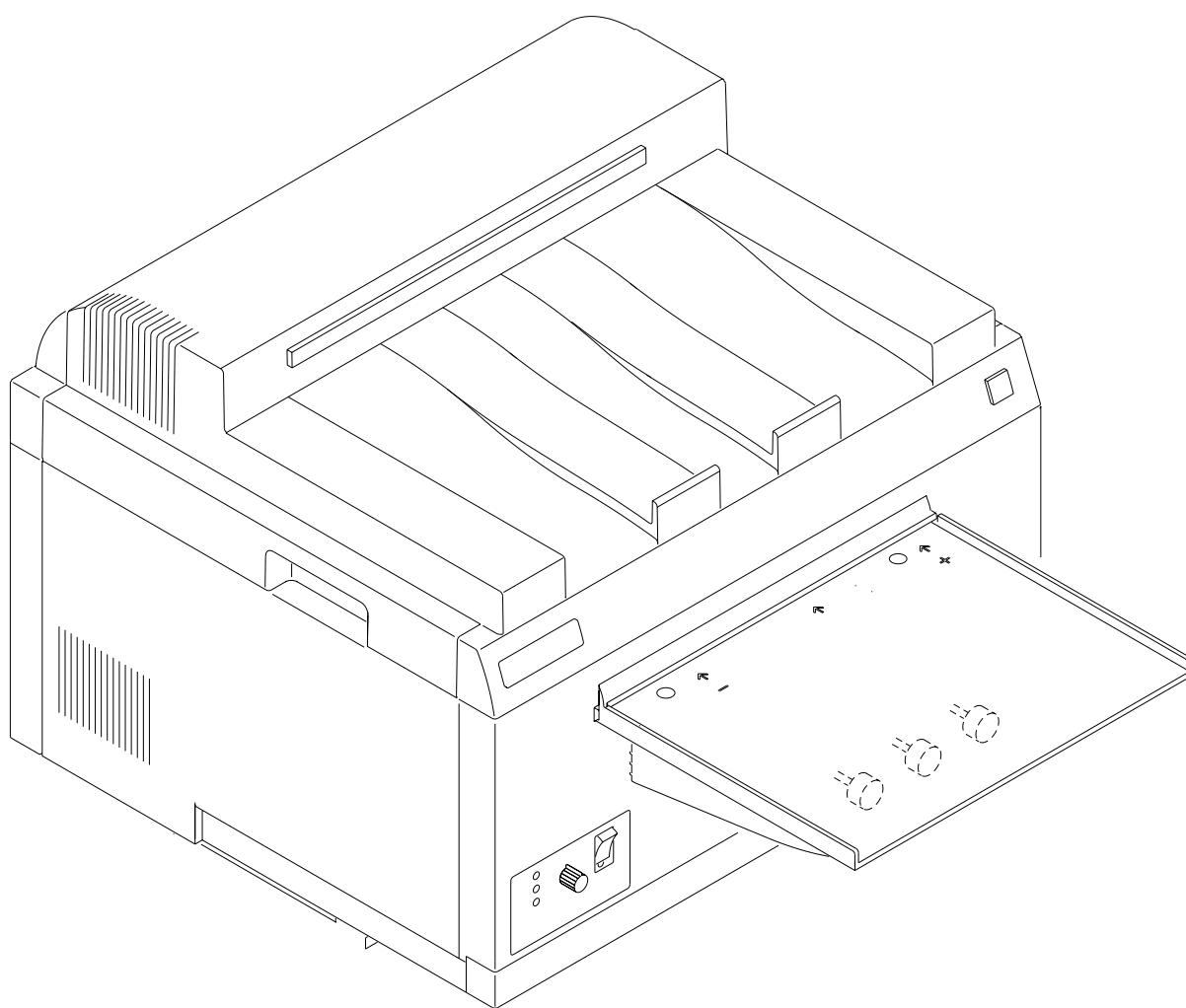


**DIAGNOSTICS**  
for the  
***Kodak X-Omat M43 and M43A PROCESSORS***  
and the  
***Kodak X-Omat Clinic 1 PROCESSOR***



H130\_0009DA



CUSTOMER EQUIPMENT SERVICES DIVISION

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**PLEASE NOTE** The information contained herein is based on the experience and knowledge relating to the subject matter gained by Eastman Kodak Company prior to publication.

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This equipment includes parts and assemblies sensitive to damage from electrostatic discharge. Use caution to prevent damage during all service procedures.



**Important**

This manual is intended for use by qualified service personnel only.

# General Description of Errors

## Errors

- Error codes represent an error or non-standard condition of the PROCESSOR. For further information, see the tables starting on page .
- Error codes are indicated by blinking LEDs on the DISPLAY PANEL.
- If a non-fatal error or a non-standard condition occurs when film is fed, the ALARM will beep twice. See Table on page .
- Error codes are listed by order of priority.
- When 2 or more errors occur at the same time, only the highest priority error is shown on the DISPLAY PANEL.
- When the higher priority error or warning is corrected, the next priority error or warning code is then displayed on the DISPLAY PANEL.
- Errors are divided into 3 categories:
  - Fatal Errors
  - Non-Fatal Errors
  - Warnings
- Processing films during an error or non-standard condition may affect the image quality.

## Fatal Errors

A Fatal Error is any error or non-standard condition that, once detected, causes the PROCESSOR to enter a protective mode to prevent a hazardous condition. If the PROCESSOR is in a Fatal Error Condition, record the error code indicated by the number of blinks on the SERVICE INDICATOR and move the MAIN CIRCUIT BREAKER CB1 to the “O” position.

For Error 1 — If the error occurs while the PROCESSOR is in standby, the PROCESSOR will not accept any film. The operator cannot correct the error.

For Errors 02 - 04 — If a sheet of film is in transit through the PROCESSOR when these errors occur, the sheet of film will exit from the PROCESSOR, the PROCESSOR will shut down, and the PROCESSOR will not accept any more sheets of film. If while the first sheet of film is in transit through the PROCESSOR, the operator inserts additional sheets of film, the PROCESSOR will:

- operate with the non-functional component disabled
- sound the ALARM in a pattern of 2 seconds on and 2 seconds off
- shutdown after all additional sheets of film exit the PROCESSOR

For Errors 05 and 06 — The transport system will continue to operate. If the operator feeds film while the PROCESSOR is in this condition, the film will exit wet. See Table on page for a description of the PROCESSOR’S operation under Fatal Error conditions. If film is moving through the PROCESSOR, the AUDIO ALARM will sound, in a pattern of 2 seconds ON and 2 seconds OFF, until the film exits the PROCESSOR.

## **Non-Fatal Errors**

A Non-Fatal Error is any error or non-standard condition that can sometimes be corrected by the operator. The PROCESSOR will attempt to correct the problem and will not enter into a protective mode.

The PROCESSOR will usually accept film and continue to operate, but the image quality may be reduced. As long as the error condition exists, the PROCESSOR will sound the ALARM twice whenever the FILM SENSORS detect a leading edge of film being fed into the PROCESSOR. The operator may be able to resolve the error condition by consulting the Operator Manual Publication No. 981089.

## **Warnings**

A Warning is any error that the operator may be able to correct and normally does not prevent the PROCESSOR from accepting film.

The PROCESSOR can continue to operate, but image quality may be affected. As long as the error condition exists, the PROCESSOR will sound the ALARM twice whenever the FILM SENSORS detect a leading edge of film being fed into the PROCESSOR. The error is a temporary condition or one that the operator may be able to correct.

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# Service Routines

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## Service Routine Selection



### Caution

**Only qualified service personnel should perform Service Routines.**

The Service Routines are capable of controlling and testing the following assemblies:

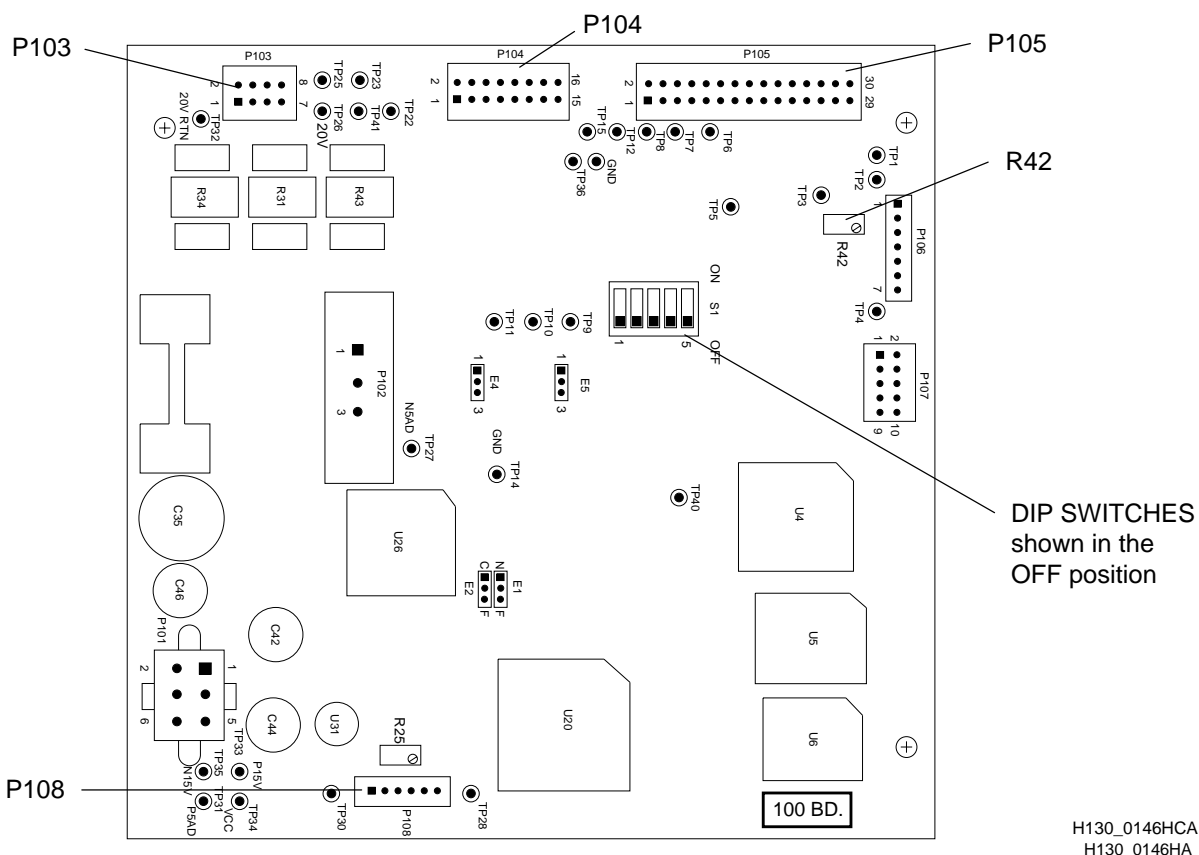
- REPLENISHMENT PUMP MOTOR
- WASH RECIRCULATION PUMP MOTOR and WASH DIVERter SOLENOID L3 of the DIVERter VALVE ASSEMBLY (M43 and M43A only)
- DEVELOPER HEATER
- WATER INPUT SOLENOID
- DEVELOPER COOLING SOLENOID L2 of the DIVERter VALVE ASSEMBLY (M43 and M43A only)
- WASH RECIRCULATION PUMP MOTOR and the DEVELOPER COOLING SOLENOID L2 of the DIVERter VALVE ASSEMBLY (M43 and M43A only)
- STATUS INDICATORS
  - READY LIGHT
  - WAIT LIGHT
  - SERVICE LIGHT
- FILM SENSORS
- DEVELOPER TEMPERATURE DISPLAY (M43 and M43A only)
- AUDIO ALARM

The table below summarizes the Service Routines available and the necessary position for all the SWITCHES on the 100 CIRCUIT BOARD.

**Table 1 SWITCH Positions for Service Routines**

Service Routine	SWITCH 1	SWITCH 2	SWITCH 3	SWITCH 4	SWITCH 5
No Service Routines Running	Off	Off	Off	Off	Off
REPLENISHMENT PUMP	On	On	Off	Off	Off
WASH RECIRCULATION PUMP and WASH DIVERter SOLENOID L3 of the DIVERter VALVE ASSEMBLY (M43 & M43A only)	On	Off	On	Off	Off
DEVELOPER HEATER	On	On	On	Off	Off
WATER INPUT SOLENOID	On	Off	Off	On	Off
DEVELOPER COOLING SOLENOID L2 of the DIVERter VALVE ASSEMBLY (M43 & M43A only)	On	On	Off	On	Off
WASH RECIRCULATION PUMP and DEVELOPER COOLING SOLENOID L2 of the DIVERter VALVE ASSEMBLY (M43 & M43A only)	On	Off	Off	Off	On
STATUS INDICATORS	On	Off	On	On	Off
FILM SENSORS	On	On	On	On	Off
DEVELOPER TEMPERATURE DISPLAY (M43 & M43A only)	On	On	Off	Off	On
AUDIO ALARM	On	Off	On	Off	On

**Figure 1 DIP SWITCH Settings**



H130\_0146HCA  
H130\_0146HA

## Executing a Service Routine



### Caution

To prevent changing the replenishment rates, **do not** place any materials on the FEED TRAY which might interrupt the beams of the FILM SENSORS while executing a Service Routine.

- [1] Remove the TOP COVER from the PROCESSOR.
- [2] Energize the PROCESSOR.
- [3] Check that all 3 STATUS INDICATORS on the DISPLAY PANEL are not illuminated.
  - (a) If all 3 INDICATORS are not illuminated, check that the PROCESSOR is in the Replenishment Check Mode by doing the following steps.

Insert a sheet of film under the MIDDLE FILM SENSOR.

Listen for the PROCESSOR to beep twice to acknowledge the request for replenishment.

Listen for the REPLENISHMENTS PUMP to energize.

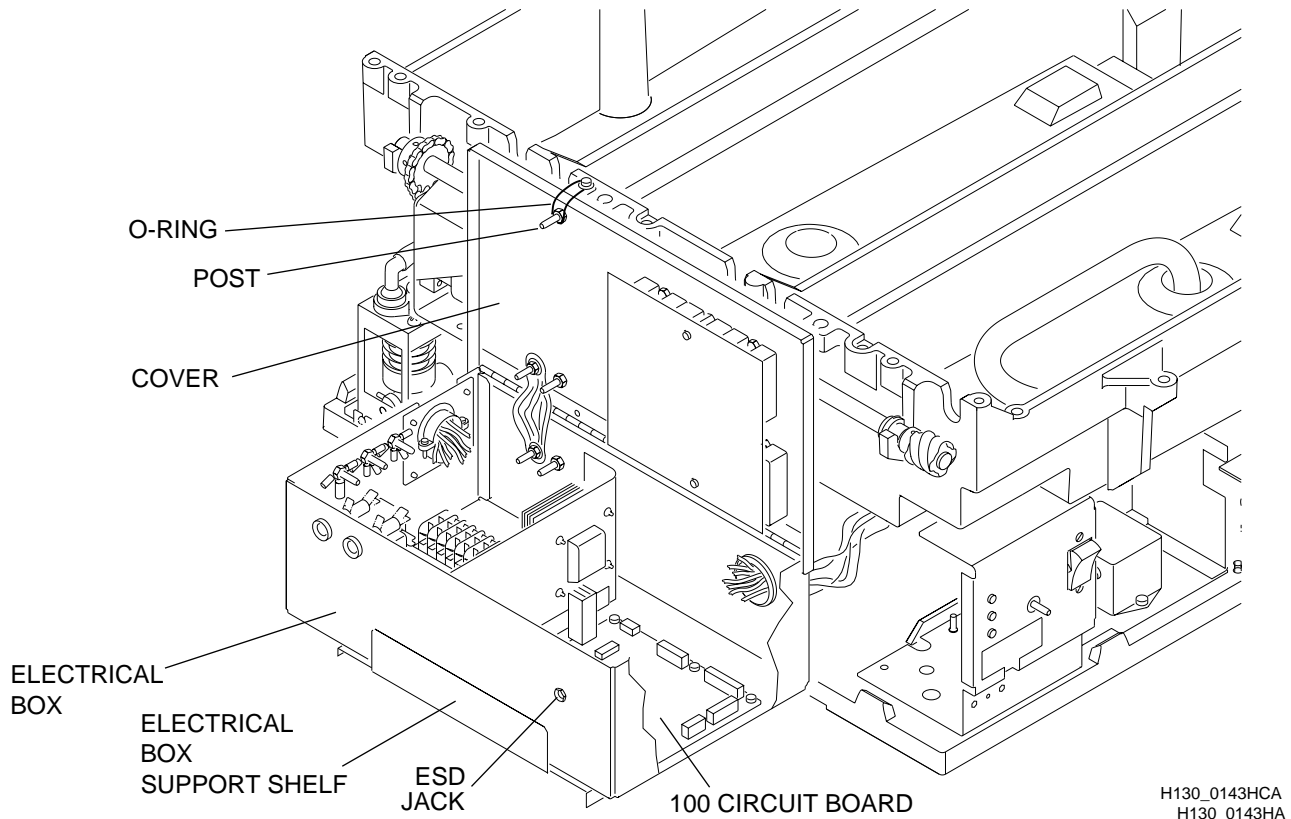
Advance to Step 4.
  - (b) If any of the INDICATORS is illuminated, check for the correct operation of AC INTERLOCK SWITCH S5 and DC INTERLOCK SWITCH S6. If necessary, install a new INTERLOCK SWITCH(ES). See the important note on page .
- [4] Loosen the 2 SCREWS and remove the DRIVE SIDE ACCESS PANEL.
- [5] Pull the SUPPORT SHELF and the ELECTRICAL BOX out of the PROCESSOR. See Figure on page .



### Warning

- High voltage.
  - Possible damage to components from electrostatic discharge.
  - Wear the ANTI-STATIC WRIST STRAP when your hands will be inside the ELECTRICAL BOX.
- [6] Connect an ANTI-STATIC WRIST STRAP into the ESD JACK on the front of the ELECTRICAL BOX.
  - [7] Open the ELECTRICAL BOX. Hold the COVER up with the O-RING.

Figure 2 Accessing the 100 CIRCUIT BOARD



H130\_0143HCA  
H130\_0143HA

[8] Enter the Diagnostic Mode by moving SWITCH 1 on the 100 CIRCUIT BOARD to the “ON” position.

**Note**

If the PROCESSOR does not enter the Diagnostic Mode, check whether the SERVICE INDICATOR on the DISPLAY PANEL is illuminated. If the SERVICE INDICATOR is illuminated, check whether the DC INTERLOCK SWITCH S6 has failed closed. If necessary, install a new DC INTERLOCK SWITCH S6. See the important note on page .

[9] Use SWITCHES 2 through 5 to select the desired Service Routine. See Figure on page .

(a) Move SWITCHES 2 through 5 to select the next Service Routine that you want to execute. After 5 seconds the PROCESSOR will automatically run the Service Routine you selected and continue to run the Service Routine until you move the SWITCHES to the “OFF” position.

(b) When you are done running Service Routines, move SWITCHES 2 through 5 to the “OFF” position.

[10] When you have executed all desired Service Routines, move SWITCHES 1 through 5 to the “OFF” position.

**Note**

The PROCESSOR will beep 3 times to acknowledge that all SWITCHES are off.

[11] Move the ELECTRICAL BOX and SUPPORT SHELF to their original positions.

[12] Install the DRIVE SIDE ACCESS PANEL, 2 SCREWS, and TOP COVER onto the PROCESSOR.

**Note**

- When the SWITCHES are again in the “OFF” position, the PROCESSOR will remain in Replenishment Check Mode until you install the TOP COVER.



- If the DC INTERLOCK SWITCH S6 has failed open, the PROCESSOR will remain in the Replenishment Check Mode even when you install the TOP COVER. To exit from the Replenishment Check Mode, you would need to:
  - check that the MAGNET is still attached to the TOP COVER and
  - if necessary, install a new DC INTERLOCK SWITCH S6. See the important note on page .
- If while the PROCESSOR in the Replenishment Mode, you insert film under the FILM SENSORS and the DC INTERLOCK SWITCH S6 has failed open, the volume of replenishment delivered may not be correct.
- If any SWITCH is in the “ON” position when you close the TOP COVER of the PROCESSOR, the SERVICE INDICATOR on the DISPLAY PANEL of the PROCESSOR will illuminate and not blink. The PROCESSOR will remain in the Diagnostic Mode.

[13] De-energize the PROCESSOR.

## Service Routine for the REPLENISHMENT PUMPS

- [1] Move SWITCHES **1 and 2** to the “ON” position.
- [2] After 5 seconds, check that the REPLENISHMENT PUMP has started to operate.
- [3] Check that developer and fixer are flowing in the replenishment lines and into the DEVELOPER and FIXER TANKS.

---

## Service Routine for the WASH PUMP



### Caution

Do not do this routine unless water is in the WASH TANK.

- [1] Remove the DRYER RACK from the PROCESSOR.
- [2] Move SWITCHES **1 and 3** to the “ON” position.
- [3] After 5 seconds, check that the WASH PUMP has started to operate by observing that water flows from the WASH TUBES in the WASH RACK.

---

## Service Routine for the DEVELOPER HEATER

- [1] Remove the DEVELOPER RACK from the PROCESSOR.



### Warning

- Do not operate the DEVELOPER HEATER unless the DEVELOPER TANK has enough water or solution in it to cover the DEVELOPER HEATER.
  - The surface of the DEVELOPER HEATER will become very hot, 140°C (220°F). **Do not** touch the DEVELOPER HEATER.
  - Do not remain in this Service Routine for more time than necessary or the developer solution might become degraded.
- [2] Move SWITCHES **1, 2, and 3** to the “ON” position.
  - [3] After 5 seconds, check that air bubbles are starting to form on the DEVELOPER HEATER in the bottom of the DEVELOPER TANK. Or use a THERMOMETER 761217 to check that the temperature of the developer near the DEVELOPER HEATER is increasing.
  - [4] Install the DEVELOPER RACK.

---

## Service Routine for the WATER INPUT SOLENOID

- [1] Remove the DRYER RACK and the WASH RACK from the PROCESSOR.
  - [2] Move SWITCHES **1 and 4** to the “ON” position.
  - [3] Check the voltage across SOLENOID L3. The voltage should start at 20 V DC.
  - [4] After 5 seconds, listen for a “click” sound indicating that WATER INPUT SOLENOID has actuated. Check that water enters the WASH TANK from the WASH INLET BAR in the WASH TANK.
  - [5] Check the voltage across SOLENOID L3 again. The voltage should have dropped to a holding voltage of 4 V DC.
    - (a) If you **did** measure the correct voltage, measure the resistance across SOLENOID L3 by doing the steps below.

Disconnect 1 of the LEADS from SOLENOID L3.

Measure the resistance of SOLENOID L3. The resistance should be  $19\ \Omega \pm 10\%$ .

If necessary, install a new SOLENOID L3.

Connect the LEAD to SOLENOID L3.
    - (b) If you did **not** measure the correct voltage, continue doing the steps below until you identify the problem.

Check the connection at the 100 CIRCUIT BOARD.

Install a new SOFTWARE PROM U5.

Install a new 100 CIRCUIT BOARD.
  - [6] Install the WASH RACK and DRYER RACK.
- 

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## Service Routine for the DEVELOPER COOLING SOLENOID (L2) of the DIVERTER VALVE (M43, M43A only)

- [1] Remove the DEVELOPER RACK from the PROCESSOR.
  - [2] Move SWITCHES **1, 2, and 4** to the “ON” position.
  - [3] After 5 seconds, listen for a “click” indicating that the DEVELOPER COOLING SOLENOID (L2) has actuated.
  - [4] Measure the voltage across the outside COIL of the DIVERTER VALVE ASSEMBLY. The voltage should read 20 V DC for one second, then decrease to a holding voltage of 4 V DC, and then decrease to 0 V DC when off.
-

### **Service Routine for the DEVELOPER COOLING SOLENOID (L2) of the DIVERTER VALVE and the WASH PUMP (M43, M43A only)**

- [1] Remove the DRYER RACK and the DEVELOPER RACK from the PROCESSOR.
  - [2] Measure and record the temperature of the solution in the DEVELOPER TANK with a THERMOMETER 761217 near the HEAT EXCHANGER.
  - [3] Move SWITCHES **1 and 5** to the “ON” position.
  - [4] After 5 seconds, check that the DEVELOPER COOLING SOLENOID (L2) and the WASH PUMP have started to operate. Listen for the “click” and do the following:
    - Measure the voltage across the outside COIL of the DIVERTER VALVE. The voltage should read 20 V DC for one second, then decrease to a holding voltage of 4 V DC, and then decrease to 0 V DC when off.
    - Check that water is circulating by observing the WASH TUBES in the WASH RACK.
    - Measure and record the temperature of the solution in the DEVELOPER TANK near the HEAT EXCHANGER. The temperature should be cooler than the temperature recorded in Step 2.
- 

### **Service Routine for the STATUS INDICATORS**

- [1] Move SWITCHES **1, 3, and 4** to the “ON” position.
- [2] After 5 seconds, check that all 3 of the STATUS INDICATORS are illuminated -- “READY”, “WAIT”, and “SERVICE”.

---

## Service Routine for the FILM SENSORS

The PROCESSOR is capable of reading the following SENSORS:

- FILM SENSOR 1, by the “ - ” near the left edge of the FEED TRAY
- FILM SENSOR 2, in the middle of the FEED TRAY
- FILM SENSOR 3, by the “ + ” near the right edge of the FEED TRAY

The STATUS INDICATORS on the FRONT ACCESS PANEL indicate the status of the SENSOR being read. The following Service Routine will check all 3 FILM SENSORS:

- [1] Check that the 3 STATUS INDICATORS illuminate correctly by running the Service Routine for the STATUS INDICATORS. See page .
- [2] With no film on the FEED TRAY, check that all 3 STATUS INDICATORS are not illuminated.
- [3] Move SWITCHES **1, 2, 3, and 4** to the “ON” position, and then:
  - (a) Place film under FILM SENSOR 1, and check that the READY INDICATOR is illuminated.
  - (b) Place film under FILM SENSOR 2, and check that the WAIT INDICATOR is illuminated.
  - (c) Place film under FILM SENSOR 3, and check that the SERVICE INDICATOR is illuminated.
- [4] Remove all film from under the FILM SENSORS.

---

## Service Routine for the Developer Temperature Display Adjustment (M43, M43A Only)

### Note

Do this routine every time you change JUMPER E2 on the 100 CIRCUIT BOARD.

The 100 CIRCUIT BOARD in the ELECTRICAL BOX of the PROCESSOR displays a known value on the DISPLAY PANEL of either:

- 33.9 for Celsius or
- 93.0 for Fahrenheit

- [1] Move SWITCHES **1, 2, and 5** to the “ON” position.
- [2] If the DISPLAY PANEL does not show “33.9” if Celsius is selected or “93.0” if Fahrenheit is selected, adjust the POTENTIOMETER R42 on the 100 CIRCUIT BOARD until the DISPLAY PANEL displays the correct value. See Figure on page . If adjustment is necessary, verify the setpoint.

---

## Service Routine for the AUDIO ALARM

- [1] Move SWITCHES **1, 3, and 5** to the “ON” position.
- [2] Check that after 5 seconds, the AUDIO ALARM sounds.

## Troubleshooting Procedures

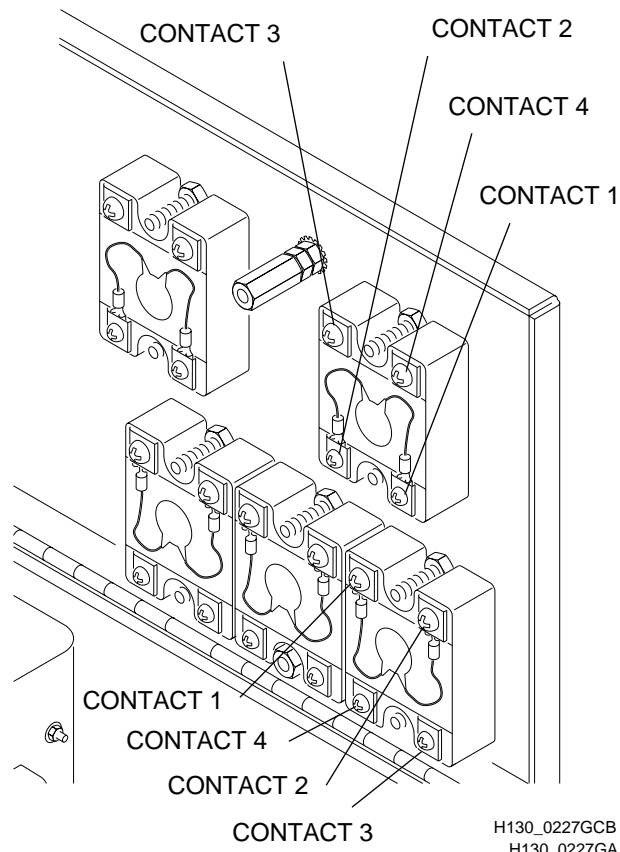
### Checking the SOLID STATE RELAYS for Correct Operation

**ESD**

Possible damage from electrostatic discharge.

- [1] Measure the voltage between CONTACTS 1 and 2. See the figure.
  - (a) If the controlled component should be operating, you should measure +5 V DC at CONTACTS 3 and 4, and a voltage of no more than 2 V AC at CONTACTS 1 and 2. If you measured more than 2 V AC at CONTACTS 1 and 2, install a new RELAY and a new MOV.
  - (b) If the controlled component should **not** be operating, you should measure an AC voltage equal to the AC supply voltage. If you measured an AC voltage of less than the AC supply voltage, install a new RELAY and a new MOV.
- [2] If the tests done in both Steps a and b passed, the failure is **not** the SOLID STATE RELAY, but the WIRING HARNESS or the controlled component.
  - (a) Remove the MOV. Check the MOV for continuity.
    - If continuity, install a new MOV.
    - If no continuity, install a new RELAY and a new MOV.

**Figure 3 Locating the CONTACTS**



## Checking the resistance of THERMISTORS

- [1] Disconnect and remove the THERMISTOR.
- [2] Using a THERMOMETER, determine the temperature of the THERMISTOR at the time of the resistance reading.
- [3] Measure the resistance of the complete THERMISTOR circuit by doing the steps below.
  - (a) Disconnect P104 from J104 at the 100 CIRCUIT BOARD.
  - (b) To measure the resistance across the **DEVELOPER THERMISTOR RT1**, use **PINS 1 and 3** on P104.
  - (c) To measure the resistance across the **DRYER THERMISTOR RT2**, use **PINS 7 and 9** on P104.
  - (d) Compare the resistance value you measured to the value in the Table on page .

If the resistance is within the limit, do the steps below.

Check for a bent PIN on CONNECTOR P/J104.

Connect P/J104.

If the resistance is more than  $\pm 10\%$  of the value in Table , measure the resistance at the THERMISTOR connection.

For the **DEVELOPER THERMISTOR RT1**, measure the resistance at **CONNECTOR P/J18**.

For the **DRYER THERMISTOR RT2**, measure the resistance at **CONNECTOR P/J19**.

Compare the resistance value you measured to the value in Table on page .

If the resistance is within the limit, connect the THERMISTOR CONNECTOR.

If the resistance is more than  $\pm 10\%$  of the value in Table , install a new THERMISTOR.

**Resistance Values for THERMISTORS**

Temperature		Resistance k $\Omega$	Temperature		Resistance k $\Omega$
$^{\circ}\text{C}$	$^{\circ}\text{F}$		$^{\circ}\text{C}$	$^{\circ}\text{F}$	
10.0	50.0	19.90	44.0	111.2	4.54
12.0	53.6	18.09	46.0	114.8	4.20
14.0	57.2	16.46	48.0	118.4	3.89
16.0	60.8	15.00	50.0	122.0	3.60
18.0	64.4	13.68	52.0	125.6	3.34
20.0	68.0	12.49	54.0	129.2	3.10
22.0	71.6	11.42	56.0	132.8	2.88
24.0	75.2	10.45	58.0	136.4	2.68
25.0	77.0	10.00	60.0	140.0	2.49
26.0	78.8	9.57	62.0	143.6	2.32
28.0	82.4	8.78	64.0	147.2	2.16
30.0	86.0	8.06	66.0	150.8	2.01
32.0	89.6	7.40	68.0	154.4	1.88
34.0	93.2	6.81	70.0	158.0	1.75
35.0	95.0	6.53	72.0	161.6	1.64
36.0	96.8	6.27	74.0	165.2	1.53
38.0	100.4	5.78	76.0	168.8	1.43
40.0	104.0	5.33	78.0	172.4	1.34
42.0	107.6	4.92	80.0	176.0	1.26





# Operating Conditions

## STATUS INDICATORS

While the PROCESSOR is operating, the condition of the PROCESSOR is communicated to the operator as outlined below:

- When the **READY** INDICATOR illuminates and neither the **WAIT** INDICATOR nor **SERVICE** INDICATOR is illuminated or blinking, it indicates that:
  - The developer and the DRYER are at the correct temperature.
  - You may feed film.
- When the **READY** INDICATOR illuminates and the **WAIT** INDICATOR is blinking 3 times, it indicates that:
  - The solutions are at the correct temperature.
  - The DRYER has not reached the set-point temperature.
  - Emergency films may be run, but may exit wet or damp.
- When the **WAIT** INDICATOR illuminates and remains illuminated while the PROCESSOR is operating, it indicates that:
  - A film is being fed and is not yet off the FEED TRAY.
  - The FILM SENSORS may be blocked by dirt or other debris, or may be defective.
- When the **WAIT** INDICATOR blinks on and off while the PROCESSOR is operating, it indicates that:
  - There is a temporary error or warning condition. See page .
  - There is an error condition that the operator **may be able** to correct. See Table on pages through .
  - The pattern of “ON” and “OFF” flashes indicates the wait error code.
- When the **SERVICE** INDICATOR blinks on and off while the PROCESSOR is operating, it indicates that:
  - There is an error condition that the operator **may** be able to correct. See Table on pages to .
  - The pattern of “ON” and “OFF” flashes indicates the service error code number.
- When the **SERVICE** INDICATOR illuminates and remains illuminated while the PROCESSOR is operating, it indicates that:
  - The PROCESSOR has been left in Diagnostic Mode.
  - To exit the Diagnostic Mode, open the ELECTRICAL BOX and move all the DIAGNOSTIC SWITCHES on the 100 CIRCUIT BOARD to the “OFF” position.

The STATUS INDICATORS help you to diagnose problems with the PROCESSOR. Check them before servicing the PROCESSOR. See the tables on the pages that follow.

## ERROR CONDITION Blink Patterns

Tables and show the blink patterns of the STATUS INDICATORS. Use these codes to diagnose problems before servicing the PROCESSOR.



### Warning

- **Only qualified service providers** should attempt the diagnostic procedures outlined in the following tables. Doing the following procedures will expose you to high voltage components. Use caution when operating the PROCESSOR with the COVERS removed. The BLOWER MOTOR and the MAIN DRIVE MOTOR energize intermittently.
- **In PROCESSORS having a serial number of less than 350 or without Mod 1 installed**, the BLOWER MOTOR and the MAIN DRIVE MOTOR will energize intermittently if all of the conditions below are met.
  - if the TOP COVER is removed
  - if the INTERLOCK TOOL TL-4740 is inserted into the AC INTERLOCK SWITCH S5
- **In PROCESSORS having a serial number of 350 or higher or PROCESSORS with Mod 1 installed**, the BLOWER MOTOR and the MAIN DRIVE MOTOR will energize intermittently if all of the conditions below are met.
  - if the TOP COVER is removed
  - if the INTERLOCK TOOL TL-4740 is inserted into the AC INTERLOCK SWITCH S5
  - if a MAGNET is placed on DC INTERLOCK SWITCH S6



### Important

The DC INTERLOCK SWITCH S6 is only found in PROCESSORS that either have a serial number of 350 or higher, or have Mod 1 installed.

### Error Condition - WAIT INDICATOR Blink Patterns

Error Condition	Corrective Action
PROCESSOR ready  <b>Ready</b> - On <b>Wait</b> - Off <b>Service</b> - Off	NORMAL OPERATION
No error, film being fed  <b>Ready</b> - On <b>Wait</b> - On <b>Service</b> - Off	NORMAL OPERATION

Error Condition	Corrective Action
<b>Error 11</b> Developer is over the set temperature  <b>Occurs when the temperature of the developer is more than 0.3°C (0.5 °F) above the set-point temperature.</b>  <b>Ready - Off</b> <b>Wait - 1 Blink</b> <b>Service - Off</b>	<ol style="list-style-type: none"> <li>1. Check that the main water supply to the PROCESSOR is turned on.</li> <li>2. Check that the WASH DRAIN VALVE and the DEVELOPER DRAIN VALVE are closed and not leaking.</li> <li>3. Check that the solution in both the DEVELOPER TANK and the WASH TANK is at the correct level.</li> <li>4. Check whether the temperature conditions outlined below are met: <ul style="list-style-type: none"> <li>• the main water supply is 5°C (8°F) lower than the developer set-point temperature, between 4° and 29°C (40° and 85°F).</li> <li>• the room ambient temperature is not greater than 30°C (86°F).</li> </ul> </li> <li>5. Check the set-point temperature of the DRYER. If the ambient temperature of your site is in the lower end of the acceptable range of 15 to 30°C (59 to 86°F), the PROCESSOR may never enter the Standby Mode, which could cause the developer temperature to become too hot. This is true especially if the ambient water temperature is higher than 26.6°C (80°F).</li> <li>6. Check the wash and developer plumbing for leaks, air bubbles, or kinks in the HOSES.</li> <li>7. Check the ORIFICE in the DEVELOPER RECIRCULATION HOSE for any dirt or obstructions. <ul style="list-style-type: none"> <li>• Note: The white ORIFICE is for fixer; the black ORIFICE is for developer.</li> </ul> </li> <li>8. On Clinic 1 PROCESSORS only, check the ORIFICE in WASH RECIRCULATION HOSE for any dirt or obstructions.</li> <li>9. Check that the WASH PUMP is not airlocked.</li> <li>10. Check that the DEVELOPER RACK and the FIXER RACK are not interchanged. You can identify the DEVELOPER RACK by the following characteristics: <ul style="list-style-type: none"> <li>• red WIRE TIE</li> <li>• RACK COVER</li> </ul> </li> <li>11. If the DEVELOPER RACK and the FIXER RACK are interchanged, do the steps below: <ul style="list-style-type: none"> <li>• Check that the developer and fixer processing solutions have not become contaminated. If necessary, drain, rinse, and fill the DEVELOPER and FIXER TANKS.</li> <li>• Rinse the RACKS.</li> <li>• Install the RACKS into the appropriate TANKS.</li> </ul> </li> <li>12. Before installing the DEVELOPER RACK into the DEVELOPER TANK, do the steps below: <ul style="list-style-type: none"> <li>• Check that the MANIFOLD on the DEVELOPER RACK is not loose.</li> <li>• Insert the INTERLOCK TOOL TL-4740 into the AC INTERLOCK SWITCH S5, and check that the DEVELOPER RECIRCULATION PUMP is operating correctly and that the developer solution is circulating.</li> <li>• If the PUMP is not operating, check the wiring and the AC INTERLOCK SWITCH S5.</li> <li>• Remove the INTERLOCK TOOL and install the DEVELOPER RACK.</li> </ul> </li> <li>13. Check that FUSE F1 is not open. If necessary, replace F1 it with a correct size <i>Slo-Blo</i> FUSE (2.0 AMP for M43A and Clinic 1; 1.0 AMP for M43)</li> <li>14. Check that J103 is connected securely to the 100 CIRCUIT BOARD.</li> </ol>

Error Condition	Corrective Action
	<p>15. Use the Service Routine for the WATER INPUT SOLENOID to check whether the SOLENOID is operating.</p> <ul style="list-style-type: none"> <li>• If the SOLENOID is not operating, clean the WASH INLET BAR and the SCREEN on the SOLENOID. Check that the voltage across the SOLENOID is 20 V DC for one second, then decreases to a holding voltage of 4 V DC, and then decreases to 0 V DC when off.</li> <li>• Check for <math>65\ \Omega \pm 5\%</math> at COIL L1 of the WATER INPUT SOLENOID. If necessary, install a new WATER INPUT SOLENOID.</li> </ul> <p>16. Use the Service Routines as described in Table on page .</p> <ul style="list-style-type: none"> <li>• For the WASH PUMP to check that SSR-U4 for the WASH PUMP is operating and that cooling water is circulating.</li> <li>• If the WASH PUMP is not operating, check for dirt or obstructions in the DIVERter VALVE in an M43 or M43A, or in the ORIFICE in a Clinic 1; and clean the holes in the WASH TUBES.</li> <li>• On an M43 or M43A PROCESSOR, check that the DIVERter VALVE is wired and operating correctly:</li> <li>• the red and black wires should connect P/J20 to the outer COIL, COOLING DIVERter SOLENOID L2</li> <li>• the green and white wires should connect P/J21 to the inner COIL, WASH DIVERter SOLENOID L3</li> <li>• Check that the actual plumbing of the DIVERter VALVE matches the plumbing diagram in the Diagram Package, Publication Number 981092.</li> <li>• Measure the voltage across the outer COIL, SOLENOID L2. The voltage should be 20 V DC for one second, then decrease to a holding voltage of 4 V DC, and then decrease to 0 V DC when off.</li> <li>• If you <b>did</b> measure the correct voltage, measure the resistance across SOLENOID L2 by doing the steps below. <ol style="list-style-type: none"> <li>1. Disconnect 1 of the LEADS from SOLENOID L2.</li> <li>2. Measure the resistance of SOLENOID L2. The resistance should be <math>19\ \Omega \pm 10\%</math>.</li> <li>3. If necessary, install a new SOLENOID L2.</li> <li>4. Connect the LEAD to SOLENOID L2.</li> </ol> </li> <li>• If you did <b>not</b> measure the correct voltage, continue doing the steps below until you identify the problem. <ol style="list-style-type: none"> <li>1. Check the connection at the 100 CIRCUIT BOARD.</li> <li>2. Install a new SOFTWARE PROM U5.</li> <li>3. Install a new 100 CIRCUIT BOARD.</li> </ol> </li> </ul> <p>17. Use the procedure on page to check SSR-U3 for the DEVELOPER HEATER.</p> <p>18. Use the procedure on page to measure the resistance at the DEVELOPER THERMISTOR. Compare your reading to the values in Table on page .</p> <ul style="list-style-type: none"> <li>• If the resistance is not within <math>\pm 10\%</math> of the correct resistance given in Table , install a new DEVELOPER THERMISTOR.</li> </ul> <p>19. Check that the resistance of the DEVELOPER HEATER, at a room temperature of <math>21^{\circ}\text{C}</math> (<math>70^{\circ}\text{F}</math>), is <math>62\ \Omega \pm 5\%</math> for the M43 and <math>16\ \Omega \pm 5\%</math> for the M43A and Clinic 1.</p> <p>20. Check that the line voltage is within specification.</p>

Error Condition	Corrective Action
<p><b>Error 12</b> Developer is under the set temperature .</p> <p><b>Occurs when the temperature of the developer is more than 0.3°C (0.5°F) below the set-point temperature.</b> .</p> <p><b>Ready - Off</b> <b>Wait - 2 Blinks</b> <b>Service - Off</b></p>	<ol style="list-style-type: none"> <li>Check the developer temperature. <ul style="list-style-type: none"> <li>Normal warm-up time from 22°C (72°F) is 20 minutes.</li> </ul> </li> <li>Check that the room temperature is 15°C (59°F) or higher.</li> <li>Check that the main water supply is between 4° and 29 °C (40° and 85°F).</li> <li>On Clinic 1 PROCESSORS, check if more than 5 films were processed in short succession when the water temperature was below 16°C (60°F).</li> <li>Use the Service Routines to check that the DEVELOPER HEATER is operating correctly. See Table on page .</li> <li>Use the procedure on page to check SSR-U3 for the DEVELOPER HEATER.</li> <li>Use the Service Routine for the WASH PUMP to check whether SSR-U4 for the WASH PUMP on a Clinic 1 PROCESSOR is operating correctly. The WASH PUMP should not be operating continuously.</li> <li>On an M43 and M43A PROCESSOR, use the Service Routine for the DIVERTER VALVE to check that the WASH DIVERTER SOLENOID L3, not the COOLING SOLENOID L2, is operating. <ul style="list-style-type: none"> <li>Check that the red and black wires connect P/J20 to the outer COIL, COOLING DIVERTER SOLENOID L2.</li> <li>Check that the green and white wires connect P/J21 to the inner COIL, WASH DIVERTER SOLENOID L3.</li> <li>Check that the plumbing of the DIVERTER VALVE matches the plumbing diagram in the Diagram Package, Publication Number 981092.</li> <li>Check the voltage across the SOLENOID L3 when the SOLENOID is on. The voltage should start at 20 V DC for one second, then decrease to a holding voltage of 4 V DC, and then decrease to 0 V DC when off.</li> <li>If you <b>did</b> measure the correct voltage, measure the resistance across SOLENOID L3 by doing the steps below. <ol style="list-style-type: none"> <li>Disconnect 1 of the LEADS from SOLENOID L3.</li> <li>Measure the resistance of SOLENOID L3. The resistance should be 19 Ω ±10%.</li> <li>If necessary, install a new SOLENOID L3.</li> <li>Connect the LEAD to SOLENOID L3.</li> </ol> </li> <li>If you did <b>not</b> measure the correct voltage, continue doing the steps below until you identify the problem. <ol style="list-style-type: none"> <li>Check the connection at the 100 CIRCUIT BOARD.</li> <li>Install a new SOFTWARE PROM U5.</li> <li>Install a new 100 CIRCUIT BOARD.</li> </ol> </li> </ul> </li> <li>Check the voltage from CONNECTOR J10, on the 100 CIRCUIT BOARD, to the HEATER. The voltage at HEATER HR-1 should be 115 V AC ±10% for the M43A and Clinic 1 and 230 V AC ±10% for the M43.</li> <li>Check that the resistance of the HEATER, at a room temperature of 21°C (70°F), is 16 Ω for the M43A and Clinic 1 and 62 Ω for the M43.</li> <li>Use the procedure on page to measure the resistance of the DEVELOPER THERMISTOR. See Table on page to compare the reading to the correct resistance. <ul style="list-style-type: none"> <li>If the resistance is not within ± 10% of the correct resistance given in the table, install a new DEVELOPER THERMISTOR.</li> </ul> </li> <li>Check that the line voltage is within specification.</li> </ol>

Error Condition	Corrective Action
<p><b>Error 13</b>  <b>DRYER</b> is under the set temperature</p> <p>Occurs when</p> <ul style="list-style-type: none"> <li>the <b>PROCESSOR</b> is being energized if the <b>DRYER</b> temperature is below the set-point temperature</li> <li>the set-point temperature is changed</li> <li>the <b>DRYER</b> is assisting with developer cooling</li> </ul> <p>Ready - On  Wait - 3 Blinks  Service - Off</p>	<ol style="list-style-type: none"> <li>Film can be fed but may exit the <b>PROCESSOR</b> damp.</li> <li>Normal warm-up time is: <ul style="list-style-type: none"> <li>15 to 20 minutes in average site conditions</li> <li>up to 45 minutes in extreme site conditions</li> </ul> </li> <li>Check that the set-point temperature for the <b>DRYER</b> is not set higher than necessary to adequately dry films.</li> <li>Check that the room temperature is 15°C (59°F) or higher.</li> <li>Check that the <b>DRYER PLENUM</b> is seated correctly on the <b>WASH TANK</b>.</li> <li>Check that the <b>WASH RACK</b> is seated correctly on the <b>DRYER PLENUM</b>.</li> <li>Check that the <b>DRYER RACK</b> is seated correctly on the <b>WASH RACK</b> and <b>DRYER PLENUM</b>.</li> <li>Check that the <b>AIR TUBES</b> are seated correctly and are correctly oriented.</li> <li>Check that the <b>DRYER BLOWER</b> is de-energizing. Turn the <b>DRYER TEMPERATURE CONTROL KNOB</b> to the lowest setting. The <b>BLOWER</b> should de-energize when the <b>PROCESSOR</b> enters Standby Mode.</li> <li>Use the procedure on page to check <b>SSR-U1</b> for the <b>DRYER HEATER</b>: <ul style="list-style-type: none"> <li>Remove the <b>TOP COVER</b>.</li> <li>Place a <b>MAGNET</b> on <b>DC INTERLOCK SWITCH S6</b>. See the important note on page .</li> <li>Insert <b>INTERLOCK TOOL TL-4740</b> into the <b>AC INTERLOCK SWITCH S5</b>.</li> <li>To energize the <b>DRYER HEATER</b> and <b>SSR-U1</b>, rotate the <b>DRYER TEMPERATURE CONTROL KNOB</b> clockwise ↻ to the maximum setting.</li> </ul> </li> <li>Check for correct operation of the <b>DRYER HEATER</b>. At a room temperature of 21°C (70°F), the resistance at <b>CONNECTOR P/J4 PINS 1 and 2</b> should be 38 Ω ±5%; the resistance at <b>PINS 1 and 3</b> should be 75 Ω ±5%.</li> <li>Use the procedure on page to measure the resistance of the <b>DRYER THERMISTOR</b>. See Table on page to compare the reading to the correct resistance. <ul style="list-style-type: none"> <li>If the resistance is not within ± 10% of the correct resistance given in the table, install a new <b>DRYER THERMISTOR</b>.</li> </ul> </li> <li>Check that the <b>DRYER HEATER</b> is mounted correctly. See the Service Manual, Publication No. 981090.</li> <li>If the control to <b>SSR-U1</b> is not +5 V DC, but the <b>THERMISTOR</b> circuit is operating correctly, continue doing the steps below until you identify the problem on the <b>100 CIRCUIT BOARD</b>. <ul style="list-style-type: none"> <li>To ensure that <b>CONNECTORS P/J101 through P/J107</b> are fully seated on the <b>100 CIRCUIT BOARD</b>, remove the <b>CONNECTORS</b> from the <b>BOARD</b> and carefully install them again.</li> <li>Install a new <b>SOFTWARE PROM U5</b>.</li> <li>Install a new <b>100 CIRCUIT BOARD</b>.</li> </ul> </li> <li>Check that the line voltage is within specification.</li> </ol>

Error Condition	Corrective Action
<p>TOP COVER is not seated correctly</p> <p>·</p> <p><b>Ready</b> - Off</p> <p><b>Wait</b> - Off</p> <p><b>Service</b> - Off</p>	<ol style="list-style-type: none"> <li>1. Install the TOP COVER onto the PROCESSOR.</li> <li>2. Check that the TOP COVER is seated correctly.</li> <li>3. Check that the main power to the PROCESSOR is turned on.</li> <li>4. Check the AC INTERLOCK SWITCH S5 using the INTERLOCK TOOL TL-4740. <ul style="list-style-type: none"> <li>• If the SWITCH is operating correctly, you will hear the RECIRCULATION PUMPS operating.</li> <li>• Adjust the BRACKET for the AC INTERLOCK SWITCH S5 towards the FRONT ACCESS PANEL so that, when the TOP COVER is installed, the COVER will make contact with the SWITCH.</li> </ul> </li> <li>5. Check that the MAGNET is installed on the TOP COVER and that the DC INTERLOCK SWITCH S6 is operating correctly. See the important note on page .</li> <li>6. Check FUSE 2. If necessary, install a new <i>Fast-Blo</i> FUSE of the correct size: 0.75 AMP for M43A and Clinic 1; 0.375 AMP for an M43.</li> </ol>
<p>Diagnostic SWITCH Error</p> <p>·</p> <p><b>Ready</b> - Off</p> <p><b>Wait</b> - Off</p> <p><b>Service</b> - Solid On</p>	<ol style="list-style-type: none"> <li>1. Check if any of the diagnostic SWITCHES on the 100 CIRCUIT BOARD are in the “ON” position.</li> <li>2. Reset any SWITCH left in the “ON” position to the “OFF” position.</li> <li>3. If all diagnostic SWITCHES are in the “OFF” position, install a new 100 CIRCUIT BOARD.</li> </ol>





Error Condition	Corrective Action
<b>Error 01</b> CIRCUIT BOARD Error . <b>Occurs when either the 100 CIRCUIT BOARD or a component on the BOARD is malfunctioning.</b> . <b>Ready - Off</b> <b>Wait - Off</b> <b>Service - 1 Blink</b>	<ol style="list-style-type: none"><li>1. Try to reset the PROCESSOR by de-energizing it, waiting 5 seconds, and energizing it.</li><li>2. Install a new 100 CIRCUIT BOARD.</li></ol>

Error Condition	Corrective Action
<p><b>Error 02</b> Loss of air flow</p> <p>· <b>Occurs when the DRYER BLOWER is energized, but no air flow is sensed at the AIR VANE SWITCH.</b></p> <p>· <b>Ready - Off</b> <b>Wait - Off</b> <b>Service - 2 Blinks</b></p>	<ol style="list-style-type: none"> <li>1. Try to reset the PROCESSOR by de-energizing it, waiting 5 seconds, and energizing it. Monitor the PROCESSOR for 15 minutes to see if the error occurs again.</li> <li>2. Check that the DC INTERLOCK SWITCH S6 is operating correctly. See the important note on page . Do the steps below and check that the PROCESSOR begins operating. <ul style="list-style-type: none"> <li>• De-energize the PROCESSOR.</li> <li>• Remove the TOP COVER.</li> <li>• Place a MAGNET on DC INTERLOCK SWITCH S6.</li> <li>• If your PROCESSOR has a serial number of 350 or above, or if your PROCESSOR has Mod 1 installed, insert the INTERLOCK TOOL TL-4740 into the AC INTERLOCK SWITCH S5.</li> <li>• Energize the PROCESSOR.</li> </ul> </li> <li>3. Check the DRYER PLENUM: <ul style="list-style-type: none"> <li>• that it is seated correctly on the TANK</li> <li>• that the WASH RACK is securing the DRYER PLENUM in place</li> <li>• that the wires under the PLENUM are not pushing the PLENUM out of position</li> </ul> </li> <li>4. Listen for the air flow. <ul style="list-style-type: none"> <li>• If the DRYER BLOWER is operating, check that the AIR VANE SWITCH is not remaining in the "UP" position. Also, check that CONNECTOR P/J105, on the 100 CIRCUIT BOARD, is secure and that CONNECTORS P/J26 and P/J27 are tightly connected. Repair or install a new AIR VANE SWITCH.</li> <li>• If the DRYER BLOWER is not operating, but the DRIVE MOTOR is operating, check the DRYER BLOWER for the following conditions: <ol style="list-style-type: none"> <li>1. that the wiring to the BLOWER and all CONNECTORS are secure</li> <li>2. that the SETSCREW securing the BLOWER CAGE is tight against the MOTOR DRIVE SHAFT</li> <li>3. that the BLOWER CAGE is not rubbing against the BLOWER HOUSING</li> <li>4. that the DRYER BLOWER is pushed up and aligns with the opening in the PROCESSOR TANK</li> <li>5. that the GASKET is pushed up against the PROCESSOR TANK and does not block the air flow</li> <li>6. if necessary, repair or install a new DRYER BLOWER</li> </ol> </li> <li>• If neither the DRIVE MOTOR nor the DRYER BLOWER is operating, insert the INTERLOCK TOOL TL-4740 into the AC INTERLOCK SWITCH S5 and check SSR-U6 and the wiring going to SSR-U6. Use the procedure on page .</li> <li>• If the STATUS INDICATORS on the DISPLAY PANEL are not illuminated, check DC INTERLOCK SWITCH S6. If necessary, install a new SWITCH S6. See the important note on page .</li> <li>• If the STATUS INDICATORS on the DISPLAY PANEL are illuminated, check AC INTERLOCK SWITCH S5. If necessary, install a new SWITCH S5.</li> </ul> </li> <li>5. Check that the line voltage is within specification.</li> </ol>

Error Condition	Corrective Action
<b>Error 03</b> AIR VANE SWITCH Error . <b>Occurs when</b> <ul style="list-style-type: none"> <li>• the <b>PROCESSOR</b> is first energized</li> <li>• the <b>PROCESSOR</b> exits Standby Mode if the <b>DRYER BLOWER</b> is de-energized, but air flow is sensed at the <b>AIR VANE SWITCH</b>.</li> </ul>	<ol style="list-style-type: none"> <li>1. Try to reset the <b>PROCESSOR</b> by de-energizing it, waiting 5 seconds, and energizing it.</li> <li>2. Check that the <b>AIR VANE SWITCH</b> is not remaining in the “UP” position.</li> <li>3. Check that the <b>AIR VANE SWITCH</b> is not shorted in the “ON” position.</li> <li>4. Check the wires in the <b>HARNESS</b> and the <b>CONNECTORS</b> P/J26, P/J27, P/J105 for shorted or open <b>CIRCUITS</b>.</li> <li>5. Repair or install a new <b>AIR VANE SWITCH</b>. Check that the <b>HEAT SHRINK TUBING</b> on the <b>SWITCH</b> is installed.</li> <li>6. Remove the <b>TOP COVER</b>, insert <b>INTERLOCK TOOL TL-4740</b> into the <b>AC INTERLOCK SWITCH S5</b>, and place a <b>MAGNET</b> on the <b>DC INTERLOCK SWITCH S6</b>. See the important note on page . Set the <b>DRYER TEMPERATURE KNOB</b> counterclockwise ↶ to the minimum setting. If the <b>DRYER BLOWER</b> does not de-energize after 10 minutes, use the procedure on page to check <b>SSR-U6</b>.</li> </ol>
<b>Error 04</b> Unable to determine the developer temperature . <b>Occurs when the temperature of the developer is less than 24°C (75°F) or more than 41°C (105°F) after the PROCESSOR has been energized for 45 minutes.</b> . <b>Ready - Off</b> <b>Wait - Off</b> <b>Service - 4 Blinks</b>	<ol style="list-style-type: none"> <li>1. De-energize the <b>PROCESSOR</b>.</li> <li>2. Check that <b>J104</b> is securely connected to the <b>100 CIRCUIT BOARD</b>.</li> <li>3. Check the <b>DEVELOPER THERMISTOR HARNESS</b> for an open circuit.</li> <li>4. Check that <b>CONNECTOR P/J18</b> is securely connected.</li> <li>5. Use the procedure on page to measure the resistance of the <b>DEVELOPER THERMISTOR</b>. See Table on page to compare the reading to the correct resistance.               <ul style="list-style-type: none"> <li>• If the resistance is not within <math>\pm 10\%</math> of the correct resistance given in the table, install a new <b>DEVELOPER THERMISTOR</b>.</li> </ul> </li> <li>6. Energize the <b>PROCESSOR</b>. Using the Service Routines for the <b>DEVELOPER HEATER</b>, check that the <b>DEVELOPER HEATER</b> is operating correctly. The voltage, across the <b>HEATER</b> when energized, should be 115 V AC <math>\pm 10\%</math> for the <b>M43A</b> and <b>Clinic 1</b> and 230 V AC <math>\pm 10\%</math> for the <b>M43</b>.</li> <li>7. Allow the <b>PROCESSOR</b> to operate for 45 minutes. Measure the developer temperature. If the temperature is not within <math>\pm 0.3^\circ\text{C}</math> (<math>\pm 0.5^\circ\text{F}</math>) of the set-point temperature, check <b>SSR-U3</b> for the <b>DEVELOPER HEATER</b>. Use the procedure on page .</li> <li>8. If the control to <b>SSR-U3</b> is not operating correctly, but the <b>THERMISTOR</b> circuit is operating correctly, continue doing the steps below until you identify the problem on the <b>100 CIRCUIT BOARD</b>.               <ul style="list-style-type: none"> <li>• To ensure that <b>CONNECTORS P/J101</b> through <b>P/J107</b> are fully seated on the <b>100 CIRCUIT BOARD</b>, remove the <b>CONNECTORS</b> from the <b>BOARD</b> and carefully install them again.</li> <li>• Install a new <b>SOFTWARE PROM U5</b>.</li> <li>• Install a new <b>100 CIRCUIT BOARD</b>.</li> </ul> </li> <li>9. Check the resistance of the <b>DEVELOPER HEATER</b>. The resistance, at a room temperature of <math>21^\circ\text{C}</math> (<math>70^\circ\text{F}</math>), should be <math>62\ \Omega \pm 5\%</math> for the <b>M43</b> and <math>16\ \Omega \pm 5\%</math> for the <b>M43A</b> and <b>Clinic</b></li> </ol>

Error Condition	Corrective Action
<p><b>Error 05</b>  <b>DRYER is over temperature.</b></p> <p><b>Occurs when the temperature of the DRYER is 71°C (160°F) or higher.</b></p> <p><b>Ready - Off</b>  <b>Wait - Off</b>  <b>Service - 5 Blinks</b></p>	<ol style="list-style-type: none"> <li>1. De-energize the PROCESSOR.</li> <li>2. Check that the VENTS in the TOP COVER and the DRIVE SIDE ACCESS PANEL are not blocked.</li> <li>3. Check the DRYER BLOWER for obstructions.</li> <li>4. Check the AIR TUBES for the conditions below: <ul style="list-style-type: none"> <li>• TUBES are seated correctly in the DRYER RACK.</li> <li>• TUBES are free of obstructions to air flow.</li> <li>• SLOTS in TUBES are clean and have a uniform opening of between 1.3 and 2.0 mm (0.052 and 0.077 in.) their entire length.</li> </ul> </li> <li>5. Check for film jams.</li> <li>6. Check that the DRYER PLENUM is seated correctly on the WASH TANK.</li> <li>7. Check that the WASH RACK is seated correctly on the DRYER PLENUM.</li> <li>8. Check that the DRYER RACK is seated correctly on the WASH RACK and the DRYER PLENUM.</li> <li>9. Use the procedure on page to check SSR-U1 for the DRYER HEATER for correct operation. The DRYER HEATER should not operate continuously. If necessary, install a new SSR-U1.</li> <li>10. Use the procedure on page to check the resistance of the DRYER THERMISTOR. See Table on page to compare the reading to the correct resistance. <ul style="list-style-type: none"> <li>• If the resistance is not within <math>\pm 10\%</math> of the correct resistance given in the table, install a new DRYER THERMISTOR.</li> </ul> </li> <li>11. If the control to SSR-U1 is not 0 V DC, but the THERMISTOR circuit is operating correctly, continue doing the steps below until you identify the problem on the 100 CIRCUIT BOARD. <ul style="list-style-type: none"> <li>• To ensure that CONNECTORS P/J101 through P/J107 are fully seated on the 100 CIRCUIT BOARD, remove the CONNECTORS from the BOARD and carefully install them again.</li> <li>• Install a new SOFTWARE PROM U5.</li> <li>• Install a new 100 CIRCUIT BOARD.</li> </ul> </li> <li>12. Check that the DRYER HEATER is oriented correctly. See the Service Manual, Publication No. 981090.</li> <li>13. Check the resistance of the DRYER HEATER. The resistance, at a room temperature of 21°C (70°F), at CONNECTOR P/J4 PINS 1 and 2 should be <math>38\ \Omega \pm 5\%</math>; for PINS 1 and 3 the resistance should be <math>75\ \Omega \pm 5\%</math>.</li> <li>14. On the DRYER BLOWER, check that: <ul style="list-style-type: none"> <li>• SETSCREW securing the BLOWER CAGE is tight against the flat side of the MOTOR DRIVE SHAFT</li> <li>• DRYER BLOWER is pushed up and aligns with the opening in the PROCESSOR TANK</li> <li>• GASKET is pushed up to the PROCESSOR TANK and does not block the air flow</li> <li>• BLOWER CAGE rotates when the PROCESSOR is energized</li> </ul> </li> </ol>

Error Condition	Corrective Action
<p><b>Error 06</b> Unable to determine the DRYER temperature</p> <p>Occurs when the <b>DRYER temperature is less than 7°C (45°F) or more than 74°C (165°F) after the PROCESSOR has been energized for 45 minutes.</b></p> <p>Ready - Off Wait - Off Service - 6 Blinks</p>	<ol style="list-style-type: none"> <li>1. De-energize the PROCESSOR.</li> <li>2. Check that the ambient room temperature is <b>not below</b> 15°C (59°F).</li> <li>3. Check that J104 is securely connected to the 100 CIRCUIT BOARD.</li> <li>4. Check that P/J19 is connected to the DRYER PLENUM correctly.</li> <li>5. Check that the voltage at CONNECTOR P/J19 PIN 1 is 5 V DC.</li> <li>6. Check that warm air is present in the DRYER. If not, check the voltage at the DRYER HEATER. <ul style="list-style-type: none"> <li>• The voltage should be 115 V <math>\pm</math>10% for the M43A and Clinic 1 and 230 V <math>\pm</math>10% for the M43.</li> </ul> </li> <li>7. If the voltage at the DRYER HEATER is not within the specified range, check for the correct voltage at the wires and HARNESS for the DRYER HEATER.</li> <li>8. Use the procedure on page to measure the resistance at the DRYER THERMISTOR. See Table on page to compare the reading to the correct resistance. <ul style="list-style-type: none"> <li>• If the resistance is not within <math>\pm</math> 10% of the correct value given in the table, install a new DRYER THERMISTOR.</li> </ul> </li> <li>9. If the control to SSR-U1 is not operating correctly, but the THERMISTOR circuit is operating correctly, continue doing the steps below until you identify the problem on the 100 CIRCUIT BOARD. <ul style="list-style-type: none"> <li>• To ensure that CONNECTORS P/J101 through P/J107 are fully seated on the 100 CIRCUIT BOARD, remove the CONNECTORS from the BOARD and carefully install them again.</li> <li>• Install a new SOFTWARE PROM U5.</li> <li>• Install a new 100 CIRCUIT BOARD.</li> </ul> </li> <li>10. Check that the line voltage is correct.</li> </ol>
<p><b>Error 07</b> FILM DETECTOR LED Error</p> <p>Occurs when the <b>FILM SENSORS detect film for longer than the time required for 152.4 cm (60 in.) of film to be fed into the PROCESSOR (150 seconds).</b></p> <p>Ready - Off Wait - Off Service - 7 Blinks</p>	<ol style="list-style-type: none"> <li>1. Clean the FILM SENSORS</li> <li>2. Check for obstructions at the FILM SENSORS.</li> <li>3. Check that P/J14, P/J15, and P/J16 of the FILM SENSORS are clean and securely connected. <ul style="list-style-type: none"> <li>• If necessary, use Contact Cleaner TL-3773.</li> </ul> </li> <li>4. Check that CONNECTOR J105, on the 100 CIRCUIT BOARD, is seated correctly.</li> <li>5. Check that neither the FRONT ACCESS PANEL nor the FEED TRAY blocks the SENSOR. If necessary, adjust the ACCESS PANEL or FEED TRAY.</li> <li>6. Use the STATUS INDICATORS Service Routine to check that the LEDs are operating. Then use the FILM SENSOR Service Routine to check the FILM SENSORS for correct operation. If necessary, install new FILM SENSOR(S).</li> </ol>

Error Condition	Corrective Action
<p><b>Error 08</b> Developer is over the set temperature range . <b>Occurs when the temperature of the developer is more than 0.4°C (0.7°F) over the set-point temperature.</b> . <b>Ready - Off</b> <b>Wait - Off</b> <b>Service - 8 Blinks</b></p>	<ol style="list-style-type: none"> <li>1. Check that the main water supply to the PROCESSOR is turned on.</li> <li>2. Check that the main water supply: <ul style="list-style-type: none"> <li>• is 5°C (8°F) lower than the developer set-point temperature when the set-point temperature is 33.9°C (93°F).</li> <li>• is between 4° and 29°C (40° and 85°F).</li> </ul> </li> <li>3. Check that the WASH DRAIN VALVE is closed and not leaking.</li> <li>4. Check that the SCREEN for the WATER INPUT SOLENOID is not plugged.</li> <li>5. Check that the WASH TANK fills within 8 minutes after energizing the PROCESSOR.</li> <li>6. Check that the solution in the DEVELOPER TANK is at the correct level.</li> <li>7. Check that the MANIFOLD on the DEVELOPER RACK is not loose.</li> <li>8. Check that the developer is circulating and that the DEVELOPER RECIRCULATION PUMP is operating correctly.</li> <li>9. Check the wash and developer plumbing for leaks, obstructions, air bubbles, or kinks in the HOSES.</li> <li>10. Check that FUSE F1 is not open. If necessary, replace it with a <i>Slo-Blo</i> FUSE (2.0 AMP for M43A and Clinic 1; 1.0 AMP for M43)</li> <li>11. Use the Service Routine for the DEVELOPER COOLING SOLENOID of the DIVERter VALVE and the WASH PUMP to check that: <ul style="list-style-type: none"> <li>• cooling water is circulating</li> <li>• the WASH PUMP is operating correctly</li> <li>• the COOLING SOLENOID of the DIVERter VALVE for the M43 and M43A is operating correctly.</li> <li>• Check that the red and black wires connect P/J20 to the outer COIL, COOLING DIVERter SOLENOID L2.</li> <li>• Check that the green and white wires connect P/J21 to the inner COIL, WASH DIVERter SOLENOID L3.</li> <li>• Check that the plumbing of the DIVERter VALVE matches the plumbing diagram in the Diagram Package, Publication Number 981092.</li> <li>• Measure the voltage across the outer SOLENOID L2. The voltage should be 20 V DC for one second, then decrease to a holding voltage of 4 V DC, and then decrease to 0 V DC when off.</li> <li>• If you <b>did</b> measure the correct voltage, measure the resistance across SOLENOID L2 by doing the steps below. <ol style="list-style-type: none"> <li>1. Disconnect 1 of the LEADS from SOLENOID L2.</li> <li>2. Measure the resistance of SOLENOID L2. The resistance should be <math>19\ \Omega \pm 10\%</math>.</li> <li>3. If necessary, install a new SOLENOID L2.</li> <li>4. Connect the LEAD to SOLENOID L2.</li> </ol> </li> <li>• If you <b>did not</b> measure the correct voltage, continue doing the steps below until you identify the problem. <ol style="list-style-type: none"> <li>1. Check the connection at the 100 CIRCUIT BOARD.</li> <li>2. Install a new SOFTWARE PROM U5.</li> <li>3. Install a new 100 CIRCUIT BOARD.</li> </ol> </li> </ul> </li> </ol>

Error Condition	Corrective Action
	<p>12. Check SSR-U3 for the DEVELOPER HEATER. Use the procedure on page .</p> <p>13. Use the procedure on page to measure the resistance of the DEVELOPER THERMISTOR at CONNECTOR P/J19 PINS 1 and 2. See Table on page to compare the reading to the correct resistance.</p> <ul style="list-style-type: none"> <li>• If the resistance is not within <math>\pm 10\%</math> of the correct value given in the table, install a new DEVELOPER THERMISTOR.</li> <li>• Check that the voltage at CONNECTOR P/J18 PIN 1 is 5 V DC when the PROCESSOR is operating.</li> </ul> <p>14. If the control to SSR-U3 is not 0 V DC, but the THERMISTOR circuit is operating correctly, continue doing the steps below until you identify the problem on the 100 CIRCUIT BOARD.</p> <ul style="list-style-type: none"> <li>• To ensure that CONNECTORS P/J101 through P/J107 are fully seated on the 100 CIRCUIT BOARD, remove the CONNECTORS from the BOARD and carefully install them again.</li> <li>• Install a new SOFTWARE PROM U5.</li> <li>• Install a new 100 CIRCUIT BOARD.</li> </ul> <p>15. Check that the line voltage is within specification.</p>

Error Condition	Corrective Action
<p><b>Error 09</b> Developer is under set temperature range</p> <p><b>Occurs when the temperature of the developer is more than 0.4°C (0.7°F) below the set-point temperature.</b></p> <p><b>Ready</b> - Off <b>Wait</b> - Off <b>Service</b> - 9 Blinks</p>	<ol style="list-style-type: none"> <li>Check the developer temperature. <ul style="list-style-type: none"> <li>Normal warm-up time from 22°C (72°F) is 20 minutes.</li> </ul> </li> <li>Check that the room temperature is 15°C (59°F) or higher.</li> <li>Check that the main water supply is between 4° and 29°C (40° and 85°F).</li> <li>On Clinic 1 PROCESSORS, check if more than 5 films were processed in short succession when the water temperature was below 16°C (60°F).</li> <li>Use the Service Routines to check that the DEVELOPER HEATER is operating correctly.</li> <li>On M43 or M43A PROCESSORS, check for correct operation of the DIVERTER VALVE. Use the Service Routine for the DIVERTER VALVE to check that the WASH DIVERTER SOLENOID L3, not the COOLING SOLENOID L2, is operating. <ul style="list-style-type: none"> <li>Check that the red and black wires connect P/J20 to the outer COIL, COOLING DIVERTER SOLENOID L2.</li> <li>Check that the green and white wires connect P/J21 to the inner COIL, WASH DIVERTER SOLENOID L3.</li> <li>Check the voltage across the inner COIL, SOLENOID L3, when the SOLENOID is on. The voltage should start at 20 V DC for one second, then decrease to a holding voltage of 4 V DC, and then decrease to 0 V DC when off.</li> <li>If you <b>did</b> measure the correct voltage, measure the resistance across SOLENOID L3 by doing the steps below. <ol style="list-style-type: none"> <li>Disconnect 1 of the LEADS from SOLENOID L3.</li> <li>Measure the resistance of SOLENOID L3. The resistance should be 19 <math>\Omega</math> <math>\pm</math>10%.</li> <li>If necessary, install a new SOLENOID L3.</li> <li>Connect the LEAD to SOLENOID L3.</li> </ol> </li> <li>If you <b>did not</b> measure the correct voltage, continue doing the steps below until you identify the problem. <ol style="list-style-type: none"> <li>Check the connection at the 100 CIRCUIT BOARD.</li> <li>Install a new SOFTWARE PROM U5.</li> <li>Install a new 100 CIRCUIT BOARD.</li> </ol> </li> <li>Check that the plumbing of the DIVERTER VALVE matches the plumbing diagram in the Diagram Package, Publication Number 981092.</li> <li>The DIVERTER VALVE may be remaining in the cooling position. If necessary, install a new DIVERTER VALVE.</li> </ul> </li> <li>On Clinic 1 PROCESSORS, use the procedure on page to check that SSR-U4 for the WASH PUMP is operating correctly.</li> <li>Use the procedure on page to check that SSR-U3 for the DEVELOPER HEATER is operating correctly.</li> <li>Use the procedure on page to measure the resistance of the DEVELOPER THERMISTOR. See Table on page to compare the reading to the correct resistance.</li> </ol>



Error Condition	Corrective Action
	<p>10. If the control to SSR-U3 is not +5 V DC, but the THERMISTOR circuit is operating correctly, continue doing the steps that follow until you identify the problem on the 100 CIRCUIT BOARD.</p> <ul style="list-style-type: none"><li>• To ensure that CONNECTORS P/J101 through P/J107 are fully seated on the 100 CIRCUIT BOARD, remove the CONNECTORS from the BOARD and carefully install them again.</li><li>• Install a new SOFTWARE PROM U5.</li><li>• Install a new 100 CIRCUIT BOARD.</li></ul> <p>11. Check that the line voltage is within specification.</p>

Error Condition	Corrective Action
<p><b>Error 10</b>            DRYER is under set temperature range            .  <b>Occurs when the DRYER temperature does not reach 27°C (80°F) within 45 minutes after the PROCESSOR is first energized.</b>            .  <b>Ready - Off</b>  <b>Wait - Off</b>  <b>Service - 10 Blinks</b></p>	<ol style="list-style-type: none"> <li>Film can be fed, but may exit the PROCESSOR damp.</li> <li>Normal warm-up time is:               <ul style="list-style-type: none"> <li>15 to 20 minutes in average site conditions</li> <li>up to 45 minutes in extreme site conditions</li> </ul> </li> <li>Check that the room temperature is 15°C (59°F) or higher.</li> <li>Check that the DRYER PLENUM is seated correctly on the WASH TANK.</li> <li>Check that the WASH RACK is seated correctly on the DRYER PLENUM.</li> <li>Check that the DRYER RACK is seated correctly on the WASH RACK.</li> <li>Check that the set-point temperature for the DRYER is not set higher than necessary to dry films.</li> <li>Check the AIR TUBES for the conditions below:               <ul style="list-style-type: none"> <li>TUBES are seated correctly in the DRYER RACK.</li> <li>TUBES are free of obstructions to air flow.</li> <li>SLOTS in TUBES are clean and have a uniform opening of between 1.3 and 2.0 mm (0.052 and 0.077 in.) their entire length.</li> </ul> </li> <li>Check for correct operation of the DRYER HEATER. The resistance, at a room temperature of 21°C (70°F), at CONNECTOR P/J4 PINS 1 and 2, should be <math>38\ \Omega \pm 5\%</math>; for PINS 1 and 3 the resistance should be <math>75\ \Omega \pm 5\%</math>.</li> <li>Use the procedure on page to check SSR-U1 for the DRYER HEATER. Use the voltage at CONNECTOR P/J4.</li> <li>Check that the DRYER BLOWER is de-energizing. Turn the DRYER TEMPERATURE CONTROL KNOB to the lowest setting. The BLOWER should de-energize when the PROCESSOR enters Standby Mode within 10 minutes.</li> <li>Use the procedure on page to measure the resistance of the DRYER THERMISTOR. See Table on page to compare the reading to the correct resistance.               <ul style="list-style-type: none"> <li>If the resistance is not within <math>\pm 10\%</math> of the correct resistance given in the table, install a new DRYER THERMISTOR.</li> </ul> </li> <li>If the control to SSR-U1 is not +5 V DC, but the THERMISTOR circuit is operating correctly, continue doing the steps below until you identify the problem on the 100 CIRCUIT BOARD.               <ul style="list-style-type: none"> <li>To ensure that CONNECTORS P/J101 through P/J107 are fully seated on the 100 CIRCUIT BOARD, remove the CONNECTORS from the BOARD and carefully install them again.</li> <li>Install a new SOFTWARE PROM U5.</li> <li>Install a new 100 CIRCUIT BOARD.</li> </ul> </li> <li>Check that the DRYER HEATER is mounted correctly. See the Service Manual, Publication No. 981090.</li> <li>Check that the line voltage is within specification.</li> </ol>

**Fatal Error Effects on Component Operation**

<b>Error Condition</b>	<b>Indicator Lights</b>	<b>Developer Heater</b>	<b>Dryer Heater</b>	<b>Dryer Blower/ Drive Motor</b>	<b>Replenishment</b>	<b>Wash Pump</b>	<b>Incoming Water</b>
Error 01 - 100 Board Error	Ready, Wait - OFF Service - 1 blink	OFF	OFF	OFF	OFF	ON	OFF
Error 02 - Loss of Airflow Error	Ready, Wait - OFF Service - 2 blinks	Normal control until film exits, then OFF	OFF	ON until film exits, then OFF	Normal control until replenishment of current film is complete, then for flooded only <sup>1</sup>	ON until film exits, then OFF	Normal control until film exits, then OFF
Error 03 - Invalid Airflow Indication	Ready, Wait - OFF Service - 3 blinks	Normal control until film exits, then OFF	OFF	ON until film exits, then OFF	Normal control until replenishment of current film is complete, then for flooded only <sup>1</sup>	ON until film exits, then OFF	Normal control until film exits, then OFF
Error 04 - Unable to Determine Developer Temperature	Ready, Wait - OFF Service - 4 blinks	OFF	Normal control until film exits, then OFF	ON until film exits, then OFF	Normal control until replenishment of current film is complete, then for flooded only <sup>1</sup>	ON	OFF
Error 05 - Dryer Over Temperature	Ready, Wait - OFF Service - 5 blinks	Normal control	OFF	ON	Normal control	Normal control	Normal control
Error 06 - Unable to Determine Dryer Temperature	Ready, Wait - OFF Service - 6 blinks	Normal control	OFF	ON	Normal control	Normal control	Normal control

<sup>1</sup>NOTE: "Flooded only" means that if Flooded Mode is selected, replenishment will occur every 24 minutes (for 35 x 43 cm [14 x 17-in.] film area).

## Non-Fatal Error Effects on Component Operation

Error Condition	Indicator Lights	Developer Heater	Dryer Heater	Dryer Blower/ Drive Motor	Replenishment	Wash Pump	Incoming Water	Div (M)
Error 07 - Film Detector LED Error	Ready, Wait - OFF Service - 7 blinks	Normal control	Normal control	Normal control (ON)	*	Normal control	*	Norm
Error 08 - Developer Over Range	Ready, Wait - OFF Service - 8 blinks	Normal control (OFF)	Normal control	Normal control	Normal control	Normal control (ON)	Normal control (ON)	Norm (co
Error 09 - Developer Under Range	Ready, Wait - OFF Service - 9 blinks	Normal control (ON)	Normal control	Normal control	Normal control	Normal control	Normal control	Norm
Error 10 - Dryer Under Range	Ready, Wait - OFF Service - 10 blinks	Normal control	Normal control (ON)	Normal control (ON)	Normal control	Normal control	Normal control	Norm

\* If all 3 SENSORS are blocked for more than 150 seconds, chemical replenishment will operate for Flooded Mode only, and incoming water will be turned on for cooling only. If 1 or 2 SENSORS are blocked for more than the 150 second limit, chemical replenishment will continue for film sensed at the remaining good SENSOR(S). Chemical and water replenishment in this condition will be based on film length only.

Error Condition	Indicator Lights	Developer Heater	Dryer Heater	Dryer Blower/ Drive Motor	Replenishment	Wash Pump	Incoming Water	Div (M)
Error 11 - Developer Over Set Temperature	Ready, Service - OFF Wait - 1 blink	Normal control (OFF)	Normal control	Normal control	Normal control	Normal control (ON)	Normal control (ON)	Norm (cool
Error 12 - Developer Under Set Range	Ready, Service - OFF Wait - 2 blinks	Normal control (ON)	Normal control	Normal control	Normal control	Normal control (ON)	Normal control (ON)	Norm
Error 13 - Dryer Under Set Temperature	Ready, Service - OFF Wait - 3 blinks	Normal control	Normal control (ON)	Normal control (ON)	Normal control	Normal control	Normal control	Norm

# Mechanical Diagnostics - Quick Reference



Note

For details, see the section starting on page 41.

						1. Transport Failure
						2. Surface Artifacts
						3. Abnormal Film Densities
						4. Wet Films
						5. Low Solution Levels
						6. Overlapping of Films
1	2	3	4	5	6	
		•		•		Check that the PROCESSOR is level.
•	•	•			•	Film Feeding Error - Check that you feed small films under a FILM SENSOR <b>Feed only single thicknesses of film. Feed the next film only after a film-feed signal. If there is no film-feed signal, refer the difficulty to qualified service personnel.</b>
•	•	•	•		•	Feed only compatible films.
•	•	•	•		•	Check that all RACKS are seated correctly and that all GEARS engage correctly. Check the RACKS for squareness.
•	•	•	•			Check that the surfaces of all the ROLLERS, especially the ROLLERS in the WASH RACK, are clean and smooth.
•	•	•	•		•	Check that the DRYER and the DRYER PLENUM are seated correctly.
•	•	•	•			Remove any dirt from the DRYER ROLLERS, the AIR TUBES, and especially from the SLOTS in the AIR TUBES. Rinse the parts with water and wipe them dry before installing them. Check that the AIR TUBES are seated properly. Check that the SLOTS in the AIR TUBES measure a minimum of 1.3 mm (0.052 in.) for the entire length of the TUBE.
•	•	•	•	•	•	Check the settings for correct replenishment. Check that the replenishment TUBING is not kinked. Use the Service Routines to check that the FILM SENSORS and REPLENISHMENT PUMPS operate correctly. See the Replenishment Rate Information Sheet, Publication Number 1C0578.
	•	•	•		•	Adjust the DRYER temperature setting to the <b>lowest</b> possible temperature that still allows good drying.
	•	•			•	Remove any buildup of debris or chemicals from the FEED TRAY and ROLLERS that are above the level of the processing solution. Check the FEED TRAY and all ENTRANCE and EXIT ROLLERS for damaged surfaces.
•	•				•	Clean any biological growth in the WASH TANK with a mild solution of chlorine bleach. Use 60 mL (2 fl oz) of bleach per 3.8 L (1 gallon) of water. Wipe the TANKS with a clean, soft, lint-free cloth. Clean the WASH TUBES.
•	•	•	•	•	•	Check that the DRAIN VALVES are completely closed and are not leaking. Check that all the TANKS are full.
	•	•				Check that the DEVELOPER ENTRANCE ROLLERS are clean and dry. Check that the FILM SENSORS are clean, without dirt or chemical residue, and do not have any raised edges.
		•				Check that the developer temperature is within 0.3°C (0.5°F) of the set-point temperature.

						1. Transport Failure
						2. Surface Artifacts
						3. Abnormal Film Densities
						4. Wet Films
						5. Low Solution Levels
						6. Overlapping of Films
1	2	3	4	5	6	
		•			•	Check that the FILM SENSORS operate correctly.
•	•		•			Check that the BLOWER has reached operating speed. Check for a malfunction of the AIR VANE SWITCH.
•	•	•	•		•	Change any incorrectly mixed, exhausted, or contaminated chemicals. If necessary, fill the REPLENISHMENT TANKS. <b>Do not mix more than a 2 week supply of developer replenisher.</b> <b>Always use a RACK DRIP TRAY when lifting the FIXER RACK to prevent contaminating the developer.</b> <b>Mix chemicals as directed.</b>
•	•				•	Replace any BEARINGS and GEARS that do not allow the ROLLERS to rotate correctly.
•	•			•		If incoming wash water is dirty, clean the RACK and TANK thoroughly. Change the incoming water FILTER at the main supply. Clean, or if necessary, replace the SCREEN of the WATER INPUT SOLENOID.
	•	•	•			<ul style="list-style-type: none"> <li>Check the temperature of the incoming water. The temperature must be between 4° and 29°C (40° and 85°F), <b>or</b> 5°C (8°F) below the developer set-point temperature.</li> <li>Check FUSE 1.</li> </ul>
		•				Check that the correct BULB, 15 watts maximum, and SAFELIGHT FILTER are in the SAFELIGHT and at the correct distance from the FEED TRAY and work surface.
•						<ul style="list-style-type: none"> <li>Check that the TOP COVER and ACCESS PANELS are installed securely on the PROCESSOR.</li> <li>Check that the PROCESSOR is level.</li> </ul>
		•				Check all GASKETS for light leaks. For through-the-wall installations, see the instructions for installing the GASKETS.
					•	Check the time delay of the AUDIO ALARM. The AUDIO ALARM should sound and the READY INDICATOR should illuminate once the trailing edge of the film has left the FEED TRAY. You should hear the AUDIO ALARM approximately 6 seconds after the trailing edge of the film has passed the FILM SENSORS.
		•				Check that the trailing edge of the film exits from the DEVELOPER ENTRANCE ROLLER before the AUDIO ALARM sounds.
			•			Check that ambient conditions are within the site specifications.
	•		•	•		Check that all HOSES and TUBING are without kinks or air bubbles.
•	•	•			•	Check that the SPRINGS on the RACKS are not broken, loose, or weak.
•						Check the MAIN DRIVE. Check that the SPROCKETS are tight and that the tension on the DRIVE CHAIN is correct.
•	•				•	Check the DRIVE BELT in the DRYER RACK.

						1. Transport Failure
						2. Surface Artifacts
						3. Abnormal Film Densities
						4. Wet Films
						5. Low Solution Levels
						6. Overlapping of Films
1	2	3	4	5	6	
•					•	Check the film path between the DRYER RACK and the WASH RACK. The FEET on the FIXER RACK should support the DRYER RACK.
•	•	•	•		•	Check the WASH PUMP using the Service Routine. Check that water flows correctly between the WASH TUBES. Clean the WASH TUBES if necessary.
•						Check the INTERLOCK SWITCHES for correct operation. See the important note on page .
•	•		•		•	Check that the EXIT ROLLERS in the WASH RACK are correctly seated and not reversed.
	•	•		•		Check that the EVAPORATION COVERS are installed correctly.
	•			•		Check that the water supply is turned on. Using the Service Routine, check that the INCOMING WATER SOLENOID operates correctly.
•	•		•		•	Check that the EXIT SQUEEGEE ROLLERS are transporting the films correctly.





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# Mechanical Diagnostics - In Detail

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## Problem — Transport Failure or Film Overlapping

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### Film Feeding Remedies

- [1] Make sure you feed only one sheet of film at a time. Make sure that if you are feeding a 10 x 10 cm (4 x 4 in.) sheet of film, you feed the film against the right FILM GUIDE. See the “Film Feeding” procedure in the Operator Manual, Publication No. 981089. Make sure you do not feed the next sheet of film until you have received the film-feed signal. If you do not receive the film-feed signal, see the Service Manual, Publication No. 981090.

### Rack Remedies

- [2] Check that all RACKS are in the correct positions. Check the RACKS for squareness. See the procedure in the Service Manual, Publication No. 981090.
- [3] Check that the WASH RACK is seated correctly and that the O-RING on the WASH MANIFOLD is positioned correctly in the groove.
- [4] Check that none of the SPRINGS on the RACKS is missing, broken, or worn.
- [5] Check that the GEARS rotate freely and engage correctly.
- [6] Check that the tension of the DRIVE BELT on the DRYER RACK is correct.
- [7] If incoming wash water is dirty, clean the WASH RACK and WASH TANK thoroughly.
  - Clean any biological growth in the WASH TANK with a mild solution of chlorine bleach. Use 60 mL (2 fl oz) of bleach per 3.8 L (1 gallon) of water. Wipe the TANK with a soft, damp, lint-free cloth that will not scratch the surface of the TANK.

### Roller Remedies

- [8] Check that all ROLLERS are correctly positioned and are rotating freely.
- [9] Check that all ROLLER GEARS, SPROCKETS, and IDLERS are engaged.
- [10] If any ROLLERS or GEARS are broken or have worn STUDS, remove them and install new ones.
- [11] If any BEARINGS are worn, remove them and install new ones.

### Dryer Remedies

- [12] Check that the AIR TUBES are in the correct positions.

### Miscellaneous Remedies

- [13] Check that the TOP COVER is installed.
- [14] Check that the DC INTERLOCK SWITCH S6 is operating correctly. See the important note on page .
- [15] Check that the MAGNET is installed on the TOP COVER.
- [16] Check that the SOLID STATE RELAY U6 has not malfunctioned.
- [17] Check that the JUMPER E5 is set to Standby Enable Mode.
- [18] Check that the FILM SENSORS are not blocked or malfunctioning.

## **Problem — Surface Artifacts or Abnormal Densities**

### **Film Feeding Remedies**

- [1] Make sure that you feed only standard cycle films.

### **Replenishment Remedies**

- [2] Check that the REPLENISHMENT RATES are set for correct replenishment. See the Replenishment Rate Sheet, Publication No. 1C0578.
- [3] Check that:
- the TUBING of the REPLENISHMENT SYSTEM is straight and not pinched or kinked
  - the REPLENISHMENT PUMP is operating
  - HOSE CLAMPS and WIRE TIES are tight
- [4] Do a replenishment calibration check.
- [5] Change any chemicals that were not mixed correctly, that are exhausted, or have been contaminated. When mixing fresh chemicals follow the recommendations below.
- Do not mix more than a 2-week supply of DEVELOPER REPLENISHER solution.
  - Always use a SPLASH GUARD 1C4019 and DRIP TRAY 1C4011 when removing the FIXER RACK from the PROCESSOR to prevent contaminating the developer.
  - Mix all chemicals and solutions as directed.
- [6] If the solution level in the REPLENISHMENT TANKS is low, fill the REPLENISHMENT TANKS.
- [7] Check that the DRAIN VALVES are completely closed. Check that the PROCESSOR TANKS are full.
- [8] Check that the REPLENISHMENT PUMP operates and delivers the preset volume of replenishment solution when you feed a 35 x 43 cm (14 x 17 in.) sheet of film into the PROCESSOR.

### **Recirculation Remedies**

- [9] With the PROCESSOR energized and the PROCESSOR TANKS full, check for movement of the solutions at the surface of the PROCESSOR TANKS. Movement indicates recirculation. If you do not observe any movement, check that:
- the TUBING for the RECIRCULATION SYSTEM is straight and free of kinks, obstructions, and air bubbles.
  - the RECIRCULATION PUMP is operating and not airlocked.
- [10] Check that the ORIFICES in the DEVELOPER and the FIXER RECIRCULATION HOSES are not plugged.
- [11] **Clinic 1 Only:** Check that the ORIFICE in the WASH RECIRCULATION HOSE is not plugged.

### **Rack Remedies**

- [12] Check that all the RACKS are in the correct positions and that the GEARS fully engage the WORMS on the MAIN DRIVE SHAFT.
- [13] If incoming wash water is dirty, clean the WASH RACK and WASH TANK thoroughly.
- Clean any biological growth in the WASH TANK with a mild solution of chlorine bleach. Use 60 mL (2 fl oz) of bleach per 3.8 L (1 gallon) of water. Wipe the TANK with a soft, damp, lint-free cloth that will not scratch the surface of the TANK.
- [14] Check that the STUDS are not broken or worn. If necessary, install new STUDS.

**Roller Remedies**

- [15] Check that the surfaces of all the ROLLERS are clean, smooth, and straight.
- [16] Check that the EVAPORATION COVERS are installed.
- [17] Check that all ROLLERS are correctly positioned and are rotating freely.
- [18] Check that all ROLLER GEARS, SPROCKETS, and IDLERS are engaged.
- [19] Remove any BEARINGS or SHAFTS that are worn and install new parts.

**Dryer Remedies**

- [20] Remove any dirt from the AIR TUBES and from within the SLOTS in the AIR TUBES. Use a BOTTLE BRUSH TL-4833 to clean **only the inside** of the AIR TUBES. Rinse the AIR TUBES with water and allow them to dry before installing them.
- [21] Check that all the AIR TUBES are seated correctly.
- [22] Adjust the setting of the DRYER TEMPERATURE CONTROL to the **lowest** possible temperature that still allows good drying.

**Unstable or Low Sensitometry**

- [23] Check that the replenishment rates are set correctly.
- [24] Check that the processing solutions in the processing TANKS are stable and not contaminated. If necessary, drain the TANKS and refill them with processing solutions.
- [25] Check that the processing solutions in the REPLENISHMENT TANKS are not more than 2 weeks old or contaminated.
- [26] Use the Service Routine to check the replenishment system.
- [27] To ensure the correct transport speed, check that the correct 50 Hz or 60 Hz DRIVE MOTOR CONNECTOR is connected and that the correct SPROCKET is installed on the MAIN DRIVE SHAFT.
- [28] Check the DEVELOPER RECIRCULATION PUMP for correct operation.
- [29] Check that the replenishment HOSES are free of kinks, obstructions, and air bubbles.
- [30] Check the MANIFOLD BOX on the DEVELOPER RACK for a loose connection.
- [31] Check for any light leaks.
- [32] Check that the COVER is installed on the DEVELOPER RACK.
- [33] Check that the level of developer solution is adequate.
- [34] Check all the RACKS for worn GEARS and BEARINGS. If necessary, remove the GEARS and BEARINGS and install new parts.
- [35] Make sure that you feed only standard cycle films and use only appropriate processing chemicals.

**Miscellaneous Remedies**

- [36] Check that the FEED TRAY is not dirty. If necessary, clean the FEED TRAY.
- [37] Check that the correct films are being processed for the cycle and chemicals in use.
- [38] Check ambient water temperature. The water temperature must be between 4° and 29°C (40° and 85°F).
- [39] If using a SAFELIGHT, check that the BULB is no more than 15 watts. Check that the FILTER is not cracked and that is the correct type for the films you are processing. Check that the SAFELIGHT is the correct distance from the FEED TRAY and work surface.
- [40] Check that the TOP COVER is closed and that the ACCESS PANELS are installed on the PROCESSOR.
- [41] For through-the-wall installations, or installations using a LIGHTTIGHT FEED TRAY, check the integrity and the positioning of the GASKETS.
- [42] Check that the wash water is flowing.
- [43] Check that the FILM GUIDE BAR at the EXIT SLOT on the TOP COVER is clean and seated correctly.

## **Problem — Wet Films**

### **Film Feeditn Remedies**

- [1] Make sure you feed only compatible films for RP chemistry.

### **Replenishment Remedies**

- [2] Check that the REPLENISHMENT RATES are set for correct replenishment. See the Replenishment Rate Sheet, Publication No. 1C0578.
- [3] Check that:
- the TUBING of the REPLENISHMENT SYSTEM is straight and free of kinks, obstructions, and air bubbles
  - the REPLENISHMENT PUMP is operating
  - HOSE CLAMPS and WIRE TIES are tight
- [4] Do a replenishment calibration check.
- [5] Change any chemicals that were not mixed correctly, that are exhausted, or are contaminated. When mixing fresh chemicals follow the recommendations below.
- Do not mix more than a 2-week supply of DEVELOPER REPLENISHER solution.
  - Always use a SPLASH GUARD 1C4019 and DRIP TRAY 1C4011 when removing the FIXER RACK from the PROCESSOR to prevent contaminating the developer.
  - Mix all chemicals and solutions as directed.
- [6] If the solution level in the REPLENISHMENT TANKS is low, fill the REPLENISHMENT TANKS.
- [7] Check that the DRAIN VALVES are completely closed. Check that the PROCESSOR TANKS are at the overflow level.
- [8] Check that the REPLENISHMENT PUMPS deliver the preset volume of replenishment solution when you feed a 35 x 43 cm (14 x 17 in.) sheet of film into the PROCESSOR.

### **Recirculation Remedies**

- [9] With the PROCESSOR energized and the PROCESSOR TANKS full, check for movement of the solutions at the surface of the PROCESSOR TANKS. Movement indicates recirculation. If you do not observe any movement, check that:
- the TUBING for the RECIRCULATION SYSTEM is straight and free of kinks, obstructions, and air bubbles
  - the RECIRCULATION PUMP is operating and is not airlocked
- [10] Check that the ORIFICES in the DEVELOPER and the FIXER RECIRCULATION HOSES are not plugged.

### **Rack Remedies**

- [11] Check that the ENTRANCE and EXIT ROLLERS of the WASH RACK are seated correctly.
- [12] Check that the SPRINGS on the WASH RACK are not worn or broken.

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**Dryer Remedies**

- [13] Check that the AIR TUBES are in the correct positions.
- [14] Remove any dirt from the AIR TUBES and from within the SLOTS in the AIR TUBES. Use a BOTTLE BRUSH TL-4833 to clean **only the inside** of the AIR TUBES. Rinse the AIR TUBES with water and allow them to dry before installing them.
- [15] Increase the DRYER TEMPERATURE, but always adjust the setting of the DRYER TEMPERATURE CONTROL to the **lowest** possible temperature that still allows good drying.
- [16] Check that the DRYER AIR EXHAUST is free from any obstruction. If installed, check that the optional VENT DUCT ADAPTER is installed according to specifications in the Installation Instructions.
- [17] Check that the DRYER HEATER is operating.

**Wash Water Remedies**

- [18] Check that the incoming water VALVE is turned on and that water is flowing at the WASH INLET BAR as soon as you energize the PROCESSOR.
- [19] Check that the holes in the WASH INLET BAR are clean and open. If necessary, clean the holes using BOTTLE BRUSH TL-4833.
- [20] Check that the SCREEN for the WATER INPUT SOLENOID is clean and not plugged.
- [21] Check that the FILTER at the main water supply is clean and not plugged.
- [22] Check FUSE 1.
- [23] Check that the WASH PUMP and WATER INPUT SOLENOID are operating correctly.
- [24] **M43 and M43A Only:** Check that the DIVERTER VALVE ASSEMBLY is operating correctly.
- [25] Check that the holes in the WASH TUBES are clean and open. If necessary, use a BOTTLE BRUSH TL-4833 to clean **only the inside** of the WASH TUBES.

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**Problem — Solution Levels****Replenishment Remedies**

- [1] Check that the REPLENISHMENT RATES are set for correct replenishment. See the Replenishment Rate Sheet, Publication Part No. 1C0578.
- [2] Check that:
  - TUBING of the REPLENISHMENT SYSTEM is straight and not pinched or kinked
  - the REPLENISHMENT PUMP is operating.
  - Check that the POPPET VALVES in the REPLENISHMENT PUMPS are not dirty or distorted and preventing correct replenishment. If necessary, clean the POPPET VALVES or remove them and install new POPPET VALVES.
- [3] Do a replenishment calibration check.
- [4] Check that all TUBING and HOSES are free of kinks, obstructions, and air bubbles.
- [5] Check that the REPLENISHMENT PUMPS operate after a sheet of film is fed into the PROCESSOR.
- [6] If the solution level in the REPLENISHMENT TANKS is low, fill the REPLENISHMENT TANKS.
- [7] Check the FILM SENSORS for correct operation.

**Publication History**

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