



**FUJI FILM SERVICE MANUAL**

**FUJI  
NDT  
FILM PROCESSOR  
FPM4200**

**Ser. Nos. 8801369 and above**

**XM3-289E5**

FUJI FILM SERVICE MANUAL

FUJI

FILM PROCESSOR

FPM4200

NDT ADDITION

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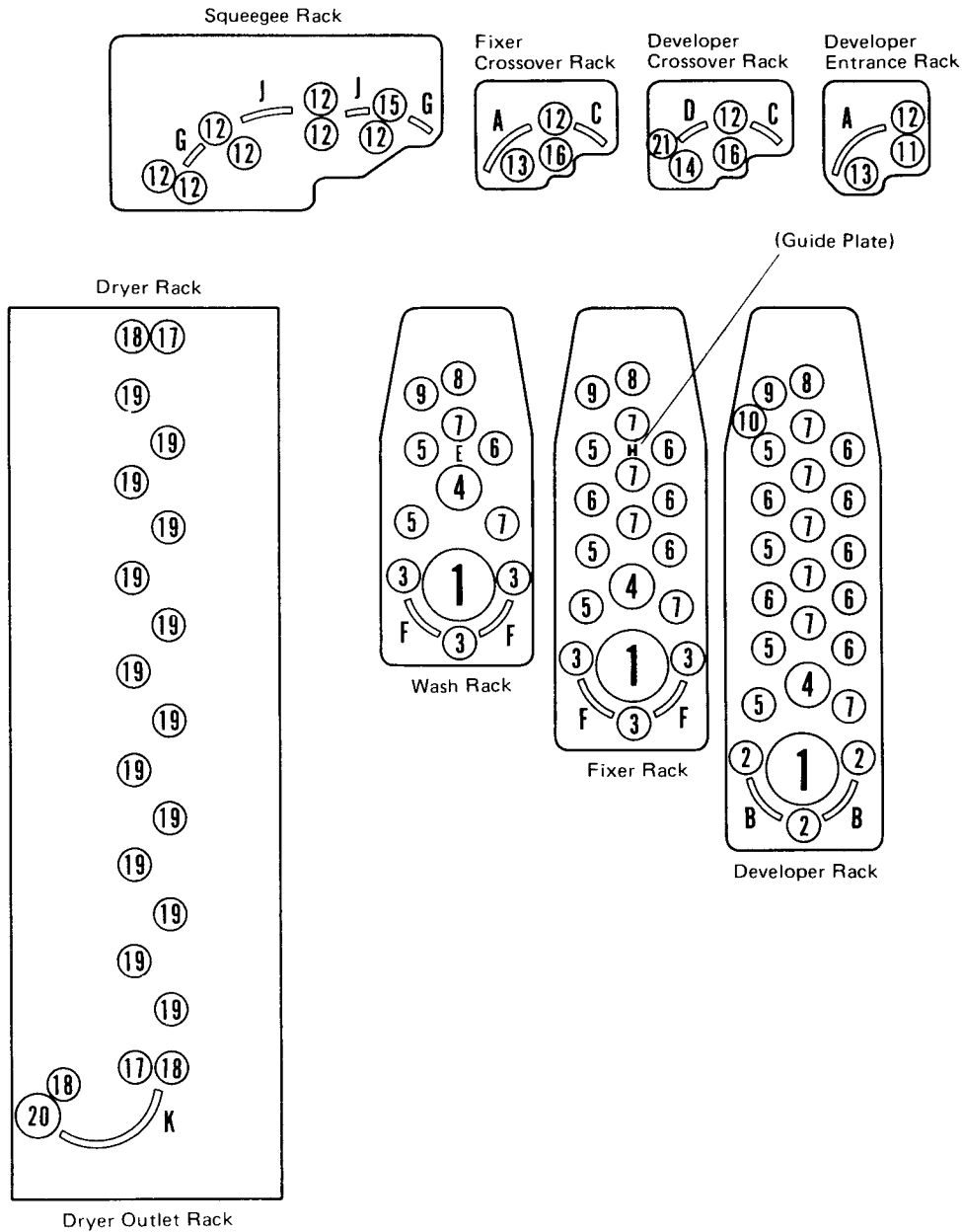
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# 1. RACK INSPECTION

## 1-1 RACK CONSTRUCTION

### 1-1-1 Rack Types and Roller Arrangements

Fig. 1

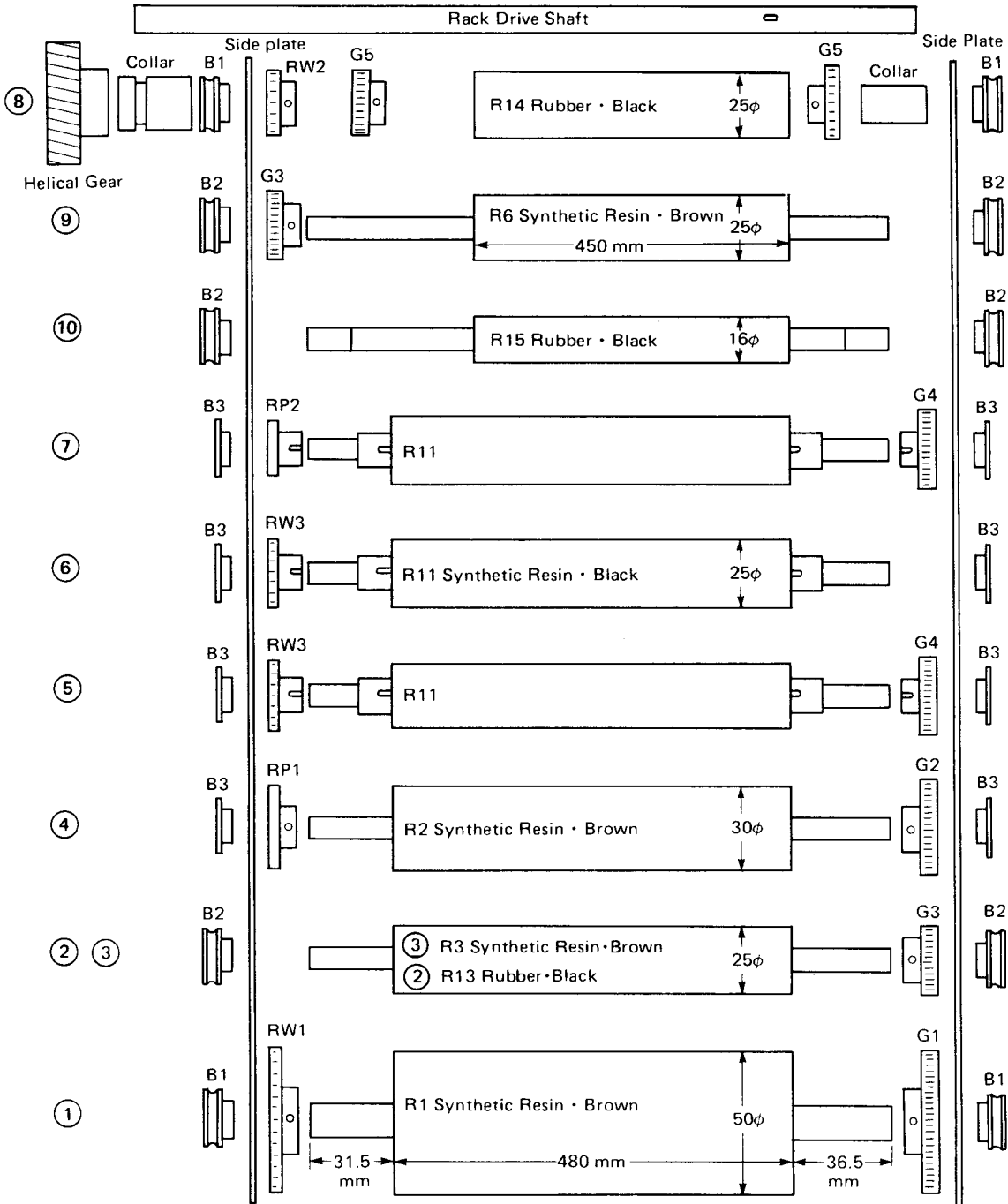


- See the illustrations on the following pages for an indication of the differences between the numbered parts in this chart.

1-1-2 Parts Configuration Drawing

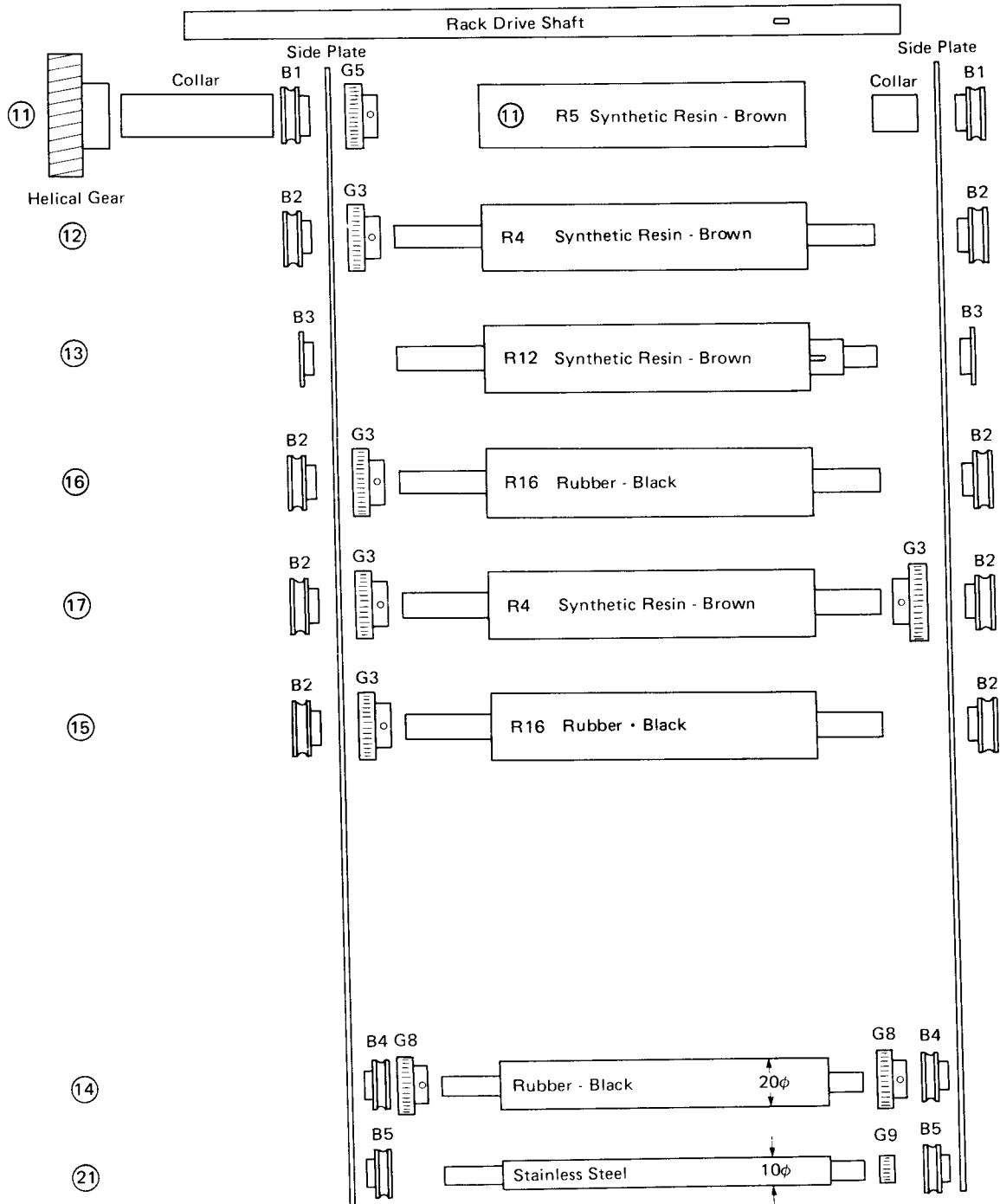
1. Developer, Fixer and Wash Racks

Fig. 2



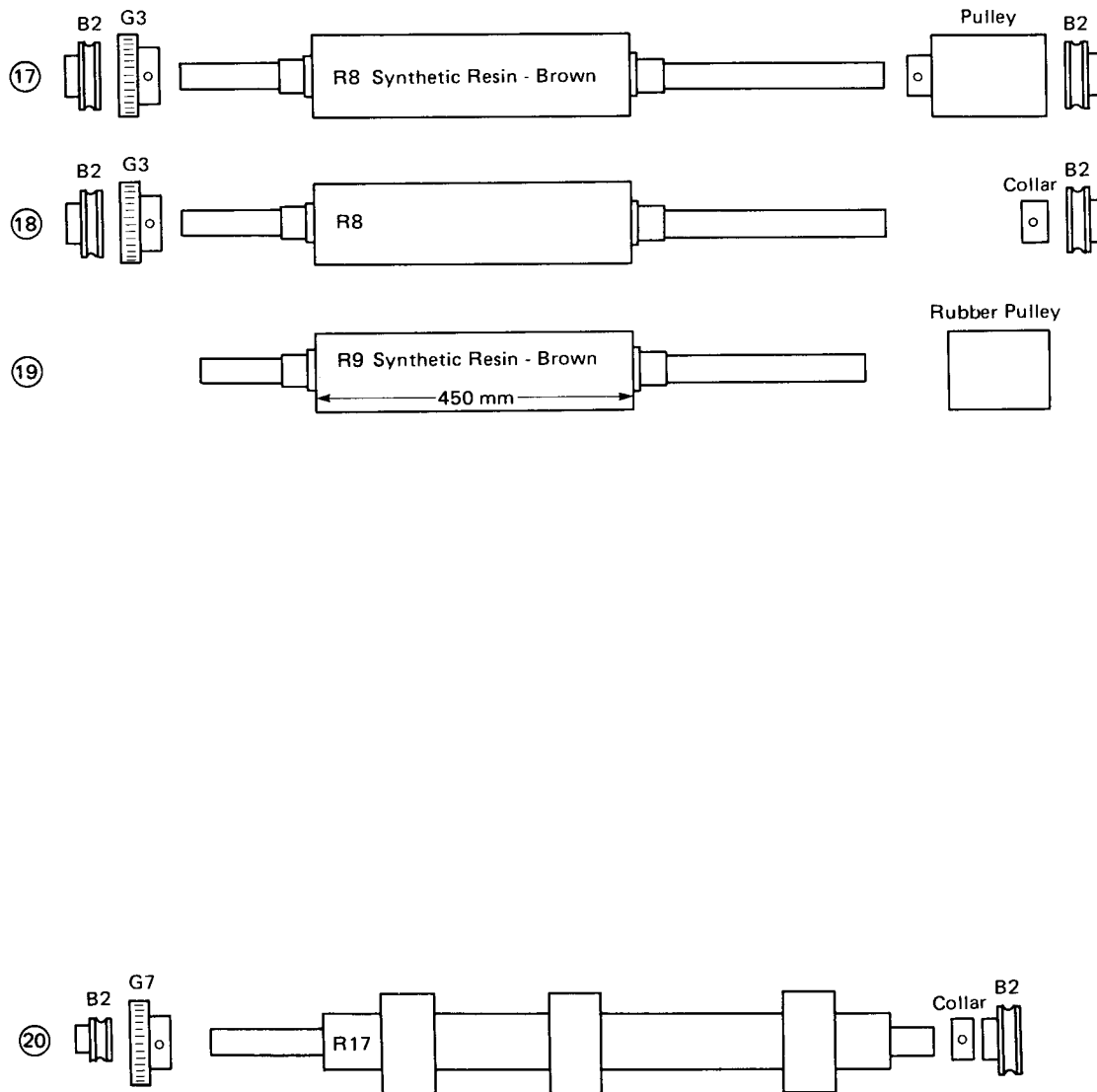
2. Developer Entrance and Crossover, Fixer, and Squeegee Racks

Fig. 3



### 3. Dryer Rack

Fig. 4



## 1-2 RACK SECTION PARTS DESCRIPTIONS

- Rollers

Ref. No.	Part No.	Q'ty	Material		
1	334F2426A	3	Synthetic Resin	Brown	50φ
2	334F8344220	3	Rubber	Black	
3	334F8345210	6	Synthetic Resin	Brown	
4	334F8344230	3	Synthetic Resin	Brown	
5	334F2154	9	Synthetic Resin	Black	
6	} Same 334F2154 334F2154 334F8344250 334F8344260 334F8344270	12	Synthetic Resin	Black	
7		12	Synthetic Resin	Black	
8 (= 12)		3	Rubber	Black	
9		3	Synthetic Resin	Brown	
10		1	Rubber	Black	16φ
11	334F8343210	1	Synthetic Resin	Brown	
12 (= 17)	334F8343220	10	Synthetic Resin	Brown	
13	334F2155	2	Rubber	Black	
14	334F3057	1	Rubber	Black	20φ
15	334F3255	1	Rubber	Black	
16 (= 13)	334F8343220	2	Synthetic Resin	Brown	
17	334F8347210	2	Synthetic Resin	Brown	
18	334F8347210	3	Synthetic Resin	Brown	
19	334F8317230	14	Synthetic Resin	Brown	
20	334F1112	1	Aluminum		
21	334F1017	1	Stainless Steel		10φ

- Guides

Ref. Symbol	Part No.	Q'ty
A	363F1609	7
B	363F1608	14
C	363F0199	7
D	363F0202	1
E	363F0203	1
F	363F1601	28
G	363F8353573	10
H	363F1443	1
J	363F1607	14
K	363F1614A	1

- Springs

Part No.	Q'ty	Length (mm)	Location
388F2018	2	65	Developer and fixer crossover rack
388F2031	22	90	Fixer, wash, feed, crossover, and squeegee racks
388F2032	2	115	Developer rack exit
388F2033	6	200	Developer, fixer, and wash rack turn-around sections
388F2035	2	85	Dryer exit face-to-face roller section

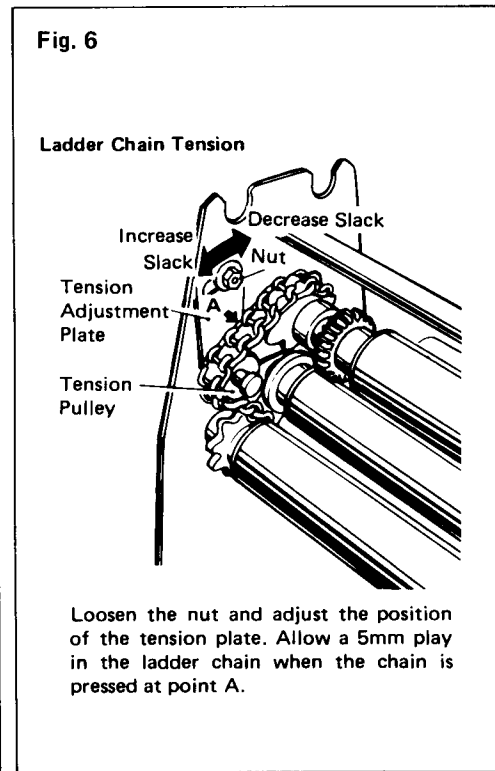
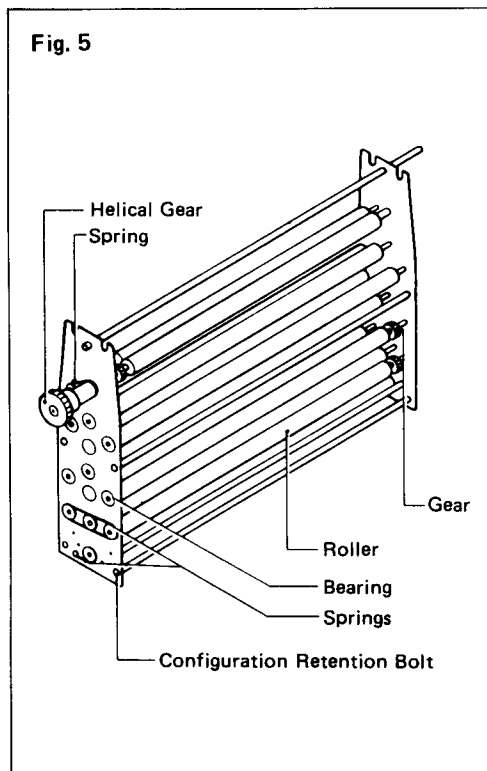
### 1-3 INSPECTION METHODS

Place the racks on a flat surfaced platform and inspect them according to the procedures indicated below.

- 1) Rack Distortion
  - Make sure that the rack sits flush on the flat platform surface.
  - When checking the racks for distortion, place the developer, fixer and wash racks on the flat surface in the upright position and the entrance, developer crossover, fixer crossover and squeegee racks upside down.
  - If any of the racks are found to be distorted, loosen the rack configuration retention bolts and straighten its geometry.
- 2) Drive Transmission Torque
  - Turn the helical gears clockwise and make sure that they turn freely.
  - If a helical gear cannot be turned freely and lightly, or if there is some excessive resistance, the gears, bearings, rollers, chains, springs and the like are to be considered at fault. If such is the case refer to procedures (3) through (6) in the following.
- 3) Roller Rotation

Make sure that all the rollers rotate when the helical gear is turned manually.
- 4) Springs

Check to insure that none of the springs are out of place, fatigued or broken. If out of place, reinstall correctly and replace if found defective.



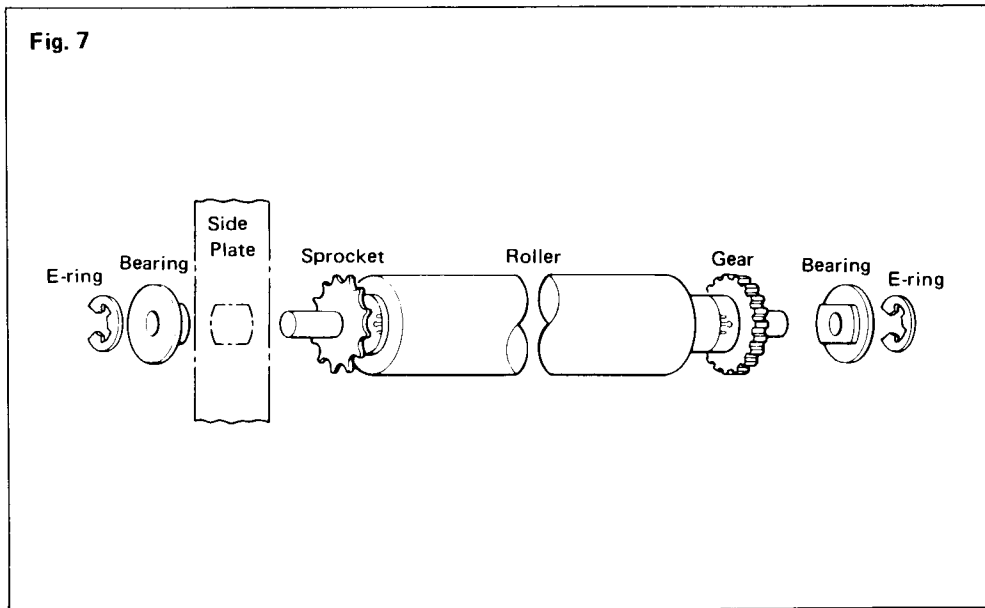
- 5) Ladder Chain Tension

Check the ladder chain for proper tension. If the chain is too slack the rollers will not rotate evenly. If the tension is not sufficient, reduce the slack by carrying out the procedures indicated in **Figure 6** above.
- 6) Gears and Bearings

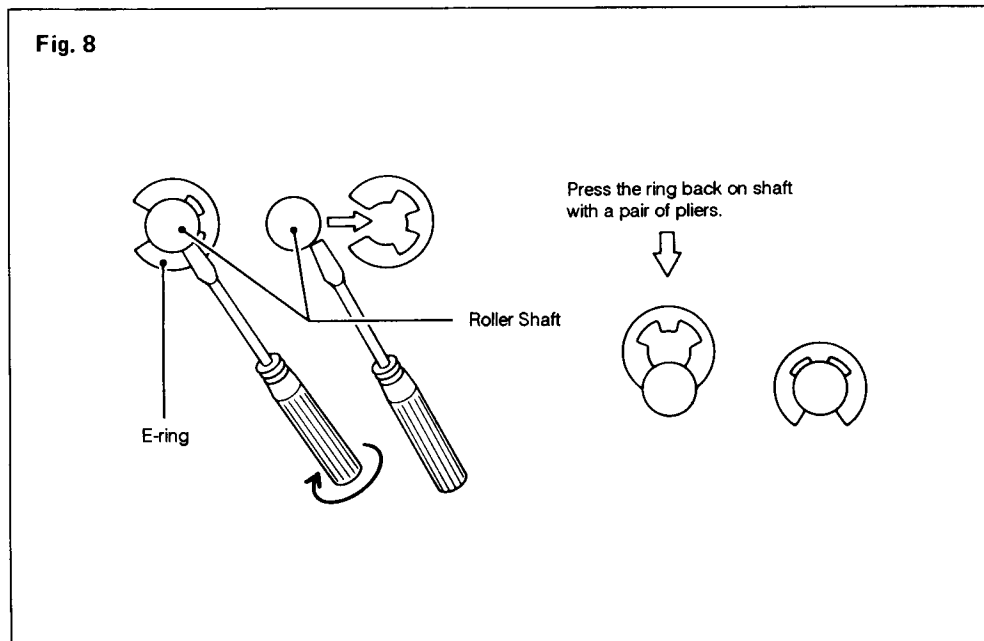
Check the gears and bearings for damage or excessive wear and replace any that are compromised beyond use.



## 1-4 PARTS REPLACEMENT ORIENTATIONS

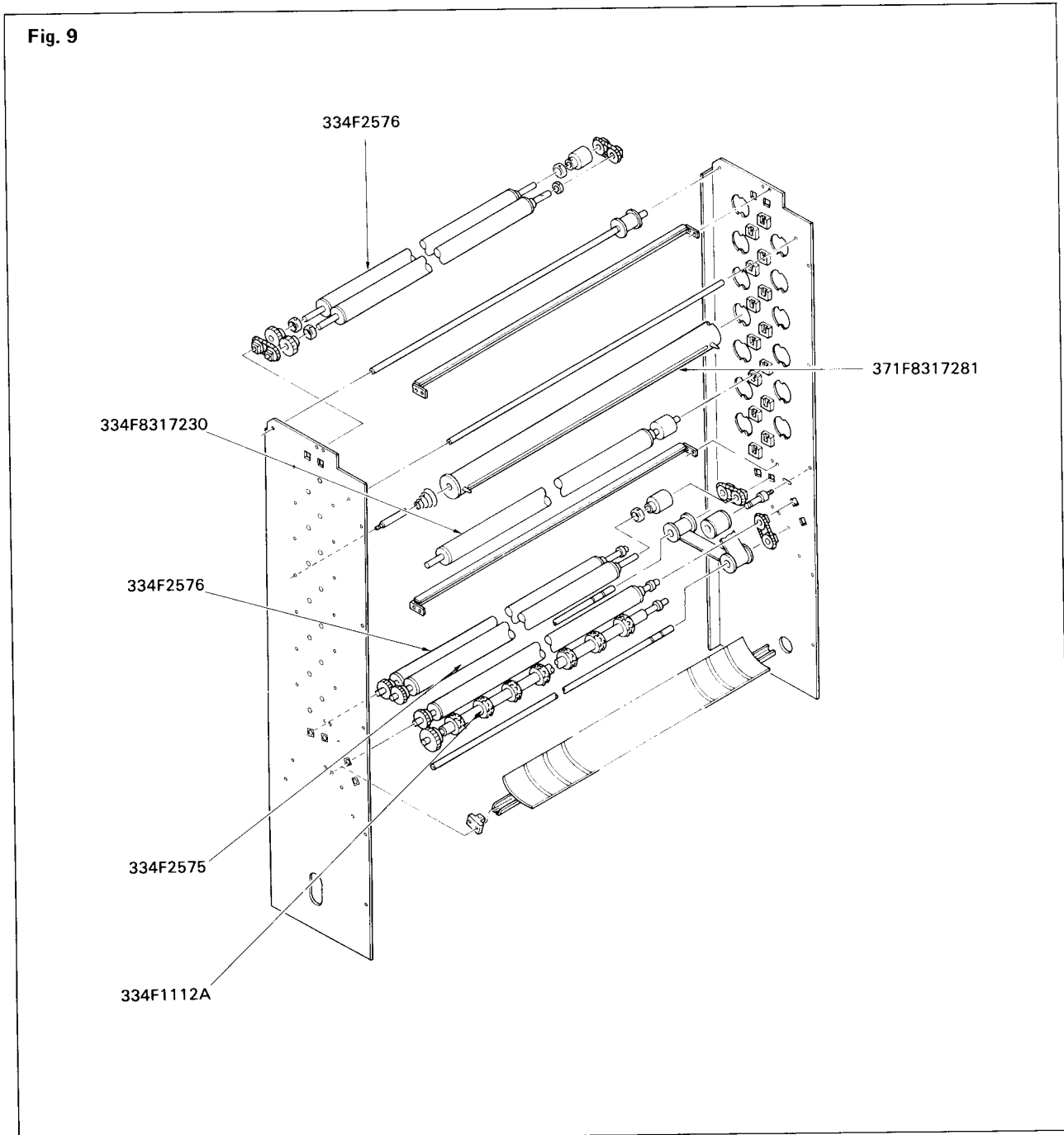


- 1) Bearing Removal  
The bearings can be pulled clear of the shafts by removing the E-rings.
- 2) Gear Removal  
By removing the E-rings and the bearings, the roller itself can be removed from the rack. By pulling outward on the gears away from the roller, the gears can be removed with the application of some degree of force.
- 3) E-ring Removal and Replacement  
Place a small minus screwdriver between the E-ring and the roller shaft and then turn the screwdriver 90 degrees to remove the ring. To replace the ring make use of a pair of pliers to press the E-ring into position.



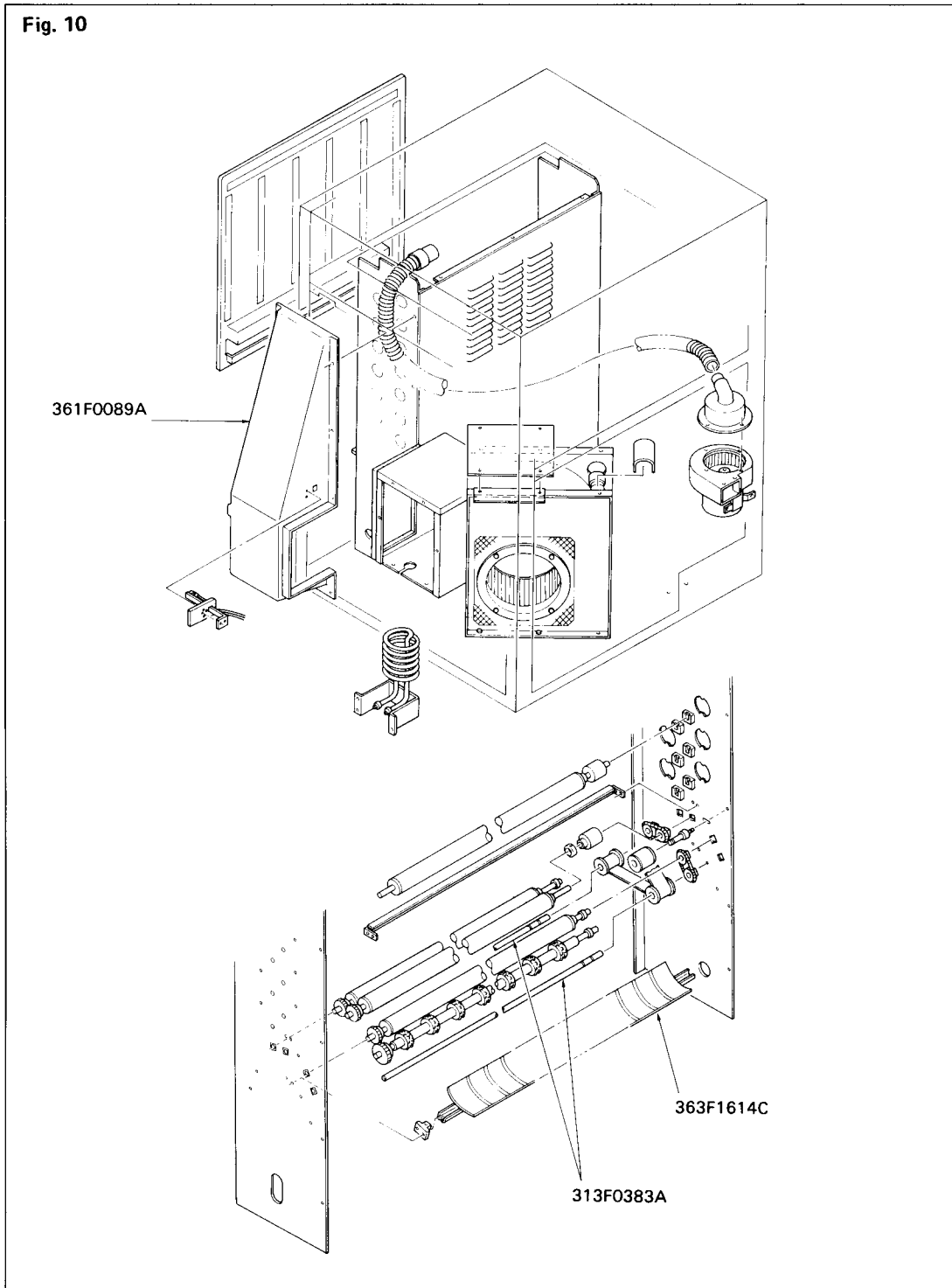
## 1-5 DRYER BELT REPLACEMENT

1. Remove the covers (350F1981A, 350F0882C) and shield plate (345F0837C).
2. Remove 13 spray pipes (371F8317281) and 20 rollers (334F1112A, 334F2575, 334F2576, and 334F8317230).



3. After removing the chamber (361F0089A) remove the guide plate (363F1614C) and the stay (313F0383A) on the belt gear (325F1005), and remove the belt (323F0031).

**Fig. 10**



4. Complete belt replacement.

After belt replacement reverse procedures in rebuilding the unit.

Belt incorporation precautions:

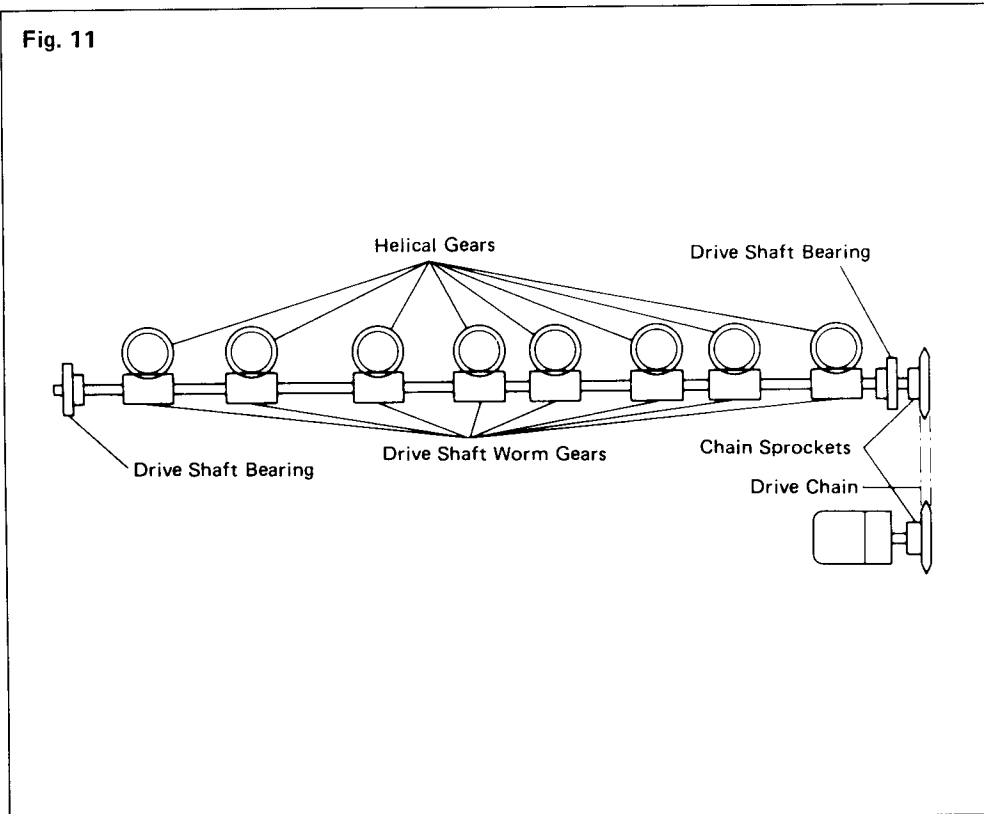
The arrow on the belt should be oriented in the direction of belt travel.

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## 2. LUBRICATION

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Apply white vaseline to the drive shaft worm gears, the helical gears, the drive chain, and the chain gears.



### 3. TUBING SYSTEM DIAGRAM

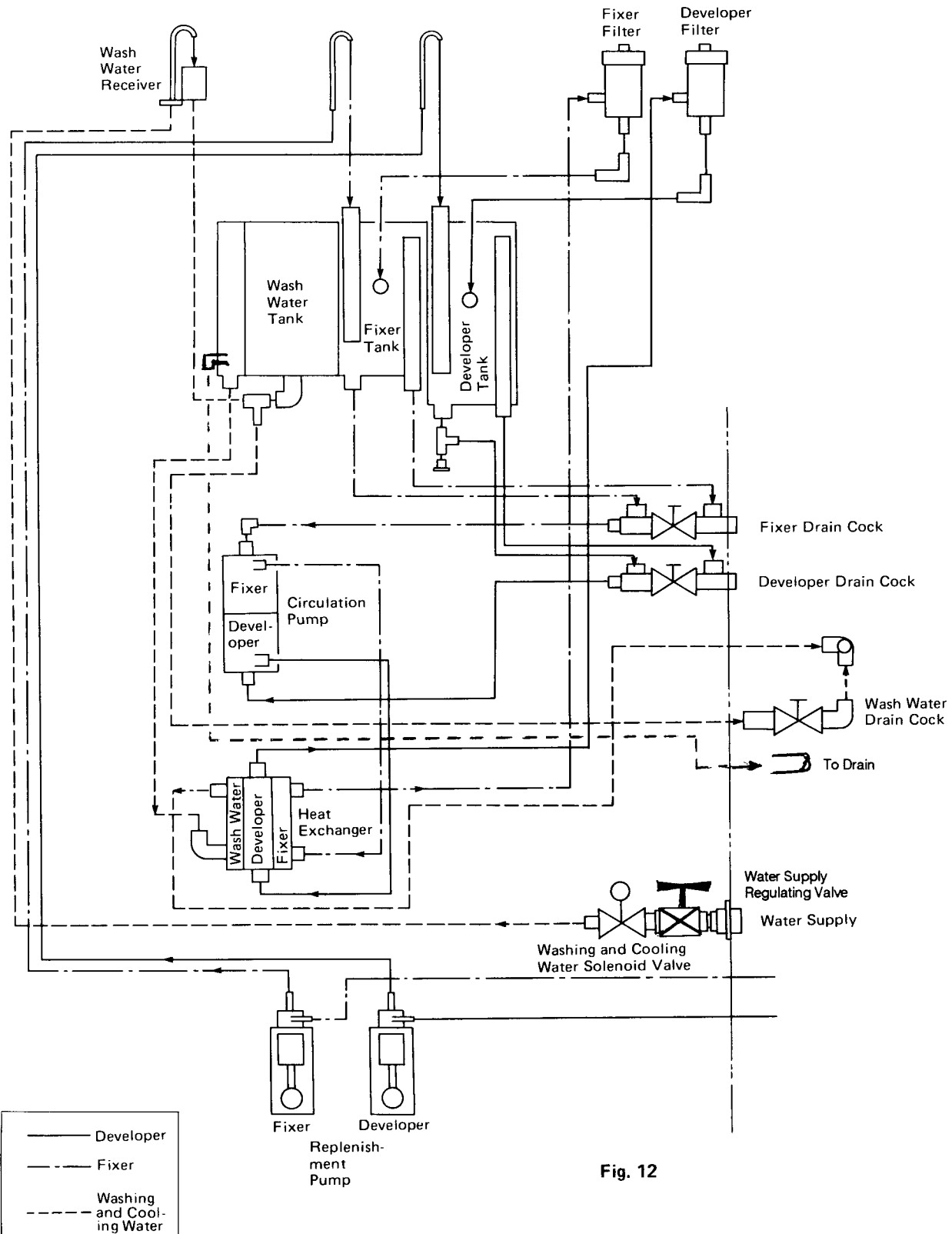


Fig. 12





## 5. SWITCH USAGE

### 5-1 TEST SWITCHES

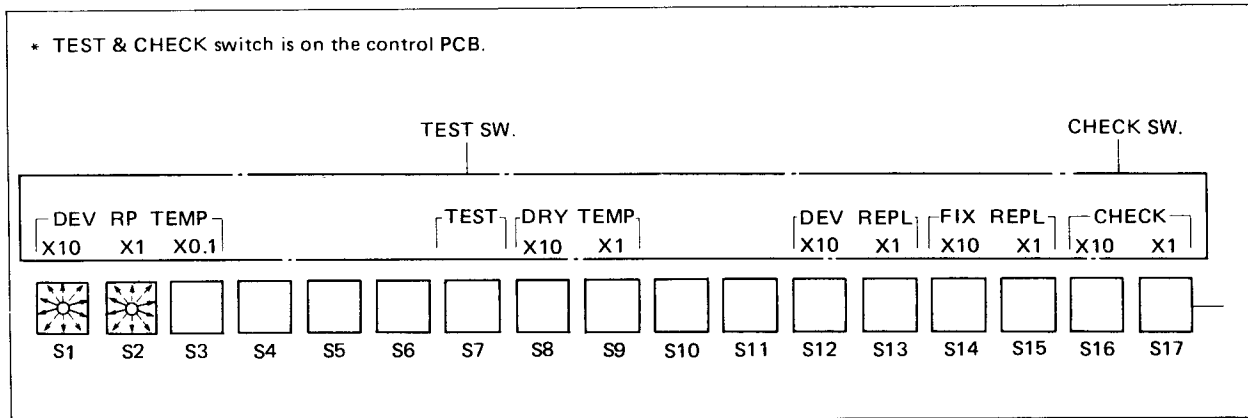
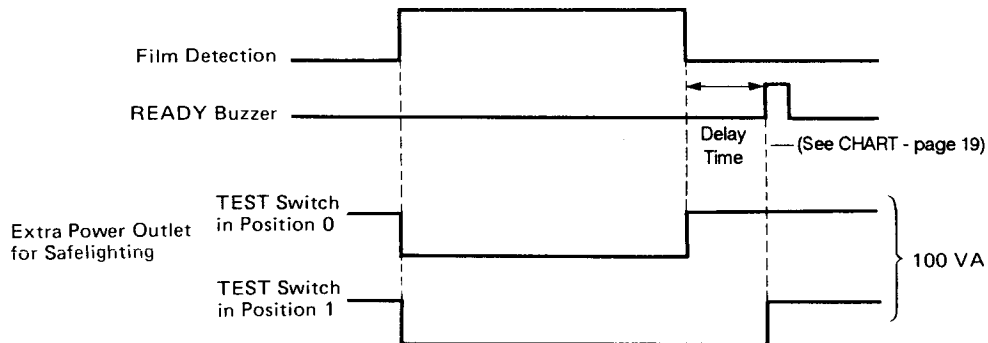


Fig. 13

#### (1) TEST Switch Positions 0 and 1

TEST switch positions 0 and 1 are provided to change the safelight illumination timing as indicated below.



#### (2) TEST Switch Position 2

TEST switch position 2 is used to selectively check microcomputer output signals. Therefore, this TEST switch position should be used for load (component) checkout as directed below.

- 1) Turn OFF the POWER switch.
- 2) Set the TEST switch to 2.
- 3) Set the CHECK switch (digital) as desired.  
For switch position-to-load correspondence, refer to the table below.
- 4) Turn ON the POWER switch.



CHECK Switch-to-Load Correspondence

Switch Setting	Load Activated	CMP Circuit Board LED
00	No loads	—————
01	Developer temperature control system	LED10 (circulation pump), LED12 (cooling solenoid valve), LED17 (developer heater)
02	No loads	—————
03	Dryer temperature control system	LED9 (dryer fan), LED18 (dryer heater)
04	Drive motor	LED8
05	Washing and cooling solenoid valve	LED12
06	Replenishment pump (DEV)	LED13
07	Replenishment pump (FIX)	LED14
08	REPL lamp	LED16
09	Extra power outlet	LED11

**NOTE:** No operation occurs at CHECK switch settings of 10 or greater.

(3) TEST Switch Position 3

This TEST switch position is selected when the drive system is to be activated with the top cover open.

**NOTE:** This switch position should not be selected except when maintenance is to be performed.

(4) TEST Switch Position 4

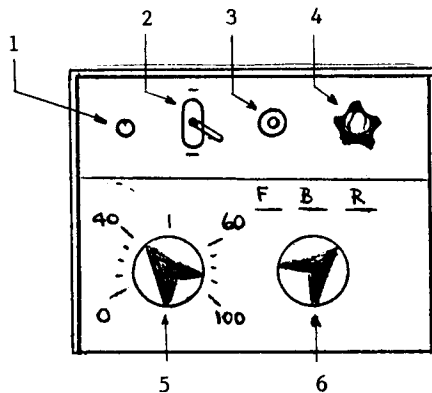
This TEST switch position is selected to cause the panel mounted digital indicator to read the dryer temperature. Therefore, this switch position should be used for dryer system maintenance.

(5) TEST Switch Position 5

This test switch position is selected for buzzer activation with the top cover open.

**NOTE:** TEST switch positions 6 through 9 are not used.

**5-2 SPEED CONTROL AND SETTINGS (Variable speed model only)**



- 1 - Pilot Lamp
- 2 - On - Off Toggle Switch
- 3 - Reset Button Circuit Protector
- 4 - Fuse (3A.)
- 5 - Speed Control Dial (0 - 100%)
- 6 - Forward / Brake / Reverse Selector

**Standard Processing Speeds**

*Long Cycle* - Based on 150 seconds developer immersion time. Approx. 12 min. dry to dry time. Set Speed Control Dial on 40%. Developer temperature should be set at 81.5° F. ± 1° F.

*Short Cycle* - Based on 100 seconds developer immersion time. Approx. 8.5 min. dry to dry time. Set Speed Control Dial on 60%. Developer temperature should be set at 86.0° F. ± 1° F.

**Modification**

With changes in the control PCB digital switches 10 and 11 (Figure 14) settings, the clear time, delay time, and developer temperature setup range (error generated when this range is exceeded) can be modified. When shipped, switches S10 and S11 are set at "0".

Target Processing Time	Switch Position		Clear Time <sup>*1</sup>	Delay Time <sup>*2</sup>	Developer Temperature Set Limits <sup>*3</sup>
	S10	S11			
90"	0	0	120"	2"	27-40°C
3'30"	0	1	270"	5"	24-40°C
7'00"	0	2	480"	9"	24-40°C
11'00"	0	3	720"	14"	24-40°C
14'00"	0	4	900"	18"	24-40°C

\*1 Clear Time: The time the automatic saving system causes a drive termination when the film trailing end passes under the film detection sensor.

\*2 Delay Time: The time required for an ensuring film signal to be generated from the time the film trailing end passes under the film detection sensor.

\*3 Dev. Temp. Set Limits: The developer temperature limits determined by digital switches S1, 2, and 3, which cause a setting abnormality error to be generated when said limits are exceeded.

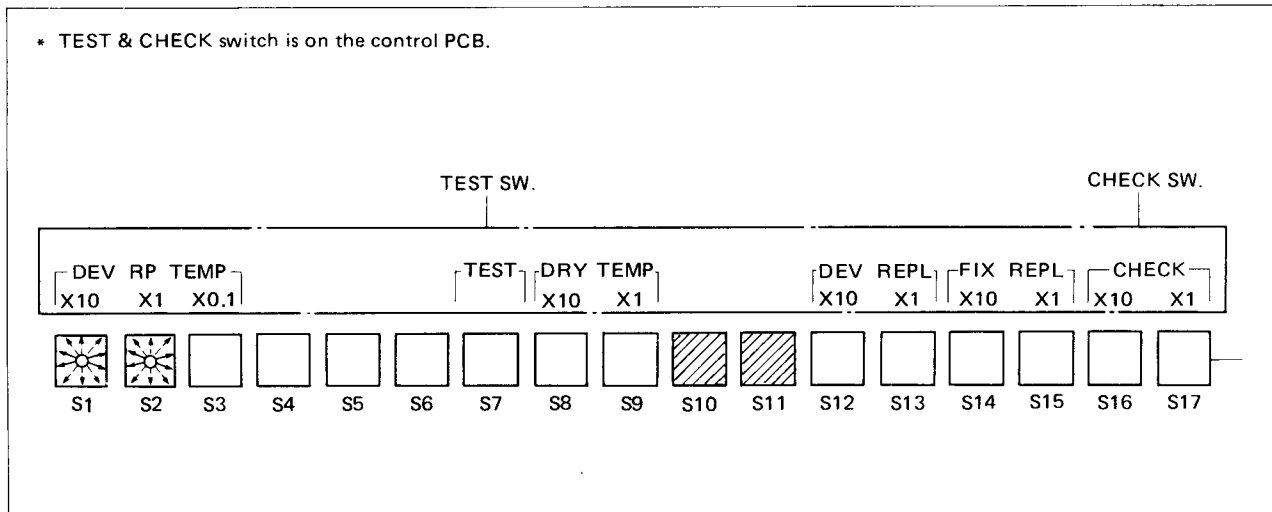


Fig. 14

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## 6. ALARM CODE TABLE

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The control panel digital indicator reads the developer temperature under normal conditions. However, such a temperature readout changes to an alarm indication in the event of machine failure. When an alarm condition occurs, the associated alarm code blinks on the digital indicator with the alarm sounding at 1-second intervals.

Alarm Code	Alarm Condition	Remedy
1	The developer temperature is above 35° C (95° F).	See problem 4 in section 8 (Abnormalities and Remedies).
2	The dryer temperature is above 70° C (158° F).	See problem 4 in section 8 (Abnormalities and Remedies).
3	The developer temperature setting is outside the 27 to 40 range.	Ensure that the DEV RP TEMP (S1–S3) setting is within the 27 to 40 range.
4	The dryer temperature setting is outside the 25 to 70 range.	Ensure that the DRY TEMP (S8–S9) setting is within the 25 to 70 range.
5	The TEST switch is set to 2 with the POWER switch ON.	Set the TEST switch to 0 or 1.
6	The thermistor (dryer) is burned out.	See problems 5 and 6 in section 8 (Abnormalities and Remedies).
7	The top cover is open.	Ensure that the top cover is closed.
9	The main switch is pressed while film processing.	Wait until film is come out.

\* Alarm code No.8 is not established.

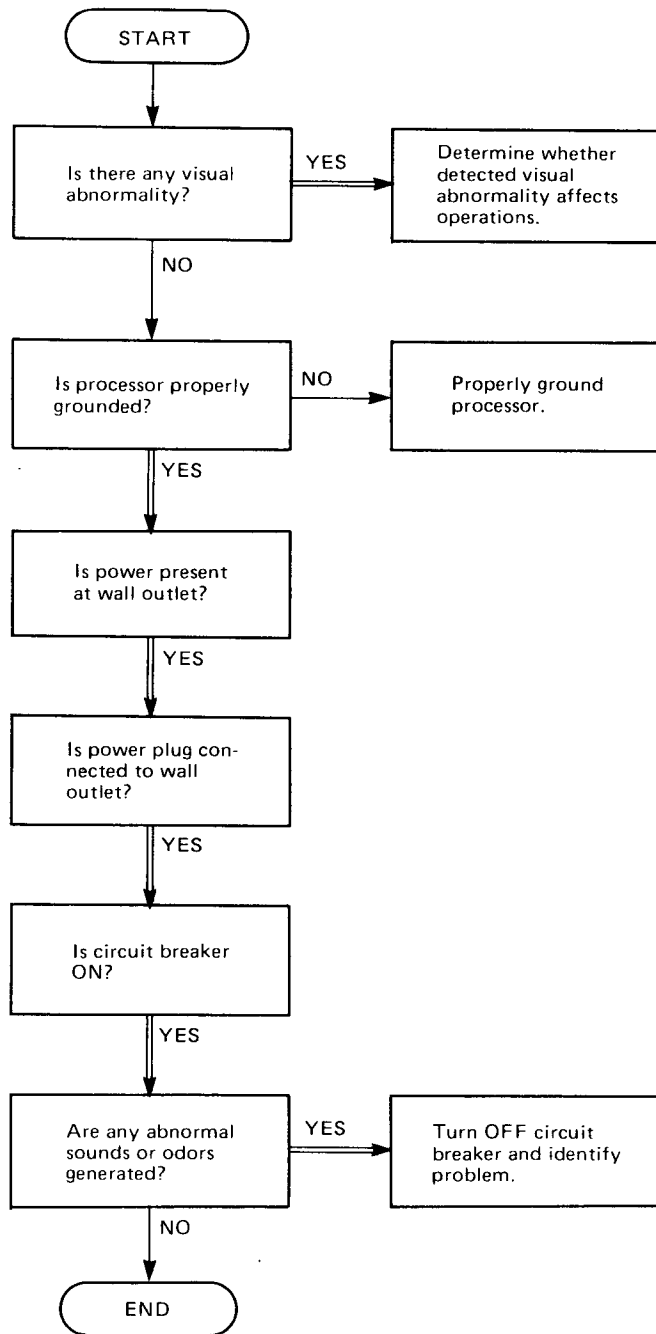
## 7. I/O CHECK LED FUNCTIONS

The following LEDs light when the control circuit board (CMP) receives signal inputs or generates signal outputs.

LED No.	LED Color	Input/ Output	Fucntion
1	Red	Input	Lights when the POWER switch is pressed to ON.
2	Red	Input	Lights when the film detector is activated.
3	Red	Input	Lights when the top cover detector is activated (the top cover is closed).
4	Red	Input	Reserved
5	Red	Input	Reserved
6	Red	Input	Reserved
7	Green	Output	Reserved
8	Green	Output	Lights when the drive motor drive signal output is generated.
9	Green	Output	Lights when the dryer fan drive signal output is generated.
10	Green	Output	Lights when the circulation pump drive signal output is generated.
11	Green	Output	Lights when the safelighting extra power outlet activation signal output is generated.
12	Green	Output	Lights when the washing and cooling solenoid valve drive signal output is generated.
13	Green	Output	Lights when the developer replenishment pump drive signal output is generated.
14	Green	Output	Lights when the fixer replenishment pump drive signal output is generated.
15	Green	Output	Lights when the buzzer drive signal output is generated.
16	Green	Output	Lights when the replenishment LED drive signal output is generated.
17	Green	Output	Lights when the developer heater drive signal output is generated.
18	Green	Output	Lights when the dryer heater drive signal output is generated.
19	Green	Output	Reserved
20	Orange	———	Blinks when the CPU is functioning normally.

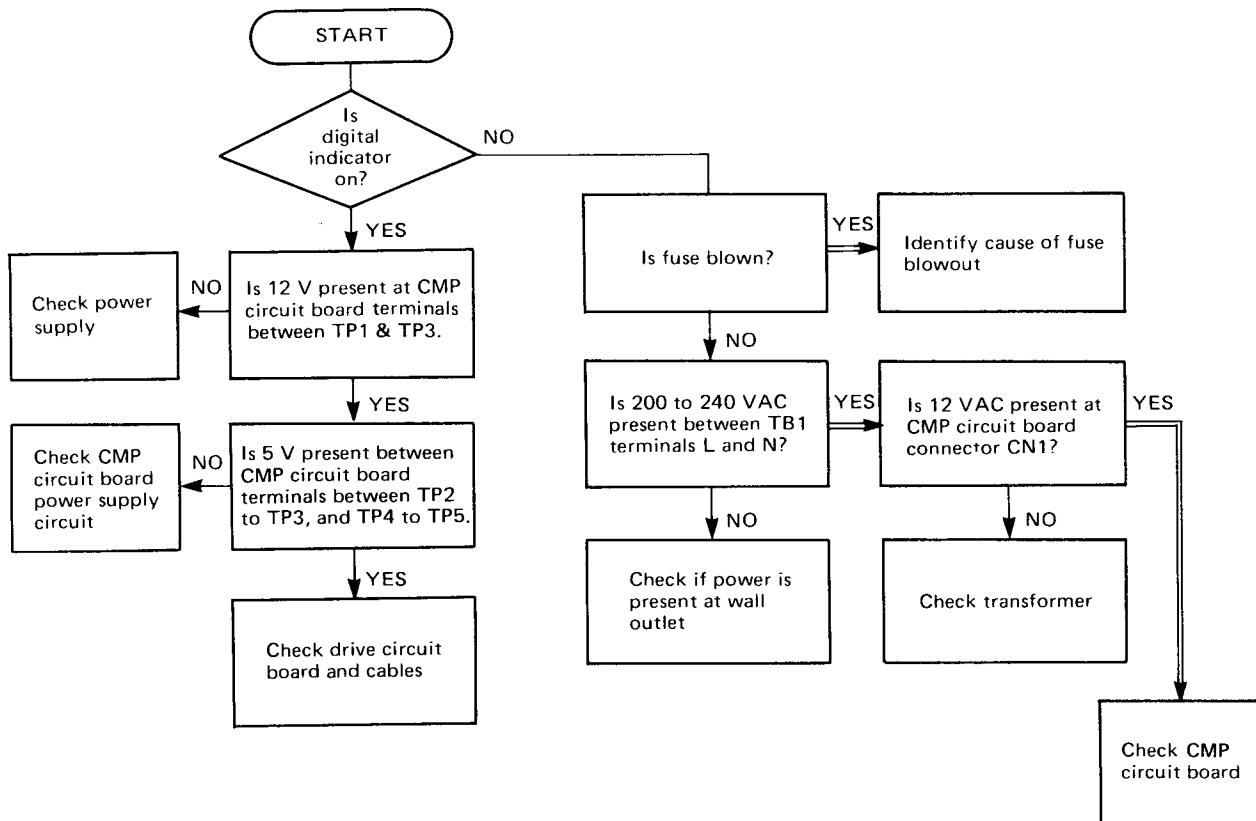
## 8. TROUBLESHOOTING GUIDE WITH FLOWCHARTS

### 1. General Checkout



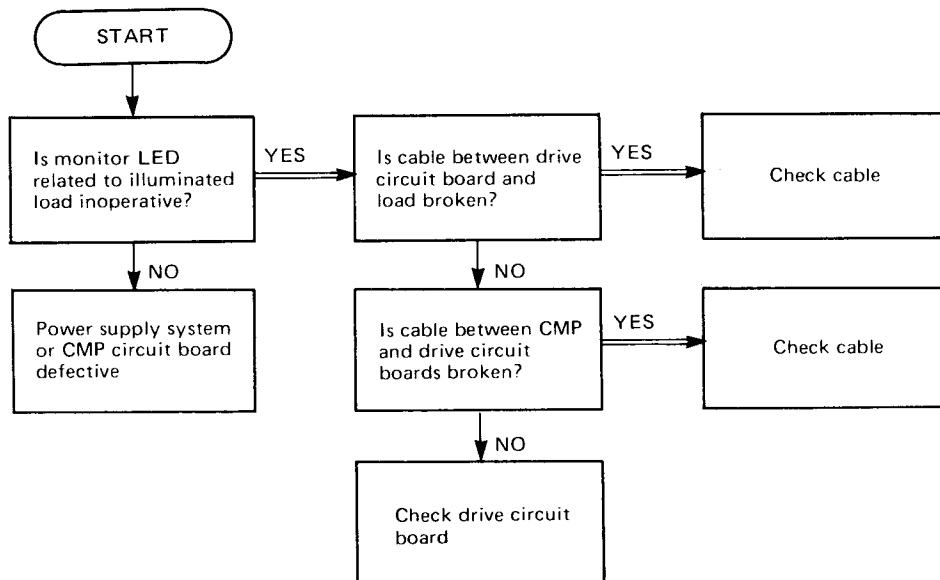
NOTE: TP indicates test point. These points are located on the circuit board on the drop door in the electronics compartment. Figure 11 shows test point orientation.

**2. Power Supply System Checkout**  
**(1) Entire System Does Not Operate**



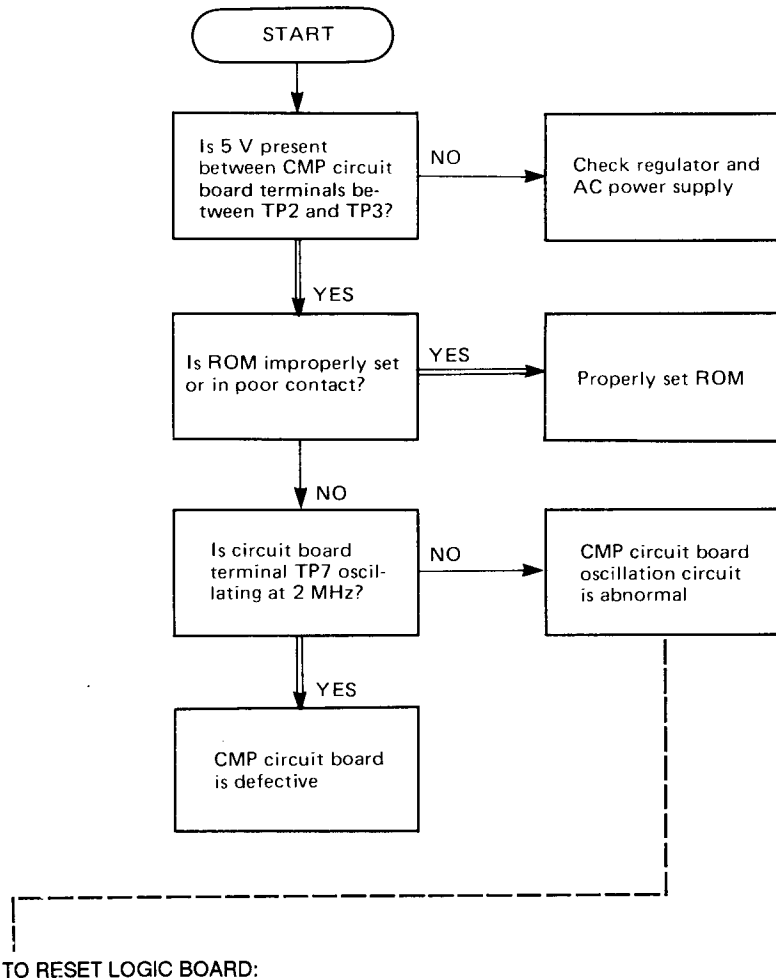
**(2) Some Loads Do Not Operate**

**NOTE:** The following flowchart does not apply to cases where no loads operate.



### 3. Circuit Board Checkout

- Entire System Does Not Operate and Program is Out of Control [LED20 (Orange) Stays Illuminated or Extinguished]



#### TO RESET LOGIC BOARD:

Locate resistor #51 (refer to lower left area of Figure 11) turn power off. Using a jumper wire, connect one end to the processor chassis and the other end to the upper end of R-51. Turn power on with jumper in place briefly - one second. Then turn power off. Remove jumper and turn power back on. Check system for correct operation. (Test point 19 (TP 19) may also be used in the same manner as described above.

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## 9. ABNORMALITIES AND REMEDIES

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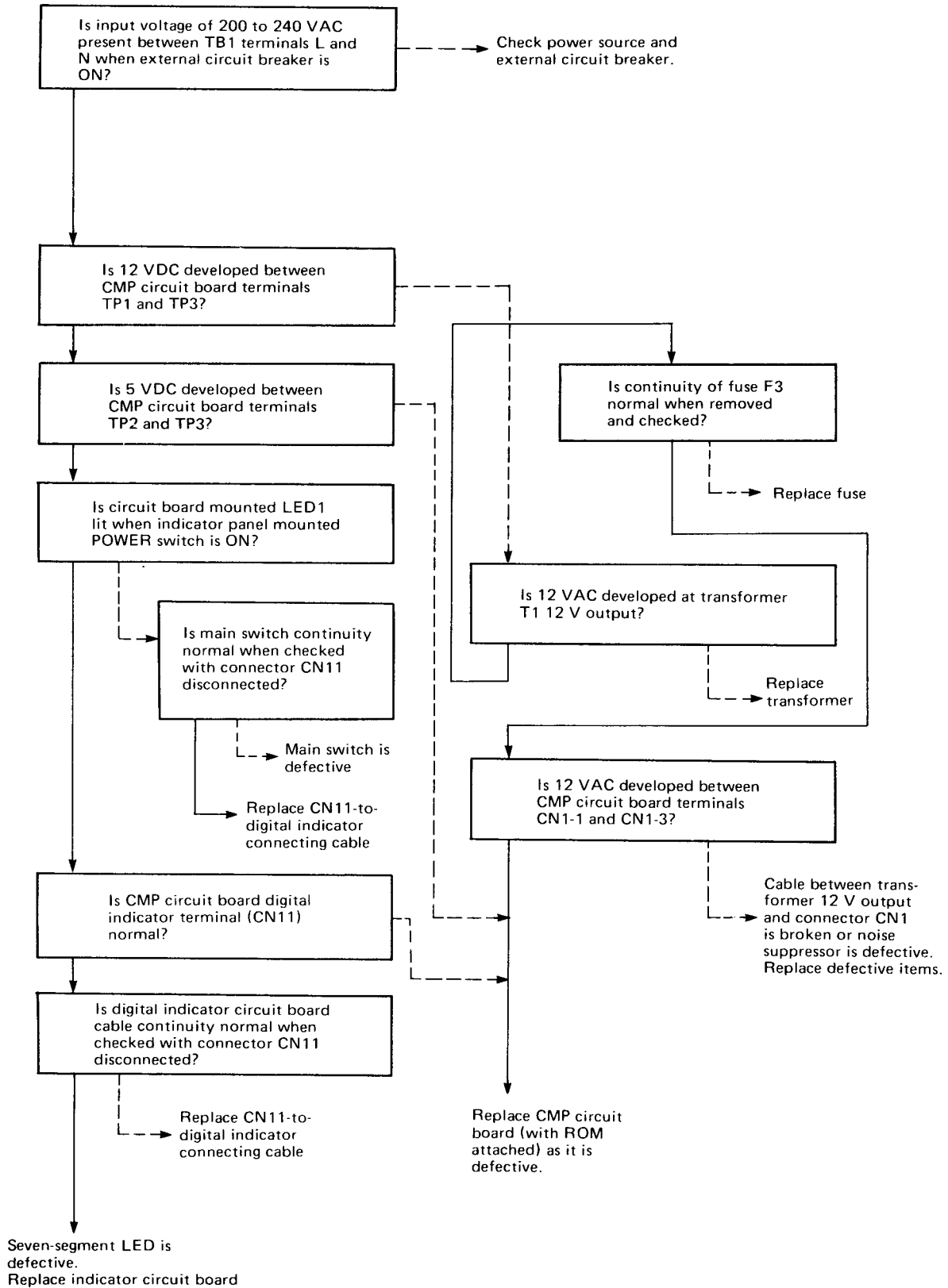
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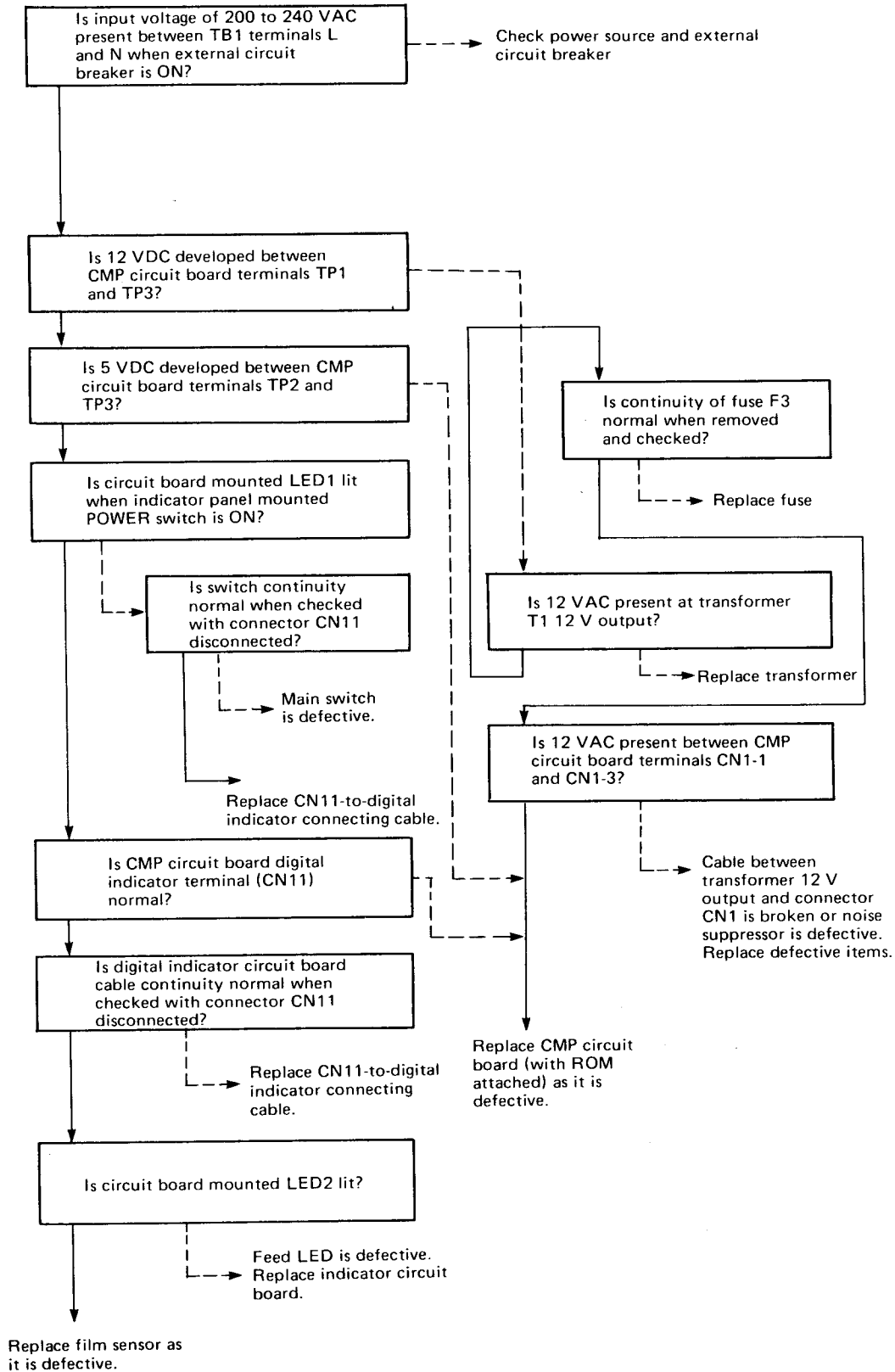


# 1. Digital Indicator Does Not Light

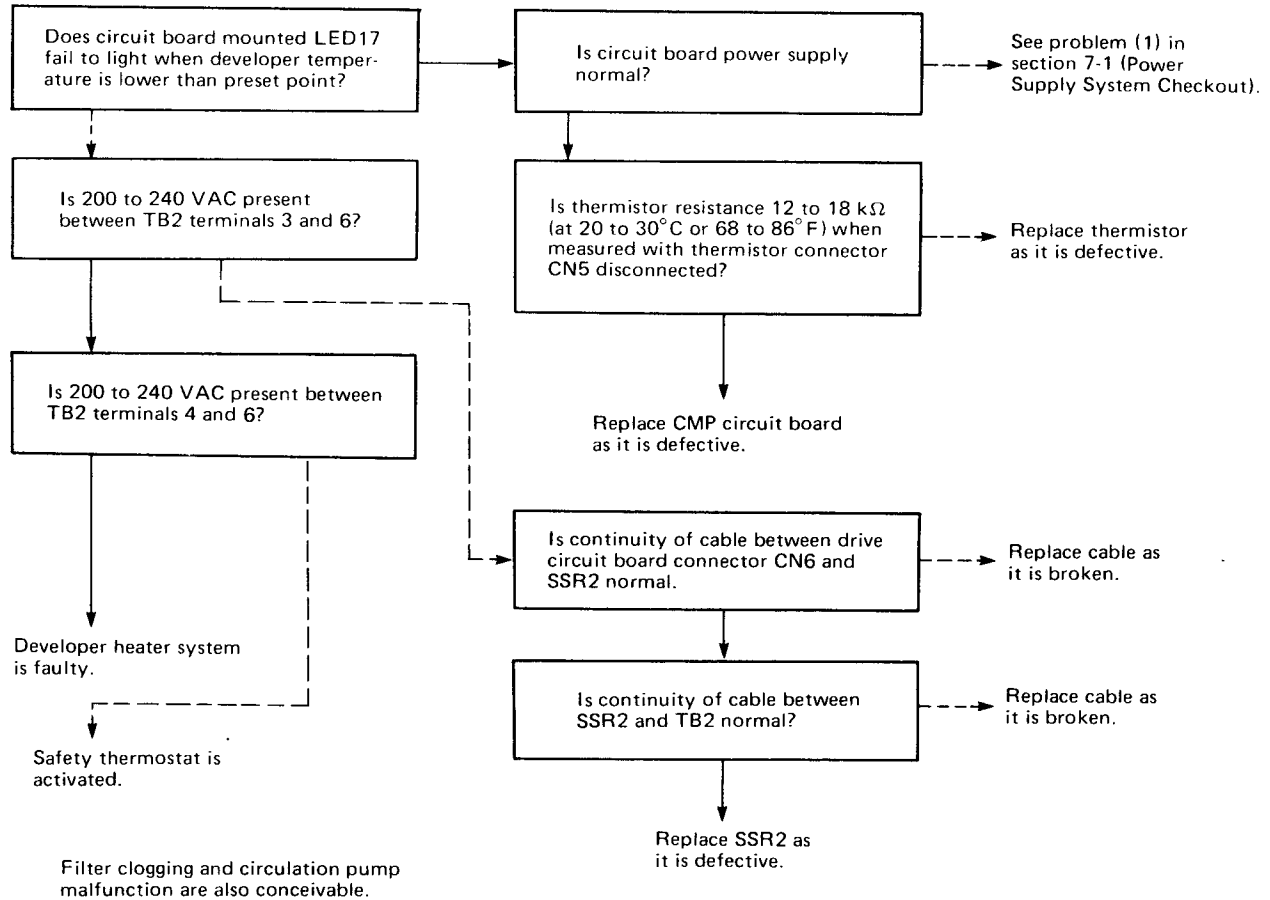
—————> YES  
 - - - - -> NO



## 2. READY Lamp (LED) Does Not Light



### 3. Developer Temperature Is Too Low



### 4. Developer Temperature Rises Above Preset Point

Perform checkout as indicated under Problem 3.

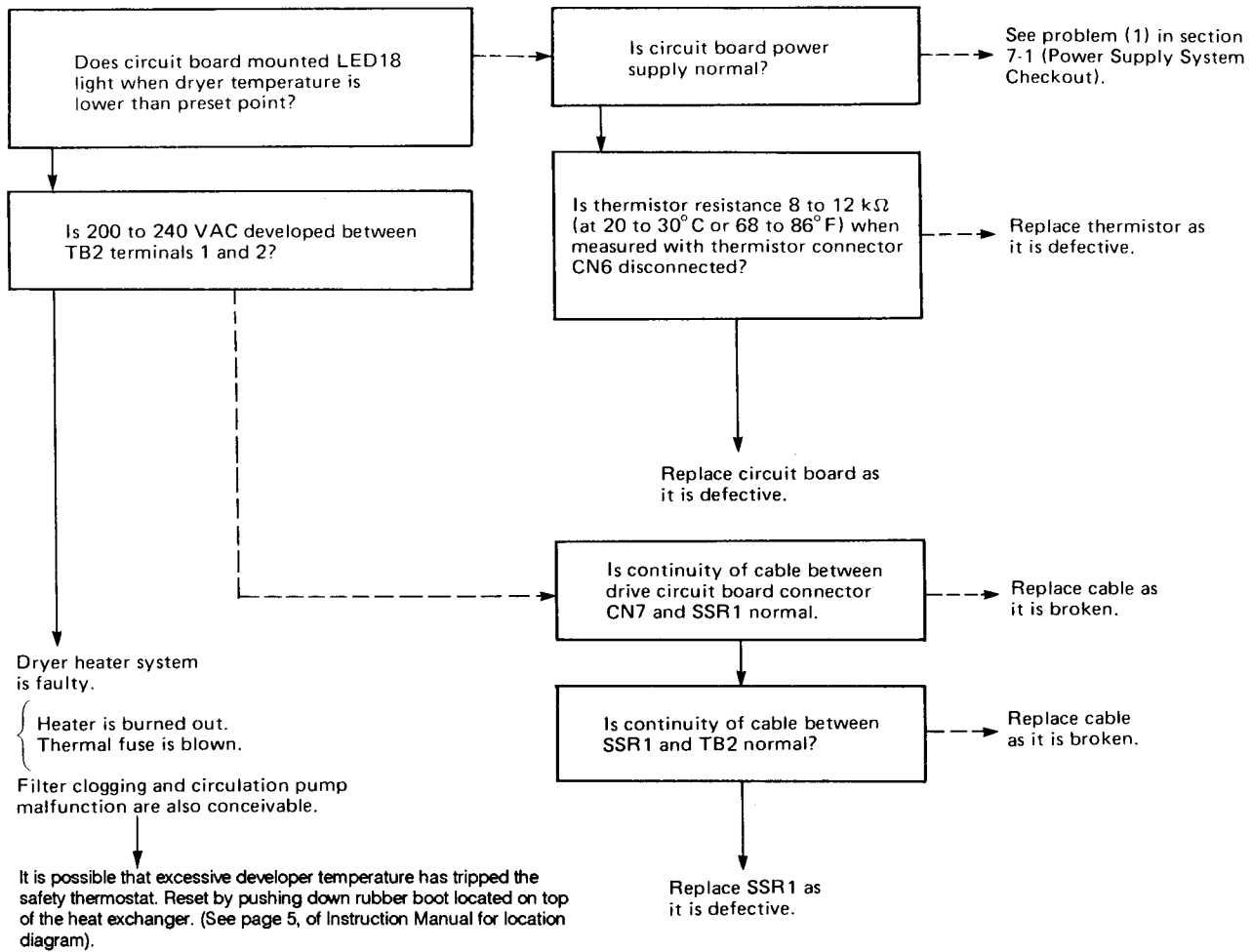
Other conceivable causes are shorted SSR2 malfunction and cooling solenoid valve (SV1) failure.

Another common cause of this symptom is excessive incoming water temperature. Incoming water must be approximately 5°F below developer temperature setting. In areas where needed, a water chiller unit can be installed to solve this problem.

Other possibilities include:

- (1) Algae build up in wash tank and heat exchanger. (Clean with diluted chlorox solution)
- (2) Recirculation pump failure.
- (3) Dryer fan wire mesh clogged - clean dirt and debris
- (4) Logic board needs resetting - see page 24.

## 5. Dryer Temperature Is Too Low (Dryer Fan Rotates)

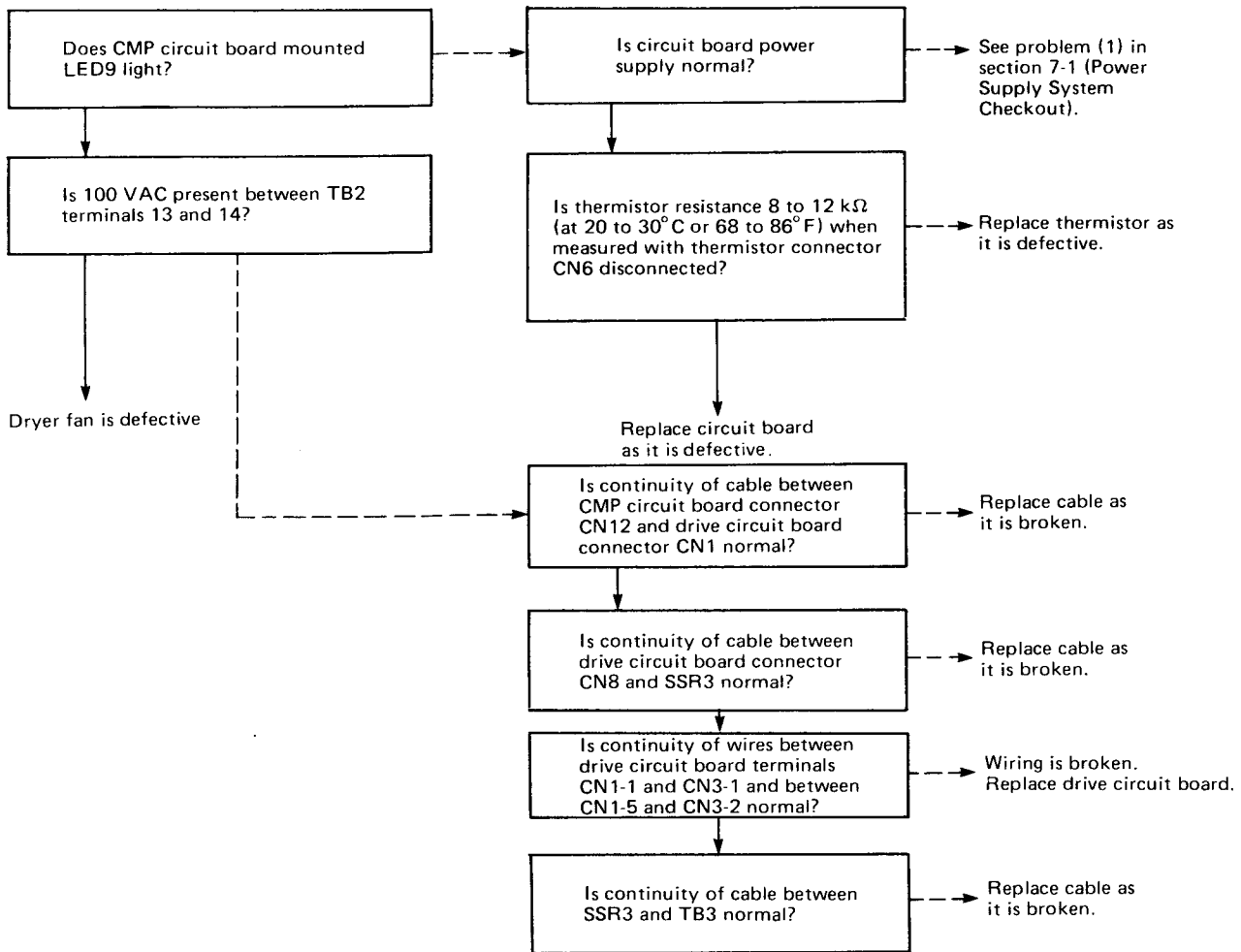


## 6. Dryer Temperature Rises Above Preset Point

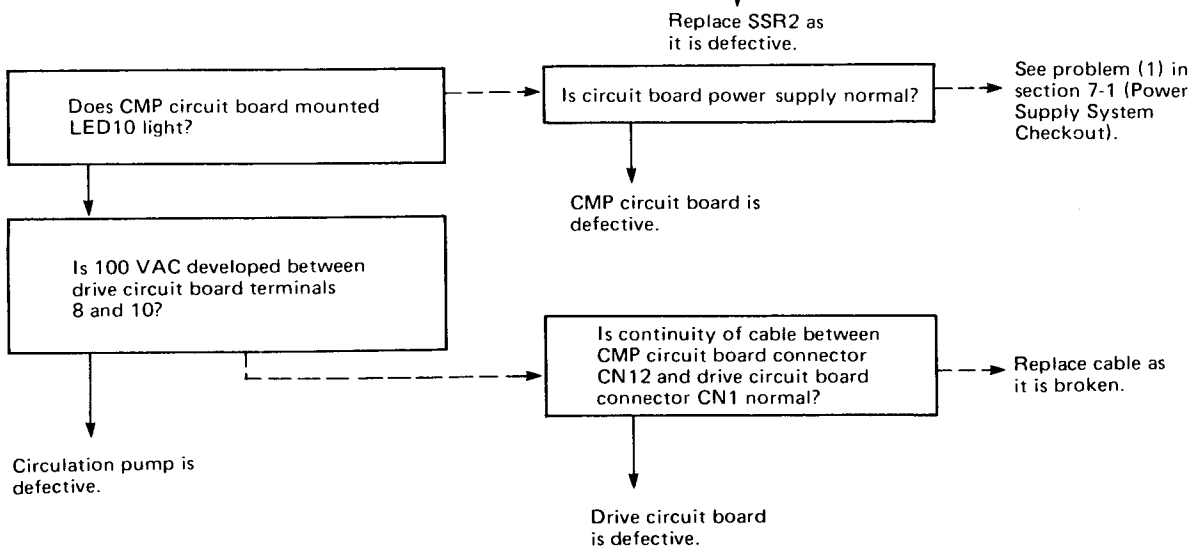
Perform checkout as indicated under Problem 5.

An additionally conceivable cause is shorted SSR1 malfunction.

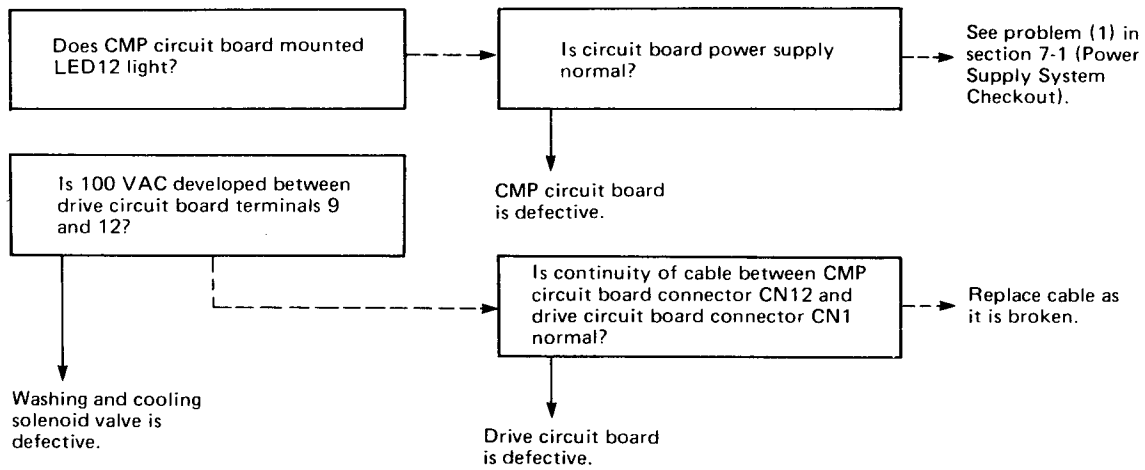
## 7. Dryer Fan Does Not Run



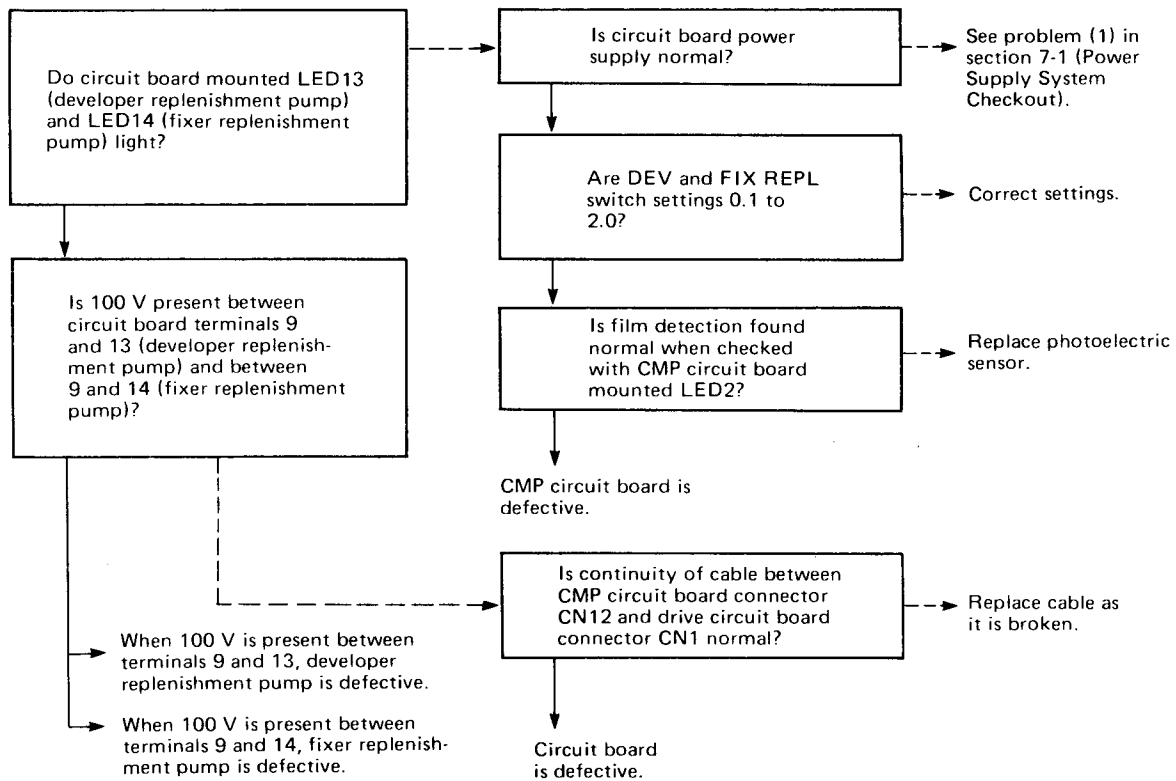
## 8. Circulation Pump Does Not Operate



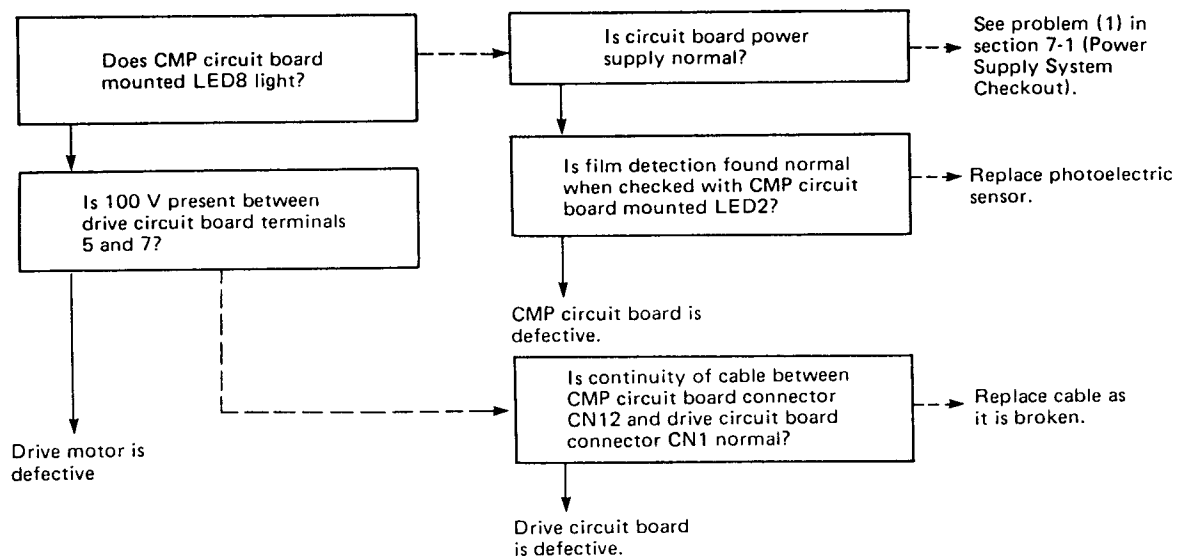
### 9. Washing and Cooling Solenoid Valve Does Not Operate



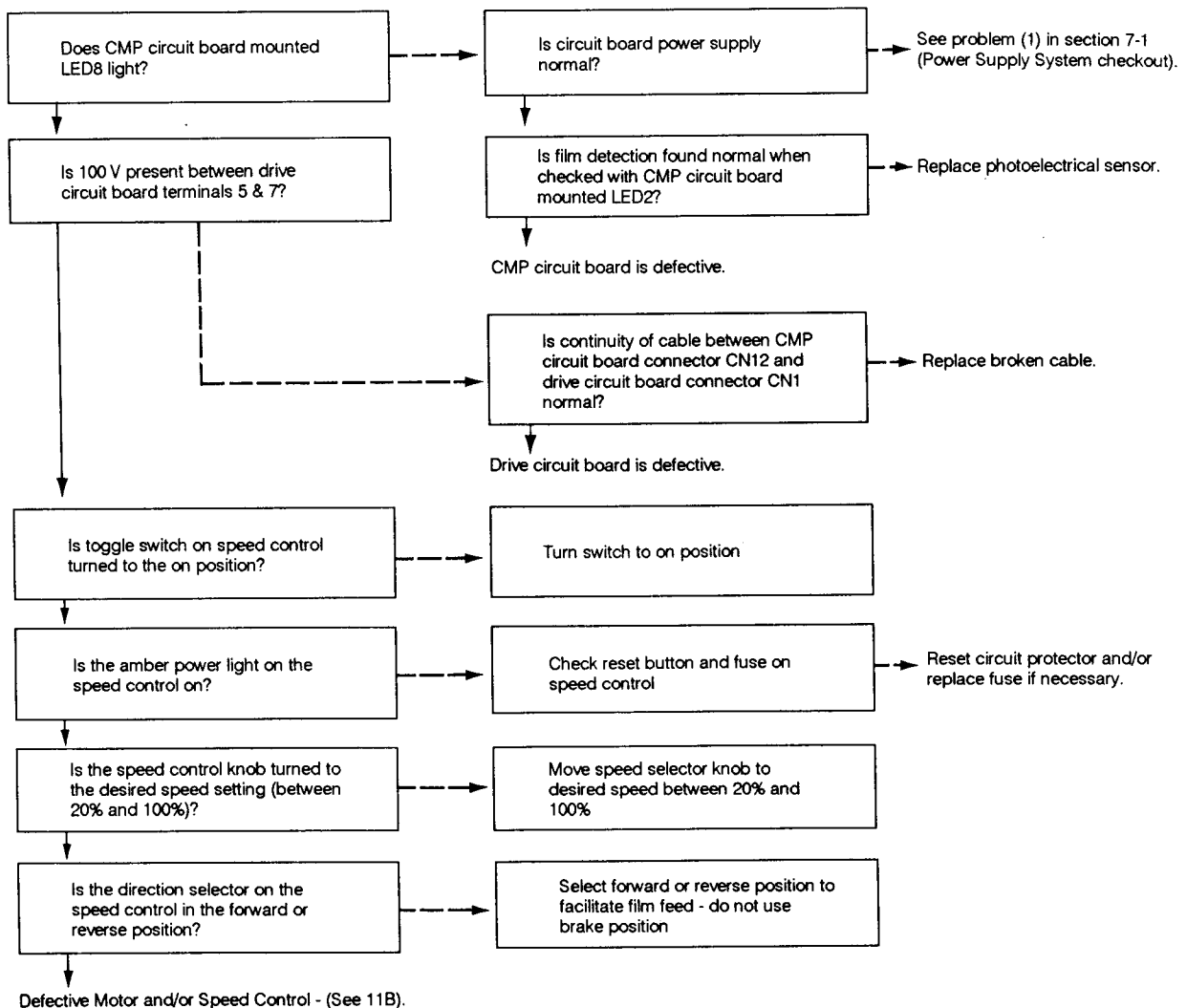
### 10. Replenishment System Does Not Operate



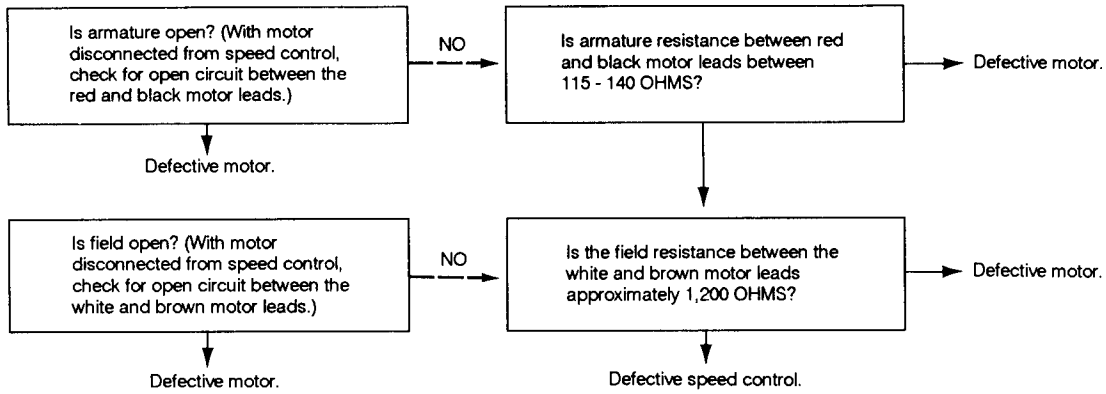
## 11. Drive Motor Does Not Run



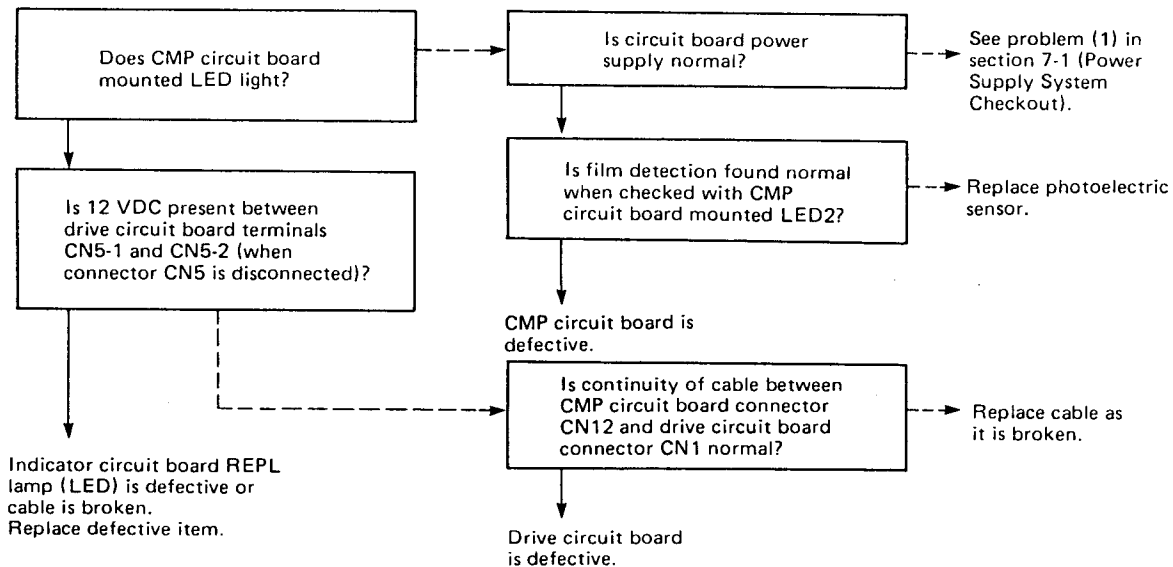
## 11A. Drive Motor Does Not Run - (Variable Speed Model Only)



**11B. Tests For Variable Speed Motor And Speed Control - (Variable Speed Model Only)**  
**Use Only After Tests in 11A Have Been Proven**

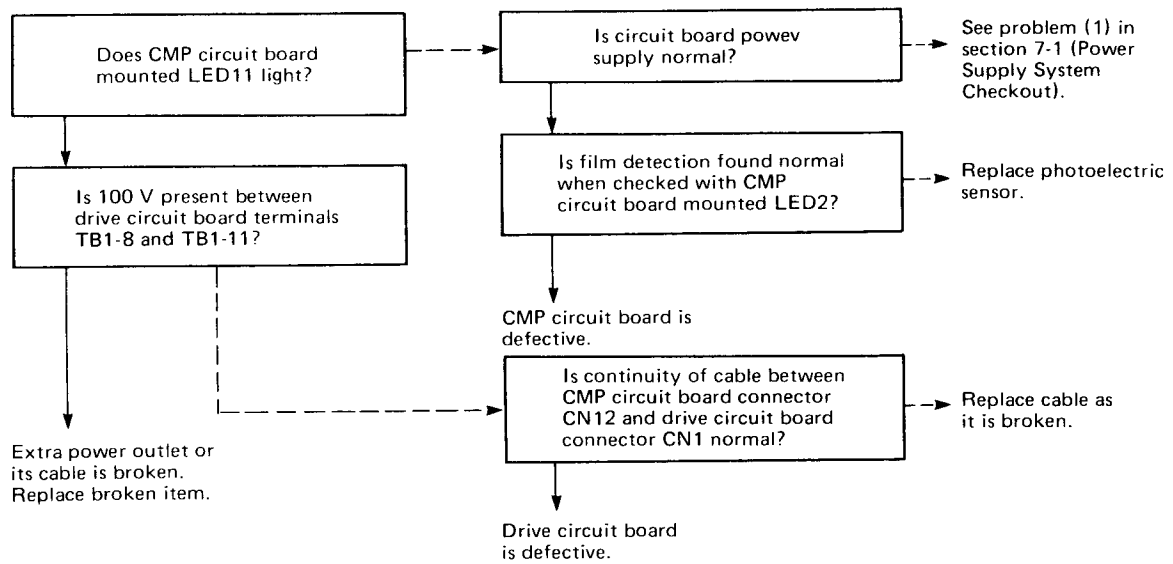


**12. REPL Lamp (LED) Does Not Light**

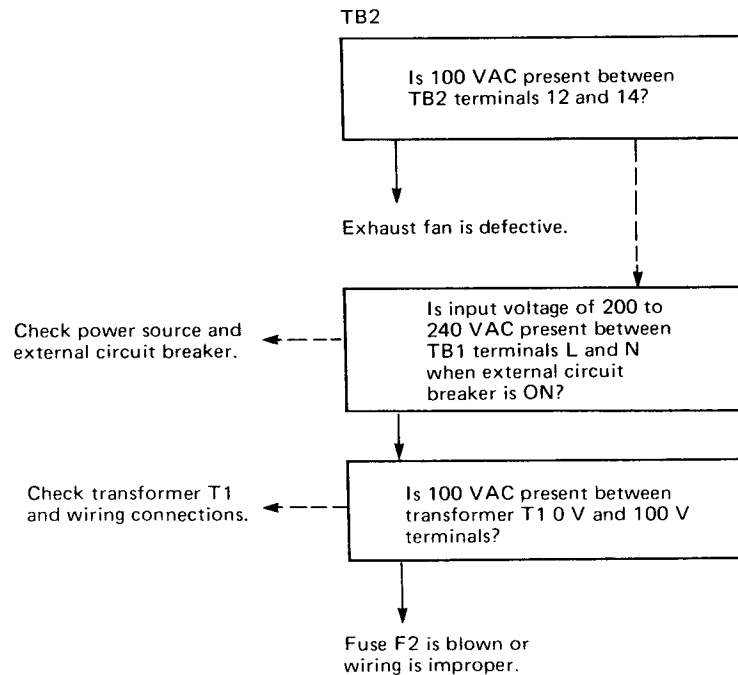




### 13. Extra Power Outlet (for Safelighting) Does Not Supply Power



### 14. Exhaust Fan Does Not Operate



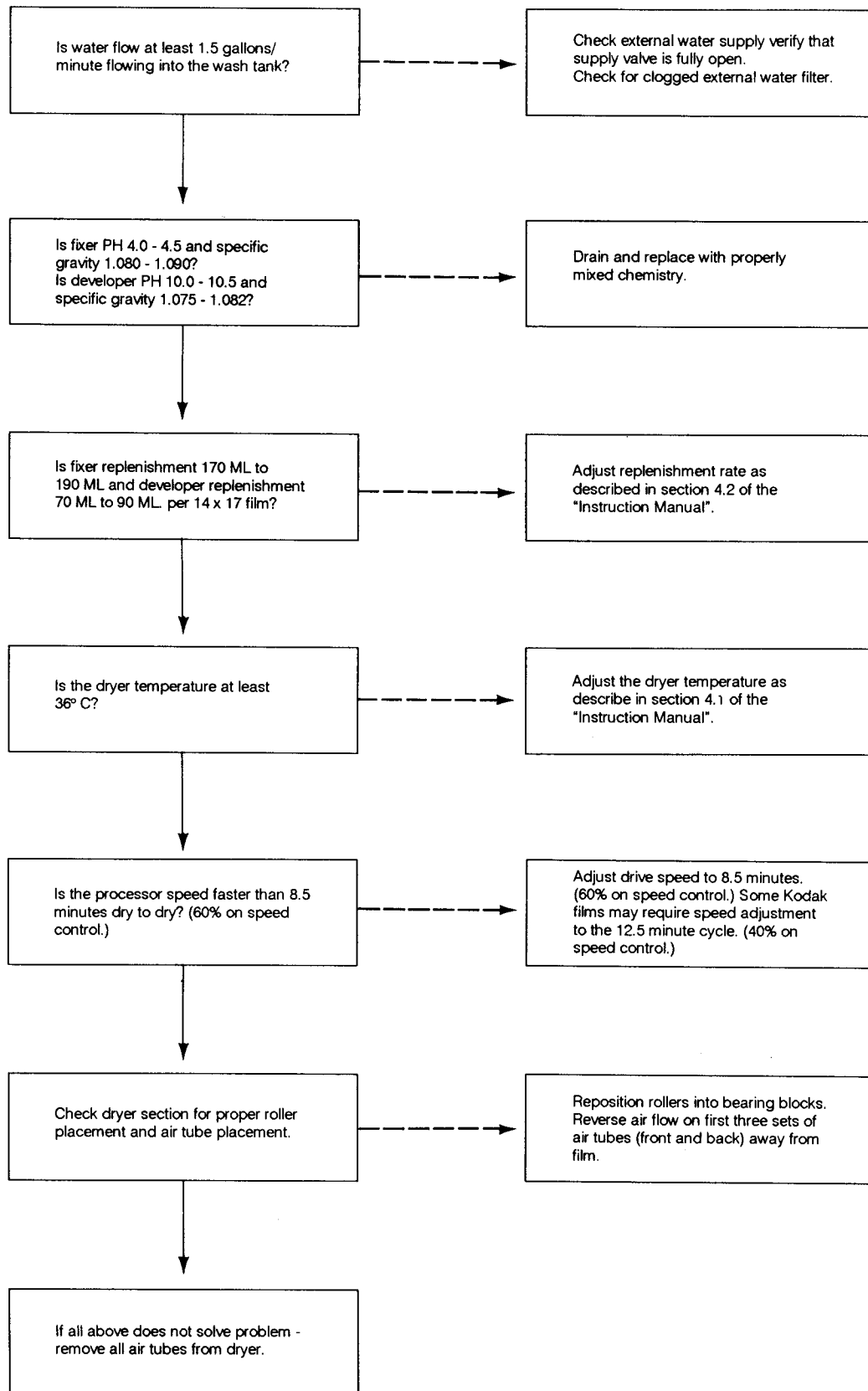
### 15. Digital Temperature Indication Adjustment Procedures

When the digital temperature indication differs from the actual measured temperature, adjust CMP circuit board mounted trimmers VR1 or VR2 as needed. This adjustment must also be made after thermistor or CMP circuit board replacement.

VR1 → Developer temperature digital indication

VR2 → Dryer temperature digital indication (with TEST switch set to 4)

## 16. Incomplete Drying or Dryer Jams



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## 10. ELECTRICAL CIRCUIT DIAGRAMS

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2018 - 2019

Fig 1. FPM4200 FLOW CHART

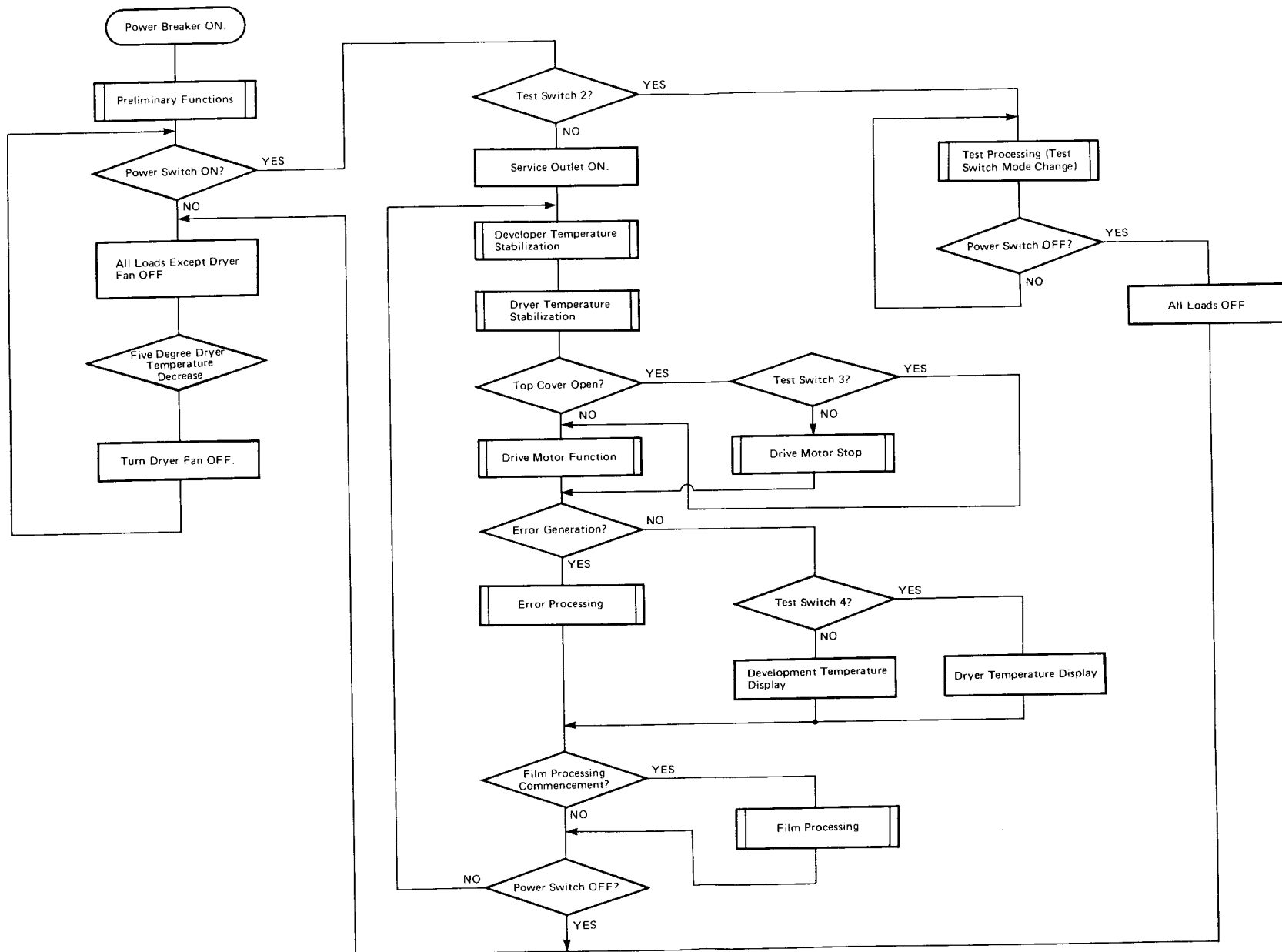
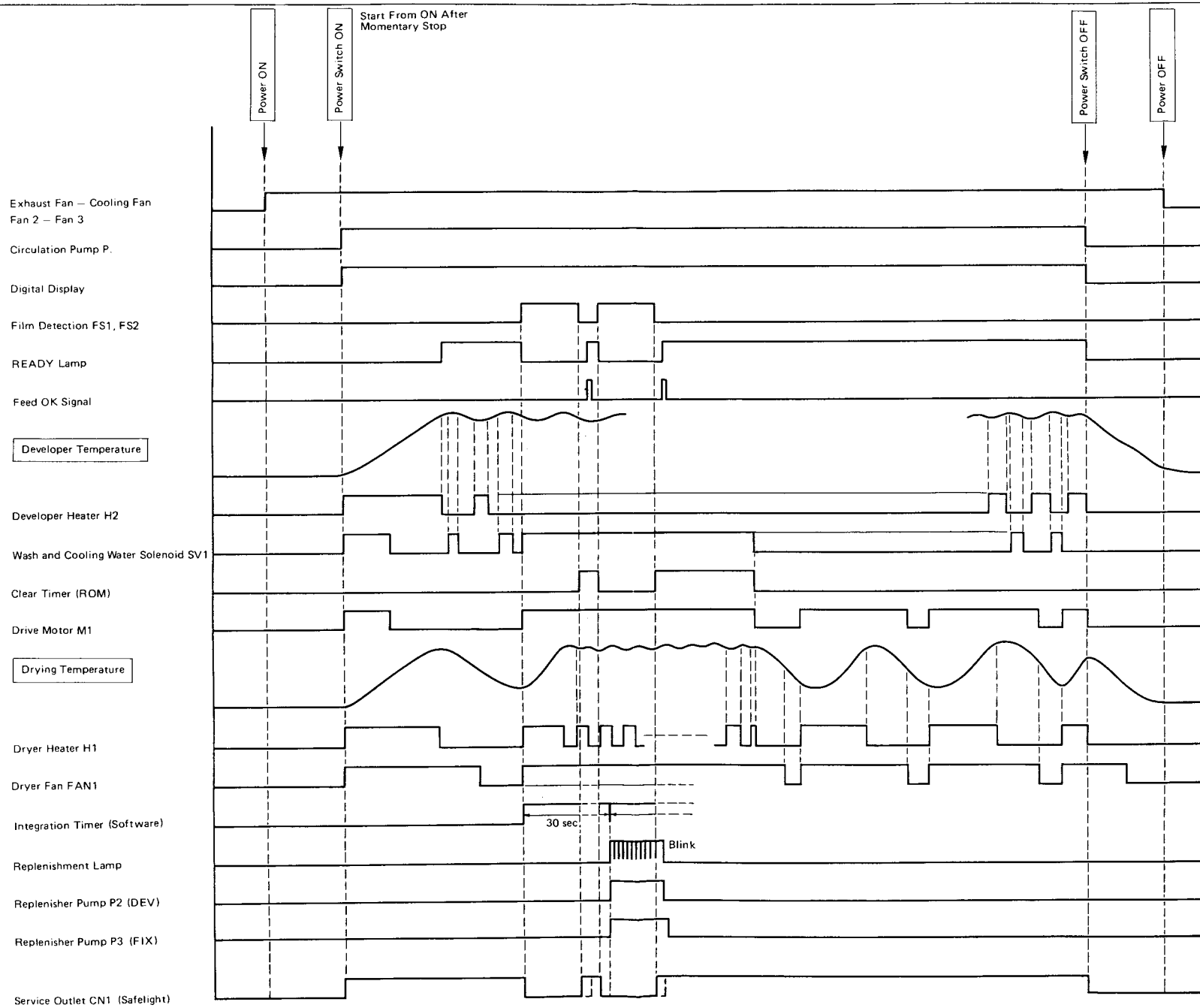


Fig 2. FPM4200 SEQUENCE DIAGRAM



**Fig 3A. FPM-42000 GENERAL SCHEMATIC CIRCUIT DIAGRAM (Showing Variable Speed Model)**

**Variable Speed Only**

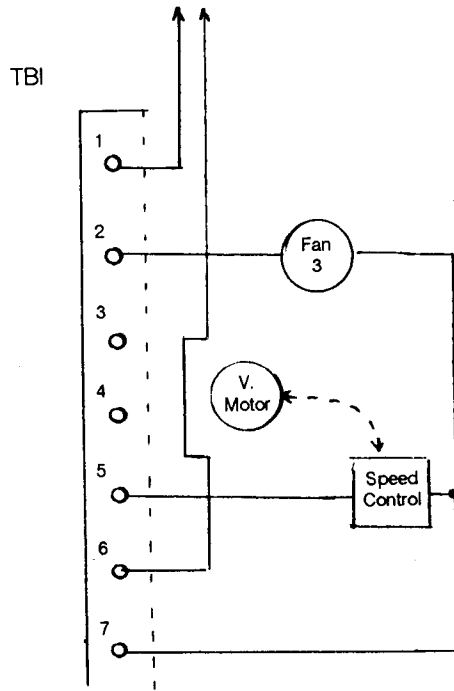


Fig 3. FPM4200 GENERAL SCHEMATIC CIRCUIT DIAGRAM

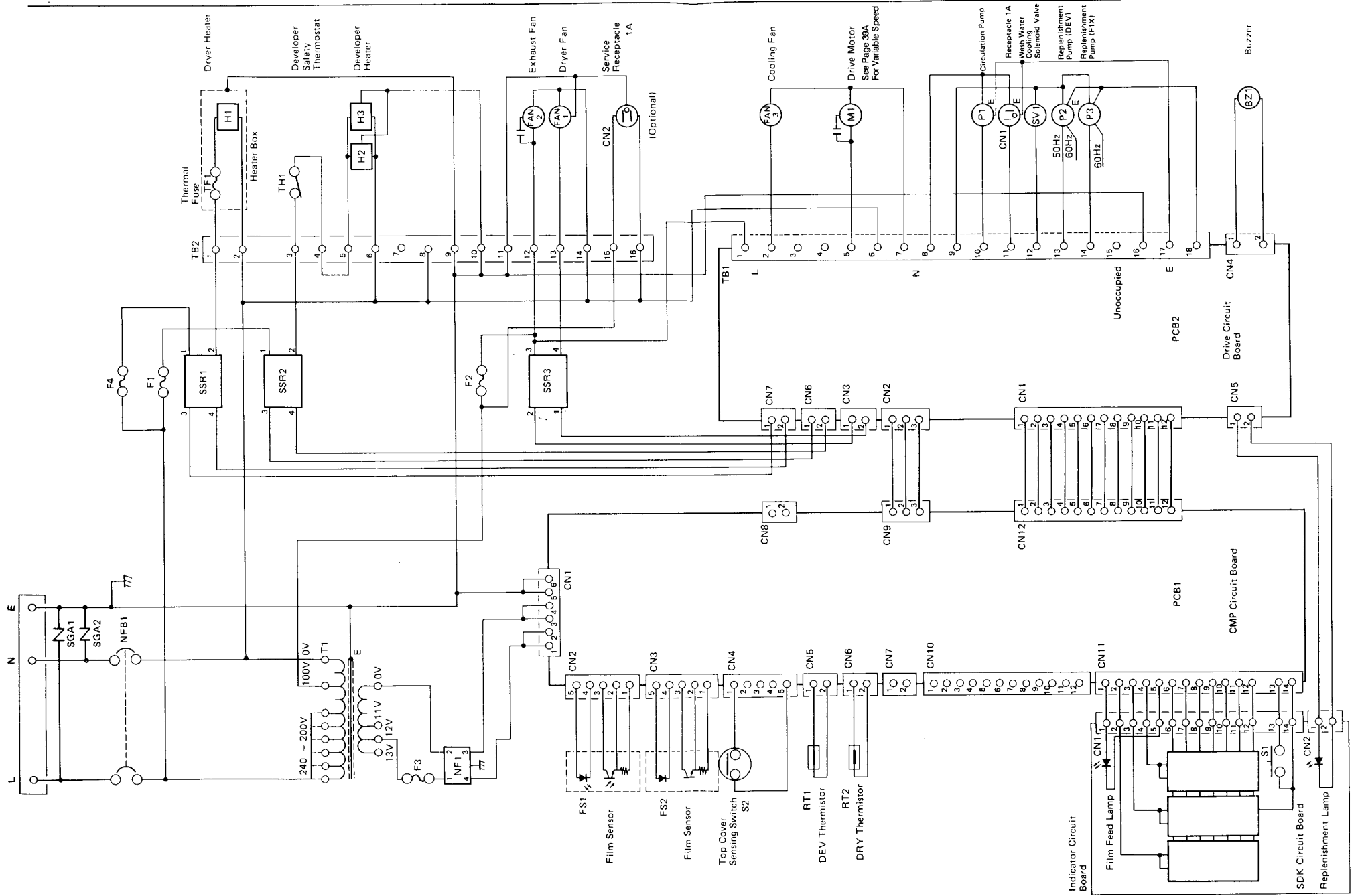


Fig 4. FPM4200 CONTROL CIRCUIT BOARD(CMP PCB) SCHEMATIC DIAGRAM 1/3

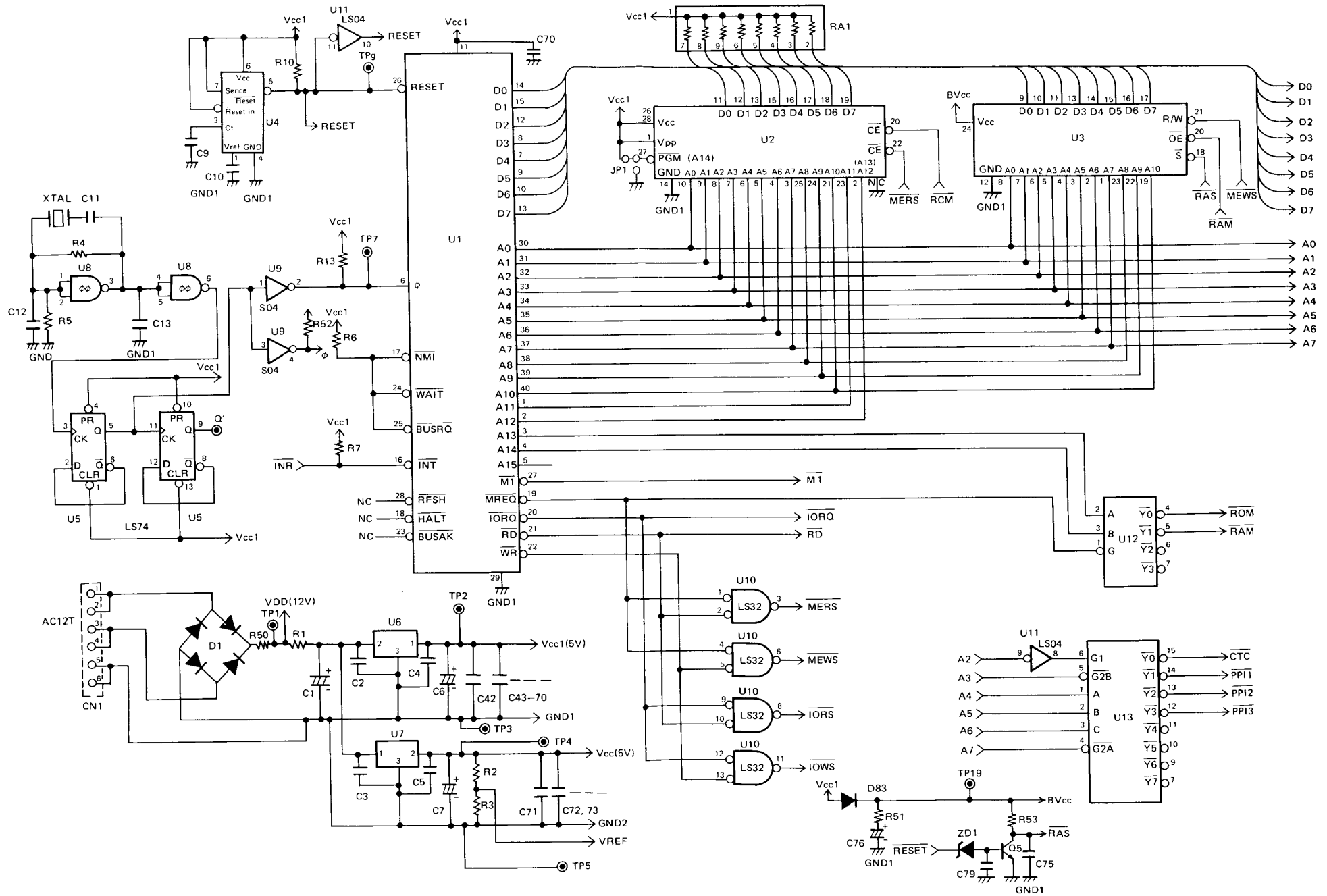




Fig 5. FPM4200 CONTROL CIRCUIT BOARD(CMP PCB) SCHEMATIC DIAGRAM 2/3

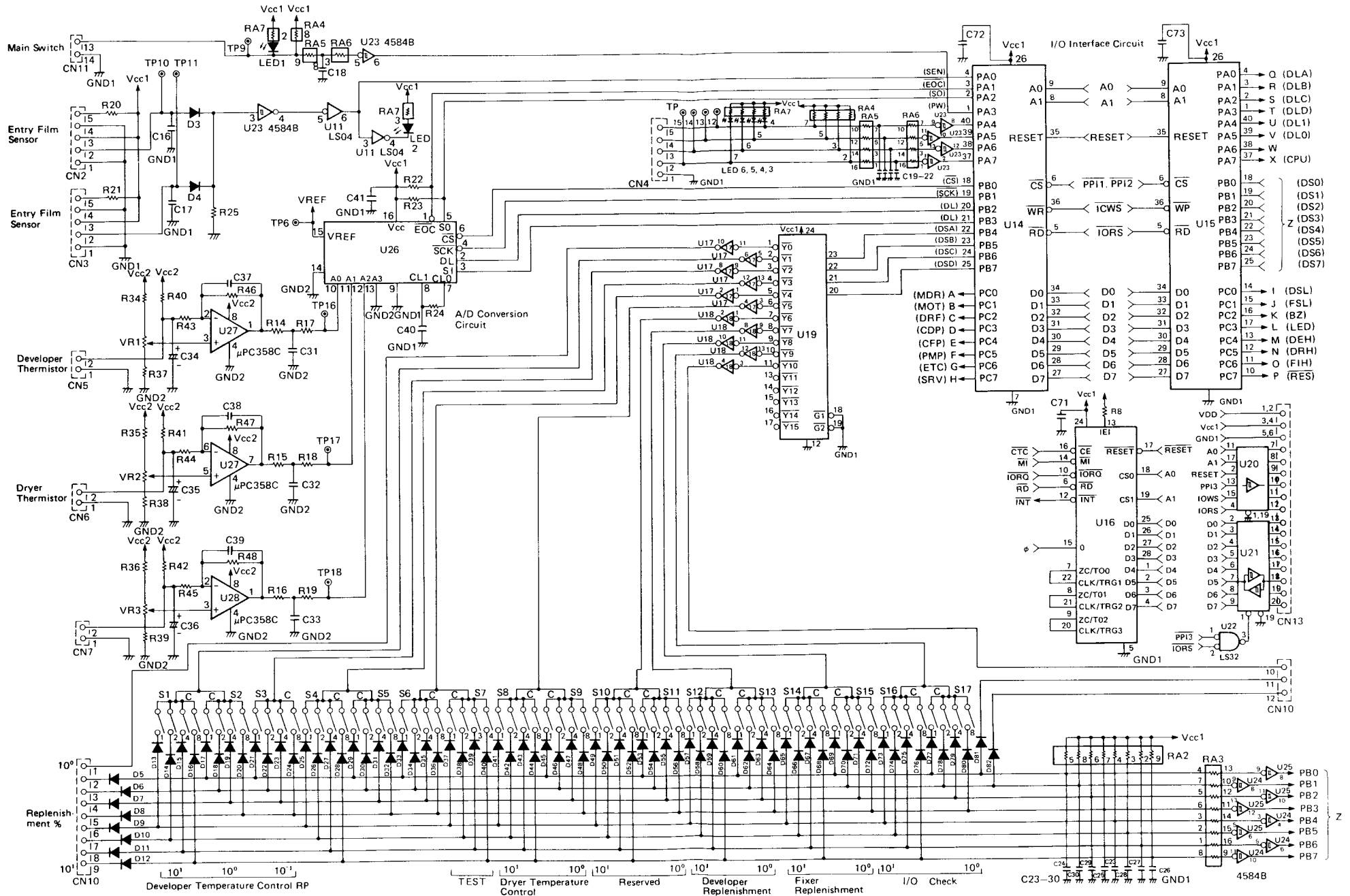


Fig 6. FPM4200 CONTROL CIRCUIT BOARD(CMP PCB) SCHEMATIC DIAGRAM 3/3

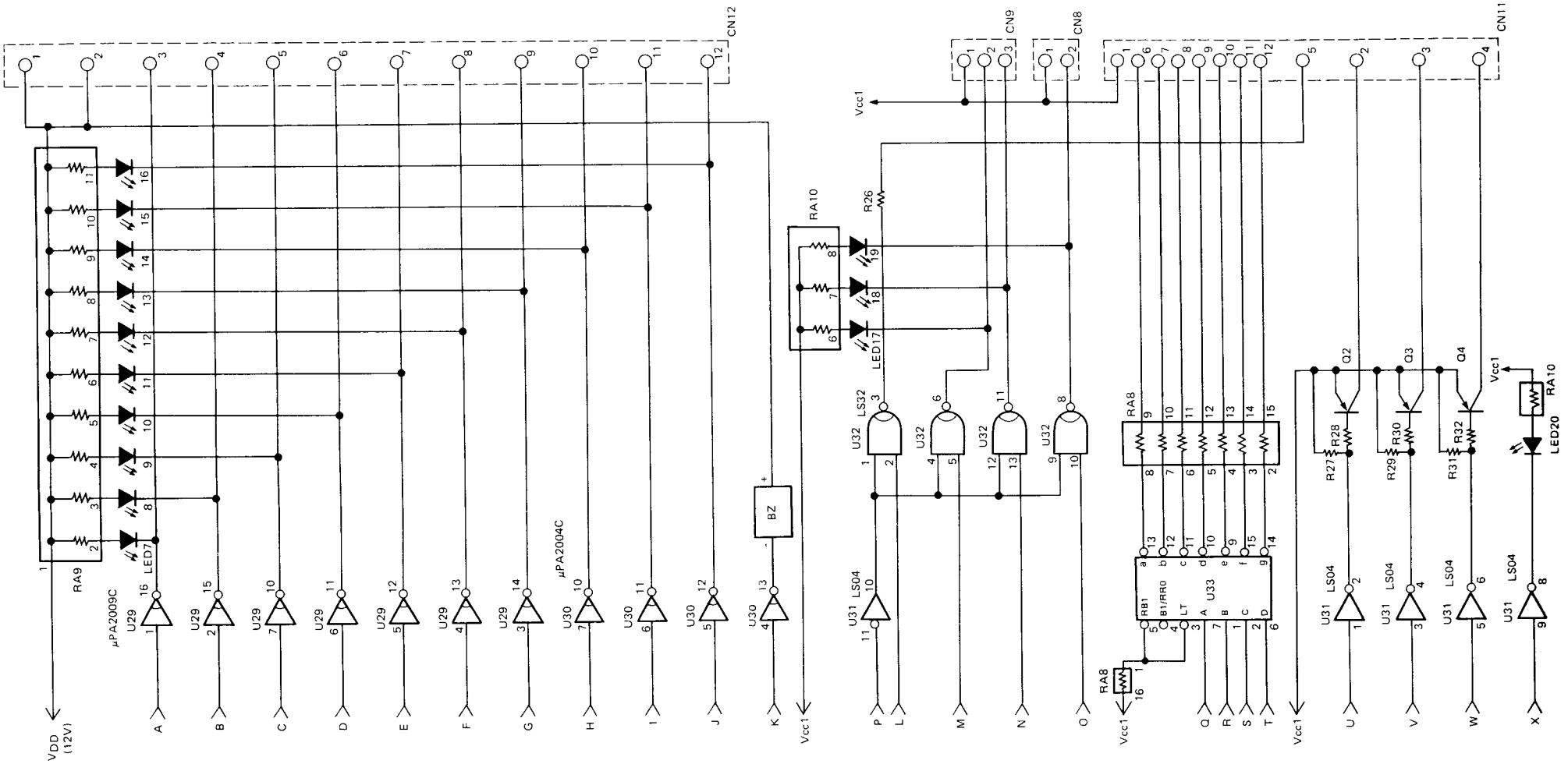


Fig 7. FPM4200 DRIVE CIRCUIT BOARD SCHEMATIC DIAGRAM

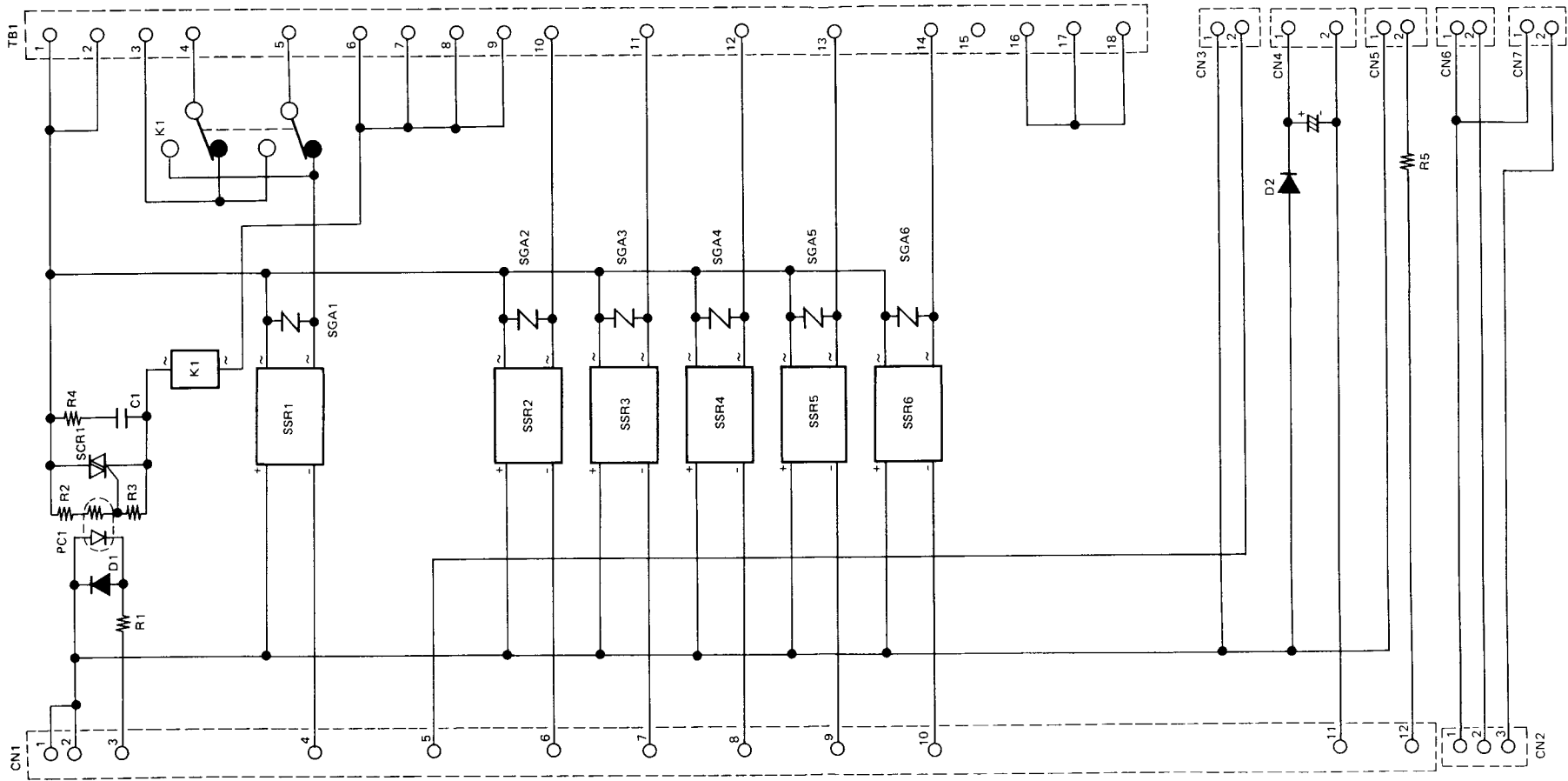


Fig 8. FPM4200 SDK CIRCUIT BOARD SCHEMATIC DIAGRAM

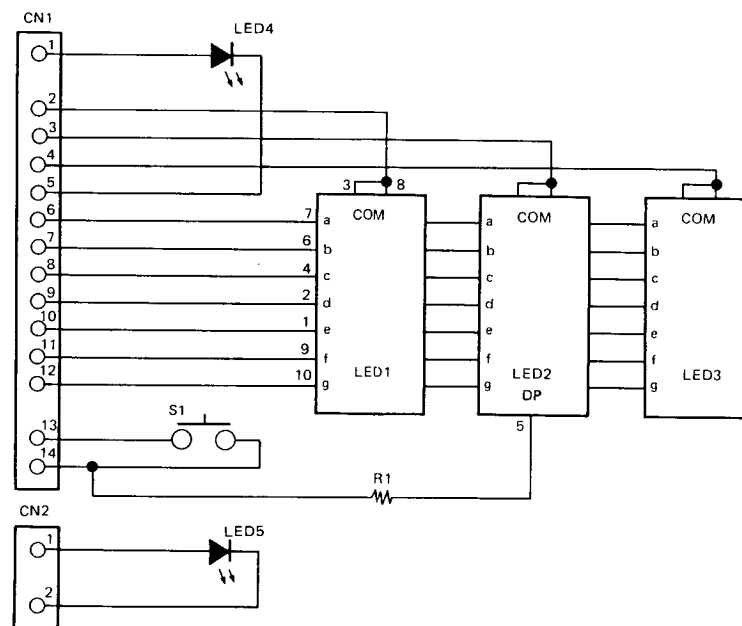


Fig 9. FPM4200 MAIN BODY PARTS ARRANGEMENT DIAGRAM 1/2

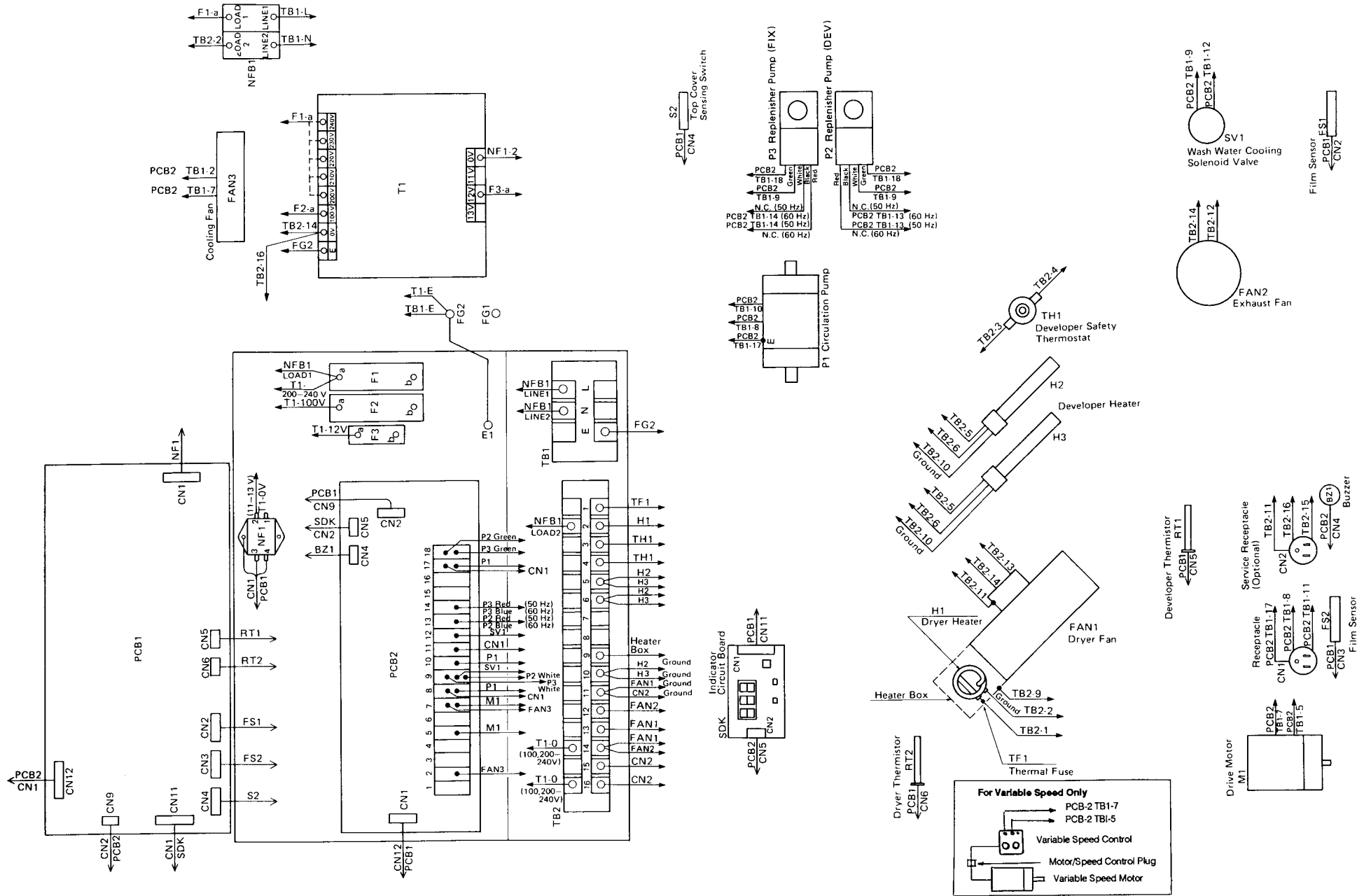
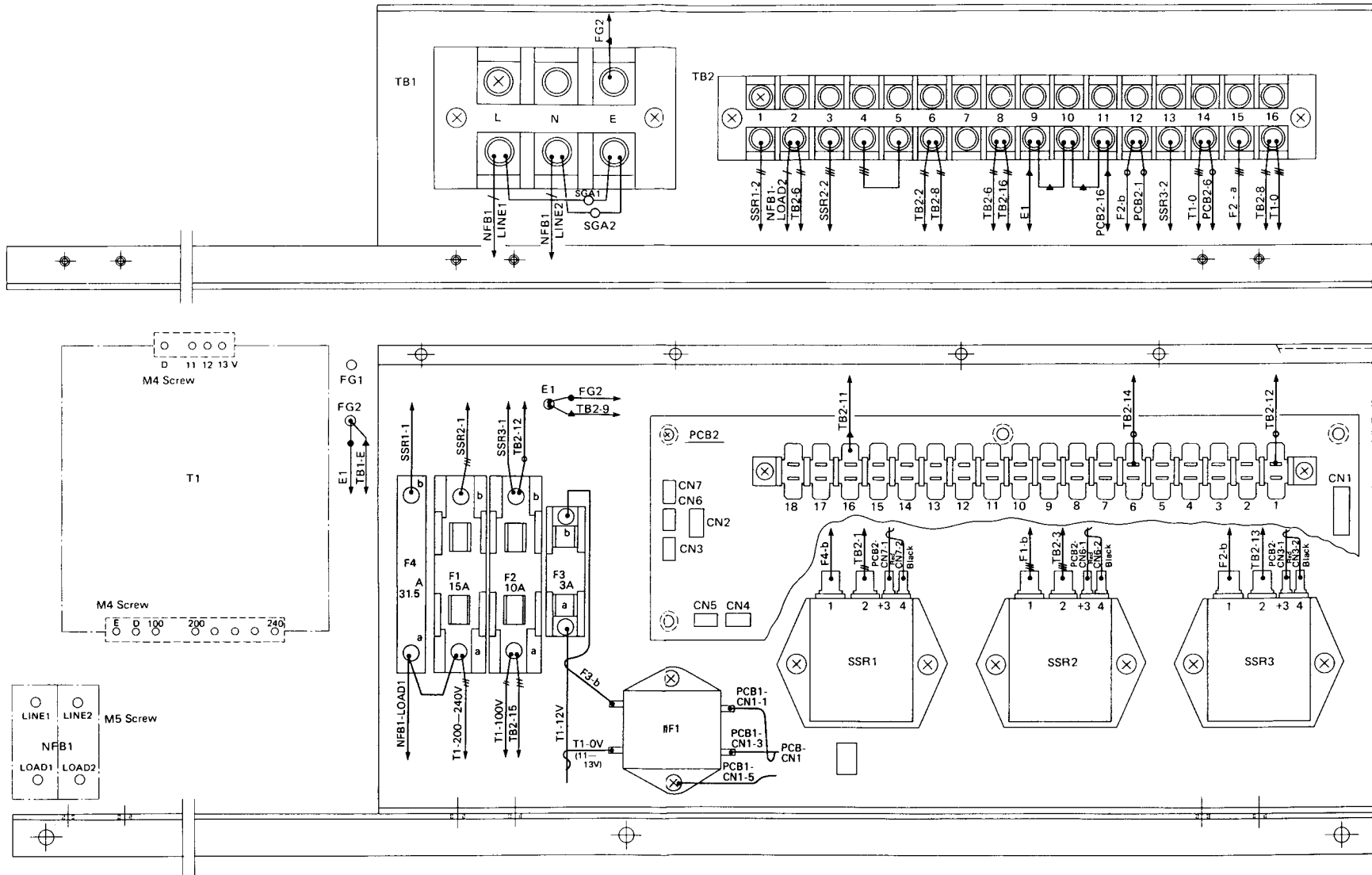


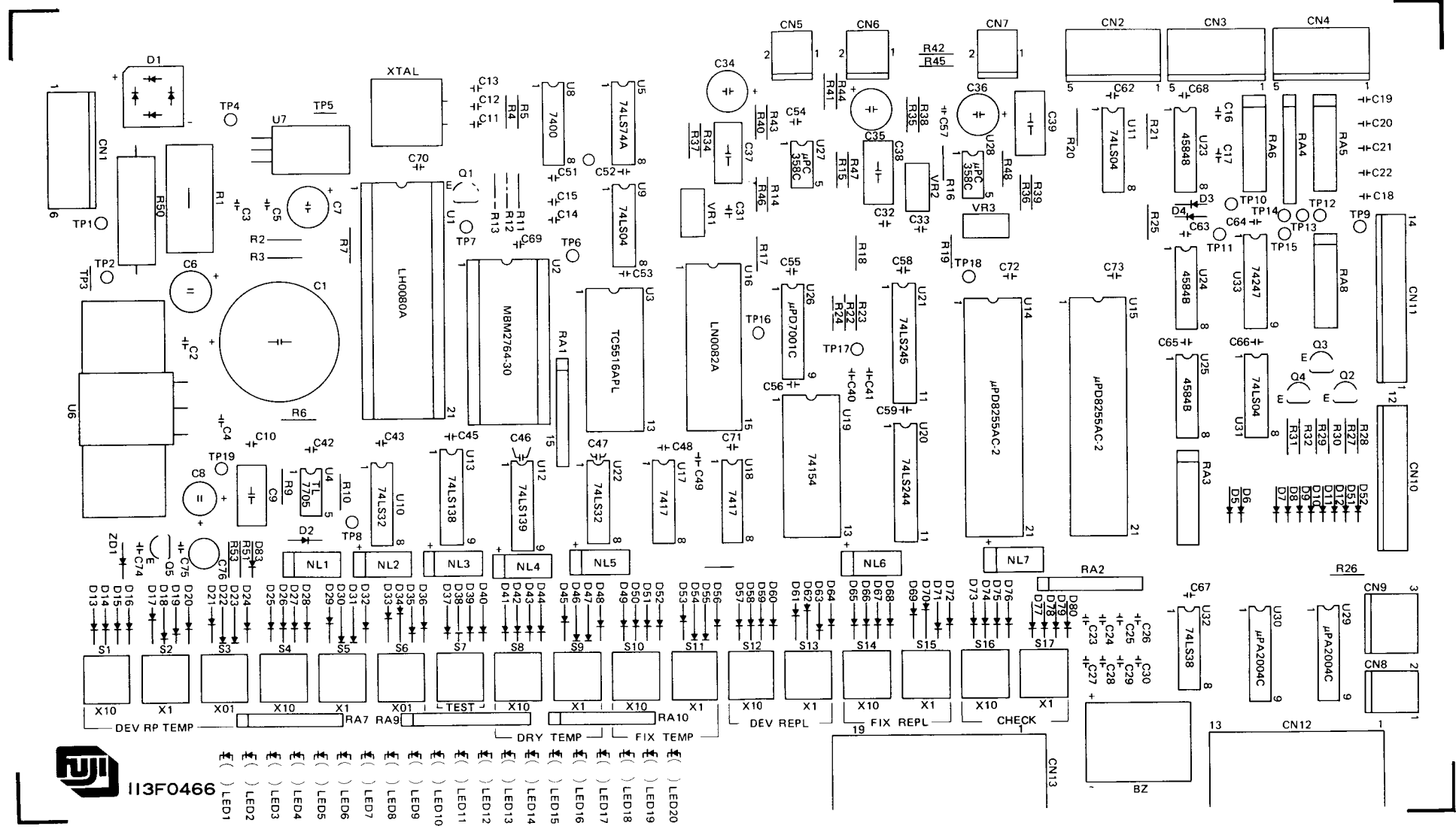
Fig 10. FPM4200 MAIN BODY PARTS ARRANGEMENT DIAGRAM 2/2



NOTE: The cables used are as follows.

1. UL1015 AWG, 10 White
2. UL1015 AWG, 12 White
3. UL1015 AWG, 14 White
4. UL1015 AWG, 16 White
5. UL1015 AWG, 10 Yellow/Green Spiral
6. UL1015 AWG, 16 Yellow/Green Spiral
7. UL1007 AWG, 18 White
8. SSR1-3 - CN3, 6, 7 Cable: UL1007, AWG, 22, Red/Black Twisted

Fig 11 FPM4200 CONTROL CIRCUIT BOARD PARTS ARRANGEMENT DIAGRAM



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