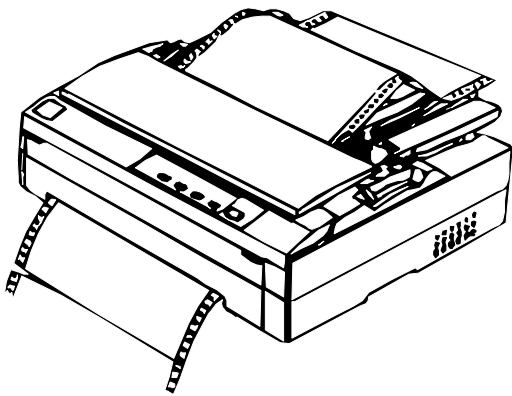


# SERVICE MANUAL



9 Pin Impact Dot Printer  
**EPSON FX-1180/880**



**EPSON®**

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# PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1) Personal injury and 2) damage to equipment.

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

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

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

## **DANGER**

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.
3. WHEN PERFORMING TESTING AS DICTATED WITHIN 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 POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

## **WARNING**

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGES 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 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. IN ORDER 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 BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.

# PREFACE

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of FX1180/880. 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 DESCRIPTIONS**

*Provides a general overview and specifications of the product.*

## **CHAPTER 2. OPERATING PRINCIPLES**

*Describes the theory of electrical and mechanical operations of the product.*

## **CHAPTER 3. TROUBLESHOOTING**

*Provides the step-by-step procedures for troubleshooting.*

## **CHAPTER 4. DISASSEMBLY AND ASSEMBLY**

*Describes the step-by-step procedures for disassembling and assembling the product.*

## **CHAPTER 5. ADJUSTMENTS**

*Provides Epson-approved methods for adjustment.*

## **CHAPTER 6. MAINTENANCE**

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

## **APPENDIX**

*Provides the following additional information for reference:*

- Connector pin assignments
- Electric circuit boards components layout
- Exploded diagram
- Electrical circuit boards schematics

## REVISION STATUS

Rev.	Date	Page(s)	Contents
A	1997/09/30	All	First release
B	1998/04/02	All	Second release owing to release of FX-1180

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**CHAPTER**

**1**

**PRODUCT SPECIFICATION**

## 1.1 SPECIFICATION

The FX-1880/880 is a small foot, 9 pins serial impact dot matrix printer. The main specification is as follows;

### HARDWARE SPECIFICATIONS

Print method	9 pins Impact dot matrix
Print pin arrangement	9 x 1
Print pin diameter	0.29 mm ( 0.0114 inch )

### RESOLUTION

**Table 1-1. Resolution ( dpi )**

Printing mode	Horizontal density	Vertical density	Adjacent dot print
High speed draft	90 dpi	72	No
Draft	120 dpi	72	No
NLQ	240 dpi	144	No
Bit image	60, 72, 80, 90 or 120 dpi	72	Yes
	120 or 240 dpi	72	No

### PRINTING SPEED

**Table 1-2. Printing Speed (cps) and Printable Columns**

	Printing mode	Character pitch	Printable column	Printing speed	
				Normal	Copy
FX-1180	High speed Draft	10cpi	136	410cps	345cps
	Draft	10cpi	136	310cps	260cps
	NLQ	10cpi	136	77cps	65cps
FX-880	High speed Draft	10cpi	80	410cps	345cps
	Draft	10cpi	80	310cps	260cps
	NLQ	10cpi	80	78cps	65cps

- When the power supply voltage drops to the lower limit, the printer stops printing once and then starts printing rest data on that line again more slowly than before.
- When the head temperature rises to the upper limit, the printer stops printing once. If the head temperature falls down to the normal level, it begins to print again more slowly than before.

### FEEDING METHOD

Friction feed	Front, Rear
Push tractor feed	Front, Rear
Push & Pull tractor feed	Front, Rear
Pull tractor feed	Front, Rear, Bottom

### FEED SPEED

Normal mode	62 ms	1/6 inch feed
	0.127MPS ( 5.0 IPS)	continuous feeding
Copy mode	83 ms	1/6 inch feeding
	0.078MPS (3.1 IPS)	continuous feed

### FEEDER

Front push tractor  
Rear push tractor  
CSF ( Option, bin1 / bin2 )  
Pull tractor ( Option )  
Roll paper holder ( Option )

**PAPER / MEDIA**

**Table 1-3. Cut Sheet**

Insertion	Front entry	Rear entry
Width	FX-1880: 148 ~ 420mm (5.8 ~ 16.5") FX-880: 148 ~ 257mm (5.8 ~ 10.1")	
Length	182 ~ 364mm ( 7.2 ~ 14.3 )	92 ~ 364mm ( 3.6 ~ 14.3")
Thickness	0.065 ~ 0.14mm ( 0.0025~ 0.0055")	
Weight	52 ~ 90g/m <sup>2</sup> ( 14 ~ 24 lb )	
Quality	Plain paper, Reclaimed paper , not curled, not folded, not crumpled	

**Table 1-4. Cut Sheet ( Multi-Part )**

Insertion	Front entry
Width	FX-1880: 148 ~ 420mm (5.8 ~ 16.5") FX-880: 148 ~ 257mm (5.8 ~ 10.1")
Length	182 ~ 364mm ( 7.2 ~ 14.3")
Copies	1(original) + 5
Total thickness	0.12 ~ 0.46mm ( 0.0047 ~ 0.018" )
Weight	40 ~ 58g/m <sup>2</sup> ( 12 ~ 15 lb )
Quality	Plain paper, Reclaimed paper, not curled, not folded, not crumpled
Joining	Line glue at the top or one side of a form

**Table 1-5. Envelope**

Insertion	Rear entry only	
Envelope	<No.6>	<No.10>
Width	165mm ( 6.5" )	241mm ( 9.5" )
Length	92mm ( 3.6" )	105mm ( 4.1" )
Total thickness	0.16 ~ 0.52mm ( 0.0063 ~ 0.020" ) The difference of thickness at the printable area is within 0.25mm ( 0.0098" )	
Weight	45 ~ 90g/m <sup>2</sup> ( 12 ~ 24 lb )	
Quality	BOND paper, plain paper, AIR MAIL, no glue at a flap, not curled, not folded, not crumpled	

**Table 1-6 Continuous Paper ( Single Sheet and Multi-Part )**

Insertion	Front entry, Rear entry, Bottom entry
Width	FX-1880: 101.6 ~ 406.4mm ( 4 ~ 16" ) FX-880: 101.6 ~ 254mm ( 4 ~ 10" )
Length	101.6 ~ 558.8mm ( 4 ~ 22" )
Copies	1(original) + 5
Total thickness	0.065 ~ 0.46mm ( 0.0025 ~ 0.018" )
Weight	52 ~ 82g/m <sup>2</sup> ( 14 ~ 22 lb )
Weight ( multi part)	40 ~ 58g/m <sup>2</sup> ( 12 ~ 15 lb )
Quality	Plain paper, Reclaimed paper, carbon less multi part paper
Joining	Point glue or both sides paper staple

**Table 1-7. Continuous Paper with Labels**

Insertion	Front entry, Bottom entry
Label size	See the figure below; <div style="text-align: center;"> <p style="text-align: center;"><b>Figure 1-1. Label</b></p> </div>
Base sheet width	FX-1180: 101.6 ~ 406.4mm (4 ~ 16") FX-880: 101.6 ~ 254.0mm (4 ~ 10")
Base sheet length	101.6 ~ 558.8mm (4 ~ 22")
Base sheet thickness	0.07 ~ 0.09mm (0.0028 ~ 0.0035")
Total thickness	0.16 ~ 0.19mm (0.0063 ~ 0.0075")
Label weight	68g/m <sup>2</sup> (17 lb)
Quality	A very continuous form labels, a very mini-line labels or the same quality labels

**Table 1-8. Roll Paper**

Insertion	Rear entry
Width	216mm (8.5")
Thickness	0.07 ~ 0.09mm (0.0028" ~ 0.0035")
Weight	52 ~ 82g/m <sup>2</sup> (14 ~ 22 lb)
Quality	Plain paper, not curled, not folded, not crumpled

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**TYPEFACE**

Bit map Font	EPSON Draft	10cpi, 12cpi, 15cpi
	EPSON Roman	10cpi, 12cpi, 15cpi, Proportional
	EPSON Sans Serif	10cpi, 12cpi, 15cpi, Proportional
Bar code fonts	EAN-13, EAN-8, Interleaved 2 of 5, UPC-A, UPC-E, Code 39, Code 128, POSTNET	

---

**CHARACTER TABLES**

Standard version	11 tables
NLSP version	35 tables

---

**INPUT BUFFER**

0 Kbytes / 32 Kbytes

**ELECTRICAL SPECIFICATION**

**120 V version**

Rated voltage	AC 120 V
Input voltage range	AC 103.5 to 132 V
Rated frequency range	50 to 60 Hz
Input frequency range	49.5 to 60.5 Hz
Rated current	0.7 A ( Max. 1.6 A )
Power consumption	FX-1180:      Approx. 36 W ( ISO/IEC10561 Letter pattern) FX-880:        Approx. 34 W ( ISO/IEC10561 Letter pattern) Energy Star compliant
Insulation resistance	Min. 10 MΩ ( between AC line and chassis)
Dielectric strength	AC 1000 V rms 1 min. or AC 1200 V rms 1 sec.(between AC line and chassis)

**230 V version**

Rated voltage	AC 220 to 240 V
Input voltage range	AC 198 to 264 V
Rated frequency range	50 to 60 Hz
Input frequency range	49.5 to 60.5 Hz
Rated current	0.4 A ( Max. 0.9 A )
Power consumption	FX-1180:      Approx. 36 W ( ISO/IEC10561 Letter pattern) FX-880:        Approx. 34 W ( ISO/IEC10561 Letter pattern) Energy Star compliant
Insulation resistance	Min. 10 MΩ   ( between AC line and chassis)
Dielectric strength	AC 1000 V rms 1 min. or AC 1200 V rms 1 sec. ( between AC line and chassis)

**UPS Version**

Rated voltage	AC 100 to 120 V      /      AC220 to AC240V
Input voltage range	AC 90 to 132 V      /      AC198 to 264V
Rated frequency range	50 to 60 Hz
Input frequency range	49.5 to 60.5 Hz
Rated current	0.8A (Max. 20.A)      /      0.5 A (Max. 1.0 A )
Power consumption	Approx. 38 W ( ISO/IEC10561 Letter pattern) Energy Star compliant
Insulation resistance	Min. 10 MΩ   ( between AC line and chassis, DC500V)
Dielectric strength	AC 1500 V rms 1 min. ( between AC line and chassis)

**ACOUSTIC NOISE**

55 dB(A)	( ISO 7779 pattern )
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**ENVIRONMENTAL CONDITION**

Temperature	5 to 35 °C ( Operating ) -30 to 60 °C ( Non-operating)
Humidity	10 to 80 % ( Operating without condensation ) 0 to 85 % ( Non-operation without condensation)

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**RELIABILITY**

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Total print volume	6.5 million lines ( Except Print head)
MTBF	10000 POH
Print head life	approx. 200 million characters

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**RIBBON CARTRIDGE**

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Type	Fabric
Color	Black
Ribbon life	Approx. 3 million characters ( Draft 10 cpi, 14 dots / character)

---

**SAFETY APPROVALS**

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**120 V version**

Safety standards	UL 1950, CSA C22.2 No. 950
EMI	FCC part 15 subpart B class B, CSA C108.8 class B

**230 V version**

Safety standards	EN60950 ( VDE, NEMKO )
EMI	EN55022 ( CISRP pub.22 ) class B AS/NZS.3548 class B

**UPS Version**

Safety standards	UL 1950, CSA C22.2 No. 950
EMI	FCC part 15 subpart B class B, CSA C108.8 class B

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**CE MARKING**

---

**230 V version**

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

---

**INTERFACE**

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Bi-directional parallel Interface ( IEEE-1284 nibble mode supported )  
Type-B I/F level 2 ( Option )

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**CONTROL CODE**

---

ESC/P  
IBM 2380 Plus emulation

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**PHYSICAL SPECIFICATIONS**

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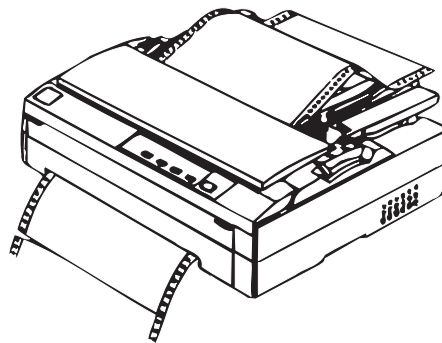
FX-1880:	[Dimensions]	590mm( W ) x 350mm ( D ) x 54mm ( H )
	[Weight]	Approx. 9.6Kg
FX-880:	[Dimensions]	415mm( W ) x 350mm ( D ) x 154mm ( H )
	[Weight]	Approx. 7.6 kg

**CONSUMABLES & OPTIONS**

**Table 1-9. Consumable & Option**

Consumables	Code No.	
	FX-1180	FX-880
Ribbon cartridge	#8755	#8750
Ribbon pack	#8758	#8758
<b>Options</b>		
High capacity cut sheet feeder ( Bin1 )	C80640*	C80638*
Single bin cut sheet feeder ( Bin 2 )	C80639*	C80637*
Pull tractor unit	C80021*	C80020*
Roll paper holder	#8310	#8310
Front paper guide	C81403*	C81402*
Front sheet guide	C81401*	C81400*
Serial Interface card	C82305* / C82306*	C82305* / C82306*
32KB intelligent serial Interface card	C82307* / C82308*	C82307* / C82308*
32KB intelligent Interface card	C82310* / C82311*	C82310* / C82311*
Local Talk I/F card	C82312*	C82312*
32KB IEEE-1284 I/F card	C82313*	C82313*
Coax I/F card	C82314*	C82314*
Twinax I/F card	C82315*	C82315*
IEEE-1284 parallel I/F card	C82345*	C82345*
Ethernet I/F card	C82357*	C82357*

“\*”: According to each destination.



**Figure 1-2. Exterior View of the FX-880(FX-1180)**

## 1.2 OPERATION

This section describes the operations equipped with this printer.

### 1.2.1 Control panel

The control panel of this printer consists of 5 switches and 5 LEDs, as shown below;

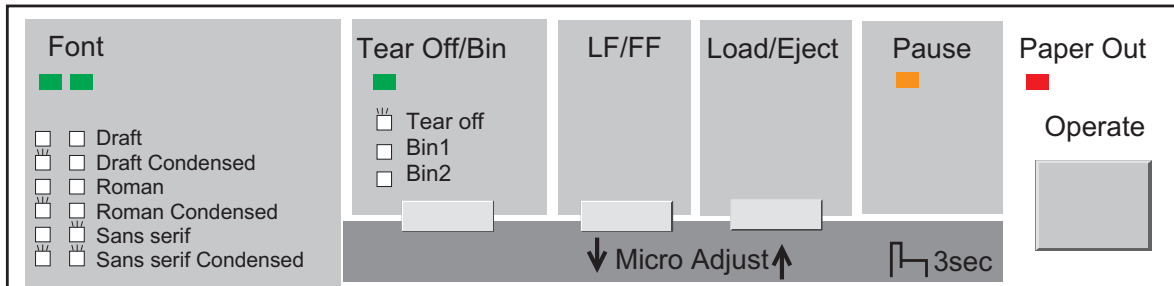


Figure 1-3. Panel Operation Outline

### 1.2.2 Switches

#### 1.2.2.1 Usual Operation

In the normal mode, pressing panel switches executes the following functions;

(1) **Operate**

This switch turns the printer on and off. It is the secondary switch in the power supply circuit.



**Unplug the power cable from the AC Inlet when connecting/  
disconnecting the Interface cable to/from the printer.**

(2) **Pause**

This switch alternates printer activity between printing and non-printing states.

If this button is held down for over 3 seconds when the printer is in the non-printing status, the Micro Adjust function and Font selection are enabled. If it is pressed again, these function are disabled.

(3) **Load/Eject**

- Loads the paper when the printer is out of paper.
- Ejects the paper to the paper park.

(4) **LF/FF**

- Feeds a line if pressed shortly.
- Feeds the continuous paper or eject the cut sheet.

(5) **Tear Off**

Advances the continuous paper to the Tear-OFF position. If it is pressed again, the paper is moved to the TOF position.

(6) **Bin**

Selects the CSF bin number when the CSF is used.

(7) **Font**

Selects the font from the list on the panel when the Micro Adjust function is enabled.

(8) **Micro Adjust**

The Micro Adjust switch is available in the Micro Adjust mode.

Micro switch executes micro feed forward or backward by 1/216 inch one by one.

The TOF adjustment is enabled in the TOF position after loading the paper, and the Tear-off adjustment is enable in the Tear-off position.



### **1.2.2.2 Operations at Power-on**

Pressing the specified switch (switches) while turning on the printer enables the following special functions:

1. Self test

- Switches :        **“Load / Eject”** while turning on the printer.  
  Function:        Executes the printing NLQ self test printing.
- Switch:         **“LF / FF”** while turning on the printer.  
  Function:        Executes the Draft self test printing.

2. Data dump mode

- Switches :        **“Load / Eject”** and **“LF / FF”** switches while turning on the printer.  
Function:         Executes the data dump function.

3. Clearing the line counter value for the ribbon life in the EEPROM

- Switches:        **“Tear-off / Bin”** and **“Pause”** while turning on the printer.  
Function:         Clears the line counter value stored in the EEPROM.

4. Bi-D adjustment

- Switches:        **“Pause”** switch while turning on the printer.  
Function:         Executes the Bi-D adjustment.

### 1.2.3 Indicators ( LEDs )

This printer has the following indicators to indicate its current condition, as shown in the table below:

1. **Pause ( Orange )**
  - Comes On when the printer is paused, and goes Off when the printer is not paused.
  - Blinks when the Micro adjust function and the Font selection are enabled or the printhead is in the overheated condition.
2. **Paper Out ( Red )**
  - Comes On when the printer is in the Paper out condition.
  - Blinks when the paper eject error has occurred .
3. **Tear Off / Bin ( Green )**
  - Blinks when the continuous paper is in the tear off position.
  - Comes On when the CSF Bin1 is selected, and goes Off when the CSF Bin2 is selected.
4. **Font ( Green )**  
Indicates the font selections.

**Table 1-10. LED Status**

Printer status	Font	Tear-Off / Bin	Pause	Paper Out
Pause	—	—	On	—
Paper out error	—	—	On	On
Release lever error	—	—	On	—
Paper eject warning	—	—	On	Blinks
Head hot warning	—	—	Blinks	Blinks
Micro adjust & Font selection	—	—	Blinks	—
Tear off	—	According as paper path	—	—
Bin selection	—	According as bin selection	—	—
Font selection	According as font selection	—	—	—
Fatal error	Blinks	Blinks	Blinks	Blinks

### 1.2.4 Buzzer

This printer has the buzzer to indicate its current condition with the following indications:

**Table 1-11. Buzzer Status**

Printer status	Beep sounds
Paper out error	•••
Release lever error	-----
Paper eject warning	•••
Illegal panel operation	•

*Note: The symbols used in the table represents the following:*

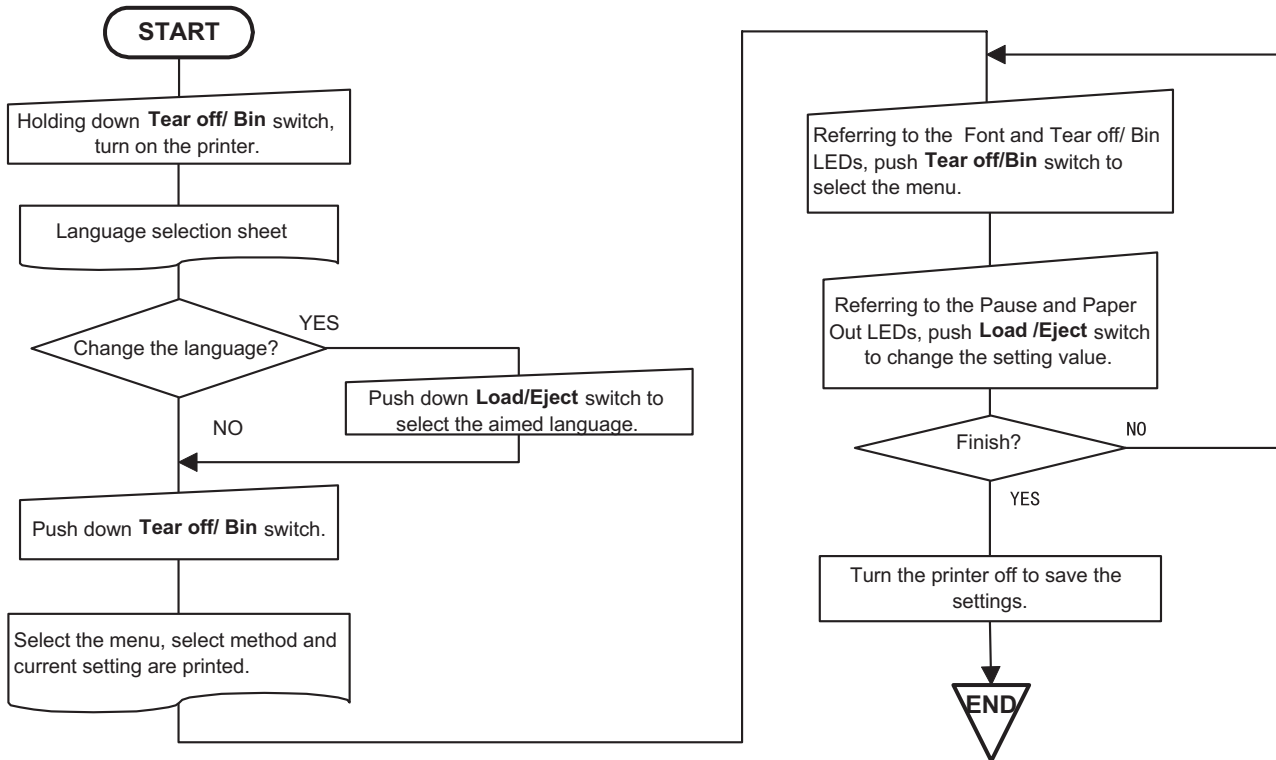
- “ • ” = A beep sounds for approximately 100 ms with the interval of approximately 100 ms.
- “ - ” = A beep sounds for approximately 500ms with the interval of approximately 100ms.

## 1.2.5 Default Setting Mode 1

You can change some parameters that the printer refers to at printer initialization.

### 1.2.5.1 Setting Method

Refer to the following flowchart for the default setting mode 1.



**Figure 1-4. Flowchart for Default Setting Mode 1**

### 1.2.5.2 Setting Items

Setting values available for the default setting mode including factory settings are as shown in the following table:

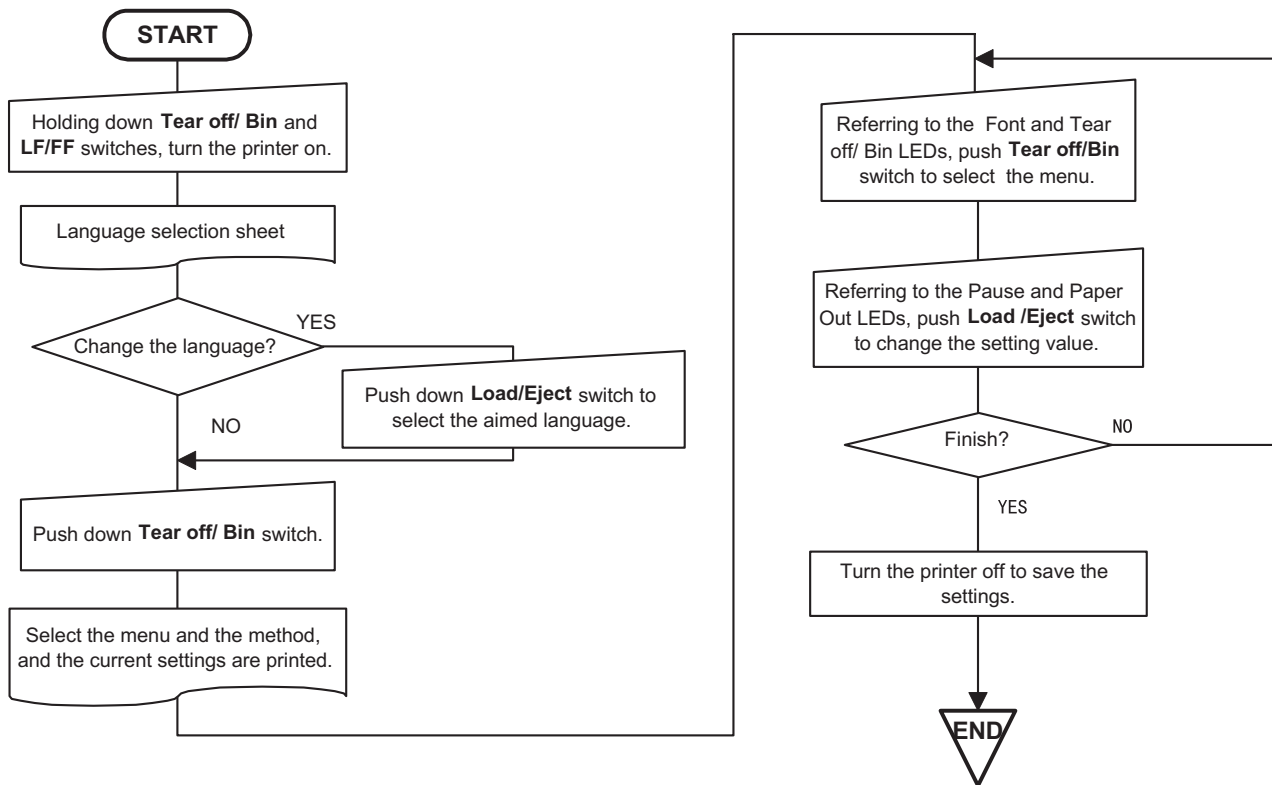
**Table 1-12. Setting Values Available for Default Setting Mode 1**

Items	Setting values ( <b>BOLD font</b> : factory setting)
Skip over perforation	On, <b>Off</b>
Auto tear off	On, <b>Off</b>
Auto line feed	On, <b>Off</b>
Print direction	<b>Bi-D</b> , Uni-D
I/F mode	<b>Auto</b> , Parallel, Option
Auto I/F wait time	<b>10 sec.</b> , 30 sec.
Software	<b>ESC/P</b> , IBM 2380 Plus
0 slash	<b>0</b> , Ø
High speed draft	<b>On</b> , Off
Input buffer	<b>On</b> , Off
Buzzer	<b>On</b> , Off
Auto CR ( IBM 2380 Plus ) *1	On, <b>Off</b>
IBM character table ( IBM 2380 Plus ) *1	<b>table 2</b> , table 1

\*1: This setting is effective when the IBM 2380 Plus emulation is selected only.

## 1.2.6 Default Setting Mode 2

Refer to the following flowchart for the default setting mode 2.



**Figure 1-5. Flowchart for Default Setting Mode 2**

### 1.2.6.1 Setting Items

Setting values available for the default setting mode including factory settings are as shown in the following table:

**Table 1-13. Setting Values Available for Default Setting Mode 2**

Items	Setting values (BOLD font : factory setting)
Page length for front tractor	3 inch, 3.5 inch, 4 inch, 5.5 inch, 6 inch, 7 inch, 8 inch, 8.5 inch, <b>11 inch</b> , 70/6 inch, 12 inch, 14 inch, 17 inch
Page length for rear tractor	3 inch, 3.5 inch, 4 inch, 5.5 inch, 6 inch, 7 inch, 8 inch, 8.5 inch, <b>11 inch</b> , 70/6 inch, 12 inch, 14 inch, 17 inch
Character table	<p><b><u>Standard version:</u></b>            Italic, <b>PC437</b>, PC850, PC860, PC863, PC865, PC861, BRASCII, Abicomp, Roman 8, ISO Latin 1</p> <p><b><u>NLSP version:</u></b>            Italic, <b>PC437</b>, PC850, PC437 Greek, PC 853, PC855, PC852, PC857, PC866, PC869, MAZOWIA, Code MJK, ISO 8859-7, ISO Latin 1T, Bulgaria, PC774, Estonia, ISO 8859-2, PC866 LAT, PC866UKR, PCAPTEC, PC708, PC720, PCAR864, PC860, PC861, PC865</p>
International character set for Italic table	<b>Italic U.S.A.</b> , Italic France, Italic Germany, Italic U.K., Italic Denmark 1, Italic Sweden, Italic Italy, Italic Spain 1

*Note: Settings with bold weight means the standard factory settings.*

## 1.2.7 EEPROM Clear Function

You can change some parameters into the factory settings to perform panel operation easily. Pressing **Tear off / Bin** and **Load / Eject** switches at same time while turning on the printer turns the default settings into the factory settings:

**Table 1-14. Cleared Items and Values on EEPROM (Standard Model)**

Item	Value
Character table selection	PC437
Page length for rear tractor	11 inch
Page length for front tractor	11 inch
Page length for CSF bin 1	22 inch
Page length for CSF bin 2	22 inch
TOF adjustment value for rear tractor	8.5 mm
TOF adjustment value for front tractor	8.5 mm
TOF adjustment value for CSF bin 1	8.5 mm
TOF adjustment value for CSF bin 2	8.5 mm
TOF adjustment value for rear manual insertion	8.5 mm
TOF adjustment Value for front manual insertion	8.5 mm
Bottom margin for rear tractor	11 inch
Bottom margin for front tractor	11 inch
Font Selection	Draft 10 cpi
Print direction setting	Bi-D
I/F mode selection	Auto
Auto I/F waiting time setting	10 sec.
Auto line feed	Off
Auto tear off	Off
Skip over perforation	Off
High speed draft	On
Input buffer	On
Software	ESC/P
0 slash	Off
Buzzer	On
Auto CR	Off
Tear-off adjustment value	0
Manual insertion time	2 or 3 sec.
Tear-off wait time	3 sec.
I/F timing data	BUSY timing data
TOF minimum value	4.2 mm
Paper edge length	0
Paper length for rear manual insertion	22 inch
Paper length for front manual insertion	22 inch
sub number for customization	Standard

## 1.2.8 Bi-D Adjustment

Refer to the following flowchart for the Bi-D adjustment.

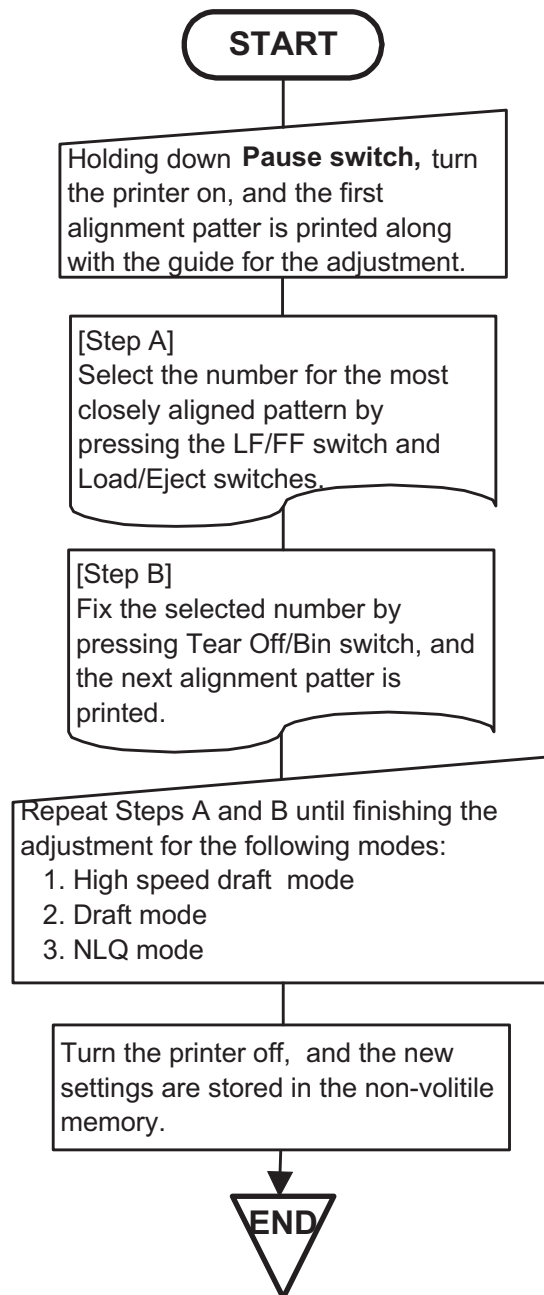


Figure 1-6. Bi-D Adjustment flowchart

**CHAPTER**

**2**

**OPERATING PRICIPLES**

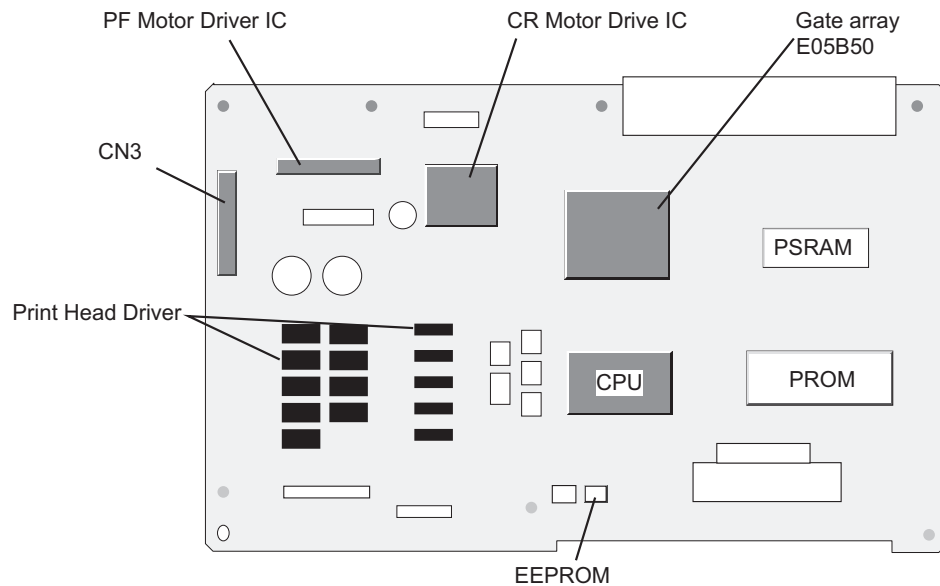
## 2.1 MAIN COMPONENTS

This printer is divided into several main components for easy removal and repair. The main components are :

- ❑ C229MAIN: Control board
- ❑ C229PSB/PSE/PSH: Power supply board
- ❑ C229PNL: Operation panel board
- ❑ M-3J60/3J10: Printer mechanism for FX-1180/FX-880
- ❑ Housing: Upper case, Lower case, Rear sheet guide, Knob, Printer cover

### 2.1.1 C229MAIN Board

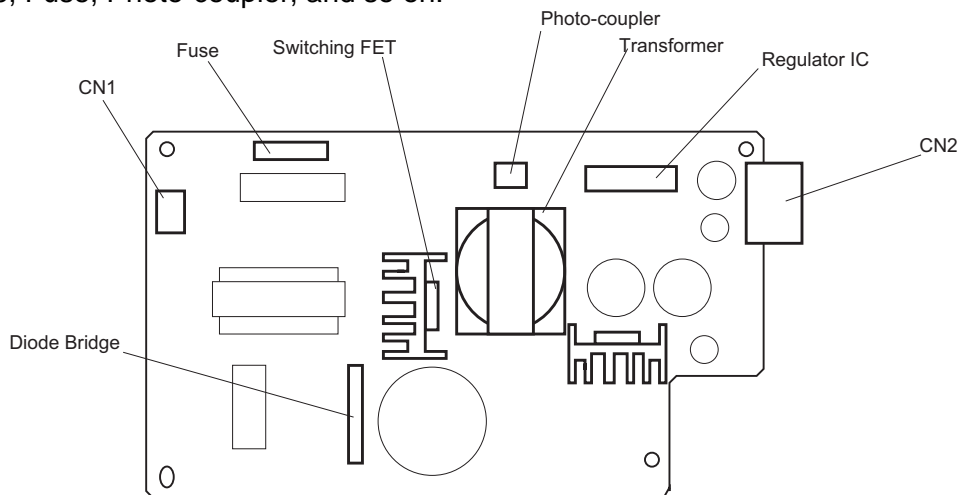
The C229MAIN board consists of CPU TMP96C141AF (IC3), gate array E05B50 (IC2), EEPROM AT93C46 (IC4), 1/4M PSRAM (IC5), 2/4M PROM (IC7), driver elements, and so on.



**Figure 2-1 . C229MAIN Component**

### 2.1.2 C229PSB/PSE/PSH Board

The C229 PSB/PSE power supply board consists of Transformer, Switching FET, Regulator IC, Diode bridge, Fuse, Photo-coupler, and so on.



**Figure 2-2. C229PSB/PSE/PSH Component**



## **2.2 PRINTER MECHANISM**

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This printer mechanism consists of Printhead, Paper feed mechanism, Carriage movement mechanism, Tractor feed mechanism, Platen gap adjustment mechanism, Ribbon feed mechanism, PF motor, CR motor, detectors, and so on.

### **2.2.1 Printhead**

The printhead prints data from the control board on paper using the ink ribbon. The printhead is mounted on the carriage unit.

### **2.2.2 Paper Feed Mechanism**

The paper feed mechanism picks up paper and transports it to the printhead, then ejects the paper step by step or continuously driven by the PF motor. PF motor drives the paper feed mechanism gears and the platen roller. The top of form and paper out condition are detected by the front and rear PE detector, respectively.

### **2.2.3 Carriage Movement Mechanism**

The carriage movement mechanism carries the carriage unit left and right along the CR guide shaft and mechanism frame, and stops it at any position for printing. It is driven by torque sent from the CR motor via the timing belt. Home position is detected by the HP (home position) detector at power on and CR motor phase changing timing.

### **2.2.4 Tractor Feed Mechanism**

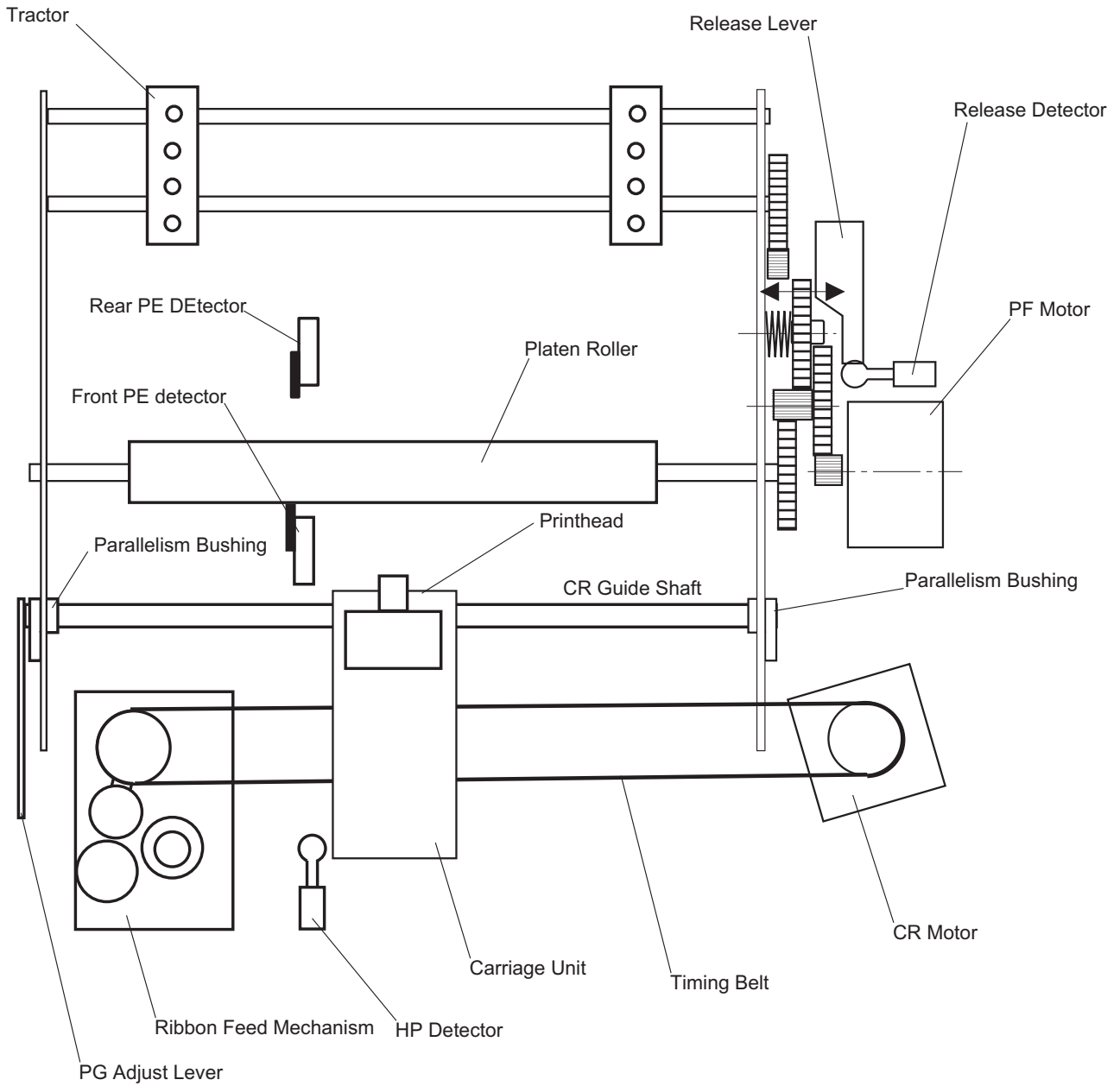
The tractor feed mechanism feeds continuous paper to the printhead and ejects it. Torque from the PF motor is transferred to the tractor unit via the release mechanism in the paper feed mechanism. The release lever in the release mechanism switches torque from the PF motor between cut sheet feeding and continuous paper feeding. This printer is equipped with several tractor feeding methods (front / rear push tractor feeding, front / rear push & pull tractor feeding and front / rear pull tractor feeding), which is selected according to the tractor unit setting positions and the lever positions. The tractor detector detects the release lever setting position, for cut sheet feeding or continuous paper feeding.

### **2.2.5 Platen Gap Adjustment Mechanism**

The platen gap (the gap between the platen and the printhead) adjustment mechanism consists of CR guide shaft, parallelism adjustment bushing, PG adjust lever and PG detector. PG adjust lever is attached to the left side of the CR guide shaft. The bushings are attached to the both sides of the frame. As the both sides of CR guide shaft are eccentric toward external form of them, printhead approaches or recedes from the platen roller as the PG lever turns forward or backward. PG detector detects PG lever position. If the lever is set to a position between "2" and "6", the printer is in the copy mode.

### **2.2.6 Ribbon Feed Mechanism**

The CR motor drives the ribbon feed mechanism via the timing belt. The ribbon feed mechanism has the sun and planetary gear system. No matter the carriage unit is driven left and right, the ink ribbon is driven in one direction.



**Figure 2-3. Printer Mechanis Outline**

## 2.3 CIRCUIT OPERATION

### 2.3.1 C229PSB/PSE/PSH Power Supply Circuit

This printer can be powered by one of the following three power supply boards: the C229PSB (120V) board, the C229PSE (230V) board, or the C229PSH (Universal) board. The function of the boards is the same, except for a difference in the primary circuitry. The power supply outputs the DC current necessary to drive the printer control circuit and drive the mechanism. The input voltages and fuse ratings are as shown in the following table:

**Table 2-1. Input Voltage and Fuse Rating**

Board	Input Voltage	Fuse F1 Rating
C229PSB	85-138VAC	4A, 125V or 250V
C229PSE	187-276VAC	T2.0AH, 250V
C229PSH	85-276VAC	T4.0AH, 250V

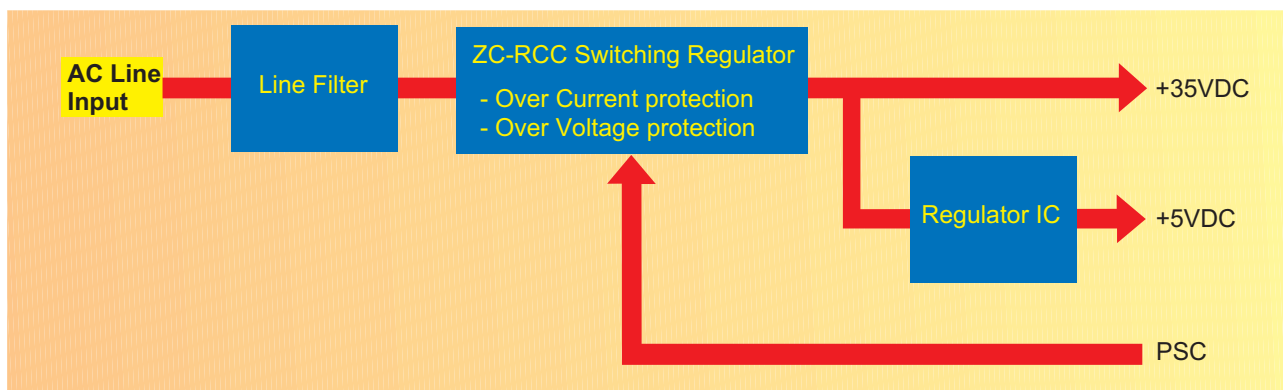
The power supply circuit outputs voltages used to drive the various control circuits and the mechanism, as shown in the following table:

**Table 2-2. Output Voltages and Applications**

Output Voltage	Applications
5V $\pm$ 5% 0.7A (Type-B I/F output is included.)	Logic lines
	Detectors
	Panel Switches & LEDs
35V $\pm$ 6% 0.8A	CR Motor
	PF Motor
	Printhead

The power supply circuit consists of the line filter circuit, ZC-RCC (Zero-Cross Ringing Choke Converter) switching circuit and 5V chopper regulator IC. The AC voltage is first input to the line filter circuit for higher harmonics absorption, then input to the switching circuit and transformed to +35VDC. +5VDC is generated from +DC35V by the regulator IC. The over current / voltage protection circuit is also designed on the board.

The power switch set in the secondary circuit that is controlled by the signal PSC from the control panel.



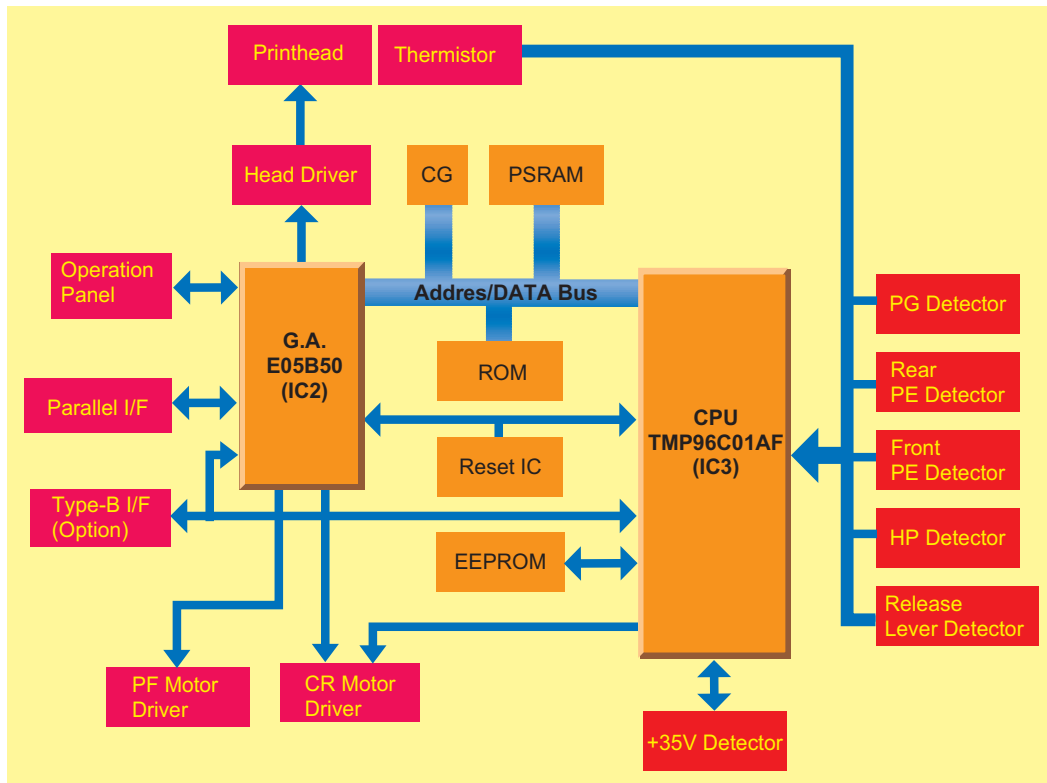
**Figure 2-4. Power Supply Circuit Block Diagram**

### 2.3.2 C229MAIN Board Circuit

The C229MAIN board is the control circuit board of this printer. This board consists of several IC chips and drivers, as shown in the table below:

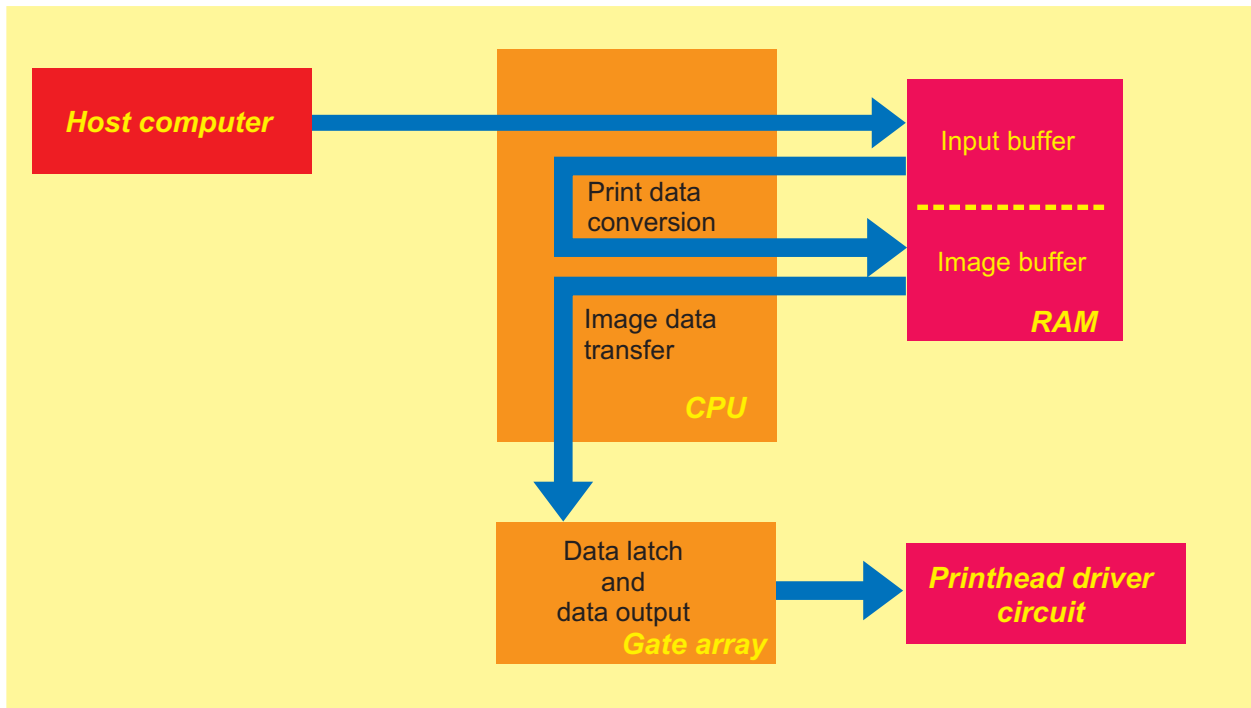
**Table 2-3. Function of the Main IC**

Element	Location	Function
TMP96C141AF	IC3	16 bit CPU runs at 14.47MHz - Main controller - Detectors control - CR Motor Control
E05B50	IC2	Gate array : System Controller - Parallel I/F control - Option Type-B I/F control - Panel Switch, LED control - Printhead Control - PF Motor Control - CR Motor Current control
PST594E	IC1	Reset IC : Hardware reset function
AT93C46	IC4	EEPROM : System control data (Market, TTL threshold, Bi-D setting, Page length, TOF, etc.) containing
PSRAM	IC5	1M/4M bit - Buffer and Working area of CPU & Gate array
ROM	IC7	2/4M bit EPROM/ Mask ROM - Control program containing
SLA7024M	IC8	CR Motor driver
A2917SEB	IC11	PF Motor driver
Comparator	IC12	Power-off signal sensing



**Figure 2-5 . C229MAIN Board Circuit Block Diagram**

Data from the host computer is stored in the input buffer once, then converted into image data and transmitted to the printhead through the gate array, as shown in the figure below:



**Figure 2-6. Data Flow**

**CHAPTER**

**3**

**TROUBLESHOOTING**

### 3.1 OVERVIEW

The printer may exhibit different symptoms for the same problem, which makes troubleshooting more difficult. This section, however, provides simple and effective ways to facilitate troubleshooting. The following flowchart illustrates the main steps of the troubleshooting process.

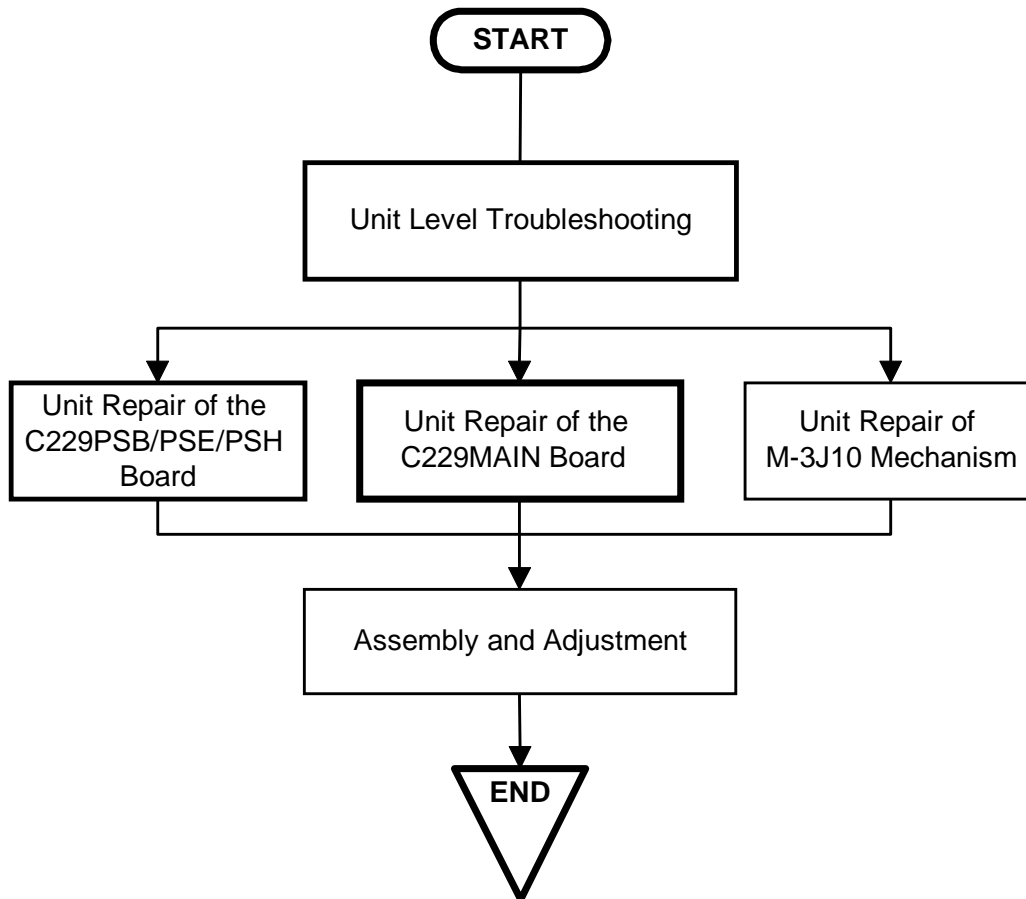


Figure 3-1. Troubleshooting Process Flowchart

#### 3.1.1 Main Component Checking Point

The following components can be checked by a simple measurement equipment such as a multi-meter, etc.) easily.

Table 3-1. Motor Coil Resistance Test Points

Motor Connector Number	Test Pin Number	Test Method (Set Meter to Ohms. Disconnect Motor from Main Board and check it with Printer Power off.)	Meter Reading
PF Motor (CN8)	1 and 3, 2 and 4	Place one lead on pin 1 (pin 2) and the other lead on pin 3 (pin 4) on each of the test pins to check the two motor phases.	<b>16.0 Ω ± 10%</b> (at 25°C per one phase)
CR Motor (CN9)	Common pin : 5 Test pins : 1, 2, 3 and 4	Place one lead on pin 5 and the other lead on each of the 4 test pins to check the two motor phase.	<b>2.7 Ω ± 10%</b> (at 25°C per one phase)

Table 3-2. Printhead Solenoid Resistance

Part	Test Pin Number (See the figure below.)	Test Method (Set Meter to Ohms. Disconnect Motor from Main Board and check it with Printer Power off.)	Specifications
Printhead	<ul style="list-style-type: none"> <li>– Common pin :C1 Test pins: 1, 4</li> <li>– Common pin :C2 Test pin: 8</li> <li>– Common pin: C3: Test pins: 2, 6</li> <li>– Common pin: C4: Test pins: 5, 9</li> <li>– Common pin :C5 Test pins: 3, 7</li> </ul>	For example, place one lead on pin C1 and the other lead on Test pin 1 to check #1 pin of the Printhead solenoid. Test pin numbers match the printhead solenoid (dot wire) numbers.	<b>8.19 ± 0.8Ω</b> (at 25°C)

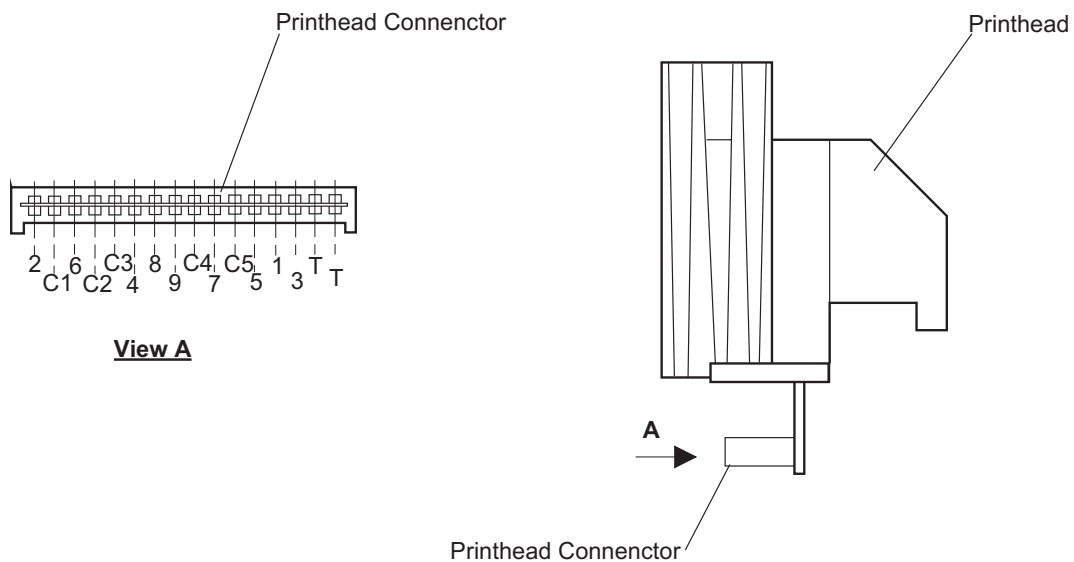


Figure 3-2. Printhead Connector Pin Alignment

Table 3-3. Printhead Driver Test Pin

Transistor Numbers	Test Method (Set meter to diodes. Check power off.)	Meter Reading
Q2, Q3, Q4, Q5, Q6,Q7, Q8, Q9, Q10 ,Q11,Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20	Check the following: <ul style="list-style-type: none"> <li>– From the base to the collector</li> <li>– From the base to the emitter</li> </ul> Reverse the leads and test again.	The tester shows neither open nor shorted.



**Table 3-4 Detector Test Point**

Detector Connector Number	Test Method (Set Meter to Ohms. Check the Printer power off.)	Meter Reading
HP Detector (CN4)	Place one lead on pin 1 and the other lead on pin 2, and toggle the detector actuator.	Meter should toggle between open and short. (LOW: within CR Home position.)
Front PE Detector (CN6)	Place one lead on pin 1 and the other lead on pin 2, and toggle the detector actuator.	Meter should toggle between open and short. (HIGH: paper is installed in the printer.)
Release Lever Detector (CN10)	Place one lead on pin 1 and the other lead on pin 2, and toggle the detector actuator.	Meter should toggle between open and short. (HIGH: Friction Feed mode.)
PG Detector (CN11)	Place one lead on pin 1 and the other lead on pin 2, and move the detector actuator from -0 to 6.	Meter should toggle between open and short. (HIGH: PG -1 ~ 3.)
Printhead thermistor	Place one lead on pin T and the other lead on other pin T to check the resistance.(Refer to Fig.3-2.)	Approx. 14KΩ (at 17°C)

### 3.1.2 Error

As this printer checks its condition by itself at power-on, when it finds any trouble, it indicates it with error indication buzzer and LEDs. The error Indications and corresponding remedies are shown in the table below:

**Table 3-5. Error Indications**

Error	LED Status	Buzzer	Cause	Remedies
Paper out error	Paper Out: On Pause: On	***	The printer fails to load paper.	Set paper to the printer correctly.
Release lever error	Pause: ON	-----	The release lever is set to a wrong position.	Set the release lever to the correct position.
Fatal error	All LEDs : Blink	—	The carriage unit gets into out of control or power supply voltage becomes incorrect.	Turn off the printer once and turn it back on.

*Note: Symbols used in the table represent the following:*

“\*” : A beep sounds for approx. 100 ms with the interval of approx. 100ms.

“-” : A beep sounds for approx. 500 ms with the interval of approx. 100ms.

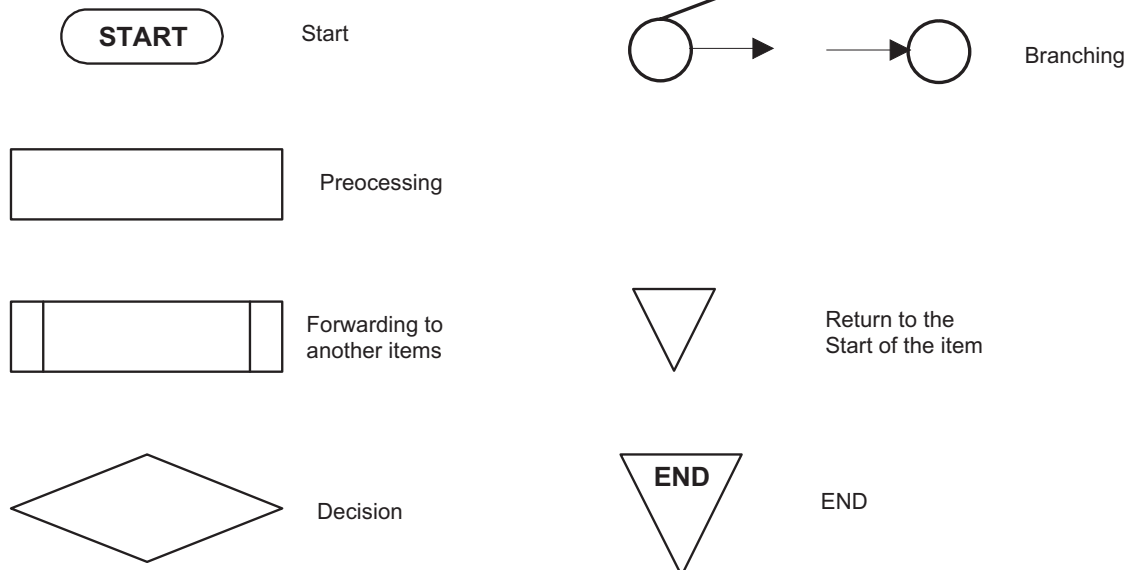
## 3.2 UNIT LEVEL TROUBLESHOOTING

You may be able to identify the defective unit just from the symptom displayed. The table below provides the symptoms for a number of failures, so that you can easily identify the problem. Once the problem has been identified, refer to the flowchart listed in the right-hand column of the table below to determine the case of the problem.

**Table 3-6. Symptoms and Problems**

Symptom	Problem	See Page
Printer fails to operate when power is on.	<ul style="list-style-type: none"> <li>• Carriage dose not move.</li> <li>• Control panel indicator LEDs do not light.</li> </ul>	3-5
Abnormal carriage operation at power on.	<ul style="list-style-type: none"> <li>• Carriage moves away from the home position at power on.</li> <li>• Carriage returns to home position correctly, but the printer then fails to enter the READY mode.</li> </ul>	3-6
Printing is faulty during self-test, but carriage operation is normal.	<ul style="list-style-type: none"> <li>• No printing at all.</li> <li>• Faulty printing — some dots are not printing.</li> </ul>	3-7
Abnormal paper feeding	The printer prints but feeds paper incorrectly.	3-8
Abnormal control panel operation	When the LF/FF switch is pressed, no paper is fed.	3-9
Data sent by the host computer is printed incorrectly	<ul style="list-style-type: none"> <li>• Carriage operates normally at power on, and self-test is executed correctly, but data is not printed.</li> <li>• Data from the computer is printed incorrectly.</li> </ul>	3-10

The repair procedure flowcharts use the following symbols:



**Figure 3-3. Symbols Used in the Flowcharts**

1. Printer fails to operate when power is on.

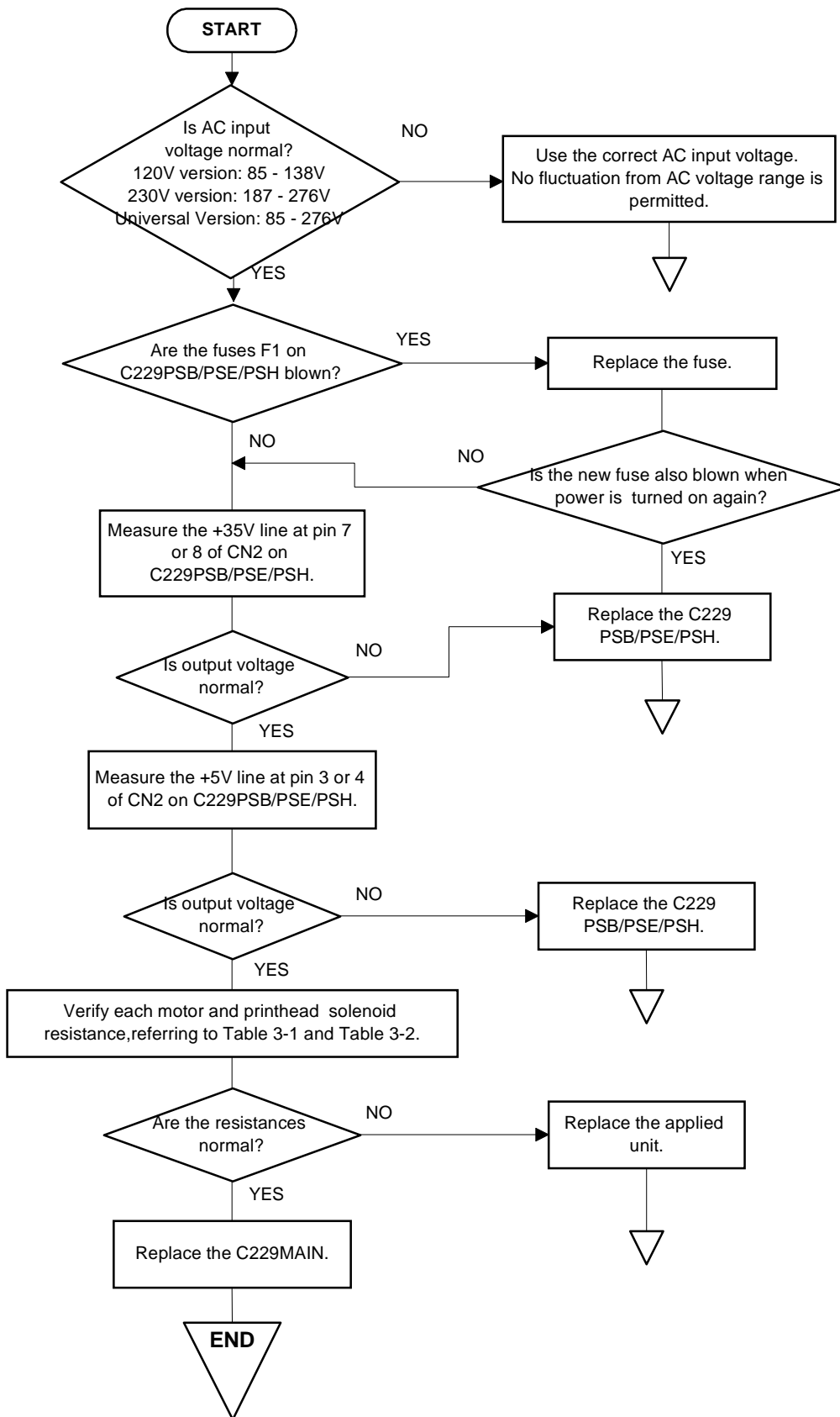


Figure 3-4. Flowchart (1)

2. Abnormal carriage operation at power on.

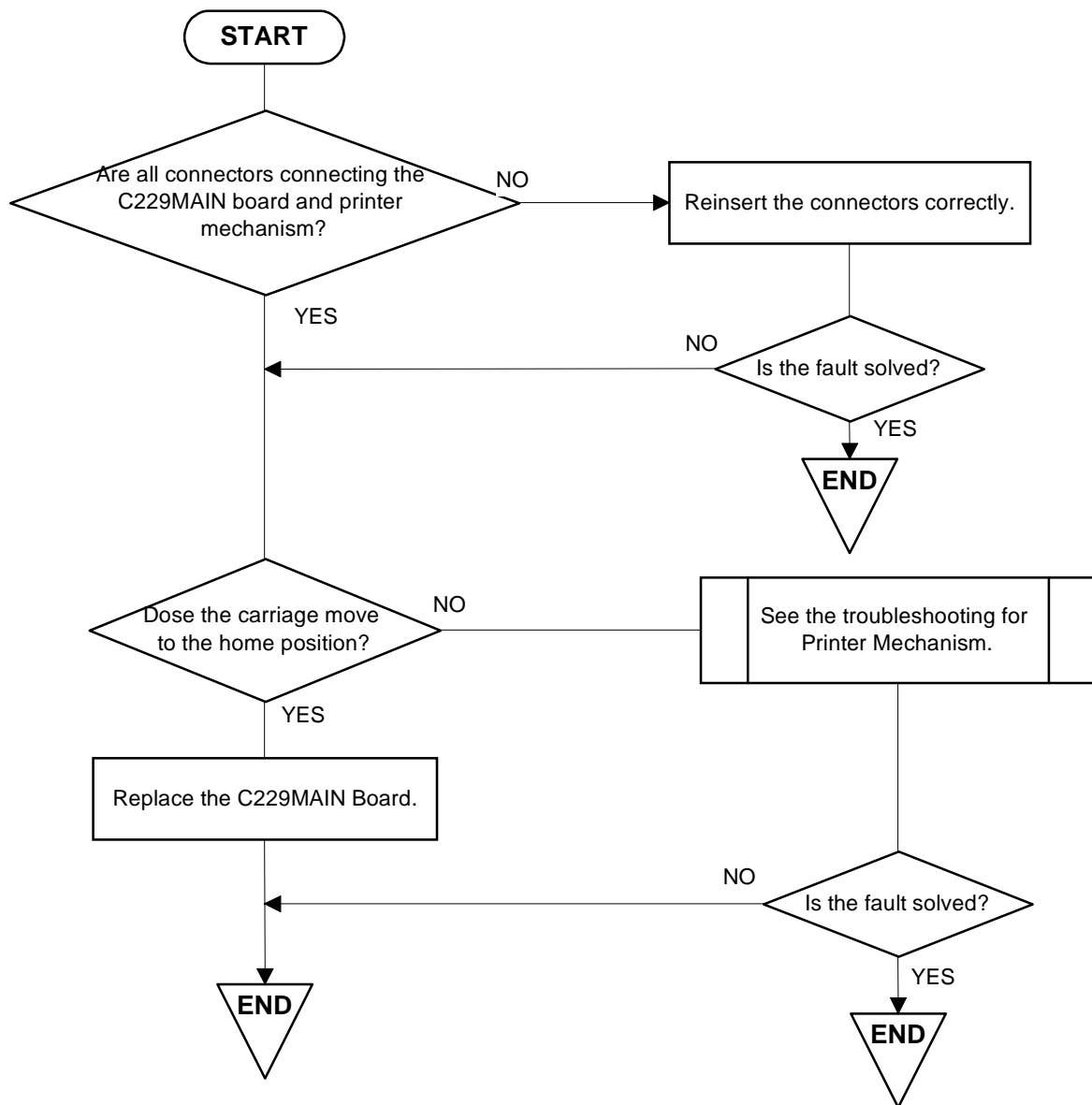


Figure 3-5. Flowchart (2)

3. Printing is faulty during self-test, but carriage operation is normal.

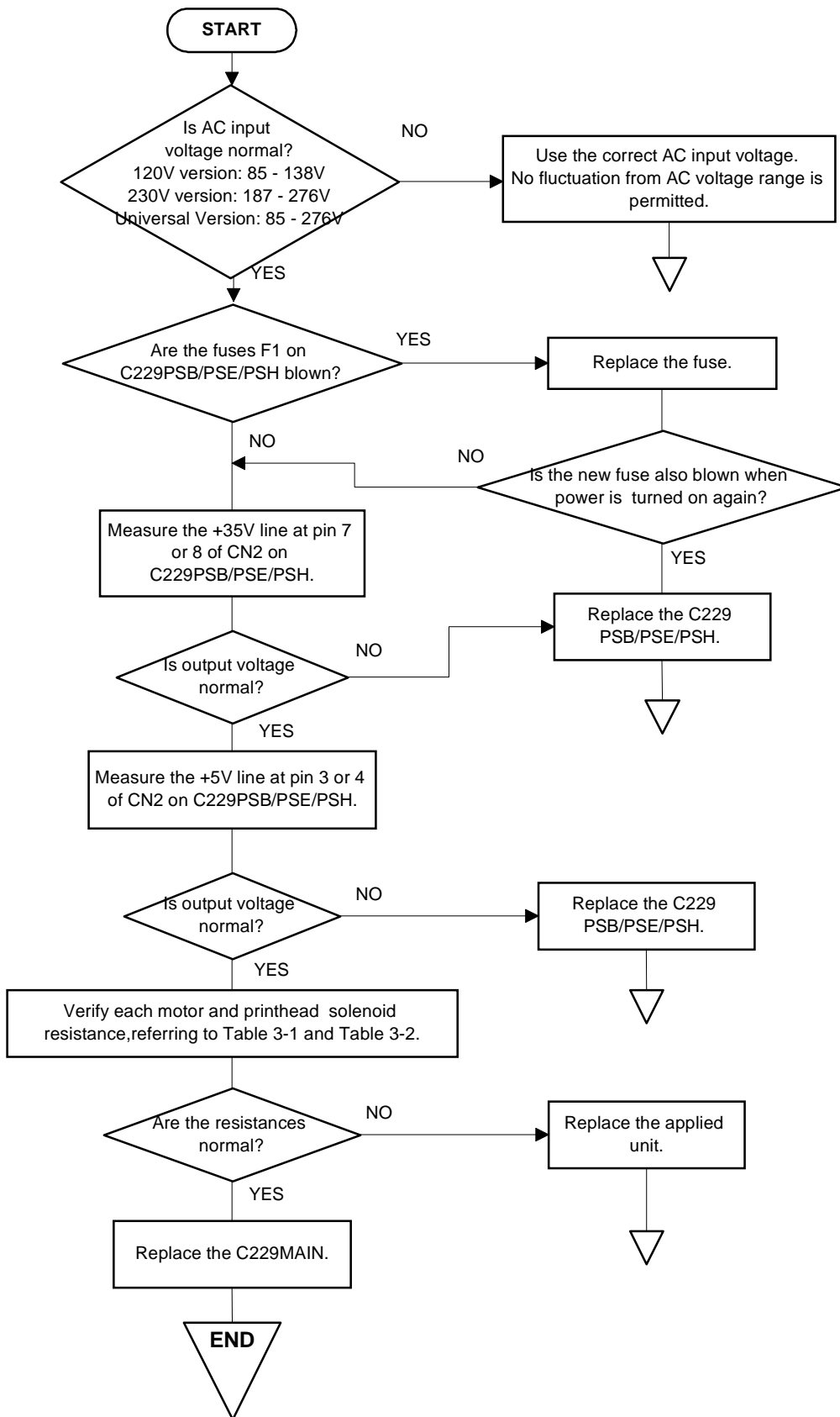


Figure 3-6. Flowchart (3)

4. Abnormal paper feeding

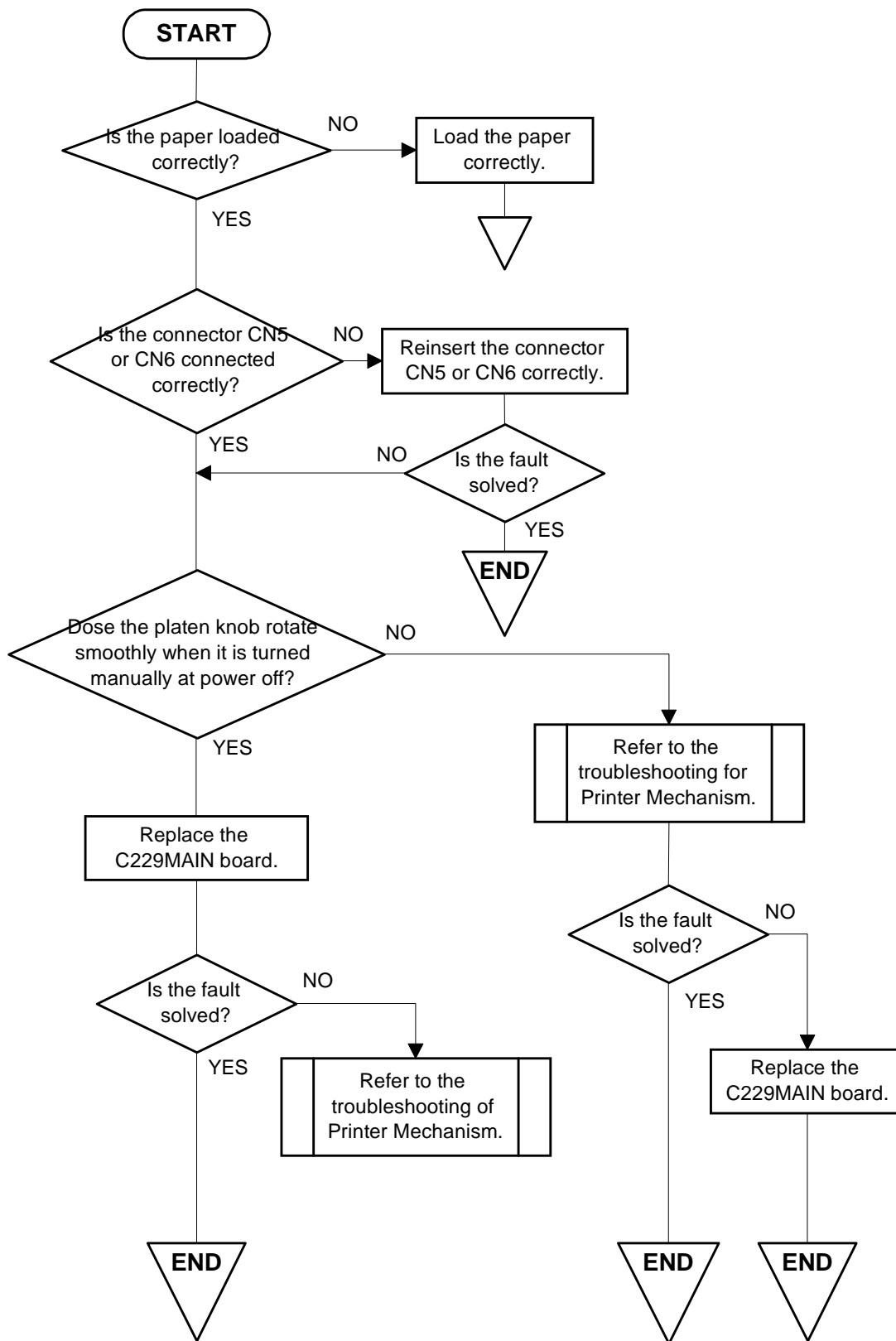


Figure 3-7. Flowchart (4)

5. Abnormal control panel operation

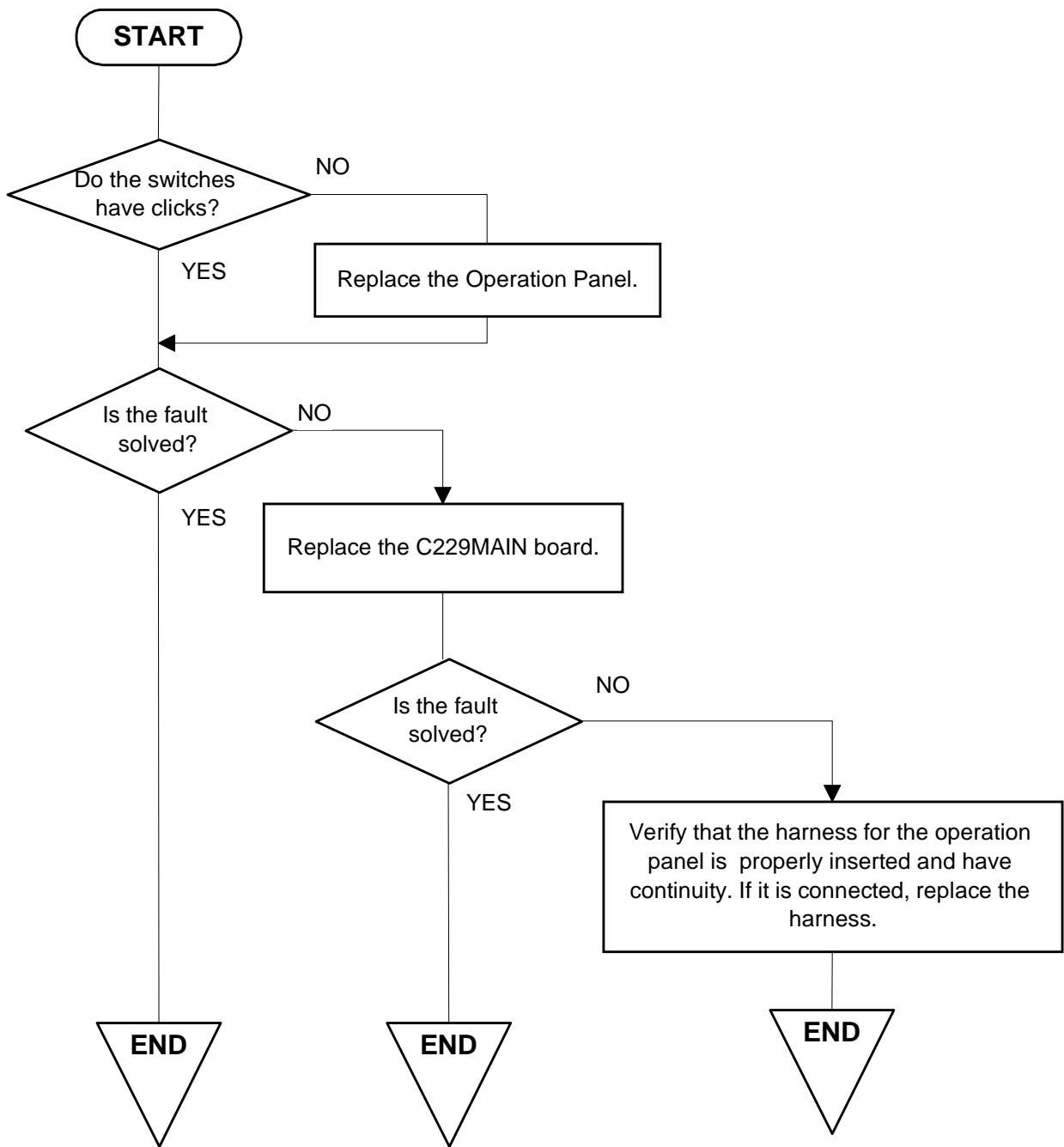


Figure 3-8. Flowchart (5)

6. Data sent by the host computer is printed incorrectly.

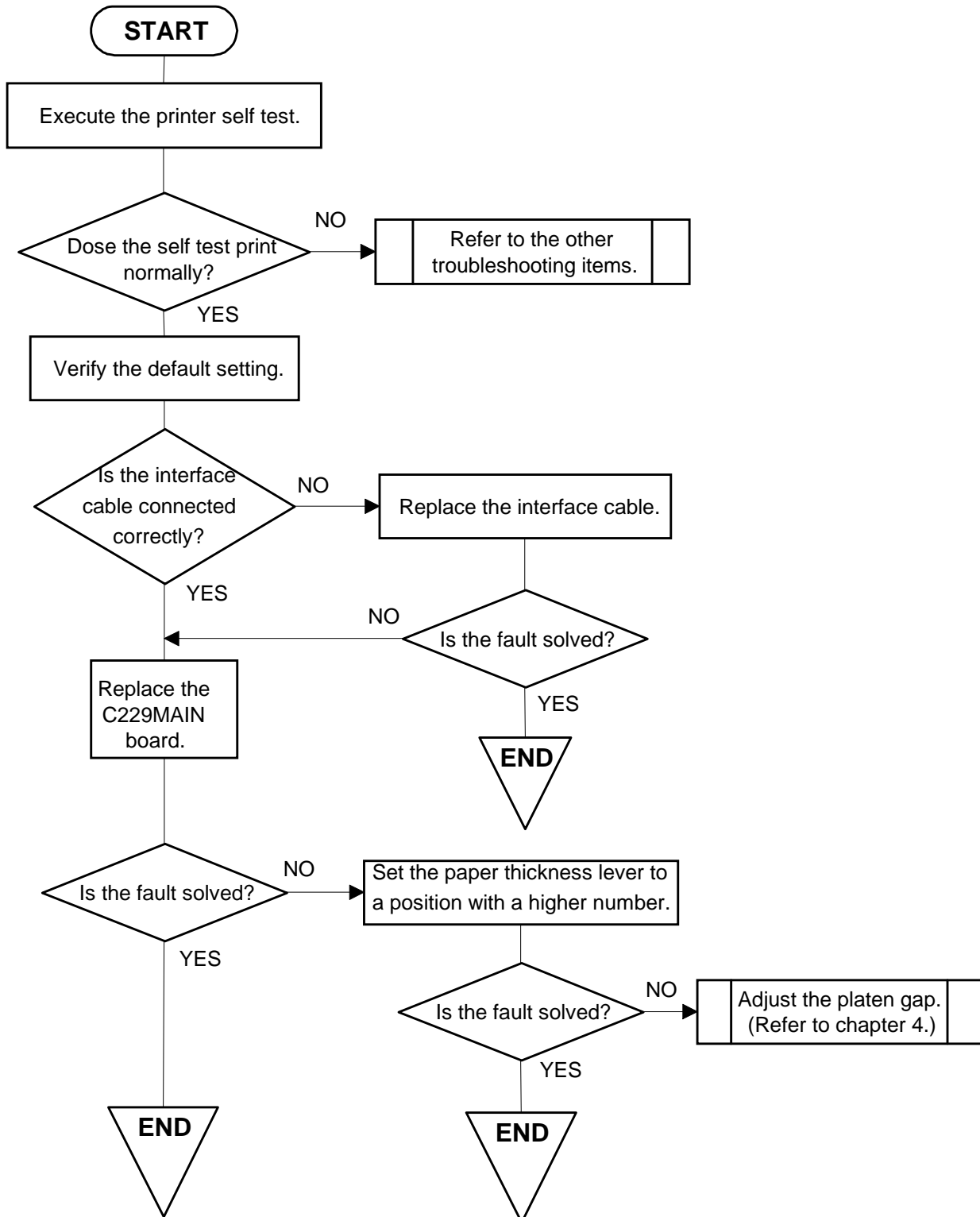


Figure 3-9. Flowchart (6)

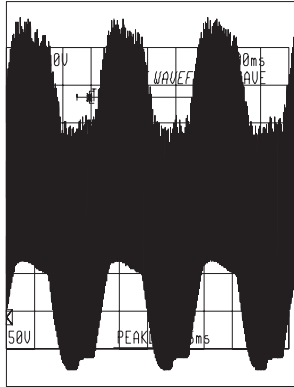
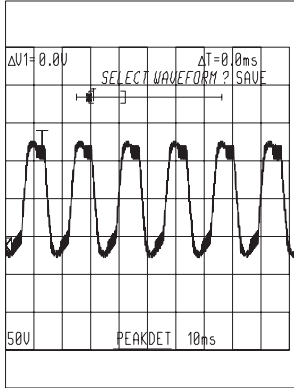


## 3.3 UNIT REPAIRING OF THE POWER SUPPLY BOARD

This section is necessary only for servicers who repair to the component level. Servicers who perform only board replacement can ignore this section.

The table below lets you troubleshoot problems with the power supply board (C229PSB/PSE/PSH). The table provides various symptoms, likely cases, and checkpoints. Checkpoints include waveforms, resistance, and other values to be checked to evaluate the operation of each component.

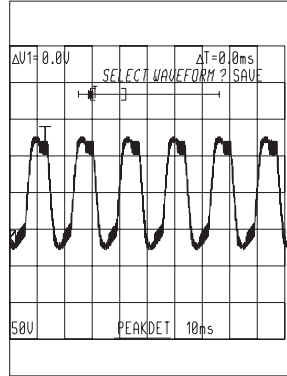
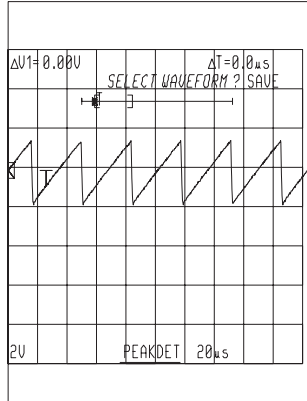
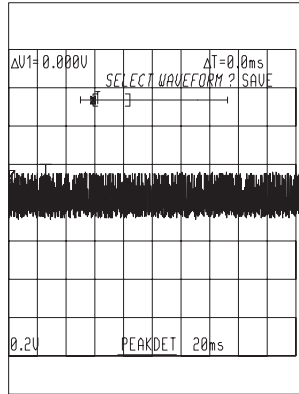
**Table 3-7. Repair of the C229PSB/PSE/PSH**

Symptom	Condition	Cause	Checkpoint	Solution
The printer dose not operate at all.	+35V line is defective.	Fuse F1 is blown.	Check that the fuse is not blown.	Replace the C229PSB/PSE/PSH board.
		Transformer (T1) is open.	Check the coil of transformer using a multimeter.	Replace the C229PSB/PSE/PSH board.
		Switching FET (Q1) is defective.	Check for the proper waveform at the drain of Q1. 	Replace the C229PSB/PSE/PSH board.
		Q2 or Q3 is defective.	Check for the proper waveform at the collector of Q2 or Q3. 	Replace the C229PSB/PSE/PSH board.

**Figure 3-10. Drain of Q1**

**Figure 3-11. Collector of Q2/Q3**

Table 3-8. Repair of the C229PSB/PSE/PSH (continued)

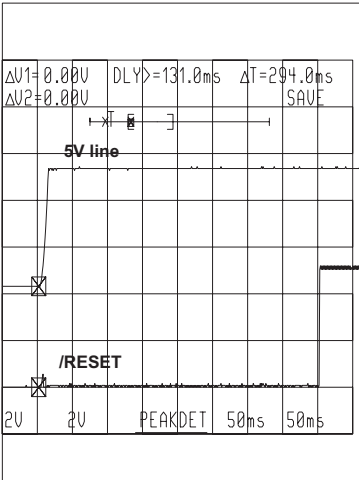
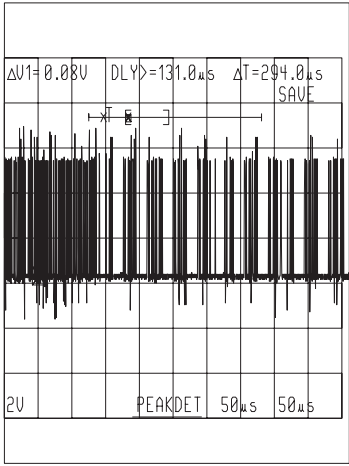
Symptom	Condition	Cause	Checkpoint	Solution
The printer dose not operate at all.	+35V line is defective.	PC1 is defective.	<p>Check for the proper waveform at pin 5 or 7 of PC1.</p>  <p><b>Figure 3-12. Waveform of PC1</b></p>	Replace the C229PSB/PSE/PSH board.
	+5V line is defective.	Regulator IC (IC51) is defective.	<p>Check for the proper waveform at pin 5 of IC51.</p>  <p><b>Figure 3-13. OSC of IC51</b></p>	
			<p>Check for the proper waveform at pin 9 or 10 of IC51.</p>  <p><b>Figure 3-14. Output of IC51</b></p>	Replace the C229PSB/PSE/PSH board.

## 3.4 UNIT REPAIRING OF THE MAIN BOARD

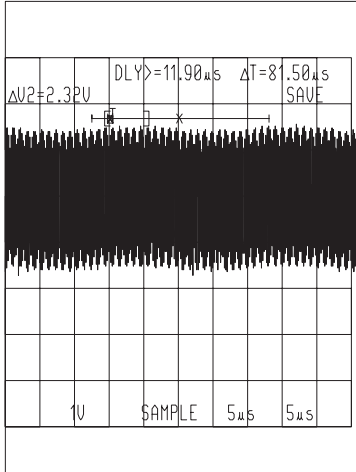
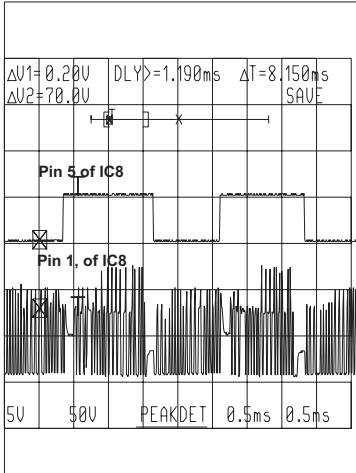
This section is necessary only for servicers who repair to the component level. Servicers who perform only board replacement can ignore this section.

The table below lets you troubleshoot problems with the main board (C229MAIN). The table provides various symptoms, likely cases, and checkpoints. Checkpoints include waveforms, resistance, and other value to be checked to evaluate the operation of each component.

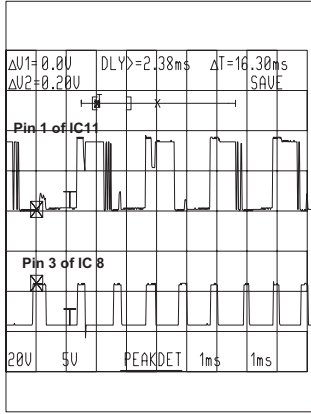
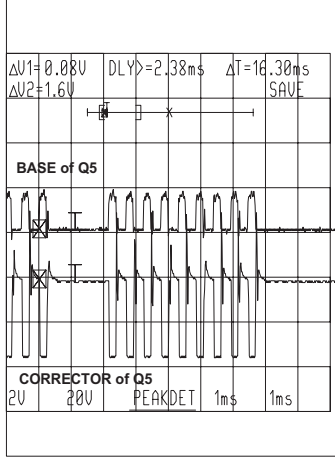
**Table 3-9. Repair of the C229MAIN**

Symptom	Condition	Cause	Checkpoint	Solution
The printer dose not operate at all.	The CPU dose not operate.	The reset circuit is not operational.	<p>Check for the proper voltage waveforms output from the +5VDC line (IC1, pin 3) and for the reset signal (IC1, pin 1) with printer power on.</p>  <p style="text-align: center;"><b>Figure 3-15. Reset Signal</b></p>	Replace the C229MAIN board.
		Selection control ROM is abnormal	<p>Check for the proper signal at pin 22 of IC7 or pin 30 of IC6 which changes between HIGH and LOW.</p>  <p style="text-align: center;"><b>Figure 3-16. Chip Select Signal for Program ROM</b></p>	

**Table 3-10. Repair of the C229MAIN (continued)**

Symptom	Condition	Cause	Checkpoint	Solution
The printer dose not operate at all.	The CPU dose not operate.	The CPU is defective.	<p>Check for the proper oscillator signal at pin 26 or 27 of the CPU (IC3).</p>  <p style="text-align: center;"><b>Figure 3-17. Clock Signal of CPU</b></p>	Replace the C229MAIN board.
The carriage operates abnormally.	The carriage dose not operate at all.	IC8 is defective.	<p>Check for the proper CR motor phase control signals at pin 5, 6, 16 and 17, and motor driving signals at pin 1, 8, 11 and 18 of IC8.</p>  <p style="text-align: center;"><b>Figure 3-18. CR Motor Control Signal</b></p>	Replace the C229MAIN board.

**Table 3-11. Repair of the C229MAIN (continued)**

Symptom	Condition	Cause	Checkpoint	Solution
Paper is fed abnormally.	Paper is not fed at all.	IC 11 is defective.	Check for the proper PF motor phase control signals at pin 1, 2, 23 and 24, and motor driving signals at pin 3, 6, 18 and 21 of IC11.  	Replace the C229MAIN board.
Self test printing is abnormal.	The self test printing is not executed or a particular dot doesn't print.	Any transistor of Q2 - Q10 is defective.	Check for the proper printhead driving signal at the collector and base of Q2 - Q11  	Replace the C229MAIN board.
		Any transistor from Q11 to Q25 is defective.	-	Replace the C229MAIN board.
Data from the host computer is printed incorrectly.	Data corruption occurs when the interface is used.	IC2 or CPU is defective.	-	Replace C229MAIN board.

## 3.5 REPAIRING THE PRINTER MECHANISM

For detailed procedures for replacing or adjusting matter, refer to Chapter 4, *Disassembly and Assembly* and Chapter 5, *adjustments*. If a problem or symptom occurs, refer to the following tables and find out other potential causes.

**Table 3-12. Repairing the Printer Mechanism**

Symptom	Cause	Checkpoint	Solution
<b>▼ Problem: The CR motor fails to operate.</b>			
The CR motor fails to drive the timing belt after power on.	Foreign matter is lodged in the mechanism.	Manually move the timing belt to see if the motor can rotate freely.	Remove the foreign substance.
	The CR motor is defective.	Measure the motor coil resistance. It should be about 16 ohms. If the coil is shorted, check CR motor driver IC8 on the main board.	Replace the CR motor (and main board, if necessary).
<b>▼ Problem: The carriage dose not operate at power on (after carriage has been manually centered prior to power on).</b>			
The CR motor rotates, but the carriage dose not move.	The belt drive or driven pulley is defective.	Check the pulleys which are broken or worn.	Replace the pulleys.
	The timing belt is defective.	Check if the timing belt is correctly set to the carriage.	Reset the belt to the carriage.
		Check if the timing belt is broken.	Replace the belt.
The carriage moves to the left slightly, then stops.	The carriage movement is not smooth.	Check if the carriage moves smoothly as you move it manually.	Clean and lubricate the CR guide shaft or frame. Otherwise, replace the CR motor.
The carriage moves to the left or right end, then stops.	The HP detector is defective.	Check the HP detector using a multi meter.	Replace the HP detector.
<b>▼ Problem: Self test printing is not executed.</b>			
The carriage moves, but dose not print.	The printhead FFC common wires are disconnected.	Check whether FFC is properly connected to the printhead or the main board.	Connect the FFC to the printhead or the main board correctly.
	The printhead is defective.	Measure the printhead coil resistance. It should be about 8 ohms. If the printhead is shorted, check the drivers on the main board.	Replace the printhead, (and drivers , if necessary).

**Table 3-13. Repairing the Printer Mechanism (continued)**

Symptom	Cause	Checkpoint	Solution
<b>▼ Problem: Self test printing is not executed.</b>			
A particular dot is missing.	The printhead is defective.	Measure the printhead coil resistance. It should be about 8 ohms. If the printhead is shorted, check the drivers on the main board.	Replace the printhead, (and drivers , if necessary).
		Check if the head wire is broken.	Replace the printhead.
The printing is too light, or the print density is uneven.	The printhead is defective.	Check if the head wire is broken.	Replace the printhead.
	The platen gap is not properly adjusted.	Set the gap adjustment lever to the first position, and check for the correct platen gap, $0.365 \pm 0.015$ .	Adjust the platen gap. Refer to Chapter 5.
<b>▼ Problem: Paper is fed abnormally.</b>			
The printer tries to print, but paper is not fed or not fed constantly.	Foreign matter is lodged in the paper path.	Check if any foreign matter is lodged in the paper path.	Remove the foreign matter.
	The PF motor dose not drive the mechanism.	Check if any foreign matter is lodged in the mechanism.	Remove the foreign matter.
	The PF motor is defective.	Measure the motor coil resistance. It should be about 16 ohms. If the motor is shorted, also check the drivers on the main board.	Replace the PF motor, (and drivers , if necessary).
<b>▼ Problem: Ribbon operation is abnormal.</b>			
The ribbon is not turning.	The ribbon cartridge is defective.	Remove the ribbon cartridge and check if the ribbon feeds normally as you turn it manually.	Replace the ribbon cartridge.
	Foreign matter is lodged in the gears.	Check if the RD ratchet rotates as you manually move the carriage right and left.	Remove the foreign matter. Otherwise, replace the ribbon feed mechanism.
The ribbon feeds properly only when the carriage moves in one direction (i.e., it fails to feed when the carriage moves in the other direction).	The planetary gear in the ribbon drive gears is defective.	Move the carriage manually, and check if the ribbon feed gears turn in reverse and engages with the gear.	Replace the ribbon feed mechanism.

**Table 3-14. Repairing the Printer Mechanism (continued)**

Symptom	Cause	Checkpoint	Solution
<b>▼ Problem: Paper is stained with ink.</b>			
Ink stains appear on printed areas.	The ribbon mask is positioned incorrectly.	Check if the ribbon mask is installed in the correct position.	Reinstall the ribbon mask.
	The platen gap is not adjusted correctly.	Set the gap adjustment lever to the first position, and check the platen gap. The correct platen gap is $0.365 \pm 0.015$ .	Adjust the platen gap. Refer to the chapter 5 <i>Adjustment</i> .
<b>▼ Problem: The printer continues to print after paper ends or when no paper is loaded.</b>			
The printer keeps printing beyond the end of the page.	The PE detector is defective.	Check if the PE detector is bad.	Replace the PE detector.



CHAPTER

4

# DISASSEMBLY AND ASSEMBLY

## 4.1 OVERVIEW

This section describes procedures for disassembling and assembling the printer. Unless otherwise specified, disassembled units or components can be re-assembled by reversing the disassembly procedure. Therefore, no assembly procedures are included in this section. Precautions for any disassembly or assembly procedure are described under the heading “CHECK POINT”. Any adjustments required after disassembling the units are described under the heading “ADJUSTMENTS”.

### 4.1.1 Disassembly Precautions

Follow the precautions below when disassembling the printer.

#### WARNING

- *Before disassembling, assembling or adjusting the printer, disconnect the power supply cable from the AC power socket. Failure to do so might cause personal injury.*
- *Be careful with the printhead when you handle it as it may be very hot right after printing.*
- *Do not touch the heat sink attached to the switching FET (Q1) on the power supply board right after power off, as it may be very hot.*
- *Never touch the heat sink attached to the switching FET (Q1) while The AC power cable is connected to the AC outlet, as it is not electrically isolated.*

#### CAUTION

- To maintain efficient printer operation, take the precautions below:*
- *Use only the recommended tools for maintenance work.*
  - *Use only the recommended lubrications and adhesives (See Chapter 6.)*
  - *Adjust the printer only in the manner described in this manual.*
  - *Be aware that the existing drawings for Fx-880 are substituted for FX-1180. It is because no exclusive drawings for FX-1180 has been made since the major mechanical difference between FX-1180 and FX-880 is width only.*

### 4.1.2 Tools and Instruments

The table below lists the tools and the instruments required for disassembling, assembling or adjusting the printer. Use only tools that meet these specifications.

**Table 4-1 . Tool and Instrument List**

Name	Specification	EPSON Part No.
Phillips Screwdriver	No.2	B743800200
Phillips Screwdriver	No.1	B743800100
Box Driver	7.0mm Diagonal	B741700200
Tweezers	—	B741000100
Round-nose pliers	—	B740400100
Thickness gage	—	B776702201
Soldering iron	—	B740200100
E-Ring holder	Size: #6	B740800800
Multi-Meter	OHM/Voltage/Current	—
Oscilloscope	Min. 50MHz	—

*Note) All tools and instruments listed above are commercially available.*

### 4.1.3 Service Check After Repair

After completing repair of the product, use the check list shown below to check the status of the repaired product and overall repair work performed before returning the product to the users. This list can be used as a record of all service works performed with the product.

**Table 4-2. Repair Status Check List**

Category	Component	Item to Check	Status
Printer Mechanism	Printhead	Do all wires print properly?	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
	Carriage Mechanism	Dose the carriage move smoothly? • Noisy • Any dirt or excessive oil?	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
		Is the CR motor at the normal temperature? (Not too hot?)	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
	Paper Feed Mechanism	Does paper advance smoothly? • Noisy? • Paper is jamming?	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
		Is the PF motor at the normal temperature? (Not too hot?)	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
	Paper Path	Do all types of paper advance smoothly?	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
		Is the tractor feeding paper smoothly?	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
		Are all paper paths clear of obstructions?	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
		Is the plate free of damage?	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
	Ribbon Mask	Is the ribbon mask free of damage?	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
Operation	Self-Test	Was the self-test printing successful?	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
	On-line Test	Was the on-line printing successful?	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
Adjustment	Platen-Gap	Is the gap adjusted correctly? (PG = 0.38 ± 0.02mm )	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
	Bi-D Alignment	Is the Bi-Directional alignment made properly?	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
ROM	Version	Latest version =	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
Packing	Ribbon Cartridge	Has the ribbon cartridge been removed from the printer?	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary
	Attachments	Have all relevant attachments been packed together with the printer?	<input type="checkbox"/> Checked, OK <input type="checkbox"/> Not necessary


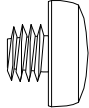
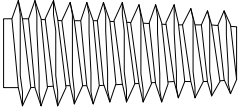
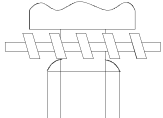
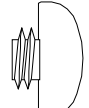
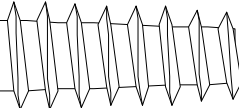

### 4.1.4 Abbreviations for Small Parts

The table below lists the abbreviations used in this manual for small parts, such as screws and washers.

**Table 4-3. Abbreviations and Screw Type**

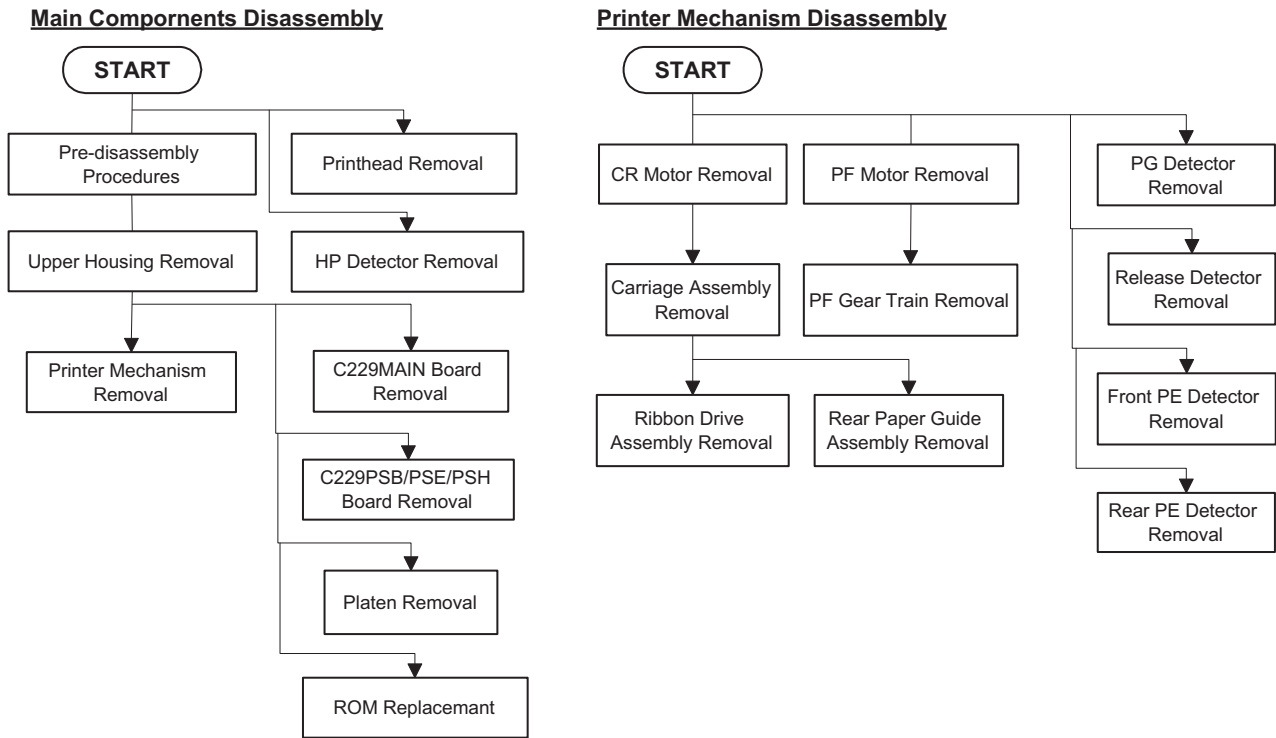
Abbreviation	Description
CB Screw	Cross-recessed <b>B</b> ind-head Screw
CBS Screw	Cross-recessed <b>B</b> ind-head <b>S</b> -tight Screw
CBB Screw	Cross-recessed <b>B</b> ind-head <b>B</b> -tight Screw
CBP Screw	Cross-recessed <b>B</b> ind-head <b>P</b> -tight Screw
CP Screw	Cross-recessed <b>P</b> an-head Screw
CB(O) Screw	Cross-recessed <b>B</b> ind-head Screw with <b>O</b> utside toothed lock washer

**Table 4-4. Screw Types and Abbreviations**

Head		Body	Washer (assembled)
Top	Side		
<b>Cross-recessed</b>  	<b>Bind-head</b>  	<b>S-tight</b>  	<b>Outside toothed lock washer</b>  
	<b>Pan-head</b>  	<b>B-tight</b>  	
		<b>P-tight</b>  	

## 4.2 DISASSEMBLY AND ASSEMBLY

This section provides the disassembly procedures. The basic order for disassembly is shown in the flowchart below. The exploded diagrams are also provided in the APPENDIX. Refer to them to see how components are engaged each other if necessary.



**Figure 4-1. Disassembly Flowchart**

## 4.2.1 Printhead Removal

1. Remove the top cover.
2. Remove 2 CBS (M3 × 8) screws attaching the printhead to the carriage assembly.
3. Disconnect the head FFC from the printhead and remove it.

### **WARNING**

- Before disassembling or assembling the printhead, disconnect the power supply cable from the AC power socket. Failure to do so might cause personal injury.
- Be careful with the printer when you handle it, as it may be very hot right after printing.

### **ADJUSTMENT**

After replacing the printhead, perform the platen gap adjustment. (Refer to Chapter 5.)

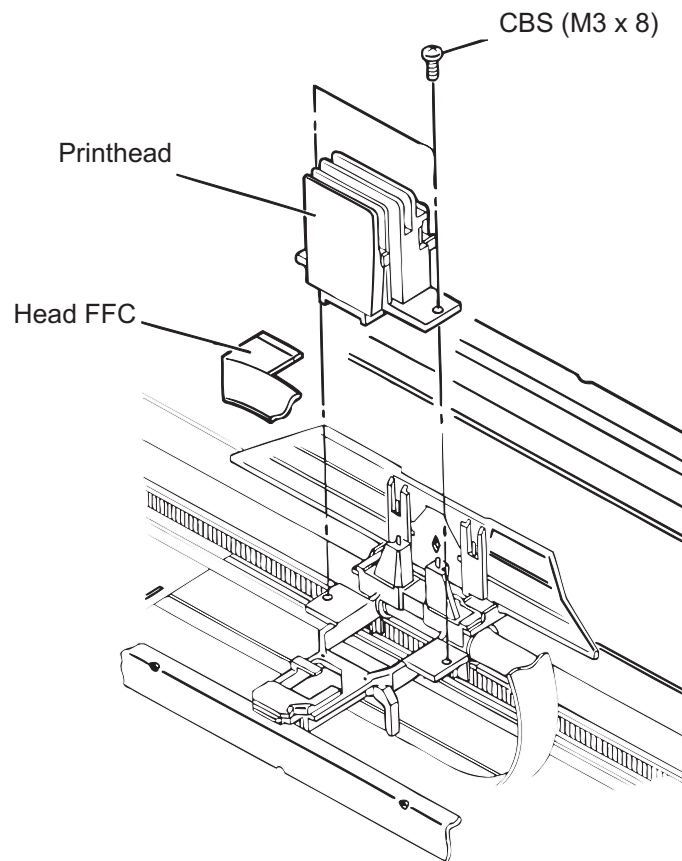
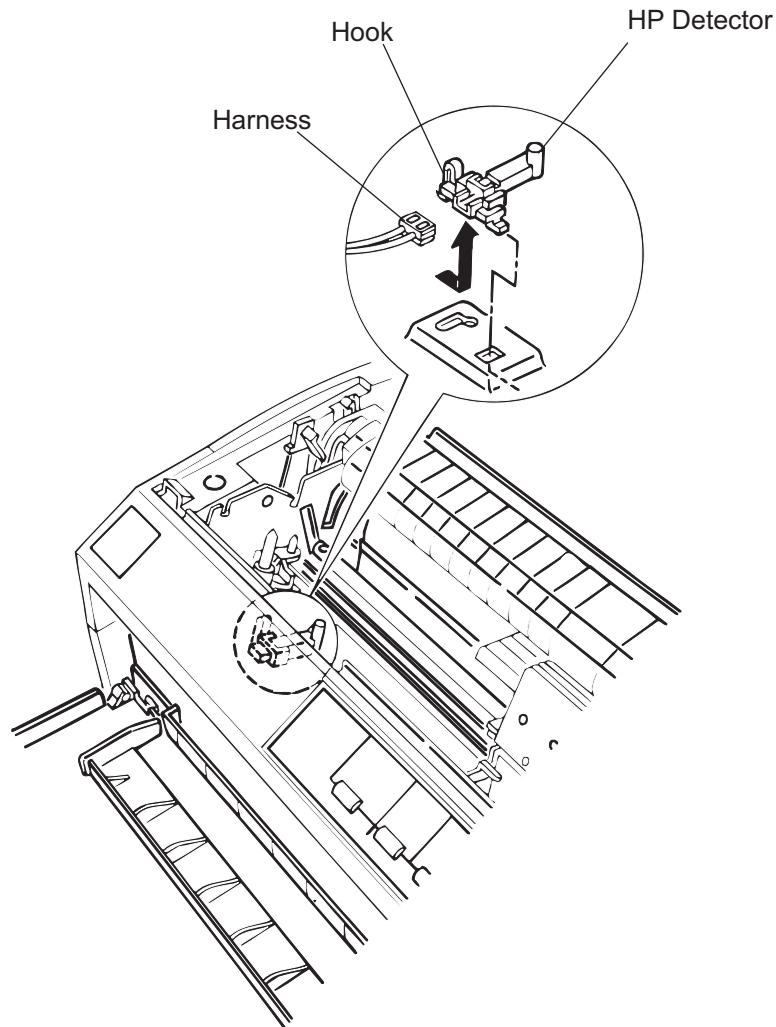


Figure 4-2. Printhead Removal

## **4.2.2 HP (Home Position) Detector Removal**

1. Remove the top cover.
2. Release the hook attaching the HP detector to the printer mechanism, and remove it.
3. Disconnect the harness of the detector from the detector connector.



**Figure 4-3. HP Detector Removal**

### 4.2.3 Pre-disassembly Procedures

1. Remove the PAPER GUIDE ASSEMBLY, top cover, front cover, paper eject cover, knob and tractor unit.

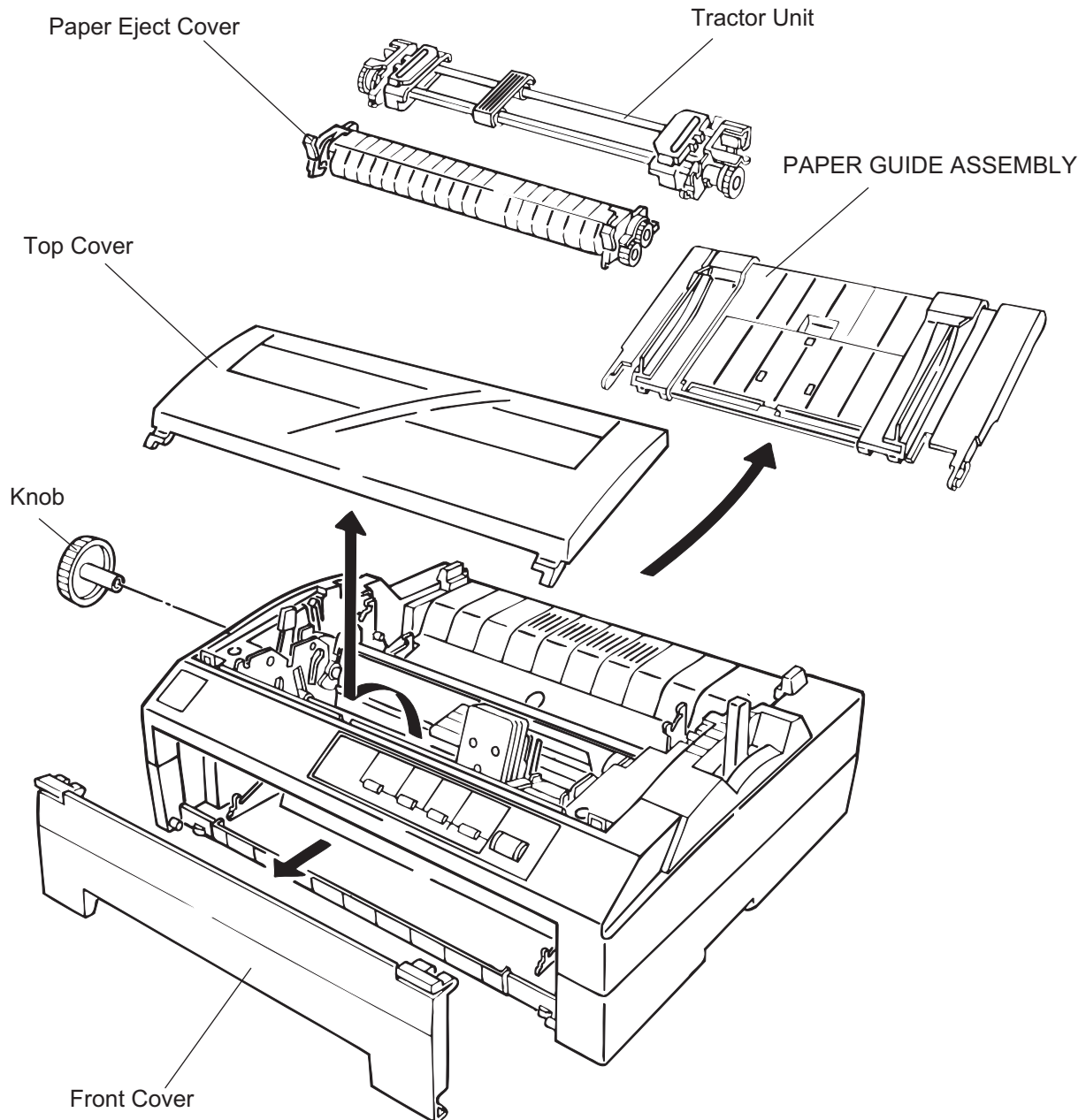


Figure 4-4. Pre-Desassembly

**CAUTION**

*Remove the paper eject cover and the tractor unit by pushing and releasing the hooks at the both sides. When remounting them, be sure to snap these hooks on the projecting parts.*



#### 4.2.4 Upper Housing Removal

1. Remove the PAPER GUIDE ASSEMBLY, top cover, front cover, paper eject cover, knob and tractor unit. (See Section 4.2.3.)
2. Remove 2 CBS (M3 × 6) screws and a CBB (4 × 12) screw securing the upper housing to the lower case.
3. Set the release lever to the friction feed side.
4. Opening the front side of the upper housing a little, disconnect the Panel FFC from the connector in the panel assembly.
5. Opening the front side of the upper housing a little, release 2 hooks securing the panel assembly to the upper housing at the front bottom side of the upper housing. Then remove the panel.
6. Open the upper housing from the front side, and remove it .

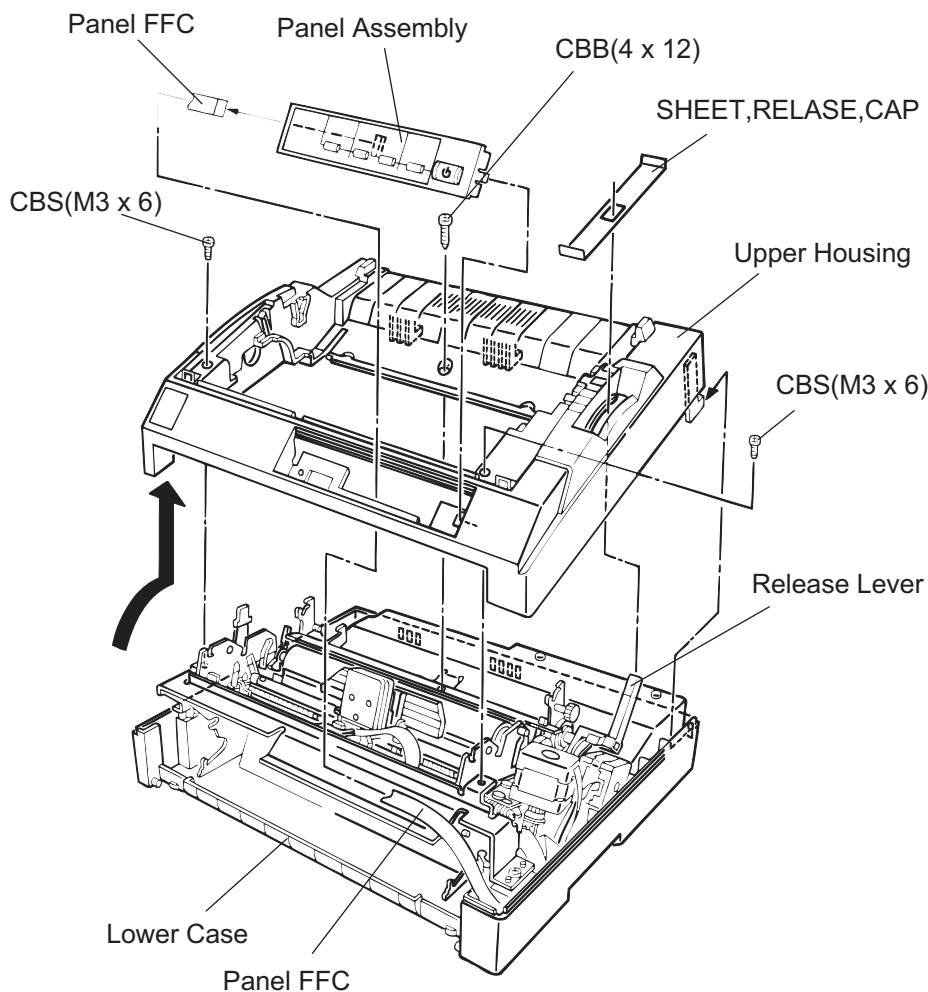


Figure 4-5. Upper Housing Removal

**CAUTION**

- When assembling the upper housing, put the hooks in the upper housing on the catching holes at the rear side of the lower case at first, then close the housing.
- Mount the Panel assembly onto the upper housing before installing the upper housing assembly.
- Sheet, Release, Cap can be assembled after the upper housing assembly is installed.

## 4.2.5 C229MAIN Board Removal

### WARNING

- *Before disassembling, assembling or adjusting the printer, disconnect the power supply cable from the AC power socket. Failure to do so might cause personal injury.*
- *Do not touch the heat sink attached to the switching FET (Q1) on the power supply board right after power off, as it may be very hot.*
- *Never touch the heat sink attached to the switching FET (Q1) while The AC power cable is connected to the AC outlet, as it is not electrically isolated.*

1. Remove the PAPER GUIDE ASSEMBLY, top cover, front cover, paper eject cover, knob and tractor unit. (See Section 4.2.3.)
2. Remove the upper housing. (See Section 4.2.4.)
3. Remove 5 CBS (M3 × 4) screws and 3 CBB (3 × 12) screws securing the shield cover to the printer mechanism and lower housing. Then remove the shield cover.
4. Disconnect the harnesses from the connectors CN3, CN4, CN5, CN6, CN7, CN8, CN9, CN10, CN11 and CN12 on the C229MAIN board.
5. Remove 2 CBS (M3 × 12) screws securing the COVER,CONNECTOR,UPPER to the I/F GROUNDING PLATE.
6. Remove 6 CBB (3 × 12) screws securing C229MAIN Board to the lower case.
7. Remove the GUIDE, I/F BOARD and GROUNDING PLATE,I/F,UPPER.
8. Remove 2 CP (M3 × 8) screws securing the I/F GROUNDING PLATE to the C229MAIN board. Then remove the I/F GROUNDING PLATE.

### CAUTION

- *Be careful with the edges of the shield plate, as they are very sharp.*
- *Be sure to match the connector colors with each other. However, the yellow harness must be connected to CN10, and the blue harness must be connected to CN11.*
- *The red line sides of the harnesses for CN3, CN8 and CN9 must be set to No.1 pin side.*

### ADJUSTMENT

*After replacing the C229MAIN Board, perform the Default setting and Bi-d adjustment to store the new data into the EEPROM on the main board. (Refer to Chapter 5.)*

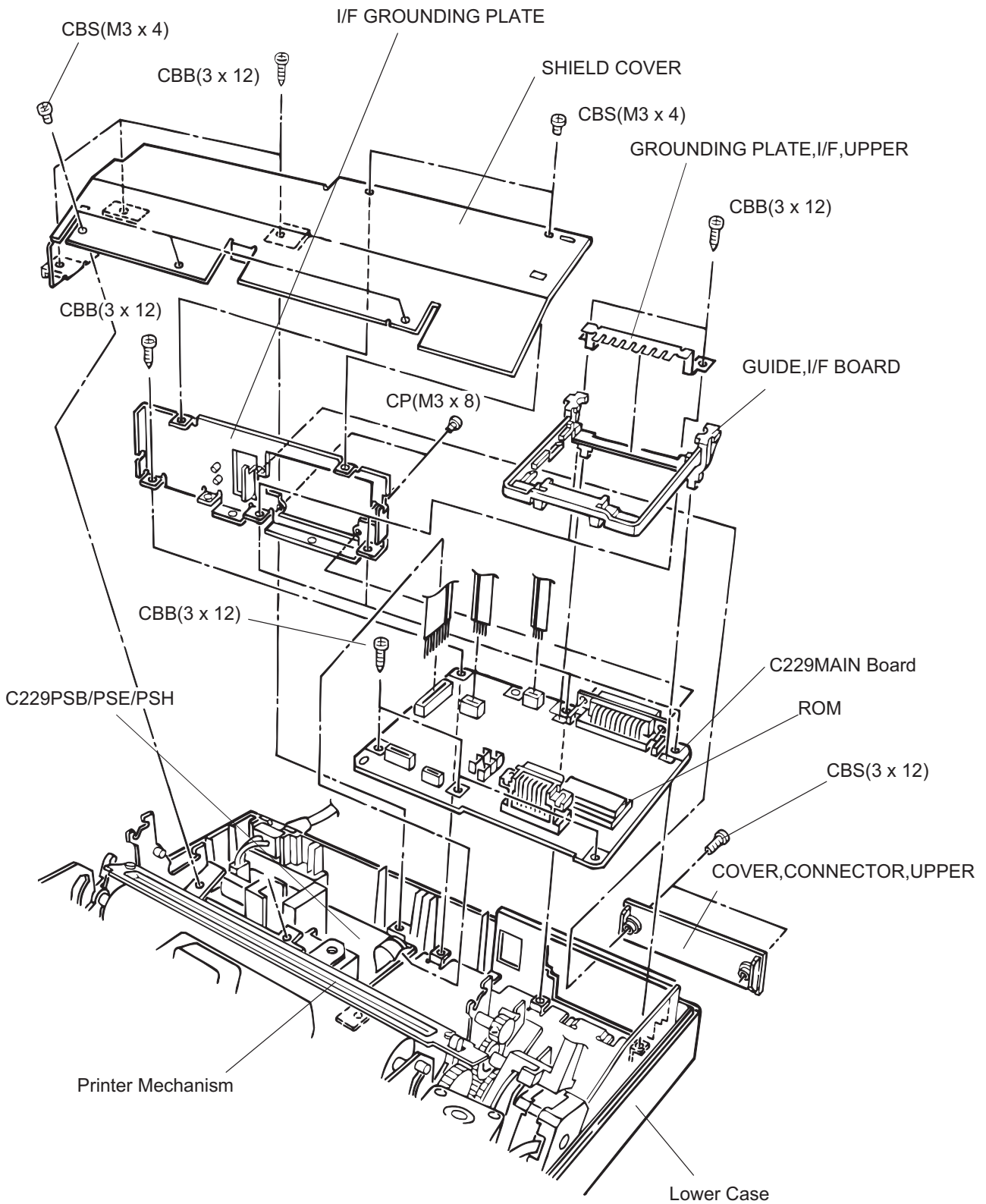


Figure 4-6. C229MAIN Board Removal

## 4.2.6 C229PSB/PSE/PSH Board Removal

1. Remove the PAPER GUIDE ASSEMBLY, top cover, front cover, paper eject cover, knob and tractor unit. (See Section 4.2.3.)
2. Remove the upper housing. (See Section 4.2.4.)
3. Remove 5 CBS (M3 × 4) screws and 3 CBB (3 × 12) screws securing the shield cover to the printer mechanism and lower housing. Then remove the shield cover. (See Section 4.2.5.)
4. Disconnect the harness from the connector CN3 on the C229MAIN board.
5. Disconnect the power cable from the connector CN1 on the C229PSB/PSE/PSH Board.
6. Remove 2 CBB (3 × 12) screws securing the C229PSB/PSE/PSH Board to the Lower Case, and remove the C229PSB/PSE/PSH Board.

### **WARNING**

- **Before disassembling, assembling or adjusting the printer, disconnect the power supply cable from the AC power socket. Failure to do so might cause personal injury.**
- **Do not touch the heat sink attached to the switching FET (Q1) on the power supply board right after power off as it may be very hot.**
- **Never touch the heat sink attached to the switching FET (Q1) while The AC power cable is connected to the AC outlet, as it is not electrically isolated.**

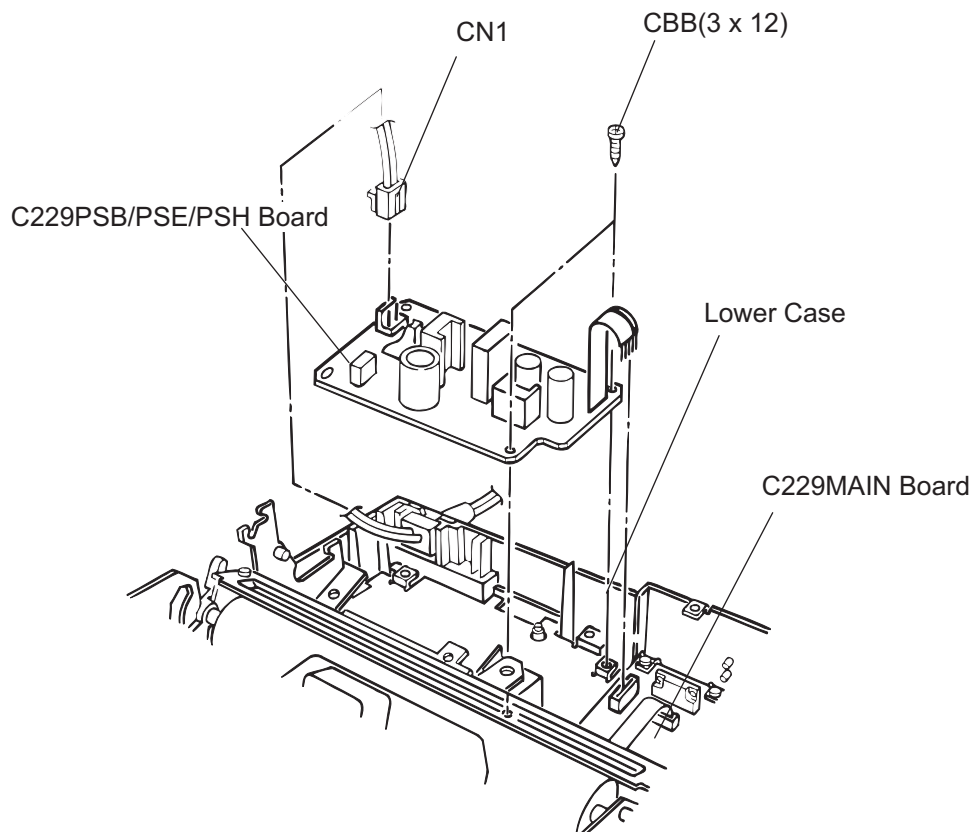


Figure 4-7. C229PSB/PSE/PSH Board Removal

## 4.2.7 ROM Removal

**⚠ WARNING**

- *Before disassembling, assembling or adjusting the printer, disconnect the power supply cable from the AC power socket. Failure to do so might cause personal injury.*
- *Do not touch the heat sink attached to the switching FET (Q1) on the power supply board right after power off, since it may be very hot.*
- *Never touch the heat sink attached to the switching FET (Q1) while the AC power cable is connected to the AC outlet, since it is not electrically isolated.*

1. Remove the PAPER GUIDE ASSEMBLY, top cover, front cover, paper eject cover, knob and tractor unit. (See Section 4.2.3.)
2. Remove the upper housing. (See Section 4.2.4.)
3. Remove 5 CBS (M3 × 4) screws and 3 CBB (3 × 12) screws securing the shield cover to the printer mechanism and lower housing and remove the shield cover. (See Section 4.2.5.)
4. Remove the ROM from the C229MAIN Board.

## 4.2.8 Platen Removal

1. Remove the PAPER GUIDE ASSEMBLY, top cover, front cover, paper eject cover, knob and tractor unit. (See Section 4.2.3.)
2. Remove the upper housing. (See Section 4.2.4.)
3. Remove 2 CBS (M3 × 8) screws securing the COVER, PLATEN.
4. Rotating the teeth of the PLATEN SHAFT HOLDERS forward, disengage them from the Left/Right Side Frame.
5. Slide the PLATEN right a little and remove it by lifting it up.

**ADJUSTMENT** ▶

*After replacing the platen, perform the platen gap adjustment. (Refer to Chapter 5.)*

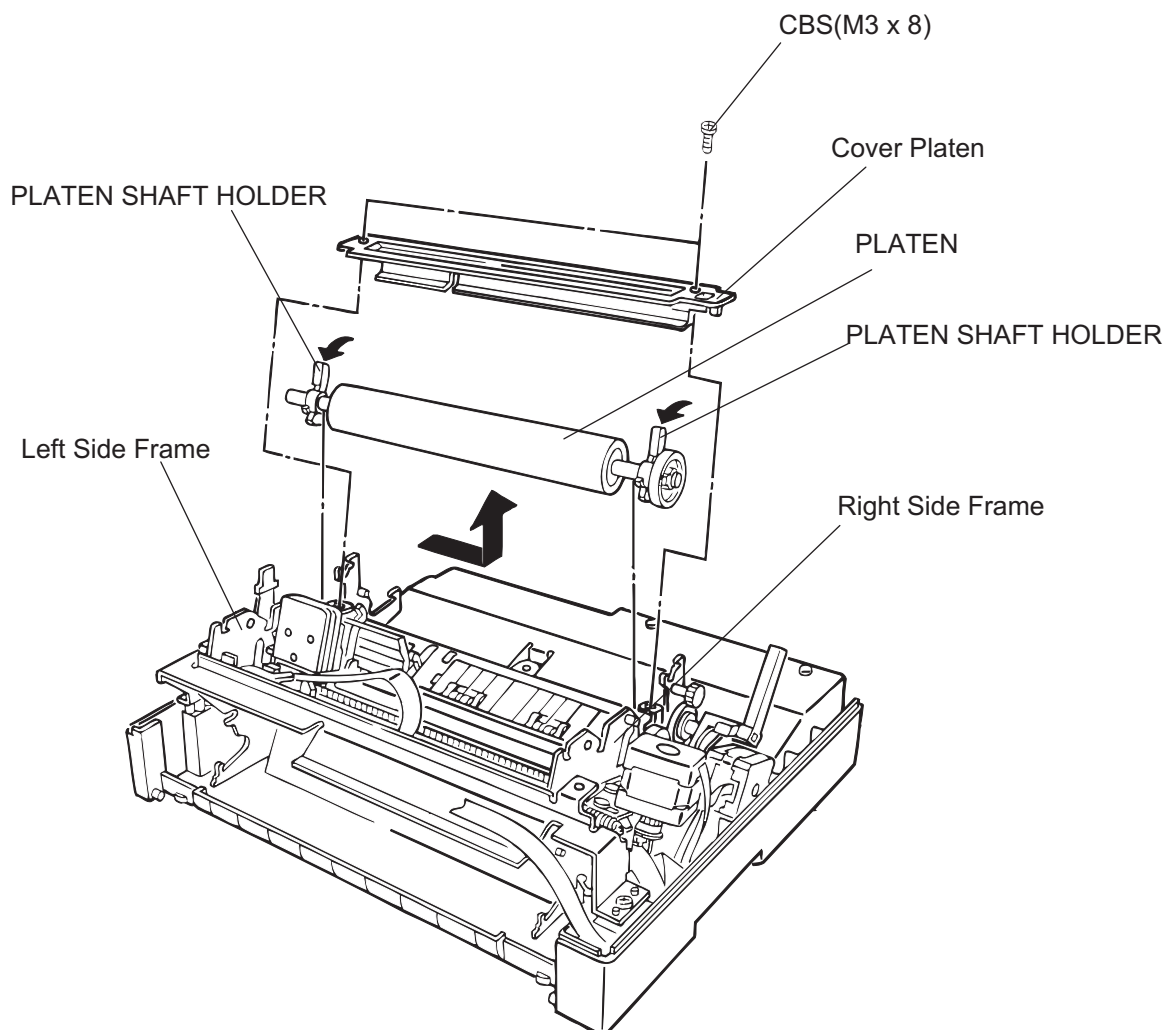


Figure 4-8. Platen Removal

## 4.2.9 Printer Mechanism Removal

1. Remove the PAPER GUIDE ASSEMBLY, top cover, front cover, paper eject cover, knob and tractor unit. (See Section 4.2.3.)
2. Remove the upper housing. (See Section 4.2.4.)
3. Remove 5 CBS (M3 × 4) screws and 3 CBB (3 × 12) screws securing the shield cover to the printer mechanism and lower housing. Then remove the shield cover. (See Figure 4-6. )
4. Disconnect the harnesses from the connectors CN3, CN4, CN5, CN6, CN7, CN8, CN9, CN10 and CN11 on the C229MAIN board.
5. Remove 2 CBB (4 × 12) screws securing the front frame to the lower housing, and remove the front frame.
6. Remove 4 mechanism fixing screws, and remove the printer mechanism by lifting it up.

### ADJUSTMENT

*Once you have removed the printer mechanism, be sure to perform the platen gap and the Bi-D adjustment.*

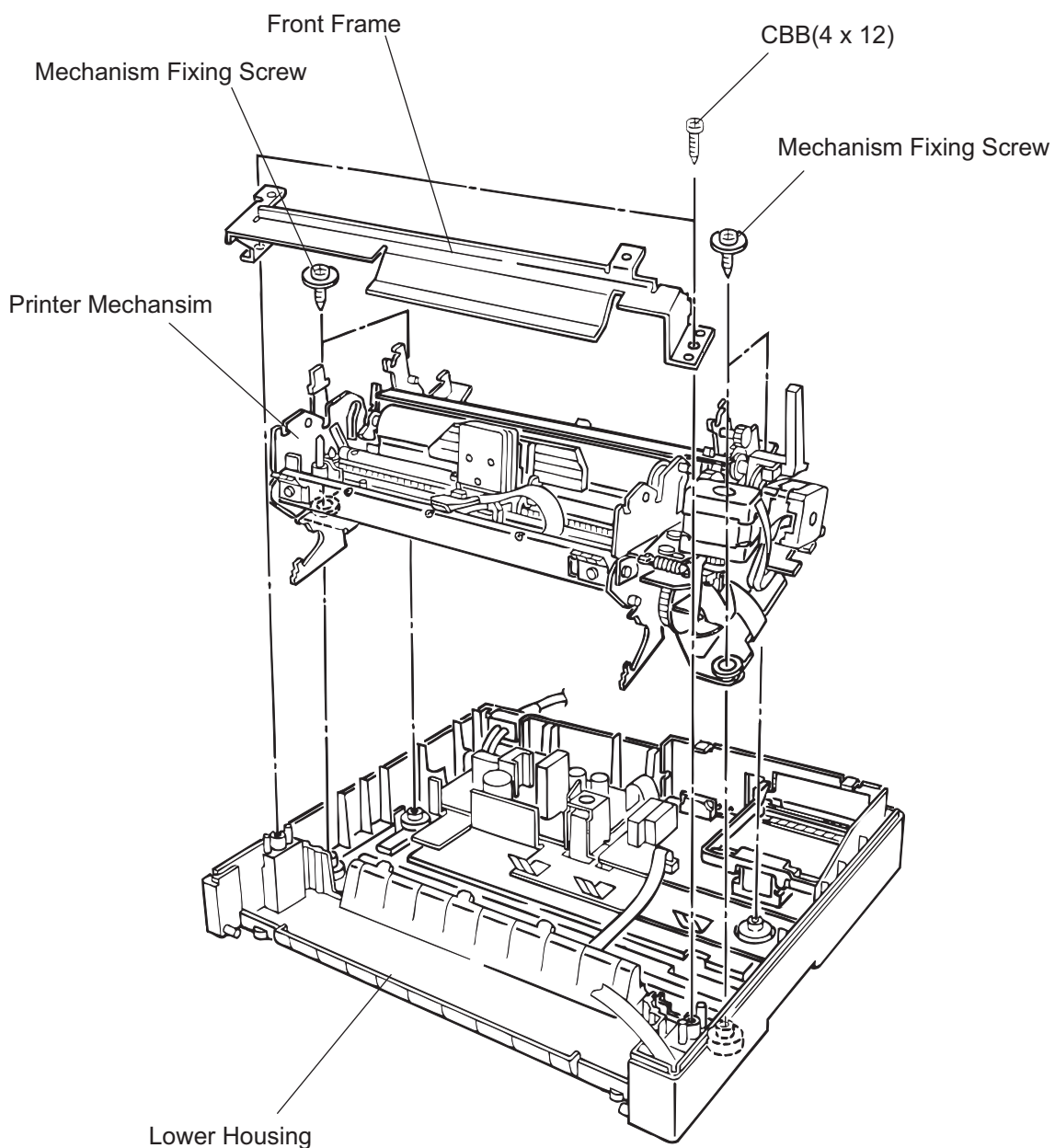


Figure 4-9. Printer Mechanism Removal

## 4.2.10 Printer Mechanism Disassembly

### 4.2.10.1 CR Motor Removal

1. Release the tension spring.
2. Disengage the TIMING BELT from the CR motor pinion and hang it on the hook.
3. Remove 2 SHAFT,MOUNT,CR screws securing the CR motor assembly to the FRAME,SUB,RIGHT, and remove the CR motor.
4. Remove 2 CB (M3 × 6) screws securing the CR motor to the motor bracket, and remove the CR motor.

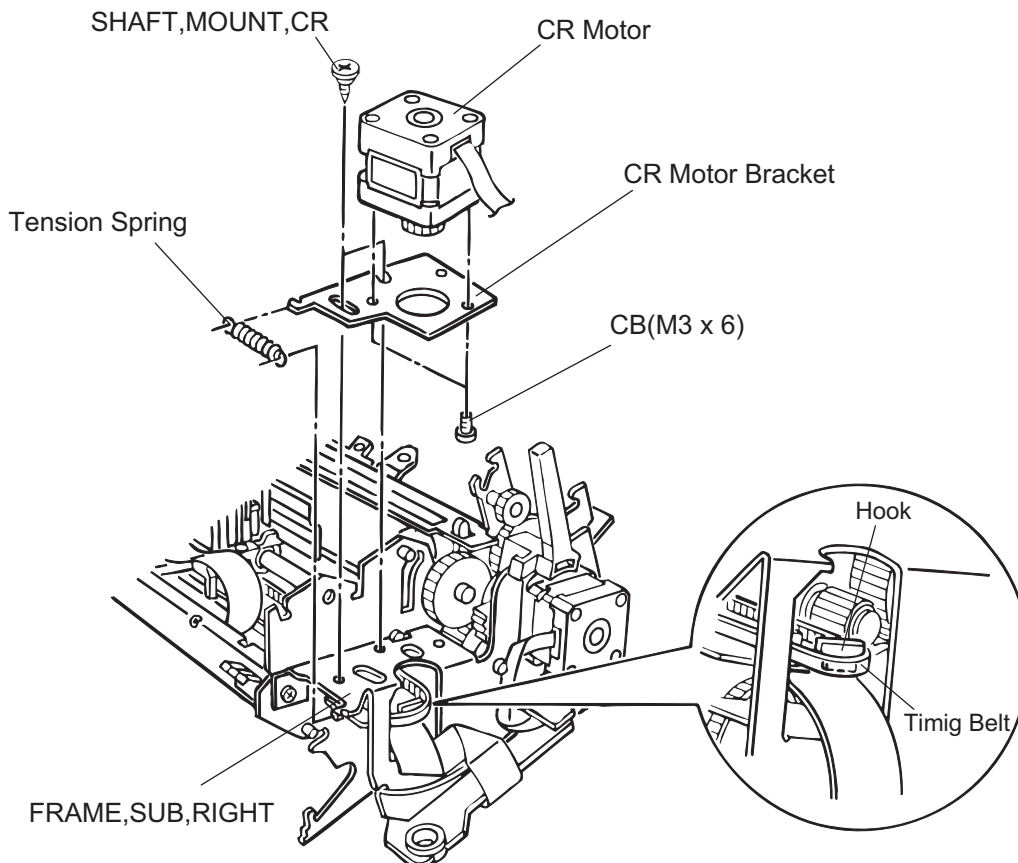


Figure 4-10. PF Motor Removal

**ADJUSTMENT** ▶

*After replacing the CR motor or TIMING BELT, perform the Bi-d adjustment. (See Chapter 5.)*

✔ **CHECK POINT**

*Position the CR motor assembly on the CR motor bracket correctly as shown below;*

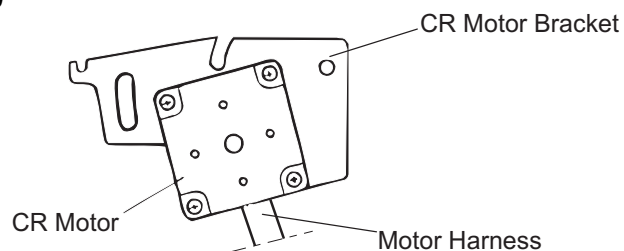


Figure 4-11. Positioning the CR Motor on the CR Motor Bracket

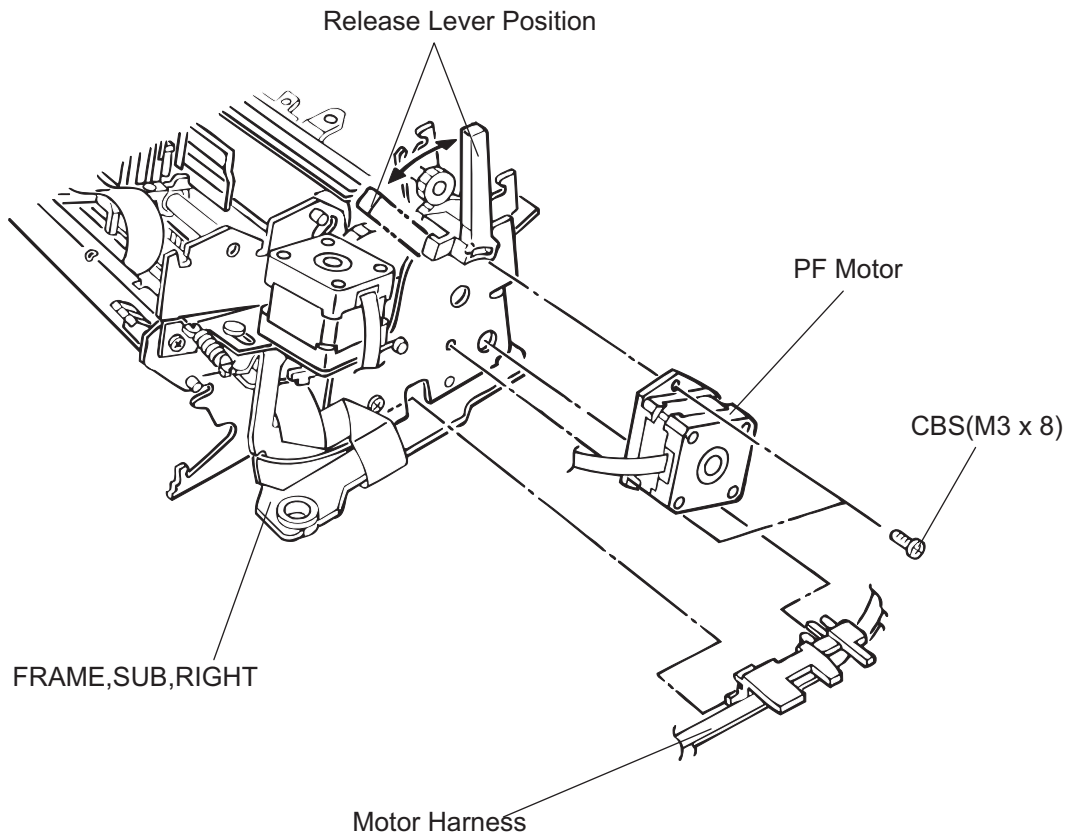


#### 4.2.10.2 PF Motor Removal

1. Remove the printer mechanism. (See Section 4.2.9.)
2. Release the motor harness from the printer mechanism.
3. Set the release lever to the vertical (Rear Push tractor) or forward (Push tractor) position.
4. Remove 2 CBS (M3 × 8) screws securing the PF motor to the FRAME,SUB,RIGHT, and remove the PF motor.



*If the release lever is set to the Friction feeding position, PF motor is not released.*



**Figure 4-12. PF Motor Removal**

### 4.2.10.3 PF Gear Train Disassembly

1. Remove the printer mechanism. (See Section 4.2.9.)
2. Remove the CR motor. (See Section 4.2.10.1.)
3. Remove the PF motor. (See Section 0)
4. Remove the head FFC from the FRAME,SUB,RIGHT of the printer mechanism.
5. Remove 2 CBS (M3 × 8) screws securing the FRAME,SUB,RIGHT, and remove the FRAME,SUB,RIGHT.

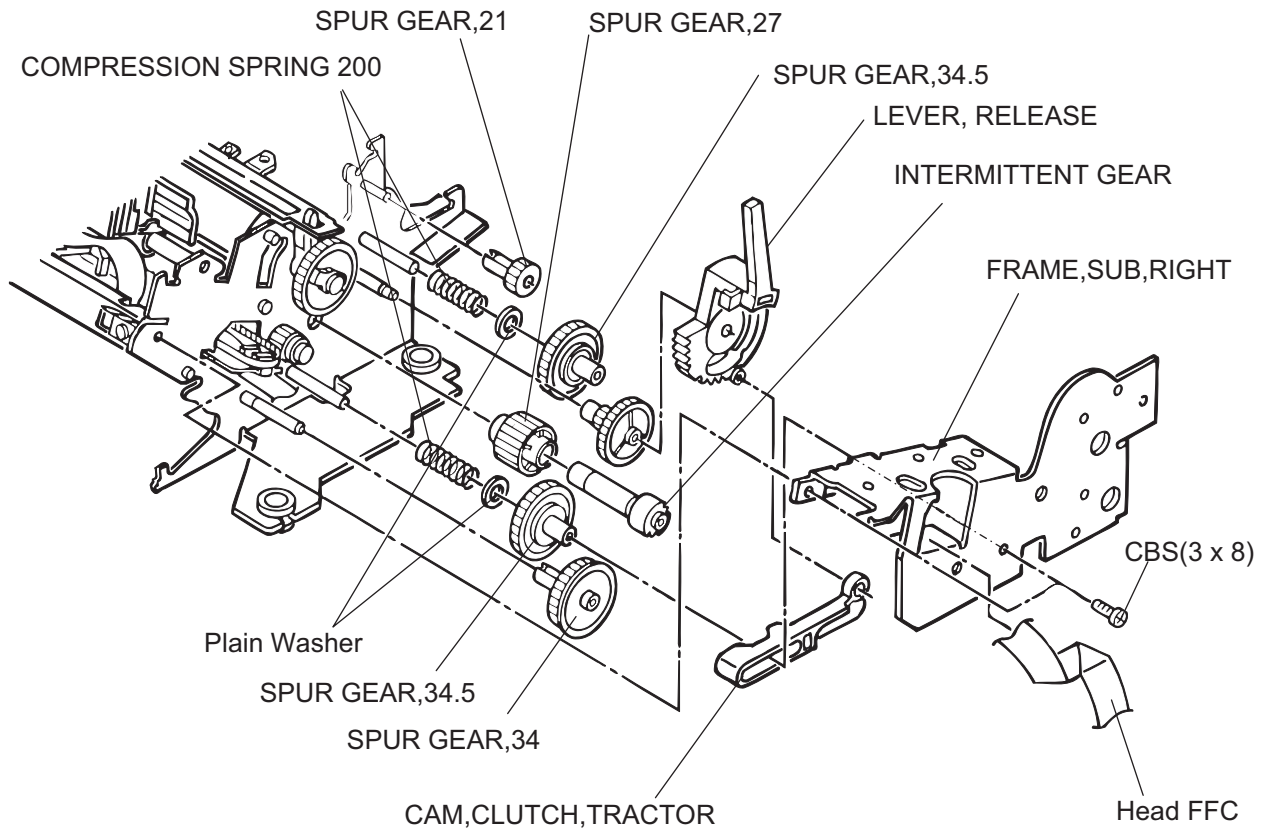


Figure 4-13. PF Gear Train Disassembly

**✓CHECK POINT**

■ **Be sure to mesh the teeth of the release lever with the INTERMITTENT GEAR properly, as shown below:**

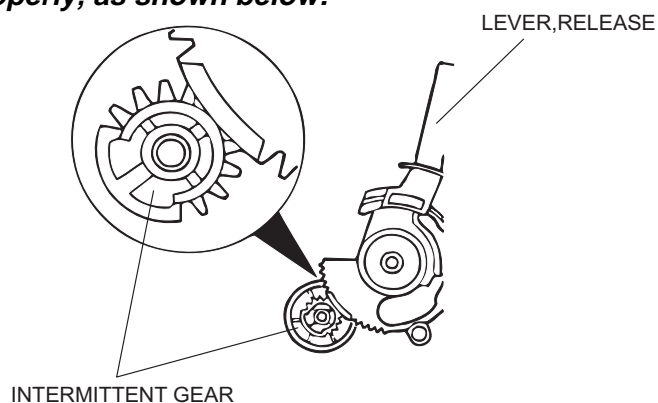


Figure 4-14.

**Engaging the Release Lever with INTERMITTENT GEAR**

■ **Be sure to engage the hole of CAM,CLUTCH,TRACTOR with the ejection part of the release lever.**

#### 4.2.10.4 PG (Platen Gap) Detector Removal

1. Remove the printer mechanism. (See Section 4.2.9.)
2. Release 2 clips attaching the PG detector to the LEFT FRAME in the printer mechanism, and remove the detector.

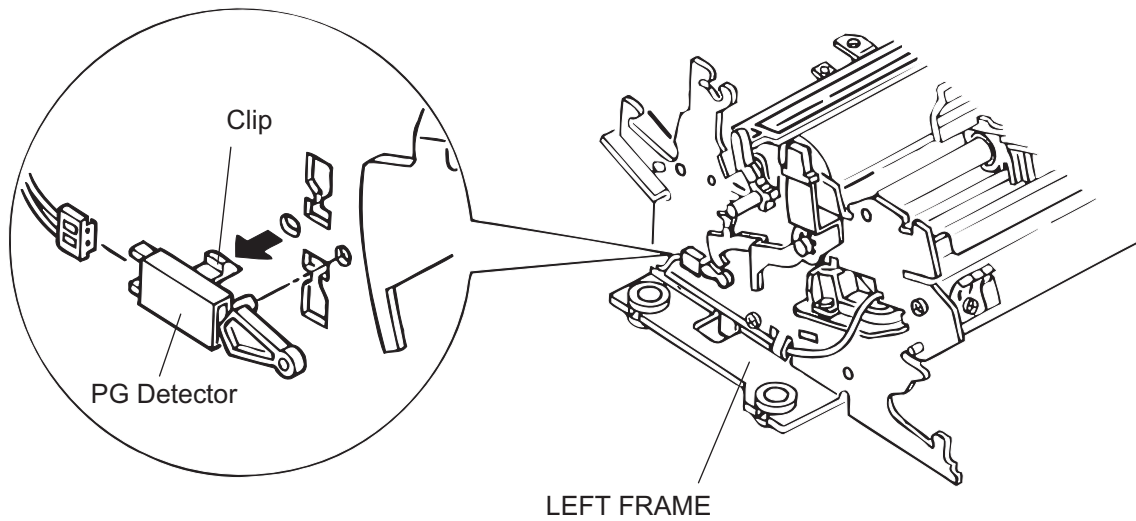


Figure 4-15. PG Detector Removal

#### 4.2.10.5 Release Detector Removal

1. Remove the printer mechanism. (See Section 4.2.9.)
2. Release 2 clips attaching the Release detector to the FRAME,SUB,RIGHT in the printer mechanism, and remove the detector.

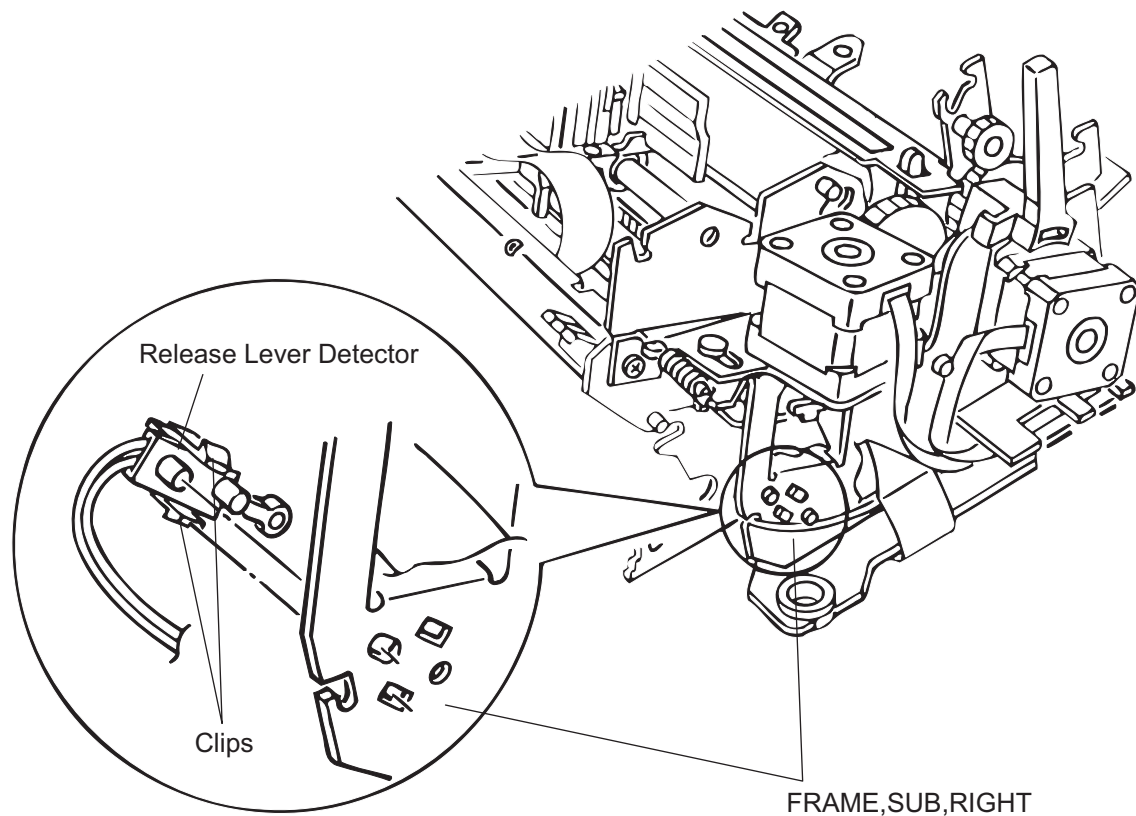


Figure 4-16. Release Detector Removal

#### 4.2.10.6 Front PE (Paper End) Detector Removal

1. Remove the printer mechanism. (See Section 4.2.9.)
2. Release 2 clips attaching the front PE detector to the REAR PAPER GUIDE ASSEMBLY, and remove the detector.
3. Disconnect the harness from the detector.

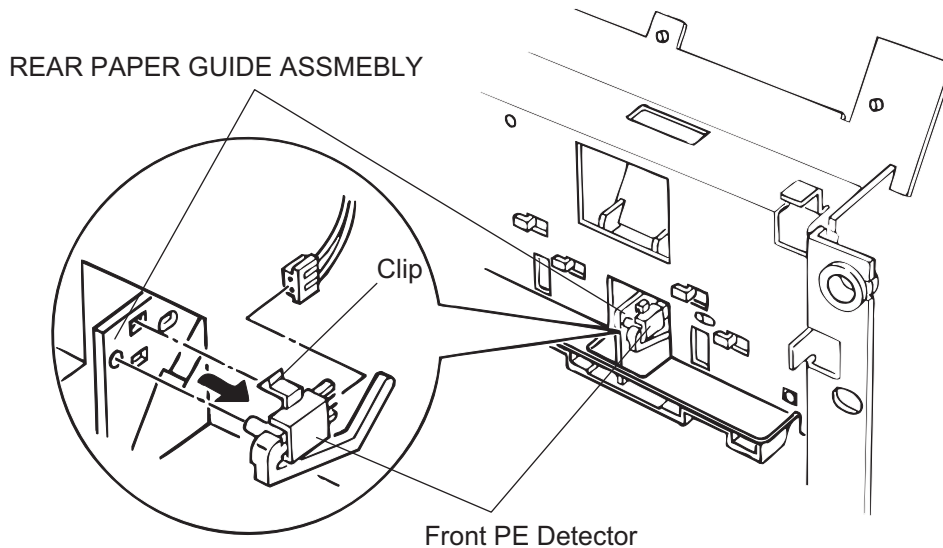


Figure 4-17. Front PE Detector Removal

#### 4.2.10.7 Rear PE Detector Removal

1. Remove the printer mechanism. (See Section 4.2.9.)
2. Hold the printer mechanism horizontally.
3. Release 2 clips securing Rear PE detector to REAR PAPER GUIDE ASSEMBLY. (①)
4. Release 2 notches on the REAR PAPER GUIDE ASSEMBLY securing the detector, and slide the detector toward rear a little. Then remove the detector by pulling it downward. (②)
5. Disconnect the harness from the detector.

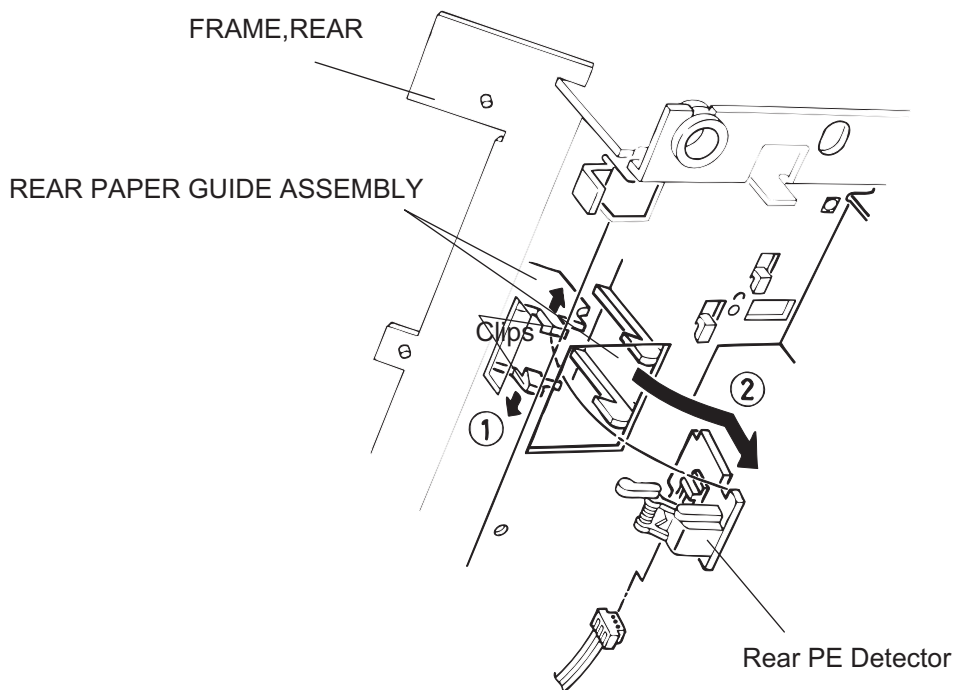
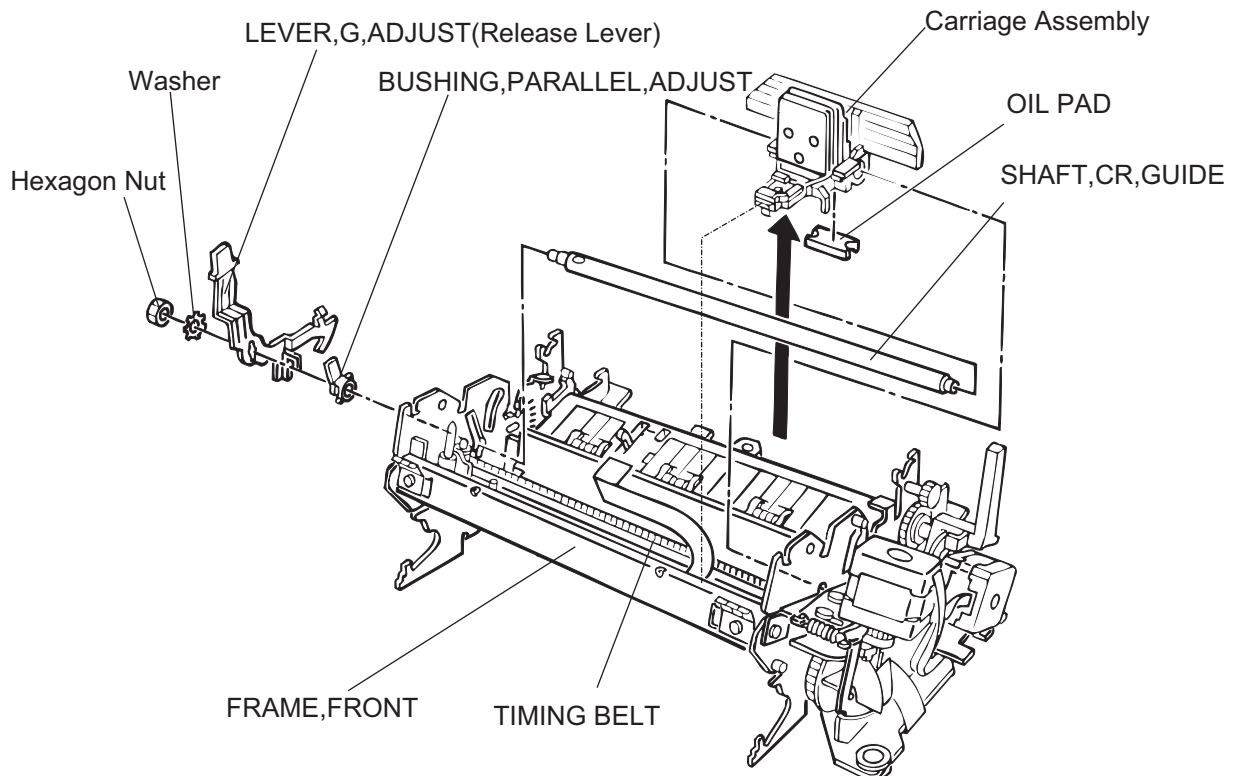


Figure 4-18. Rear PE Detector Removal

### 4.2.10.8 Carriage Assembly Removal

1. Remove the printer mechanism. (See Section 4.2.9.)
2. Remove the Head FFC. (See Section 4.2.1.)
3. Remove the Platen. (See Section 4.2.8.)
4. Remove the hexagon nut and the washer securing the LEVER,G,ADJUST to the SHAFT,CR,GUIDE, and remove the lever.
5. Remove the BUSHING,PARALLEL,ADJUST to turn the SHAFT,CR,GUIDE.
6. Disengage the TIMING BELT from the CR motor. (See Section 4.2.10.1.)
7. Move the carriage assembly to the right end, and remove it from the rack of the FRAME,FRONT with the SHAFT,CR,GUIDE.
8. Release the TIMING BELT from the 2 clips at the bottom of the carriage assembly.



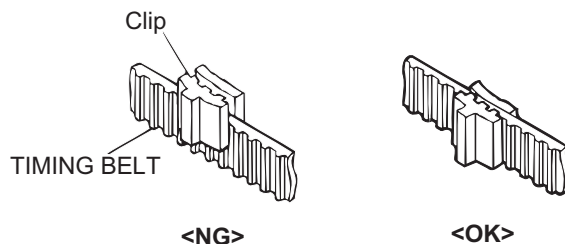
**Figure 4-19. Carriage Assembly Removal**

**ADJUSTMENT** ▶

**After removing the carriage assembly, perform the Platen Gap adjustment and Bi-d adjustment. (See Chapter 5.)**

✔ **CHECK POINT**

**When attaching the TIMING BELT to the carriage assembly, secure the TIMING BELT with the left and right clips in the carriage assembly, as shown below, and ensure there is no slack in the TIMING BELT.**



**Figure 4-20. Attaching the TIMING BELT**

#### 4.2.10.9 Rear Paper Guide Assembly Removal

1. Remove the printer mechanism. (See Section 4.2.9.)
2. Remove the Platen. (See Section 4.2.8.)
3. Remove the hexagon nut and the washer securing the LEVER,G,ADJUST to the SHAFT,CR,GUIDE, and remove the lever. (See Section 4.2.10.8.)
4. Remove the BUSHING,PARALLEL,ADJUST to turn the SHAFT,CR,GUIDE. (See Section 4.2.10.8.)
5. Remove the PG Detector. (See Section 4.2.10.4.)
6. Remove the harness for HP Detector.
7. Remove 4 CBS (M3 × 8) screws securing the LEFT FRAME in the printer mechanism, and remove the LEFT FRAME.
8. Remove the Head FFC from the FRAME,REAR in the printer mechanism.
9. Remove 2 CBS (M3 × 8) screws securing the FRAME,REAR to the RIGHT FRAME, and remove the REAR PAPER GUIDE ASSEMBLY.
10. Push the clip at the bottom of the REAR PAPER GUIDE ASSEMBLY, and slide out the REAR PAPER GUIDE ASSEMBLY from the REAR FRAME.

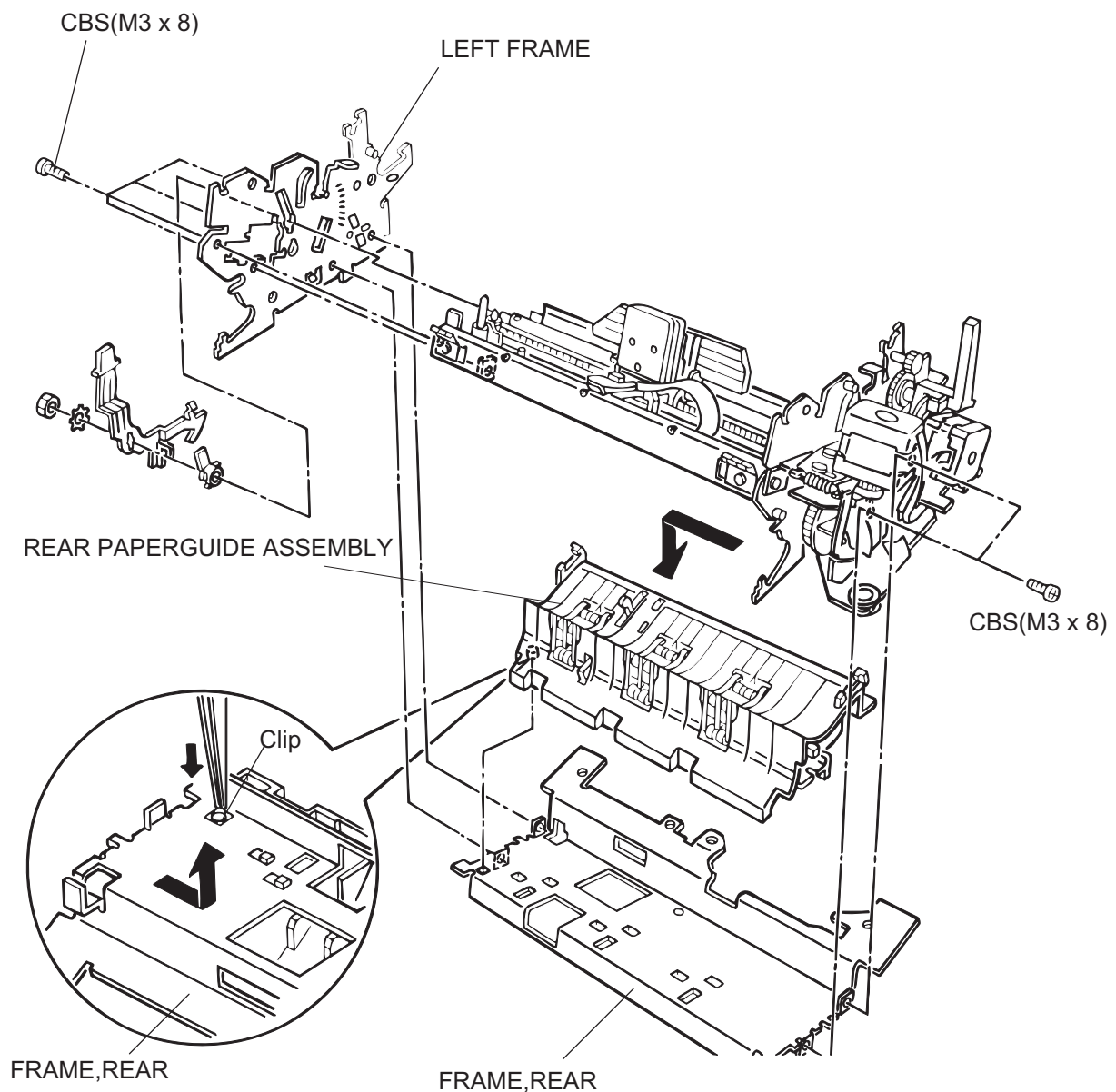


Figure 4-21. REAR PAPER GUIDE ASSEMBLY Removal

#### 4.2.10.10 Ribbon Drive (RD) Assembly Removal

1. Remove the printer mechanism. (See Section 4.2.9.)
2. Remove the Platen. (See Section 4.2.8.)
3. Remove the hexagon nut and the washer securing the LEVER,G,ADJUST to the SHAFT,CR,GUIDE, and remove the lever.
4. Remove the BUSHING,PARALLEL,ADJUST to turn the SHAFT,CR,GUIDE. (See Section 4.2.10.8.)
5. Remove the harness for PG Detector. (See Section 4.2.10.4.)
6. Remove the harness for HP Detector from the LEFT FRAME.
7. Remove 4 CBS (M3 × 8) screws securing the LEFT FRAME in the printer mechanism, and remove the LEFT FRAME.
8. Remove the CBC (M3 × 8) screw and the CBB (3 × 8) screw securing the ribbon drive assembly.
9. Release the ribbon drive assembly engaging with the ROLLER ASSEMBLY,DRIVE, and remove the ribbon drive assembly.

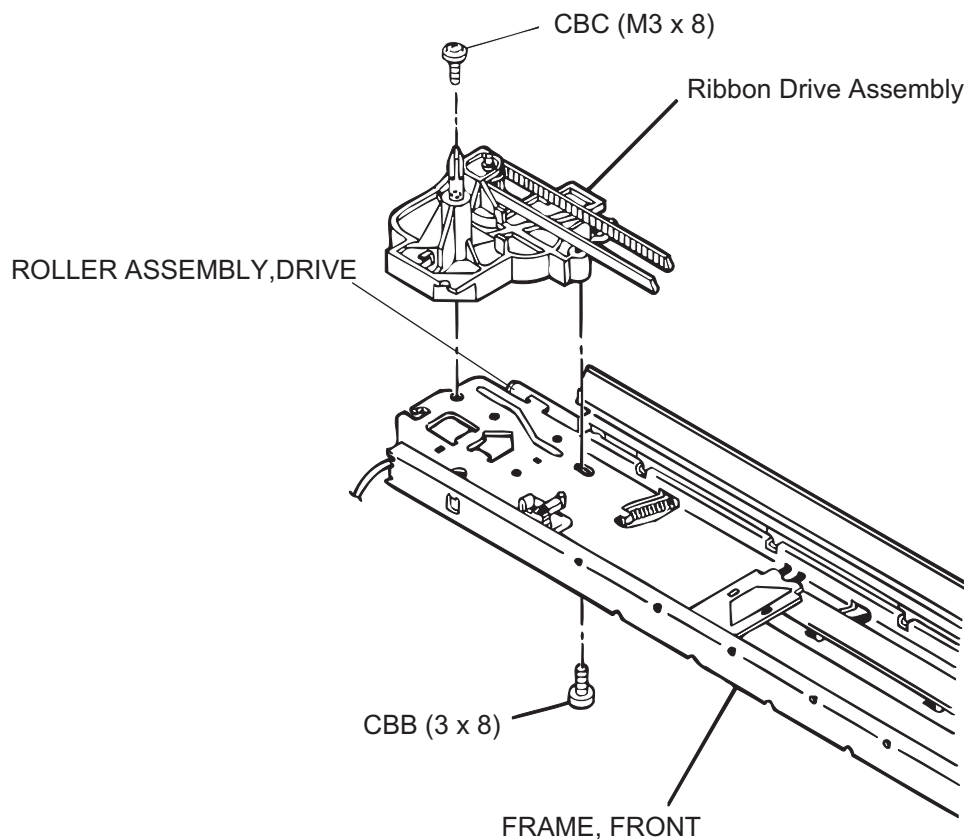


Figure 4-22. RD Assembly Removal

**CHAPTER**

**5**

**ADJUSTMENT**



## 5.1 ADJUSTMENT OVERVIEW

### 5.1.1 Required Adjustment

This section describes the adjustments required after specified parts are removed or replaced. The following table shows the parts removed/replace and corresponding adjustments required.

**Table 5-1. Required Adjustment**

Required Adjustment	Platen Gap	Factory Setting	Bi-D Adjustment
Printhead Removal or Replacement	○	---	○
Printer Mechanism Replacement	---	---	○
Printer Mechanism Removal	○	---	○
Main Boar Replacement	---	○	○
Timing Belt Replacement	○	---	○
Platen Replacement	○	---	---
Carriage Assembly Replacement	○	---	○
CR Motor Replacement	---	---	○
EEPROM Clear	---	---	○

Note 1) "○": Adjustment required.

Note 2) "---": Adjustment not required.

### 5.1.2 Adjustment Tools

The following table shows the tools required for each adjustment.

**Table 5-2. Required Adjustment Tool**

Adjustment	Required Tool
Platen Gap	Thickness gauge
Factory Setting	Setting a diskette
Bi-D Adjustment	Setting a diskette

## 5.2 ADJUSTING AND RESETTING THE PRINTER

### 5.2.1 Platen Gap Adjustment

When the SHAFT,CR,GUIDE or BUSHING,PARALLEL,ADJUST is rotated or reassembled, or printing is too faint or stained, the Platen Gap adjustment must be performed in the following order:

1. Remove the Upper Housing. (See Section 4.2.4.)
2. Remove the printhead from the carriage assembly. (See Section 4.2.1.)
3. Using tweezers, remove the ribbon mask from the carriage assembly.

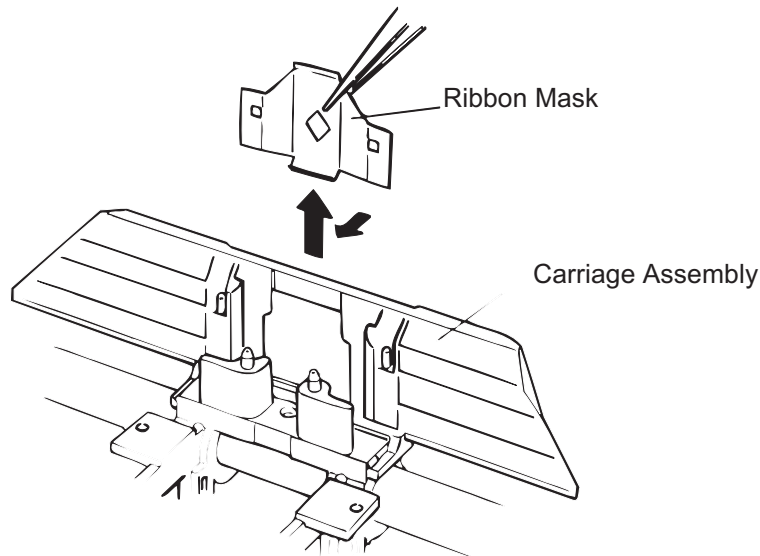


Figure 5-1. Ribbon Mask Removal

4. Attach the printhead onto the carriage assembly.
5. Set the paper adjustment lever to the position "0" (the second step position) from the rear.
6. Rotate the SHAFT,CR,GUIDE so that the large countersink on the left edge of the shaft comes upward.

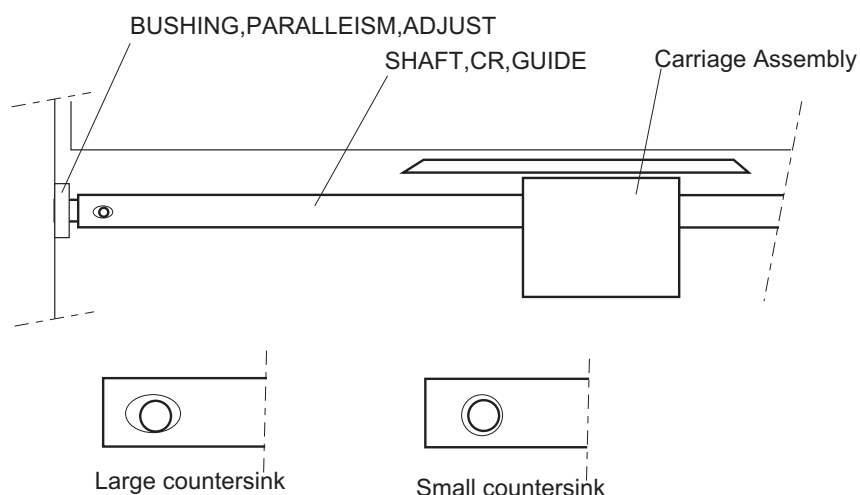
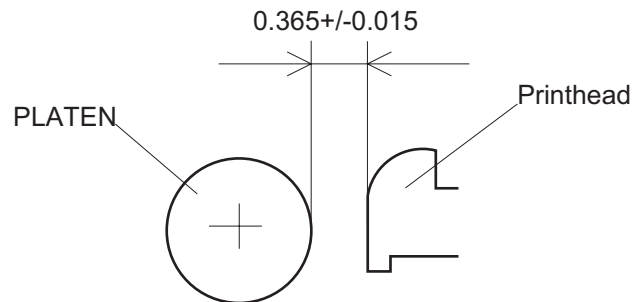


Figure 5-2. SHAFT,CR,GUIDE Setting

7. Move the carriage assembly to the right end.
8. Loosen the hexagon nut securing the PG adjust lever and the SHAFT,CR,GUIDE a little.
9. Insert a thickness gauge (0.38 mm) between the Printhead and PLATEN.

10. Insert a screwdriver into the countersink located on the left side of the SHAFT,CR,GUIDE and turn it until the PLATEN and Printhead come in light contact.
11. Move the carriage assembly to the left end.
12. Insert the thickness gauge (0.38 mm) between the Printhead and the PLATEN.
13. Insert the screwdriver into the countersink and turn it until the PLATEN and Printhead come in light contact.
14. Repeat the steps from 10 to 13, rotating the BUSHING,PARALLELISM,ADJUST until the parallelism gaps at the right and left become less than 0.02 mm.
15. When the parallelism gaps at the right and left are less than 0.02 mm, move the carriage assembly to the center of the printable area.
16. Insert the thickness gauge between the printhead and the PLATEN, and turn the SHAFT,CR,GUIDE so that the platen gap becomes  $0.365 \pm 0.015$  mm.



**Figure 5-3. Platen Gap**

17. When the adjustment is complete, tighten the hexagon nut and the washer securing the adjust lever.
18. Remove the printhead once, and install the ribbon mask.
19. Attach the printhead back onto the carriage assembly.

**✓CHECK POINT**

***Do not rotate the PLATEN during the adjustment.***

## 5.2.2 Factory Setting

The factory settings of the printer for each destination are written in the EEPROM on the main board. Therefore, If you have replaced the main board, you must use the adjustment program to write the factory settings again. This section describes how to write the factory settings:

1. Connect the printer and the host DOS/V computer with a parallel interface cable.
2. Set continuous paper \* to the printer.  
\* Set the appropriate size of continuous paper, as follows;  
    FX-1880: 15 inch in width  
    FX-880: 10 inch in width
3. Run the adjustment program in the host computer.
4. The printhead wire select menu appears. Move the cursor using “↑” or “↓” key to select “9 pins” from the list and press “Return” key.

```

Program : xxxxx      Setting:
      VR 0 = x      VR 1 = x      VR 2 = x
                   **          **

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

5. Then the market setting menu appears. Referring to the market list table, move the cursor using “↑” or “↓” key to select your market from the list and press “Return” key. To change the selection to another market, press “ESC” key only, and the market setting menu appears again. An example (for EAI) is shown below:

```

Program : xxxxx      Setting:
9 pins VR 0 = x      VR 1 = x      VR 2 = x
                   **          **

[ Setting File ]
(1) DEFSTD          (6) ITALIC
>(2) USASTD
(3) EURSTD
(4) NLSP
(5) RUSSIAN
    
```

**Table 5-3. Market List**

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

6. The process selection menu appears. Move the cursor using “↑” or “↓” key to select “In line” and press “Return” key.

```

Program : xxxxx      Setting:
9 pins VR 0 = x      VR 1 = x      VR 2 = x
                   **          **

[ Process select ]
>(1) In line
(2) Out-Going
    
```

7. The carriage width select menu appears. Move the cursor using “↑” or “↓” key to select the carriage width and press “Return” key.

The carriage width to be selected is as follows:

FX-1180: (3) 136 columns

FX-880: (1) 80 columns

```
Program : xxxxx      Setting:
9 pins VR 0 = x      VR 1 = x      VR 2 = x
                    ** In line**

[ Carriage Width ]
>(1) 80 column
(2) 106 column
(3) 136 column
```

8. The main menu appears. Move the cursor using “↑” or “↓” key to select “(2) FF paper” from the list and press “Return” key, and the test pattern printing starts.

```
Program : xxxxx      Setting:
9 pins VR 0 = x      VR 1 = x      VR 2 = x
                    ** In line**

[ Main Menu ]
(1) Bi-D Adjust      (6) Envelope
>(2)FF paper         (7) · SUB MENU
(3) ---- N/A ----
```

9. After the test pattern is printed out, turn the printer off once to write the factory setting into the EEPROM.
10. Press “ESC” key several times to quite the program.

 **CAUTION**

- ***As this adjustment program is same as the check program in the factory and includes many other check items which are not needed for service, you should not perform any items which are not described in this manual. Otherwise, the printer functions are not guaranteed.***
- ***The factory setting value is not written into the EEPROM without this FF paper printing.***

### 5.2.3 Bi-D Adjustment

Bi-D adjustment can be made either through the panel operation or with the adjustment program. This section describes Bi-D adjustment performed with the following program:

1. Connect the printer and the PC by a parallel interface cable.
2. Set 10-inch-wide continuous paper to the printer.
3. Run the adjustment program in the host computer.
4. Select the printhead wire. (Refer to 5.2.2.)
5. Select the market setting. (Refer to 5.2.2.)
6. Select the carriage width. (Refer to 5.2.2.)
7. The main menu appears. Move the cursor using “↑” or “↓” key to select “(1) Bi-D Adjust” from the list and press “Return” key, and the test pattern printing starts.

```

Program : xxxxx      Setting:
9 pins VR 0 = x     VR 1 = x      VR 2 = x
                    ** In line**

[ Main Menu ]
>(1) Bi-D Adjust    (6) Envelope
(2)FF paper        (7) – SUB MENU
(3) ---- N/A ----
    
```

8. Then the Bi-D adjustment menu appears. Move the cursor using “↑” or “↓” key to select Bi-D printing mode from the three printing modes and “←” or “→” key to change the setting value.

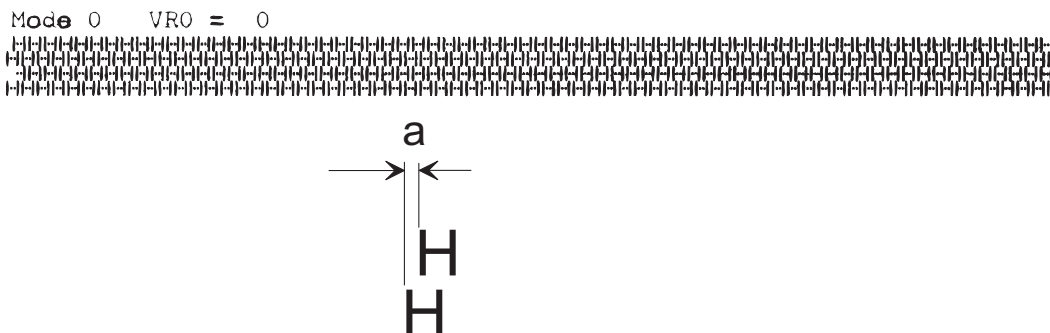
```

< Bi-D Adjustment >

> Mode 0 = x
Mode 1 = x
Mode 4 = x

Cancel Print      Speed Value Write Default
[ESC] [SPACE]    [↑ ↓] [←→] [RET] [HOME]
    
```

9. Press “Space” key, and a Bi-D pattern in four tiers for the current setting print mode and the value shown below are printed:



**Figure 5-4. Bi-D Adjustment Pattern**

10. Repeat Step 8 and Step 9 to align the lines continuously by making “a” as specified below:

All mode	: Less than 0.05 mm (at the center of the column)
Mode 0	: Less than 0.3 mm (at the left and right sides of the column)
Mode 1	: Less than 0.2 mm (at the left and right sides of the column)
Mode 4	: Less than 0.05 mm (at the left and right sides of the column)

11. Press “Return” key to fix the adjustment value in each mode.

12. Turn off the printer once to write the Bi-D setting into the EEPROM.

13. Press “ESC” key several times to quite the program.

 **CAUTION**

- *As this adjustment program is the same as the check program in the factory and includes many other check items which are not needed for service, you should not perform any items which are not described in this manual. Otherwise, the printer functions are not guaranteed.*
- *The Bi-D adjustment value is not written into the EEPROM without turning the printer off.*

**CHAPTER**

**6**

**MAINTENANCE**



## 6.1 PREVENTIVE MAINTENANCE

Preventive maintenance is important to keep the printer in the best condition and to prevent potential troubles from occurring. If necessary, use denatured alcohol to clean the exterior cases. Use a vacuum cleaner to remove dust and paper debris accumulated in the printer.

### WARNING

- *Disconnect the printer from the AC socket before servicing.*

### CAUTION

- *Do not use thinner, trichloroethylene, or ketone-based solvents on the plastic components of the printer.*
- *Never use the oil and grease other than those specified in this manual, and using different type of lubrication can damage the printer and the components.*

## 6.2 LUBRICATION

Influence that oil and grease give is considerably large especially in low temperature. Therefore, EPSON has tested and analyzed various types of oil and grease extensively, and found the oil and grease listed below most applicable to the printer.

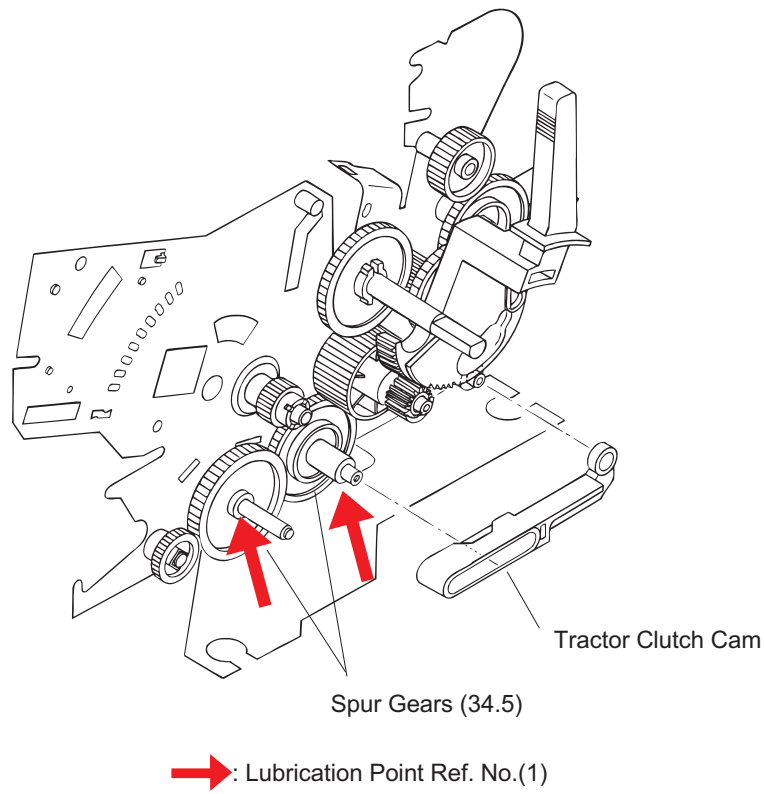
**Table 6-1. Lubrication**

Type	Name	Quantity	Available	Part No.
Oil	O-2	40 cc	EPSON	B710200001
Grease	G-26	40 g	EPSON	B702600001

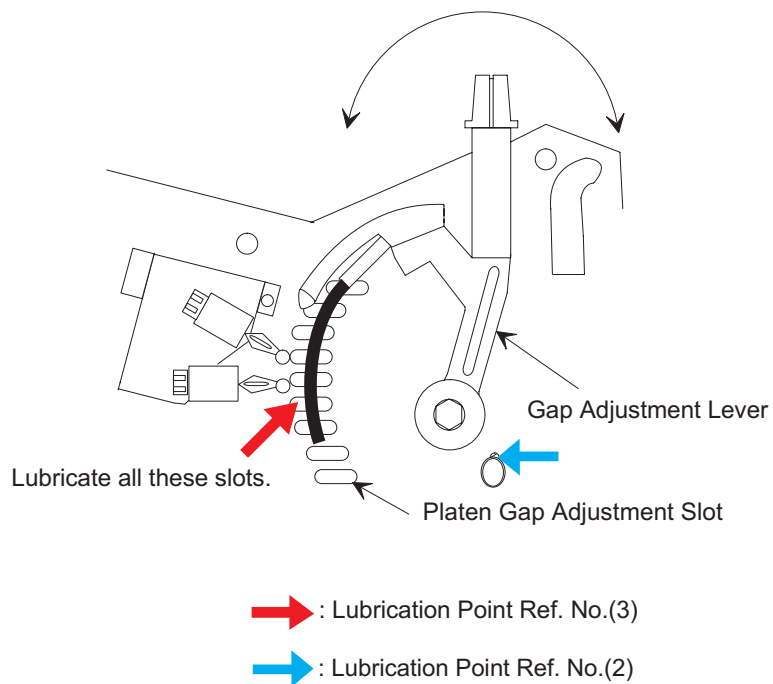
**Table 6-2. Lubrication Points**

Ref. No.	Lubrication Point	Lubricant
1	2 holes in the SPUR GEARS,34.5	G-26 (5mg)
2	The hole in the left side frame where the ROLLER,PF,DRIVE is in contact	G-26 (5mg)
3	The surface of the left side frame where the gap adjustment lever is in contact	G-26 (3mg for each slot)
4	Oil Pad	O-2 (0.6 ml)
5	The contact surface of the gear and the shaft in the RD ASSEMBLY	G-26 (3mg)
6	3 shafts and the hole in HOUSING,RD	G-26 (3mg)
7	The contact surfaces of the gears in RD ASSEMBLY	G-26 (3mg)
8	6 contact points for the release shaft and ROLLER ASSEMBLY, PF	G-26 (5mg)

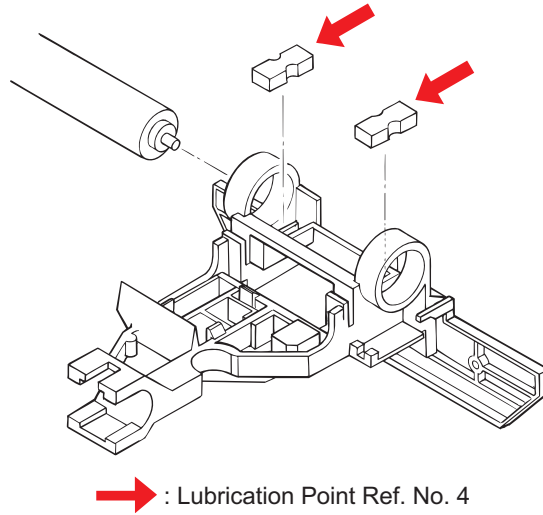
*Note: Lubricant must be applied during the reassembling process.*



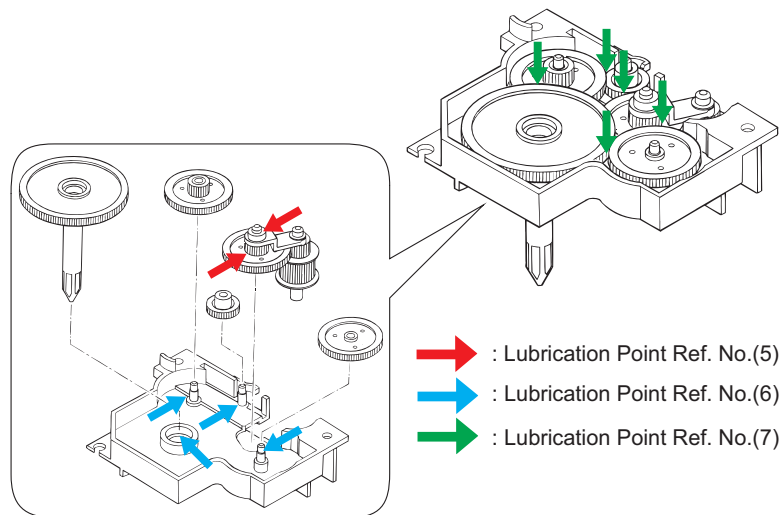
**Figure 6-1. Lubrication Point (1)**



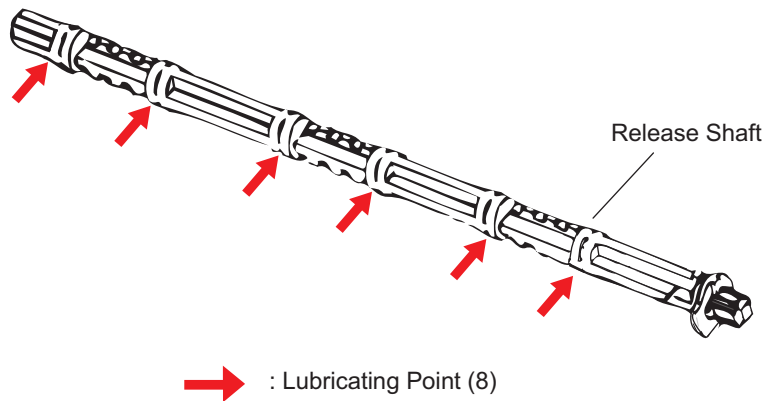
**Figure 6-2. Lubricating Point (2) and (3)**



**Figure 6-3. Lubricating Point (4)**



**Figure 6-4. Lubricating Points (5), (6) and (7)**



**Figure 6-5. Lubricating Point (8)**

**CHAPTER**

**7**

**APPENDIX**

## 7.1 CONNECTOR SUMMARY

The primary components of the printer are connected as shown below;

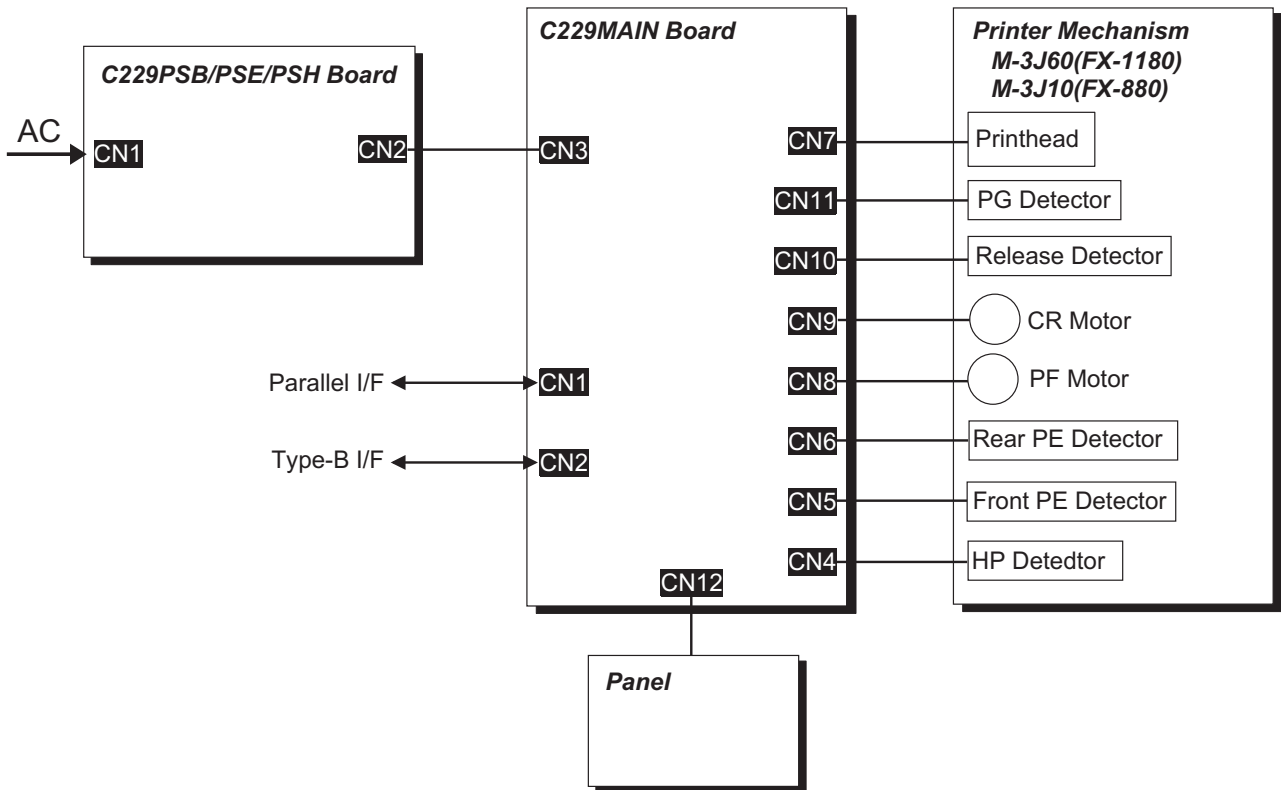


Figure 7-1. Cable Connections

Table 7-1. Connector Summary

Board	Connector No.	Pin	Description
C229MAIN Board	CN1	36	Parallel I/F
	CN2	36	Type-B I/F (Option)
	CN3	10	DC input, Power On/Off
	CN4	2	HP Detector
	CN5	3	Rear PE Detector
	CN6	2	Front PE Detector
	CN7	16	Printhead, Thermistor
	CN8	4	PF Motor
	CN9	5	CR Motor
	CN10	2	Release Detector
	CN11	2	PG Detector
	CN12	12	Panel
C229PSB/PSE/PSH Board	CN1	2	AC line input
	CN2	10	DC output

**Table 7-2. Connector Pin Assignment - CN1**

<b>Pin No.</b>	<b>I/O</b>	<b>Signal Name</b>	<b>Function</b>
1	I	/STROBE	Strobe pulse. Input data is latched at falling edge of the signal.
2 - 9	I	DATA1 - DATA8	Parallel input data to the printer
10	O	/ACKNLG	This pulse indicates that the printer has received data and turned into ready to accept next one.
11	O	BUSY	When this signal is HIGH, the printer is not ready to accept data.
12	O	PE	When this signal is HIGH, the printer is in a state of paper-out error
13	O	SLCT	This signal is always HIGH when printer power is on.
14	I	/AFXT	Not used.
15	—	NC	Not connected.
16	—	GND	Signal ground
17	—	Chassis	Chassis ground
18	O	Logic H	This line is pulled up to +5V through 3.9 kΩ.
19 - 30	—	GND	Signal ground
31	I	/INIT	This signal initializes the printer.
32	O	/ERROR	This signal is output when the printer is in an error status.
33	—	GND	Signal ground
34	—	NC	Not connected.
35	O	+5V	This line is pulled up to +5V through 1.0 kΩ.
36	O	/SLIN	This signal is always HIGH when printer power is on.

**Table 7-3. Connector Pin Assignment - CN2**

Pin No.	I/O	Signal Name	Function
1 - 6	—	+5	+5 V
7	O	TXD	Transmit data
8	O	/READY	Ready to receive data
9	I	RXD	Receive data
10	—	NC	Not connected.
11	O	/RST	Reset
12	O	INH	Inhibit
13	I	/CMREQ	Command request
14	I	/WRRDY	Write ready
15	I	/RDRDY	Read request
16	O	/WR	Write
17	O	/RD	Read
18	O	/CS	chip select
19 - 24	—	GND	Ground
25	O	A3	Address bus bit 3
26	O	A2	Address bus bit 2
27	O	A1	Address bus bit 1
28	O	A0	Address bus bit 0
29	I/O	D7	Data bus bit 7
30	I/O	D6	Data bus bit 6
31	I/O	D5	Data bus bit 5
32	I/O	D4	Data bus bit 4
33	I/O	D3	Data bus bit 3
34	I/O	D2	Data bus bit 2
35	I/O	D1	Data bus bit 1
36	I/O	D0	Data bus bit 0

**Table 7-4. Connector Pin Assignment - CN3**

Pin No.	I/O	Signal Name	Function
1	O	PSC	
2	I	PWDN	
3 - 4	—	+5V	+5V
5 - 6	—	GND	Ground
7	—	+35V	+35V
8	—	+35V	+35V
9 - 10	—	GP	Ground

**Table 7-5. Connector Pin Assignment - CN4**

Pin No.	I/O	Signal Name	Function
1	I	HP	HP Detector signal
2	—	GND	Ground



**Table 7-6. Connector Pin Assignment - CN5**

Pin No.	I/O	Signal Name	Function
1	—	+5V	+5V
2	I	PE	Rear PE Detector signal
3	—	GND	Ground

**Table 7-7. Connector Pin Assignment - CN6**

Pin No.	I/O	Signal Name	Function
1	I	PE	Front PE Detector signal
2	—	GND	Ground

**Table 7-8. Connector Pin Assignment - CN7**

Pin No.	I/O	Signal Name	Function
1	—	+5V	+5V
2	I	HTMP	Head temperature signal
3	O	HEAD3	#3 Head Data
4	O	HEAD1	#1 Head Data
5	O	HEAD5	#5 Head Data
6	O	C5	#3, 7 Common
7	O	HEAD7	#7 Head Data
8	O	C4	#5,9 Common
9	O	HEAD9	#9 Head Data
10	O	HEAD8	#8 Head Data
11	O	HEAD4	#4 Head Data
12	O	C3	#3 Common
13	O	C2	#8 Common
14	O	HEAD6	#8 Head Data
15	O	C1	#1,4 Common
16	O	HEAD2	#2 Head Data

**Table 7-9. Connector Pin Assignment - CN8**

Pin No.	I/O	Signal Name	Function
1	O	PFA	PF Motor phase A
2	O	PF-A	PF Motor phase /A
3	O	PFB	PF Motor phase B
4	O	PF-B	PF Motor phase /B

**Table 7-10. Connector Pin Assignment - CN9**

Pin No.	I/O	Signal Name	Function
1	O	CRA	CR Motor phase A
2	O	CR-A	CR Motor phase /A
3	O	CRB	CR Motor phase B
4	O	CR-B	CR Motor phase /B
5	—	+35V	Common

**Table 7-11. Connector Pin Assignment - CN10**

Pin No.	I/O	Signal Name	Function
1	I	RELEASE	Release Detector signal
2	—	GND	Ground

**Table 7-12. Connector Pin Assignment - CN11**

Pin No.	I/O	Signal Name	Function
1	I	PG1	PG Detector signal
2	—	GND	Ground

**Table 7-13. Connector Pin Assignment - CN12**

Pin No.	I/O	Signal Name	Function
1	—	+5V	+5V
2	O	POUTL	Paper Out LED
3	O	PAUSE	Pause LED
4	O	TOFFL	Tear Off/Bin LED
5	O	FONT2L	Font LED
6	O	FONT1L	Font LED
7	I	FONTSW	Font Switch
8	I	LFFFSW	FF/LF Switch
9	I	LDEJSW	Load/Eject Switch
10	I	PAUSSW	Pause Switch
11	I	PSC	Power Switch Control signal
12	—	GND	Ground

## 7.2 COMPONENT LAYOUT

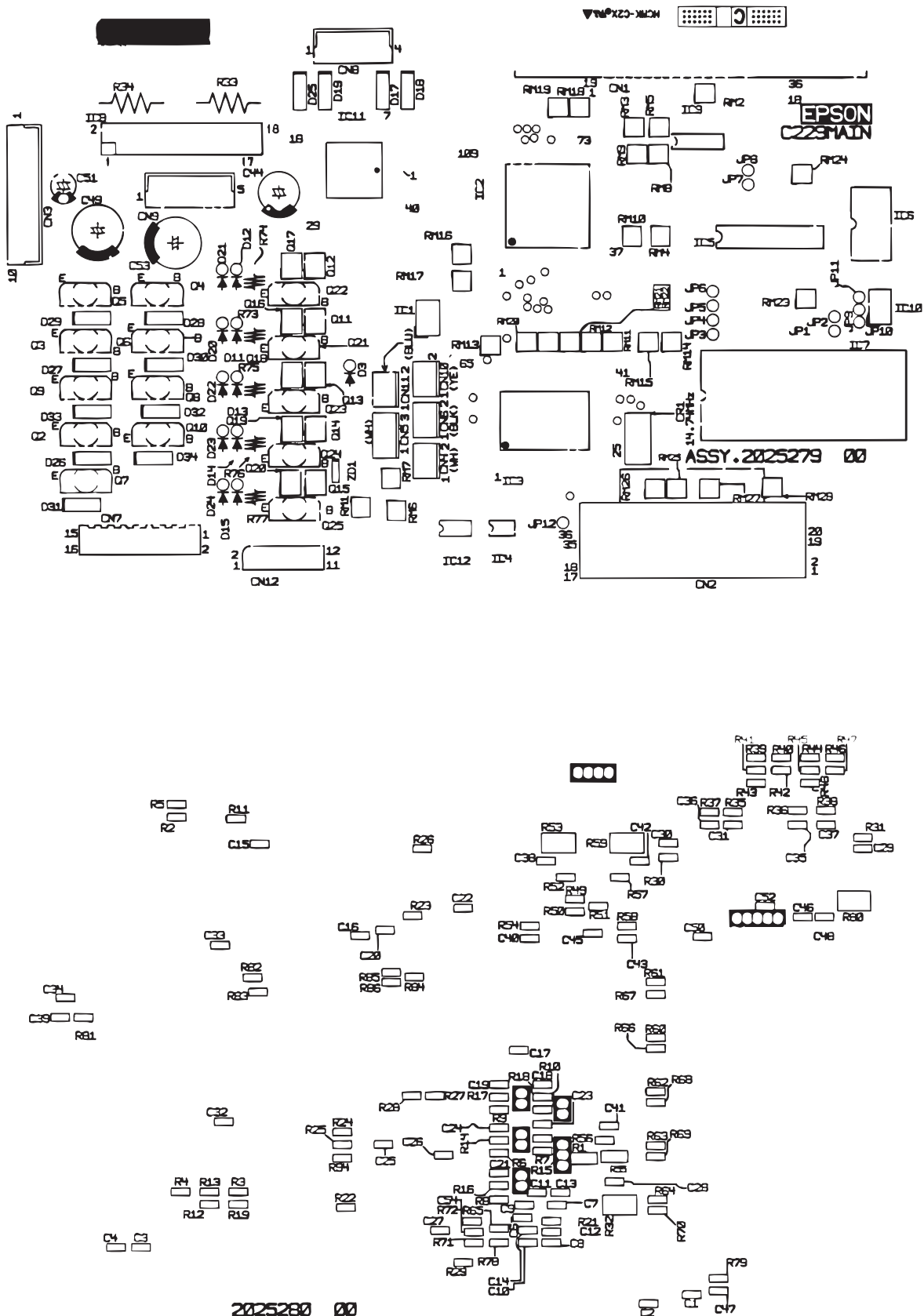


Figure 7-2. C229MAIN Board Component Layout

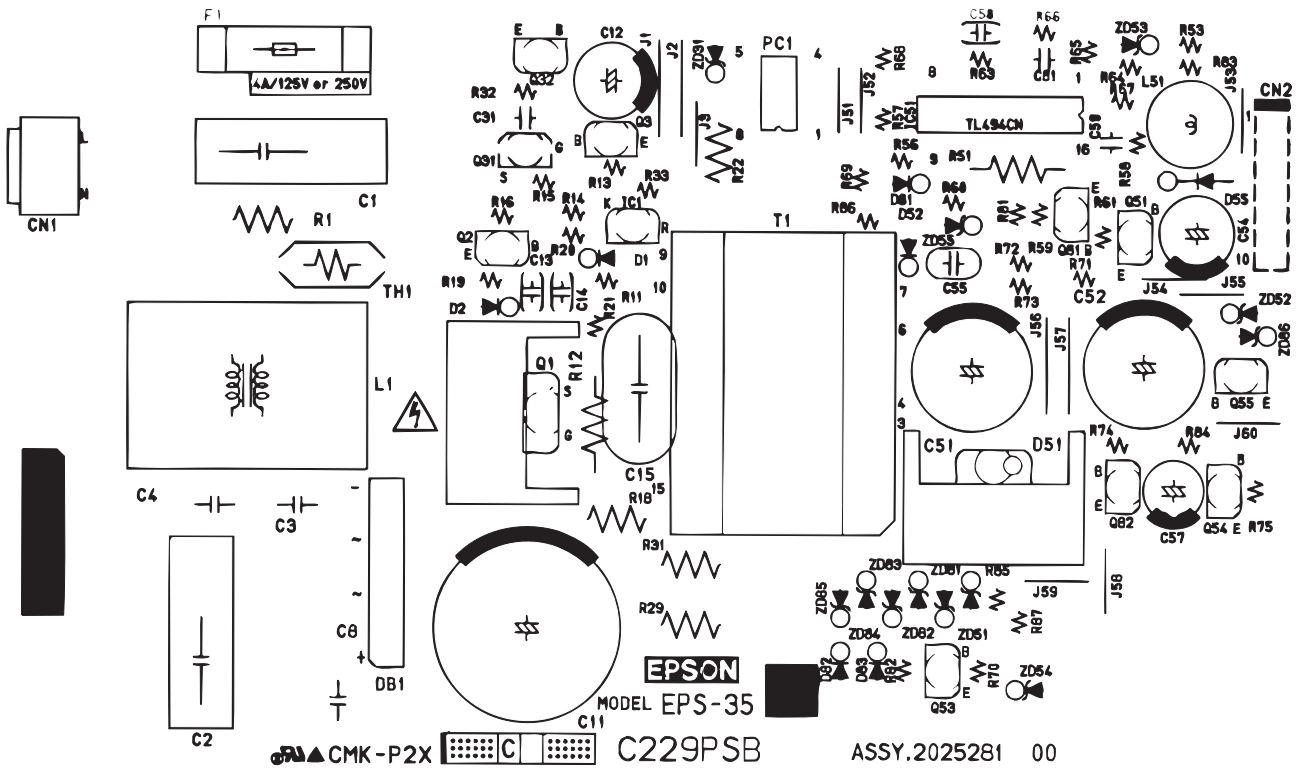


Figure 7-3. C229PSB Board Component Layout

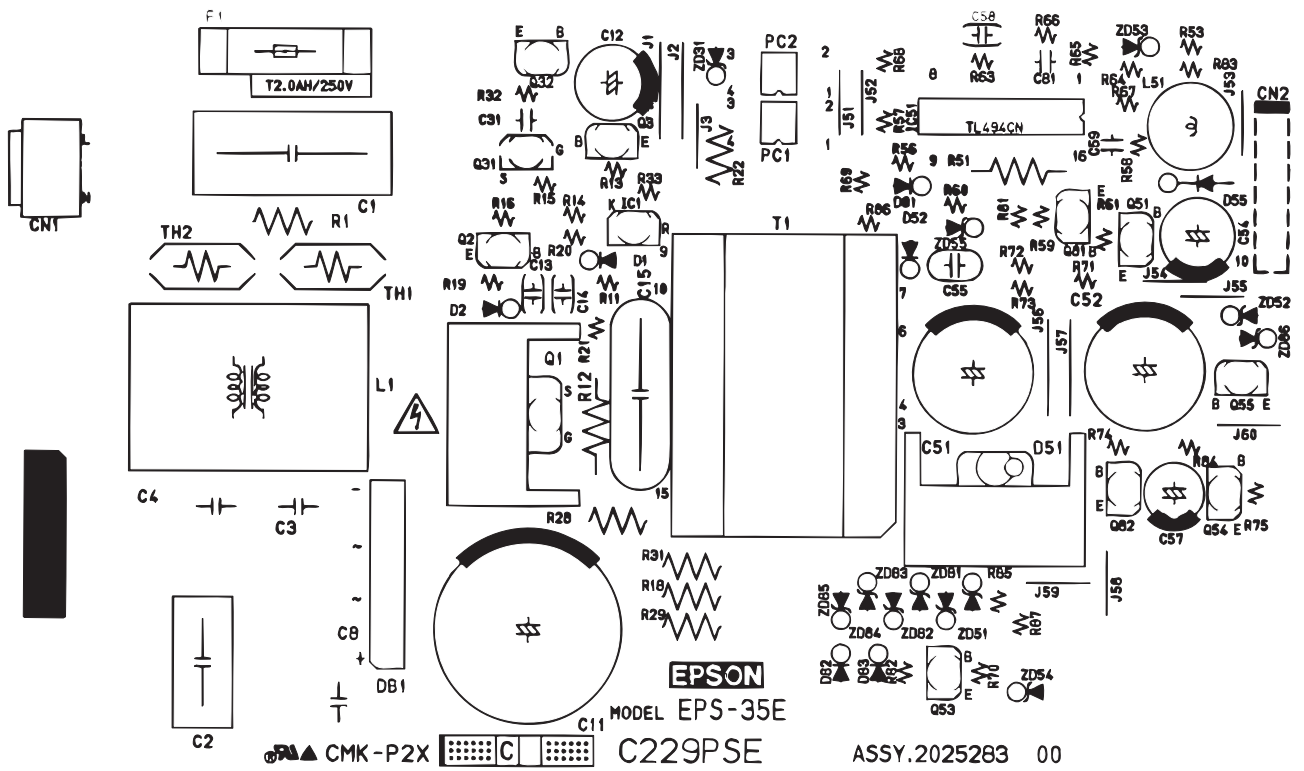


Figure 7-4. C229PSE Board Component Layout

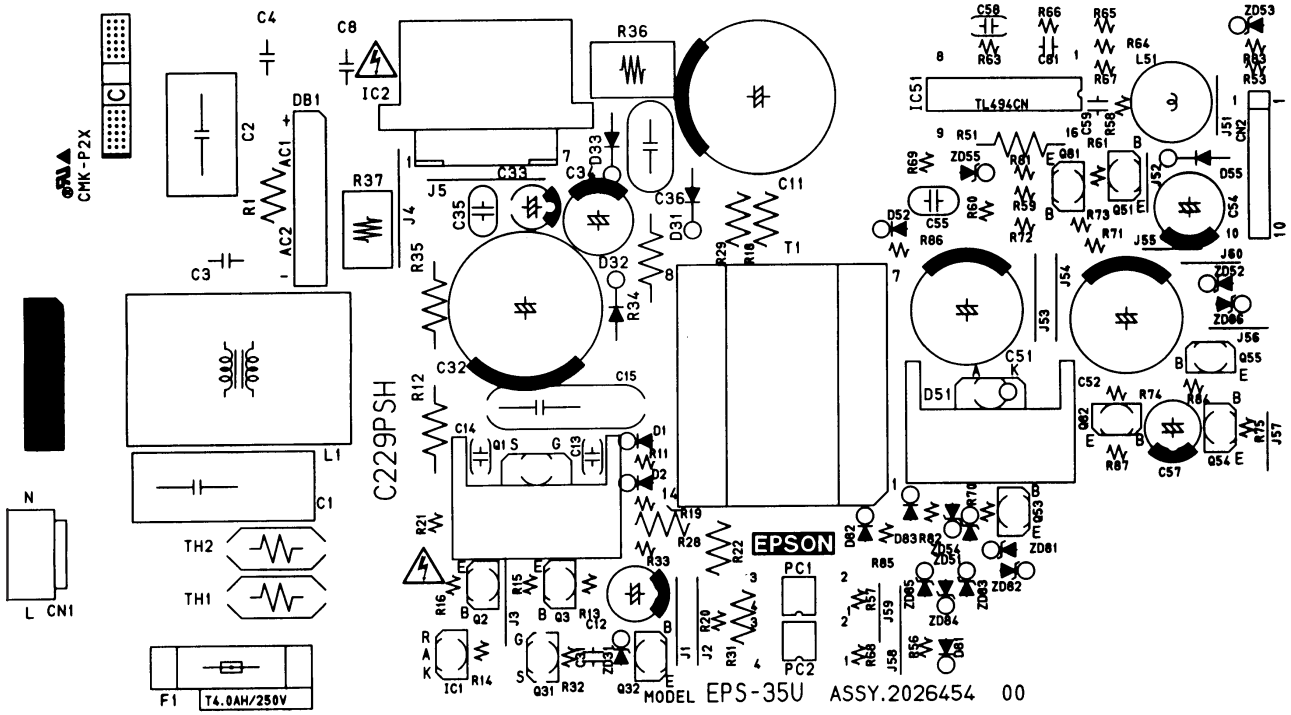


Figure 7-5. C229PSH Component Layout

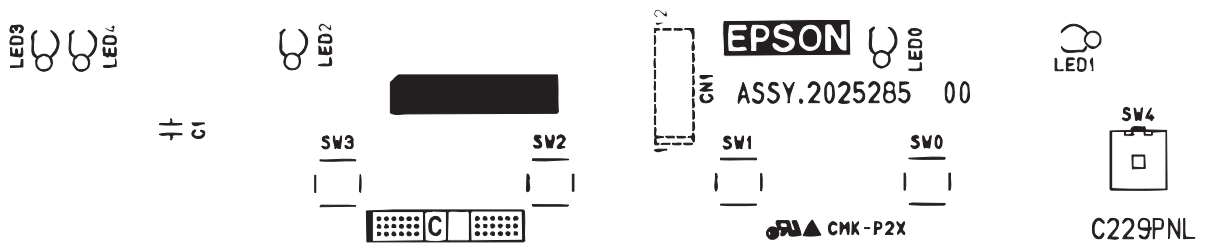


Figure 7-6. C229PNL Board Component Layout

## 7.3 DIMENSIONS AND WEIGHT

- FX-1180
  - Dimensions: 590mm(W) × 350mm(D) × 154mm(H)
  - Weight: Approximately 9.6Kg
  - Appearance: See the figures below.

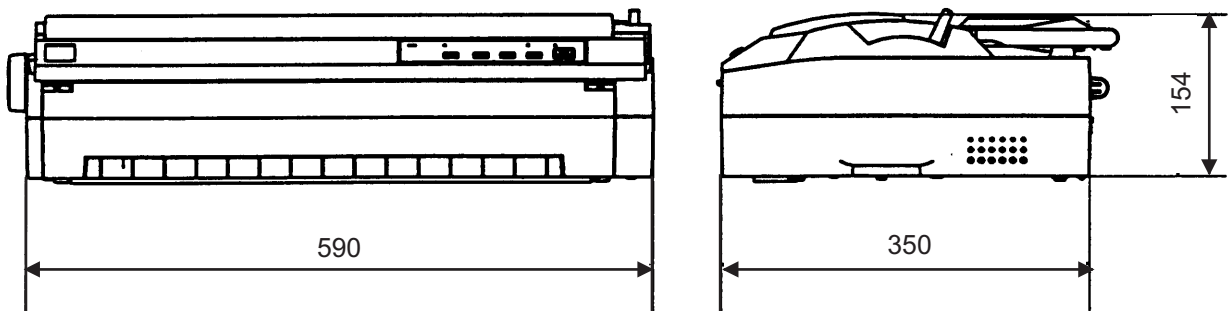
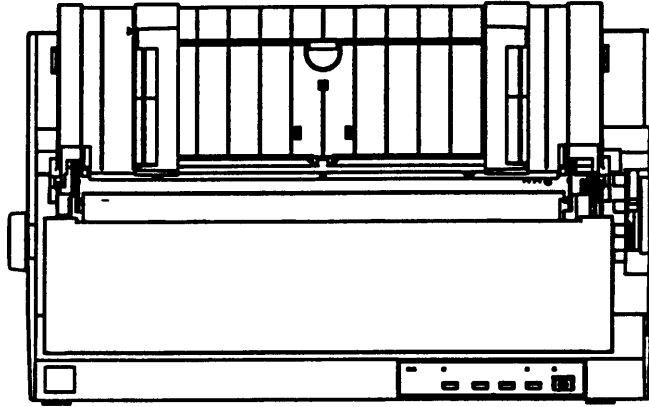
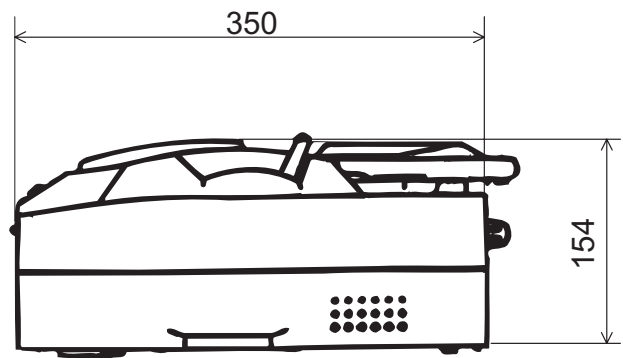
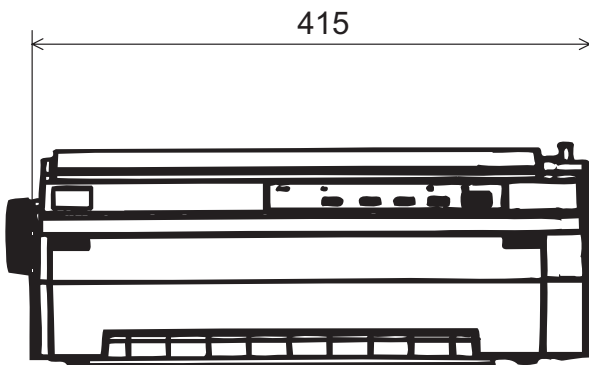
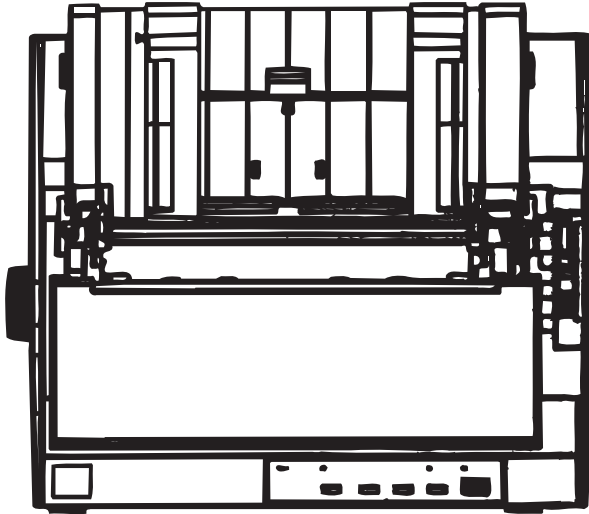


Figure 7-7. Physical Specifications for FX-1180

- FX-880
  - Dimensions: 415mm(W) × 350mm(D) × 154mm(H)
  - Weight: Approximately 9.6Kg
  - Appearance: See the figures below.



**Figure 7-8. Physical Specification for FX-880**

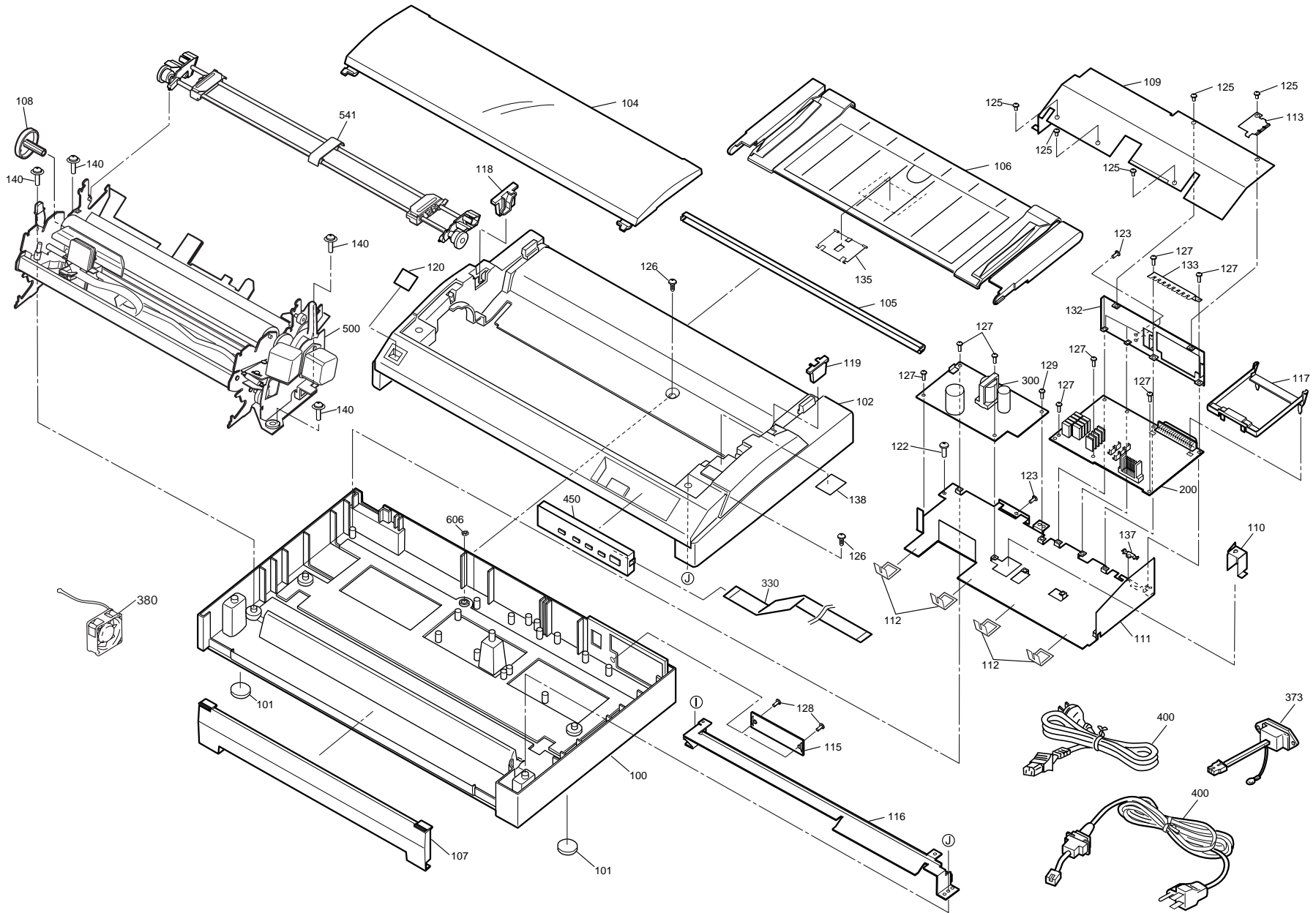
## **7.4 EXPLODED DIAGRAM**

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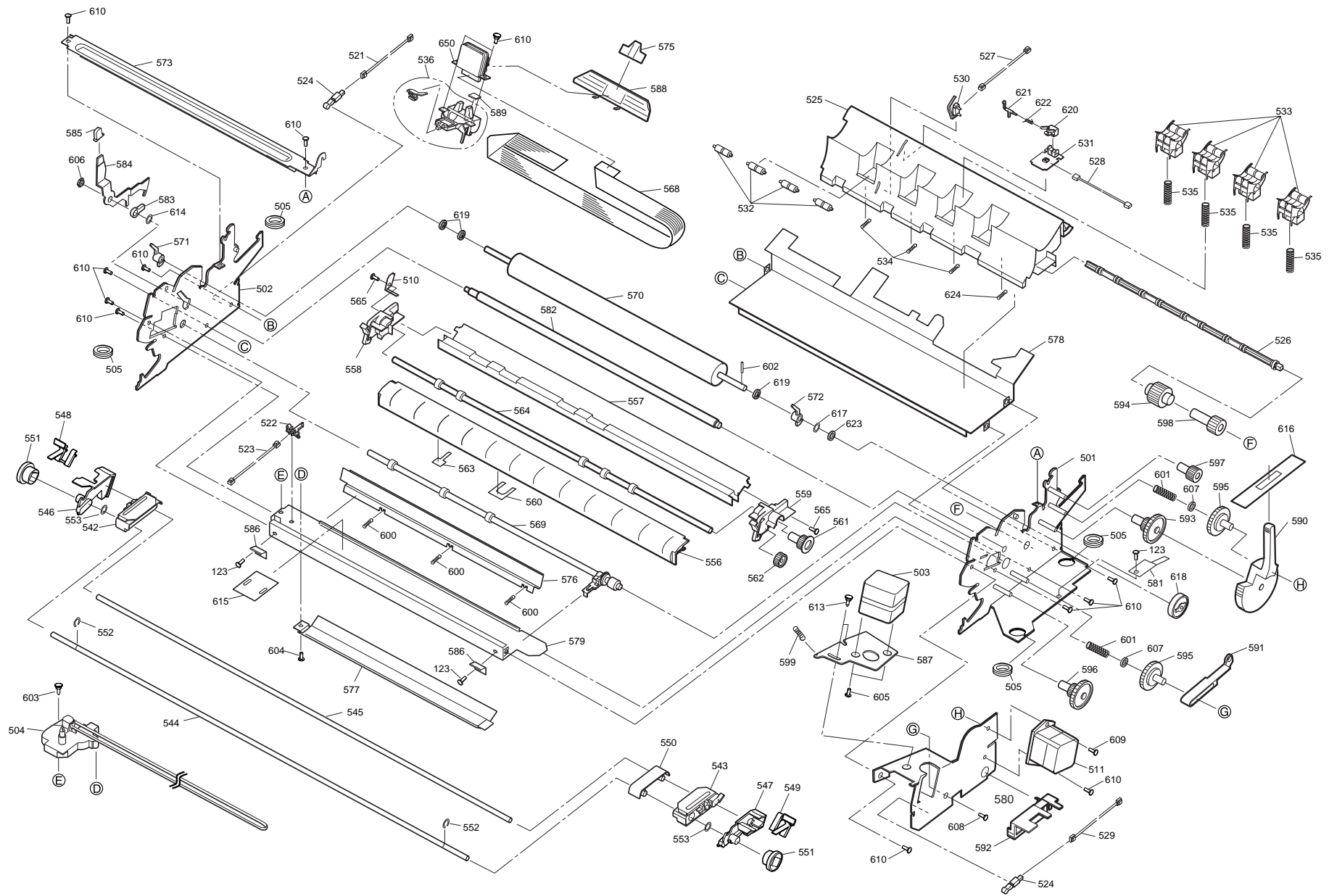
See the following pages for the exploded diagrams below:

- Exploded Diagram for FX-1180 (1)
- Exploded Diagram for FX-1180 (2)
- Exploded Diagram for FX-880 (1)
- Exploded Diagram for FX-880 (2)

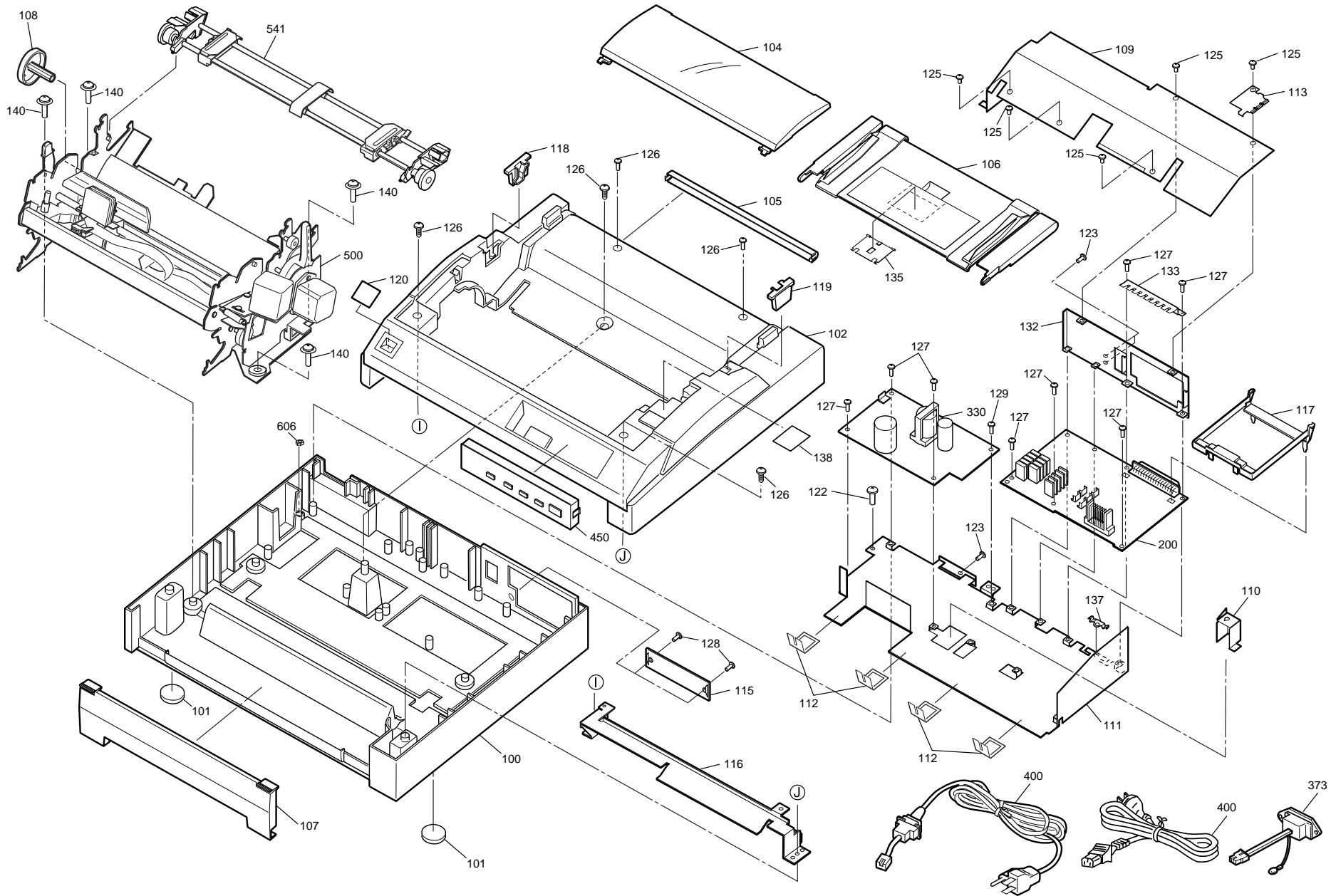




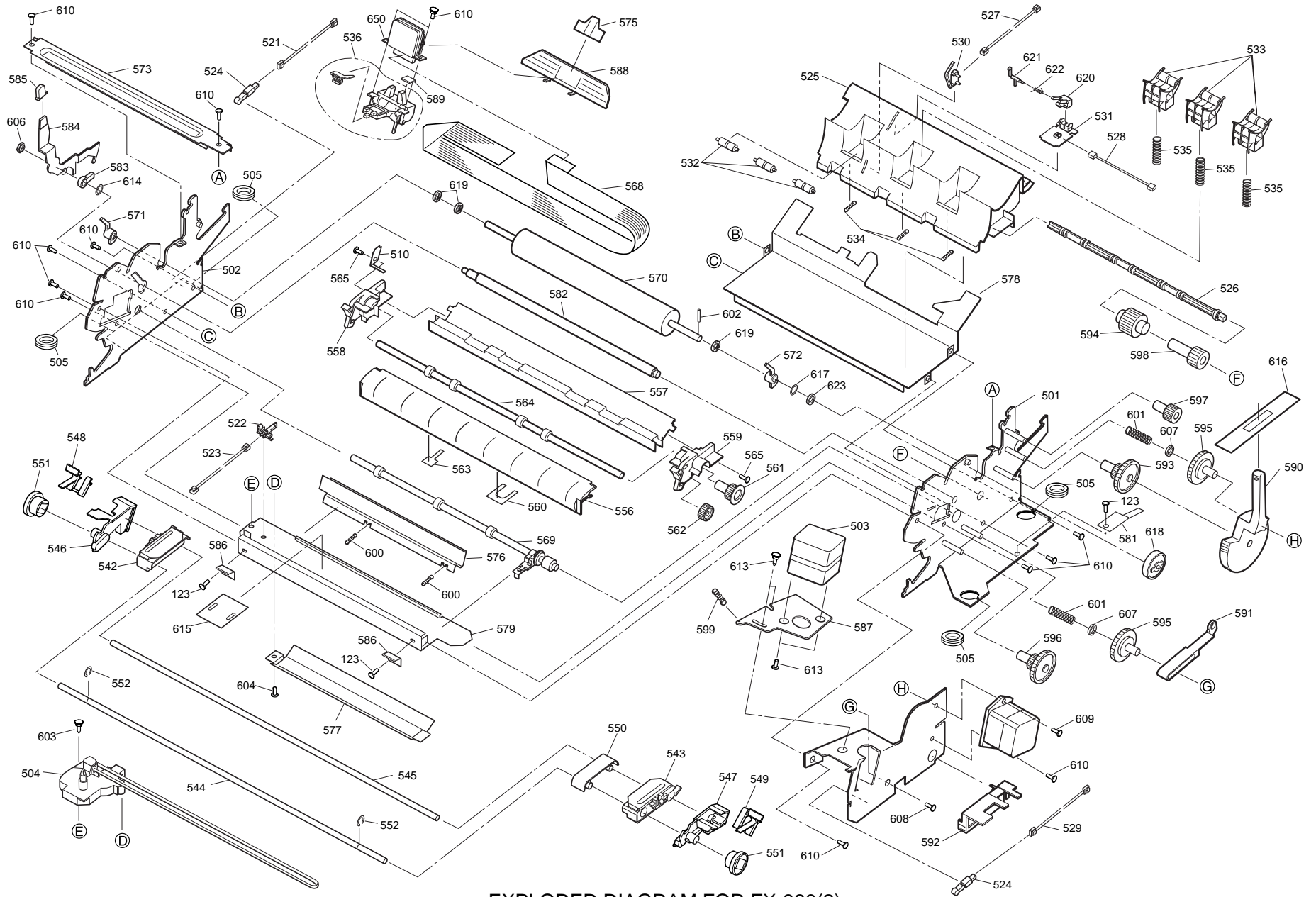
EXPLODED DIAGRAM FOR FX-1180(1)



EXPLODED DIAGRAM FOR FX-1180(2)



EXPLODED DIAGRAM FOR FX-880(1)



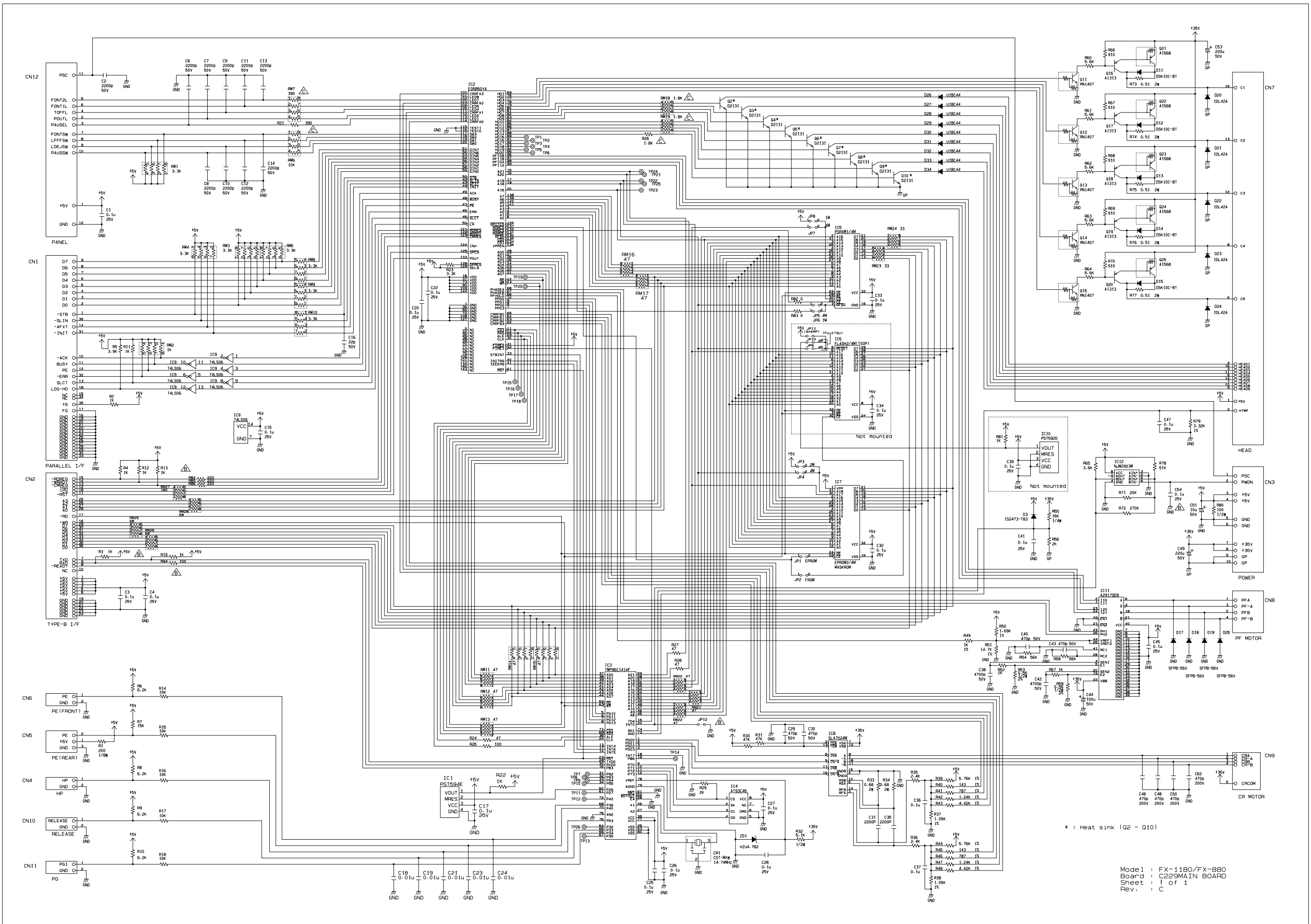
EXPLODED DIAGRAM FOR FX-880(2)

## **7.5 CIRCUIT DIAGRAM**

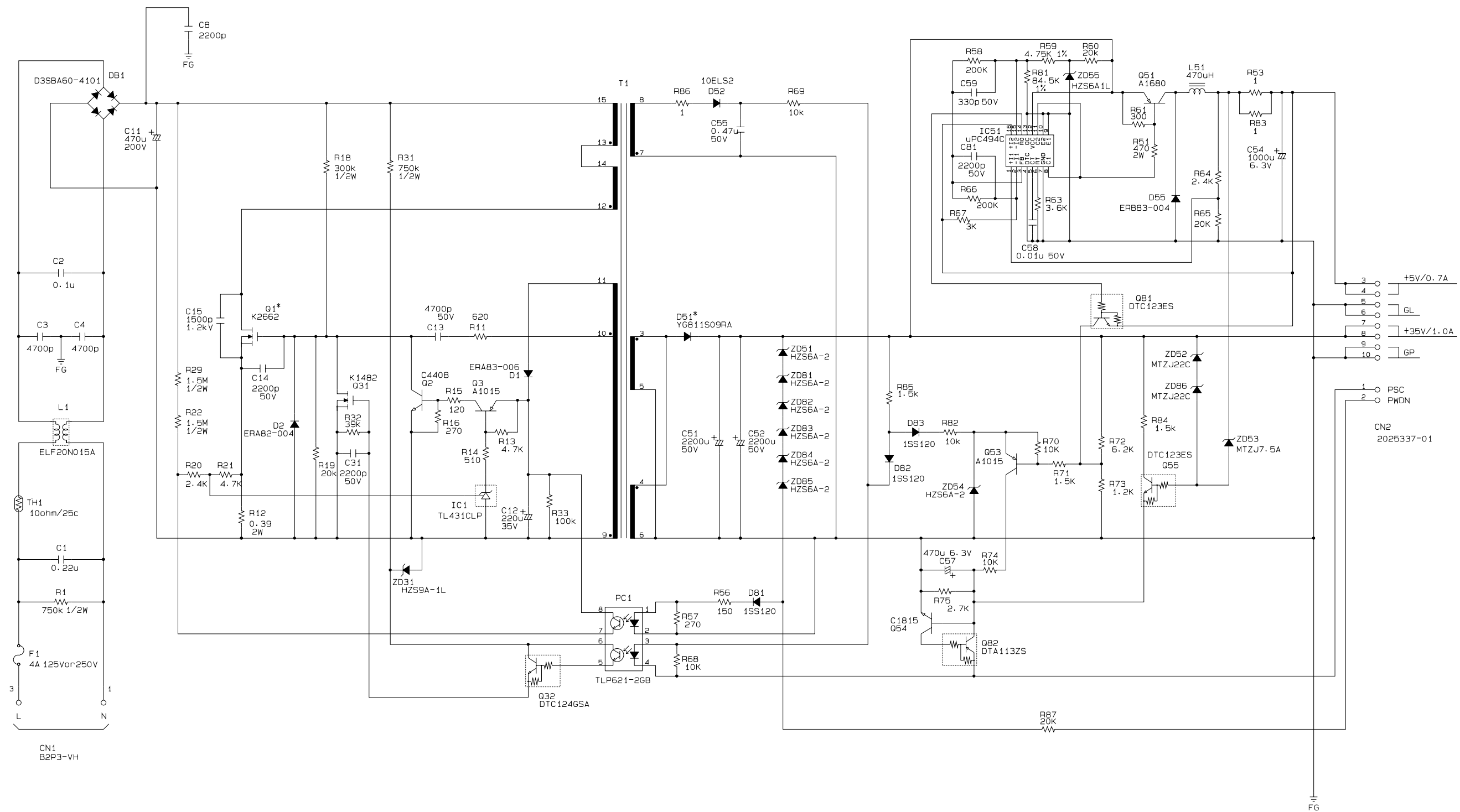
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See the following pages for the circuit diagrams below:

- C229MAIN Circuit Diagram
- C229PSB Circuit Diagram
- C229PSE Circuit Diagram
- C229PSH Circuit Diagram
- C229PNL Circuit Diagram

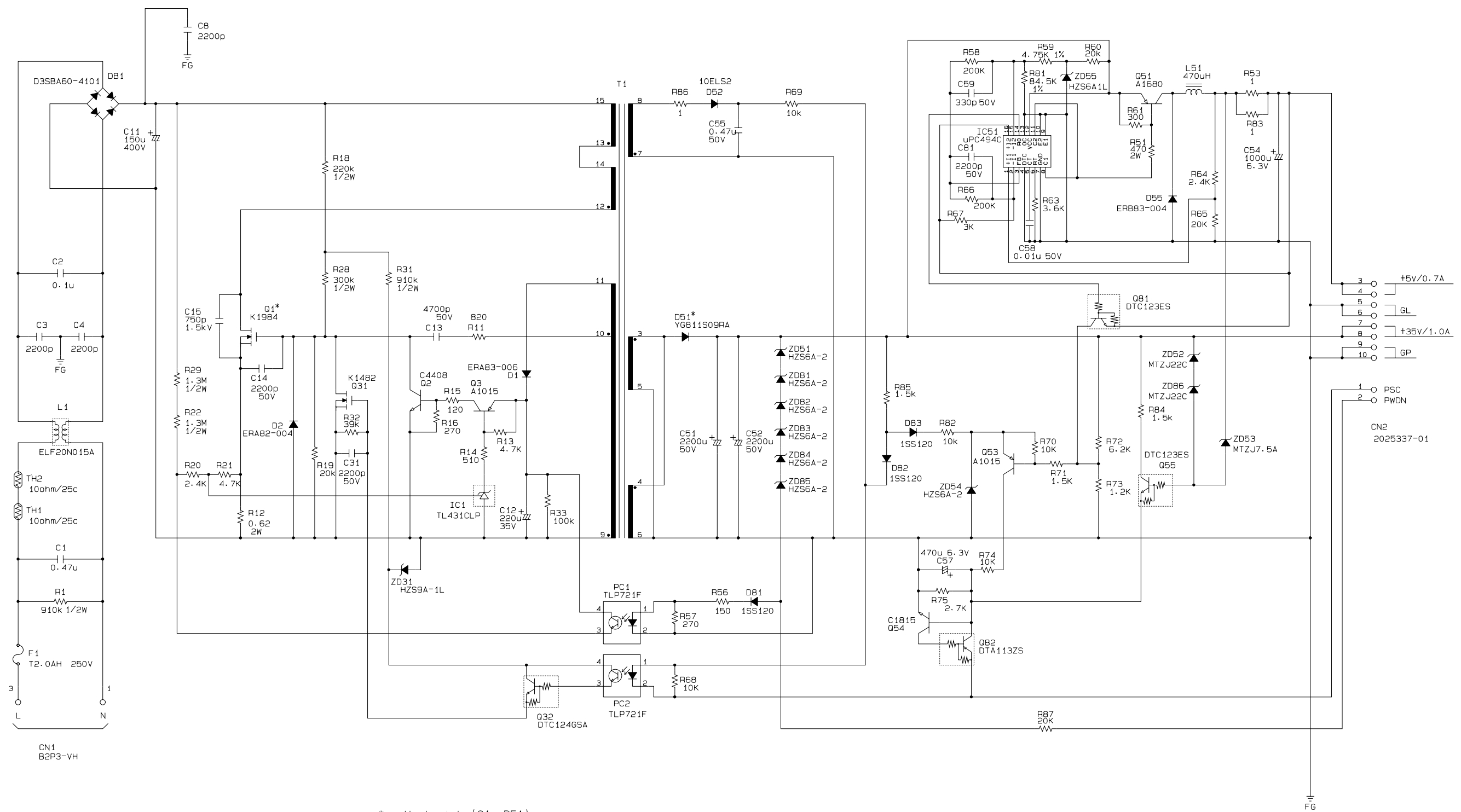


Model 1 : FX-1180/FX-880  
 Board : C229MAIN BOARD  
 Sheet : 1 of 1  
 Rev. : C



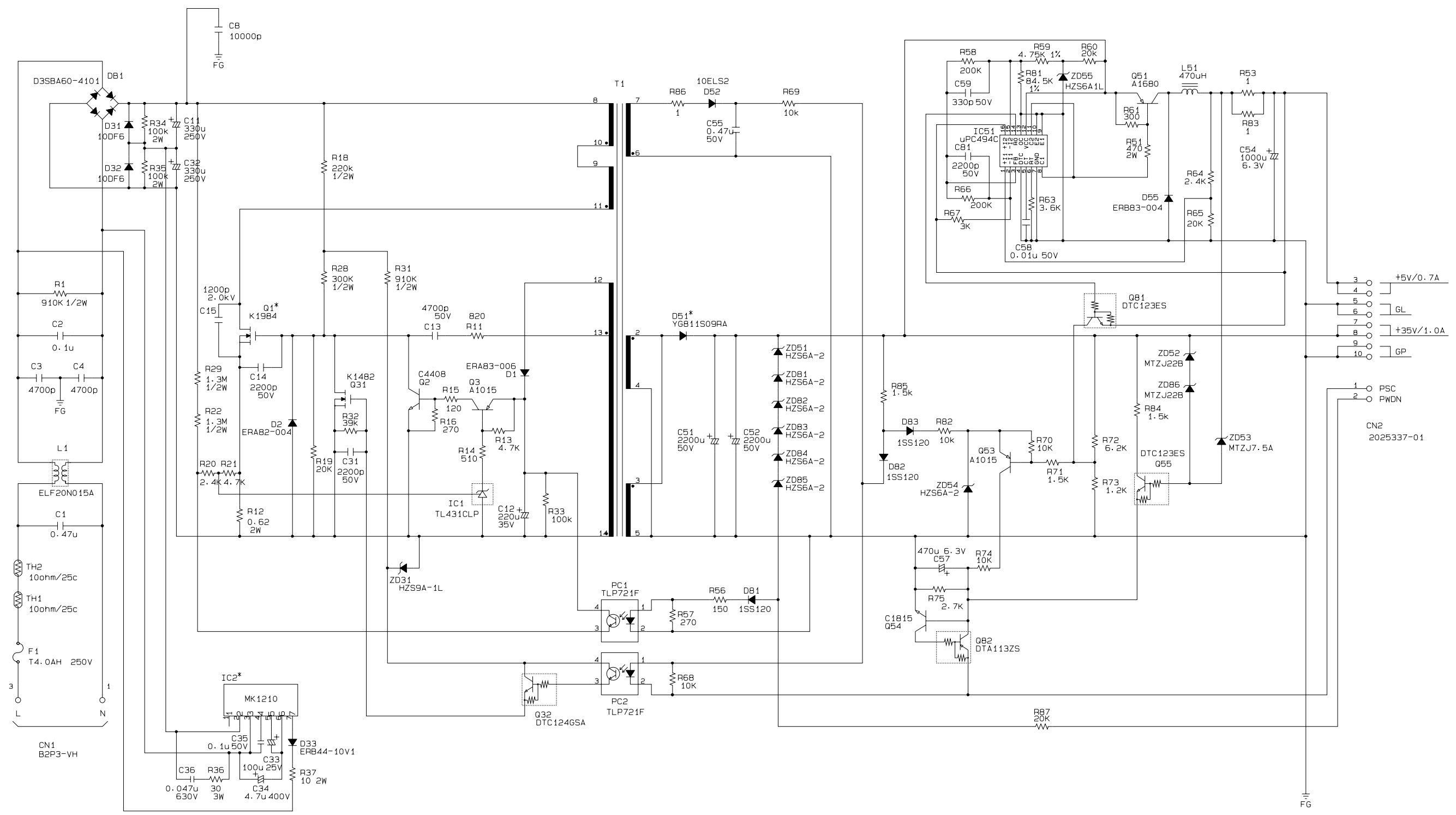
\* : Heat sink ( Q1, D51 )

Model : FX-1180 / FX-880  
 Board : C229PSB BOARD  
 Sheet : 1 of 1  
 Rev. : A



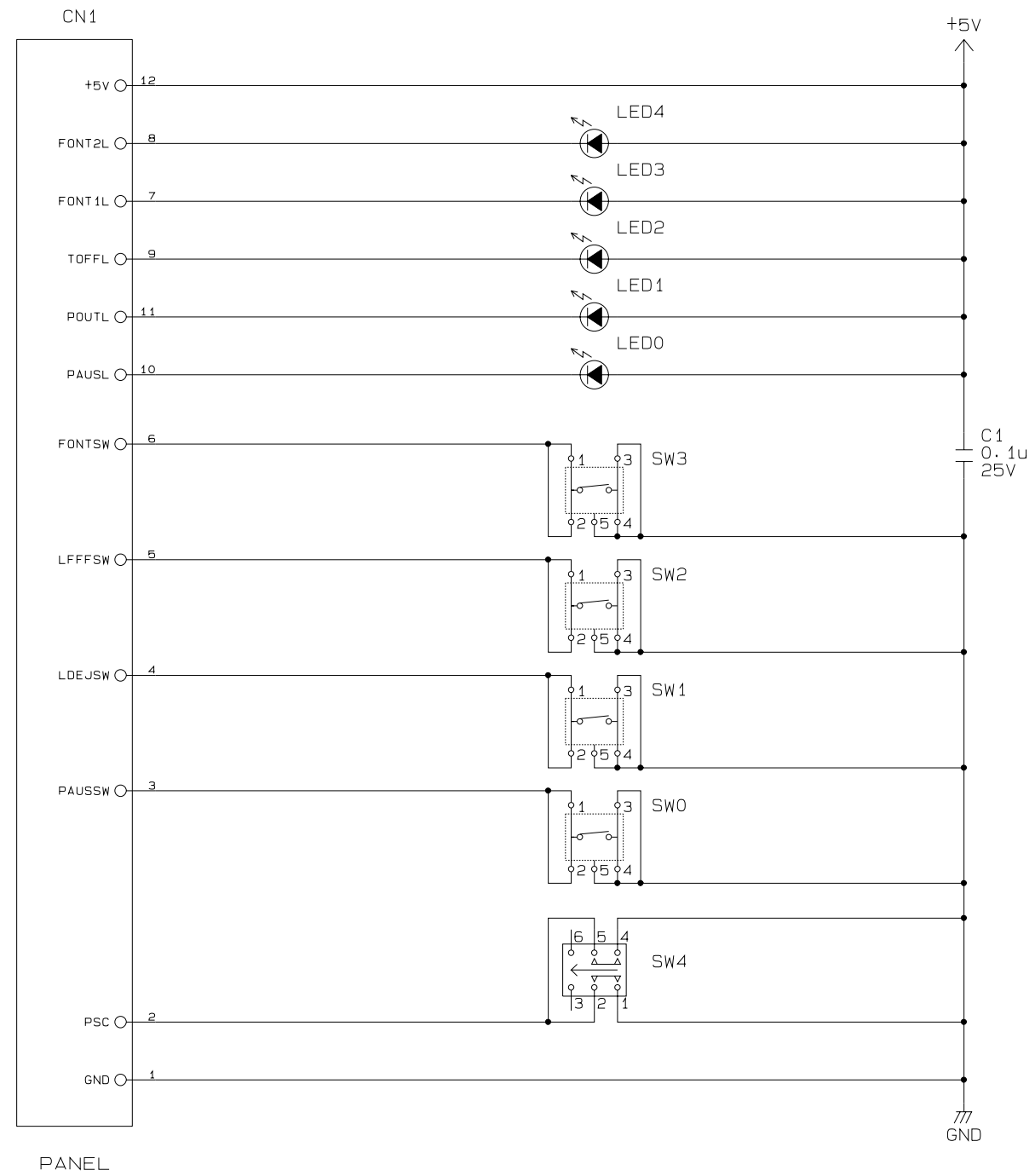
\* : Heat sink (Q1, D51)





\* : Heat sink (Q1, D51, IC2)

Model : FX-1180 / FX-880  
 Board : C229PSH BOARD  
 Sheet : 1 of 1  
 Rev. : B



Model : FX-1180 / FX-880  
 Board : C229PNL BOARD  
 Sheet : 1 of 1  
 Rev. : A