FUJI FILM SERVICE MANUAL

FUJI
NDT
FILM PROCESSOR

FPM4200
Ser. Nos. 8801369 and above

XM3-289E5
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1. RACK INSPECTION

1-1 RACK CONSTRUCTION

1-1-1 Rack Types and Roller Arrangements

Fig. 1

Dryer Rack

(Wash Rack)

Fixer Rack

Developer Rack

Dryer Outlet Rack

(Guide Plate)

* See the illustrations on the following pages for an indication of the differences between the numbered parts in this chart.
2. Developer Entrance and Crossover, Fixer, and Squeegee Racks

Fig. 3

- Helical Gear
- Collar B1 G5
- Rack Drive Shaft
- Helical Gear
- Collar B1 G5
- Rack Drive Shaft
- Helical Gear
- Collar B1 G5
- Rack Drive Shaft
- Helical Gear
- Collar B1 G5
- Rack Drive Shaft
- Helical Gear
- Collar B1 G5
- Rack Drive Shaft

11 R5 Synthetic Resin - Brown
12 R4 Synthetic Resin - Brown
13 R12 Synthetic Resin - Brown
16 R16 Rubber - Black
17 R4 Synthetic Resin - Brown
15 R16 Rubber - Black
14 Rubber - Black 20\(\phi\)
14 B4 G8
14 B5
14 G8 B4
14 G9 B5
21 Stainless Steel 10\(\phi\)
21
3. Dryer Rack

Fig. 4

R8 Synthetic Resin - Brown

450 mm

R9 Synthetic Resin - Brown

R17
## 1-2 RACK SECTION PARTS DESCRIPTIONS

### Rollers

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Part No.</th>
<th>Q'ty</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>334F2426A</td>
<td>3</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>2</td>
<td>334F8344220</td>
<td>3</td>
<td>Rubber</td>
</tr>
<tr>
<td>3</td>
<td>334F8345210</td>
<td>6</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>4</td>
<td>334F8344230</td>
<td>3</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>5</td>
<td>334F2154</td>
<td>9</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>6</td>
<td>334F2154</td>
<td>12</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>7</td>
<td>334F2154</td>
<td>12</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>8 (=12)</td>
<td>334F8344250</td>
<td>3</td>
<td>Rubber</td>
</tr>
<tr>
<td>9</td>
<td>334F8344260</td>
<td>3</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>10</td>
<td>334F8344270</td>
<td>1</td>
<td>Rubber</td>
</tr>
<tr>
<td>11</td>
<td>334F8343210</td>
<td>1</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>12 (=17)</td>
<td>334F8343220</td>
<td>10</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>13</td>
<td>334F2155</td>
<td>2</td>
<td>Rubber</td>
</tr>
<tr>
<td>14</td>
<td>334F3057</td>
<td>1</td>
<td>Rubber</td>
</tr>
<tr>
<td>15</td>
<td>334F3255</td>
<td>1</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>16 (=13)</td>
<td>334F8343220</td>
<td>2</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>17</td>
<td>334F8347210</td>
<td>2</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>18</td>
<td>334F8347210</td>
<td>3</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>19</td>
<td>334F8317230</td>
<td>14</td>
<td>Synthetic Resin</td>
</tr>
<tr>
<td>20</td>
<td>334F1112</td>
<td>1</td>
<td>Aluminum</td>
</tr>
<tr>
<td>21</td>
<td>334F1017</td>
<td>1</td>
<td>Stainless Steel</td>
</tr>
</tbody>
</table>

### Guides

<table>
<thead>
<tr>
<th>Ref. Symbol</th>
<th>Part No.</th>
<th>Q'ty</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>363F1609</td>
<td>7</td>
</tr>
<tr>
<td>B</td>
<td>363F1608</td>
<td>14</td>
</tr>
<tr>
<td>C</td>
<td>363F0199</td>
<td>7</td>
</tr>
<tr>
<td>D</td>
<td>363F0202</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>363F0203</td>
<td>1</td>
</tr>
<tr>
<td>F</td>
<td>363F1601</td>
<td>28</td>
</tr>
<tr>
<td>G</td>
<td>363F8353573</td>
<td>10</td>
</tr>
<tr>
<td>H</td>
<td>363F1443</td>
<td>1</td>
</tr>
<tr>
<td>J</td>
<td>363F1607</td>
<td>14</td>
</tr>
<tr>
<td>K</td>
<td>363F1614A</td>
<td>1</td>
</tr>
</tbody>
</table>

### Springs

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

Fig. 9
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).

   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.
2. LUBRICATION

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

Fig. 11
3. TUBING SYSTEM DIAGRAM

Fig. 12
4. PERIODIC INSPECTION

Since this unit functions under high and multiple temperature conditions making use of acidic and alkaline solutions, it is subjected to continual stress which encourages malfunctioning. In this regard, in order to maintain the processor in optimum working conditions, it is essential that the "Instruction Manual" be consulted for daily maintenance procedures and periodic inspections.

1. Periodic Part Replacement

The parts indicated in the table below are subjected to changes in material quality over time and their actual useful life is difficult to predict. Further, since the parts indicated are essential to good mechanical functioning, proper replacement intervals should be noted and new parts reinstalled on a periodic basis. Replacement parts are to be supplied to the customer on a contractual basis.

<table>
<thead>
<tr>
<th>Periodic Replacement Parts</th>
<th>Replacement Periodicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Springs, Gears, Shaft Retainers, Developer Filters, and E Rings.</td>
<td>Every Year</td>
</tr>
<tr>
<td>Fuses, Dryer Thermal Fuses, Dryer Roller Pulleys, Output Conveyor Rings, Developer Crossover Rack Rollers, Fixer Crossover Rack Rollers, Squeegee Rack Input Rollers, and Developer Submerged Rack Rollers.</td>
<td>Every Two Years</td>
</tr>
<tr>
<td>Dryer Belt, Fixer Submerged Rack Rollers, Wash Water Submerged Rack Rollers, and Squeegee Rack Rollers.</td>
<td>Every Three Years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inspection Period (Months)</th>
<th>12</th>
<th>24</th>
<th>36</th>
<th>48</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replacement Parts</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(●... Replacement Period)

2. Check List

- Rack Sections, Drive Systems
  - Rack Looseness and Geometry
  - Rack Shaft Retainers, Gear Wear
  - Rack Helical Gear Looseness
  - Rack Roller Foreign Matter Buildup
  - Drive Motor Chain Tension
  - Abnormal Noises

- Replenishment System
  - Photoelectric Detection Section Function
  - Replenishment Supply Hose Clogging
  - Developer and Fixer Replenisher Amounts Check

- Circulation and Temperature Control Systems
  - Processing Tank Internal Foreign Matter Buildup
  - Supply Hose Solution Leaks
  - Developer Temperature Check
    - Set Temperature _______°C
    - Actual Temperature _______°C
  - Fixer Temperature Check
    - Actual Temperature _______°C
  - Circulation Pump Functioning
- Dryer System
  - Dryer Pulley Wear
  - Dryer Belt Tension
  - Slit Pipe Foreign Matter Buildup
  - Dryer Section Temperature Check
    - Set Temperature  __________ °C
    - Actual Temperature  __________ °C

- Miscellaneous
  - Finished Product Photographic Quality
  - Upper Lids, Lower Lids, and Side Plate Checks
  - Water Supply and Ventilation Checks
5. SWITCH USAGE

5-1 TEST SWITCHES

* TEST & CHECK switch is on the control PCB.

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.

![Diagram of TEST Switch Positions 0 and 1]

(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

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

**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)

![Diagram of speed control settings](image)

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".

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

*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.

* TEST & CHECK switch is on the control PCB.

Fig. 14
6. ALARM CODE TABLE

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.

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

* 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.

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

   START
   \diamond Is digital indicator on? 
     \begin{cases} 
     \text{NO} & \text{Check power supply} \\
     \text{YES} & \begin{cases} 
     \text{NO} & \text{Check CMP circuit board power supply circuit}\text{.} \\
     \text{YES} & \begin{cases} 
     \text{NO} & \text{Check drive circuit board cables}\text{.} \\
     \text{YES} & \text{Yes Identifying cause of fuse blowout.} \\
     \end{cases} \\
     \end{cases} \\
   \end{cases} \\

   Is 12 V present at CMP circuit board terminals between TP1 & TP3.
   \begin{cases} 
     \text{NO} & \text{Check if power is present at wall outlet} \\
     \text{YES} & \text{Yes Identifying cause of fuse blowout.} \\
     \end{cases} \\

   Is fuse blown?
   \begin{cases} 
     \text{NO} & \text{Check transformer} \\
     \text{YES} & \text{Check CMP circuit board} \\
     \end{cases} \\

   Is 200 to 240 VAC present between TB1 terminals L and N?
   \begin{cases} 
     \text{NO} & \text{Check transformer} \\
     \text{YES} & \text{Check CMP circuit board connector CN1?} \\
     \end{cases} \\

   (2) Some Loads Do Not Operate
   NOTE: The following flowchart does not apply to cases where no loads operate.

   START
   \begin{cases} 
     \text{YES} & \text{Is monitor LED related to illuminated load inoperative?} \\
     \text{NO} & \begin{cases} 
     \text{NO} & \text{Power supply system or CMP circuit board defective} \\
     \text{YES} & \text{Is cable between drive circuit board and load broken?} \\
     \end{cases} \\
   \end{cases} \\

   \begin{cases} 
     \text{YES} & \text{Check cable} \\
     \text{NO} & \text{Check cable} \\
   \end{cases} \\

   Is cable between CMP and drive circuit boards broken?
   \begin{cases} 
     \text{NO} & \text{Check drive circuit board} \\
     \text{YES} & \text{Check cable} \\
   \end{cases}
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.)
9. ABNORMALITIES AND REMEDIES

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1. Digital Indicator Does Not Light

- YES
- NO

Is input voltage of 200 to 240 VAC present between TB1 terminals L and N when external circuit breaker is ON?

---

Is 12 VDC developed between CMP circuit board terminals TP1 and TP3?

---

Is 5 VDC developed between CMP circuit board terminals TP2 and TP3?

---

Is circuit board mounted LED1 lit when indicator panel mounted POWER switch is ON?

---

Is main switch continuity normal when checked with connector CN11 disconnected?

- Main switch is defective
- Replace CN11-to-digital indicator connecting cable

---

Is CMP circuit board digital indicator terminal (CN11) normal?

---

Is digital indicator circuit board cable continuity normal when checked with connector CN11 disconnected?

- Replace CN11-to-digital indicator connecting cable

---

Check power source and external circuit breaker.

---

Is continuity of fuse F3 normal when removed and checked?

- Replace fuse

---

Is 12 VAC developed at transformer T1 12 V output?

- Replace transformer

---

Is 12 VAC developed between CMP circuit board terminals CN1-1 and CN1-3?

---

Cable between transformer 12 V output and connector CN1 is broken or noise suppressor is defective. Replace defective items.

---

Seven-segment LED is defective. Replace indicator circuit board.
2. READY Lamp (LED) Does Not Light

- Is input voltage of 200 to 240 VAC present between TB1 terminals L and N when external circuit breaker is ON? — Check power source and external circuit breaker

- Is 12 VDC developed between CMP circuit board terminals TP1 and TP3?

- Is 5 VDC developed between CMP circuit board terminals TP2 and TP3?

- Is circuit board mounted LED1 lit when indicator panel mounted POWER switch is ON?

- Is switch continuity normal when checked with connector CN11 disconnected?
  - Main switch is defective.
  - Replace CN11-to-digital indicator connecting cable.

- Is CMP circuit board digital indicator terminal (CN11) normal?

- Is digital indicator circuit board cable continuity normal when checked with connector CN11 disconnected?
  - Replace CN11-to-digital indicator connecting cable.

- Is 12 VAC present at transformer T1 12 V output?
  - Replace transformer

- Is 12 VAC present between CMP circuit board terminals CN1-1 and CN1-3?
  - Cable between transformer 12 V output and connector CN1 is broken or noise suppressor is defective.
  - Replace defective items

- Replace CMP circuit board (with ROM attached) as it is defective.

- Feed LED is defective.
  - Replace indicator circuit board

- Replace film sensor as it is defective.
3. Developer Temperature Is Too Low

Does circuit board mounted LED17 fail to light when developer temperature is lower than preset point?

Is circuit board power supply normal?

See problem (1) in section 7-1 (Power Supply System Checkout).

Is 200 to 240 VAC present between TB2 terminals 3 and 6?

Is thermistor resistance 12 to 18 kΩ at 20 to 30°C or 68 to 86°F when measured with thermistor connector CN5 disconnected?

Replace thermistor as it is defective.

Replace CMP circuit board as it is defective.

Is continuity of cable between drive circuit board connector CN6 and SSR2 normal?

Replace cable as it is broken.

Is continuity of cable between SSR2 and TB2 normal?

Replace cable as it is broken.

Replace SSR2 as it is defective.

Developer heater system is faulty.

Safety thermostat is activated.

Filter clogging and circulation pump malfunction are also conceivable.

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)

Does circuit board mounted LED18 light when dryer temperature is lower than preset point?

Is 200 to 240 VAC developed between TB2 terminals 1 and 2?

Is circuit board power supply normal?

Is thermistor resistance 8 to 12 kΩ (at 20 to 30°C or 68 to 86°F) when measured with thermistor connector CN6 disconnected?

Replace circuit board as it is defective.

Replace thermistor as it is defective.

Replace cable as it is broken.

Replace cable as it is broken.

Replace SSR1 as it is defective.

Dryer heater system is faulty.

Heater is burned out.

Thermal fuse is blown.

Filter clogging and circulation pump malfunction are also conceivable.

It is possible that excessive developer temperature has tripped the safety thermostat. Reset by pushing down rubber boot located on top of the heat exchanger. (See page 5, of Instruction Manual for location diagram).

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

Does CMP circuit board mounted LED9 light? 

Is 100 VAC present between TB2 terminals 13 and 14? 

Dryer fan is defective

Is circuit board power supply normal? 

See problem (1) in section 7-1 (Power Supply System Checkout).

Is thermistor resistance 8 to 12 kΩ (at 20 to 30°C or 68 to 86°F) when measured with thermistor connector CN6 disconnected? 

Replace thermistor as it is defective.

Replace circuit board as it is defective.

Is continuity of cable between CMP circuit board connector CN12 and drive circuit board connector CN1 normal? 

Replace cable as it is broken.

Is continuity of cable between drive circuit board connector CN8 and SSR3 normal? 

Replace cable as it is broken.

Is continuity of wires between drive circuit board terminals CN1-1 and CN3-1 and between CN1-5 and CN3-2 normal? 

Wiring is broken. Replace drive circuit board.

Is continuity of cable between SSR3 and TB3 normal? 

Replace cable as it is broken.

8. Circulation Pump Does Not Operate

Does CMP circuit board mounted LED10 light? 

Is 100 VAC developed between drive circuit board terminals 8 and 10? 

Circulation pump is defective.

Is circuit board power supply normal? 

See problem (1) in section 7-1 (Power Supply System Checkout).

CMP circuit board is defective.

Is continuity of cable between CMP circuit board connector CN12 and drive circuit board connector CN1 normal? 

Replace cable as it is broken.

Drive circuit board is defective.
9. Washing and Cooling Solenoid Valve Does Not Operate

Does CMP circuit board mounted LED12 light?  

Is circuit board power supply normal?  

Is 100 VAC developed between drive circuit board terminals 9 and 12?  

CMP circuit board is defective.  

Is continuity of cable between CMP circuit board connector CN12 and drive circuit board connector CN1 normal?  

Replace cable as it is broken.  

Washing and cooling solenoid valve is defective.  

Drive circuit board is defective.

10. Replenishment System Does Not Operate

Do circuit board mounted LED13 (developer replenishment pump) and LED14 (fixer replenishment pump) light?  

Is circuit board power supply normal?  

Are DEV and FIX REPL switch settings 0.1 to 2.0?  

Correct settings.  

Is film detection found normal when checked with CMP circuit board mounted LED2?  

Replace photoelectric sensor.  

CMP circuit board is defective.  

Is continuity of cable between CMP circuit board connector CN12 and drive circuit board connector CN1 normal?  

Replace cable as it is broken.  

When 100 V is present between terminals 9 and 13, developer replenishment pump is defective.  

When 100 V is present between terminals 9 and 14, fixer replenishment pump is defective.  

Circuit board is defective.
11. Drive Motor Does Not Run

Does CMP circuit board mounted LED8 light?

Is 100 V present between drive circuit board terminals 5 and 7?

Drive motor is defective

Is circuit board power supply normal?

Is film detection found normal when checked with CMP circuit board mounted LED2?

CMP circuit board is defective.

Is continuity of cable between CMP circuit board connector CN12 and drive circuit board connector CN1 normal?

Drive circuit board is defective.

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

Does CMP circuit board mounted LED8 light?

Is 100 V present between drive circuit board terminals 5 & 7?

CMP circuit board is defective.

Is continuity of cable between CMP circuit board connector CN12 and drive circuit board connector CN1 normal?

Drive circuit board is defective.

Is toggle switch on speed control turned to the on position?

Turn switch to on position

Is the amber power light on the speed control on?

Check reset button and fuse on speed control

Is the speed control knob turned to the desired speed setting (between 20% and 100%)?

Move speed selector knob to desired speed between 20% and 100%

Is the direction selector on the speed control in the forward or reverse position?

Select forward or reverse position to facilitate film feed - do not use brake position

Defective Motor and/or Speed Control - (See 11B).
11B. Tests For Variable Speed Motor And Speed Control - (Variable Speed Model Only)

Use Only After Tests in 11A Have Been Proven

Is armature open? (With motor disconnected from speed control, check for open circuit between the red and black motor leads.)

- NO
  - Defective motor.

Is armature resistance between red and black motor leads between 115 - 140 OHMS?

- NO
  - Defective motor.

- Defective speed control.

Is field open? (With motor disconnected from speed control, check for open circuit between the white and brown motor leads.)

- NO
  - Defective motor.

Is the field resistance between the white and brown motor leads approximately 1,200 OHMS?

- NO
  - Defective motor.

- Defective speed control.

---

12. REPL Lamp (LED) Does Not Light

Does CMP circuit board mounted LED light?

- NO
  - See problem (1) in section 7-1 (Power Supply System Checkout).

Is circuit board power supply normal?

- NO
  - Replace photoelectric sensor.

Is film detection found normal when checked with CMP circuit board mounted LED2?

- NO
  - Replace cable as it is broken.

CMP circuit board is defective.

Is continuity of cable between CMP circuit board connector CN12 and drive circuit board connector CN1 normal?

- NO
  - Replace defective item.


Is 100 V present between drive circuit board terminals TB1-8 and TB1-11? → Is film detection found normal when checked with CMP circuit board mounted LED2? → Replace photoelectric sensor.

CMP circuit board is defective. → Is continuity of cable between CMP circuit board connector CN12 and drive circuit board connector CN1 normal? → Replace cable as it is broken.

Extra power outlet or its cable is broken. Replace broken item.

Drive circuit board is defective.

14. Exhaust Fan Does Not Operate

TB2

Is 100 VAC present between TB2 terminals 12 and 14? → Exhaust fan is defective.

Check power source and external circuit breaker.

Is input voltage of 200 to 240 VAC present between TB1 terminals L and N when external circuit breaker is ON? → Check transformer T1 and wiring connections.

Is 100 VAC present between transformer T1 0 V and 100 V terminals? → Fuse F2 is blown or wiring is improper.

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

Is water flow at least 1.5 gallons/minute flowing into the wash tank?

Is fixer pH 4.0 - 4.5 and specific gravity 1.080 - 1.086?
Is developer pH 10.0 - 10.5 and specific gravity 1.075 - 1.082?

Check external water supply verify that supply valve is fully open.
Check for clogged external water filter.

Drain and replace with properly mixed chemistry.

Adjust replenishment rate as described in section 4.2 of the "Instruction Manual".

Is fixer replenishment 170 ML to 190 ML, and developer replenishment 70 ML to 90 ML, per 14 x 17 film?

Adjust the dryer temperature as described in section 4.1 of the "Instruction Manual".

Is the dryer temperature at least 36°C?

Adjust drive speed to 8.5 minutes.
(60% on speed control) Some Kodak films may require speed adjustment to the 12.5 minute cycle. (40% on speed control.)

Is the processor speed faster than 8.5 minutes dry to dry? (60% on speed control)

Check dryer section for proper roller placement and air tube placement.

Reposition rollers into bearing blocks.
Reverse air flow on first three sets of air tubes (front and back) away from film.

If all above does not solve problem - remove all air tubes from dryer.
# 10. ELECTRICAL CIRCUIT DIAGRAMS

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Fig. 5. FPM4200 CONTROL CIRCUIT BOARD (CMP PCB) SCHEMATIC DIAGRAM 2/3
Fig 8. FPM4200 SDK CIRCUIT BOARD SCHEMATIC DIAGRAM
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 to CN3, 6, 7 Cable: UL1007, AWG. 22, Red/Black Twisted