

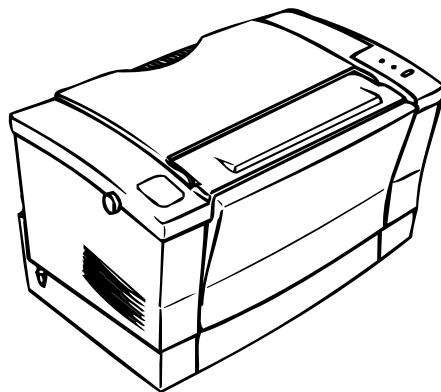
EPSON TERMINAL PRINTER

**EPL-5500W**

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**SERVICE MANUAL**

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**EPSON**

4005668



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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 BOTH THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURE.
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 VOLTAGE IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM 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.

# SAFETY INFORMATION

This printer is a page printer which operates by means of a laser. There is no possibility of danger from the laser, provided the printer is operated according to the instructions in this manual provided.

Since radiation emitted by the laser is completely confined within protective housings, the laser beam cannot escape from the machine during any phase of user operation.

## For United States Users;

### [Laser Safety]

This printer is certified as a Class 1 Laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

### [CDRH Regulations]

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. Compliance is mandatory for products marketed in the United States. The label shown below indicates compliance with the CDRH regulations and must be attached to laser products marketed in the United States.

**WARNING :** Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

### [Internal Laser Radiation]

Maximum Radiation Power:  $5.0 \times 10^{-4}$  (W)  
Wave Length:  $790 \pm 20$  nm

This is a Class IIIb Laser Diode Assay that has an invisible laser beam. The print head unit is NOT A FIELD SERVICE ITEM. Therefore, the print head unit should not be opened under any circumstances.

## For Other Countries Users;

**WARNING:** Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

**This is a semiconductor laser. The maximum power of the laser diode is  $5.0 \times 10^{-4}$  W and the wavelength is  $790 \pm 20$  nm.**

## For Denmark Users;

### **ADVARSEL**

Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

Klasse 1 laser produkt der opfylder IEC825 sikkerheds kravene.

## For Finland, Sweden Users;

**VAROITUS**

Laitteen käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

**WARNING**

Om apparaten används på annat sätt än i denna bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laser klass 1.

**For Finland, Sweden Service People****VAROITUS**

Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle laser-säteilylle. Älä katso säteeseen.

**WARNING**

Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.

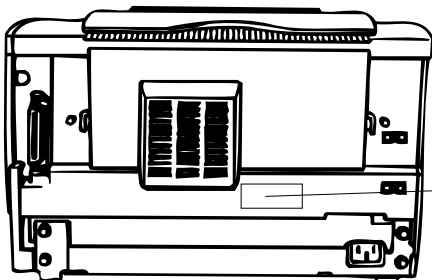
**For Norway Users;****ADVARSEL**

Dersom apparatet brukes på annen måte enn spesifisert i denne bruksanvisning, kan brukeren utsettes for usynlig laserstråling som overskrider grensen for laser klasse 1.

Dette er en halvleder laser. Maksimal effekt til laserdiode er  $5.0 \times 10^{-4}$  W og bølgelengde er  $790 \pm 20$  nm.

**Laser Safety Labels****[Label on rear printer case]**

A laser safety labels is attached on the outside of the printer shown below.

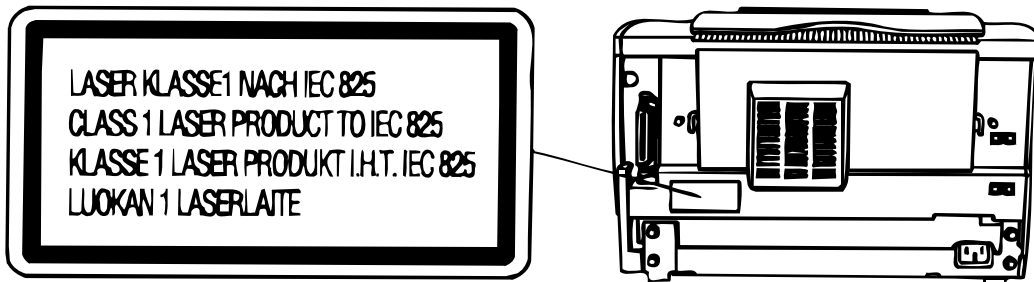
**For United State****For Europe**

This laser product conforms to the applicable requirement of 21 CFR Chapter I, subchapter J.

SEIKO EPSON CORP.  
Hirooka Office  
80 Hirooka, Shiojiri-shi, Nagano-ken,  
Japan

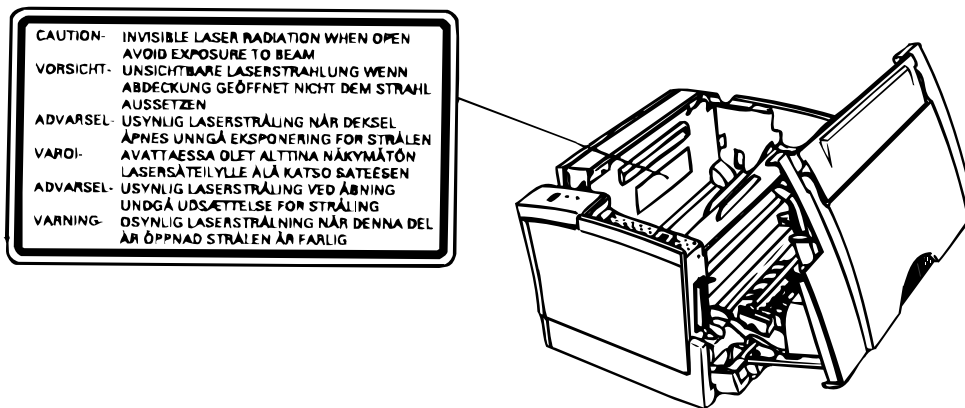
MANUFACTURED:

[Label inside printer]



The following laser safety label will be attached inside the printer as shown below.

For Denmark, Finland, Sweden, and Norway



# PREFACE

This manual describes functions, theory of electrical and mechanical operations, maintenance, and repair of EPL-5500W.

The instructions and procedures included herein are intended for the experience repair technician, and attention should be given to the precautions on the preceding page. The chapters are organized as follows:

## **CHAPTER 1. GENERAL DESCRIPTION**

Provides a general product overview, lists specifications, and illustrates the main components of the printer.

## **CHAPTER 2. OPERATING PRINCIPLES**

Describes the theory of printer operation.

## **CHAPTER 3. DISASSEMBLY AND ASSEMBLY**

Includes a step-by-step guide for product disassembly and assembly.

## **CHAPTER 4. ADJUSTMENTS**

Includes a step-by-step guide for adjustment.

## **CHAPTER 5. TROUBLESHOOTING**

Provides Epson-approved techniques for adjustment.

## **CHAPTER 6. MAINTENANCE**

Describes preventive maintenance techniques and lists lubricants and adhesives required to service the equipment.

## **APPENDIX**

Describes connector pin assignments, circuit diagrams, circuit board component layout and exploded diagram.

*The contents of this manual are subject to change without notice.*



# REVISION SHEET

Revision	Issue Date	Revision Page
Rev. A	November 24, 1995	1st issue

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# Chapter 1 General Description

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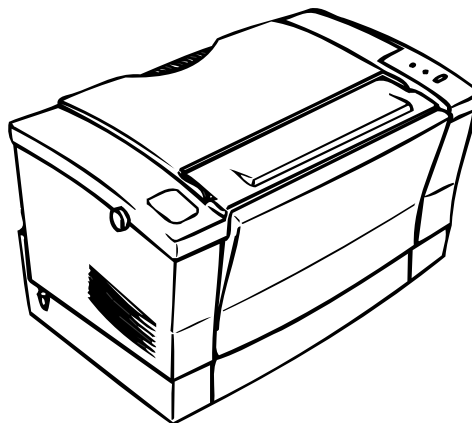


## 1.1 FEATURES

The EPSON® EPL-5500W laser printer has a 300/600 dots per inch (dpi) resolution and 6 pages per minute (ppm) printing speed in a dedicated Microsoft® Windows® Printing System. It works under Microsoft Windows 3.1x and Windows 95, achieving very high performance due to the recent advances in PC technology. The main features are:

- No ozone
- Printing speed — 6 ppm
- Resolution — 600/300 dpi
- Light weight — about 5 kg (11 lb)
- Small footprint
- Low running cost: separation of the development/toner cartridge and photoconductor unit
- Ease of use with Microsoft Windows Printing System (WPS)
- PCL4 software emulation mode
- High throughput, especially with fine-pitch halftone image output
- Freedom from the memory overflow
- Freedom from document incompatibility, True WYSIWYG
- Bidirectional parallel interface (ECP and Microsoft Peppy modes)
- Achieves high throughput with a very high-speed parallel interface. Maximum transmission speed is approximately 2 MB/sec. (under ECP mode) or 600 KB/ sec. (under Peppy mode).

Figure 1-1 shows an exterior view of the EPL-5500W.



**Figure 1-1. Exterior View of the EPL-5500W**

Table 1-1 lists the optional units available for the EPL-5500W.

**Table 1-1. Options for the EPL-5500W**

<b>Cat. No.</b>	<b>Description</b>	<b>Note</b>
S050005	Developer cartridge	Developer and toner cartridge
S051029	Photoconductor unit	—





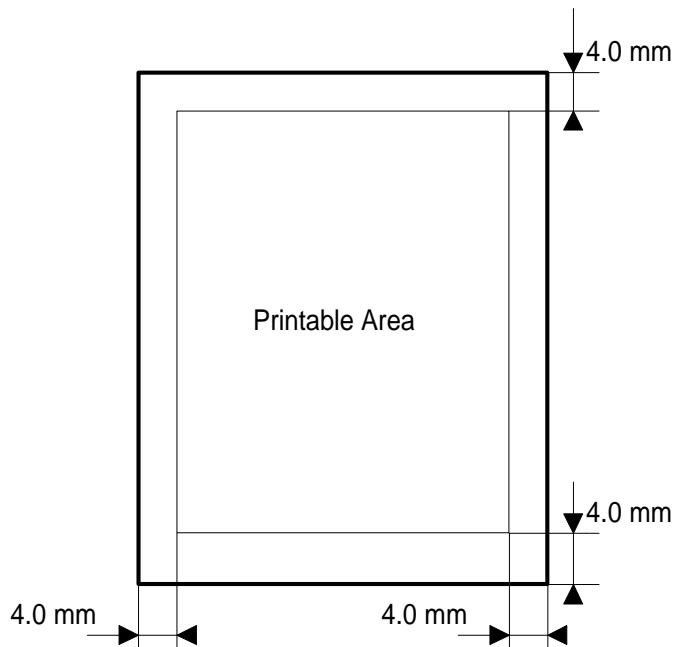
Usability of special papers: See Table 1-4.

**Table 1-4. Usability of Special Papers**

Input	OHP	Envelopes	Labels	Card Stock	Letterhead
Standard built-in paper tray	P	P	P	P	R
Manual feed slot	P	P	P	P	R

R: Reliable feeding and good image quality.  
 P: Possible, but better avoided.  
 N: Not supported.

Paper feed alignment and direction: Center alignment for all sizes  
 Paper ejection: Face down  
 Output tray capacity: 100 sheets (face down)  
 Printable area (standard paper): See Figure 1-2.



**Figure 1-2. Printable Area**

**Note:** The actual printable area depends on the printer mode.

Noise: Less than 35 dB(A), standby  
 Less than 47 dB(A), operating  
 Ozone density: Less than 0.01 ppm  
 Toxicity: No toxicity exists in organic photoconductor (OPC), toner, or plastic materials

## 1.2.2 Electrical Specifications

**Table 1-5. Electrical Requirements and Ranges**

Description	100 V Version	200 V Version
Rated voltage	100 ~ 120 VAC	220 ~ 240 VAC
Input voltage range	90 ~ 132 VAC	198 ~ 264 VAC
Rated frequency range	50 ~ 60 Hz	
Input frequency range	47 ~ 63 Hz	
Power consumption	Less than 500 W	Less than 600 W
Power consumption while in standby mode	Less than 15 W (without option)	

## 1.2.3 Reliability Specifications

MPBF (Mean Prints Between Failures): Over 25,000 sheets

**Note:** MPBF indicates the average number of pages printed before an occurrence of a problem requiring replacement or service.

MTBF (Mean Time Between Failures): 3000 power on hours (POH)

Jam rate: 1 out of 2,000 sheets or less (excluding multiple-sheet feeding)

Feed failure: 1 out of 2,000 sheets or less (excluding multiple-sheet feeding)

Multiple paper feeds: 1 out of 500 sheets or less

Paper curl height: 30 mm (1.2 inches) or less

Leading edge bending (1 cm or more): 1 out of 1,000 sheets

MTRR (Mean Time To Repair): 30 minutes or less

Durability: 5 years or 1,800,000 sheets

## 1.2.4 Environmental Conditions for Operation (Including Imaging Cartridge)

Temperature: 10 to 35° C (50 to 95° F)

Humidity: 15 to 85% RH

Altitude: 2,500 m (8,200 feet) or lower

Levelness: 1°

Illuminance: 3,000 lux or less (Must not be exposed to direct sunlight.)

Surrounding space: Printer should have at least 100 mm (4") of clearance on its sides and rear.

## 1.2.5 Environmental Conditions for Storage and Transportation

Temperature: 0 to 35° C (32 to 95° F)

Humidity: 30 to 85% RH

Drop test: Clear to JIS Z0200-1987 Level 1

Vibration: Vibration frequency 5 to 100 Hz and 100 to 5 Hz  
Acceleration 1 G  
Acceleration direction 3 directions

Resistance to atmospheric pressure: More than 61.3 KPa

Storage life: 18 months (following date of manufacture)

## 1.2.6 Applicable Standards

### Safety Standards

120 VAC model:	UL 1950, CSA 22.2 No. 950 Deviation 3
220/240 VAC model:	EN 60950 (IEC950), NEMKO (IEC950), SETI (IEC950), SEMKO (IEC950), DEMKO (IEC950)

### Safety Regulations (Laser Radiation)

120 VAC model:	FDA (NCDRH) Class 1
220/240 VAC model:	VDE 0837 (Laser Class 1) (IEC825), SETI (IEC825), SEMKO (IEC825), DEMKO (IEC825)

### EMI

120 VAC model:	FCC Part 15 Subpart B Class B, DOC Class B
220/240 VAC model:	Vfg 243 (VDE 0878 Part 3,30) EN55022 Class B (CISPR Pub. 22 Class B) CE marking, EMC

### Others

Toner:	No effect on human health (OSHA-TSCA, EINECS)
OPC:	No effect on human health (OSHA)
Ozone:	Less than 0.01 mmp other UL478 (5th edition)
Materials:	SWISS environmental law (must contain no CdS)

## 1.2.7 Specifications for Consumables

Life:	Developer and toner cartridge: 3,000 pages Photoconductor unit: 20,000 pages
-------	---

**Note:** In continuous printing mode with A4/letter paper at a 5% image ratio (black/white ratio). The life varies, depending on the printing mode (continuous or intermittent) and/or the image ratio.

## Environmental Conditions for Storage and Transportation

Temperature:	0 to 35° C (32 to 95° F)
Humidity:	30 to 85% RH
Drop test:	Height 76 cm (30.4 inches)
Vibration:	Same as printer
Resistance to atmospheric pressure:	More than 74 Kpa
Storage term:	18 months (following date of manufacture)

## 1.2.8 Physical Specifications

Dimensions (Width × Depth × Height):

Printer:	352 × 264 × 299 mm (13.9 × 10.4 × 11.8 inches)
Weight:	Approx. 5 kg (11 lb), with consumables, excluding all options

## **1.2.9 Software Specifications**

Built-in modes:           Microsoft Windows Printing System  
                                  PCL4 (software emulation)

## 1.3 INTERFACE SPECIFICATIONS

The EPL-5500W is equipped with the following external interfaces:

- Parallel interface

### 1.3.1 Parallel Interface

The parallel interface has the following two modes:

- ECP mode
- Microsoft Peppy mode

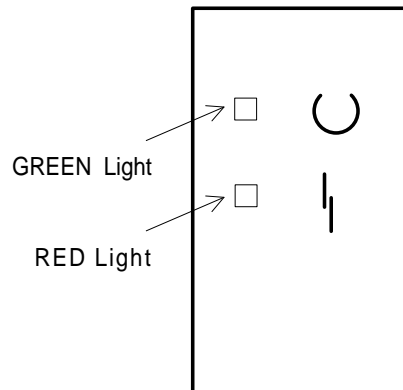
Pin assignments: Fully IEEE-1284 compliant  
Connector type: P90-25027-1 (Amphenol) receptacle  
Applicable plug: 57-30360 (Amphenol or equivalent)

## 1.4 OPERATING INSTRUCTIONS

This section describes printer functions, including control panel operation and messages.

### 1.4.1 Control Panel

The printer control panel gives you easy control over most common printer operations. The panel consists of the indicator lights described below.



**Figure 1-3. Control Panel**

#### Indicator Lights

□ GREEN light

ON: Printer is ready or idle.

Blinking: Printer is currently receiving data.

□ RED light

ON: Printer has detected errors.

## 1.4.2 Display of Messages

This printer indicates two types of messages with the status message window for the printer driver on the PC.

### 1.4.2.1 Status Messages

This section describes the status messages.

**Table 1-6. Status Messages**

Message	Status
Printer ready	Printer is ready.
Printing	Printer is printing.
Manual feed	Printer is loading paper from manual feed slot.
Paused	Printer is in pause mode.
Printing stopped	Printer is stopping during printing of a job.
Please wait	Printer is in the wait condition.
Paused printer warming up	Printer is warming up.
Printer warming up	Printer is warming up.

### 1.4.2.2 Error Messages

This section describes error messages, what they indicate, and what measures to take to eliminate the error.

**Table 1-7. Error Messages**

Message	Status	Measures
Configuration error	The user is unable to redirect a port, or system software cannot find a file to complete a request.	Check the printer connection port, and reinstall the driver.
Low memory	Memory in PC has run out.	Add the memory to the PC.
No local printer	The printer is not connected to the local port when you are using PCL emulation.	PCL emulation does not support a network.
Status not available	The printer does not return status information.	Check the printer connection.
Check printer/ cable	The printer does not return status information.	Check the printer connection.
Service error	Printer is damaged.	Service required.
Clear paper jam	A paper jam occurred.	Open the cover and remove the jammed paper. Then close the cover.

**Table 1-7. Error Messages (Continued)**

Message	Status	Measures
Check Toner & Cover	Printer is cover open or no toner cartridge is installed.	Check the cover and toner cartridge.
Wrong paper loaded	Paper in the tray to be fed into the printer is different from the specified paper size.	Check the paper size.
Change paper	Paper settings are wrong.	Check the paper size settings.

### 1.4.3 Printing Resolution Host PC Capability Dependency

This printer driver calculates the host PC's capability every time Windows starts up, and the driver drops the printing resolution at the beginning of each job automatically if the value it detects will not allow complete printing at the resolution the user has set. This printer can print pages at the resolution if the HOST PC fulfill the following conditions.

**Table 1-8. Host PC Conditions**

CPU	Installed DRAM Quantity			
	Windows 3.1, WFW 3.11		Windows 95	
	< 8 MB	≥ 8 MB	< 8 MB	≥ 12 MB
80386SX 16/20/25/33 MHz or compatibles	300 DPI (Note 1)	300 DPI (Note 1)	—	—
80386DX 16/20/25/33 MHz or compatibles	300 DPI (Note 1)	300 DPI (Note 1)	300 DPI (Note 1)	300 DPI (Note 1)
80486SX/DX 16/20 MHz or compatibles	300/600 DPI (Note 2)	300/600 DPI (Note 2)	300/600 DPI (Note 2)	300/600 DPI (Note 2)
80486SX/DX 25/33/50 MHz 80486DX2 50/66 MHz 80486DX4 75/100 MHz Pentium 60/66/75/90/100 120/133 MHz	300/600 DPI (Note 2)	300/600 DPI	300/600 DPI (Note 2)	300/600 DPI

Note 1: Some pages may be not be printed completely, depending on complexity of those pages.

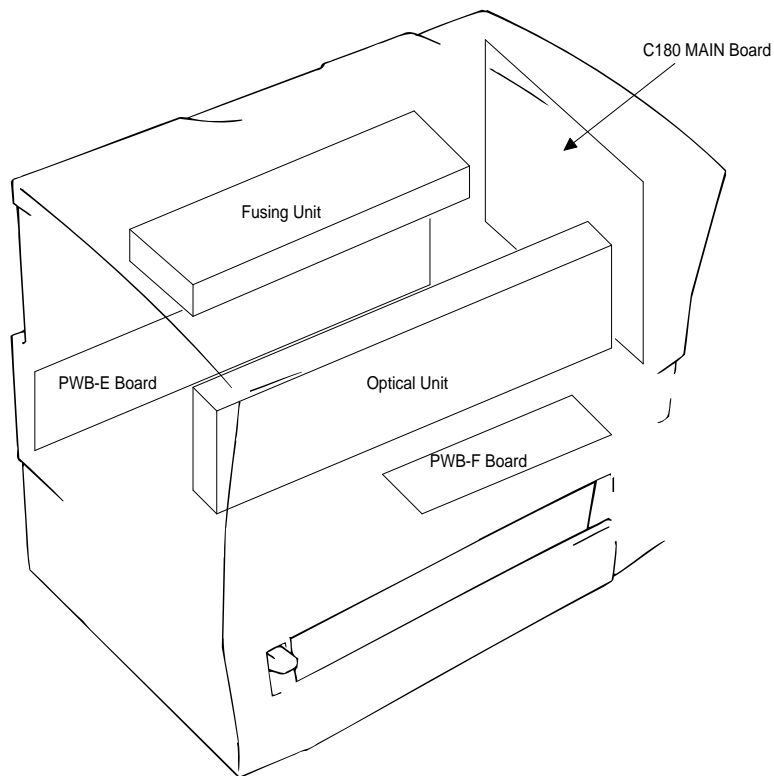
Note 2: Some pages may not be printed at 600 DPI depending on complexity of those pages.



## 1.5 MAIN COMPONENTS

To simplify maintenance and repair, the main components of the EPL-5500W have been designed for easy removal and replacement. The main components are:

- C180 MAIN Board                      Main board
- PWB-E Board                          Power supply circuit board
- PWB-F Board                          High-voltage supply circuit board
- Optical Unit                            Printhead unit
- Fusing Unit
- Photoconductor unit
- Developer cartridge
- Housing



**Figure 1-4. Main Components**

### 1.5.1 C180 MAIN Board

The C180 MAIN board contains a parallel interface controller and engine controller board. The primary functions of this board are receiving print data from the host and sending the print image to the engine controller via the video interface.

- ❑ Memory chips
  - 4M-bit DRAM (U4)
- ❑ Custom ICs
  - ASIC E05B23 (U6)

The engine controller consists of an M3807 x 8-bit CPU, including a MASK ROM. It controls laser scanning (the polygon mirror drive motor), image synchronization, laser beam pulse width, and power.

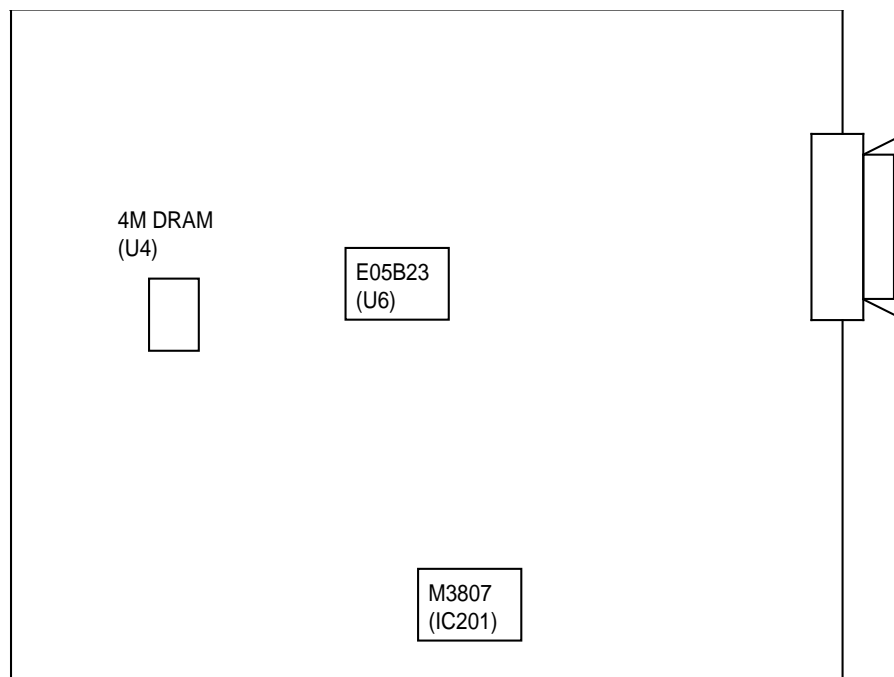


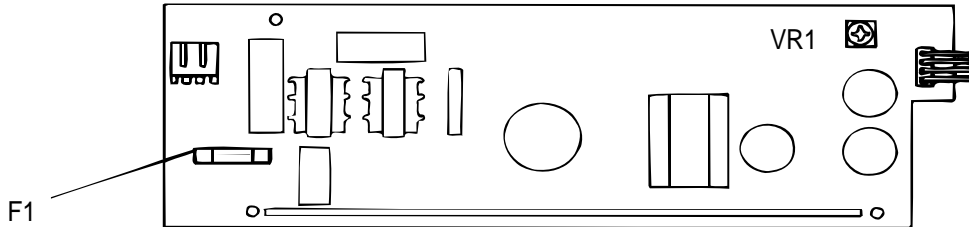
Figure 1-5. C180 MAIN Board

### 1.5.2 PWB-E Board

The PWB-E is the power supply board, which consists of a switching regulator circuit. It converts the AC line voltage into +24 V and +5 VDC voltages. There are two types of power supply board, the 100/120 V type and 220/240 V type. The difference between the two circuits is only in the input section.

**CAUTION**

*Do not touch VR1 on PWB-E board. This volume is for factory setting only.*



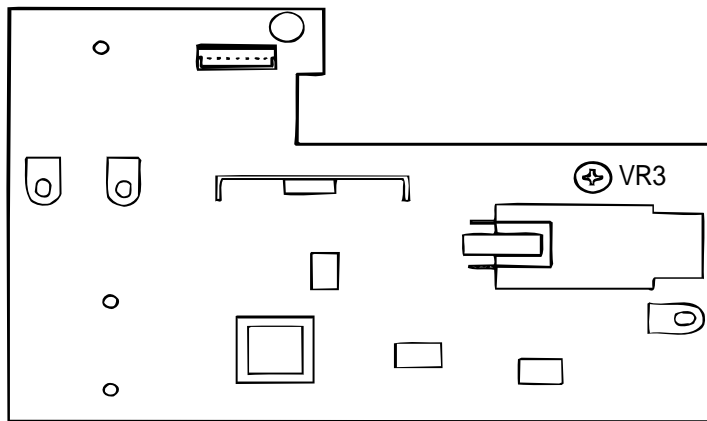
**Figure 1-6. PWB-E Board**

### 1.5.3 PWB-F Board

The PWB-F is the high-voltage supply circuit board. It converts the development bias, OPC drum charge bias, and image transfer bias.

**CAUTION**

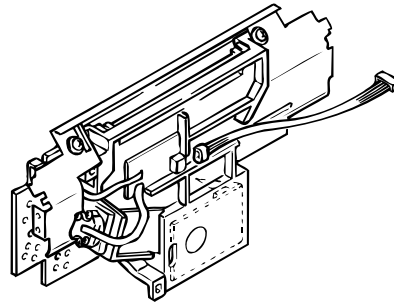
*Do not touch VR3 on the PWB-F board. These volumes are for factory setting only.*



**Figure 1-7. PWB-F Board**

### 1.5.4 Optical Unit

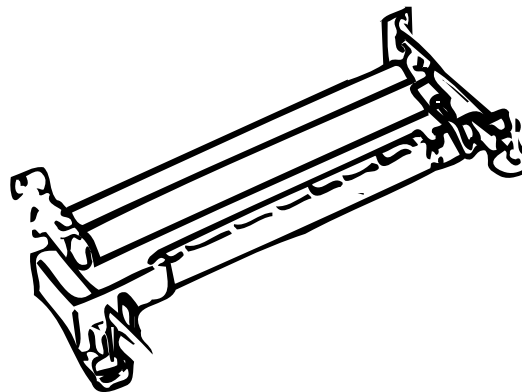
The optical unit consists of the laser diode (semi-conductor laser), the mirror motor (scanner motor) which drives the polygon mirror for laser scanning, and several mirrors and lenses. The laser beam generated by the laser diode is conducted to the OPC drum surface by way of the polygon mirror, as well as several mirrors and lenses, to create a latent electro-photographic image on the drum.



**Figure 1-8. Optical Unit**

### 1.5.5 Fusing Unit

The fusing unit fixes the toner to the paper using heat and pressure. This unit has a heater lamp, thermistor, and thermal fuse. There are two types of fusing units, the 120 V type and the 220/240 V type. The only difference between them is the heater lamp.



**Figure 1-9. Fusing Unit**

### 1.5.6 Photoconductor Unit

Core mechanisms of the printing process, such as charging and imaging, are integrated into this unit.

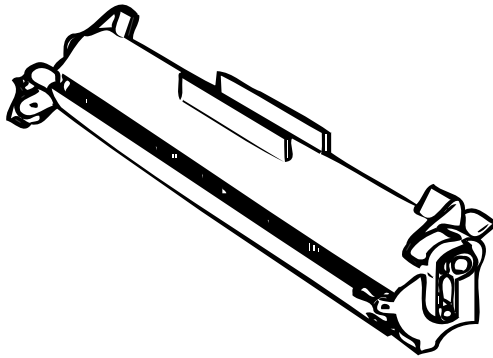


Figure 1-10. Photoconductor Unit

### 1.5.7 Developing Cartridge

The developing mechanism for the printing process is integrated into this cartridge.

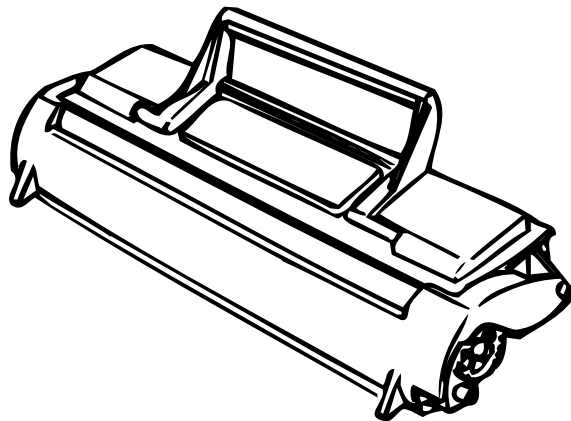


Figure 1-11. Developing Unit

# Chapter 2 Operating Principles

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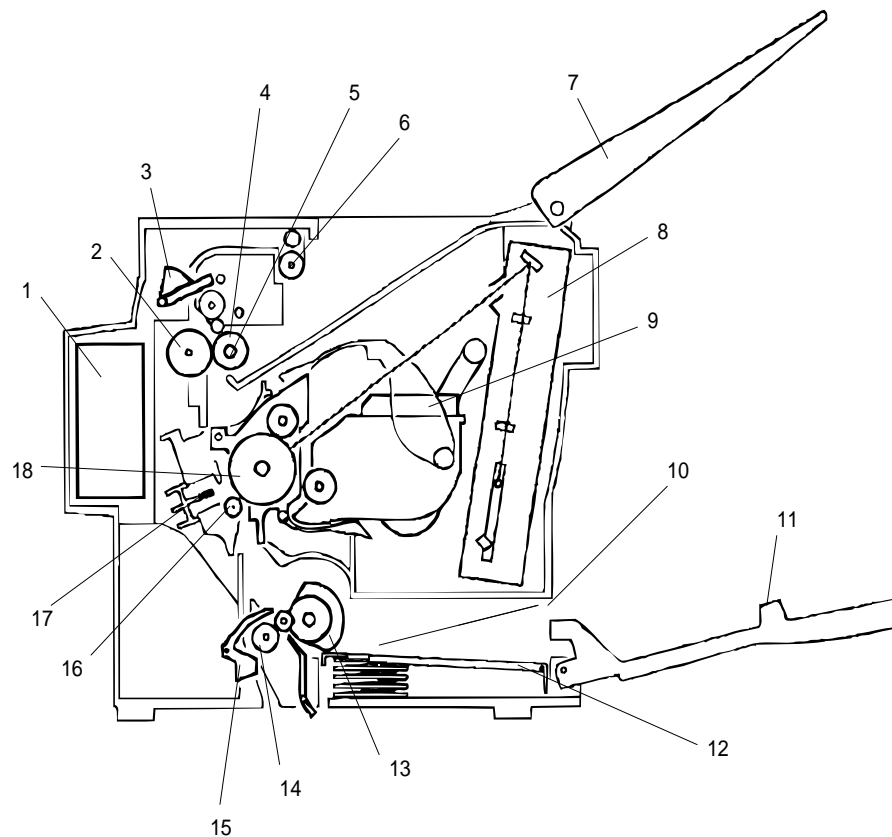
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## 2.1 ENGINE OPERATION

This section describes the functions and operating principles of the EPL-5500W engine. Figure 2-1 shows the locations and names of the main engine components.



**Figure 2-1. Main Components**

- |                            |                                |
|----------------------------|--------------------------------|
| 1. Fan Motor (M3)          | 11. Paper Feeding Tray         |
| 2. Lower Fusing Roller     | 12. Paper Lift-up Plate        |
| 3. Paper Exit Sensor (PC3) | 13. Paper Take-up Roller       |
| 4. Upper Fusing Roller     | 14. Paper Transport Roller     |
| 5. Heater Lamp (H1)        | 15. Paper Take-up Sensor (PC1) |
| 6. Paper Exit Roller       | 16. Pre-image Transfer Roller  |
| 7. Print Tray              | 17. Electrode Comb             |
| 8. Optical Unit            | 18. Drum Cartridge             |
| 9. Toner Cartridge         |                                |
| 10. Manual Feed Guide      |                                |



### 2.1.1 Print Process

This section describes the print process from paper feeding to paper exit. Figure 2-2 shows a diagram of the print process.

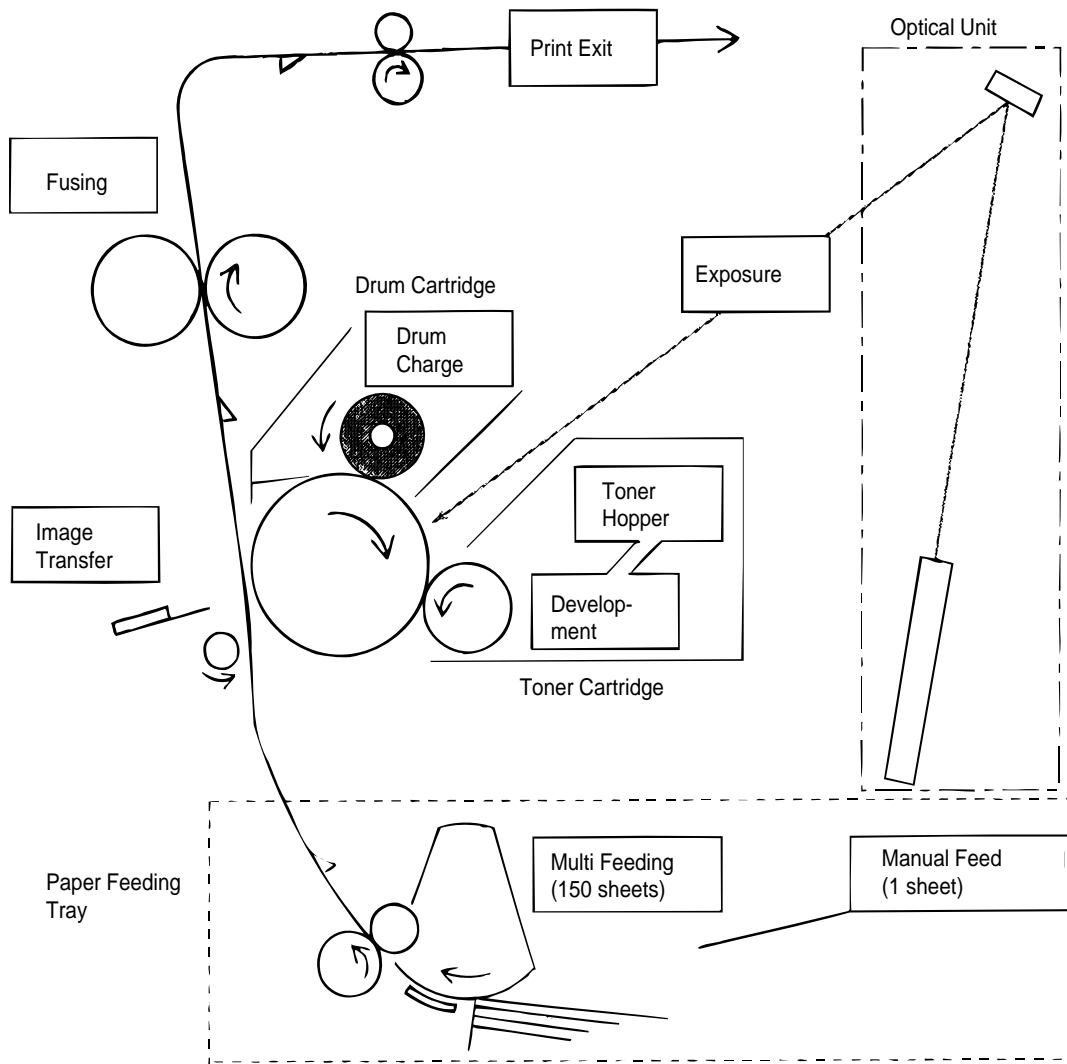


Figure 2-2. Print Process Diagram

### 2.1.1.1 Paper Feeding

Paper can be fed into the printer from the paper feed tray (150 sheets) or from the manual feed slot (1 sheet at a time). Paper fed by the paper take-up roller is transported to the transport roller, pre-image transfer roller, and then exit roller. After this, the paper is fed out onto the print tray. The starting position of an image is decided by the paper take-up sensor (PC1). A photo sensor is used as the paper take-up sensor (PC1) and the paper exit sensor (PC3).

#### Paper Feeding Tray (Standard Tray)

When the paper take-up solenoid is energized, the main motor (M1) drive is transmitted to the paper take-up roller via the paper take-up clutch (a one-way clutch) to rotate the paper take-up roller one revolution. At the same time, the depression cam rotates and releases the paper lift-up plate to feed the top (first) paper. The fixed separating pad is used for the paper separation system. It prevents the second or later sheets from being fed together with the top paper.

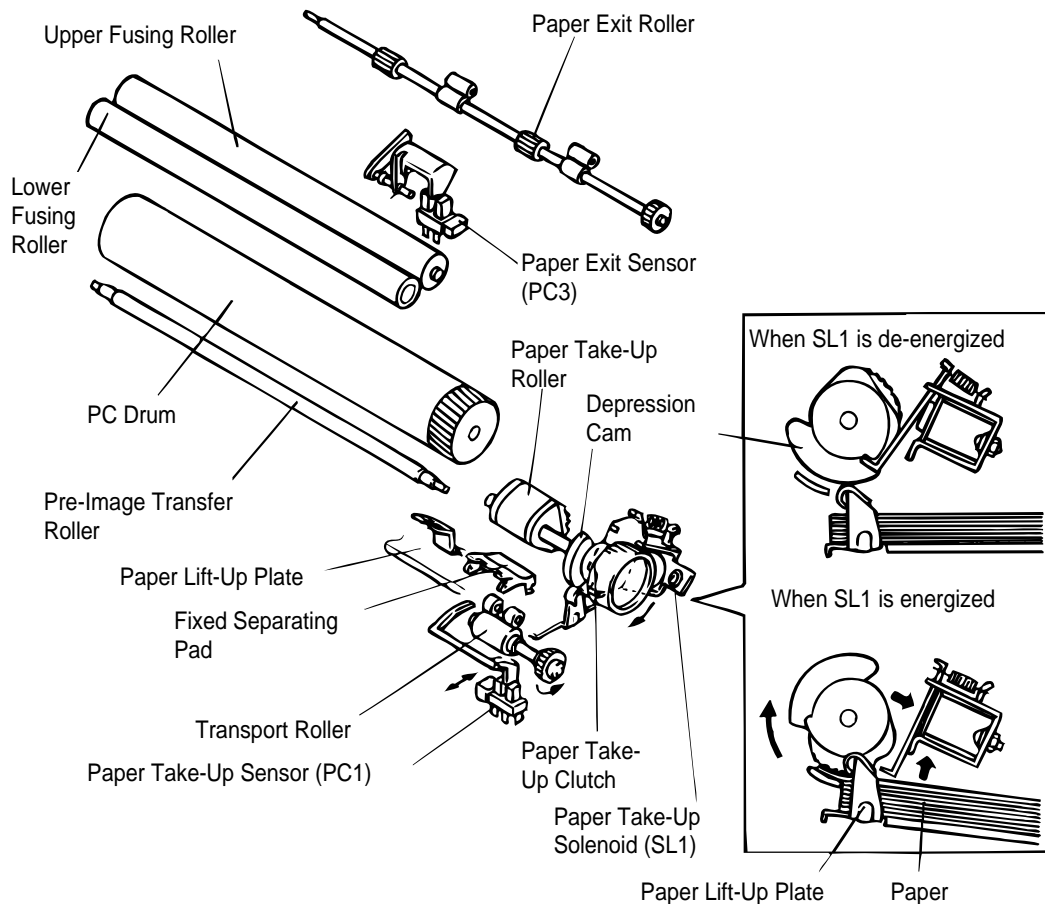


Figure 2-3. Paper Feeding from the Paper Feed Tray

### 2.1.1.2 Drum Charge

The PC drum is charged with static electricity before laser exposure. The rotating charge brush and pre-film are used as the charging method. Less ozone is generated by the corona charge of the rotating charge brush and the pre-film, and the PC drum can be charged with low voltage because the charge is directly applied to the PC drum. The charge brush is rotated by the drive of the M1 main motor via its gear.

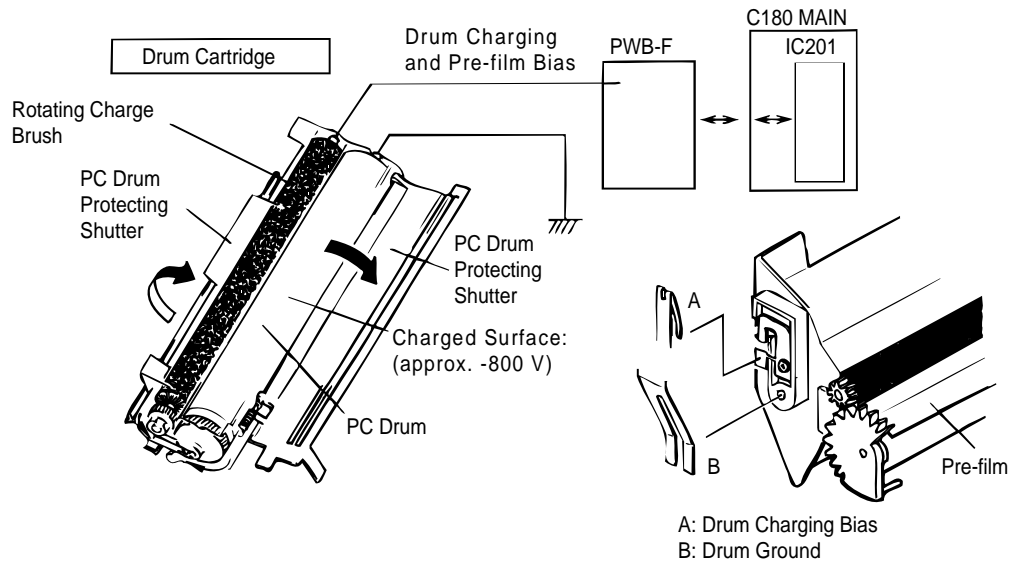


Figure 2-4. Drum Charge

### 2.1.1.3 Laser Exposure

The laser beam, emitted from the optical unit, makes an invisible static image. The SOS (start of scan) sensor, installed on the laser diode control board (PWB-D), unifies the laser emission timing for each scan line.

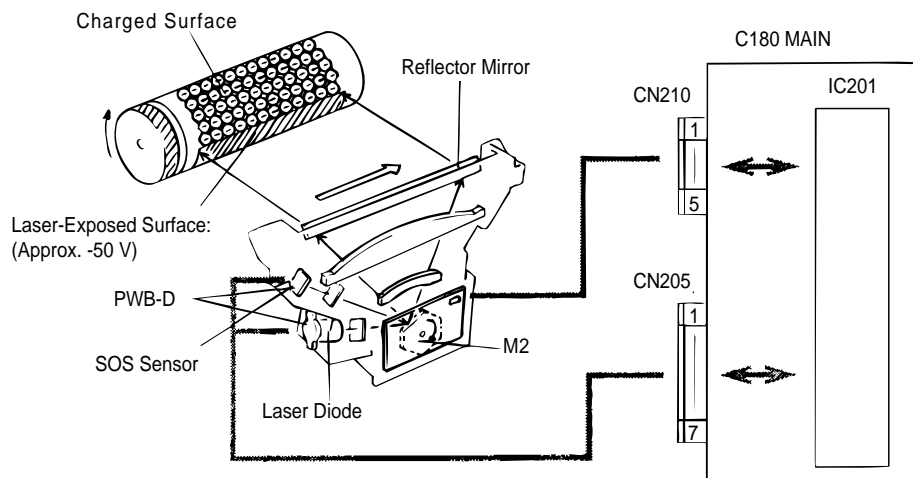


Figure 2-5. Laser Exposure

### 2.1.1.4 Development

Toner is applied to the invisible static image on the PC drum and a toner image is created on the surface. When the PC drum starts to rotate (when the main motor is activated), the PC drum surface remains 0 V at the position between the rotating charge brush and sleeve roller. At this time, a specified positive voltage is applied to the sleeve roller to prevent toner from being attracted back onto the PC drum (reverse bias control).

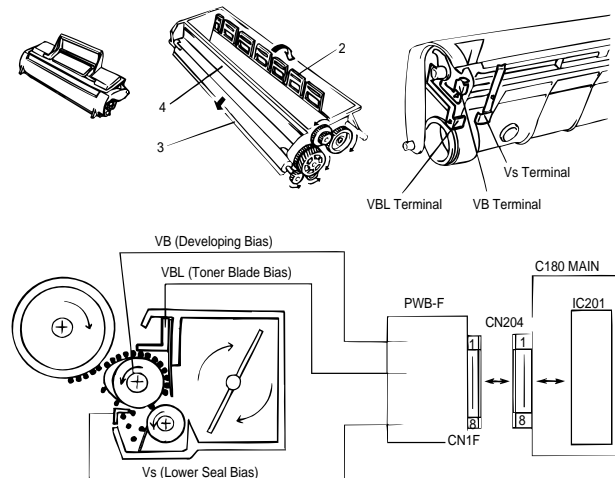


Figure 2-6. Development

1. Toner hopper: Contains toner.
2. Toner agitating screw:Stirs the toner in the hopper and sends the toner to the toner transport roller.
3. Toner transport roller: Transports the toner to the sleeve roller.
4. Doctor blade: Spreads a thin, even coat of toner over the resin sleeve. The toner is negatively charged by passing between this blade and resin sleeve.
5. Sleeve roller: Rotates the resin sleeve.
6. Resin sleeve: Carries the toner to the PC drum surface for development.
7. Bias seal: Collects the toner remaining on the resin sleeve.
8. PC drum: Is exposed to the laser to create an invisible image and rotates to carry the developed image to the paper surface.

### 2.1.1.5 Image Transfer

The electrode comb is an image transfer system that transfers the toner image on the PC drum onto the paper.

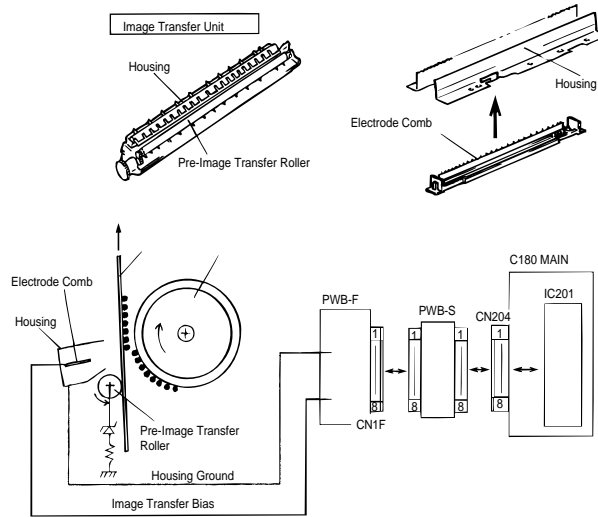


Figure 2-7. Image Transfer

### 2.1.1.6 Fusing

The toner image transferred onto the paper is fixed securely using a heat roller system as the fusing system. The upper fusing roller, which is heated by the heater lamp, fuses the toner image, which is securely fixed by the pressure between the upper and lower fusing rollers. Thermistor TH1 detects and controls the temperature of the upper fusing roller. Thermal fuse TF1 blows when the temperature exceeds 200° C (392° F), shutting down power to the heater lamp.

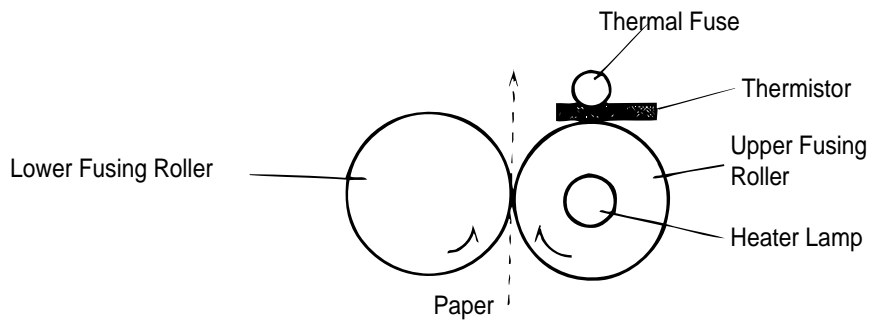
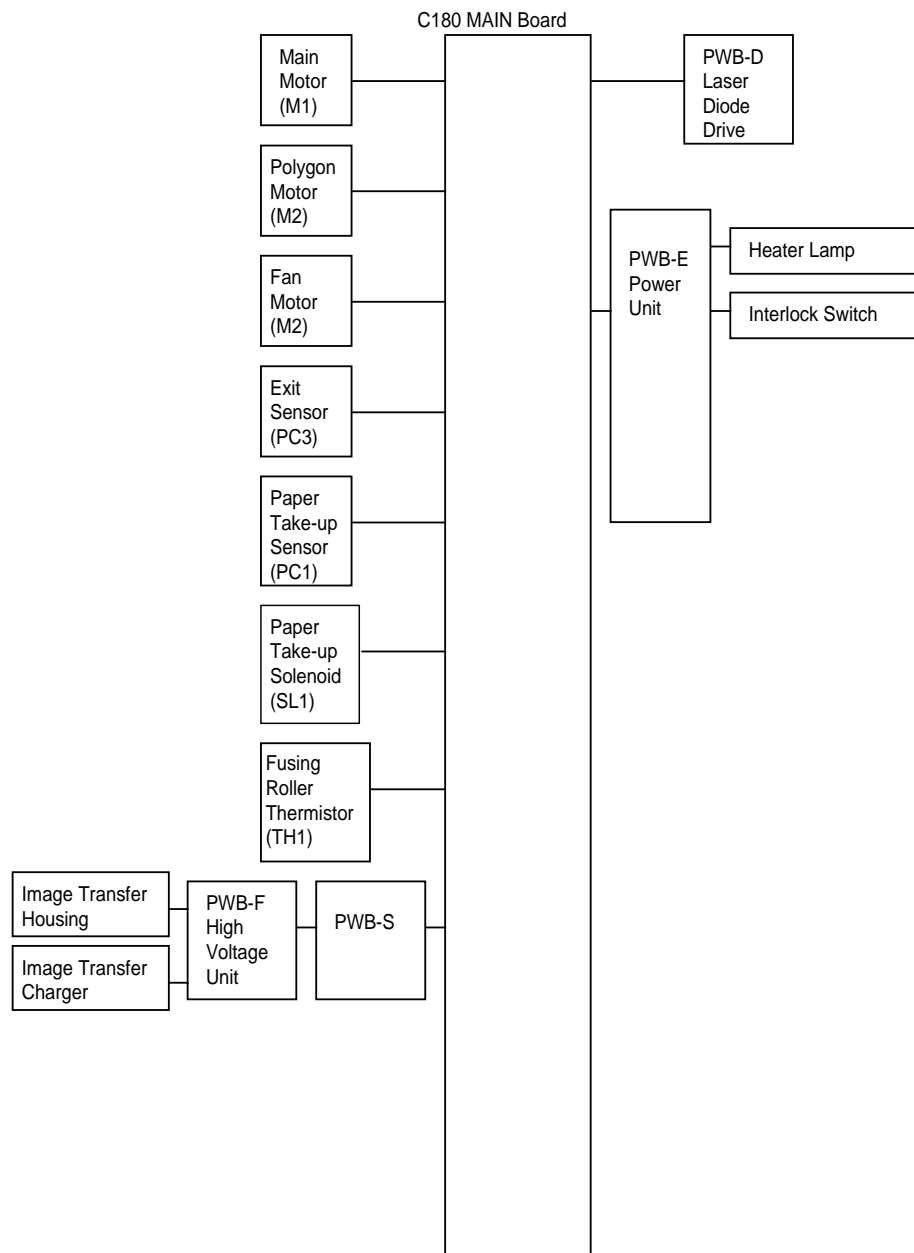


Figure 2-8. Fusing

### 2.1.2 Engine Control

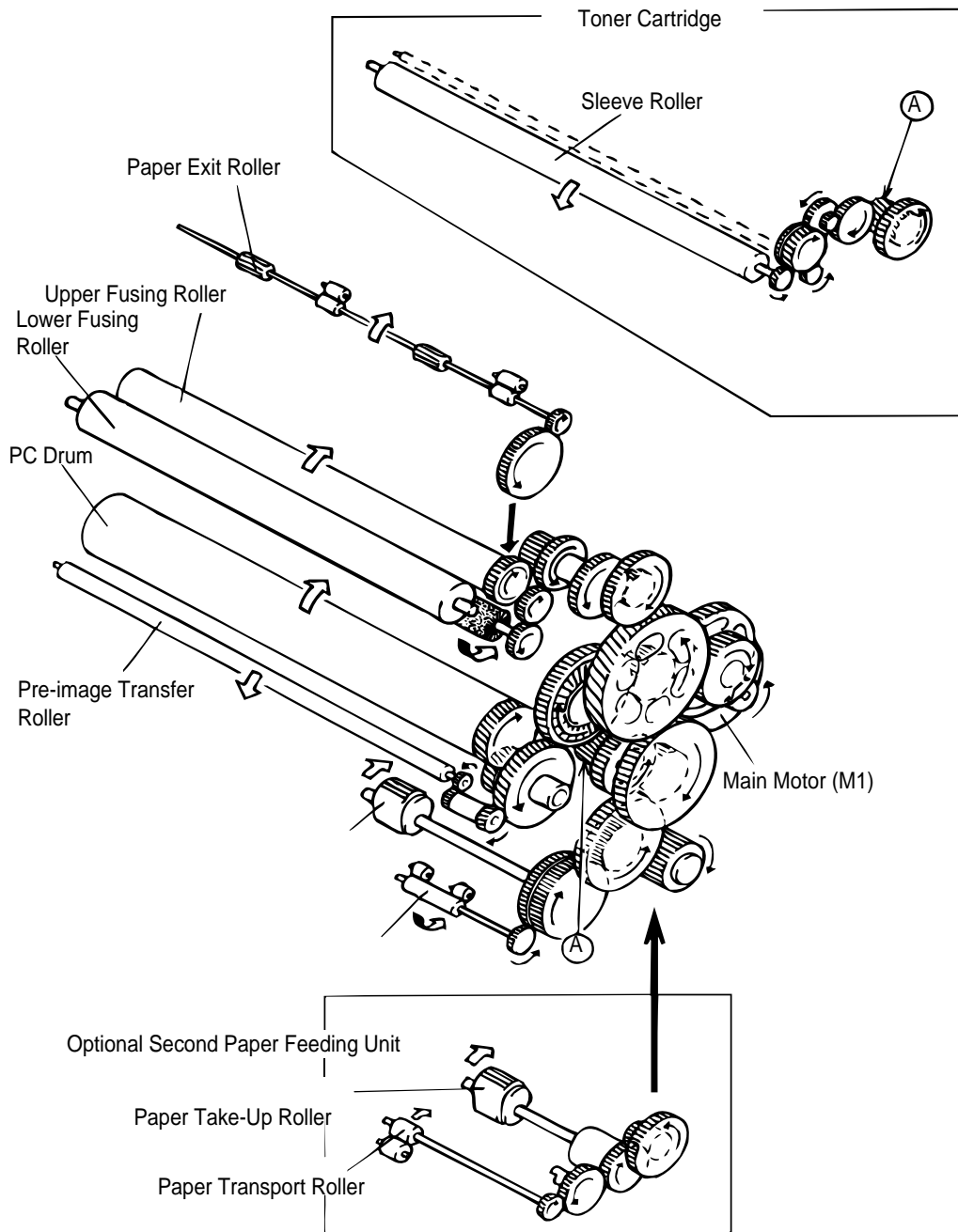
This section describes engine control, the power supply board, and the high-voltage supply board. The engine is controlled by the main board (C180 MAIN board). Figure 2-9 shows the engine controller connection diagram.



**Figure 2-9. Engine Controller Connection Diagram**

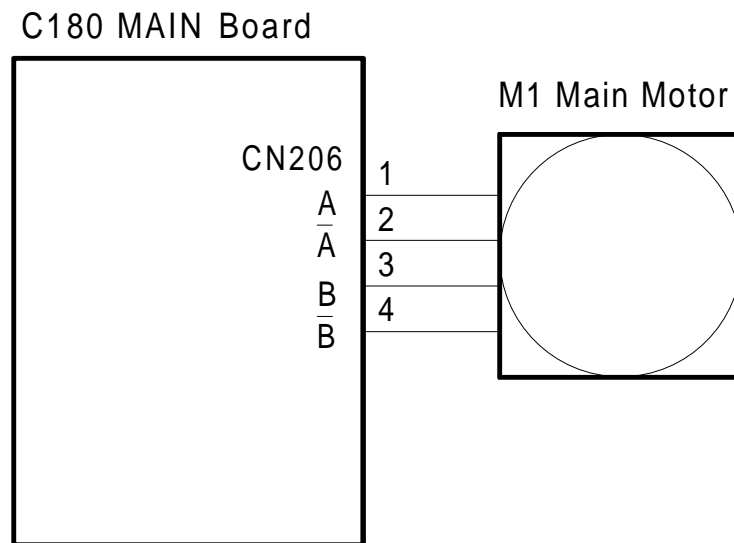
### 2.1.2.1 Main Motor Functions and Control

The M1 main motor transmits the drive to the printer rollers and the optional second paper feed unit (lower cassette) via each gear, as shown below.



**Figure 2-10. Gear and Roller Positions**

Figure 2-11 shows the main motor drive circuit. The M1 main motor is a four-phase stepping motor, controlled by the CPU (IC201) on the main board (C180 MAIN). This board has a stepping motor driver IC that drives the M1 main motor with a constant current.



**Figure 2-11. Main Motor Drive Circuit**

### 2.1.2.2 Paper Take-Up Sensor and Paper Exit Sensor

The paper take-up sensor has three functions:

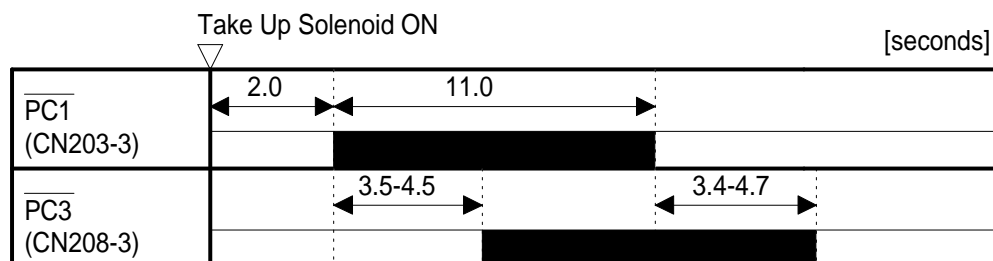
1. To detect the top edge of paper. The engine starts printing when the detection signal is received.
2. To detect paper size. The printer detects the time it takes for paper to pass the paper take-up sensor during paper feeding. If this time is long, longer paper is feeding; if the time is short, shorter paper is feeding.
3. To detect paper jams and feed jams.

If the paper take-up sensor does not turn on for paper feeding, the printer detects a feed jam or no paper. A feed jam is a paper jam that occurs in the feed process.

If any of the following conditions is detected, the printer detects a paper jam. A paper jam is a jam that occurs in the printing process area.

The paper take-up sensor (PC1) or the paper exit sensor (PC3) is on at power on or when the upper case is closed.

The paper take-up sensor (PC1) or the paper exit sensor (PC3) is not turned on or off within the specified time. (Refer to the following timing chart.)



**Figure 2-12. Paper Take-Up Sensor and Paper Exit Sensor On/Off Timing**



### 2.1.2.3 Fuser Control

The heater lamp, powered by AC voltage, heats the fuser. When the power supply board receives a FUSER signal from the main board (C180 MAIN), the power supply board (PWB-E) supplies the AC voltage to the heater lamp. This AC voltage is cut by an interlock switch when the case is open.

Thermistor TH1 detects the surface temperature of the upper fusing roller and inputs that analog voltage to the 77-pin chip, IC201. Based on this temperature data, the heater lamp on/off signal (the FUSER signal) is output from the 54-pin chip, IC201, causing heater lamp H1 to turn on or off to control the fusing temperature. When the heater lamp is not turned off even if the thermistor detects a high temperature malfunction (which occurs if the surface temperature of the upper fusing roller exceeds 200° C), the signal from the 75-pin chip, IC201, changes from H to L to turn off the heater lamp forcibly.

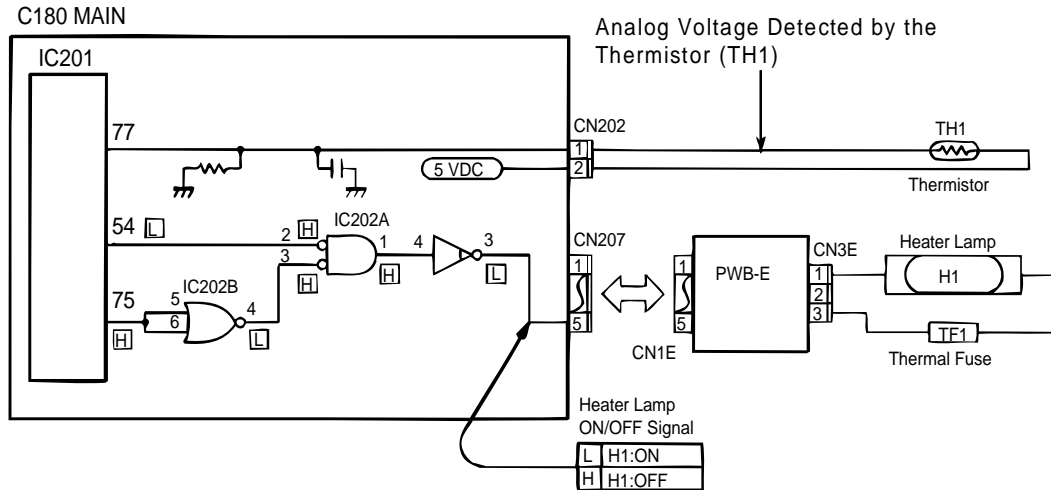


Figure 2-13. Fuser Control Circuit

The following figure shows the fuser temperature control procedure.

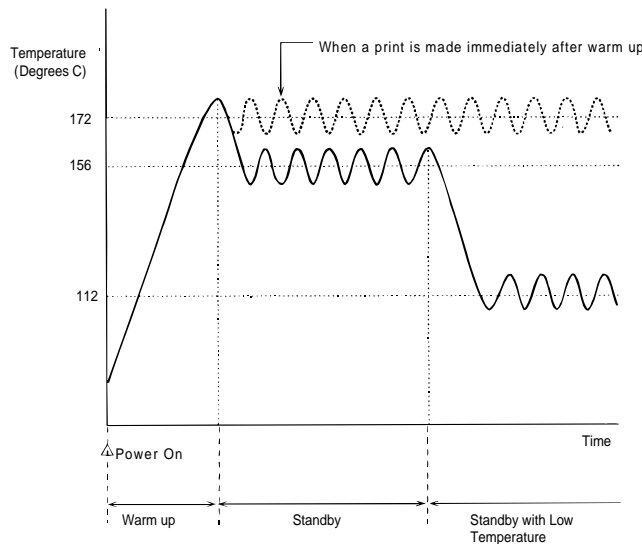


Figure 2-14. Temperature for Fuser Control Procedure

1. Warm up: After printer initialization, printer warm up starts, and the heater lamp turns on until the upper fusing roller's temperature reaches approximately 172° C (342° F).
2. Standby: In standby mode, the upper fusing roller's temperature is controlled to maintain 156° C (313° F). When this condition continues for 3 minutes, the printer goes into standby mode at low temperature.
3. Print cycle: When the printer receives the printing command from the controller, the upper fusing roller is controlled to maintain 172° C (342° F).
4. Standby at low temperature: The upper fusing roller is controlled to maintain 112° C (234° F).

If any of the following conditions are detected, the printer indicates a fuser error:

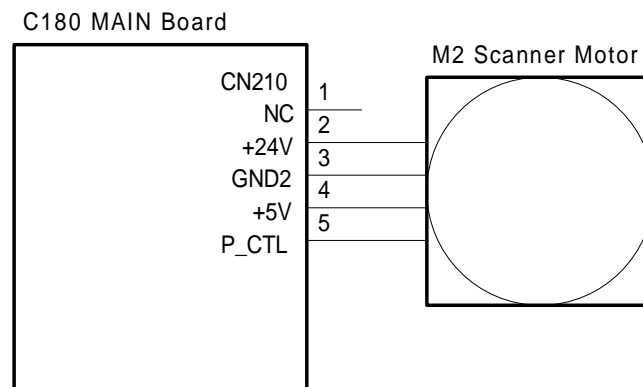
1. If the thermistor detects the temperature has not risen by 20° C for 50 msec. within 12 to 30 sec. after warm up. (This error applies only when the thermistor detects a temperature of 90° C (194° F) or less.)
2. If the thermistor detects that the temperature has not reached 172° C (342° F) within 60 sec. after warm up.
3. Except in pause mode (see the note below), if the thermistor detects that the temperature in the idle state has fallen to 80° C (176° F) or lower for 50 msec., or the temperature during printing has fallen to 133° C (271° F) or lower.
4. The thermistor detects that the temperature has exceeded 193° C (379° F) for 50 msec. during temperature control.

*Note: In Pause Mode, the control temperature is decreased to save power in the idle state, the heater lamp is turned OFF.*

Thermo fuse TF1 cuts power if the temperature of the fusing section rises to an abnormally high level (over 200° C, 392° F).

#### 2.1.2.4 Scanner Motor Control

Figure 2-16 is the scanner motor (M2) control circuit. The scanner motor is driven while it receives the POLYGON CTL signal. Motor rotation speed is 8622 rpm.



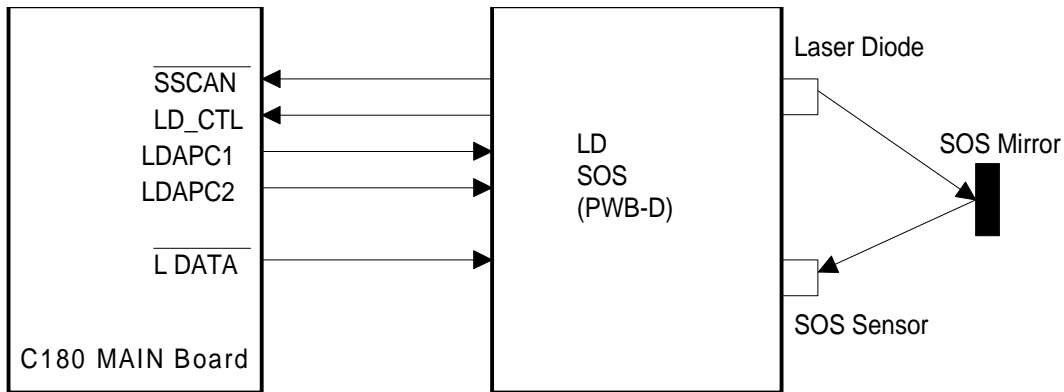
**Figure 2-15. Scanner Motor Control Circuit**

If the any of following conditions are detected, the printer indicates a scanner motor error:

1. The SSCAN signal has not been given once within 1 sec. after the scanner motor is energized.
2. The number of scanner motor rotations has not stabilized within  $\pm 0.5$  rpm by 4.2 sec. after the motor is energized.
3. The number of scanner motor rotations has exceeded  $\pm 3\%$  for more than 0.5 sec. after the motor is energized, even if the rotation number stabilizes within  $\pm 0.5$  rpm.

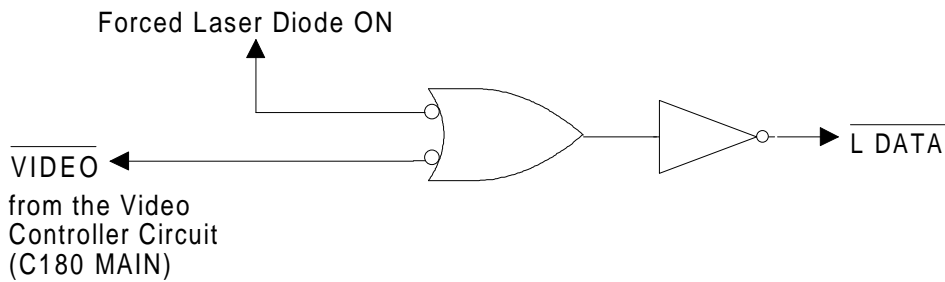
### 2.1.2.5 Laser Diode Drive

Figure 2-16 shows the laser diode drive circuit. Laser diode emission is controlled by three signals ( $\overline{\text{LDATA}}$ , LDAPC1, and LDAPC2) from the main board (C180 MAIN).



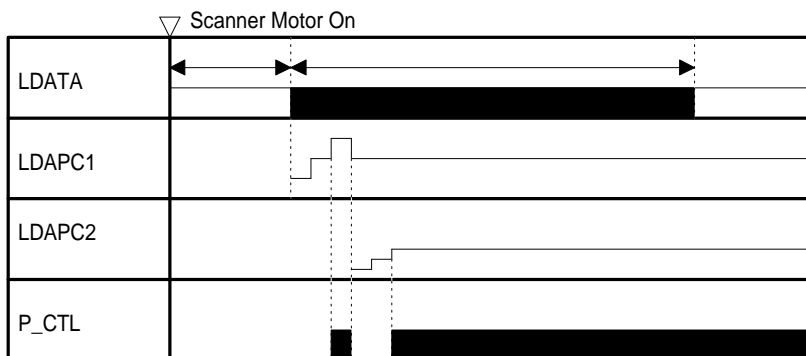
**Figure 2-16. Laser Diode Drive Circuit**

The  $\overline{\text{LDATA}}$  signal is the laser on/off signal. When it is LOW, the laser emits, and when it is HIGH, the laser stops emitting.  $\overline{\text{LDATA}}$  is the combination of the two signals in the figure below. If the VIDEO or the FORCED LASER DIODE ON signal is activated (LOW), the  $\overline{\text{LDATA}}$  signal will be active. The VIDEO signal is an image signal sent from the video controller circuit. The FORCED LASER DIODE ON signal is a laser emission signal to apply the laser beam to the SOS sensor.



**Figure 2-17. LDATA Generation Circuit**

The laser diode is forcibly activated after scanner motor M2 turns on. At this time, laser emission power is adjusted. LDAPC1 and LDAPC2 are the laser emission power adjust signals; they are analog signals. LDAPC1 is a tuning, and LDAPC2 is a fine tuning signal.



**Figure 2-18. Laser Emission Power Adjustment Timing**

If either of the following conditions is detected, the printer indicates a laser error:

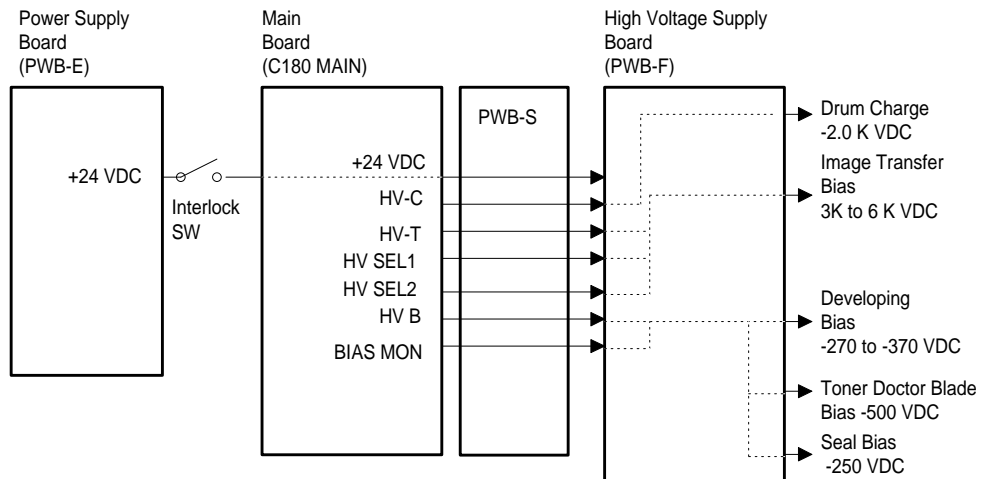
The LDAPC1 signal or LDAPC2 signal has been out of the specified range while laser power is adjusted.

### 2.1.2.6 Bias Voltages and Laser Drive Timing

Figure 2-19 is a diagram of the drum charge bias voltage, image transfer bias voltage, and the developing bias voltage control circuit. These bias voltages are generated from the +24 VDC from the high-voltage supply board (PWB-F). If the printer detects a case-open condition, the interlock switch is set to off, which cuts the +24 VDC, which, in turn, cuts the bias voltages.

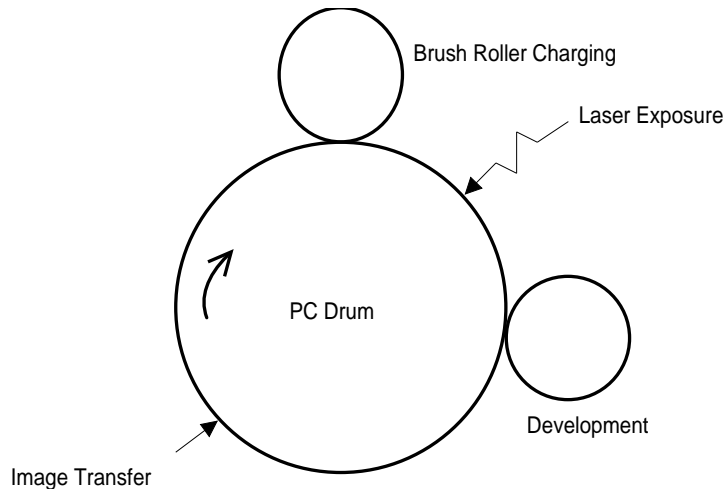
These bias voltages are controlled by the main board (C180 MAIN). The  $\overline{\text{HV-T}}$  signal is the image transfer bias voltage control. While this signal is LOW, the image transfer electrode comb is charged to from +3 to +6K VDC by the high-voltage supply circuit. HV SEL1 and HV SEL2 are image transfer bias level control signals.

The HVB signal is the digital signal for developing bias voltage control. This signal controls the bias on/off. The BIAS MON signal controls the bias voltage level (-300 V to -375K VDC) using pulse data. The image density is controlled by the developing bias voltage level.



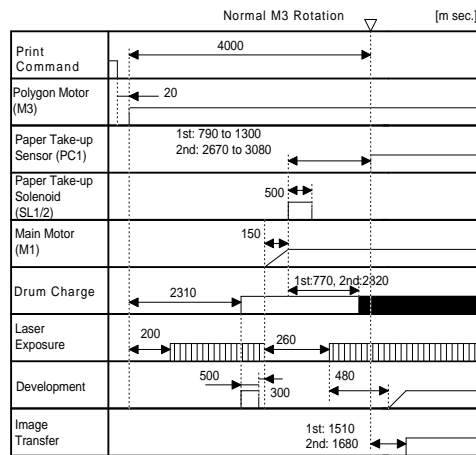
**Figure 2-19. High-Voltage Supply Block Diagram**

Figure 2-20 shows the print process.



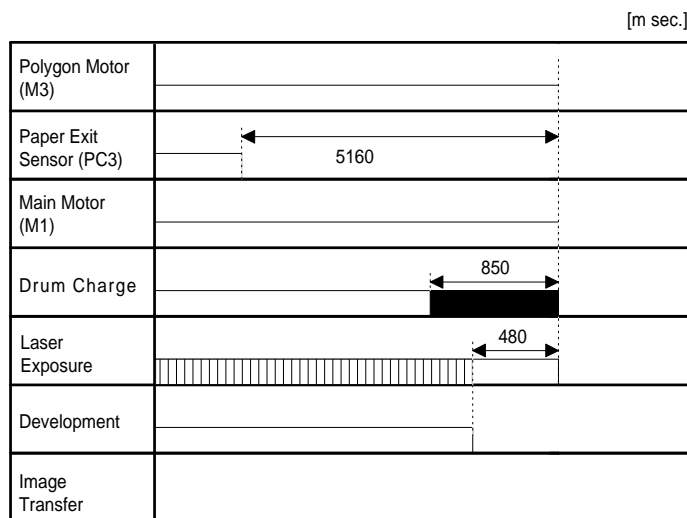
**Figure 2-20. Print Process**

Figure 2-21 shows the start print sequence. The printer's engine starts printing when it receives the PRINT signal from the video controller circuit.



**Figure 2-21. Print Sequence (Start)**

Figure 2-22 is the end of the print sequence.



**Figure 2-22. Print Sequence (End)**

### 2.1.2.7 Fan Motor Control

The fan motor (M3) rotates at engine initialization, and stops after 2 sec. The fan motor also rotates during printing. When printing ends, the fan motor stops after 3 min.

If the following condition is detected, the printer indicates a laser error:

The voltage equivalent to the motor current of the fan motor remains 160 mV or lower for 2 sec.

### 2.1.2.8 Power Supply Circuit Function and Safety Protection

The printer's power supply board (PWB-E) supplies the +5 VDC and +24 VDC. The +24 VDC is used as the bias voltage supply, main motor (M1) drive, scanner motor (M2) drive, fan motor (M3) drive, and solenoid drive. For safety protection, the +24 VDC line is cut when the interlock switch (case open switch) is off.

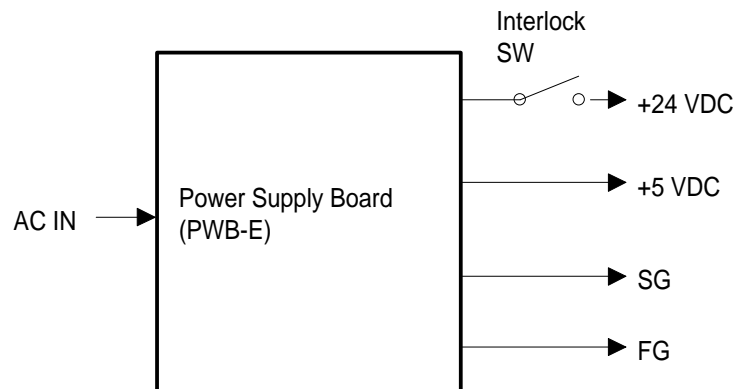
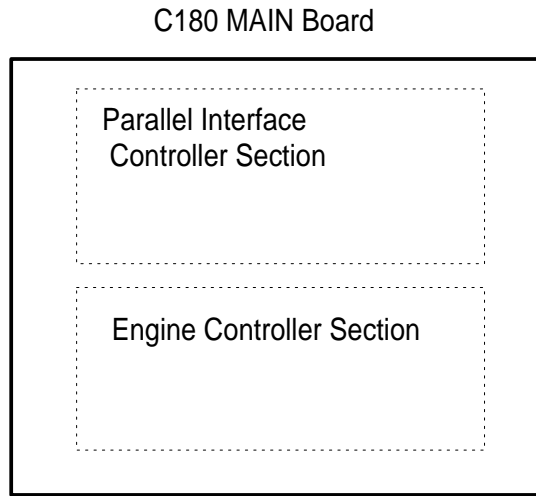


Figure 2-23. Power Supply Circuit Block Diagram

## 2.2 PARALLEL INTERFACE CONTROLLER OPERATION

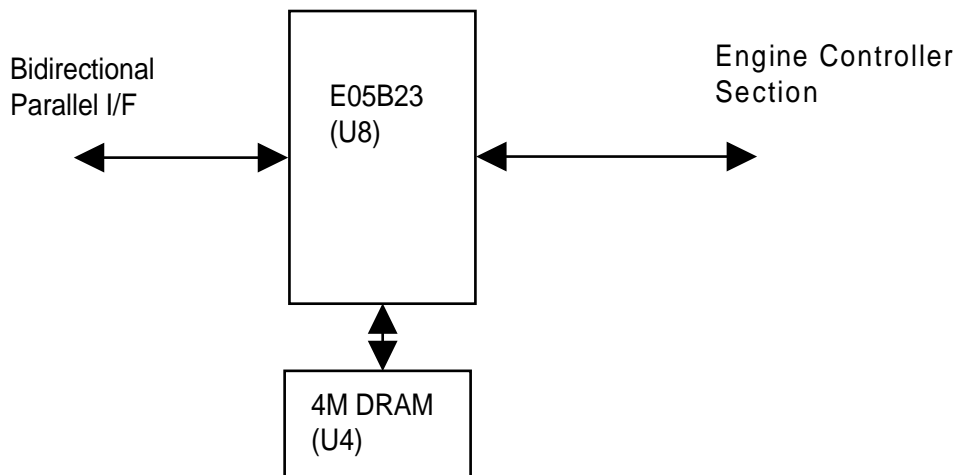
The parallel interface controller section converts from a bidirectional parallel interface to a video interface. The parallel interface controller section is in the C180 MAIN board.



**Figure 2-24. Parallel Interface Controller Section**

### 2.2.1 C180 MAIN Board Operation

Figure 2-25 shows a block diagram of parallel interface controller section of the C180 MAIN board.



**Figure 2-25. C180 MAIN Board Block Diagram**

Table 2-1 lists the functions of the main elements of the video controller section in the C180 MAIN board.

**Table 2-1. Functions of C180 MAIN Board Main Elements**

Element	Location	Function
E05B23 ASIC	U8	This ASIC contains the following functions: Changing from parallel I/F to video I/F. DRAM management (refresh control, RAS/CAS control).
DRAM	U4	These DRAMs are used as the working area of the E05B23.



# Chapter 3 Disassembly and Assembly

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## 3.1 GENERAL INFORMATION

This chapter describes disassembly/assembly procedures to use to replace the main assemblies of the EPL-5500W.

### 3.1.1 Precautions for Disassembly/Assembly

Follow the precautions below when disassembling/assembling the printer.

#### **WARNING**

- Disconnect the power cord before disassembling/assembling the printer.*
- Be sure to handle the fusing unit carefully, because the unit remains hot for a while after the printer stops printing.*
- If it is necessary to plug in the power cord and operate the printer after disassembling it, please be careful of the following:*
  - 1.Keep your hands and clothing well away from operating or rotating parts (such as rollers, fan motors, etc.).*
  - 2.Never touch electric terminals or high-voltage components (such as the charger and the high-voltage unit).*

#### **CAUTION**

- Do not disassemble the photoconductor unit and toner cartridge.*
- If the photoconductor unit is removed from the printer, do not place it in direct sunlight.*
- Do not disassemble the optical unit.*
- Never turn power on if the optical unit is not installed.*
- To prevent damage to ICs from static electricity, do not touch the ICs on the circuit board or the terminals of peripheral electrical components with your hands.*
- Use only the recommended tools to ensure safe and efficient maintenance work. Inappropriate tools may damage the machine.*
- Never open the upper unit until the main motor stops completely. Otherwise, the gears may be damaged.*
- When transporting the printer, remove the photoconductor unit and toner cartridge from the printer.*
- When transporting the printer a long distance, pack up the printer using the original packing material.*

### 3.1.2 Tools

Use the tools listed in Table 3-1 for disassembling/assembling the printer and for troubleshooting.

**Table 3-1. Tools**

Name	Commercially Available?	Part No.
Philips screwdriver no. 2	Yes	B743800200
Regular screwdriver	Yes	B743000100
Tweezers	Yes	B641000100
Soldering iron	Yes	B740200100
Round-nose pliers	Yes	B740400100


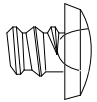

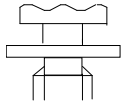
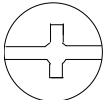
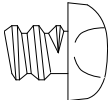

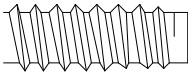
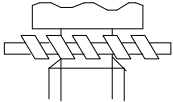
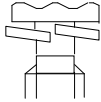
### 3.1.3 Small Parts

In the following sections, abbreviations are used for small parts, such as screws and washers. Tables 3-2 and 3-3 list these abbreviations.

**Table 3-2. Abbreviations Used for Screws**

Abbreviation	Part Name
CP	Cross-recessed Pan head
CC	Cross-recessed Cup head
CP(O)	Cross-recessed Pan head with Outside-toothed lock washer
CP(S)(P1)	Cross-recessed Pan head with Spring lock washer and 1 Plain washer
CCB	Cross-recessed Cup head Bind
SCB	Slotted Cross-recessed B-tight
SCB(S)(P1)	Slotted Cross-recessed Bind with Spring washer and 1 Plain washer

**Table 3-3. Screw Types and Abbreviations**

Head		Body	Washer (Assembled)
Top	Side		
1. <u>C</u> ross-recessed head 	1. <u>B</u> ind 	1. Normal 	1. <u>P</u> lain washer 1 
2. <u>S</u> lotted <u>C</u> ross-recessed head 	2. <u>P</u> an   3. <u>C</u> up 	2. <u>B</u> -tight 	2. <u>O</u> utside-toothed lock washer   3. <u>S</u> pring washer 

### 3.1.4 Service Checks after Repair

Check the repaired unit using the following list on completion of servicing.

**Table 3-4. Checks after Repair**

Item	Location	Checkpoint	Check
Operation	Control panel	Do all LEDs and buttons function normally?	
	Heater lamp	Does the heater lamp turn on normally?	
	Test Page	Is the test page printed normally?	
	Data print	Does data print in all modes?	
Adjustments	Print position	Is the gap between the top edge of the paper and the horizontal line in the adjustment printing sheet print exactly 4.2 mm (0.17 inch).	
Cleaning		Is toner and dust removed from the paper path? Is the paper take-up roller cleaned? Is the roller in the fusing unit cleaned? Is the outer surface of the printer clean?	
Packing		Are the consumables removed from the printer? Is the unit packed securely? Are accessories packed also?	

## 3.2 DISASSEMBLY AND ASSEMBLY

This section describes and illustrates procedures for removing and disassembling components of the EPL-5500W. Cleaning is described in Chapter 6. The assembly procedures are not described, except for special notes where necessary, because assembly can be accomplished by performing disassembly in reverse.

### 3.2.1 Housing Removal

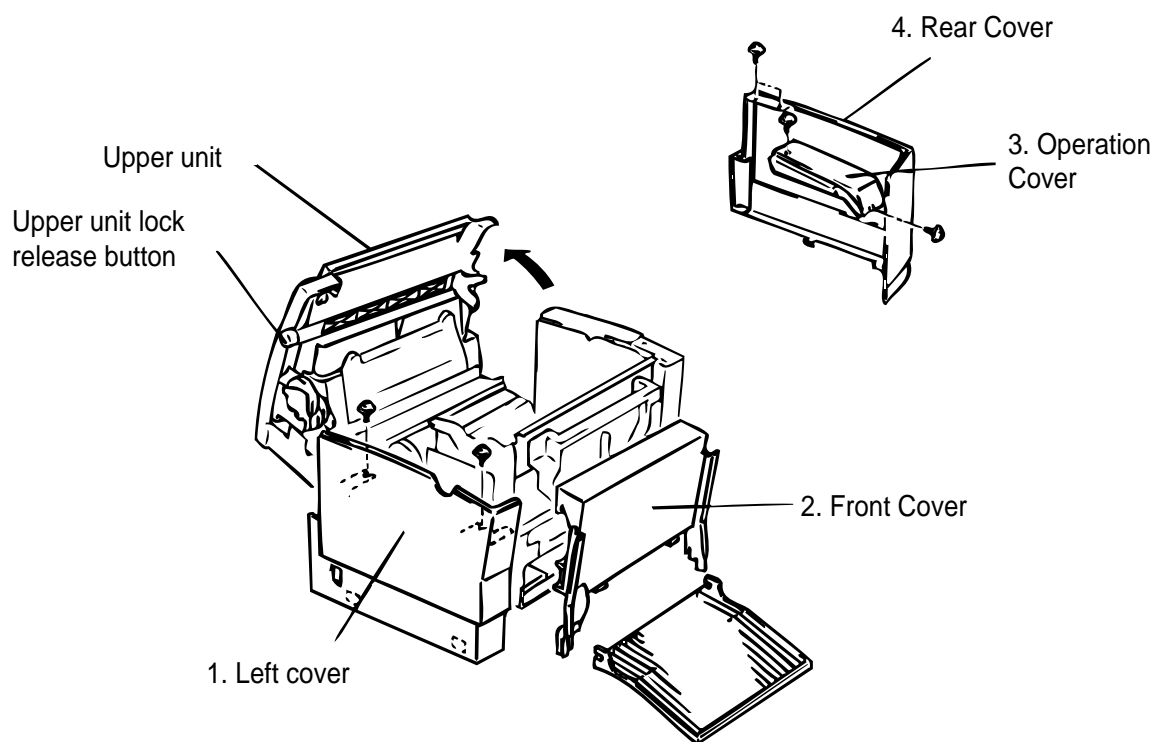
This section describes how to remove the cases and the rear frame.

#### 3.2.1.1 Case Removal

1. Push the upper unit lock release button, and open the upper unit.
2. Remove each cover in the following order.

### ASSEMBLY POINT

*When reinstalling each cover, securely insert the protrusions for the cover into the cutouts in the printer frame.*



**Figure 3-1. Removing the Housing**

## 3.2.2 Removal of the Controller Section

The control section is comprised of the controller board (the C180 MAIN board).

### 3.2.1.1 Main Board (C180 MAIN Board) Removal

1. Turn the printer so that its right side faces you.
2. Remove the right cover.
3. Remove 2 screws, and then remove the shield case.

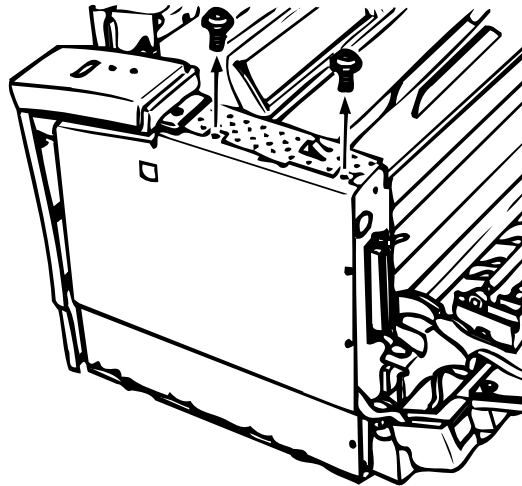


Figure 3-2. Removing the Shield Case

4. Disconnect all connectors on the C180 MAIN board.
5. Remove the 5 screws for the C180 MAIN board.
6. Remove the C180 MAIN board.

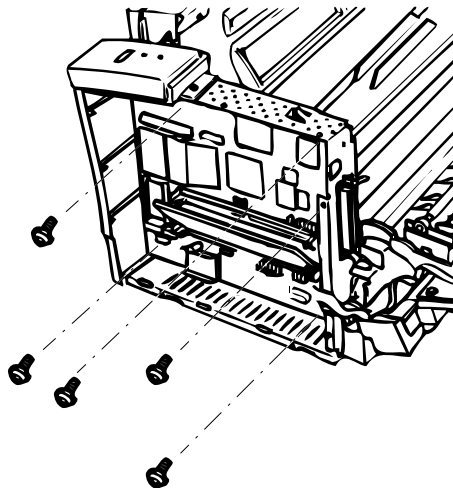


Figure 3-3. Removing the C180 MAIN Board

### 3.2.3 Disassembling the Engine

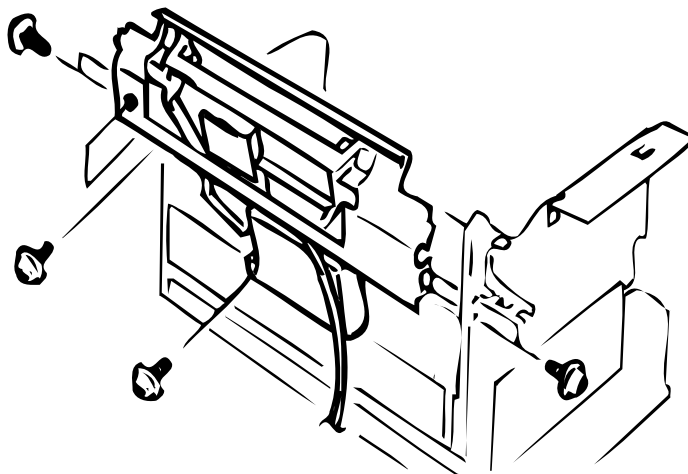
This section describes disassembling the engine, including the high-voltage unit (PWB-F) and power supply board (PWB-E).

#### 3.2.3.1 Optical Unit Removal

#### **CAUTION**

- Do not touch the optical unit, except during replacement.*
- Do not open the unit under any conditions.*
- Do not remove the circuit board from the optical unit under any conditions.*

1. Open the top cover.
2. Remove the right cover, left cover, and front cover. (Refer to Section 3.2.1.1.)
3. Remove the cover shield plate.
4. Disconnect connectors CN205 and CN210 from the C180 MAIN board.
4. Remove the 6 screws from the optical unit.
5. Remove the optical unit.

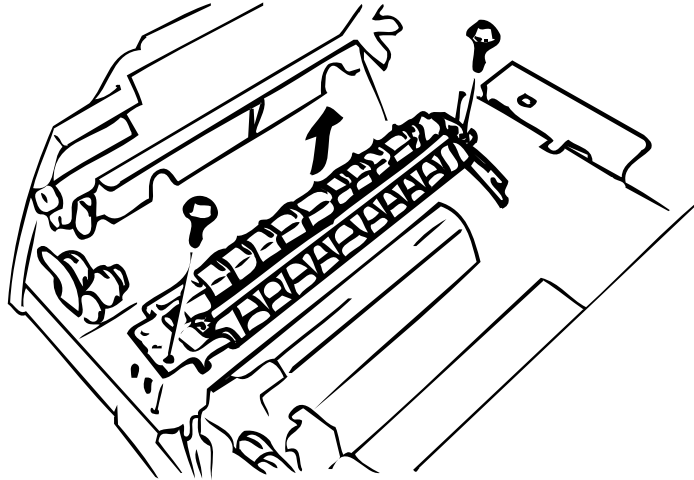


**Figure 3-4. Removing the Optical Unit**



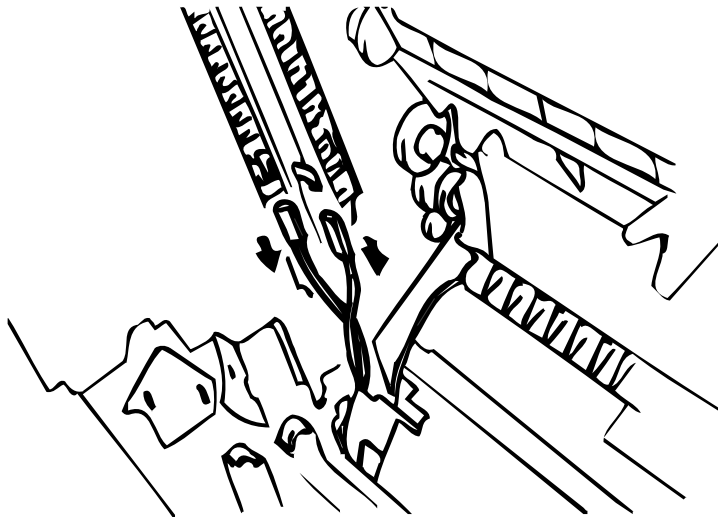
### 3.2.3.2 Image Transfer Unit Removal

1. Open the top cover.
2. Remove harness cover A. (Refer to Section 3.2.3.3.)
3. Remove the 2 screws and holders at both ends of the image transfer unit.



**Figure 3-5. Removing the Image Transfer Unit - 1**

4. Disconnect the 2 connectors and remove the unit.



**Figure 3-6. Removing the Image Transfer Unit - 2**

**ASSEMBLY POINT**

After reinstalling the image transfer unit, check that the unit smoothly moves up and down.

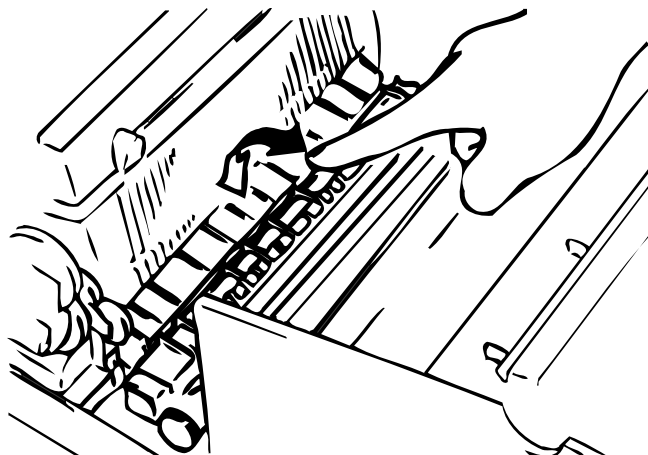


Figure 3-7. Moving the Image Transfer Unit

- 5. Remove the electrode comb.

**ASSEMBLY POINT**

When reinstalling the electrode comb, be careful of the direction of installation. Install the electrode comb so that the comb terminal faces the image transfer roller drive gear.

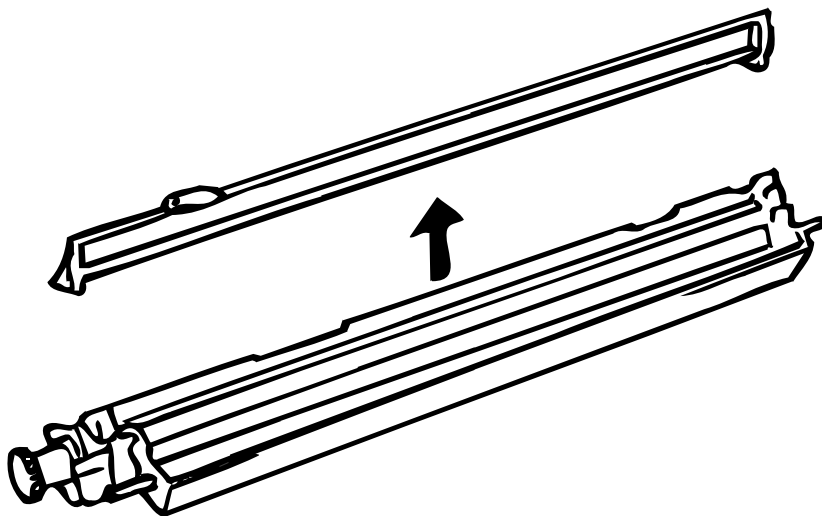
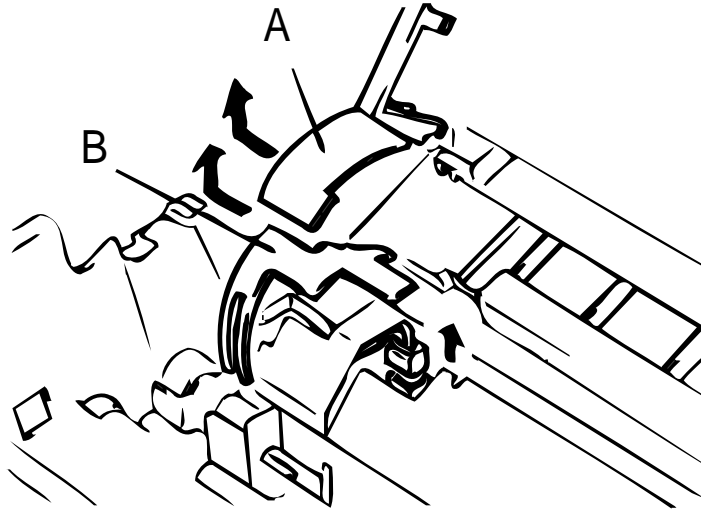


Figure 3-8. Reinstalling the Electrode Comb

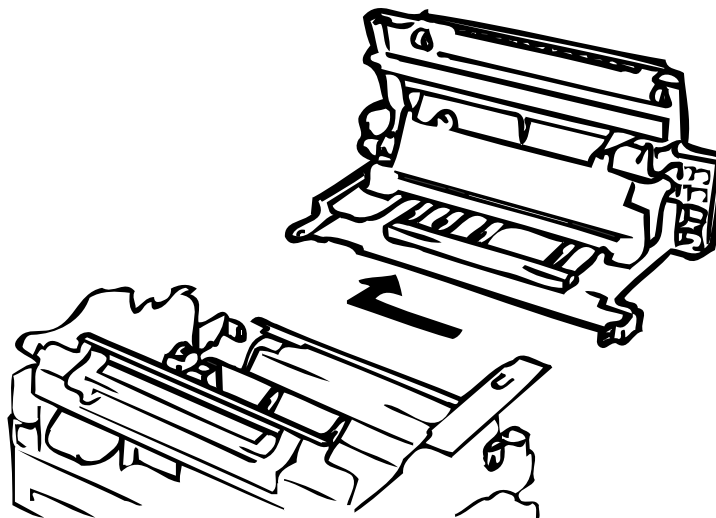
### 3.2.3.3 Upper Unit Removal

1. Open the upper unit.
2. Remove the right cover and left cover. (Refer to Section 3.2.1.1.)
3. Disconnect connectors CN202, CN208, and CN211 from the C180 MAIN.
4. Remove harness covers A and B, and pull CN1 out from the PWB-E board.
5. Remove the image transfer unit. (Refer to Section 3.2.3.2.)



**Figure 3-9. Removing the Harness Cover**

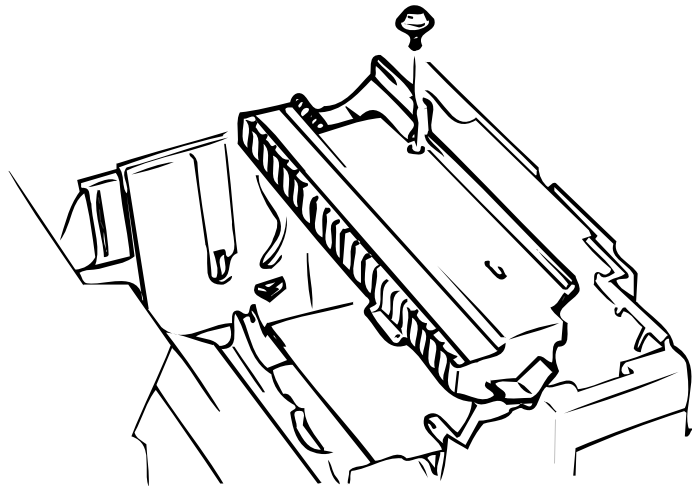
6. Slide and remove the unit as shown in the illustration.



**Figure 3-10. Removing the Upper Unit**

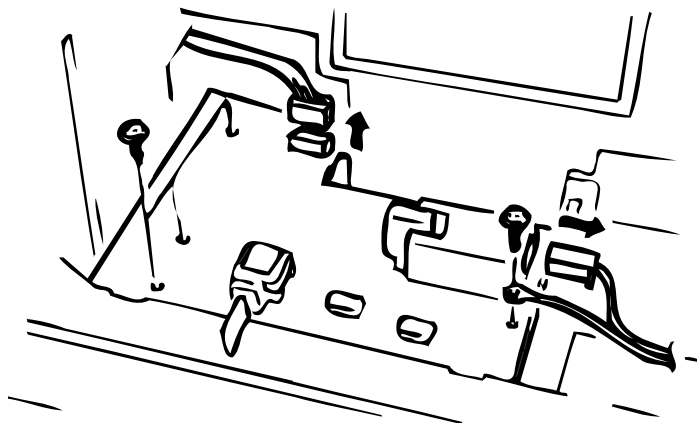
### 3.2.3.4 High-Voltage Supply Board (PWB-F) Removal

1. Open the top cover.
2. Remove 1 screw from the PWB-F cover.
3. Remove the PWB-F cover.



**Figure 3-11. Removing the PWB-F Cover**

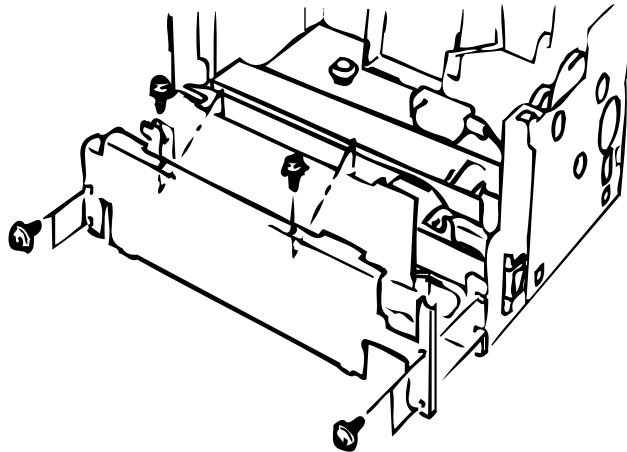
4. Remove the 4 screws from the PWB-F board.
5. Disconnect 2 connectors.
6. Remove the PWB-F board.



**Figure 3-12. Removing the PWB-F**

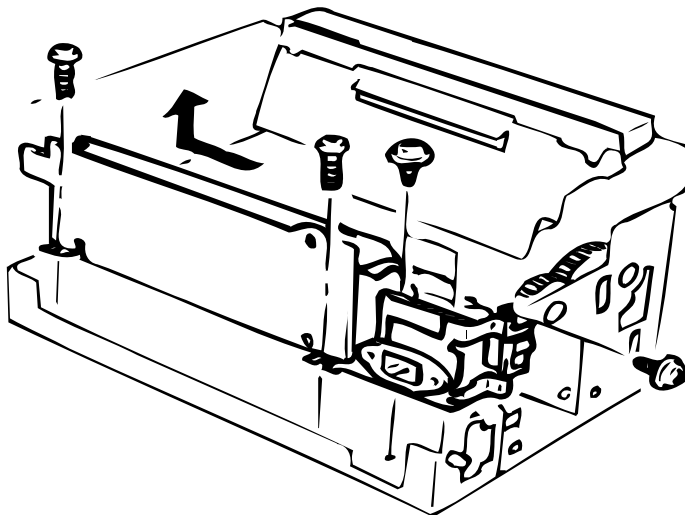
### 3.2.3.5 Power Supply Unit (PWB-E) Removal

1. Remove the upper unit. (Refer to Section 3.2.3.3.)
2. Remove 6 screws, and remove the PWB-E cover.



**Figure 3-13. Removing the PWB-E Cover**

3. Disconnect connector CN207 from the C180 MAIN board.
4. Remove 4 screws and 2 screws, and then remove the PWB-E.



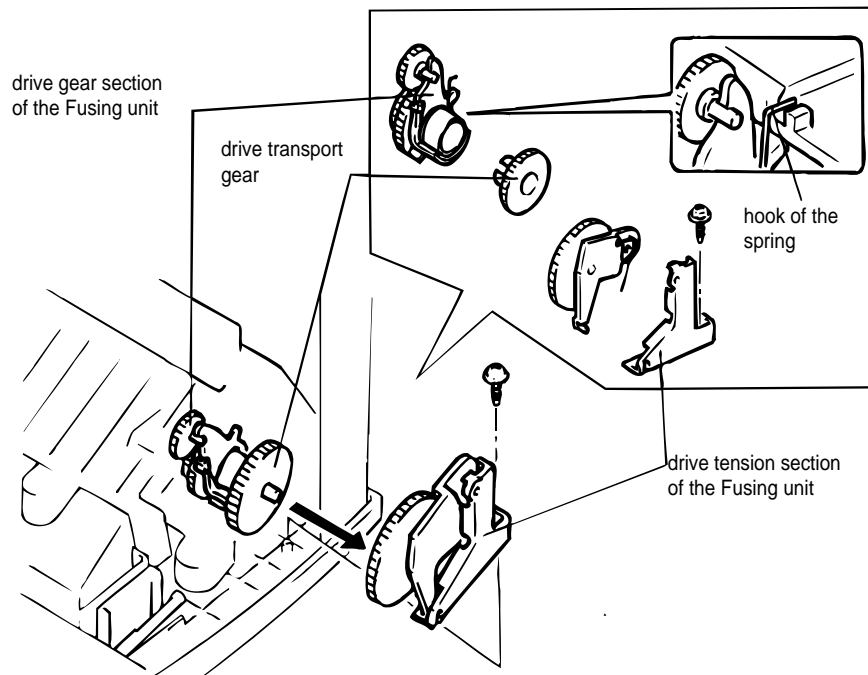
**Figure 3-14. Removing the PWB-E**

### 3.2.3.6 Fusing Unit Removal

1. Open the top cover. (Refer to Section 3.2.3.3.)
2. Remove the image transfer unit. (Refer to Section 3.2.3.2.)
3. Remove 1 screw, and remove the drive tension section of the fusing unit.
4. Remove the transport gear.
5. Release the hook for the spring and remove the drive gear section of the fusing unit.

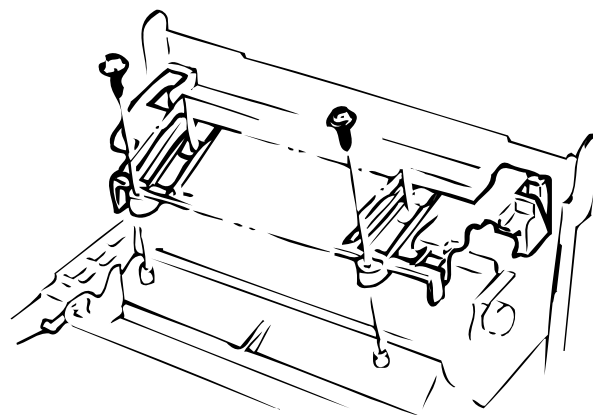
#### **ASSEMBLY POINT**

*When rehooking the spring, be sure to hook it in the correct position.*



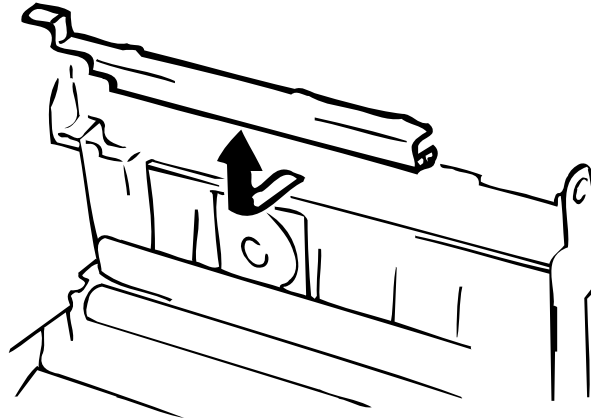
**Figure 3-15. Gear and Spring Position**

6. Remove 2 screws, and remove the fusing guide plate.



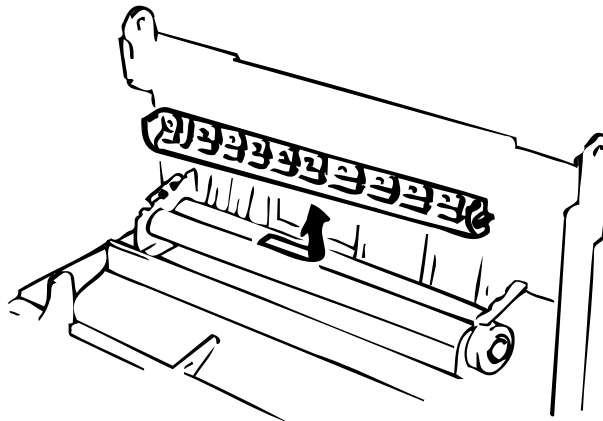
**Figure 3-16. Removing the Fusing Guide Plate**

7. Remove the harness cover.



**Figure 3-17. Removing the Harness Cover**

8. Remove the fusing entrance guide.



**Figure 3-18. Removing the Fusing Entrance Guide**

10. Remove 4 screws, and remove the fusing unit.

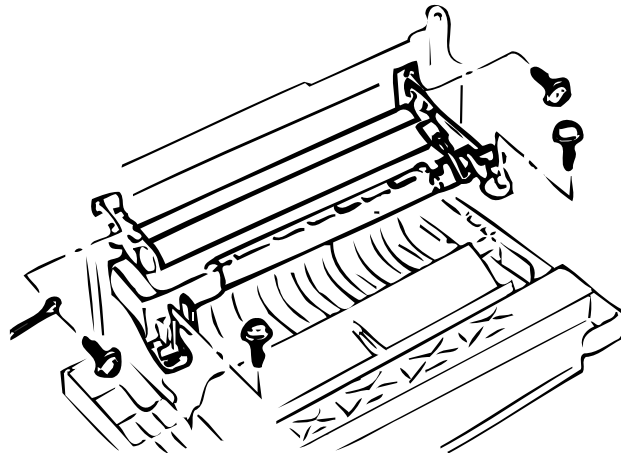


Figure 3-19. Removing the Fusing Unit

**ASSEMBLY POINT**

*After reinstalling the fusing unit, check the direction of the bushings on the paper exit roller and the connection between the roller and the ground plate.*

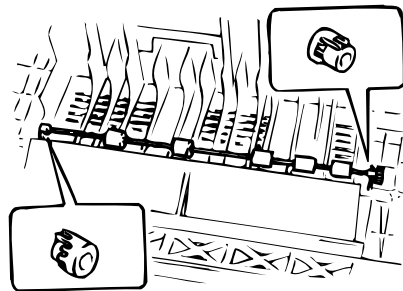


Figure 3-20. Roller Position



### 3.2.3.7 Fusing Unit Disassembly

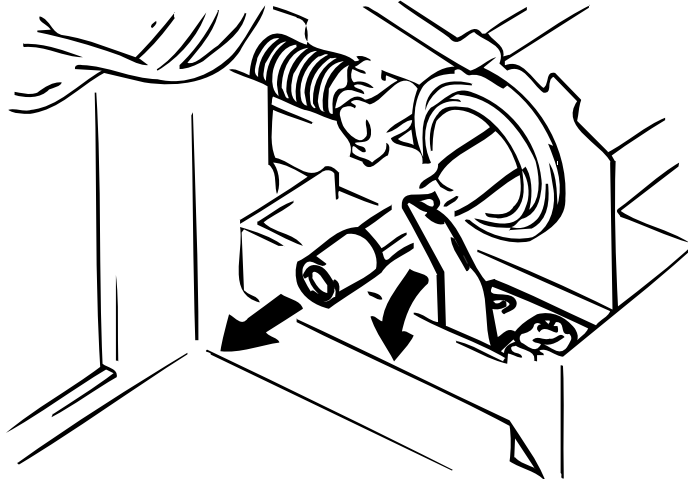
This section describes how to remove the paper exit sensor, heater lamp, lower fusing roller, and upper fusing roller.

#### *Heater Lamp*

#### **CAUTION**

*Do not touch the glass surface of the lamp with your bare hands.*

1. Remove the fusing guide plate. (Refer to Section 3.2.3.8.)
2. Pull the heater lamp out of the lamp holder from the front side.



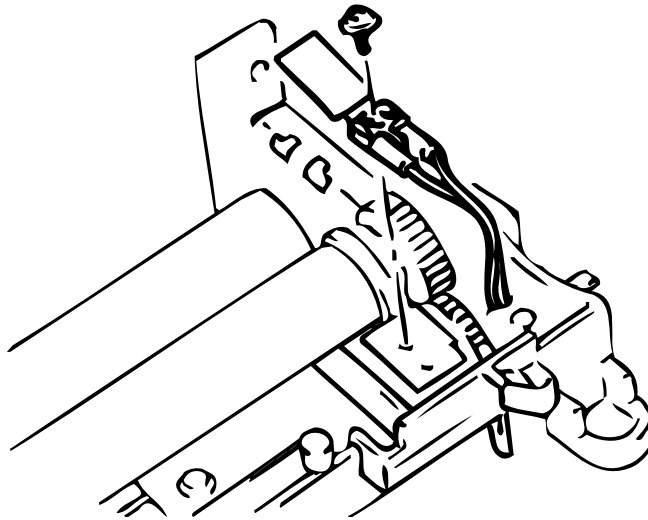
**Figure 3-21. Removing the Heater Lamp**

#### **ASSEMBLY POINT**

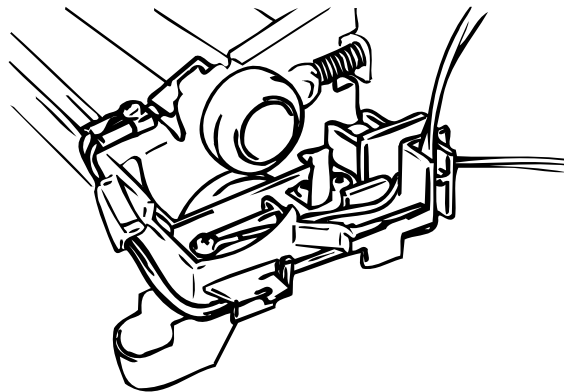
*When reinstalling the lamp, position its voltage indicator to the left side (non-gear end.).*

**Thermistor**

1. Remove the fusing unit. (Refer to Section 3.2.3.6.)
2. Remove the 1 screw, and remove the thermistor.

**Figure 3-22. Removing the Thermistor****ASSEMBLY POINT**

*When reinstalling the thermistor, wire the harness as shown below.*

**Figure 3-23. Wiring**

### Paper Separator

1. Remove the fusing unit. (Refer to Section 3.2.3.6.)
2. Release the lock of the holder, and remove the 3 paper separators.

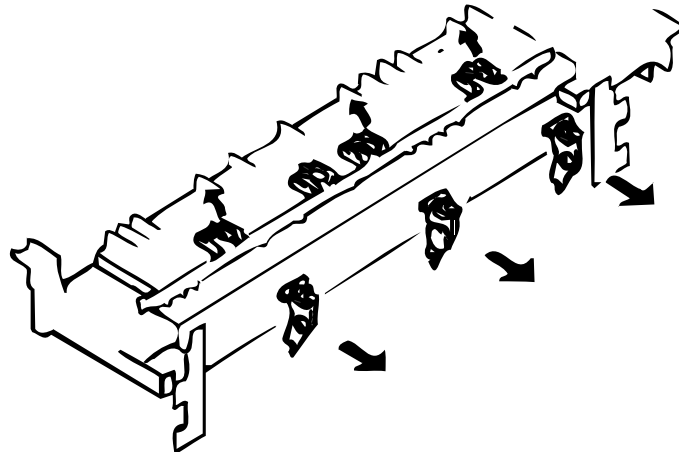


Figure 3-24. Removing the Paper Separators

### ASSEMBLY POINT

*When reinstalling the paper separators, be careful of their positions, because the middle one differs from the others.*

### Paper Exit Sensor

1. Remove the fusing unit. (Refer to Section 3.2.3.6.)
2. Remove the paper exit sensor.

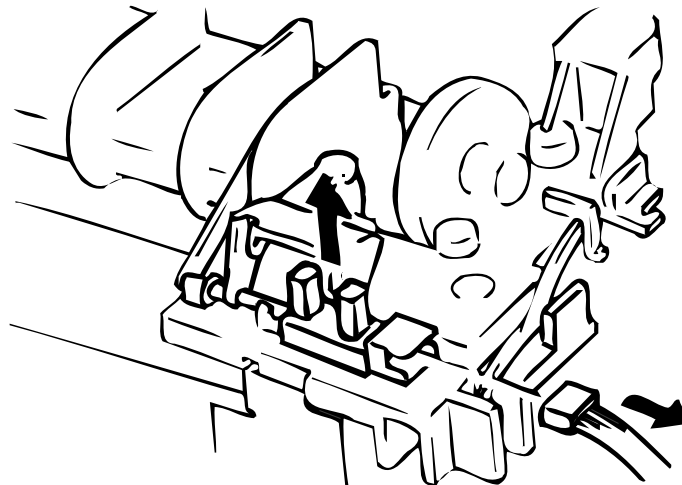
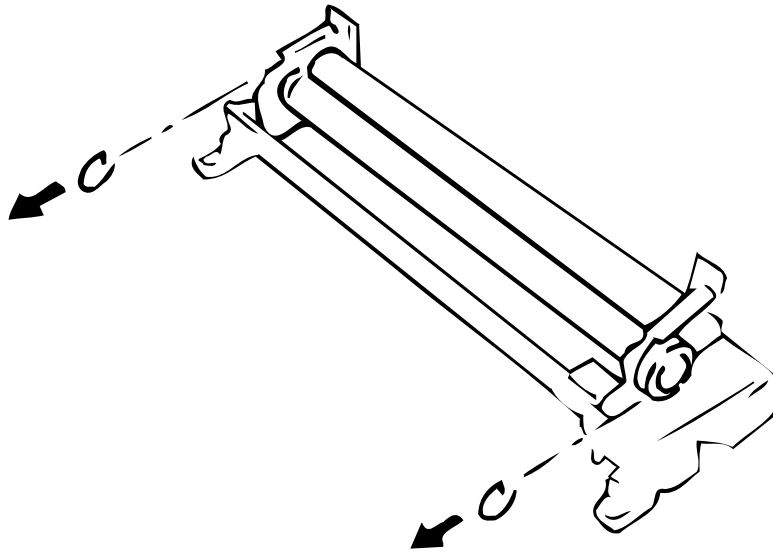


Figure 3-25. Paper Exit Sensor

**Fusing Roller**

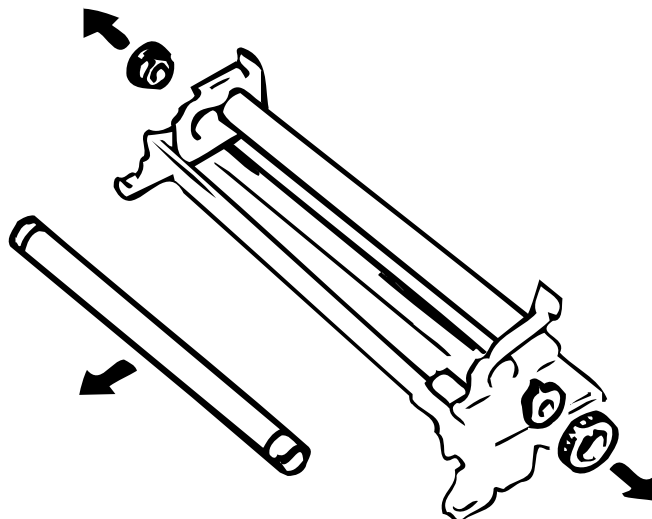
1. Remove the fusing unit. (Refer to Section 3.2.3.6.)
2. Remove the 2 G-rings from the fusing unit.

**Figure 3-26. Removing the G-Rings****CAUTION**

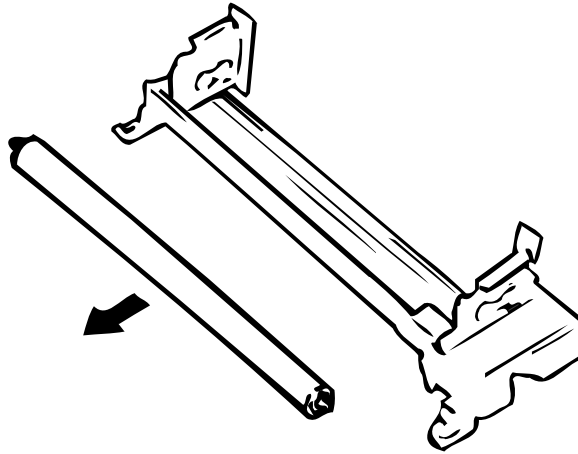
*When reinstalling the G-rings:*

- Be careful of the direction.*
- Securely position them into the grooves of the fusing roller.*

3. Remove the upper fusing roller drive gear.
4. Remove the upper fusing roller.

**Figure 3-27. Removing the Upper Fusing Roller**

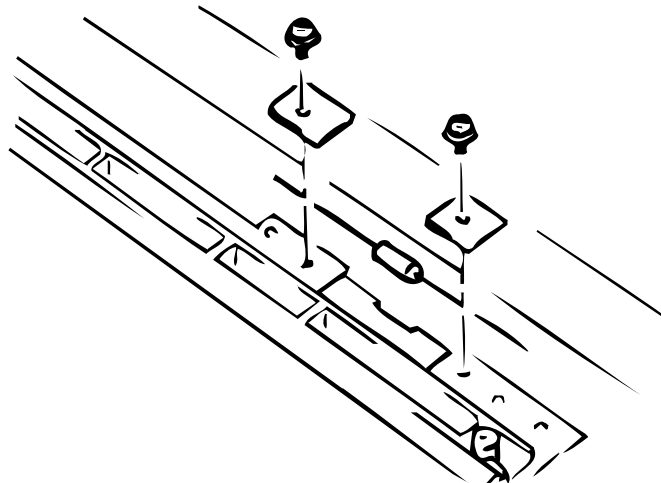
5. Take out the lower fusing roller.



**Figure 3-28. Removing the Lower Fusing Roller**

*Thermal Fuse*

1. Remove the fusing unit. (Refer to Section 3.2.3.6.)
2. Remove 2 screws, and remove the thermal fuse.



**Figure 3-29. Removing the Thermal Fuse**

# Chapter 4 Adjustment

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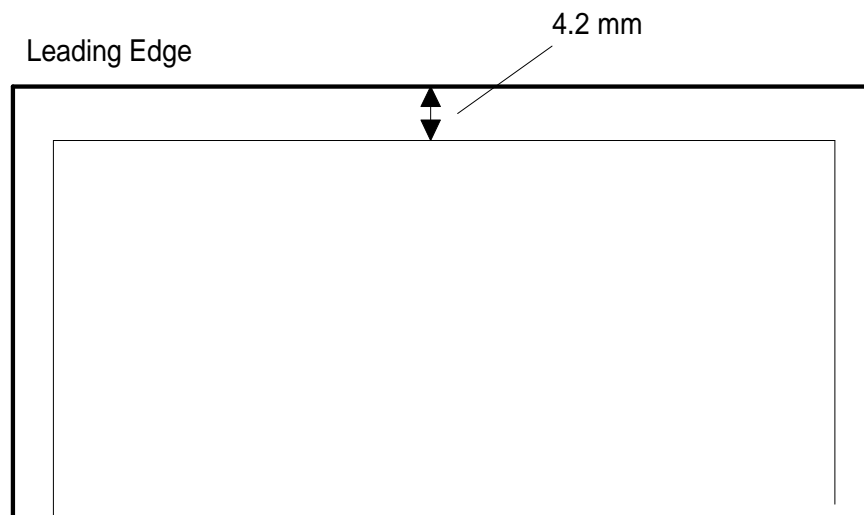
## 4.1 ADJUSTMENTS

This section describes the adjustment procedures for the EPL-5500W. You must perform these adjustments after servicing the printer, especially when any component or part is replaced.

### 4.1.1 Print Position Adjustment

You can adjust the vertical print position on a sheet of paper by turning the image synchronizing volume control on the main board (C180 MAIN). After replacing a main board, be sure to adjust the print position using the procedure below.

1. Connect the EPL-5500W to LPT1 port of PC. And set the A4 size paper.
2. Install the EPL-5500W printer driver.
3. Set paper size to A4 setting by **PCL Emulation Front Panel** window.
4. Copy the adjustment printing data file **lj4a4.bin** to **c:\** drive.
5. Open the **DOS Prompt** window.
7. Type the **copy /b lj4a4.bin lpt1:** , and then **Enter**. Printer print adjustment printing sheet.
8. Check that the registration gap between the leading edge of the sheet and the horizontal line printed on the page is within the following range:  
 $4.2 \pm 2.5$  mm ( $0.17 \pm 0.1$  inches) for a adjustment printing sheet on A4 paper:  
 If the gap is not correct, adjust the print position as described in the next few steps.



**Figure 4-1. Print Position Adjustment**

9. Turn printer power off.
10. Open the right cover and shield plate. (See Chapter 3.)
11. Adjust the image synchronizing adjustment volume (VR1) on the main board (C180 MAIN) so that the gap for the print position of the horizontal line (down from the top edge of the sheet) becomes 4.2 mm (0.17 inches) .  
 Turn VR1 clockwise to increase the gap for the print position of the horizontal line.  
 Turn VR1 counterclockwise to decrease the gap.
12. Turn on the printer.
13. Print a adjustment printing sheet again (Step 7) to check the print position.
14. Repeat steps 8 to 13 until the print position is 4.2 mm (0.17 inches).
15. Reattach the shield plate and right case.



# Chapter 5 Troubleshooting

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## 5.1 OVERVIEW

The EPL-5500W has a sophisticated, built-in, self-diagnostic function that reduces troubleshooting time by identifying failed parts or components. This self-diagnostic test identifies the troubleshooting problems for page printers, in which even a trivial failure can result in a serious print quality problem.

## 5.2 SELF-DIAGNOSTIC FUNCTION AND TOOL

This section describes the self-diagnostic function, in which the controller automatically checks the operating conditions of each component. If any abnormality is detected, the printer driver displays a message in the status window.

If an engine error is detected, the printer driver displays a “SERVICE CALL” message. This error message does not display error information details. To isolate the problem more, you must read the engine error status register of the printer using a special tool. This tool is program for Windows 3.1.

The procedure for using the program is as follows:

1. Connect the EPL-5500W to the PC's LPT1 port, and power the printer on.
2. Start Windows 3.1.
3. If you are using the EPL-5500W printer driver, you must change it so that it does not direct output to a printer. (If you are not using the EPL-5500W printer driver, skip to step 9.)

### CAUTION

*The tool program cannot run if EPL-5500W printer driver output is directed a printer port in Windows 3.1, because the EPL-5500W printer driver and special tool both use an interface protocol program. The interface protocol program for the special tool cannot be active in Windows 3.1 while the interface protocol for the EPL-5500W printer driver is active.*

4. Open the **Main** window in Windows 3.1.
5. Open the **Printers** window.
6. Select **EPL-5500W**.
7. Click the **Connect** button to change the **Ports:** selection in the **Connect** menu from **LPT1:** or **LPT2:** to **FILE:**.
8. Select another printer under the **Installed Printers:** list, and then click the **Set As Default Printer** button.
9. Run the SLEEKDBG.EXE file for the special tool from the Program Manager. Windows 3.1 opens the **Cimarsosa Debug Tool** window.
10. Set the **Port** to **LPT1** in the **Cimarsosa Debug Tool** window.
11. Click the **Read / Write Register** button in the **Cimarsosa Debug Tool** window. The **Select Protocol Cimarsosa** window is opened.
12. Set the protocol to **Peppy**.
13. Type **000D** in the **Address** box and **04** in the **Data write** box. Then click the **Write** button.
14. Type **000E** in the **Address** box. And then click the **Read** button. The **Data read** box displays the error code.

The error codes are shown in Table 5-1 on the next page.

**Table 5-1. Error Codes**

Error Code	Error Condition
0x02	Fan motor error
0x10	Scanner mirror motor error
0x13	Scanner mirror motor and fan motor error
0x20	Laser light error
0x23	Laser light and fan motor error
0x31	Laser light and scanner mirror motor error
0x40	Fusing unit error
0x43	Fusing unit and fan motor error
0x51	Fusing unit and scanner mirror motor error
0x52	Fusing unit, scanner mirror motor, and fan motor error
0x61	Fusing unit and laser light error
0x62	Fusing unit, laser light, and fan motor error
0x70	Fusing unit, laser light, and scanner mirror motor error
0x73	Fusing unit, laser light, scanner mirror motor, and fan motor error

## 5.3 TROUBLESHOOTING

This section describes troubleshooting abnormal operations and print quality problems.

### 5.3.1 Troubleshooting of Abnormal Operations

This section describes how to detect malfunctions, and determine their cause, and it suggests what actions to take for various types of malfunctions. Each paragraph refers you to a detailed troubleshooting table.

**Table 5-2. Symptoms and Reference Tables**

Symptom	Printer Condition	Reference Table
The printer does not operate at all.	The heater lamp in fusing unit does not come on, and so neither LED light is on.	5-3
“Status not available” or “Check printer / cable” is displayed.	“Status not available” or “Check printer / cable” is displayed by the printer driver interface.	5-4
“Clear paper jam” is displayed.	“Clear paper jam” is displayed by the printer driver interface during power on.	5-5
	“Clear paper jam” is displayed by the printer driver interface during printing.	5-6
“Check Toner & Cover” is displayed.	“Check Toner & Cover” is displayed by the printer driver interface.	5-7
“Service Call” is displayed.	A fusing unit error is detected. (Refer to Section 5.2)	5-8
	A fan motor error is detected. (Refer to Section 5.2)	5-9
	A scanner motor error is detected. (Refer to Section 5.2)	5-10
	A laser light error is detected. (Refer to Section 5.2)	5-11

**Table 5-3. The Printer Does Not Operate at All**

Cause	Step	Checkpoint	Finding	Solution
Connector CN207 on the C180 MAIN board may be disconnected.	1	Is connector CN207 on the C180 MAIN board disconnected?	Yes	Connect CN207 on the board.
The fuse on the PWB-E board may be blown.	2	Has the fuse blown on the PWB-E board?	Yes	Replace the fuse.
PWB-E board may be dead.	3	With power on, is there an output of +5 VDC between pin 4 (+) and pin 3 (-) for CN207 on C180 MAIN board?	No	Replace the PWB-E board.
C180 MAIN board may be dead.	4	—	—	Replace the C180 MAIN board.

**Table 5-4. Both LED Lights Do Not Come On**

Cause	Step	Checkpoint	Finding	Solution
The C180 MAIN board may be dead.	1	If you replace the C180 MAIN board, do the LEDs come on?	Yes	Replace the C180 MAIN board.

**Table 5-5. Clear Paper Jam (1)**

Cause	Step	Checkpoint	Finding	Solution
The paper take-up sensor flag position may be incorrect.	1	Is the paper take-up sensor flag position OK?	No	Reposition the paper take-up sensor flag.
The paper exit sensor flag position may be incorrect.	2	Is the paper exit sensor flag position OK?	No	Reposition the paper exit sensor flag.
The paper take-up sensor connector may be disconnected.	3	Is the paper take-up sensor connector disconnected?	Yes	Connect it.
The paper exit sensor connector may be disconnected.	4	Is the paper exit sensor connector disconnected?	Yes	Connect it.
The paper exit sensor may be bad.	5	—	—	Replace it.
The paper take-up sensor may be bad.	6	—	—	Replace it.

Table 5-6. Clear Paper Jam (2)

Cause	Step	Checkpoint	Finding	Solution
The paper take-up solenoid coils may be open or shorted.	1	Disconnect CN203 on the C180 MAIN board, and check the coil resistance between pins 5 and 6 on the disconnected cable side of the connector using a multimeter. Is the resistance approximately 80 ohms?	No	Replace the paper take-up solenoid.
		If the coil is shorted, check the solenoid drive circuit using the procedure below: <ol style="list-style-type: none"> <li>Set the multimeter to voltage.</li> <li>Place the (-) terminal of the multimeter on pin 5 of connector CN207 on the C180 MAIN board.</li> <li>Place the (+) terminal of the multimeter on pin 6 (GND).</li> </ol> With power on, does the multimeter detect any current?	Yes	Replace the paper take-up solenoid and the C180 MAIN board.
The main motor coils may be open or shorted.	2	Disconnect CN206 on the C180 MAIN board, and check the coil resistance between pins 1 and 2 and between pins 3 and 4 (2 points total) on the disconnected cable side of the connector using a multimeter. Pin 1 — Pin 2 Pin 3 — Pin 4 Are the resistances of all four points approximately 10 ohms?	No	Replace the main motor.
	3	If any coil is shorted, check the main motor drive circuit using the following procedure: <ol style="list-style-type: none"> <li>Set the multimeter to voltage.</li> <li>Place the (-) terminal of the multimeter on pins 1, 2, 3, or 6 of CN206 on the C180 MAIN board.</li> <li>Place the (+) terminal on pin 2 of CN207 on the C180 MAIN board (GND).</li> </ol> With power on, does the multimeter detect current?	Yes	Replace the C180 MAIN board.

Continued on next page

**Table 5-6. Clear Paper Jam (2) (Continued)**

Cause	Step	Checkpoint	Finding	Solution
Paper take-up sensor flag position may be incorrect.	4	Is the paper take-up sensor flag position incorrect?	Yes	Reseat the paper take-up sensor flag.
Paper take-up roller may be bad.	5	—	—	Replace the paper take-up roller.

**Table 5-7. Check Toner & Cover**

Cause	Step	Checkpoint	Finding	Solution
The interlock switch lever is bad.	1	Does the switch turn on when the case is closed?	No	Replace the interlock lever.
The interlock switch may be bad.	2	Does the switch toggle? (Check with a multimeter.)	No	Replace the interlock switch.
The PWB-E board may be dead.	3	With power on, is there an output of +24 VDC between pin 1 (+) and pin 2 (-) for CN207 on C180 MAIN board?	No	Replace the PWB-E board.

**Table 5-8. Service Error (1)**

Cause	Step	Checkpoint	Finding	Solution
The connector for the thermistor may be disconnected.	1	Is the thermistor connector disconnected?	Yes	Connect it.
The C180 MAIN board may be bad.	2	Does the heater lamp remain lit up until the error occurs?	Yes	Replace the C180 MAIN board.
The heater lamp or thermal fuse in the fusing unit may be bad.	3	Does the heater lamp come on at power on?	No	Replace the heater lamp or thermal fuse in the fusing unit.
The PWB-E board may be dead.	4	—	—	Replace the PWB-E board.

**Table 5-9. Service Error (2)**

Cause	Step	Checkpoint	Finding	Solution
Connector CN211 on the C180 MAIN board may be disconnected.	1	Is CN211 on the C180 MAIN board disconnected?	Yes	Connect it.
The fan motor may be bad.	2	—	—	Replace it.

**Table 5-10. Service Error (3)**

Cause	Step	Checkpoint	Finding	Solution
The optical unit may be bad.	1	—	—	Replace the optical unit.
The C180 MAIN board may be bad.	2	—	—	Replace the C180 MAIN board.

**Table 5-11. Service Error (4)**

Cause	Step	Checkpoint	Finding	Solution
The optical unit may be bad.	1	—	—	Replace the optical unit.
The C180 MAIN board may be dead.	2	—	—	Replace the C180 MAIN board.



### 5.4.2 Print Quality Anomalies

This section describes how to isolate possible causes of a print quality problem.

**Table 5-12. Print Quality Anomalies**

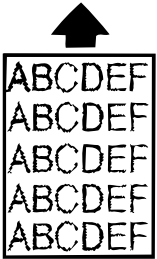
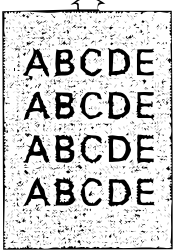
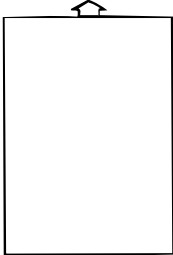
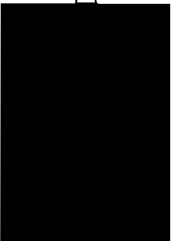
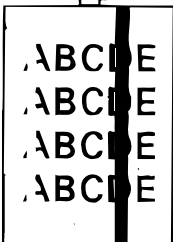
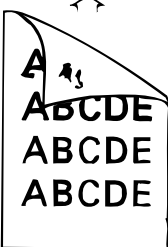
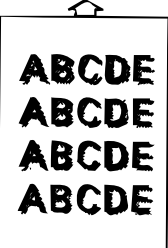
Symptom	Possible Cause	Part Name	Check Item	Remedy
Low image density 	Poor development	PWB-F board	—	Replace the PWB-F board.
	Image transfer problem	Image transfer unit	Check to see if the surface of image transfer unit is damaged.	Replace the image transfer unit.
		PWB-F board	—	Replace the PWB-F board.
	Defective PC drum	Photoconductor unit	—	Replace the photoconductor unit.
	Improper print density setting	—	—	Adjust the print density using the printer settings.
Foggy background 	Poor development	Toner cartridge	—	Replace the toner cartridge.
	Improper charging	Drum charge	—	Replace the PWB-F board.
			Check the wiring of the PC drum charging bias line.	Replace the photoconductor unit.
Improper print density setting	—	—	Adjust the print density using the printer settings.	

Table 5-12. Print Quality Anomalies (Continued)

Symptom	Possible Cause	Part Name	Check Item	Remedy
Blank print 	Poor development	Imaging cartridge	Check whether the toner cartridge is installed properly.	Reinstall the toner cartridge.
		PWB-F board	—	Replace the PWB-F board.
	Improper charging	PWB-F board	—	Replace the PWB-F board.
	Poor image transfer	Image transfer unit	Check the surface of the image transfer unit.	Replace the image transfer unit.
		PWB-F board	—	Replace the PWB-F board.
	Improper print density setting	—	—	Adjust the print density using the printer settings.
Defective optical unit	Optical unit	—	Replace the optical unit.	
Black print 	Improper charging	Photoconductor unit	—	Replace the photoconductor unit.
		PWB-F board	—	Replace the PWB-F board.
	Poor development	Toner cartridge	—	Replace the toner cartridge.
		PWB-F board	—	Replace the PWB-F board.
	Improper print density setting	—	—	Adjust the print density using the printer settings.
	Defective optical unit	Optical unit	—	Replace the optical unit.
White/black lines and bands. 	Improper charging	Photoconductor unit	—	Replace the imaging cartridge.
	Poor development	PWB-F board	—	Replace the PWB-F board.
		Toner cartridge	—	Replace the toner cartridge.
	Dirt on the fusing roller	Fusing roller	—	Clean the fusing roller.

**Table 5-12. Print Quality Anomalies (Continued)**

Symptom	Possible Cause	Part Name	Check Item	Remedy
Toner smudges on the back side of the sheet. 	Improper charging	PWB-F	—	Replace the PWB-F board.
	Poor development	PWB-F	—	Replace the PWB-F board.
	Improper fusing	Fusing unit	—	Replace the fusing unit.
Offset print 	Improper fusing	Fusing unit	—	Replace the fusing unit.
White spots	Poor image transfer	Image transfer unit	—	Replace the image transfer unit.
		PWB-F	—	Replace the PWB-F board.

# Chapter 6 Maintenance

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## 6.1 MAINTENANCE

The EPL-5500W is a page printer that uses an electrophotographic printing method. Unlike most impact or ink-jet printers, the key components in the electrophotographic process are integrated into two expendable units (the photoconductor unit and toner cartridge). Therefore, periodic replacement of them is essential to ensure high-quality output. Other maintenance items are also described in this chapter, which is divided into two sections: user maintenance (preventive maintenance) and service maintenance (repair).

### 6.1.1 User Maintenance

Users can achieve maximum print quality from the printer by following the procedures below:

#### 6.1.1.1 Cleaning

This section describes the cleaning required for optimal print quality.

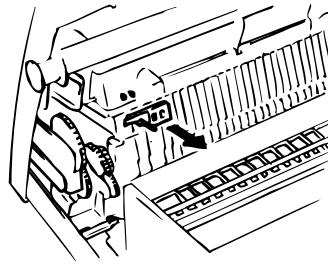
##### □ External Cleaning

Be sure to disconnect the printer from the power outlet before cleaning it. Wipe the cover and external parts of the printer with a damp cloth that has been soaked in a neutral cleaning solution.

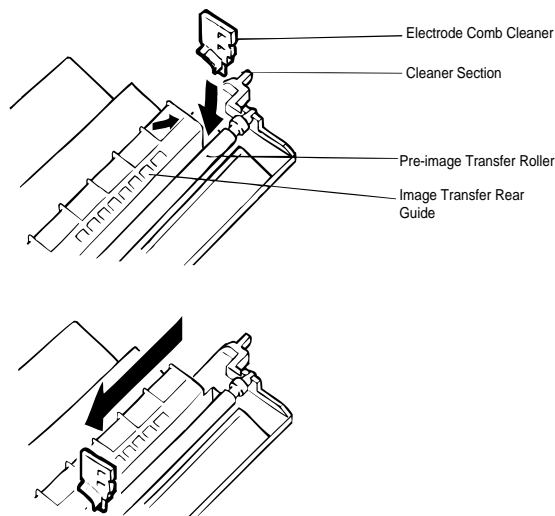
##### □ Internal Cleaning

Be sure the printer has been disconnected from the power supply and that the fusing unit has cooled down. If the electrode comb of the image transfer unit is dirty, clean it with a special tool, using the following steps:

1. Pick up the electrode comb cleaner from the upper unit.
2. Wipe the electrode comb surface from end to end with the electrode comb cleaner several times.



**Figure 6-1. Position of the Special Tool**



**Figure 6-2. Cleaning the Electrode Comb**

**6.1.1.2 Replacement of Consumables**

This printer uses a consumable photoconductor unit and toner cartridge. The life of photoconductor unit is 20,000 pages and the toner cartridge life is 3,000 pages, when printing on A4- or letter-size pages with a 5% print ratio.

If printed images become faint, remove the toner cartridge and gently shake it. This will distribute the toner and may make the images darker. If the image is still too light, replace the toner cartridge cartridge.

If the printed image remains faint after you have replaced the toner cartridge, change the photoconductor unit.

## 6.1.2 Service Maintenance

This section describes the periodic service maintenance and the cleaning required.

### 6.1.2.1 Periodic Service Maintenance

The following units need service maintenance periodically, because they are subject to functional deterioration as the total number of printed pages increases, resulting in bad print quality.

**Table 6-1. Periodic Service Maintenance**

Unit	Service Interval
Image transfer unit	Approx. 100,000 pages
Fusing unit	Approx. 100,000 pages

The service interval listed above is only a reference value. You do not need to perform service maintenance exactly at this time.

### 6.1.2.2 Cleaning

Some parts of this printer require regular cleaning. Clean each part using the specified method and tools. (Refer to Chapter 3 for disassembly procedures.)

**Table 6-2. Cleaning Parts and Procedures**

Parts Name	Cleaning Procedure
Paper take-up roller	Wipe the surface with a dry soft cloth.
Upper fusing roller (in fusing unit)	Dip a soft cloth in silicon oil and wipe the dust off.
Lower fusing roller (in fusing unit)	
Thermistor (in fusing unit)	Dip a soft cloth in denatured alcohol and wipe the dust off.
Paper separator and rollers (in fusing unit)	





# Appendix A Reference Materials

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## A.1 CONNECTOR PIN ASSIGNMENTS

Figure A-1 illustrates the interconnection of the primary components. Table A-1 gives the size and a description of each connector.

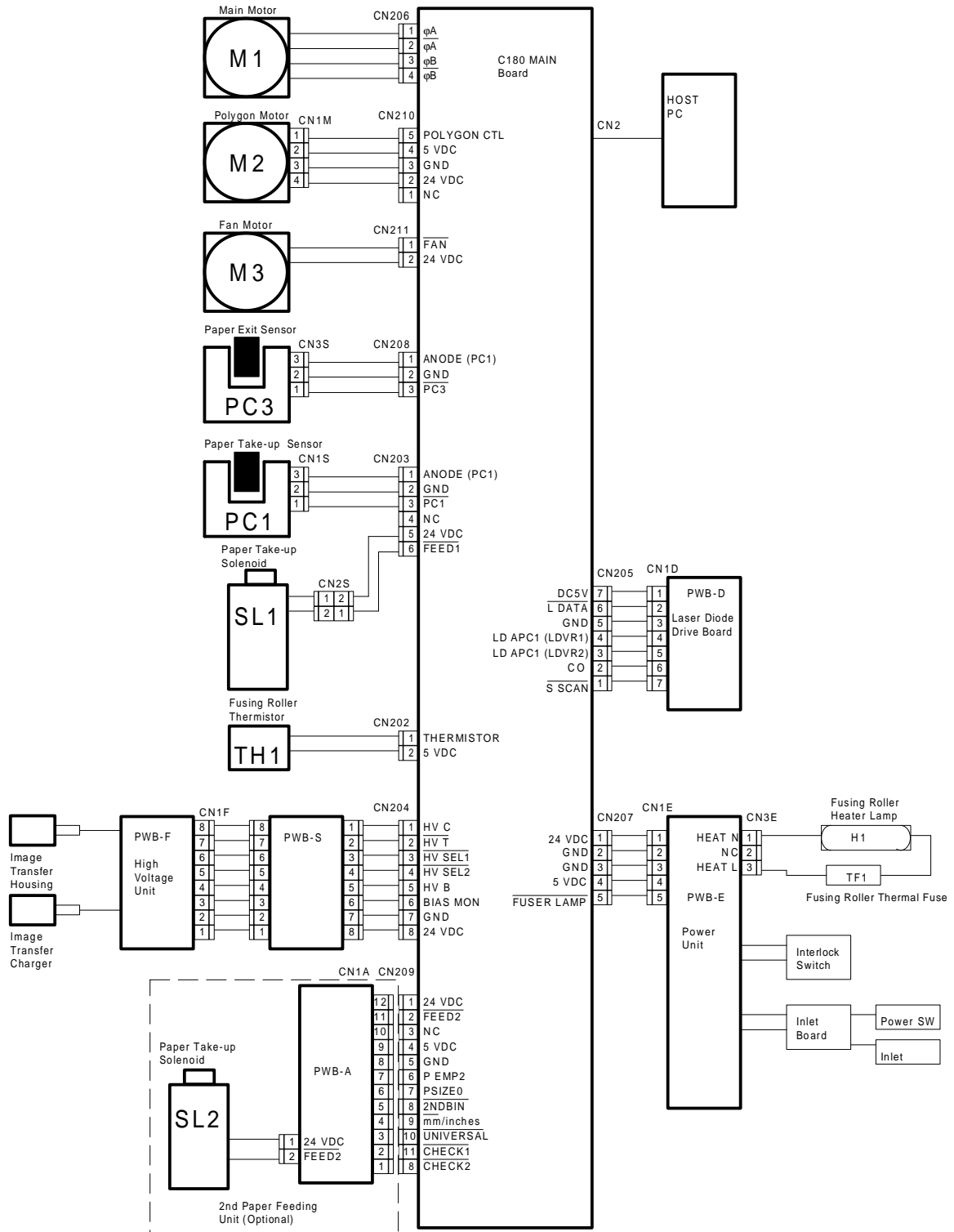


Figure A-1. Connector Connections

Table A-1. Board Connector Summary

Connector	Description	Pins	Reference
<b>Main Board (C180 MAIN Board)</b>			
CN1	Video interface (not used)	20 pins	—
CN2	Centronics parallel interface	36 pins	Table A-2
CN202	Connector for thermistor	2 pins	Table A-3
CN203	Connector for paper take-up solenoid and paper take-up sensor	6 pins	Table A-4
CN204	Connector for high-voltage supply board (PWB-S and PWB-F board)	8 pins	Table A-5
CN205	Connector for optical unit	7 pins	Table A-6
CN206	Connector for motor	4 pins	Table A-7
CN207	Connector for power supply board (PWB-E board)	5 pins	Table A-8
CN208	Connector for paper exit sensor	3 pins	Table A-9
CN209	Connector for lower paper cassette	12 pins	Table A-10
CN210	Connector for optical unit	5 pins	Table A-11
CN211	Connector for fan	2 pins	Table A-12
<b>Power Supply Board (PWB-E Board)</b>			
CN1	Connector for AC power inlet	4 pins	—
CN2	Connector for main board	5 pin	Table A-8
CN3	Connector for heater lamp	3 pins	—
<b>High-Voltage Supply Board (PWB-F Board)</b>			
CN1	Connector for main board	8 pins	Table A-5
CN2	Connector for paper take-up sensor	3 pins	—

## A.1.1 Main Board (C180 MAIN Board)

Table A-2. CN2 Pin Assignments

Pin No.	Signal Name	I/O	Description
1	STROBE	I	STROBE signal
2	DATA1	I	Data bit 1
3	DATA 2	I	Data bit 2
4	DATA 3	I	Data bit 3
5	DATA 4	I	Data bit 4
6	DATA 5	I	Data bit 5
7	DATA 6	I	Data bit 6
8	DATA 7	I	Data bit 7
9	DATA 8	I	Data bit 8
10	ACKNLG	O	ACKNLG signal
11	BUSY	O	BUSY signal
12	PE	O	PE signal
13	SLCT	O	SLCT signal
14	AUTO-FEED	I	AUTO-FEED signal
15	NC	—	Not connected
16	GND	—	GND
17	CHASSIS GND	—	CHASSIS GND
18	NC	—	Not connected
19	GND	—	GND
20	GND	—	GND
21	GND	—	GND
22	GND	—	GND
23	GND	—	GND
24	GND	—	GND
25	GND	—	GND
26	GND	—	GND
27	GND	—	GND
28	GND	—	GND
29	GND	—	GND
30	GND	—	GND
31	INIT	I	INIT signal
32	ERROR	O	ERROR signal
33	GND	—	GND
34	NC	—	Not connected
35	+5	—	+5 VDC
36	SLCT IN	I	SLCT IN signal

**Table A-3. CN202 Pin Assignments**

Pin No.	Signal Name	I/O	Description
1	+5	—	+5 VDC
2	TH	I	Fuser temperature

**Table A-4. CN203 Pin Assignments**

Pin No.	Signal Name	I/O	Description
1	PS1	I	Paper take-up sensor
2	GND1	—	Ground
3	PS1	I	Paper take-up sensor
4	NC	—	Not connected
5	+24V	—	+24 VDC
6	FEED1	O	Paper take-up solenoid drive

**Table A-5. CN204 Pin Assignments**

Pin No.	Signal Name	I/O	Description
1	HV-C	—	
2	HV-T	I	
3	HV-S	—	
4	HV-S2	—	
5	HV-B	—	
6	BIAS-M	O	
7	GND2	—	Ground
8	+24	—	+24 VDC

**Table A-6. CN205 Pin Assignments**

Pin No.	Signal Name	I/O	Description
1	SSCAN	I	Horizontal synchronous signal
2	LD-CTL	I	Laser power signal
3	LDAPC2	O	Laser power adjust 2
4	LDAPC1	O	Laser power adjust 1
5	GND1	—	Ground
6	LDATA	O	Laser data
7	+5V	—	+5 VDC

**Table A-7. CN206 Pin Assignments**

Pin No.	Signal Name	I/O	Description
1	<u>A</u>	O	Motor phase <u>A</u>
2	<u>A</u>	O	Motor phase <u>A</u>
3	<u>B</u>	O	Motor phase <u>B</u>
4	<u>B</u>	O	Motor phase <u>B</u>

**Table A-8. CN207 Pin Assignments**

Pin No.	Signal Name	I/O	Description
1	+24V	—	+24 VDC
2	GND2	—	Ground
3	GND1	—	Ground
4	+5V	—	+5 VDC
5	FUSER	O	Heater lamp on

**Table A-9. CN208 Pin Assignments**

Pin No.	Signal Name	I/O	Description
1	PS3	I	Paper exit sensor
2	PS3	I	Paper exit sensor
3	GND	—	Ground

**Table A-10. CN209 Pin Assignments**

Pin No.	Signal Name	I/O	Description
1	+24 V	—	+24 VDC
2	FEED2	O	Lower cassette solenoid on
3	NC	—	Not connected
4	+5V	—	+5 VDC
5	GND1	—	Ground
6	PE2	I	Lower cassette paper empty
7	PSIZ0		
8	PSIZ1		
9	PSIZE2		
10	CHECK1		
11	CHECK2		
12	CHECK3		

**Table A-11. CN210 Pin Assignments**

Pin No.	Signal Name	I/O	Description
1	NC	—	Not connected
2	+24V	—	+24 VDC
3	GND2	—	Ground
4	+5V	—	+5 VDC
5	P-CTL	O	Polygon motor control

**Table A-12. CN211 Pin Assignments**

Pin No.	Signal Name	I/O	Description
1	+24V	—	+24 VDC
2	FAN	O	Fan control





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## A.2 CIRCUIT DIAGRAMS

Figure A-2. C180 MAIN Circuit Diagram (1/2)



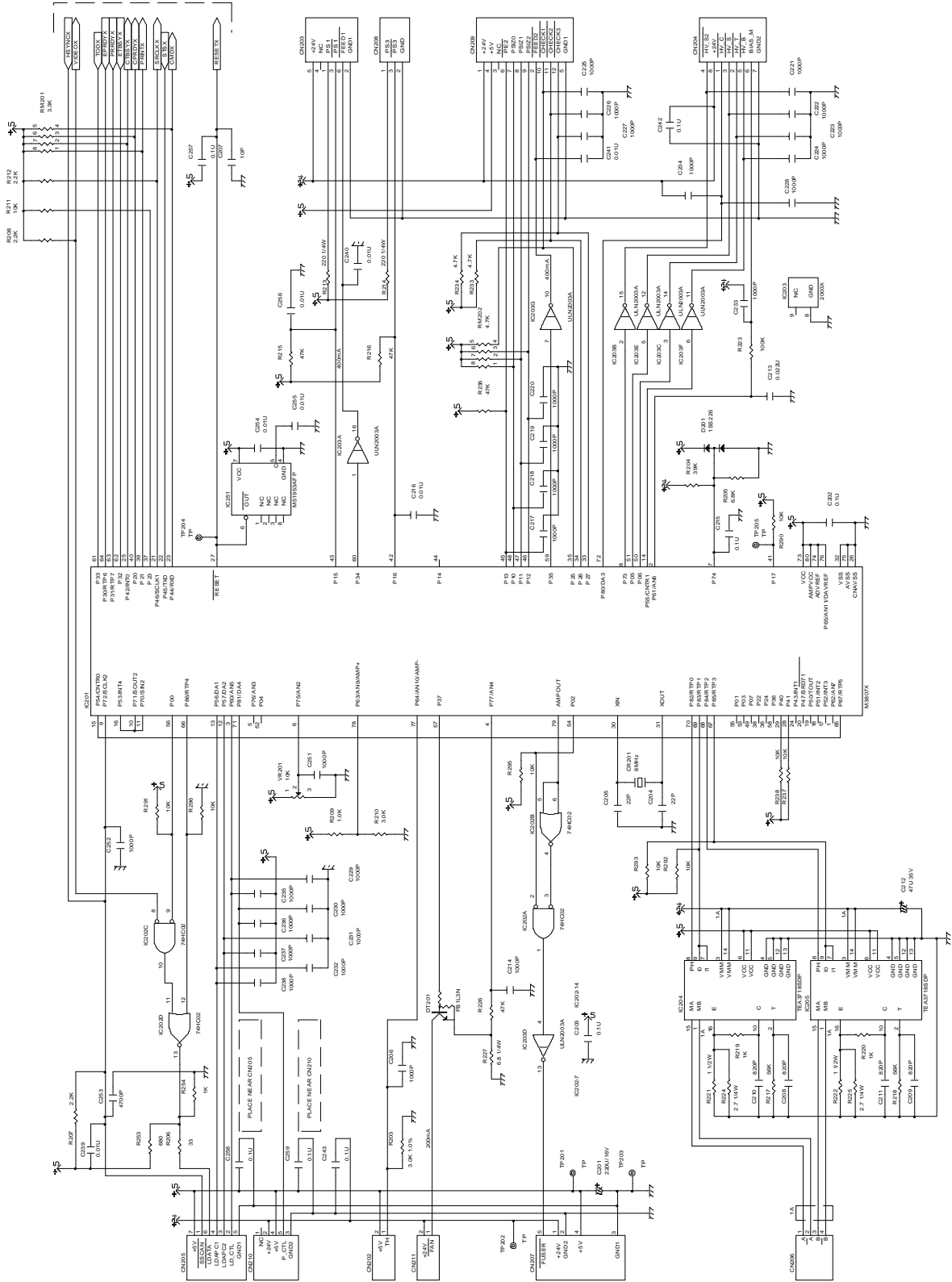


Figure A-3. C180 MAIN Circuit Diagram (2/2)

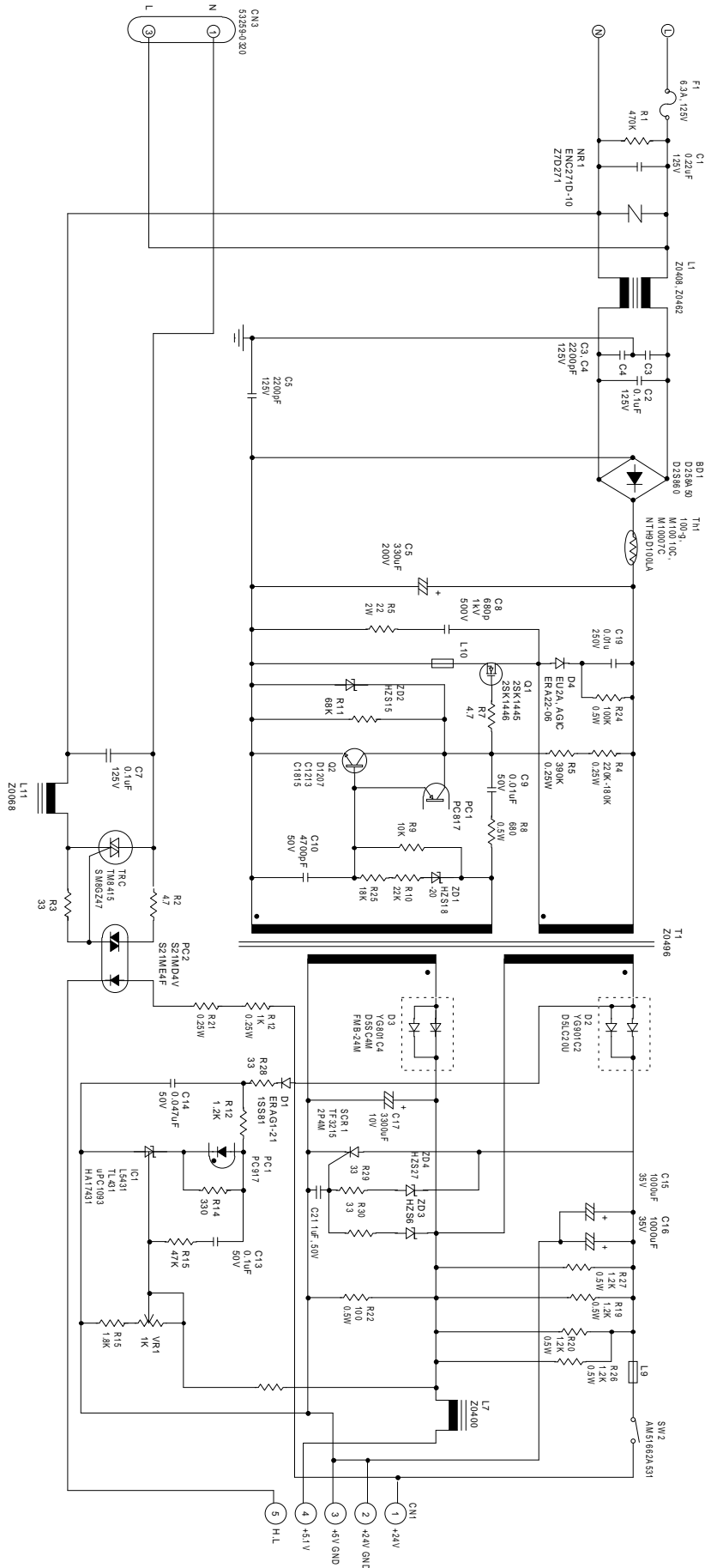


Figure A-4. PWB-E (120 V) Circuit Diagram





2021117 00



Figure A-7. C180 MAIN Component Layout (Side B)

## EPSON OVERSEAS MARKETING LOCATIONS

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**EPSON AMERICA, INC**  
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