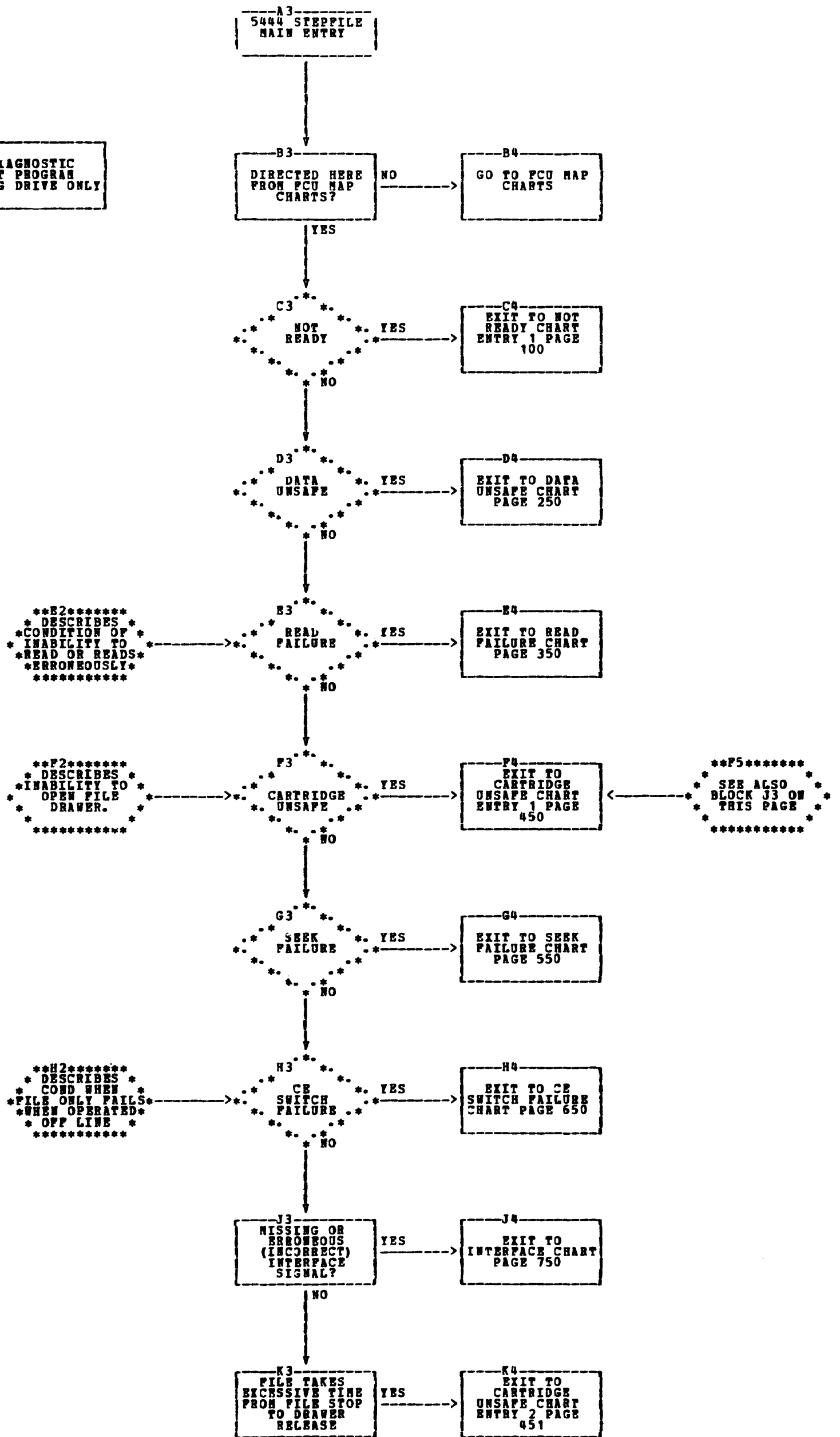


CHART NAME	PART NUMBER	PRES EC
5444 MAIN ENTRY	2600546	392697
NOT READY	2600547	392697
DATA UNSAFE	2600548	392667
READ FAILURE	2600549	392697
CARTRIDGE UNSAFE	2600550	392667
SEEK FAILURE	2600551	392667
CE SWITCH FAILURE	2600552	392652
MISSING INTERFACE SIGNAL	2600553	392697
SERVICE CHECKS	2600554	392697

NOTE- WHEN LOOPING ON A DIAGNOSTIC PROGRAM IT IS REQUIRED THAT PROGRAM SHOULD BE LOOPED ON FAILING DRIVE ONLY



\*\*\*\*\*  
 \* CAUTION. \*  
 \* DO NOT ATTEMPT TO REMOVE \*  
 \* CARTRIDGE BEFORE CHECKING \*  
 \* HEADS AND BRUSHES ARE \*  
 \* CLEAR OF DISK \*  
 \*\*\*\*\*

A3  
 NOT READY ENTRY

1. STOP FILE-LEAVE SYSTEM  
 POWER ON.  
 2. REMOVE FRONT COVER  
 3. BYPASS DRAWER LOCK SW  
 4. PULL FILE OUT AT REAR  
 5. ENSURE C.E. SW. SET TO  
 'ON LINE.' >SR.

C3  
 INSPECT ALL  
 PHOTO CELL  
 LAMPS FOR  
 ILLUMINATION  
 >SEE NOTE

\*\*C4\*\*\*\*\*  
 \* NOTE. \*  
 \* THREE LAMPS \*  
 \* ON ENCODER \*  
 \* ASSEMBLY TWO \*  
 \* ON ACTUATOR \*  
 \*\*\*\*\*

D3  
 ALL  
 LAMPS LIT

\*\*\*\*  
 \*107\*  
 \* E2\*  
 \*\*

D1  
 NOT READY ENTRY  
 2

E1  
 START FILE  
 DRIVE MOTOR AND  
 BRUSHES

E3  
 IS CARR STOPPED  
 RETRACTED WITH  
 HEADS CLEAR OF  
 DISK

\*\*\*\*  
 \*108\*  
 \* A3\*  
 \*\*

F1  
 IS MOTOR  
 DRIVING BELT  
 CONTINUOUSLY  
 WITHIN ONE  
 MINUTE ?

F3  
 IS STEPPER  
 MOTOR  
 TURNING

F4  
 SWITCH OFF  
 SYSTEM POWER.  
 >SC 15. REMOVE  
 FUSE F1.

\*\*\*  
 \*01\*  
 \* A3\*  
 \*\*

G1  
 DO BRUSHES  
 MOVE > SEE  
 NOTE

\*\*G2\*\*\*\*\*  
 \* OBSERVE \*  
 \* BRUSH ARMS \*  
 \* THRU SMALL \*  
 \* WINDOW IN \*  
 \* FILE COVER \*  
 \*\*\*\*\*

G3  
 SW OFF SYSTEM  
 POWER. VISUALLY  
 INSPECT  
 LEADSCREW DRIVE  
 COUPLING

G4  
 MOVE CARR TO  
 TRACK MINUS 119  
 (ENCODER DISK  
 READS TRK 31)

G5  
 SW ON SYSTEM  
 POWER ONLY. P.  
 SLD Y-W1P6D10  
 -CARR RETRACTED

\*\*\*  
 \*02\*  
 \* A2\*  
 \*\*

BRUSH CYCLE TAKES ONE  
 MINUTE TO COMPLETE  
 OBSERVE CARRIAGE AND  
 HEAD LATCH MOVEMENT  
 WHEN BRUSHES ARE  
 RETRACTING

H3  
 COUPLING LOOSE  
 OR ANY FREE  
 PLAY BETWEEN  
 MOTOR SHAFT AND  
 LEADSCREW?

\*\*\*\*\*H4\*\*\*\*\*  
 \* CHK FOR LOOSE \*  
 \* OR BROKEN \*  
 \* COUPLING SPRING \*  
 \* >SC 14 \*  
 \*\*\*\*\*

H5  
 LINE UP

\*\*\*\*  
 \*107\*  
 \* B1\*  
 \*\*

J1  
 DOES CARR STOP  
 ON TRK ZERO  
 WHEN BRUSHES  
 RETRACT? >SEE  
 NOTE

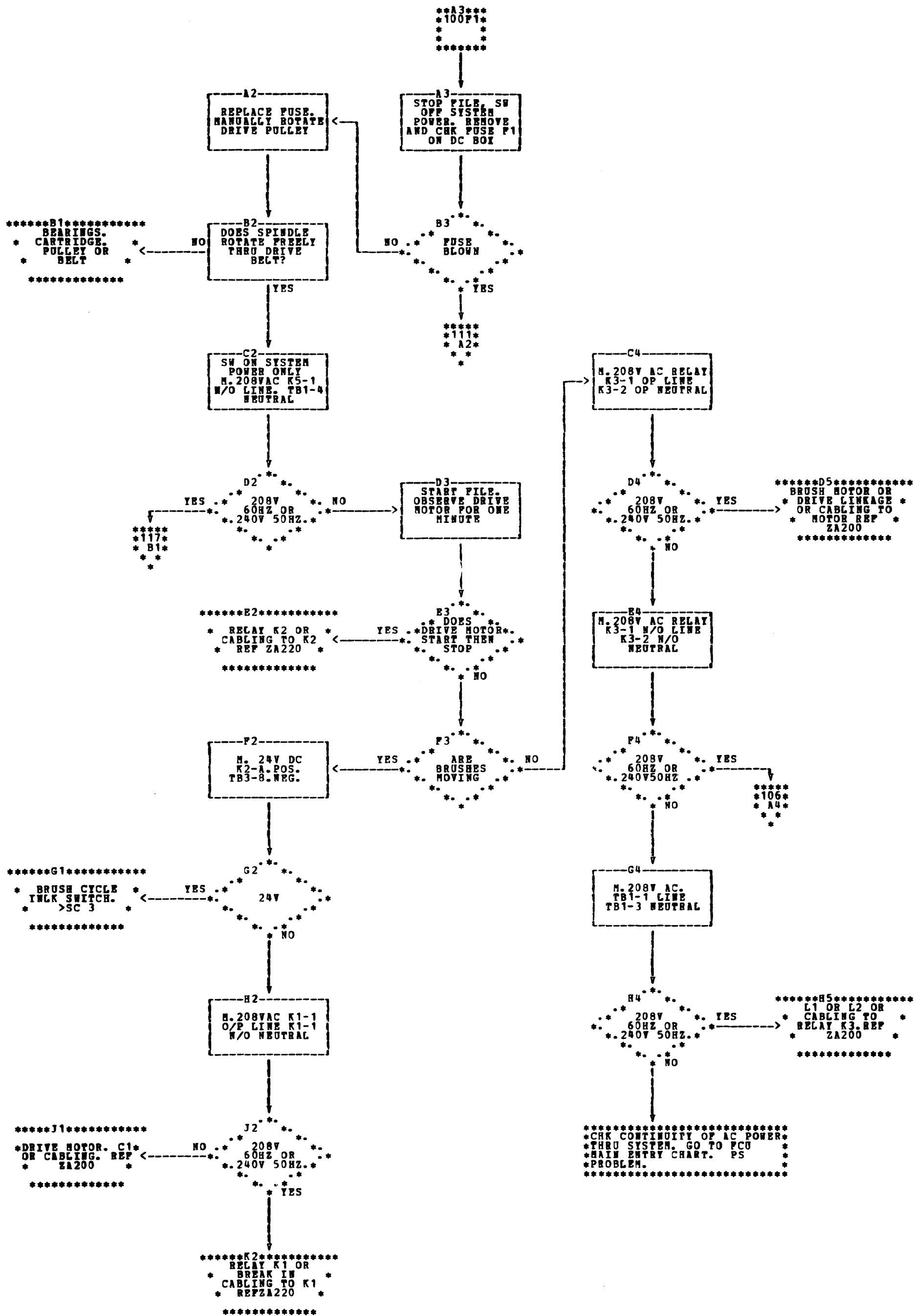
\*\*J2\*\*\*\*\*  
 \* CHK ON TRK \*  
 \* INDICATORS OF \*  
 \* CARRIAGE AND \*  
 \* ENCODER DISK \*  
 \*\*\*\*\*

J3  
 SWITCH ON  
 SYSTEM POWER.

\*\*\*  
 \*103\*  
 \* A3\*  
 \*\*

\*\*\*\*  
 \*105\*  
 \* A3\*  
 \*\*

\*\*\*\*  
 \*113\*  
 \* B4\*  
 \*\*



\*\*A2\*\*  
\*100G1\*  
\*103G3\*  
\*\*\*\*\*

A2  
STOP FILE. SW  
OFF SYSTEM  
POWER. REMOVE  
AND CHECK FUSE  
F1

B2  
FUSE  
BLOWN  
YES  
NO

\*\*\*\*\*  
\*111\*  
\*A2\*  
\*\*\*\*\*

C2  
REPLACE FUSE SW  
ON SYSTEM  
POWER. START  
FILE.

\*\*D1\*\*  
NOTE  
FOR 50HZ  
SYSTEMS  
N. 240VAC.  
\*\*\*\*\*

D2  
N. +208V AC  
K3-1 O/P LINE  
TB1-4 NEUTRAL  
(SEE NOTE).

E2  
208V.  
(SEE NOTE)  
YES  
NO

E4  
OBTAIN ACCESS  
TO TB2 (SEE  
SC3) N. 208V AC  
TB2-2 LINE  
TB2-1 NEUTRAL

F2  
N. +24V DC  
RELAY K3-B POS  
TB3-8 NEG  
+24V. DRIVER

F4  
208V  
SEE NOTE (D1)  
YES  
NO

\*\*\*\*\*F5\*\*\*\*\*  
RELAY K3 OR  
CABLING K3 TO  
TB2 REF. ZA200  
\*\*\*\*\*

G2  
+24V +  
OR - 3V  
YES  
NO

G3  
N. +24V DC  
RELAY K3-A POS  
TB3-8 NEG

\*\*\*\*\*G4\*\*\*\*\*  
BRUSH DRIVE  
\*LINKAGE. BRUSH \*  
MOTOR OR  
\*CABLING. REF \*  
ZA 200  
\*\*\*\*\*

\*\*H2\*\*  
\*106G4\*  
\*\*\*\*\*

H2  
N. +24V DC  
TB3-7. POS  
TB3-8. NEG  
+24V. DRIVER

H3  
+24V +  
OR - 3V  
YES  
NO

H4  
N. +24V DC  
EC2-D POS.  
TB3-8 NEG

\*\*\*\*\*J1\*\*\*\*\*  
OPEN LINE.  
RELAY K3-B TO  
TB3-7  
(REF. ZA220)  
\*\*\*\*\*

J2  
+24V +  
OR - 3V  
YES  
NO

\*\*\*\*\*J3\*\*\*\*\*  
RELAY K3. CHECK  
CABLING REF  
ZA220  
\*\*\*\*\*

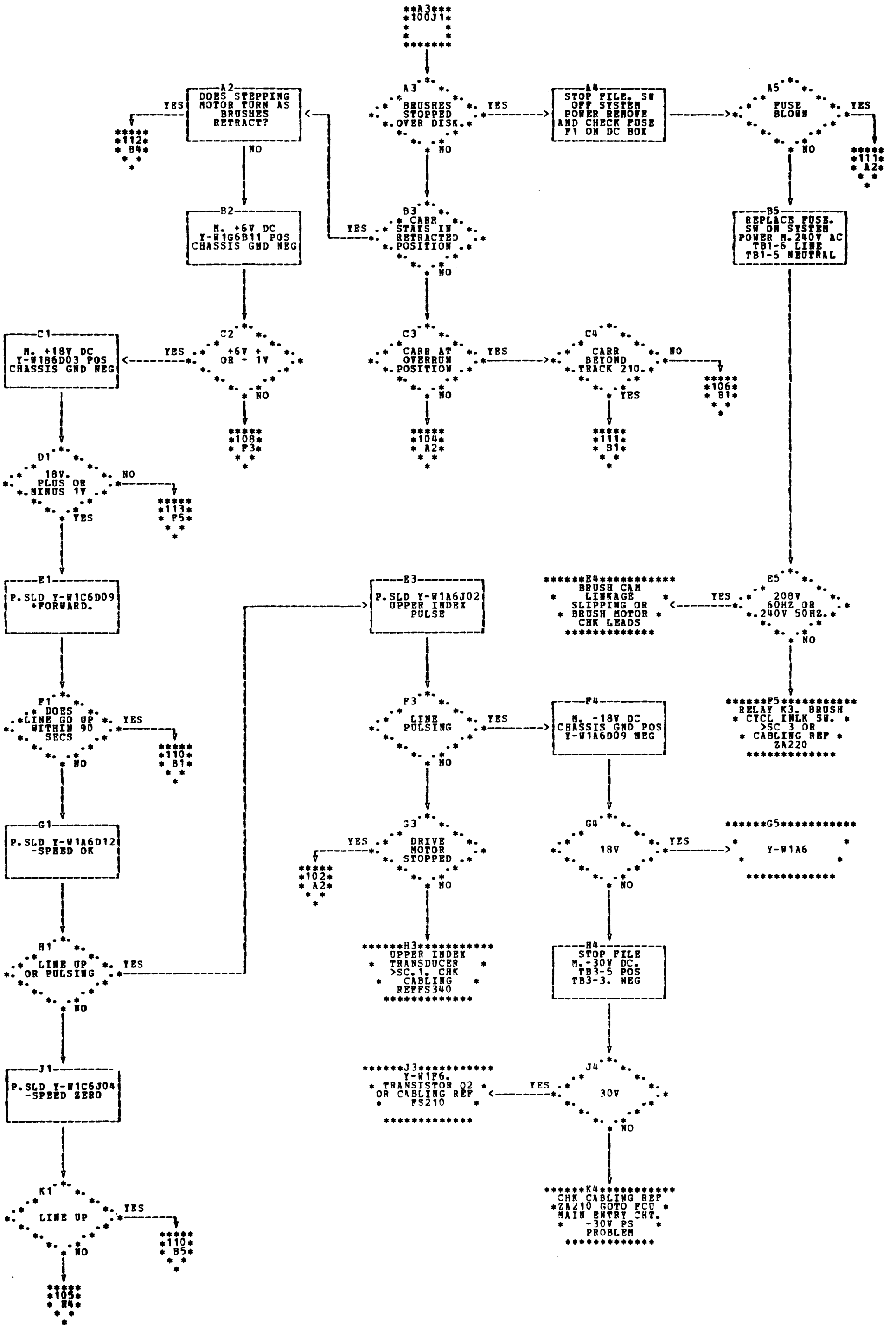
J4  
+24V +  
OR - 3V  
YES  
NO

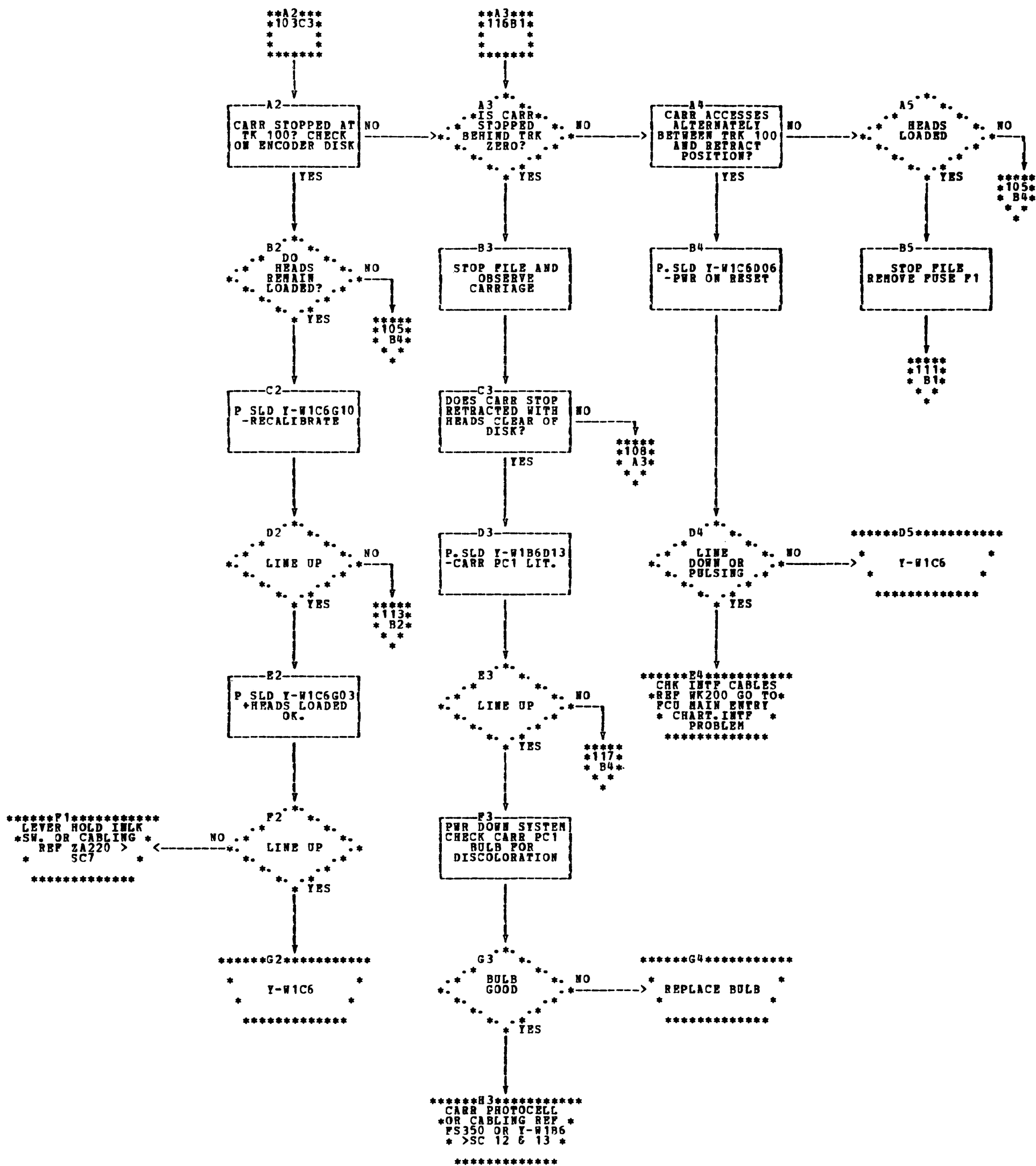
\*\*\*\*\*J5\*\*\*\*\*  
CARR RETRACTED  
\*INLK SW. >SC 4 \*  
CR12 OR OPEN  
\*LINE EC2-G TO  
EC2-D (ZA220)  
\*\*\*\*\*

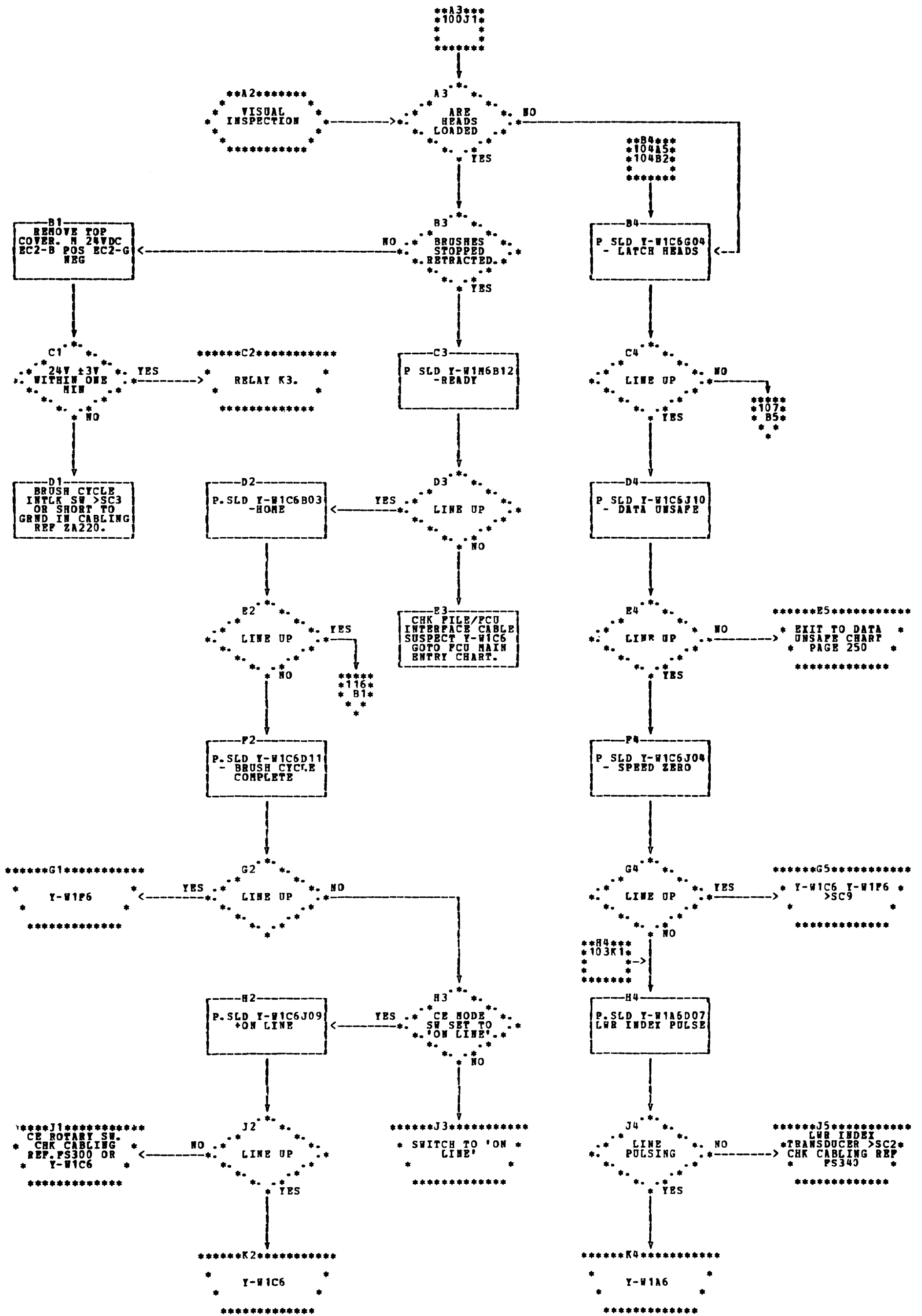
K1  
EXIT TO PCU  
MAIN ENTRY CHT.  
24V DRIVER PS  
PROBLEM

K2  
CHK CONTINUITY  
OF 24V DRIVER  
AND COMMON  
LINES THROUGH  
SYSTEM.

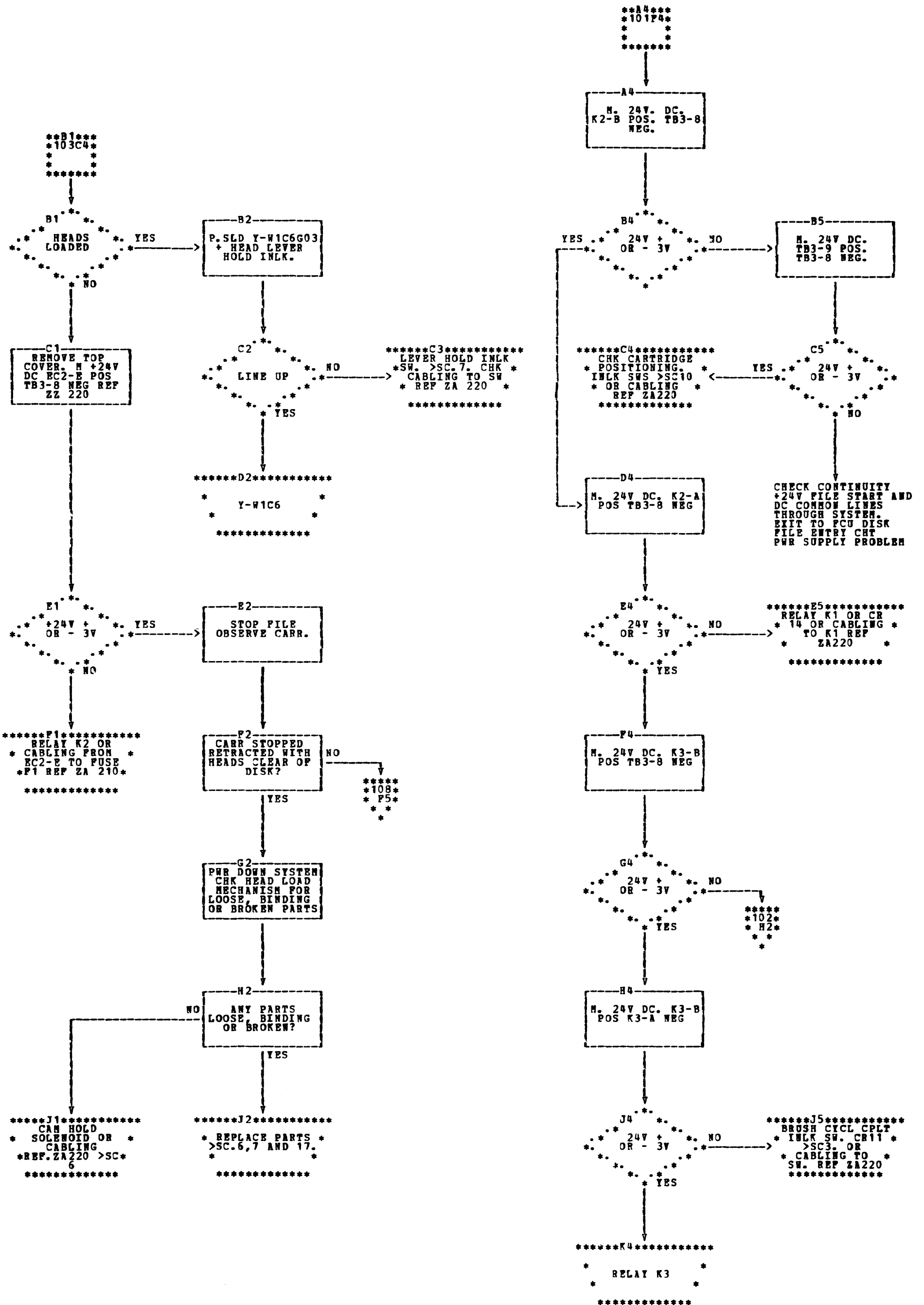
\*\*\*\*\*K4\*\*\*\*\*  
RELAY K2 OR  
\*CABLING K3-A TO\*  
EC2-D  
\* REF. ZA220 \*  
\*\*\*\*\*

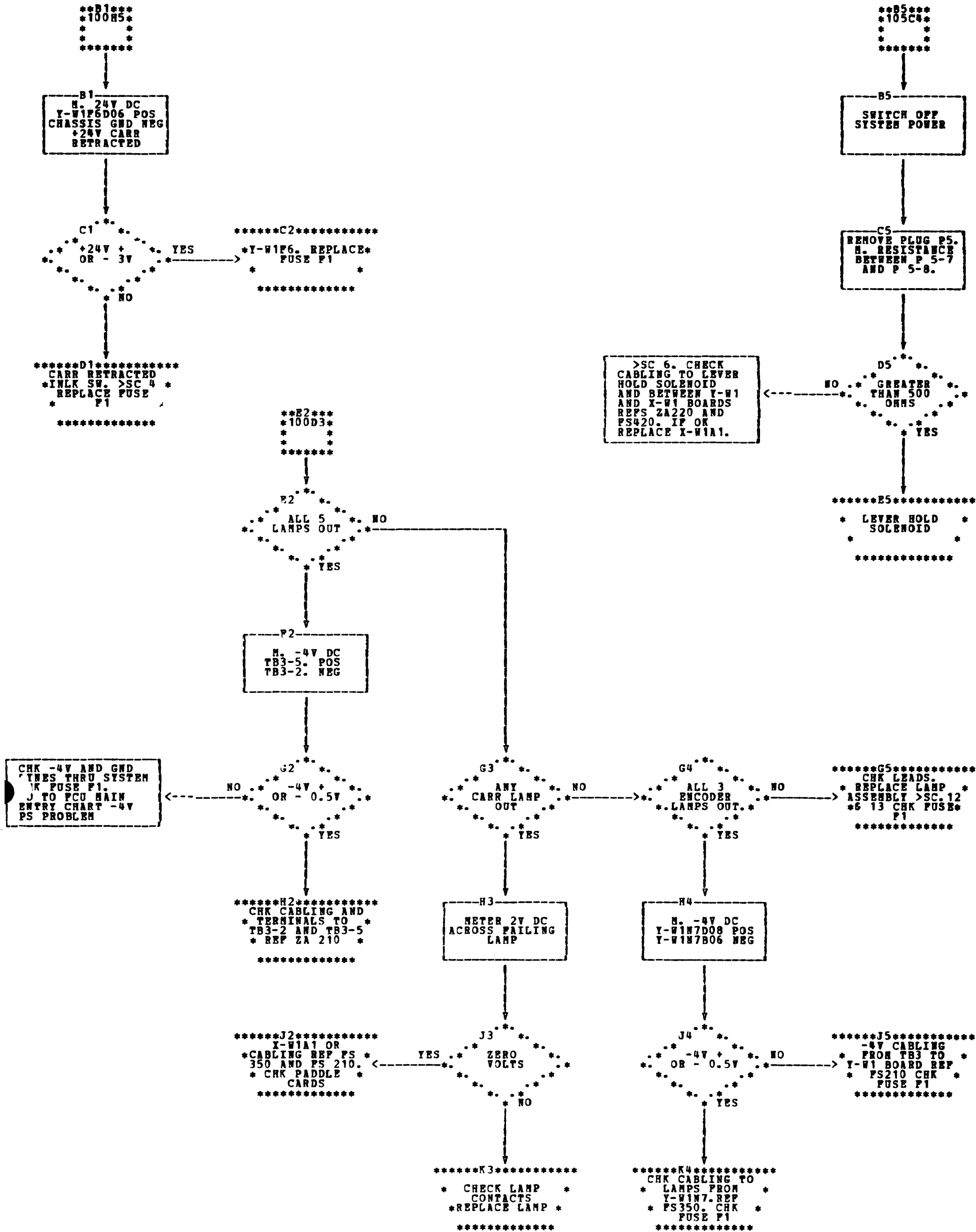












\*\*A3\*\*  
\*100E3\*  
\*104C3\*  
\*  
\*\*\*\*\*

A1  
P SLD Y-W1P6G13  
- CE FORWARD

A3  
CARR ACCESSES  
ALTERNATELY  
BETWEEN OVERRUN  
AND RETRACT  
SW'S ?

B1  
LINE UP

\*\*\*\*\*B2\*\*\*\*\*  
\* Y-W1P6 \*

B3  
IS  
STEPPING  
MOTOR  
TURNING

\*\*\*\*  
\*109\*  
\* A1 \*

\*\*\*\*\*C1\*\*\*\*\*  
\* Y-W1C6 \*

C4  
M. +24V DC  
EC4-C POS  
TB3-8. NEG

D3  
M. +6V DC  
Y-W1G6B11 POS  
CHASSIS GND NEG

D4  
+24V +  
OR - 3V

E3  
+6 + OR  
- 1V

E4  
M. +24V DC  
TB3-7. POS  
TB3-8. NEG

F3  
M. +6V DC  
C5-B. POS  
CHASSIS GND NEG

F4  
+24V +  
OR - 3V

\*\*F5\*\*  
\*106F2\*  
\*  
\*\*\*\*\*  
P5  
REMOVE AND  
CHECK F1 FUSE  
ON DC BOX

\*\*\*\*\*G2\*\*\*\*\*  
\* VOLTAGE  
CONNECTOR TO  
Y-W1 BOARD OR  
\* CABLING \*

G3  
+6V +  
OR - 1V

CHK CONTINUITY  
+24V DC DRIVER  
AND COMMON LINES  
THRU SYSTEM EXIT  
TO FCU MAIN ENTRY  
CHART. +24V DRIVER  
PS PROBLEM

H3  
M. +6V DC  
TB3-1. POS  
TB3-5. NEG

H4  
LEAVE FUSE OUT  
TO INVESTIGATE  
CAUSE

H5  
FUSE  
BLOWN

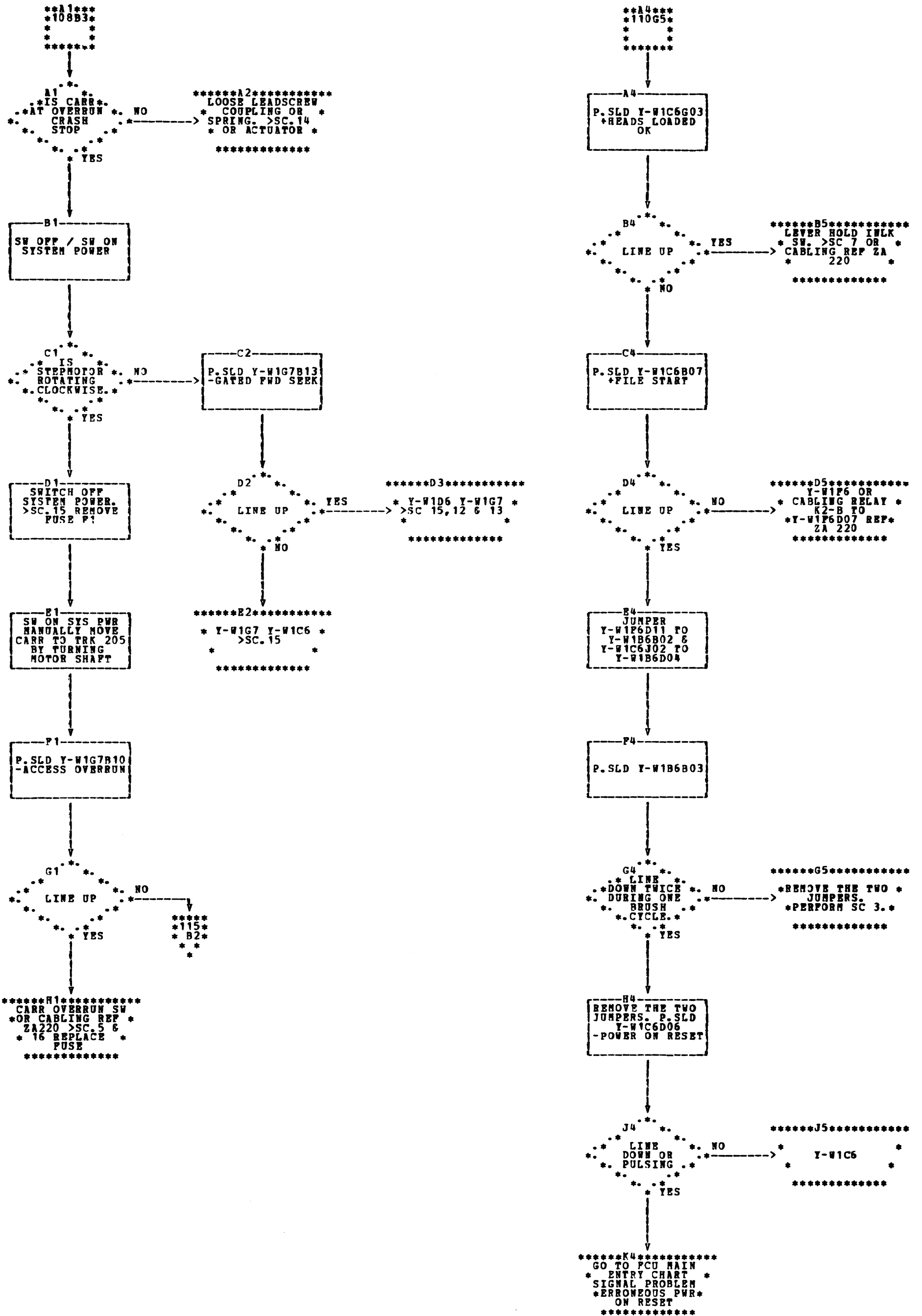
\*\*\*\*\*J2\*\*\*\*\*  
\* C5 OR LINE O/C  
C5-A TO TB3-1 \*

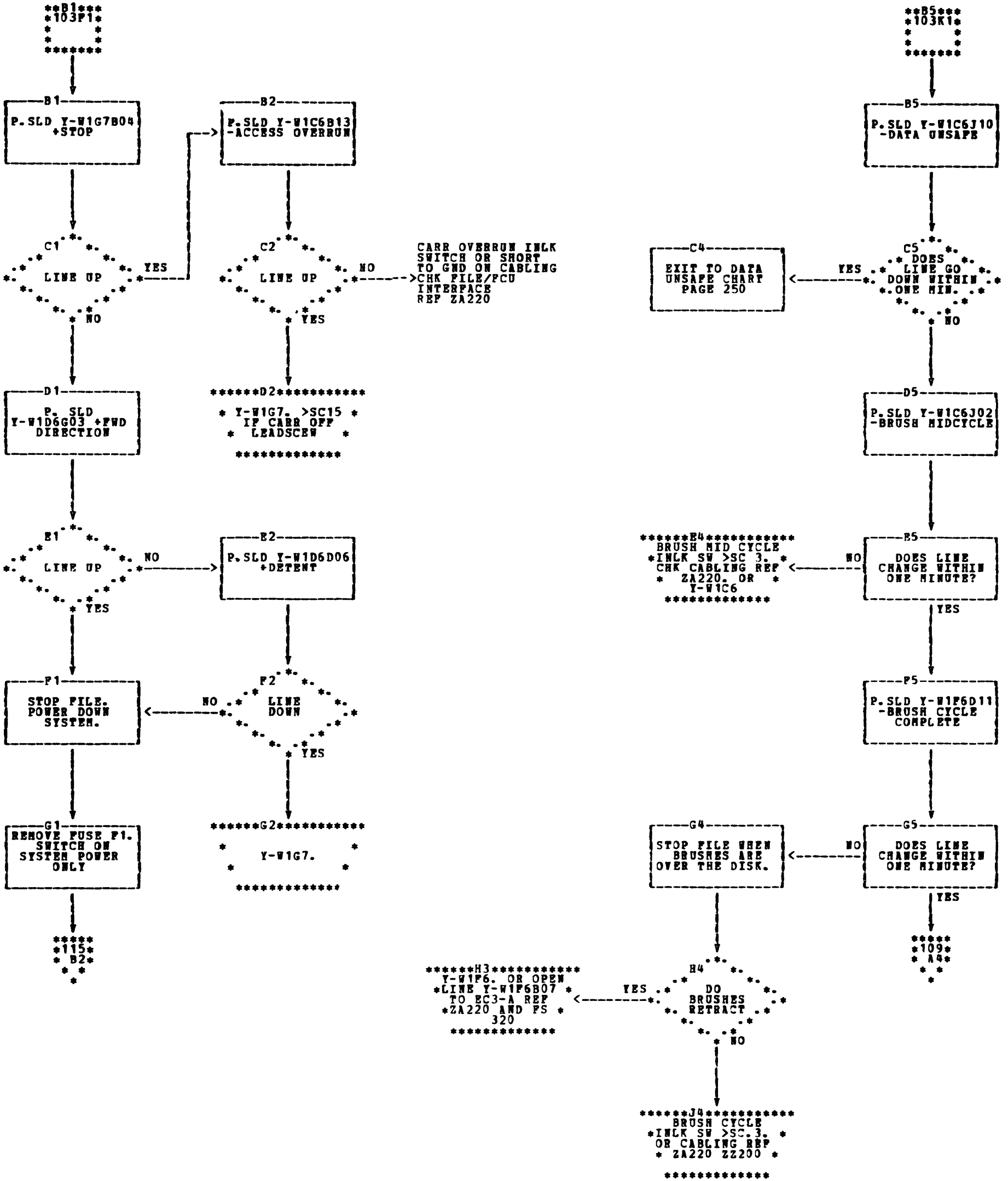
J3  
+6V +  
OR - 1V

\*\*\*\*  
\*111\*  
\* B1 \*

\*\*\*\*\*J5\*\*\*\*\*  
\* OPEN CCT. LINE \*  
EC4-C TO TB3-7 \*  
\* (REF ZA230) \*

K3  
CHK 6V POWER  
LINE TO SYSTEM  
EXIT TO FCU  
MAIN ENTRY CHT  
6V P S PROBLEM





\*\*A2\*\*\*  
\*101B3\*  
\*102B2\*  
\*103A5\*  
\*\*\*\*\*

A2  
LEAVE OUT FUSE  
PWR UP SYSTEM  
N. +18V DC  
Y-W1B6D03 POS  
Y-W1B6J08 NEG

\*\*B1\*\*\*  
\*103C4\*  
\*104B5\*  
\*108H4\*  
\*\*\*\*\*

B1  
SW OFF SYSTEM  
POWER VISUALLY  
INSPECT ENCODER  
DISK FOR DAMAGE

B2  
\*+18V +\*  
\*OR -1V\*  
\*NO\*

\*\*\*\*\*  
\*113\*  
\*P5\*  
\*\*

\*\*\*\*  
\* B4 \*  
\*\*\*\*

B4  
N. 6V DC  
Y-W1B6J06 POS  
CHASSIS GND NEG  
+ON TRACK

TURN STEPPING MOTOR  
SHAFT SLOWLY BY HAND  
TO MOVE CARR TOWARDS  
TRK ZERO AND OBSERVE  
METER.

C1  
\*LOOSE\*  
\*DAMAGED OR\*  
\*SCRATCHED IN\*  
\*PC AREA\*  
\*NO\*

\*\*\*\*\*C2\*\*\*\*\*  
REPLACE  
\*STEPPING MOTOR\*  
>SC 12, 13 &  
14  
\*\*\*\*\*

\*\*D2\*\*\*  
\*115C4\*  
\* \* \*  
\*\*\*\*\*

D1  
CLEAN ENCODER  
DISK CAREFULLY  
WITH ISO-PROPYL  
ALCOHOL.

D2  
PERFORM SC15 IF  
CARR AT CRASH  
STOP (OFF  
LEADSCREW)

\*\*D3\*\*\*\*\*  
\*NOTE...\*  
\*STEADY\*  
\*VOLTAGE TAKE\*  
\*NO DECISION\*  
\*\*\*\*\*

D4  
\*METER\*  
\*FLUCTUATION\*  
\*GREATER THAN\*  
\*1V. >SEE\*  
\*NOTE\*  
\*NO\*

\*\*\*\*\*  
\*112\*  
\*P3\*  
\*\*

E2  
SWITCH ON  
SYSTEM POWER  
ONLY

F2  
N. 6V DC  
Y-W1B6J04 POS  
CHASSIS GND NEG  
-DELAYED  
FEEDBACK

TURN STEPPING MOTOR  
SHAFT SLOWLY BY HAND  
TO MOVE CARR TOWARDS  
TRK ZERO AND OBSERVE  
METER. >SEE NOTE.

E4  
N. +4V DC TB3-5  
POS. SOCKETS  
J4-6 NEG AND  
J4-4 NEG

P4  
\*BOTH\*  
\*LINES 4V\*  
\*OR -0.5V\*  
\*NO\*

\*\*\*\*\*P5\*\*\*\*\*  
OPEN LINE P4 TO  
TB3-2 REF PS210  
REPLACE P4 &  
FIT NEW FUSE \*  
\*\*\*\*\*

CHK CABLING TO PHOTO  
CELLS. REF PS350.  
IF OK Y-W1B6  
OR PHOTO CELL ASSEMBLY  
>SC 12 AND 13  
FIT NEW FUSE & REPLACE  
PLUG P4.

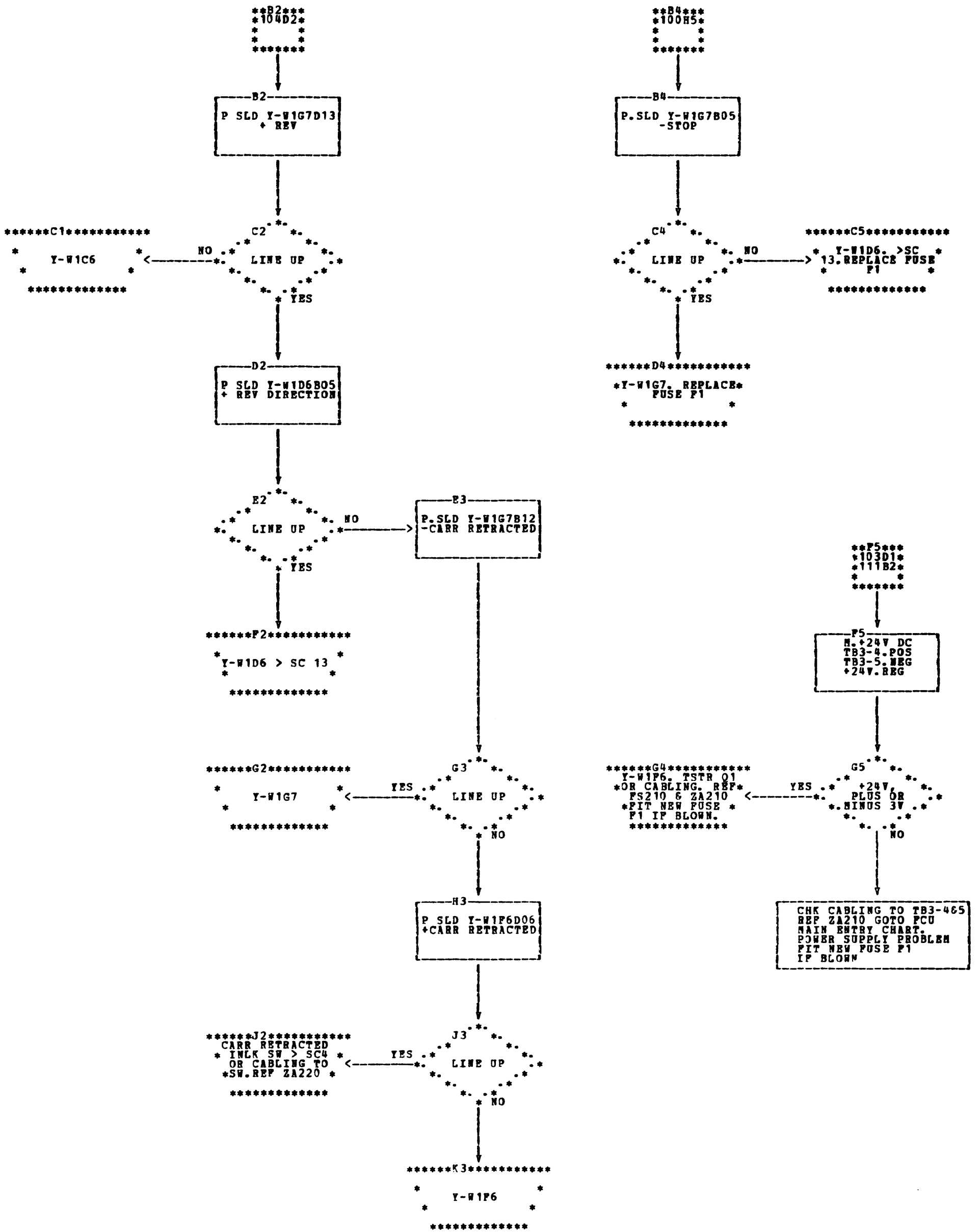
NOTE.  
IF ANY BINDING  
ENCOUNTERED  
INVESTIGATE AND  
REPLACE ACTUATOR  
OR STEPPER MOTOR  
IF NECESSARY

\*\*H1\*\*\*\*\*  
\*NOTE...\*  
\*STEADY\*  
\*VOLTAGE TAKE\*  
\*NO DECISION\*  
\*\*\*\*\*

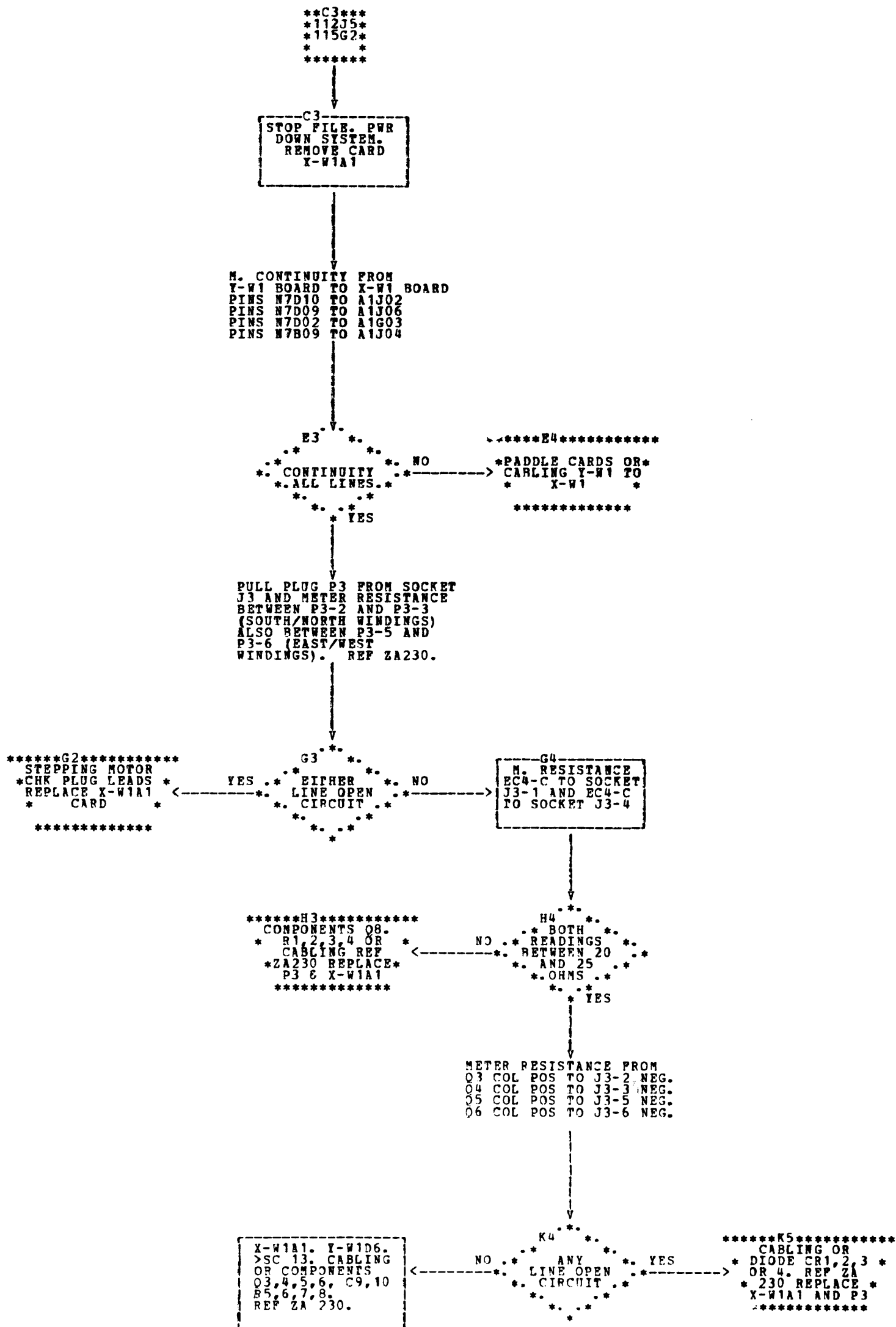
H2  
\*METER\*  
\*FLUCTUATION\*  
\*GREATER THAN\*  
\*1V. >SEE\*  
\*NOTE\*  
\*YES\*

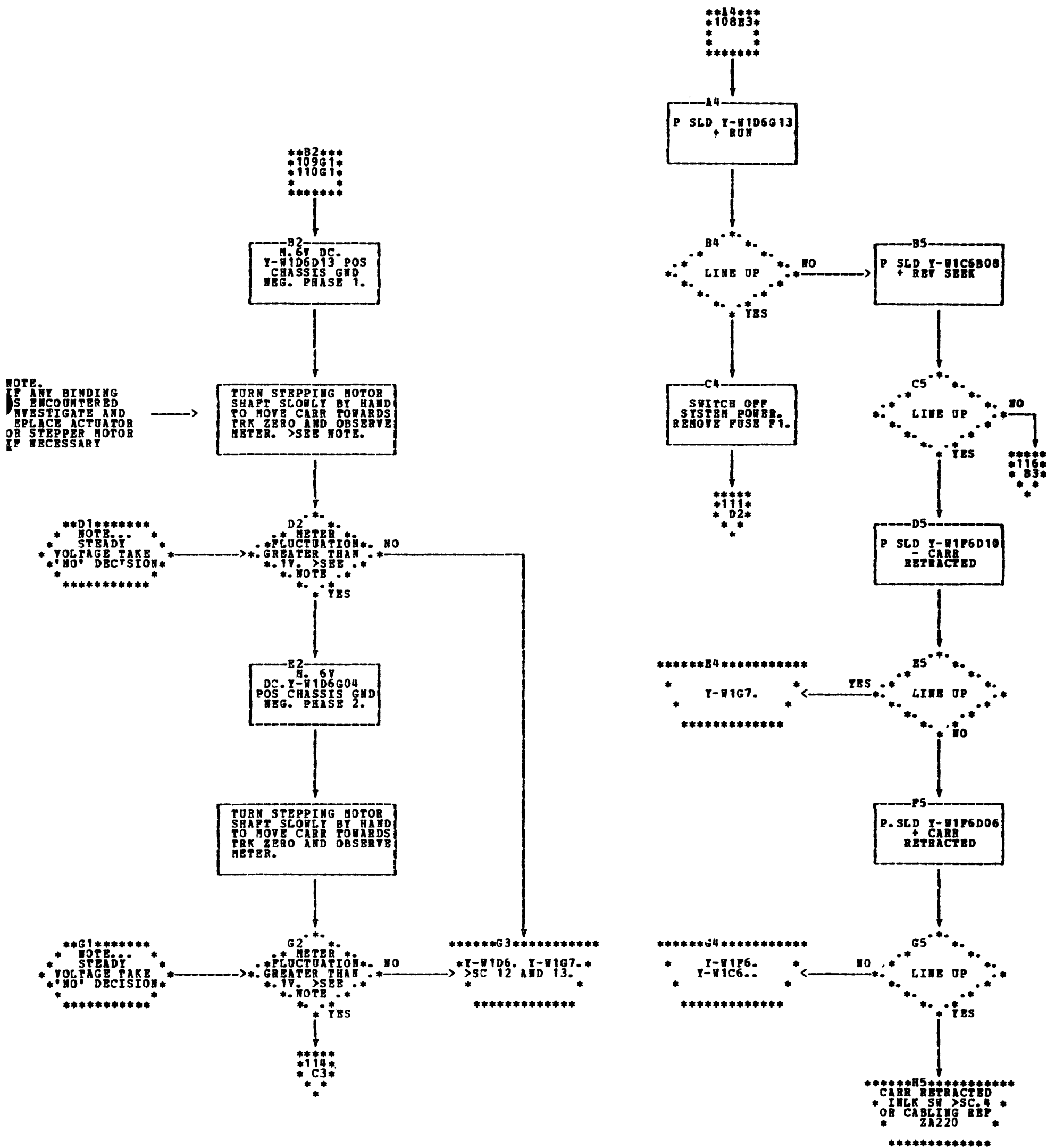
\*\*\*\*  
\* B4 \*  
\*\*\*\*



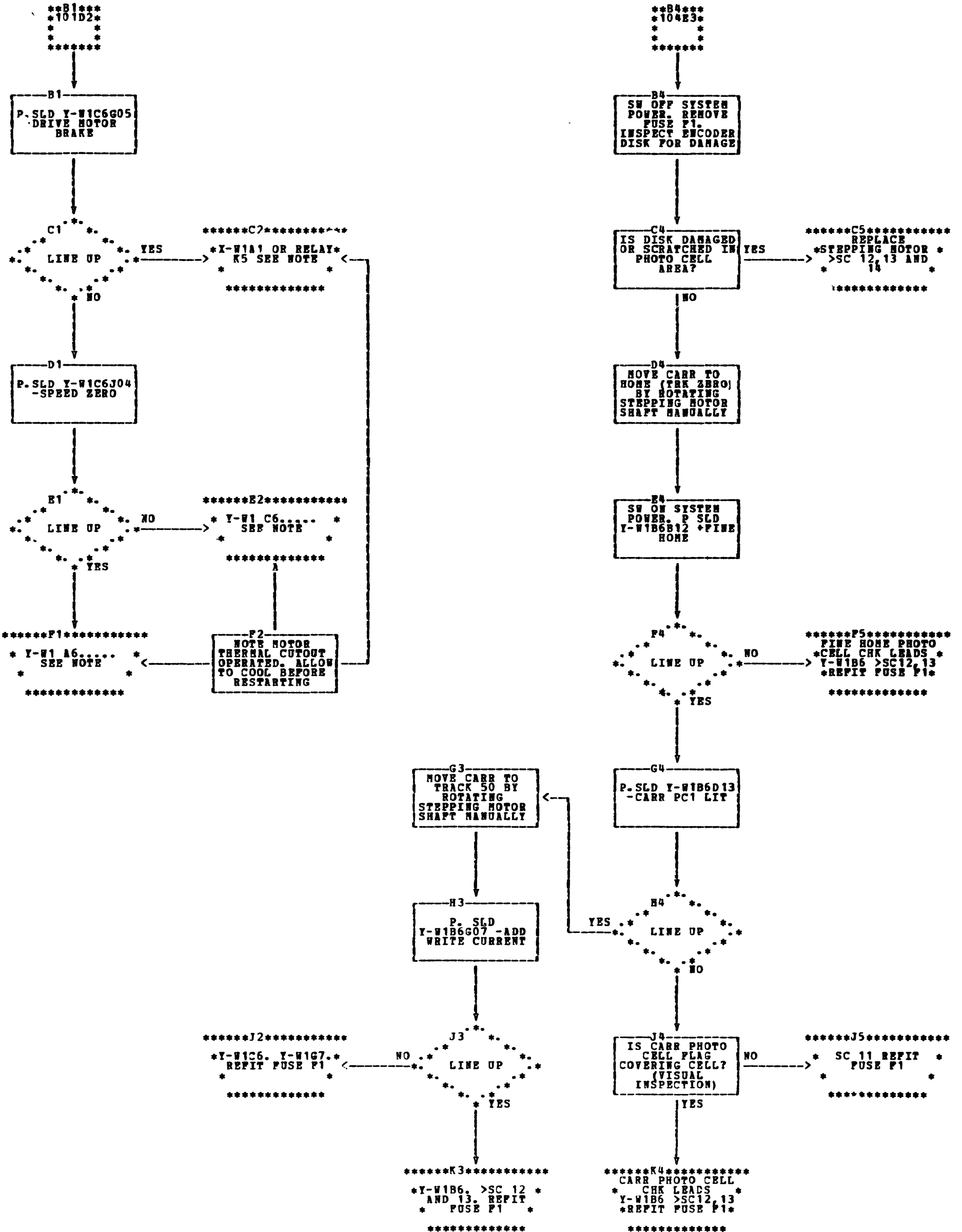


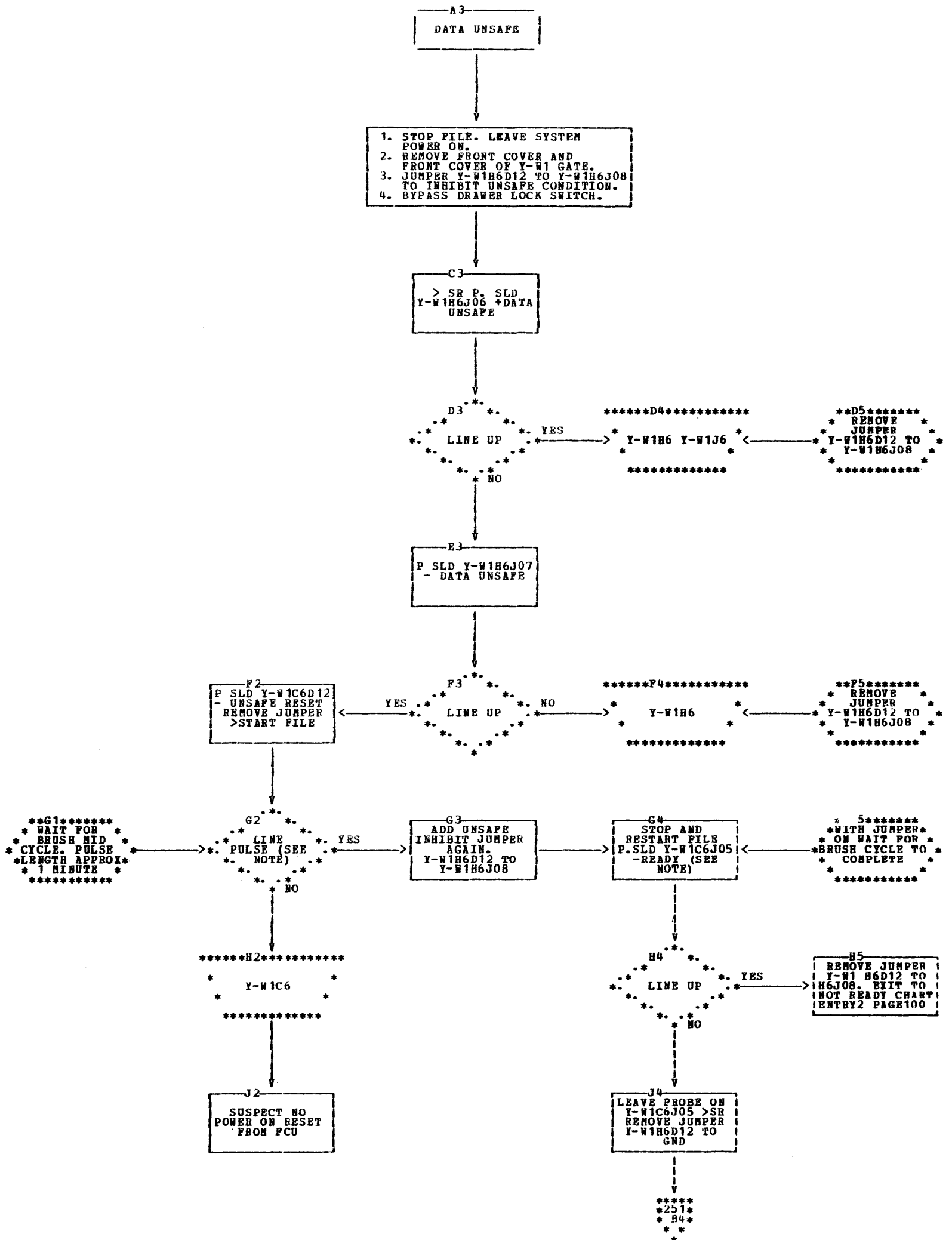


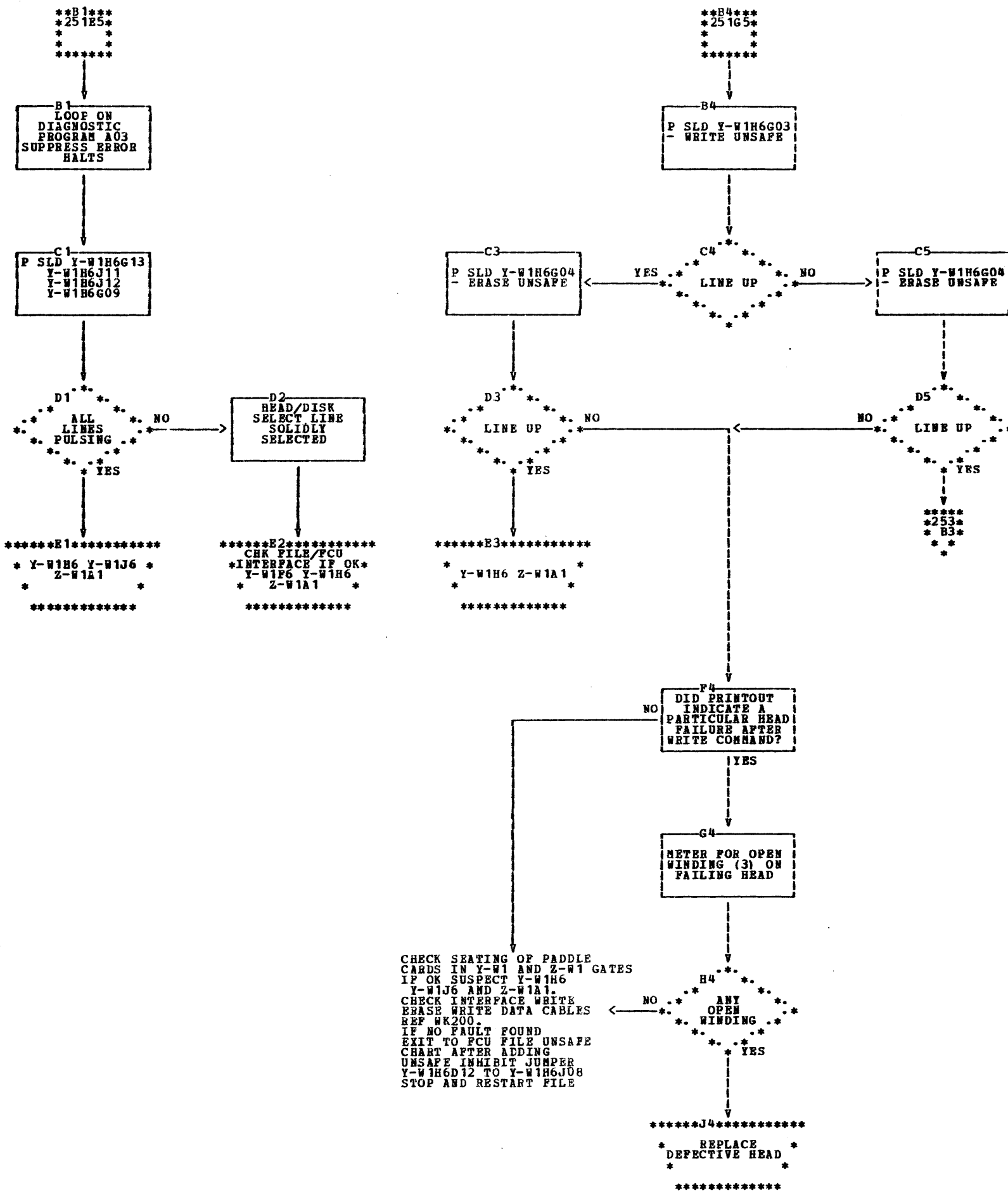


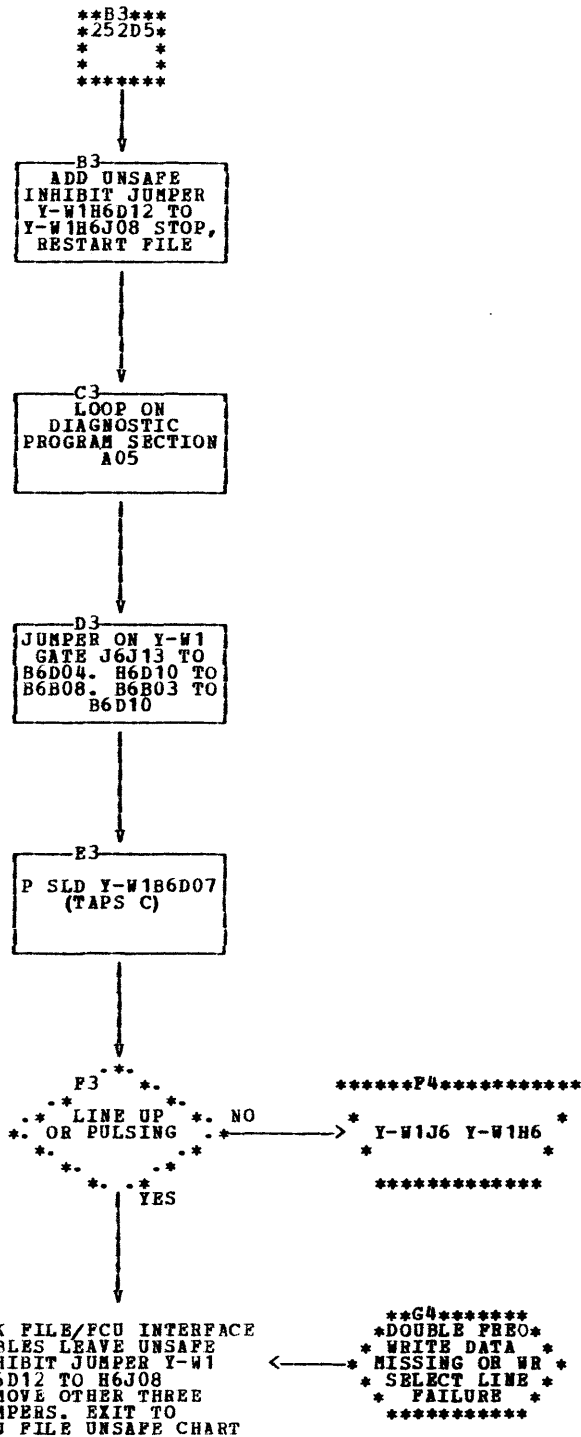








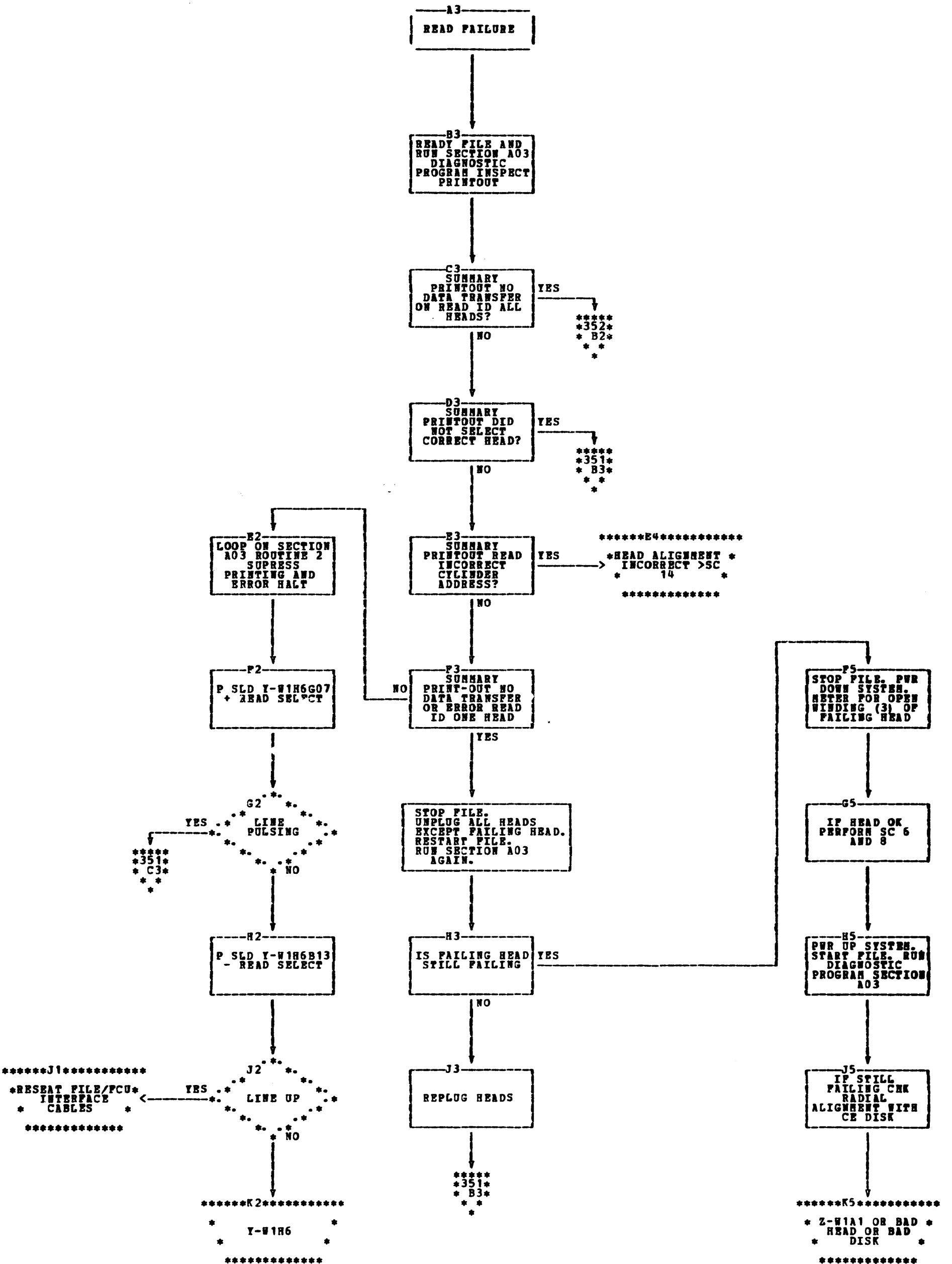


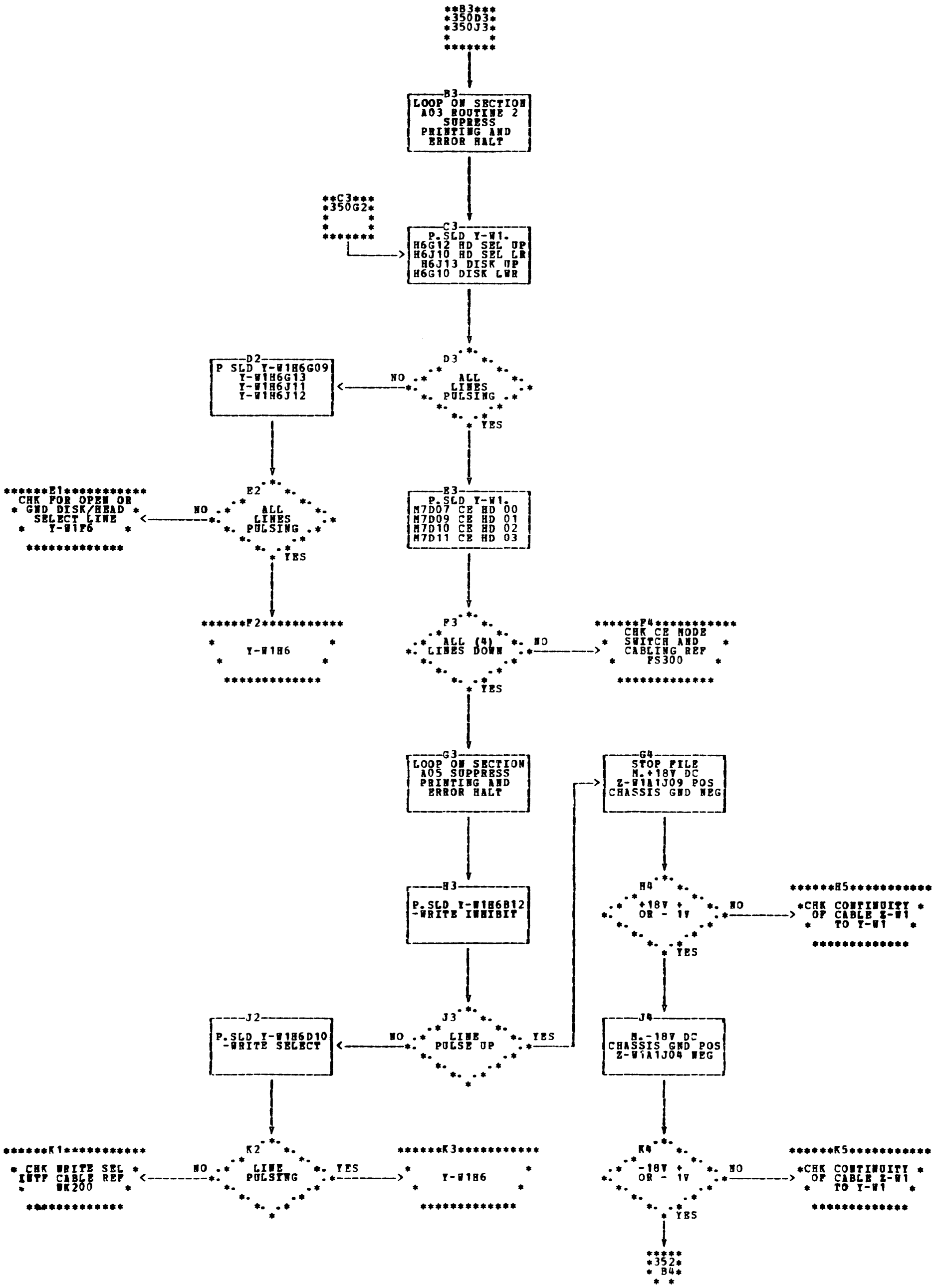


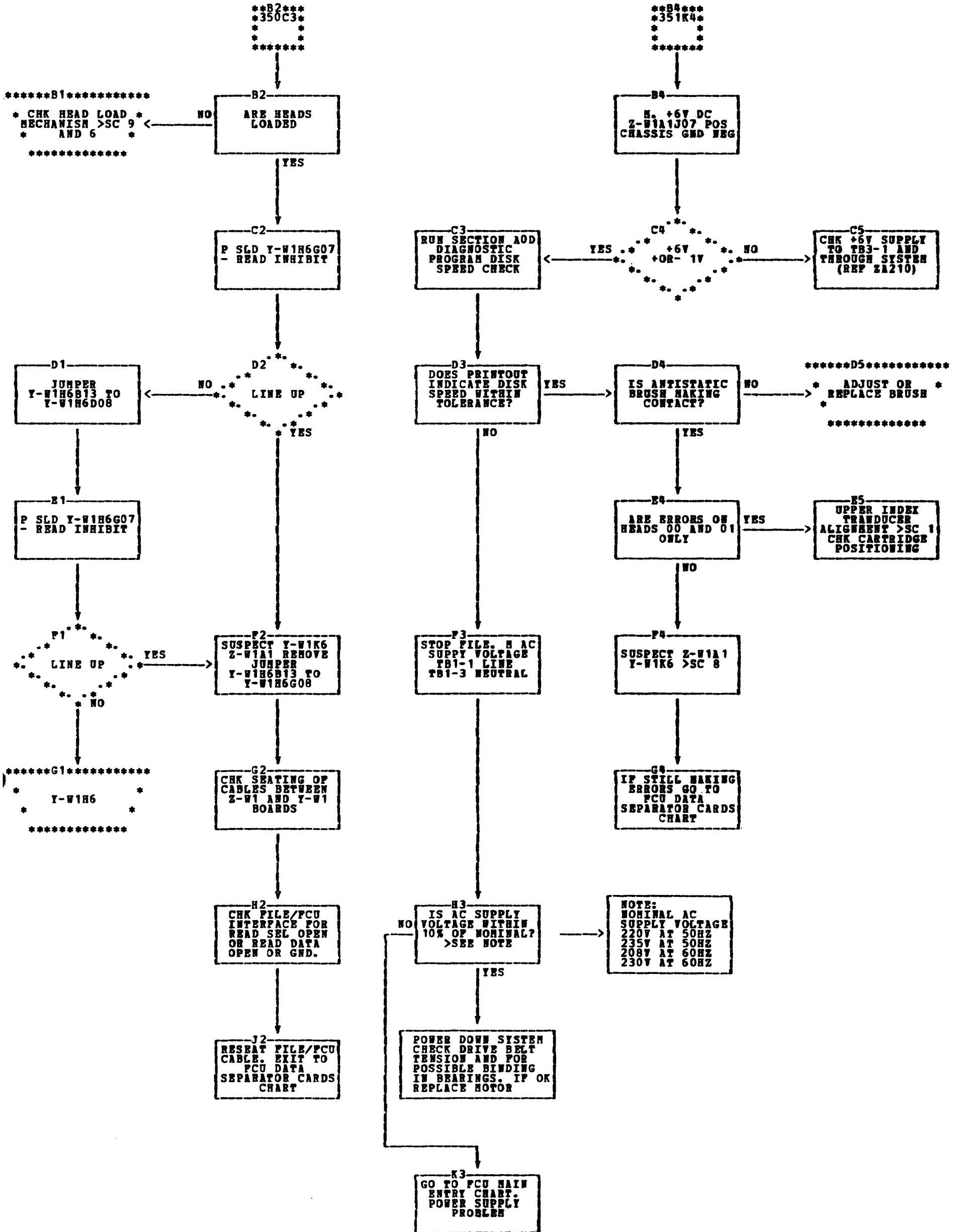




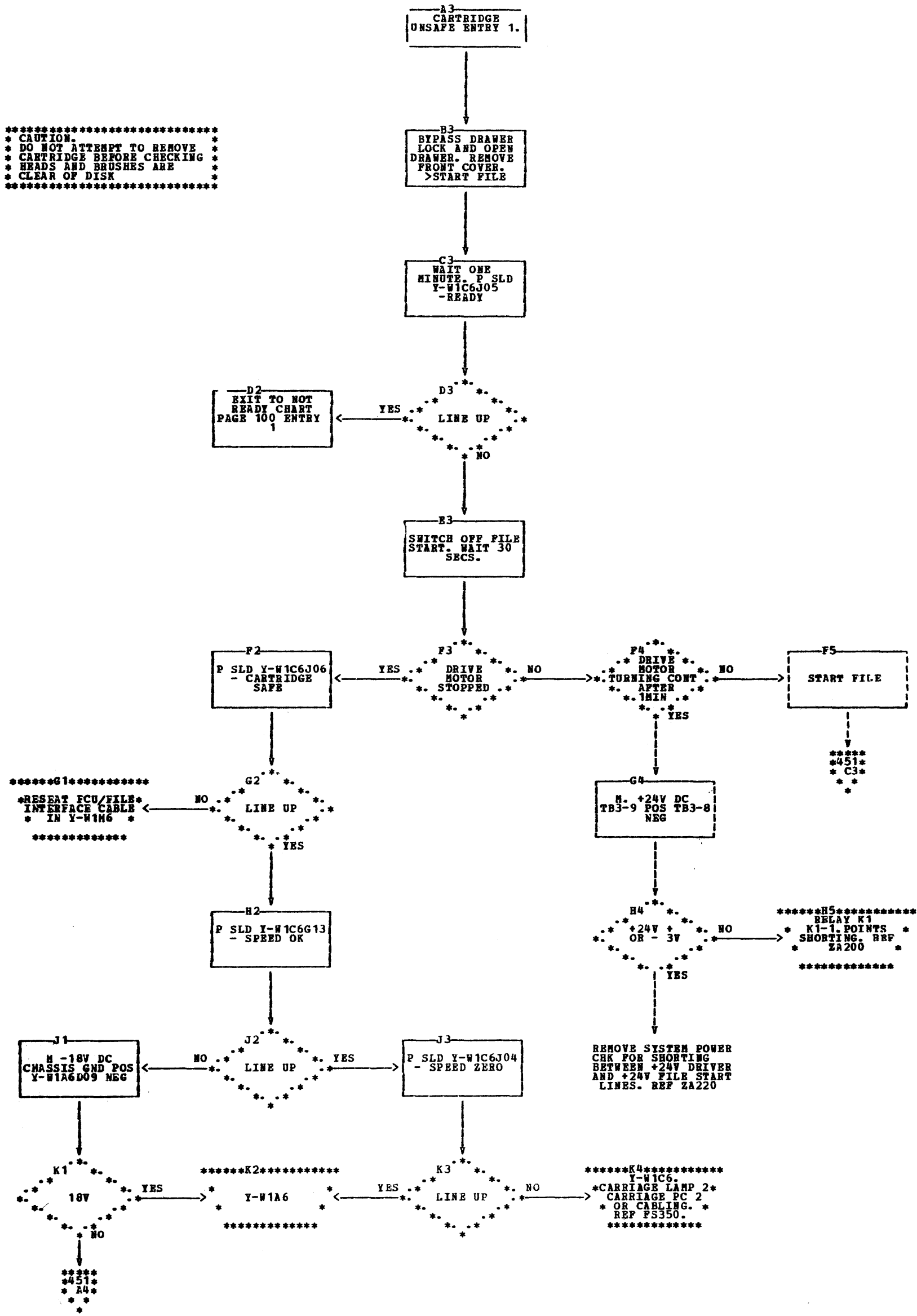


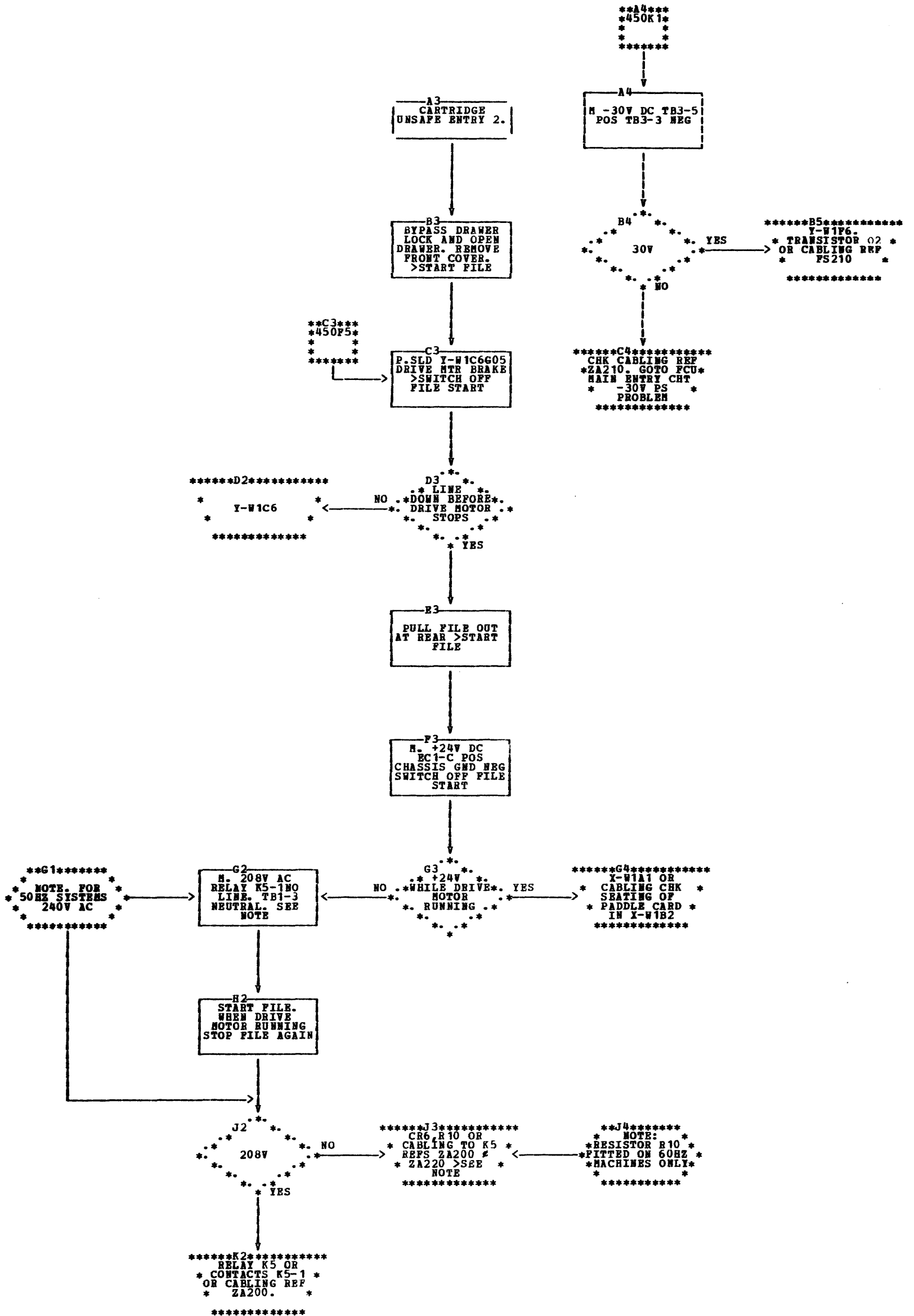


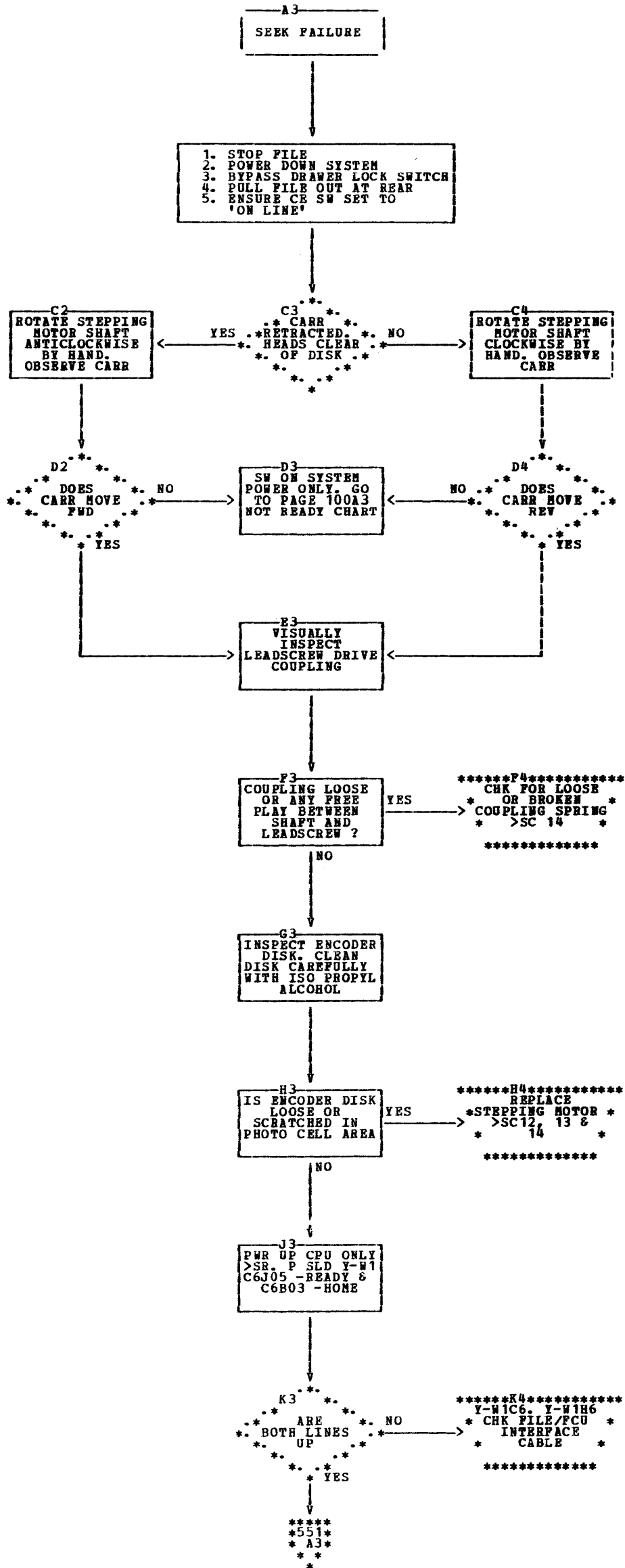


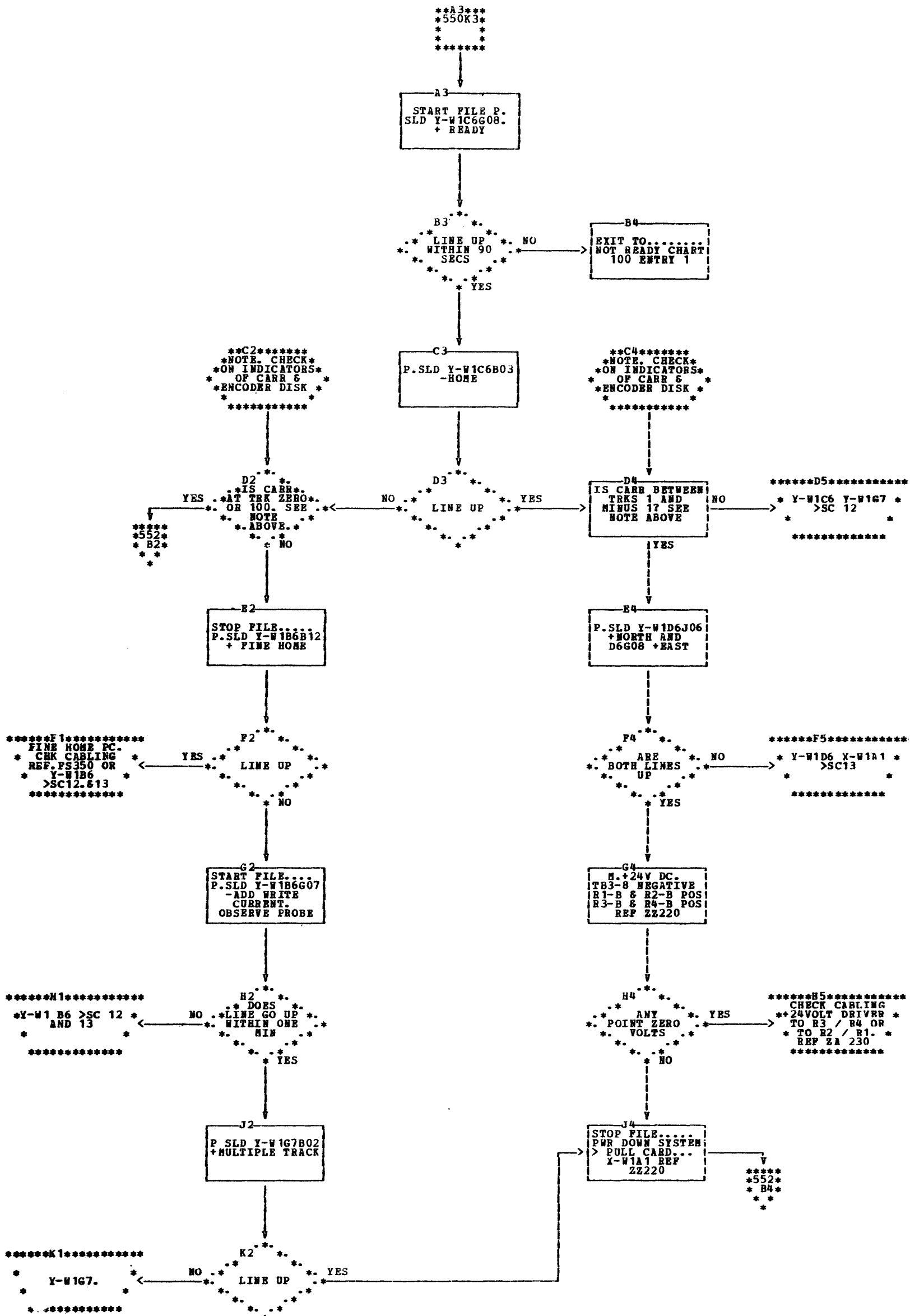


\*\*\*\*\*  
 \* CAUTION.  
 \* DO NOT ATTEMPT TO REMOVE  
 \* CARTRIDGE BEFORE CHECKING  
 \* HEADS AND BRUSHES ARE  
 \* CLEAR OF DISK  
 \*\*\*\*\*

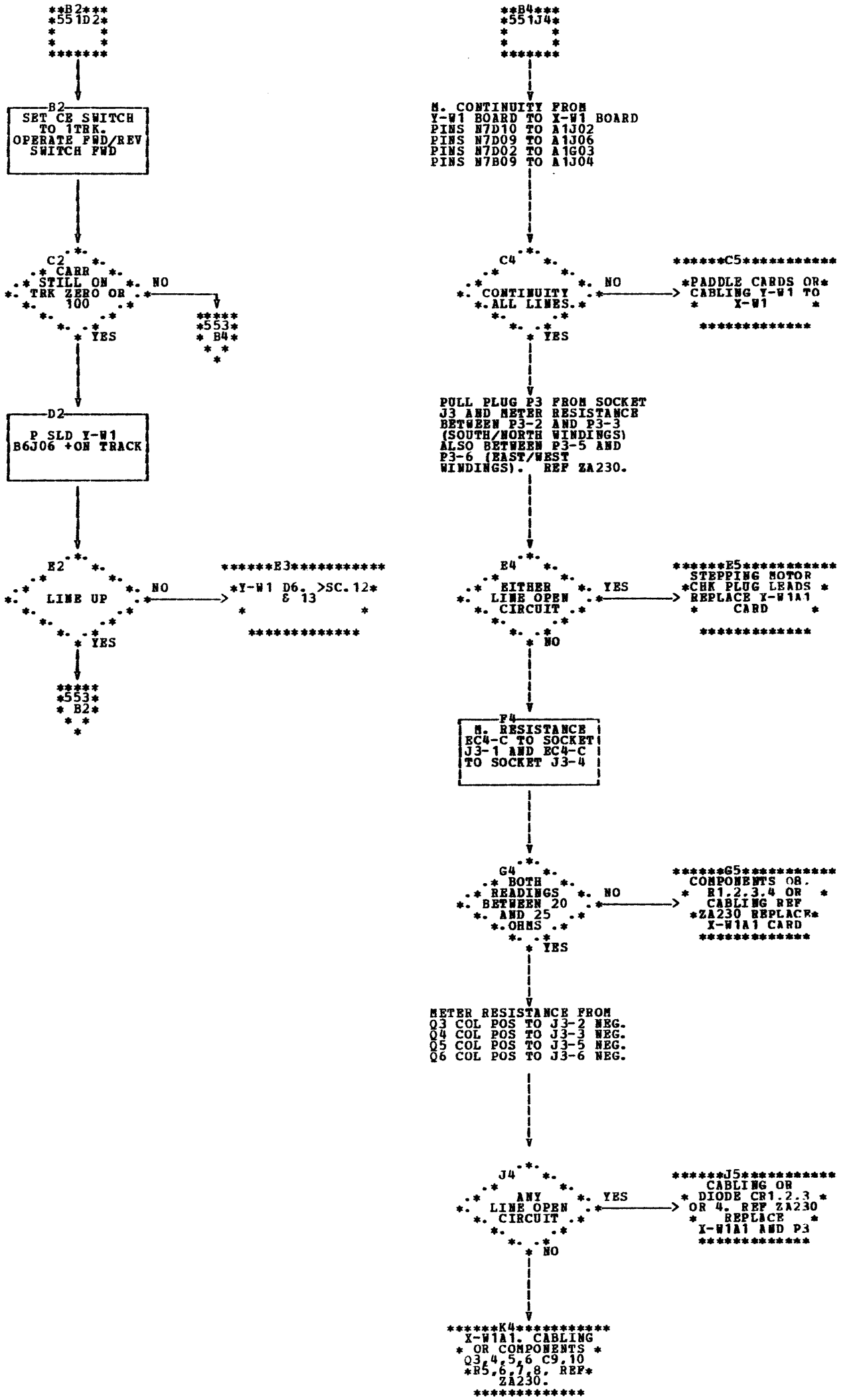


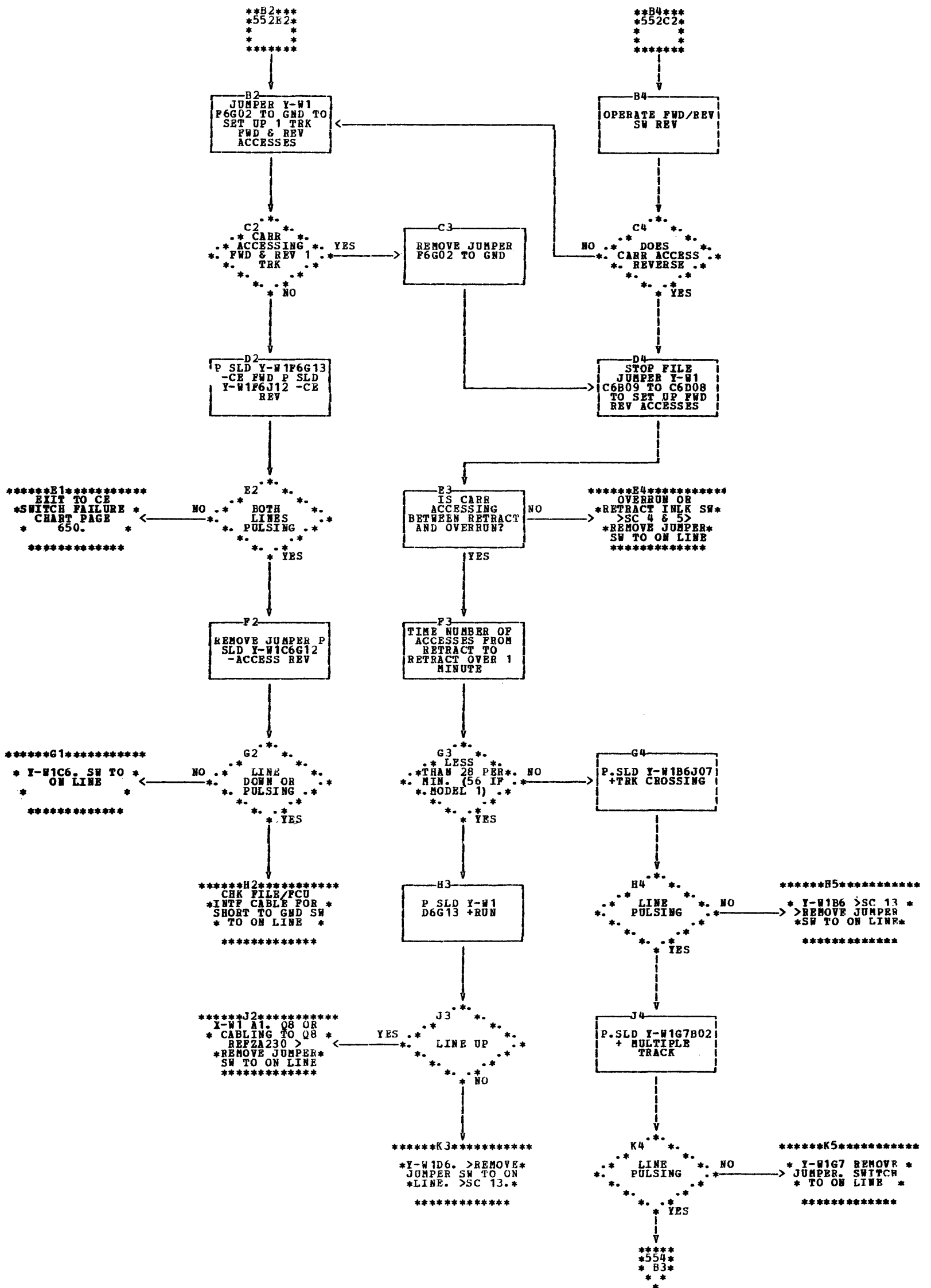


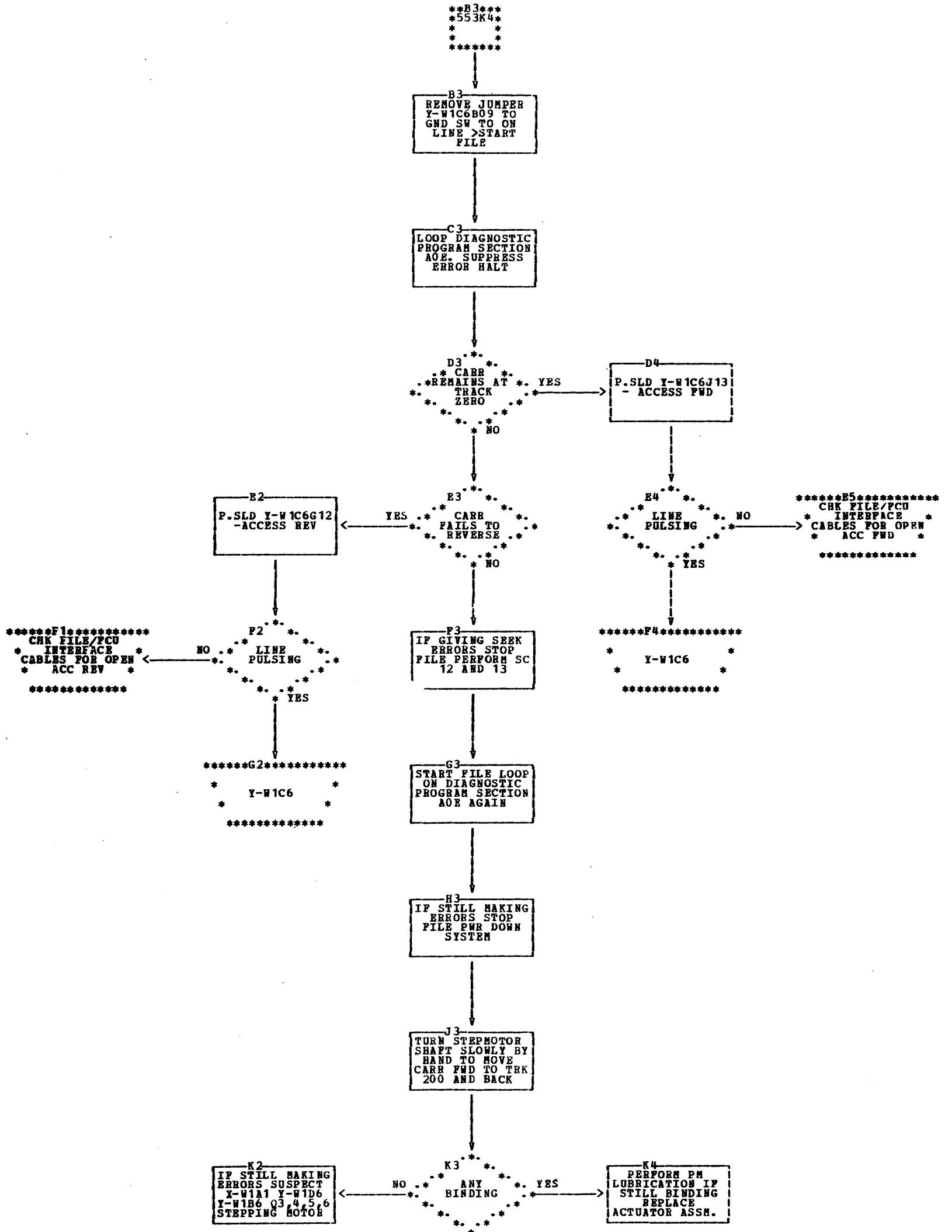


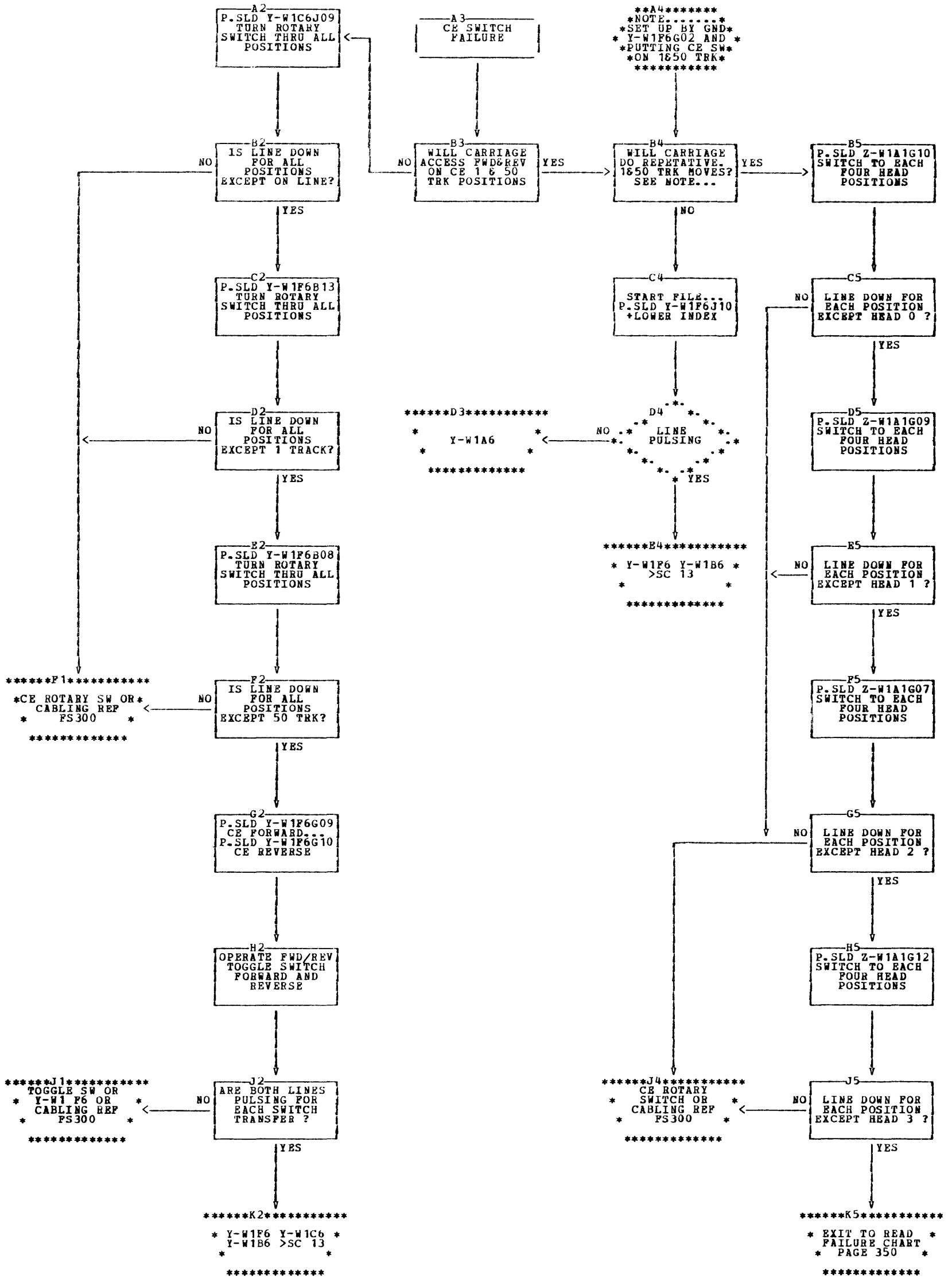












A3  
MISSING  
INTERFACE  
SIGNAL

IF MISSING OR ERRONEOUS  
SIGNAL IS LISTED BELOW  
GO TO APPROPRIATE MAP  
CHART, AS FOLLOWS:  
1. READY 100 ENTRY 1.  
2. DATA UNSAFE 250  
3. READ DATA 350  
4. CARTRIDGE UNSAFE  
450 ENTRY 1.

C4  
P SLD Y-W1H6D11  
+TRACK CROSSING  
>ACCESS CE MODE  
50 TRACKS

D3  
MISSING  
OR  
ERRONEOUS TRK.  
CROSSING  
PULSE

D4  
LINE  
PULSING

\*\*\*\*\*D5\*\*\*\*\*  
CHK FILE/PCU  
INTERFACE CABLE  
BETWEEN Y-W1H6  
AND PCU  
\*\*\*\*\*

E2  
IF CARR NOT  
HOME ACCESS  
CARR TO HOME ON  
CE MODE 50  
TRACK

E3  
MISSING  
OR  
ERRONEOUS  
HOME

\*\*\*\*\*E4\*\*\*\*\*  
\* Y-W1B6 >SC 13 \*  
\*\*\*\*\*

F2  
P SLD Y-W1H6B10  
- PCU HOME

F3  
MISSING  
OR  
ERRONEOUS  
INDEX  
PULSE

\*\*\*\*\*  
\*751\*  
\* B3\*  
\*\*\*\*\*

G1  
LEAVE PROBE ON  
Y-W1H6B10  
ACCESS CARR TO  
TRK1 (CE MODE)

G2  
LINE UP

G3  
MISSING  
OR  
ERRONEOUS  
OVERRUN

\*\*\*\*\*  
\*752\*  
\* B3\*  
\*\*\*\*\*

H1  
LINE UP

\*\*\*\*\*H2\*\*\*\*\*  
\* Y-W1C6 OR O/C  
LINE Y-W1C6B3  
TO Y-W1H6B10 \*  
\*\*\*\*\*

H3  
MISSING  
+18V (SEE  
NOTE)

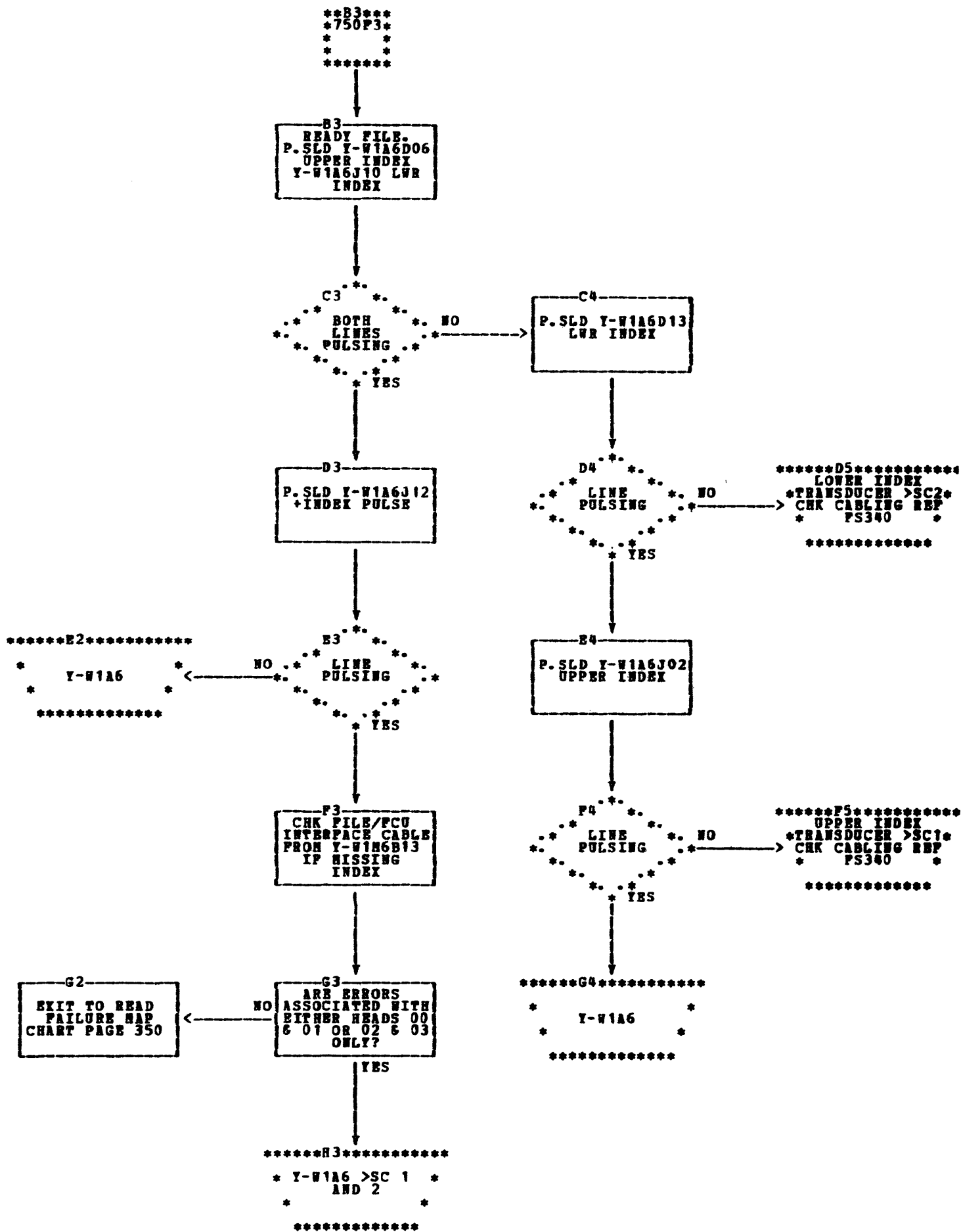
\*\*\*\*\*H4\*\*\*\*\*  
CHK FILE/PCU  
INTERFACE CABLE  
BETWEEN Y-W1H6  
AND PCU  
\*\*\*\*\*

\*\*\*\*\*J1\*\*\*\*\*  
CHK FILE/PCU  
INTERFACE CABLE  
FROM  
\* Y-W1H6B10 \*  
\*\*\*\*\*

\*\*\*\*\*J2\*\*\*\*\*  
NOTE.. ON 2\*  
FILE SYSTEM \*  
+18V AND -18V \*  
ARE SUPPLIED \*  
FROM FILE 1\*  
\*\*\*\*\*

J3  
MISSING -18V  
(SEE NOTE)

\*\*\*\*\*J4\*\*\*\*\*  
CHK FILE/PCU  
INTERFACE CABLE  
BETWEEN Y-W1H6  
AND PCU  
\*\*\*\*\*





## 1. UPPER INDEX TRANSDUCER (REF FETHN 3.5.1.)

## (A) RADIAL ADJUSTMENT. OSCILLOSCOPE REQUIRED

1. SET THE OSCILLOSCOPE UP AS FOLLOWS:  
CONNECT X10 PROBE TO CH1  
A SWEEP MODE TO NORM TRIG  
LEVEL TO 0 (A TRIGGERING)  
SCOPE TO - (A TRIGGERING)  
COUPLING TO DC (A TRIGGERING)  
SOURCE TO INT (A TRIGGERING)  
MODE TO CH1  
TRIGGER TO CH1 ONLY  
CH1 VOLTS/DIV TO CAL 0.2V  
INPUT TO DC (CH1)  
A TIME/DIV TO CAL 0.5MS  
CH2 VOLTS/DIV TO CAL 0.2
2. IF AVAILABLE SELECT A DISK PACK WITH A .080 INCH WIDE SENSE SLOT IN THE CARTRIDGE ARMATURE PLATE (SEE STEP 4) OTHERWISE USE ONE WITH A .040 INCH SLOT.
3. START THE FILE AND DISPLAY UPPER INDEX PULSE ON PIN Y-W1A6J02.
4. CHECK THAT WAVEFORM HAS A PEAK OF  
A. -1.5V TO -5.0V IF USING A DISC PACK WITH .080 (2.032MM) SLOT.  
B. -1.0V TO -4.0V IF USING A DISC PACK WITH .040 (1.016MM) SLOT.
5. IF OUTPUT IS OUTSIDE LIMITS STATED IN STEP 4, STOP FILE AND REMOVE CARTRIDGE. SLACKEN 4 SCREWS HOLDING THE UPPER INDEX TRANSDUCER ASM. TO INCREASE OUTPUT ADD SHIMS IN PAIRS UNDER THE ASM. TO DECREASE OUTPUT REMOVE SHIMS IN PAIRS FROM UNDER THE ASM. A 0.003IN SHIM IS APPROXIMATELY EQUAL TO A VOLTAGE DIFFERENCE OF 2 VOLTS.  
NOTE: SHIMS MAY HAVE NOTCHES.  
2 NOTCHES INDICATE .002 INCH SHIM.  
3 NOTCHES INDICATE .003 INCH SHIM.

CAUTION.. DO NOT DROP ANY METAL PARTICLES ON TO THE FIXED DISK SURFACE.

6. BEFORE RECHECKING THE OUTPUT, CARRY OUT THE MECHANICAL CHECKS STEPS 1 THROUGH 16.
7. REPEAT STEPS 5 AND 6 TO OBTAIN LIMITS STATED IN STEP 4. IF THE NEGATIVE PEAK VALUE CANNOT BE OBTAINED REPLACE THE TRANSDUCER. REF FETHN 3.5.2.3
8. CHANGE OSCILLOSCOPE SETTING TO  
MODE TO CHOP  
A TIME/DIV TO CAL 50 MICROSECONDS.
9. LEAVE CH 1 PROBE ON Y-W1A6J02. DISPLAY UPPER INDEX PULSE ON CH 2 PROBE PIN Y-W1A6 D06.
10. IF THE POSITIVE GOING EDGE OF THE INDEX PULSE DOES NOT COINCIDE WITH WAVEFORM CROSSOVER POINT, CHANGE THE INDEX AMPLIFIER CARD Y-W1A6. LOGIC PAGE FS340 REFERS.
11. STOP FILE AND REMOVE THE DISK CARTRIDGE.
12. PLACE HUB TOOL P/N 2537550 ON THE SPINDLE WITH THE PROJECTING TIP CLEAR OF TRANSDUCER POLE PIECE LOWER THE HANDLE AND LOCATE THE TOOL FIRMLY.
13. ROTATE THE TOOL UNTIL THE TIP OVERLAPS THE TRANSDUCER POLE PIECE. DO NOT HIT IT.
14. USING 0.003 INCH FEELER GAGE P/N 2536581, CHECK THAT THE VERTICAL GAP BETWEEN THE TIP OF THE HUB TOOL AND THE POLE PIECE IS NOT LESS THAN 0.003 INCH. DO THIS CHECK AT LEAST TWICE, WITH THE HUB TOOL IN DIFFERENT POSITIONS.
15. CHECK THAT THE HORIZONTAL GAP BETWEEN THE POLE PIECE AND THE TIP OF THE HUB TOOL IS 0.007 INCH  $\pm$  0.002 (0.18 MM  $\pm$  0.05 MM). ADJUST BY SLACKENING THE TRANSDUCER MOUNTING SCREWS, MOVING THE TRANSDUCER AND TIGHTENING THE SCREWS.
16. REMOVE THE HUB TOOL.

## (B) CIRCUMFERENTIAL ADJUSTMENT. (REF FETHN 3.5.2.2.) OSCILLOSCOPE REQUIRED.

1. LOAD THE CE DISK CARTRIDGE.
2. START UP FILE. WAIT FOR FILE TO COME READY
3. CE MODE SELECT '1 TRK ACCESS' AND FWD/REV TO FWD. ACCESS TO TRK 005.
4. SET CE MODE TO 'HEAD 0' OR HEAD 1'.
5. CONNECT THE OSCILLOSCOPE (USING X1 PROBE) TO:  
CHANNEL 1 Y-W1K6J12 (LINEAR READ SIG 1-ALD FS260)  
CHANNEL 2 Y-W1K6J10 (LINEAR READ SIG 2-ALD FS260)  
TRIGGER Y-W1A6J12 (INDEX PULSE -ALD FS 340)-POS  
MODE ADD.  
CHANNEL 1 VOLTS/DIV 50MV. NORMAL (AC INPUT)  
CHANNEL 2 VOLTS/DIV 50MV. INVERTED (AC INPUT)  
TIME/DIV 5 MICRO SEC/DIV.
6. LOOSEN THE CIRCUMFERENTIAL ADJUSTMENT SCREW LOCKNUTS.
7. THE OSCILLOSCOPE SHOULD DISPLAY A MARKER PULSE PRECEDING A TRAIN OF PULSES BY 10 MICROSECONDS. THE MARKER PULSE SHOULD OCCUR 30 + OR - 5 MICROSECONDS FROM THE START OF THE TRACE. TO ADJUST THE MARKER PULSE, BACK OFF ONE ADJUSTING SCREW AND TIGHTEN THE OTHER, TO PIVOT THE BOOM ABOUT THE CLAMP SCREW. BACKING OFF THE RIGHT SCREW AND TURNING IN ON THE LEFT MOVES THE MARKER PULSE TOWARDS THE START OF THE TRACE, THAT IS, SHORTENS THE DELAY TIME.
8. ENSURE THE MARKER PULSE OCCURS AT 30 MICROSECONDS, WITH THE CIRCUMFERENTIAL ADJUSTMENT SCREWS BACKED OFF. THE ADJUSTMENT MAY CHANGE AS SCREWS ARE BACKED OFF.
9. OPEN Y-GATE TO GET A SCREWDRIVER ON HEAD OF CLAMP SCREW. LOOSEN SCREW HALF A TURN AND RETIGHTEN.
10. CHECK THAT MARKER PULSE OCCURS WITHIN 25 TO 35 MICROSECONDS, AND IF NOT REPEAT ADJUSTMENT.
11. LOCK CIRCUMFERENTIAL ADJUSTMENT SCREWS IN BACKED-OFF POSITION.

## S.C. 2. LOWER INDEX TRANSDUCER (REF FETHN 3.5.1.2.) OSCILLOSCOPE REQUIRED.

1. SET UP THE OSCILLOSCOPE AS IN SERVICE CHECK 1 (A)
2. START THE FILE AND DISPLAY LOWER INDEX PULSE ON PIN Y-W1A6D13.
3. CHECK THAT THE WAVEFORM HAS A NEGATIVE PEAK OF -1.5V TO -5.0V.
4. IF THE OUTPUT IS OUTSIDE THE VOLTAGE LIMITS STATED IN STEP 3, STOP FILE, SLACKEN THE LOCK NUT AND SETSCREW AND MOVE TRANSDUCER ASSEMBLY TOWARDS THE SPINDLE TO INCREASE OUTPUT OR AWAY TO DECREASE OUTPUT.
5. CHECK THAT GAP BETWEEN TRANSDUCER AND THE FACE OF THE SPINDLE PULLEY IS NOT LESS THAN 0.001 INCH. CHECK THE SETTING ON EITHER SIDE OF THE SLOT WITHIN 0.5 INCH OF THE SLOT.
6. IF THE NEGATIVE PEAK VALUE IS STILL NOT WITHIN THE VOLTAGE LIMITS STATED IN STEP 3 REPLACE THE TRANSDUCER (REF FETHN 3.5.3.3.).
7. TIGHTEN SETSCREW AND LOCKNUT (DO NOT OVERTIGHTEN) AND REPEAT STEPS 2 AND 3.
8. CHANGE OSCILLOSCOPE SETTING TO  
MODE TO CHOP  
A TIME/DIV TO CAL
9. LEAVE CH1 PROBE ON Y-W1A6D13. DISPLAY LOWER INDEX PULSE ON CH2 PIN Y-W1J10 USING X10 PROBE.
10. IF THE POSITIVE GOING EDGE OF THE INDEX PULSE DOES NOT COINCIDE WITH THE WAVEFORM CROSSOVER POINT, CHANGE THE INDEX AMPLIFIER CARD Y-W1A6. LOGIC PAGE FS340 REFERS.

## S.C. 3. BRUSH MICROSWITCHES (REF FETHN 3.6.2.)

1. REMOVE THE FILE COVER.
2. UNCLIP AND TAKE OFF THE BRUSH ARM. REMOVE THE COVER PLATE.
3. WITH THE CAM ARM ON THE PARKED STOP. CHECK THE GAP BETWEEN THE BODY OF THE SWITCHES AND THE CAM SURFACE. THE CLEARANCE SHOULD BE 0.045 INCH. TO ADJUST, SLACKEN OFF THE PIVOT SCREW AND MOUNTING SCREW, MOVE THE SWITCH, THE NUTS BELOW THE SCREWS ARE CAPTIVE.
4. CHECK THE ORDER IN WHICH THE SWITCHES OPERATE, WHEN THE CAM ARM IS MOVING FROM PARKED TO FORWARD STOP. THE CYCLE COMPLETE SWITCH MUST TRANSFER BEFORE THE MIDCYCLE SWITCH. ON RETURN, CAM ARM MOVING FROM FORWARD TO PARKED STOP MIDCYCLE SWITCH MUST TRANSFER BEFORE CYCLE COMPLETE SWITCH THE 0.045 INCH GAP MAYBE EXTENDED + OR - 0.005 INCH TO OBTAIN THESE CONDITIONS.

## S.C. 4. CARRIAGE RETRACTED SWITCH (REF FETHN 3.10.2.)

1. STOP FILE LEAVE CPU POWER ON.
  2. REMOVE FUSE F1 AND CARRIAGE FLAG ASSEMBLY.
  3. LOOSEN THE TWO SECURING SCREWS ON SWITCH.
  4. TURN THE STEPPING MOTOR SHAFT BY HAND TO MOVE CARRIAGE. SET THE SWITCH TO TRANSFER AT TRACK MINUS 118 (TRACK 32 ON ENCODER DISK) + OR - 1/2 A TRACK TO BE READ OFF THE ENCODER DISK WHEN MOVING CARRIAGE TOWARDS RETRACTED LIMIT OF TRAVEL.
- NOTE. ENSURE THAT THE MICROSWITCH TRANSFERS ON CHAMFER OF STRIKER BRACKET.
5. TIGHTEN THE SECURING SCREWS.
  6. REPLACE CARRIAGE FLAG ASSEMBLY AND FUSE F1.

## S.C. 5. CARRIAGE OVERRUN SWITCH (REF FETHN 3.10.2)

1. START FILE.
  2. LOOSEN THE TWO SECURING SCREWS ON SWITCH.
  3. SET THE SWITCH TO TRANSFER AT TRACK 204 (TRACK 4 ON ENCODER DISK) + OR - 1/2 A TRACK WHEN ACCESSING CARRIAGE IN CE MODE TOWARDS INNER LIMIT OF TRAVEL. FINE ADJUSTMENT CAN BE MADE BY ADJUSTING THE STRIKER BRACKET.
- NOTE. ENSURE THAT THE MICROSWITCH TRANSFERS ON CHAMFER OF STRIKER BRACKET.
4. TIGHTEN SECURING SCREWS.
- NOTE. FOR A MODEL 1 FILE THE SWITCH IS REVERSED. SET THE SWITCH TO TRANSFER AT TRACK 104 + OR - 1/2 A TRACK.



## S.C. 6. HEAD LOAD MECHANISM (REF FETHM 3.9.1.)

1. WITH THE SYSTEM POWER OFF REMOVE STEPPING MOTOR PLUG P3. AND FILE TOP COVER.

NOTE. CHECK HEAD LOAD SHAFT SPRINGS ARE CORRECTLY SEATED ON THE HEAD DIMPLE.

2. CHECK THAT THE HEAD LOAD ARM IS SECURE ON THE HEAD LOAD SHAFT. IF NOT CARRY OUT SC 8 BEFORE SC 6.
3. CHECK THAT THE CAN HOLD MAGNET IS AGAINST THE CAN HOLD LEVER AND ENSURE THE TWO POLES OF THE MAGNET ARE IN CONTACT WITH THE LEVER.
4. SWITCH ON SYSTEM POWER THEN FILE START.
5. ADD JUMPER FROM Y-W1P6B07 TO GROUND.

NOTE. THE BRUSH MOTOR WILL THEN CYCLE CONTINUOUSLY. THIS ALLOWS THE CAN HOLD MAGNET TO BE ENERGISED.

6. MANUALLY ACCESS THE CARRIAGE TO TRACK 100 BY TURNING STEPPING MOTOR SHAFT IN AN ANTICLOCKWISE DIRECTION.
7. LOOSEN THE TWO SECURING SCREWS OF THE LEVER HOLD MAGNET AND MOVE THE MAGNET AWAY FROM THE LATCH LEVER.
8. HOLD THE LATCH LEVER IN ITS PRESENT POSITION.

NOTE. DO NOT OVERCOME THE RESISTANCE OF THE HEADS BY PRESSING TOO HARD ON THE LATCH LEVER AS THIS WILL OVERLOAD THE HEADS ON THE DISK.

9. BIAS THE LEVER HOLD MAGNET AGAINST THE LATCH LEVER ENSURING THAT THE TWO POLES OF THE MAGNET ARE IN CONTACT WITH THE LEVER AND LOCK SECURING SCREWS.
10. ADJUST LEVER HOLD INLK MICROSWITCH AS IN SC 7.
11. MANUALLY ACCESS CARRIAGE TO TRACK MINUS 100.
12. STOP FILE AND REMOVE THE JUMPER Y-W1P6B07 TO GROUND.
13. REPLACE BRUSH ARM ASSEMBLY COVER PLATE, PLUG P3. AND TOP COVER.

## S.C. 7. LEVER HOLD INLK MICROSWITCH (REF FETHM 3.9.5.)

1. WITH SYSTEM POWER OFF REMOVE STEPPING MOTOR PLUG P3. AND FILE TOP COVER.
2. SWITCH ON SYSTEM POWER THEN FILE START.
3. DURING THE BRUSH CYCLE RETURN STROKE MANUALLY ACCESS THE CARRIAGE TO TRK 200 BY TURNING STEPPING MOTOR SHAFT IN AN ANTICLOCKWISE DIRECTION.
4. SLACKEN OFF LEVER HOLD INLK MICROSWITCH LOCKING SCREWS AND, TAKING CARE NOT TO RELEASE THE LATCH LEVER FROM THE LEVER HOLD SOLENOID, ADJUST THE SWITCH SO IT IS IN THE OPERATED POSITION AND ALL THE OVERTRAVEL IS TAKEN UP.

NOTE. TAKE CARE NOT TO RELEASE THE LATCH LEVER FROM THE LEVER HOLD SOLENOID, BUT DO NOT HOLD MANUALLY THE LEVER IN POSITION WHEN CARRYING OUT THIS ADJUSTMENT.

5. TIGHTEN LOCKING SCREWS.

NOTE. FOR A VISUAL INDICATION OF WHEN SWITCH IS MADE P. SLD Y-W1 C6G03. LINE SHOULD SHOW AN UP LEVEL WHEN SWITCH IS MADE.

6. STOP FILE, REPLACE FILE TOP COVER AND PLUG P3.

## S.C. 8. HEAD LOAD SPRING SHAFTS (REF FETHM 3.9.9)

TO CHECK THE HEAD LOAD SHAFT SPRINGS, CARRY OUT STEPS 1 TO 20 WITHOUT LOOSENING THE CLAMP SCREWS.

1. IF DATA HAS TO BE RETAINED ALL ATTEMPTS SHOULD BE MADE TO TRANSFER TO A SCRATCH DISK PACK.
2. WITH SYSTEM POWER OFF REMOVE FILE TOP COVER.
3. WITH CARRIAGE IN THE FULLY RETRACTED POSITION REMOVE HEAD ARM ASSEMBLIES. REF FETHM 3.8.2.4.
4. REMOVE HEAD LOAD MICROSWITCH ASSEMBLY.
5. REMOVE CABLE CLAMP PILLAR, LOCATE THE DISK CLEARANCE AND HEAD LOAD SPRING GAGE (P/N 2600555) ON THE HOLE IN THE MACHINE PAD, SECURING THE GAGE WITH THE CAPTIVE SCREW.

NOTE. IF HEAD LOAD SPRING GAGE P/N 5144375 IS BEING USED REFER TO FETHM 3.9.9.2.

6. REMOVE PLASTIC TRANSISTOR COVER.
7. SET THE LINKS IN ORDER 03, 02, 01 AND 00. 03 IS THE MASTER SHAFT WHICH CARRIES THE HEAD LOAD LEVER.
8. LOOSEN THE HEAD LOAD LEVER CLAMP SCREW, WITH THE HEAD LOAD LEVER IN THE UNLOADED POSITION, TOUCHING THE CARRIAGE SURFACE CENTRALLY POSITIONED IN THE RECESS OF THE CARRIAGE CASTING, THE HEAD LOAD SPRING 03 SHOULD CLEAR THE 03 GAGE SURFACE BY .006 TO .014 INCH. ENSURE THAT THE SHAFT SHOULDER IS BEARING ON THE BUSH. TIGHTEN THE HEAD LOAD ARM SCREW TO 8LB/IN TORQUE AND RECHECK THE SPRING TO 03 GAGE SURFACE CLEARANCE.

CAUTION. ENSURE THE HEAD LOAD SPRINGS ARE CLEAR OF THE FIXED DISK WHEN CARRIAGE IS MOVED.

9. WITH THE HEAD LOAD LEVER TOUCHING THE CARRIAGE CASTING, MOVE CARRIAGE TO TRACK 100.
10. STILL KEEPING THE CONDITION IN STEP 8, LOOSEN THE 03 LINK SOCKET SCREW, SET LINK 03 VERTICAL AND TIGHTEN THE SCREW TO 8 LB IN TORQUE. ENSURE THE END PLAY OF THE SHAFTS DOES NOT EXCEED 0.003 INCH
11. MOVE GAGE ARM 03 BACK AND PROCEED WITH 02. LOOSEN LINK 02 SOCKET SCREW, RETRACT THE CARRIAGE TO APPROXIMATELY TRACK MINUS 70. SET THE 02 HEAD LOAD SPRING .006 INCH TO .014 INCH ABOVE THE 02 GAGE SURFACE AND ADJUST THE LINK TO TOUCH THE SLOT OF THE 03 LINK. LIGHTLY TIGHTEN THE 02 LINK SOCKET SCREW. MOVE THE CARRIAGE TO TRACK 100 AND TIGHTEN SOCKET SCREW TO 8LB/IN TORQUE.

NOTE. ADJUST ALL HEAD LOAD SPRINGS WHETHER BLANK ARMS ARE FITTED IN LOWER POSITIONS OR NOT.

12. MOVE CARRIAGE TO APPROXIMATELY TRACK MINUS 70, CHECK THAT THE 02 HEAD LOAD SPRING CLEARS THE 02 GAGE SURFACE BY .006 INCH TO .014 INCH.
13. MOVE THE GAGE ARM 02 BACK AND PROCEED WITH 01. LOOSEN LINK 01 SOCKET SCREW. SET THE 01 HEAD LOAD SPRING .006 INCH TO .014 INCH ABOVE THE 01 GAGE SURFACE AND ADJUST THE LINK TO TOUCH THE SLOT OF THE 02 LINK. LIGHTLY TIGHTEN THE 01 LINK SOCKET SCREW. MOVE THE CARRIAGE TO TRACK 100 AND RETIGHTEN SOCKET SCREW TO 8 LB IN TORQUE.
14. MOVE CARRIAGE TO APPROXIMATELY TRACK MINUS 70, CHECK THAT THE 01 HEAD LOAD SPRING CLEARS THE 01 GAGE SURFACE BY .006 INCH TO .014 INCH.
15. MOVE 01 GAGE ARM BACK AND PROCEED WITH SHAFT 00. ADJUST AS FOR PREVIOUS SHAFTS MAKING SURE THE LINK TOUCHES THE 01 LINK ON THE CORRECT SIDE.

CAUTION. NOTE THAT EACH LINK IS DEPENDENT UPON THE OTHER SO ALL LINKS MUST BE CHECKED WHEN ANY ONE IS ADJUSTED.

16. REPLACE MICROSWITCH ASSEMBLY AND ADJUST TO SC 7.
17. REPLACE HEADS AND CHECK THAT THE HEAD LOAD SHAFT SPRINGS ARE SEATED CORRECTLY ON HEAD DIMPLE. (REF FETHM 3.8.2.5.) ADJUST HEADS AS PER FETHM 3.8.2.3

CAUTION. ENSURE THAT THE WIRING IN THE AREA OF MICROSWITCHES AND CARRIAGE PHOTO CELLS DOES NOT FOUL THE CARRIAGE FLAG WHEN CARRIAGE IS MOVED OVER FULL RANGE OF TRAVEL.

18. REPLACE TRANSISTOR COVER.
19. ENSURE HEAD KNOCK OFF SETTING IS CORRECT TO SC 9.
20. IF DATA IS STILL TO BE RECOVERED FROM FIXED DISK REFER TO ERP CHART FETHM 2.2.
21. REINITIALISE THE FIXED DISK
22. REPLACE CUSTOMER DATA IF REQUIRED.

## 9. HEAD KNOCK OFF (REF FETNM 3.9.2.1.)

1. SWITCH ON FILE START
  2. WITH CARRIAGE AT TRACK ZERO JUMPER DOWN Y-W1C6D02 TO GROUND, PERMITTING ACCESSING BEHIND HOME.
  3. SWITCH TO CE MODE SINGLE TRACK.
  4. ADJUST KNOCK OFF BRACKET TO OPERATE LATCH LEVER BETWEEN TRACKS -5 AND -7.
- CAUTION. DO NOT ACCESS PASSED TRACK -8 TOWARDS RETRACTED POSITION. IF HEADS UNLOAD, REMOVE JUMPER BEFORE RELOADING.
5. ACCESS FORWARD TO TRACK ZERO.
  6. REMOVE JUMPER.

## S... 10. CARTRIDGE INTERLOCK SWITCHES (REF FETNM 3.4.4.)

EACH CLAMP ARM ASSEMBLY CONTAINS AN INTERLOCK PRECISION SWITCH.

1. OPEN THE ARMS.

DANGER. THE TOGGLE SPRING ASSEMBLY UNDER EACH ARM IS UNDER TENSION. KEEP FINGERS CLEAR.

2. DETACH THE ARM. (3 SOCKET SCREWS PER ARM).
3. IF THE ASSEMBLY IS LIFTED, FREE PLAY OF 1/16 TH. INCH CAN BE FELT. ADJUST EACH SWITCH TO TRANSPARENT IN BOTH DIRECTIONS WITHIN THE FREE PLAY.
4. TIGHTEN THE SWITCHES DOWN AND REPLACE THE CLAMP ARMS.

## S.C. 11. CARRIAGE FLAG ADJUSTMENT (REF FETNM 3.10.5.)

1. INSPECT BULBS FOR DISCOLORATION AND FOCUS REPLACE IF NECESSARY
2. LOOSEN THE TWO LOCKING SCREWS AND POSITION THE FLAG SUCH THAT IT RUNS MIDWAY BETWEEN THE PHOTOCELL ON THE PC BOARD AND THE LAMP HOLDER.

NOTE. THE FLAG SHOULD NOT TOUCH EITHER THE PHOTOCELL OR THE LAMP WHEN THE CARRIAGE IS ACCESSED OVER ITS COMPLETE RANGE.

3. ACCESS THE CARRIAGE TO TRACK 95 BY USE OF THE CE SWITCH.
4. PROBE SLD Y-W1B6G05. POSITION THE FLAG UNTIL LINE CHANGES FROM ACTIVE (UP LEVEL) TO INACTIVE (DOWN LEVEL).
5. TIGHTEN THE FLAG RETAINING SCREWS AND CARRY OUT THE FOLLOWING CHECKS.
6. POSITION CARRIAGE AT TRACK 94 AND CHECK FOR AN 'UP' LEVEL.
7. POSITION CARRIAGE AT TRACK 96 AND CHECK FOR A 'DOWN' LEVEL.

## S.C. 12. ENCODER ADJUSTMENTS (REF FETNM 3.7.6.4.)

NOTE. THESE ADJUSTMENTS NEED THE USE OF OSCILLOSCOPE 453. THE ENCODER DISK SHOULD BE WIPED CLEAN WITH A LINT FREE TISSUE BEFORE ATTEMPTING ADJUSTMENT, DIRT ON THE DISK COULD INTRODUCE EXTRA PULSES AND UPSET THE MOTOR RUNNING. THE ENCODER DISK SHOULD ALSO BE CLEANED AFTER ANY CHECKING OR ADJUSTMENT. IF THE CELL MOUNTING BLOCK HAS BEEN REMOVED CARE MUST BE TAKEN TO ENSURE THAT THE SLIT IS CLEAN AND UNOBSTRUCTED.

CHECK THAT THE HORIZONTAL ADJUSTER ON THE ENCODER IS APPROXIMATELY AT THE CENTRE POSITION.

1. SWITCH ON FILE START, AND MOVE CE SWITCH TO 50 TRACK MODE.
2. ENSURE FILE IS AT TRACK ZERO AND BRUSH CYCLE IS COMPLETE. SET UP 50 TRACK REPETITIVE ACCESSES BY JUMPING F6 G02 TO GROUND.
3. PLACE A 1X PROBE ON Y-W1B6B12 (+FINE HOME). UNCALIBRATE THE TIME BASE AND USE 10 MILLISECOND /DIVISION, AND 5 VOLT/DIVISION. TRIGGER INTERNALLY ON THE NEGATIVE GOING EDGE AND ADJUST THE UNCALIBRATED TIME BASE SO THAT THE POSITIVE GOING EDGES OCCUR NEAR THE END OF THE SWEEP. IF ADJUSTMENT IS REQUIRED, THE POSITIVE GOING EDGES WILL APPEAR AT TWO DIFFERENT POSITIONS, INDICATING THAT THE SEEK IS FASTER IN ONE DIRECTION.
4. REMOVE ENCODER COVER AND SLACKEN OFF LAMP/CELL ASSEMBLY FIXING SCREWS. (REF FETNM 3.7.5.)
5. ADJUST THE HORIZONTAL ADJUSTING SCREW ON THE LAMP/CELL ASSEMBLY BY SMALL AMOUNTS AT A TIME SO THAT THE TWO EDGES COME TOGETHER. NOTE THAT THERE IS A LOT OF BACKLASH IN THE ADJUSTING SCREW.
6. TIGHTEN LOCKING SCREWS CAREFULLY, ALTERNATING BETWEEN THE TWO SO AS NOT TO UPSET THE SETTING. REPLACE THE ENCODER COVER.

## S.C. 13. MOTOR CONTROL SYSTEM ADJUSTMENTS (REF FETNM 3.7.8)

NOTE. CE OSCILLOSCOPE AND TACHOMETER ASSEMBLY WILL BE REQUIRED FOR THESE ADJUSTMENTS.

## 13.1. MOTOR SPEED ADJUSTMENT.

1. THE OBJECT OF THE SPEED ADJUSTMENT IS TO ENSURE THAT THE MOTOR RUNS AT A CONSTANT SPEED EQUAL TO THAT REACHED AFTER THE FIRST TRACK OF AN ACCESS.
2. THIS IS DONE BY OBSERVING THE TIME INTERVAL BETWEEN THE FALL OF THE FINE HOME NEAR TRACK 1 AND THE ON TRACK PULSE AT TRACK 3 AND EQUALISING THIS TO THE CORRESPONDING TIME INTERVAL AS THE CARRIAGE PASSES TRACK 53 DURING AN ACCESS FROM TRACK 0 TO TRACK 100.

PERFORM THIS ADJUSTMENT AS FOLLOWS.

3. FILE START MUST BE ON AND THE START UP CYCLE COMPLETE.
4. MOVE CE SWITCH TO 50TRK POSITION.
5. SET UP ALTERNATING MOVES BETWEEN TRKS 000 AND 100 BY JUMPING Y-W1 B6G12 TO B6D13 AND F6G02 TO GROUND
6. ADD THE FOLLOWING TWO JUMPERS ON Y-W1 BOARD. B6B02 TO B6B13 AND B6D04 TO C6D09. THIS USES AN "AND" GATE (ON FS260) TO FORM A SIGNAL TO TRIGGER THE SCOPE.
7. DISPLAY '+ON TRACK', PIN B6 J06 ON 5V/CN. TRIGGER SCOPE WITH THE NEGATIVE EDGE OF THE SIGNAL ON B6B03 AND SET TIMEBASE TO 1MSEC/DIV. WHEN THE TRIGGERING IS CORRECT, TWO TRACES WILL BE SEEN IN RAPID SUCCESSION FOR EACH FORWARD ACCESS FROM TRK 000, SIMILAR TO THAT SHOWN IN FETNM 3.7.8.1.

CAUTION: IF THE DOUBLE SWEEP CEASES, CHECK THAT THE CARRIAGE IS STILL ACCESSING BETWEEN TRACKS 000 AND 100. IF NOT, REMOVE JUMPERS IN INSTRUCTION 5. AND ACCESS TO TRACK 000, THEN REPLACE JUMPERS TO START AGAIN. IF CARRIAGE WILL NOT RETRACT USING CE SWITCH, GROUND PIN Y-W1C6B13, DO ONE FORWARD ACCESS THEN RETRACT TO TRACK 000. REMOVE C6B13 JUMPER.

8. EXPAND THE TIMEBASE USING THE "X10" KNOB AND ADJUST THE HORIZONTAL POSITION CONTROL TO DISPLAY THE SECOND PULSE. REFER FETNM 3.7.8.1.
9. OBSERVE THE TIMING OF PAIRS OF PULSES. THEY SHOULD OCCUR AT IDENTICAL TIMES, WITHIN ONE SMALL DIVISION ON THE SCOPE. IF THEY ARE NOT, ADJUST THE FEEDBACK DELAY POTENTIOMETER (CARD Y-W1B6). AS IN PARAGRAPH 10.
10. IF THE FIRST PULSE APPEARS TO THE LEFT OF THE SECOND PULSE (MOTOR SPEED TOO SLOW), TURN THE POTENTIOMETER ANTICLOCKWISE, ADJUSTING THE HORIZONTAL POSITION CONTROL ON THE SCOPE TO KEEP THE PULSES ON THE SCREEN AS THE MOTOR SPEED INCREASES. WHEN THE TWO PULSES COINCIDE THE ADJUSTMENT IS CORRECT. IF THE FIRST PULSE APPEARS TO THE RIGHT, OF THE SECOND PULSE, THE MOTOR SPEED IS TOO FAST AND THE POTENTIOMETER SHOULD BE TURNED CLOCKWISE.

## 13.2. MULTI-TRACK STOP ADJUSTMENT (REF FETNM 3.7.8.3.)

NOTE. SERVICE CHECK 13. 1. MUST BE PERFORMED BEFORE THIS SECTION.

1. REMOVE ENCODER COVER AND ATTACH CE TACHOMETER ASSEMBLY AS SECTION FETNM 3.7.7.
2. DC POWER MUST BE ON THE MACHINE, BUT FILE START MUST BE OFF.
3. ADD THE FOLLOWING JUMPERS  
A6G09 - GROUND  
A6D12 - GROUND  
C6J07 - GROUND

4. MOVE CE SWITCH TO 50 TRACK POSITION, AND ACCESS CARRIAGE TO TRACK + 50 AND THEN TO TRACK 0 BY MEANS OF THE CE TOGGLE SWITCH.

NOTE. IF A CHECK IS REQUIRED, DO ITEMS 10 AND 11, AND THEN PROCEED TO ITEM 15.

5. SET UP ALTERNATE MOVES BETWEEN TRACK 0 AND 50 BY ADDING JUMPER FROM F6G02 AND GROUND.
6. SET SCOPE UP AS FOLLOWS (X10 PROBE CONNECTED TO CHANNEL 1).  
TRIGGERING- MODE = 'NORM TRIG'. LEVEL = '0'.  
SLOPE = '+'. COUPLING = 'DC'. SOURCE = 'INT'.  
X MODE- MODE = 'CH1'. TRIGGER = 'CH1 ONLY'.  
VOLTS CAL- CH1 = '2V'. DC COUPLING.  
TIME BASE- TIME DIV A = '100US'.
7. DISPLAY '+ SINGLE SHOT A MULTI' BY PLACING CH1 PROBE ON D6B04, SET DURATION OF POSITIVE PULSE TO 500NANOSECS BY ADJUSTING SINGLE SHOT 'A' MULTI (Y-W1D6 LOWER POT).
8. CHANGE TRIGGERING TO- SLOPE = '-'.  
CHANGE TIME BASE TO- TIME DIV A = '200US'.
9. DISPLAY - SINGLE SHOT B BY PLACING CH1 PROBE ON D6G09, SET DURATION OF NEGATIVE PULSE TO 1400 US BY ADJUSTING SINGLE SHOT B POT (Y-W1D6 TOP POT)
10. ARRANGE SCOPE AS FOLLOWS (X10 PROBES)  
TRIGGERING- MODE = 'NORM TRIG'. LEVEL = '0'.  
SLOPE = '+'. COUPLING = 'DC'. SOURCE = 'INT'.  
MODE- TRIGGER = 'CH1 ONLY'. MODE = 'CH2'.  
VOLTS CAL- CH1 = '2V'. CH2 = '50MV'. DC COUPLING  
TIME BASE- TIME DIV A = '5NS'.  
SET GROUND OF CH2 TO MIDDLE OF THE SCREEN.

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## SERVICE CHECKS

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## MULTI-TRACK STOP ADJUSTMENT CONTINUED.

11. CONNECT CH2 PROBE TO TACHOMETER AND CH1 PROBE TO G7D12.
12. SCOPE WAVEFORM MAY BE SIMILAR TO MALADJUSTED SETTING (REF PETHM SECTION 3.7.8.3.) EXCEPT THAT TRACE COULD BE INVERTED, IF SO, REVERSE LEADS ON TACHOMETER. ADJUST SINGLE SHOT A MULTI TO BRING POSITIVE PEAK AT 10 NS FROM START OF TRACE TO GROUND. ADJUST SINGLE SHOT B TO OBTAIN MINIMUM AMPLITUDE AFTER 12 NS FROM THE START OF THE TRACE. POSITIVE PEAK MAY BE HIDDEN IF THE SETTLING IS A LONG WAY OUT OF ADJUSTMENT. IN WHICH CASE SET THE TRACE AT 10 NS TO GROUND.
13. REPEAT ITEM 12 UNTIL NO FURTHER IMPROVEMENT CAN BE OBTAINED.
14. REMOVE JUMPER BETWEEN GROUND AND F6G02.
15. CHECK COMPLETE WAVEFORM BY OPERATING CE TOGGLE SWITCH ALTERNATELY FORWARD AND REVERSE, AND ON REVERSE ACCESS CHECK THAT THERE IS NO SETTLING TRANSIENT GREATER THAN + OR - 50 MV AFTER 15 MILLISECOND FROM START OF WAVEFORM.
16. IF WAVEFORM IS OUT OF TOLERANCE GROUND F6G02 WITH A JUMPER AND PROCEED AGAIN FROM ITEM 12.
17. LEAVING MACHINE IN EXISTING STATE PROCEED TO PETHM SECTION 3.7.8.4. 'SINGLE STOP ADJUSTMENT'.

## 13.3. SINGLE TRACK STOP ADJUSTMENT (REF PETHM 3.7.8.4.)

E. SERVICE CHECK 13.2. MUST BE PERFORMED BEFORE THIS SECTION.

1. USING CE TOGGLE SWITCH, ACCESS CARRIAGE TO TRACK 0. TURN MODE SWITCH TO '1 TRK' MODE.

NOTE. IF A CHECK ONLY IS REQUIRED PROCEED TO ITEM 6.

2. SET UP ALTERNATE MOVES BETWEEN TRACK 0 AND 1 BY ADDING A JUMPER FROM Y-W1P6G02 TO GROUND.
3. CHANGE TIME BASE OF SCOPE TO 2 NS/DIV
4. ADJUST SINGLE SHOT A SINGLE (Y-W1D6 MIDDLE POT) TO OBTAIN MINIMUM SETTLING (REF PETHM 3.7.8.4.)
5. REMOVE JUMPER Y-W1P6G02 TO GROUND.
6. CHANGE SCOPE TIME BASE BACK TO 5 NS/DIV AND CHECK COMPLETE WAVEFORM BY OPERATING CE TOGGLE SWITCH ALTERNATELY FORWARD AND REVERSE, AND ON REVERSE ACCESS, CHECK THAT THERE IS NO SETTLING TRANSIENT GREATER THAN + OR - 50 MV AFTER 15 MILLISECOND FROM START OF WAVEFORM.
7. IF WAVEFORM IS OUT OF TOLERANCE GROUND Y-W1P6G02 WITH A JUMPER AND PROCEED AGAIN FROM ITEM 2.

## 14. STEPPING MOTOR SHAFT / LEADSCREW COUPLING

(REF PETHM 3.7.3.1.)

NOTE. THESE ADJUSTMENTS REQUIRE THE USE OF THE CE OSCILLOSCOPE.

1. POWER DOWN FILE
2. ENSURE CARRIAGE IS IN FULLY RETRACTED POSITION.
3. PUT CE CARTRIDGE ON TO THE FILE.
4. SWITCH ON FILE START.
5. WITH MOTOR/LEADSCREW COUPLING LOOSE HOLD THE CARRIAGE MANUALLY SO THAT THE RETRACT MICROSWITCH IS TRANSFERRED UNTIL A BRUSH CYCLE STARTS.
6. WHEN THE BRUSHES ARE ON THE RETURN STROKE, PUSH CARRIAGE TO TRACK 100 TO LOAD HEADS.
7. WHEN THE BRUSH CYCLE IS COMPLETED SWITCH TO CE MODE.
8. ACCESS THE STEPPING MOTOR FOR ONE OR MORE 50 TRACK MOVES. THIS WILL ENSURE THE STEPPER MOTOR IS IN A HOME POSITION.
9. ACCESS THE STEPPING MOTOR 23 SINGLE TRACK MOVES. THE MOTOR IS NOW DETENTED TO TRACK 73.
10. WITH THE CE OSCILLOSCOPE CONNECTED AS SHOWN IN PETHM 3.8.2.5 MOVE THE CARRIAGE MANUALLY TO TRACK 73. USE OSCILLOSCOPE TRACE TO MONITOR THE HEAD POSITION.
11. TIGHTEN THE COUPLING CLAMP SCREW WITH TORQUE WRENCH P/N 2598187 AND ADAPTOR P/N 2597971 (8 LB IN), WHILE RETAINING BOTH THE STEPPING MOTOR AND CARRIAGE AT TRACK 73, ENSURE THAT THE COUPLING ROTATES CLEAR OF THE CASTING.

NOTE. THE COUPLING SPRING MUST BE ON THE COUPLING WHEN TIGHTENING THE CLAMP SCREW, AND THE PRESSURE PADS MUST BE IN CONTACT.

12. ACCESS THE CARRIAGE FORWARDS AND REVERSE A FEW TIMES USING THE CE SWITCHES.
13. ACCESS TO TRACK 73 AND CHECK HEAD ALIGNMENT FOR HEADS 00 AND 01.

NOTE. (A.) IF THE OSCILLOSCOPE TRACE SHOWS THE HEADS TO BE ON OR NEAR TO TRACK 73 GO THROUGH THE PROCEDURE STATED IN PETHM 3.8.2.3. FOR FINAL ADJUSTMENT OF HEADS 00 AND 01.

(B.) IF HEADS ARE NOT NEAR TRACK 73 GO THROUGH THE PROCEDURE FROM STEP 5 ABOVE AGAIN.

## S.C. 15. RE-ENGAGEMENT: CARRIAGE.

(REF PETHM 3.7.9.2.)

1. REMOVE ALL POWER FROM THE FILE.
2. REMOVE TOP COVER.
3. MOVE CARRIAGE MANUALLY FORWARD OR REVERSE, AS REQUIRED, AT THE SAME TIME MANUALLY ROTATE THE STEPPING MOTOR SHAFT ANTICLOCKWISE OR CLOCKWISE RESPECTIVELY UNTIL THE FOLLOWER WHEEL ENGAGES WITH THE LEADSCREW.
4. RELEASE THE CARRIAGE AND CONTINUE TO ROTATE THE MOTOR SHAFT UNTIL THE CARRIAGE IS AT TRACK MINUS 100.
5. REPLACE TOP COVER

## S.C. 16. MECHANICAL LIMIT STOP - ADJUSTMENT.

NOTE.

IF THE CARRIAGE TRAVELS FARTHER THAN THE NORMAL LIMIT SWITCHES, THE FOLLOWER WHEEL DISENGAGES FROM THE LEADSCREW. WITH THE CARRIAGE GOING INTO THE FORWARD CRASH STOP POSITION, IT IS POSSIBLE FOR THE LOWER HEAD (03) TO BE DAMAGED BY HITTING THE DISK HUB. TO PREVENT THIS A MECHANICAL LIMIT STOP HAS BEEN FITTED.

1. UNDO THE HEXAGON HEADED STOP SCREWS HALF A TURN FROM THE FULLY TIGHT POSITION.
2. SLACKEN OFF THE TWO FIXING SCREWS SO THAT THE STOP BRACKET IS FREE TO SLIDE.
3. MOVE THE CARRIAGE GENTLY FORWARD AS FAR AS IT WILL GO.
4. WITH THE STOP SCREW TOUCHING THE CARRIAGE POINTER TIGHTEN THE TWO FIXING SCREWS HOLDING THE STOP BRACKET.
5. TIGHTEN THE HEXAGON HEADED STOP SCREW. THE CARRIAGE POINTER WILL NOW REACH THE STOP SCREW APPROXIMATELY .010 INCH BEFORE THE HEAD MEETS THE HUB.

## S.C. 17. ADJUSTMENT OF DASHPOT.

(REF PETHM 3.9.10.3.)

NOTE:

THIS SERVICE CHECK CAN ONLY BE PERFORMED ON MACHINES WITH DASHPOT E/C 392669 INSTALLED. CHECK MACHINE HISTORY.

1. FORCE PISTON DOWN BY EXTENDING THE SPRING UNTIL THE PISTON BOTTOMS IN THE POT.
2. CHECK THE DISTANCE FROM THE BOTTOM OF THE SPRING ON THE PISTON TO THE TOP OF THE CAP ON THE DASHPOT ASM. NOTE THIS DIMENSION AS -Y- INCHES.
3. RELEASE THE PISTON AND CHECK GAP AS IN STEP 2. NOTE THIS DIMENSION AS -Z- INCHES. FOR CORRECT ADJUSTMENT DIMENSION Z MUST EQUAL DIMENSION Y PLUS 0.025 INCHES ±0.01 INCHES.