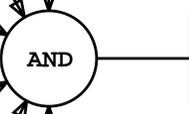
[14] See TABLE F. Using horizontal position of matrix pack, determine column associated with miscellaneous points

[15] See NOTE 4 and TABLE G. Determine bay and decimal row of miscellaneous points using matrix pack location (bay-level)

[16] See FIG. 1. Determine MSNs and MDNs associated with matrix pack, using SP member number, bay, row, and column

[17] See NOTE 5 and FIG. 2. Using office drawings index through 16 SCAN rows and 16 distributor rows, determine all UNIT TYPES associated with each miscellaneous point

[18] See TABLE C, Page 3. For each UNIT TYPE associated with a miscellaneous point, determine required action

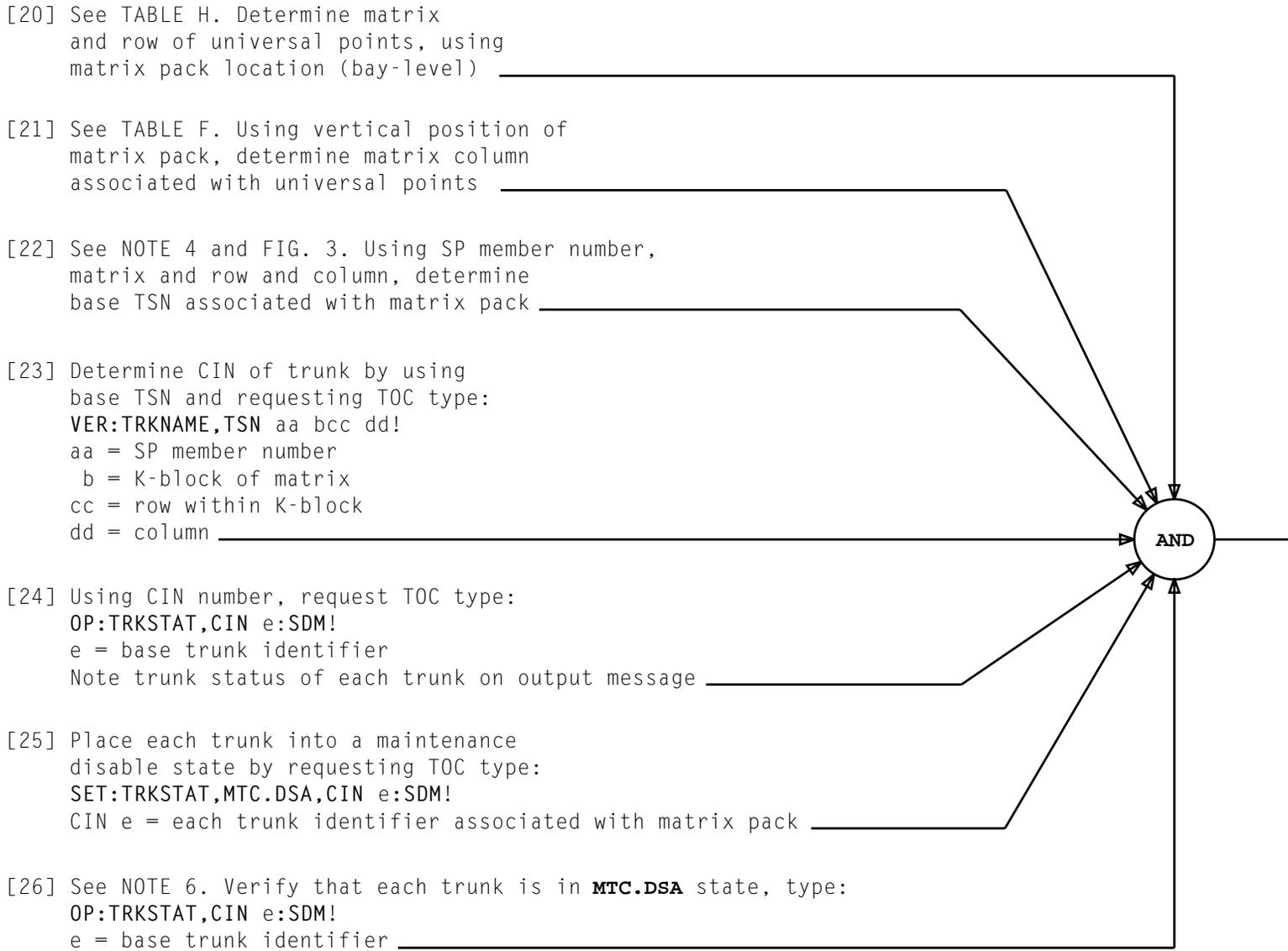


NOTES

4. Within each matrix pack, there are 32 points, 16 TDNs and 16 TSNs; or 16 MSNs and 16 MDNs. Base point on pack has lowest decimal K and row number

5. MSN assignments are located in T-(OFFICE BASE NO.)-H0-461-00. MDN assignments are located in T-(OFFICE BASE NO.)-H0-462-00

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NOTE 6
 A waiting period may be required since a trunk must first be in a nonactive state before being placed into a maintenance-disable state

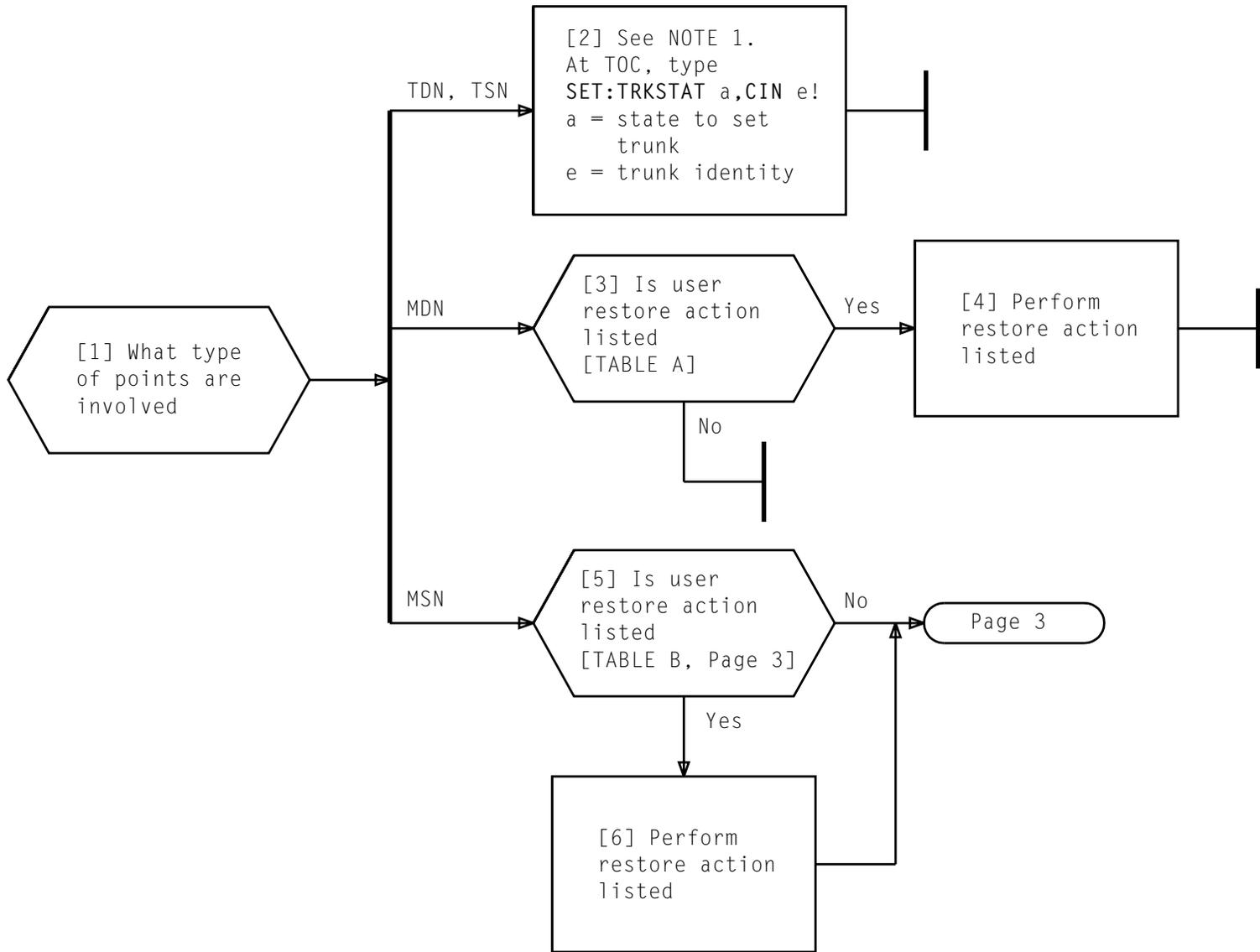
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TABLE F HORIZONTAL POSITION OF CIRCUIT PACK	
HORIZONTAL POSITION	COLUMN NUMBER
22P	00
24	01
25P	02
27	03
30	04
31	05
33	06
34P	07
37P	08
39	09
40P	10
42	11
45	12
46P	13
48	14
49P	15

TABLE G MISCELLANEOUS SCAN AND DISTRIBUTOR POINTS LAYOUT			
CIRCUIT PACK LOCATION		MATRIX (K-BLOCK)	DECIMAL ROW
BAY	VERTICAL LEVEL		
0	34	4	000-015
0	26	4	016-031
1	34	4	032-047
1	26	4	048-063
4	34	5	064-079
4	26	5	080-095
5	34	5	096-111
5	26	5	112-127

TABLE H UNIVERSAL SCAN AND DISTRIBUTOR POINTS (TSN)			
CIRCUIT PACK LOCATION		MATRIX (K-BLOCK)	DECIMAL K AND ROW
BAY	VERTICAL LEVEL		
0	76	0	000-015
0	68	0	016-031
1	76	0	032-047
1	68	0	048-063
4	76	1	064-079
4	68	1	080-095
5	76	1	096-111
5	68	1	112-127
0	60	2	128-143
0	52	2	144-159
1	60	2	160-175
1	52	2	176-191
4	60	3	192-207
4	52	3	208-223
5	60	3	224-239
5	52	3	240-255

REMOVE SP MATRIX POINTS FROM SERVICE



NOTE 1
Trunk status was noted when SP matrix points were removed from service; set the trunks to those states

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TABLE A	
USER	RESTORE ACTION
Trunk circuits	At TOC, for each trunk involved, type: SET:TRKSTAT ACT,CINe! (e = trunk identity)
Recorded announcements	At MOC, type: AUD:NUM 47! and take whatever manual action needed to restore RA frame to prior status before pack is replaced
Ringing and tone	At MOC, type: AUD:NUM 20! and take whatever actions needed to restore frame to prior status before pack is replaced
Alarm transfer or grouping	At MOC, for transfer, type: STOP:RTE:ALM [,MC a]! (a = maintenance center or for grouping, type: to be transferred from) STOP:CFR:ALM GRP [,MC a]!
Service circuits	At MOC for each service circuit involved, type: SET:TRKSTAT ACT,CIN e! (e = service circuit identity)
51A test position	Notify TOC points are restored to service and for each trunk removed from service type: SET:TRKSTAT ACT,CIN e! (e = trunk identity)

[7] At MOC, type:
 ORD:TBITS;NORM:SP a,EQPTLOC bcc-dd!
 a = member number
 b = bay number
 cc = level
 dd = horizontal position

[8] At MOC, type:
 ALW:AUD:NUM 28!

[9] At MOC, type:
 AUD:NUM 28!

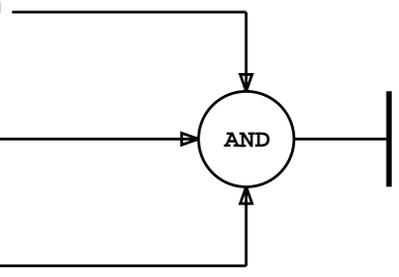
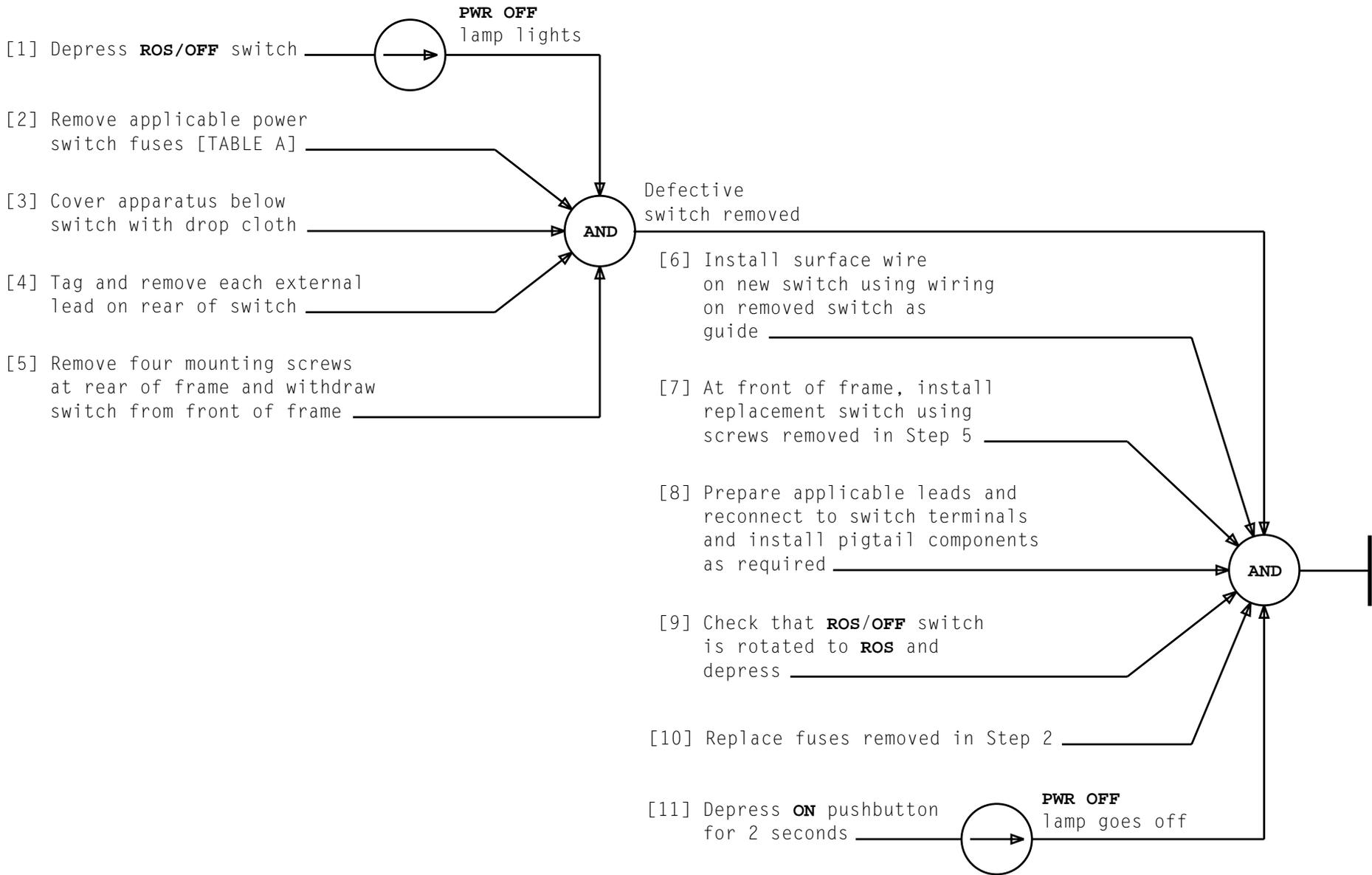


TABLE B	
USER	RESTORE ACTION
Recorded announcement	At TOC, for each trunk involved, type: SET:TRKSTAT ACT,CIN e! e = trunk identity Take whatever manual action needed to restore RA frame to prior status before pack is replaced
Ringing and tone	At MOC, type: AUD:NUM 20! Take whatever actions needed to restore frame to prior status before pack is replaced
51A Test position	Notify TOC points are restored to service
Service circuits	At MOC, for each trunk involved, type: SET:TRKSTAT ACT,CIN e! e = trunk identity

RESTORE SP MATRIX POINTS TO SERVICE



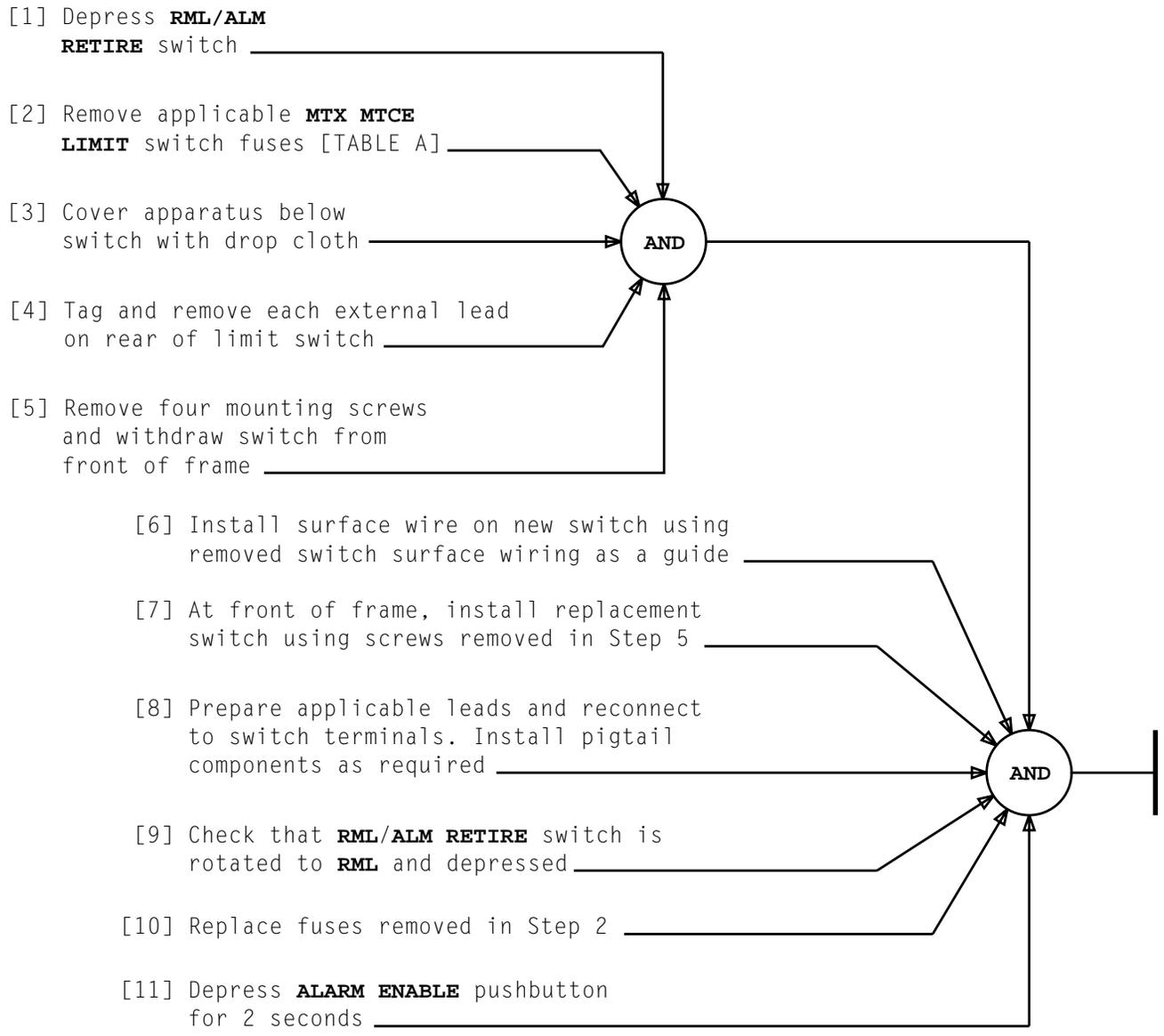
REPLACE POWER SWITCH

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TABLE A					
FRAME	UNIT LOCATION	UNIT DESIGNATION	SWITCH LOCATION	ASSOCIATED FUSES	
				+24V	
				FUSE LOCATION	FUSE DESIG
Control frame (bays 1 and 2)	178	Peripheral bus unit 0	180-43	107-28	0CN, 0CR, 0CS
	144	Control unit 0	146-03	107-28	0CK
	278	Peripheral bus unit 1	280-43	207-28	1CN, 1CR, 1CS
	244	Control unit 1	246-03	207-28	1CK
Supplementary matrix frame (bay 0)	050	Pulse point unit	052-69	007-45	FAT, ST
		MTX maintenance limit switch	066-36	007-72	MML

REPLACE POWER SWITCH

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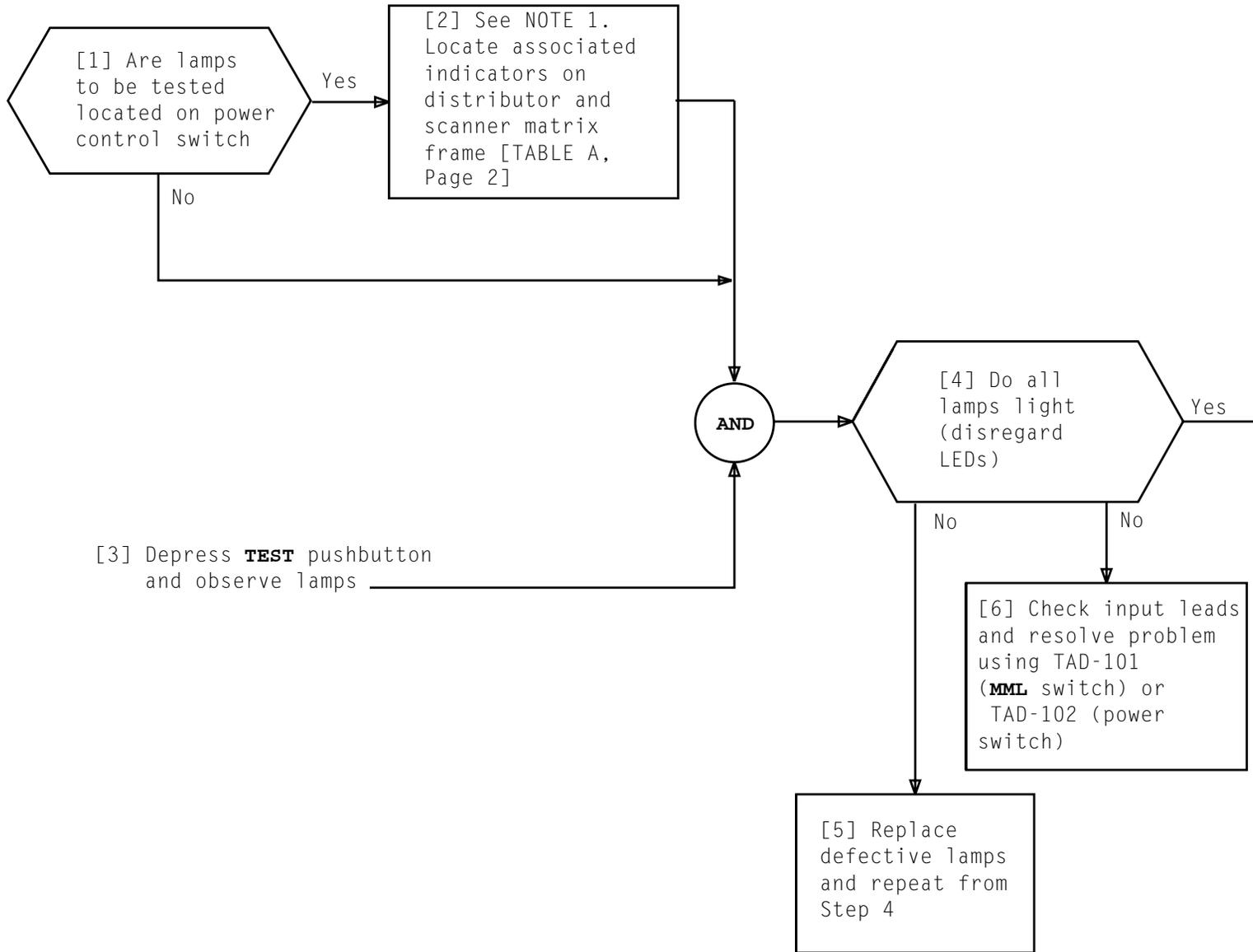
REPLACE MATRIX MAINTENANCE LIMIT SWITCH

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TABLE A					
FRAME	UNIT LOCATION	UNIT DESIGNATION	SWITCH LOCATION	+24V	
				LOCATION	DESIG
Supplementary matrix frame	056	Supplementary access and matrix unit	066-35	007-27	MML (SW)

REPLACE MATRIX MAINTENANCE LIMIT SWITCH

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NOTE 1	
Indicator on each scanner access unit and distributor access unit of the distributor and scanner matrix duplicates appropriate power switch lamps on the control unit	
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TABLE A				
FRAME	SWITCH/INDICATOR	BAY	(VERT) POSITION	FUNCTION
Control	Power switch	1 and 2	80	Peripheral bus
	Power switch	1 and 2	46	Controls lamps on associated indicator
Supplementary matrix	Matrix maintenance limit switch	0	68	Controls alarm capabilities
	Indicator	0	64	Duplicates power switch lamps on control panel
	Power switch	0	52	Pulse point switch

At tape transport:

[1] Open interlocked cover door;
at upper right of tape
transport, pull interlock
plunger out

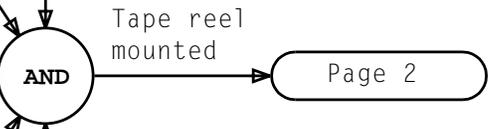
[2] Operate **LOCAL/REMOTE**
switch to obtain **LOCAL**
lighted condition



[3] Verify that empty lower (take-up) tape reel is
same size or larger than tape reel to be mounted

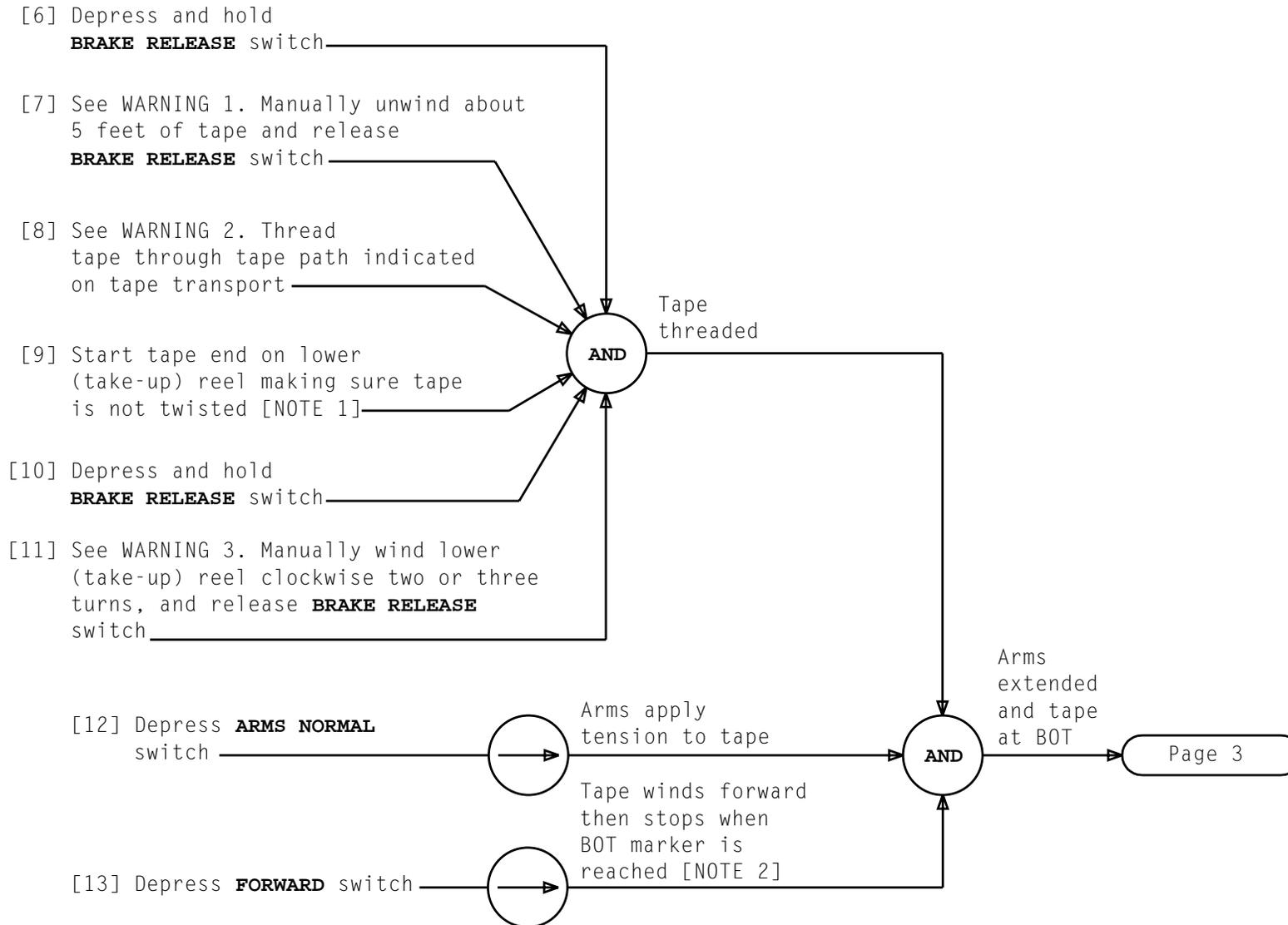
[4] With hub (knob) of upper reel in
counterclockwise position, mount reel
with tape on reel holder

[5] Rotate hub (knob) of upper reel clockwise
to detent to lock tape reel securely



MOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT

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NOTES

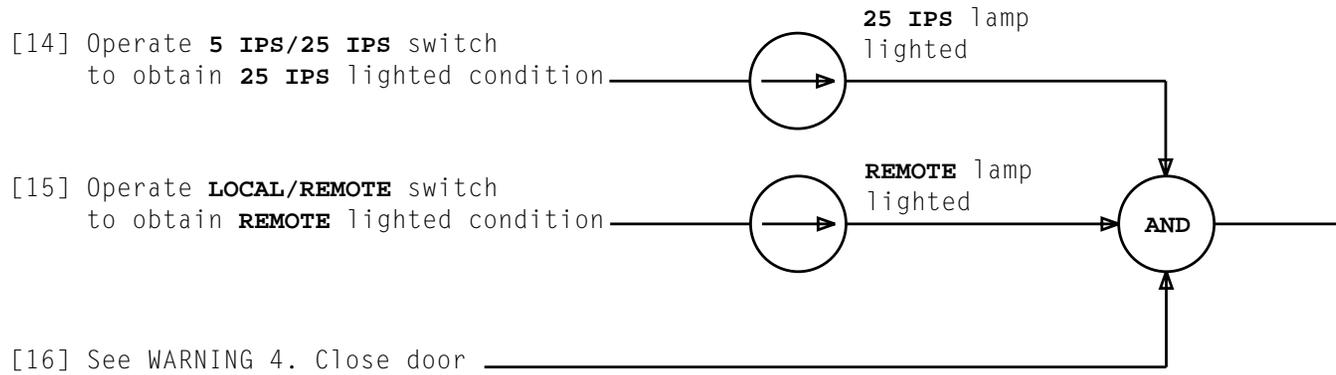
1. To start tape on take-up reel, it may help to moisten the tape end (moistened fingers) and stick it to the reel axle
2. Tape may not stop at BOT marker if fast forward is depressed

WARNINGS

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

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MOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT



<i>WARNING 4</i> <i>Closing tape transport door in a harsh manner may upset alignment</i>	
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MOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT

[1] Identify location of circuit packs associated with converter to be removed [TABLE A]

[2] At signal processor frame, determine type of circuit packs associated with converter

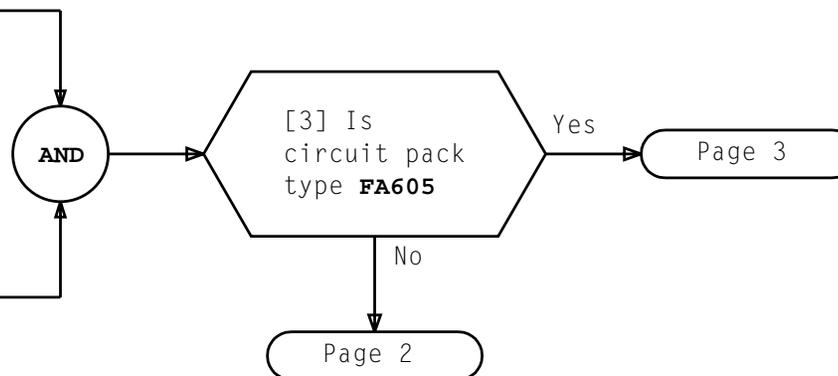


TABLE A SUPPLEMENTARY MATRIX UNIT POWER (BAY 0)								
REPLACEMENT CONVERTER LOCATION	ASSOCIATED PACK POSITION		CONTROL FUSE		START FUSE		140V FUSE	
	VERT	HORIZONTAL	LOCATION	NAME	LOCATION	NAME	LOCATION	NAME
12-02	58	04,05,07,08	07-33	BAO	07-33	CAO	07-53	AAO
12-05	58	11,12,14,15	07-33	BBO	07-33	CBO	07-53	ABO
12-08	58	21,22,24,25	07-33	BCO	07-33	CCO	07-53	ACO
12-11	58	28,29,31,32	07-33	BDO	07-33	CDO	07-53	ADO
12-14	58	39,40,42,43	07-39	BEO	07-39	CEO	07-59	AEO
12-17	58	46,47,49,50	07-39	BFO	07-39	CFO	07-59	AFO
12-20	58	56,57,59,60	07-39	BGO	07-39	CGO	07-59	AGO
12-23	58	63,64,66,67	07-39	BHO	07-39	CHO	07-59	AHO

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REPLACE DC-DC CONVERTER, POWER CONTROLLED BY MML SWITCH

[4] Remove fuses associated with converter in the following sequence: **START** fuse (C_ _), **+24V CONTROL** fuse (B_ _), **140V** fuse (A_ _)
 [TABLE A]

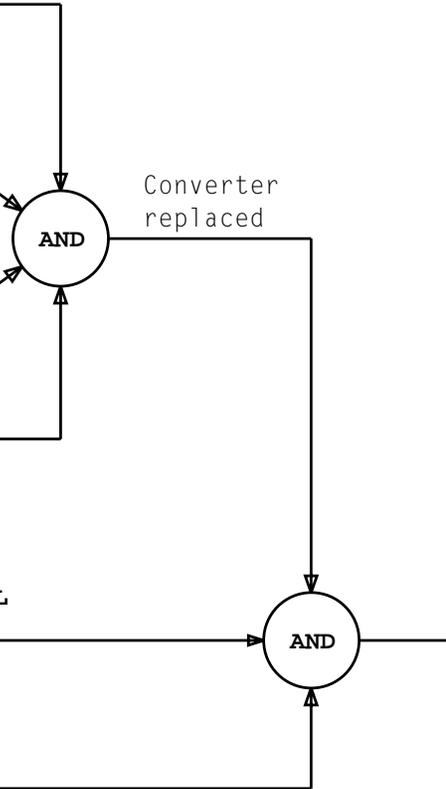
[5] See CAUTION 1.
 Remove converter

[6] Inspect backplane connectors for bent, broken, or shorted contacts

[7] Install and seat replacement converter

[8] See NOTE 1. Install fuses in following sequence: **140V** fuse (A_ _), **+24V CONTROL** fuse (B_ _), **START** fuse (C_ _)

[9] Test power monitor circuits [DLP-521]



NOTE 1
 If fuses are not installed in proper sequence, converter will not power up

CAUTION 1
 If OS lamp does not light, delay removing power until duplicate pulse points are returned to service

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[10] Remove from service SP matrix points associated with four **FA605** circuit packs [DLP-512]

[11] At **MML** switch, rotate **RML/ALM RETIRE** switch clockwise

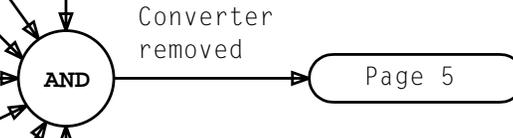
[12] Depress **RML/ALM RETIRE** switch

[13] Using TABLE B, identify location of 16 **FB228** packs associated with 4 **FA605** packs identified in Step 1

[14] Unseat 16 **FA228** circuit packs

[15] Remove fuses associated with converter in following sequence: **START** fuse (C_ _), **24V CONTROL** fuse (B_ _), **140V** fuse (A_ _) [TABLE A]

[16] Remove converter



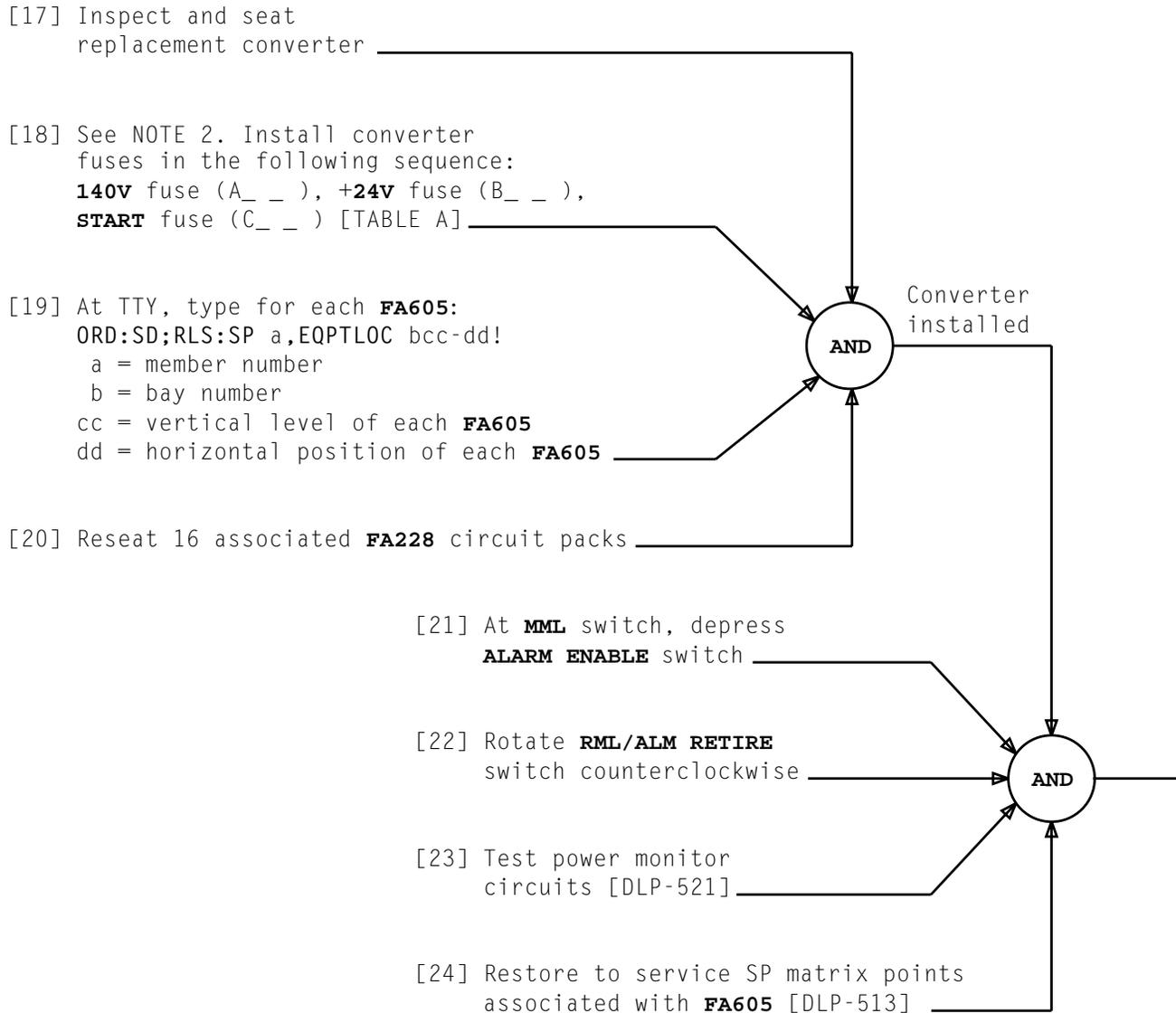
REPLACE DC-DC CONVERTER, POWER CONTROLLED BY MML SWITCH

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TABLE B

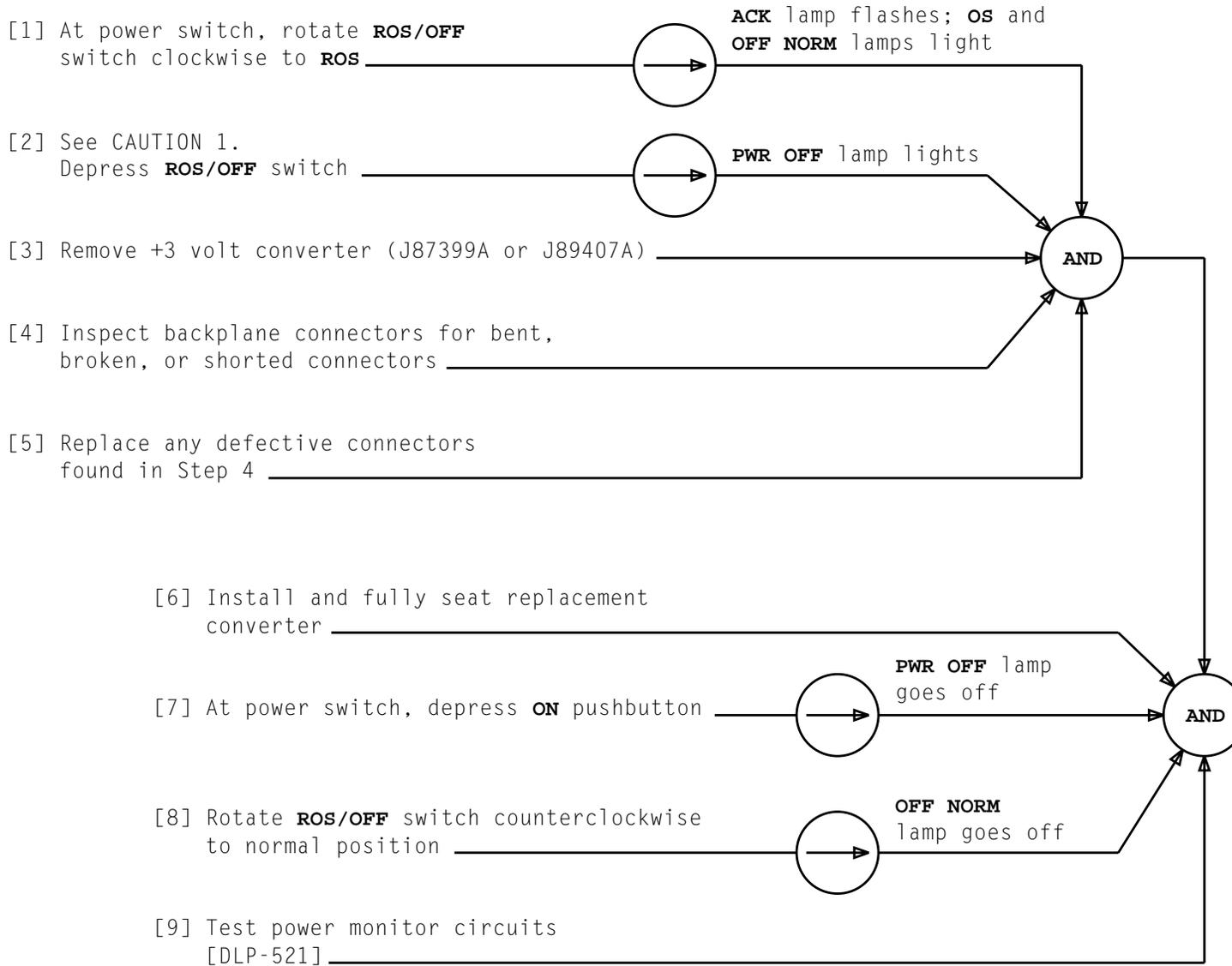
FRAME	FA605 LOCATION			ASSOCIATED PACK LOCATION			FRAME	FA605 LOCATION			ASSOCIATED PACK LOCATION		
	BAY	VERT	HOR	BAY	VERT	HOR		BAY	VERT	HOR	BAY	VERT	HOR
Supplementary matrix	0	58	04	0	33	02P, 04, 05P, 07	Supplementary matrix	0	58	39	0	44	02P, 04, 05P, 07
			05			08P, 10, 11P, 13				40			08P, 10, 11P, 13
			07			21P, 23, 24P, 26				42			21P, 23, 24P, 26
			08			27P, 29, 30P, 32				43			27P, 29, 30P, 32
			11			38P, 40, 41P, 43				46			38P, 40, 41P, 43
			12			44P, 46, 47P, 49				47			44P, 46, 47P, 49
			14			57P, 59, 60P, 62				49			57P, 59, 60P, 62
			15	0	33	63P, 65, 66P, 68				50	0	44	63P, 65, 66P, 68
			21	0	38	02P, 04, 05P, 07				56	0	50	02P, 04, 05P, 07
			22			08P, 10, 11P, 13				57			08P, 10, 11P, 13
			24			21P, 23, 24P, 26				59			21P, 23, 24P, 26
			25			27P, 29, 30P, 32				60			27P, 29, 30P, 32
			28			38P, 40, 41P, 43				63			38P, 40, 41P, 43
			29			44P, 46, 47P, 49				64			44P, 46, 47P, 49
			31			57P, 59, 60P, 62				66			57P, 59, 60P, 62
0	58	32	0	38	63P, 65, 66P, 68	0	58	67	0	50	63P, 65, 66P, 68		

REPLACE DC-DC CONVERTER, POWER CONTROLLED BY MML SWITCH



NOTE 2	
If fuses are not installed in proper sequence, converter will not power up	
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REPLACE DC-DC CONVERTER, POWER CONTROLLED BY MML SWITCH



CAUTION 1
 If **PPL/PPR** switch is the power control associated with converter, ensure **OS** lamp is lighted, indicating duplicate pulse points have been placed into service

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REPLACE POWER CONVERTER +3 VOLT J87399A or J89407A

[1] See CAUTION 1 and NOTE 1. On 98A converter, position toggle switch to **OFF**

[2] Using Table A, Page 3, identify and remove **140V** and **24V** fuses associated with converter

[3] Remove 98A converter

[4] Inspect backplane connectors for bent, broken, or shorted contacts

[5] Replace any defective connectors

[7] On replacement converter, position **ON/OFF** toggle switch to **OFF**

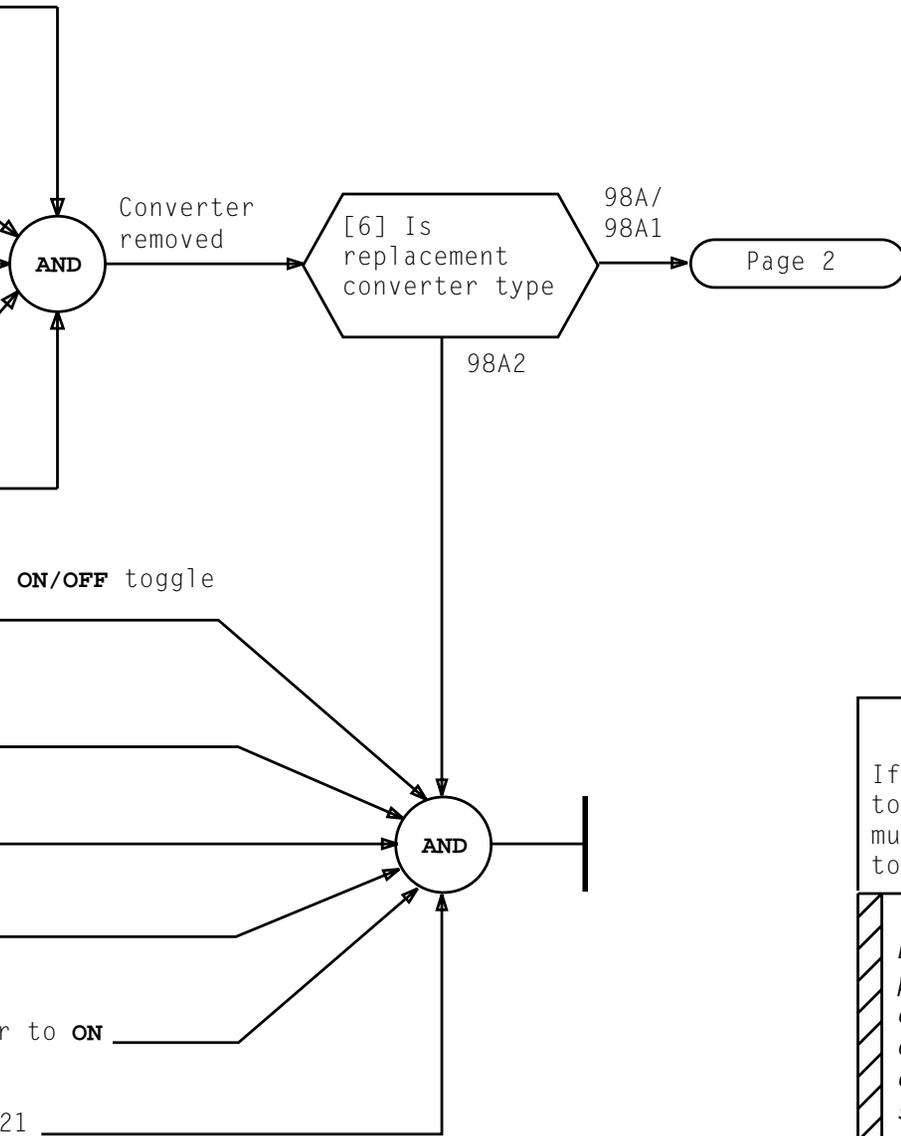
[8] Install and fully seat replacement converter

[9] Install **24V** fuse

[10] Install **140V** fuse

[11] Position toggle switch on converter to **ON**

[12] Test power monitor circuits DLP-521

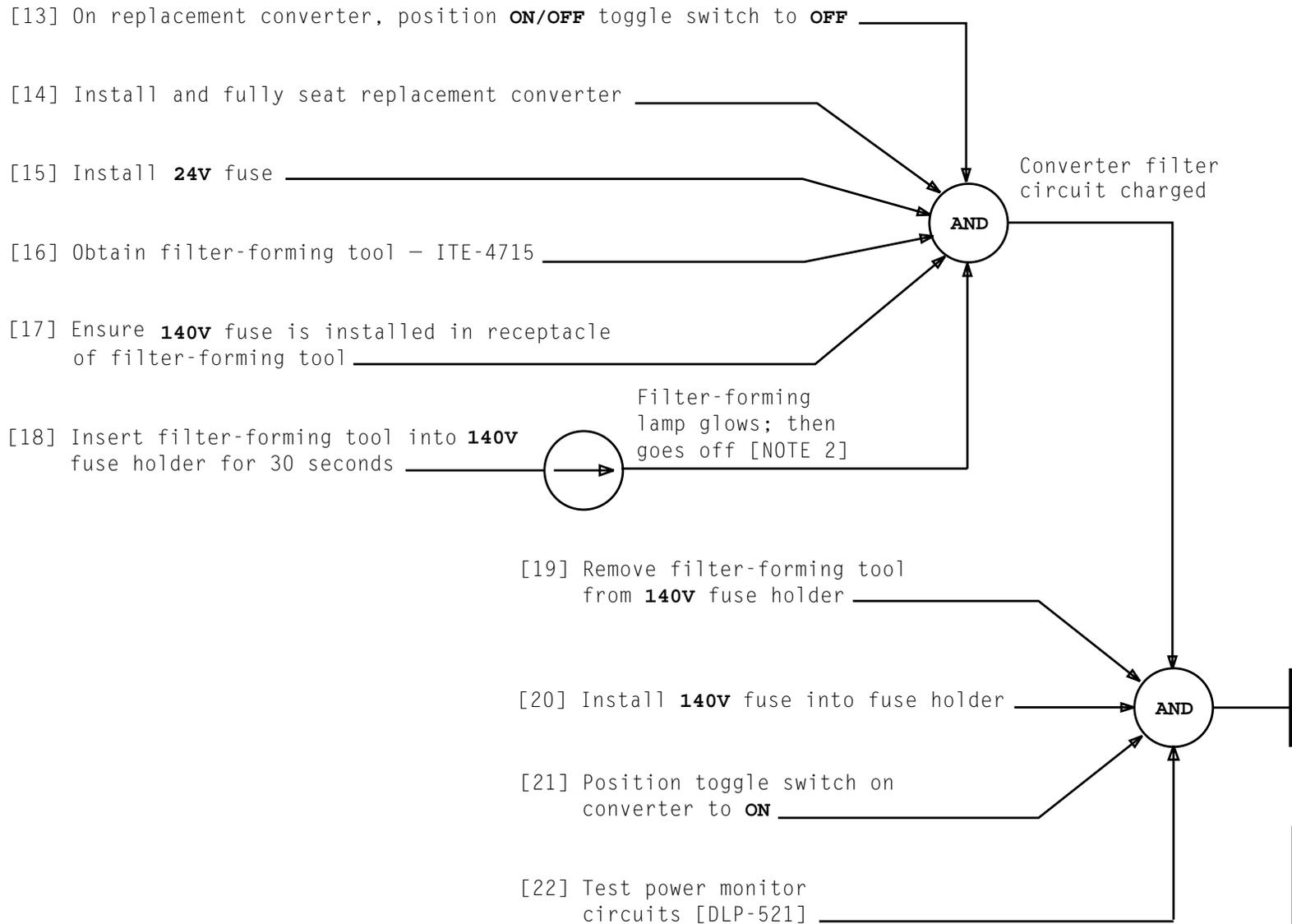


NOTE 1
If converter is 98A2, toggle switch, it must be pulled out to position switch

CAUTION 1
Do not remove power from converter if any other 98A converter in same bay is out of service

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REPLACE 98A CONVERTER

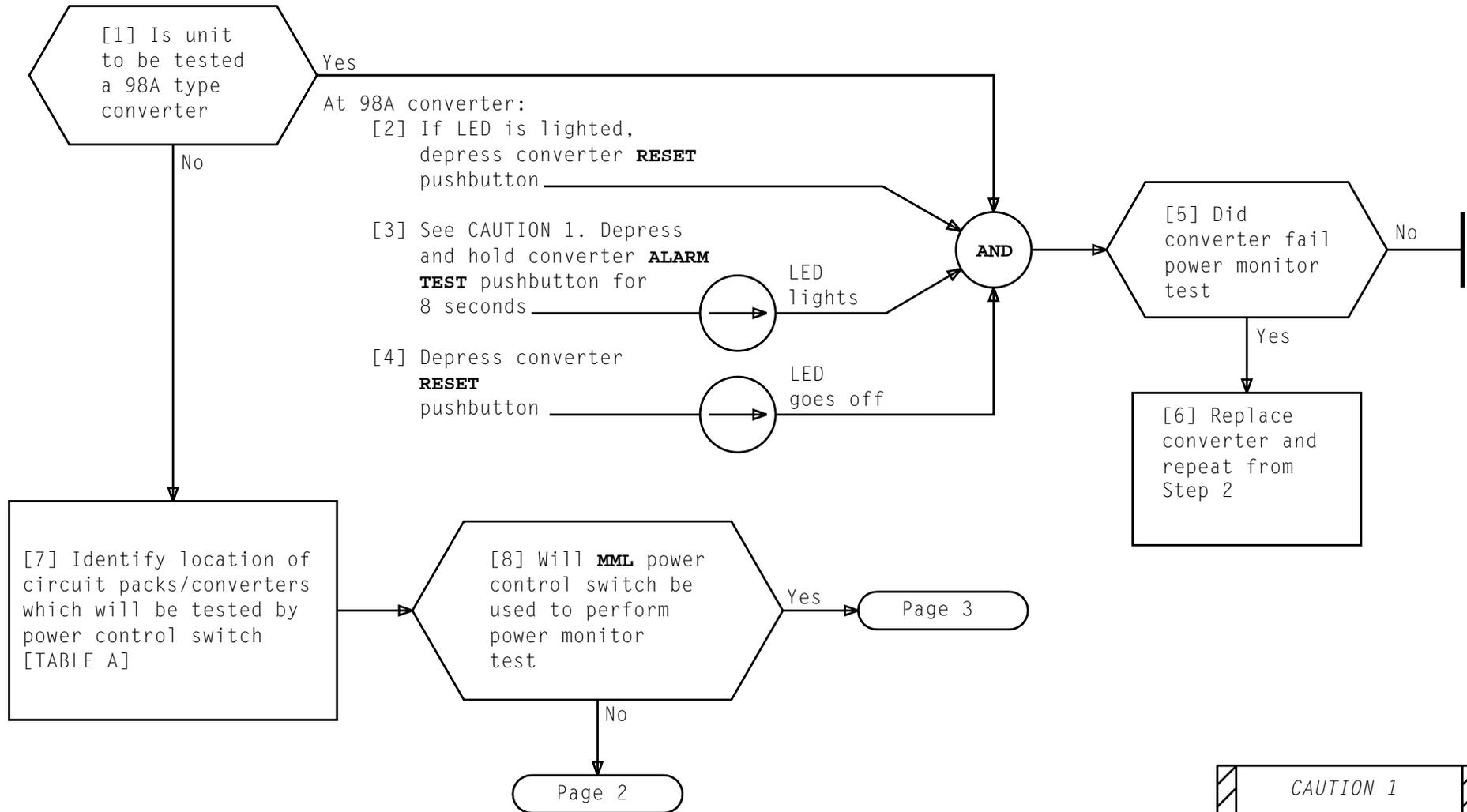


NOTE 2	
If filter capacitor is already charged, lamp will remain off	
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TABLE A											
98A CONVERTER LOCATION				FUSE TYPE							
FRAME	BAY	VERT	HOR	140V				24V			
				NAME	LOCATION			NAME	LOCATION		
					BAY	VERT	HOR		BAY	VERT	HOR
Supplementary matrix	0	12	30	VB0	0	07	53	VA0	0	07	27
	0	12	42	VB1	0	07	53	VA1	0	07	27
	0	12	54	VB2	0	07	53	VA2	0	07	27

REPLACE 98A CONVERTER

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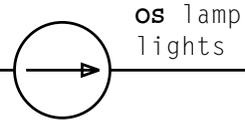
CAUTION 1

Do not test 98A converter if any other 98A converter in same bay has LED lighted

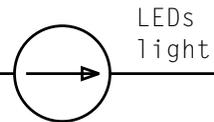
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At power control switch:

[9] Ensure **ROS/OFF** switch is in **ROS** position

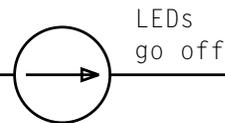


[10] Depress and hold **TEST** pushbutton for 2 seconds



[11] Note location of any converters or circuit packs which are being tested, and do not have LED lighted

At power control switch:
[12] Depress and release **ON** pushbutton



[13] Rotate **ROS/OFF** switch counterclockwise

[14] Note location of any converters or circuit packs which are being tested, and LED does not go off

[15] Was converter or circuit pack noted in Step 11 or Step 14

[16] Replace converter or circuit pack noted and repeat from Step 9

At **MML** switch:

[17] Ensure **RML/ALM RETIRE** switch is in **RML** position

[18] Depress **TEST** pushbutton

[19] Note location of any converters or circuit packs which are being tested, and do not have LED lighted

[20] Depress **ALM ENABLE** pushbutton

[21] Rotate **RML/ALM RETIRE** switch counterclockwise

[22] Note location of any converters or circuit packs which are being tested, and LED does not go off

LEDs light

LEDs go off

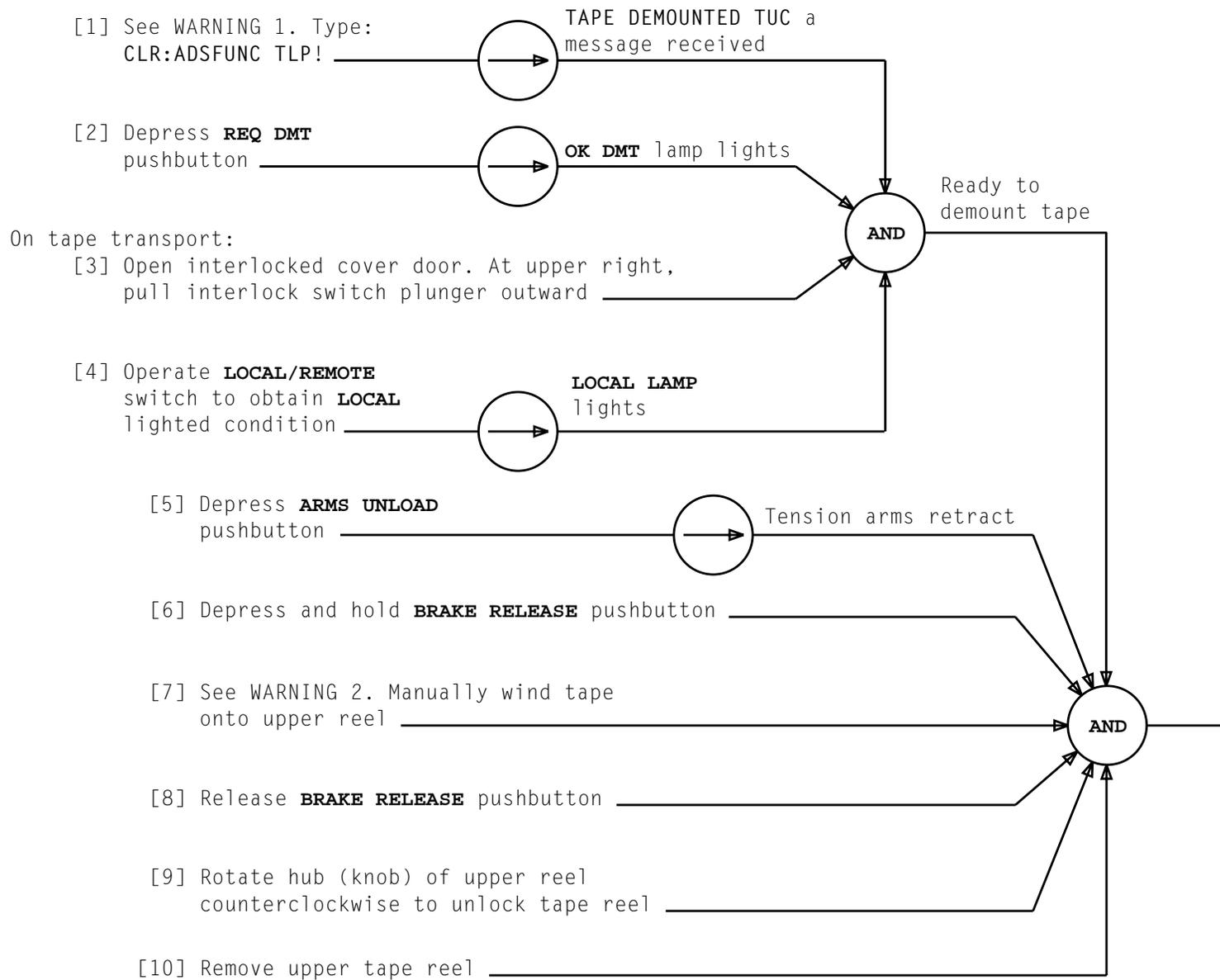
[23] Was converter or circuit pack noted in Step 19 or Step 22

No

Yes

[24] Replace converter or circuit pack noted and repeat from Step 17

TABLE A CONVERTERS AND CIRCUIT PACKS CONTAINING LEDs (EXCEPT 98A-TYPE CONVERTERS)						
BAY						POWER CONTROL SWITCH
0		1		2		
CONV	CP	CONV	CP	CONV	CP	
		80-37				PUB 0 BAY 1
				80-37		PUB 1 BAY 2
16-2 16-11		12-2,8,14, 20,26,56, 62,68,42 16-2,8,14, 20,26, 32,50,59,65	62-4 66-67			CONTR 0 BAY 1
16-62 16-71				12-2,8,14, 20,26,56, 62,68,42 16-2,8,14, 20,26, 32,50,59,65	62-4 66-67	CONTR 1 BAY 2
12-2,5,8, 11,14,17, 20,23	58-2,17,19, 34,37,52, 54,69					MML BAY 0
12-62,65,68, 71	52-45,14 46-14,45 52-29,60 46-29,60					PPL BAY 0

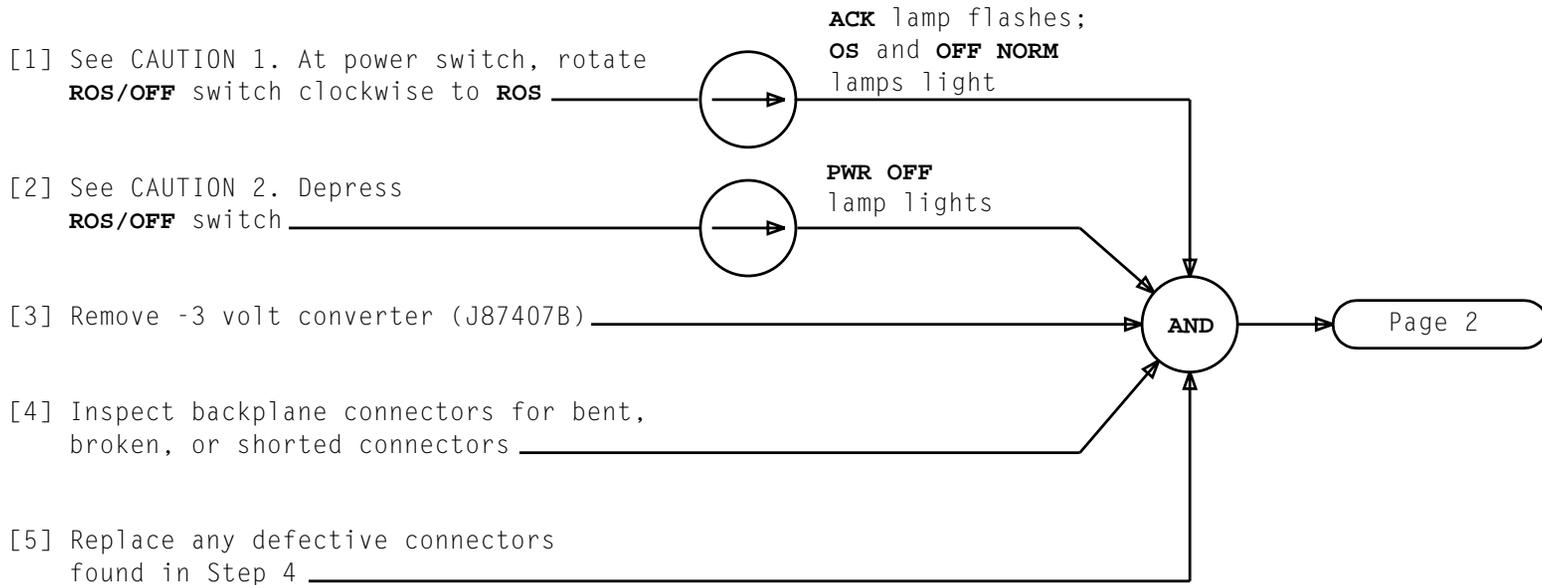


WARNINGS

1. Cycling tape transport or tape unit controller with tape over read/write heads may damage tapes
2. Pulling or dragging last 2 feet of tape across heads may contaminate heads

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DEMOUNT TLP TAPE FROM TAPE TRANSPORT



CAUTIONS

1. Do not attempt to reseat and power up a failed J87407B power converter in controller. Replace the J87407B with a known good spare. Duplex failure of an SP can result if power restoral is attempted on controller that has a bad J87407B power converter
2. If **PPL/PPR** switch is the power control associated with converter, ensure **OS** lamp is lighted, indicating duplicate pulse points have been placed into service

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[6] Install and fully seat replacement converter

[7] Remove +3 volt converter at LOC *12-26 (* = 1 or 2)

[8] At power switch, depress **ON** pushbutton (do not ROS)

[9] Check for -3V at LOC *58-01 (* = 1 or 2) [NOTE 1]

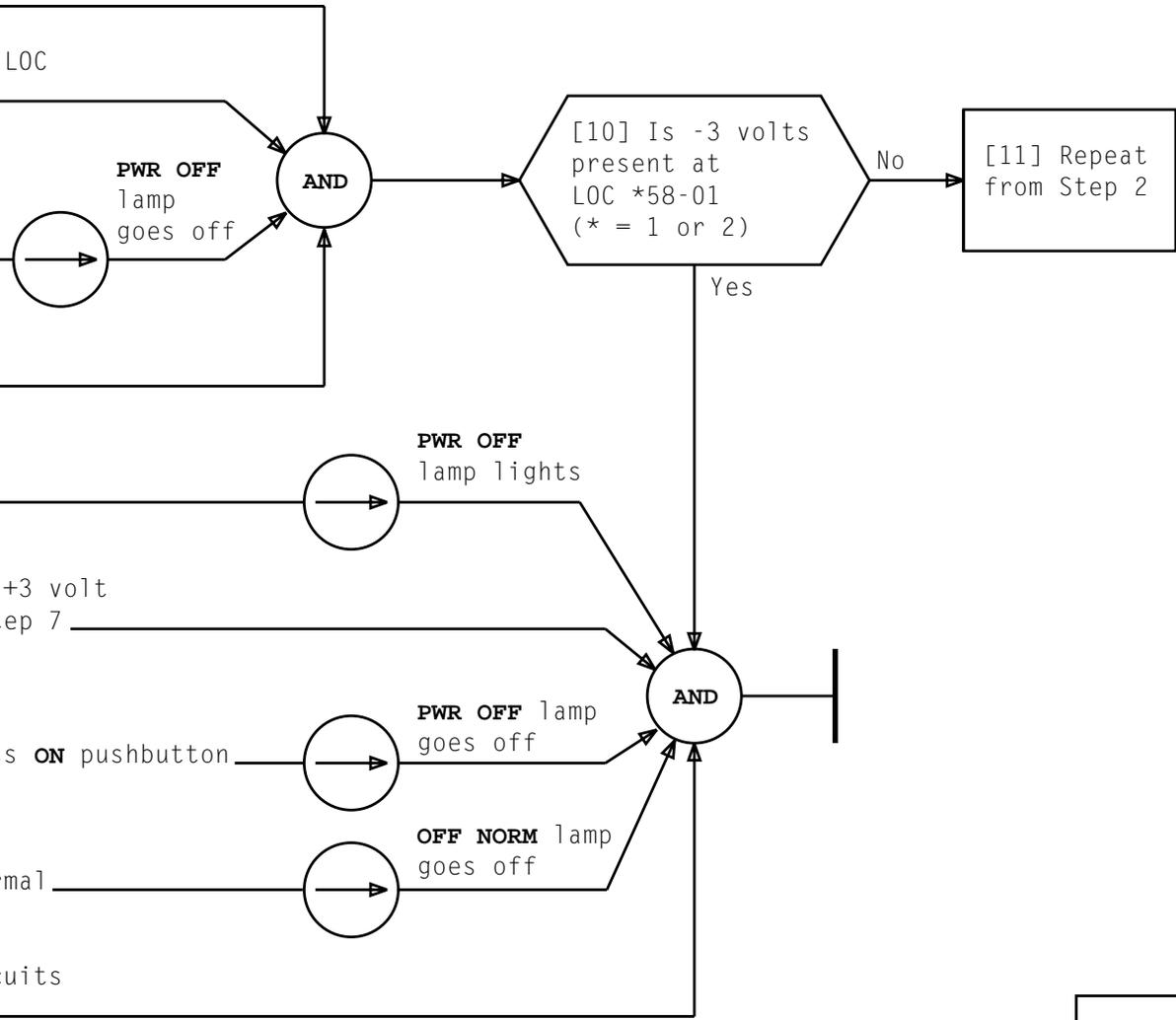
[12] Depress **ROS/OFF** switch

[13] Install and fully seat +3 volt converter removed in Step 7

[14] At power switch, depress **ON** pushbutton

[15] Rotate **ROS/OFF** switch counterclockwise to normal

[16] Test power monitor circuits [DLP-521]



NOTE 1 Use VOM capable of measuring +3 volts ±5%	
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REPLACE POWER CONVERTER, -3 VOLT J87407B

[1] Enter message VER:UTYPE:SP x!
 (where x = SP office member number)
 to verify Unit Translator

[2] Using printout [Figure 1], identify
 SP type

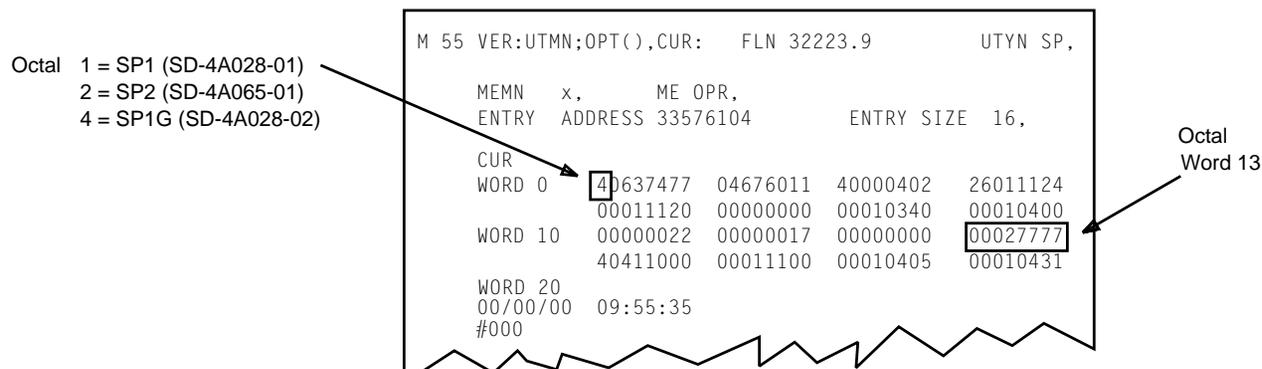
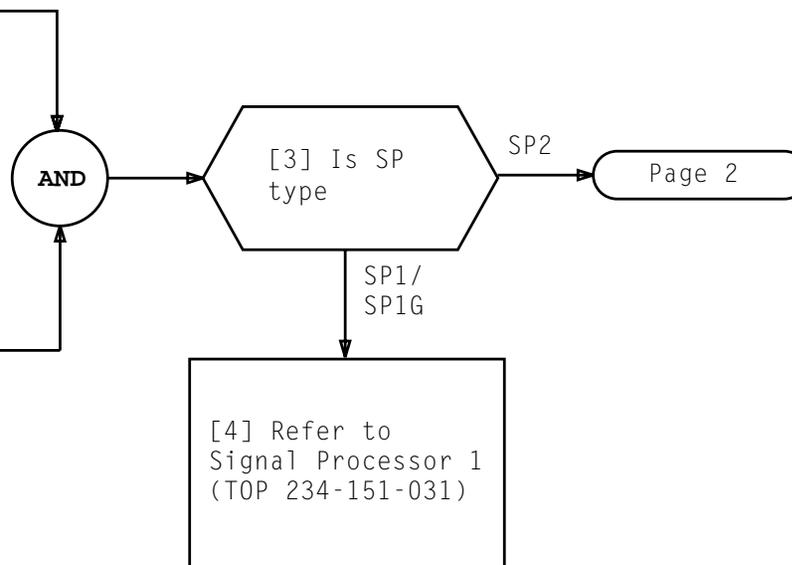


Figure 1. Typical VER:UTMN:OPT Message Printout

**REMOVAL OF PULSE POINT DURING MAINTENANCE ACTIVITY
 ON SP-TYPE FRAME**

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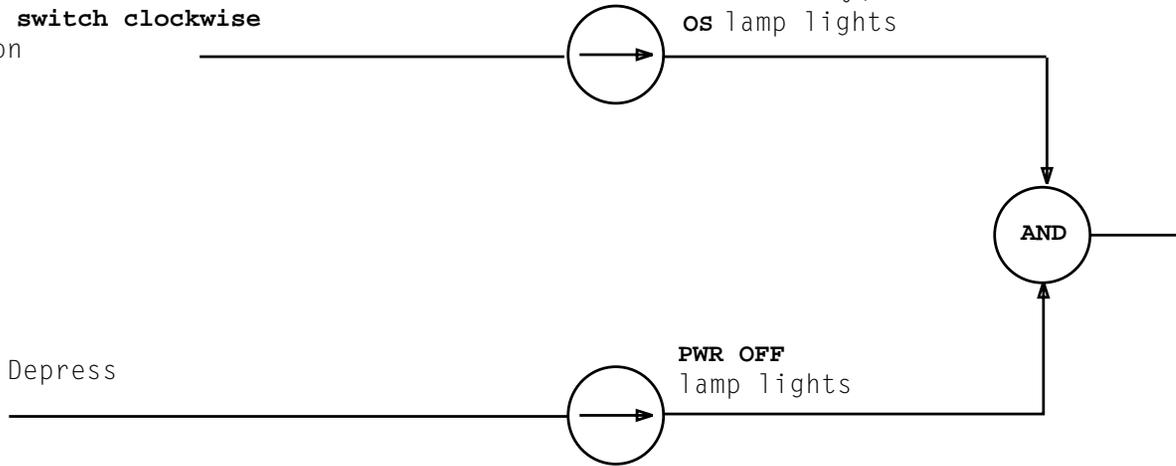
[10] At **PPL/PPR** switch [TABLE B], rotate **ROS/OFF** switch clockwise to ROS position

OFF NORM lamp lights and **ACK** lamp lights momentarily; then **OS** lamp lights

TABLE B			
NAME	SWITCH LOCATIONS		
	BAY	VERT	HOR
PPL	0	52	69

[11] See CAUTION 1. Depress **ROS/OFF** switch

PWR OFF lamp lights

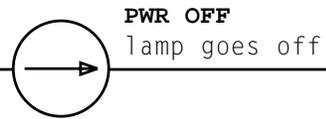


*CAUTION 1
If OS lamp does not light, delay until duplicate pulse points are returned to service*

**REMOVAL OF PULSE POINT DURING MAINTENANCE ACTIVITY
ON SP-TYPE FRAME**

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[1] At **PPL/PPR** switch [TABLE A],
depress and hold **ON**
pushbutton (2 seconds)



[2] Rotate **ROS/OFF** switch
(counterclockwise)

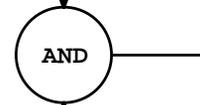


TABLE A			
NAME	SWITCH LOCATION		
	BAY	VERT	HOR
PPL	0	52	69

**RESTORE OF PULSE POINT DURING MAINTENANCE ACTIVITY
ON SP-TYPE FRAME**

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ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	
TPG-000		TAP-126		<ul style="list-style-type: none"> • DLP-525 • CKL-891 TNG-893 								
IXL-001		ISD-127										
NTP-002		TAP-128										
NTP-003		ISD-129										
NTP-004		ISD-130										
NTP-005		ISD-131										
NTP-006		TAP-132										
NTP-007		TAP-133										
NTP-008		TAP-134										
TAD-100		TAP-135										
TAD-101		DLP-500										
TAD-102		DLP-501										
TAP-103		DLP-502										
TAP-104		DLP-503										
TAP-105		DLP-504										
TAP-106		DLP-505										
TAP-107		DLP-506										
TAP-108		DLP-507										
TAP-109		DLP-508										
TAP-110		DLP-509										
TAP-111		DLP-510										
TAP-112		DLP-511										
ISD-113		DLP-512										
ISD-114		DLP-513										
ISD-115		DLP-514										
ISD-116		• DLP-515										
ISD-117		• DLP-516										
TAP-118		DLP-517										
TAP-119		DLP-518										
ISD-120		DLP-519										
ISD-121		• DLP-520										
ISD-122		DLP-521										
TAP-123		DLP-522										
TAP-124		• DLP-523										
TAP-125		• DLP-524										

• REVISED OR ADDED ITEM

☐ CANCELED ITEM

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CKL

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CHECKLIST