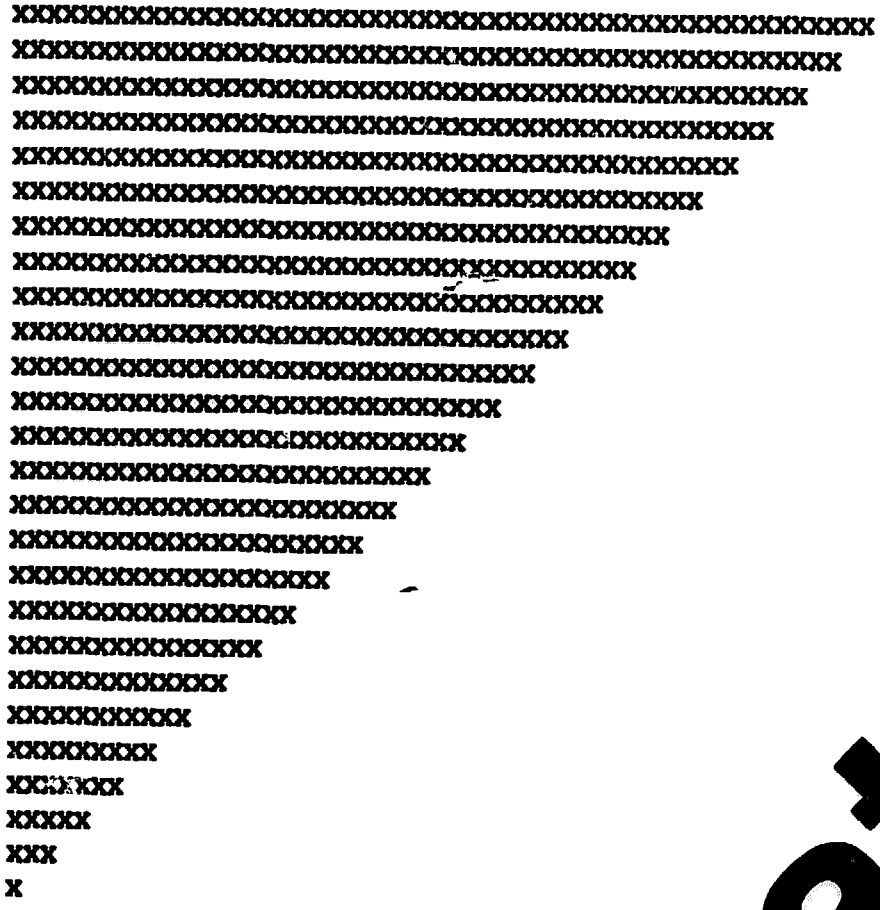

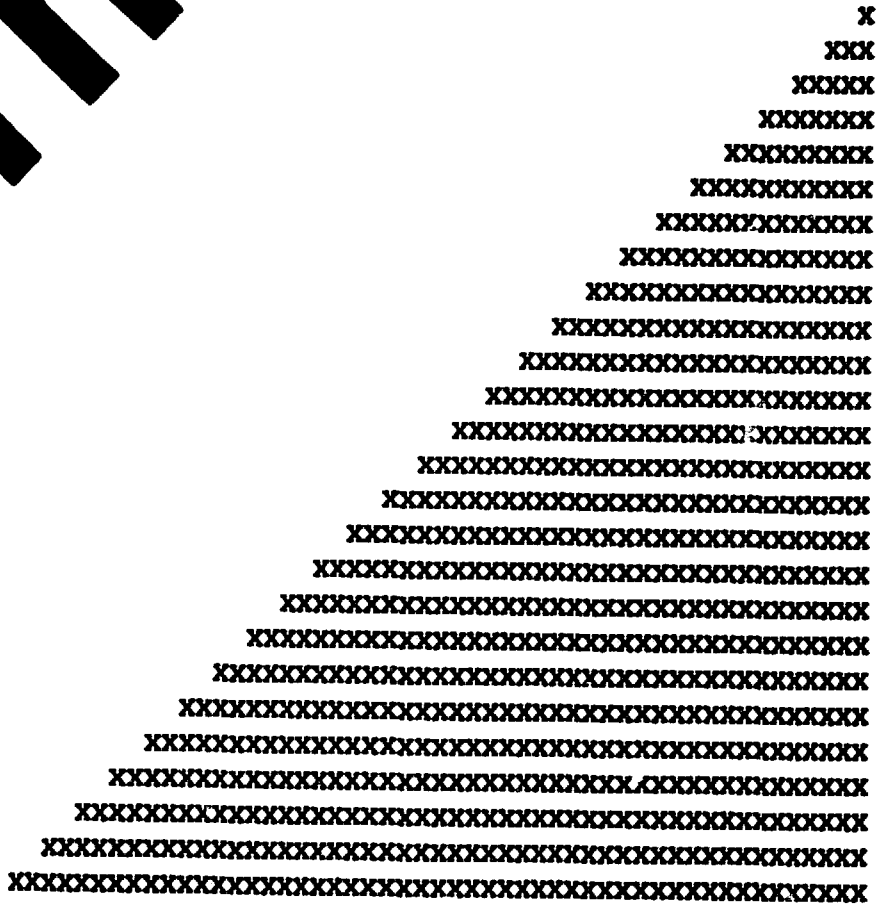

Colormate PS

digital

Service Guide

Order Number: EK-LF01R-SG-001

First Printing, December 1990

FCC NOTICE: This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following methods.

- Reorient the receiving antenna.
- Relocate the computer or peripheral with respect to the receiver.
- Move the computer or peripheral away from the receiver.
- Plug the computer or peripheral into a different outlet so that they are on different branch circuits than the receiver.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the booklet *How to Identify and Resolve Radio/TV Interference Problems*, prepared by the Federal Communications Commission helpful. This booklet is available from the U.S. Government Printing Office, Washington, DC., 20402, Stock No. 004-000-00345-4.

To meet FCC requirements a shielded parallel cable is required to connect the device to a personal computer or other Class B device.

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Preface

This service guide is written for dealers and customer engineers who repair and maintain the Colormate™ PS thermal transfer printer.

Abbreviations

ac	alternating current
BTU	British Thermal Unit
C	Celsius or centigrade
CHAR	character
CSG	cut sheet guide
CW	clockwise
CCW	counterclockwise
dc	direct current
db(A)	decibels
F	Fahrenheit
g	gram
g/m2	grams per square meter
HDC	head cam
hex	hexadecimal
Hz	hertz
LF	line feed
LC	lift cam
in.	inch
kg	kilogram
MB	megabyte
MHz	megahertz
mm	millimeter
MTBF	mean time between failures
PCB	printed circuit board
PS	PostScript
RAM	random access memory
RB	ribbon
RE and RBE	ribbon end
STB	strobe
VA	volt/amperes
µm	micrometer


SECTION 1

Section 1

General Information

The Colormate PS thermal transfer printer uses micro-processor controlled electromechanical components to merge text and graphics and produce presentation-quality, four color output on specially coated sheets of paper or transparencies. The Centronics® parallel, RS-232C serial, RS422 AppleTalk®, and Small Computer Systems Interface (SCSI) ports on the rear of the printer allow it to communicate in the PostScript® language with a variety of input devices. Figure 1-1 shows the main features and controls of the Colormate PS thermal transfer printer.

There are two versions of the Colormate PS printer: an earlier version with 8-megabyte (MB) of built-in random access memory (RAM) and a later version with 8-MB of RAM plus 0.5-MB of read-only memory (ROM). The earlier version has 35 resident fonts and prints on standard size letter and A4 paper or transparencies. The later version has 35 resident fonts and prints on standard letter, A4 and legal size paper or transparencies.

Both versions of the Colormate PS printer are similar, differing only in the configuration of the logic controller board assembly. These differences are explained in the appropriate sections of this service guide.

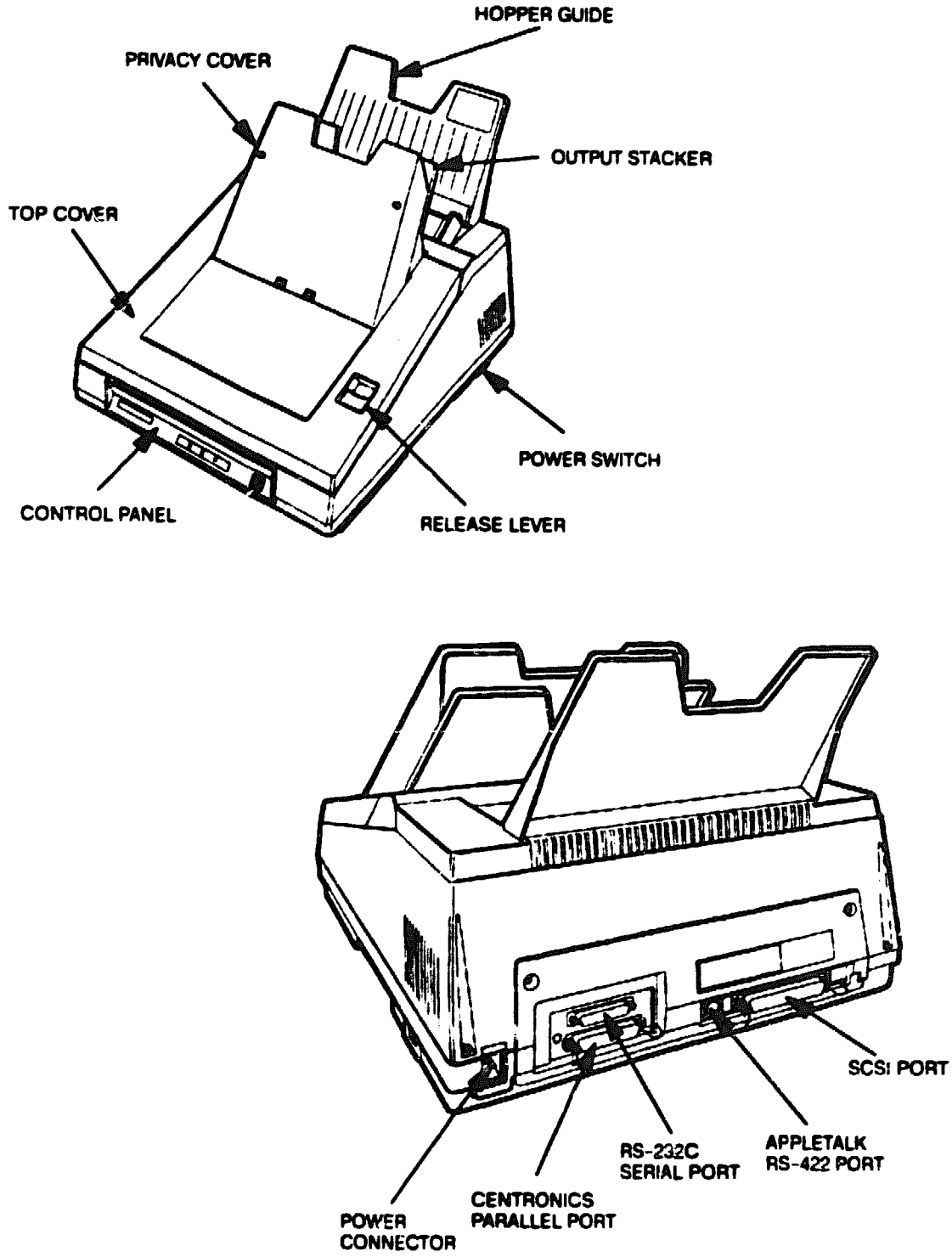


Figure 1-1 Colormate PS Features and Controls

HARDWARE DESCRIPTION

Printer operation is carried out by the following electromechanical assemblies, which are described in the next subsections.

- Paper feed mechanism
- Ribbon feed mechanism
- Print mechanism
- Controller and memory boards
- Power supply
- Sensors

Figure 1-2 shows a block diagram of the printer's main assemblies. Cabling diagrams are provided in Section 2 of this guide and the appendix.

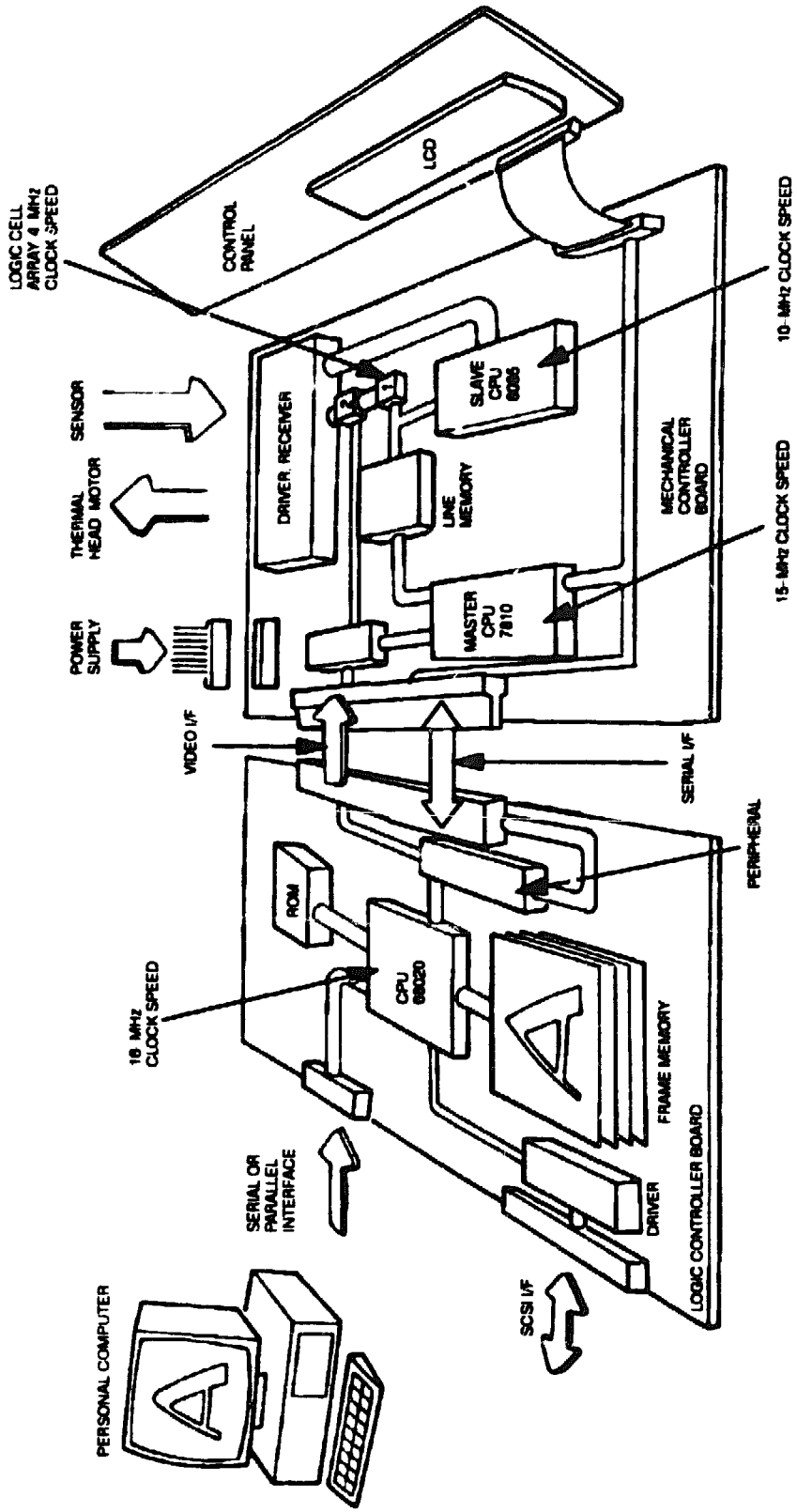


Figure 1-2 Colormate PS Printer Block Diagram

Paper Feed Mechanism

As shown in Figure 1-3, the paper feed mechanism is functionally divided into two submechanisms that are driven by the cut sheet guide (CSG) motor and the line feed (LF) motor.

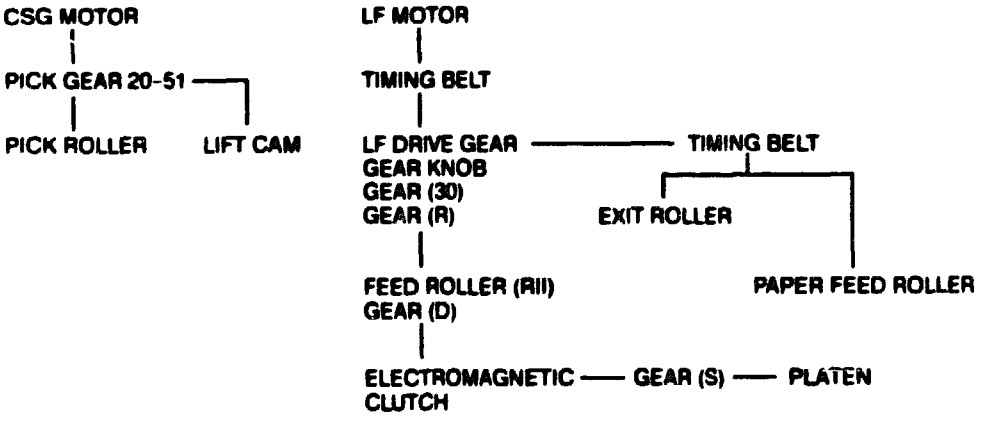


Figure 1-3 Paper Feed Subassemblies

Figure 1-4 shows a cut-away view of the paper feed mechanism inside the printer. During the printing process, these parts move the paper across the thermal print head from one to four times, depending on the number of colors being produced. Paper feed operation depends on the direction of CSG motor rotation, various sensor settings, and the condition (locked or free) of the electromagnetic clutch.

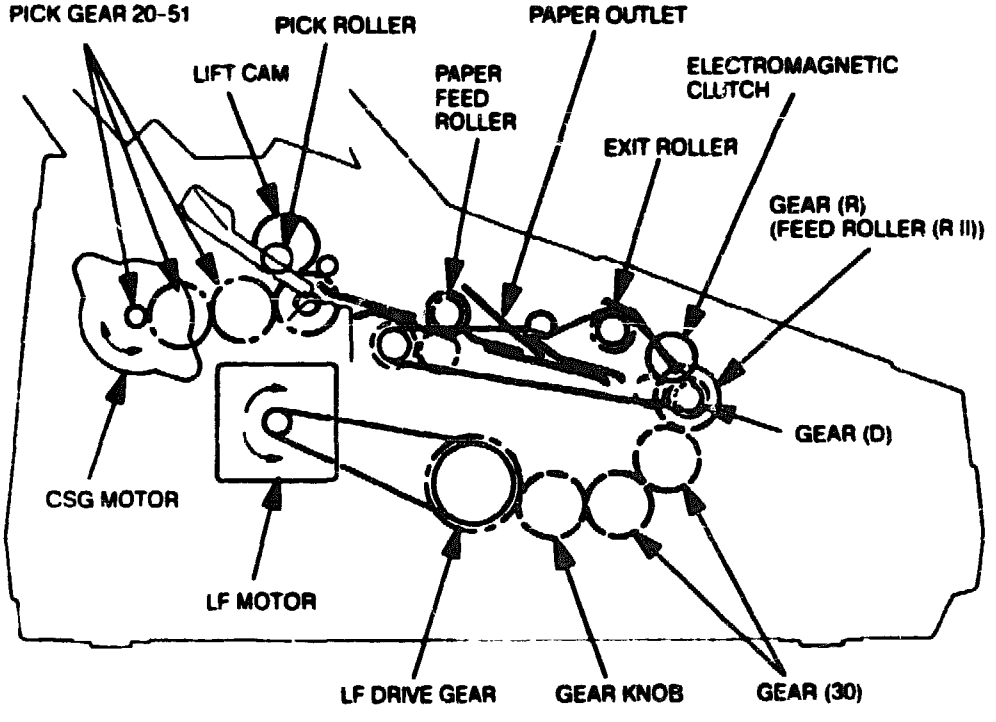


Figure 1-4 Paper Feed Mechanism

Ribbon Feed Mechanism

An outline of ribbon feed mechanism subassemblies is provided in Figure 1-5. Figure 1-6 shows a cut-away view of the ribbon feed mechanism inside the printer, and Figure 1-7 summarizes ribbon feed operation. The ribbon feed mechanism moves the ribbon across the thermal print head, where it presses against the paper. Ink from the ribbon is applied to the paper each time it crosses the print head by the heating of individual print head elements (resistors).

See the following subsections for further details about the printing process.

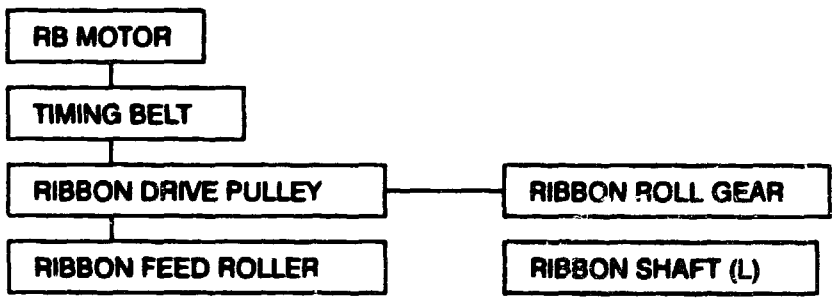


Figure 1-5 Ribbon Feed Mechanism Subassemblies

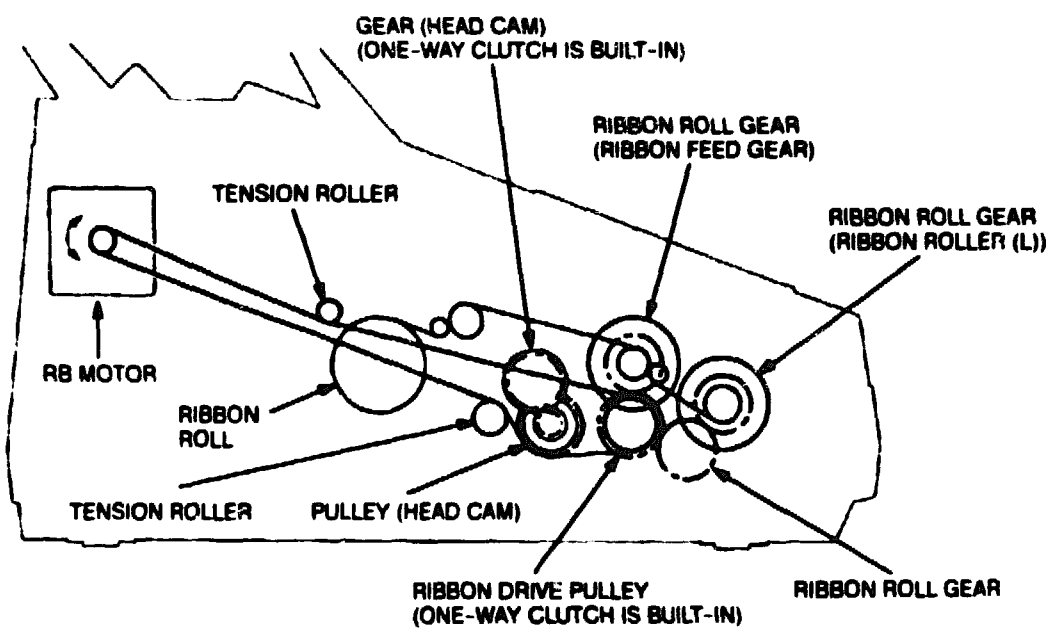


Figure 1-6 Ribbon Feed Mechanism

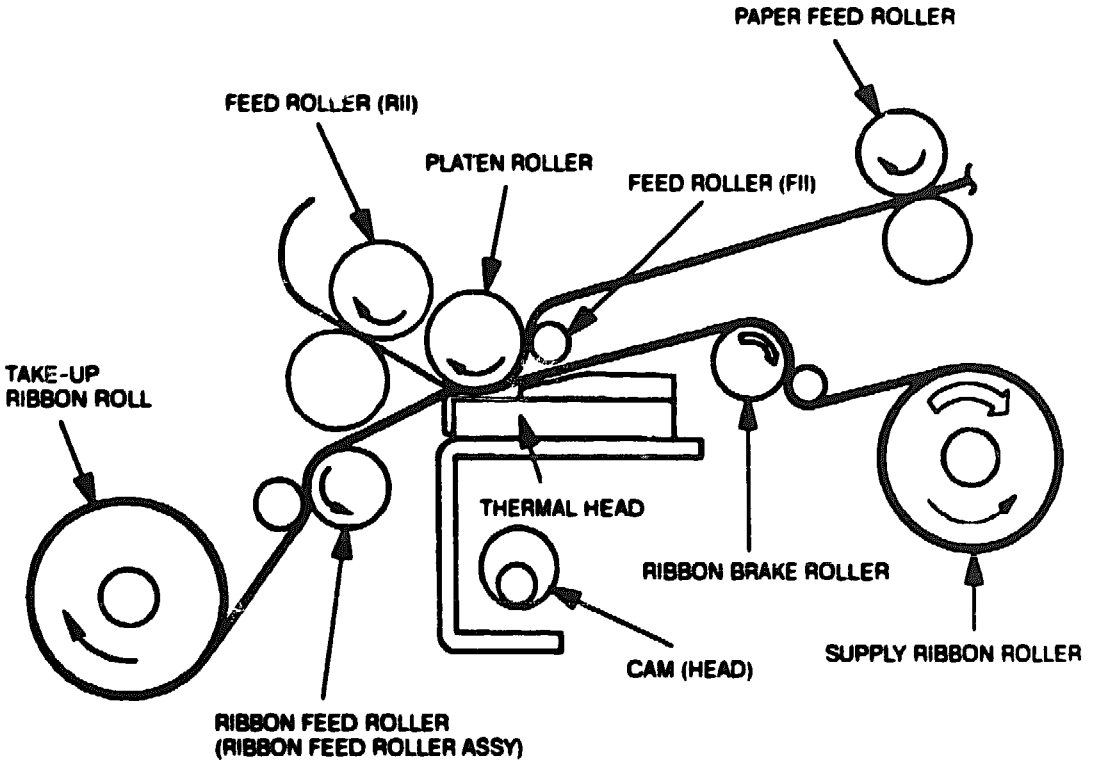


Figure 1-7 Ribbon Feed Operation

Print Mechanism

When the paper and the ink-film ribbon are pressed between the platen and thermal print head, a print command is sent to the head by the G8CRJ controller and heat builds up in the thermal head heater, which contains a bank of resistors that selectively heat up. The heat transfers ink on the ribbon to areas on the paper that correspond to the heated resistors and fuses the ink to the paper. Figure 1-8 shows the print mechanism.

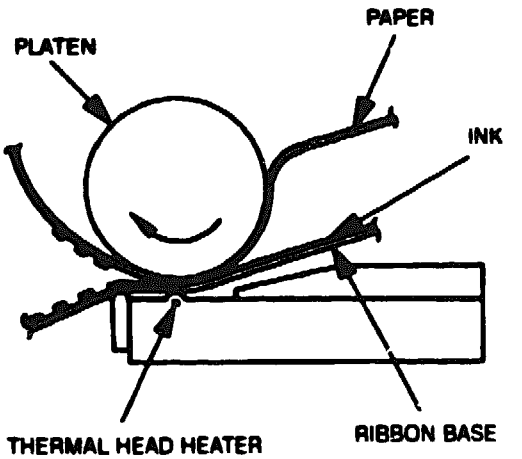


Figure 1-8 Print Mechanism

Print speed is controlled by sending the appropriate strobe (STB) pulse (applied pulse) according to the temperature information sent from the thermistor built into the thermal print head. Printing of one sheet is followed by approximately 10 seconds of wait time in case the temperature of the thermistor drops to 111° F (44° C) or lower. If the temperature of the thermistor is higher than 115° F (46° C) after a sheet is printed, the printer waits until the thermistor returns to the specified temperature of 113° F (45° C).

Figure 1-9 shows a thermal head operations timing diagram. A description of thermal head operations follows.

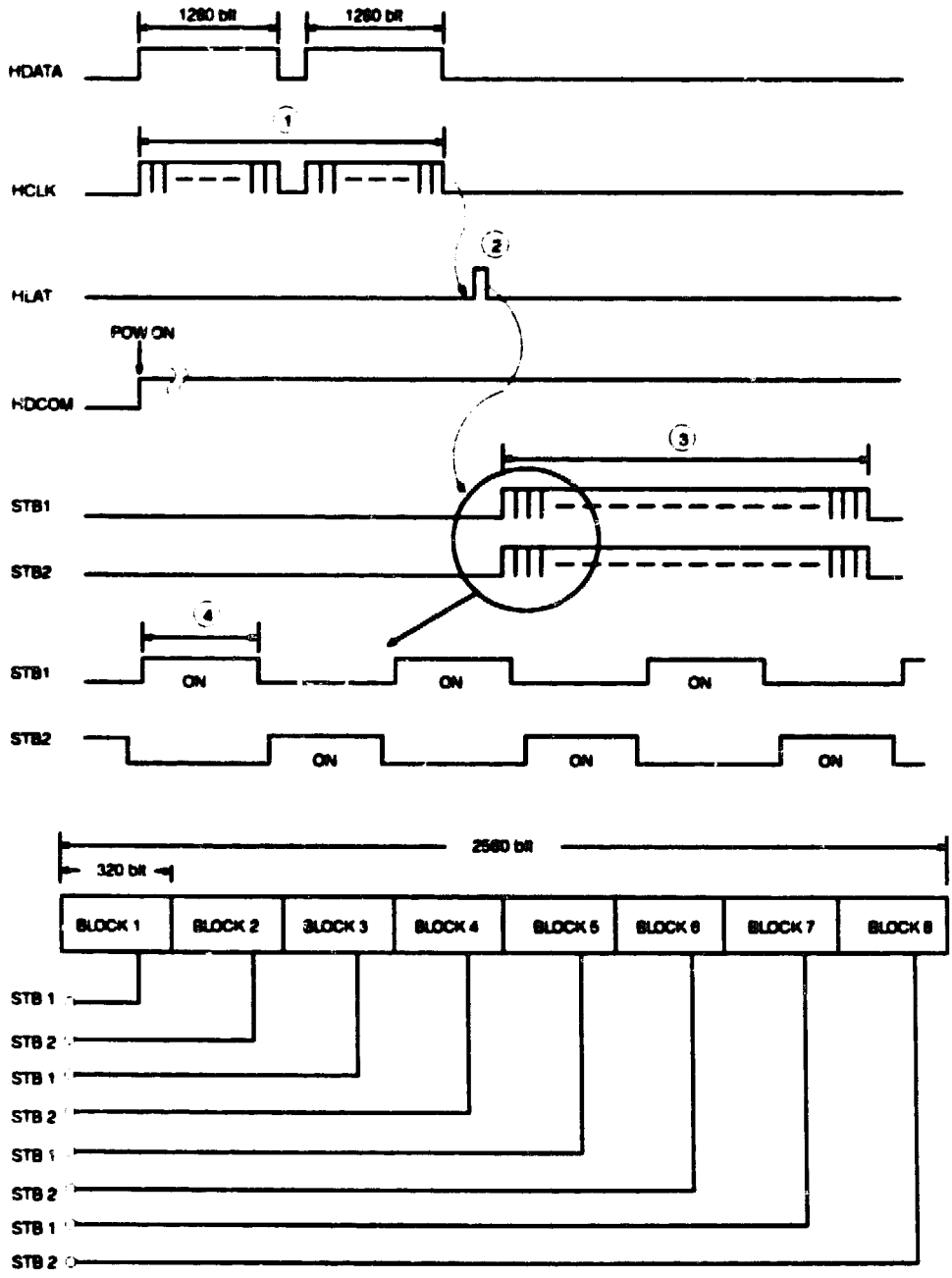


Figure 1-9 Thermal Head Operations Timing Diagram

DATA TRANSFER (AREAS 1 AND 2 IN FIGURE 1-9)

HDATA transfers 2560-dot data (1280 dots x 2) to the thermal head with a 4-MHz clock. The data is stored in the buffer inside the head.

PRINTING (AREAS 3 AND 4 IN FIGURE 1-9)

A 22V current is always supplied to the thermal head. Data stored in the buffer is printed when the STB signal is received. STB outputs 4-block data by alternately applying STB1 and STB2 signals (STB1 drives the odd block, STB2 the even block). The width of the STB pulse changes under the following conditions.

- When the head temperature changes
  - — to high temperature, STB pulse is small
  - — to low temperature, STB pulse is large.
- When print density is changed by changing the print density switch on the control panel.
- When print density is changed by changing the SW1 switch settings (SW1 segments 6 through 8).
- When the head rank is changed (that is, when the thermal print head is removed and replaced).

Logic Controller and Mechanical Controller Boards

Printer operations are coordinated by the logic controller board and the mechanical controller board, as explained in the following paragraphs.

LOGIC CONTROLLER BOARD

The logic controller board interfaces with the host computer, interprets the PostScript language received through each interface, develops the interpreted data in the built-in RAM under 68020 CPU control, and transfers the data to the mechanical controller board through the video interface.

Early versions of the printer contain a G8CRG controller board and a G8CRH memory board. The G8CRH memory board contains 8-MB of RAM for developing the interpreted data. The board's configuration is shown in Figure 1-10.

Later versions of the printer contain a G8HEH controller board with 4-MB of built-in memory and memory boards G8HEK and G8HEJ. The G8HEK board has 4-MB of dynamic RAM for legal size printing. The G8HEJ 0.5-MB ROM board contains 18 fonts; the other 17 fonts are on the G8HEH controller board. Both memory boards are controlled by the 68020 CPU on the G8HEH controller board. The board's configuration is shown in Figure 1-11.

Cabling and interface information for both versions of the logic controller board is contained in the appendix.

MECHANICAL CONTROLLER BOARD

The G8CRJ mechanical controller board contains the 7810 master CPU and the 8085 slave CPU. The CPUs control printer functions as follows.

The 7810 master CPU:

- transfers data from the logic controller board under 8085 slave control
- communicates with the logic controller board through the serial interface
- monitors and supervises the status of each sensor
- controls the CSG motor.

The 8085 master CPU:

- controls the LF and RB motors and motor circuits
- controls the thermal head.

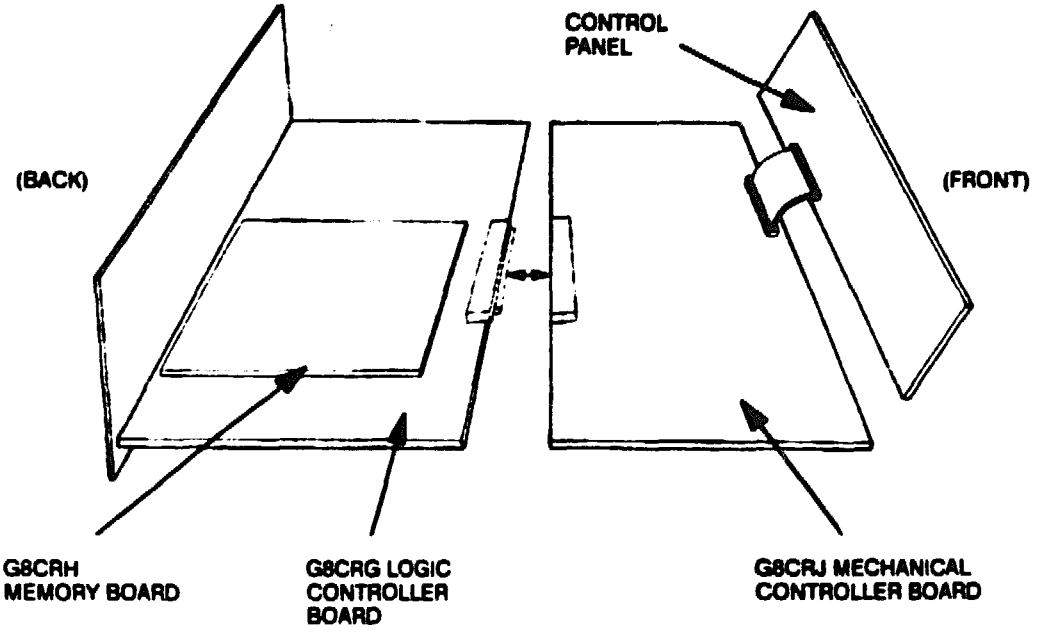


Figure 1-10 Controller and Memory Board Configuration (Early Version)

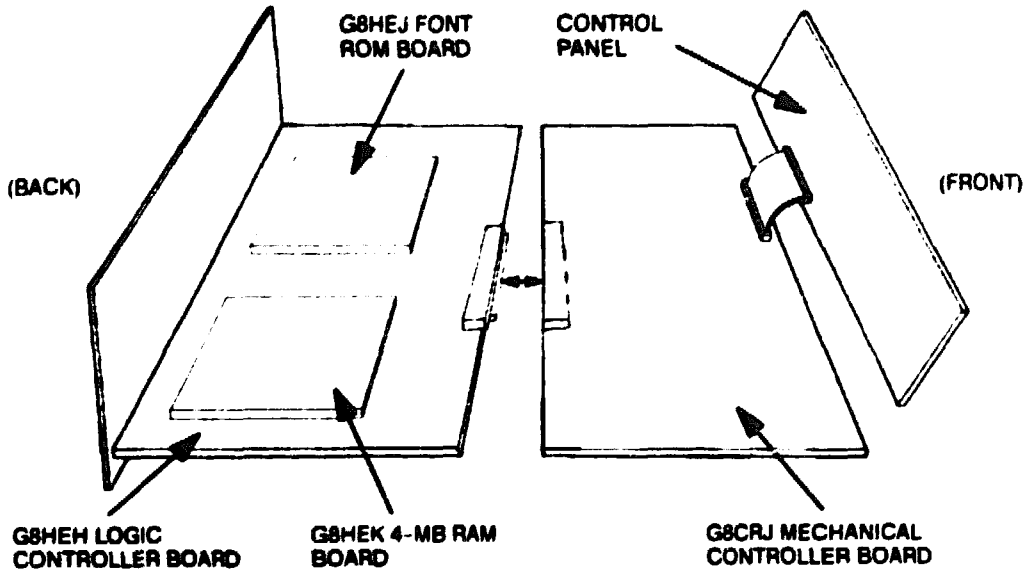


Figure 1-11 Controller and Memory Board Configuration (Later Version)

Power Supply

The power supply has four output terminals. The CN2 terminal is the +5V connector and ground lines. The CN3 terminal consists of the 22V output connector, a ground, and the AN5V (5V driver) and PTEMP (power temperature warning) lines. The CN5 terminal is the 22V connector and ground lines. The output is supplied to the thermal head (refer to the Appendix for cabling diagrams).

The two power supply terminals are cable-connected to the G8CRJ board (refer to Section 2 and the Appendix for cabling diagrams).

Sensors

Sensor locations are shown in Figure 1-12. A description of sensor functions follows.

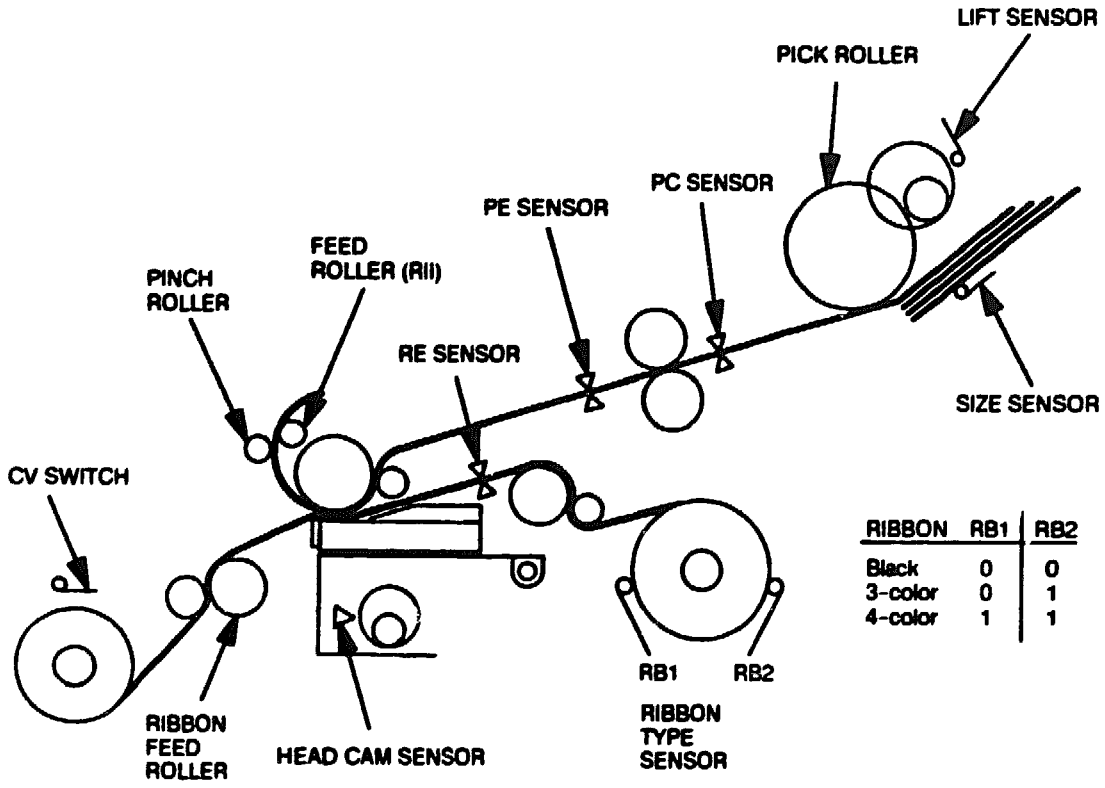


Figure 1-12 Sensor Locations

LIFT SENSOR

The lift sensor microswitch detects the status (raised or lowered) of the lift plate during paper feed operations from the cut sheet guide.

PAPER SIZE SENSOR MICROSWITCH

This sensor detects paper sizes. The switch is on for letter and A4 size paper. The switch turns off for smaller paper sizes.

PAPER CHECK (PC) SENSOR

The PC sensor detects when paper has been fed from the cut sheet guide.

PAPER END (PE) SENSOR

This sensor detects the top and bottom of the sheet. Its function is to determine the initial paper feed location for measuring paper length.

RIBBON END (RE) SENSOR

The RE sensor detects the end of ribbon.

HEAD CAM SENSOR

The head cam sensor detects when the thermal head is in the raised position and pressing against the ribbon during printing operations.

COVER MICROSWITCH

This switch detects whether the upper unit is open or closed. Printing stops automatically when the switch detects a cover open condition.

Control Panel

The control panel is located on the front of the printer and contains the buttons, display lamps, and circuitry that allow you to control the unit and monitor its operation.

Control panel functions are described in Section 3.

ADMINISTRATIVE COMPLIANCE

115 Vac Printer

- UL
- CSA
- FCC class B
- CRC C.1374

230 Vac Printer

- TUV (IEC 950)
- NEMKO
- SET I
- VDE-0871 Class B

SPECIFICATIONS

Following are Colormate PS thermal transfer printer specifications.

Dimensions

- Weight: 55.00 lbs (25 kg) maximum
- Dimensions
  - Depth (D): 18.31 in. (465 mm)
  - Width (W): 16.93 in. (430 mm)
  - Height (H): 9.45 in. (240 mm)
  - With hopper and stacking guide: W 16.93 in. x D 21.49 in. x H 15.35 in. (W 430 mm x D 546 mm x H 390 mm)

Power

115 Vac Printer

- Dedicated power supply
- Input voltage: 90 to 132 Vac
- Frequency: 47 to 63 Hz
- Maximum power consumption: 340 VA (at 33% duty printing)

230 Vac Printer

- Dedicated power supply
- Input voltage: 198 to 264 Vac
- Frequency: 47 to 63 Hz
- Maximum power consumption: 340 VA (at 33% duty printing)

Heat Output

1160 BTUs per hour, maximum

Controller

- Adobe 68020 16.7 MHz PostScript controller
- 8 MB random access memory (RAM)

Interface Ports

- Centronics parallel
- RS-232C/RS-422 serial
- Apple LocalTalk/Appletalk®
- SCSI

Noise

Acoustic noise while printing is less than 53 dB A-weighted per ISO DP7779. Acoustic noise while idle is less than 43 dB(A).

Ribbon

- 4-color ink-film roll: standard (shipped with printer)
- Ribbon life
  - 122 legal size pages for 4-color ribbon
  - 150 pages for 4-color ribbon
  - 215 pages for optional 3-color ribbon
  - 480 pages for optional monochrome ribbon
- Order number
  - 4-color ribbon LF01X-KD (letter and A4)
  - 4-color ribbon LF01X-(TBD) (legal only)
  - 3-color ribbon LF01X-KB (letter only)
  - 3-color ribbon LF01X-KC (A4 only)
  - monochrome ribbon LF01X-KA (letter, A4, legal)

Print

- 300 x 300 dots per inch (DPI) resolution
- 3 color (yellow, magenta, cyan), 4 color (yellow, magenta, cyan, black), and monochrome (black) capability
- 60 second, 3-color throughput (approximately 1 page per minute for color ribbon and 3 pages per minute for monochrome)
- Registration error less than 0.008 in. (0.20 mm), ensuring the precise layering of dots and sharp, accurate color
- 35 resident fonts
- Print area: 8 inches wide x 9 inches high (letter)

Environmental Conditions

- Operating temperature: 50 to 95° F (10 to 35° C)
- Operating humidity: 30 to 80% (non-condensing)

Cut Sheet Guide Hopper Capacity

100 sheets maximum (20 lb. paper) or 10 transparencies

Print Media

PAPER

- Specially coated cut sheets
- Size:
  - Letter (8.5 x 11 in. or 216 x 279 mm)
  - Legal (8.5 x 14 in. or 216 x 356 mm)
  - A4 (8.27 x 11.69 in. or 210 x 297 mm)
- Weight: 17 to 21 lbs. (64 to 81 g/m2
- Smoothness: 400 ± 70 seconds (JIS Bekk)
- Order number
  - Letter LF01X-TP
  - Legal LF01X-(TBD)
  - A4 LF01X-TQ

TRANPARENCIES

- Specially coated transparent sheets
- Size: Letter (8.5 in. x 11 in. or 216 mm x 279 mm)
  Legal (8.5 x 14 in. or 216 x 356 mm)
  A4 (8.27 x 11.69 in. or 210 x 297 mm)
- Thickness: 75 µm
- Weight: 105 g/m2
- Order number
  - Letter LF01X-TT
  - Legal LF01X-(TBD)
  - A4 LF01X-TU

Reliability

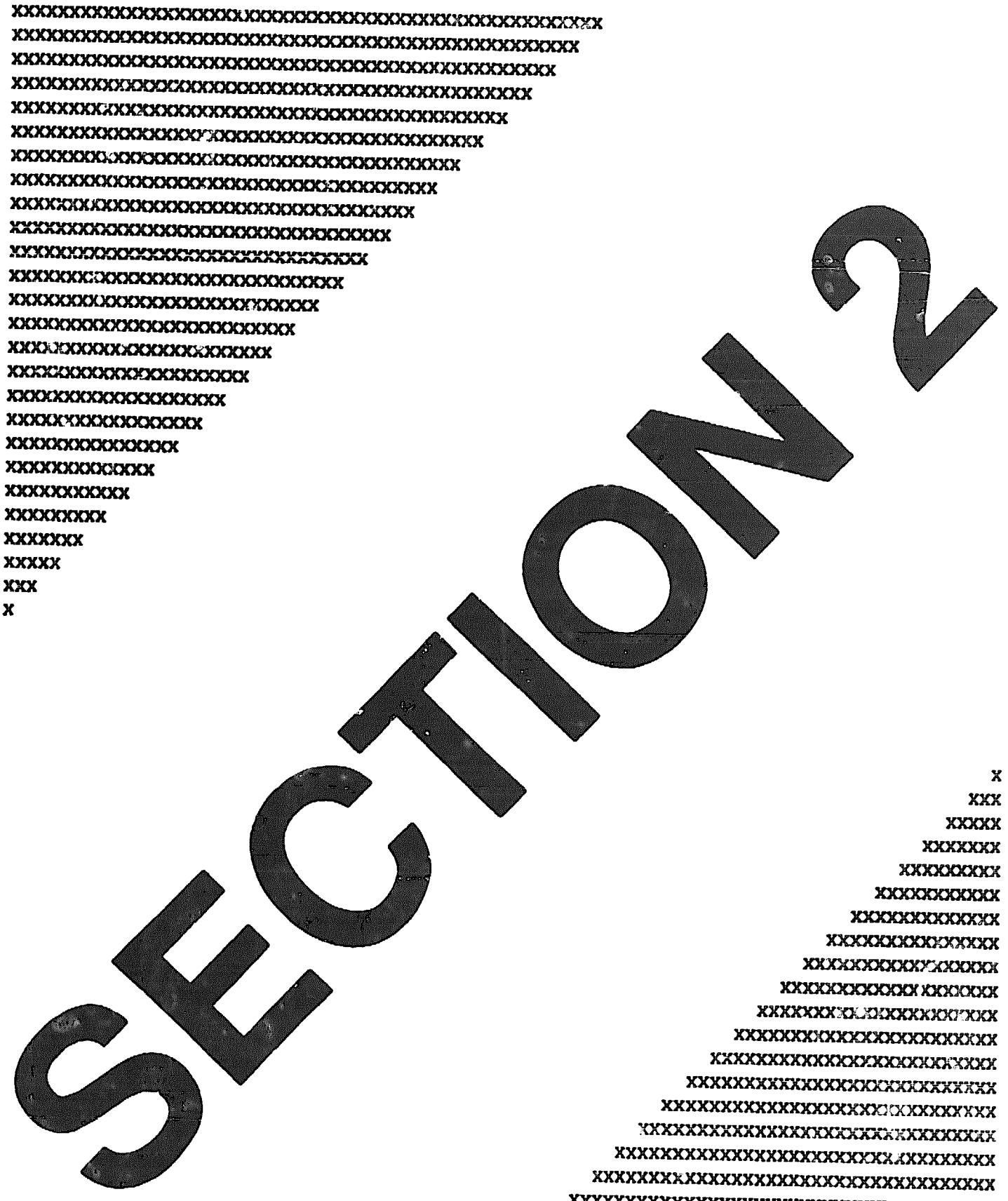
- 3000 hour MTBF
- 500 sheets per month average duty cycle

Early Printers

G8CRJ PCB:	80,000 hour MTBF
G8CRG PCB:	60,000 hour MTBF
G8CRH PCB:	20,000 hour MTBF
Thermal head:	59,000 hour MTBF (500 sheets per month)

Later Printers

G8CRJ PCB:	80,000 hour MTBF
G8HEH PCB:	25,000 hour MTBF
G8HEJ PCB:	200,000 hour MTBF
G8HEK PCB:	40,000 hour MTBF
Thermal head:	59,000 hour MTBF (500 sheets per month)


SECTION 2

Section 2

Setup and Check

This section describes routine setup and self-test procedures for the Colormate PS thermal transfer printer. Setup procedures include an environmental check, cabling diagrams, and paper loading instructions. Instructions on how to replace the ribbon are also included. The self-test procedures provided at the end of this section should be used to check printer operation before and after performing any maintenance procedures.

SYSTEM SETUP

Colormate PS operation and print quality are affected by the environment in which the printer is placed. When setting up the printer or doing any maintenance procedure, always be sure the printer meets the environmental specifications listed in Section 1 of this manual.

To maintain the best conditions for trouble-free operation, observe the following environmental standards.

- Place the printer in a well-ventilated, air-conditioned area.
- Make sure the printer fan ventilation holes are not blocked. Allow at least six inches of clearance between the printer and the wall for ventilation and accessibility.
- Avoid exposing the printer to direct sunlight and extreme changes in temperature.
- Avoid exposing the printer to excessive dust, moisture, vibration, shock, chemicals, or chemical vapors.
- Place the printer away from devices that generate strong magnetic fields such as electronic motors or transformers.
- After first disconnecting the AC power cord from the rear of the printer, immediately remove any foreign material (such as paper clips) found inside the unit.
- Check that the shipping restraints inside the printer are in the up position during printer operation (see Figure 2-1).

CAUTION

Print quality may be impaired if the shipping restraints are not set all the way up during operation. If problems with print quality develop, always check that the restraints are all the way up. In addition, if the printer must be packed and shipped off-site, turn to "Packing" at the end of Section 4 for instructions on setting the shipping restraints.

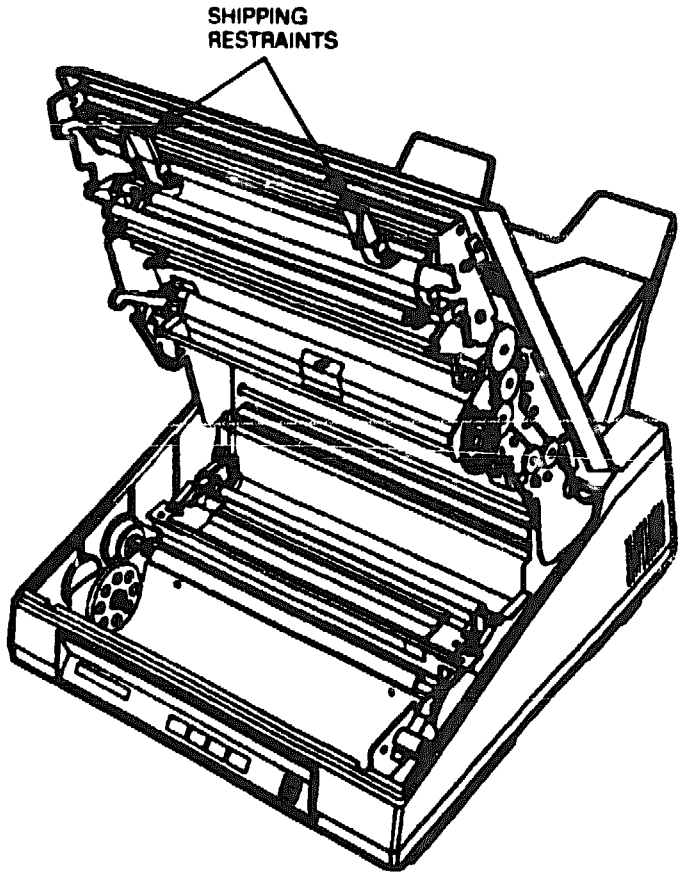


Figure 2-1 Shipping Restraints

Connecting the Power Cord

The power cord supplied with the printer connects to the AC inlet connector on the rear of the printer (see Figure 2-2). The other (male) end of the power cord plugs into a properly grounded, three-prong wall receptacle or other grounded power outlet.

NOTE

Always plug the power cord into a power outlet that is properly grounded. In addition, turn the printer off before plugging in the cord.

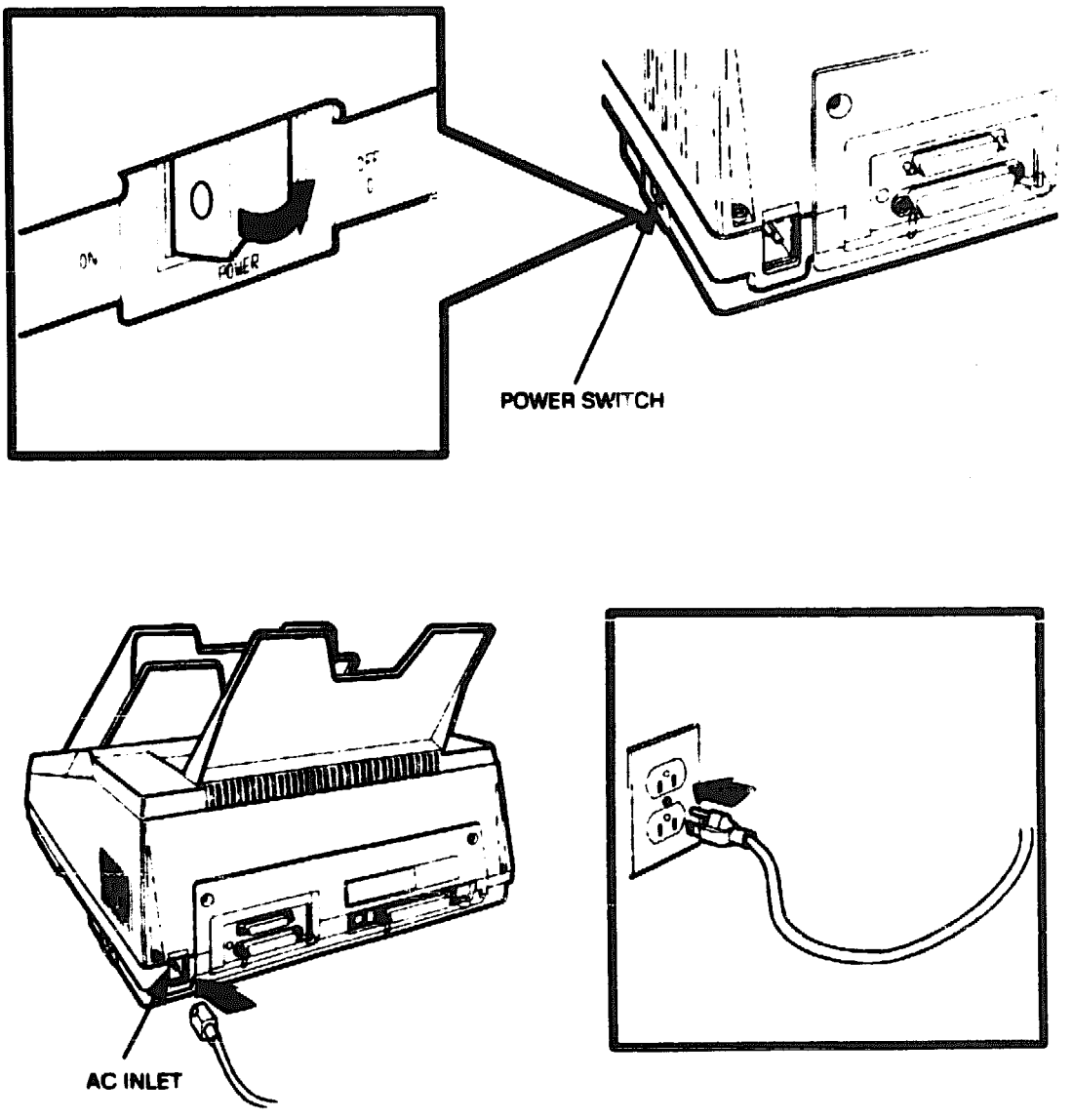


Figure 2-2 Connecting Power

Interface Cable

The Colormate PS thermal transfer printer is equipped with RS-232C serial and Centronics parallel interface ports on the rear of the printer. The printer also has ports configured for AppleTalk (RS-422) and a Small Computer Systems Interface (SCSI). Depending on the type of interface used in the computer system, the interface cable connects to one of the ports on the rear of the printer. Figure 2-3 shows the interface ports for connecting the interface cable.

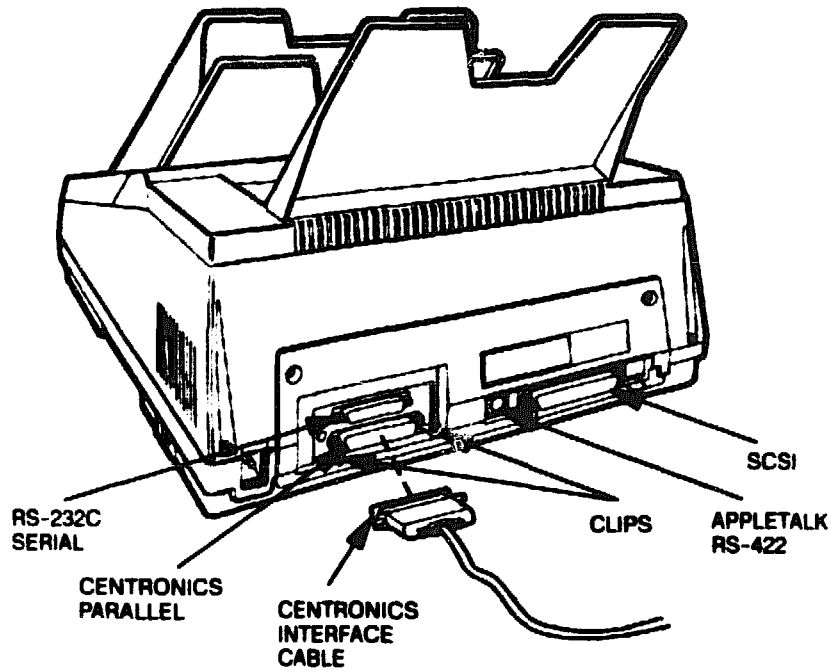


Figure 2-3 Interface Ports

NOTE

Turn off the computer and printer before removing and replacing the interface cable. Also, with the exception of the SCSI port, do not simultaneously connect different types of interface cables to the printer ports. Only one cable (Centronics, Serial, or AppleTalk) at a time should be connected.

Pin assignments for each interface type are provided in the Appendix. Be sure the correct type of interface cable is used for the system. In addition, check that the cable is securely connected to the printer port by the attached clips or screws. Connect the other end of the interface cable to the host computer according to the manufacturer's instructions.

Ribbon Replacement

To install a new ribbon in the printer when the old ribbon reaches its end, proceed as follows.

NOTE

To avoid losing information sent from the computer to the printer, do not turn off the printer when changing a ribbon. Turning off the printer erases all data stored in the printer buffer.

1. Make sure the printer has stopped printing.
2. Slide the release lever forward (toward the control panel) on the top cover and open the upper unit (see Figure 2–4). Lift the top cover up until the upper unit locks into position.

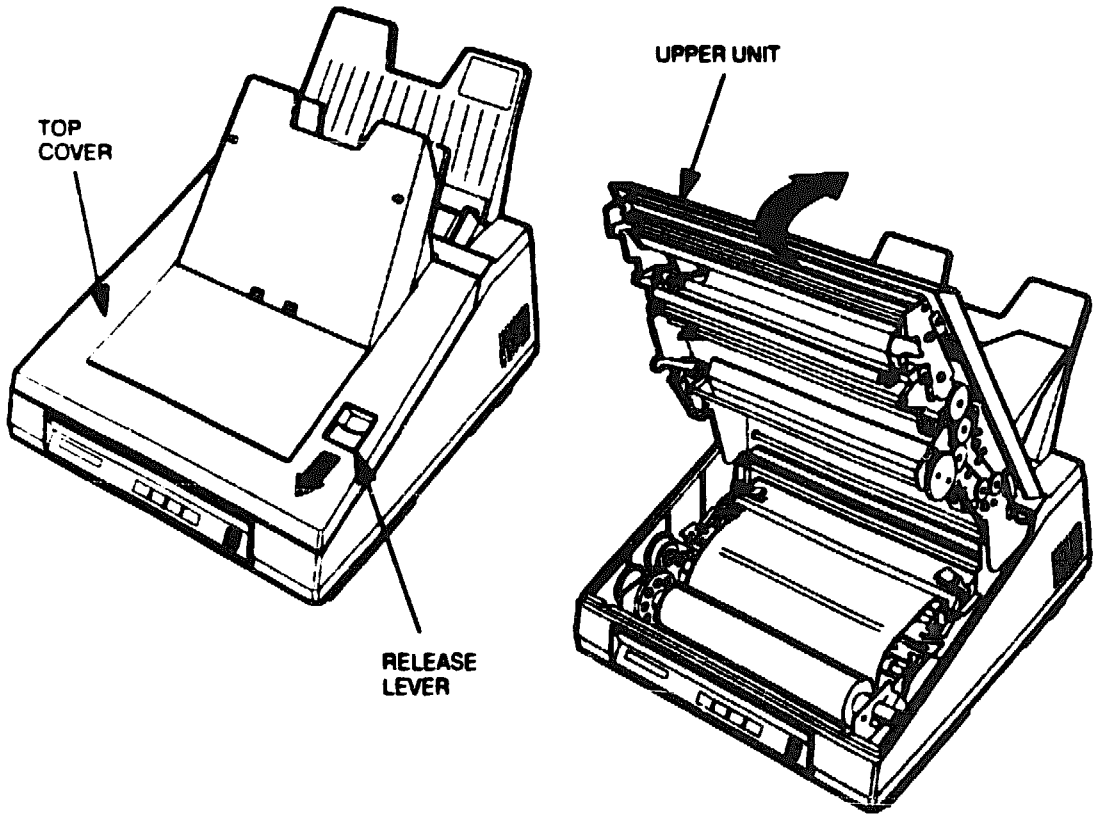


Figure 2–4 Opening the Upper Unit

NOTE

When closing the upper unit after replacing the ribbon or performing other maintenance procedures, be sure to apply downward pressure evenly on *both* sides of the top cover to avoid bending or warping printer parts.

3. Lift the right side of the take-up ribbon roller off the support arm (see Figure 2-5). Remove the take-up ribbon roller by sliding the left side of the roller off the left hub.

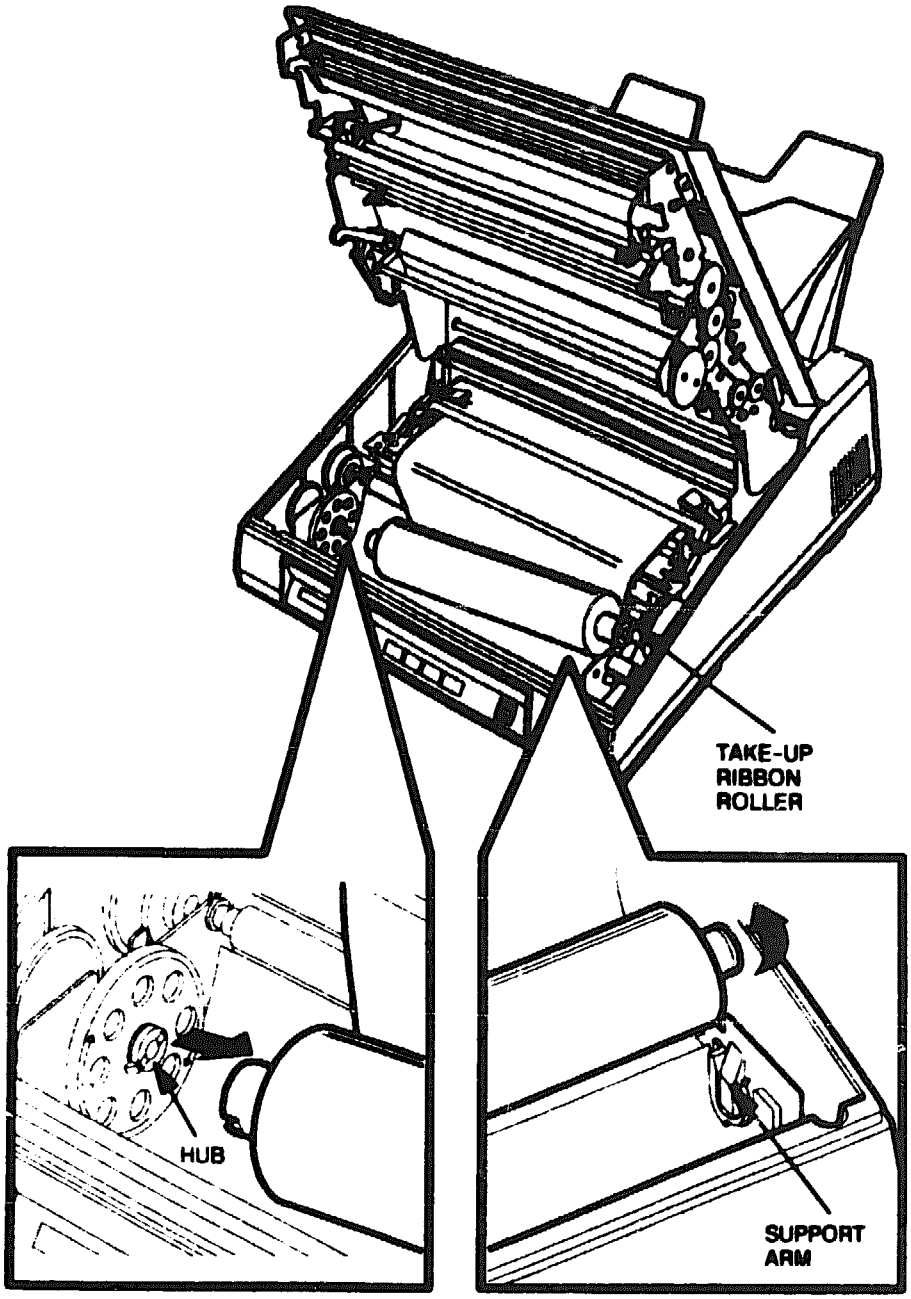


Figure 2-5 Removing the Take-up Ribbon Roller

4. Carefully wind the take-up ribbon roller toward the supply ribbon cartridge. Mount the take-up ribbon roller on the supply ribbon cartridge holders (see Figure 2-6).

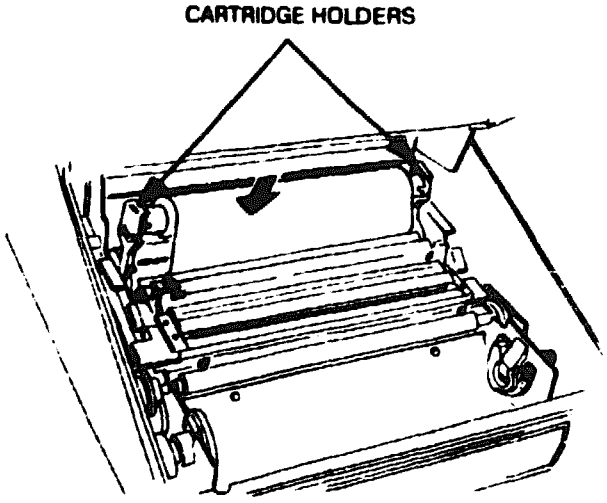


Figure 2-6 Mounting the Take-up Roller on the Supply Ribbon Cartridge

5. As shown in Figure 2-7, lift the supply ribbon cartridge off the mounting blocks. Discard the old cartridge and take-up ribbon roller.

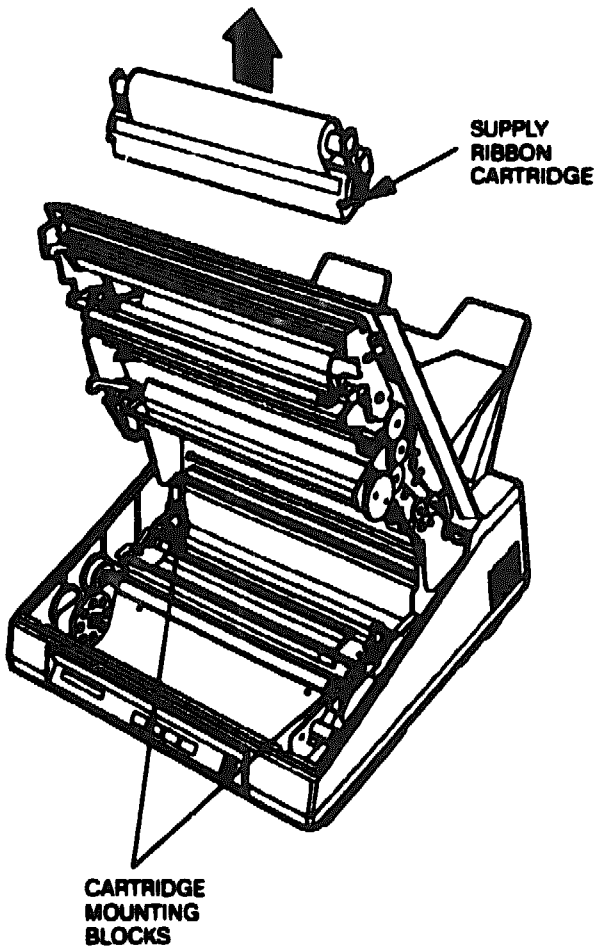


Figure 2–7 Removing the Supply Ribbon Cartridge

6. Place the new supply ribbon cartridge inside the printer. Press down slightly on the cartridge holders until both sides of the cartridge lock into place on the cartridge mounting blocks (see Figure 2-8).

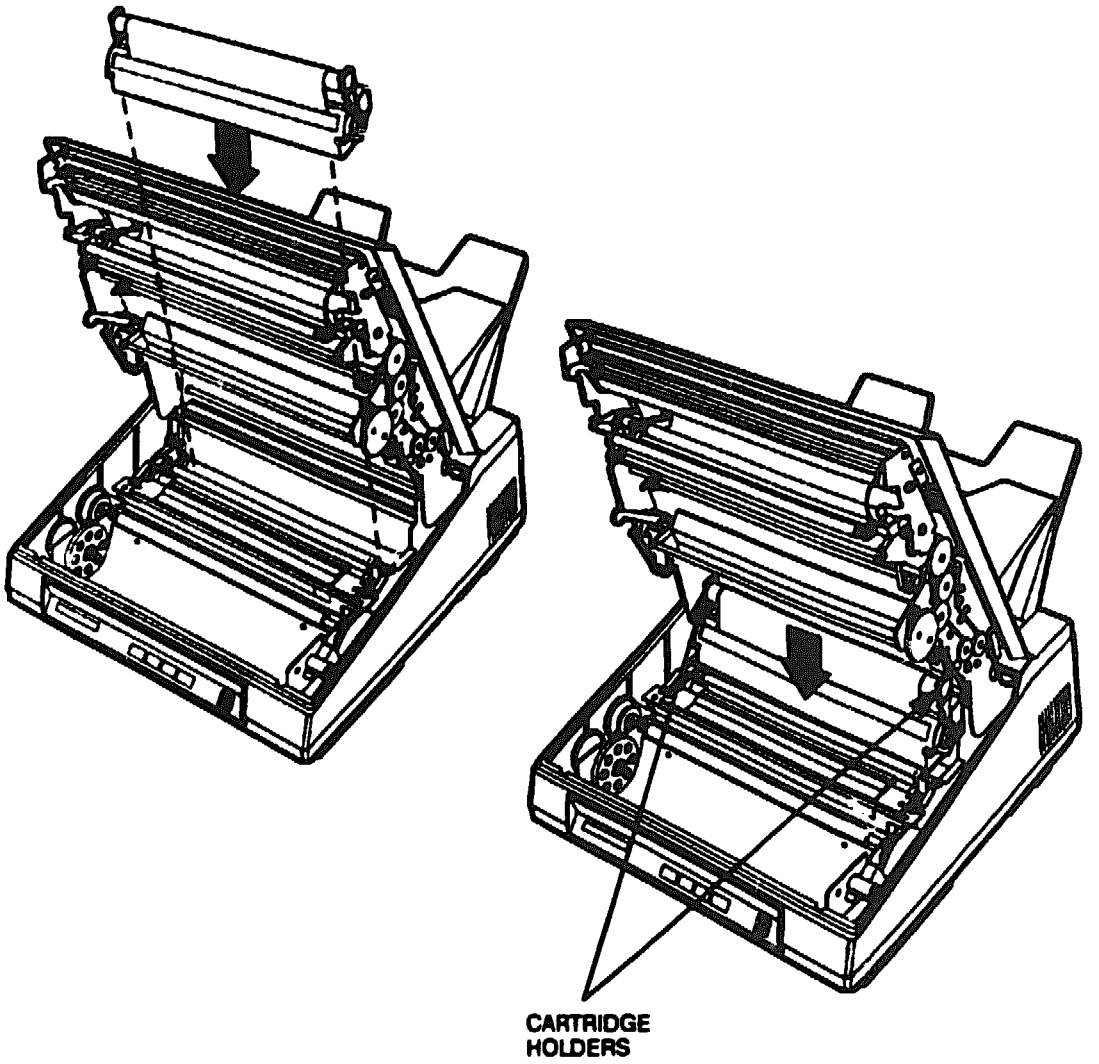


Figure 2-8 Installing the Supply Ribbon Cartridge

7. Remove the ribbon core from the holder on the supply ribbon cartridge. Unwind the ribbon by rolling the core toward the front of the printer (toward the control panel). Then place the left end of the ribbon core on the take-up roller hub (see Figure 2-9). Fit the notch on the ribbon core into the stud on the ribbon hub. Gently press down on the right side of the core until it snaps into place on the support arm (see Figure 2-9).

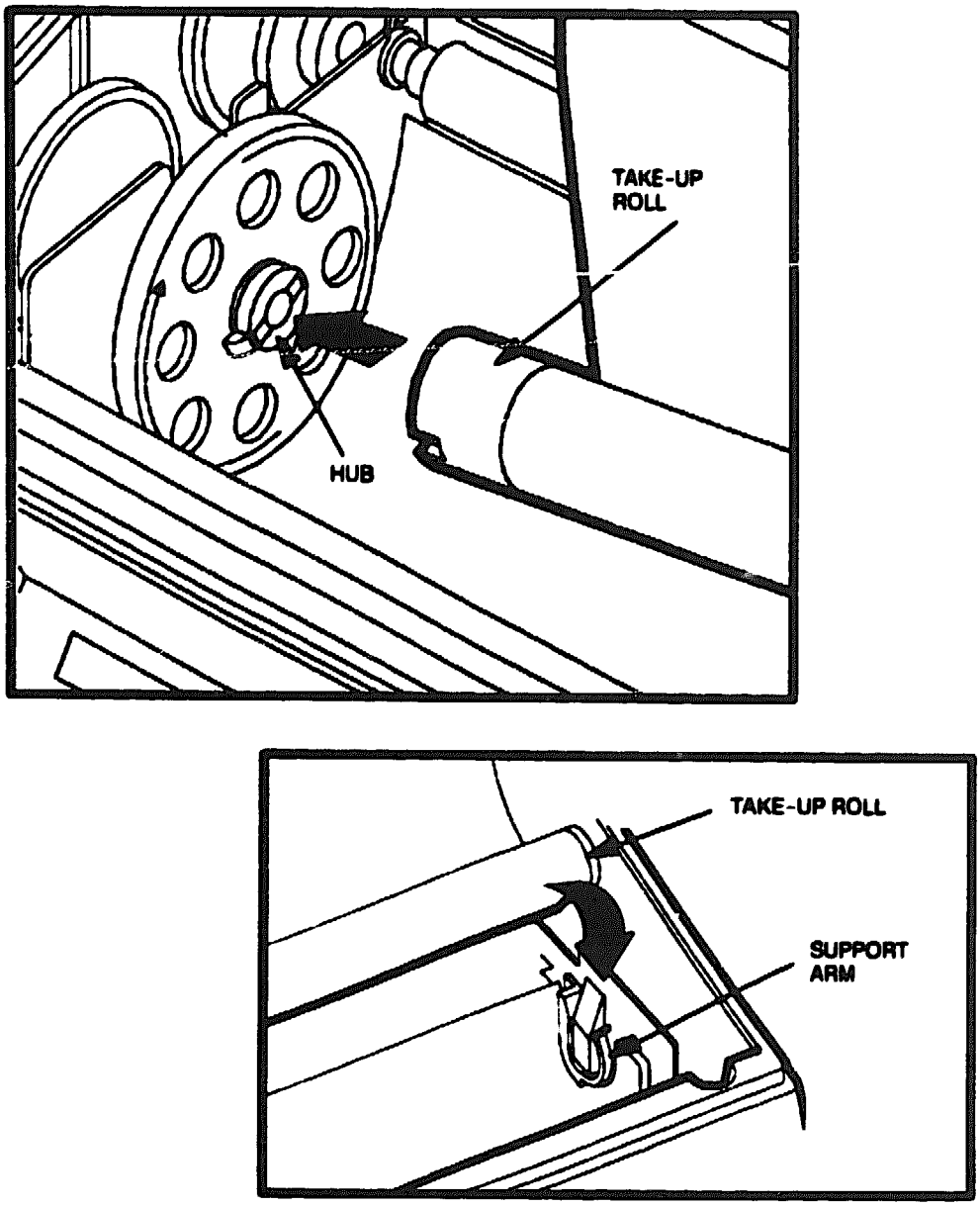


Figure 2-9 Installing the Take-up Roller Core

8. While making sure the left edge of the ribbon passes through the narrow channel in the ribbon end sensor (see Figure 2-10), turn the ribbon hub to remove slack in the ribbon.

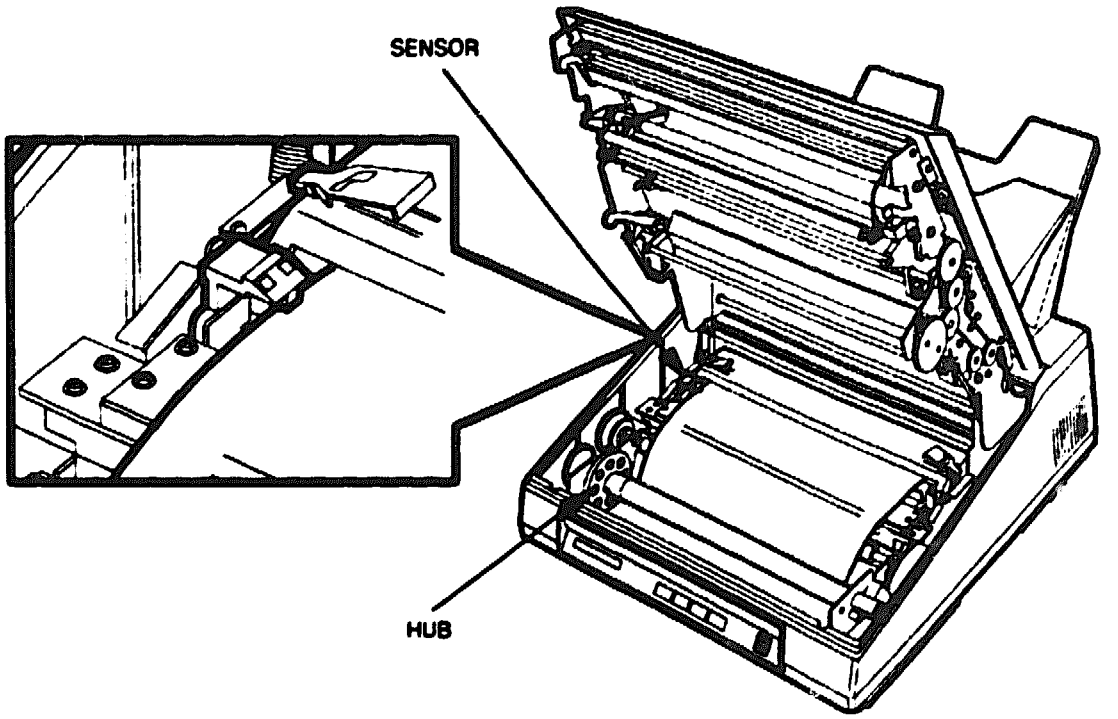


Figure 2-10 Ribbon Sensor and Hub

9. Press down evenly on the sides of the top cover until the upper unit locks into place (see Figure 2-11).

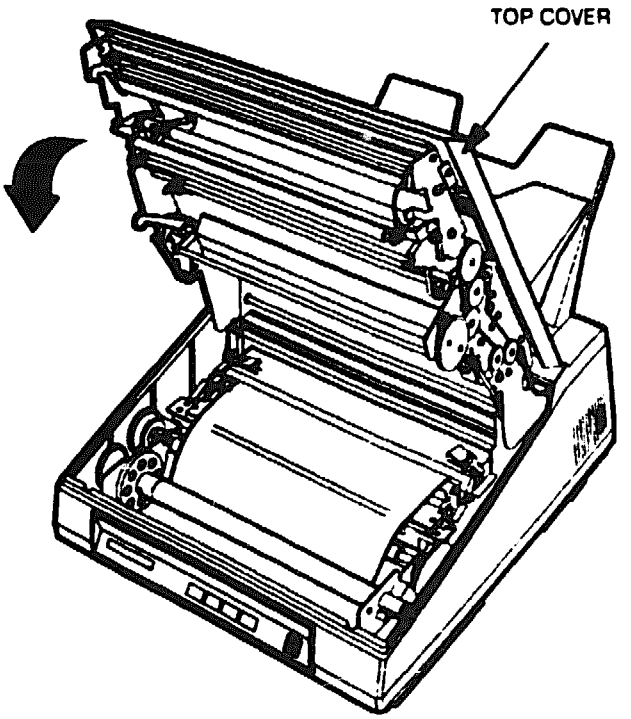


Figure 2-11 Closing the Upper Unit

Paper Loading

To load paper into the printer, follow these steps. Turn to "Specifications" in Section 1 for information on paper specifications and print area dimensions. Turn to Section 3 for information on how to adjust the paper's top-of-form using the SW2 DIP switch.

1. Place up to 100 sheets of specially coated, DEC-supplied sheets (or up to 10 transparencies) in the hopper tray. Be sure the paper stack does not exceed the hopper capacity indicated by the marking on the left edge guide (see Figure 2-12).

CAUTION

Do not load paper of different types, quality, or thickness simultaneously, or a paper jam may occur. Refer to Section 5 for information on paper jams.

2. Adjust the edge guides to snugly fit the width of the paper or transparencies (see Figure 2-12). The printer is now ready to receive print commands from the host computer.

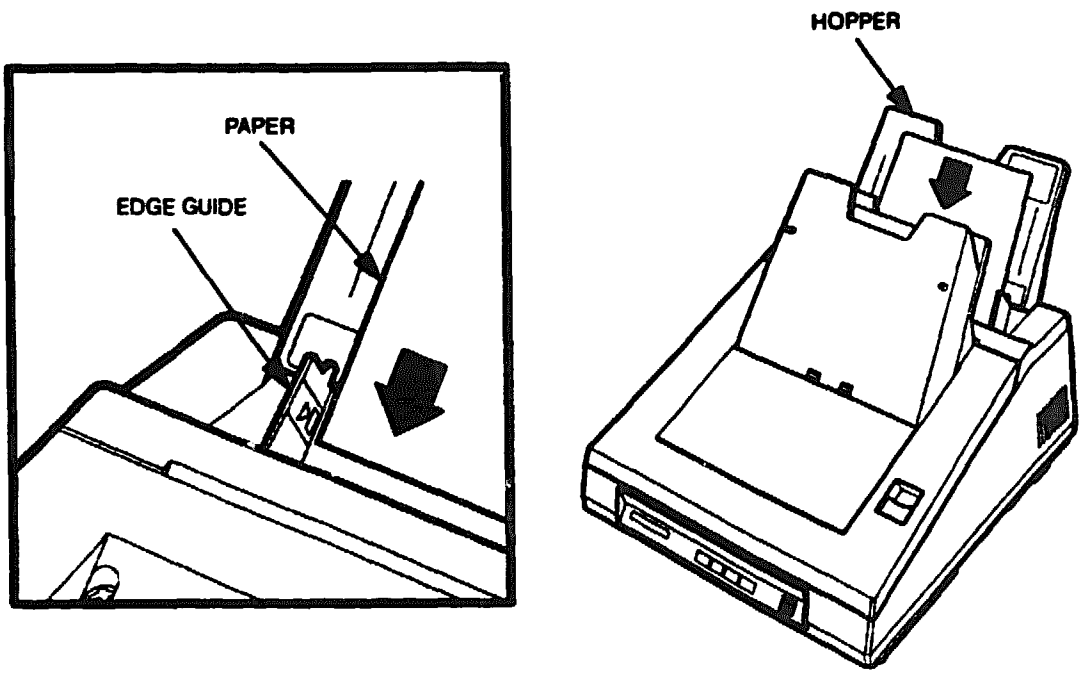


Figure 2-12 Adjusting the Edge Guides

PRINTER TESTS

Customer engineers should use the Colormate's built-in self-tests to check printer operation before and after maintenance. The Colormate PS printer is factory-set to automatically print a start page each time the printer is turned on. The start page indicates the total number of pages printed, the engineering firmware revision level, and hardware/software interface information.

The start page feature can be toggled on or off from the the control panel by entering Menu Mode (see the *Colormate PS User's Guide*, document number EK-LF01R-UG-001 for instructions on how to disable/enable the automatic, power-on start page). Alternatively, customer engineers may use the other built-in self-tests, the Hex Mode test, or the Character Mode test to check performance and print quality.

Self-Test

To run the self-test, proceed as follows.

1. Turn the printer on, wait approximately 30 seconds for the "READY PS" prompt to appear in the control panel display, and press the **Online** button to set the printer offline (the Online LED in the button's upper left corner should turn off).
2. Press the **Menu** button to enter the Menu Mode. Then press the **Next** button once (or until "USER1" appears in the display).
3. Press the **Select** button. Then press the **Next** button repeatedly until "TEST PRINT" appears in the display.
4. Press the **Select** button so that "TEST PAGE 0" appears in the display.
5. Press the **Next** button repeatedly until a desired self-test type from among "TEST PAGE 0", "TEST PAGE 1", "TEST PAGE 2", and "TEST PAGE 3" appears in the display.
6. Press the **Select** button. Then press the **Next** button to alternate and choose between "SINGLE SHEET" (the self-test stops after one cycle) and "CONTINUOUS" (the self-test repeats until it is disabled either from the control panel or by turning off the printer).
7. Press the **Select** button. Depending on the type of self-test selected in step 5, a self-test printout will begin printing.

   For example, Figure 2-13 shows a portion of the output from "TEST PAGE 3", which is useful in determining thermal head positioning, alignment, and cleanliness, as well as the condition of the thermal head resistors (heat elements) and the paper feed mechanism.

   If the output of "TEST PAGE 3" showed blank areas appearing in the first horizontal band in Figure 2-13 (instead of the minutely offset vertical lines shown in the figure), this condition would indicate that one or more of the resistors inside the thermal head is malfunctioning, and the head would have to be replaced.

The other horizontal bands in Figure 2-13 can be examined to determine print density (the black/white ratio on the printed sheet). In addition, the distance between the bands can be measured to determine if the sheet is feeding through the printer properly. Irregularly spaced bands indicate one or more of the parts in the paper feed mechanism (rollers, motors, etc.) discussed in Section 1 have worn out or gone out of adjustment.

Blank areas, spots, and blotches in any of the bands indicate either the thermal head is dirty and needs to cleaned (see Section 4) or the head is malfunctioning and needs to be replaced (see Section 6).

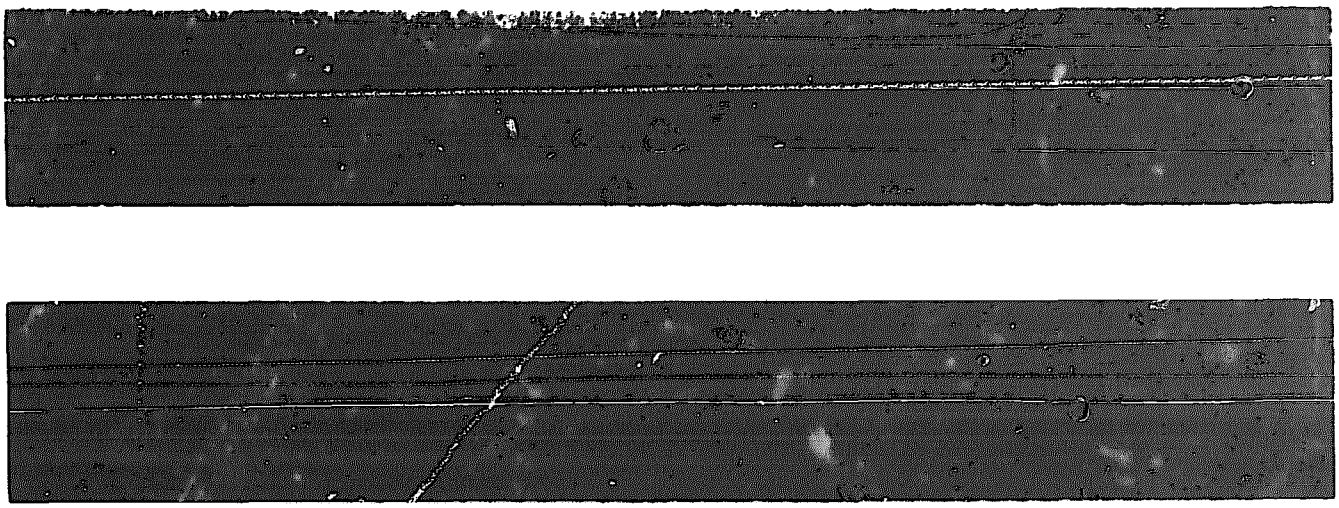


Figure 2-13 Sample Printout of "TEST PAGE 3"

8. To stop the self-test and put the printer online, press the **Online** button. The printer will continue to operate until the current page is ejected. Then the printer will stop, "READY PS" will appear in the display, and the Online LED will light, indicating that the printer is online with the host computer.

Hex Mode

The Hex Mode feature (also called "data dump") is useful in interface troubleshooting and program debugging. This control panel feature makes it easy for experienced users to find the cause of printer problems. The Hex Mode test prints out, in hexadecimal (hex) notation, the ASCII code of each character sent to the printer. One line consists of 16 bytes. The number of vertical printout lines is 64 (16 x 4). At the top of the page, the current interface type (Centronics, AppleTalk RS422, RS-232C) is printed. When the time out error occurs, the remaining data is printed.

Figure 2-14 provides a brief sample printout in Hex Mode. Instructions on how to do a data dump from the control panel follow.

```
Page 1  [Hardware Interface : Centronics]
0000  54 68 69 73 20 69 73 20 61 20 74 65 73 74 20 69 6E    This is a test in
0010  20 48 65 78 20 6D 6F 64 65 2E 0D 0A 54 68 69 73 20     Hex mode...This
0020  69 73 20 61 20 74 65 73 74 20 69 6E 20 48 65 78 20    is a test in Hex
0030  6D 6F 64 65 2E 0D 0A 54 68 69 73 20 69 73 20 61 20    mode...This is a
0040  74 65 73 74 20 69 6E 20 48 65 78 20 6D 6F 64 65 2E    test in Hex mode.
0050  0D 0A 54 68 69 73 20 69 73 20 61 20 74 65 73 74 20    ..This is a test
0060  69 6E 20 48 65 78 20 6D 6F 64 65 2E 0D 0A 0C 0D 0A    in Hex mode.....
```

Figure 2-14 Sample HEX Mode Printout

To perform a hex dump, follow these steps.

1. Turn the printer on and press the **Online** button to set the printer offline (the Online LED in the button's upper left corner should turn off).
2. Press the **Menu** button to enter the Menu Mode.
3. Press the **Next** button repeatedly until a desired user type from among "USER 1", "USER 2", and "USER 3" appears in the display.
4. Press the **Select** button. Then press the **Next** button repeatedly until "MODE" appears in the display.
5. Press the **Select** button and then press the **Next** button repeatedly until "HEX MODE" appears in the display. Then press the **Select** button again to enter the Hex Mode.

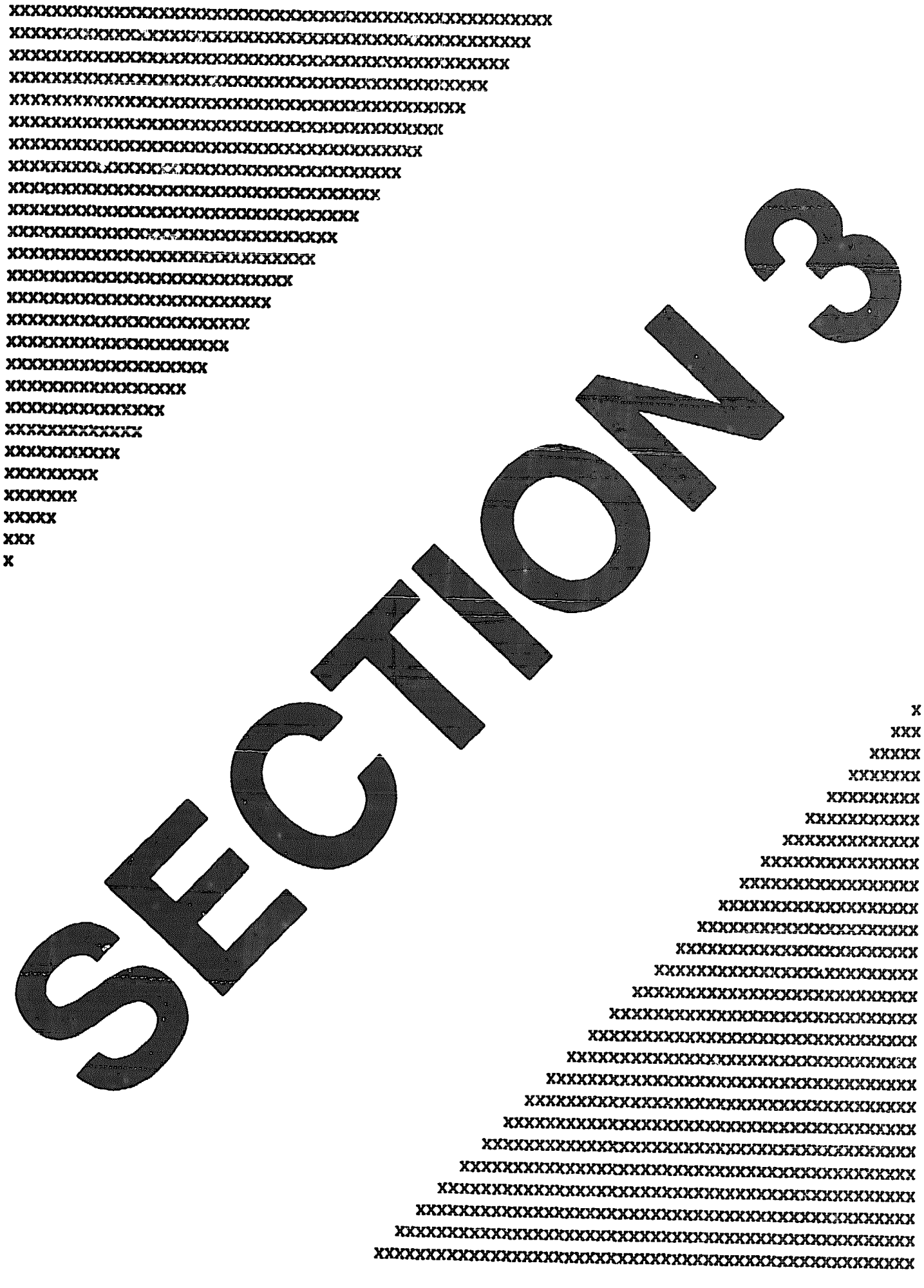
   Data sent from the host computer will be output by the printer in hexadecimal format, similar to the printout shown in Figure 2-14.

Character Mode

Character (CHAR) Mode is a type-through feature that allows you to type ASCII characters from the keyboard to the printer. Character Mode prints out, in ASCII format, characters generated from the PostScript language.

To perform a test in character mode, follow these steps.

1. Turn the printer on and press the **Online** button to set the printer offline (the Online LED in the button's upper left corner should turn off).
2. Press the **Menu** button to enter the Menu Mode.
3. Press the **Next** button repeatedly until a desired menu type from among "USER 1", "USER 2", and "USER 3" appears in the display.
4. Press the **Select** button. Then press the **Next** button repeatedly until "MODE" appears in the display.
5. Press the **Select** button and then press the **Next** button repeatedly until "CHAR MODE" appears in the display. Then press the **Select** button again to enter the Character Mode.


SECTION 3

Section 3

Operation

This section briefly explains how to operate and control the Colormate PS printer using the control panel buttons and the printer's internal, dual in-line package (DIP) switches. Details on how to operate the printer are contained in the *Colormate™ PS User's Guide* (EK-LF01R-UG-001) and *Colormate PS Technical Reference Guide* (EK-LF01R-TR-001).

CONTROL PANEL

Figure 3-1 describes the functions of the control panel buttons, lamps, and display. Table 3-1 explains display status messages that may appear while the printer is operating. Figure 3-2 provides a flowchart for configuring various printer settings and parameters from the control panel in Menu Mode.

Table 3-1 Control Panel Display Status Messages

MESSAGE	EXPLANATION
READY PS	The printer is ready to operate in the PostScript Mode.
READY HEX	The printer is ready to perform a hex dump.
READY CHAR	The printer is ready to operate in Character (ASCII) Mode.
PROCESSING	The printer is processing input data.
PRINTING	The printer is printing a page.
WAITING	The printer is waiting for additional input data before resuming processing.
RESETTING	The printer is being reset to the initialized state. Menu Mode settings are saved.
TEST PRINTING	The self-test is in progress. To stop the self-test, press the **Online** button.
AGING	The aging is in progress. To stop the aging, turn off the power SW.

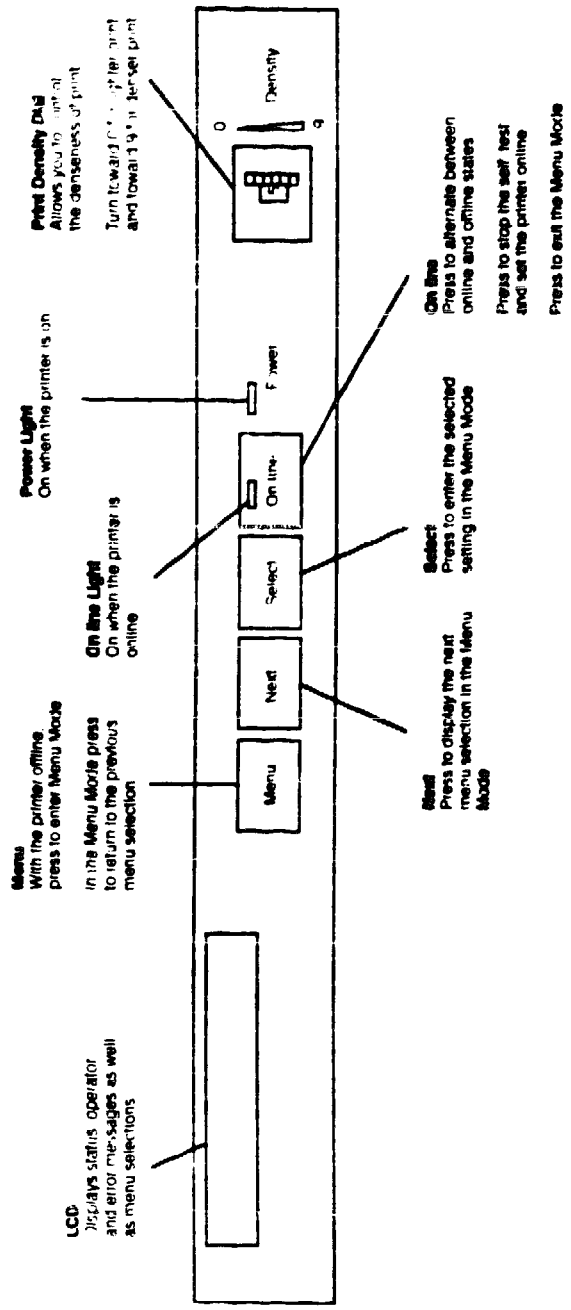
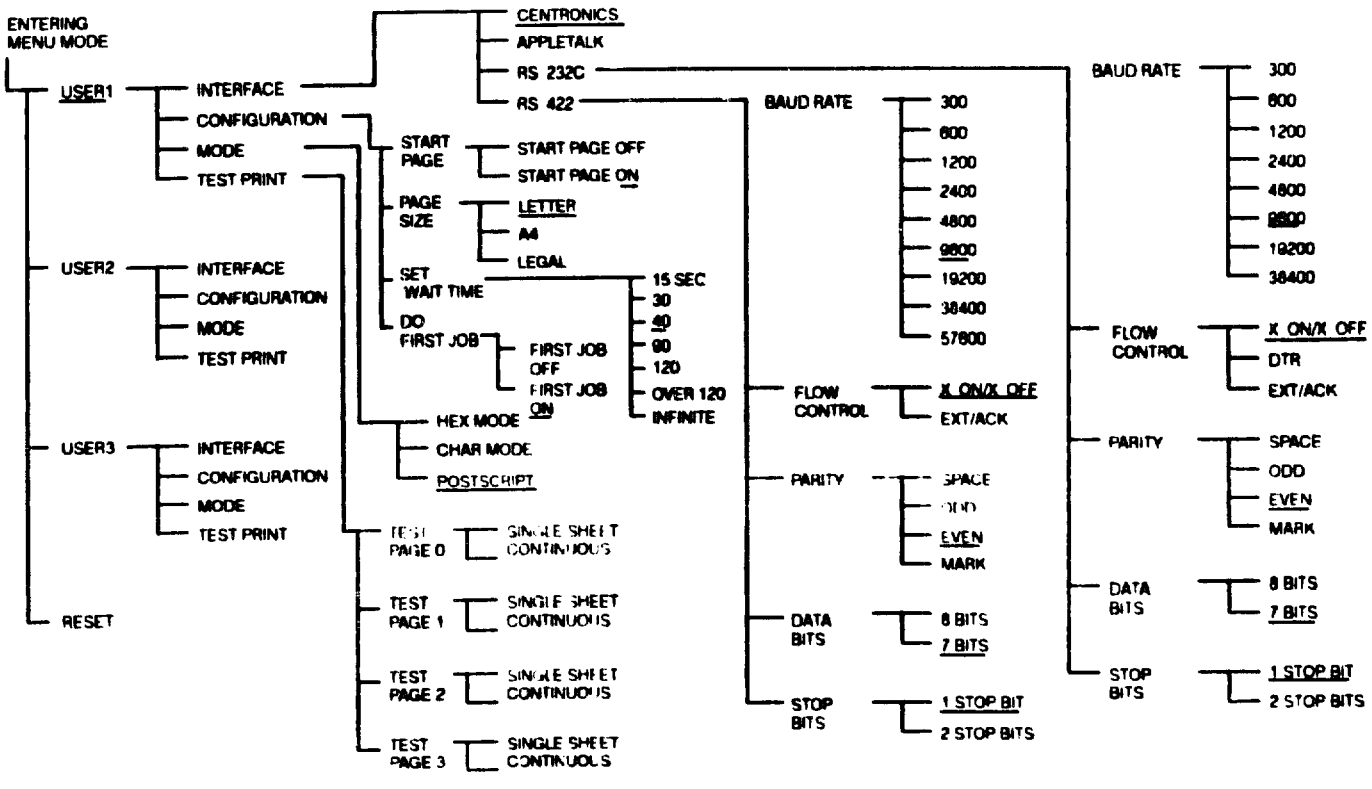


Figure 3-1 Control Panel Functions



NOTE All parameters for User1 apply to User2 and User3 as well
—— = DEFAULT PARAMETER
User2 default interface is AppleTalk®
User3 default interface is RS 232C

Figure 3-2 Menu Mode Operations Tree

SWITCH LOCATIONS

The printer has two eight-segment DIP switch banks located on the G8CRJ mechanical control board (see Figure 3-3). These switches are accessible by removing the printed circuit board (PCB) cover. Refer to "PCB Cover" in Section 6 for PCB cover removal and replacement procedures.

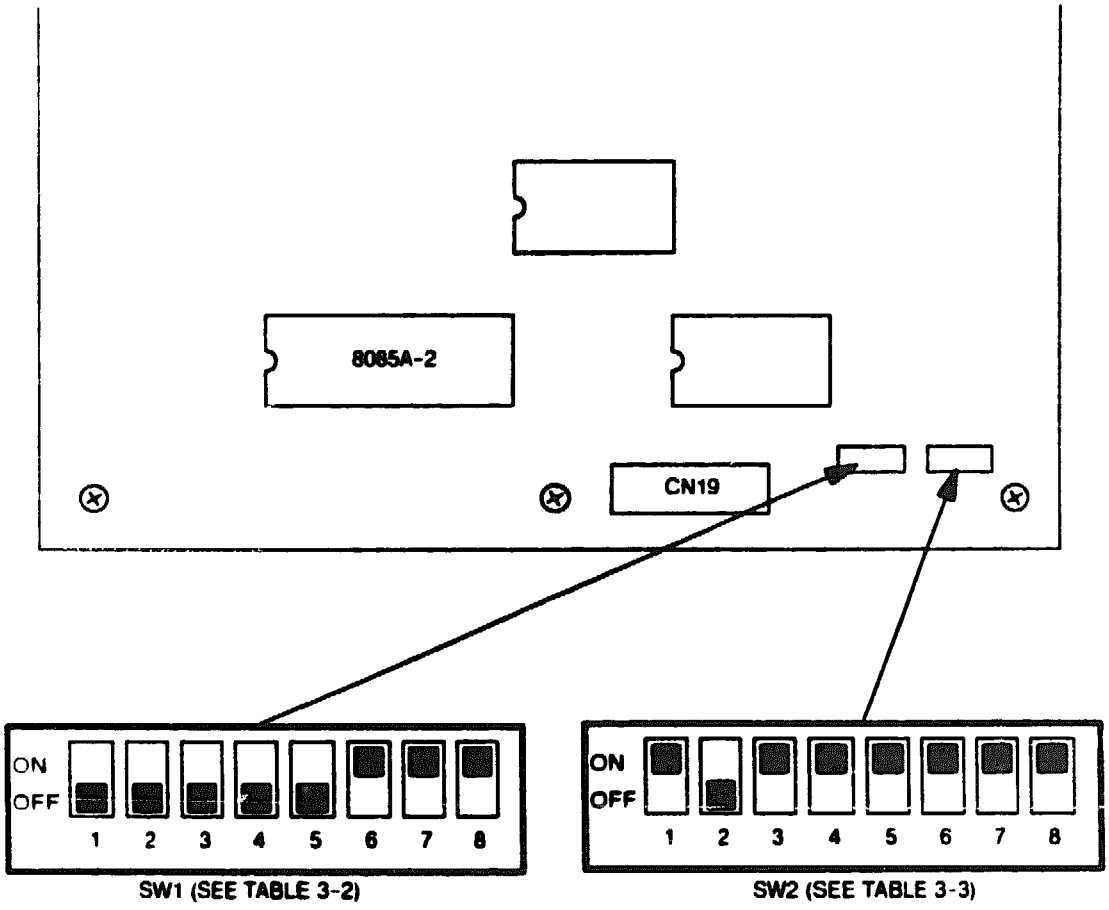


Figure 3-3 G8CRJ Mechanical Control Board SW1 and SW2 DIP Locations

SW1 AND SW2 SWITCH FUNCTIONS

SW1 DIP switch functions are shown in Figure 3-4. SW1 switch segments 1 through 5 are not used and must be set to OFF. SW1 segments 6, 7, and 8 are used for print density correction (see Table 3-2).

NOTE

The SW1 print density switches (segments 6, 7, and 8) are set at the factory for each thermal head. Since the tolerance of the resistors in each thermal head varies slightly from one head to another, the print density switch settings at SW1 are not the same for every Colormate. These switch settings may therefore have to be tested and reset by the CE whenever the thermal head is removed and replaced with another one.

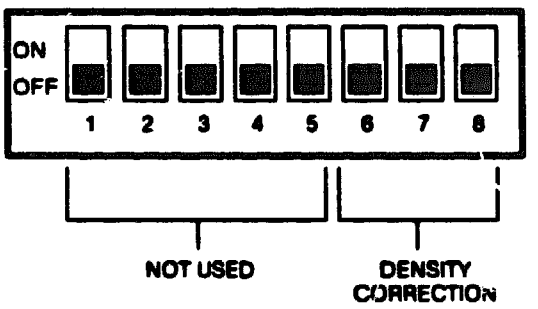


Figure 3-4 SW1 Functions

Table 3-2 Print Density Correction

DENSITY CORRECTION STEP	SW1 SWITCH SEGMENT 6	7	8	
+4	On	On	On	
+3	On	On	Off	Dark
+2	On	Off	On	↑
+1	On	Off	Off	!
0 (standard)	Off	Off	Off	!
-1	Off	Off	On	↓
-2	Off	On	Off	Light
-3	Off	On	On	

SW2 DIP factory switch functions are shown in Figure 3–5. SW2 switch segments 1 through 4 are used to correct the amount of initial paper feed steps in color mode (when a 3- or 4-color ribbon is being used), while segments 4 through 8 perform the same function in monochrome mode (when a black ribbon is being used). See Table 3–3 and Figure 3–6 for information on adjusting the number of paper feed steps, which is basically a method for adjusting the top-of-form. This adjustment feature allows you to vertically shift the entire printable area on the sheet or transparency and adjust the position (up or down) of the printed image. Among other purposes, this feature provides a temporary solution to top-of-form problems that may develop due to worn out paper feed rollers.

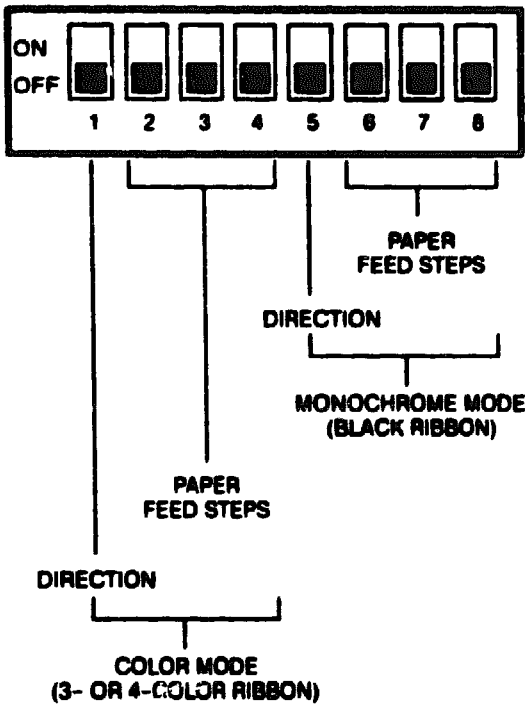


Figure 3–5 SW2 Functions

Table 3-3 Correction of Initial Paper Feed Steps

NUMBER OF CORRECTION STEPS	SW2 SWITCH SEGMENT							
		COLOR MODE				MONOCHROME MODE		
	1	2	3	4	5	6	7	8
0	•	On	On	On	•	On	On	On
8 (approx. 0.027 in. or 0.68 mm)	•	Off	On	On	•	Off	On	On
16 (approx. 0.053 in. or 1.36 mm)	•	On	Off	On	•	On	Off	On
24 (approx. 0.080 in. or 2.04 mm)	•	Off	Off	On	•	Off	Off	On
32 (approx. 0.107 in. or 2.72 mm)	•	On	On	Off	•	On	On	Off
40 (approx. 0.134 in. or 3.4 mm)	•	Off	On	Off	•	Off	On	Off
48 (approx. 0.160 in. or 4.08 mm)	•	On	Off	Off	•	On	Off	Off
56 (approx. 0.187 in. or 4.76 mm)	•	Off	Off	Off	•	Off	Off	Off

• = Direction of correction (see Figure 3-6).

On: Direction in + steps (toward ribbon supply roller)
Off: Direction in - steps (toward ribbon take-up roller)

One step = approximately 0.003 in. (0.0847 mm)

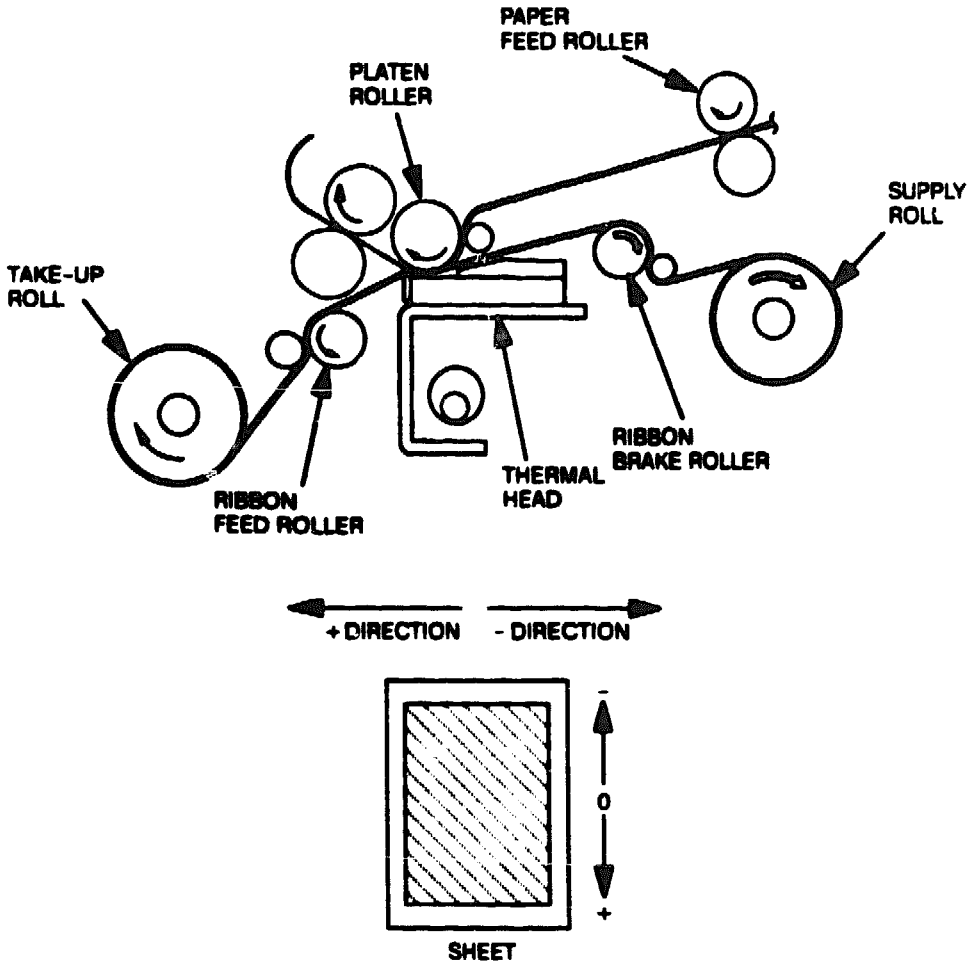


Figure 3-6 Direction of Initial Paper Feed Steps


SECTION 4

Section 4

Maintenance

This section contains instructions for cleaning the Colormate PS printer, adjusting the printer, and packing it for shipment. Although the printer requires no scheduled maintenance procedures, the unit should be cleaned at regular intervals and then adjusted as necessary to maintain high print quality and trouble-free operation.

Before cleaning or adjusting the printer, complete the following preliminary steps.

- Inspect the unit for any loose cables or connectors.
- Check that all connectors are installed in the correct location (refer to the appendix for a printer configuration diagram).
- Check the printer for any obviously missing or broken parts.
- Run any or all of the self-tests described in Section 2 to check and compare printer performance before and after maintenance.

If the printer fails to operate at a high level after being cleaned, adjust parts in conjunction with the troubleshooting information outlined in Section 5. If necessary, remove and replace parts as instructed in Section 6. If required to pack the printer for shipment to a repair center, refer to "Packing" at the end of this section.

CLEANING

To clean the printer, proceed as follows.

CAUTION

Before starting any cleaning procedure, turn off and unplug the printer and remove the ribbon cartridge. Refer to Section 6 for instructions on how to remove the ribbon cartridge. In addition, do not use rubbing alcohol, benzine, paint thinner, or other strong chemicals or abrasives to clean the printer's plastic surfaces. Such materials may dissolve the plastic or cause discoloration.

1. Periodically wipe the printer's outside covers and control panel with a soft, clean, lint-free cloth. The cleaning cloth may be lightly dampened with water and a mild, liquid detergent, such as a common household cleaner. Wipe off any ink stains, smudges, fingerprints, or other residue that detracts from the unit's appearance.

2. Slide the release lever forward (toward the control panel) on the top cover and open the upper unit. Remove dust from inside the printer with a vacuum cleaner (equipped with a rubber-tipped nozzle).

3. Using a soft, lint-free cloth dampened with isopropyl (90%) alcohol, wipe the following surfaces inside the printer (see Figure 4-1).

   - ribbon pinch roller
   - ribbon brake shaft
   - feed roller (FII)
   - pinch roller (RII)
   - pass shaft

4. As shown in Figure 4-1, wipe the surface of the platen with the cleaning cloth.

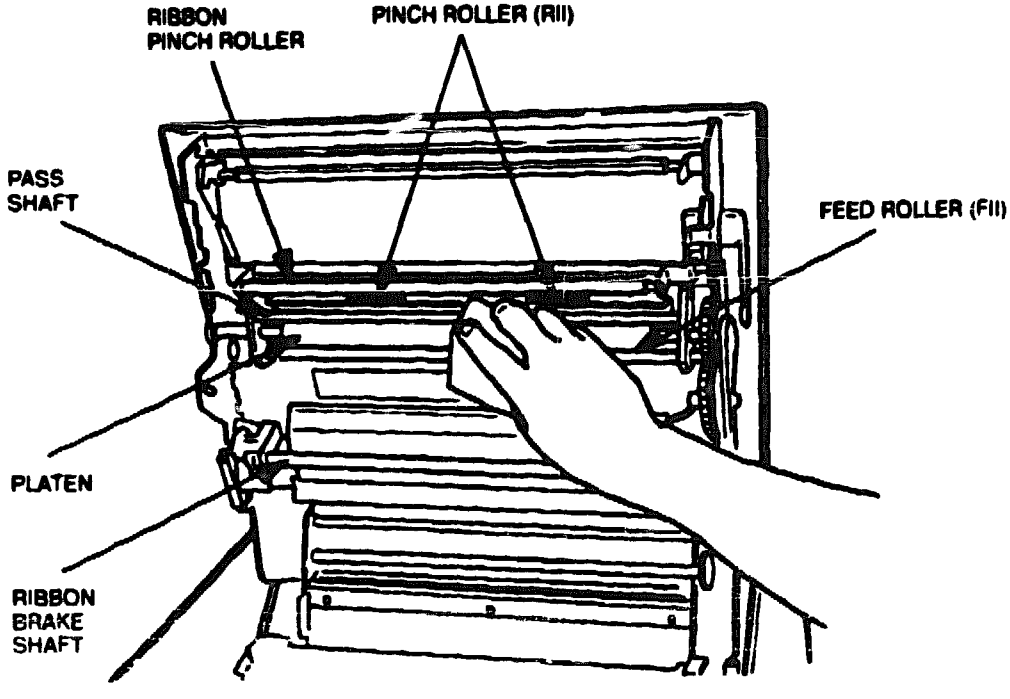


Figure 4-1 Platen, Rollers, and Shafts

5. Place a clean cloth over the thermal head shown in Figure 4-3 to protect the head from damage.

CAUTION

Always place a protective cloth over the thermal head when working inside the printer. Screws, bushings, and tools accidentally dropped on the thermal head may crack the glass inside the head and permanently damage it.

6. Remove the dust cover by loosening and removing the thumb screws shown in Figure 4–2. Remove any accumulated dust or foreign objects on the surfaces behind the cover. Wipe the surfaces of the paper feed roller and pick roller. Then reinstall the dust cover.

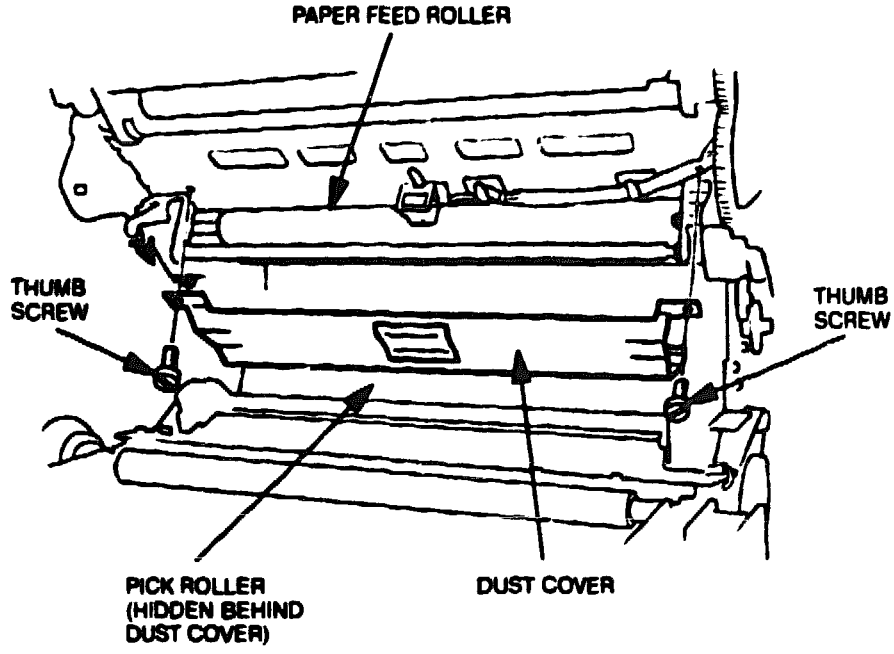


Figure 4–2 Dust Cover Removal

7. Wipe the ribbon feed roller and ribbon brake roller (see Figure 4–3). Then wipe the thermal head as shown in Figure 4–3.

NOTE

The thermal head should be wiped with a soft, lint-free cloth on a daily basis by the end user. However, to ensure proper operation, customer engineers should wipe the thermal head using isopropyl (90%) alcohol during every service call. Before cleaning, allow ample time for the thermal head to cool after turning off and unplugging the printer. Do not use strong solvents such as rubbing alcohol or lacquer thinner to clean the head.

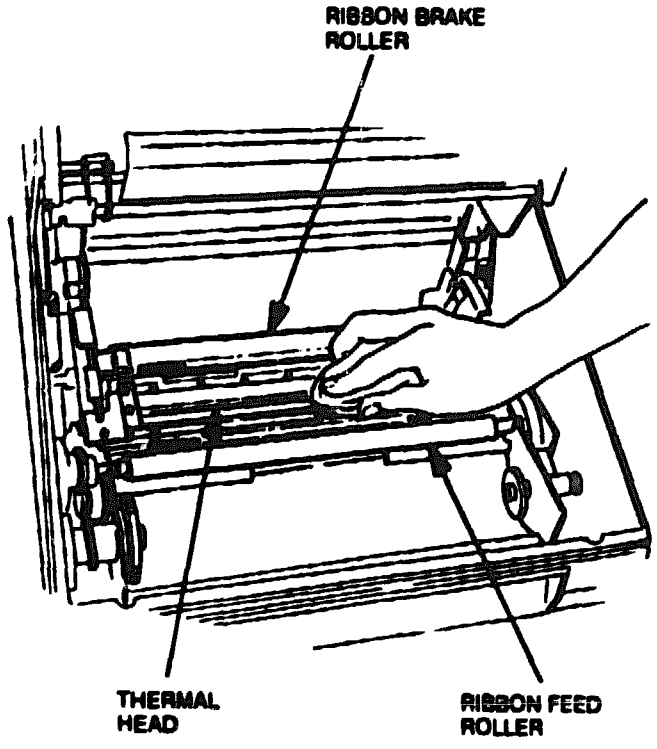


Figure 4–3 Ribbon Feed Roller, Ribbon Brake Roller, and Thermal Head Cleaning

ADJUSTMENTS

This subsection contains adjustment procedures for the Colormate PS thermal transfer printer. These adjustments may be necessary to eliminate paper jams or maintain consistent print quality. Refer to Section 6 for instructions on how to remove the parts necessary to make the adjustments described in this subsection.

Adjustment Tools

The following tools are required to make thermal transfer printer adjustments.

- #1 Philips screwdriver
- #2 Philips screwdriver
- 500 and 2000 gram (g) tension gauges
- 0.80 in. (2.0 mm) feeler gauge for thermal head height
- small metric ruler
- two 5.5 mm open-end wrenches
- blank ribbon core (cardboard cylinder) and supply ribbon hubs
- Vernier calipers
- 8.50 x 1.18 in. (216 x 30 mm) set piece (cut from 8 1/2 x 11-in. paper)

Line Feed Motor Timing Belt B140MXL9.5 Tension Adjustment

Adjustment of the line feed motor tension belt may be necessary to correct paper feeding problems. To adjust the belt, follow these steps.

1. Remove the middle cover (see Section 6).
2. Using a tension gauge, press on the center of timing belt B140MXL9.5 with a load of 300 g. Then, using a small, metric ruler, check that the flexure value of the pressed belt is 4.5 to 6.5 mm (see Figure 4–4). If the correct value is not attained, proceed as follows.

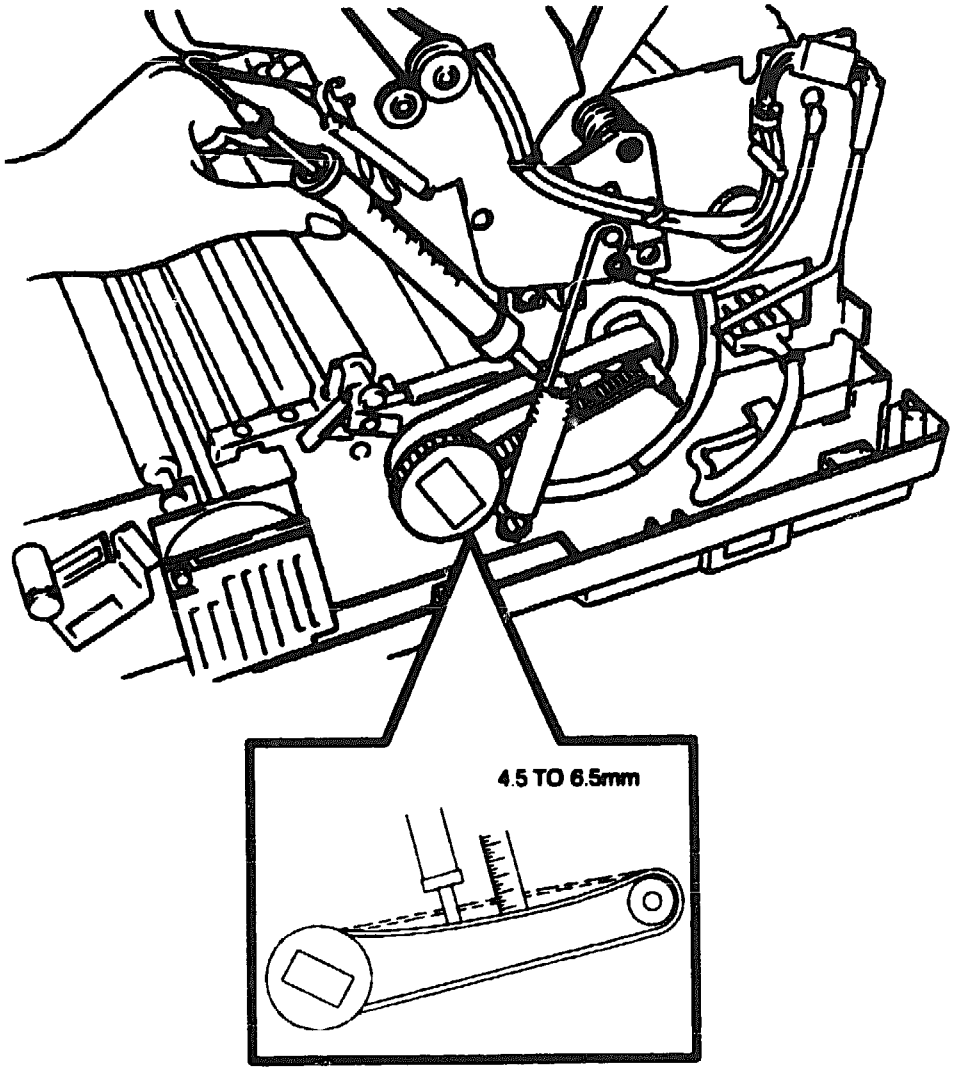


Figure 4–4 Timing Belt B140MXL9.5 Tension Measurement

3. Loosen the three screws that secure the LF motor assembly (see Figure 4–5).

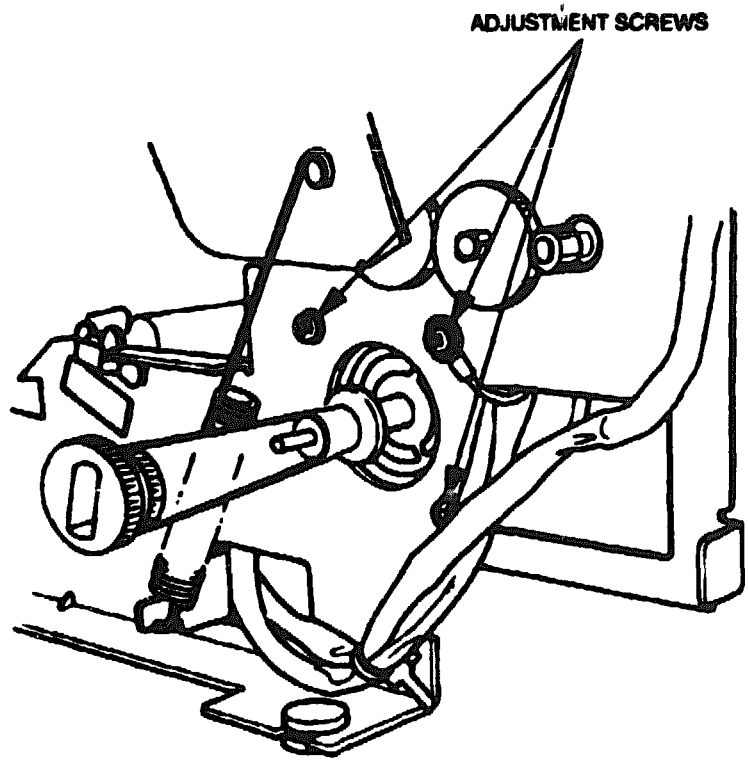


Figure 4–5 LF Motor Assembly Tension Adjustment Screws

4. If the flexure value is smaller than 4.5 mm, move the LF motor forward (toward the control panel) and tighten the securing screws.

   If the flexure value is larger than 6.5 mm, move the LF motor backward (toward the rear of the printer) and tighten the securing screws.

5. Repeat step 2 to check the belt tension. If necessary, repeat steps 2 through 5 until the correct tension value is attained.

Ribbon Motor Timing Belt B328MXL9.5 Tension Adjustment

Adjustment of the B328MXL9.5 timing belt may be necessary to correct ribbon feeding problems. To adjust the belt, follow these steps.

1. Remove the middle cover (see Section 6).

2. Using a 500 g tension gauge, press on the center of timing belt B328MXL9.5 between the roller and the head cam pulley with a load of 150 g. Then, using a small, metric ruler, check that the flexure value of the pressed belt is between 4.5 and 6.5 mm (see Figure 4-6). If the correct value is not attained, proceed as follows.

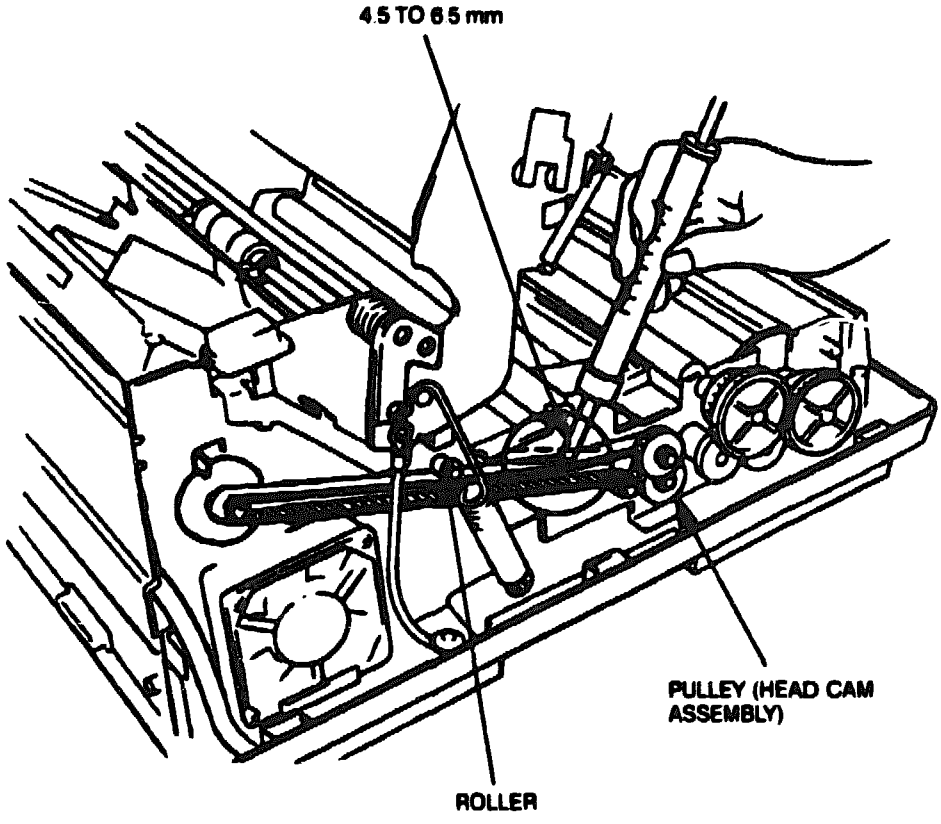


Figure 4-6 Timing Belt B328MXL9.5 Tension Measurement

3. Loosen the three screws securing the RB motor assembly (see Figure 4-7).

4. If the flexure value is smaller than 4.5 mm, move the RB motor forward (toward the control panel) and tighten the securing screws.

   If the flexure value is larger than 6.5 mm, move the RB motor backward (toward the rear of the printer) and tighten the securing screws.

5. Repeat step 2 to check the belt tension. If necessary, repeat steps 2 through 5 until the correct amount of tension is measured.

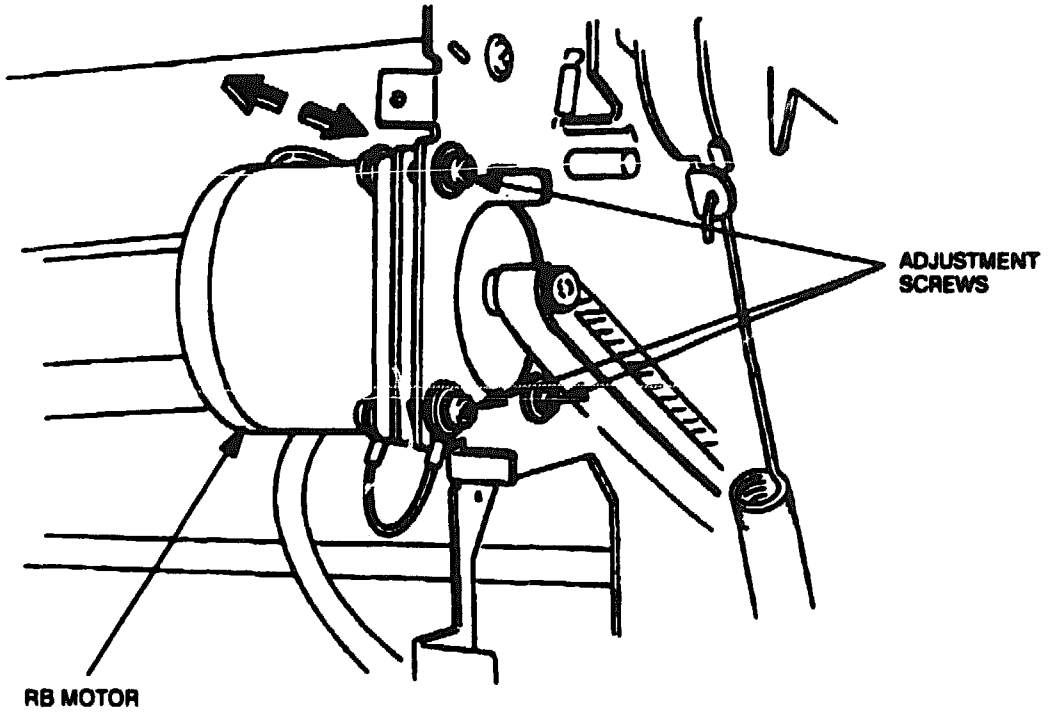


Figure 4–7 RB Motor Tension Belt Adjustment

Ribbon Take-Up Roller Winding Force

This adjustment determines how tightly the ribbon is wound around the ribbon take-up roller (ribbon core). Adjustment of the ribbon take-up roller winding force may be necessary to correct ribbon feeding problems and/or poor print quality. To adjust the ribbon take-up roller winding force, follow these steps.

1. Slide the release lever forward (toward the control panel) on the top cover and open the upper unit.
2. Install a blank ribbon core (a cardboard core with no ribbon wound around it) on the take-up ribbon hubs. Attach a set piece on the center of the ribbon core with a piece of tape.
3. Wind the set piece two complete turns around the ribbon core. Then hold the ribbon roller gear so it doesn't turn and, as shown in Figure 4–8, pull the set piece as slowly as possible using a tension gauge. Monitor the amount of force (as measured by the tension gauge) required to cause the roller to rotate. The standard force value is 500 to 800 g. If the value obtained by pulling on the set piece is not between 500 and 800 g, proceed as follows.

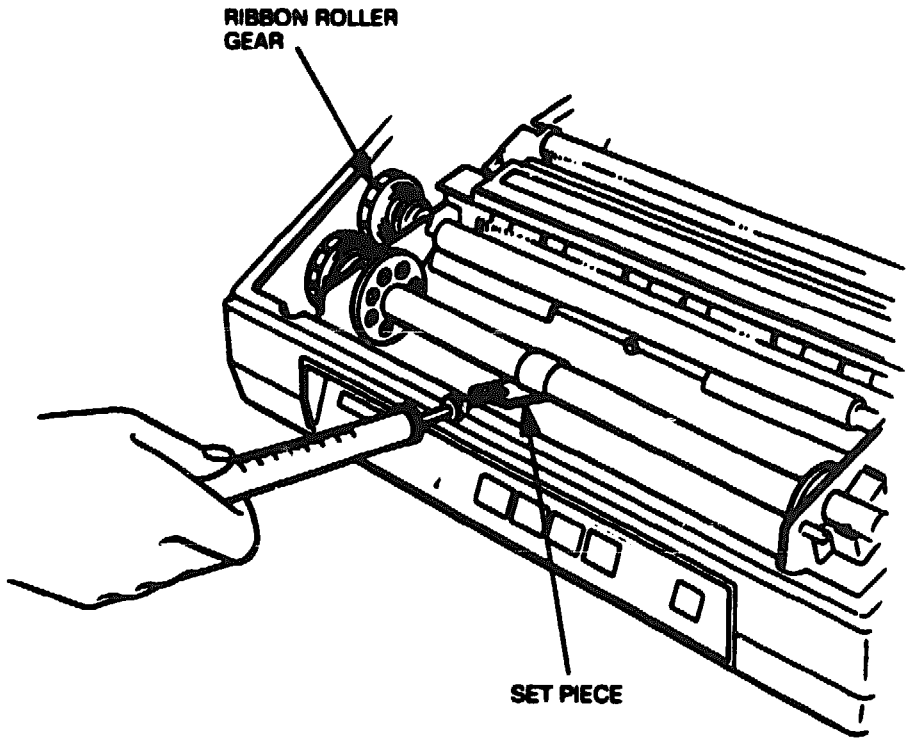


Figure 4-8 Ribbon Take-Up Roller Winding Force Adjustment

4. Remove the middle cover (refer to Section 6).
5. Remove the retaining pin shown in Figure 4-9 by pressing the ribbon roller clutch inward and then turning it. If the amount of tension measured in step 3 is smaller than 500 g, set the retaining pin to position A on the ribbon roller clutch (see Figure 4-9). If the measurement is larger than 800 g, set the retaining pin to position C.
6. Repeat step 3 to check the ribbon winding force. If necessary, repeat steps 3 through 6 until the correct amount of tension is measured for the ribbon take-up roller winding force.

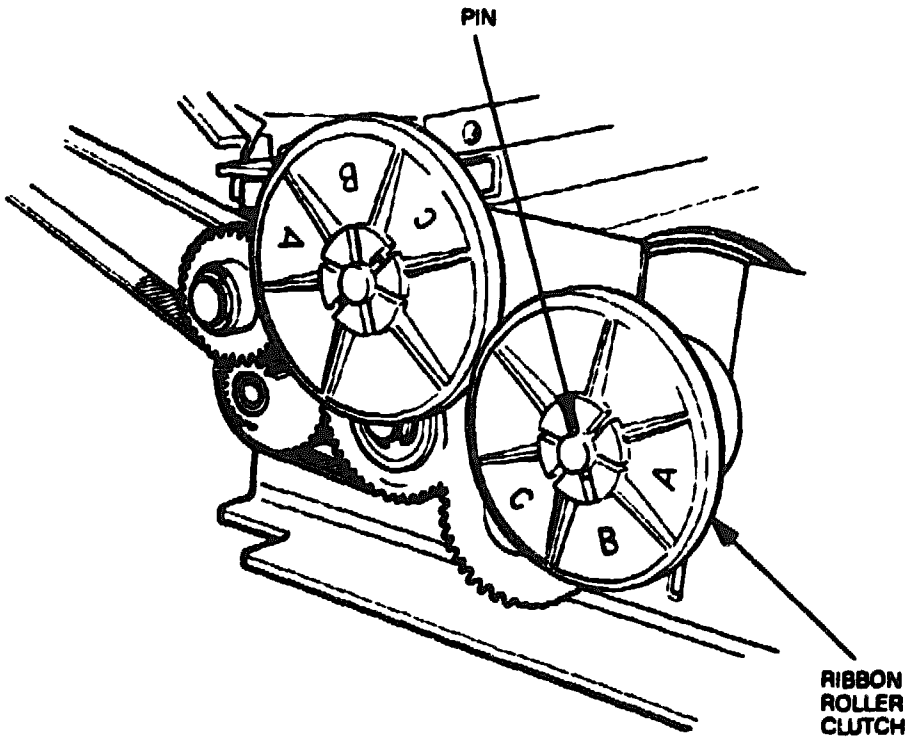


Figure 4-9 Ribbon Take-Up Roller Clutch Adjustment

Ribbon Feed Roller Feeding Adjustment

This adjustment determines how strongly the ribbon is driven and guided by the ribbon feed roller onto the ribbon take-up roller. Adjustment of the ribbon feed roller force may be necessary to correct ribbon feeding problems and/or poor print quality. To make this adjustment, proceed as follows.

1. Slide the release lever forward (toward the control panel) on the top cover and open the upper unit.
2. Attach a set piece on the center of the ribbon feed roller with a piece of tape.

NOTE

After adjusting the ribbon feed roller, wipe the roller with a clean cloth moistened with isopropyl (90%) alcohol to eliminate any residue left by the tape.

3. Wind the set piece two complete turns around the ribbon feed roller (see Figure 4-10). Then hold the ribbon roller gear so it doesn't turn and, as shown in Figure 4-10, pull the set piece as slowly as possible using a 2000 g tension gauge. Monitor the amount of force (as measured by the tension gauge) required to cause the roller to rotate. The standard force value is 1.6 to 2.0 kg. If the value obtained by pulling on the set piece is not between 1.6 and 2.0 kg, proceed as follows.

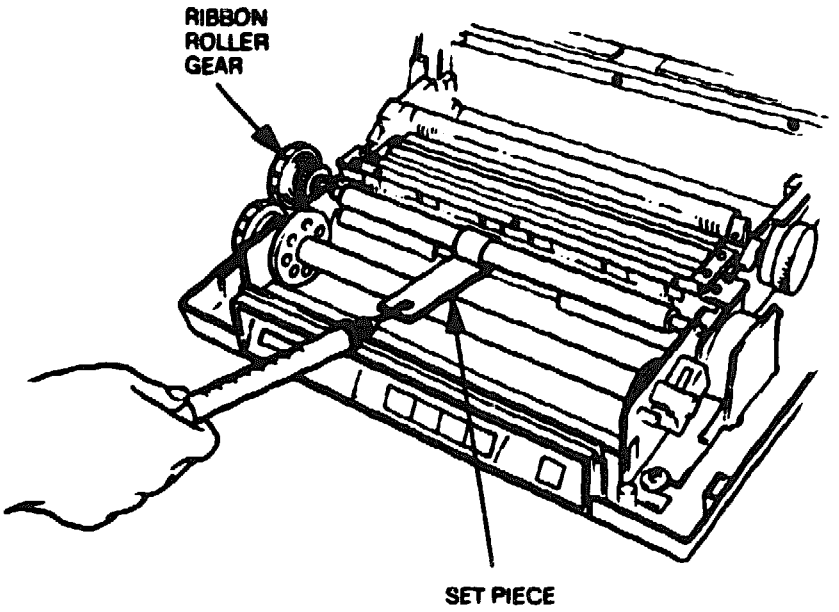


Figure 4-10 Ribbon Feed Roller Feeding Force Adjustment

4. Remove the middle cover (refer to Section 6).
5. Remove the retaining pin shown in Figure 4-11 by pressing the ribbon roller clutch inward and then turning it. If the amount of tension measured in step 3 is smaller than 1.6 kg, set the retaining pin to position A on the ribbon roller clutch (see Figure 4-11). If the measurement is larger than 2.0 kg, set the retaining pin to position C.
6. Repeat step 3 to check the ribbon feed force. If necessary, repeat steps 3 through 6 until the correct amount of tension is measured for the ribbon feed roller.

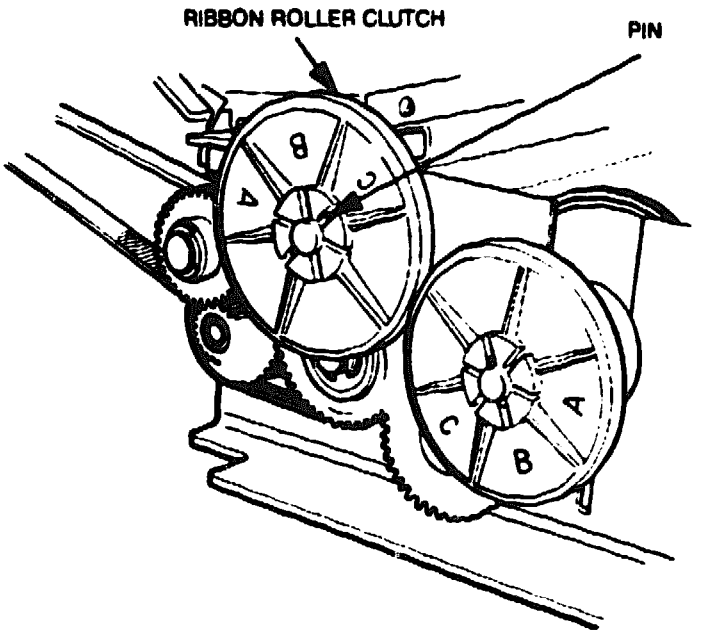


Figure 4-11 Ribbon Feed Roller Clutch Adjustment

Ribbon Brake Roller Friction Adjustment

When properly adjusted, the friction applied by the ribbon brake roller helps ensure smooth ribbon feeding operations. When ribbon feeding problems occur, follow these steps to check the amount of friction applied by the ribbon brake roller.

1. Slide the release lever forward (toward the control panel) on the top cover and open the upper unit.
2. Attach a set piece on the ribbon brake roller with a piece of tape. Wind the set piece two complete turns around the ribbon brake roller (see Figure 4–12).

NOTE

After adjusting the ribbon brake roller, wipe the roller with a clean cloth moistened with isopropyl (90%) alcohol to eliminate any residue left by the tape.

3. Using a tension gauge, pull the set piece as slowly as possible. Monitor the amount of force (as measured by the tension gauge) required to cause the roller to rotate. The standard force value is 100 to 200 g. If the value obtained by pulling on the set piece is not between 100 and 200 g, proceed as follows.

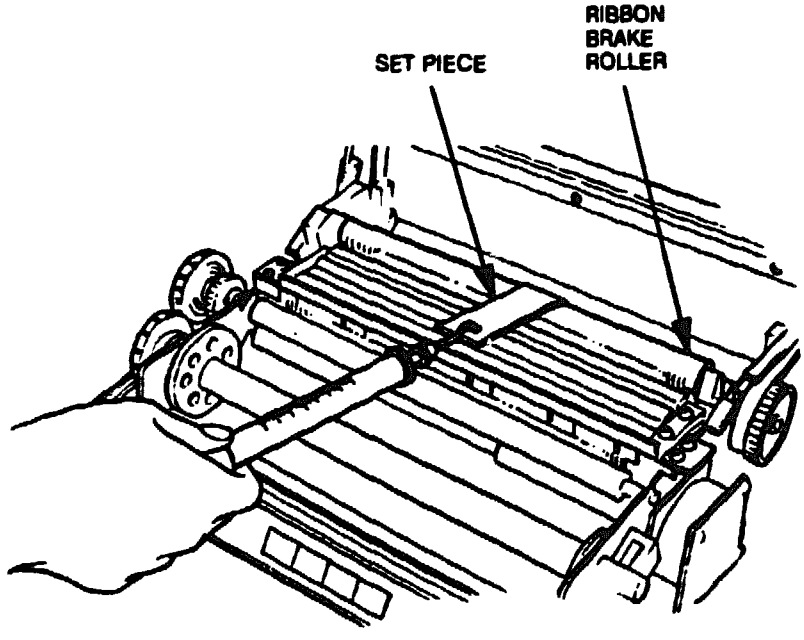


Figure 4–12 Ribbon Brake Roller Friction Measurement

4. Remove the middle cover (see Section 6).
5. Loosen the screw that secures the RBB leaf spring assembly (see Figure 4–13). If the value on the tension gauge measured in step 3 is smaller than 100 g, raise the RBB leaf spring assembly and tighten the screw (see Figure 4–13). This will increase the drag on the roller. If the measurement is larger than 200 g, lower the RBB leaf spring assembly and tighten the screw. This will decrease the drag on the roller.
6. Repeat step 3 to check the ribbon brake roller friction. If necessary, repeat steps 3 through 6 until the correct amount of friction is measured for the ribbon brake roller.

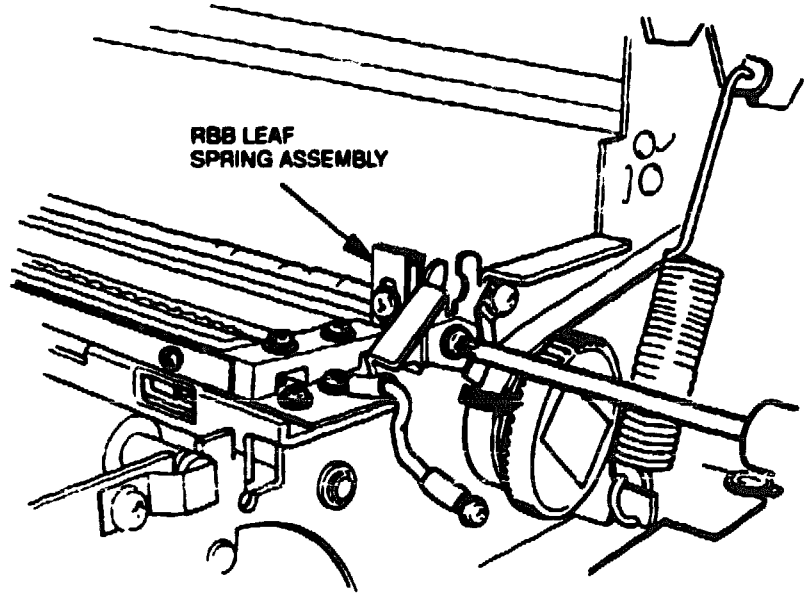


Figure 4–13 RBB Leaf Spring Adjustment

Ribbon Supply Roller Friction Adjustment

This adjustment ensures that the proper amount of friction is supplied by the ribbon supply roller. When adjusted properly, the ribbon is unwound from the supply roller by the ribbon motor at a force that helps ensure smooth ribbon feeding operations. When ribbon feeding problems occur, follow these steps to check the amount of friction applied by the ribbon supply roller.

1. Slide the release lever forward (toward the control panel) on the top cover and open the upper unit.
2. Install supply hubs and a blank ribbon core (a cardboard core with no ribbon wound around it) to the supply cartridge mounting blocks. Attach a set piece on the center of the ribbon core with a piece of tape.
3. Wind the set piece two complete turns around the ribbon core (see Figure 4–14).

4. Using a tension gauge, pull the set piece as slowly as possible. Monitor the amount of force (as measured by the tension gauge) required to cause the roller to rotate. The standard force value is 30 to 100 g. If the value obtained by pulling on the set piece is not between 30 and 100 g, proceed as follows.

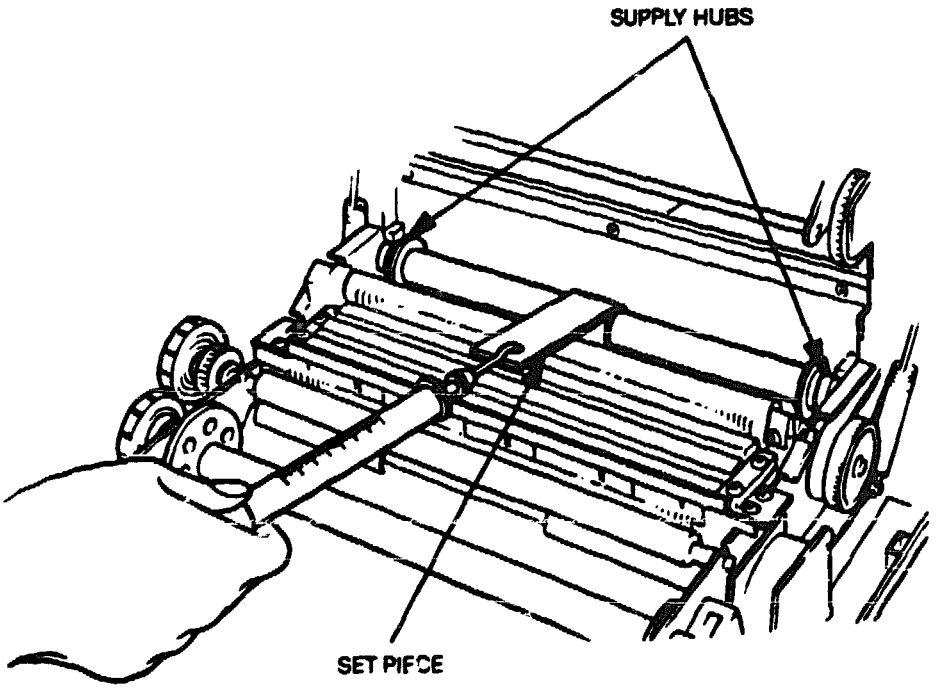


Figure 4–14 Ribbon Supply Roller Friction Adjustment

5. Remove the middle cover (see Section 6).
6. If the amount of tension measured in step 4 is less than 30 g, bend the RBK leaf spring assembly shown in Figure 4–15 forward (toward the control panel). If the measurement is larger than 100 g, bend back the RBK leaf spring assembly toward the rear of the printer.
7. Repeat step 4 to check the ribbon supply roller friction. If necessary, repeat steps 4 through 7 until the correct amount of friction is measured for the ribbon supply roller.

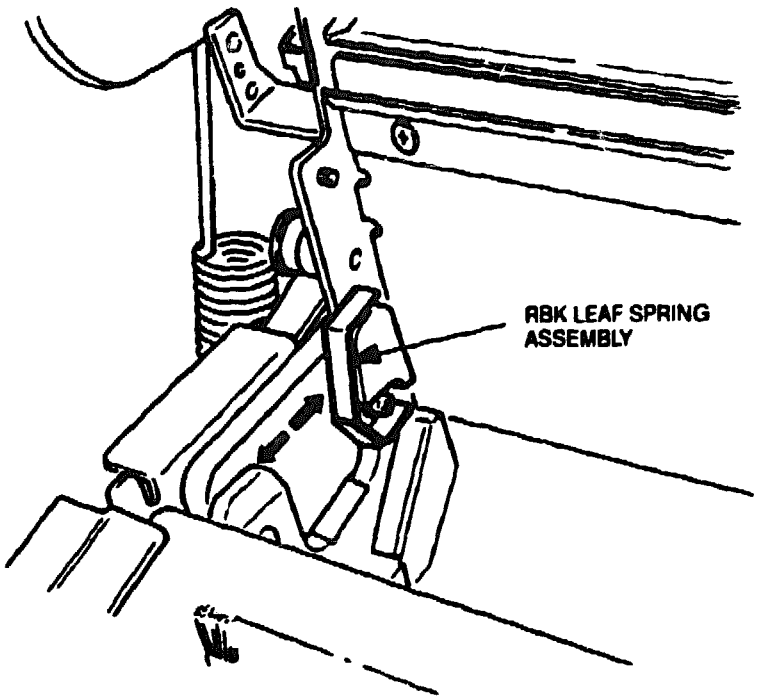


Figure 4-15 RBK Leaf Spring Assembly Adjustment

Lift Sensor Subassembly Adjustment

The lift sensor subassembly detects when a sheet of paper is fed ("picked") from the cut sheet guide (CSG) and helps determine the timing of subsequent paper feeding operations. Adjustment of the lift sensor subassembly may be necessary if the sheet doesn't feed properly from the CSG into the printer. To adjust the lift sensor subassembly, follow these steps.

1. Remove the middle cover (refer to Section 6).
2. Turn the lift shaft so that the lift plate is in the lower position. Then check that the brake shown in Figure 4-16 presses on the lift sensor subassembly lever. If the brake does not press against the lever, proceed as follows.

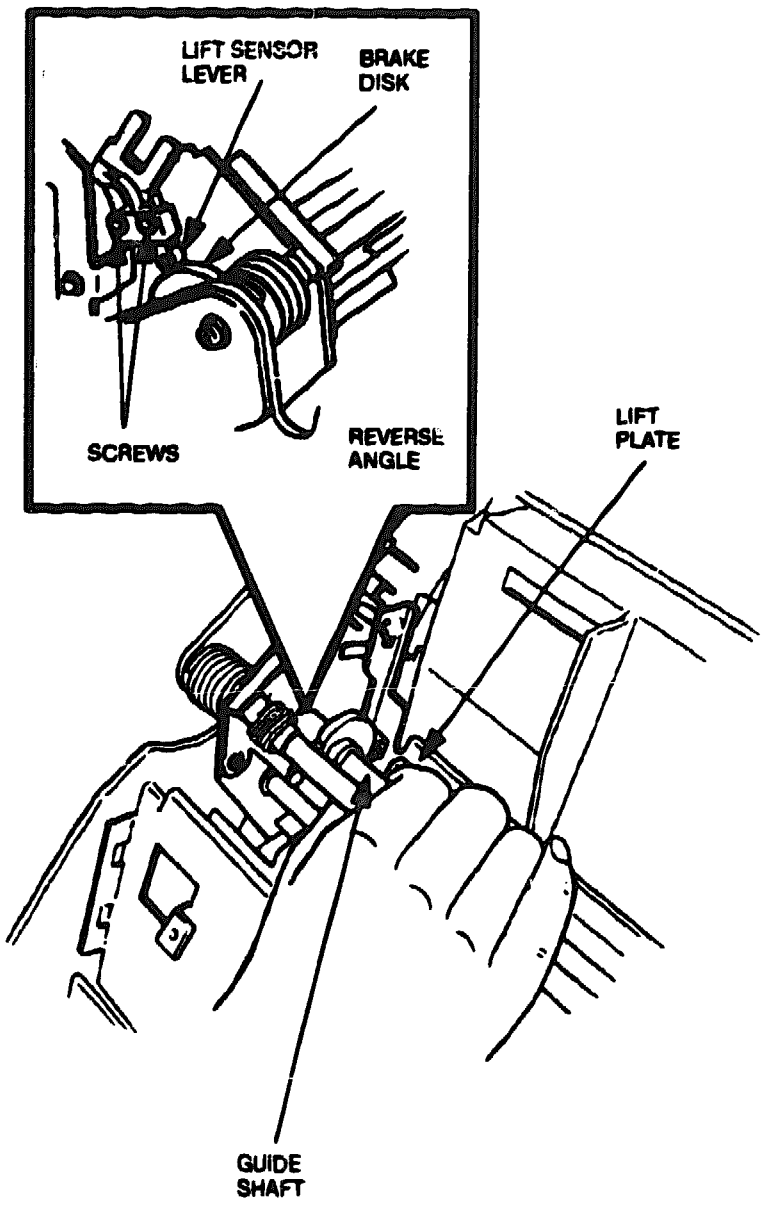


Figure 4–16 Lift Sensor Subassembly Adjustment

3. Open the upper unit and loosen the screws on the lift sensor subassembly (see Figure 4–16).
4. Gently press the sensor lever so it touches the outer circumference of the brake disk and tighten the screws.
5. Repeat step 2 to check sensor operation. If necessary, repeat steps 3 through 5 until the lift sensor subassembly is adjusted properly.

Pick Gear 20-51 Backlash Adjustment

This adjustment may be necessary if the sheet is not fed ("picked") properly from the CSG into the printer. To adjust the pick gear 20-51, follow these steps.

1. Remove the middle cover (see Section 6).
2. To measure the backlash between the CSG motor gear and pick gear 20-51 (see Figure 4-17), insert a sheet of plain, white paper between the gears. Then slowly pull out the sheet so that the gears rotate. Examine the gear marks left on the sheet. If the sheet is crinkled but not torn, the backlash is within the specified range of between 0.004 and 0.008 in. (0.1 and 0.2 mm). If the paper tears, the backlash is not within the allowable range. Adjust the backlash as follows.

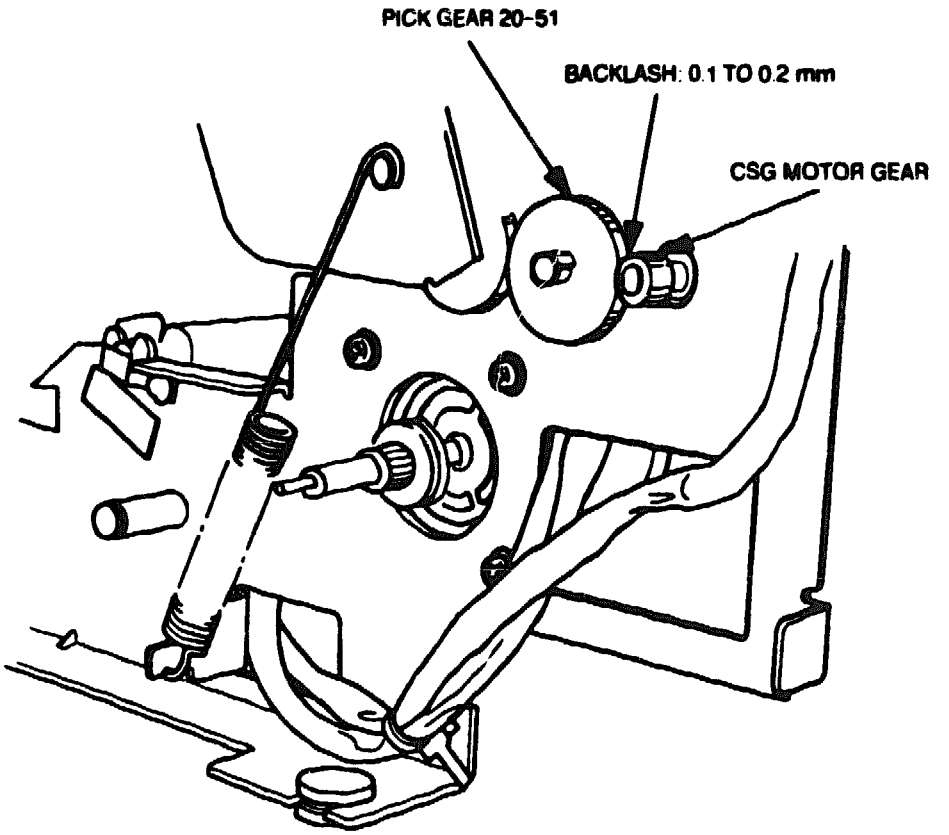


Figure 4-17 Pick Gear 20-51 Backlash Adjustment

3. Remove the power supply (refer to Section 6).
4. Loosen the CSG motor screws (see Figure 4-18).
5. Adjust the CSG motor position and tighten the motor screws when the correct amount of backlash between the gears has been measured.

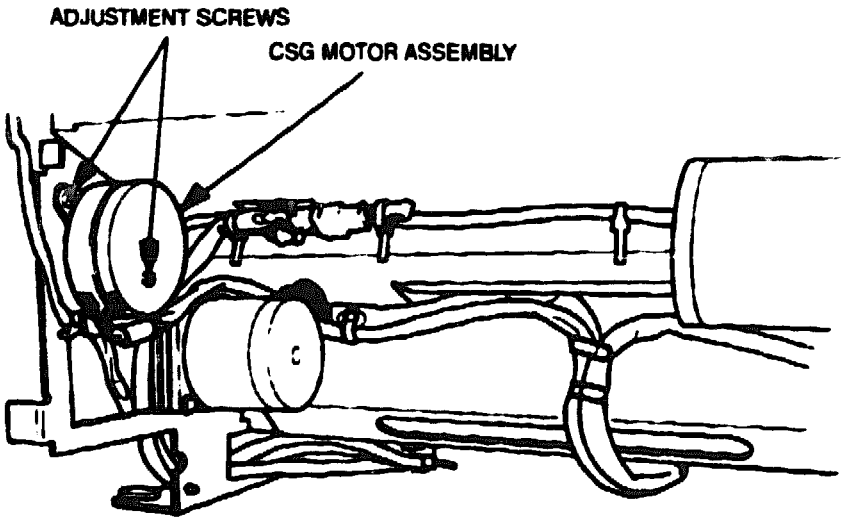


Figure 4-18 CSG Motor Position Adjustment

Thermal Head Height Adjustment

If print quality and/or paper feeding problems occur, the problem may be due to the thermal head not lifting (or not lifting enough), causing the sheet to be improperly positioned for printing and paper feeding functions. Follow these steps to ensure that the thermal head height adjustment is within specifications.

1. Remove the thermal head (see Section 6).
2. Inspect the six screws on the head holder plate (see Figure 4-19). The ends of the two middle screws should protrude from the nuts, and the distance from the base of the nuts to the ends of the two middle screws should be 0.086 to 0.090 in. (2.2 to 2.3 mm). Use a feeler gauge to verify that the two middle screws are adjusted correctly. The other four screws should be flush with the nut surface. If the measurement for each screw is not within specification, refer to the next step.
3. Insert a 5.5 mm, open-end wrench into each head holder plate hole to keep each screw from turning. Using a second wrench, turn the nuts shown in Figure 4-19 to adjust the height of each hexagon head screw until each screw meets the specifications provided in step 2. When the correct measurement has been obtained, reinstall the thermal head.

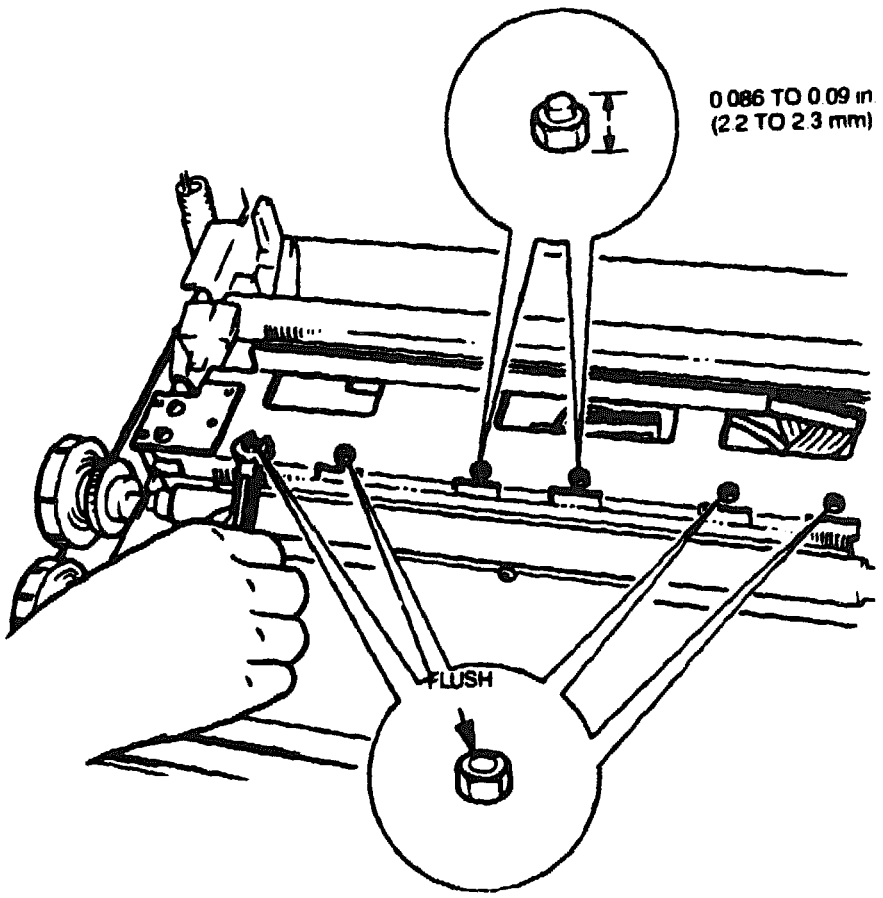


Figure 4–19 Thermal Head Height Adjustment

Timing Belt B170MXL3.2 Tension Adjustment

If paper feeding problems occur, check the tension on timing belt B170MXL3.2 by following these steps.

1. Remove the top cover on the upper unit (see Section 6).
2. Open the upper unit.
3. Using a tension gauge, apply a force of 100 g on the middle of the belt between the idler gear and idler pulley (see Figure 4–20). Then, using a small, metric ruler, check the flexure value of the pressed belt. The standard flexure value is 3.5 to 4.5 mm. If the standard measurement is not obtained, proceed as follows.

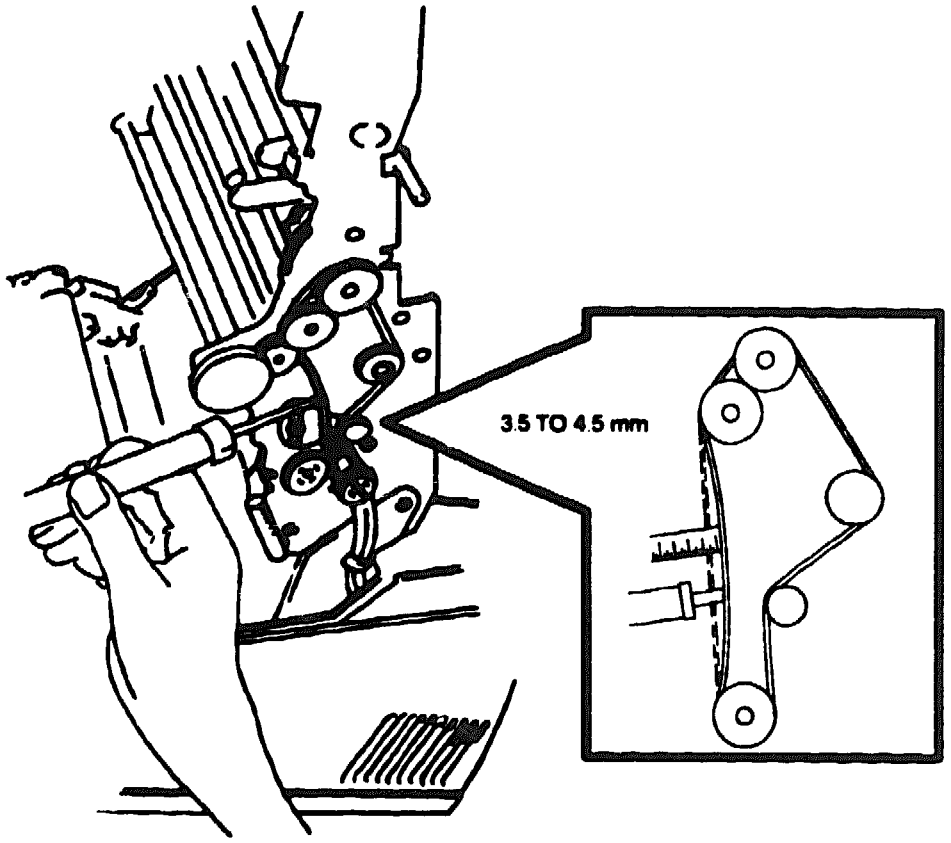


Figure 4–20 Timing Belt B170MXL3.2 Tension Measurement

4. Loosen the tension plate assembly screw shown in Figure 4–21.
5. Slide the tension plate assembly in the direction necessary to achieve the correct belt tension (see Figure 4–21). Slide the plate assembly toward the rear of the printer to loosen the belt and increase the flexure value. Slide the assembly toward the front of the printer (toward the control panel) to tighten the belt and decrease the flexure value.
6. Repeat step 3 to check the belt tension.

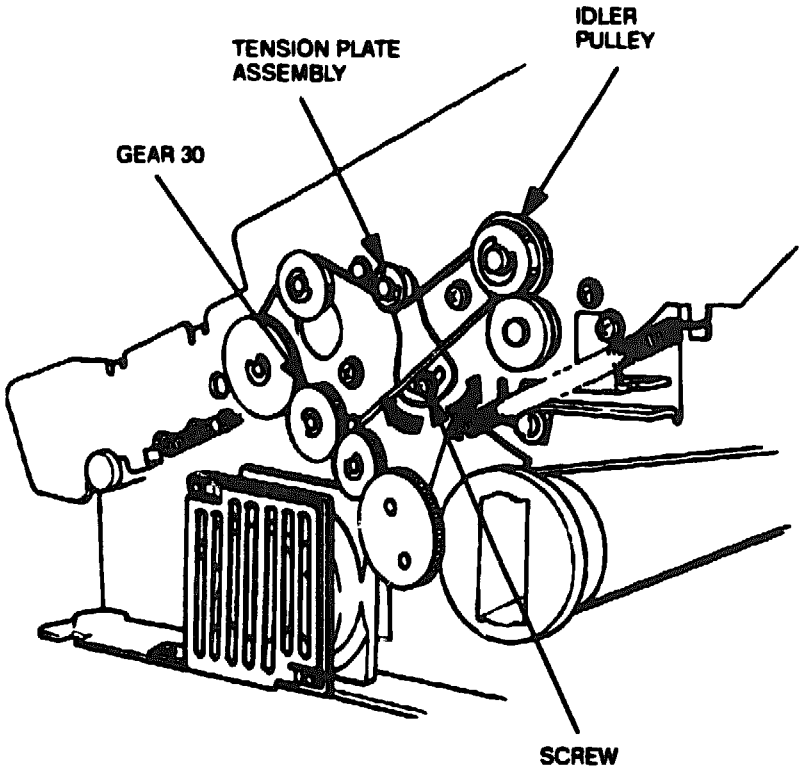


Figure 4-21 Tension Roller Assembly Adjustment

Pinch Roller (RII) and Feed Roller (RII) Friction Adjustment

To correct paper feeding problems, check the distance between the pinch roller (RII) and feed roller (RII) by following these steps.

1. Remove the top and middle covers (see Section 6).
2. Remove the four screws that secure the paper guide plate (C) assembly (see Figure 4-22) and remove the assembly.

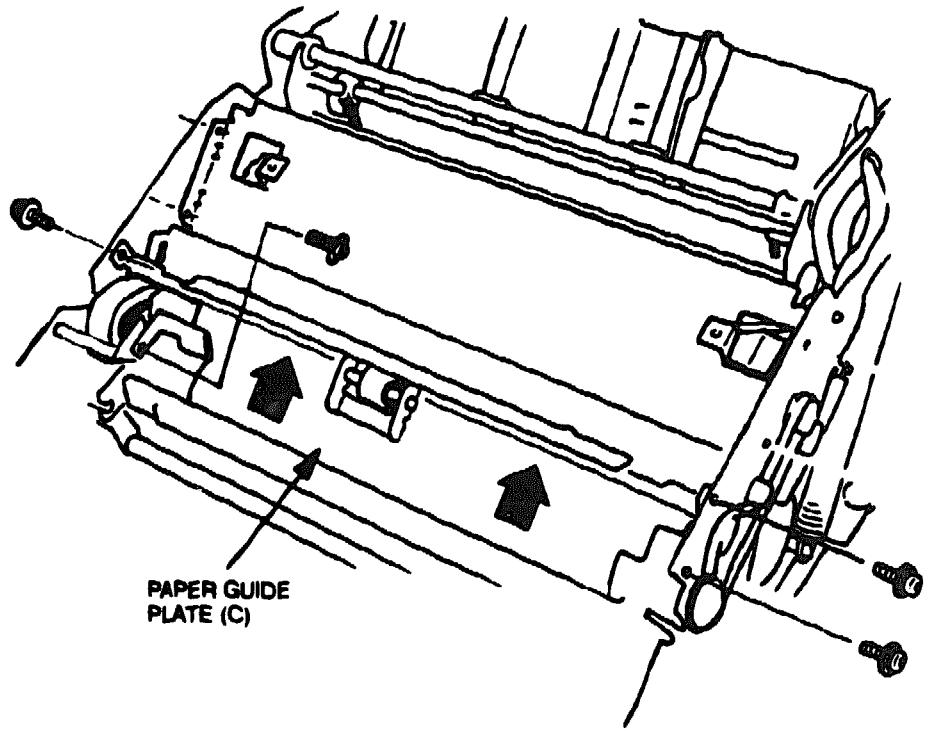


Figure 4-22 Paper Guide Plate (C) Assembly

3. As shown in Figure 4-23, use a pair of calipers to measure the distance between the top and bottom coils on the left and right upper unit tension stay springs. The coil length of the springs should be between 0.976 to 0.984 in. (24.8 to 25.0 mm) with a tolerance of ± 0.010 in. (0.254 mm).

NOTE

Measure from the first complete, 360° coil at one end of the spring to the last 360° coil at the other end. Do not place the calipers on the sections of coil with the hooks on the ends.

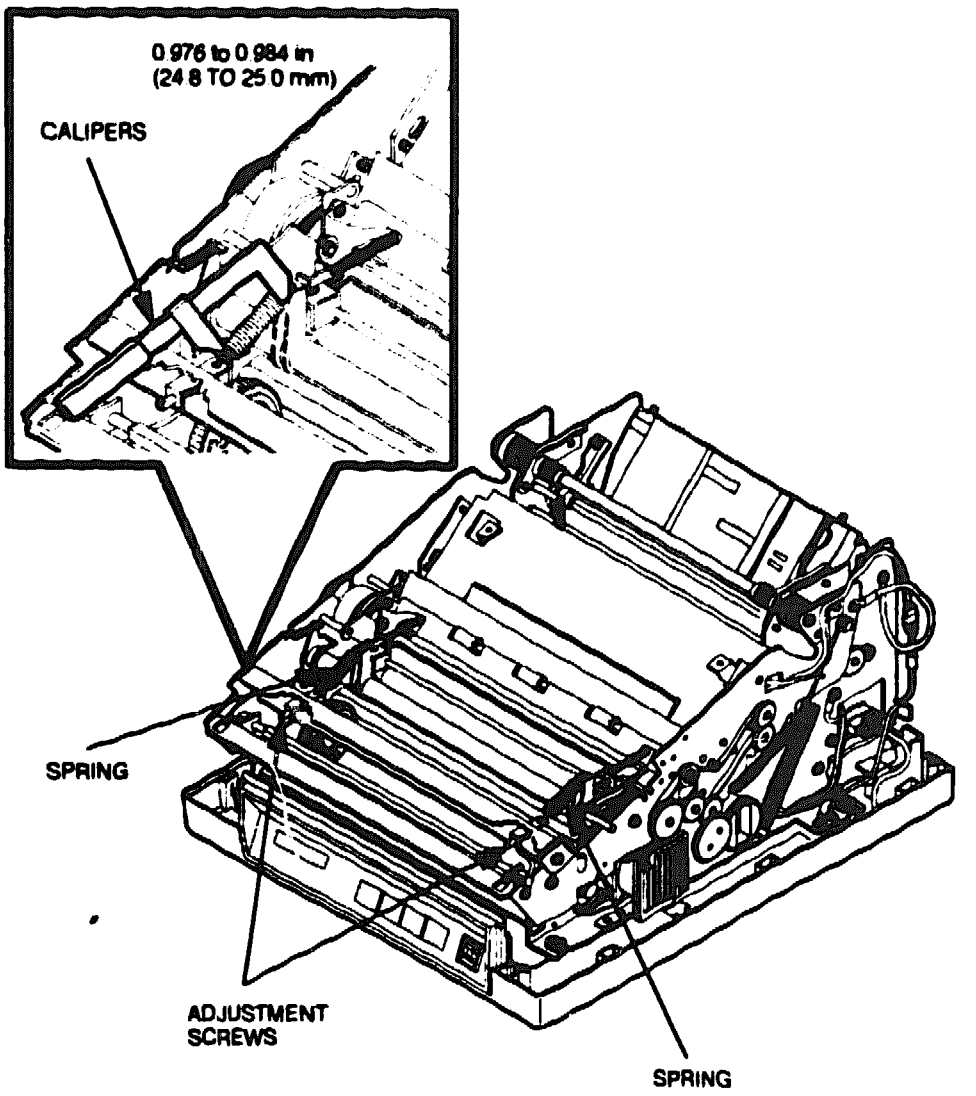


Figure 4-23 Pinch Roller (RII) and Feed Roller (RII) Friction Measurement

4. If the coil length for each spring is not within specification, use a flat-tip screwdriver to adjust the tension on the right and left tension stay springs. If the measured coil length is longer than 0.984 in. (25.0 mm) turn the screws clockwise to lessen the spring tension. If the coil length is less than 0.976 in. (24.8 mm), increase the tension on the springs by turning them counterclockwise.
5. If necessary, repeat steps 3 through 5 until the correct measurement is obtained for each spring.

Platen Roller and Feed Roller (FII) Friction Adjustment

To correct paper feed problems, check the distance between the platen roller and feed roller (FII) by following these steps.

1. Remove the top cover on the upper unit (see Section 6).
2. As shown in Figure 4-24, insert a set piece between the platen roller and feed roller (FII) a distance of 1.97 in. (50 mm).
3. While holding the gear knob to keep the roller gear from turning, slowly pull the other end of the set piece with a tension gauge. Measure the amount of force registered on the gauge required to pull out the set piece from between the platen and feed rollers. The standard force should measure between 500 and 600 g. Check for the correct measurement on both the right and left ends of the rollers. If the correct measurement is not obtained at each end, proceed as follows.

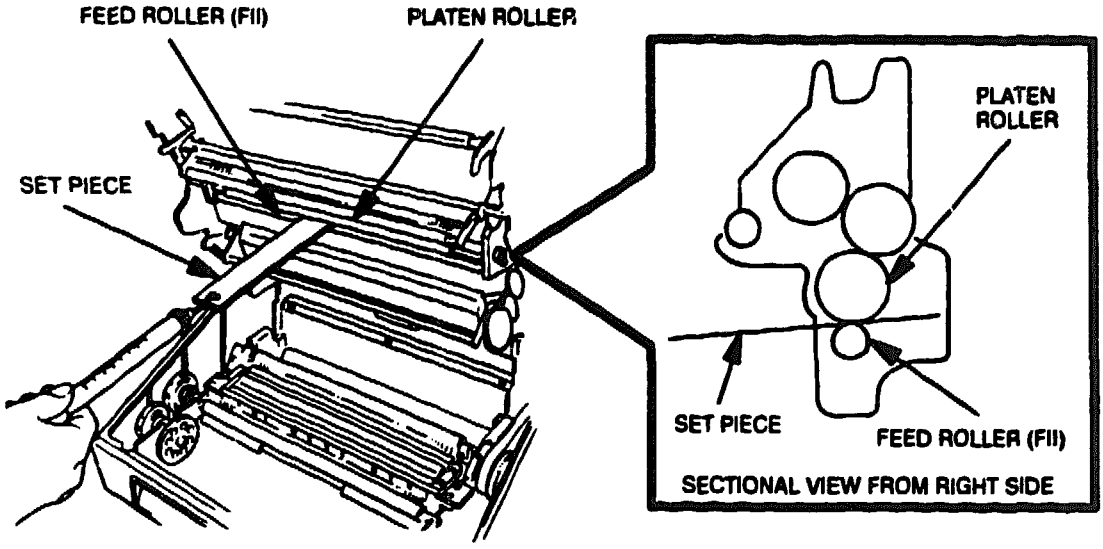


Figure 4-24 Platen Roller and Feed Roller (FII) Friction Measurement

4. If the measured pull-out force is larger than 600 g, use a flat-tip screwdriver to turn the screw on the right and left tension stays (see Figure 4-25) clockwise. If the pull-out force is smaller than 500 g, turn the screws counterclockwise.

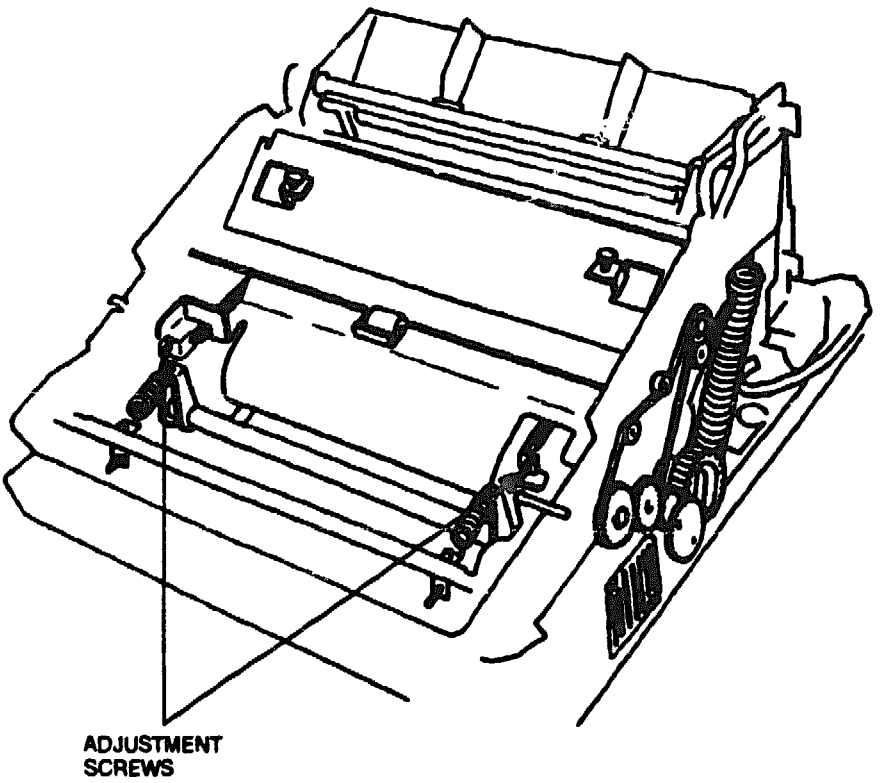


Figure 4-25 Tension Stay Friction Adjustment Screws

5. If necessary, repeat steps 3 through 5 until the correct measurement is obtained.

PACKING

When packing the Colormate PS printer for shipment, dealers and customer engineers should, whenever possible, pack the printer in the original shipping materials and cartons.

To prepare the printer for packing, follow these steps.

1. Turn the printer off and unplug the power cord from the printer.
2. Remove the ribbon (see Section 6).
3. Disconnect the interface cable from the port on the rear of the printer.
4. Remove any paper or transparencies from the printer, then remove the hopper, privacy cover, and stacker.
5. Set the shipping restraints shown in Figure 4-26 to the down position.

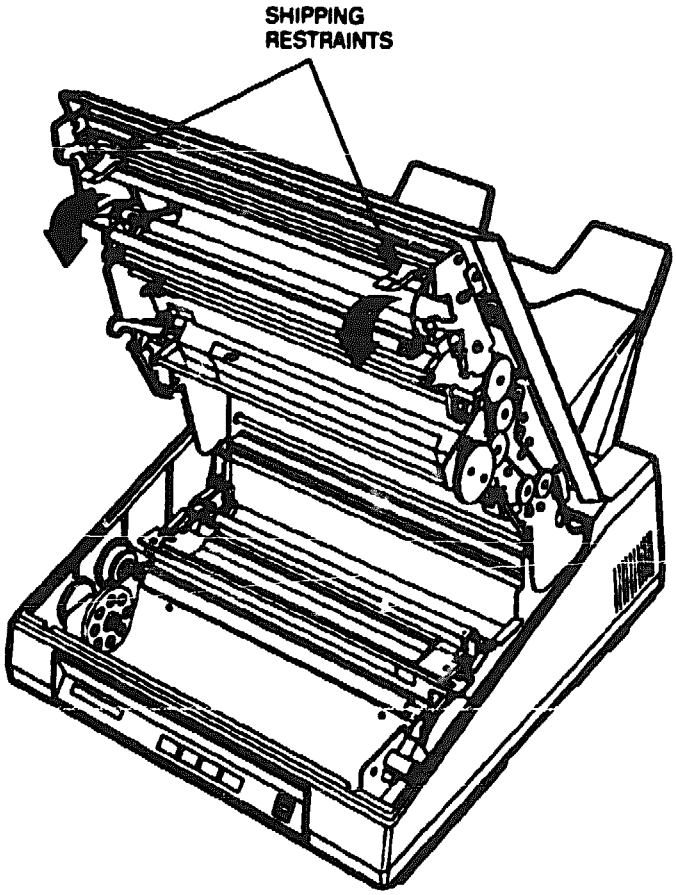
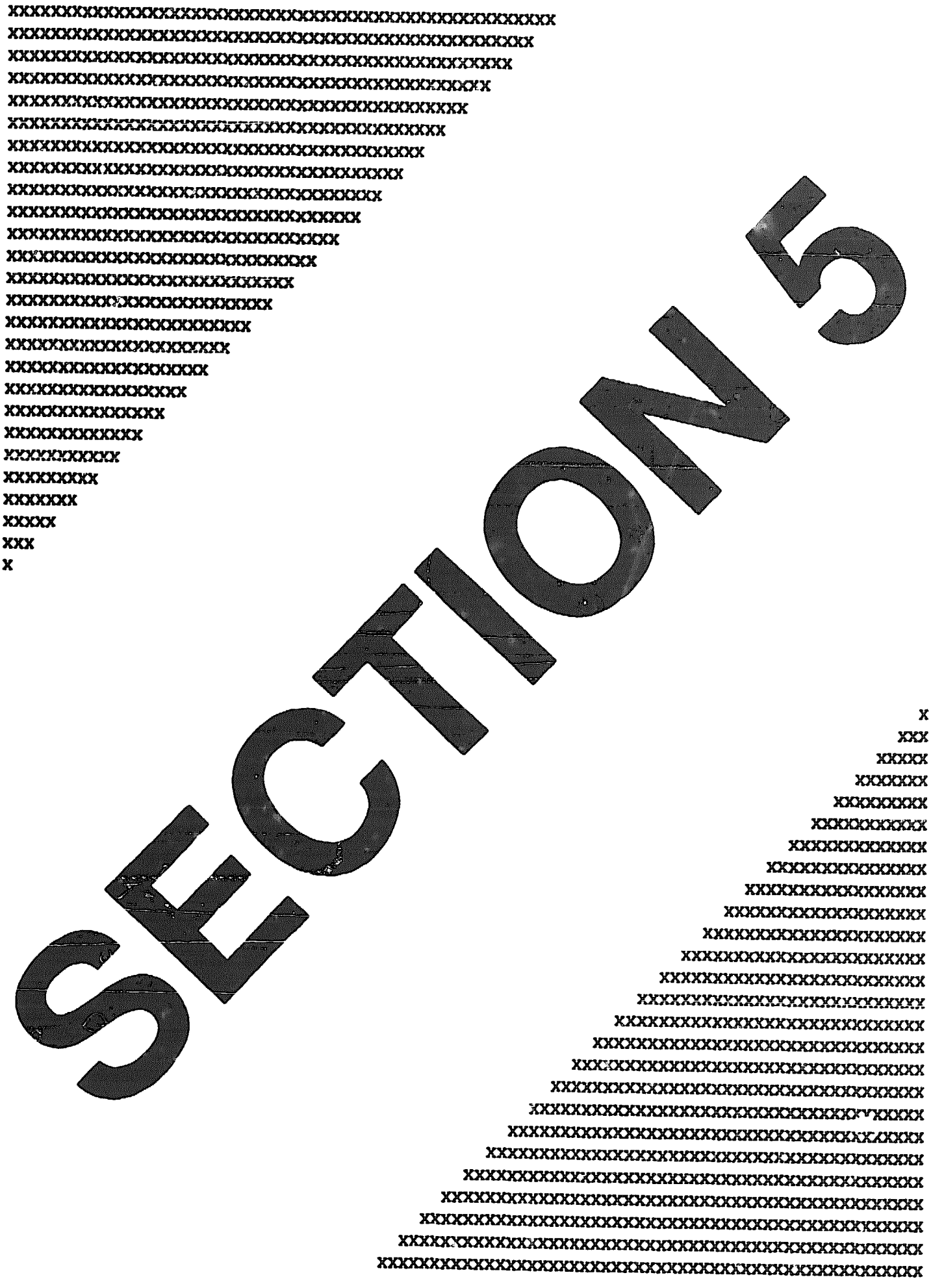


Figure 4–26 Shipping Restraints Set for Packing

6. Pack the printer in the original shipping container.

   - Place the printer in the styrofoam-lined inner box.
   - Lower the inner box into the shipping container.
   - Fit the accessory box and the box for the ribbon in the cutouts on top of the printer.
   - Close the container flaps, and secure them for shipment with packing tape.


SECTION 5

Section 5

Troubleshooting

If a malfunction develops during the operation of a Colormate PS thermal transfer printer, use the information in this section to identify the problem. This section contains instructions on

- eliminating paper jams
- control panel operator messages and error messages
- diagnosing mechanical and electrical breakdowns.

NOTE

For instructions on running printer tests useful for checking print quality, refer to Section 2. See Section 4 for maintenance procedures. Section 6 describes how to remove and replace parts.

PAPER JAM

A paper jam is one of the most common problems that can occur in any printer. When the paper path is blocked inside the printer or the ribbon snags while winding around the rollers, a paper jam occurs and "PAPER JAM" appears in the control panel display.

Figure 5-1 shows the path of the paper and ribbon during printer operation.

If paper jams occur frequently, check the following.

- Be sure the paper is stored in an area that meets temperature and humidity specifications (see "Specifications" in Section 1).
- Check that the paper being used is in good physical condition. Feeding torn or crinkled sheets into the printer may result in paper jams.
- Check that different paper types are not mixed together in the hopper. Simultaneously using paper made of different materials or different weights may lead to paper misfeeds and jams.
- Check rollers and sensors. Adjust or replace parts as required.

- Avoid adding paper to the hopper immediately after the last sheet feeds into the printer. Consequent double-feeding problems and paper jams may occur if the paper-end sensor malfunctions. (The sensor may read the two separate sheets as one long sheet if the second sheet is fed too quickly after the first).

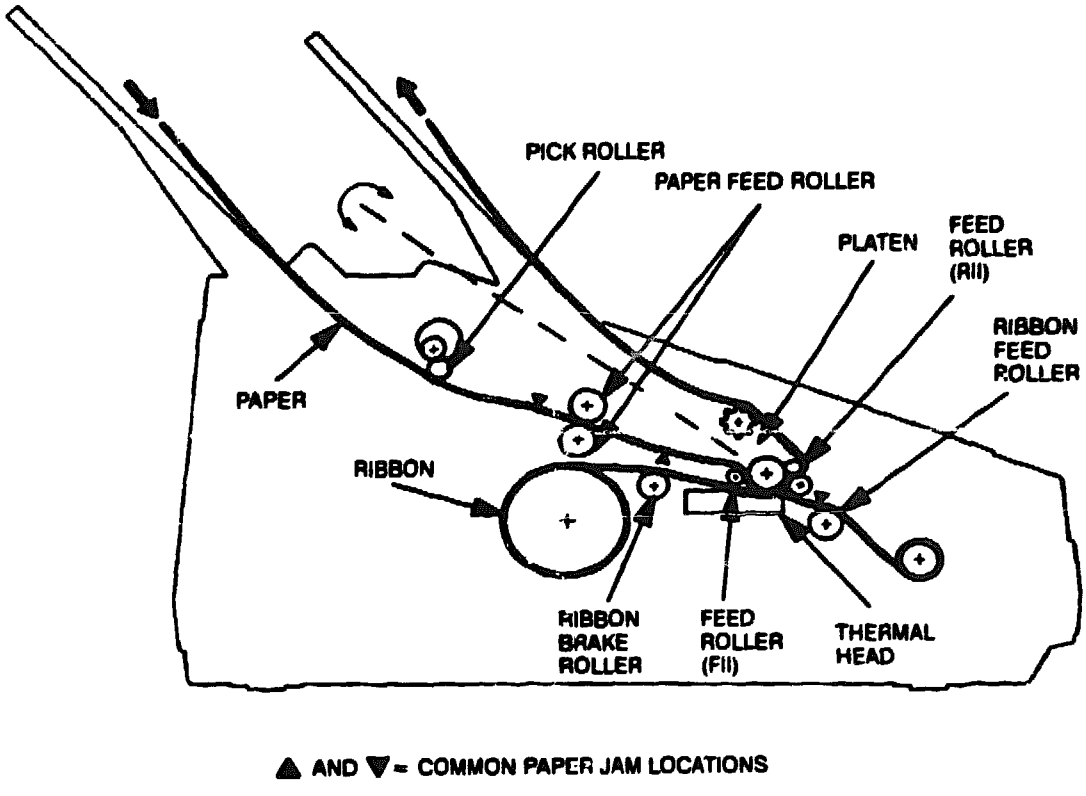


Figure 5-1 Paper and Ribbon Path

The locations of possible paper jams are shown in Figures 5-2 through 5-4. Paper jams commonly occur in the cut sheet guide hopper, the stacker, or inside the printer.

Hopper

If the paper jams in the cut sheet guide hopper as shown in Figure 5-2, simply pull the sheet out.

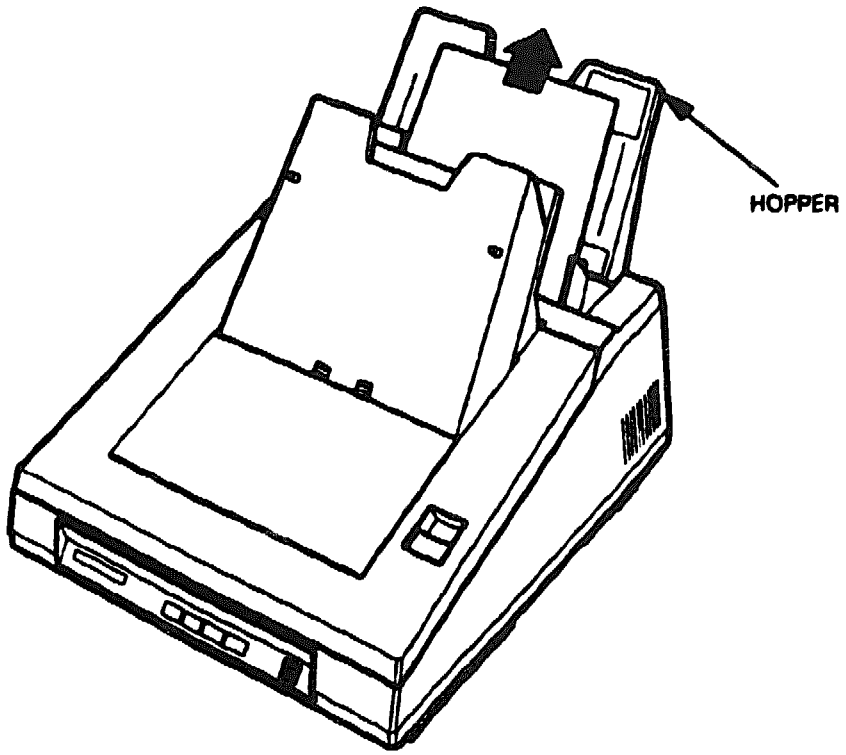


Figure 5-2 Paper Jam in Hopper

Stacker

If the paper jams in the stacker, lower the privacy cover and pull the sheet straight out as shown in Figure 5-3. If the sheet is difficult to remove, open the upper unit and remove the sheet by manually rotating the gear knob (see Figure 5-4).

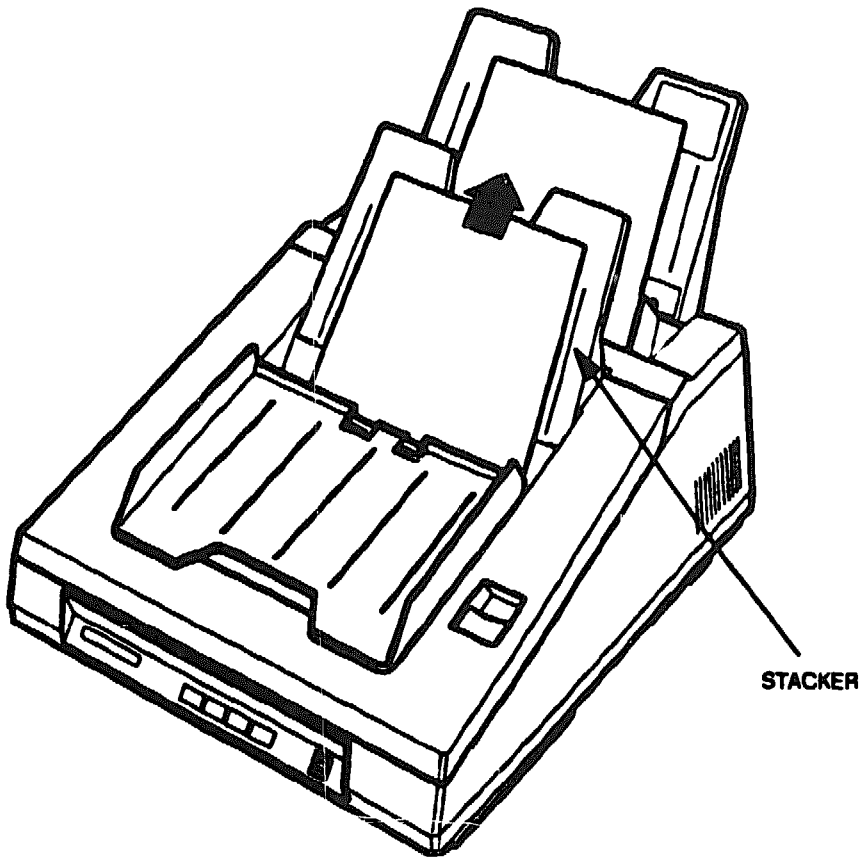


Figure 5-3 Paper Jam in Stacker

Inside Printer

If the paper jams inside the printer, open the upper unit and remove the jammed sheet. In cases where the sheet or ribbon winds around the platen, unjam the sheet or ribbon by rotating the gear knob (see Figure 5-4).

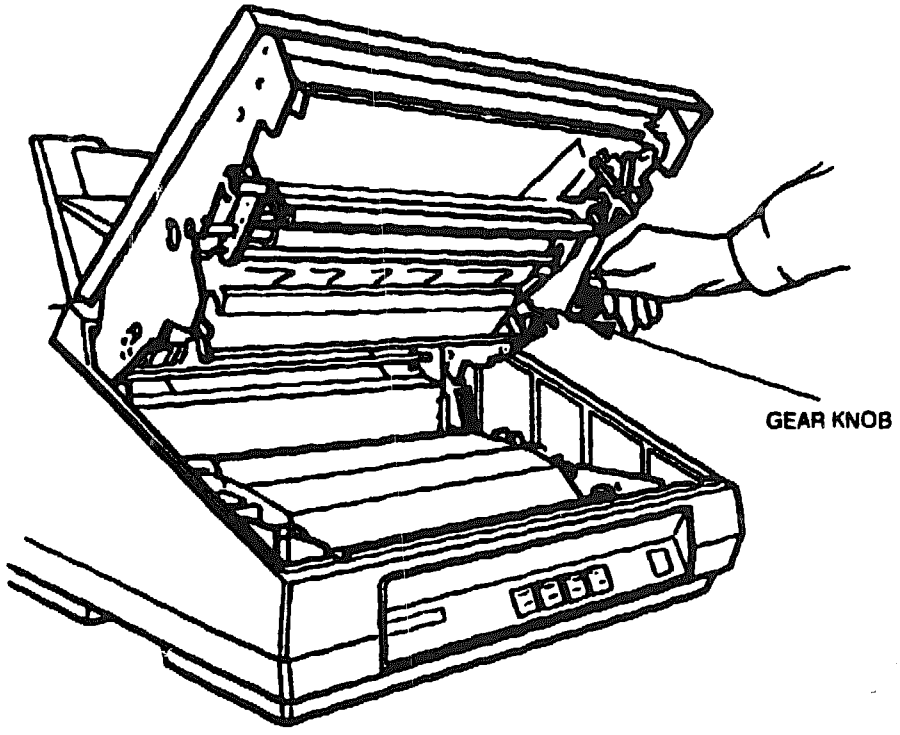


Figure 5-4 Paper Jam Inside the Printer

TROUBLESHOOTING GUIDE

The following subsection describes control panel operator messages and error messages.

Control Panel Operator Messages

During a malfunction, the control panel LCD display on the front of the printer may show one of the operator messages listed in Table 5-1. Operator messages normally blink on and off in the display at intervals of 1.5 seconds (on) and 1 second (off). After completing the steps listed in Table 5-1 for each message, press the **Online** button on the control panel to resume normal printer operation.

Table 5-1 Operator Messages and Solutions

MESSAGE	ACTION NEEDED
PAPER EMPTY	Load specially coated, DEC-approved cut sheets or transparencies into the hopper.
COVER OPEN	Close the upper unit.
PAPER JAM	Remove the jammed paper (refer to "Paper Jam" in this subsection).
RIBBON END	1. Check that the ribbon is positioned properly under the ribbon end sensor. 2. Replace the ribbon.
RIBBON ERROR*	1. Check ribbon installation. 2. Replace the ribbon.
PAPER LENGTH ERR	1. Check paper type and condition. 2. Remove the paper and replace with new.
HEAD TEMP	Wait until READY appears in the display.
PAPER FEED ERROR	1. Remove the misfed paper. 2. Check paper quality and specifications. 3. Check that paper is loaded in hopper correctly. 4. Check that pick roller and paper feed roller are not dirty, worn, or improperly installed. 5. Check cable connections to lift sensor, size sensor, PC sensor, and PE sensor. 6. Adjust (see Section 4): • Lift sensor subassembly. • Pick gear 20-51 backlash. • Timing belt B170MXL3.2 tension. • Line feed motor timing belt B140MXL9.5 tension. 7. Replace (see Section 6) • G8CRJ mechanical control board. • Sensors.
RIBBON TYPE ERROR	Supply ribbon type (3-, 4-color, or monochrome) is changed without first turning off the printer. Turn the machine off, then turn it on to eliminate the error message (print data in buffer will be lost). Or leave printer on and replace the ribbon with matching type.

* This message can occur only when a monochrome ribbon is used.

Control Panel Error Messages

Error messages on the control panel display indicate a printer malfunction that cannot be corrected through simple operator intervention. The error messages listed in Table 5-2 blink on and off at intervals 1.5 seconds (on) and 1 second (off).

When one of the messages listed in Table 5-2 appears in the display, refer to the indicated figure and follow the troubleshooting flowchart until the error message is eliminated.

Table 5-2 Control Panel Error Messages

DISPLAY	MEANING	ACTION
POWER TEMP	The temperature in the power supply is abnormal.	See Figure 5-6.
RS232C ERROR	An error has occurred in the interface connected to each port.	See Figure 5-7.
RS422 ERROR	An error has occurred in the interface connected to each port.	See Figure 5-8.
SCSI ERROR	An error has occurred in the interface connected to each port.	See Figure 5-9.
ROM ERROR	A ROM error has occurred.	See Figure 5-10, 5-12.
RAM ERROR	A RAM error has occurred.	See Figure 5-11, 5-13.
ENGINE CTRL ERR	An engine control error has occurred.	See Figure 5-14.
VIDEO ERROR	A video data error has occurred.	See Figure 5-15.
RIBBON SENS ERR	A ribbon end sensor error has occurred.	See Figure 5-16.
LC SENS ERROR	A lift cam sensor error has occurred.	See Figure 5-17.
HEAD SENS ERR	A thermal head up/down sensor error has occurred.	See Figure 5-18.

PROBLEM SOLVING

Troubleshooting Checklist

Table 5-3 provides a checklist designed to help you diagnose and correct common printer problems. For solutions to more complex printer malfunctions, refer to the next subsection.

Table 5-3 Problem Solving Checklist

PROBLEM	CHECK
Printer does not print. The control panel power light is off.	1. Is the power cord connected to a live, properly grounded ac power outlet? 2. Is the power switch turned on?
Printer does not print. The control panel power light is on.	1. Is the printer online? Press the **Online** button. 2. Is the ribbon installed and set correctly? 3. Is the interface cable connected correctly? 4. Is the printer software program functioning correctly? 5. Is the host computer functioning correctly?
Printed data is incorrect.	1. Is the printer software program functioning correctly? 2. Is the interface cable connected correctly? 3. Is the host computer functioning correctly? 4. Is the power cord connected to a live, properly grounded, ac outlet on a separate, noise-free circuit?
Print is smudged or dirty.	1. Was the sheet touched before or during printing? 2. Was vibration applied to the printer during printing? 3. Is the ribbon worn out or installed incorrectly? 4. Is the thermal print head or platen dirty?
Background is blurry.	1. Is the print density dial set correctly? 2. Is the ribbon wrinkled or feeding incorrectly? 3. Is the platen dirty? 4. Is the thermal print head dirty?
Registration is incorrect.	1. Is the ribbon installed correctly? 2. Has a paper jam occurred? 3. Is the platen or pinch roller dirty? 4. Is the thermal print head dirty?

Troubleshooting Flowcharts

The following flowcharts are designed to help you isolate and correct printer malfunctions at the field level of repair. The flowcharts address the following printer symptoms listed in Table 5-4.

Table 5-4 Troubleshooting Guide

MESSAGE	ACTION
POWER lamp does not light when the printer is turned on.	See Figure 5-5.
Control panel error messages appears:	See below.
POWER TEMP	See Figure 5-6.
RS-232C ERROR	See Figure 5-7.
RS-422 ERROR	See Figure 5-8.
SCSI ERROR	See Figure 5-9.
ROM ERROR	See Figure 5-10, 5-12.
RAM ERROR	See Figure 5-11, 5-13.
ENGINE CTRL ERROR	See Figure 5-14.
VIDEO ERROR	See Figure 5-15.
RIBBON SENS ERROR	See Figure 5-16.
LC SENS ERROR	See Figure 5-17.
HEAD SENS ERROR	See Figure 5-18.
Printer does not print.	See Figure 5-19.
Print image is too dark.	See Figure 5-20.
Print image is too light.	See Figure 5-21.
Characters are missing or print is uneven.	See Figure 5-22.
Ribbon reaches its end.	See Figure 5-23.

The troubleshooting flowcharts provide a systematic method of isolating the cause of a printer problem to a faulty assembly. If a malfunction occurs, refer to Table 5-4 and begin at the START block in the appropriate troubleshooting flowchart. At each decision block (diamond-shaped symbol), the procedure takes two possible courses (based on a "yes" or "no" answer). Choose the appropriate course and follow the arrow.

Action points are symbolized by rectangular blocks; they represent a customer engineer's activity, such as checking a specific component. Checks can consist of making measurements with a tension gauge or calipers, or substituting a working component in place of a suspect one. Once you have replaced a component, return to the START block and follow the flowchart again. The printer is repaired when the error message is eliminated or the symptom disappears.

NOTE

The circled letters below certain blocks signify that the procedure is continued at another block in the flowchart marked by a matching letter above the block.

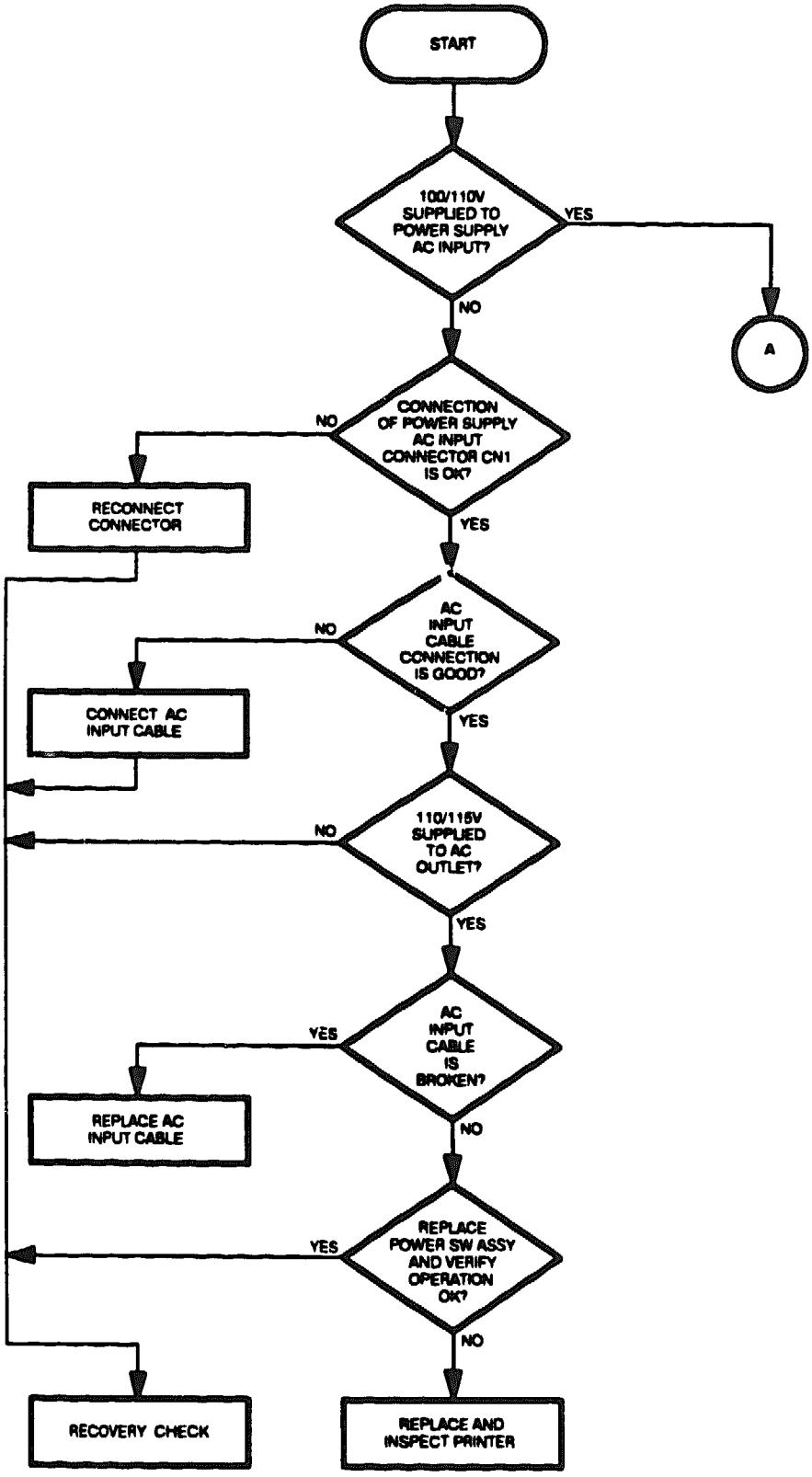


Figure 5-5 Power Lamp Does Not Light (Sheet 1 of 3)

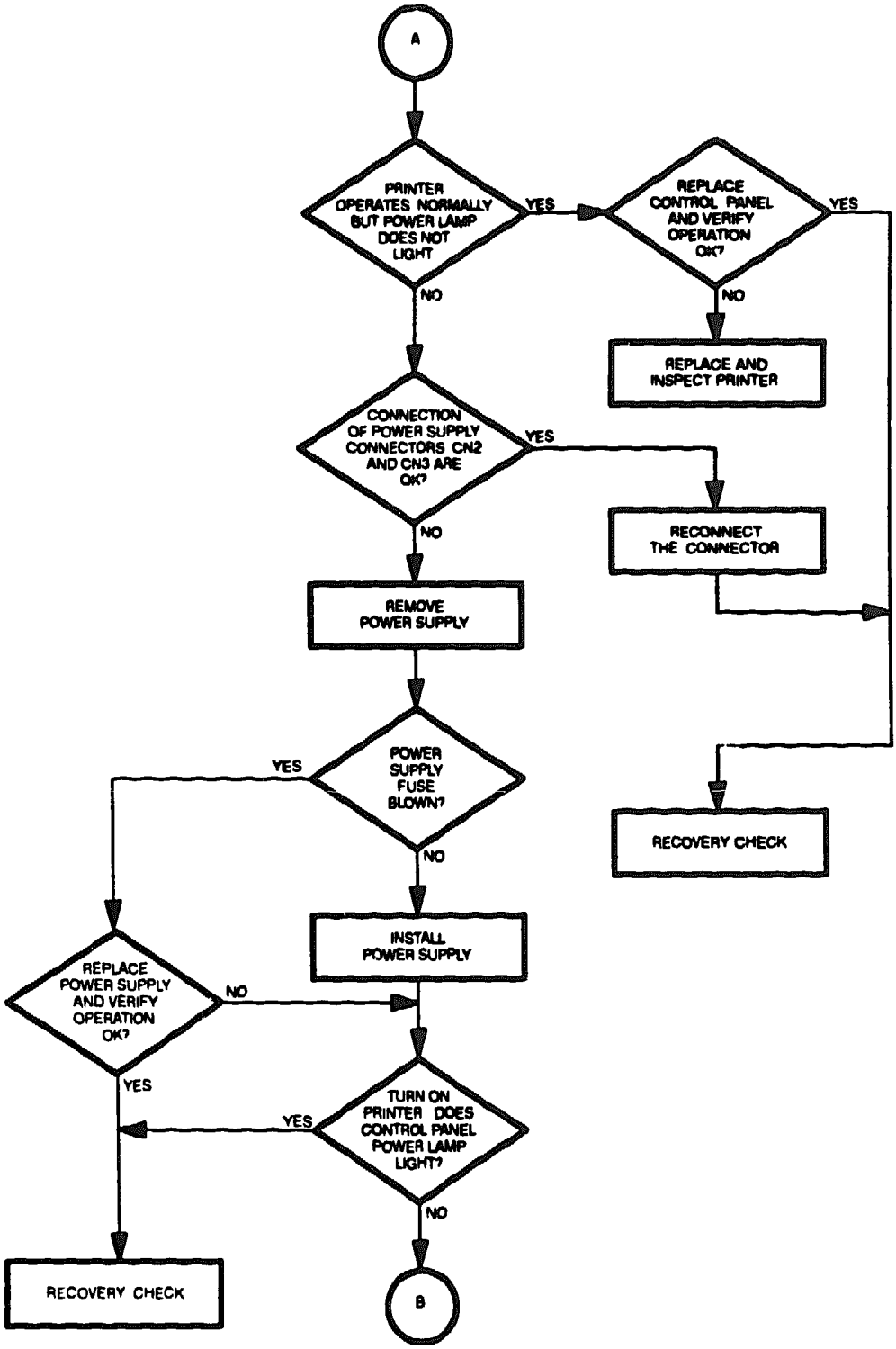


Figure 5-5 Power Lamp Does Not Light (Sheet 2 of 3)

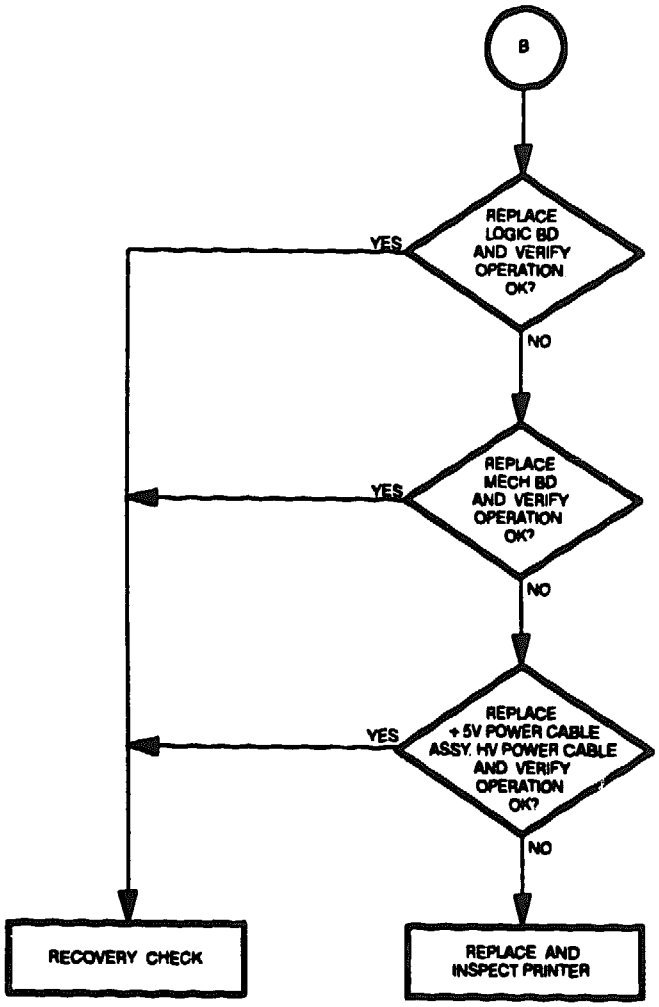


Figure 5-5 Power Lamp Does Not Light (Sheet 3 of 3)

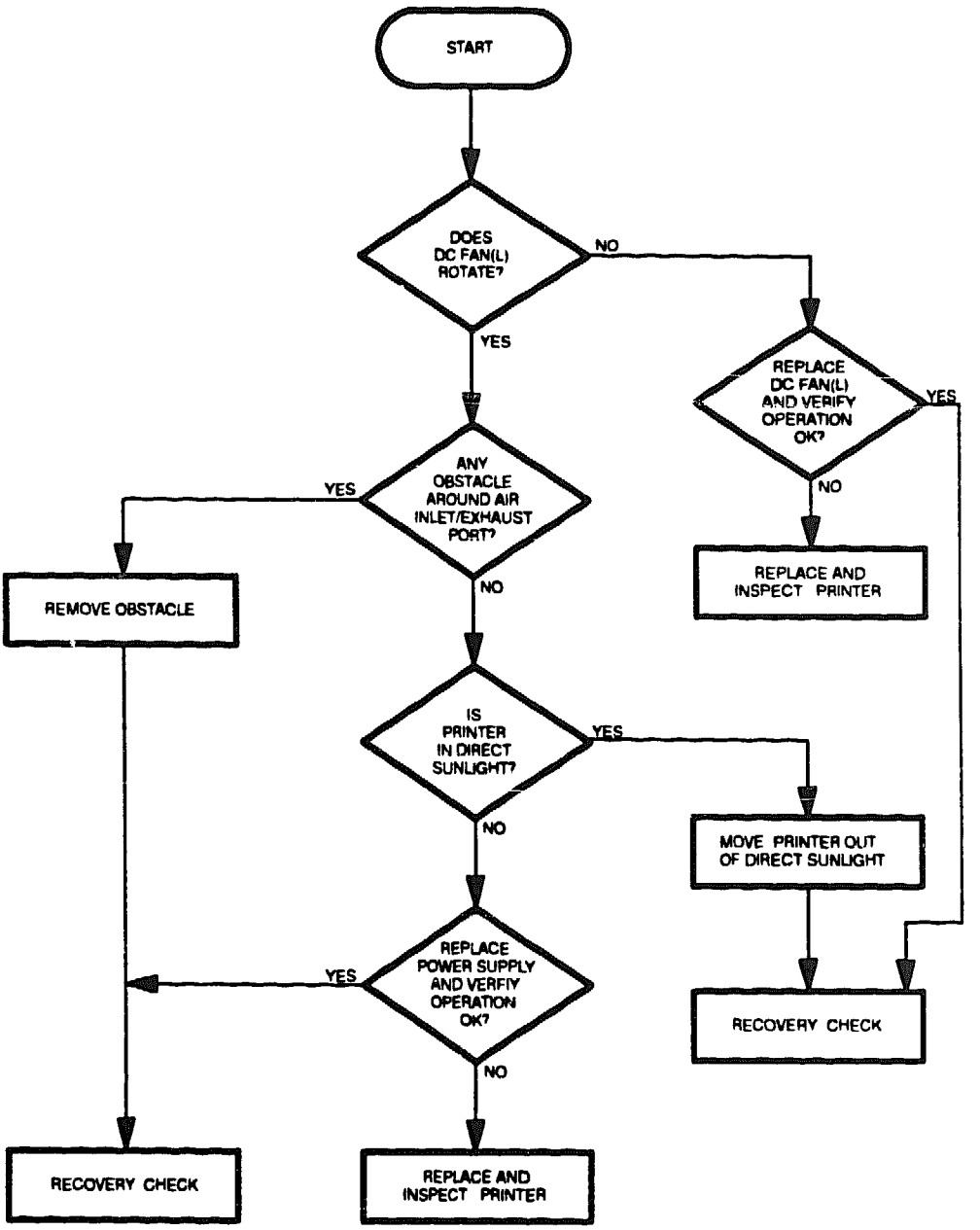


Figure 5-6 POWER TEMP Error

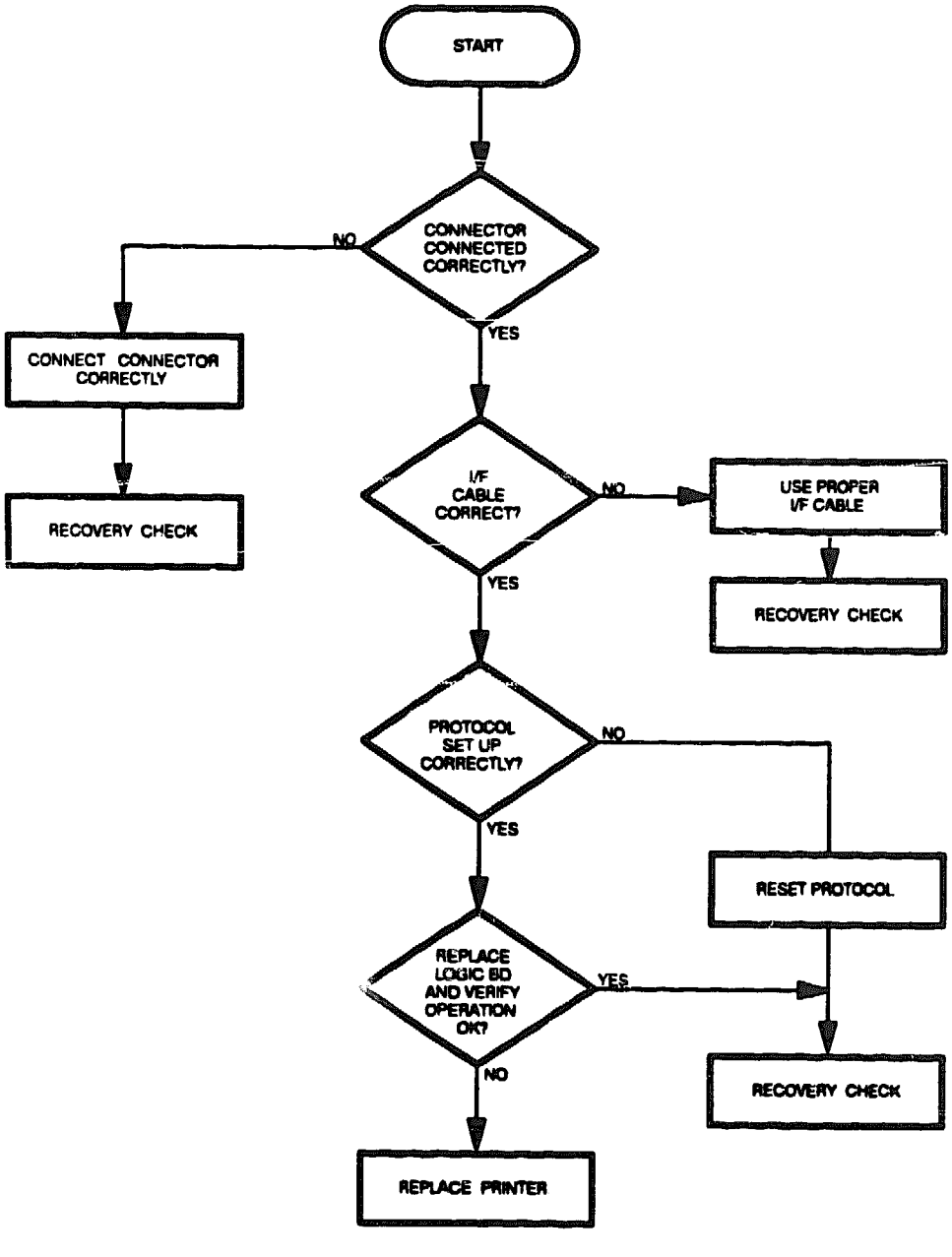


Figure 5-7 RS-232C Error

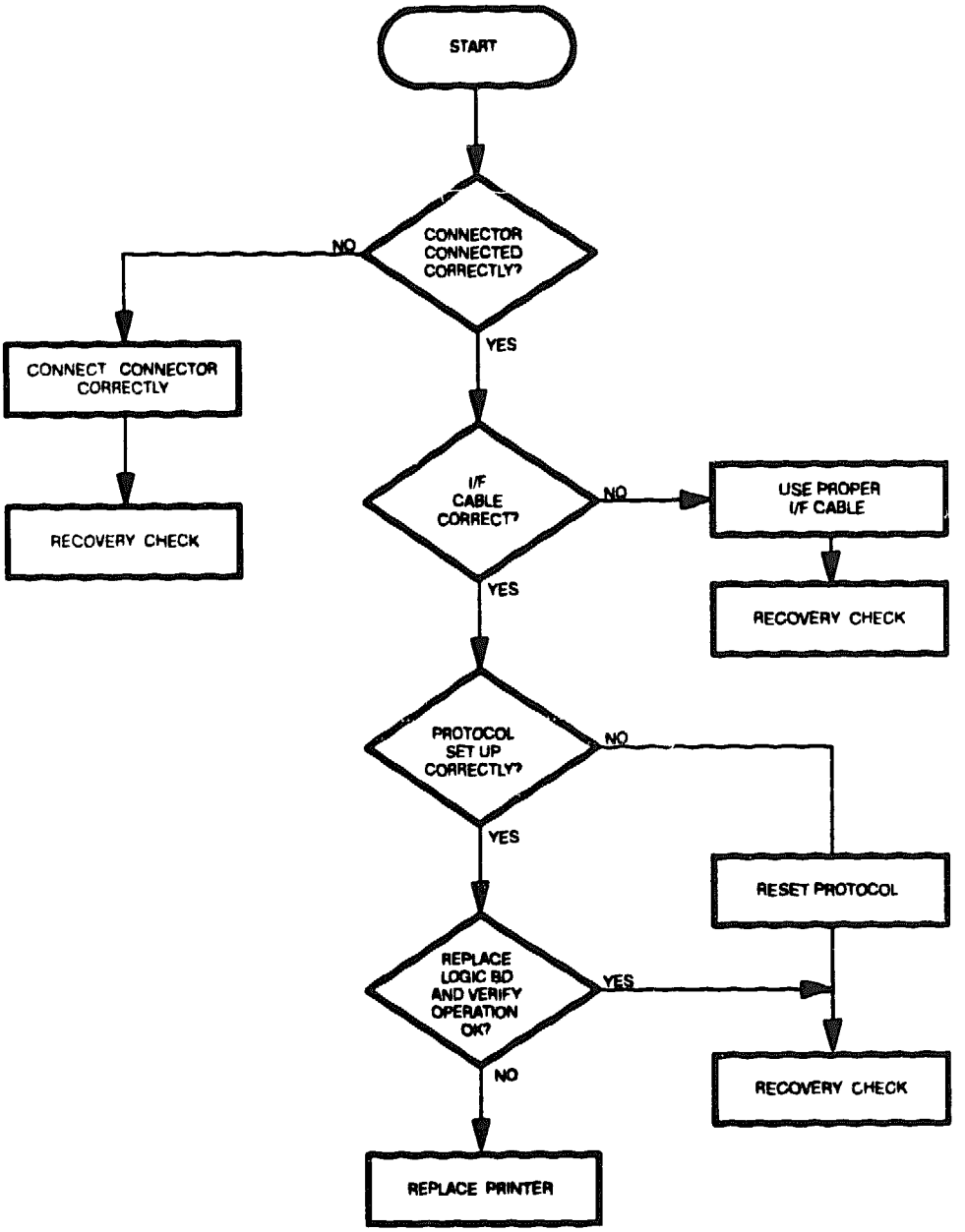


Figure 5-8 RS-422 Error

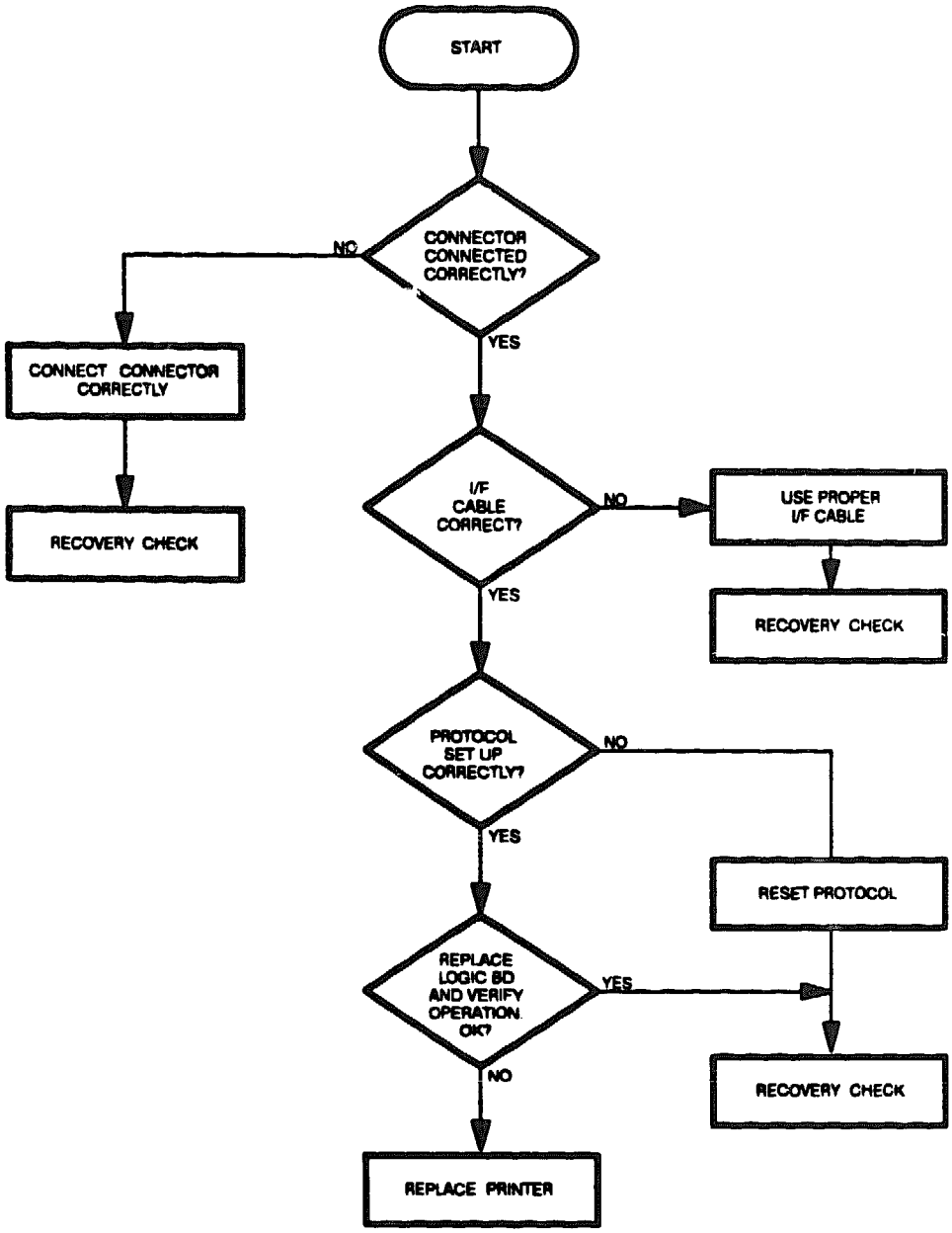


Figure 5-9 SCSI Error

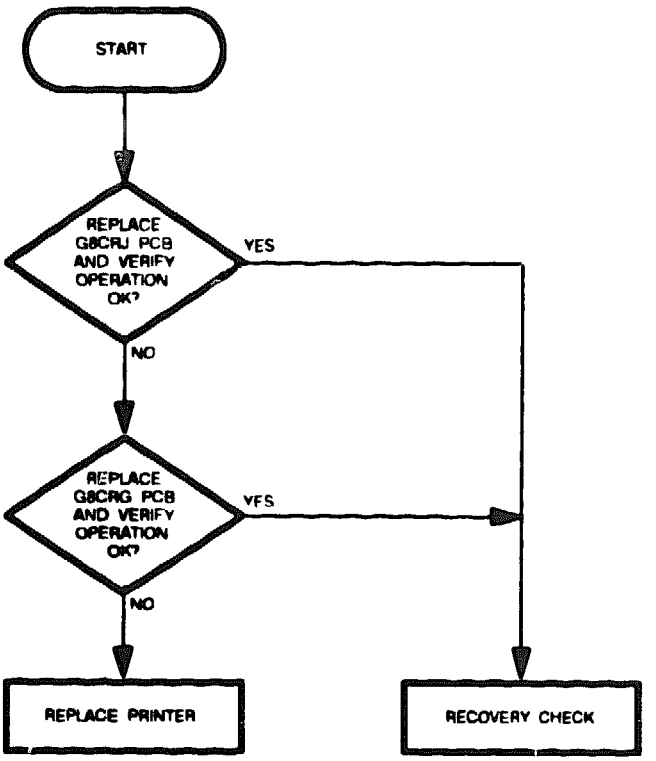


Figure 5-10 ROM Error (Early Version)

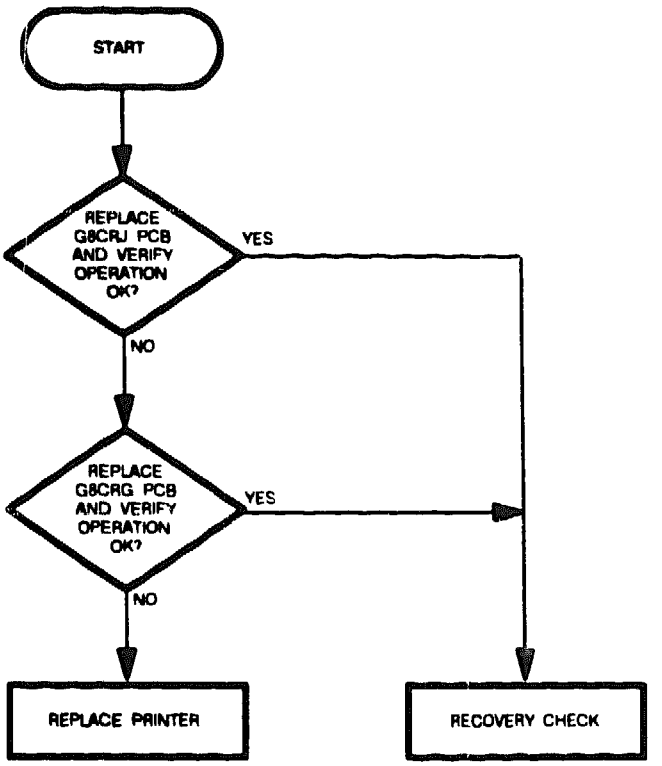


Figure 5-11 RAM Error (Early Version)

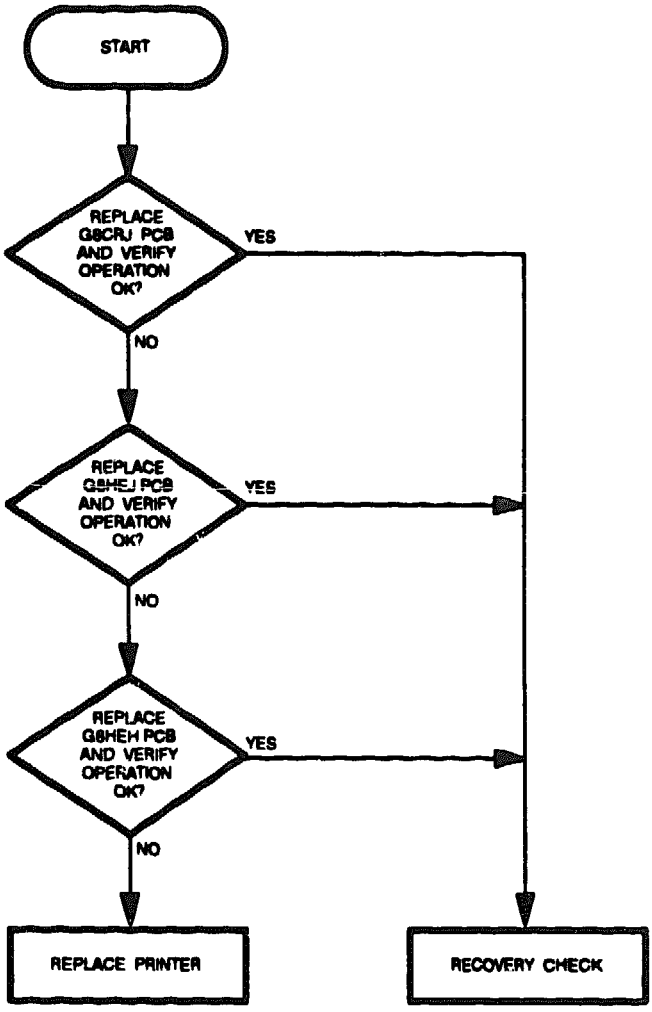


Figure 5-12 ROM Error (Later Version)

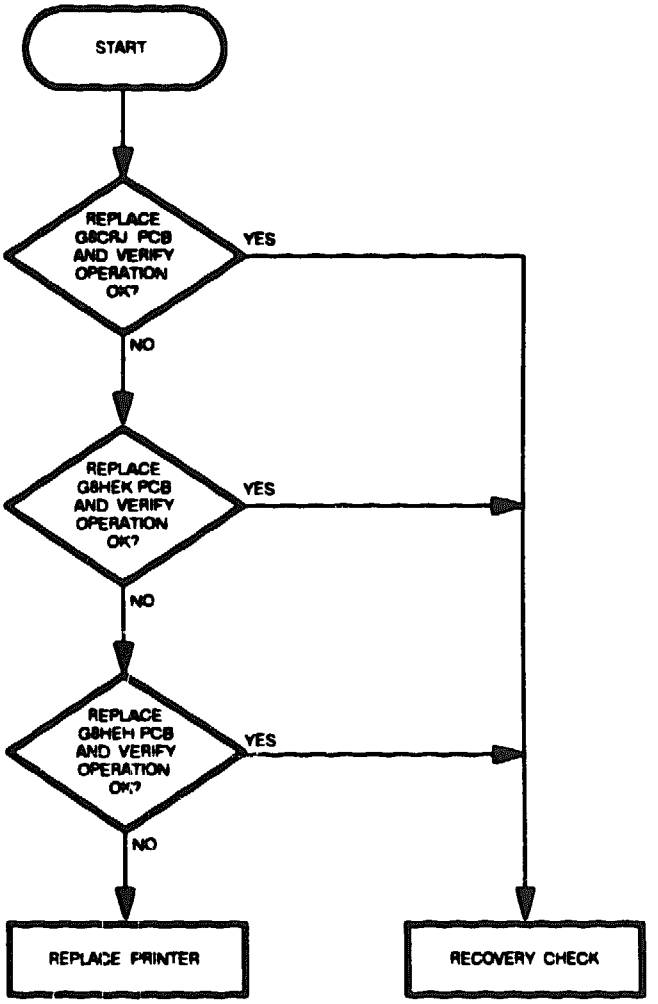


Figure 5-13 RAM Error (Later Version)

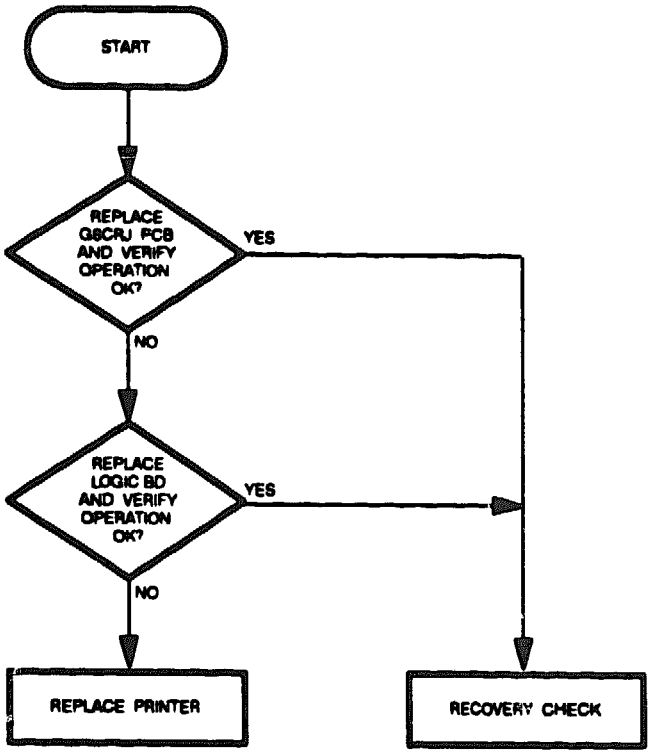


Figure 5-14 Engine CTRL Error

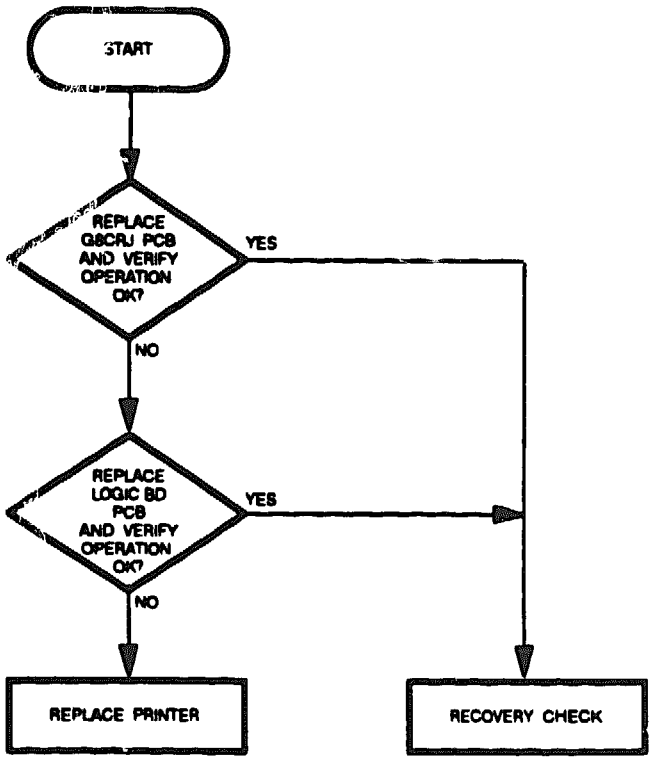


Figure 5-15 VIDEO Error

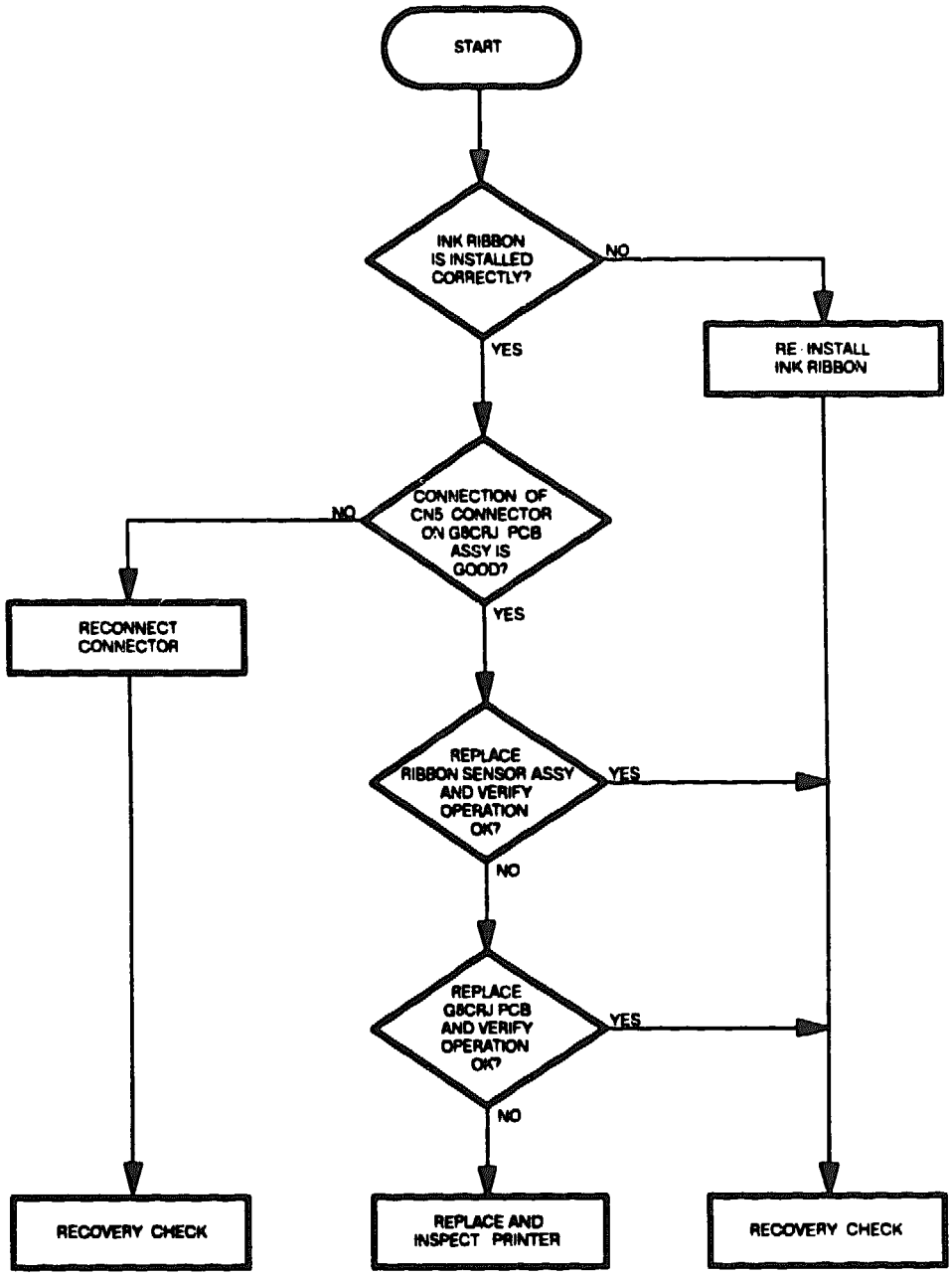


Figure 5-16 RIBBON SENS Error

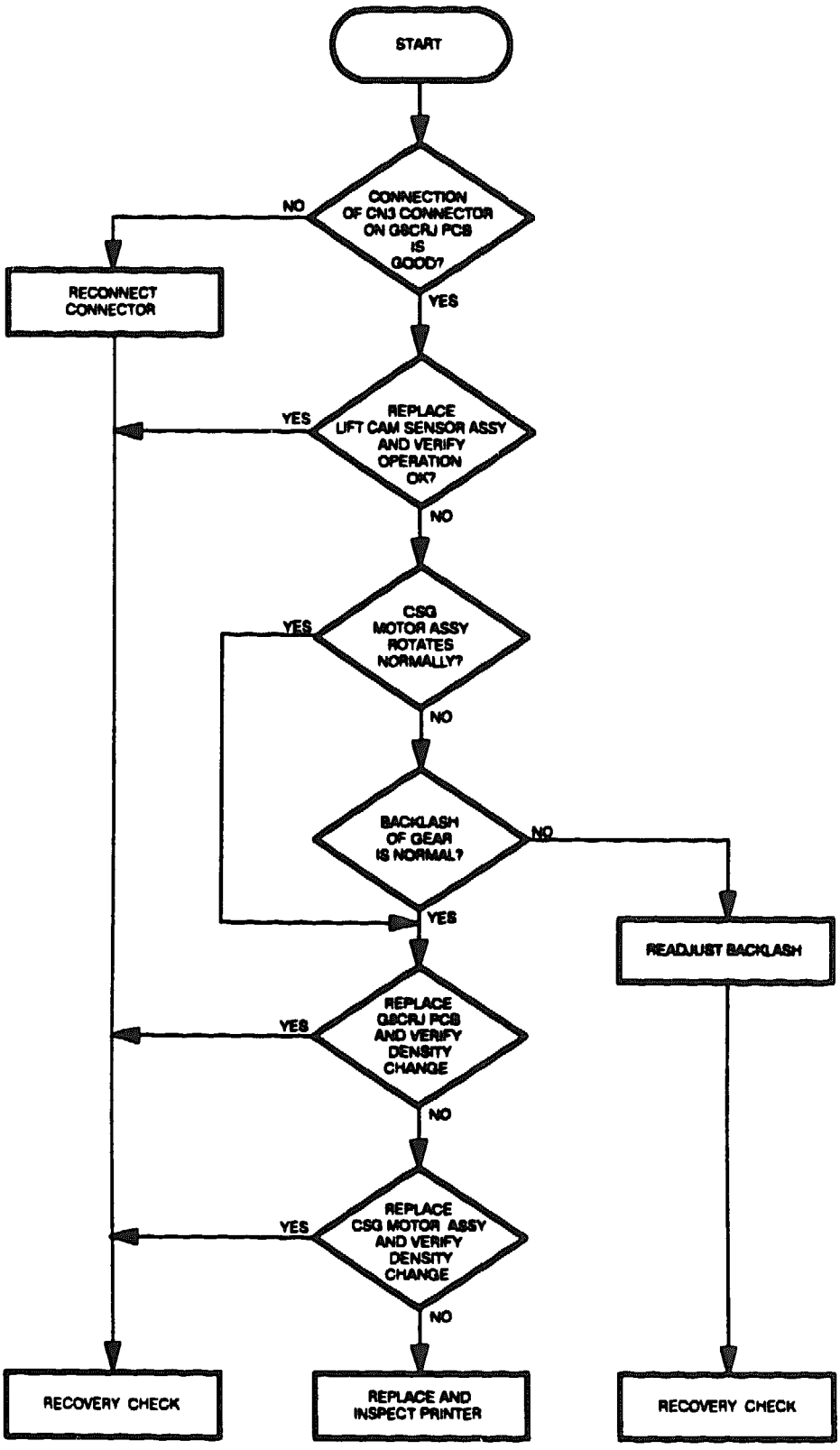


Figure 5-17 LC SENS Error

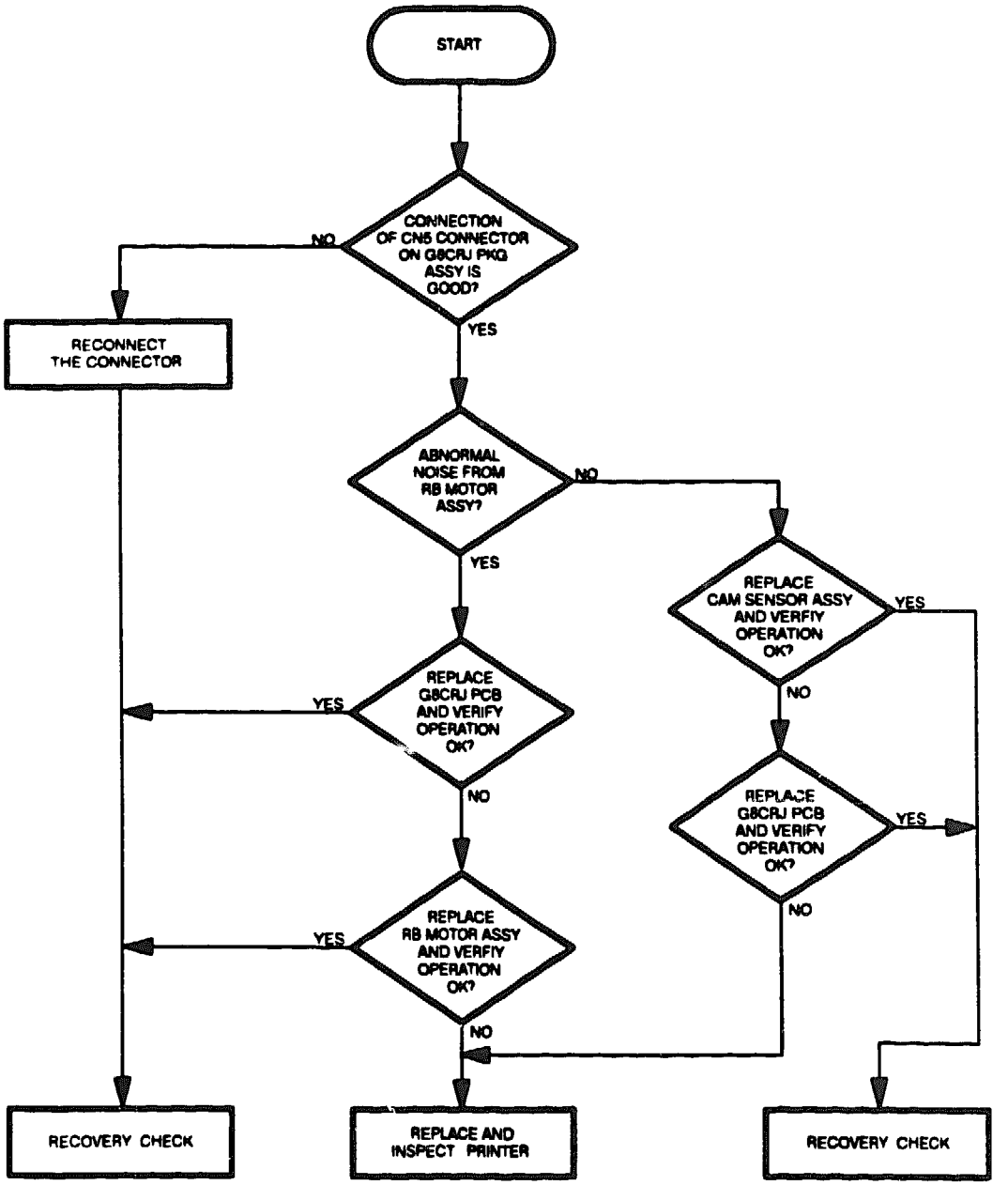


Figure 5-18 HEAD SENS Error

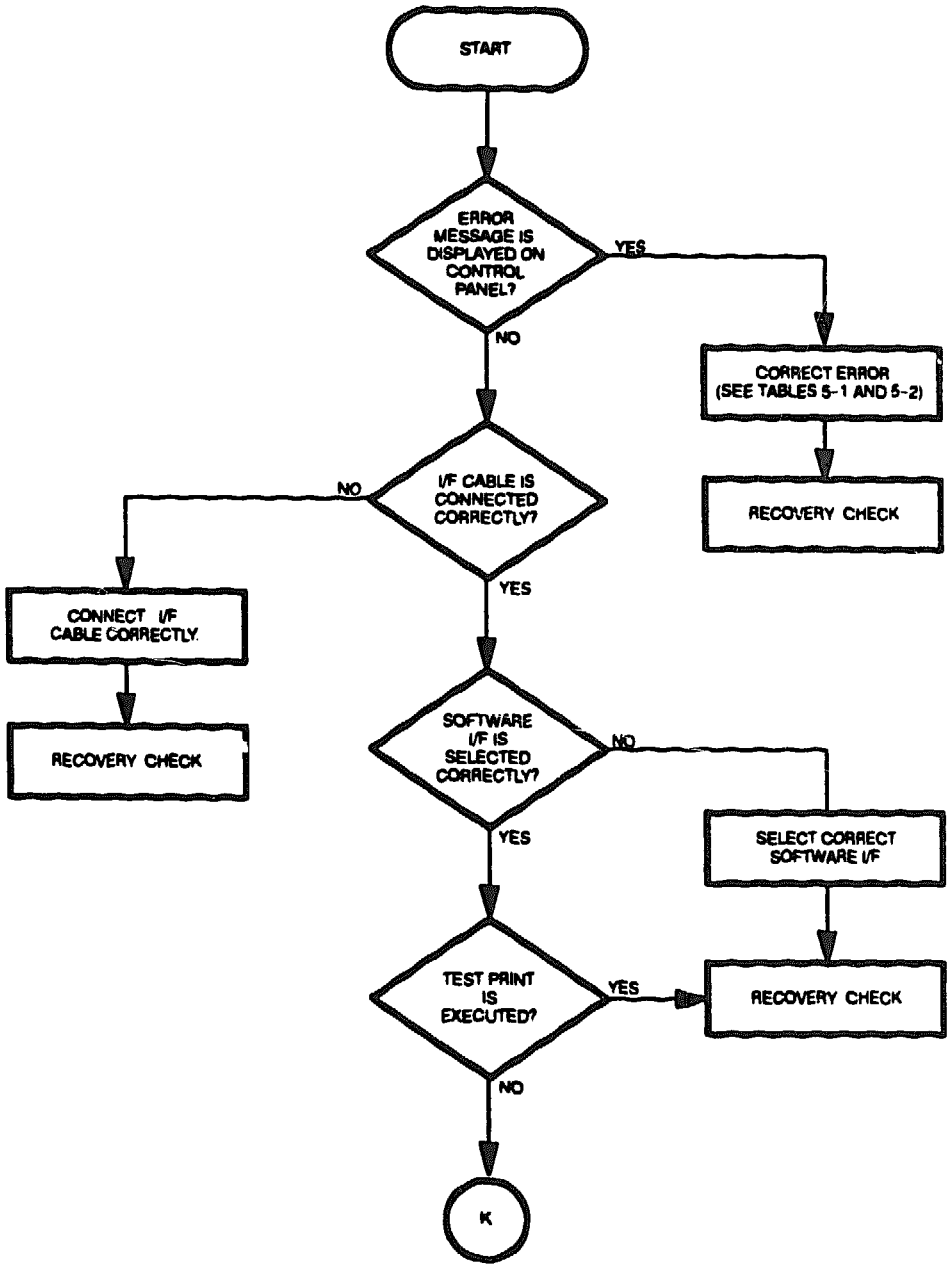


Figure 5-19 Printer Does Not Print (Sheet 1 of 2)

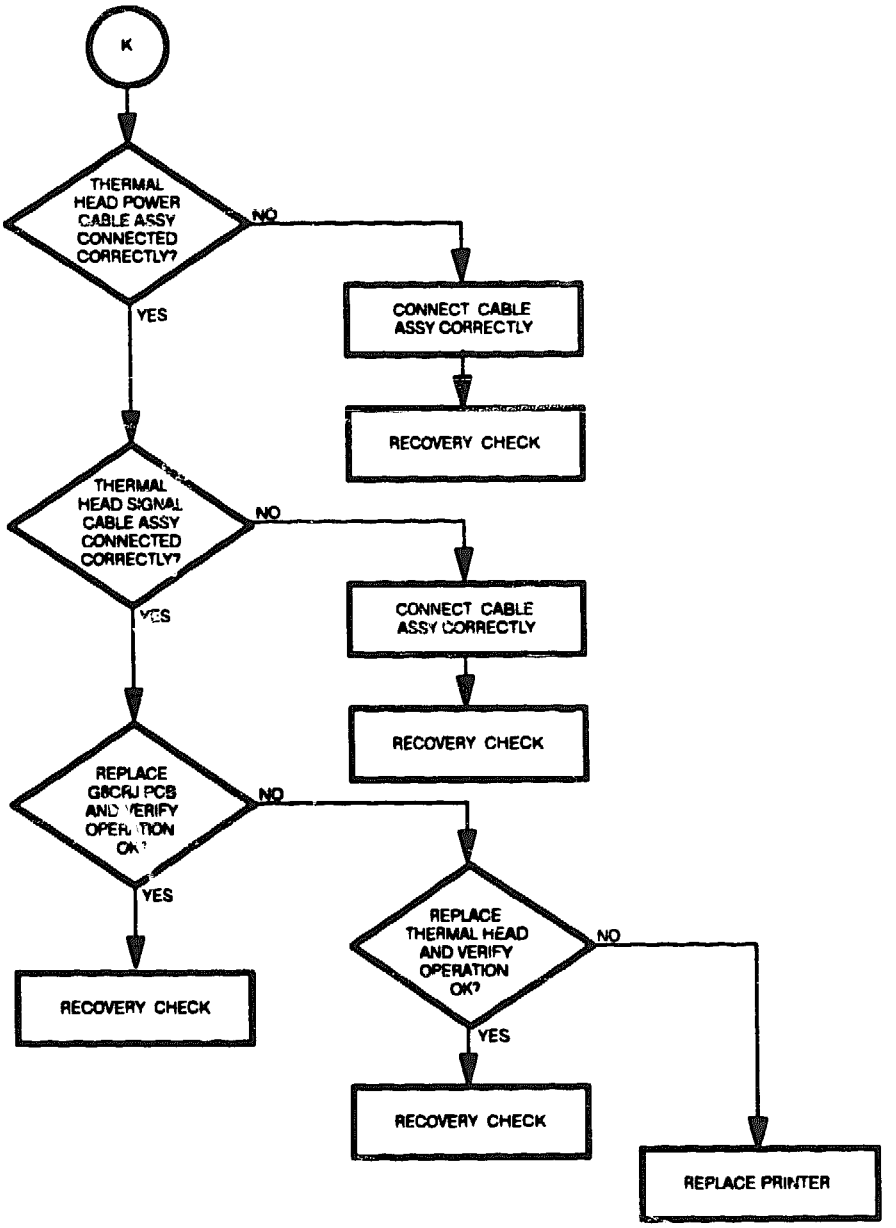


Figure 5–19 Printer Does Not Print (Sheet 2 of 2)

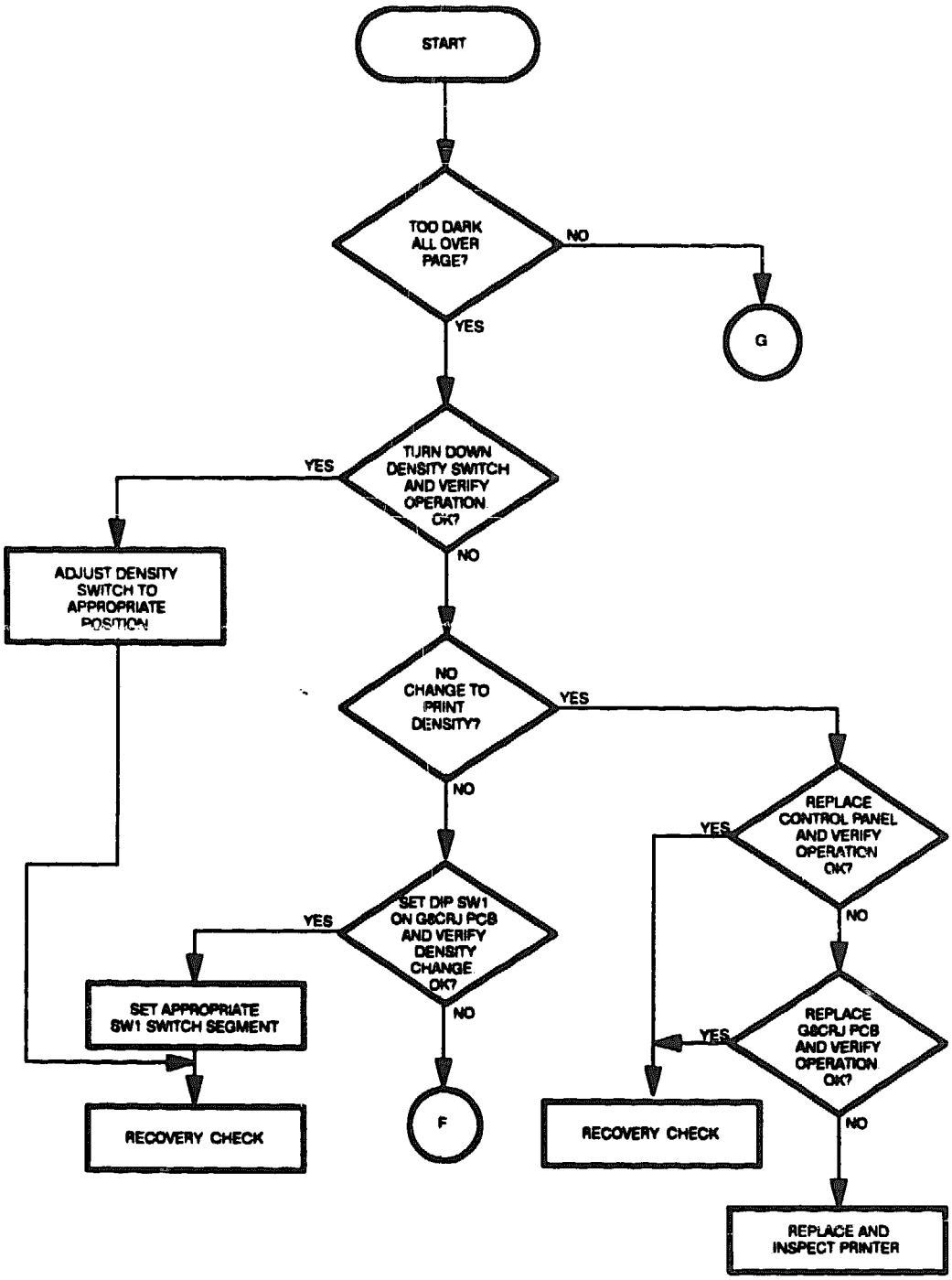


Figure 5–20 Print Image Is Too Dark (Sheet 1 of 3)

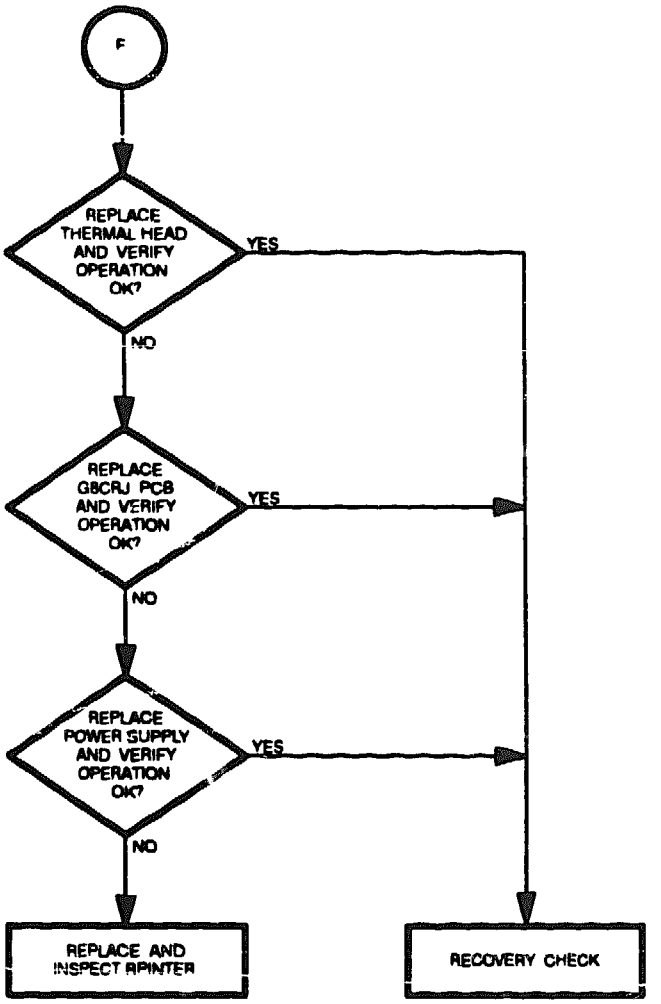


Figure 5–20 Print Image Is Too Dark (Sheet 2 of 3)

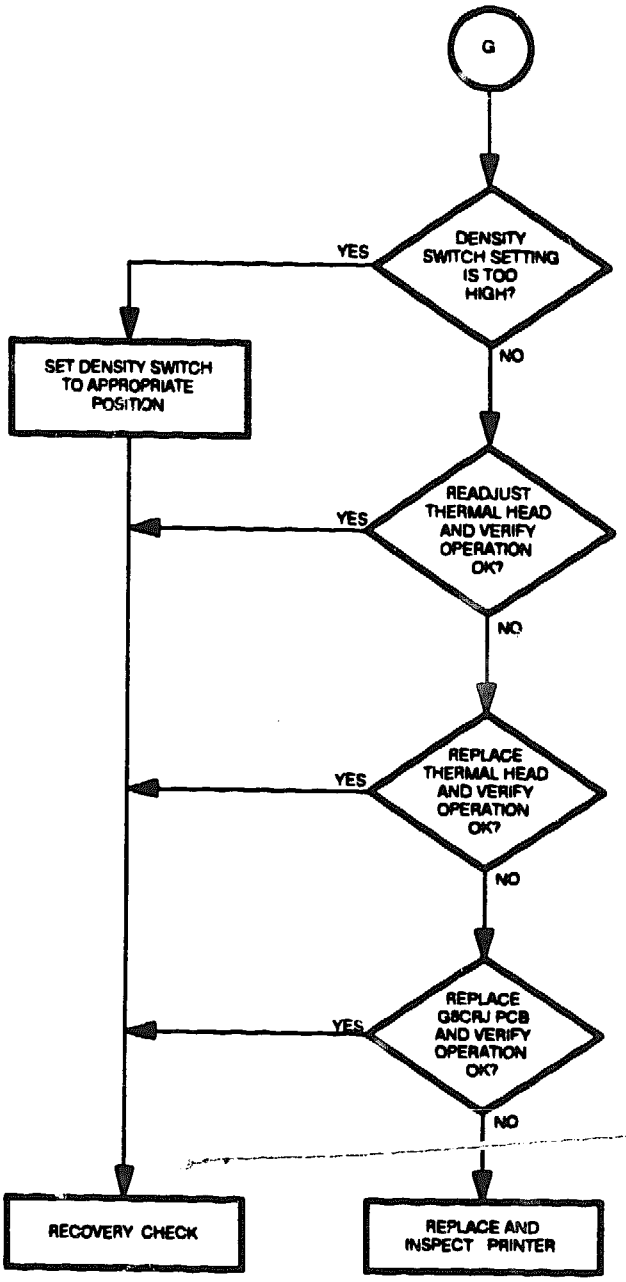


Figure 5–20 Print Image Is Too Dark (Sheet 3 of 3)

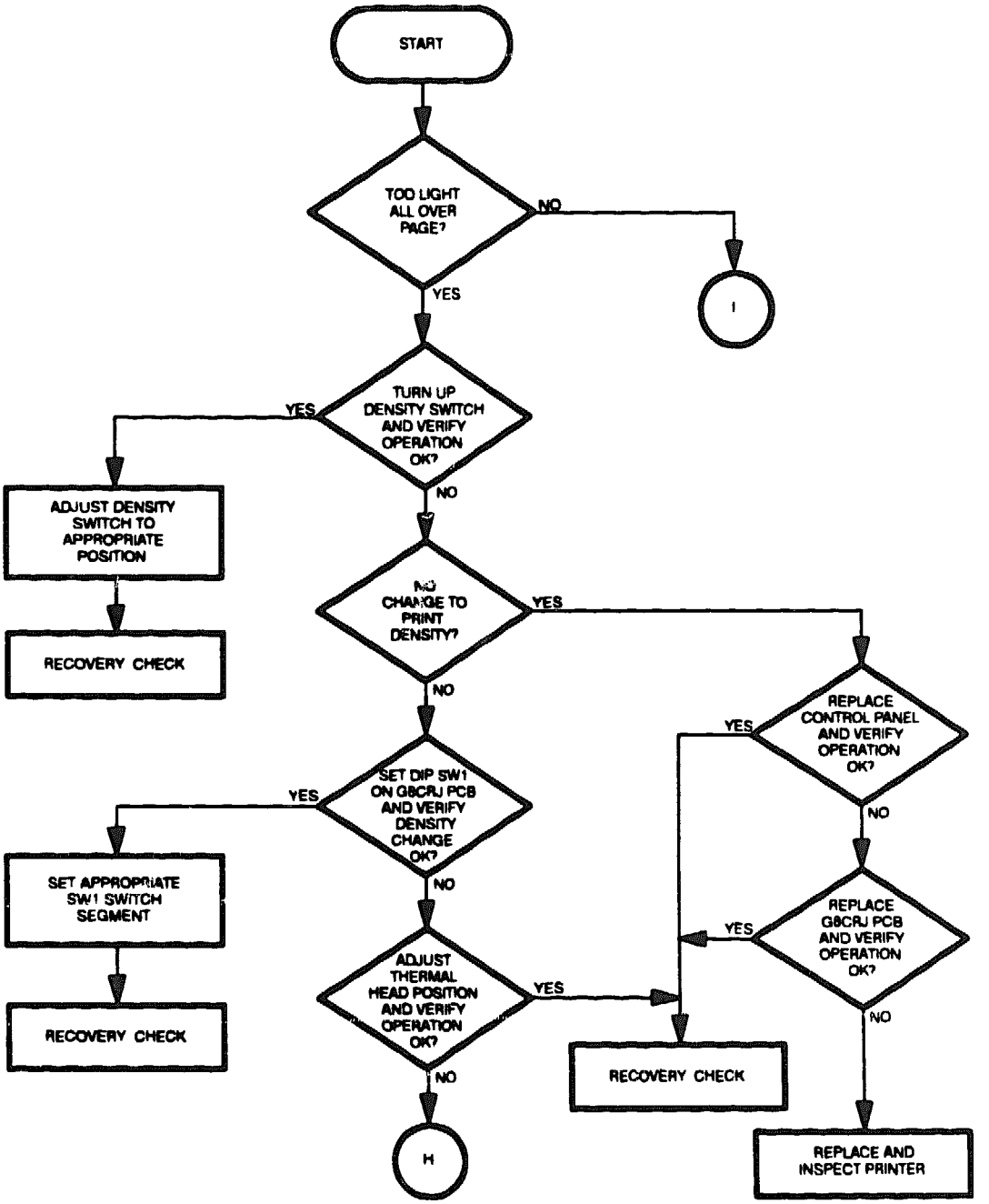


Figure 5-21 Print Image Is Too Light (Sheet 1 of 3)

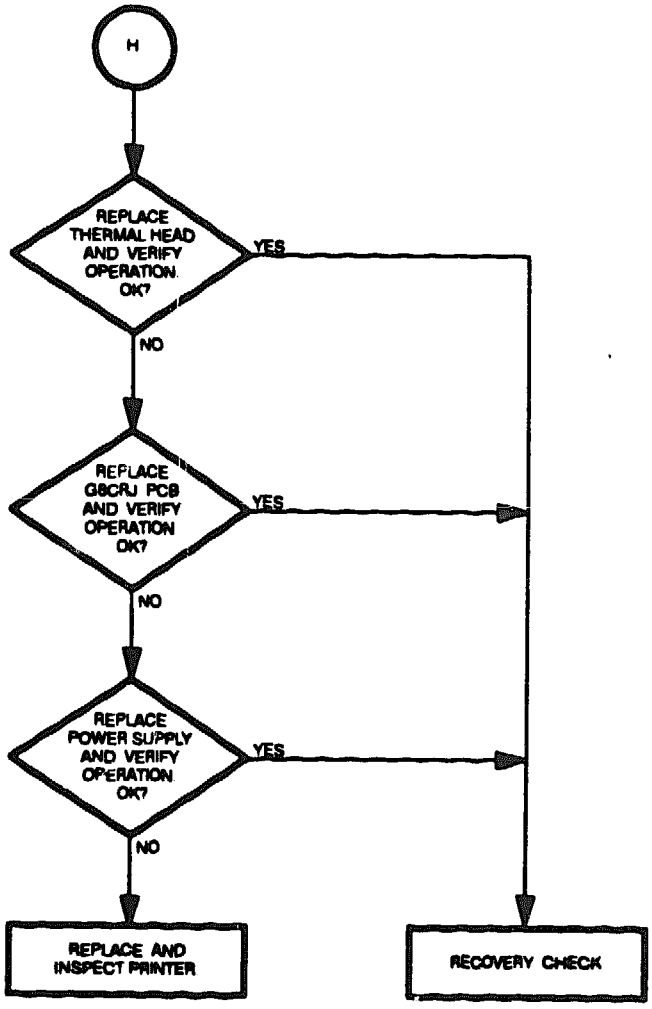


Figure 5–21 Print Image Is Too Light (Sheet 2 of 3)

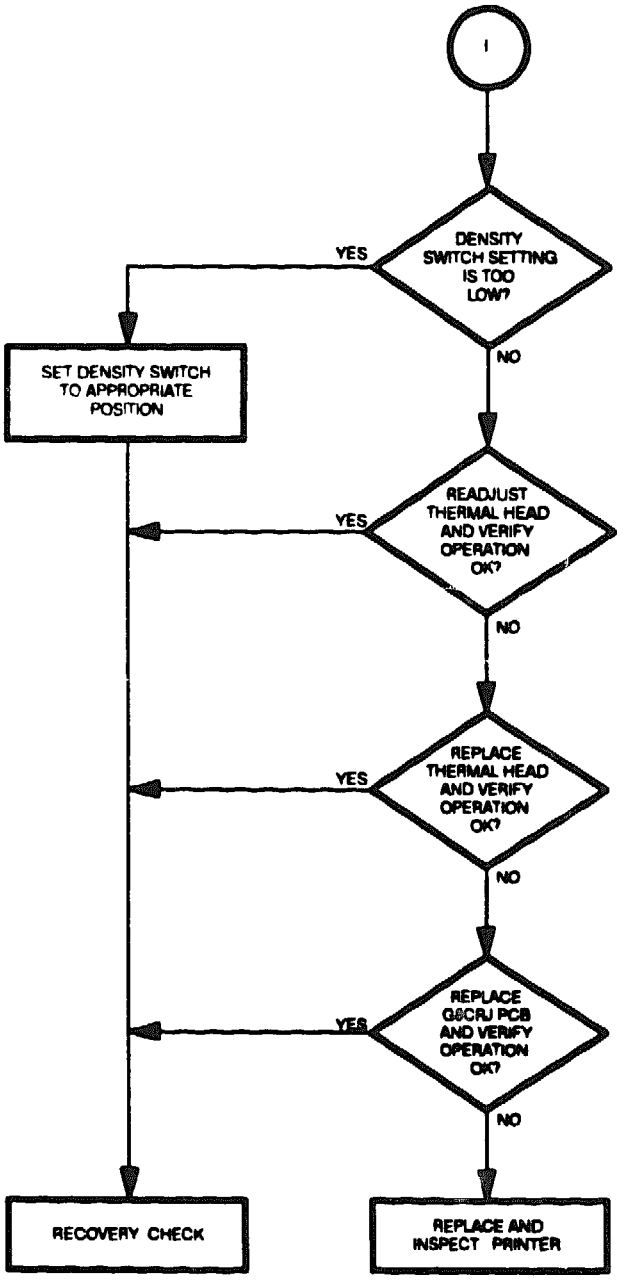


Figure 5-21 Print Image Is Too Light (Sheet 3 of 3)

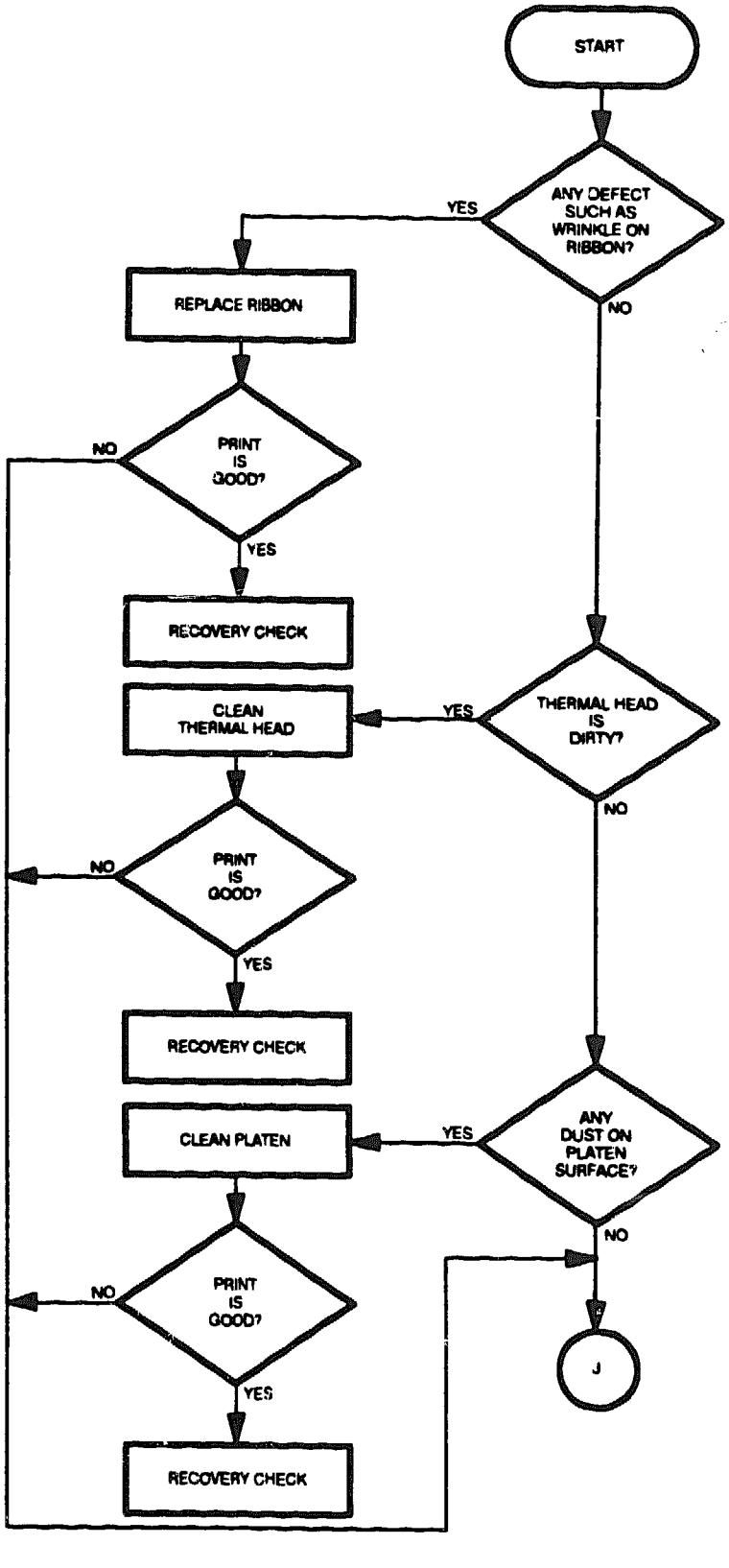


Figure 5-22 Characters Missing or Uneven Printing (Sheet 1 of 2)

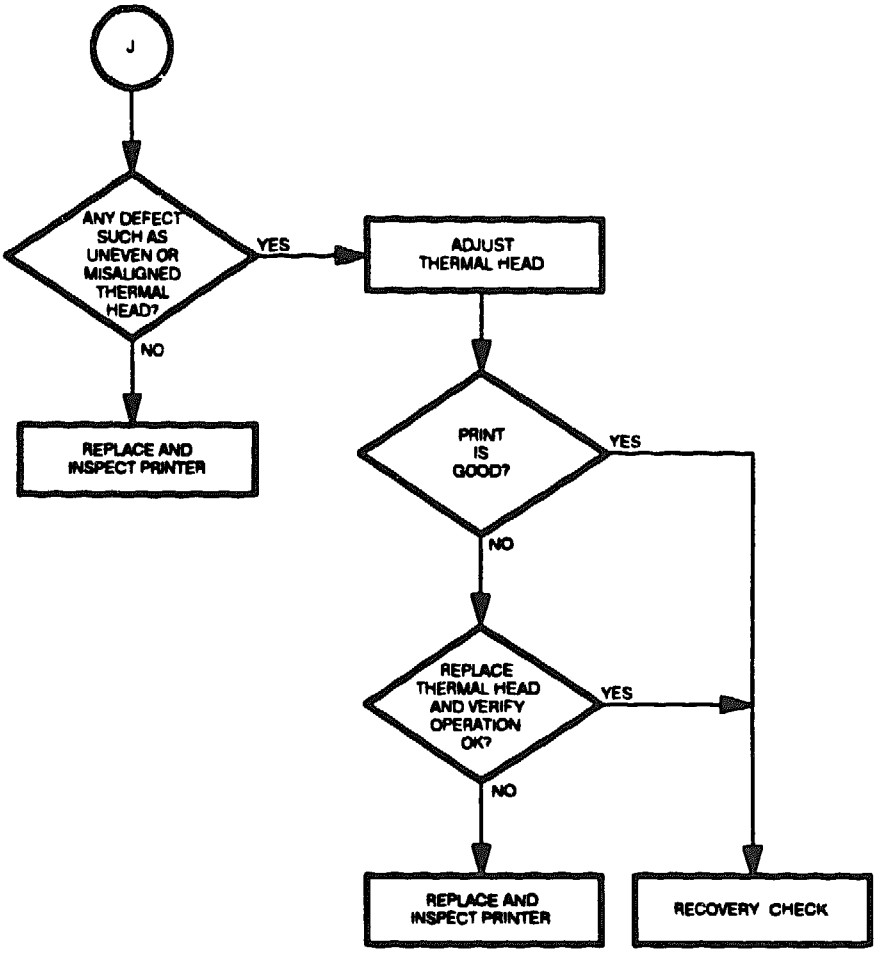


Figure 5-22 Characters Missing or Uneven Printing (Sheet 2 of 2)

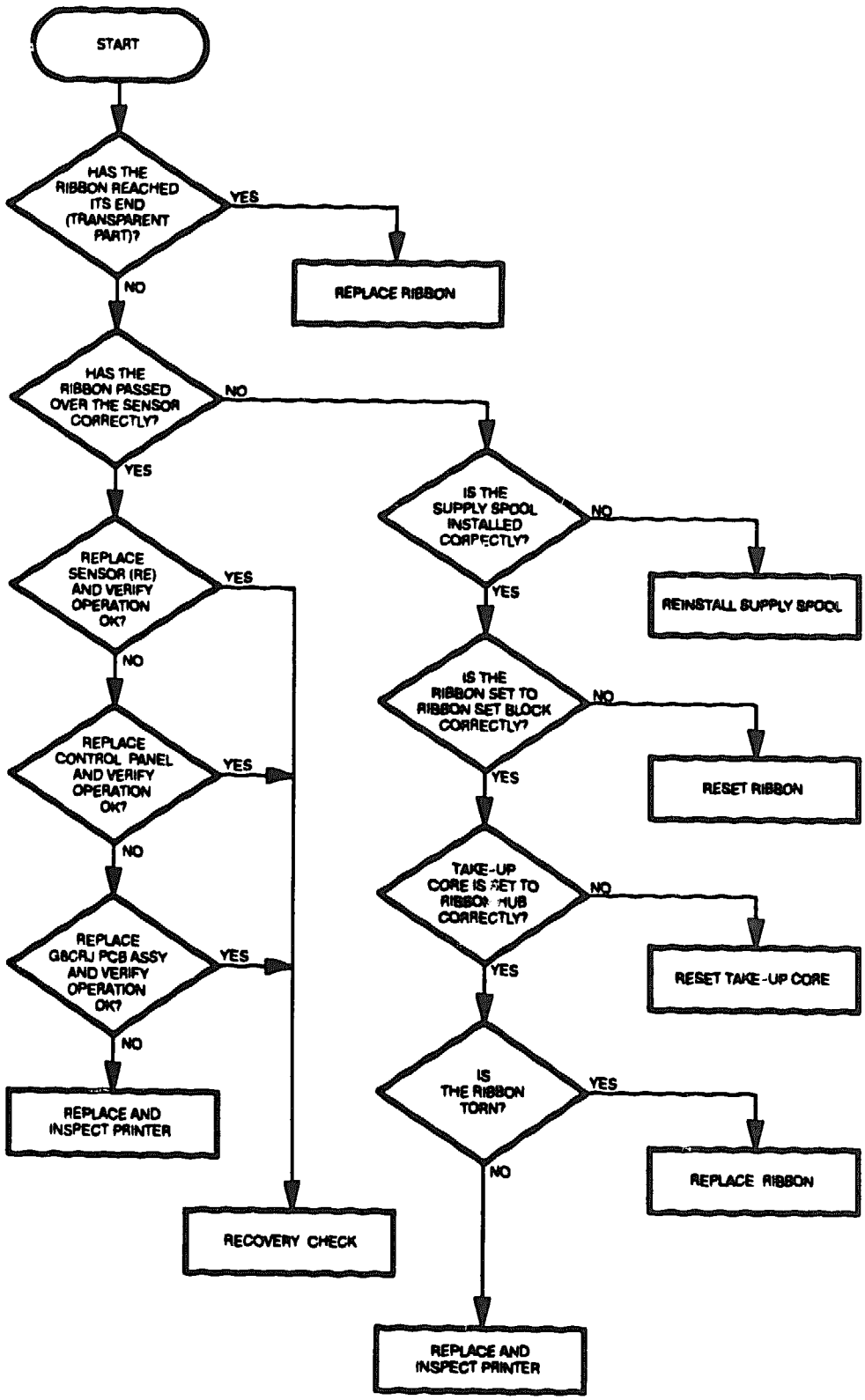
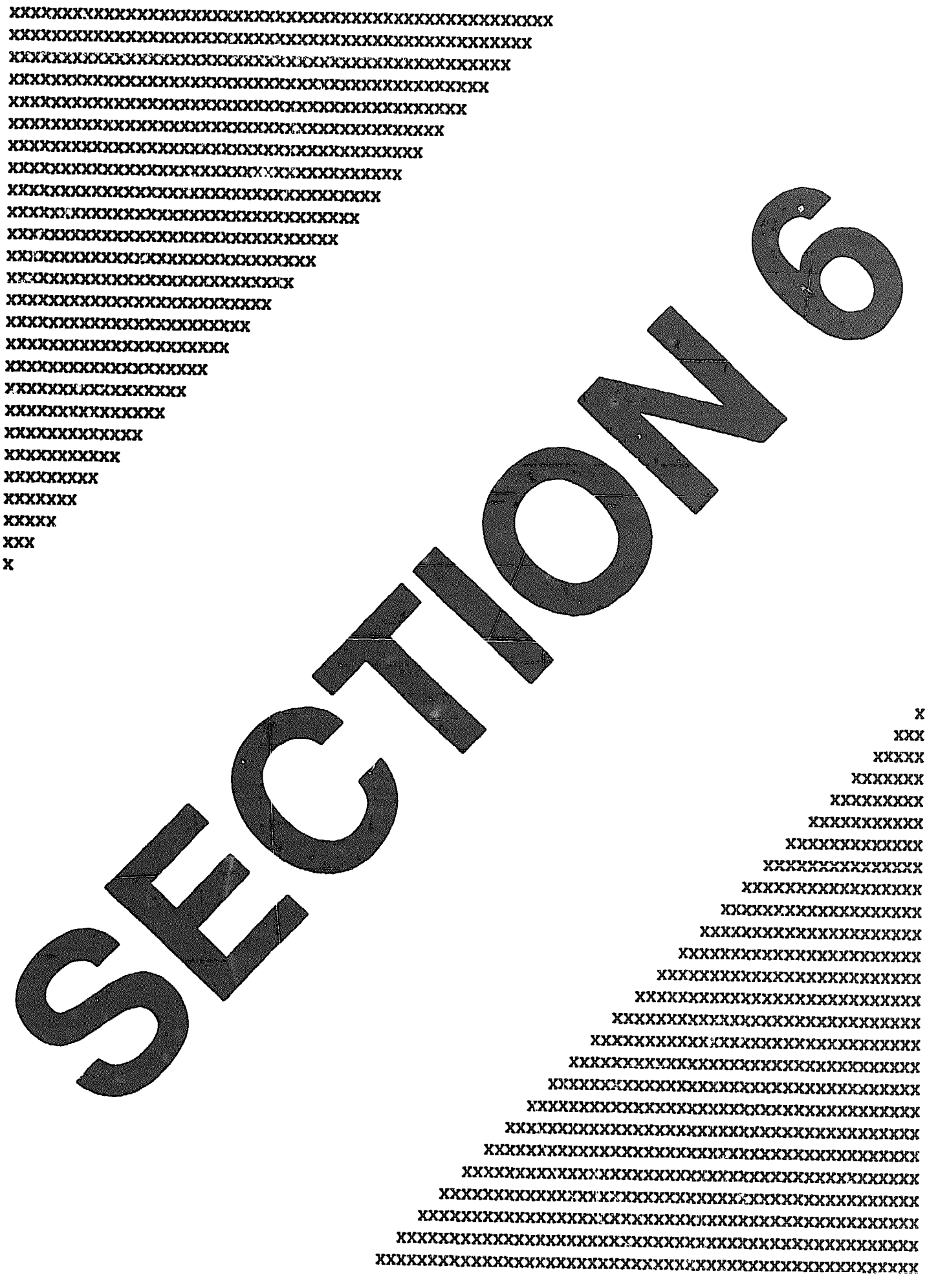


Figure 5-23 RIBBON or RIBBON END Error


SECTION 6

Section 6

Disassembly and Reassembly

This section contains step-by-step disassembly and reassembly procedures for the Colormate PS thermal transfer printer. A list of required tools is also included.

Printer parts should be removed and replaced as directed during troubleshooting (see Section 5) or when the part is obviously malfunctioning. Section 7 lists part numbers for field-replaceable parts.

GENERAL MAINTENANCE RULES

Observe the following rules when performing any disassembly or reassembly procedure.

CAUTION

Always turn off the printer and disconnect the power cord before doing any maintenance, disassembly, or reassembly procedure. Voltage is present inside the printer even after power is turned off. Only when the power cord is unplugged is all voltage removed.

- Whenever possible, remove cables by grasping and pulling on the sides of their attached connectors. When space and size limitations make it impossible to grasp the connector, remove the cable by pulling very gently on the wire harness or as close as possible to the base of the connector. Damage to the cable, connector, and connector pins may result from removing cables improperly.
- Label all removed connectors and record the location and position in which they were installed. In addition, follow all connector alignment marks and keys when reattaching cables.
- Do not remove any parts unless they are specified in the disassembly procedure. Do not disassemble individual parts unless specified in the procedure.
- Do not remove and replace PCBs unless you are properly grounded to your work surface and the PCB. PROMs, EPROMs, and all metal-oxide

semiconductor ICs are sensitive to static electricity and must be handled with caution during maintenance. If an antistatic mat and wrist strap are not available, make sure to discharge yourself on the common ground of the unit before touching any printer PCB.

- Be careful not to drop anything inside the printer. Immediately remove any foreign object inside the unit (such as paper clips).
- Always place a protective cloth over the thermal head when working inside the printer. Screws, bushings, and tools accidentally dropped on the thermal head may crack the glass inside the head and permanently damage it.
- To reassemble parts, follow the disassembly procedure in reverse order.

REQUIRED TOOLS

The following tools are required to disassemble and reassemble the printer at the modular, field level.

- #1 Phillips screwdriver
- #2 Phillips screwdriver
- #2 offset-type Phillips screwdriver
- Flat-tip screwdriver
- Long-nose pliers
- Tweezers
- 1.5 mm Allen wrench (for M3-type set screw)
- 5.5 mm open-end wrench (for M3-type screw and nut of less than 2 mm thickness)

DISASSEMBLY AND REASSEMBLY SEQUENCE

Printer hardware can be completely disassembled at the modular, field-level of repair by following the sequence listed in Table 6-1 from top to bottom. To reassemble the printer, follow the table from bottom to top.

To remove a specific part listed in Table 6-1, you are *not* required to first remove the parts listed above it in the table. Each of the following subsections lists the parts that must be removed before you can do the desired removal procedure.

Table 6-1 Disassembly and Reassembly Sequence

ITEM	PAGE	PART
1	6-4	Ribbon
2	6-6	PCB cover
3	6-7	Thermal head
4	6-9	Ribbon shaft (L) assembly
5	6-10	Rear cover
6	6-11	Logic Controller and Memory Boards
7	6-14	Top cover
8	6-16	Middle cover
9	6-17	Control panel
10	6-18	Pick roller assembly
11	6-19	Power switch assembly
12	6-24	Cut sheet guide assembly
13	6-25	DC fan (R)
14	6-27	Paper sensor assembly
15	6-33	Cover switch assembly
16	6-35	Ribbon feed roller assembly
17	6-35	Ribbon brake roller
18	6-38	Ribbon brake leaf spring assembly
19	6-39	Timing belt B170MXL3.2
20	6-40	Platen unit
21	6-43	Discharging bars (static brushes)
22	6-46	Lift plate assembly
23	6-49	Upper unit
24	6-52	DC fan (L)
25	6-55	Power supply assembly
26	6-58	Paper size sensor subassembly
27	6-58	Timing belt B140MXL9.5
28	6-60	Mechanism unit (printer frame)
29	6-63	Timing belt B328MXL9.5
30	6-66	DC fan (C) on printer bottom
31	6-68	G8CRJ mechanical controller PCB
32	6-69	Thermal head power cable
33	6-70	Thermal head signal cable
34	6-71	RBE sensor assembly
35	6-75	Lift sensor subassembly
36	6-77	CSG motor assembly
37	6-79	Ribbon motor
38	6-81	Line feed motor
39	6-84	Electromagnetic clutch assembly

Ribbon

To remove the ribbon, follow these steps.

1. Slide the release lever forward (toward the control panel) on the top cover and open the upper unit.
2. Lift up the ribbon core (take-up roller) on the right side. Then remove the left side from the ribbon hub (see Figure 6–1).

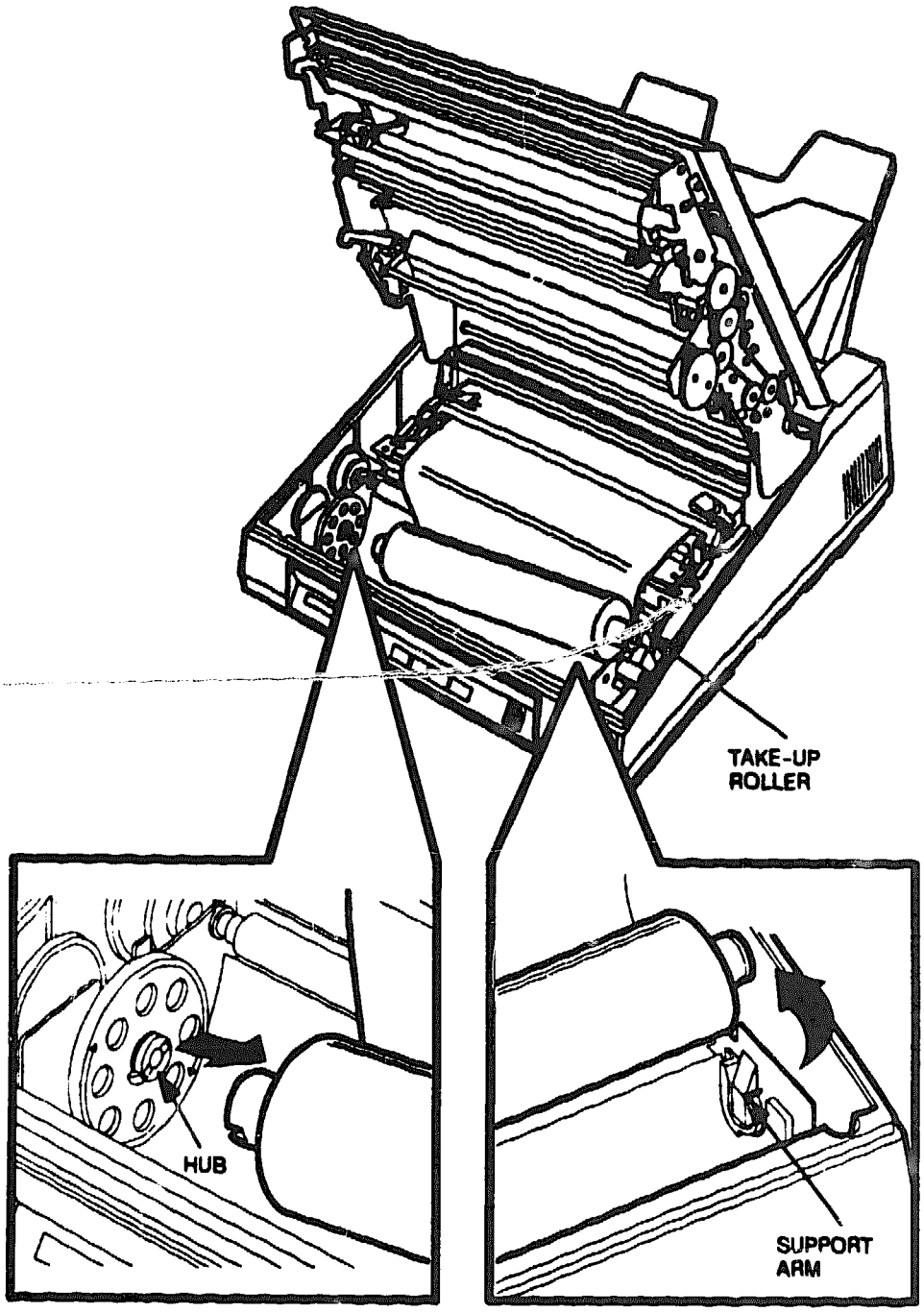


Figure 6–1 Ribbon Core (Take-up Roller) Removal

3. Roll up the ribbon around the ribbon core roller and mount the ends of the core roller onto the supply ribbon cartridge holders (see Figure 6-2).

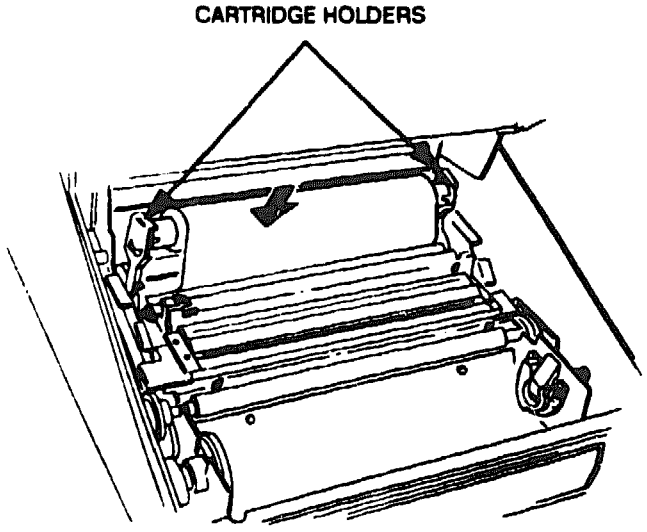


Figure 6-2 Mounting the Take-Up Roller on the Supply Ribbon Cartridge

4. Lift up the ends of the supply ribbon cartridge and remove the cartridge from the mounting blocks (see Figure 6-3).

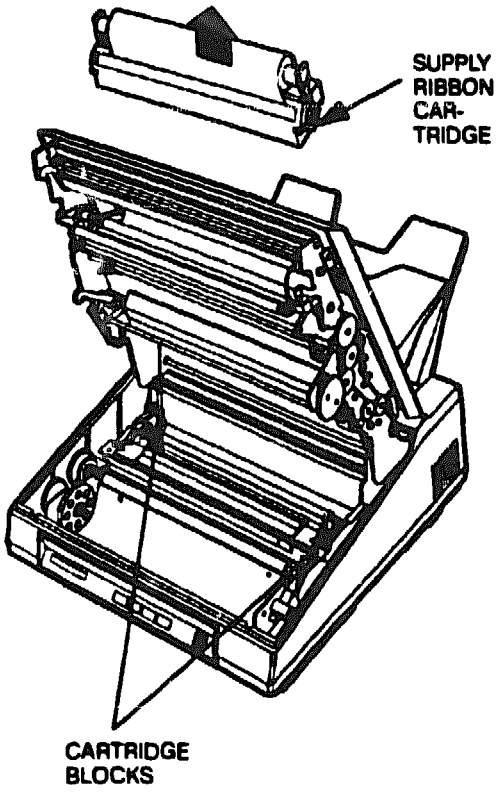


Figure 6-3 Supply Ribbon Cartridge Removal

PCB Cover

To change switch settings or access any of the components on the G8CRJ mechanical controller board, remove the PCB cover by following these steps.

1. Slide the release lever forward (toward the control panel) on the top cover and open the upper unit.
2. Remove the ribbon (refer to the previous subsection).
3. Remove the four screws shown in Figure 6-4 securing the PCB cover to the printer base.

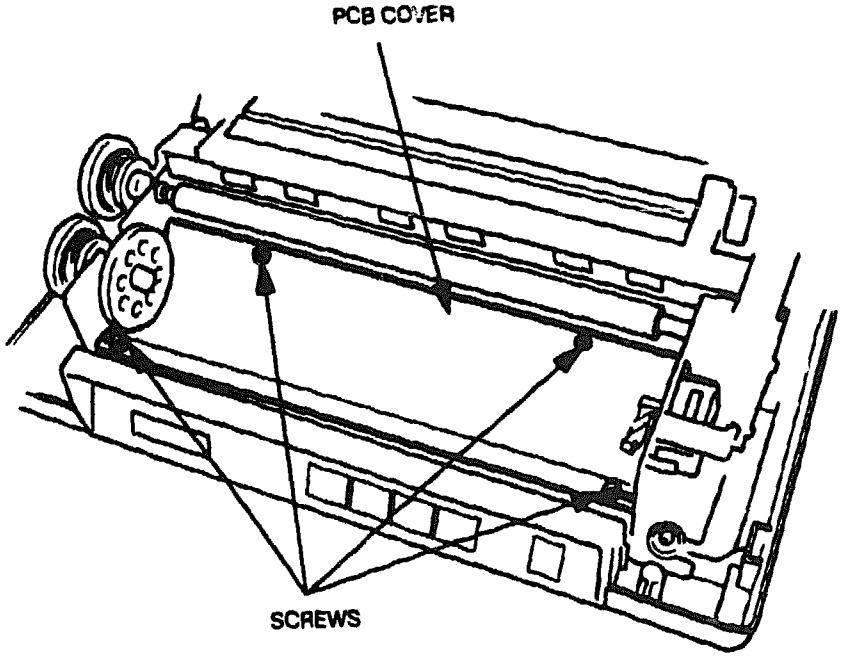


Figure 6-4 PCB Cover Screws

4. Grasp each side of PCB cover and slide it toward you and out of the printer (see Figure 6-5).

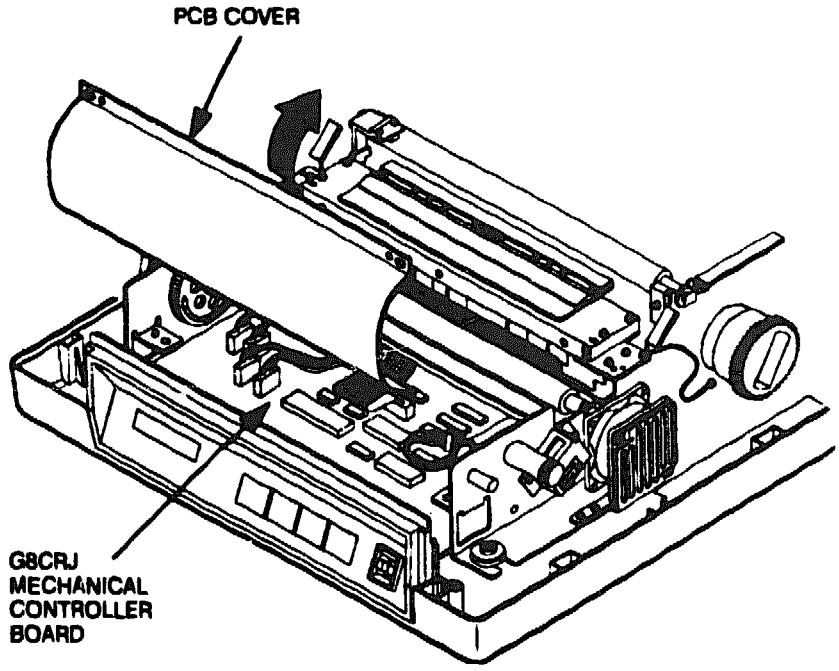


Figure 6-5 PCB Cover Removal

Thermal Head

To remove the thermal head, follow these steps.

1. Slide the release lever forward (toward the control panel) on the top cover and open the upper unit.
2. Remove the ribbon.
3. Remove the four screws shown in Figure 6-6 that secure the thermal head to the head holder sub-plates and partially lift the head up.

CAUTION

Remove only the screws that secure the thermal head to the head holder sub-plates (see Figure 6-6). Do *not* remove the screws securing the sub-plates. The printer will not operate properly if the sub-plate screws are removed and replaced.

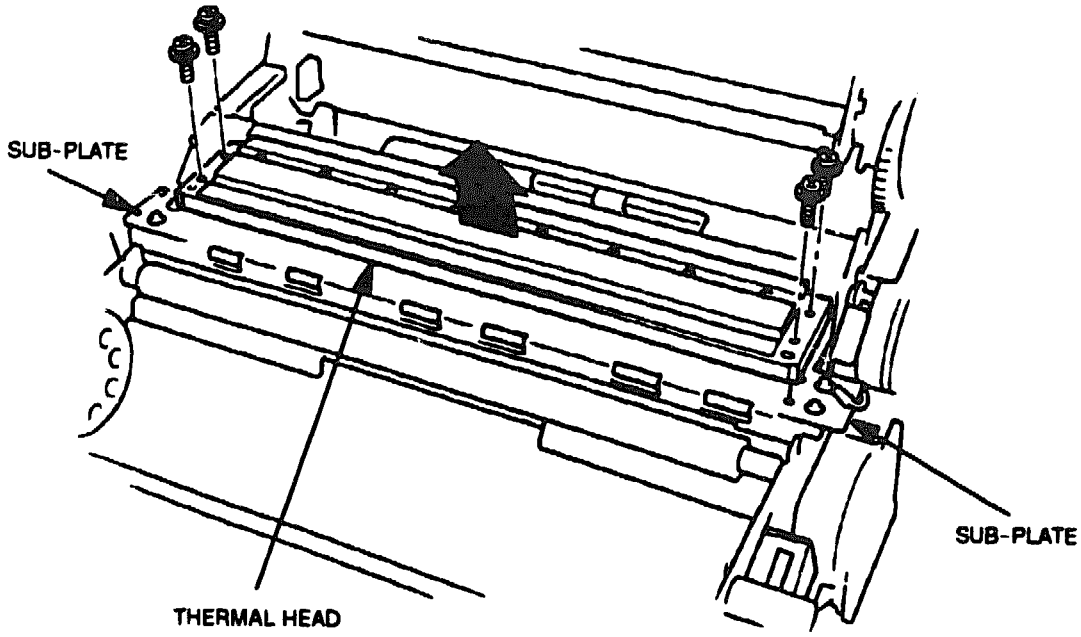


Figure 6-6 Thermal Head Screws

4. Unplug the two thermal head connectors. Lift the thermal head out of the printer (see Figure 6-7).

NOTE

When replacing the thermal head in the printer, fit the positioning holes on the head onto the protruding studs on the head holder subplates to secure the head in the proper position.

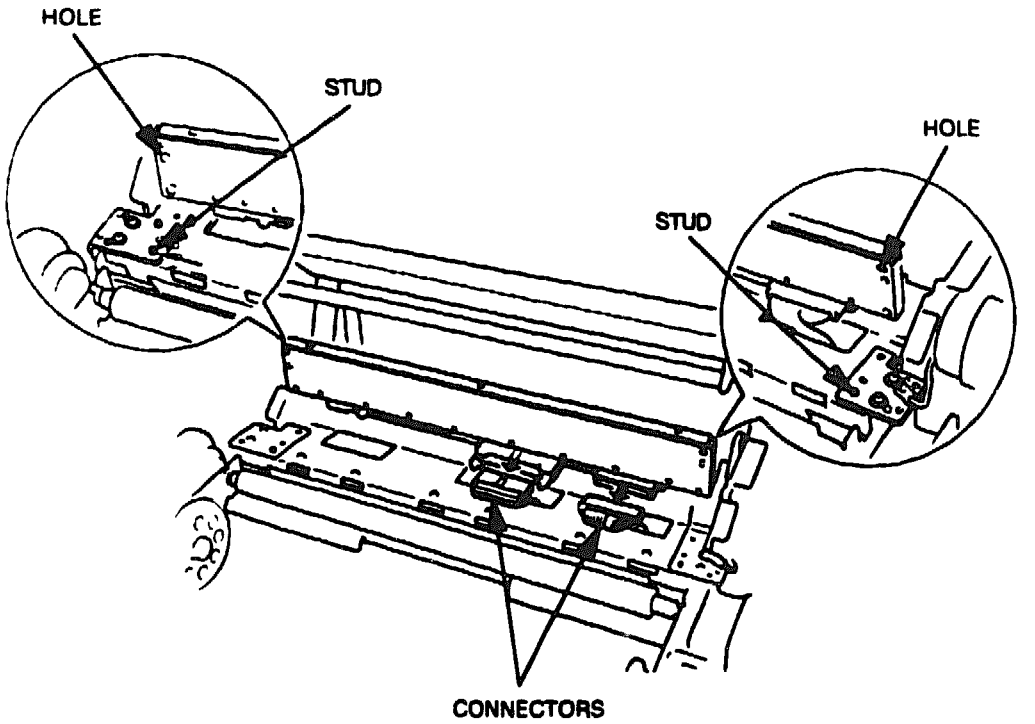


Figure 6-7 Thermal Head Removal

5. Remove the three screws that secure the thermal head to the separator plate and remove the plate from the head.

Ribbon Shaft (L) Assembly

To remove the ribbon shaft (L) assembly, proceed as follows.

1. Slide the release lever forward (toward the control panel) on the top cover and open the upper unit.
2. Remove the ribbon.
3. As shown in Figure 6-8, insert a screwdriver into the holes in the ribbon hub (L) assembly and remove the three screws on the bushing assembly. Slide the ribbon shaft (L) assembly to the right and remove it from the lower side frame (L).

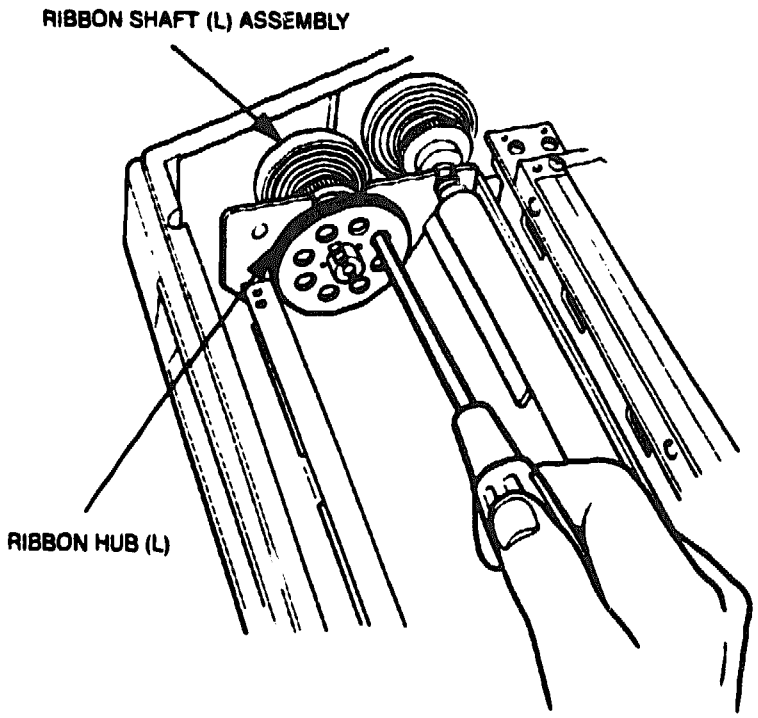


Figure 6-8 Ribbon Shaft (L) Assembly Removal

Rear Cover

To remove the rear cover, follow these steps.

1. Unplug the interface cable from the rear of the printer.
2. Remove the two rear cover screws and lift off the rear cover (see Figure 6-9).

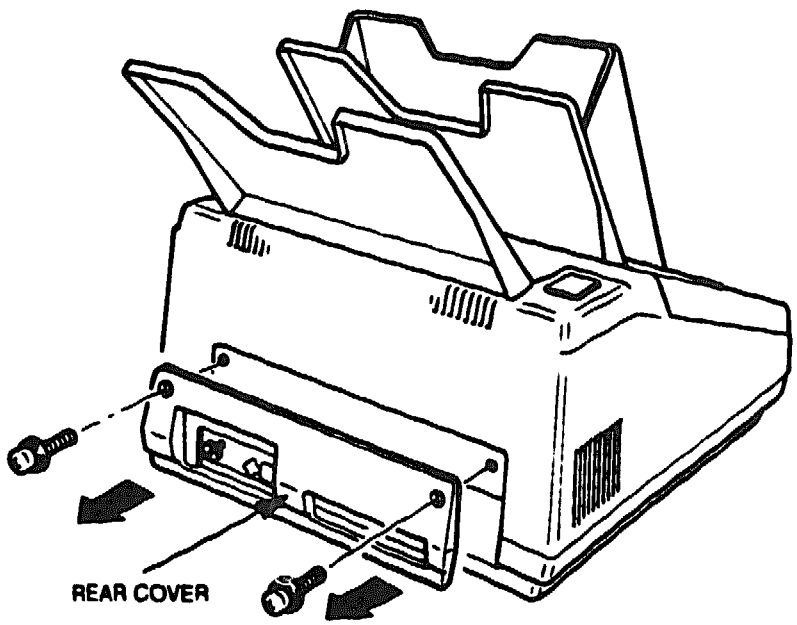


Figure 6-9 Rear Cover Removal

Logic Controller Board Assembly

Remove the logic controller board assembly as follows.

1. Remove the rear cover.
2. Loosen the thumb screws that secure the controller assembly to the printer (see Figure 6-10).
3. Pull the controller assembly out of the printer.

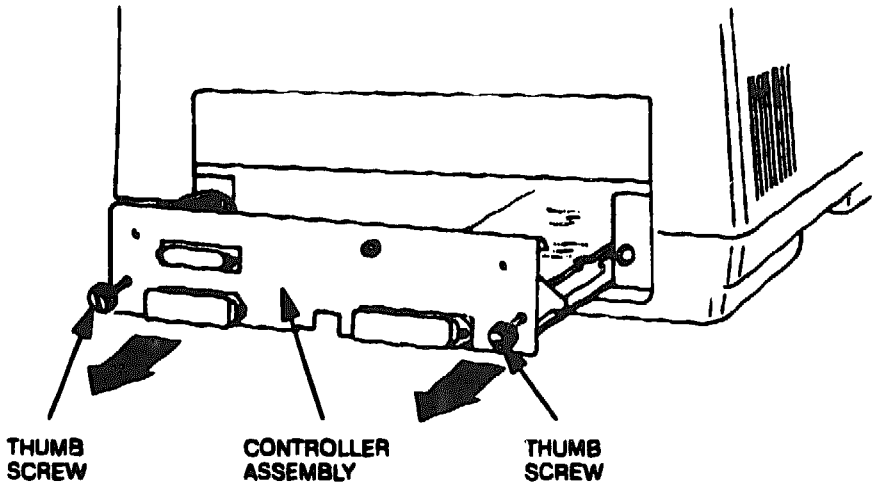


Figure 6-10 Controller Board Assembly Removal

Memory Board G8CRH (Early Printers Only)

Remove the G8CRH memory board from the G8CRG logic controller board as follows.

1. Remove the logic controller board.
2. Remove the three screws securing the G8CRH board (see Figure 11).
3. Carefully lift the G8CRH memory board out of its connector on the logic board, and off the logic board.

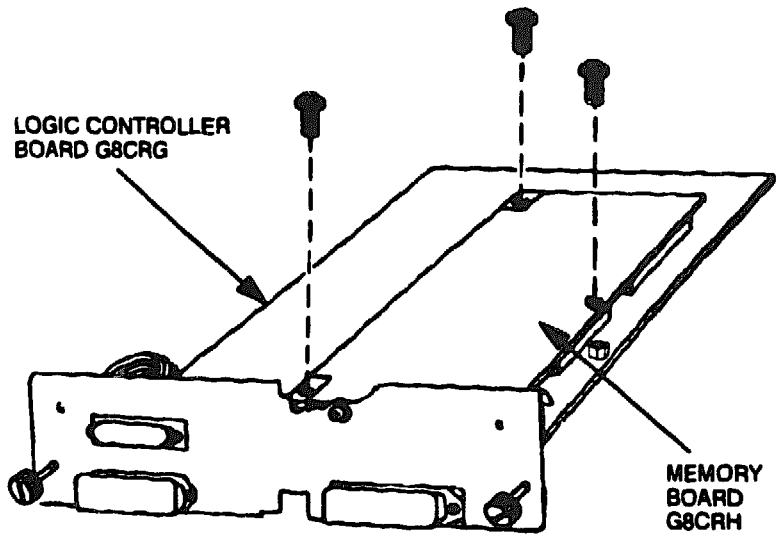


Figure 6-11 Memory Board G8CRH Removal (Early Printers Only)

Memory Boards G8HEJ and G8HEK (Later Printers Only)

Remove the G8HEJ and G8HEK memory boards from the G8HEH logic controller board as follows (see Figure 6–12).

1. Remove the logic controller board.
2. Remove either memory board by alternately squeezing the tips of the four standoffs while carefully lifting the memory board out of its connector on the logic board.

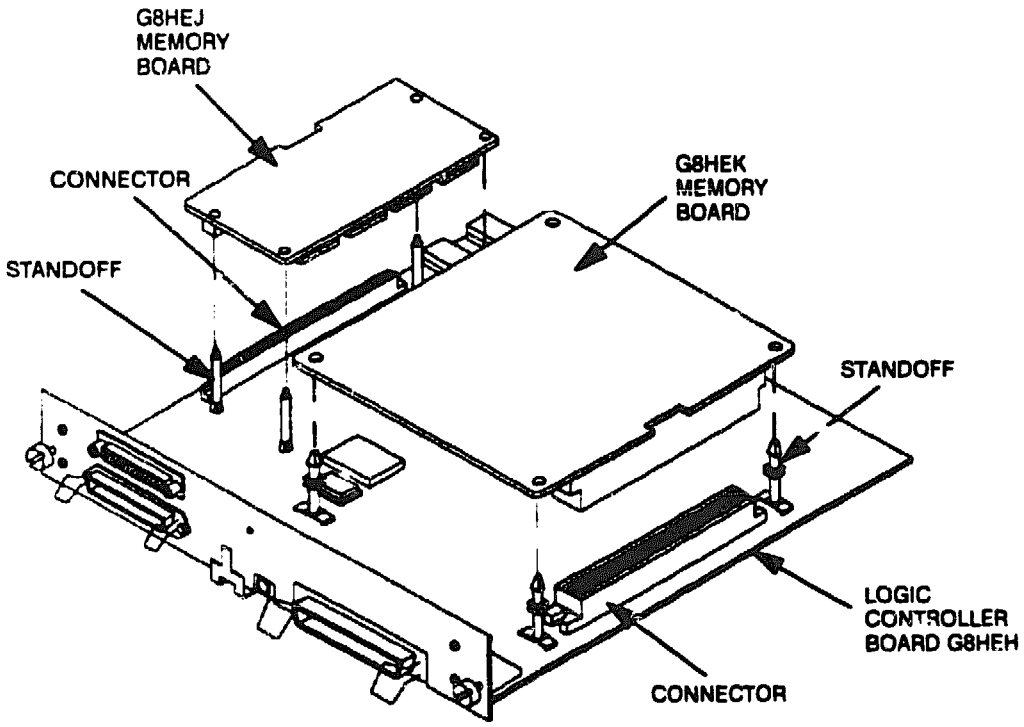


Figure 6–12 Memory Boards G8HEJ and G8HEK Removal (Later Printers Only)

Top Cover

To remove the top cover, proceed as follows.

1. Lift the stacker and privacy covers toward you and remove them from the printer (see Figure 6–13).
2. Slide the hopper guide away from the printer and lift it up and off the unit (see Figure 6–13.)

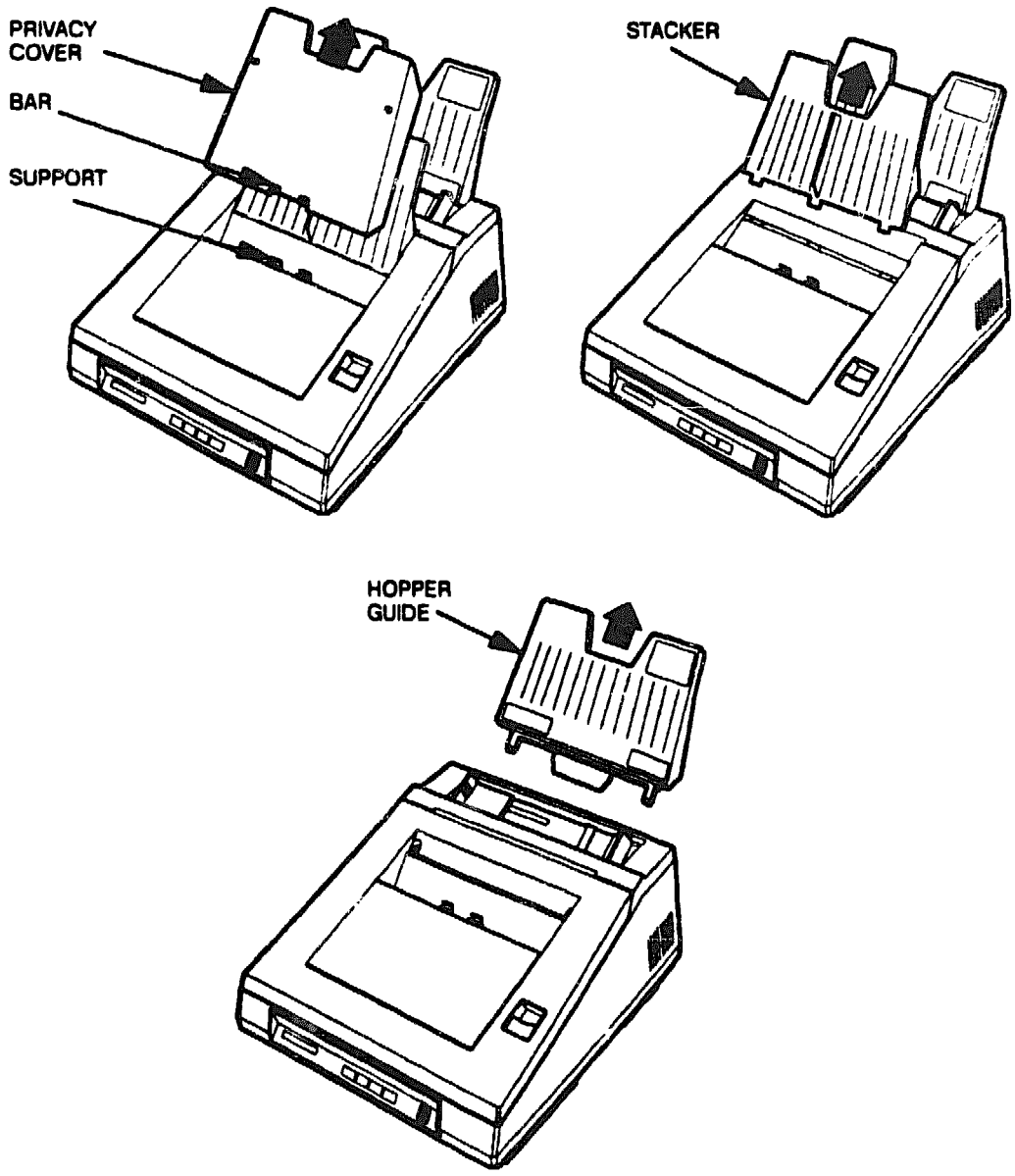


Figure 6–13 Stacker and Privacy Covers and Hopper Guide

3. As shown in Figure 6-14, remove the two screws on the rear portion of the top cover. Then slide the release lever forward (toward the control panel) on the top cover and open the upper unit.
4. Remove the two top cover screws on the upper unit inside frame (see Figure 6-14). Then lift the top cover off the printer.

NOTE

When replacing the top cover, be sure the slotted channel on the bottom of the plastic release lever assembly is seated so it latches onto the metal rod on the upper unit. If the slot is not positioned so it latches onto the rod when you replace the top cover, you will not be able to open the upper unit by sliding the release lever button.

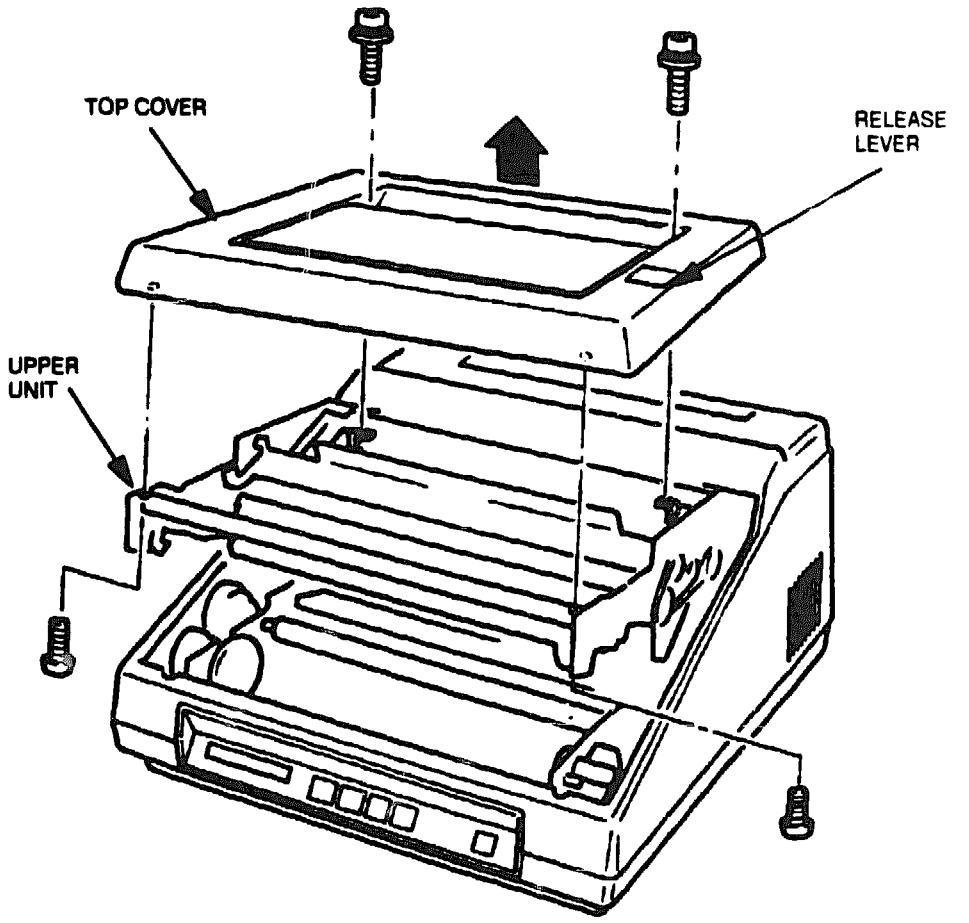


Figure 6-14 Top Cover Removal

Middle Cover

To remove the middle cover, follow these steps.

1. Remove the top cover (refer to the previous subsection).
2. Loosen the two screws on the front of the base (see Figure 6-15) and remove the two screws on the rear corners of the base. Then carefully lift the middle cover up and off.

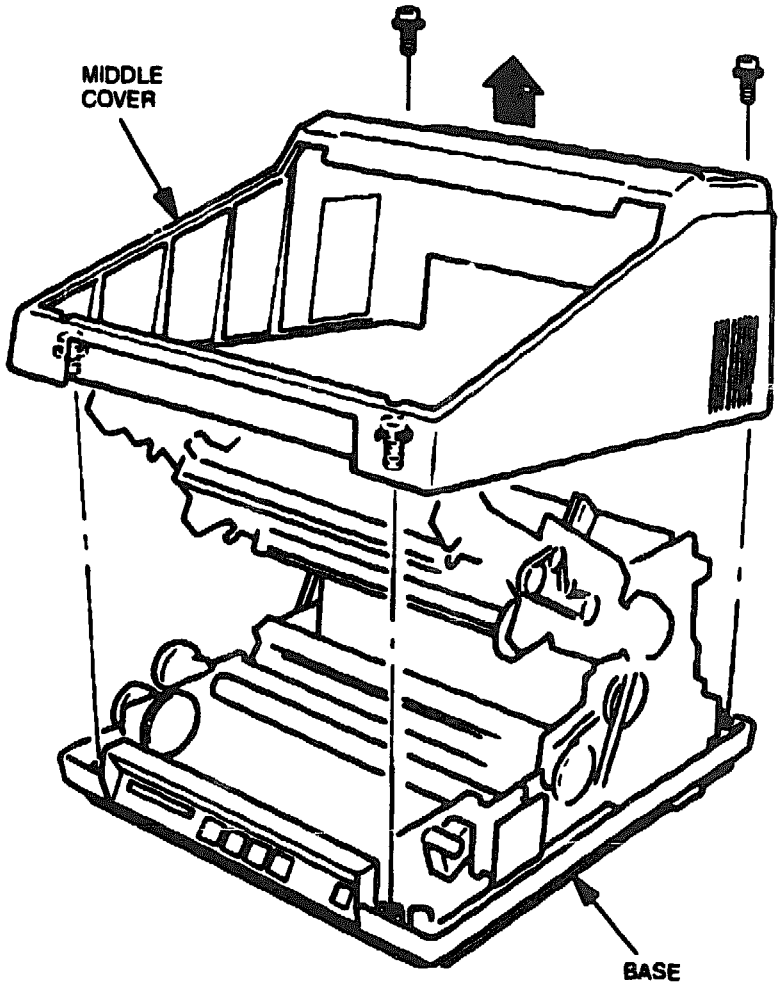


Figure 6-15 Middle Cover Removal

Control Panel

To remove the control panel, proceed as follows.

1. Remove the ribbon.
2. Remove the middle cover.
3. Remove the PCB cover.
4. Lift the front shield out of the printer (see Figure 6-16).

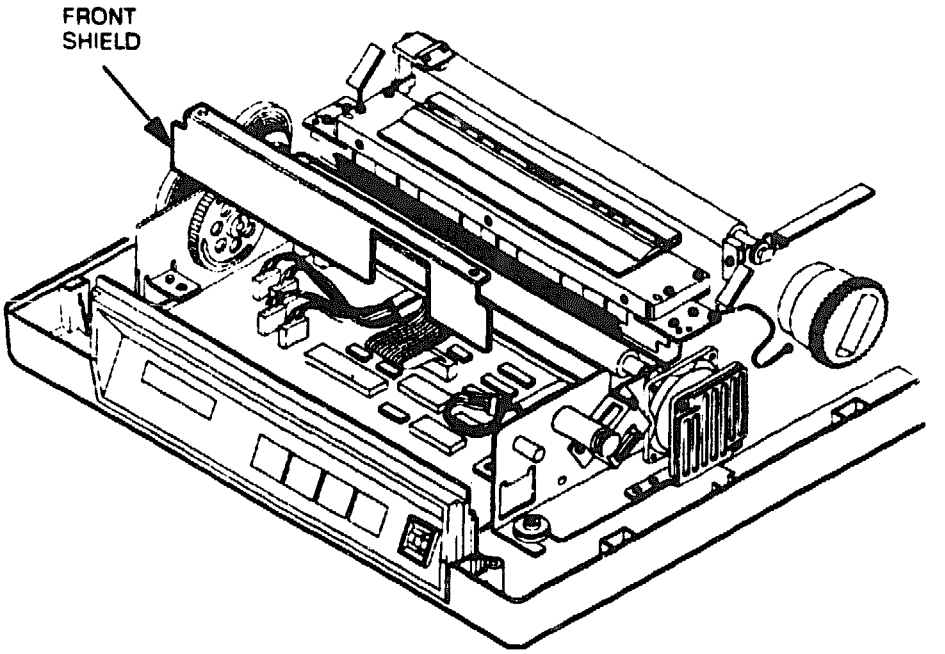


Figure 6-16 Front Shield Removal

5. Being careful not to stretch or damage to control panel cable, slowly and partially lift the control panel assembly straight up (see Figure 6-17).
6. Unplug the control panel cable connector labeled CN19 from the G8CRJ PCB and remove the panel from the front of the printer.

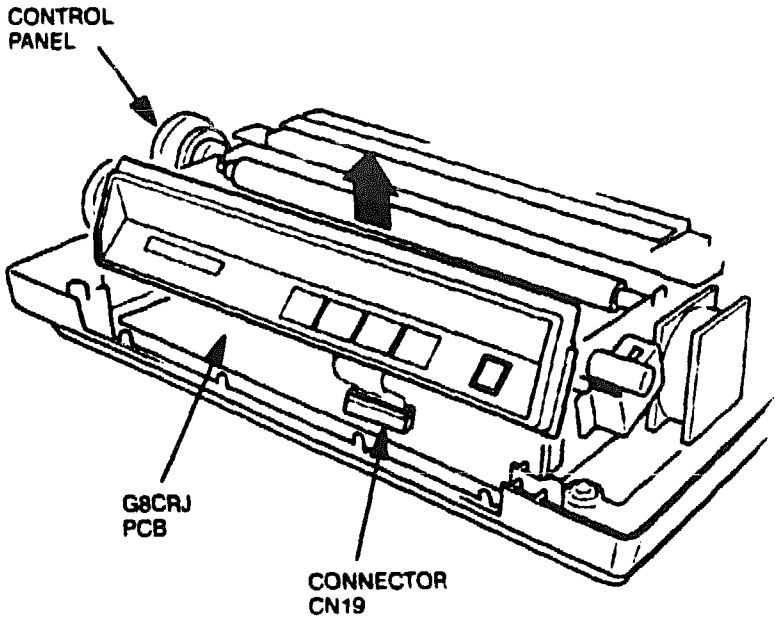


Figure 6-17 Control Panel Removal

Pick Roller Assembly

To remove the pick roller, follow these steps.

1. Remove the top cover.
2. With the upper unit open, use a flat-tip screwdriver to remove the two E retaining rings on the pick drive shaft (see Figure 6-18).
3. Slide the bushing to the left on the right side of the pick drive shaft (see Figure 6-18). Slightly lift the right side of the shaft off the support frame.
4. While being careful not to misplace the bushing on the left side frame, remove the pick drive shaft assembly from the printer.
5. Using a flat-tip screwdriver, remove the E retaining ring on the pick roller shaft (see Figure 6-18).
6. Slide the pick roller to the right and out of its left support bushing. Then remove the pick roller from the printer (see Figure 6-18).

NOTE

During reinstallation of the pick roller, be careful to install each bushing in the correct orientation.

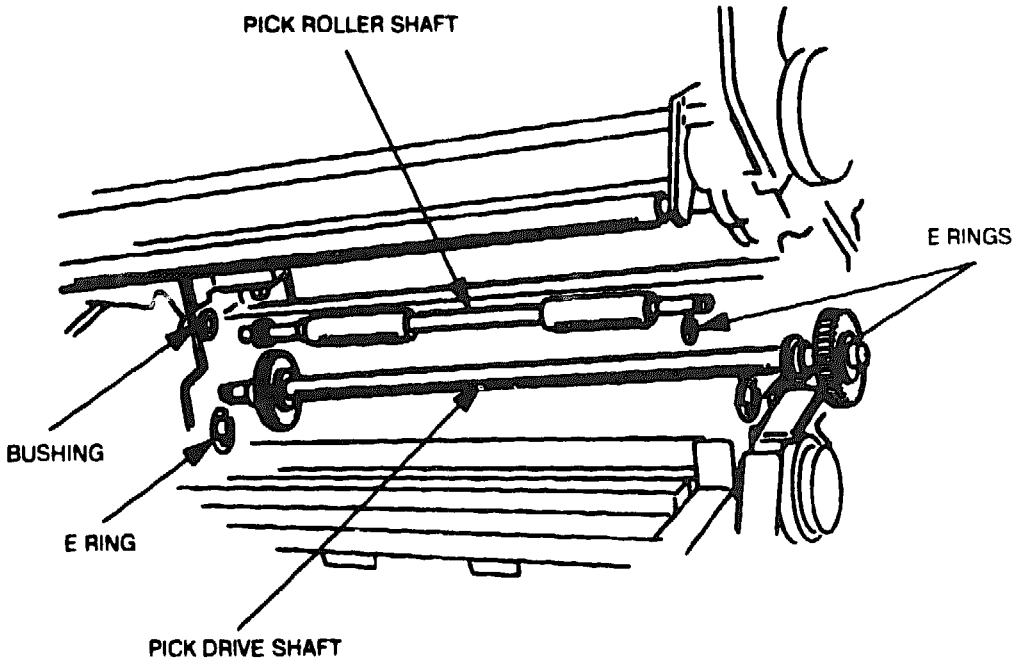


Figure 6-18 Pick Roller Removal

Power Switch Assembly

To remove the power switch assembly, follow these steps.

1. Remove the top and middle covers.
2. Unplug connector CN1 from the power supply (see Figure 6-19).
3. Unscrew the two FG cables from the mechanism unit (see Figure 6-19).

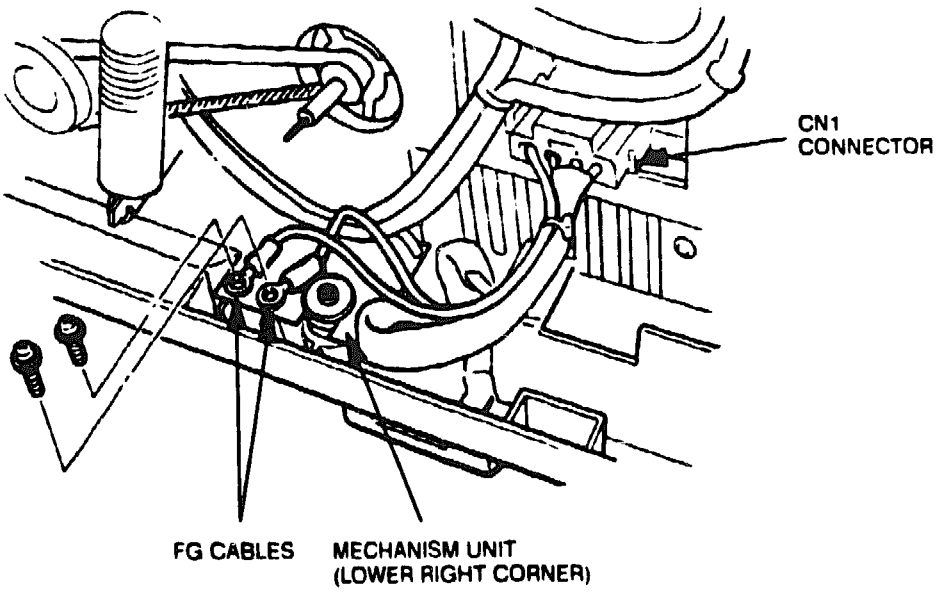


Figure 6-19 Power Switch Assembly Connector and FG Cables

4. Remove the two screws that secure the power switch assembly (see Figure 6- 20). Lift the power switch assembly out of the printer.

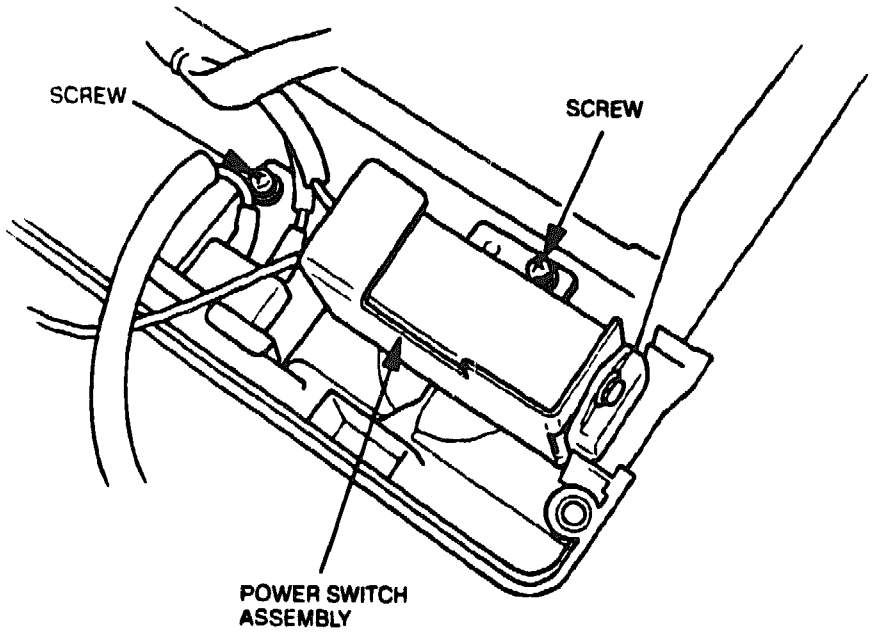


Figure 6-20 Power Switch Assembly Removal

Cut Sheet Guide Assembly

To remove the cut sheet guide (CSG) assembly, proceed as follows.

1. Remove the top, middle, and rear covers.
2. Remove the pick roller.

3. Remove the two shield plate screws and lift the shield plate off (see Figure 6-21).

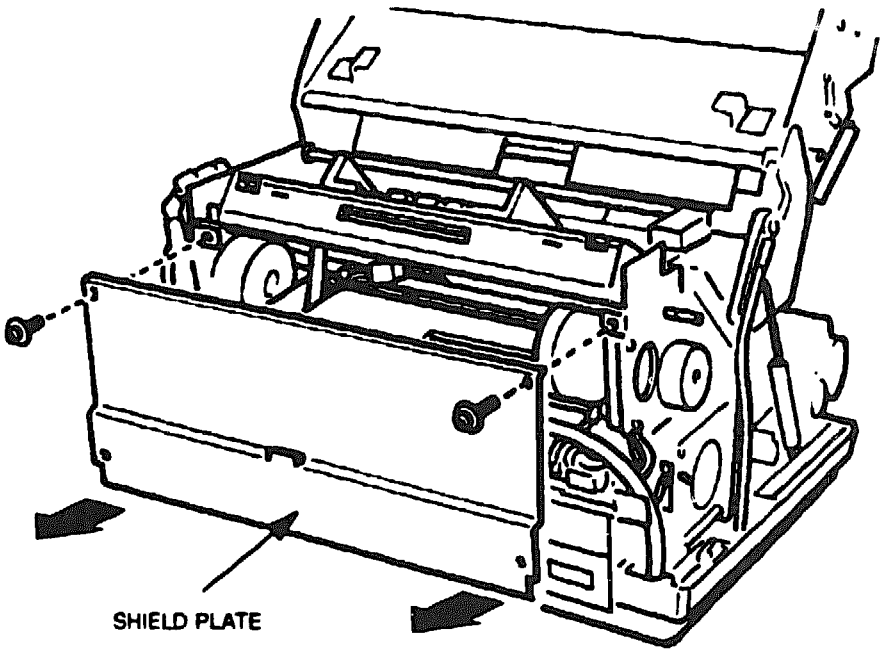


Figure 6-21 Shield Plate Removal

4. Remove the two cable ties that fasten the size sensor cable to the CSG base frame. Then unplug the size sensor cable connector (see Figure 6-22).

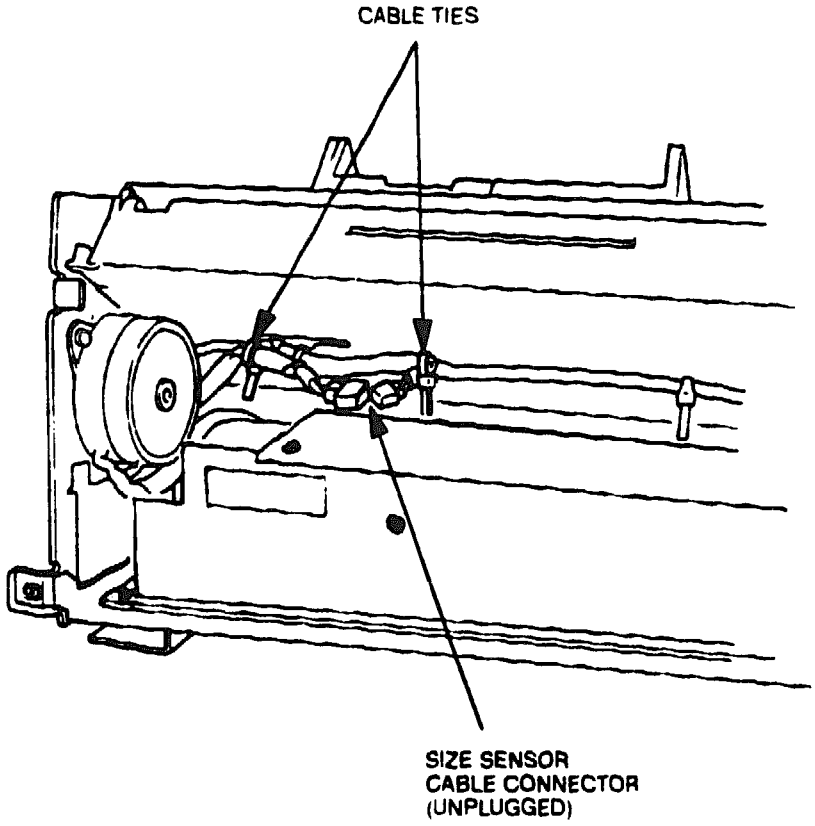


Figure 6-22 Size Sensor Cable Connector

5. Turn the lift shaft so that the lift plate releases from the cam and is set to the fully raised position (see Figure 6-23).

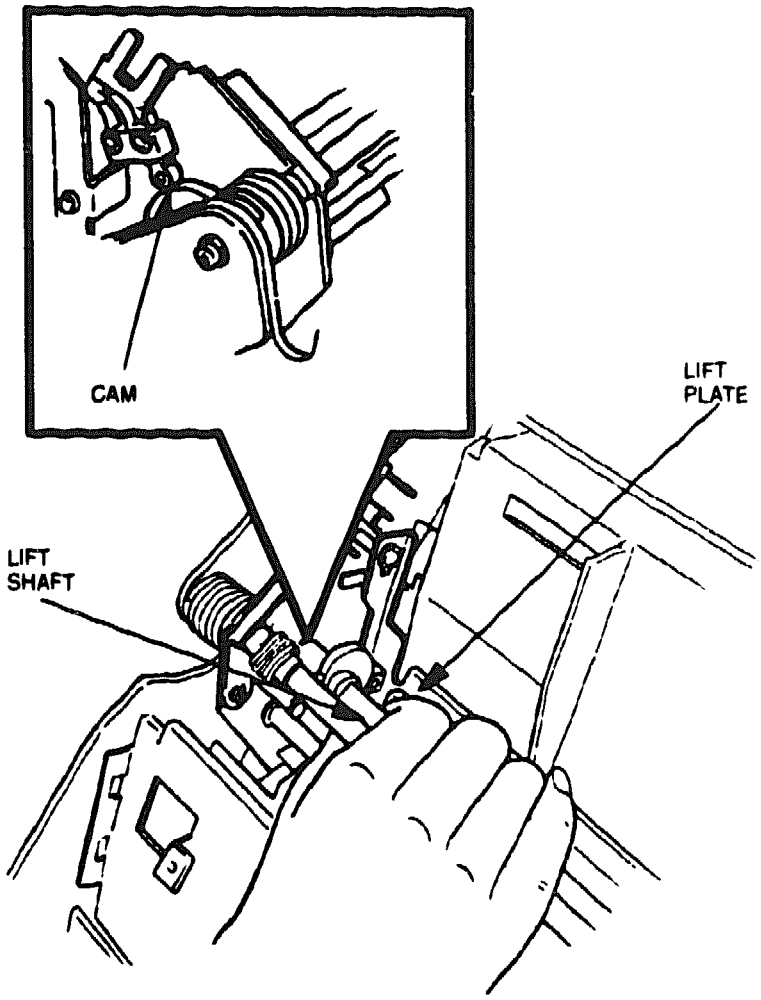


Figure 6-23 Turning the Lift Shaft

6. As shown in Figure 6-24, remove the two screws that secure the CSG assembly to the CSG base frame. Carefully lift the CSG assembly up and away from the printer.

NOTE

When reinstalling the cut sheet guide assembly, insert the two tabs into the slots in the CSG base frame. Then push the CSG assembly slightly to the left (see Figure 6-25).

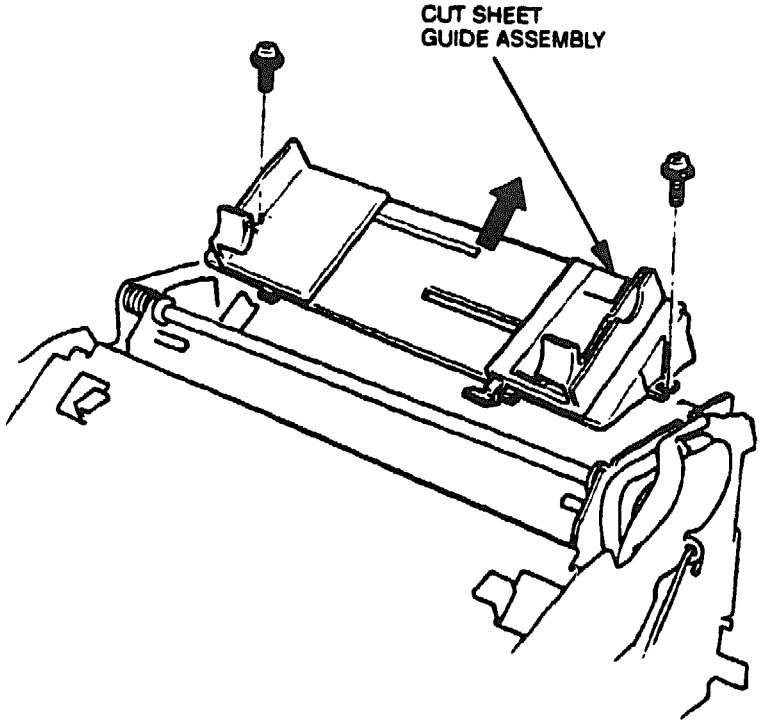


Figure 6–24 Cut Sheet Guide Assembly Removal

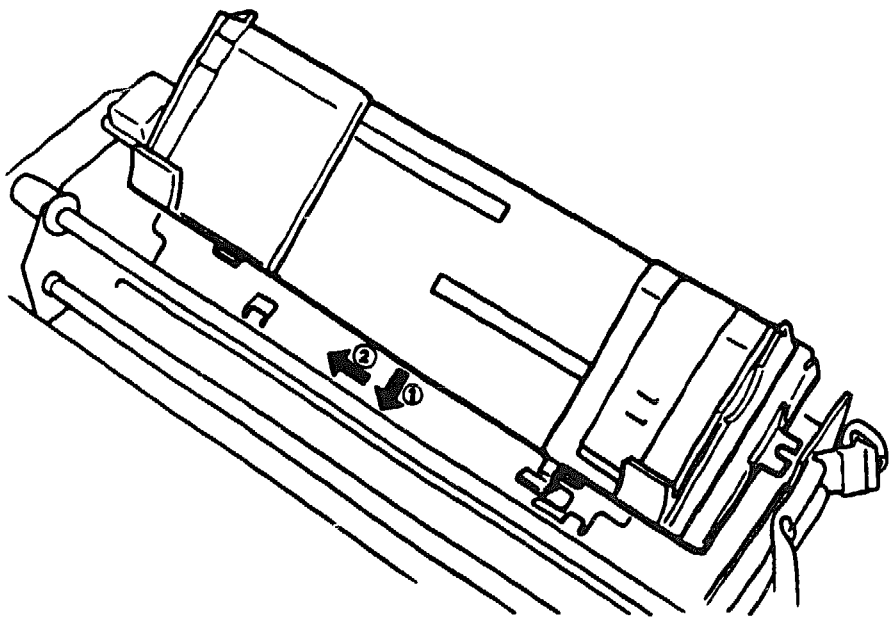


Figure 6–25 Cut Sheet Guide Assembly Installation

DC Fan (R)

To remove the DC fan (R), follow these steps.

1. Remove the ribbon.
2. Remove the PCB cover.
3. Unplug the DC fan cable connector CN15 from the G8CRJ mechanical control board (see Figure 6-26).

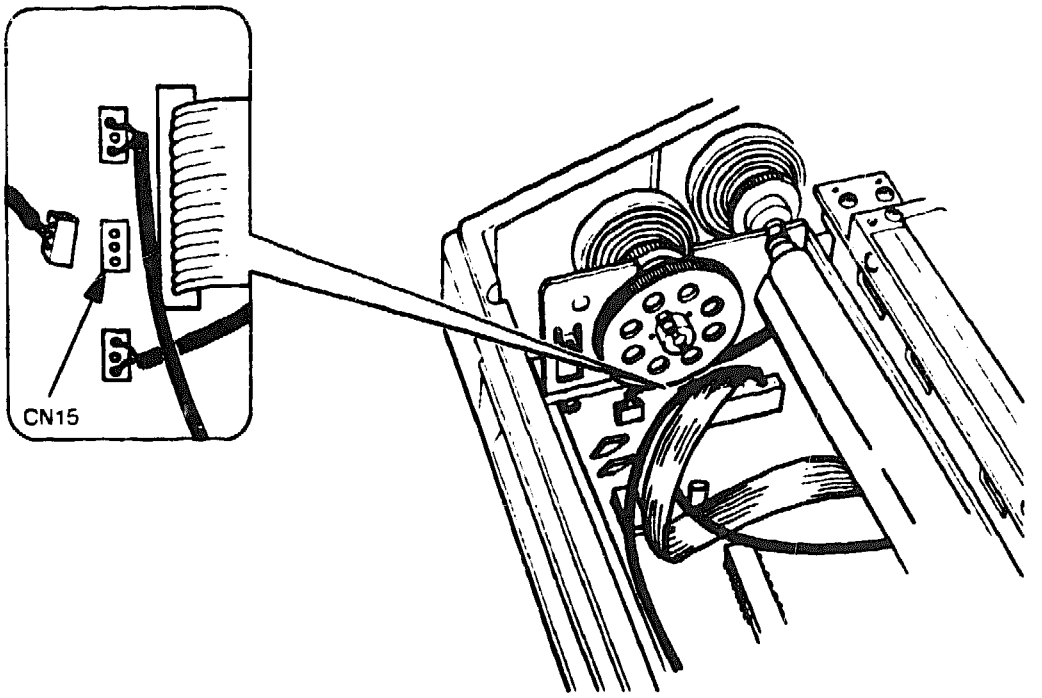


Figure 6-26 DC Fan (R) Cable Connector CN15

4. Remove the middle cover.
5. Remove the two fan bracket screws shown in Figure 6-27 and lift the bracket up and away from the frame.
6. Remove the two DC fan screws from the fan bracket (see Figure 6-27). Remove the DC fan from the bracket.

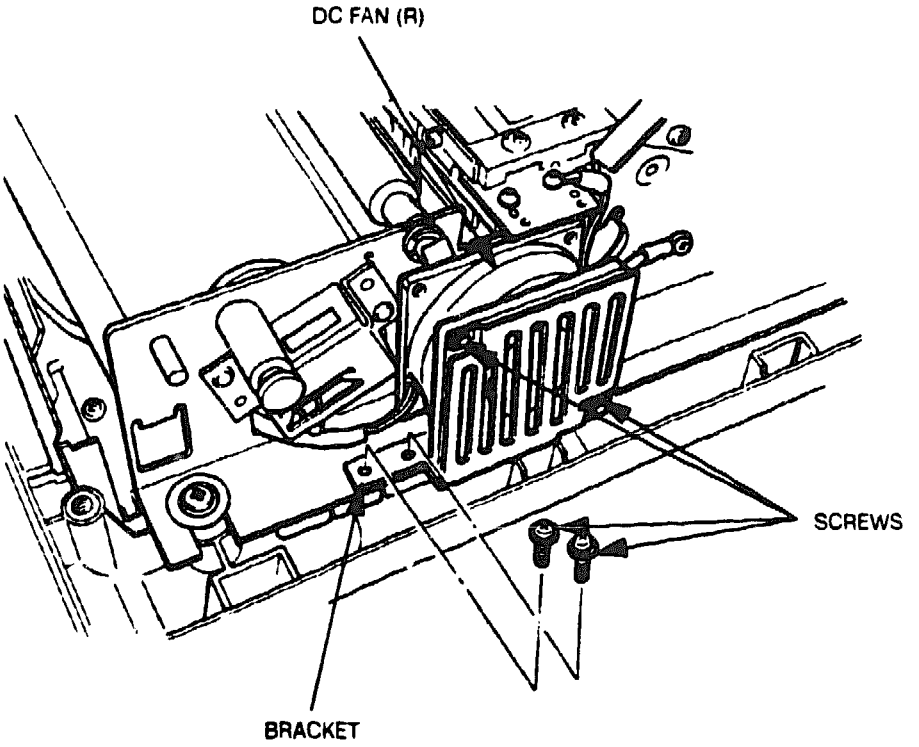


Figure 6-27 DC Fan (R) Removal

NOTE

When replacing the DC fan (R), be sure to position the fan so the air flows inward as shown in Figure 6-28.

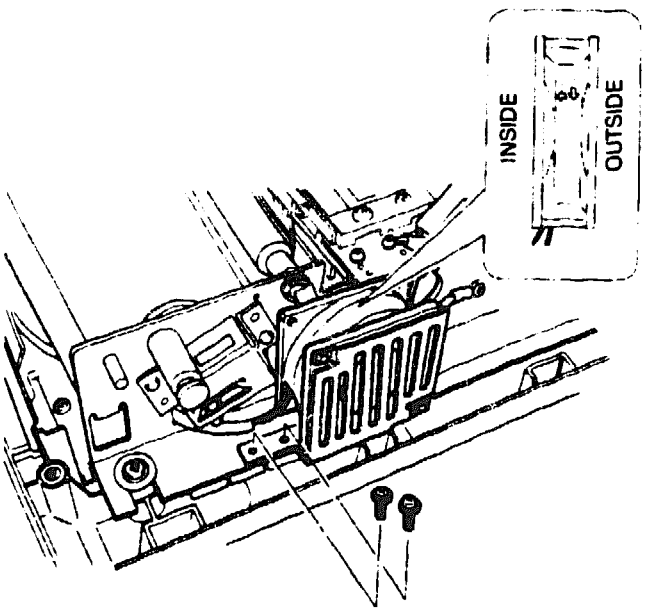


Figure 6-28 DC Fan (R) Installation

Paper Sensor Assembly

To remove the paper sensor assembly (PC and PE sensors), proceed as follows.

1. Remove the top and middle covers.
2. Remove the four screws that secure the upper plate (A) on the right and left upper frame assemblies (see Figure 6-29).

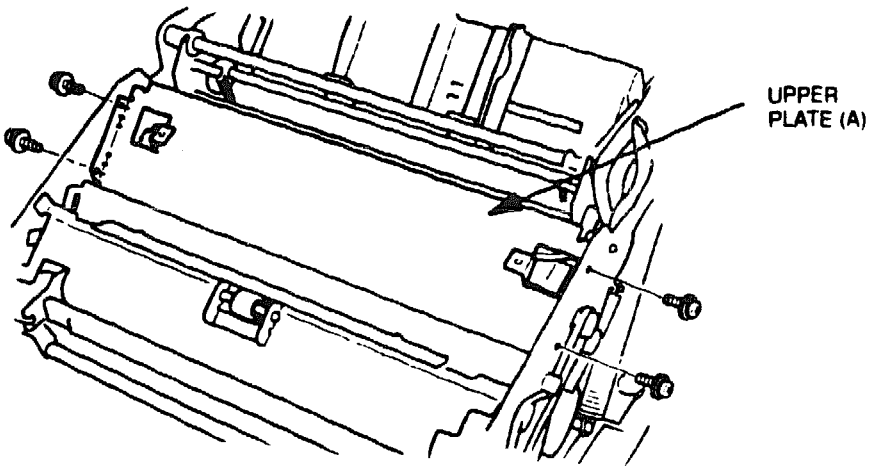


Figure 6-29 Upper Plate (A) Screws

3. Lift the upper plate (A) away from the printer (see Figure 6-30).

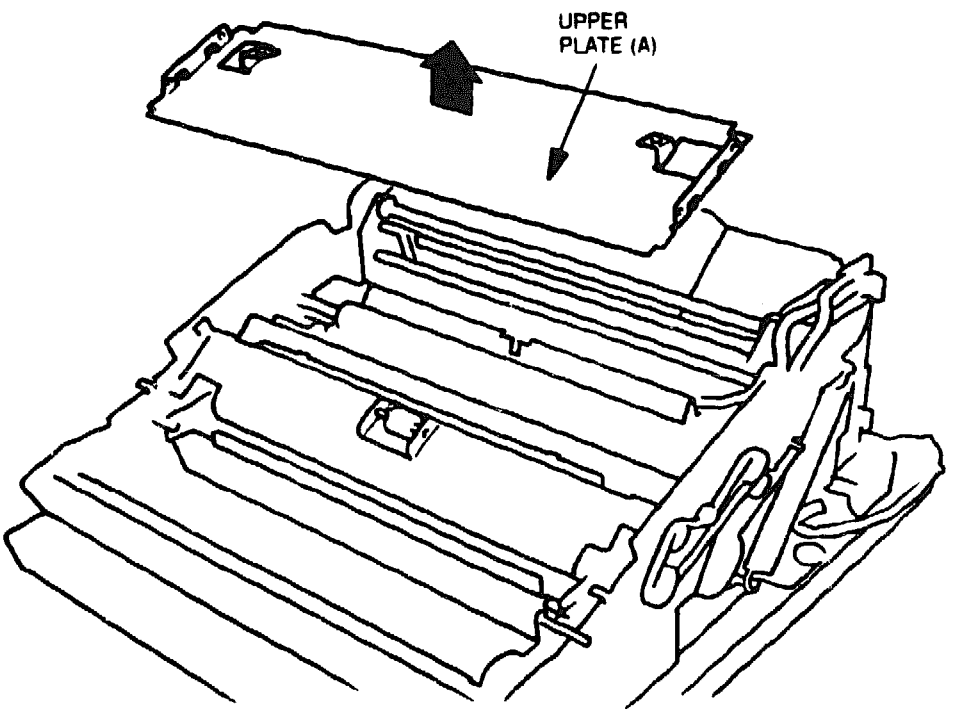


Figure 6-30 Upper Plate (A) Removal

4. Press the locking tabs inward to release the upper paper sensor (PC sensor) shown in Figure 6-31.

NOTE

Be careful when detatching the PC sensor.
The sensor is easily damaged if mishandled.

5. Remove the PC sensor while being careful not to damage the sensor lever (see Figure 6-31). Then remove the cable from the wire sticker on the plate shown in Figure 6-31.

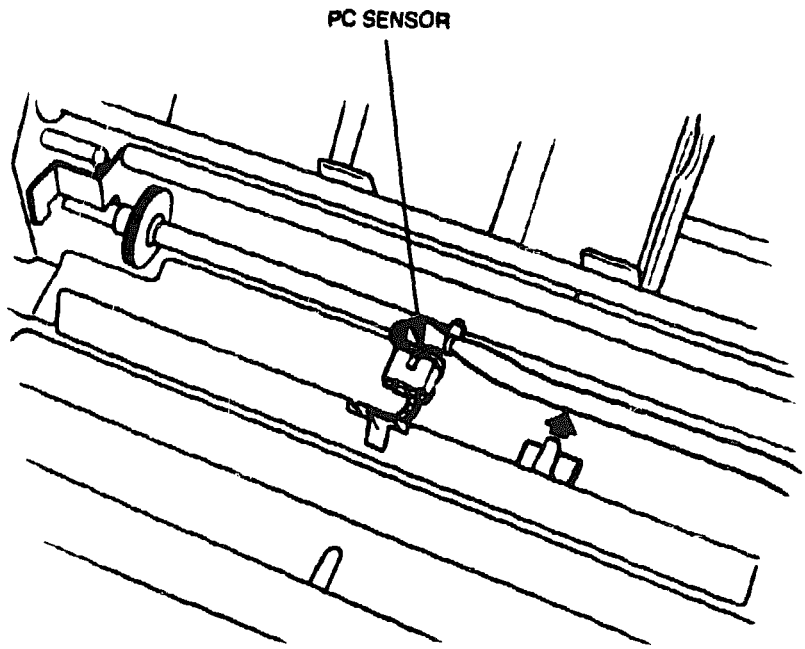


Figure 6-31 PC Sensor Removal

6. Slide the release lever forward (toward the control panel) on the top cover and open the upper unit. Remove the dust cover screws on the inside of the upper unit. Then remove the dust cover (see Figure 6-32).

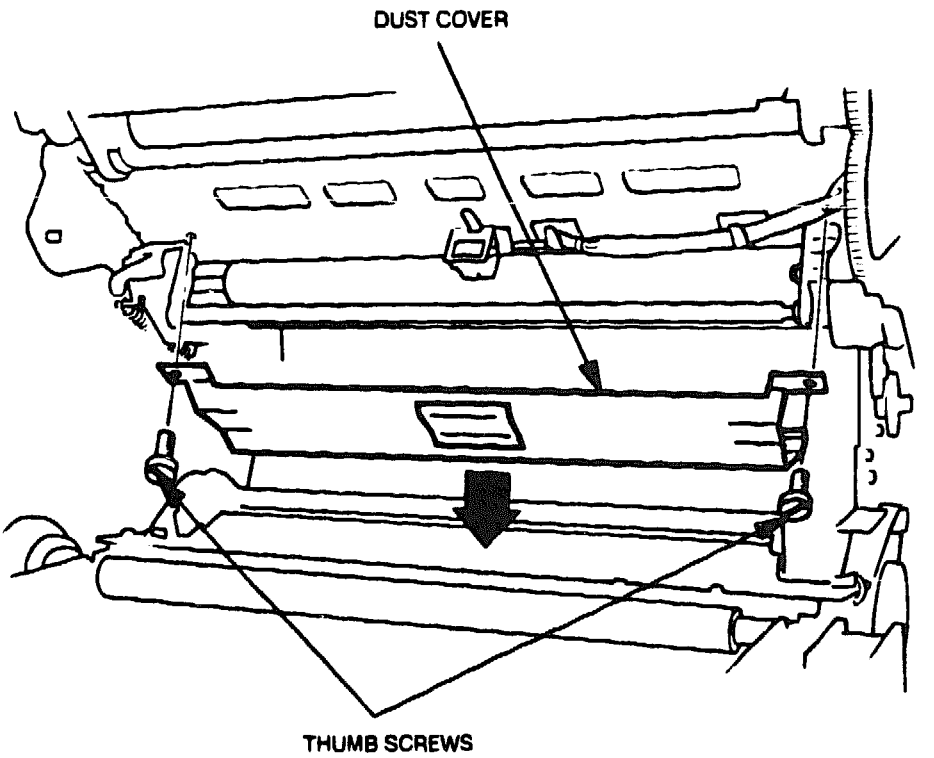


Figure 6-32 Dust Cover Removal

7. Press the locking tabs inward to release the lower paper sensor (PE sensor) shown in Figure 6-33.

CAUTION

Be careful when detatching the PE sensor as it is easily damaged.

8. Remove the PE sensor while being careful not to damage the sensor lever (see Figure 6-33). Then remove the cable from the wire stickers on the lower guide plate (B).

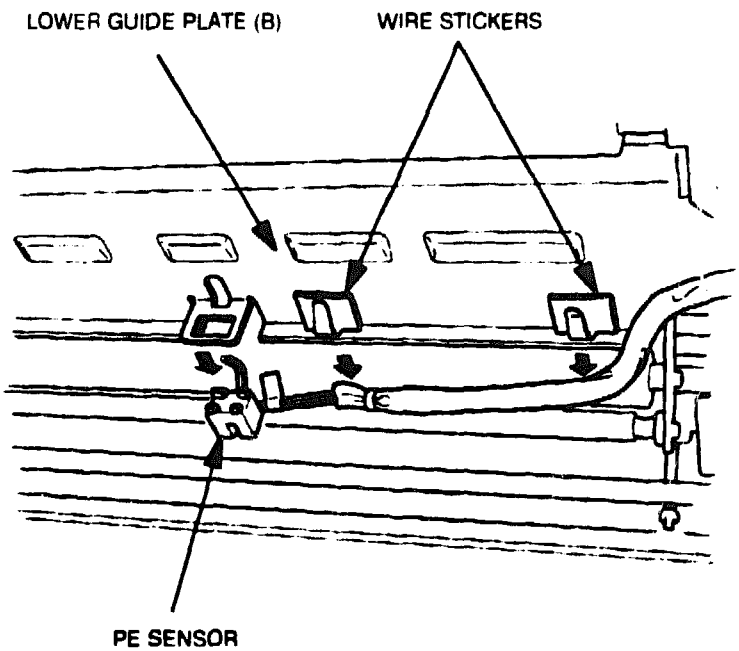


Figure 6-33 PE Sensor on Lower Guide Plate (B)

9. Remove the cables from the wire stickers and cable ties on the upper side frame assembly (R) shown in Figure 6-34.
10. Unplug the connector and remove the cables from the wire sticker on the lower side plate (B) shown in Figure 6-34. Carefully pull the cables through the holes in the plate and upper side frame assembly (R) and remove the paper sensor assembly from the printer.

NOTE

The long cable is for the PE sensor, and the short cable is for the PC sensor.

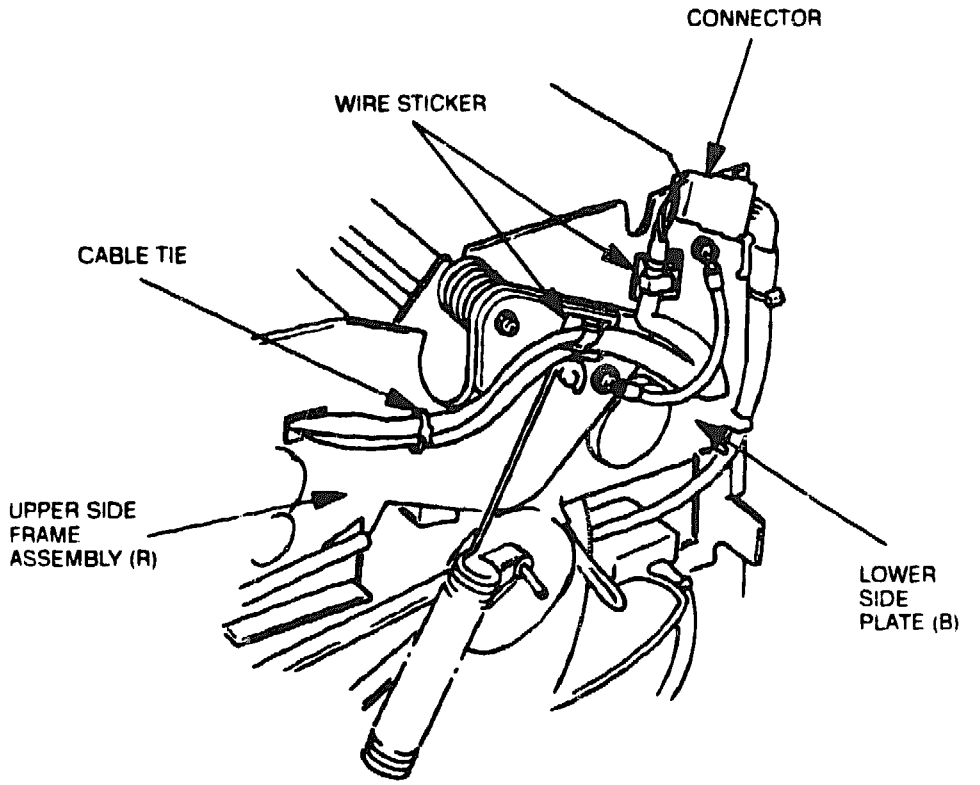


Figure 6-34 Paper Sensor Assembly Connector, Wire Stickers, and Cable Tie

Cover Switch Assembly

To remove the cover switch assembly, follow these steps.

1. Remove the middle cover.
2. Remove the DC fan (R).

3. Unplug cable connector CN4 from the G8CRJ mechanical control board (see Figure 6-35).

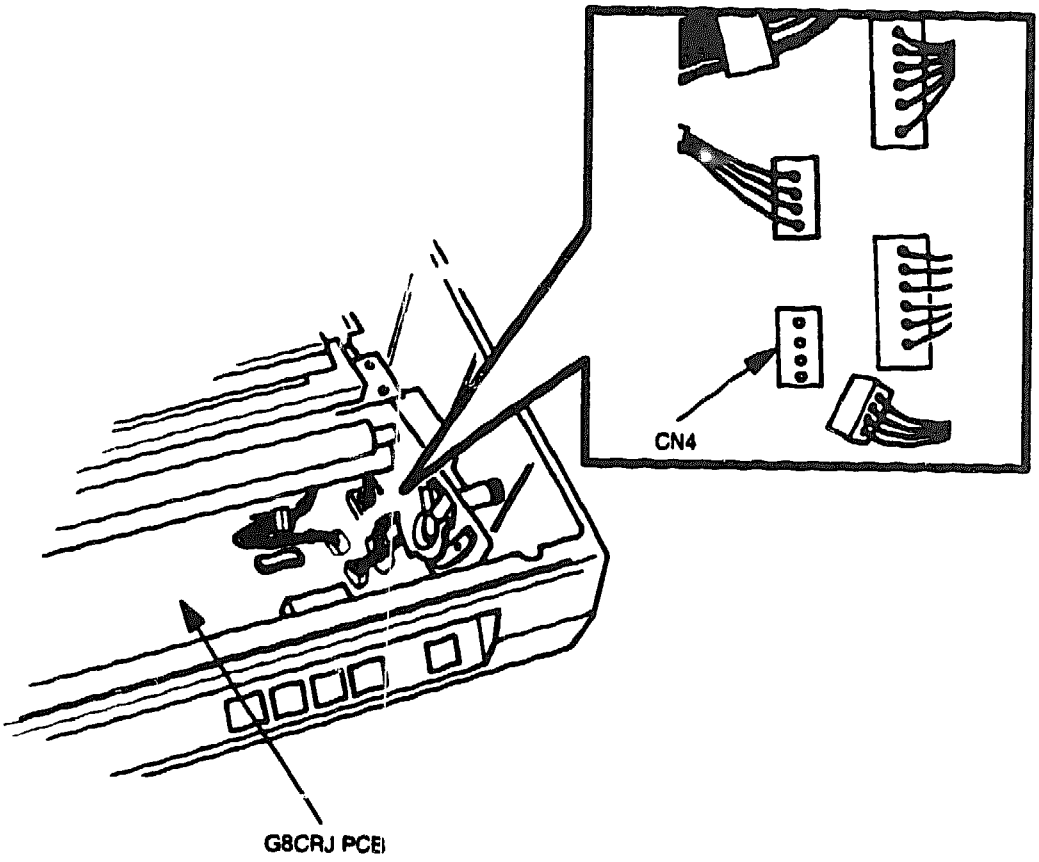


Figure 6-35 CN4 Cover Switch Connector

4. Remove the two screws that secure the cover switch assembly to the lower side plate (R) assembly and remove the cover switch assembly from the printer (see Figure 6-36).

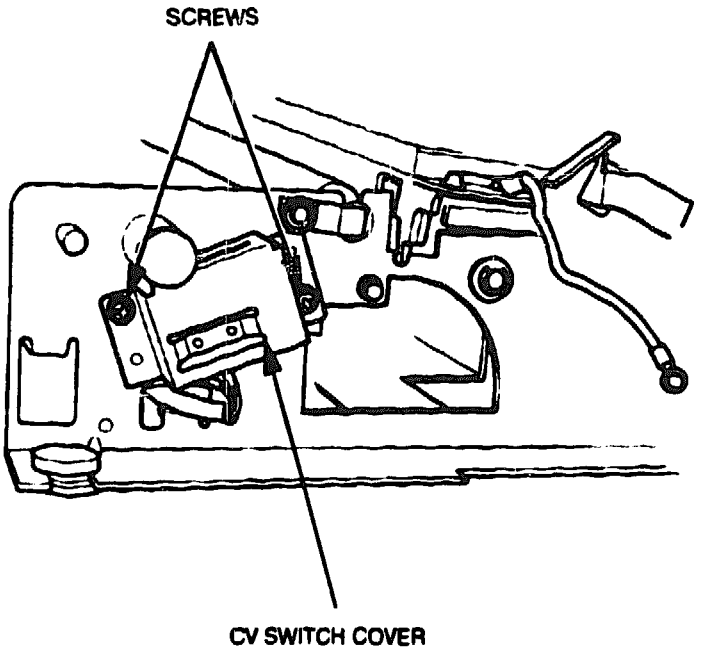


Figure 6-36 Cover Switch Assembly Screws

5. Remove the two screws on the cover switch assembly and separate the switch from the switch cover (see Figure 6-37).

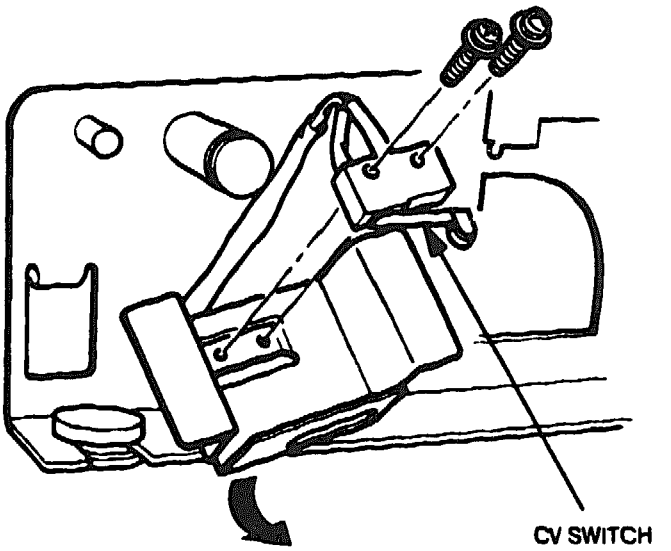


Figure 6-37 Cover Switch Removal

Ribbon Feed Roller Assembly

To remove the ribbon feed roller assembly, proceed as follows.

1. Remove the ribbon.
2. Remove the middle cover.
3. Remove the DC fan (R).
4. As shown in Figure 6-38, loosen the FG spring screw on the right side of the printer frame. Then move the FG spring away from the feed roller shaft.

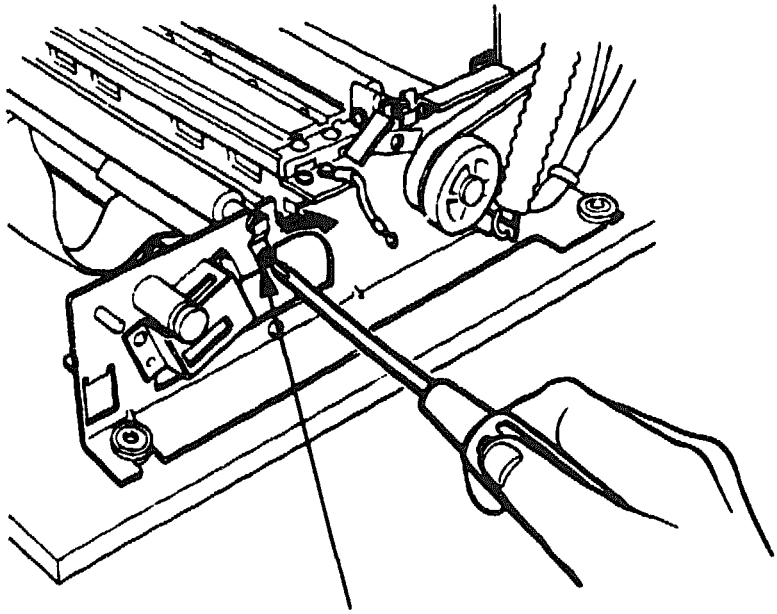


Figure 6-38 FG Spring

5. Using a flat tip screwdriver, remove the E retaining ring and the bushing on the right end of the ribbon feed roller (see Figure 6-39). Then slide the ribbon feed roller to the left and remove the assembly from the printer.

NOTE

When replacing the ribbon feed roller assembly, be sure to install the bushing in the correct orientation (see Figure 6-42).

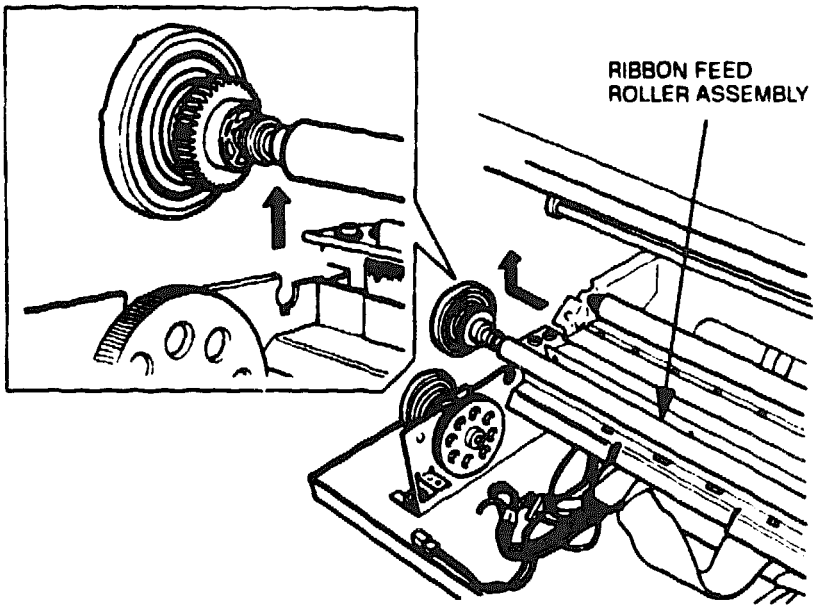


Figure 6-39 Ribbon Feed Roller Assembly Removal

Ribbon Brake Roller

To remove the ribbon brake roller, proceed as follows.

CAUTION

Use extreme care when removing and replacing the ribbon brake roller so you do not damage the ribbon end sensor near the left end of the roller. As a precaution, loosen the screw securing the ribbon end sensor bracket (refer to "RBE Sensor Assembly") and move the sensor away from the roller. After replacing the roller, be sure to reposition the sensor properly and retighten the bracket screw.

1. Remove the ribbon.
2. Remove the middle cover.
3. Loosen the FG spring screw on the lower side frame (R) and move the FG clip away from the right end of the roller shaft (see Figure 6-40).

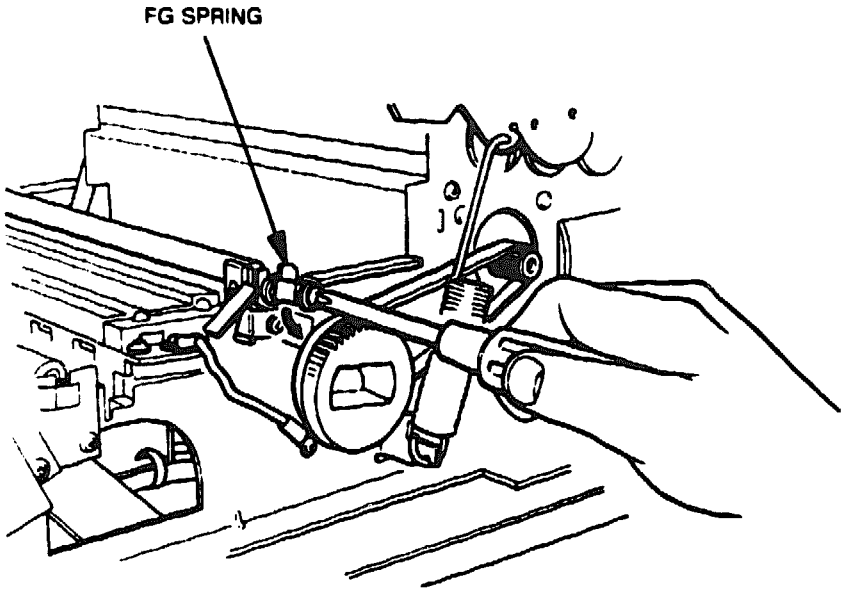


Figure 6-40 FG Spring

4. Using a flat-tipped screwdriver, remove the E retaining ring and bushing on the right end of the ribbon brake roller (see Figure 6-41).
5. As shown in Figure 6-41, slide the ribbon brake roller to the left and lift it off the printer.

NOTE

When replacing the ribbon brake roller, be sure to install the bushing in the correct orientation (see Figure 6-42).

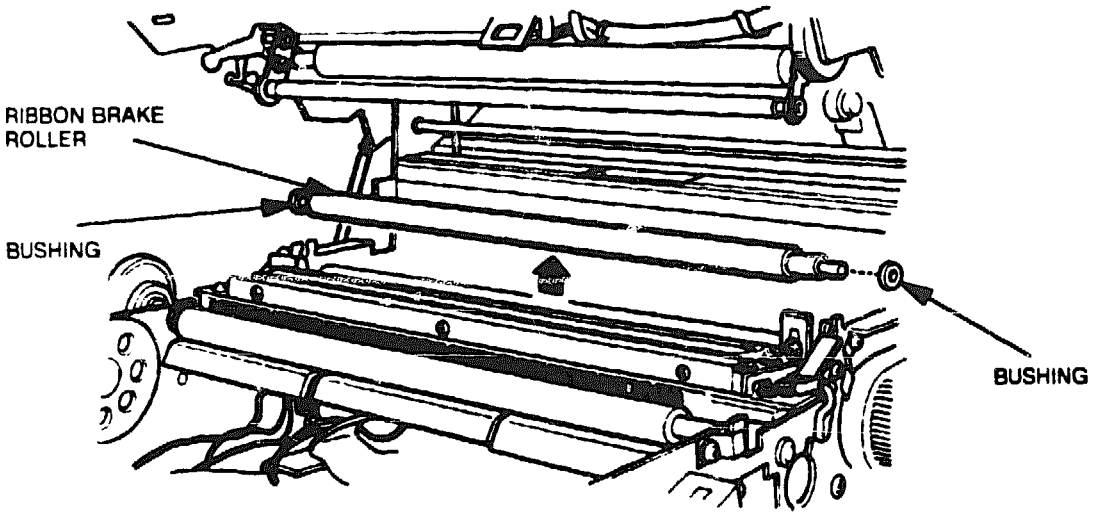


Figure 6-41 Ribbon Brake Roller

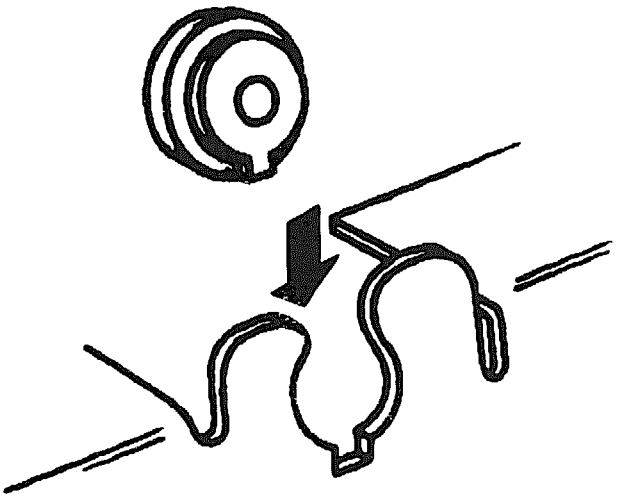


Figure 6-42 Roller Bushing Position

RBB Leaf Spring Assembly

To remove the RBB leaf spring assembly, proceed as follows.

CAUTION

Be careful not to damage the thermal head when removing and replacing the RBB leaf spring assembly. After replacing the assembly, adjust the ribbon brake roller friction (refer to Section 4).

1. Remove the middle cover.
2. Remove the ribbon brake roller.
3. Remove the screw shown in Figure 6-43 that secures the leaf spring bracket and lift the RBB leaf spring assembly from the lower side frame (R).

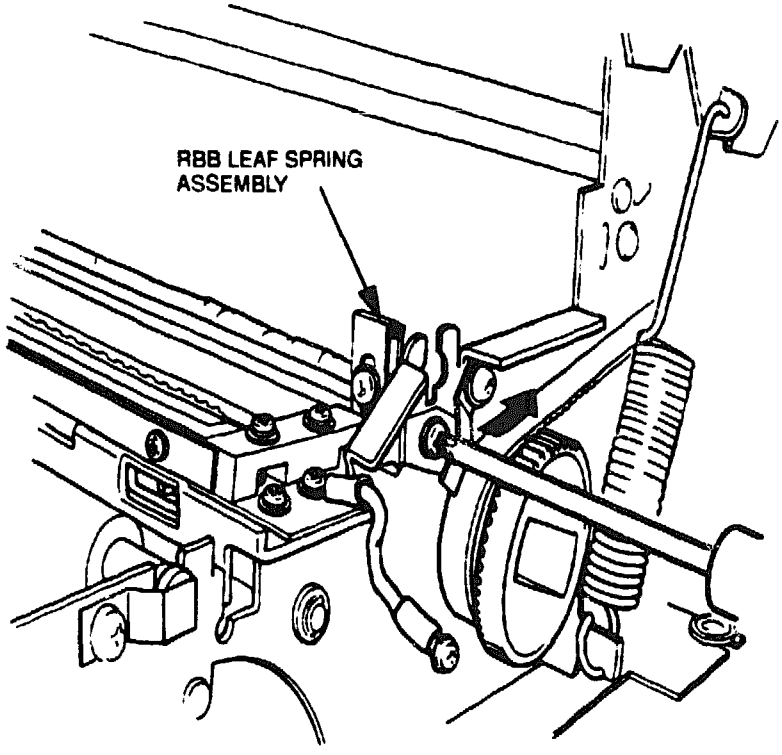


Figure 6-43 RBB Leaf Spring Assembly

Timing Belt B170MXL3.2

To remove timing belt B170MXL3.2, follow these steps.

1. Remove the top and middle covers.
2. Loosen the screw shown in Figure 6–44 securing the tension plate assembly to the upper frame (R).
3. Using a flat-tip screwdriver, remove the E retaining rings on the gear 30 and idler pulley (see Figure 6–44).

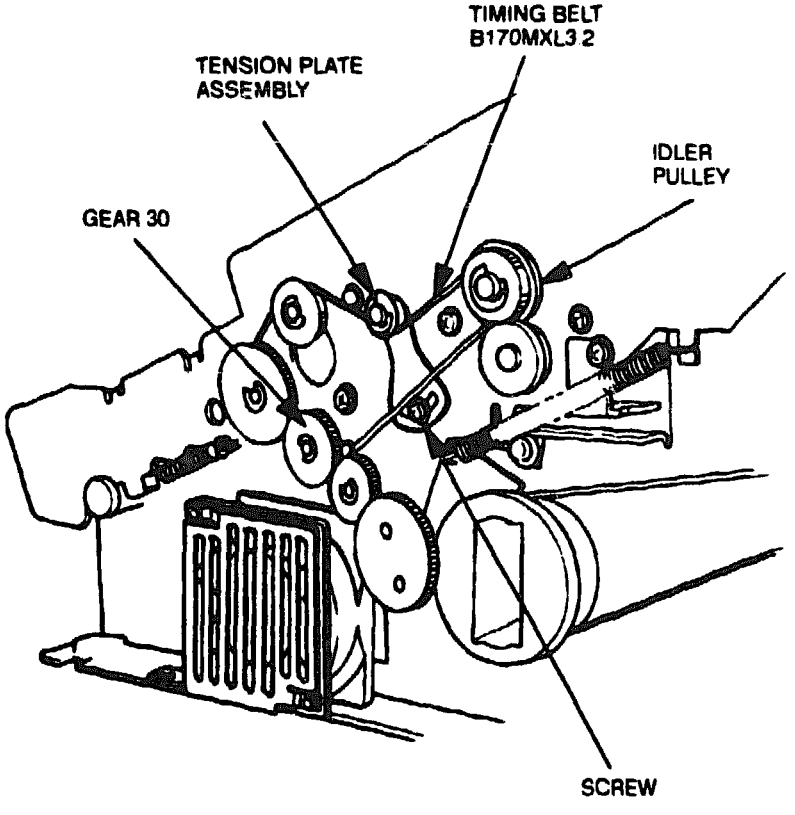


Figure 6–44 Tension Plate, Gear 30, and Idler Pulley

4. Pull off the gear 30 and idler pulley and remove timing belt B170MXL3.2.

NOTE

After replacing the B170MXL3.2 belt, refer to Section 4 and adjust the belt tension.

Platen Unit

To remove the platen unit, follow these steps.

CAUTION

Place a protective cloth over the thermal head and handle the platen unit with care so the thermal head is not damaged. After replacing the unit, adjust the friction of the pinch roller (RII) and feed roller (RII) and platen roller and feed roller (FII) as instructed in Section 4.

1. Remove the top and middle covers.
2. Remove the screws securing the upper guide plate (A) assembly and remove the plate (refer to Figures 6-29 and 6-30).
3. To loosen and relieve tension on the upper unit tension stay springs shown in Figure 6-45, turn the screws clockwise.
4. Using long-nose pliers, remove the two springs on the upper unit tension stay (see Figure 6-45).

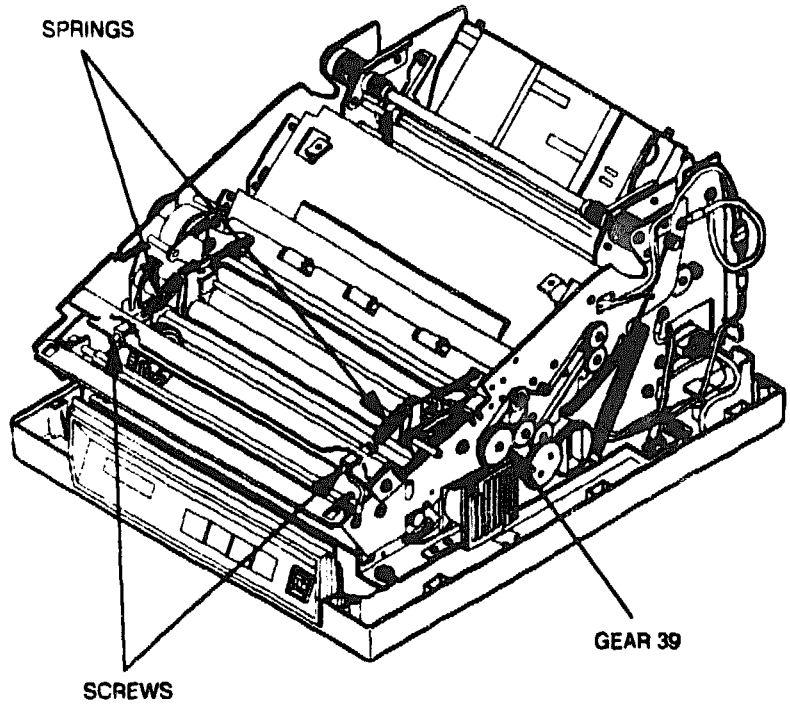


Figure 6-45 Upper Unit Tension Stay Screws and Springs

5. Remove timing belt B170MXL3.2 (refer to the previous subsection).
6. Remove the E retaining ring that secures gear 39 on the upper unit (R) frame (refer to Figure 6-45) to the feed roller shaft. Then pull off gear 39 as shown in Figure 6-46.
7. Remove the pin and pulley on the feed roller shaft (see Figure 6-46).

NOTE

When reinstalling the pulley on the feed roller shaft, make sure to mount the pulley on the shaft with the bearing facing out.

8. Remove the E retaining ring and bearing that secure the platen roller shaft to the upper unit (R) frame (see Figure 6-46).

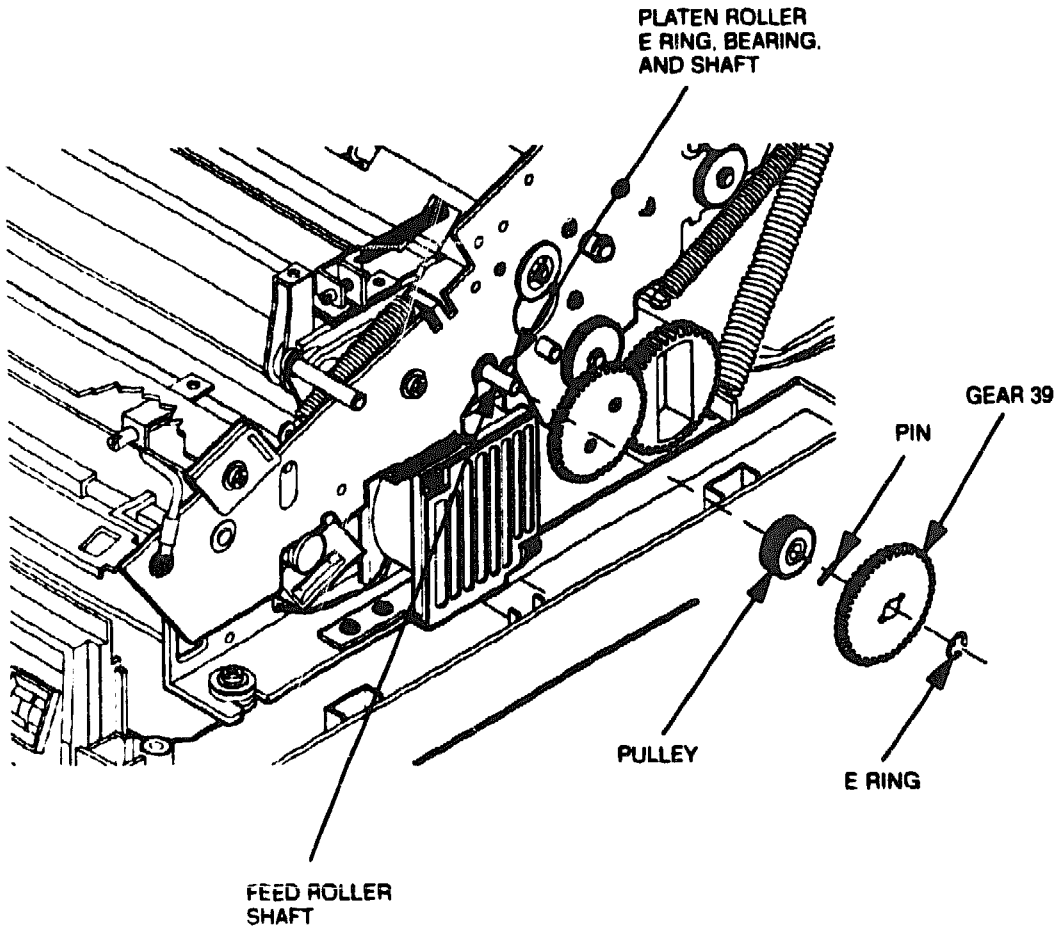


Figure 6-46 Right Side Frame E Rings, Gears, Bearings, and Shafts

9. Loosen the screw shown in Figure 6–47 that secures the FG clip to the upper unit (L) frame. Move the clip away from the gear mounted on the platen unit shaft (see Figure 6–47).
10. Using a 1.5 mm allen wrench, loosen the two set screws that secure the gear on the upper unit (L) frame and remove the gear from the platen shaft. Then remove the support bearing that secures the platen shaft to the upper unit (L) frame.

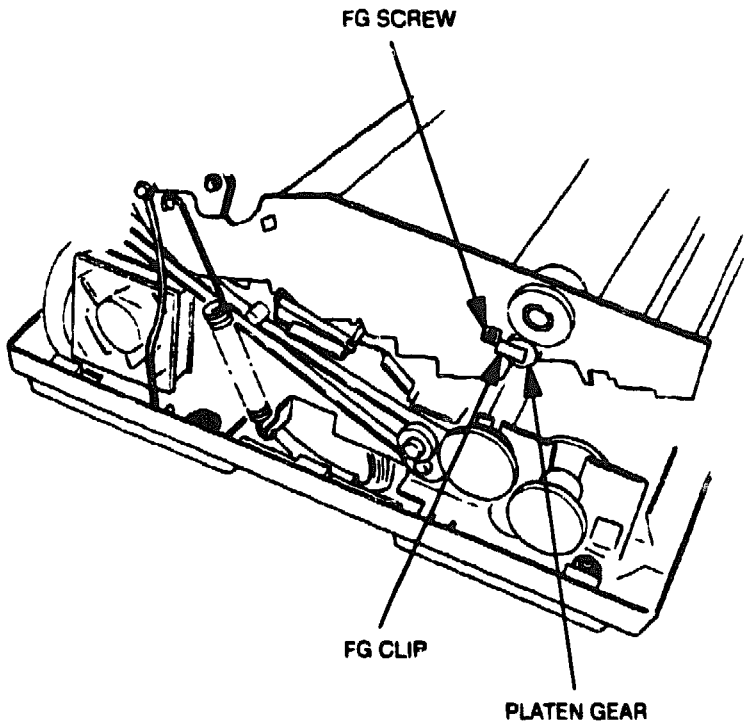


Figure 6–47 FG Clip and Platen Gear

11. While being careful not to let the platen unit drop down on the thermal head, grasp the platen unit and slide it to the left. Remove the platen unit from the upper unit by pulling the ribbon pinch roller toward you (see Figure 6–48).

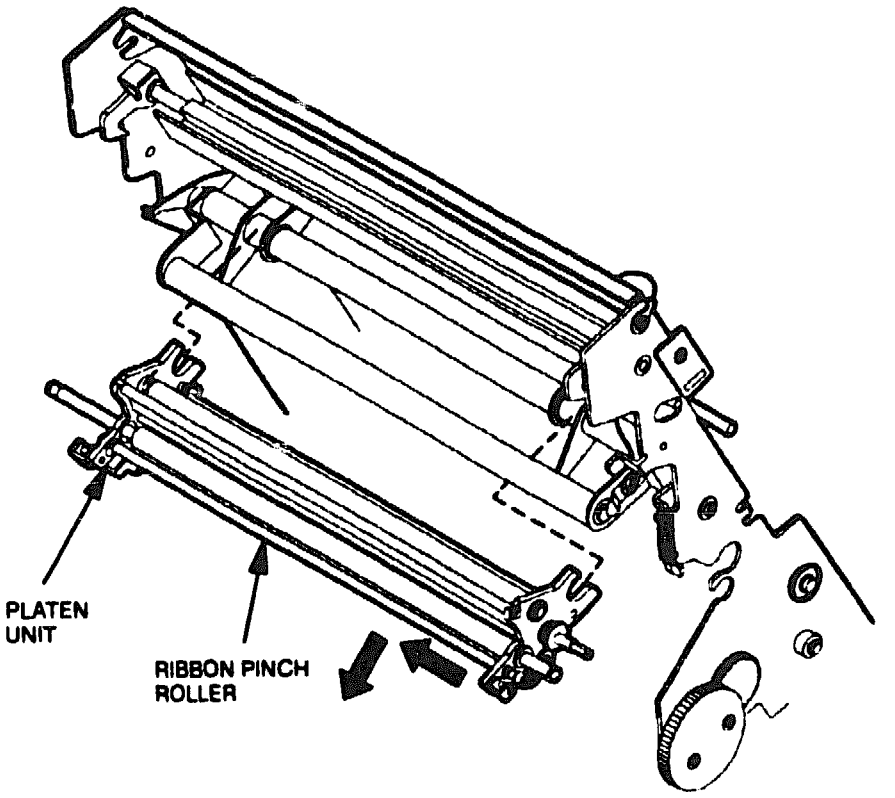


Figure 6-48 Platen Unit Removal

Discharging Bars (Static Brushes)

To remove the discharging bars, proceed as follows.

1. Remove the ribbon.
2. Remove the top and middle covers.
3. With the upper unit closed, remove the screws that secure the discharging bars to the top of the unit (see Figure 6-49) and remove the bars. Then open the upper unit and remove the screws that secure the bar on the inside (see Figure 6-49) and lift off the bar.

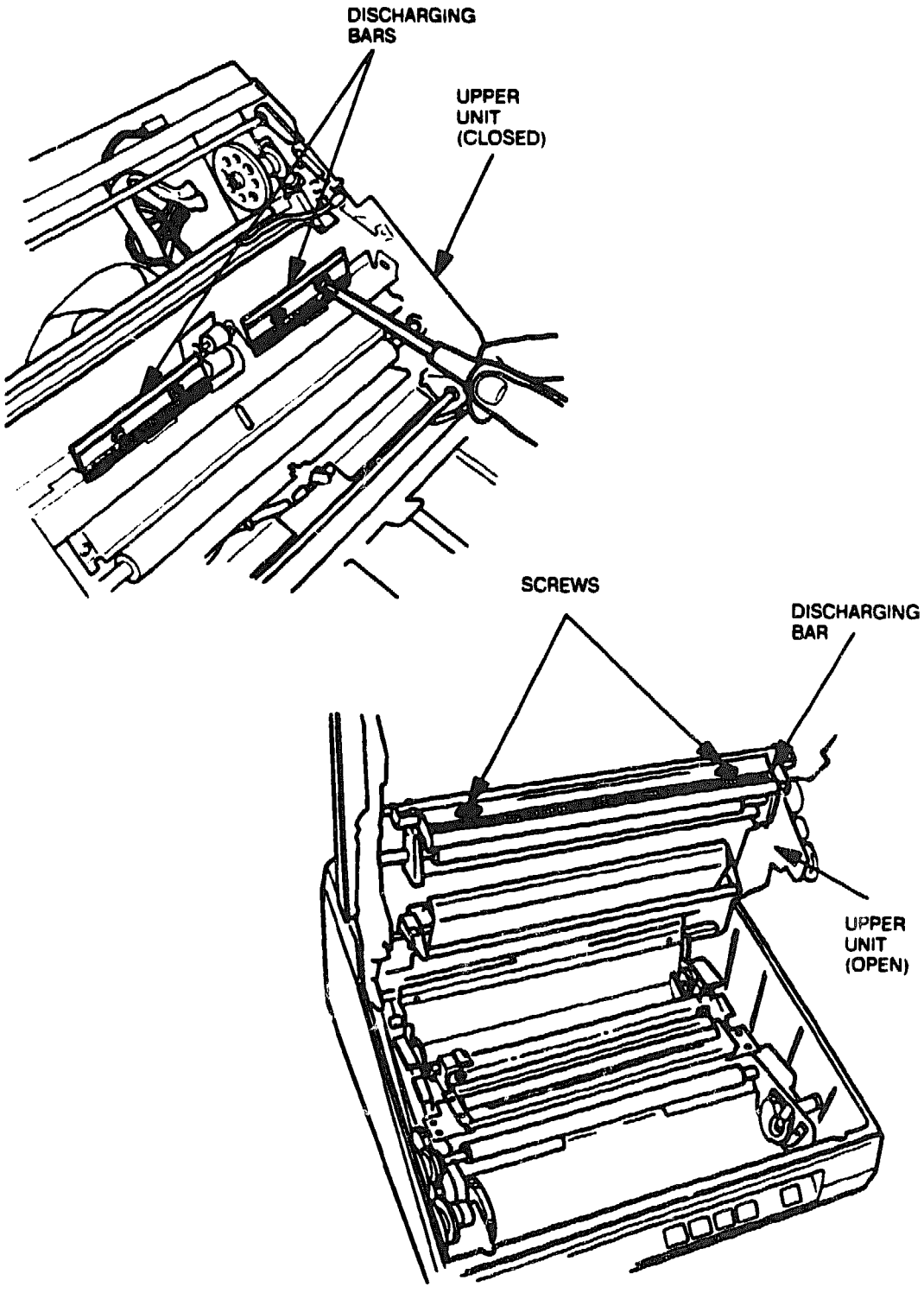


Figure 6-49 Upper Unit Discharging Bars

4. Remove the ribbon feed roller.
5. Remove the screws that secure the discharging bar to the lower stay (see Figure 6-50) and lift the bar off the stay.

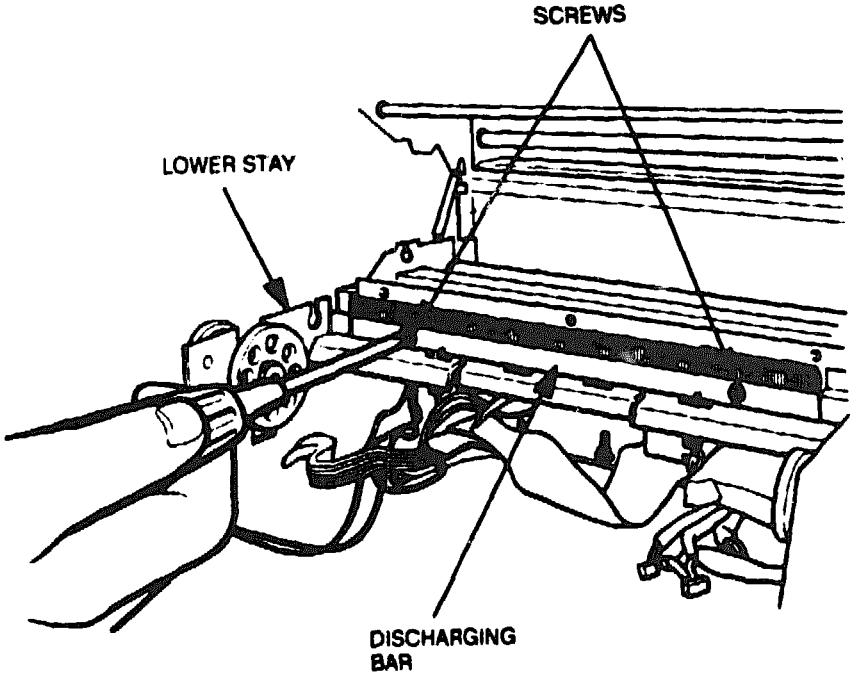


Figure 6-50 Lower Stay Discharging Bar

6. Remove the ribbon brake roller.
7. Using a stubby or offset-type screwdriver, remove the two screws that secure the discharging bar to the head roller plate (B) and lift the bar off the plate (see Figure 6-51).

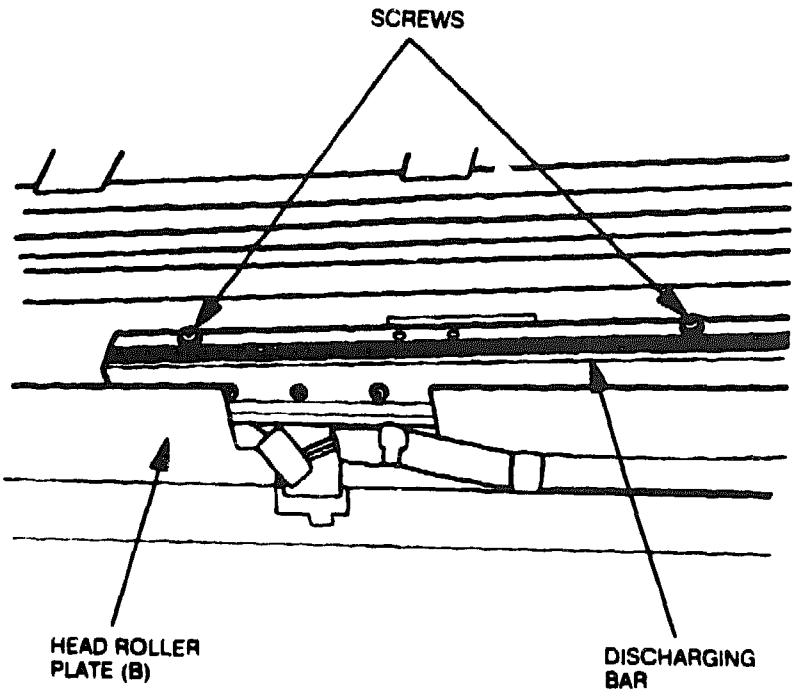


Figure 6-51 Head Roller Plate (B) Discharging Bar

Lift Plate Assembly

To remove the lift plate assembly, proceed as follows.

1. Remove the middle cover.
2. Remove the pick roller assembly.
3. Remove the cut sheet guide assembly.
4. Remove the two springs from the studs on the left and right lower side plates (see Figure 6-52).

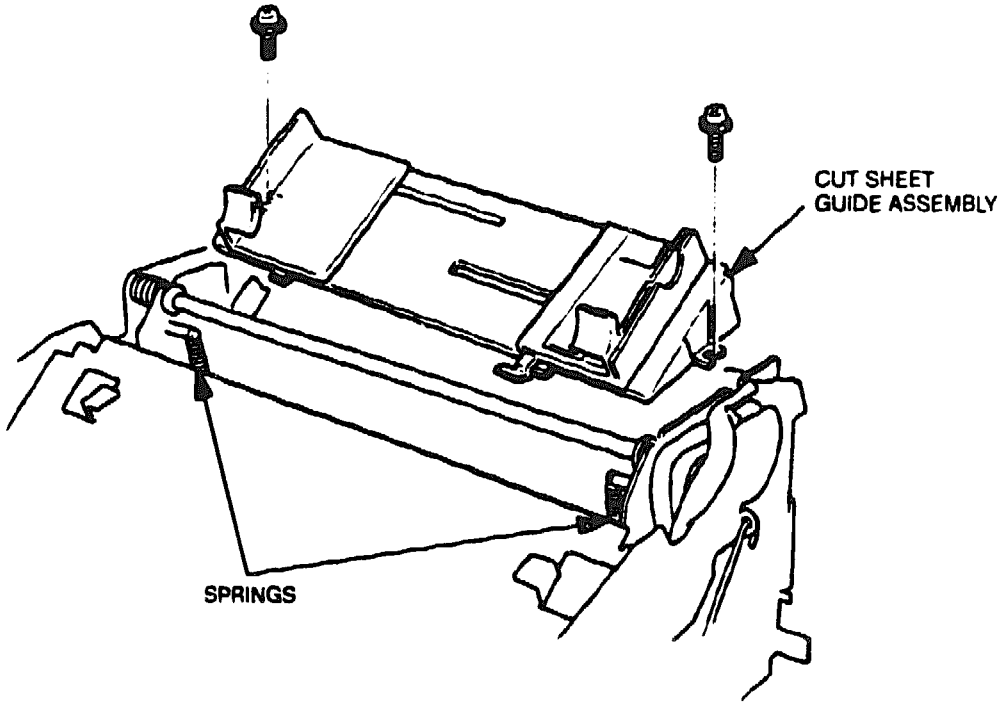


Figure 6-52 Cut Sheet Guide and Springs

5. Using a flat-tip screwdriver, remove the E retaining ring shown in Figure 6-53 that secures the lift plate to the stud on the lower side plate (L). Then remove the bushings from the studs on the lower side plates (see Figure 6-52).

NOTE

When replacing the lift plate, the bushings should be positioned as shown in Figure 6-53.

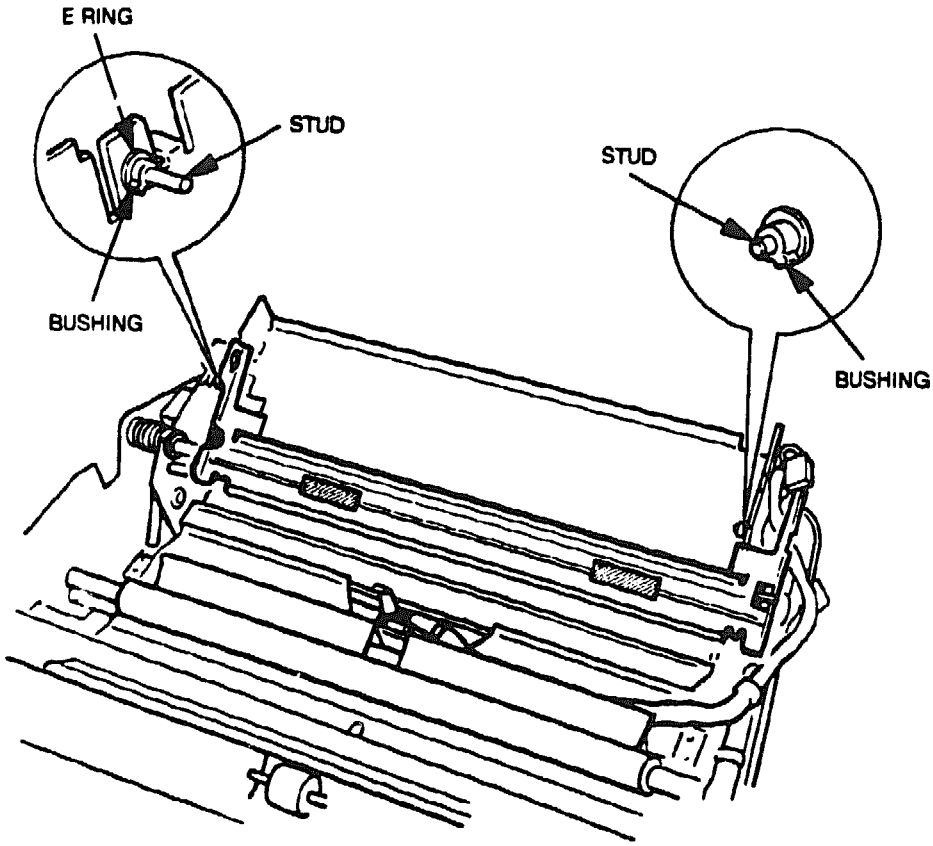


Figure 6-53 E Retaining Ring and Bushings

6. Slide the lift plate to the left. Then lift the plate up and remove it from the right side of the printer (see Figure 6-54). Be careful not to drop the bushings on the sides of the lift plate into the printer.

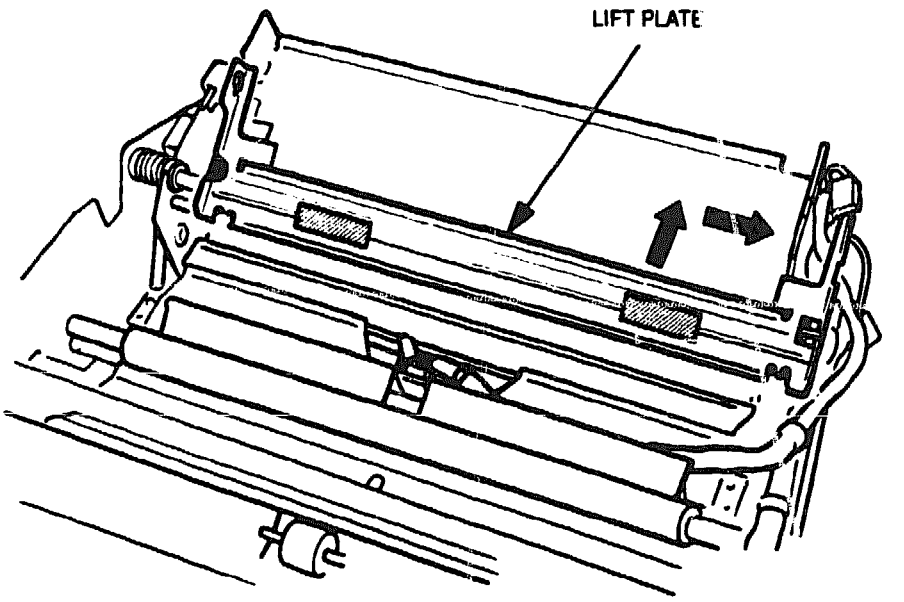


Figure 6-54 Lift Plate

Upper Unit

To remove the upper unit, follow these steps.

1. Remove the middle cover.
2. Open the upper unit.
3. Unscrew the FG cable on the right and left lower frames (see Figure 6-55).
4. Remove the paper sensor cable from the wire sticker on the lower side plate (R). Then unplug the paper sensor cable connector (see Figure 6-55).
5. Remove the spring on the left and right lower side plates (see Figure 6-55).

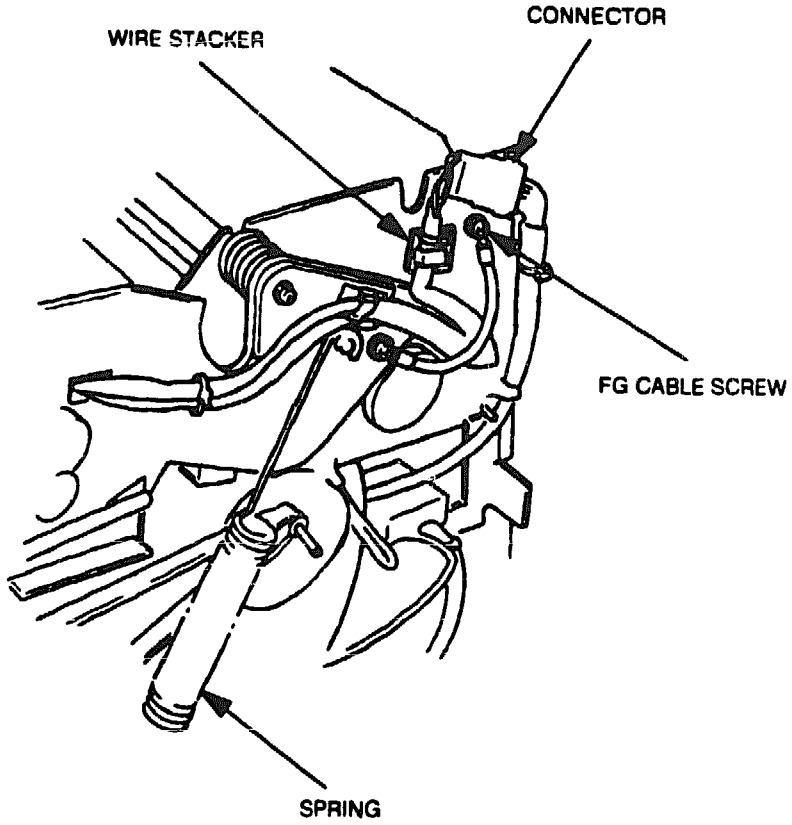


Figure 6-55 Upper Unit FG Cable, Connector, and Spring

6. Unplug the electromechanical clutch cable connector on the lower side plate (L) as shown in Figure 6-56.

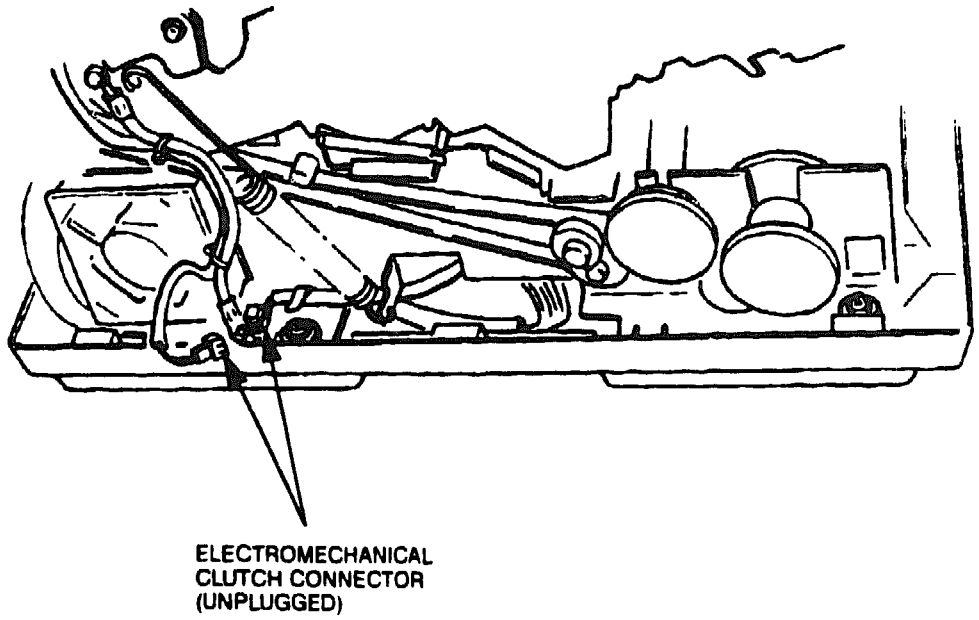


Figure 6-56 Electromechanical Clutch Connector

7. Remove the two screws that secure the stopper bracket on each lower side plate (see Figure 6–57). Then lift and remove the stopper brackets.

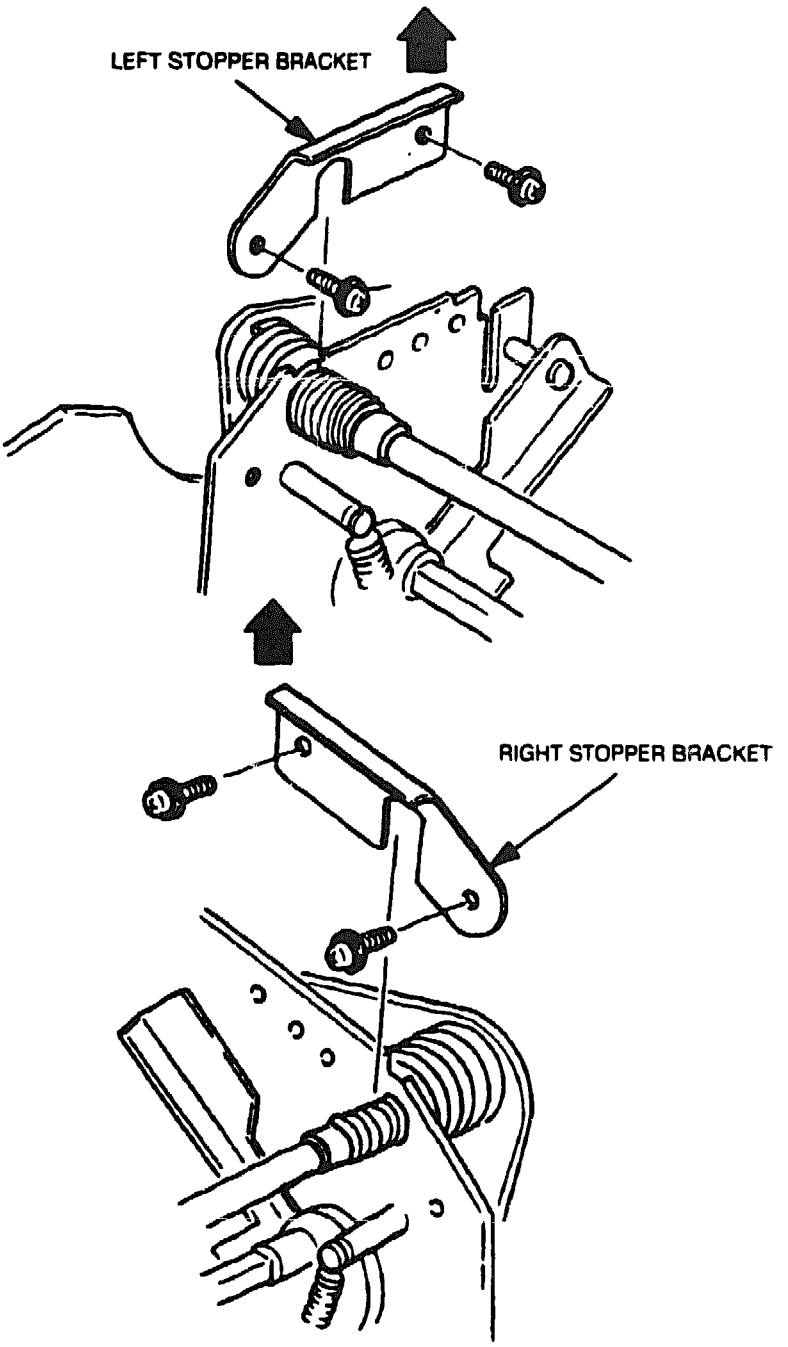


Figure 6–57 Stopper Brackets

8. As shown in Figure 6–58, lift the upper unit off the printer.

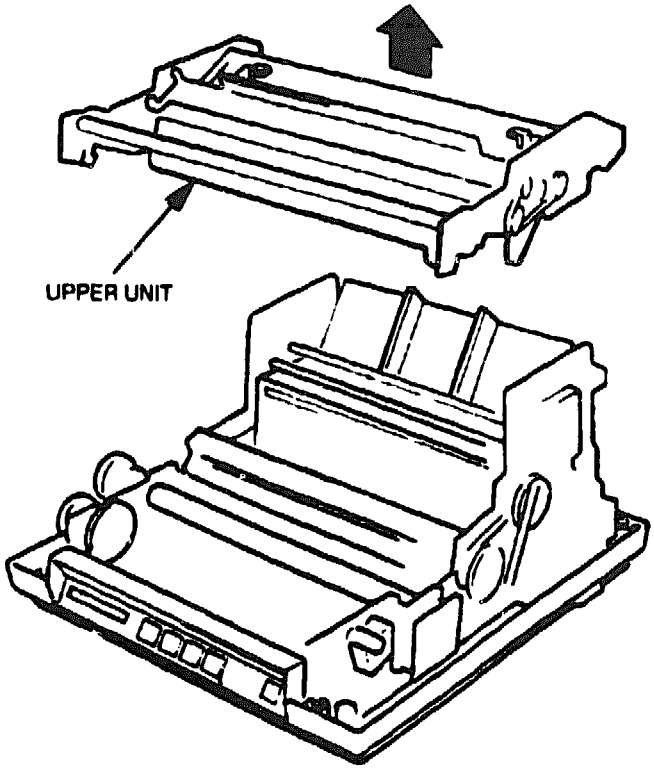


Figure 6-58 Upper Unit Removal

DC Fan (L)

To remove the DC fan (L), proceed as follows.

1. Remove the middle and rear covers.
2. Remove the two screws securing the shield plate to the rear of the printer frame. Then remove the shield plate from the frame (see Figure 6-59).

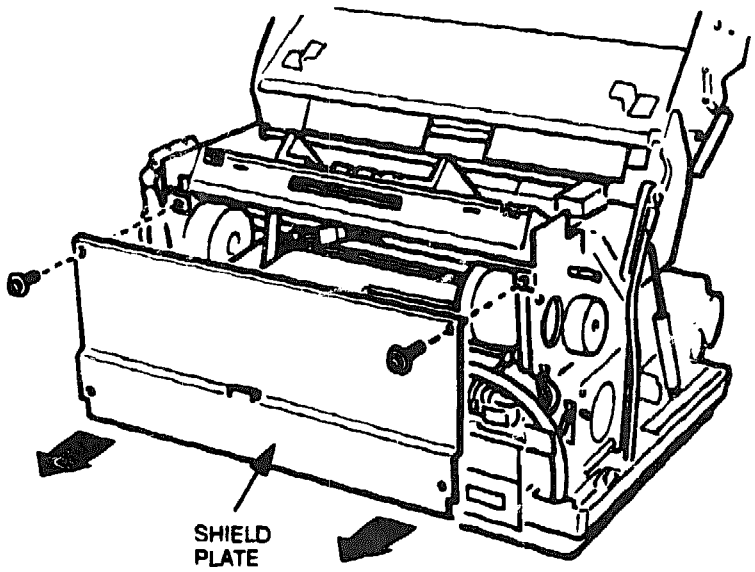


Figure 6-59 Shield Plate

3. Unplug connector CN4 from the power supply (see Figure 6-60).
4. Remove the two DC fan (L) screws and remove the DC fan from the printer (see Figure 6-60).

NOTE

When reinstalling the DC fan (L), be sure to install it so air flows outward as shown in Figure 6-61.

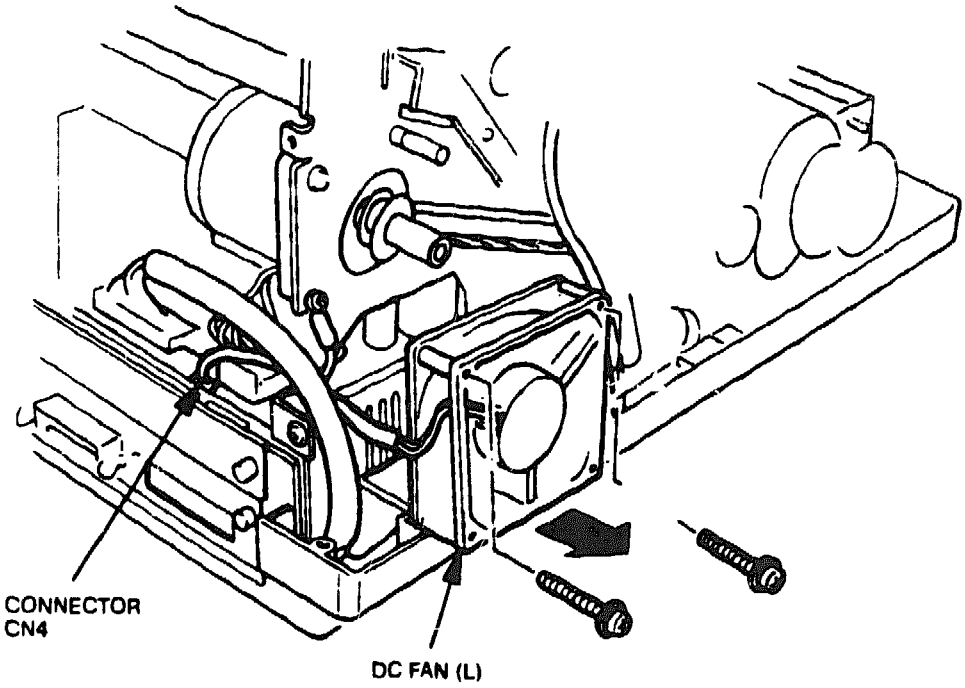


Figure 6-60 DC Fan (L) Removal

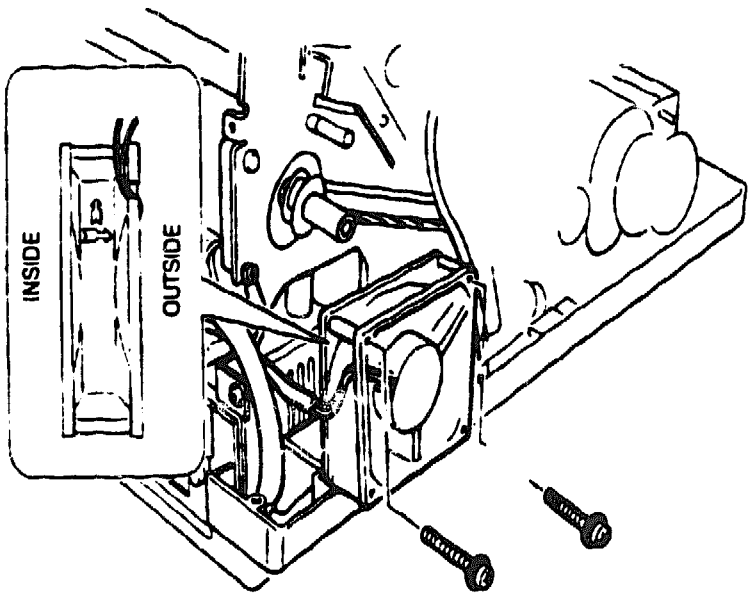


Figure 6-61 DC Fan (L) Installation

Power Supply Assembly

To remove the power supply assembly, follow these steps.

NOTE

Removal of the power supply assembly entails the removal and replacement of the entire power supply unit. Do not remove the power supply board from the power supply frame.

1. Remove the middle and rear covers.
2. Remove the two screws securing the shield plate to the rear of the printer frame. Then remove the shield plate from the frame (see Figure 6-62).

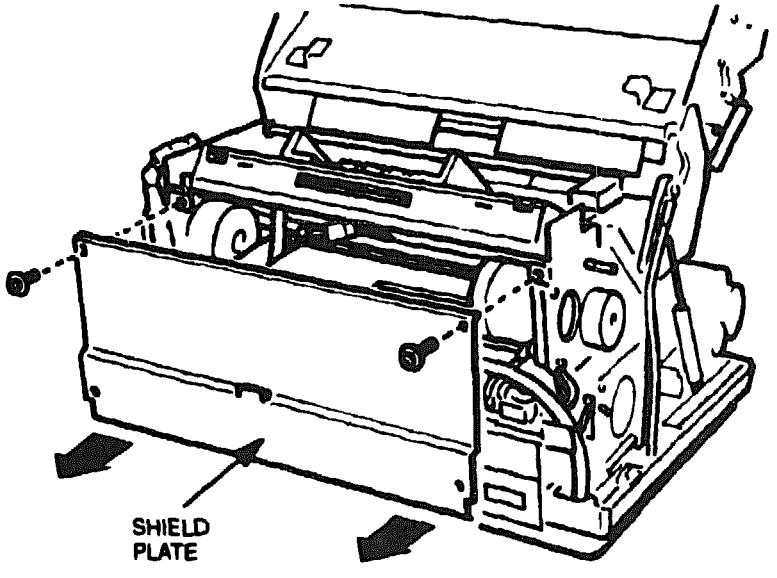


Figure 6-62 Shield Plate

3. Unplug connectors CN1 through CN4 on the power supply (see Figure 6-63).
4. Remove the two screws shown in Figure 6-63 and pull the power supply out of the printer.

CAUTION

When reinstalling the power supply, position the CN1 through CN4 connector cables so that they do not touch or interfere with the line feed motor.

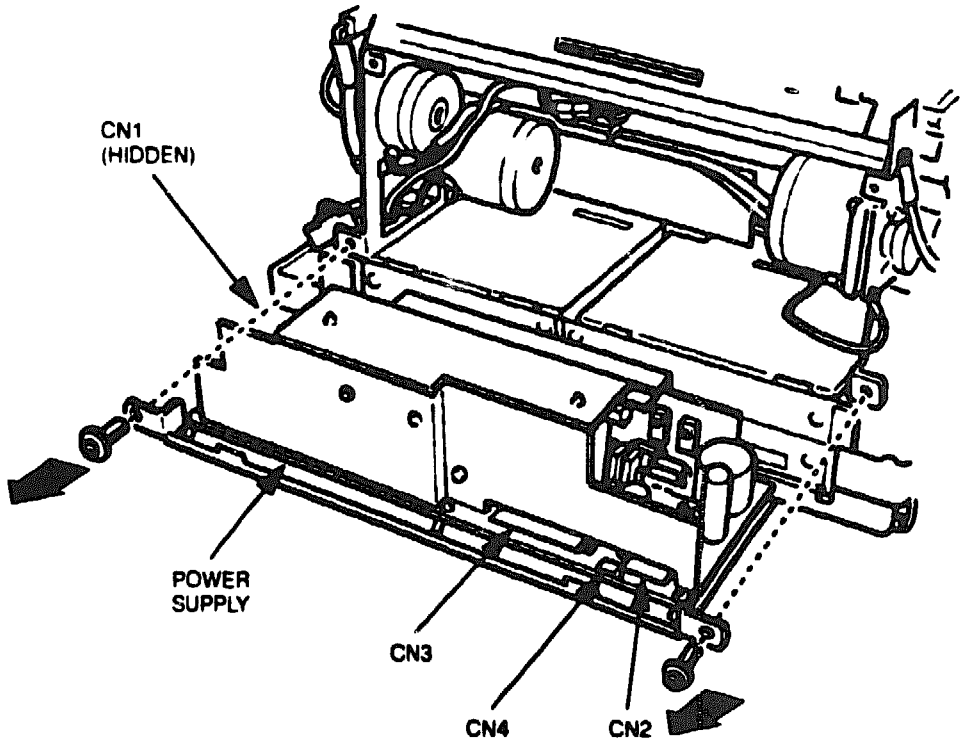


Figure 6-63 Power Supply Removal

Paper Size Sensor Subassembly

To remove the paper size sensor subassembly, follow these steps.

1. Remove the cut sheet guide assembly.
2. Unscrew the hold plate shown in Figure 6-64 and remove it from the cut sheet guide assembly.

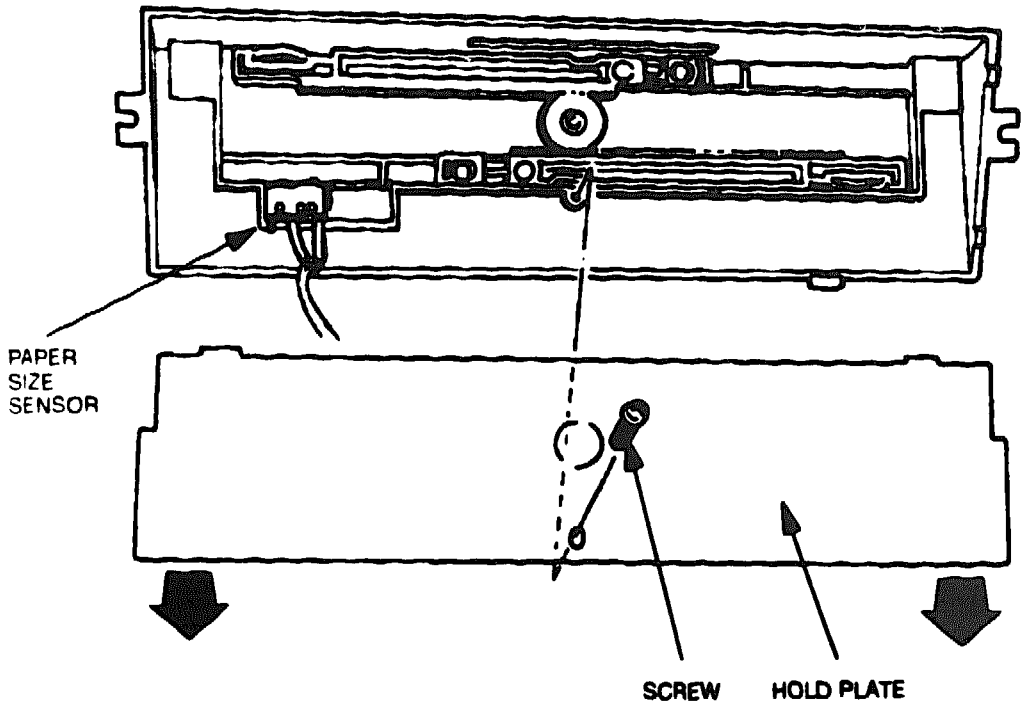


Figure 6-64 Hold Plate

3. Remove the size sensor assembly from the CSG paper guide base (see Figure 6-65).

NOTE

Refer to Figure 6-65 for the correct mounting position of the paper size sensor.

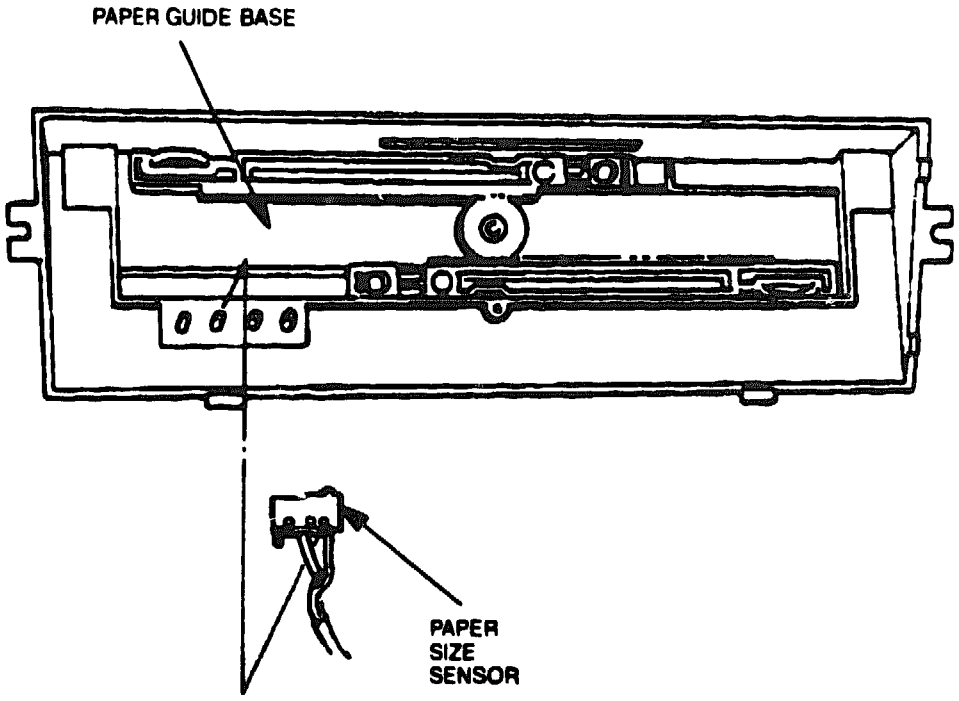


Figure 6-65 Paper Size Sensor Subassembly

Timing Belt B140MXL9.5

To remove timing belt B140MXL9.5, proceed as follows.

1. Remove the middle cover.
2. Open the upper unit.
3. Loosen the three screws shown in Figure 6-66 securing the LF motor assembly to the lower side (R) plate.
4. Using a flat-tip screwdriver, remove the E retaining ring on the LF drive gear (see Figure 6-66). Then pull off the LF drive gear.

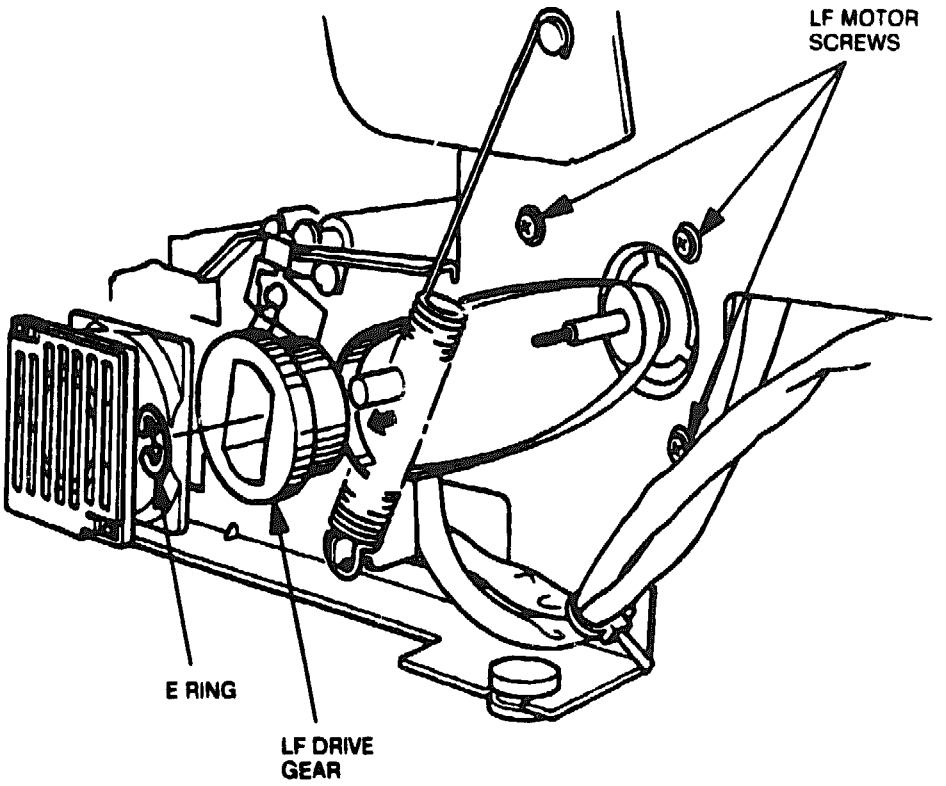


Figure 6-66 LF Drive Gear and LF Motor Screws

5. Remove timing belt B140MXL9.5 (see Figure 6-67).

NOTE

After replacing the B140MXL9.5 belt, refer to Section 4 and adjust the belt tension.

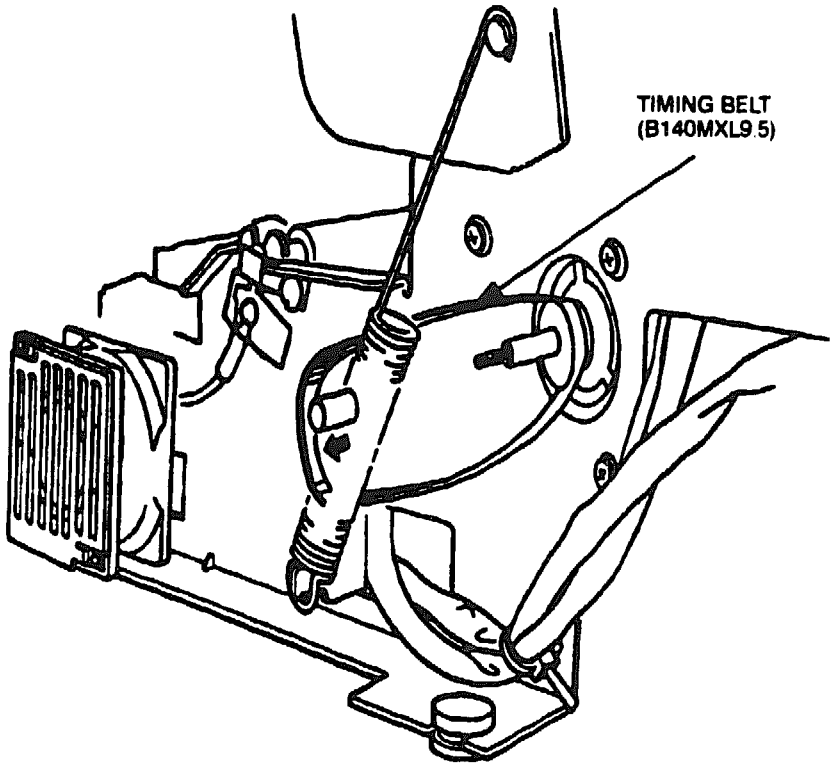


Figure 6-67 Timing Belt B140MXL9.5 Removal

Mechanism Unit

To remove the mechanism unit, follow these steps.

1. Remove the top, middle, and rear covers.
2. Remove the control panel.
3. Remove the power supply.
4. Remove the PCB cover protecting the G8CRJ mechanical control assembly board.
5. As shown in Figure 6-68, unscrew the two FG Cables on the rear of the lower side plate.
6. Remove the four screws that secure the mechanism unit to the printer base (see Figure 6-68).

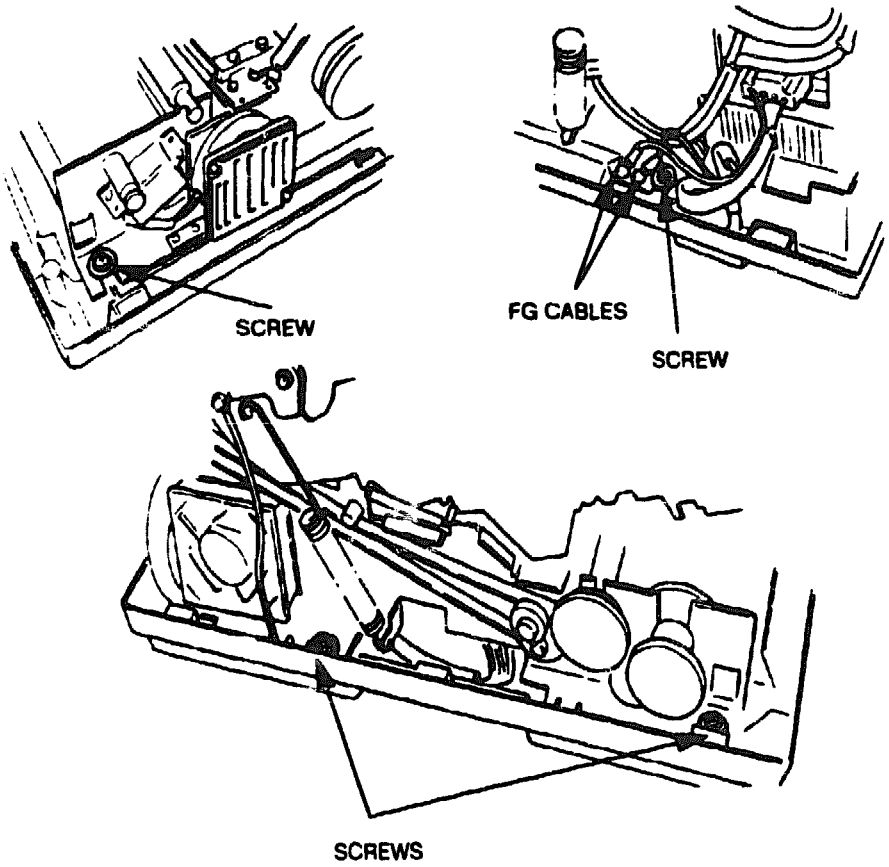


Figure 6-68 FG Cables and Mechanism Unit Screws

7. Unplug connectors CN2 to CN5, CN7, and CN9 to CN16 from the G8CRJ PCB (see Figure 6-69).

NOTE

You already disconnected CN19 from the board when you removed the control panel.

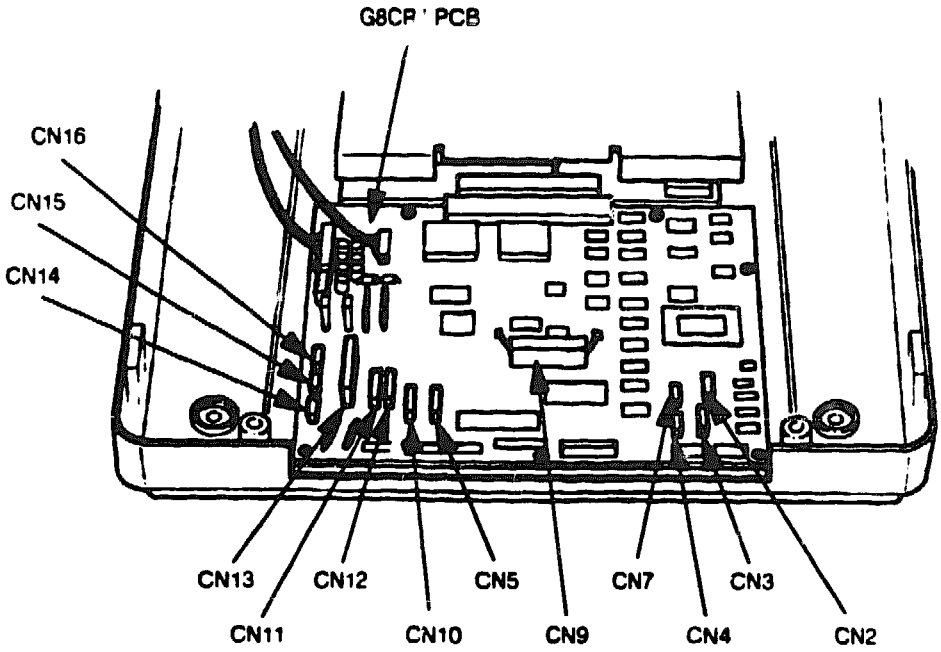


Figure 6-69 G8CRJ Connector Locations

8. Close the upper unit. As shown in Figure 6-70, carefully lift the mechanism unit up and away from the printer base.

CAUTION

The mechanism unit is heavy and cumbersome to remove. Be sure to grasp both side of the unit firmly when lifting it up from the base.

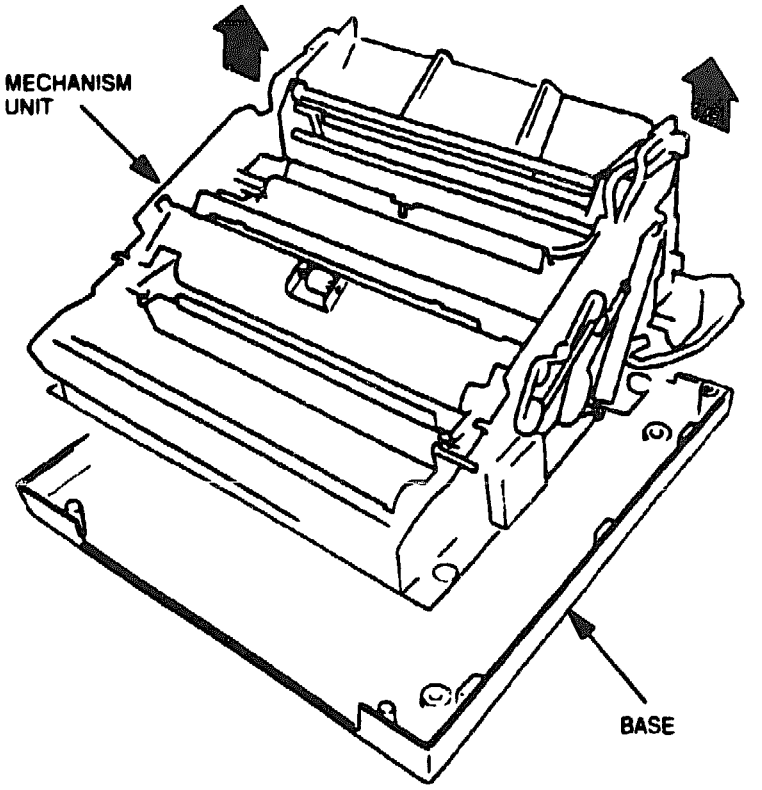


Figure 6–70 Mechanism Unit Removal

Timing Belt B328MXL9.5

To remove timing belt B328MXL9.5, follow these steps.

1. Remove the mechanism unit. Place the mechanism unit on its side on the worktable so that the bottom of the unit can be accessed.
2. Loosen the three screws shown in Figure 6–71 securing the RB motor to the lower plate (L).

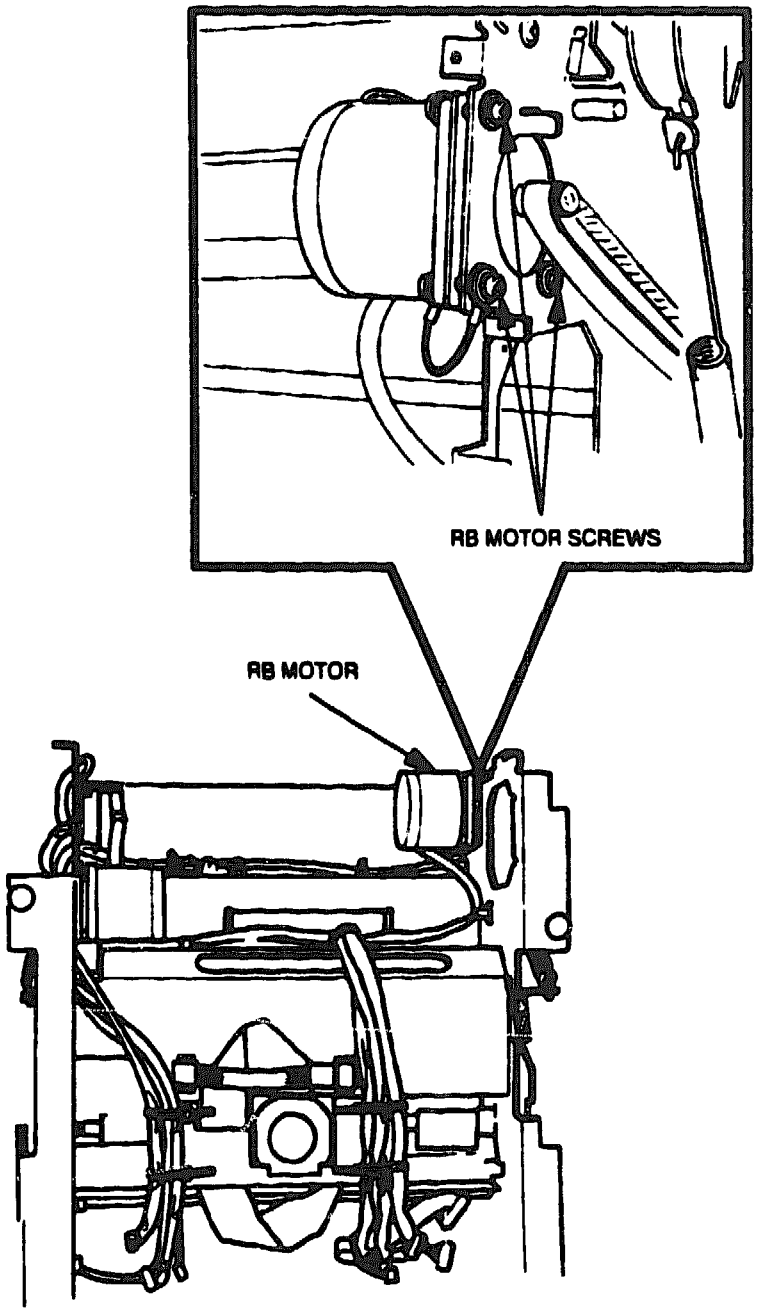


Figure 6-71 RB Motor Screws

3. Place the mechanism flat on the worktable. Remove the ribbon feed roller assembly.
4. Using a flat-tip screwdriver, remove the E retaining rings on the ribbon drive pulley and the ribbon roller gear (see Figure 6–72). Then slide the ribbon roller gear outward and away from the support stud.
5. Carefully pull off the ribbon drive pulley assembly by turning it slowly.
6. Remove timing belt B328MXL9.5.

NOTE

After replacing the B328MXL9.5 belt, refer to Section 4 and adjust the belt tension.

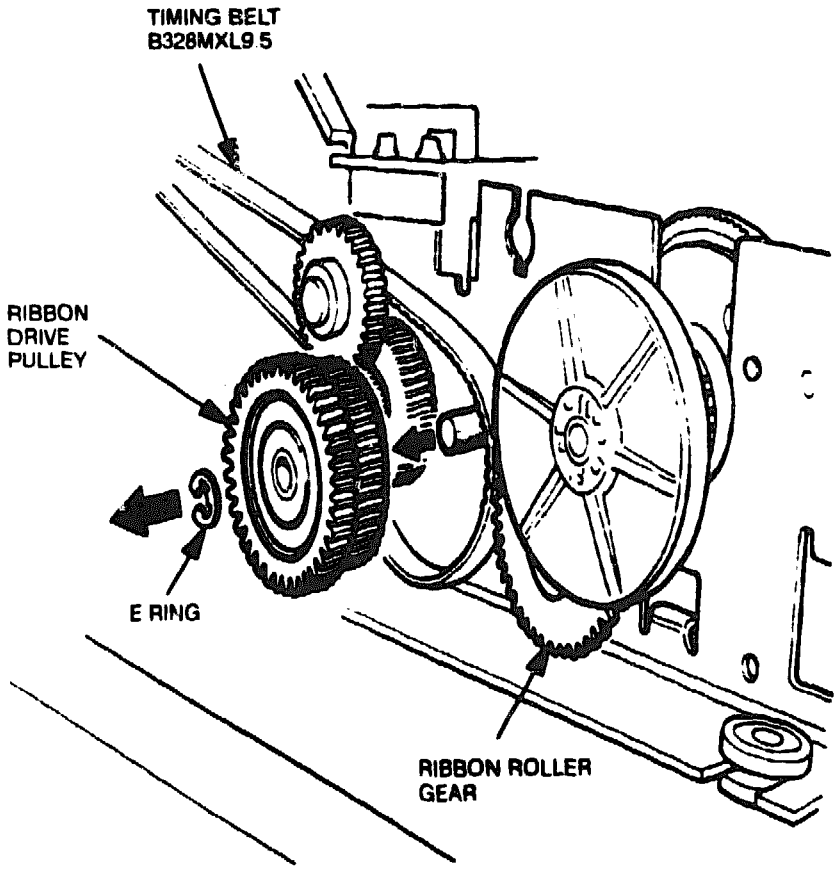


Figure 6–72 Ribbon Drive Pulley, Ribbon Roller Gear, and Timing Belt B328MXL9.5

Bottom DC Fan (C)

To remove the DC fan from the printer base, proceed as follows.

1. Remove the mechanism unit. Then place the mechanism unit on its side on the worktable so the bottom of the unit is exposed (see Figure 6-73).
2. Remove the two screws that secure the DC fan (C) to the bottom of the mechanism unit. Then remove the fan (see Figure 6-73)

NOTE

Use needle-nose pliers to hold the nuts on the ends of each screw in place when removing the bottom DC fan (C). Additionally, be careful not to drop or misplace the washers and rings used to secure the fan (see Figure 6-73). When reinstalling the bottom DC fan (C), be sure to install it so air flows inward as shown in Figure 6-73.

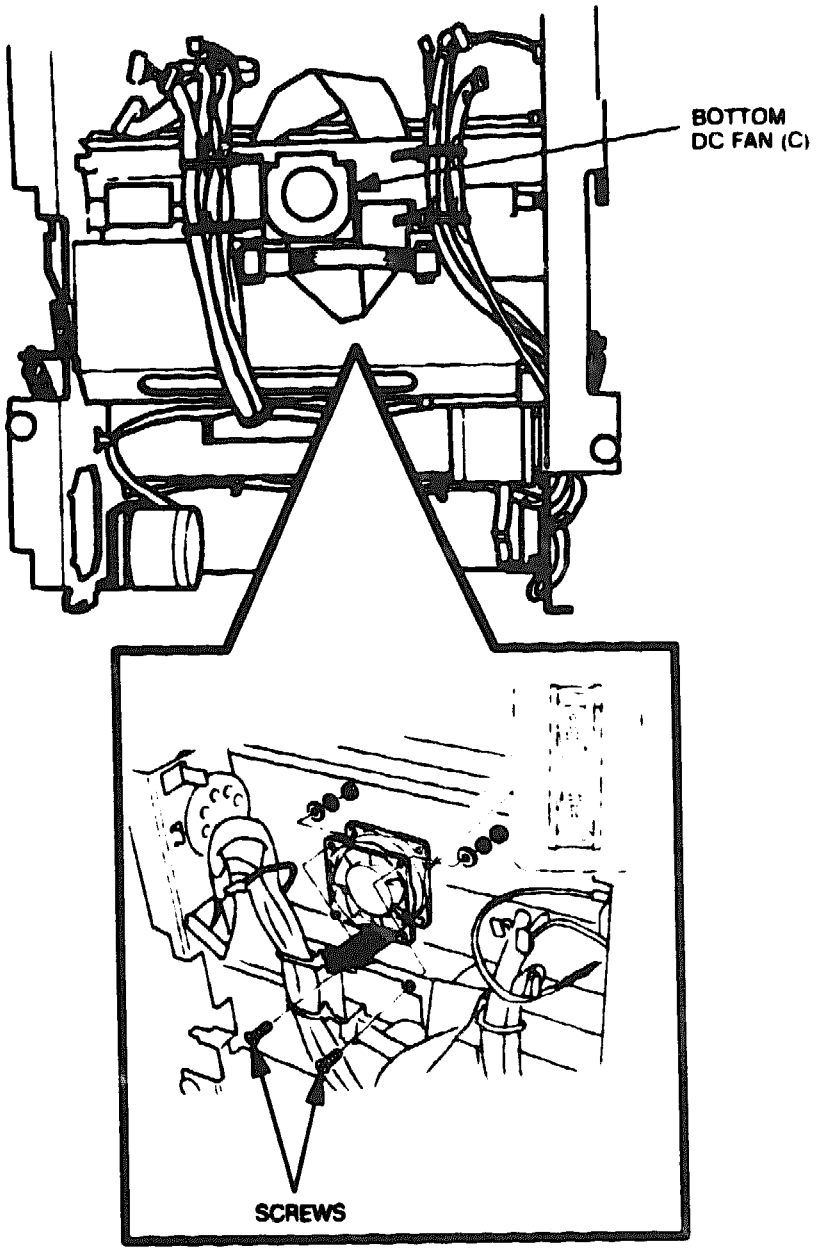


Figure 6-73 Bottom DC Fan (C) Removal

G8CRJ PCB

To remove the G8CRJ mechanical control board, proceed as follows.

1. Remove the top cover, middle cover, and control panel.
2. Remove the G8CRG logic board.
3. Remove the mechanism unit.
4. Unplug connectors CN17 and CN18 on the G8CRJ board (see Figure 6-74).
5. Remove the seven screws shown in Figure 6-74 and remove the G8CRJ board from the printer base.

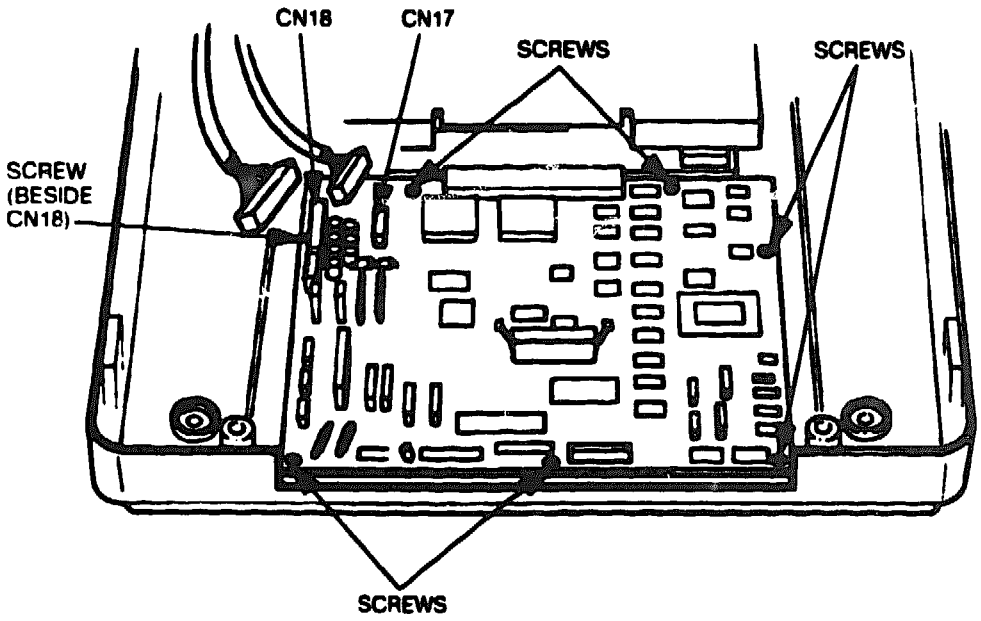


Figure 6-74 G8CRJ Connectors CN17 and CN18

Thermal Head Power Cable

To remove the thermal head power cable, follow these steps.

1. Remove the thermal head.
2. Remove the mechanism unit and place the unit on its side on the worktable so the bottom of the unit is exposed (see Figure 6–75).
3. Disconnect the head power cable and release it from the two cable clips (see Figure 6–75)
4. Remove the two cable ties that secure the head power cable to the lower base plate. Then remove the cable.

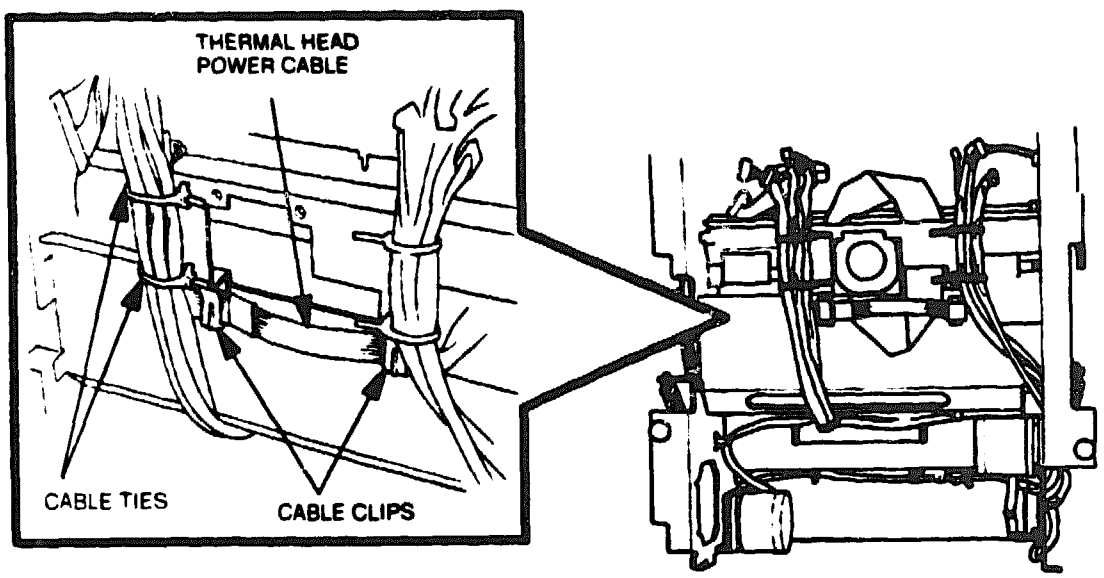


Figure 6–75 Thermal Head Power Cable Removal

Thermal Head Signal Cable

To remove the thermal head signal cable, follow these steps.

1. Remove the thermal head.
2. Remove the bottom DC fan (C) from the printer base.
3. Remove the head signal cable from the printer (see Figure 6-76).

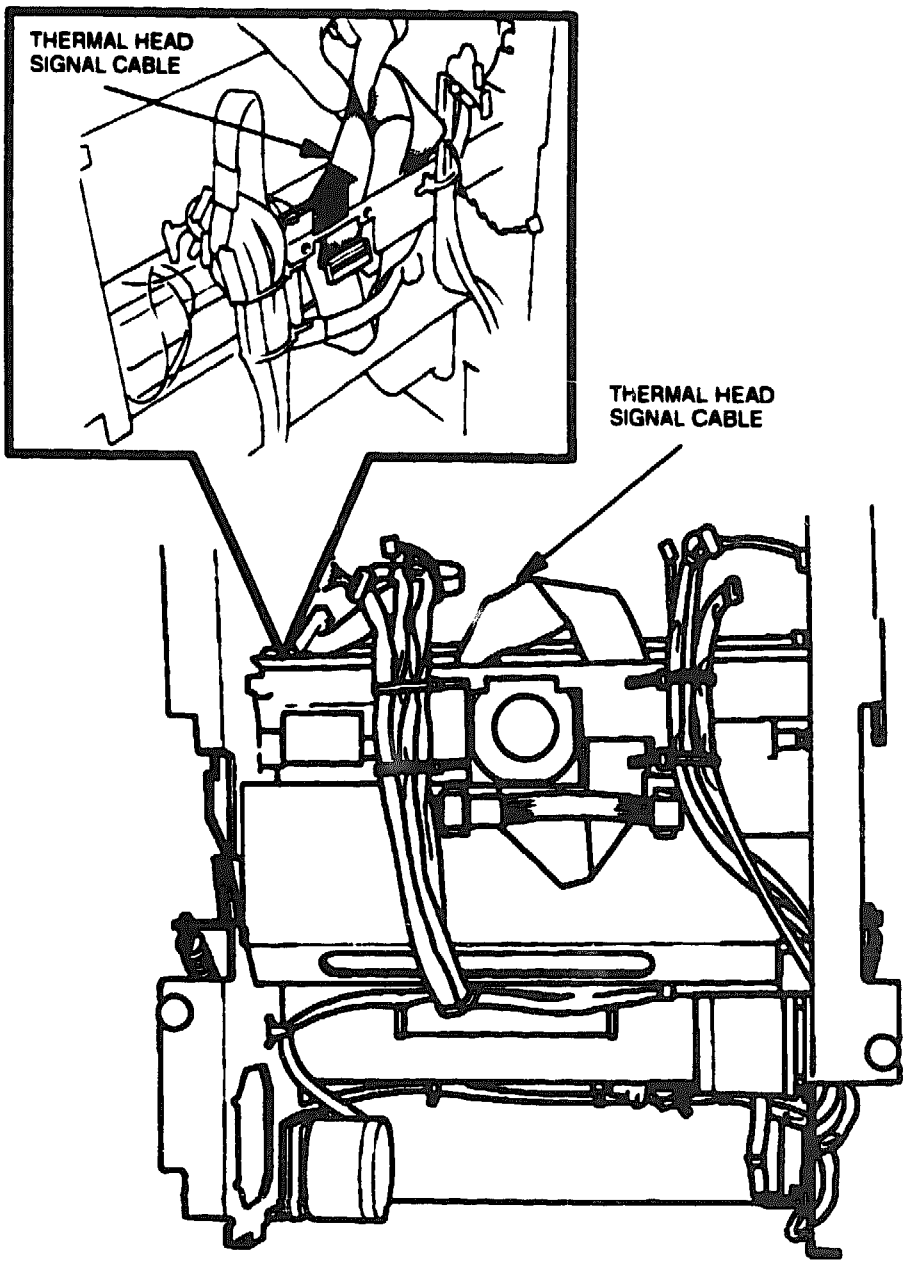


Figure 6-76 Thermal Head Signal Cable Removal

RBE Sensor Assembly

To remove the RBE sensor assembly, follow these steps.

1. Remove the ribbon.
2. Remove the mechanism unit.
3. Open the upper unit and remove the screw securing the RBE sensor assembly bracket (see Figure 6-77).

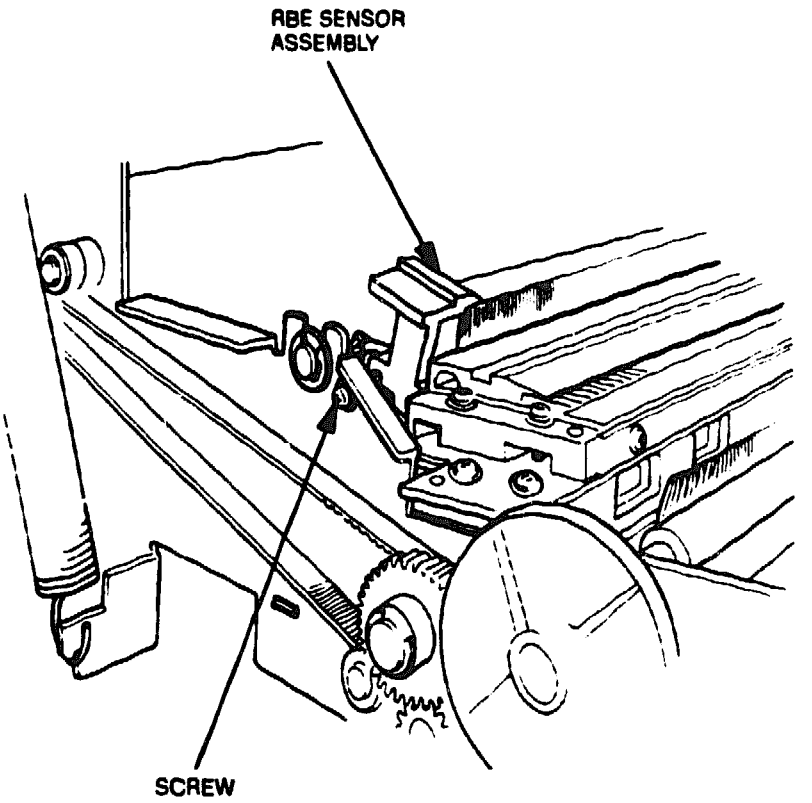


Figure 6-77 RBE Sensor Assembly Bracket Screw

4. While being careful not to damage the sensor, gently remove the RBE sensor from the RBE sensor cover (see Figure 6-78).

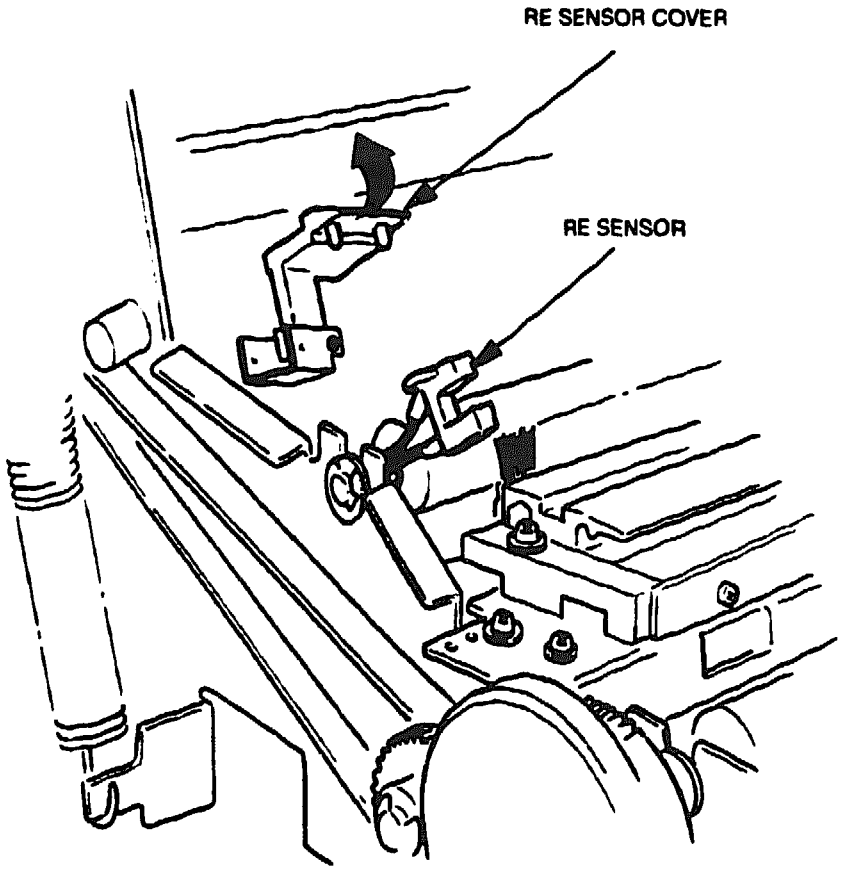


Figure 6–78 RBE Sensor and RBE Sensor Cover

5. Remove the sensor cable from the wire sticker on the lower-base plate (see Figure 6–79).

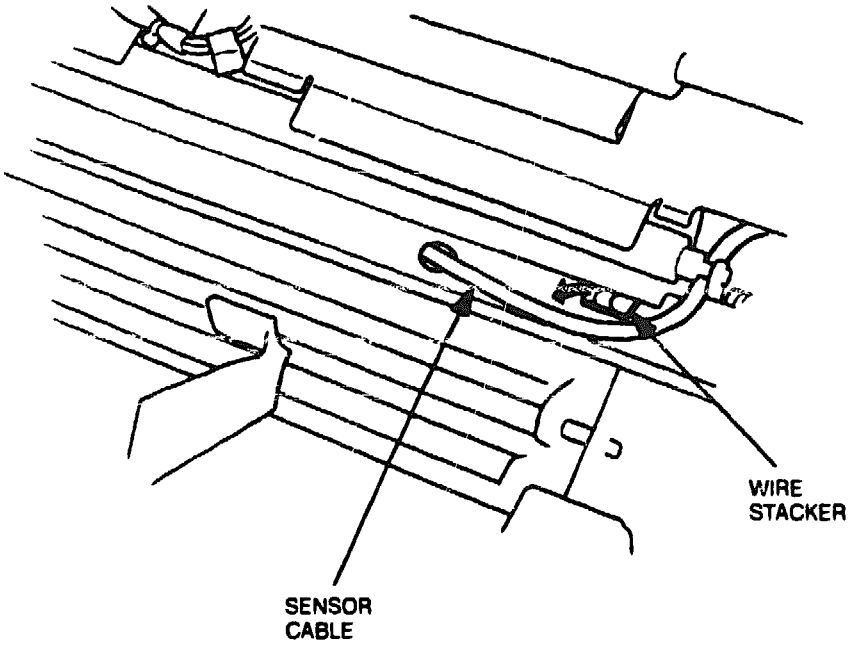


Figure 6-79 Sensor Cable

6. Place the mechanism unit on its side on the worktable to access the bottom of the unit. Then remove the two cable ties that secure the cables to the lower base plate (see Figure 6-80).

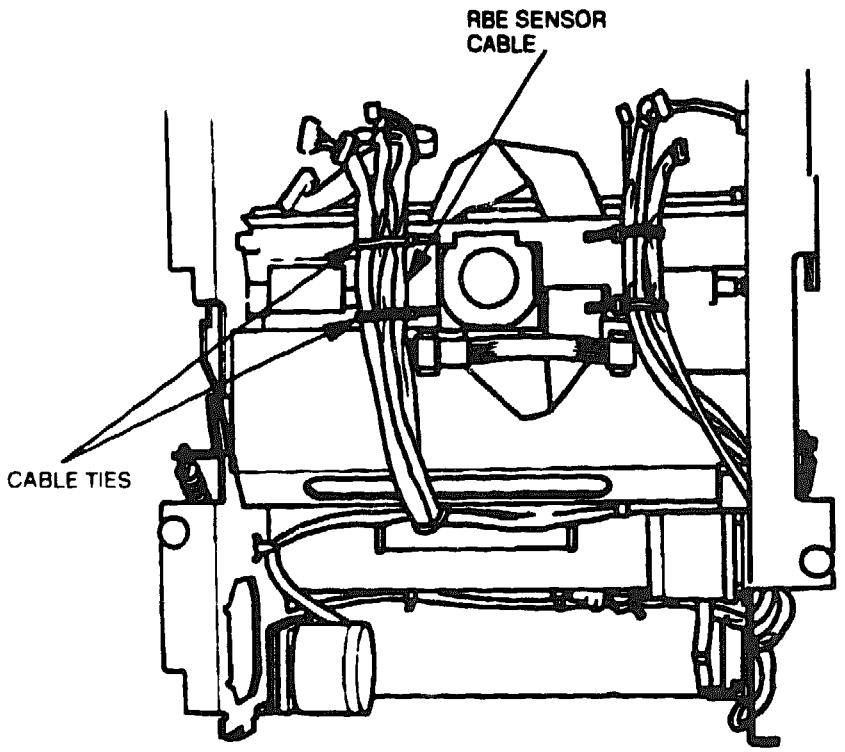


Figure 6-80 RBE Sensor Cable Ties

7. Remove the E retaining rings that secure the head cam gear and head cam pulley assemblies. Using a flat tip screwdriver, remove the two nylon rivets and remove the RBE sensor assembly (see Figure 6-81).

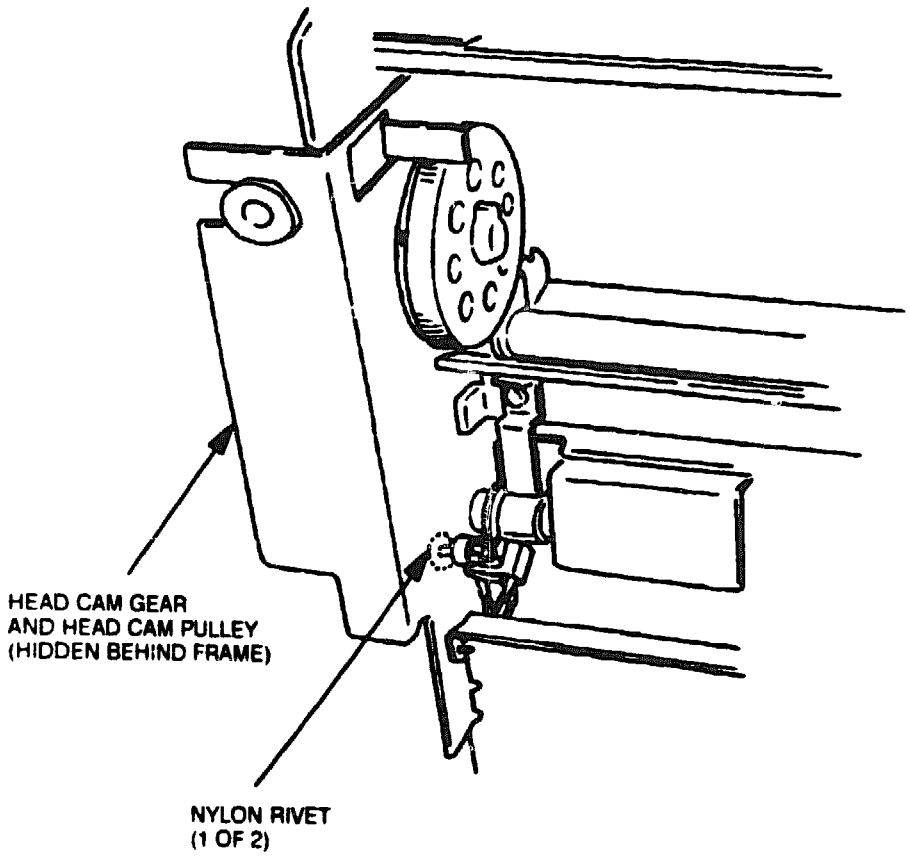


Figure 6-81 RBE Sensor Removal

Lift Sensor Subassembly

To remove the lift sensor subassembly, proceed as follows.

1. Remove the mechanism unit.
2. Open the upper unit.
3. Remove the two screws that secure the lift sensor to the lower side plate (L) assembly (see Figure 6-82).

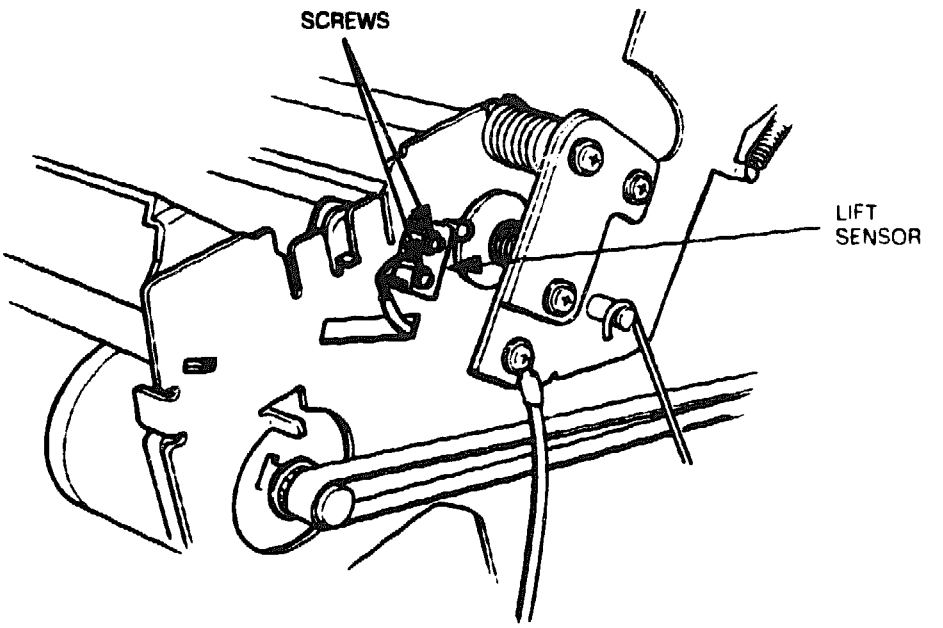


Figure 6-82 Lift Sensor Screws

4. Remove the cable from the two cable ties on the cut sheet guide base frame (see Figure 6-83).

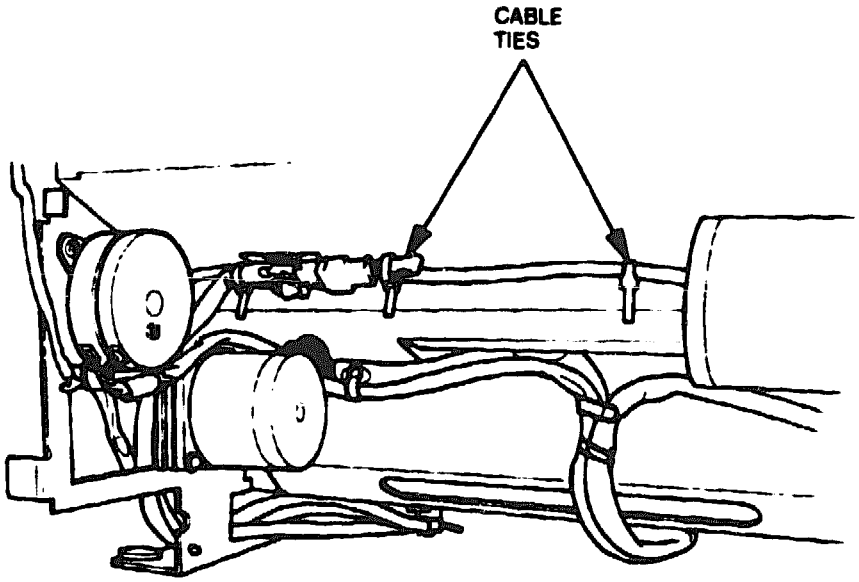


Figure 6-83 Cut Sheet Guide Base Frame Cable Ties

5. Close the upper unit and place the mechanism unit on its side on the worktable to access the bottom of the unit (see Figure 6-84).
6. Remove t he cable from the two cable ties on the lower base plate (see Figure 6-84). Then remove the lift sensor subassembly.

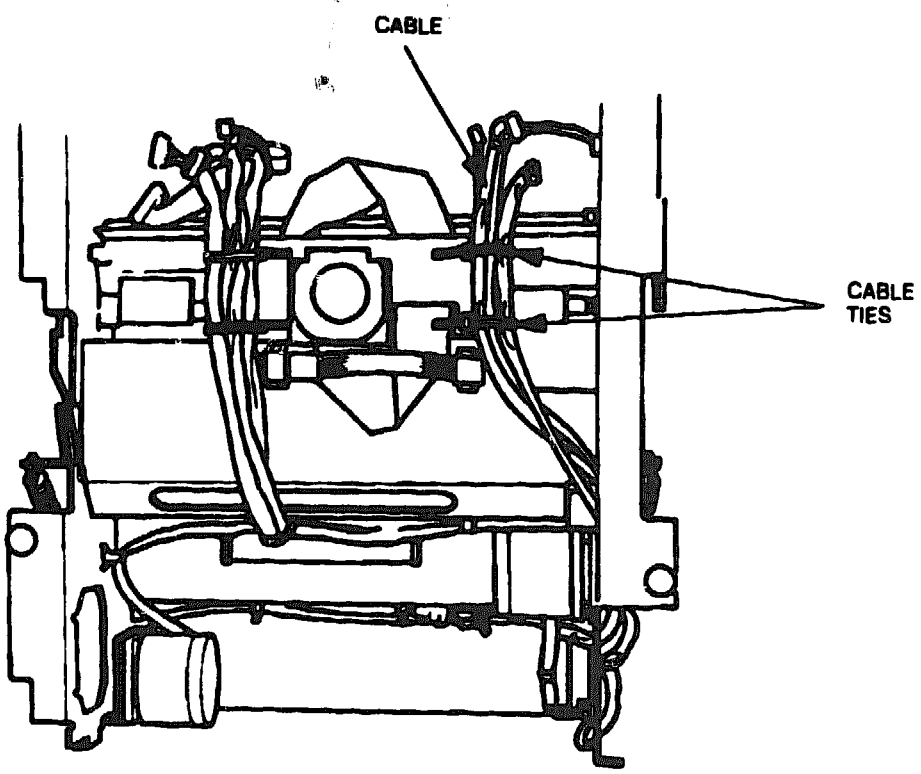


Figure 6-84 Lower Base Plate Cable Ties

Cut Sheet Guide Motor Assembly

To remove the cut sheet guide motor assembly, proceed as follows.

1. Remove the mechanism unit and place it on its side on the worktable to access the bottom of the unit (see Figure 6-85).
2. Remove the cable shown in Figure 6-85 from the cable ties on the lower base plate.

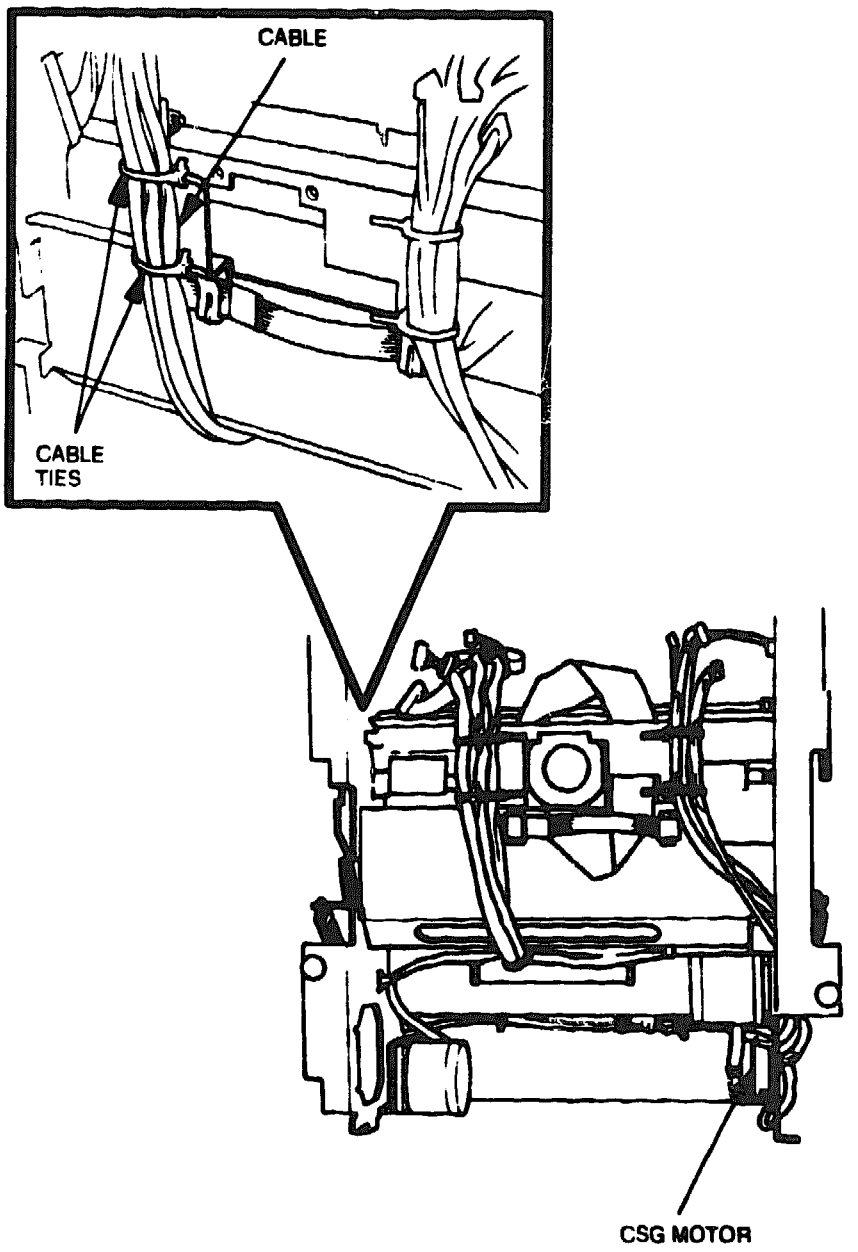


Figure 6-85 Lower Base Plate Cable Ties

3. Place the mechanism flat on the worktable. Then remove the cable from the two wire stickers on the lower base plate (see Figure 6-86).
4. Remove the two screws shown in Figure 6-86 securing the cut sheet guide motor plate to the lower side plate (R) and lift the cut sheet motor assembly off the mechanism unit.

NOTE

After replacing the CSG motor assembly, adjust the backlash between the CSG motor gear and the pick gear 20-51 (refer to Section 4).

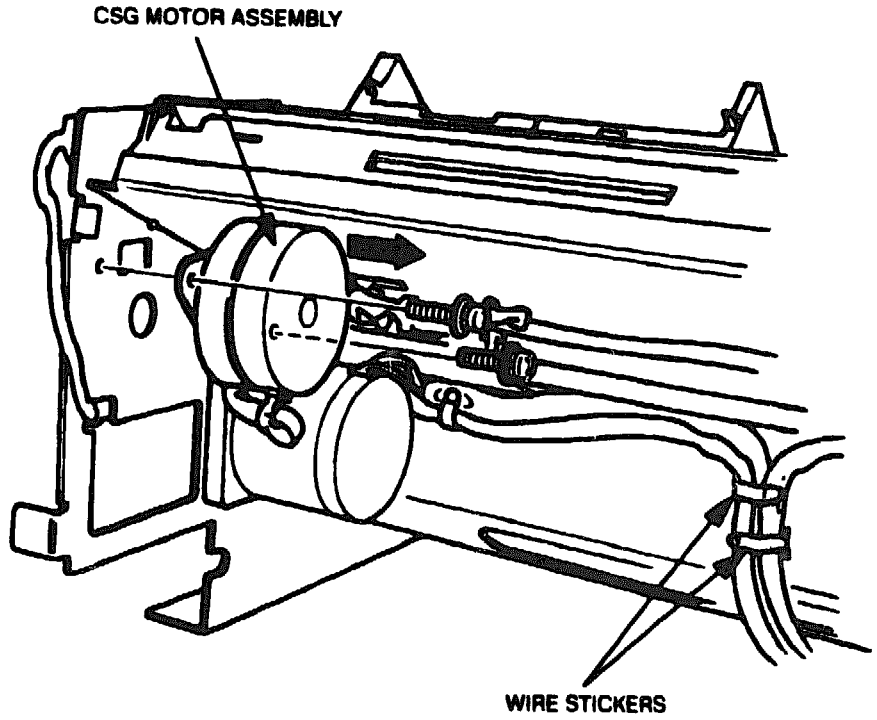


Figure 6-86 Cut Sheet Guide Motor Assembly Removal

RB Motor Assembly

To remove the RB motor assembly, proceed as follows.

1. Remove the mechanism unit.
2. Remove timing belt B328MXL9.5.
3. Place the mechanism unit on its side on the worktable to access the bottom of the unit.
4. Remove the cable from the cable ties on the lower base plate (see Figure 6-87).

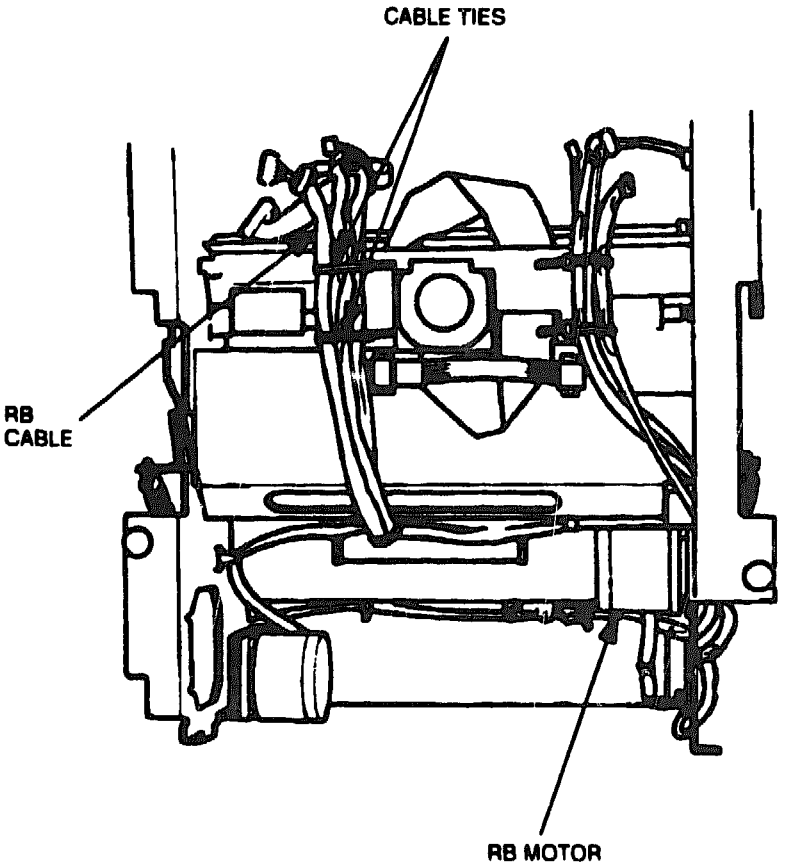


Figure 6-87 Lower Base Plate Cable Ties

5. Place the mechanism unit flat on the worktable. Then remove the two wire stickers on the lower base plate (see Figure 6-88).

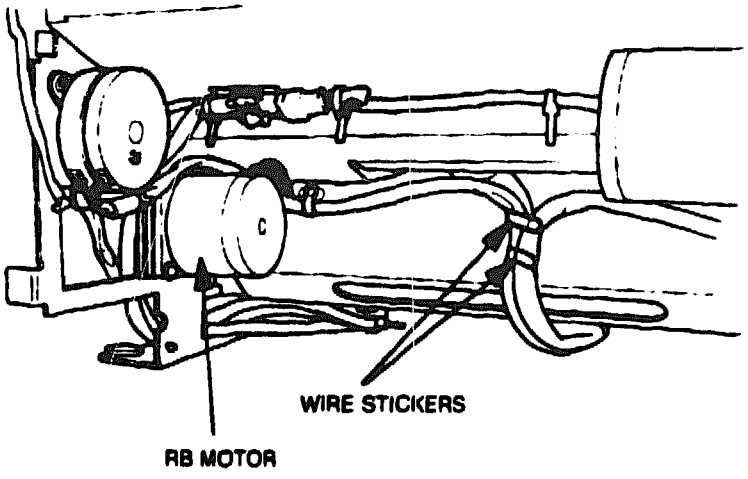


Figure 6-88 RB Motor Wire Stickers

6. Remove the three screws that secure the RB motor plate to the lower side plate (L) and lift the RB motor assembly away from the printer (see Figure 6-89).
7. Remove the four screws securing the RB motor to the RB motor plate and separate the motor from the plate.

NOTE

When replacing the RB motor assembly, fasten the FG cable to the RB motor plate as shown in Figure 6- 89 and adjust the tension of timing belt B328MXL9.5 (refer to Section 4).

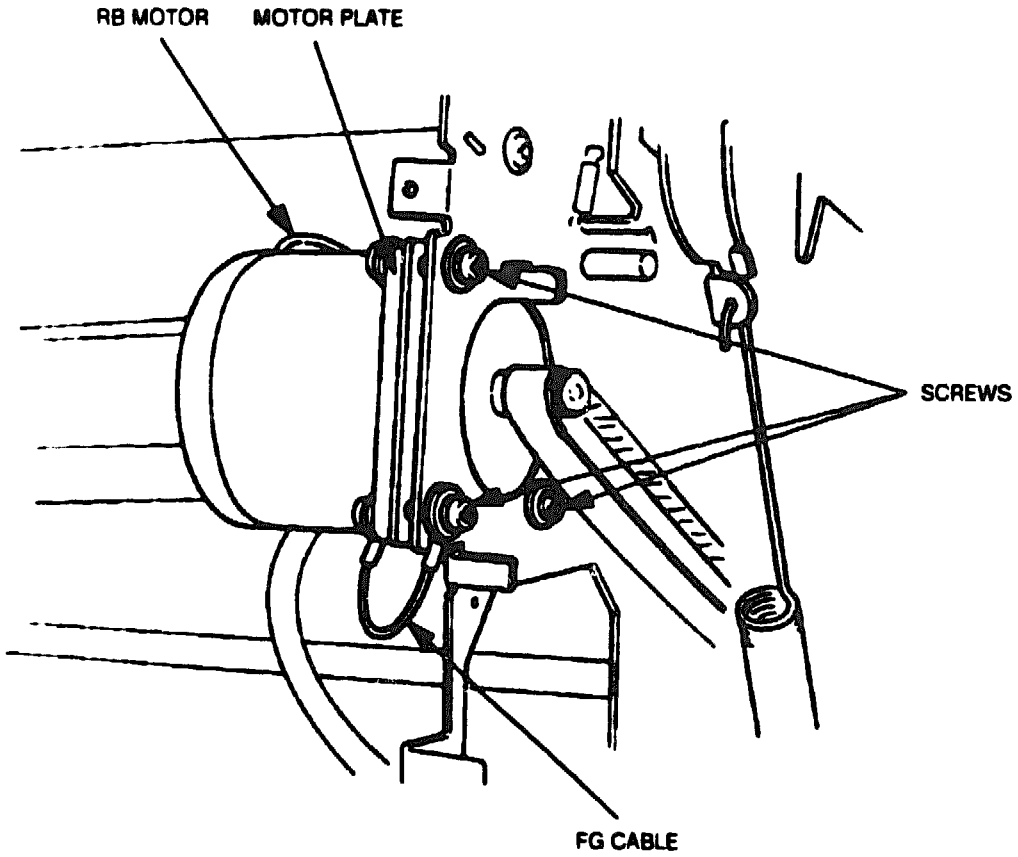


Figure 6-89 RB Motor Assembly Removal

LF Motor Assembly

To remove the LF motor assembly, proceed as follows.

1. Remove the mechanism unit and place the unit on its side on the worktable to access the bottom.
2. Remove the cable from the cable ties on the lower base plate (see Figure 6-90).

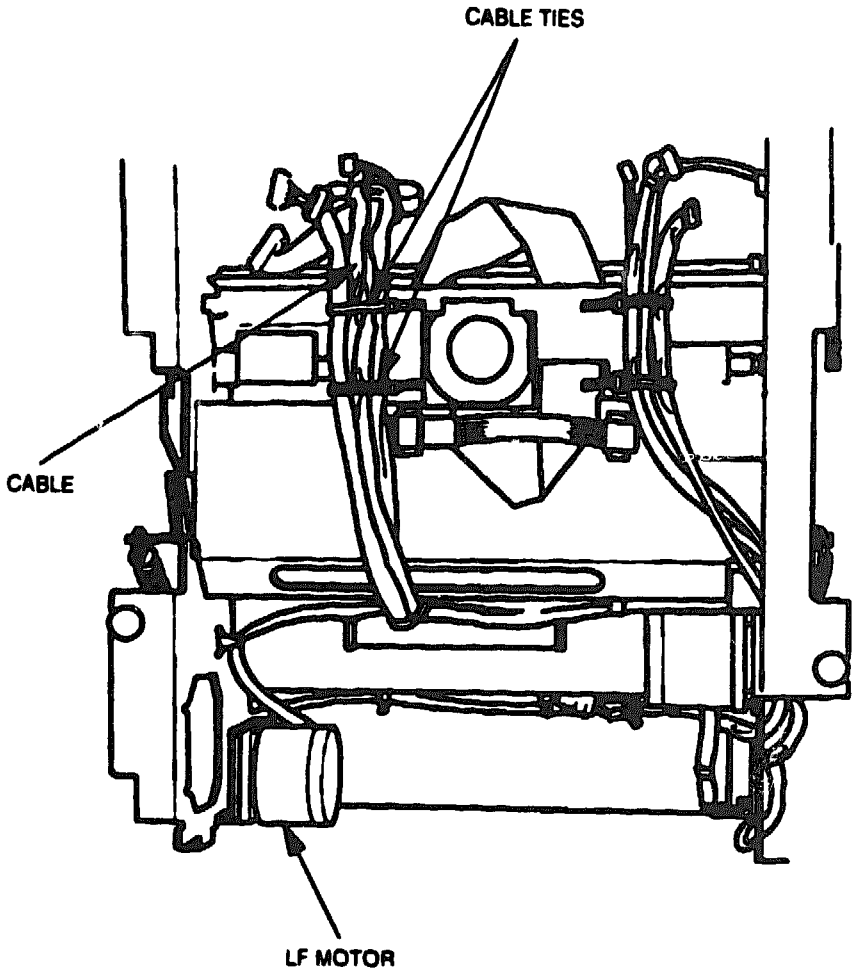


Figure 6-90 Lower Base Plate Cable Ties

3. Place the mechanism unit flat on the worktable. Then remove the LF motor cable from the two wire stickers on the lower base plate (see Figure 6-91).

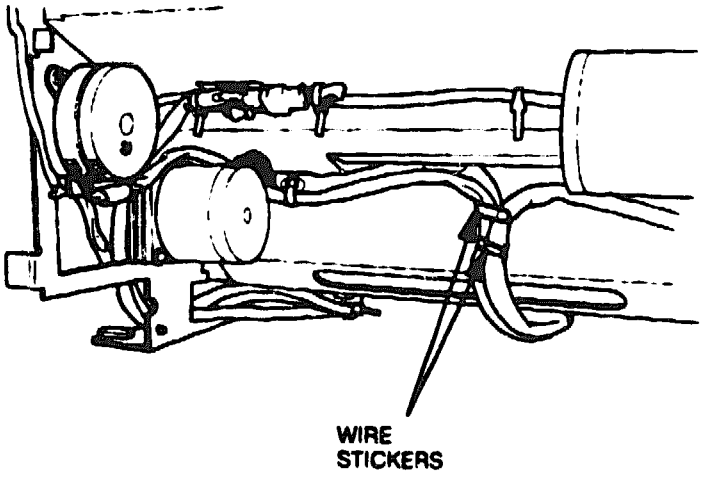


Figure 6-91 LF Motor Wire Stickers

4. Remove the three screws that secure the LF motor to the lower side plate (R) and lift the LF motor assembly away from the printer (see Figure 6-92).
5. Remove the four screws securing the LF motor to the LF motor plate and separate the motor from the plate.

NOTE

When replacing the LF motor assembly, fasten the FG cable to the upper right screw on the lower side plate (R) as shown in Figure 6-92 and adjust the tension of timing belt B140MXL9.5 (refer to Section 4).

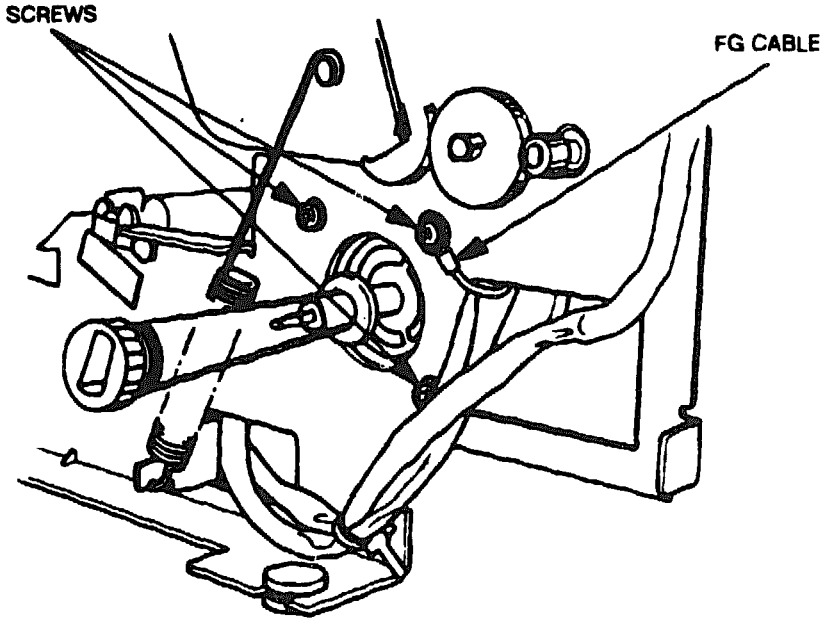


Figure 6-92 LF Motor Removal

Electromechanical Clutch Assembly

To remove the electromechanical clutch assembly, follow these steps.

1. Remove the top and middle covers.
2. Using a small, flat-tipped screwdriver, remove the E retaining ring shown in Figure 6-93 from the right end of the clutch shaft. Loosen or remove the screw on the upper side frame (L). Then loosen the two screws on the clutch support frame to allow clearance for removing the clutch (see Figure 6-93).

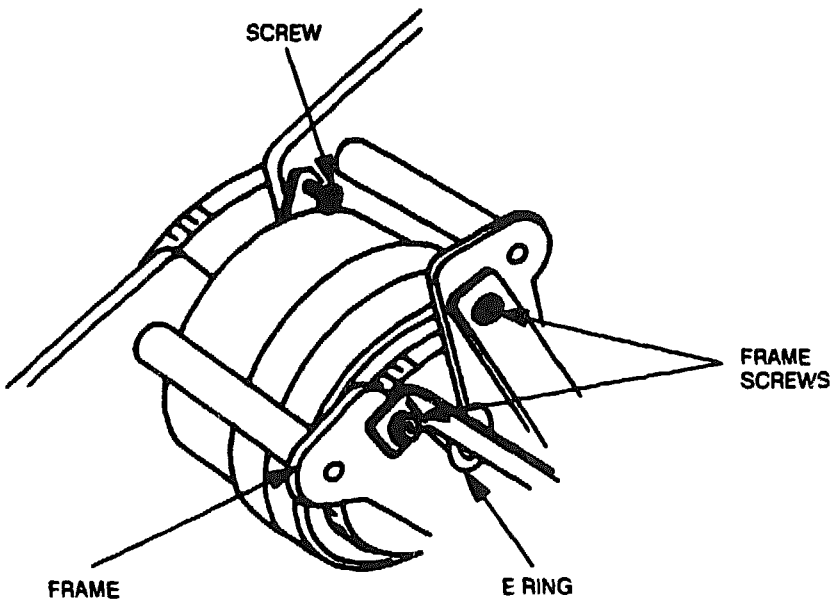


Figure 6-93 Upper Side Frame (L) Screws and E Ring

3. Unplug the electromechanical clutch connector (see Figure 6-94).
4. Remove the clutch cable shown in Figure 6-94 from the cable ties on the upper side frame (L) and pull out the cable.
5. Remove the E retaining ring on the clutch gear and slide the clutch gear off the clutch shaft (see Figure 6-94).
6. Remove the pin and bearing on the clutch shaft (see Figure 6-94).

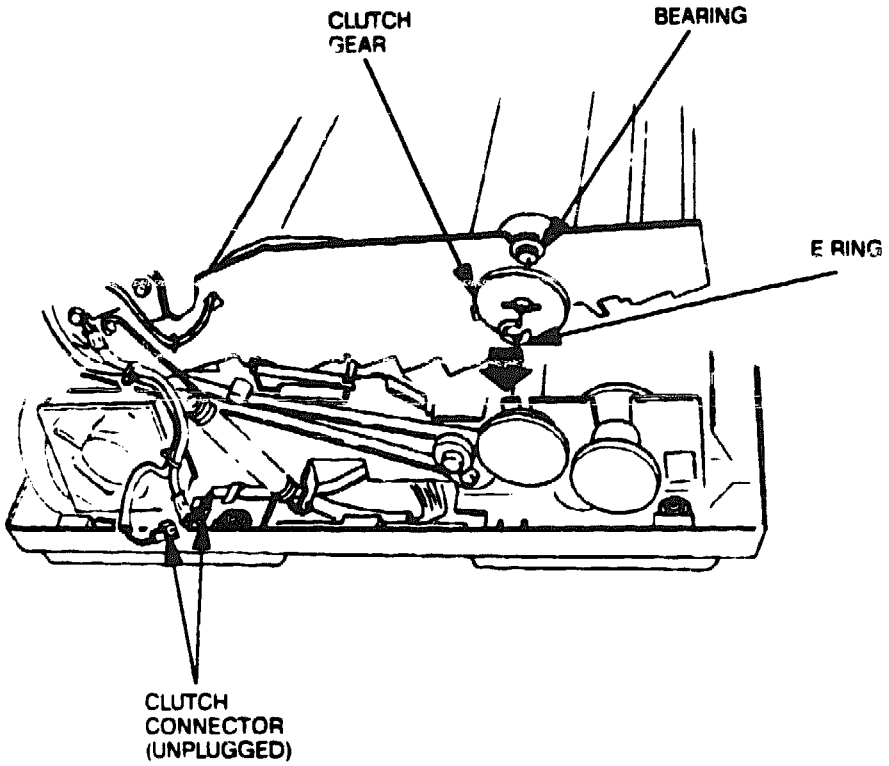


Figure 6-94 Electromechanical Clutch Cable, Cable Tie, Clutch Gear, and Bearing

7. Lift the clutch assembly away from the support frame on the upper unit (see Figure 6-95) and slide the bearing off the right end of the clutch shaft.

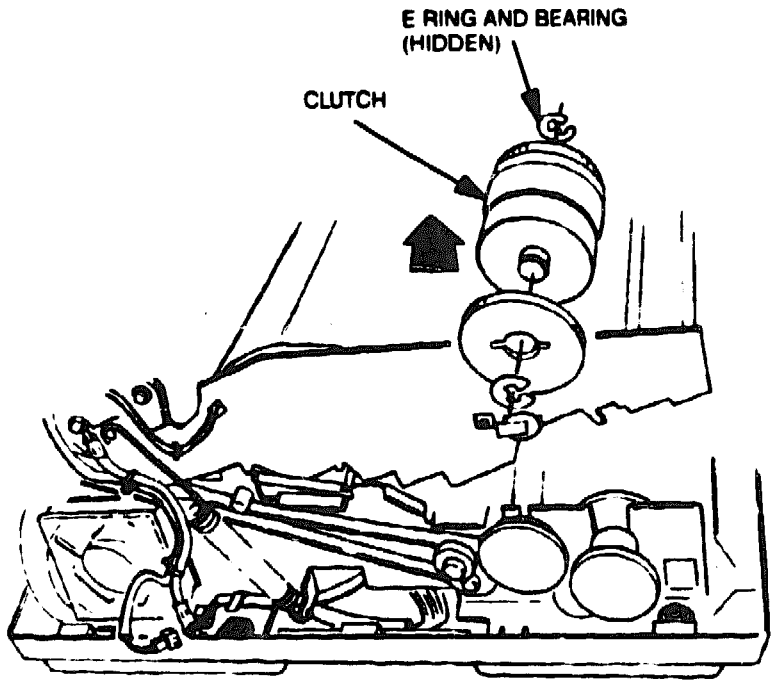


Figure 6-95 Electromechanical Clutch Assembly Removal


SECTION 7

Section 7

Illustrated Parts Breakdown

This section contains the illustrated parts breakdown (IPB) and DEC part numbers for the Colormate PS thermal transfer printer.

Table 7–1 lists field-replaceable parts. Figure 7–1 shows the corresponding IPB.

Table 7–1 Field-Replaceable Parts

ITEM	DESCRIPTION	DEC P/N	VENDOR P/N	QTY
1	Operator Panel Assembly	29-28788-01	136-214755-004A	1
2	MXL Belt	29-28789-01	808-805093-0750	1
3	Ribbon Shaft (L) Assembly	29-28790-01	136-833775-0	1
4	Ribbon Feed Roller Assembly	29-28826-01	136-833774-0	1
5	Thermal Print Head	29-28791-01	808-861092-0030	1
6	Privacy Cover Assembly	—	136-846821-0	1
7	Stacker	—	136-785663-004A	1
8	Hopper Guide Assembly	—	136-818153-301-0	1
9	Pick Roller	29-28792-01	136-841308-0010	1
10	HV Power Cable Assembly	—	136-046767-A	1
11	RB Motor Assembly	29-28793-01	808-820408-003A	1
12	G8CRJ (A) PCB Assembly	29-28794-01	136-435418-001D	1
13	CSG Motor Assembly	29-28802-01	808-805223-A	1
14	Power Supply, 115 Vac	29-28795-01	808-891064-001A	1
-	Power Supply, 230 Vac	29-28811-01	804-020827-003A	1
15	MXL Belt	29-28796-01	808-805093-1470	1
16	G8CRH Memory Bd (Early Printers)	29-28797-01	136-435417-001B	1
17	G8CRG Logic Bd (Early Printers)	29-28798-01	136-435416-001C	1
-	G8HEH Logic Bd (Later Printers)	(TBD)	136-437179-001A	1
-	G8HEJ Memory Bd (Later Printers)	(TBD)	136-437180-001A	1
-	G8HEK Memory Bd (Later Printers)	(TBD)	136-437181-001A	1
18	CV Cable Assembly	—	136-045367-001A	1
19	Discharging Bar	—	136-840429-0	1
20	RBE/HDC Sensor Assembly	29-28799-01	136-046460-0010	1
21	DC Fan (C), 115 Vac Printer	29-28800-01	808-820410-002A	1
-	DC Fan, 230 Vac Printer	29-28812-01	808-820410-101A	1
22	T/H Head Signal Cable Assembly	—	136-046058-0010	1
23	T/H Head Power Cable Assembly	—	136-046766-A	1
24	Platen Assembly	29-28801-01	136-214271-3010	1
25	Discharging Bar (C)	—	136-843787-0	1

Table 7-1 Field-Replaceable Parts (cont'd)

ITEM	DESCRIPTION	DEC P/N	VENDOR P/N	QTY
26	Electromagnetic Clutch Brake	29-28803-01	808-820710-0	1
27	Lift Sensor Subassembly	29-28804-01	136-818141-0	1
28	Paper Sensor Assembly	29-28805-01	136-045363-0010	1
29	Size Sensor Assembly	29-28806-01	136-840425-0	1
30	DC Fan (L), 115 Vac Printer	29-28807-01	808-820410-001A	1
-	DC Fan (L), 230 Vac Printer	29-28812-01	808-820410-101A	1
31	RBB Leaf Spring Assembly	29-28808-01	136-830092-0	1
32	LF Motor Assembly	29-28827-01	808-820409-003A	1
33	DC Fan (R)	29-28828-01	808-820410-003A	1
34	MXL Belt	29-28809-01	808-805093-0410	1
35	Power Switch Assembly	29-28810-01	136-785687-003A	1

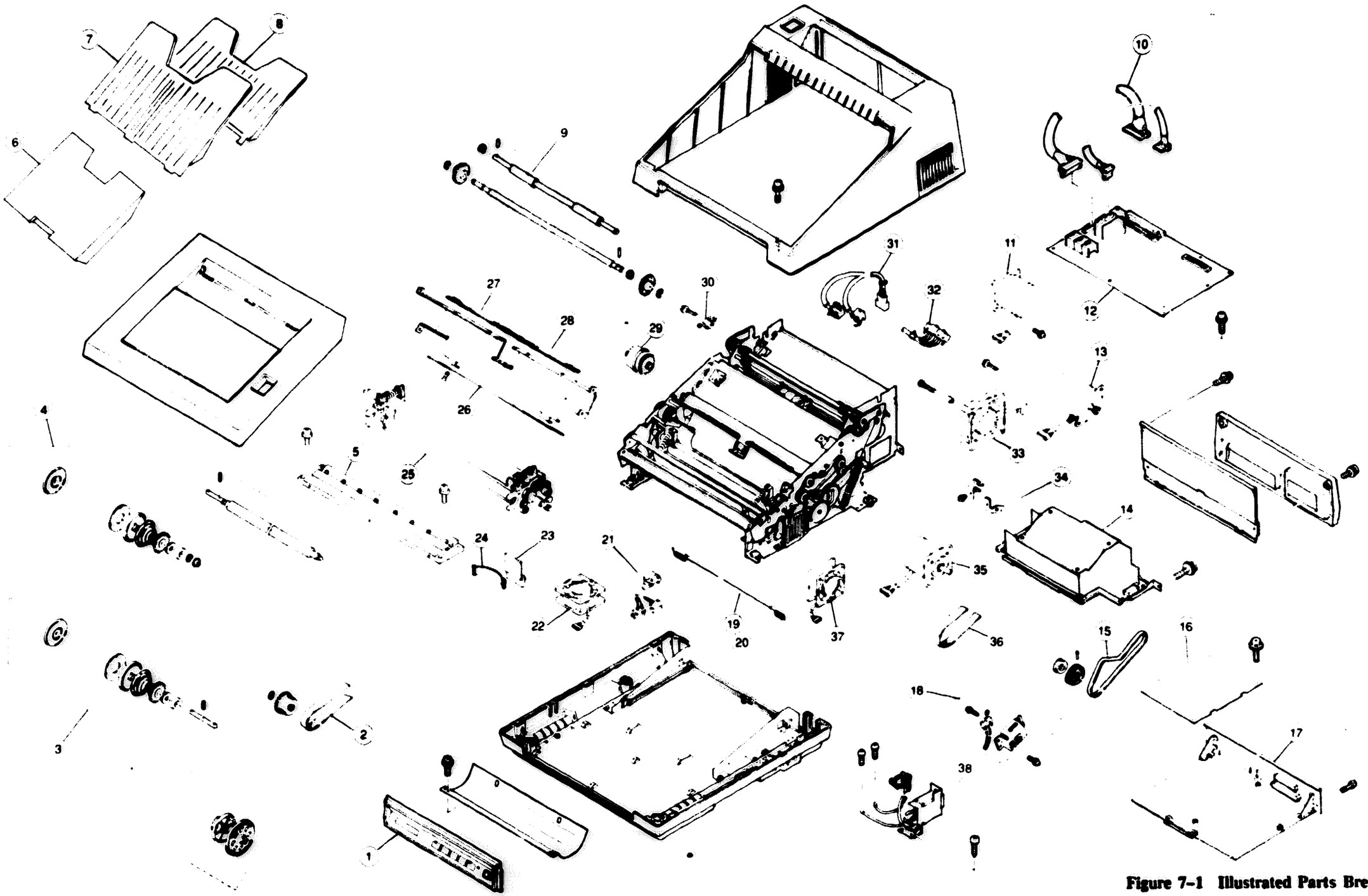


Figure 7–1 Illustrated Parts Breakdown


APPENDIX

Appendix

Configuration and Interface Information

This appendix provides a configuration diagram for the Colormate PS thermal transfer printer. Pin assignments for the printer's parallel, serial, RS-422 AppleTalk, and SCSI interfaces are also provided.

PRINTER CONFIGURATION

Figures A-1 and A-2 show configuration diagrams for Colormate PS printer hardware.

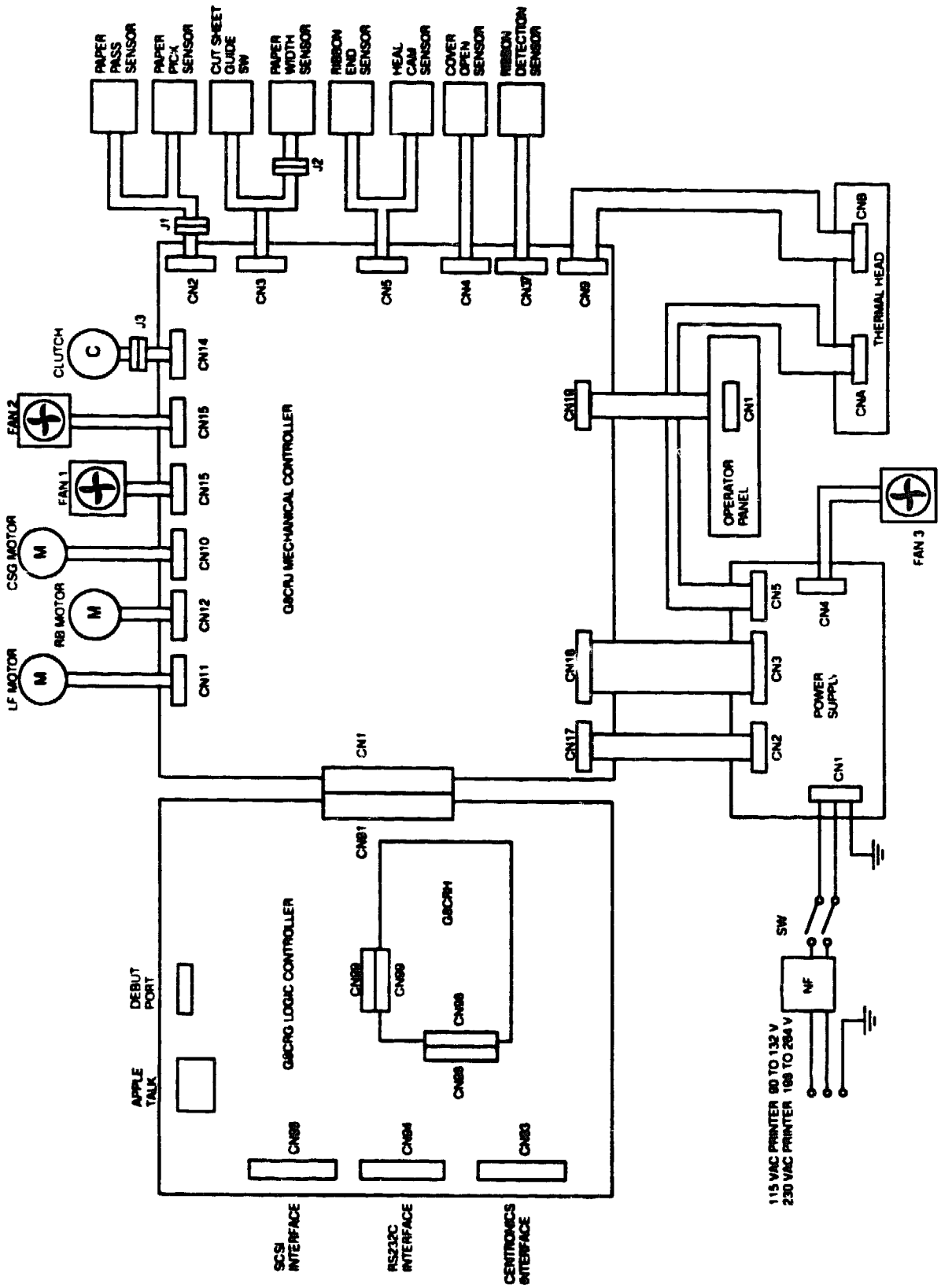


Figure A-1 Printer Configuration Diagram (Early Printers Only)

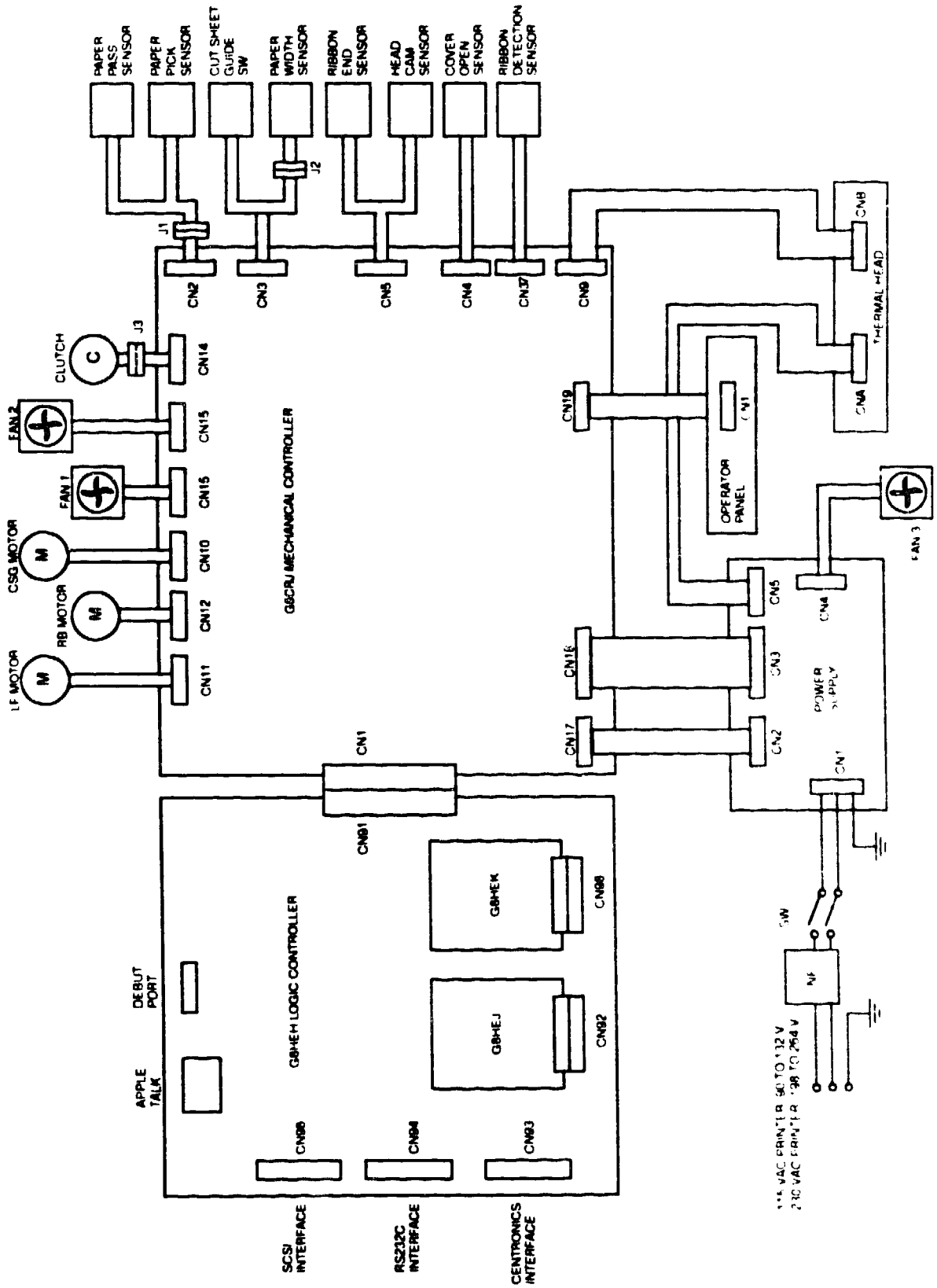


Figure A-2 Printer Configuration Diagram (Later Printers Only)

INTERFACE INFORMATION

The pin assignments (pinouts) for each ColorMate PS printer interface type (Centronics parallel, RS-232C serial, RS-422 AppleTalk, and SCSI) are provided in Tables A-1 through A-4.

Table A-1 Centronics Interface Pin Assignments

SIGNAL PIN	RETURN PIN	SIGNAL	DIRECTION
1	19	$\overline{\text{Data Strobe}}$	To printer
2	20	Data 1	To printer
3	21	Data 2	To printer
4	22	Data 3	To printer
5	23	Data 4	To printer
6	24	Data 5	To printer
7	25	Data 6	To printer
8	26	Data 7	To printer
9	27	Data 8	To printer
10	28	$\overline{\text{Acknowledge}}$	From printer
11	29	Busy	From printer
12	30	Paper Empty	From printer
13	—	Select	From printer
16	—	Signal Ground	—
17	—	Frame Ground	—
19 through 30	—	Ground	—
31	—	$\overline{\text{Input Prime}}$	To printer
32	—	$\overline{\text{Fault}}$	To printer
33	—	Signal Ground	—

Note: Pin 18 (+5V) is not used.
Pins 14, 15, 34 through 36 are not used.

Table A-2 RS-232C Serial Interface Pin Assignments

PIN	SIGNAL	DIRECTION
1	Frame Ground	–
2	Transmit Data	From printer
3	Receive Data	To printer
4	Request to Send	From printer
5	Clear to Send	To printer
6	Data Set Ready	To printer
7	Signal Ground	–
8	Carrier Detect	To printer
20	Data Terminal Ready	From printer

Note: Pins 9 through 19, 21 through 25 are not used.

Table A-3 RS-422 AppleTalk Pin Assignments

PIN	SIGNAL	DIRECTION
1	Handshaking Protocol Out	From printer
2	Handshaking Protocol In	To printer
3	Transmit Data -	From prir
4	Signal Ground	–
5	Receive Data -	To printer
6	Transmit Data +	From printer
7	Handshaking Protocol Out	From printer
8	Receive Data +	To printer

Table A–4 SCSI Pin Assignments

SIGNAL	PIN NUMBER	SIGNAL	PIN NUMBER
-DB(0)	26	GND	
-DB(1)	27	GND	
-DB(2)	28	-ATN	41
-DB(3)	29	GND	
-DB(4)	30	-BSY	43
-DB(5)	31	-ACK	44
-DB(6)	32	-RST	45
-DB(7)	33	-MSG	46
-DB(P)	34	-SEL	47
GND		-C/D	48
GND		-REQ	49
GND		-I/O	50
Terminator Power	38		

NOTE: Pins 1 through 12, 14 through 25, 35 through 37, 39, 40, and 42 are connected to Ground. Pin 13 is not connected.