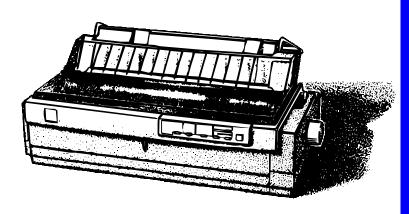
SERVICE MANUAL



9 Pin Impact Dot Printer EPSON FX-2180



FCC COMPLIANCE STATEMENT FOR AMERICAN USERS

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and 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 measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels that exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the printer.

FOR CANADIAN USERS

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le materiel brouilleur du Canada.

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EPSON FX-2180 Service Manual

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PRECAUTIONS

There are cautionary notes throughout the text to help you avoid personal injury or equipment damage.

WARNING

Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by a WARNING heading.

CAUTION

Signals a precaution which, if ignored, could result in damage to equipment.

Always observe the measures listed below when performing repair or maintenance procedures.

WARNING

- 1. Always disconnect the product from both the power source and host computer before performing any maintenance or repair procedure.
- 2. No work should be performed on the unit by persons unfamiliar with basic safety measures dictated for all electronics technicians in their line of work.
- 3. In performing testing described in this manual, do not connect the unit to a power source until instructed to do so. When the power supply cable must be connected, use extreme caution in working on the power supply and other electronic components.

CAUTION

- 1. Repairs on EPSON products should be performed only by an EPSON-certified repair technician.
- 2. Make certain that the source voltage is the same as the rated voltage listed on the serial number/rating plate. If the EPSON product has a primary AC rating different from the available power source, do not connect it to the power source.
- 3. Always verify that the EPSON product has been disconnected from the power source before removing or replacing printed circuit boards and/or individual chips.
- 4. To protect sensitive microprocessors and circuitry, use static discharge equipment, such as anti-static wrist straps, when accessing internal components.
- 5. Replace malfunctioning components only with those components recommended by the manufacturer; introduction of second-source ICs or other nonapproved components may damage the product and void any applicable EPSON warranty.

PREFACE

This manual describes the basic functions, theory of electrical and mechanical operations, and maintenance and repair procedures of the EPSON FX-2180. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page. The chapters are organized as follows:

Chapter 1. Product Description

Provides specifications and a general overview of the printer.

Chapter 2. Operating Principles

Describes the electrical and mechanical operation of the printer.

Chapter 3. Troubleshooting

Provides step-by-step troubleshooting procedures.

Chapter 4. Disassembly and Assembly

Provides step-by-step instructions on disassembling and assembling the printer.

Chapter 5. Adjustments

Provides Epson-approved adjustment methods.

Chapter 6. Maintenance

Provides preventive maintenance procedures and lists the Epson-approved lubricants and adhesives required for servicing the printer.

Appendix

Provides the following additional reference information:

- Connector pin assignments
- Circuit board components layouts
- · Circuit board schematics
- Exploded diagrams

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PRODUCT DESCRIPTION

1.1 Specifications

This section provides detailed specifications for the EPSON® FX-2180 impact dot matrix printer. The FX-2180 is based on the FX-2170 printer, and its main components are very similar to those of the FX-2170. However, the FX-2180 provides a faster printing speed, better multi-part form printing, and other enhancements.

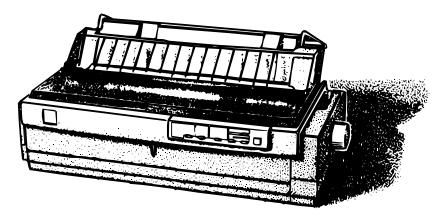


Figure 1-1. Exterior View of the FX-2180

1.1.1 Printing Specifications

Print method: Impact dot matrix

Number of pins: 18 Print pin arrangement: 9×2

Print pin diameter: 0.0114 inch (0.29 mm)

Color: Black

Print direction: Bidirectional with logic seeking

1.1.2 Print Speed and Printable Columns

Table 1-1. Print Speed and Printable Columns

Printing	Character	Printable	Printing Speed (cps)		
Mode	Pitch (cpi)	Columns	Normal	Copy 1*	Copy 2**
High speed draft	10	136	506	439	337
Draft	10	136	380	330	284
	12	163	455	396	341
	15	204	380	285	285
Draft	17	233	325	282	244
condensed	20	272	380	330	284
Draft	10	136	190	165	142
emphasized					
NLQ	10	136	95	82	71
	12	163	114	99	85
	15	204	94	71	31

Paper thickness lever set to 3.

Note:

- ☐ When the power supply voltage drops to the lower limit, the printer stops printing, and then starts printing again on the same line at a slower speed.
- ☐ When the print head temperature rises to the upper limit, the printer stops printing. When the head temperature returns to the normal level, the printer starts printing again at a slower speed.

^{**} Paper thickness lever set to 4 or more.

1.1.3 Resolution

Table 1-2. Resolution

Printing Mode	Horizontal Density (dpi)	Vertical Density (dpi)	Adjacent Dot Printed
High speed draft	90	72	No
Draft	120	72	No
Draft condensed	240	720	No
Draft emphasized	120	72	Yes
NLQ	240	144	No
Bit image	60, 72, 80, 90, or 120	72	Yes
	120 or 240	72	No

1.1.4 Printable Area

☐ Single sheets

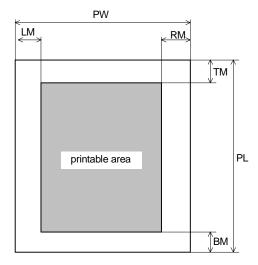
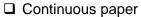


Figure 1-2. Printable Area for Single Sheets

Table 1-3. Printable Area for Single Sheets

	Single Sheets	Single-sheet Multi-part Forms
PW (width)	See Table 1-8	See Table 1-9
PL (length)	See Table 1-8	See Table 1-9
LM (left margin)		
RM (right margin)	0.12 in. (3 mm) or more (PW ≤ 14.33 in. or 364 mm) 0.98 in. (25 mm) or more (PW = 16.5 in. or 420 mm)	0.12 in. (3 mm) or more (PW ≤ 14.33 in. or 364 mm) 0.98 in. (25 mm) or more (PW = 16.5 in. or 420 mm)
TM (top margin)	0.17 in. (4.2 mm) or more	0.17 in. (4.2 mm) or more
BM (bottom margin)	0.17 in. (4.2 mm) or more	0.17 in. (4.2 mm) or more

Note: The maximum horizontal printable area is 13.6 inches (345.2 mm).



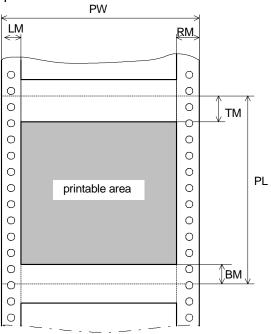


Figure 1-3. Printable Area for Continuous Paper

Table 1-4. Printable Area for Continuous Paper

	Continuous Paper
PW (width)	See Table 1-12
PL (length)	See Table 1-12
LM (left margin)	0.12 in. (3 mm) or more
RM (right margin)	0.12 in. (3 mm) or more
TM (top margin)	0.17 in. (4.2 mm) or more
BM (bottom margin)	0.17 in. (4.2 mm) or more

□ Envelopes

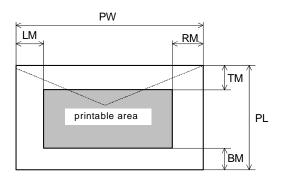


Figure 1-4. Printable Area for Envelopes

Table 1-5. Printable Area for Envelopes

	Envelopes
PW (width)	See Table 1-10
PL (length)	See Table 1-10
LM (left margin)	0.12 in. (3 mm) or more
RM (right margin)	0.12 in. (3 mm) or more
TM (top margin)	0.17 in. (4.2 mm) or more
BM (bottom margin)	0.17 in. (4.2 mm) or more

Postcards

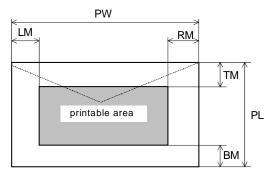


Figure 1-5. Printable Area for Postcards

Table 1-6. Printable Area for Postcards

	Postcards
PW (width)	See Table 1-11
PL (length)	See Table 1-11
LM (left margin)	0.12 in. (3 mm) or more
RM (right margin)	0.12 in. (3 mm) or more
TM (top margin)	0.17 in. (4.2 mm) or more
BM (bottom margin)	0.17 in. (4.2 mm) or more

□ Roll paper

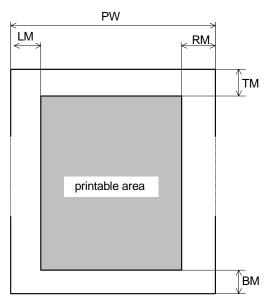


Figure 1-6. Printable Area for Roll Paper

Table 1-7. Printable Area for Roll Paper

	Roll Paper
PW (width)	See Table 1-14
PL (length)	See Table 1-14
LM (left margin)	0.12 in. (3 mm) or more
RM (right margin)	0.12 in. (3 mm) or more
TM (top margin)	0.17 in. (4.2 mm) or more
BM (bottom margin)	0.17 in. (4.2 mm) or more

1.1.5 Paper Feed Specifications

Standard feeding Friction front, rear methods: Push tractor front, rear

Pull tractor front, rear, bottom

Push and pull tractor front, rear

Optional feeding Cut-sheet feeder (CSF), methods: bin 1 or bin 2

bin 1 or bin 2 rear (top)
Roll paper holder rear

Paper paths: Manual insertion front or rear in; top out

CSF rear in; top out

Tractor front, rear, or bottom in;

top out

Feed speed: Normal 61 ms for 1/6-inch line

feed

5.0 ips or 0.127 mps (continuous paper) 83 ms for 1/6-inch line

Copy mode 83 ms for 1/6-ii

feed

3.1 ips or 0.078 mps (continuous paper)

1.1.6 Paper Specifications

□ Single sheets

Table 1-8. Specifications for Single Sheets

	Front Entry		Rear Entry		
	Minimum Maximum		Minimum	Maximum	
Width					
(inches)	3.9	16.5	3.9	16.5	
(mm)	100	420	100	420	
Length					
(inches)	5.8	16.5	3.9	16.5	
(mm)	148	420	100	420	
Thickness					
(inches)	0.0025	0.0055	0.0025	0.0055	
(mm)	0.065	0.14	0.065	0.14	
Weight					
(lb)	14	24	14	24	
(g/m²)	52	90	52	90	
Quality	Plain or recycled paper; Plain or rec		Plain or recycled	cycled paper; not	
	not curled, folded, or curled, folded,		curled, folded, or	crumpled	
	crumpled				

Note: Use recycled paper only under normal temperature and humidity conditions.

□ Single-sheet multi-part forms

Table 1-9. Specifications for Single-sheet Multi-part Forms

	Front Entry		Rear Entry	
	Minimum Maximum		Minimum	Maximum
Width				
(inches)	3.9	16.5	3.9	16.5
(mm)	100	420	100	420
Length				
(inches)	5.8	16.5	3.9	16.5
(mm)	148	420	100	420
Copies	1 original	+ 5 copies	1 original + 5 copies	
Total				
thickness				
(inches)	0.0047	0.018	0.0047	0.018
(mm)	0.012	0.46	0.012	0.46
Weight				
(lb)	12	15	12	15
(g/m^2)	40	58	40	58
Quality	Plain or recycled paper, not		Plain or recycled paper; not	
	curled, folded, or crumpled		curled, folded, or crumpled	
Binding	A line of glue at the top or		A line of glue at the top of	
	on one side of the form		the form	

□ Envelopes

Table 1-10. Specifications for Envelopes

		Re	ar Entry	
		Minimum	Maximum	
No. 6 envelopes	Width			
	(inches)		6.5	
	(mm)		165	
	Length			
	(inches)		3.9	
	(mm)		92	
No. 10 envelopes	Width			
	(inches)	9.5		
	(mm)	241		
	Length			
	(inches)		4.1	
	(mm)		105	
Total thickness	(inches)	0.0063	0.020	
	(mm)	0.16	0.52	
Weight	(lb)	12	15	
	(g/m²)	40	58	
Quality		Bond, plain, or airmail paper; not		
		curled, folded,	or crumpled	

Note:

- □ Load envelopes using the rear (top) slot only; do not load envelopes in the front slot.
- ☐ Insert the envelope into the printer with the flap side on top and the printable side down.
- ☐ Before printing on envelopes, set the paper thickness lever to a minimum of position 4 or 5 and turn on the card mode by pressing the **Tear Off/Bin** button until both Tear Off/Bin lights are on. After you finish printing on envelopes, press the **Tear Off/Bin** button once to exit the card mode.
- ☐ Use envelopes only under normal temperature and humidity conditions.

Postcards

Table 1-11. Specifications for Postcards

	Front Entry		Rear Entry	
	Minimum	Maximum	Minimum	Maximum
Width				
(inches)	3.9	5.83	3.9	5.83
(mm)	100	148	100	148
Length				
(inches)	5.83	5.83	3.9	5.83
(mm)	148	148	100	148
Thickness				
(inches)	0.0087			
(mm)	0.22			
Weight				
(lb)	51			
(g/m2)	192			

Note:

- □ Before printing on postcards, set the paper thickness lever to position 3 or higher and turn on the card mode by pressing the **Tear Off/Bin** button until both Tear Off/Bin lights are on. After you finish printing on envelopes, press the **Tear Off/Bin** button once to exit the card mode.
- ☐ Use postcards only under normal temperature and humidity conditions.

□ Continuous paper

Table 1-12. Specifications for Continuous Paper

	Front Entry		Rear Entry		Bottom Entry	
	Min.	Max.	Min.	Max.	Min.	Max.
Width						
(inches)	4	16	4	16	4	16
(mm)	101.6	406.4	101.6	406.4	101.6	406.4
Length						
(inches)	4	22	4	22	4	22
(mm)	101.6	558.8	101.6	558.8	101.6	558.8
Copies*	1 orig	inal + 5	1 origi	nal + 5	1 origir	nal + 5
	СО	pies	cop	oies	сор	ies
Total thickness						
(inches)	0.0025	0.018	0.0025	0.018	0.0025	0.018
(mm)	0.065	0.046	0.065	0.046	0.065	0.046
Weight						
(ordinary page)						
(lb)	12	22	12	22	12	22
(g/m ²)	52	82	52	82	52	82
Weight (one						
sheet of a						
multi-part form)						
(lb)	12	15	12	15	12	15
(g/m²)	40	58	40	58	40	58
Quality	Plain or recycled paper, carbonless multi-part forms					
Binding	Dots of glue or paper staples on both sides (front,					
	bottom, or rear entry) or dots of glue on only one side					
	(rear entry)					
To wint 4 original + C copies you must use the will treater close with						

To print 1 original + 6 copies, you must use the pull tractor along with the front or rear tractor.

□ Continuous paper with labels

Table 1-13. Specifications for Continuous Paper with Labels

	Front Entry		Bottom Entry	
	Minimum Maximum		Minimum	Maximum
Label size				
(inches)	15/16	× 2.5	15/16 × 2.5	
(mm)	23.8 >	< 63.5	23.8	3×63.5
Width				
(inches)	4	16	4	16
(mm)	101.6	406.4	101.6	406.4
Length				
(inches)	4	22	4	22
(mm)	101.6	558.8	101.6	558.8
Backing sheet				
thickness				
(inches)	0.0028	0.0035	0.0028	0.0035
(mm)	0.07	0.09	0.07	0.09
Total thickness				
(lb)	0.16	0.19	0.16	0.19
(g/m²)	0.0063	0.0075	0.0063	0.0075
Label weight				
(lb)	17			17
(g/m²)	68			68
Quality	Avery continuous form		Avery conti	nuous form
	labels, Avery mini-line		labels, Avery mini-line	
	labels, or equivalent		labels, or equivalent	
	quality label	S	quality labe	els

Note:

- ☐ Use only continuous labels; do not use labels with single-sheet backing paper.
- □ Load continuous paper with labels only in the front or bottom slot; do not load labels in the rear slot.

□ Roll paper

Table 1-14. Specifications for Roll Paper

		Rear Entry		
		Minimum	Maximum	
Width	(inches)	8.	5	
	(mm)	21	16	
Length	(inches)	_		
	(mm)			
Thickness				
	(inches)	0.0028	0.0035	
	(mm)	0.07	0.09	
Weight	(lb)	14	22	
	(g/m²)	52	82	
Quality		Plain paper; not curled, folded, or crumpled		

1.1.7 Interface Specifications

Standard: Bidirectional parallel interface

(IEEE-1284 nibble mode supported)

Optional: Type B interface, level 2

1.1.8 Software Specifications

Control codes: ESC/P®

IBM® 2381 Plus emulation

Fonts: 1 draft bitmap and 2 LQ typefaces

8 barcode fonts

Character tables: Standard version: 11 tables

NLSP version: 20 tables

Input buffer: 64 KB

1.1.9 Environmental Conditions

Temperature

Operating: 41° to 95° F (5° to 35° C)

When using recycled

paper, envelopes, labels,

or roll paper: 59° to 77° F (15° to 25° C) Non-operating (storage): -22° to 140° F (-30° to 60° C)

Humidity

Operating: 10% to 80% RH

When using recycled

paper, envelopes, labels,

or roll paper: 30% to 60% RH Non-operating (storage): 0% to 85% RH

1.1.10 Electrical Specifications

120 V model

Rated voltage: 120 VAC

Input voltage range: 99 to 132 VAC Rated frequency range: 50 to 60 Hz Input frequency range: 49.5 to 60.5 Hz

Rated current: 1.0 A (1.8 A maximum)

Power consumption: Approx. 46 W (ISO/IEC 10561 letter pattern)

Energy Star compliant

Insulation resistance: $10 \text{ M}\Omega$ minimum (between AC line and

chassis, 500 V)

Dielectric strength: 1000 VAC rms. 1 minute or 1200 VAC rms.

1 second (between AC line and chassis)

220 to 240 V model

Rated voltage: 220 to 240 VAC Input voltage range: 198 to 264 VAC Rated frequency range: 50 to 60 Hz Input frequency range: 49.5 to 60.5 Hz

Rated current: 0.5 A (0.9 A maximum)

Power consumption: Approx. 46 W (ISO/IEC 10561 letter pattern)

Energy Star compliant

Insulation resistance: $10 \text{ M}\Omega$ minimum (between AC line and

chassis, 500 V)

Dielectric strength: 1500 VAC rms. 1 minute (between AC line

and chassis)

UPS (Universal Power Supply) model

Rated voltage: 100 to 120 VAC or 220 to 240 VAC

Input voltage range: 90 to 132 VAC or 198 to 264 VAC

Rated frequency range: 50 to 60 Hz Input frequency range: 49.5 to 60.5 Hz

Rated current: 1.1 A (2.2 A maximum) or 0.6 A (1.1 A

maximum)

Power consumption: Approx. 46 W (ISO/IEC 10561 letter pattern)

Energy Star compliant

Insulation resistance: $10 \text{ M}\Omega$ minimum (between AC line and

chassis, 500 V)

Dielectric strength: 1500 VAC rms. 1 minute (between AC line

and chassis)

1.1.11 Physical Specifications

Dimensions: 25.16 in. (W) \times 15.83 in. (D) \times 10.12 in (H)

639 mm (W) \times 402 mm (D) \times 257 mm (H)

(with CSF bin 1): $25.16 \text{ in. (W)} \times 18.46 \text{ in. (D)} \times 14.96 \text{ in (H)}$

639 mm (W) \times 469 mm (D) \times 380 mm (H)

(with CSF bin 2): $25.16 \text{ in. (W)} \times 23.54 \text{ in. (D)} \times 16.18 \text{ in (H)}$

639 mm (W) \times 598 mm (D) \times 411 mm (H)

Weight: Approx. 28.66 lb (13 kg) (with CSF bin 1): Approx. 35.94 lb (16.3 kg)

(with CSF bin 2): Approx. 37.92 lb (17.2 kg)

1.1.12 Reliability

Total print volume: 7.5 million lines (except print head)

MTBF: 10,000 power-on hours (POH)
Print head life: Approx. 300 million characters

1.1.13 Safety Approvals

120 V model

Safety standards: UL1950

CSA C22.2 No. 950

EMI: FCC part 15 subpart B class B

CSA C108.8 class B

220 to 240 V model

Safety standards: EN 60950 (TÜV, NEMKO)

EMI: EN 55022 (CISPR pub. 22) class B

AS/NZS 3548 class B

UPS model

Safety standards: UL1950

CSA C22.2 No. 950

EN 60950 (TÜV, NEMKO)

EMI: FCC part 15 subpart B class B

CSA C108.8 class B

EN 55022 (CISPR pub. 22) class B

AS/NZS 3548 class B

1.1.14 CE Marking

220 to 240 V and UPS models

Low Voltage Directive 73/23/EEC: EN60950

EMC Directive 89/336/EEC: EN55022 class B

EN61000-3-2 EN61000-3-3 EN50082-1 IEC801-2 IEC801-3

IEC801-4

1.1.15 Acoustic Noise

Level: Approx. 55 dB(A), according to ISO 7779

pattern

1.1.16 Ribbon Cartridge

Type: Fabric Color: Black

Ribbon life: Approx. 12 million characters

(draft, 10 cpi, 14 dots/character)

1.2 Operation

This section provides detailed information about the control panel buttons and LEDs, and explains the printer's beep patterns.

1.2.1 Control Panel

The control panel contains seven non-locking pushbuttons and nine LEDs, as shown below.

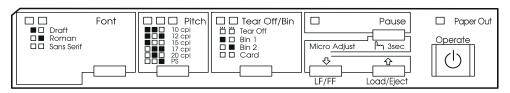


Figure 1-7. Control Panel

1.2.1.1 Buttons



The power switch is wired in the secondary circuitry of the power supply board. Therefore, the power supply's primary circuitry remains live even after the printer is turned off.

Table 1-15. Button Functions

Button	Function
Operate	Turns the printer on and off. The printer is off when the top
	of this button is even with the button protectors.
Pause	Stops printing temporarily, and resumes printing when
	pressed again. (Selects on line or off line status.)
	When held down for three seconds when the printer is in
	the standby state, enters the micro adjust mode. When
	pressed again, exits the micro adjust mode.
Load/Eject	Loads continuous paper from the standby position.
	Feeds continuous paper backward to the standby
	position.
	Loads a single sheet of paper from the paper entry slot.
	Ejects a single sheet of paper if a sheet is loaded.
LF/FF	When pressed, executes a line feed.
	When held down, executes a form feed. This advances
	continuous paper to the next top-of-form position or
	ejects a single sheet.
Tear	Feeds continuous paper forward to the tear-off position.
Off/Bin	Feeds continuous paper backward from the tear-off
	position to the top-of-form position.
	 Selects a cut-sheet feeder bin when the cut-sheet feeder is installed.
	Enters the card mode to print on postcards and
	envelopes.
Font	Selects one of the following fonts: Draft, Roman, or Sans
	Serif.
Pitch	Selects one of the following font widths: 10 cpi,
	12 cpi, 15 cpi, 17 cpi, 20 cpi, or PS (proportional spacing).
Micro	In the micro adjust mode, executes a micro feed (moves
Adjust ↑ / ↓	the paper forward or backward 1/216 inch). Depending on
	the position of your paper, you can use this button to adjust
	the top-of-form or tear-off position.

1.2.1.2 LEDs

Table 1-16. LED Indicators

LED(s)	Color	Description
Pause	Orange	 On when the printer is paused. Off when the printer is on line. Flashes when the printer is in the micro adjust mode or the print head is overheated.
Paper Out	Red	 On when no paper is loaded or paper is not loaded correctly in the selected paper source. Off when paper is loaded correctly in the selected paper source. Flashes when paper has not been fully ejected or a paper jam has occurred.
Tear Off/Bin	Green	 ■ when continuous paper is not in the tear-off position. □ □ when continuous paper is in the tear-off position. ■ □ when bin 1 of the optional cut-sheet feeder is selected. □ ■ when bin 2 of the optional cut-sheet feeder is selected. □ □ when the printer is in the card mode. □ □ on ■ = off □ = flashing
Font	Green	Indicates which font is selected.
Pitch	Green	Indicates which font size is selected.

1.2.1.3 Beeper

The printer beeps during the error conditions described in Table 1-17.

Table 1-17. Error Conditions

Error	Beep Pattern
Paper out	000
Cover open	000
Paper release lever operation	0000
Illegal panel operation	0

O indicates the beeper sounds for approximately 100 ms with an interval of approximately 100 ms.

1.2.2 Paper Release Lever Positions

Use the paper release lever to select which paper path you want the printer to load paper from. The table below shows the corresponding paper path(s) for each paper release lever position.

Table 1-18. Paper Release Lever Positions

Lever Position	Description
Single-sheet	For loading single sheets from the top or front slot.
Rear push tractor	For loading continuous paper from the tractor installed in the rear push position. Also set the lever to this position when using the rear push and pull tractors in combination.
Front push tractor	For loading continuous paper from the tractor installed in the front push position. Also set the lever to this position when using the front push and pull tractors in combination.
Pull tractor PULL	For loading continuous paper from the tractor installed on top of the printer in the pull position.

1.2.3 Paper Thickness Lever Positions

You need to set the paper thickness lever for the type of paper you are using, as shown in the table below.

Table 1-19. Paper Thickness Lever Positions

Paper Type	Lever Position
Ordinary paper (single sheets or continuous paper)	0
Carbonless multi-part forms with:	
2 parts (original + 1 copy)	1
3 parts (original + 2 copies)	3
4 parts (original + 3 copies)	4
5 parts (original + 4 copies)	5
6 parts (original + 5 copies)	6
7 parts (original + 6 copies)	6
Thin paper	-1 or 0
Continuous paper with labels	2
Envelopes	4 or 5
Postcards	3

1.3 Special Functions

You can access the printer's special functions by holding down the button indicated while turning on the printer.

1.3.1 Printing a Self Test

To perform a self test, follow these steps:

- 1. Make sure paper is loaded and the printer is turned off.
- To run the test using the draft font, hold down the LF/FF button while you press the Operate button to turn on the printer. To run the test using the printer's near letter-quality fonts, hold down the Load/Eject button while you turn on the printer.

After a few seconds, the printer loads the paper automatically and begins printing the self test. A series of characters is printed.

 To end the self test, press the Pause button to stop printing. If a printed page remains in the printer, press the Load/Eject button to eject it. Then turn off the printer.

1.3.2 Turning on the Double-strike Mode

If the printing on the bottom copies of your thick multi-part forms is faint, turn on the double-strike mode as described below. In the double-strike mode, the printer prints draft and bitmap images using double-strike printing. The printer does not use two-pass printing in this mode.

Note:

- ☐ The double-strike mode is available only when the paper thickness lever is set to position 4 or higher and the paper release lever is set to the pull tractor position.
- ☐ Always turn on the double-strike mode before printing on multi-part forms with seven parts.
- ☐ Use double-strike mode only under normal temperature and humidity conditions.
- ☐ When the printer is in the double-strike mode, the print speed is reduced.
- 1. Load your multi-part forms on the pull tractor.
- 2. Make sure the printer is turned off.
- While holding down the Font button, press the Operate button to turn on the printer. The printer beeps twice to indicate double-strike mode is on.

To exit the double-strike mode, turn off the printer, then hold down the **Font** button and press the **Operate** button to turn the printer back on. The printer beeps once to indicate double-strike mode is off.

1.3.3 Using the Bidirectional Adjustment Mode

If the vertical lines in the printout are not properly aligned, you can use the printer's bidirectional adjustment mode to correct this problem. See Chapter 5 for instructions on performing the bidirectional adjustment.

1.3.4 Changing Default Settings

You can change the printer's default settings using the default-setting mode. To enter the default-setting mode, hold down the **Pitch** button and press the **Operate** button to turn on the printer. The printer prints the language selection instructions. Select the language you want, and then press the **Font** button to print the default-setting mode instructions. The printed instructions list the settings you can change, describe how to change them, and show you how the control panel lights help you make settings.

Table 1-20 summarizes the default settings and options. Factory settings are bold.

Table 1-20. Default Settings

Setting	Options
Page length for front tractor*	Length in inches: 3, 3.5, 4, 5.5, 6, 7, 8,
	8.5, 11 , 70/6, 12, 14, 17
Page length for rear tractor*	Length in inches: 3, 3.5, 4, 5.5, 6, 7, 8,
	8.5, 11 , 70/6, 12, 14, 17
Skip over perforation	Off, On
Auto tear-off	Off, On
Auto line feed	Off, On
Print direction	Bi-D , Uni-D
I/F (interface) mode	Auto, Parallel, Optional
Auto I/F (interface) wait time	10 seconds, 30 seconds
Software	ESC/P, IBM 2381 Plus
0 slash	Off, On
High speed draft	Off, On
Input buffer	Off, On
Buzzer	Off, On
Auto CR (IBM 2381 Plus)**	Off, On
IBM character table**	Table 2, Table1
Character table	Standard model: Italic, PC 437, PC
	850, PC 860, PC 863, PC 865, PC
	861, BRASCII, Abicomp, Roman 8,
	ISO Latin 1
International character set for	Italic U.S.A., Italic France, Italic
Italic table	Germany, Italic U.K., Italic Denmark 1,
	Italic Sweden, Italic Italy, Italic Spain 1

^{*} The options available vary depending on the country.

^{**} These settings take effect only when IBM 2381 Plus emulation is selected.

1.3.5 Printing a Hex Dump

You can print a hexadecimal dump to isolate communication problems between the printer and a software program. To enter hex dump mode, hold down both the **LF/FF** and **Load/Eject** buttons while you press the **Operate** button to turn on the printer. Then open a software program and send a print job to the printer.

Your printer prints all the codes it receives in hexadecimal format. If characters are printable, they appear in the right column as ASCII characters. Nonprintable codes, such as control codes, are represented by dots.

To exit hex dump mode, press the **Pause** button to stop printing and the **Load/Eject** button to eject the printed page. Then turn off the printer.

1.3.6 Clearing the EEPROM

To clear the EEPROM, hold down the **Font** and **Tear Off/ Bin** buttons while you press the **Operate** button to turn on the printer. The settings in EEPROM area 1 are reset to the factory defaults, with the exception of the counters that provide the following information:

- ☐ Total lines printed since production
- ☐ Total power-on hours (in minutes)
- ☐ Total lines printed since a new ribbon cartridge was installed
- ☐ Starting year, month, and date. This is the date of printer production, and helps you determine if it is better for the user to repair or replace the printer.

See the FX-2180 specifications for more information.



The printer stores the values for the total lines printed since production, total power-on hours, total lines printed since ribbon cartridge replacement, and starting year, month, and date in the EEPROM on the main board.

1.3.6.1 Clearing the Ribbon Cartridge Replacement Counter

To reset the EEPROM's ribbon cartridge replacement counter to zero, hold down the **LF/FF** and **Tear Off/Bin** buttons while you press the **Operate** button to turn on the printer.

1.4 Consumables and Options

1.4.1 Consumables

Ribbon cartridge:	S015086
Ribbon pack:	S010033

1.4.2 Options

Paper Handling Options

High-capacity cut-sheet feeder (bin 1):	C806731
Second-bin cut-sheet feeder (bin 2):	C806741
Pull tractor:	C800321
Roll paper holder:	#8310

Optional Interface Cards

Serial I/F card:	C823051
32KB intelligent serial I/F card:	C823071
Coax I/F card:	C823141
Twinax I/F card:	C823151
Type B IEEE-1284 bidirectional parallel I/F card:	C823452
Multi-protocol Ethernet print server I/F card:	C823572

CHAPTER 2

OPERATING PRINCIPLES

2.1 Overview

The printer's main components include the printer mechanism, power supply circuit, control circuit, control panel, and housing. This chapter describes the operating principles of the main components.

2.1.1 Printer Mechanism

The printer mechanism consists of the following parts:

- □ Print head
 - The print head prints dots on paper using the ink ribbon. Print data comes from the control circuit.
- □ Carriage mechanism
 - The main parts of the carriage mechanism are the carriage unit, carriage (CR) motor, timing belt, driven pulley, and CR guide shaft. The carriage unit contains the print head. The carriage mechanism moves the carriage unit along the CR guide shaft between the left and right ends of the printable area.
- ☐ Platen gap mechanism
 - The platen gap is the gap between the platen and the print head. You adjust the platen gap to maintain print quality when using paper of different weights or thicknesses. The platen gap mechanism consists of the CR guide shaft, the platen gap adjustment bushing, and the platen gap (PG) adjustment lever. The platen gap mechanism moves the print head toward or away from the platen, depending on the position of the PG adjustment lever.
- Paper feed mechanism
 - The main components of the paper feed mechanism are the paper feed (PF) motor, the rear or front tractor, and the platen. Using the PF motor, the paper feed mechanism picks up continuous or single-sheet paper, moves it to the print head for printing, and ejects it from the printer after the page has been printed.

□ Disengage mechanism

The disengage mechanism consists of two disengage gears. It switches the paper feed torque from the PF motor to the tractor(s) or the paper feed rollers depending on the selected paper feed method (friction, front push tractor, rear push tractor, pull tractor, or push-pull tractor feeding).

☐ Ribbon advance mechanism

The main components of the ribbon advance mechanism are the ribbon feed roller and the driven pulley. The ribbon advance mechanism winds the ink ribbon in one direction. This allows the printer to use a fresh ribbon surface for printing.

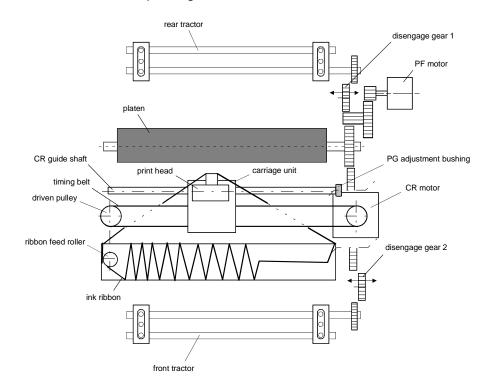


Figure 2-1. Printer Mechanism

2.1.2 Power Supply Circuit

The printer can be powered by one of the following three power supply boards: C166 PSB (120 V), C166 PSE (220 – 240 V), or C244 PSH (120 V / 220 – 240 V). The boards function in the same way, except each board has a different primary circuit. The table below lists the input voltages and fuse ratings of the boards.

Table 2-1. Power Supply Board

Board	Input Voltage	Fuse F1 Rating
C166 PSB	103.5 – 132 V	3.15 A / 125 V
C166 PSE	198 – 264 V	T 2.0 AH / 250 V
C244 PSH	85 – 138 V / 187 – 276 V	5HT4

2.1.2.1 Power Supply Circuit Operation

The power supply board has two DC power outputs: one for the control circuit and one for the printer mechanism. The table below lists the applications of the output voltages.

Table 2-2. Power Supply Output Applications

Output Voltage	Applications		
+5 VDC	Control circuit board logic		
	Sensors		
	 Control panel LEDs 		
+35 VDC	CR motor		
	PF motor		
	Print head		

When AC power enters the printer from an external power source, the filter circuit removes the noise. Then the AC voltage undergoes full-wave rectification and is smoothed to produce direct voltage. In the C244 PSH board, the AC voltages undergo voltage doubler rectification in the automatic switching IC and are smoothed to produce direct voltage. The voltage is fed to the gate port for switching FET Q1 through resistors R18 and R31. Then the switching circuit operates.

The secondary smoothing circuit produces a stepped down +35 VDC voltage. The +5 VDC voltage is generated and stabilized by feeding the +35 VDC voltage through the +5 VDC power supply circuit. The power supply circuit includes a ZC-RCC (zero cross-ringing choke converter), which contributes to the power supply circuit's high stability, efficiency, and portability.

The secondary circuit system of the power supply circuit includes the **Operate** (power) button. The **Operate** button is located on the printer's control panel and controls the power supply circuit.

A +35 V line constant voltage control circuit and over-current/over-voltage protection circuits are provided to protect the printer and control circuits.

The figure below shows the power supply circuit block diagram.

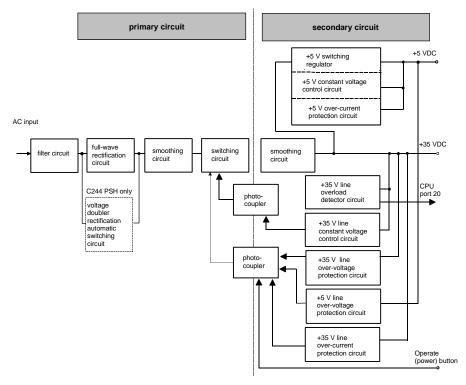


Figure 2-2. Power Supply Circuit Block Diagram

2.1.3 Control Circuit

The printer's control circuit consists of the C244 MAIN control board and the control panel board.

2.1.3.1 Control Circuit Operation

The control circuit includes a TMP96C141BF CPU that runs at 17.20 MHz, an E05B50** gate array, a 2 Mbit PROM (or 2 Mbit / 4 Mbit flash ROM), a 1 Mbit / 4 Mbit PS-RAM (or SRAM), a serial (or parallel) EEPROM, and other circuits. The control circuit controls all the printer's components. Figure 2-3 shows the control circuit block diagram.

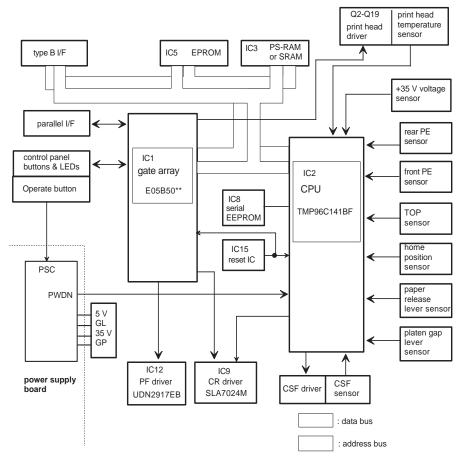


Figure 2-3. Control Circuit Block Diagram

The table below identifies and describes the main components of the control circuit on the C244 MAIN board.

Table 2-3. Main Components of the Control Circuit

Component	IC	Function(s)		
Gate array	IC1	System control		
(E05B50**)		 Peripheral device control 		
CPU	IC2	Receives data from the host		
(TMP96C141BF)		computer and sends it to the input		
		buffer in RAM		
		Extends the input data held in the huffer to greate image data		
		buffer to create image data		
		Loads image data to the image data buffer		
		Transfers image data to the print		
		head		
1 Mbit / 4 Mbit	IC3	Contains the buffer and the working		
PS-RAM		area		
2 Mbit PROM	IC5	Contains the character tables and the		
		program that runs the CPU		
Serial EEPROM	IC8	Contains data including:		
(AT93C46)		Default setting values		
		Market data		
		Mechanism and print head		
	-	parameters		
SLA7024M	IC9	Driver circuit for the CR motor		
A2917SEB	IC12	Driver circuit for the PF motor		
Reset IC	IC15	Generates the reset signal at power on		
(BH6150F)		and power down, and resets the CPU		
		and the gate array		

CHAPTER 3

TROUBLESHOOTING

3.1 Overview

This chapter contains flowcharts and checkpoint tables for troubleshooting the printer. The flowcharts tell you which printer unit or part to replace based on the printer's symptoms. The checkpoint tables list the correct values and ranges for printer part characteristics, such as resistance and continuity. You can compare the characteristics of a printer part to the checkpoint values to identify defective parts.

3.2 Troubleshooting Information

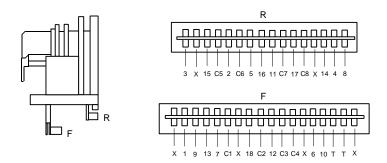
This section describes how to determine whether various printer units or parts are defective.

3.2.1 Print Head

To determine whether a print head is defective, measure the print head's coil resistance as described in the table below. Then compare the coil resistances with the correct meter reading in the table.

Table 3-1. Print Head Coil Resistance Test Points

Common pin numbers	See Figure 3-1
Test pin numbers	See Figure 3-1
Test method	Turn off the printer and disconnect the print head. Set the meter to ohms, and place one lead on each pin and the other lead on each common pin.
Meter reading	16.4 Ω ± 10% at 77° F (25° C)



F					
COM. C1 C2 C3 C4					
Pin No.	1, 7, 13	9	10, 18	6, 12	

		R				
COM.	COM. C5 C6 C7 C8					
Pin No.	2, 5, 11	3, 15	16, 17	4, 8, 14		

Figure 3-1. Print Head Connector Pin Alignment

T: Thermistor terminal

X: Not used

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3.2.2 Sensors

Table 3-2. Sensor Test Points

Sensor Connector	Test Pin Numbers	Test Method (Set the meter to DC voltage.)	Meter Reading
CN4 (HP sensor)	1: HP 2: GND 3: +5 V	Place one lead on pin 1 and the other lead on pin 2. Check the resistances while blocking the two sensor terminals.	 Open: +5 V (home position) Short: 0 V (not in home position)
CN5 (rear PE sensor)	1: +5 V 2: PE 3: GND	Place one lead on pin 2 and the other lead on pin 3. Check the resistances while toggling the rear PE sensor lever.	 Open: +5 V (Paper is loaded.) Short: 0 V (No paper is loaded.)
CN6 (front PE sensor)	1: PE 2: GND	Place one lead on pin 1 and the other lead on pin 2. Check the resistances while toggling the front PE sensor lever.	 Open: +5 V (Paper is loaded.) Short: 0 V (No paper is loaded.)
CN7 (TOP sensor)	1: E 2: GND 3: +5 V 4: A	Place one lead on pin 2 and the other lead on pin 3. Check the resistances while inserting and removing paper between the platen and the sensor.	 Open: 0 V (No paper is loaded.) Short: +5 V (Paper is loaded.)

Table 3-2. Sensor Test Points (Continued)

Sensor Connector	Test Pin Numbers	Test Method (Set the meter to DC voltage.)	Meter Reading
CN12 (paper release sensors 1 and 2)	1: Release 1 2: GND 3: Release 2 4: GND	1. Place one lead on pin 1 and the other lead on pin 2. Check the resistances while toggling the paper release lever. 2. Place one lead on pin 3 and the other lead on pin 4. Check the resistances while toggling the paper release lever.	• Open: +5 V • Short: 0 V
CN13 (PG sensors 1 and 2)	1: PG 1 2: GND 3: PG 2 4: GND	Place one lead on pin 1 and the other lead on pin 2. Check the resistances while toggling the PG sensor lever.	Open: +5 VShort: 0 V
CN2 on the control panel board (cover open sensor)	1: COPEN 2: GND	Place one lead on pin 2 and the other lead on pin 3. Check the resistances while toggling the cover open sensor lever.	 Open: +5 V (The cover is open.) Short: 0 V (The cover is closed.)

3.2.3 Motors

Table 3-3. Motor Test Points

PF Motor	
Motor connector	CN10
Common pin number	_
Test pin numbers	1, 2, 3, and 4
Test method	Turn off the printer and disconnect the PF
	motor from the control board. Set the meter to
	ohms, and place one lead on pin 1 and the
	other lead on pin 3. Then place one lead on
	pin 2 and the other lead on pin 4.
Meter reading	16.1 Ω ± 10% per phase at 77° F
	(25° C)
CR Motor	
Motor connector	CN11
Common pin number	5
Test pin numbers	1, 2, 3, and 4
Test method	Turn off the printer and disconnect the CR
	motor from the control board. Set the meter to
	ohms, and place one lead on pin 5 and the
	other lead on each of the four test pins.
Meter reading	2.7 Ω ± 10% per phase at 77° F (25° C)

3.2.4 Error Conditions

Table 3-4. Error Conditions

Error	Lights				Веер	
	Pause	Paper	Tear	Pitch	Font	Pattern
		Out	Off/Bin			
Paper out	On	On	_	_	_	O×3
Paper jam	On	Flashes		_		O×3
(The paper is						
not ejected						
completely.)						
Print head	Flashes					_
overheated						
Cover open	On	_	_	_	_	O×3
Fatal error	Flashes	Flashes	Flashes	Flashes	Flashes	●×5

- O Indicates the beeper sounds for approximately 100 ms with an interval of approximately 100 ms.
- Indicates the beeper sounds for approximately 500 ms with an interval of approximately 100 ms.

3.3 Unit Level Troubleshooting

You may be able to identify a defective printer unit simply by observing the printer's symptoms. The table below lists the symptoms for several printer problems. After you determine the type of printer problem you have, see the corresponding flowchart to isolate the cause of the problem and repair the printer.

Table 3-5. Printer Symptoms and Problem Descriptions

Symptom	Problem Description	Flowchart
Abnormal	The carriage does not move at all.	Flowchart 1
carriage	When you turn on the printer, the carriage	
operation	moves away from the home position and then	
	stops. All the indicator LEDs on the control	
	panel flash.	
Abnormal	The printer does not feed the paper at all.	Flowcharts
paper	When you turn on the printer, the printer ejects	2-1 and 2-2
feeding	the paper automatically.	
	After you load paper, the printer ejects the	
	paper automatically and then indicates it is in	
	the ready state.	
Abnormal	The control panel indicator LEDs do not	Flowchart 3
power	come on.	
operation	The Operate button does not work.	
	The control panel buttons do not work.	
Abnormal	No image is printed.	Flowchart 4
printing	Printing is faulty; some dots are not printed.	

The flowcharts use the following symbols:

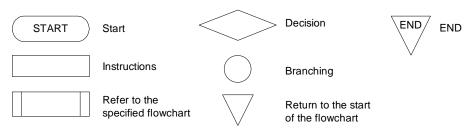


Figure 3-2. Flowchart Symbols

1. Abnormal Carriage Operation

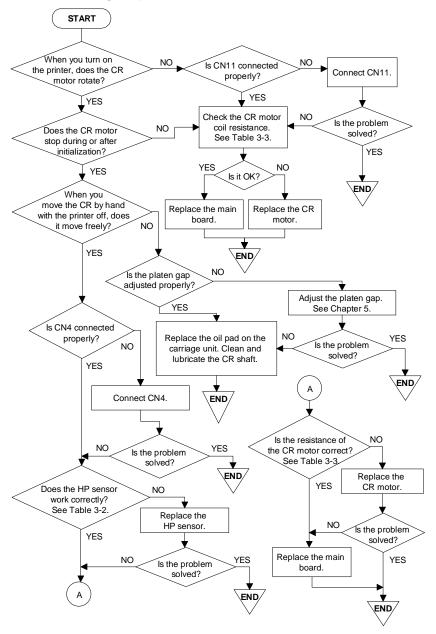


Figure 3-3. Flowchart 1

2-1. Abnormal Paper Feeding

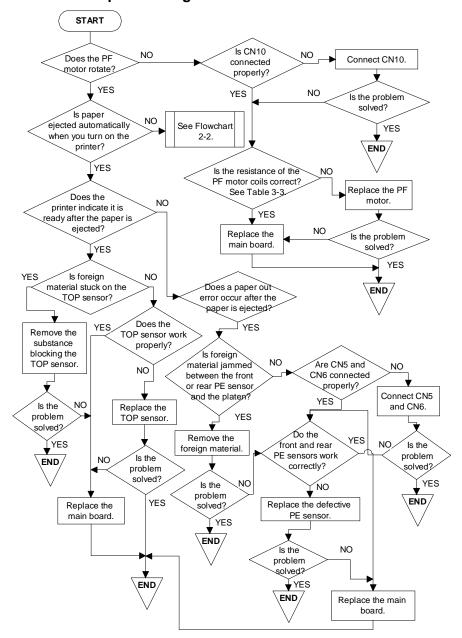


Figure 3-4. Flowchart 2-1

2-2. Abnormal Paper Feeding

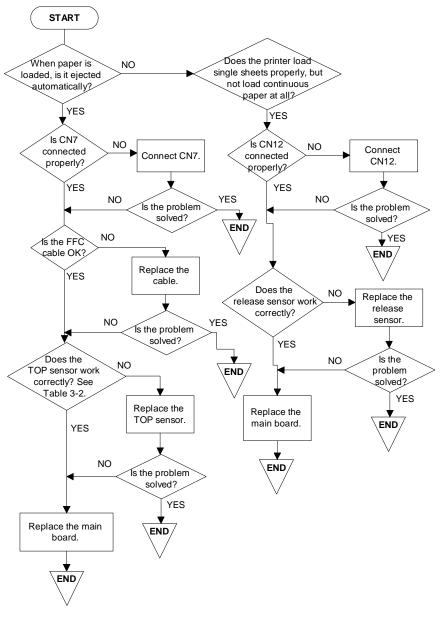


Figure 3-5. Flowchart 2-2

3. Abnormal Power Operation

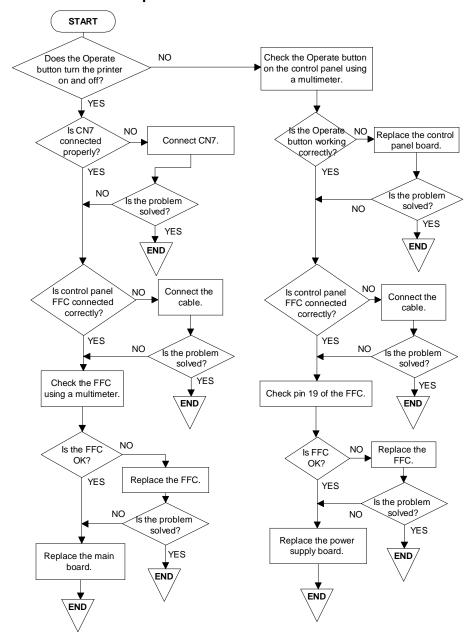


Figure 3-6. Flowchart 3

4. Abnormal Printing

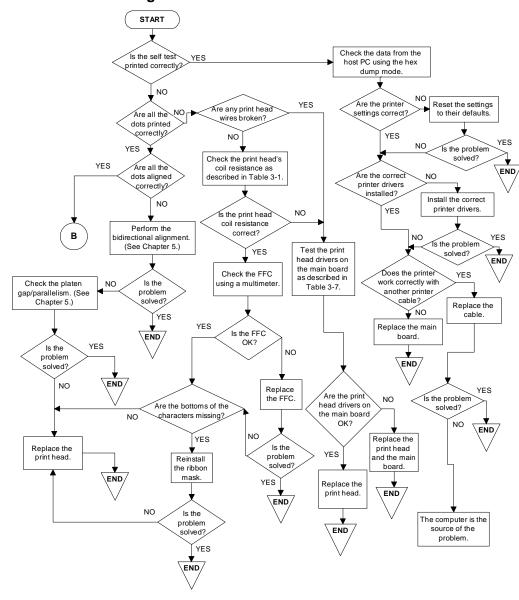


Figure 3-7. Flowchart 4

3.4 Repairing the Power Supply Board

The table below provides instructions on how to repair the power supply board assembly. It lists various power supply board problems and provides likely causes, checkpoints, and solutions. To determine whether a component is defective, compare its readings with the correct waveforms, resistances, and other values listed in the table below. Then replace the component if necessary.



The OPERATE button on the control panel only turns the secondary power circuit on or off, so the primary circuit is live as long as the printer is connected to an AC power outlet. Before you touch the power supply board or repair it, disconnect the printer from the AC power outlet.

Note:

Use an oscilloscope to check the waveforms in Table 3-6.

Table 3-6. Repairing the Power Supply Board

Problem	Cause	Checkpoint	Solution
The +35 V and +5	Diode bridge DB1	Measure the DC	Replace
V lines are not	is dead.	voltage between pins	DB1.
output when the		3 and 4 of DB1.	
printer is turned			
on.			
	Transformer coil	Measure the	Replace
	T1 is open.	resistances of the T1	T1.
		transformer coils at	
		pins 12 and 15, 9 and	
		11, 7 and 8, and 3	
		and 4.	

Table 3-6. Repairing the Power Supply Board (Continued)

Problem Cause Solution Checkpoint The +35 V and Switching Replace · Check that the resistance +5 V lines are FET Q1 is between the source and the Q1. not output dead. drain is infinite. • Check the voltage waveform when the printer is between the source and the turned on. drain of Q1. Figure 3-8. Waveform 1 PC1 is Check the waveform between Replace PC1. dead. pins 3 and 4. Figure 3-9. Waveform 2 Q32 is Check that the resistance Replace dead. between the collector and the Q32. emitter is infinite. Q31 is Replace Check that the resistance dead. between the source and the drain Q31. is infinite.

Table 3-6. Repairing the Power Supply Board (Continued)

Problem	Cause	Checkpoint	Solution
The +5 V line is not output.	Chopper IC IC51 is dead.	Check the waveform at pin 8 of IC51. AVIT B. BU LATE B. BUS SAVE SAVE SAVE SAVE SAVE SAVE SAVE SAV	Replace IC51.
	Q51 is	Check the waveform at	Replace Q51.
	dead.	the collector of Q51.	rtopiaco do i.
		AUT 0.00 AT = 0.0us SAUF SAUF SAUF SAUF SAUF SAUF SAUF SAUF	
	L51 is	Check the resistance	Replace L51.
	dead.	between the terminals of L51.	
The PWDN	IC51 is	Check if the voltage of pin 6	Replace IC51.
signal is constantly HIGH.	dead.	exceeds 1.3 V. If it does, IC51 is dead.	

3.5 Repairing the Main Board Assembly

The table below provides instructions on how to repair the main board assembly. It lists various main board problems and provides likely causes, checkpoints, and solutions. To determine whether a component is defective, compare its readings with the correct waveforms, resistances, and other values listed in the table below. Then replace the component if necessary.

Note:

Use an oscilloscope to check the waveforms in Table 3-7.

Table 3-7. Repairing the Main Board Assembly

Problem	Cause	Checkpoint	Solution
The printer does not operate at all.	Reset IC IC15 is defective.	Check the voltage waveforms of the VCC signal (CH 1: pin 7 of IC15) and the /RESET signal (CH 2: pin 5 of IC15) when the printer is turned on.	Replace the main board or IC15.

Table 3-7. Repairing the Main Board Assembly (Continued)

Problem	Cause	Checkpoint	Solution
The printer does not operate at all.	The PROM (IC5) is not selected.	Check for a change in the signal (HIGH to LOW or LOW to HIGH) at pin 137 of IC1.	Replace the main board.
		Figure 3-13. Waveform 6	
	The PSRAM (IC3) is not selected.	Check for a change in the signal (HIGH to LOW or LOW to HIGH) at pin 132 of IC1.	Replace the main board.
	The CPU (IC2) is defective.	Check the oscillator signal at pin 26 or 27 of the CPU. AVITER SHUP TO THE THE TRANSPORT TO THE TRANSPORT	Replace the main board.

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Table 3-7. Repairing the Main Board Assembly (Continued)

Problem Cause Checkpoint Solution Carriage The CPU or · Check the input signal • If an input IC9 is waveforms (CH 1) at operation is signal is not pins 5, 6, 16, and 17 of abnormal. defective. correct, IC9. replace the • Check the output signal main board. waveforms (CH 2) at • If an output pins 1, 8, 11, and 18 of signal is not IC9. correct, replace IC9 or the main board. Figure 3-15. Waveform 8 IC1 is If an output signal Check the output signals at pins 62, 63, 64, and 65 of is not correct, defective. IC1. replace the main board.

Table 3-7. Repairing the Main Board Assembly (Continued)

	o 7. Repairii	ig the Main Board Assembly	(00111111111111111111111111111111111111
Problem	Cause	Checkpoint	Solution
Paper feeding is abnormal.	IC1, IC2, or IC12 is defective.	Check the input signal waveforms (CH 1) at pins 26 and 43 of IC12. Check the output signal waveforms (CH 2) at pins 3, 6, 18, and 21 of IC12. AU1=18.8U AU1=18.8U	If an input signal is not correct, replace the main board. If an output signal is not correct, replace IC12 or the main board.
No data is printed.	The CPU is defective.	Check the output signal waveforms at pin 15 or 19 of IC2. AVIT B. BBU PEAKDET Ins PEGURE 3-17. Waveform 10	If an output signal is not correct, replace the main board.

Table 3-7. Repairing the Main Board Assembly (Continued)

Problem	Cause	Checkpoint	Solution
A particular dot does not print.	IC1 is defective, or one of the print head drive transistors (Q2 – Q19) is defective.	Check the input signal waveform (CH 1) at the base of each transistor. Check the output signal waveform (CH 2) at the collector for each transistor. AUT 0.88U AT = 7 + .22 ms SAUT CH 2 SAUT PEAKDET 2ms Figure 3-18. Waveform 11	If an input signal is not correct, replace the main board. If an output signal is not correct, replace the transistor or the main board.

3.6 Repairing the Printer Mechanism

The table below describes how to repair the printer mechanism. It lists various printer mechanism problems and symptoms, and provides likely causes, checkpoints, and solutions. The checkpoint column lists what to check and indicates how the printer mechanism works when it is operating properly. The solution column tells you how to repair the printer mechanism.

For replacement and adjustment instructions, see Chapter 4, "Disassembly and Assembly," and Chapter 5, "Adjustment." If the same symptom recurs after you repair the printer mechanism, select another probable cause and repair the printer mechanism again.

Table 3-8. Repairing the Printer Mechanism

Problem	Symptom	Cause	Checkpoint	Solution
Carriage operation is abnormal.	When you turn on the printer, the CR motor does not rotate at all.	The CR motor is defective.	Measure the CR motor's coil resistance. It should be approx. 2.7 Ω. (See Table 3-3.)	Replace the CR motor.
	When you turn on the printer, the CR motor does not rotate at all and the control panel LEDs flash.	CN11 is not properly connected to the main board.	Check the connection.	Connect CN11.
	When you turn on the printer, the CR motor rotates but the carriage does not move.	The timing belt has come off the pinion gear of the CR motor.	Check the timing belt.	Replace the timing belt.
	The carriage moves slightly and then stops.	The platen gap is too narrow.	Move the carriage by hand to check if it moves smoothly.	Check the platen gap and adjust it if it is too small. See Chapter 5.

Table 3-8. Repairing the Printer Mechanism (Continued)

Solution **Problem Symptom** Cause Checkpoint Carriage Replace Move the The carriage There is a lack operation is the oil moves slightly of lubrication, carriage by and then stops. pad. abnormal. or foreign hand to check if it moves Remove material is stuck on the smoothly. the CR • Check the CR shaft, CR shaft or oil shaft and oil pad. clean it. pad to see if and then they are **lubricate** sufficiently it. lubricated. The HP sensor Check the Replace the HP is defective. operation of the HP sensor. (See sensor. Table 3-2.) Foreign Check the HP Remove material is sensor. any lodged foreign between the material. HP sensor terminals. The HP sensor Check the Connect is not properly connection. CN4. connected to CN4. The HP sensor The carriage Check the Replace the HP moves left is defective. operation of the (toward the HP sensor. (See sensor. home position) Table 3-2.) and strikes the printer frame.

Table 3-8. Repairing the Printer Mechanism (Continued)

Problem	Symptom	Cause	Checkpoint	Solution
Printing is abnormal.	No image is printed.	The common wires in the print head FFC are disconnected or there is no continuity.	Check the common wires in the print head FFC.	Replace the print head FFC.
	The printer does not print certain dots.	The print head is defective.	Measure the coil resistance of the print head. It should be approx. 16.4 Ω. (See Table 3-1.)	Replace the print head.
		The common wires in the print head FFC are disconnected, or there is no continuity.	Check the continuity in the FFC.	Replace the print head FFC.

Table 3-8. Repairing the Printer Mechanism (Continued)

Problem	Symptom	Cause	Checkpoint	Solution
	Printing is	Platen	Check the	Adjust the
	uneven (lighter	parallelism is	platen	platen
	or darker on the	not adjusted	parallelism.	parallelism.
	left side of the	properly.	(See Chapter 5.)	(See
	page than on			Chapter 5.)
	the right side).			
	Printing is too	The platen gap	Check the	Adjust the
	light.	is too wide.	platen gap. (See	platen gap.
			Chapter 5.)	(See
				Chapter 5.)
		The print head	Check if the tips	Replace
		is defective.	of the dot wires	the print
			are worn.	head.
		The print head	Check the print	Replace
		drivers on the	head drivers on	the main
		main board are	the main board.	board.
		bad.	(See Table 3-7.)	

Table 3-8. Repairing the Printer Mechanism (Continued)

Problem	Symptom	Cause	Checkpoint	Solution
Paper	The PF motor	The PF motor is	Measure the coil	Replace
feeding is	does not rotate	defective.	resistance of the	the PF
abnormal.	at all.		PF motor. It	motor.
			should be	
			approx. 16.1 Ω.	
		011401	(See Table 3-3.)	
		CN10 is not	Check the	Connect
		properly	connection.	CN10.
		connected to the main board.		
		The front or rear	Check the	Donloos
		PE sensor is	operation of the	Replace the front or
		defective.	front and rear PE	rear PE
		derective.	sensors.	sensor.
			(See Table 3-2.)	301.001.
		The front or rear	Check the front	Install the
		PE sensor is not	and rear PE	front and/or
		installed	sensor	rear PE
		correctly.	connections.	sensor
				correctly.
	When you turn	Foreign material	Check the TOP	Remove
	on the printer,	is stuck on the	sensor.	any foreign
	it ejects the	TOP sensor.		material
	paper			from the
	automatically			TOP
	and then			sensor.
	indicates it is in			
	the ready state.			
	siale.	The TOP sensor	Check the	Replace
		is defective.	operation of the	the TOP
		.5 40.000.	TOP sensor.	sensor.
			(See Table 3-2.)	
	<u>I</u>		(300 : 550 0 2.)	

Table 3-8. Repairing the Printer Mechanism (Continued)

Problem Symptom Cause Checkpoint Solution When you turn Paper Remove and Remove Foreign feeding is on the printer, it material is check the platen. any foreign abnormal. ejects the lodged material paper autobetween the from the matically and a front or rear PE platen. paper out error sensor and the occurs. platen. CN5 or CN6 is Check the Connect CN5 and/or disconnected. connections. CN6. The front or Check the Replace rear PE sensor operation of the the front or is defective. front and rear PE rear PE sensors. (See sensor. Table 3-2.) The TOP When you load Check the Connect the FFC. paper, the sensor's FFC is connection. printer ejects it not properly automatically. connected to CN7. The FFC is Check the FFC's Replace continuity using a defective. the FFC. multimeter. The TOP Check the Replace the TOP sensor is operation of the TOP sensor. defective. sensor. (See Table 3-2.)

Table 3-8. Repairing the Printer Mechanism (Continued)

Problem	Symptom	Cause	Checkpoint	Solution
Paper feeding is abnormal.	The printer loads single-sheet paper correctly, but does not load continuous paper at all.	CN12 is not connected properly.	Check the connection.	Connect CN12.
		One of the paper release sensors is defective.	Check the operation of the paper release sensors. (See Table 3-2.)	Replace the paper release sensor.
Ribbon feeding is abnormal.	The printer does not feed the ribbon.	The ribbon cartridge is defective.	Remove the cartridge, and turn the ribbon feed knob by hand to check if the ribbon cartridge feeds the ribbon normally.	Replace the ribbon cartridge.
		Foreign material is caught in the ribbon driving gears.	Check the ribbon driving gears.	Remove any foreign material caught in the gears or replace the ribbon cartridge.
	The ribbon feeds properly only when the carriage moves in one direction.	The ribbon driving gears are defective.	Move the carriage by hand to check if the gears function normally.	Replace the ribbon driving mechanism.



DISASSEMBLY AND ASSEMBLY

4.1 Overview

This section provides warnings and cautions about disassembling and assembling the printer, and information about tools and screws. It also describes how to check the printer after you repair it to make sure it is operating properly.

4.1.1 Precautions

Follow the precautions below when disassembling or assembling the printer.



- Before disassembling, assembling, or adjusting the printer, disconnect the power supply cable from the AC power socket. Failure to do so can cause physical injury.
- The power switch is wired in the secondary circuitry of the power supply board. Therefore, the power supply's primary circuitry remains live even after the printer is turned off.
- Never touch primary parts of the power supply unit (including the heat sink) while the printer is plugged in.

⚠CAUTION

To maintain efficient printer operation:

- Use only recommended tools for repair or maintenance work.
- Use only recommended lubricants and adhesives. (See Chapter 6.)
- Adjust the printer only as described in this manual.

4.1.2 Tools

Tables 4-1 and 4-2 list the tools recommended for disassembling, assembling, or adjusting the printer. Use only tools that meet these specifications.

Table 4-1. Recommended Tools

Tool	Part No.
Round-nose pliers	B740400100
Wire cutters	B740500100
Tweezers	B741000100
Soldering iron	B740200100
E-ring holder #2.5	B740800400
Phillips screwdriver No. 2	B743800200
Standard screwdriver	B743000100
Thickness gauge	B776702201
Needle-nose pliers	_
Pin drive	_

Note: All tools are commercially available.

Table 4-2. Equipment Required for Maintenance

Description	Specification		
Multimeter	_		
Oscilloscope	50 MHz		

Note: An oscilloscope is required only for servicers who repair to the component level.

4.1.3 Specifications for Screws

Table 4-3 lists the abbreviations used in this chapter for small parts, such as screws and washers.

Table 4-3. Screw Types and Abbreviations

Abbreviation	Part Name			
CPS	Cross-recessed pan head S-tight screw			
CBB	Cross-recessed bind head B-tight screw			
CBS	Cross-recessed bind head S-tight screw			
CBN	Cross-recessed bind head N-tight screw			
CBC	Cross-recessed bind head C-lamitite screw			
CBA	Cross-recessed bind head A-lamitite screw			
CB(O)	Cross-recessed bind head with outside-toothed lock			
	washer			

Table 4-4 illustrates the various screw types.

Table 4-4. Screw Types

Head				
Тор	Side	Body		
Cross-recessed head	Pan Bind (with notch)	S-tight Normal B-tight C-lamitite A-lamitite		

4.1.4 Service Check After Repair

After you repair the printer and before you return it, use the checklist in Table 4-5 to make sure the printer is operating properly.

Table 4-5. Inspection Checklist for the Repaired Printer

Category	Item to Check	Question to Answer	Checkmark
Printer unit	Print head	Are any wires broken?	□ Checked□ Not necessary
		Are any wires worn out?	□ Checked□ Not necessary
	Carriage mechanism	Does the carriage move smoothly? Movement noisy Mechanism dirty Mechanism oily	□ Checked □ Not necessary
		Is the CR motor running at the correct temperature (not overheating)?	□ Checked □ Not necessary
	Paper advance mechanism	Is paper advancing smoothly? Movement noisy Mechanism dirty Mechanism oily	□ Checked □ Not necessary
		Is the PF motor running at the correct temperature (not overheating)?	□ Checked □ Not necessary

Table 4-5. Inspection Checklist for the Repaired Printer (Continued)

Category	Item to Check	Question to Answer	Checkmark
Printer unit	Paper path	Is the type of paper in the	□ Checked
(continued)		printer feeding smoothly?	□ Not necessary
		Is the tractor feeding	□ Checked
		paper correctly?	□ Not necessary
		Is the paper path clear of	□ Checked
		all obstructions?	□ Not necessary
		Is the platen free of	□ Checked
		damage?	□ Not necessary
	Ribbon	Is the ribbon mask free of	□ Checked
	mask	distortion?	□ Not necessary
Testing	Self test	Does the self test print	□ Checked
		correctly?	□ Not necessary
	Online test	Does the online test print	□ Checked
		correctly?	□ Not necessary
Adjustment	Print head	Is the platen gap adjusted	□ Checked
		correctly?	□ Not necessary
		Is the bidirectional print	□ Checked
		position adjusted correctly?	□ Not necessary
	Default	Have the user-change-	□ Checked
	settings	able settings been reset to the default settings?	□ Not necessary
System	ROM	What is the ROM	□ Checked
upgrade	version	version? Install the latest	□ Not necessary
		ROM version, if	-
		necessary.	
	Shipment	Has the ribbon been	□ Checked
		removed?	□ Not necessary
		Are all the necessary	□ Checked
		parts included in the shipment?	□ Not necessary

4.2 Disassembly and Assembly

This section describes procedures for disassembling and assembling the main components of the printer. When the procedure for installing a component is simply the reverse of removing the component, this chapter does not describe the assembly procedure. If necessary, special notes on assembling or adjusting a component are given at the end of the description of each procedure. Be sure to follow the instructions in these notes.

The exploded diagrams in the appendix show how the components fit together. Refer to them as necessary.

∧ CAUTION

- Before you disassemble any part of the printer, read the warnings in section 4.1.1.
- Before you disassemble the printer, follow the instructions in section 4.2.1.
- Whenever you repair the printer, wipe the surface of the paper width (PW) sensor assembly with a soft cloth, and keep it clean to avoid abnormal operation. If the surface is dirty because of any adhering material, sensor sensitivity decreases and printer operation is impaired.

The flowchart below shows the order in which to disassemble the printer.

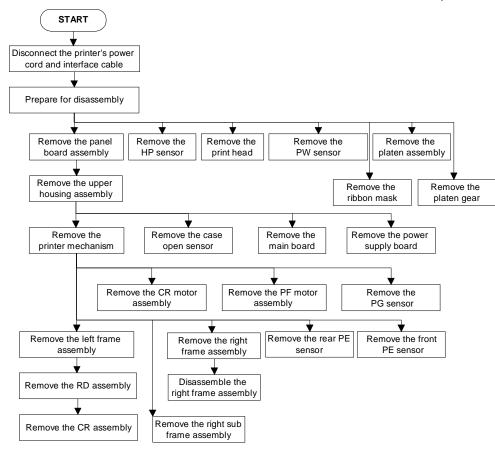


Figure 4-1. Flowchart for Disassembling the Printer

4.2.1 Preparing to Disassemble the Printer

Before you disassemble the printer, disconnect the printer's power cord and interface cable, and remove any paper loaded in the printer. Then remove the following parts from the printer:

front edge guide assembly rear edge guide assembly front tractor assembly platen knob rear tractor assembly paper eject assembly front cover bottom cover printer cover ribbon cartridge

Refer to Figure 4-3.



Remove the paper eject assembly. Then remove the front and rear tractor assemblies by pushing the tabs to release the hooks on both sides. (See Figure 4-2 to locate the tabs on the rear tractor.) When reinstalling the tractors, be sure to snap the hooks onto the projecting parts.

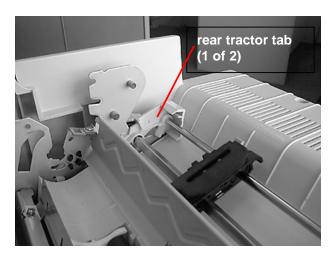


Figure 4-2. Removing the Rear Tractor

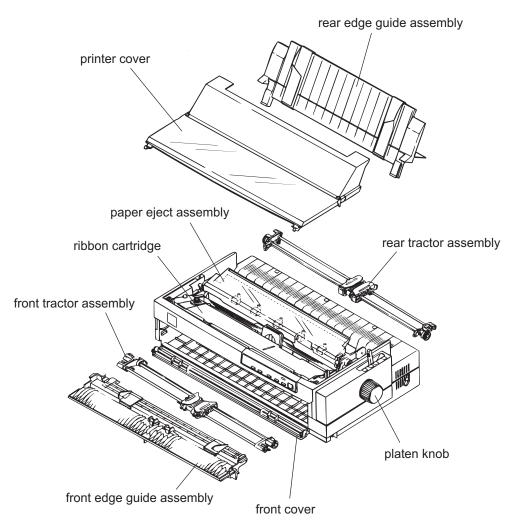


Figure 4-3. Parts to Remove Before Disassembling the Printer

4.2.2 Removing the Panel Board Assembly

- 1. Remove the printer cover and ribbon cartridge. (See section 4.2.1.)
- Release the left clips for the panel board assembly by pushing them from the cutout located on the inside front of the upper housing assembly.
- Release the flexible flat cable (FFC) by sliding the lock cover of connector CN1 as shown in Figure 4-5. Then disconnect the FFC from connector CN1 and disconnect connector CN2 from the panel board assembly.

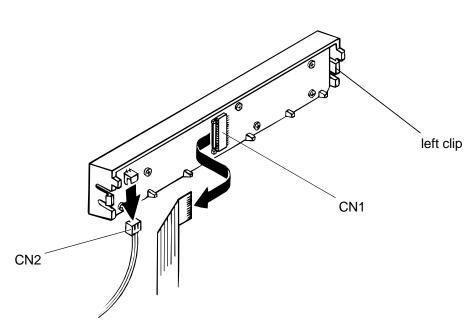


Figure 4-4. Removing the Panel Board Assembly

4. Remove the panel board assembly from the upper housing assembly.



- Before disconnecting the FFC from CN1, slide the lock cover for CN1 as shown in Figure 4-5. Then disconnect the FFC from CN1. After you reconnect the FFC for CN1, lock the lock cover.
- The FFC must be connected properly, as shown in Figure 4-5. Connect it so that the exposed terminals of the FFC face upward against the panel board.

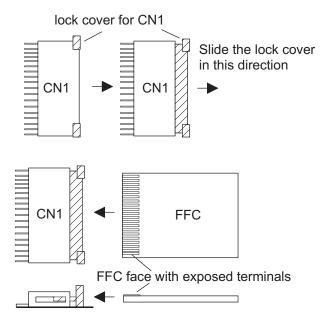


Figure 4-5. Disconnecting and Connecting CN1 and the FFC

4.2.3 Removing the Print Head

- 1. Remove the printer cover and ribbon cartridge. (See section 4.2.1.)
- 2. Remove the two CBS screws (3 \times 10) securing the print head to the CR assembly.
- 3. Remove the print head from the CR assembly.
- 4. Disconnect the two wide FFCs from the print head and then disconnect the narrow FFC from the connector on the CR cover.

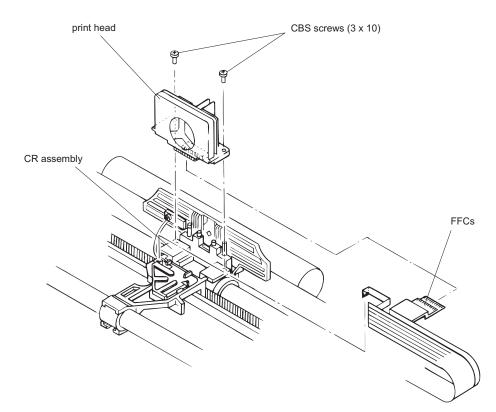


Figure 4-6. Removing the Print Head



- The FFCs must be connected properly, as shown in Figure 4-7.
- The tightening torque for the CBS screws is 0.59 0.78 Nm (6 8 Kgf-cm).



Perform the platen gap/parallelism, bidirectional print alignment, factory settings, and TPE level reset adjustments. (See Chapter 5.)

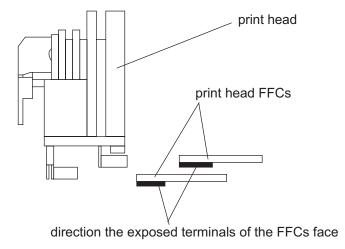


Figure 4-7. Connecting the Print Head FFCs

4.2.4 Removing the HP Sensor

- 1. Remove the printer cover, ribbon cartridge, front edge guide, and front cover. (See section 4.2.1.)
- 2. Disconnect the connector cable for the HP sensor.



Note the orientation of the HP sensor so you can reinstall it the same way. See Figure 4-8.

3. Remove the HP sensor from the front paper entrance by pushing up and releasing the two clips at the bottom of the HP sensor.

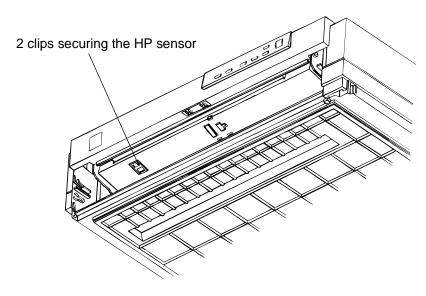


Figure 4-8. Removing the HP Sensor

4.2.5 Removing the PW Sensor Assembly

- 1. Remove the printer cover and ribbon cartridge. (See section 4.2.1.)
- 2. Remove the print head. (See section 4.2.3.)
- 3. Remove the CB screw (2.5×5) securing the PW sensor to the ribbon mask holder.
- 4. Release the three clips on the CR cover that secure it to the bottom of the CR assembly. Then lift the cover slightly.
- 5. Remove the FFC from the PW sensor connector on the CR cover.
- 6. Remove the PW sensor assembly along with the CR cover by pushing and releasing the clip for the CR cover, as shown in Figure 4-9.

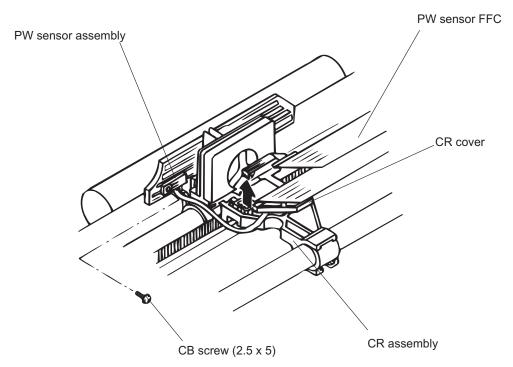


Figure 4-9. Removing the PW Sensor Assembly

- Mount the PW sensor assembly onto the ribbon mask holder groove, aligning the bottom line of the micro photo sensor with the bottom line of the groove.
- Whenever you remove the PW sensor assembly, clean the surface of the sensor by wiping it with a soft cloth. If the PW sensor is not clean, the printer may operate incorrectly. For example, it may print on the platen surface.
- The tightening torque for the CB screw is 0.08 0.12 Nm (0.8 0.12 Kgf-cm).

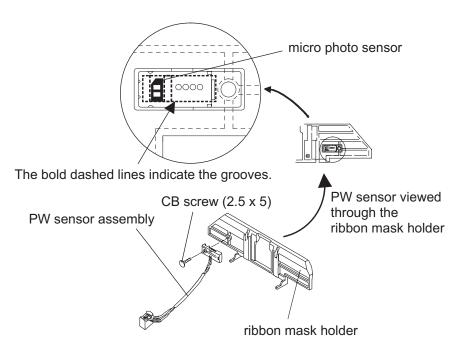


Figure 4-10. Installing the PW Sensor Assembly

ADJUSTMENT

After you replace the PW sensor assembly, reset the TPE level. (See Chapter 5.)

4.2.6 Removing the Ribbon Mask

- 1. Remove the printer cover, ribbon cartridge, and print head. (See sections 4.2.1 and 4.2.3.)
- 2. Using tweezers, remove the ribbon mask from the ribbon mask holder, as shown in Figure 4-11.

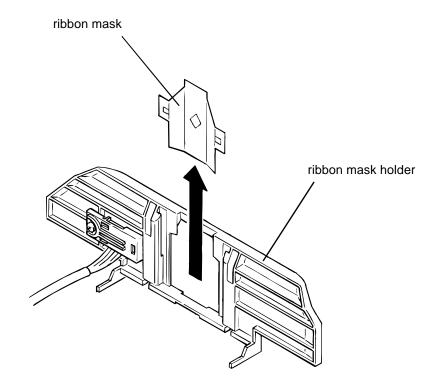


Figure 4-11. Removing the Ribbon Mask

4.2.7 Removing the Upper Housing Assembly

- 1. Remove the printer cover, rear edge guide assembly, paper eject assembly, and rear tractor unit. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the four CBB screws (4×4) securing the upper housing assembly. (Figure 4-13 shows the screw locations.)
- 4. Remove the platen knob.
- Release the two hooks from the holes on both sides of the upper housing assembly near the front, and release the tab in the middle front of the upper housing assembly. Then lift up the front of the upper housing assembly.

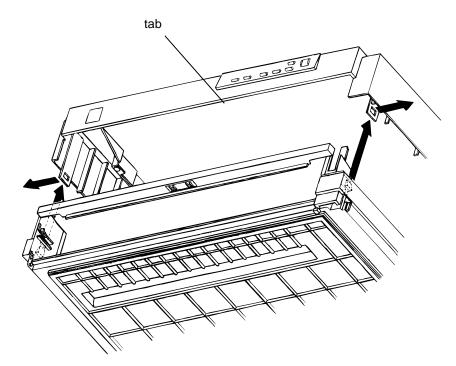


Figure 4-12. Releasing the Upper Housing Assembly Hooks and Tab

6. Remove the upper housing assembly.

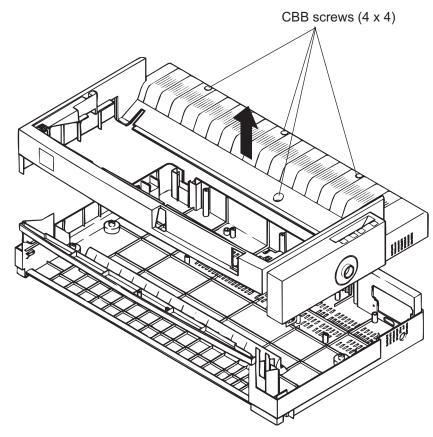


Figure 4-13. Removing the Upper Housing Assembly

✓ IMPORTANT

The tightening torque for the four CBB screws is 0.98 - 1.22 Nm (10 - 12 Kgf-cm).

4.2.8 Removing the Platen Assembly

- 1. Remove the printer cover, ribbon cartridge, and platen knob. (See section 4.2.1.)
- 2. Remove the print head, ribbon mask, and upper housing assembly. (See sections 4.2.3, 4.2.6, and 4.2.7.)
- 3. Move the paper release lever to the pull tractor position.
- 4. Release the locks for the left and right bushings (8 mm) by pushing the lever holders for the bushings out and then forward, as shown in Figure 4-14.

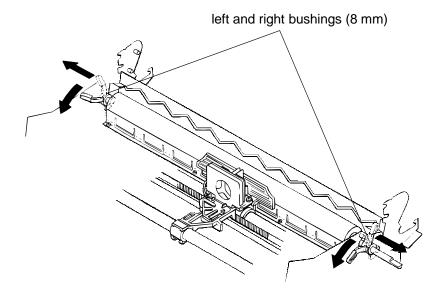


Figure 4-14. Releasing the Locks for the Bushings

5. Slide the platen assembly to the right, and move the print head to the right edge.

6. Pull up the left edge of the platen assembly by tilting it backward. Then pull up the right edge of the platen assembly.

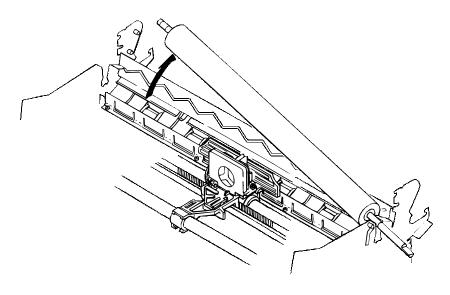


Figure 4-15. Removing the Platen Assembly



- Before installing the platen assembly in the printer mechanism, move the print head to the right edge of the CR shaft, and move the paper release lever to the pull tractor position. This helps you mount the platen assembly more easily.
- After installing the platen assembly in the printer mechanism, make sure the locks for both the left and right bushings (8 mm) are locked completely.
- Be careful handling the lever holders for the left and right bushings (8 mm); they are fragile.



Adjust the platen gap/parallelism and reset the TPE level. (See Chapter 5.)

4.2.9 Removing the Platen Gear

- 1. Remove the printer cover, ribbon cartridge, and platen knob. (See section 4.2.1.)
- 2. Remove the print head, ribbon mask, and upper housing assembly. (See sections 4.2.3, 4.2.6, and 4.2.7.)
- 3. Remove the platen assembly. (See section 4.2.8.)
- 4. Remove the retaining ring (C clip) by pushing both sides of it using needle-nose pliers.

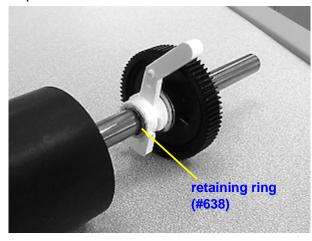


Figure 4-16. Removing the Retaining Ring

5. Remove the spring pin (2 x 12) using a pin drive. Then remove the platen gear (36 mm spur gear).

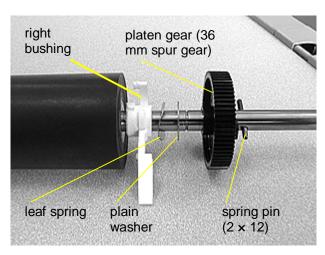


Figure 4-17. Removing the Platen Gear

4.2.10 Removing the Case Open Sensor Assembly

- 1. Remove the printer cover, rear edge guide assembly, paper eject assembly, and rear tractor unit. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Turn the upper housing assembly over and remove the case open sensor assembly by loosening the CBB screw (3×8) securing the sensor holder to the upper housing assembly.

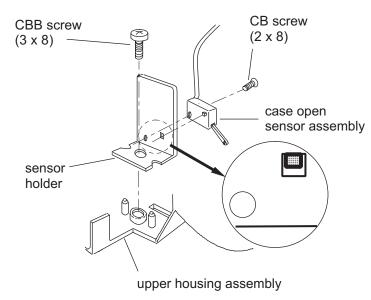


Figure 4-18. Removing the Case Open Sensor Assembly

4.2.11 Removing the Printer Mechanism

- 1. Remove the printer cover, front and rear edge guide assemblies, front cover, paper eject assembly, and rear tractor unit. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Remove the three CBS screws (3×4) securing the upper shield plate to the printer mechanism and remove the upper shield plate. Then remove the upper I/F grounding plate from the main board assembly.

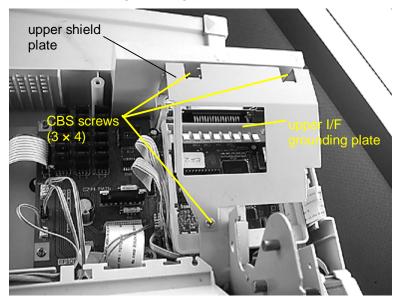


Figure 4-19. Removing the Upper Shield Plate and Upper I/F Grounding Plate

5. Disconnect the cables from the following connectors on the main board assembly.

Table 4-6. Main Board Connectors

Connector Number	Pins	Connector Color	Connector Number	Pins	Connector Color
CN4	3	white	CN5	3	black
CN6	2	white	CN7	4	gray
CN8	18	gray	CN9	16	gray
CN10	4	white	CN11	5	white
CN12	4	white	CN13	4	black

Note: To disconnect the cables from CN10 and CN11, pull up the connector locks.

- 6. As shown in Figure 4-20, remove the four printer mechanism mounting screws securing the printer mechanism.
- 7. Remove the printer mechanism.

✓ IMPORTANT

- When you connect the cables to CN10 and CN11, align the red line in the cable with pin 1 of the connector.
- The tightening torque for the four printer mechanism mounting screws is 0.78 0.98 Nm (10 12 Kgf-cm).

ADJUSTMENT

Adjust the bidirectional print alignment and reset the TPE level. (See Chapter 5.)

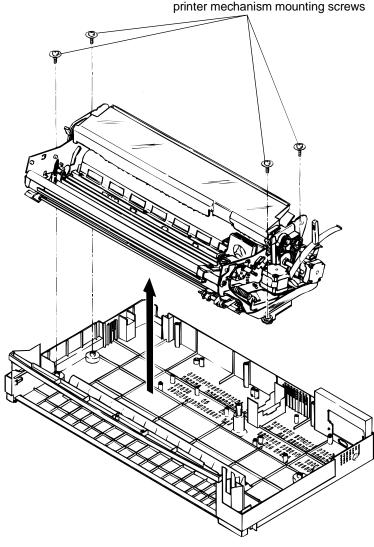


Figure 4-20. Removing the Printer Mechanism

4.2.11.1 Removing the CR Motor Assembly

- 1. Remove the printer cover, rear edge guide assembly, paper eject assembly, and rear tractor unit. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Remove the printer mechanism. (See section 4.2.11.)
- 5. Release the extension spring (15.7 g) and then disengage the timing belt from the CR motor assembly.
- 6. Remove the two screws securing the CR motor assembly.
- 7. Remove the CR motor assembly from the printer mechanism.

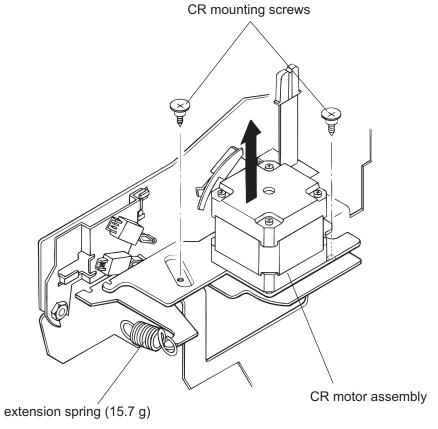


Figure 4-21. Removing the CR Motor Assembly

✓ IMPORTANT

The tightening torque for the two CR mounting screws is 0.78 - 0.98 Nm (8 - 10 Kgf-cm).

ADJUSTMENT

Adjust the bidirectional print alignment and reset the TPE level. (See Chapter 5.)

4.2.11.2 Removing the PF Motor Assembly

- 1. Remove the printer cover, front and rear edge guide assemblies, front cover, paper eject assembly, and front and rear tractor units. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Remove the printer mechanism. (See section 4.2.11.)
- 5. Move the paper release lever to the pull tractor position.
- 6. Remove the CBS screw (3×6) and the CB screw (3×8) securing the PF motor to the right sub frame.
- 7. Remove the PF motor from the right sub frame.

✓ IMPORTANT

- Before attaching the PF motor to the right sub frame, set the paper release lever to the pull tractor position (full release position).
- The CB screw (3 × 8) is used to secure the upper part of the PF motor. The CBS screw (3 × 6) is used to secure the lower part of the PF motor.
- The tightening torque for the CB and CBS screws is 0.8 1.0 Nm (8 10 Kgf-cm).

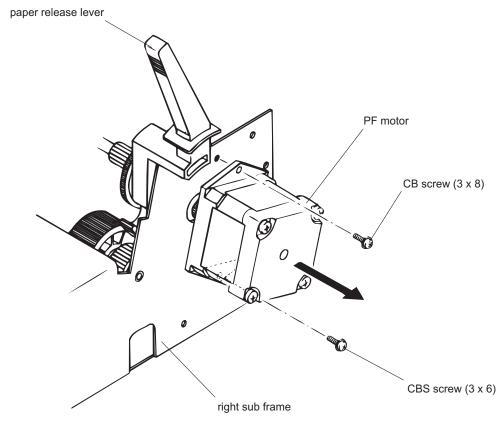


Figure 4-22. Removing the PF Motor

4.2.11.3 Removing the PG Sensor Assembly

- 1. Remove the printer cover, front and rear edge guide assemblies, front cover, paper eject assembly, and front and rear tractor units. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Remove the printer mechanism. (See section 4.2.11.)
- 5. Loosen but do not remove the hexagonal nut (M4) securing the PG sensor assembly to the right frame assembly.
- 6. Remove the PG sensor assembly from the right frame assembly.

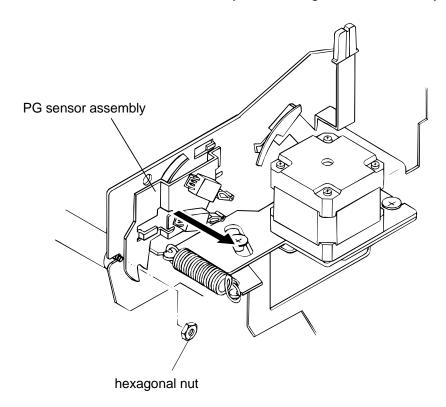


Figure 4-23. Removing the PG Sensor Assembly

✓ IMPORTANT

- When you connect the PG sensors to the PG sensor holder, make sure the sensor with the white connector is in the upper position, as shown in Figure 4-24.
- The tightening torque for the hexagonal nut is 1.18 1.37 Nm (12 14 Kgf-cm).

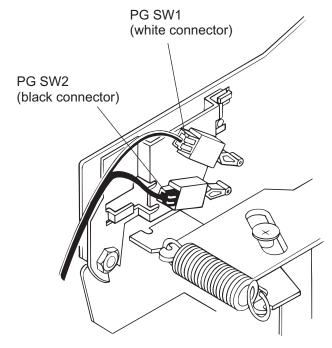


Figure 4-24. Connecting the PG Sensors to the PG Sensor Holder

4.2.11.4 Removing the Right Sub Frame Assembly

- 1. Remove the printer cover, front and rear edge guide assemblies, front cover, paper eject assembly, and front and rear tractor units. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Remove the printer mechanism. (See section 4.2.11.)
- 5. Remove the PF motor assembly. (See section 4.2.11.2.)
- 6. Remove the two CBS screws $(3 \times 6 \text{ and } 3 \times 8)$ securing the right sub frame.
- 7. Remove the right sub frame from the right frame.

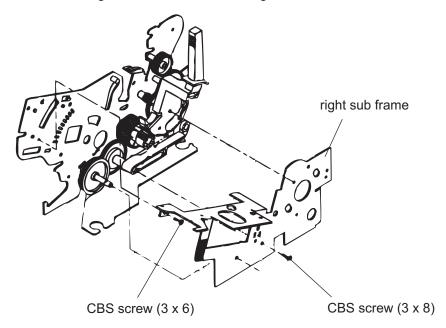


Figure 4-25. Removing the Right Sub Frame



■ The tightening torque for the CBS screws $(3 \times 6$ and $3 \times 8)$ is 0.78 - 0.98 Nm (8 - 10 Kgf-cm).



Adjust the bidirectional print alignment. (See Chapter 5.)

4.2.11.5 Removing the Right Frame Assembly

- 1. Remove the printer cover, front and rear edge guide assemblies, front cover, paper eject assembly, and front and rear tractor units. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Remove the printer mechanism. (See section 4.2.11.)
- 5. Remove the platen assembly. (See section 4.2.8.)
- 6. Remove the PG sensor assembly. (See section 4.2.11.3.)
- 7. Remove the right sub frame assembly. (See section 4.2.11.4.)
- 8. Remove the hexagonal nut (M4) securing the gap adjust lever. Then remove the lever from the right frame assembly.
- 9. Remove the CBS screw (3×6) securing the platen cover to the right frame assembly.
- 10. Remove the two CBS screws (3×6) securing the right frame assembly at the positions shown in Figure 4-26.
- 11. Remove the right frame assembly.

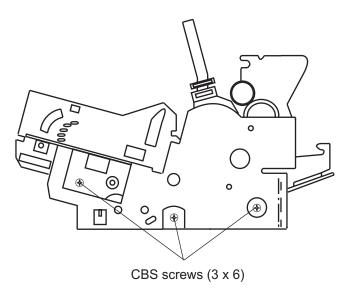


Figure 4-26. Removing the Right Frame Assembly

■ The tightening torque for the hexagonal nut is 1.18 - 1.37 Nm (12 - 14 Kgf-cm).

ADJUSTMENT >

Adjust the platen gap/parallelism and bidirectional print alignment, and reset the TPE level. (See Chapter 5.)

4.2.11.6 Disassembling the Right Frame Assembly

- 1. Remove the printer cover, front and rear edge guide assemblies, front cover, paper eject assembly, and front and rear tractor units. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Remove the printer mechanism. (See section 4.2.11.)
- 5. Remove the PF motor assembly. (See section 4.2.11.2.)
- 6. Remove the right sub frame assembly. (See section 4.2.11.4.)
- 7. Remove the right frame assembly. (See section 4.2.11.5.)
- 8. Remove the following 11 parts from the right frame assembly:

2 compression springs (200 g) 2 plain washers 2 spur gears (34.5 mm) 1 spur gear (27 mm) 1 spur gear (21 mm) 1 combination gear (8 mm, 31.5 mm) 1 intermittent gear

✓ IMPORTANT

■ When assembling the right frame assembly, attach the 11 parts listed in step 8 to the right frame assembly as shown in the following figures.

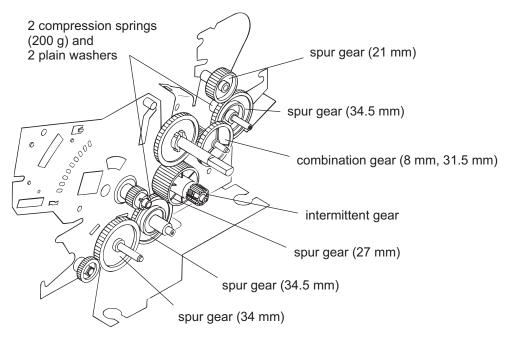


Figure 4-27. Engaging the Right Frame Assembly Gears (1 of 2)



- Engage the intermittent gear, release lever, and release lever transmission as shown in Figure 4-28.
- Engage the release lever and release lever transmission with the tractor clutch cam.
- Attach the tractor clutch cam as shown in Figure 4-29.

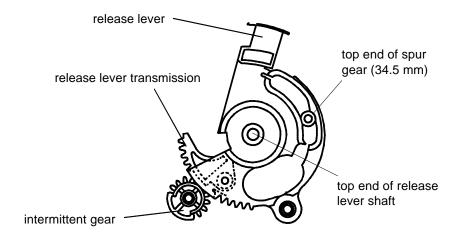


Figure 4-28. Engaging the Right Frame Assembly Gears (2 of 2)

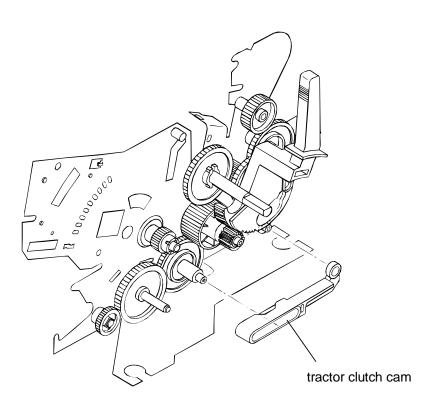


Figure 4-29. Engaging the Tractor Clutch Cam

ADJUSTMENT

Adjust the bidirectional print alignment. (See Chapter 5.)

4.2.11.7 Removing the Left Frame Assembly

- 1. Remove the printer cover, front and rear edge guide assemblies, front cover, paper eject assembly, and front and rear tractor units. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Remove the printer mechanism. (See section 4.2.11.)
- 5. Disconnect the cable connector from the release lever sensor, and then disconnect the cable connector from the HP sensor.
- 6. Remove the print head and the ribbon mask holder. (See sections 4.2.3 and 4.2.6.)
- 7. Remove the platen assembly. (See section 4.2.8.)
- 8. Remove the CBS screw (3×6) securing the platen cover to the left frame assembly.
- 9. Loosen the hexagonal nut (M4) securing the CR guide shaft and left frame.
- 10. Remove the parallelism adjustment bushing.
- 11. Remove the four CBS screws (3 \times 6) securing the left frame assembly.
- 12. Remove the left frame assembly.



- The tightening torque for the CBS screws (3×6) is 0.78 0.98 Nm (8 10 Kgf-cm).
- The tightening torque for the hexagonal nut is 1.18 1.37 Nm (12 14 Kgf-cm).



Adjust the platen gap/parallelism and bidirectional print alignment, and reset the TPE level. (See Chapter 5.)

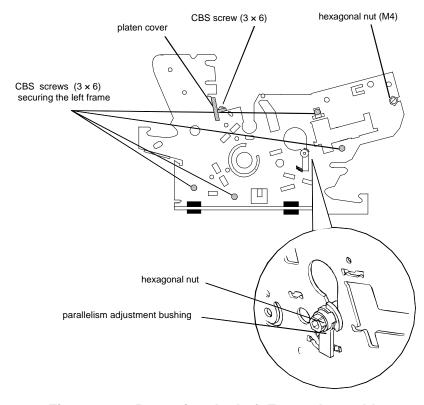


Figure 4-30. Removing the Left Frame Assembly

4.2.11.8 Removing the Ribbon Drive (RD) Assembly

- 1. Remove the printer cover, front and rear edge guide assemblies, front cover, paper eject assembly, and front and rear tractor units. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)

- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Remove the printer mechanism. (See section 4.2.11.)
- 5. Remove the CR motor tension spring and disengage the timing belt from the CR motor pinion gear. (See section 4.2.11.1.)
- 6. Remove the left frame assembly. (See section 4.2.11.7.)
- 7. Remove the two CBS screws (3×8) securing the RD assembly to the front frame.
- 8. Remove the RD assembly from the front frame.
- 9. Remove the timing belt from the RD assembly.

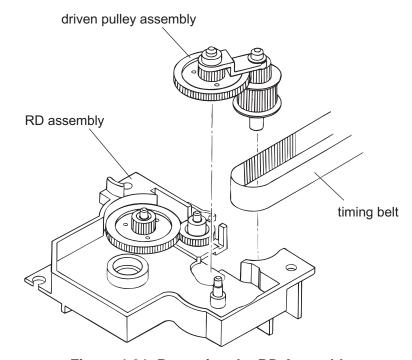


Figure 4-31. Removing the RD Assembly

- The tightening torque for the two CBS screws (3×8) is 0.78 0.98 Nm (8 10 Kgf-cm).
- Engage the RD assembly gears as shown in Figure 4-32.

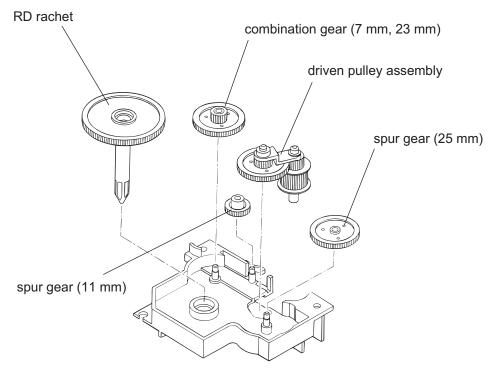


Figure 4-32. Engaging the RD Assembly Gears

ADJUSTMENT

Adjust the platen gap/parallelism and bidirectional print alignment, and reset the TPE level. (See Chapter 5.)

4.2.11.9 Removing the CR Assembly

- 1. Remove the printer cover, front and rear edge guide assemblies, front cover, paper eject assembly, and front and rear tractor units. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Remove the printer mechanism. (See section 4.2.11.)
- 5. Remove the left frame assembly. (See section 4.2.11.7.)
- 6. Remove the RD assembly. (See section 4.2.11.8.)
- 7. Remove the CR assembly from the front and rear CR guide shafts.

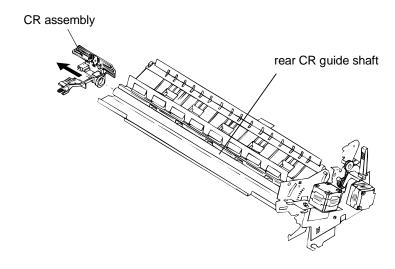


Figure 4-33. Removing the CR Assembly

- 8. Remove the CR assembly.
- 9. Remove the timing belt from the two holding slots under the CR assembly.

- When installing the CR assembly, insert the timing belt securely into the two holding slots at the bottom of the CR assembly.
- Make sure you take up all the slack in the timing belt between the two slots, as shown below.

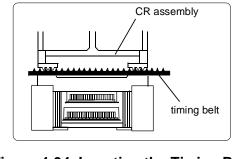


Figure 4-34. Inserting the Timing Belt

✓ IMPORTANT

Insert the two oil pads into the proper positions in the CR assembly, as shown in Figure 4-35.

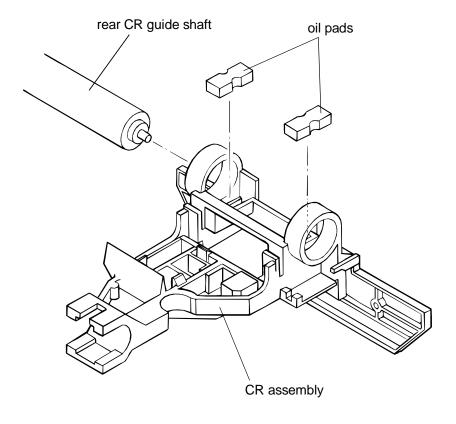


Figure 4-35. Installing the Oil Pads in the CR Assembly

- If you remove the rear CR guide shaft along with the CR assembly, be sure to reinstall the rear CR guide shaft in the printer mechanism.
- The rear CR guide shaft has a hole near the right edge. One side of the hole has a chamfered edge; this side of the hole should face up, as shown in Figure 4-36.

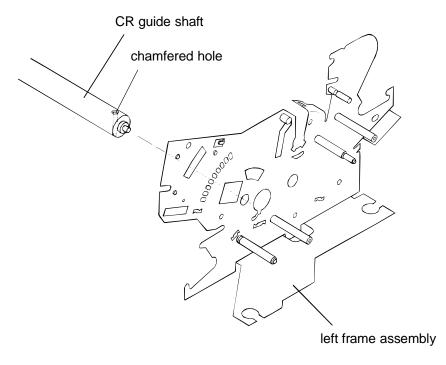


Figure 4-36. Installing the Rear CR Guide Shaft

ADJUSTMENT

Adjust the platen gap/parallelism and bidirectional print alignment, and reset the TPE level. (See Chapter 5.)

4.2.11.10 Removing the Rear PE Sensor Assembly

- 1. Remove the printer cover, front and rear edge guide assemblies, front cover, paper eject assembly, and front and rear tractor units. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Remove the printer mechanism. (See section 4.2.11.)
- 5. Turn the printer over, and insert a standard screwdriver or other prying tool into the hole in the rear frame.
- 6. Release the two clips while pushing up the rear PE sensor with the screwdriver or other prying tool. See Figure 4-37.
- 7. Disconnect the rear PE sensor connector and then remove the rear PE sensor assembly.

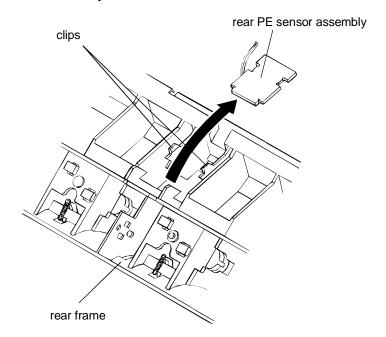


Figure 4-37. Removing the Rear PE Sensor Assembly

4.2.11.11 Removing the Front PE Sensor Assembly

- 1. Remove the printer cover, front and rear edge guide assemblies, front cover, paper eject assembly, and front and rear tractor units. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Remove the printer mechanism. (See section 4.2.11.)
- 5. Turn the printer over, and insert a standard screwdriver or other prying tool into the hole in the rear frame.
- 6. Release the two clips while pushing up the front PE sensor with the screwdriver or other prying tool. See Figure 4-38.
- 7. Disconnect the front PE sensor connector and then remove the front PE sensor assembly.

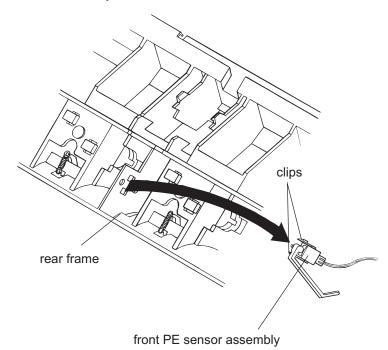


Figure 4-38. Removing the Front PE Sensor Assembly

4.2.11.12 Removing the Main Board Assembly

- 1. Remove the printer cover, front and rear edge guide assemblies, front cover, paper eject assembly, and front and rear tractor units. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Disconnect the cables from the following connectors on the main board assembly.

Table 4-7. Main Board Connectors

Connector Number	Pins	Connector Color	Connector Number	Pins	Connector Color
CN3	10	white	CN4	3	white
CN5	3	black	CN6	2	white
CN7	4	gray	CN8	18	gray
CN9	16	gray	CN10	4	white
CN11	5	white	CN12	4	white
CN13	4	black	CN15	22	white

Note:

- ☐ To disconnect the cables from CN10 and CN11, pull up the connector locks.
- ☐ To disconnect the cable from CN3, push down on the connector cover.

5. Remove the three CBS screws (3×4) securing the upper shield plate to the printer mechanism and remove the upper shield plate. Then remove the upper I/F grounding plate from the main board assembly.

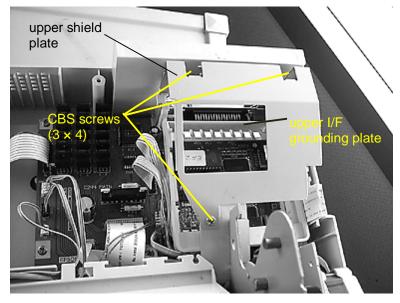


Figure 4-39. Removing the Upper Shield Plate and Upper I/F Grounding Plate

- 6. Remove the two CBS screws (3 \times 12) securing the upper connector cover.
- 7. Remove the five CBB screws (3×12) and one CBC lamitite screw (3×8) securing the main board assembly to the lower housing assembly.
- 8. Remove the optional I/F cage from the main board by releasing the hooks that secure it to the main board.
- 9. Remove the main board assembly with the upper I/F grounding plate.

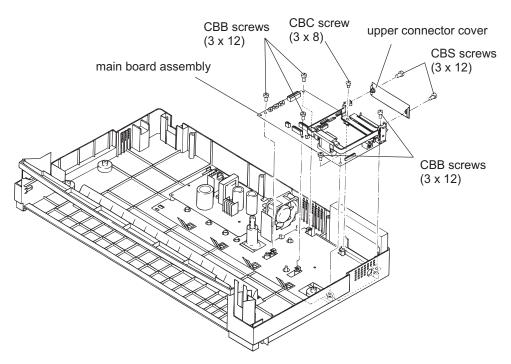


Figure 4-40. Removing the Main Board Assembly

✓ IMPORTANT

- Insert the CBC lamitite screw (3 × 8) into the appropriate screw hole as shown in Figure 4-40.
- After you insert the cable connectors into CN10 and CN11, push down each connector's lock.
- The tightening torque for the four CBB screws (3×12) is 0.78 0.98 Nm (8 10 Kgf-cm).
- The tightening torque for the CBC screw (3×8) is 0.78 0.98 Nm (8 10 Kgf-cm).

ADJUSTMENT

If you replace the main board, adjust the bidirectional print alignment, reset the factory settings, and reset the TPE level. (See Chapter 5.)

4.2.11.13 Removing the Power Supply Board Assembly

- 1. Remove the printer cover, front and rear edge guide assemblies, front cover, paper eject assembly, and front and rear tractor units. (See section 4.2.1.)
- 2. Remove the panel board assembly. (See section 4.2.2.)
- 3. Remove the upper housing assembly. (See section 4.2.7.)
- 4. Disconnect the cable from CN3 on the main board assembly.
- 5. Disconnect the cable for the fan motor from CN3 on the power supply board assembly. Then remove the fan motor.
- 6. Remove the five CBB screws (3 \times 12) securing the power supply board assembly.
- 7. Remove the power supply board assembly.

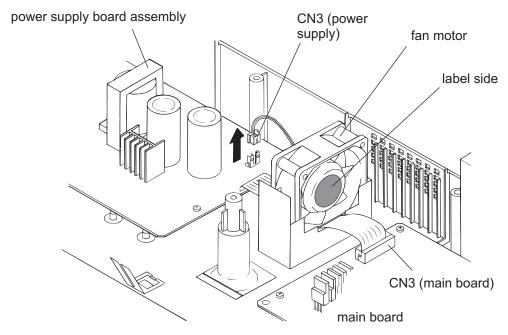


Figure 4-41. Removing the Power Supply Board Assembly



- When installing the power supply board assembly, insert the cable for CN2 on the power supply board under the fan motor.
- The tightening torque for the CBB screws (3×12) is 0.78 0.98 Nm (8 10 Kgf-cm).
- Install the fan motor so that the label side of the fan faces the main board assembly. (See Figure 4-41 above.)

CHAPTER 5

ADJUSTMENTS

5.1 Adjustment Overview

5.1.1 Required Adjustments

This chapter describes the adjustments you need to perform after you remove or replace certain printer parts. The table below indicates which adjustments are required for each repair procedure.

Table 5-1. Required Adjustments

Repair Procedure/ Adjustment	Platen Gap/ Parallelism	Bidirectional Print Alignment	Factory Settings	TPE Level Reset
Printer mechanism replacement	_	~	_	~
Print head removal or replacement	>	~	>	'
Main board replacement	_	~	V	~
PW sensor assembly replacement	_	_	_	~
Platen assembly removal or replacement	~	_	_	~
Carriage motor assembly removal or replacement	_	~	_	~
Right frame assembly removal or replacement	V	~	_	~
Right sub frame assembly removal or disassembly	_	V	_	_

Table 5-1. Required Adjustments (Continued)

Repair Procedure/ Adjustment	Platen Gap/ Parallelism	Bidirectional Print Alignment	Factory Settings	TPE Level Reset
Left frame removal or replacement	~	~		~
RD assembly removal or replacement	V	~	_	•
Carriage assembly removal or replacement	V	~	_	~

- Indicates that the adjustment is required.
- Indicates that the adjustment is not required.



When you replace or reassemble any printer part, use the Check program on the Settings diskette to print various check patterns and check the printer's performance and settings.

5.1.2 Adjustment Tools

The following table lists the tools required for each adjustment.

Table 5-2. Required Adjustment Tools

Adjustment	Required Tool	
Platen gap	Thickness gauge (B776702201)	
Bidirectional print	Settings diskette, Remote utility, or the	
alignment	printer's control panel	
Factory settings	Settings diskette	
TPE level reset	Settings diskette	

5.2 Adjusting and Resetting the Printer

5.2.1 Platen Gap/Parallelism Adjustment

If you have rotated or reassembled the rear carriage guide shaft or parallelism adjustment bushing, or if printing is too light or too dark even when the PG lever is in the proper position, perform the platen gap/parallelism adjustment.

Perform this adjustment at the following three positions: the far left, center, and far right (about the 1st, 68th, and 136th) columns.

- 1. Remove the print head from the carriage assembly. (See Chapter 4.)
- 2. Using tweezers, remove the ribbon mask from the ribbon mask holder, as shown in Figure 5-1.

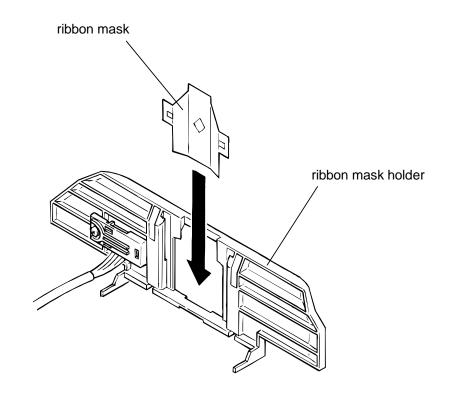


Figure 5-1. Removing the Ribbon Mask

- 3. Attach the print head to the carriage assembly again and tighten the two CBS screws (3×10) .
- 4. Move the print head to the left end column position.
- 5. Set the paper release lever to the single-sheet position.
- 6. Loosen the hexagonal nut (M4) securing the PG adjustment lever and set the PG adjustment lever to the second slot from the rear of the printer mechanism, as shown in Figure 5-2.

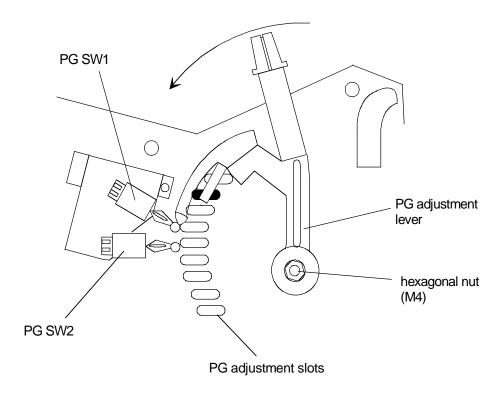


Figure 5-2. Setting the PG Adjustment Lever

7. Hold the thickness gauge vertically and insert it between the print head and platen.

8. Insert a thin screwdriver into the drilled hole located at the right edge of the rear carriage guide shaft. Then adjust the platen gap by moving the screwdriver forward or backward until the gap is large enough for a 0.42 mm thickness gauge, but too narrow for a 0.45 mm thickness gauge.

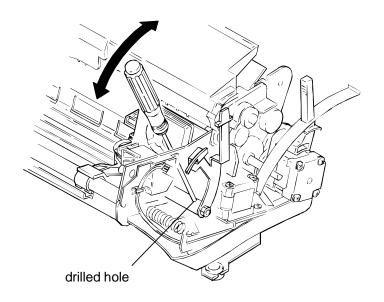


Figure 5-3. Adjusting the Platen Gap

9. When the gap is correct at the left end column, check the platen gap at the center and right end column positions.

10. If the platen gap is wider at the left end column than at the right end column, adjust the parallelism for the rear carriage guide shaft by moving the parallelism adjustment bushing backward. If the platen gap is narrower at the left end column than at the right end column, move the parallelism adjustment bushing forward. See Figure 5-4.

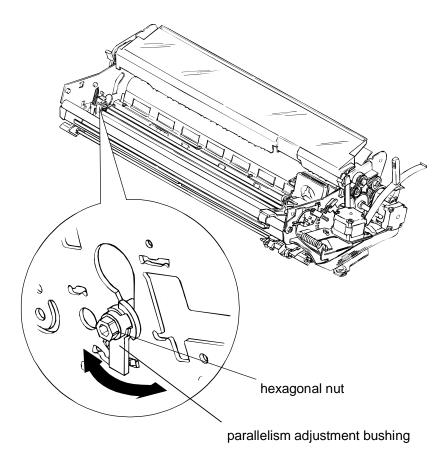


Figure 5-4. Adjusting the Parallelism of the Carriage Guide Shaft

11. Continue performing steps 7 through 10 until the platen gap is correct at all three positions (left end, right end, and center). After completing the adjustment, remove the screwdriver from the drilled hole in the rear carriage guide shaft.

- 12. Remove the print head from the carriage assembly.
- 13. Insert the ribbon mask into the ribbon mask holder. Then attach the print head to the carriage assembly, and tighten the two CBS screws (3 \times 8) to secure the print head.
- 14. Tighten the hexagonal nut (M4) to secure the PG adjustment lever.

5.2.2 Bidirectional Print Alignment (Bi-d) Adjustment

This section describes how to adjust the bidirectional print alignment. This adjustment is required after you remove or replace the printer mechanism. It is also necessary after you replace the main board assembly or the EEPROM, because the adjustment values are written to the EEPROM on the main board.

You can perform this adjustment using the Settings diskette, the control panel buttons and lights, or the Remote utility. This section first describes how to perform the bi-d adjustment using the Settings diskette, and then describes how to perform the adjustment from the control panel.



- When you replace the main board, reset the factory settings as described in section 5.2.3 first, and then adjust the bidirectional print alignment.
- Do not adjust the bidirectional print alignment if the input voltage is fluctuating significantly.
- Before you run GWBASIC, exit Windows and go to the DOS prompt.
- When you adjust the bidirectional print alignment, use continuous paper that is 15 inches (381 mm) wide.
- Clearing the EEPROM does not reset the bidirectional adjustment values.

5.2.2.1 Performing the Bi-d Adjustment Using the Settings Diskette

- 1. Make sure the PC is turned off. Insert the Settings diskette into drive A of the PC and turn on the PC.
- 2. Exit Windows and go to the DOS prompt.
- 3. At the DOS prompt, type **GWBASIC J10a72v.bas** and press **Enter**. You see the Printer Select menu.

```
Program: J****** Setting: *****
9 pins VR 0 = 0 VR 1 = 0 VR 2 = 0

[ Printer select ]
> (1) 9 pins
(2) 24 pins
```

Figure 5-5. Printer Select Menu

4. Use the ↑ or ↓ key to highlight **9 pins** and then press **Enter**. You see the Setting File menu.

```
Program: J***** Setting: ******
9 pins VR 0 = 0 VR 1 = 0 VR 2 = 0

[ Setting File ]
> (1) DEFSTD
(2) EURSTD
(3) NLSP
(4) ITALIC
(5) RUSSIAN
```

Figure 5-6. Setting File Menu

5. Use the ↑ or ↓ key to highlight the factory setting for the printer's destination and press **Enter**. Refer to Table 5-3 for destination settings.

Table 5-3. Destination Settings

Destination	Setting	Destination	Setting
EAI	USASTD	EAI (Latin)	USASTD
EIRO	EURSTD	EDG	EURSTD
EUL	EURSTD	EUL (SCANDINAVIA)	EURSTD
EFS	EURSTD	EIS	EURSTD
EIB	EURSTD	EDG (NLSP)	NLSP
EUL (MIDDLE EAST)	DEFSTD	EAL	DEFSTD
ESP	DEFSTD	EHK	DEFSTD

After you select the destination setting, you see the Main menu.

```
Program: J****** Setting: *****

9 pins VR 0 = 0 VR 1 = 0 VR 2 = 0

[ Main MENU ]

> (1) Bi-d Adjust (6) Envelope
(2) FF paper (7) ---- N/A ----
(3) A3 Cut sheet (8) -- SUB MENU
(4) A4 1P Cut sheet
(5) A4 6P Cut sheet
```

Figure 5-7. Main Menu

6. Use the ↑ or ↓ key to highlight **Bi-d Adjust** and press **Enter**.

You see the Bi-d Adjustment menu.

< Bi-d adjustment >

> Mode 0 = 0 Mode 1 = 0

Mode 2 = 0

Cancel Print Speed Value Write Default [ESC] [SPACE] [$\uparrow \downarrow$] [$\longleftarrow \rightarrow$] [RET] [HOME]

Figure 5-8. Bi-d Adjustment Menu

7. Use the ↑ or ↓ key to highlight the mode. Then press the space bar to print the current bi-d print alignment pattern for that mode.

Mode 0 VR0 = 0

Figure 5-9. Current Bi-d Print Alignment Pattern

- 8. If the bi-d pattern is not aligned properly, you need to adjust it by changing the input value with the ← or → key. If the second row is shifted to the right of the first row, change the value by pressing the ← key. If the second row is shifted to the left of the first row, change the value by pressing the → key. Press the space bar to print the new bi-d pattern.
- 9. Perform steps 7 and 8 for each mode (0,1, and 2).
- 10. After you correct the bidirectional print alignment for each print mode, press Enter to print the adjustment values. The program returns to the Main menu.
- 11. To exit the program, press **Esc** until you return to the DOS prompt.



The adjustment values are stored in the EEPROM only when you turn off the printer. Turn the printer off and then on again after you perform the bi-d adjustment.

5.2.2.2 Performing the Bi-d Adjustment from the Control Panel

- 1. Make sure that continuous paper is loaded and the printer is turned off.
- Turn on the printer while holding down the **Pause** button to enter bidirectional print alignment adjustment mode. The printer prints an instruction sheet that contains 25 Super Draft mode alignment patterns.

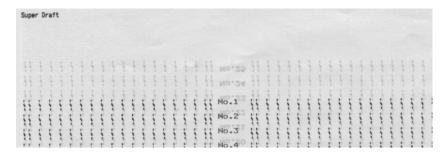


Figure 5-10. Super Draft Alignment Patterns

3. Look for the pattern with the best alignment on the sheet.

 Press the LF/FF or Load/Eject button until the Pitch lights indicate the number of the pattern with the best alignment, as shown in Figure 5-11.

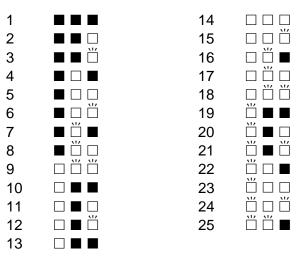


Figure 5-11. Pitch Lights

- 5. Press the **Font** button to save your selection. The printer then prints 25 Draft mode alignment patterns.
- 6. Repeat steps 3 through 5 for the Draft and NLQ modes.
- 7. After you perform the NLQ mode bi-d adjustment, turn off the printer to save the bi-d values you selected in the EEPROM on the main board. Turning off the printer also exits the bidirectional adjustment mode.

5.2.3 Factory Settings

This section describes how to reset the factory settings. You must reset the factory settings after you replace the main board or the EEPROM. You can perform this procedure only with the Settings diskette.

✓ IMPORTANT

After you select the factory settings in the Setting File menu, be sure to run the Check program from the Main menu. Running the Check program writes the selected factory settings to the EEPROM and prints several check patterns.

- 1. Make sure the PC is turned off. Insert the Settings diskette into drive A of the PC and turn on the PC.
- 2. Exit Windows and go to the DOS prompt.
- 3. At the DOS prompt, type **GWBASIC J10a72v.bas** and press **Enter**. You see the Printer Select menu.

```
Program: J***** Setting: *****

9 pins VR 0 = 0 VR 1 = 0 VR 2 = 0

[ Printer select ]

> (1) 9 pins
(2) 24 pins
```

Figure 5-12. Printer Select Menu

4. Use the ↑ or ↓ key to highlight **9 pins** and then press **Enter**. You see the Setting File menu.

```
Program: J****** Setting: ******

9 pins VR 0 = 0 VR 1 = 0 VR 2 = 0

[ Setting File ]
> (1) DEFSTD
(2) EURSTD
(3) NLSP
(4) ITALIC
(5) RUSSIAN
```

Figure 5-13. Setting File Menu

Use the ↑ or ↓ key to highlight the factory setting for the printer's destination and press Enter. Refer to Table 5-3 for destination settings.
 After you select the factory setting, you see the Main menu.

EPSON FX-2180 Service Manual

```
Program: J****** Setting: ******
9 pins VR 0 = 0 VR 1 = 0 VR 2 = 0

[ Main MENU ]
(1) Bi-d Adjust (6) Envelope
>(2) FF paper (7) ---- N/A ----
(3) A3 Cut sheet (8) -- SUB MENU
(4) A4 1P Cut sheet
(5) A4 6P Cut sheet
```

Figure 5-14. Main Menu

- 6. Select one of the Check programs (selections 2 through 6) depending on the paper loaded in the printer. Run the Check program to write the selected factory settings to the EEPROM and print several check patterns.
- 7. To exit the program, press **Esc** until you return to the DOS prompt.

5.2.4 TPE Level Reset

This section describes how to reset the TPE (top paper end) level (value). Table 5-1 lists when you need to reset the TPE level. For example, if you do not perform this adjustment after you replace the PW sensor assembly, the printer does not recognize that the PW sensor has been replaced, and the ability of the new sensor to operate properly is limited. You can perform this procedure using the Settings diskette only.



After you perform the TPE level reset adjustment, the printer automatically prints the reset value for the TPE level. Check that the reset value is FF.

- 1. Make sure the PC is turned off. Insert the Settings diskette into drive A of the PC and turn on the PC.
- 2. Exit Windows and go to the DOS prompt.

3. At the DOS prompt, type **GWBASIC J10a72v.bas** and press **Enter**. You see the Printer Select menu.

```
Program: J****** Setting: *****

9 pins VR 0 = 0 VR 1 = 0 VR 2 = 0

[ Printer select ]
> (1) 9 pins
(2) 24 pins
```

Figure 5-15. Printer Select Menu

4. Use the ↑ or ↓ key to highlight **9 pins** and then press **Enter**. You see the Setting File menu.

```
Program: J****** Setting: ******

9 pins VR 0 = 0 VR 1 = 0 VR 2 = 0

[ Setting File ]
> (1) DEFSTD
(2) EURSTD
(3) NLSP
(4) ITALIC
(5) RUSSIAN
```

Figure 5-16. Setting File Menu

5. Use the ↑ or ↓ key to highlight the factory setting for the printer's destination and press **Enter**. Refer to Table 5-3 for destination settings.

After you select the factory setting, you see the Main menu.

```
Program : J****** Setting : *****
9 pins VR 0 = 0 VR 1 = 0 VR 2 = 0

[ Main MENU ]
(1) Bi-d Adjust (6) Envelope
(2) FF paper (7) ---- N/A ----
(3) A3 Cut sheet (4) A4 1P Cut sheet
(5) A4 6P Cut sheet
```

Figure 5-17. Main Menu

6. Use the ↑ or ↓ key to highlight **SUB MENU** and press **Enter**. You see the following submenu:

```
Program: J****** Setting: *****

9 pins VR 0 = 0 VR 1 = 0 VR 2 = 0

[ Sub MENU ]
(1) Memory SW Print
(2) EEPROM Reset
>(3) TPE Adjust
(4) Pitch 1P
(5) Pitch 20P
```

Figure 5-18. Submenu

- 7. Use the \uparrow or \downarrow key to highlight **TPE Adjust** and press **Enter**.
- Insert an A4-size sheet of paper into the printer's rear paper guide.
 Make sure the paper is positioned in the portrait orientation. The TPE check pattern and the current TPE position value is printed, as shown in Figure 5-19.

9. Measure the distance from the top of the paper to the 0 level line, as shown below. Check whether the distance equals 0.335 inches \pm 0.020 inches (8.5 mm \pm 0.5 mm).

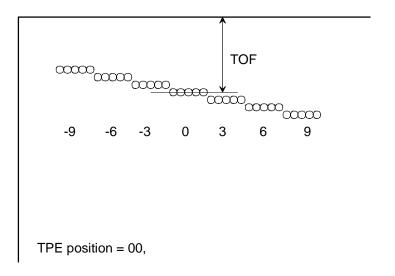


Figure 5-19. TOF Measurement

After the page is printed, you see the following menu:

```
< TPE adjustment > TPE Pos. = 0

Exit Print Value Write Default [ESC] [SPACE] [\uparrow \downarrow (0-9)] [RET] [HOME]
```

Figure 5-20. TPE Adjustment Menu

10. If your TOF measurement is not equal to 0.335 inches \pm 0.020 inches (8.5 mm \pm 0.5 mm), use the \uparrow or \downarrow key to change the TOF value. Then press **Enter**.

11. To exit the program, press **Esc** until you return to the DOS prompt.



The adjusted TPE value is stored in the EEPROM only when you turn off the printer. Turn the printer off and then on again after you perform the TPE level reset adjustment.

CHAPTER

MAINTENANCE

EPSON FX-2180 Service Manual Chapter 6 Maintenance

6.1 Preventive Maintenance

To keep the printer operating properly, regularly clean the exterior case using denatured alcohol and also vacuum the inside of the printer to remove any dust and paper debris.

After you clean the printer, check that it is adequately lubricated as described in the next section. Before returning the printer to the customer, inspect the springs and paper feed rollers, and check the basic operation of the printer.



Disconnect the printer from the external AC power source before you perform any maintenance procedures.



Do not use thinner, trichloroethylene, or ketonebased solvents on the plastic components of the printer.

6.2 Lubrication

Table 6-1 provides information about the recommended lubricants. These lubricants are EPSON G-26 and O-2, which have been tested extensively and found to comply with the needs of the printer.

EPSON recommends the printer be lubricated at the points illustrated in Figures 6-1 and 6-2. Table 6-2 lists each lubrication point along with the lubricant and amount recommended for that point.

Before applying a lubricant, be sure the surface to be lubricated is clean. Do not apply too much lubricant, because this may damage nearby printer parts.

Table 6-1. Lubricants

Туре	Name	Quantity	Availability	Part Number
Grease	G-26	40 g	EPSON	B702600001
Oil	0-2	40 cc	EPSON	B710200001

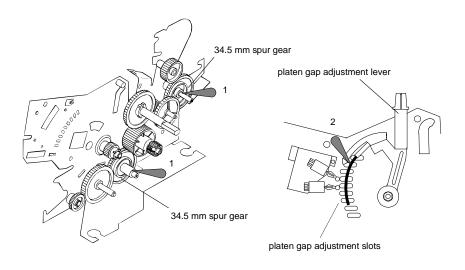
EPSON FX-2180 Service Manual Chapter 6 Maintenance

Table 6-2. Lubrication Points

Ref. No.	Lubrication Points	Quantity	Lubricant
1	Cam surfaces of the 34.5 mm spur gears	2 mm width, halfway	G-26
2	The platen gap adjustment slots on the right frame	2 mm width, from the top slot to the 3 rd slot from the bottom	G-26
3	The end of the shaft of the drive roller assembly and the cutout section on the left frame	About ½ the size of a grain of rice	G-26
4	Oil pads	Half of the pads	O-2
5	RD planetary shaft and planetary lever leaf spring	About ½ the size of a grain of rice	G-26
6	RD housing • Side of shafts: 3 points • Inside hole: 1 point	About ½ the size of a grain of rice	G-26
7	5 points on the RD assembly gear teeth	About ½ the size of a grain of rice	G-26
8	The side of the RD ratchet shaft	About the size of a grain of rice	G-26
9	10 contact points between the paper guide and the release shaft	About the size of a grain of rice	G-26

Note: Apply lubricants when you are reassembling the printer. For lubrication points, see the following figures.

EPSON FX-2180 Service Manual Chapter 6 Maintenance



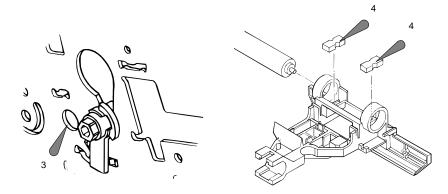


Figure 6-1. Lubrication Points (1 of 2)

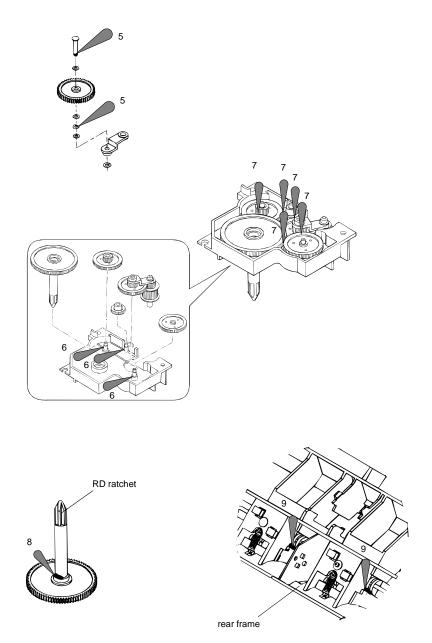
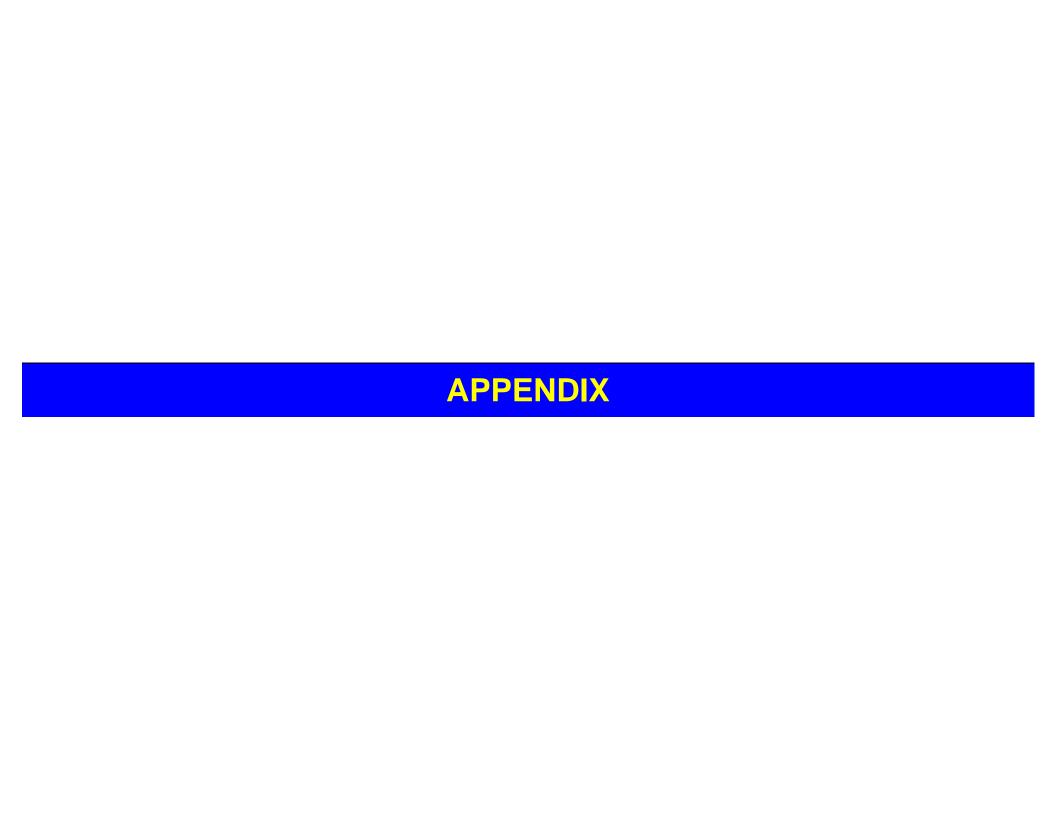


Figure 6-2. Lubrication Points (2 of 2)



A.1 Connector Summary

The figure below shows how the primary components of the printer are connected. Table A-1 summarizes the functions and sizes of the connectors.

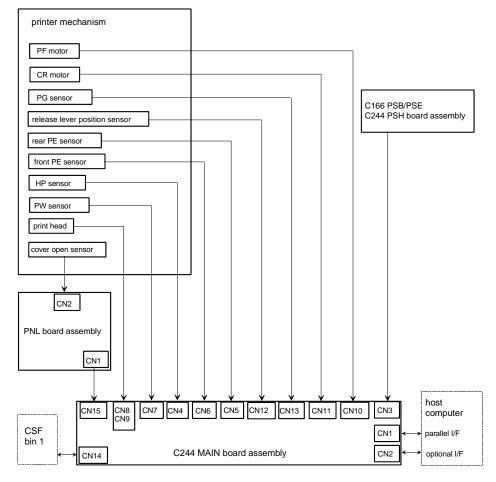


Figure A-1. Cable Connections

Table A-1. Connector Summary

Board	Connector	Function	Pins
Main	CN1	Parallel interface	36
Board	CN2	Type B interface	36
Assembly	CN3	Power supply board	10
	CN4	HP sensor	3
	CN5	Rear PE sensor	3
	CN6	Front PE sensor	2
	CN7	PW sensor	4
	CN8	Print head	18
	CN9	Print head	16
	CN10	PF motor	4
	CN11	CR motor	5
	CN12	Release lever position sensor	4
	CN13	PG sensor	4
	CN14	CSF bin 1	10
	CN15	PNL board	22

Table A-2. Connector Pin Assignments – CN3

Pin	I/O	Signal Name	Function
1		GP	
2	1	GP	_
3		+35V	+35 VDC line
4		+35V	+35 VDC line
5		GND	Signal ground
6		GND	Signal ground
7		+5V	+5 VDC line
8	-	+5V	+5 VDC line
9	I	PWDN	Power down detection signal
10	0	PSC	Power switch on/off signal

Table A-3. Connector Pin Assignments – CN4

Pin	I/O	Signal Name	Function
1	I	HP	CR home position signal
2	-	GND	Signal ground
3	_	+5V	+5 VDC

Table A-4. Connector Pin Assignments – CN5

Pin	I/O	Signal Name	Function
1	_	+5V	+5 VDC
2	I	PE	Rear paper end signal
3	_	GND	Signal ground

Table A-5. Connector Pin Assignments – CN6

Pin	I/O	Signal Name	Function
1		PE	Front paper end signal
2		GND	Signal ground

Table A-6. Connector Pin Assignments – CN7

Pin	I/O	Signal Name	Function
1	ı	Е	PW sensor signal
2	-	GND	Signal ground
3		+5V	+5 VDC line
4	1	А	+5 VDC line

Table A-7. Connector Pin Assignments - CN8

Pin	I/O	Signal Name	Function
1	_	NC	Not connected
2	0	HD1	Head data 1
3	0	HD9	Head data 9
4	0	HD13	Head data 13
5	0	HD7	Head data 7
6		+35V	+35 VDC line
7		NC	Not connected
8	0	HD18	Head data 18
9		+35V	+35 VDC line
10	0	HD12	Head data 12
11		+35V	+35 VDC line
12	-	+35V	+35 VDC line
13		NC	Not connected
14	0	HD6	Head data 6
15	0	HD10	Head data 10
16	I	HTMP	Head temperature signal
17		+5V	+5 VDC line
18	_	NC	Not connected

Table A-8. Connector Pin Assignments - CN9

Pin	I/O	Signal Name	Function
1	0	HD3	Head data 3
2	_	NC	Not connected
3	0	HD15	Head data 15
4	_	+35V	+35 VDC line
5	0	HD2	Head data 2
6	-	+35V	+35 VDC line
7	0	HD5	Head data 5
8	0	HD16	Head data 16
9	0	HD11	Head data 11
10	_	+35V	+35 VDC line
11	0	HD17	Head data 17
12	-	+35V	+35 VDC line
13		NC	Not connected
14	0	HD14	Head data 14
15	0	HD4	Head data 4
16	0	HD8	Head data 8

Table A-9. Connector Pin Assignments – CN10

Pin	I/O	Signal Name	Function
1	0	PF A	PF motor phase A signal
2	0	PF B	PF motor phase B signal
3	0	PF –A	PF motor phase /A signal
4	0	PF –B	PF motor phase /B signal

Table A-10. Connector Pin Assignments - CN11

Pin	I/O	Signal Name	Function
1	0	CR A	CR motor phase A signal
2	0	CR –A	CR motor phase /A signal
3	0	CR B	CR motor phase B signal
4	0	CR –B	CR motor phase /B signal
5		CR COM	CR motor common

Table A-11. Connector Pin Assignments – CN12

Pin	I/O	Signal Name	Function
1	ı	RELEASE1	Release sensor 1 signal
2	-	GND	Signal ground
3	ı	RELEASE2	Release sensor 2 signal
4		GND	Signal ground

Table A-12. Connector Pin Assignments – CN13

Pin	I/O	Signal Name	Function
1		PG1	Platen gap sensor 1 signal
2	-	GND	Signal ground
3	1	PG2	Platen gap sensor 2 signal
4		GND	Signal ground

Table A-13. Connector Pin Assignments – CN14

Pin	I/O	Signal Name	Function
1	0	А	CSF motor phase A signal
2	0	В	CSF motor phase B signal
3	0	-A	CSF motor phase /A signal
4	0	–B	CSF motor phase /B signal
5	0	HOLD	CSF motor hold signal
6	-	+5V	+5 VDC line
7		GND	Signal ground
8	_	GND	Signal ground
9		+35V	+35 VDC line
10	_	+35V	+35 VDC line

Table A-14. Connector Pin Assignments – CN15

Pin	I/O	Signal Name	Function
1	I	COPEN	Cover open sensor signal
2	0	PAUSE	Pause LED signal
3		+5V	+5 VDC line
4	0	POUTL	Paper out LED signal
5	0	RESRVL	Pitch select LED signal
6	- 1	PAUSSW	Pause button signal
7	0	TBIN2L	Tear off/bin select signal
8	0	TBIN1L	Tear off/bin select signal
9	0	PITC1L	Pitch select LED
10	0	PITC2L	Pitch select LED
11		FONT3L	Not connected
12	0	FONT2L	FONT LED signal
13	0	FONT1L	FONT LED signal
14	1	GND	Signal ground
15		GND	Signal ground
16		FONTSW	Font button signal
17	-	PITCSW	Pitch button signal
18		TBINSW	Tear off/bin button signal
19	-	PSC	Operate button signal
20	- 1	LDEJSW	Load/Eject button signal
21	-	LFFFSW	LF/FF button signal
22	_	FG	Frame ground

Circuit Board Component Layout Diagrams

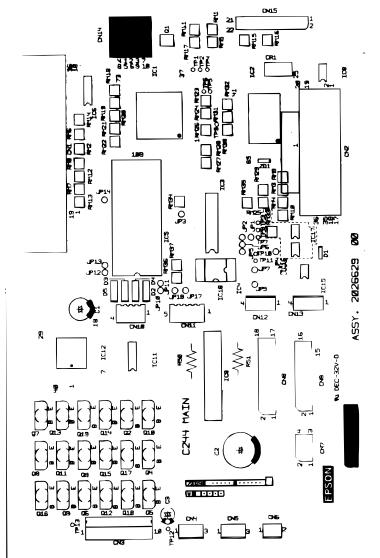


Figure A-2. C244 MAIN Board Component Layout Diagram (1 of 2)

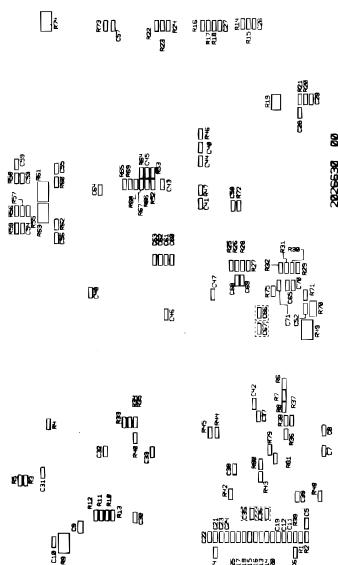
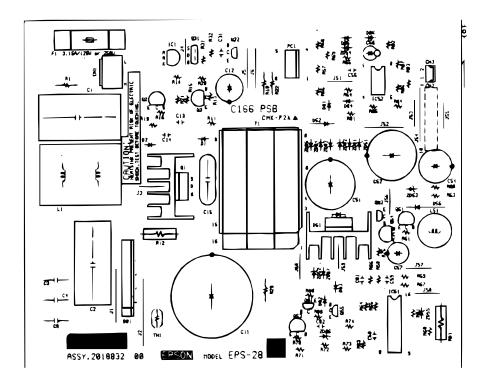


Figure A-3. C244 MAIN Board Component Layout Diagram (2 of 2)



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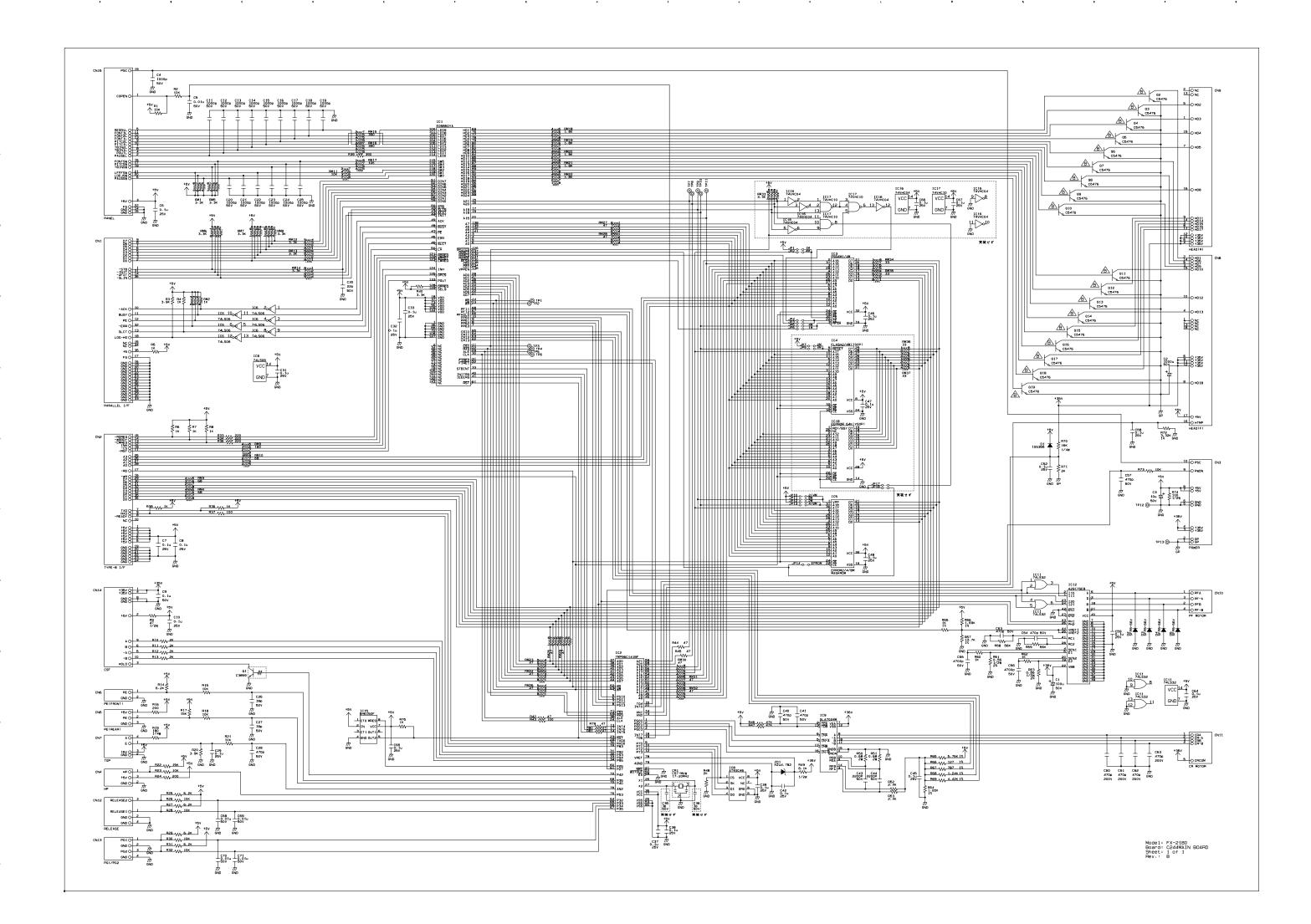
Figure A-4. C166 PSB Board Component Layout Diagram

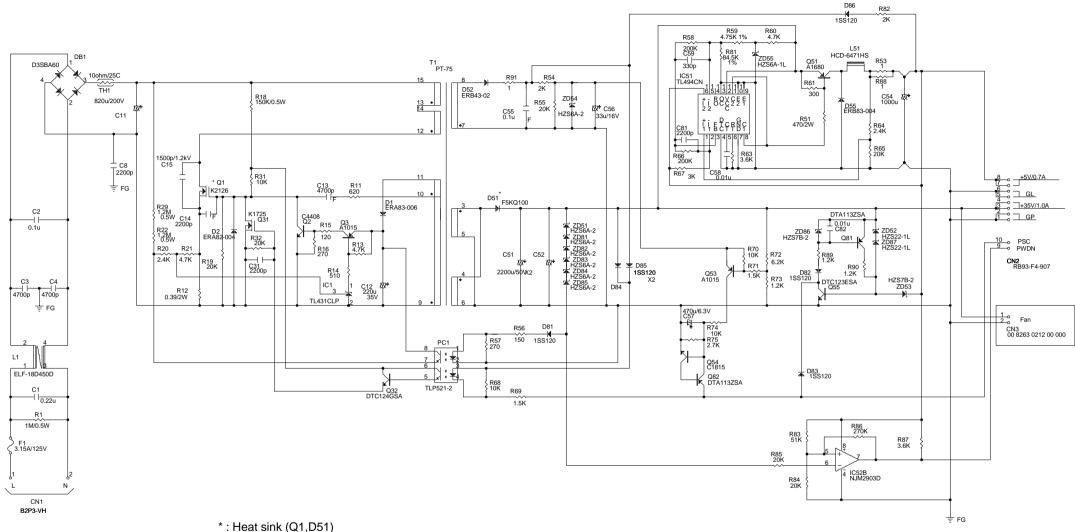
Figure A-5. C166 PSE Board Component Layout Diagram

A.3 Circuit Board and Exploded Diagrams

This section provides the following diagrams:

- ☐ C244 MAIN circuit board diagram
- ☐ C166 PSB circuit board diagram
- ☐ C166 PSE circuit board diagram
- ☐ C244 PSH circuit board diagram
- ☐ FX-2180 exploded diagram (1 of 3)
- ☐ FX-2180 exploded diagram (2 of 3)
- ☐ FX-2180 exploded diagram (3 of 3)



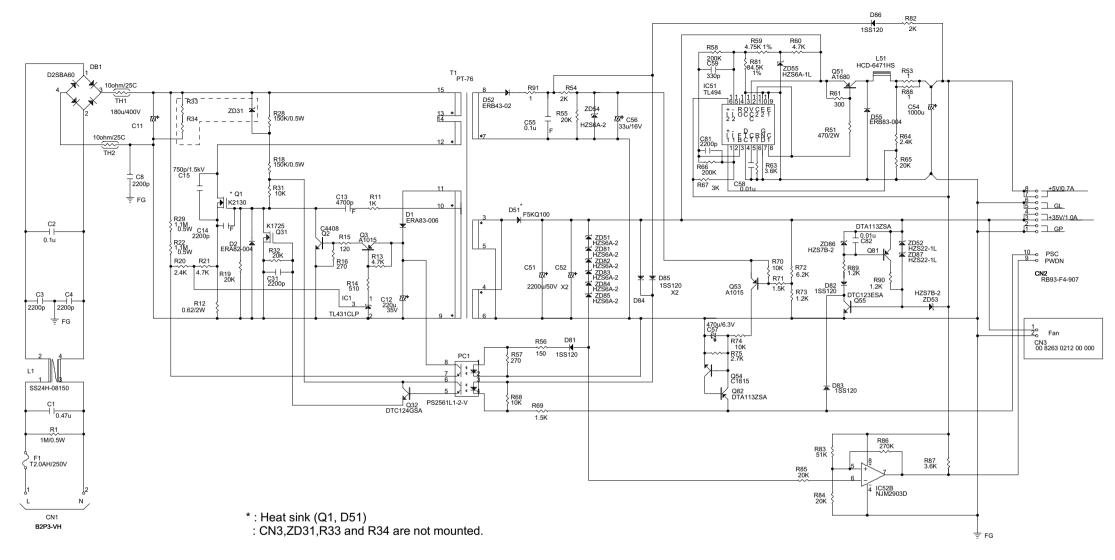


* : Heat sink (Q1,D51): CN3 is not mounted.

Model : FX-2180

Board: C166PSB BOARD

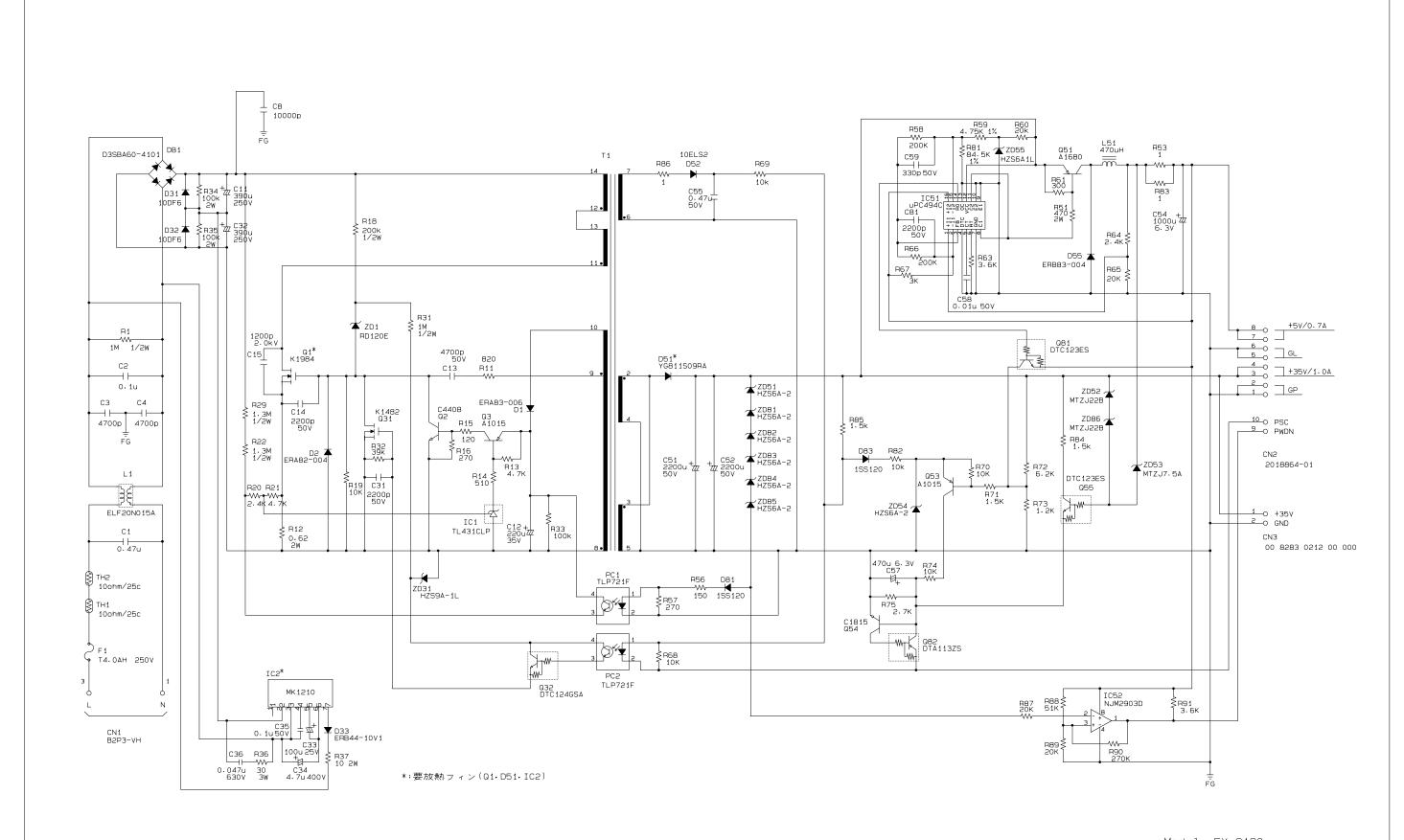
Sheet: 1 of 1 Rev.: B



Model: FX-2180

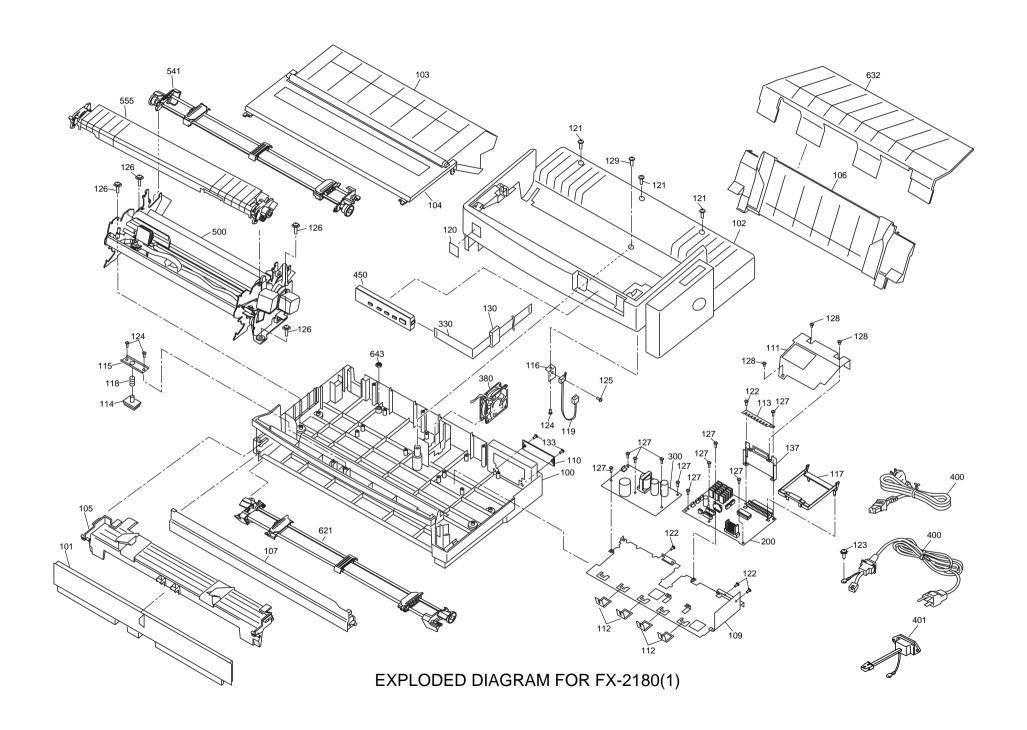
Board: C166PSE BOARD

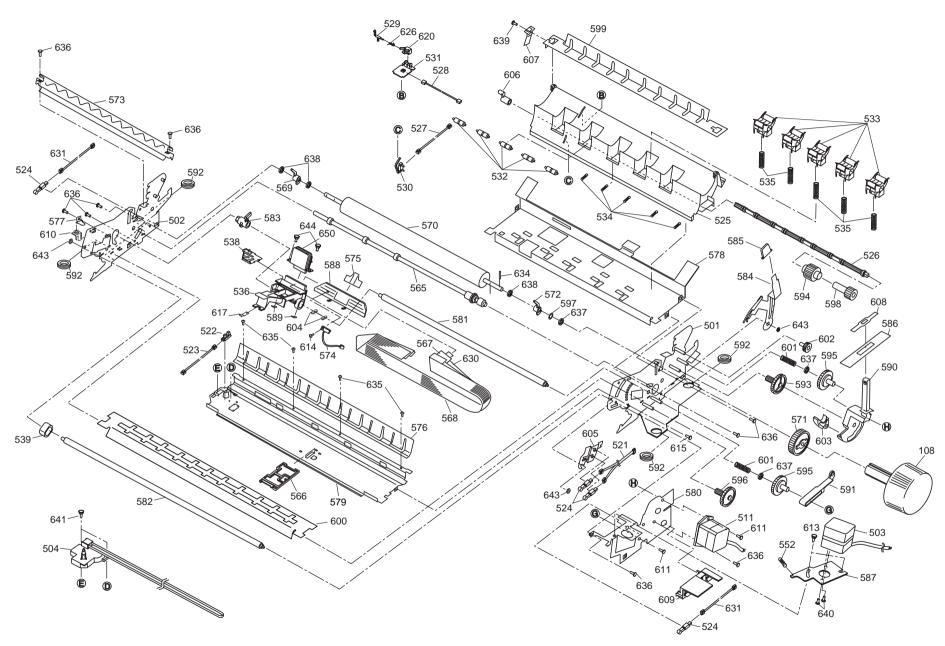
Sheet: 1 of 1 Rev.: B



Model: FX-2180 Board: C244PSH BOARD Sheet: 1 of 1

Rev.: 0





EXPLODED DIAGRAM FOR FX-2180(2)

