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4 | TROUBLESHOOTING

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4.1. Introduction

This chapter describes how to respond to the troubles that may arise with the printer. The procedures are easy to follow as the main procedures are written in flow charts.

First of all, trace the **General Flow Chart** in section 4.3. to find the appropriate troubleshooting approach to be taken as explained in 4.1.1. below.

Before starting troubleshooting, ensure that the location of the printer used satisfies the environment conditions described in section 4.2.1.

4.1.1. Using flow charts

In the flow charts that follow, problems are categorized as follows, depending on the part of the printer in which the trouble has been located.

- ❖ **Power problem.** Malfunctions caused by the defects in the power supply section.
- ❖ **Front panel problem.** Malfunctions concerning the display and key entry functions.
- ❖ **Problems with error message.** Malfunctions detected by the internal microprocessors and messaged on the front panel.
- ❖ **Paper feed problem.** Defects in the paper feed path.
- ❖ **Print quality problem.** Defects of print quality.
- ❖ **Host interface problem.** Malfunctions in the host interfaces (serial, parallel, and option).

After the part which is causing the problem is isolated, refer to the corresponding subsection in section 4.4. *Troubleshooting Procedures*. This section describes the troubleshooting procedures for each problem as categorized in section 4.3.

4.2. Environmental Requirements

Examine first the compliance of the specific location of the printer to the requirements below before proceeding with troubleshooting.

The use of the printer in a location which does not satisfy these requirements may cause subsequent troubles and may shorten its service life. If the printer appears to be used in an adverse condition, advise the user to use it in a proper environment.

4.2.1. Environment conditions

Temperature: 10°C to 32.5°C (50°F to 90.5°F)

Humidity: 20% to 80% RH

Optimum condition: 20°C, 65% RH

Altitude: Maximum 2000 m (6500 feet)

Power source: The tolerance of the power voltage should be less than **±10% and the frequency ±1Hz for all countries.**

Placement: The printer should be placed on a firm, stable base.

Others: Away from heat sources, steam, humidized air, etc.; Away from generation of ammonium gas, etc.

4.3. General troubleshooting

Figure 4.1. General Troubleshooting Flow

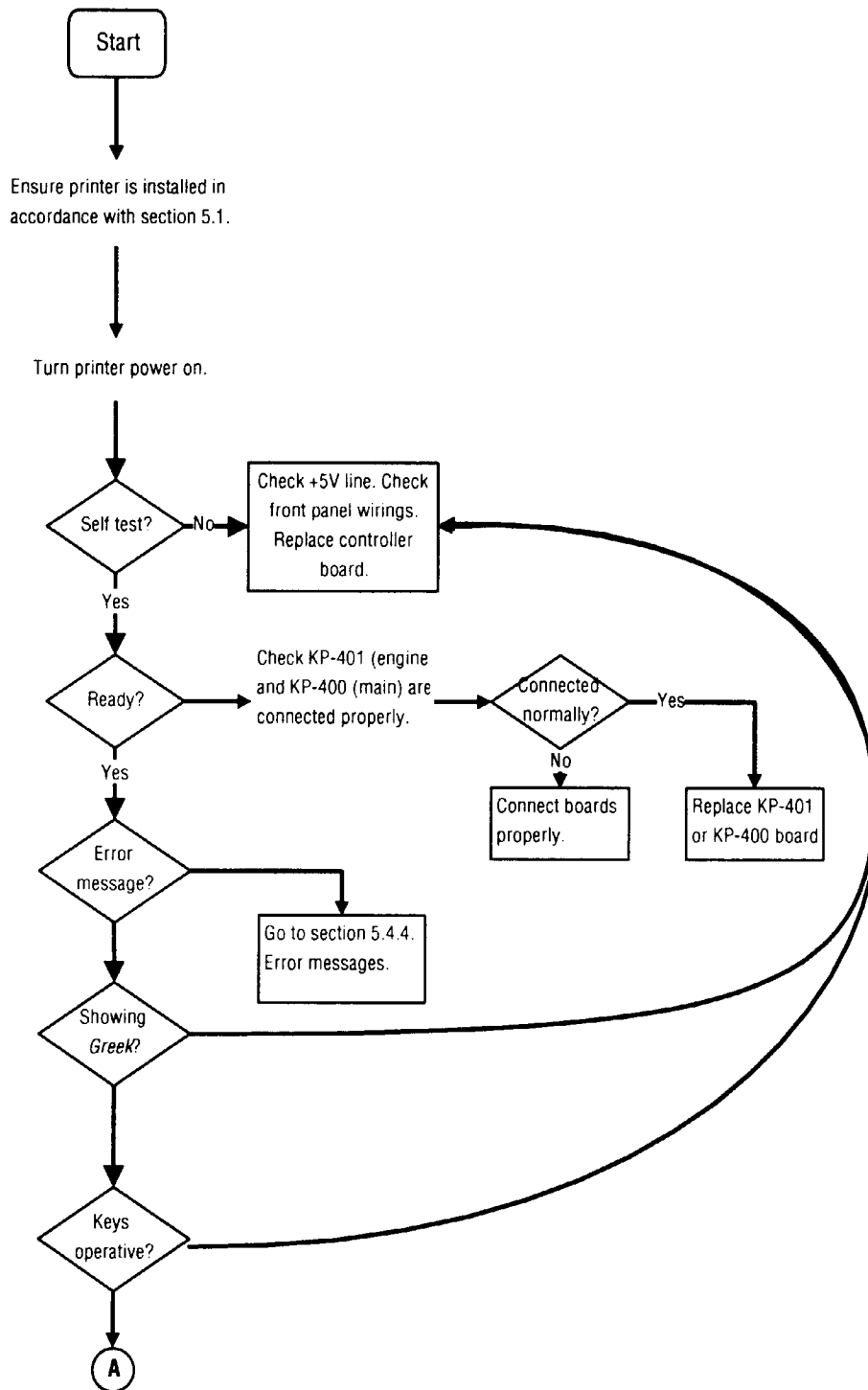
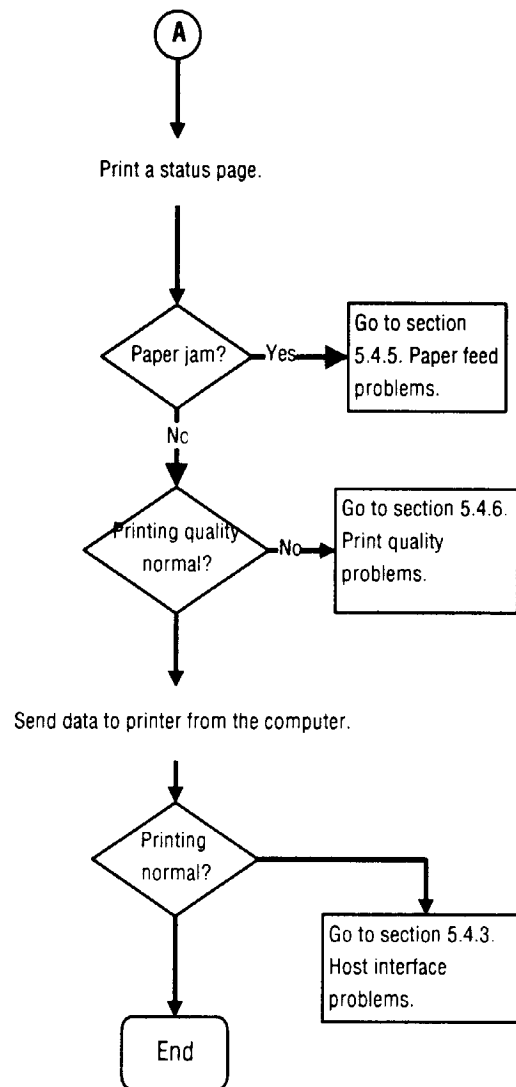


Figure 4.2. General Troubleshooting Flow



4.4. Electrical troubleshooting

In this section the following troubleshooting procedures are given.

- ❖ Identifying error messages
- ❖ Fuser heater error (E4)
- ❖ Eraser error (E5)
- ❖ Engine CPU error (E6)
- ❖ Engine EEPROM error (E7)
- ❖ Toner motor error (E9)
- ❖ Top cover open error
- ❖ Process unit installation error
- ❖ Paper empty error

4.4.1. Identifying electrical error messages

This section provides information on how to respond to the SERV. (Call for service) messages given on the printer's message display. The messages are headed by a code beginning with E or F and a number. Codes beginning with E implies mechanical problems which are detected by the engine system; while codes beginning with F indicate errors occurred in the main logic controller.

The following table lists the printer's messages concerning the printer's electrical problem. The corrective actions to be taken against them are also given.

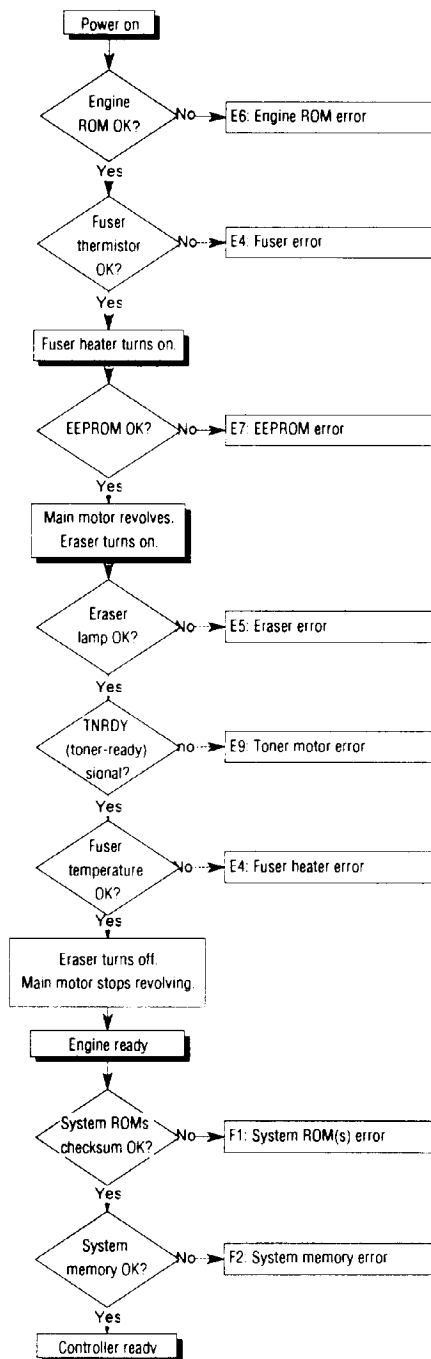
	Message	Meaning	Corrective action
Engine system	E4: SERV. 012345	Fuser heater error.	Refer to page 4-9.
	E5: SERV. 012345	Eraser error.	Refer to page 4-10.
	E6: SERV. 012345	Engine ROM check sum error.	Replace the engine (KP-401) board.
	E7: SERV. 012345	EEPROM error.	Replace the EEPROM on the engine (KP-401) board.
	E9: SERV. 012345	Toner motor error.	Refer to page 4-11.
Controller	F1: SERV. 012345	System checksum error.	Replace the main controller (KP-400) board.
	F2: SERV. 012345	Main RAM error.	
	F3: SERV. 012345	General controller error.	Switch the printer off then on. If not recovered, replace the main controller board.

See section 4.4.4. for other paper feed problems.

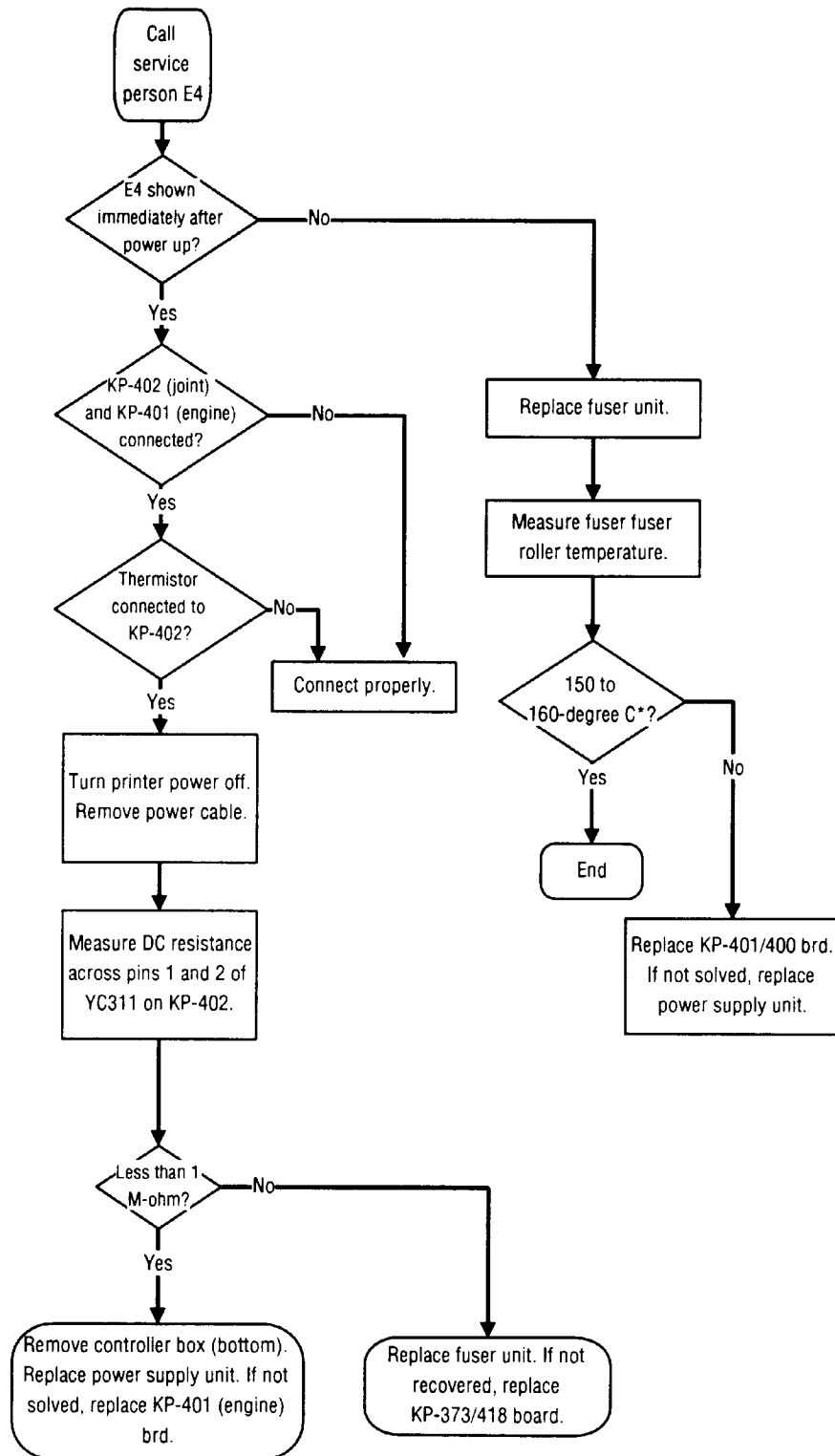
Engine check sequence at power-up

The SERV. messages are given on the message display at the printer's power-up if the specific item fails to clear the self diagnostics sequence performed internally by the printer's engine system. The table below shows the sequence of the items to be diagnosed one by one at power up.

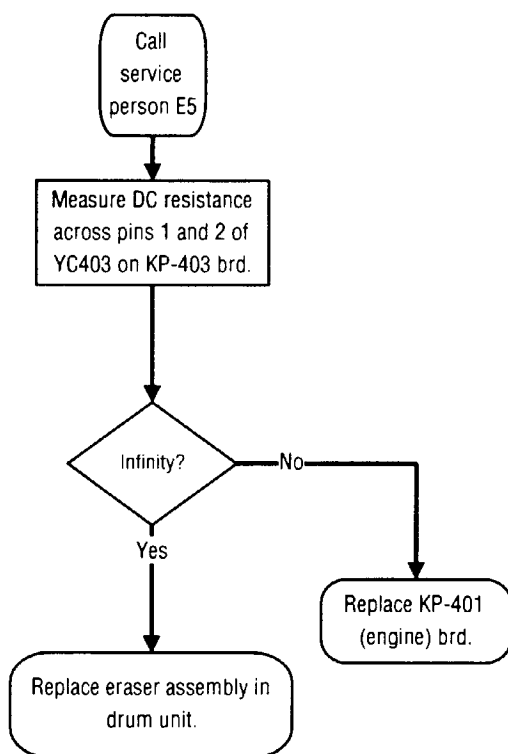
Figure 4.3. Engine Self-diagnostics Sequence (E Code)



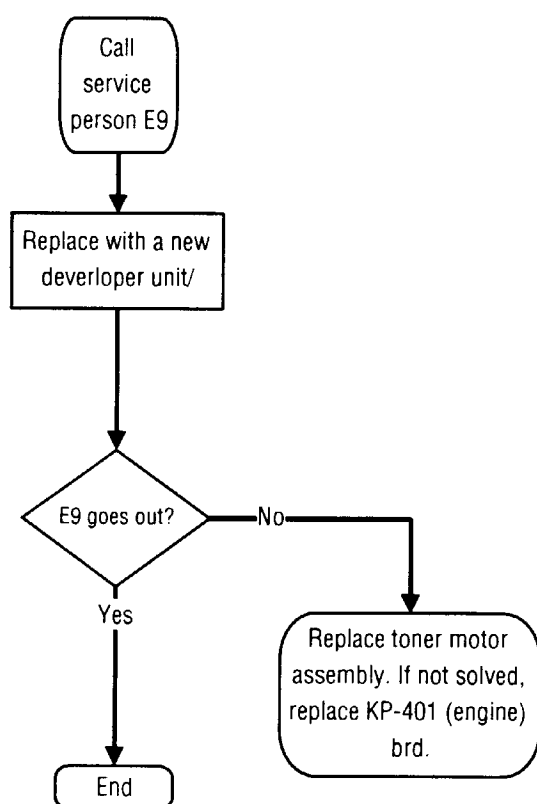
E4: SERV. (Fuser heater error) message



E5: SERV. (Eraser error) message



E9: SERV. (Toner motor error) message



4.4.2. Connector Configurations

KP-401 (engine controller) board

YC-1 (to the engine board [KP-401])

Pin	Signal	Description
A1	GND	Ground
A2	GND	Ground
A3	—	No connection
A4	PPRDY	Printer power ready
A5	ENGIR	Engine interrupt
A6	SBSY	Status busy
A7	CMND	Command
A8	VSYNCR	Vertical synchro
A9	CTRIR	Controller interrupt
A10	RDY	Ready
A11	—	No connection
A12	LEDLS	LED line synchro
A13	LEDENB	LED enable
A14	RES	Reset
A15	FPRW	Front panel R/W
A16	FPENB	Front panel enable
A17	LDS	Lower data strobe
A18	GND	Ground
A19	D6	Data bus
A20	D4	Data bus
A21	D2	Data bus
A22	D0	Data bus
A23	GND	Ground
A24	Vcc	+5V
A25	Vcc	+5V
B1	VDOID	Video ID
B2	Vcc	+5V
B3	Vcc	+5V
B4	CPRDY	Controller power ready
B5	VSREQ	Vertical synchro request
B6	CBSY	Command ready
B7	STAT	Status
B8	SCLK	Serial clock
B9	PRNT	Print
B10	GND	Ground
B11	LEDVDO	LED video data
B12	GND	Ground
B13	LEDVCK	LED video clock
B14	GND	Ground
B15	KBIR	Keyboard interrupt request

Pin	Signal	Description
B16	KYBD	Keyboard select
B17	LEDECK	LED enable clock
B18	LCDRS	LCD register strobe
B19	D7	Data bus
B20	D5	Data bus
B21	D3	Data bus
B22	D1	Data bus
B23	GND	Ground
B24	Vcc	+5V
B25	Vcc	+5V

YC-4 (to the option interface board)

Pin	Signal	Description
1—6	Vcc	+5V
7—11	—	No connection
12—30	BA20—BA2	Address bus
31	BA1	Address bus (LSB)
32, 33	—	No connection
34	OPIF*	Option interface select
35	OPRDY*	Option interface ready
36	ID6	ID data (MSB)
37—41	ID5—ID1	ID data
42	ID0	ID data (LSB)
43	—	No connection
44	—	No connection
45	AS*	Address strobe
46	DS*	Data strobe
47	OPDAC*	Option interface DTAC
48	RW	Read/write
49	OPIR*	Option interface interrupt
50	RESET*	Reset signal
51	D15	Data bus (MSB)
52—65	D14—D1	Data bus
66	D0	Data bus (LSB)
67	VDO%	Video (external input)
68	PLSYNC*	Video output sync signal
69	VCLK1	Video clock
70	PRINT%	Print request
71	VSREQ*	Video sync request
72	VSYNC%	Video sync acknowledge
73	RDY%	Engine ready
74	—	No connection
75—80	GND	Ground

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4.4.3. Other maintenance messages

The messages listed below mean user-maintenance activities.

Message	Corrective Action
Add paper	Add paper to the paper cassette or add a sheet of paper to the manual feed tray.
Paper jam	A paper jam has occurred. Clear the jam as explained in section 4.5.4.
Cover Open	Open the top cover, then close it securely.
Check Process Unit	Turn off the printer power, then check that the process unit and toner container have been properly installed.
Warning LowToner TK-11	The toner level is low. Printing is still possible; however, the toner container must be replaced as soon as possible.
Replace TonerKit TK-11	The toner is completely depleted. The toner container must be replaced in order to resume printing.
Warning Low memory	The printer's internal memory is running out due to too many fonts and macros downloaded. Print a status page to see how much user memory is left and try deleting unnecessary fonts and macros.

4.4.4. Paper feed problems

The message display displays `Paper jam` when paper becomes stuck in the paper transport system, the paper feed timing is incorrect, or paper fails to feed at all.

General suggestions for clearing paper jam

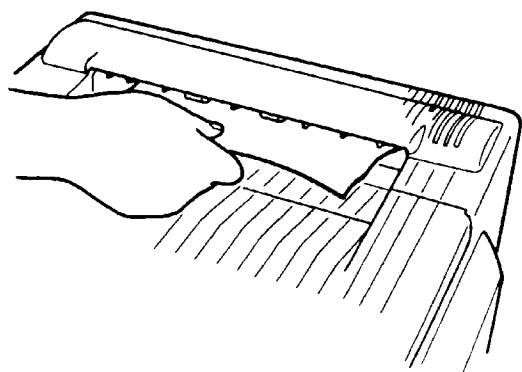
- ❖ Replace paper with another ream of paper.
- ❖ Use another type of paper.
- ❖ Check/replace the main PWB (which may be causing incorrect paper feeding timing).
- ❖ Use power line filter (Noise in power line may cause malfunction of CPU which subsequently will develop paper jam).
- ❖ Check for proper operation on all rollers.

If paper jams occur frequently, try using a different type of paper, replace with paper from another ream, turn the stack of paper over, or turn the paper the other way around. Also, read information in chapter 1.

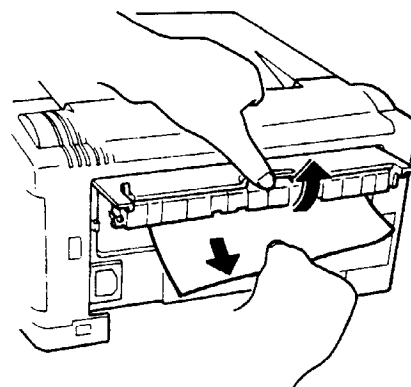
Check the following locations for the jammed paper.

Jam at the Face-down and Face-up (Optional) Trays

Figure 4.4. Jam at the output trays

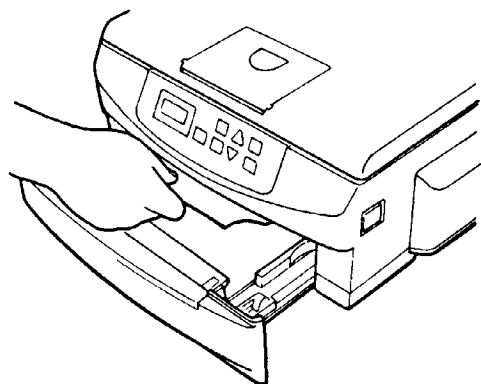


If paper is fed part way out into the tray, pull the paper out the rest of the way by hand (See Figure 5.1). Open and close the printer's top cover to clear the error.

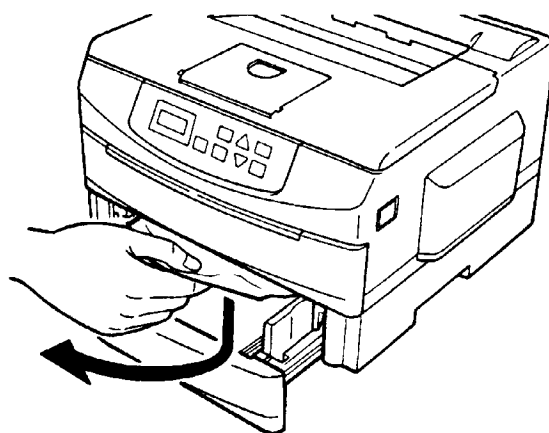


Jam at the Paper Cassette and the (Optional) Paper Feeder's Cassette

Figure 4.5. Jam at Paper Cassette(s)



Pull out the paper cassette and remove any partially fed paper, then reclose the paper cassette. Open and close the printer's top cover to clear the error. Follow the same steps for clearing the jammed paper at the option paper feeder's cassette.

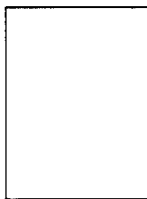


4.4.5. Print quality problems

Print quality problems range from uneven tone to completely blank output. The troubleshooting procedure for each type of problem is given on the following pages.

Note: For all print quality problems, clean the main charger wire and other various parts in the paper path before proceeding.

Blank Printout



The LED head won't light.

Software error.

The LED head is not properly connected to the boards. (Check.)

The LED head driver circuit is defective. (Replace the head.)

KP-402 board is defective. (Replace.)

The developer and main-charging bias is not active.

High voltage generator is defective. (Replace high voltage circuit.)

May also cause the gray background effect.

All-black Printout



The drum surface potential is too low.

LED head does not turn off. (Software error.)

LED head is defective. (Replace.)

The LED head driver circuit is defective. (Replace KP-401 engine board.)

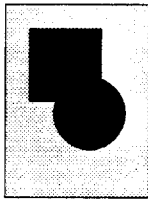
The drum is not main-charged.

The main charging is not active. (Replace KP-401 engine board.)

Wiring is defective between the main charging to the power supply. (Check.)

The charging roller is defective. (Replace the process unit.)

Grey Background



The drum surface potential is too low (lower than approx. 400V).

The main-charging roller is not properly biased. (Replace KP-401 [engine] board or the power supply.)

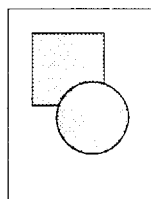
The main-charging roller is defective. (Replace the process unit.)

The developing system is defective.

The toner concentration in the developer is too low or too high. (Replace KP-401 [engine] board or the process unit.)

The developer bias is incorrect. (Check wiring; or replace KP-401 [engine] board or power supply.)

Light Printing



The developing system is defective.

Toner concentration ratio is incorrect.

Replace the process unit.

Developer bias is incorrect.

The developer (powder) is short.

The drum surface potential is too high (greater than 450V).

Main charging is defective. (Replace the process unit.)

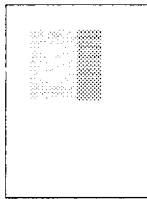
Drum ground is defective. (Check.)

The eraser assembly is defective. (Replace drum.)

The LED head is defective.

The LED luminosity is too low. (Replace KP-401 or KP-402; check the LED head wirings; if not recovered, replace the LED head.)

Non-uniform Printing



Same as Light Printing.

Refer to the previous page.

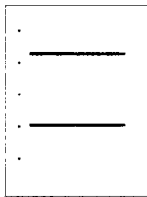
Transferring bias is incorrect.

The transfer system is defective. (Replace KP-401 [engine] board; replace the power supply; or check wiring between the transfer roller and the power supply.)

The transfer roller is defective.

The transfer roller holders are contaminated. (Clean; or replace the transfer roller.)

Dropouts and Streaks



If the streaks, etc. occur at regular intervals of 44 mm (1.74 inches):

The transfer roller is defective. (Replace.)

If the streaks occur at regular intervals of 94 mm (3.7 inches):

The drum or the drum in the process unit is defective. (Replace the process unit.)

If the streaks occur at regular intervals of 37.7 mm (1.5 inches):

The main-charging roller in the process unit is defective. (Replace the process unit.)

If the streaks occur at regular intervals of 56.5 mm (2.6 inches):

The fuser [heat] roller in the process unit is defective. (Replace the process unit.)