

Task Oriented Practice
(TOP)

4ESS™ SWITCH
1B PROCESSOR

AUXILIARY DATA SYSTEM

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Call: 1-800-334-0404
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Developed by
AT&T Network Systems Customer Education & Training

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FIND YOUR JOB IN THE LIST BELOW THEN GO TO

Acceleration Fault; Capstan – Clear	TAP-124
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Alarm Circuits; Power – Tape Unit Controller – Test	DLP-543
Arms Will Not Hold Tape Tension Fault – Clear	TAP-115
Automatic Power Monitor Test Failure – Data Unit Selector – Clear	TAP-136
Automatic Power Monitor Test Failure – Tape Unit Controller – Clear	TAP-135
Brake Fault; Reel Motor – Clear	TAP-114
Brake; Reel Motor – Tape Transport – Replace	NTP-016
Brushes; Reel Motor – Tape Unit – Inspect	NTP-008
Capstan Acceleration Fault – Clear	TAP-124
Capstan Diagnostic Assembly Voltage Levels – Tape Transport – Check	NTP-019
Capstan Fast FWD/Rewind Speed Fault – Clear	TAP-118
Capstan Motion Fault – Clear	TAP-116
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Capstan Rotates in One Direction Fault – Clear	TAP-121
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Capstan Speed – Tape Unit Frame – Check	NTP-006
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 DC-to-DC Converter - KS-22434 – Replace NTP-023
 DC-to-DC Converter – Tape Unit Controller – Replace DLP-536
 DC-to-DC Converter Voltages – Check DLP-514
 Demand Diagnostics – Tape Unit Controller – Perform NTP-012
 Demand Diagnostic, Phase 93 – Data Unit Selector – Perform NTP-011
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 Diagnostic Failure – Clear Auxiliary Unit Bus (AUB) Diagnostic Failure By Analyzing Raw Data TAP-134
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 Diagnostic Failure – TLP Disk Queue Full – Clear TAP-112
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FIND YOUR JOB IN THE LIST BELOW THEN GO TO

EOT/BOT Sensor Fault – Clear TAP-125

Fast FWD/Rewind Speed Fault: Capstan – Clear TAP-118

Failure to Return to Load Point Fault – Clear TAP-125

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Head Fault; Read, Write, or Erase – Clear TAP-128

Head; Read, Write, or Erase – Tape Transport – Replace and Check NTP-009

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Lamp Fault; Servo – Clear TAP-123

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Lamps; Local Mode – Tape Transport – Replace DLP-539

Loaded/Unloaded Indication Fault; Tape Reel – Clear TAP-126

Local Mode Lamps – Tape Transport – Replace DLP-539

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FIND YOUR JOB IN THE LIST BELOW THEN GO TO

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FIND YOUR JOB IN THE LIST BELOW THEN GO TO

Tape Pack Problem; Magnetic – Clear TAP-131

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Tape Transport Operation – Tape Unit Frame – Check Using Local Mode Switches NTP-007

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Test Failure; Automatic Power Monitor – Tape Unit Controller – Clear TAP-135

TLP Abort – Diagnostic Failure – Clear TAP-108

TLP Disk Queue Full – Diagnostic Failure – Clear TAP-112

TLP Inhibit – Diagnostic Failure – Clear TAP-107

TLP Queue Blockage – Diagnostic Failure – Clear TAP-106

TLP Tape Acquisition Error – Diagnostic Failure – Clear TAP-110

TLP Tape Not Mounted – Diagnostic Failure – Clear TAP-111

TLP Tape Version X Does Not Match Version Y – Diagnostic Failure – Clear TAP-109

TTY Printout – DGN:AUB a PH b STF TAP-137

TTY Printout – DGN:DUS a:TUC b PH c STF
 ANALY:TLPFILE:DUS a ABORTED TAP-108

TTY Printout – DGN:DUS a:TUC b PH c STF
 ANALY:TLPFILE:DUS a NULL PACK TEST GENERATED TAP-103

TTY Printout – DGN:DUS a:TUC b PH c STF
 ANALY:TLPFILE:DUS a SUMMARY DATA
 QUEUE ACCESS DENIED: DATA NOT RETAINED: CODE 0001 TAP-112

FIND YOUR JOB IN THE LIST BELOW THEN GO TO

TTY Printout - DGN:DUS a:TUC b PH c STF
 ANALY:TLPFILE:DUS a SUMMARY DATA
 QUEUE ACCESS DENIED: DATA NOT RETAINED: CODE 0002 TAP-106

TTY Printout - DGN:DUS a:TUC b PH c STF
 ANALY:TLPFILE:DUS a SUMMARY DATA
 QUEUE ACCESS DENIED: DATA NOT RETAINED: CODE 0004 TAP-107

TTY Printout - DGN:DUS a:TUC b PH c STF
 ANALY:TLPFILE:DUS a SUSPECTED FAULTY EQUIPMENT
 NOTE column does not contain NOTE 2 TAP-101

TTY Printout - DGN:DUS a:TUC b PH c STF
 ANALY:TLPFILE:DUS a SUSPECTED FAULTY EQUIPMENT
 NOTE column contains NOTE 2
 Fuse blown TAP-132

TTY Printout - DGN:DUS a:TUC b PH c STF
 ANALY:TLPFILE:DUS a SUSPECTED FAULTY EQUIPMENT
 NOTE column contains NOTE 2
 No fuse blown TAP-136

TTY Printout - DGN:DUS a:TUC b PH c STF
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 CURRENT TLP SEARCH ABORTED TAP-108

TTY Printout - DGN:DUS a:TUC b PH c STF
 ANALY:TLPFILE:DUS a TLP
 WARNING: VERSION x DOES NOT MATCH VERSION y TAP-109

TTY Printout - DGN: DUS a:TUC b PH c STF
 ANALY:TLPFILE:DUS a TLP
 TLP TAPE ACQUISITION ERROR
 MOUNT TAPE WITH FILE ID=f TAP-110

TTY Printout - DGN:DUS a:TUC b PH c STF
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TTY Printout - DGN:TUC a:DUS b PH c STF
 ANALY:TLPFILE:TUC a NULL PACK TEST GENERATED TAP-104

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FIND YOUR JOB IN THE LIST BELOW THEN GO TO

TTY Printout - DGN:TUC a:DUS b PH c STF
 ANALY:TLPFILE:TUC a SUMMARY DATA
 QUEUE ACCESS DENIED: DATA NOT RETAINED: CODE 0001 TAP-112

TTY Printout - DGN:TUC a:DUS b PH c STF
 ANALY:TLPFILE:TUC a SUMMARY DATA
 QUEUE ACCESS DENIED: DATA NOT RETAINED: CODE 0002 TAP-106

TTY Printout - DGN:TUC a:DUS b PH c STF
 ANALY:TLPFILE:TUC a SUMMARY DATA
 QUEUE ACCESS DENIED: DATA NOT RETAINED: CODE 0004 TAP-107

TTY Printout - DGN:TUC a:DUS b PH c STF
 ANALY:TLPFILE:TUC a TLP
 CURRENT TLP SEARCH ABORTED TAP-108

TTY Printout - DGN:TUC a:DUS b PH c STF
 ANALY:TLPFILE:TUC a SUSPECTED FAULTY EQUIPMENT
 NOTE column does not contain NOTE 2 TAP-102

TTY Printout - DGN:TUC a:DUS b PH c STF
 ANALY:TLPFILE:TUC a SUSPECTED FAULTY EQUIPMENT
 NOTE column contains NOTE 2
 Fuse blown TAP-132

TTY Printout - DGN:TUC a:DUS b PH c STF
 ANALY:TLPFILE:TUC a SUSPECTED FAULTY EQUIPMENT
 NOTE column contains NOTE 2
 No fuse blown TAP-135

TTY Printout - DGN:TUC a:DUS b PH c STF
 ANALY:TLPFILE:TUC a TLP
 WARNING: VERSION x DOES NOT MATCH VERSION y TAP-109

TTY Printout - DGN:TUC a:DUS b PH c STF
 ANALY:TLPFILE:TUC a ABORTED TAP-108

FIND YOUR JOB IN THE LIST BELOW THEN GO TO

TTY Printout – DGN:TUC a:DUS b PH c STF
 ANALY:TLPFILE:TUC a TLP
 TLP TAPE ACQUISITION ERROR
 MOUNT TAPE WITH FILE ID=f TAP-110

TTY Printout – DGN:TUC a:DUS b PH c STF
 REPT:TAPE MUST BE MOUNTED FOR FUNCTION TLP TAP-111

Voltage Levels; Capstan Diagnostic Assembly – Tape Transport – Check NTP-019

Voltage Levels; Capstan Servo Assembly – Tape Transport – Check NTP-018

Voltages – DC-to-DC Converter – Check DLP-514

Write Enable Ring Sensing Fault – Clear TAP-130

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

ACCEPTANCE

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

	<i>CAUTION: If Function Assigned to Tape Unit Controller (TUC) Is AMA (Active or Standby), Perform This Task At A Later Date</i>	
1	Obtain Support Apparatus: <ul style="list-style-type: none"> • KS-6232 Lubricating Oil • KS-2423 Twill Cloth 	—
2	At TTY, Type: OP:DUSTATUS!	—
3	If TUC Function Is Other Than Unassigned (UNA), Type: CLR:ADSFUNC a! Where a = Function Assigned to TUC	—
4	At 1B Processor MTC Terminal, Remove Unit From Service (RMV:a b!)	DLP-561
5	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OS</i> And OFF NORM Lamps Light	—
6	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
7	Depress LOCAL/REMOTE Pushbutton to Obtain LOCAL Lighted Condition	—
8	If Tape Is Mounted on Tape Transport, Demount Tape	DLP-513
9	Lubricate Door Hinges	DLP-507
10	If Tape Is To Be Mounted, Perform the Following:	—
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
11	Gently Close Tape Transport Cover Door	—
12	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OS</i> And OFF NORM Lamps Go Off	—
13	At 1B Processor MTC Terminal, Restore Unit To Service (RST:a b!)	DLP-562
14	If Tape Was Mounted, Perform One Of The Following To Set TUC Function:	—
	A. At TUC, Depress Appropriate Function Pushbutton	—
	B. At TTY, Type: SET:TUC a ;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	—

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

	<i>CAUTION: If Function Assigned to Tape Unit Controller (TUC) Is AMA (Active or Standby), Perform This Task At A Later Date</i>	
1	Obtain Support Apparatus: <ul style="list-style-type: none"> • KS-2423 Twill Cloth • KS-20406,L1 Cleaner Solvent • KS-14377,L5 Vacuum Cleaner • KS-14377,L3 Flexible Nozzle • KS-21808 Magnifier Lamp 	—
2	At TTY, Type:OP:DUSTATUS!	—
3	If TUC Function Is Other Than Unassigned (UNA), Type:CLR:ADSFUNC a! Where a = Function To Be Assigned to TUC	—
4	At 1B Processor MTC Terminal, Remove Unit From Service (RMV:a b!)	DLP-561
5	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OFF NORM</i> Lamp Lights	—
6	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
7	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
8	If Tape Is Mounted On Tape Transport, Demount Tape	DLP-513
9	Check Tension On Tape Guide Assemblies	DLP-545
10	Mount Blank Tape On Tape Transport	DLP-512
11	Check Reels And Hubs For Wobble	DLP-525
12	Check Tape Travel On Tape Transport	DLP-508
13	Demount Blank Tape On Tape Transport	DLP-513
14	Check Tape Heads	DLP-524

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

15	If Precision Tape Guide Assembly Spring Washers Were Compressed During Inspection (Spools Moved Axially), Or Precision Plate Components or Precision Tape Guide Assemblies Were Replaced, Perform the Following:	-
	1. Obtain Support Apparatus: <ul style="list-style-type: none"> • Tektronix Oscilloscope (2232) Or Equivalent • Test Pack (Skew Alignment Tool 814A) • Alignment Tape KS-20315,L1 • Blank Tape • Write Enable Ring • Card Extender 826A Or 826B 	-
	2. Check Read Pulse Widths, Tape Transport	DLP-540
	3. Check Read Head Alignment, Tape Transport	DLP-509
	4. Check Write and Erase Head Alignments, Tape Transport	DLP-542
	5. If Write Head Required Alignment, Repeat From Item 14-2	-
16	Clean Tape Path	DLP-526
17	If Tape Is To Be Mounted, Perform The Following:	-
	1. Mount Tape on Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	-
18	Gently Close Tape Transport Cover Door	-
19	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OFF NORM</i> Lamp Goes Off	-
20	At 1B Processor MTC Terminal, Restore Unit To Service (RST:a b!)	DLP-562

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

21	If Tape Was Mounted, Perform One Of The Following To Set TUC Function:	-
	A. At TUC, Depress Appropriate Function Pushbutton	-
	B. At TTY, Type:SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	-

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

	<i>CAUTION: If Function Assigned to Tape Unit Controller (TUC) Is AMA (Active or Standby), Perform This Task at a Later Date</i>	
1	Obtain Support Apparatus: <ul style="list-style-type: none"> • Tektronic Oscilloscope (2232) or Equivalent • Test Pack (Skew Alignment Tool 814A) • Alignment Tape KS-20315,L1 • Blank Tape • Write Enable Ring • Card Extender 826A or 826B 	—
2	At TTY, Type:OP:DUSTATUS!	—
3	If TUC Function Is Other Than Unassigned (UNA), Type:CLR:ADSFUNC a! Where a = Function Assigned To TUC	—
4	At 1B Processor MTC Terminal, Remove Unit From Service (RMV:a b!)	DLP-561
5	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OFF NORM</i> Lamp Lights	—
6	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
7	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
8	If Tape Is Mounted On Tape Transport, Demount Tape	DLP-513
9	Check Read Pulse Widths, Tape Transport	DLP-540
10	Check Read Head Alignment, Tape Transport	DLP-509
11	Check Write and Erase Head Alignments, Tape Transport	DLP-542
12	If Write Head Required Alignment, Repeat From Item 8	—
13	If Tape Is To Be Mounted, Perform the Following:	—
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
14	Gently Close Tape Transport Cover Door	—

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

15	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OS</i> and OFF NORM Lamps Go Off	-
16	At 1B Processor MTC Terminal, Restore Unit To Service (RST:a b!)	DLP-562
17	If Tape Was Mounted, Perform One Of The Following To Set TUC Function:	-
	A. At TUC, Depress Appropriate Function Pushbutton	-
	B. At TTY, Type:SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	-

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

	<i>CAUTION: If Function Assigned To Tape Unit Controller (TUC) Is AMA (Active or Standby), Perform This Task At A Later Date</i>	
1	At TTY, Type:OP:DUSTATUS!	-
2	If TUC Function Is Other Than Unassigned (UNA), Type:CLR:ADSFUNC a! Where a = Function Assigned To TUC	-
3	At 1B Processor MTC Terminal, Remove Unit From Service (RMV:a b!)	DLP-561
4	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OFF NORM</i> Lamp Lights	-
5	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	-
6	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	-
7	If Tape Is Mounted On Tape Transport, Demount Tape	DLP-513
8	Check Capstan Speed, Tape Transport	DLP-510
9	If Tape Is To Be Mounted, Perform The Following:	-
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	-
10	Gently Close Tape Transport Cover Door	-
11	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OFF NORM</i> Lamp Goes Off	-
12	At 1B Processor MTC Terminal, Restore Unit To Service (RST:a b!)	DLP-562
13	If Tape was Mounted, Perform One Of The Following To Set TUC Function:	-
	A. At TUC, Depress Appropriate Function Pushbutton	-
	B. At TTY, Type:SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	-

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

	<i>CAUTION: If Function Assigned To Tape Unit Controller (TUC) Is AMA (Active Or Standby), Perform This Task At A Later Date</i>	
1	At TTY, Type:OP:DUSTATUS!	—
2	If TUC Function Is Other Than Unassigned (UNA), Type:CLR:ADSFUNC a! Where a = Function Assigned To TUC	—
3	At 1B Processor MTC Terminal, Remove Unit From Service (RMV:a b!)	
4	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OFF NORM</i> Lamp Lights	—
5	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
6	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
7	If Tape Is Mounted On Tape Transport, Demount Tape	DLP-513
	NOTE: Recommend That BOT And EOT Markers Be Approximately 300 Feet Apart	—
8	Mount Blank Tape On Tape Transport	DLP-512
9	Check Operation Of Tape Transport Using Local Mode Switches	DLP-511
10	Demount Blank Tape On Tape Transport	DLP-513
11	If Tape Is To Be Mounted, Perform the Following:	—
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
12	Gently Close Tape Transport Cover Door	—
13	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OFF NORM</i> Lamp Goes Off	—
14	At 1B Processor MTC Terminal, Restore Unit To Service (RST:a b!)	DLP-562
15	If Tape Was Mounted, Perform One Of The Following To Set TUC Function:	—
	A. At TUC, Depress Appropriate Function Pushbutton	—
	B. At TTY, Type:SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	—

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

	<i>CAUTION: If Function Assigned To Tape Unit Controller (TUC) Is AMA (Active Or Standby), Perform This Task At A Later Date</i>	
1	Obtain Support Apparatus: <ul style="list-style-type: none"> ● 6-inch Scale (R-8550 Or Equivalent) ● 4-inch E Screwdriver 	—
2	At TTY, Type:OP:DUSTATUS!	—
3	If TUC Function Is Other Than Unassigned (UNA), Type:CLR:ADSFUNC a! Where a = Function Assigned to TUC	—
4	At 1B Processor MTC Terminal, Remove Unit From Service (RMV:a b!)	DLP-561
5	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OS and OFF NORM Lamps Light</i>	—
6	Depress ROS/OFF Switch <i>Response: PWR OFF Lamp Lights</i>	—
7	Inspect Supply And Take-up Reel Motor Brushes, Tape Transport	DLP-515
8	At TUC Power Switch, Depress And Hold ON Pushbutton For 2 Seconds <i>Response: PWR OFF Lamp Goes Off</i>	—
9	Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OS and OFF NORM Lamps Go Off</i>	—
10	At 1B Processor MTC Terminal, Restore Unit To Service (RST:a b!)	DLP-562
11	Perform One Of The Following To Set TUC Function:	—
	A. At TUC, Depress Appropriate Function Pushbutton	—
	B. At TTY, Type:SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	—

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

	<i>CAUTION: If Function Assigned To Tape Unit Controller (TUC) Is AMA (Active Or Standby), Perform This Task At A Later Date</i>	
1	Obtain Support Apparatus: <ul style="list-style-type: none"> • Tektronic Oscilloscope (7000) Or Equivalent • Test Pack (Skew Alignment Tool 814A) • Alignment Tape KS-20315,L1 • Blank Tape • Write Enable Ring • Card Extender 826A or 826B 	—
2	At TTY, Type:OP:DUSTATUS!	—
3	At 1B processor MTC Terminal, Remove Unit From Service (RMV:a b!)	DLP-561
4	If TUC Function Is Other Than Unassigned (UNA), Type:CLR:ADSFUNC a! Where a = Function Assigned To TUC	—
5	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OS</i> and OFF NORM Lamps Light	—
6	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
7	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
8	If Tape Is Mounted On Tape Transport, Demount Tape	DLP-513
9	Replace Read, Write, Or Erase Head	DLP-522
10	Check Read Pulse Widths, Tape Transport	DLP-540
11	Check Read Head Alignment, Tape Transport	DLP-509
12	Check Write and Erase Head Alignments, Tape Transport	DLP-542
13	If Write Head Required Alignment, Repeat From Item 9	—
14	If Tape Is To Be Mounted, Perform the Following:	—
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—

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

15	Gently Close Tape Transport Cover Door	-
16	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OFF NORM</i> Lamp Goes Off	-
17	At 1B Processor MTC Terminal, Restore Unit To Service (RST:a b!)	DLP-562
18	If Tape Was Mounted, Perform One Of The Following To Set TUC Function:	-
	A. At TUC, Depress Appropriate Function Pushbutton	-
	B. At TTY, Type:SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	-

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

	<i>CAUTION: If Function Assigned To Tape Unit Controller (TUC) Is AMA (Active Or Standby), Perform This Task At A Later Date</i>	
1	At TTY, Type:OP:DUSTATUS!	—
2	If TUC Function Is Other Than Unassigned (UNA), Type:CLR:ADSFUNC a! Where a = Function Assigned to TUC	—
3	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OFF NORM</i> Lamp Lights	—
4	At 1B Processor MTC Terminal, Remove Unit From Service (RMV:a b!)	DLP-561
5	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
6	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
7	If Tape Is Mounted On Tape Transport, Demount Tape	DLP-513
8	Replace Circuit Pack, Tape Transport	DLP-502
9	If Circuit Pack CP10 Was Replaced, Check Capstan Diagnostic Assembly Voltage Levels	DLP-535
10	If Circuit Pack CP2, CP3, CP10, CP11, Or CP14 Was Replaced, Perform The Following:	—
	1. Check Capstan Speed, Tape Transport	DLP-510
	2. Check Capstan Servo Assembly Voltage Levels	DLP-534
11	If Tape Is To Be Mounted, Perform The Following:	—
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
12	Gently Close Tape Transport Cover Door	—
13	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OS</i> and <i>OFF NORM</i> Lamps Go Off	—
14	At 1B Processor MTC Terminal, Restore Unit To Service (RSRT:a b!)	DLP-562

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

15	If Tape Was Mounted, Perform One Of The Following To Set TUC Function:	-
	A. At TUC, Depress Appropriate Function Pushbutton	-
	B. At TTY, Type:SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	-

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

	<i>CAUTION: If Function Assigned To Tape Unit Controller (TUC) Is AMA (Active Or Standby), Perform This Task At A Later Date</i>	
1	Obtain ADS Test Tape Or Blank Tape	—
2	At TTY, Type:OP:DUSTATUS!	—
3	If TUC Function Is Other Than Unassigned (UNA), Type:CLR:ADSFUNC a! Where a = Function Assigned To TUC	—
4	Type:RMV:TUC a! Where a = TUC Member Number <i>Response:</i> RMV:TUC a COMPLETED; OS Lamp Lights	—
5	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response:</i> OFF NORM Lamp Lights	—
6	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
7	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
8	If Tape Is Mounted On Tape Transport, Demount Tape	DLP-513
9	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response:</i> OFF NORM Lamp Goes Off	—
10	Mount ADS Test Tape (If Available) Or Blank Tape (With Write Permit Ring Installed) On Tape Transport	DLP-512
11	At TTY, Type:RST:TUC a! Where a = TUC Member Number <i>Response:</i> RST:TUC a COMPLETED; OS Lamp Goes Off	—
12	Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
13	Gently Close Tape Transport Cover Door	—
14	At TTY, Type:SET:TUC a;FUNCTION DGN! Where a = TUC Member Number	—
15	Perform One Of The Following To Allow Tape To Be Processed:	—
	A. If Blank Tape Was Mounted, Type:ALW:TUC a:RW,WVH,VSN ADSTST! Where a = TUC Member Number	—
	B. If ADS Test Tape Was Mounted, Type:ALW:TUC a:RW! Where a = TUC Member Number	—

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

16	Type:DGN:DUS a:TUC b,PH 93! Where a = DUS Member; b = TUC Member Number <i>Response:</i> DGN:DUS a:TUC b,PH 93 COMPLETED ATP Or CATP	—
17	Type:RST:DUS a;UCL! Where a = DUS Member Number <i>Response:</i> RST:DUS a COMPLETED	—
18	Repeat Steps 17 And 18 For Other Data Unit Selector (DUS)	—
19	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
20	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
21	Demount ADS Tape On Tape Transport	DLP-513
22	If Tape Is To Be Mounted, Perform The Following:	—
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
	3. Perform One Of The Following To Set TUC Function:	—
	A. At TUC, Depress Appropriate Function Pushbutton	—
	B. At TTY, Type:SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	—
23	Gently Close Tape Transport Cover Door	—

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

	<i>CAUTION: If Function Assigned To Tape Unit Controller (TUC) Is AMA (Active Or Standby), Perform This Task At A Later Date</i>	
1	Obtain ADS Test Tape Or Blank Tape	—
2	At TTY, Type:OP:DUSTATUS!	—
3	If TUC Function Is Other Than Unassigned (UNA), Type:CLR:ADSFUNC a! Where a = Function Assigned To TUC	—
4	Type:RMV:TUC a! Where a = TUC Member Number <i>Response:</i> RMV:TUC a COMPLETED; OS Lamp Lights	—
5	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response:</i> OFF NORM Lamp Lights	—
6	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
7	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
8	If Tape Is Mounted On Tape Transport, Demount Tape	DLP-513
9	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response:</i> OFF NORM Lamp Goes Off	—
10	Mount ADS Test Tape (If Available) Or Blank Tape (With Write Permit Ring Installed) On Tape Transport	DLP-512
11	At TTY, Type:RST:TUC a! Where a = TUC Member Number <i>Response:</i> RST:TUC a COMPLETED; OS Lamp Goes Off	—
12	If Blank Tape Was Mounted, Generate Diagnostic Test Tape	DLP-518
13	Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
14	Gently Close Tape Transport Cover Door	—
15	At TTY, Type:SET:TUC a;FUNCTION DGN! Where a = TUC Member Number	—
16	Perform One Of The Following To Allow Tape To Be Processed:	—
	A. If Blank Tape Was Mounted, Type:ALW:TUC a:RW,WVH,VSN ADSTST! Where a = TUC Member Number	—
	B. If ADS Test Tape Was Mounted, Type:ALW:TUC a:RW! Where a = TUC Member Number	—

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

17	Perform One Of The Following To Initiate TUC Diagnostics:	-
	A. Data Unit Community 0, Type:DGN:TUC a:PH 81-83! Where a = TUC Member Number	-
	B. Data Unit Community 1, Type:DGN:TUC a:PH 91-93! Where a = TUC Member Number	-
18	Type:RST:TUC a! Where a = TUC Member Number <i>Response:</i> RST:TUC a COMPLETED; OS Lamp Goes Off	-
19	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	-
20	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	-
21	Demount Tape On Tape Transport	DLP-513
22	If Tape Is To Be Mounted, Perform The Following:	-
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	-
	3. Perform One Of The Following To Set TUC Function:	-
	A. At TUC, Depress Appropriate Function Pushbutton	-
	B. At TTY, Type:SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned to TUC	-
23	Gently Close Tape Transport Cover Door	-

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

1	If Pack to be Replaced Is Located at 80-38 Through 80-45 Or 80-63 Through 80-69; At TTY, Type: RMV:AUB a! Where a = 0 If DUS 0 Or If a = 1 If DUS1. <i>Response:</i> RMV:AUB a COMPLETED	-
2	At DUS Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response:</i> OS And OFF NORM Lamps Light	-
3	Replace Circuit Pack, Data Unit Selector (DUS)	DLP-500
4	At DUS Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response:</i> OS and OFF NORM Lamps Go Off	-
5	If Auxiliary Bus Was Removed From Service, Perform The Following:	-
	1. At TTY, Type:RST:AUB a! Where a = 0 or 1 <i>Response:</i> RST:AUB a COMPLETED	-
	2. Type:RST:DUS a! Where a = DUS Member Number <i>Response:</i> RST:DUS a COMPLETED	-
	3. Type:RST:FS a! Where a = API Member Number <i>Response:</i> RST:API a COMPLETED	-

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

1	If Pack To Be Replaced Is Coded FC12 Or FC13 ; At TTY, Type:RMV:DUS a! Where a = 0 if Pack Location Is 80-16, 18, 20, 22, 24, 26, 28, 31, 33, 35, or 1 if Pack Location Is 80-17, 19, 21, 23, 25, 27, 29, 32, 34, 36 <i>Response:</i> RMV:DUS a COMPLETED	-
2	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response:</i> OS and OFF NORM Lamps Light	-
3	Replace Circuit Pack, Tape Unit Controller (TUC)	DLP-501
4	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response:</i> OS and OFF NORM Lamps Go Off	-
5	If DUS Was Removed From Service; At TTY, Type:RST:DUS a! Where a = 0 Or 1 <i>Response:</i> RST:DUS a COMPLETED	-

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

1	At 1B Processor MTC Terminal, Remove Unit From Service (RMV:a b!)	DLP-561
2	At DUS Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OFF NORM</i> Lamp Lights	-
3	Replace DUS DC-To-DC Converter	DLP-538
4	At DUS Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OFF NORM</i> Lamp Goes Off	-
5	At 1B Processor MTC Terminal, Restore Unit To Service (RST:a b!)	DLP-562

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

	<p><i>CAUTION 1: If Function Assigned To Tape Unit Controller (TUC) Is AMA (Active Or Standby), Perform This Task At A Later Date</i></p> <p>NOTE 1: Brake on Late Model Motors Is Assembled With Permanent Pin; Making Field Replacement Of Brake Impossible. Replacement Of Reel Drive Motor Assembly Is Required</p>	—
1	<p>Obtain Support Apparatus:</p> <ul style="list-style-type: none"> • Allen Wrench 5/64-inch • Magnetic Brake L502574 	—
2	At TTY, Type:OP:DUSTATUS!	—
3	If TUC Function Is Other Than Unassigned (UNA), Type:CLR:ADSFUNC a! Where a = Function Assigned To TUC	—
4	At 1B Processor MTC Terminal, Remove Unit From Service (RMV:a b!)	DLP-561
5	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OFF NORM</i> Lamp Lights	—
6	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
7	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
8	If Tape Is Mounted On Tape Transport, Demount Tape	DLP-513
9	Replace Reel Motor Brake	DLP-532
10	If Tape Is To Be Mounted, Perform The Following:	—
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
11	Gently Close Tape Transport Cover Door	—
12	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OFF NORM</i> Lamp Goes Off	—
13	At 1B Processor MTC Terminal, Restore Unit To Service (RST:a b!)	DLP-562

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

14	If Tape Was Mounted, Perform One Of The Following To Set TUC Function:	-
	A. At TUC, Depress Appropriate Function Pushbutton	-
	B. At TTY, Type:SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	-

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

	<i>CAUTION 1: If Function Assigned To Tape Unit Controller (TUC) Is AMA (Active Or Standby), Perform This Task At A Later Date</i>	—
1	Obtain Support Apparatus: <ul style="list-style-type: none"> • Heat Sink Compound C-2471 • Capstan Motor Assembly L-502558 	—
2	At TTY, Type:OP:DUSTATUS!	—
3	If TUC Function Is Other Than Unassigned (UNA), Type:CLR:ADSFUNC a! Where a = Function Assigned To TUC	—
4	At 1B Processor MTC Terminal, Remove Unit From Service (RMV:a b!)	DLP-561
5	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OFF NORM</i> Lamp Lights	—
6	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
7	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
8	If Tape Is Mounted On Tape Transport, Demount Tape	DLP-513
9	Replace Capstan Motor Assembly	DLP-537
10	Check Capstan Speed, Tape Transport	DLP-510
11	If Tape Is To Be Mounted, Perform The Following:	—
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
12	Gently Close Tape Transport Cover Door	—
13	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OFF NORM</i> Lamp Goes Off	—
14	At 1B Processor MTC Terminal, Restore Unit To Service (RST:a b!)	DLP-562

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

15	If Tape Was Mounted, Perform One Of The Following To Set TUC Function:	-
	A. At TUC, Depress Appropriate Function Pushbutton	-
	B. At TTY, Type SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	-

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

	<i>CAUTION: If Function Assigned To Tape Unit Controller (TUC) Is AMA (Active Or Standby), Perform This Task At A Later Date</i>	—
1	At TTY, Type: OP:DUSTATUS!	—
2	If TUC Function Is Other Than Unassigned (UNA), Type: CLR:ADSFUNC a! Where a = Function Assigned To TUC	—
3	At 1B Processor MTC Terminal, Remove Unit From Service (RMV:a b!)	DLP-561
4	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OFF NORM</i> Lamp Lights	—
5	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
6	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
7	If Tape Is Not Mounted On Tape Transport, Mount Blank Tape	DLP-512
8	Check Capstan Servo Assembly Voltage Levels	DLP-534
9	If Blank Tape Was Mounted, Demount Tape On Tape Transport	DLP-513
10	If Tape Is To Be Mounted, Perform The Following:	—
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
11	Gently Close Tape Transport Cover Door	—
12	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OFF NORM</i> Lamp Goes Off	—
13	At 1B Processor MTC Terminal, Restore Unit To Service (RMV:a b!)	DLP-562
14	If Tape Was Mounted, Perform One Of The Following To Set TUC Function:	—
	A. At TUC, Depress Appropriate Function Pushbutton	—
	B. At TTY, Type SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	—

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

	<i>CAUTION: If Function Assigned To Tape Unit Controller (TUC) Is AMA (Active Or Standby), Perform This Task At A Later Date</i>	—
1	At TTY, Type: OP:DUSTATUS!	—
2	If TUC Function Is Other Than Unassigned (UNA), Type: CLR:ADSFUNC a! Where a = Function Assigned To TUC	—
3	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OFF NORM</i> Lamp Lights	—
4	At 1B Processor MTC Terminal, Remove Unit From Service (RMV:a b!)	DLP-561
5	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
6	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
7	If Tape Is Not Mounted On Tape Transport, Mount Blank Tape	DLP-512
8	Check Capstan Diagnostic Assembly Voltage Levels	DLP-535
9	If Blank Tape Was Mounted, Demount Tape On Tape Transport	DLP-513
10	If Tape Is To Be Mounted, Perform The Following:	—
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
11	Gently Close Tape Transport Cover Door	—
12	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OFF NORM</i> Lamp Goes Off	—
13	At 1B Processor MTC Terminal, Restore Unit To Service (RST:a b!)	DLP-562
14	If Tape Was Mounted, Perform One Of The Following To Set TUC Function:	—
	A. At TUC, Depress Appropriate Function Pushbutton	—
	B. At TTY, Type: SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	—

**CHECK CAPSTAN DIAGNOSTIC ASSEMBLY VOLTAGE LEVELS —
TAPE TRANSPORT**

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

	<i>CAUTION: If Function Assigned To Tape Unit Controller (TUC) Is AMA (Active Or Standby), Perform This Task At A Later Date</i>	—
1	At TTY, Type: OP:DUSTATUS!	—
2	If TUC Function Is Other Than Unassigned, Type: CLR:ADSFUNC a! Where a = Function Assigned To TUC	—
3	At 1B Processor MTC Terminal, Remove Unit From Service (RMV:a b!)	DLP-561
4	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OFF NORM</i> Lamp Lights	—
5	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
6	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
7	If Tape Is Mounted On Tape Transport, Demount Tape	DLP-513
8	Replace DC-To-DC Converter	DLP-517
9	If Tape Is To Be Mounted, Perform The Following:	—
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
10	Gently Close Tape Transport Cover Door	—
11	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OFF NORM</i> Lamp Goes Off	—
12	At 1B Processor MTC Terminal, Restore Unit To Service (RST:a b!)	DLP-562
13	If Tape Was Mounted, Perform One Of The Following To Set TUC Function:	—
	A. At TUC, Depress Appropriate Function Pushbutton	—
	B. At TTY, Type: SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned To TUC	—

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

1	At TTY, Type OP:DUSTATUS!	-
2	If Tape Unit Controller (TUC) Function Is Other Than Unassigned (UNA), Type: CLR:ADSFUNC a! Where a = Function Assigned To TUC	-
3	At TUC, Depress REQ DMT Pushbutton <i>Response: OK DMT</i> Lamp Lights	-
4	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	-
5	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	-
6	Demount Tape On Tape Transport	DLP-513
7	Gently Close Tape Transport Cover Door	-

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

1	Obtain Support Apparatus: <ul style="list-style-type: none"> • Twill Cloth KS-2423 • Cleaner Solvent KS-20406,L1 • Vacuum Cleaner KS-14377,L5 • Flexible Nozzle KS-14377,L3 	—
2	If Tape Transport Cover Door Is Not Open, Open Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
3	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
4	Clean Tape Path	DLP-526
5	Mount Tape On Tape Transport	DLP-512
6	Check Reels And Hubs For Wobble	DLP-525
7	Depress REWIND Pushbutton <i>Response: REWIND</i> Lamp Lights; Tape Rewinds To BOT Marker and Stops	—
8	Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
9	Gently Close Tape Transport Cover Door	—
10	Perform One Of The Following To Set TUC Function:	—
	A. At TUC, Depress Appropriate Function Pushbutton	—
	B. At TTY, Type: SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned to TUC	—

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

	<i>CAUTION: If Function Assigned To Tape Unit Controller (TUC) Is AMA (Active Or Standby), Perform This Task At A Later Date</i>	—
1	At TTY, Type: OP:DUSTATUS!	—
2	If TUC Function Is Other Than Unassigned, Type: CLR:ADSFUNC a! Where a = Function Assigned to TUC	—
3	At TUC Power Switch, Rotate ROS/OFF Switch Clockwise To ROS <i>Response: OS</i> And OFF NORM Lamps Light	—
4	Open Tape Transport Cover Door And Pull Interlock Switch Plunger Out To Override Position	—
5	Depress LOCAL/REMOTE Pushbutton To Obtain LOCAL Lighted Condition	—
6	If Tape Is Mounted On Tape Transport, Demount Tape	DLP-513
7	Replace DC-to-DC Converter	DLP-547
8	If Tape Is To Be Mounted, Perform The Following:	—
	1. Mount Tape On Tape Transport	DLP-512
	2. Depress LOCAL/REMOTE Pushbutton To Obtain REMOTE Lighted Condition	—
9	Gently Close Tape Transport Cover Door	—
10	At TUC Power Switch, Rotate ROS/OFF Switch Counterclockwise To Normal Position <i>Response: OS</i> and OFF NORM Lamps Go Off	—
11	If Tape Was Mounted, Perform One Of The Following To Set TUC Function:	—
	A. At TUC, Depress Appropriate Function Pushbutton	—
	B. At TTY, Type: SET:TUC a;FUNCTION b! Where a = TUC Member Number; b = Function To Be Assigned to TUC	—

GENERAL

The maintenance philosophy contained in this document is based on the design of equipment hardware, diagnostic software, and test equipment employed. Procedures are intended to aid personnel in performing routine maintenance and trouble-clearing tasks. The degree to which these procedures accomplish this depends on 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. are referred to where applicable rather than duplicating that information in the TOP. Some portions of those documents may be used in procedures, but only as examples for explanation. Test equipment (oscilloscopes, voltmeters, etc) and parameters involved in circuits being tested, adjusted, or checked are usually prescribed. Setup and method of operation is not described unless it is unusual or unique. When procedures are affected by differences in hardware and/or software, the procedure addresses the differences when possible. Where extensive differences exist, separate procedures are provided and referenced according to SD, J-spec, or option. When a procedure does not address differences, the procedure applies to all versions and options of the equipment.

IXL PHILOSOPHY

The IXL is structured to provide access to procedures pertinent to symptoms identified. Power problems are sensed by scan points that generate a minor alarm. The user is required to be able to locate the frame with the power fault that was automatically powered down (1B power switch with **PWR OFF** lamp lighted and **OFF NORM** lamp off) by following the aisle pilot lights or by reading the **REPT:PA** printout. The precise structure of the message is given in the Input/Output (I/O) message manuals. Symptoms described in the IXL reflect the preceding requirements, and

indicate other conditions that are observable at the frame that would enable the user to access the proper trouble-clearing procedure. These conditions are as follows: fuse blown, lighted LEDs on converters, and power function circuit packs.

In general, logic circuit failures cause the fault recovery program to request a diagnostic program. This method of requesting the diagnostic program includes the TLP option. The IXL reflects this in the **ANALY:TLPFILE** messages listed. All **ANALY:TLPFILE** messages other than those listed with a notation of **SUSPECTED FAULTY EQUIPMENT** or **NULL PACK TEST GENERATED** pertain to problems in generating a TLP **SUSPECTED FAULTY EQUIPMENT** list. The IXL references the appropriate procedure that attempts to correct the problem. If successful in generating a suspected faulty equipment list, those messages reference the appropriate procedure that attempts to clear the trouble using the list. If not successful, the procedure then references the next level of trouble-clearing, raw data analysis. This level is an alternative to the first and most common trouble-clearing approach.

TAP PHILOSOPHY

When documenting a procedural approach to trouble clearing, certain requirements are made. One fault is to be cleared at a time. When directing the user to perform an action, the user must perform that action correctly. Similarly, when directed to make replacements, the replacement part is always good. Equipment used for testing, both built-in (hardware and software) and commercial, is to be good.

These requirements and the fact that trouble-clearing procedures are designed for faults with consistent fault

MAINTENANCE PHILOSOPHY

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signatures provide procedures with a clean straightline approach to trouble clearing. There is a possibility that some faults do not present a consistent fault signature or TLP pack list. If this occurs, then the 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 resulted in clearing the problem.

Trouble-clearing TAPs provided for diagnostic failures are provided on three levels. Level one addresses what to do with a software-generated TLP **SUSPECTED FAULTY EQUIPMENT** list and provides a step-by-step procedure for replacing circuit packs one at a time, and analyzing the results. This level is straightforward and requires some familiarity with the equipment (descriptive and theory 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. The first level may also be accessed directly from the IXL or any of the TAPs that produce a **NULL PACK TEST GENERATED** response. This level is known as *raw data analysis* and describes what to do with the summary and supplemental data printed either with or instead of the **SUSPECTED FAULTY EQUIPMENT** list; This is expected to 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.

The third level of trouble clearing is *signal tracing* using interactive diagnostics. This procedure is

accessible only from the previous level and uses information derived in the performance of that procedure. This level of trouble clearing requires an increase in the capabilities cited in the first two levels and requires additional knowledge and skill in the setup and use of test equipment (oscilloscopes, voltmeters, etc).

Another method of trouble clearing that may be used is *interrupt analysis*. Procedures provided for analyzing interrupts are for recurring interrupts. Therefore, a history of the time between interrupts is essential when replacing suspect circuit packs and analyzing the results. Enough time should be allowed between replacement of suspect packs for interrupt to recur. Should this be the wrong circuit pack, then the probability is high that the interrupt occurs again with the same symptoms. If interrupt recurs, the next most suspect circuit pack should be replaced. Before changing circuit packs, diagnostics should be run with **ATP** expected. If diagnostics produce one of the following:

ATP – The most suspect circuit pack is the first pack on list obtained by analysis of interrupt.

STF – The most suspect circuit pack is the pack that appears on both TLP **SUSPECTED FAULTY EQUIPMENT** list and list obtained by analysis of interrupt.

ALTERNATE METHODS

The more knowledgeable and experienced personnel may access TOP documents at a point in trouble clearing when analysis is completed (faulty component determined) and only repair or replacement is required. In many instances, access to these procedures may be obtained by locating procedural data provided on the Task Index List. Most DLPs are designed to support TAPs and NTPs with preconditioning and system restoration steps covered in those level procedures (TAPs,

NTPs). Therefore, access to data (DLPs) on a hunt-and-find basis is a threat to equipment operation and may compound trouble-clearing problems.

EQUIPMENT TEST LIST

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

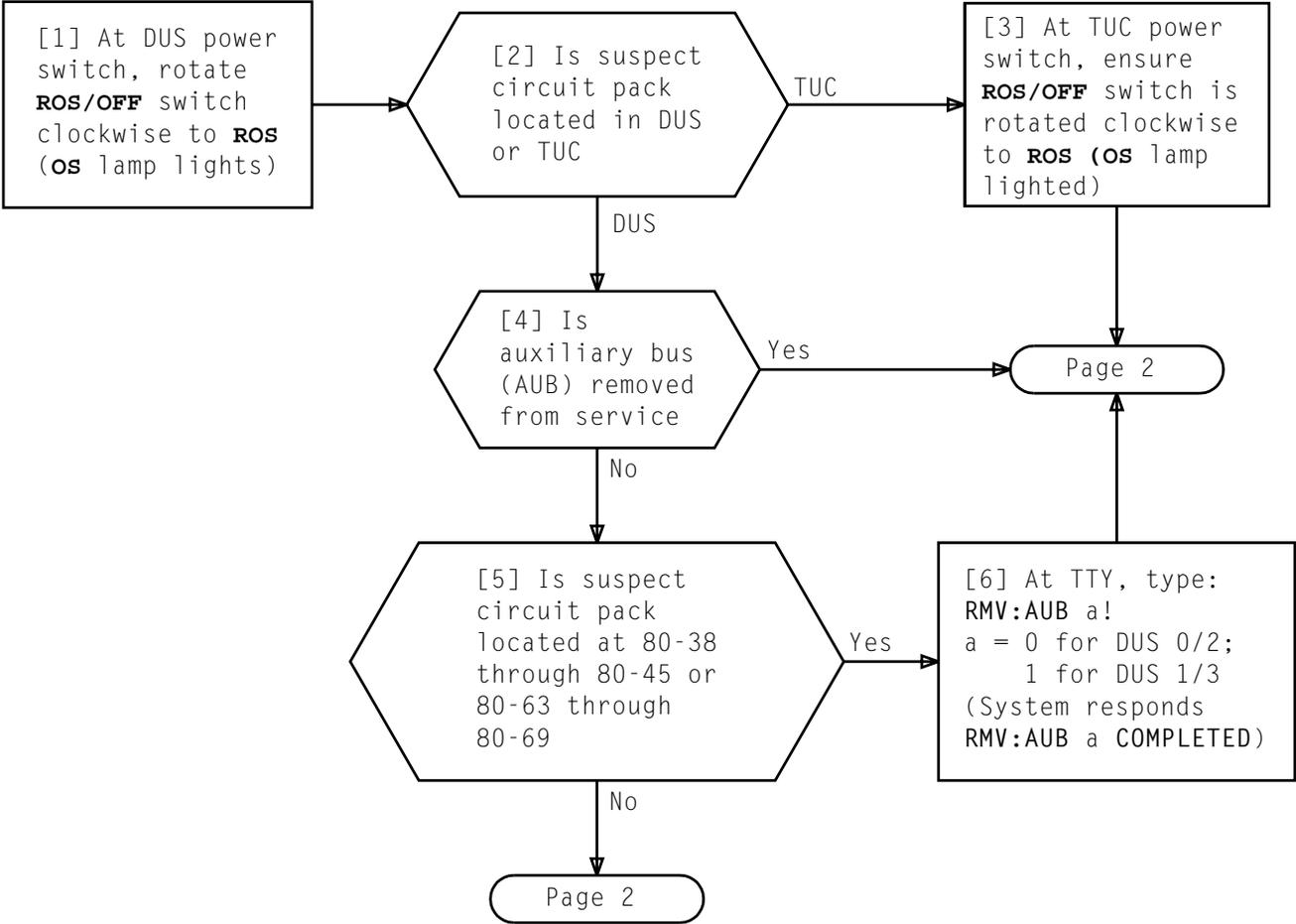
1B PROCESSOR; TAPE FRAME, DUS FOR ALL UNITS

W	INSPECT AND CLEAN TAPE PATH	004
W	CHECK OPERATION OF TAPE TRANSPORT	007
M	TUC DEMAND DIAGNOSTIC - PH 81-83, 91-93	012
6M	CHECK READ, WRITE AND ERASE HEADS	005
6M	CHECK CAPSTAN SPEED	006
6M	CHECK CAPSTAN AND DIAGNOSTIC ASSEMBLE VOLTAGE LEVELS, TAPE TRANSPORT	019
6M	TEST LAMPS ON POWER SWITCH	506
6M	TEST POWER ALARM CIRCUITS TAPE UNIT CONTROLLER.	543
6M	TEST POWER ALARM CIRCUIT DATA UNIT SELECTOR	546
12M	INSPECT REEL MOTOR BRUSHES	008

4ESS SWITCH

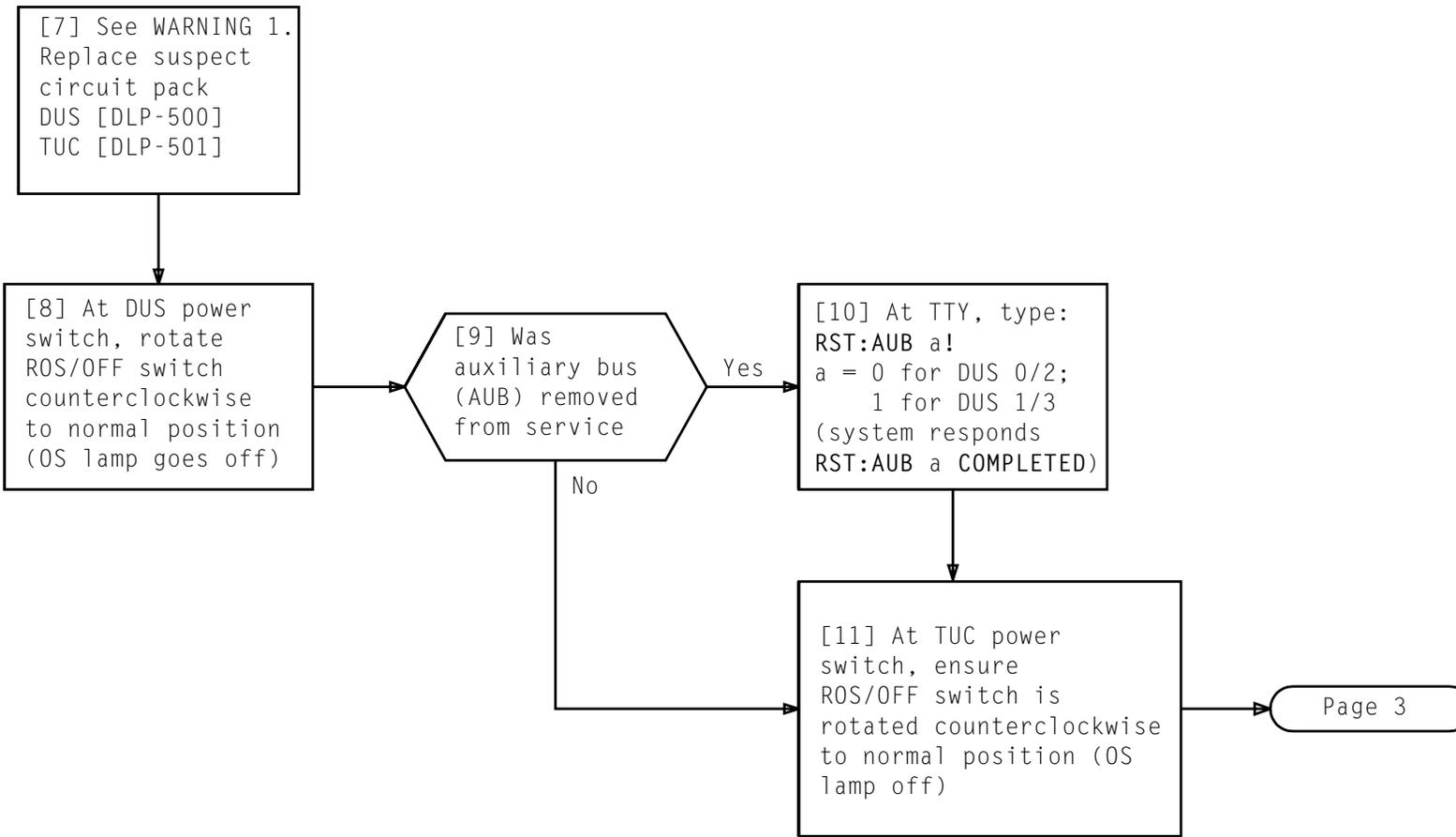
M	DIAGNOSE DATA UNIT SELECTORS (DEMAND PHASE 93)	011
---	---	-----

<p style="text-align: center;">SUMMARY</p> <p>Replace each circuit pack on TLP suspected faulty equipment list beginning with first pack. After each replacement, check diagnostic results to determine if trouble is cleared. If failure recurs, reinsert original pack. Repeat procedure</p>	<p>for each succeeding pack on list until trouble is cleared. If trouble is not cleared, clear data unit selector diagnostic failure by analyzing raw data and replacing suspect packs [TAP-103]</p>
--	--



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

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**CLEAR DATA UNIT SELECTOR DIAGNOSTIC FAILURE BY REPLACING
PACKS ON TLP SUSPECTED FAULTY EQUIPMENT LIST**

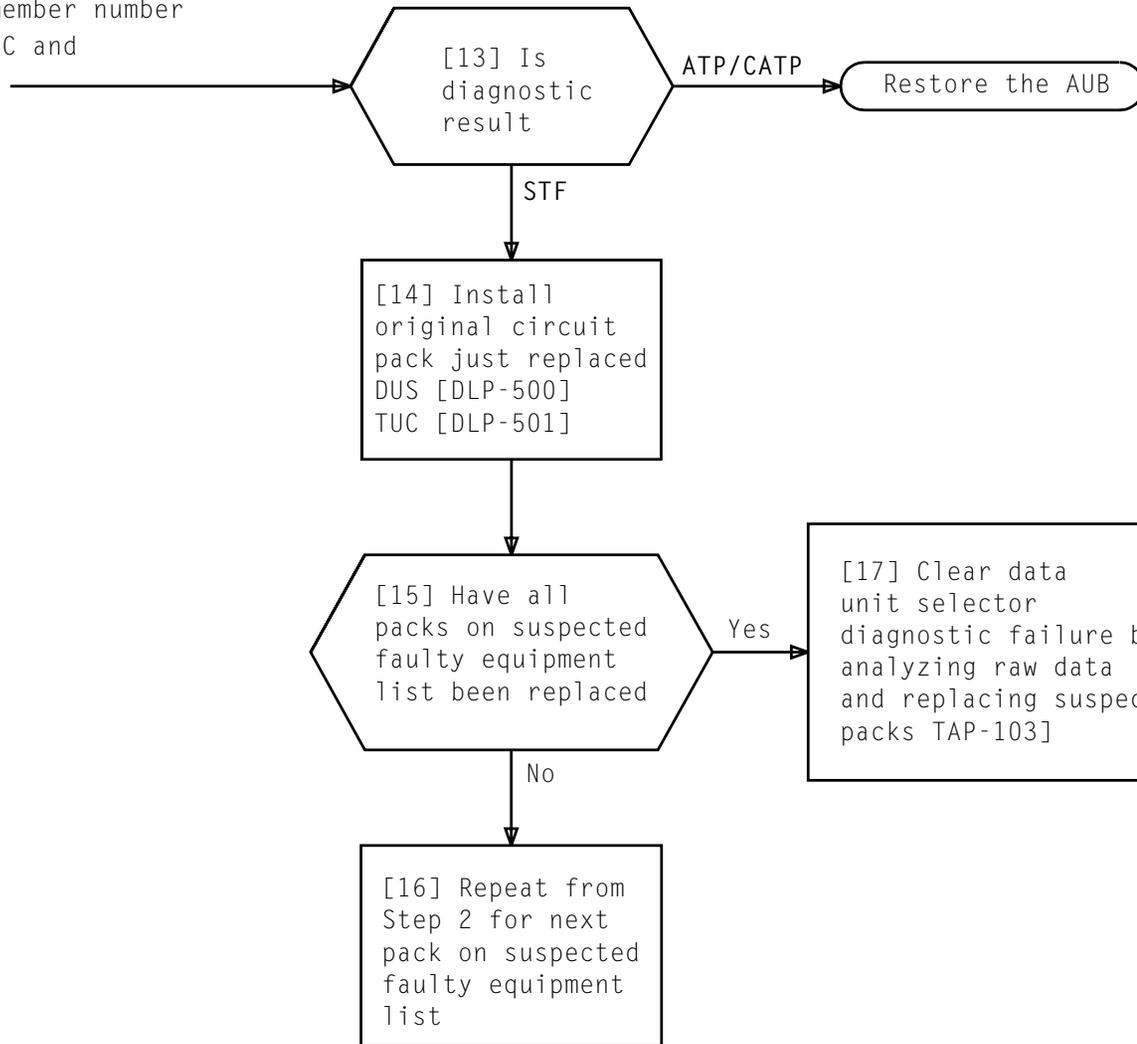
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[12] At TTY, type:

DGN:a:b!

a = DUS/TUC and member number

b = helper DUS/TUC and member number



WARNING 1
Red designation marker at pack indicates fuse removal required to replace pack

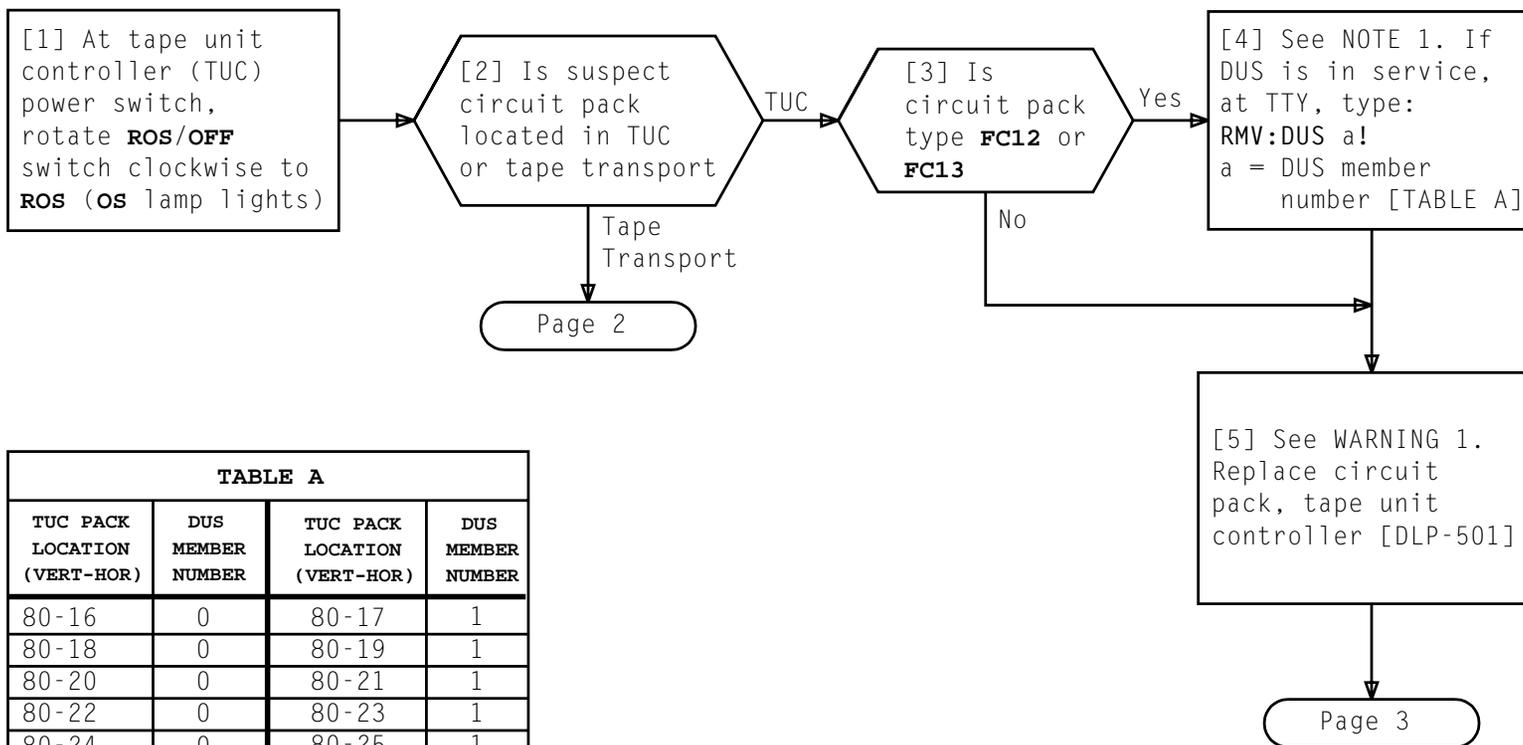
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CLEAR DATA UNIT SELECTOR DIAGNOSTIC FAILURE BY REPLACING PACKS ON TLP SUSPECTED FAULTY EQUIPMENT LIST

SUMMARY

Replace each circuit pack on TLP suspected faulty equipment list beginning with first pack. After each replacement, check diagnostic results to determine if trouble is cleared. If failure recurs, reinsert original pack. Repeat procedure

for each succeeding pack on list until trouble is cleared. If trouble is not cleared, clear tape unit controller diagnostic failure by analyzing raw data and replacing suspect packs [TAP-104]



TUC PACK LOCATION (VERT-HOR)	DUS MEMBER NUMBER	TUC PACK LOCATION (VERT-HOR)	DUS MEMBER NUMBER
80-16	0	80-17	1
80-18	0	80-19	1
80-20	0	80-21	1
80-22	0	80-23	1
80-24	0	80-25	1
80-26	0	80-27	1
80-28	0	80-29	1
80-31	0	80-32	1
80-33	0	80-34	1
80-35	0	80-36	1

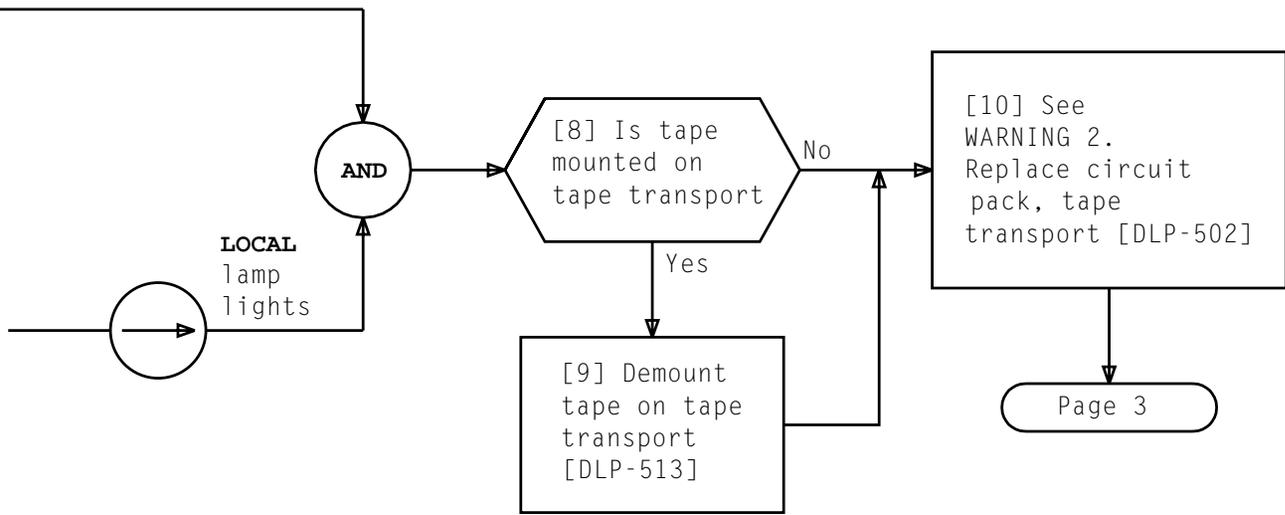
NOTE 1
It may be necessary to restore mate DUS before removal of selected DUS using RST:DUS a! message

WARNING 1
Red designation marker at pack indicates fuse removal required to replace pack

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

[6] Open tape transport cover door and pull interlock switch plunger out to override position

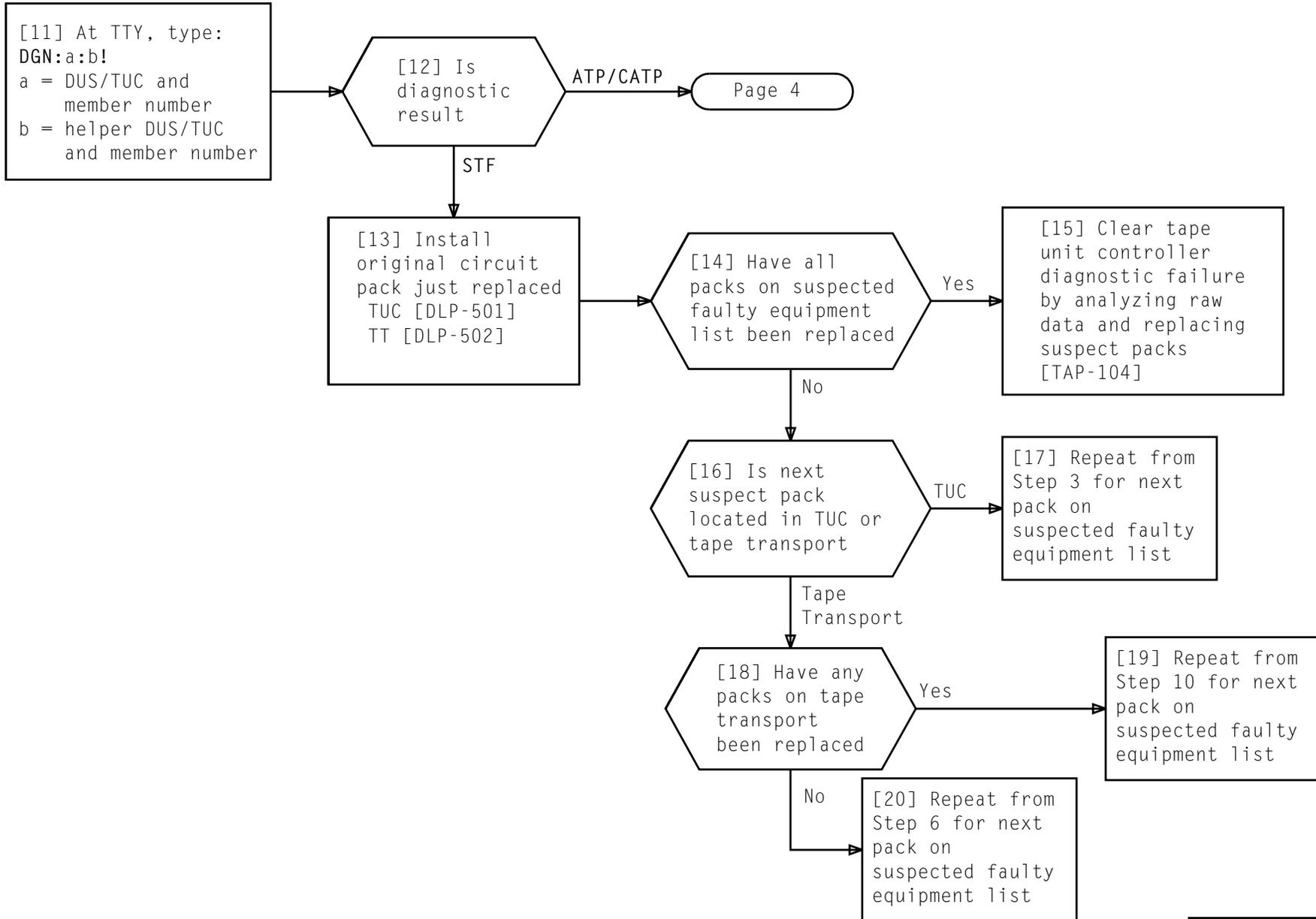
[7] Depress **LOCAL/REMOTE** pushbutton to obtain **LOCAL** lighted condition



WARNING 2
 Red designation marker at pack indicates fuse removal required to replace pack

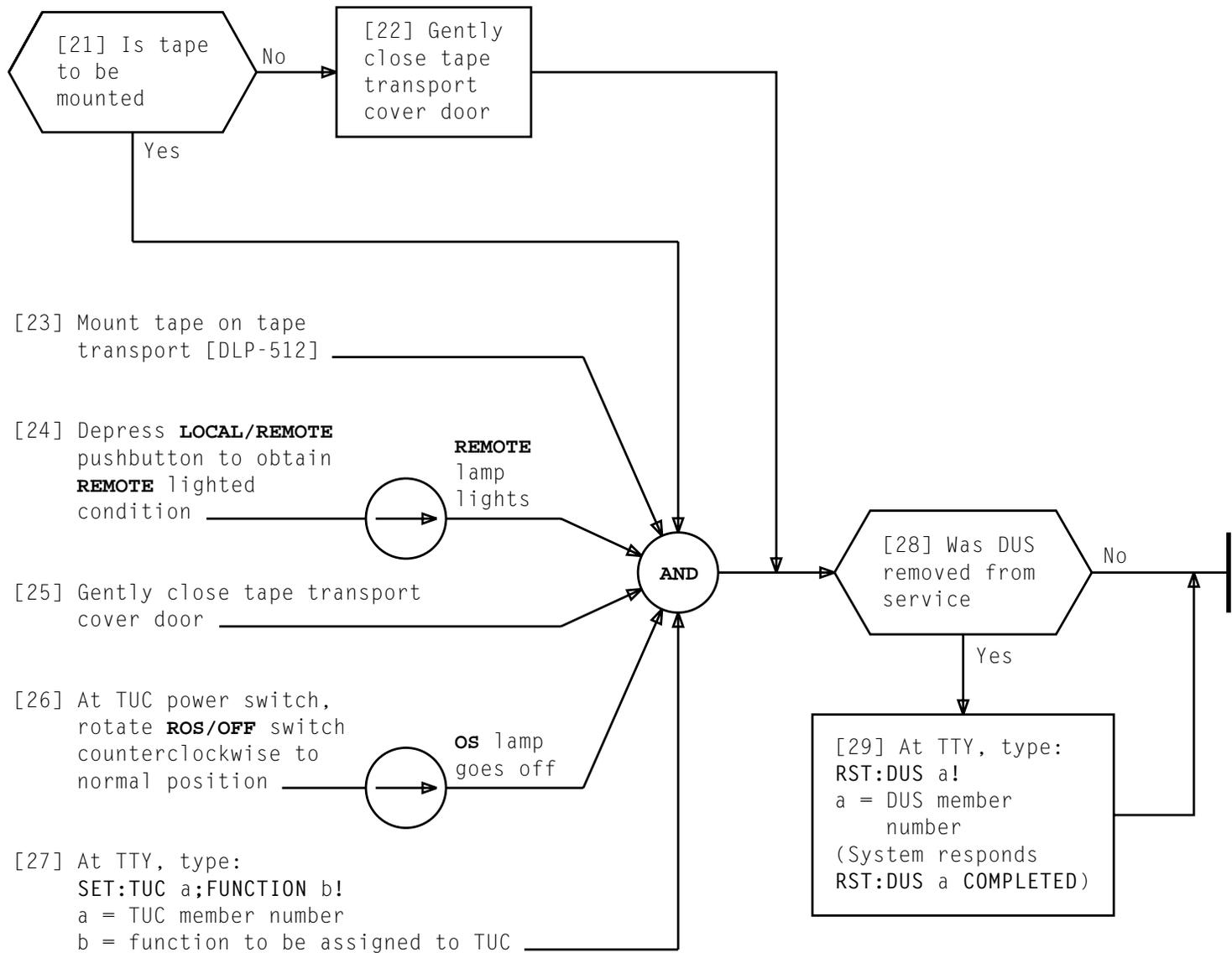
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CLEAR TAPE UNIT CONTROLLER DIAGNOSTIC FAILURE BY REPLACING PACKS ON TLP SUSPECTED FAULTY EQUIPMENT LIST



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

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

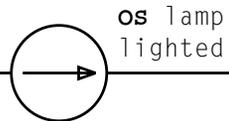
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SUMMARY

Identify list of suspect circuit packs by analyzing raw data. Replace each pack identified beginning with first pack. After each replacement, check diagnostic results to determine if trouble is cleared. If failure recurs,

reinsert original pack. Repeat procedure for each succeeding pack on list until trouble is cleared. If trouble is not cleared, clear diagnostic failure by looping over first failing test and signal tracing [TAP-105]

[1] At DUS power switch, ensure **ROS/OFF** switch is rotated clockwise to **ROS**



[2] Identify list of suspect circuit packs by analyzing raw data [DLP-504]



Yes

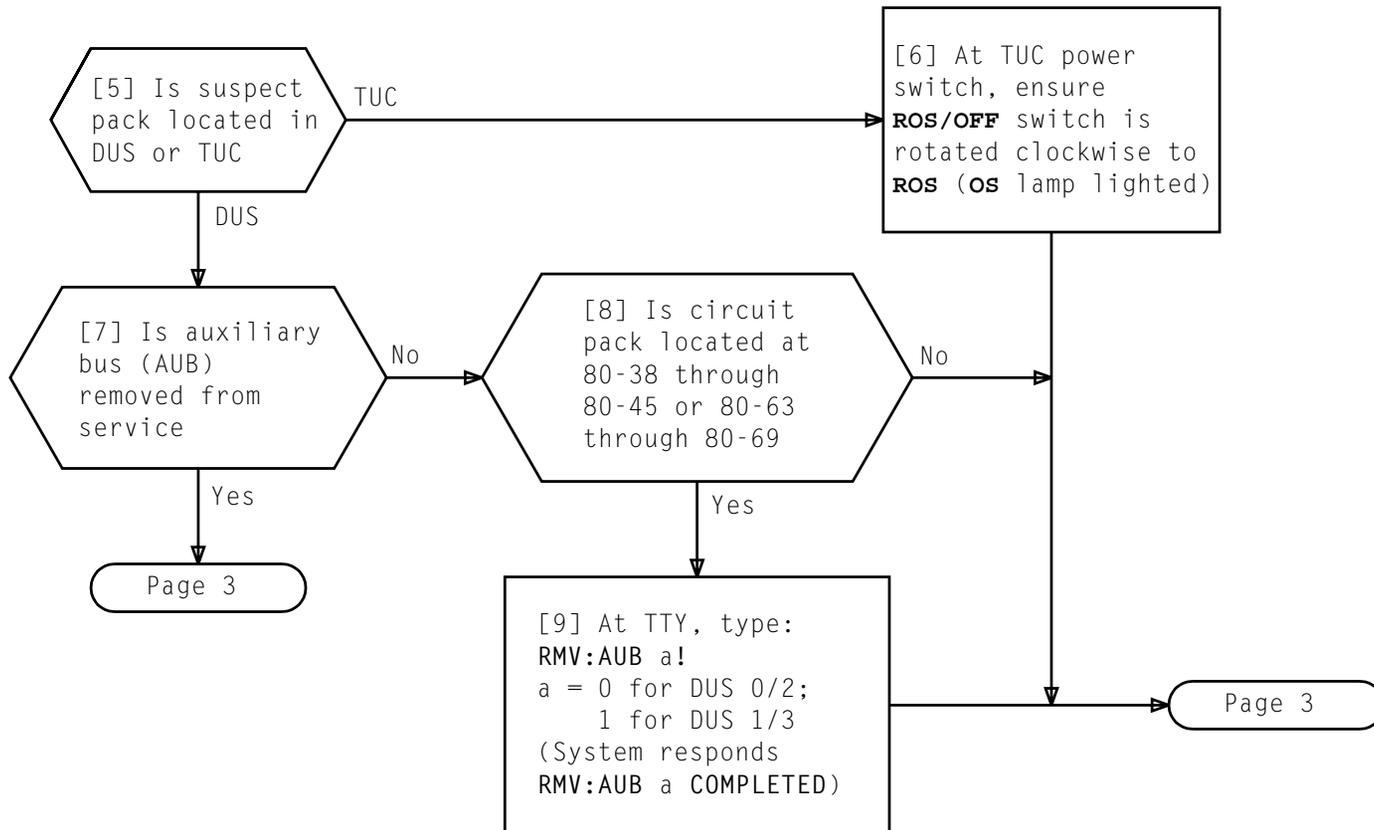
[4] Clear diagnostic failure by looping over first failing test and signal tracing [TAP-105]

No



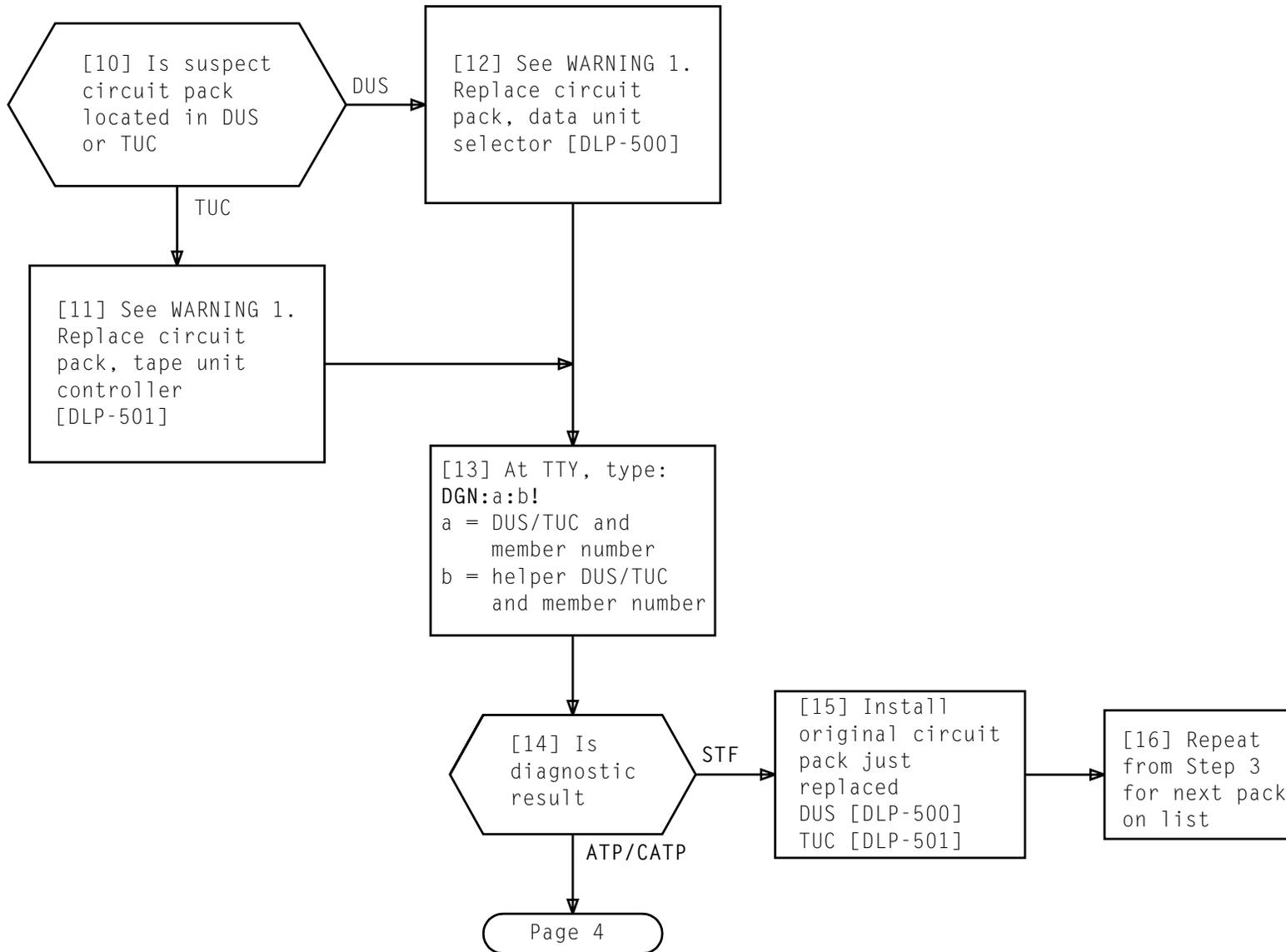
CLEAR DATA UNIT SELECTOR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS

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CLEAR DATA UNIT SELECTOR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS

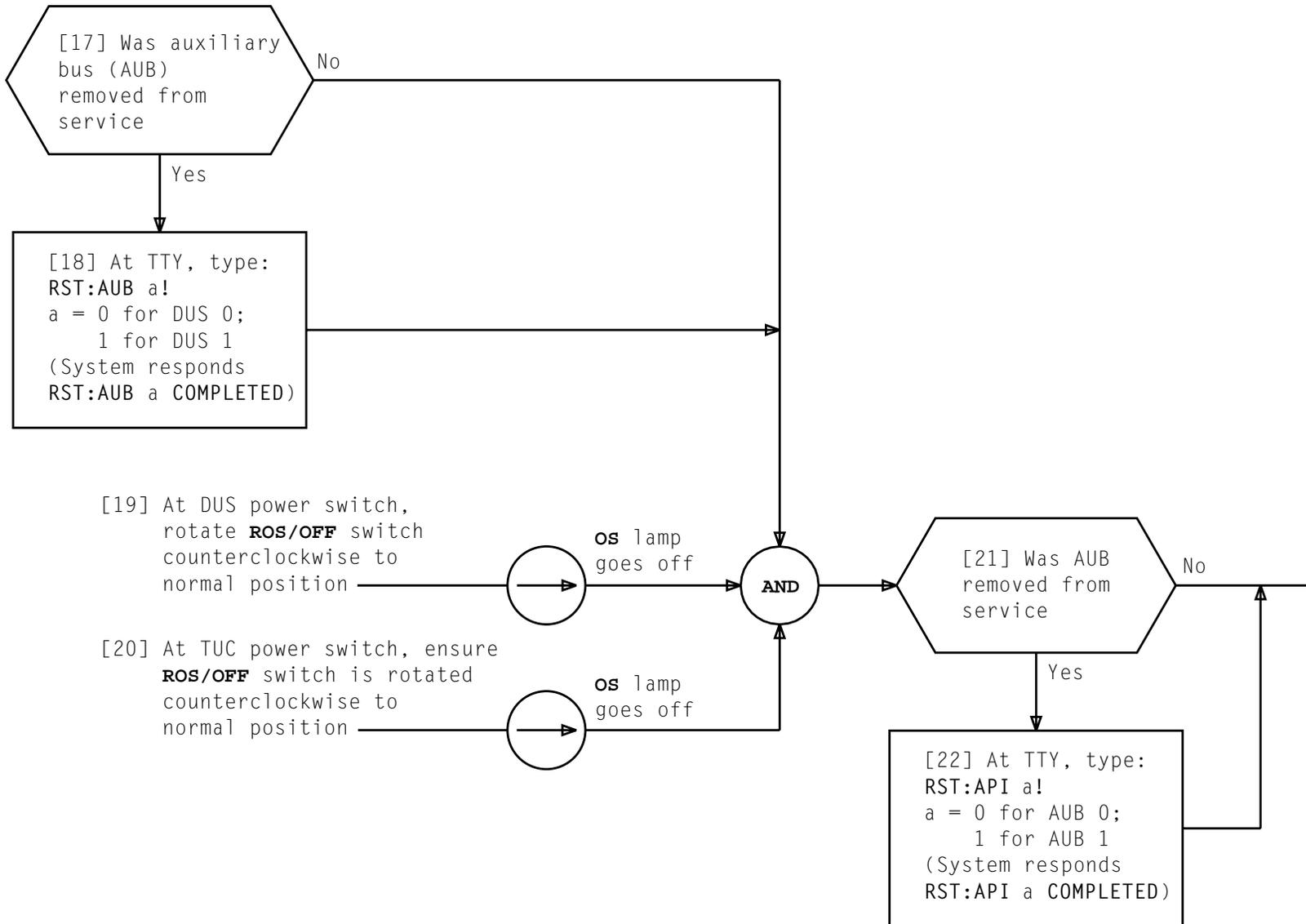
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*WARNING 1
Red designation
marker at pack
indicates fuse
removal required
to replace pack*

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CLEAR DATA UNIT SELECTOR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS



CLEAR DATA UNIT SELECTOR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS

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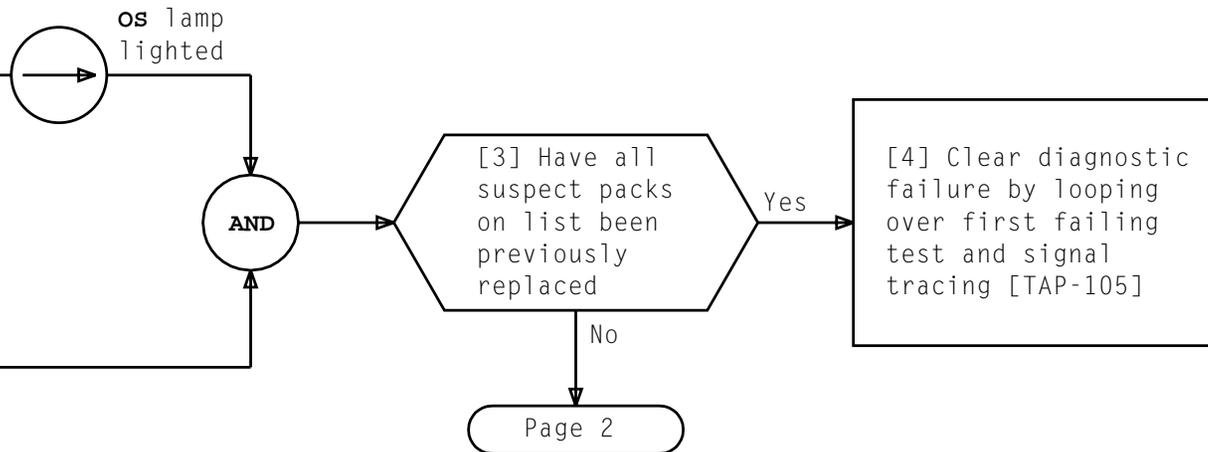
SUMMARY

Identify list of suspect circuit packs by analyzing raw data. Replace each pack identified beginning with first pack. After each replacement, check diagnostic results to determine if trouble is cleared. If failure recurs,

reinsert original pack. Repeat procedure for each succeeding pack on list until trouble is cleared. If trouble is not cleared, clear diagnostic failure by looping over first failing test and signal tracing [TAP-105]

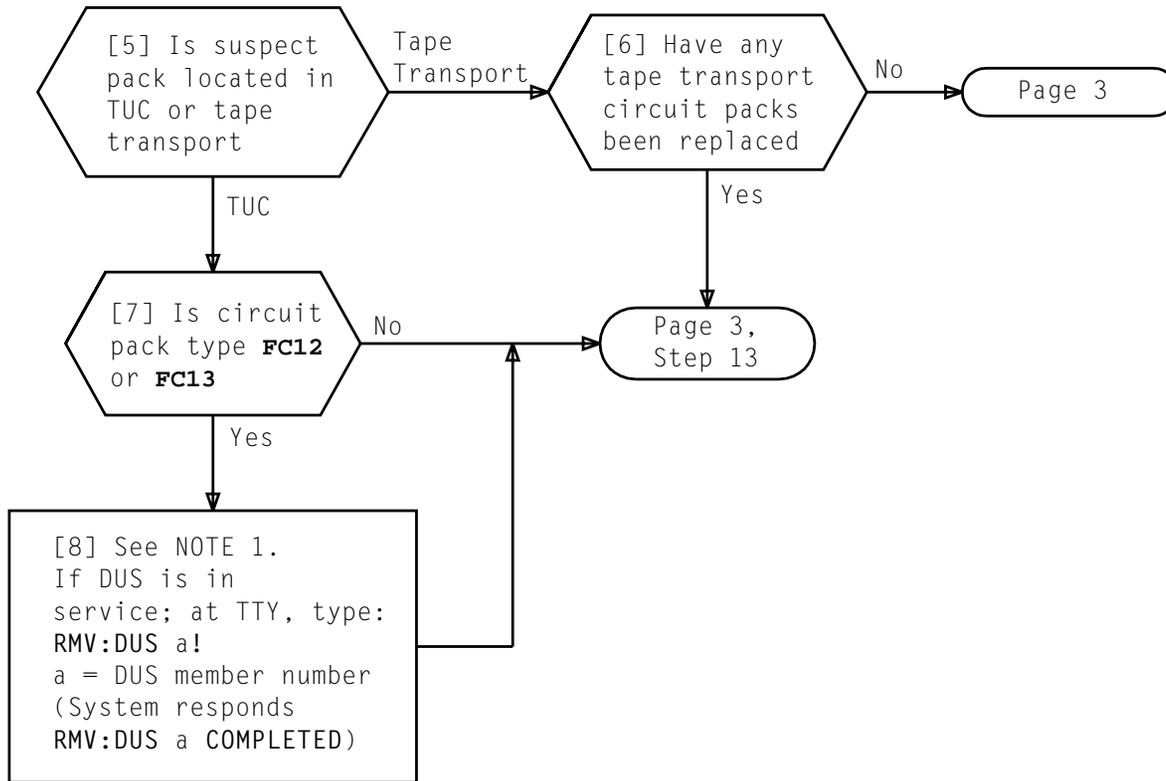
[1] At tape unit controller (TUC) power switch, ensure **ROS/OFF** switch is rotated clockwise to **ROS**

[2] Identify list of suspect circuit packs by analyzing raw data [DLP-504]



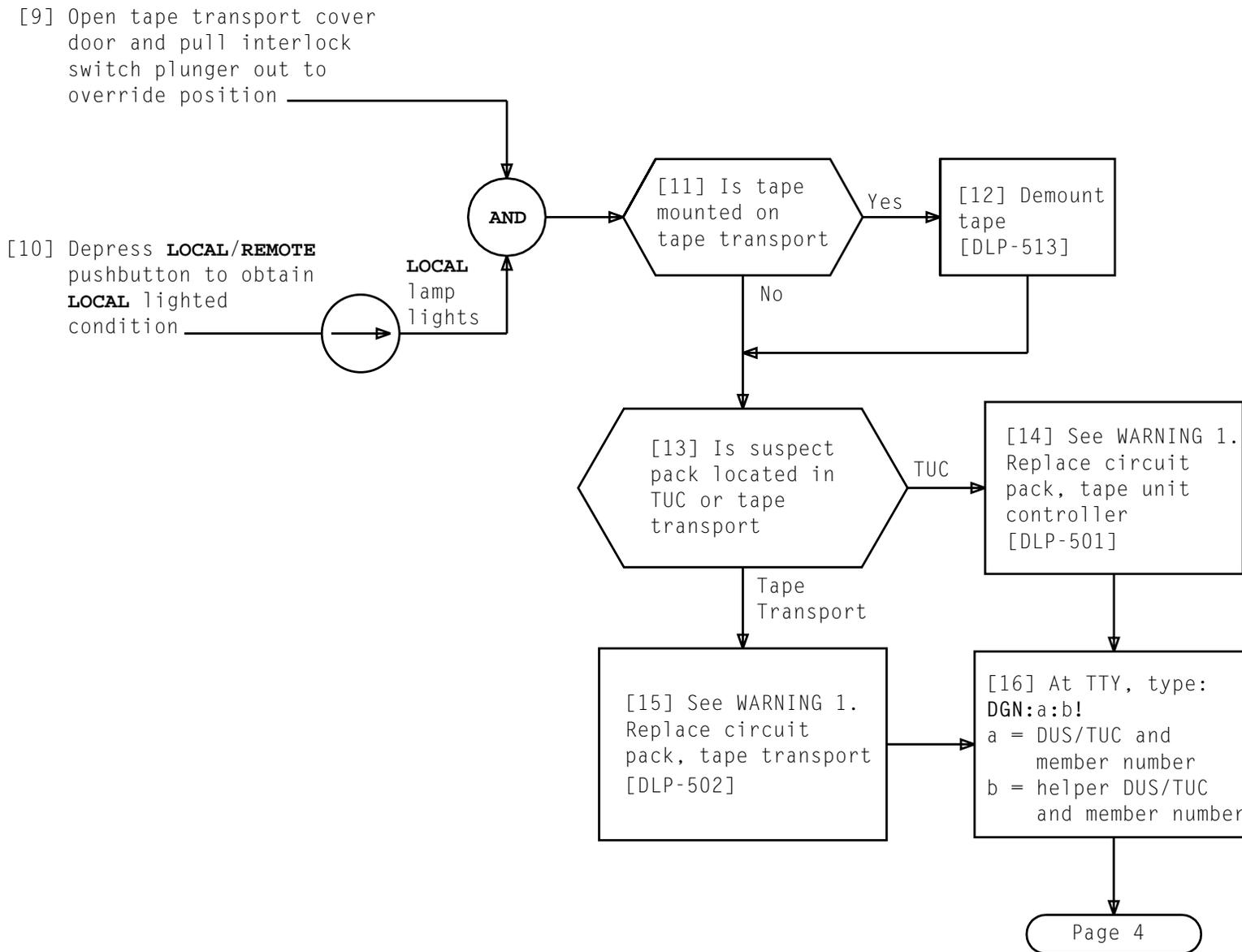
CLEAR TAPE UNIT CONTROLLER DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS

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**CLEAR TAPE UNIT CONTROLLER DIAGNOSTIC FAILURE
BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS**

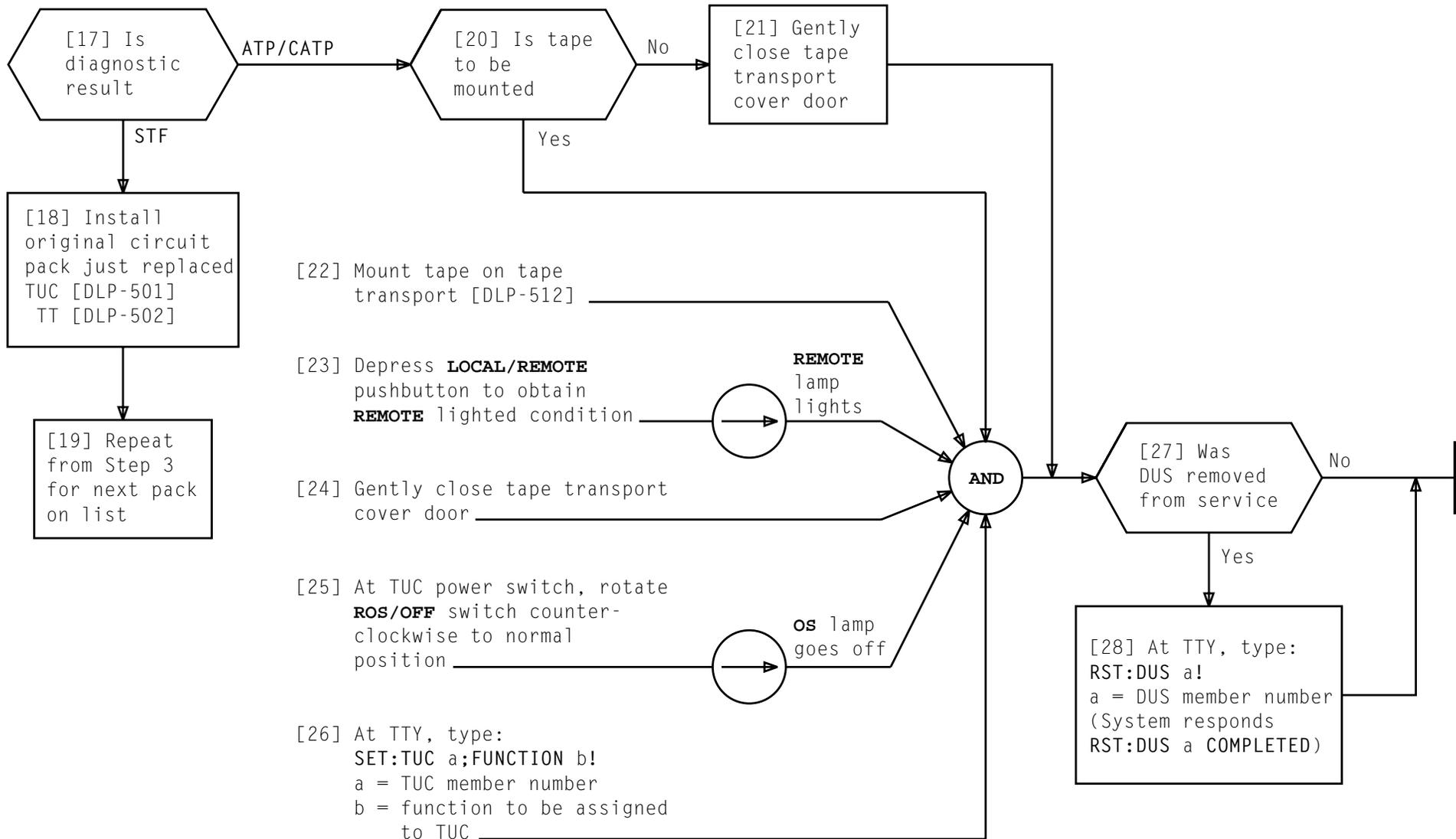
NOTE 1	
It may be necessary to restore mate DUS before removing selected DUS using RST:DUS a! message	
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*WARNING 1
Red designation marker at pack indicates fuse removal required to replace pack*

CLEAR TAPE UNIT CONTROLLER DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS

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**CLEAR TAPE UNIT CONTROLLER DIAGNOSTIC FAILURE
BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS**

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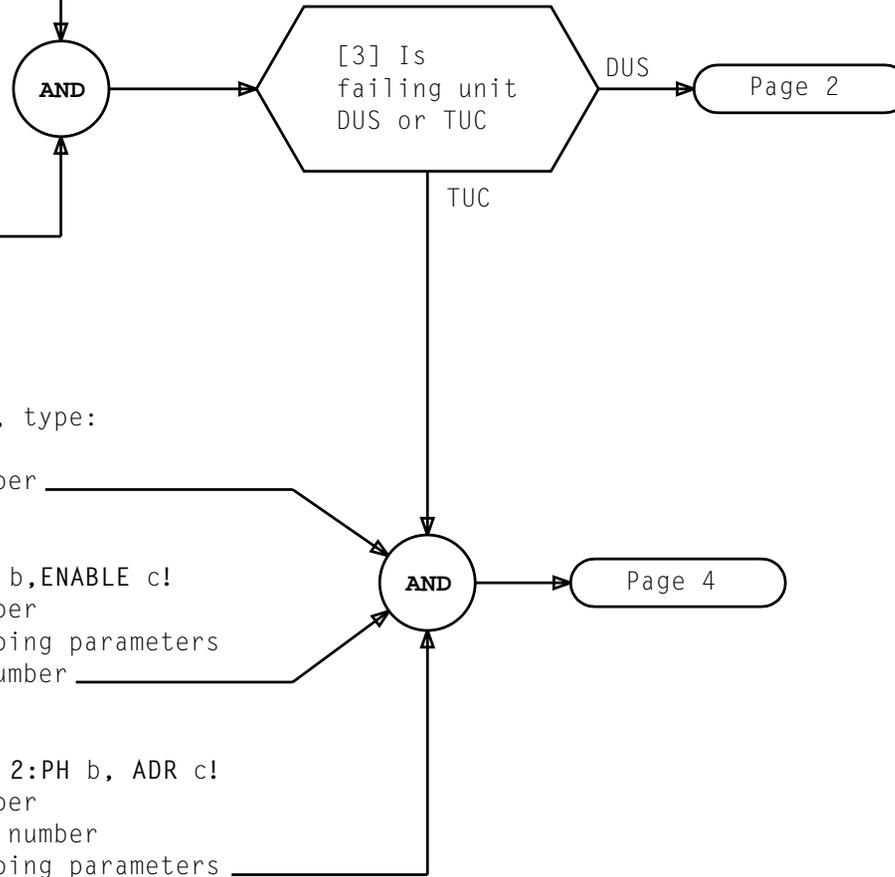
[1] Obtain and power up oscilloscope allowing period for stabilization

[2] Determine looping parameters for failing phase [DLP-505]

[4] See NOTE 1. At TTY, type:
EX:TUC a;START!
a = TUC member number

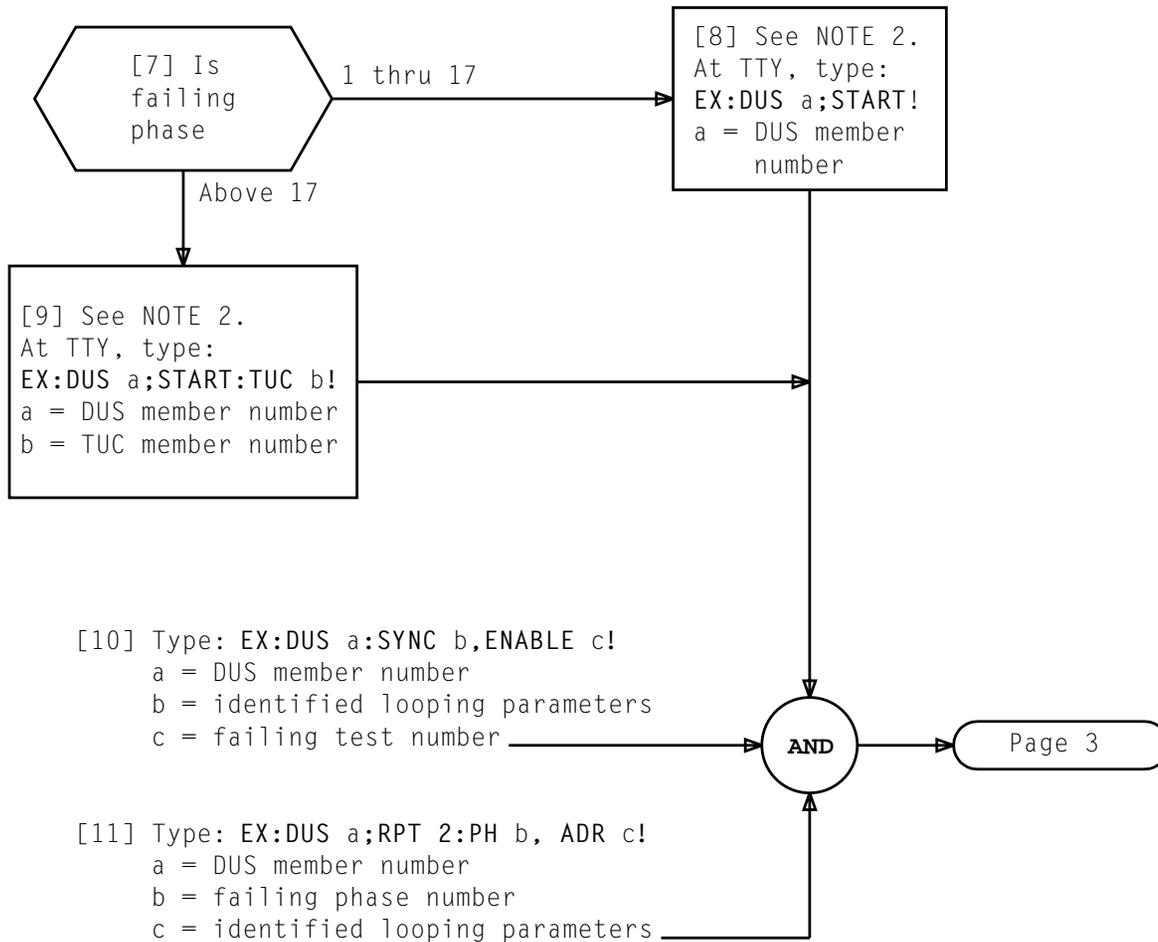
[5] Type EX:TUC a:SYNC b,ENABLE c!
a = TUC member number
b = identified looping parameters
c = failing test number

[6] Type: EX:TUC a;RPT 2:PH b, ADR c!
a = TUC member number
b = failing phase number
c = identified looping parameters



NOTE 1	
To discontinue looping condition, identify MACLI MTCE SUBCLASS assigned to frame under test by typing: OP:MACLI,CLASS MTCE! then type: STOP:MACLI,CLASS MTCE,SUBCLASS a! a = subclass assigned to frame under test	
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CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER FIRST FAILING TEST AND SIGNAL TRACING



NOTE 2	
To discontinue looping condition, identify MACLI MTCE SUBCLASS assigned to frame under test by typing: OP:MACLI,CLASS MTCE! then type: STOP:MACLI,CLASS MTCE,SUBCLASS a! a = subclass assigned to frame under test	
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CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER FIRST FAILING TEST AND SIGNAL TRACING

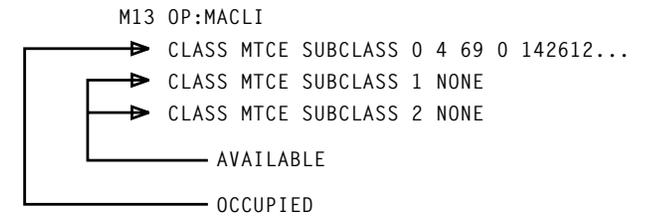
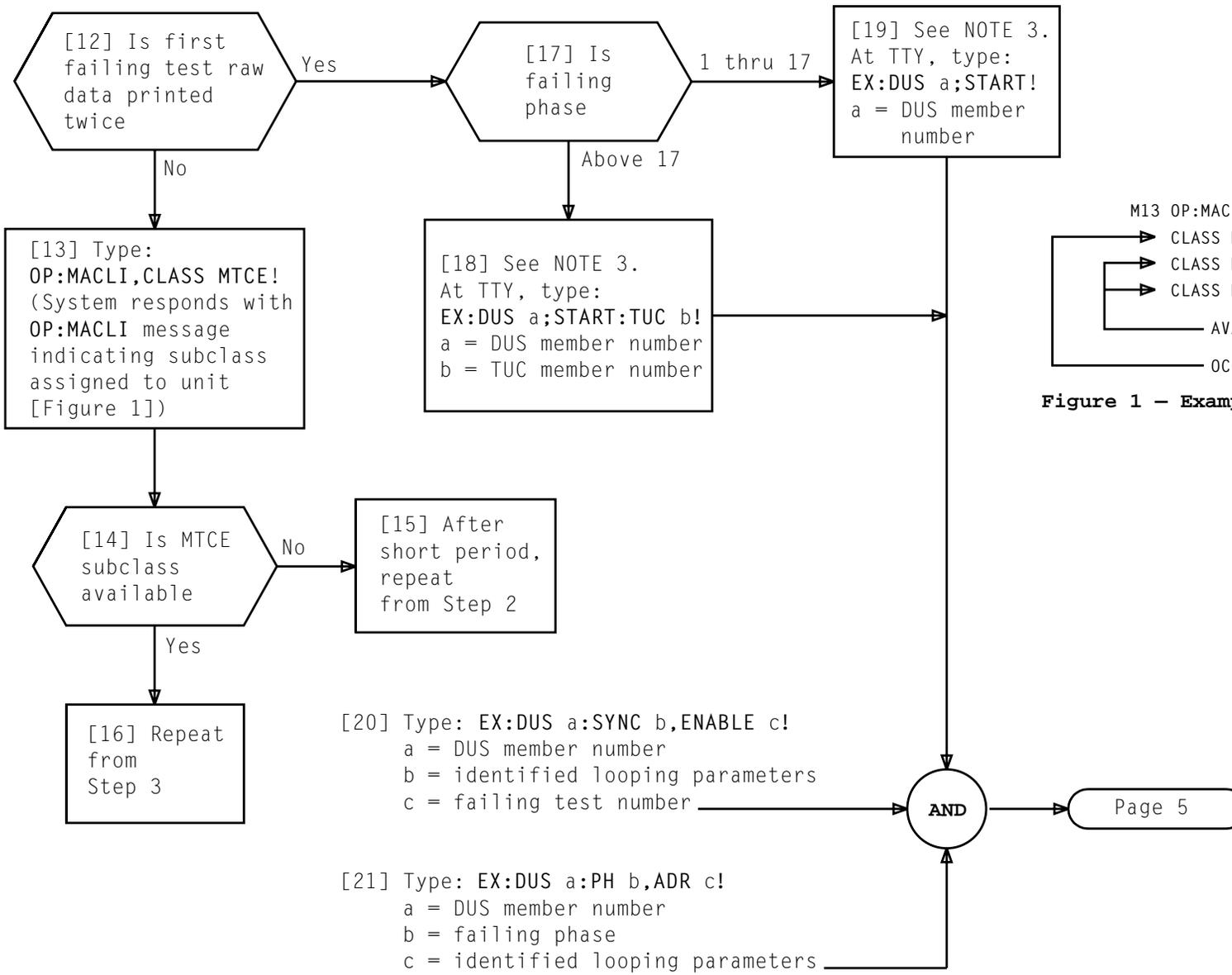


Figure 1 - Example of MACLI Output Message

NOTE 3
 To discontinue looping condition, identify MACLI MTCE SUBCLASS assigned to frame under test by typing:
 OP:MACLI, CLASS MTCE!
 then type:
 STOP:MACLI, CLASS MTCE, SUBCLASS a!
 a = subclass assigned to frame under test

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

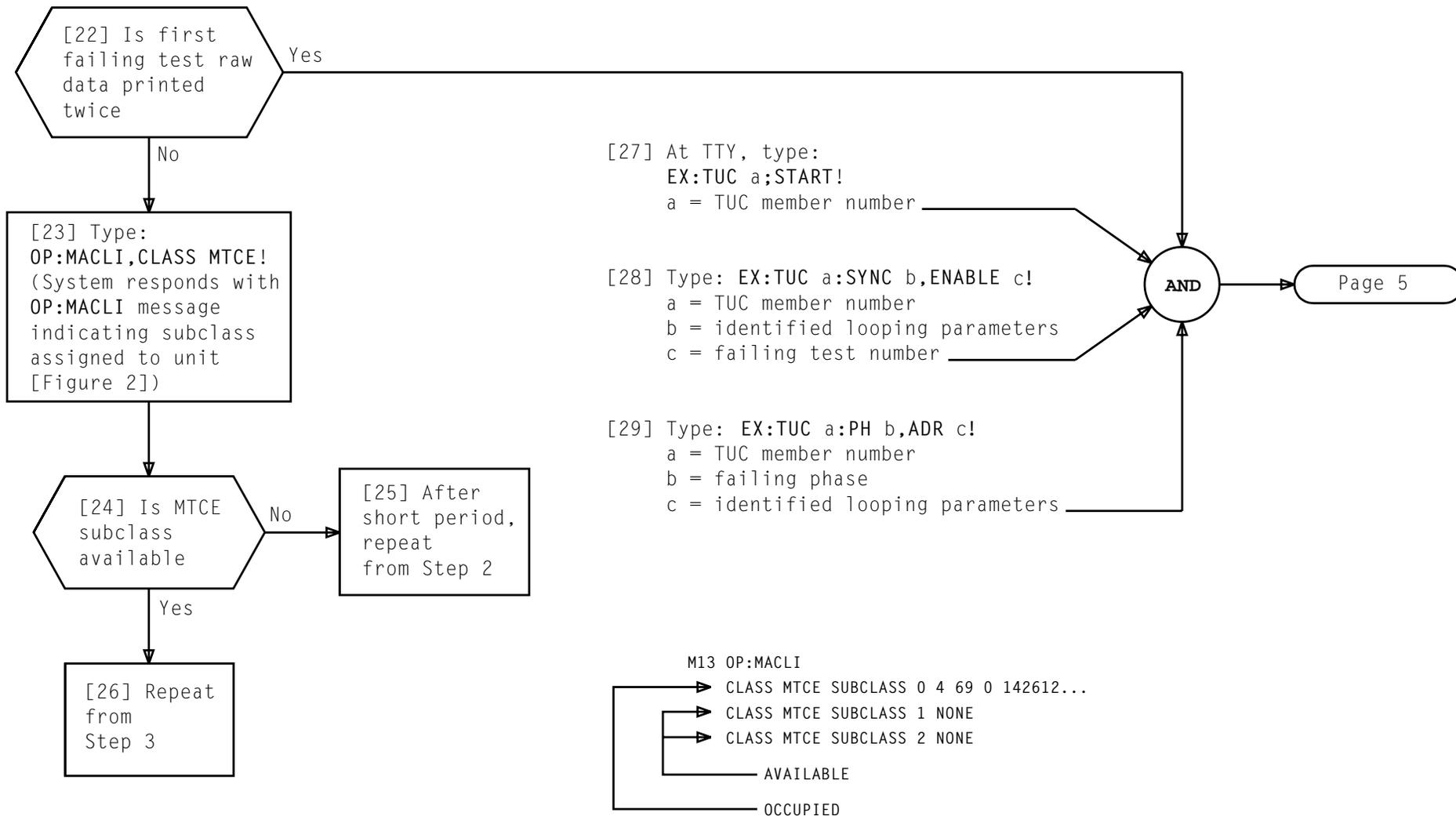
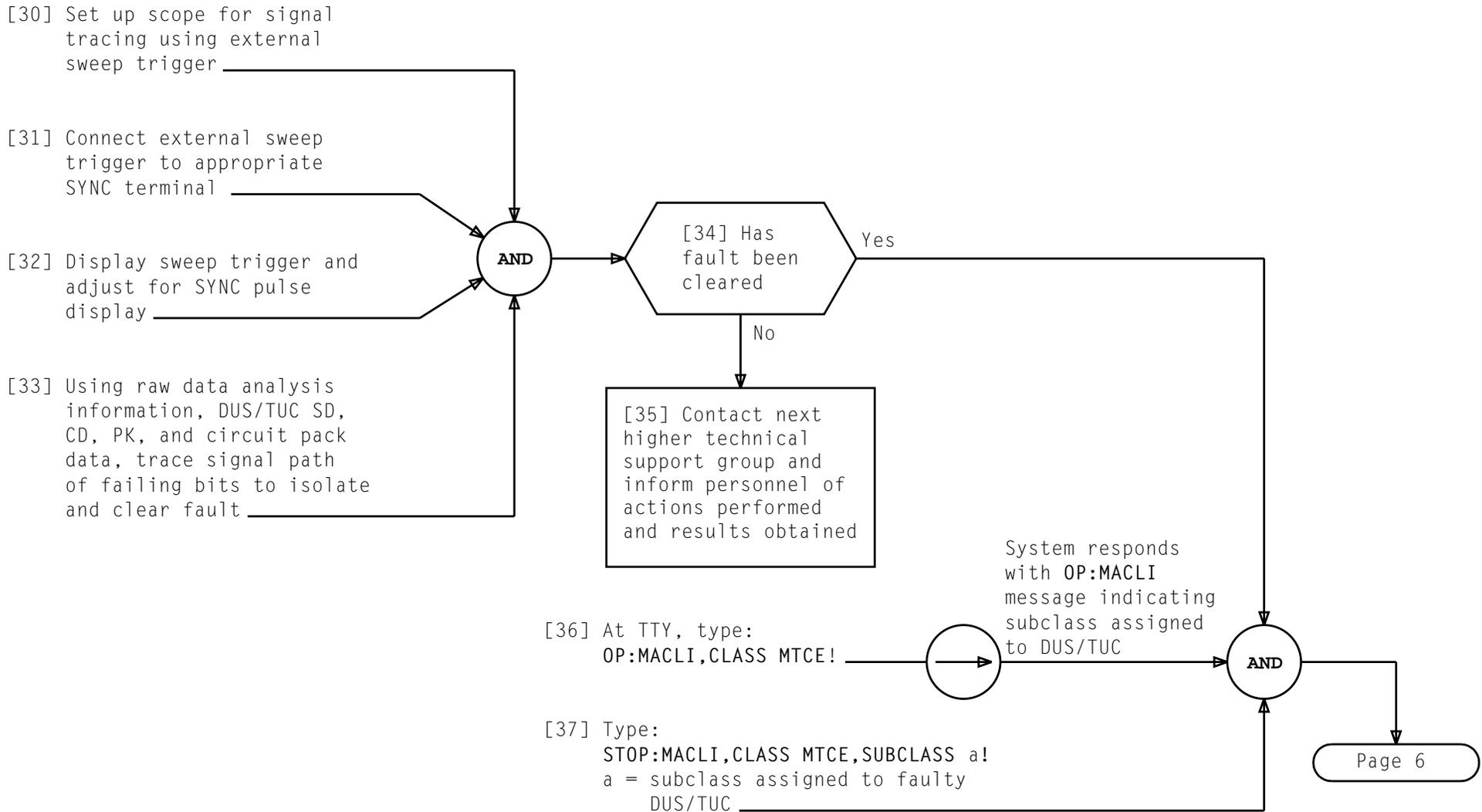


Figure 2 - Example of MACLI Output Message

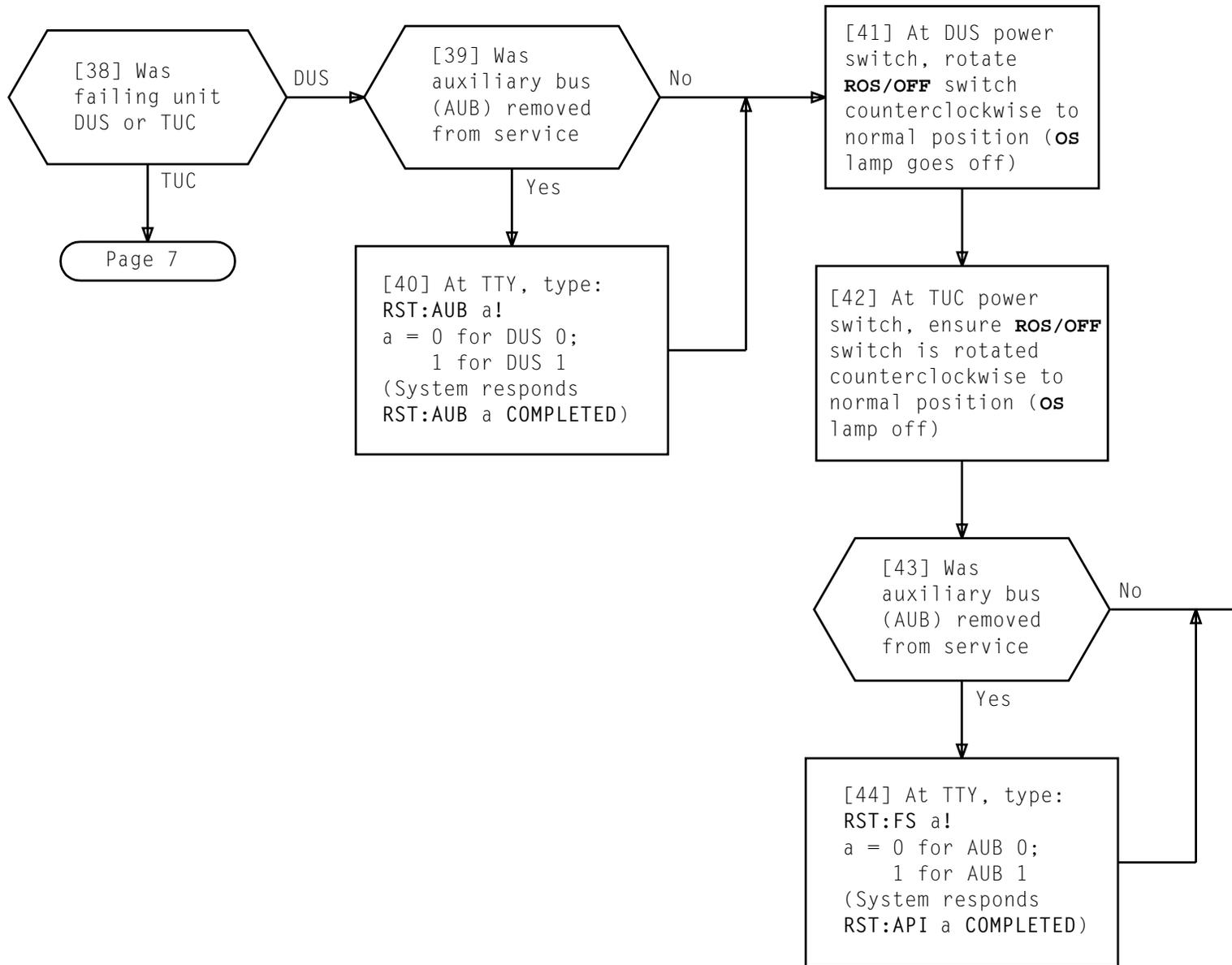
CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER FIRST FAILING TEST AND SIGNAL TRACING

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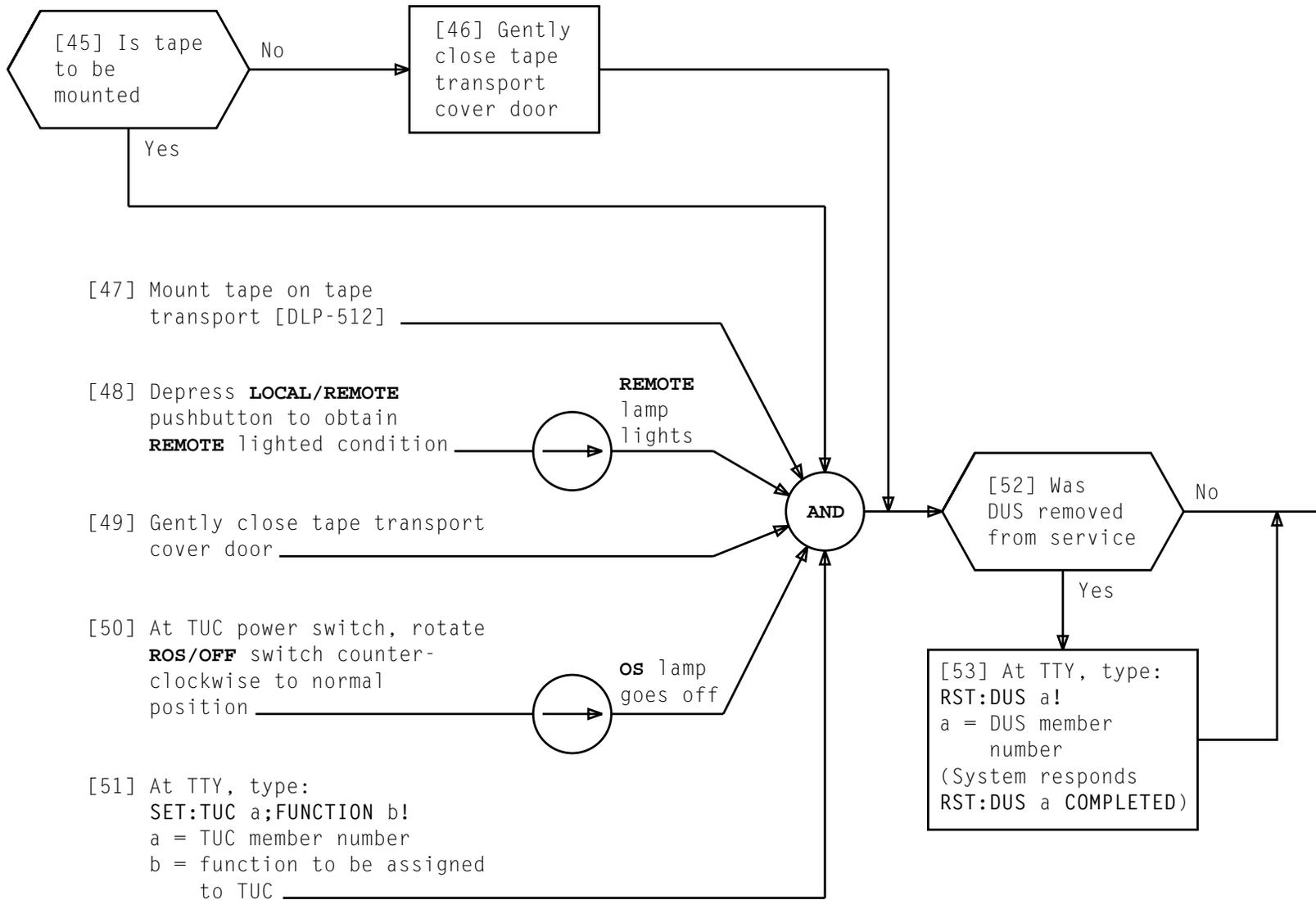
CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER FIRST FAILING TEST AND SIGNAL TRACING

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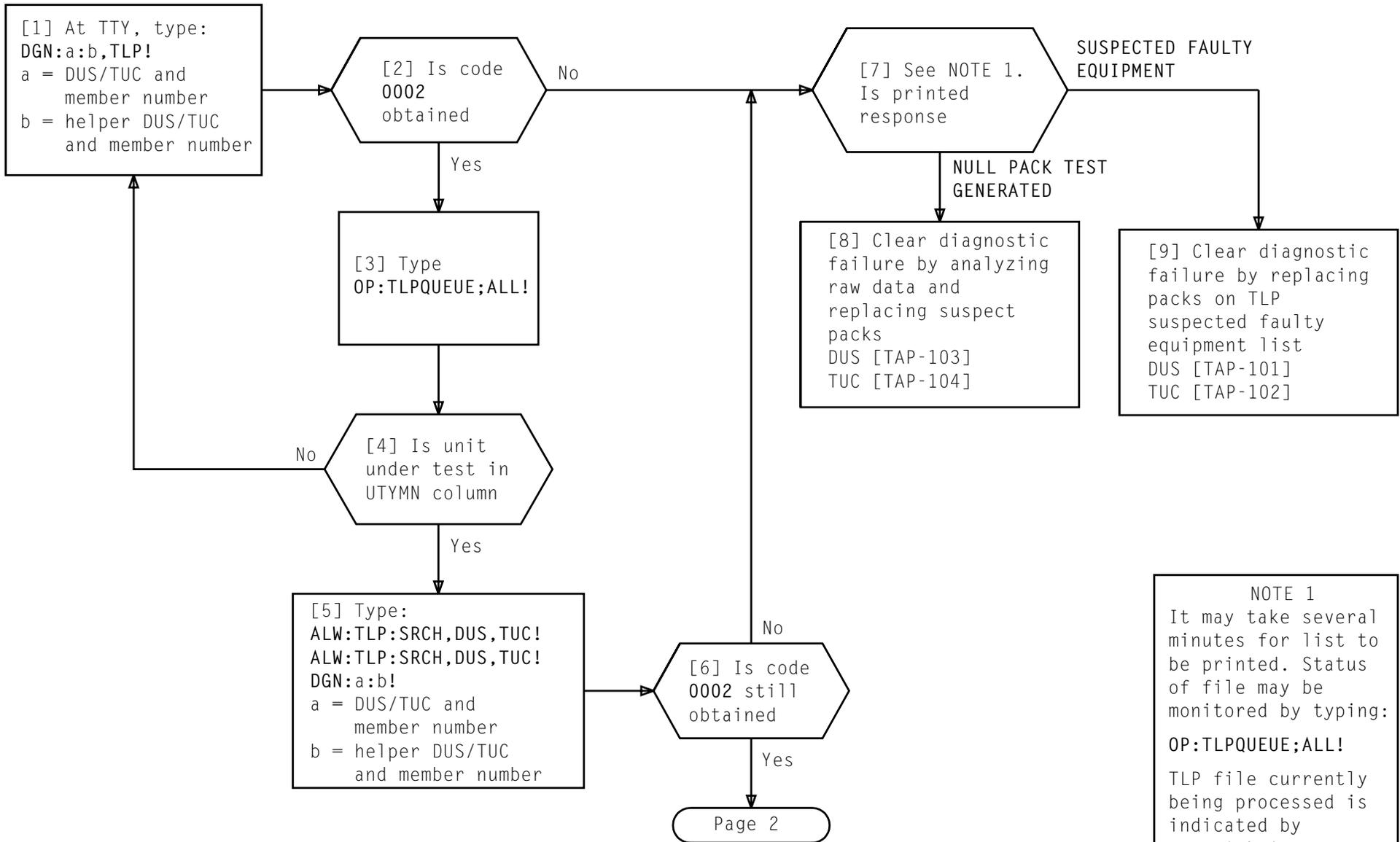
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CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER FIRST FAILING TEST AND SIGNAL TRACING

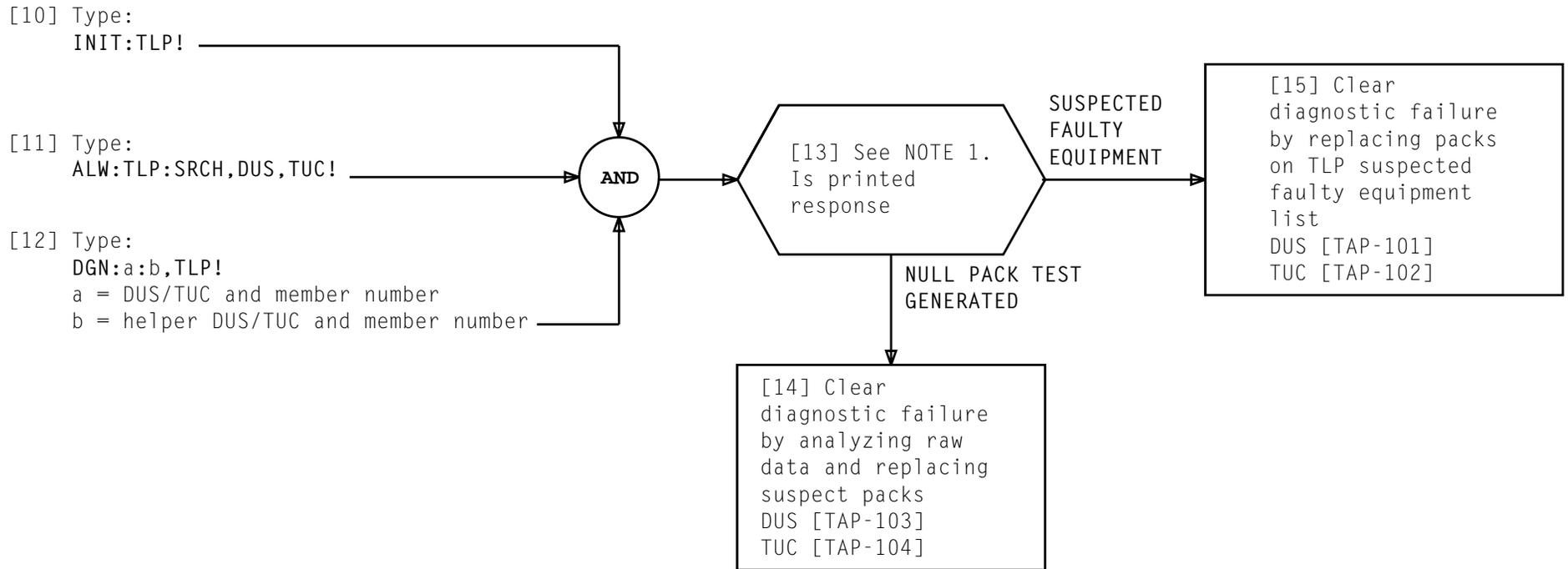
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NOTE 1
It may take several minutes for list to be printed. Status of file may be monitored by typing:
OP:TLPQUEUE;ALL!
TLP file currently being processed is indicated by asterisk in priority column

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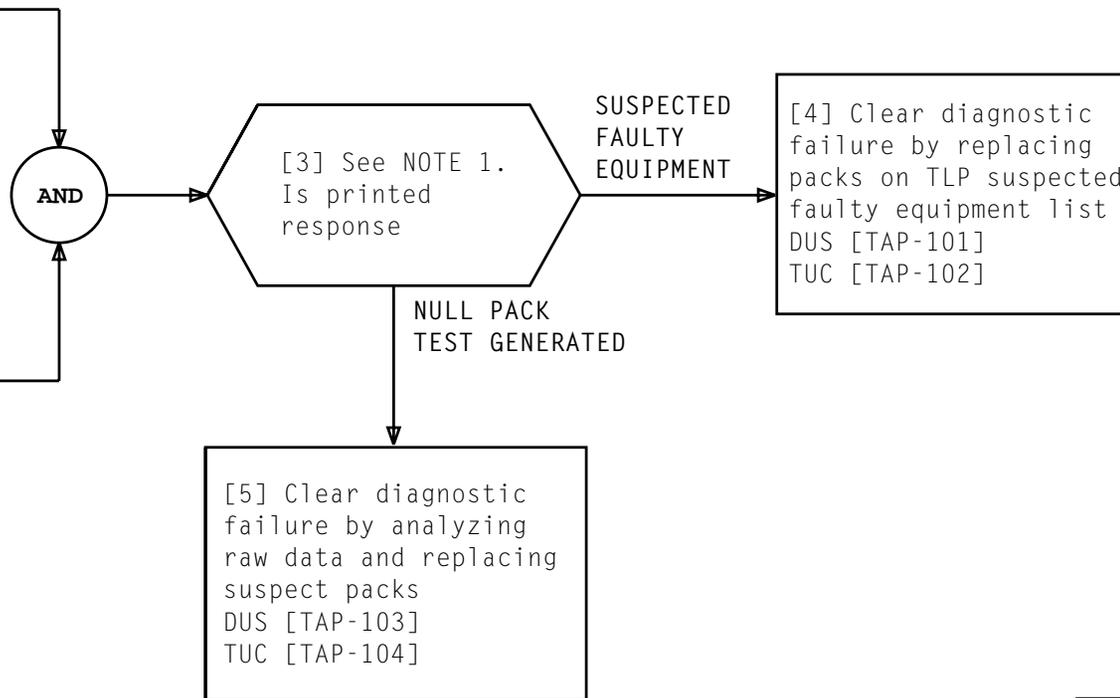
CLEAR DIAGNOSTIC FAILURE - TLP QUEUE BLOCKAGE



At TTY:

[1] Type:
ALW:TLP:DUS,TUC!

[2] Type:
DGN:a:b,TLP!
a = DUS/TUC and
member number
b = helper DUS/TUC and
member number



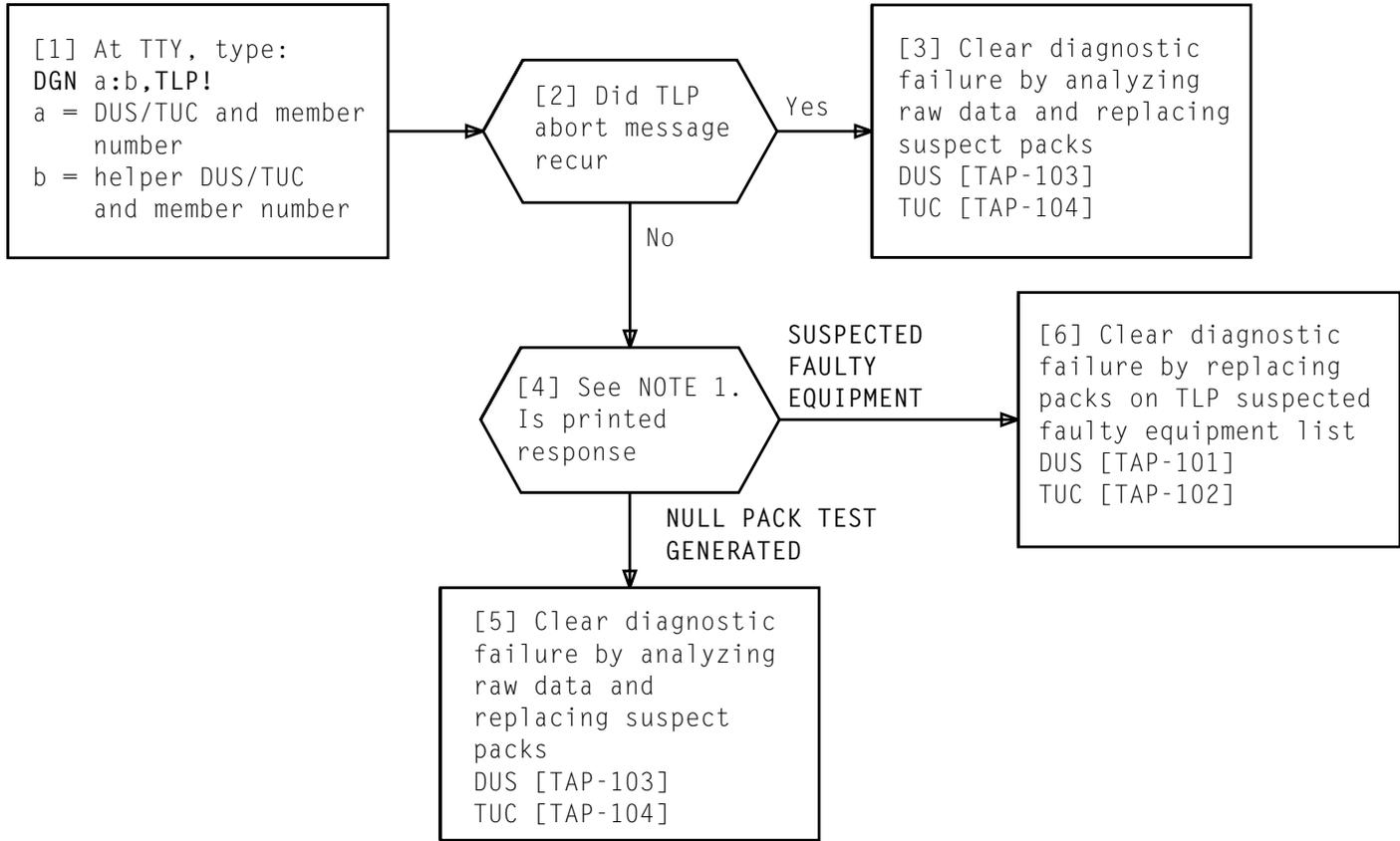
NOTE 1

It may take several minutes for list to be printed. Status of file may be monitored by typing:

OP:TLPQUEUE;ALL!

TLP file currently being processed is indicated by asterisk in priority column

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

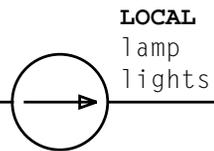
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[1] TLP tape being used is not correct issue for this generic. Obtain correct TLP tape

[2] At TTY, type: CLR:ADSFUNC TLP!

[3] Open tape transport cover door and pull interlock switch plunger out to override position

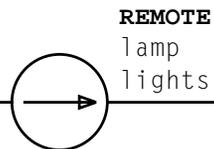
[4] Depress **LOCAL/REMOTE** pushbutton to obtain **LOCAL** lighted condition



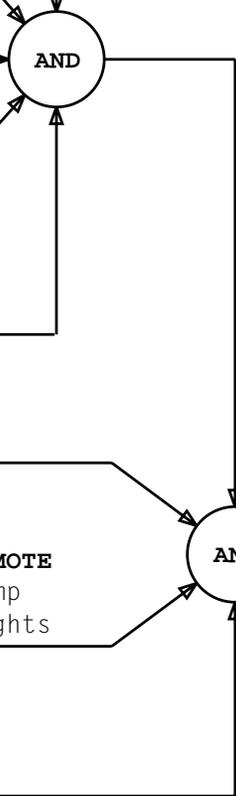
[5] Demount tape on tape transport [DLP-513]

[6] Mount correct tape on tape transport [DLP-512]

[7] Depress **LOCAL/REMOTE** pushbutton to obtain **REMOTE** lighted condition



[8] Gently close tape transport cover door



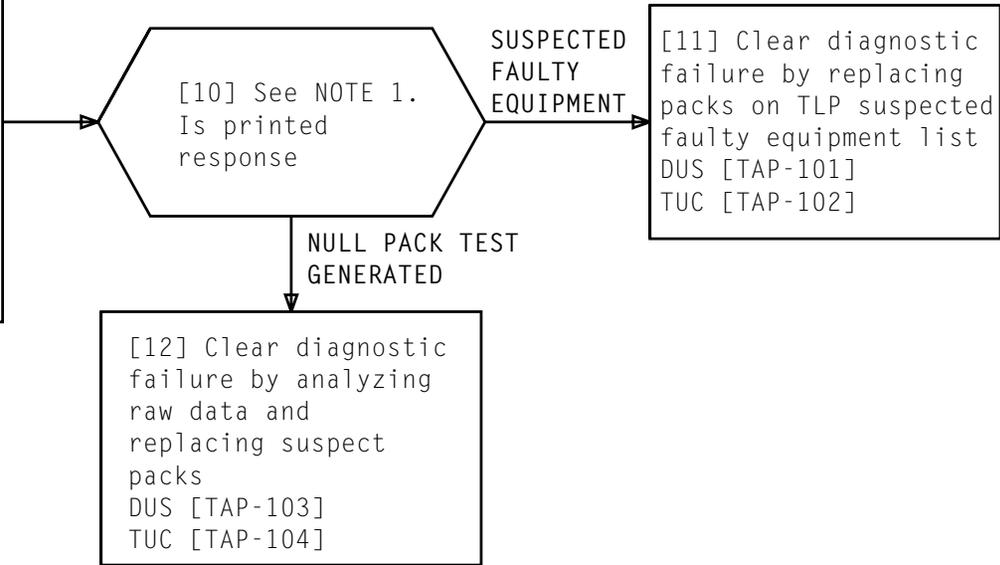
CLEAR DIAGNOSTIC FAILURE – TLP TAPE VERSION X DOES NOT MATCH VERSION Y

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```

[9] At TTY, type:
SET:TUC a;FUNCTION TLP!
ALW:TUC a:RO!
ALW:TLP:SRCH,DUS,TUC!
DGN:b:c,TLP!
a = TUC member number
  with TLP tape mounted
b = DUS/TUC and member
  number
c = helper DUS/TUC and
  member number

```



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

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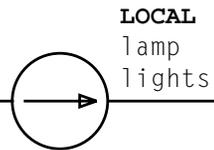
CLEAR DIAGNOSTIC FAILURE – TLP TAPE VERSION X DOES NOT MATCH VERSION Y

[1] TLP tape being used does not contain proper data file.
Obtain correct TLP tape

[2] At TTY, type: CLR:ADSFUNC TLP!

[3] Open tape transport cover door and pull interlock switch plunger out to override position

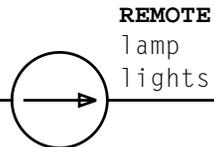
[4] Depress **LOCAL/REMOTE** pushbutton to obtain **LOCAL** lighted condition



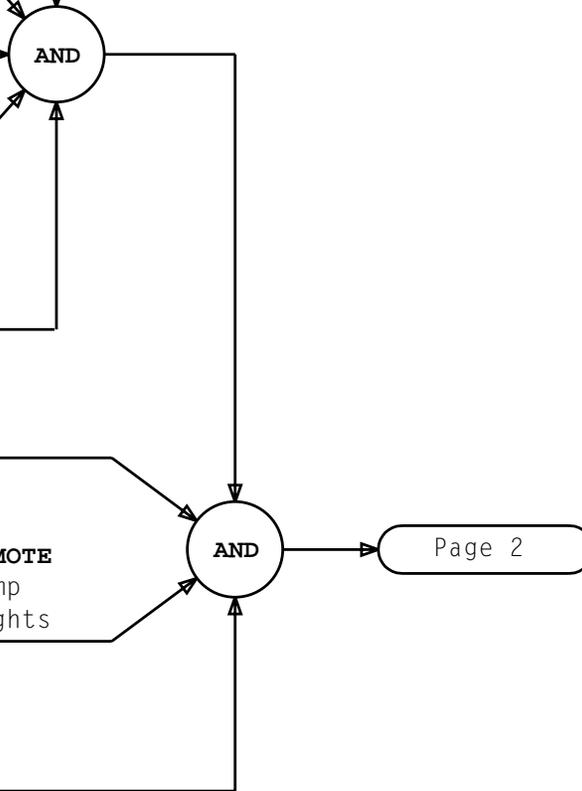
[5] Demount tape on tape transport [DLP-513]

[6] Mount correct tape on tape transport [DLP-512]

[7] Depress **LOCAL/REMOTE** pushbutton to obtain **REMOTE** lighted condition



[8] Gently close tape transport cover door



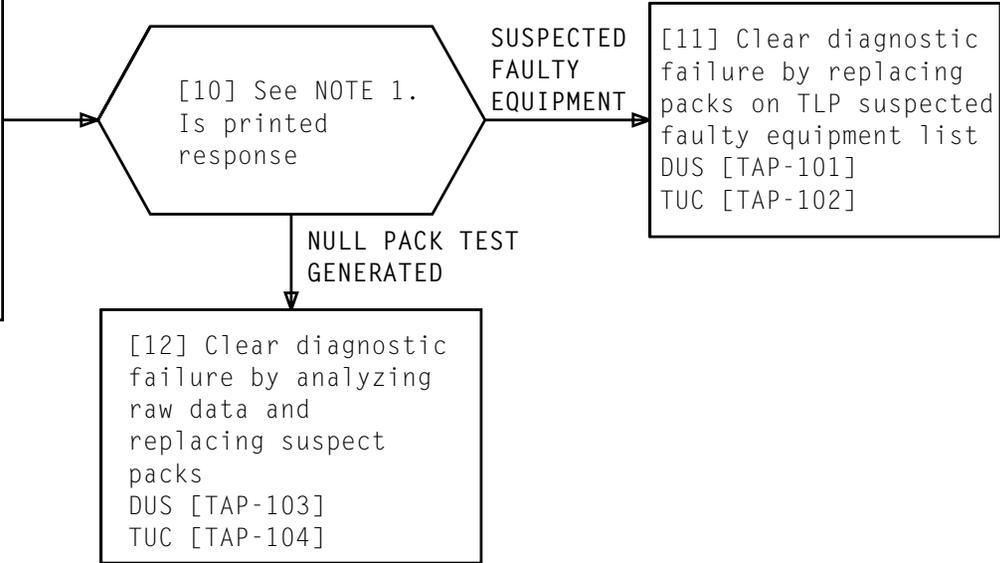
CLEAR DIAGNOSTIC FAILURE - TLP TAPE ACQUISITION ERROR

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```

[9] At TTY, type:
SET:TUC a;FUNCTION TLP!
ALW:TUC a:RO!
ALW:TLP:SRCH,DUS,TUC!
DGN:b:c,TLP!
a = TUC member number
  with TLP tape mounted
b = DUS/TUC and member
  number
c = helper DUS/TUC and
  member number

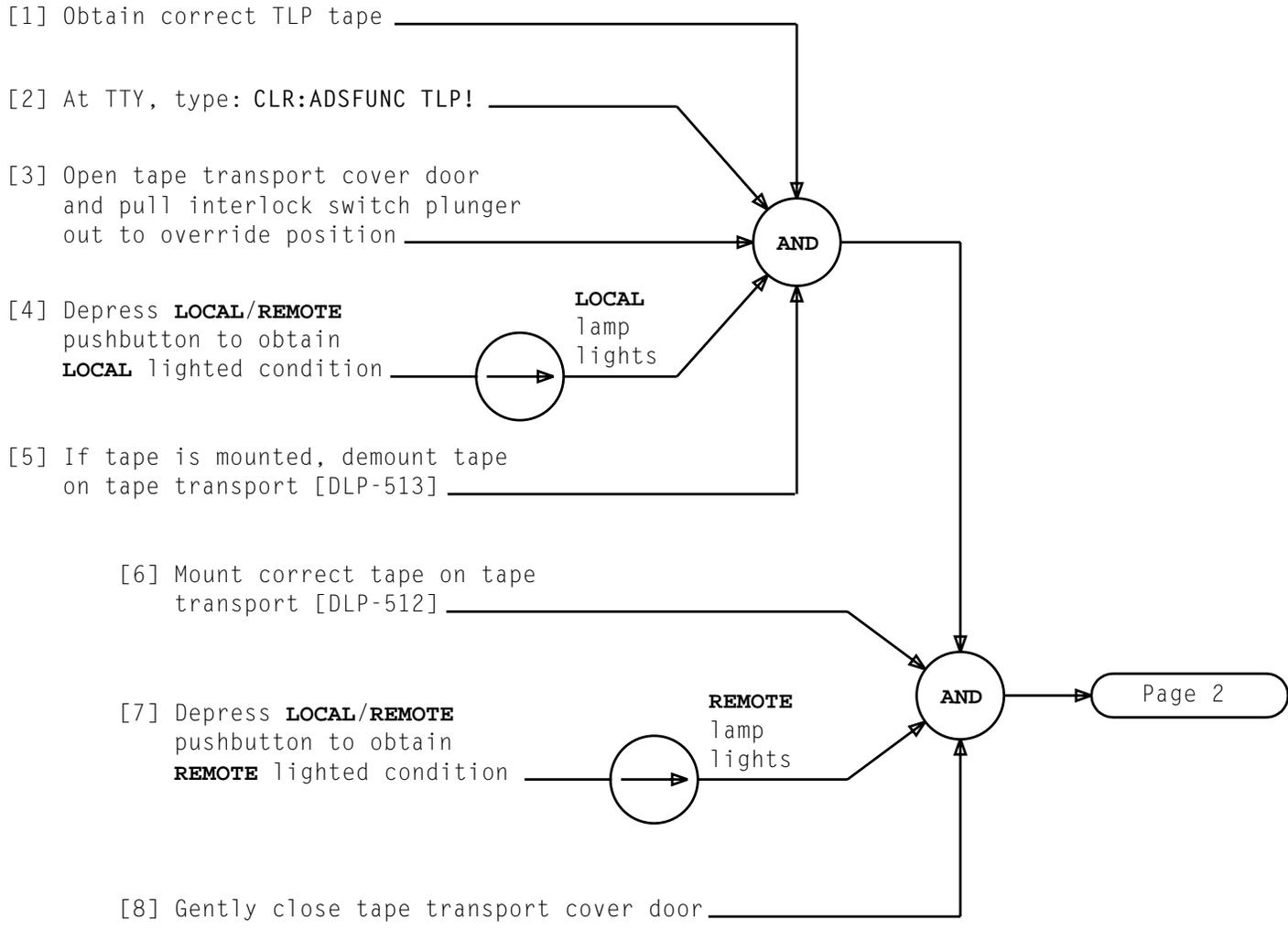
```



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

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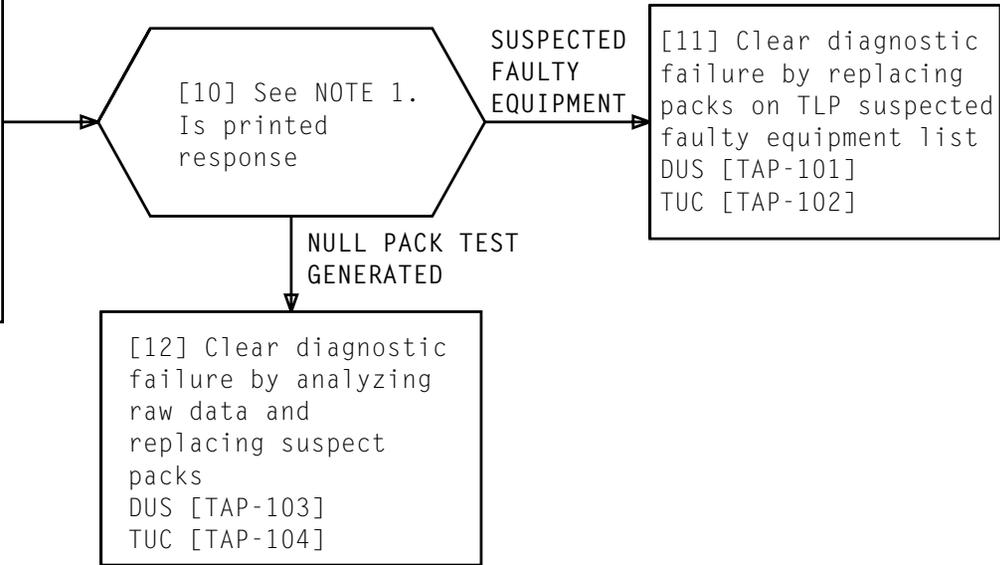
CLEAR DIAGNOSTIC FAILURE – TLP TAPE ACQUISITION ERROR



CLEAR DIAGNOSTIC FAILURE - TLP TAPE NOT MOUNTED

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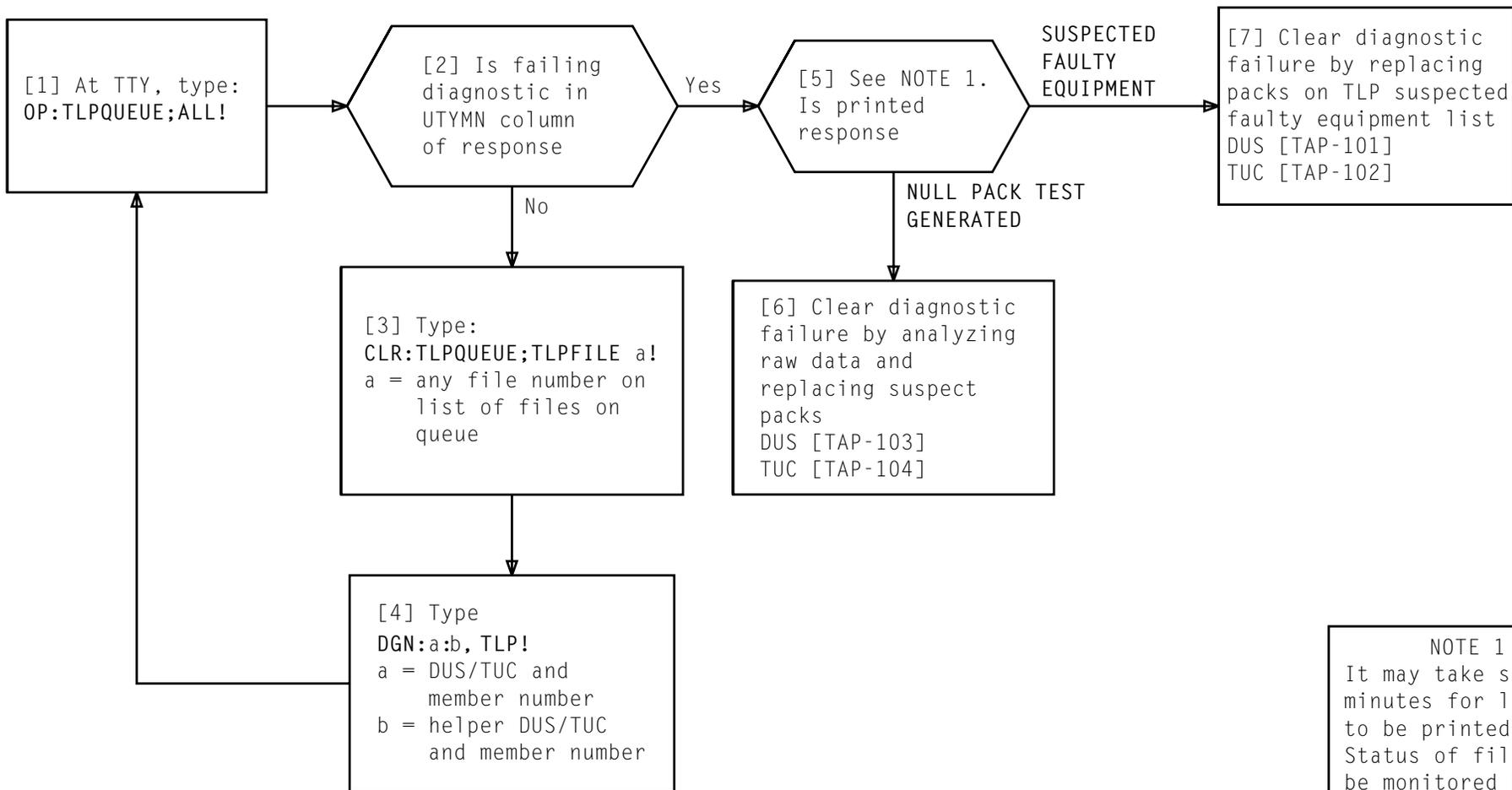
[9] At TTY, type:
 SET:TUC a;FUNCTION TLP!
 ALW:TUC a:RO!
 ALW:TLP:SRCH,DUS,TUC!
 DGN:b:c,TLP!
 a = TUC member number
 with TLP tape mounted
 b = DUS/TUC and member
 number
 c = helper DUS/TUC and
 member number



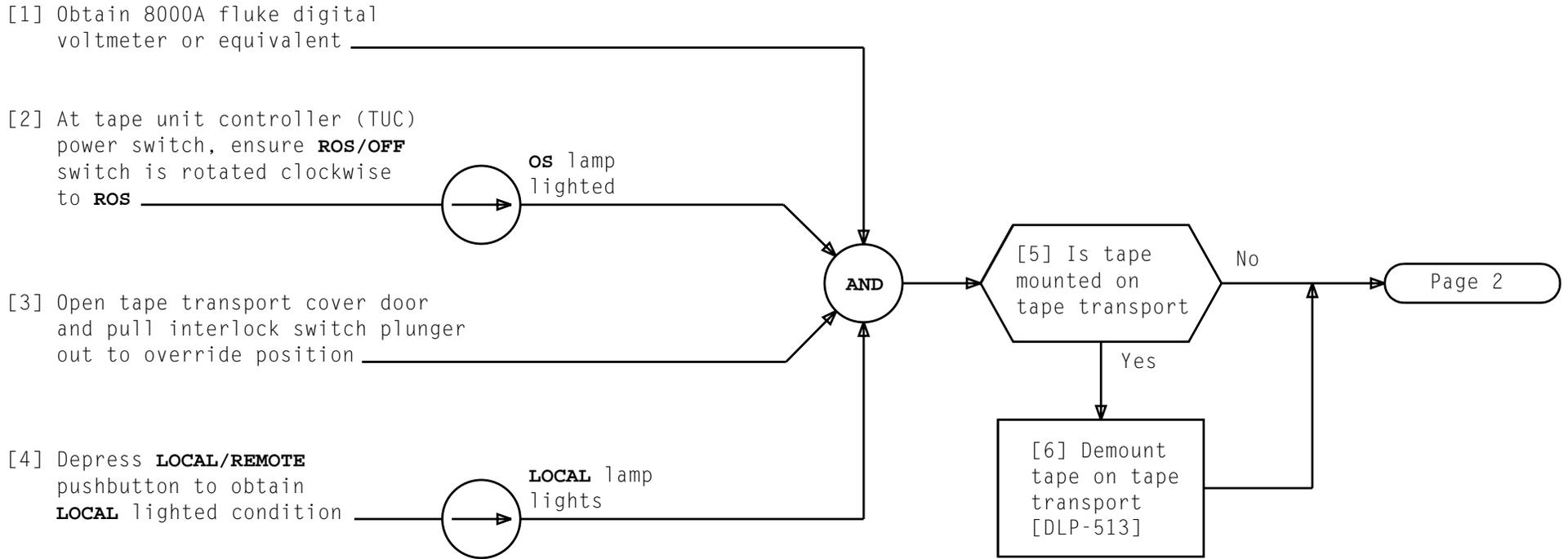
NOTE 1
 It may take several minutes for list to be printed. Status of file may be monitored by typing:
 OP:TLPQUEUE;ALL!
 TLP file currently being processed is indicated by asterisk in priority column

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CLEAR DIAGNOSTIC FAILURE — TLP TAPE NOT MOUNTED

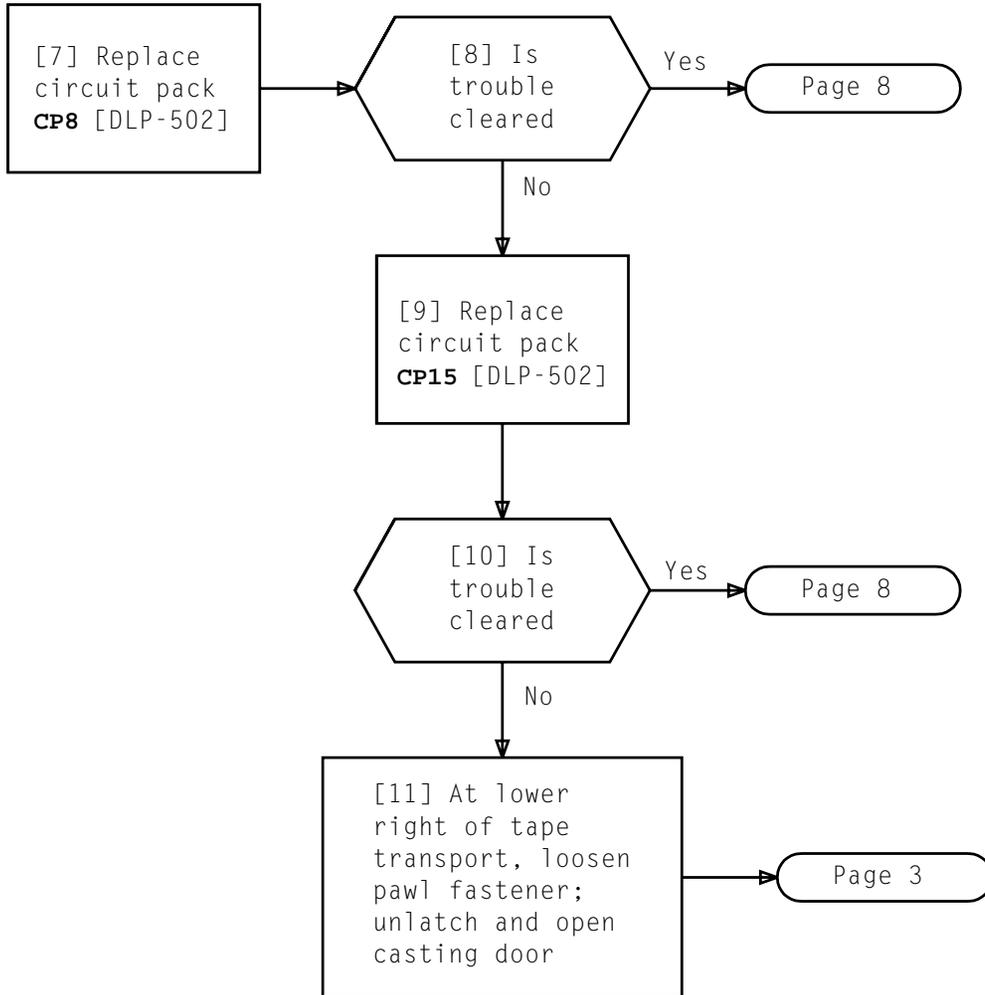


NOTE 1	
It may take several minutes for list to be printed. Status of file may be monitored by typing:	
OP:TLPQUEUE;ALL!	
TLP file currently being processed is indicated by asterisk in priority column	
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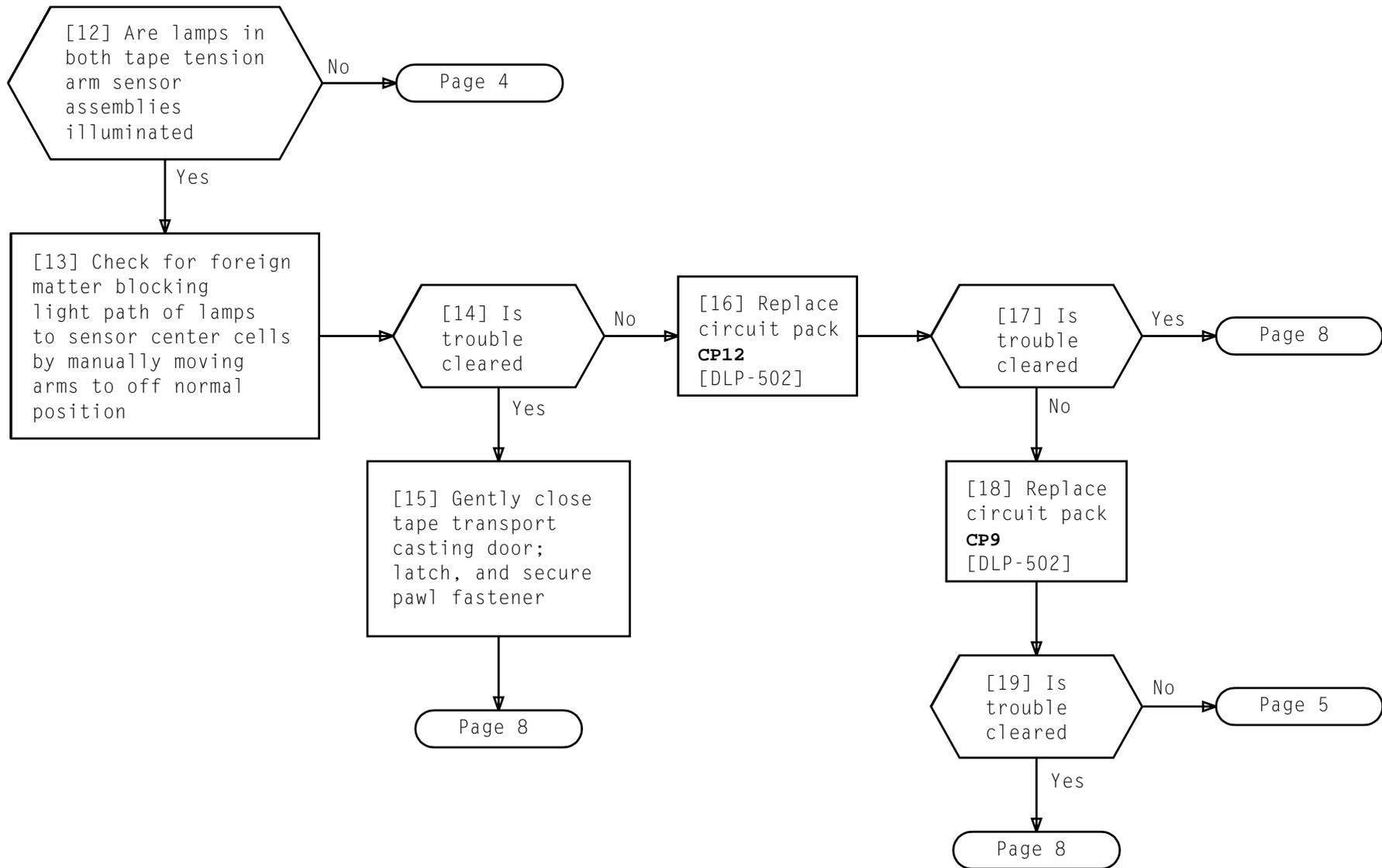
CLEAR READY MODE NOT ATTAINABLE FAULT

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CLEAR READY MODE NOT ATTAINABLE FAULT

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CLEAR READY MODE NOT ATTAINABLE FAULT

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[20] See WARNING 1. At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**

[21] Manually move arms to off-normal position

[22] At rear of casting door, replace unlighted sensor lamps (GE-381 or equivalent) [Figure 1]

[23] At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door

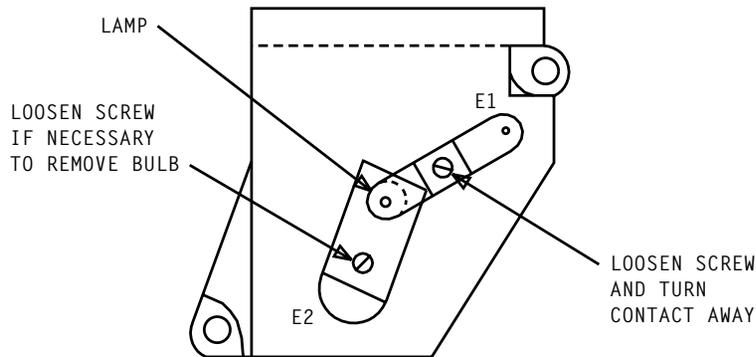
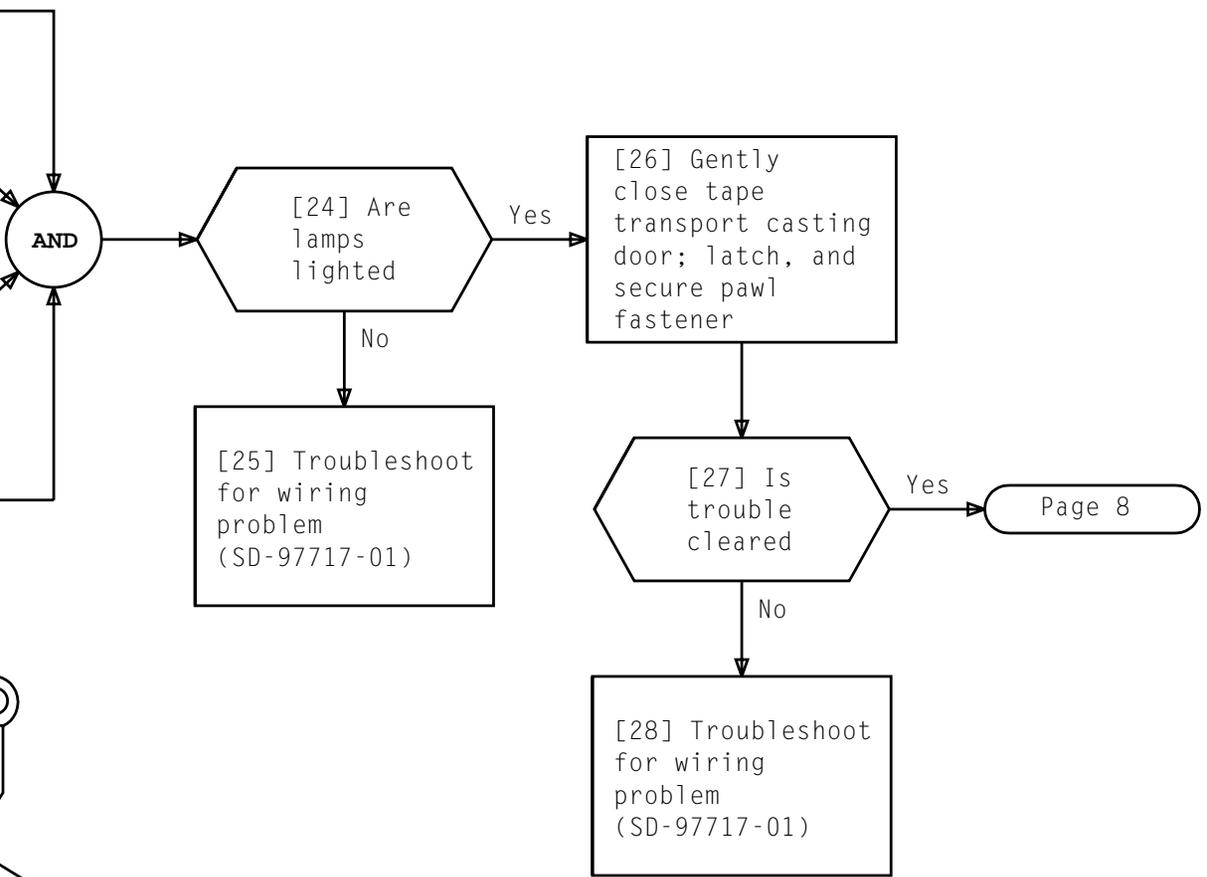


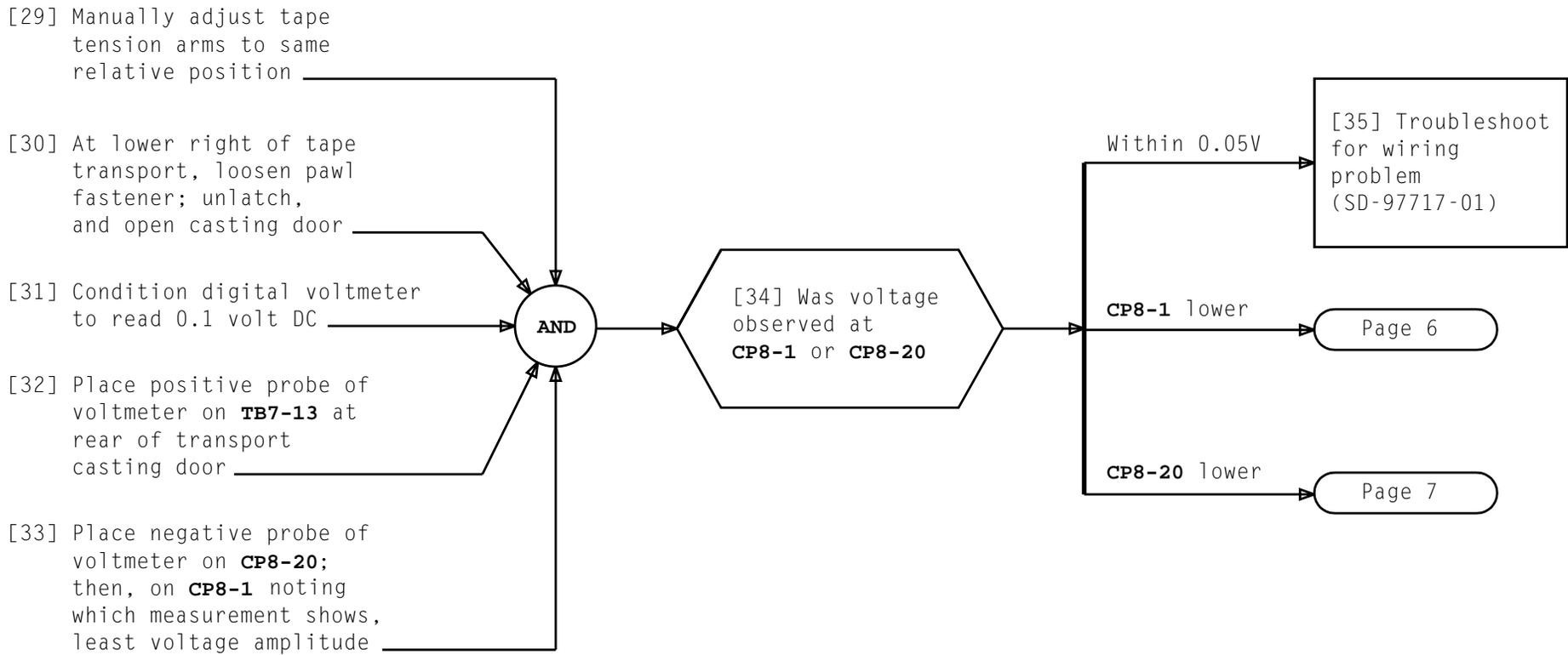
Figure 1 - Tape Tension Arm Sensor Assembly



WARNING 1
When DC-to-DC converter is turned off, tape reel motors spin uncontrolled

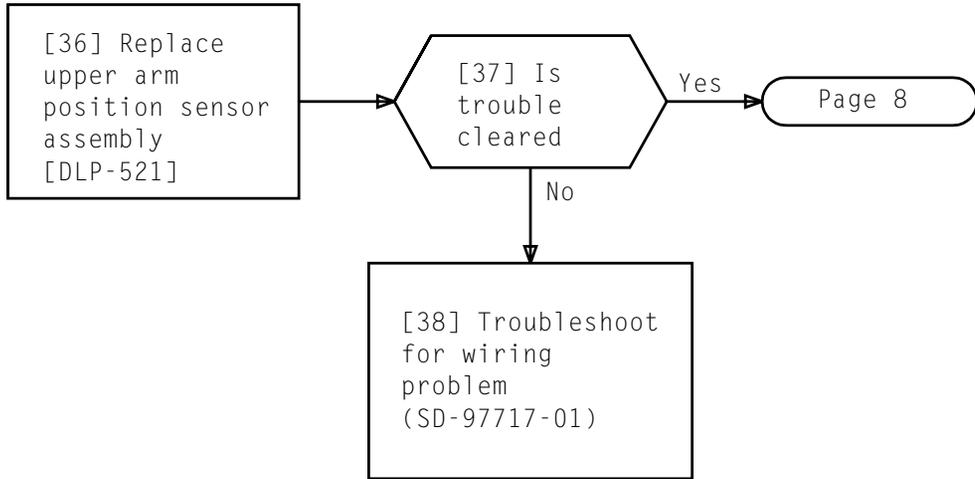
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CLEAR READY MODE NOT ATTAINABLE FAULT



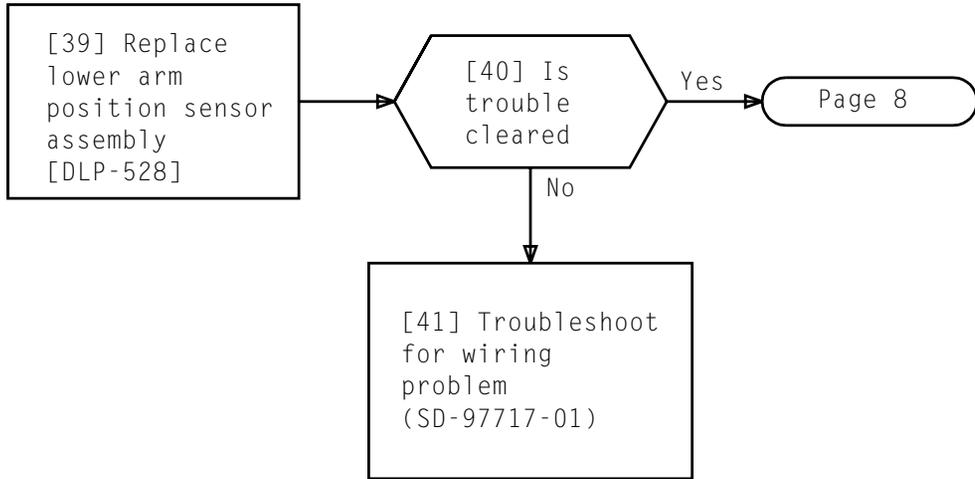
CLEAR READY MODE NOT ATTAINABLE FAULT

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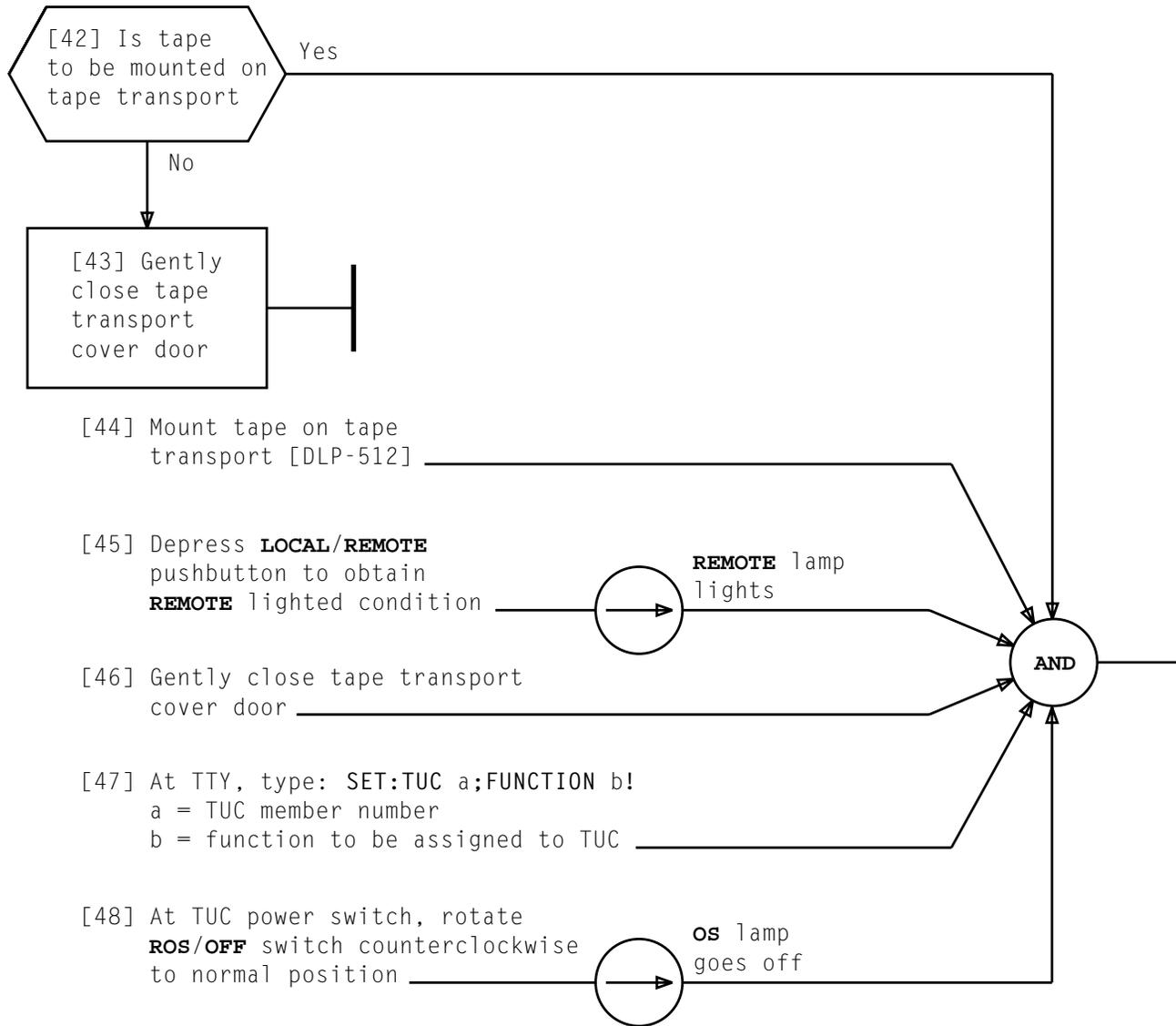
CLEAR READY MODE NOT ATTAINABLE FAULT

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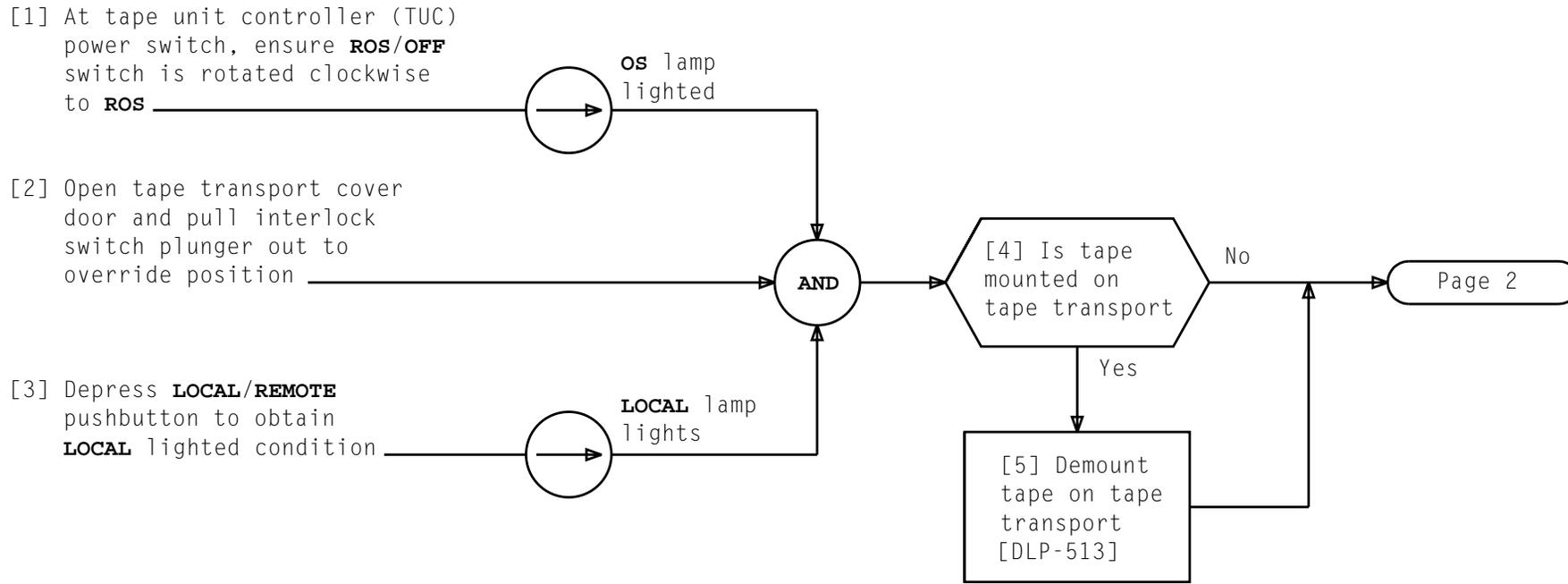
CLEAR READY MODE NOT ATTAINABLE FAULT

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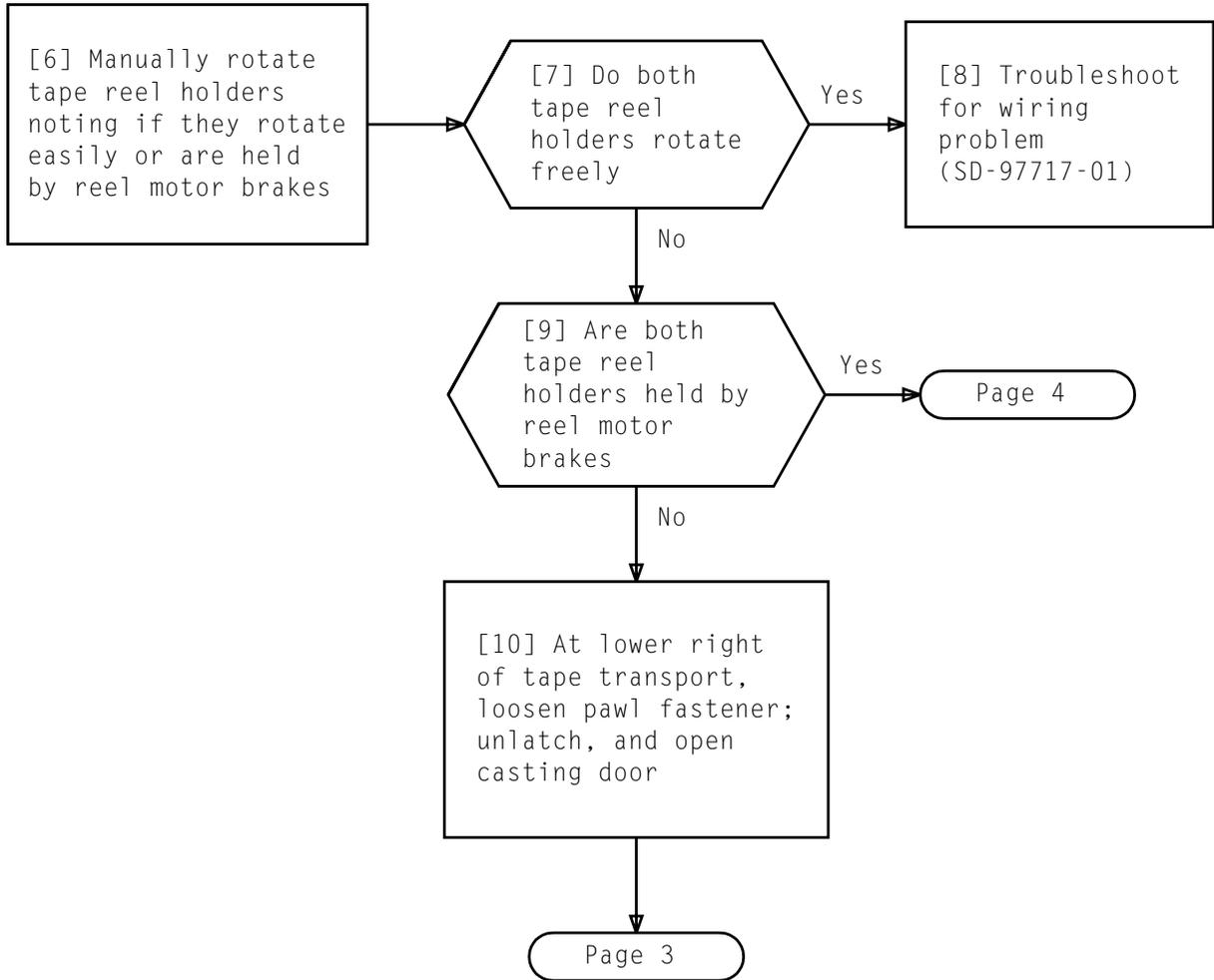
CLEAR READY MODE NOT ATTAINABLE FAULT

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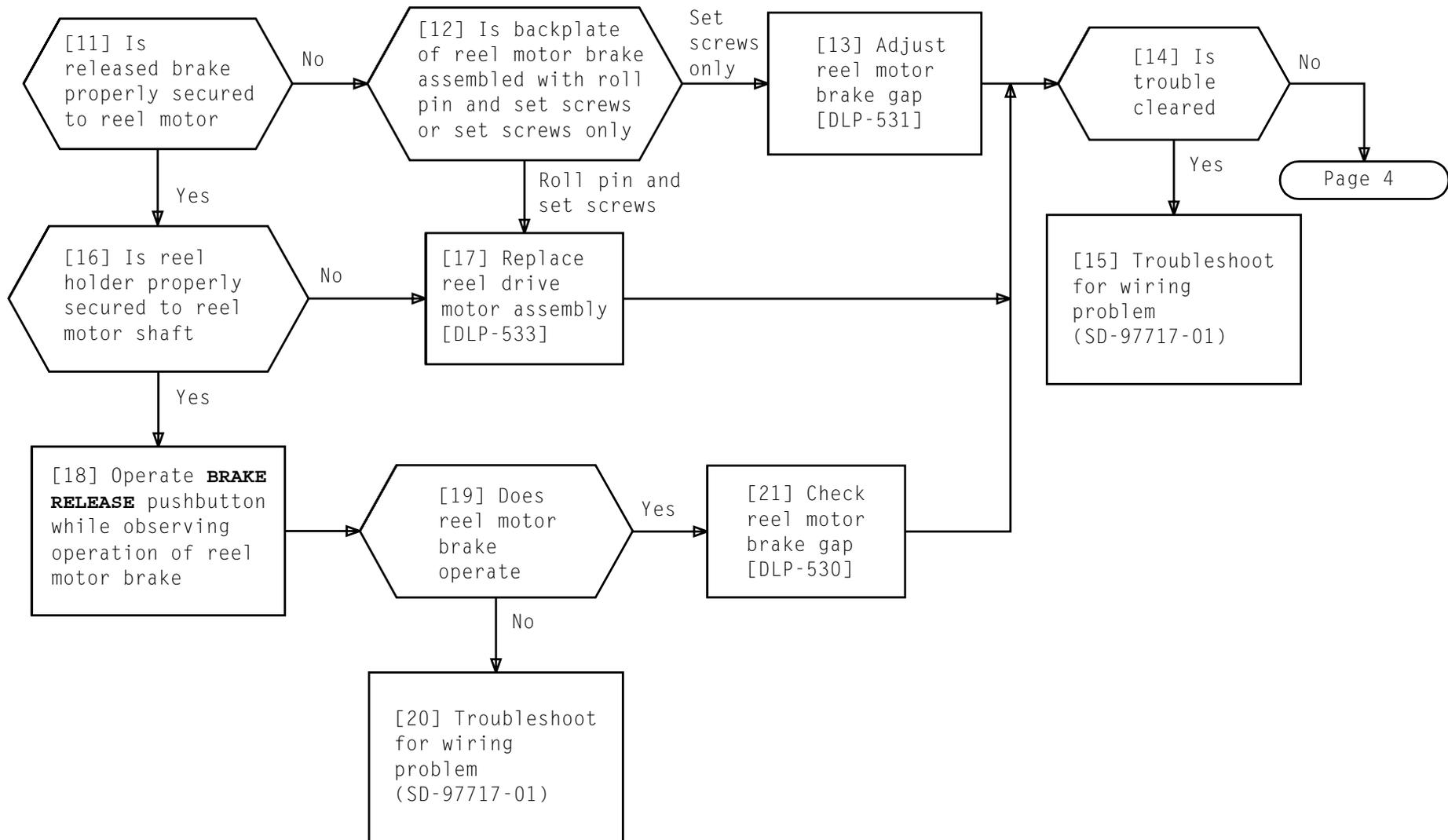
CLEAR REEL MOTOR BRAKE FAULT

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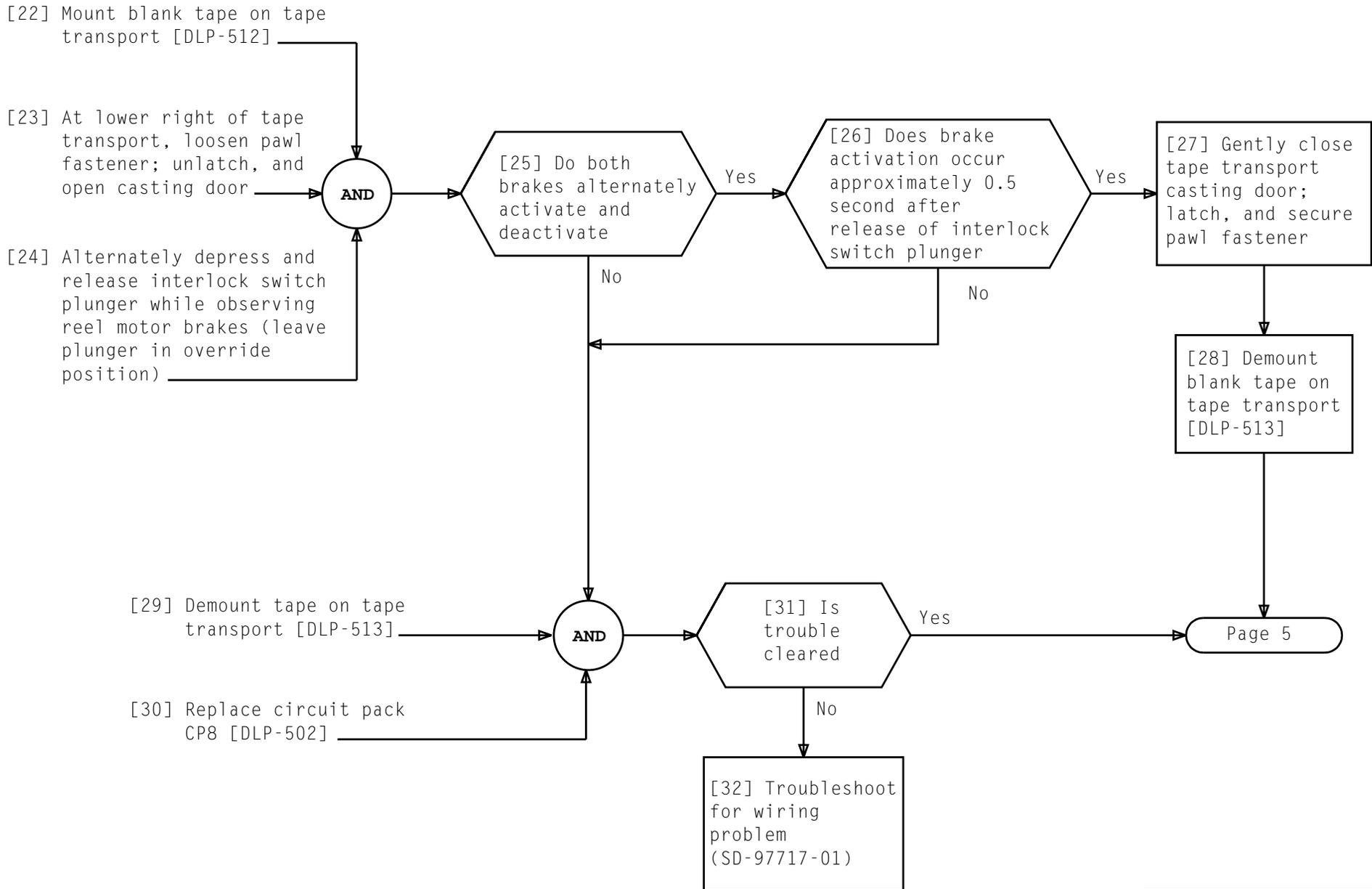
CLEAR REEL MOTOR BRAKE FAULT

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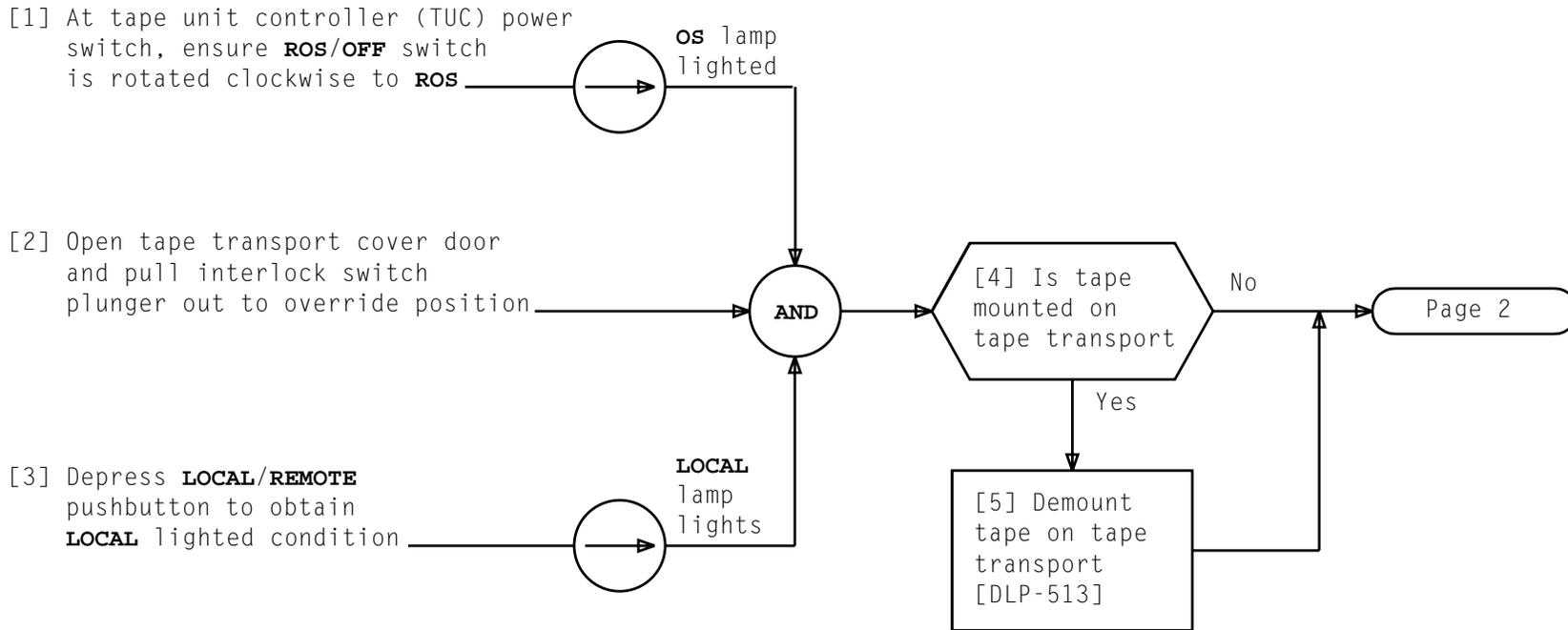
CLEAR REEL MOTOR BRAKE FAULT

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CLEAR REEL MOTOR BRAKE FAULT

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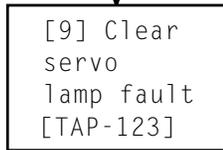


CLEAR ARMS WILL NOT HOLD TAPE TENSION FAULT

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[6] At lower right of tape transport, loosen pawl fastener; unlatch, and open casting door

[7] Inspect upper and lower servo lamps



[10] Gently close tape transport casting door; latch, and secure pawl fastener

[11] Obtain blank tape

[12] With hub of upper reel holder in counterclockwise position, mount tape on upper reel holder

[13] Rotate hub of upper reel holder clockwise to lock tape reel securely

[14] Ensure lower (take-up) reel is same size or larger than tape reel mounted



CLEAR ARMS WILL NOT HOLD TAPE TENSION FAULT

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[15] While depressing **BRAKE RELEASE** pushbutton, manually unwind approximately 5 feet of tape from upper reel

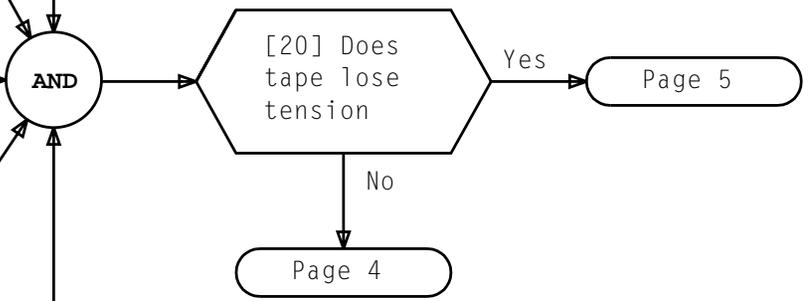
[16] Thread tape through tape path indicated on tape transport

[17] While depressing **BRAKE RELEASE** pushbutton, manually wind three or four turns of tape onto lower (take-up) reel

[18] See WARNING 1. With tape unit in **NOT READY** mode, manually move arms to normal position (both horizontal)

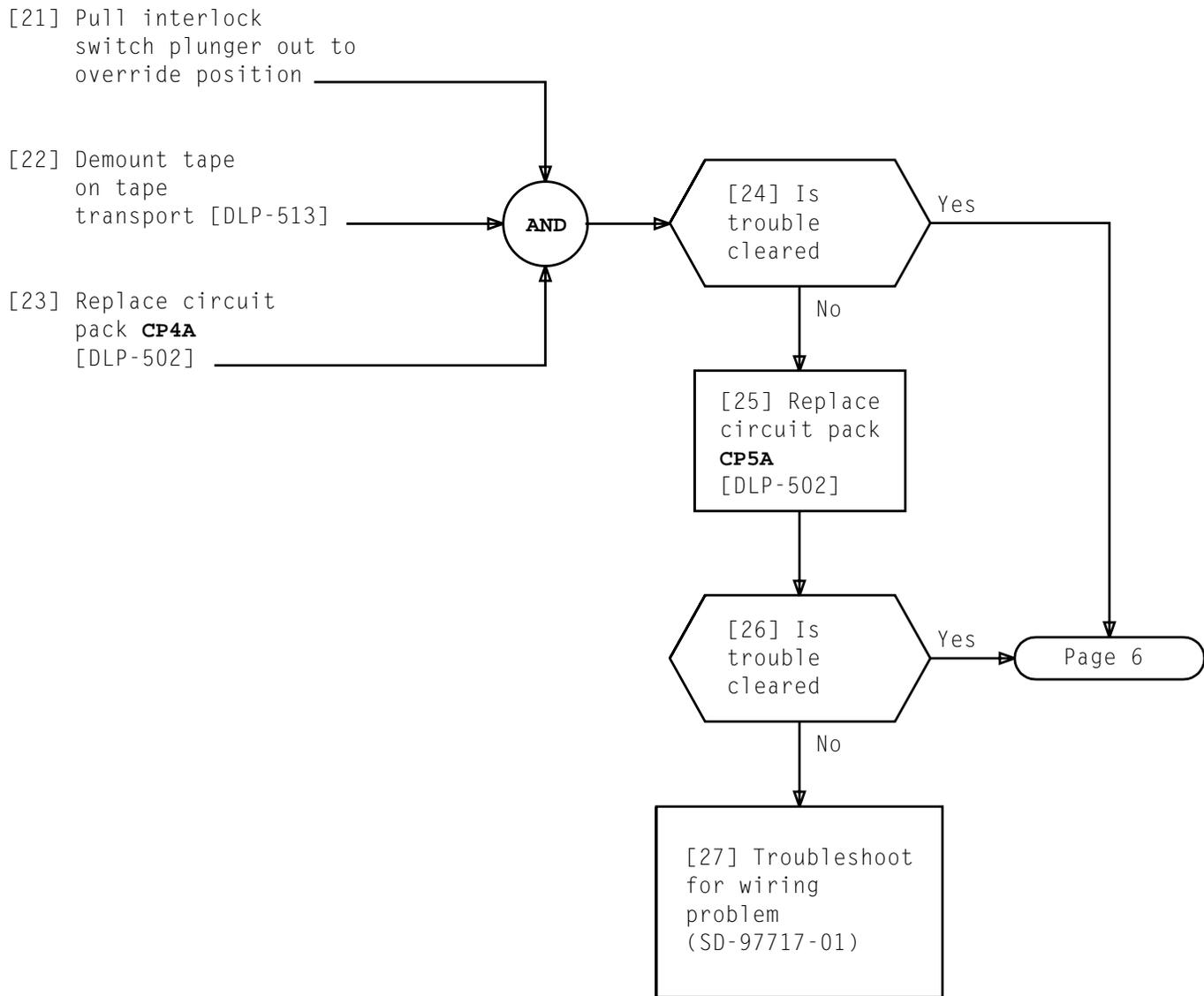
[19] Hold upper tape reel and depress interlock switch plunger

NOT READY
lamp goes off



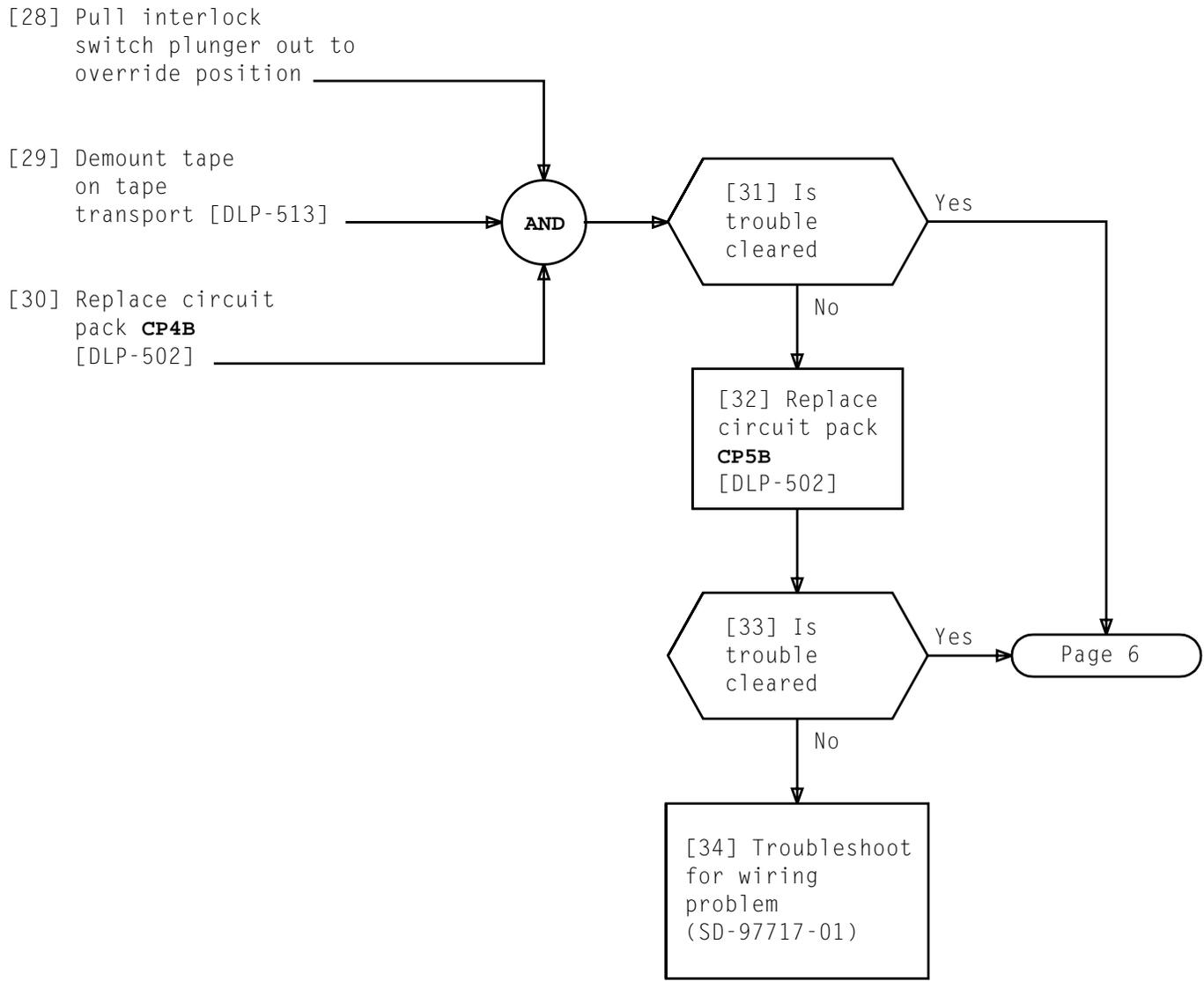
<i>WARNING 1</i>	
<i>Do not touch any surface that comes in contact with tape. Body oil contaminates polyester base magnetic tape</i>	
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CLEAR ARMS WILL NOT HOLD TAPE TENSION FAULT



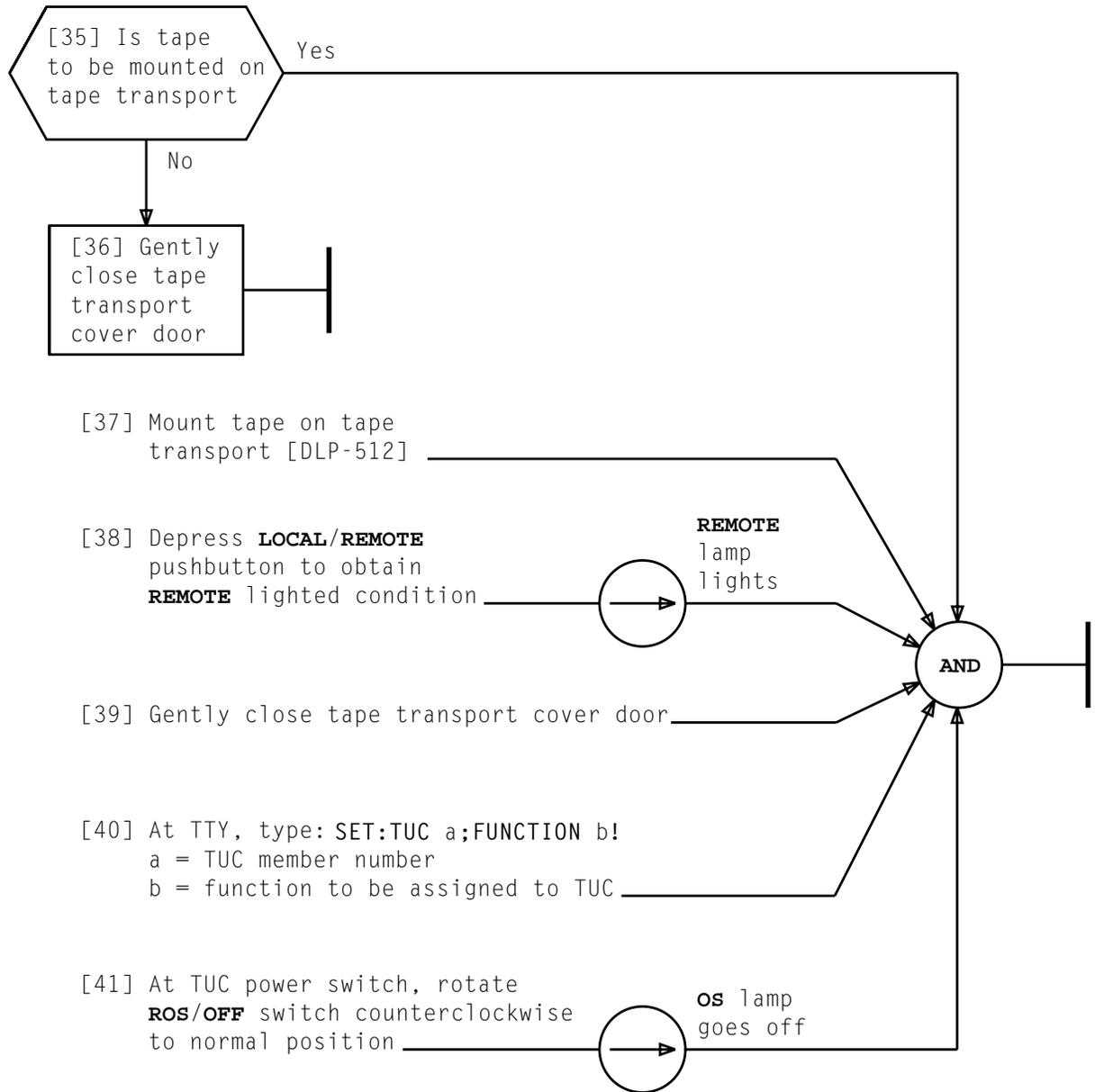
CLEAR ARMS WILL NOT HOLD TAPE TENSION FAULT

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CLEAR ARMS WILL NOT HOLD TAPE TENSION FAULT

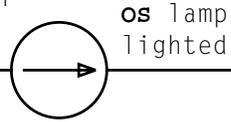
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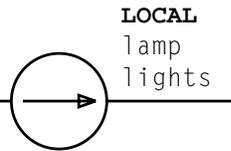
[1] At tape unit controller (TUC) power switch, ensure **ROS/OFF** switch is rotated clockwise to **ROS**



[2] Open tape transport cover door and pull interlock switch plunger out to override position

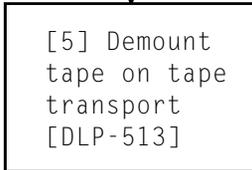


[3] Depress **LOCAL/REMOTE** pushbutton to obtain **LOCAL** lighted condition



No

Yes



[6] Obtain support apparatus [TABLE A]

[7] Clean tape path [DLP-526]

[8] Check capstan speed, tape transport [DLP-510]



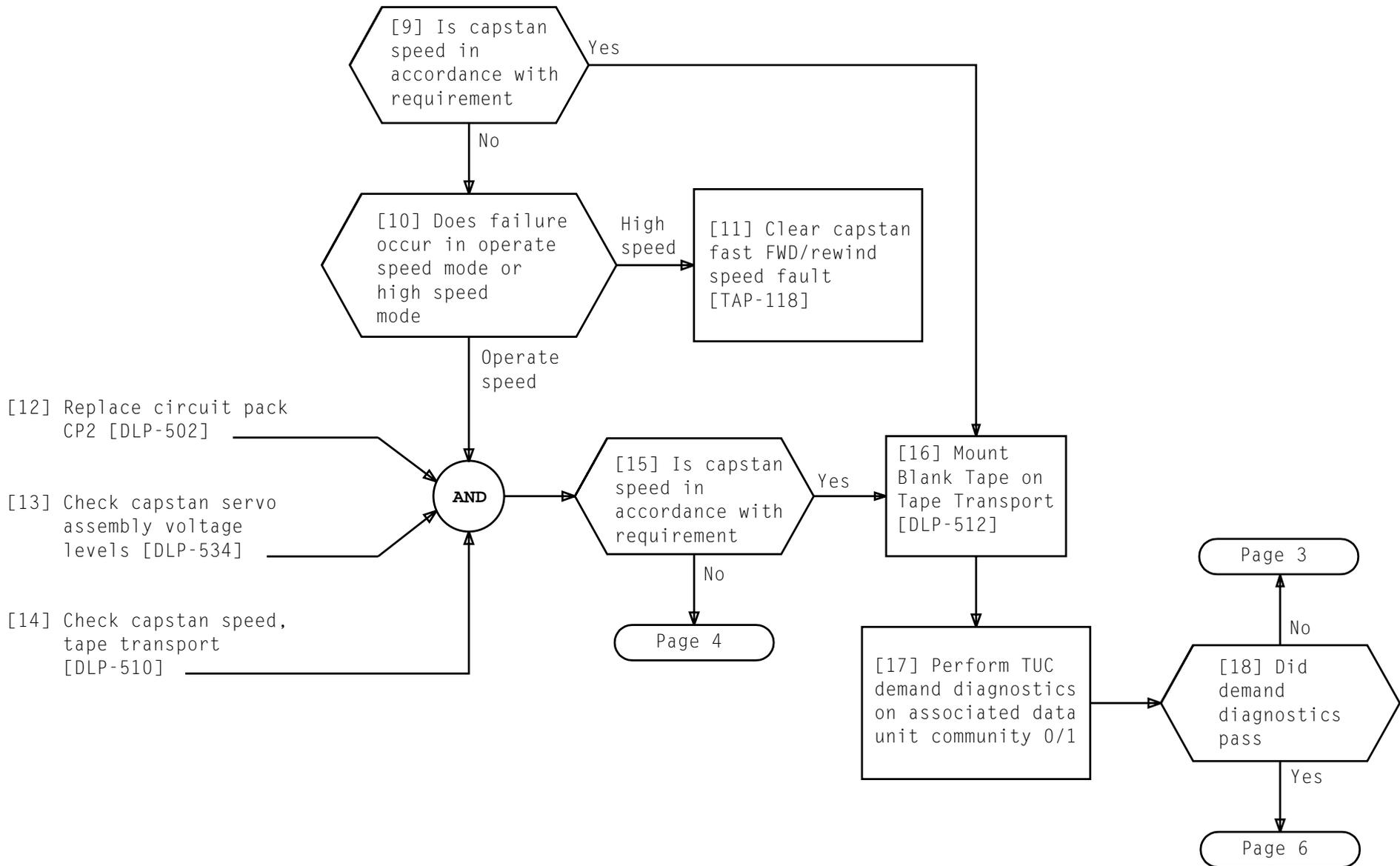
Page 2

TABLE A

COMMON NAME	PART NUMBER
Twill cloth	KS-2423
Cleaner solvent	KS-20406,L1
Vacuum cleaner	KS-14377,L5
Flexible nozzle	KS-14377,L3

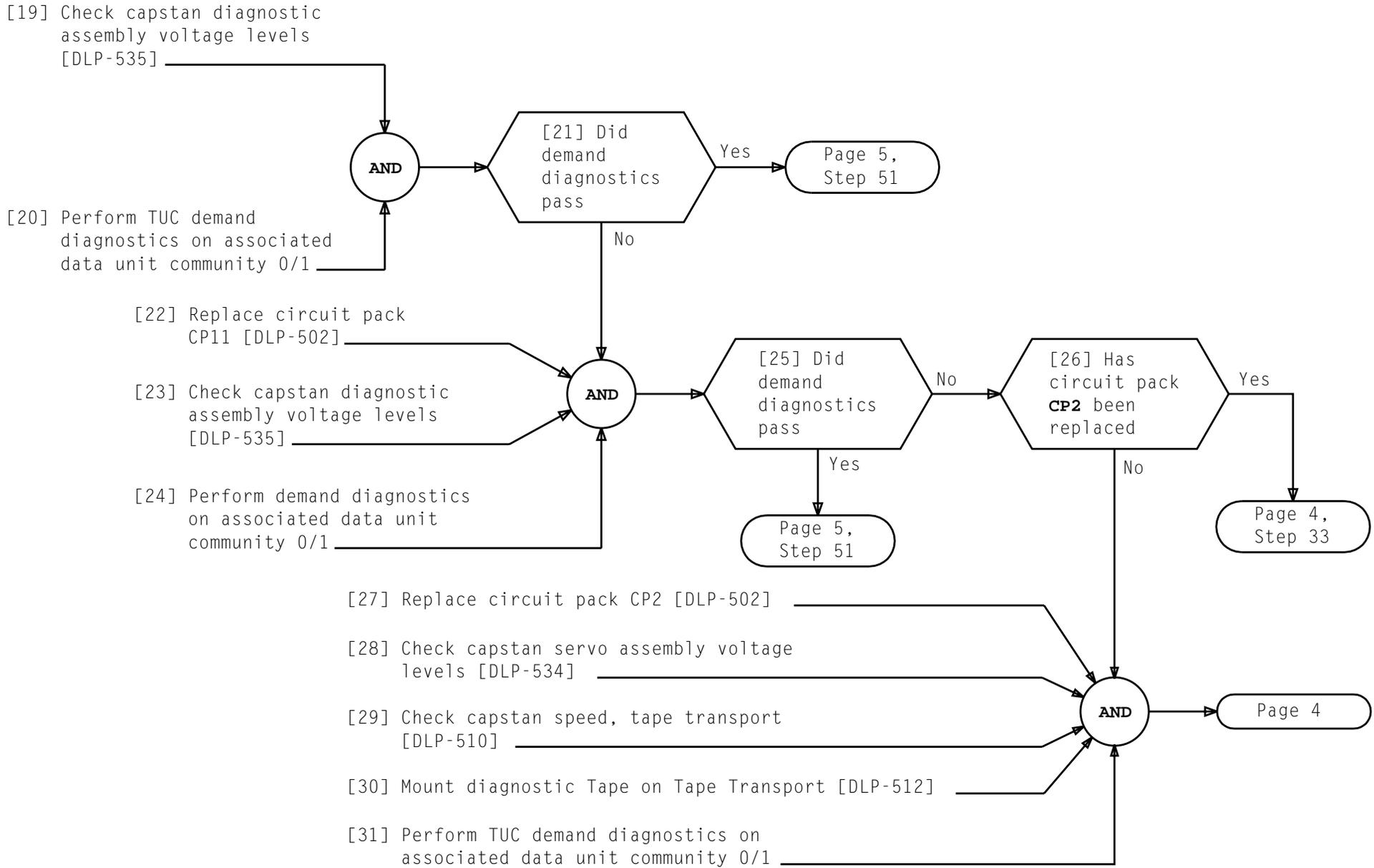
CLEAR CAPSTAN MOTION FAULT

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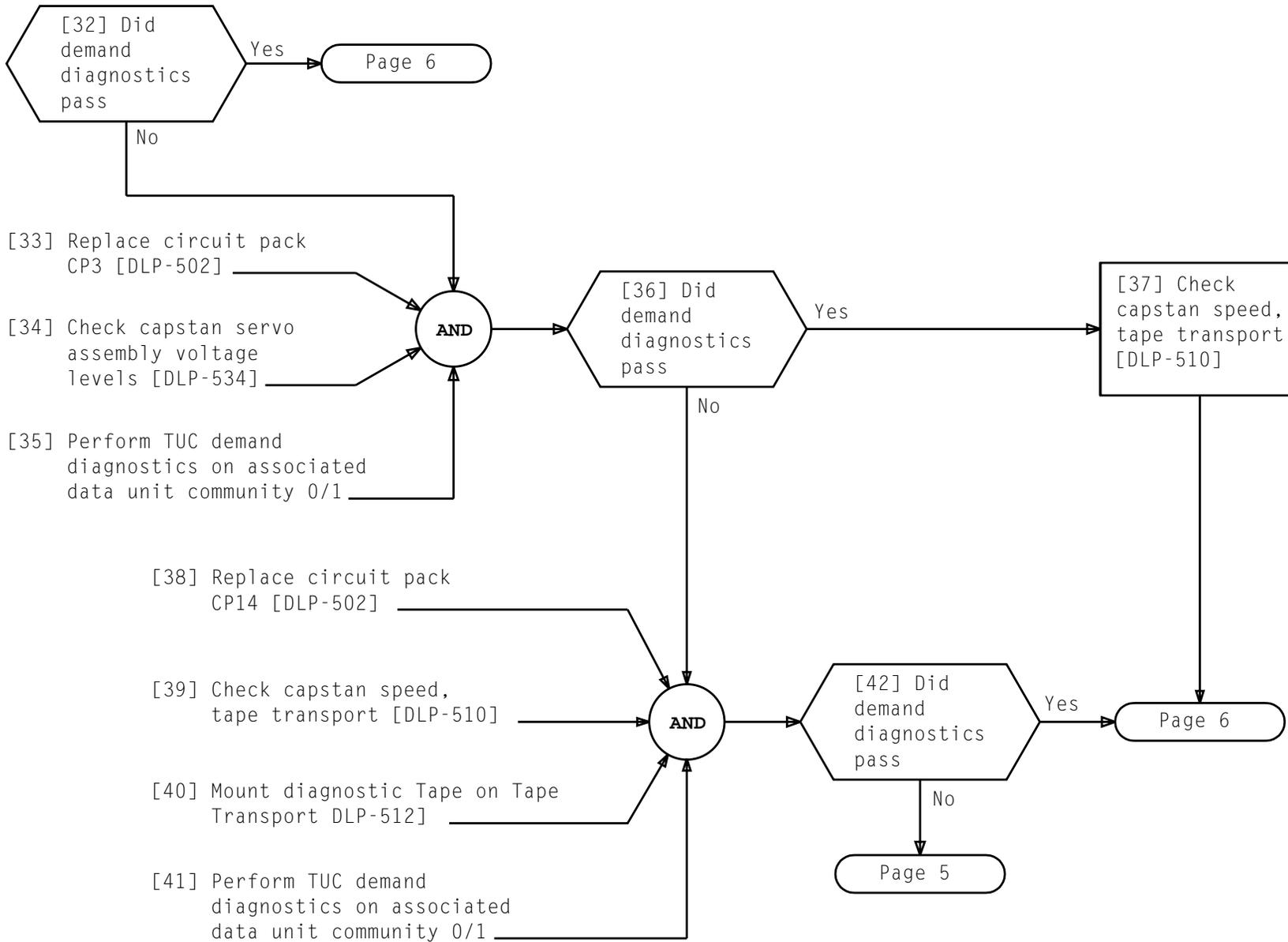
CLEAR CAPSTAN MOTION FAULT

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CLEAR CAPSTAN MOTION FAULT



CLEAR CAPSTAN MOTION FAULT

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[43] See WARNING 1. At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**

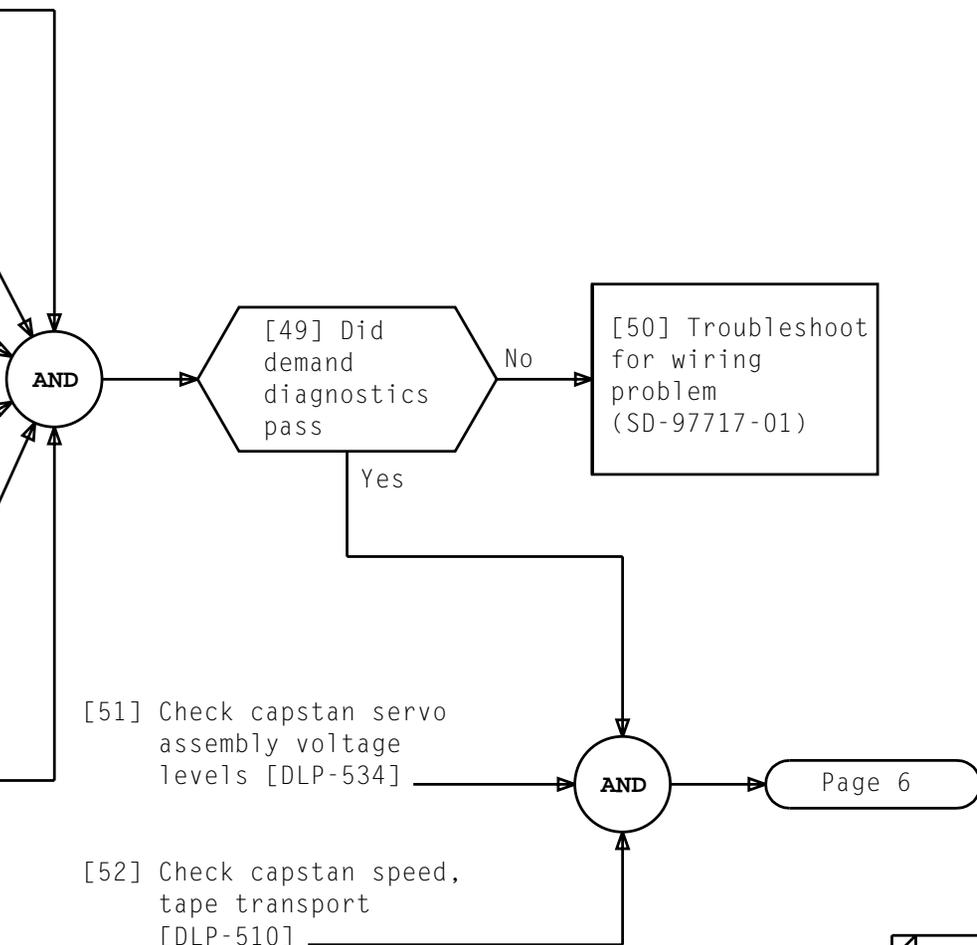
[44] At lower right of tape transport, loosen pawl fastener; unlatch, and open casting door

[45] Replace capstan motor brushes

[46] Gently close tape transport casting door; latch, and secure pawl fastener

[47] At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door

[48] Perform TUC demand diagnostics on associated data unit community 0/1



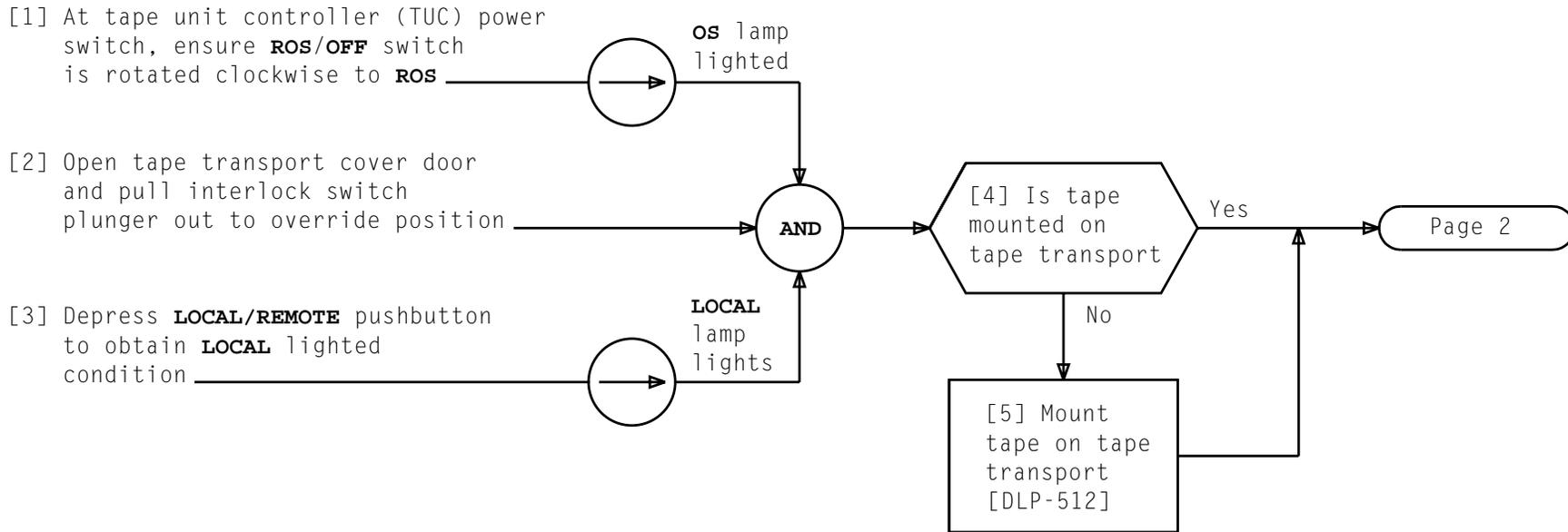
[51] Check capstan servo assembly voltage levels [DLP-534]

[52] Check capstan speed, tape transport [DLP-510]

WARNING 1
When DC-to-DC converter is turned off, tape reel motors spin uncontrolled

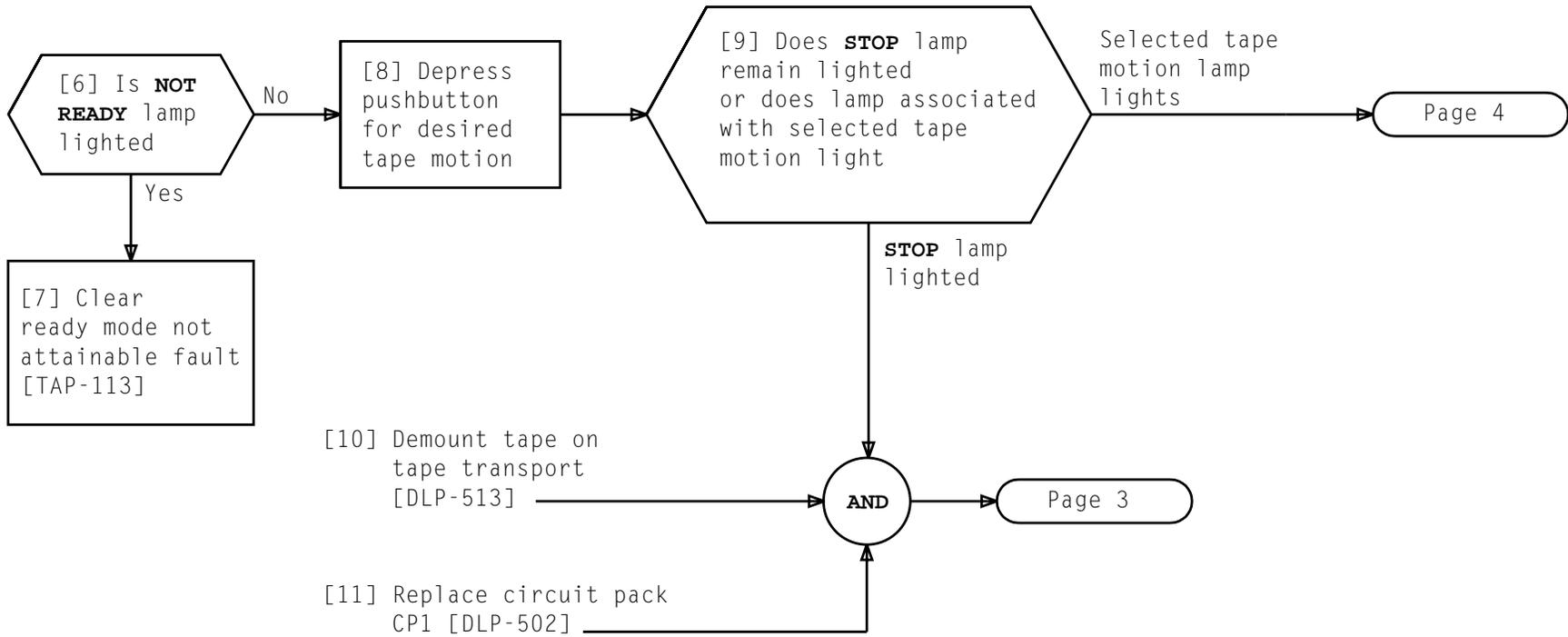
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CLEAR CAPSTAN MOTION FAULT



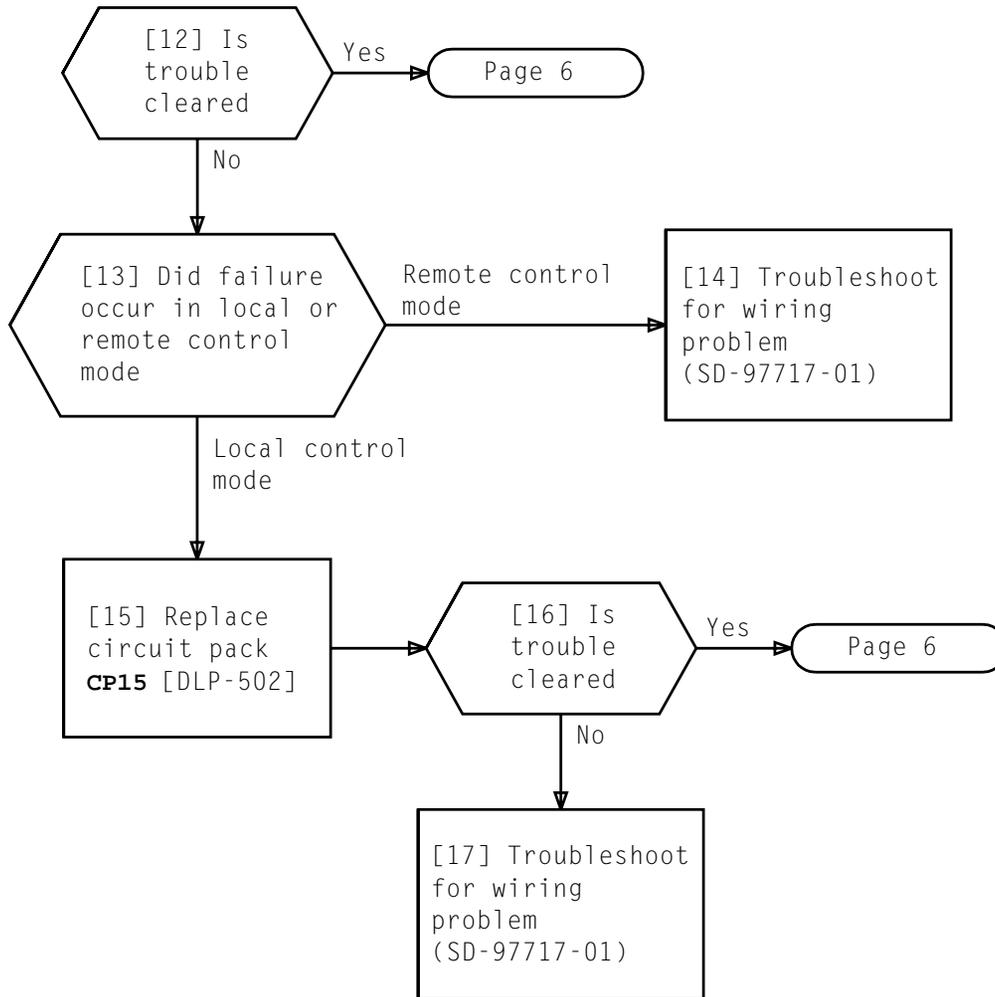
CLEAR CAPSTAN WILL NOT ROTATE FAULT

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[18] Demount tape on
tape transport
[DLP-513]

[19] Replace circuit pack
CP1 [DLP-502]

AND

[20] Is
trouble
cleared

Yes

Page 6

No

[21] Replace
circuit pack
CP2 [DLP-502]

[22] Is
trouble
cleared

Yes

Page 5,
Step 36

No

[23] Replace circuit pack
CP3 [DLP-502]

[24] Mount Blank Tape
on Tape Transport
[DLP-512]

[25] Check capstan servo
assembly voltage
levels [DLP-534]

AND

[26] Is
trouble
cleared

No

Page 5

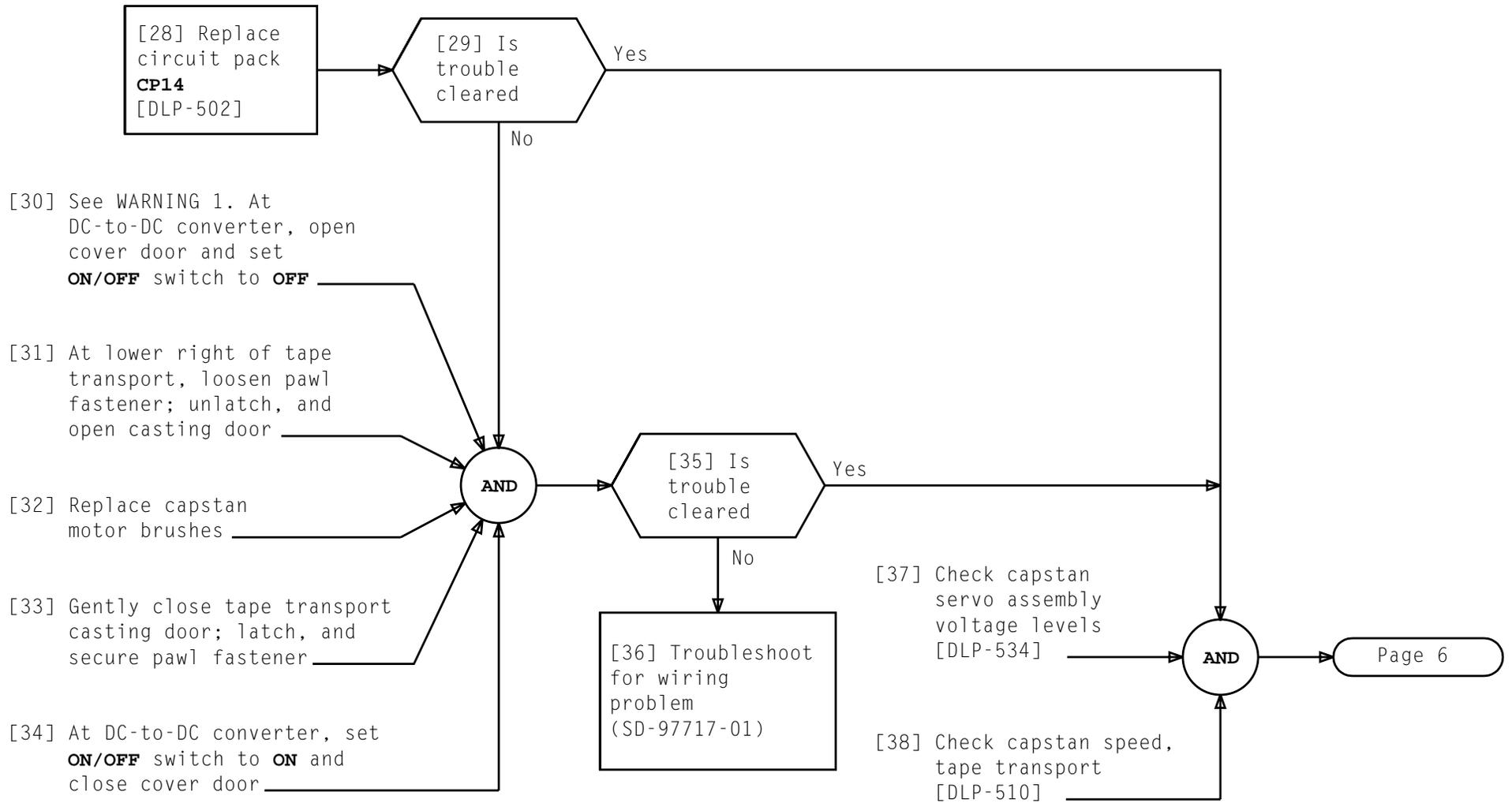
Yes

[27] Check
capstan speed,
tape transport
[DLP-510]

Page 6

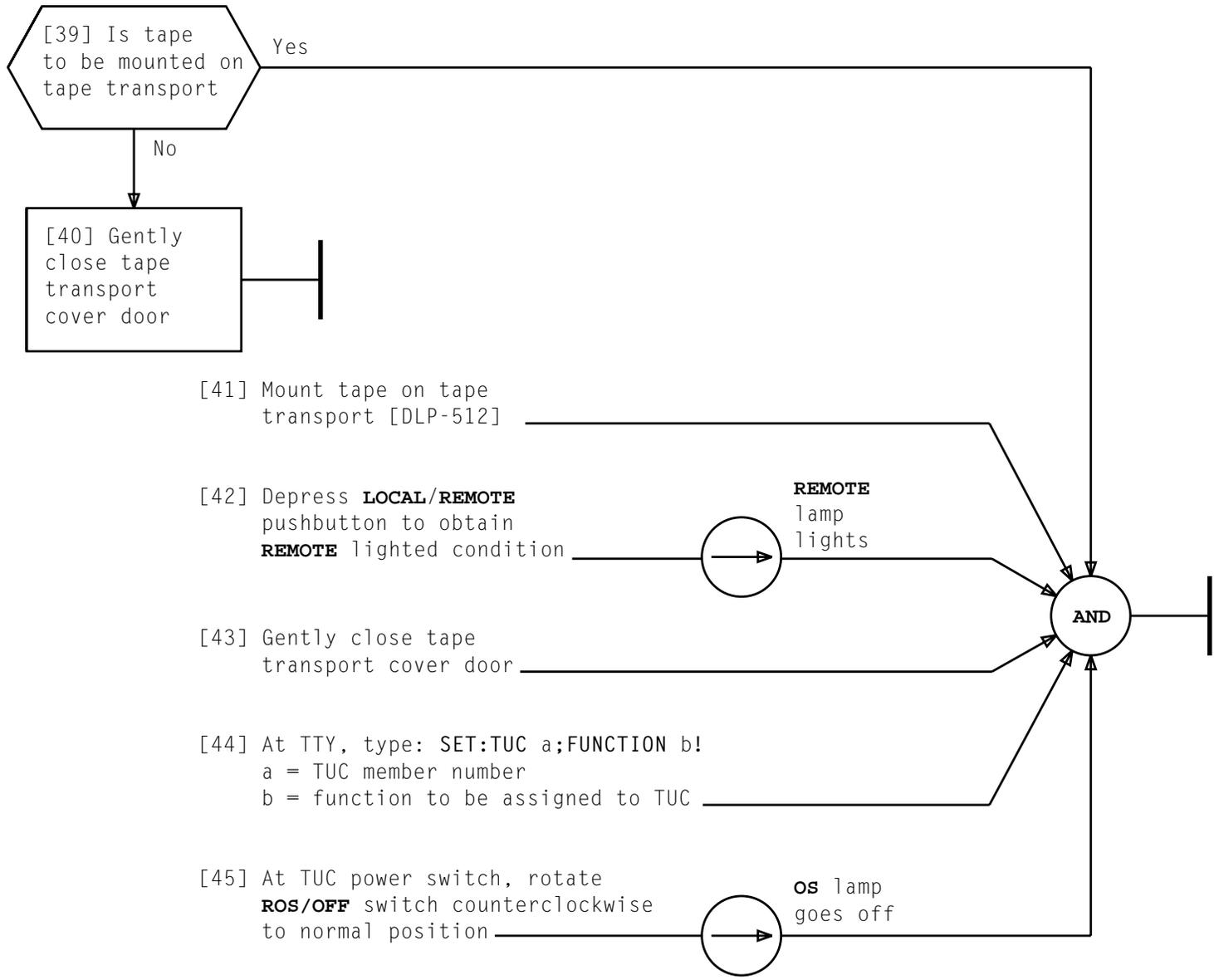
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CLEAR CAPSTAN WILL NOT ROTATE FAULT



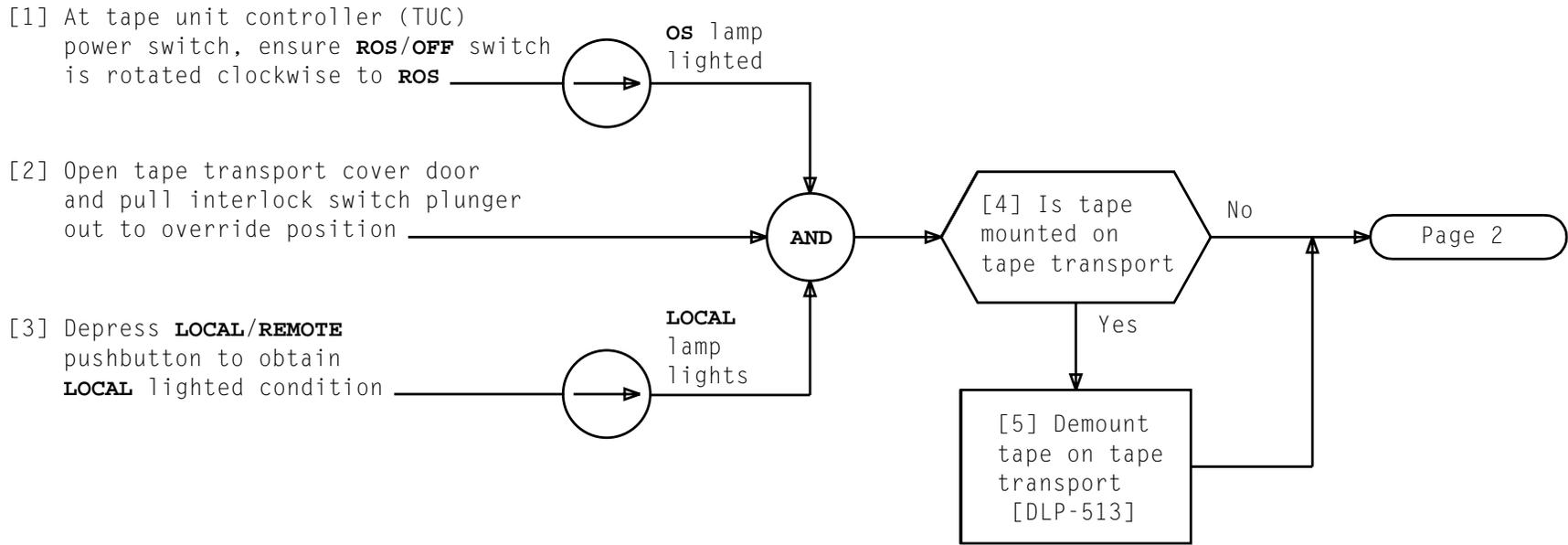
CLEAR CAPSTAN WILL NOT ROTATE FAULT

<i>WARNING 1</i> When DC-to-DC converter is turned off, tape reel motors spin uncontrolled	
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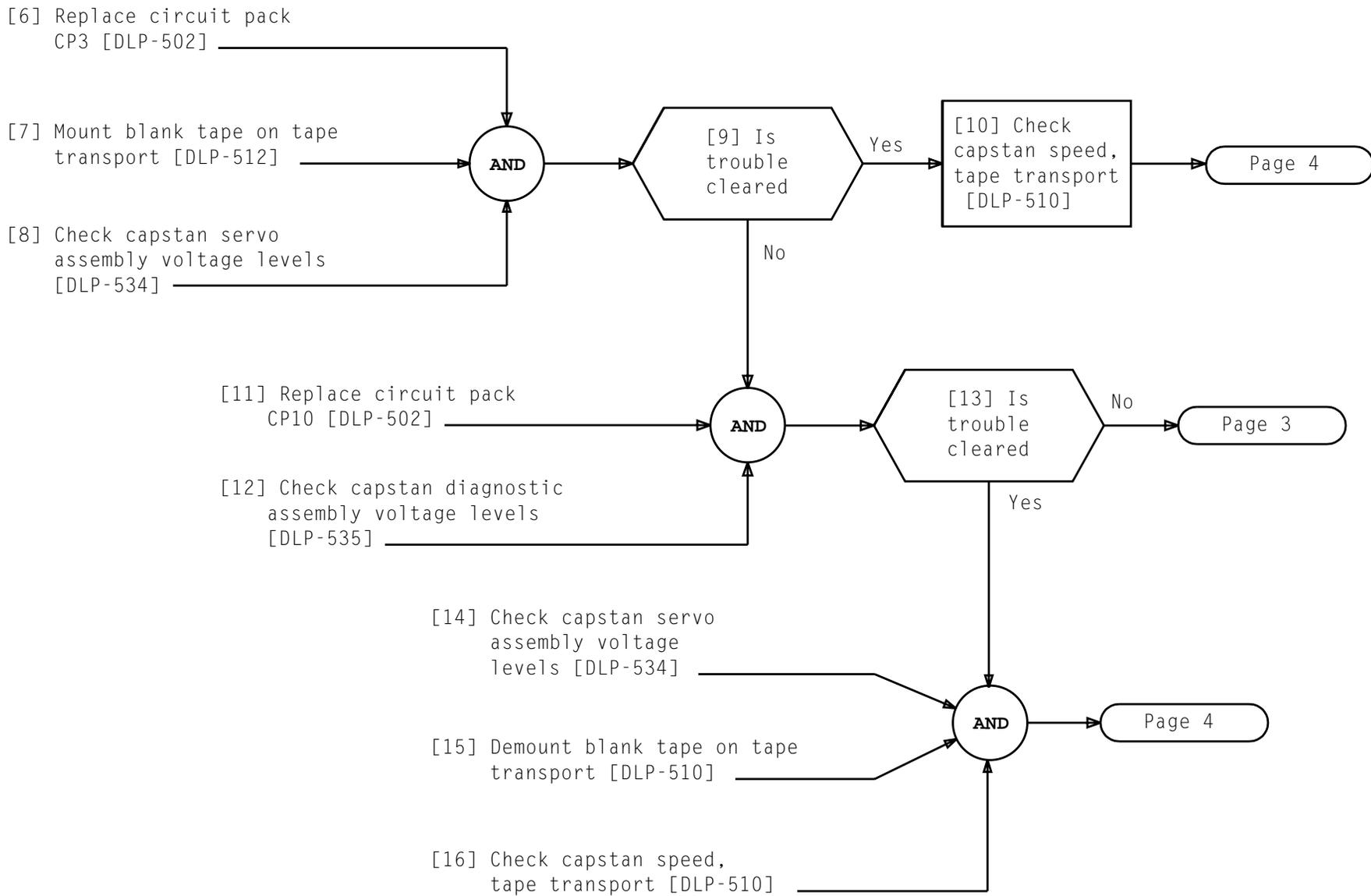
CLEAR CAPSTAN WILL NOT ROTATE FAULT

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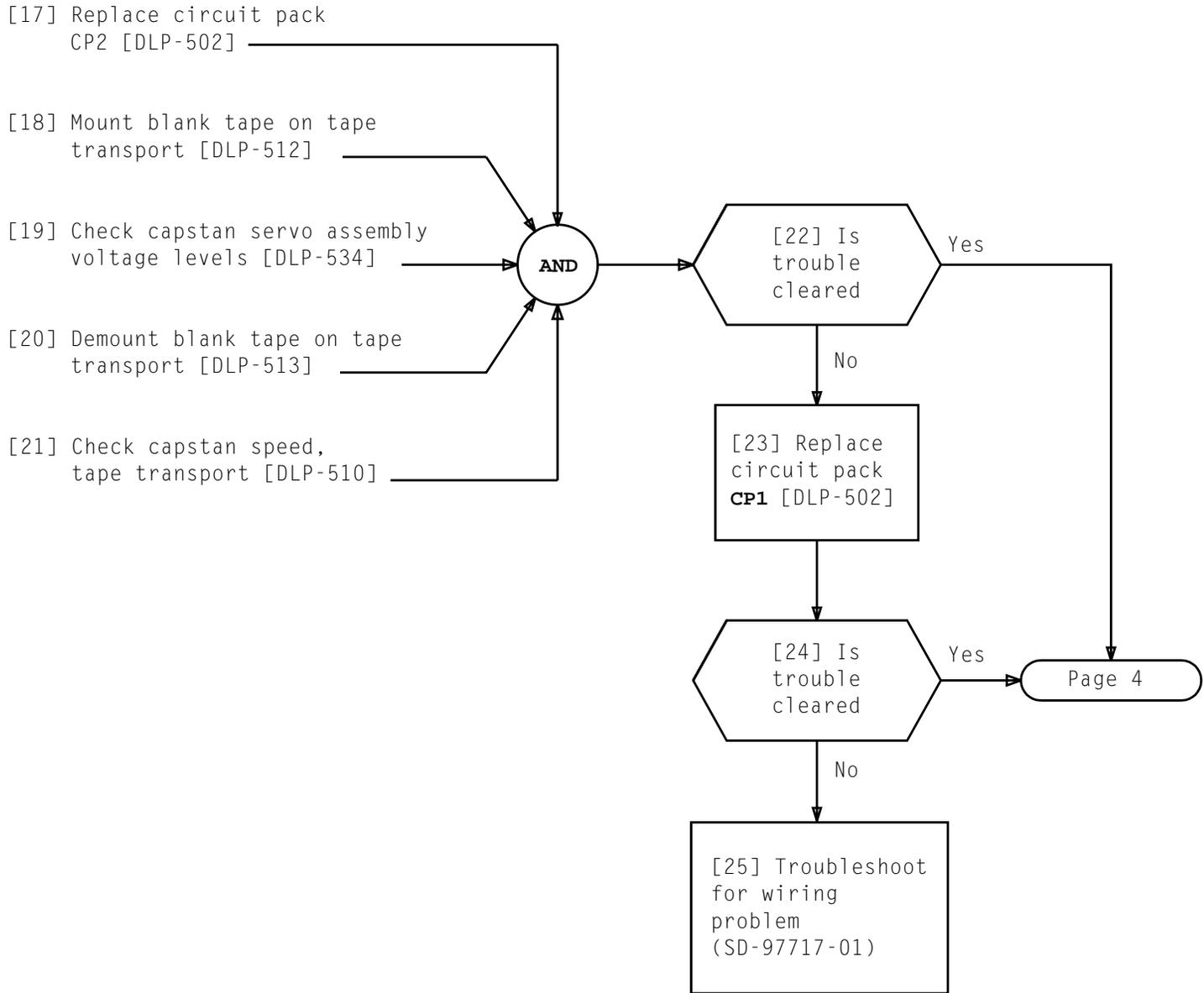
CLEAR CAPSTAN FAST FWD/REWIND SPEED FAULT

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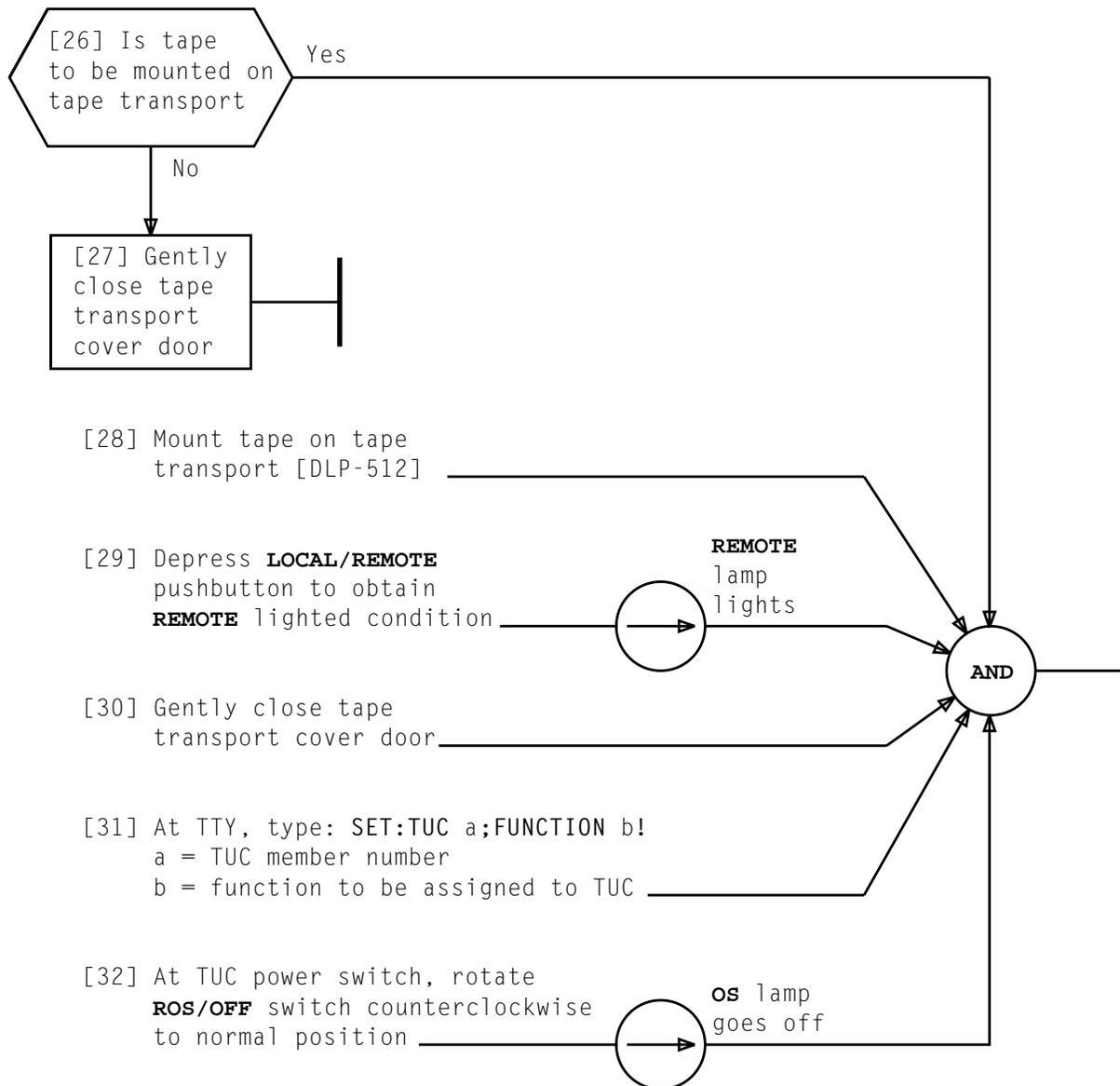
CLEAR CAPSTAN FAST FWD/REWIND SPEED FAULT

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CLEAR CAPSTAN FAST FWD/REWIND SPEED FAULT

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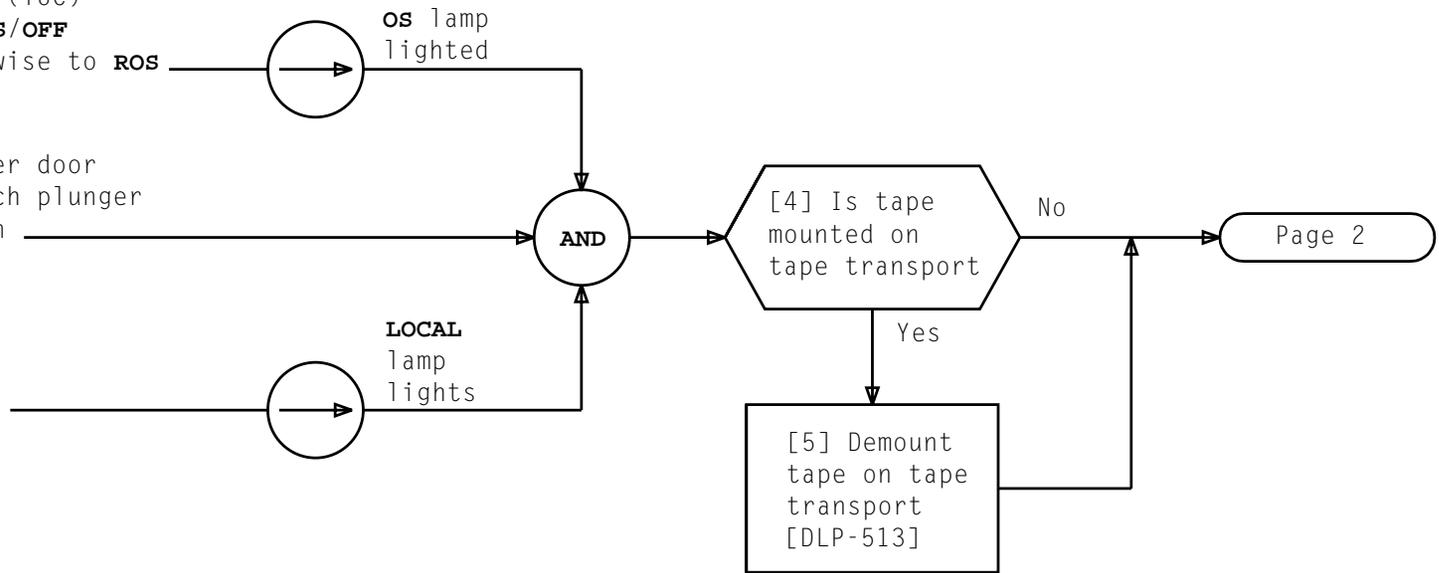
CLEAR CAPSTAN FAST FWD/REWIND SPEED FAULT

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[1] At tape unit controller (TUC) power switch, ensure **ROS/OFF** switch is rotated clockwise to **ROS**

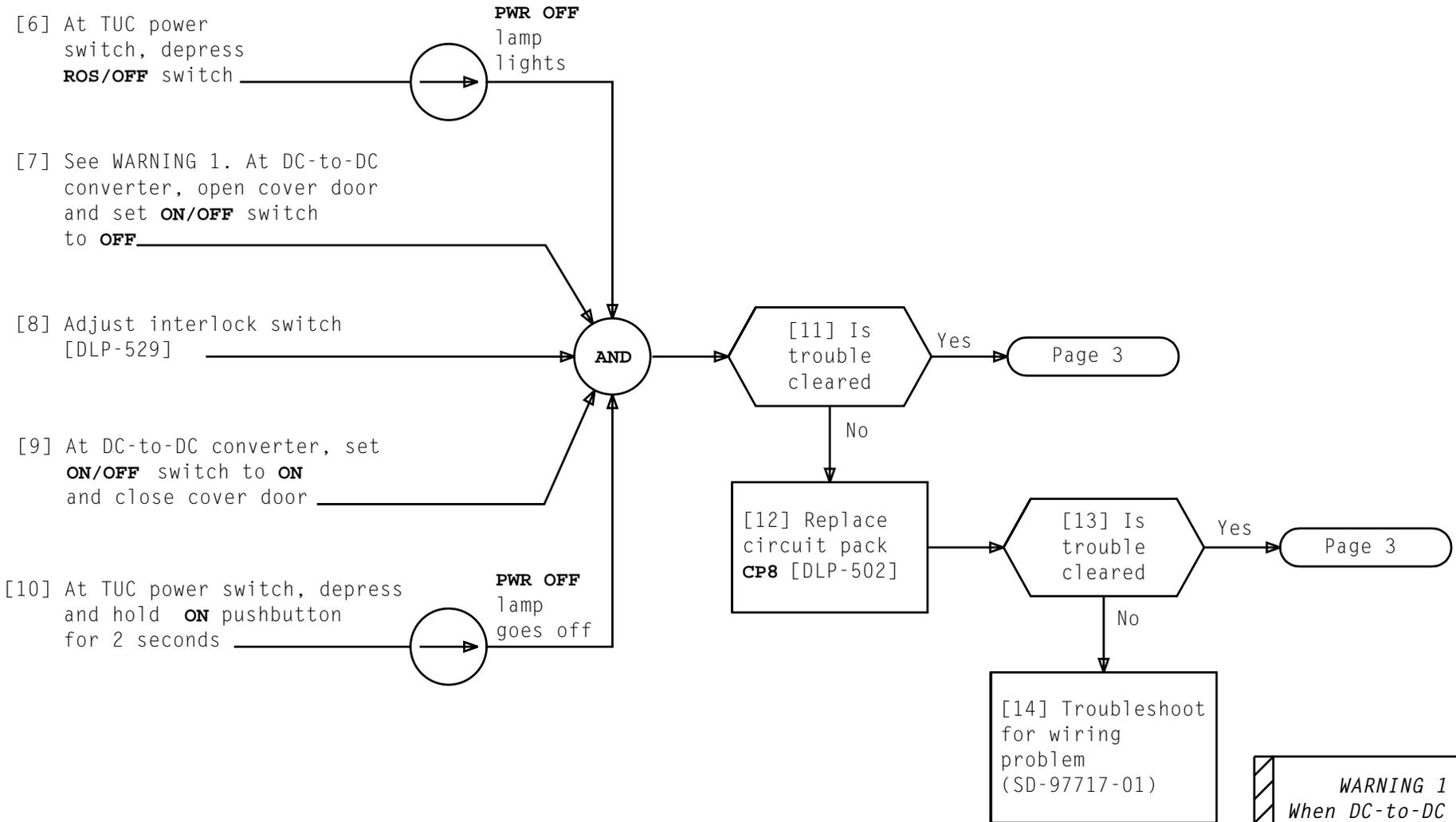
[2] Open tape transport cover door and pull interlock switch plunger out to override position

[3] Depress **LOCAL/REMOTE** pushbutton to obtain **LOCAL** lighted condition



CLEAR DOOR INTERLOCK FAULT

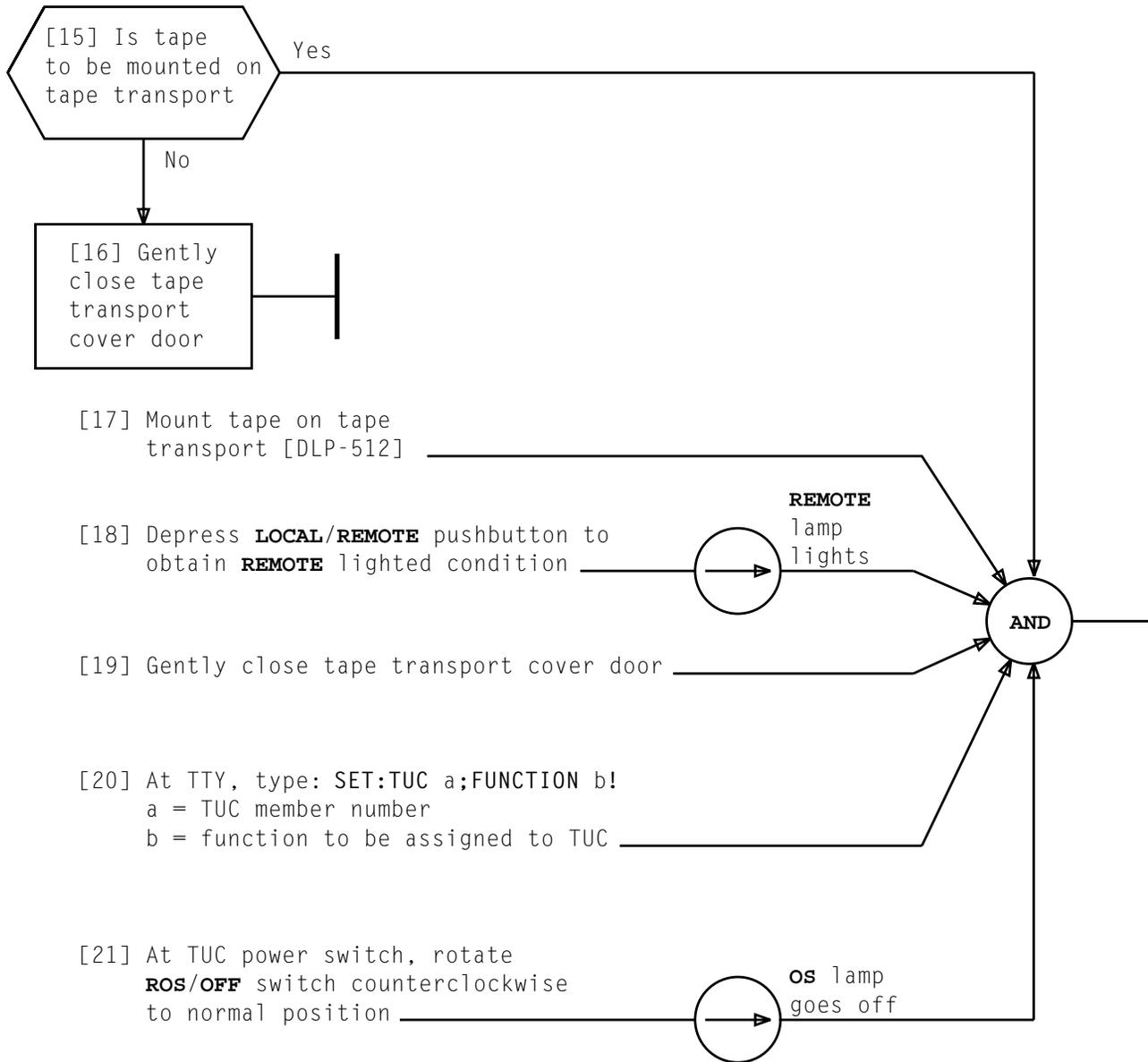
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WARNING 1
 When DC-to-DC converter is turned off, tape reel motors spin uncontrolled

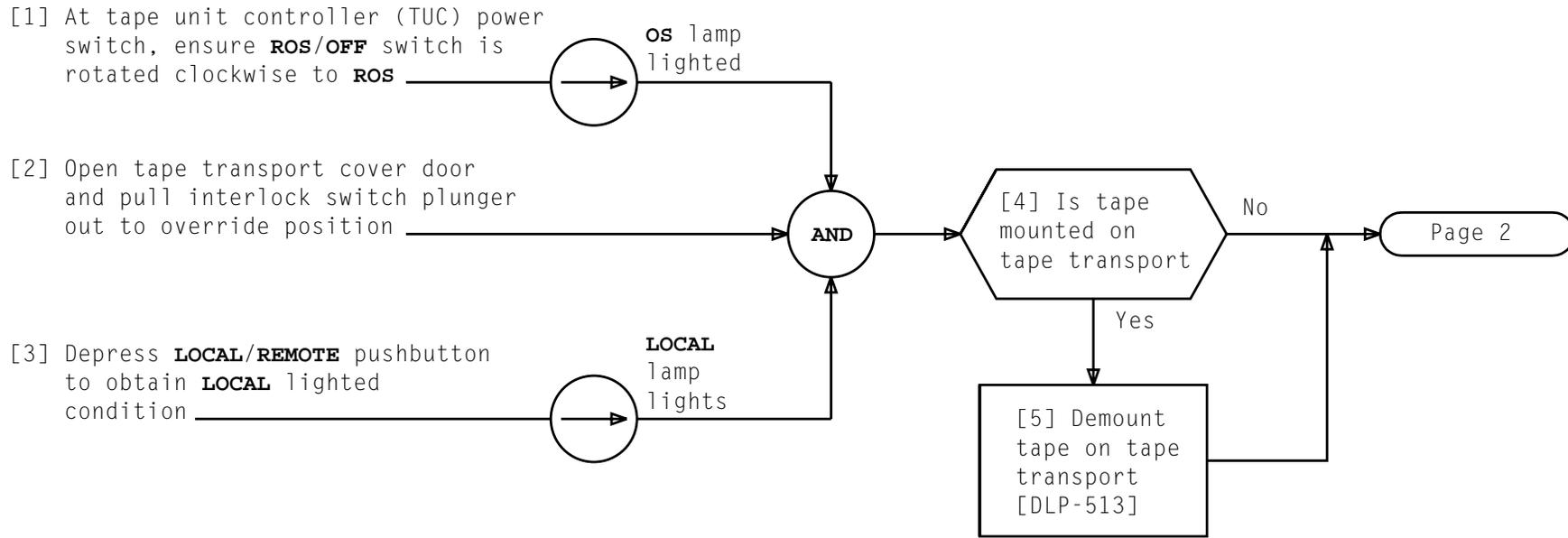
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CLEAR DOOR INTERLOCK FAULT



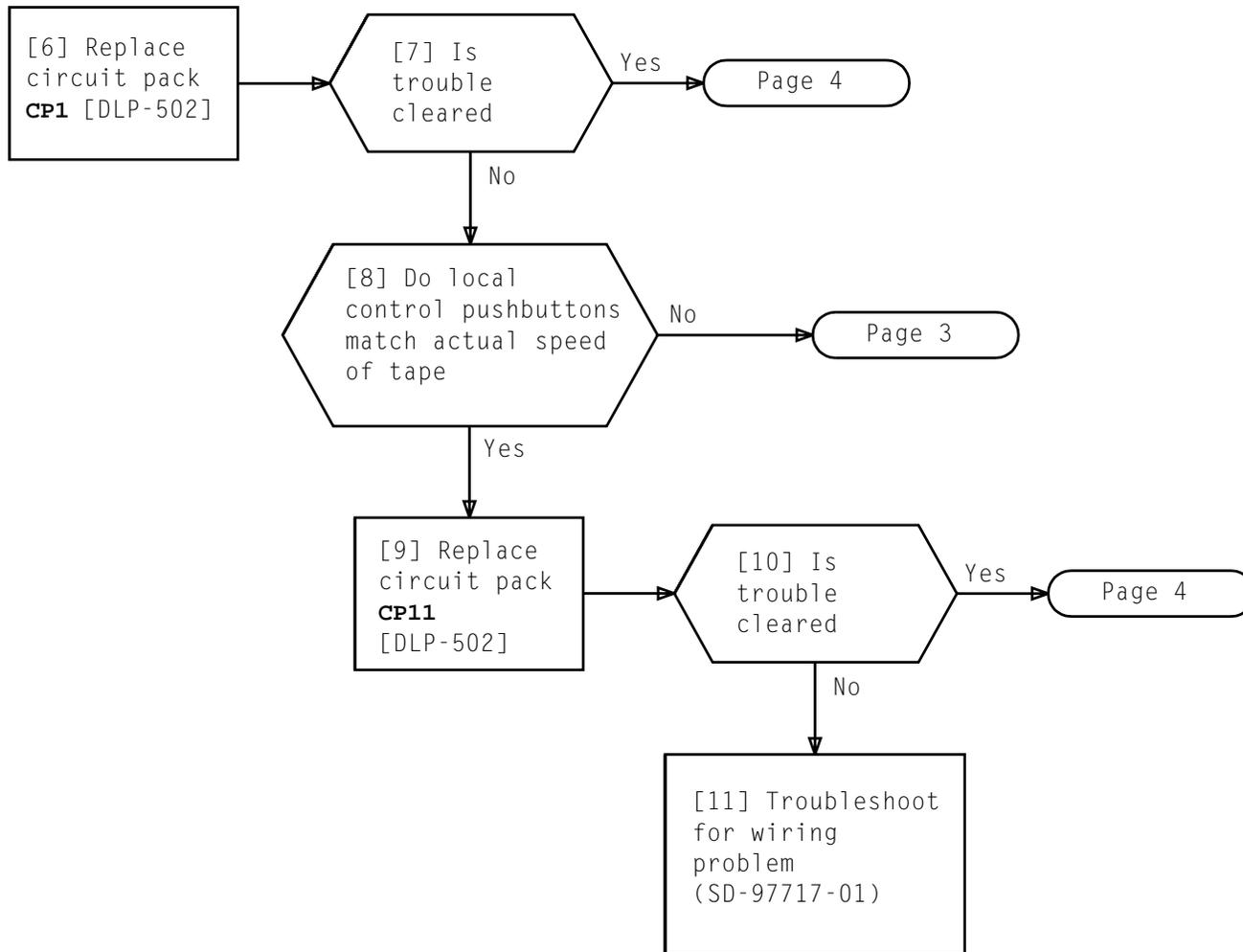
CLEAR DOOR INTERLOCK FAULT

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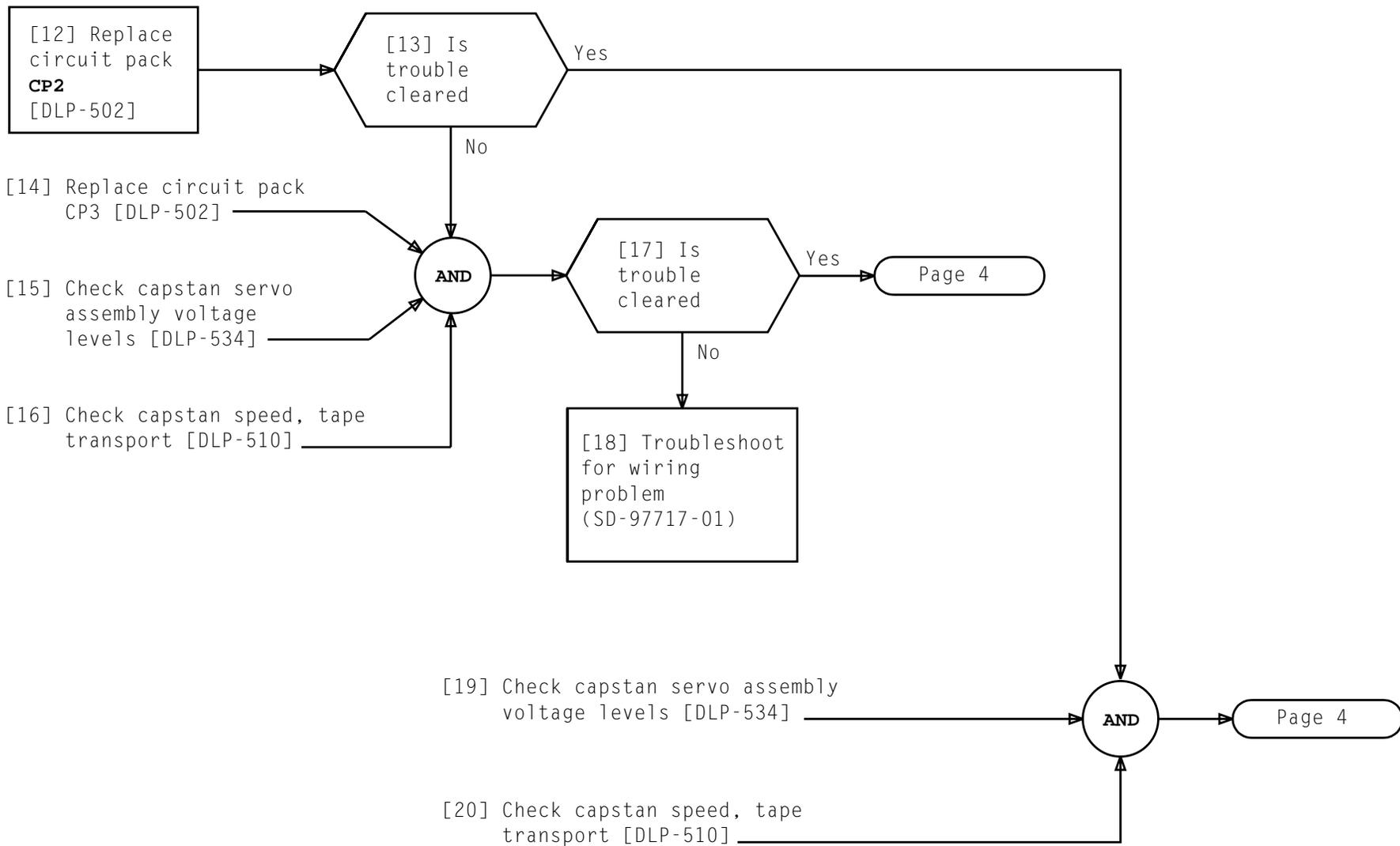
CLEAR CAPSTAN WILL NOT SWITCH SPEED FAULT

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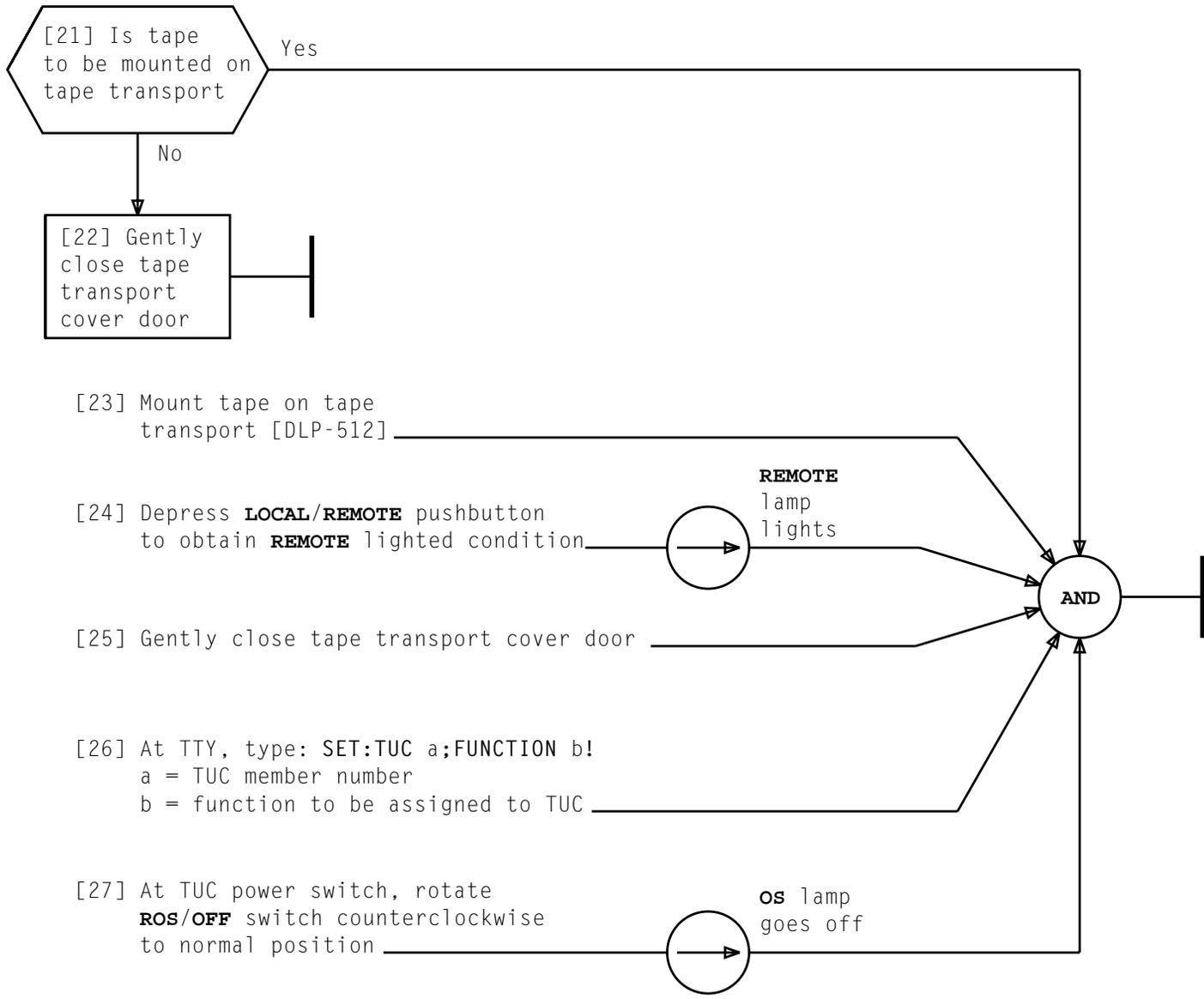
CLEAR CAPSTAN WILL NOT SWITCH SPEED FAULT

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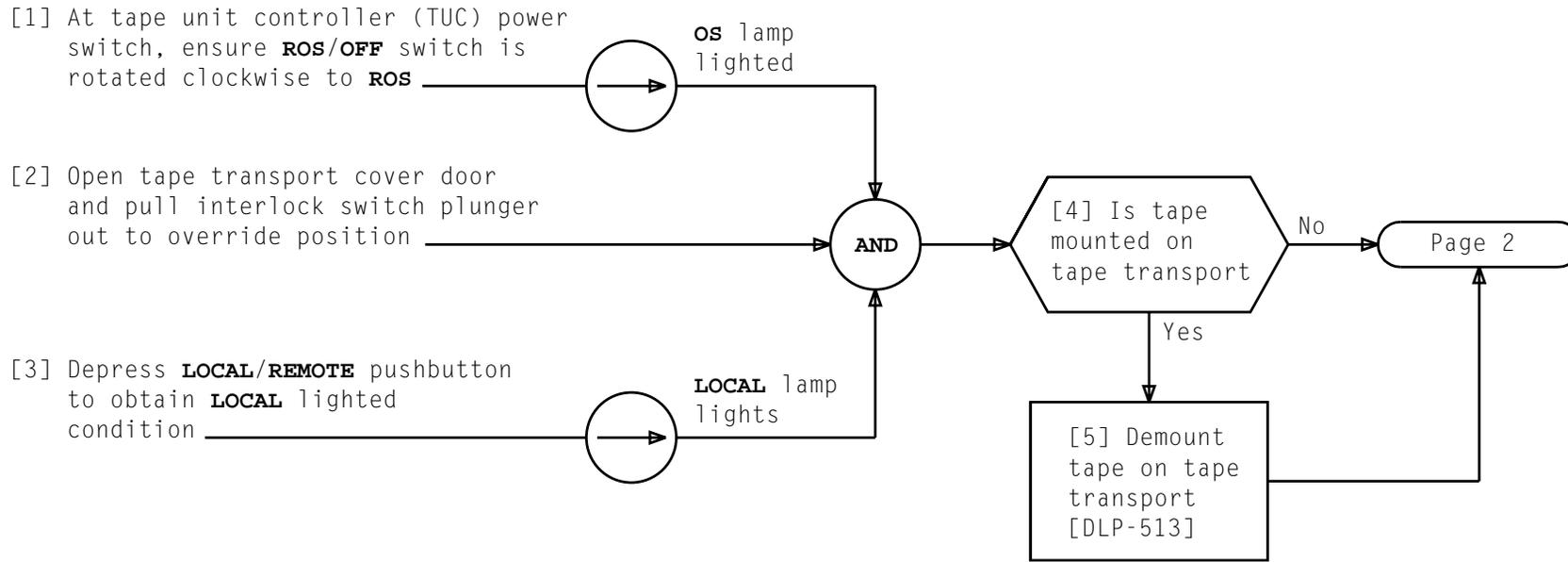
CLEAR CAPSTAN WILL NOT SWITCH SPEED FAULT

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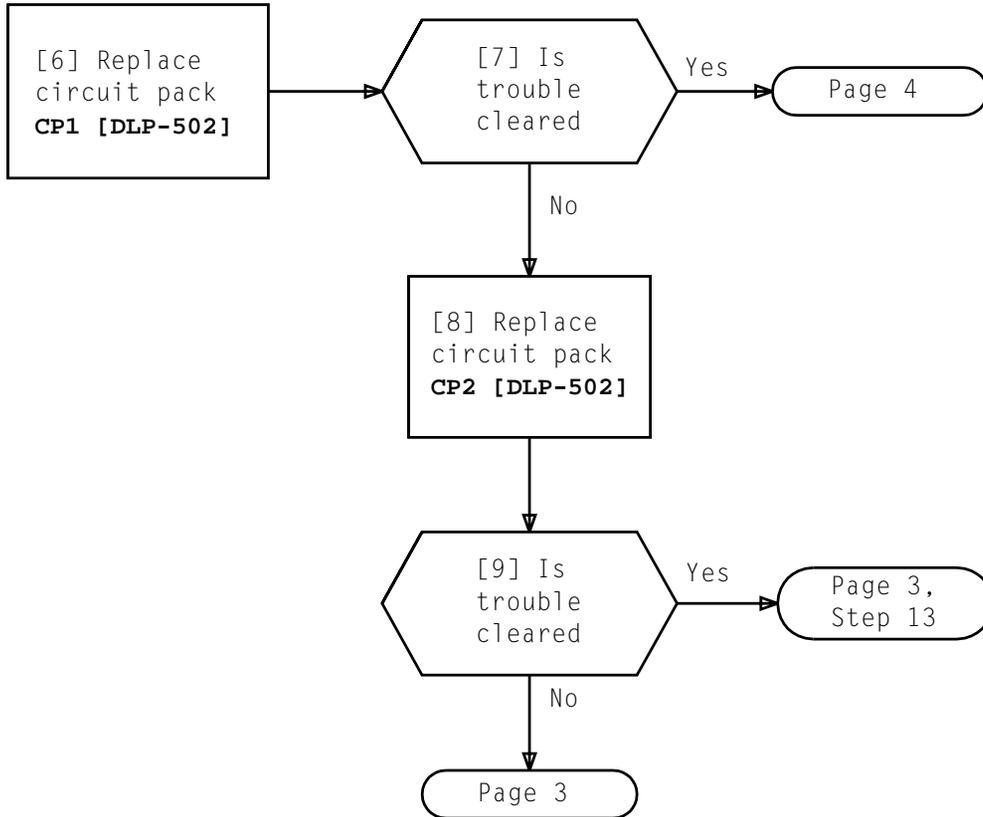
CLEAR CAPSTAN WILL NOT SWITCH SPEED FAULT

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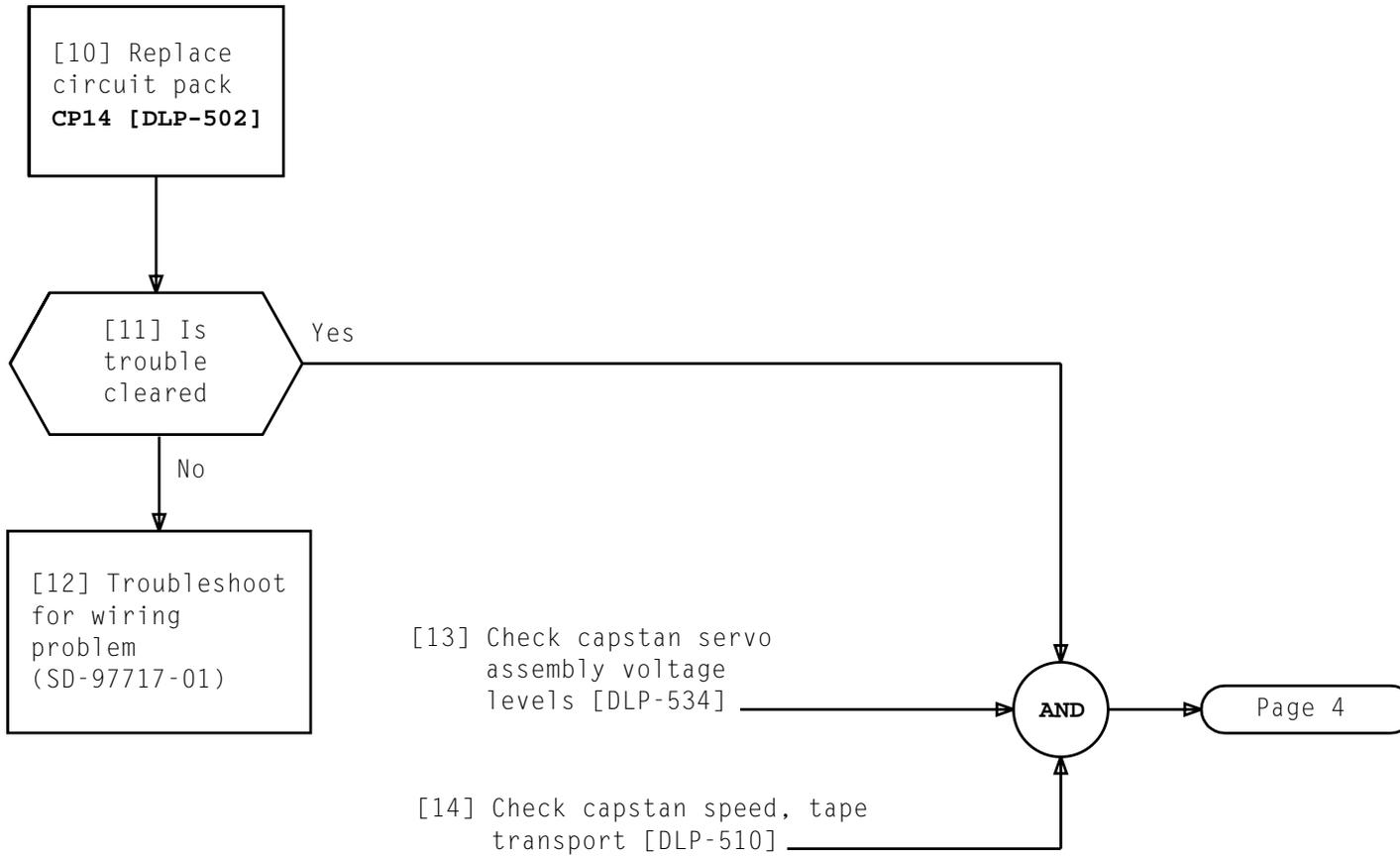
CLEAR CAPSTAN ROTATES IN ONE DIRECTION FAULT

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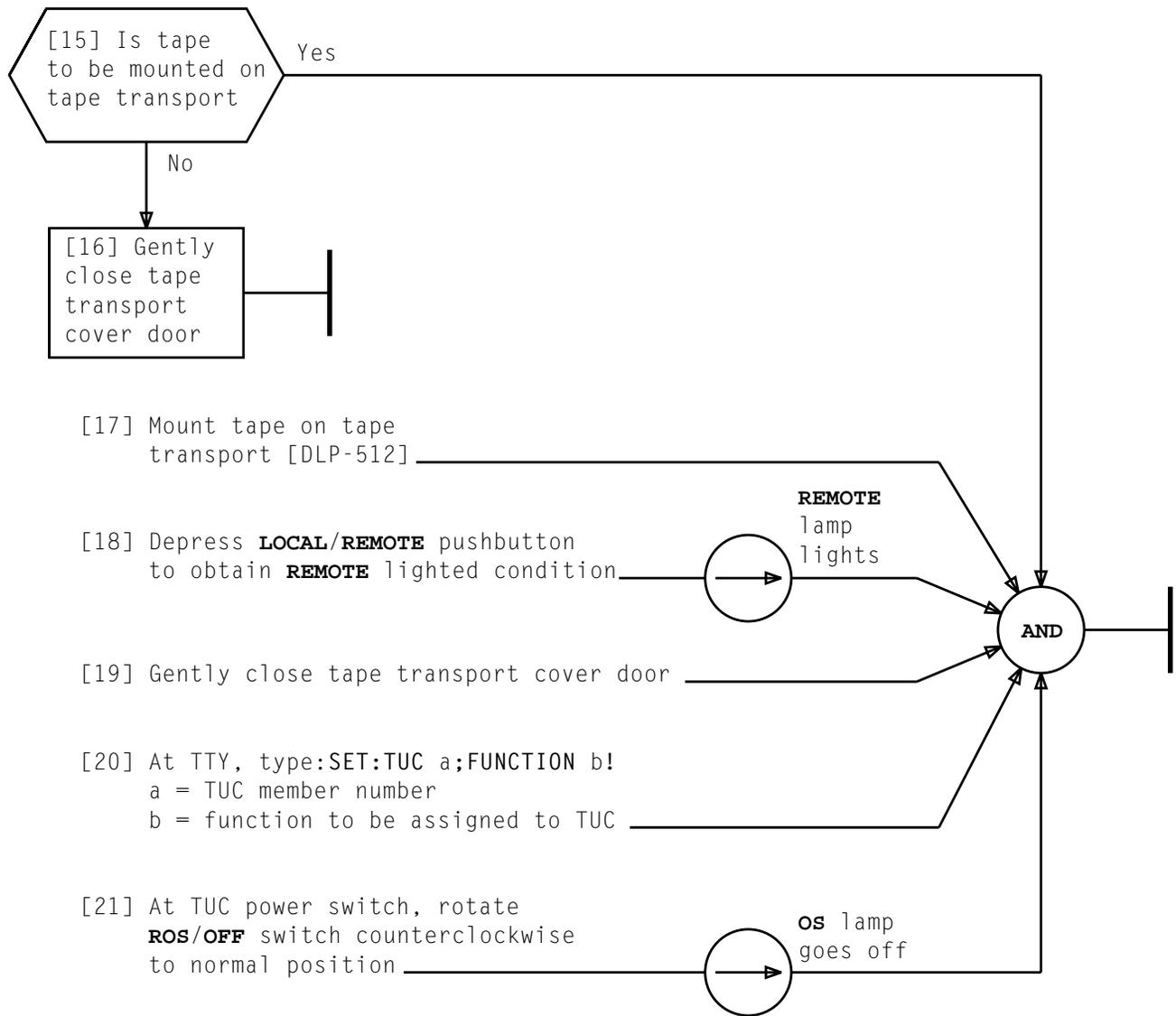
CLEAR CAPSTAN ROTATES IN ONE DIRECTION FAULT

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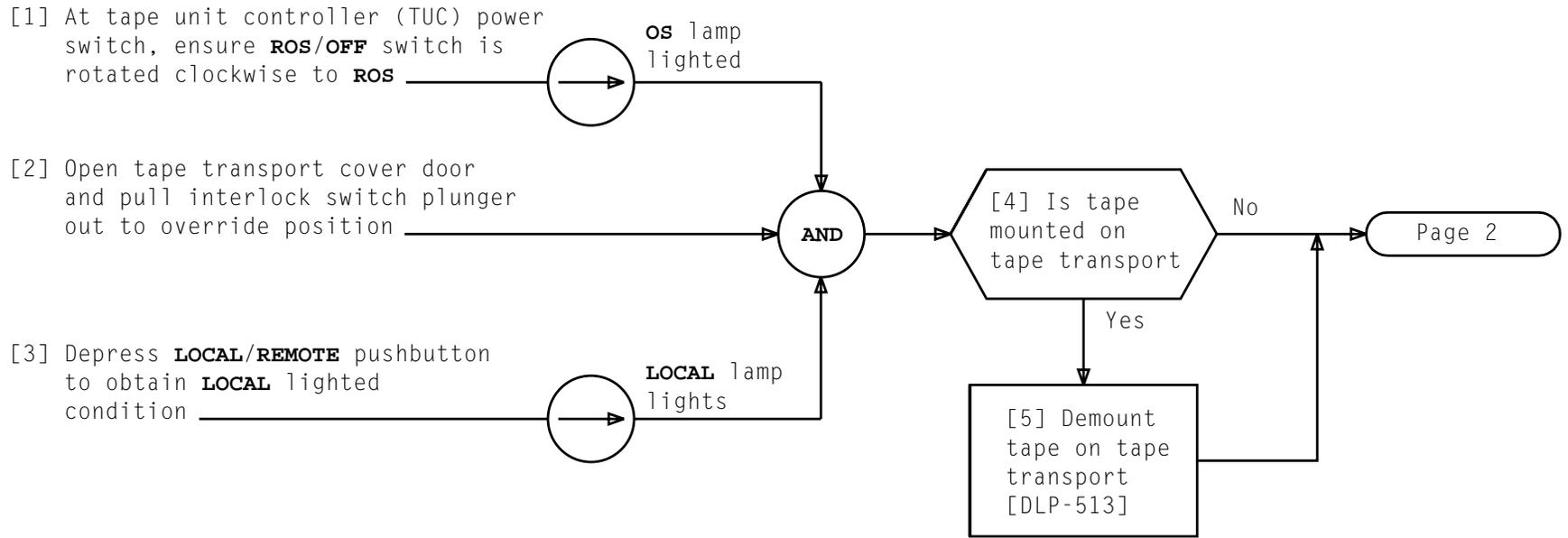
CLEAR CAPSTAN ROTATES IN ONE DIRECTION FAULT

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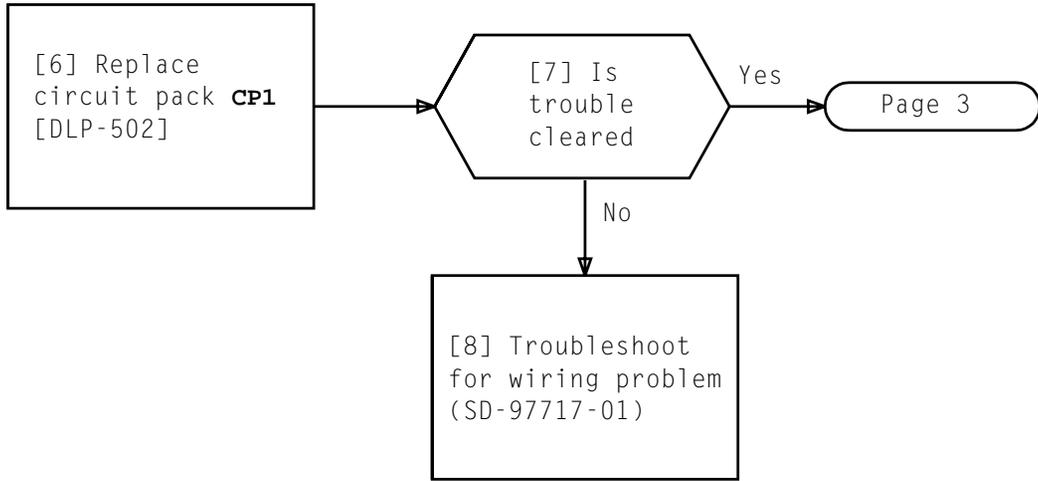
CLEAR CAPSTAN ROTATES IN ONE DIRECTION FAULT

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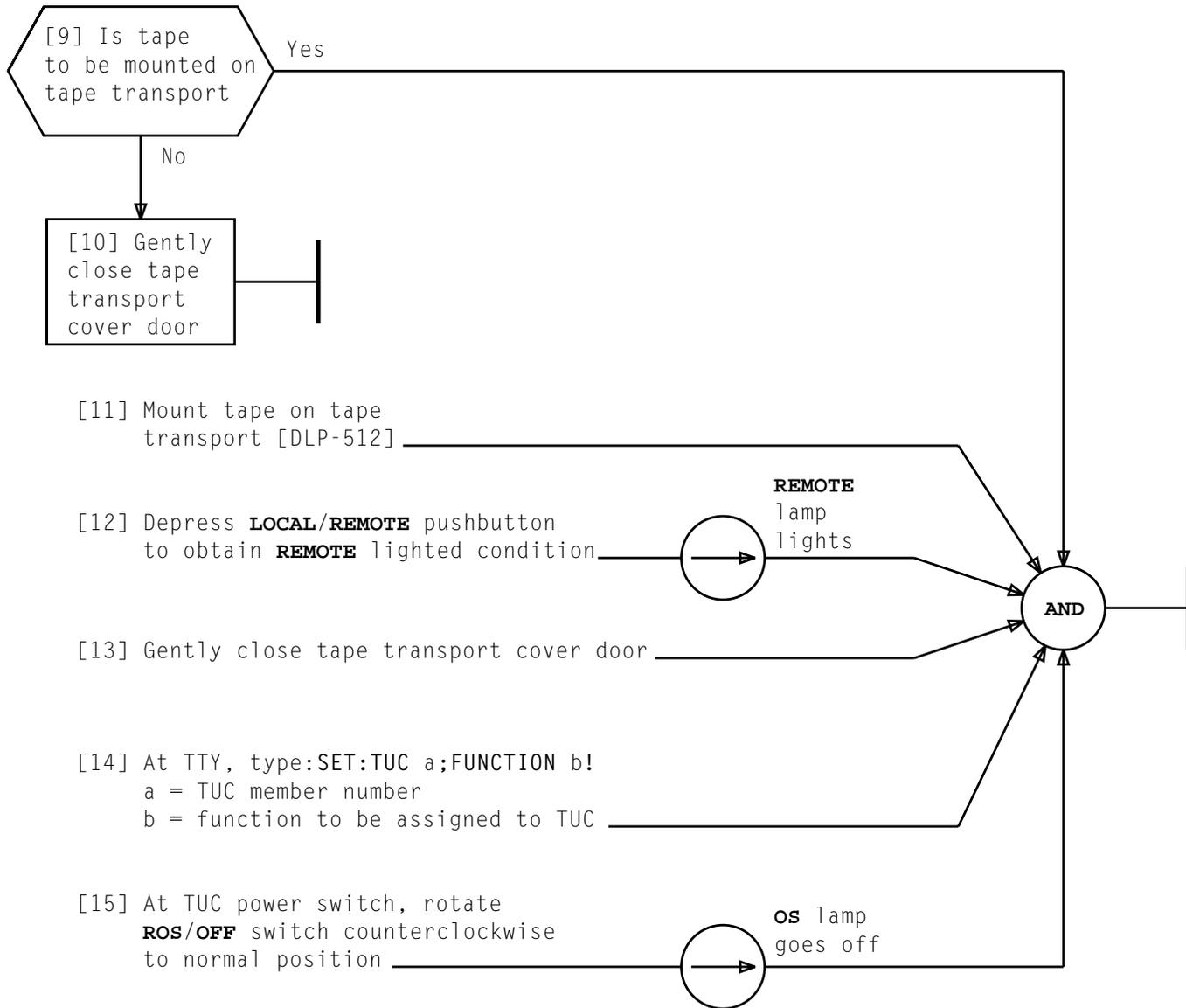
CLEAR LOCAL/REMOTE SWITCHING FAULT

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CLEAR LOCAL/REMOTE SWITCHING FAULT

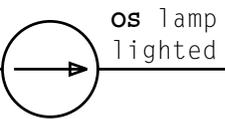
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CLEAR LOCAL/REMOTE SWITCHING FAULT

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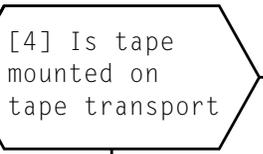
[1] At tape unit controller (TUC) power switch, ensure **ROS/OFF** switch is rotated clockwise to **ROS**



[2] Open tape transport cover door and pull interlock switch plunger out to override position



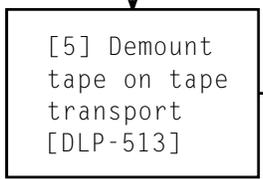
[3] Depress **LOCAL/REMOTE** pushbutton to obtain **LOCAL** lighted condition



No

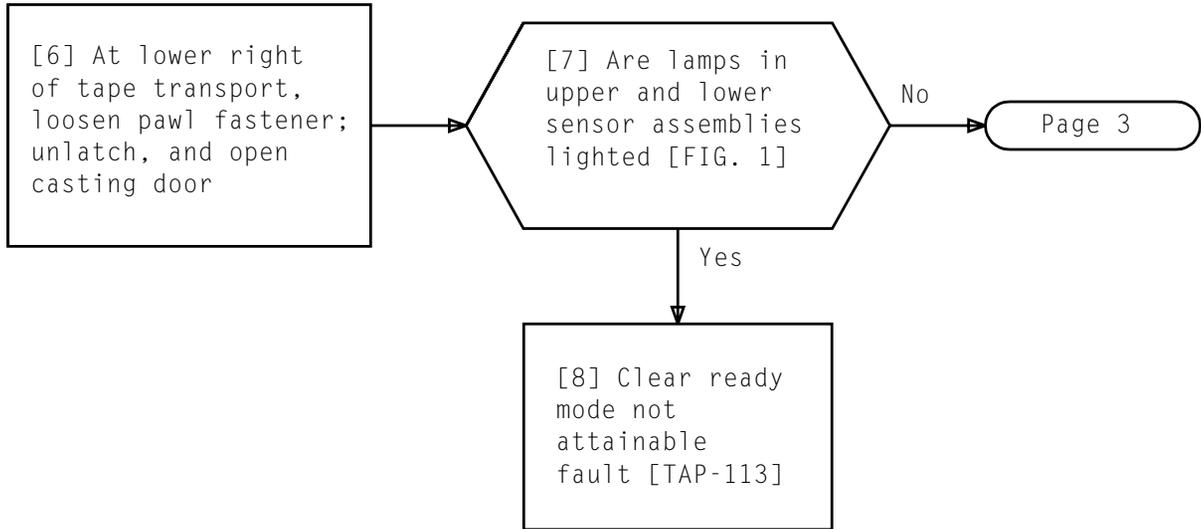


Yes



CLEAR SERVO LAMP FAULT

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CLEAR SERVO LAMP FAULT

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[9] See WARNING 1. At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**

[10] Manually move arms to off-normal position

[11] At rear of casting door, replace unlighted sensor lamps (GE-381 or absolute equivalent) [FIG. 1]

[12] At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door

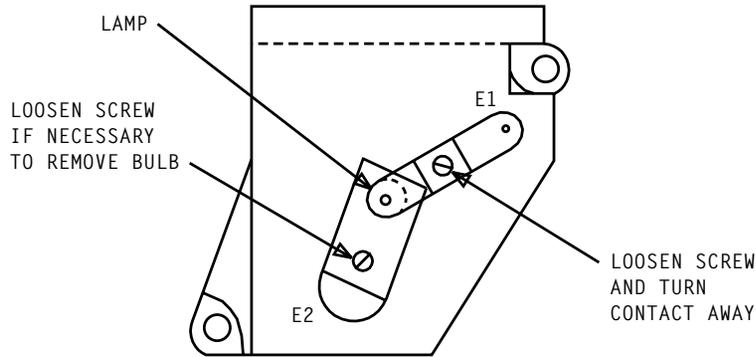
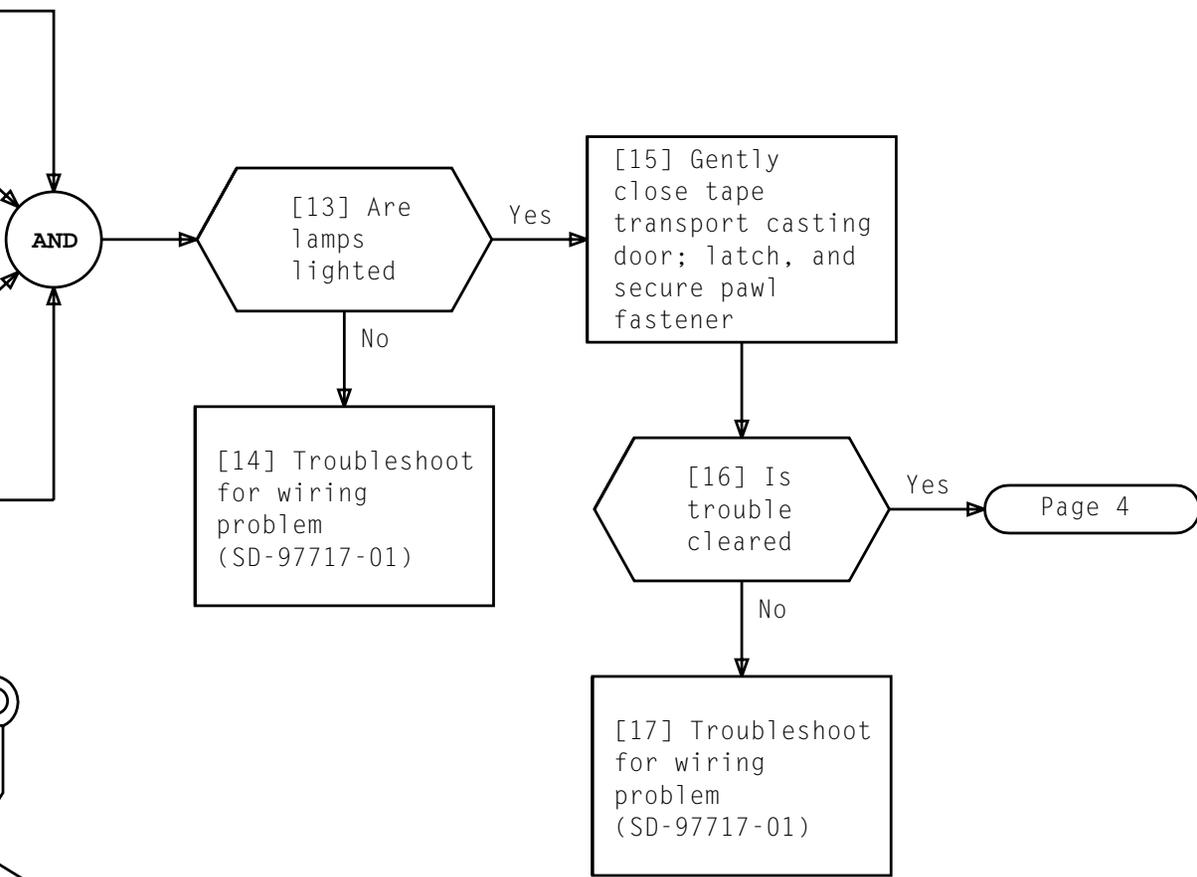
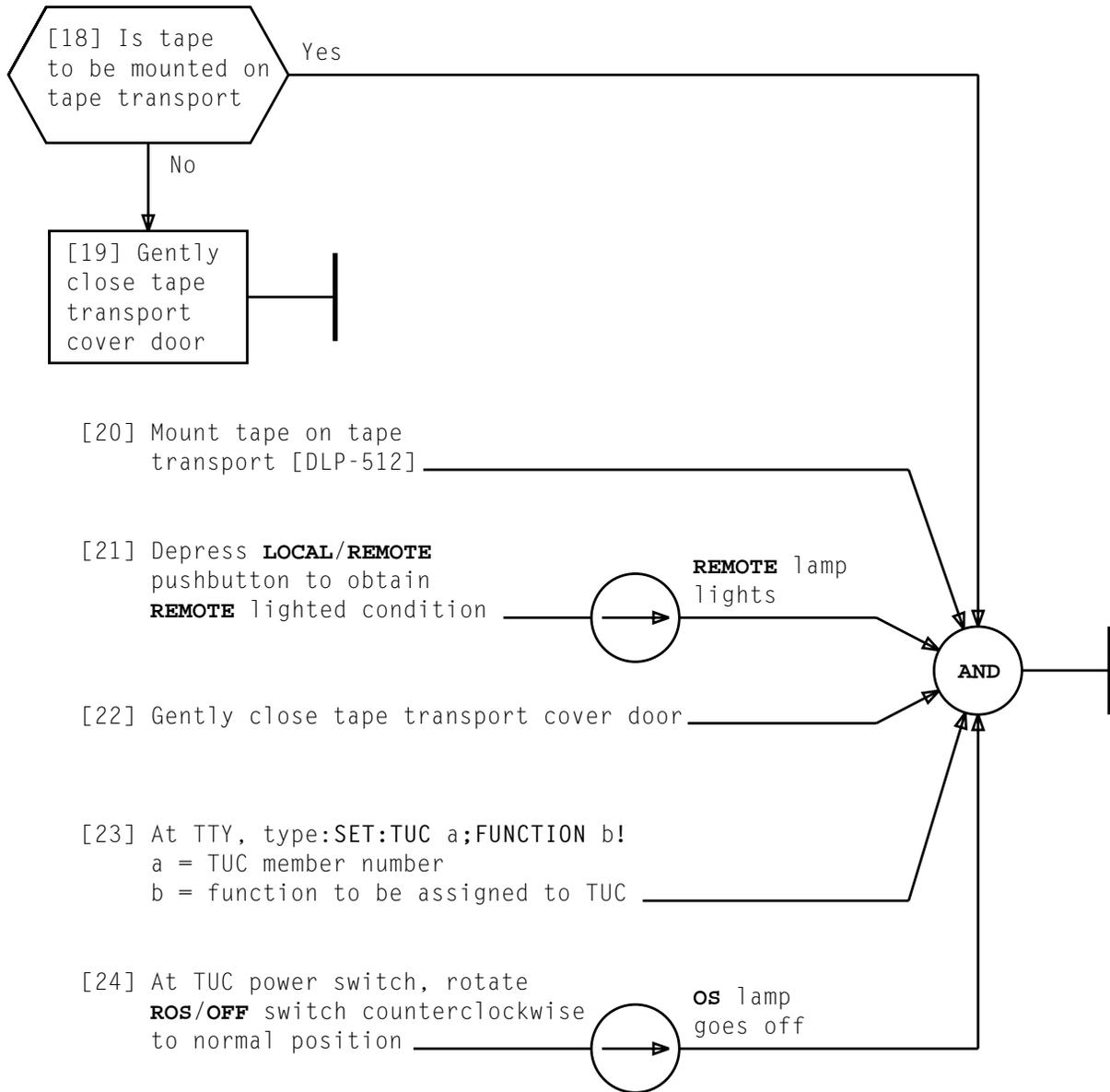


Figure 1 - Tape Tension Arm Sensor Assembly

CLEAR SERVO LAMP FAULT

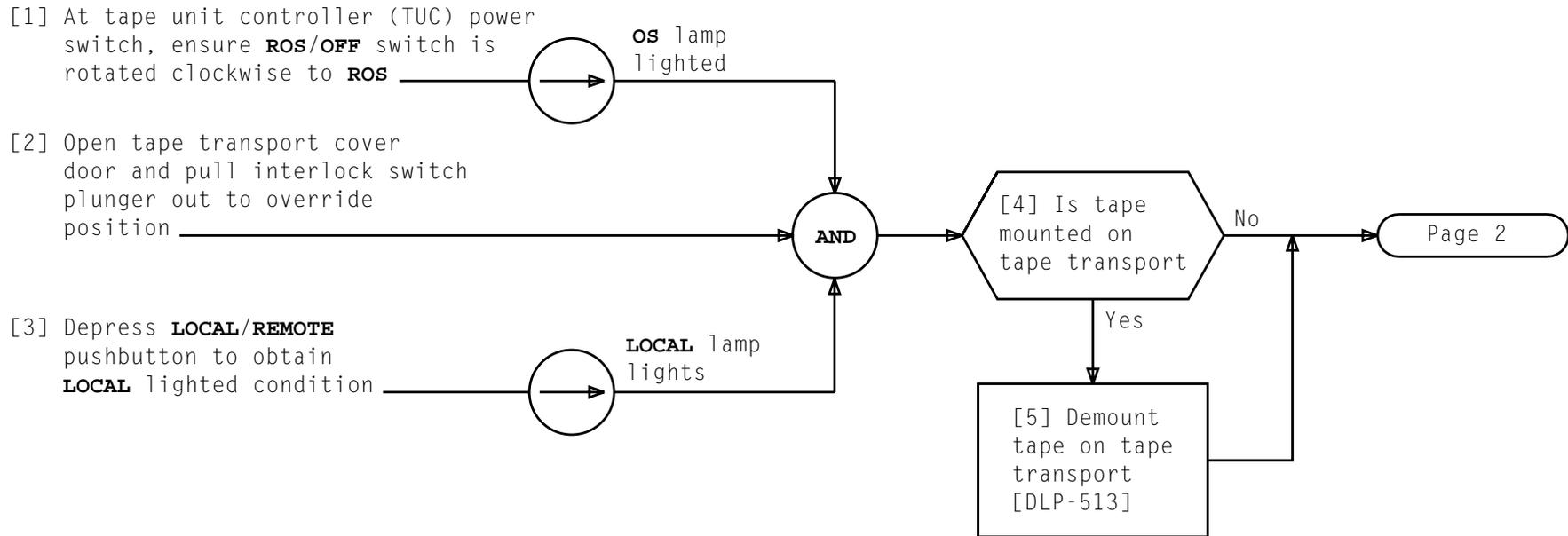
WARNING 1
When DC-to-DC converter is turned off, tape reel motors spin uncontrolled

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CLEAR SERVO LAMP FAULT

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CLEAR CAPSTAN ACCELERATION FAULT

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[6] Obtain support apparatus
[TABLE A]

[7] Mount blank tape on
tape transport
[DLP-512]

[8] Check tape travel on
tape transport
[DLP-508]

[9] Demount blank tape
on tape transport
[DLP-513]

[10] Clean tape path
[DLP-526]

[11] Check read pulse widths
[DLP-540]

[12] Check read head
alignment [DLP-509]

[13] Check write and erase head
alignments [DLP-542]

AND

AND

[14] Was write
head alignment
required

Yes

[15] Repeat
from
Step 11

No

[16] Is
trouble
cleared

No

[17] Replace
circuit pack
CP2 [DLP-502]

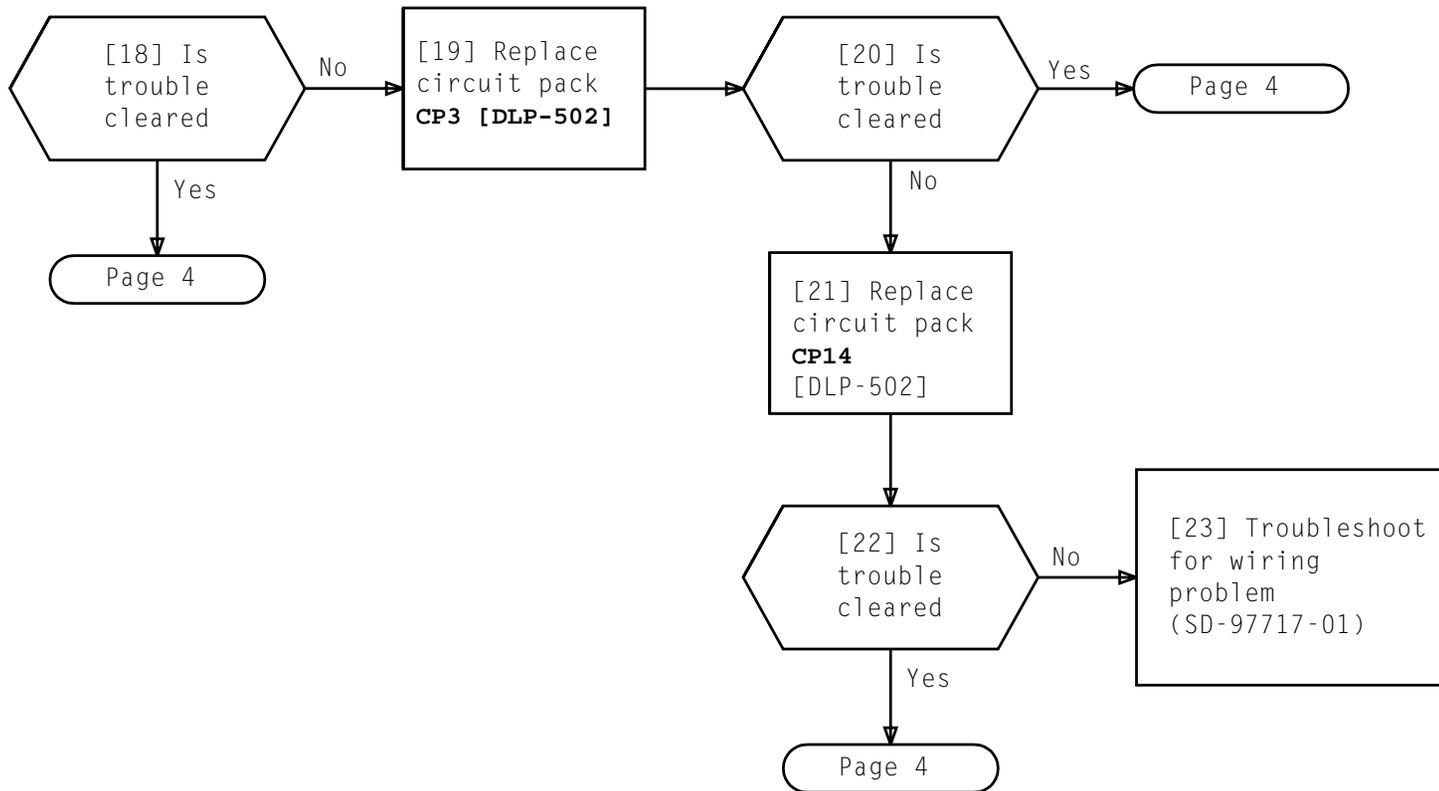
Page 3

Yes

Page 4

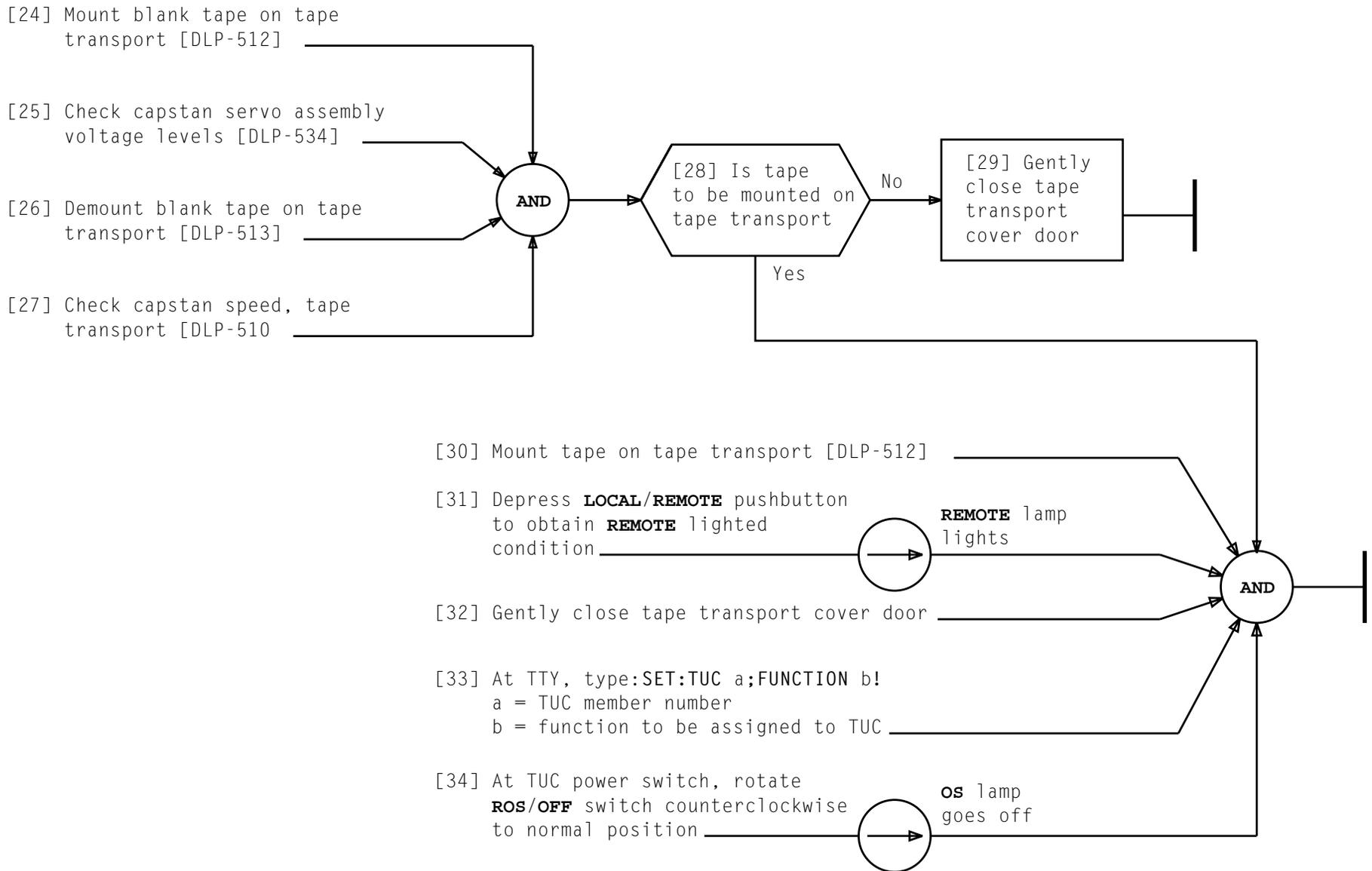
TABLE A

COMMON NAME	PART NUMBER	COMMON NAME	PART NUMBER
TEKTRONIX oscilloscope	2232 or equivalent	Card extender	826A or 826B
Test pack	Skew Alignment Tool 814A	Twill cloth	KS-2423
Alignment tape	KS-20315,L1	Cleaner solvent	KS-20406,L1
Blank tape	-	Vacuum cleaner	KS-14377,L5
Write enable ring	-	Flexible nozzle	KS-14377,L3



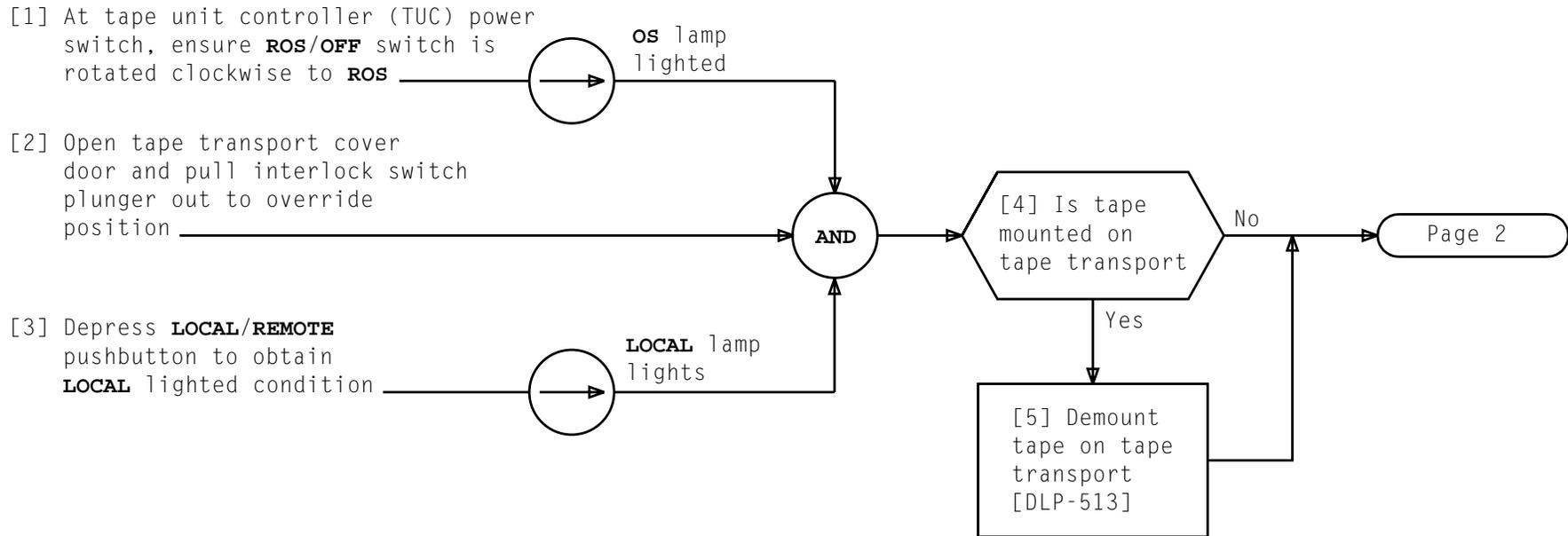
CLEAR CAPSTAN ACCELERATION FAULT

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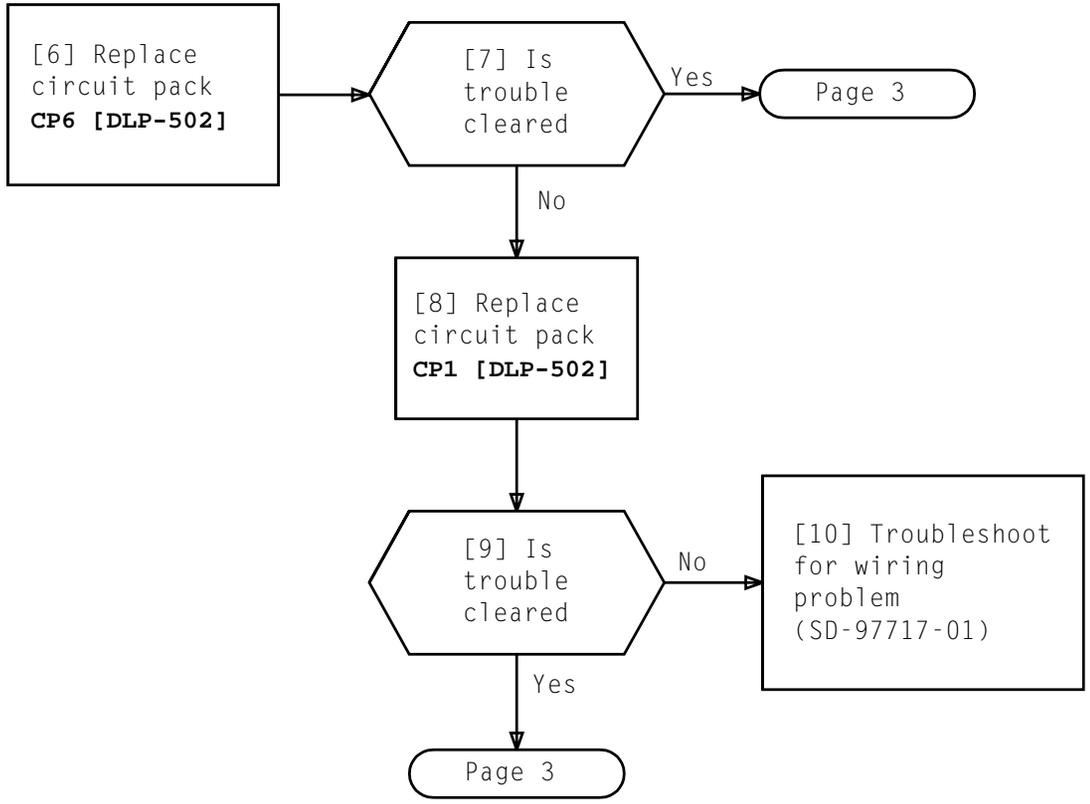
CLEAR CAPSTAN ACCELERATION FAULT

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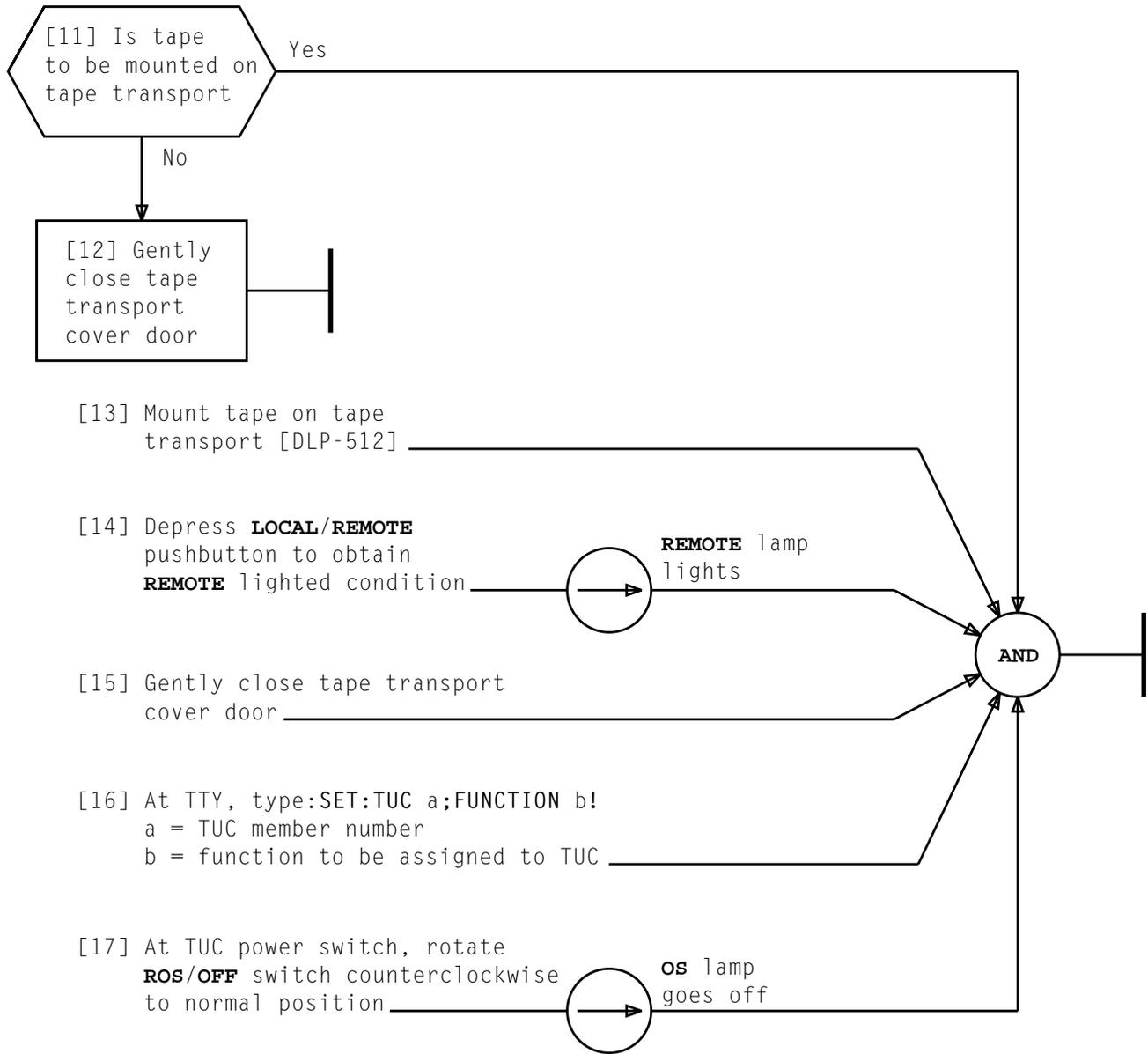
CLEAR EOT/BOT SENSOR FAULT OR FAILURE TO RETURN TO LOAD POINT FAULT

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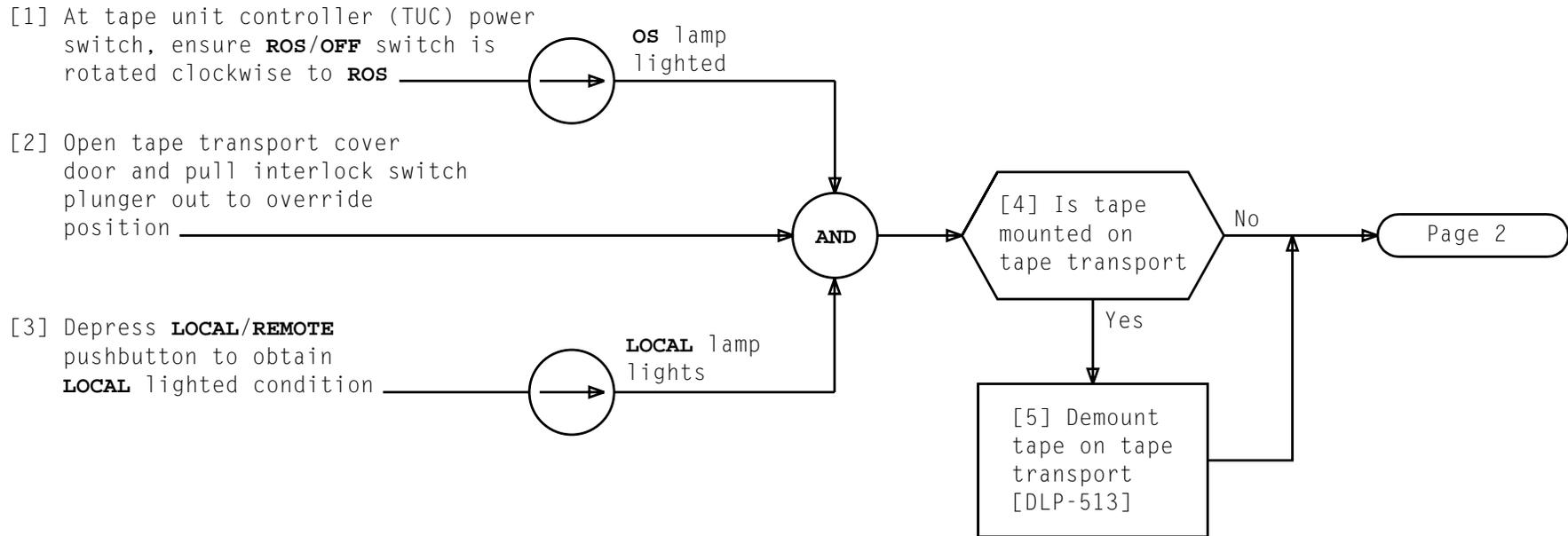
CLEAR EOT/BOT SENSOR FAULT OR FAILURE TO RETURN TO LOAD POINT FAULT

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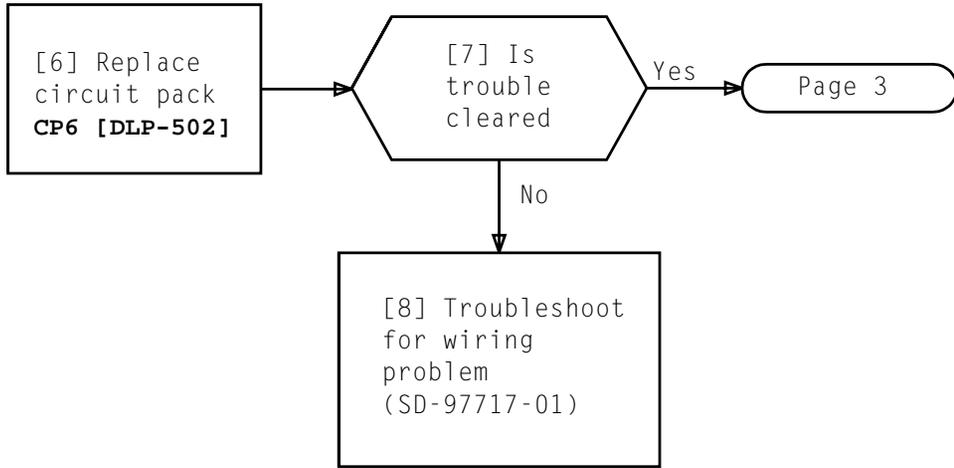
CLEAR EOT/BOT SENSOR FAULT OR FAILURE TO RETURN TO LOAD POINT FAULT

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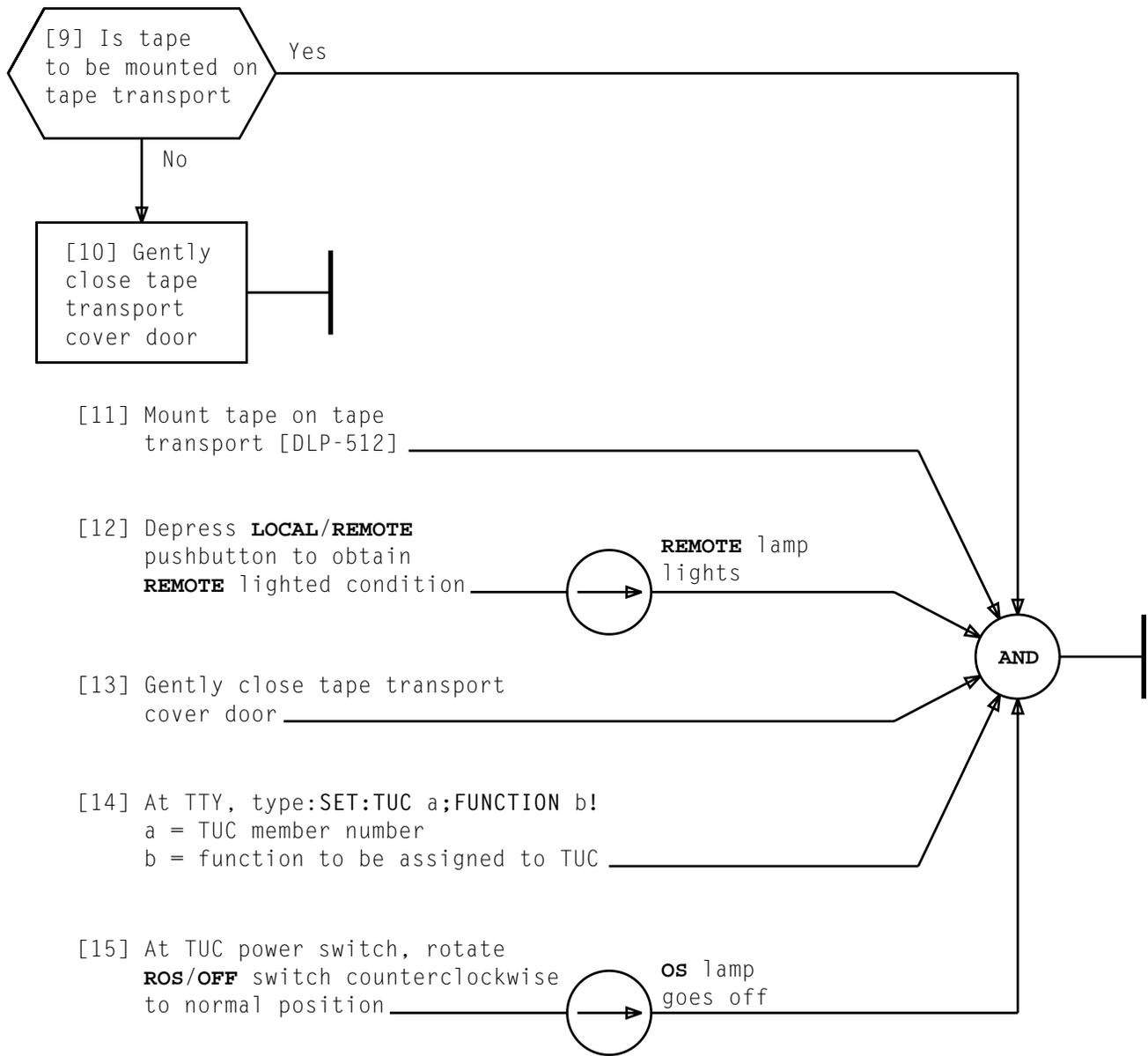
CLEAR TAPE REEL LOADED/UNLOADED INDICATION FAULT

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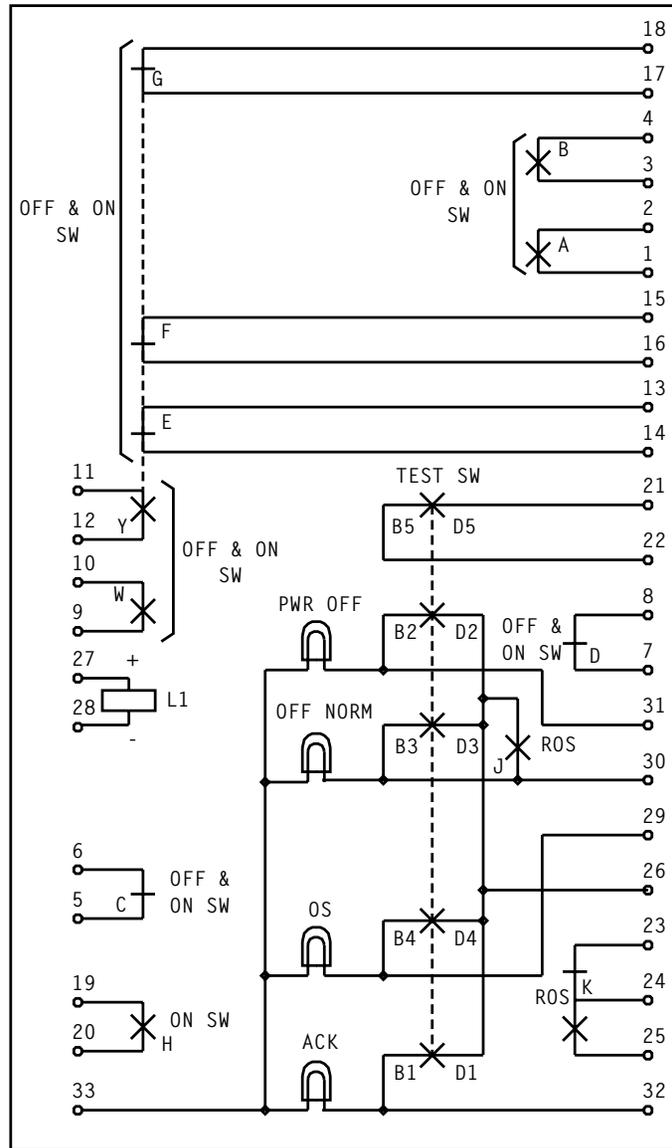
CLEAR TAPE REEL LOADED/UNLOADED INDICATION FAULT

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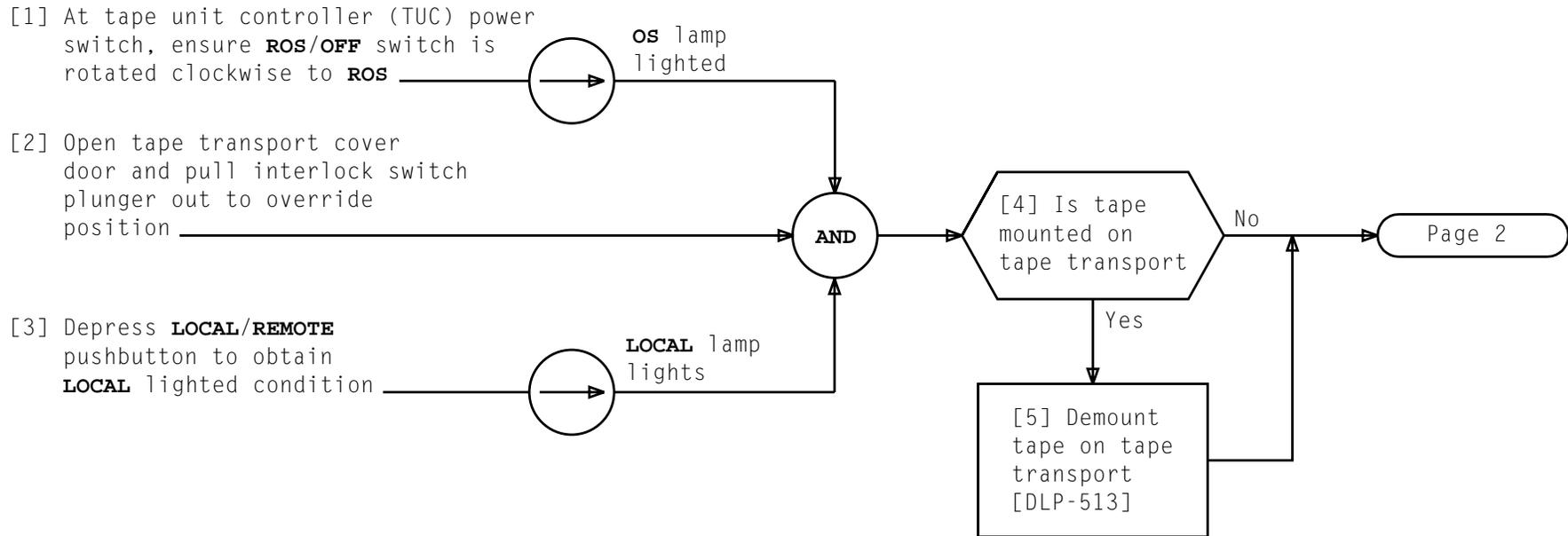
CLEAR TAPE REEL LOADED/UNLOADED INDICATION FAULT

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POWER SWITCH (KS-20738)

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CLEAR READ, WRITE, OR ERASE HEAD FAULT

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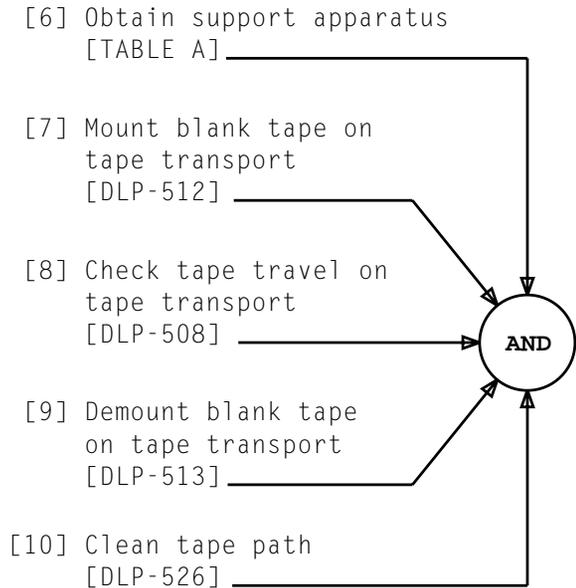
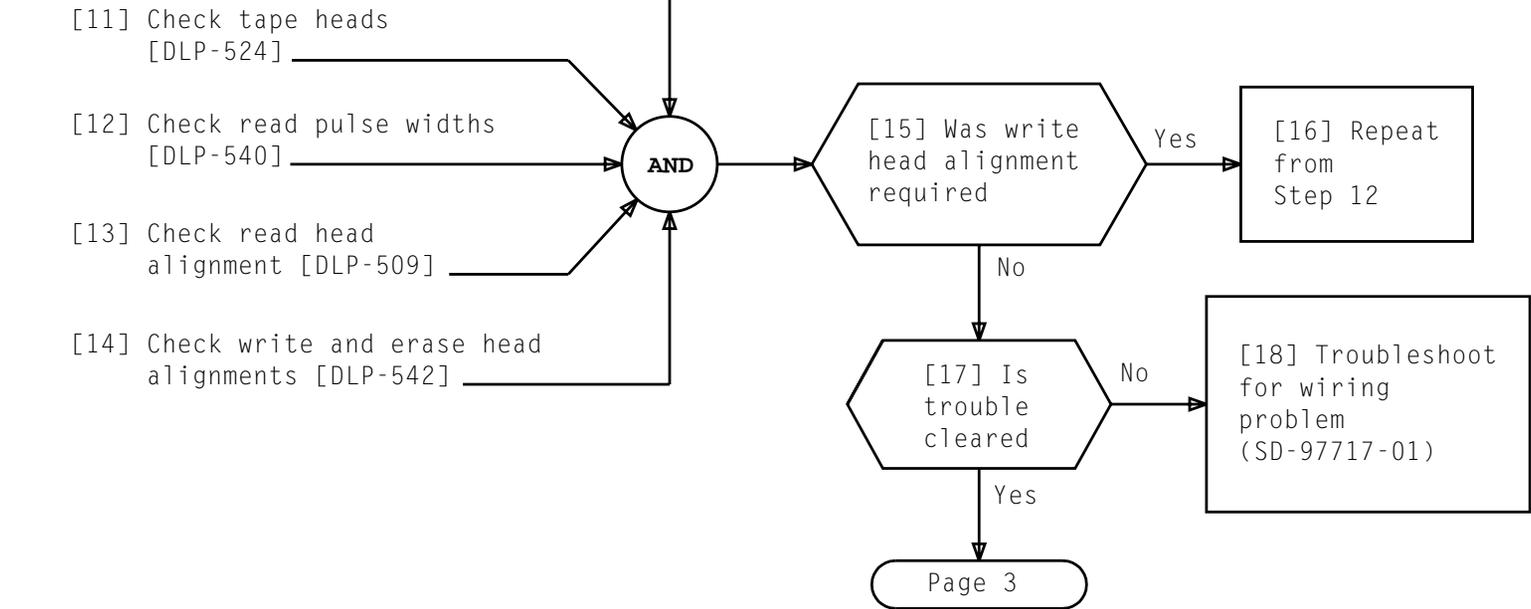
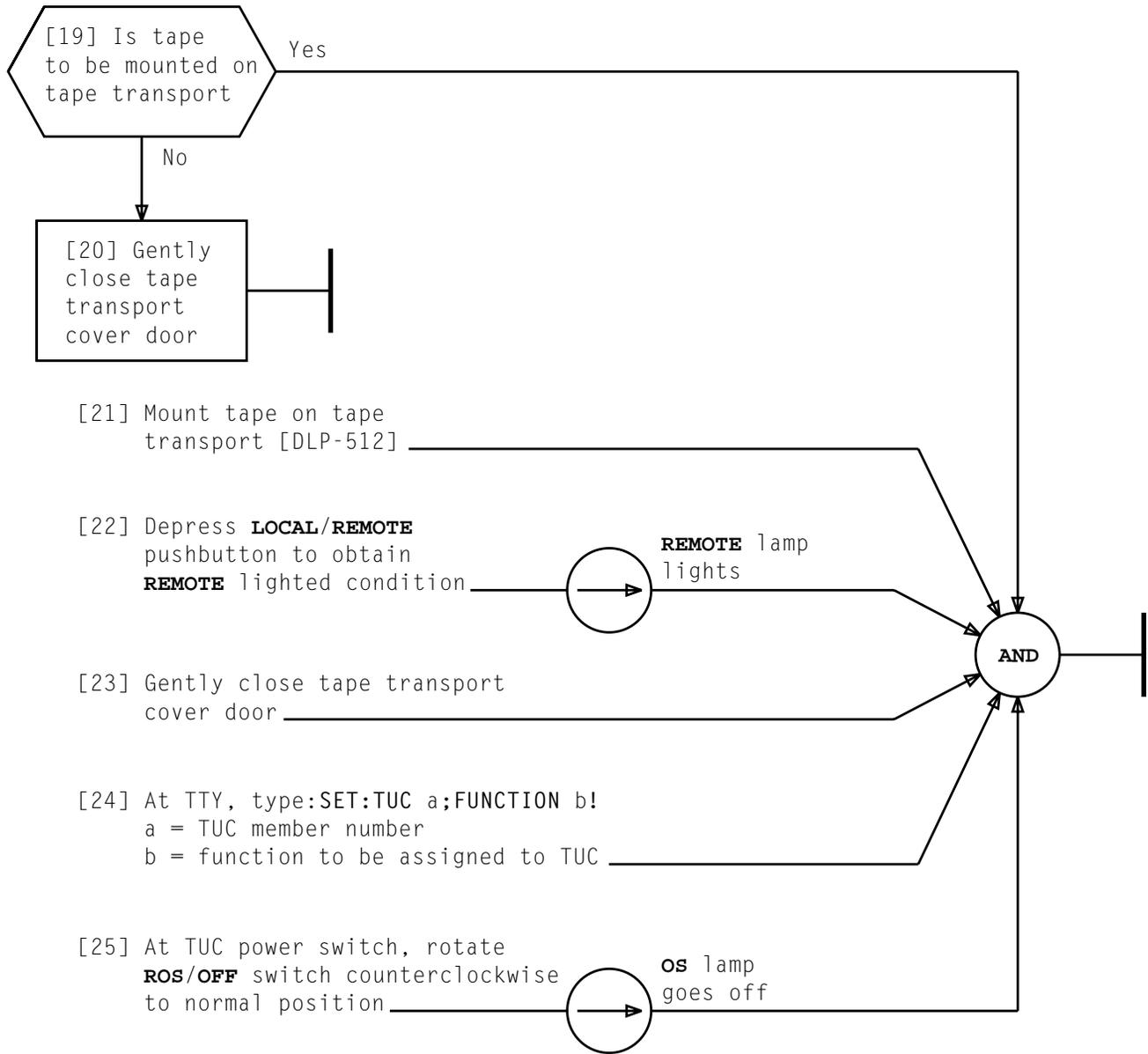


TABLE A			
COMMON NAME	PART NUMBER	COMMON NAME	PART NUMBER
TEKTRONIX oscilloscope	2232 or equivalent	Card extender	826A or 826B
		Magnifier lamp	KS-21808
Test pack	Skew Alignment Tool 814A	Twill cloth (white, 9-inch)	KS-2423
		Cleaner solvent	KS-20406,L1
Alignment tape	KS-20315,L1	Vacuum cleaner	KS-14377,L5
Blank tape	-	Flexible nozzle	KS-14377,L3
Write enable ring	-		



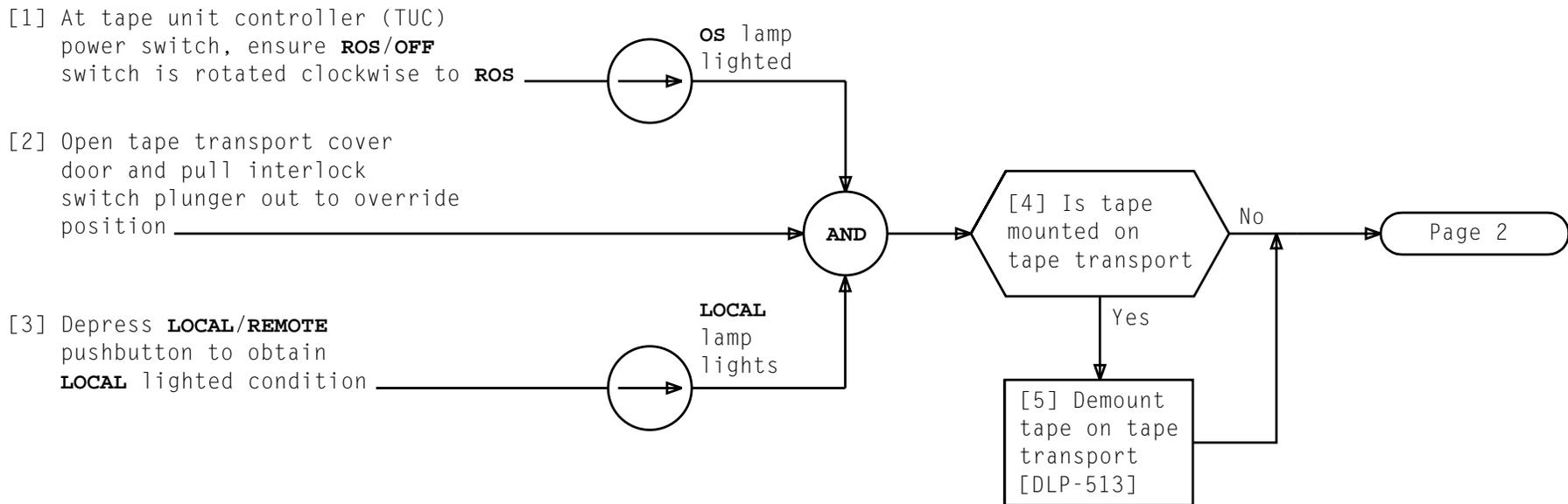
CLEAR READ, WRITE, OR ERASE HEAD FAULT

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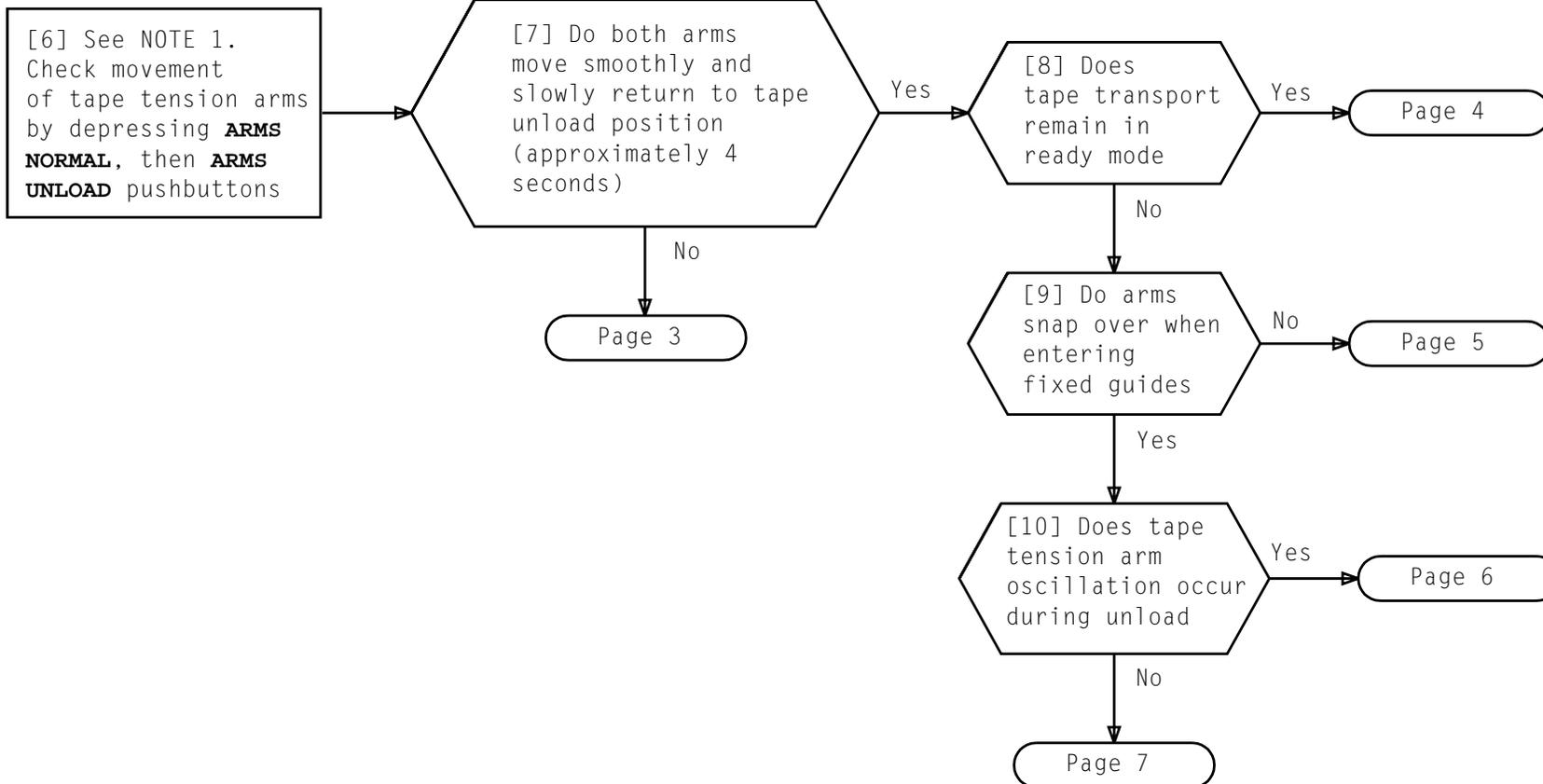
CLEAR READ, WRITE, OR ERASE HEAD FAULT

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CLEAR TAPE UNLOAD FAULT

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NOTE 1	
It may be necessary to prevent travel of tape tension arms to tape break position	
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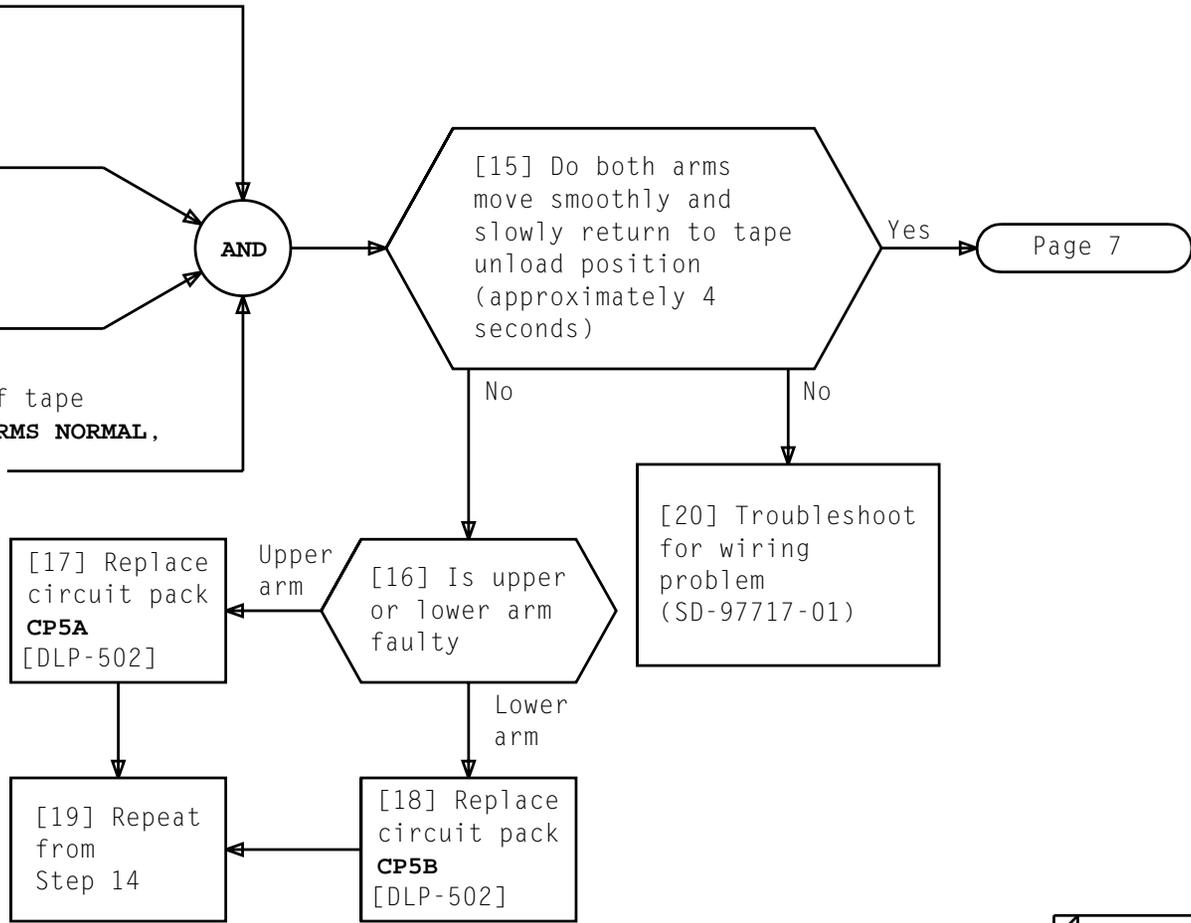
CLEAR TAPE UNLOAD FAULT

[11] See WARNING 1. At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**

[12] At DC-to-DC converter fuse panel, check all fuses and replace as necessary

[13] At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door

[14] See NOTE 2. Check movement of tape tension arms by depressing **ARMS NORMAL**, then **ARMS UNLOAD** pushbuttons



WARNING 1
When DC-to-DC converter is turned off, tape reel motors spins uncontrolled

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CLEAR TAPE UNLOAD FAULT

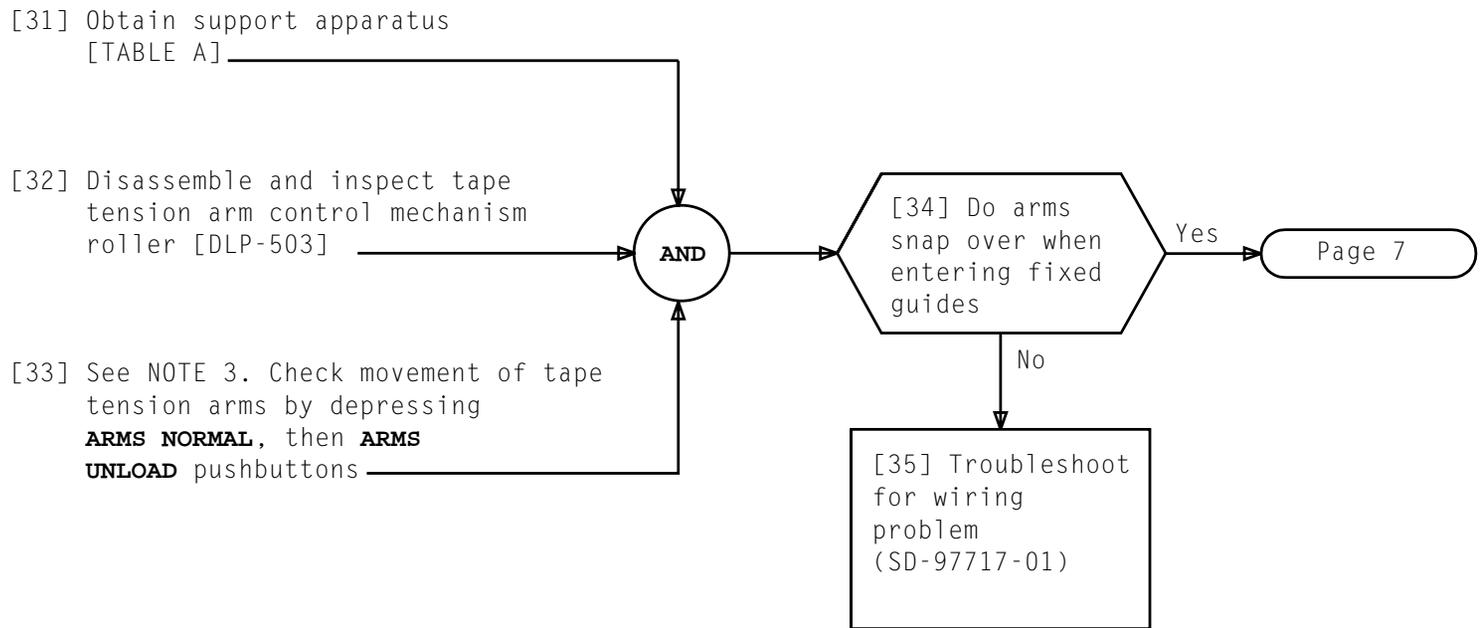
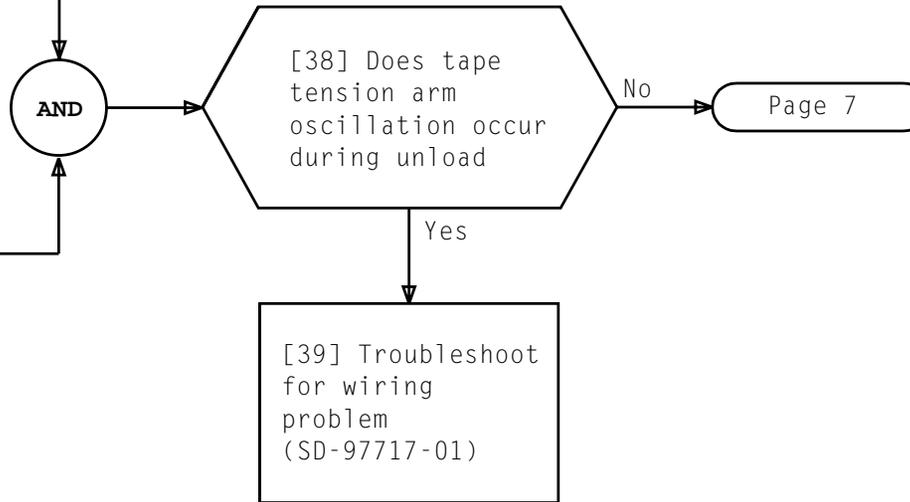


TABLE A	
COMMON NAME	PART NUMBER
Twill cloth	KS-2423
Cleaner solvent	KS-20406,L1

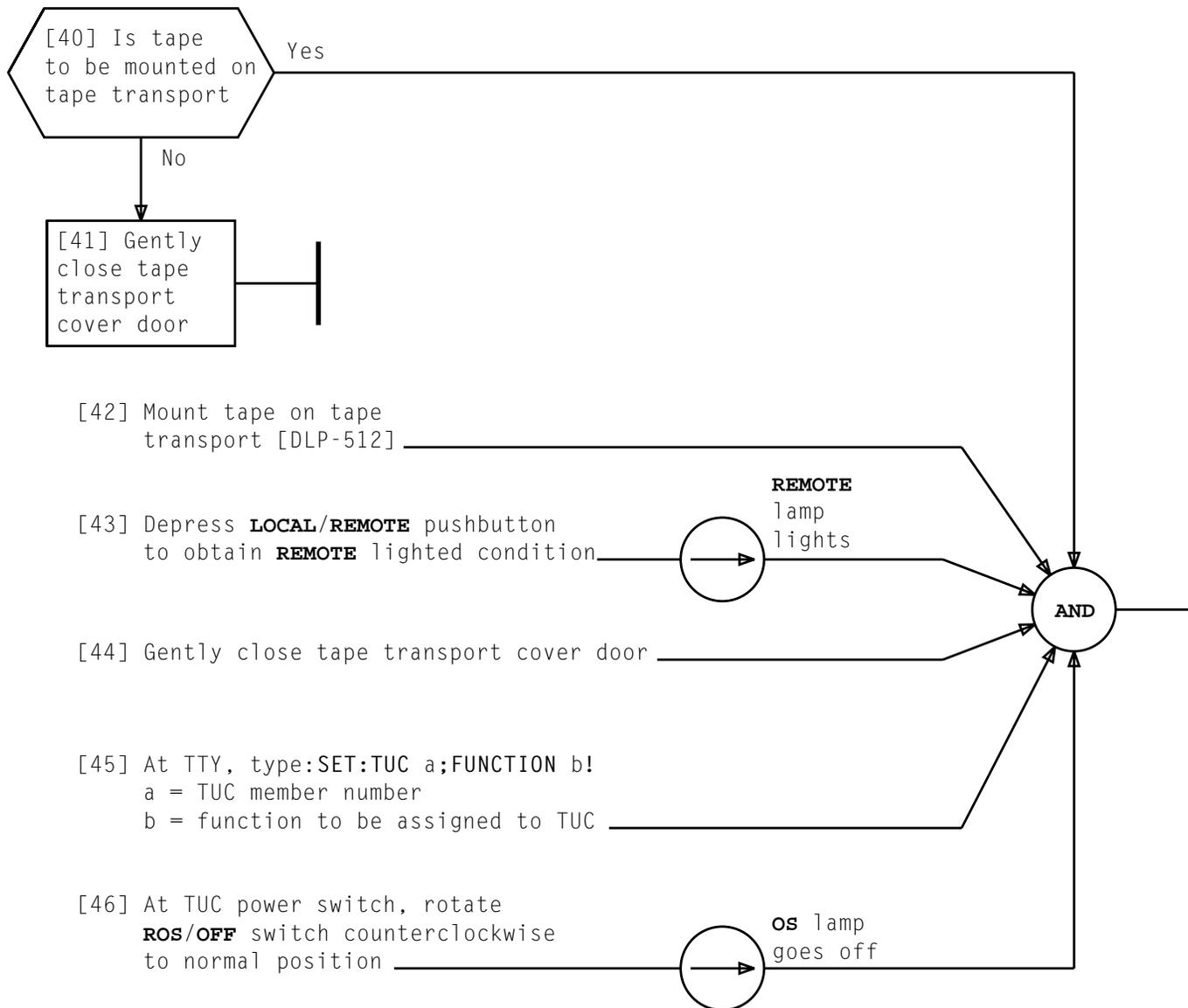
[36] Replace circuit pack **CP12**
[DLP-502]

[37] See NOTE 3. Check movement of tape
tension arms by depressing
ARMS NORMAL, then **ARMS**
UNLOAD pushbuttons



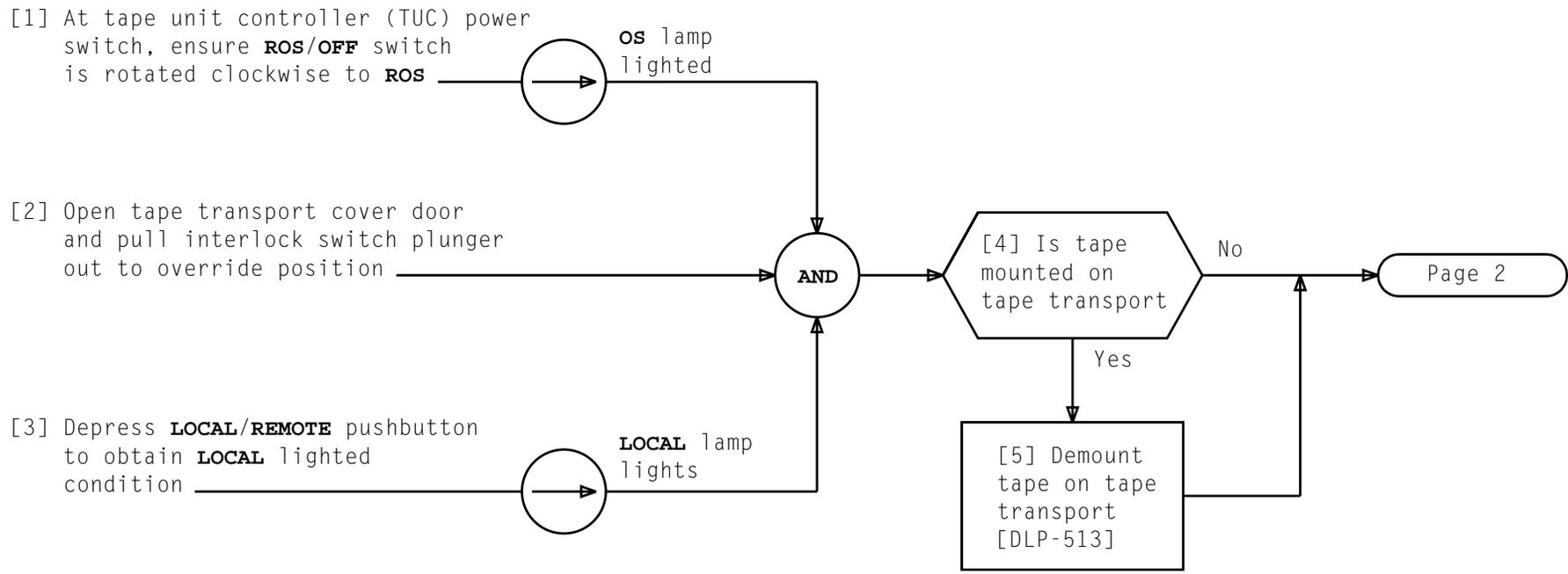
CLEAR TAPE UNLOAD FAULT

NOTE 3	
It may be necessary to prevent travel of tape tension arms to tape break position	
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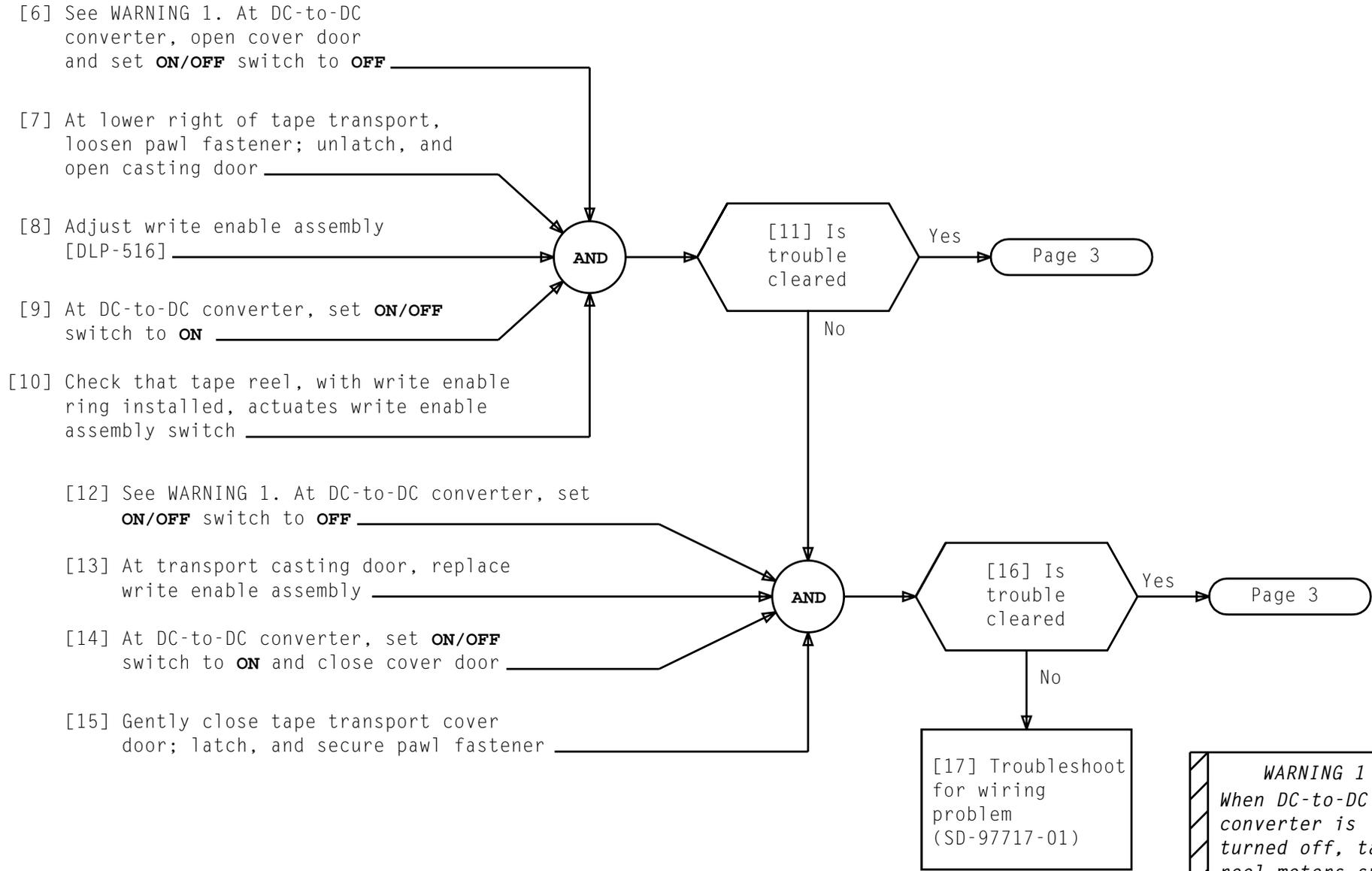
CLEAR TAPE UNLOAD FAULT

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CLEAR WRITE ENABLE RING SENSING FAULT

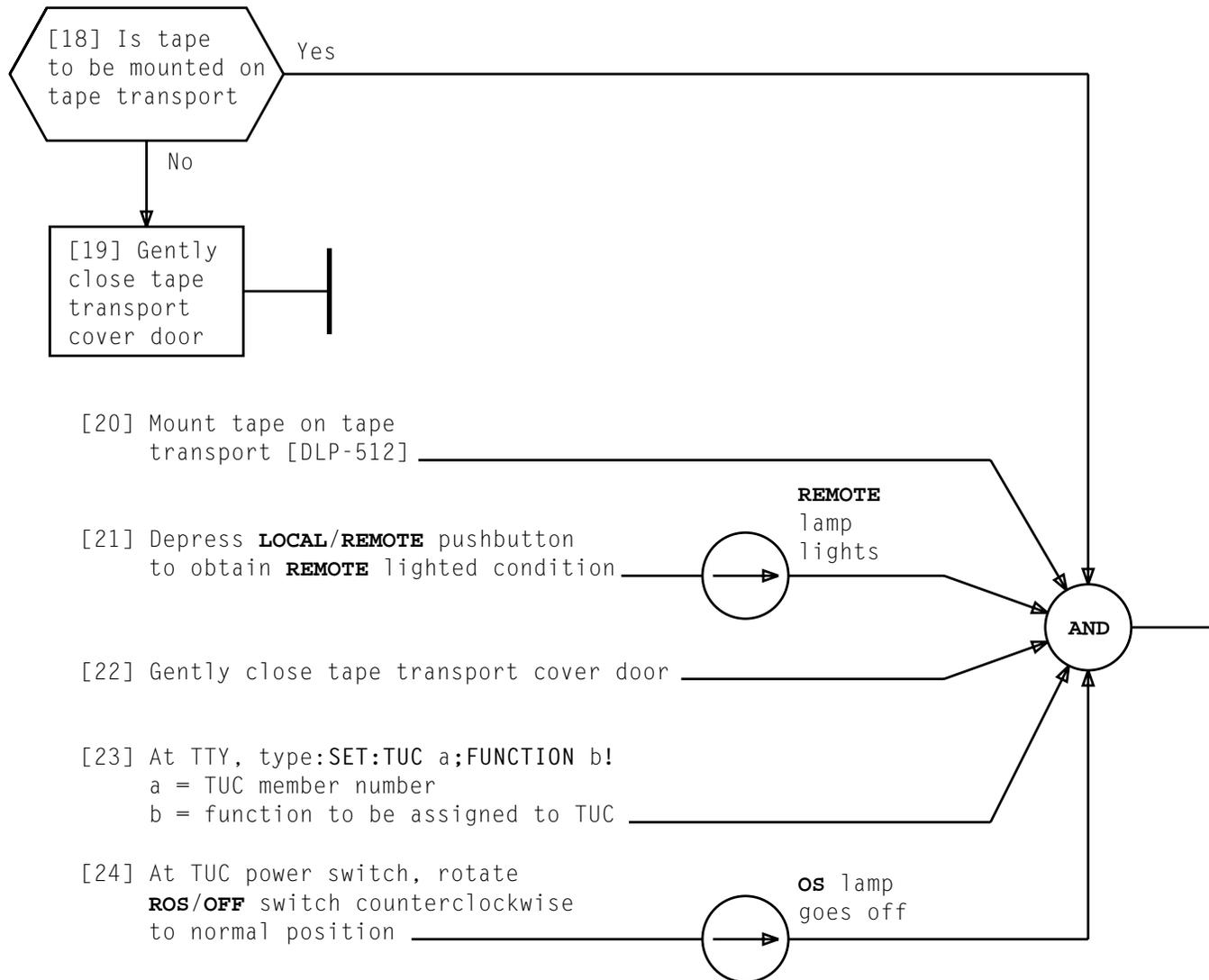
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CLEAR WRITE ENABLE RING SENSING FAULT

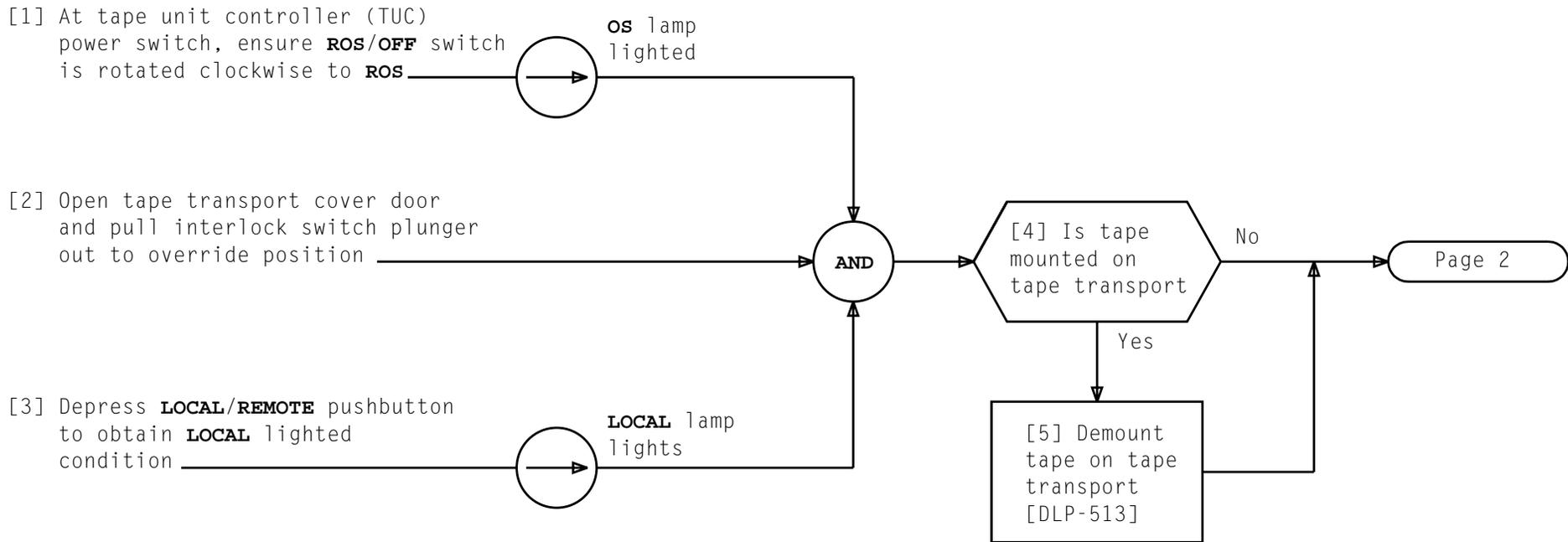
WARNING 1
When DC-to-DC converter is turned off, tape reel motors spin uncontrolled

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CLEAR WRITE ENABLE RING SENSING FAULT

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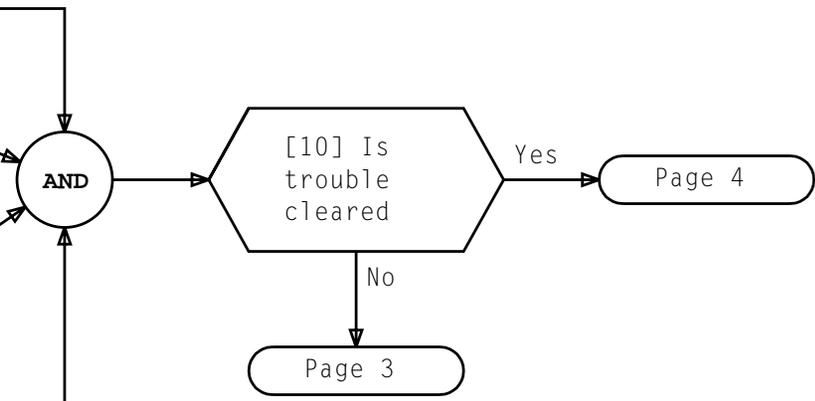


[6] See WARNING 1. Ensure that all tape guides and tape tension arms are not bent or deformed, are normally secure, and rotate freely in both directions. Repair or replace damaged components if necessary

[7] Mount blank tape on tape transport [DLP-512]

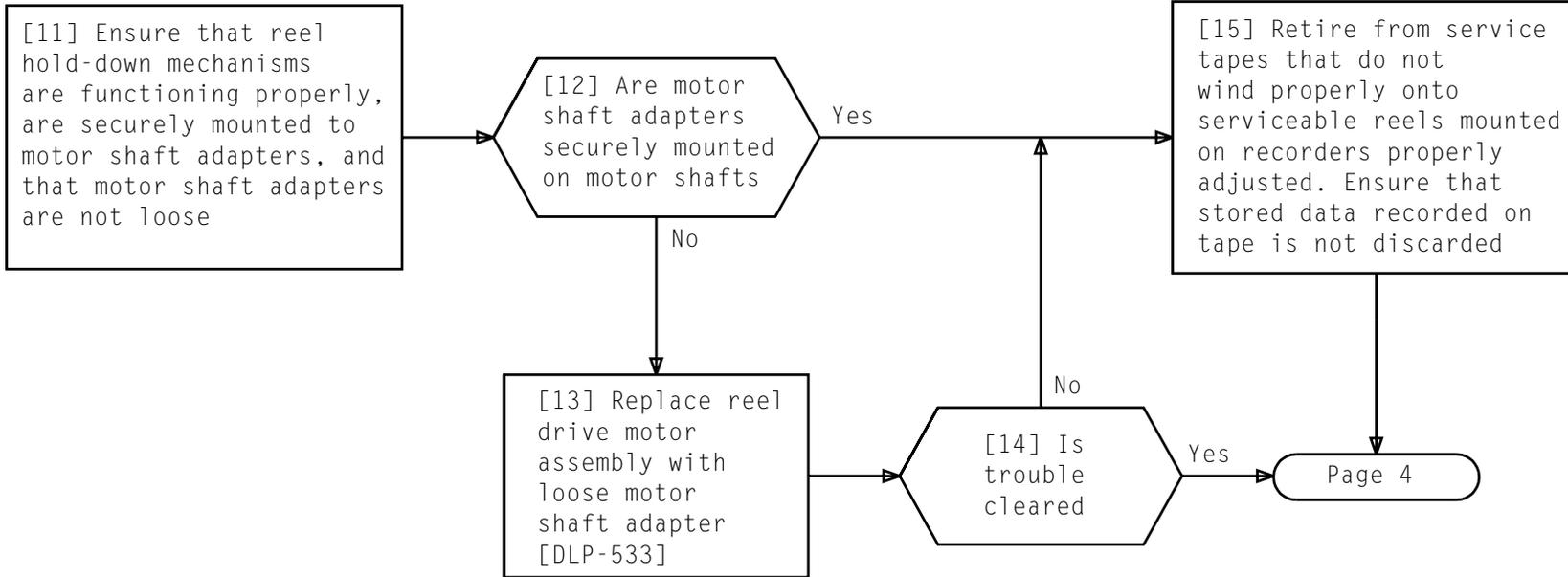
[8] Observe tape reels during fast forward and rewind operation. Replace damaged or deformed tape reels if necessary

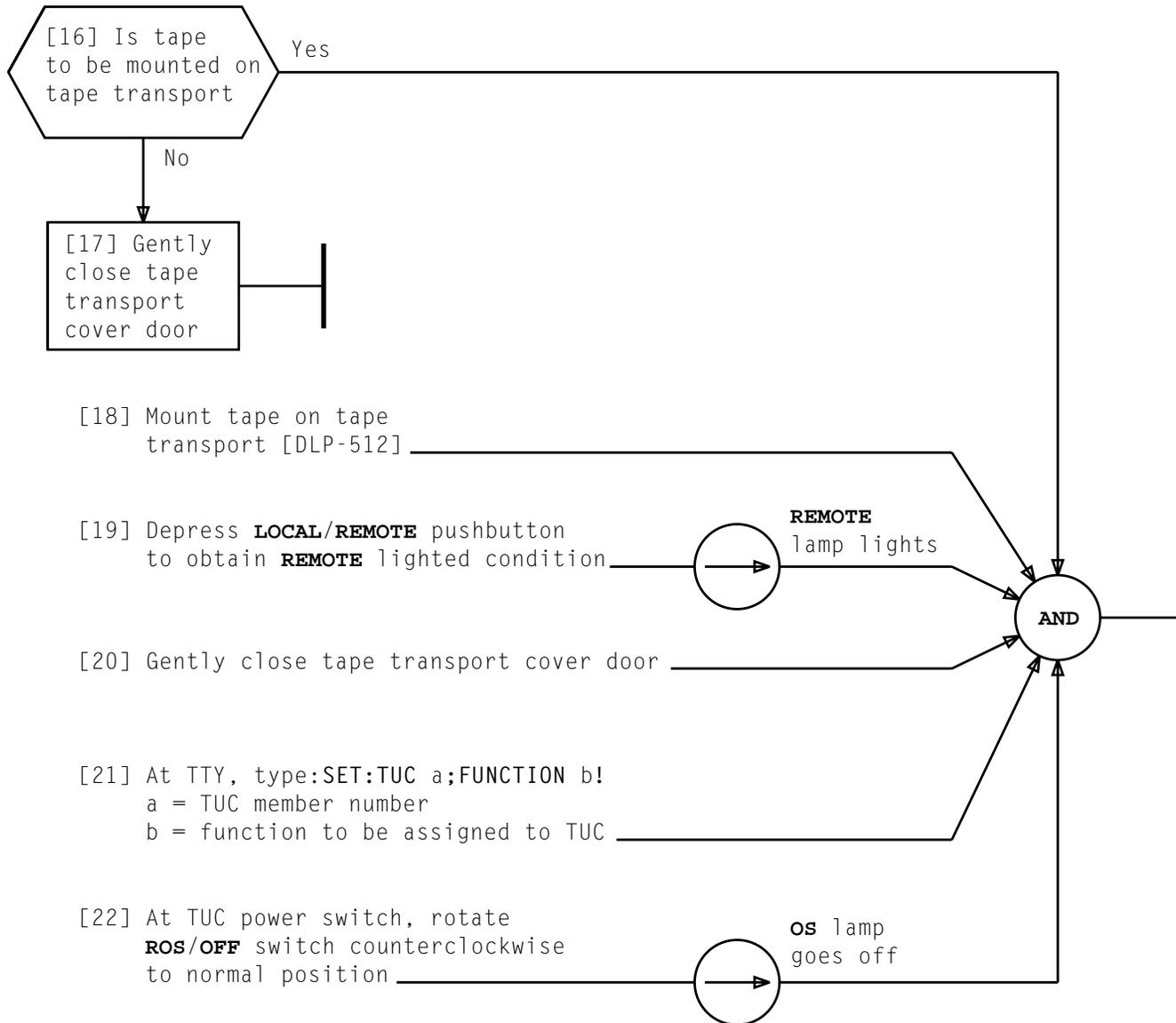
[9] Demount blank tape on tape transport [DLP-513]



*WARNING 1
Do not touch surfaces that come in contact with tape. Body oil contaminates polyester base magnetic tape*

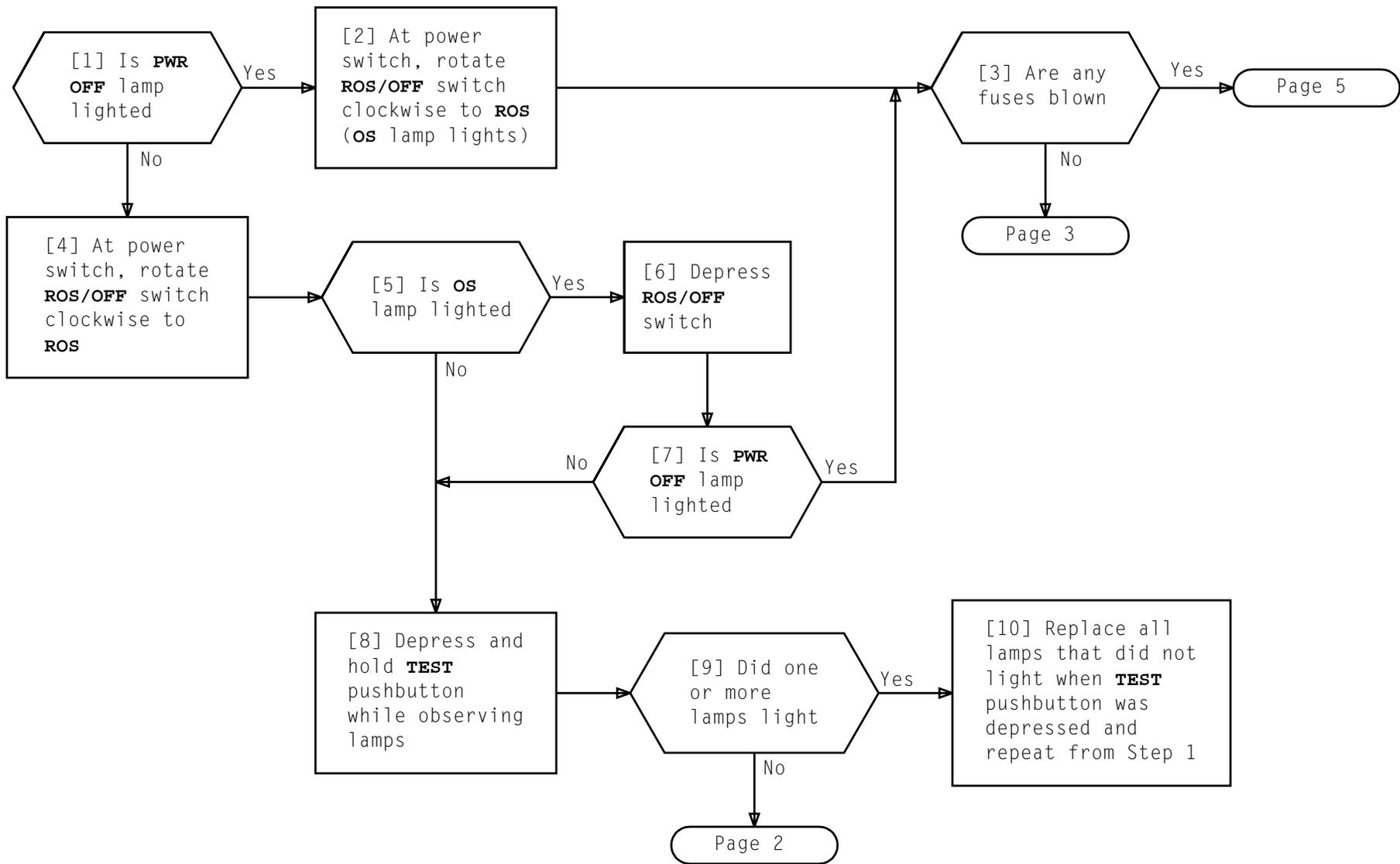
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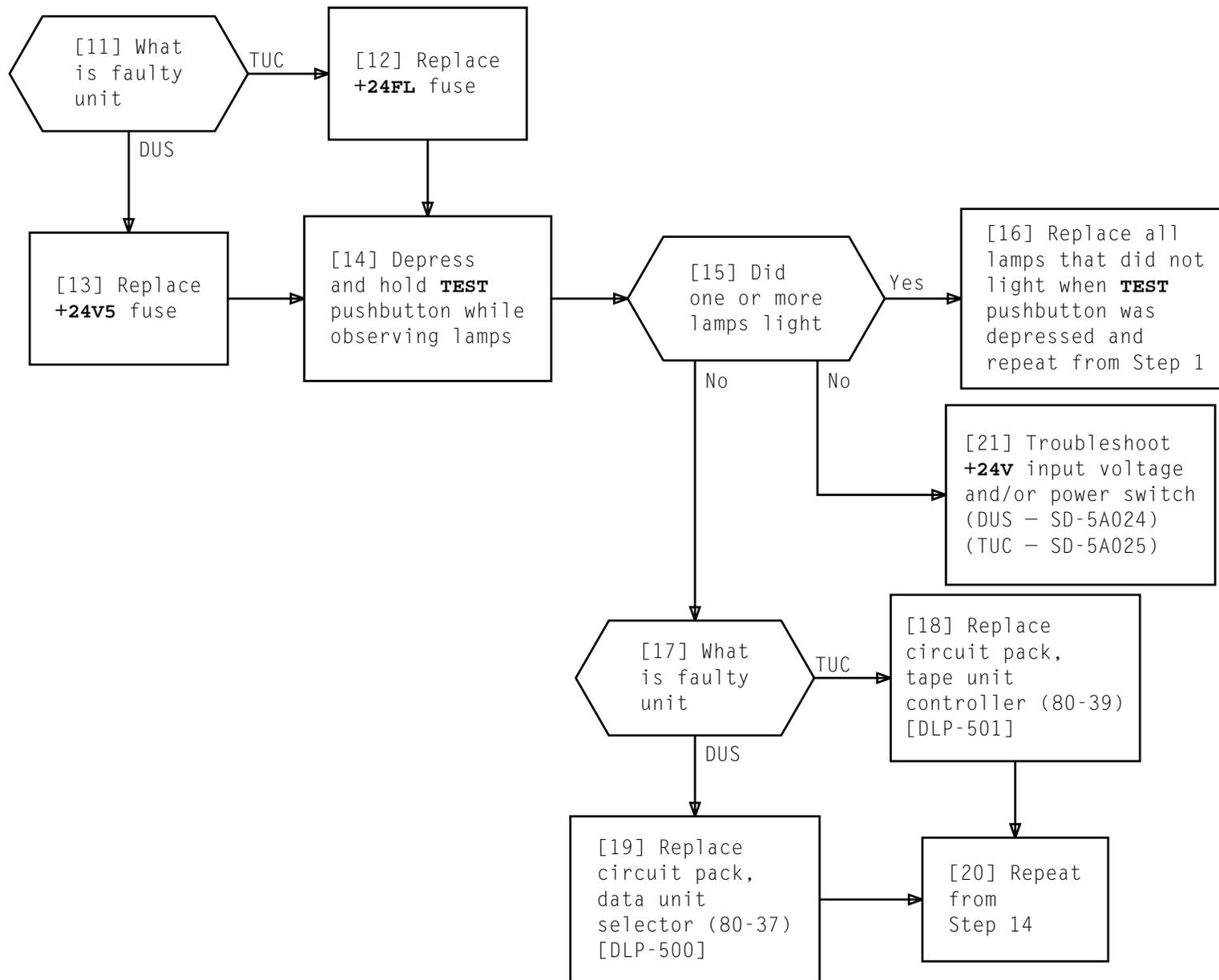
CLEAR MAGNETIC TAPE PACK PROBLEM

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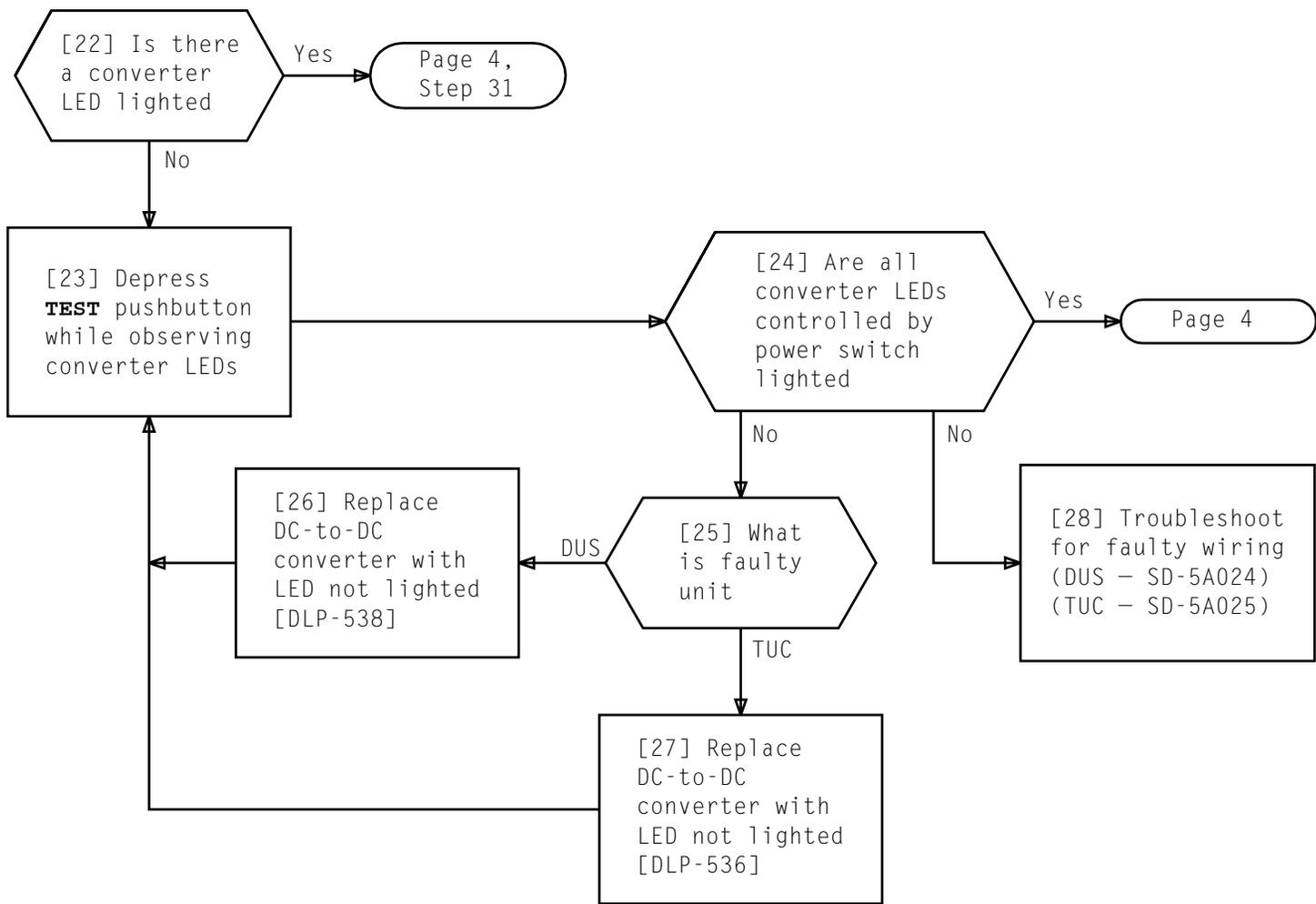


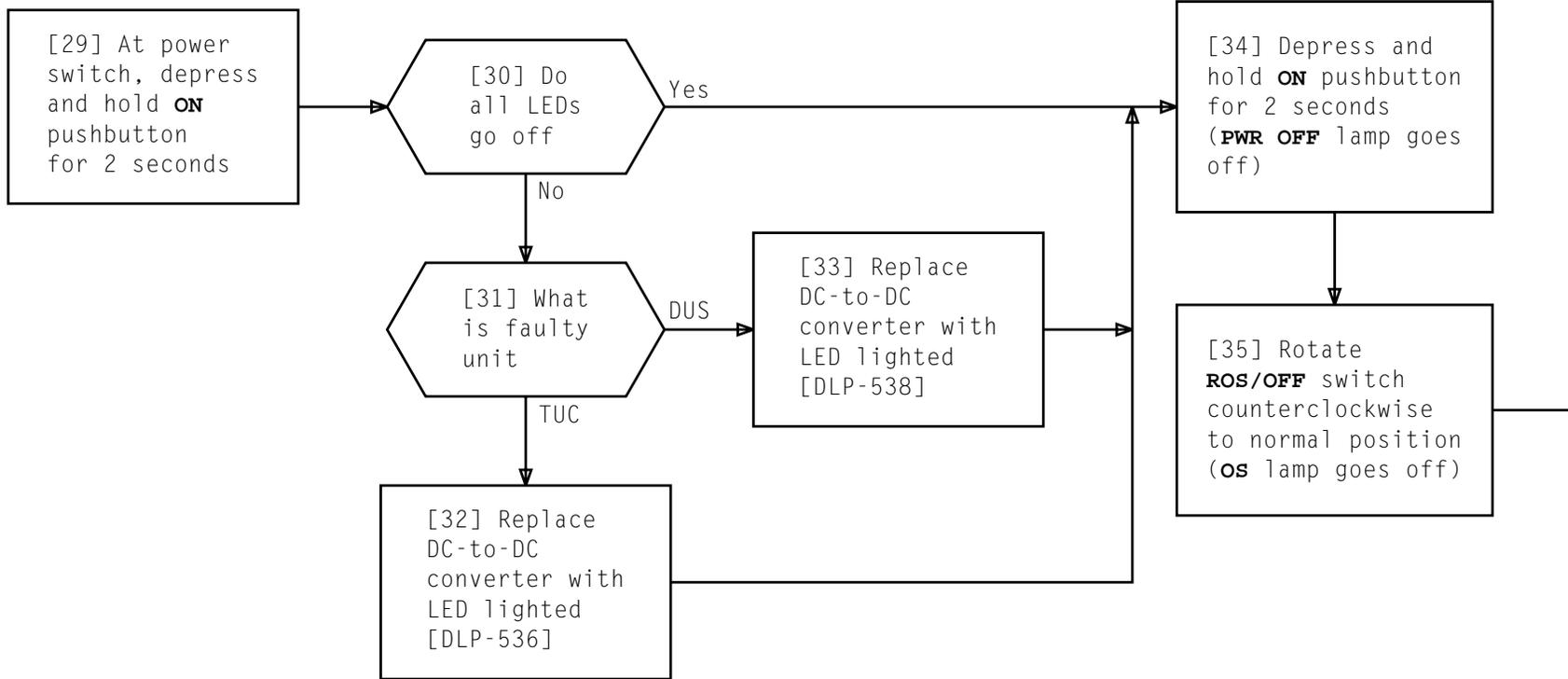
CLEAR POWER PROBLEM — DATA UNIT SELECTOR/TAPE UNIT CONTROLLER

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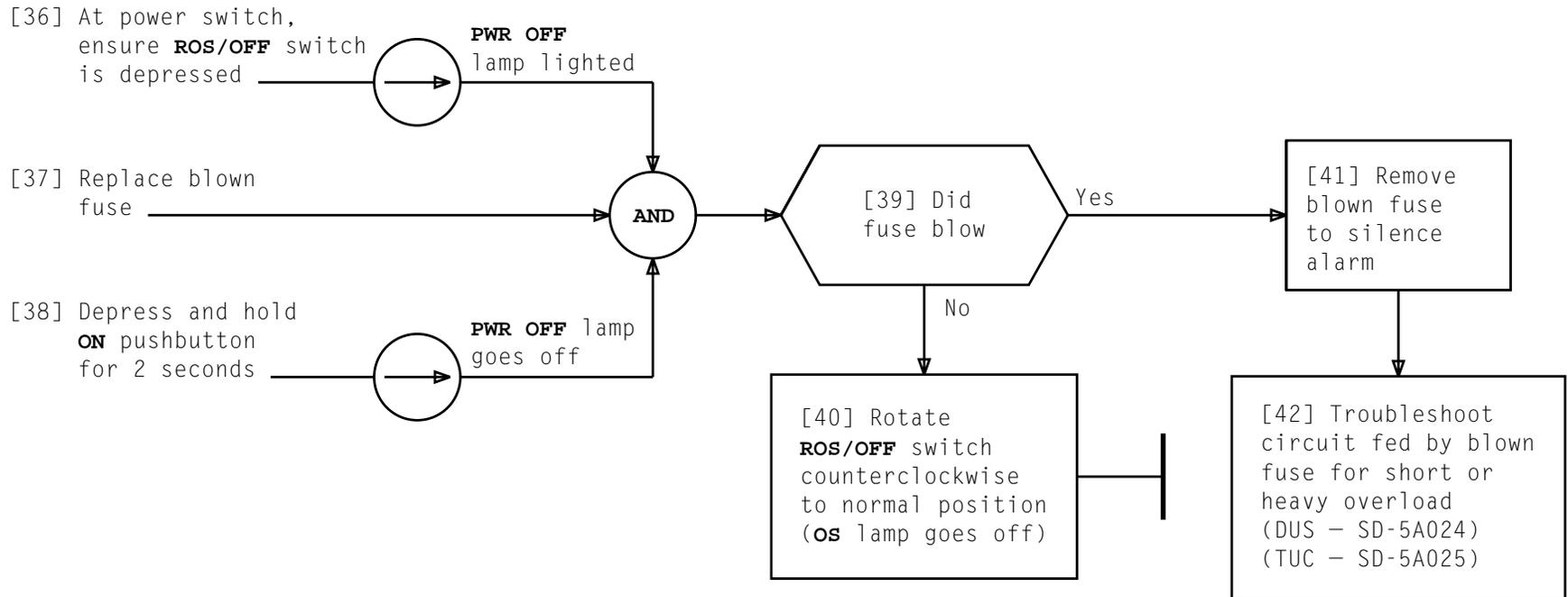


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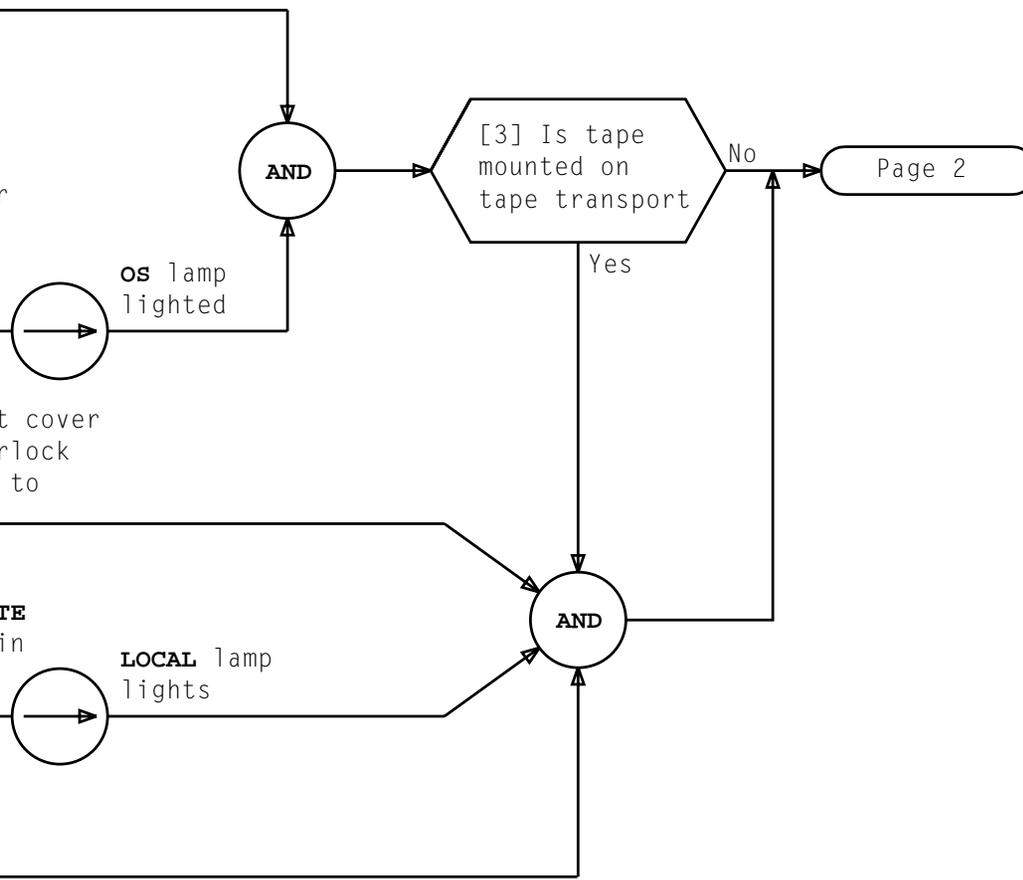
[1] Obtain 8000A fluke digital voltmeter or equivalent

[2] At tape unit controller (TUC) power switch, ensure **ROS/OFF** switch is rotated clockwise to **ROS**

[4] Open tape transport cover door and pull interlock switch plunger out to override position

[5] Depress **LOCAL/REMOTE** pushbutton to obtain **LOCAL** lighted condition

[6] Demount tape on tape transport [DLP-513]

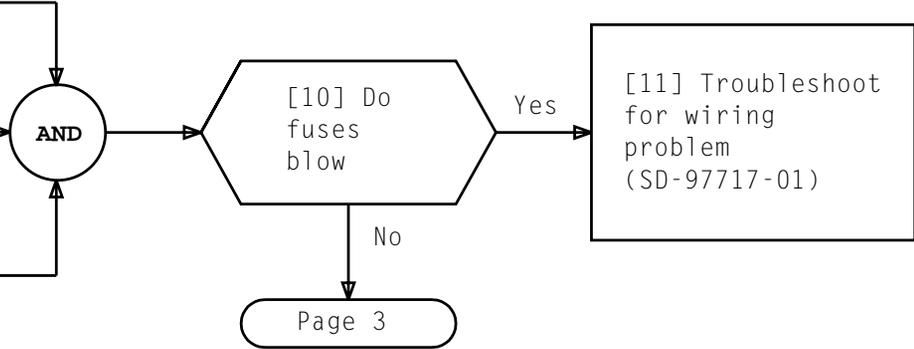


At DC-to-DC converter:

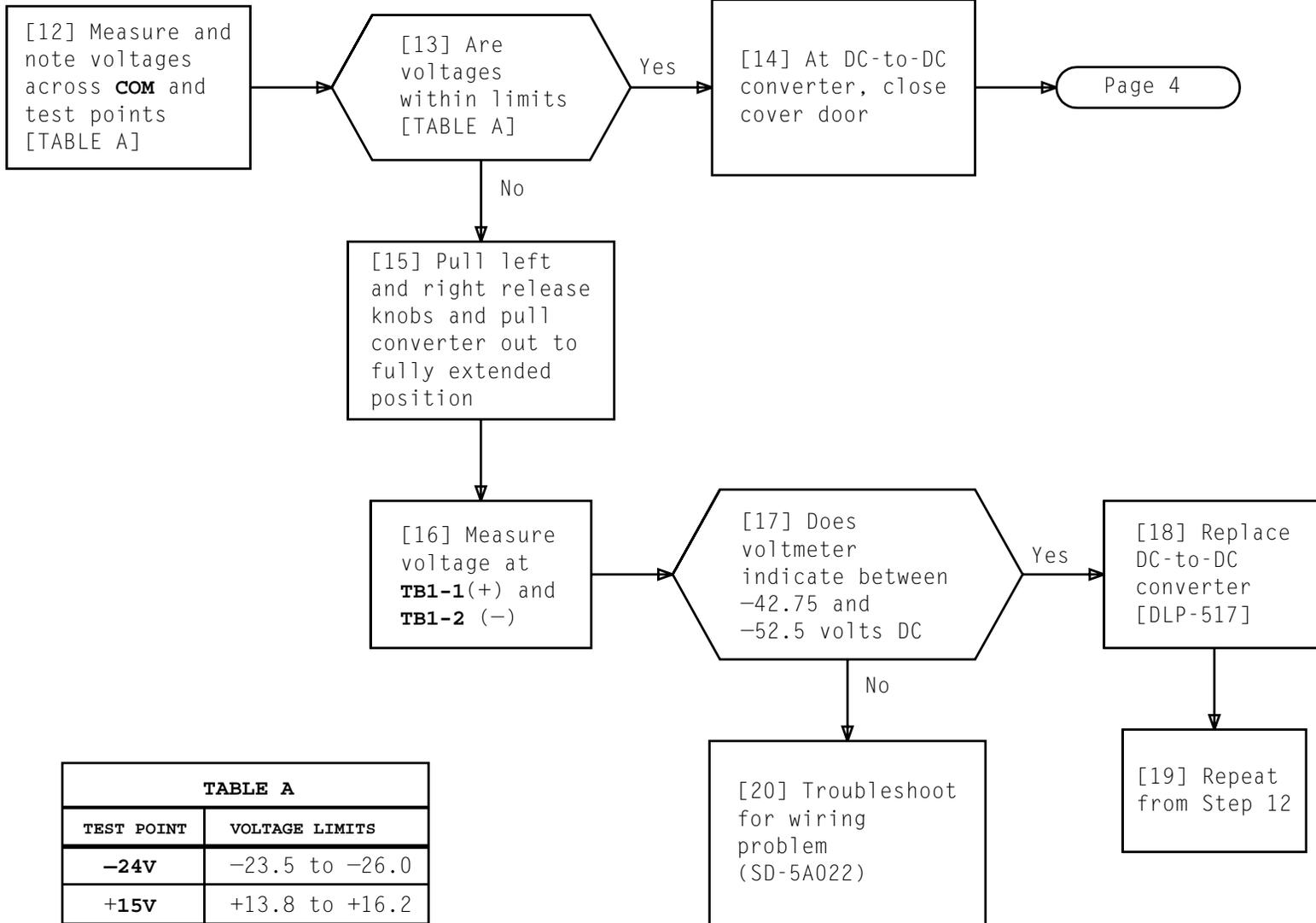
[7] See WARNING 1. Open cover door and set **ON/OFF** switch to **OFF**

[8] Check fuses and replace any that have blown

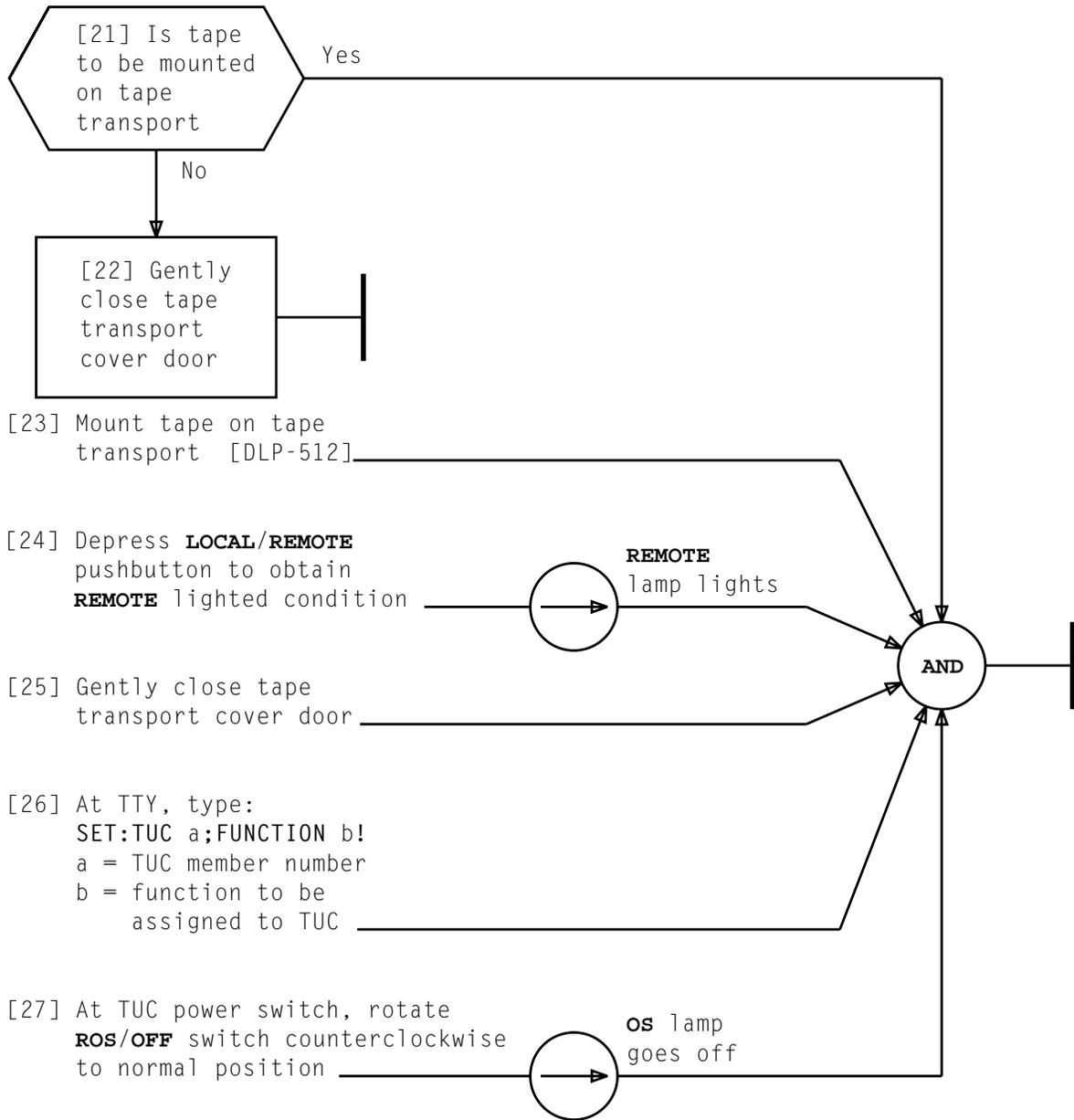
[9] Set **ON/OFF** switch to **ON**



<i>WARNING 1</i> <i>When DC-to-DC converter is turned off, tape reel motors spins uncontrolled</i>	
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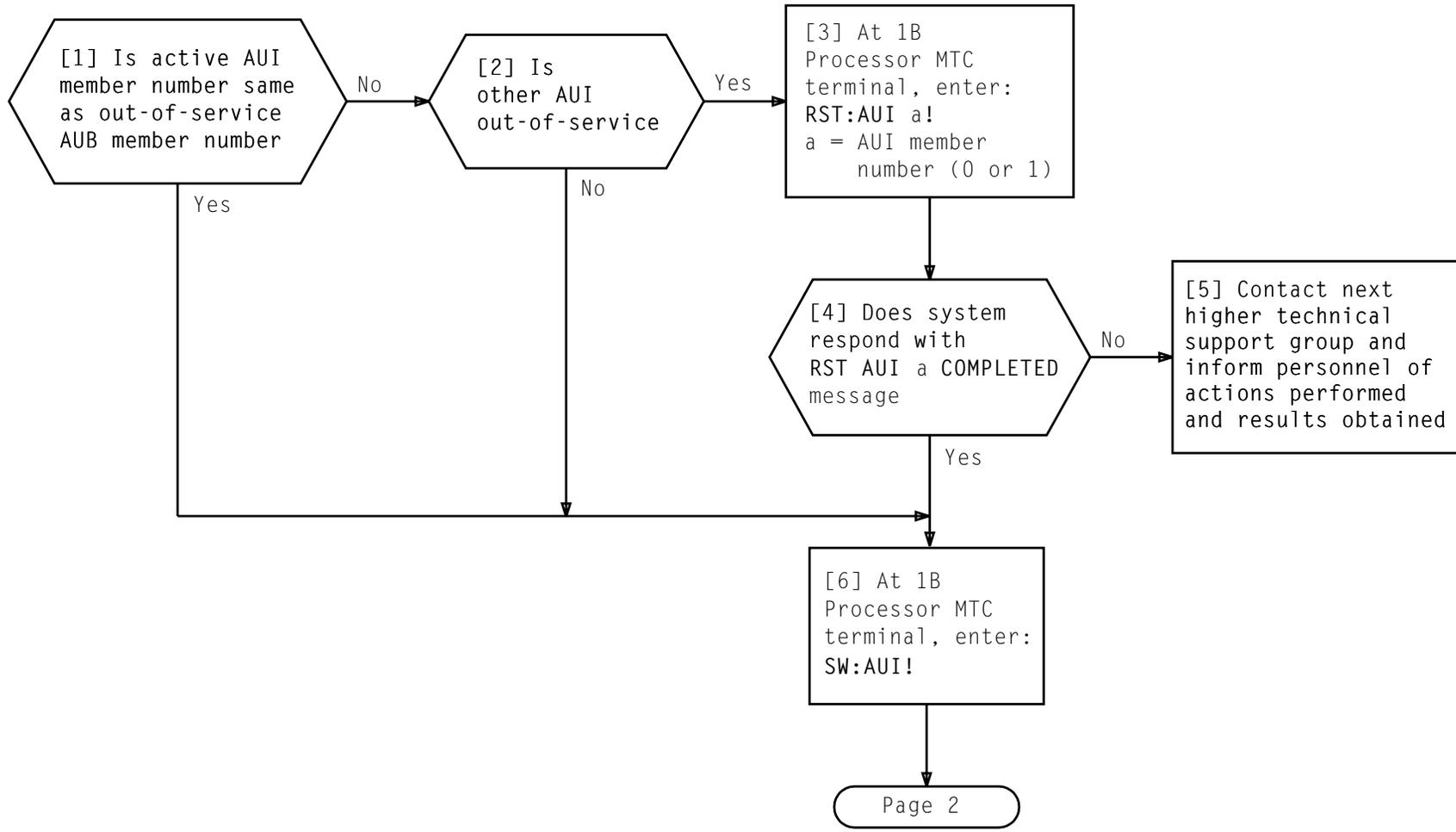


TEST POINT	VOLTAGE LIMITS
-24V	-23.5 to -26.0
+15V	+13.8 to +16.2
+5V	+4.8 to +5.8
-15V	-13.8 to -16.2



CLEAR DC-TO-DC CONVERTER FAULT – TAPE TRANSPORT

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[7] At 1B Processor MTC terminal,
 enter: DGN:AUB a!
 a = AUB failing
 diagnostics (0 or 1)

System responds
 with printout of
 failing AUB diagnostic
 raw data

[8] Using printout of failing diagnostic
 raw data [Figure 1, Page 3], identify
 all failing phases

[9] Translate each failing phase to
 affected auxiliary unit bus [TABLE A]

[10] Identify auxiliary unit associated
 with first failing phase [TABLE A]

[11] Convert mismatch data for first
 failing test to binary and identify
 failing bits (bits set to one)
 [Figure 2, Page 4]

[12] Identify circuit pack letter codes
 associated with failing test and
 associated failing bits
 (bits set to one) [TABLE B, Page 5]

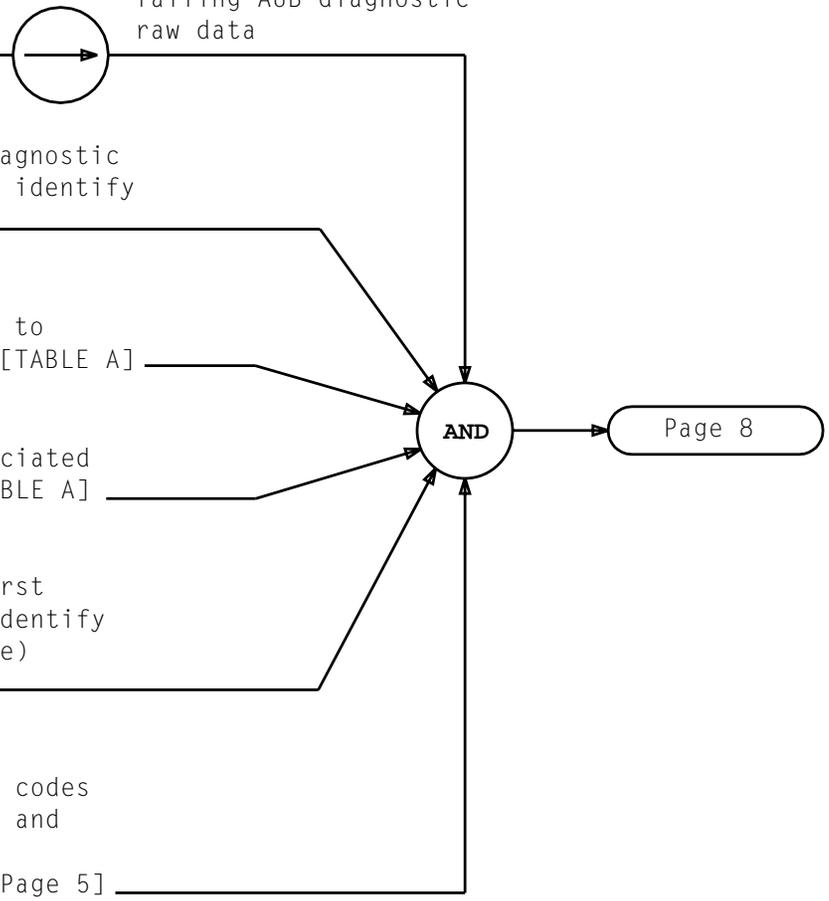


TABLE A PHASES ASSOCIATED WITH AUXILIARY UNITS AND AUXILIARY UNIT BUSES		
PHASE NUMBER	AUXILIARY UNIT	AUXILIARY UNIT BUS
11	API0	0
17	DUS0	0
31	API1	1
37	DUS1	1

**CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY ANALYZING
 RAW DATA**

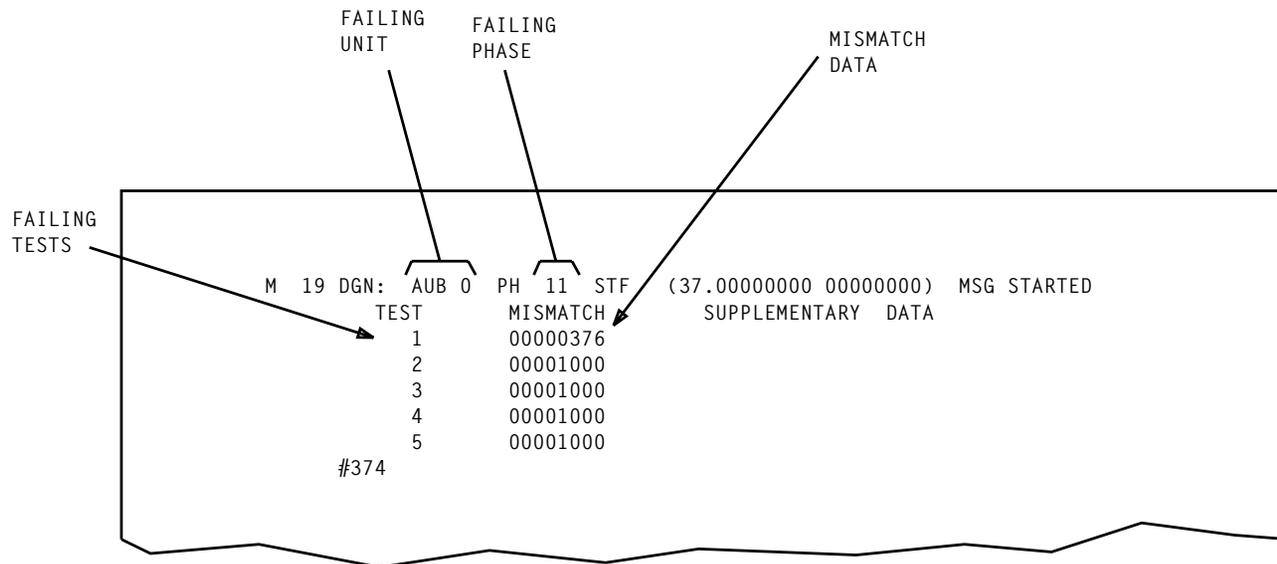


Figure 1- Sample Printout of Failing Diagnostic Raw Data

CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY ANALYZING RAW DATA

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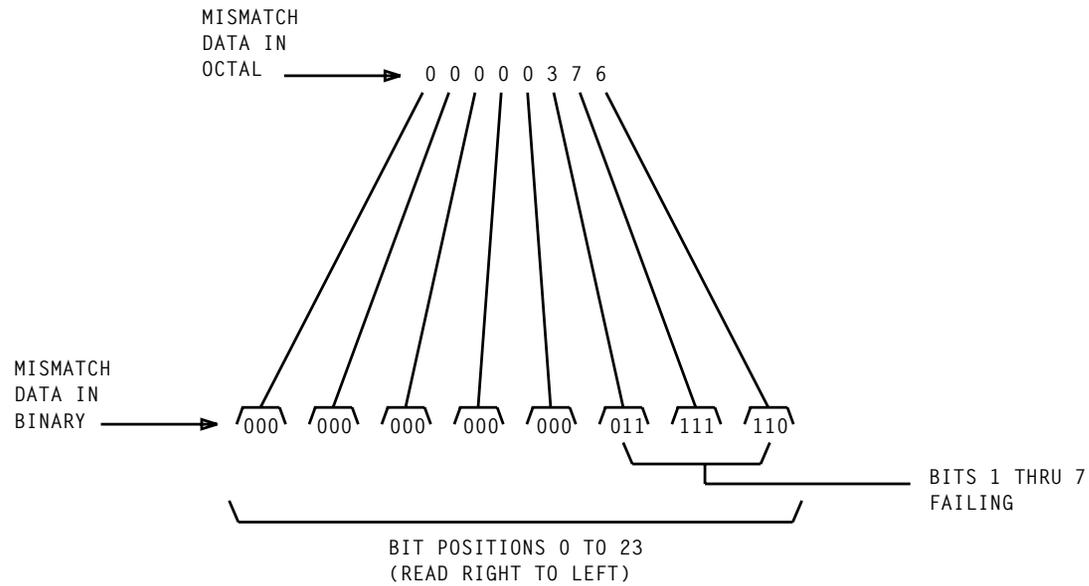


Figure 2 - Example of Mismatch Data Octal To Binary Conversion

TABLE B
CIRCUIT PACK LETTER CODES ASSOCIATED WITH DIAGNOSTIC TEST AND FAILING BITS

TEST NUMBER	CIRCUIT PACK LETTER CODES ASSOCIATED WITH FAILING BITS					BUS GROUP	TEST NUMBER	CIRCUIT PACK LETTER CODES ASSOCIATED WITH FAILING BITS					BUS GROUP	TEST NUMBER	CIRCUIT PACK LETTER CODES ASSOCIATED WITH FAILING BITS				BUS GROUP
	21	20	19	18	6			21	20	19	18	6			7	17	22	23	
000	C	ABC	A	A	-	ADDRESS	029	ABC	B	A	A	-	ADDRESS	057	-	B	DEFG	G	WRITE
001	↓	↓	↓	↓	↓	↓	030	↓	↓	↓	↓	↓	064	↓	↓	↓	↓	↓	↓
002	↓	↓	↓	↓	↓	↓	031	↓	↓	↓	↓	↓	065	↓	↓	↓	↓	↓	↓
003	↓	↓	↓	↓	↓	↓	032	↓	↓	↓	↓	↓	072	↓	↓	↓	↓	↓	↓
004	↓	↓	↓	↓	↓	↓	033	↓	↓	↓	↓	↓	073	↓	↓	↓	↓	↓	↓
005	↓	↓	↓	↓	↓	↓	034	↓	↓	↓	↓	↓	080	↓	↓	↓	↓	↓	↓
006	↓	↓	↓	↓	↓	↓	035	↓	↓	↓	↓	↓	081	↓	↓	↓	↓	↓	↓
007	C	↓	↓	↓	↓	↓	036	ABC	B	↓	↓	↓	082	↓	↓	↓	↓	↓	↓
008	B	↓	↓	↓	↓	↓	037	BC	A	↓	↓	↓	083	↓	↓	↓	↓	↓	↓
009	↓	↓	↓	↓	↓	↓	038	↓	↓	↓	↓	↓	084	↓	↓	↓	↓	↓	↓
010	↓	↓	↓	↓	↓	↓	039	BC	↓	↓	↓	↓	091	↓	↓	↓	↓	↓	↓
011	↓	↓	↓	↓	↓	↓	040	ABC	A	↓	↓	↓	092	↓	↓	↓	↓	↓	↓
012	↓	↓	↓	↓	↓	↓	041	AC	BC	↓	↓	↓	099	↓	↓	↓	↓	↓	↓
013	↓	↓	↓	↓	↓	↓	042	↓	↓	↓	↓	↓	100	↓	↓	↓	↓	↓	↓
014	↓	↓	↓	↓	↓	↓	043	↓	↓	↓	↓	↓	107	↓	↓	↓	↓	↓	↓
015	B	ABC	↓	↓	↓	↓	044	↓	↓	↓	↓	↓	108	↓	↓	↓	↓	↓	↓
016	A	BC	↓	↓	↓	↓	045	↓	↓	↓	↓	↓	109	↓	↓	↓	↓	↓	↓
017	ABC	ABC	↓	↓	↓	↓	046	↓	↓	↓	↓	↓	110	↓	↓	↓	↓	↓	↓
018	↓	↓	↓	↓	↓	↓	047	↓	↓	↓	↓	↓	111	↓	↓	↓	↓	↓	↓
019	↓	↓	↓	↓	↓	↓	048	AC	↓	↓	↓	↓	118	↓	↓	↓	↓	↓	↓
020	↓	ABC	↓	↓	↓	↓	049	AB	↓	↓	↓	↓	119	↓	↓	↓	↓	↓	↓
021	↓	C	↓	↓	↓	↓	050	↓	↓	↓	↓	↓	126	↓	↓	↓	↓	↓	↓
022	↓	↓	↓	↓	↓	↓	051	↓	↓	↓	↓	↓	127	↓	↓	↓	↓	↓	↓
023	↓	↓	↓	↓	↓	↓	052	↓	↓	↓	↓	↓	134	↓	↓	↓	↓	↓	↓
024	↓	↓	↓	↓	↓	↓	053	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
025	↓	↓	↓	↓	↓	↓	054	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
026	↓	↓	↓	↓	↓	↓	055	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
027	↓	↓	↓	↓	↓	↓	056	AB	BC	A	A	A	ADDRESS	↓	↓	↓	↓	↓	↓
028	ABC	C	A	A	-	ADDRESS								-	B	DEFG	E	WRITE	

CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY ANALYZING RAW DATA

TABLE B (Contd)
CIRCUIT PACK LETTER CODES ASSOCIATED WITH DIAGNOSTIC TEST AND FAILING BITS

TEST NUMBER	CIRCUIT PACK LETTER CODES ASSOCIATED WITH FAILING BITS				BUS GROUP	ODD TEST NUMBER	CIRCUIT PACK LETTER CODES ASSOCIATED WITH FAILING BITS			BUS GROUP	EVEN TEST NUMBER	CIRCUIT PACK LETTER CODES ASSOCIATED WITH FAILING BITS		BUS GROUP
	7	17	22	23			23-16	15-8	7-0			21	20	
135	-	B	DEFG	D	WRITE	189	J	K	L	REPLY	190	H	H	REPLY
136	↓	↓	↓	D	↓	191	↓	↓	↓	↓	192	↓	↓	↓
137	↓	↓	DEFG	DEFG	↓	193	↓	↓	↓	↓	194	↓	↓	↓
138	↓	↓	G	↓	↓	195	↓	↓	↓	↓	196	↓	↓	↓
↓	↓	↓	↓	↓	↓	197	↓	↓	↓	↓	198	↓	↓	↓
145	↓	↓	G	↓	↓	199	↓	↓	↓	↓	200	↓	↓	↓
146	↓	↓	F	↓	↓	201	↓	↓	↓	↓	202	↓	↓	↓
↓	↓	↓	↓	↓	↓	203	↓	↓	↓	↓	204	↓	↓	↓
153	↓	↓	F	↓	↓	205	↓	↓	↓	↓	206	↓	↓	↓
154	↓	↓	E	↓	↓	207	↓	↓	↓	↓	208	↓	↓	↓
↓	↓	↓	↓	↓	↓	209	↓	↓	↓	↓	210	↓	↓	↓
161	↓	↓	E	↓	↓	211	↓	↓	↓	↓	212	↓	↓	↓
162	↓	↓	D	↓	↓	213	↓	↓	↓	↓	214	↓	↓	↓
163	↓	↓	D	↓	↓	215	↓	↓	↓	↓	216	↓	↓	↓
164	-	↓	DEFG	DEFG	↓	217	↓	↓	↓	↓	218	↓	↓	↓
165	D	↓	↓	G	↓	219	↓	↓	↓	↓	220	↓	↓	↓
↓	↓	↓	↓	↓	↓	221	↓	↓	↓	↓	222	↓	↓	↓
172	↓	↓	↓	G	↓	223	↓	↓	↓	↓	224	↓	↓	↓
173	↓	↓	↓	F	↓	225	↓	↓	↓	↓	226	↓	↓	↓
↓	↓	↓	↓	↓	↓	227	↓	↓	↓	↓	228	↓	↓	↓
180	↓	↓	↓	F	↓	229	↓	↓	↓	↓	230	↓	↓	↓
181	↓	↓	↓	E	↓	231	↓	↓	↓	↓	232	↓	↓	↓
↓	↓	↓	↓	↓	↓	233	↓	↓	↓	↓	234	↓	↓	↓
188	D	B	DEFG	E	WRITE	235	↓	↓	↓	↓	236	↓	↓	↓
						237	↓	↓	↓	↓	238	↓	↓	↓
						239	↓	↓	↓	↓	240	↓	↓	↓
						241	↓	↓	↓	↓	242	↓	↓	↓
						243	J	K	L	REPLY	244	H	H	REPLY
						245	↓	↓	↓	↓	246	↓	↓	↓

CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY ANALYZING RAW DATA

TABLE B (Contd)
CIRCUIT PACK LETTER CODES ASSOCIATED WITH DIAGNOSTIC TEST AND FAILING BITS

TEST NUMBER	CIRCUIT PACK LETTER CODES ASSOCIATED WITH FAILING BITS	BUS GROUP	ODD TEST NUMBER	CIRCUIT PACK LETTER CODES ASSOCIATED WITH FAILING BITS			BUS GROUP	EVEN TEST NUMBER	CIRCUIT PACK LETTER CODES ASSOCIATED WITH FAILING BITS	BUS GROUP	TEST NUMBER	CIRCUIT PACK LETTER CODES ASSOCIATED WITH FAILING BITS	BUS GROUP
				21-16	15-8	7-0							
	0			0									
247	H	CONTROL	261	V	U	T	STORE ADDRESS	262	VW	STORE ADDRESS	313	X/Y (NOTE)	CONTROL
248	H	↓	263	↓	↓	↓	↓	264	↓	↓	314	↓	↓
249	M	↓	265	↓	↓	↓	↓	266	↓	↓	315	↓	↓
250	M	↓	267	↓	↓	↓	↓	268	↓	↓	316	↓	↓
251	NPQR	↓	269	↓	↓	↓	↓	270	↓	↓	317	X/Y (NOTE)	CONTROL
252	↓	↓	271	↓	↓	↓	↓	272	↓	↓	318	D	WRITE
253	↓	↓	273	↓	↓	↓	↓	274	↓	↓	319	D	WRITE
254	↓	↓	275	↓	↓	↓	↓	276	↓	↓	320	D	WRITE
255	↓	↓	277	↓	↓	↓	↓	278	↓	↓			
256	↓	↓	279	↓	↓	↓	↓	280	↓	↓			
257	↓	↓	281	↓	↓	↓	↓	282	↓	↓			
258	NPQR	↓	283	↓	↓	↓	↓	284	↓	↓			
259	S	↓	285	↓	↓	↓	↓	286	↓	↓			
260	NPQR	CONTROL	287	↓	↓	↓	↓	288	↓	↓			
			289	↓	↓	↓	↓	290	↓	↓			
			291	↓	↓	↓	↓	292	↓	↓			
			293	↓	↓	↓	↓	294	↓	↓			
			295	↓	↓	↓	↓	296	↓	↓			
			297	↓	↓	↓	↓	298	↓	↓			
			299	↓	↓	↓	↓	300	↓	↓			
			301	↓	↓	↓	↓	302	↓	↓			
			303	↓	↓	↓	↓	304	↓	↓			
			305	↓	↓	↓	↓	306	↓	↓			
			307	↓	↓	↓	↓	308	↓	↓			
			309	↓	↓	↓	↓	310	↓	↓			
			311	V	U	T	STORE ADDRESS	312	VW	STORE ADDRESS			

NOTE: Use Circuit Pack Letter Code X for Bus 0
Use Circuit Pack Letter Code Y for Bus 1

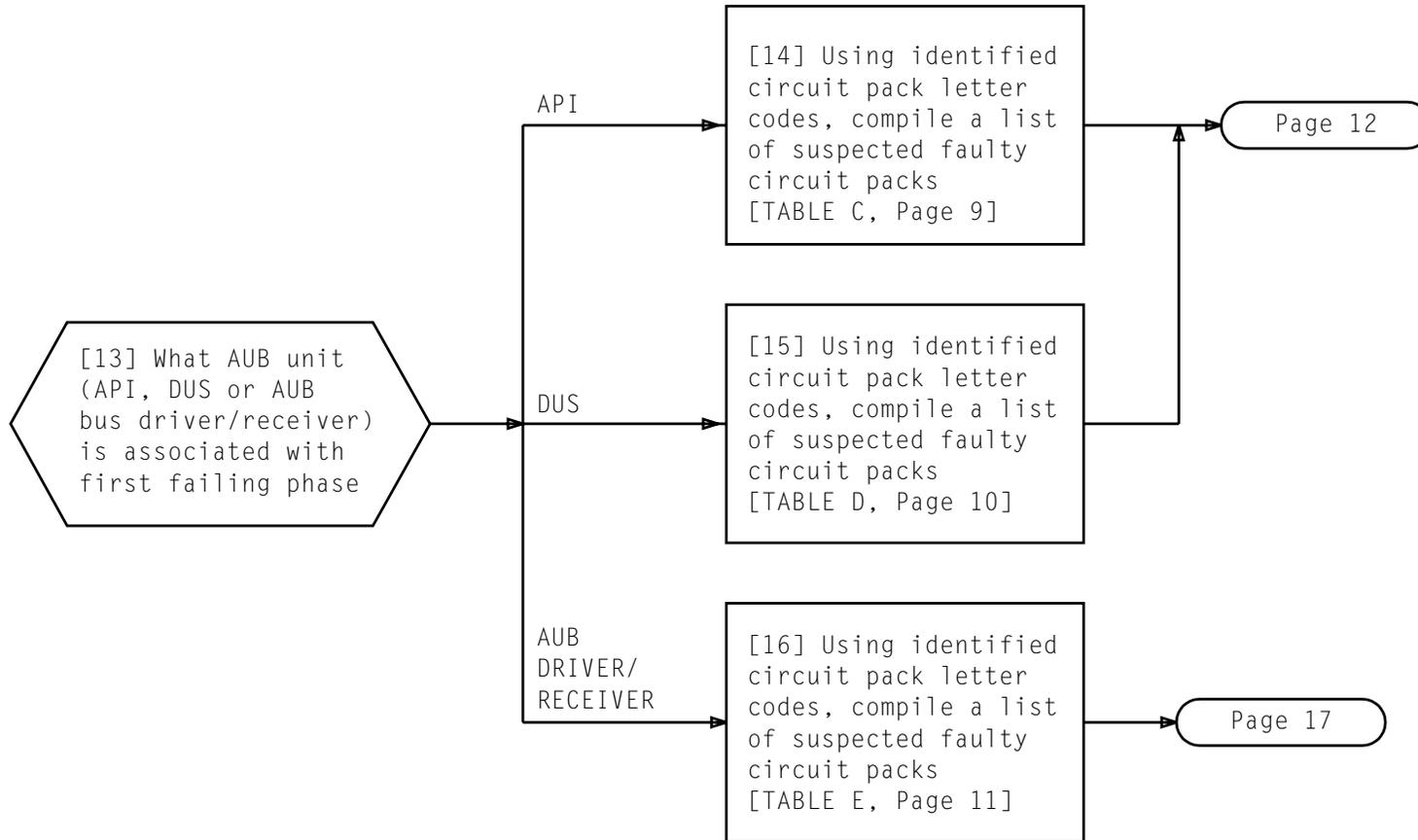


TABLE C ATTACHED PROCESSOR INTERFACE (API) SUSPECTED CIRCUIT PACK LOCATIONS					
CIRCUIT PACK LETTER CODE	API SUSPECTED CIRCUIT PACK LOCATION	BUS	CIRCUIT PACK LETTER CODE	API SUSPECTED CIRCUIT PACK LOCATION	BUS
A	*76-253	—	N	*76-253	—
B	*76-253	—	P	*76-253	—
C	*76-253	—	Q	*76-253	—
D	*76-253	—	R	*76-253	—
E	*76-253	—	S	*76-253	—
F	*76-253	—	T	*76-265	—
G	*76-253	—	U	*76-265	—
H	*76-265	—	V	*76-265	—
J	*76-265	—	W	*76-265	—
K	*76-265	—	X	*76-253	0
L	*76-265	—	Y	*76-253	1
M	*76-253	—			

* = AUB Being Diagnosed (0 or 1)

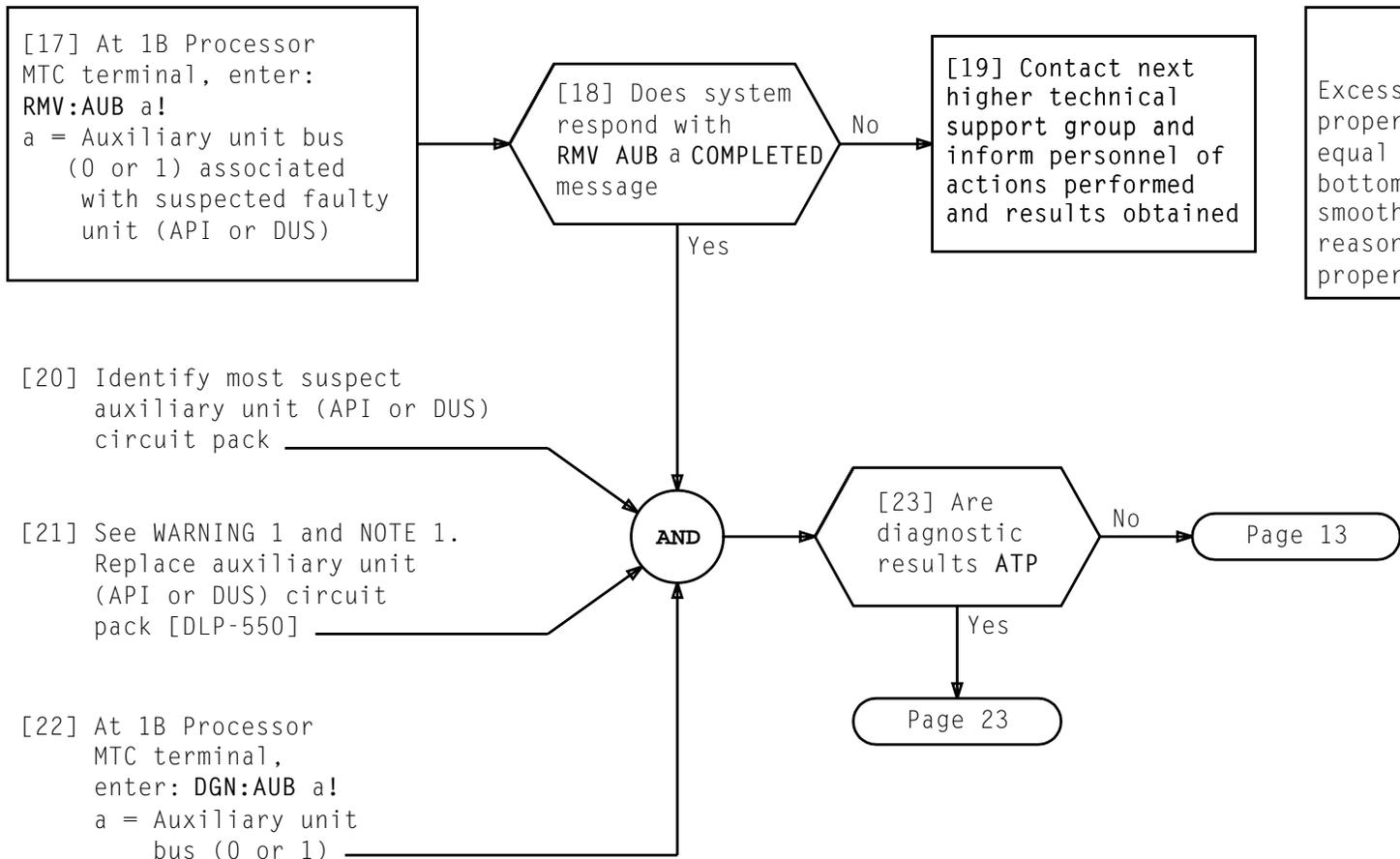
TABLE D DATA UNIT SELECTOR (DUS) SUSPECTED CIRCUIT PACK LOCATIONS					
CIRCUIT PACK LETTER CODE	DUS SUSPECTED CIRCUIT PACK LOCATION	BUS	CIRCUIT PACK LETTER CODE	DUS SUSPECTED CIRCUIT PACK LOCATION	BUS
A	*80-63	—	N	—	—
B	*80-64	—	P	*80-38	—
C	*80-65	—	Q	—	—
D	*80-66	—	R	*80-38	—
E	*80-67	—	S	*80-42	—
F	*80-68	—	T	*80-41	—
G	*80-69	—	U	*80-40	—
H	*80-42	—	V	*80-39	—
J	*80-43	—	W	*80-42	—
K	*80-44	—	X	*80-47	0
L	*80-45	—	Y	*80-46	1
M	*80-39	—			
* = AUB Being Diagnosed (0 or 1)					

CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY ANALYZING
RAW DATA

TABLE E AUXILIARY UNIT BUS (AUB) DRIVER/RECEIVER SUSPECTED CIRCUIT PACK LOCATIONS					
CIRCUIT PACK LETTER CODE	AUB DRIVER/ RECEIVER SUSPECTED CIRCUIT PACK LOCATION	BUS	CIRCUIT PACK LETTER CODE	AUB DRIVER/ RECEIVER SUSPECTED CIRCUIT PACK LOCATION	BUS
A	*70-096 *70-144	0 1	L	*70-128 *70-176	0 1
B	*70-096 *70-144	0 1	M	*70-096 *70-144	0 1
C	*70-128 *70-176	0 1	N P	*70-128 *70-176	- -
D	*70-112 *70-160	0 1	Q R	*70-128 *70-176	- -
E	*70-112 *70-160	0 1	S T	*70-112 *70-160	- 0
F	*70-128 *70-176	0 1	U	*70-096 *70-144	0 1
G	*70-128 *70-176	0 1	V	*70-096 *70-144	0 1
H	*70-112 *70-160	0 1	W	*70-112 *70-116	0 1
J	*70-112 *70-160	0 1	X	*70-062 *70-062	0 1
K	*70-128 *70-176	0 1		*70-062 *70-062	0 1
* = AUB Being Diagnosed (0 or 1)					

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RAW DATA

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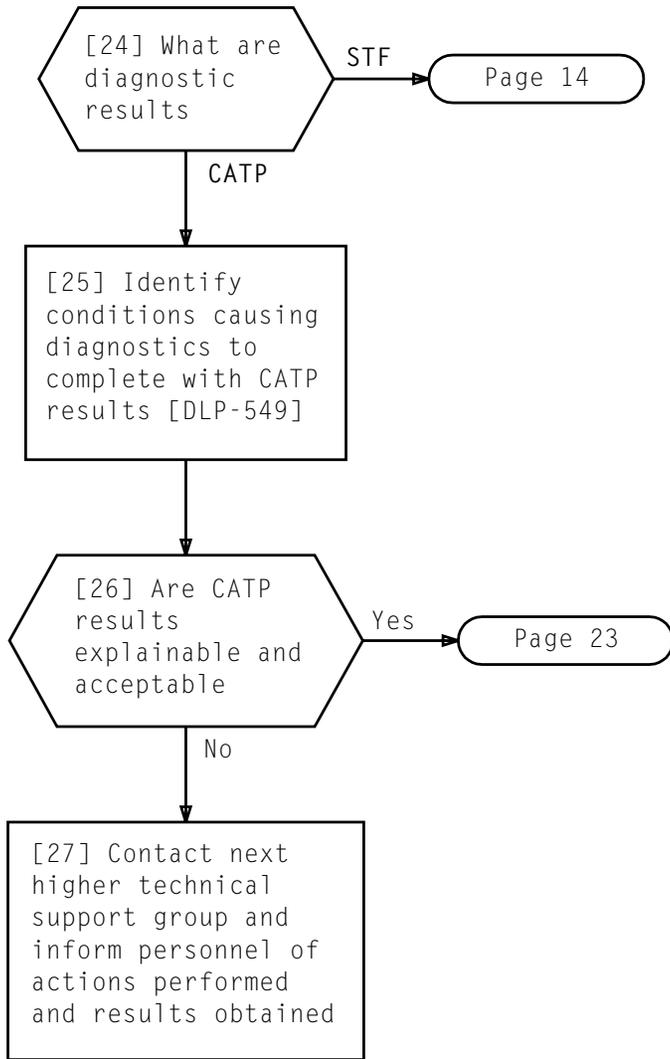


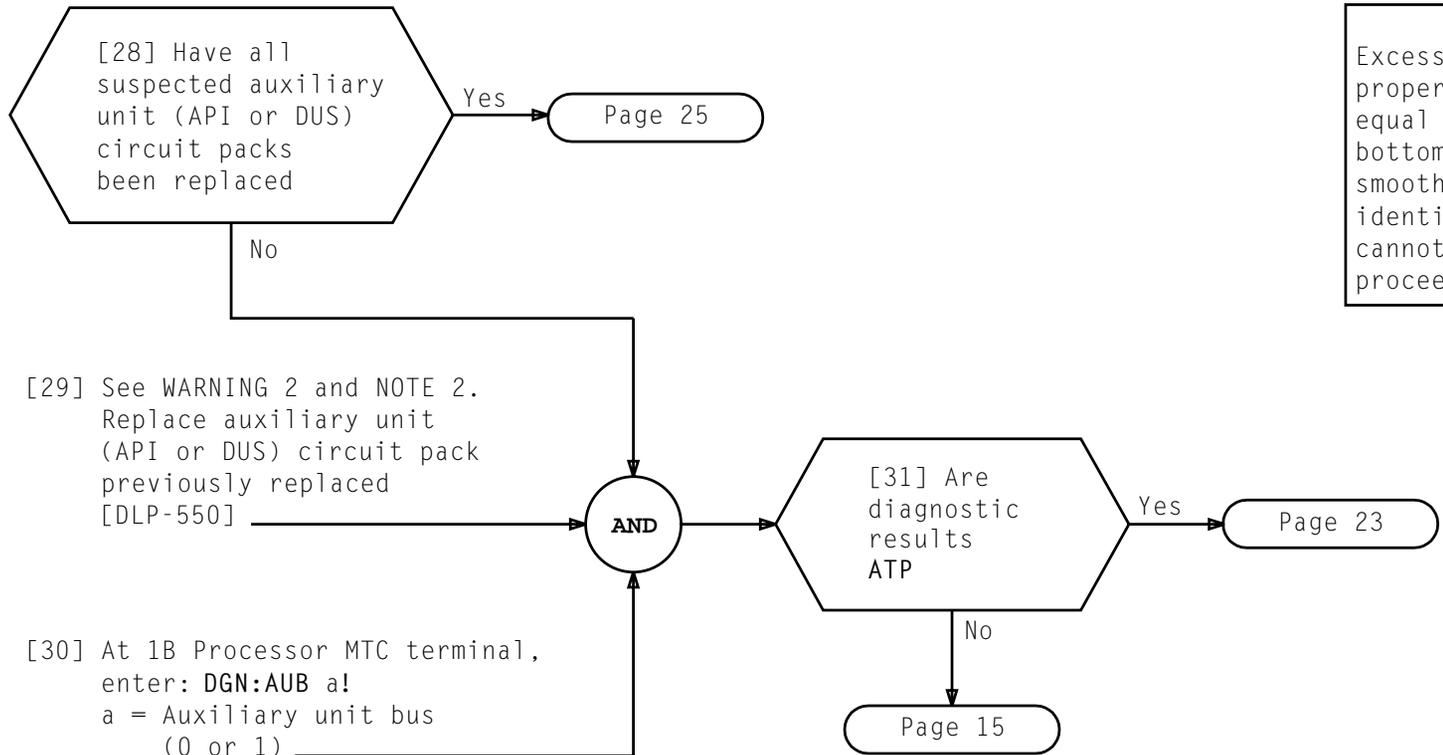
NOTE 1
Excessive force is not required to properly seat circuit packs. If equal pressure applied at top and bottom of circuit pack does not smoothly seat circuit pack, identify reason that circuit pack cannot be properly seated before proceeding

WARNING 1
A grounded antistatic wrist strap (R-4987 or equivalent) must be worn when handling circuit packs. The wrist strap must be connected to a ground common to the circuit pack ground. When appropriate wrist strap is not available, always touch grounded (exposed) metal before handling circuit pack in any manner. Never pass an unprotected circuit pack to an ungrounded person or touch components, leads or connector pins

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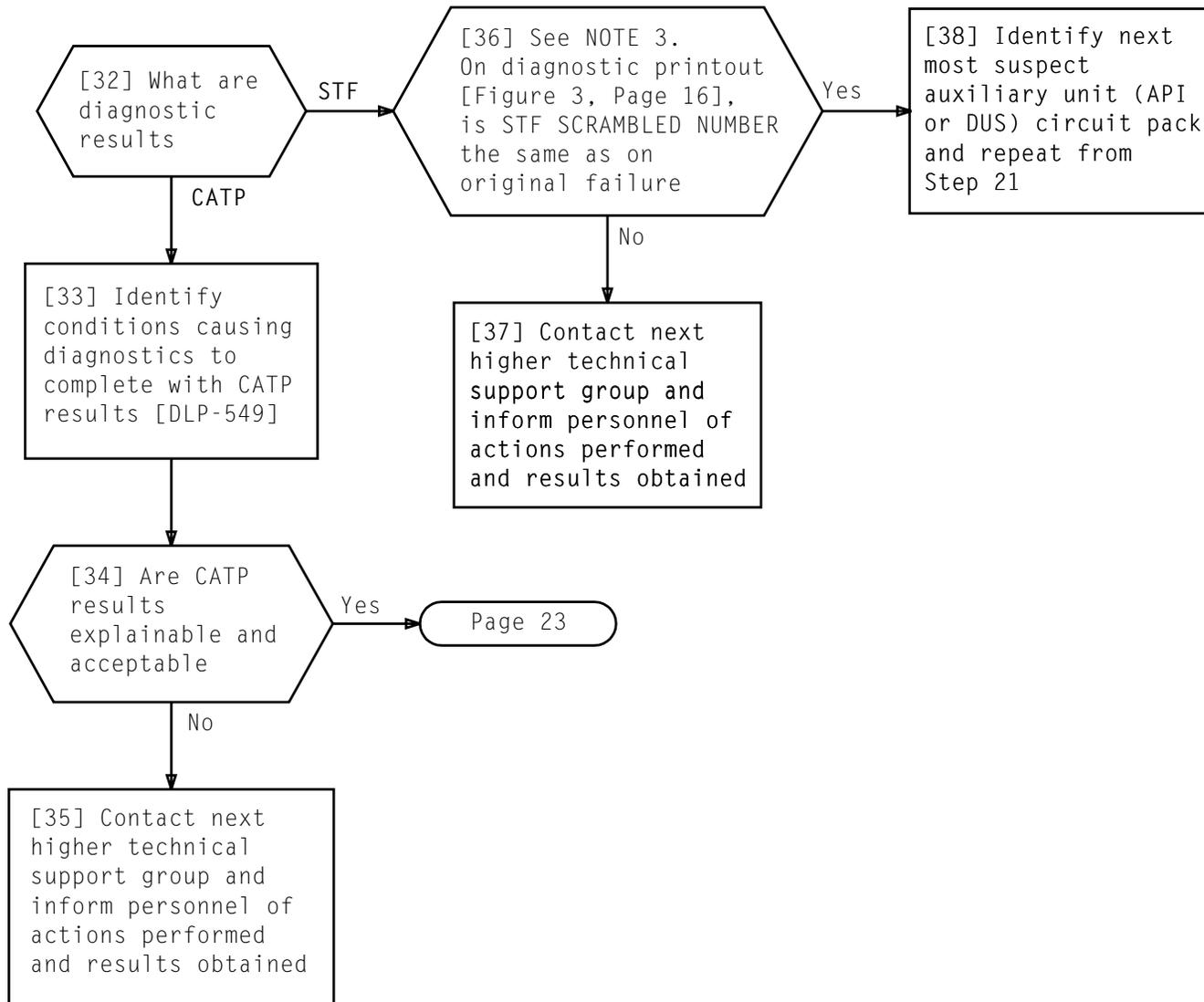


NOTE 2
 Excessive force is not required to properly seat circuit packs. If equal pressure applied at top and bottom of circuit pack does not smoothly seat circuit pack, identify reason that circuit pack cannot be properly seated before proceeding

WARNING 2
A grounded antistatic wrist strap (R-4987 or equivalent) must be worn when handling circuit packs. The wrist strap must be connected to a ground common to the circuit pack ground. When appropriate wrist strap is not available, always touch grounded (exposed) metal before handling circuit pack in any manner. Never pass an unprotected circuit pack to an ungrounded person or touch components, leads or connector pins

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NOTE 3	
The STF SCRAMBLED NUMBER indicates if all the diagnostic raw data (test and mismatch) is identical or different for two diagnostic runs. If TLP SCRAMBLED NUMBER value is same, diagnostic raw data is identical. Otherwise, diagnostic raw data has changed in some manner	
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CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY ANALYZING RAW DATA

```

M 28 DGN: CC 0 TERMINATED AT PH 56 ADR 4666 AFTER TEST 343   MSG STARTED
#896
M 28 DGN: CC 0 PH 56 STF (9,00000000 00000000) MSG IP
TEST MISMATCH SUPPLEMENTARY DATA
19 00400000
26 00400000
#897
M 28 ANALY:TLPFILE :CC 0 SUMMARY DATA   MSG STARTED
KEY: V1 V2 V3 V4 V5 V6
TD : 03020014 00000000 00000523 00700000 00000000 00000000
ED : 01060020 00000000 00132014 00000000 00132123 00000000
ED : 00050001 00000000 00024016 00000000 00000000 00000000
MFNUM : 00000523
#898
M 28 ANALY:TLPFILE: CC 0 SUSPECTED FAULTY EQUIPMENT   MSG IP
IN UNIT UNDER TEST
MFNUM : 00000523
FLN 00015.640
EQPT LOC CODE (FN) NOTE WT FS SYM SD HELPER ID
-----
1B PROC-041-062 KLV24 (CKUT ) 1 10 7 1 4A148
1B PROC-041-046 KLV8 (CB1 ) 2 9 1 4A148
#899
M 28 ANALY:TLPFILE: CC 0 SUSPECTED FAULTY EQUIPMENT   MSG IP
NOT IN UNIT UNDER TEST
MFNUM : 00000523
EQPT LOC CODE (FN) NOTE WT FS SYM SD HELPER ID
-----
1B PROC-141-062 KLV24 (CKUT ) 1 1 7 1 4A148 :CC 1
NEQLS 00000006
#900
M28 ANALY:TLPFILE: CC 0 SUSPECTED FAULTY EQUIPMENT   MSG COMPL
NOTES
MFNUM : 00000523
NOTES:
1 (COM01)----SPECIAL PROCEDURES ARE REQUIRED FOR CIRCUIT PACK
REPLACEMENT. REFER TO THE ASSOCIATED TOP.
#901
M 28 DGN: CC 0 STOPPED STF (1.9,15364222) MSG COMPL
05/20/92 00:28:38
#902

```

UNIT FAILING
DIAGNOSTICS
CONTAINING
SUSPECTED FAULTY
EQUIPMENT

SUSPECTED
FAULTY
EQUIPMENT CODE
AND FUNCTION

SUSPECTED
FAULTY
EQUIPMENT
LOCATION

STF
SCRAMBLED
NUMBER

LOCATION OF
SUSPECTED FAULTY
EQUIPMENT NOT IN
UNIT FAILING
DIAGNOSTICS

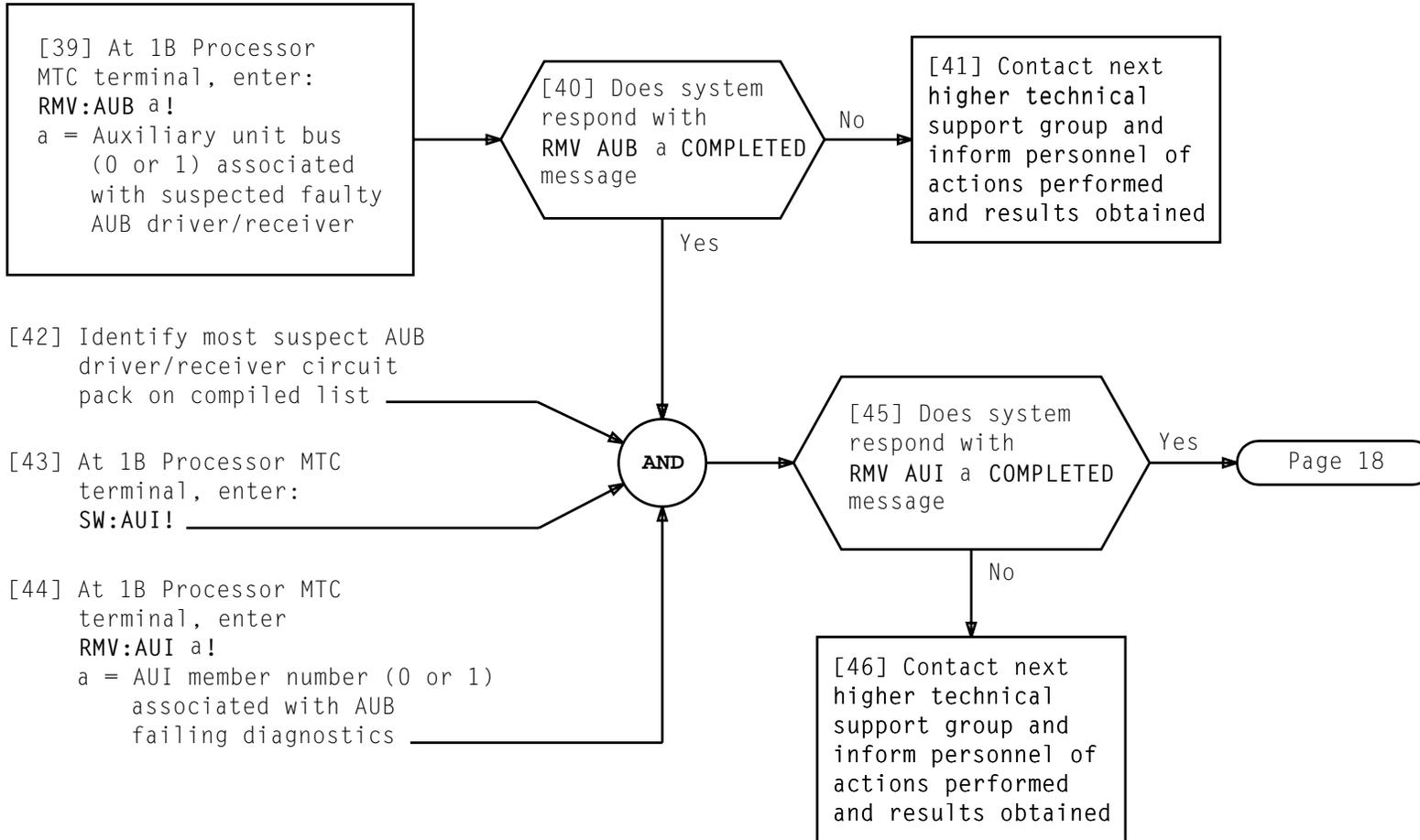
EQUIPMENT CODE
AND FUNCTION OF
SUSPECTED FAULTY
EQUIPMENT NOT IN
UNIT FAILING
DIAGNOSTICS

UNIT CONTAINING
SUSPECTED FAULTY
EQUIPMENT NOT IN
UNIT FAILING
DIAGNOSTICS

Figure 3 - Sample Printout of Diagnostic Failure With TLP Suspected Faulty Equipment List

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[47] See WARNING 3 and
NOTE 4. Replace suspect
circuit pack
[DLP-548]

[48] Allow ample time
for diagnostics to
complete

[49] At 1B Processor MTC
terminal, enter:
RST:AUI a!
a = AUI member number
(0 or 1)

[50] At 1B Processor MTC
terminal, enter:
SW:AUI!

[51] At 1B Processor MTC
terminal, enter:
DGN:AUB a!
a = AUB member
number (0 or 1)

AND

[52] Are
diagnostic
results
ATP

No

Page 19

Yes

Page 23

NOTE 4

Excessive force is not required to properly seat circuit packs. If equal pressure applied at top and bottom of circuit pack does not smoothly seat circuit pack, identify reason that circuit pack cannot be properly seated before proceeding

WARNING 3

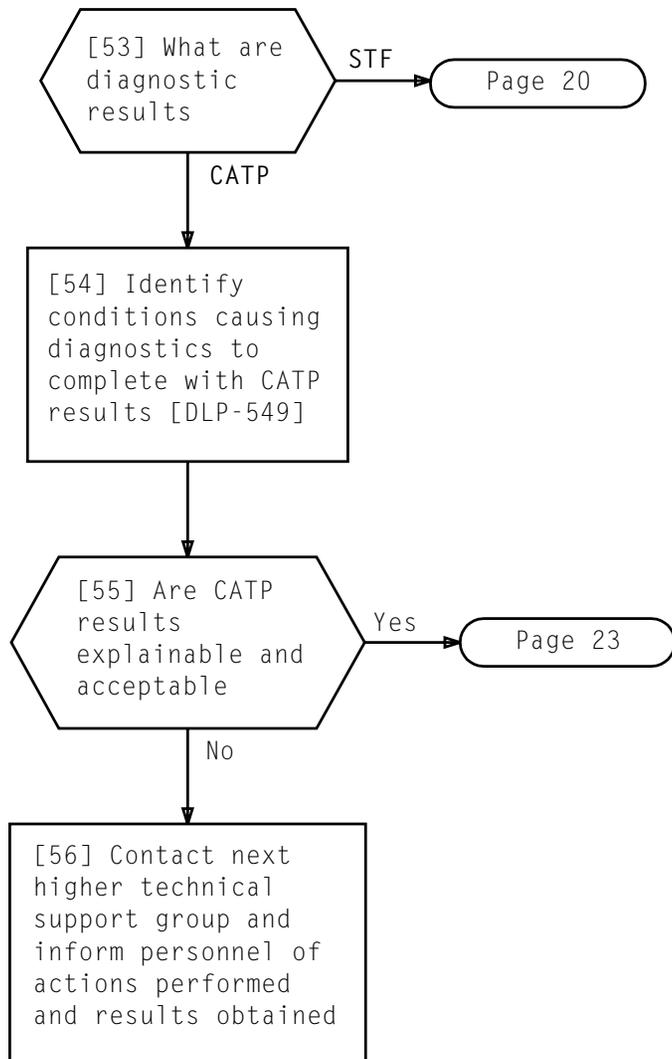
A grounded antistatic wrist strap (R-4987 or equivalent) must be worn when handling circuit packs. The wrist strap must be connected to a ground common to the circuit pack ground. When appropriate wrist strap is not available, always touch grounded (exposed) metal before handling circuit pack in any manner. Never pass an unprotected circuit pack to an ungrounded person or touch components, leads, or connector pins

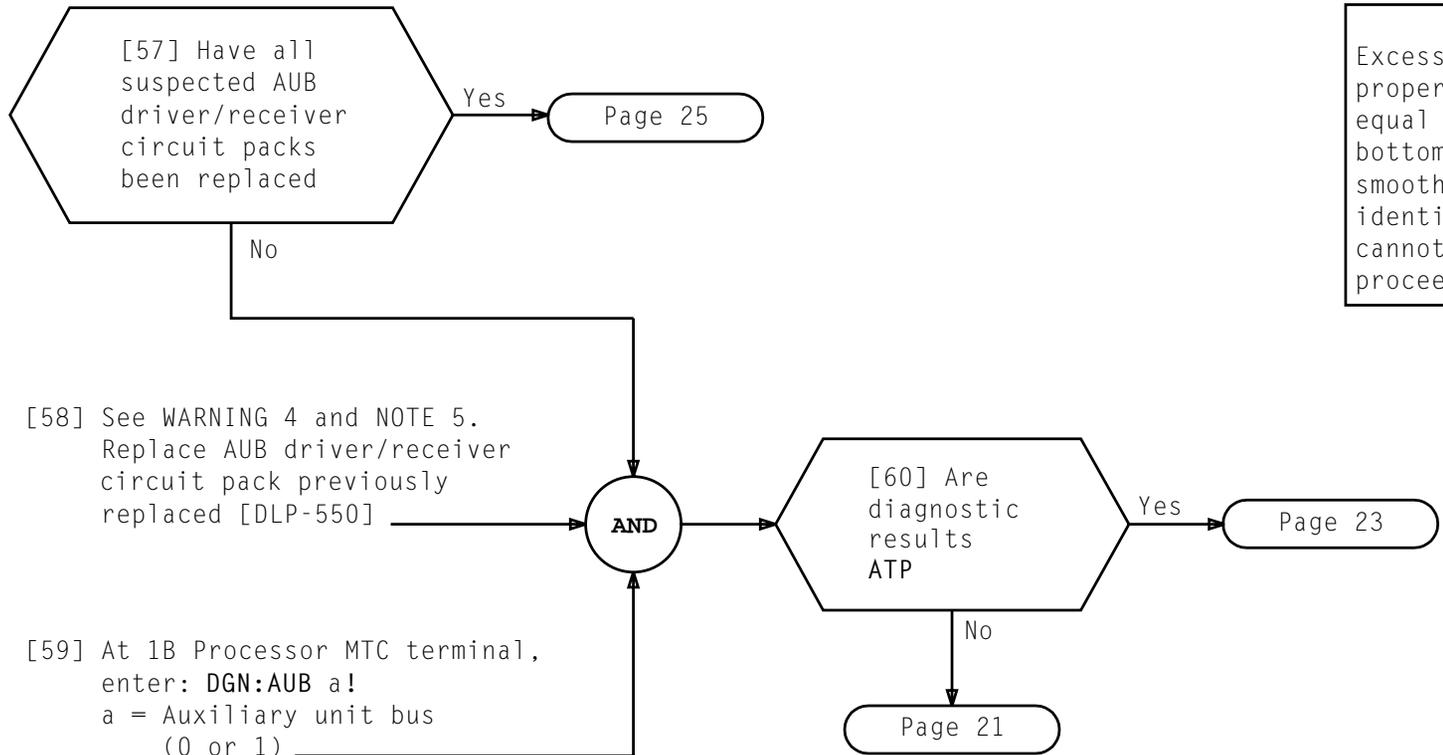
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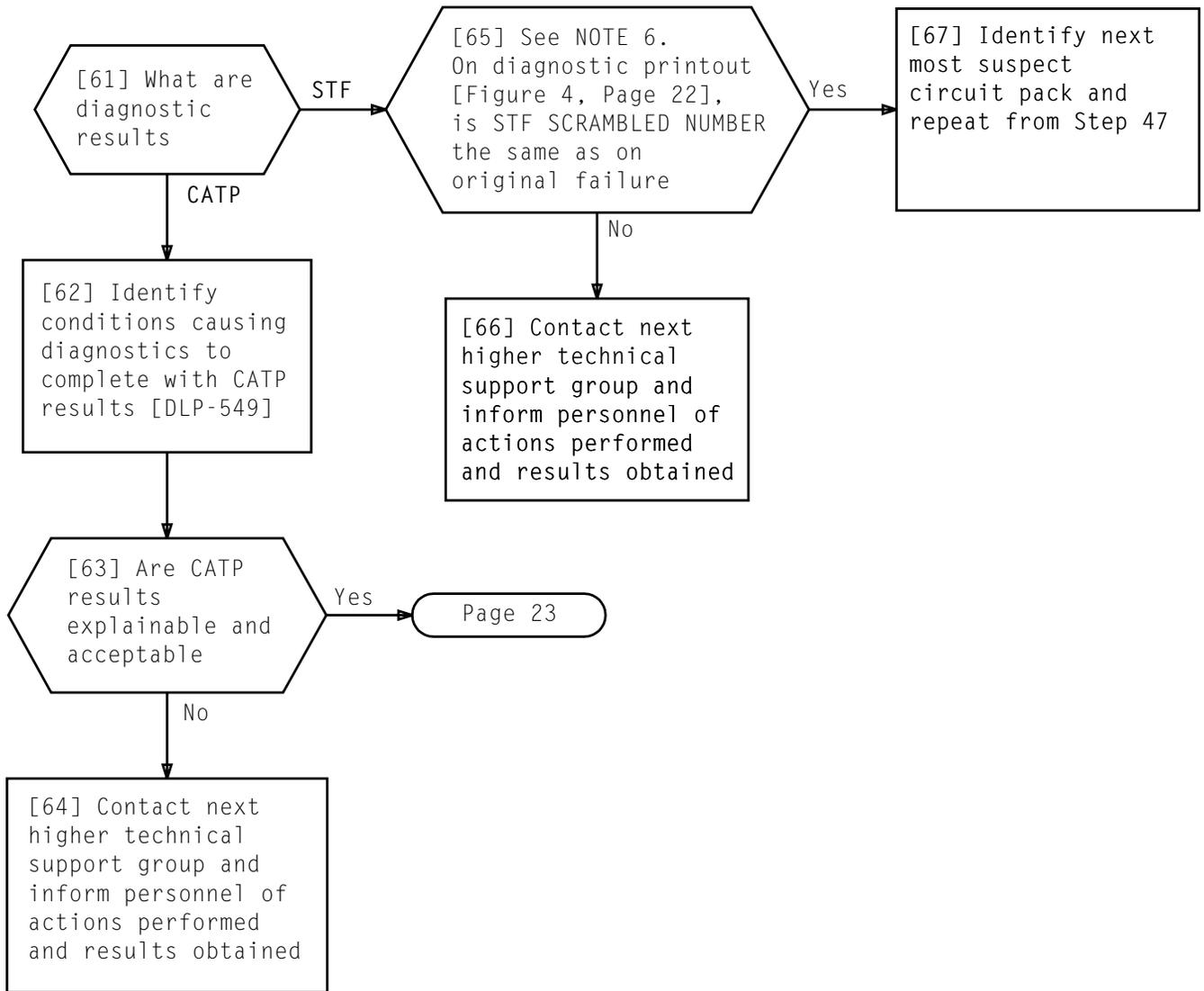


NOTE 5
 Excessive force is not required to properly seat circuit packs. If equal pressure applied at top and bottom of circuit pack does not smoothly seat circuit pack, identify reason that circuit pack cannot be properly seated before proceeding

WARNING 4
A grounded antistatic wrist strap (R-4987 or equivalent) must be worn when handling circuit packs. The wrist strap must be connected to a ground common to the circuit pack ground. When appropriate wrist strap is not available, always touch grounded (exposed) metal before handling circuit pack in any manner. Never pass an unprotected circuit pack to an ungrounded person or touch components, leads or connector pins

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NOTE 6	
The STF SCRAMBLED NUMBER indicates if all the diagnostic raw data (test and mismatch) is identical or different for two diagnostic runs. If TLP SCRAMBLED NUMBER value is same, diagnostic raw data is identical. Otherwise, diagnostic raw data has changed in some manner	
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```

M 28 DGN: CC 0 TERMINATED AT PH 56 ADR 4666 AFTER TEST 343   MSG STARTED
#896
M 28 DGN: CC 0 PH 56 STF (9,00000000 00000000) MSG IP
TEST MISMATCH SUPPLEMENTARY DATA
19 00400000
26 00400000
#897
M 28 ANALY:TLPFILE :CC 0 SUMMARY DATA   MSG STARTED
KEY: V1 V2 V3 V4 V5 V6
TD : 03020014 00000000 00000523 00700000 00000000 00000000
ED : 01060020 00000000 00132014 00000000 00132123 00000000
ED : 00050001 00000000 00024016 00000000 00000000 00000000
MFNUM : 00000523
#898
M 28 ANALY:TLPFILE: CC 0 SUSPECTED FAULTY EQUIPMENT   MSG IP
IN UNIT UNDER TEST
MFNUM : 00000523
FLN 00015.640
EQPT LOC CODE (FN) NOTE WT FS SYM SD HELPER ID
-----
1B PROC-041-062 KLV24 (CKUT ) 1 10 7 1 4A148
1B PROC-041-046 KLV8 (CB1 ) 2 9 1 4A148
#899
M 28 ANALY:TLPFILE: CC 0 SUSPECTED FAULTY EQUIPMENT   MSG IP
NOT IN UNIT UNDER TEST
MFNUM : 00000523
EQPT LOC CODE (FN) NOTE WT FS SYM SD HELPER ID
-----
1B PROC-141-062 KLV24 (CKUT ) 1 1 7 1 4A148 :CC 1
NEQLS 00000006
#900
M28 ANALY:TLPFILE: CC 0 SUSPECTED FAULTY EQUIPMENT   MSG COMPL
NOTES
MFNUM : 00000523
NOTES:
1 (COM01)----SPECIAL PROCEDURES ARE REQUIRED FOR CIRCUIT PACK
REPLACEMENT. REFER TO THE ASSOCIATED TOP.
#901
M 28 DGN: CC 0 STOPPED STF (1.9,15364222) MSG COMPL
05/20/92 00:28:38
#902

```

UNIT FAILING
DIAGNOSTICS
CONTAINING
SUSPECTED FAULTY
EQUIPMENT

SUSPECTED
FAULTY
EQUIPMENT CODE
AND FUNCTION

SUSPECTED
FAULTY
EQUIPMENT
LOCATION

STF
SCRAMBLED
NUMBER

LOCATION OF
SUSPECTED FAULTY
EQUIPMENT NOT IN
UNIT FAILING
DIAGNOSTICS

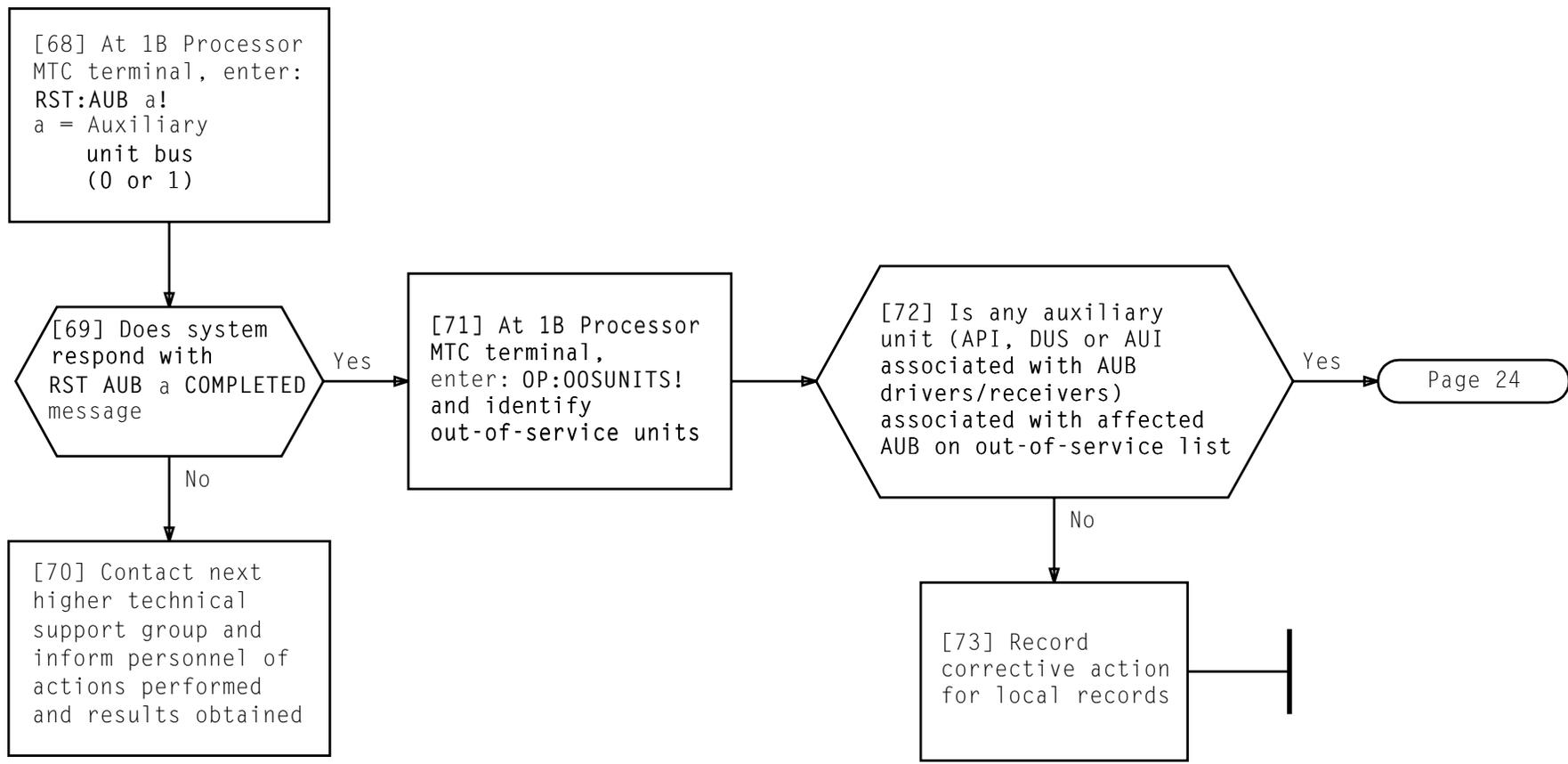
EQUIPMENT CODE
AND FUNCTION OF
SUSPECTED FAULTY
EQUIPMENT NOT IN
UNIT FAILING
DIAGNOSTICS

UNIT CONTAINING
SUSPECTED FAULTY
EQUIPMENT NOT IN
UNIT FAILING
DIAGNOSTICS

Figure 4 - Sample Printout of Diagnostic Failure With TLP Suspected Faulty Equipment List

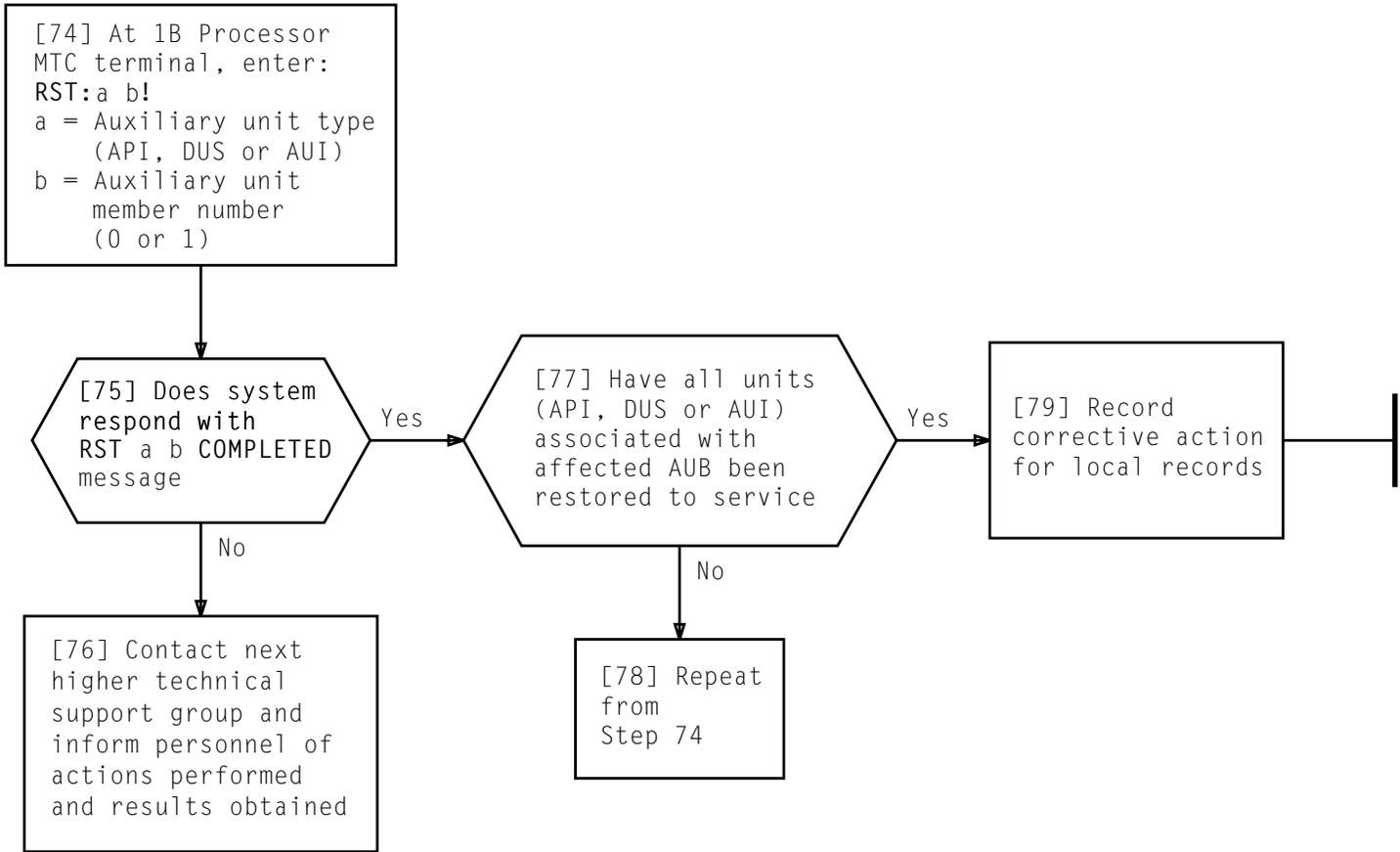
CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY ANALYZING RAW DATA

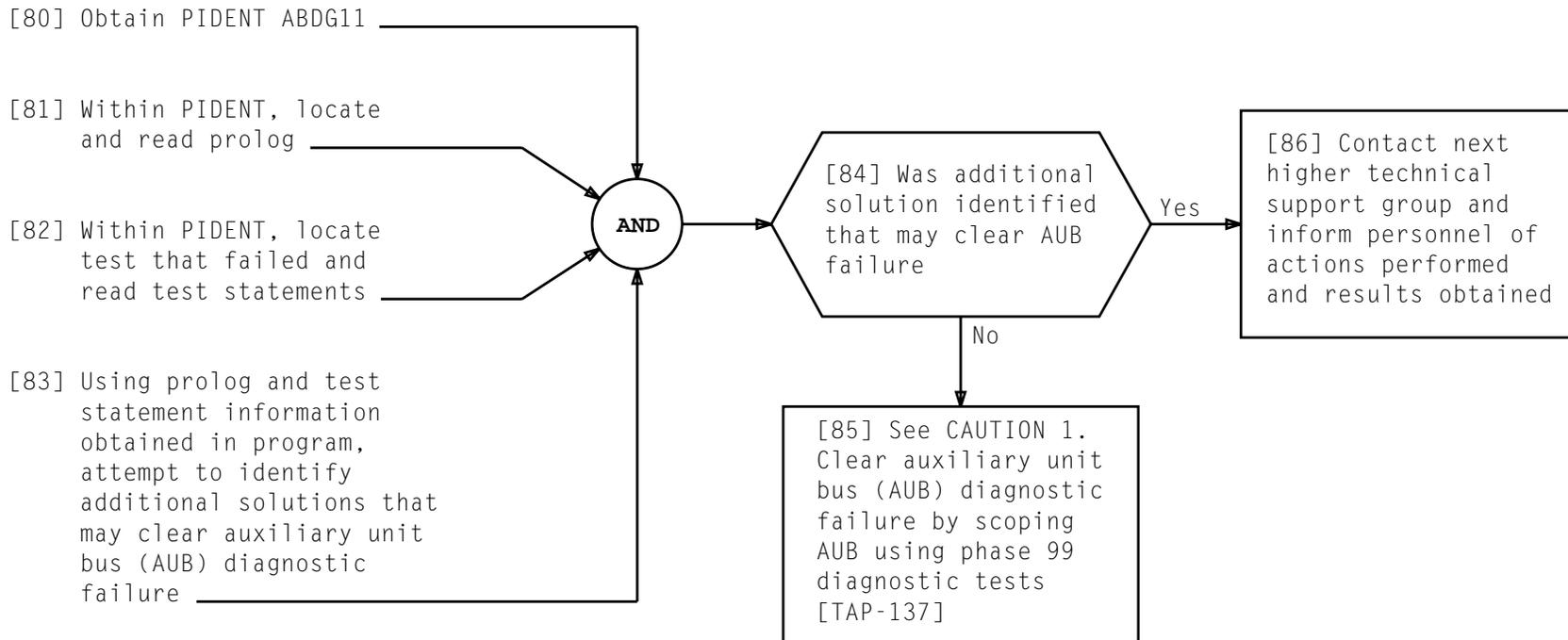
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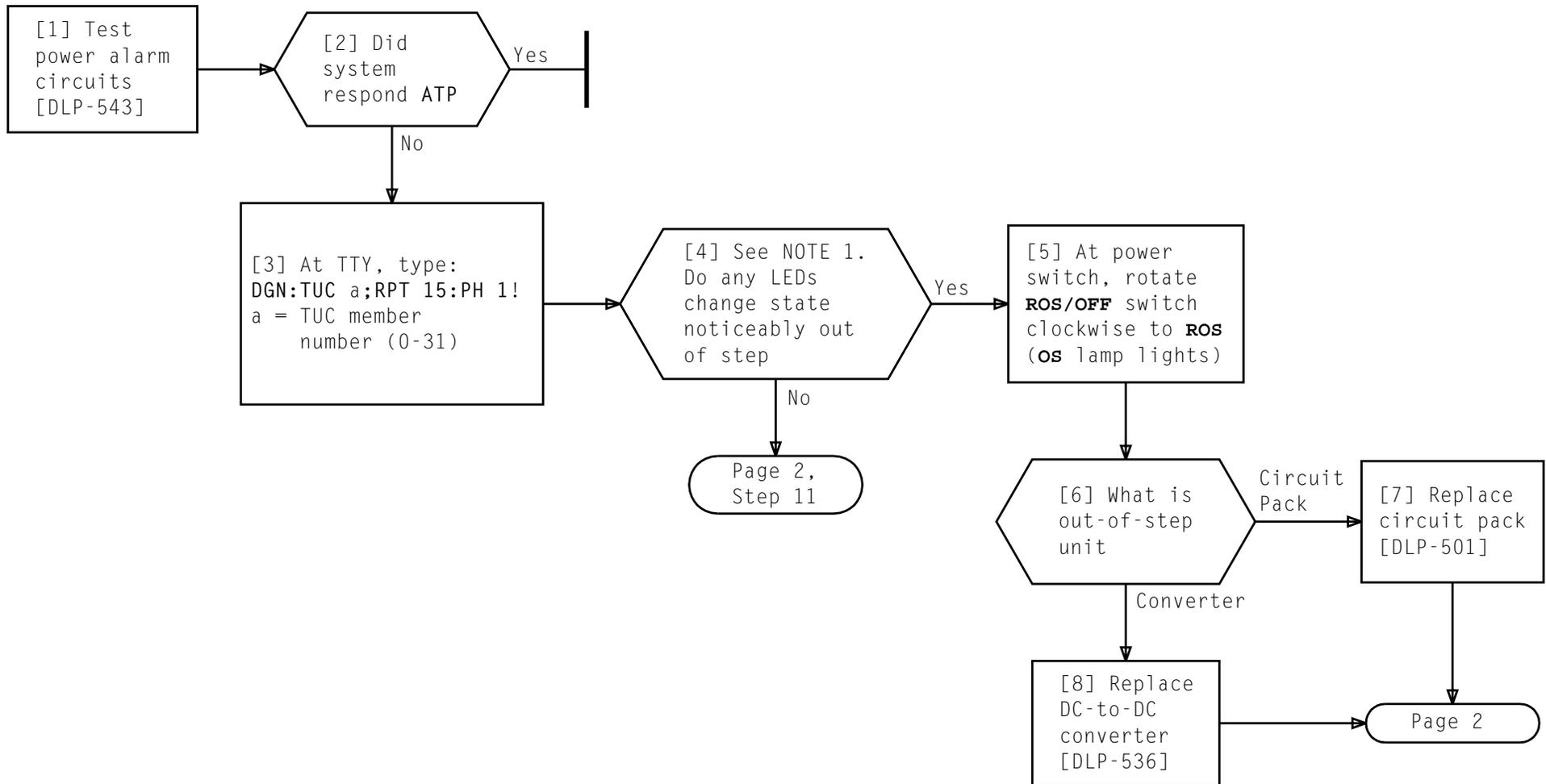




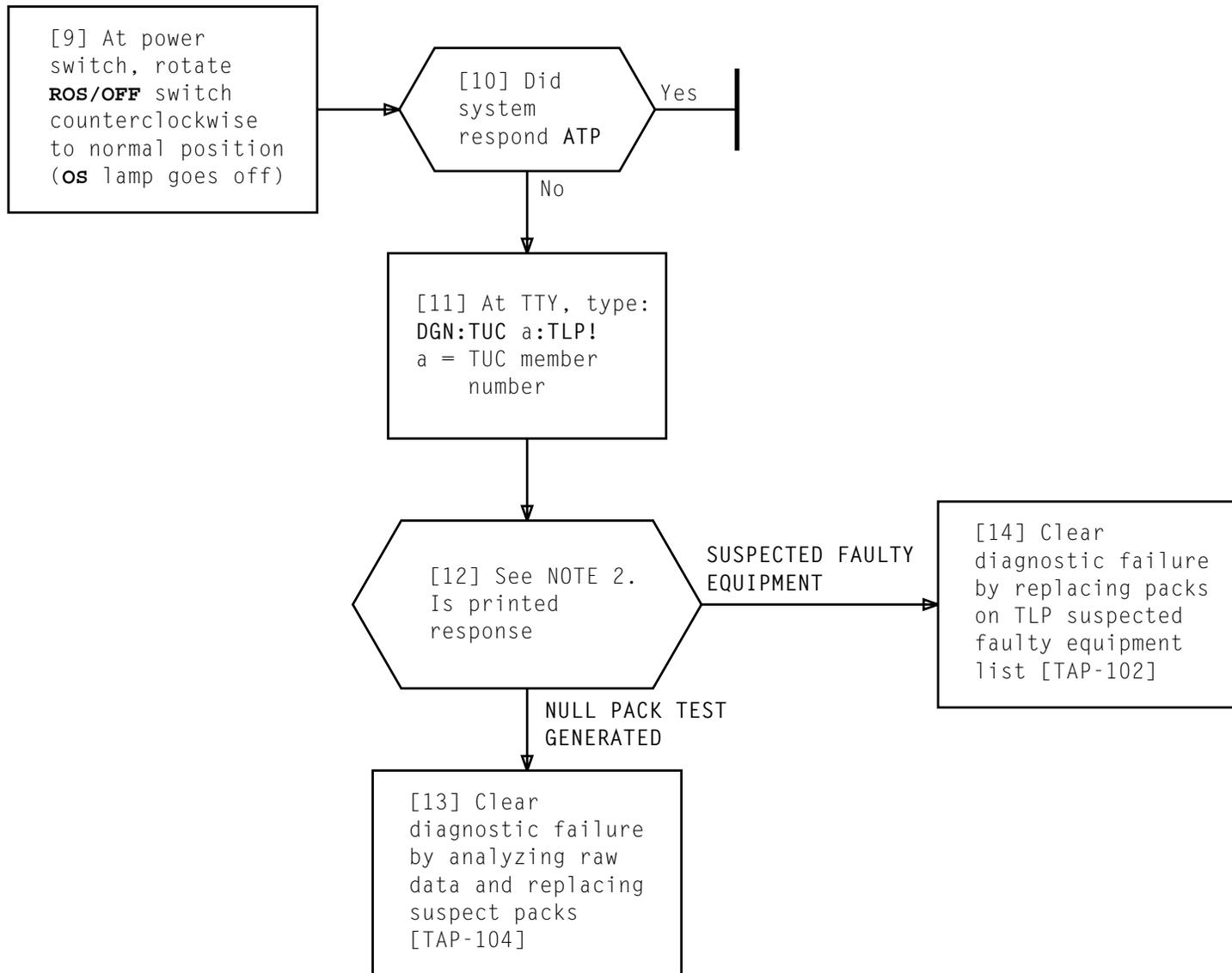
*CAUTION 1
To avoid service interruption, bus scoping must be performed at low traffic periods*

CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY ANALYZING RAW DATA

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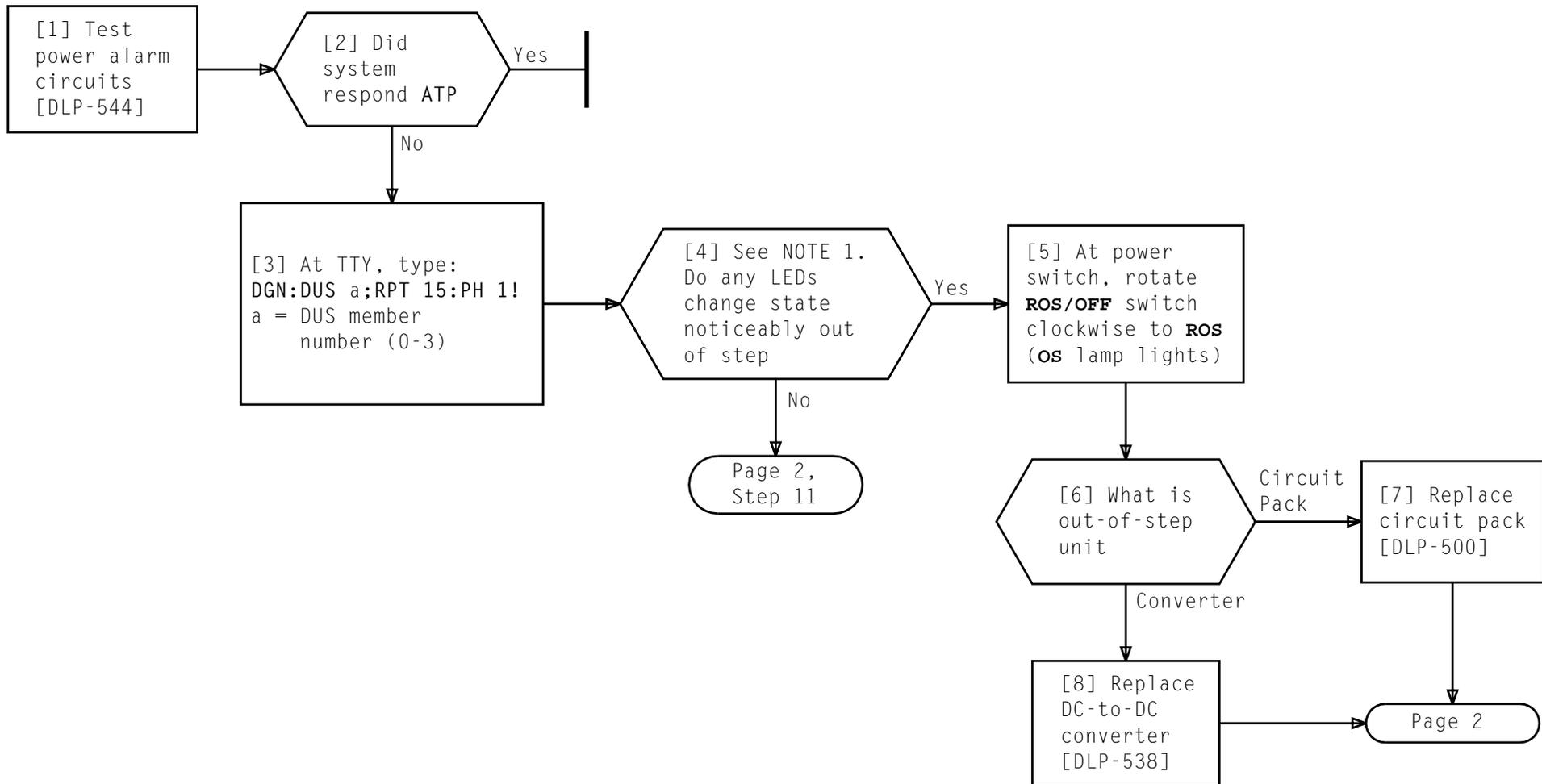


NOTE 1	
Normally, all LEDs do not change state simultaneously	
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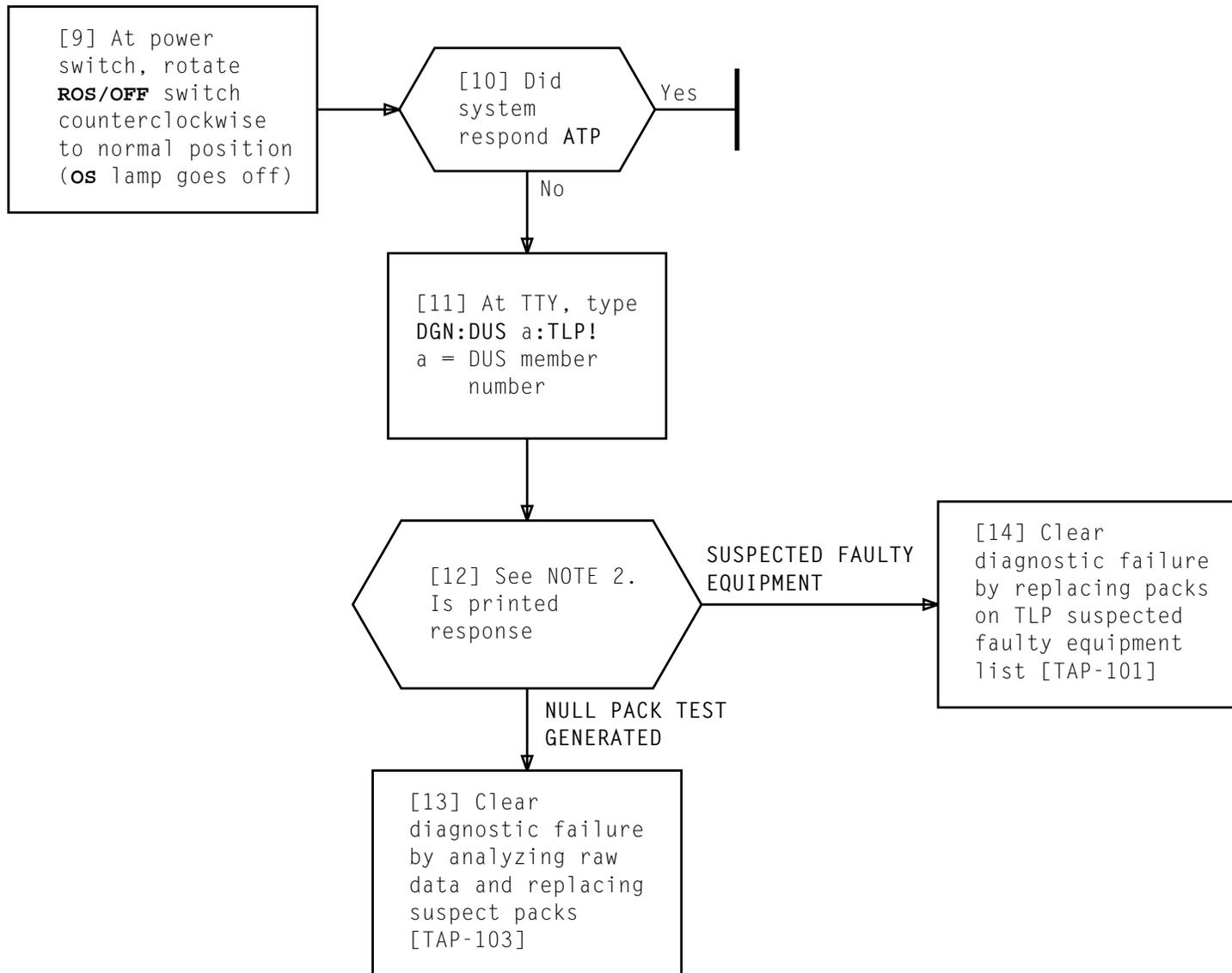


NOTE 2
 It may take several minutes for list to be printed. Status of file may be monitored by typing:
OP:TLPQUEUE;ALL!
 TLP file currently being processed is indicated by asterisk in priority column

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NOTE 1	
Normally, all LEDs do not change state simultaneously	
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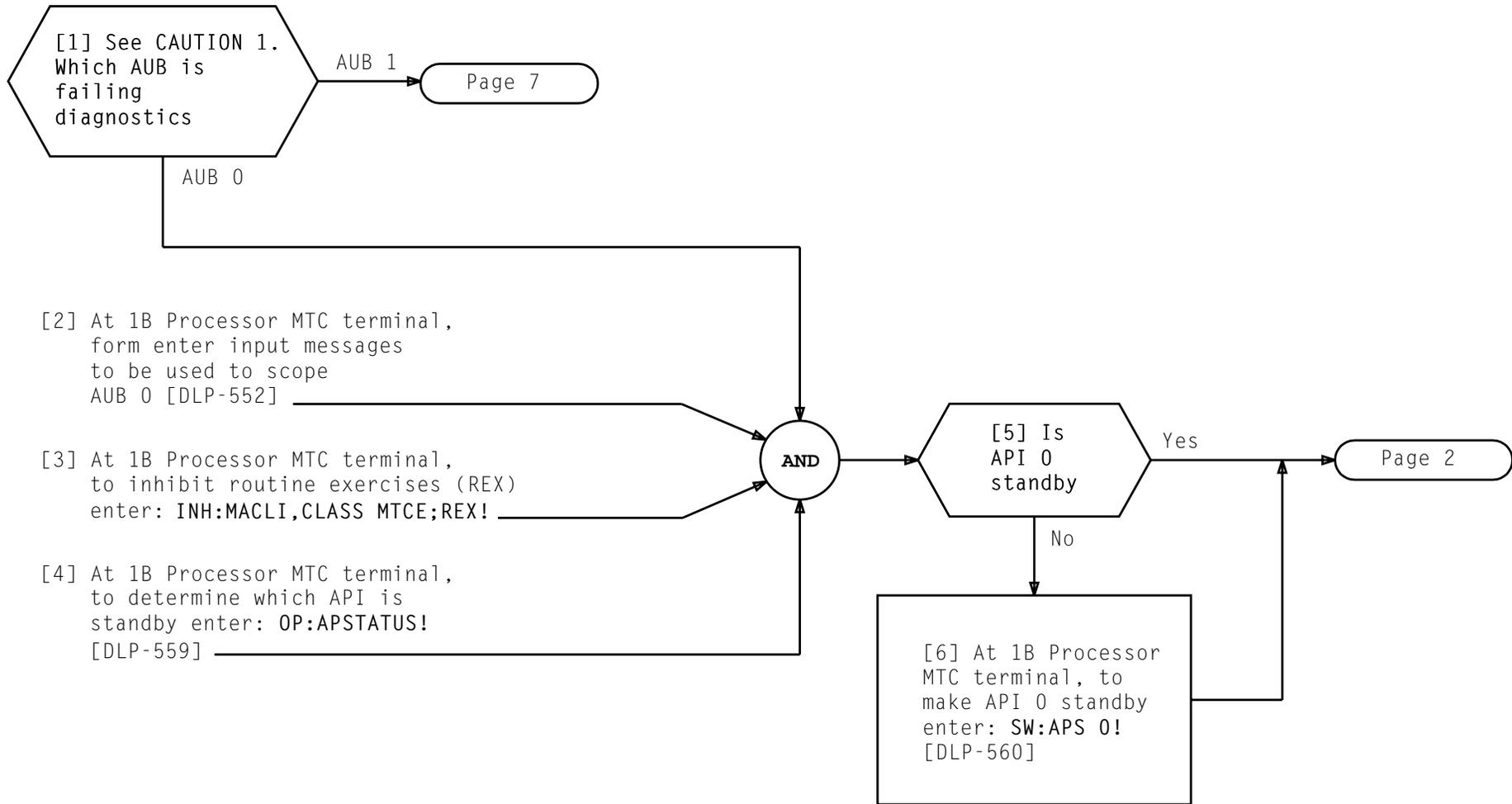
NOTE 2
 It may take several minutes for list to be printed. Status of file may be monitored by typing:

OP:TLPQUEUE;ALL!

TLP file currently being processed is indicated by asterisk in priority column

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CLEAR AUTOMATIC POWER MONITOR TEST FAILURE – DATA UNIT SELECTOR



CAUTION 1
To avoid service interruption, bus scoping must be performed at low-traffic periods

CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY SCOPING AUB USING PHASE 99 DIAGNOSTIC TESTS

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[7] At 1B Processor MTC terminal, enter:

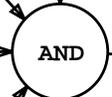
RMV:AUB 0!

[8] Set up storage oscilloscope for scoping AUB [DLP-551]

[9] At 1B Processor MTC terminal, enter execute messages for looping on AUB 0 write bus [DLP-553]

[10] Scope AUB 0 write bus bits 0 to 23 at bus terminating resistors (BTRs) [DLP-554]

[11] At 1B Processor MTC terminal, to stop looping on AUB 0 enter: EX:AUB 0!

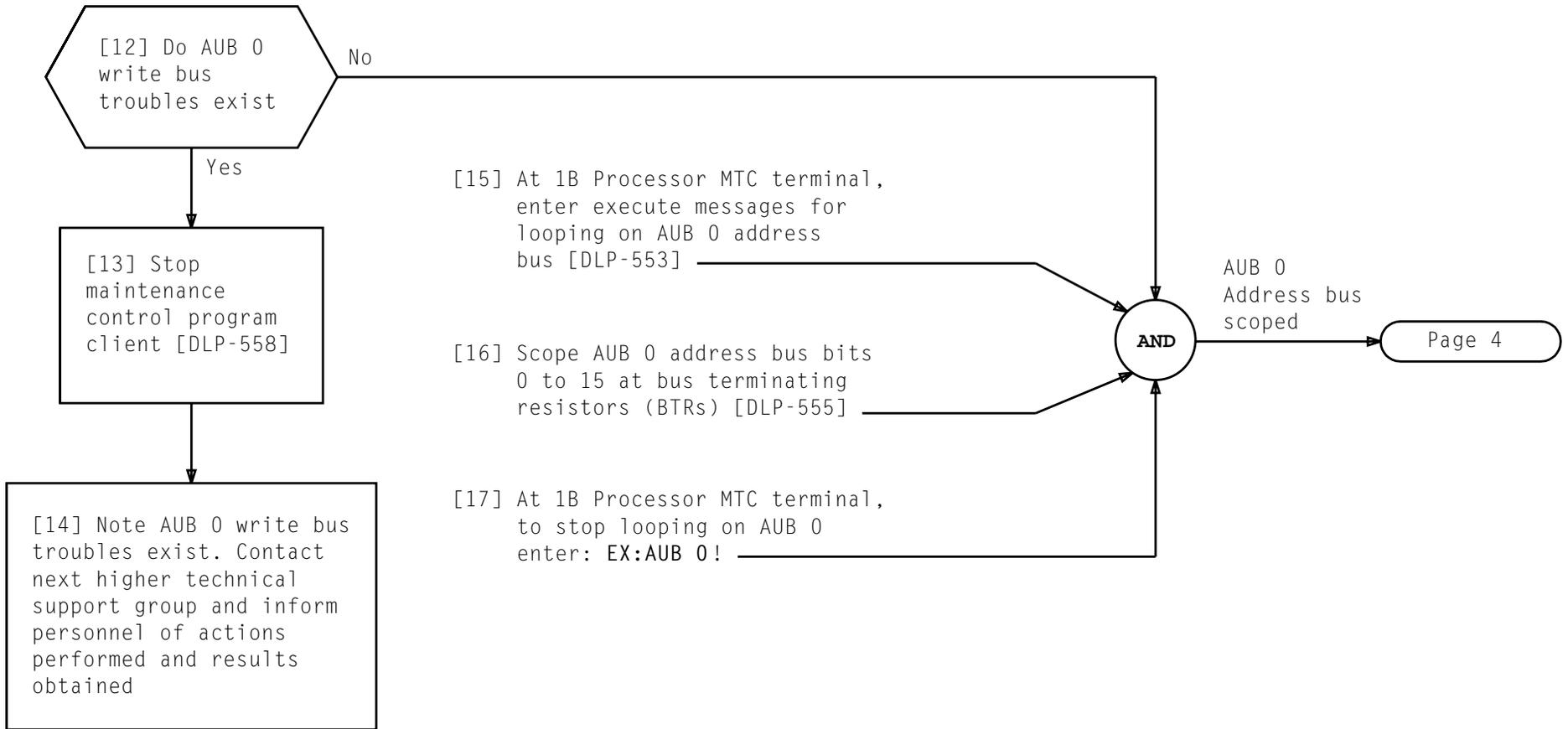


AUB 0
Write bus
scoped

Page 3

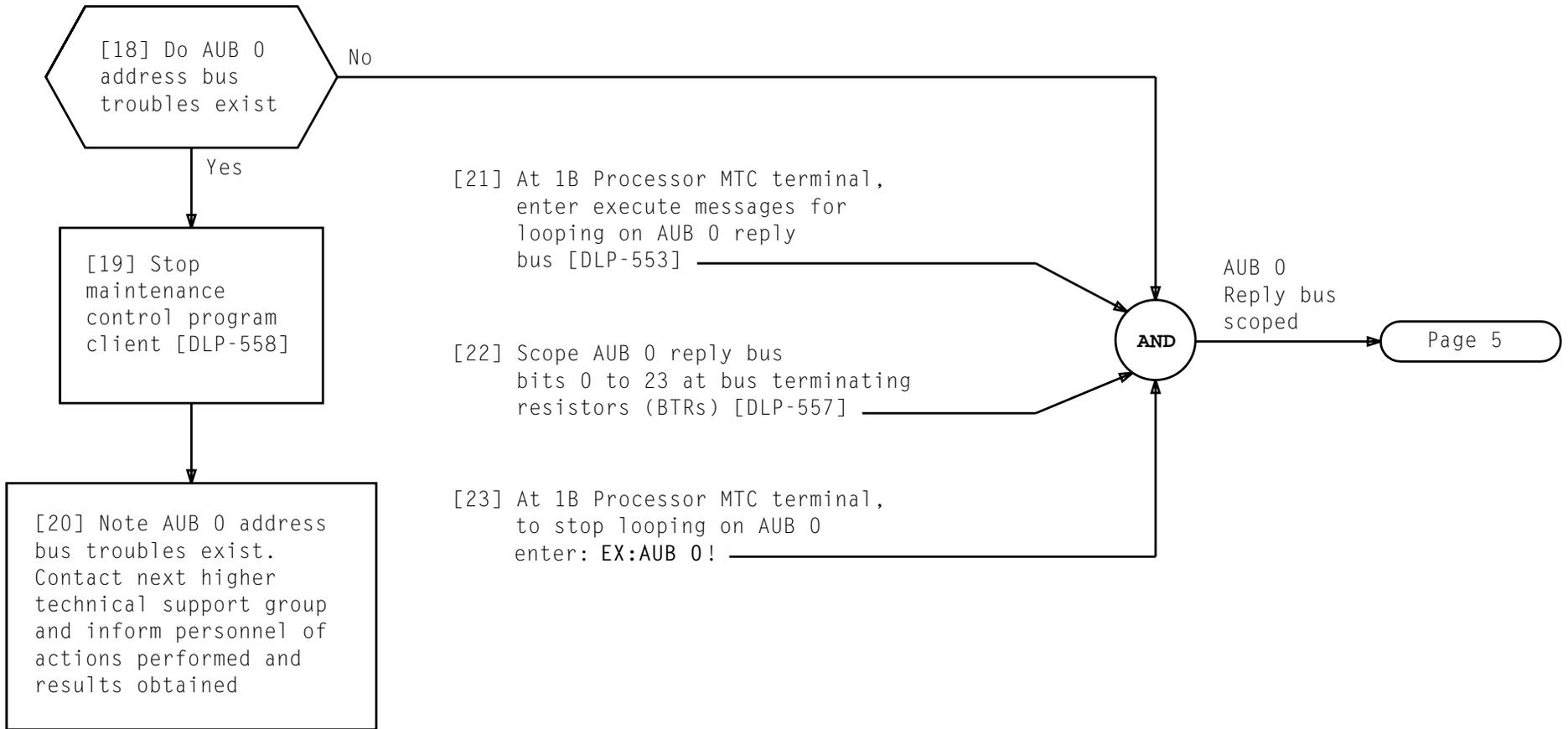
CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY SCOPING AUB USING PHASE 99 DIAGNOSTIC TESTS

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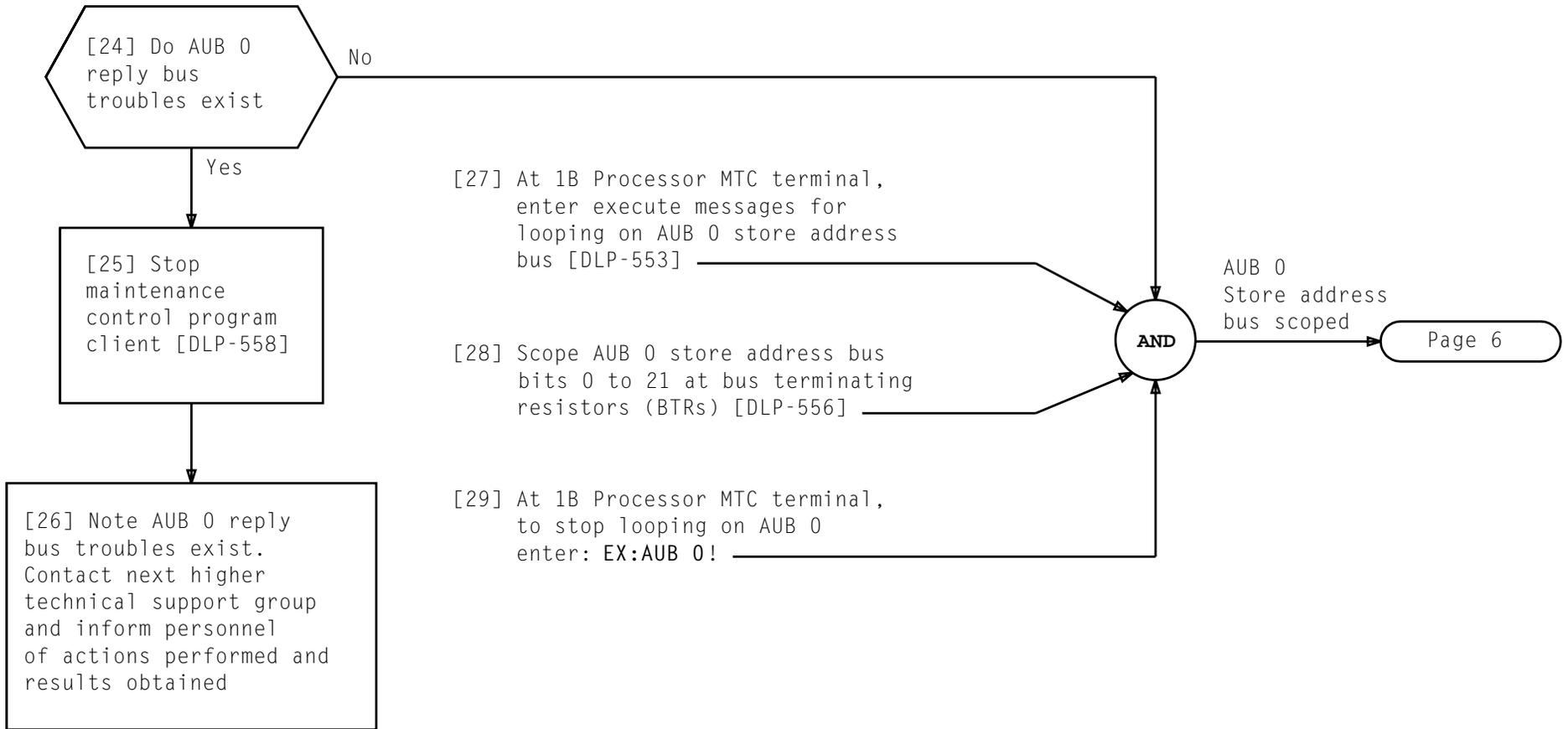
CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY SCOPING AUB USING PHASE 99 DIAGNOSTIC TESTS

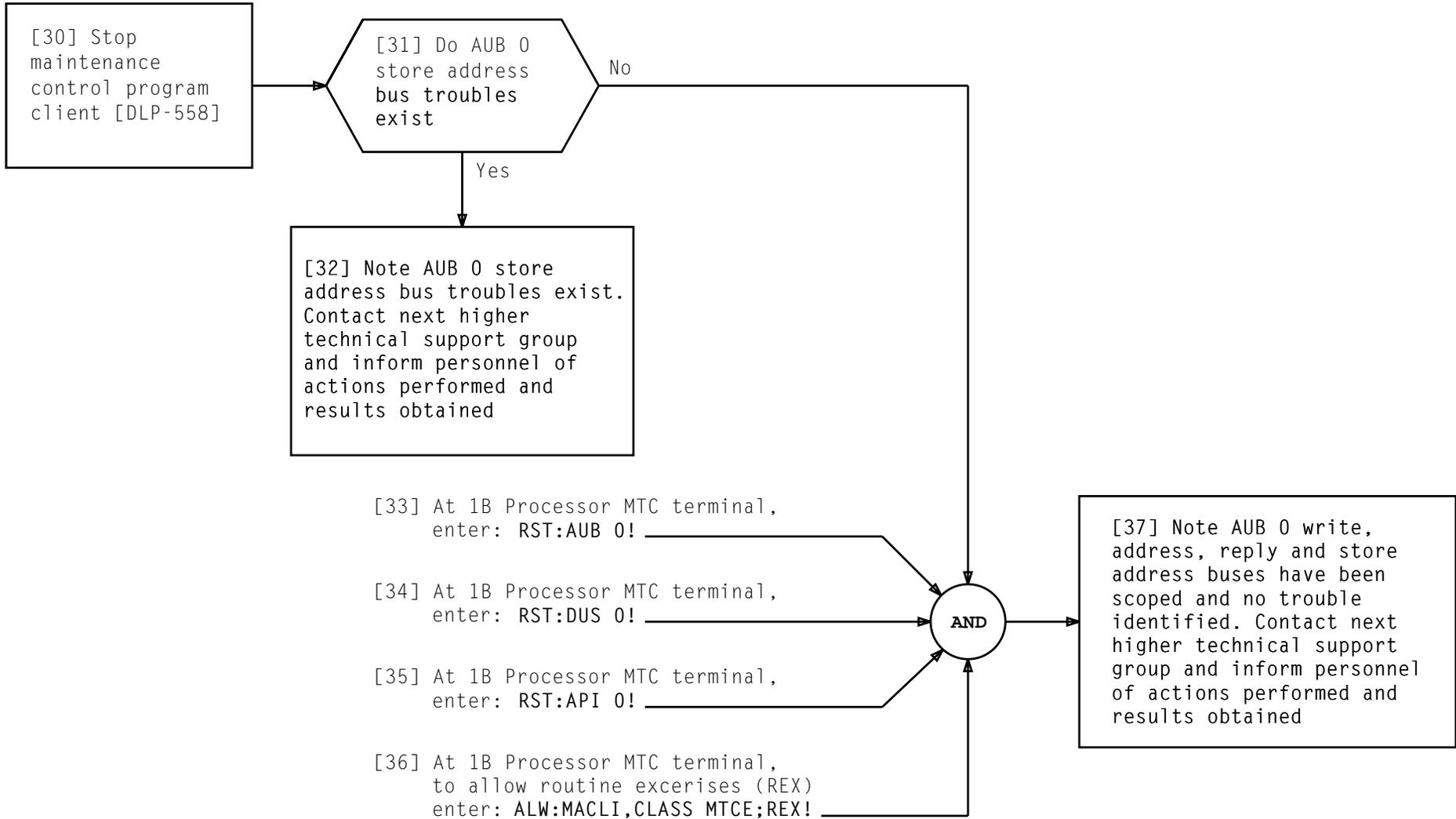
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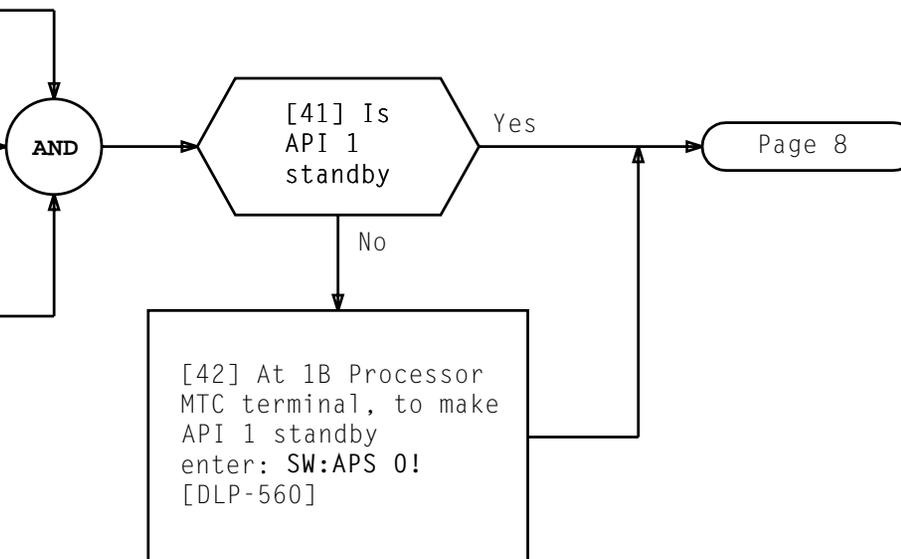




[38] At 1B Processor MTC terminal,
form enter input messages
to be used to scope
AUB 1 [DLP-552]

[39] At 1B Processor MTC terminal,
to inhibit routine exercises (REX)
enter: INH:MACLI,CLASS MTCE;REX!

[40] At 1B Processor MTC terminal,
to determine which API is standby
enter: OP:APSTATUS!
[DLP-559]



[43] At 1B Processor MTC terminal, enter:

RMV:AUB 1!

[44] Set up storage oscilloscope for scoping AUB [DLP-551]

[45] At 1B Processor MTC terminal, enter execute messages for looping on AUB 1 write bus [DLP-553]

[46] Scope AUB 1 write bus bits 0 to 23 at bus terminating resistors (BTRs) [DLP-554]

[47] At 1B Processor MTC terminal, to stop looping on AUB 1 enter: EX:AUB 1!

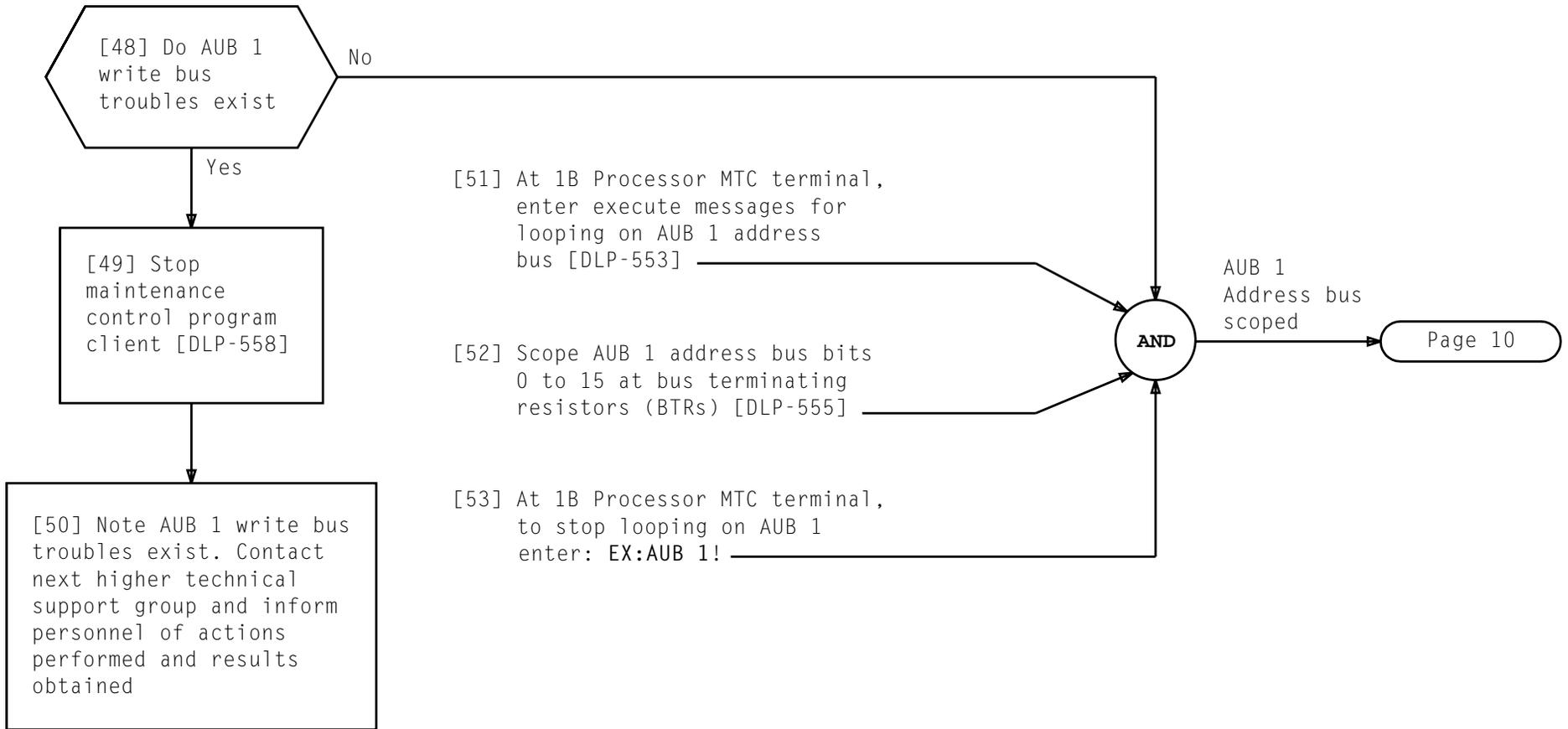


AUB 1
Write bus
scoped

Page 9

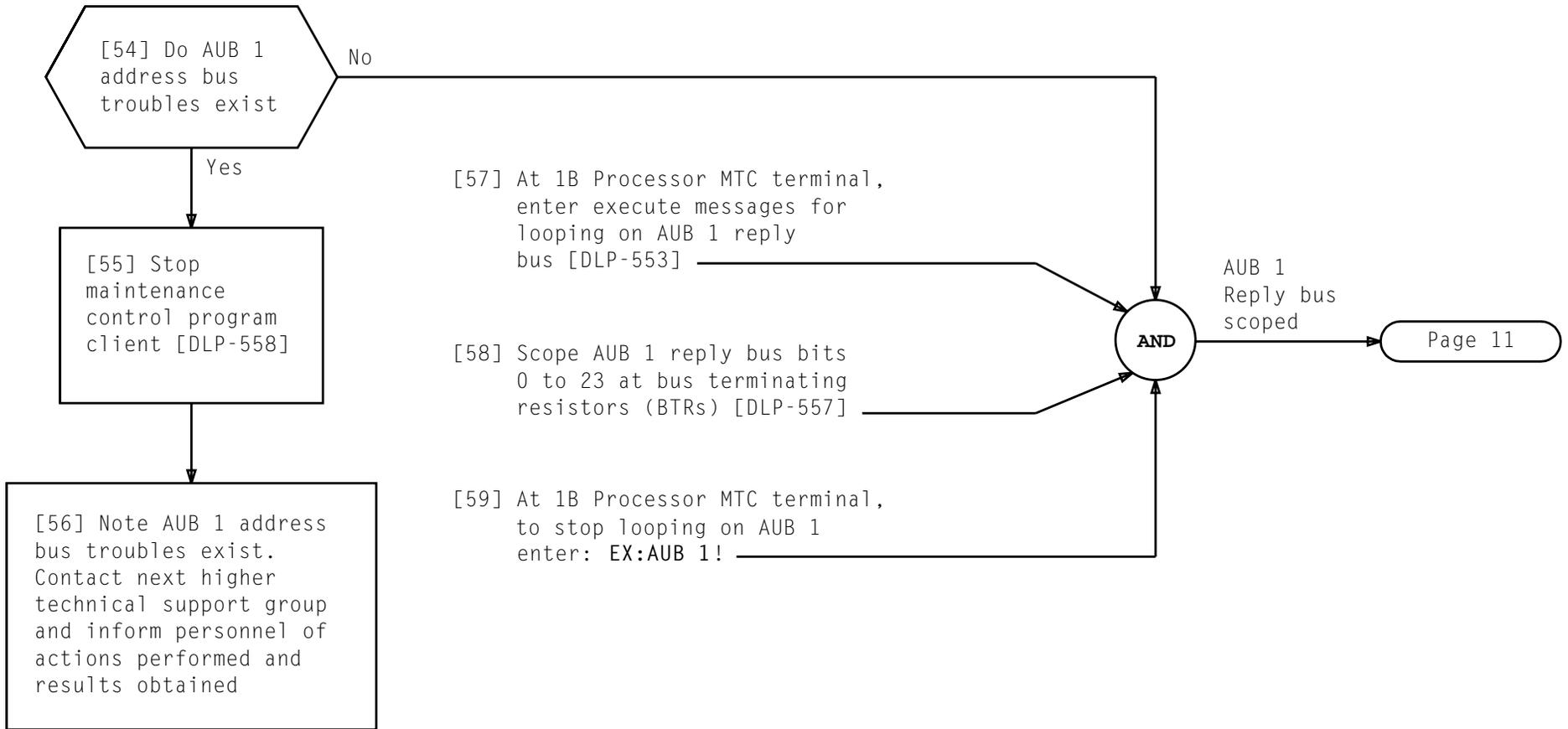
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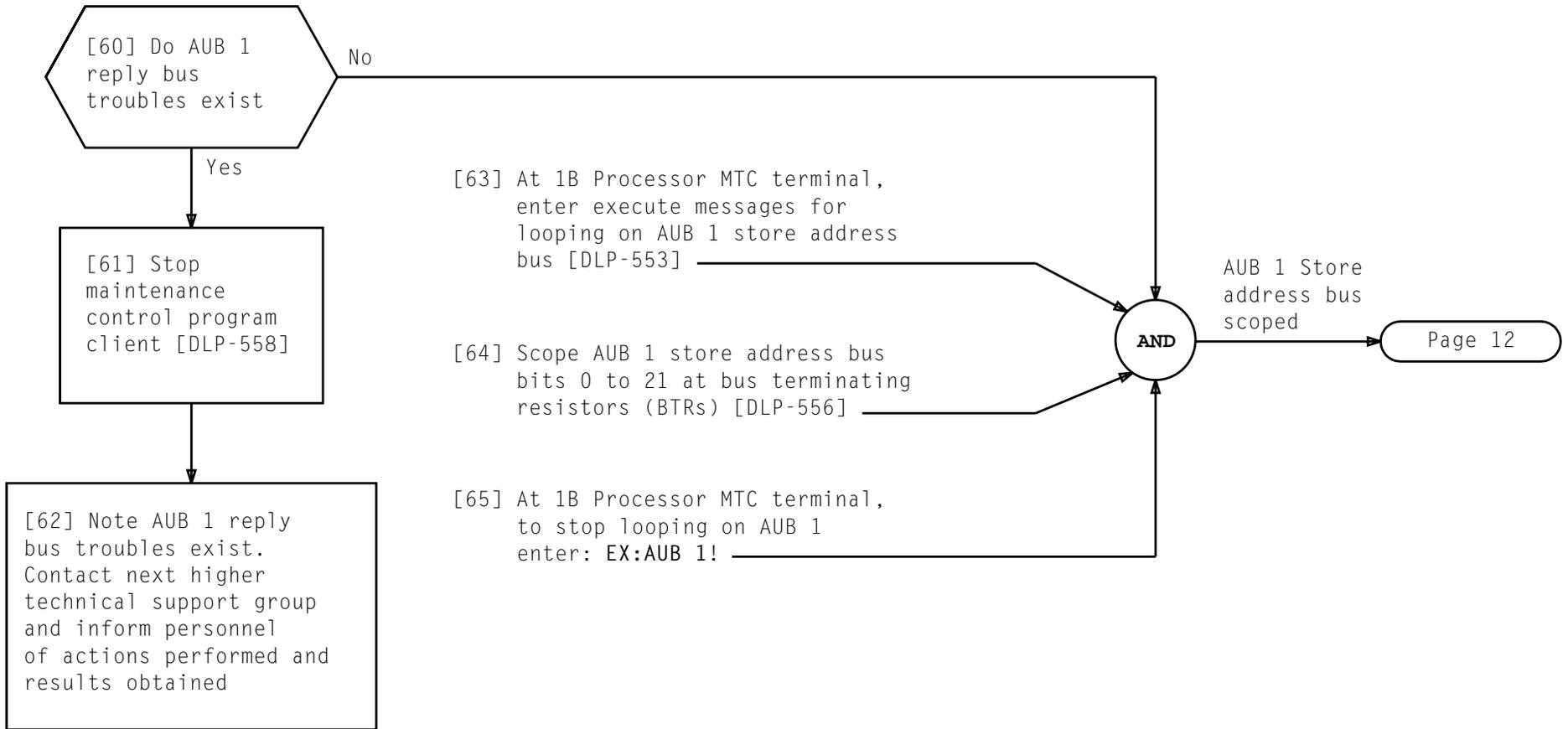
CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY SCOPING AUB USING PHASE 99 DIAGNOSTIC TESTS

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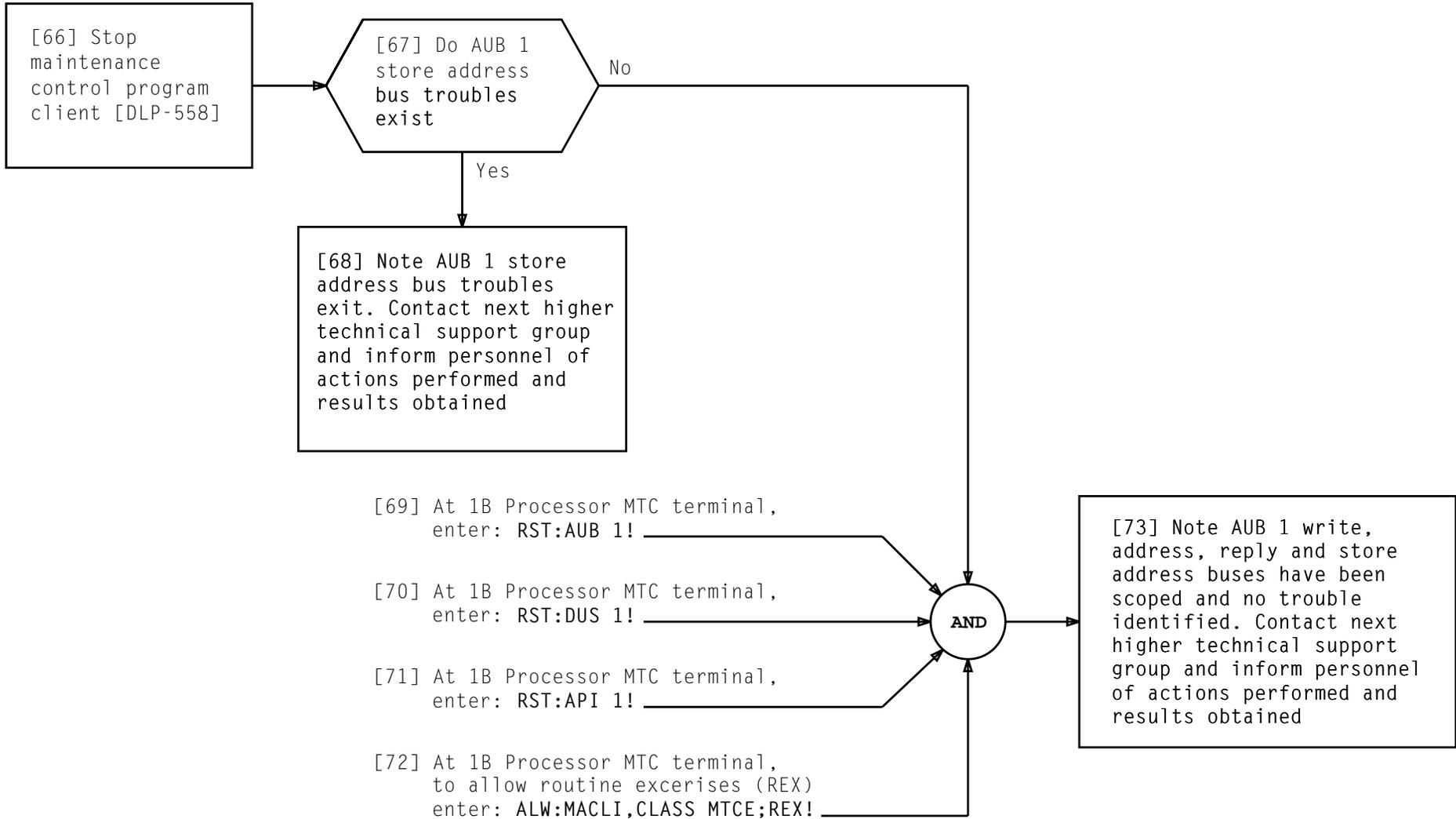
CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY SCOPING AUB USING PHASE 99 DIAGNOSTIC TESTS

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CLEAR AUXILIARY UNIT BUS (AUB) DIAGNOSTIC FAILURE BY SCOPING AUB USING PHASE 99 DIAGNOSTIC TESTS

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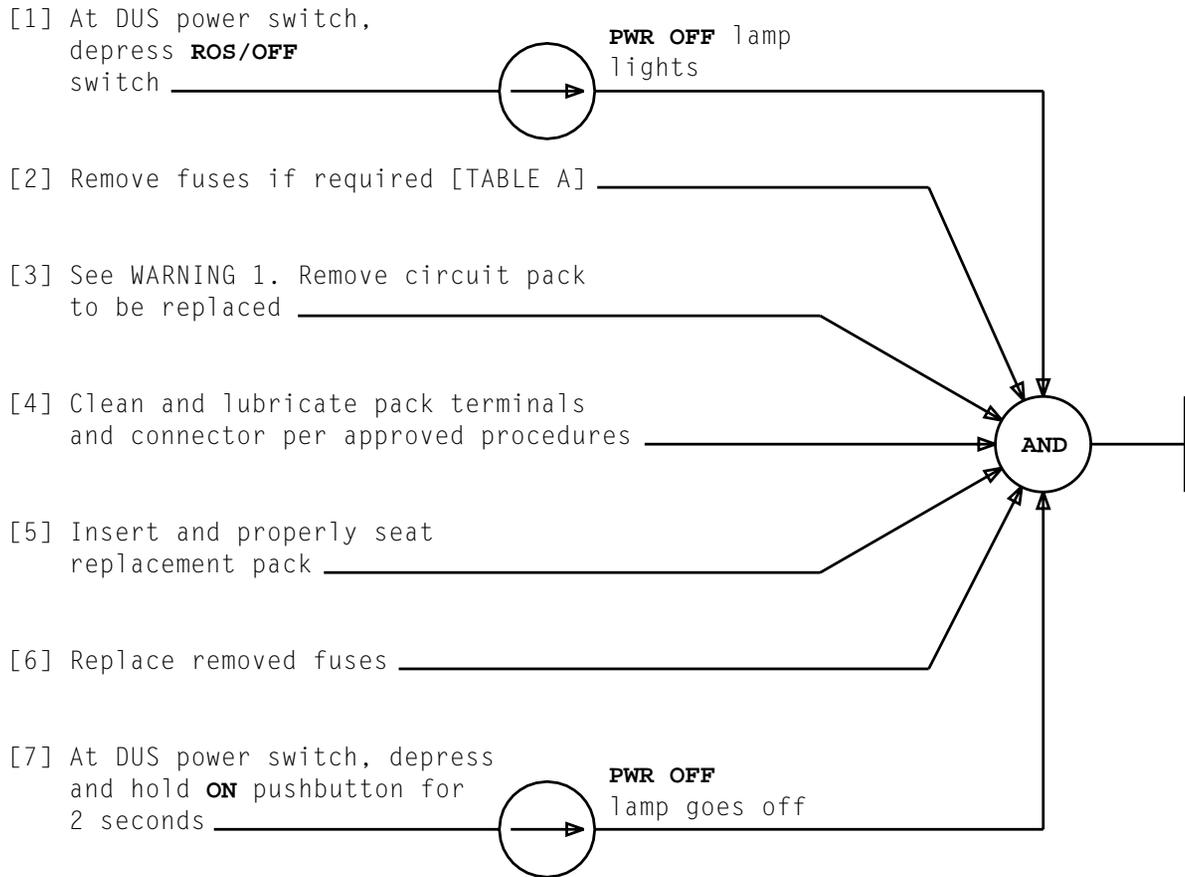


TABLE A		
PACK LOCATION	FUSE	
	NAME	LOCATION
80-37	+24-V5	77-4
	+24-V7	77-4
76-42, 43, 45, 47	+24-V6	77-4

WARNING 1

A ground antistatic wrist strap (R-4987 or equivalent) must be worn when handling circuit packs. The wrist strap must be connected to a ground common to CP ground. When appropriate wrist strap is not available, always touch grounded (exposed) metal before handling CP in any manner. Never hand an unprotected CP to an ungrounded person or touch component, leads connector pins

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REPLACE CIRCUIT PACK — DATA UNIT SELECTOR (DUS)

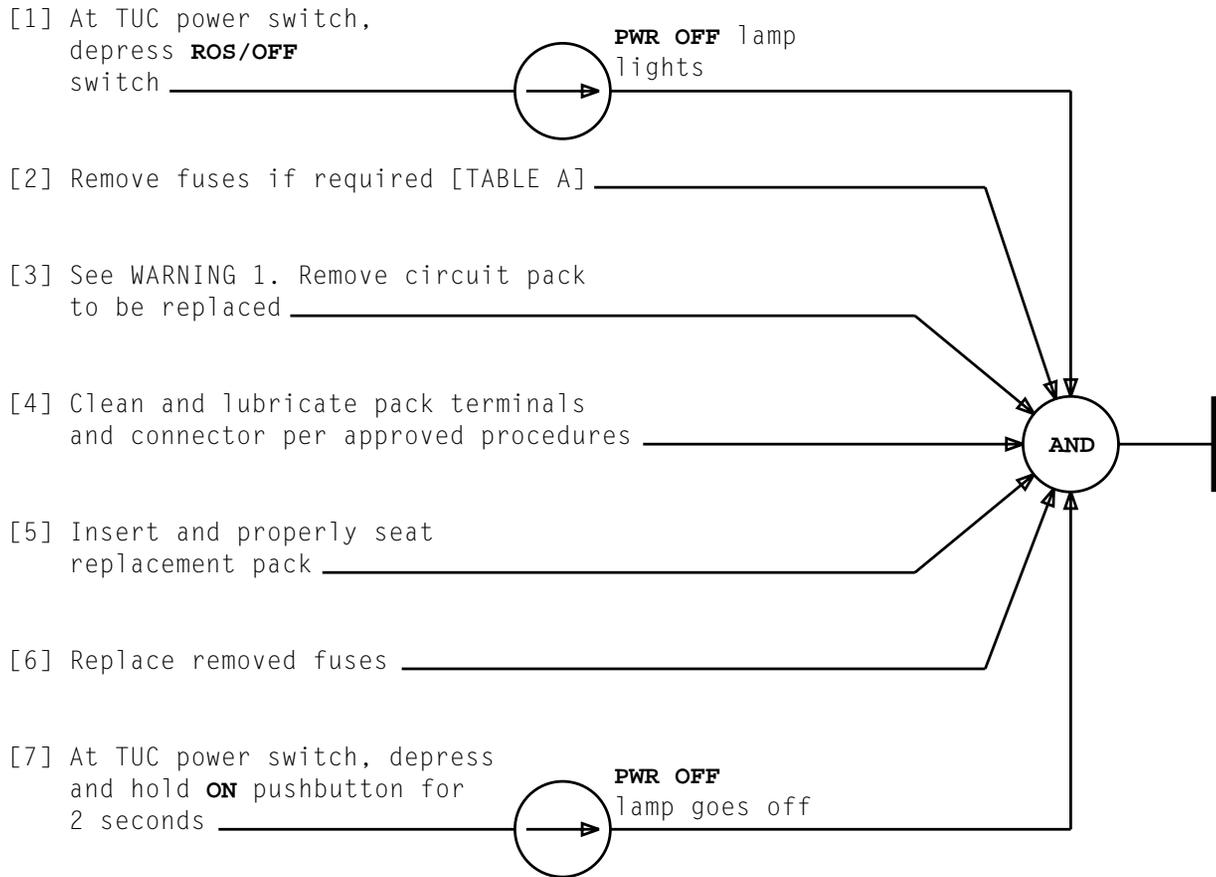


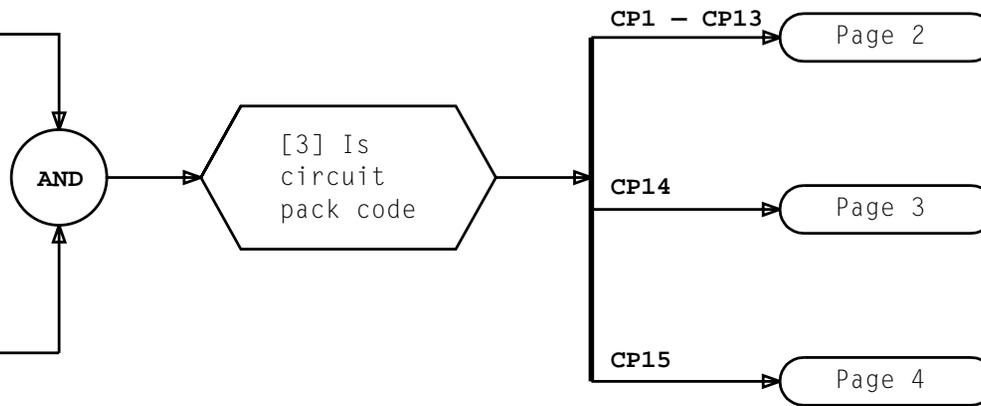
TABLE A		
PACK LOCATION	FUSE	
	NAME	LOCATION
80-39	+24V-FL	68-6
	+24V-V3	68-8
72-40, 80-40 76-11 to 76-13, 76-37, 39, 40	+24V-V3	68-8

WARNING 1
 A ground antistatic wrist strap (R-4987 or equivalent) must be worn when handling circuit packs. This wrist strap must be connected to a ground common to CP ground. When appropriate wrist strap is not available, always touch grounded (exposed) metal before handling CP in any manner. Never hand an unprotected CP to an ungrounded person or touch component, leads connector pins

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[1] See WARNING 1. At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**

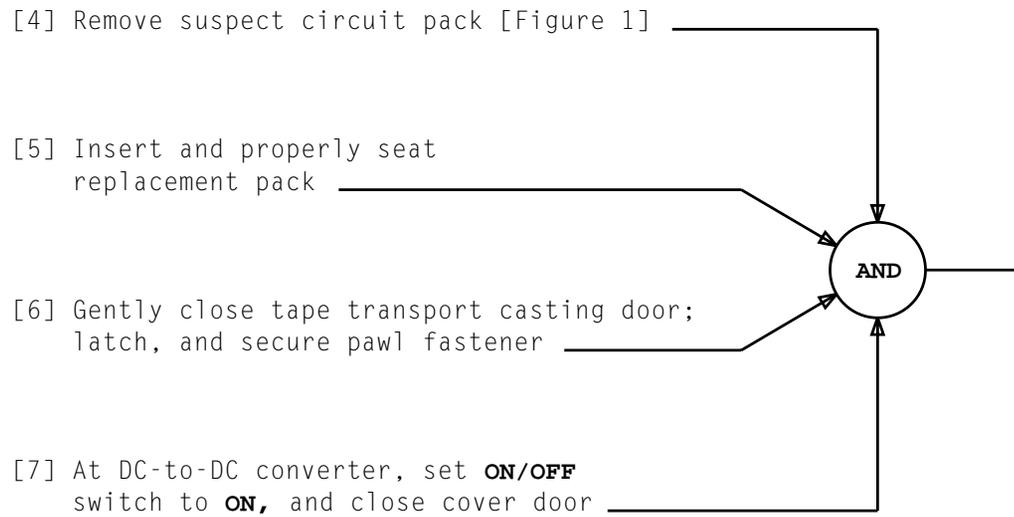
[2] See WARNING 2. If tape transport casting door is not open, at lower right, loosen pawl fastener; unlatch, and open casting door



WARNINGS

1. When DC-to-DC converter is turned off, tape reel motors spin uncontrolled
2. A ground antistatic wrist strap (R-4987 or equivalent) must be worn when handling circuit packs. The wrist strap must be connected to a ground common to CP ground. When appropriate wrist strap is not available, always touch grounded (exposed) metal before handling CP in any manner. Never hand an unprotected CP to an ungrounded person or touch component, leads connector pins

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CP1 A/B	CP6	CP7	CP8	CP2	CP3	CP13	CP5A	CP4A
	CP9	CP10	CP11	-	CP12	-	CP5B	CP4B

Figure 1 - Circuit Pack Locations, CP1 - CP13

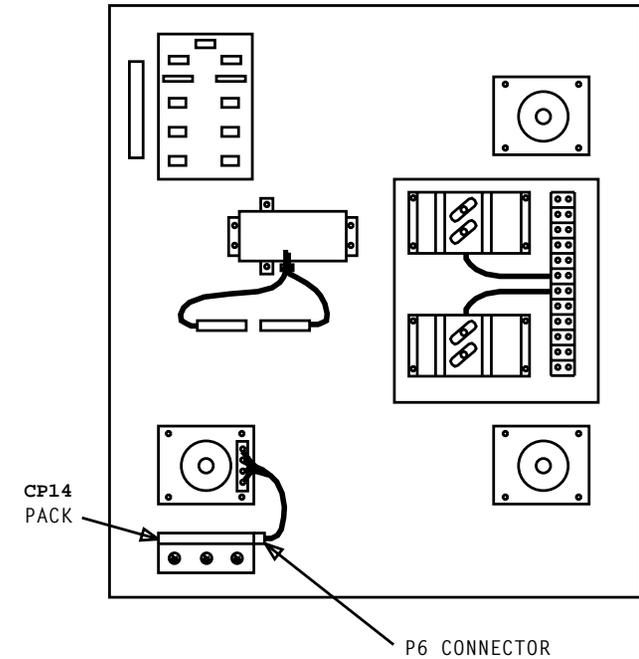
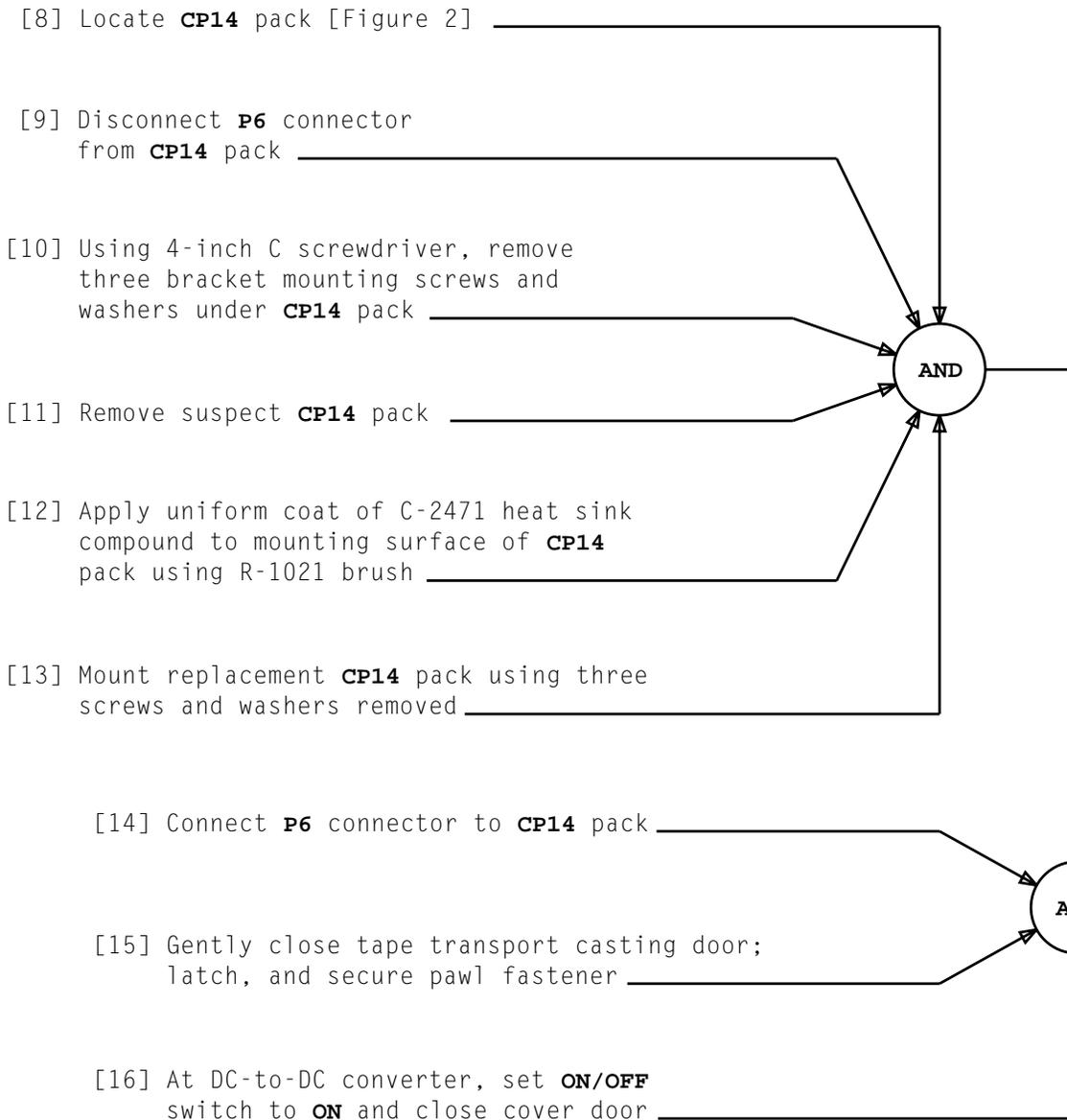


Figure 2 - CP14 Pack Location -
Tape Transport Casting
Door (Rear View)

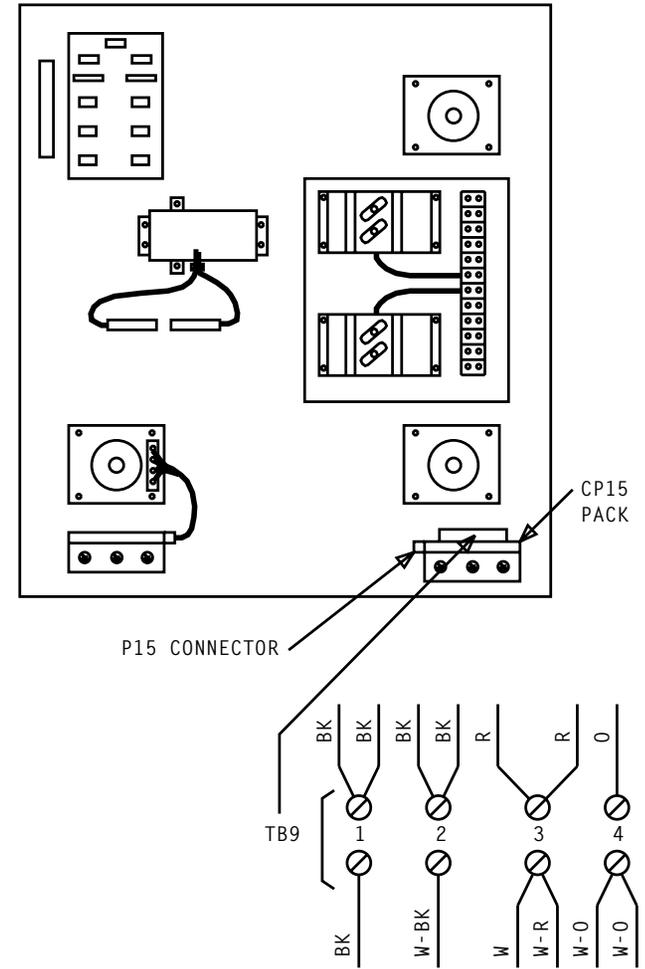
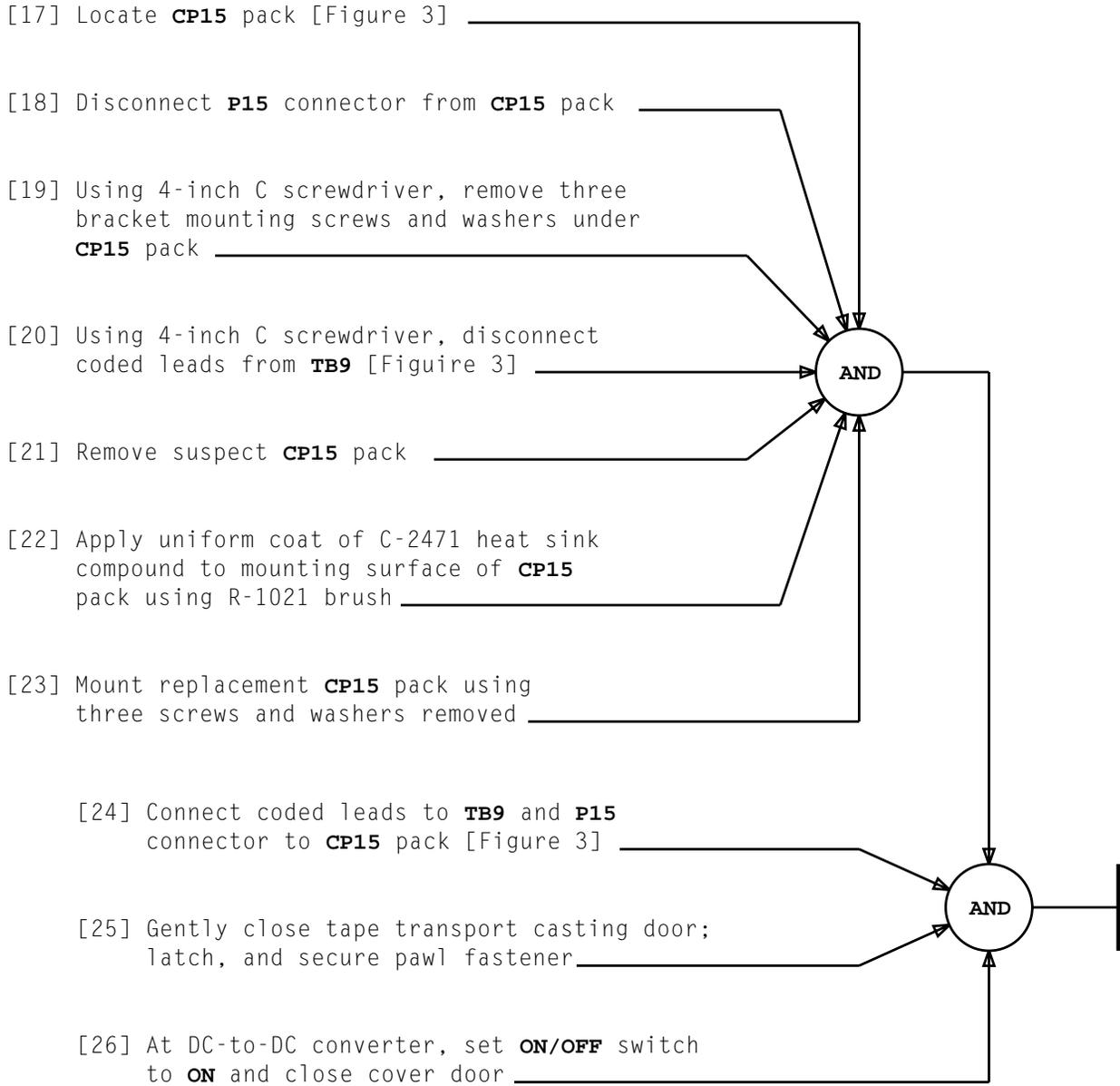


Figure 3 - CP15 Pack and TB9 Location - Tape Transport Casting Door (Rear View)

REPLACE CIRCUIT PACK - TAPE TRANSPORT

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WARNING: When DC-to-DC converter is turned off, tape reel motors will spin uncontrolled

1. At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**

WARNING: Do not hold tension arms by tape guide assemblies

2. Carefully move tape tension arms from tape unload position, and bring to gentle stop against opposite bumper (tape break position)
3. At lower right of tape transport, loosen pawl fastener; unlatch, and open casting door
4. At rear of transport casting door, remove extension spring that interconnects upper and lower tape tension arm control mechanisms
5. Remove spring holder and roller from appropriate cam assembly
6. Check roller for binding that may prevent arm from locking in place. Inspect roller for nicks and excessive wear. Replace if necessary
7. Clean roller and cam assembly using twill cloth dampened with cleaner solvent
8. Reassemble spring holder and cam assembly

9. Install extension spring

10. Manually check operation of arms. Observe smooth motion of spring and roller arms

11. Gently close tape transport casting door; latch, and secure pawl fastener

12. At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door

End of procedure

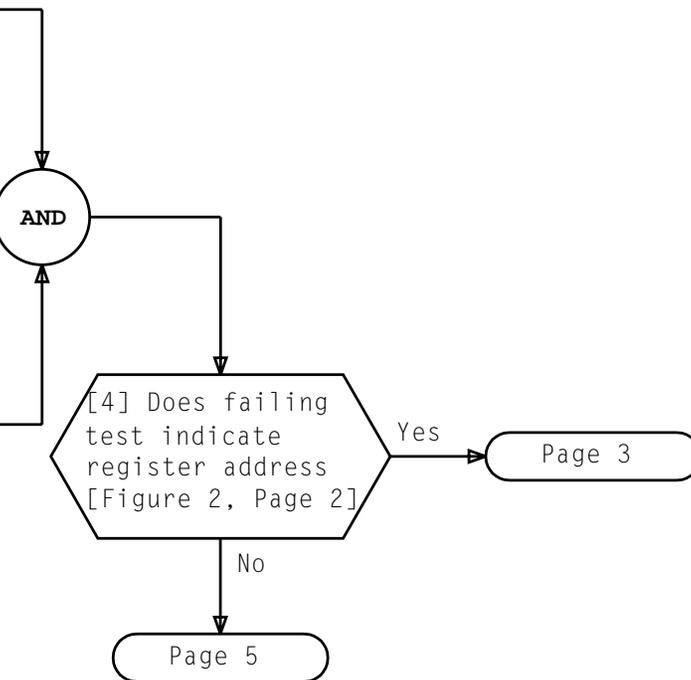
DISASSEMBLE AND INSPECT TAPE TENSION ARM CONTROL MECHANISM ROLLER — TAPE TRANSPORT

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[1] Identify failing phase on printout [Figure 1]

[2] Identify program listing (PR) for failing phase [TABLE A]

[3] Obtain PR and locate first failing test [Figure 2, Page 2]



```

    FIRST FAILING TEST --> M 56 DGN: TUC 4 PH 21 STF (1,00000000 00000000) MSG IP
    TEST 23 MISMATCH SUPPLEMENTARY DATA
    #569 00000060 00000001
    MISMATCH DATA --> 00000060
  
```

Figure 1 - Example of Failing Phase Message

TABLE A				
DUS DIAG PHASE NUMBER	TUC DIAG PHASE NUMBER		ADDG PIDENT	PR
	HELPER DUS ON AUB 0	HELPER DUS ON AUB 1		
Control	Control		ADDG00	5A503
PH01	PH01 (No helper)		ADDG01	734
PH11	—	—	ADDG11	504
PH12	—	—	ADDG12	505
PH13	—	—	ADDG13	506
PH14	—	—	ADDG14	507
PH15	—	—	ADDG15	508
PH16	—	—	ADDG16	509
PH17	—	—	ADDG17	510
—	PH21	PH31	ADDG21	511
PH22	PH22	PH32	ADDG22	512
PH23	PH23	PH33	ADDG23	513
PH24	PH24	PH34	ADDG24	514
PH25	PH25	PH35	ADDG25	515
—	PH41	PH51	ADDG41	516
—	PH42	PH52	ADDG42	517
—	PH43	PH53	ADDG43	518
—	PH44	PH54	ADDG44	519
—	PH45	PH55	ADDG45	520
—	PH46	PH56	ADDG46	521
—	PH61	PH71	ADDG61	522
—	PH81	PH91	ADDG91	523
—	PH82	PH92	ADDG92	524
PH93	PH83	PH93	ADDG93	525
PH99	—	—	ADDG99	738

```

CLOCK OUT OF SYNC FF TEST SET - DUS 0 HELPER (PH21)                20:20:30    11/02/76    ****
                                                                ADDG21    02    03
-002-  01 #          ADDRESS = 21 DATA = 00000102
5280.  03 #
5290.  04 # THE DUC CLOCK HAS THREE TESTABLE CONTROL FF'S
5300.  05 #
5310.  06 # THE INHIBIT CLOCK OUT OF SYNC FF IS SET BY EITHER A HLBO OR HLB1, AND
5320.  07 # RESET BY A HLCS FOLLOWED BY A DUS SYNC PULSE.
5330.  08 #
5340.  09          TUCMWRITE WORD(TU1HLBO),DATA(0)
243 00 01406010 -002- 10          DATA  1 = 0.9 = 0(30).2 = IDG_UNUSED.6 = A(TU1HLBO).6 = 1DGTUCMWRI
E
-002- 12          ADDRESS = 60 DATA = 00000000
5350.  14          DL1SKPTST SKIP=1
-003- 15 #*****
-003- 16 #*
-003- 17 #* TEST 22
-003- 18 #*
-003- 19 #*****
243 00 30000136 -002- 20          DATA  6 = 0(30).12 = IDGDTJUMP
5370.  21          TUCMWRITE WORD(TU1HLBO),DATA(0)
243 00 01407110 -002- 22          DATA  1 = 0.9 = 0(30).2 = IDG_UNUSED.6 = A(TU1HLBO).6 = 1DGTUCMWRI
E
-002- 24          ADDRESS = 71 DATA = 00000000
5380.  26          DUSMREAD ITEM(DS1HLIC00S),EXPECT(M(DS1HLIC00S))
-003- 27 #*****
-003- 28 #*
-003- 29 #* TEST 23
-003- 30 #*
-003- 31 #*****
243 00 40111211 -002- 32          DATA  1 = 1.1 = 0.9 = 0(4).7 = A(DS1HLIC00S).6 = 1DGDUSMREAD
5370.  33 #          ADDRESS = 112 MASK = 00000020 EXPECT = 00000020

```

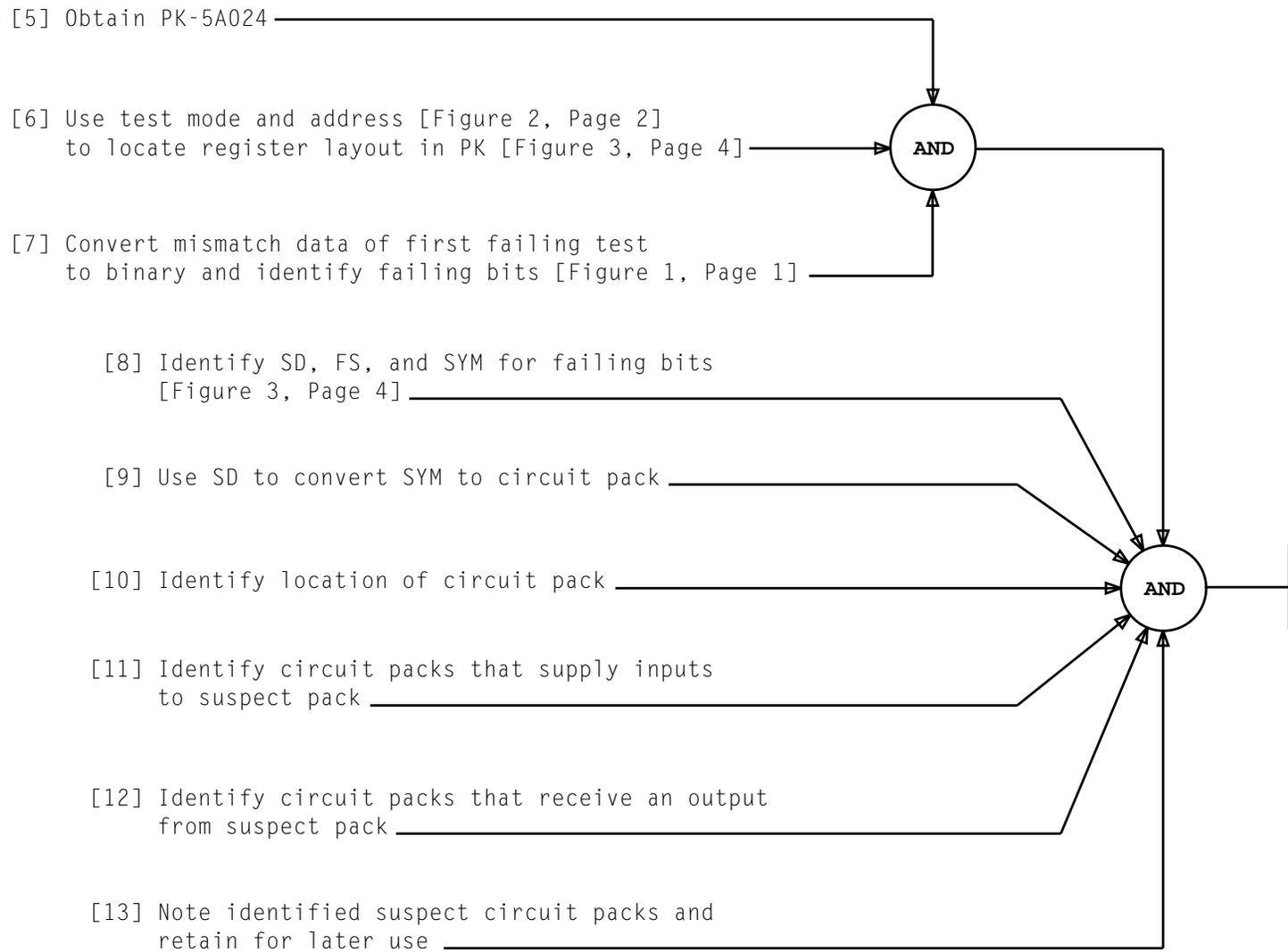
PHASE

MODE = DUS READ

FAILING TEST

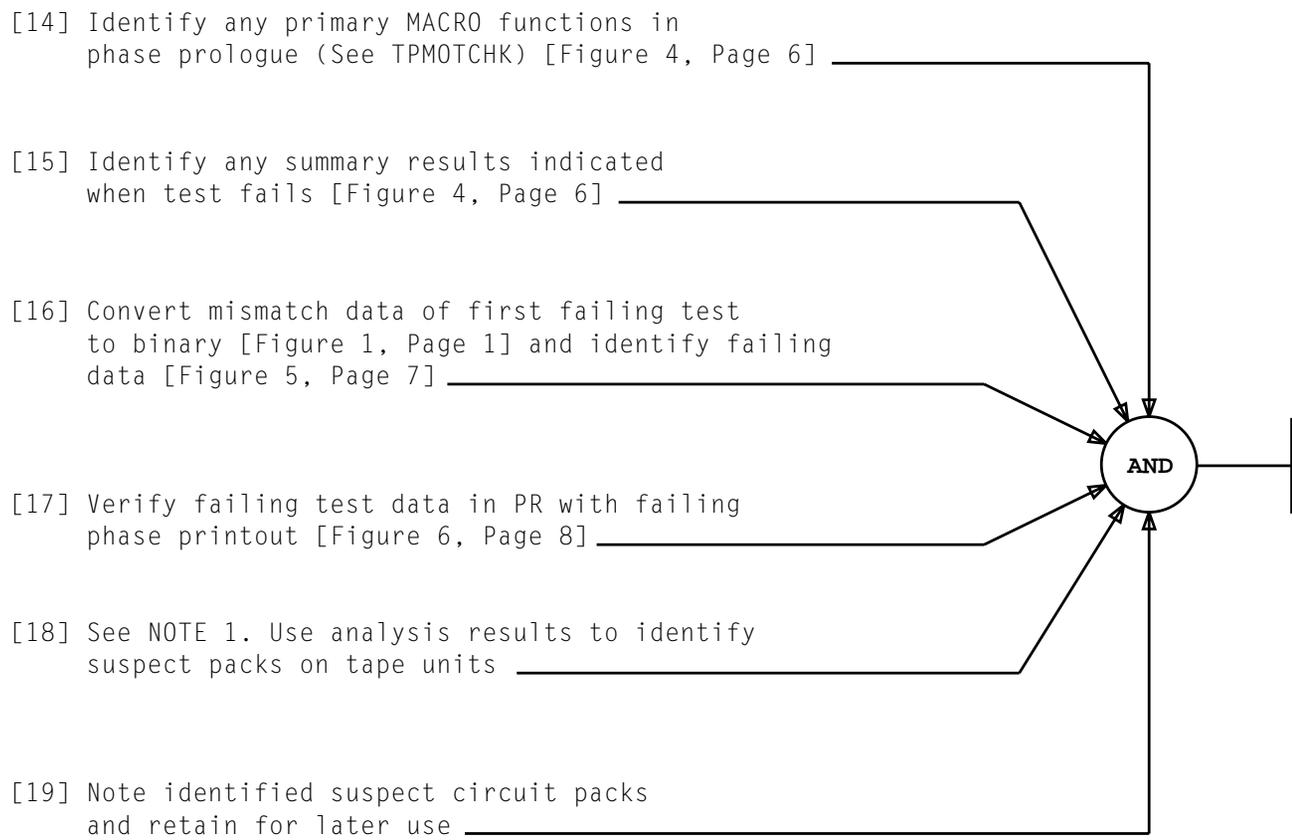
ADDRESS = 112

Figure 2 - Example of Program Listing for Failing Test



IDENTIFY LIST OF SUSPECT CIRCUIT PACKS BY ANALYZING RAW DATA

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NOTE 1	
In example shown [Figure 1], analysis indicates suspect transport units or packs as follows:	
<ul style="list-style-type: none"> • Dirty capstan drive wheel • Bad spot on tape used • Faulty capstan drive assembly • CP2, CP11, CP3, CP14 	
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IDENTIFY LIST OF SUSPECT CIRCUIT PACKS BY ANALYZING RAW DATA

```

41 # FUNCTION
42 #
0010 43 # THIS PHASE TESTS THE ABILITY OF THE TUC AND TAPE TRANSPORT
0020 44 # TO PERFORM VARIOUS TAPE MOTION, READ, AND WRITE FUNCTIONS.
0030 45 # THIS PHASE IS RUN AS PART OF THE AUTOMATIC TUC DIAGNOSIS,
0040 46 # AND THE TESTS WILL BE EXECUTED UNDER THE AUTOMATIC MODE
0050 47 # ONLY IF ALL PREVIOUS PHASES WERE RUN AND WERE ATP. THIS
0060 48 # PHASE WILL BE RUN ONLY IF THE TAPE MOUNTED ON THE TUC IS:

```

PRIMARY MACRO

```

320 01 # TPMOTCHK MACRO IS USED EXTENSIVELY IN ADD61. IT PERFORMS MANY CHECKS ON THE TUC
330 02 # BASED ON G-LEVEL TIMING. A BRIEF DESCRIPTION FOLLOWS:
340 03 # AT 00 MS: TPMOTCHK WRITES THE SPECIFIED COMMAND INTO THE COMMAND REGISTER.
350 04 # AT 06 MS: TPMOTCHK READS THE TTS TRANSPORT CONTROL BITS 8 THROUGH 12 FOR STATES
360 05 # SPECIFIED IN TTS EXPECT AND THE REWINDING INDICATOR BIT 6 FOR RESET. IF NOT
370 06 # AS EXPECTED, TRANSPORT IS STOPPED FIVE WAYS. OUTPUT FAILING BITS WITH
380 07 # SUPPLEMENTAL DATA = 00000000 TO INDICATE COMMAND DID NOT START CORRECTLY.

```

SUMMARY RESULTS

```

550 24 # AT COMPLETION: TTS TAPE MOTION INDICATOR BITS 3, 4, 5, 6 ARE READ. ONLY THE
560 25 # STOPPED BIT, BIT 5, IS EXPECTED TO BE SET. IF THESE BITS ARE NOT AS
570 26 # EXPECTED, TRANSPORT IS STOPPED FIVE WAYS. OUTPUT
580 27 # FAILING BITS WITH SUPPLEMENTAL DATA = 00000001 TO INDICATE THE COMMAND
590 28 # DID NOT COMPLETE IN THE SPECIFIED TIME.
600 29 # FIVE WAYS TPMOTCHK STOPS THE TRANSPORT ON AN ERROR CONDITION ARE:
610 30 # 1. CLEAR THE COMMAND REGISTER AND WRITE THE STOP COMMAND.
620 31 # 2. CLEAR THE MIS REGISTER AND SET THE TIME-OUT INDICATOR.
630 32 # 3. CLEAR THE MAINT REGISTER AND SET SUPPRESS TAPE MOTION.
640 33 # 4. CLEAR THE TTS REGISTER AND SET STOP/START AND PARK/NORMAL.
650 34 # 5. SEND THE HOTLINE POWER UP ADDRESS.
660 35 # READS OF TUC REGISTERS AFTER A FAILING TPMOTCHK ARE USELESS FOR THE ABOVE FIVE REASONS.
670 36 # A DLIETERM MACRO FOLLOWS THE TPMOTCHKS TO TERMINATE THE PHASE.

```

Figure 4 - Example of PR Prologue

```

29275. 07 #
29280. 08 # PROCEDURE:
29285. 09 #
29290. 10 # SEND REVERSE LOCATE EOF COMMAND AND THEN STOP COMMAND.
29295. 11 # TAPE SHOULD STOP WITH HEADS ON INTER BLOCK GAP BETWEEN DATA BLOCK THREE AND DATA BLOCK FIVE.
29295.1000 12 #

```

```

ADG61
DUS=1(ADG 71)

```

```

29370. 27 #
29375. 28 # TERMINATION STRATEGY: TERMINATE PHASE ON TAPE MOTION FAILURE.
29380. 29 #

```

PRIMARY
MACRO

```

3 00 00034024      29620.  41      OUTFOR 1DGNOPAGE
                   29625.  42      DLITFZAP
                   -002-  43      DATA  8 = 1DG_UNUSED.5 = 1DG_UNUSED.6 = 1DGCCNTLPGM
                   29630.  44      TPMOTCHK COMMAND(M(TUIREVEOF)),TTSEXPCT(M(TUILOWSPD,TUIBSYIDL,TUIREVM
                   OT.TUITTRDY)),CMPLTIME(MSEC(140)),DELYSTOP
3 00 24000033      -002-  46      DATA  3 = 0(2).15 = M(TUIREVEOF).6 = 1DGTMPOTCHK
3 00 00002421      -002-  47      DATA 11 = 0.13 = M(TUILOWSPD,TUIBSYIDL,TUIREVMOT,TUITTRDY)
3 00 00000214      -002-  48      DATA 10 = 0.14 = 140

```

```

003- 01 #*****
003- 02 #*
003- 03 # TEST 6159
003- 04 #*
003- 05 #*****
                   29634.  06      DLIETERM TESTFAIL,LABEL(PH61CLEANUP),YESTERM
3 00 00232224      -002-  07      DATA  5 = 1DG_UNUSED.1 = 0.1 = 0.1 = 1.5 = 1DGTRM.1 = 1.2 =
                   1DG_UNUSED.1 = 1.1 = 0.6 = 1DGCCNTLPGM
3 00 00002151      -002-  09      DATA 24 = PH61CLEANUP-*

```

Figure 5 - Examples of PR Showing Failed Data

MODE=TUC READ ADDRESS=C42		TUC/TT STATUS REGISTER				10:04:02 09/15/76	
		COMPOOL MNEMONIC = TTS SD5A024-01 SD5A025-01					
		GATEOUT ENABLE = SELTTSRO					
BIT OP	FUNCTION NAME COMPOOL ALIAS	SD FS/SYM	LEAD DESIG	CPS REG/GATE NAME	DESCRIPTION	NOTE	
00	TTRDY	25 11/1	B000	TTTSR000	TT READY		
01	BOT	25 11/1	B010	TTTSR010	BOT PRESENT		
02	BOT	25 11/1	B020	TTTSR020	BOT PRESENT		
03	FWDROT	25 11/1	B030	TTTSR030	FORWARD MOTION		
04	← REVMOT	25 11/1	B040	TTTSR040	REVERSE MOTION	IN MISMATCH EXAMPLE SET = SHOULD NOT BE RESET = SHOULD NOT BE	
05	← STOPPED	25 11/1	B050	TTTSR050	STOPPED MOTION		
06	REWIND	25 11/1	B060	TTTSR060	REWINDING		
07	LRCEQZ	25 11/1	B070	OB070	LRC EQUAL ZERO		
08	BSYIDL	25 11/2	B080	TTTS08	BUSY/IDLE		
09	PRKNOR	25 11/2	B090	TTT9MR09	PARK/NORMAL		
10	LOWSPD	25 11/2	B100	TTTS1011(A)	LOW SPEED		
11	FWDREV	25 11/2	B110	TTTS1011(B)	FORWARD/REVERSE MOTION		
12	STPSTRT	25 11/3	B120	TTTSR12	STOP/START		
13					UNUSED RESPONSE		
14	CAPMOT	25 11/3	B140	TTTS1415(A)	ENABLE CAPSTAN MOTION INDICATOR		
15					UNUSED RESPONSE		
16	ACTIVE	25 11/3	B160	TTTS1617(A)	ACTIVE		
17	STDBY	25 11/3	B170	TTTS1617(B)	STANDBY		
18	SB2	25 11/4	B180	TTTS1819(A)	READ ONLY/READ-WRITE		
19	ROBW	25 11/4	B190	TTTS1819(B)	FILE OPEN/CLOSED		
20	FILEOC	25 11/4	B200	TTTS2021(A)	ACKNOWLEDGE DEMOUNT REQUEST		
21	DEMQRST	25 11/4	B210	TTTS2021B	OK TO DEMOUNT		
22	OKDEMNT	25 11/4	B220	TT22M118	UNUSED RESPONSE		
23							

Figure 6 - Example of TTS Register Layout

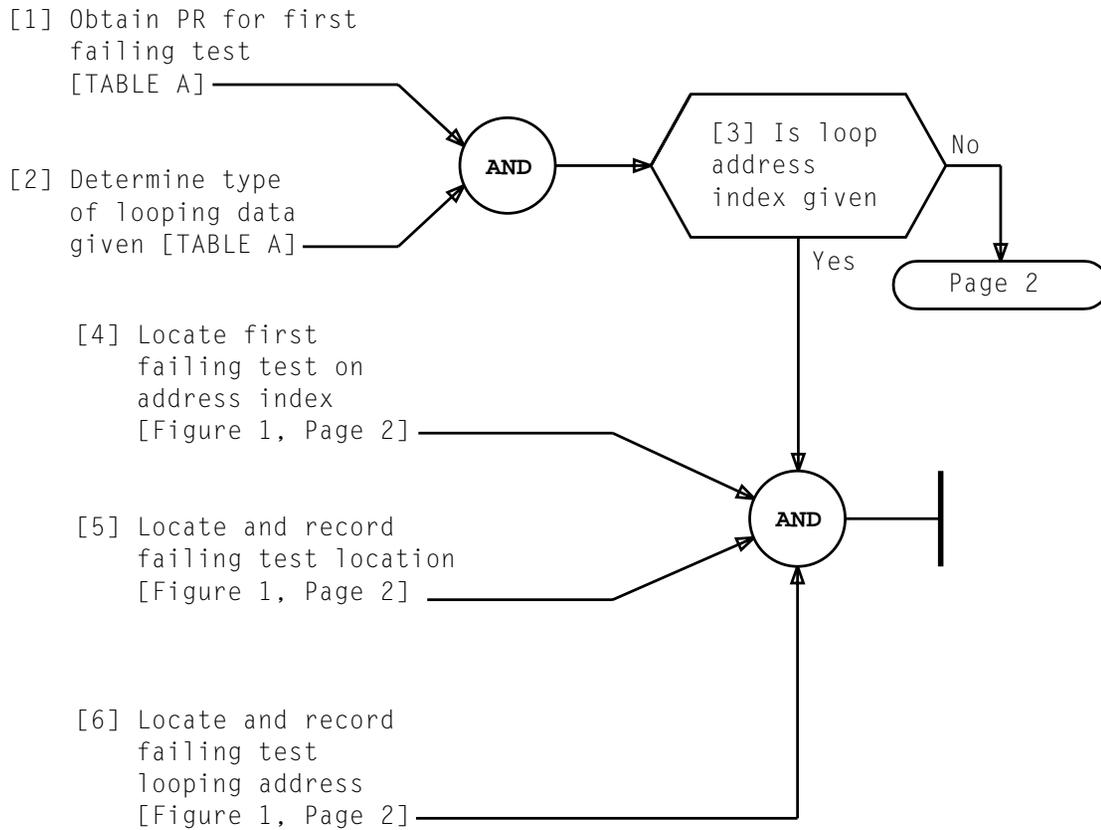


TABLE A				
DUS DIAG PHASE NUMBER	TUC DIAG PHASE NUMBER		ADDG PIDENT	PR*
	HELPER DUS ON AUB 0	HELPER DUS ON AUB 1		
CONTROL	CONTROL		ADDG00	5A503a
PH01	PH01(NO HELPER)		ADDG01	5A734b
PH11	—	—	ADDG11	5A504b
PH12	—	—	ADDG12	5A505b
PH13	—	—	ADDG13	5A506b
PH14	—	—	ADDG14	5A507b
PH15	—	—	ADDG15	5A508b
PH16	—	—	ADDG16	5A509b
PH17	—	—	ADDG17	5A510b
—	PH21	PH31	ADDG21	5A511b
PH22	PH22	PH32	ADDG22	5A512b
PH23	PH23	PH33	ADDG23	5A513b
PH24	PH24	PH34	ADDG24	5A514b
PH25	PH25	PH35	ADDG25	5A515b
—	PH41	PH51	ADDG41	5A516b
—	PH42	PH52	ADDG42	5A517b
—	PH43	PH53	ADDG43	5A518b
—	PH44	PH54	ADDG44	5A519b
—	PH45	PH55	ADDG45	5A520b
—	PH46	PH56	ADDG46	5A521b
—	PH61	PH71	ADDG61	5A522c
—	PH81	PH91	ADDG91	5A523c
—	PH82	PH92	ADDG92	5A524c
PH93	PH83	PH93	ADDG93	5A525c
PH99	—	—	ADDG99	5A738b

* Type of looping data by PR:
a = no looping data
b = loop address index
c = loop guidelines

[7] Identify program unit for failing test
in PR (upper left hand of page)

[8] Locate program unit and
recommended loops in PR
[Figure 2, Page 3]

AND

[9] Does list
show recommended
unit or loop
for testing

Yes

[11] Use
address
identified
for looping
instructions

No

[10] Select
range of
program units
that include
failing test

TEST NUMBER INDEX		DATA TABLE TEST LOCATION AND SEGMENT LOOP ADDRESS INDEX								
-002-	01									
-002-	02	ADDG15 02 03								
-002-	03									
-002-	04									
-002-	05									
-002-	06									
-002-	07	TEST	LOC	LOOPING ADR	TEST	LOC	LOOPING ADR	TEST	LOC	LOOPING ADR
-002-	08									
-002-	09	0000	00017	00002-00102	0001	00021	00002-00102	0002	00023	00002-00102
-002-	10	0003	00025	00002-00102	0004	00027	00002-00102	0005	00033	00002-00102
-002-	11	0006	00037	00002-00102	0007	00042	00002-00102	0008	00052	00002-00102
-002-	12	0009	00057	00002-00102	0010	00064	00002-00102	0011	00071	00002-00102
-002-	13	0012	00076	00002-00102	0013	00111	00002-00102	0014	00116	00002-00102
-002-	14	0015	00123	00102-00210	0016	00130	00102-00210	0017	00136	00102-00210
-002-	15	0018	00144	00102-00210	0019	00152	00102-00210	0020	00157	00102-00210
-002-	16	0021	00165	00102-00210	0022	00173	00102-00210	0023	00200	00102-00210
-002-	17	0024	00204	00102-00210	0025	00224	00102-00210	0026	00225	00102-00210
-002-	18	0027	00231	00210-00262	0028	00234	00210-00262	0029	00237	00210-00262
-002-	19	0030	00242	00210-00262	0031	00245	00210-00262	0032	00250	00210-00262
-002-	20	0033	00253	00210-00262	0034	00256	00210-00262	0035	00266	00210-00262
-002-	21	0036	00271	00262-00352	0037	00274	00262-00352	0038	00277	00262-00352

Figure 1 - Example of Loop Address Index

LOOPING INFORMATION

12:39:23 10/22/77 ****
 ADDG61 C2 04

01 # a list of recommended loops in terms of program units, TEST NUMBERS, AND LOOP BOUNDARY
 02 # ADDRESSES IS PROVIDED. ALTHOUGH MANY LOOPS ARE POSSIBLE, A RECOMMENDED LOOP IS ONE THAT WILL
 03 # (1) NOT RUN OUT OF TAPE BY TRYING TO GO BEYOND BOT OR EOT, AND (2) WILL NOT HAVE TEST FAILURES
 04 # AS A RESULT OF THE LOOP ITSELF. TEST FAILURES CAN BE CAUSED BY LOOPING IF LOOP BOUNDARIES
 05 # ARE POORLY CHOSEN. INCOMPATIBILITY AMONG THE PROGRAM UNITS OF THE LOOP (REGARDING INFORMATION
 06 # ON TAPE, TAPE POSITION, AND TIME ALLOWED TO COMPLETE A TAPE MOTION OPERATION) IS THE MAIN REASON
 07 # FOR TEST FAILURES AS A RESULT OF LOOPING.
 08 #

09 # PROGRAM UNITS:

RECOMMENDED LOOPS:

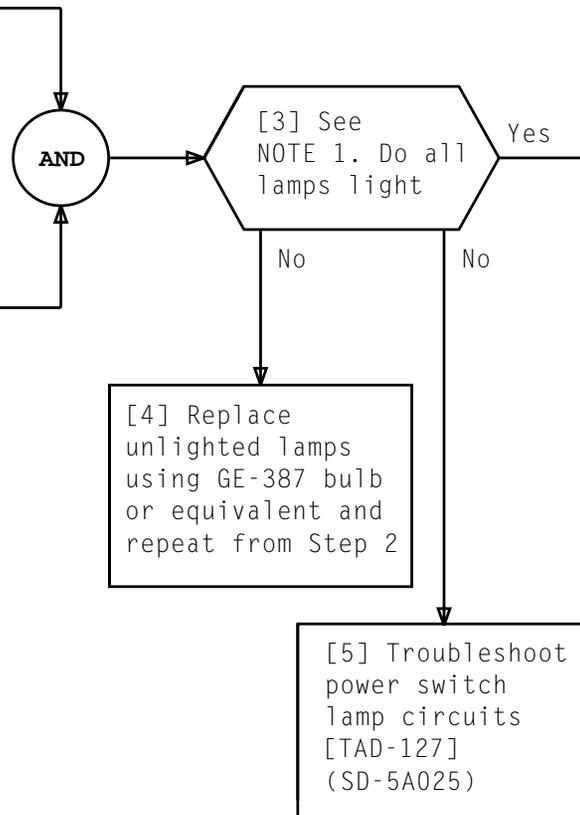
10 #		
11 #	01 THROUGH 03	TESTS 0000-0016 LOOPING ADR 00137-00337
12 #	04 THROUGH 07	TESTS 0017-0034 LOOPING ADR 00377-00560
13 #	05 THROUGH 06	TESTS 0021-0030 LOOPING ADR 00432-00526
14 #	06 THROUGH 09	TESTS 0026-0042 LOOPING ADR 00470-00644
15 #	09 THROUGH 26	TESTS 0039-2307 LOOPING ADR 00612-02224
16 #	10 THROUGH 11	TESTS 0043-0057 LOOPING ADR 00644-00772
17 #	10 THROUGH 35	TESTS 0043-4518 LOOPING ADR 00644-03117
18 #	11 THROUGH 12	TESTS 0052-0245 LOOPING ADR 00732-01062
19 #	11 THROUGH 12 LESS MEMCHECKS	TESTS 0052-0065 LOOPING ADR 00732-01053
20 #	13 THROUGH 14	TESTS 0246-0262 LOOPING ADR 01062-01213
21 #	14 THROUGH 15	TESTS 0257-0450 LOOPING ADR 01153-01307
22 #	14 THROUGH 15 LESS MEMCHECKS	TESTS 0257-0270 LOOPING ADR 01153-01272
23 #	16 THROUGH 17	TESTS 0451-0469 LOOPING ADR 01307-01443
24 #	17 THROUGH 18	TESTS 0464-0657 LOOPING ADR 01403-01537
25 #	17 THROUGH 18 LESS MEMCHECKS	TESTS 0464-0477 LOOPING ADR 01403-01522
26 #	19 THROUGH 20	TESTS 0658-0674 LOOPING ADR 01537-01706

Figure 2 - Example of Looping Guidelines

At power switch:

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

[2] Depress and hold **TEST** pushbutton



TEST POWER SWITCH LAMPS

NOTE 1	
REQ DMT lamp does not light	
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At tape transport:

[1] Apply one drop of oil to each cover door hinge and cover door latch hinge [Figure 1]

[2] Operate door latch and cover door on hinges

[3] Remove excessive oil using twill cloth

[4] Apply one drop of oil to each casting door hinge [Figure 1]

[5] At lower right, loosen pawl fastener; unlatch, and open casting door [Figure 1]

[6] Operate casting door on hinges and remove excessive oil using twill cloth

[7] Gently close casting door; latch, and secure pawl fastener

AND

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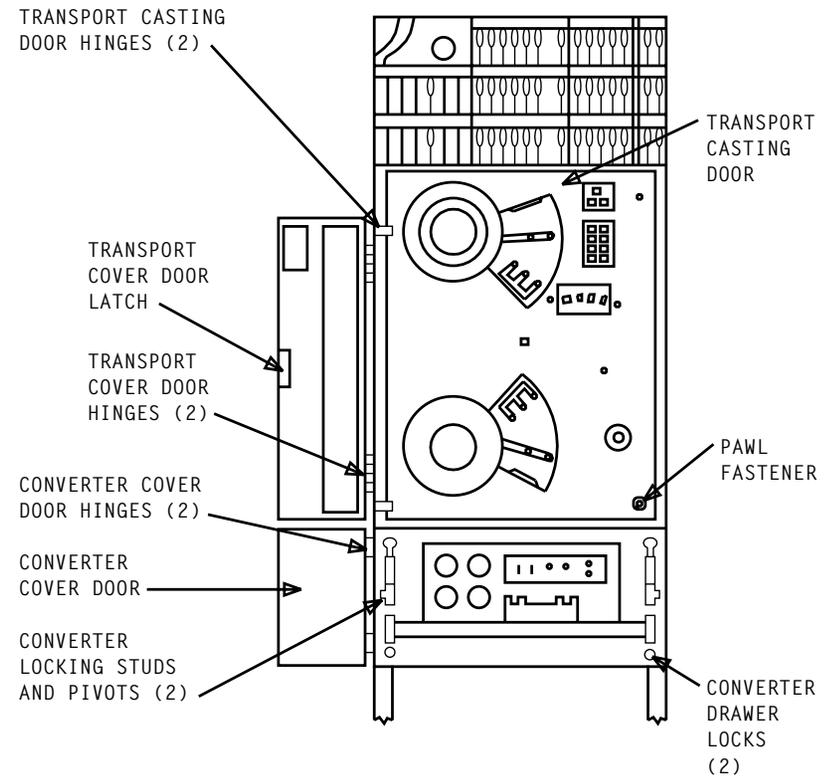


Figure 1 - Tape Unit Frame (Front View)

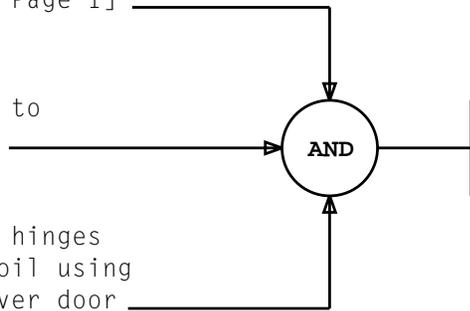
LUBRICATE DOOR HINGES

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[8] At DC-to-DC converter, open cover door [Figure 1, Page 1]

[9] Apply one drop of oil to each cover door hinge

[10] Operate cover door on hinges and remove excessive oil using twill cloth; close cover door



LUBRICATE DOOR HINGES

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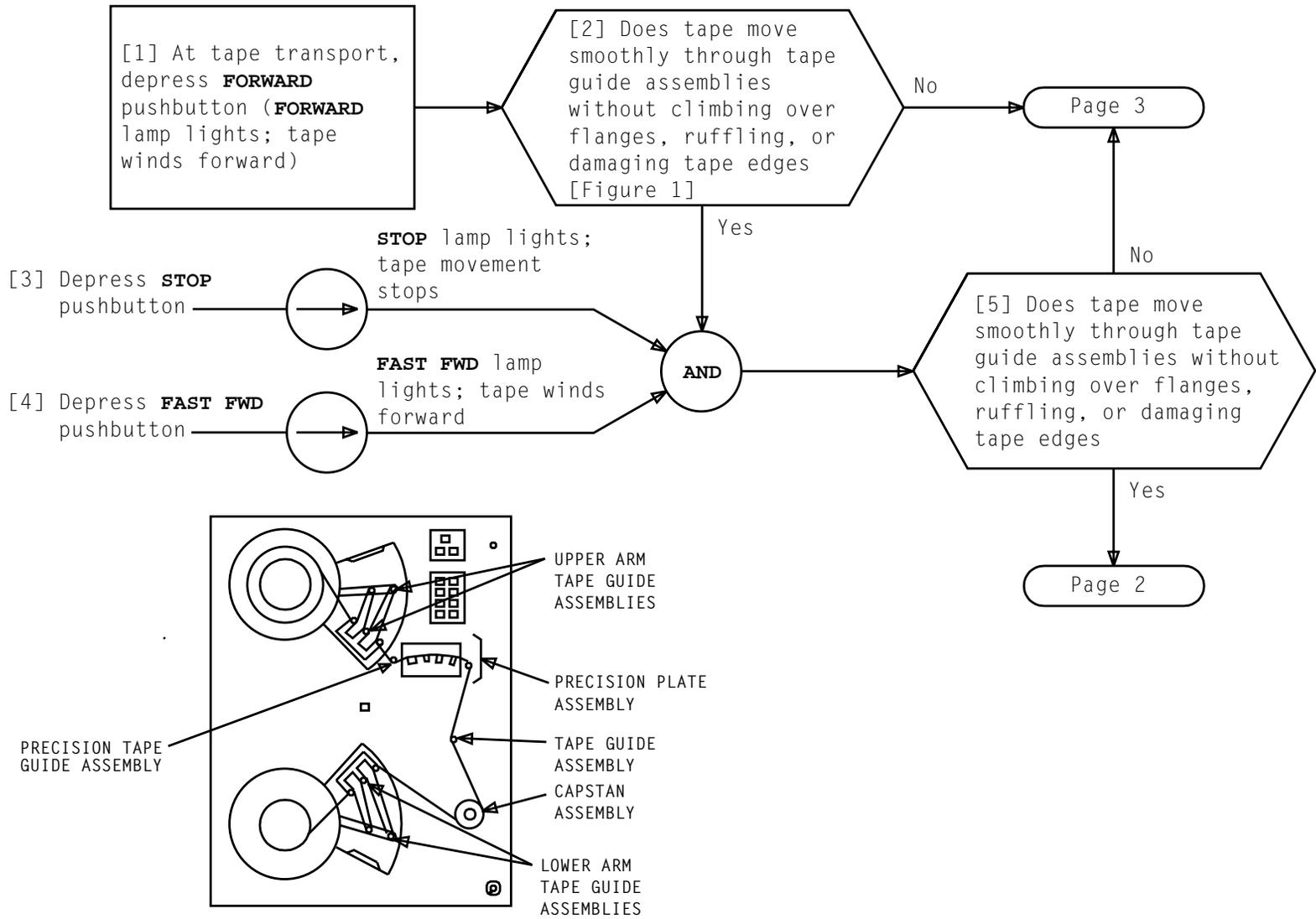
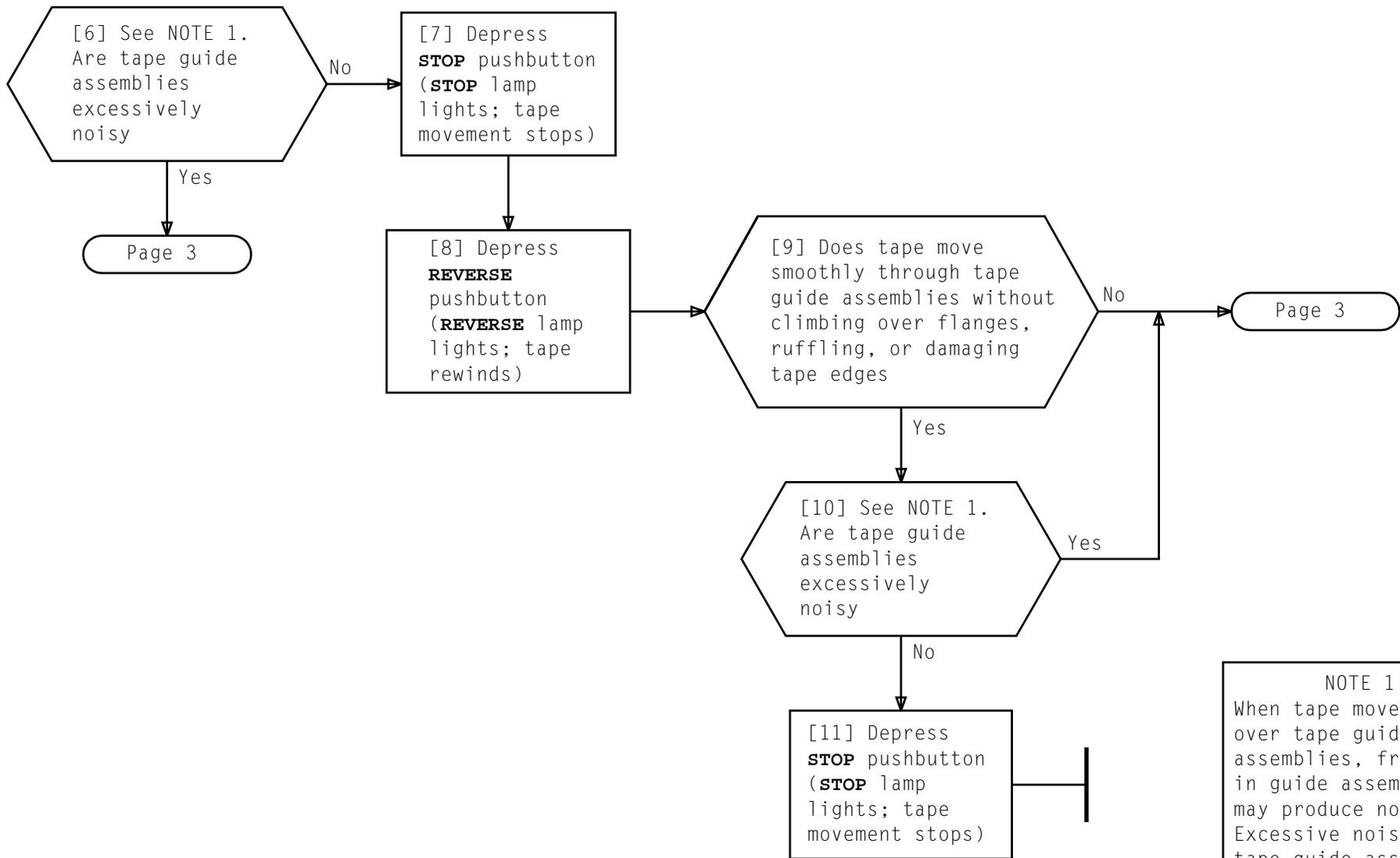


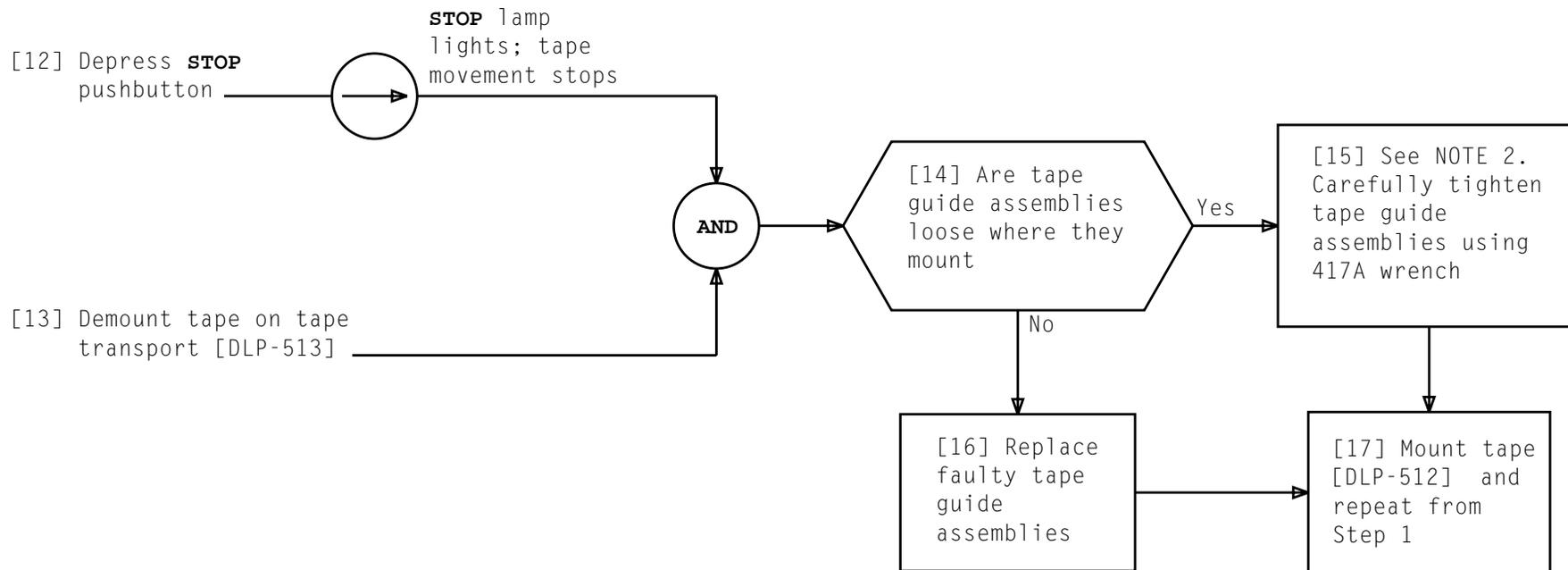
Figure 1 - Tape Transport - Front View
With Cover Door Open

CHECK TAPE TRAVEL ON TAPE TRANSPORT

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NOTE 1	
When tape moves over tape guide assemblies, friction in guide assemblies may produce noise. Excessive noise of tape guide assembly may not be related to tape transport problems	
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NOTE 2	
It may be necessary to grind off half the thickness on large end of 417A wrench	
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[1] On test pack,
set MODE switch **R-W-E** to **R**

[2] Condition oscilloscope to 1-volt/cm,
5-microsecond/cm, chopped mode,
and SYNC to channel 1

[3] On test pack, connect channel 1
of oscilloscope to test point **2** and
channel 2 to test point **0**

[4] See NOTE 1. At tape transport,
depress **FORWARD** pushbutton

FORWARD lamp lights;
tape winds forward

[5] See NOTES 2 and 3. Determine pulse
difference (static skew) of displayed
pulses by comparing trailing edge of
channel 2 pulse to trailing edge of
channel 1 pulse (ignore leading edge
of pulses) [Figure 1, Page 2]

[6] Record read head pulse difference
[DLP-541]

AND

Page 3

NOTES

1. Take pulse difference readings only when tape transport is in **FORWARD** mode
2. Pulse difference steps may jitter. If so, maximum pulse difference should be noted
3. If trailing edge of channel 2 pulse occurs before trailing edge of channel 1 pulse, difference is expressed as positive; if it occurs after, trailing edge of channel 1 pulse difference is expressed as negative

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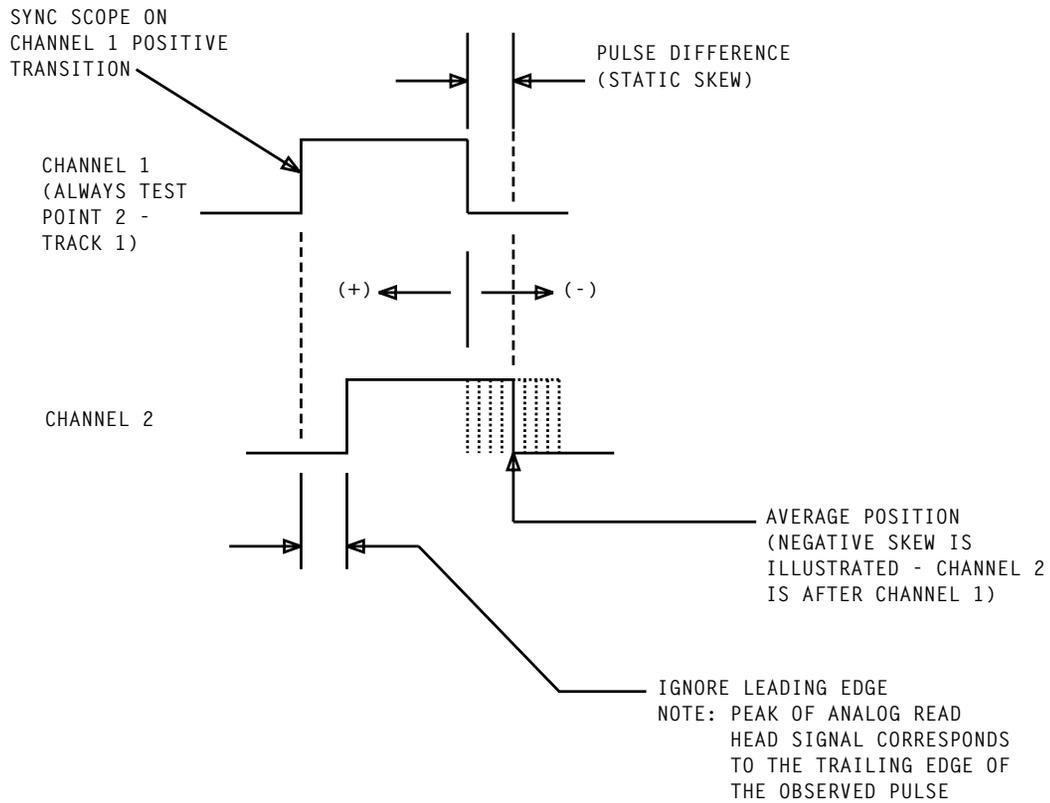


Figure 1 - Example of Pulse Difference (Static Skew)

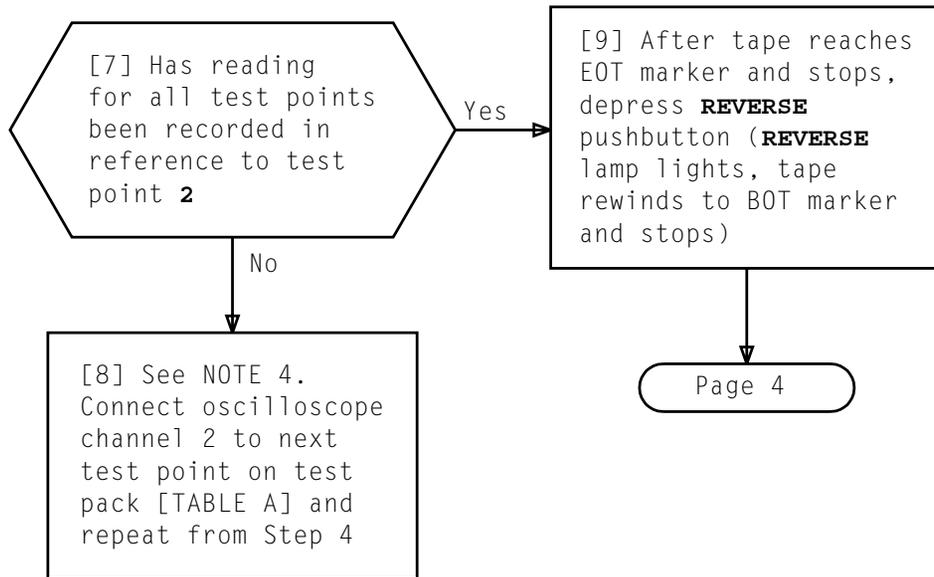


TABLE A	
TEST PACK TEST POINT	TAPE TRACK
0	2
1	8
2	1
3	9
4	3
5	5
6	6
7	7
8	4

NOTE 4 Comparing test points 3 and 2 normally gives greatest difference	
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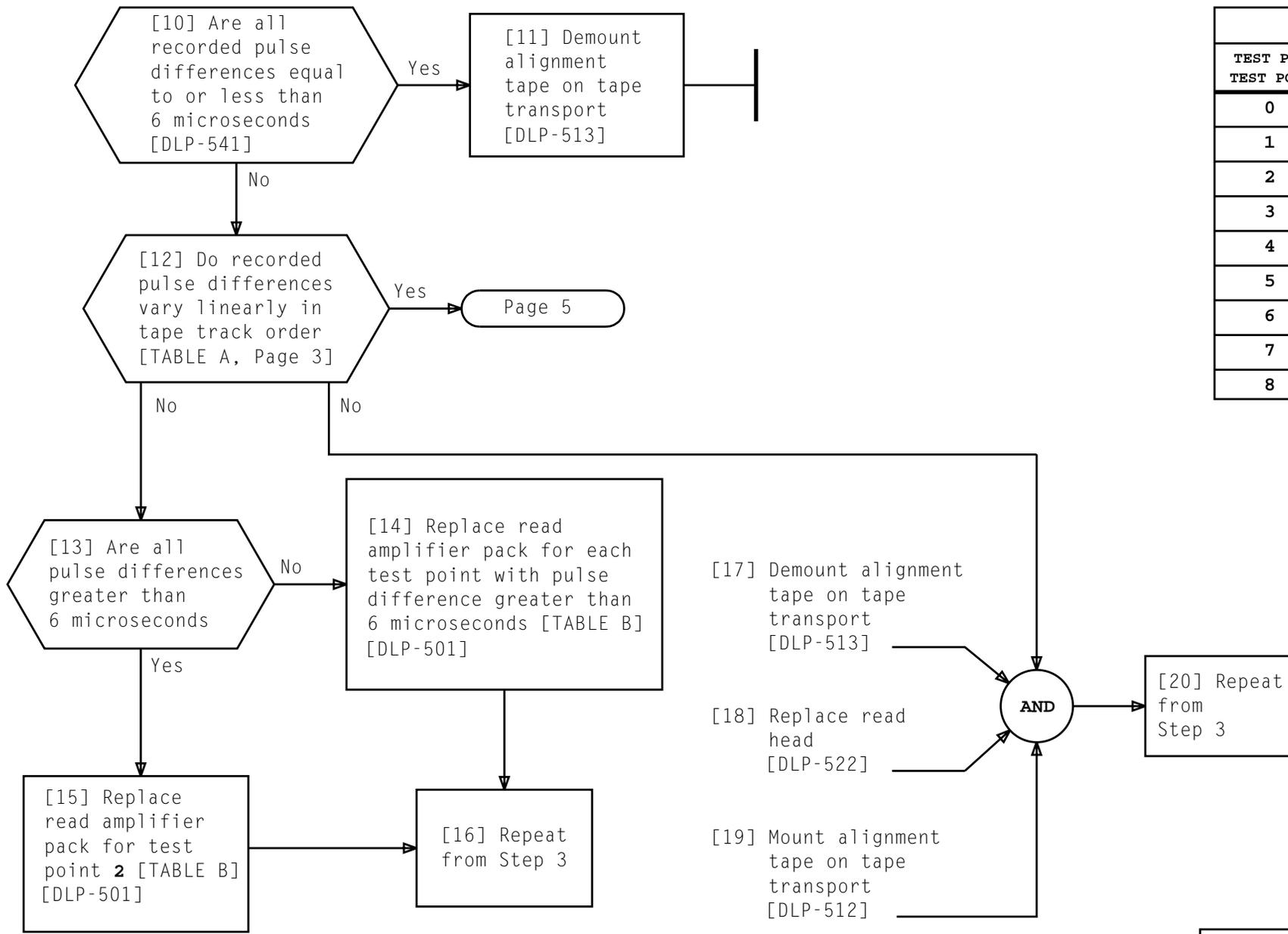


TABLE B	
TEST PACK TEST POINT	READ AMPL PACK LOC
0	72-12
1	72-13
2	72-14
3	72-16
4	72-17
5	72-18
6	72-19
7	72-20
8	72-21

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CHECK READ HEAD ALIGNMENT – TAPE TRANSPORT

[21] See NOTE 5. Connect channel 2 to test point 3

[22] At lower right of tape transport, loosen pawl fastener; unlatch, and open casting door

[23] See WARNING 1. Check component mounting screws and upper and lower mounting screws of precision plate for snugness [Figure 2]

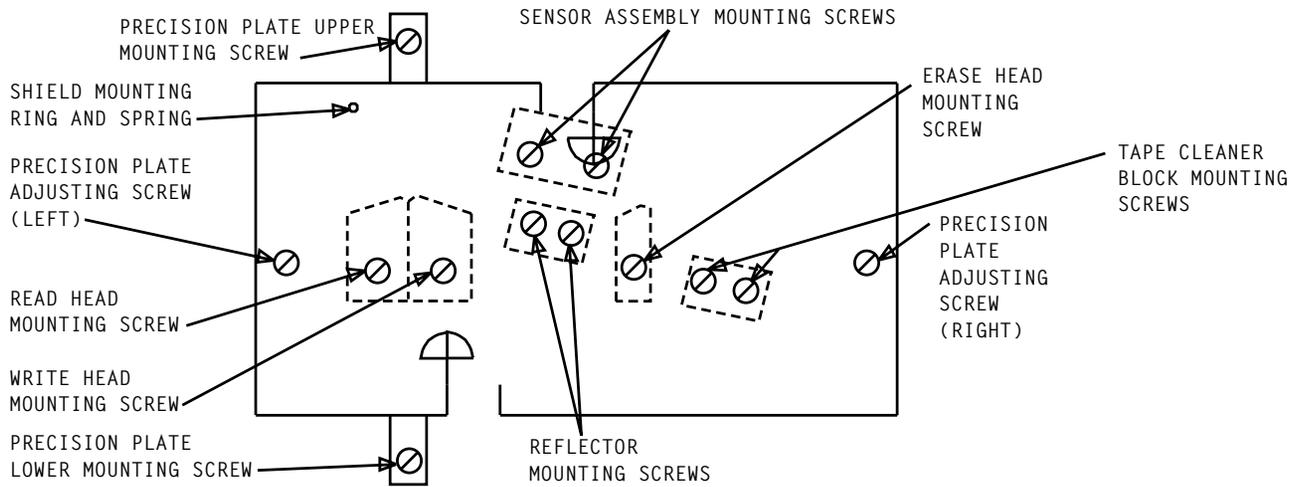
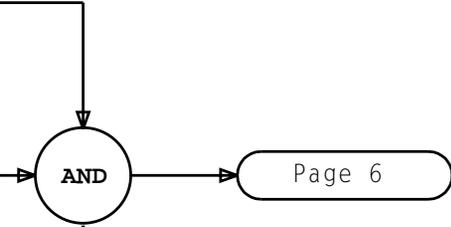


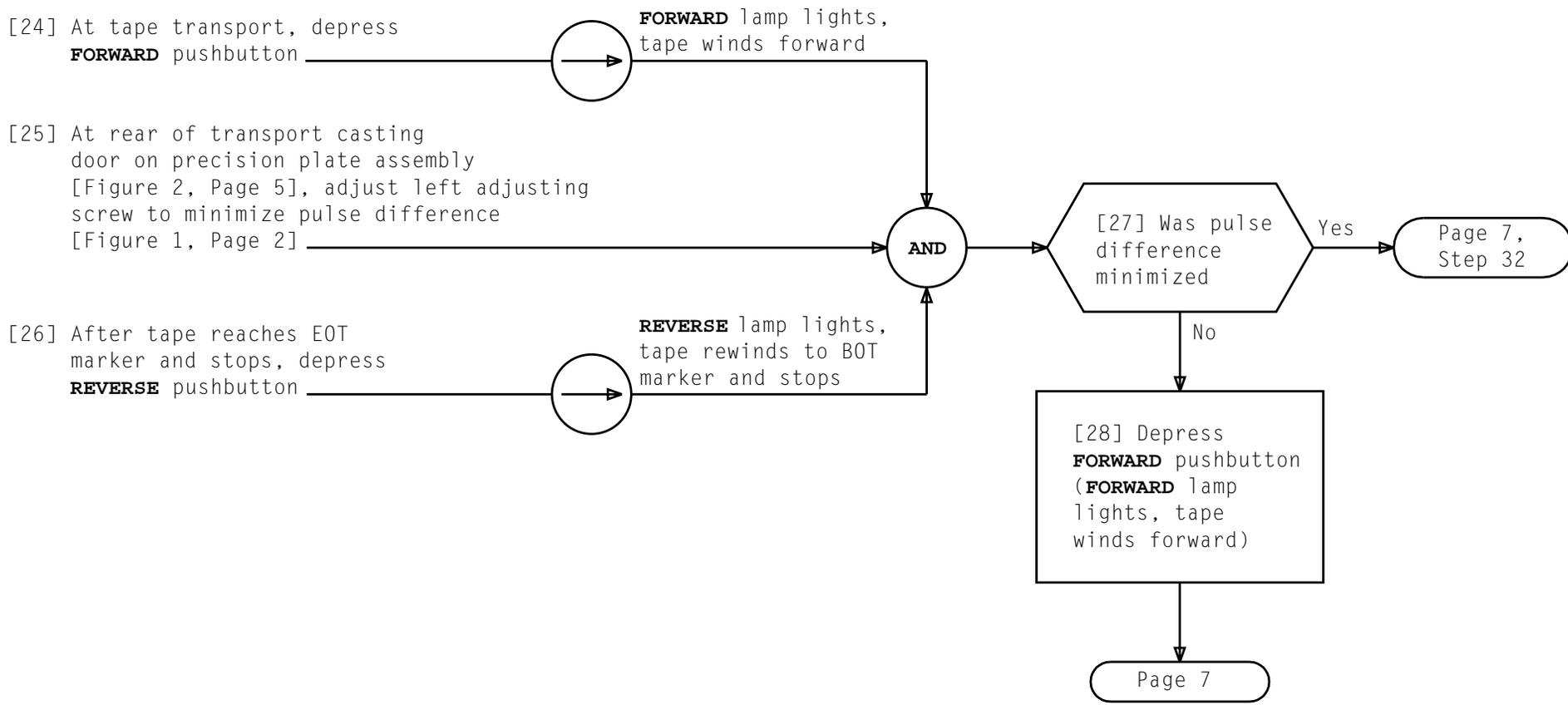
Figure 2 - Precision Plate Assembly-Rear View
Showing Component Mounting Screws

NOTE 5
Adjusting right or left precision plate adjusting screw affects all nine tape tracks

WARNING 1
Screws associated with precision plate are small and strip or break easily. Tighten carefully

CHECK READ HEAD ALIGNMENT - TAPE TRANSPORT

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At rear of transport casting door
on precision plate assembly:

[29] Back out left or both precision plate
adjusting screws until plate and
screwhead are separated by approximately
3/16 inch [Figure 3, Page 8]

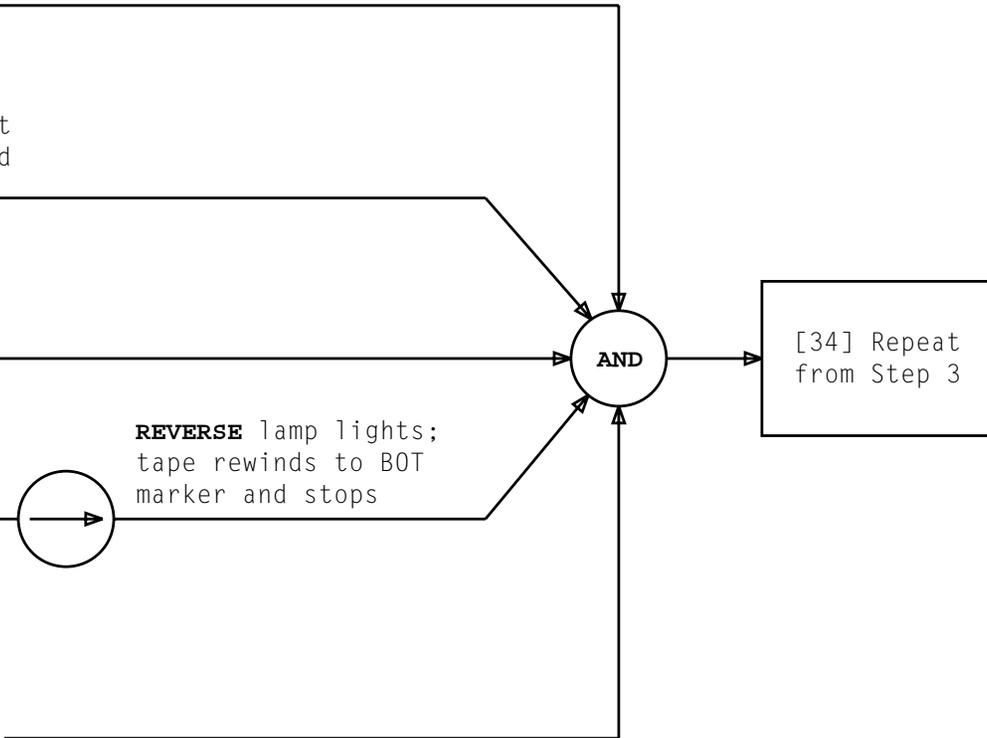
[30] Insert screwdriver between plate and
casting on right side and gently twist
screwdriver using adjustment screwhead
as stop [Figure 3, Page 8]

[31] Repeat Steps 29 and 30 three times;
then tighten adjustment screws to
contact precision plate

[32] After tape reaches EOT marker
and stops, depress **REVERSE**
pushbutton

REVERSE lamp lights;
tape rewinds to BOT
marker and stops

[33] Gently close tape transport casting
door; latch, and secure pawl fastener



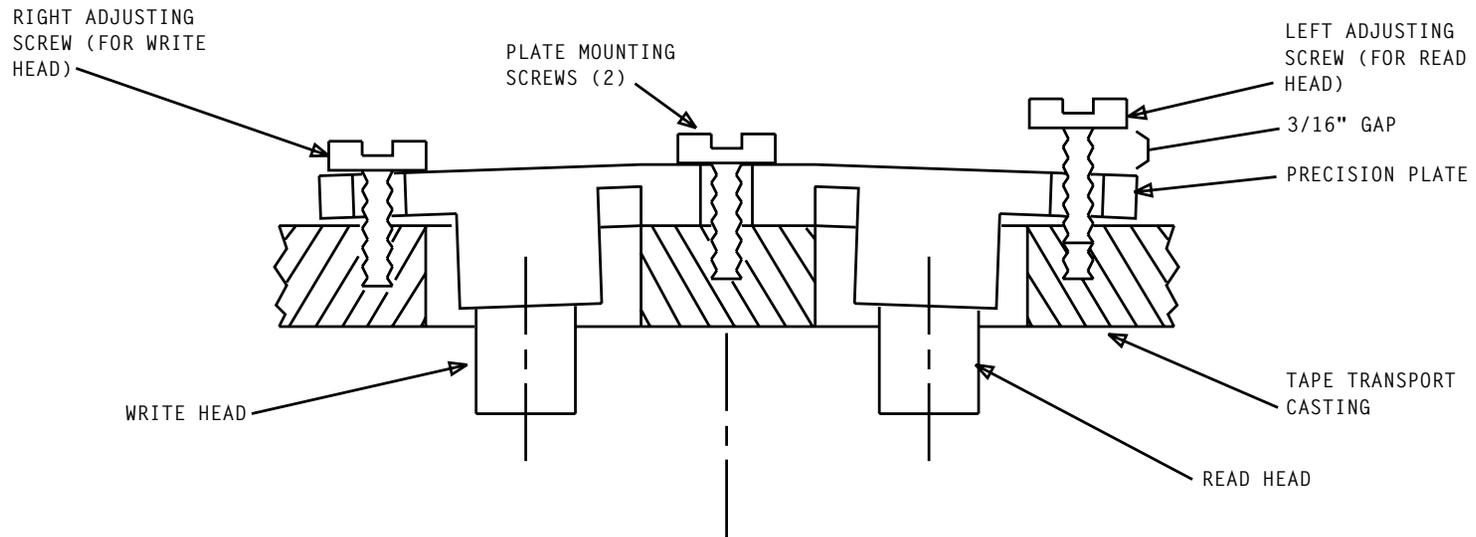


Figure 3 - Cross Section View of Flexed Precision Plate Assembly

CHECK READ HEAD ALIGNMENT - TAPE TRANSPORT

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[1] Obtain support apparatus [TABLE A]

[2] At TUC power switch, depress **ROS/OFF** switch

PWR OFF
lamp
lights

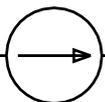
[3] At rear of tape unit frame, remove **J10** connector from **P10**

[4] At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**

[5] At lower right of tape transport, loosen pawl fastener; unlatch, and open casting door

[6] At rear of transport casting door, remove **CP2** pack from printed circuit board chassis

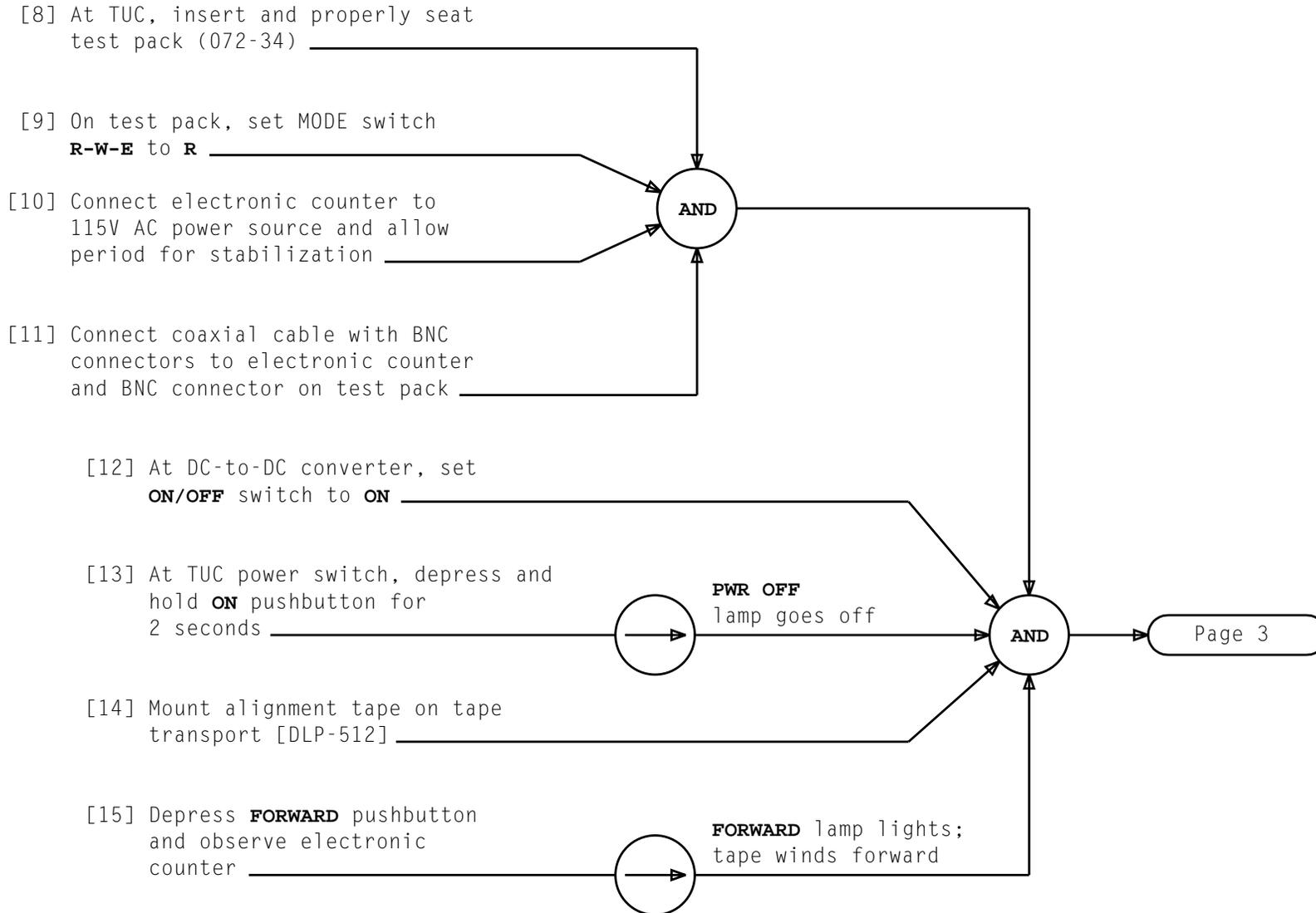
[7] Insert and properly seat **CP2** pack into card extender and insert card extender assembly into location from which **CP2** pack was removed



Card
extender
and **CP2**
pack installed

Page 2

TABLE A	
COMMON NAME	PART NUMBER
Electronic counter	HP-5345A or equivalent
Card extender	L-502681
Test pack	Skew alignment Tool 814A
Alignment tape	KS-20315,L1
Coaxial cable (50-ohm, terminated on both ends with BNC connectors)	-



CHECK CAPSTAN SPEED - TAPE TRANSPORT

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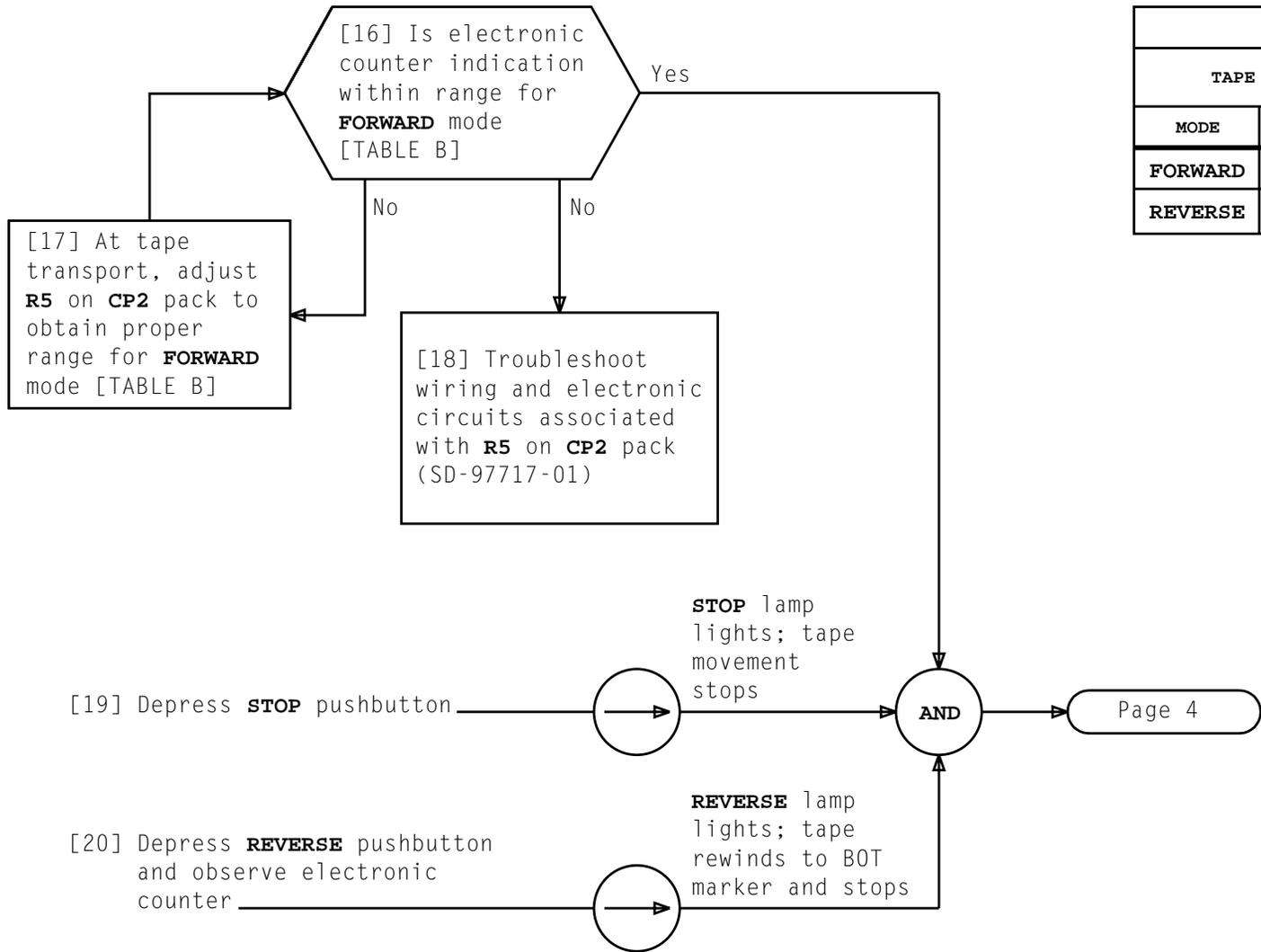
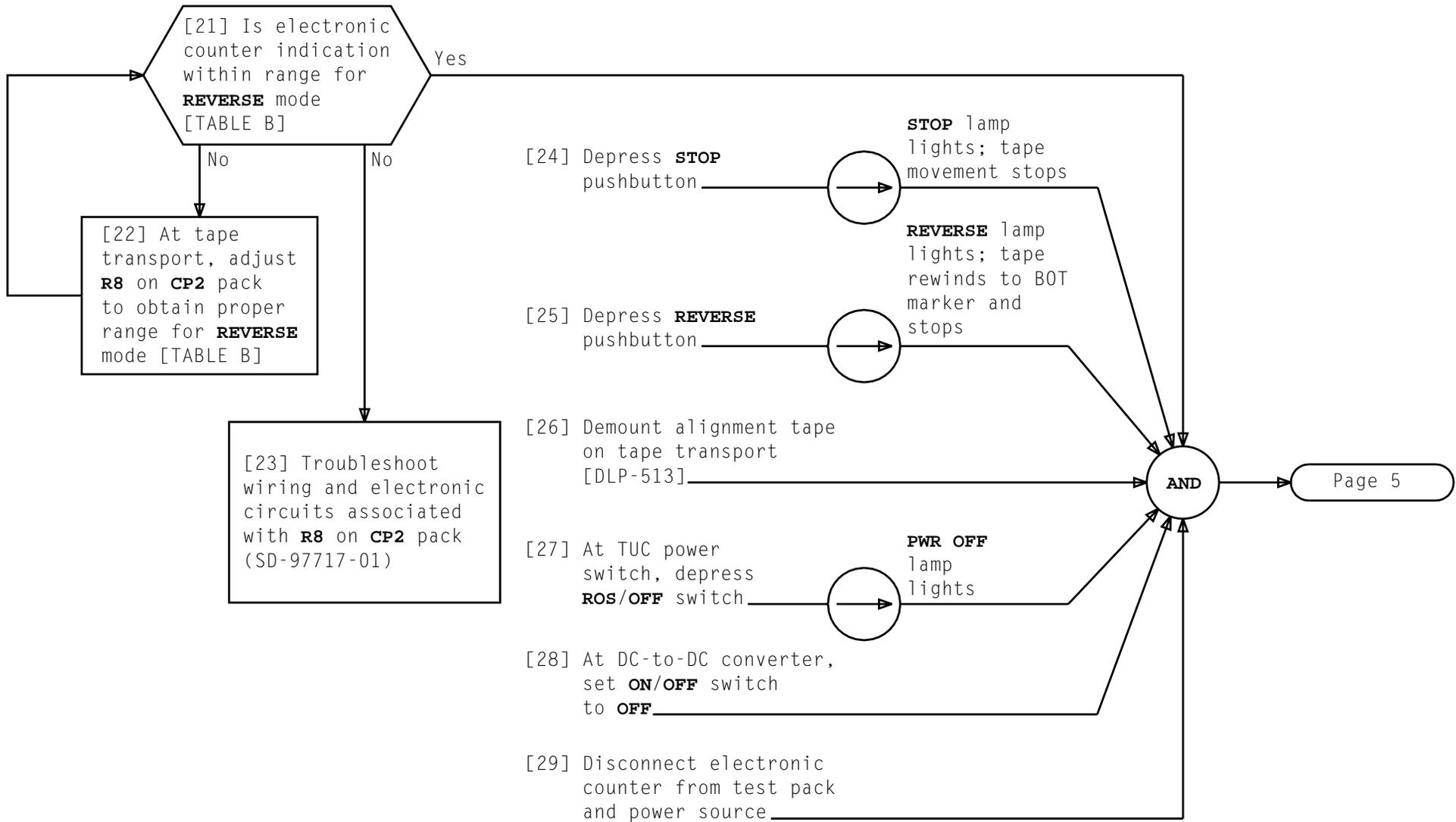


TABLE B		
TAPE TRANSPORT		ELECTRONIC COUNTER INDICATION
MODE	TAPE SPEED	
FORWARD	24.8 IPS	4952 to 4968 Hz
REVERSE	24.8 IPS	4952 to 4968 Hz

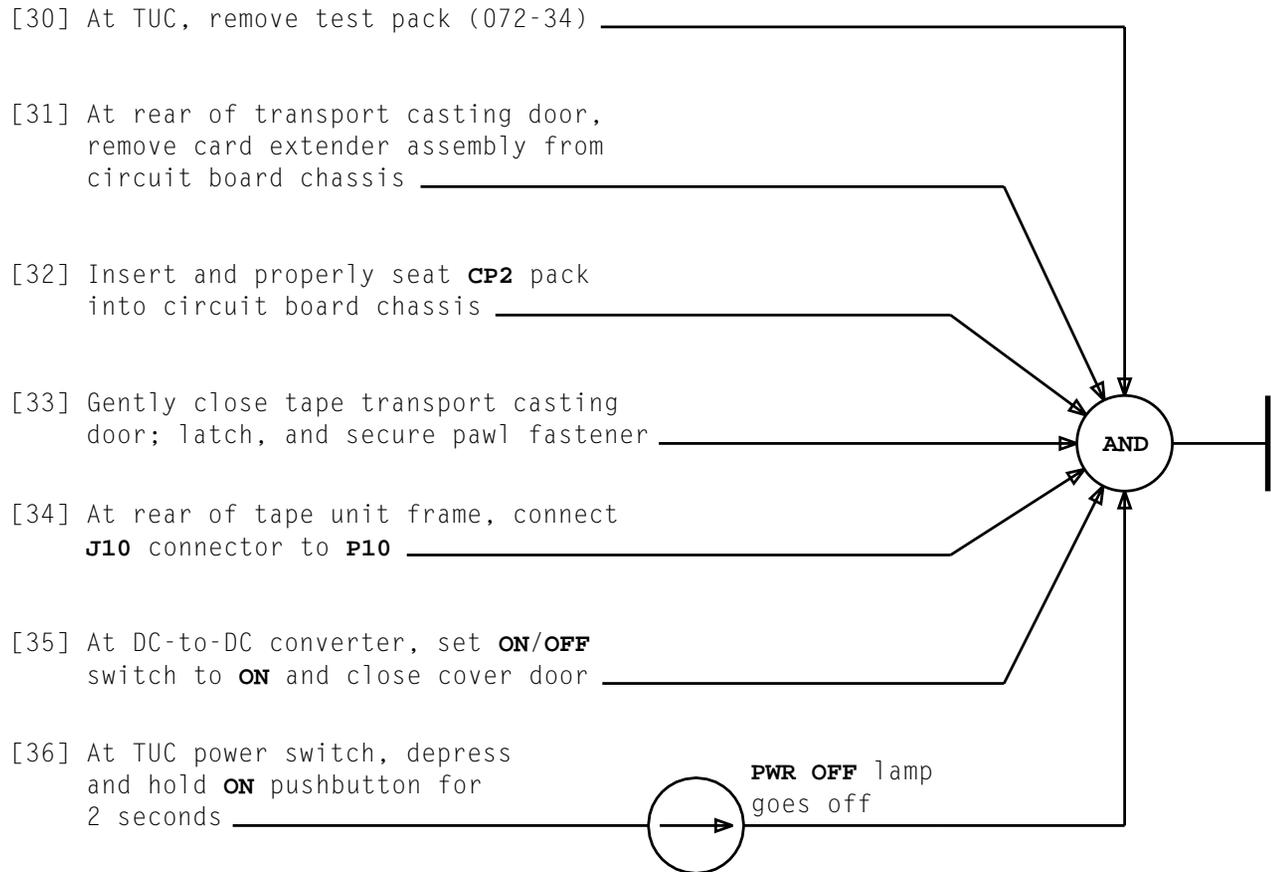
CHECK CAPSTAN SPEED – TAPE TRANSPORT

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CHECK CAPSTAN SPEED – TAPE TRANSPORT

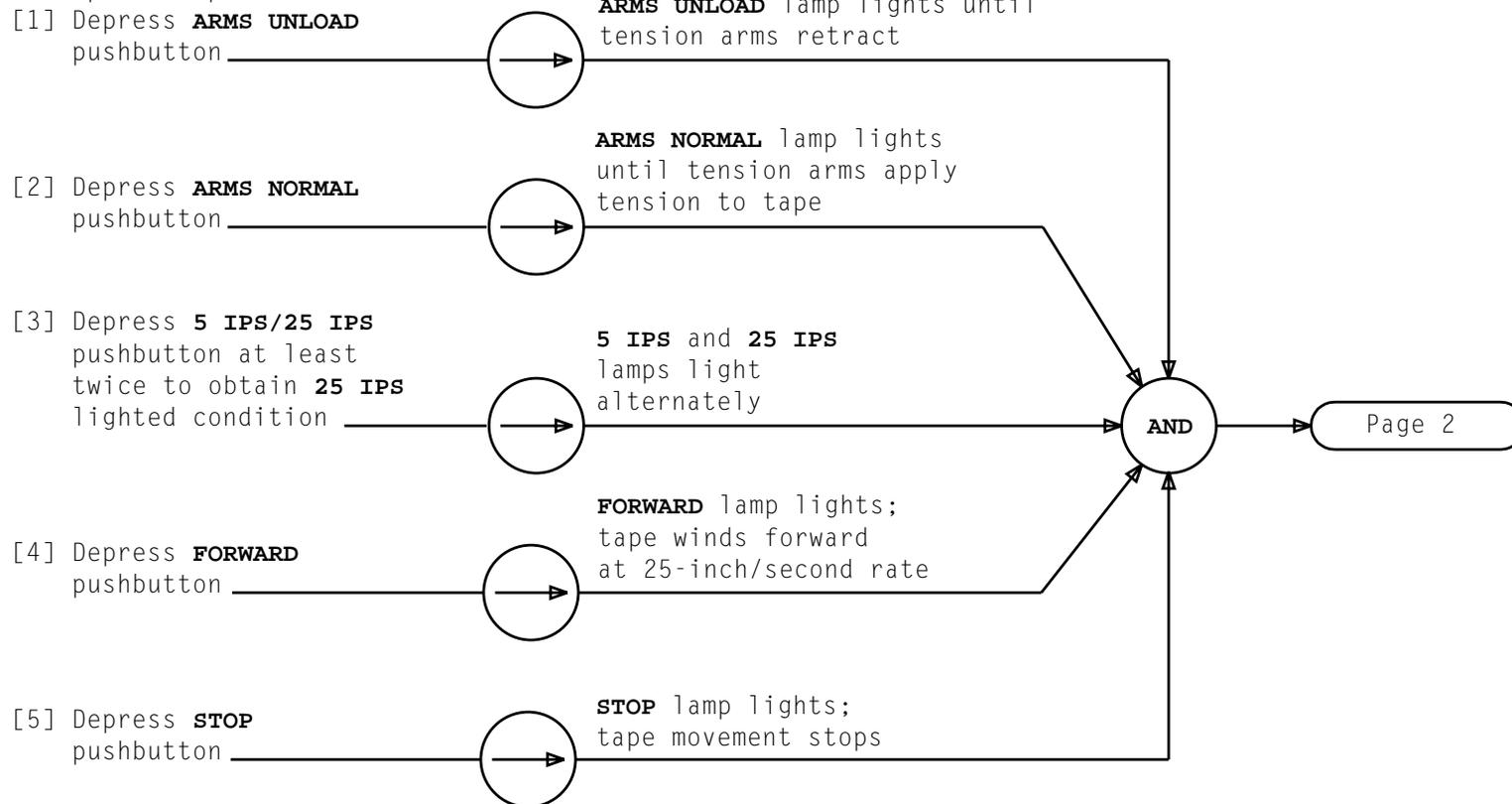
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CHECK CAPSTAN SPEED — TAPE TRANSPORT

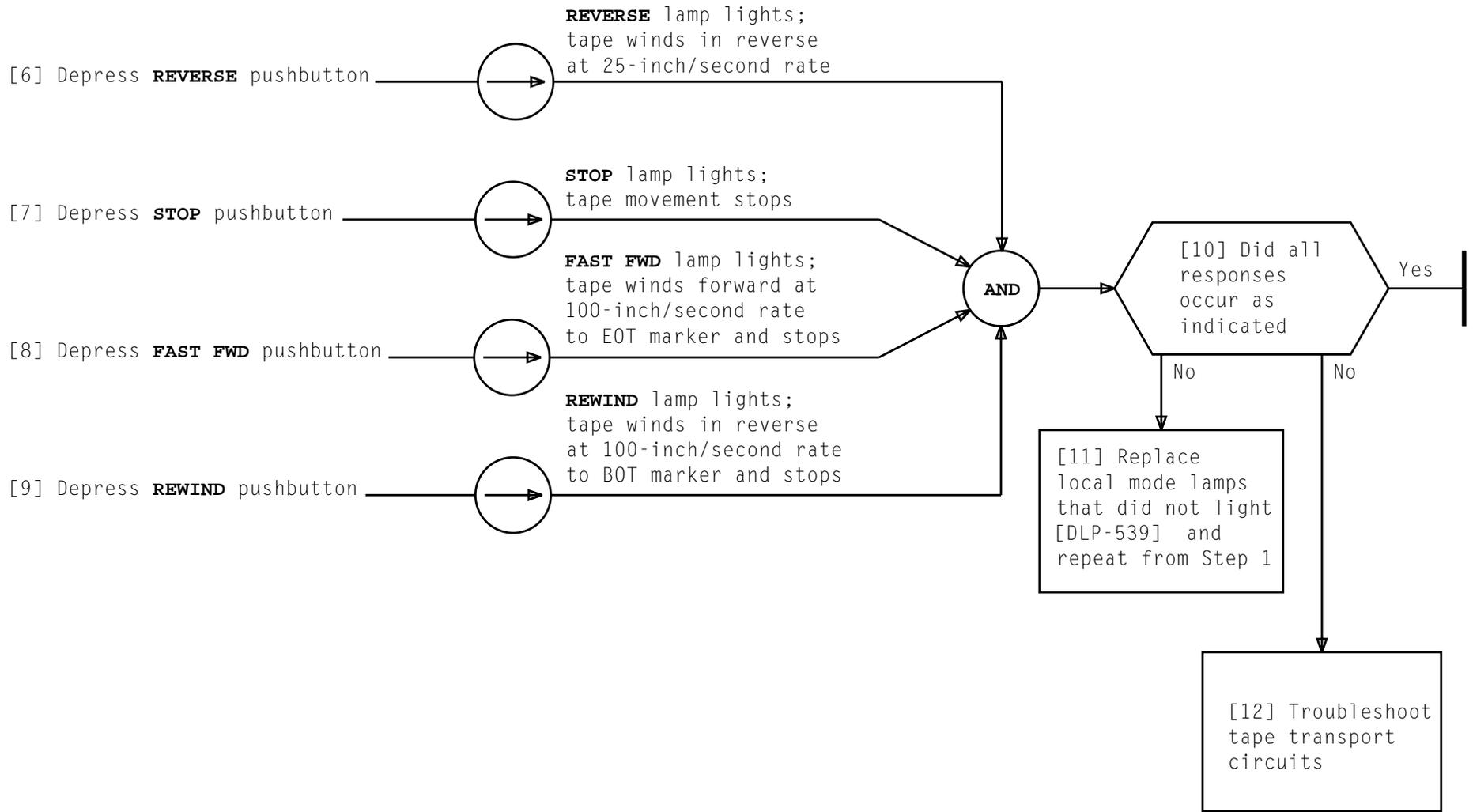
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At tape transport:



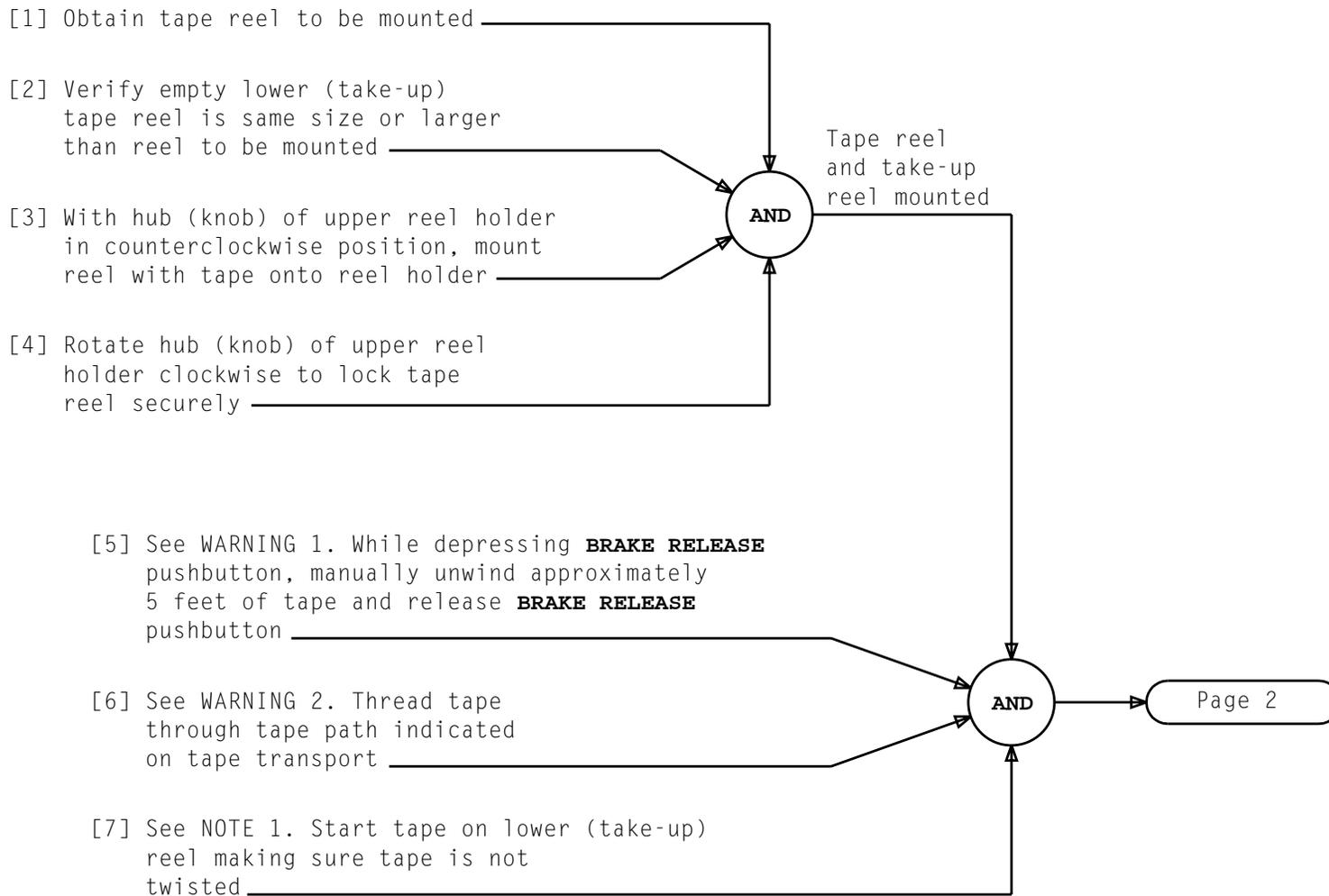
CHECK OPERATION OF TAPE TRANSPORT USING LOCAL MODE SWITCHES

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CHECK OPERATION OF TAPE TRANSPORT USING LOCAL MODE SWITCHES

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NOTE 1
 To start tape on take-up reel, it may help to moisten tape end (moistened fingers) and stick tape to reel axle

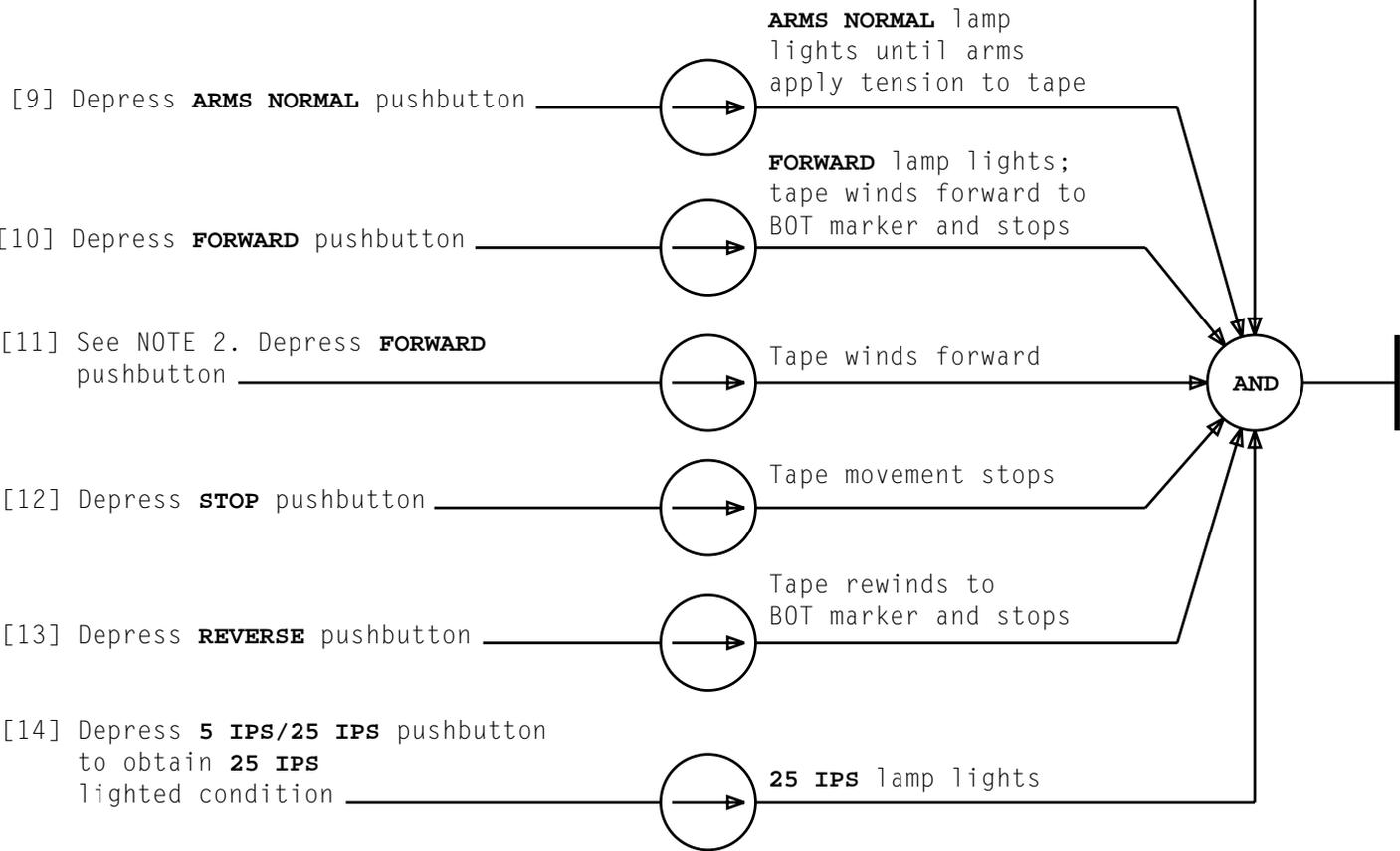
WARNINGS

1. Contamination of tape by contact with floor damages tape heads
2. Do not touch tape head surfaces; body oil contaminates tape

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MOUNT TAPE ON TAPE TRANSPORT

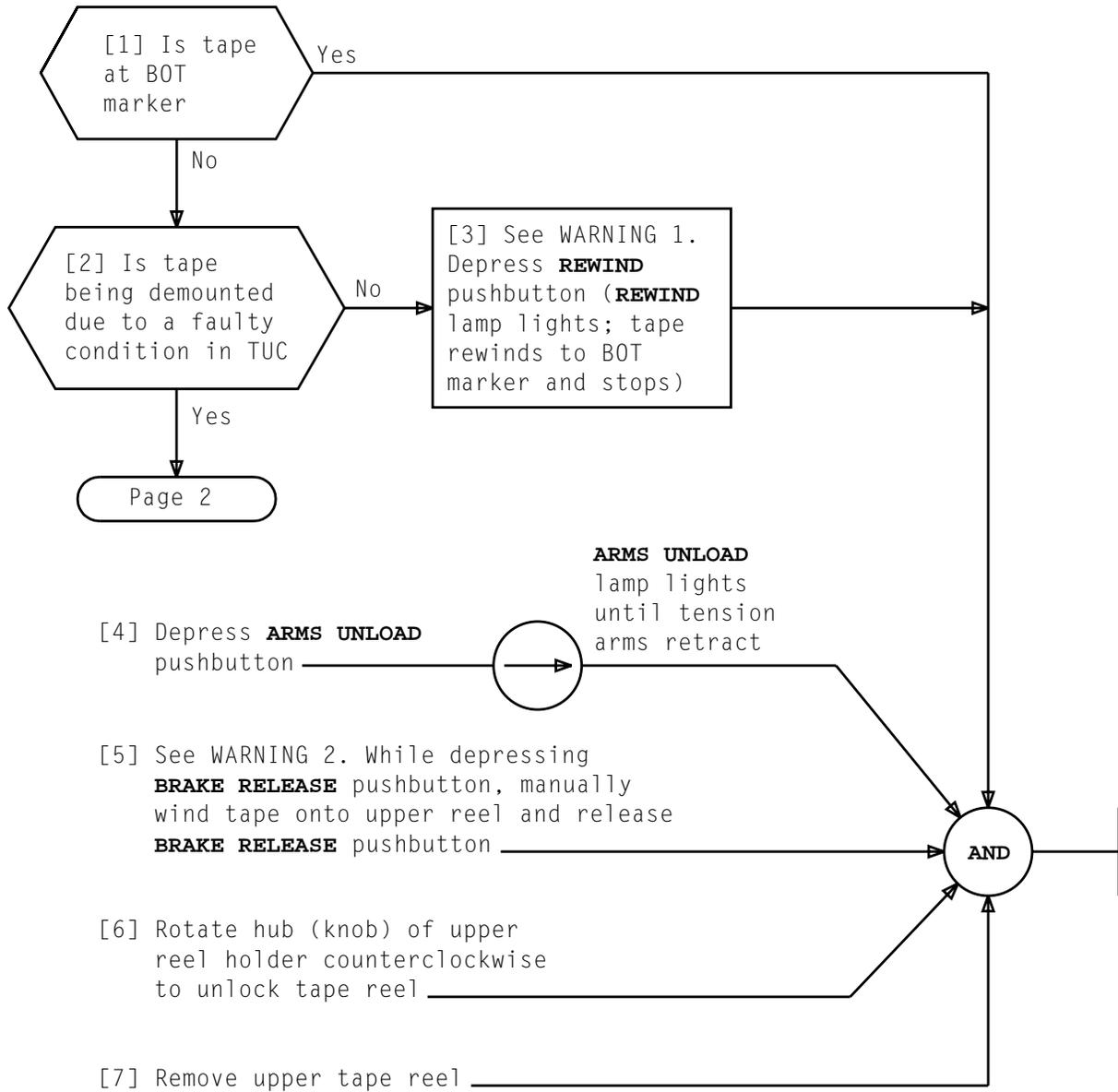
[8] See WARNING 3. While depressing **BRAKE RELEASE** pushbutton, manually wind lower (take-up) reel three or four turns and release **BRAKE RELEASE** pushbutton



NOTE 2
Steps 11, 12, and 13 cause BOT marker to be approached from recorded area of tape

*WARNING 3
If tape is not properly aligned along rollers and guides or is too loose, it may be damaged*

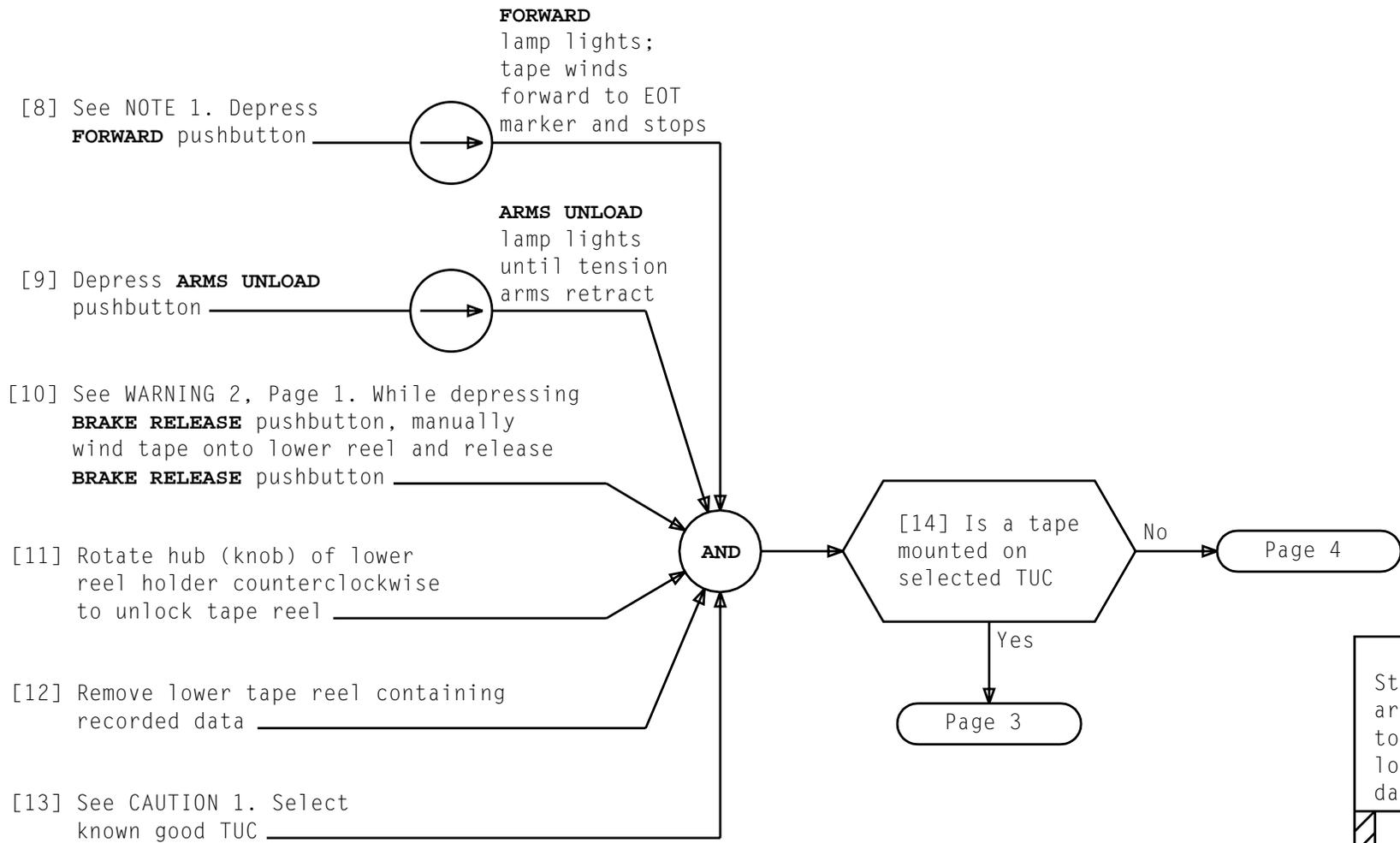
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WARNINGS

1. *If alignment tape is mounted, use **REVERSE** pushbutton to rewind tape*
2. *Pulling or dragging last 5 feet of tape across heads may contaminate heads*

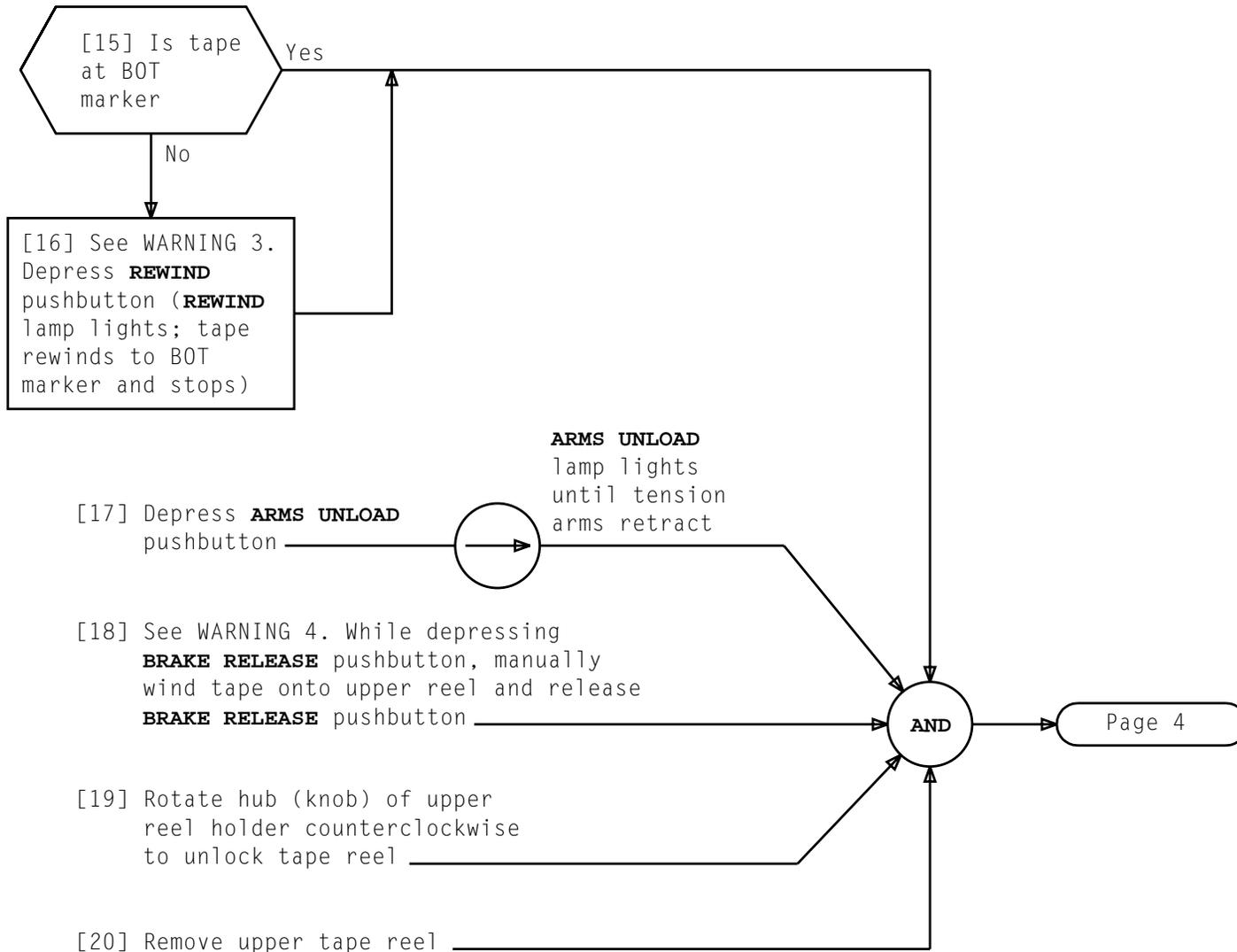
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NOTE 1
Steps 8 through 37 are being performed to prevent possible loss of recorded data

CAUTION 1
If function assigned to selected TUC is AMA (active or standby) perform remaining steps at a later date

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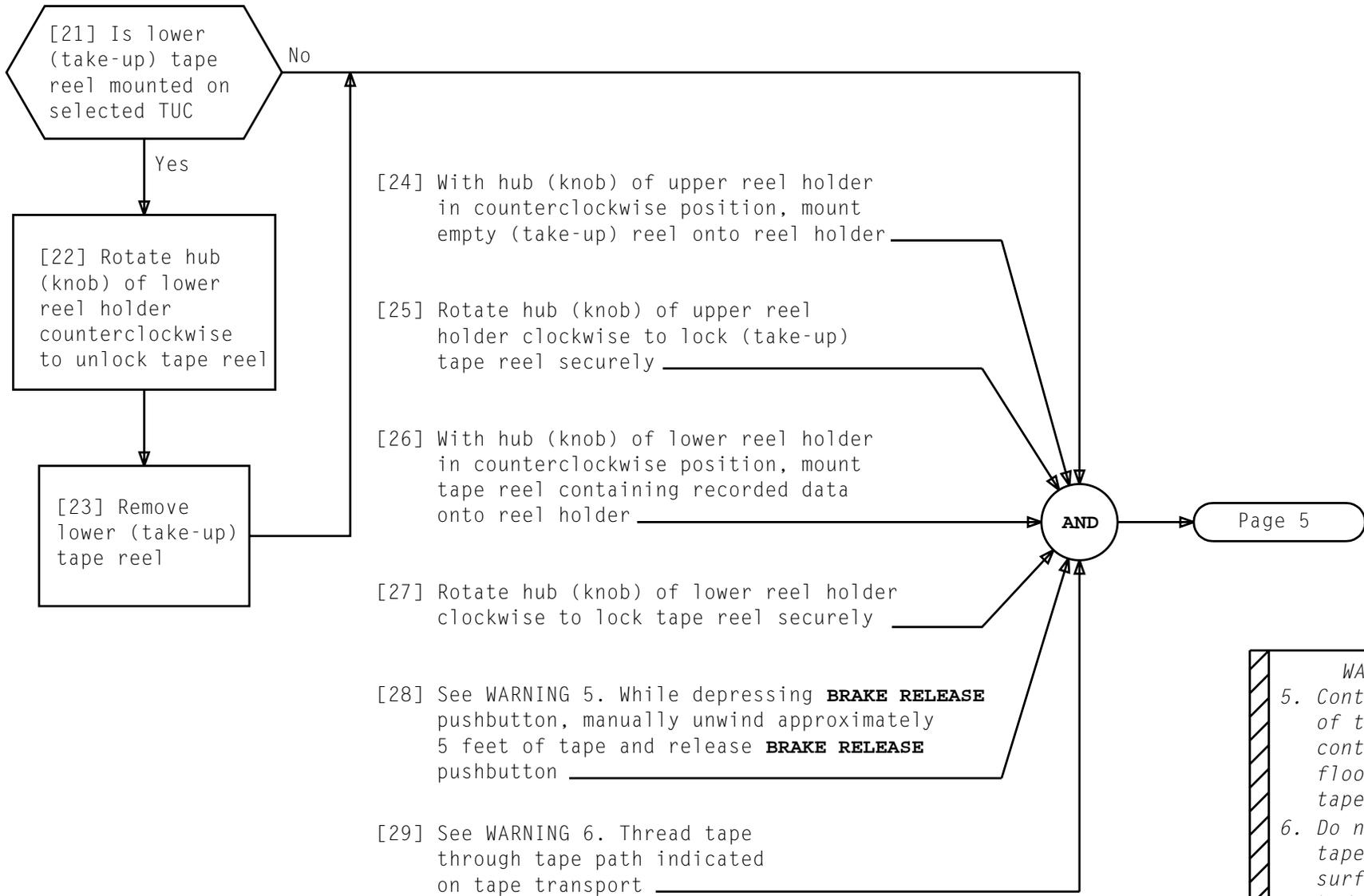
WARNINGS

3. *If alignment tape is mounted, use **REVERSE** pushbutton to rewind tape*

4. *Pulling or dragging last 5 feet of tape across heads may contaminate heads*

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DEMOUNT TAPE ON TAPE TRANSPORT



WARNINGS

5. Contamination of tape by contact with floor damages tape heads
6. Do not touch tape head surfaces; body oil contaminates tape

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[30] See NOTE 2. Start tape on upper (take-up) reel making sure tape is not twisted

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

[32] Depress **ARMS NORMAL** pushbutton

ARMS NORMAL lamp lights until arms apply tension to tape

[33] Depress **REWIND** pushbutton

REWIND lamp lights; tape rewinds to BOT marker and stops

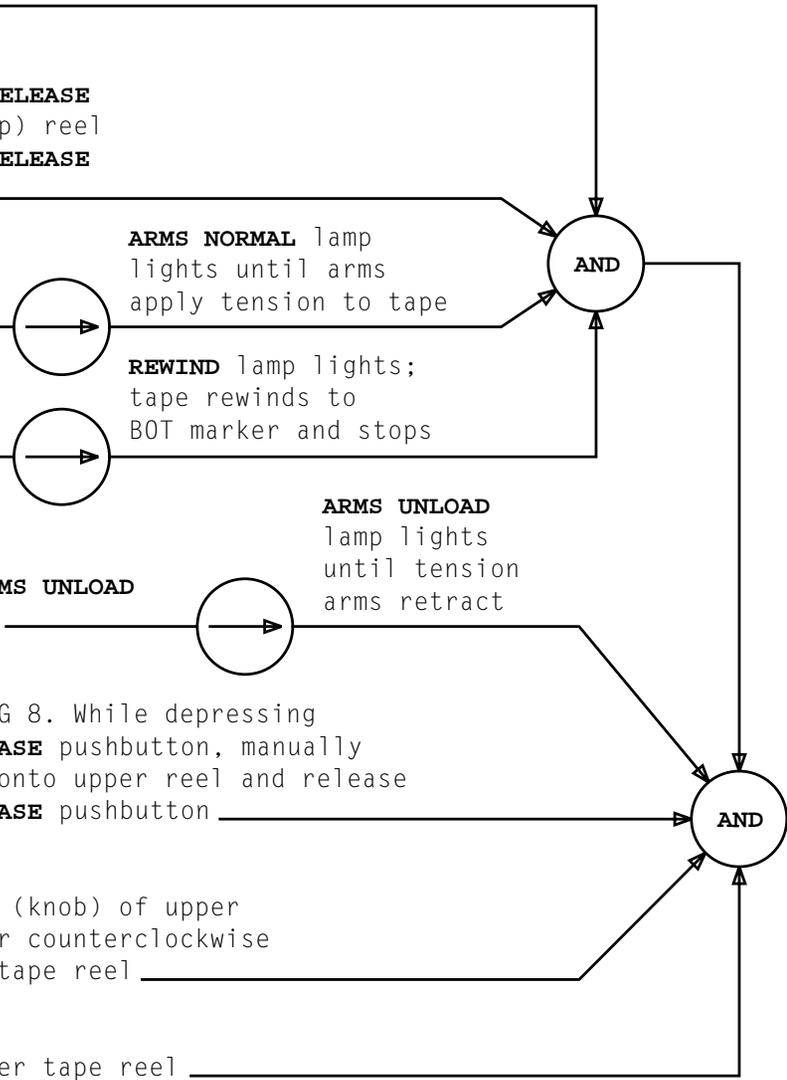
[34] Depress **ARMS UNLOAD** pushbutton

ARMS UNLOAD lamp lights until tension arms retract

[35] See WARNING 8. While depressing **BRAKE RELEASE** pushbutton, manually wind tape onto upper reel and release **BRAKE RELEASE** pushbutton

[36] Rotate hub (knob) of upper reel holder counterclockwise to unlock tape reel

[37] Remove upper tape reel



NOTE 2
To start tape on take-up reel, it may help to moisten tape end (moistened fingers) and stick tape to reel axle

WARNINGS

7. If tape is not properly aligned along rollers and guides or is too loose, it may be damaged

8. Pulling or dragging last 5 feet of tape across heads may contaminate heads

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[1] Obtain 8000A fluke digital voltmeter or equivalent (allow 5 minutes for stabilization)

[2] See DANGER 1. At DC-to-DC converter, open cover door

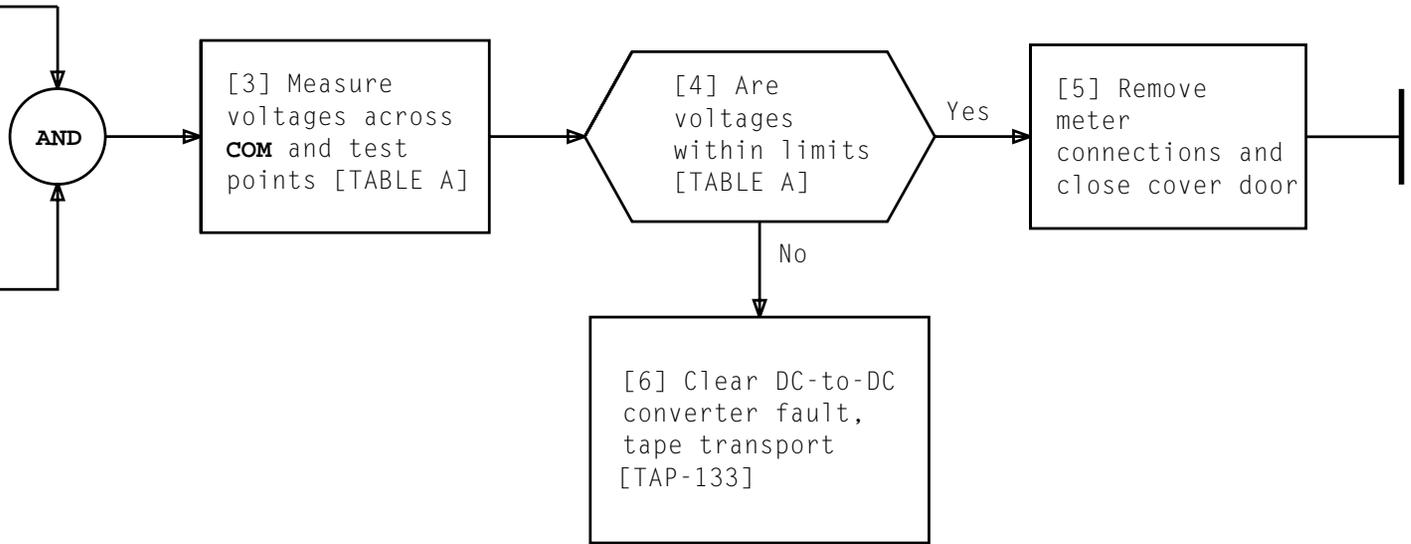


TABLE A	
TEST POINT	VOLTAGE LIMITS
-24V	-23.5 to -26.0
+15V	+13.8 to +16.2
+5V	+4.8 to +5.8
-15V	-13.8 to -16.2

*DANGER 1
High DC current
exists on
DC-to-DC
converter
terminals*

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At tape unit frame:

[1] Open converter cover door and set **ON/OFF** switch to **OFF**

[2] Close converter cover door and open tape transport cover door

[3] At lower right of tape transport, loosen pawl fastener; unlatch, and open casting door

[4] See NOTE 1. Using 4-inch screwdriver, remove reel motor brush cap [Figure 1]

[5] See WARNING 1. Withdraw brush from motor noting brush orientation

[6] Using 6-inch scale, measure brush length



Page 2

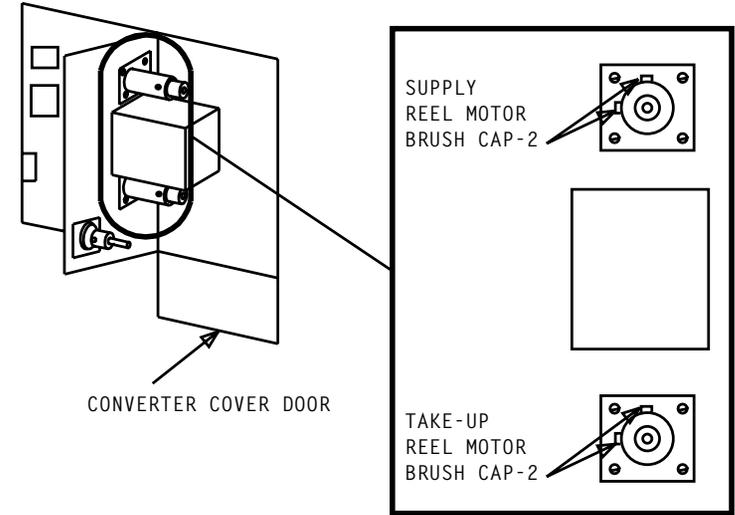


Figure 1 - Tape Transport Casting Door (Rear View)

NOTE 1

Access to second brush on take-up reel motor is accomplished by removing four screws and rotating motor 90 degrees

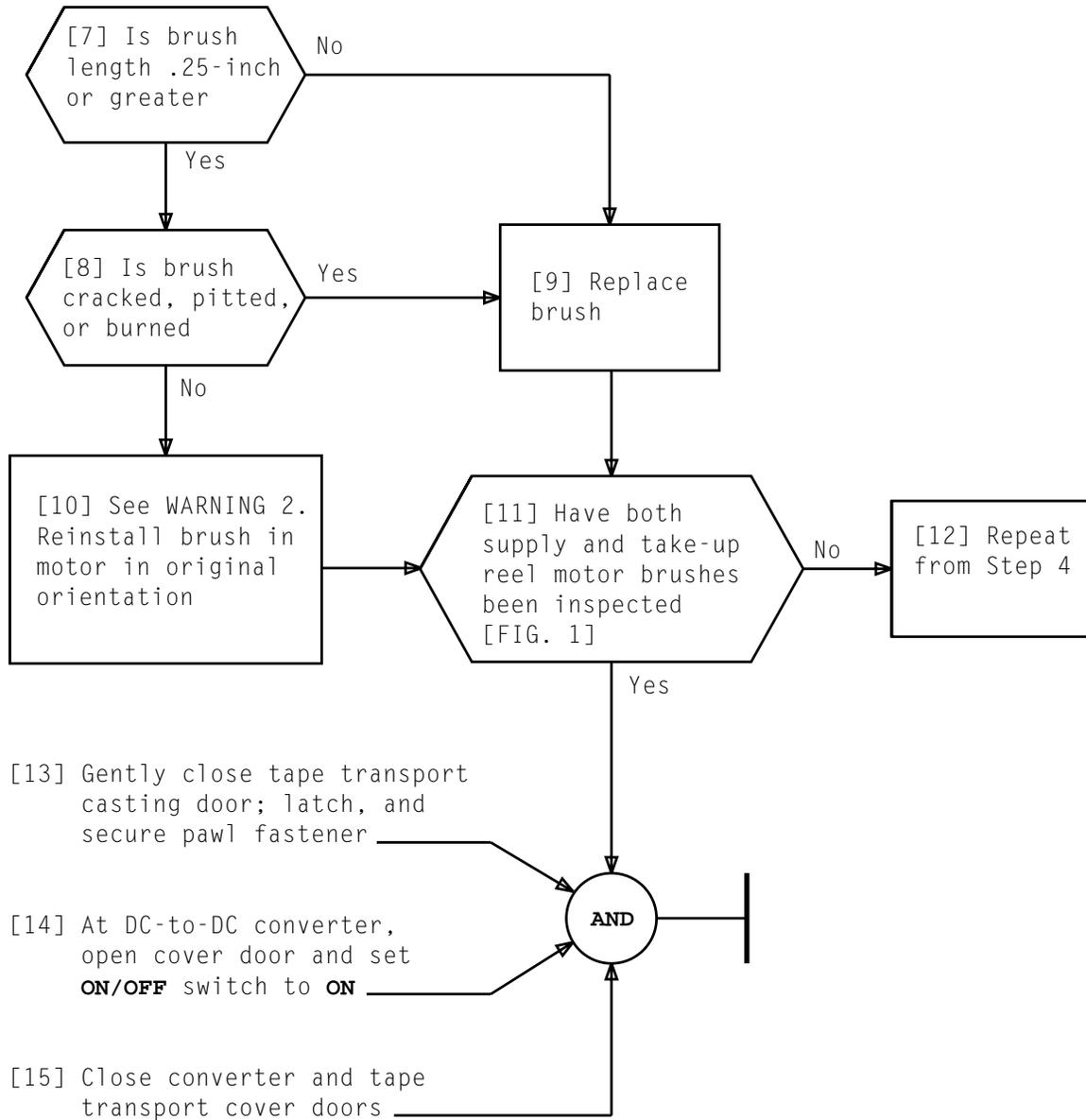
WARNING 1

The brush must be oriented before removal to prevent damage to brush and commutator when brush is reinstalled in motor

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WARNING 2
The brush must be oriented before removal to prevent damage to brush and commutator when brush is reinstalled in motor

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INSPECT SUPPLY AND TAKE-UP REEL MOTOR BRUSHES, TAPE TRANSPORT

1. Carefully loosen two screws securing switch (**S7**) to write enable assembly bracket [Figure 1]
 2. Depress and hold solenoid plunger to maximum rear position
 3. While holding solenoid plunger, push switch (**S7**) forward until actuating arm is at limit of its travel without bending
 4. Tighten two screws to secure switch (**S7**)
- End of procedure

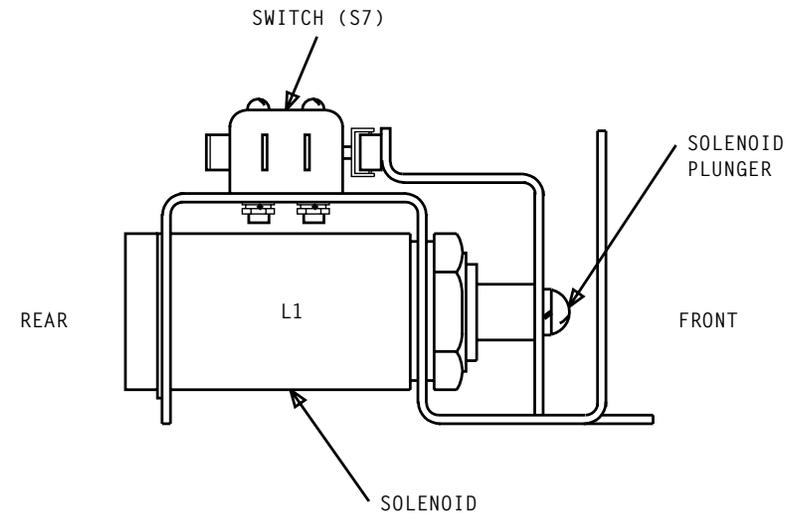


Figure 1 - Write Enable Assembly

[1] See DANGER 1. Obtain replacement DC-to-DC converter

[2] At TUC power switch, depress **ROS/OFF** switch

[3] At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF** [Figure 1]

[4] At Power Distributing (PD) frame, remove -48 volt fuse (refer to office drawings, -48Q lead) for tape unit frame to be repaired

[5] Release converter drawer locks and pull converter out to fully extended position [Figure 1]

[6] Verify absence of -48 volts across **TB1-1** (+) and **TB1-2** (-) leads [TABLE A]

[7] Disconnect three -48 volt power cable leads [TABLE A]

[8] Remove three cable clamps holding input and output power cables to converter

[9] Unscrew **P1** locking ring and remove **P1** from **J1**

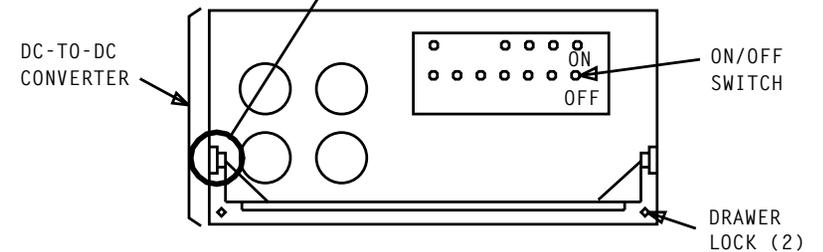
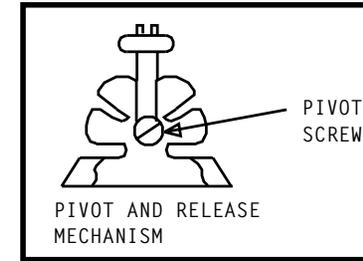
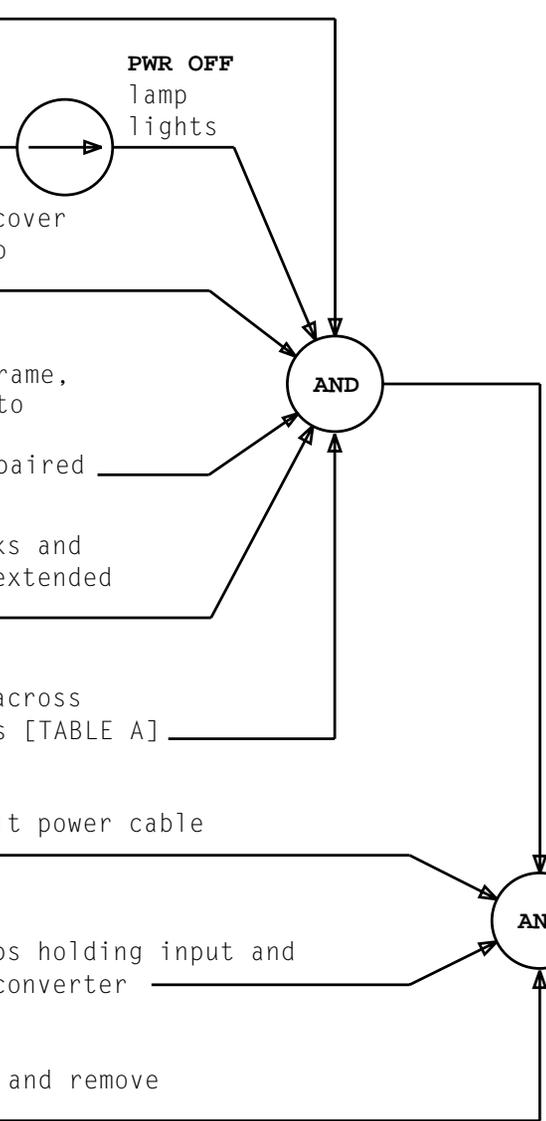


Figure 1 - DC-to-DC Converter With Cover Door Open

TABLE A	
LEAD IDENTIFICATION	LEAD DESIGNATION
White	TB1-1
Black	TB1-2
Green	FR GRD

DANGER 1
DC-to-DC converter weighs approximately 80 pounds

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[10] See DANGER 2. Remove screw from each pivot mechanism; tilt converter, remove retaining nut from pivot mechanism slot, and retain hardware [Figure 1, Page 1]

[11] See DANGER 2. Lift converter off pivot mechanism

[12] Examine old and new converters for hardware requirements. New converter needs should be supplied by old converter

[13] See DANGER 2. Install replacement converter on pivot mechanism

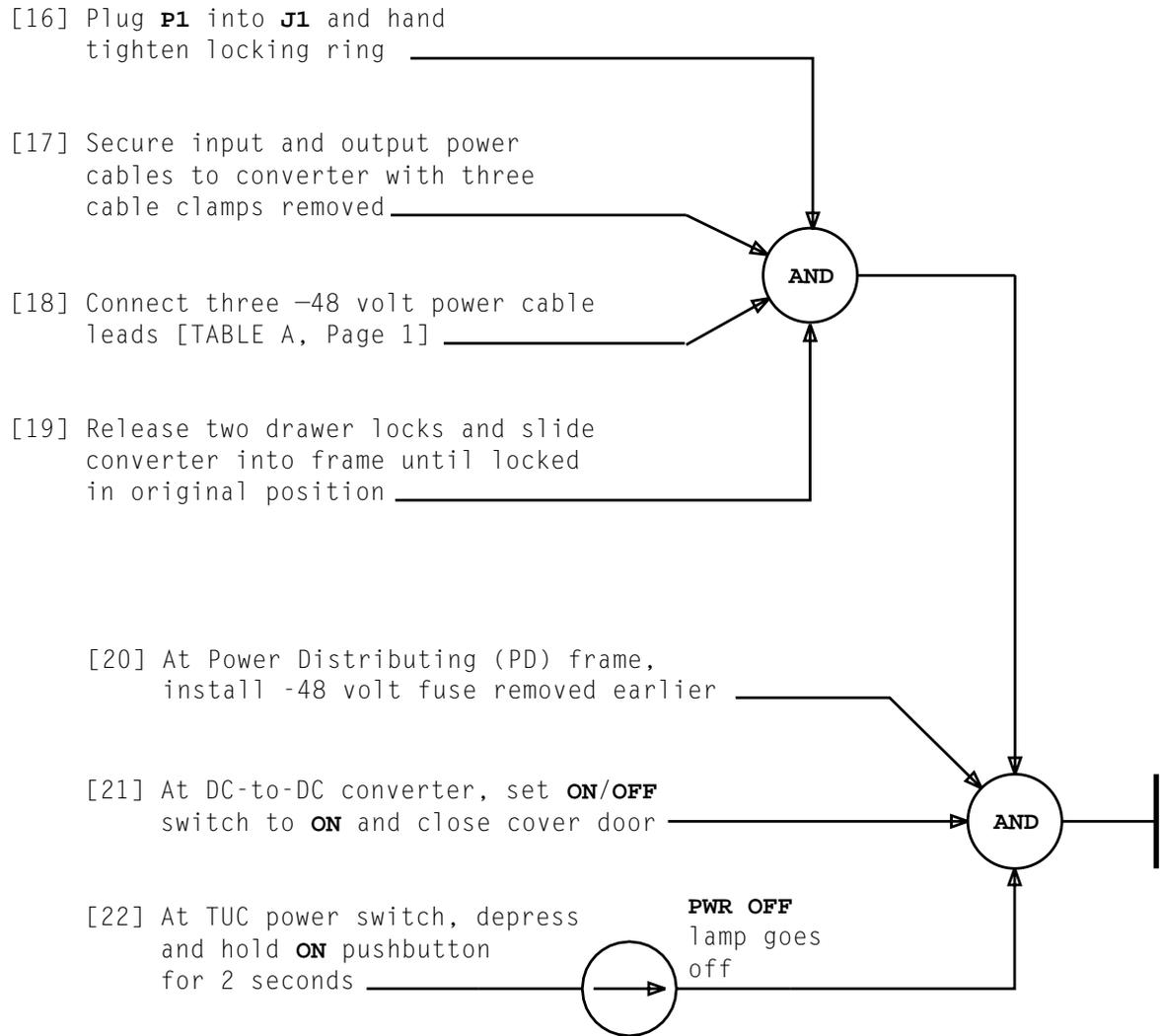
[14] Install pivot screw and retaining nut removed

[15] At replacement DC-to-DC converter, set **ON/OFF** switch to **OFF**

AND

Page 3

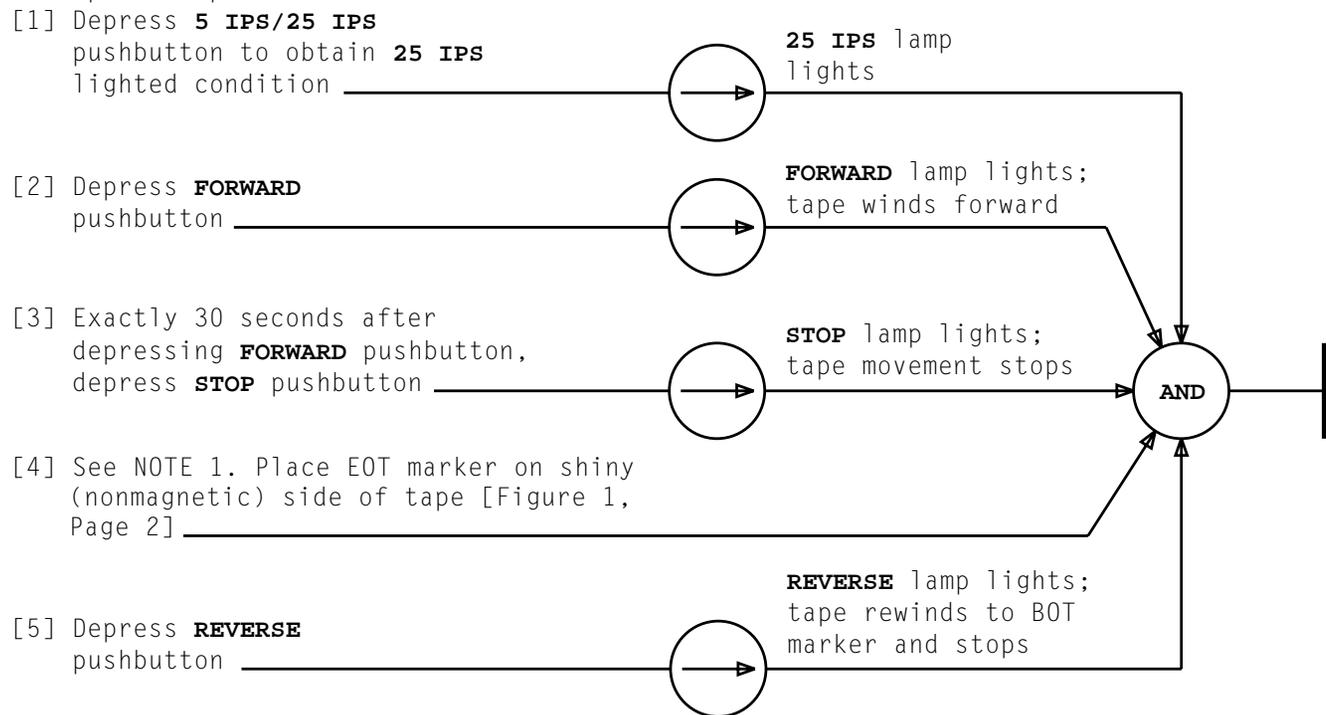
<i>DANGER 2 DC-to-DC converter weighs approximately 80 pounds</i>	
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REPLACE DC-TO-DC CONVERTER UNIT, KS-21104

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At tape transport:



NOTE 1
 Markers must not protrude beyond edge of tape and must be free of wrinkles and excessive adhesive. Marker dimensions:
 Length - 2.75cm ±0.5cm (1.1 inch ±0.2 inch)
 Width - 0.475cm ±0.05cm (0.19 inch ±0.02 inch)
 Thickness - 0.002cm (0.0008 inch maximum)

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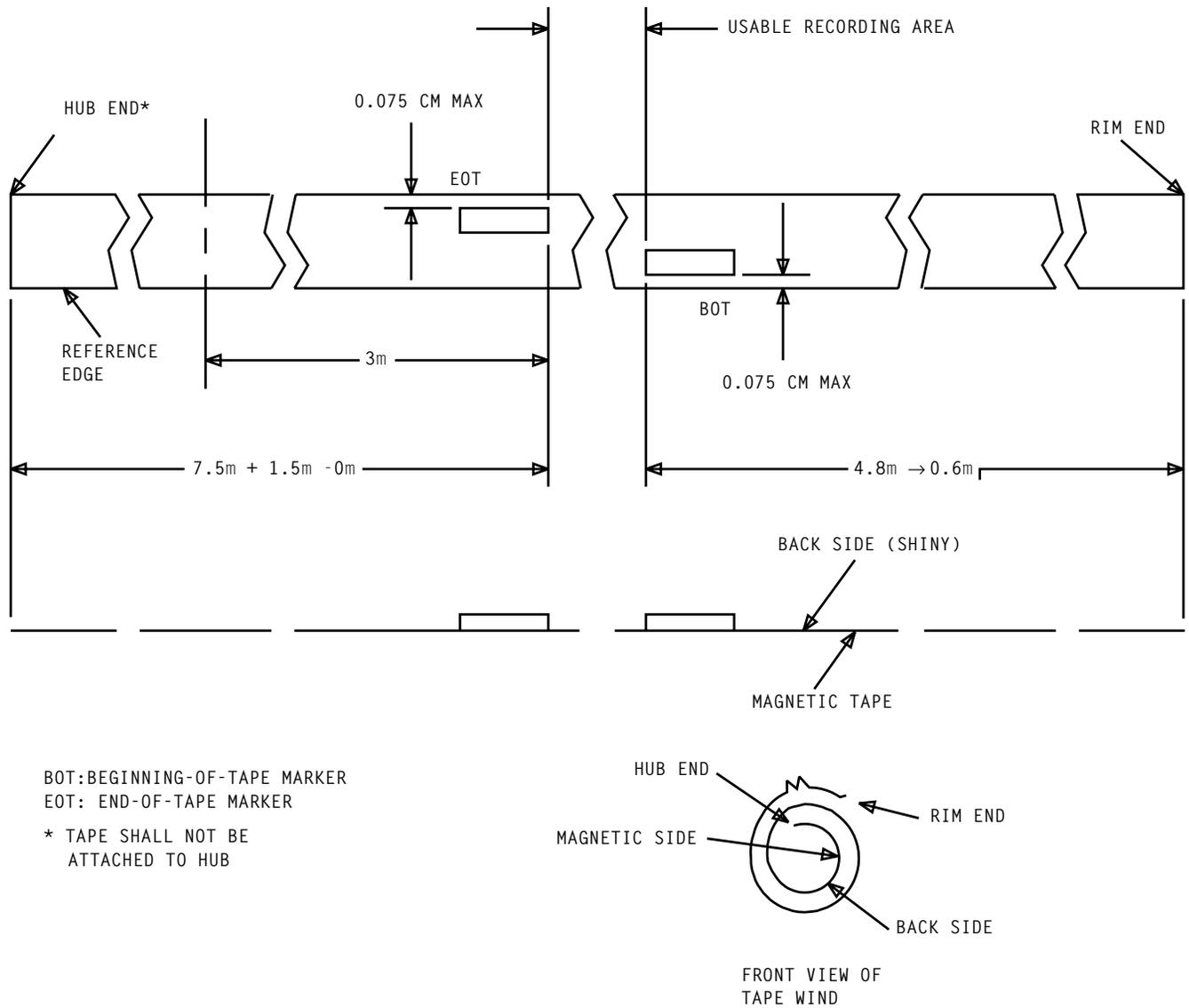
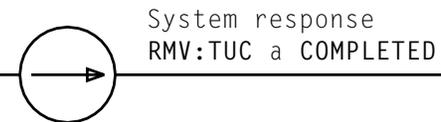


Figure 1 - Placement of Tape Markers on 1/2-Inch Magnetic Tape

[1] At TTY, type:
 RMV:TUC a!
 a = TUC member
 number
 (0-31)



- [2] Remove applicable input power fuses in sequence indicated [TABLE A]
- [3] Remove **24V** fuse at power distribution frame associated with pin 9 of power switch
- [4] Cover apparatus below power switch with drop cloth
- [5] Tag and remove external leads on rear of power switch
- [6] Remove four mounting screws and withdraw switch from front of frame

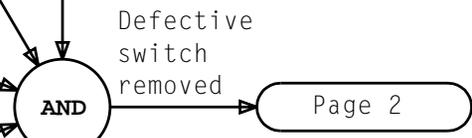


TABLE A INPUT FUSES		
NAME	SEQ IND	FUSE BLOCK LOCATION
+24 S1	*	69-10
+24 V1	*	
+24 S2	*	
+24 V2	*	
+24 S3	*	69-04
+24 V3	*	
-48 V1I	*	
-48 V1	*	
-48 V2I	*	69-04
-48 V2	*	

* Sequence indicator identifies those fuses which should be removed first and installed last

[7] At front of frame, install replacement switch using screws removed

[8] Reconnect external leads to switch terminals

[9] Install pigtail components

[10] Install fuses removed in sequence indicated [TABLE A]

[11] Install **24V** fuse at power distribution frame removed in Step 3

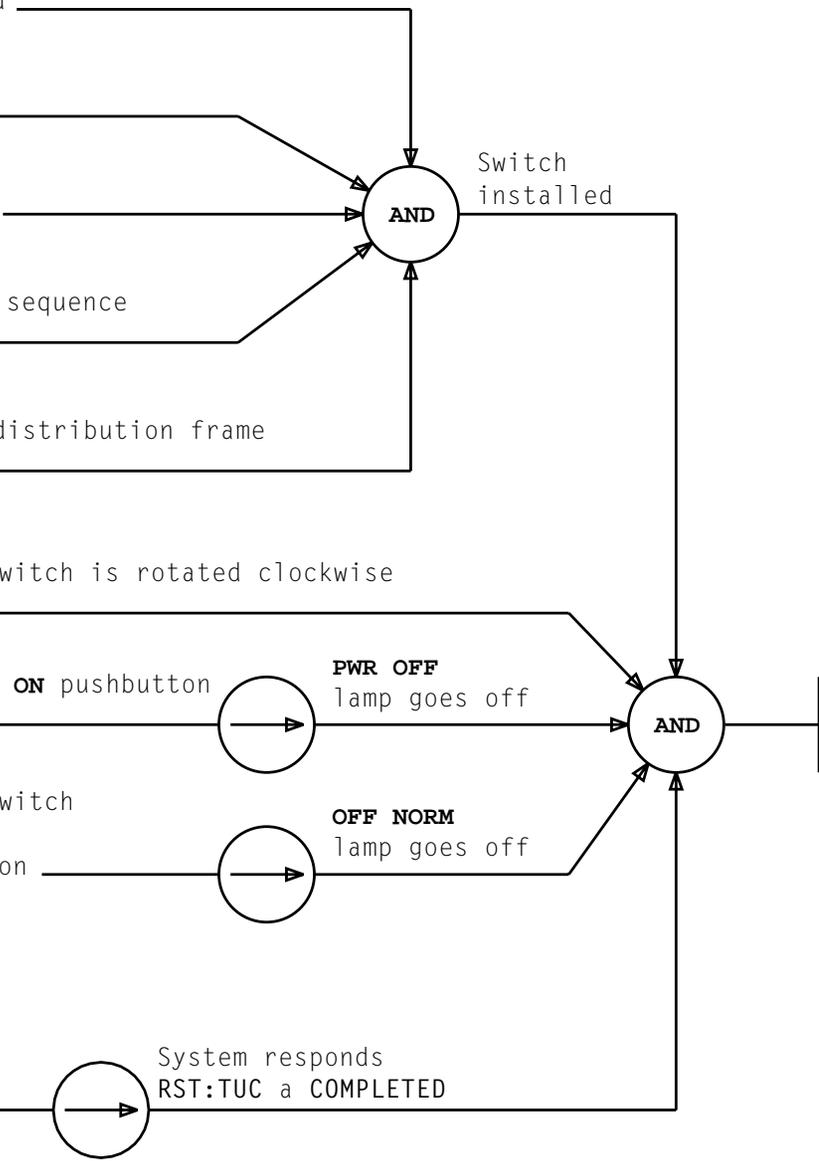
At power switch:

[12] Ensure **ROS/OFF** switch is rotated clockwise to **ROS**

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

[14] Rotate **ROS/OFF** switch counterclockwise to normal position

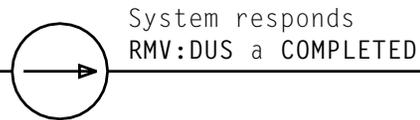
[15] At TTY, type:
RST:TUC a!
a = TUC member number
(0-31)



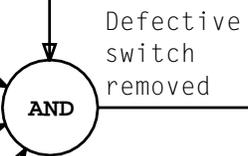
REPLACE POWER SWITCH - TAPE UNIT CONTROLLER

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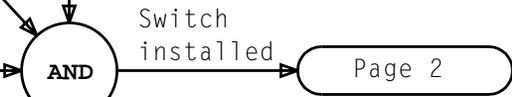
- [1] At TTY, type:
 RMV:DUS a!
 a = DUS member number
 (0-3)



- [2] Remove applicable input power fuses in sequence indicated [TABLE A, Page 2]
- [3] Cover apparatus below power switch with drop cloth
- [4] Tag and remove external leads on rear of power switch
- [5] Remove four mounting screws and withdraw switch from front of frame



- [6] At front of frame, install replacement switch using screws removed
- [7] Reconnect external leads to switch terminals
- [8] Install pigtail components
- [9] Install fuses removed in sequence indicated [TABLE A, Page 2]



REPLACE POWER SWITCH — DATA UNIT SELECTOR

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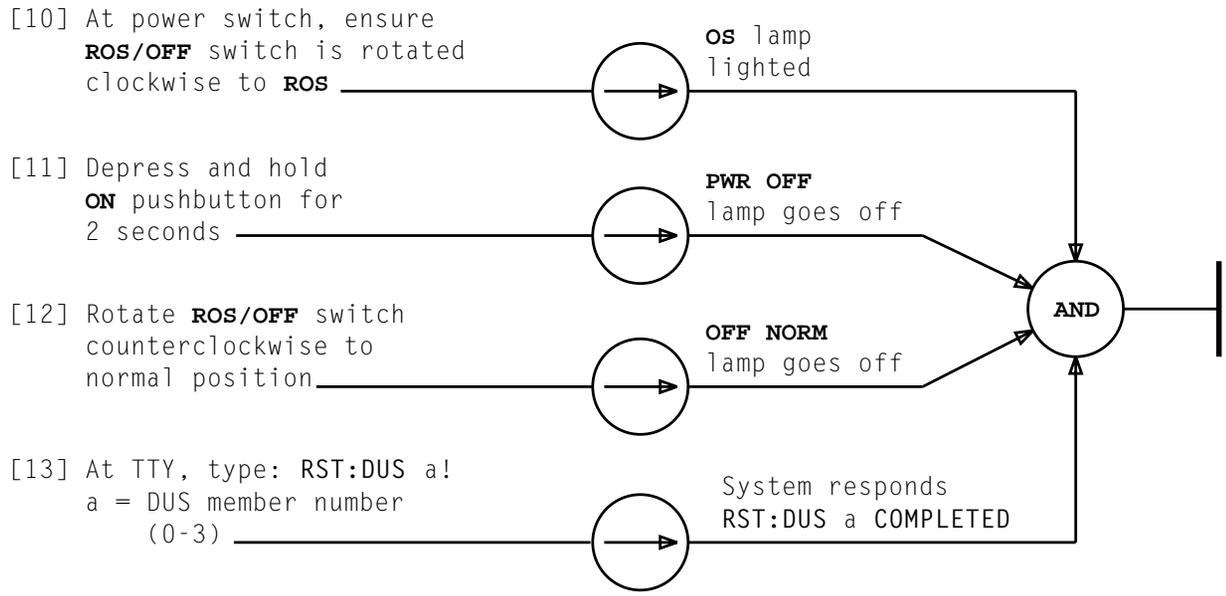


TABLE A

NAME	SEQ IND	FUSE BLOCK LOCATION	NAME	SEQ IND	FUSE BLOCK LOCATION
+24 ST1	*	75-04	+24 V6		77-04
+24 V1		77-04	+24 V7		
+24 ST2	*	75-04	-48 V1I	*	77-10
+24 V2		77-04	-48 V1		
+24 ST3	*	75-04	-48 V2I	*	
+24 V3		77-04	-48 V2		
+24 V5		77-04			

* Sequence indicator identifies those fuses which should be removed first and installed last

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[1] See WARNING 1. At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**

[2] Manually place tape tension arms against stops

[3] At rear of transport casting door, disconnect **J3** connector from upper sensor assembly

[4] Remove two sensor assembly mounting screws

[5] Remove sensor assembly being careful to avoid damaging thin aluminum light shield on reel motor control mechanism cam assembly

Sensor removed

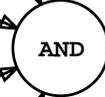
[6] Mount replacement sensor assembly using two mounting screws removed

[7] Connect **J3** connector to replacement sensor assembly

[8] Return arms to tape unload position

[9] Gently close tape transport casting door; latch, and secure pawl fastener

[10] At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door



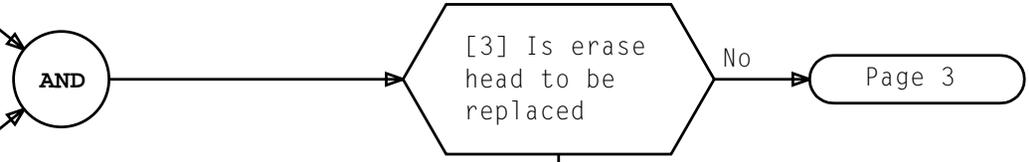
WARNING 1
When DC-to-DC converter is turned off, tape reel motors spins uncontrolled

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REPLACE UPPER ARM POSITION SENSOR ASSEMBLY

[1] At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**

[2] At lower right of tape transport, loosen pawl fastener; unlatch, and open casting door

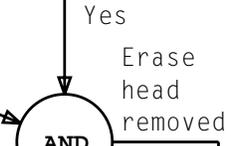


Page 3

[4] Disconnect erase head leads from **TB4** [Figures 1 and 2, Page 2]

[5] Support erase head and carefully remove mounting screw [Figure 3, Page 2]

[6] Remove erase head, guiding leads through cutaway hole

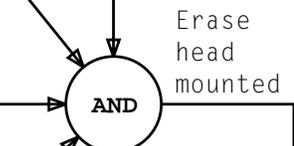


[7] Clean mounting surfaces on replacement head and precision plate of burrs and dirt

[8] Guide replacement erase head leads through cutaway hole and position head for mounting

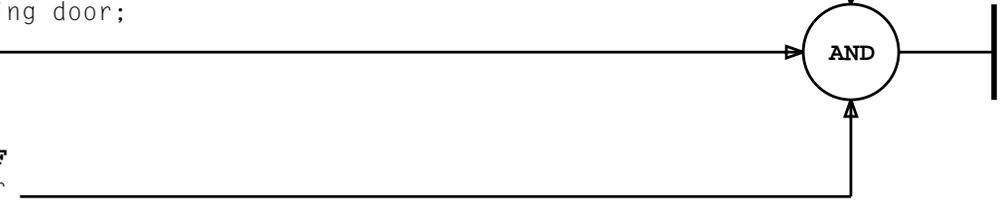
[9] Support erase head and carefully install mounting screw

[10] Connect erase head leads to **TB4** [Figures 1 and 2, Page 2]



[11] Gently close tape transport casting door; latch, and secure pawl fastener

[12] At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door



REPLACE READ, WRITE, OR ERASE HEAD

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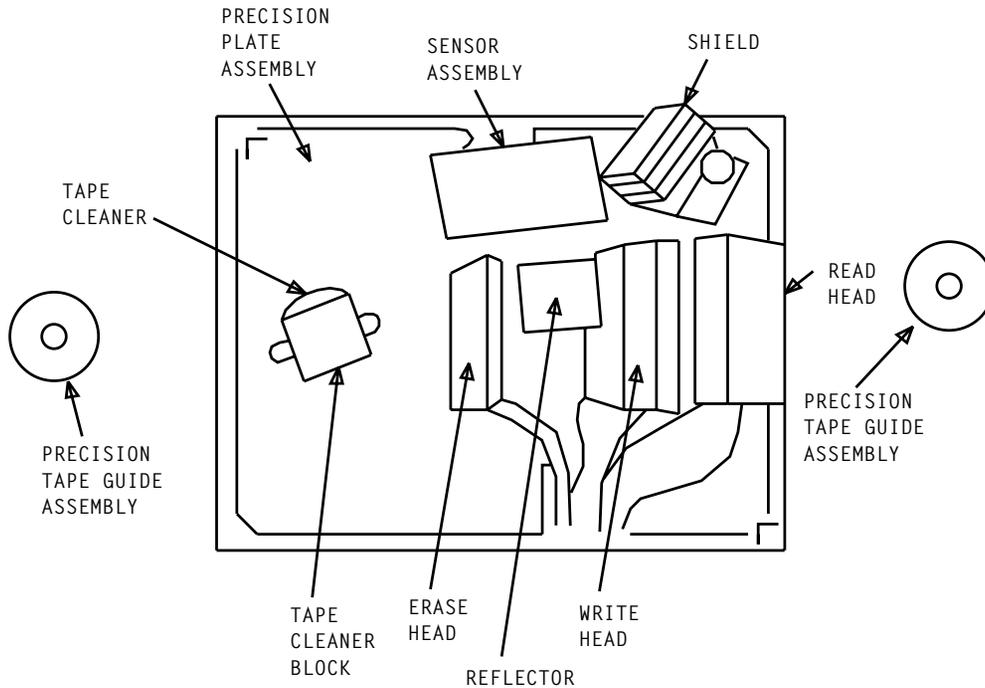


Figure 1 - Precision Plate and Tape Guide Assemblies

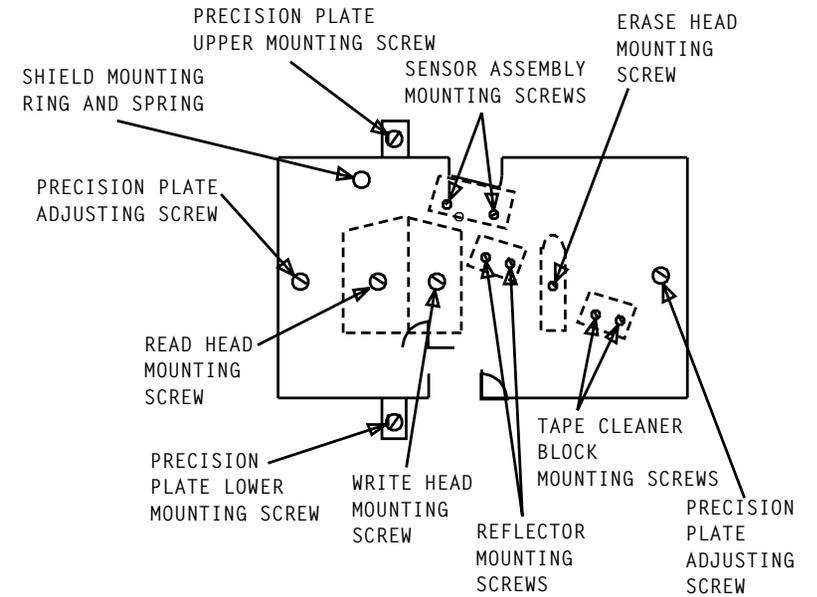


Figure 3 - Precision Plate Assembly - Rear View Showing Component Mounting Screws

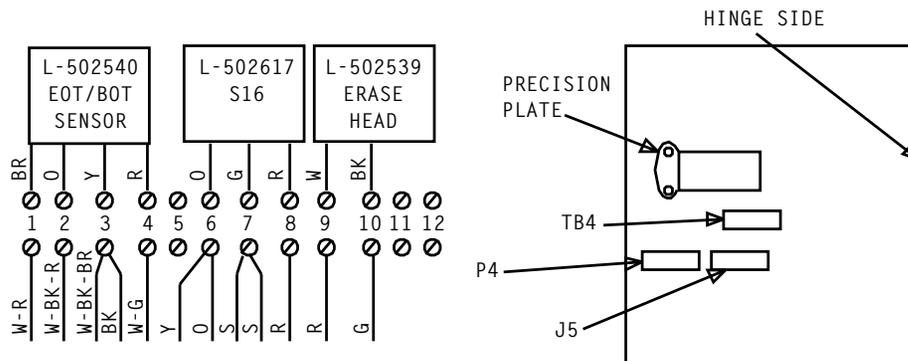
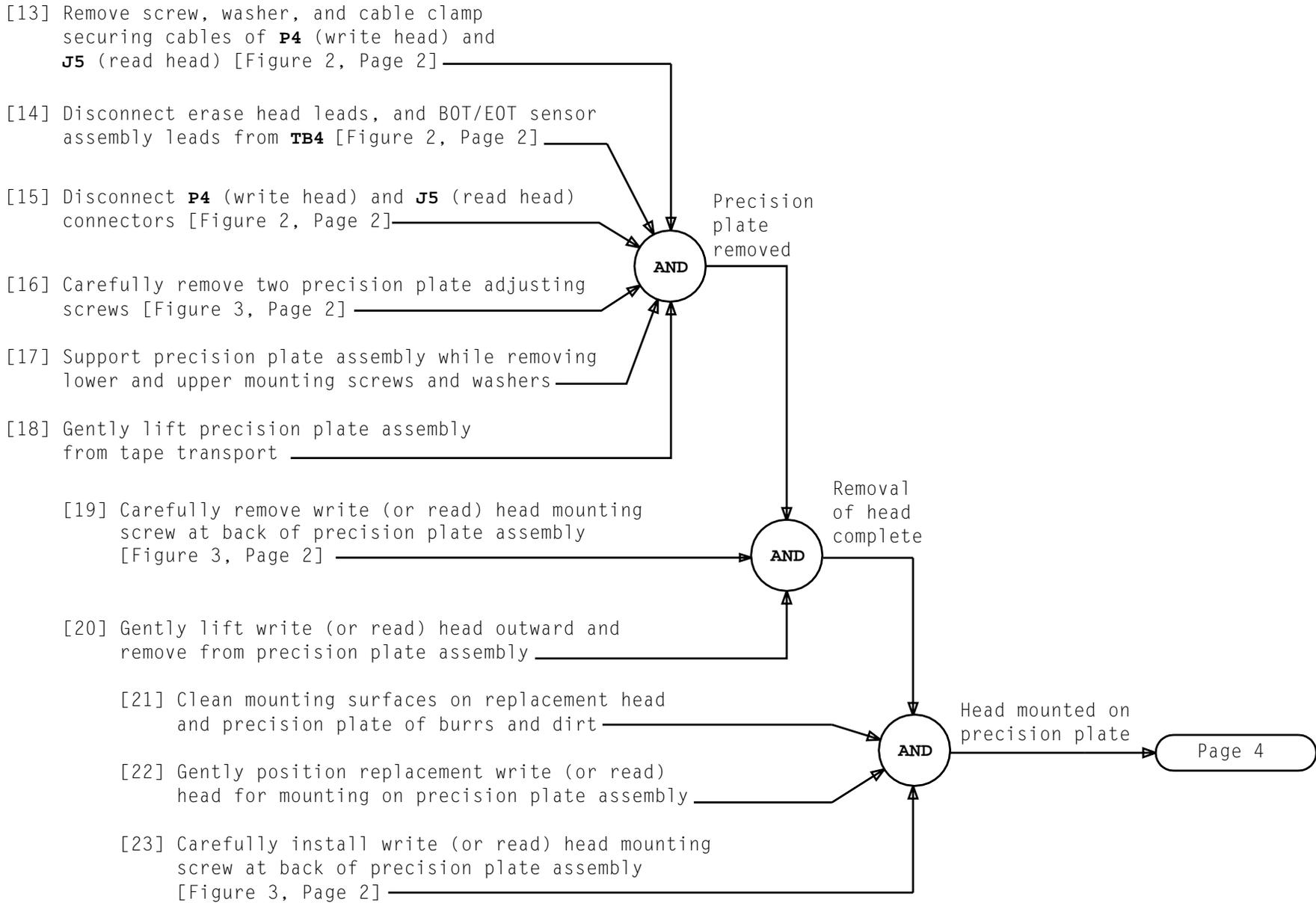


Figure 2 - TB4 Wiring Diagram and Location (Rear View of Tape Transport Casting Door)

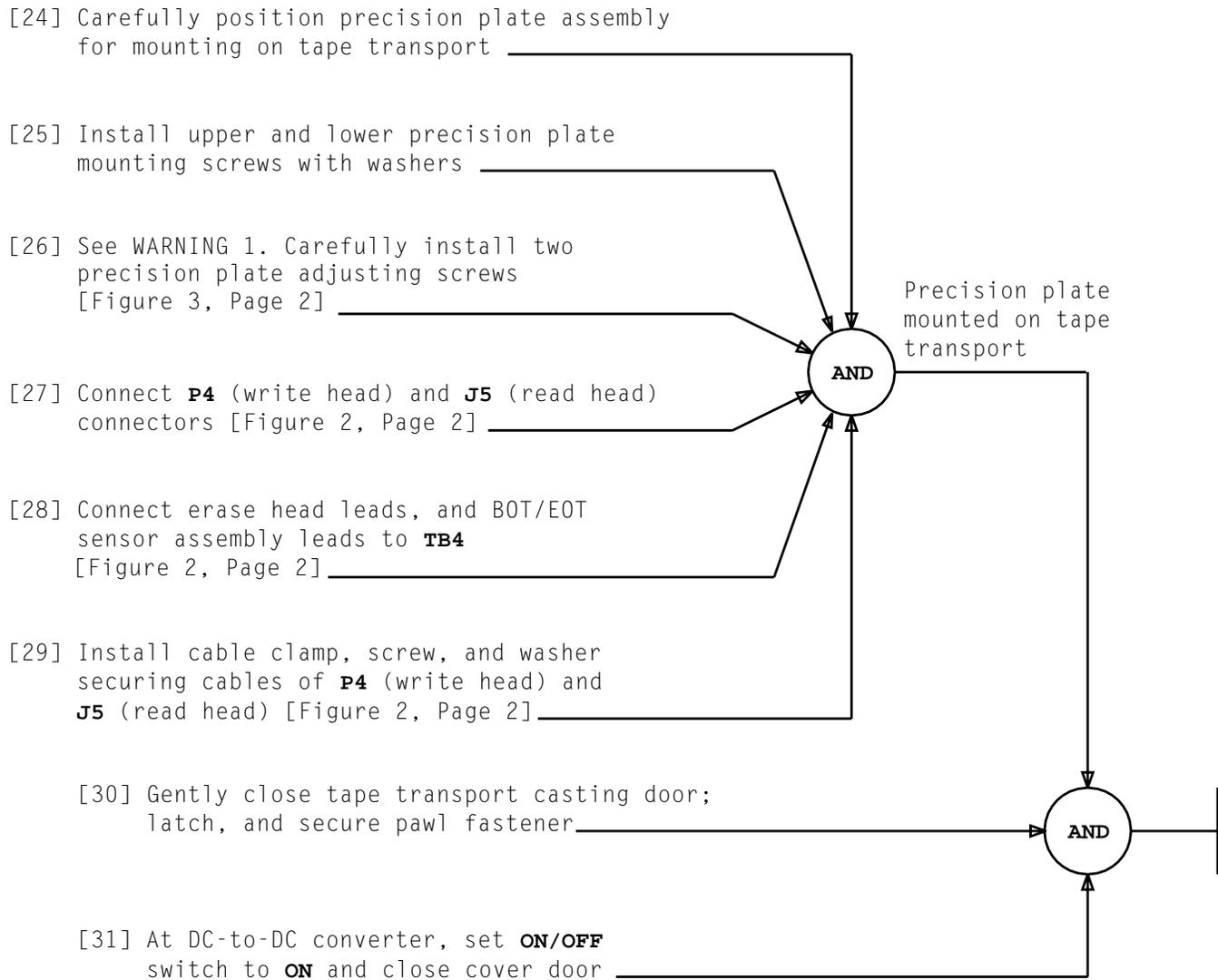
REPLACE READ, WRITE, OR ERASE HEAD

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REPLACE READ, WRITE, OR ERASE HEAD

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*WARNING 1
Precision plate
adjusting screws
should only be
tightened to
point where they
make contact
with precision
plate assembly*

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REPLACE READ, WRITE, OR ERASE HEAD

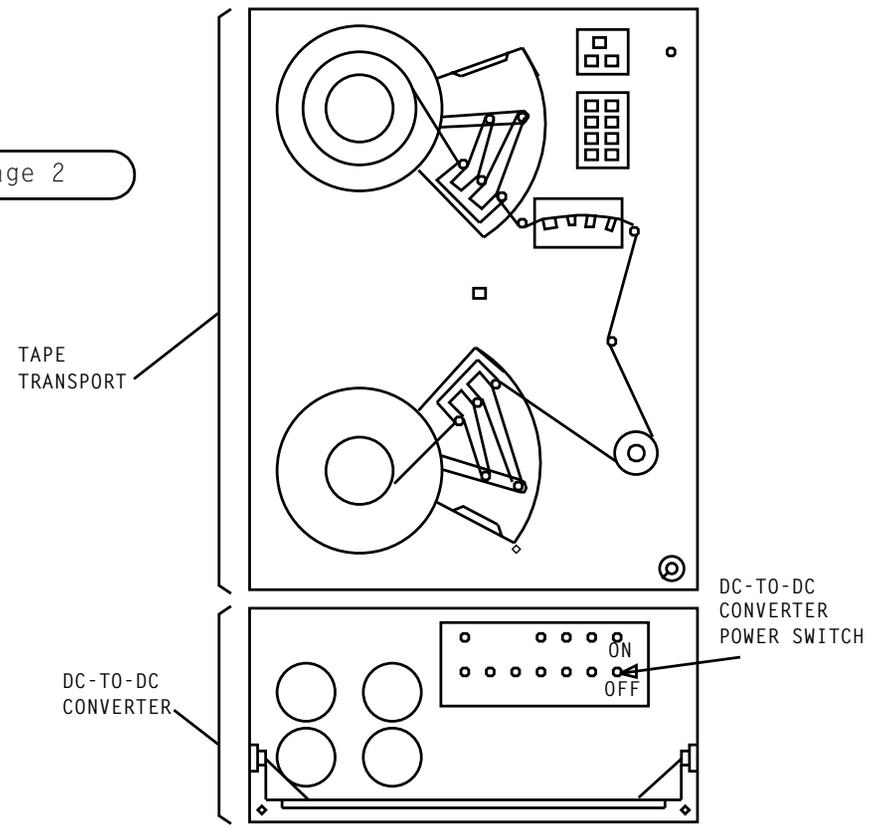
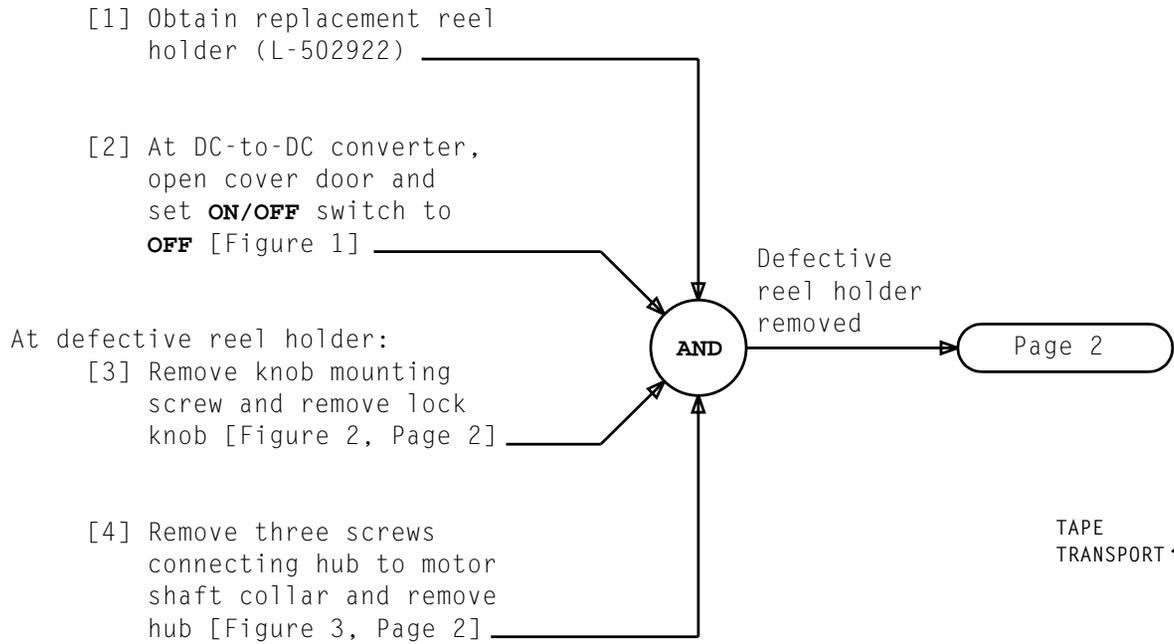


Figure 1 - Tape Transport and DC-to-DC Converter With Cover Doors Open

REPLACE REEL HOLDER

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[5] On exposed motor shaft collar [FIG. 2],
mount new hub using three screws
removed [Figure 3]

[6] Align three finger pins [Figure 2]
of new lock knob with holes in
end of each finger [Figure 3]

[7] Install knob mounting screw
and tighten securely [Figure 2]

[8] At DC-to-DC converter, set **ON/OFF**
switch to **ON** and close cover door

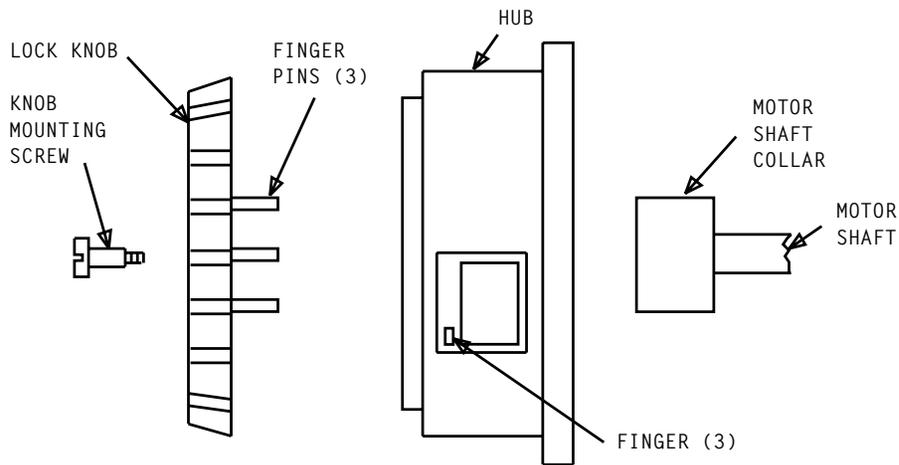
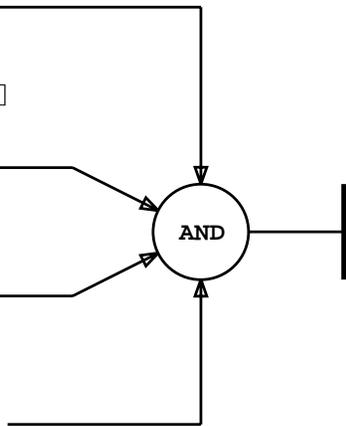


Figure 2 - Reel Holder - Side View

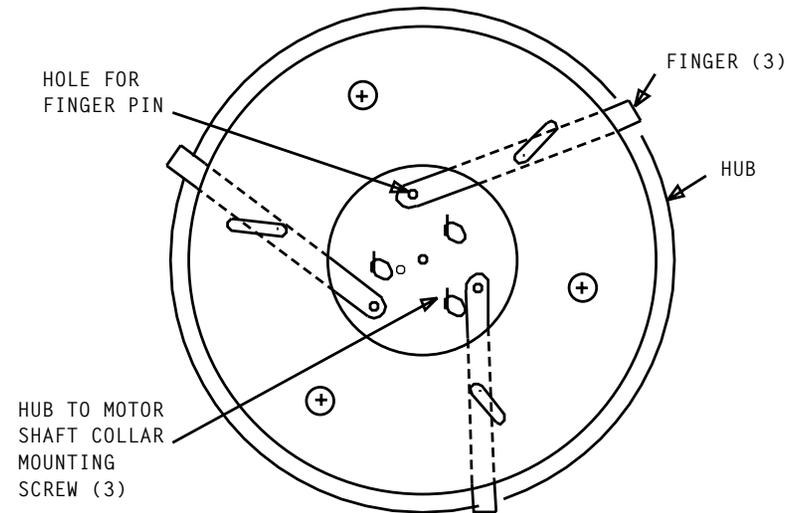
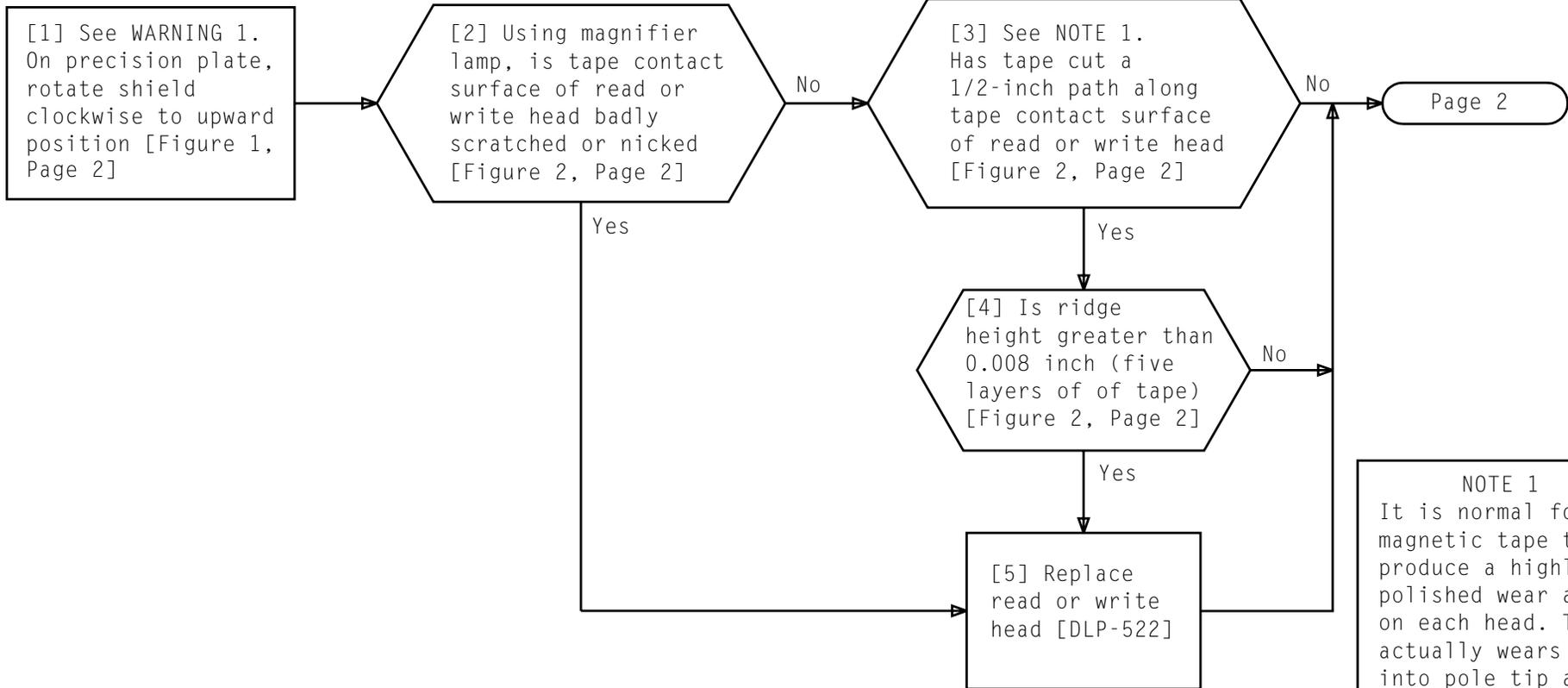


Figure 3 - Reel Holder Hub (Knob Removed)

REPLACE REEL HOLDER

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NOTE 1
 It is normal for magnetic tape to produce a highly polished wear area on each head. Tape actually wears into pole tip area of head surfaces, cutting a 1/2-inch wide path several thousandths of an inch deep

WARNING 1
Shield can rotate counterclockwise beyond detent position contact, and damage read/write heads

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CHECK TAPE HEADS

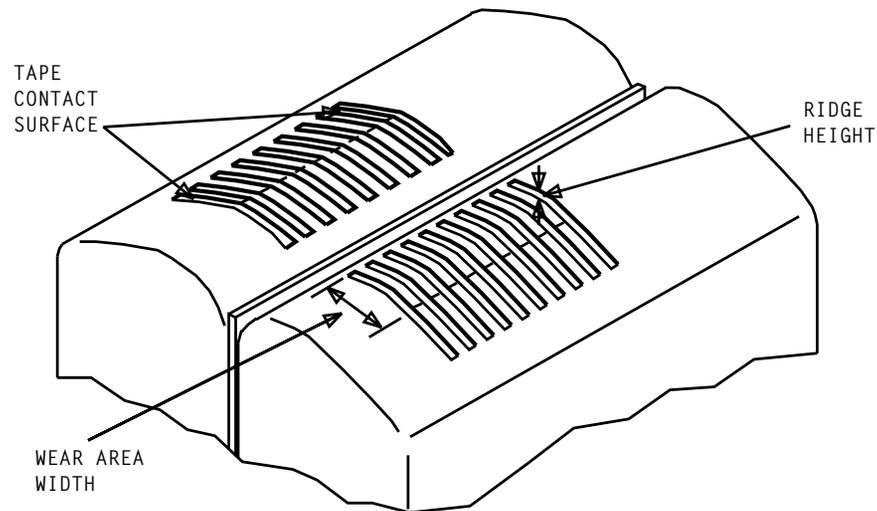
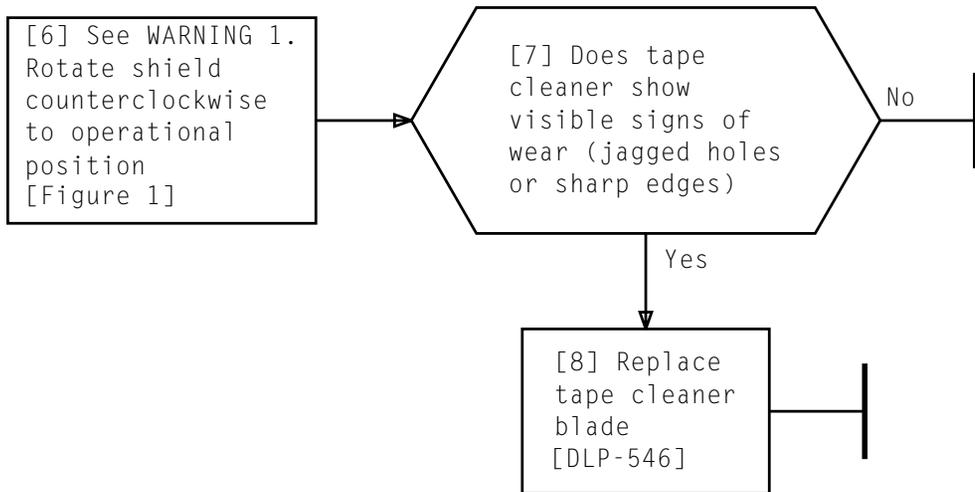


Figure 2 - Worn Read and Write Heads (Front View)

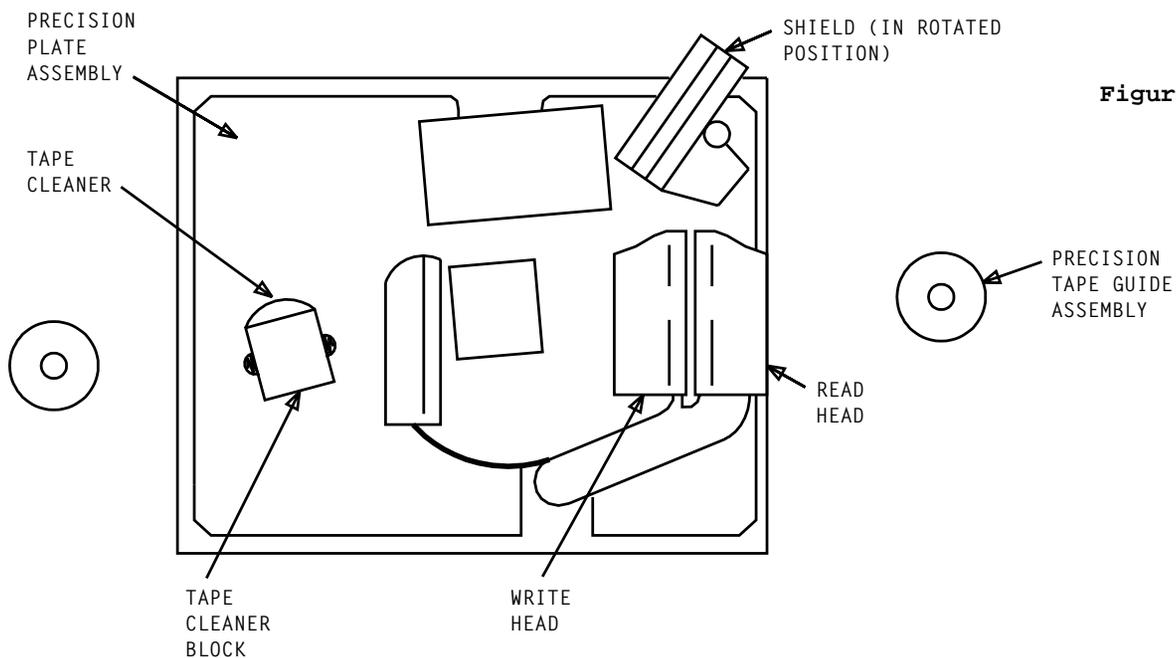
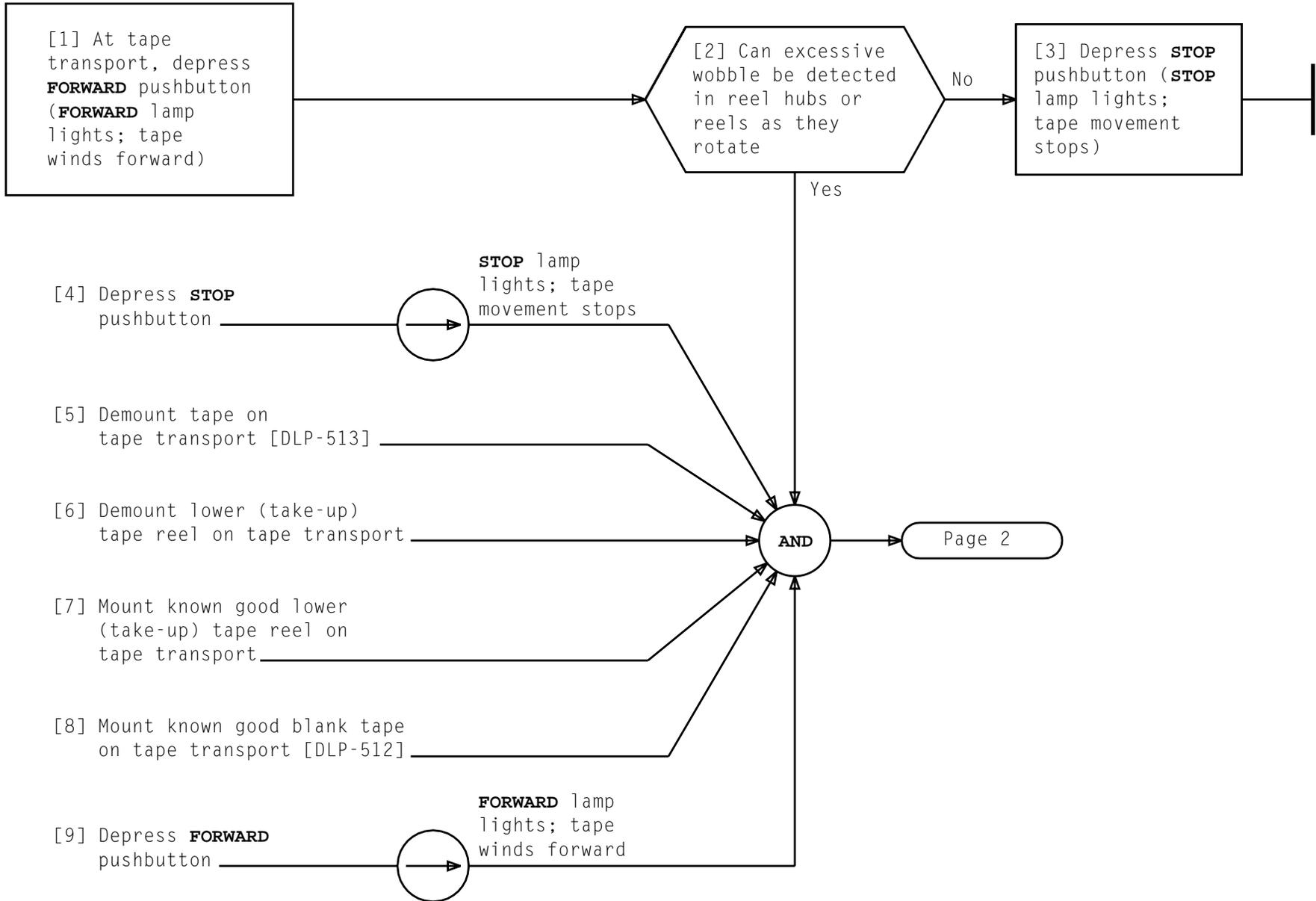


Figure 1 - Precision Plate and Tape Guide Assemblies

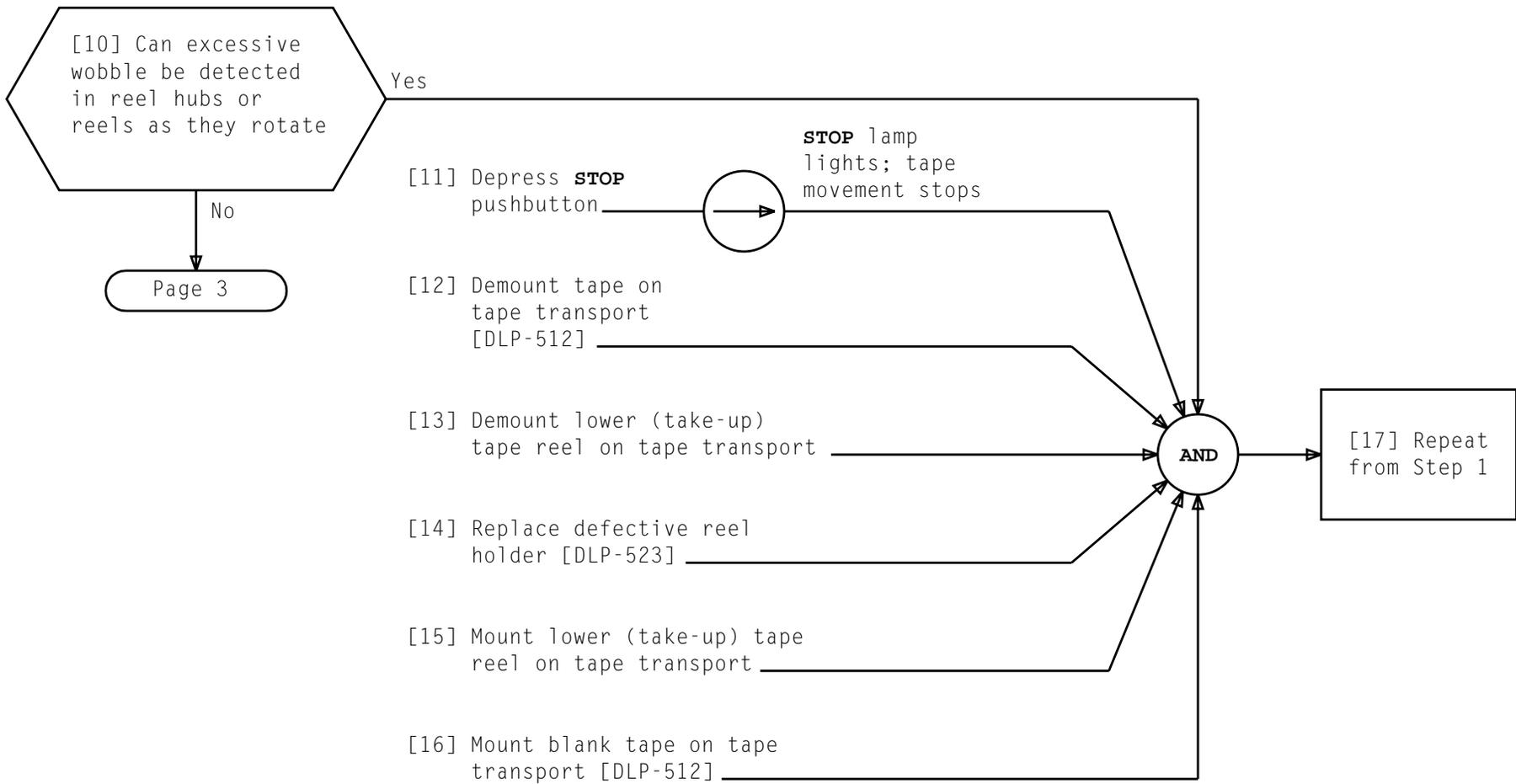
CHECK TAPE HEADS

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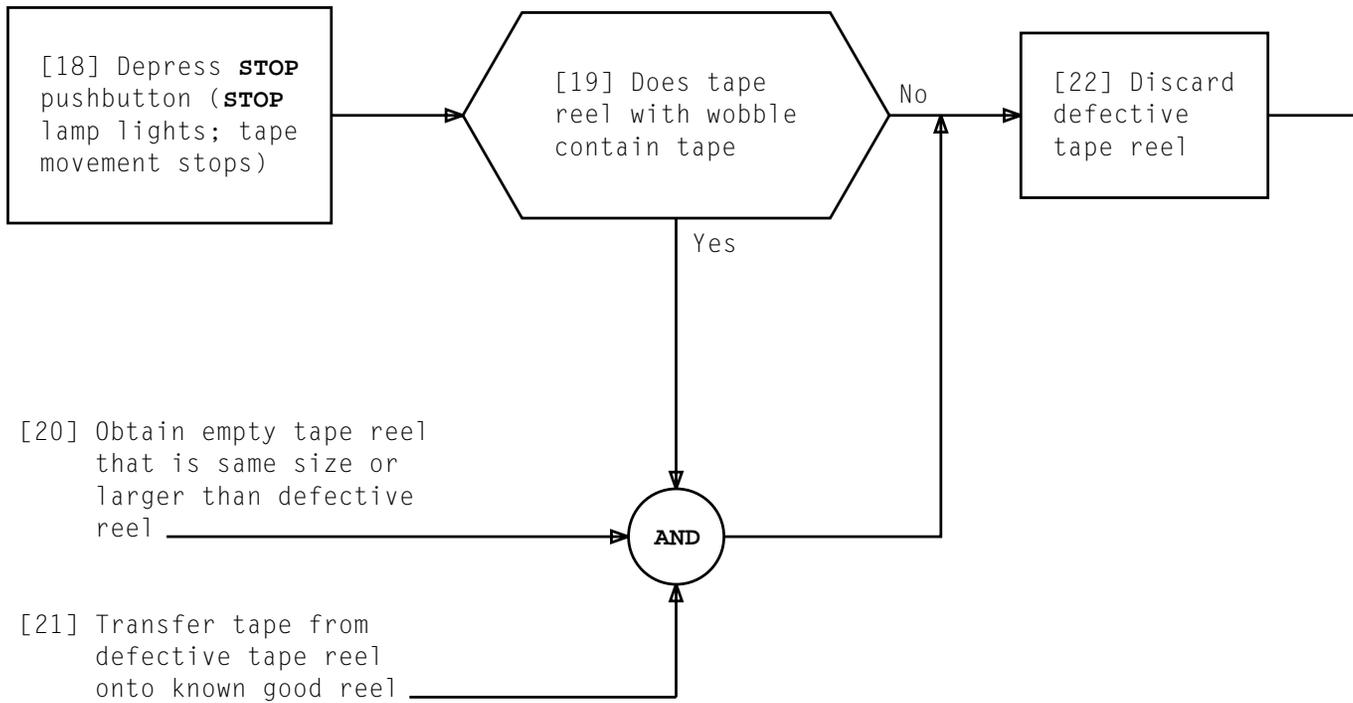
CHECK REELS AND HUBS FOR WOBBLE

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CHECK REELS AND HUBS FOR WOBBLE

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CHECK REELS AND HUBS FOR WOBBLE

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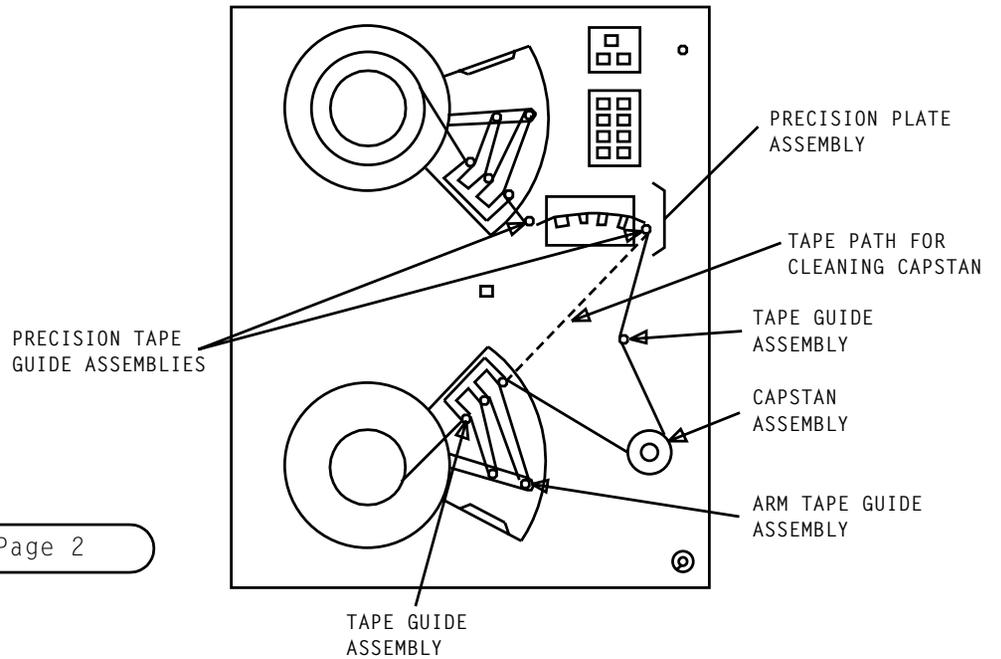
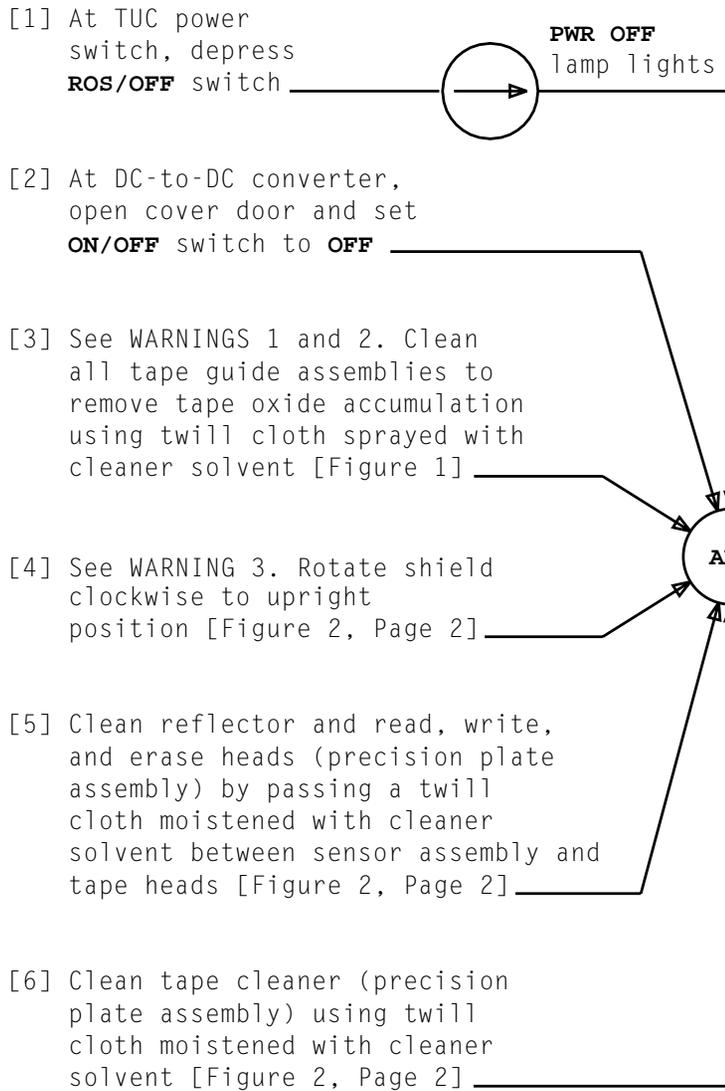


Figure 1 - Tape Transport - Front View With Cover Door Open

- WARNINGS**
1. Fingers should never touch tape contact surfaces, as body oil contaminates magnetic tape
 2. Never spray cleaner solvent directly on equipment
 3. Shield can rotate counterclockwise beyond detent position contact, and damage read/write heads

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[7] At DC-to-DC converter, open cover door and set **ON/OFF** switch to **ON**

[8] Mount scratch tape on tape transport and thread tape to bypass capstan (dashed line) [Figure 1, Page 1] [DLP-512]

[9] Depress **ARMS NORMAL** pushbutton → **ARMS NORMAL** lamp lights until arms apply tension to tape

[10] Depress **FORWARD** pushbutton → **FORWARD** lamp lights; capstan rotates

[11] Hold lint-free twill cloth saturated with cleaning solvent (KS-20406,L1) against rubber capstan surface

[12] Repeat Step 11 several times, resaturating clean area of cloth each time and finishing with dry cloth to remove excess solvent

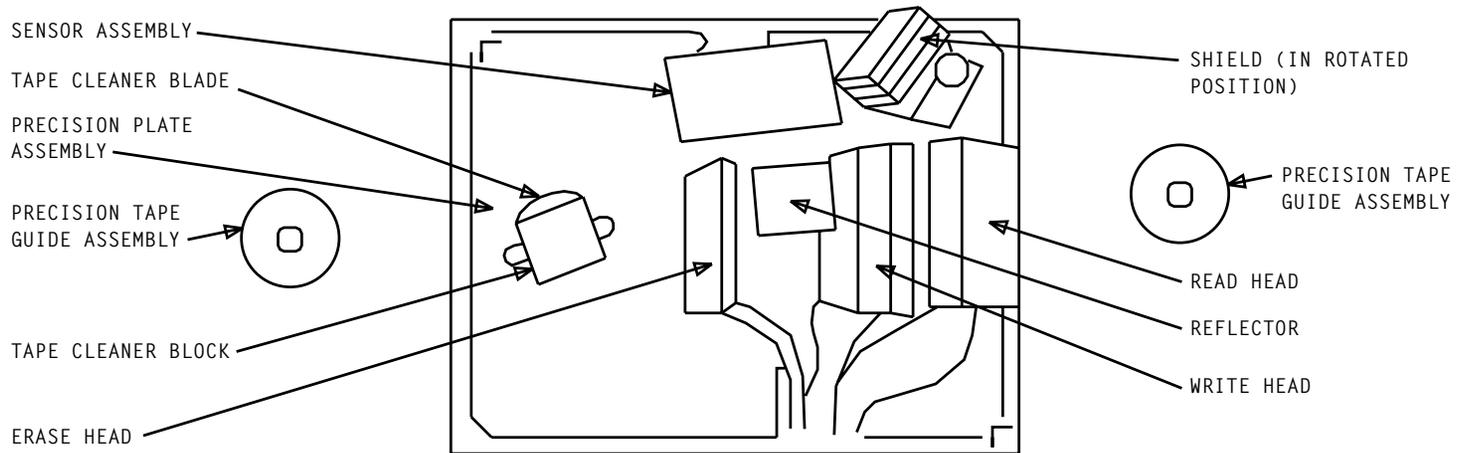
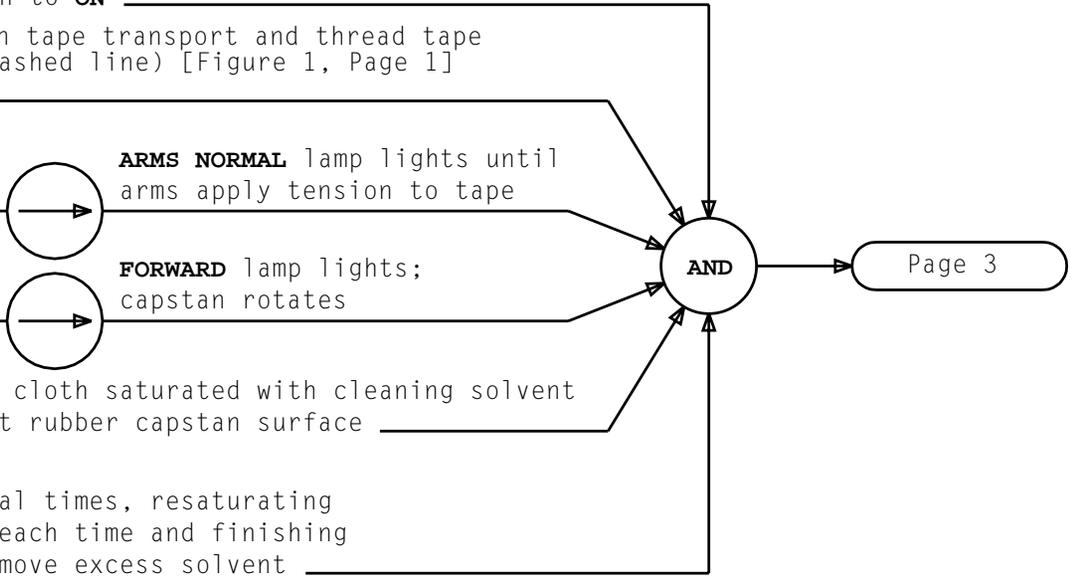
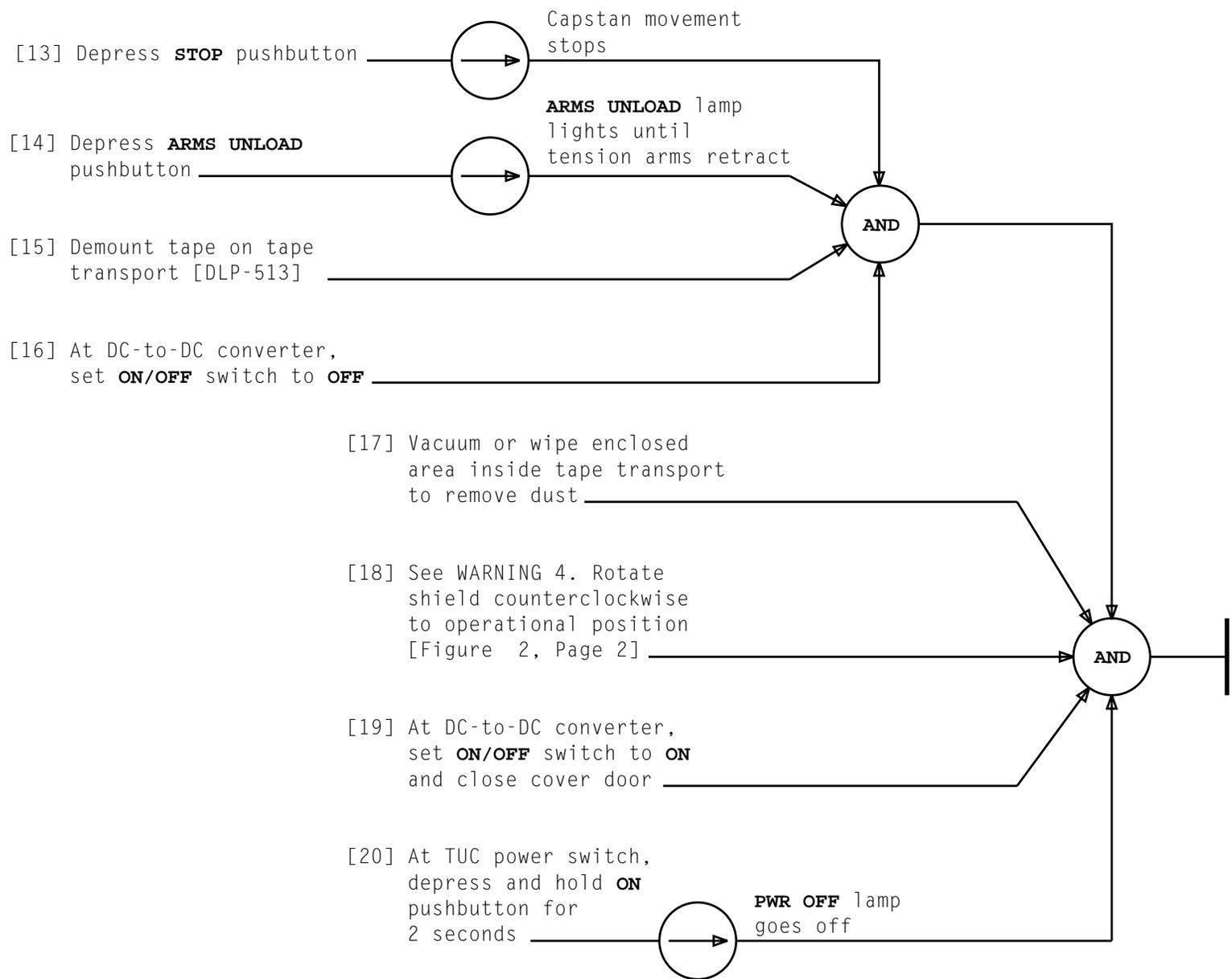


Figure 2 - Precision Plate Assembly and Tape Guide Assemblies



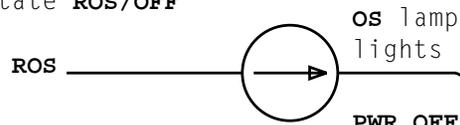
CLEAN TAPE PATH

WARNING 4
 Shield can rotate counterclockwise beyond detent position contact, and damage read/write heads

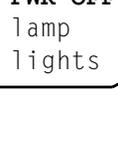
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[1] Obtain replacement switch bracket assembly L-502512 (interlock switch assembly)

[2] At tape unit controller (TUC) power switch, rotate **ROS/OFF**



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



[4] At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF** [Figure 1]

[5] Open tape transport cover door

[6] Rotate switch plunger counterclockwise and remove plunger and washer from casting door [Figure 1]

[7] At lower right of tape transport, loosen pawl fastener; unlatch, and open casting door

[8] At **TB11** (below bracket switch assembly), tag and disconnect interlock switch leads from terminals **1, 2, 4, 5,** and **6** [Figure 2, Page 2]

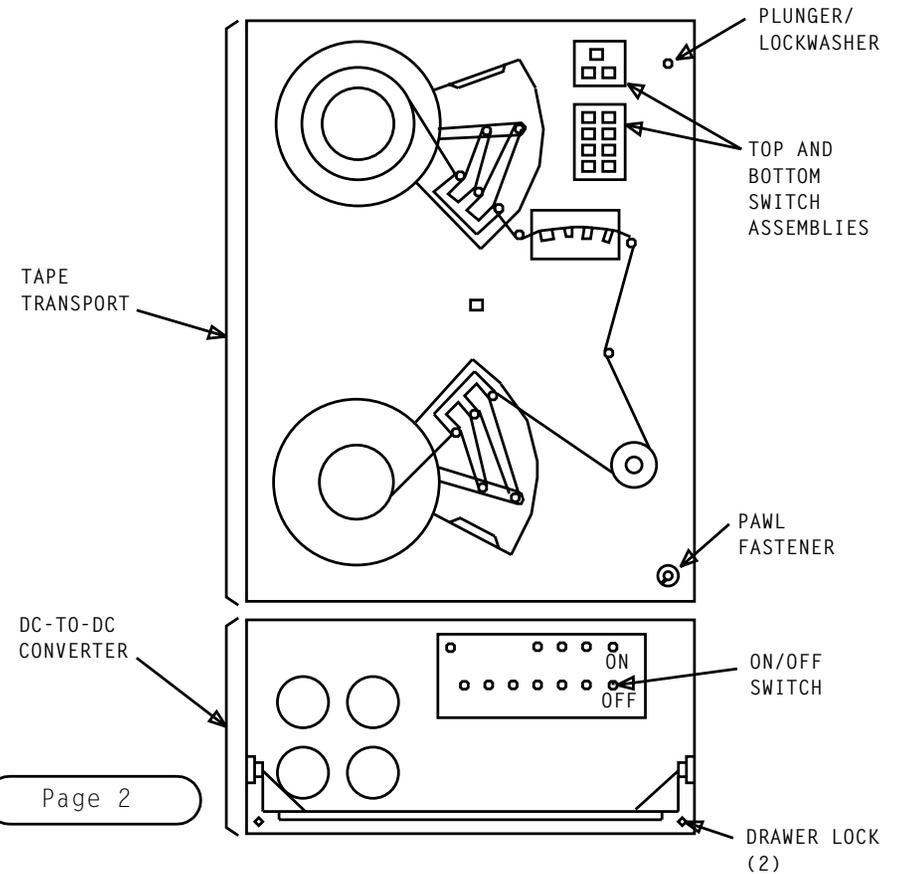
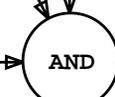
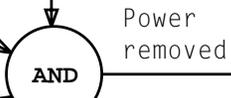


Figure 1 - Tape Transport and DC-to-DC Converter With Cover Doors Open

REPLACE INTERLOCK SWITCH

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At rear of transport casting door:

[9] Remove two switch bracket mounting screws and lockwashers, and remove switch assembly bracket [Figure 3, Page 3]

[10] Remove two switch assembly mounting screws and lockwashers

[11] Mount new interlock switch to switch bracket with two switch assembly mounting screws and lockwashers, but do not tighten

[12] Mount bracket switch assembly to tape transport with two switch bracket mounting screws and lockwashers, but do not tighten

[13] At **TB11**, connect interlock switch leads to terminals and remove tags [Figure 2]

[14] At front of tape transport, install lockwasher and plunger on new interlock switch and turn plunger clockwise until tight

[15] Position plunger to prevent binding from side to side and tighten switch bracket mounting screws [Figure 3, Page 3]

[16] Position plunger to prevent binding from top to bottom and tighten switch assembly mounting screws using right angle screwdriver

[17] Gently close tape transport casting door; latch, and secure pawl fastener

[18] Depress and release interlock switch plunger, leaving in override position

[19] Adjust interlock switch [DLP-529]

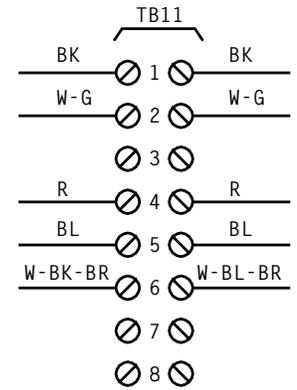


Figure 2 - TB11 Wiring Diagram

Page 3

REPLACE INTERLOCK SWITCH

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[20] At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door

[21] At TUC power switch, depress and hold **ON** pushbutton for 2 seconds

[22] Rotate **ROS/OFF** switch counterclockwise to normal position

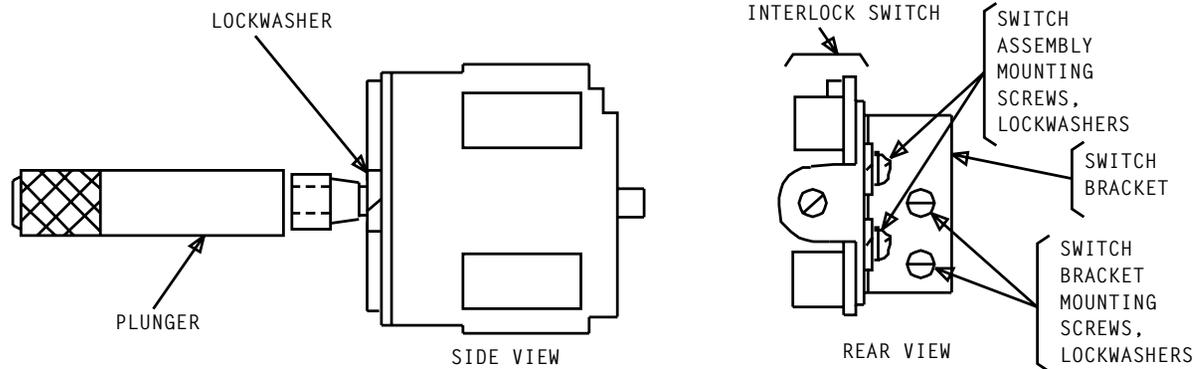
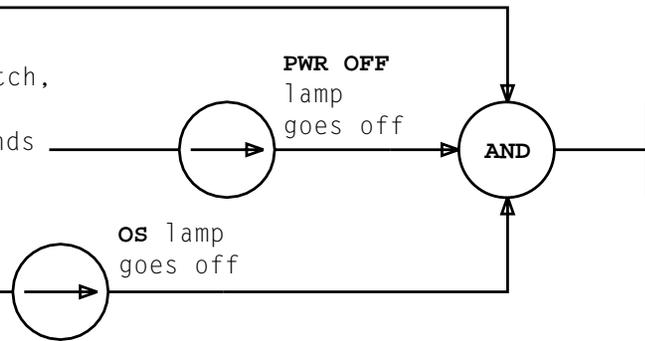


Figure 3 - Bracket Switch Assembly (L-502512)

REPLACE INTERLOCK SWITCH

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[1] See WARNING 1.

At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**

[2] Manually place tape tension arms against stops

[3] At rear of tape transport casting door, disconnect **J7** connector from lower sensor assembly

[4] Remove two sensor assembly mounting screws

[5] Remove sensor assembly being careful to avoid damaging thin aluminum light shield on reel motor control mechanism cam assembly

Sensor removed

[6] Mount replacement sensor assembly using two mounting screws removed

[7] Connect **J7** connector to replacement sensor assembly

[8] Return arms to tape unload position

[9] Gently close tape transport casting door; latch, and secure pawl fastener

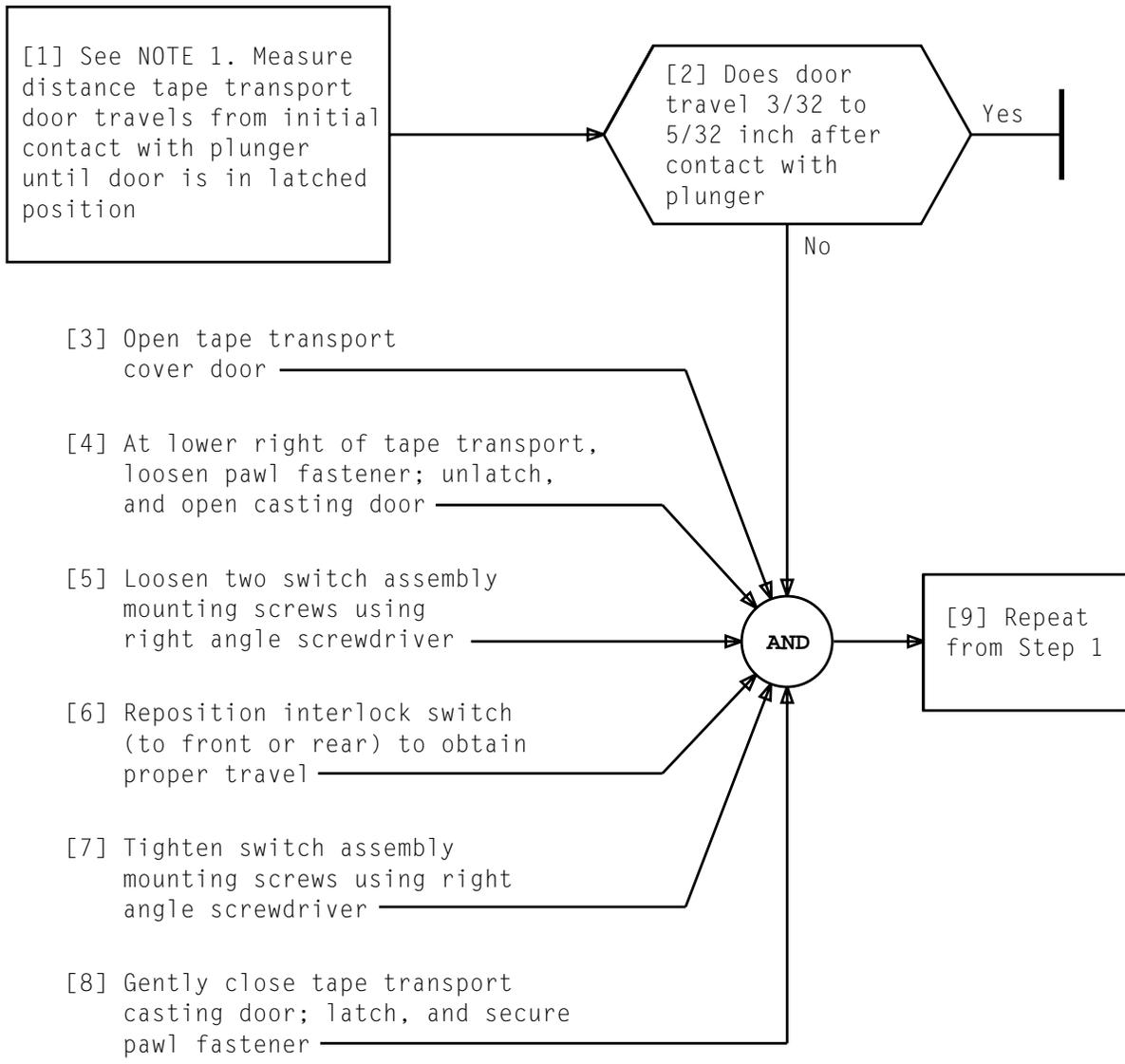
[10] At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door



WARNING 1
When DC-to-DC converter is turned off, tape reel motors spin uncontrolled

REPLACE LOWER ARM POSITION SENSOR ASSEMBLY

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NOTE 1
 Distance of travel can be measured by placing ruler against bottom switch assembly and to right of **FAST FWD** pushbutton. Contact must be observed between plunger and tape transport cover door through top switch assembly window

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ADJUST INTERLOCK SWITCH

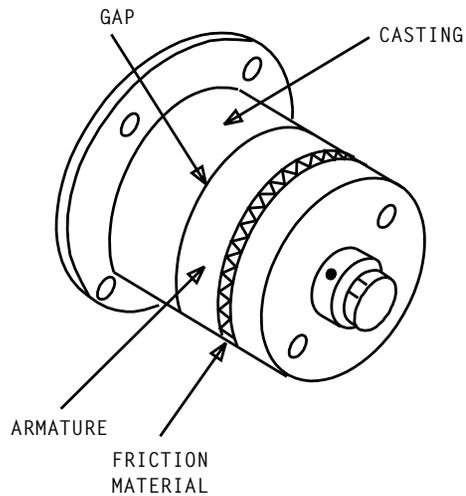
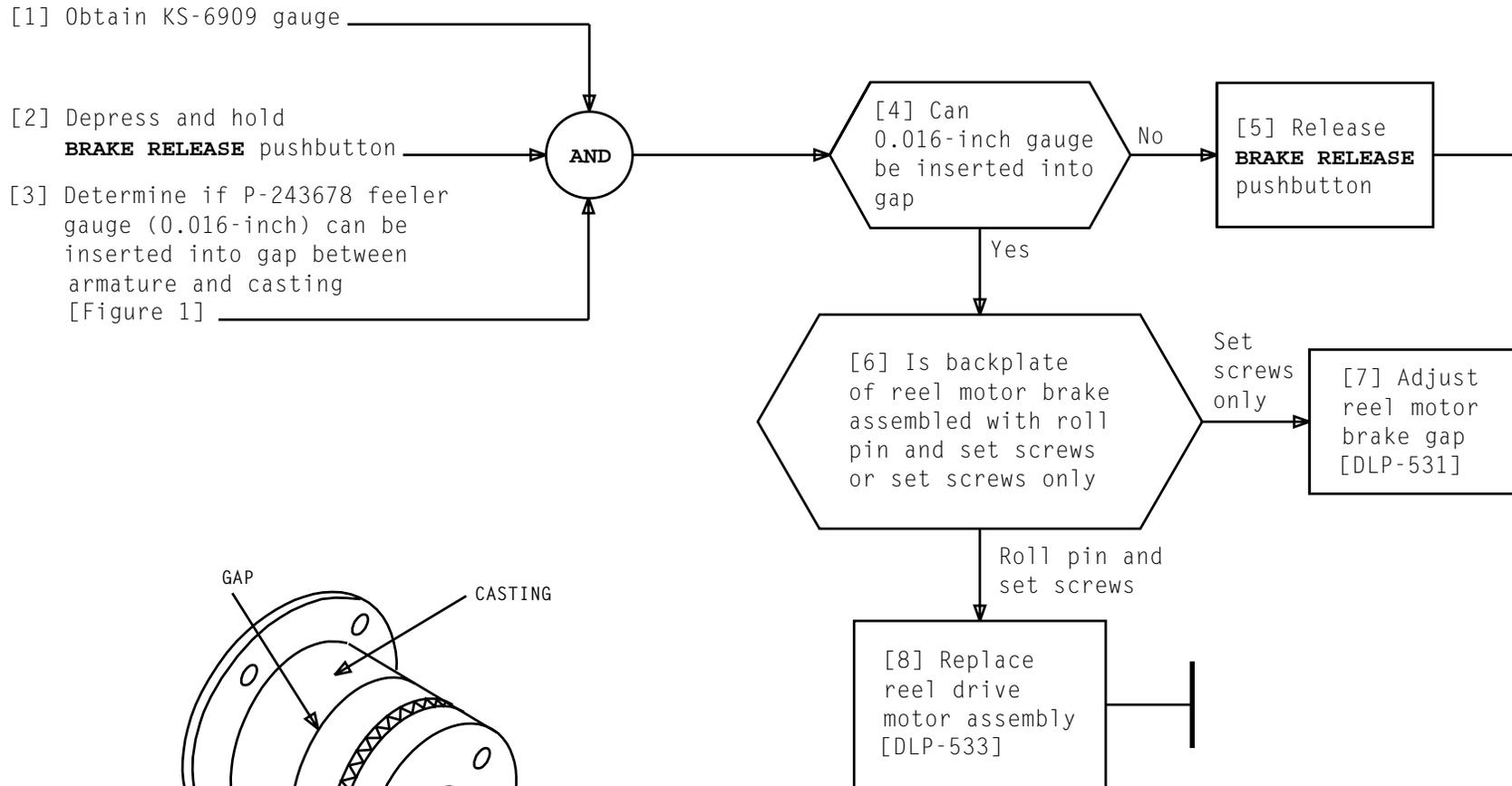


Figure 1 - Reel Motor Brake

CHECK REEL MOTOR BRAKE GAP

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[1] Obtain support apparatus
[TABLE A]

[2] See DANGER 1. Carefully
loosen setscrews while
holding backplate against
spring pressure [Figure 1]

[3] Slide backplate away from casting
enough to insert two .010 feeler
gauges (P-243671) in gap between armature
and casting (one on each side of
motor shaft) [Figure 1]

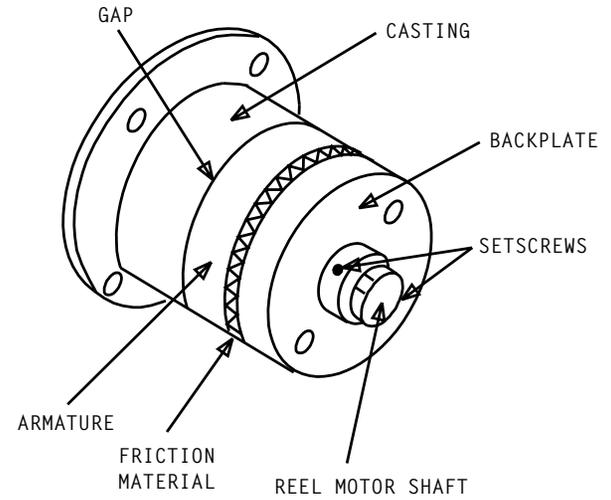
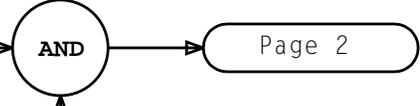


Figure 1 - Reel Motor Brake

TABLE A	
COMMON NAME	PART NUMBER
5/64-inch Allen wrench	-
Feeler gauge (2)	KS-6909

ADJUST REEL MOTOR BRAKE GAP

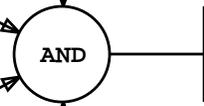
<i>DANGER 1</i>	
<i>There is approximately 10 pounds of spring pressure against armature and backplate with brake deenergized (BRAKE RELEASE pushbutton released)</i>	
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[4] Depress and hold **BRAKE RELEASE** pushbutton to energized brake (armature, spring, and feeler gauges are held in place)

[5] While depressing **BRAKE RELEASE** pushbutton, slide backplate against armature but do not apply pressure between armature and backplate [Figure 1]

[6] Using 5/64-inch allen wrench, tighten both set screws

[7] Release **BRAKE RELEASE** pushbutton to deenergize brake and remove feeler gauges



WARNING: *When DC-to-DC converter is turned off, tape reel motors spins uncontrolled*

1. At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**
2. At lower right of tape transport, loosen pawl fastener; unlatch, and open casting door
3. At rear of transport casting door, disconnect two reel motor brake leads from **TB2** or **TB8** as appropriate [Figure 1, Page 2]

DANGER: *There is approximately 10 pounds of spring pressure against armature and backplate with **BRAKE RELEASE** deenergized (**BRAKE RELEASE** pushbutton not depressed)*

4. Carefully loosen setscrews while holding backplate against spring pressure [Figure 2, Page 2]
5. Carefully slide backplate armature, and spring off motor shaft (spring pressure is relieved)
6. Remove four brake mounting screws and washers that secure brake housing to motor housing, and remove brake from reel motor
7. Install replacement brake, and align setscrews on reel motor shaft flats

8. Secure brake housing to reel motor housing using four brake mounting screws and washers removed
 9. Tighten both setscrews securely
 10. Twist reel motor brake leads together (as a pair) and connect to **TB2** or **TB8** as appropriate [Figure 1, Page 2]
 11. Remove screws on brake plate, and then remove spacer shims
 12. Gently close tape transport casting door; latch, and secure pawl fastener
 13. At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door
- End of procedure

REPLACE REEL MOTOR BRAKE

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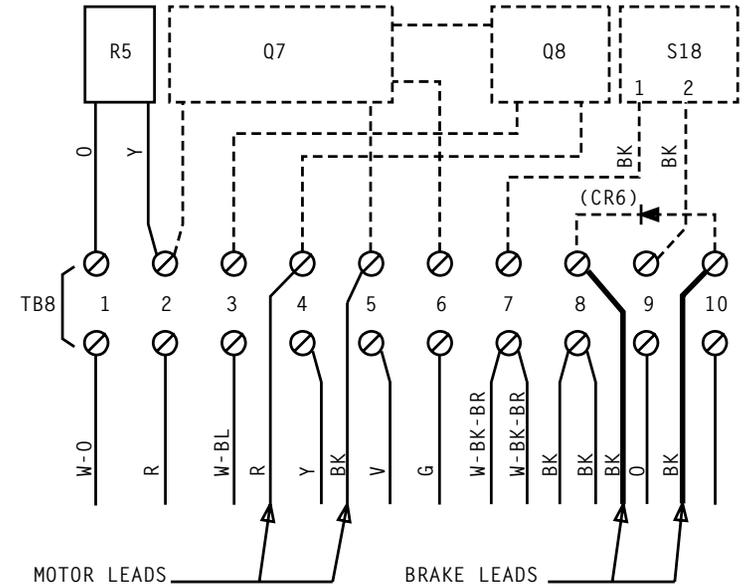
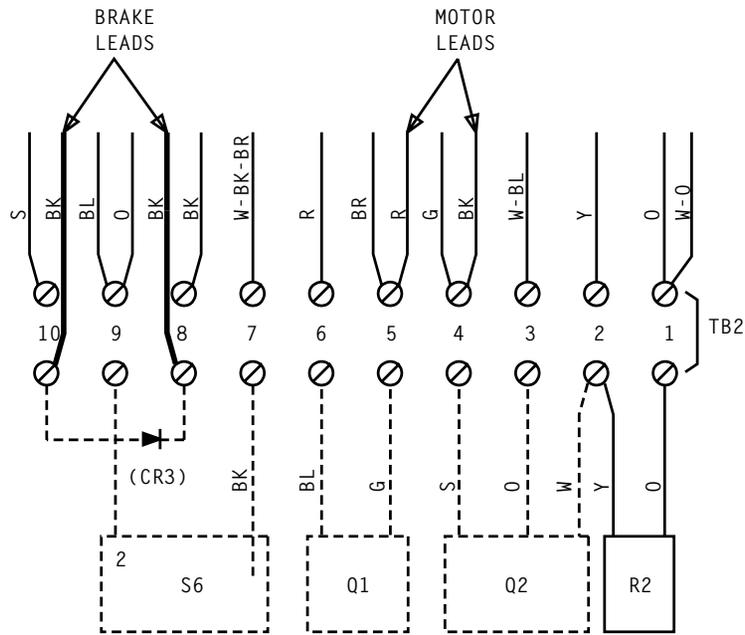


Figure 1 - Terminal Board Wiring

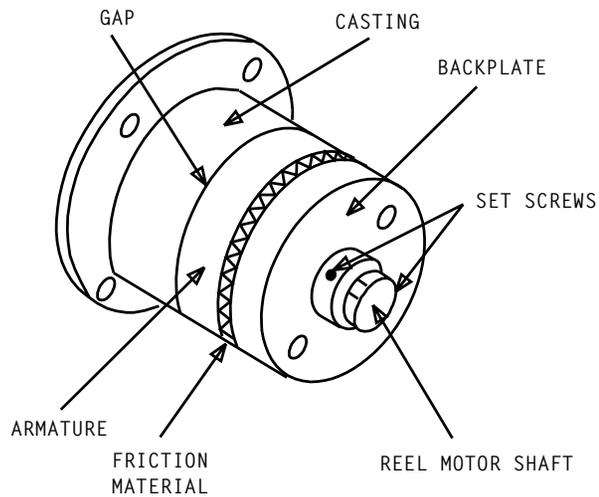


Figure 2 - Reel Motor Brake

REPLACE REEL MOTOR BRAKE

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- [1] Obtain support apparatus [TABLE A]
- [2] See WARNING 1. At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**
- [3] At tape transport, remove screw from center of knob and remove knob by lightly pulling outward [Figure 1]
- [4] See NOTE 1. Remove three flat-head machine screws and pull off reel hub assembly
- [5] If tape transport casting door is not open, at lower right loosen pawl fastener; unlatch, and open casting door
- [6] At rear of transport casting door, disconnect two motor leads and two brake leads from **TB2** or **TB8** as appropriate [Figure 2, Page 2]
- [7] See WARNINGS 2 and 3. Remove four reel motor mounting screws and washers and remove motor

TABLE A	
COMMON NAME	PART NUMBER
Compound	C-2471
Brush	R-1021
Reel motor assembly	L-502554

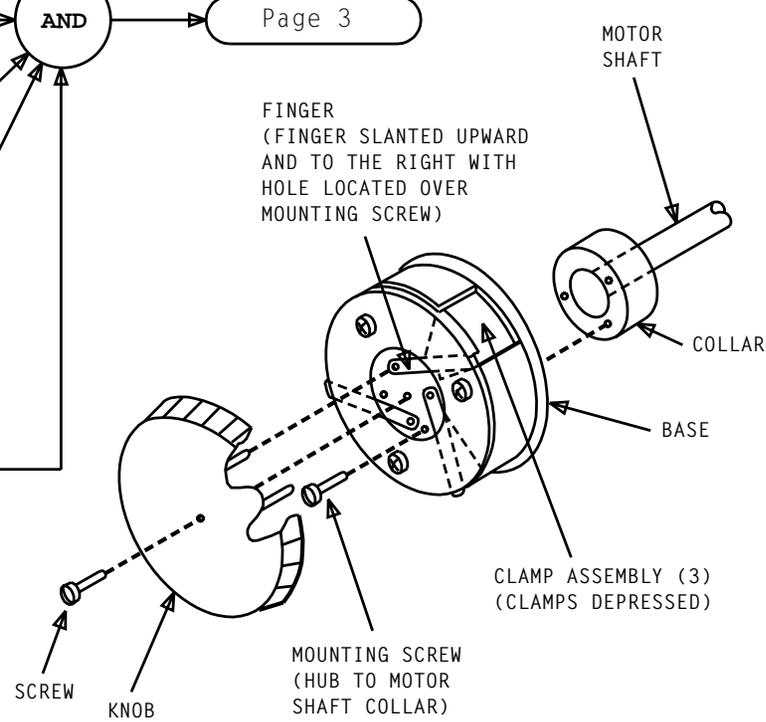


Figure 1 - Reel Holder

NOTE 1
 Knob removal exposes three flat-head machine screws in center of hub assembly which hold hub assembly to motor shaft collar. All other parts of hub assembly are captive and may be displaced slightly to facilitate removal of three flat-head screws

- WARNINGS**
1. When DC-to-DC converter is turned off, tape reel motors spin uncontrolled
 2. Do not disturb motor assembly drive shaft collar as faulty tracking of magnetic tape over tape guides result
 3. When removing lower motor, support weight so relays directly under the motor are not damaged

REPLACE REEL DRIVE MOTOR ASSEMBLY

Page 3

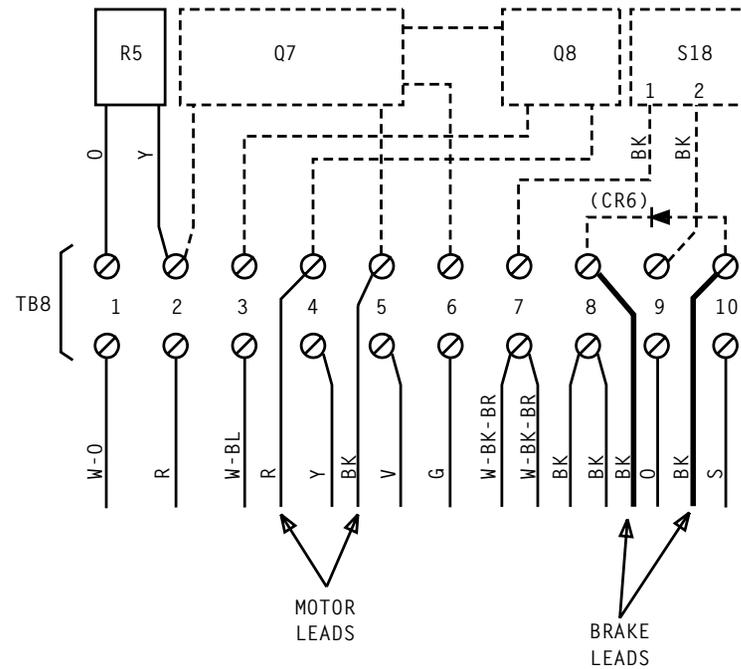
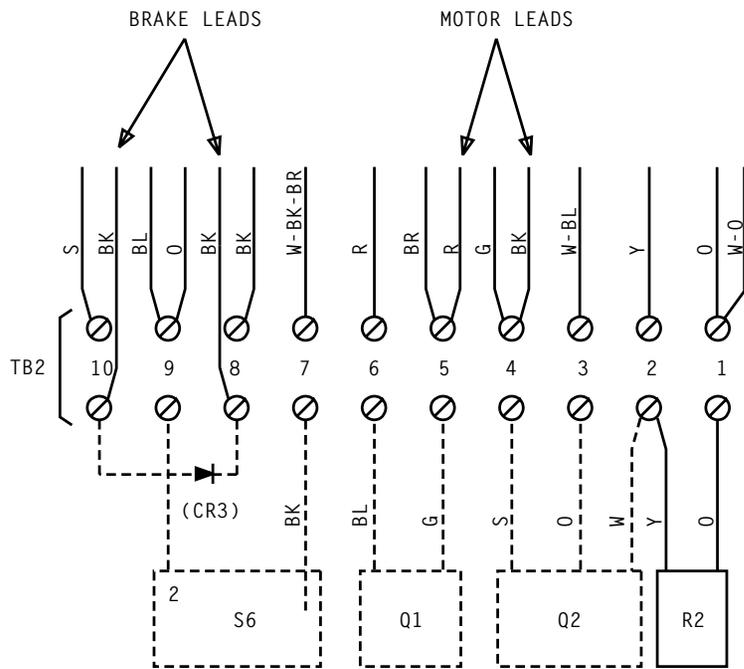
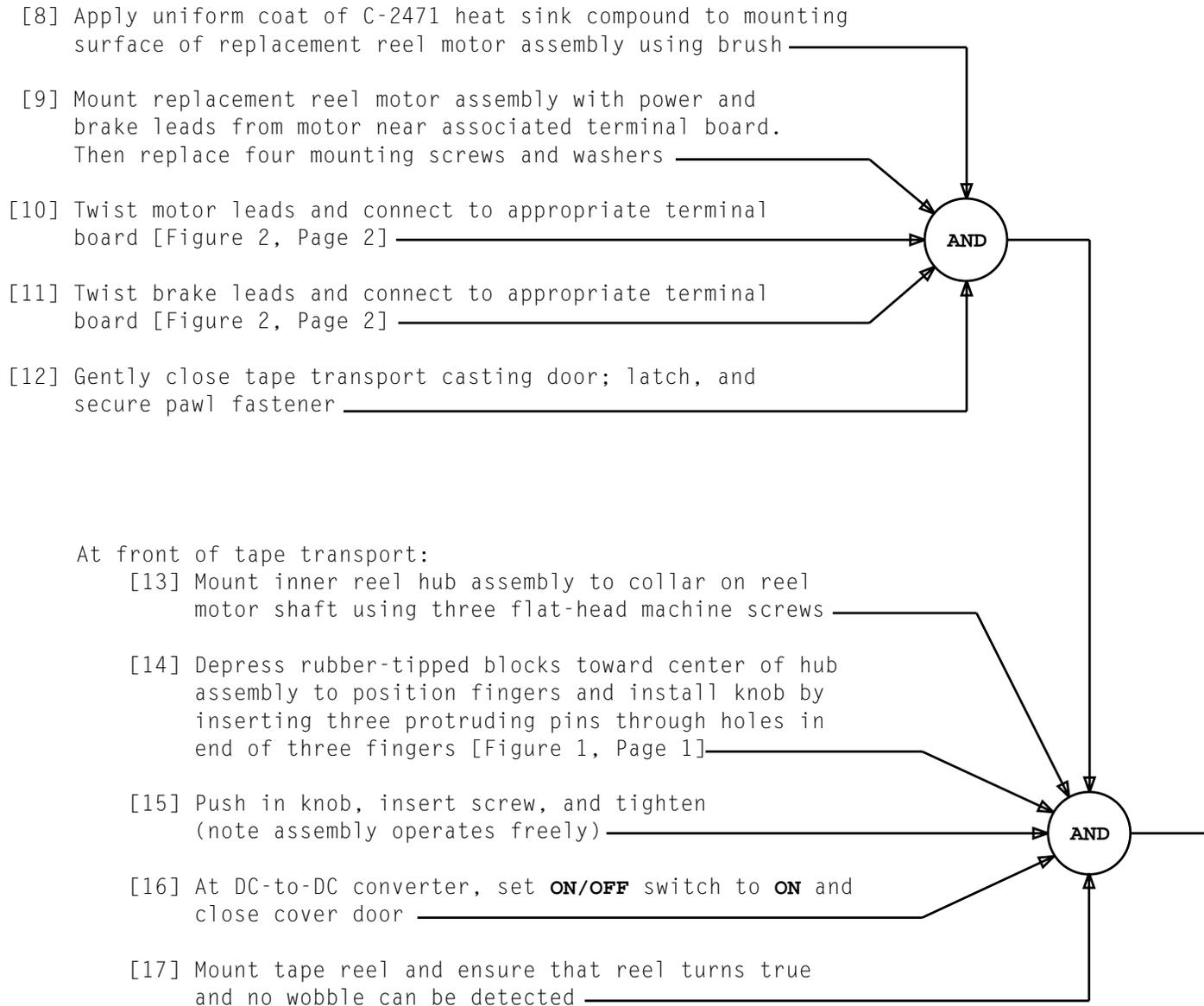


Figure 2 - Terminal Board Wiring



REPLACE REEL DRIVE MOTOR ASSEMBLY

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[1] Obtain support apparatus [TABLE A]

[2] Mount blank tape on tape transport [DLP-512]

[3] See WARNING 1. At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**

[4] At lower right of tape transport, loosen pawl fastener; unlatch, and open casting door

[5] At rear of transport casting door, remove **CP2** and **CP3** packs

[6] Insert **CP3** pack into card extender

[7] See WARNING 2. Using two cords, connect pins 5, 10, and 13 of **CP3** pack together

[8] Insert **CP3** and card extender assembly into location specified for **CP3** pack. Do not reinsert **CP2** pack

[9] Connect digital voltmeter to **TP1 (+)** and pin 10 (-) of **CP3** pack

[10] At DC-to-DC converter, set **ON/OFF** switch to **ON** and allow period for **CP3** pack to stabilize before taking voltage readings



Page 2

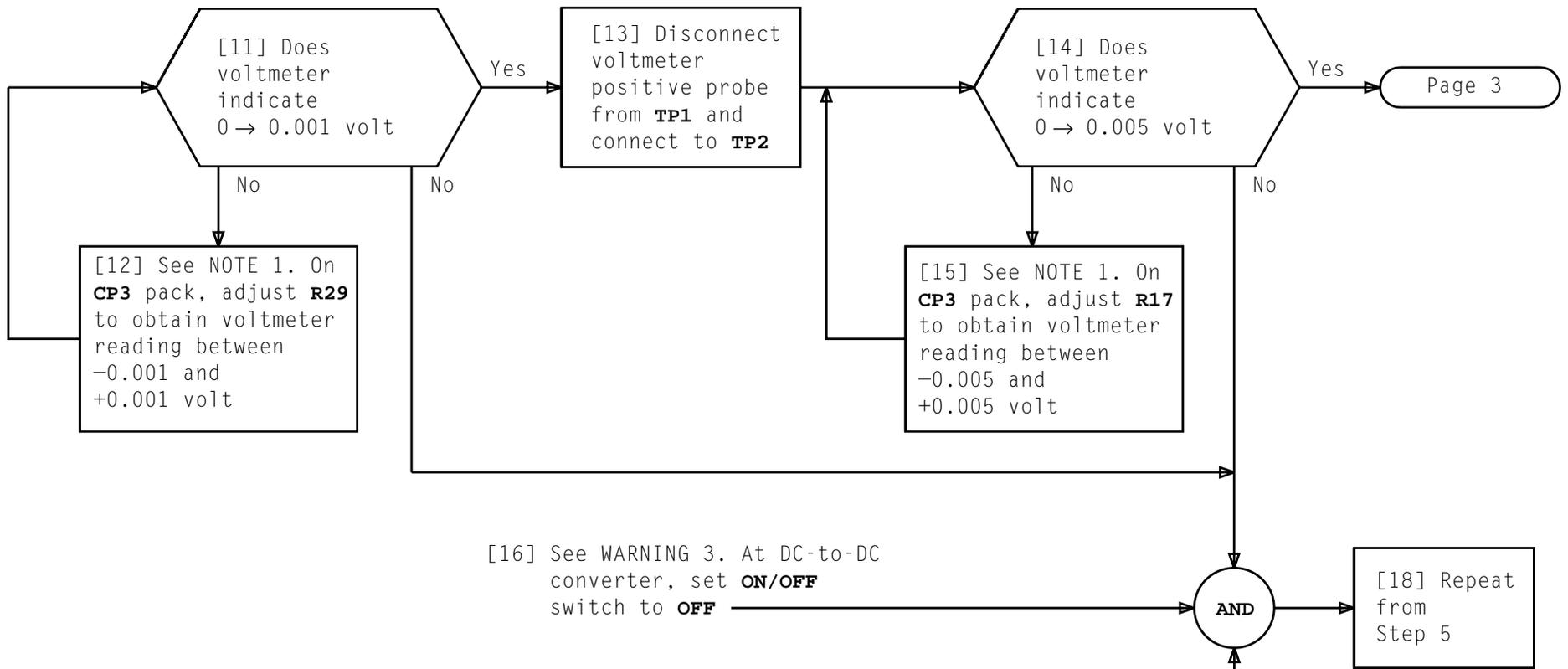
TABLE A	
COMMON NAME	PART NUMBER
Fluke digital voltmeter	8000A or equivalent
Cord (2)	W1AP
Printed wiring board assembly (card extender)	L-502681

WARNINGS

- When DC-to-DC converter is turned off, tape reel motors spin uncontrolled
- Connector pins are numbered from top to bottom and begin with pin 1. Incorrect strapping can damage circuit packs

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CHECK CAPSTAN SERVO ASSEMBLY VOLTAGE LEVELS



[16] See WARNING 3. At DC-to-DC converter, set **ON/OFF** switch to **OFF**

[17] At rear of transport casting door, replace **CP3** pack

NOTE 1
Allow period for **CP3** pack to stabilize before adjusting voltage levels

WARNING 3
When DC-to-DC converter is turned off, tape reel motors spin uncontrolled

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CHECK CAPSTAN SERVO ASSEMBLY VOLTAGE LEVELS

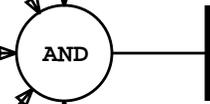
[19] See WARNING 4. At DC-to-DC converter, set **ON/OFF** switch to **OFF**

[20] Disconnect all test connections and board assembly from **CP3**

[21] At rear of transport casting door, remove card extender assembly and reinsert **CP2** and **CP3** packs into assigned locations

[22] At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door

[23] Gently close tape transport casting door; latch, and secure pawl fastener



<i>WARNING 4</i> <i>When DC-to-DC converter is turned off, tape reel motors spin uncontrolled</i>	
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CHECK CAPSTAN SERVO ASSEMBLY VOLTAGE LEVELS

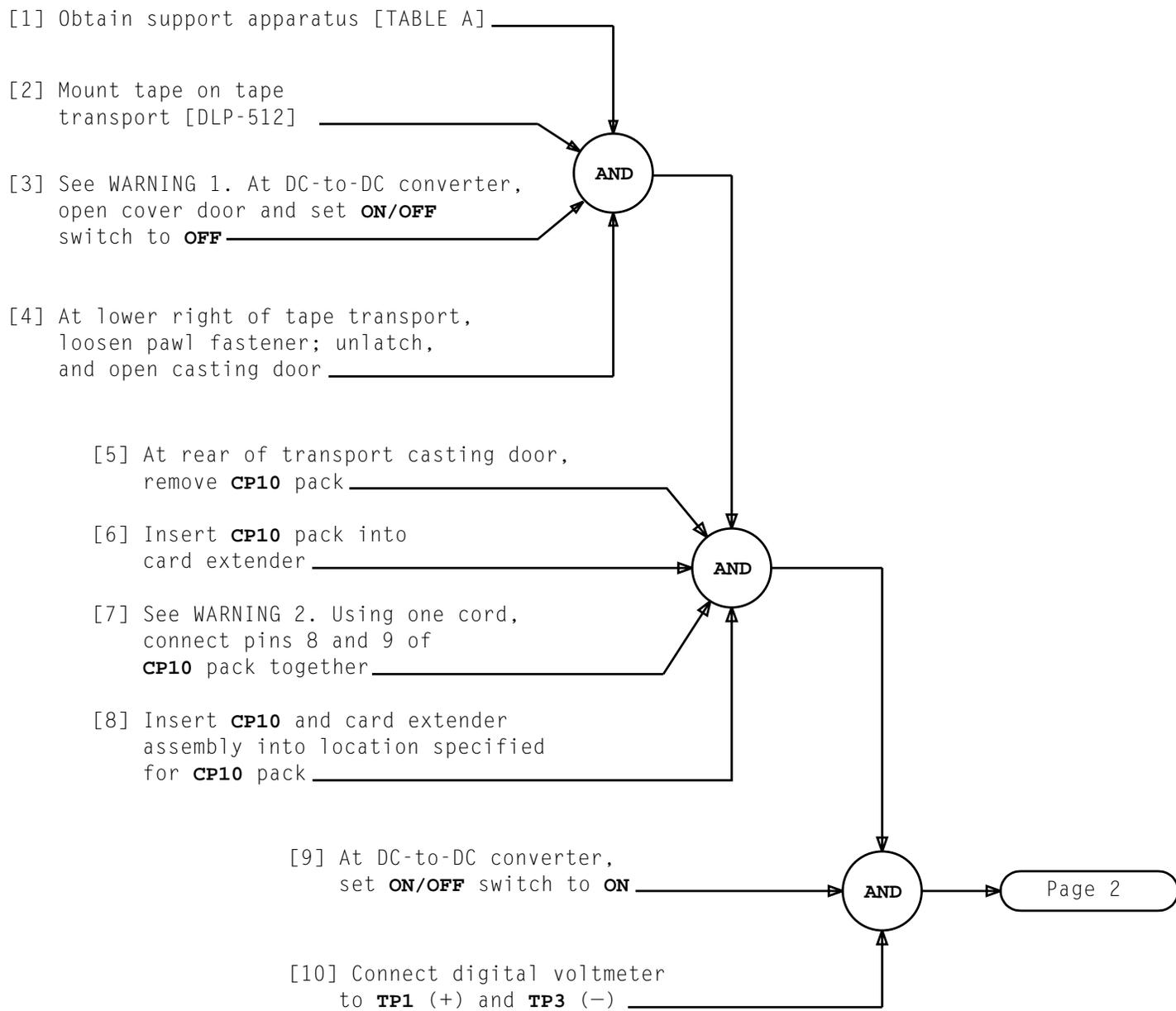


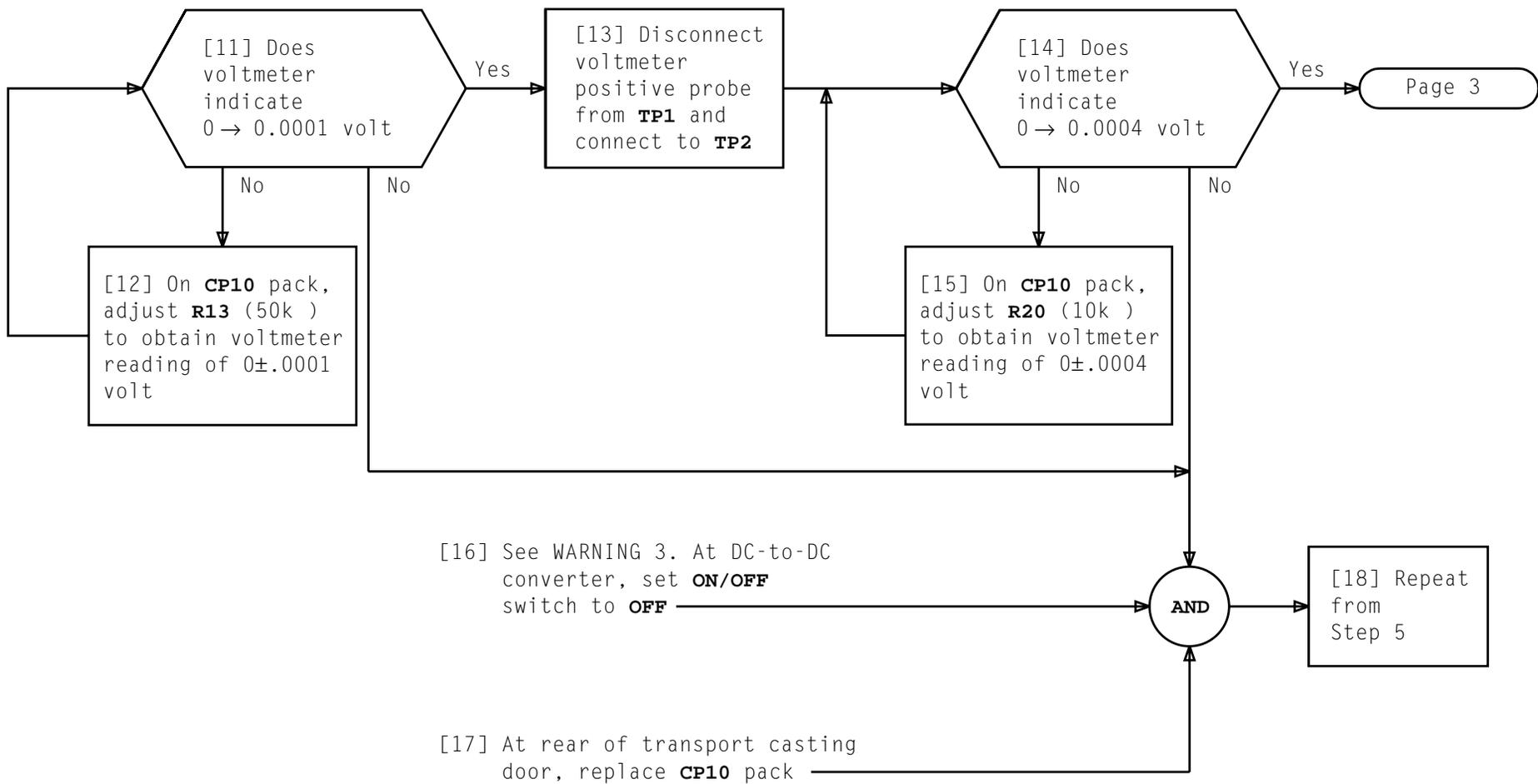
TABLE A	
COMMON NAME	PART NUMBER
Fluke digital voltmeter	8000A or equivalent
Cord	W1AP
Printed wiring board assembly (card extender)	L-502681

WARNINGS

1. When DC-to-DC converter is turned off, tape reel motors spin uncontrolled
2. Connector pins are numbered from top to bottom and begin with pin 1. Incorrect strapping can damage circuit packs

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CHECK CAPSTAN DIAGNOSTIC ASSEMBLY VOLTAGE LEVELS



<i>WARNING 3</i> When DC-to-DC converter is turned off, tape reel motors spin uncontrolled	
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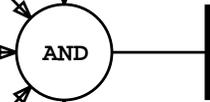
[19] See WARNING 4. At DC-to-DC converter, set **ON/OFF** switch to **OFF**

[20] Disconnect all test connections

[21] At rear of transport casting door, remove card extender assembly and reinsert **CP10** pack into its assigned location

[22] At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door

[23] Gently close tape transport casting door; latch, and secure pawl fastener

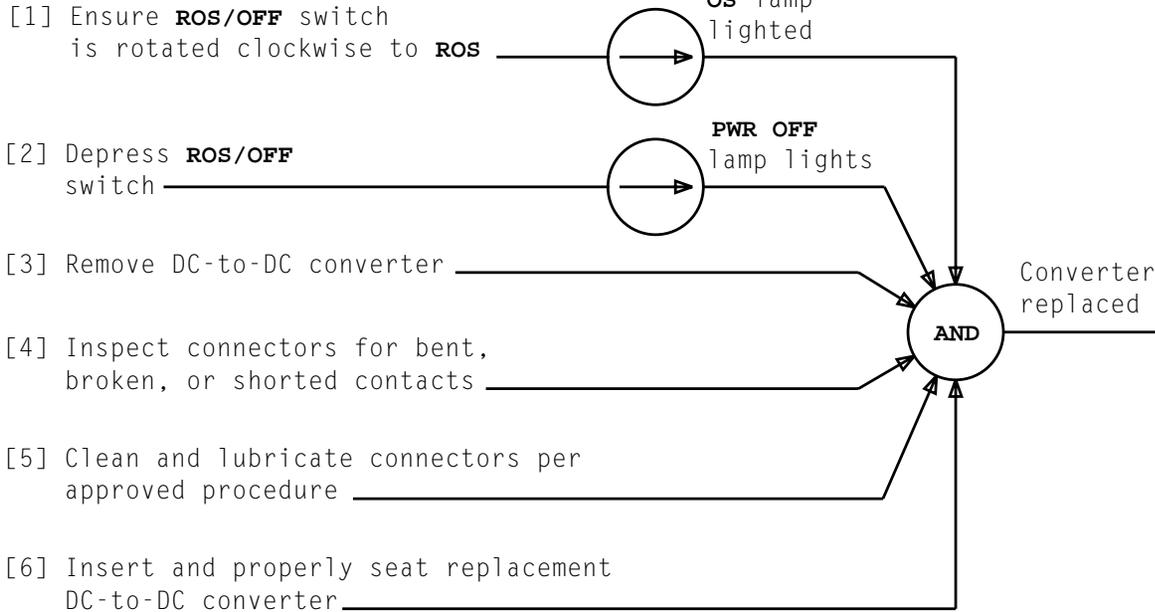


*WARNING 4
When DC-to-DC
converter is
turned off, tape
reel motors
spin uncontrolled*

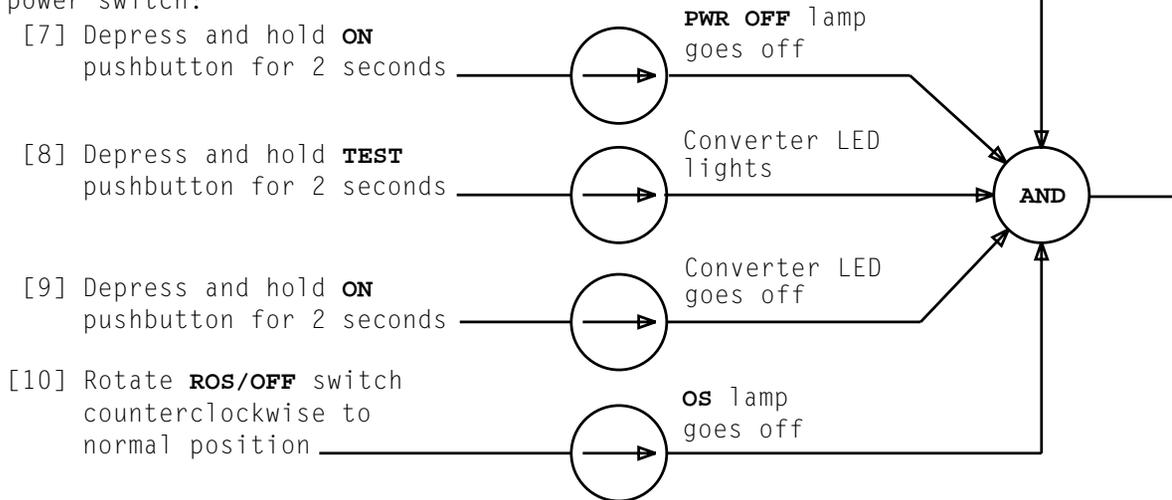
CHECK CAPSTAN DIAGNOSTIC ASSEMBLY VOLTAGE LEVELS

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At power switch (69-17):



At power switch:



REPLACE DC-TO-DC CONVERTER — TAPE UNIT CONTROLLER

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WARNING: When DC-to-DC converter is turned off, tape reel motors spin uncontrolled

1. At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**
2. At lower right of tape transport, loosen pawl fastener; unlatch, and open casting door
3. At rear of transport casting door, remove three cable assembly leads from **TB5** and two motor leads from **TB6** [Figure 1]
4. Remove four motor mounting screws and washers, being careful to support capstan motor
5. Carefully guide capstan motor assembly through transport casting door hole
6. Remove all burrs and dirt from mounting surface on transport casting door and from mounting plate of replacement capstan motor
7. Apply uniform coat of heat sink compound to mounting surface of capstan motor
8. Using four mounting screws and washers, mount replacement motor with **TB5** located on top right side of mounting plate

9. Connect three cable assembly leads to **TB5** and two motor leads to **TB6** [Figure 1]
10. Gently close tape transport casting door; latch, and secure pawl fastener
11. At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door

End of procedure

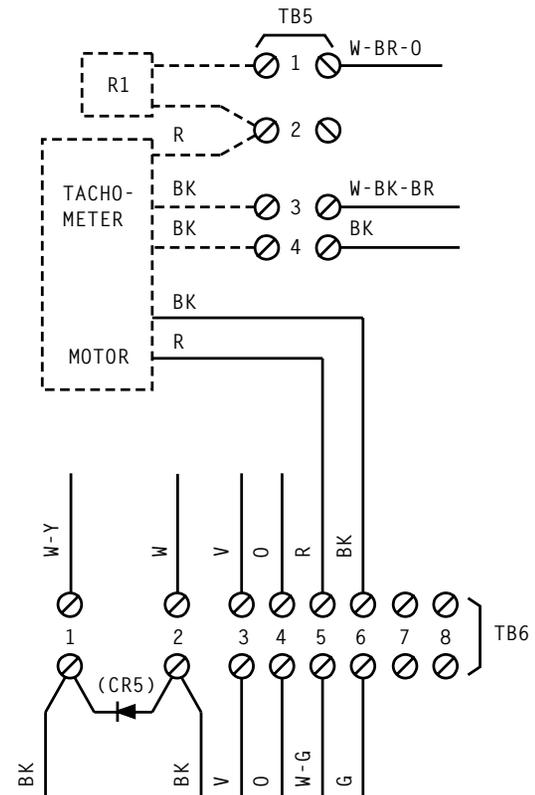


Figure 1 - Terminal Board Wiring (TB5 and TB6)

REPLACE CAPSTAN MOTOR ASSEMBLY

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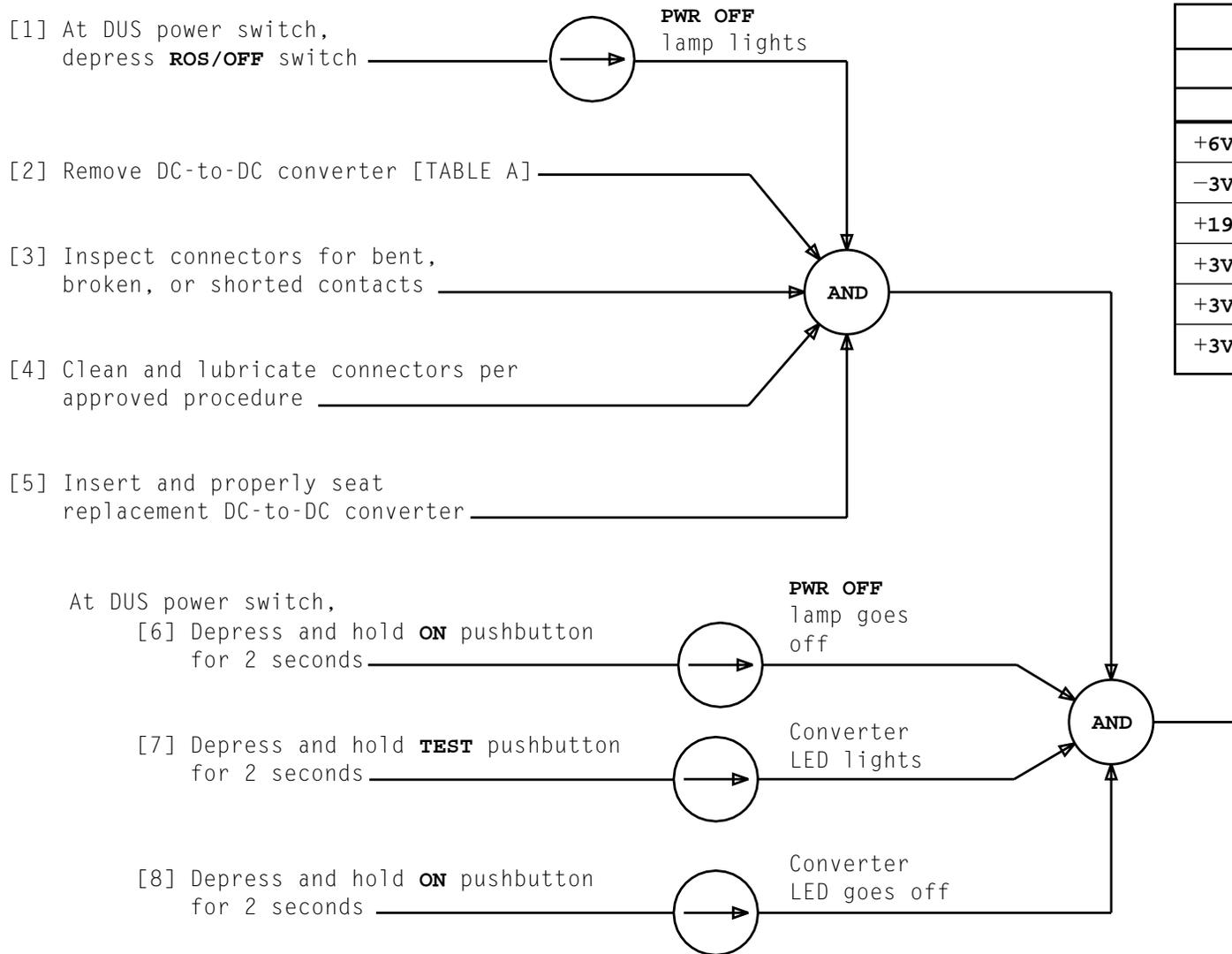


TABLE A		
DC-TO-DC CONVERTER		
NAME	TYPE	LOCATION
+6V DC-DC CONV	J87389H-1	80-20
-3V DC-DC CONV	J87389E-1/2	80-25
+19V DC-DC CONV	106A	80-32
+3V DC-DC CONV	J87389F-1/2	76-24
+3V DC-DC CONV	J87389F-2	76-28
+3V DC-DC CONV	J87389F-1/2	76-32

At tape transport:

[1] Open tape transport cover door and pull interlock switch plunger out to override position

[2] Depress **LOCAL/REMOTE** pushbutton to obtain **LOCAL** lighted condition

[3] See WARNING 1. At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**

[4] Grasp lamp switch assembly firmly and pull outward until it stops [Figure 1]

[5] Rotate assembly counterclockwise 90 degrees; gently push inward, and pull out

[6] Remove faulty lamp

[7] Insert replacement lamp into switch assembly (GE-387 bulb or equivalent)

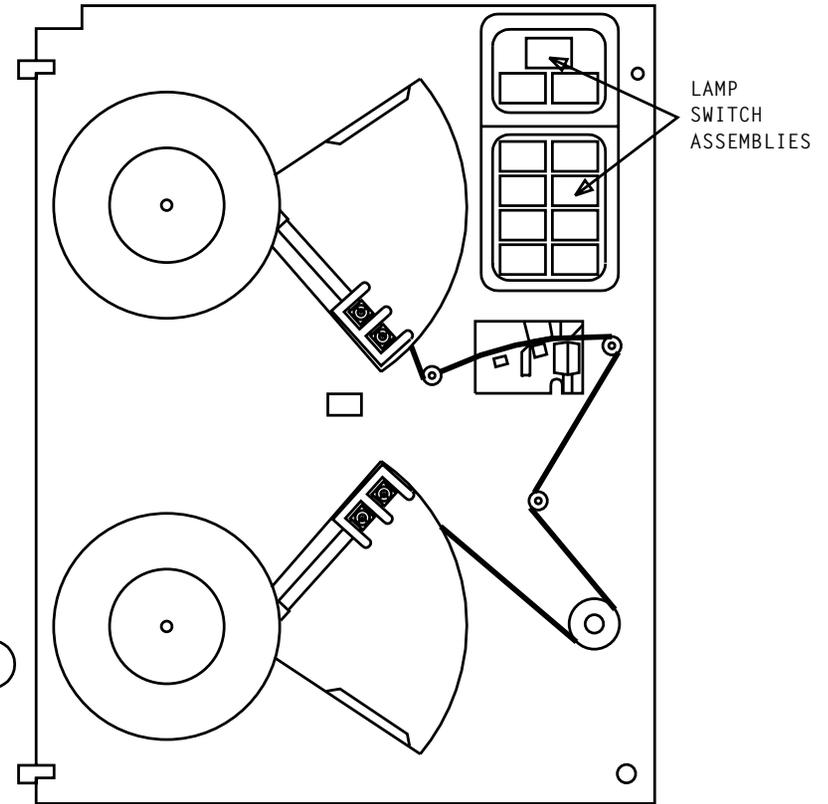
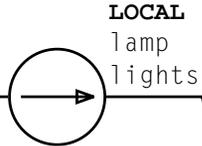
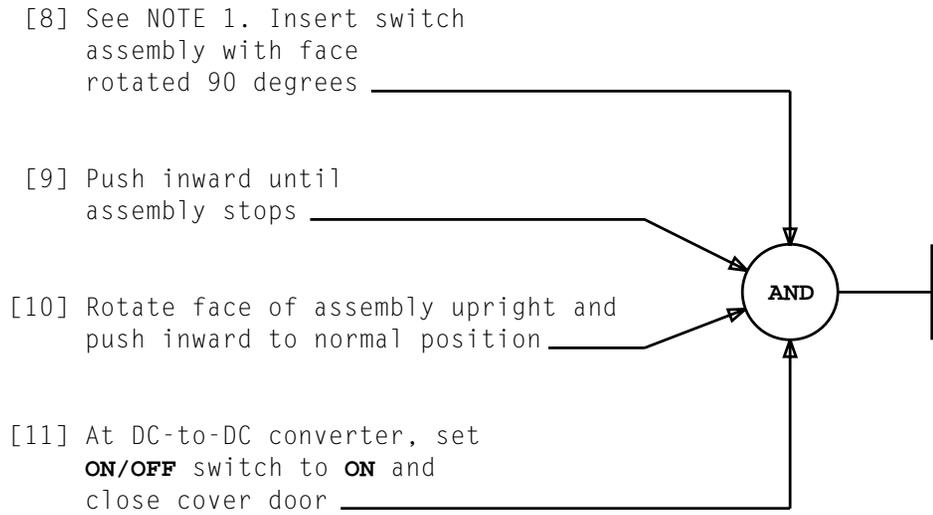
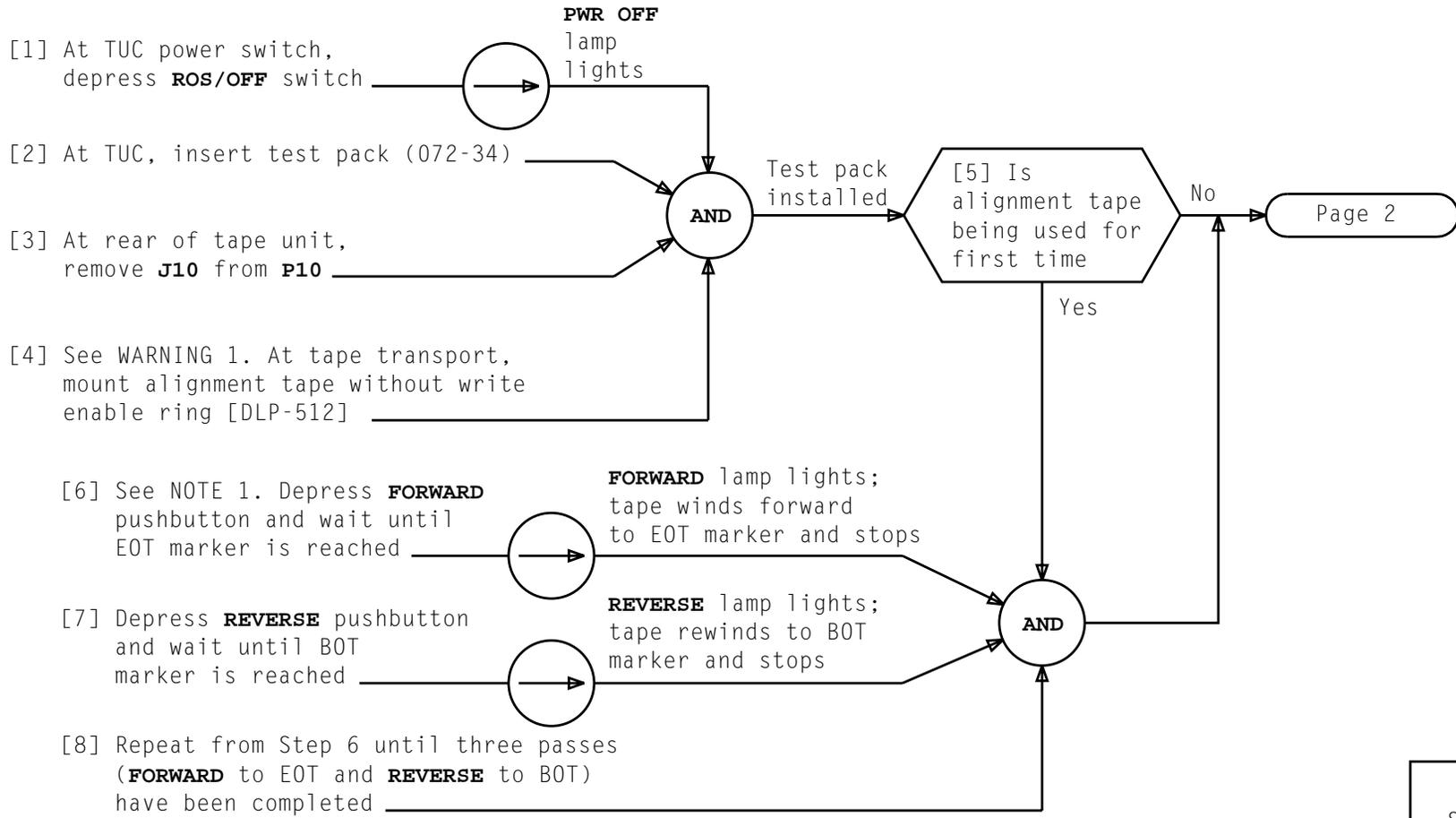


Figure 1 - Tape Transport (Door Removed)

<i>WARNING 1</i> When DC-to-DC converter is turned off, tape reel motors spin uncontrolled	
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NOTE 1	
Switch indicator base has alignment slot. Alignment slot must be positioned left to insert switch assembly	
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NOTE 1
Steps 6, 7, and 8 are performed to stabilize pulse amplitudes

WARNING 1
Alignment tape should not be run in **FAST FWD** or **REWIND** modes

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CHECK READ PULSE WIDTHS — TAPE TRANSPORT

[9] On test pack, set MODE switch
R-W-E to **R**

[10] At TUC power switch, depress and hold
ON pushbutton for 2 seconds

PWR OFF lamp
 goes off

[11] At tape transport, depress
5 IPS/25 IPS pushbutton to
 obtain **25 IPS** lighted condition

25 IPS lamp
 lights

[12] Condition oscilloscope to 1 volt/cm
 and 5 microsecond/cm

[13] On test pack, connect one channel
 of oscilloscope to test point **0**
 [TABLE A]

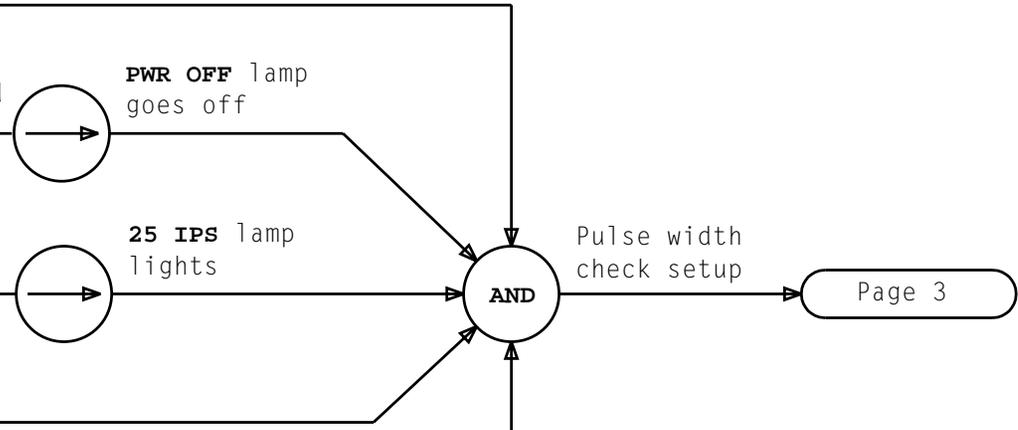


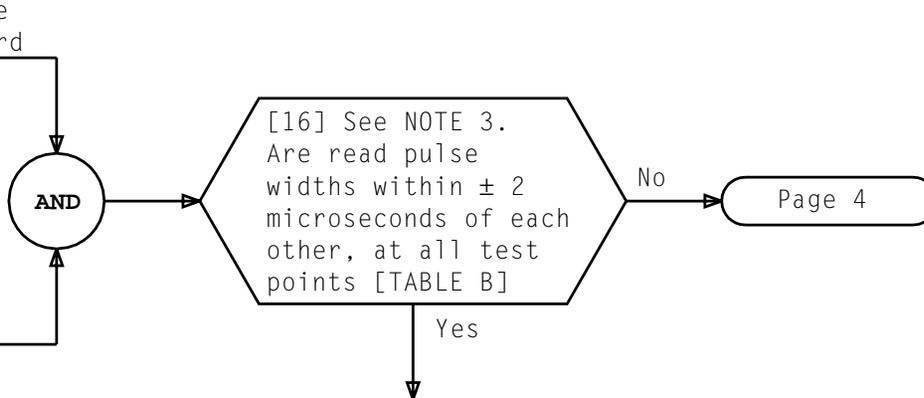
TABLE A	
TEST PACK TEST POINT	TAPE TRACK
0	2
1	8
2	1
3	9
4	3
5	5
6	6
7	7
8	4

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[14] At tape transport, depress **FORWARD** pushbutton

FORWARD lamp lights; tape winds forward

[15] See NOTE 2. Measure and record read pulse widths from test points 0 through 8 [DLP-541]



[17] After tape reaches EOT marker and stops, depress **REVERSE** pushbutton (**REVERSE** lamp lights; tape rewinds to BOT marker and stops)

TABLE B	
ALIGNMENT TAPE SENSITIVITY	READ PULSE WIDTHS RANGE IN MICROSECONDS
70%	15-25
72%	16-26
74%	17-27
76%	18-28
78%	19-29
80%	20-30*
82%	21-31*
84%	22-32*
86%	23-33*
88%	24-34*

* Alignment tapes manufactured by Honeywell (rectangular label) will produce pulse widths approximately one-half to two-thirds of pulse width value listed

NOTES

- Take pulse width readings only when tape transport is in **FORWARD** mode
- Current alignment tapes (rectangular label), with sensitivity rating of 90 percent and above, produce read-pulse widths in range of 15 to 25 microseconds. Other 90 percent and above tapes (half-moon label) produce read pulse widths in range of 24 to 38 microseconds

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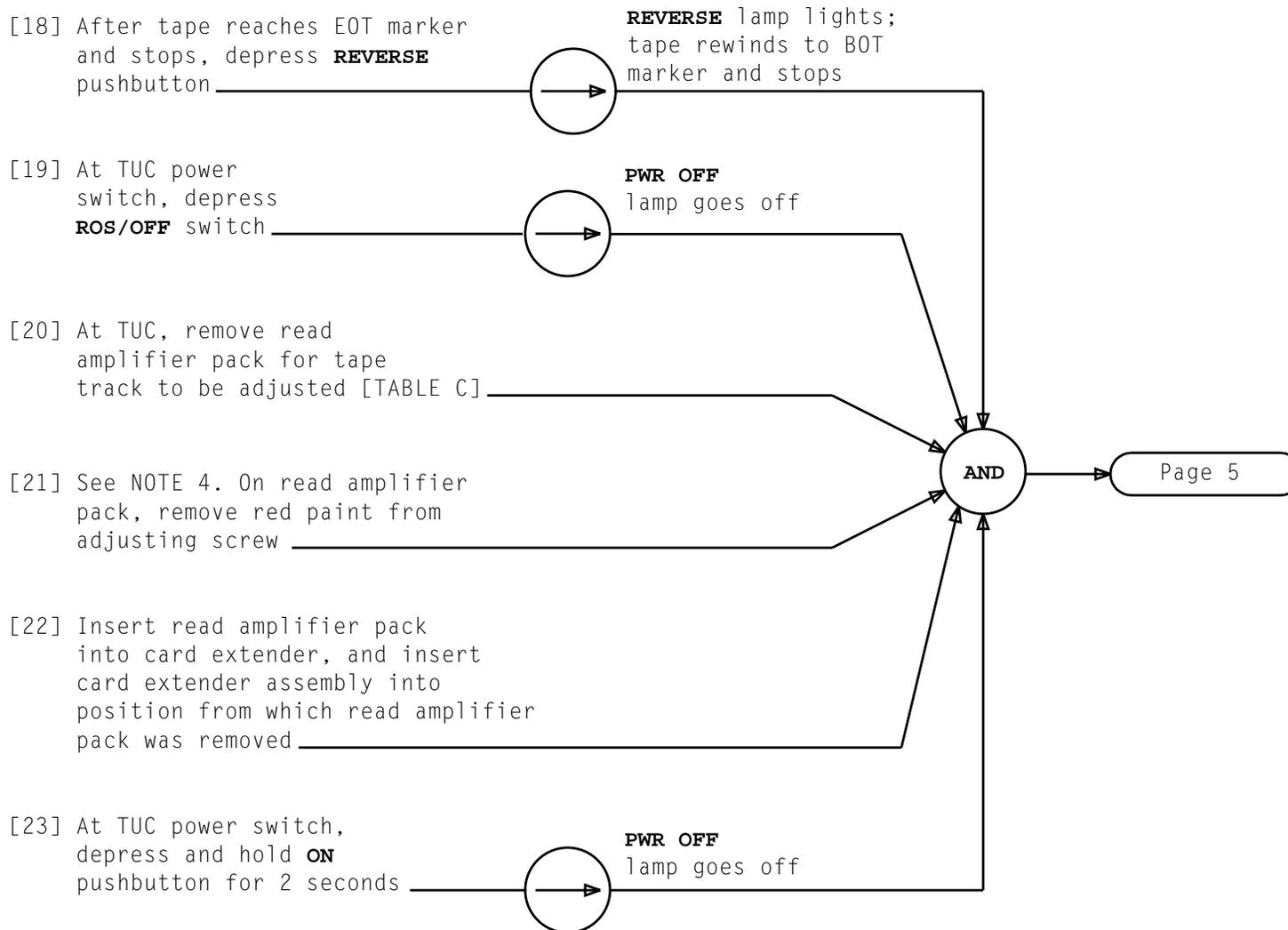


TABLE C		
TAPE TRACK	TEST PACK TEST POINT	READ AMP PACK LOC
2	0	72-12
8	1	72-13
1	2	72-14
9	3	72-16
3	4	72-17
5	5	72-18
6	6	72-19
7	7	72-20
4	8	72-21

NOTE 4 Adjusting screw is 1-1/2 inches behind front of pack and is covered with red paint that can be chipped off	
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[24] Connect oscilloscope to test point on test pack (072-34) for tape track to be adjusted

[25] At tape transport, depress **FORWARD** pushbutton

FORWARD lamp lights; tape winds forward

[26] See NOTE 5. On read amplifier pack, adjust screw (clockwise to decrease; counterclockwise to increase) to place pulse width within range and as close to other pulse widths as possible [TABLE B, Page 3]

[27] After tape reaches EOT marker and stops, depress **REVERSE** pushbutton

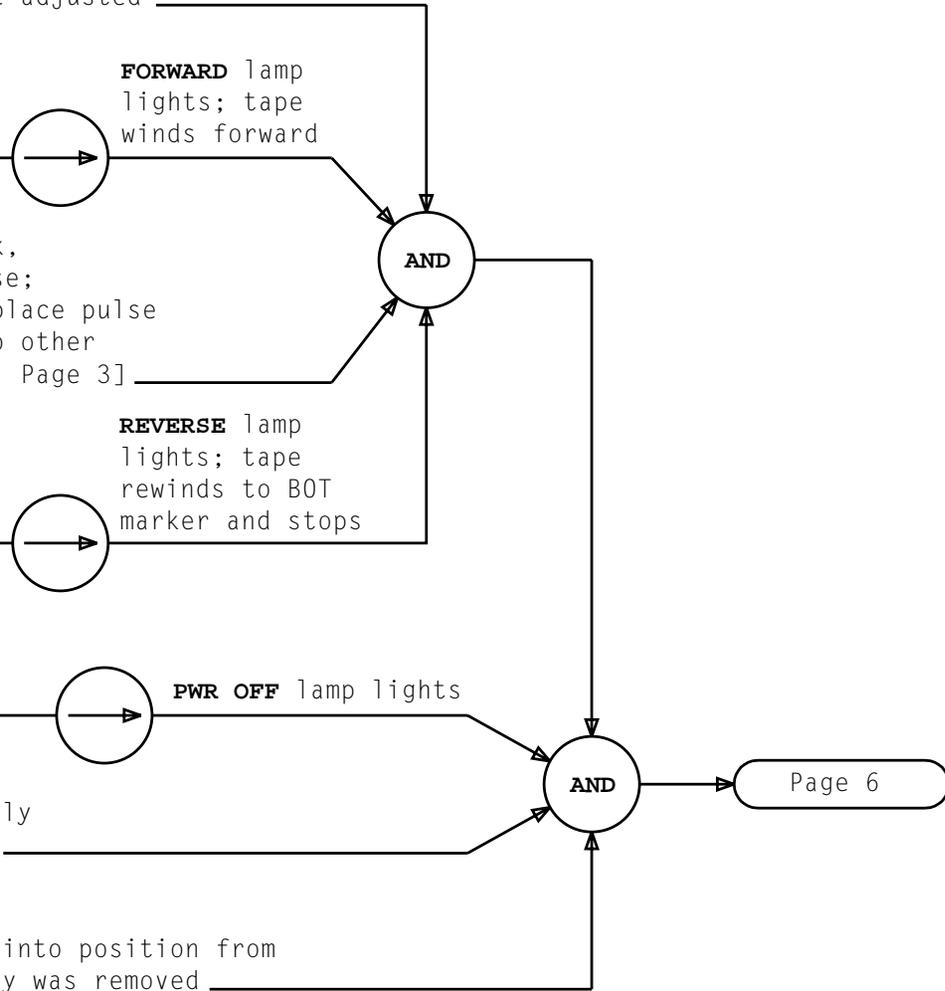
REVERSE lamp lights; tape rewinds to BOT marker and stops

[28] At TUC power switch, depress **ROS/OFF** switch

PWR OFF lamp lights

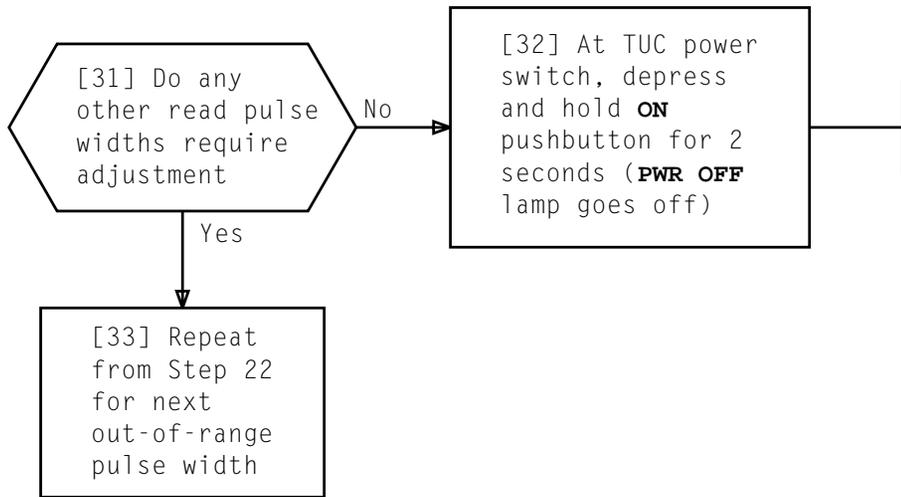
[29] Remove card extender assembly from circuit board chassis

[30] Insert read amplifier pack into position from which card extender assembly was removed



NOTE 5	
If unable to adjust pulse width within range, adjust to closest possible setting	
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CHECK READ PULSE WIDTHS — TAPE TRANSPORT

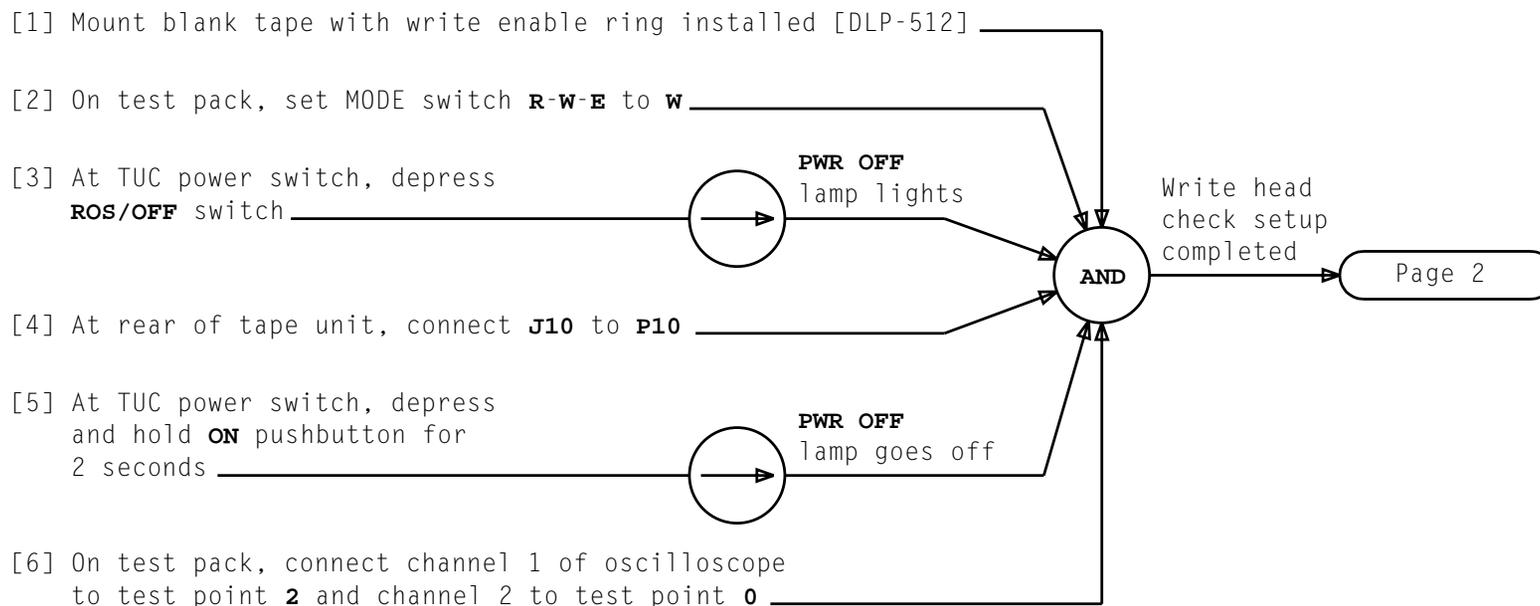


CHECK READ PULSE WIDTHS — TAPE TRANSPORT

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1. Record determined data on alignment form
[Figure 1, Page 2]

End of procedure

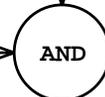
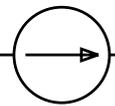


[7] See NOTE 1. At tape transport, depress **FORWARD** pushbutton

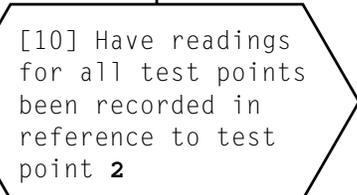
FORWARD lamp lights;
tape winds forward

[8] See NOTES 2 and 3. Determine pulse difference (static skew) of displayed pulses by comparing trailing edge of channel 2 pulse to trailing edge of channel 1 pulse (ignore leading edge of pulses) [Figure 1, Page 4]

[9] Record write head pulse difference [DLP-541]



Page 3

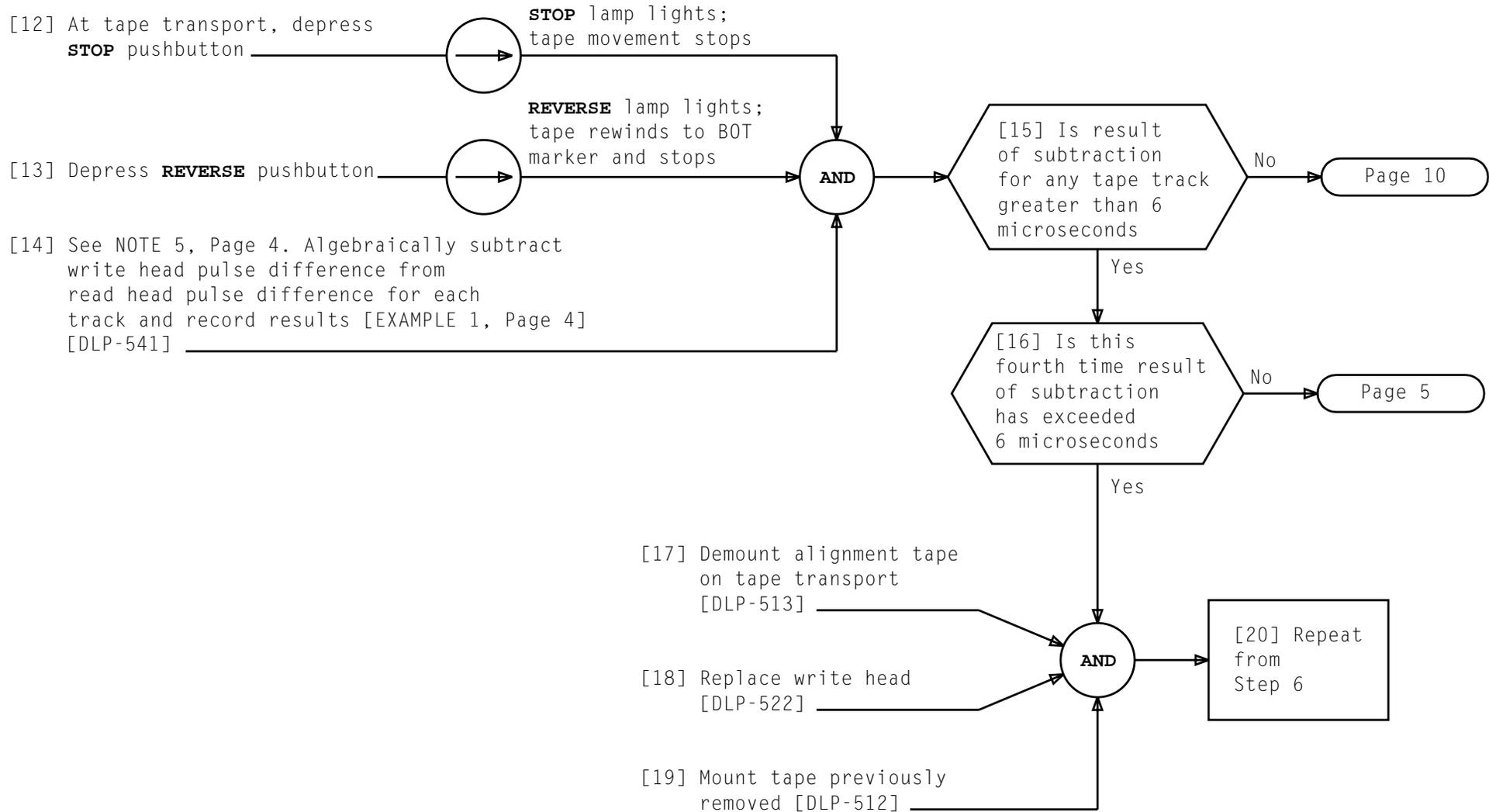


[11] See NOTE 4. Connect oscilloscope channel 2 to next test point on test pack [TABLE A] and repeat from Step 8

TABLE A	
TEST PACK TEST POINT	TAPE TRACK
0	2
1	8
2	1
3	9
4	3
5	5
6	6
7	7
8	4

- NOTES
1. Take pulse difference readings only when tape transport is in **FORWARD** mode
 2. Pulse difference steps may jitter. If so, maximum pulse difference should be noted
 3. If trailing edge of channel 2 pulse occurs before trailing edge of channel 1 pulse, difference is expressed as positive; if it occurs after, difference is expressed as negative
 4. Comparing test points 3 and 2 normally gives greatest difference

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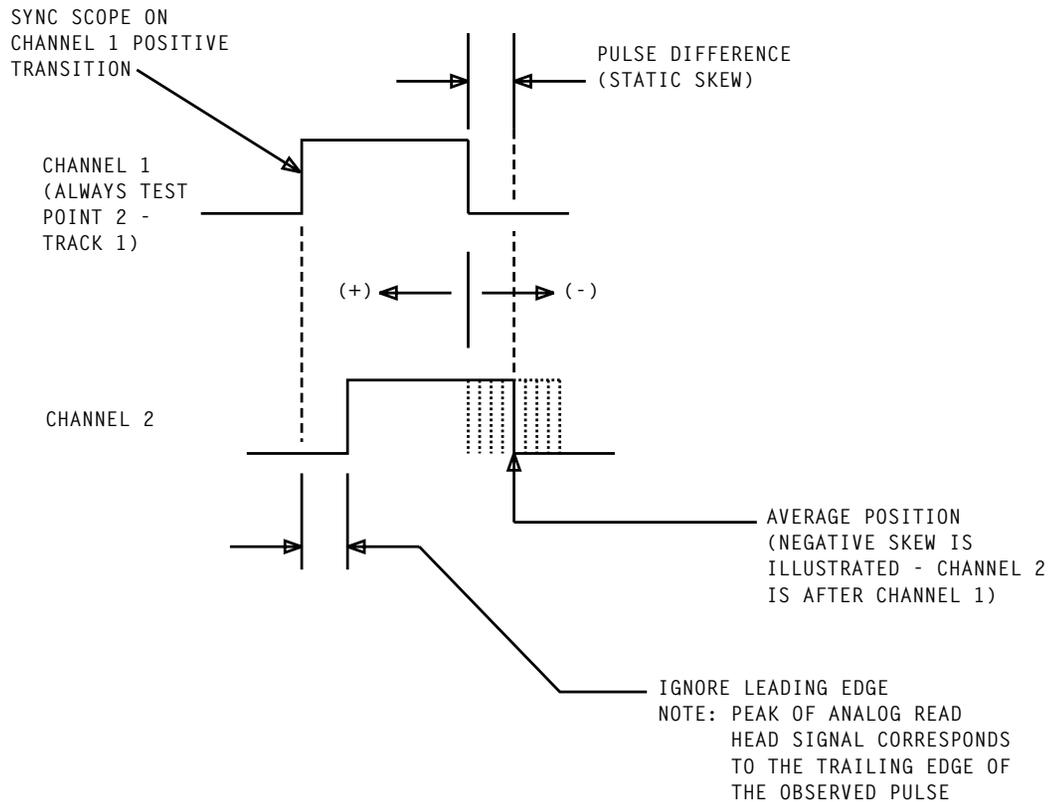


Figure 1 - Example of Pulse Difference (Static Skew)

NOTE 5
Note that read head pulse differences vary almost linearly in tape track order from -0.5 for track 2 to -6 microseconds for tape track 9. Write head pulse differences vary almost linearly in tape track order from 0 for track 2 to $+4$ microseconds for track 9

EXAMPLE 1
Track 7 has a read head pulse difference of -4.5 microseconds and a write head pulse difference of $+2$ microseconds. The algebraic subtraction of the pulse differences yields a recorded pulse difference of -6.5 microseconds

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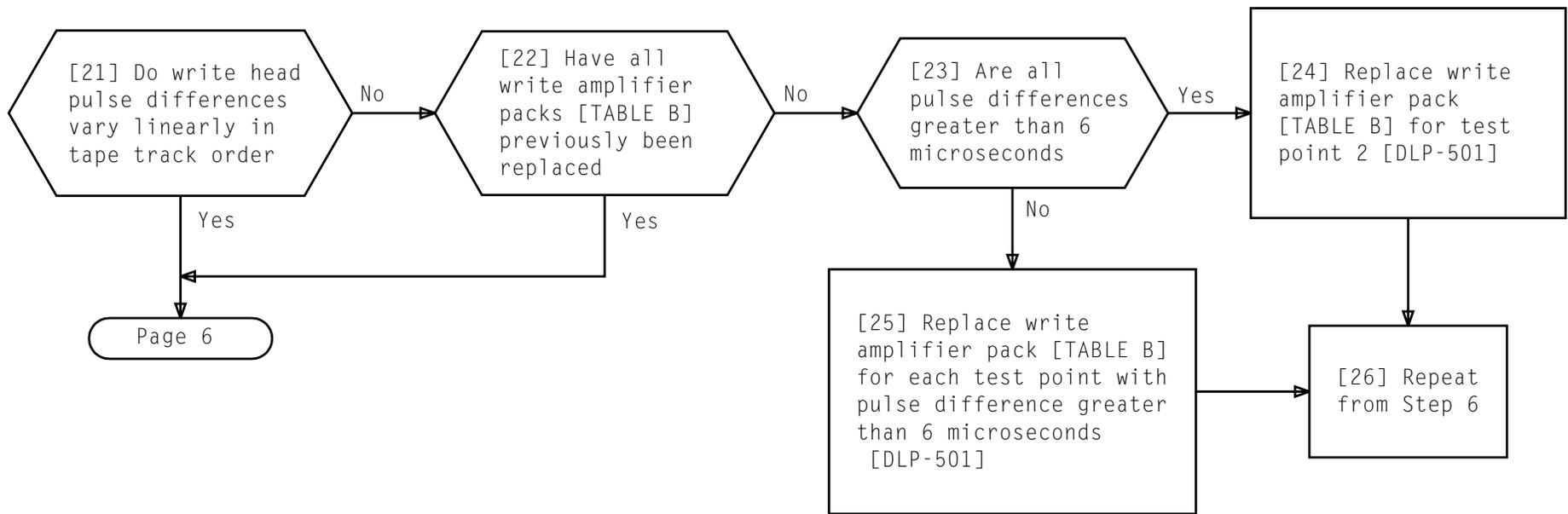


TABLE B	
TEST PACK TEST POINT	WRITE AMP PACK LOC
0	
1	72-36
2	
3	
4	72-37
5	
6	
7	72-38
8	

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[27] See NOTE 6. Connect channel 2 to test point 3

[28] At lower right of tape transport, loosen pawl fastener; unlatch, and open casting door

[29] See WARNING 1. Check component mounting screws and upper and lower mounting screws of precision plate for snugness [Figure 2]

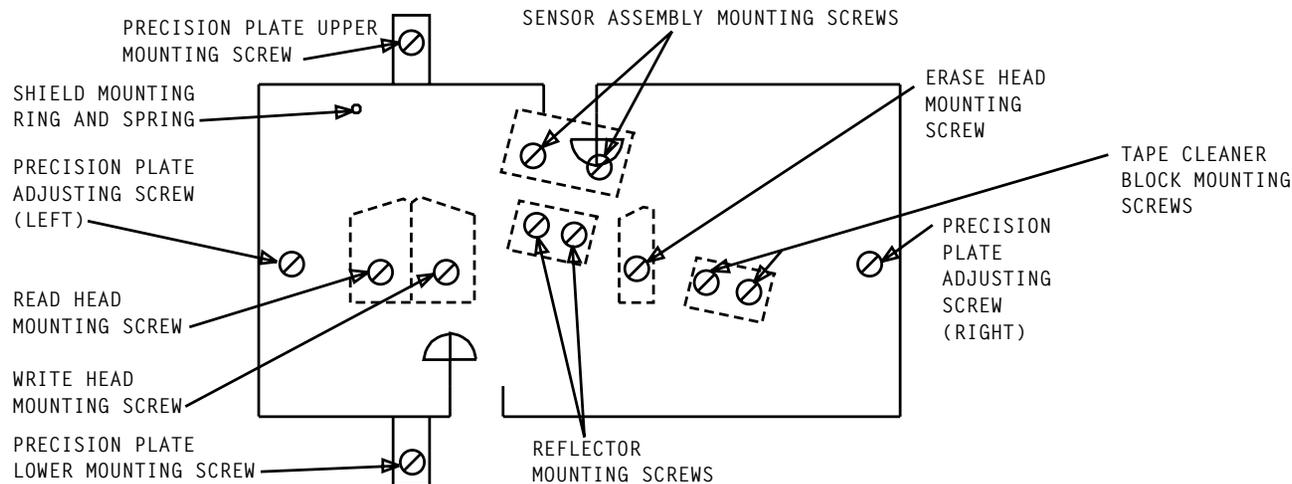
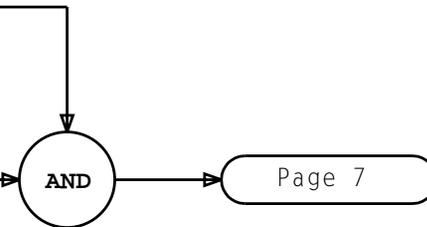
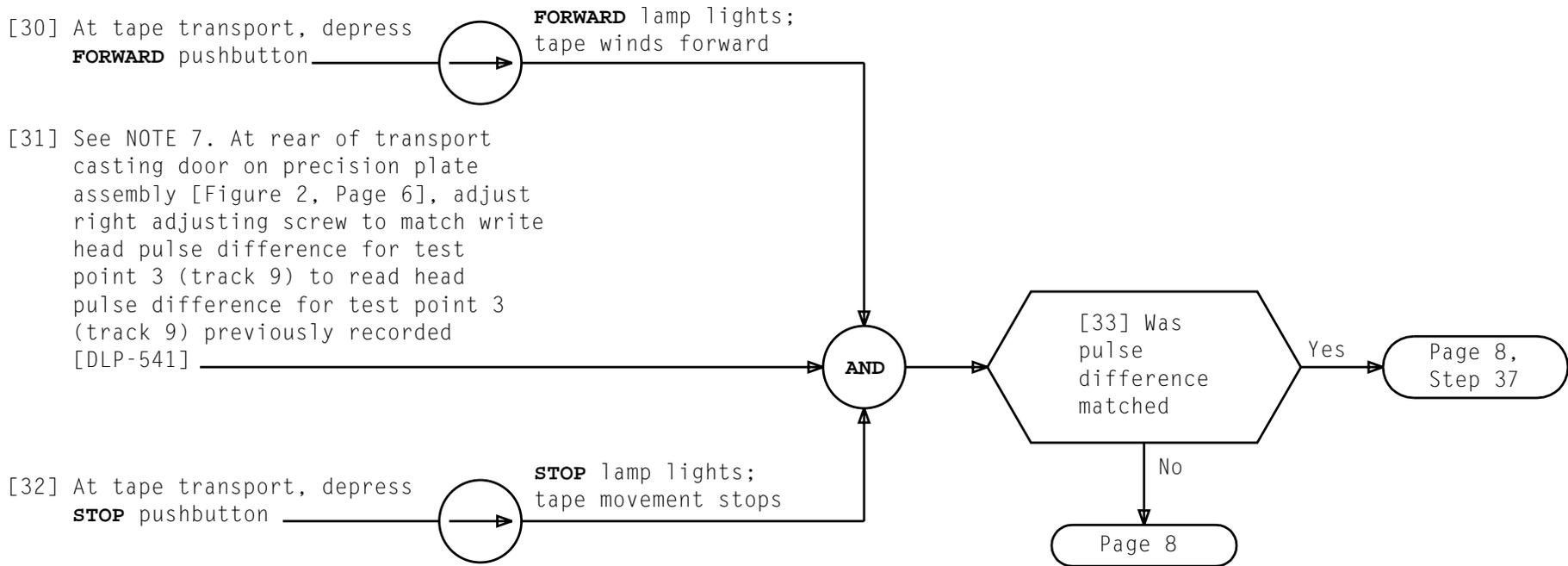


Figure 2 - Precision Plate Assembly - Rear View
Showing Component Mounting Screws

NOTE 6
Adjusting right or left precision plate adjusting screw affects all nine tape tracks

WARNING 1
Screws associated with precision plate are small and strip or break easily. Tighten carefully

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NOTE 7	
Adjusting right or left precision plate adjusting screw affects all nine tape tracks. Therefore, additional read head alignment may be necessary	
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At rear of transport casting door
on precision plate:

[34] See NOTE 7. Back out right or both precision
plate adjusting screws until plate and
screwhead are separated by approximately
3/16 inch [Figure 3, Page 9]

[35] Insert screwdriver between plate and
casting on right side and gently twist
screwdriver using adjustment screwhead
as stop [Figure 3, Page 9]

[36] Repeat Steps 33 and 34 three times
and then tighten adjustment screws to
contact precision plate

[37] At tape transport, depress **REVERSE**
pushbutton

REVERSE lamp lights;
tape rewinds to BOT
marker and stops

[38] Gently close tape transport casting
door; latch, and secure pawl fastener

AND

[39] Repeat
from Step 6

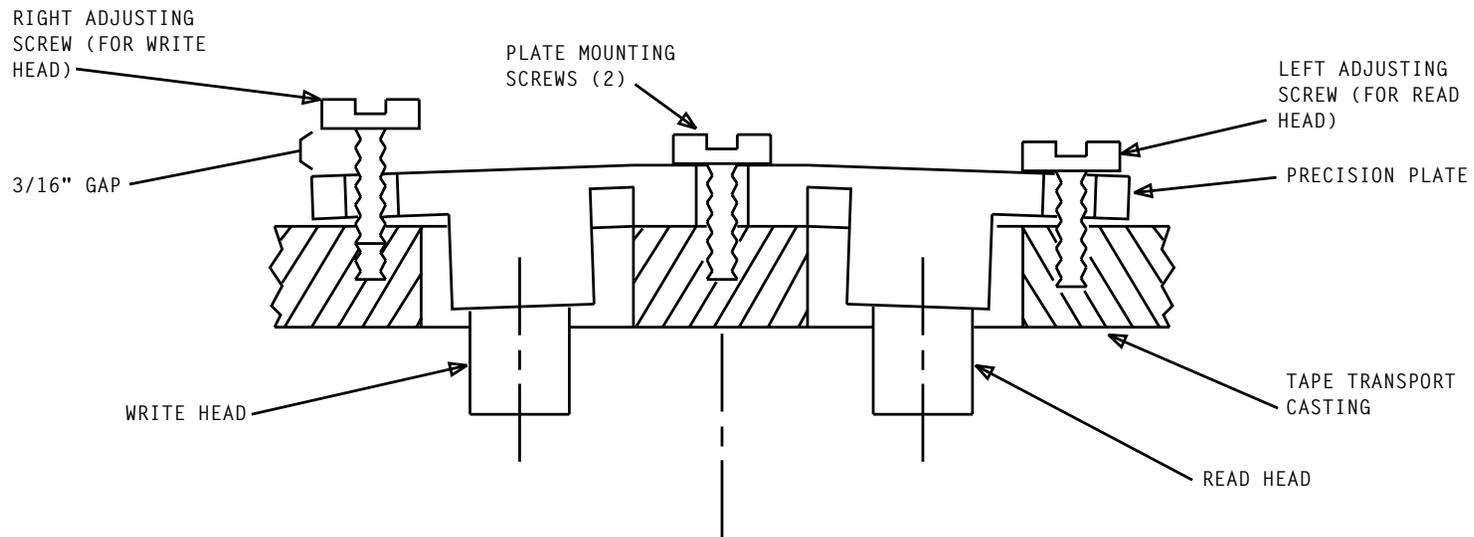
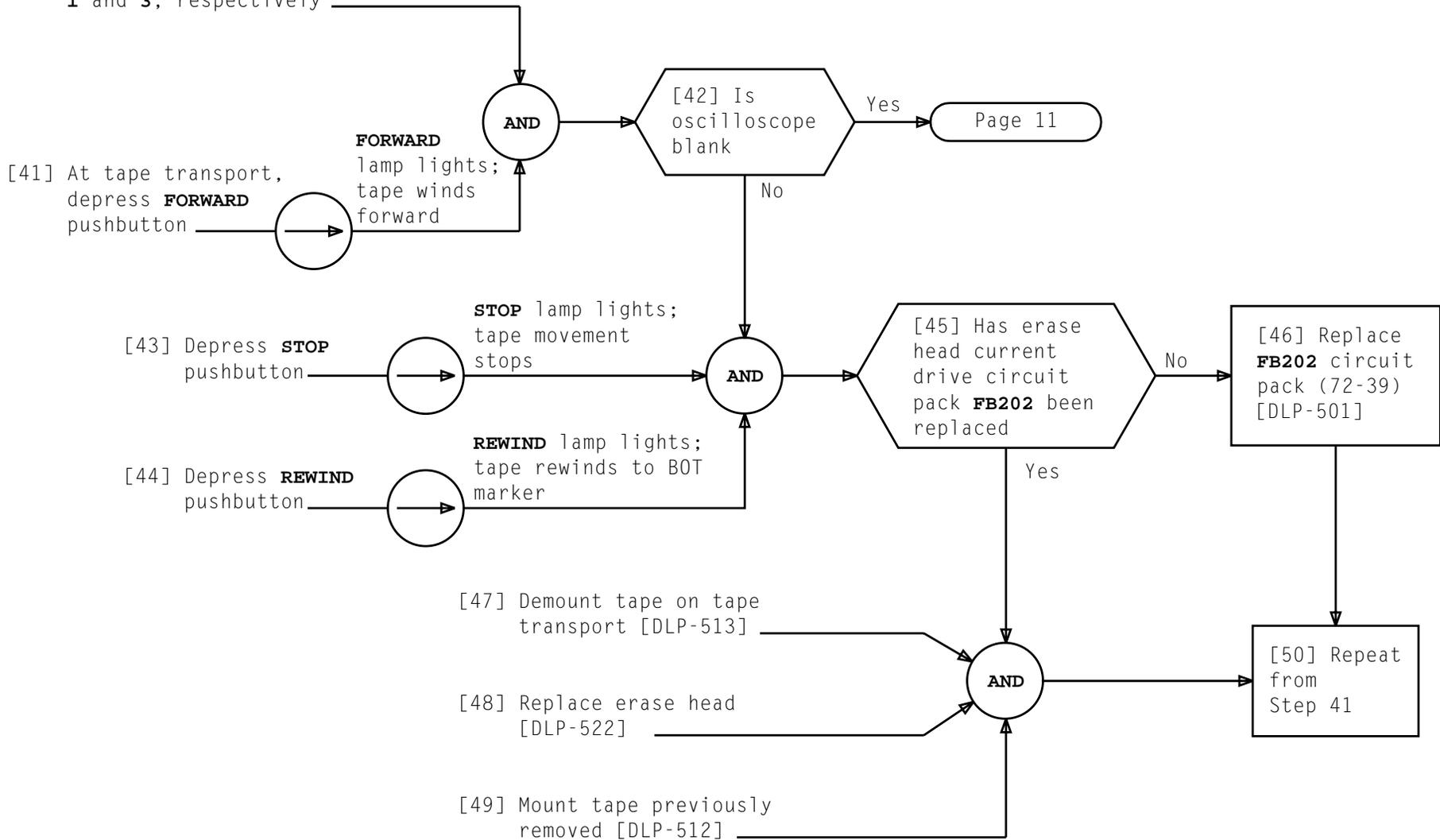
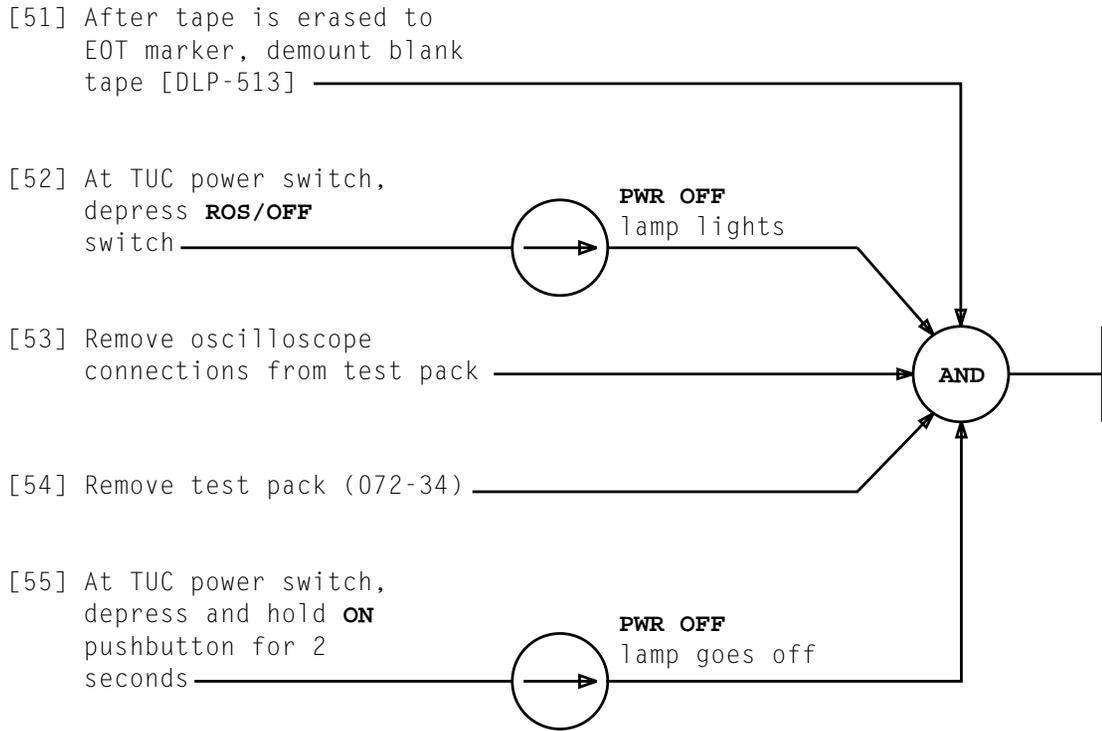


Figure 3 - Cross Section View of Flexed Precision Plate Assembly

[40] On test pack, set mode switch **R-W-E** to **E** and verify that scope channels 1 and 2 are still connected to test points 1 and 3, respectively





At TUC power switch:

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

OFF NORM and **OS** lamps light

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

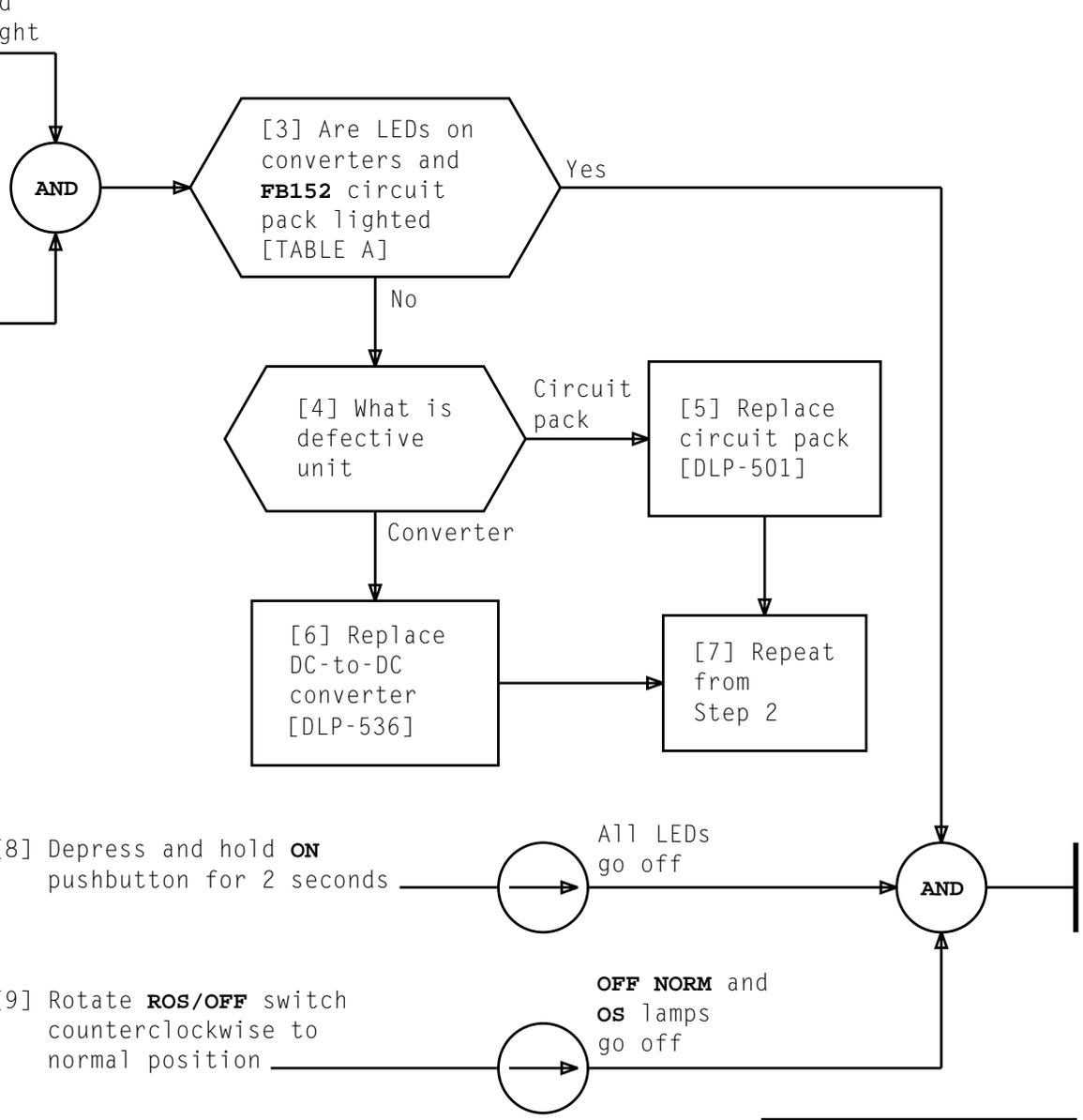


TABLE A	
UNIT	LOCATION
+3V converters	80-42 76-02, 07, 42
-3V converter	72-02
+6V converter	72-07
+3V converter	72-42
FB152 circuit pack	76-12

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

All LEDs go off

[9] Rotate **ROS/OFF** switch counterclockwise to normal position

OFF NORM and **OS** lamps go off

At DUS power switch:

[1] Rotate **ROS/OFF** switch clockwise to **ROS** **OFF NORM** and **OS** lamps light

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

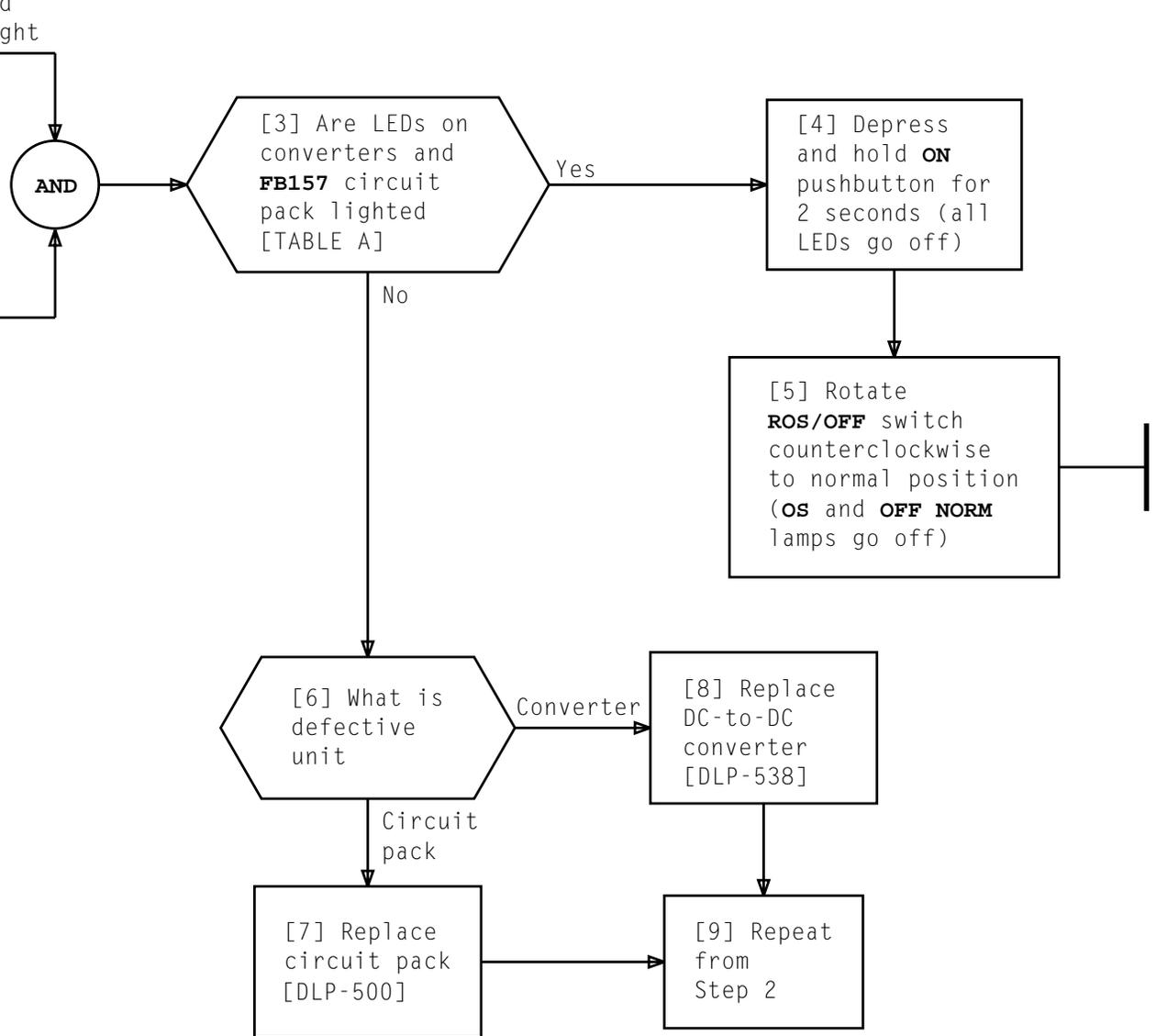
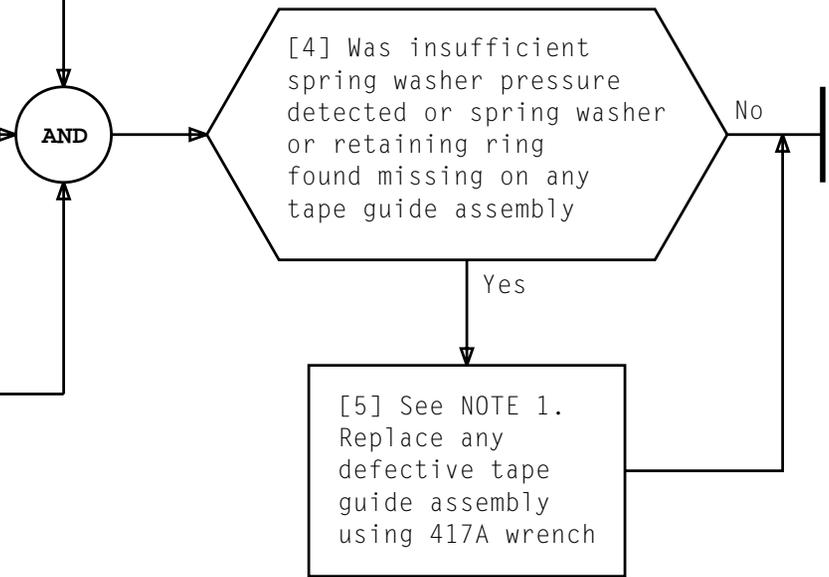


TABLE A	
UNIT	LOCATION
+6V converter	80-20
-3V converter	80-25
+3V converter	76-24, 28, 32
FB157 circuit pack	76-42

[1] Check for missing dark metal spring washer and retaining ring on all tape guide assemblies (particularly both precision tape guides) [Figure 1, Page 2]

[2] Check spring washer pressure of all non-precision tape guide assemblies by manually applying outward axial pressure to spools (Do not apply enough pressure to cause axial movement) [Figure 1, Page 2]

[3] See CAUTION 1. Without moving spools axially, check spring washer pressure of both precision tape guide assemblies [Figure 1, Page 2]



NOTE 1
It may be necessary to grind off half the thickness on large end of 417A wrench

CAUTION 1
Axial movement of precision tape guide assemblies (positioned to right and left of precision plate) can upset tape head alignments

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CHECK TENSION ON TAPE GUIDE ASSEMBLIES

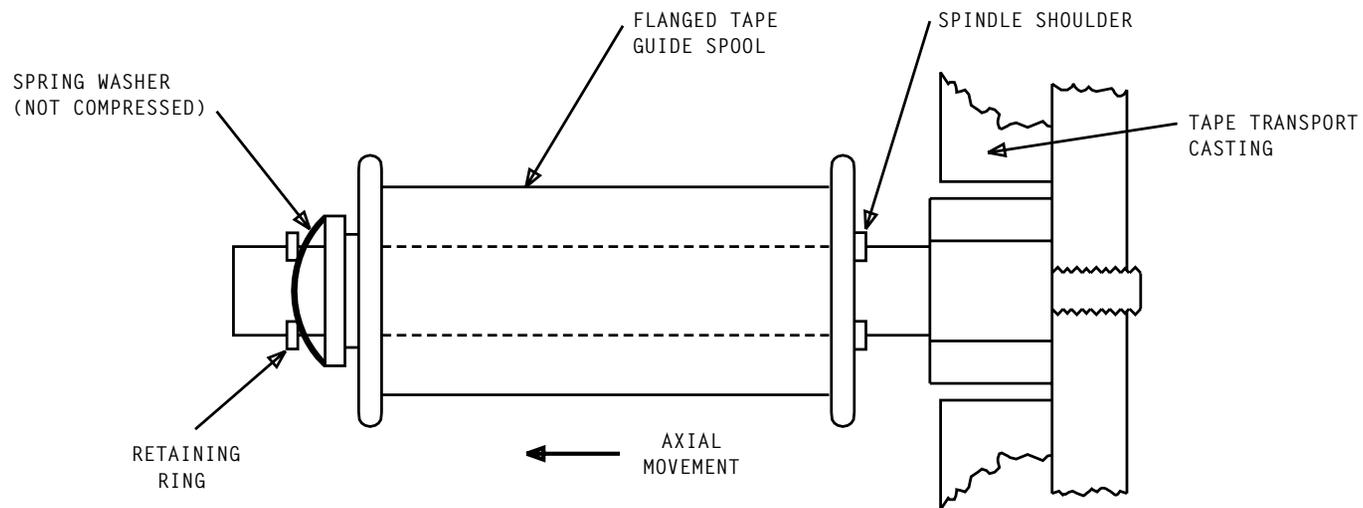


Figure 1 - Tape Guide Assembly

CHECK TENSION ON TAPE GUIDE ASSEMBLIES

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[1] Obtain replacement tape cleaner blade (L-502537)

[2] At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF**

[3] At lower right of tape transport, loosen pawl fastener; unlatch, and open casting door

[4] While supporting tape cleaner block, remove tape cleaner block mounting screws at rear of precision plate assembly [Figure 1, Page 2]

[5] Remove tape cleaner blade mounting screws and washers from tape cleaner block

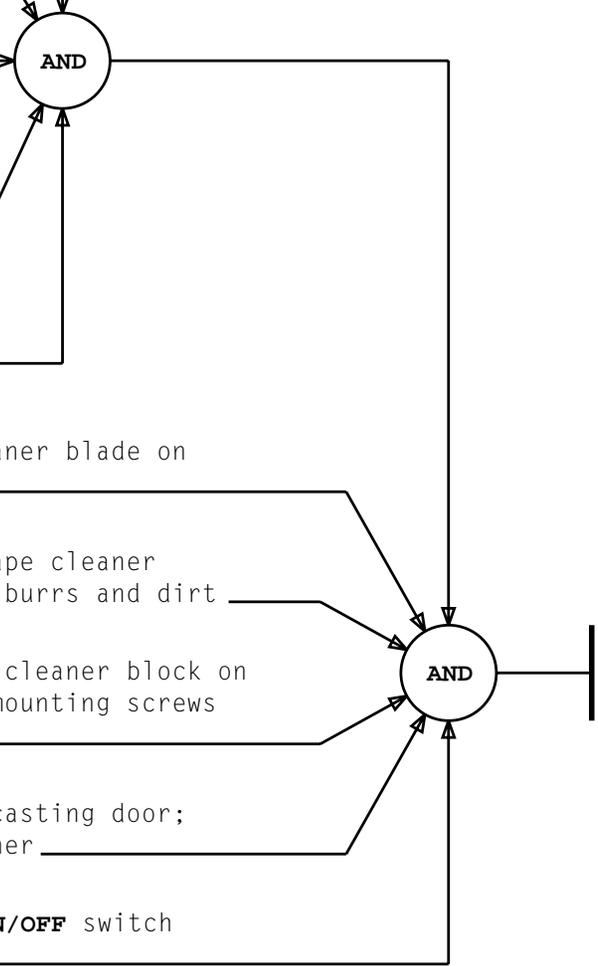
[6] Install replacement tape cleaner blade on tape cleaner block

[7] Clean mounting surfaces of tape cleaner block and precision plate of burrs and dirt

[8] See WARNING 1. Position tape cleaner block on precision plate and install mounting screws removed [Figure 1, Page 2]

[9] Gently close tape transport casting door; latch, and secure pawl fastener

[10] At DC-to-DC converter, set **ON/OFF** switch to **ON** and close cover door



WARNING 1
Screws associated with precision plate are small and strip or break easily. Tighten carefully

REPLACE TAPE CLEANER BLADE

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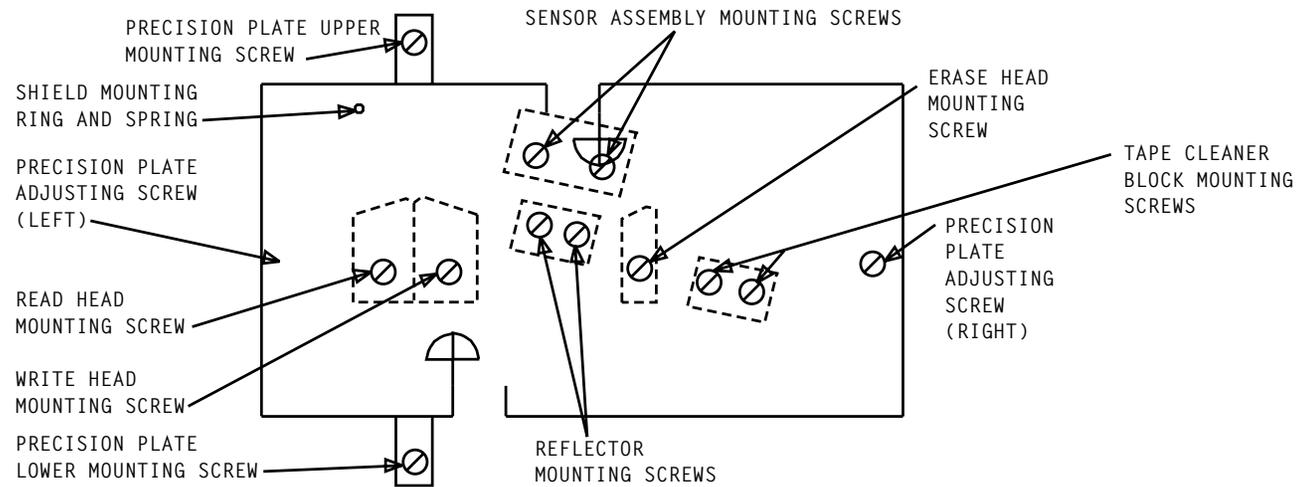


Figure 1 - Precision Plate Assembly - Rear View
Showing Component Mounting Screws

REPLACE TAPE CLEANER BLADE

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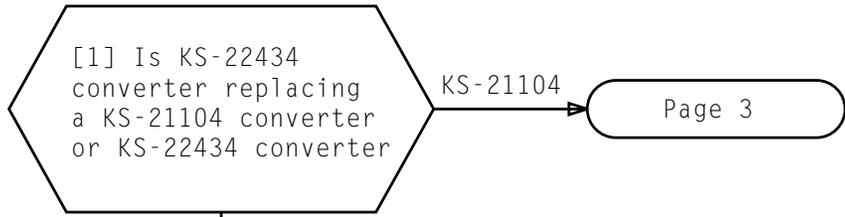
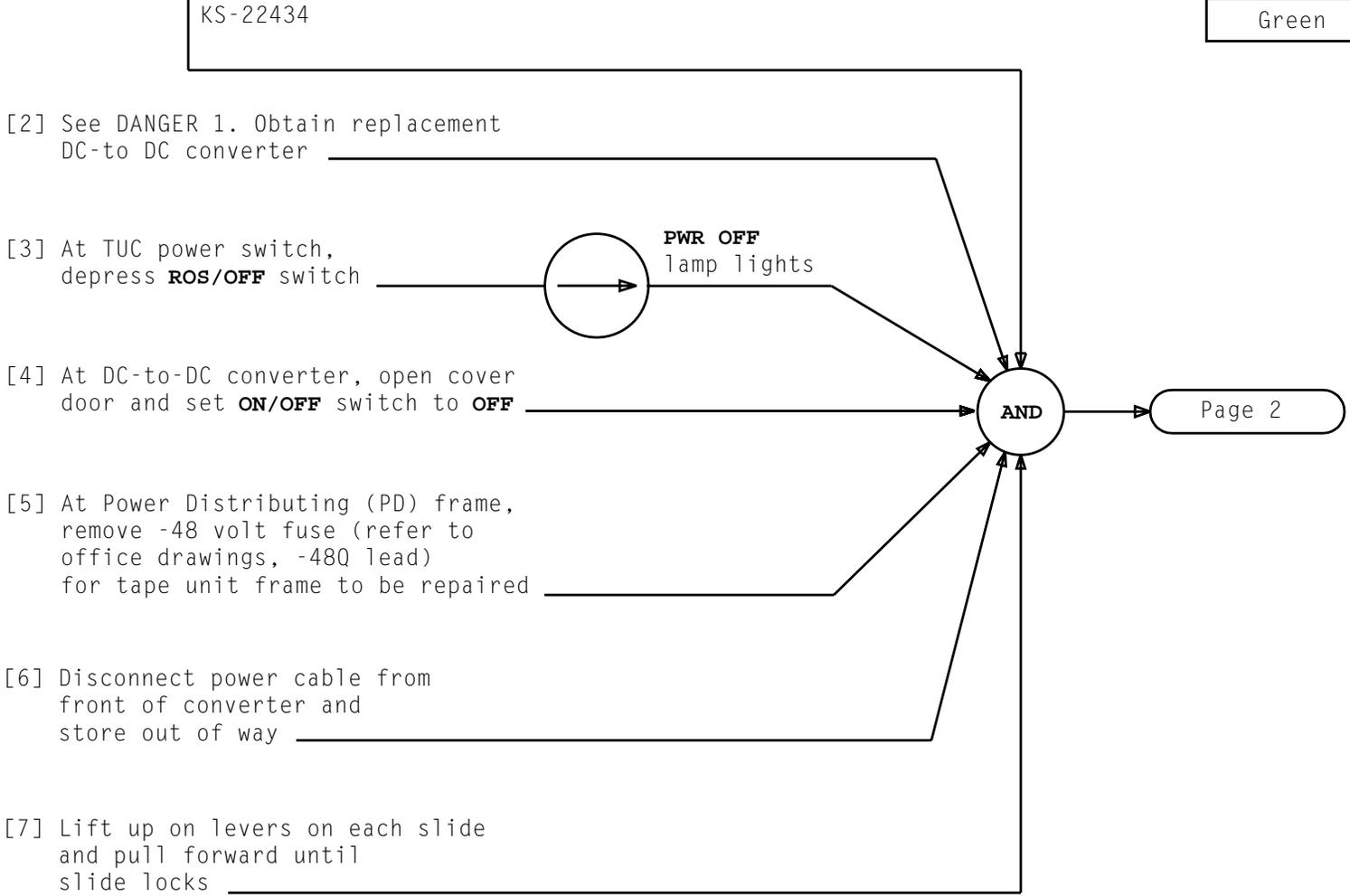


TABLE A	
LEAD IDENTIFICATION	LEAD DESIGNATION
White	TB1 - 1
Black	TB1 - 2
Green	FR GRD



*DANGER 1
DC-to-DC
converter weighs
approximately 80
pounds*

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REPLACE DC-TO-DC CONVERTER UNIT-KS-22434

[8] Verify absence of -48 volts across
TB1-1 (+) and **TB1-2** (-) leads (TABLE A, Page 1)

[9] At rear of recorder cabinet on **TB1** (Figure 1),
disconnect three -48 volt power cable leads

[10] Unscrew four mounting screws on each
slide of converter

[11] See DANGER 2. Lift converter up
and out of slides

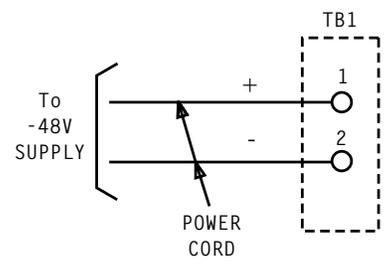
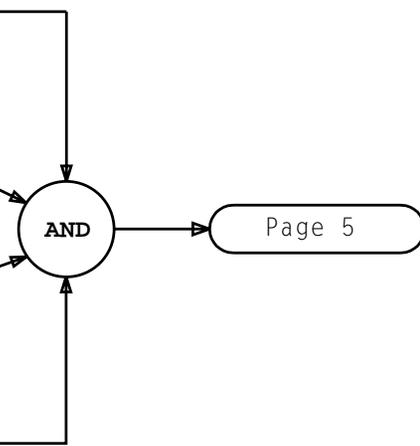


Figure 1 - KS-22434 Converter Power Cord Connection Diagram

<i>DANGER 2 DC-to-DC converter weighs approximately 80 pounds</i>	
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REPLACE DC-TO-DC CONVERTER UNIT-KS-22434

[12] See DANGER 3. Obtain replacement DC-to-DC converter

[13] At TUC power switch, depress **ROS/OFF** switch

[14] At DC-to-DC converter, open cover door and set **ON/OFF** switch to **OFF** [Figure 2]

[15] At Power Distributing (PD) frame, remove -48 volt fuse (refer to office drawings, -48Q lead) for tape unit frame to be repaired

[16] Release converter drawer locks and pull converter out to fully extended position [Figure 2]

[17] Verify absence of -48 volts across **TB1-1 (+)** and **TB1-2 (-)** leads [TABLE B]

[18] Disconnect three -48 volt power cable leads [TABLE B]

[19] Remove three cable clamps holding input and output power cables to converter

[20] Unscrew **P1** locking ring and remove **P1** from **J1**

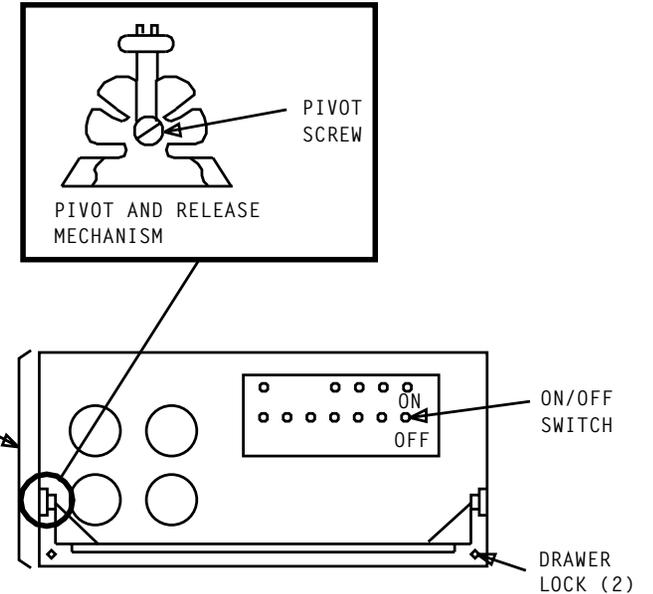
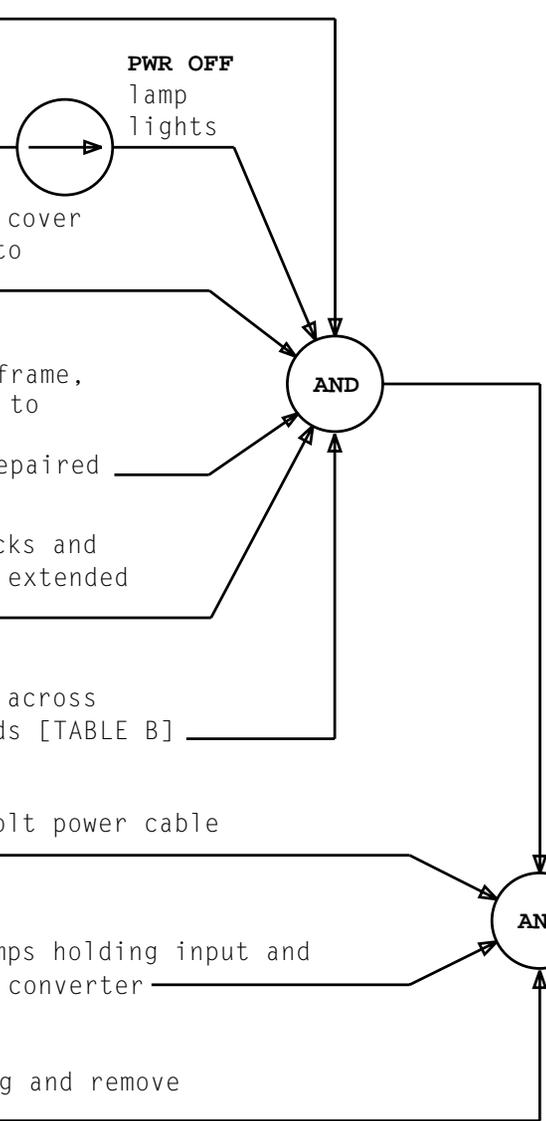


Figure 2 - DC-to-DC Converter With Cover Door Open

TABLE B	
LEAD IDENTIFICATION	LEAD DESIGNATION
White	TB1-1
Black	TB1-2
Green	FR GRD

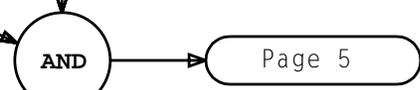
<i>DANGER 3 DC-to-DC converter weighs approximately 80 pounds</i>	
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[21] See DANGER 4. Remove screw from each pivot mechanism; tilt converter, remove retaining nut from pivot mechanism slot, and retain hardware [Figure 1, Page 2]

[22] See DANGER 4. Lift converter off pivot mechanism

[23] Remove right and left quadrants from slide

[24] Mounting screws removed from quadrants are to be used for mounting converter on slides



REPLACE DC-TO-DC CONVERTER UNIT-KS-22434

<i>DANGER 4 DC-to-DC converter weighs approximately 80 pounds</i>	
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[25] See DANGER 5. Install replacement converter on slides

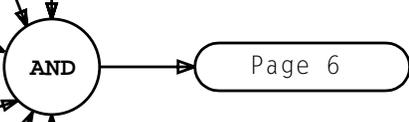
[26] Insert mounting screws into holes and tighten

[27] Connect three -48 volts power leads to **TB1** (Figure 1, Page 2)

[28] Connect power cable to front of converter

[29] Depress spring locks on each slide to unlock

[30] Push converter slowly into recorder cabinet until converter stops



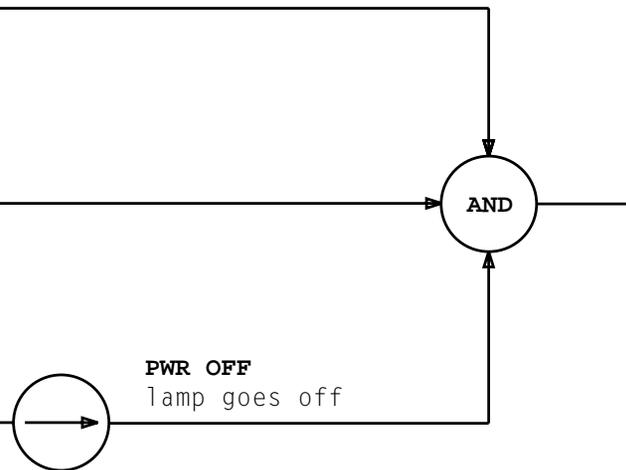
*DANGER 5
DC-to-DC
converter weighs
approximately
80 pounds. Two
people are
required to place
converters on
slides*

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[31] At Power Distributing (PD) frame,
install -48 volt fuse removed
earlier

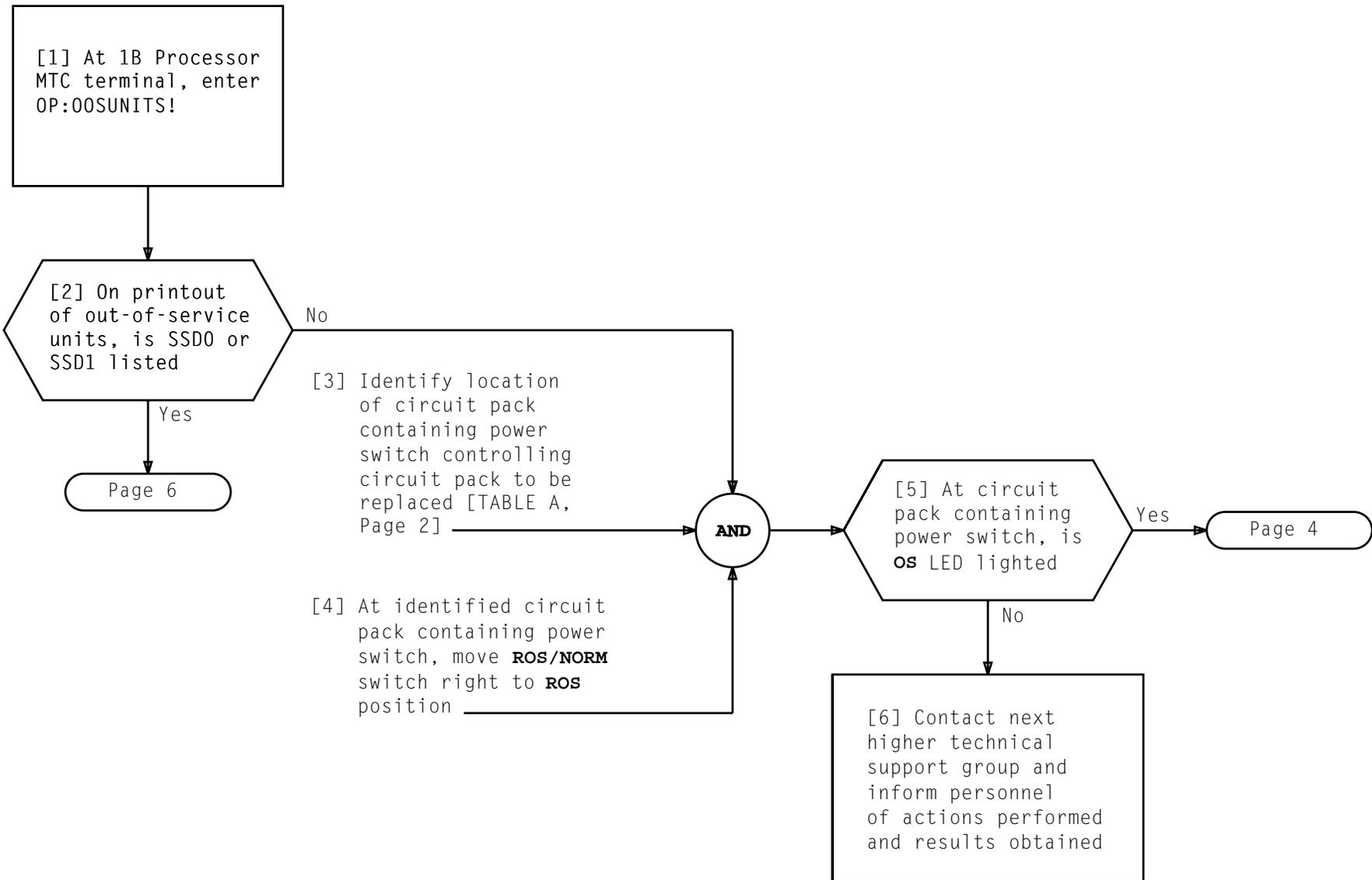
[32] At DC-to-DC converter, set **ON/OFF**
switch to **ON** and close cover door

[33] At TUC power switch, depress
and hold **ON** pushbutton
for 2 seconds



REPLACE DC-TO-DC CONVERTER UNIT-KS-22434

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REPLACE CIRCUIT PACK – 1B PROCESSOR CABINET

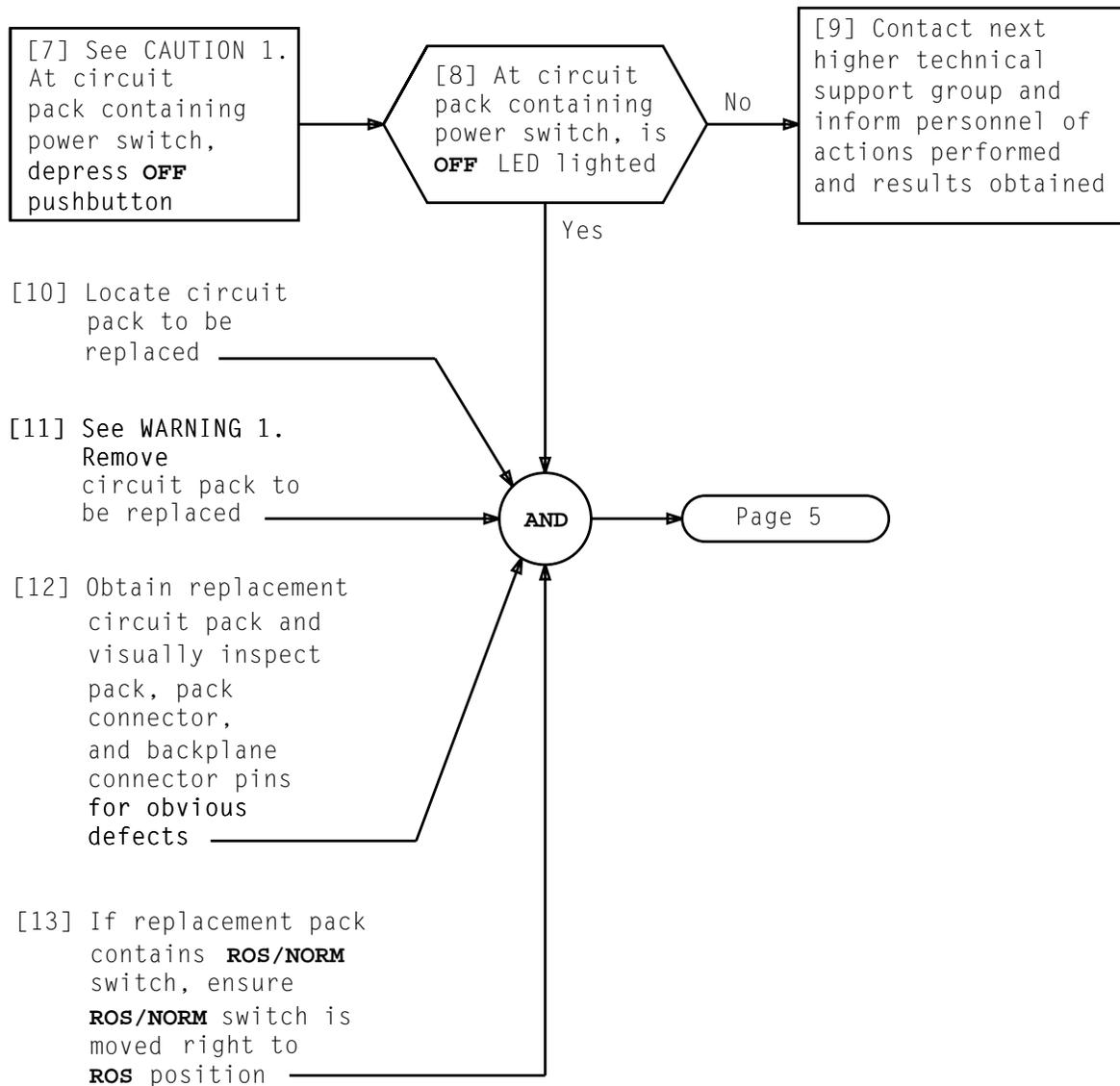
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TABLE A
1B PROCESSOR UNIT POWER SWITCH IDENTIFIERS AND LOCATIONS

UNIT	CIRCUIT PACK TO BE REPLACED		CIRCUIT PACK CONTAINING POWER SWITCH		UNIT	CIRCUIT PACK TO BE REPLACED		CIRCUIT PACK CONTAINING POWER SWITCH	
	IDENTIFIER	LOCATION	IDENTIFIER	LOCATION		IDENTIFIER	LOCATION	IDENTIFIER	LOCATION
CC	KLW03	41-104	KLW11	41-014	AUI (Contd)	UN338	70-144	KLW18	58-120
	KLW04	41-112					70-160		
	KLW05	41-096					70-176		
	KLW06	41-054			MUP	KLW16	58-078	KLW25	58-086
	KLW07	41-078				KLW25	58-086		
	KLW08	41-046			CS	KLW01	24-006	Self-Powered	Same Location
	KLW09	41-038					24-014		
	KLW10	41-030					24-022		
	KLW11	41-014					24-030		
	KLW12	58-014					24-038		
	KLW13	58-070					24-046		
	KLW14	58-038					24-054		
	KLW17	41-086					24-062		
	KLW19	41-070					24-070		
	KLW20	58-062					24-078		
	KLW21	58-046					24-104		
	KLW22	41-120					24-112		
	KLW24	41-062					24-120		
	KLW28	41-022					24-128		
	UN339	70-014					24-136		
70-030		24-144							
70-070		24-152							
70-086		24-160							
70-062		24-168							
UN340	70-038	24-176							
	70-062								
AUI	KLW18	58-120	KLW18	58-120	PS	KLW02	41-128	Self-Powered	Same Location
	UN338	70-096					41-136		
		70-112					41-144		
		70-128					41-152		

TABLE A (Contd)
1B PROCESSOR UNIT POWER SWITCH IDENTIFIERS AND LOCATIONS

UNIT	CIRCUIT PACK TO BE REPLACED		CIRCUIT PACK CONTAINING POWER SWITCH		UNIT	CIRCUIT PACK TO BE REPLACED		CIRCUIT PACK CONTAINING POWER SWITCH	
	IDENTIFIER	LOCATION	IDENTIFIER	LOCATION		IDENTIFIER	LOCATION	IDENTIFIER	LOCATION
PS	KLW02	41-160	Self-Powered	Same Location					
		41-168							
		41-176							
SSD	KLW15	58-168	Self-Powered	Same Location					
XPWR	KLW23	24-030	Self-Powered	Same Location					
CALL STORE BUS 0 BUFFER	KLW26	24-086	Self-Powered	Same Location					
CALL STORE BUS 1 BUFFER	KLW27	24-096	Self-Powered	Same Location					
FAN SYSTEM	FC	77-000	NA	NA					



WARNING 1

A grounded antistatic wrist strap (R-4987 or equivalent) must be worn when handling circuit packs. The wrist strap must be connected to a ground common to the circuit pack ground. When appropriate wrist strap is not available, always touch grounded (exposed) metal before handling circuit pack in any manner. Never pass an unprotected circuit pack to an ungrounded person or touch components, leads or connector pins

CAUTION 1

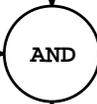
Powering down an out-of-service unit should not cause system recovery actions (interrupts, phases, etc.) to be initiated. If system recovery actions are initiated when powering down an OOS unit, another unit may be at fault. Immediately confirm that the switch is processing calls. If there are indications of a continuing outage, power up the unit previously powered down. If there are no indications of a continuing outage, determine the unit that caused the system recovery actions to be initiated and correct the fault in that unit before continuing to work on the OOS unit originally powered down

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[14] See WARNING 2 and NOTE 1.
Insert and properly seat
replacement pack

[15] At circuit pack
containing power switch,
depress **OFF** pushbutton
to clear alarms

[16] See CAUTION 2.
At circuit pack
containing power
switch, depress
ON pushbutton



[17] At circuit
pack containing
power switch, did
OFF LED go off

No

Yes

[18] Contact next
higher technical
support group and
inform personnel of
actions performed
and results obtained

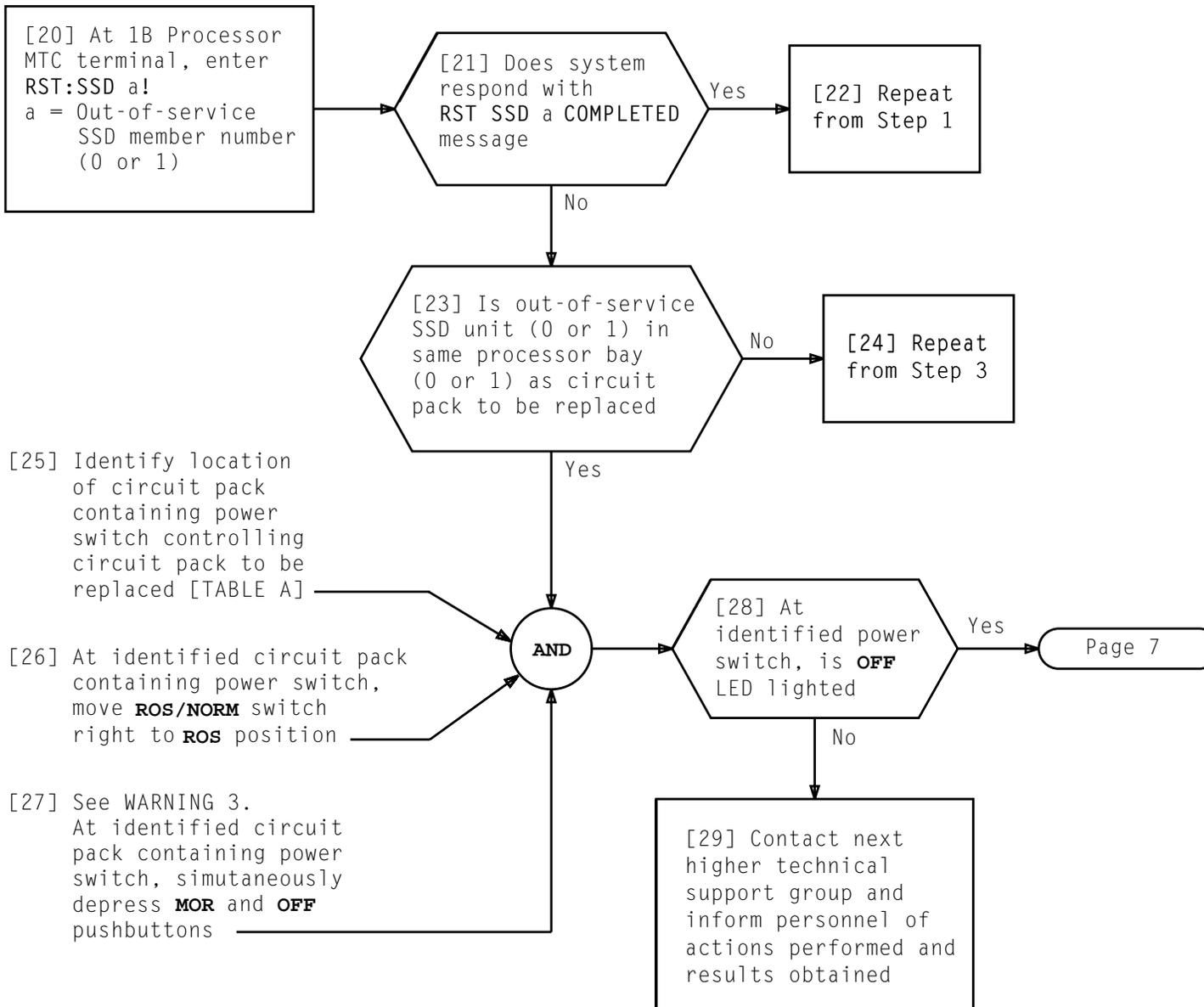
[19] At circuit
pack containing
power switch,
move **ROS/NORM**
switch left to
NORM position

NOTE 2
Excessive force is not required to properly seat circuit packs. If equal pressure applied at top and bottom of circuit pack (using pack seating mechanism) does not smoothly seat circuit pack, identify reason that circuit pack cannot be properly seated before proceeding

WARNING 2
A grounded antistatic wrist strap (**R-4987** or equivalent) must be worn when handling circuit packs. The **wrist** strap must be connected to a ground common to the circuit pack ground. When appropriate wrist strap is not available, always touch grounded (exposed) metal before handling circuit pack in any manner. Never pass an unprotected circuit pack to an ungrounded person or touch components, leads, or connector pins

CAUTION 2
If system recovery actions (interrupts, phases, etc.) are initiated when powering up any unit (CC, CS, etc.), the suspected cause should be the unit just powered up. Therefore, the first action to take in this situation should be to power down the unit just powered up in an attempt to clear the reason that system recovery actions were initiated

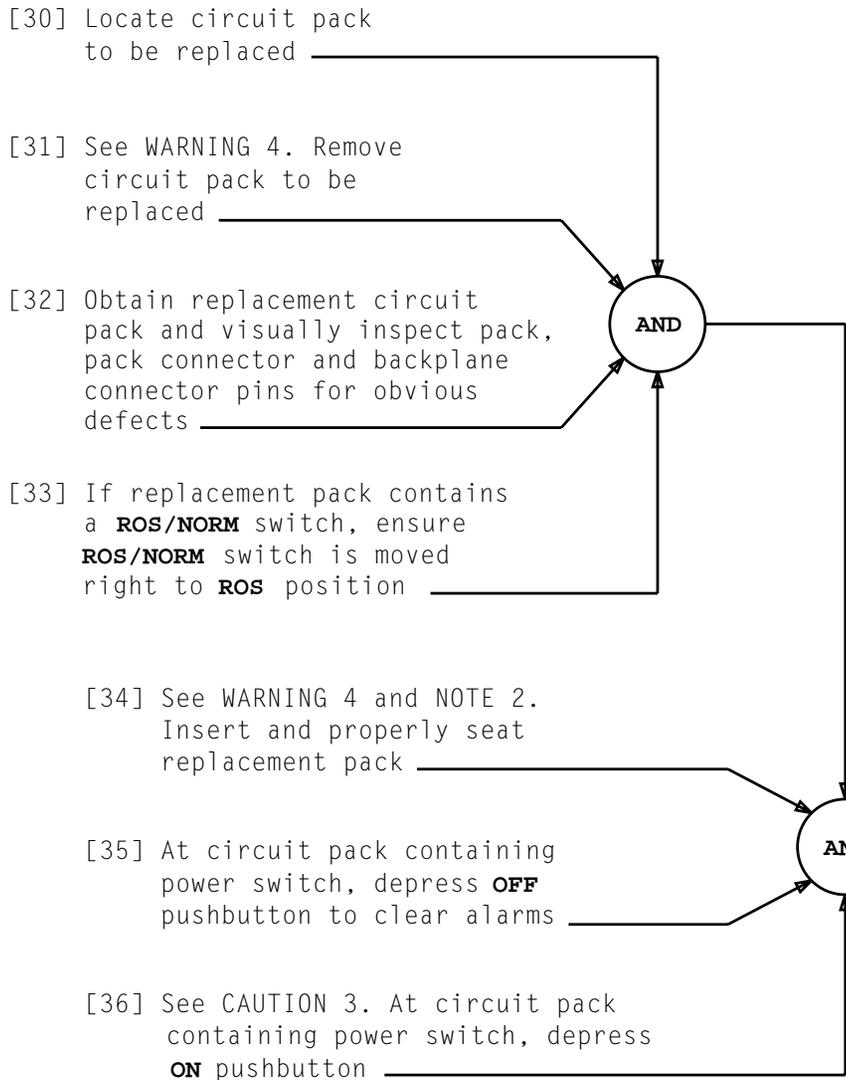
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WARNING 3

Extreme caution must be taken to ensure circuit pack replacement is being performed in the correct unit. Consulting next higher technical support group before manually overriding power switch may be required per local practice

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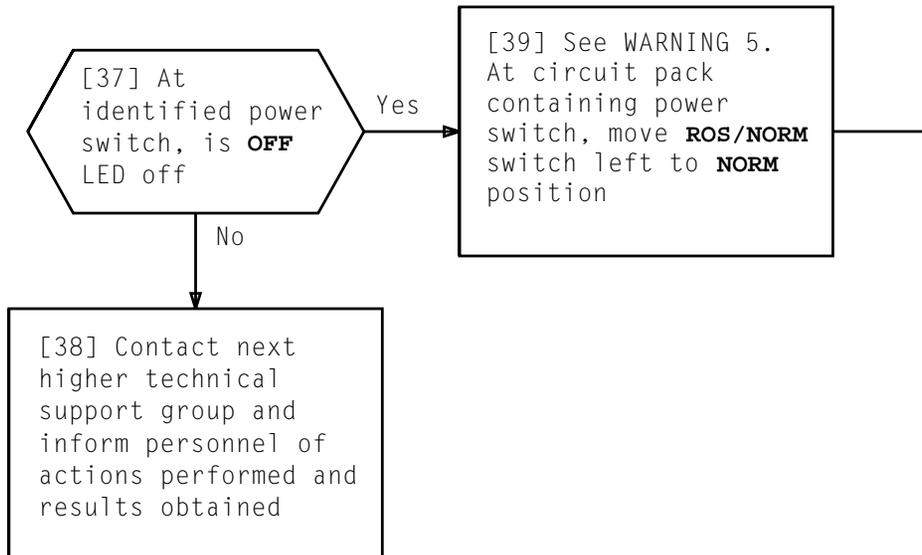


NOTE 1
 Excessive force is not required to properly seat circuit packs. If equal pressure applied at top and bottom of circuit pack (using pack seating mechanism) does not smoothly seat circuit pack, identify reason that circuit pack cannot be properly seated before proceeding

WARNING 2
A grounded antistatic wrist strap (R-4987 or equivalent) must be worn when handling circuit packs. The wrist strap must be connected to a ground common to the circuit pack ground. When appropriate wrist strap is not available, always touch grounded (exposed) metal before handling circuit pack in any manner. Never pass an unprotected circuit pack to an ungrounded person or touch components, leads, or connector pins

CAUTION 3
If system recovery actions (interrupts, phases, etc.) are initiated when powering up any unit (CC, CS, etc.), the suspected cause should be the unit just powered up. Therefore, the first action to take in this situation should be to power down the unit just powered up in an attempt to clear the reason that system recovery actions were initiated

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WARNING 5

Extreme caution must still be taken from this point forward due to the SSD unit controlling this processor's scan and signal distributor points is out-of-service. Thus, any OS and ACK LED responses controlled via these scan and signal distributor points must be ignored until the out-of-service SSD unit is diagnosed, repaired, and restored to service. Consulting next higher technical support group before proceeding may be required per local practice

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Using printout of diagnostics with
CATP results [Figure 1, Page 2]:

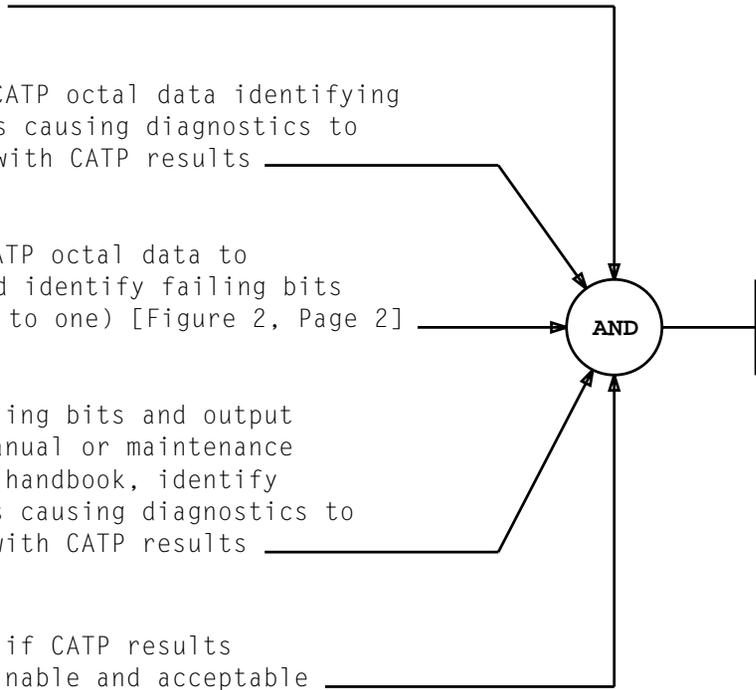
[1] Identify unit being
diagnosed

[2] Identify CATP octal data identifying
conditions causing diagnostics to
complete with CATP results

[3] Convert CATP octal data to
binary and identify failing bits
(bits set to one) [Figure 2, Page 2]

[4] Using failing bits and output
message manual or maintenance
reference handbook, identify
conditions causing diagnostics to
complete with CATP results

[5] Determine if CATP results
are explainable and acceptable



IDENTIFY CONDITIONS CAUSING DIAGNOSTICS TO COMPLETE WITH CATP RESULTS

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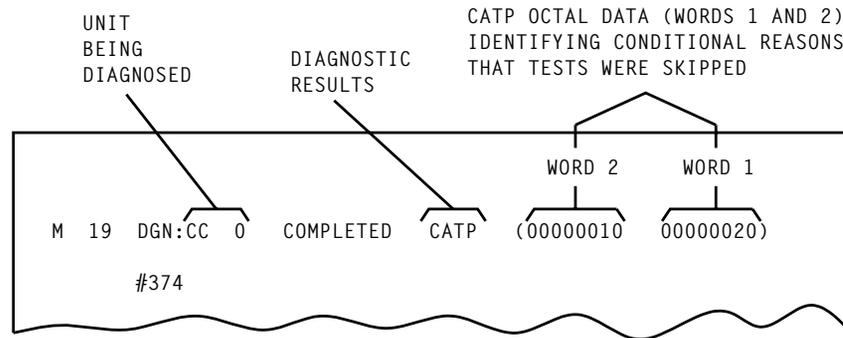


Figure 1 - Sample Printout of Diagnostics With CATP Results

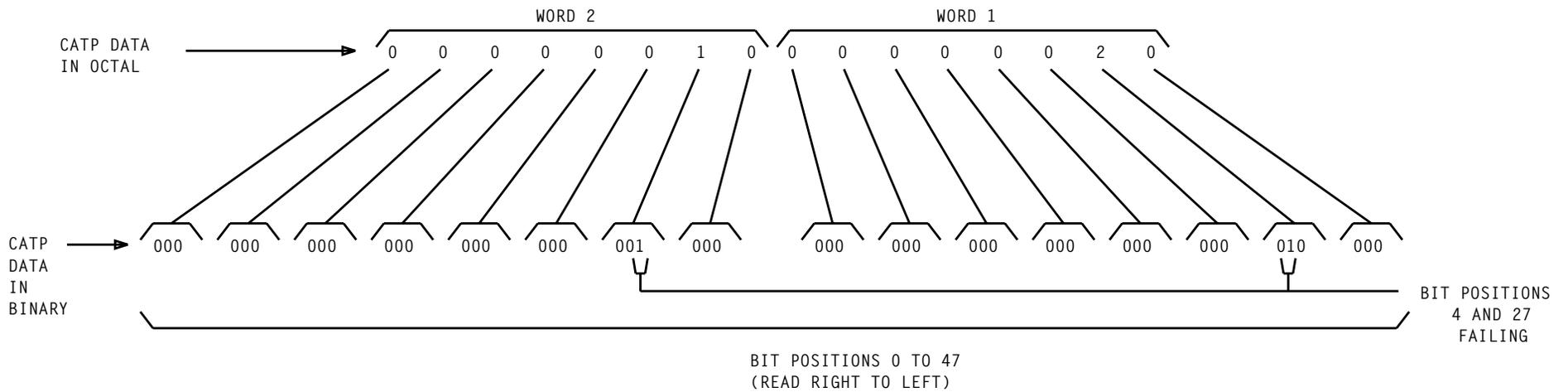
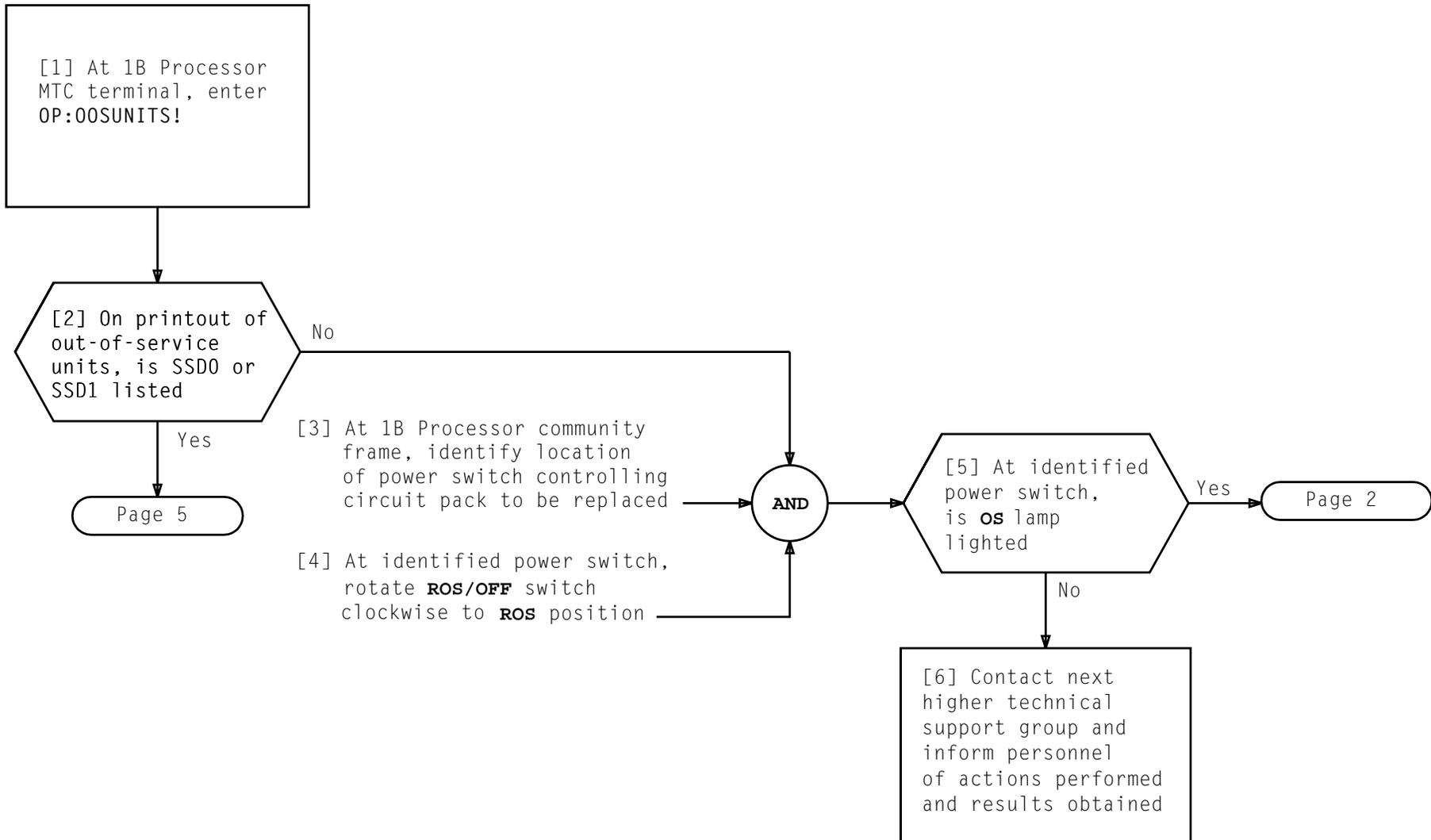


Figure 2 - Example of CATP Data Octal To Binary Conversion

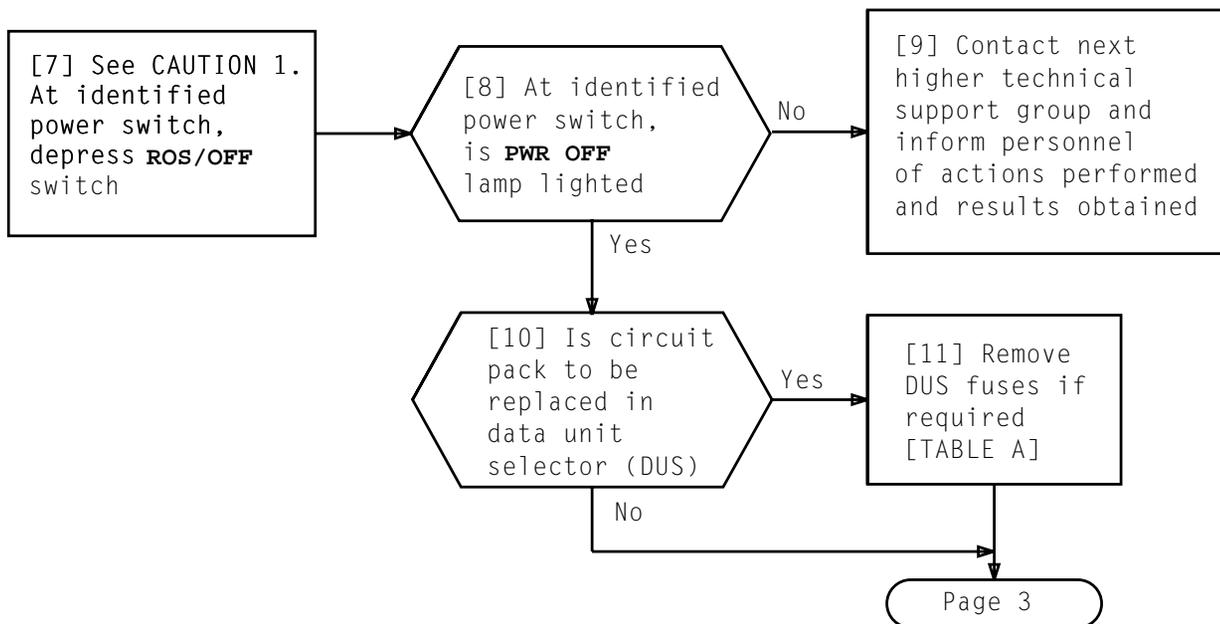
IDENTIFY CONDITIONS CAUSING DIAGNOSTICS TO COMPLETE WITH CATP RESULTS

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REPLACE CIRCUIT PACK – 1B PROCESSOR COMMUNITY FRAME OTHER THAN 1B PROCESSOR CABINET

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**TABLE A
DUS CIRCUIT PACKS
REQUIRING FUSE REMOVAL**

CIRCUIT PACK LOCATION	FUSE	
	NAME	LOCATION
80-37	+24-V5	77-04
	+24-V7	77-04
76-42, 76-43, 76-45, 76-47	+24-V6	77-04

CAUTION 1

Powering down an out-of-service unit should not cause system recovery actions (interrupts, phases, etc.) to be initiated. If system recovery actions are initiated when powering down an OOS unit, another unit may be at fault. Immediately confirm that the switch is processing calls. If there are indications of a continuing outage, power up the unit previously powered down. If there are no indications of a continuing outage, determine the unit that caused the system recovery actions to be initiated and correct the fault in that unit before continuing to work on the OOS unit originally powered down

REPLACE CIRCUIT PACK — 1B PROCESSOR COMMUNITY FRAME OTHER THAN 1B PROCESSOR CABINET

[12] Locate circuit pack to be replaced

[13] See WARNING 1. Remove circuit pack to be replaced

[14] Obtain replacement circuit pack and visually inspect pack, pack connector, and backplane connector pins for obvious defects

[15] See WARNING 1 and NOTE 1. Insert and properly seat replacement pack

[16] Replace any fuses previously removed

[17] See CAUTION 2. At identified power switch, depress and hold **ON** pushbutton for 2 seconds

AND

Page 4

NOTE 1

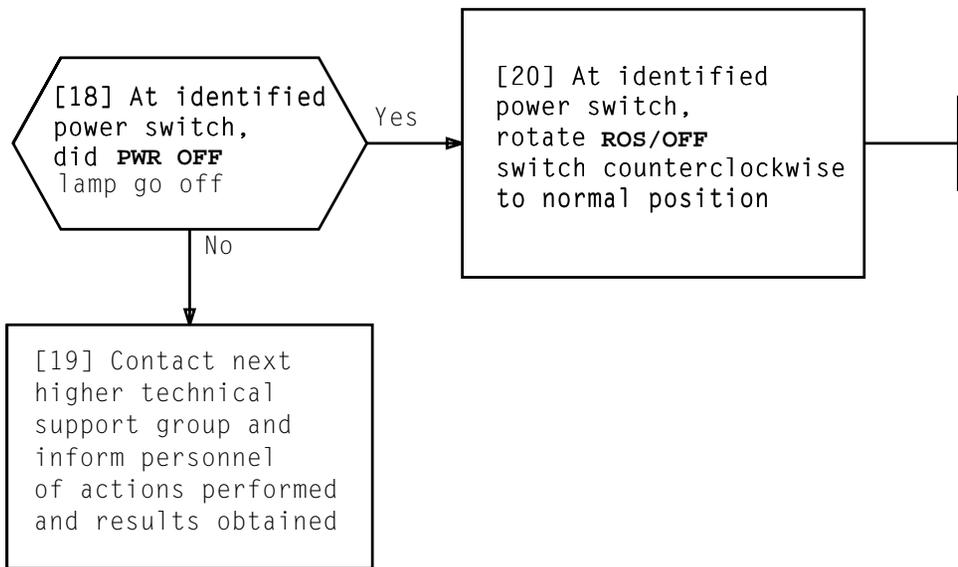
Excessive force is not required to properly seat circuit packs. If equal pressure applied at top and bottom of circuit pack (using pack seating mechanism) does not smoothly seat circuit pack, identify reason that circuit pack cannot be properly seated before proceeding

WARNING 1

A grounded antistatic wrist strap (R-4987 or equivalent) must be worn when handling circuit packs. The wrist strap must be connected to a ground common to the circuit pack ground. When appropriate wrist strap is not available, always touch grounded (exposed) metal before handling circuit pack in any manner. Never pass an unprotected circuit pack to an ungrounded person or touch components, leads, or connector pins

CAUTION 2

If system recovery actions (interrupts, phases, etc.) are initiated when powering up any unit (CC, CS, etc.), the suspected cause should be the unit just powered up. Therefore, the first action to take in this situation should be to power down the unit just powered up in an attempt to clear the reason that system recovery actions were initiated



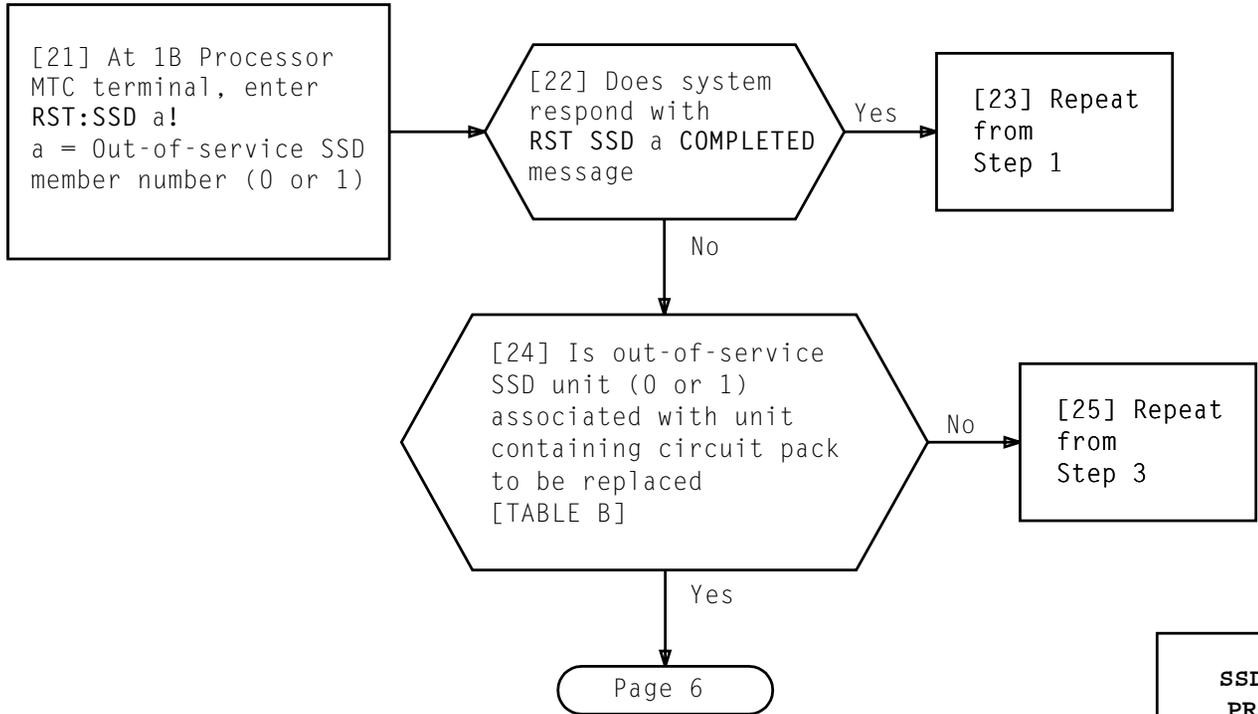


TABLE B
SSD UNIT AND ASSOCIATED 1B PROCESSOR UNITS IN FRAMES OTHER THAN 1B PROCESSOR CABINET

UNIT CONTAINING CIRCUIT PACK TO BE REPLACED	ASSOCIATED SSD UNIT
DUS0 TUC0 API0	SSD0
DUS1 TUC1 API1	SSD1

[26] See WARNING 2.
At 1B Processor community frame, identify location of power switch controlling circuit pack to be replaced

[27] At identified power switch, rotate **ROS/OFF** switch clockwise to **ROS** position

[28] At identified power switch, depress **ROS/OFF** switch

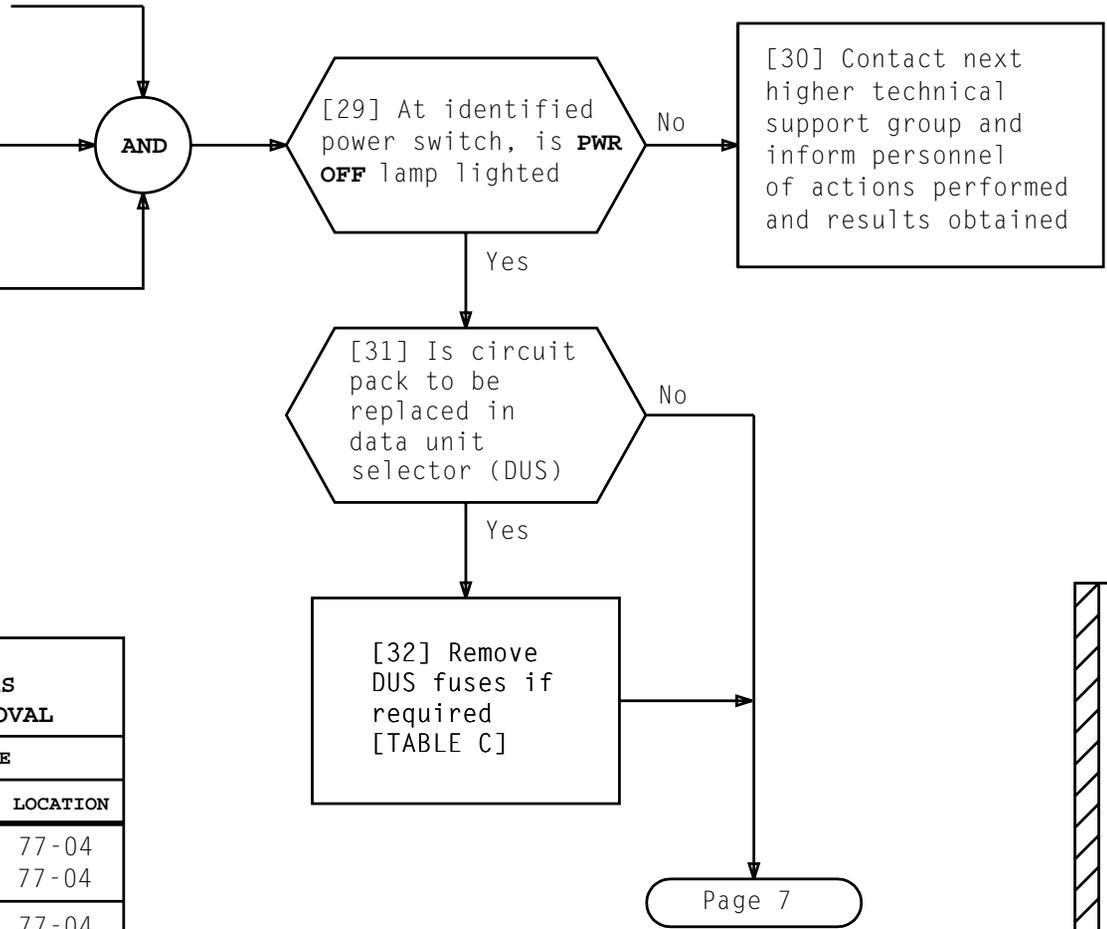


TABLE C DUS CIRCUIT PACKS REQUIRING FUSE REMOVAL		
CIRCUIT PACK LOCATION	FUSE	
	NAME	LOCATION
80-37	+24-V5	77-04
	+24-V7	77-04
76-42, 76-43, 76-45, 76-47	+24-V6	77-04

WARNING 2
Extreme caution must be taken to ensure circuit pack replacement is being performed in the correct unit. Consulting next higher technical support group before manually overriding power switch may be required per local practice

REPLACE CIRCUIT PACK – 1B PROCESSOR COMMUNITY FRAME OTHER THAN 1B PROCESSOR CABINET

[33] Locate circuit pack to be replaced

[34] See WARNING 3. Remove circuit pack to be replaced

[35] Obtain replacement circuit pack and visually inspect pack, pack connector, and backplane connector pins for obvious defects

[36] See WARNING 3 and NOTE 2. Insert and properly seat replacement pack

[37] Replace any fuses previously removed

[38] See CAUTION 3. At identified power switch, depress and hold **ON** pushbutton for 2 seconds

AND

Page 8

NOTE 2

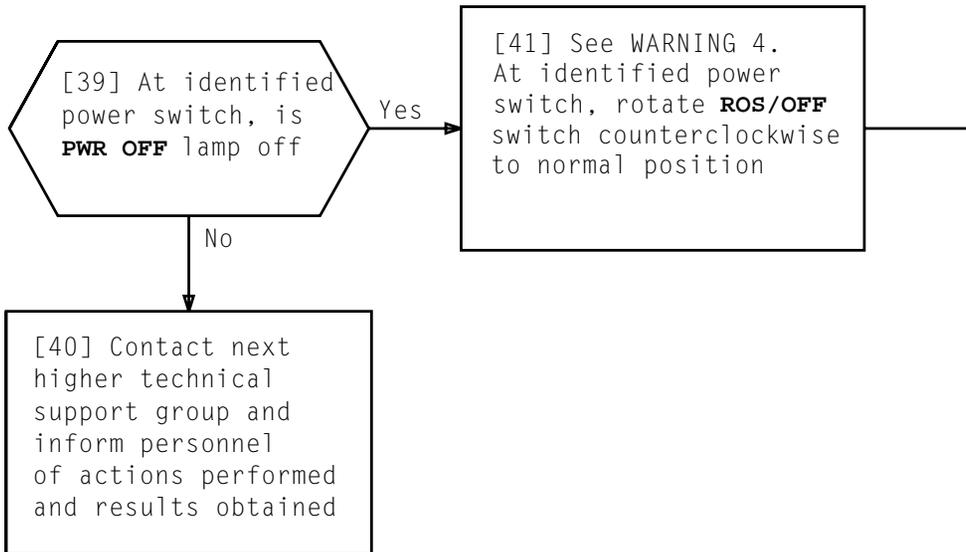
Excessive force is not required to properly seat circuit packs. If equal pressure applied at top and bottom of circuit pack (using pack seating mechanism) does not smoothly seat circuit pack, identify reason that circuit pack cannot be properly seated before proceeding

WARNING 3

A grounded antistatic wrist strap (R-4987 or equivalent) must be worn when handling circuit packs. The wrist strap must be connected to a ground common to the circuit pack ground. When appropriate wrist strap is not available, always touch grounded (exposed) metal before handling circuit pack in any manner. Never pass an unprotected circuit pack to an ungrounded person or touch components, leads, or connector pins

CAUTION 3

If system recovery actions (interrupts, phases, etc.) are initiated when powering up any unit (CC, CS, etc.), the suspected cause should be the unit just powered up. Therefore, the first action to take in this situation should be to power down the unit just powered up in an attempt to clear the reason that system recovery actions were initiated



WARNING 4
 Extreme caution must still be taken from this point forward due to the SSD unit controlling the power switch scan and signal distributor points being out-of-service. Thus, any OS and ACK lamp responses controlled via these scan and signal distributor points must be ignored until the out-of-service SSD unit is diagnosed, repaired and restored to service. Consulting next higher technical support group before proceeding may be required per local practice

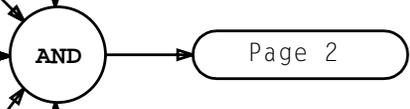
[1] Obtain TEKTRONIX* storage oscilloscope (model 2232 or equivalent) and two TEKTRONIX oscilloscope X10 probes (model P6109 or equivalent)

[2] See NOTE 1. Obtain 30-foot coax cable with male BNC connector at each end

[3] Power up storage oscilloscope

[4] At storage oscilloscope, depress **STORE** to IN position

[5] Depress **SETUP - ACQ**



*Registered trademark of TEKTRONIX, Inc.

SET UP STORAGE OSCILLOSCOPE FOR SCOPING AUXILIARY UNIT BUS (AUB)

NOTE 1 The maximum length coaxial cable that can be used with a high impedance oscilloscope to scope auxiliary unit bus (AUB) is 75 feet.	
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[6] Observe storage oscilloscope screen and set **ACQ** controls by depressing switch associated with control not set correctly [TABLE A]

[7] Depress **SETUP - DISPLAY**

[8] Observe storage oscilloscope screen and set **DISPLAY** controls by depressing switch associated with control not set correctly [TABLE B]

[9] Depress **SETUP - REF**

[10] Observe storage oscilloscope screen and set **REF** controls by depressing switch associated with control not set correctly [TABLE C, Page 3]

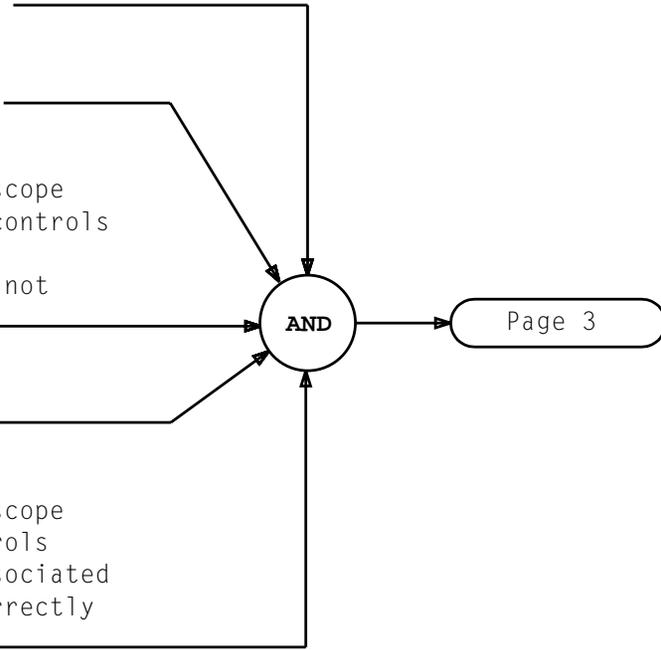


TABLE A TEKTRONIX STORAGE OSCILLOSCOPE MODEL 2232 ACQ CONTROLS		
CONTROL IDENTIFIER COLUMN	CONTROLS	SWITCH*
1	Peakdet	SAVE REF
2	Scan	1
3	Fast	2
5	Swp Lim: NO LIMIT	4K (for Swp Lim:) and adjust CURSORS to obtain NO LIMIT
5	Trig Pos: 720/4K	4K (for Trig Pos:), ACQUISITION - 1K/4K (for 4K) and adjust CURSORS to obtain 720

* Switches under display screen are associated with CONTROL IDENTIFIER column that they are under except for TRIG POS and Swp Lim

TABLE B TEKTRONIX STORAGE OSCILLOSCOPE MODEL 2232 DISPLAY CONTROLS		
CONTROL IDENTIFIER COLUMN	CONTROLS	SWITCH*
1	ΔT	SAVE REF
2	ON	1
3	ON	2

* Switches under display screen are associated with CONTROL IDENTIFIER column that they are under

SET UP STORAGE OSCILLOSCOPE FOR SCOPING AUXILIARY UNIT BUS (AUB)

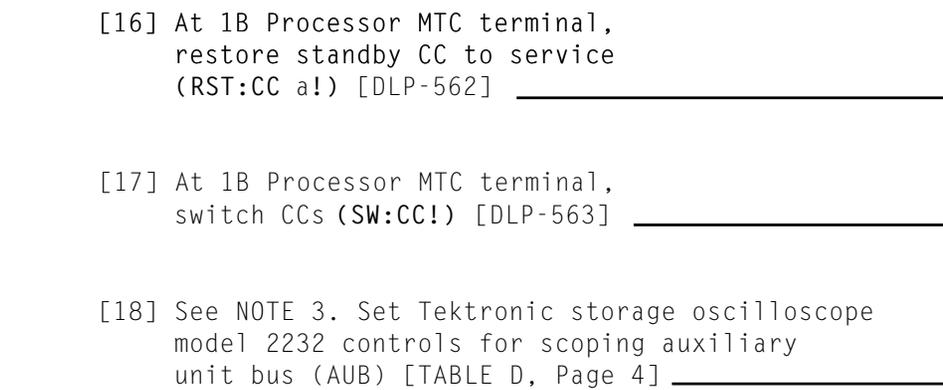
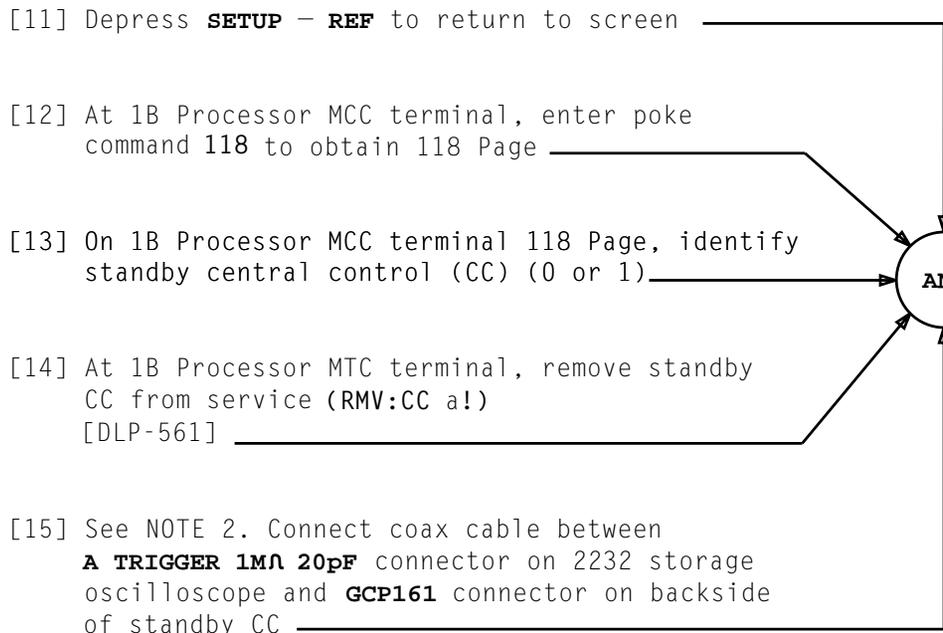


TABLE C TEKTRONIX STORAGE OSCILLOSCOPE MODEL 2232 REF CONTROLS		
CONTROL IDENTIFIER COLUMN	CONTROLS	SWITCH*
1	Format	SAVE REF
2	Ref1	1
3	CH1	2
4	X1	3
5	Vert Gain: 0.2V	4K (for Vert Gain:) and adjust CURSORS to obtain 0.2V

* Switches under display screen are associated with CONTROL IDENTIFIER column that they are under

NOTES

- Coax cable must be connected to oscilloscope before connecting to standby CC.
- Adjustments for controls specified in TABLE D will provide a general setup for scoping AUB. Final adjustments may be required to completely set up scope for viewing bit patterns

SET UP STORAGE OSCILLOSCOPE FOR SCOPING AUXILIARY UNIT BUS (AUB)

TABLE D	
TEKTRONIX STORAGE OSCILLOSCOPE MODEL 2232 CONTROLS FOR SCOPING AUXILIARY UNIT BUS (AUB)	
CONTROLS	POSITION*
ACQUISITION – SAVE/CONT STORE	Depress until SAVE is not displayed
VAR HOLDOFF	Depress (in)
VERTICAL – POSITION (left)	Position Not Critical
VERTICAL – A/B SWP SEP	Rotate to 11 o'clock position
VERTICAL – POSITION (right)	Position Not Critical
VERTICAL MODE – CH 1 BOTH CH 2	Rotate to 12 o'clock position
VERTICAL MODE – X-Y	BOTH
VERTICAL MODE – BW LIMIT	Out position
VERTICAL MODE – ADD ALT CHOP	Out position
VERTICAL – CH 1 VOLTS/DIV	ADD
VERTICAL – CH 1 VOLTS/DIV – AC GND DC	2
VERTICAL – INVERT	DC
VERTICAL – CH 2 VOLTS/DIV	Depress (in)
VERTICAL – CH 2 VOLTS/DIV – AC GND DC	2
HORIZONTAL – POSITION	DC
HORIZONTAL – MODE – A BOTH B	Rotate to 1 o'clock position
HORIZONTAL – A and B SEC/DIV	A
CURSORS	.1 μ s
B TRIGGER – SLOPE	Adjust until ΔT is 0.0 μ s on screen
B TRIGGER – LEVEL	Position Not Critical
A TRIGGER – TV FIELD – NORM	Position Not Critical
A TRIGGER – SLOPE	Depress (in)
A TRIGGER – LEVEL	Out position
A TRIGGER – A & B SOURCE	Rotate to 1 o'clock position
A TRIGGER – A COUPL	A EXT CH 1
A TRIGGER – A EXT COUPL	NORM
	Position Not Critical
* Adjustments for controls specified will provide a general setup for scoping AUB. Final adjustments may be required to completely set up scope for viewing bit patterns.	

[1] Obtain program listing
ABDG99 (PR-5A737)

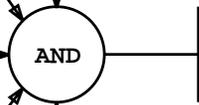
[2] Using program listing, identify
and record start and end addresses
for all unique loop boundaries
associated with AUB 0 and 1
write, address, reply and store
address buses

At 1B Processor MTC terminal:

[3] Depress **FORM ENTER**
key to activate function

[4] See NOTE 1. Type (form enter)
input messages
[TABLE A, Page 2]

[5] Depress **FORM ENTER**
key to deactivate function



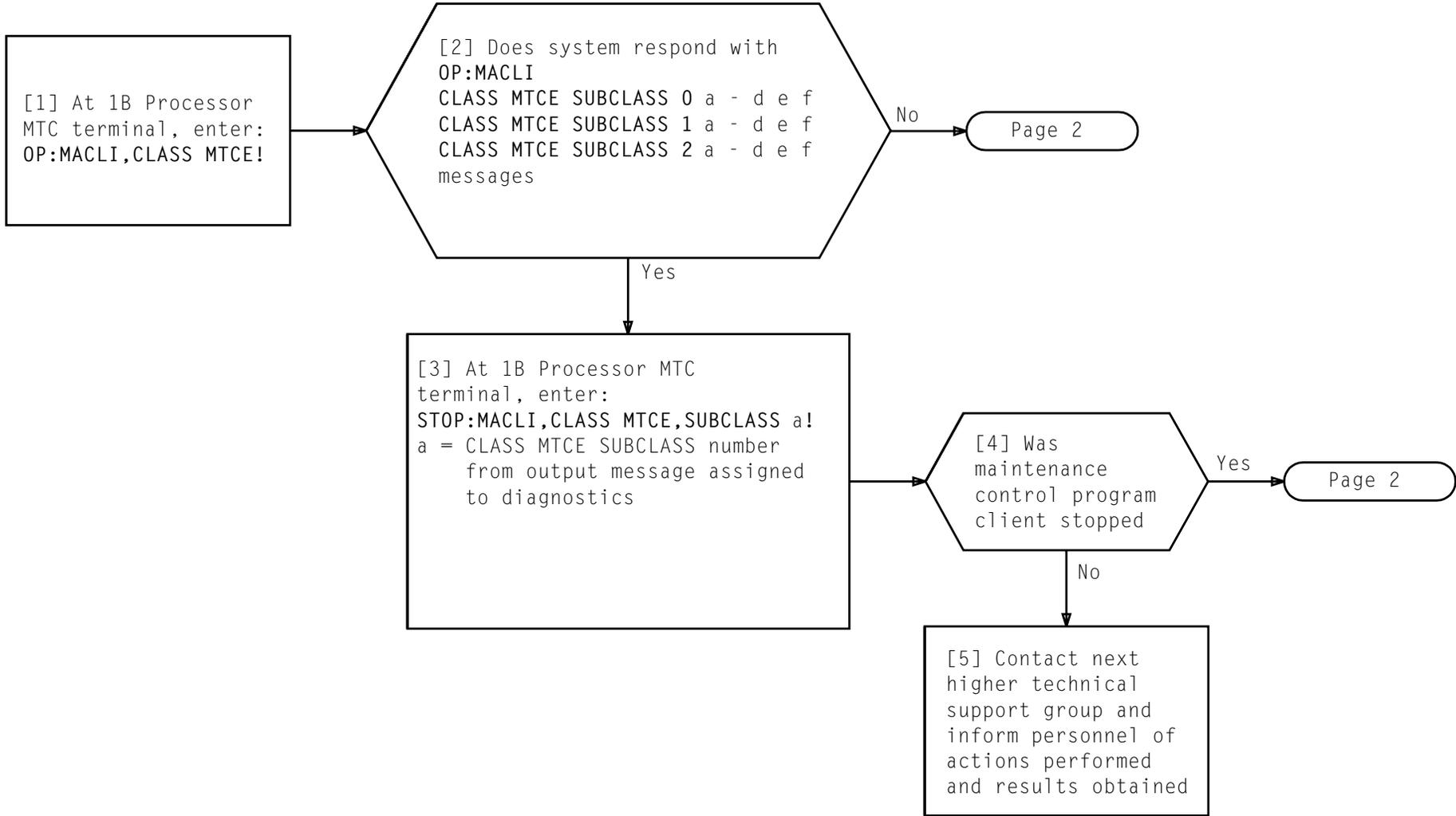
FORM ENTER INPUT MESSAGES USED TO SCOPE AUB USING PHASE 99 DIAGNOSTIC TESTS

NOTE 1 Messages must not be entered into system at this time	
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TABLE A INPUT MESSAGES USED TO SCOPE AUB			
NUMBER	INPUT MESSAGES	NUMBER	INPUT MESSAGES
1	EX:AUB a;START! a = Bus 0 or 1	3	EX:AUB a! a = Bus 0 or 1
2	NOTE: This message must be repeated for all unique loop boundaries identified in program listing. EX:AUB a:PH 99,ADR b-c,SYNC d! a = Bus 0 or 1 b = Start address of loop boundary for bus 0 or 1 c = End address of loop boundary for bus 0 or 1 d = Address that generates sync pulse	4	OP:MACLI,CLASS MTCE!
		5	STOP:MACLI,CLASS MTCE,SUBCLASS a! a = CLASS MTCE SUBCLASS number from OP:MACLI output message assigned to Phase 99 diagnostics
		6	ALW:MACLI,CLASS MTCE!
		7	INH:MACLI,CLASS MTCE;REX!

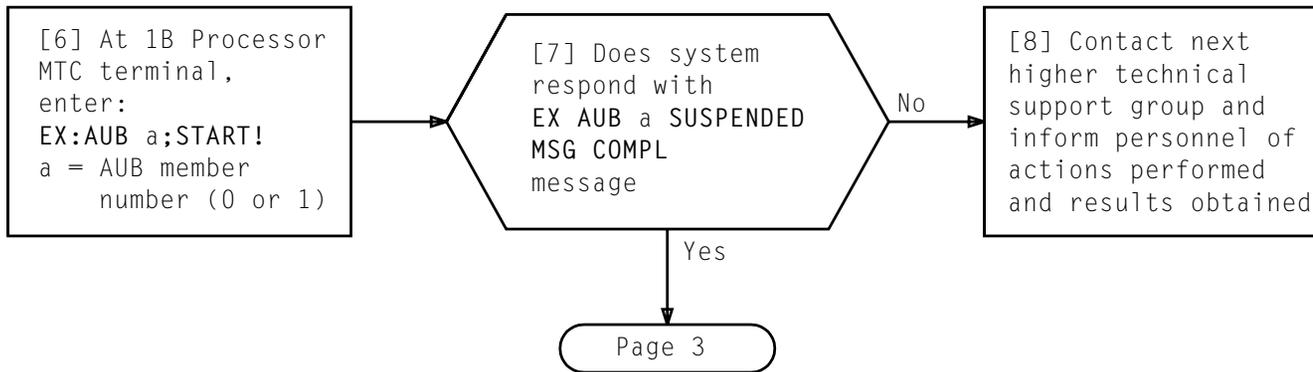
FORM ENTER INPUT MESSAGES USED TO SCOPE AUB USING
PHASE 99 DIAGNOSTIC TESTS

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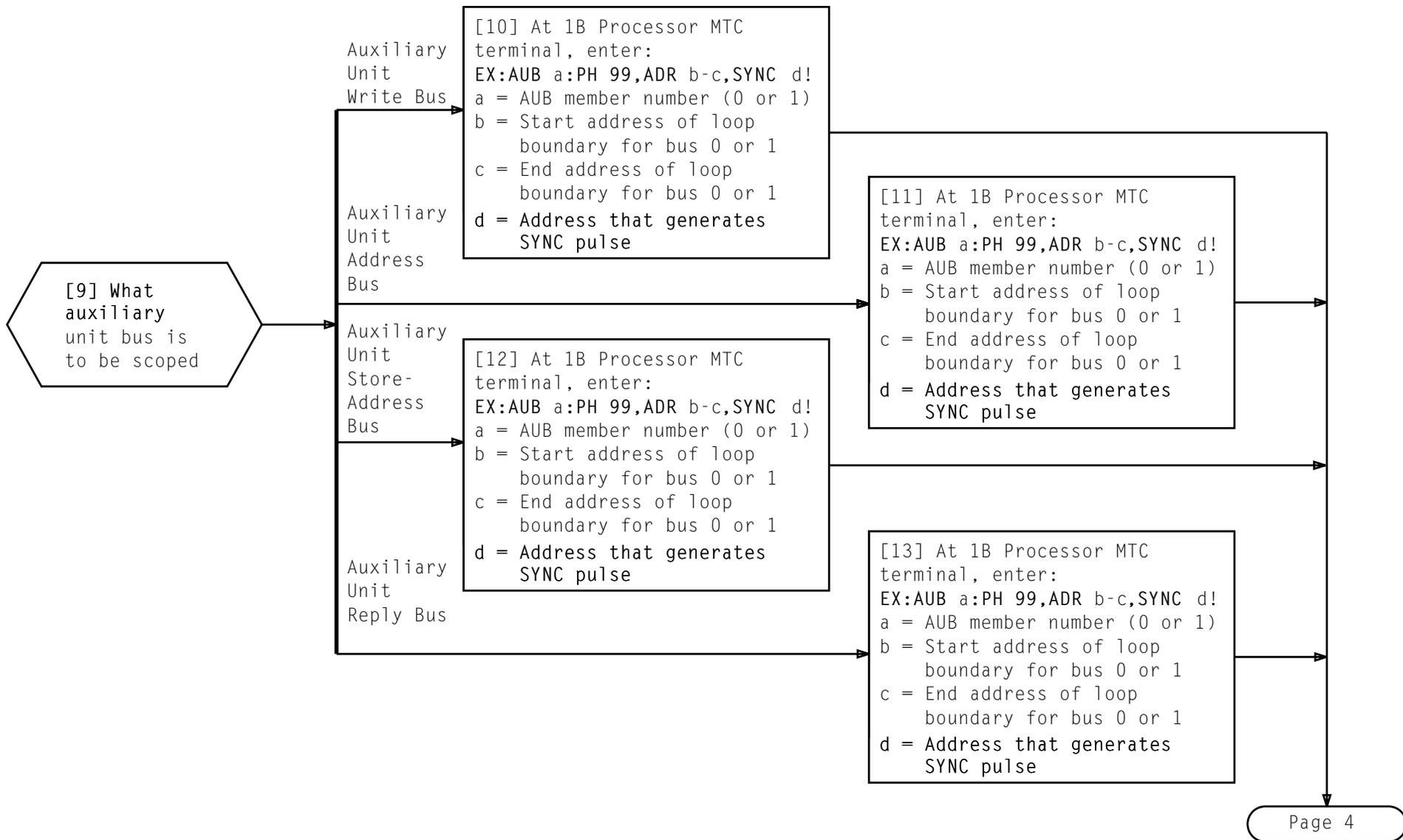
ENTER EXECUTE MESSAGES FOR LOOPING ON SPECIFIED AUXILIARY UNIT BUS (AUB)

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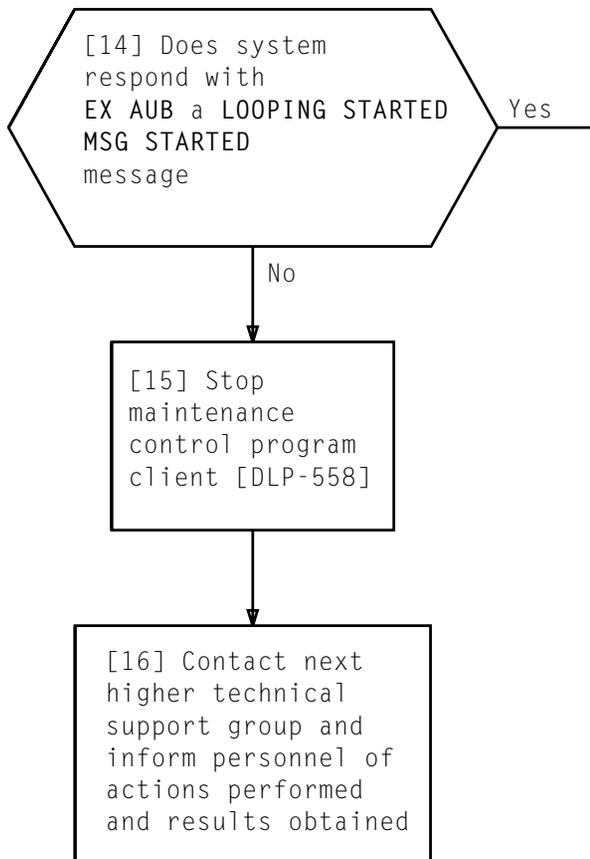
ENTER EXECUTE MESSAGES FOR LOOPING ON SPECIFIED AUXILIARY UNIT BUS (AUB)

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ENTER EXECUTE MESSAGES FOR LOOPING ON SPECIFIED AUXILIARY UNIT BUS (AUB)

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ENTER EXECUTE MESSAGES FOR LOOPING ON SPECIFIED AUXILIARY UNIT BUS (AUB)

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[1] At API frame where AUB write bus terminates, locate connectors containing BTRs on applicable API unit (0 or 1) at position XXX-253 [Figure 1, Page 2]

[2] Connect bus scoping tool to BTR on applicable API unit (0 or 1) [Figure 2, Page 3]

[3] Connect one X10 probe to channel 1 of oscilloscope and positive (P) pin of bus scoping tool [Figure 2, Page 3]

[4] Connect another X10 probe to channel 2 of oscilloscope; wrap channel 2 probe lead around channel 1 probe lead and connect to negative (N) pin of bus scoping tool [Figure 2, Page 3]

[5] Attach oscilloscope channel 1 and channel 2 probe ground leads together

[6] Review usage of bus scoping tool [DLP-564]

[7] Set bus scoping tool selector to position 0

AND

[8] Is oscilloscope set up for scoping AUB

Yes

Page 4

No

[9] Set up storage oscilloscope for scoping AUB [DLP-551]

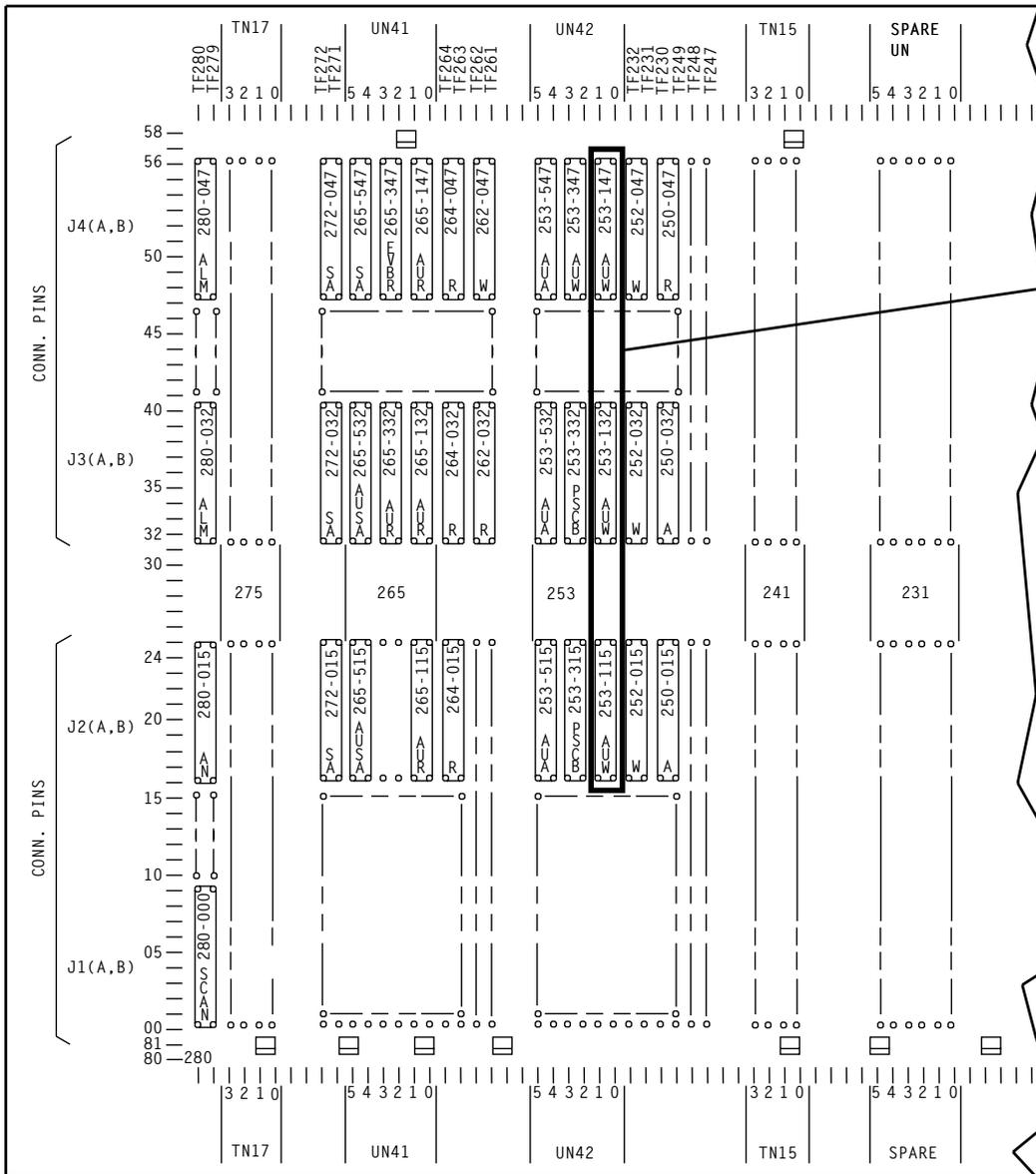
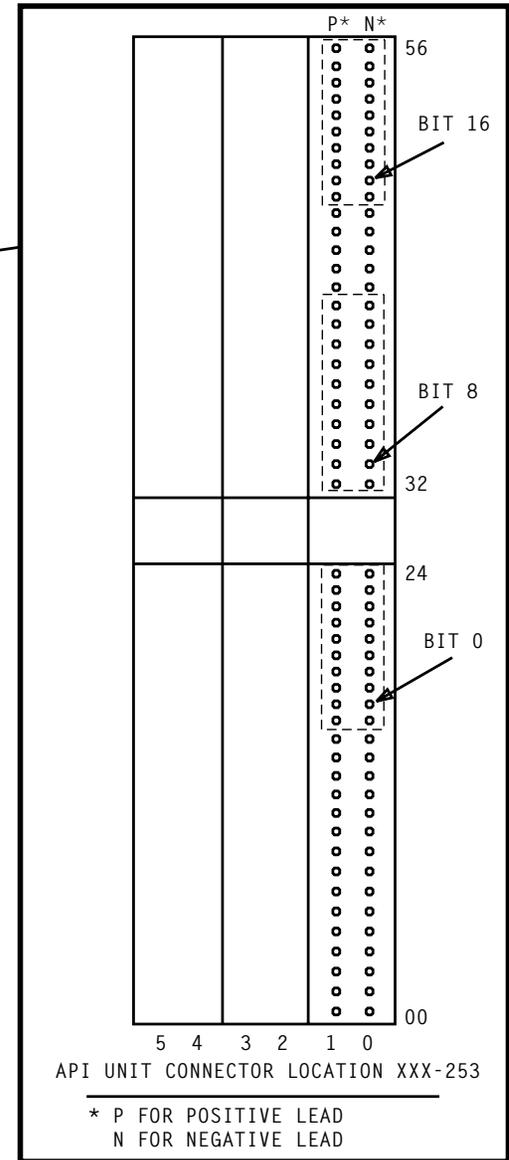


Figure 1 - Example of API Unit (0 or 1) Connector Layout Showing AUB 0 or 1 Write Bus Bits 0 to 23



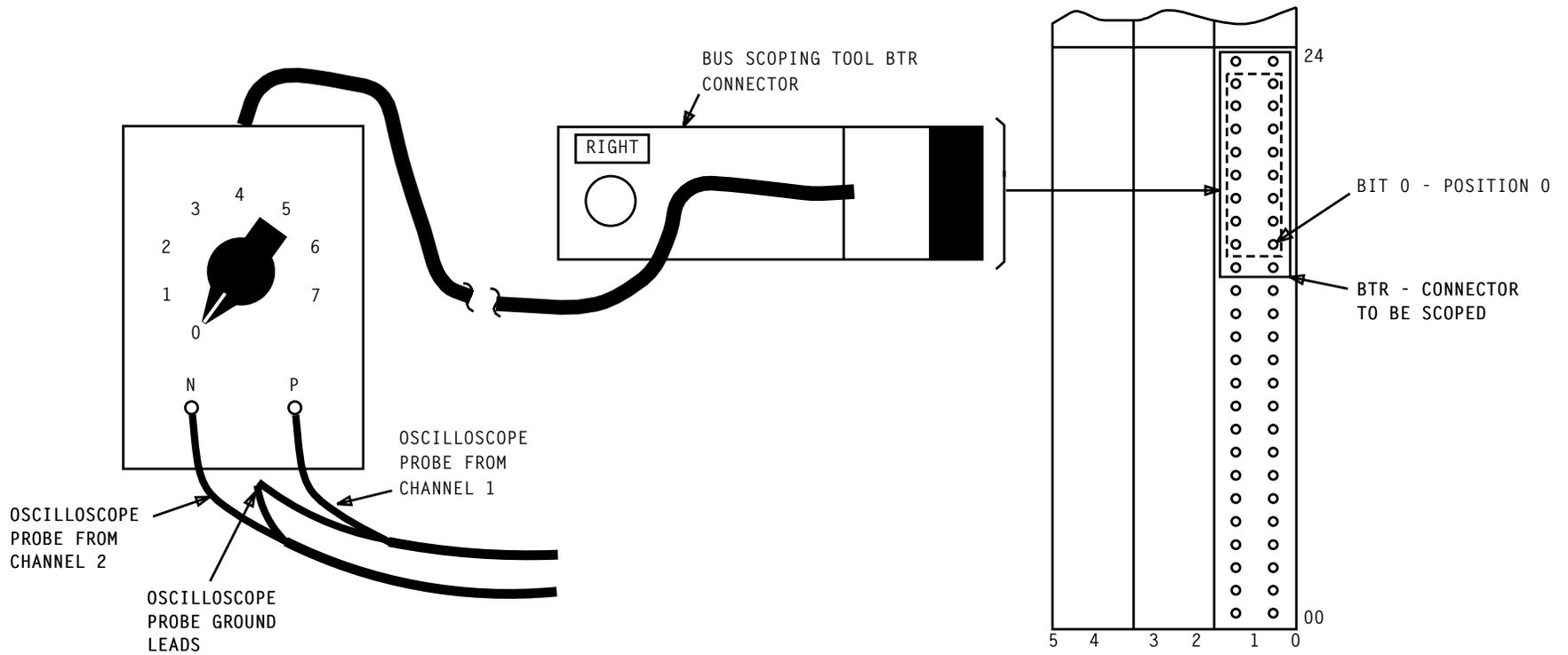


Figure 2 - Bus Scoping Tool, Oscilloscope Probes and BTR Connections for Scoping Auxiliary Unit Bus (AUB)

SCOPE AUB 0 OR 1 WRITE BUS BITS 0 TO 23

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[10] See NOTE 1. Scope positive and negative pins for bit 0 at connector containing BTR on applicable API unit (0 or 1) (dashed line box) [Figure 1, Page 2]

[11] Observe oscilloscope for correct bit pattern [TABLE A] and note any discrepancies [Figure 3]

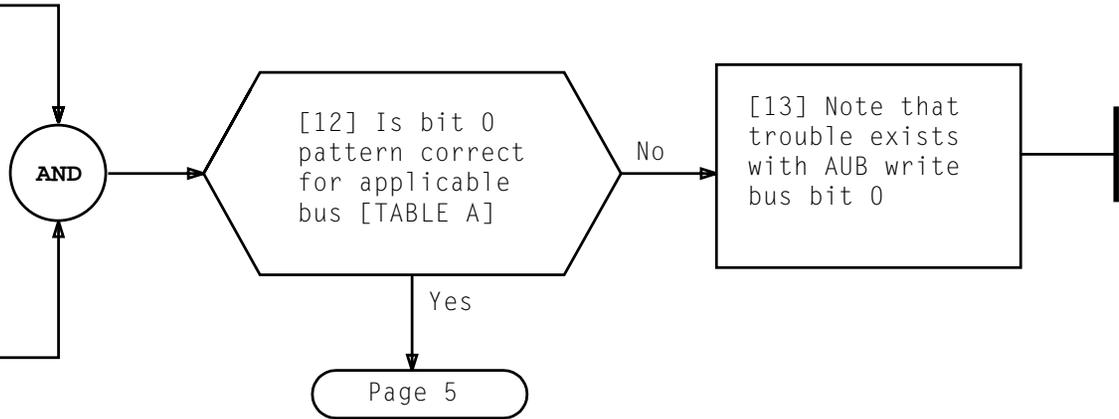


TABLE A AUB 0 OR 1 WRITE BUS BITS 0 TO 23 BIT PATTERNS					
BIT	BIT PATTERN		BIT	BIT PATTERN	
	BUS 0	BUS 1		BUS 0	BUS 1
0	01000000	00000001	12	01001100	00011001
1	01000001	00000011	13	01001101	00011011
2	01000010	00000101	14	01001110	00011101
3	01000011	00000111	15	01001111	00011111
4	01000100	00001001	16	01010000	00100001
5	01000101	00001011	17	01010001	00100011
6	01000110	00001101	18	01010010	00100101
7	01000111	00001111	19	01010011	00100111
8	01001000	00010001	20	01010100	00101001
9	01001001	00010011	21	01010101	00101011
10	01001010	00010101	22	01010110	00101101
11	01001011	00010111	23	01010111	00101111

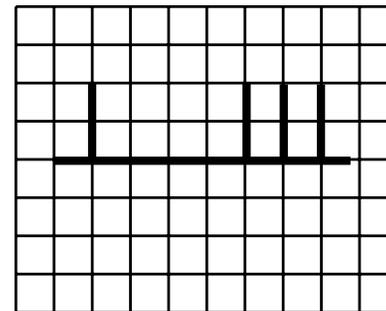
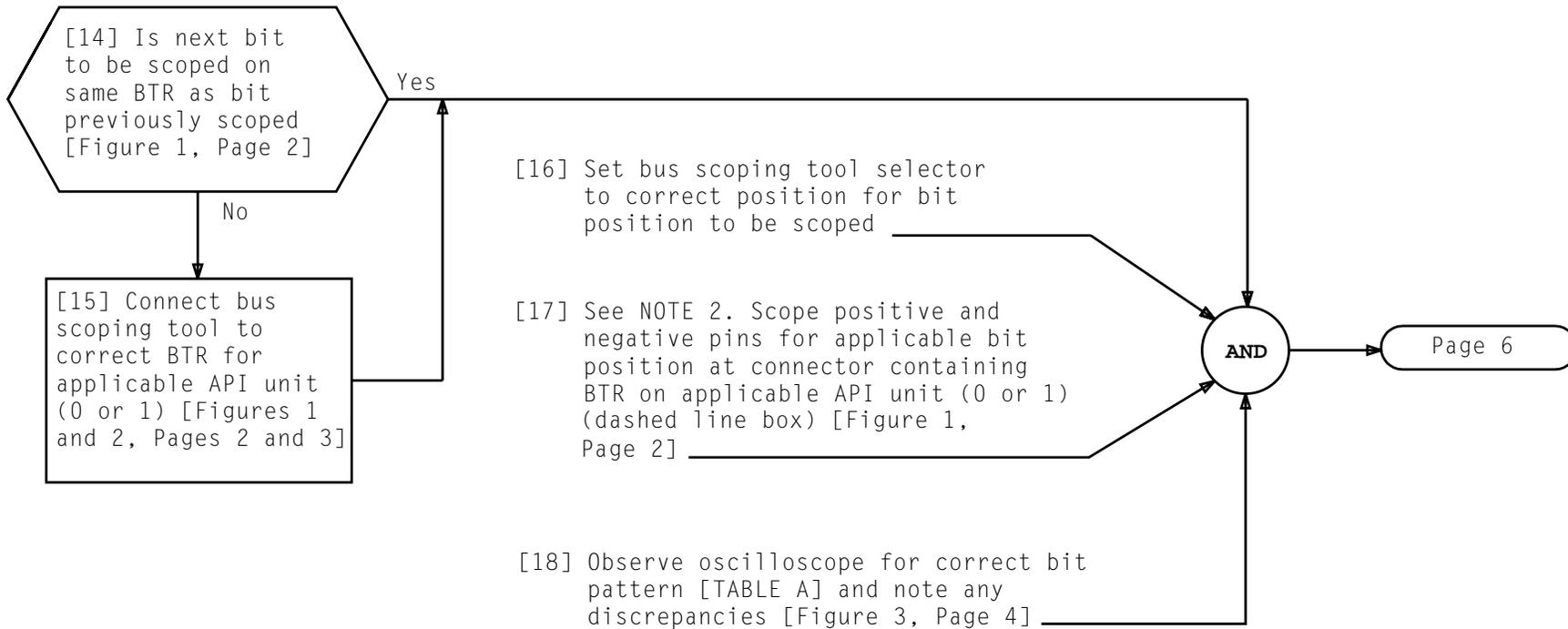
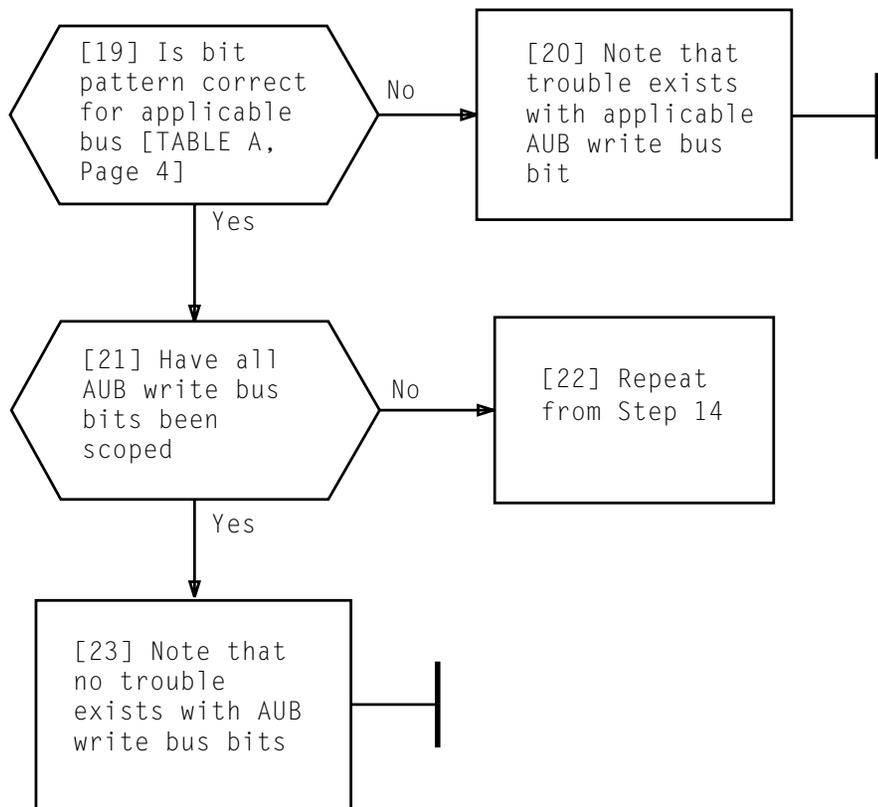


Figure 3 - Example of Typical AUB Bit Pattern

NOTE 1 Oscilloscope CURSORS may need to be adjusted to observe bit pattern	
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NOTE 2	
Oscilloscope CURSORS may need to be adjusted to observe bit pattern	
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SCOPE AUB 0 OR 1 WRITE BUS BITS 0 TO 23

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[1] At API frame where AUB address bus terminates, locate connectors containing BTRs on applicable API unit (0 or 1) at position XXX-253 [Figure 1, Page 2]

[2] Connect bus scoping tool to BTR on applicable API unit (0 or 1) [Figure 2, Page 3]

[3] Connect one X10 probe to channel 1 of oscilloscope and positive (P) pin of bus scoping tool [Figure 2, Page 3]

[4] Connect another X10 probe to channel 2 of oscilloscope; wrap channel 2 probe lead around channel 1 probe lead and connect to negative (N) pin of bus scoping tool [Figure 2, Page 3]

[5] Attach oscilloscope channel 1 and channel 2 probe ground leads together

[6] Review usage of bus scoping tool [DLP-564]

[7] Set bus scoping tool selector to position 0

AND

[8] Is oscilloscope set up for scoping AUB

Yes

Page 4

No

[9] Set up storage oscilloscope for scoping AUB [DLP-551]

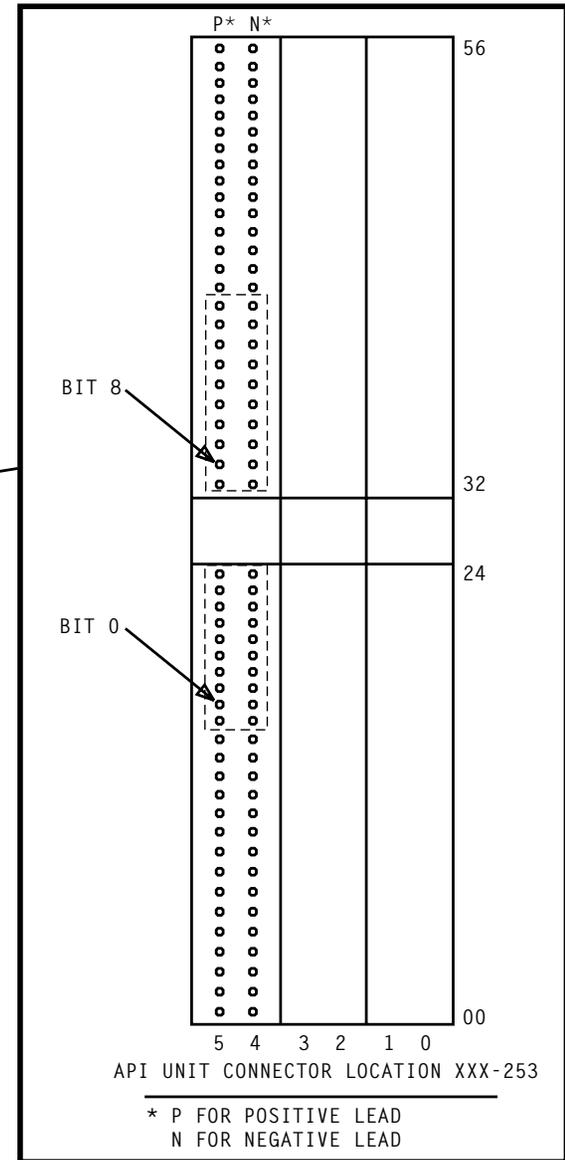
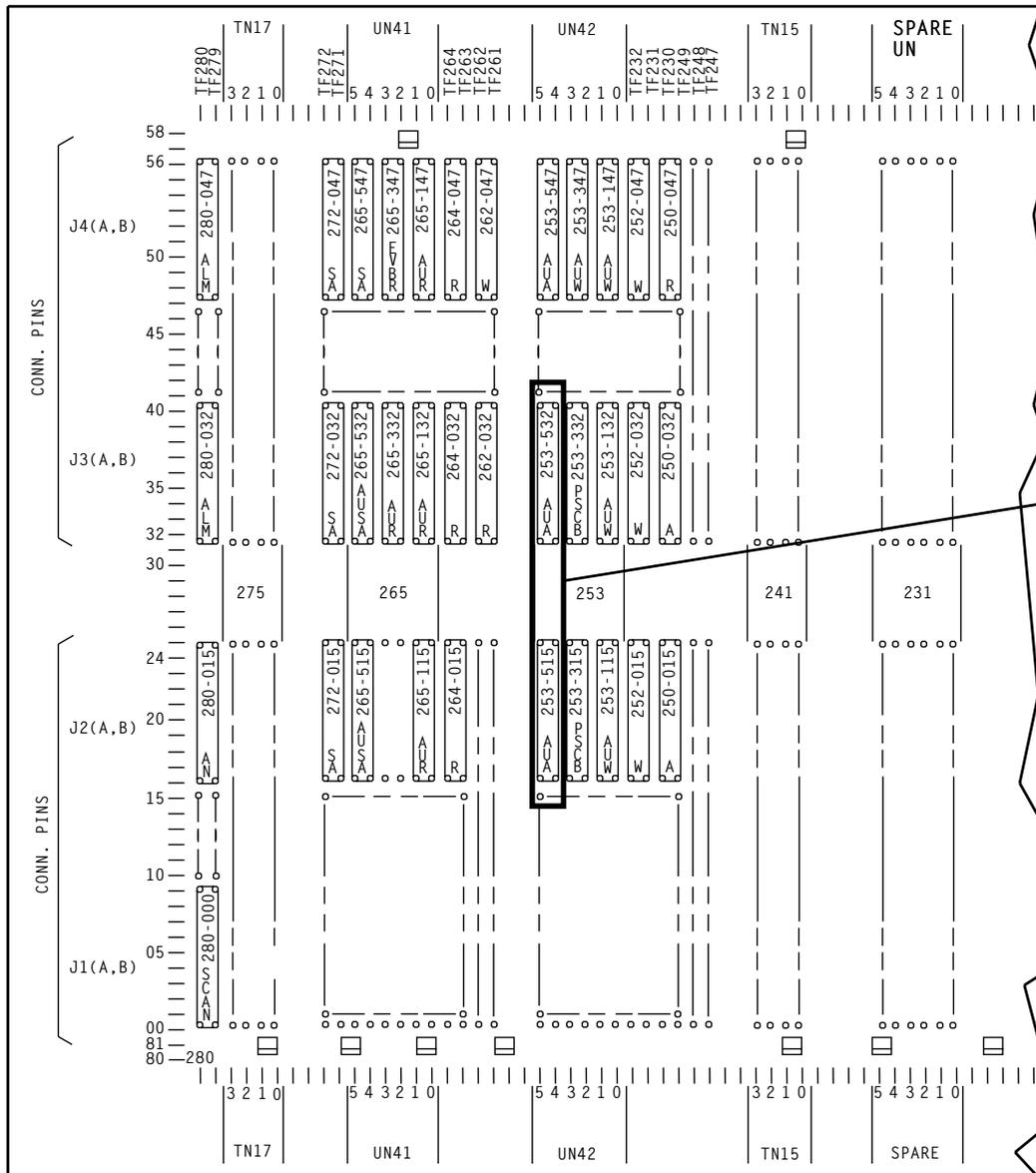


Figure 1 - Example of API Unit (0 or 1) Connector Layout Showing AUB 0 or 1 Address Bus Bits 0 to 15

SCOPE AUB 0 OR 1 ADDRESS BUS BITS 0 TO 15

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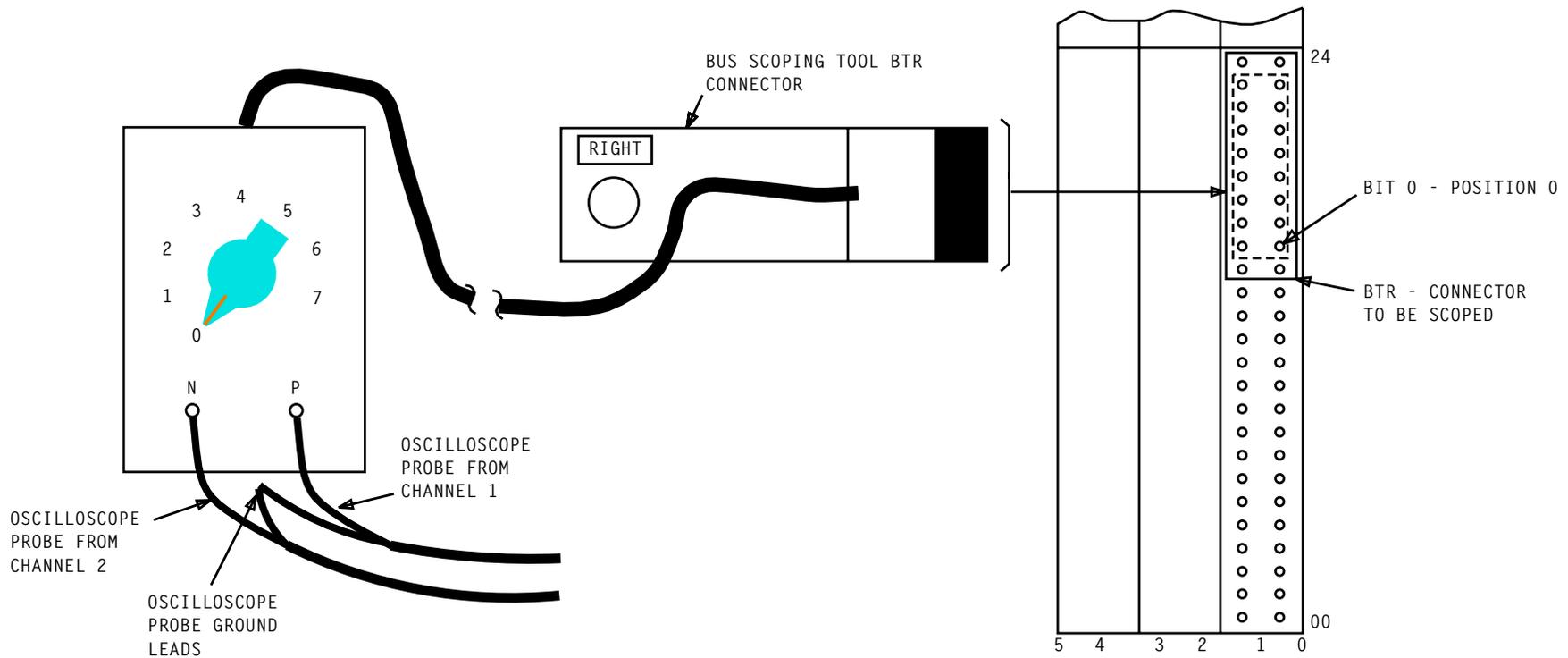


Figure 2 - Bus Scoping Tool, Oscilloscope Probes and BTR Connections for Scoping Auxiliary Unit Bus (AUB)

SCOPE AUB 0 OR 1 ADDRESS BUS BITS 0 TO 15

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[10] See NOTE 1. Scope positive and negative pins for bit 0 at connector containing BTR on applicable API unit (0 or 1) (dashed line box) [Figure 1, Page 2]

[11] Observe oscilloscope for correct bit pattern [TABLE A] and note any discrepancies [Figure 3]

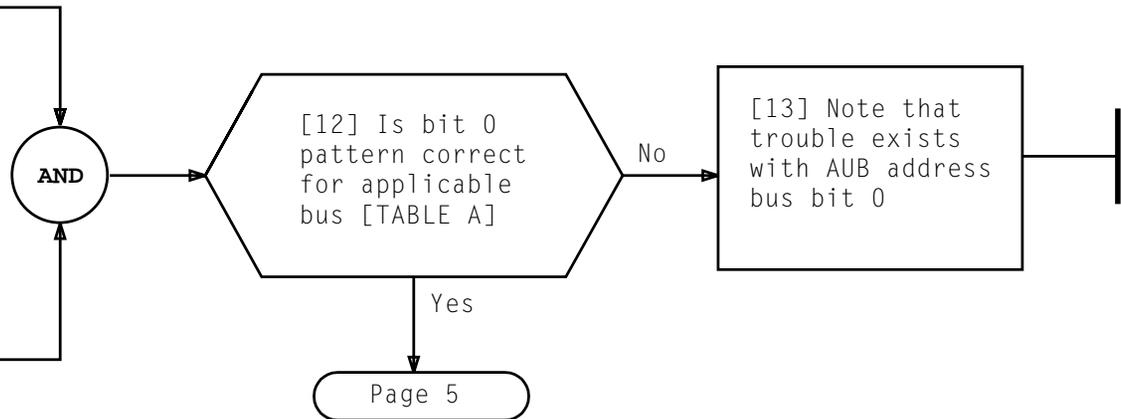


TABLE A AUB 0 OR 1 ADDRESS BUS BITS 0 TO 15 BIT PATTERNS		
BIT	BIT PATTERN	
	BUS 0	BUS 1
0	01000000	00000001
1	01000001	00000011
2	01000010	00000101
3	01000011	00000111
4	01000100	00001001
5	01000101	00001011
6	01000110	00001101
7	01000111	00001111
8	01001000	00010001
9	01001001	00010011
10	01001010	00010101
11	01001011	00010111
12	01001100	00011001
13	01001101	00011011
14	01001110	00011101
15	01001111	00011111

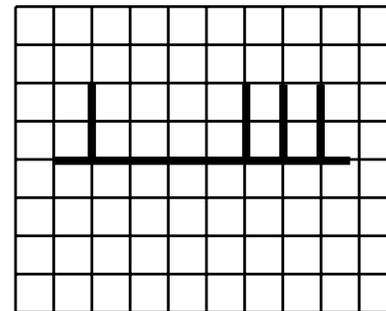
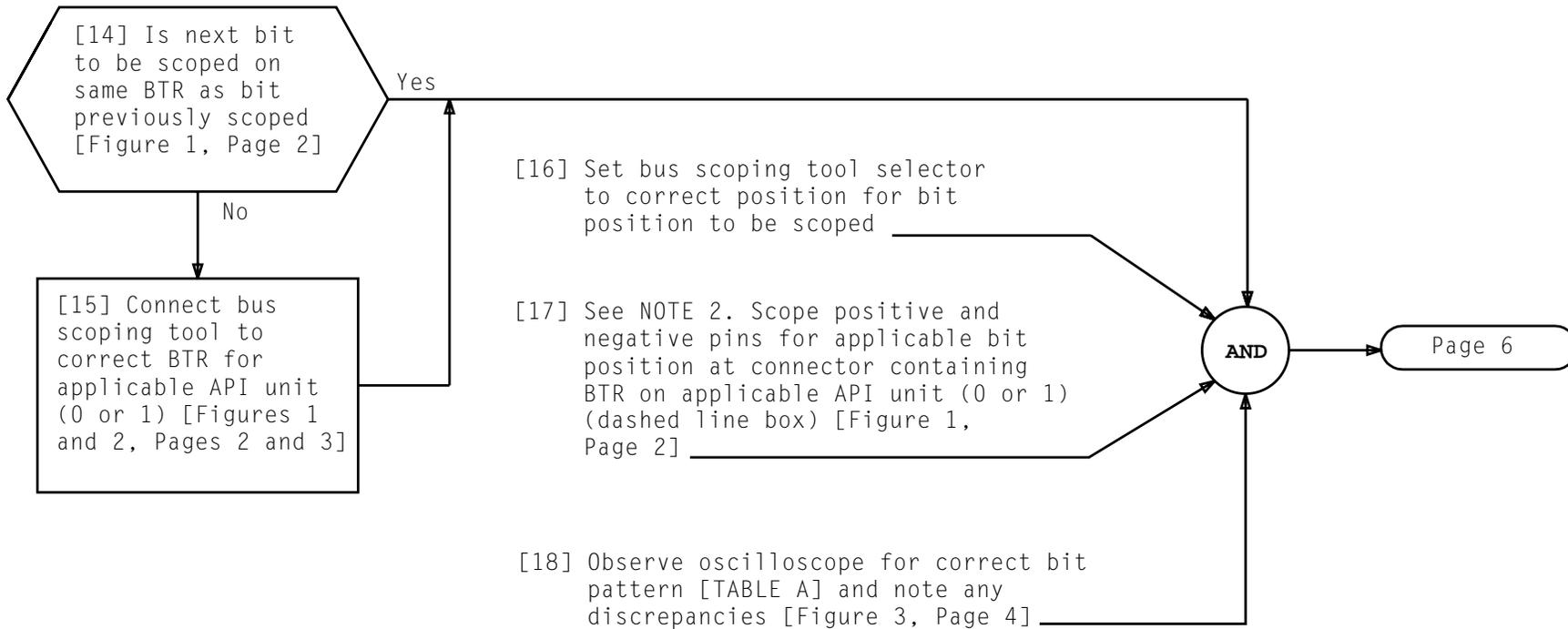
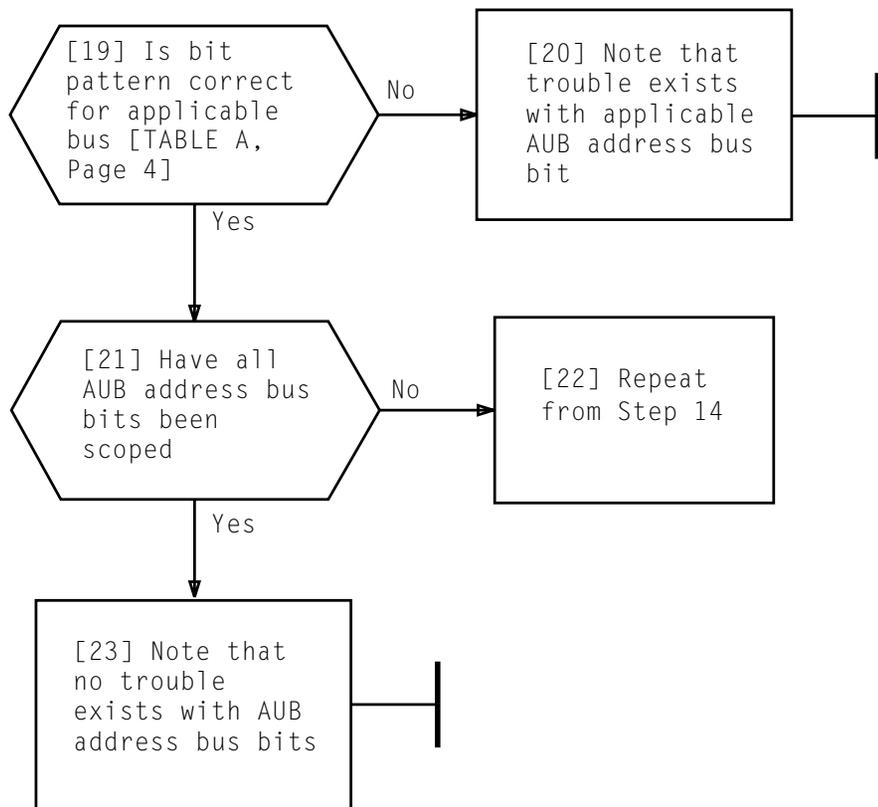


Figure 3 - Example of Typical AUB Bit Pattern

NOTE 1 Oscilloscope CURSORS may need to be adjusted to observe bit pattern	
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NOTE 2	
Oscilloscope CURSORS may need to be adjusted to observe bit pattern	
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SCOPE AUB 0 OR 1 ADDRESS BUS BITS 0 TO 15

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[1] At API frame where AUB store address bus terminates, locate connectors containing BTRs on applicable API unit (0 or 1) at position XXX-265 [Figure 1, Page 2]

[2] Connect bus scoping tool to BTR on applicable API unit (0 or 1) [Figure 2, Page 3]

[3] Connect one X10 probe to channel 1 of oscilloscope and positive (P) pin of bus scoping tool [Figure 2, Page 3]

[4] Connect another X10 probe to channel 2 of oscilloscope; wrap channel 2 probe lead around channel 1 probe lead and connect to negative (N) pin of bus scoping tool [Figure 2, Page 3]

[5] Attach oscilloscope channel 1 and channel 2 probe ground leads together

[6] Review usage of bus scoping tool [DLP-564]

[7] Set bus scoping tool selector to position 0

AND

[8] Is oscilloscope set up for scoping AUB

Yes

Page 4

No

[9] Set up storage oscilloscope for scoping AUB [DLP-551]

SCOPE AUB 0 OR 1 STORE ADDRESS BUS BITS 0 TO 21

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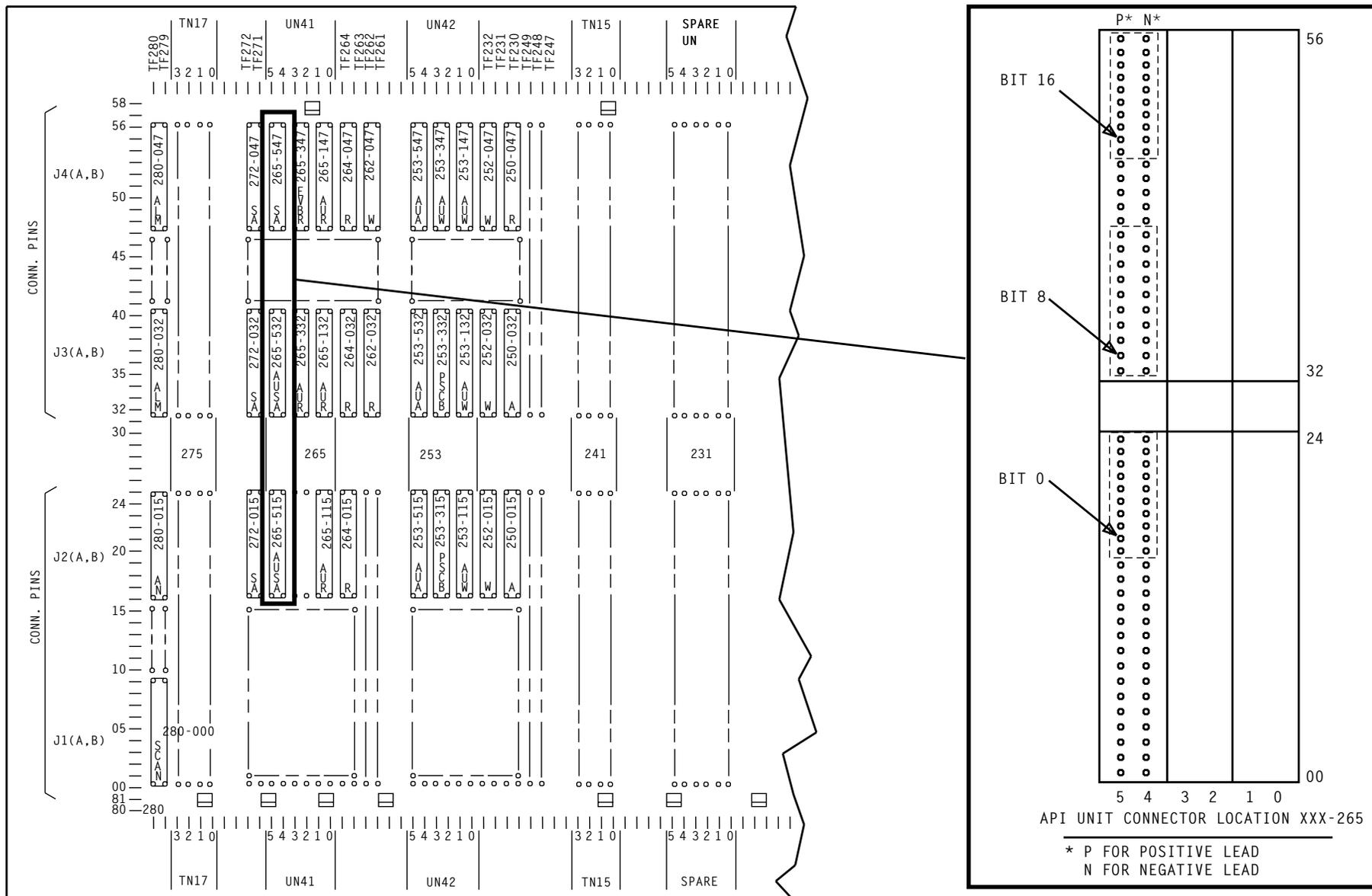


Figure 1 - Example of API Unit (0 or 1) Connector Layout Showing AUB 0 or 1 Store Address Bus Bits 0 to 21

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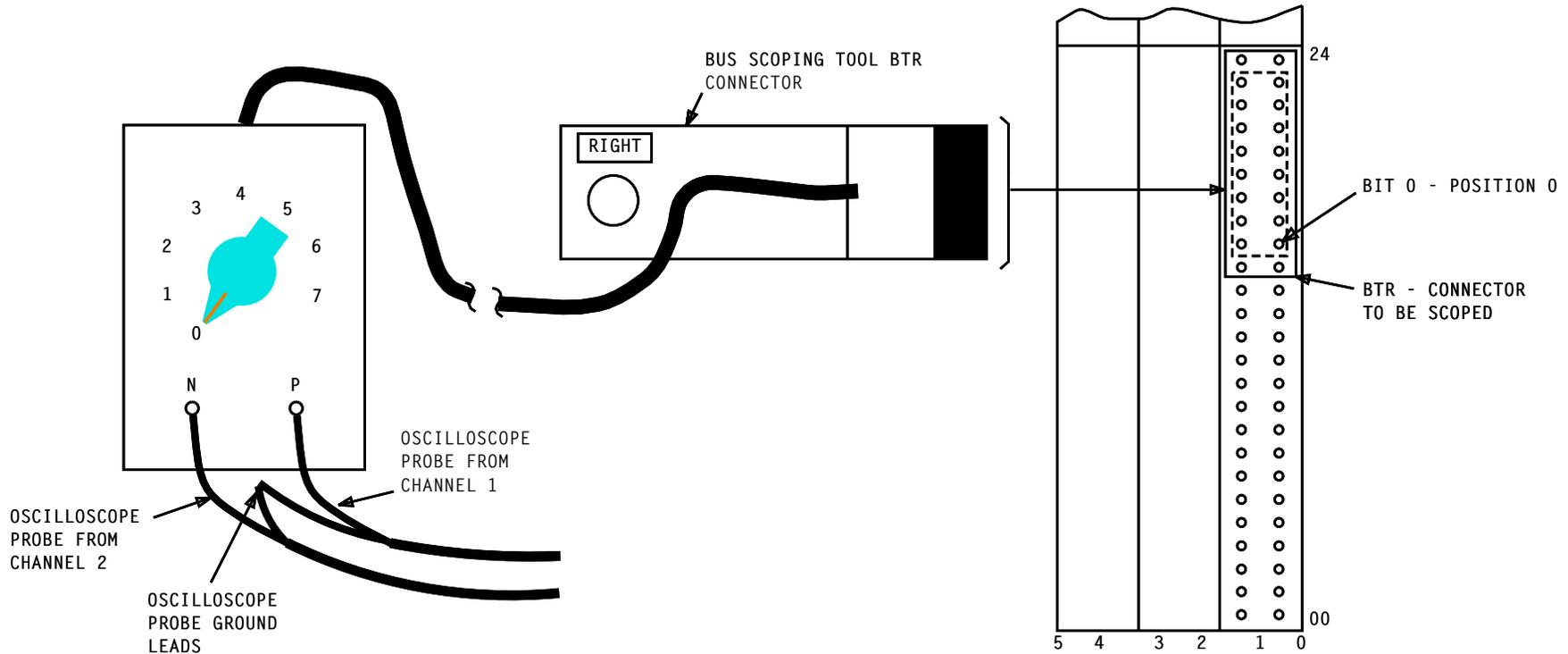


Figure 2 - Bus Scoping Tool, Oscilloscope Probes and BTR Connections for Scoping Auxiliary Unit Bus (AUB)

SCOPE AUB 0 OR 1 STORE ADDRESS BUS BITS 0 TO 21

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[10] At oscilloscope, set **HORIZONTAL - A AND B**
SEC/DIV to 50µs

[11] See NOTE 1. Scope positive and negative pins for bit 0 at connector containing BTR on applicable API unit (0 or 1) (dashed line box) [Figure 1, Page 2]

[12] Observe oscilloscope for correct bit pattern [TABLE A] and note any discrepancies [Figure 3]

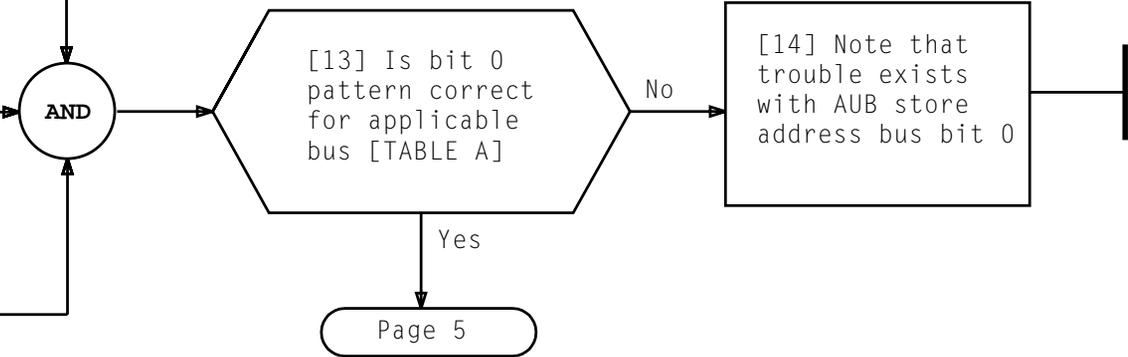


TABLE A AUB 0 OR 1 STORE ADDRESS BUS BITS 0 TO 21 BIT PATTERNS					
BIT	BIT PATTERN		BIT	BIT PATTERN	
	BUS 0	BUS 1		BUS 0	BUS 1
0	01000000	00000001	12	01001100	00011001
1	01000001	00000011	13	01001101	00011011
2	01000010	00000101	14	01001110	00011101
3	01000011	00000111	15	01001111	00011111
4	01000100	00001001	16	01010000	00100001
5	01000101	00001011	17	01010001	00100011
6	01000110	00001101	18	01010010	00100101
7	01000111	00001111	19	01010011	00100111
8	01001000	00010001	20	01010100	00101001
9	01001001	00010011	21	01010101	00101011
10	01001010	00010101			
11	01001011	00010111			

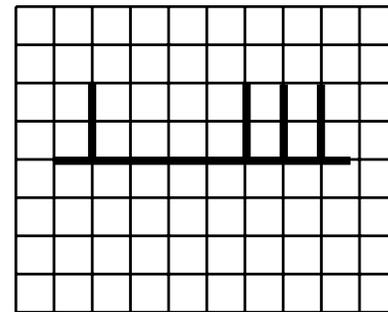
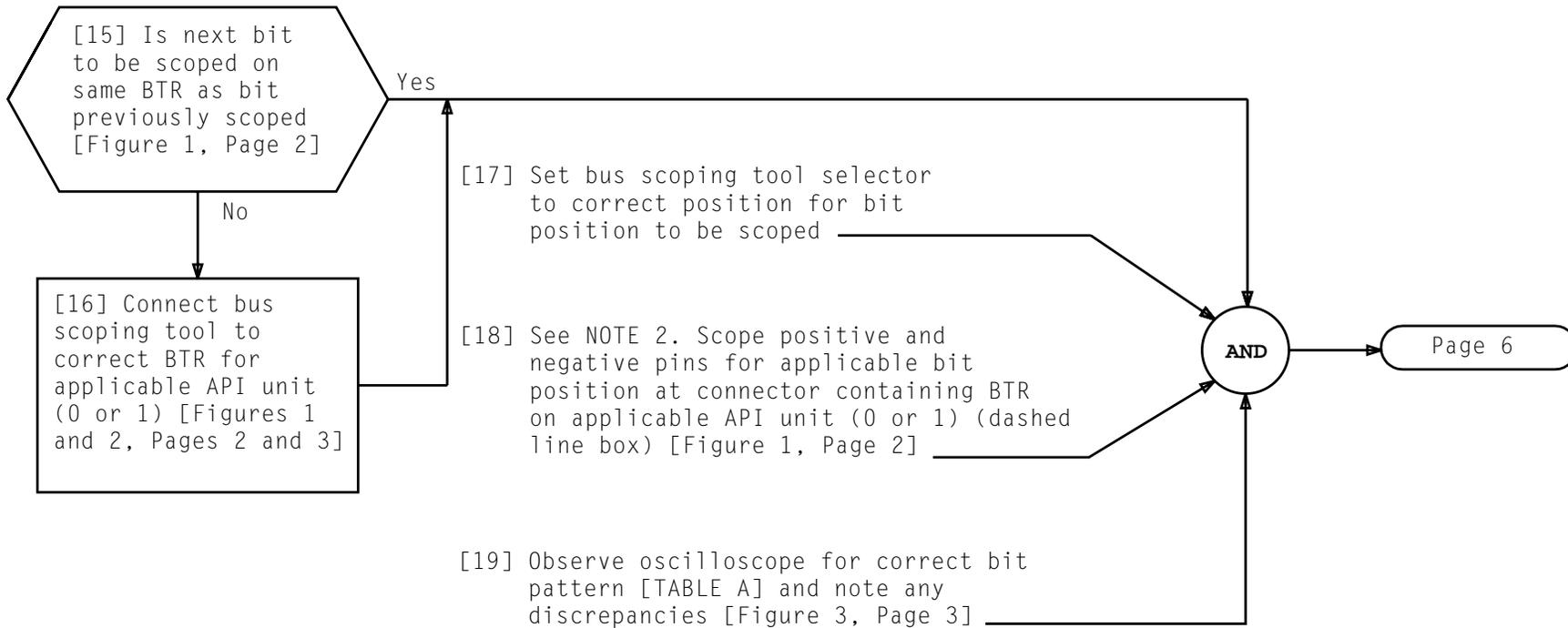


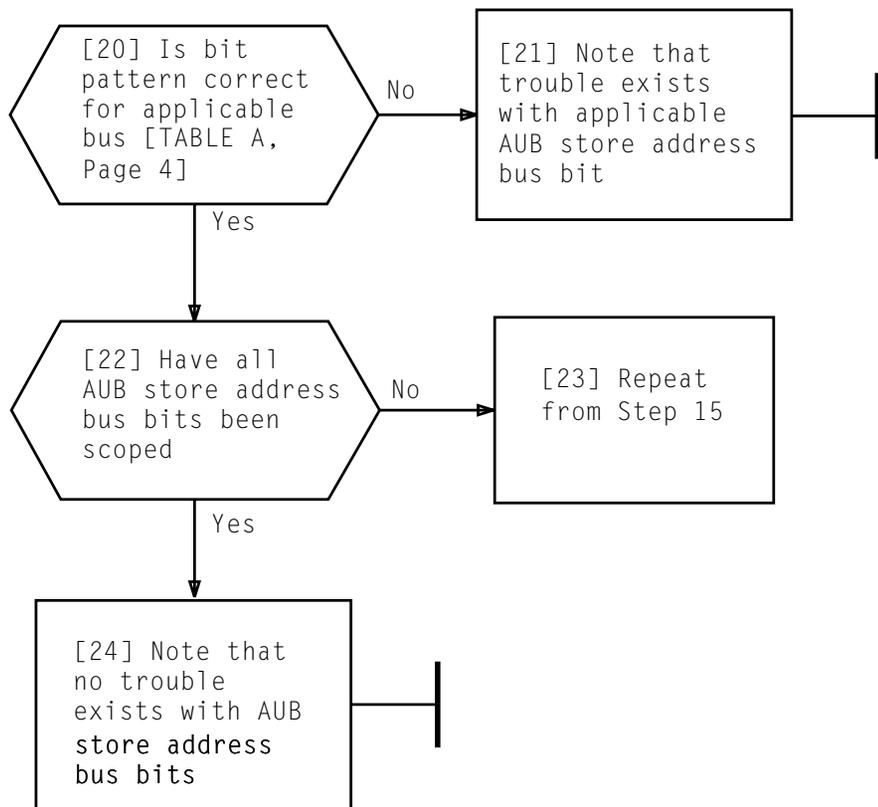
Figure 3 - Example of Typical AUB Bit Pattern

NOTE 1
 Oscilloscope **CURSORS** may need to be adjusted to observe bit pattern

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NOTE 1 Oscilloscope CURSORS may need to be adjusted to observe bit pattern	
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SCOPE AUB 0 OR 1 STORE ADDRESS BUS BITS 0 TO 21

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[1] At API frame where AUB reply bus terminates, locate connectors containing BTRs on applicable API unit (0 or 1) at position XXX-265 [Figure 1, Page 2]

[2] Connect bus scoping tool to BTR on applicable API unit (0 or 1) [Figure 2, Page 3]

[3] Connect one X10 probe to channel 1 of oscilloscope and positive (P) pin of bus scoping tool [Figure 2, Page 3]

[4] Connect another X10 probe to channel 2 of oscilloscope; wrap channel 2 probe lead around channel 1 probe lead and connect to negative (N) pin of bus scoping tool [Figure 2, Page 3]

[5] Attach oscilloscope channel 1 and channel 2 probe ground leads together

[6] Review usage of bus scoping tool [DLP-564]

[7] Set bus scoping tool selector to position 0

AND

[8] Is oscilloscope set up for scoping AUB

Yes

Page 4

No

[9] Set up storage oscilloscope for scoping AUB [DLP-551]

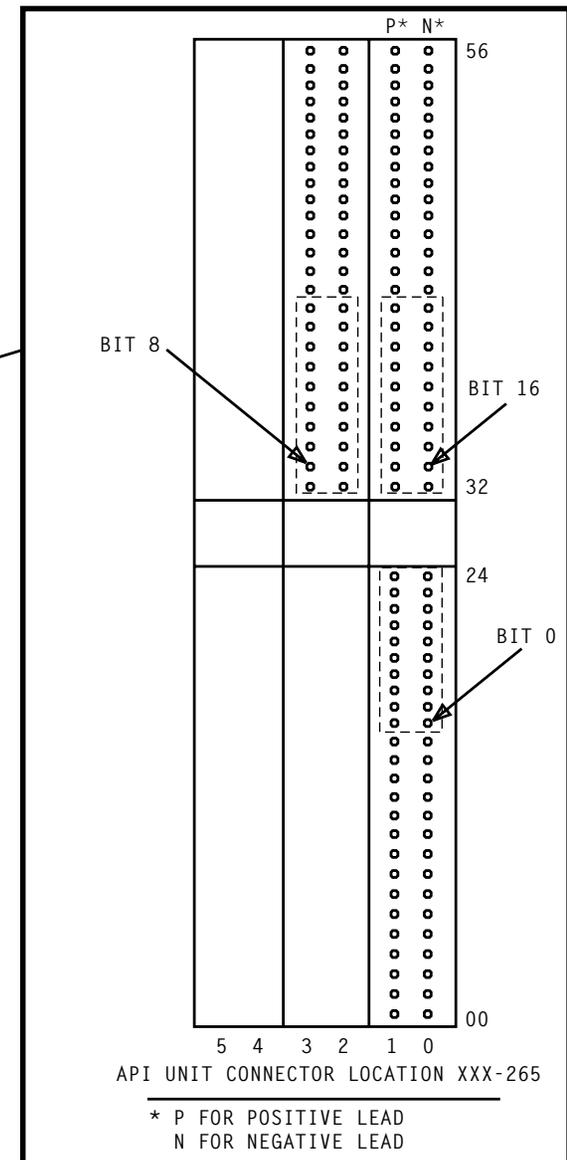
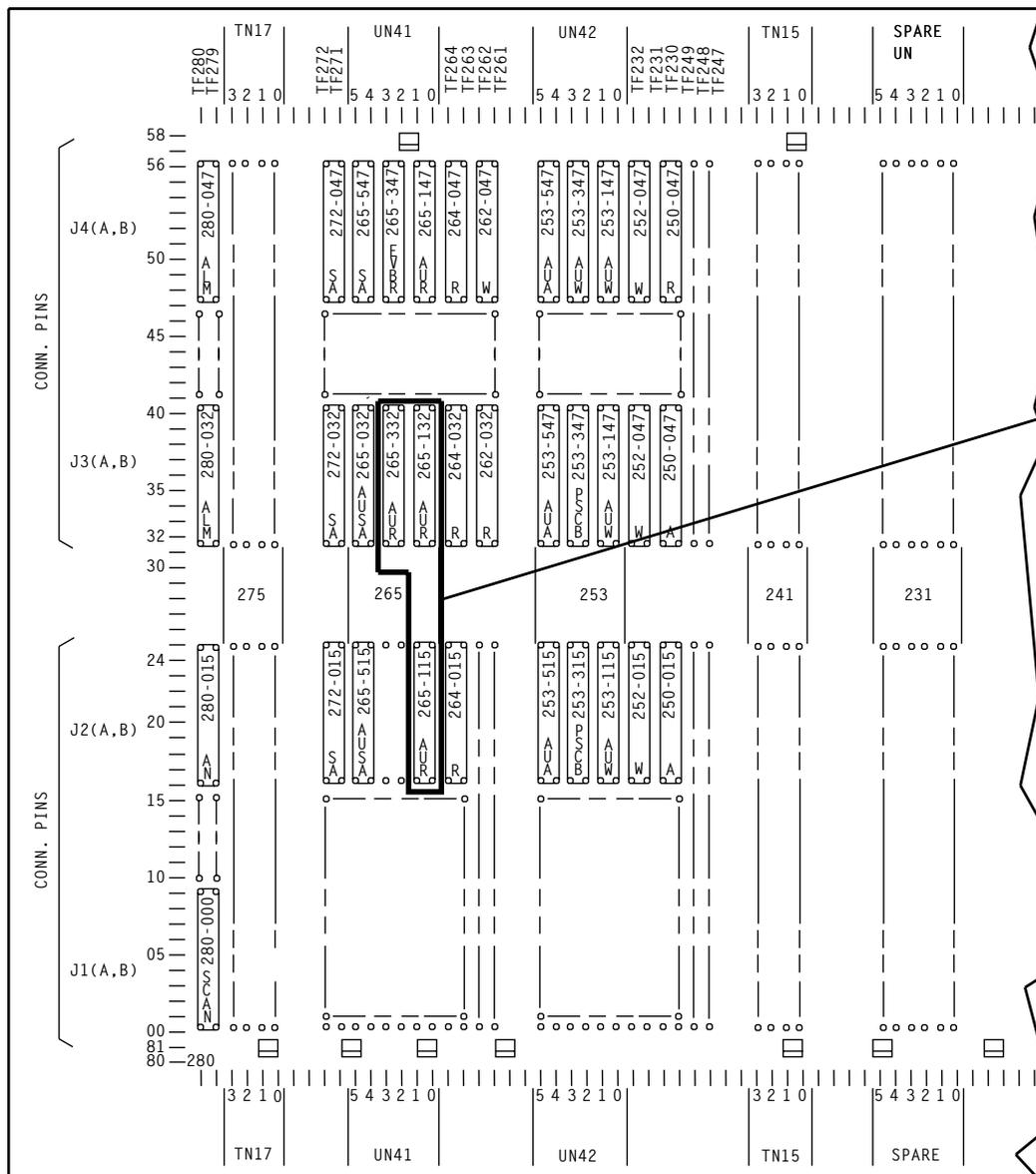


Figure 1 - Example of API Unit (0 or 1) Connector Layout Showing AUB 0 or 1 Reply Bus Bits 0 to 23

SCOPE AUB 0 OR 1 REPLY BUS BITS 0 TO 23

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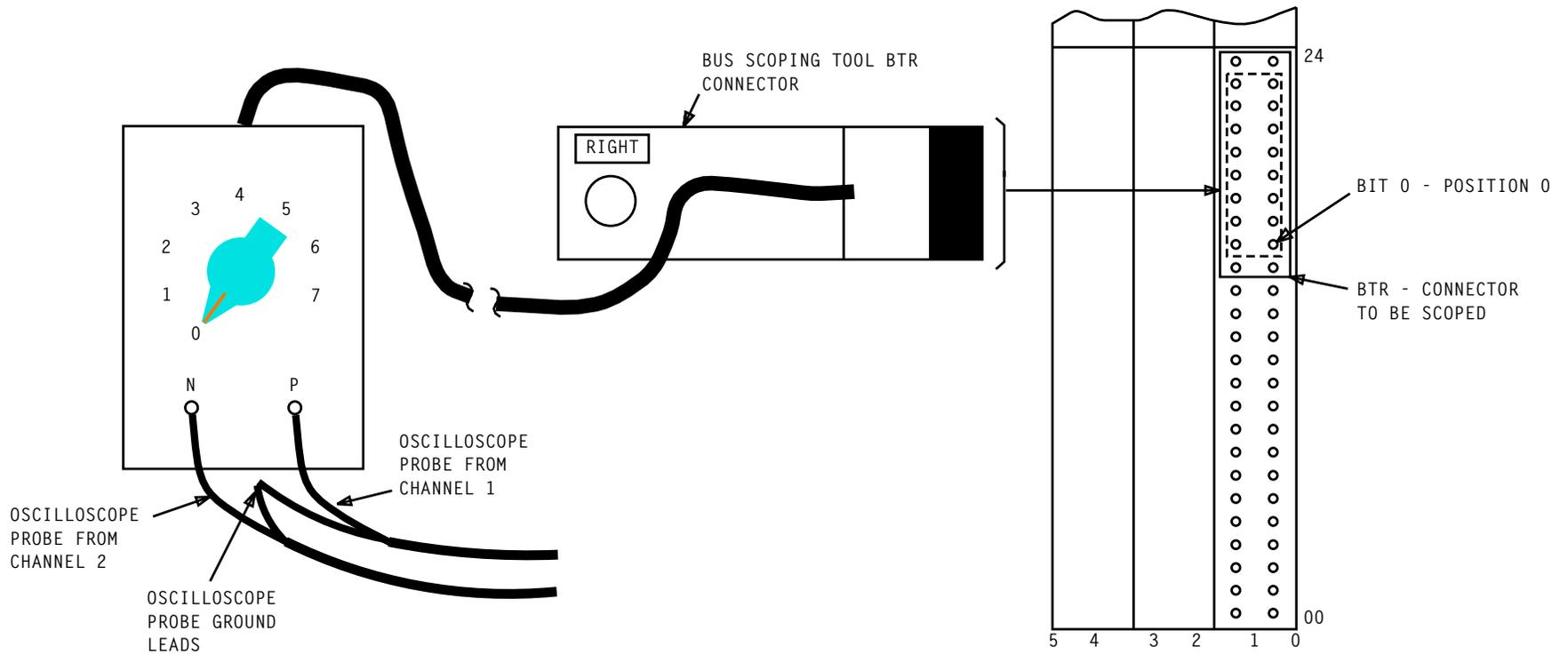


Figure 2 - Bus Scoping Tool, Oscilloscope Probes and BTR Connections for Scoping Auxiliary Unit Bus (AUB)

SCOPE AUB 0 OR 1 REPLY BUS BITS 0 TO 23

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[10] See NOTE 1. Scope positive and negative pins for bit 0 at connector containing BTR on applicable API unit (0 or 1) (dashed line box) [Figure 1, Page 2]

[11] Observe oscilloscope for correct bit pattern [TABLE A] and note any discrepancies [Figure 3]

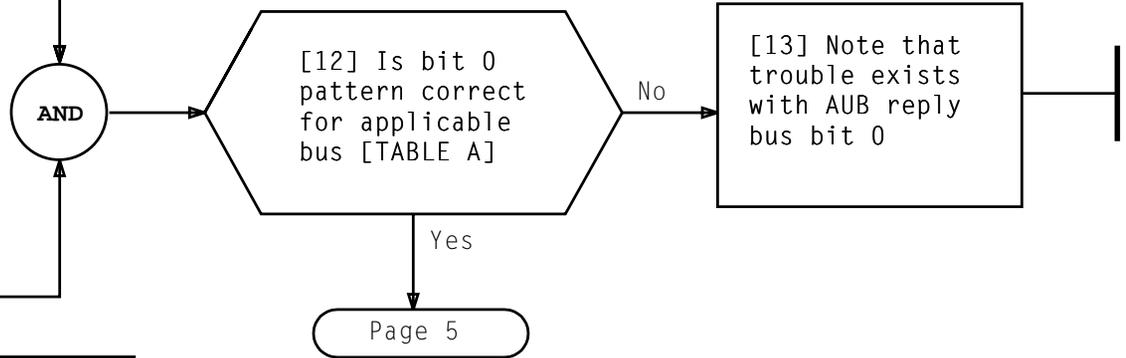


TABLE A AUB 0 OR 1 REPLY BUS BITS 0 TO 23 BIT PATTERNS					
BIT	BIT PATTERN		BIT	BIT PATTERN	
	BUS 0	BUS 1		BUS 0	BUS 1
0	01000000	00000001	12	01001100	00011001
1	01000001	00000011	13	01001101	00011011
2	01000010	00000101	14	01001110	00011101
3	01000011	00000111	15	01001111	00011111
4	01000100	00001001	16	01010000	00100001
5	01000101	00001011	17	01010001	00100011
6	01000110	00001101	18	01010010	00100101
7	01000111	00001111	19	01010011	00100111
8	01001000	00010001	20	01010100	00101001
9	01001001	00010011	21	01010101	00101011
10	01001010	00010101	22	01010110	00101101
11	01001011	00010111	23	01010111	00101111

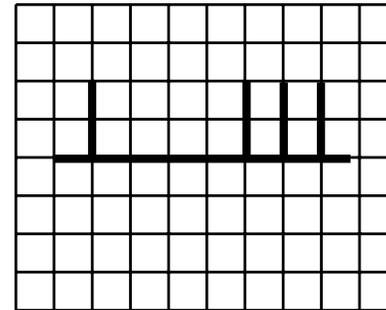
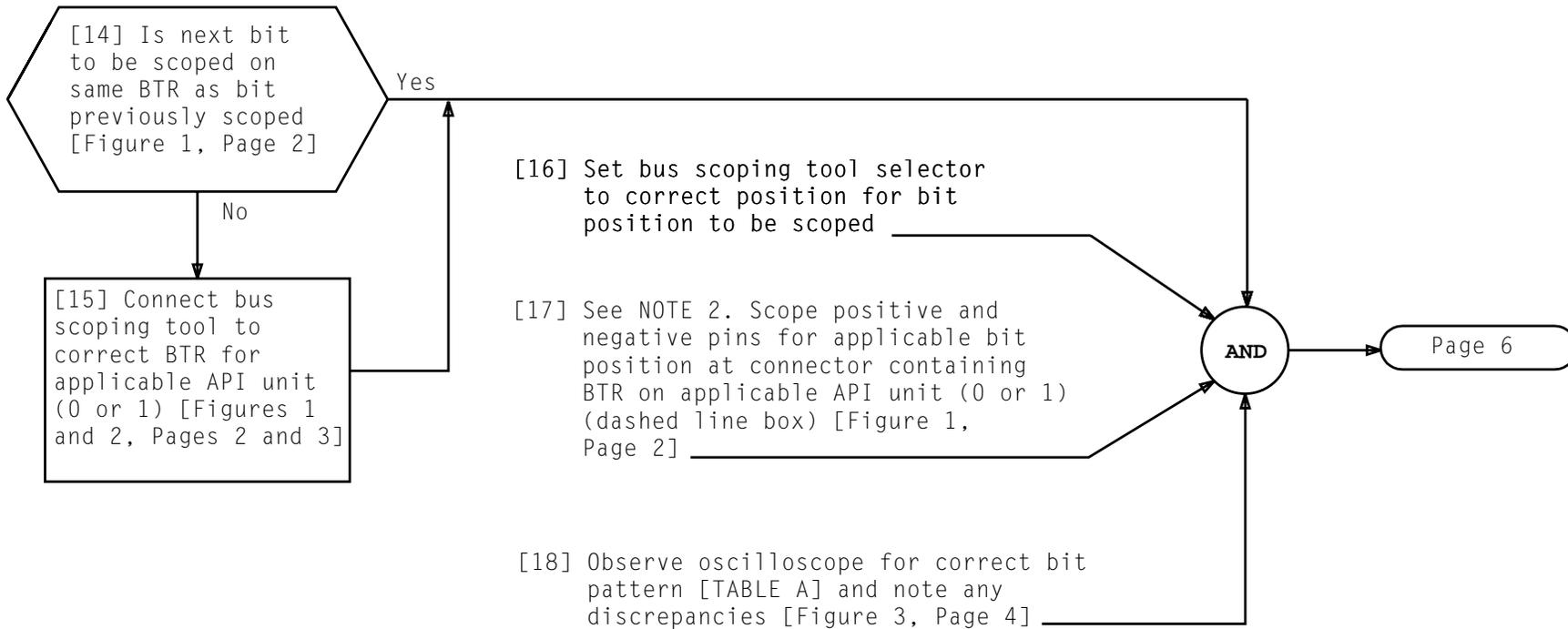
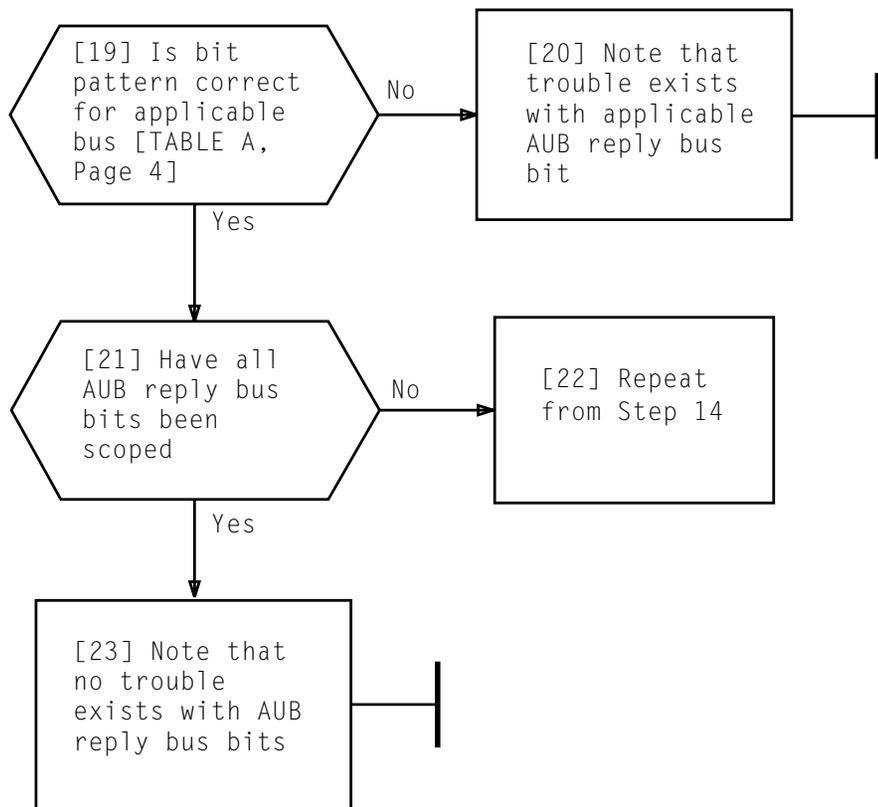


Figure 3 - Example of Typical AUB Bit Pattern

NOTE 1 Oscilloscope CURSORS may need to be adjusted to observe bit pattern	
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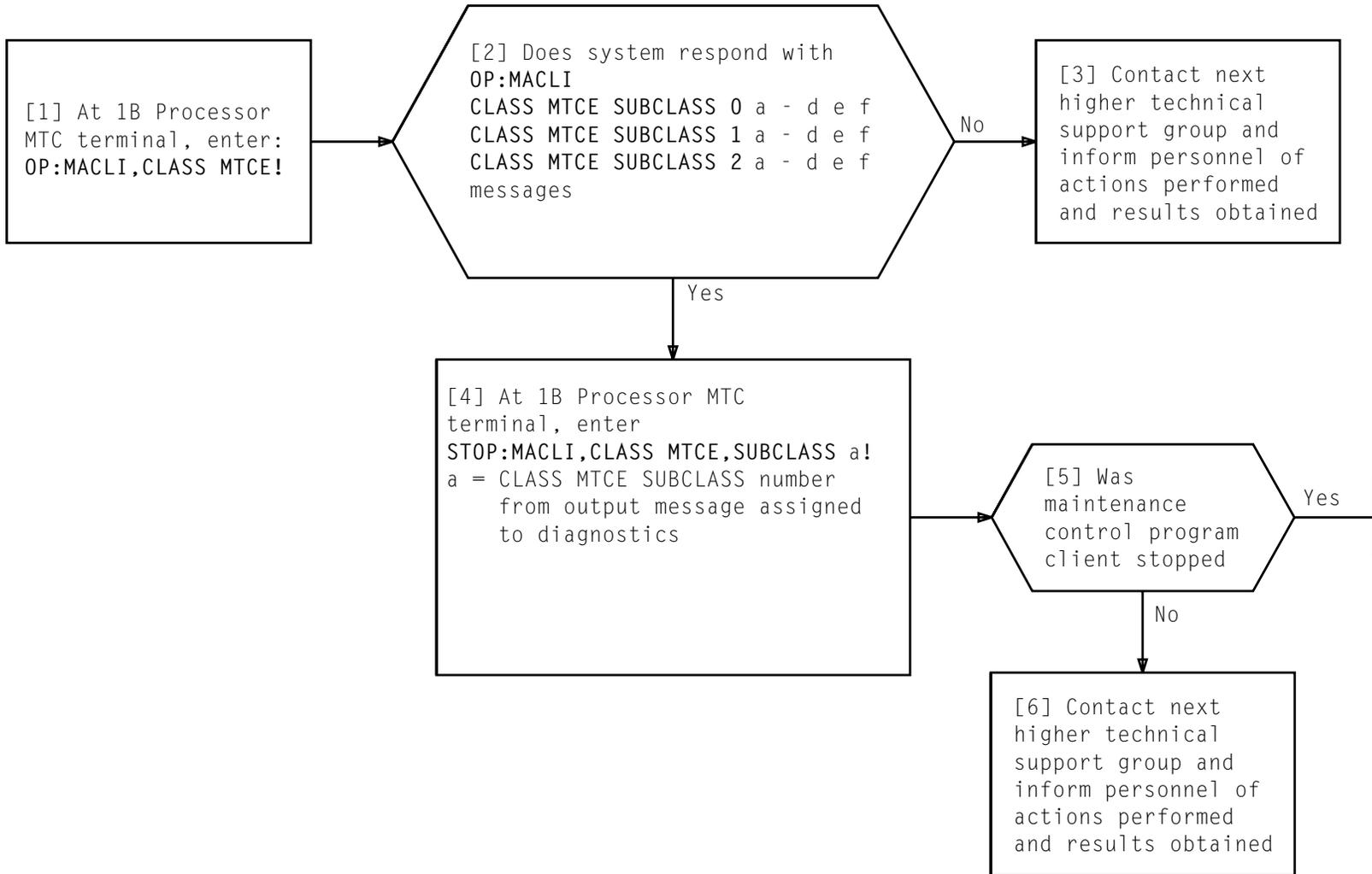


NOTE 2	
Oscilloscope CURSORS may need to be adjusted to observe bit pattern	
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SCOPE AUB 0 OR 1 REPLY BUS BITS 0 TO 23

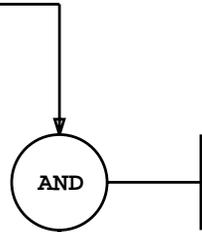
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STOP MAINTENANCE CONTROL PROGRAM CLIENT

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[1] At 1B Processor MTC
terminal, enter
OP:APSTATUS!



[2] Using APS status printout
[Figure 1], determine standby
(SBY) API member number and
record for later use _____

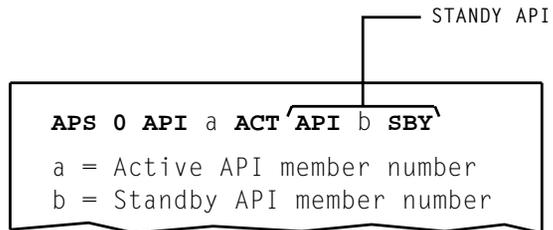


Figure 1 - Sample OP:APSTATUS Printout

DETERMINE STANDBY API

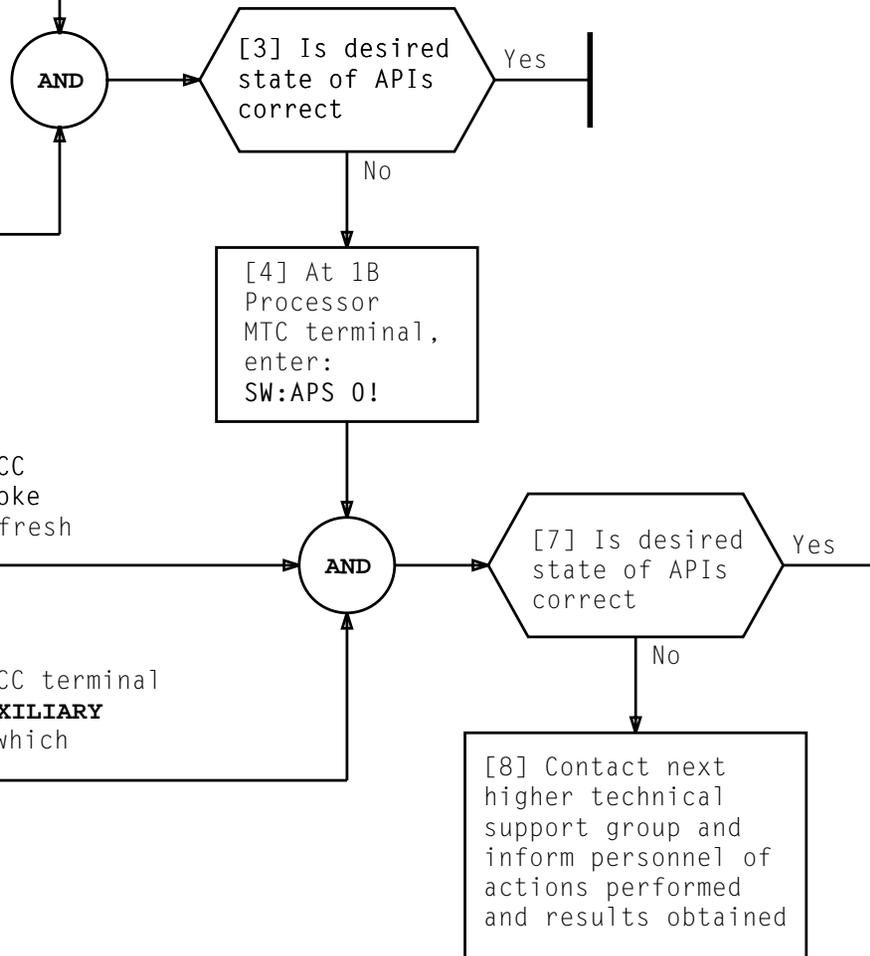
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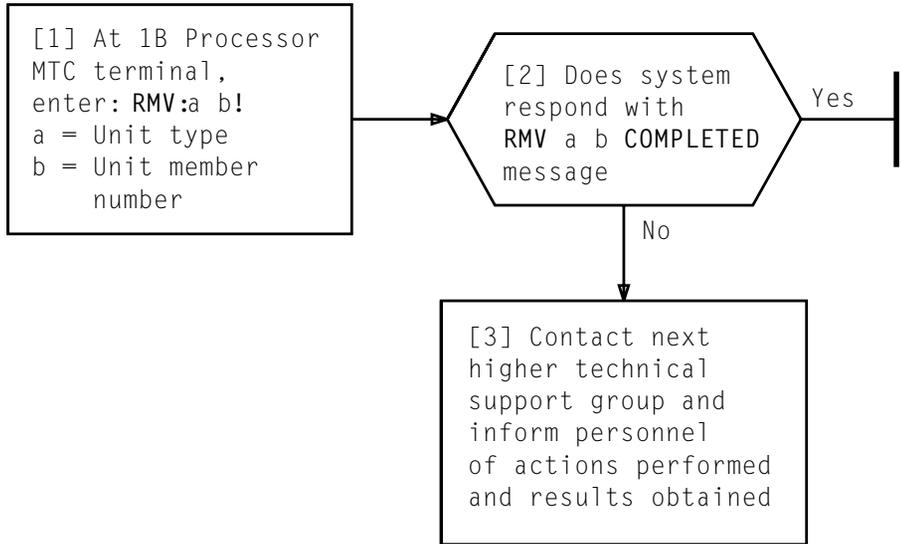
[1] At 1B Processor MCC terminal, enter poke command 118 to obtain 118 Page

[2] On 1B Processor MCC terminal 118 Page under **AUXILIARY UNITS**, determine which API is active

[5] At 1B Processor MCC terminal, enter poke command 118 to refresh 118 Page

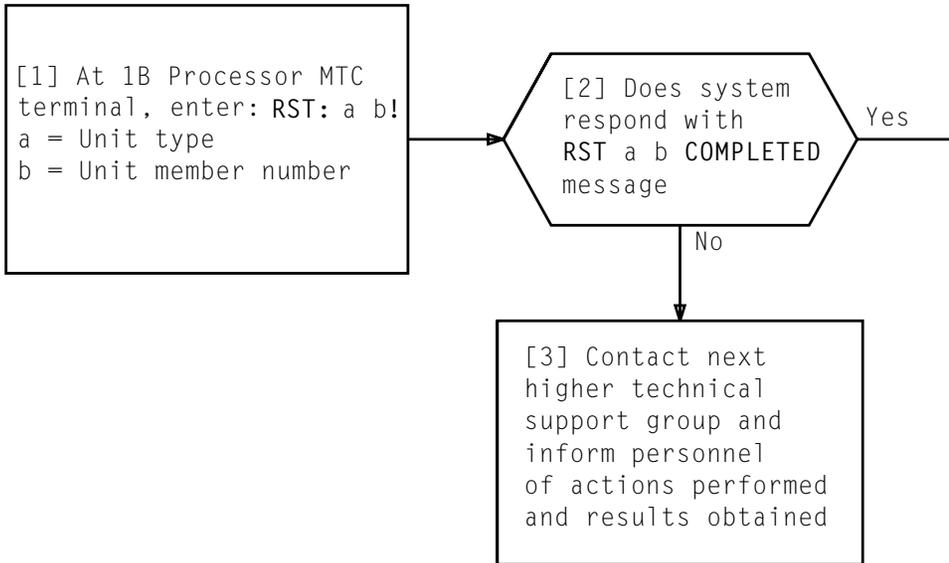
[6] On 1B Processor MCC terminal 118 Page under **AUXILIARY UNITS**, determine which API is active





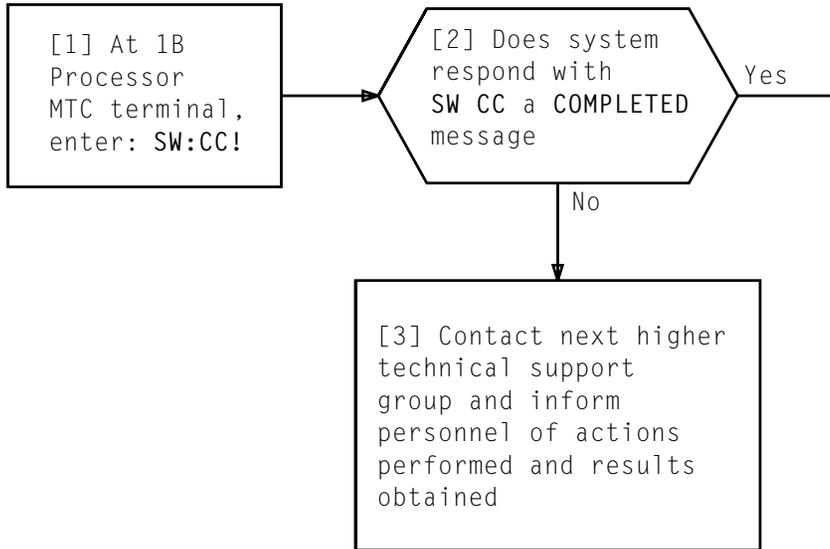
REMOVE 1B PROCESSOR COMMUNITY UNIT FROM SERVICE

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RESTORE 1B PROCESSOR COMMUNITY UNIT TO SERVICE

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[1] See WARNING 1. Ensure bus scoping tool BTR connector is connected to applicable BTR [Figure 1, Page 2]

[2] Ensure oscilloscope channel 1 probe is connected to positive (P) pin of bus scoping tool bit selector box [Figure 1, Page 2]

[3] Ensure oscilloscope channel 2 probe is connected to negative (N) pin of bus scoping tool bit selector box [Figure 1, Page 2]

[4] Ensure oscilloscope channel 1 and channel 2 probe ground leads are connected together [Figure 1, Page 2]

[5] Using scoping tool bit selector box, rotate selector to applicable position for bit to be scoped [TABLE A]

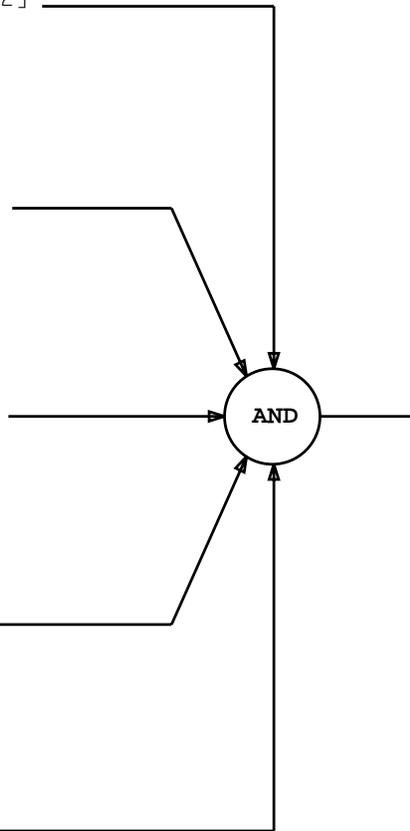


TABLE A BUS SCOPING TOOL BIT SELECTOR BOX BIT SELECTOR POSITIONS			
BIT	ASSOCIATED BUS SCOPING TOOL SELECTOR POSITION	BIT	ASSOCIATED BUS SCOPING TOOL SELECTOR POSITION
0	0	12	4
1	1	13	5
2	2	14	6
3	3	15	7
4	4	16	0
5	5	17	1
6	6	18	2
7	7	19	3
8	0	20	4
9	1	21	5
10	2	22	6
11	3	23	7

WARNING 1
Bus scoping tool is designed to be used as an aid when scoping the auxiliary unit bus (AUB) in the 1B Processor community. Use of this tool to scope any other circuitry within the 1B Processor community could possibly cause service interruptions and/or equipment damage

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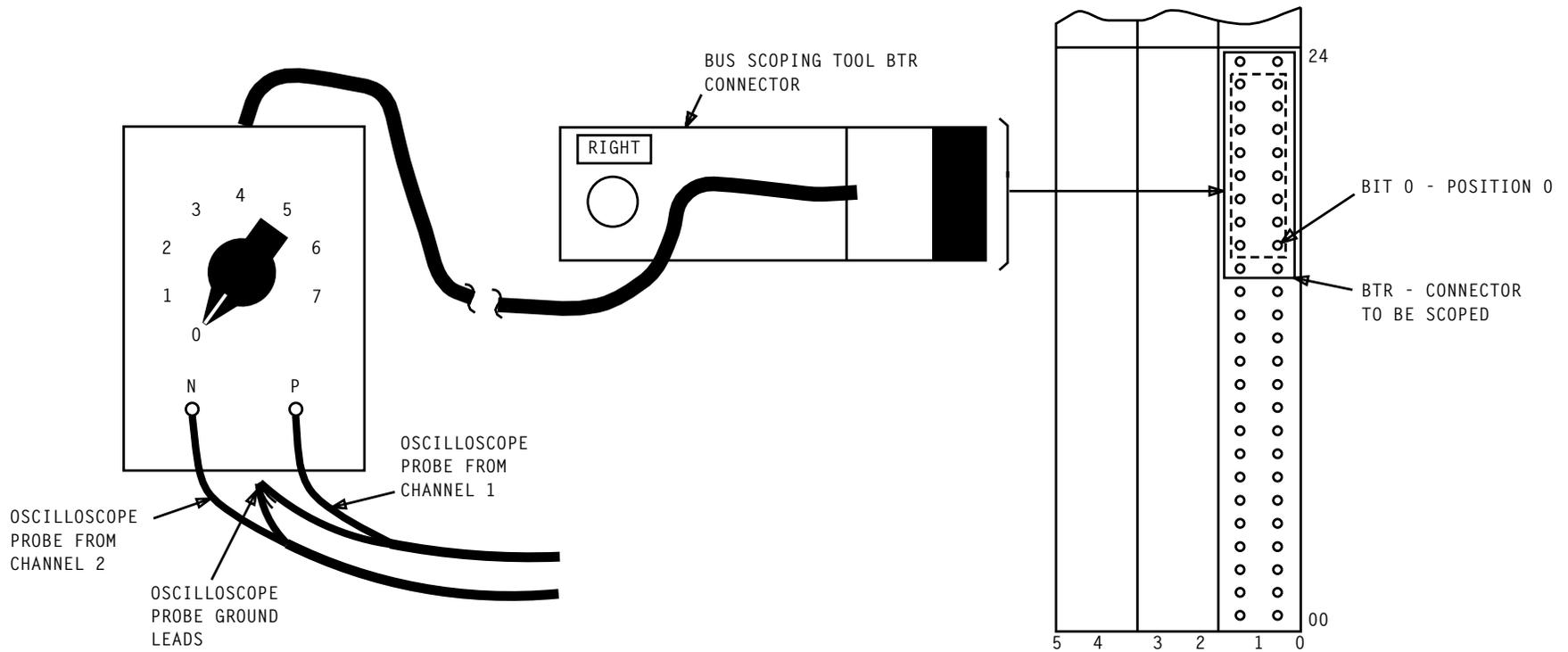


Figure 1 - Bus Scoping Tool, Oscilloscope Probes and BTR Connections for Scoping Auxiliary Unit Bus (AUB)

ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE
IXL-001		TAP-112		DLP-509		DLP-544					
NTP-002		TAP-113		DLP-510		DLP-545					
NTP-003		TAP-114		DLP-511		DLP-546					
NTP-004		TAP-115		DLP-512		DLP-547					
NTP-005		TAP-116		DLP-513		DLP-548					
NTP-006		TAP-117		DLP-514		DLP-549					
NTP-007		TAP-118		DLP-515		DLP-550					
NTP-008		TAP-119		DLP-516		DLP-551					
NTP-009		TAP-120		DLP-517		DLP-552					
NTP-010		TAP-121		DLP-518		DLP-553					
NTP-011		TAP-122		DLP-519		DLP-554					
NTP-012		TAP-123		DLP-520		DLP-555					
NTP-013		TAP-124		DLP-521		DLP-556					
NTP-014		TAP-125		DLP-522		DLP-557					
NTP-015		TAP-126		DLP-523		DLP-558					
NTP-016		TAD-127		DLP-524		DLP-559					
NTP-017		TAP-128		DLP-525		DLP-560					
NTP-018		TAP-129		DLP-526		DLP-561					
NTP-019		TAP-130		DLP-527		DLP-562					
NTP-020		TAP-131		DLP-528		DLP-563					
NTP-021		TAP-132		DLP-529		DLP-564					
NTP-022		TAP-133		DLP-530		CKL-891					
NTP-023		TAP-134		DLP-531		TNG-893					
TAD-100		TAP-135		DLP-532							
TAP-101		TAP-136		DLP-533							
TAP-102		TAP-137		DLP-534							
TAP-103		DLP-500		DLP-535							
TAP-104		DLP-501		DLP-536							
TAP-105		DLP-502		DLP-537							
TAP-106		DLP-503		DLP-538							
TAP-107		DLP-504		DLP-539							
TAP-108		DLP-505		DLP-540							
TAP-109		DLP-506		DLP-541							
TAP-110		DLP-507		DLP-542							
TAP-111		DLP-508		DLP-543							

● REVISED OR ADDED ITEM

□ CANCELED ITEM

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CHECKLIST