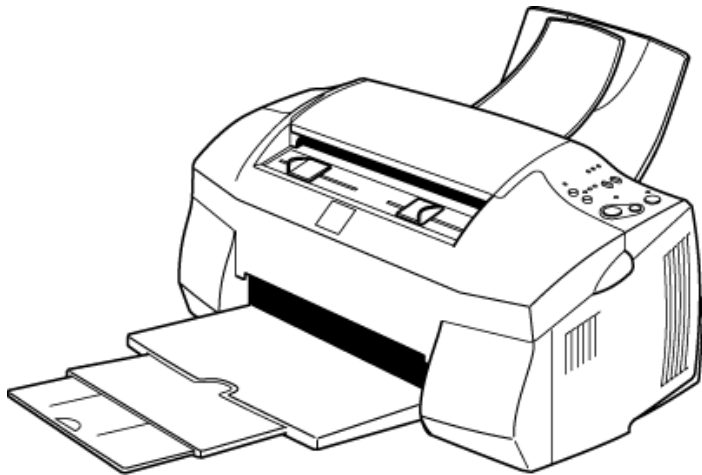


SERVICE MANUAL



All-in-one printer, scanner, and copier

EPSON STYLUS Scan 2000



EPSON®

SEIJ99006

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PRECAUTIONS

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



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



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

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NOWORK 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 MADE BY THE MANUFACTURER; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.

PREFACE

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of EPSON STYLUS Scan 2000. The instructions and procedures

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

CHAPTER 1. “Product Description”

Provides 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 step-by-step procedures for troubleshooting.

CHAPTER 4. “Disassembly & Assembly”

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

CHAPTER 5. “Adjustment”

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.

CHAPTER 7. “Appendix”

Provides the following additional information for reference:

- *EEPROM Address Map*
- *Connector Pin Assignment*
- *Schematics*
- *Circuit Diagrams*

Revision Status

Revision	Issued Date	Description
Revision A	October 4, 1999	Full version
Revision B	October 20, 1999	Changed Disassembly and Troubleshooting to account for ASP blue protective tape, also fixed scanner removal description

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CHAPTER

1

PRODUCT DESCRIPTION

1.1 Features

The major features of the EPSON Stylus Scan 2000 are:

- High Color Print Quality
 - 1440 (H) X 720 (V) dpi printing
 - Four Color Printing (CMYK)
 - Traditional and New Microweave
- Sheet-fed 300dpi scanning
- High quality local copy

One color copy mode	Text & Graphics
Two B&W copy modes	Black & White, Grayscale
- High speed local copy

Color normal mode copy	Max. 1.2 PPM
Gray mode copy	Max. 1.3 PPM
B/W normal mode copy	Max. 3.0 PPM
- Local copy settings from the control panel

Enlargement	141%
Reduction	93%, 70%
Copy size protection	Letter/Half Letter/5 x 8" /Legal A4/B5/A6

(Copy size protection prevents the printhead from firing ink onto the platen in cases where the loaded paper size does not match the paper size selected in the software.)
- Built-in Auto Sheet Feeder
 - Holds 100 cut-sheets (64g/m²)
 - Holds 10 envelopes
 - Holds 30 transparency films
- Two Built-in Interfaces
 - Bi-directional parallel I/F (IEEE-1284 level 1 device)
 - USB
- Windows/Macintosh exclusive
- Copy settings from the computer
 - Auto Photo Fine
 - Auto Enlarge
 - Auto Layout
 - Background reduction
- Installed functions are the same or equivalent to the EPSON Stylus Color 740 and the GT-2200.
- Small footprint 228 x 437 x 279 mm (HWD)

1.2 General Specifications

1.2.1 Local copy

1. Local copy

Table 1-1. Local Copy Specifications

Mode		Scan res.	Output mode	Print res.	Micro Weave	Variable dot	Head seq.	Media
B/W	B/W	300x300	Line art	360x360	Off	No	Bi-D	Normal
	Grayscale	300x300	Gray	360x360	On	No	Bi-D	Normal
Color	Text & Graphics	300x300	Full color	360x360	On	No	Bi-D	Normal

Output mode = data from the scanner ASIC to the printer

- 2. Enlargement:
 - Default 100%
 - Enlargement 141%
 - Reduction 70%, 93% (not continuous)
- 3. Copy size
 - Max. copy size 216 x 355.6mm (8.5 x 14inches) (Top, bottom, and both sides need 3mm margins)
 - Copy size protection A4/B5/A6 (A-size version)
Letter/Half Letter/5 x 8"/Legal (Letter size version)
- 4. Printing paper size
 - Normal paper A4/Letter
 - Photo paper A4/Letter

1.2.2 Scan area

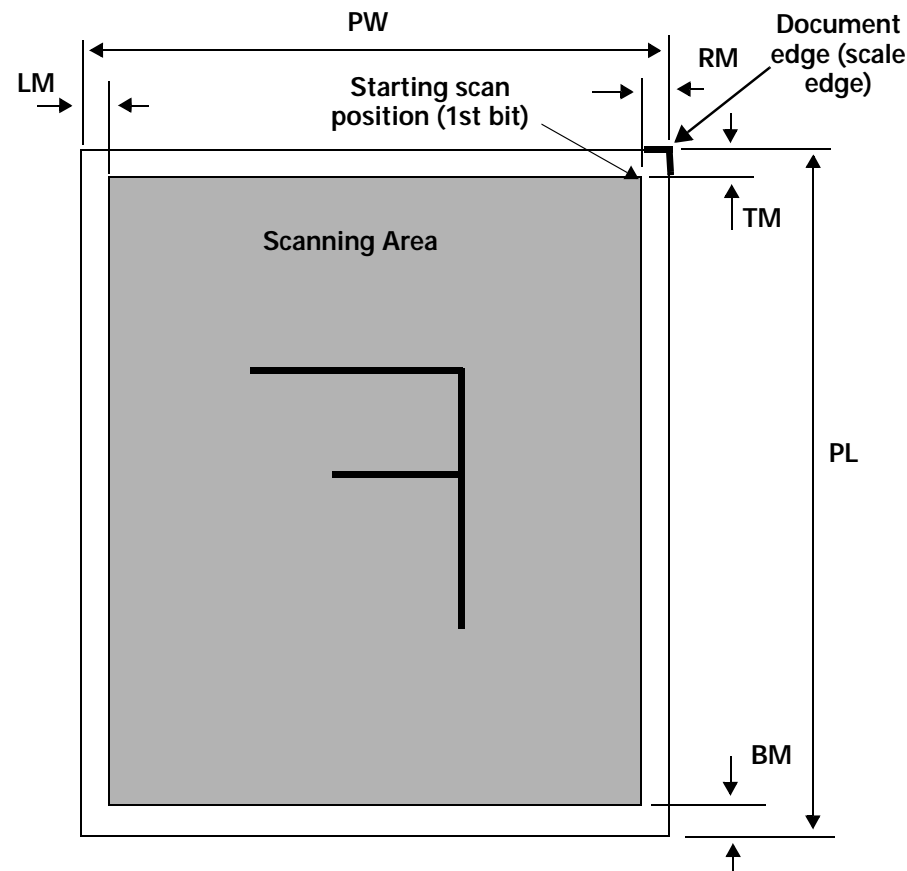


Figure 1-1. Scan Area

Table 1-2. Scan Area

Document size	PW (width)	PL (length)	LM (left)	RM (right)	TM (top)	BM (bottom)
A4	210mm	297mm	at least 3mm	at least 3mm	at least 3mm	at least 3mm
Letter	216mm	355.6mm	at least 3mm	at least 3mm	at least 3mm	at least 3mm

1.2.3 Print area

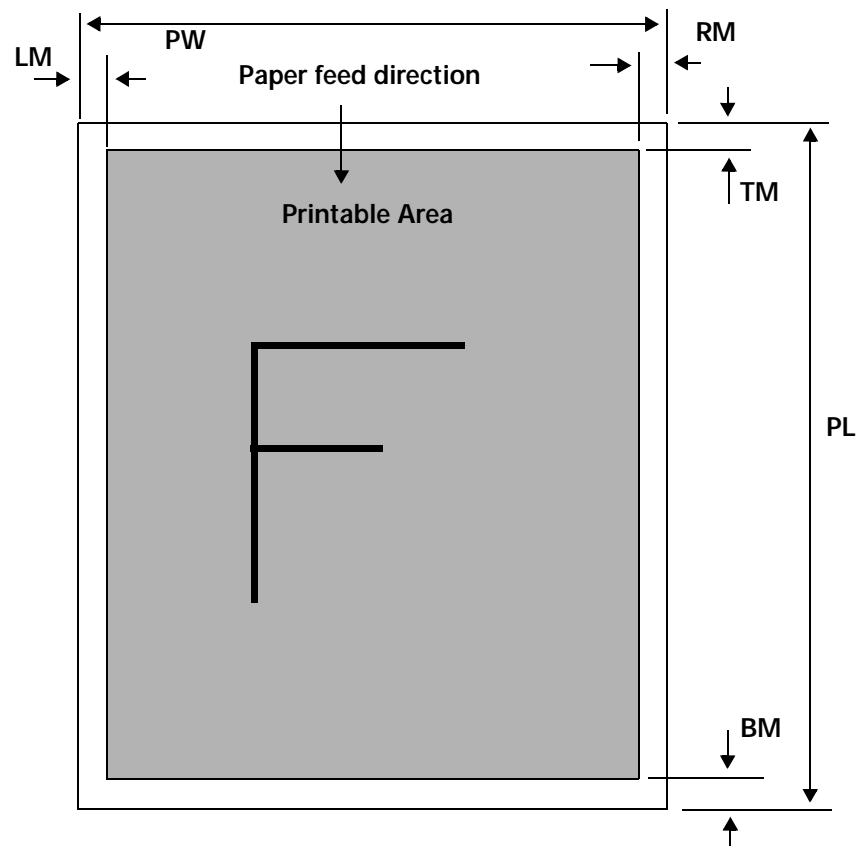


Figure 1-2. Print Area

Table 1-3. Print Area

Size	PW	PL	LM	RM	TM	BM
A4	210mm	297mm	at least 3mm	at least 3mm	at least 3mm	at least 3mm
Letter	216mm	279mm	at least 3mm	at least 3mm	at least 3mm	at least 3mm
B5	182mm	257mm	at least 3mm	at least 3mm	at least 3mm	at least 3mm
Legal	216mm	356mm	at least 3mm	at least 3mm	at least 3mm	at least 3mm

1.2.4 Printer

PRINTING

- Print method Drop On Demand ink jet
- Nozzle configuration monochrome 144 nozzles (48 x 3 staggered)
 color 48 nozzles each (cyan, magenta, yellow)
- Print direction Bi-direction with logic seeking
- Print speed & printable columns

Table 1-4. Character mode

Character pitch	Printable columns	LQ speed
10 CPI (Pica)	80	200 cps

Table 1-5. Raster graphic mode

Horizontal resolution	Printable area	Available dots	CR speed
180 dpi	8.26 inch	1488	20 IPS
360 dpi	8.26 inch	2976	20 IPS
720 dpi	8.26 inch	5952	20 IPS

CONTROL CODES

- ESC/P Raster
- EPSON Remote Command

PAPER FEED

- | | |
|-------------------|--|
| 1. Feeding method | Friction feed with ASF |
| 2. Line spacing | 1/6 inch or programmable at 1/360 inch |
| 3. Paper path | cut-sheet ASF (front enter, front out) |
| 4. Feed speed | 2.36 inch/sec. normal/ continuous
4.5 inch/sec. fast/continuous |

PAPER

Cut-sheets

size: A4 210(W) x 297mm (L) (8.3 x 11.7")
 Letter 216 x 279mm (8.5 x 11.0")
 B5 182 x 257mm (7.2 x 10.1")
 Legal 216 x 356mm (8.5 x 14.0")
 Statement 139.7 x 215.9mm (5.5 x 8.5")
 Executive 184.2 x 266.7mm (7.25 x 10.5")
 Photo paper 101.6 x 152.4mm (4 x 6")

thickness: 0.08~0.11mm (0.003~0.004")

weight: 64g/m²~90g/m² (17~24lb.)

quality: Exclusive paper, bond paper, PPC

OHP sheets, Glossy paper

size: A4 210(W) x 297mm (L) (8.3 x 11.7")
 Letter 216 x 279mm (8.5 x 11.0")

thickness: 0.075~0.085mm (0.003~0.0033")

NOTE: Transparency printing is only supported at normal temperature.

Envelopes

size: No.10 241(W) x 104.8mm (H) (9.5 x 4.125")
 DL 220 x 110mm (8.7 x 4.3")
 C6 162 x 114mm (6.4 x 4.5")

thickness: 0.16~0.52mm (0.006~0.02")

weight: 45g/m²~75g/m² (12~20lb.)

quality: Exclusive paper, bond paper, Air mail

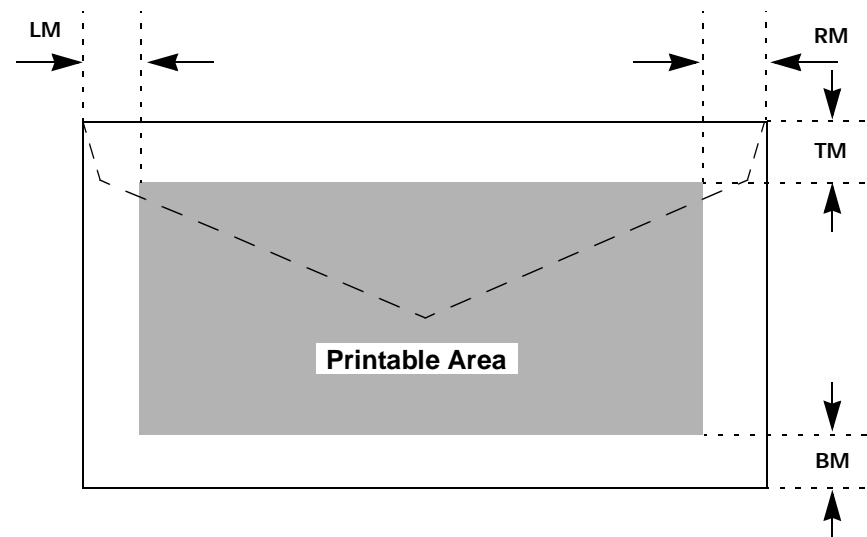


Figure 1-3. Printable Area for Envelopes

Table 1-6. Envelope Margin

Size	Left Margin (min.)	Right Margin (min.)	Top Margin (min.)	Bottom Margin (min.)
#10	3 mm (0.12")	28 mm (1.10")	3 mm (0.12")	14 mm (0.55")
DL	3 mm (0.12")	7 mm (0.28")	3 mm (0.12")	14 mm (0.55")
C6	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	14 mm (0.55")

NOTE: Envelope printing is only supported at normal temperature.
 Load long edge first.

Index cards

size: A6 index 105(W) x 148mm (L) (4.1 x 5.8")
 A5 index 148 x 210mm (5.8 x 8.3")
 5x8" index 127 x 203mm (5.0 x 8.0")
 10x8" index 254 x 203mm (10.0 x 8.0")

thickness: less than 0.23mm (0.0091")

INK

1. Ink cartridge (black)

Type: Exclusive cartridge
 Color: Black
 Print capacity: 900 pages/A4 (ISO/IEC 10561 Letter pattern 360dpi)
 Ink life: Two years from production date
 Storage temperature: -20~40°C (storage, less than a month at 40°C)
 -30~40°C (packing storage, less than month at 40°C)
 -30~60°C (transit, within 120 hours at 60°C and within a month at 40°C)
 Dimensions: 27.8 (W) x 52.7 (D) x 38.5mm (H)

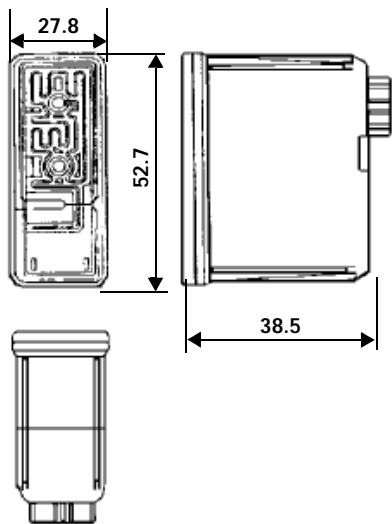


Figure 1-4. Black Ink Cartridge

2. Ink cartridge (color)

Type: Exclusive cartridge
 Colors: Magenta, cyan, and yellow
 Print capacity: 300 pages/A4 (360 dpi, 5% duty each color)
 Ink life: Two years from production date
 Storage temperature: -20~40°C (storage, less than a month at 40°C)
 -30~40°C (packing storage, less than month at 40°C)
 -30~60°C (transit, within 120 hours at 60°C and within a month at 40°C)
 Dimensions: 42.9 (W) x 52.7 (D) x 38.5mm (H)

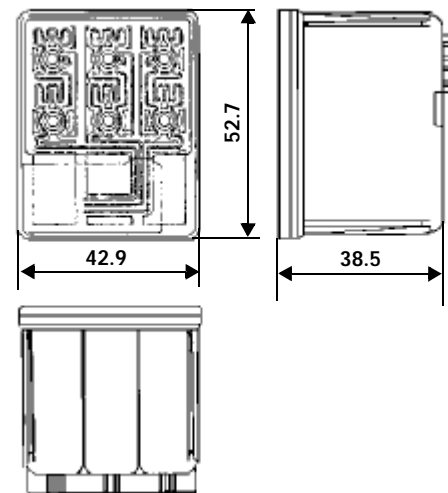


Figure 1-5. Color Ink Cartridge

NOTE: Ink cartridges are consumable products and cannot by any means be refilled.
 Do not use cartridges that have passed their expiration date.
 Ink will freeze at less than -4°C but can be used after thawing for three hours at room temperature.

INPUT DATA BUFFER

64K bytes

1.2.5 Scanner

Product type	Sheet-fed color image scanner (without ADF)
Sub scan method	Sheet-fed type
Photoelectric device	Color CCD line sensor
Max. scan area	8.5 x 14" (216 x 355.6mm)
Max. effective pixels	2550 x 4220 pixels (300dpi)
Scan resolution	main = 300dpi and sub = 300dpi
Output resolution	50~4800 dpi (1dpi increments)
Scan speed (300dpi, Draft mode)	Color = 4.25 msec/line Monochrome (bi-level) = 1.68 msec/line
Color separation	By the CCD color filter
Command level	ESC/I - B7
Zoom	50~200% (1% increments)
Pixel depth	8 bits/color (input 12 bits/pixel/color, output 8 bits/pixel/color)
Gamma correction	CRT two levels (A,B) PRINTER three levels (A,B,C) User defined = one level
Color correction	Impact-dot printer Thermal printer Ink-jet printer CRT display User defined
Brightness	Seven levels
Line art	Fixed threshold TET
Digital halftoning	AAS Error diffusion three modes (A,B,C)
(Bi-level, Quad-level)	Dither (resident) four modes (A,B,C,D) Dither (user defined) two modes (A,B)
Interface	USB and IEEE1284.4
Light source	White cold cathode fluorescent lamp

1.2.6 Common

ELECTRICAL SPECIFICATIONS

Rated voltage	AC 120V AC 220-240V
Input voltage	AC 99-132V AC 198-264V
Rated current	0.6A (AC 120V model) 0.4A (AC 220-240V model)
Rated frequency range	50-60 Hz
Input frequency range	49.5-60.5 Hz
Power consumption	Approx. 29W (local copy printing)
Insulation resistance	10MΩ at 500V DC (between AC line and chassis)

SAFETY, EMC

Safety	UL1950 (UL) CSA C22.2 No. 950 (CSA) EN60950 (VDE)
EMC	FCC Part15 Subpart B Class B CSA C108.8 Class B AS/NZS3548 Class B
CE Marking	Low voltage directive 73/23/EEC EMC Directive 89/336/EEC
	EN60950 EN55022 Class B EN61000-3-2 EN61000-3-3 EN50082-1 IEC 801-2/801-3/801-4

ENVIRONMENTAL CONDITIONS

Temperature	10~35°C (operating, see figure below) -20~60°C (non-operating, in packaging) One month at 40°C 120 hours at 60°C
Humidity	20~80% RH (operating, without condensation, see figure below) 5~85% RH (non-operating, in packaging without condensation)

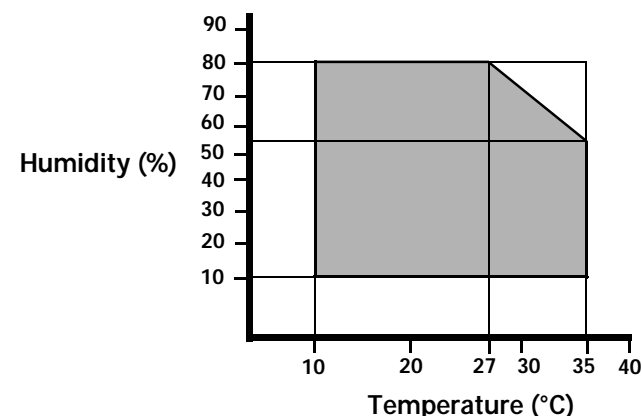


Figure 1-6. Environment

Resistance to shock	1 G, within one ms (operating) 2 G, within two ms (non-operating, in packaging)
Resistance to vibration	0.15G (operating) 0.50G (non-operating, in packaging)

RELIABILITY

Main unit	Life 75,000 pages
Lamp	Life 15,000 hours

1.3 Interfaces

This section is divided into printer and scanner interface specifications. See the following section for printer interface details or see “Scanner interfaces” on page 22 for scanner interface details.

1.3.1 Printer interface

PARALLEL

BUSY signal is set high before setting either -ERROR low or PE high, and held high until all these signals return to their inactive state.

BUSY signal is at high level in the following cases:

- During data entry (see data transmission timing)
- When input data buffer is full
- During -INIT signal is at low level or during hardware initialization
- During printer error (see -ERROR signal)
- When the parallel interface is not selected

ERROR signal is at low level when the printer is in one of the following states:

- Printer hardware error (fatal error)
- Paper-out error
- Paper-jam error
- Ink-out error

PE signal is at high level during paper-out error.

1. Specifications

Transmission mode	8 bit parallel, IEEE-1284 ECP compatibility/nibble mode
Synchronization	Refer to the IEEE-1284 specification
Handshaking	Refer to the IEEE-1284 specification

Packet Refer to the IEEE-P1284.4 Standard for Data Delivery and Logical Channels for IEEE Std. 1284 Interface (Draft D1.50)

Signal level TTL compatible level (IEEE-1284 Level 1 device)

Data trans. timing Refer to the IEEE-1284 specification

2. Connector pin assignment and signals

Table 1-7. Forward channel pin assignments and signals

Pin #	Signal Name	Return GND pin	In/Out	Description
1	-STROBE	19	In	The strobe pulse. Read-in data is preformed at the falling edge of this pulse.
2	DATA0	20	In	The DATA0 through DATA7 signals represent data bits 0 to 7, respectively. Each signal is high when data is logical 1 and low when data is logical 0.
3	DATA1	21	In	
4	DATA2	22	In	
5	DATA3	23	In	
6	DATA4	24	In	
7	DATA5	25	In	
8	DATA6	26	In	
9	DATA7	27	In	
10	-ACKNLG	28	Out	A negative signal that indicates the printer is ready to accept data
11	BUSY	29	Out	A high signal that indicates the printer is not ready and cannot receive data
12	PE	28	Out	A high signal indicates a paper-out error
13	SLCT	28	Out	Always at high level when the printer is on
14	-AFXT	30	In	Not used
31	-INIT	30	In	The falling edge of a negative pulse or a low signal on this line causes the printer to initialize. Minimum 50us pulse necessary.

Table 1-7. Forward channel pin assignments and signals

Pin #	Signal Name	Return GND pin	In/Out	Description
32	-ERROR	29	Out	A low signal indicates a printer error condition
36	-SLIN	30	In	Not used
18	Logic H	-	Out	Pulled up to +5V via 3.9K Ω resistor
35	+5V	-	Out	Pulled up to +5V via 3.3K Ω resistor
17	Chassis GND	-	-	Chassis GND
16, 33 19-30	GND	-	-	Signal GND
15,34	NC	-	-	Not connected.

Table 1-8. Reverse channel pin assignments and signals

Pin #	Signal Name	Return GND pin	In/Out	Description
1	HostClk	19	In	Data or address information transferred from host to product.
2	DATA0	20	In	The DATA0 through DATA7 signals represent data bits 0 to 7, respectively. Each signal is high when data is logical 1 and low when data is logical 0. These signals are used to transfer the 1284 extensibility request values to the printer.
3	DATA1	21	In	
4	DATA2	22	In	
5	DATA3	23	In	
6	DATA4	24	In	
7	DATA5	25	In	
8	DATA6	26	In	
9	DATA7	27	In	
10	PeriphClk	28	Out	
11	PeriphAck	29	Out	Printer busy signal and reverse channel transfer data bit 3 or 7
12	nAckReverse	28	Out	Printer goes to Low and approves nReverseRequest

Table 1-8. Reverse channel pin assignments and signals

Pin #	Signal Name	Return GND pin	In/Out	Description
13	Xflag	28	Out	X-flag signal and reverse channel transfer data bit 1 or 5
14	HostAck	30	In	Host uses this signal for flow control in reverse direction. Also this signal offers the data bit 9 that is used to judge whether the data or command will be sent on the data signal in forward direction.
31	nReverseRequest	30	In	This signal goes low to change to the reverse channel.
32	nPeriphRequest	29	Out	This signal produces a host interrupt.
36	1284-Active	30	In	1284 active signal, High in ECP mode.
18	Periph-Logic H	-	Out	Always high. Pulled up to +5V via 3.9K Ω resistor
35	+5V	-	Out	Always high. Pulled up to +5V via 1.0K Ω resistor
17	Chassis GND	-	-	Chassis GND
16, 33 19-30	GND	-	-	Signal GND
15,34	NC	-	-	Not connected.

3. Data trans. timing Refer to the IEEE-1284 specification and the following.

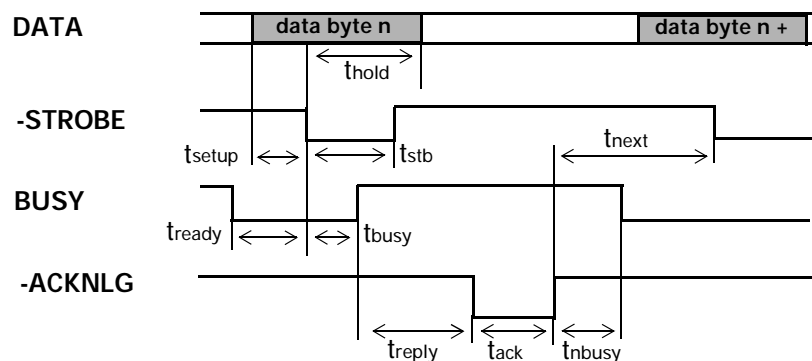


Figure 1-7. Data Transmission Timing

Table 1-9. Data transmission times

Parameter	Minimum	Maximum
tsetup	500 ns	-
thold	500 ns	-
tstb	500 ns	-
tready	0	-
tbusy	-	500 ns
tt-out*	-	120 ns
tt-in**	-	200 ns
treply	0	-
tack	500 ns	10 us
tnbusy	0	-
tnext	0	-

* Rise and fall time of every output signal

** Rise and fall time of every input signal

Table 1-10. Typical tack time

Parallel I/F mode	Time required
High speed	1 us
Normal speed	3 us

* The Logic H signal goes low, 2.0 V or less, when the printer is turned off and goes high, 3.0 V or more, when the printer is turned on. The receiver shall provide an impedance equivalent to 7.5 KΩ to ground.

4. Extensibility Request:

The printer responds affirmatively when the extensibility request values are 00H or 04H, which mean

- 00H Request nibble mode reverse channel transfer
- 04H Request Device ID; Return data using nibble mode reverse channel transfer

Device ID:

The printer sends the following device ID string when it is requested.

IEEE 1284.4 is enabled,

```
[00H][5EH]
MFG:EPSON;
CMD:ESCPL2,BDC,D4,SPC;
MDL:Stylus[SP]Scan[SP]2000;
CLS:PRINTER
DES:EPSON[SP]Stylus[SP]Scan[SP]2000;
```

Note: (1)[00H] denotes a hexadecimal value of zero
(2)MDL value depends on the EEPROM setting.

USB

Standard :based on
 "Universal Serial Bus Specifications Revision 1.0"
 "Universal Serial Bus Device Class Definition for Printing Devices Version 1.0"

Bit rate :12Mbps (Full speed device)

Data encoding :NRZI

Adaptable connector :USB series B

Suggested cable length :2 meters

PREVENTING DATA TRANSFER TIME-OUTS

Generally, hosts abandon data transfer to peripherals when a peripheral is in the busy state for dozens of seconds continuously. To prevent hosts from entering this kind of time-out period, the printer slows down the data reception rate to around several bytes per minute, even if the printer is in the busy state. This slowdown starts when the remaining open buffer area decreases to several hundred bytes. The Stylus Scan enters a continuous busy state if the input buffer becomes full.

Table 1-11. USB connector pin assignments and signals

Pin no.	Signal name	In/Out	Description
1	VCC	-	Cable power, max. power consumption is 100mA
2	-Data	bi-directional	data
3	+Data	bi-directional	data, pull up to +3.3V via 1.5K Ω resistor
4	Ground	-	Cable ground

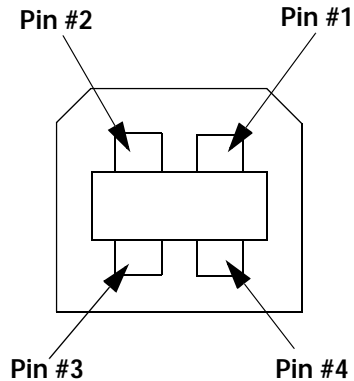


Figure 1-8. USB Pins

INTERFACE SELECTION

The Stylus Scan has two built-in interfaces; the USB and parallel interfaces. The interface in use is selected automatically.

■ Automatic selection

When the Stylus Scan is turned on, it initializes and then goes into an idle state. During this idle period the printer scans the interfaces for incoming data. The interface that receives data first is selected.

When the host stops transferring data and the printer is in the stand-by state for a certain amount of time, the printer returns to the idle state. As long as the host sends data or the printer interface is in the busy state, the interface selection does not change.

■ Interface status and selection

When the parallel interface is not selected, the interface goes into the busy state. When the printer initializes or returns to the idle state, the parallel interface goes into the ready state. Be aware that an interrupt signal such as the -INIT signal only takes effect on the parallel interface when the parallel interface is selected.

IEEE1284.4 PROTOCOL

The packet protocol described by IEEE1284.4 standard allows a device to carry on multiple exchanges or conversations which contain data and/or control information with another device at the same time across a single point-to-point link. The protocol is not, however, a device control language. It does provide basic transport-level flow control and multiplexing services. The multiplexed logical channels are independent of each other and blocking of one has no effect on the others. The protocol operates over IEEE1284.

□ Automatic Selection

An initial state is compatible interface and starts IEEE1284.4 communication when magic strings (1284.4 synchronous commands) are received.

□ On

An initial state is IEEE1284.4 communication and data that received it by the time it is able to take synchronization by magic string (1284.4 synchronous commands) is discarded.

□ Off

An initial state is compatible interface and never starts IEEE1284.4 communication even if magic strings (1284.4 synchronous commands) are received.

1.3.2 Scanner interfaces

PARALLEL

1. Specification

Transmission mode	8 bit parallel, IEEE-1284 ECP (Compatibility/Nibble) mode
Synchronization	Refer to the IEEE-1284 specification
Handshaking	Refer to the IEEE-1284 specification
Packet	Refer to the IEEE P1284.4 Standard for Data Delivery and Logical Channels for IEEE Std. 1284 Interface (Draft D1.50) Refer to the IEEE 1284.4 specification
Signal level	TTL compatible level (IEEE-1284 Level 1 device)
Data trans. timing	Refer to the IEEE-1284 specification

2. Connector pin assignments Refer to the IEEE-1284 specification

USB

Any items not included in this specification shall be in compliance with the Universal Serial Bus Specification Revision 1.0

- Configuration - the scanner supports the following configurations

Table 1-12. USB Configuration

Element	Description
Device	Full Speed Mode (12Mbit/s) Class: Vendor-specific Subclass: Vendor-specific Protocol: Vendor-specific Vendor ID: 0x04B8 (Seiko Epson Corp.) Product ID: 0x0105 Number of possible configurations: 1
Configuration	Number of interfaces supported by this configuration: 1 Characteristics: Self-powered (Remote wake-up feature not supported) Max. power consumption from VBUS: 2mA (5V)
Interface	No alternate setting Number of endpoints used by this interface (excluding endpoint 0):2 Class: Vendor specific Subclass: Vendor specific Protocol: Vendor specific
Endpoint	Bulk IN transfer Max. data transfer size: 64 bytes
	Bulk OUT transfer Max. data transfer size: 64 bytes
String Descriptor	Language ID: English, US 1: iManufacturer "EPSON" 2: iProduct "Scanner Stylus Scan 2000"

- Requests

The scanner must support almost all standard device requests. The scanner does not support vendor specific requests.

Some requests and descriptors depend on the configuration (endpoint number) of each USB device. Therefore this specification recommends the configuration where Endpoint 1 is Bulk IN endpoint and Endpoint 2 is OUT endpoint.

1.4 Control Panel

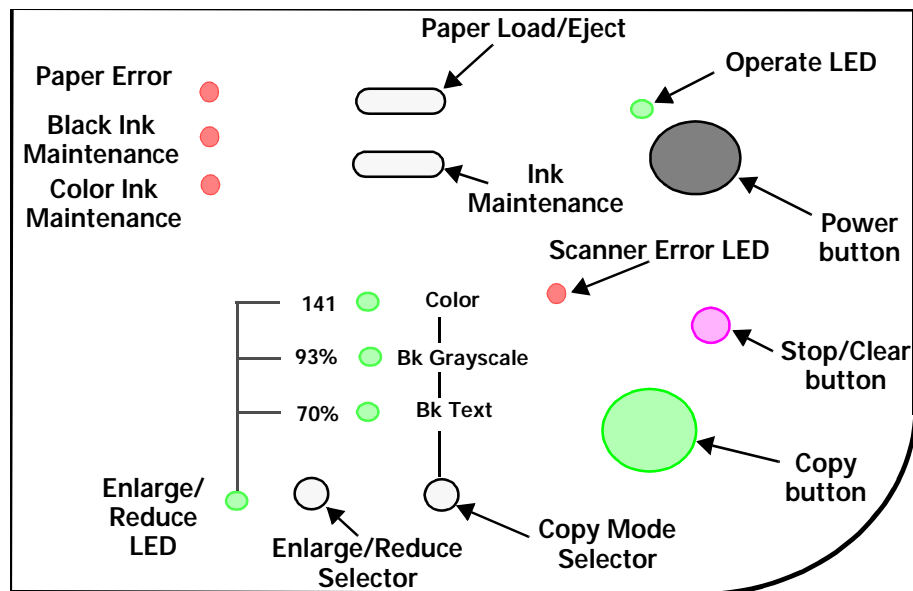


Figure 1-9. Control Panel

1.4.1 Buttons

Table 1-13. Normal button functions

Button	Function
Load/Eject	<ul style="list-style-type: none"> Loads or ejects paper If the carriage is at the ink cartridge installation position, returns the carriage back to the home position
Load/Eject (pushed for two* seconds)	<ul style="list-style-type: none"> Starts the ink cartridge replacement sequence (not available during printing). The carriage moves to the black ink cartridge installation position first, and then to the color ink cartridge installation position when pushed a second time.
Cleaning (pushed for two* seconds)	<ul style="list-style-type: none"> Starts the printhead cleaning cycle. If the printer is in the "Ink Low" or "Ink Out" condition, starts the ink cartridge replacement sequence.
Cleaning	<ul style="list-style-type: none"> Returns the carriage from the ink cartridge replacement position to the home position.

* The user's guides state three seconds.

Table 1-14. Power-on button functions

Button	Function
Load/Eject	Prints a status sheet that includes firmware version, ink counter, and nozzle check patterns.
Load/Eject + Cleaning	Enters the special-settings mode (see table below), which remains active for three seconds. If neither the Load/Eject nor Cleaning button is pushed in that three seconds, normal initialization begins.

Table 1-15. Special settings mode

Button	Function
Load/Eject	Resets the real-time counter (power-off time) in EEPROM
Cleaning (hold for ten seconds)	Resets the waste ink overflow counter

COPY BUTTON

Table 1-16. Copy button functions

Button	Function
Operate	<ul style="list-style-type: none"> • Sets Local Copy Mode as the default.
Stop/Clear	<ul style="list-style-type: none"> • Stops the current copy job and ejects the paper during copying. • Ejects paper during paper loading.
Copy	<ul style="list-style-type: none"> • The default setting for copying is B & W and 100%
Copy Mode	<ul style="list-style-type: none"> • Selects Grayscale, Black Text, or Color (Text & Graphics) • First press = LED shows current status • Multiple presses (within 5 sec.s) = moves up one setting each time • Example First time = Black Text LED activated (default) Second time = Grayscale LED activated Third time = Color Text & Graph LED activated Fourth time = Black Text LED activated
Enlarge/Reduce	<ul style="list-style-type: none"> • Selects reduce or enlarge • Default = 100% • First press = LED shows current status • Multiple presses (within 5 sec.s) = moves up one setting each time • Example First time = Enlarge/Reduce LED only (100%) activated (default) Second time = Enlarge/Reduce and 70% LEDs activated Third time = Enlarge/Reduce and 93% LEDs activated Fourth time = Enlarge/Reduce and 141% LEDs activated Fifth time = Enlarge/Reduce LED only (100%) activated

Table 1-17. Power-on functions for the Copy button

Button	Function
Copy	Prints a status sheet including firmware version and paper size.
Stop/Clear	Changes printout paper size during copying (see below).

To change the printout paper size during copying, press the Stop/Clear button until the appropriate indicator combination activates, as described below.

Table 1-18. Changing printout paper sizes during local copying

Paper size	Control Panel Indicators			
	Scanner Error	Color	Grayscale	Black Text
A4	on	on	off	off
Letter	on	off	off	on

1.4.2 Control panel indicates the printer's condition

PRINTER

Table 1-19. Printer Condition

Printer status	Indicators			
	Power	Ink Out (BK)	Ink Out (C)	Paper Out
Printing	Flashing	-	-	-
Ink charging	Flashing	-	-	-
Ink cartridge replacement mode	Flashing	-	-	-
Paper Out	Flashing	-	-	On
Paper jam	-	Off	Off	Flashing
No ink cartridge/ ink end black	-	On	-	-
Ink low black	-	Flashing	-	-
No ink cartridge/ ink end color	-	-	On	-
Ink low color	-	-	Flashing	-
Enter EEPROM and Timer IC reset	-	On	On (one second only)	
Maintenance request	Flashing	Flashing	On	On
Fatal error	Flashing	On	On	Flashing

"-" = does not matter

SCANNER

Table 1-20. Scanner Condition

Scanner status	Indicators		
	Power	Error	Priority
Lamp warming up	Flashing	-	1
Fatal error	-	On	1
Paper jam	-	On	2

"-" = does not matter

LOCAL COPY

Table 1-21. Copy Status

Scanner status	Indicators		
	Power	Error	Priority
Power on	On	-	3
Copying	Flashing	-	2
Scanner/Printer error Paper jam	-	On	1

"-" = does not matter

1.4.3 Initialization

PRINTER

There are three initialization methods.

1. Power-on (hardware) initialization

The printer initializes when turned on or when it recognizes the cold-reset command (remote RS command).

When the printer initializes, the following actions are performed.

- Initialize printer mechanism
- Clear input data buffer
- Clear print buffer
- Set default values

2. Operator initialization

The printer initializes when turned on, or when the printer recognizes the -INIT signal (negative pulse) from the parallel interface.

When the printer initializes, the following actions are performed.

- Cap the printhead
- Eject paper
- Clear input data buffer
- Clear print buffer
- Set default values

3. Software initialization

The ESC@ command also initializes the printer.

When the printer initializes, the following actions are performed.

- Clear print buffer
- Set default values

Table 1-22. Initialization

Operation	Operating	Standby	Controller process	Scanner process	Printer process	Restart
Power on	Valid	Valid	Set the local copy setting to default	H/W initialization	H/W initialization	-
Panel Reset	Valid	Valid		Controller initialization	Panel initialization	-
Initialize by command	Valid	Valid		S/W initialization	S/W initialization	-
STOP	Valid	-	Stop copying Setting remains as is	Cancel	Eject paper	Copy button
CLEAR	-	Valid	<ul style="list-style-type: none"> • Setting mode: default • Copy mode: Multi-copies volume 1 			

SCANNER

There are three initialization methods.

1. Hardware initialization

The scanner initializes when turned on.

When the scanner initializes, the following actions are performed.

- Initialize scanner mechanism
- Clear input/output data buffer
- Set default values

2. Operator initialization

The scanner initializes when it recognizes the -INIT signal (negative pulse) from the parallel interface.

When the scanner initializes, the following actions are performed.

- Clear input/output data buffer
- Set default values

3. Software initialization

The ESC@ command also initializes the scanner.

When the scanner initializes, the following actions are performed.

- Clear input/output data buffer
- Set default values

1.5 Stylus Scan Errors

PRINTER

Table 1-23. Printer Related Errors

Error	Cause	Solution
Ink out	When one or more ink cartridges are almost empty, the printer enters the low-ink state and continues printing. When the cartridge is completely empty, the printer indicates an ink-out error and stops printing.	Install a new ink cartridge.
Paper out	If the printer fails to properly load paper, it indicates a paper-out error.	Load paper and press the Load/Eject button.
Paper jam	If the printer fails to properly eject paper, it indicates a paper jam.	Press the Load/Eject button. If this does not clear the error, remove the paper by hand.
No ink cartridge	If the printer detects that one of the ink cartridges is not installed, it indicates a no-ink-cartridge error.	Install a new ink cartridge.
Maintenance request	When the total amount of waste ink reaches the limit, the printer indicates a maintenance request and stops printing.	Replace the waste ink pads.
Fatal error	A carriage control or CG access error has occurred.	Turn off the Stylus Scan and turn it back on. If the error does not clear, service.

NOTE: Do not re-install used ink cartridges. Doing so confuses the ink-level detection function and may cause a serious problem in the printhead.

SCANNER

Table 1-24. Scanner Related Errors

Error	Cause	Solution
Fatal error	<ul style="list-style-type: none"> The lamp is broken. System breakdown. Scanner fails to eject the document. (Disposition) 	Turn off the Stylus Scan and turn it back on. If the error does not clear, service. Turn off the lamp and stop operation. Set bit 7 of the status byte.??
Command error	Unidentified command detected. (Disposition) The scanner sent a NACK signal and is waiting for the next command. If an incorrect command or parameter is received, it is disregarded and the previous value is maintained.	Send a correct command to clear the error.

1.6 Physical Characteristics

1.6.1 Dimensions

228 x 437 x 279 mm (HWD)

1.6.2 Weight

7.5 Kg

1.6.3 External view

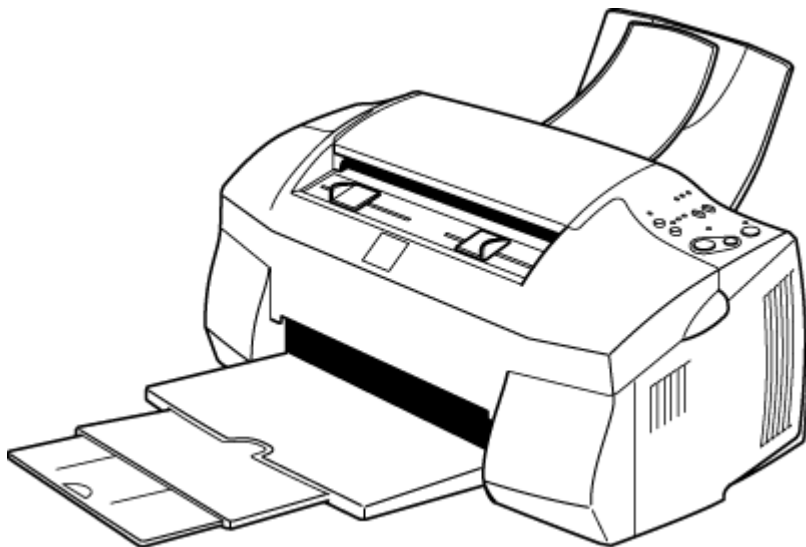


Figure 1-10. EPSON Stylus Scan 2000

CHAPTER

2

OPERATING PRINCIPLES

2.1 General

The main components of the EPSON Stylus Scan 2000 are the printer mechanism, scanner mechanism, and the following electronic boards;

Main:	B101 Main Board
Power Supply:	B101 PSB/PSE Board
Panel:	B101 PNL Board

2.2 Printer Mechanism Operation

Like previous EPSON Ink Jet printers such as the Stylus Color 740, the printer mechanism of the EPSON Stylus Scan 2000 does not have an exclusive mechanism to switch from paper feeding to pumping and back. Instead, this control is done by the rotational direction of the paper feed/pump motor and also depends on the position of the carriage.

The printhead combines the black and CMY heads in one unit. The following indicate the nozzle configurations of these 3 models.

- ❑ Black Nozzles: 144 nozzles (120 dpi x 3 rows in staggered)
- ❑ CMY Nozzles: 48 nozzles/colors (120 dpi x 1 row)

Table 2-1. Motor Types and Corresponding Functions

Motor	Type	Function	For details see
CR Motor	Stepping	Used to drive the carriage.	page 35
PF Motor	Stepping	<ul style="list-style-type: none"> • Drives the ASF to feed paper into paper path • Drives paper feed rollers at variable speeds • Drives the CR Lock lever (as described on page 40) • Drives pump unit to absorb ink 	page 37

Figure 2-1 in the right column shows the outline of the printer mechanism.

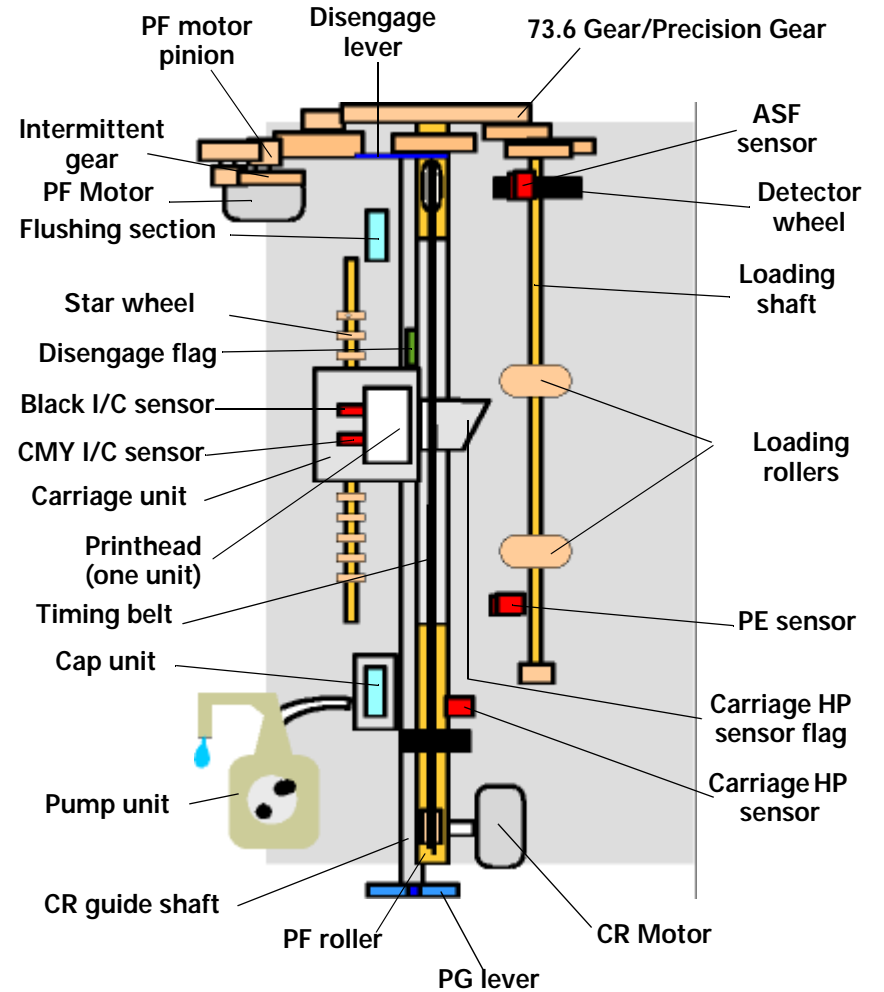


Figure 2-1. Printer Mechanism Block Diagram

2.2.1 Printing Mechanism

The basic principles of the printhead are the same as previous models; Drop-On-Demand type MACH head method.

You need to manually input the drive-voltage code (printed on top of the printhead) for the multi-layer piezo electric element. Input this value every time you replace the printhead, MAIN board, or printer mechanism.

The main parts of the printhead and carriage are described below.

- PZT
PZT is an abbreviation of Piezo Electric Element. The print signal is sent from the PSB/PSE board through the driver board on the printhead unit and to the PZT. Then, the appropriate PZT squeezes the cavity, forcing the ink stored in the cavity out through the nozzle. This process is described in more detail on the next page.
- Ink cavity
Ink flows from the ink cartridge, through the filter, and to the ink cavity where it is stored until one of the PZT units forces it out through the nozzles.
- Nozzle Plate
The bottom surface of the printhead which contains nozzle holes to direct ejected ink toward the paper below. See the next page.
- Filter
When the ink cartridge is installed, if any dirt or dust around the cartridge needles is absorbed into the inside of the printhead, there is a large possibility that the nozzles will clog. Clogged nozzles can be detected by alignment failure and dot-missing problems. To prevent these kinds of problems, a filter is set below the cartridge needle and ink flows through the filter on its way to the ink cavity.

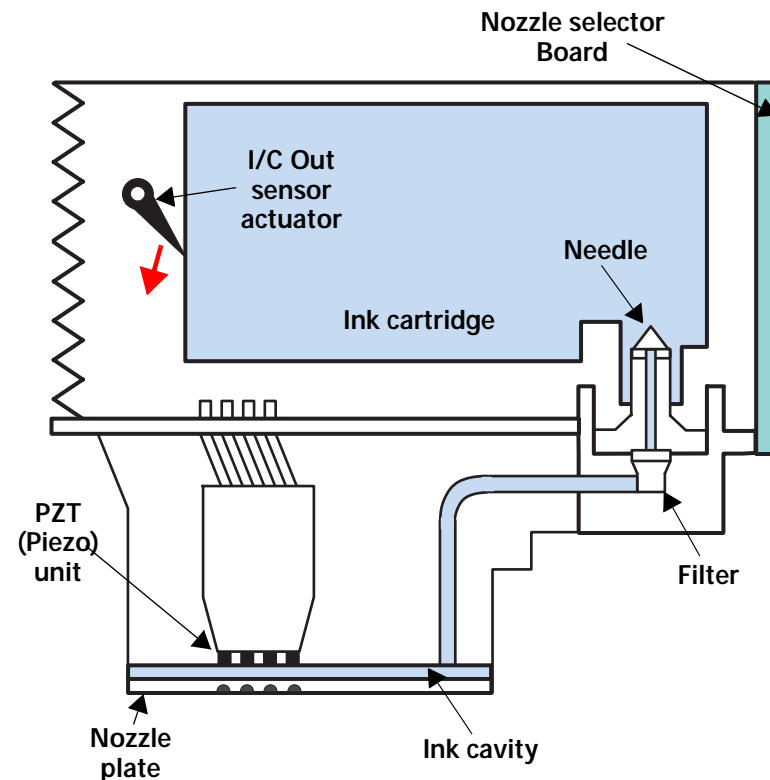


Figure 2-2. Printhead Sectional Drawing

- I/C Out sensor actuator
The I/C Out sensor detects whether or not an ink cartridge is installed according to the position of the I/C Out sensor actuator. When a cartridge is installed, the actuator is pushed down, which turns the shaft that is connected to the actuator. The flag at the other end of the shaft activates the I/C Out sensor when the cartridge is fully in place.

See the next page for more details on the nozzle selector board and the ink ejecting process.

2.2.2 Printing Process

The following figures show sectional drawings of the printhead in the normal and ejecting states.

1. Normal State:

When no print signal is output, the PZT is in the normal, standby, state.

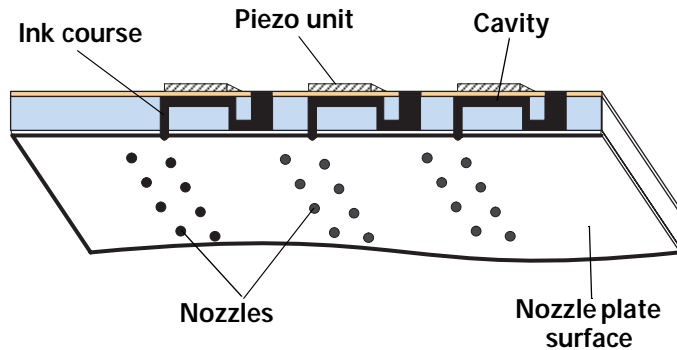


Figure 2-3. Printhead Normal State

2. Ejecting State:

When a print signal is sent from the MAIN board, the IC (Nozzle Selector) located on the printhead unit receives the data in 1-byte units. The Nozzle Selector then sends the voltage signal on to the appropriate PZT. Due to the physical properties of the PZT, electrical signals cause the PZT to change shape. When the PZT changes shape, it squeezes the ink cavity, ejecting ink out through the nozzles.

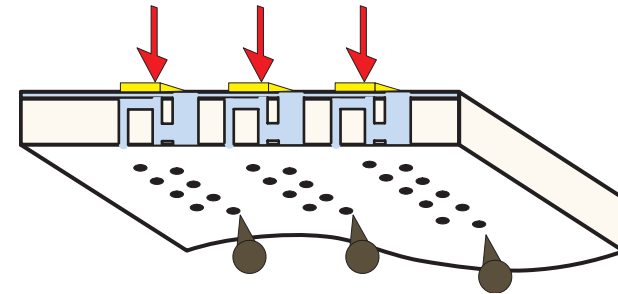


Figure 2-4. Printhead Ejecting State

2.2.3 Carriage Mechanism

The carriage mechanism moves the carriage back and forth according to the drive from the carriage motor. See Figure 2-6 on the next page.

The carriage motor is a 4-phase, 200-pole, stepping motor and is driven by 2-2 phase, 1-2 phase, Double 1-2 phase, 2-Double 1-2 phase, and 4-Double 1-2 phase drives. This stepping motor allows the carriage to move freely to fixed positions where necessary operations such as ink absorption can be performed. The following tables show carriage the motor specifications and motor controls.

Table 2-2. Carriage Motor Specifications

Items	Description
Motor type	4-Phase/200-pole Stepping motor
Drive voltage Range	42VDC ± 5%
Internal coil resistance	7.8 Ohms ± 10%(per phase under 25 °C environment)
Control method	Bi-Polar Drive

Table 2-3. Phase drive

Phase Drive	inch/pulse	mm/pulse
2-2	1/120	0.212
1-2	1/240	0.106
Double 1-2	1/480	0.053
2-Double 1-2	1/960	0.026
4-Double 1-2	1/1920	0.013

Table 2-4. CR Motor Control at Each Mode

Printing mode	Drive Speed [CPS]	Drive frequency [PPS]	Drive method
High Speed Skip	340	4080	Double1-2, 2-2,1-2 phase drive*
Normal Printing	200	2400	Double 1-2, 2-2 phase drive
Capping	80	960	2-Double 1-2, 2-2 phase drive
Wiping	40	480	2-Double 1-2, 2-2 phase drive
Cap (Valve Release)	20	240	4-Double 1-2, 2-2 phase drive
Withdrawal of cap	5	60	4-Double 1-2, 2-2 phase drive

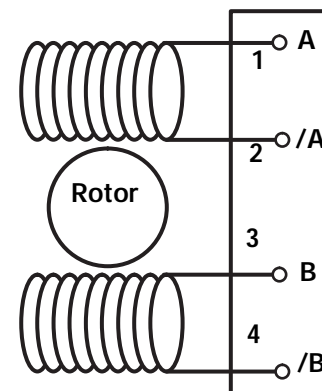


Figure 2-5. CR Motor Internal Circuit Diagram

PLATEN GAP LEVER

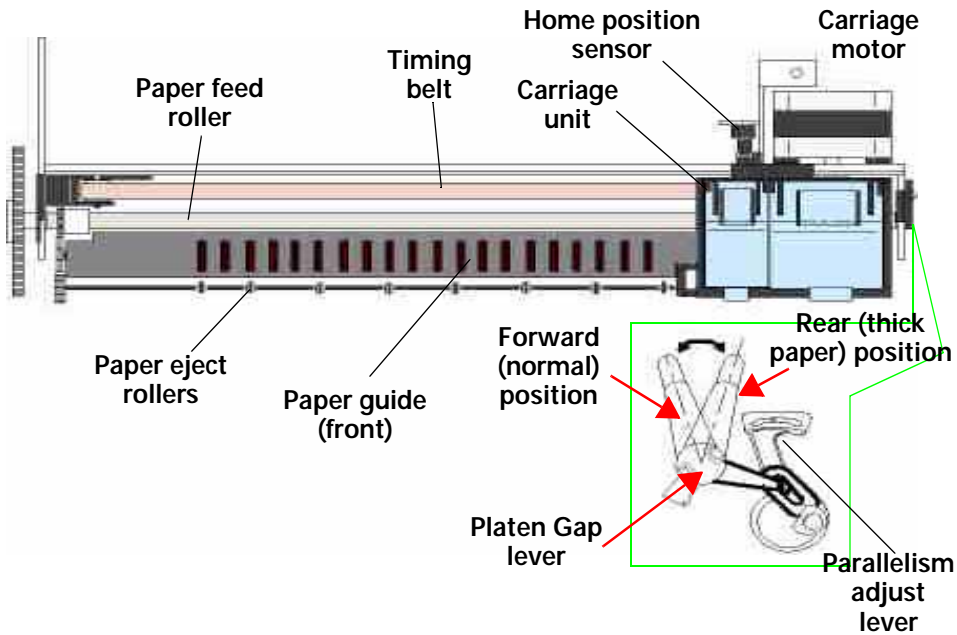


Figure 2-6. Carriage Mechanism with platen gap lever (Top view)

As shown in Figure 2-6, the Platen Gap lever can be moved forward or back to adjust for the thickness of the paper. The PG lever is connected to the carriage guide shaft, which raises or lowers the carriage depending on the PG lever position. The nozzle surface remains parallel to the paper in either position thanks to a tilt adjustment mechanism. Also, the two parallelism-adjustment levers, one mounted on each side of the carriage guide shaft, adjust the parallelism between the platen and shaft when the shaft is installed in the factory. This precise adjustment is necessary to make sure the gap between the platen surface and the printhead surface is 1.04 mm in the normal position or 1.74 mm in the thick-paper position.

2.2.4 Paper Feeding Mechanism

The paper feeding process begins at the ASF, continues through the PF roller, and ends at the paper eject roller (and star-wheel gear).

The ASF unit, which is common with the Stylus COLOR 740 printers, is driven by the PF motor (stepping motor). Torque sent from this motor switches between the ASF unit and pump/PF roller depending on the position of the disengage lever (described later).

In the EPSON Stylus Scan 2000, a four-phase hybrid type pulse motor is used in the PF motor as a motive power of the paper mechanism. The torque is sent at 2-Double 1-2, Double 1-2, 1-2, and 2-2 phase drives. This motor drives the paper-feeding mechanism as well as the pump mechanism which is necessary for printhead cleaning. By using this pulse motor, it becomes possible to use variable drive levels for many purposes, such as paper feed, slight paper feed, and high or low speed absorption of pump operations. The following table shows PF motor specifications.

Table 2-5. PF Motor Specifications

Item	Description
Motor type	4-phase/200-pole Stepping motor
Drive voltage	42VDC ± 5%
Coil Resistance	8.8 Ohm ± 10%(per 1 phase under 25°C environment)
Control method	Bi-Polar Drive
Phase drive	1-2, 2-2, Double 1-2, 2-Double 1-2

Table 2-6. Phase drive

Phase Drive	Inch/pulse	mm/pulse
2-2	1/720	0.035
1-2	1/1440	0.018
Double 1-2	1/2880	0.0088
2-Double 1-2	1/5760	0.0044

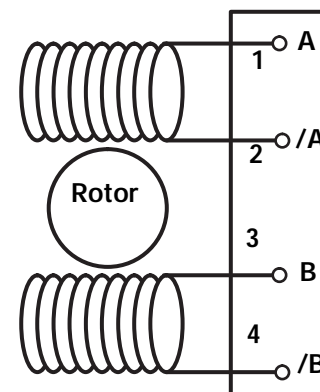


Figure 2-7. PF Motor Internal Circuit Diagram

Table 2-7. Print Modes and Drive Methods

Printing mode	Drive Speed [CPS]	Drive frequency [PPS]	Drive method
High Speed Skip	340	4080	Double 1-2, 2-2,1-2 phase drive*
Normal Printing	200	2400	Double 1-2, 2-2 phase drive
Capping	80	960	2-Double 1-2, 2-2 phase drive
Wiping	40	480	2-Double 1-2, 2-2 phase drive
Cap (Valve Release)	20	240	4-Double 1-2, 2-2 phase drive
Withdrawal of cap	5	60	4-Double 1-2, 2-2 phase drive

Drive from the PF motor is sent to the PF rollers and paper eject rollers as described below.

- To the PF rollers:
PF motor pinion gear (CCW rotation) → Gear 73.6 → PF rollers
- To the eject rollers:
PF motor pinion gear (CCW rotation) → Gear 73.6 → Combination gear (13.5, 30.8) → Spur gear (28) → Paper eject rollers

NOTE: Above CCW rotation is mentioned viewing from the PF motor pinion gear side.

Figure 2-8 shows a paper feeding mechanism block diagram, which includes the parts along the PF motor drive-transmission paths.

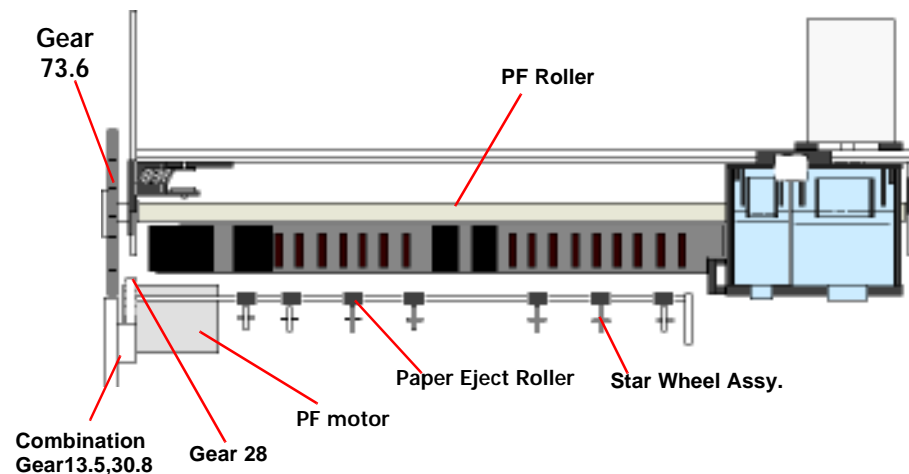


Figure 2-8. Paper Feeding Mechanism (Top View)

The printer feeds paper from the ASF (when the PE sensor located near the carriage motor detects paper is loaded) through the paper path and stops feeding when the paper's leading edge reaches the halfway point of the front paper guide. To correct for any misfeeding, the paper is fed back toward the ASF a predetermined number of steps and then it is fed forward again until it reaches the top-of-form position.

Once the printer starts printing, it advances paper using the PF rollers and subrollers until it reaches the last 14mm of the paper, when it advances the paper using the star wheel gear and paper eject rollers.

Torque sent from the ASF/Pump motor to the ASF unit via the disengage mechanism is used for the following operation.

MULTI-FEED PREVENTION MECHANISM

Like the Stylus COLOR 740 ASF, the ASF built in the Stylus Scan has the multiple-paper-feeding-prevention mechanism to provide accurate and consistent paper feeding. This mechanism prevents a sheet of paper from falling from the paper set position into the paper path. A paper return lever in the mechanism pushes paper that may have fallen off back onto the hopper. After this motion is completed, the LD roller starts loading paper. The multiple-paper-feeding-prevention operation is described in the following steps.

1. When the printer power is turned on, the ASF/Pump motor rotates counterclockwise to detect ASF home position. Then the motor rotates clockwise specified steps to set the LD roller and paper return lever to their proper positions. (See "Standby State" in Figure 2-9.)
2. When the paper loading signal is sent from the PC or the Load/Eject button is pressed, the PF motor turns counterclockwise to let the LD roller load paper. (See "Paper Pick Up State" in Figure 2-9.)

3. Due to the design of the ASF, the LD roller loses friction on the paper and stops at the point where the paper is fed by the PF roller. (See "PF Roller Paper Feed State" in Figure 2-9.)
4. When the next print signal is sent or the Load/Eject button is again pressed, the PF motor rotates clockwise a specified number of steps to set the LD roller and the paper return lever in place. (See "Standby State" in Figure 2-9.)

NOTE: If no print signal is sent for a predetermined number of seconds in step 4, the LD roller and the paper return lever automatically return to the standby state.

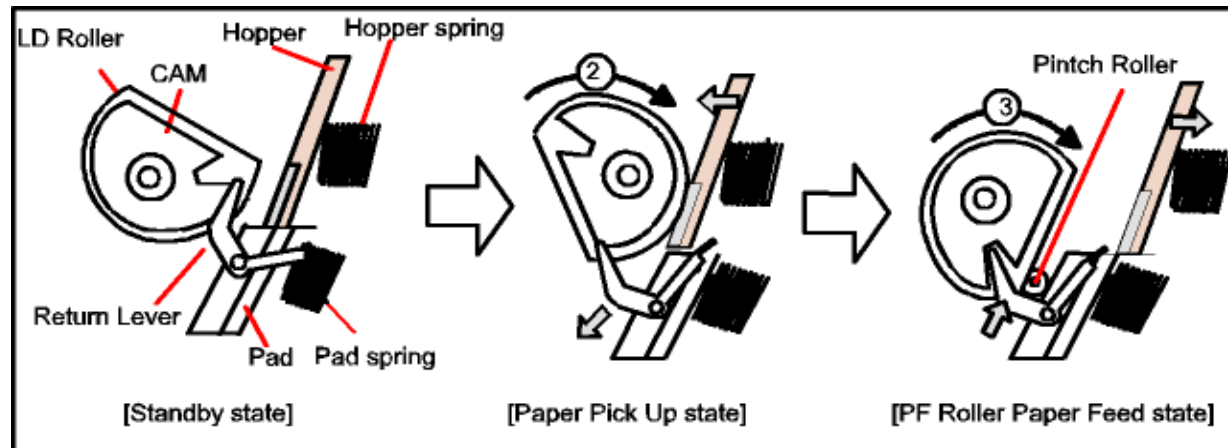


Figure 2-9. Multiple Paper Loading Prevention Mechanism (right side view)

SMALLER TRAILING-EDGE MARGIN

Like the Stylus COLOR 740, this model uses a new design to allow printing up to the last 3mm by changing the design and position of the star-wheel gear. The star-wheel gear assembly has been shifted 5 degrees from directly on top of the eject rollers towards the front paper guide. This change suppresses the tailing edge of the paper so that the old minimum margin of 14mm has been reduced to only 3mm.

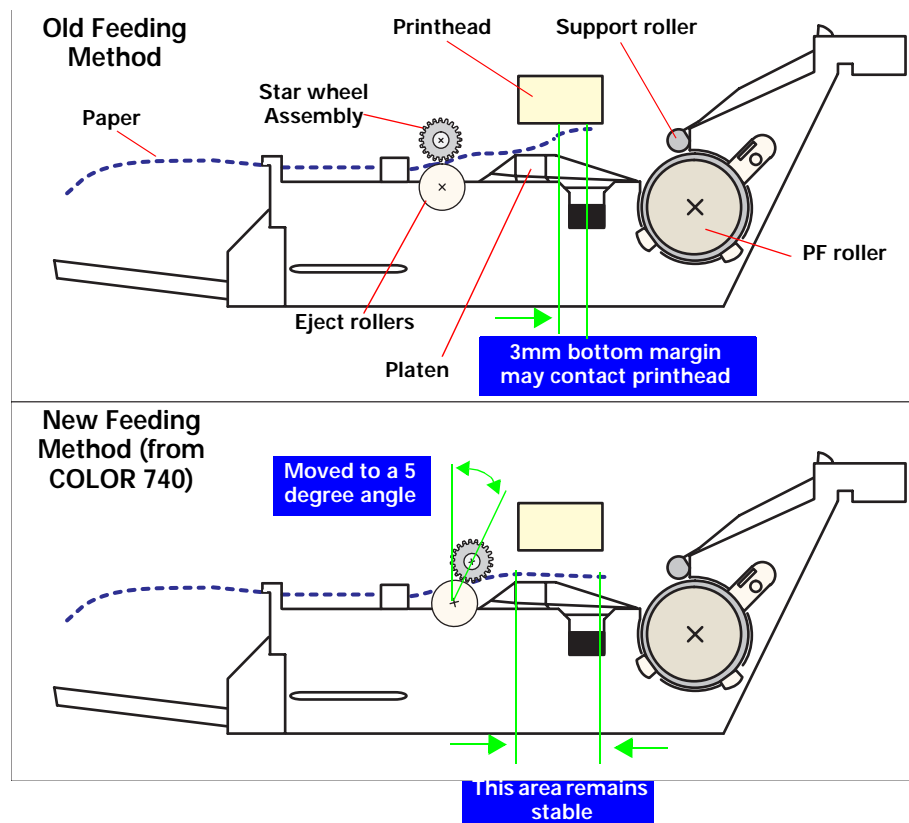


Figure 2-10. 3mm improved margin (viewed from right side)

CARRIAGE LOCK MECHANISM

The carriage lock mechanism prevents the carriage from being left at an uncapped position for a long time which can occur due to user mistakes, physical shock, vibration during transport, and so on. The CR lock mechanism is driven by the stepping PF motor. See Table 2-5, "PF Motor Specifications," on page 37 for motor specifications.

The PF motor controls the CR lock mechanism as well as the PF mechanism depending on the direction of the PF motor rotation. The CR lock mechanism is located at the right end of the paper eject roller.

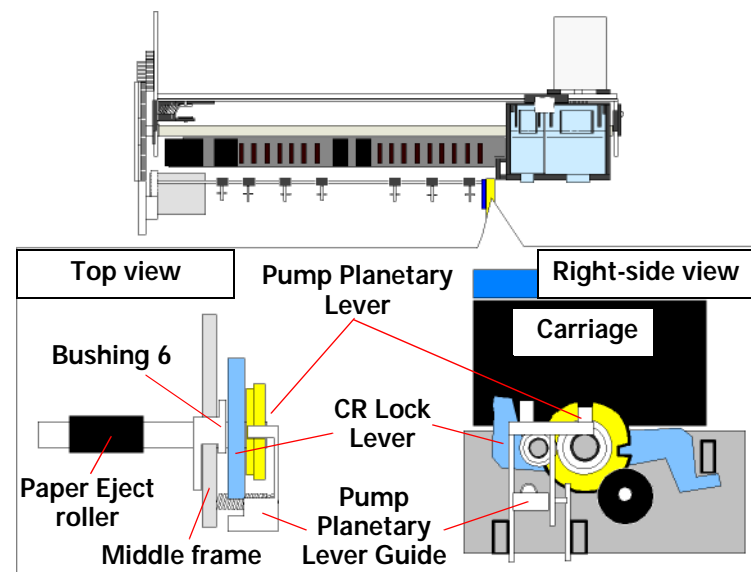


Figure 2-11. CR Lock Mechanism

While the PF motor drive is used for paper feeding (PF motor rotation = CCW), the CR Lock Lever is set under the Paper Eject Frame. But the CR Lock lever rises up and locks the carriage when the PF motor rotates CW.

The PF motor drive is sent to the CR Lock lever via the Paper Eject roller.

PF Motor pinion gear (CW rotation) → Gear 73.6 → Combination gear → Gear 28 → Paper Eject Roller → CR Lock Lever

If the carriage is left uncapped for a long time, ink on the printhead surface gradually thickens and may clog the nozzles. In some cases, the nozzles may be so thoroughly clogged that they cannot be cleared even after performing multiple cleaning operations.

To prevent clogged nozzles, the printer caps and locks the carriage in the following conditions.

- **Power off sequence:**
When power is turned off, even during printing, the printer caps and locks the carriage at the end of the power-off sequence.
- **Power on sequence:**
When power is turned on, the printer automatically performs an automatic (power-on) cleaning cycle and then caps and locks the carriage.

NOTE: The power-on cleaning cycle is an automatic head cleaning sequence that is performed every time the power is turned on. The timer IC, which is powered by the lithium battery, measures the length of time the printer has been off. The printer selects and performs the appropriate cleaning operation according to the length of time it has been off.

- **Paper eject sequence:**
When the Load/Eject button is pressed, the printer ejects any paper in the paper path. If no print data is received at this time, the printer caps and locks the carriage and then enters the standby mode. However, if no paper is in the paper path when the Load/Eject is pressed, the printer loads a sheet and does not lock the carriage.

PF motor torque is always transmitted to the CR lock lever side, but the operation of the CR lock mechanism varies depending on the rotation direction of the motor.

Clockwise = sets the carriage lock lever
Counterclockwise = releases the carriage lock lever

PAPER PICK UP OPERATION

When the Load/Eject switch is pressed or printing order is input, the carriage unit moves until the left edge and collides with paper pick up trigger lever. When the carriage collides with this trigger level, a planetary gear located on the same axis is also pushed at the same time and conveys the motive power on the platen to the adjoining gear line side for ASF drive.

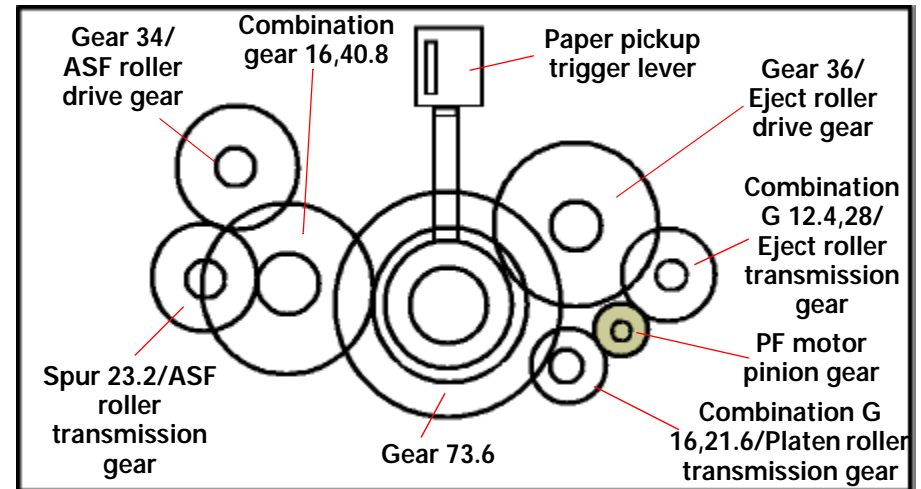


Figure 2-12. Paper Pickup Mechanism

2.2.5 Ink System

Ink system mechanism consists of 1) cap mechanism, 2) pump mechanism, 3) carriage lock mechanism, 4) waste ink absorber and 5) ink sequence. Out of these mechanisms, 1) to 4) are physical mechanism and parts which are mounted on the printer mechanism and 5) the ink sequence is performed automatically by the firmware. The EPSON Stylus Scan 2000 has no engage/disengage mechanism, meaning the pump and platen are always at work when the PF motor operates. The figures below show printhead positions when the ink system and various ink-pumping sequences are performed.

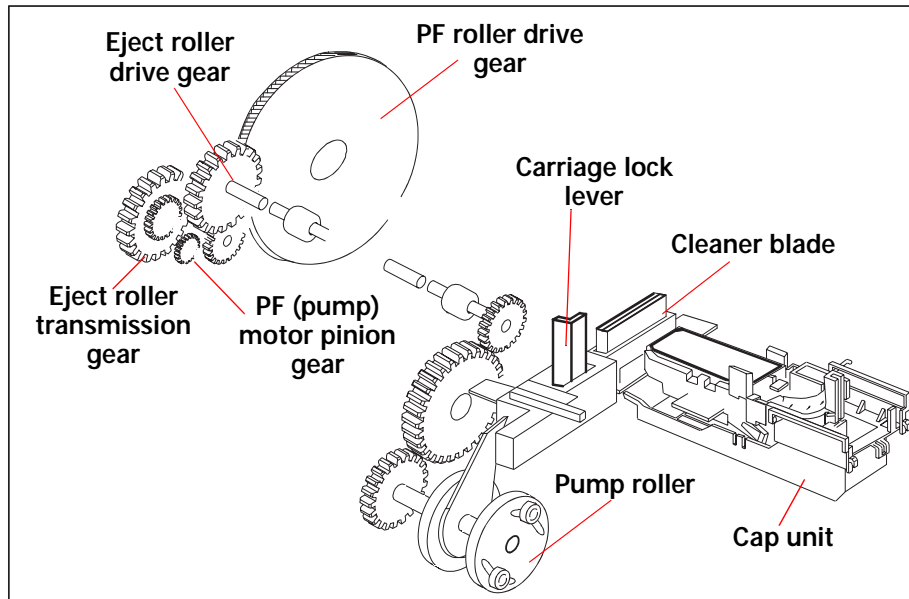


Figure 2-13. Ink System Mechanism

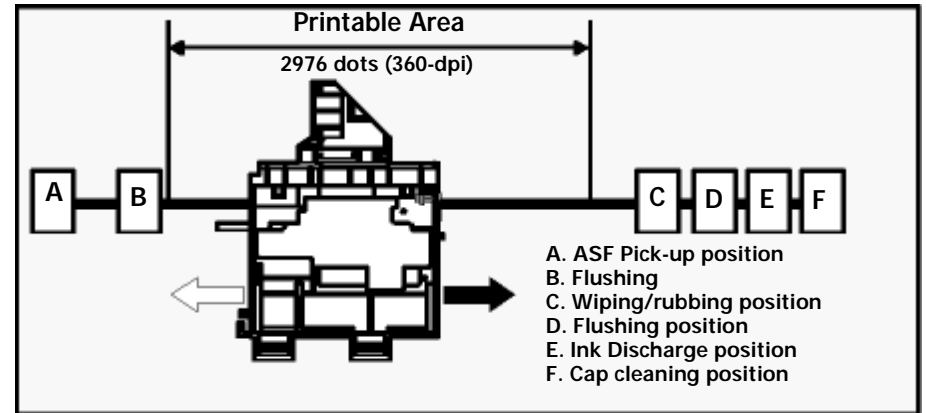


Figure 2-14. Major Ink Sequence Positions on Carriage

2.2.6 Pump, Carriage Lock, Head Cleaner Mechanism

In the EPSON Stylus Scan 2000, there is no switch or mechanism to switch between the ink pump and paper feed operations. Therefore, whenever the paper feed/pump motor rotates, the pump-drive roller inside the pump unit rotates. However, the rotational direction of the rollers determines whether or not the pump sucks ink. Also, even if the pump rotates in the ink-absorption direction, ink is not absorbed if the carriage is in the false-absorption position. Figure 2-13 shows process of conveying motive power to the pump drive roller.

The process of conveying the motive power to the paper eject roller is shown in Figure 2-15. This motive power is conveyed to Gear C through Gear B. The lever that drives Gear C, the carriage lock, and the head-cleaner mechanism is shown separately but it is constructed as one unit. Since the engagement of these parts depends on the tension of the compression spring, if the lever is burdened, only Gear C and the pump roller rotate and no more motive power is conveyed to the lever part.

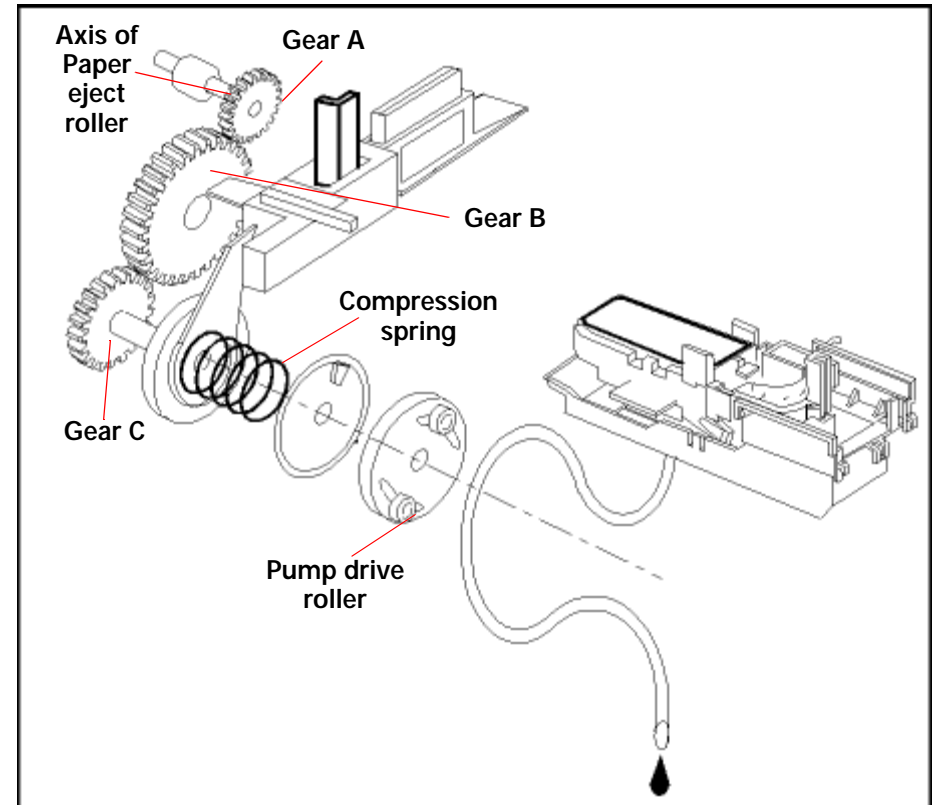


Figure 2-15. Pump Mechanism Power Transmission Process

The table below shows PF/Pump motor rotational direction and pump system operation.

Table 2-8. Pump Motor Rotation and Operation

PF motor pinion gear rotation (looking at gear surface)	Pump unit operation
Clockwise (CW) forward rotation	1) Release the tubes 2) Disengage Head Cleaner 3) Disengage carriage lock
Counterclockwise (CCW) backward rotation	1) Squeeze tubes to pump ink 2) Engage Head cleaner 3) Engage carriage lock

Refer to Figure 2-16 in the right column which shows the pump operations at clockwise and counterclockwise rotation.

During ink-absorptive operations such as cleaning and flushing (but not during normal printing), ink drains from the ink cartridge to the waste-ink pads through the cap. During printing and flushing, ink is fired out of the nozzles by the PZT. But during absorption operations the head is capped and ink is sucked off the nozzle plate by the force of the vacuum created by the pump drive and the PZT does not move.

Table 2-9. Pumping modes

Pump Mode	Revolutions	Absorption
Low speed	0.38rev/second	0.06ml/second
Regular absorption	1.3 rev/second	0.2ml/second
High speed	2.6rev/second	0.4ml/second
Super high speed	3.38rev/second	0.54ml/second

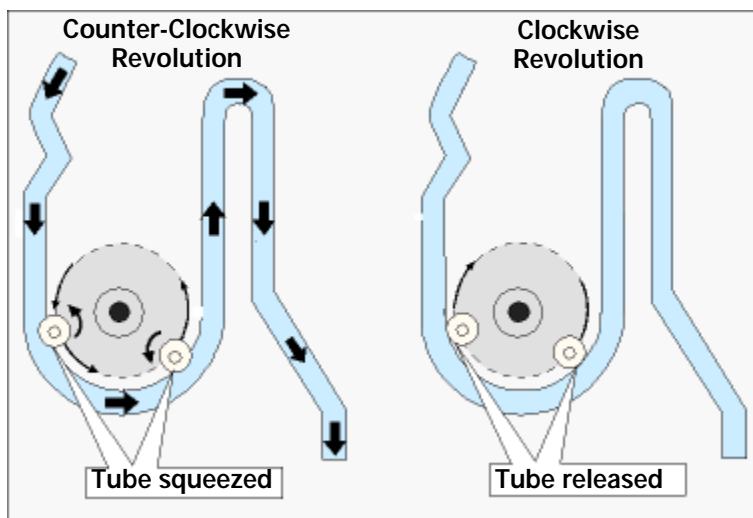


Figure 2-16. Pump Roller Rotation and it's Operation

2.2.6.1 Cap Mechanism

The cap mechanism prevents ink from thickening and sticking on the head surface when the printer is not in operation and it also plays a part in cleaning the printhead. During the power-off sequence, the printhead moves to the right where the head surface and cap come into contact, and the head surface contacts the rubber frame of the cap surface until the power is turned back on.

An absorber pad is spread in the cap and can hold a certain amount of ink which is absorbed from the head without draining it to the waste ink pad. Also, below the absorber pad, there are two valves that control the adhesion pressure between the head and cap surface. There is also one exit and tube to drain ink to the waste ink pads.

Position A

When the carriage is out of the HP (for example in the printable area or paper feed position), the valves on the cap mechanism stay in Position A (closed) as shown to the right.

Position B

When the carriage returns to the right, it catches the carriage flag on the cap mechanism. This raises the cap to meet the head surface. This position is used for head cleaning because the valves are still closed but the rubber around the cap traps air, so when the pump sucks air away from the cap, a vacuum is created and ink is sucked away from the head surface. Ink absorption and slight ink absorption are performed in Position B.

Position C

By moving the carriage a little further to the right, the frame flag on the cap mechanism contacts the frame and the air valve opens. When the carriage is in this position and the pump sucks air, no ink is absorbed from the head surface but ink left in the absorber pad in the cap is drained.

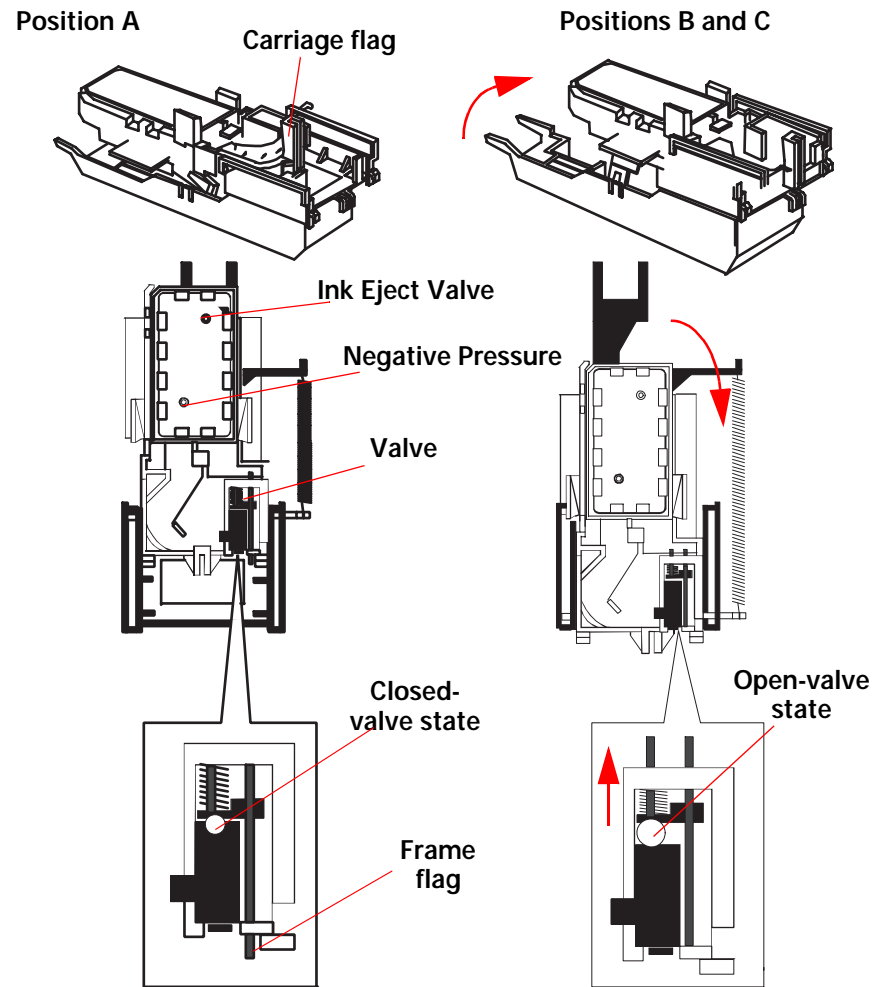


Figure 2-17. Cap mechanism and valve operation

2.3 Scanner Mechanism Operation

2.3.1 Mechanism

The figure below describes how the light reflected off the document passes through the lens and reaches the CCD and how the CCD reproduce an image. The CCD reads the light, converts light into various analog data according to the strength of the light, and sends this various analog data to the MAIN board. The analog data received by the MAIN board is converted into digital data, and after being processed, the digital data is sent to the host.

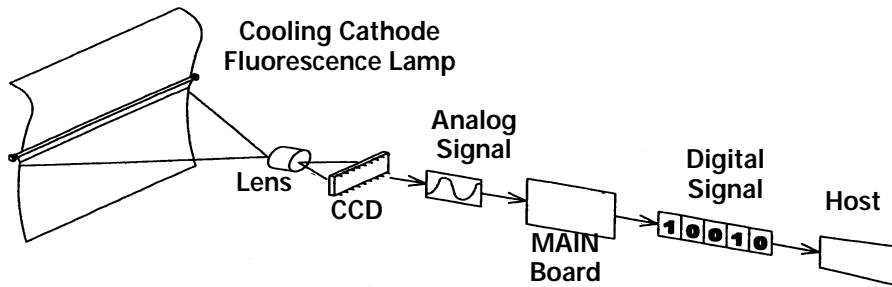


Figure 2-18. Scanner Operating Principle

2.3.1.1 Video Circuit

The video circuit of the scanner mechanism has a CCD drive circuit and a CCD signal process circuit.

1. CCD drive circuit
The CCD drive circuit generates the appropriate signal for the CCD so that the CCD can accurately read the image.
2. CCD signal process circuit
The CCD signal processor contains the circuits that are necessary for adjustment and sampling of the three channels. Each signal from CCD goes through CDS (correlated double sampling) to PGA (programmable gain amplifier). Each R, G, B signal, after having gone through PGA, is selected by multiplexer, converted from analog data to digital data by 10-bit A/D Converter (ADC), and then is output to the B101 MAIN board.

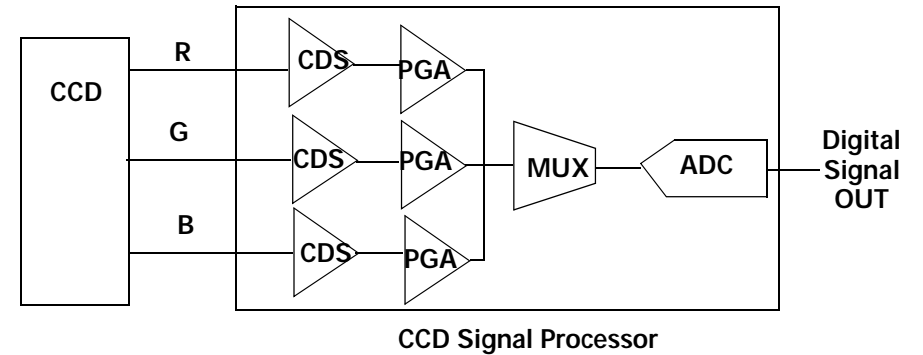


Figure 2-19. CCD Signal Process Circuit

2.3.1.2 Scanner ASF Sensor Input

Sensor Input includes the ASF paper edge sensor.

The leading edge of the paper is loaded by hand through the front paper edge guides. When the paper enters the scanner feed path, it pushes the sensor flag which activates the ASF paper edge sensor. The ASF motor then feeds the paper roughly a quarter of an inch.

2.4 Local and PC-Centric Copy Principles

This section covers the main differences between Local Copy and PC-Centric Copy operations.

- Local Copy = Scan and print the scanned document using only the Stylus Scan processing power. Can be connected or not connected to a computer.
- PC-Centric Copy = Scan, process the scanned document in the open application, and print from the application.

2.4.1 Local copy process

Scan > gamma curve > color matching table > print

1. The scanner scans at 300 dpi.
2. The image data is processed through the gamma curve to remove the background color of plain paper.
3. The color matching table is consulted to convert RGB to CMYK.
4. The printer prints at 360x360dpi and color is composite black.

Table 2-10. Stylus Scan 2000 Local Copy

Mode	Setting	Scan Res. dpi	Print Res. dpi	Media
B/W	LineArt	300	360x360	Plain Paper
B/W	Grayscale	300	360x360	Plain Paper
Color (CMY only)	Color	300	360x360	Plain Paper

2.4.2 PC-Centric copy process

PC-Centric Copy Settings

Mode	Setting	Scan Res. dpi	Print Res. dpi	Media
Text	Normal	240	Speed	All
	Fine	360	Quality	All
Text & Image	Normal	240	Speed	All
	Fine	360	Quality	All
Photo	Normal	240	Speed	All
	Fine	360	Quality	All
OriginalColorCopy	Normal	240	Speed	All
	Fine	360	Quality	All

2.4.2.1 Normal PC-Centric copy

Scan > gamma curve > image enhancement > color matching table > print

1. The scanner scans at 300 or 600 dpi, but EPSON TWAIN calls for 240 or 360 dpi image data (to match printer resolution).
2. The image data is analyzed to remove the background color of paper and to remove any image from the reverse side of the paper.
3. The image is improved; edges are sharpened, characters smoothed out, moire removed (usually - see original color copy below), and a feature similar to PhotoEnhance is used to improve quality.
4. The color matching table is consulted to convert RGB to CMYK.
5. The print resolution varies according to media type; same as Speed vs. Quality slide bar in the printer driver.

2.4.2.2 Original color copy

Scan > OriginalColorCopy > color matching > print

1. The scanner scans at 300 or 600 dpi, but EPSON TWAIN calls for 240 or 360 dpi image data (to match printer resolution).
2. The image data is not analyzed or modified.
3. The LUT is consulted to convert RGB to CMYK.
4. The print resolution varies according to media type; similar to the Speed vs. Quality slide bar in the printer driver.

2.5 Electrical Circuit Operating Principles

EPSON Stylus Scan 2000 contains the following three electric circuit boards.

- Main: B101 Main Board
- Power Supply: B101 PSB/PSE Board
- Panel: B101 PNL Board

Refer to Figure 2-20 for the major connection of the 3 boards and their roles.

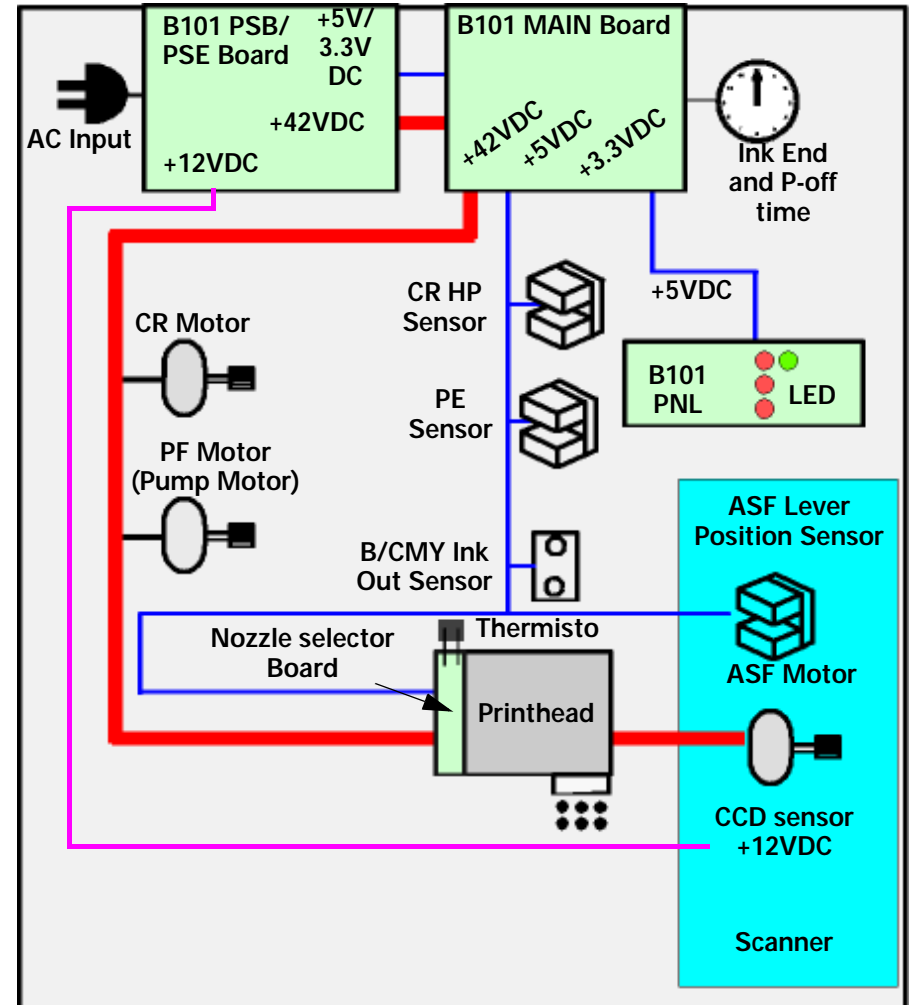


Figure 2-20. Electric Circuit layout

2.5.1 B101 PSB/PSE Board

The power supply board for the EPSON Stylus Scan 2000 generates +42VDC to drive the motors, +12VDC to power the lamp, +5VDC to power sensors/ printer logic, and +3.3VDC for some printer logic. The table below shows how the voltages are applied.

1. Even if the power button is pressed during the middle of a print job, the actual driving power is cut off thirty seconds later; after the carriage goes back to the carriage lock position to prevent clogged nozzles.
2. If power is turned off while paper is being fed in the printer, the same operation mentioned above is performed and the driving power is turned off after the paper is completely ejected. The time allowed is approximately 30 seconds, meaning voltage is flowing for 30 seconds after the power is turned off.

Table 2-11. Application of DC Voltage

Voltage	Application	
	Printer	Scanner
+42VDC	<ul style="list-style-type: none"> • CR Motor • PF/Pump Motor • Printhead drive 	
+12VDC		ASF motor Inverter board CCD sensor board
+5VDC	Common Control circuit Sensors (CR HP, PE, ASF) Control panel Printhead control	
+3.3VDC	Control circuit	

Figure 2-21 shows a block diagram of power supply board. The process from the input of AC voltage to the output of DC voltage is explained in the following pages.

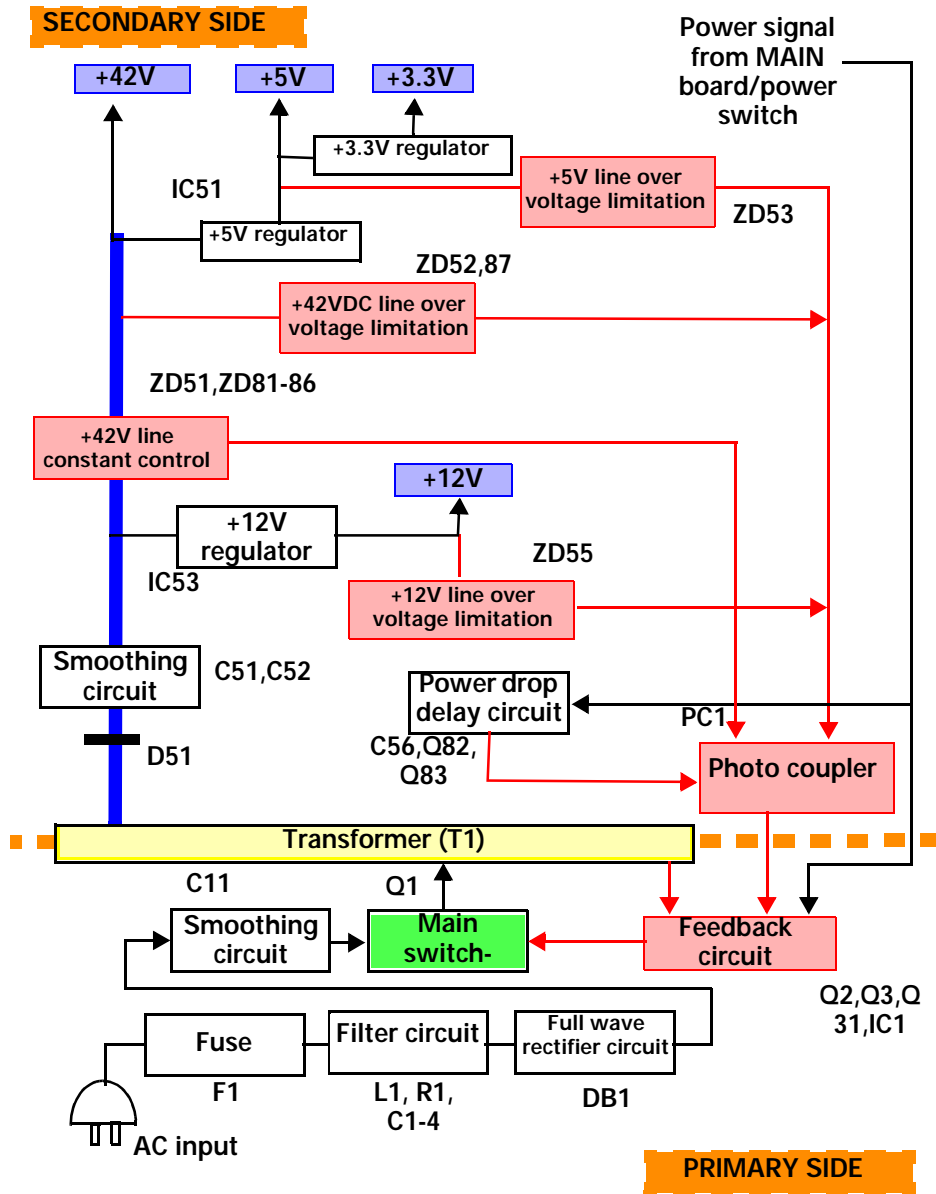


Figure 2-21. B101 PSB/PSE Board Block Diagram

1. As long as the AC plug is plugged into a power source, voltage flows through the primary side (bottom in figure above) of the power supply board.
2. The fuse prevents damage to the power supply board in case the current is too strong.
3. The filter circuit acts to filter incoming electrical noise and to smoothen the electrical current.
4. The full wave rectifier circuit converts AC to DC.
5. The smoothing circuit stabilizes out the DC wave.
6. The main switching circuit controls the flow of current to the transformer (hence to the entire secondary side). The main switching circuit, transformer, and feedback circuit work in combination like the heart, lungs, and brain (respectively) of the human body. The main switching circuit is the variable-flow generator like the heart, the transformer convert the power to a usable form like lungs adding oxygen to blood, and the feedback circuit controls the flow like the brain controlling the heartbeat/pulse.
7. The transformer receives approximate 100V or 220V DC (depending on the model) current and steps the current down before sending it out to the secondary side.
8. The current is stabilized as it goes through another smoothing circuit.
9. The +12V, +5V, and +3.3V regulators control the flow of current so that only the rated voltage flows through each regulator.
10. The +42V, +12V, and +5V line over-voltage limitation protectors monitor their individual lines for any voltage over the rated amount. If over-current is detected, a signal is sent to the photo coupler to decrease current.
11. The +42V line constant control is similar to a regulator in that it is always working, but instead of fixing the current it reports over-current to the photo coupler.
12. The photo coupler communicates over-current problems to the feedback circuit by means of a photo emitter. A photo emitter is used to make sure that currents between the primary side (AC as well as DC) and secondary side (DC only) do not mix and short the board.

13. The feedback circuit 1) receives over-current information from the photo coupler by means of a photo receiver 2) monitors the transformer for over-current and 3) receives power-supply information/commands from the MAIN board and power switch. The feedback circuit slows down the voltage sent from the main switching circuit to the transformer when necessary.
14. The power-drop delay circuit is a thirty-second timer that makes sure there is enough time to complete the power-down sequence after power is turned off.

2.5.2 B101 MAIN Board

The B102 MAIN Board controls the printer, scanner, copy function, pumping, paper feeding, and all signals to/from the control panel unit. The following figure shows the MAIN Board circuit diagram for EPSON Stylus Scan 2000.

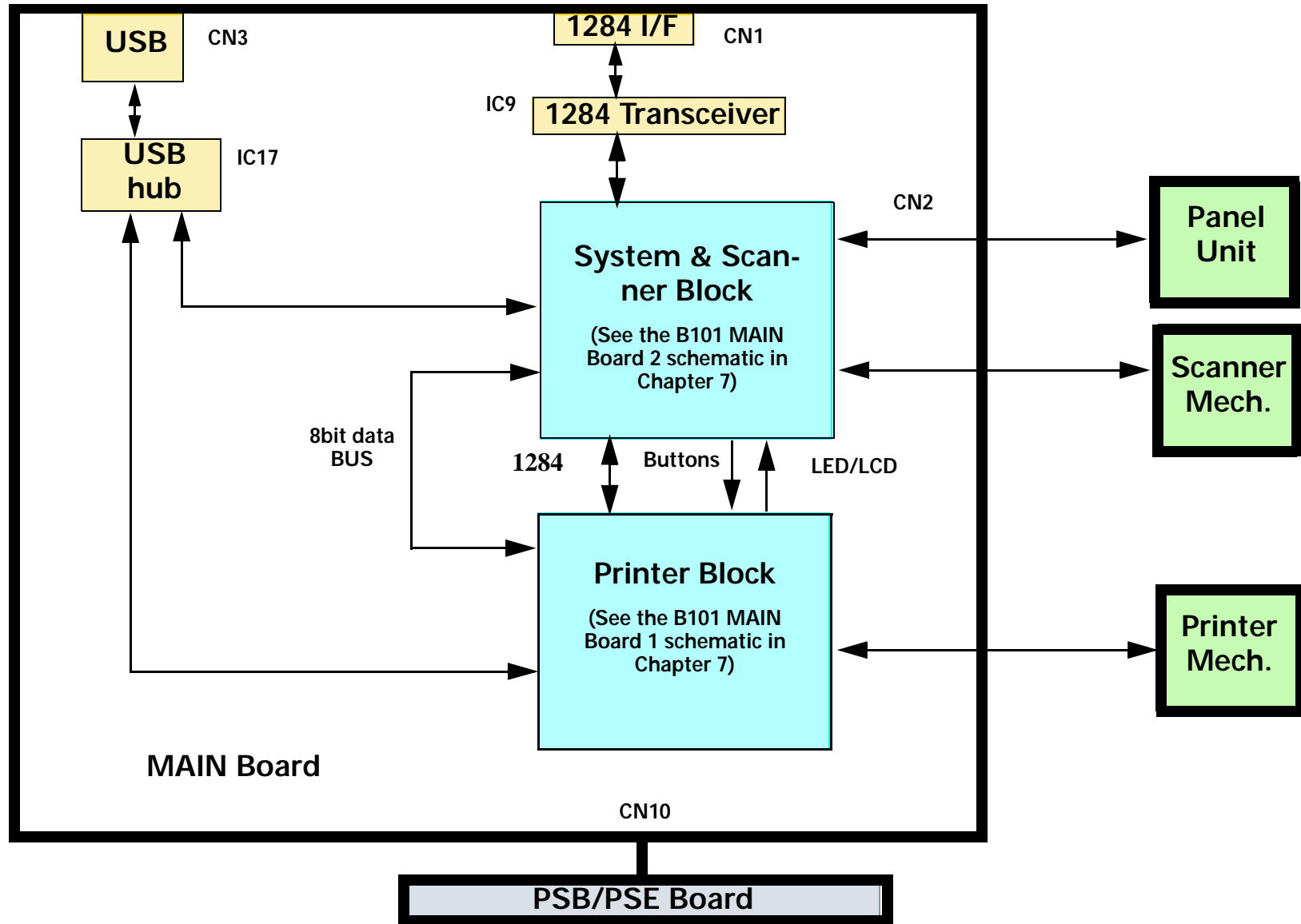


Figure 2-22. B101 Main Board Block Diagram

The System & Scanner Block

The System & Scanner Block is all of the ICs that handle image data from the scanner. Also this block handles all control/communication signals sent to and from the Control Panel unit.

The Printer Block

The Printer Block is all the ICs that handle print data and communication data to and from the print mechanism. The print data can come through the USB or parallel port, and communication can be with the print mechanism, System & Scanner Block, or host. One example of communication data from the System & Scanner Block would be a paper feed signal generated when the user presses the Paper Feed button.

The USB hub

There are actually two USB interfaces (one for each IC block) on this model plus the USB hub. The hub receives incoming signals or data and determines which IC block to send the data to.

CHAPTER

3

TROUBLESHOOTING

3.1 Unit Level Troubleshooting

When a problem occurs, you can identify the defective unit according to the symptoms exhibits. The table below lists the symptoms of certain problems. Once the problem is identified, refer to the flowchart that corresponds to the problem.

The following flowchart illustrates the main steps of the troubleshooting process.

NOTE: There is a special section for motors and sensors that starts on page 69.

Table 3-1. Printer Condition and Panel Status

Error Status	Indicators				Recovery
	Power	Ink out (Black)	Ink Out (Color)	Paper Out	
Paper Out	---	---	---	On	Load paper by pressing the load/eject button.
Paper jam condition	---	Off	Off	Flash	Eliminate a paper then press the load/eject button.
No Ink cartridge or Ink end (black)	---	On	---	---	Install a new black ink cartridge by pressing the load/eject button for 3 seconds.
No Ink cartridge or Ink end (color)	---	---	On	---	Install a new color ink cartridge by pressing the load/eject button for 3 seconds.
Maintenance request/ Service Call	Flash	Flash	Flash	Flash	Change the waste ink drain tank and reset the EEPROM.
Fatal error	Flash	On	On	Flash	Turn the printer off and on again. If the printer does not recover, repair the appropriate part.

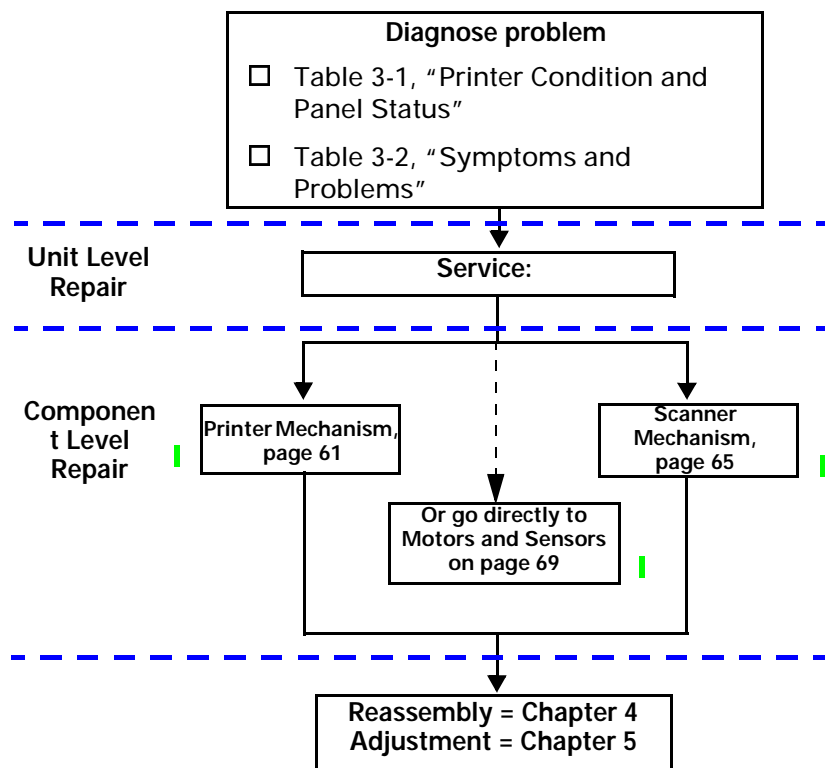
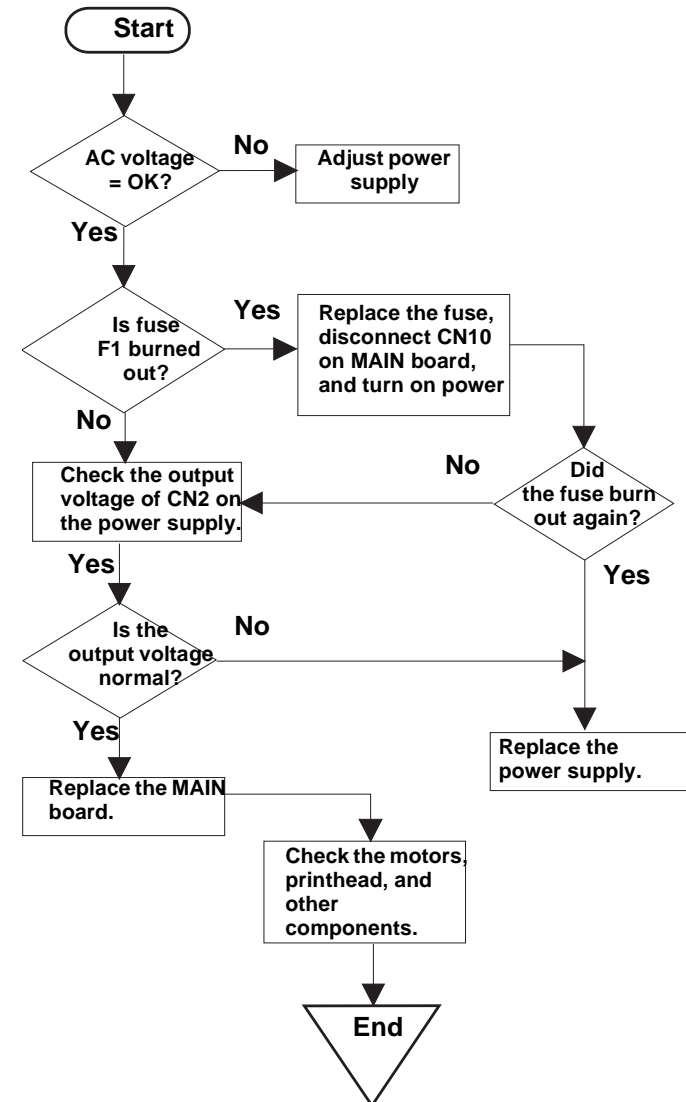


Figure 3-1. Troubleshooting Process Flowchart

Table 3-2. Symptoms and Problems

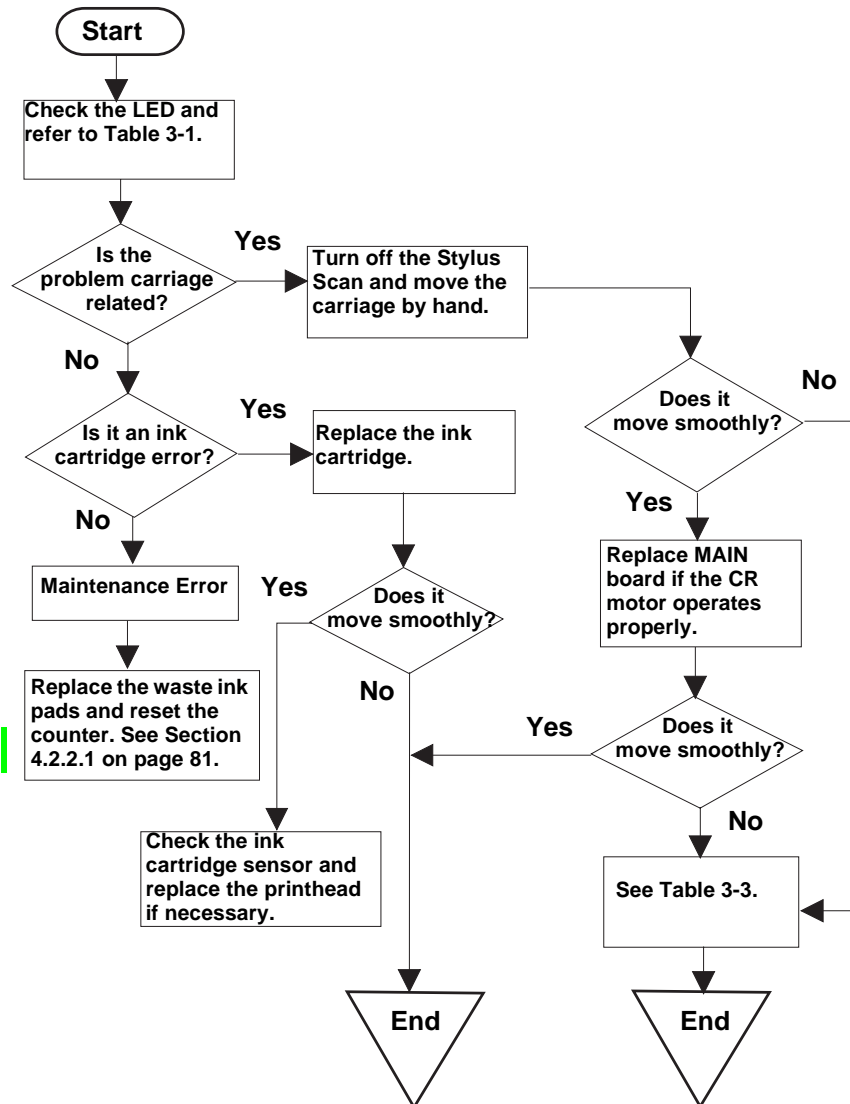
Symptom	Problem	Flowchart No.
Printer does not operate at power on.	LEDs do not light. Printer mechanism does not operate.	Flowchart 3-1
Error is detected	Error is indicated by LED indication.	Flowchart 3-1
Failure occurs during printing.	Printing is not performed. Abnormal printing (missing dot, etc.) Print quality is poor.	Flowchart 3-1
Printer does not feed paper correctly.	No paper is fed. Paper feed is irregular. Paper jam occurs.	Flowchart 3-1
Control panel operation is abnormal.	No response to button access.	Flowchart 3-1

3.1.1 Printer/Scanner does not operate at power on



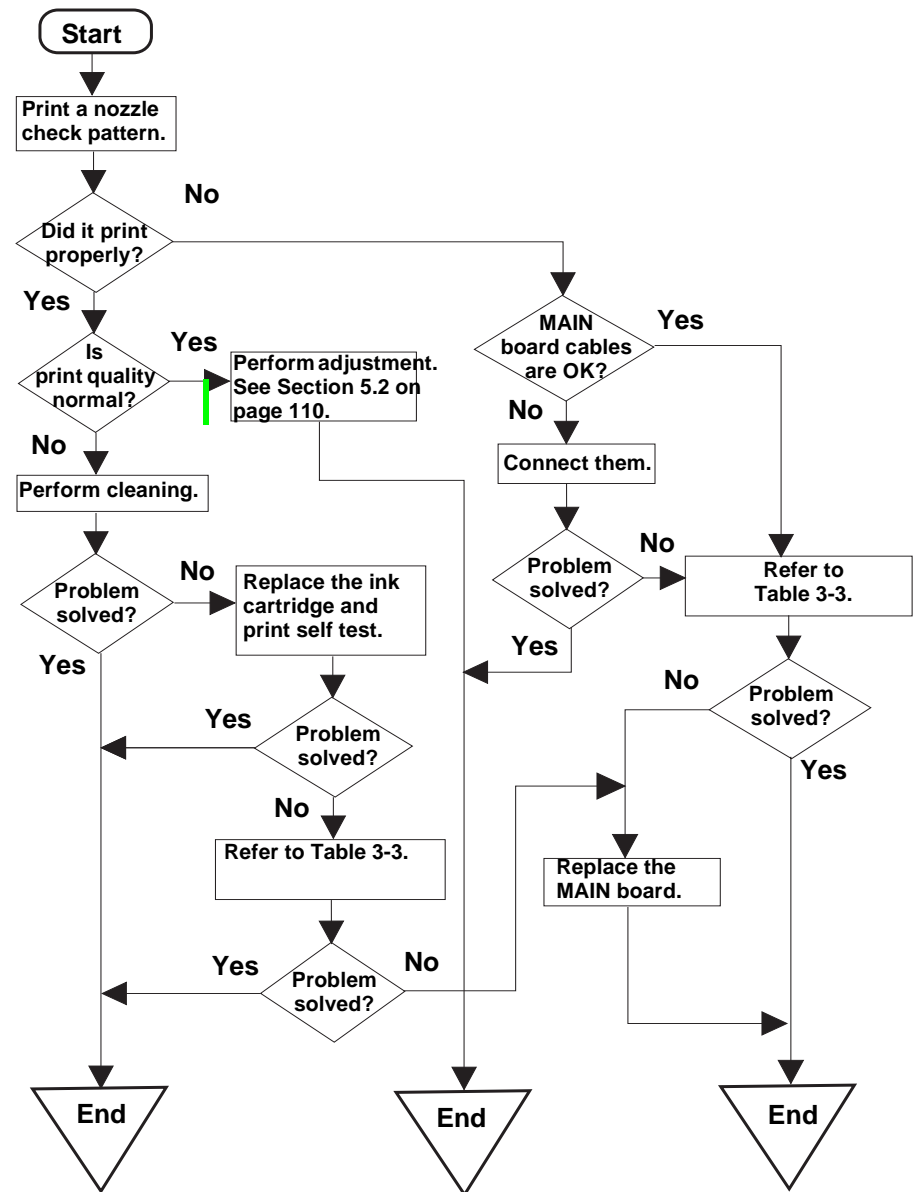
Flowchart 3-1.

3.1.2 Error is detected



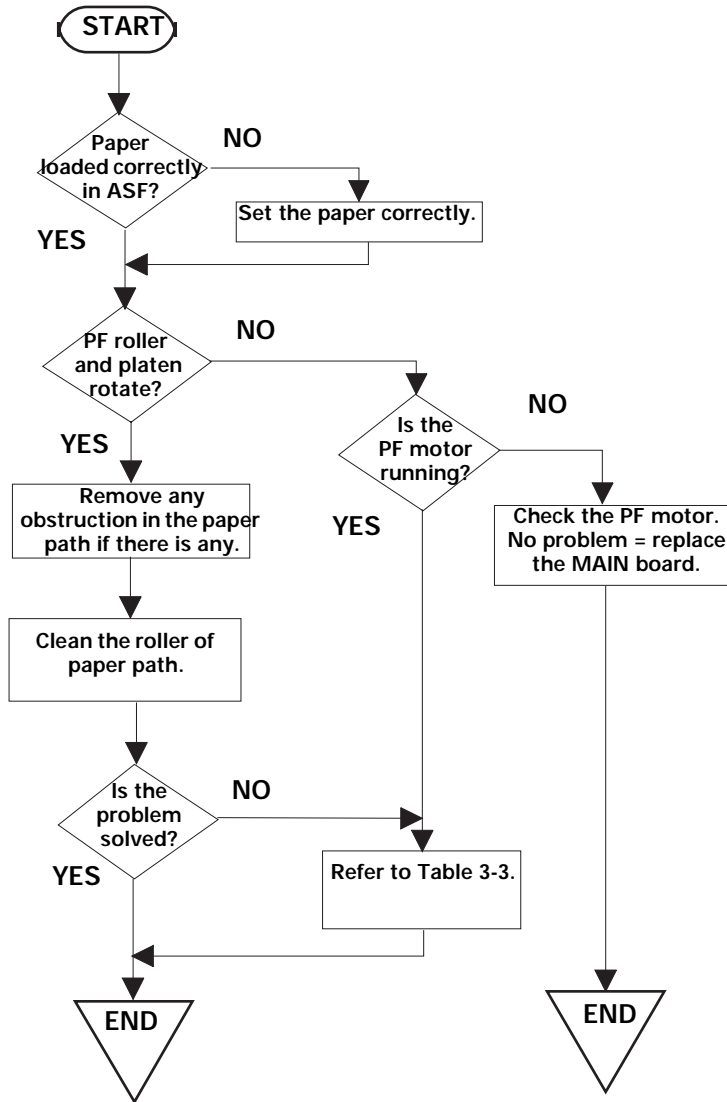
Flowchart 3-1.

3.1.3 Failure occurs during printing



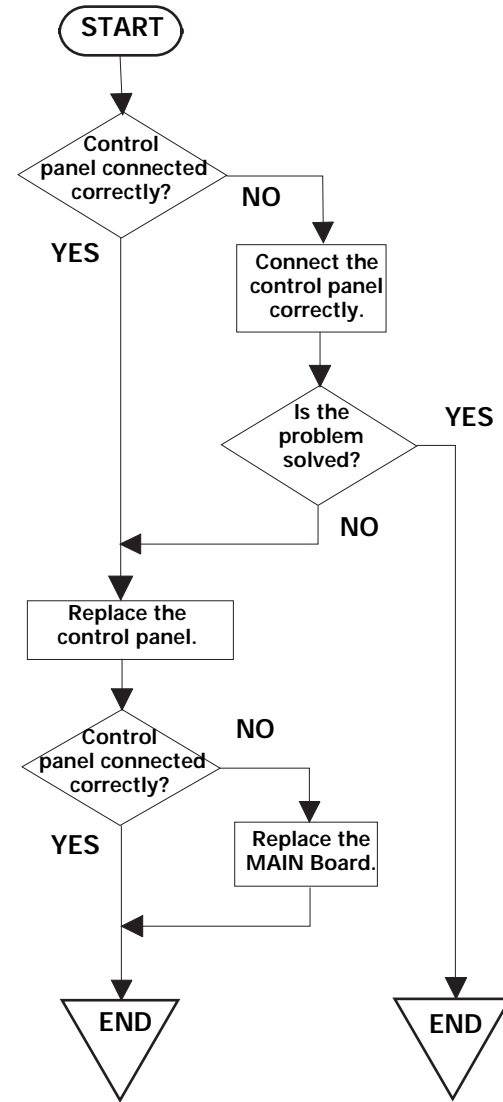
Flowchart 3-1.

3.1.4 Printer does not feed paper correctly



Flowchart 3-1.

3.1.5 Control panel operation is abnormal



Flowchart 3-1.

3.2 Repair of the Printer Mechanism

This section provides instruction for repairing the printer mechanism. It describes various problems, symptom, likely causes, checkpoints, and solutions. Select appropriate symptom from the table and check each parts and its function as described in the checkpoint.

Table 3-3. Repair of the Printer Mechanism

Symptom	Condition	Cause	Check Point	Solution
Abnormal pump mechanism operation	Abnormal PF motor operation when the power is turned on.	Foreign substances are loaded in the PF gears.	Manually rotate the platen drive gear and check it if it rotates normally.	Remove any foreign substances.
		The PF motor is defective. (Refer to Table5-1)	Check the inner coil resistance and see if there is any disconnection of the coil.	Replace the PF motor.
Ink is not absorbed or is poorly absorbed.	Used ink does not go through the waste ink tube.	The pump tube is crashed.	Check the tube visually.	Fix the crashed part by the airgun.
		Capping rubber is damaged or deformed.	Check the capping rubber visually.	Replace the cap mechanism.
		The tube is out of the cap.	Check if the tube is out of the cap visually.	Connect the tube properly.
		Pump bulb is not closed at absorption.	Check the bulb operation visually.	Replace the cap mechanism.
Abnormal carriage operation.	Abnormal carriage operation at power on.	Foreign substance in the CR drive gear.	Check visually if there are any substances or not.	Remove any foreign substances.
		CR motor is defective.	Check the inner coil resistance and see if there is any disconnection of the coil.	Replace the CR motor.
	Abnormal carriage operation during printing.	Carriage movement is not smooth.	Check whether the carriage moves smoothly when moved manually.	Clean and lubricate the carriage guide axis.
			Check the tension of the timing belt.	Adjust tension mechanism or replace it.
			Check if there are any foreign substances in the carriage path.	Remove any foreign substances.

Table 3-3. Repair of the Printer Mechanism (continued)

Symptom	Condition	Cause	Check Point	Solution
Printing is not performed.	The carriage moves, but no printing is performed.	Head FFC is out of connection.	Check if the head FFC on the board or carriage is connected surely.	Connect the FFC properly.
		The FFC is disconnected inside.	Check the FFC by using a tester.	Replace the FFC.
		I/C is defective.	Install a new I/C and perform the self-test.	Replace I/C.
		Head unit is defective.	If the condition does not improve even after 2 or 3 cleaning operations, replace the head unit and perform the self-test.	Replace the head unit.

Table 3-3. Repair of the Printer Mechanism (continued)

Symptom	Condition	Cause	Check Point	Solution
Abnormal printing (continued on next page)	Only a particular dot causes abnormal printing.	Print head surface is not clean. (dot missing)	Perform the cleaning operation several times and check printing.	Perform the cleaning.
		The head unit is defective.	Perform the cleaning operation several times and check printing.	If condition does not improve even after the cleaning, replace the head.
		Capping absorber pad is touching the head surface.	Check the head absorber pad visually.	Replace the head absorber pad if it is deformed.
	A dot is not printed occasionally.	Printhead surface is not clean. (dot-missing)	Perform the cleaning operation several times and check printing.	Perform the cleaning.
		The head FFC is disconnected inside.	Check the FFC by using a tester.	Replace the head FFC.
		The head FFC is out of connection.	Check if the head FFC on the board or carriage is connected surely.	Connect the FFC properly.
		The head unit is defective.	Perform the cleaning operation several times and check printing.	If condition does not improve even after the cleaning, replace the head.
		I/C is defective.	Install the new I/C and perform self-test.	Replace I/C.
	Black specks or dots.	The head FFC is out of connection.	Check if the head FFC on the board or carriage is connected surely.	Connect the FFC properly.
		The head unit is defective.	Check connection with the head FFC.	Replace the head if there is no connection problem with the FFC.
	A vertical line is not aligned.	Bi-directional alignment is not adjusted.	Perform Bi-D adjustment.	Refer to Chapter 4.

Table 3-3. Repair of the Printer Mechanism (continued)

Symptom	Condition	Cause	Check Point	Solution
Abnormal printing (continued)	White line appears in the image data.	Head angle is not correct.	Perform head angle adjustment.	Refer to Chapter 4.
		Platen gap is not correct.	Perform platen gap adjustment.	Refer to Chapter 4.
		Dot shooting direction is tilted because head surface is not clean	Perform the cleaning operation several times and check printing.	Perform the cleaning operation.
		I/C is defective.	Install a new I/C and perform the self- test.	Replace I/C.
		Head unit is defective.	Perform the cleaning operation several times and check printing.	Replace the head unit.
Abnormal paper feeding.	Paper is not fed.	Friction of the PF roller.	Check if the PF roller rotates when paper is not fed.	Clean the PF roller by the cleaning sheet. Replace the PF roller if it does not recover.
		Abnormal operation of the hopper.	Check movement of the ASF hopper visually.	Replace ASF.
		Malfunction of ASF drive change-over.	Check if the ASF gear rotates visually.	Replace gears of the ASF drive change-over.
		Friction of the PF roller.	Check if the PF roller slips during paper feeding.	Clean the PF roller by the cleaning sheet. Replace the PF roller if it does not recover.
Printer stops during initialization.	Fatal error appears.	ASF sensor is defective.	Check the signal level of the ASF sensor. (Refer to Table 5-2)	Replace ASF sensor.
		PE sensor is defective.	Check the signal level of the PE sensor. (Refer to Table 5-2)	Replace PE sensor.
		HP sensor is defective.	Check the signal level of the HP sensor. (Refer to Table 5-2.)	
		Head FFC is disconnected.	Check if the head FFC is connected.	Connect the head FFC.
		CR motor is defective.	Check the CR motor cable is connected.	Replace the CR motor if there is no problem in the cable connection.
		PF motor is defective.	Check if the PF motor cable is connected.	Replace the PF motor if there is no problem in the cable connection.

3.3 Troubleshooting the Scanner

This section explains the failure of scanner mechanism; its cause and solution.

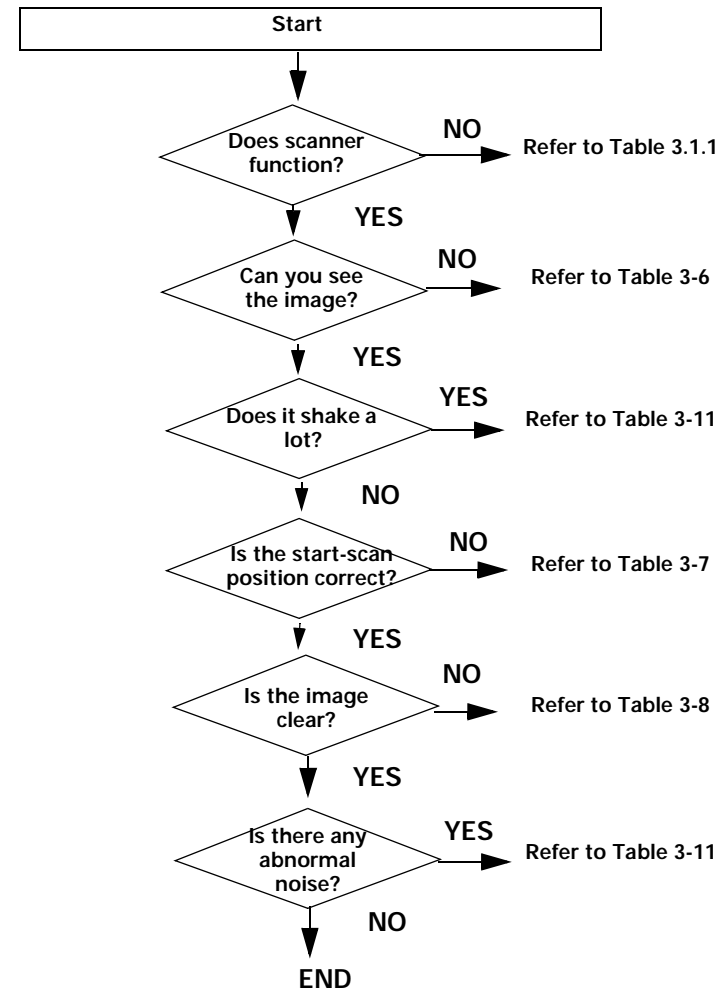
If any error or failure occurs, check the cause with the flow chart, and treat appropriately.

1. Is there any problem in the scanner operational mechanism?
2. Does the same error occur repeatedly?

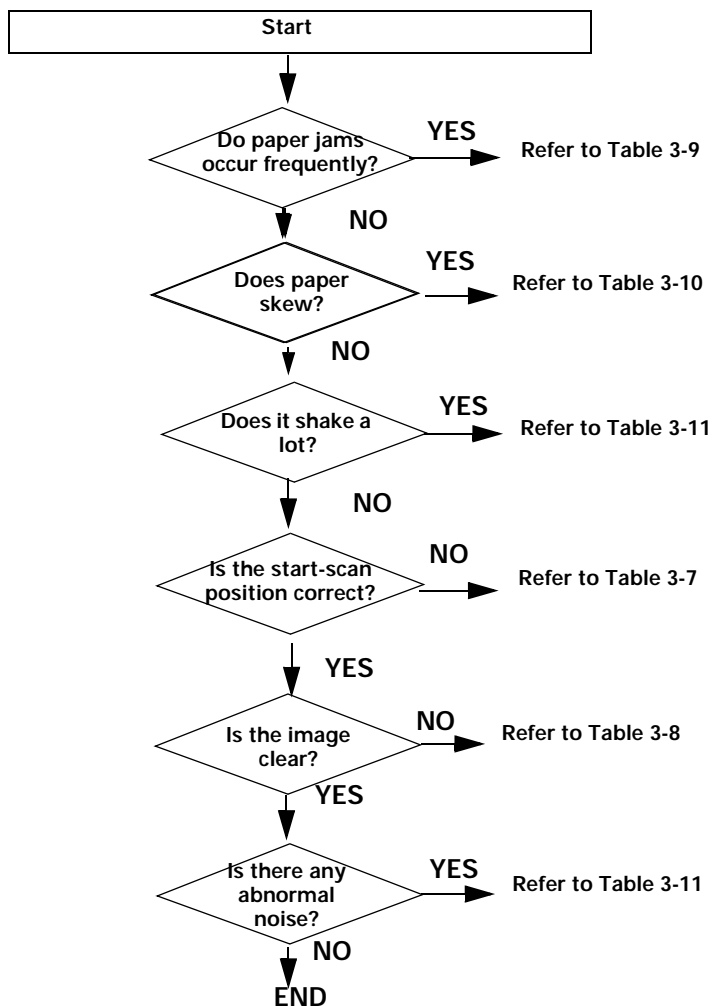
Follow the flow chart below, check the table specified, and take the appropriate action.

3.3.1 Scanner Troubleshooting Flowcharts

SCANNING OPERATION ERRORS



ADF OPERATION ERRORS



3.3.2 Scanner troubleshooting check points

See the following table when scanned-image quality problems seem to be caused by mechanism or system errors.

Table 3-4. Scanner quality troubleshooting

Failure	Refer to
Light areas of document appear dark	Table 3-5
Scanner seems to operate but no image appears.	Table 3-6
Start of scan position is wrong.	Table 3-7
The scanned image is not clear.	Table 3-8
Paper jams occur frequently.	Table 3-9
Feed skewed.	Table 3-10

Table 3-5. Light areas of document appear dark

Cause	Related Unit	Check Method	Solution
Lamp Connector is not connected.	None	Visual Check	Connect the connector.
Lamp is wrong.	Lamp	Tester Check	Replace the lamp.
Inverter is wrong.	Inverter	Tester Check	Replace the inverter.
CCD Connector is not connected.	None	Visual Check	Connect the connector.
CCD Module is wrong.	B101 MAIN Board	Tester Check	Remove the cause or replace the MAIN Board.
MechanicalModule is wrong.	MechanicalModule Unit	Tester Check	Replace the Module Unit.
System Error	None	Visual Check	Re-boot the PC or turn the scanner ON/OFF.

Table 3-5. Light areas of document appear dark (continued)

Cause	Related Unit	Check Method	Solution
CCD Module is wrong.	B101 MAIN Board	Tester Check	Remove the cause or replace the MAIN Board.
MechanicalModule is wrong.	MechanicalModule Unit	Tester Check	Replace the Module Unit.
System Error	None	Visual Check	Re-boot the PC or turn the scanner ON/OFF.

Table 3-6. Scanner scans but no image appears

Cause	Related Unit	Check Method	Solution
ADF cover is open but scanner still scans.	ADF Cover	Make sure the cover is all the way down.	Close the ADF Cover.
CCD Connector is not connected.	None	Visual Check	Connect the connector.
CCD Board is wrong.	CCD Board	Tester Check	Replace the CCD Board.
MAIN Board is wrong.	B101 MAIN Board	Tester Check	Replace the MAIN Board.
Power Supply is wrong.	Power Supply	Tester Check	Replace the power supply.
Lamp is wrong.	Lamp	Tester Check	Replace the lamp.
Inverter is wrong.	Inverter	Tester Check	Replace the inverter.

Table 3-7. The Start of Scan position is wrong

Cause	Related Unit	Check Method	Solution
Power Supply Connector is not installed.	None	Visual Check	Connect the connector.
Power Supply is wrong.	Power Supply	Tester Check	Replace the power supply.
Motor Connector is not installed.	None	Visual Check	Connect the connector.
MAIN Board is wrong.	B101 MAIN Board	Tester Check	Replace the MAIN Board.
Motor is wrong.	Motor	Tester Check	Replace the motor.
Sensor Connector is not installed.	None	Visual Check	Connect the sensor connector
Sensor is wrong.	Sensor	Visual Check or Tester Check	Replace the sensor module.
MechanicalFailure.	Mechanicalmodule	Tester Check	Replace the mechanical module.

Table 3-8. The Image is not clear

Cause	Related Unit	Check Method	Solution
Lamp is too dark.	Lamp	Tester Check	Replace the lamp or the inverter.
Calibration Reference Plate is dirty.	Calibration Reference Plate	Visual Check	Wipe off the calibration reference plate with isopropyl-alcohol.

Table 3-8. The Image is not clear (continued)

Cause	Related Unit	Check Method	Solution
Mirror is dirty.	Mirror	Visual Check	Wipe off the mirror with isopropyl-alcohol.
Lens is dirty.	Sense	Visual Check	Wipe off the sense with isopropyl-alcohol.
Blue protective tape from ASP is still attached to the standard white strip.	Cover (ASP)	Look for blue tape covering the white strip.	Remove the blue tape.

Table 3-9. Paper jams occur frequently

Cause	Related Unit	Check Method	Solution
Pad assembly is wrong.	Pad Assembly	Check the pad assembly.	Replacme the pad assembly and adjust it.
Dust on the pad or roller.	Roller	Visual Check	Wipe off the pad or roller with isopropyl-alcohol.
Paper is not set correctly.	Operational Error	Check if the paper is set correctly on the paper support or slide guide.	Teach the user the right paper loading position.
Paper is wrong.	Operational Error	Check if the user uses the specified paper.	None
Motor Connector is wrong.	None	Visual Check	Connect the connector.

Table 3-10. Paper Feed Skewed

Cause	Related Unit	Check Method	Solution
Paper guide is not set correctly.	None	Check the pad assembly.	Replace the pad assembly and adjust it.
Pad assembly is wrong.	Pad Assembly	Check the pad assembly.	Replace the pad assembly and adjust it.
Dust on the roller.	Roller	Visual Check	Wipe off the roller with alcohol.
Paper is not set correctly.	Operational Error	Check if the paper is set correctly on the paper support or slide guide.	Teach the user the right paper loading position.
Paper is wrong.	Operational Error	Check if the user uses the specified paper.	None
Motor connector is wrong.	None	Visual Check	Connect the connector.

Table 3-11. Abnormal noise/shaking

Cause	Related Unit	Check Method	Solution
Paper is not set correctly.	Operational Error	Check if the paper is set correctly on the paper support or slide guide.	Teach the user the right paper loading position.
Paper is wrong.	Operational Error	Check if the user uses the specified paper.	None

Table 3-11. Abnormal noise/shaking

Cause	Related Unit	Check Method	Solution
Motor Unit is wrong.	Motor Unit	Replace the motor unit.	Replace the motor.
The connection with motor is wrong.	None	Visual Check	Connect the connector.
MAIN Board is wrong.	B101 MAIN Board	Tester Check	Replace the MAIN Board.

3.4 Troubleshooting the Motors and Sensors

This section only covers motor and sensor checkpoints.

Table 3-12. Motor Resistances and Measurement Points

Motor Name	Location	Check Point	Resistance
CR Motor	CN7 (MAIN board *)	Pins 1 & 3, Pins 2 & 4	7.8 Ohms \pm 10%
PF (Pump) Motor	CN8 (MAIN board *)	Pins 1 & 3, Pins 2 & 4	7.8 Ohms \pm 10%

Table 3-13. Sensor Check

Sensor Name	Location	Signal Level	Sensor Status
Paper End Sensor	CN5/ Pins 1 & 2	Close: more than 2.4V	No paper
Carriage Home Position Sensor	CN4/ Pins 1 & 2	Close: more than 2.4V	Out of home position
ASF HP Sensor	CN6/ Pins 1 & 2	Close: more than 2.4V	Out of home position
Black Cartridge Sensor	CN9/ Pins 1 & 19	Off: more than 2.4V	Black cartridge installed
Color Cartridge Sensor	CN9/ Pins <u>2 & 19</u>	Off: more than 2.4V	Color cartridge installed
Thermistor	CN9/ Pins <u>2 & 19</u>	Analog data	Change the VH voltage of charge pulse for common driver circuit

CHAPTER

4

DISASSEMBLY & ASSEMBLY

4.1 Overview

This chapter describes procedures for disassembling the main components of the EPSON Stylus Scan 2000. Unless otherwise specified, disassembly units or components can be reassembled by reversing the disassembly procedure. Therefore, no specific assembly procedures are included in this chapter, but special points regarding re-assembly are given under the heading "CHECK POINT". Any adjustments required after disassembling the units are described under the heading "REQUIRED ADJUSTMENT".

4.1.1 Precautions for Disassembling the Printer

See the precautions given under the headings "WARNING" and "CAUTION" below, before disassembling or assembling the EPSON Stylus Scan 2000.



- Disconnect the power cable before disassembling or assembling the printer.
- Wear protective goggles to protect your eyes from ink. If ink gets in your eye, flush the eye with fresh water and see a doctor immediately.
- If ink comes into contact with your skin, wash it off with soap and water. If irritation occurs, contact a physician.
- A lithium battery is installed on the MAIN Board of this printer. Be sure to observe the following instructions when servicing the battery:
 - Keep the battery away from any metal or other batteries so that electrodes of the opposite polarity do not come in contact with each other.
 - Do not heat the battery or put it near fire.
 - Do not solder on any part of the battery. (Doing so may result in leakage of electrolyte from the battery, burning or explosion. The leakage may affect other devices close to the battery.)
 - Do not charge the battery. (An explosion may be generated inside the battery, and cause burning or explosion.)
 - Do not dismantle the battery. (The gas inside the battery may hurt your throat. Leakage, burning or explosion may also be resulted.)
 - Do not install the battery in the wrong direction. (This may cause burning or explosion.)



There is danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to your local laws and regulations.



Risque d'explosion si la pile est remplacée incorrectement. Ne remplacer que par une pile du même type ou d'un type équivalent recommandé par le fabricant. Éliminer les piles déchargées selon les lois et les règles de sécurité en vigueur.



- Never remove the ink cartridge from the carriage unless this manual specifies to do so.
- When transporting the printer after installing the ink cartridge, be sure to pack the printer for transportation without removing the ink cartridge.
- Use only recommended tools for disassembling, assembling or adjusting the printer.
- Apply lubricants and adhesives as specified. (See Chapter 6 for details.)
- Make the specified adjustments when you disassemble the printer. (See Chapter 5 for details.)
- When assembling, if an ink cartridge is removed and needs to be installed again, be sure to install a new ink cartridge because of the following reasons;
 - Once the ink cartridge mounted on the printer is removed, air comes into and creates bubbles in the cartridge. These bubbles clog ink path and cause printing malfunction.
 - If an ink cartridge in use is removed and is reinstalled, ink quantity will not be detected correctly since the counter to check ink consumption is cleared.
- Because of the reasons above, make sure to return the printer to the user with a new ink cartridge installed.

4.1.2 Tools

Table 4-1 lists the tools recommended for disassembling, assembling, or adjusting the printer. Use only tools that meet these specifications.

Table 4-1. Tool List

Tools	Commercially Available	Code
(+) Driver No.2	yes	B743800200
(+) Driver No.1	yes	B743800400
Tweezers	yes	B741000100
Hexagon Box Driver (Opposite side: 5.5mm)	yes	B741700100
M3 (5.5mm) wrench	yes	-
Pliers	yes	-
Acetate tape	yes	-


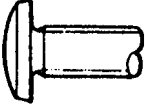









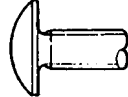

4.1.3 Screw Numbering System and Specifications

Table 4-2 lists the screws used in the EPSON Stylus Scan 2000 and Table 4-3 provides detailed screw specifications. During assembly and disassembly, make sure that the specified types of screws are used in the proper locations.

Table 4-2. Screw Numbering System

Name	Size
+Bind, S-tight (CBS)	3X6
+Bind, S-tight (CBS)	3X10
+Bind, P-tight (CBP)	3X6
+Bind, P-tight (CBP)	3X10
+Bind, P-tight (CBP)	3X8
+Pan head (CP)	3X4
+Bind, S-tight, Sems R2(CBS Sems)	3X6

Table 4-3. Screw Types and Abbreviations

Head		Body	Washer (assembled)
Top	Side		
1. Cross-recessed head 	1. Bind 	1. Normal 	1. Plain washer 
2. Slotted head 	2. Pan  (with Notch)	2. S-tight 	2. Outside toothed lock washer 
	3. Cup 	3. P-tight 	3. Spring washer 
	4. Truss 	4. Tapping 	

4.1.4 Service Checks After Repair

Before returning the printer after servicing, use the check list below, which enables you to keep record of servicing and shipping more efficiently.

Table 4-4. Inspection Checklist for the Stylus Scan

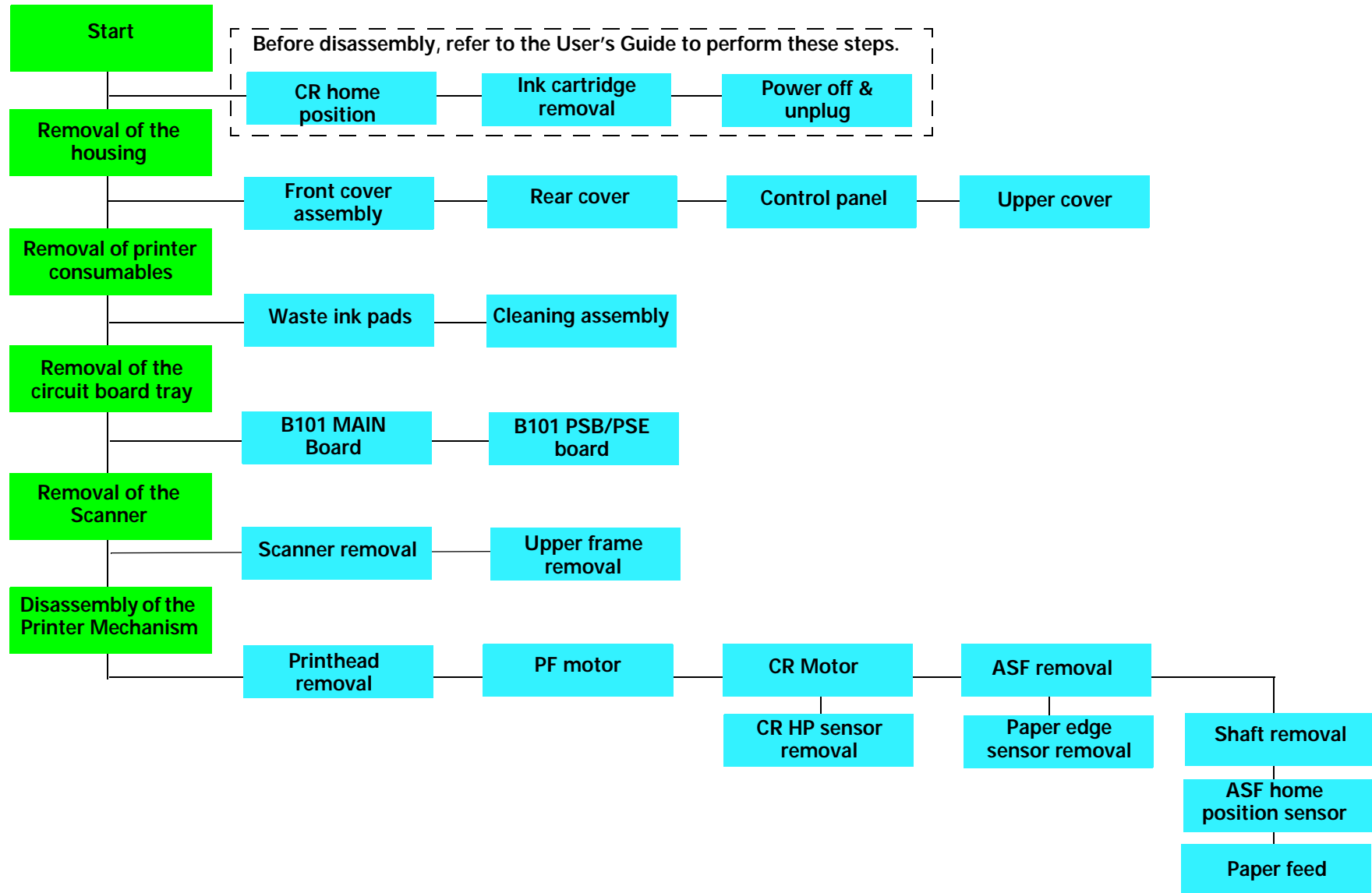
Category	Component	Item to check	Is Check Required?
Printer unit	Self-test	Is the operation normal?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
	On-line test	Was the on-line test successful?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
	Print head	Is ink ejected normally from all nozzles?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
	Carriage mechanism	Does the carriage move smoothly?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Any abnormal noise during movement?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Any dirt or obstacles around the shaft of gear cover?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Is the CR motor at the correct temperature (not over heating)?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
	Paper feeding mechanism	Is paper fed smoothly?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Does paper get jammed?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Does paper skew during paper feeding?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Are papers multi fed?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Does the PF motor get overheated?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Any abnormal noise during paper feeding?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Is the paper path clear of all obstructions?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary

Table 4-4. Inspection Checklist for the Stylus Scan

Category	Component	Item to check	Is Check Required?
Scanner unit	Mechanism	Is the glass surface clean?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Does paper skew during loading or feeding?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Any abnormal noise during movement?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Is the blue protective tape removed from over the white strip?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
	Carriage mechanism	Does the carriage move smoothly?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Any abnormal noise during movement?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Any dirt or obstacles around the shaft of gear cover?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Is the CR motor at the correct temperature (not over heating)?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
Lamp	Does the lamp turn on and successfully perform white-reflective test near home position?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary	
Local copy	System	Perform a color test of the local copy function. Is the output quality satisfactory?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
Adjustment	Specified adjustment items	Are adjusted conditions all right?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
Lubricant	Specified lubricated item	Is lubrication applied to the specified locations?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
		Is the quantity of lubrication adequate?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
Function	Printer ROM version	Newest version:	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
	Scanner ROM version	Newest version:	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
Shipping	Ink cartridges	Are the ink cartridges installed correctly?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
	Pads on bottom	Are all six pads attached?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
	Protection conditions during transport	Are all the pointed parts firmly fixed?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary
Others	Attached items	Are all attached items from users included?	<input type="checkbox"/> Checked / <input type="checkbox"/> Not necessary

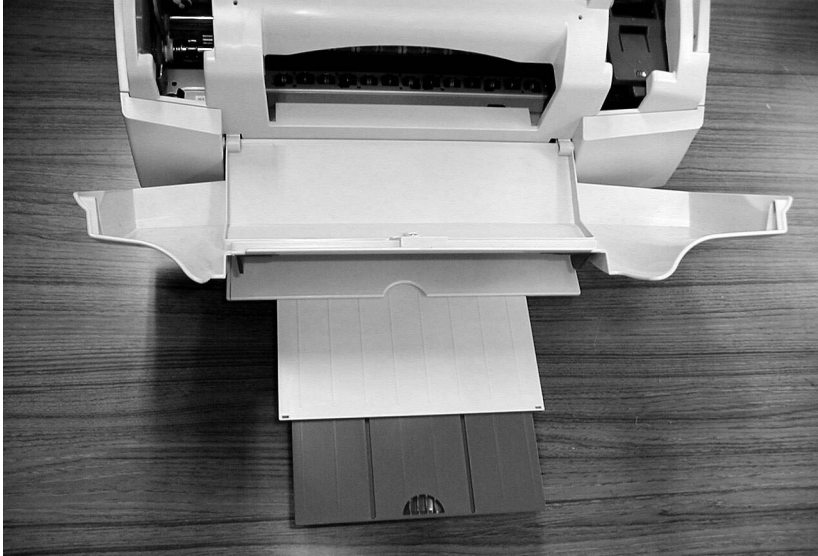
4.2 Disassembly Procedures

The flowchart below shows procedures for disassembly.



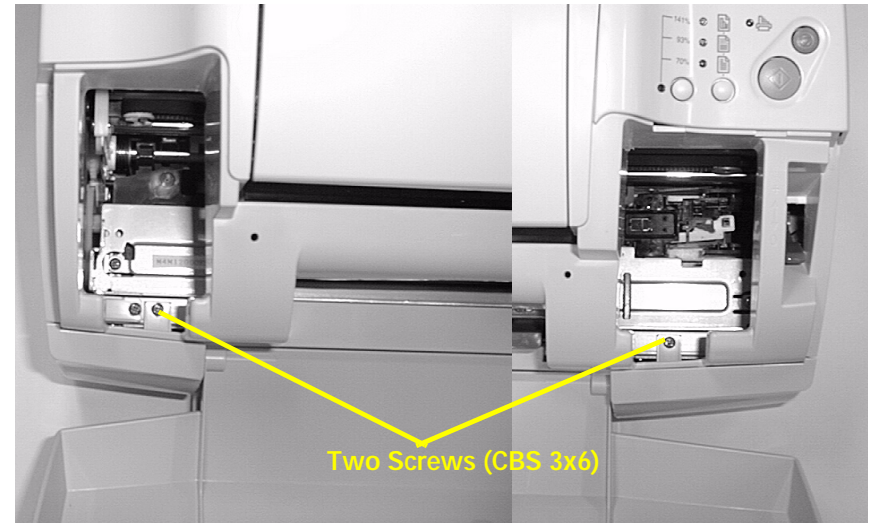
4.2.1 Removing the Housing

4.2.1.1 Front cover assembly



1. Open the paper eject tray and the front cover. These two pieces are held in place by the left and right lower covers, so removing the right or left lower cover may cause the eject tray and front cover to drop.
2. Gently insert a narrow tip screwdriver under the carriage from the center, and move the carriage lock toward you. Then move the carriage to the center.

3. Remove one screw (CBS 3x6) securing the left lower cover and one screw (CBS 3x6) securing the right lower cover.



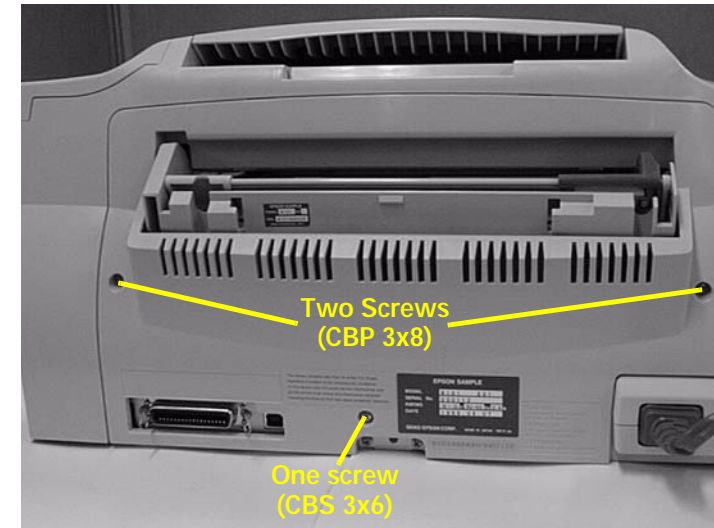
4. While supporting the paper eject tray and the front cover with your free hand, pull either of the lower covers out and down from the top (if necessary, lift the front of the Stylus Scan). This will free the paper eject tray and front cover so you can place them aside.

**CHECK
POINT**

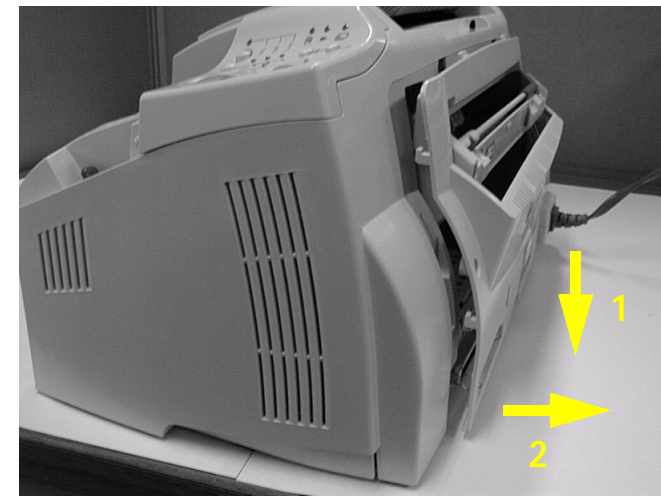
When reinstalling the front cover assembly, make sure the pegs at the bottom of the lower covers are visible through the holes in the waste ink tank. If some pegs are not visible, the pegs are bent and a lower cover has not been installed correctly.

**4.2.1.2 Rear cover**

1. Remove three screws (two x CBP 3x8 and one x CBS 3x6).



2. As shown below, evenly pull the rear cover down (#1) and out (#2) to remove it. (Try this over the edge of your desk if you have difficulty.)



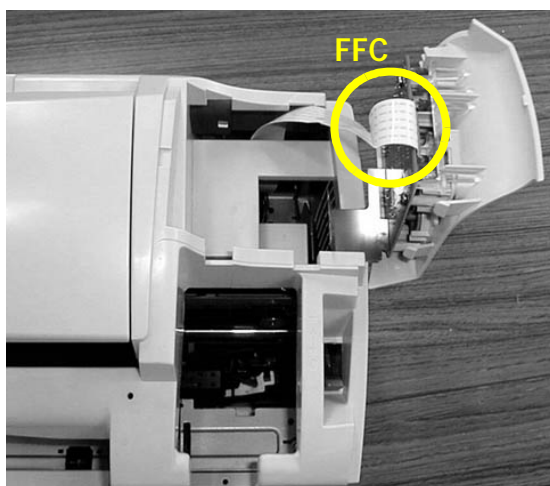
4.2.1.3 Control panel

1. Using a flat tip screwdriver or similar tool, gently push in the two hooks of the control panel while lifting up the control panel.

NOTE: You may find that you can remove the control panel by pushing in the hook on the right only, as shown below.



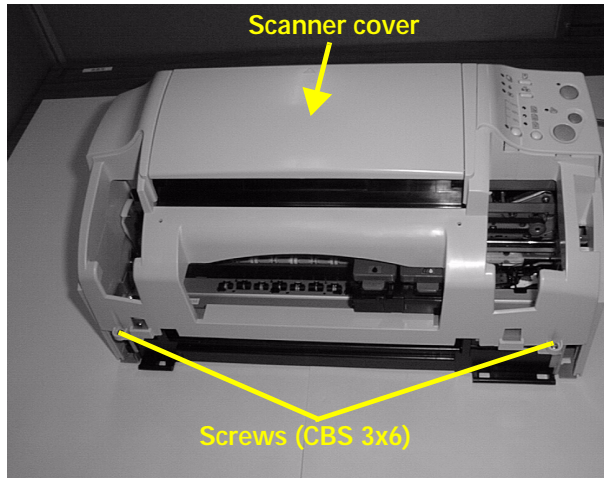
2. Remove the FFC from the control panel.



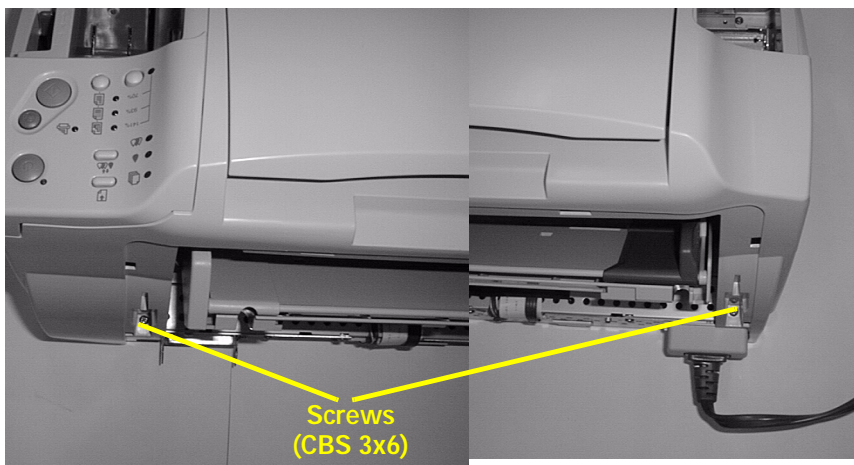
4.2.1.4 Upper cover

NOTE: Before removing the upper cover, you may wish to remove the control panel as described in the previous section. If you do not remove it first, keep in mind that you need to remove the control panel FFC during step 4 below.

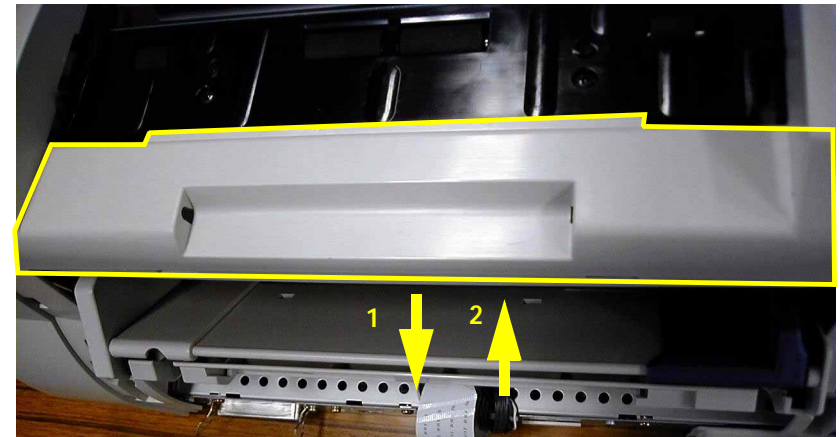
1. Remove two screws from the front (CBS 3x6).



2. Remove two screws from the back (CBS 3x6).



3. Open the scanner cover, and pull the upper cover to the rear to remove its projection from under the scanner's edge (black); then release so the upper cover is above the scanner's edge.



4. Move the carriage back to the home position and lift up the upper cover and remove it.

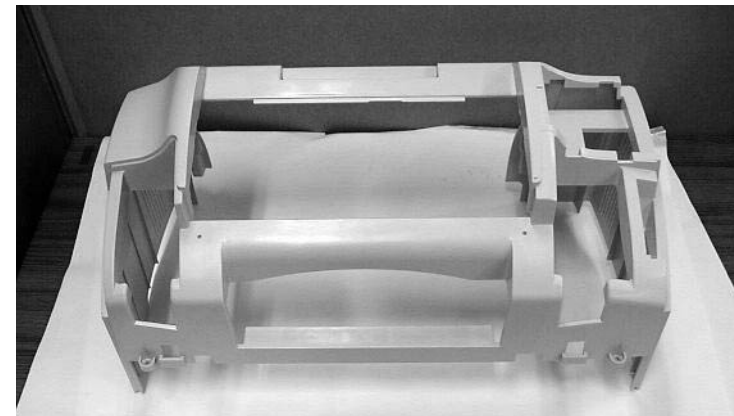


Figure 4-1. Upper cover (from front)

4.2.2 Removal of printer consumables

The printer consumables consist of the waste ink pads (described below) and cleaning assembly (described in "Removing the cleaning assembly (Pump and Cap)" on page 82).

4.2.2.1 Removing the waste ink pads

1. Remove the front cover assembly as described in Section 4.2.1.1.
2. Remove one screw (CBP 3x8) securing the waste ink tank and which is located on the right side of the printer mechanism.

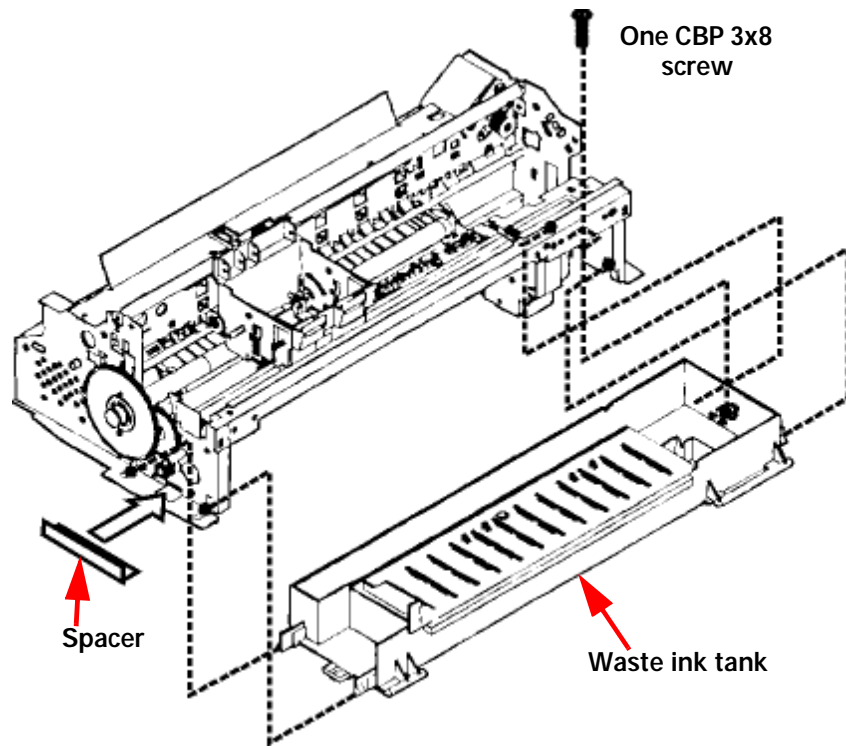


Figure 4-2. Removing the waste ink tank

3. Remove the spacer on the left side of the tank and carefully pull the tank out and downward.

CHECK
POINT



When re-installing the waste ink tank, make sure to secure the hooks on the left of the tank on top of the spacer. After replacing the waste ink pads, reset the waste ink counter.

4. Remove one screw (CBP 3x10) securing the waste ink tank cover, and then remove the cover by lifting up from the center.
5. Carefully remove the old waste ink pads so as not to get yourself or anyone/anything else dirty.

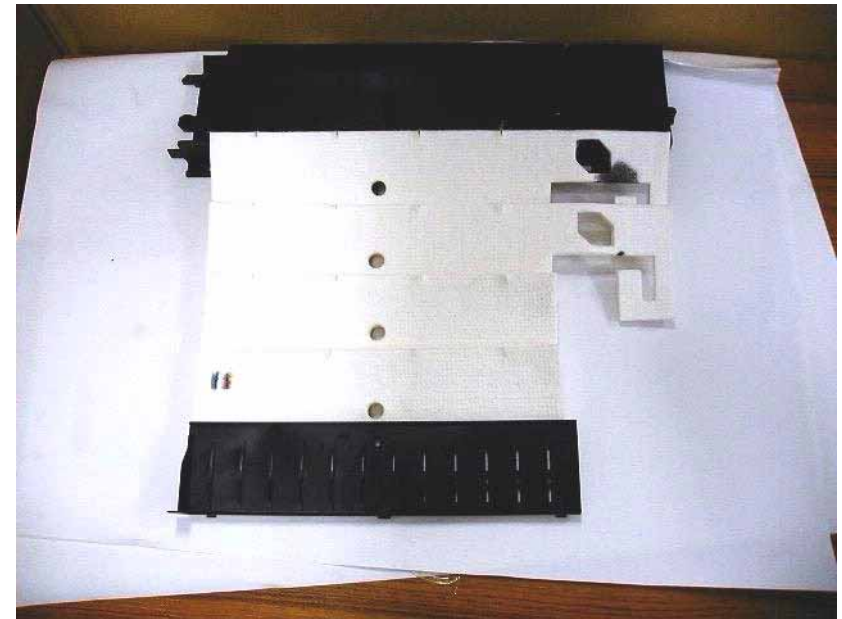


Figure 4-3. Waste ink cover, pads, and tank

4.2.2.2 Removing the cleaning assembly (Pump and Cap)

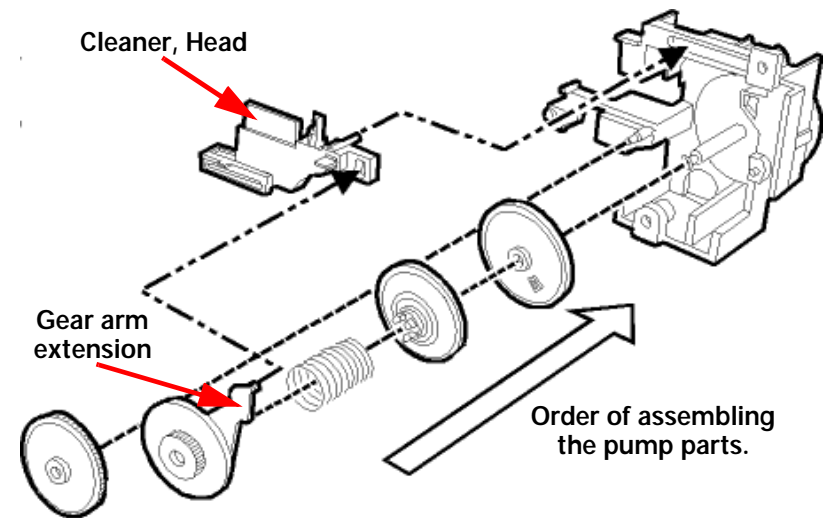
1. Remove the front cover assembly as described in Section 4.2.1.1.
2. Remove the waste ink tank as described in Section 4.2.2.1.
3. Loosen two screws located on the edge of the paper eject frame assembly and float release the joints for the paper eject assembly and the side frames, as shown on the next page.
4. Raise the printer mechanism toward the ASF side so that you can see the bottom of the printer mechanism.
5. On the right side of the frame, remove the hook holding the cap assembly and release two protrusions attached to the frame. Lift up the right side of the cap assembly and take it out towards the bottom of the printer mechanism. Note that the cap assembly is still connected to the pump assembly by the ink tube at this point. (Refer to Figure 4-4 on the next page.)
6. Remove two screws (CBP 3x8) securing the pump assembly to the frame. (Refer to Figure 4-4 on the next page.)
7. Release a hook securing the pump assembly to the frame and remove the pump assembly, moving it toward the right. (Refer to Figure 4-4 on the next page.)



- When reassembling the cleaning assembly, refer to the figure below.
- Since the spring is included among the gears in the pump assembly, be careful that the parts do not pop out during disassembly and assembly.
- When assembling the printer, be careful not to crush nor leave any stress on the ink tube connecting the pump assembly and the cap assembly.
- After installing the pump assembly, make sure that the cleaner parts move back and forth by rotating the gear 73.6.



- Do not damage the rubber part (black square) of the cap installed in the cap assembly. (If it gets damaged, it will not be able to adhere closely to the surface of the printhead, and may cause a malfunction in operation.)
- When you replacing the cleaner head built in the pump assembly, be careful of the following points.
 - Do not touch the cleaner head with your bare hands. Use gloves or tweezers.
 - Do not let oil or grease touch the head cleaner.
 - When installing the cleaner head, set the rubber side (black side) toward the right side of the frame.
- When installing the pump assembly, do not tighten the screw more than necessary torque.



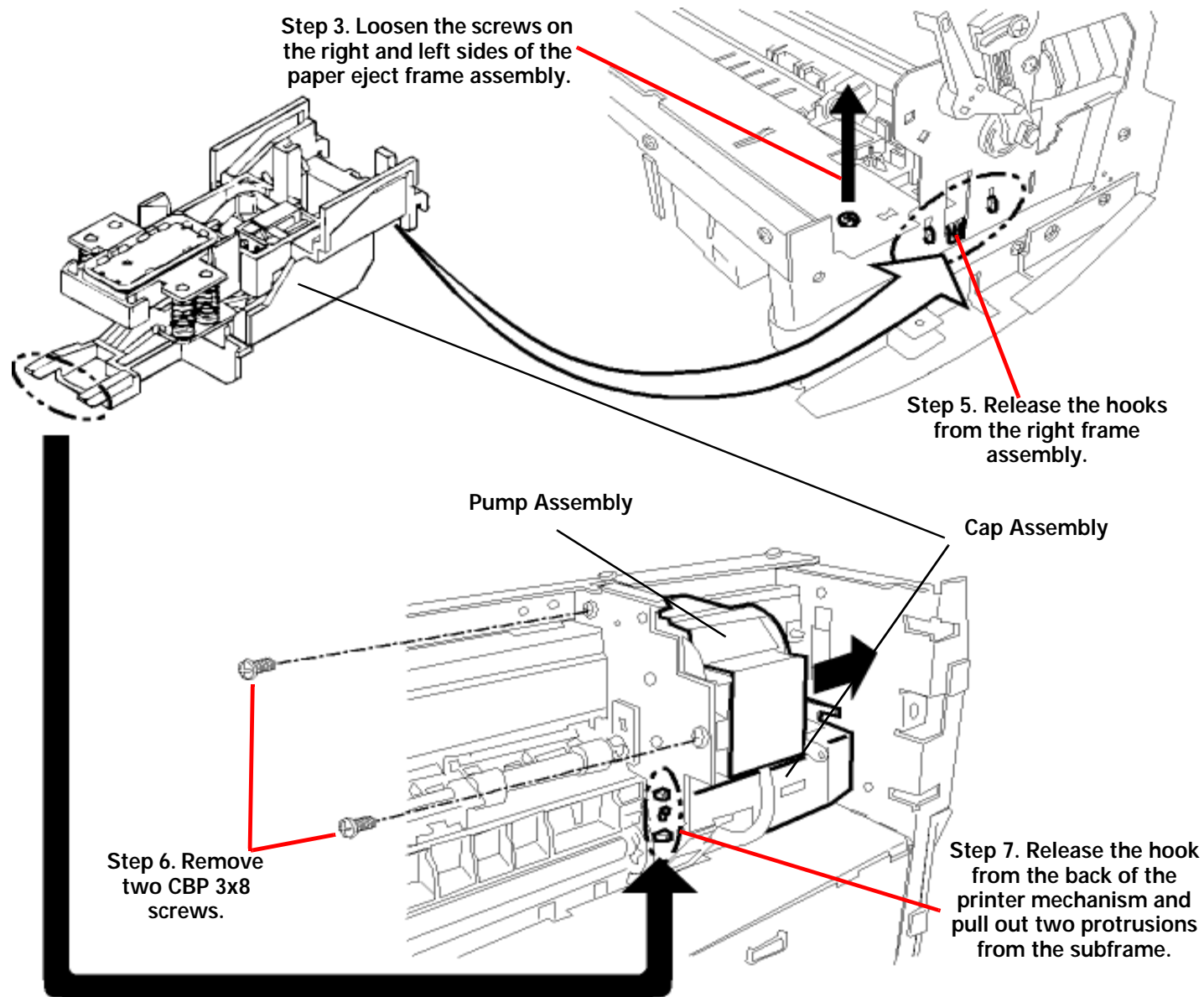


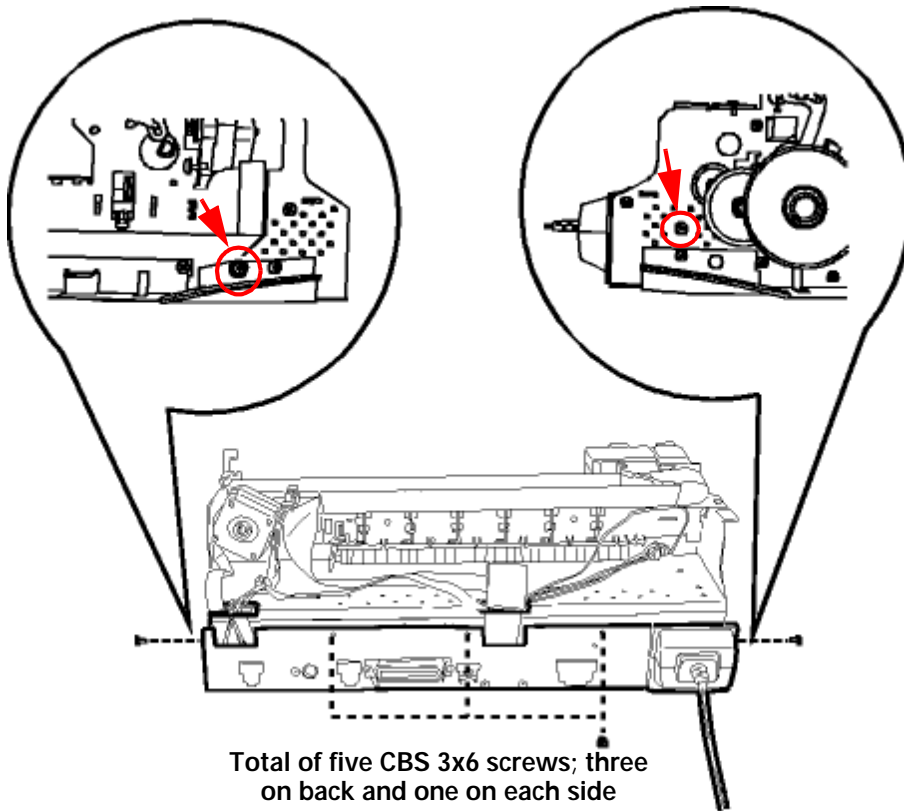
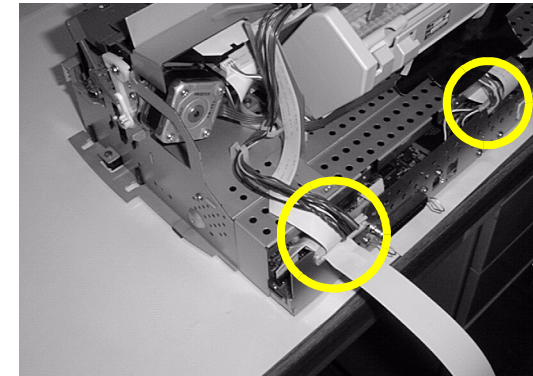
Figure 4-4. Removing the Cap and Pump Assemblies

4.2.3 Removing the Circuit Board Tray

Since the B101 MAIN and B101 PSB/PSE boards are built in a removable tray, remove the whole tray as described below to access these boards. Keep in mind that for many service operations you do not have to fully remove the tray, you can just pull it out far enough to remove the connectors.

1. Remove the rear cover and upper cover as described in "Rear cover" on page 78 and "Upper cover" on page 80.
2. As shown below, remove the three screws (CBS 3x6) on the back of the tray and one screw (CBS 3x6) on each side. (To remove the screw on the carriage-motor side, it is recommended you first remove the hand hold as this partially blocks access to the screw.)

3. Pull out the circuit board tray a little and carefully remove two plastic cable protectors from the cut-out sections on the back of the circuit board tray.



CAUTION The plastic cable protectors are held in place when the tray is shut, but they can easily break or chip when removing or replacing the tray. Be careful not to twist or force the protectors.

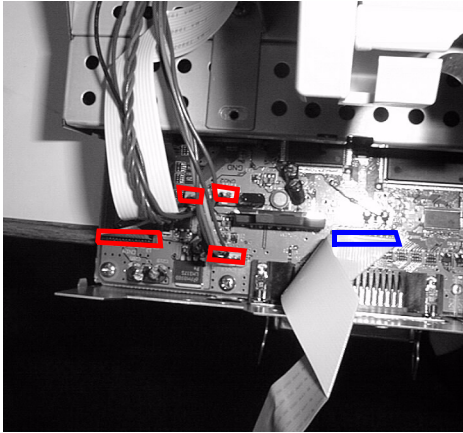


CHECK POINT When replacing the cables in the cable protectors, keep in mind the following.

- The protectors have grooves on three sides and the side without a groove faces up.
- The protectors slide halfway under the printer mechanism frame. If the protectors are not fully inserted under the frame, there will be a gap between the frame and the top edge of the circuit board tray.
- It is a good idea to have an extra protector handy in case you accidentally break one.

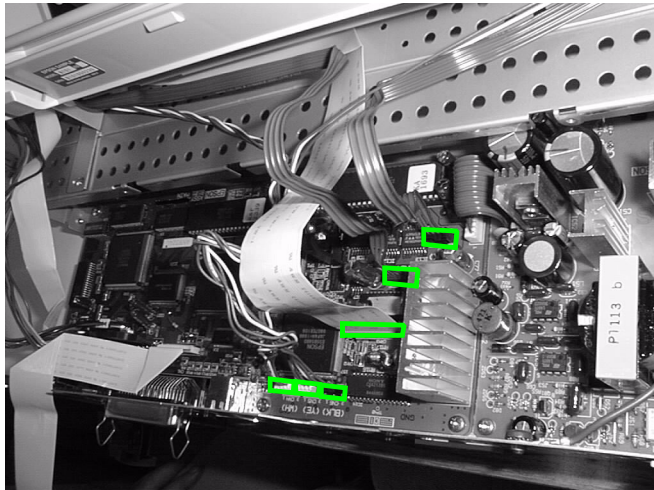
4. Remove the connector cables and FFC cables as described below.

- To the scanner: CN14, CN11, CN12, CN13
To the control panel: CN2



Red = Scanner
Blue = Control Panel

- To the printer: CN4, CN5, CN6, CN7, CN8, CN9



5. After removing all of the cables, detach the circuit board tray completely from the printer mechanism.

4.2.3.1 Removing the B101 MAIN Board

Follow the steps in the previous section to remove (the covers and) the circuit board tray from the Stylus Scan. To remove the B101 MAIN Board from the tray, remove:

- The cable (CN10) that connects to the power supply board
- Seven (CBS 3x6) screws securing the board
- Three (CBS 3x6) screws securing the interface connectors

CAUTION



To avoid short circuiting the Lithium battery, always put the MAIN board on a grounded pad or surface.

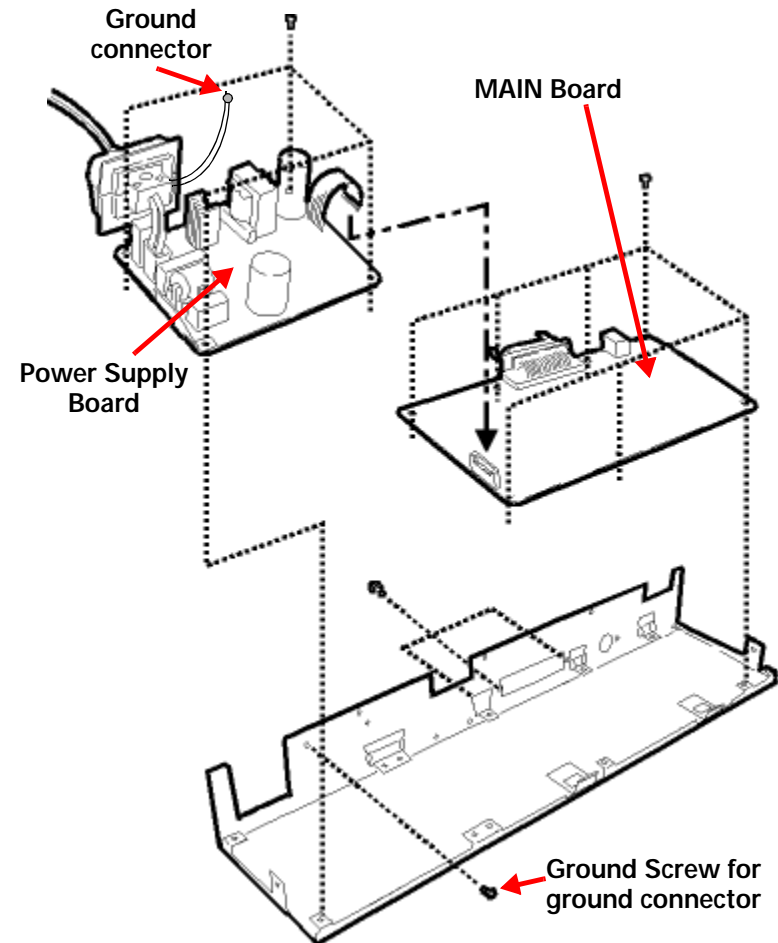


Figure 4-5. Removal of the circuit boards

**ADJUSTMENT
REQUIRED**



Be sure to perform the following adjustments when the MAIN Board is replaced;

1. Head voltage ID Input (Refer to Chapter 5.)
2. Bi-D adjustment (Refer to Chapter 5.)

Also, replace the waste ink pads at this time.

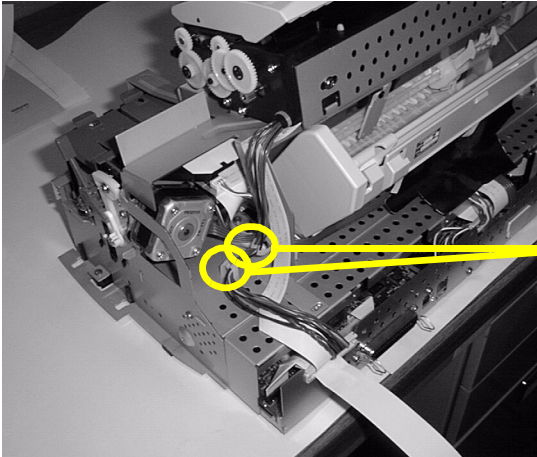
4.2.3.2 Removing the B101 PSB/PSE board

Follow the steps in Section 4.2.3 to remove (the covers and) the circuit board tray from the Stylus Scan. To remove the B101 PSE/PSB board from the tray, refer to Figure 4-5 in the previous section and remove:

- The cable (CN10) that connects to the MAIN Board
- The cable (CN1) that connects to the power cord
- Four screws (CBS 3x6) securing the board
- One screw (CBS 3x6) securing the ground

4.2.4 Removing the Scanner Mechanism

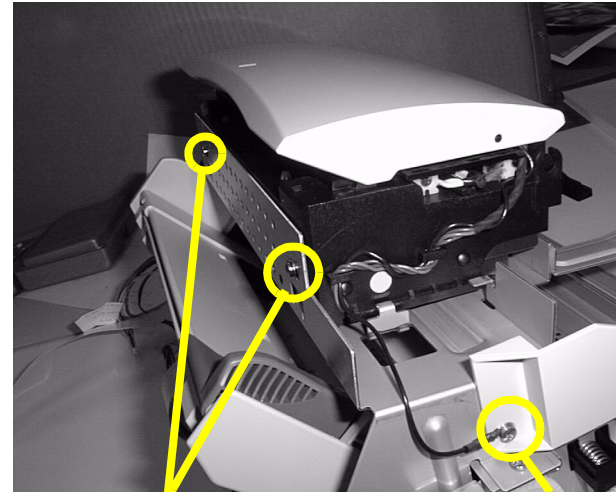
1. Remove the housing as described in "Front cover assembly" on page 77, "Rear cover" on page 78, and "Upper cover" on page 80.
2. Remove the scanner cables from the cable clips as shown below.



Remove the cables from these clips.

3. Slightly pull out the circuit board tray as described in "Removing the Circuit Board Tray" on page 84, and then remove the scanner-related cables from the B101 MAIN board as described in "Removing the B101 MAIN Board" on page 86.

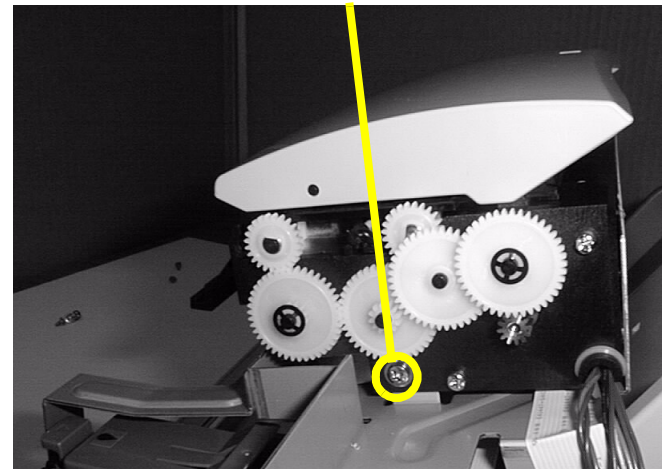
4. Remove one ground screw (CBP 3x6) and three screws (CBP 3x6) securing the scanner.



Remove two screws (CBP 3x8)

One screw (CBS 3x6)

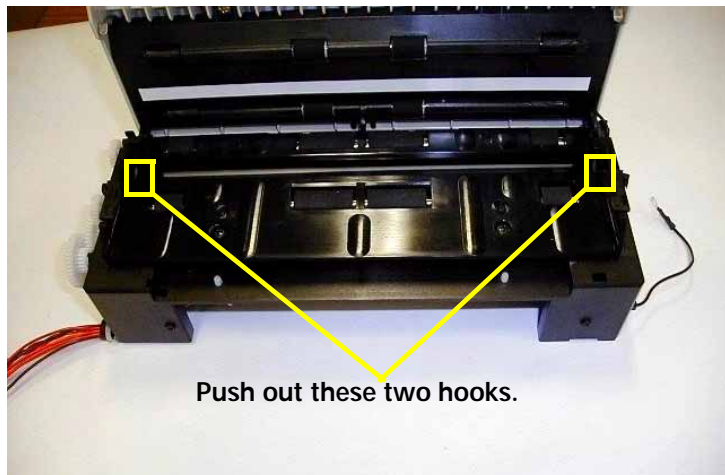
Ground connector and screw (CBS 3x6)



5. Slide the scanner slightly toward the CR motor and pull up to remove.

4.2.4.1 Removing the glass surface

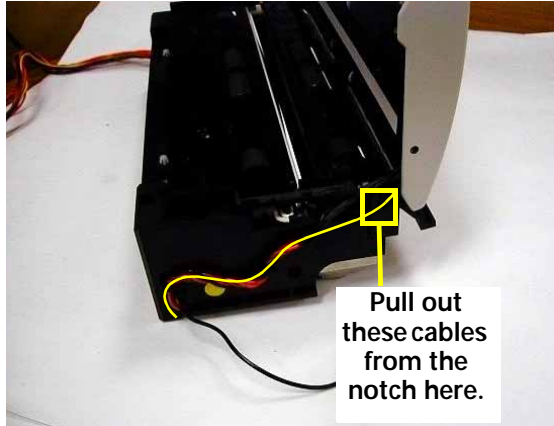
1. Open the scanner cover.
2. Push out the two hooks securing the glass surface and carefully remove the glass.



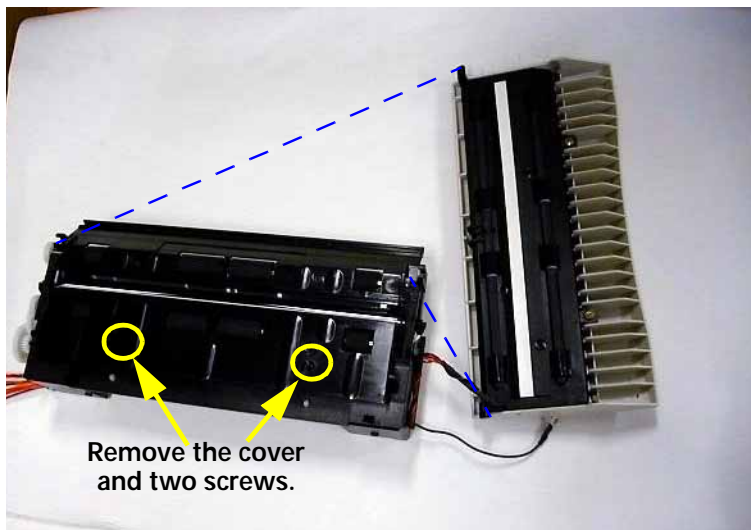
3. Carefully lift up the glass to remove it.

4.2.4.2 Removing the lamp

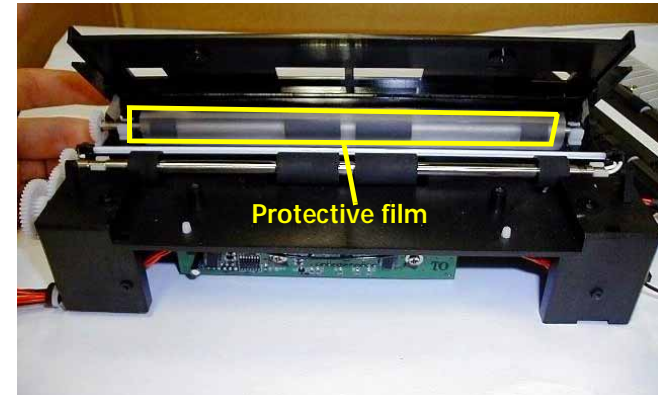
1. Remove the scanner as described in "Removing the Scanner Mechanism" on page 88.
2. Open the scanner unit and pull the cables free from the slot on the right side.



3. Fully open the scanner cover and remove the right and left cover projections. Then remove two black screws (CBP 3x6) from the document path..

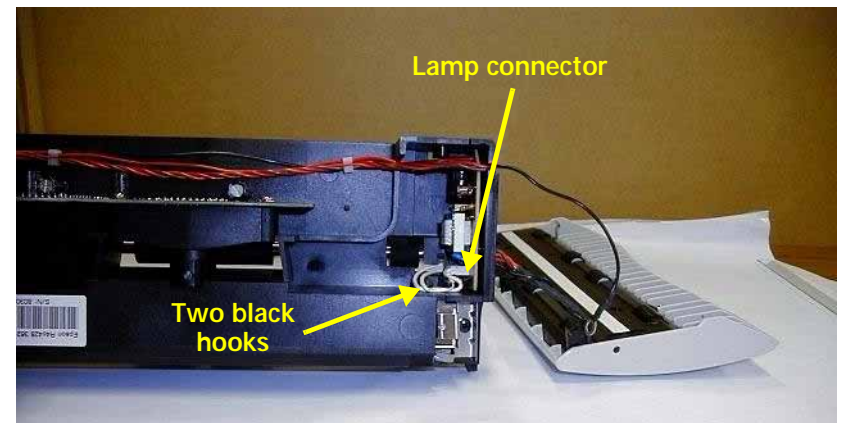


4. Lift up the document guide as shown below, and remove it.



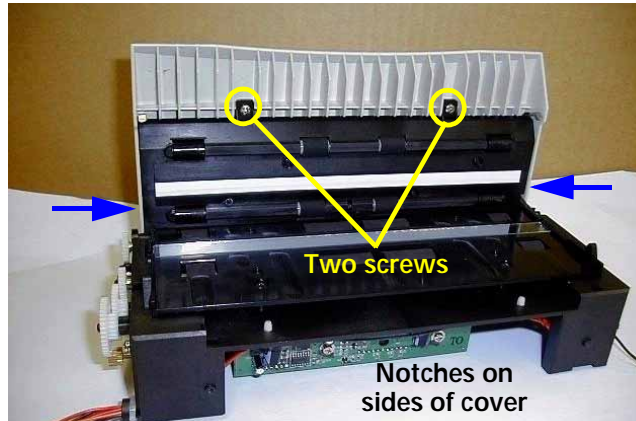
When reinstalling the document guide, make sure the protective film slides under the forward rollers.

5. Lift from underneath both ends of the lamp assembly (lamp, cable, and lamp support) to remove it. The lamp assembly snaps in and out.
6. Turn over the scanner mechanism so you can see the circuit boards. Pull the lamp cables out of the two black hooks and remove the lamp connector. Then pull out the cable and connector.

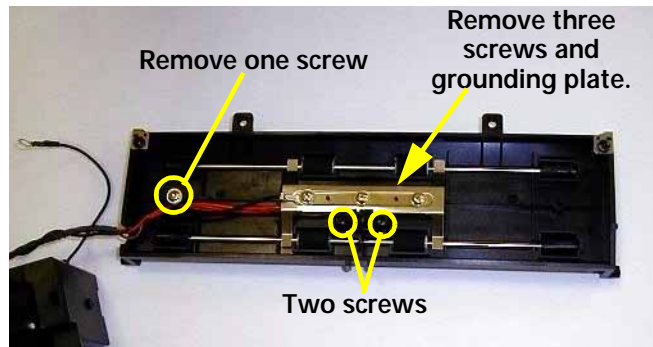


4.2.4.3 Removing the ASF (paper end) sensor

1. Remove the scanner as described in "Removing the Scanner Mechanism" on page 88.
2. Open the scanner cover and remove two screws (CBP 3x6).



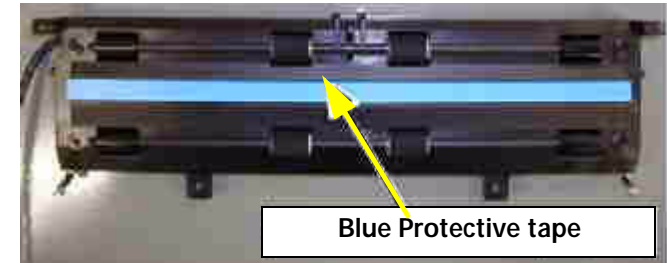
3. Using a flat-tip screwdriver or similar tool, push out the sides of scanner cover's sides so the cover comes free from the notches.
4. Remove three silver screws (CBP with flange 3x6) plus the grounding plate, one screw (CBP with flange 3x6), and two black screws (CBP 3x6) securing the ASF (paper end) sensor.



5. Remove the sensor.



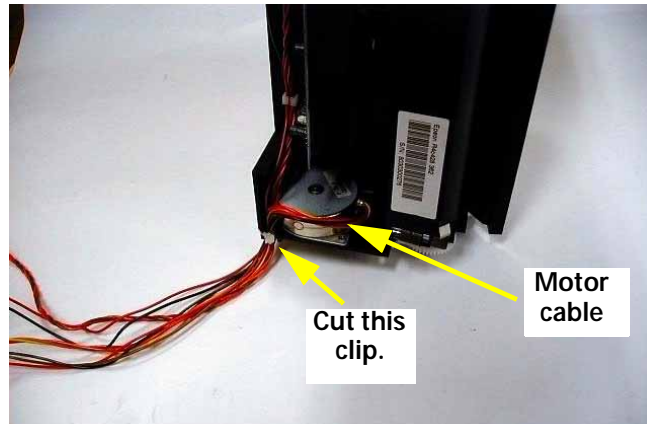
When replacing the scanner cover assembly, make sure you remove the blue protective tape that covers the standard-white strip during ASP transport.



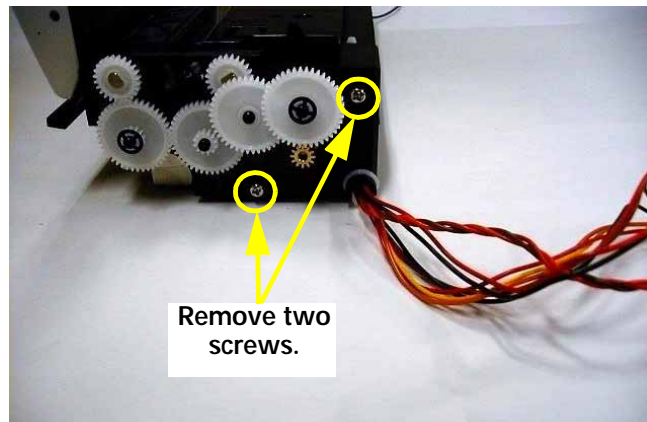
The scanner performs a standard-white test during every initialization and if the blue protective tape is not removed, scanned output will appear like a 1950's era 3-D movie - without the glasses. In other words, blurry.

4.2.4.4 Removing the scanner motor

1. Remove the scanner as described in "Removing the Scanner Mechanism" on page 88.
2. Cut the plastic clip securing the cables.



3. Remove two screws (CBP 3x6 with plain washer).



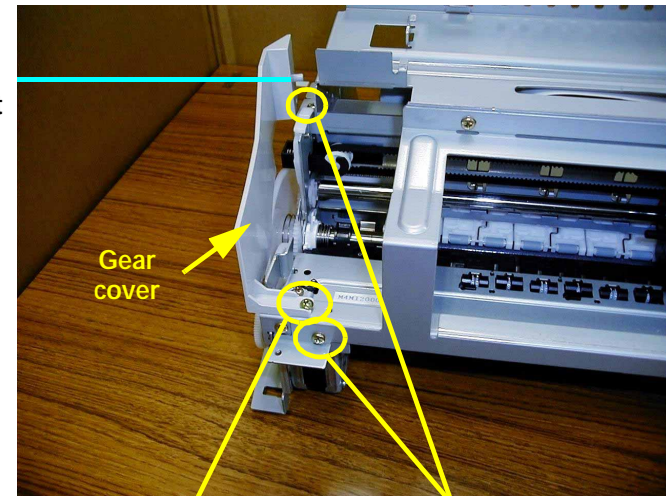
- Make sure the motor cable wraps around the back of the motor, as shown in step 2.
- Replace the cables with a new plastic clip when reinstalling the scanner motor as shown in steps 2 and 3.

4.2.4.5 Removing the upper frame

Removing the upper frame can make some procedures such as removing the printhead easier, but is not required.

1. Remove the upper cover as described in Section 4.2.1.4.
2. Remove the scanner as described in "Removing the Scanner Mechanism" on page 88.
3. If you have not already removed it, remove one screw (CBP 3x6) securing the carriage guard and then remove the guard. Also remove two screws (CBP 3x6) securing the upper frame on the left side.

When re-installing the gear cover, insert this knob into the upper hole.

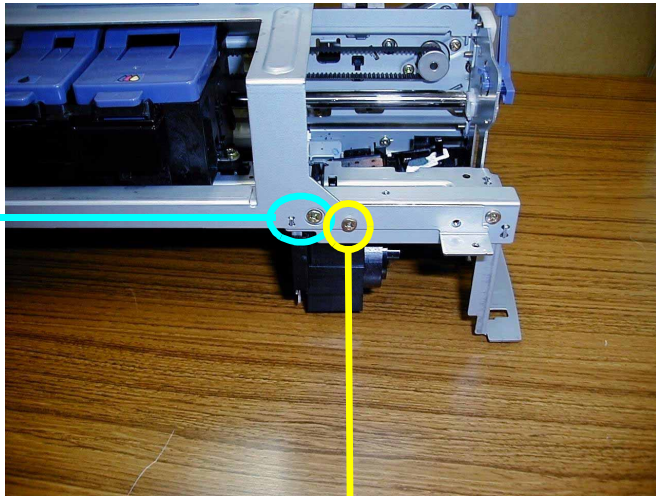


First remove this screw and the gear cover.

Then remove these screws.

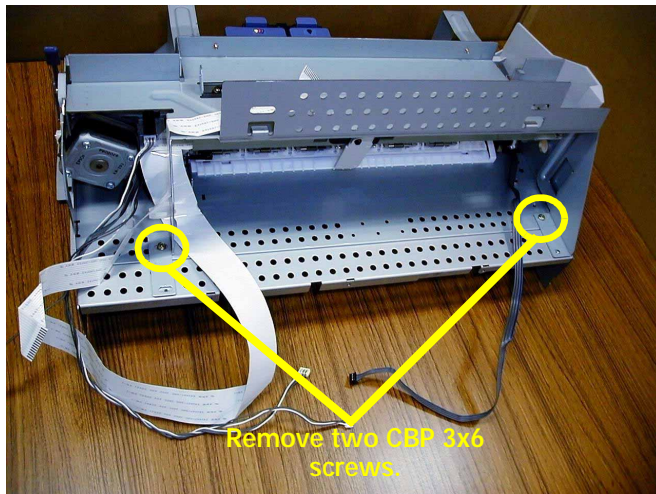
- Remove one screw (CBP 3x6) securing the upper frame on the right side.

Note: When re-installing, fit the frame over this hook and screw.



Remove this CBP 3x6 screw.

- Turn the printer so you face the rear and remove two screws (CBP 3x6) as shown below.

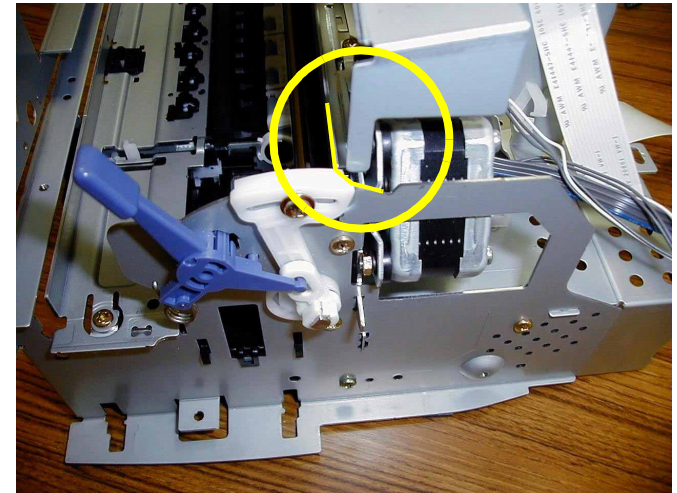


- Pull the front edge of the upper frame out and up to make sure it clears the carriage and then pull the upper frame straight up to remove it.

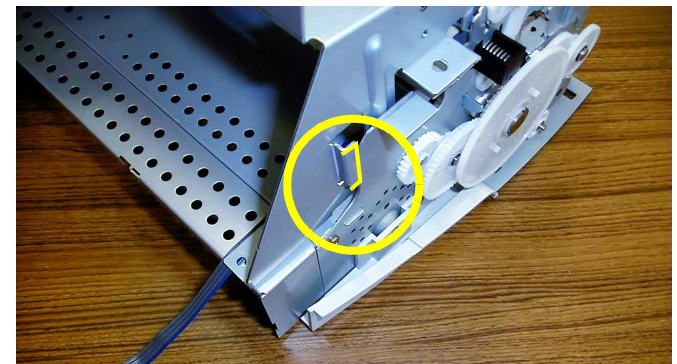


Be sure to keep the following in mind when re-installing the upper frame.

- The frame extension on the CR motor side slides behind and to the right of the yellow lines below.



- The highlighted area of the upper frame (below) hooks around the outside of the lower frame.



4.2.5 Disassembling the Printer Mechanism

This section explains procedures for disassembling the major parts or units of the printer mechanism.

4.2.5.1 Removing the Printhead

1. Remove the upper cover as described in Section 4.2.1.4.
2. Remove the upper frame as described in "Removing the upper frame" on page 92.
3. Rotate the flat gear 73.6 towards yourself (front) to release the carriage lock mechanism. Then move the carriage to the left edge.
4. Fully open the blue plastic cover for the black ink cartridge and squeeze the bottom of the cover to release it from the ink cartridge holder. Turn it slightly so the knob at the end of the cover releases from the carriage.
5. Move the carriage to the HP and repeat for the color ink cartridge cover.
6. Remove the carriage FFC and FFC guide as shown in Figure 4-6 on the next page.
7. Remove the tension spring 49.
8. Remove one screw (CBP 3x6) and twist the fastener to pull it out the hole on the right side.
9. Remove the printhead from the carriage.



- See Figure 4-7 on the next page to make sure that the grounding plate is installed correctly. (There are 2 pins to determine the location.)
- When installing the printhead, make sure that the location pin on the carriage side is placed in the notch of the printhead. See Figure 4-7.



- Since the ink cartridge once taken out can not be used again, be sure to install a new ink cartridge when you return the printer to the user.
- When you return the printer to the user, be sure to pack the printer for transportation with a new ink cartridge installed and the carriage in the home position when the printer is turned on.



When you replace the printhead, perform the following adjustments (Refer to Chapter 5 for more details.):

1. Initial ink charge (Refer to Chapter 5/Section 5.2.2.3)
2. Head Voltage ID Input (Refer to Chapter 5/Section 5.2.2.7.)
3. Head Angular Adjustment (Refer to Chapter 5/Section 5.2.2.8.)
4. Bi-D Adjustment (Chapter 5 /Section 5.2.2.9)

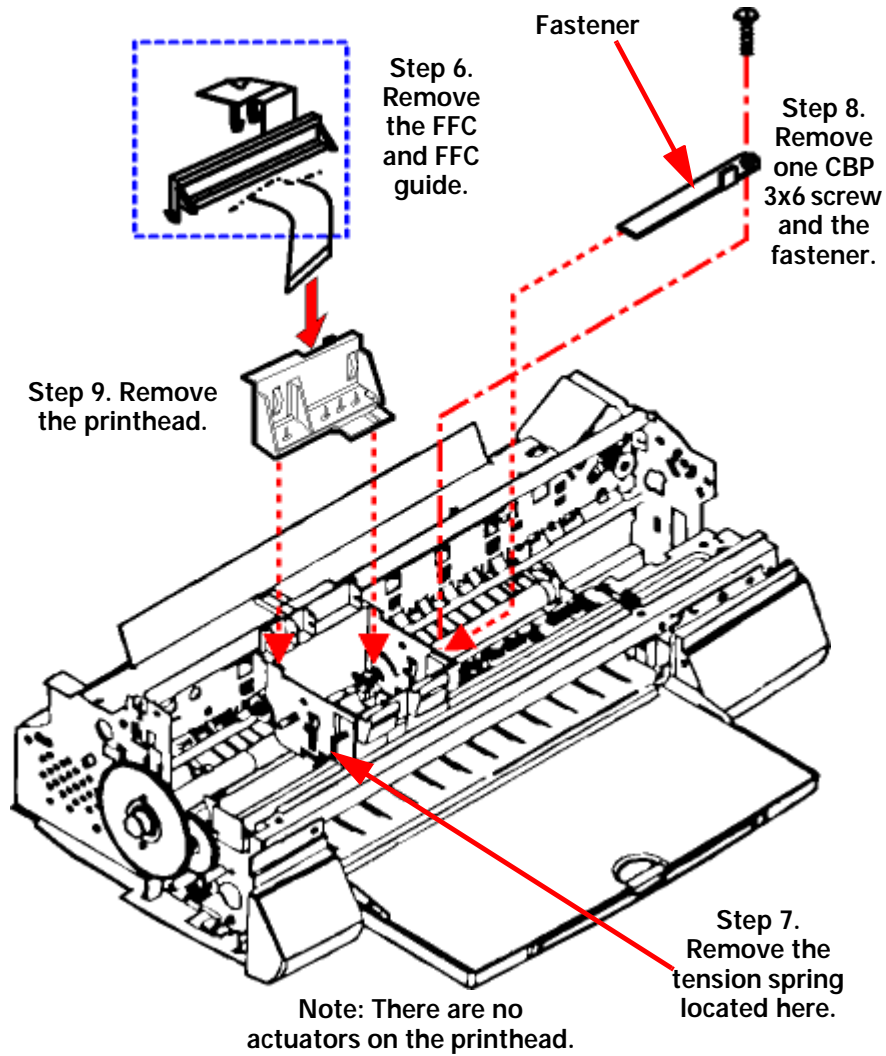


Figure 4-6. Removing the Printhead

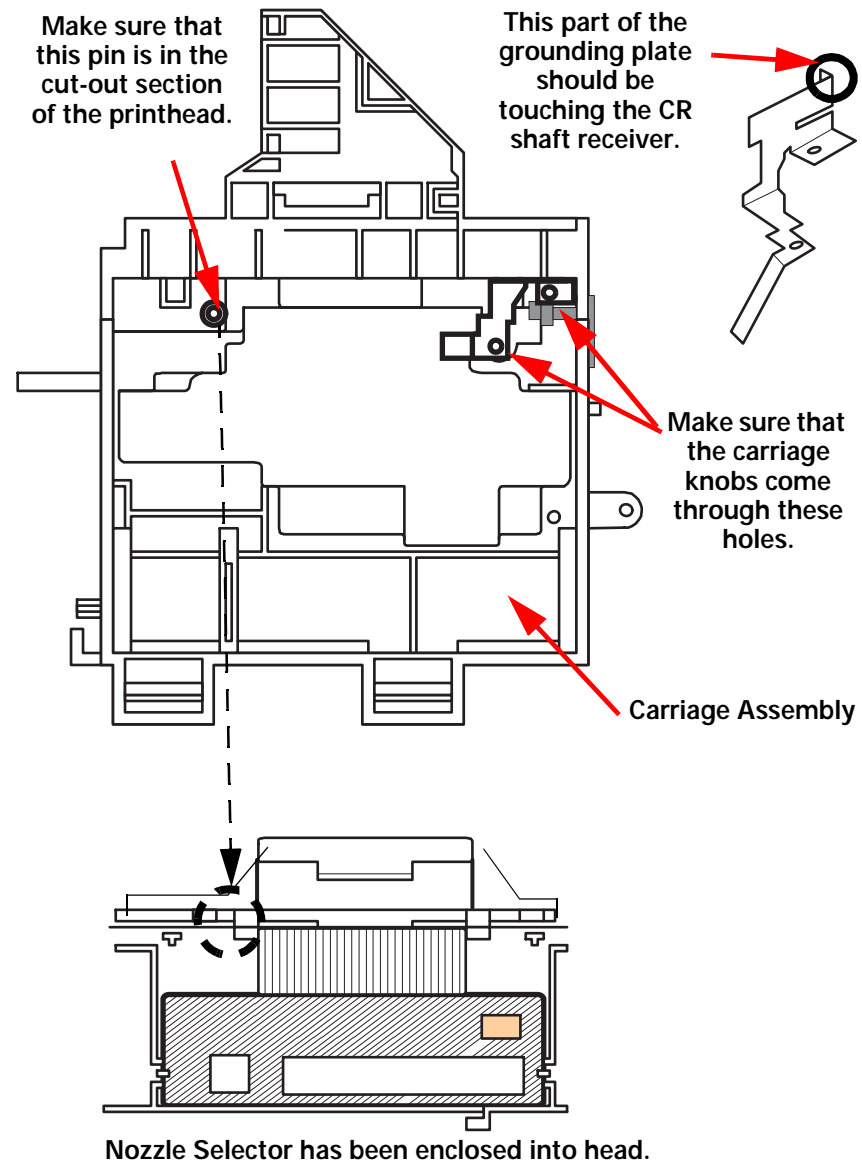



Figure 4-7. Installing the Printhead

4.2.5.2 Removing the PF Motor Assembly

1. Remove the housing as described in Section 4.2.1.1, Section 4.2.1.2, and Section 4.2.1.4.
2. Remove the waste ink tank as described in Section 4.2.2.1.
3. Remove an E-ring, a C-ring, and the following gears. (See Figure 4-8, "Removing the PF Motor Assembly" below for reference.)
 - Combination gear 12.4, 28
 - Gear 36
 - Gear 73.6

CAUTION  Gear 73.6 is a precision gear and you must replace the gear anytime you touch the teeth or bend it.

4. Remove the circuit board tray as described in "Removing the Circuit Board Tray" on page 84, and remove the PF motor cable from connector CN8.
5. Tilt the Stylus Scan so you can see the bottom and cut the plastic tie band that secures the PF motor cable.
6. Remove 3 hexagon nuts with the M3 wrench on the left side frame and slide the PF motor pinion gear toward the front of the Stylus Scan where you can remove it through the large hole.



When reinstalling the PF motor, keep the following in mind.

- Be careful of the direction of the cable from the PF motor assembly.
- Tie a plastic tie band around the PF motor cable; see step 5 above.
- Be very careful of the grooves in the gears during disassembly and assembly.

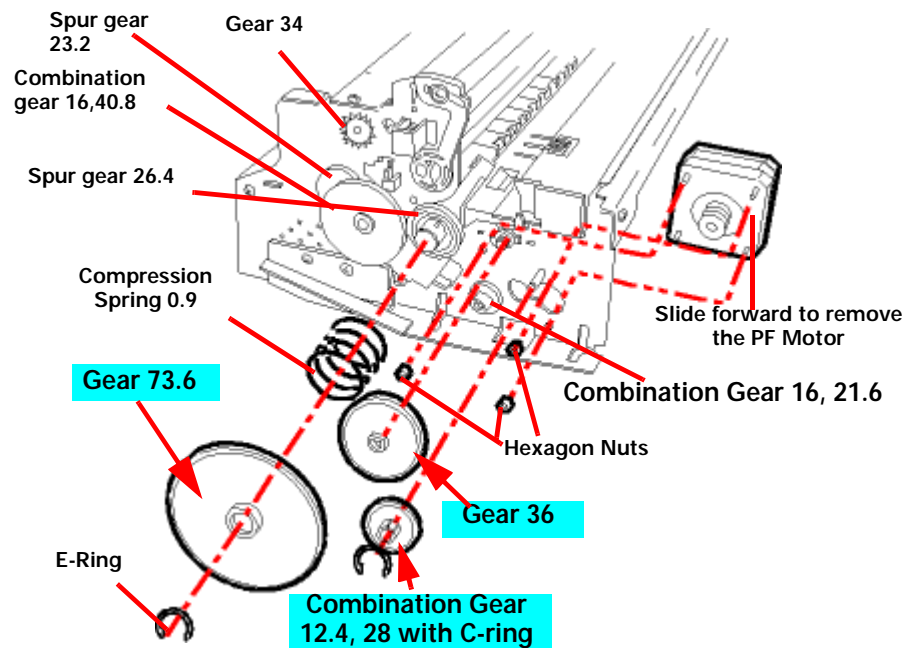


Figure 4-8. Removing the PF Motor Assembly

4.2.5.3 Removing the CR Motor Assembly

1. Remove the housing. (Refer to Section 4.2.1)
2. Pull out the circuit board tray as described in "Removing the Circuit Board Tray" on page 84, and disconnect the CR motor cable from CN7.
3. Rotate Gear 73.6 to release the carriage lock mechanism, and then move the carriage to the center.
4. Loosen the timing belt by pushing the driven pulley holder to the inside of the side frame, and remove the timing belt from the pulley on the CR motor.
5. Remove two screws (CBS 3x6) and remove the CR motor assembly.



When reinstalling the timing belt, make sure the driven pulley assembly fits tightly in the angled slots in the driven pulley holder. (Refer to Figure 4-9.)

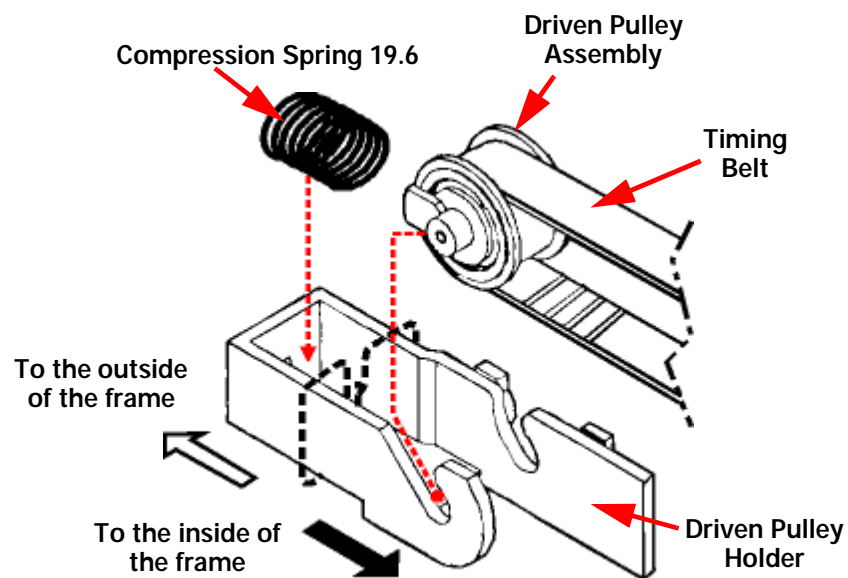


Figure 4-9. Removing the Timing Belt

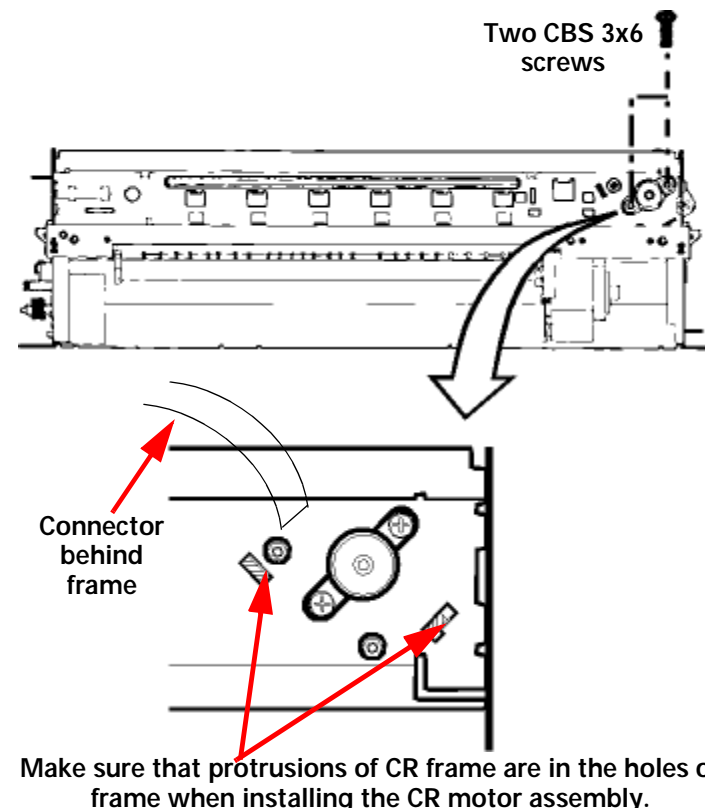


Figure 4-10. Removing and Installing the CR Motor Assembly

4.2.5.4 Removing the ASF Assembly

1. Remove the housing. (Refer to Section 4.2.1.)
2. Release the fixed hook from the inside of the printer mechanism and carefully but forcefully remove Gear 34 from the roller shaft in the ASF assembly.
3. Remove the cables from the cable hook on the printer mechanism and the hook on the ASF assembly.
4. Remove two screws (one CBS Sems R2 3x6 with plain washer and one CR shaft installation screw).
5. With one hand move the paper depressor to the left and up, and with the other hand remove the ASF assembly, releasing the protrusion on the left side of the ASF assembly from the hole in the frame.

CHECK
POINT



- When installing the ASF assembly, make sure that the frame and ASF assembly are attached each other without any space between them.
- Screws for ASF assembly should be used at the following positions. (Viewing from the back of the printer)
 - Right: CR shaft installation screw
 - Left: Screw (CBS, Sems R2; with a plain washer)

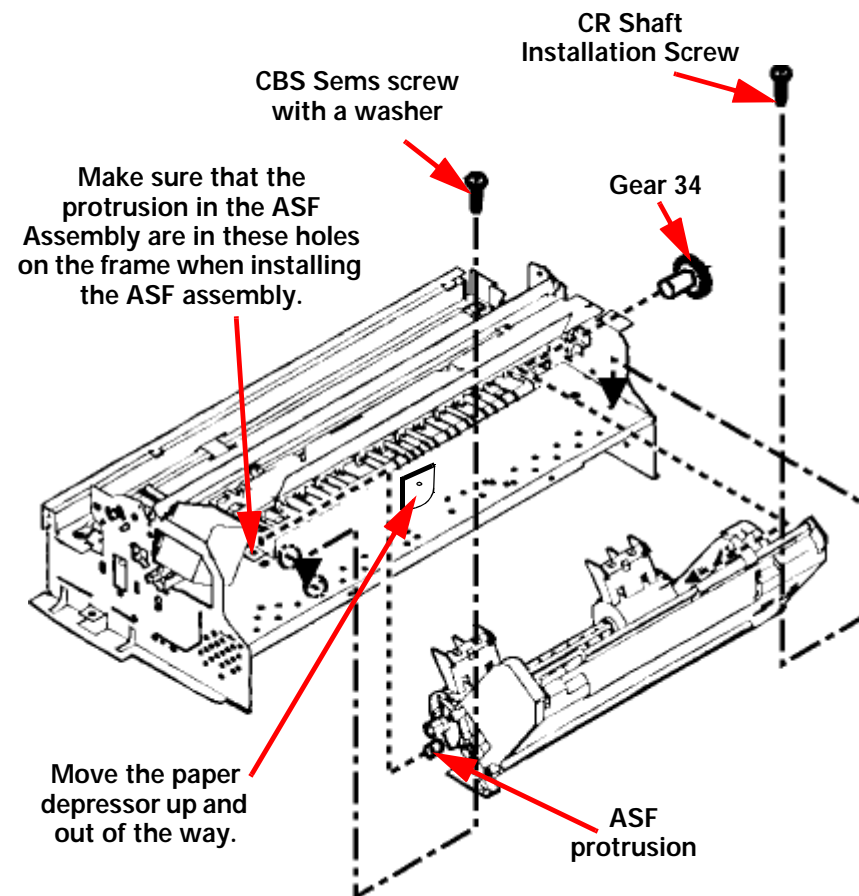


Figure 4-11. Removing the ASF Assembly

4.2.5.5 Disassembling the ASF Roller Assembly

1. Remove the ASF assembly. (Refer to Section 4.2.5.4.)
2. Remove the brake lever, releasing one leg of the torsion spring 41.2 from the hook of the ASF frame.
3. Remove the shaft-fixing bushing from the right side of the LD roller shaft and the release hopper lever.
4. Move the left paper feed assembly to the center and remove the cam fixing bushing (white plastic) attached to the left side of LD roller shaft.
5. Push the LD roller shaft to the left and remove the left shaft fixing bushing after releasing its hook.
6. Holding the hopper assembly by hand, remove the cam part of hopper assembly from the right holes of ASF frame.
7. Holding the hopper assembly by hand, remove the cam part of hopper assembly from the right holes of ASF frame.

See the next section for details on disassembling the paper-feed roller assemblies.



- During disassembly and assembly of the hopper assembly, do not let grease from the cam parts touch any other parts. Wipe off any grease transferred to other parts.
- Be careful of the direction of the hopper lever release when installing it.
- Make sure that the right and left shaft-fixing bushings are fully installed and do not slip off.
- During assembly, attach the cam fixing bushing after installing the LD roller shaft to the ASF frame.
- When installing the right and left paper feed roller assemblies to the LD roller shaft, the black paper feed roller assembly goes on the right side and the standard EPSON color one goes on the left side.

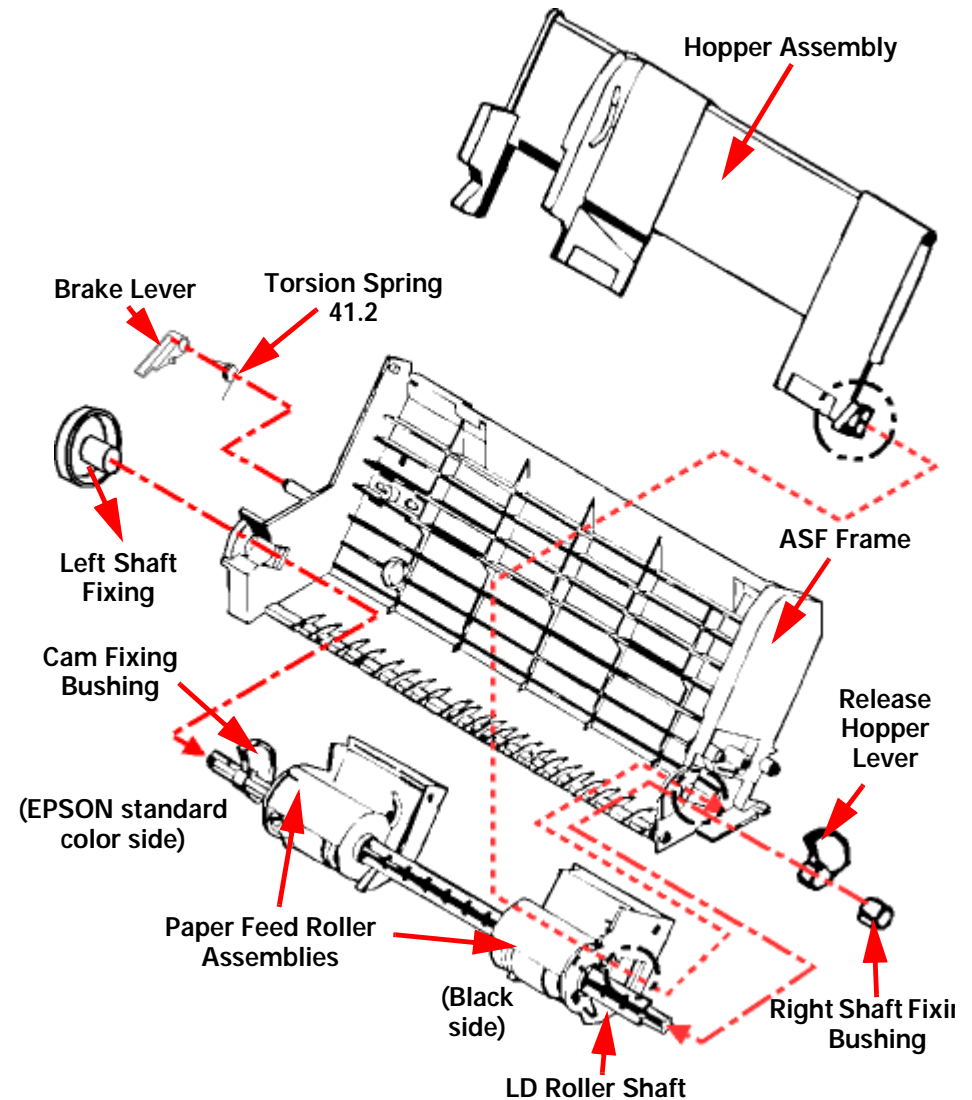


Figure 4-12. Disassembly of ASF Assembly

4.2.5.5.1 Removing the Right and Left LD Roller Assemblies

1. Disassemble the ASF assembly and remove the paper feed roller assembly and hopper assembly from the ASF assembly. (Refer to Section 4.2.5.4.)
2. Take out the right and left compression springs 1.66 from the back of the hopper assembly.
3. Pull out the cam part of the hopper assembly from the hole located on the frame of the right LD roller assembly,
4. Pull out the LD roller shaft. The paper feed roller assembly and hopper assembly should be disconnected by now.
5. Release the hook of LD roller assembly at the shaft hole of the paper feed roller assembly. Also, release the fixed hook of the cover roller LD and remove the LD roller assembly.



- When installing the LD roller assembly, make sure that the hooks are hung on the paper feed assembly.
- During assembly, when setting the compression spring 1.66 to the spring installation position in the paper feed assembly, hang both ends of the spring on the hooks temporarily. Also, do not forget to release the hooks of these springs from the holes located on the back of paper feed assembly by rotating the spring. (Refer to the figure below.)

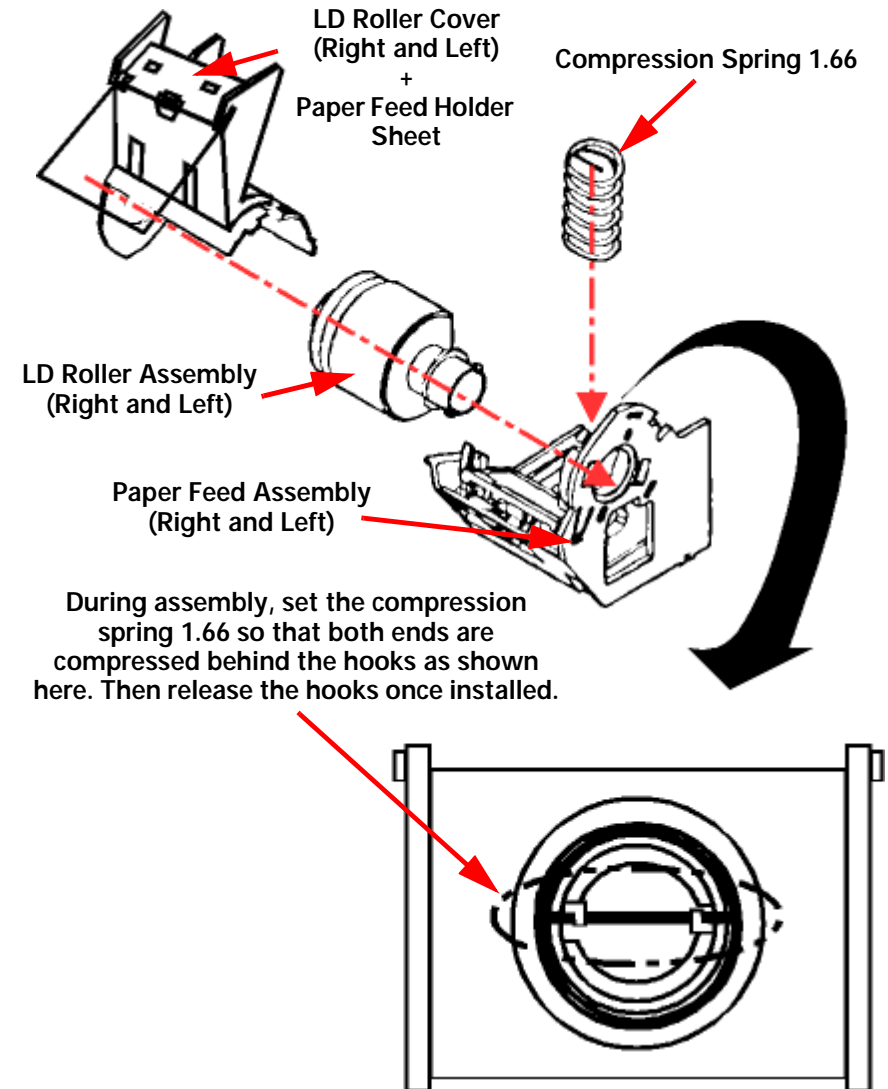


Figure 4-13. Disassembly of Paper Feed Roller Assembly

4.2.5.6 Removing the Carriage Assembly

1. Remove the housing. (Refer to Section 4.2.1)
2. Loosen the timing belt by pushing the driven pulley holder and remove the timing belt from the pulley of the CR motor side. (See Figure 4-9 on page 97.)
3. Take the compression spring 19.6 out of the driven pulley holder.
4. Remove the driven pulley assembly from the driven pulley holder with the timing belt. Slide the driven pulley holder and remove it from the frame.
5. Remove the 63.7 torsion spring between the frame and PG lever. Release the fixed hook of the PG lever from the PG support lever and remove the PG lever.
6. Release the fixed hook of the PG lever support from the right parallelism bushing and remove the PG lever support and washer. (Refer to the figure next page.)
7. Remove one screw (CBS Sems R2 3x6) and rotate the right parallelism adjustment bushing so that it fits in the notch of the frame, and remove it.
8. Remove the CR assembly with the CR guide shaft.



- When disassembling the right parallelism adjustment bushing, mark present location where the bushing is fixed on the frame so that you can omit gap adjustment after assembly.
- When installing the washer, pay attention to its direction. (Convex side should face the right parallelism adjustment bushing side.) Refer to the figure below.
- When installing the PG lever, refer to the figure below.

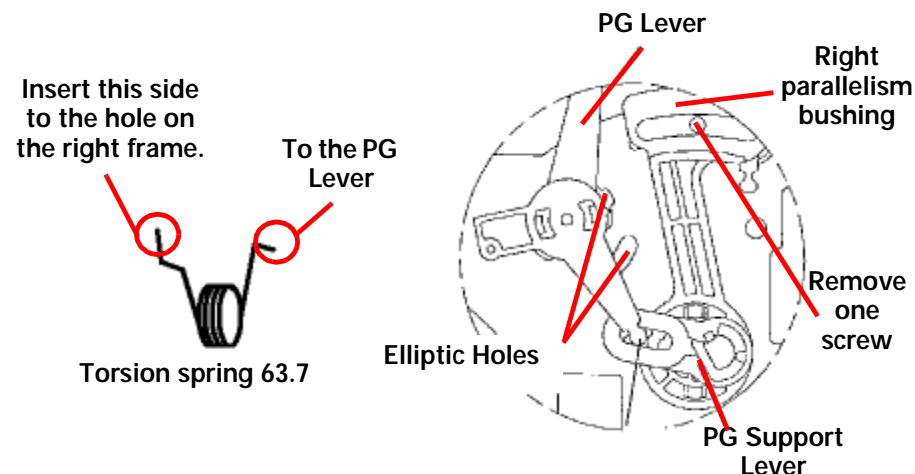


Figure 4-14. Installing the PG Lever

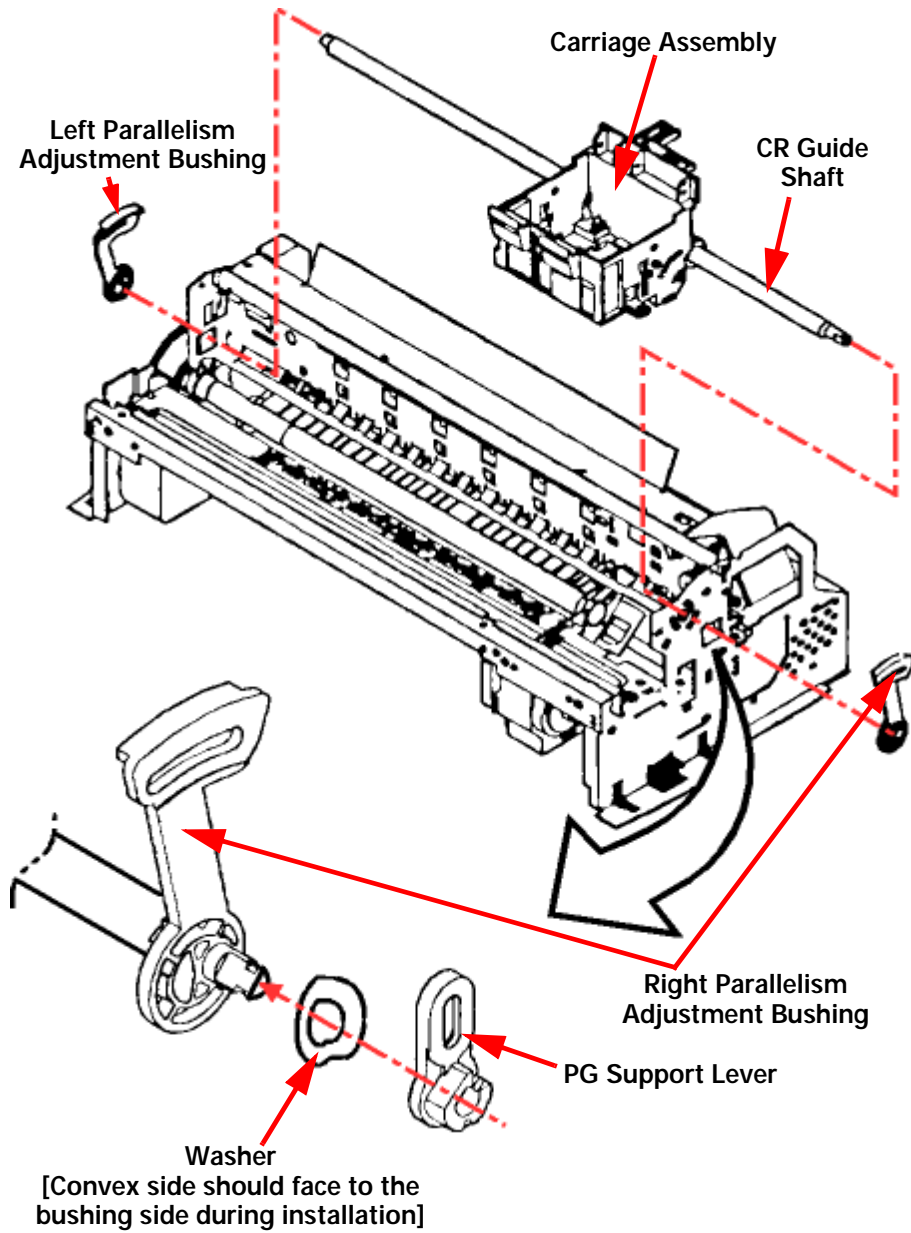


Figure 4-15. Removing the Carriage Assembly

4.2.5.7 Removing the PF Roller Assembly

1. Remove the housing. (Refer to Section 4.2.1.)
2. Remove the carriage assembly. (Refer to Section 4.2.5.6.)
3. Remove three screws (CBS 3x6) on the printer mechanism and disassemble the cable guide board.
4. Remove six upper paper guide assemblies, releasing their springs from the hooks in the frame.
5. Remove the front paper guide, releasing the hooks. (Refer to next page.)
6. Remove the paper eject roller assembly, releasing the fixed locks located on the right and left edges of the shaft.
7. Release the fixed hook located on the left side of the PF roller assembly shaft and rotate it so that the protrusion on the shaft (white) and hole for receiving the shaft in the frame align.
8. Slide the PF roller assembly to the right and pull it out.



- During disassembly and assembly of the upper paper guide assemblies, since one of the upper paper guide assemblies to be installed on the right side overlaps with the PE detector lever, pay attention not to damage the lever.
- Be careful not to damage the hook during disassembly and assembly of the front paper guide.
- Be careful not to scratch the PF roller assembly during disassembly and assembly, since its surface is specially coated to improve paper feeding. (black part)
- Be careful not to damage the combination gears.

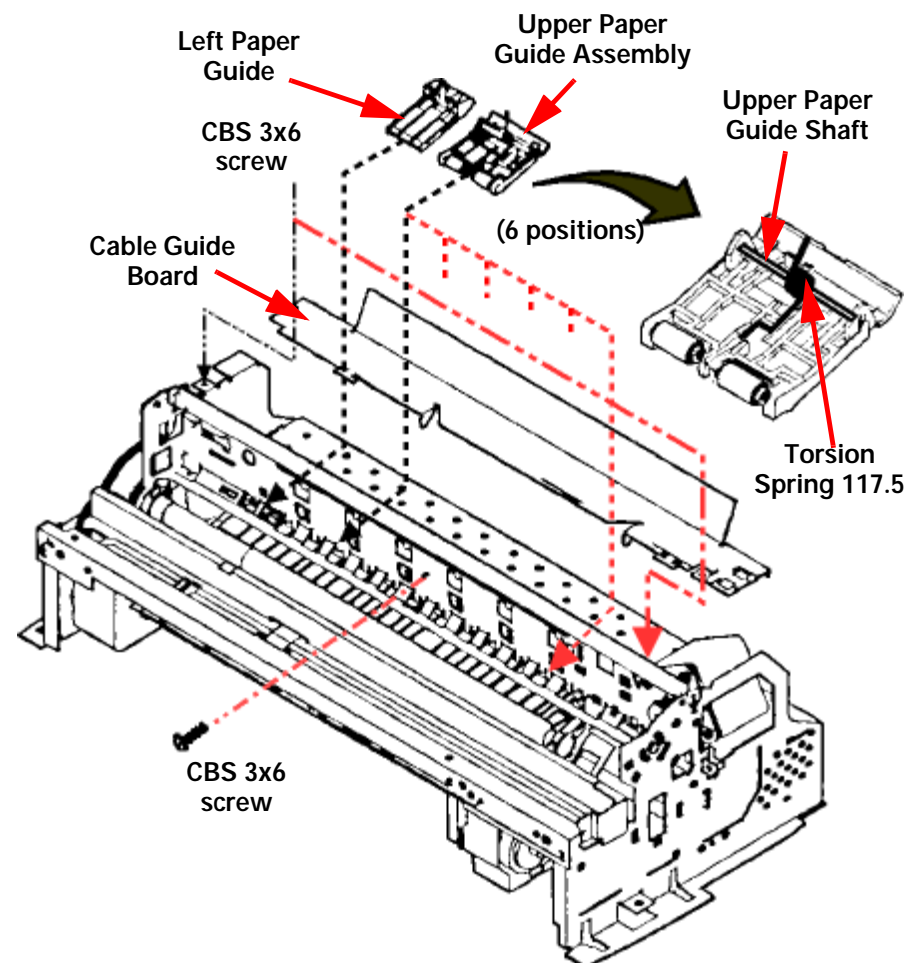


Figure 4-16. Removing the Paper Guide Assembly

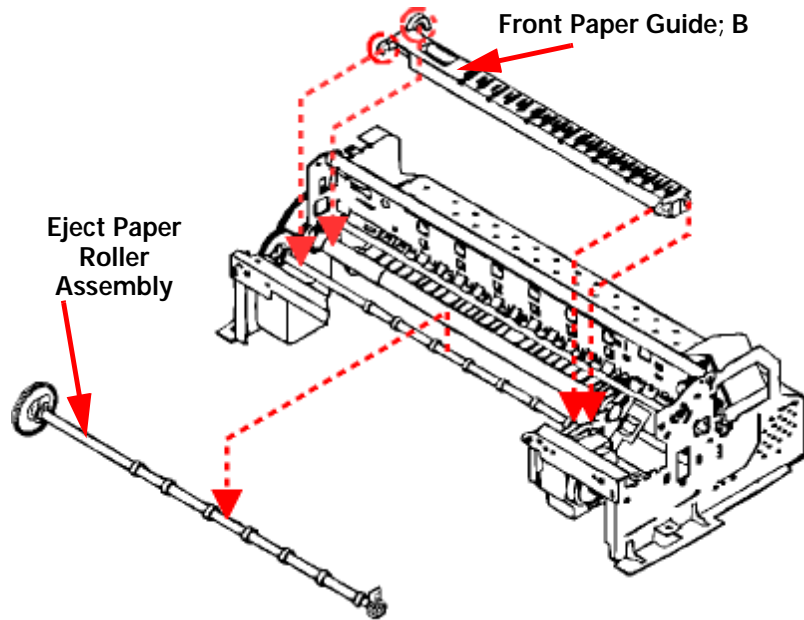


Figure 4-17. Removing the Paper Eject Roller Assembly

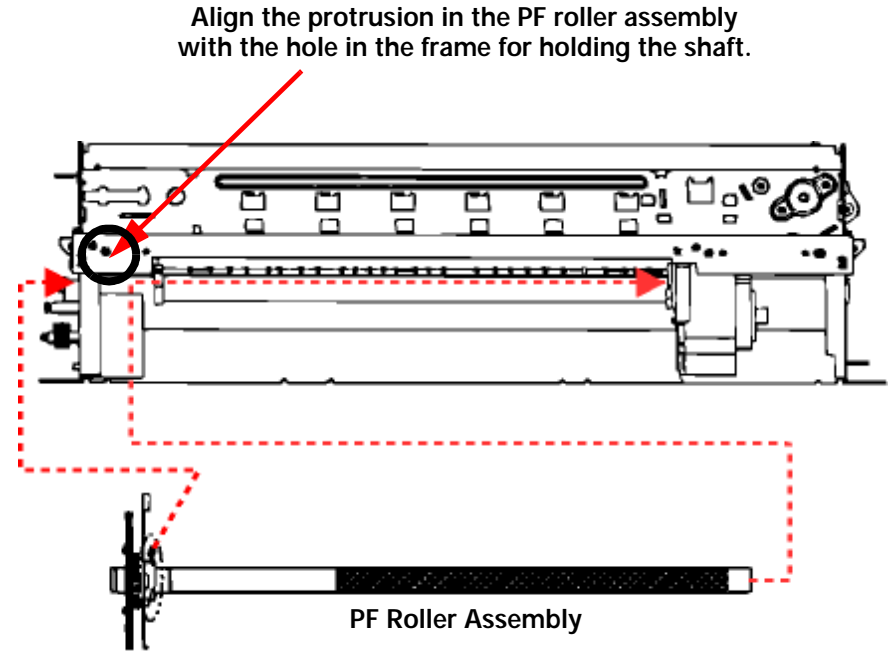


Figure 4-18. Removing the PF Roller Assembly

4.2.5.8 Removing the PE Paper Detector Assembly

1. Remove the housing. (Refer to Section 4.2.1.)
2. Move the carriage out of the home position.
3. Release two fixed hooks securing the PE detector assembly from the back of the frame and remove the PE detector assembly, sliding it upward.



During assembly, make sure that the tip (sensor part) of the detector lever is in the hole of the paper guide assembly.

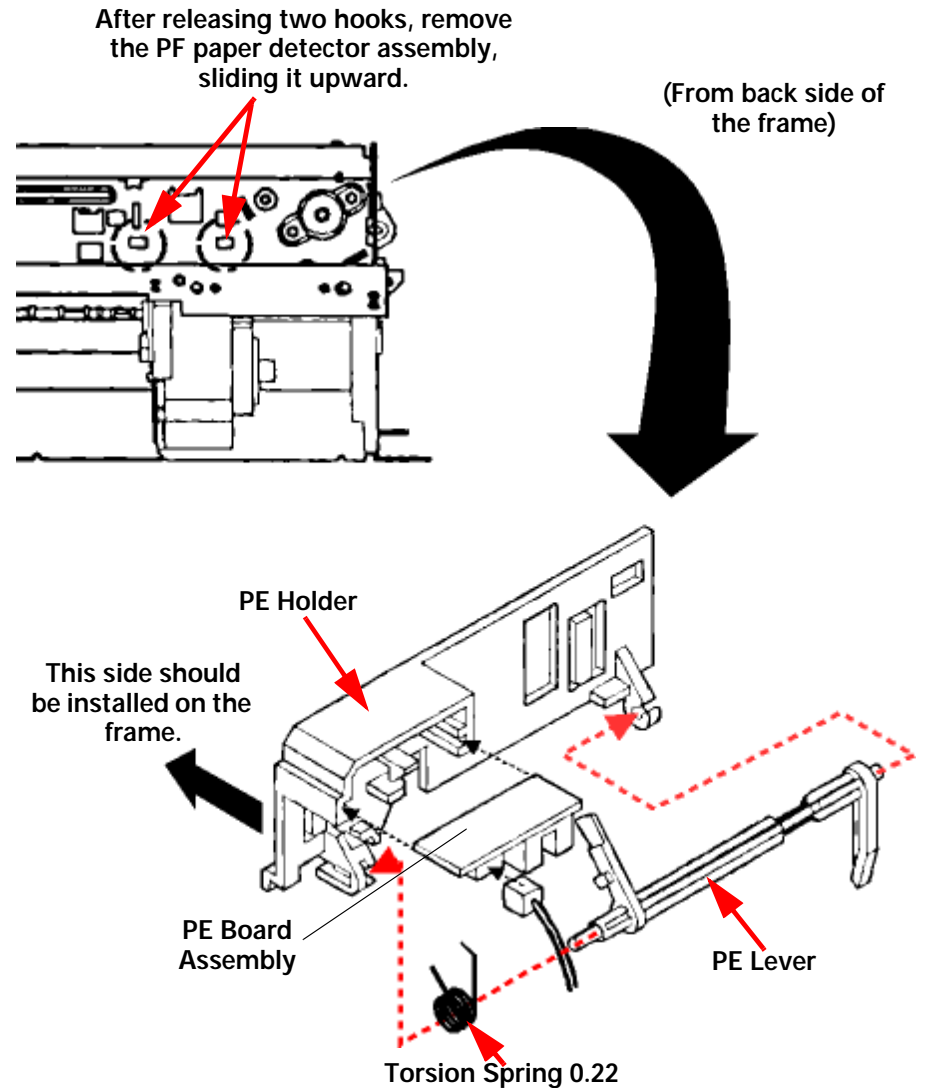


Figure 4-19. Removing the PE Detector Assembly

4.2.5.9 Removing the HP Detector

1. Remove the housing. (Refer to Section 4.2.1.)
2. Remove the cable from the HP detector and take it out after releasing the fixed hook.

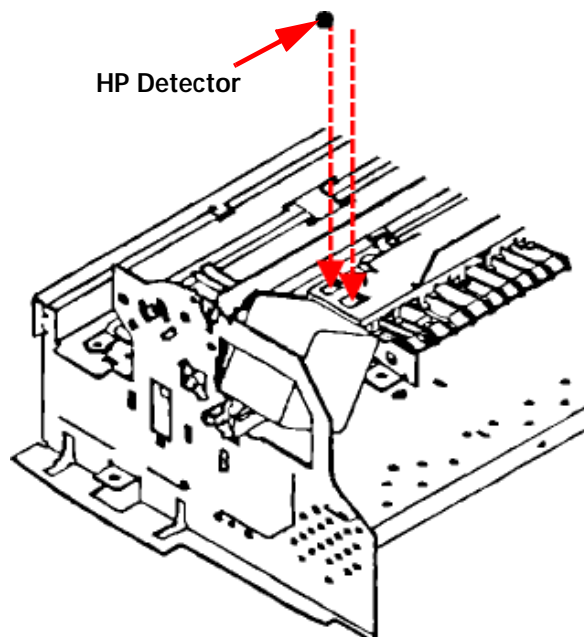


Figure 4-20. Removing the HP Detector

CHAPTER

5

ADJUSTMENT

The scanner mechanism requires no adjustment for any service operation provided you closely follow the specifications in this manual and the instructions in Chapter 4 "Disassembly and Assembly".

5.1 Required Adjustments

The Stylus Scan printer mechanism requires the adjustments shown in Table 5-1. Perform the necessary adjustment referring to the steps and figures described throughout this chapter. Table 5-2 provides a list of necessary adjustments and the conditions when they are required.

Table 5-1. List of Service Procedures That Require Adjustment

No.	Content of Operation	Adjustment Procedure
1	Replacement of the printhead	<ol style="list-style-type: none"> 1. Perform Vh voltage writing operation. 2. Perform initial ink charge. 3. Perform printhead angle adjustment. 4. Perform Bi-d Adjustment.
2	Replacement of the main board	<ol style="list-style-type: none"> 1. Perform Vh voltage writing operation. 2. Perform Bi-d adjustment.
3	Replacement or Removal of the Carriage Unit	<ol style="list-style-type: none"> 1. Perform parallel adjustment. 2. Perform printhead angle adjustment. 3. Perform Bi-d adjustment. 4. Reset ink counter.
4	Replace of the CR Motor	<ol style="list-style-type: none"> 1. Perform Bi-d adjustment.
5	Replacement of the Printer Mechanism	<ol style="list-style-type: none"> 1. Perform Head Voltage ID Input. 2. Perform initial ink charge. 3. Perform Bi-d adjustment.
6	Replacement of the waste ink pads	<ol style="list-style-type: none"> 1. Reset waste ink counter

Table 5-2. List of Required Adjustments

No.	Adjustment Item	Conditions
1	Parallelism Adjustment	<ul style="list-style-type: none"> When you replace or remove the carriage or carriage guide shaft. When you move the parallelism adjustment bushing.
2	Initial Ink Charge	<ul style="list-style-type: none"> When you replace or remove the printhead.
3	Head Voltage ID Input	<ul style="list-style-type: none"> When you replace the printhead. When you replace the main board. <p>Note) The values stored in this address are not erased by the EEPROM reset operation.</p>
4	Printhead Angle Adjustment	<ul style="list-style-type: none"> When you replace or remove the printhead. When you move the printhead angle-adjust lever. When you replace or remove the carriage or carriage guide shaft.
5	Bi-D Adjustment	<ul style="list-style-type: none"> When you replace or remove the printhead. When you replace the main board. When you replace the CR Motor. When you replace or remove the carriage or carriage guide shaft.
6	Reset waste ink counter.	<ul style="list-style-type: none"> When you replace the waste ink pads.

Table below shows the actions taken and required adjustments in the order to be performed.

5.1.1 Adjustment Tools Required

Table 5-3 below shows necessary adjustment tools.

Table 5-3. Adjustment Tools Required

No.	Name	Adjustment Item	Contents/Spec.
1	Thickness Gauge	Parallelism Adjustment	1.04 mm
2	Adjustment Program	Mechanism Settings	Program for Production; P00A10W (included in the Self Training Kit No. 1052134)



- Never use a bent (curved or tilted) or rusty thickness gauge.
- Remove any dirt, grease or obstacles on the thickness gauge before you use it.

5.2 Printer Adjustment

This section explains detailed adjustment procedures for the printer mechanism such as parallelism adjustment and using the adjustment program to enter market and Head ID information (see page 122).

NOTE: *The adjustment program for the Stylus Scan is not an exclusive service program; it is actually the production program used at the factory during assembly. However, for the purposes of this manual, it will be called the adjustment program except when referring to the Smart menu icon.*

The following section describes the physical adjustments that must be performed. See “Using the Service-Adjustment Program” on page 113 for details on adjustments performed using the adjustment program.

5.2.1 Printer hardware adjustments

5.2.1.1 Parallelism Adjustment

When replacing the carriage assembly or removing it during printer mechanism disassembly, perform the parallelism adjustment during re-assembling and set the standard distance from the surface of the printhead to the paper surface.



- Do not scratch the special coated surface of the PF roller assembly or the ribbed surface of the front paper guide; B.
- Be careful not to scratch or leave anything such as dirt on the surface of the printhead. (Never use a rusty or dirty thickness gauge. Also, do not push the thickness gauge hard against the head.)

[RIGHT PARALLELISM ADJUSTMENT]

1. Install the "parallelism adjustment bushing" for right and left frame and set them on the peaking of the upper frame side so that they match with "the standard mark of parallelism adjustment bushing".
2. Make sure the PG lever is pulled forward (small gap position).
3. Move the carriage to the center and set the thickness gauge on the fixed position of the front paper guide; B as shown in Figure 5-1 on the next page.
4. Move the carriage so that the printhead overlaps the thickness gauge.



- Put the thickness gauge on the flat side of a ribbed section of the front paper guide; B.
- To move the carriage, pull the timing belt with your hand.

5. Move the right parallelism adjustment bushing to the rear until the thickness gauge moves with the carriage when you move the carriage about 20 mm right and left (the gap will narrow).

6. From the point where the thickness gauge starts moving with the carriage, move the gear of the right parallelism adjustment bushing one notch toward you (the gap will widen)
7. With the PG lever pulled forward (gap is small), move the carriage right and left to make sure that the thickness gauge does not move.

[LEFT PARALLELISM ADJUSTMENT]

8. Perform Steps 2 to 7 for the left parallelism adjustment bushing.

[CHECKING PARALLELISM]

9. Perform steps 1 to 4 again.
10. Make sure that the thickness gauge does not move right and left along with the carriage when the carriage is moved about 20 mm.
11. Move the right parallelism adjustment bushing one notch to the rear (the gap will narrow). Then check that the thickness gauge moves along with the carriage. If the thickness gauge does not move, go back to Step 1 and repeat the adjustment.
12. If the gap is adjusted correctly, move the right parallelism adjustment bushing one notch toward you (the gap will widen).

[FIXING PARALLELISM ADJUSTMENT BUSHING]

13. Fix the right and left parallelism adjustment bushings with screws (CBS 3x6).

ADJUSTING THE GAP

When finished with this adjustment, check the overlap amount of the printhead and Cleaner Head as described below.

1. Rotate the gear 73.6 and move the head cleaner to the printer rear side.
2. Move the carriage next to the Cleaner Head and make sure that overlap between the tip of the printhead and Cleaner Head is more than 0.5 mm.
3. Then, rotate the gear 73.6 and return the head cleaner to the front position.

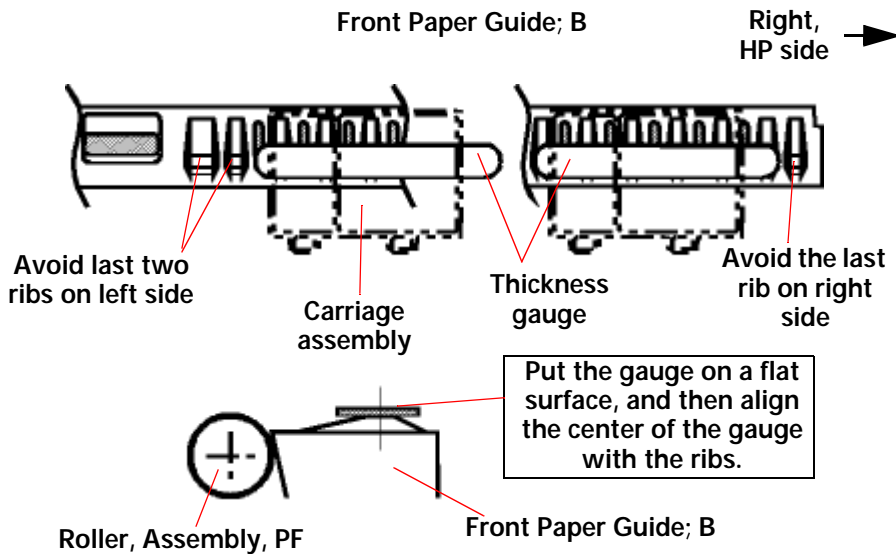


Figure 5-1. Setting the Parallelism-Adjustment Gauge

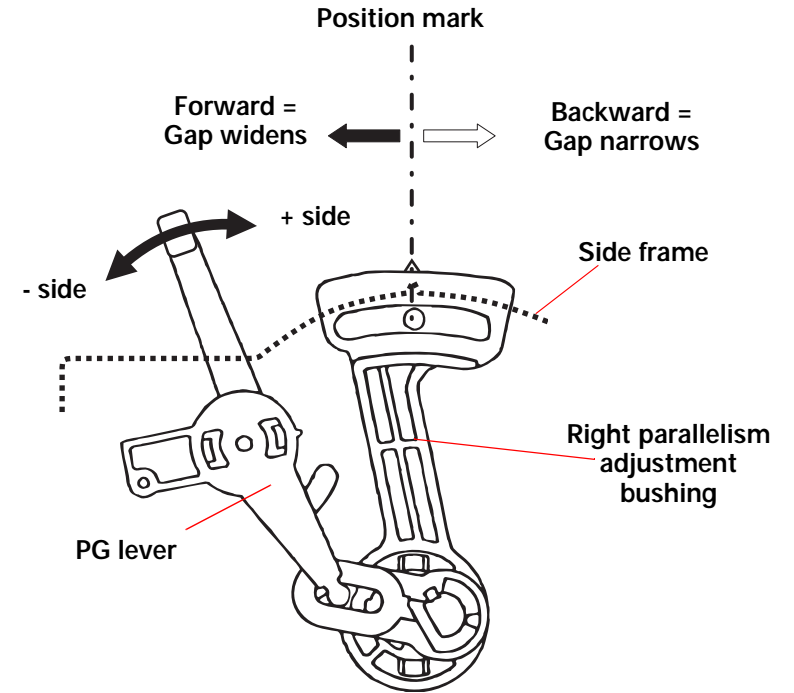


Figure 5-2. Parallelism Adjustment

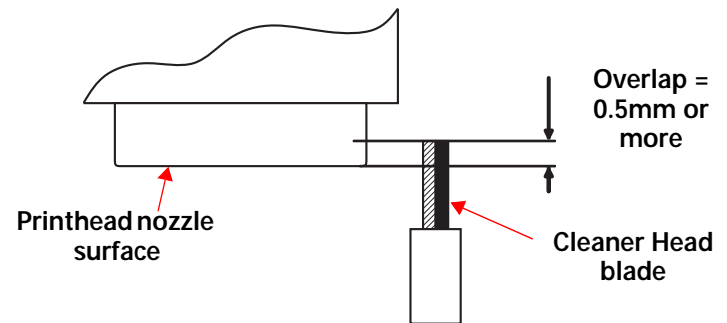


Figure 5-3. Overlap of Head Surface and Cleaner Blade

5.3 Using the Service-Adjustment Program

For the Stylus Scan, instead of an exclusive service-adjustment program, you need to use the production program when performing certain service operations.

This program is necessary to eliminate any malfunction or fluctuation between individual printer mechanisms and printer parts. Therefore, any time you replace the printer mechanism, printhead, or main board you need to enter the correct information in the main board using this production program.

5.3.1 Installing the program

1. Insert the floppy disk in the "A" drive and open the "A" drive folder from My Computer or the Explorer.
2. Click the program icon for the Adjustment program.

NOTE: *The program name varies according to model and program version. At the time of the publication, SS 2000 = N90B01W and SS2500 = P00B01W*

3. Select an installation folder and click OK.

5.3.2 Opening the Start-up menu

1. Connect the printer and PC and turn on the printer.
2. From the Start menu, select Programs>Program for Production>P00B01W The following screen appears.

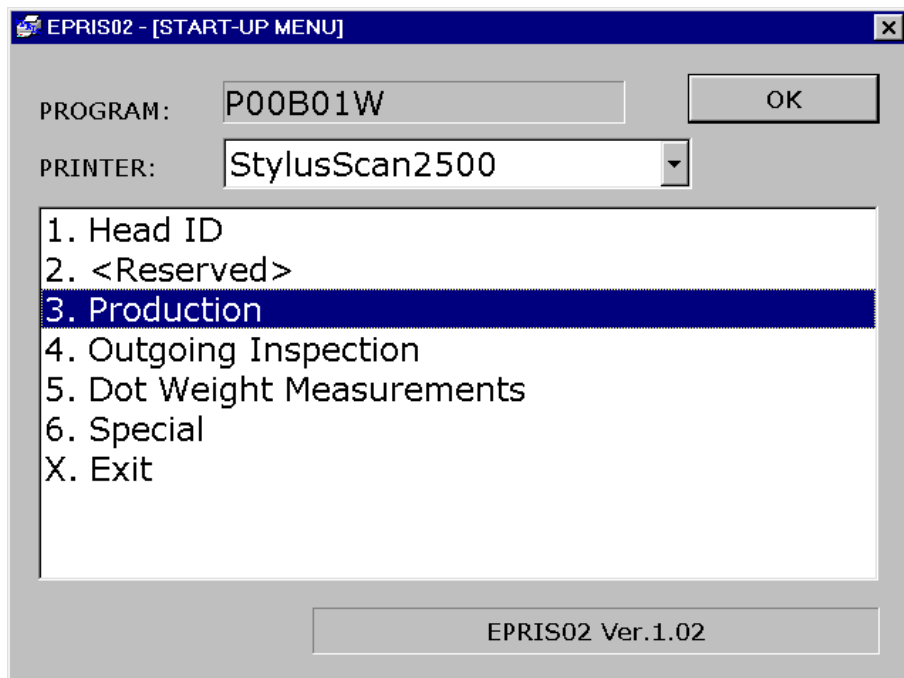


Figure 5-4. Initial Menu

From the Startup menu you need to choose Head ID or Production depending on the adjustment procedure you perform. See the table below for details.

Table 5-4. Software-based Adjustment Procedures

Adjustment procedure	See	Then see
Input the head voltage	"Head ID Menu" on page 115	"Head Voltage ID Input" on page 122
Charge ink	"Production Menu" on page 117	"Initial Ink Charge Operation" on page 119
Adjust normal Bi-d		"Bi-D Adjustment" on page 120
Adjust variable Bi-d		
Clean the printhead		"Head Cleaning Operation" on page 121
Drain ink		"Ink draining" on page 125
Reset EEPROM	Special	
Clear ink counter		

The following table gives a list of adjustment that are available on the service-related menus. Other menus and items are for production purposes only.

Table 5-5. Service Menu Items

Menu name	Operations available
Head ID Menu	Input Head ID
Production Menu	<ul style="list-style-type: none"> • Input the head voltage • Charge ink • Adjust normal Bi-d • Adjust variable Bi-d • Clean the printhead • Drain ink
Special	<ul style="list-style-type: none"> • Reset EEPROM • Clear ink counter

HEAD ID MENU

To enter the Head ID menu, follow these steps.

1. Open the Start-up menu as described above.
2. Select Head ID and click OK. The following menu appears.



Only select Print Head ID in the Head ID menu. All other options are for factory use only.

Head ID MENU

Execute - Printer!

1. Input-Write-Verify / QR Code	Program	P00B01W
2. Input-Write-Verify / Manual	Printer	StylusScan2500
3. <Reserved>	Interface	LPT1(D4 Mode)
4. <Reserved>	JIG/CT	
5. <Reserved>	Customer	
6. Print Head ID	M/C No.	
7. <Reserved>	Head ID	
X. Return to START-UP Menu	Device ID	

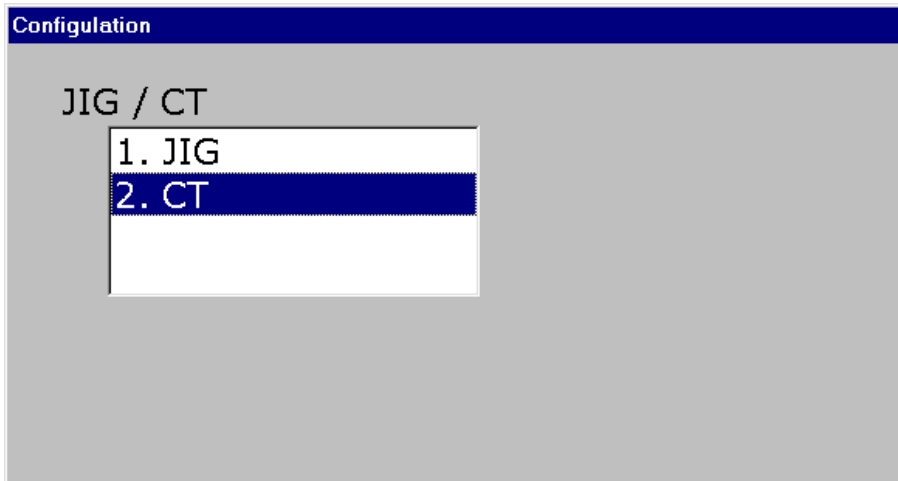
[SPACE] EXECUTE

Figure 5-5. Head ID Menu

PRODUCTION MENU

To enter the Production menu, follow these steps.

1. Open the Start-up menu as described above.
2. Select Production and click OK.
3. Make sure CT (cartridge) is selected in the first Configuration window and then click Next.

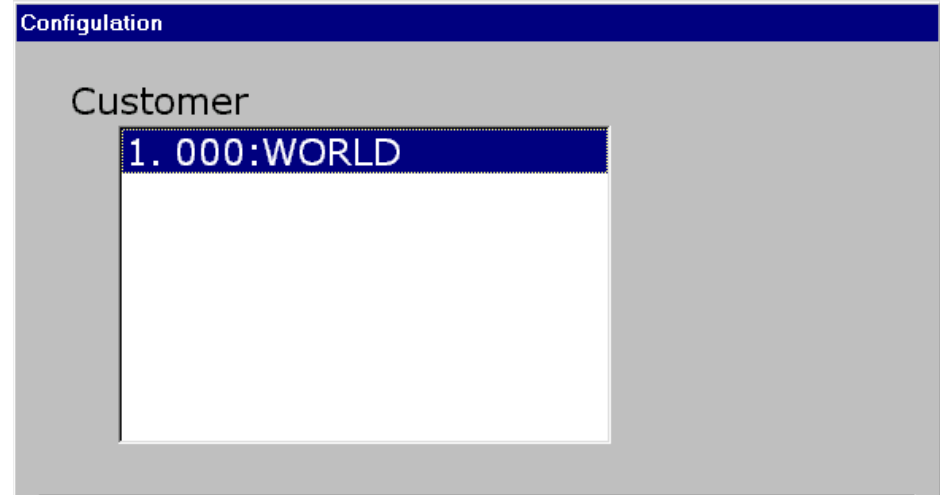


CAUTION

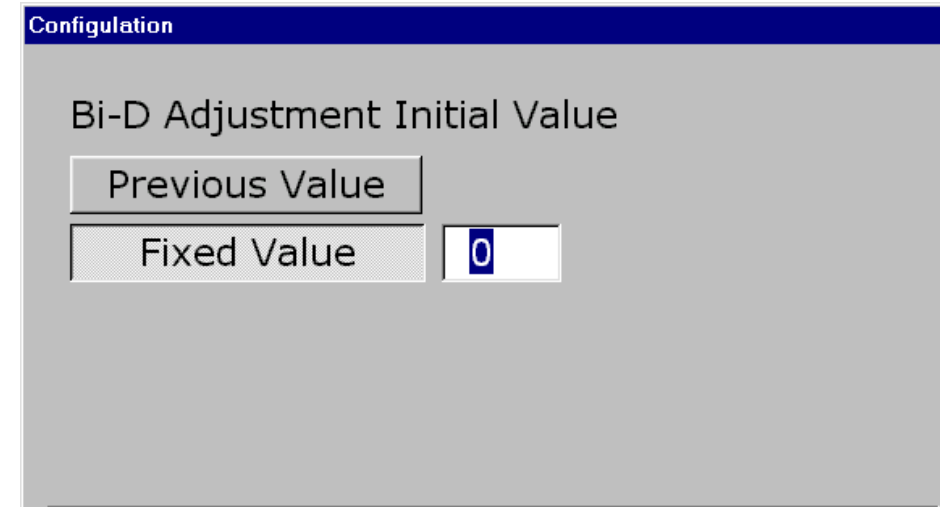


Do not select JIG in the Configuration window as this option is for factory use only.

4. Click Next again.



5. Click FINISH.



6. The Production Menu appears, as shown on the next page. See the following pages for details on performing service-related adjustments.

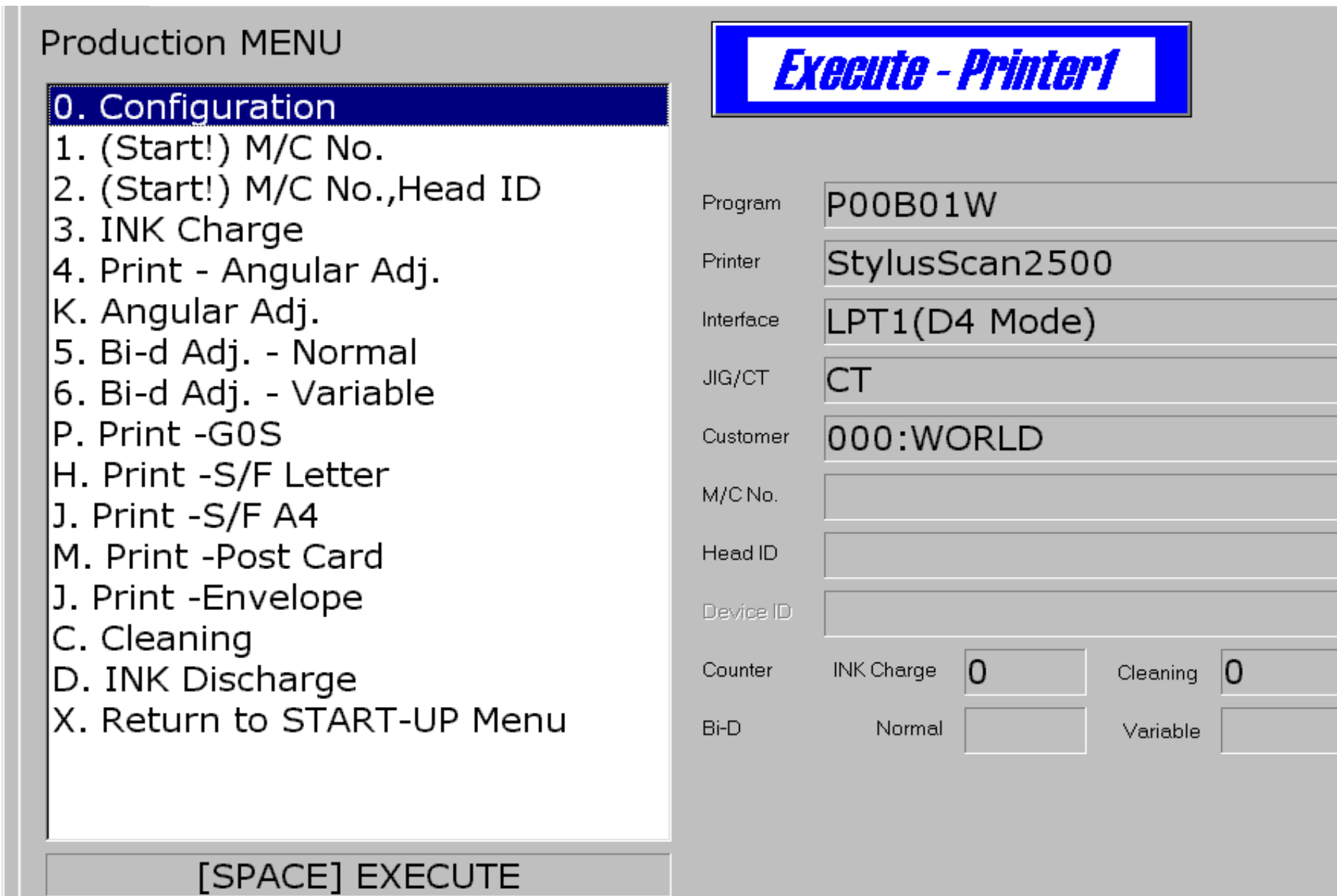


Figure 5-6. Production Menu

5.3.3 Initial Ink Charge Operation

There is no ink in the ink path of a spare printhead and printer mechanism when first installed; therefore, after replacing either of these two parts, you need to perform an initial ink charge.

1. Enter the Production menu as described in "Using the Service-Adjustment Program" on page 113.
2. On the Production menu (Figure 5-6), select **Ink Charge**. Then click OK in the dialog box that appears.

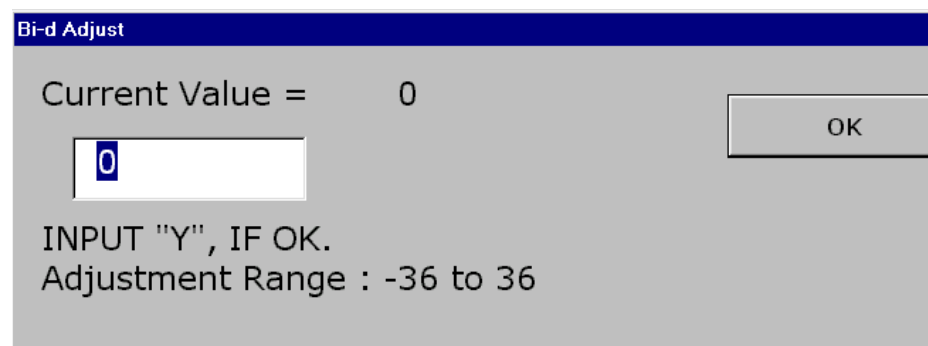


It takes approximately 90 seconds for the ink charge operation to complete.

5.3.4 Bi-D Adjustment

You perform this adjustment to correct differences in printing positions, which is caused by slippage of printing timing in right and left directions during the Bi-directional printing. Therefore, you need to perform this adjustment after performing the following operations.

- Replacing the printer mechanism
 - Replacing the main board
 - Replacing the CR motor
 - Replacing the Carriage Assembly
 - Replacing the Printhead
1. Enter the Production menu as described in "Using the Service-Adjustment Program" on page 113.
 2. On the Production menu (Figure 5-6), select **Bi-d Adj. - Normal**. The Bi-d Adjust dialog box appears.



3. Click OK in the dialog box that appears to print adjustment patterns with the current settings.

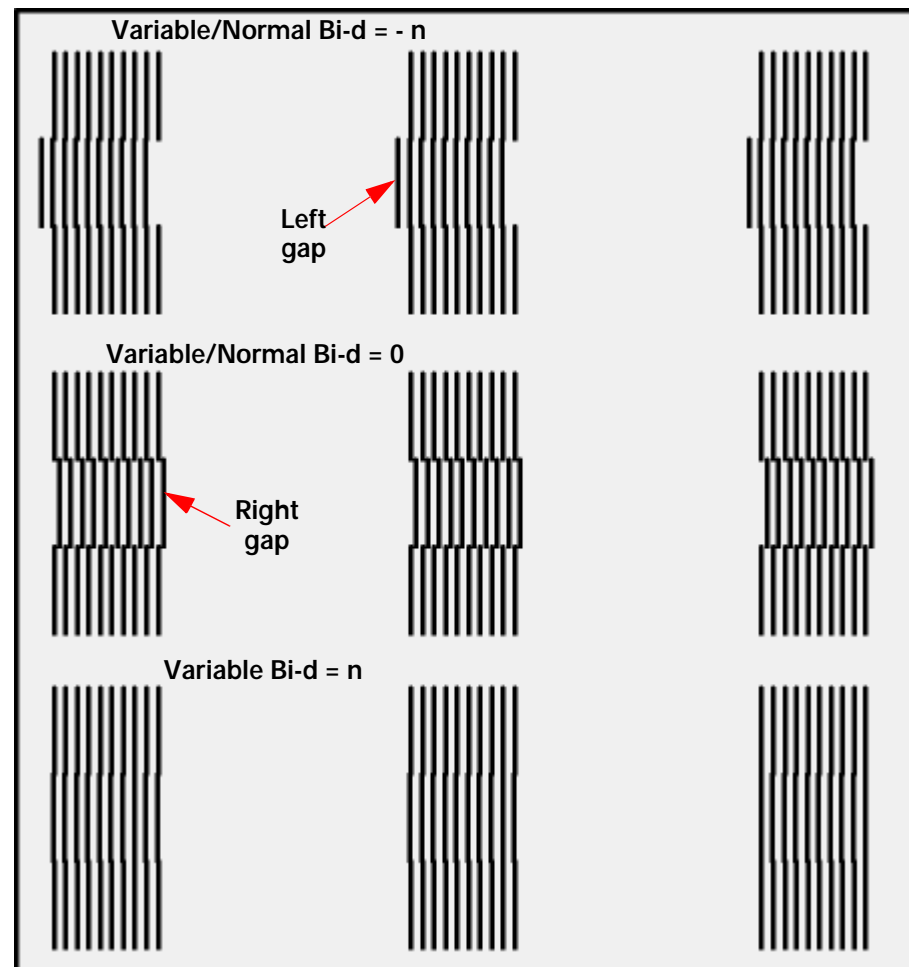


Figure 5-7. Bi-D Adjustment Pattern Sample

4. Looking at the printed patterns, determine which set is vertically aligned. Enter the number of that set in the Bi-d Adjust dialog box. If no patterns are vertically aligned, enter the number of the pattern that is most aligned. Repeat this process until the lines are aligned, and then enter "y" in the Current Value field.

5.3.5 Head Cleaning Operation

Unlike many previous models, the Stylus Scan does not have a dummy cleaning sequence called CL3, which was performed to prevent ink from being unnecessarily consumed when cleaning was repeated without any printout. However, Stylus Scan is alternatively equipped with the strongest cleaning sequence CL2 contained in this adjustment program. With this sequence, you can forcibly solve the clogged-nozzle problems that were caused by viscous ink.

CAUTION

If you cannot recover the clogged nozzles even after performing the CL2 operation, enter the Initial ink charge sequence by referring to "Initial Ink Charge Operation" on page 119.

1. Enter the Production menu as described in "Using the Service-Adjustment Program" on page 113.
2. On the Production menu (Figure 5-6), select **Cleaning**. Then click OK in the dialog box that appears.
3. The printer enters the CL2 sequence.



The CL2 cleaning operation takes 60 seconds to complete.

5.3.6 Head Voltage ID Input

Head voltage value adjustment function enables you to write printhead ID. This operation is considered the most important to maintain proper ink discharging system. If an ID is not written correctly, it results in white or color lines and also cause wrong dot-weight errors. This adjustment is required in the following cases.

1. When exchanging the main board
2. When exchanging the printhead
3. When exchanging the printer mechanism



CAUTION When performing this operation, also see Table 5-4 on page 114 to determine what other procedures are necessary.

1. When replacing any of the parts above, make a note of VH voltage ID. You can find the VH voltage ID on the following position:
 - Printhead: On the top side of the printhead.
 - Printer mechanism: On the label of the packing box of the printer mechanism.
1. Enter the Head ID menu as described in "Using the Service-Adjustment Program" on page 113.
2. On the Production menu (Figure 5-6), select **Head ID**. Then click OK in the dialog box that appears.
3. From the Head ID menu, select Print Head ID to verify the voltage information is enabled.

5.3.7 Head Angular Adjustment

During production, slight variations are created in printheads and carriage (which are used as a printhead base.) The head angular adjustment procedure compensates for these differences so that no banding or color/white line patterns appear in the printout.

To adjust the printhead angle correctly, an exclusive lever for adjusting the printhead angle is installed on the side of the carriage unit. By moving this lever, you are able to adjust the printhead angle without removing the ink cartridge.

This adjustment is required in the following cases.

- When a printhead is replaced.
- When the carriage unit is replaced.
- When the angle adjustment lever is moved.

Print the check pattern in the adjustment program to determine the angle degree needed for the printhead. Then move the adjustment lever in the carriage unit to set the printhead angle referring to the printed check pattern.



Figure 5-8. Sample of Head Angular Adjustment Pattern

NOTE: In the above figure, Head Katamuki means Head Angle.

4. Loosen the screw securing the printhead on the carriage. (You don't need to remove it completely.)

CAUTION



Before or after performing this operation, refer to Table 5-2 and perform appropriate adjustments or operations.

1. Remove the upper case from the main unit. (Refer to Chapter 4.)
2. Enter the Production menu as described in "Using the Service-Adjustment Program" on page 113.
3. On the Production menu (Figure 5-6), select Print - **Angular Adj.** The following patterns are printed.

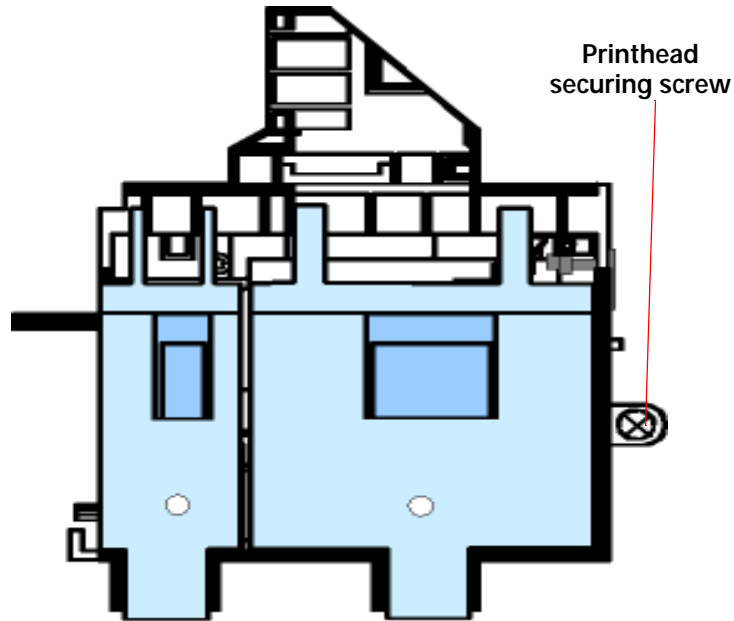


Figure 5-9. Screw Position

NOTE: Make sure to loosen this screw. Otherwise, the printhead angle will not change even if the adjustment lever moves.

5. Look very closely at the black/magenta lines in the bottom pattern and move the adjustment lever to center the magenta lines between the black lines. The figure below shows how to move the lever to correct a misaligned pattern.

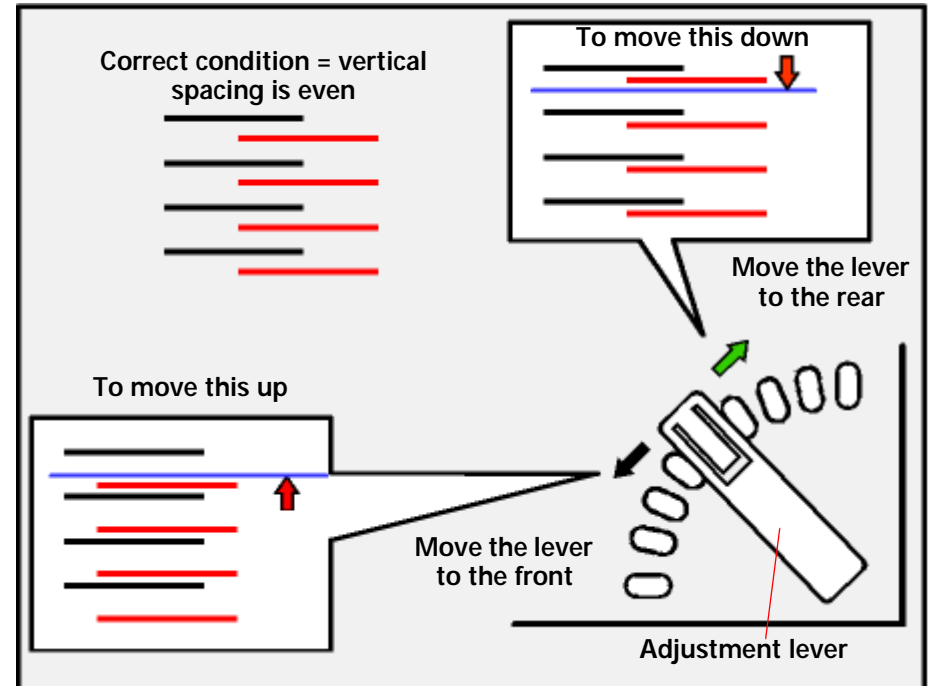


Figure 5-10. Lever Operation

6. After changing the position of the adjust lever, select Print - Angular Adj. again from the Production Menu.
7. Verify the pattern on the printout again.
8. Repeat this process until the combination pattern of black/magenta is correct.
9. After completing the adjustment, tighten the printhead screw, and reassemble the Stylus Scan.

5.3.8 Ink draining

To drain the ink from the cartridge before transporting it a long distance, follow the steps below.

1. Enter the Production menu as described in "Using the Service-Adjustment Program" on page 113.
2. On the Production menu (Figure 5-6), select Ink Discharge. Click OK in the following dialog box.

SPECIAL MENU

To enter the Special menu, follow these steps.

1. Open the Start-up menu as described on page 114.
2. Double-click Special and click OK.
3. Double-click Counter Clear and click OK.



You can also perform a hex dump of the EEPROM data by double-clicking EEPROM DUMP on the Special menu. The printer will print the EEPROM parameters in hexadecimal characters.

5.4 Scanner Adjustment

The scanner mechanism requires no adjustment for any service operation provided you closely follow the specifications in this manual and the instructions in Chapter 4 "Disassembly and Assembly".

CHAPTER

6

MAINTENANCE

This chapter is divided into three sections; printer maintenance, general cleaning, and lubrication.

6.1 Printer-Related Maintenance

If the Stylus Scan prints irregularly (missing dot, banding, and so on) or the LED lights indicate a maintenance error, take the corresponding action below to solve the problem.

Head Cleaning

The printer has a built-in head cleaning function that is activated through the control panel operation.

1. Confirm that the printer is in stand-by state (the POWER indicator is not blinking), and hold down the cleaning button on the control panel for more than 3 seconds.
2. The printer enters the built-in cleaning sequence. (During the sequence, the POWER indicator blinks.)

Maintenance Error Clear

Besides actual the actual printing operation, other operations such as cleaning also consume ink. During all of these operations, the Stylus Scan counts the amount of waste ink drained to the waste ink pads. Once the amount of waste ink reaches the predefined limit, the printer indicates "MAINTENANCE ERROR" and does not operate until the waste ink pads are replaced as described in "Removing the waste ink pads" on page 81.

6.2 Cleaning

This section describes the points and the procedures for maintaining the printer in its optimum condition.



- Never use chemical solvents, such as thinner, to clean the printer. These chemicals can damage the components of the printer.
- Be careful not to damage the components when you attempt to clean the inside the printer.
- Do not scratch surface of "ROLLER, ASSEMBLY, PF". (Use soft brush to wipe off any dusts, or use a soft cloth moistened with alcohol.)

6.2.1 Exterior

Use a clean soft cloth moistened with water and wipe off any dirt. If the housing is stained with ink, use a cloth moistened with neutral detergent to wipe it off.

6.2.2 Inside

Inside the printer:

Use a vacuum cleaner to remove any paper dust.

6.2.2.1 Printer Mechanism

The printer mechanism has no mechanical components which require regular cleaning. Therefore, keep the above points in mind and perform cleaning when necessary.

6.2.2.2 Scanner mechanism

Perform cleaning if a noticeable stain appears on the scanner mechanism and especially if dirt, ink, etc. are on the document glass. Objects or stains on the document glass mar output quality; therefore, be sure to clean the glass thoroughly to remove any objects or stains.



- Never apply any organic solvent such as thinner or benzine, since they may damage or deteriorate plastic and rubber parts.
- Document Glass
Remove dust and paper debris with a clean, dry cloth. If a stain remains or a foreign object is stuck, use a neutral detergent and try cleaning again. Finally, wipe the glass surface with a dry, clean cloth to remove any moisture.

6.3 Lubrication

6.3.1 Printer Mechanism

The type and amount of oil and grease used to lubricated the printer parts are determined based on the results of internal evaluations. Therefore, be sure to apply the specified type and amount of oil and grease to the specified part of the printer mechanism during servicing.



- Never use oil or grease other than those specified in this manual. Use of different types of lubricant can damage the printer and the components.
- Never apply a larger amount of lubricant than specified in this manual.

Table 6-1. Specified Lubricants

Type	Name	EPSON Code	Supplier
Grease	G-26	B702600001	EPSON
Oil	O-12	1038991	EPSON

Table 6-2. Lubrication Points

No.	Standard	Remarks	See page
1	<Lubrication Point> Contact between "ROLLER, PF" and "PAPER GUIDE, REAR"	Do not put grease around the paper path.	131
	<Lubricant Type> G-26	Use a syringe to apply it.	
	<Lubrication Amount> A half turn of "ROLLER, PF"	Apply grease while rotating "GEAR, 73.6".	

Table 6-2. Lubrication Points (continued)

No.	Standard	Remarks	See page
2	<Lubrication Point> Contact points between "PAPER GUIDE, FRONT" and each roller: "ROLLER, PF" (1 point) "ROLLER, EXIT" (2 points)	Lubricate the contact points between the hooks on "PAPER GUIDE, FRONT" and each roller. Avoid applying grease around the paper path. Use a syringe to apply it.	132
	<Lubricant Type> G-26		
	<Lubrication Amount> 10-mm long 2-mm long		
3	<Lubrication Point> Contact points between the carriage assembly and "FRAME, UPPER"	Verify that the carriage moves smoothly after lubricating it. Use a syringe to apply it.	132
	<Lubricant Type> G-26		
	<Lubrication Amount> Range from the HP sensor installation point to the point where "GUIDE PLATE, CABLE" is attached.		
4	<Lubrication Point> Gears: "GEAR, 73.6" "COMBINATION GEAR, 8, 14.4" "GEAR, 23.2"	Rotate the gears after applying grease to evenly distribute it. Use a syringe to apply it.	133
	<Lubricant Type> G-26		
	<Lubrication Amount> 1/4 of gear tooth 1/3 of gear tooth 1/3 of gear tooth 1/3 of gear tooth		

Table 6-2. Lubrication Points (continued)

No.	Standard	Remarks	See page
5	<Lubrication Point> The shaft for "GEAR, 16, 40.8" on "FRAME, LEFT"	Use a syringe to apply it.	133
	<Lubricant Type> G-26		
	<Lubrication Amount> Approximately 5-mm long		
6	<Lubrication Point> Bushings for "ROLLER, PF" Left: Inside the bushing Right: Inside the bushing (near the pump assembly)	For the right bushing, apply it from the paper path side, and wipe off any grease sticking out to the cap assembly side. Rotate "ROLLER, PF" after applying grease to evenly distribute it in the bushing. Use a syringe to apply it.	133
	<Lubricant Type> G-26		
	<Lubrication Amount> Approximately 3 mm diametrically		
7	<Lubrication Point> Both Left/Right Bushings for "ROLLER, EXIT"	Avoid applying grease around the paper path. Use a syringe to apply it.	134
	<Lubricant Type> G-26		
	<Lubrication Amount> Evenly apply inside the bushings.		
8	<Lubrication Point> Contact points between "HOLDER, PULLEY, DRIVEN" and "FRAME, UPPER"	Verify that the holder slides only with spring force after applying grease. Use a syringe to apply it.	134
	<Lubricant Type> G-26		
	<Lubrication Amount> 2-mm long for each point		

Table 6-2. Lubrication Points (continued)

No.	Standard	Remarks	See page
9	<Lubrication Point> ASF; The round hole in the right frame of ASF (to hold the roller shaft)	Avoid applying grease to "ROLLER, ASSEMBLY, LD".	134
	<Lubricant Type> G-26		
	<Lubrication Amount> Evenly apply inside the hole.		
10	<Lubrication Point> ASF; Contact points between "HOPPER" and "LEVER, HOPPER, RELEASE"	Completely wipe off any grease sticking out to the inner side of ASF.	135
	<Lubricant Type> G-26		
	<Lubrication Amount> Evenly apply lubrication to the points.		
11	<Lubrication Point> The round cutout in the left frame of ASF ("GEAR, 34" is inserted to the cutout.)	Completely wipe off any grease sticking out to the inner side of ASF.	135
	<Lubricant Type> G-26		
	<Lubrication Amount> Evenly apply inside the hole		

Table 6-2. Lubrication Points (continued)

No.	Standard	Remarks	See page
12	<Lubrication Point> Oil pad in the carriage assembly	Lubricate the oil pad only when: Replacing the carriage assembly	136
	<Lubricant Type> O-12	Replacing the oil pad	
	<Lubrication Amount> 0.72 ~ 0.77cc (0.65 ~ 0.69g)	Use a precise syringe to apply oil. If you accidentally apply too much oil to the oil pad, throw the pad away and take a new one again.	
	Note: This is the amount to be applied to a new oil pad.	Leave the pad for a while to wait until oil is evenly infiltrated, then install it on the carriage assembly.	

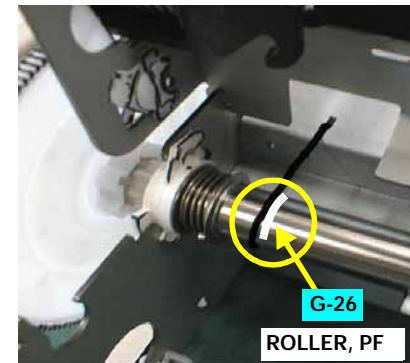
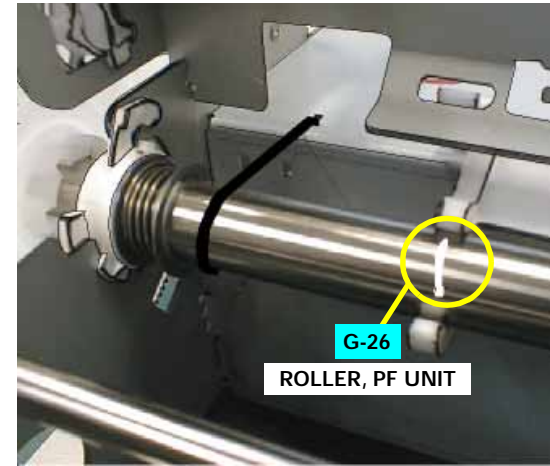


Figure 6-1. #1 Paper Feed Roller x two places



When rotating the Paper Feed Roller, only touch the projections on the outside surface of the 73.6 precision gear. Do not touch the teeth of the gear.

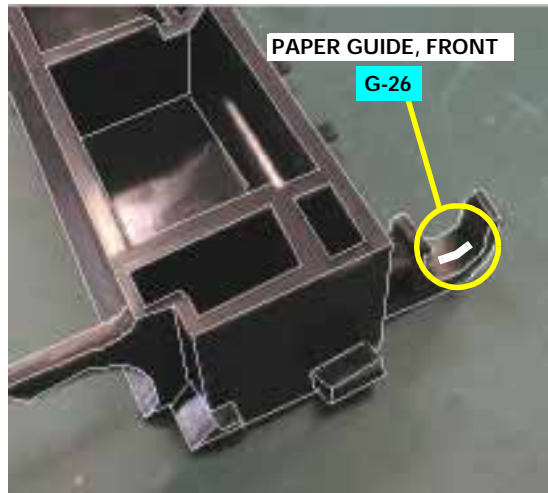


Figure 6-2. #2 Front Paper Guide - A

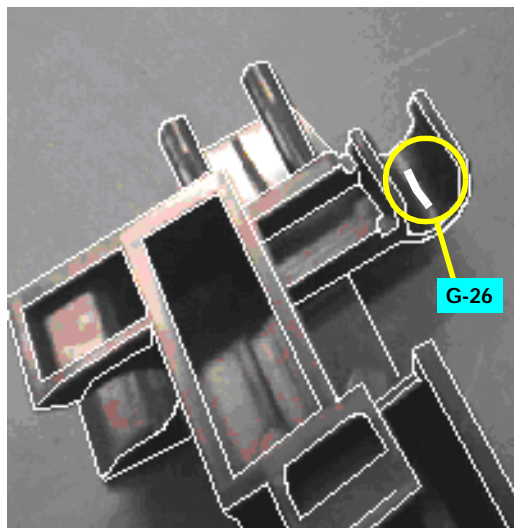


Figure 6-3. #2 Front Paper Guide - B



Figure 6-4. #2 Front Paper Guide - C

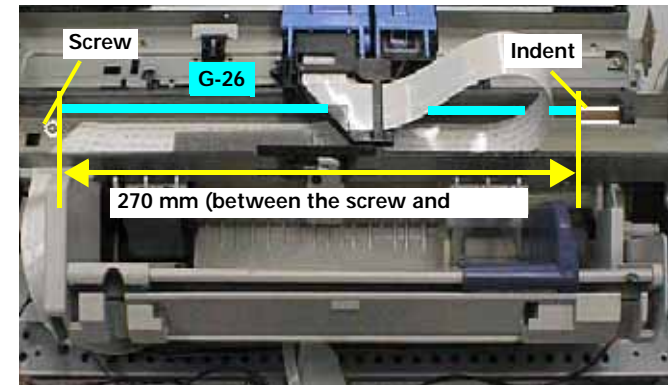


Figure 6-5. #3 Carriage Assembly Contact Point

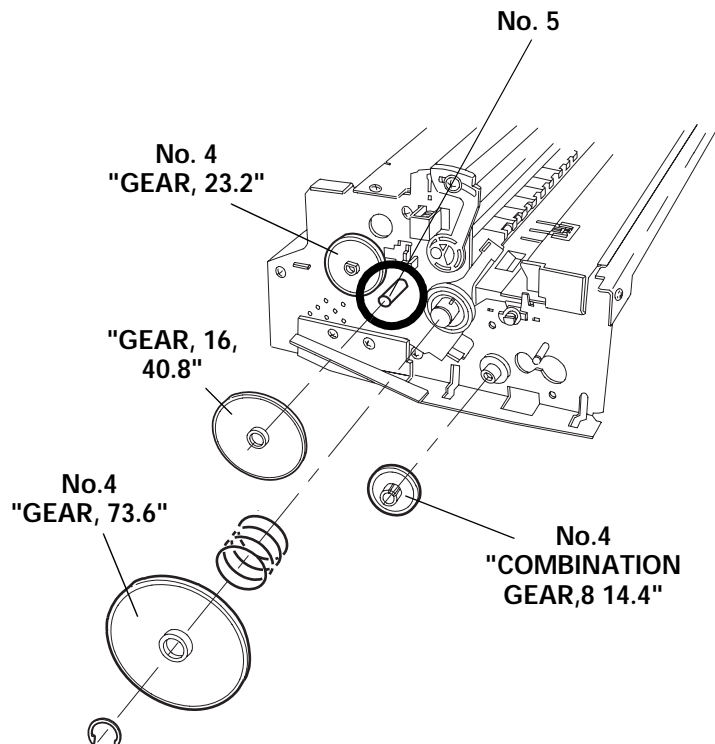


Figure 6-6. #4 Combination Gears and #5 Gear Shaft

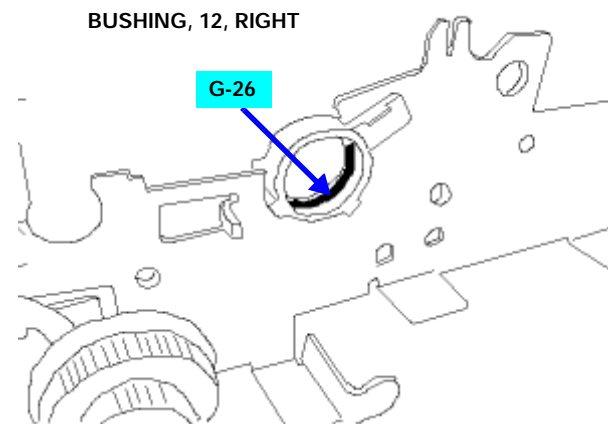


Figure 6-7. #6 Inside the PF Roller Bushing - Right

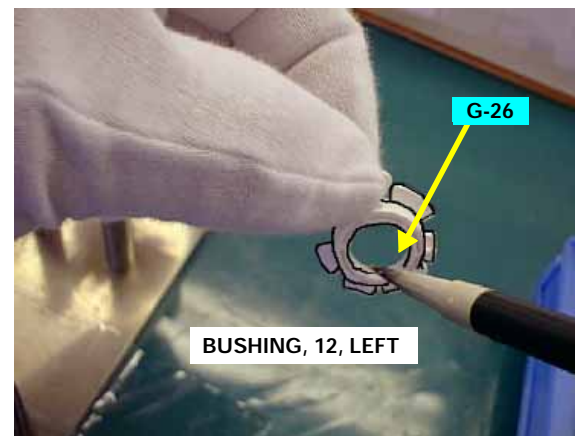


Figure 6-8. #6 Inside the PF Roller Bushing - Left

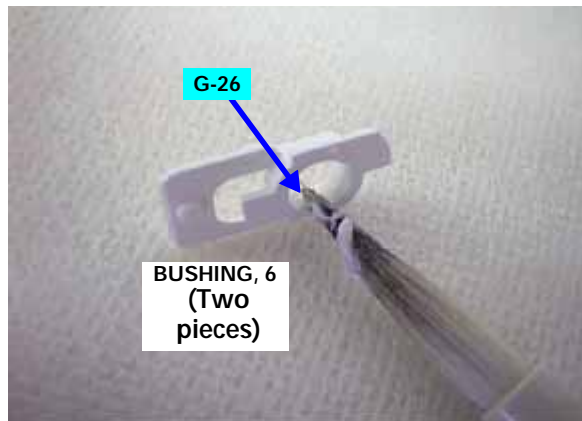
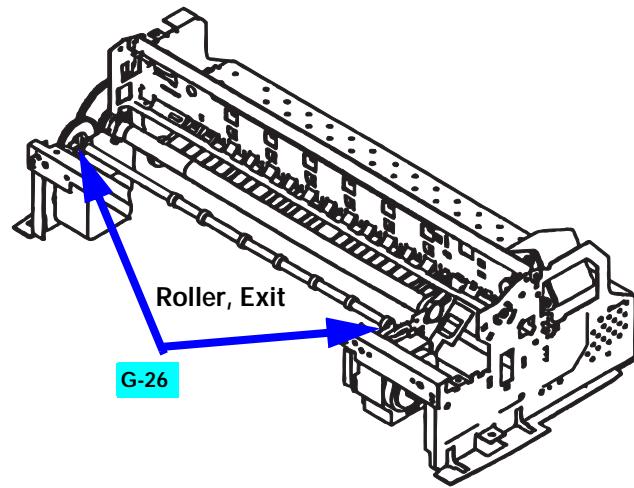


Figure 6-9. #7 Left & Right Exit Roller Bushings

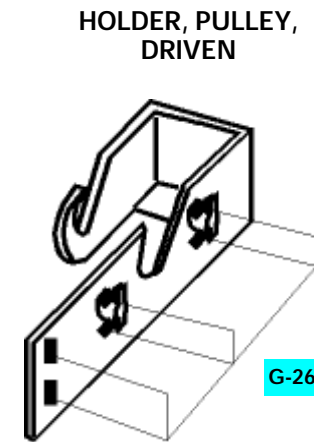


Figure 6-10. #8 Driven Pulley Holder

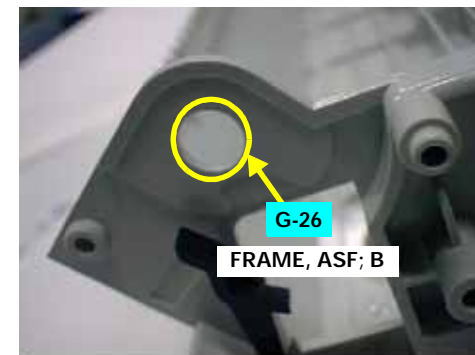


Figure 6-11. #9 ASF Roller Shaft

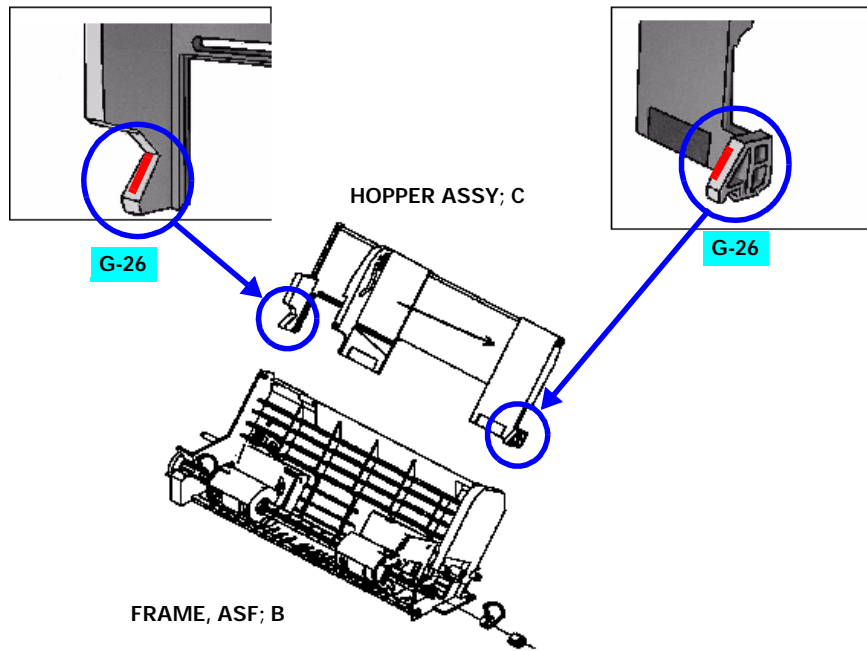


Figure 6-12. #10 ASF Hopper Assembly

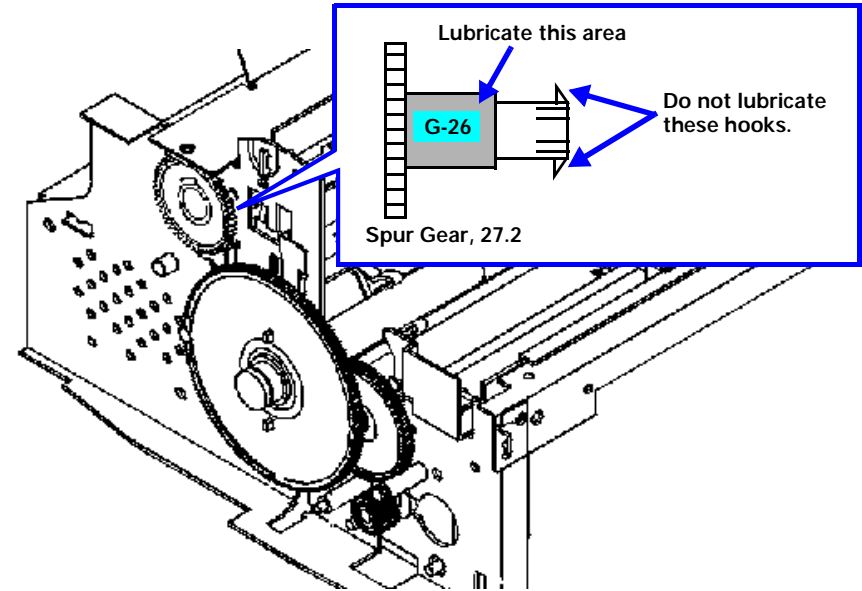


Figure 6-13. #11 Gear 34 (ASF Roller Gear)

*Never apply more than 0.6cc of the oil.

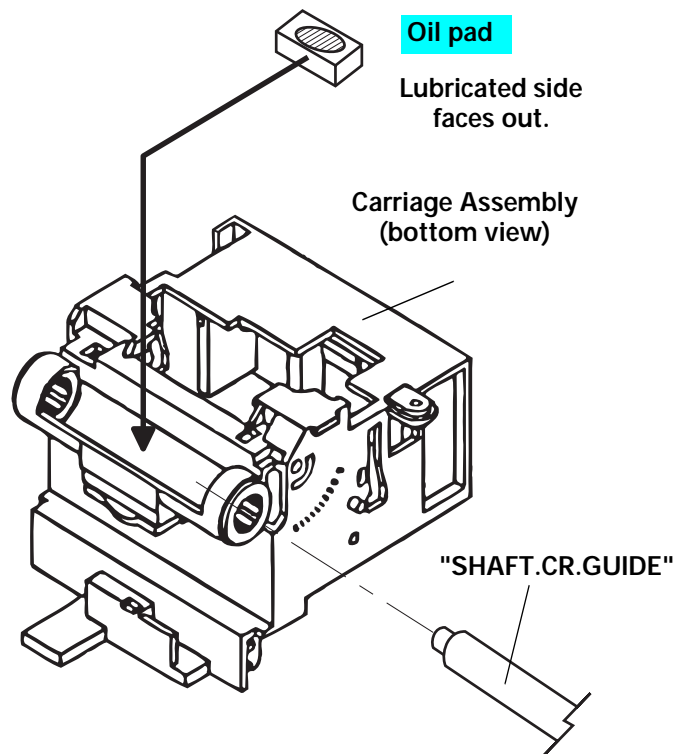


Figure 6-14. #12 Carriage Assembly Oil Pad



- Never apply oil to the CR guide shaft directly. This may cause fatal damage to the components of the printer.
- Avoid applying oil excessively to the oil pad. This may cause fatal damage to the components of the printer.

6.3.1.1 Scanner Mechanism

This chapter provides information necessary to keep the scanner function in optimum condition constantly and to prevent troubles.

When the carriage unit needs to be replaced, or the operation sound of the carriage movement becomes noisy, it is necessary to apply lubrication. Following tables show the recommended grease type and lubrication points.

Table 6-3. Recommended Grease

Type	Name	Supply Quantity	Part No.	Specification
Grease	G-26	40g	B702600001	E*

Note*) "E" means exclusive product for EPSON. (Not available on the market.)

Table 6-4. Lubrication points

Figure	Lubrication Points	Lubrication
6-1	Transmission Gear Shaft of the CR motor and Driven pulley shaft.	G-26 (1x3mm)
6-1	Driven Pulley Shaft	G-26(1x3mm)



Excessive lubrication may damage the mechanism part or cause the malfunction of the operation.

CHAPTER

7

APPENDIX

7.1 Connector Summary

This section provides information on connectors in the main units of the Stylus Scan 2000. Figure 1 shows how the main component units are connected.

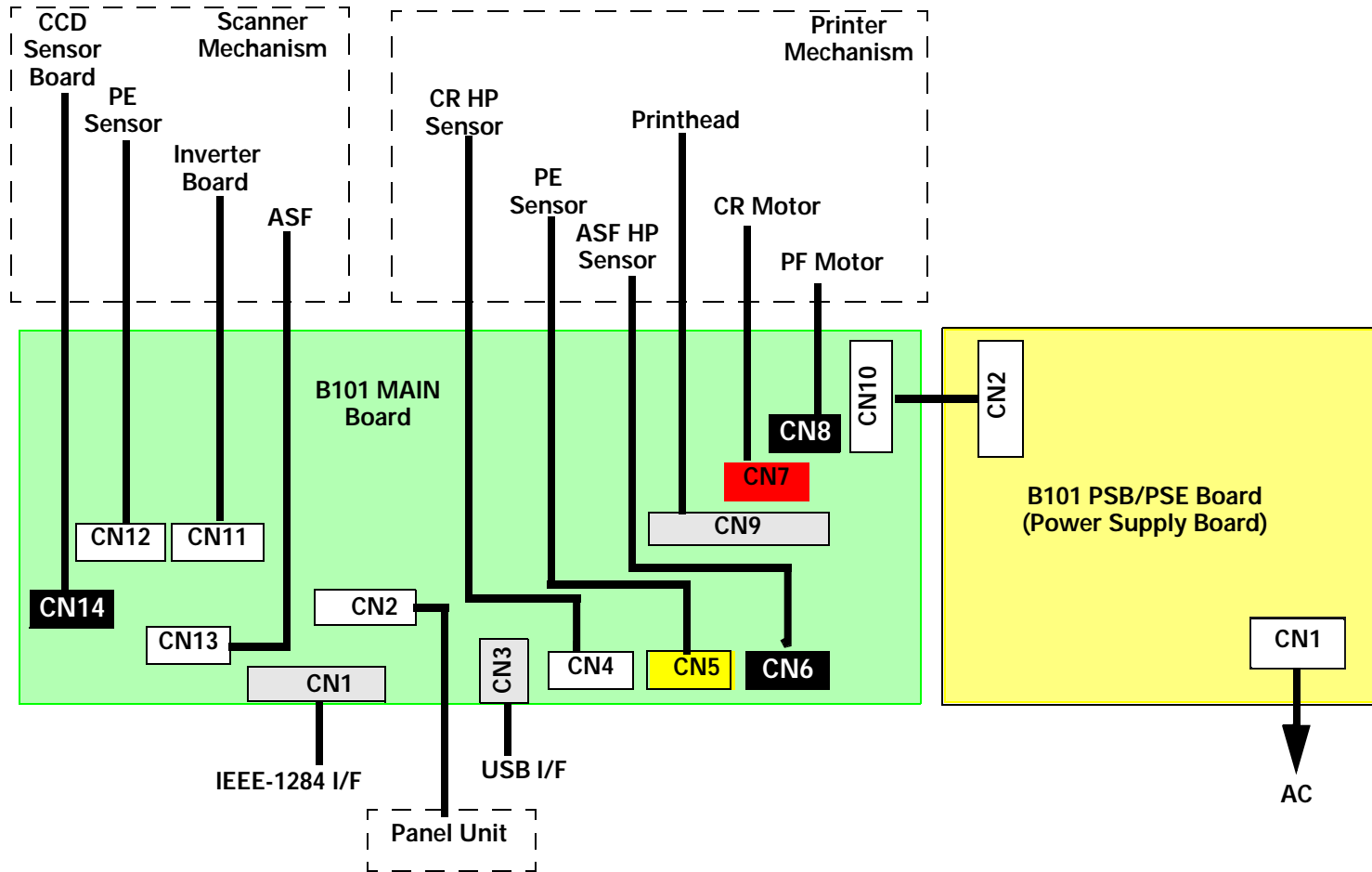


Figure 7-1. Cable Connection Assignments of Stylus Scan 2000

7.1.1 Board Connector Summary

The table below provides board connector summary of Stylus Scan 2000.

Table 7-1. Board Connector Summary

Connector	Connection	Pin Number	Refer to
B101 MAIN Board			
CN1	→IEEE-1284 I/F	36-pin	"Printer interface" on page 17
CN2	→Panel Unit	21-pin	Table 7-2 on page 140
CN3	→USB	4-pin	"Printer interface" on page 17
CN4	→Printer Mechanism (CR HP)	3-pin	Table 7-3 on page 140
CN5	→Printer Mechanism (PE)	3-pin	Table 7-4 on page 140
CN6	→Printer Mechanism (ASF HP)	3-pin	Table 7-5 on page 140
CN7	→Printer Mechanism (CR motor)	4-pin	Table 7-6 on page 141
CN8	→Printer Mechanism (PF motor)	4-pin	Table 7-7 on page 141
CN9	→Printer Mechanism (Print heads)	24-pin	Table 7-8 on page 141
CN10	→B101 PSB/PSE board	12-pin	Table 7-9 on page 141
CN11	→Scanner Mechanism (source)	2-pin	Table 7-10 on page 142
CN12	→Scanner Mechanism (Manual SE)	3-pin	Table 7-11 on page 142

Table 7-1. Board Connector Summary (continued)

Connector	Connection	Pin Number	Refer to
CN13	→Scanner Mechanism (ASF motor)	6-pin	Table 7-12 on page 142
CN14	→Scanner Mechanism (CCD sensor board)	14-pin	Table 7-13 on page 142
B101 PSB/PSE board			
CN1	→AC inlet	2-pin	Table 7-14 on page 144
CN2	→B101 MAIN Board	12-pin	Table 7-9 on page 141
Panel Unit			
CN1	→B101 MAIN Board	14-pin	Table 7-2 on page 140

7.1.2 Connector Pin Assignment

Tables in this section provide connector pin assignments of the Stylus Scan 2000.

Signals of each connector on the B101 MAIN Board are listed below.

Table 7-2. Connector Pin Assignment-CN2

Pin No.	Signal Name	I/O	Function
1	SW3	I	Panel switch input (3)
2	LED0	O	LED drive signal (0)
3	SW2	I	Panel switch input (2)
4	LED7	O	LED drive signal (7)
5	LED4	O	LED drive signal (4)
6	LED6	O	LED drive signal (6)
7	LED3	O	LED drive signal (3)
8	LED5	O	LED drive signal (5)
9	LED2	O	LED drive signal (2)
10	+5V	O	Panel unit power supply
11	+5V	O	Panel unit power supply
12	GND	O	Ground
13	GND	O	Ground
14	LED1	O	LED drive signal (1)
15	LED8	O	LED drive signal (8)
16	PSC	O	PS Board off/on
17	SW6	I	Panel switch input (6)
18	SW0	I	Panel switch input (0)

Table 7-2. Connector Pin Assignment-CN2

Pin No.	Signal Name	I/O	Function
19	SW4	I	Panel switch input (4)
20	SW5	I	Panel switch input (5)
21	SW1	I	Panel switch input (1)

Table 7-3. Connector Pin Assignment-CN4

Pin No.	Signal Name	I/O	Function
1	HP	I	Sensor detect signal
2	GND	O	Ground
3	HPV	O	Sensor power supply (+5V)

Table 7-4. Connector Pin Assignment-CN5

Pin No.	Signal Name	I/O	Function
1	PE	I	Sensor detect signal
2	GND	O	Ground
3	PEV	O	Sensor power supply (+5V)

Table 7-5. Connector Pin Assignment-CN6

Pin No.	Signal Name	I/O	Function
1	ASF	I	Sensor detect signal
2	GND	O	Ground
3	ASFV	O	Sensor power supply (+5V)

Table 7-6. Connector Pin Assignment-CN7

Pin No.	Signal Name	I/O	Function
1	CR-A	O	Phase drive signal (A)
2	CR-B	O	Phase drive signal (B)
3	CR-/A	O	Phase drive signal (/A)
4	CR-/B	O	Phase drive signal (/B)

Table 7-7. Connector Pin Assignment-CN8

Pin No.	Signal Name	I/O	Function
1	PF-A	O	Phase drive signal (A)
2	PF-B	O	Phase drive signal (B)
3	PF-/A	O	Phase drive signal (/A)
4	PF-/B	O	Phase drive signal (/B)

Table 7-8. Connector Pin Assignment-CN9

Pin No.	Signal Name	I/O	Function
1	COB	I	I/C black detect
2	COC	I	I/C color detect
3	THM	I	Thermometer detect system
4	GND	O	Ground
5	LAT	O	Head data latch pulse output
6	GND	O	Ground
7	SI6	O	Head data output (6)
8	SI5	O	Head data output (5)
9	SI4	O	Head data output (4)
10	SI3	O	Head data output (3)
11	SI2	O	Head data output (2)

Table 7-8. Connector Pin Assignment-CN9

Pin No.	Signal Name	I/O	Function
12	SI1	O	Head data output (1)
13	GND	O	Ground
14	CLK	O	Clock pulse for head data transfer
15	GND	O	Ground
16	NCHG	O	Head all on pulse output
17	GND	O	Ground
18	VDD	O	Logic power supply (+5V)
19	GND2	O	Ground
20	GND2	O	Ground
21	GND2	O	Ground
22	GND2	O	Ground
23	COM	O	Head drive power supply
24	COM	O	Head drive power supply
25	COM	O	Head drive power supply
26	COM	O	Head drive power supply
27	VHV	O	Head drive voltage control signal

Table 7-9. Connector Pin Assignment-CN10

Pin No.	Signal Name	I/O	Function
1	+12V	I	Mechanism drive power supply
2	+12V	I	Mechanism drive power supply
3	GND	I	Ground
4	GND	I	Ground
5	+5V	I	Logic power supply
6	+5V	I	Logic power supply

Table 7-9. Connector Pin Assignment-CN10

Pin No.	Signal Name	I/O	Function
7	+3.3V	I	Logic power supply
8	GND	I	Ground
9	GND	I	Ground
10	+42V	I	Mechanism drive power supply
11	+42V	I	Mechanism drive power supply
12	PSC	O	Power supply switch output signal
13	SW4	I	Panel switch input (4)
14	SW5	I	Panel switch input (5)
15	SW1	I	Panel switch input (1)

Table 7-10. Connector Pin Assignment-CN11

Pin No.	Signal Name	I/O	Function
1	VCC	O	Power
2	GND	O	Ground

Table 7-11. Connector Pin Assignment-CN12

Pin No.	Signal Name	I/O	Function
1	SPWR	O	Sensor power
2	GMD	O	GND
3	SENSE	I	Sensor signal

Table 7-12. Connector Pin Assignment-CN13

Pin No.	Signal Name	I/O	Function
1	A	O	ASF Motor Phase A
2	Ax	O	ASF Motor Phase \bar{A}
3	B	O	ASF Motor Phase B

Table 7-12. Connector Pin Assignment-CN13

Pin No.	Signal Name	I/O	Function
4	Bx	O	ASF Motor Phase \bar{B}
5	COM1	O	ASF drive power supply (1)
6	COM2	O	ASF drive power supply (2)

Table 7-13. Connector Pin Assignment-CN14

Pin No.	Signal Name	I/O	Function
1	VOR	I	Red signal
2	AGND	O	GND
3	VOG	I	Green signal
4	AGND	O	GND
5	VOB	I	Blue signal
6	AGND	O	GND
7	12VC	O	+12V
8	PH1	O	clock
9	PH2	O	clock
10	SH	O	clock
11	DGND	O	GND
12	RS	O	clock
13	CP	O	clock
14	VCC	O	+5V

7.2 EEPROM Address Map

This section provides EEPROM address map for the Stylus Scan.

Table 7-14. Stylus Scan EEPROM Address Map

Address	Explanation	Setting	QPIT Settings	Factory Settings
00H	Password 0		0FH	-
01H			5AH	-
02H	EEPROM mapping revision		41H	-
03H	Reserved		00H	(*1)
04H	Reserved		00H	(*1)
05H	Market ID	0: Standard (World) 2: Custom	00H	(*1)
06H	Custom EEPROM sub number		00H	00H
07H			00H	00H
08H			00H	00H
09H			00H	00H
0AH	Head actuator rank ID for VhN		00H	(*1)
0BH	Head actuator rank ID for Vh μ		00H	(*1)
0CH	Head actuator rank ID for VhL		00H	(*1)
0DH	Head actuator rank ID for AR		00H	(*1)
0EH	Head rank MW-ID		00H	(*1)
0FH	Reserved		00H	-
10H	Reserved		00H	-
11H	Reserved		00H	-
12H	Head actuator rank ID for lwAB		00H	(*1)

Table 7-14. Stylus Scan EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
13H	Head actuator rank ID for lwCD		00H	(*1)
14H	Head actuator rank ID for lwEF		00H	(*1)
15H	Bi-D Adjustment data for Normal-dot	-36<=n<=+36 (by 1/1440 inch)	00H	(*1)
16H	Bi-D Adjustment data for Micro-dot	-36<=n<=+36 (by 1/1440 inch)	00H	(*1)
17H	Bi-D Adjustment data for Variable-dot	-36<=n<=+36 (by 1/1440 inch)	00H	(*1)
18H	Uni-Dadjustment data	-36<=n<=+36 (by 1/1440 inch)	00H	(*1)
19H	Reserved		00H	-
1AH	Reserved		00H	-
1BH	1st dot position adjustment data	-40<=n<=+40 (by 1/1440 inch)	00H	(*1)
1CH	Carriage speed adjustment data	-4<=n<=+4 (by G.A. timer unit)	00H	(*1)
1DH	Carriage phase on Home		00H	-
1EH	Paper sensor adjustment data	-127<=n<=+127 (by 1/720 inch)	00H	(*1)
1FH	ERROR Code		00H	00H

Table 7-14. Stylus Scan EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
20H	CPSI password		00H	00H
21H			00H	00H
22H			00H	00H
23H			00H	00H
24H	CPSI license flag	0: disable 1: enable	00H	00H
25H	CPSI font license	0: disable 1: enable	00H	00H
26H	Interface selection	0: Auto, 1: Parallel 2: Serial, 3: USB	00H	00H (*2)
27H	Interface time-out	0 to 255 (by second, value of 0 means 10 seconds)	0AH	0AH
28H	Compatibility speed	0: Fast, 1: Slow 2: Special-1, 3: Special-2	00H	00H
29H	ECP speed *3	0: Fast, 1: Slow	00H	00H
2AH	IEEE1284.4 for parallel	0: Auto, 1: On 2: Off	00H	00H
2BH	I/F Control flags	bit 1: ECP mode (0=Off, 1=On) *4 bit 0: IEEE1284 mode (0=On, 1=Off) *5	00H	00H
2CH	IEEE1284.4 for USB	0: Auto, 1: On 2: Off	00H	01H
2DH	Reserved		00H	-
2EH	Reserved		00H	-
2FH	Reserved		00H	-
30H	Reserved		00H	02H
31H	Reserved		00H	00H

Table 7-14. Stylus Scan EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
32H	Print direction control	0: Bi-D 1: Uni-D 2: Auto	02H	02H
33H	CG table	8: PC437 10: PC850	08H	08H
34H	Auto LF, Network I/F mode	bit1: Network I/F mode (0=Off, 1=On), bit0: Auto line feed (0=Off, 1=On)	00H	00H
35H	Panel mask function	bit 7: Entry Self-Test bit 6: Entry Hex-Dump bit 5: Extended settings bit 4: Reserved bit 3: Reserved bit 2: Cleaning bit 1: Replace I/C bit 0: Load/Eject	00H	00H
36H	Top margin	42 to 44x360 (by 1/360 inch)	00H	00H
37H			78H	78H
38H	Bottom margin	1244 to 44x360 (by 1/360 inch)	IEH	IEH
39H			F0H	F0H
3AH	Page length	1244 to 44x360 (by 1/360 inch)	IEH	IEH
3BH			F0H	F0H
3CH	Reserved		00H	-
3DH	Reserved		00H	-
3EH	Reserved		00H	-
3FH	Reserved		00H	-
40H	Password 1		0FH	-
41H			5AH	-

Table 7-14. Stylus Scan EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
42H	Ink flag 1	bit 7: Reserved bit 6: black one-time bit 5: color one-time bit 4: Initial fill required bit 3: Reserved bit 2: ink cleaning seq. Bit 1: black CL required bit 0: color CL required	00H	00H
43H	Ink flag 2	bit 2: YMC cartridge changed and cleaned bit 1: Black cartridge changed and cleaned bit 0: Black cartridge changed and cleaned	00H	00H
44H	Ink counter Cb		00H	00H
45H			00H	00H
46H			00H	00H
47H			00H	00H
48H	Ink counter Cy		00H	00H
49H			00H	00H
4AH			00H	00H
4BH			00H	00H
4CH	Ink counter Cm		00H	00H
4DH			00H	00H
4EH			00H	00H
4FH			00H	00H

Table 7-14. Stylus Scan EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
50H	Ink counter Cc		00H	00H
51H			00H	00H
52H			00H	00H
53H			00H	00H
54H	Ink counter Clm		00H	00H
55H			00H	00H
56H			00H	00H
57H			00H	00H
58H	Ink counter Clc		00H	00H
59H			00H	00H
5AH			00H	00H
5BH			00H	00H
5CH	Ink counter Rb		00H	00H
5DH			00H	00H
5EH	Ink counter Ry		00H	00H
5FH			00H	00H
60H	Ink counter A		00H	00H(*2)
61H			00H	00H(*2)
62H	Power off time		00H	00H(*2)
63H			00H	00H(*2)
64H	CL time		00H	00H(*2)
65H			00H	00H(*2)
66H	Accumulated print time		00H	00H
67H			00H	00H

Table 7-14. Stylus Scan EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
68H	Reserved		00H	-
69H	Reserved		00H	-
6AH	Printer-ID Strings [22]		00H	00H
6BH			00H	00H
6CH			00H	00H
6DH			00H	00H
6EH			00H	00H
6FH			00H	00H
70H			00H	00H
71H			00H	00H
72H			00H	00H
73H			00H	00H
74H			00H	00H
75H			00H	00H
76H			00H	00H
77H			00H	00H
78H			00H	00H
79H			00H	00H
7AH			00H	00H
7BH			00H	00H
7CH			00H	00H
7DH			00H	00H
7EH			00H	00H
7FH			00H	00H

*1: Adjusted at factory

*2: Initialized after panel initialization of EEPROM is performed.

*3: BUSY signal delay time form fall-edge of a -STB signal.
(Fast: Maximum 1MB/s, Slow: Maximum 600KB/s)

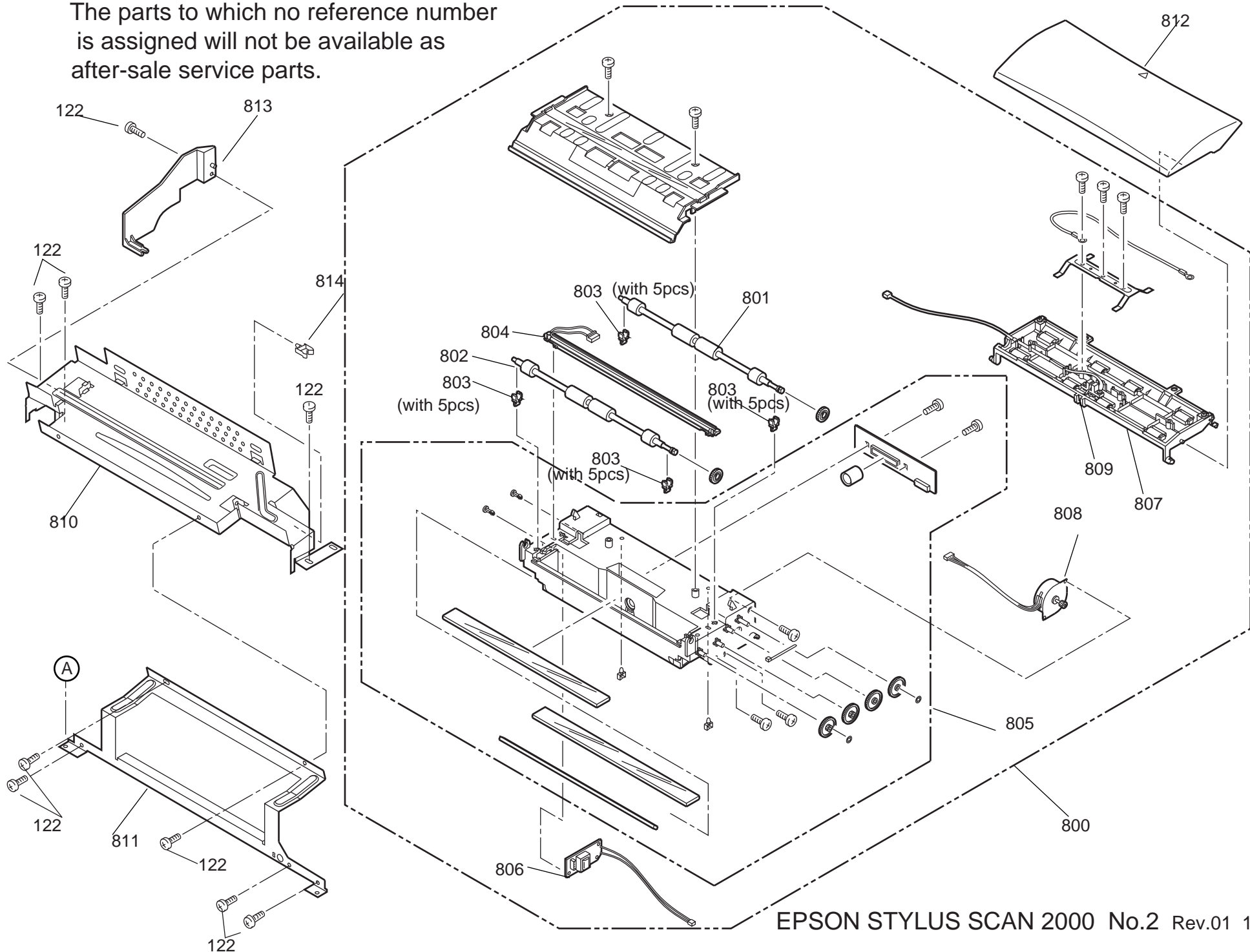
*4: Select IEEE1284 transfer mode. (ECP or Nibble)

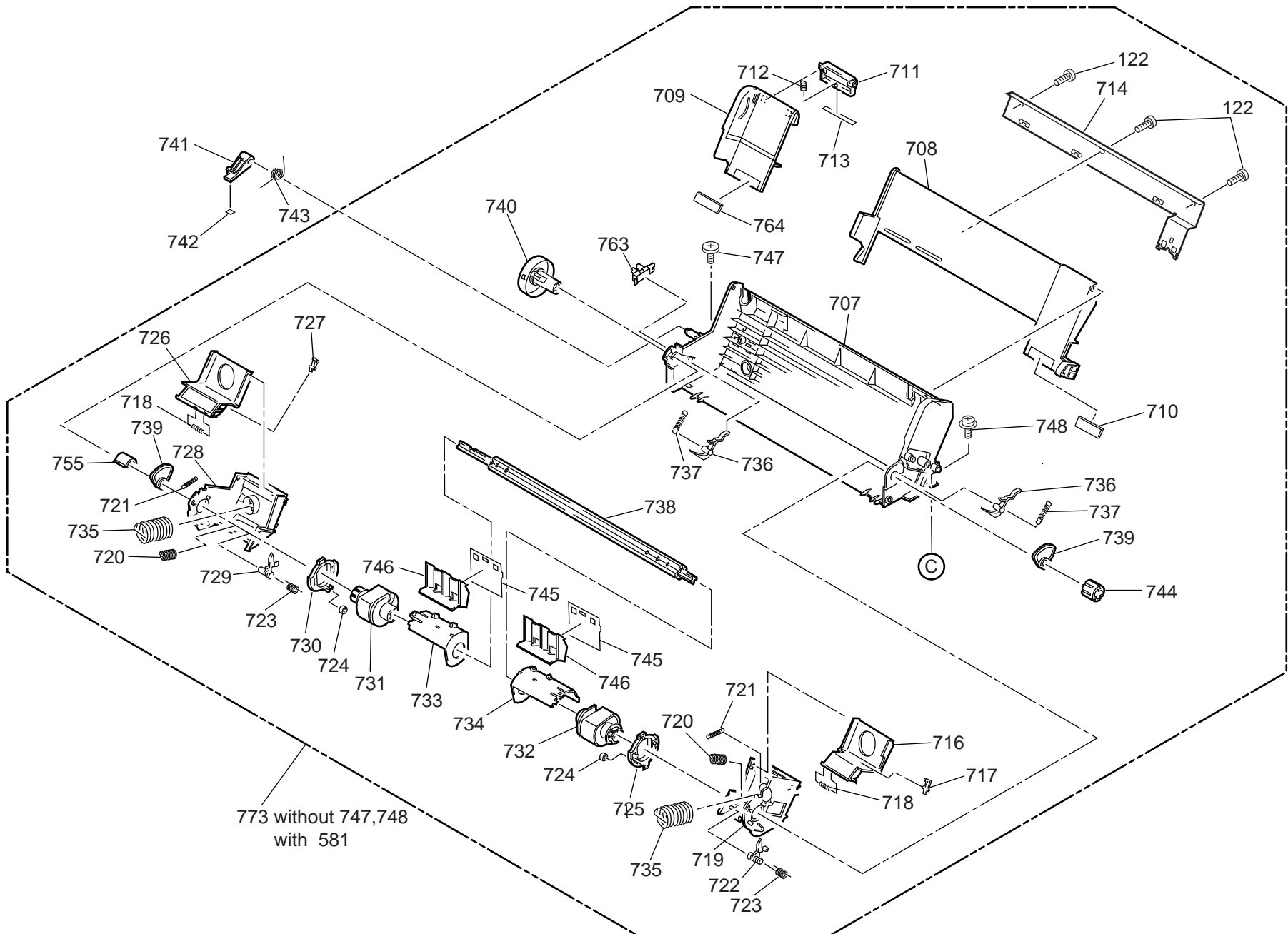
*5: Enable or disable reverse transfer. (When disabled, ignore -SLIN signal)

7.3 Exploded Diagrams

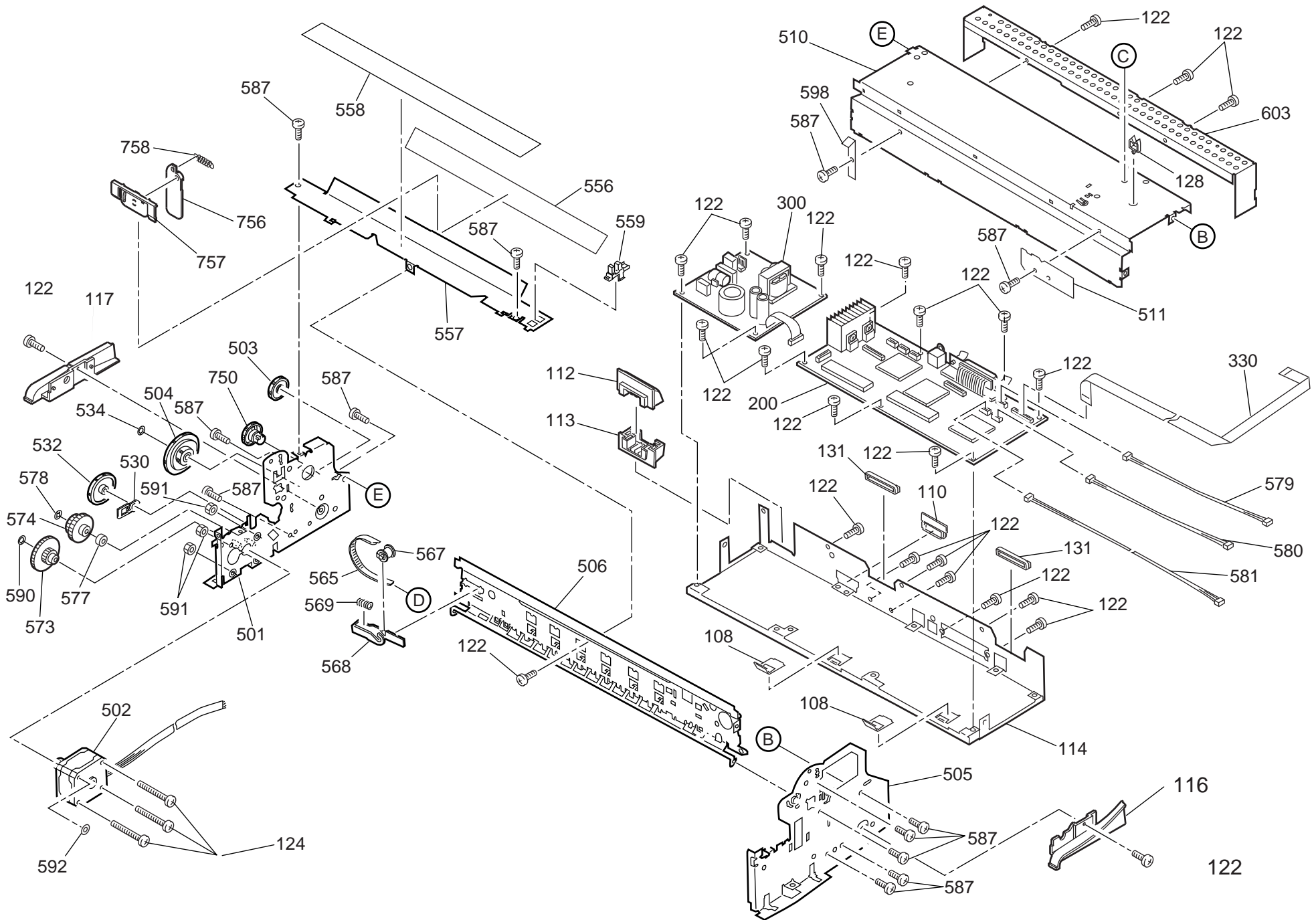
This section contains six exploded diagrams.

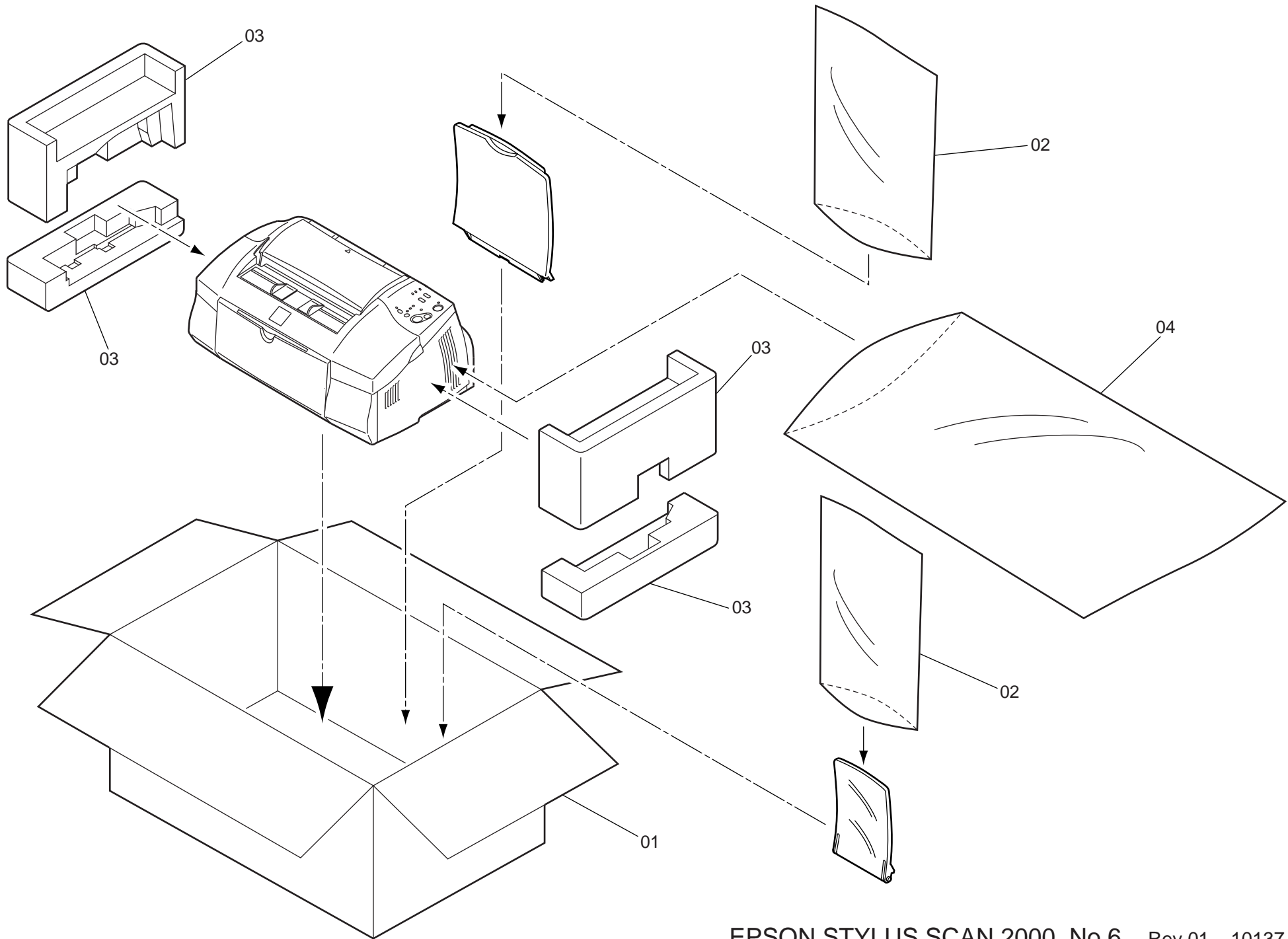
The parts to which no reference number is assigned will not be available as after-sale service parts.





773 without 747,748
with 581





7.4 Parts List

Table 7-15. Parts List

Reference Number	Part Name
100	HOUSING
101	COVER,PRINTER
103	STACKER ASSY.
104	COVER,STACKER,RIGHT
106	COVER,STACKER,LEFT
107	BUTTON
108	GROUNDING PLATE
109	GROUNDING PLATE,PANEL
110	COVER,SHIELD PLATE,M/B,LEFT
111	COVER,GEAR
112	COVER,INLET,UPPER;B
113	COVER,INLET,LOWER;B
114	SHIELD PLATE,M/B
115	LOGO PLATE
116	HOUSING,SUPPORT,RIGHT
117	HOUSING,SUPPORT,LEFT
119	FOOT
122	C.B.S. SCREW
123	C.B.(O) SCREW,4X5,F/ZG
124	C.B.S. SCREW
125	C.B.P-TITE SCREW,3X8,F/ZN
126	C.B.P-TITE,3X10,F/ZN

Table 7-15. Parts List (continued)

Reference Number	Part Name
127	C.B.P-TITE(P4),3X8,F/ZN
128	MINI CLAMP
131	COVER,CABLE;B
132	LOCK,STACKER
133	COMPRESSION SPRING,2.94
136	HOUSING,PANEL
137	BUTTON,POWER
138	BUTTON,STOP
139	BUTTON,COPY
140	BOARD ASSY.,PANEL
141	COVER,ASF
142	PAPER SUPPORT,SCANNER
143	EDGEGUIDE,RIGHT
144	EDGEGUIDE,LEFT
145	RACK,EDGEGUIDE
146	PINION,EDGEGUIDE
183	LABEL,LEVER CARTRIDGE,BLACK
184	LABEL,LEVER CARTRIDGE,COLOR
185	LENS,1
186	LENS,2
200	BOARD ASSY.,MAIN
300	BOARD ASSY.,POWER SUPPLY
330	HARNESS
400	POWER CABLE ASSY.

Table 7-15. Parts List (continued)

Reference Number	Part Name
500	PRINTER MECHANISM(ASP)M4M12-100
501	FRAME ASSY.,LEFT
502	MOTOR ASSY.,PF
503	SPUR GEAR,23.2
504	COMBINATION GEAR,16,40.8
505	FRAME,RIGHT
506	FRAME, TOP
507	MOTOR ASSY.,CR
508	PUMP ASSY.
509	CAP ASSY.;B
510	FRAME,BOTTOM
511	SHEET,PROTECTION,HEAD
512	FRAME,FRONT;B
513	BUSHING,PARALLELISM ADJUST,LEFT
514	BUSHING,PARALLELISM ADJUST,RIGHT
515	PAPERGUIDE,REAR
516	ROLLER,PF
517	COMPRESSION SPRING,5.85
518	BUSHING,12,LEFT
519	LEVER,CHANGE
520	SPURGEAR,26.4
521	SPACER,C-RING
522	SCALLOP SPRING PIN-AW,2X16,F/B
523	COMPRESSION SPRING,0.9

Table 7-15. Parts List (continued)

Reference Number	Part Name
524	SPURGEAR,73.6
525	SPACER,FASTEN,ROLLER,PF
526	SPACER,FASTEN,ROLLER,PF;B
527	C-RING
528	PLANE WASHER,12.2X0.5X15
529	ROLLER,ASSY.,PAPER EJECT
530	BUSHING,6
531	RETAINING RING
532	SPUR GEAR,36
533	SUPRGEAR,11
534	PLANE WASHER,4.1X0.5X6.5
535	PAPER GUIDE,FRONT;B
536	GROUNDING WIRE,EJ
538	FRAME, PAPER EJECT
539	HOLDER,STAR WHEEL,RIGHT
540	HOLDER,STAR WHEEL,LEFT
541	HOLDER,STARWHEEL,FRONT
542	STARWHEEL ASSY.,8;E
543	STARHWEEL,8;B
544	ROD SPRING,STAR WHEEL
545	PAPER GUIDE,UPPER
546	PAPER GUIDE,LEFT
547	PAPER GUIDE,RIGHT
548	SHAFT,PAPER GUIDE,UPPER

Table 7-15. Parts List (continued)

Reference Number	Part Name
549	SHAFT,ROLLER,DRIVEN
550	ROLLER,DRIVEN;D
551	TORSION SPRING,117.6
552	CIRCUIT ASSY,PE
553	HOLDER,PE
554	LEVER,PE
555	TORSION SPRING,0.22
556	SHEET,GUIDE PLATE,CABLE
557	GUIDEPLATE,CABLE
558	SHEET,CABLE
559	DETECTOR,HP;E
560	CARRIAGE ASSY.
561	LEVER,ADJUST
562	GROUNDING PLATE,HEAD
563	OIL PAD
564	SLIDER,CR
565	TIMINGBELT
566	SHAFT,CR,GUIDE
567	PULLEY ASSY.,DRIVEN
568	HOLDER,PULLEY,DRIVEN;B
569	COMPRESSION SPRING,19.6
570	LEVER,PG
571	LEVER,PG,SUPPORT
572	TORSION SPRING,63.7

Table 7-15. Parts List (continued)

Reference Number	Part Name
573	COMBINATION GEAR,12.4,28
574	COMBINATION GEAR,16,21.6
576	POROUS PAD,SLIDER,CAP
577	BUSHING,FASTEN,COMBINATION GEAR
578	PUSHING NUT,2
579	HARNESS,HP
580	HARNESS,PE
581	HARNESS,ASF
586	C.P.S-TITE(P4),3X6,F/ZN
587	C.B.S. SCREW
589	LEAF SPRING
590	PLANE WASHER,6.1X0.5X9.0
591	HEXAGON NUT,NORMAL,M3
592	PLAIN WASHER
595	HOLDER, DETECTOR,I/C
596	LEVER,DETECTOR,I/C,BK
597	LEVER,DETECTOR,I/C,CL
598	GROUNDING PLATE,ROLLER,PF
600	TORSION SPRING,1.08
601	DETECTOR,I/C
602	HARNESS,I/C
603	SHIELED PLATE,M/B,SUPPORT
700	PRINT HEAD IJ288-0AA
701	FASTENER,HEAD

Table 7-15. Parts List (continued)

Reference Number	Part Name
702	TORSION SPRING,49
703	C.B.P-TITE SCREW,3X6,F/ZN
704	CABLE,HEAD
705	HOLDER,CABLE
706	SPACER,CABLE HEAD
707	FRAME,ASF;B
708	HOPPER
709	EDGE GUIDE
710	CORK
711	SLIDER,EDGEGUIDE
712	COMPRESSION SPRING,3.23
713	PAD,BREAK,EDGE GUIDE
714	REINFORCEMENT PLATE,HOPPER
716	PAD ASSY.,RIGHT
717	LEVER,PAD,RELEASE,RIGHT
718	ROD SPRING,HOLDER,PAD
719	HOLDER,EDGEGUIDE,RIGHT
720	COMPRESSION SPRING,1.17
721	EXTENSION SPRING,0.62
722	LEVER,PAPERRETURN,RIGHT
723	EXTENSION SPRING,0.294
724	ROLLER,LD,SUPPORT
725	HOLDER,ROLLER,LD,SUPPORT,RIGHT
726	PAD ASSY.,LEFT

Table 7-15. Parts List (continued)

Reference Number	Part Name
727	LEVER,PAD,RELEASE,LEFT
728	HOLDER,EDGEGUIDE,LEFT
729	LEVER,PAPERRETURN,LEFT
730	HOLDER, ROLLER,LD,SUPPORT,LEFT
731	ROLLER ASSY.,LD,LEFT
732	ROLLER ASSY.,LD,RIGHT
733	COVER,ROLLER,LD,LEFT
734	COVER,ROLLER,LD,RIGHT
735	COMPRESSION SPRING,1.961
736	LEVER,FASTEN,EDGEGUIDE;B
737	EXTENSION SPRING,0.088
738	SHAFT,ROLLER,LD
739	LEVER,HOPPER,RELEASE
740	WHEEL,DETECT
741	LEVER,BRAKE
742	PAD,BREAK
743	TORSION SPRING,41.2
744	BUSHING,FASTEN,SHAFT
745	SHEET,PAPERFEED
746	HOLDER,SHEET,PAPERFEED
747	SHAFT,MOUNT,CR
748	C.P.S-TITE(P4),3X6,F/ZN
750	SPURGEAR,34
751	PAPERGUIDE,LOWER

Table 7-15. Parts List (continued)

Reference Number	Part Name
752	POROUSPAD,INKEJECT,LARGE
753	TRAY,PORUSPAD
754	SPACER,TRAY
755	BUSHING,FASTEN,SHAFT,LEFT
756	PAPER SUPPORT,SUUPPORT,UPPER
757	HOLDER,PAPER SUPPORT,SUPPORT,UPPER
758	EXTENSION SPRING,0.29
759	COVER,CARTRIDGE,BK
760	COVER,CARTRIDGE,C
761	SEPARATOR,CARTRIDGE,BK
762	SEPARATOR,CARTRIDGE,C
763	DETECTOR,HP;E
764	CORK;B
765	CLEANER,HEAD,ASP
766	POROUSPAD,INKEJCT,SMALL
767	C.P.B.(O) SCREW,1.7X5,F/ZN
768	BUSHING,HOLDER,DETECTOR,I/C
769	FOOT
773	ASF UNIT, ASP
800	CARRIAGE UNIT,SC(ASP)
801	BACK FEEDING ROLLER ASSEMBLY
802	FRONT FEEDING ROLLER ASSEMBLY
803	SHAFT SUPPORT ASSEMBLY
804	CCFL ASSEMBLY

Table 7-15. Parts List (continued)

Reference Number	Part Name
805	OPTICAL ASSEMBLY
806	INVERTER ASSEMBLY
807	FRONT COVER ASSEMBLY
808	DC MOTOR ASSEMBLY(9WATT)
809	SENSOR ASSEMBLY
810	FLAME,SCANNER
811	FLAME,SUPPORT
812	COVER,SCANNER
813	COVER,GEAR,PF
814	MINI CLAMP
1	INDIVIDUAL CARTON BOX
2	POLYETHYLENE SHEET 315X135X0.04T
3	PAD SET,SPC
4	PLASTIC PROTECTIVE BAG 530X700X0.04T

7.5 Component Layout

- B101 MAIN Component Layout 1
- B101 MAIN Component Layout 2
- B101 PSB Component Layout
- B101 PSE Component Layout

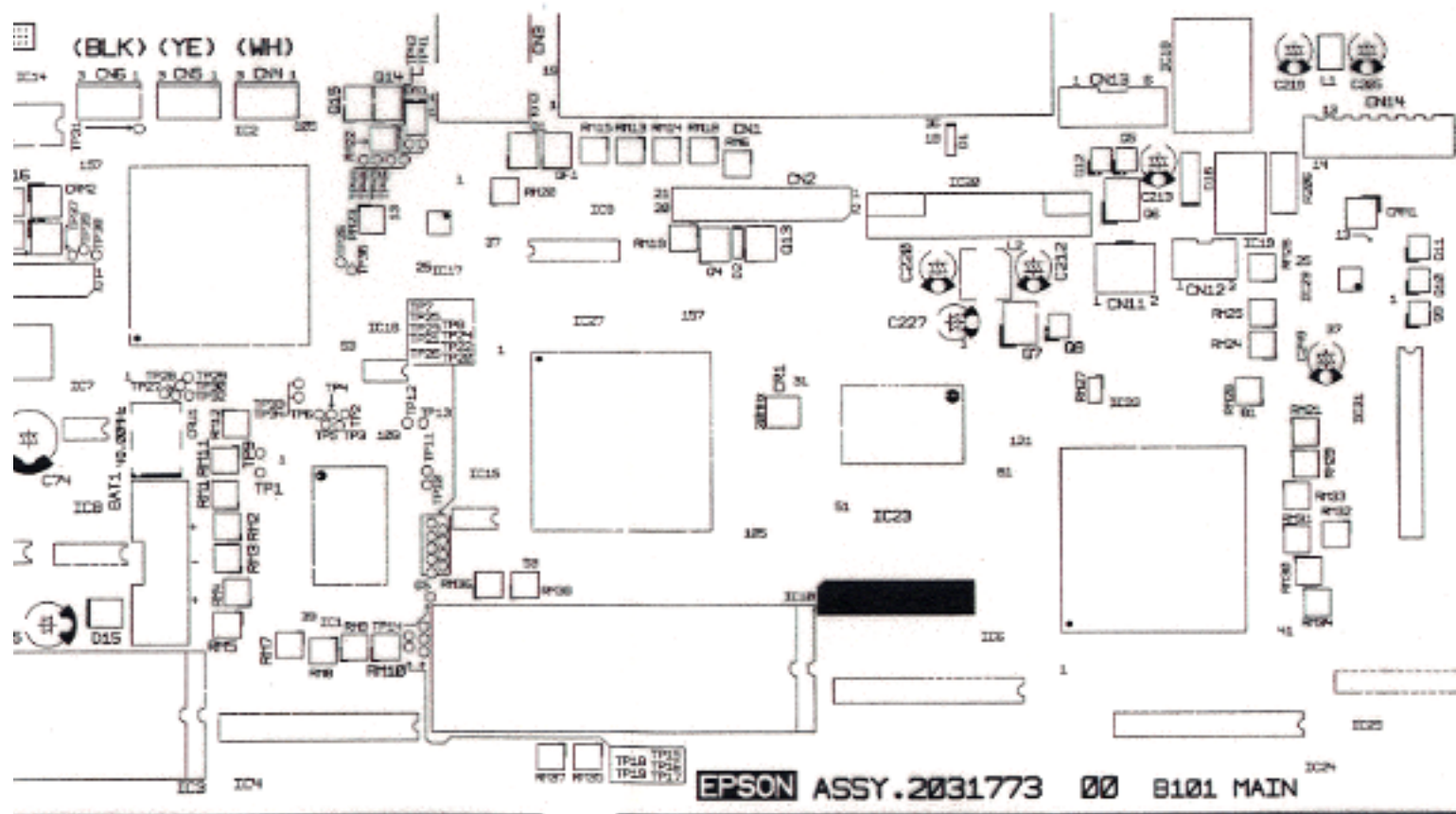


Figure 7-2. MAIN Board Component Layout 1

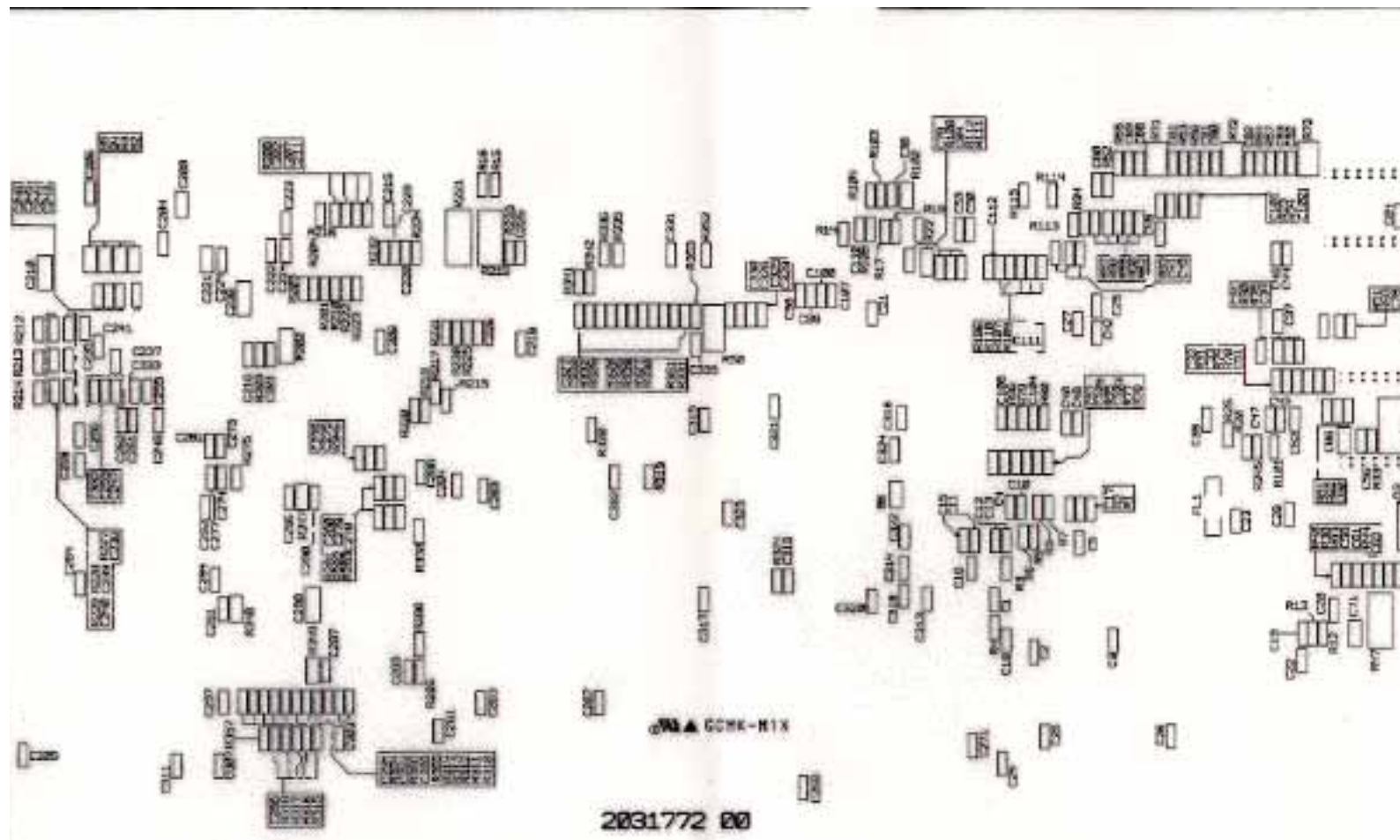


Figure 7-3. MAIN Board Component Layout 2

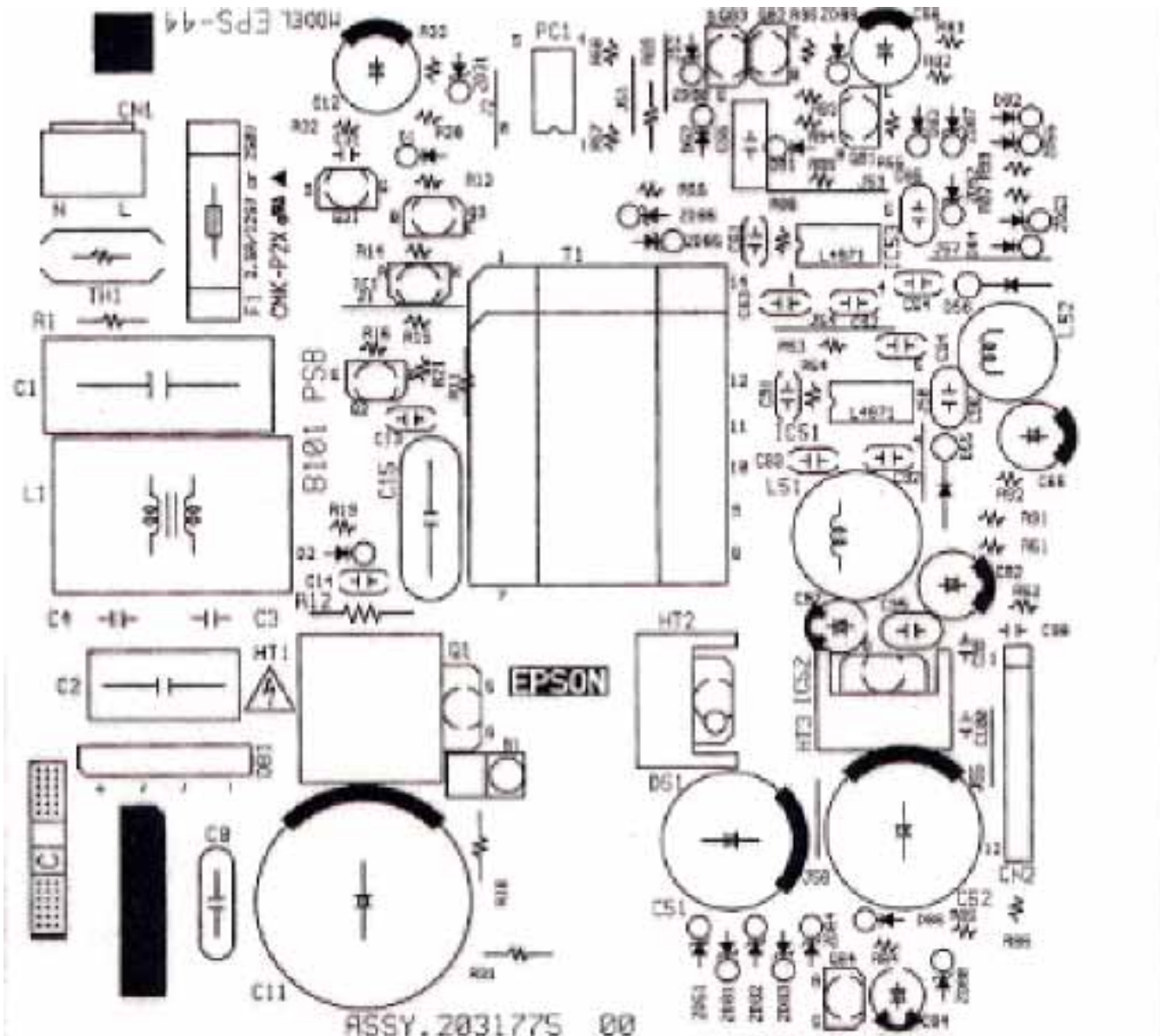


Figure 7-4. PSB Component Layout

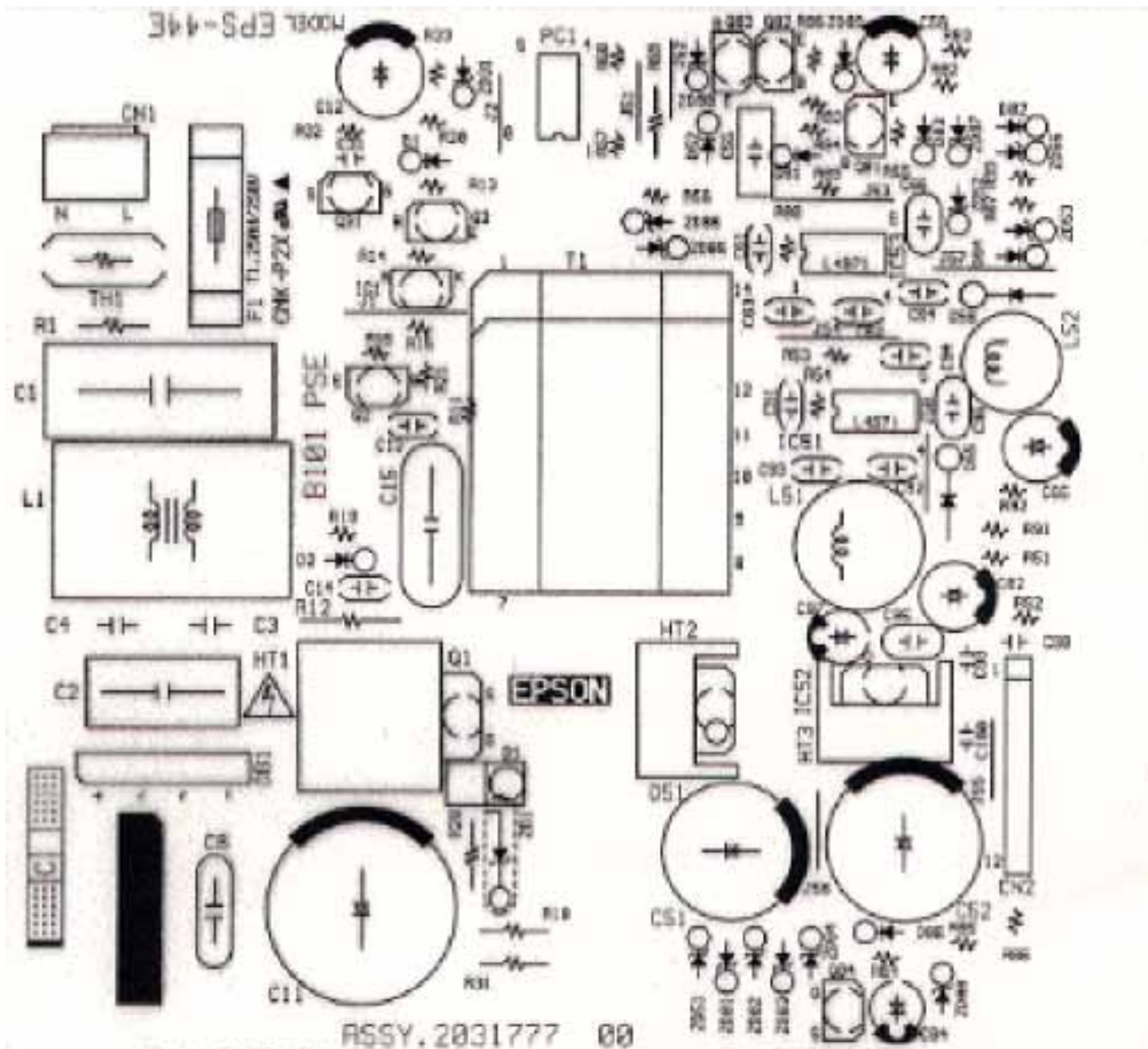
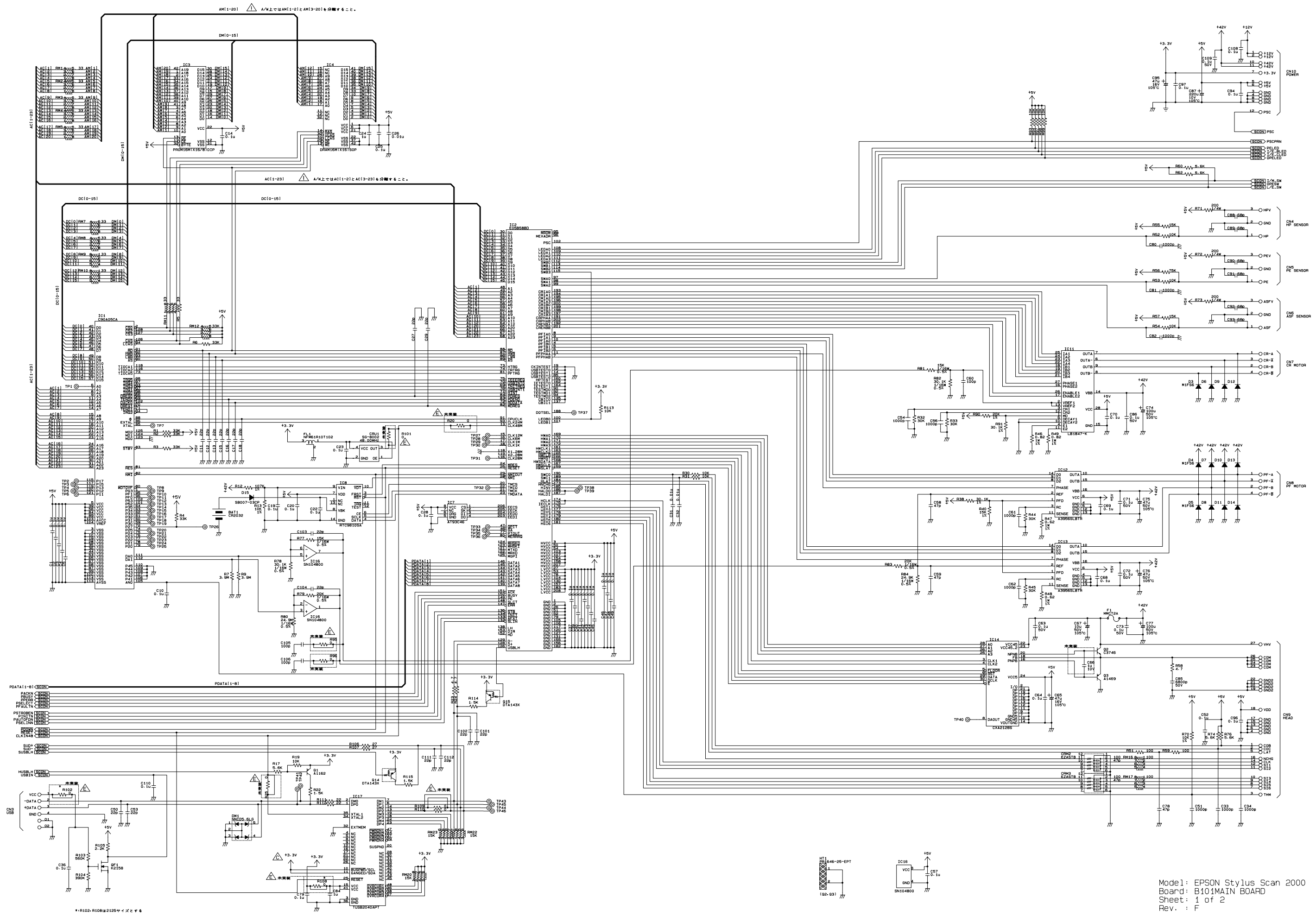


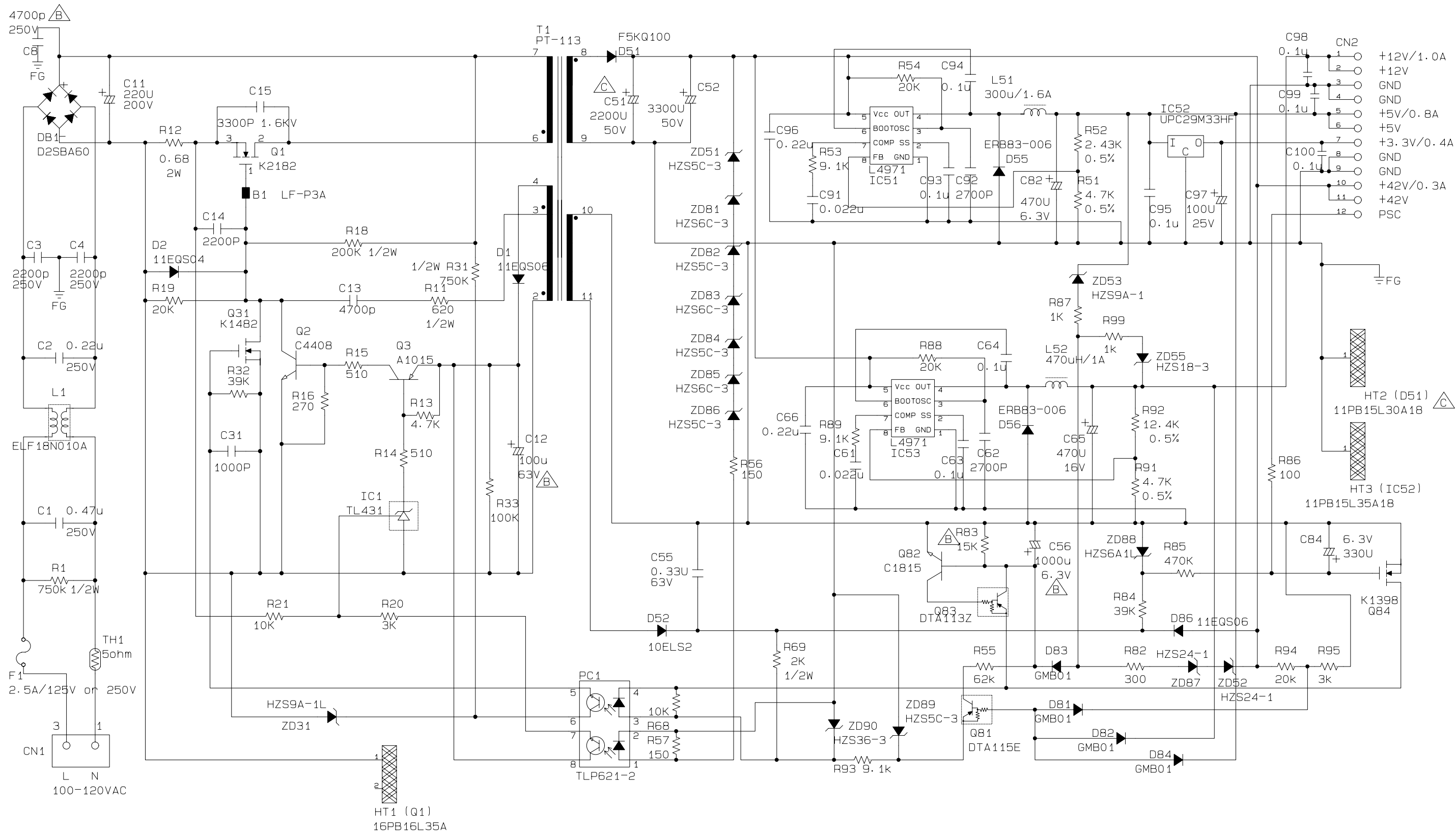
Figure 7-5. PSE Component Layout

7.6 Circuit Diagrams

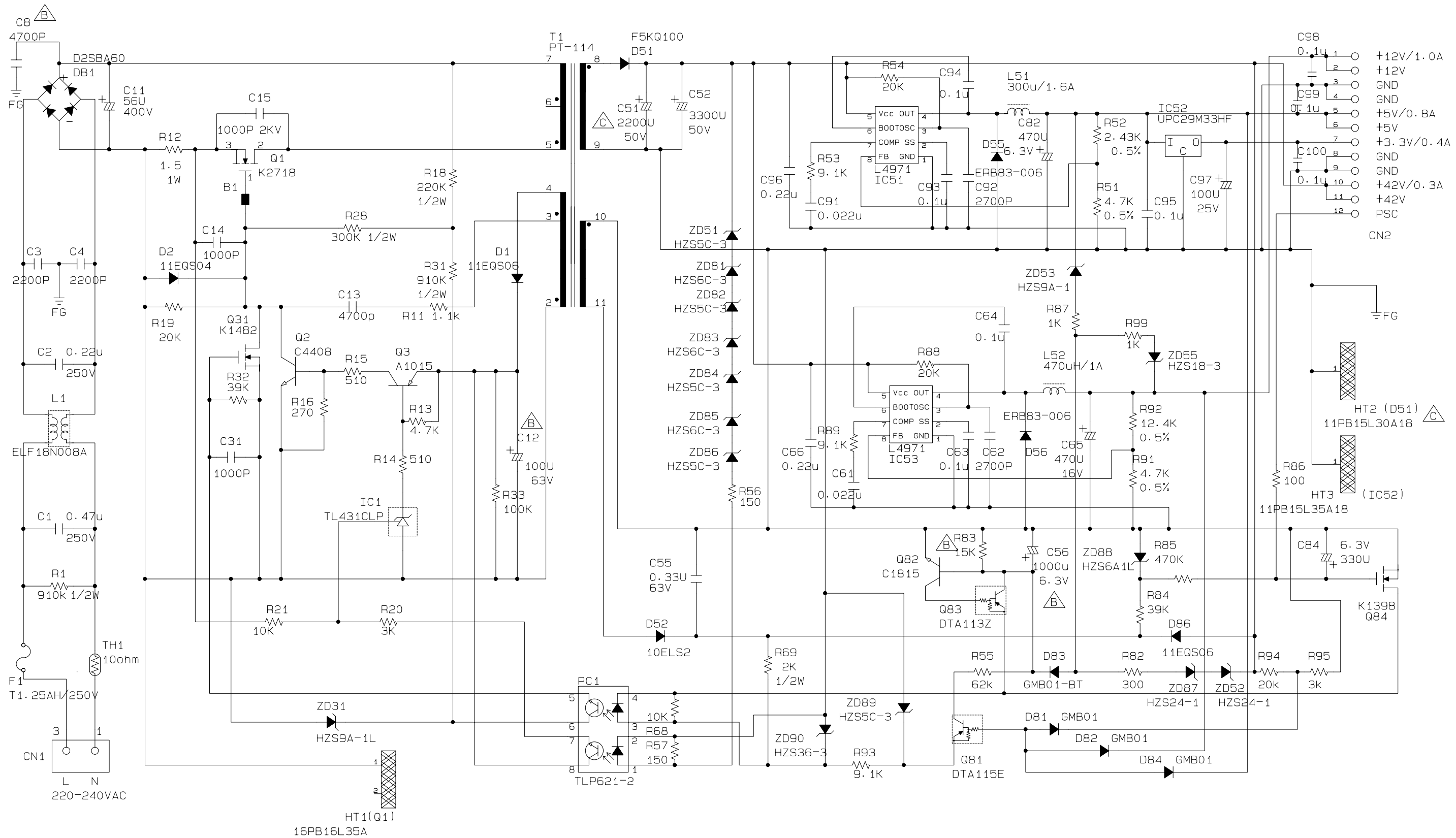
This section contains the following circuit diagrams.

- B101MAIN circuit diagram 1
- B101MAIN circuit diagram 2
- B101PSB circuit diagram
- B101PSE circuit diagram





Model: EPSON Stylus Scan 2000
 Board: B101PSB BOARD
 Sheet: 1 of 1
 Rev. : C



Model: EPSON Stylus Scan 2000
 Board: B101PSE BOARD
 Sheet: 1 of 1
 Rev. : C