Section 3: Diagnostics

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Error Codes

Note

See the Theory of Operation in Section 2 for further explanation of the Error Codes.

Error Code	Error Description	Possible Malfunction	Action
E080	BIN ASSEMBLY not in position	BIN ASSEMBLY removed from SORTER	Install the BIN ASSEMBLY.
		S20 BIN INTERLOCK SWITCH	Install a new S20 BIN INTERLOCK SWITCH.
		4000 BOARD	Check that the 4000 BOARD is supplying 24 V return on P/J 4001 PIN 3 when S20 is ON. If necessary, install a new 4000 BOARD.
		100 BOARD	Check that the 100 BOARD is supplying 24 V return on P/J123 PIN 22 when S20 is ON. If necessary, install a new 100 BOARD.
		500 BOARD	If the above checks do not determine the problem, install a new 500 BOARD.
E081	FILM TRAY not in position	FILM TRAY removed while TOP COVER is open	Close the TOP COVER or install the FILM TRAY.
		S21 FILM TRAY SENSOR	Adjust the S21 SENSOR or install a new SENSOR.
		100 BOARD	Check that the 100 BOARD is supplying +5 V on P/J123 PIN 22 when S21 is ON. If necessary, install a new 100 BOARD.
		500 BOARD	If the above checks do not determine the problem, install a new 500 BOARD.

Error Code	Error Description	Possible Malfunction	Action
E082	Speed of the 180 LP PROCESSOR is out of range	PROCESSOR transport not operating	Using the PORTABLE COMPUTER diagnostics, energize the PROCESSOR transport. Check for nominal 230 V AC on the PROCESSOR B6 Motor CONNECTOR P/J22 PINS 2 and 3. If correct voltage is present and the MOTOR is not running, change the B6 MOTOR. If the correct voltage is not present, check the F3 FUSE in the ELECTRICAL BOX of the PROCESSOR. If necessary, install a new FUSE.
		PROCESSOR speed ENCODER U11 or the 100 BOARD	Using the PORTABLE COMPUTER diagnostics, energize the PROCESSOR transport. Check for 0 - 5 V pulses (nominal frequency of 26 - 30 Hz) at P/J123 PIN 31 or TP16 on the 100 BOARD. If there is no signal, install a new U11. If the signal is correct, check P/J123 PIN 26 for 5 V pulses (nominal frequency of 26 - 30 Hz). If the signal is not present, install a new 100 BOARD.
		500 BOARD	If the above checks do not determine the problem, install a new 500 BOARD in the PROCESSOR.

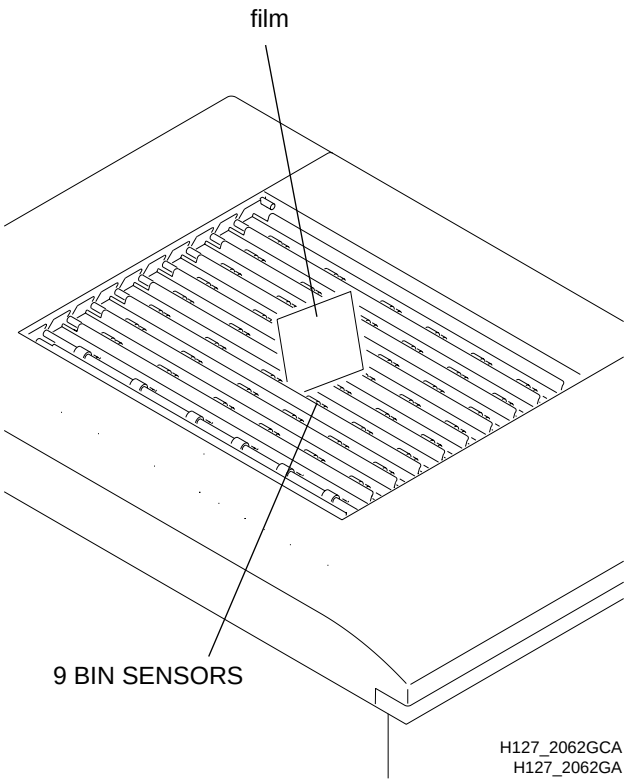
Error Code	Error Description	Possible Malfunction	Action
E083	Inoperative Transport in the SORTER	4000 BOARD	Check that DS3 on the 4000 BOARD (indicates 24 V is being supplied to the MOTOR CONTROLLER BOARD) is illuminated when the BIN INTERLOCK SWITCH is ON. If DS3 is OFF, install a new 4000 BOARD.
		500 BOARD	Using the PORTABLE COMPUTER diagnostics, energize the DRIVE MOTOR in the SORTER. • Measure P/J504 PIN 10 in the ELECTRICAL BOX (SORTER speed control). The voltage should be approximately 4 V for nominal speed of 63 in./min. • Measure P/J507 PIN 2 in the ELECRICAL BOX (CW/CCW signal) It should be low (between 0 and 0.8 V). • Measure P/J507 PIN 3 in the ELECTRICAL BOX (start/stop signal). It should be low (between 0 and 0.8 V). Measure P/J507 PIN 9 in the ELECRICAL BOX (run/brake signal) It should be low (between 0 and 0.8 V). If necessary, install a new 500 BOARD.
		100 BOARD, MOTOR CONTROLLER, or DRIVE MOTOR	• If the DRIVE MOTOR in the SORTER is operating: 1. Check for 0 - 5 V pulses (nominal frequency of 350 Hz 10Hz) at P/J111 PIN 1 ot TP18 on the 100 BOARD. If there is no signal, install a new DRIVE MOTOR or MOTOR CONTROLLER. 2. If the correct signal is present on P/J111 PIN 1, check for 0 - 5 V pulses (nominal frequency of 350 Hz 10Hz) on P/J123 PIN 23. If there is no signal, install a new 100 BOARD. • If the DRIVE MOTOR in the SORTER is not operating and the 500 BOARD is sending the correct control voltage: 1. Install a new MOTOR CONTROLLER. 2. Install a new MOTOR.
		BIN INTERLOCK SENSOR	If the circuit incorrectly indicates that the BIN is in position, even though the BIN is removed and the MOTOR CONTROLLER is de-energized, check the 100 BOARD. If necessary, install a new 100 BOARD.
		Mechanical Binding	Check that the transport system in the SORTER is not binding. Repair if necessary.

Error Code	Error Description	Possible Malfunction	Action
E091 - E099	Film did not arrive at BINS 1 - 9 (the last digit of the error code = the BIN No.)	This error may occur because the film did not arrive at the correct BIN at the expected time or because it arrived at the correct BIN but was not sensed.	
		Film jam in the SORTER	• Clear the jam. • Check that the BIN capacity of 50 sheets per BIN is not exceeded. • Check that the films exiting the PROCESSOR are fully dry. If necessary, increase the temperature of the DRYER.
		Damp films sticking to the DIVERTER, forcing the DIVERTER to close	Increase the temperature of the DRYER.
		A lower numbered DIVERTER (“upstream”)	Check if a DIVERTER before the selected DIVERTER is in the down position. Repair as necessary. See “Troubleshooting the DIVERTERS” on Page 3–8.
		DIVERTER X (X = last digit in the Error Code)	Repair the DIVERTER. See “Troubleshooting the DIVERTERS” on Page 3–8.
		If the film arrived at the correct BIN but was not sensed:	
		BIN SENSOR in MODULE X (X = last digit in the Error Code)	SENSOR is not sensing film. See “Troubleshooting the BIN SENSORS” on Page 3–6.
E101 - 109	Film jam at BIN 1 - 9 (the last digit of the error code = the BIN No.)	Film jam in the SORTER	• Clear the jam. • Check that the BIN capacity of 50 sheets per BIN is not exceeded. • Check that the films exiting the PROCESSOR are fully dry. If necessary, increase the temperature of the DRYER.
		DRYER or EXIT RACK in the PROCESSOR causing a delay in the film transport	• Clean and repair, if necessary, the DRYER and EXIT RACKS. • Check for any binding. • Check for damaged DRIVE GEARS and worn BEARINGS in the DRYER.
E111 - 119	Unexpected film sensed at BIN 1 - 9 (the last digit of the error code = the BIN No.)	DIVERTER X (X = last digit in the Error Code)	Check if the DIVERTER is in the down position, causing film to enter the unexpected BIN. If down, repair the DIVERTER. See “Troubleshooting the DIVERTERS” on Page 3–8.
		BIN SENSOR in MODULE X (X = last digit in the Error Code)	SENSOR is incorrectly reporting film when no film is there. See “Troubleshooting the BIN SENSORS” on Page 3–6.

Error Code	Error Description	Possible Malfunction	Action
E182	LASER PRINTER's sorting queue is full. PRINTER is receiving Film Exited commands faster than it expects film to be exiting the PROCESSOR and entering the SORTER.	EXIT SWITCH	Check the mounting and connections of the EXIT SWITCH in the EXIT RACK.
		Faulty connection between PROCESSOR and LASER PRINTER causing PRINTER to receive signals intermittently.	Check the connection between the LASER PRINTER and the PROCESSOR.
E183	Sorter time has expired at the PRINTER. The LASER PRINTER did not receive either a Film In Bin command or an error from the PROCESSOR for a film that it is tracking through the SORTER.	Faulty connection between PROCESSOR and LASER PRINTER causing PRINTER not to receive signals.	Check the connection between the LASER PRINTER and the PROCESSOR.
		Processor's POWER SUPPLY was reset causing film destinations to be lost from memory.	Check for shorted connections and high current loads on POWER SUPPLY.
		500 BOARD	Check connections to the 500 BOARD. Install a new 500 BOARD if necessary.
W184	LASER PRINTER's sorting queue error. The PRINTER received a Film In Bin command specifying a BIN No. that does not match the BIN No. saved for the oldest in its sorting queue.	Faulty connection between the PROCESSOR and the PRINTER, causing PRINTER to receive signals intermittently. If it missed one command in a series, the PRINTER queue would be out of sequence with the commands received.	Check the connection between the LASER PRINTER and the PROCESSOR.

Troubleshooting the BIN SENSORS

Figure 3–1 **Checking the BIN SENSORS**



[1] Using the PORTABLE COMPUTER, go to the specific test mode, “Sorter Sensor Test”. The status of the BIN SENSORS will be displayed. With no film in the SENSOR area, “No Film Detected” should be displayed.

[2] Place a piece of film in the SENSOR area. “Film Detected” should be displayed.

Note

- A malfunction might be caused by a malfunctioning SENSOR, 100 BOARD, 500 BOARD, or loose or faulty CONNECTORS. See the Circuit Diagrams in Section 5 for the CONNECTOR numbers involved.
- If a BIN SENSOR is disconnected, the “Sorter Sensor Test” on the PORTABLE COMPUTER will indicate “Film Detected” for that SENSOR.

If a malfunction occurs, proceed as follows:

[3] Interchange the BIN SENSOR with a known good SENSOR to see if the BIN SENSOR is causing the malfunction. For example, assume that BIN SENSOR No. 3 is malfunctioning:

(a) De-energize the PROCESSOR.

(b) Disconnect CONNECTOR P/J115 for BIN SENSOR No. 3 from the 100 BOARD.

(c) Disconnect the adjacent CONNECTOR P/J116 (for BIN SENSOR No. 4) from the 100 BOARD, and connect it to P115 on the 100 BOARD. Energize the PROCESSOR. BIN SENSOR No. 3 should indicate “No Film Detected” on the PORTABLE COMPUTER.

(d) Place a piece of film in the SENSOR area for BIN No. 4. BIN SENSOR No. 3 should indicate “Film Detected” on the PORTABLE COMPUTER.

(e) If the interchanged BIN SENSOR works correctly, replace the malfunctioning BIN SENSOR disconnected in Step (b).

Note

The BIN SENSOR in the extreme right MODULE is not used. Therefore, you may swap this MODULE with any other MAIN MODULE to temporarily repair a SORTER that has a malfunctioning SENSOR.

[4] Check the SENSOR Enable Signal. Check for a pulsed 5 V signal (ON for 80 mseconds, OFF for 100 mseconds) at P/J508 PIN 14 on the 500 BOARD.

Note

Remain in the “Sorter Sensor Test” to keep the Enable Signal ON.

- If no signal is present, install a new 500 BOARD.
- If a signal is present at P/J508 PIN 14, check for a pulsed 5 V signal (OFF for 80 mseconds, ON for 100 mseconds) at P/J113 PIN 5 or TP15 on the 100 BOARD. If no signal is present, install a new 100 BOARD.

[5] If the above steps do not isolate the problem, check the SENSOR Output Signal from the 100 BOARD at the PINS in the table below. There should be a pulsing 5 V signal (ON for 80 mseconds, OFF for 100 msecond) when film is in the BIN SENSOR area. There should be a 0 V signal when no film is in the area. If no signal is present, install a new 100 BOARD.

Pin No. on P/J123	BIN SENSOR No.
2	1
4	2
6	3
8	4
10	5
12	6
14	7
16	8
18	9

[6] If the above steps do not isolate the problem, install a new 500 BOARD.

Troubleshooting the DIVERTERS

[1] Using the PORTABLE COMPUTER, go to the specific test mode, “Sorter Component Test”. Activate the DIVERTERS to check that the DIVERTER is up when the DIVERTER is “OFF” and down when the DIVERTER is “ON”.

Important

A malfunction might be caused by a mechanical problem; loose or faulty CONNECTORS; or a malfunctioning DIVERTER SOLENOID, 500 BOARD, or 100 BOARD. See the Circuit Diagrams in Section 5 for the CONNECTOR numbers involved.

The 100 BOARD might fail in the mode of applying a constant 24 V to the SOLENOID. This will, in many cases, cause a failure of the SOLENOID (partial shorting of the coil). If only the SOLENOID is replaced, the faulty BOARD will cause the new SOLENOID to fail. If a new BOARD is installed with a faulty SOLENOID, the faulty SOLENOID might cause the new BOARD to fail. It is, therefore, important to proceed in the following sequence.

If a malfunction occurs, proceed as follows:

[2] Manually move the DIVERTER to check that the DIVERTER is operating smoothly. Check for any binding, a missing SPRING, etc.

[3] Measure the resistance of the SOLENOID. It should be approximately 9 - 11 ohms. If the resistance is not correct, install a new SOLENOID. Do not connect a SOLENOID that has incorrect resistance to a new 100 BOARD. It can cause damage to the BOARD.

[4] Check the signal from the 500 BOARD at the PINS in the table below. The voltage should be 0 V when the DIVERTER is de-energized and 5 V when the DIVERTER is energized. If the voltage is incorrect, install a new 500 BOARD.

PIN No. on P/J506	DIVERTER No.
7	1
8	2
9	3
10	4
11	5
13	6
14	7
15	8

Important

Be sure that the PROCESSOR is de-energized before you disconnect or connect a SOLENOID.

[5] De-energize the PROCESSOR.

[6] With the SOLENOID disconnected, measure the voltage at the CONNECTOR for the SOLENOID on the 100 BOARD.

- **(a)** Using the “Sorter Component Test”, check that the voltage is 0 with the DIVERTER “Off”.
- **(b)** Turn on the DIVERTER. The voltage should initially be 20 - 24 V and quickly ddrop to 4 - 6 V over the next $^1/_4$ second.
- **(c)** If these signals are not correct, install a new 100 BOARD.

[7] Replace the DIVERTER SOLENOID with a known good SOLENOID to see if the SOLENOID is causing the malfunction. For example, assume that DIVERTER SOLENOID No. 3 is malfunctioning:

- **(a)** Disconnect CONNECTOR P/J103 for DIVERTER SOLENOID No. 3 from the 100 BOARD.
- **(b)** Disconnect the adjacent CONNECTOR P/J104 (for BIN SENSOR No. 4) from the 100 BOARD, and connect it to P103 on the 100 BOARD.

(c) Using the PORTABLE COMPUTER “Sorter Component Test”, energize DIVERTER SOLENOID No. 3.

(d) If the interchanged SOLENOID works correctly, replace the malfunctioningDIVERTER SOLENOID disconnected in Step (a).

Note

If you measure the output of the 100 BOARD to the DIVERTER SOLENOID, the voltage should be 20 - 24 V for $^1/_4$ second after the SOLENOID is energized and 4 - 6 V holding voltage after $^1/_4$ second. See Section 2, “Theory of Operation”, for more details on the operation of the 100 BOARD.