Section 3: Diagnostics

Diagnostic Table

Problem	Possible Cause	Action
Film is slanted	• Film is not inserted correctly. • SPRING does not apply correct pressure to ROLLER.	• Insert film at the FEED TRAY edge. • Install the SPRINGS correctly.
Film is jamming	• ROLLERS to not engage the film. • An AIR TUBE in the DRYER RACK is disconnected.	• Check the SPRINGS on the ROLLERS. • Install the AIR TUBE correctly.
Linear scratches or dirt along the film in the transport direction	The ROLLERS are scratched or dirty.	• For black marks, check and clean the GUIDES between the ENTRANCE ROLLERS and the FIXER RACK. • For white marks, check and clean the ROLLERS in the DEVELOPER RACK, or install replacement ROLLERS.
Scratches or dirt at 63 mm intervals along the film in the transport direction	The ROLLERS are scratched or dirty.	• For black marks, check and clean the ROLLERS, or install new ROLLERS in the DEVELOPER RACK. • For white marks, check and the ROLLERS in the FIXER and DRYER RACKS, or install replacement ROLLERS.
Random scratches or dirt	The FEED TRAY is dirty.	Clean the FEED TRAY.
Fogging	• The FEED TRAY COVER is not clean. • The FEED TRAY COVER is not seated correctly. • The brightness in the room exceeds 1080 luxes.	• Check the FEED TRAY COVER for dirt. • Check that the FEED TRAY COVER is closed correctly. • Decrease the brightness to less than 1080 luxes.
Film cannot be inserted while the ROLLERS rotate	The FEED TRAY is tacky with residual water or solution.	Check that the VENTILATION FAN is operating.
Improper agitation	The DEVELOPER RECIRCULATION PUMP has a malfunction.	Install a new RECIRCULATION PUMP.
Linear and parallel unevenness on the ROLLERS	• A RECIRCULATION HOSE is blocked. • The PROCESSOR is tilted. • The ROLLERS do not rotate correctly. • The ROLLERS are dirty.	• Check the HOSES. • Level the PROCESSOR. • Check the film transport components. • Clean the ROLLERS.
Base density too high	• The developer contaminated the fixer. • The developer or fixer solutions are old or contaminated. • The DEVELOPER or FIXER REPLENISHMENT PUMP has a malfunction.	• Drain the developer solution. • Use new solutions. • Install a new REPLENISHMENT PUMP.

Problem	Possible Cause	Action
Improper development, base density too low	• Replenishment rate is too low. • The DEVELOPER REPLENISHMENT PUMP has a malfunction. • A CHECK VALVE on the DEVELOPER REPLENISHMENT PUMP has a malfunction. • The developer temperature is too low. • The developer or fixer solutions are old or contaminated.	• Check the replenishment preset. • Install a new DEVELOPER REPLENISHMENT PUMP. • Install a new CHECK VALVE. • Set the developer temperature. • Use new solutions.
Improper fixing, poor transparency	• Replenishment rate is too low. • The FIXER REPLESISHMENT PUMP has a malfunction. • The CHECK VALVE on the FIXER REPLESISHMENT PUMP is broken. • The fixer solution is old or contaminated.	• Check the replenishment rate. • Install a new FIXER REPLESISHMENT PUMP. • Install a new CHECK VALVE. • Use new chemicals.
Improper drying	• The drying temperature is not correct. • An AIR TUBE in the DRYER RACK is not in the correct position. • The DRYER HEATER has a malfunction. • The DRYER BLOWER has a malfunction. • The DRYER TEMPERATURE SENSOR has a malfunction.	• Set the temperature. • Install the AIR TUBE correctly. • Install a new DRYER HEATER. • Install a new DRYER BLOWER. • Install a new SENSOR.
There is no solution flow in the DEVELOPER or FIXER TANK	There might be air in a RECIRCULATION PUMP.	• Open the DRAIN VALVE to release some solution from the TANK. Do not drain the TANK. Repeat if necessary and add solution so the TANK is not drained. • Check the RECIRCULATION PUMP.
• The “Low t” INDICATOR illuminates continually • The “Ready” INDICATOR is not illuminated	The developer temperature is below the set•point.	Wait until PROCESSOR is ready.
• The “High s” INDICATOR illuminates continually • The “Ready” INDICATOR is not illuminated	The developer temperature is above the set•point.	Wait until PROCESSOR is ready.
• The “Ready” INDICATOR blinks when PROCESSOR is energized	The WASH TANK is filling.	Wait until the WASH TANK has filled.

Table 3–1 PROCESSOR INDICATORS and ALARMS

Indication	Problem Analysis	Action
• DRIVE MOTOR does not operate • ALARM emits a beep when film is inserted	The TOP COVER of the PROCESSOR is not seated correctly, or has it been removed from the PROCESSOR when PROCESSOR is energized.	Place COVER on PROCESSOR.
• The “Service” INDICATOR illuminates continually • The “Low t” INDICATOR blinks • The ALARM emits a beep • The “Ready” INDICATOR is not illuminated	The developer temperature circuit is broken.	Determine cause of the malfunction and repair the circuit.
• The “Service” INDICATOR illuminates continually • The “High s” INDICATOR blinks • The ALARM emits a beep • The “Ready” INDICATOR is not illuminated	The DRYER temperature circuit is broken.	Determine cause of the malfunction and repair the circuit.

POWER SUPPLY Checkout and Diagnostics

Warning

Dangerous Voltage.

[1] Check that the PROCESSOR is connected to the main power.

[2] Energize the PROCESSOR.

[3] Measure the DC voltages on the DRIVE BOARD:

Position	Approximate Voltage
P1 (GND) to P2	+5 V DC
P1 (GND) to P4	+24 V DC

[4] If the voltages are not correct, advance to Step 5. If the voltages are correct, the POWER SUPPLY is operating correctly.

[5] Check:

- FUSE F51
- FUSES F2 and F3 on the DRIVE BOARD

[6] If the FUSES do not indicate failure, advance to Step 7. If the FUSES indicate failure, install new FUSES.

[7] Check the AC input voltage to the DRIVE BOARD at CONNECTOR CNP3:

Position	Approximate Voltage
PIN 1 to PIN 2	8 V AC
PIN 3 to PIN 4	24 V AC

[8] If the voltages are not correct, advance to Step 9. If the voltages are correct, install a new DRIVE BOARD.

[9] Check the AC output voltage on EMI FILTER NF51 at PINS 3 and 4.

[10] If the voltage at NF51 is the same as the voltage at the site, advance to Step 11. If the voltage at NF51 is not the same as the voltage at the site, advance to Step 13.

[11] Check for correct operation of SWITCH SW51.

[12] If SW51 operates correctly, install a new TRANSFORMER. If SW51 does not operate correctly, install a new SW51.

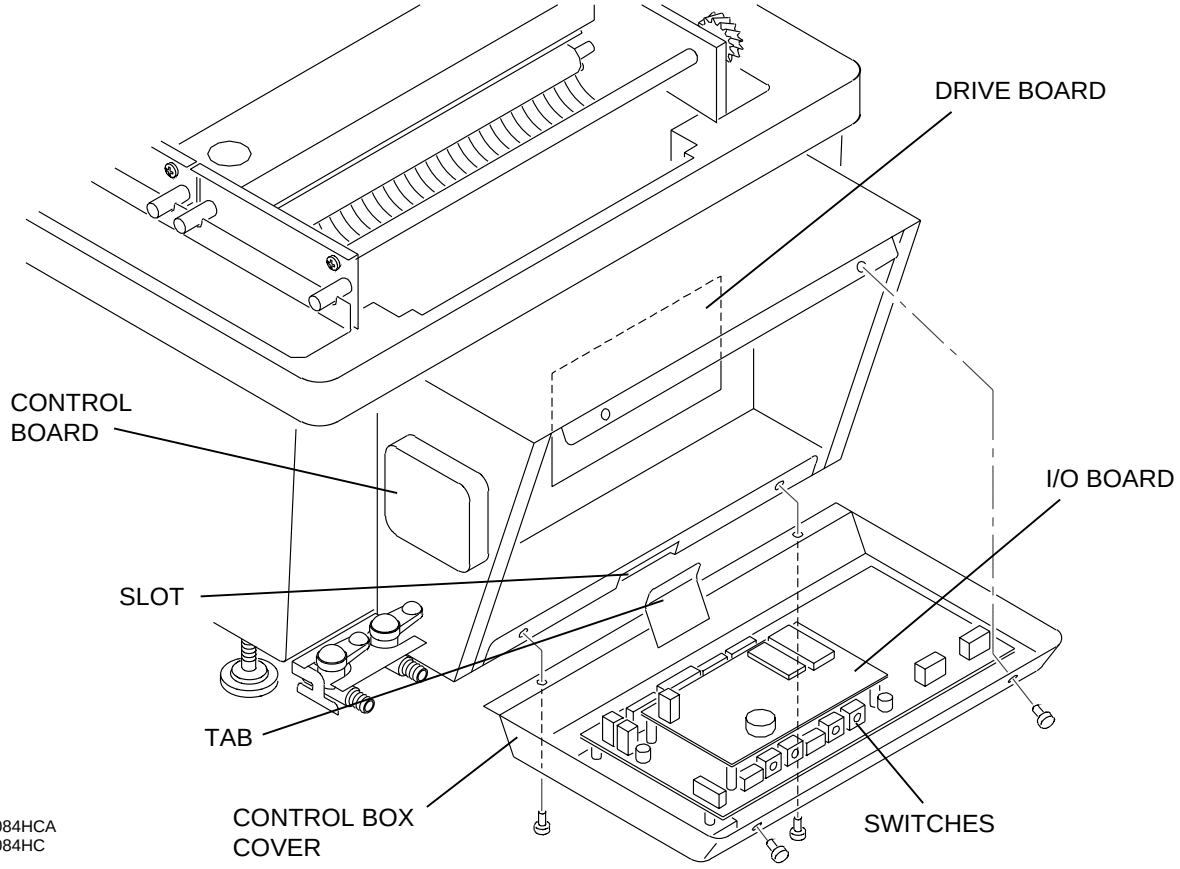
[13] Check the AC input voltage on EMI FILTER NF51 at PINS 1 and 2.

[14] If the voltage at NF51 is the same as the voltage at the site, install a new EMI FILTER. If the voltage at NF51 is not the same as the voltage at the site, there is a problem with the main power at the site.

Internal PROCESSOR Diagnostics

Setting Diagnostics Modes

- When the PROCESSOR is used in the diagnostic mode, systems and components of the PROCESSOR can be actuated.
- There are 8 modes. The PROCESSOR has a corresponding mode for most of the PROCESSOR systems.
- When the PROCESSOR is initialized in the diagnostics mode, it automatically enters the first mode. The “Dev” BUTTON on the CONTROL BOARD is used to advance to the next mode. The “Fix” BUTTON can be used to select the preceding mode.
- In some modes, pressing the “Run” BUTTON operates components.



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H164_0084HC

Warning
Dangerous Voltage.

[1] De-energize the PROCESSOR.

ESD
Possible damage from electrostatic discharge.

[2] Remove the 4 SCREWS and the CONTROL BOX COVER for access to the SWITCHES.

[3] Place the TAB on the CONTROL BOX COVER in the SLOT on the PROCESSOR.

[4] Move SWITCH SW02-4 to the “ON” position.

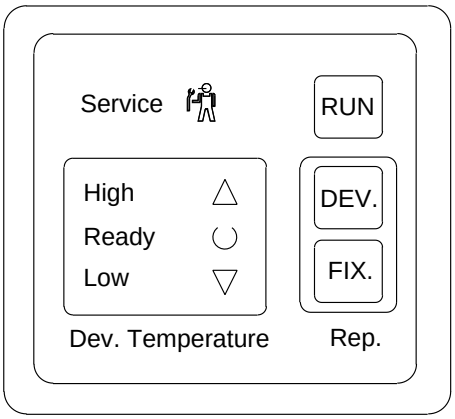
[5] Energize the PROCESSOR.

Note

- The PROCESSOR enters mode 1.
- The ALARM should emit 2 or 3 rapid beeps, then emit 3 more long beeps.
- If the ALARM does not emit the rapid beeps, a malfunction in the I/O BOARD is the primary cause.

[6] If the ALARM emits a continual sound, advance to “Checking the TEMPERATURE SENSOR”.

[7] To diagnose a problem with the ENTRANCE SENSOR BOARD, advance to “Checking the ENTRANCE SENSOR BOARD”.



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[8] Use the “DEV” BUTTON on the CONTROL BOARD to select the mode and check the other components.

[9] Count the increments when you press the “DEV” BUTTON.

To Check:	Press the “DEV” BUTTON:	Advance to Procedure:
DEVELOPER HEATER	1 time to enter mode 2	“Checking the DEVELOPER HEATER”
DRYER HEATER	2 times to enter mode 3	“Checking the DRYER HEATER”
DRYER BLOWER	2 times to enter mode 3	“Checking the DRYER BLOWER”
DEVELOPER REPLENISHMENT and RECIRCULATION PUMPS	3 times to enter mode 4	“Checking the DEVELOPER PUMPS”
FIXER RECIRCULATION and REPLENISHMENT PUMPS	4 times to enter mode 5	“Checking the FIXER PUMPS”
WATER SOLENIOD VALVE	5 times to enter mode 6	“Checking the WATER SOLENIOD VALVE”
COVER INTERLOCK SWITCHES	6 times to enter mode 7	“Checking the COVER INTERLOCK SWITCHES”
DRIVE MOTOR	7 times to enter mode 8	“Checking the DRIVE MOTOR”

[10] To begin at mode 1 again:

(a) De-energize the PROCESSOR.

(b) Energize the PROCESSOR.

(c) Do Step 8 again.

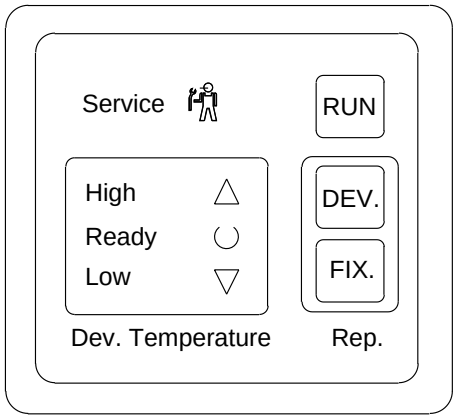
[11] When you complete the diagnostics:

(a) De-energize the PROCESSOR.

(b) Move SWITCH SW02-4 to the “OFF” position.

(c) Install the CONTROL BOX COVER.

Checking the TEMPERATURE SENSOR



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[1] Enter mode 1. The ALARM should emit 2 or 3 rapid beeps, then emit 3 more long beeps.

[2] If the ALARM emits a continual sound, observe the CONTROL BOARD:

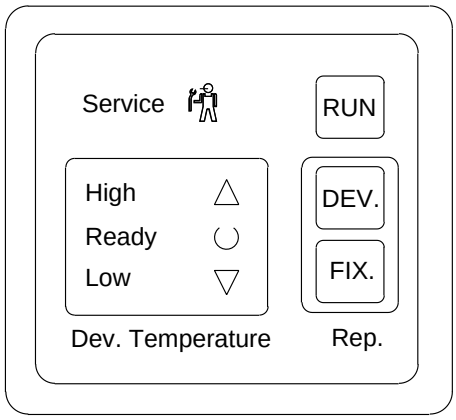
(a) If the “High s” INDICATOR blinks, check the DRYER TEMPERATURE SENSOR SE52 for an open•circuit or a short•circuit.

(b) If the “Low t” INDICATOR blinks, check the DEVELOPER TEMPERATURE SENSOR SE51 for an open•circuit or a short•circuit.

Note

The resistance of the TEMPERATURE SENSORS should be approximately 5.4 k Ohm at 22 C (75 F).

Checking the ENTRANCE SENSOR BOARD



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[1] Enter mode 1.

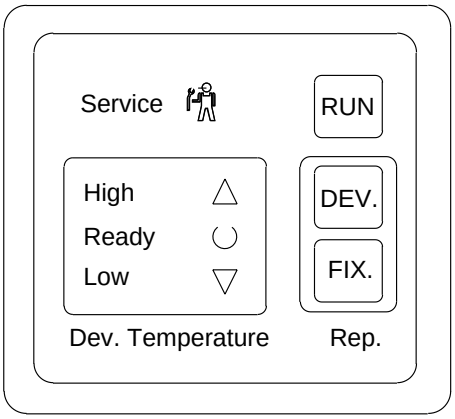
[2] Block one of the SENSORS on the ENTRANCE SENSOR BOARD. The “Ready” INDICATOR on the CONTROL BOARD should illuminate.

[3] Block the other SENSOR on the ENTRANCE SENSOR BOARD. The “Ready” INDICATOR should illuminate.

Note

If the “Ready” INDICATOR does not illuminate when an ENTRANCE SENSOR is blocked, a malfunction in the ENTRANCE SENSOR BOARD is the primary cause.

Checking the DEVELOPER HEATER



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[1] Enter mode 2.

[2] Press the “RUN” BUTTON on the CONTROL BOARD.

Note

The DEVELOPER HEATER circuit and LED 9 on the DRIVE BOARD will actuate for 0.2 seconds.

[3] Check LED 9. If LED 9 does not illuminate, a malfunction in the I/O BOARD is the primary cause.

[4] If LED 9 illuminates and the DEVELOPER HEATER does not operate, check the resistance of DEVELOPER HEATER H51:

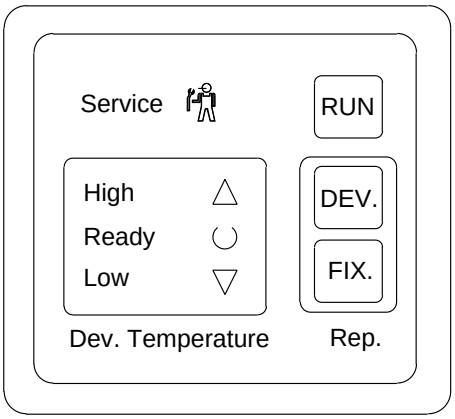
PROCESSOR	H51 resistance, Ohms
1000A	30 - 40
1000J	25 - 35
1000	150 - 170

[5] Check the resistance of DEVELOPER HEATER OVERTEMPERATURE THERMOSTAT SW52. The resistance should be approximately 0 Ohms.

Note

If no problems are identified, a malfunction in the DEVELOPER HEATER RELAY SSR51 is the primary cause.

Checking the DRYER HEATER



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[1] Enter mode 3.

[2] Press the “RUN” BUTTON on the CONTROL BOARD.

Note

The DRYER HEATER circuit and LED 8 on the DRIVE BOARD will actuate for 0.2 seconds.

[3] Check LED 8. If LED 8 does not illuminate, a malfunction in the I/O BOARD is the primary cause.

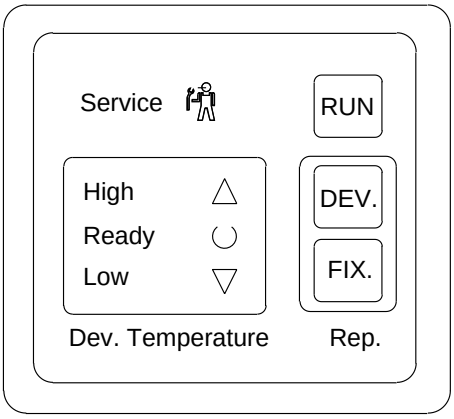
[4] Remove the SIDE COVER of the PROCESSOR BASE for access to the DRYER HEATER components.

[5] If LED 8 illuminates and the DRYER HEATER does not operate, check the resistance of DRYER HEATER H52:

PROCESSOR	H52 resistance, Ohms
1000A	12 - 18
1000J	52 - 62
1000	52 - 62

[6] Check the resistance of DRYER HEATER OVERTEMPERATURE THERMOSTAT SW53. The resistance should be approximately 0 Ohms. If no problems are identified, a malfunction in the DRYER HEATER RELAY SSR52 is the primary cause.

Checking the DRYER BLOWER



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[1] Enter mode 3.

[2] Press and hold the “RUN” BUTTON on the CONTROL BOARD.

Note

The fast speed DRYER BLOWER circuit will actuate and LED 10 on the DRIVE BOARD will illuminate continually when the “RUN” BUTTON is held.

[3] Release the “RUN” BUTTON.

Note

The slow speed DRYER BLOWER circuit will actuate continually when the “RUN” BUTTON is released. LED 10 will illuminate with less brightness.

[4] If LED 10 does not illuminate, check for control signals from the I/O BOARD:

Signal	Position on DRIVE BOARD	Voltage
DRYER ON/OFF	P1 (GND) to PIN 5 on U1	0 - 1 V DC
DRYER BLOWER HIGH	P1 (GND) to PIN 11 on U1	0 - 1 V DC
DRYER BLOWER LOW	P1 (GND) to PIN 11 on U1	4 - 5 V DC

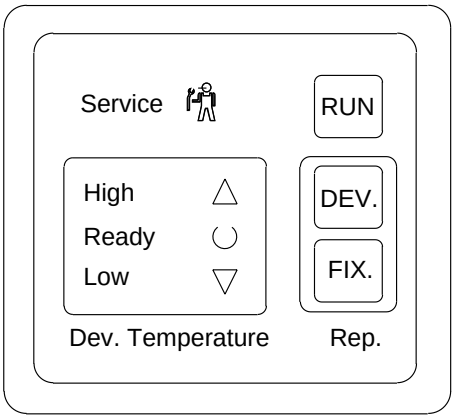
[5] If the control signals are not correct, a malfunction in the I/O BOARD or the I/O BOARD/DRIVE BOARD CABLE is the primary cause.

[6] If LED 10 illuminates and the DRYER BLOWER does not operate, check the DRYER BLOWER voltage:

Signal	Position on DRIVE BOARD	Voltage
DRYER BLOWER HIGH	P1 (GND) to P3	23 - 24 V DC
DRYER BLOWER LOW	P1 (GND) to P3	13 - 15 V DC

[7] If the DRYER BLOWER voltages are not correct, a malfunction in the DRIVE BOARD is the primary cause. See the “Adjusting the Dryer Blower speed” procedure in the Adjustments and Replacements section. If no problems are identified, a malfunction in the DRYER BLOWER is the primary cause.

Checking the DEVELOPER PUMPS



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[1] Enter mode 4.

Caution

Operating the PUMPS excessively without solution might cause damage to the PUMPS.

[2] Press and hold the “RUN” BUTTON on the CONTROL BOARD.

Note

Holding the “RUN” BUTTON:

- Actuates the DEVELOPER RECIRCULATION PUMP and illuminates LED 2 continuously.
- Actuates the DEVELOPER REPLENISHMENT PUMP and illuminates LED 4 continuously.

[3] Check LED 2 and LED 4. If either LED does not illuminate, a malfunction in the I/O BOARD or the I/O BOARD/ DRIVE BOARD CABLE is the primary cause.

[4] If LED 2 and LED 4 illuminate and the PUMPS do not operate:

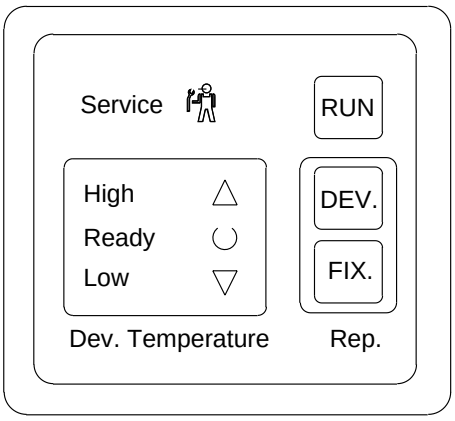
(a) Check FUSE F1 on the DRIVE BOARD.

(b) Check the output signal for the DEVELOPER PUMP CIRCUITS on the DRIVE BOARD:

Signal	Position on DRIVE BOARD	Voltage
DEVELOPER RECIRCULATION PUMP	PIN 15 to PIN 3 on CN2	approximately 100 V AC
DEVELOPER REPLENISHMENT PUMP	PIN 19 to PIN 7 on CN2	approximately 100 V AC

[5] If the voltages are correct, check the PUMP for a malfunction. If the voltages are not correct, check SOLID STATE RELAY SSR2 or SSR4 on the DRIVE BOARD.

Checking the FIXER PUMPS



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[1] Enter mode 5.

Caution

Operating the PUMPS excessively without solution might cause damage to the PUMPS.

[2] Press and hold the “RUN” BUTTON on the CONTROL BOARD.

Note

Holding the “RUN” BUTTON:

- Actuates the FIXER RECIRCULATION PUMP and illuminates LED 3 continuously.
- Actuates the FIXER REPLENISHMENT PUMP and illuminates LED 5 continually.

[3] Check LED 3 and LED 5. If either LED does not illuminate, a malfunction in the I/O BOARD or the I/O BOARD/ DRIVE BOARD CABLE is the primary cause.

[4] If LED 3 and LED 5 illuminate and the PUMPS do not operate:

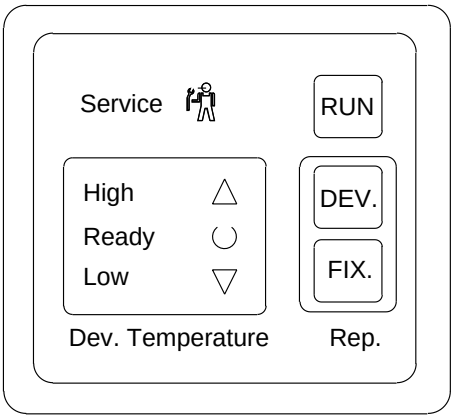
(a) Check FUSE F1 on the DRIVE BOARD.

(b) Check the output signal for the FIXER PUMP CIRCUITS on the DRIVE BOARD:

Signal	Position on DRIVE BOARD	Voltage
FIXER RECIRCULATION PUMP	PIN 5 to PIN 17 on CN2	approximately 100 V AC
FIXER REPLENISHMENT PUMP	PIN 21 to PIN 9 on CN2	approximately 100 V AC

[5] If the voltages are correct, check the PUMP for a malfunction. If the voltages are not correct, check SOLID STATE RELAY SSR3 or SSR5 on the DRIVE BOARD.

Checking the WATER SOLENOID VALVE



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[1] Enter mode 6.

[2] Press and hold the “RUN” BUTTON on the CONTROL BOARD.

Note

Pressing and holding the “RUN” BUTTON actuates the WATER SOLENOID circuit and illuminates LED 11 on the DRIVE BOARD. LED 6 might illuminate for 0.5 seconds, but LED 6 is not used in this evaluation.

[3] If the WATER SOLENOID VALVE does not operate, check the input voltages:

Position on the DRIVE BOARD	“RUN” BUTTON	Voltage
P1 (GND), PIN 1 on U1	pressed	0 - 1 V DC
P1 (GND), PIN 1 on U1	released	4 - 5 V DC

[4] If the control voltages are not correct, check the I/O BOARD or the I/O BOARD/DRIVE BOARD CABLE.

[5] If the input voltages are correct and the SOLENOID VALVE does not operate, check the output voltages:

Position on the DRIVE BOARD	“RUN” BUTTON	Voltage
PIN 1 to PIN 2 on CNP6 on the DRIVE BOARD	pressed	9 V DC, following a 24 V DC pulse
PIN 1 to PIN 2 on CNP6 on the DRIVE BOARD	released	0 V DC

[6] If the output voltages are not correct check the DRIVE BOARD. If all voltages are correct, check the WATER SOLENOID VALVE.

Checking the COVER INTERLOCK SWITCHES

[1] Enter mode 7.

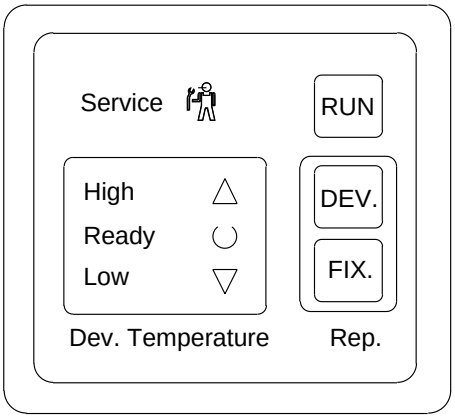
[2] Install the COVER on the PROCESSOR.

[3] Check that LED 7 on the DRIVE BOARD is illuminated.

[4] If LED 7 is not illuminated, measure the resistance of the COVER INTERLOCK SWITCHES. Remove the COVER and make the measurements again:

SWITCH	Position	Resistance
SW55	PIN 1 and PIN 2 at CNP10 on the DRIVE BOARD	Approximately 0 Ohms with the COVER installed, Open•circuit without the COVER
SW54	PIN 1and PIN 2 at CNP11 on the DRIVE BOARD	Approximately 0 Ohms with the COVER installed, Open•circuit without the COVER

Checking the DRIVE MOTOR



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[1] Do the procedure “Checking the COVER INTERLOCK SWITCHES”.

[2] Install the COVER on the PROCESSOR.

[3] Enter mode 7.

[4] Press and hold the “RUN” BUTTON on the CONTROL BOARD.

Note

Pressing and holding the “RUN” BUTTON operates the DRIVE MOTOR and illuminates LED 1 on the DRIVE BOARD.

[5] Check LED 1. If LED 1 does not illuminate when the “RUN” BUTTON is pressed, a malfunction in the I/O BOARD or the I/O BOARD/DRIVE BOARD CABLE is the primary cause.

[6] If LED 1 illuminates but the DRIVE MOTOR does not operate, check the DRIVE MOTOR voltage:

Position	Voltage
PIN 1 and PIN 2 on DRIVE BOARD CONNECTOR CN2	Approximately 100 V AC

[7] If the voltage is correct, check the DRIVE MOTOR for a malfunction.

[8] If the DRIVE MOTOR voltage is not correct, check the voltage to RELAY RY51/DRIVE MOTOR:

Position	Voltage
PIN 1 and PIN 14 on DRIVE BOARD CONNECTOR CN2	Approximately 100 V AC

[9] If the voltage is correct, check RELAY RY51 or the COVER INTERLOCK CIRCUIT. If the voltage is not correct, check RELAY SSR 1 on the DRIVE BOARD.