SERVICE MANUAL

Color ink jet printer

EPSON Stylus PHOTO 2000P

COLOR IMAGING
EPSON

EPSON®

Notice:

PRECAUTIONS

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

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

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

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

DANGER

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

PREFACE

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of EPSON Stylus PHOTO 2000P. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page. The chapters are organized as follows:

CHAPTER 1. PRODUCT DESCRIPTIONS

Provides a general overview and specifications of the product.

CHAPTER 2. OPERATING PRINCIPLES

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

CHAPTER 3. TROUBLESHOOTING

Provides the step-by-step procedures for troubleshooting.

CHAPTER 4. DISASSEMBLY AND ASSEMBLY

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

CHAPTER 5. ADJUSTMENTS

Provides Epson-approved methods for adjustment.

CHAPTER 6. MAINTENANCE

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

APPENDIX

Provides the following additional information for reference:

- *Connector Summary*
- *EEPROM Address Map*
- *Circuit Board Component Layout*
- *Exploded Diagrams*
- *Parts List*
- *Electrical Board Circuit Diagrams*

Revision Status

Revision	Issued Date	Description
A	May 11, 2000	First Release

Contents

Chapter 3 TROUBLESHOOTING

Chapter 4 DISASSEMBLY AND ASSEMBLY

Chapter 5 ADJUSTMENT

Chapter 6 MAINTENANCE

Chapter 7 APPENDIX

PRODUCT DESCRIPTIONS

1.1 General Characteristics

□ High color print quality
- 2880 (H) x 720 (V) dpi printing
- 6 color printing (YMCK)
- Traditional and New Microweave
- Pigment Ink supported

□ Built-in auto sheet feeder
- A3+paper supported
- Holds 100 cut-sheets (64 g/m^2)
- Holds 10 envelopes
- Holds 30 transparency films

□ Built-in 2 I/F
- Bi-directional parallel I/F (IEEE-1284 level 1 device)
- USB

□ Windows/Macintosh exclusive

1.2 Printing specification

1.2.1 Printing specification

☐ Print method   : On demand ink jet

☐ Nozzle Configuration: 48 nozzles x 6 colors
(Black, Cyan, Magenta, Yellow,
Light-Cyan, Light-Magenta)

☐ Print direction: Bi-direction with logic seeking

☐ Print speed & Printable columns

Table 1-1. Character Mode

Character pitch	Printable columns	LQ speed
10 CPI (Pica)	127	238 CPS**

* Do not mention in the user's manual.
** This value is the speed of normal-dot printing.

Table 1-2. Raster Graphic Mode

Horizontal resolution	Printable area	Available dot	CR Speed
180 dpi	322.986mm(12.716 inch)	2289	60.452/48.26cm/s(23.8/19 IPS)
360 dpi	322.986mm(12.716 inch)	4578	60.452/48.26cm/s (23.8/19 IPS)
720 dpi	322.986mm(12.716 inch)	9156	48.26cm/s(19 IPS)

☐ Control code   : ESC/P Raster command
: EPSON Remote command

☐ Character tables   : 2 international character sets
- PC 437 (US, Standard Europe)
- PC 850(Multilingual)

☐ Typeface   : Bit map LQ font
- EPSON Courier 10 CPI

1.2.2 Paper feeding

Feeding Method

Friction feed with ASF

Line Spacing

Programmable by 1/6" or 1/360" step

Paper Path

Cut-sheet   ASF (Top entry Front out)

Feed Speed

☐ 110msec (10.16mm feed)

☐ 152.4mm/sec (6.0 inch/sec) (Fast, continuous feed)

ASF Hopper Specification

☐ Paper size
  90mm x 205mm ~ A3+

☐ Thickness
  8mm or less

☐ Number of sheets

Table 1-3. Hopper Capacity

Paper Type	Size	Sheets
Plain paper (65g/m^2)	A4, A3, Letter, Legal	approx. 100 sheets
Envelope	See "Paper specification" on page -25	10 sheets
Premium Semigloss Photo Paper	A3+, A3, A4, Letter, US B	1 sheet
Glossy Paper-Photo Weight	A3+, A3, A4, Letter, US B	1 sheet
Archival Matte Paper	A4, Letter	1 sheet
	A3, A3+, US B	20 sheet
Watercolor Paper-Radiant White	A3+	1 sheet
Super Fine	A3+, A3, A4	approx. 65 sheets

Stacker Capacity

NOTE: *The figures in the table is measured in the normal room condition.*

Table 1-4. Stacker Capacity

Paper Type	Print Type	Stacker Capacity
Plain paper	Text	30 sheet or more
	Graphics	20 sheet or more
Envelope	Text	10 sheet or more
Archival Matte Paper	Graphics	10 sheet or more
Super Fine	Graphics	10 sheet or more
Other special paper	Graphics	1 sheet or more

1.2.3 Input data buffer

: 256KB

1.2.4 Electric specification

120 V version

Rated voltage:	AC 120 V
Input voltage range:	AC 99 - 132 V
Rated frequency range:	50 - 60 Hz
Input frequency range:	49.5 - 60.5 Hz
Rated current:	0.4A
Power consumption:	Approx. 1815W (ISO10561 Letter Pattern) Approx. 3.5W in standby mode Energy Star compliant
Insulation Resistance:	10 M ohms min. (between AC line and chassis, DC 500 V)

Dielectric strength: AC 1000 V rms. 1 minute or
                            AC 1200 V rms. 1 second
                            (between AC line and chassis)

220-240 V version

Rated voltage: AC 220 - 240 V

Input voltage range: AC 198 - 264 V

Rated frequency range: 50 - 60 Hz

Input frequency range: 49.5 - 60.5 Hz

Rated current: 0.2A

Power consumption: Approx. 1815W (ISO10561 Letter Pattern)
                         Approx. 3.5W in standby mode
                         Energy Star compliant

Insulation Resistance: 10 M ohms min.
                         (between AC line and chassis, DC 500 V)

Dielectric strength: AC 1500 V rms. 1 minute
                         (between AC line and chassis)

1.2.5 Environmental condition

Temperature   : 10 to 35 °C (operating *3)

                   : -20 to 60 °C (non-operating, *1)
                    1 month at 40 °C
                    120 hours at 60 °C

Humidity   : 20 to 80% RH (operating, *2,*3)

                   : 5 to 85% RH (non-operating, *1, *2)

Resistance to shock: 1 G, within 1 ms (operating)

                   : 2 G, within 2 ms (non-operating, *1)

Resistance to vibration: 0.15G (operating)

                   : 0.50G (non-operating, *1)

NOTE: **1: with shipment container*
         *2: without condensation
         *3: Condition is as following figure.
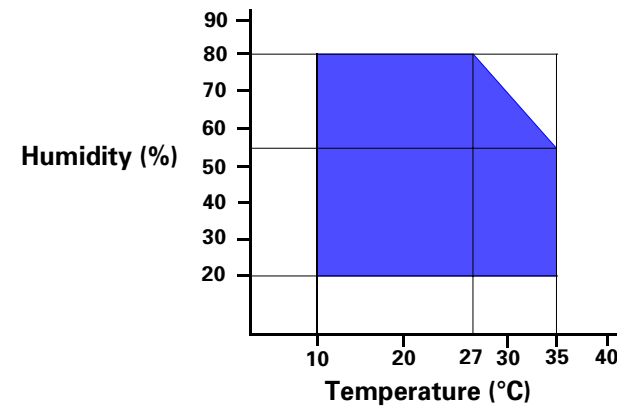
Figure 1-1. Environmental Condition

1.2.6 Reliability

Total print volume : 25,000 pages(Black)/10,000 pages(Color) (A4, Letter)

Print Head Life   : 3000 million dots/nozzle

1.2.7 Safety Approvals

120 V version:

Safety standards	: UL1950
	CSA22.2 No.950
EMI	: FCC part15 subpart B class B
	CSA C108.8 class B

220-240 V version:

Safety standards	: EN 60950(VDE)
EMI	: EN 55022(CISPR Pub.22) class B
	: AS/NZS 3548 class B

1.2.8 Acoustic noise

Level   : Approx. 42 dB(A) (According to ISO 7779)

1.2.9 CE Marking

220-240 V version

Low Voltage Directive 73/23/EEC:	EN60950
EMC Directive 89/336/EEC:	EN55022 class B
	EN61000-3-2
	EN61000-3-3
	EN50082-1
	IEC801-2
	IEC801-3
	IEC801-4

1.3 Interface

1.3.1 Hardware interface

This printer provides USB and parallel interface as standard.

1.3.1.1 Parallel interface

Transmission mode   : 8 bit parallel, IEEE-1284 compatibility mode

Synchronization   : By STROBE pulse

Handshaking   : By BUSY and ACKNLG signal

Signal level   : TTL compatible level

Adaptable connector   : 57-30360(amphenol) or equivalent

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.

Data transmission timing
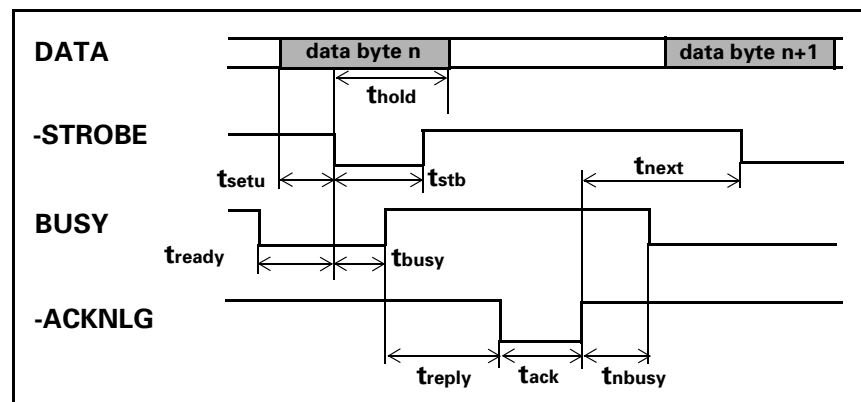
Table 1-5. Parameters

Parameter	Minimum	Maximum
tsetup	500ns	-
thold	500ns	-
tstb	500ns	-
tready	0	-
tbusy	-	500ns
tt-out[*1]	-	120ns
tt-in[*2]	-	200ns
treply	0	-
tack	500ns	10us
tnbusy	0	-
tnext	0	-

*1:Rise and fall time of every output signal.
*2:Rise and fall time of every input signal.

Typical timing for tack is shown below.

Table 1-6. Typical Time of Tack

Parallel I/F Mode	Typical Time of tack
High Speed	0.5us
Normal Speed	2us

Table 1-7.
Signal Level: TTL Compatible (IEEE-1284 level 1 device)

Parameter	Minimum	Maximum	Condition
VOH*	-	5.5V	
VOL*	-0.5V	-	
IOH*	-	0.32mA	VOH = 2.4V
IOL*	-	12mA	VOL = 0.4V
CO	-	50pF	
VIH	-	2.0V	
VIL	0.8V	-	
IIH	-	0.32mA	VIH = 2.0V
IIL	-	12mA	VIL = 0.8V
CI	-	50pF	

*   A low logic level on the Logic H signal is 2.0V or less when the printer is
    powered off, and this signal is equal to or exceeding 3.0V when the printer
    is powered on. The receiver shall provide an impedance equivalent to 7.5K
    ohm to ground.

Table 1-8. Connector Pin Assignment and Signals

Pin No.	Signal Name	Return GND pin	In/Out	Functional description
1	-STROBE	19	In	The strobe pulse. Read-in of data is performed at the falling edge of this pulse.
2	DATA0	20	In	The DATA0 through DATA7 signals represent data bits 0 to 7, respectively.
3 -9	DATA1-7	21-27	In	Each signal is at high level when data is logical 1 and low level when data is logical 0.
10	-ACKNLG	28	Out	This signal is a negative pulse indicating that the printer can again accept data.
11	BUSY	29	Out	A high signal indicates that the printer cannot receive data.
12	PE	28	Out	A high signal indicates paper-out error.
13	SLCT	28	Out	Always at high level when the printer is powered 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 50 us pulse is necessary.
32	-ERROR	29	Out	A low signal indicates printer error condition.
36	-SLIN	30	In	Not used.
18	Logic H	-	Out	Pulled up to +5 V via 3.9 K ohm resistor.
35	+5V	-	Out	Pulled up to +5 V via 3.3 K ohm resistor.

Table 1-8. Connector Pin Assignment and Signals

Pin No.	Signal Name	Return GND pin	In/Out	Functional description
17	Chassis GND	-	-	Chassis GND.
16, 33 19-30	GND	-	-	Signal GND.
15, 34	NC	-	-	Not connected.

NOTE: *In/Out refers to the direction of signal flow seen from the printer side.*

1.3.1.2 Parallel Interface (Reverse Channel)

Transmission mode   : IEEE-1284 nibble mode

Adaptable connector   : See forward channel

Synchronization   : Refer to the IEEE-1284 specification

Handshaking   : Refer to the IEEE-1284 specification

Data trans. timing   : Refer to the IEEE-1284 specification

Signal level   : IEEE-1284 level 1 device
              See forward channel

Table 1-9. Connector pin assignment and signals

Pin No.	Signal Name	Return GND Pin	In/ Out*	Functional description
1	HostClk	19	In	Host clock signal.
2	DATA0	20	In	The DATA0 through DATA7 signals represent data bits 0 to 7,
3	DATA1	21	In	respectively.
4	DATA2	22	In	Each signal is at high level when data is logical 1 and low level when
5	DATA3	23	In	data is logical 0.
6	DATA4	24	In	These signals are used to transfer the 1284 extensibility request values
7	DATA5	25	In	to the printer.
8	DATA6	26	In	
9	DATA7	27	In	
10	PtrClk	28	Out	Printer clock signal.
11	PtrBusy / DataBit-3,7	29	Out	Printer busy signal and reverse channel transfer data bit 3 or 7.

Table 1-9. Connector pin assignment and signals

Pin No.	Signal Name	Return GND Pin	In/ Out*	Functional description
12	AckDataReq / DataBit-2,6	28	Out	Acknowledge data request signal and reverse channel transfer data bit 2 or 6.
13	Xflag / DataBit-1,5	28	Out	X-flag signal and reverse channel transfer data bit 1 or 5.
14	HostBusy	30	In	Host busy signal.
31	-INIT	30	In	Not used.
32	-DataAvail / DataBit-0,4	29	Out	Data available signal and reverse channel transfer data bit 0 or 4.
36	1284-Active	30	In	1284 active signal.
18	Logic-H	-	Out	Pulled up to +5 V via 3.9 K ohm resistor.
35	+5V	-	Out	Pulled up to +5 V via 3.3 K ohm resistor.
17	Chassis GND	-	-	Chassis GND.
16, 33 19-30	GND	-	-	Signal GND.
15, 34	NC	-	-	Not connected.

NOTE: *In/Out refers to the direction of signal flow seen from the printer side.*

Extensibility Request

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

00H   : Request Nibble Mode Reverse Channel Transfer.

04H   : Request Device ID;
               Return Data Using Nibble Mode Rev Channel Transfer.

Device ID

World Standard Model

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

☐ When IEEE1284.4 is enabled,

    [00H] [5CH]

    MFG:EPSON;

    CMD:ESCPL2,BDC,D4;

    MDL:Stylus[[SP]Photo[SP]2000P;

    CLS:PRINTER;

    DES:EPSON[SP]Stylus[SP]Photo[SP]2000P;

☐ When IEEE1284.4 is disabled,

    [00H] [59H]

    MFG:EPSON;

    CMD:ESCPL2,BDC;

    MDL:Stylus[SP]Photo[SP]2000P;

    CLS:PRINTER;

    DES:EPSON[SP]Stylus[SP]Photo[SP]2000P;

1.3.1.3 USB interface

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

Recommended cable length: 2 meters

Table 1-10. Connector pin assignment and signals

Pin No.	Signal name	In/Out	Function description
1	VCC	-	Cable power. Maximum power consumption is 2mA
2	-Data	bi-directional	data
3	+Data	bi-directional	data, pull up to +3.3V via 1.5K ohm resistor
4	Ground	-	Cable ground
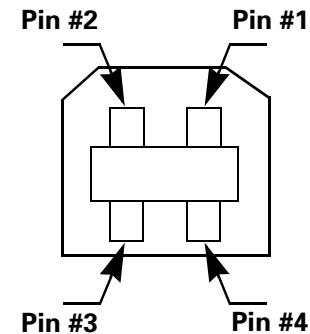
Figure 1-2. USB Pin Assignment

1.3.1.4 Prevention Hosts from Data Transfer Time-out

Generally, hosts abandon data transfer to peripherals when a peripheral is in the busy state for dozens of seconds continuously. To prevent hosts from this kind of time-out, the printer receives data very slowly, several bytes per minute, even if the printer is in busy state. This slowdown is started when the rest of the input buffer becomes several hundreds of bytes. Finally, the printer is in the busy state continuously when the input buffer is full.

USB and IEEE1284.4 on the parallel interface do not require this function.

1.3.1.5 Interface Selection

The printer has 2 built-in interfaces; the USB and parallel interface. These interfaces are selected automatically.

- Automatic selection

In this automatic interface selection mode, the printer is initialized to the idle state scanning which interface receives data when it is powered on. Then the interface that receives data first is selected. When the host stops data transfer and the printer is in the stand-by state for the seconds, the printer is returned to the idle state. As long as the host sends data or the printer interface is busy state, the selected interface is let as it is.

- Interface state and interface selection

When the parallel interface is not selected, the interface got into the busy state. When the printer is initialized or returned to the idle state, the parallel interface got into the ready state. Caution that the interrupt signal such as the -INIT signal on the parallel interface is not effective while that interface is not selected.

1.3.1.6 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 operate 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.

1.4 Operator Controls

1.4.1 Buttons

- ☐ Operating button
- ☐ Load/Eject button
- ☐ Cartridge replacement button
- ☐ Cleaning
- ☐ Button
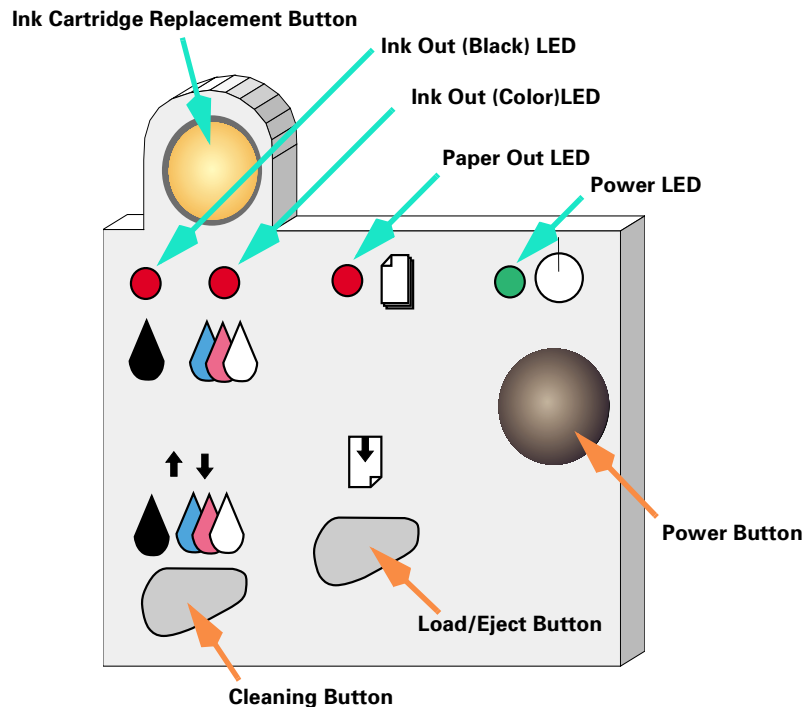
1.4.2 LED Indicators

- ☐ **Power**
  Lights when the power switch is "ON" and AC power is supplied.

- ☐ **Paper Out**
  Lights during the paper out condition, and blinks during the paper jam condition.

- ☐ **Ink Out (Black)**
  Lights during no black ink condition, and blinks during the black ink low condition.

- ☐ **Ink Out (Color)**
  Lights during no color ink condition, and blinks during the color ink low condition.

Ink Cartridge Replacement Button

Ink Out (Black) LED

Ink Out (Color)LED

Paper Out LED

Power LED

Power Button

Load/Eject Button

Cleaning Button

1.4.3 Panel Functions

Table 1-11. Panel Functions

Buttons	Function
Load / Eject	• Loads or ejects paper. • Returns the printhead from the ink cartridge replacement position to the capping position.
Ink Cartridge Replacement	• Starts the ink cartridge replacement sequence. • Moves the carriage to the cartridge replacement position. • Returns the carriage from the ink cartridge replacement position.
Cleaning (Push for 3 seconds)	• Starts a head cleaning. • In the condition of "Ink Low", "Ink Out", or "No Ink Cartridge", starts the ink cartridge replacement sequence. • Returns the carriage from the ink cartridge replacement position.

Table 1-12. Power-on Panel Functions

Switch	Pressing with Power On Function
Load / Eject	• Starts status printing. [*1]
Cleaning	• Changes code pages / Selects IEEE1284.4 mode for parallel I/F. [*2]
Load/Eject + Cleaning	• Enters the special settings mode. (Factory use only). [*3]

*1:One of the actions in Table 1-13 is carried out according to the content of 1BH of EEPROM.
*2:Not intended for users.
*3:See Section 1.4.4. (Not intended for users.)

Table 1-13. Content of 1BH of EEPROM

[bit7] [bit6]	Actions
00[*1]	Print firmware version, ink counter, selected code page and nozzle check pattern.
11	
01	Hex-dump mode
10	Self test mode

*1:Factory default setting

1.4.4 Special Setting Mode

To enter the special setting mode, press Load/Eject button and Cleaning button while turning on the printer. The Paper Out LED starts blinking. While it is blinking (for three seconds), press the specified button to activate the desirable setting mode.

NOTE: *Special setting modes are not intended for users.*

Table 1-14. Special Setting Modes

Switch	Function
Load / Eject	• Resets EEPROM and timer IC.
Cleaning (Push for 10 seconds)	• Resets the ink overflow counter in EEPROM.

☐ EEPROM/Timer IC reset

   The following is reset with this operation:

   ■   Interface selection (04H)

   ■   Power off timer (6CH, 6DH)

☐ Waste ink counter reset

   The following is reset with this operation:

   ■   Ink counter A0 (50H, 5DH)

   ■   Ink counter A80 (5EH, 5FH)

1.4.5 Printer Condition and Panel Status

Table 1-15 shows various errors and printer status.

Table 1-15. Printer Condition and Panel Status

Printer Status	Indicators				Priority
	Power	**Ink Out (Black)**	**Ink Out (Color)**	**Paper Out**	
Power on condition	On	--	--	--	9
Ink sequence	Blinks	--	--	--	6
Ink cartridge replacement mode	Blinks	--	--	--	5
Data processing	Blinks	--	--	--	8
Paper out	--	--	--	On	4
Paper jam condition	--	Off	Off	Blinks	3
No ink cartridge or ink end (black)	--	On	--	--	7
Ink level low (black)	--	Blinks	--	--	7
No ink cartridge or ink end (color)	--	--	On	--	7
Ink level low (color)	--	--	Blinks	--	7
Enter EEPROM and Timer IC reset	--	On (for one second only)			-
Maintenance request	Blinks	Blinks	Blinks	Blinks	2
Fatal error	Blinks	On	On	Blinks	1

NOTE: *"--" means "no effect".*

1.4.6 Errors

Ink out

When the printer runs out most of the ink of any color, it warns of an ink low condition and keeps printing. When the ink cartridge is completely empty, the printer stops printing and generates Ink out error. In this condition, the ink cartridge must be replaced with a new one. Note an ink cartridge that is once taken out must not be used again. Reinstalling of ink cartridges whose ink level is not full upsets the ink level detection and may cause serious problems in the printheads.

Paper out

When the printer fails to load a sheet of paper, it goes into the Paper Out error condition.

Paper jam

When the printer fails to eject a sheet of paper, it goes into the Paper Jam error condition.

No ink cartridge

When the printer detects that an ink cartridge is missing, it goes into the No Ink Cartridge error condition.

Maintenance request

When the total quantity of waste ink collected during cleanings and flushing reaches the limit, printer indicates the Maintenance Request error and stops printing. The absorber must be replaced by a service person.

Fatal errors

When the printer detects a carriage control error or CG access error, it goes into a fatal error condition.

1.4.7 Printer Initialization

There are three kinds of initialization methods as explained below:

1. Power on initialization
    It performs the following when the printer is turned on or the printer recognizes the cold reset command (remote RS command):

    (a) Initializes printer mechanism.
    (b) Clears input data buffer.
    (c) Clears print buffer.
    (d) Sets default values.

2. Panel initialization
    Performed if the printer is turned off and back on within 10 seconds or /INIT signal is input. It performs the following:

    (a) Cap the printer head.
    (b) Eject a paper.
    (c) Clears input data buffer.
    (d) Clears print buffer.
    (e) Sets default values.

3. Software initialization
    The ESC@ command also initializes the printer. It performs the following:

    (a) Clears print buffer.
    (b) Sets default values.

1.5 Paper

1.5.1 Paper handling

Do not perform reverse feed more than 9.5 mm(0.38″).

1.5.2 Paper specification

1.5.2.1 Cut Sheet

Size:	A3 (297mm x 420mm)
	A4 (210mm x 297mm)
	A5 (148mm x 210mm)
	A6 (105mm x 148mm)
	B (279mm x 432mm)
	B4 (257mm x 364mm)
	B5 (182mm x 257mm)
	Letter (216mm x 279mm)
	Half letter (139.7mm x 215.9mm)
	Legal (216mm x 356mm)
	Executive (184.2mm x 266.7mm)
Quality:	Plain paper, Bond paper
Thickness:	0.08mm ~ 0.11mm (0.003 ~ 0.004 inch)
Weight:	$64g/m^2$ ~ $90g/m^2$ (17 lb ~ 24 lb, 55kg ~ 78kg)

1.5.2.2 Envelope

Size:	#10 (241.3mm x 104.8mm)
	DL (220mm x 110mm)
	C6 (162mm x 114mm)
	220x132 (220mm x 132mm)
Quality:	Bond paper, PPC, Air mail
Weight:	$45g/m^2$ ~ $75g/m^2$ (12 lb ~ 20 lb)

NOTE: *Envelope printing is only available at normal temperature.*
NOTE: *Keep the longer side of the envelope horizontally at setting.*

1.5.2.3 EPSON special media

Quality:	EPSON specifically designed media for pigment ink jet printers

(1) Glossy Paper - Photo Weight

Size:	A3+ (329mm x 483mm)
	A3 (297mm x 420mm)
	A4 (210mm x 297mm)

(2) Premium Semigloss Photo

Size:	A3+ (329mm x 483mm)
	A3 (297mm x 420mm)
	A4 (210mm x 297mm)
	Letter (216mm x 279mm) (only for EAI)
	B (only for EAI)
	Roll paper width: 89mm, 100mm, 210mm, 329mm

(3)Archival Matte Paper

Size: A3+ (329mm x 483mm)

                    A3 (297mm x 420mm)

                    A4 (210mm x 297mm)

                    Letter (216mm x 279mm)

                    B

                    Roll paper
                    width: 89mm, 100mm

 (4)Water Paper - Radiant White

Size: A3+ (329mm x 483mm)

(5) Ink Jet Transparencies

Size: A4 (210mm x 297mm)

                    Letter (216mm x 279mm)

(6) Photo Quality Glossy Film

Size: A4 (210mm x 297mm)

                    Letter (216mm x 279mm)
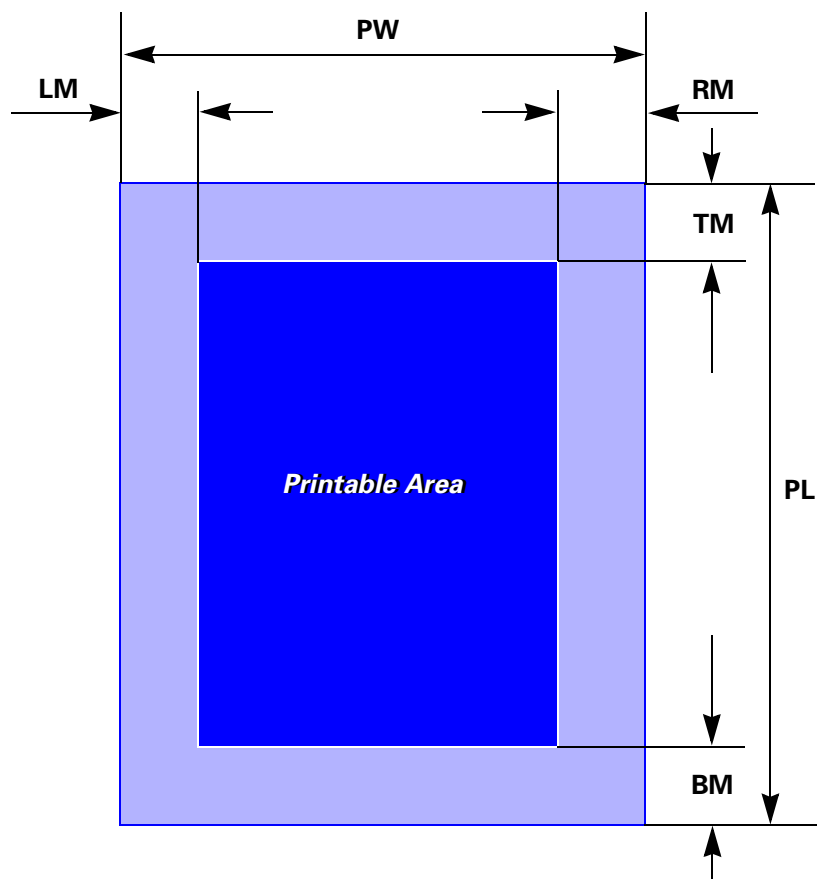
1.6 Printing area

1.6.1 Cut Sheet

Figure 1-3. Printable Area for Cut Sheet

Table 1-16. Printing Area - Character Mode

Paper Size	Left Margin (minimum)	Right Margin (minimum)	Top Margin (minimum)	Bottom Margin (minimum)
A3	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.54″)
A4	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.54″)
Letter	3 mm (0.12″)	9 mm (0.35″)	3 mm (0.12″)	14 mm (0.54″)
B5	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.54″)
Legal	3 mm (0.12″)	9 mm (0.35″)	3 mm (0.12″)	14 mm (0.54″)
Statement	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.54″)
Executive	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.54″)

Table 1-17. Printing Area - Raster Graphics Mode

Paper Size	Left Margin (minimum)	Right Margin (minimum)	Top Margin (minimum)	Bottom Margin[1] (minimum)
A3+	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.54″)
A3	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.54″)
A4	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.54″)
Letter	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.54″)
B5	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.54″)
Legal	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.54″)
Statement	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.54″)
Executive	3 mm (0.12″)	3 mm (0.12″)	3 mm (0.12″)	14 mm (0.54″)

[1]:Bottom margin can be reduced to 3mm when paper dimension is defined by using command, otherwise it remains 14mm. As for an area between 3mm and 14mm margin, print quality may decline.

1.6.1.1 Envelopes
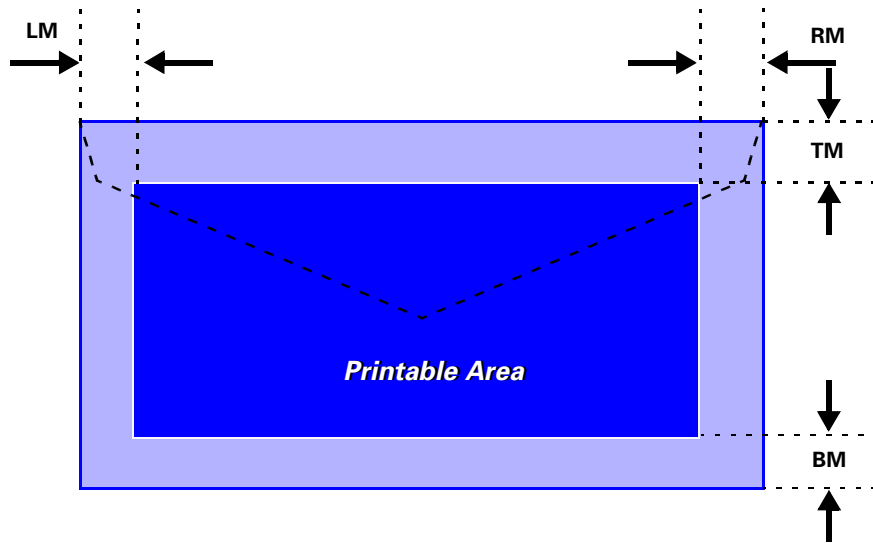
Figure 1-4. Printable Area for Envelopes

Table 1-18. Envelope Margin

Size	Left Margin (minimum)	Right Margin (minimum)	Top Margin (minimum)	Bottom Margin (minimum)
#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″)

1.7 Ink cartridge

1.7.1 Black ink cartridge

Type   : Exclusive cartridge

Color   : Black

Print capacity   : TBD

Ink life   : 2 years from production date

Storage temperature
            : -20 °C - 40 °C (Storage, within a month at 40 °C)
            : -30 °C - 40 °C (Packing storage, within a month at 40 °C)
            : -30 °C - 60 °C (Transit, within 120 hours at 60 °C
                        and within a month at 40°C)

Dimension   : 20.1 mm(W) x 66.85 mm(D) x 38.5 mm(H)

1.7.2 Color ink cartridge

Type   : Exclusive cartridge

Color   : Magenta, Cyan, Yellow, Light Cyan, Light Magenta

Print capacity   : TBD

Ink life   : 2 years from production date

Storage temperature
            : -20 °C - 40 °C (Storage, within a month at 40 °C)
            : -30 °C - 40 °C (Packing storage, within a month at 40 °C)
            : -30 °C - 60 °C (Transit, within 120 hours at 60 °C
                        and within a month at 40 °C)

Dimension   : 49.1 mm(W) x 84.05 mm(D) x 41.8 mm(H)

NOTE: *Do not refill the ink cartridge. The ink cartridge is a consumable item.*
        Do not use a cartridge whose ink life has expired.
        Ink freezes below -4 °C; however it will be usable again after keeping
        it for more than 3 hours at room temperature.

1.8 Physical specification

Weight　　　　　　: 8.4kg (without the ink cartridges)

Dimension　　　　: 609 mm(W) x 311 mm (D) x 175 mm (H) (Storage)

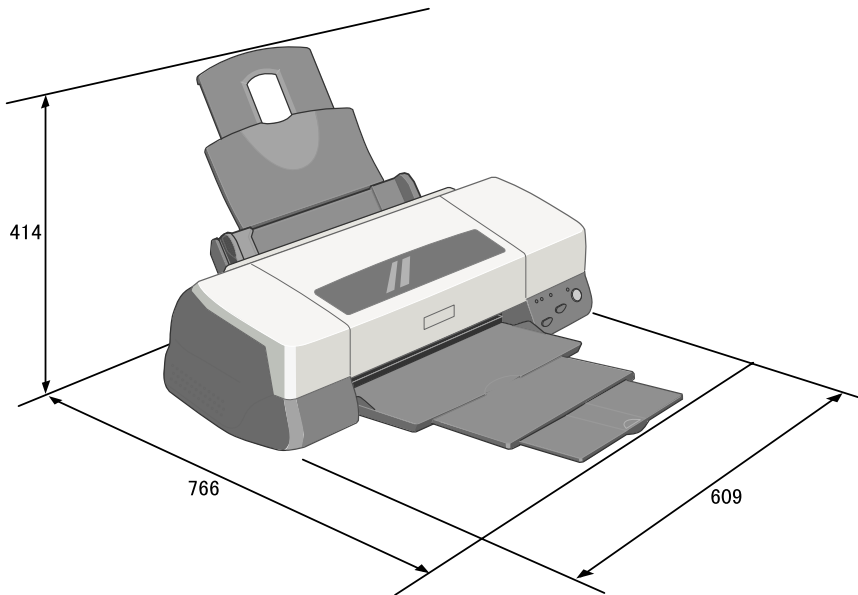　　　　　　　　　: 609 mm(W) x 766 mm (D) x 414 mm (H) (Printing)

Figure 1-6. With Roll Holder
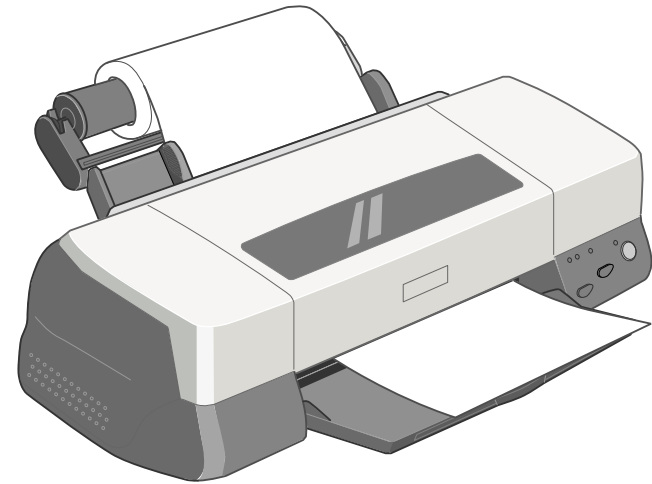

Figure 1-5. Dimension -- Printing

CHAPTER

2

OPERATING PRINCIPLES

2.1 Overview

This section describes the operating principles of the printer mechanism and electrical circuit boards. The major components of the EPSON Stylus PHOTO 2000P are:

☐ Printer mechanism: M4W60

☐ Main board: C304MAIN Board

☐ Power supply board: C298PSB/PSE Board
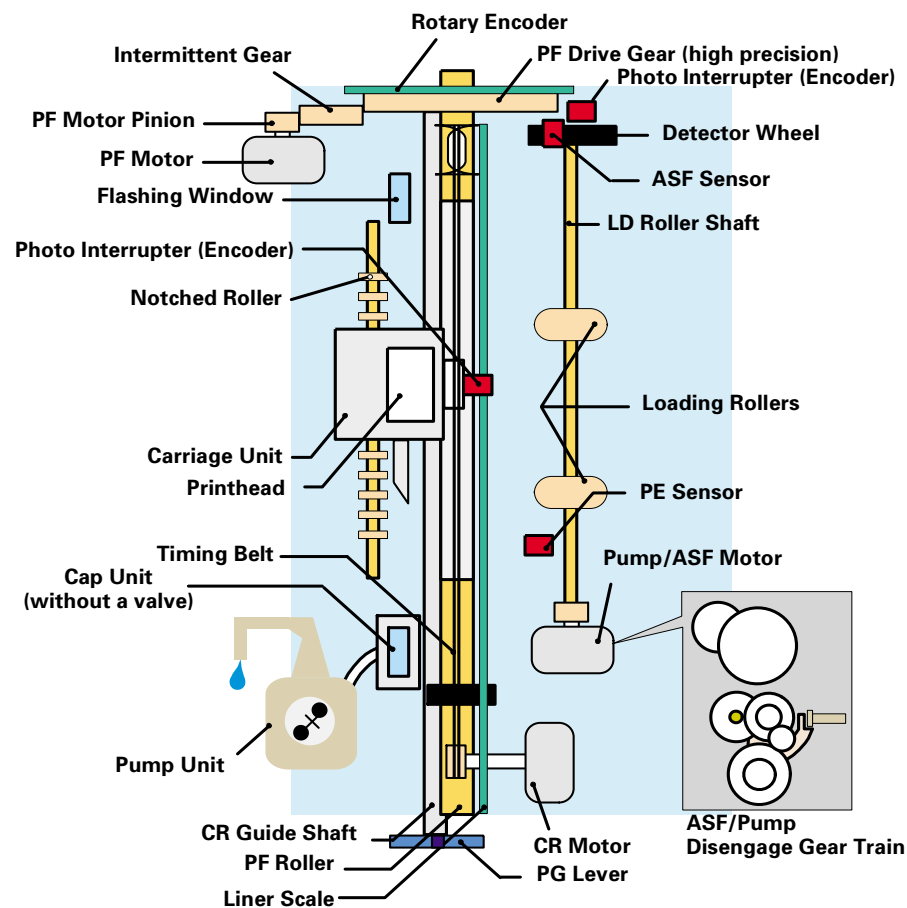
2.1.1 Printer Mechanism

Unlike other EPSON ink jet printers, the EPSON Stylus PHOTO 2000P uses a DC motor as power source. The DC motor enables the printer to lower noise during printing. Table 2-1 shows various motor types used in the printer and their applications.

Table 2-1. Motor Types and Corresponding Applications
Table 2-2.

Motor Name	Type	Application / Feature
CR motor	DC motor with brush	Drives the carriage making little noise. Works with a linear scale to monitor motor's operating condition.
PF motor	DC motor with brush	Supplies power to drive paper feeding rollers used to send paper at specified speeds and load/eject paper. To monitor paper feeding pitch, a loop scale is attached beside the high-precision gear.
Pump/ASF motor	4-Phase / 48-pole stepping motor	Sends drive for pump operation and paper feeding from ASF. Since this is a stepping motor, it has no scales or photo sensors that are used to monitor motor's operating condition.

The basic structure of the printer mechanism is mostly common to the Stylus COLOR 400, except that the Stylus PHOTO 2000P uses a Pump/ASF motor. With this motor equipped, the paper loading mechanism and the pumping mechanisms are independently driven, which allows the printer to offer higher throughput.

Figure 2-1 shows the printer mechanism block diagram for the Stylus PHOTO 2000P.

op01

Figure 2-1. Printer Mechanism Block Diagram

2.1.2 Ink

2.1.2.1 Comparison between Pigment Ink and Dye Ink

The main component of Stylus PHOTO 2000P is almost the same as of Stylus Photo 1270. The most significant difference is its pigment ink use.

The difference between the pigment ink and dye ink is shown in the table below.

Table 2-3. Physical Differences

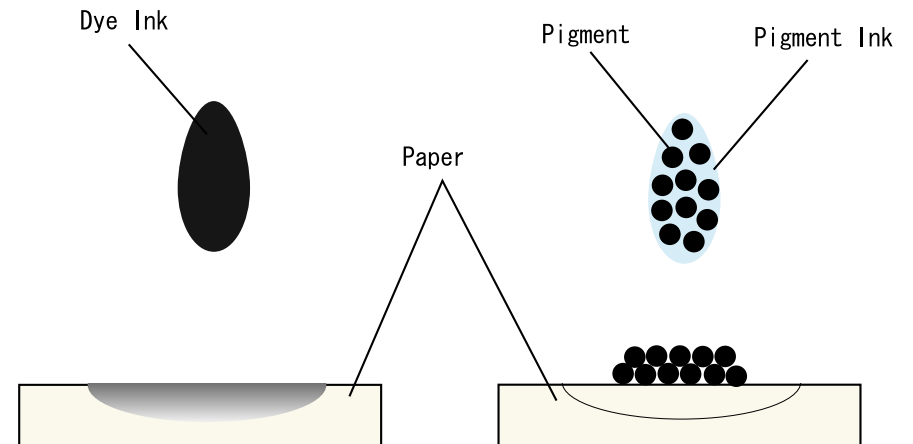| Dye Ink	Pigment Ink
Single element that has a specific chemical structure.	Aggregate material of elements.
Element minimum unit: 1 ~ 2 nm	Element minimum unit: 50 ~ 200nm
Ink is only composed of liquid phase (solvent and element).	Ink is composed of 2 phases: liquid phase (solvent) and solid phase (element).
Solvable to solvent (water, glycol, etc.)	Not solvable. Only disperse.

Table 2-4. Features of Pigment Ink

Advantage	Disadvantage
It can make high density color.	Have to keep equally dispersed condition. Long time storage may cause pigment sediment.
Better durability against climate.	
Not easy to blur.	
No limit on its solubility.	
Chemically stable: Not easy to change into poison: High safety.	

Table 2-5. Features of Dye Ink -- Reference

Advantage	Disadvantage
Have been used for ink jet for long time.	Restriction on its solubility.
Easy to express the gradation.	Less durability against climate.
Solvable to solvent (water, glycol, etc.)	Easy to blur.
Homogeneity is kept.	When impurities are interfuse, chemical change occurs and the element may be deteriorated.
High brightness.	

2.1.2.2 Drop of Pigment Ink and Dye Ink

The figure below shows how pigment ink and dye ink goes onto paper.

Figure 2-2. Pigment Ink and Dye Ink

Dye ink infiltrates paper and the element disperses, then the thickness of color decreases.

For pigment ink, the solvent infiltrates paper but the pigment goes onto paper and membranes. Thereby, it keeps the printing sharp and with high density.

2.1.3 Printhead Mechanism

The printhead mechanism operating principles of the Stylus PHOTO 2000P are basically the same as for the previous EPSON ink jet printers. This printer, however, employs a newly developed ink and improved printhead driving method to provide a higher print quality and faster printing speed than ever. Also, an IC called CSIC that stores ink-life data is attached to each ink cartridge. With this IC, ink life of each cartridge can be individually monitored. Note, like for other models, a head voltage must be written with a PC.

The printhead mechanism consists of ink cartridges and printheads. Each printhead is composed of PZT (Piezo Electric Element), nozzle surface, ink supply needle, nozzle selection circuit board, cartridge sensor, CSIC, and CSIC connection circuit. Figure 2-3 shows its component layout.
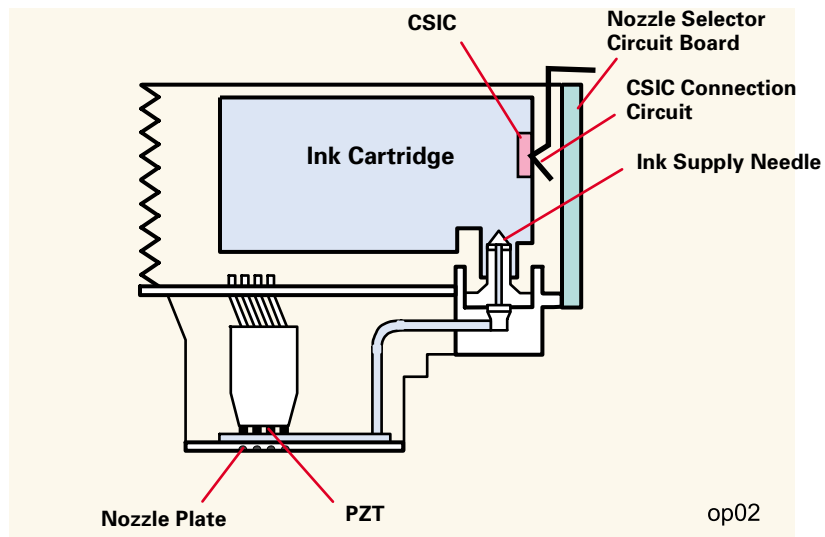

Figure 2-3. Printhead Mechanism

□ Ink Cartridge
   An ink cartridge stores ink to be supplied to the printhead.

   ■ CSIC:
      CSIC is a non-volatile memory EEPROM attached to each black and color ink cartridge. It keeps the following information:

      1) Ink remaining level

      2) Number of cleanings performed

      3) Number of installation of the ink cartridge

      4) Accumulated installation time of the cartridge

      5) Model name of the printer in use

      6) Ink cartridge production information

      7) Ink cartridge code

      8) Number of times that the ink cartridge is recycled

□ Printhead

   ■ PZT
      Driven by the print signal from the control circuit board, it ejects ink from the nozzle plate.

   ■ Nozzle plate
      Ink pressured by the PZT is ejected from this plate.

   ■ Ink supply needle
      Connects the ink cartridge and printhead to run ink to the printhead.

   ■ CSIC connection circuit
      Connects the control circuit board and CSIC attached on the ink cartridge. One end of the harness is connected to the control board together with the printhead cable.

   ■ Nozzle selection circuit board
      This circuit, controlled by ASIC on the control circuit board, selects nozzles to be driven for printing. On the other hand, head drive voltage is produced on the controller circuit side.

2.1.4 Carriage Mechanism

The carriage mechanism of the Stylus PHOTO 2000P is composed of the carriage motor (CR motor), carriage guide shaft, platen gap adjustment/ parallelism adjustment mechanism, carriage lock mechanism, and so on.

2.1.4.1 Carriage Motor (CR Motor)

The carriage mechanism this printer is mostly the same as for other ink jet printers' except it uses a DC motor as power source. See the table below for the carriage motor specifications.

Table 2-6. Carriage Motor Specifications

Table 2-7.

Items	Specifications
Type	DC Motor with brush
Drive Voltage	+42 V +/- 5% (Applied to the driver)
Coil resistance	29.2 ohms +/- 25%
Inductance	30.8 mH +/- 25%
Drive Method	Constant Current Chopping
Driver IC	LB1947

In previous ink jet printers, since a stepping motor is used as a CR motor, the CR motor controls the carriage position under the open loop system. This printer, however, controls carriage speed and position with the closed loop system enabled by a DC motor and encoder. This system, also used in the Stylus COLOR 900, is applied to maintain a constant print quality. The CR motor also produces the print timing signal (PTS signal) used for an accurate ink ejection timing. (Refer to Section 2.2.2.3 for further information on the CR motor control circuit.)

For printing, the CR motor moves the carriage unit in the printing area along the CR guide shaft.

Op03
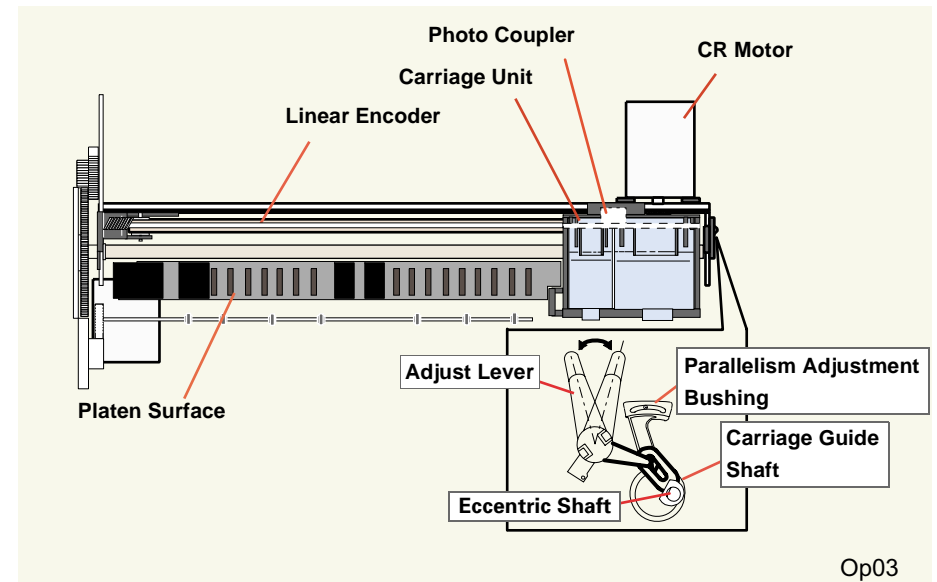
Figure 2-4. Carriage Mechanism (Top view)

2.1.4.2 Platen Gap (PG) /Parallelism Adjustment Mechanism

The PG adjust lever is attached to the left end of the carriage guide shaft. When the carriage guide shaft, which has an eccentricity, rotates as the adjustment lever moves, it narrows or widens the distance (=PG: from 1.2 mm to 2.1 mm). This mechanism enables the user to print with a correct PG according to print result or other conditions such as paper curl. Also, the parallelism adjustment bushings are attached to the right and left ends of the carriage guide shaft. They are used to set the carriage guide shaft parallel with a platen.

Table 2-8. Platen Gap Adjust Lever Setting
Table 2-9.

Lever Position	PG adjustment value
Front (0)	0 mm (=PG is 1.2 mm)
Rear (+)	+ 0.9 mm (=PG is 2.1 mm)

2.1.4.3 Carriage Home Position (HP) Detection

Unlike previous Epson ink jet printers, the carriage home position is detected with the drive current from the CR motor and speed/position signal from the linear encoder.

2.1.5 Paper Feeding Mechanism

The paper feeding mechanism transports paper loaded from ASF using the PF rollers and paper eject rollers. A new type of DC motor is used as the PF motor. See the table below for the PF motor specifications.

**Table 2-10. PF Motor Specifications**
Table 2-11.

Item	Description
Motor type	DC Motor with Brush
Drive voltage	+42V +/- 5% (Applied to the driver)
Coil Resistance	31.1 ohm +/- 25%
Inductance	26.6mH +/- 25%
Control method	Constant current chopping drive

Stepping motor that is used in other printers as the PF motor controls paper feed by the open loop system. On the other hand, this printer controls paper feeding mechanism with the closed loop system by employing the DC motor and rotary encoder for more accurate paper feeding. Therefore, a rotary encoder attached to the left end of the PR roller shaft controls paper feed amount. For detailed information, see Section "PF motor driver circuit".

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

☐ Drive transmission to the PF rollers:
   PF motor pinion gear → Spur gear (76) → PF rollers

☐ Drive transmission to the eject rollers:
   PF motor pinion gear → Spur gear (76) → Combination gear (13.5, 308) → Spur gear (28) → Paper eject rollers

Figure 2-5 gives the paper feeding mechanism block diagram, showing the parts along the PF motor drive transmission paths.

Op21
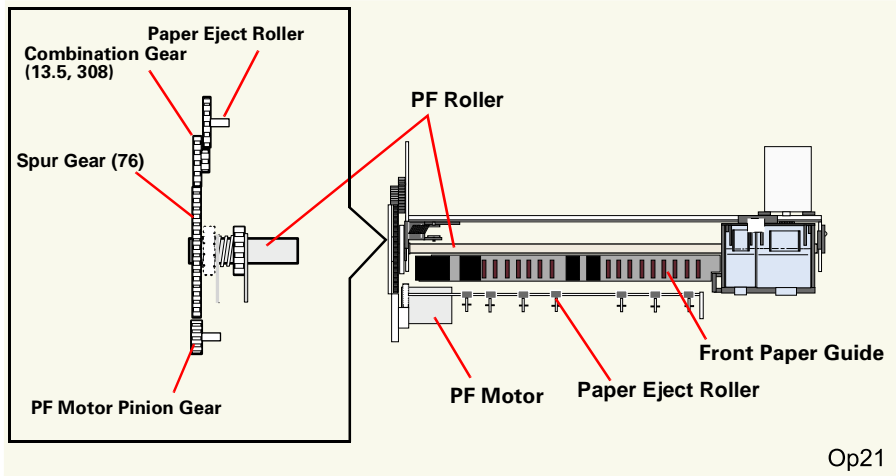
Figure 2-5. Paper Feeding Mechanism

The printer loads paper at the ASF, which is detected by the PE sensor attached to the right side of the top frame, and advances it to send the paper's leading edge to the halfway of the front paper guide. Then, to correct paper deflection, the printer feeds the paper back specified steps toward ASF, and advances the paper again toward the front paper guide and stops it at the specified TOF (Top Of Form) position. Once printing starts, the paper is fed by the PF rollers and sub rollers. For printing or transporting the tailing edge area (14 mm), a notched roller and drive from the paper eject roller are used. Like the Stylus Photo 750/1200, this printer also provides this extra printable range of 14 mm from the bottom edge, excluding the bottom margin of 3mm, by changing the position of the star wheel gear; it has been shifted by 5° from the top of the eject roller toward the front paper guide. Due to this change, the tailing edge of paper is suppressed, and the printer can advance paper steadily. See Figure 2-6 next page that shows how paper is transported and parts involved.

Op04
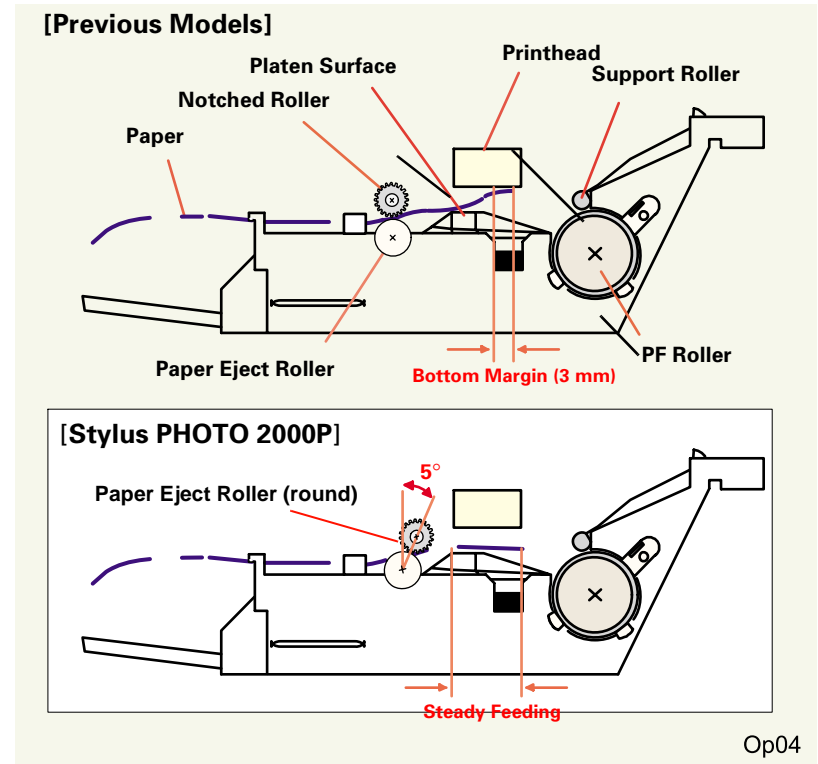
Figure 2-6. Paper Transportation

Notched roller is used for previous models as a paper eject roller. Stylus PHOTO 2000P adopts a round roller to prevent a paper from notched roller trace. When the paper setting on the printer and the actual paper type differs and if the paper eject roller is tainted with ink because the printer ejects paper before the printed surface would be dried, you have to clean the roller by the roller cleaning function by the panel operation. (See "Special Setting Mode" on page -22.)

2.1.5.1 CR Lock Mechanism

The carriage lock mechanism prevents the carriage from being left uncapped for a long time, which is usually caused by vibration during printer transportation, user's mishandling of the printer, and so on. If the carriage unit is left uncapped for a long time, ink on the printhead surface dries gradually and, eventually, ink can not flow to nozzles. In addition to that, there is a possibility that the nozzles clogged with dried ink can not be recovered by a head cleaning. To avoid this problem, the printer locks the carriage unit under the circumstance below:

☐ After Power-Off

   If the printer power is turned off in the middle of printing or other operations, the printer completes the initialization sequence and then performs a carriage lock.

☐ After Power-On

   When the printer is turned on, the printer automatically begins a power-on cleaning and then performs a carriage lock.

   [Power-on cleaning]

   The printer runs a power-on cleaning automatically when its power is turned on. Since the timer IC on the main control circuit board is powered by a lithium battery that is also mounted on the board, it keeps counting the printer's power off time. According to the power of time counted, the printer selects the cleaning level to perform.

☐ After paper ejection

   If the printer does not receive any print data after Load/Eject button is pressed, it performs a carriage lock and enters a standby status. But if paper is fed into the printer, the printer does not perform it.
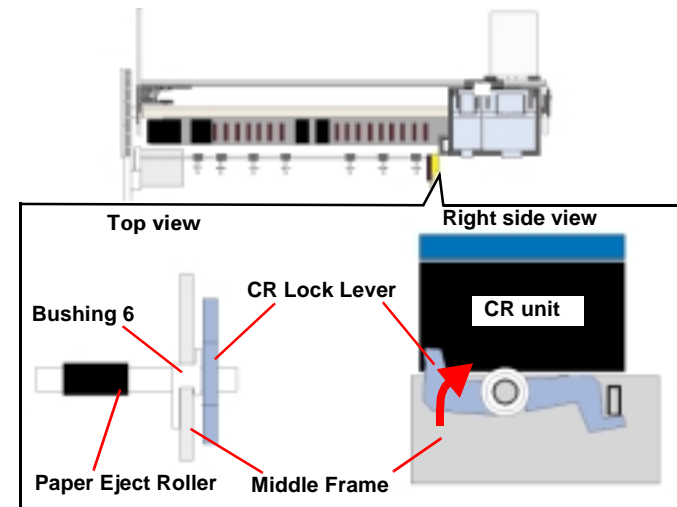

Figure 2-7. CR Lock Mechanism

2.1.6 Paper Loading Mechanism

The paper loading mechanism loads paper at the ASF unit and feeds paper to the PF rollers. The ASF unit is the same as in previous models. A 4-phase 48-pole PM type stepping motor is used as the ASF/Pump motor to drive ASF. Drive sent from this motor is transmitted to the ASF side and Pump side via the disengage mechanism (DE mechanism). See Figure 2-12 for the ASF/Pump motor specifications.

Table 2-12. ASF/Pump Motor Specifications
Table 2-13.

| Items	Description
Motor type	4 Phase/ 48-pole /PM type pulse motor
Drive method	Bipolar constant current drive
Drive voltage	+42V +/- 5% (applied to the driver)
Coil Resistance	10.4 ohm +/- 10%
Inductance	15.0 ohm +/- 10%

Drive from the ASF/Pump motor is sent to the ASF unit by the switching operation of the carriage unit and the DE mechanism described in the following section.

2.1.6.1 Drive Transmission to the ASF Unit

1) The CR unit moves to the right end of the CR shaft, which then pushes the DE lock lever to the right end.

2) The ASF/Pump motor rotates counterclockwise specified steps (viewed from the motor pinion gear side).

3) With the ASF-Pump motor's rotation of step 2), the planetary gear set in the DE unit shifts toward the combination gear (12, 22.4).

4) The carriage unit moves from the right end of the CR shaft specified steps, which causes the DE lock lever to fix the planetary gear unit.

5) Torque from the ASF/Pump motor is transmitted as described below.

> Motor pinion gear → Planetary gear (15.2) → Combination gear (12, 22.4) → Combination gear (14, 28) → Spur gear (32) in ASF

Figure 2-8 shows the disengage mechanism and its parts.
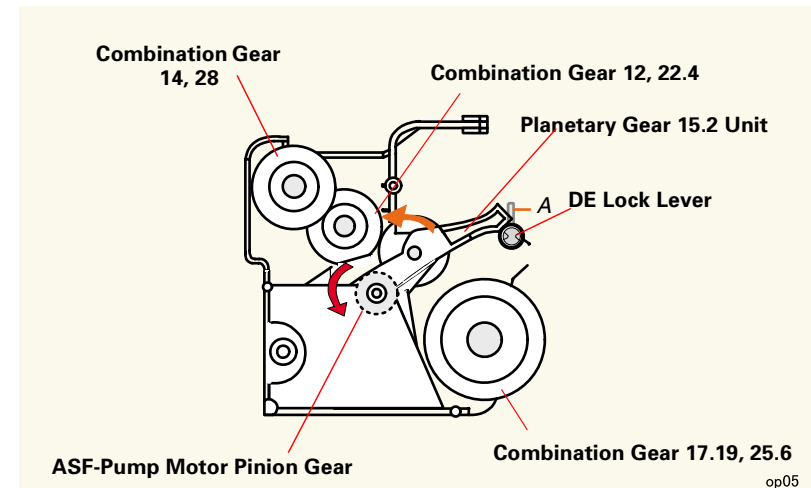
**Figure 2-8. Disengage Mechanism**

The ASF unit loads paper by the torque sent from the ASF/Pump motor via the DE mechanism as described in the following section.

2.1.6.2 Paper Loading Operation

Multiple paper loading prevention mechanism is included in the ASF unit to ensure steady paper loading. To prevent any paper from falling from the paper set position into the paper path, the paper return lever pushes paper that may have fallen off back onto the hopper. After this motion is completed, the LD roller starts loading paper. The paper loading mechanism, including the multiple paper loading prevention mechanism, 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 it rotates clockwise specified steps to set the LD roller and paper return lever in their standby status. (See "Standby State" in Figure 2-1.)

2) When the paper loading signal is sent from the PC and the Load/Eject button is pressed, the ASF/Pump motor turns counterclockwise to let the LD roller start loading paper. (See "Paper Pick Up State" in Figure 2-1.)

3) When the paper is transported to the PF roller, the LD roller stops where it loses friction. (See "PF Roller Paper Feed State" in Figure 2-1.)

4) When the next print signal is sent and Load/Eject button is pressed*, the ASF/Pump motor rotates clockwise specified steps to set the LD roller and the paper return lever in standby status. (See "Standby State" in Figure 2-1.)

  If the printer does not receive any print signal for TBD seconds in step 4, the LD roller and the paper return lever automatically return to the standby state.
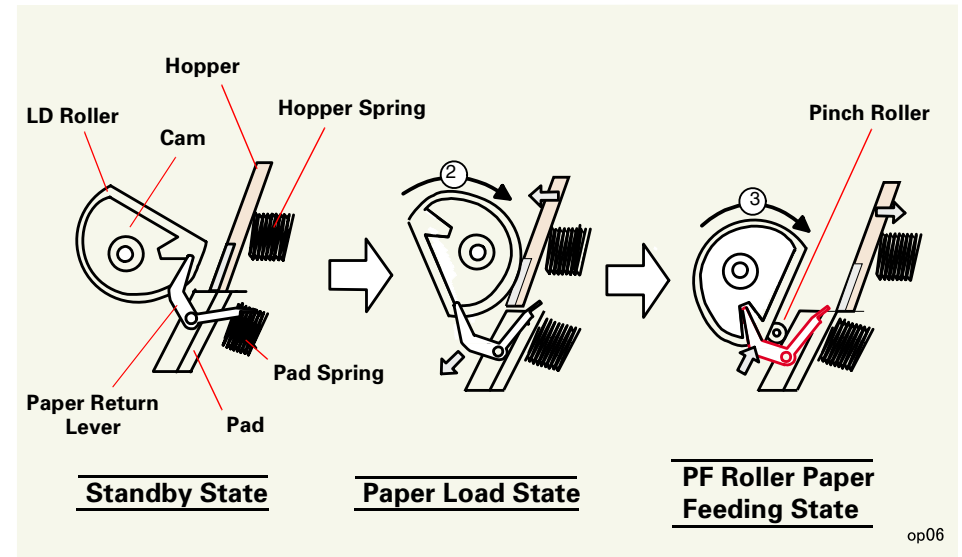
Flowchart 2-1. Multiple Paper Loading Prevention Mechanism

2.1.6.3 Pump Mechanism

The pump mechanism absorbs ink from the printhead and the cap assembly. The wiper for head cleaning is included in the cap assembly.

The pump mechanism is driven by the ASF/Pump motor, a 4phase 48-pole PM type stepping motor. See Table 2-12 for the ASF/Pump motor specifications. When the torque from the ASF/Pump motor is switched to the pump unit side, the pump mechanism acts differently according to the directions of the ASF/Pump motor rotation, as shown in the table below:

Table 2-14. ASF/Pump Motor Functions
Table 2-15.

Directions	Corresponding Functions
Counterclockwise	• Absorbs ink. • Sets the wiper.
Clockwise	• Releases tube. • Resets the wiper.

☐ Torque transmission to the pump unit

The torque from the ASF/Pump motor is transmitted to the pump mechanism as described below:

1) The CR unit moves to the right end of the CR shaft, which then pushes the DE lock lever to the right end.

2) The ASF-Pump motor rotates clockwise (viewed from the motor pinion gear side) specified steps.

3) With the rotation of step 2), the planetary gear set in the DE unit moves toward the combination gear (17.19, 25.6).

4) The CR unit moves specified steps from the right end of the CR shaft to the left. With this motion, the DE lock lever fixes the planetary gear set.

5) Torque from the ASF/Pump motor is transmitted as described below.
Motor pinion gear → Planetary gear (15.2) → Combination gear (17.19, 25.6) → Tension belt → Pump unit gear → Pump unit
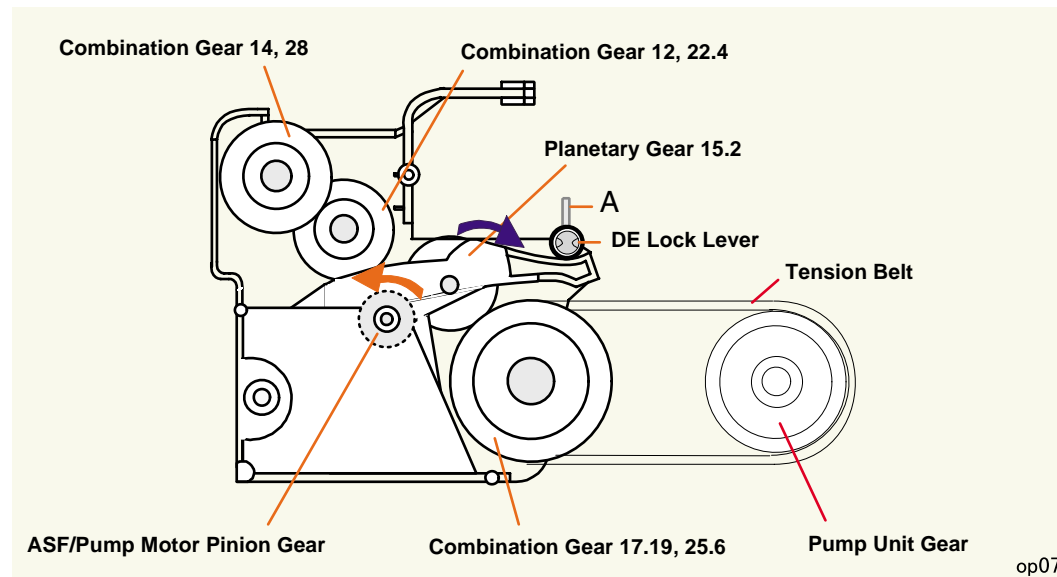
Figure 2-9. Torque to the Pump Mechanism

2.1.6.4 Capping Mechanism

The capping mechanism, which is driven by the pump unit, caps the printhead closely to maintain air tightness inside the cap. This operation is required to vacuum ink from the ink cartridges, printhead, and cap. Also, to moisten the inside of the cap while the printer power is off, this mechanism works to keep the cap and the printhead surface in a tight contact. This function prevents ink from clogging while the printer is not in use.

The capping mechanism of this printer is a newly designed valveless capping mechanism. So, unlike previous printers, it does not integrates an air valve. The air valve is usually equipped to remove bubbles created inside the cap by releasing the negative pressure. However, due to change in the ink sequence, the new valveless capping mechanism enables the printer to maintain the initial ink charge and cleaning effects at the same level as before. Figure 2-10 outlines the valveless capping mechanism.
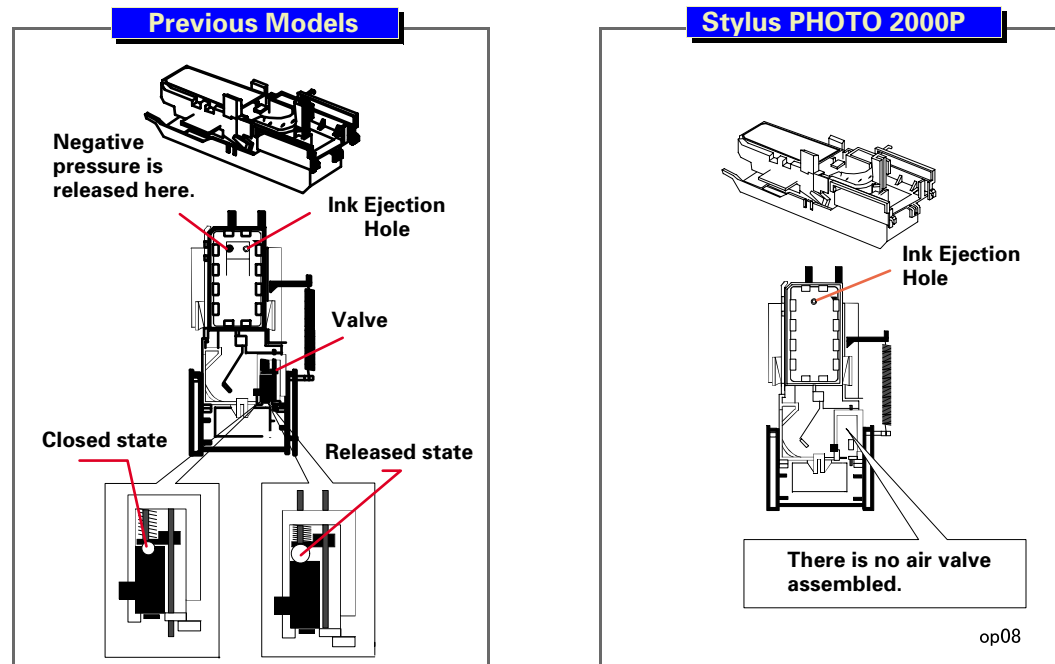

Figure 2-10. Valveless Capping Mechanism

2.2 Electrical Circuit Operating Principles

The electric circuit of the Stylus PHOTO 2000P consists of the following:

☐ Control circuit board: C304MAIN

☐ Power supply board: C298PSB/PSE

☐ Panel board: C304PNL

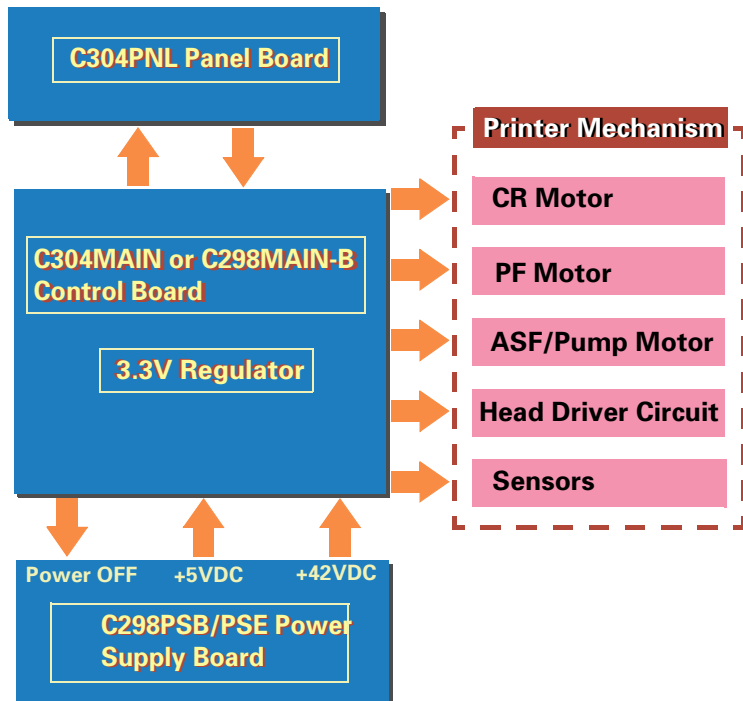Refer to Figure 2-11 for the major connection of the boards and their roles.

2.2.1 C298PSB/PSE Board

The power supply board for the Stylus PHOTO 2000P is C298PSB/PSE. It uses a RCC switching regulator system, and supplies +42VDC and +5VDC to the printer mechanism and control board.

2.2.1.1 Electrical Circuit

The table below shows the voltages produced in this circuit and their applications.

Table 2-16. Application of the DC Voltages
Table 2-17.

Voltage	Application
+42VDC ± 2VDC Rated output current: 0.5 A Maximum current: 1.4 A	• CR Motor • ASF/Pump Motor • PF Motor • Head driving power supply
+5VDC ± 0.25VDC Rated output current: 0.5 A Maximum current: 0.6 A	• Logic sensor circuit • Panel LED • Nozzle selection circuit (on the printhead) • I/F control circuit • Slave CPU for DC motor control

NOTE: *The 5VDC is only applied to the parts and locations shown in the table above. The C304MAIN uses 3.3V drive chips for most of the logic-line chips (CPU, ASIC, ROM, DRAM). For this reason, those chips are not driven by the +5VDC produced by the but power supply board but the 3.3VDC that is reduced by the 3.3VDC regulator on the C298PSB/PSE.*

Figure 2-11.   Electric Circuit of Stylus PHOTO 2000P

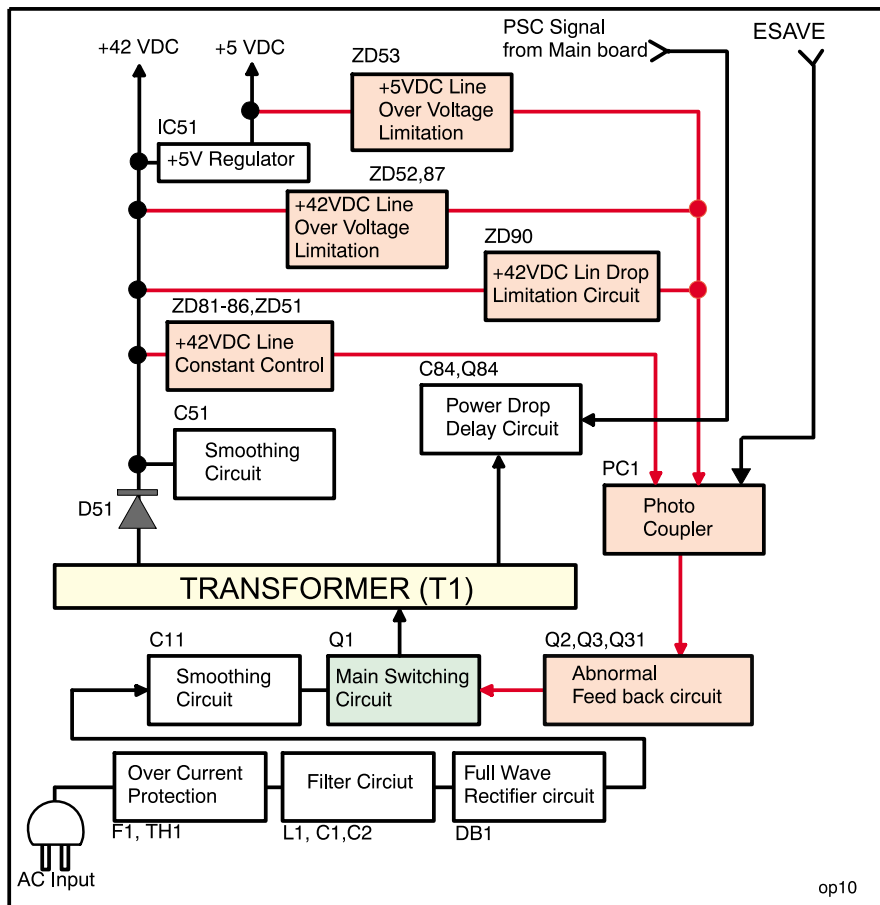Figure 2-12 shows the block diagram for the C298PSB/PSE board.

Figure 2-12. C298PSB/PSE Board Block Diagram

The C298PSB/PSE Board produces the +42VDC and +5VDC using AC power as described below:

1. Regardless of the power switch's on/off condition, voltage is always applied to the primary side of the power supply board from the moment or at the state that AC-plug is plugged in. F1, a fuse, prevents AC100V from flowing into the circuit. A power thermistor TH1 also protects the circuit from rush current after power-on. The filter circuit composed of L1, C1, and C2 prevents high harmonic wave noise generated in the switching circuit from going out, and eliminates the noise from outside.

2) The AC voltage is full-wave rectified by the diode bridge DB1 and smoothed by C11.

3) Switching FET Q1 turns on via starting resistors R18 and R28 that are located on the AC side to begin switching operation. By arranging the starting resistors on the AC side, half waves of the AC voltage are only applied, and power used for this operation is reduced compared with usual serial layout.

4) When the primary side is on, because the diode (D51) on the secondary side is installed in the reverse direction, energy (current) led by the electromagnetic induction through the trans (T1) does not flow to the secondary side.

5) When the energy charged in the transformer reaches a saturated state, the voltage which keeps Q1 on becomes weak gradually. At the point this voltage drops to a certain level, C13 absorbs the reverse current and Q1 quickly shuts off.

6) When the primary side is turned off, the energy charged in T1 is opened according to the diode(D51) direction on the secondary side. +42 V DC is output by these circuit operations and the number of T1 spiral coil.

7) +5VDC is generated out of this +42VDC. Forming reference sawteeth waveforms with an external RC integrating circuit, IC51 produces stable +5VDC with a chopping circuit.

2.2.1.2 Protection Circuits

The C298PSB/PSE board has the various protection circuits to stop voltage outputs if an abnormal condition relating to the control circuit or the printer mechanism's duty occurs.

☐ +42VDC Line Constant Voltage Control Circuit:
  The output level of the +42V line is monitored by a detection circuit composed of numbers of Zener diodes, and the information is fed back to the primary side via photo coupler PC1. Along with the fed back signal, the switching FET on the primary side varies the level of the voltage output to the secondary side by changing its frequency to keep the voltage up.

☐ +42VDC line over current protection circuit:
  If the +42 VDC line is over currented, the output voltage level drops drastically. When the voltage level is 36V or lower, zener diode ZD90 detects that condition and sends information to the primary side via photo coupler PC1. In the primary circuit, then, switching operation stops to protect the electrical circuits and printer mechanism. To reset the circuit, turn the printer off and back on.

☐ +42VDC line over voltage protection circuit:
  If the voltage level of the +42VDC line exceeds 59V, zener diodes D52 and ZD87 detect it and feed back the information to the primary side via photo coupler PC1. The switching operation in the primary side then stops to protect the electrical circuits and printer mechanism.

☐ +5V line constant voltage/constant current control circuit:
  Both +5V line output voltage and +5V line output current are monitored by chopper IC (IC51). Detected information is input to the IC's internal comparator and stabilizing circuit. When the IC detects abnormally high current level, it stops outputting voltage. The circuit recovers automatically.

☐ +5V line over voltage protection circuit:
  If the +5VDC output level exceeds 12V, zener diode ZD53 detects that condition and feeds back the information to the primary side via photo coupler PC1. The switching operation in the primary side then stops to protect the electrical circuits and printer mechanism.

2.2.1.3 Power Supply Control Function

Since this printer has the power switch in the secondary circuit, even if its power is turned off through the operation panel, it can continue to supply voltage to the +5VDC line and +42VDC line for about 30 seconds. This extra time allows the printer to complete the following operations:

☐ If the printer is in a printing motion and the CR unit is out of its home position, the printer stops printing, returns the CR unit to the home position, and performs CR lock operation. Then the printer power shuts down.

☐ If the printer is not printing but paper loaded at ASF remains in the printer, the printer ejects the paper before the printer power shuts down.

2.2.1.4 Energy Save Mode

The power supply circuit enters the energy save mode by the signal ESAVE sent from the control circuit. One the circuit is in this mode, it maintains the +42V line level in a range from +20V to +23V.

2.2.2 C304MAIN Board Circuit Operation Principles

The C304MAIN board includes the following:

- Logic circuit (CPU, ASIC, DRAM, EEPROM, and so on)

- Various motor control/driver circuits (CR motor, PF motor, and ASF/Pump motor)

- Head control/driver circuits

- Interface circuit (parallel I/F, USB I/F)

- Sensor circuit

- Timer circuit

- Reset circuit

The C304MAIN board is mainly different from other main boards in the following two points.

1) Use of 3.3V drive logic chips
   IC9, the 3.3 V regulator IC on the C304MAIN, produces 3.3 V by pressuring down the 5.5 VDC generated on the C298PSB/PSE board to drive several chips. These chips are used to reduce power used to drive the logic circuit. See the table below that separately shows the chips driven by the +5V and +3V.

### Table 2-18. 3.3V Drive Chips & 5.5V Drive Chips
Table 2-19.

+5V	3.3V
Sensors I/F Circuit PNL Board	CPU ASIC P-ROM D-RAM

2) Use of slave CPU
   Since the CR motor and PF motor of this printer are DC motors, a slave CPU is attached on the main board in addition to the CPU and ASIC. This slave CPU exclusively controls the DC motors to remove the task from the CPU and ASIC. So the CPU and ASIC can process data faster than before.

NOTE: The control board has C304Main board and C298MAIN board. C209MAIN Board is named IC25, which is composed of IC20 and IC8.

See Figure 2-13 for the C304MAIN board block diagram.
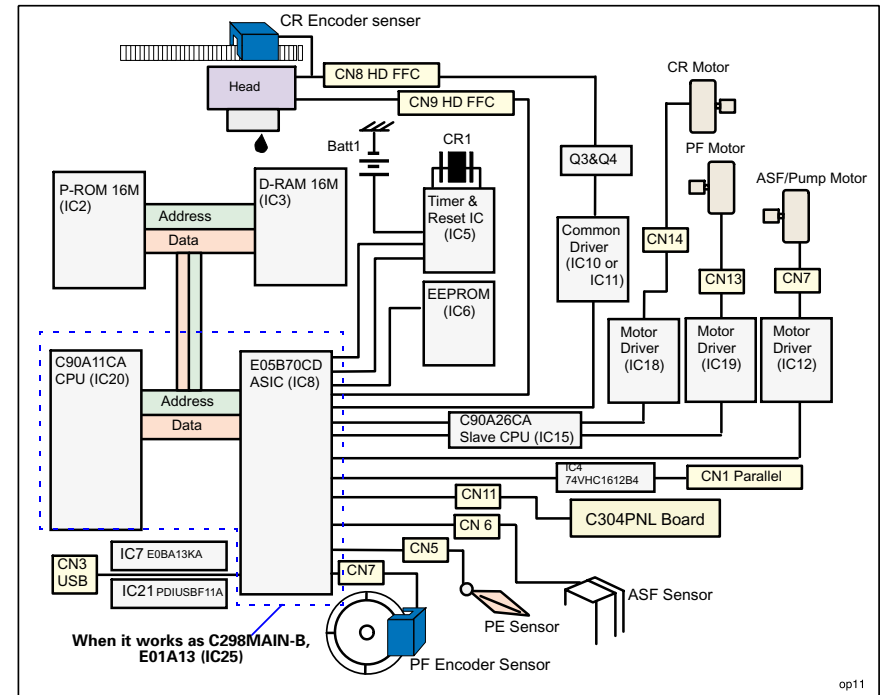
Figure 2-13. Block Diagram for the C304MAIN Board

Table 2-20 shows the major ICs on the C304MAIN Board and their functions.

Table 2-20. Major Element on C304MAIN

IC	Location	Functions
CPU (C90A11CA)	IC20	A 128-pin SQFP package. Operates at 24.0MHz. Power supply voltage is 3.3V. • Sets the current value for the ASF/Pump motor. • Measures the printhead temperature. • Several interrupting functions • Outputs the system clock signal.
ASIC (E05B70**)	IC8	A 240-pin QFP package. Operates at 48.0MHz/24.0MHz/28.0MHz. Power supply voltage is 3.3V. • Controls interfaces. • Controls specified motors. • Controls the printhead drive waveform circuit. • Transfers serial data to the printhead. • Controls the ASF/Pump motor • Receives panel control signals and sensor signals • EEPROM • Controls detection of the signals output from the encoder.
Slave CPU (C90A26CA)	IC15	A 128-pin SQFP package. Operates at 24.0MHz. Power supply voltage is 3.3V. • Controls the DC motors. (Setting and controlling the current value for the PF motor and CR motor)
PROM	IC2	8/16Mbit • Stores the firmware or firmware +CG

Table 2-20. Major Element on C304MAIN

IC	Location	Functions
DRAM	IC3	A 16Mbit DRAM. Power supply voltage is 3.3V. • Serves as specified buffers and work area
EEPROM AT93C56	IC6	2kbit • Stores default setting values and specified parameters.
Reset IC RTC9810SA	IC5	• Resets the +5V/+24 VDC line circuits. • Serves as the timer powered by a lithium battery.

NOTE: C298MAIN Board is IC25, which is composed of IC20 and IC8.

2.2.2.1 Printhead Driver Circuit

The printhead driver circuit includes:

- Common driver IC IC10 (E09A14RA)/IC10 (E09A15KA) directly attached to the C304MAIN board.

- Nozzle selector IC (IR2C95F or SED6125T0A) on the head board.

The common driver generates reference drive waveforms according to the output signals from ASIC on the C304MAIN board. The reference drive waveforms are amplified by the transistors Q3 and Q4 and then transferred to the nozzle selector IC on the head board. Print data is converted to serial data by the ASIC and then also sent to the nozzle selector IC on the head board. Based on the serial data, the nozzle selector IC determines the nozzles to be actuated. The selected nozzles (PZT) are driven according to the drive waveforms produced by the common driver. See Figure 2-14 for the printhead driver circuit block diagram.

☐ Head common driver circuit
The head common driver IC10 (E09A14RA)/IC10 (E09A15KA) generates reference head drive waveforms according to the output of the following 9 signal lines: A0-A4, CLK1, CLK2, RST, FLOOR, and DATA.
By the DATA signal output from the IC8 ASIC (E05B70**), the original data for the head drive waveform is written in the memory in the IC10/IC11. Addresses for the written data are determined by the A0 - A4 signals, and, of among, data used to determine the waveform angles is selected. Then, setting the selected data, producing trapezoid waveform value, and canceling the data are performed by the rising edges of the CLK1 and CLK2 signals.

☐ Head nozzle selector circuit
Print data is converted into serial data by the ASIC (E05B70**). Then the converted data is allocated to the six rows, the number of the head nozzle rows, to be transferred to the nozzle selector IR2C95F (Sharp) or SED6125T0A (EPSON) through the six signal lines (HS01 to HS06). Data transmission from IC8 ASIC (E05B70**) to the nozzle selector synchronizes with the LAT signal and SCK clock signal. Referring to the transferred data, The nozzle selector IC selects the nozzles to be activated, and the PZTs of the activated nozzles are driven by the drive waveforms output from the head common driver.
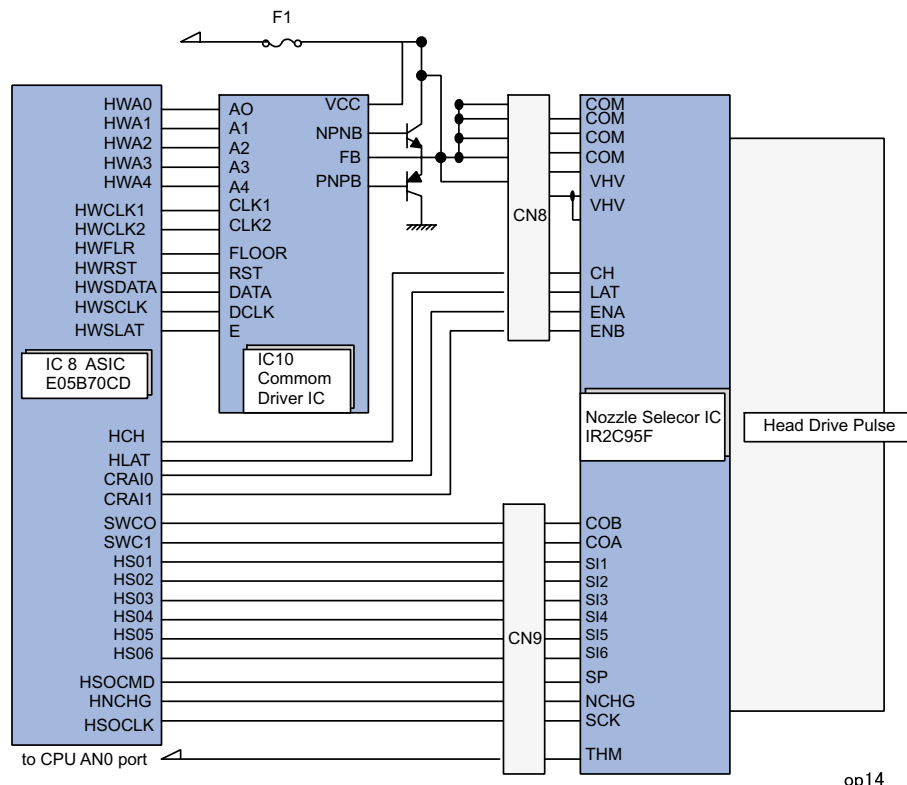

Figure 2-14. Printhead Driver Circuit

2.2.2.2 Reset Circuit

Reset circuits are attached on the C304MAIN board to monitor the two voltages: +5V for the logic line and +42V for the drive line. When each circuit detects abnormality on the corresponding line, it resets CPU and ASIC to prevent the printer from operating abnormally. IC5 RTC-9820SA, the reset circuit IC attached directly on the main board, monitors both +5V and +45 lines but can reset them independently. See Figure 2-15 for the block diagram for the reset circuits.
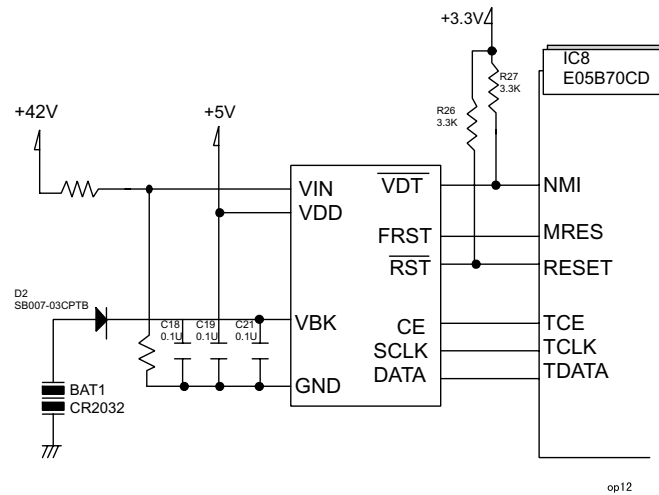

Figure 2-15. Reset Circuit Block Diagram

☐ +5V line reset circuit
  The VDD port of IC5 reset IC monitors the +5V line. When the IC detects an abnormal voltage level (4.3 V or lower), it outputs a reset signal from the RST port to CPU and ASIC.

☐ +42V line reset circuit
  The VIN port of the IC5 reset IC monitors the +45V line. When the IC detects an abnormal voltage level (35.5V or lower), it outputs a reset signal from the VDT port to CPU and ASIC.

NOTE: *IC5, also serving as RIC (Real Time Clock), manages timer control when the printer power is turned off. Power for this operation is supplied from the BAT1.*

2.2.2.3 Motor Driver Circuit

The Stylus PHOTO 2000P is equipped with the CR motor and PF motor that are DC motors and ASF/Pump motor, a stepping motor. To control the DC motors, a slave CPU is mounted on the C304MAIN board beside the CPU and ASIC. Since the slave CPU is exclusively used to control DC motors, it reduces duty of CPU and ASIC to offer faster data processing.

CR motor driver circuit

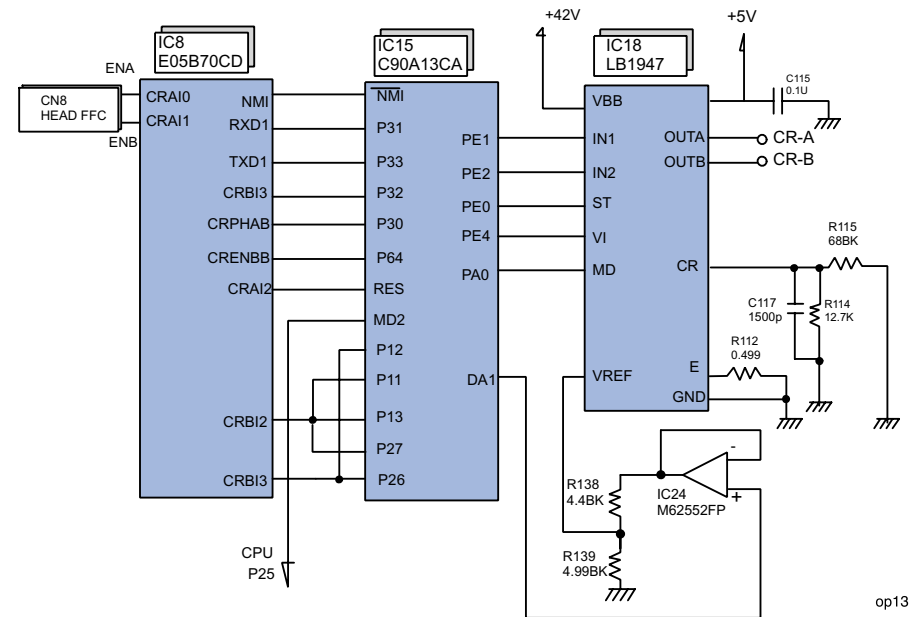The internal equivalent circuit of the CR motor driver IC (LB1947) is as shown below.

Figure 2-16. Internal Equivalent Circuit of the CR Motor Driver IC

The Slave CPU (C90A26CA) controls the CR position by referring to the pulses sent from the linear encoder via ASIC (IC18). Based on the data sent from ASIC, the CPU sets an appropriate drive current value used to

determine the CR position and the direction in which the CR moves. The slave CPU outputs specified control signals to the motor driver. The motor driver IC18 then outputs CR motor drive current to the CR motor.

Unlike stepping motors, the DC motor that drives the carriage can not detect the current carriage position by referring to the pulses given. For this reason, a linear scale is attached along the carriage operation range to detect the carriage position. The linear encoder sensor outputs two kinds of TTL level pulses: Phase A and Phase B.
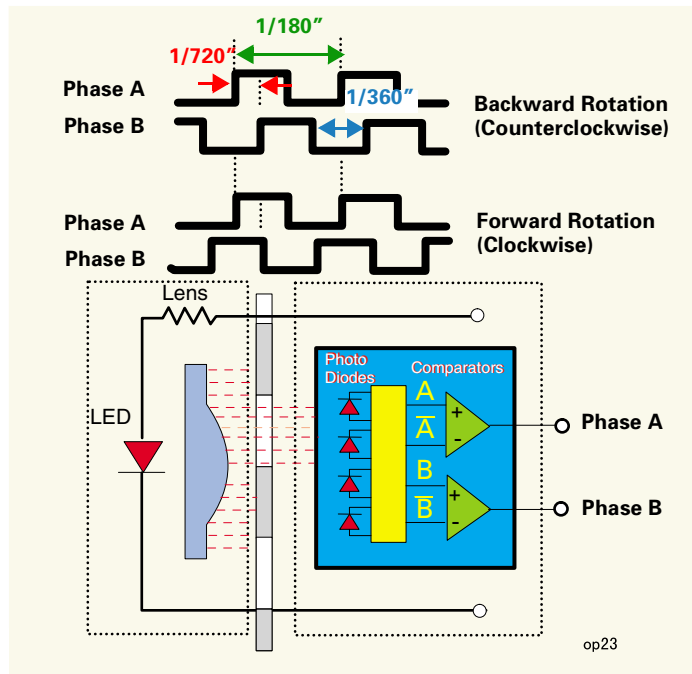
Figure 2-17. CR Linear Scale Encoder Pulse

Direction for the CR's current movement is detected based on the pulse waveforms of the shifted Phases A and B. Carriage position is, on the other hand, controlled based on a cycle of Phase A output waveform (1 cycle=1/180 inches). Also, all rising and falling edges of the waveforms in the both phases (1 cycle=720) are used to control the position of the CR that is in its home position for ink system.

☐ Home position detection
Home position is detected based on the pulses output from the linear scale sensor and DC motor control current value. The basic home position detection sequence is as described below:

1) The linear encoder pulse counter in the IC15 Slave CPU (C90A26CA) is reset by an initialization sequence at power-on.

2) The CR motor turns forward (clockwise) to move the carriage to the right. Slave CPU (C90A26CA) assumes that the CR is in contact with the right frame when the following conditions are satisfied:

   ■ The slave CPU detects the motor control current value is 720mA.

   ■ P1 (= number of pulses output during the above carriage movement) is 30* or less.

   Specified value that indicates CR is in the home position. (All edges in the waveform are used in this condition.)

3) The CR motor rotates backward (counterclockwise) to move the carriage back to the left, and the Slave CPU (C90A26CA) assumes that the carriage enters the CR lock lever position when the following conditions are satisfied:

   ■ Slave CPU (C90A26CA) detects the motor control current value is 500 mA.

   ■ Difference between P1 and P2 (= number of pulses output while the CR moves from the right frame) is 30 or less.

4) The CR motor rotates backward to move the carriage to the right again, and if Slave CPU (C90A26CA) detects the motor control current value is 720 mA, it assumes that the CR comes in back in contact with the right frame.

5) Difference between P1 and P3 (= number of pulses output for the CR's movement from the CR lock lever position to the right frame) is 4 or less.

When all the conditions in the sequence are satisfied, the printer detects the CR is in the home position.

☐ PTS (Print Timing Signal) production
The circuit produces PTS signal (cycle: 1/360 inches) by dividing waveform cycles of Phase A. The print timing signal is used to eject ink at a correct timing.
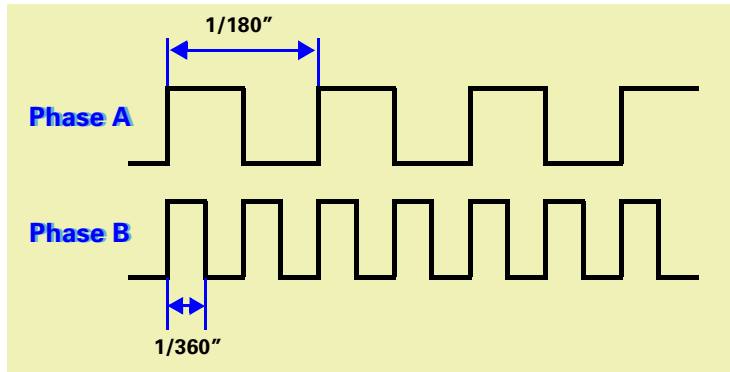

Figure 2-18. Print Timing Signal and Linear Encoder Phase A

PF motor driver circuit

A DC motor is used as the PF motor in this printer. In addition to the CPU and ASIC, a slave CPU is mounted on the C304MAIN board. Since the slave CPU is exclusively used to control DC motors, it reduces duty of CPU and ASIC to offer faster data processing. The block diagram for the PF motor driver circuit is as shown below:
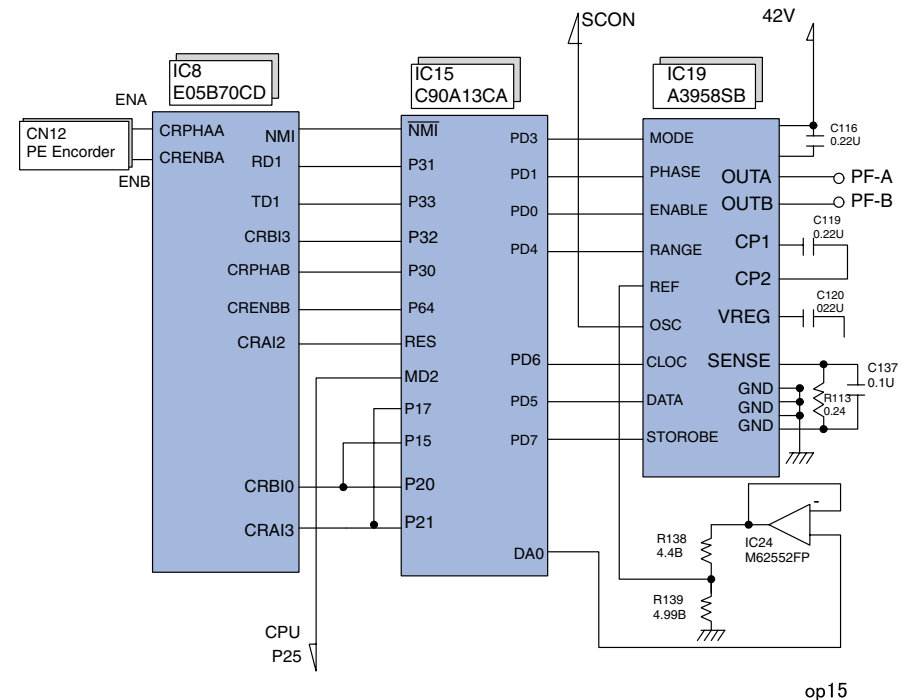

Figure 2-19. PF Motor Driver Circuit Block Diagram

Slave CPU (C90A26CA) controls paper feeding amount by referring to the encoder pulses sent from ASIC (IC18). It sends a proper drive current value to the motor driver. Based on the control signal from the slave CPU, the motor driver (IC19) outputs drive current to the PF motor.
Unlike a stepping motor, this DC motor can not detect paper feeding amount by referring to the pulses given. For this reason, a loop scale is

attached on the Gear 76 to detect paper feed amount.
The loop scale encoder sensor outputs two kinds of TTL level pulses Phase A and Phase B to ASIC (IC8).
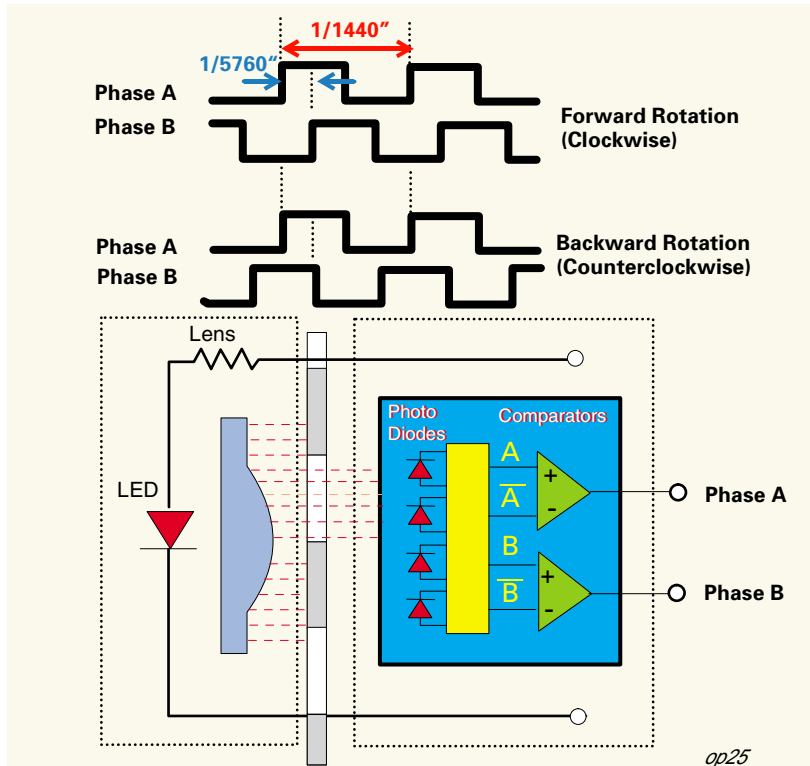

Figure 2-20. Loop Scale Encoder Pulse

2.2.2.4 ASF/Pump Motor Driver Circuit

ASF/Pump motor is a PM type stepping motor. The block diagram for the ASF/Pump motor is as shown below:
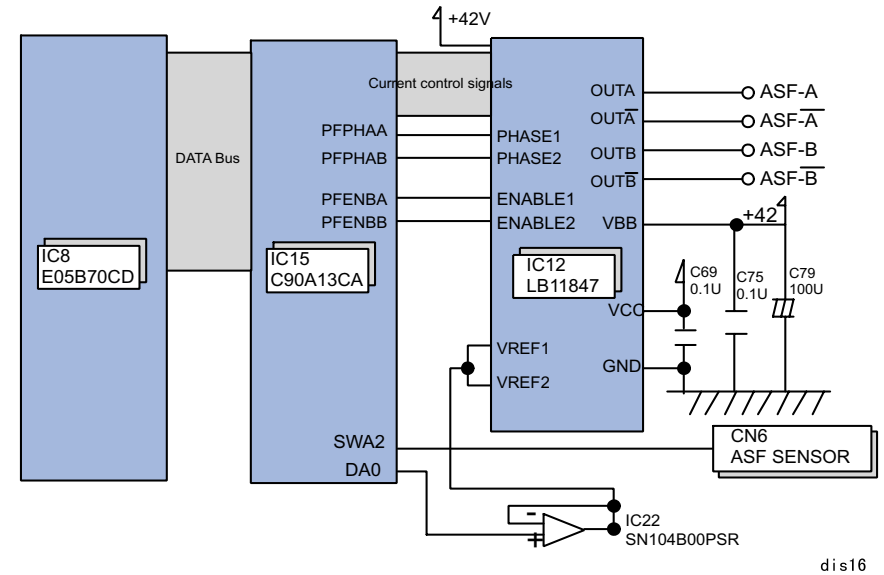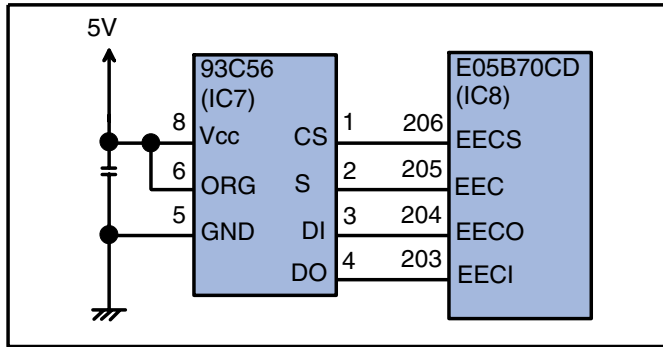

Figure 2-21. ASF/Pump Motor Circuit Block Diagram

2.2.2.5 EEPROM Control Circuit

Since EEPROM is a nonvolatile memory, it keeps information written if the printer power is turned off. It stores such information as adjustment values, factory values, and printer status values.

The EEPROM control circuit block diagram is as shown below:

op17

Figure 2-22. EEPROM Circuit Block Diagram

EEPROM is connected to ASIC with 4 lines and each line has the following function.

- CS: Chip selection signal
- CK: Data synchronism clock pulse
- DI: Data writing line (serial data) at power off.
- DO: Data reading line (serial data) at power on.

2.2.2.6 Sensor Circuit

The Stylus PHOTO 2000P has the following five sensors to detect printer's status.

- PE Sensor
- ASF Sensor
- BCO (Black head cartridge) sensor
- CCO (Color head cartridge) sensor
- Head Thermistor sensor
- Liner sensor

The block diagram for the sensor circuit is as shown below:
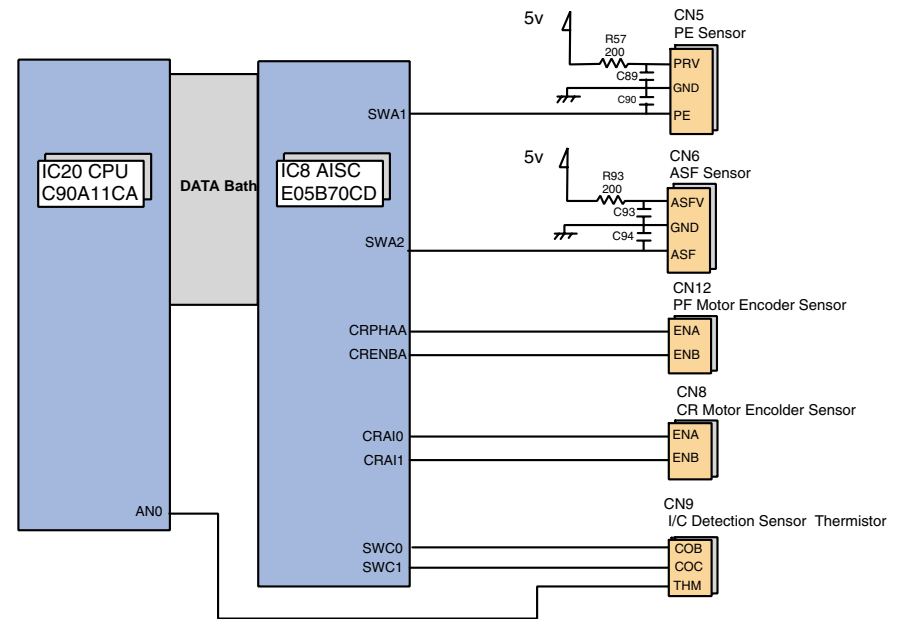
op18

Figure 2-23. Sensor Circuit Block Diagram

Each sensor's functions and operating principles are as described below:

☐ PE sensor
The PE sensor is located at the bottom right edge of the top frame in the printer mechanism. It detects paper on the rear paper guide using a photo sensor and PE sensor lever that are included in the sensor. When paper is present, the PE sensor lever does not cut in between the photo sensor terminals. So it outputs a LOW signal to the ASIC. If there is no paper, on the other hand, the lever cuts in between the photo sensor terminals. So it outputs a HIGH signal to the ASIC.

☐ ASF sensor
The ASF sensor, located at the left edge of the ASF, detects ASF home position. This sensor consists of the ASF HP detector wheel and a transmission photo sensor. A small portion of the ASF HP sensor has a cutout, and when the cutout comes into position between the photo diode terminals, that condition is detected as ASF home position. In this status, since the photo diode terminals are not blocked by the wheel, a LOW signal is output to ASIC. Otherwise, a HIGH signal is output. Referring to the ASF home position detected by this sensor, the printer drives the ASF/Pump motor to set the LD roller and paper return lever ready to the paper loading position.

☐ Ink cartridge sensor (CSIC connector on the head board)
Ink cartridge sensor detects whether a black or color ink cartridge is installed. Installation condition is determined depending on the CSIC's connection. When a cartridge is installed, i a LOW signal to ASIC is output. On the other hand, a HIGH signal is output when a cartridge is out.

☐ Head thermistor
The head thermistor is directly attached on the head driver board. It monitors the temperature around the printhead and feeds back the temperature to the CPU analog port. The printer refers to this information to control head driver voltage based on the ink viscosity.

☐ PF motor encoder
The PF motor encoder includes the loop scale attached to the left end of the PF roller shaft and the transmission photo sensor. The minimum resolution of the sensor is 1/180 inches. The sensor outputs HIGH signals for the black lines and LOW signals for the transparent parts to the ASIC. The printer controls the PF motor based on the signals output from this sensor.

☐ CR motor encoder
CR motor encoder consists of the transmission photo sensor assembled in the CR unit and the linear scale attached along the CR scanning line. The minimum resolution of the sensor is 1/180 inch. It outputs HIGH signals for the black bands and LOW signals for the transparent parts of the linear scale to the ASIC. The printer controls the CR motor based on the signals output from this sensor. CR home position is also detected based on the signals from this sensor.

TROUBLESHOOTING

3.1 Overview

This chapter describes how to troubleshoot problems. It consists of the sections shown in the flowchart below. When identifying and troubleshooting problems, be sure to proceed to the correct section specified in the flowchart.
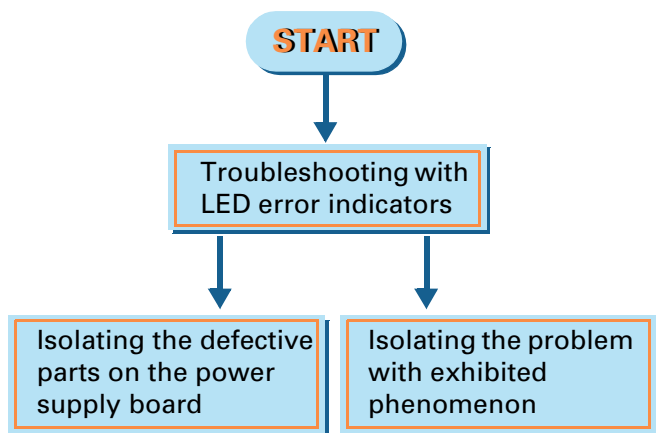

Figure 3-1. Troubleshooting Flowchart

Following sections give detailed information on each step in the flowchart. Be sure to perform troubleshooting by following the specified steps without omitting any necessary operations.

Following tables show the checkpoints for each motor and sensor.

Table 3-1. Motor Resistance and Measurement Procedure

Motor	Connector to check	Check pins	Coil resistance
CR Motor	CN14	Pins 1 & 2,	31.1 Ω +/- 25%
PF Motor	CN13	Pins 1 & 2,	31.1 Ω +/- 25%
ASF/Pump Motor	CN7	Pins 1& 3 or Pins 2 & 4	10.4 Ω +/-10%

Table 3-2. Sensor Check and Measurement Procedure

Sensor	Checkpoints	Signal level	Corresponding condition
PE Sensor	CN4, Pins 1 &2	LOW	Paper present
		HIGH	Paper out
ASF Sensor	CN6, Pins 1 &2	LOW	In the ASF home position
		HIGH	Out of the ASF home position

3.1.1 Self-Diagnostic Function

The EPSON Stylus PHOTO 2000P is equipped with the self-diagnostic
function. With this function, the printer can check its operations after
power-on, and shows its various conditions using LED indicators.

3.1.1.1 Troubleshooting with LED Error Indicators

Table 3-3. Error Indication of Operation Panel

Printer Status	Indicators				Priority
	Power	Ink Out (Black)	Ink Out (Color)	Paper Out	
Power On condition	On	-*1	-	-	9
Ink sequence proceeding	Blink	-	-	-	6
Ink cartridge replacement mode	Blink	-	-	-	5
Data Processing	Blink	-	-	-	8
Paper Out	-	-	-	On	4
Paper Jam	-	Off	Off	Blink	3
No Ink Cartridge / Ink End (black ink cartridge)	-	On	-	-	7
Ink low (black ink cartridge)	-	Blink	-	-	7
No Ink Cartridge / Ink End (color ink cartridge)	-	-	On	-	7
Ink low (color ink cartridge)	-	-	Blink	-	7
Reset, Timer IC reset, EEPROM reset	-	On (for 1 second only)			-
Maintenance Request (Waste ink counter overflow)	Blink	Blink	Blink	Blink	2
Fatal Error	Blink	On	On	Blink	1

*1: "-" means "no effect".

3.1.1.2 Error Conditions

This printer indicates an error when detecting the following conditions, and sets the interface signal "/ERROR" to LOW and "BUSY" to HIGH to stop data input. In this condition, the printer automatically enters non-printable status. Note if the printer is establishing communication by IEEE1284.4 protocol, however, it remains in printable status.

Each error condition is described below:

Ink End

- ☐ Ink in black/color cartridge ends.

- ☐ Remaining level of ink is low. In this case, the printer warns of the condition with LED indicators. If ink runs out, on the other hand, the printer shows an ink end condition and stops its operation. Note the error occurs if ink of any color in the color ink cartridge runs out.

Paper Out

The printer attempts to load paper but fails.

Paper Jam

- ☐ The printer fails to eject remaining paper with the specified number of paper feeding steps at power-on.

- ☐ The printer can not eject paper despite the FF command is sent or Load/Eject button is pressed.

No Ink Cartridge / Ink Cartridge Problem

- ☐ Ink cartridge is not installed or installed incorrectly.

- ☐ Information in CSIC of the ink cartridge is not read or written properly.

Maintenance Request

Total wasted ink amount reaches capacity. The printer stops operations.

> **CAUTION**
> ⚠
>
> **Maintenance request error is not cleared until the ink absorber is replaced and waste ink counter in EEPROM is reset by the service operation.**

Fatal Error

An fatal error is indicated when such an error as carriage control error, or CG access error occurs.

Table 3-4. Error Condition and Possible Causes

No.	Error	Possible Causes	Refer to:
1	Paper Out	1. Failure in paper loading 2. PE sensor connector is disconnected. 3. Sensor actuator is not acting properly or sensor bracket is not installed correctly. 4. PE sensor is defective. 5. ASF operates abnormally.	Table 3-5
2	Paper Jam	1. Paper length is beyond the specifications. 2. The sensor is left on because paper dust or other foreign matter is lodged. 3. Sensor actuator is not acting properly or sensor bracket is not installed correctly. 4. PE sensor is defective. 5. Hopper release lever is not attached properly.	Table 3-6
3	Ink End / No Ink Cartridge	1. CSIC is not connected properly. 2. CSIC is defective. 3. Head FPC is defective. 4. Control board is defective.	Table 3-7
4	Maintenance Request	Protect counter is showing limit.	Table 3-8
5	Fatal Error	1. Linear encoder FFC is disconnected from the sensor or liner encoder is not attached to the carriage. 2. Linear encoder is dislocated. 3. ASF sensor is dislocated or ASF sensor connector is disconnected. 4. ASF sensor is defective or it fails to detect ASF home position. 5. PF encoder FFC is disconnected from the encoder sensor or the encoder fails to read the slit pattern on the loop scale. 6. CR motor coil is discontinued or burnt. 7. PF motor coil is discontinued or /burnt. 8. ASF/Pump motor coil is discontinued or burnt. 9. Improper engagement of ASF gear (32) and the combination gear (14, 28) in the DE unit. 10.Torsion spring (0.618) has come off the DE lock lever or hook in the DE unit.	Table 3-9

3.1.1.3 Remedies for Paper Out Error

This section provides checkpoints and corresponding actions to take when a Paper Out error occurs for either of the following reasons:

- Paper is set in the ASF hopper but not fed.

- Paper is loaded but not detected by the PE sensor actuator.

Be sure to follow the steps in the order listed in the table.

NOTE: *If the exhibited problem is similar to a problem listed under "Problem", take the actions in the right column. If not, proceed to the next step.*

Table 3-5. Remedies for Paper Out Error
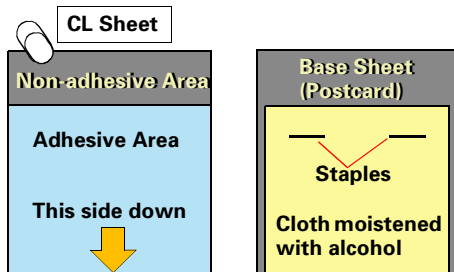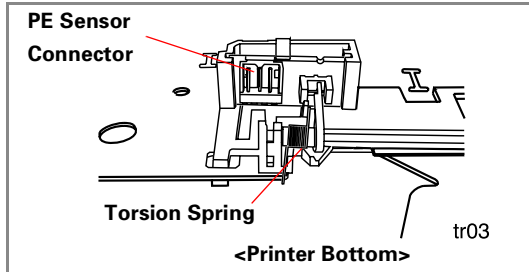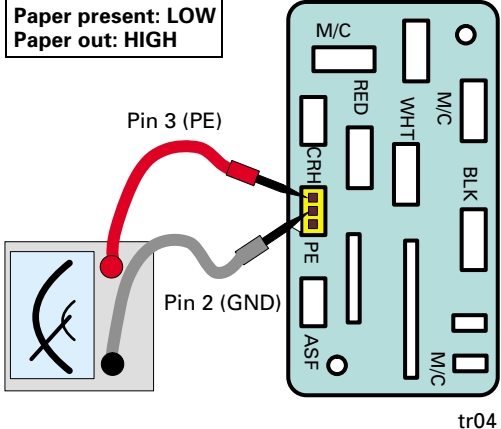
Step	Problem	Check & Actions
1	Load/Eject button is pressed but paper is not loaded even when the ASF LD rollers turn, and a Paper Out error is displayed.	1. Set a cleaning sheet in the ASF up side down. 2. Holding the top edge, press the Load/Eject button to remove micro pearl from the paper load roller. To remove severe soiling, staple a cloth moistened with alcohol to a postcard and clean the roller in the same manner.
2	The Load/Eject button is pressed and the ASF LD rollers turn. But they turn again to send paper beyond TOP position. Then a Paper Out error is displayed.	Check if the connector (yellow, 3-pin) for the PE sensor is connected to PE sensor or CN5 on the Main Board.

Table 3-5. Remedies for Paper Out Error (continued)

Step	Problem	Check & Actions
Ditto	Ditto	• Using your hand, move the actuator as if it were being pushed by incoming paper. Then release the actuator and check if it automatically returns to its original position with the tension of the torsion spring. • Referring to the illustration above, check that the sensor base is securely installed to the frame. If the sensor base is loose or installed insecurely, instal it securely.
3	Ditto	Check if the PE sensor is defective. Manually toggling the actuator, measure the voltage at CN6/Pin 3. The correct voltage levels are as follows: tr04
4	The Load/Eject button is pressed and the hopper appears to be working OK. But paper is not loaded. Then a Paper Out error is displayed.	Hand-rotate the shaft in the ASF in the paper feed direction and check if the hopper springs back every time you rotate the shaft. **NOTE:** *Even though the ASF HP sensor is working properly, the hopper does not load paper if it is not operating at the correct timing. To solve that problem, disassemble and reassemble the ASF or replace it. In case the ASF HP sensor detects the ASF home position during paper feed sequence, the printer enters a fatal error condition.*

3.1.1.4 Remedies for the Paper Jam Error

This section includes the checkpoints and actions the take to troubleshoot the Paper Jam error when it occurs during paper feeding or after the printer is turned on.
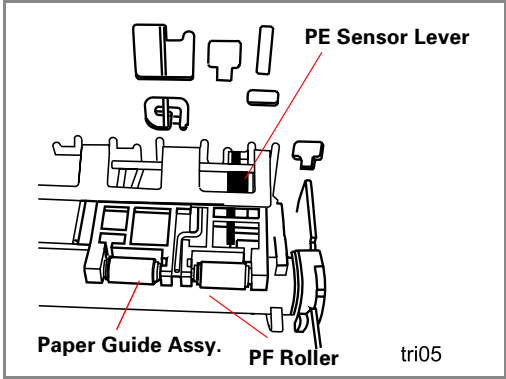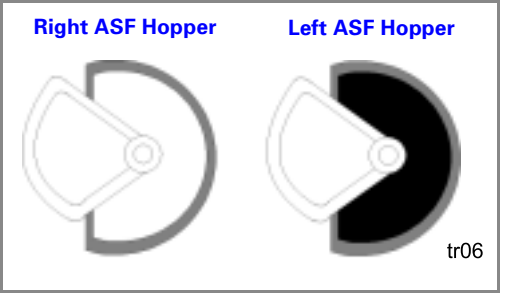
The printer detects the Paper Jam Error in the following condition.

■ When the printer is turned on, the PE sensor detects paper and attempts to eject it using the PF roller. But the paper detection signal does no change to HIGH.

Be sure to follow the steps in the order described in the tables.

NOTE: *If the exhibited problem is similar to a problem listed under "Problem", take the actions in the right column. If not, proceed to the next step.*

Table 3-6. Remedies for Paper Jam Error

Step	Problem	Check & Actions
1	The PF roller turn to eject paper but can not eject it completely. Then a Paper Jam error is displayed.	Explain to the user that a Paper Jam error occurs if the paper whose length is beyond the specifications is used.
2	Printer is turned on, PF roller turns continuously for ten seconds, and then a Paper Jam error is displayed.	Check if there is any paper debris or dust lodged on the PE sensor. Also, viewing the PE sensor from the front, check its lever is set in the correct position. **PE Sensor Lever** · **Paper Guide Assy.** · **PF Roller** · tri05
3	ditto	Referring to Table 3-5 / Step 3, check if the sensor is operating properly.
4	Paper is loaded at the ASF and fed by the PF roller, but its leading edge dose not reach the front paper guide. The ASF repeats paper feeding motion and the Fatal Error is displayed.	Check if the ASF hopper release lever is properly installed to the LD roller shaft. **Right ASF Hopper** · **Left ASF Hopper** · tr06

3.1.1.5 Remedies for No Ink Cartridge Error/Ink Cartridge Problem

This section includes the checkpoints and corresponding actions to take to troubleshoot the No Ink Cartridge Error / Ink Cartridge Problem. Be sure to follow the steps in the order listed in the table.

NOTE: *If the exhibited problem is similar to a problem listed under "Problem", take the actions in the right column. If not, proceed to the next step.*

**Table 3-7.
Remedies for No Ink Cartridge Error/Ink Cartridge Problem**

Step	Problem	Check & Actions
1	The printer is turned on and then displays a No Ink Cartridge error.	• Check if any ink cartridges are installed improperly. If so, reinstall them. • Try removing the ink cartridges and reinstalling them.
2	Ditto	Check the level of the ink remaining using the printer driver or progress meter.
3	Ditto	Replace the ink cartridges with new ones. • CSIC is defective.
4	Ditto	• Check that the head FFC is correctly connected to the head. • Check that the head FFC is properly connected to the connector on the main board. • Check if the main board is defective.

3.1.1.6 Remedies for Maintenance Request Error

If the printer is in this error condition, it stops all operations, including data transfer, except for specified control panel functions.

Table 3-8. Remedies for Maintenance Request Error

Step	Actions	LED condition
1	Turn the printer on while pressing the Load/Eject and the Cleaning button. The Paper Out LED starts blinking.	The Paper Out LED blinks for three seconds.
2	While the Paper Out LED is blinking, press the Cleaning button.	The following three red LEDs blink: • Ink Out (Black) • Ink Out (Color) • Paper Out

NOTE: *If you press the Load/Eject button in Step 2, you activate the EEPROM initialization mode instead. This mode enables you to return the printer to its normal condition if it is not accepting any data from the PC. This operation clears the following:*

1) Power-off time: Length of time which the printer has been off since the last power-off.

2) I/F selection: Selects an interface from "Auto", "Parallel" or "USB". Factory default is "Auto".

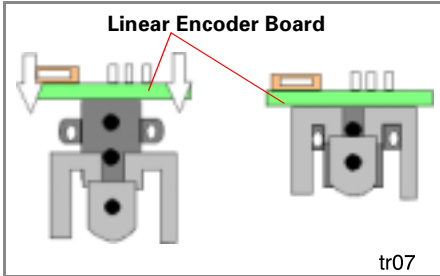## 3.1.1.7 Remedies for Fatal Error

A fatal error is basically caused by any of the following conditions:

- The printer fails to detect the CR home position.
- The printer fails to detect signals from the linear scale.
- The ASF sensor fails to detect the ASF home position.

The following table shows various causes of the fatal error and corresponding solutions. Be sure to follow the steps correctly to troubleshoot the fatal error.

NOTE: *If the exhibited problem is similar to a problem listed under "Problem", take the actions in the right column. If not, proceed to the next step.*

Table 3-9. Remedies for Fatal Error

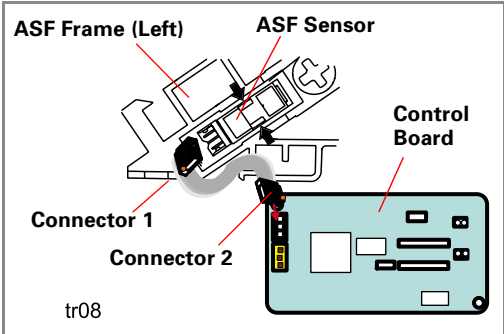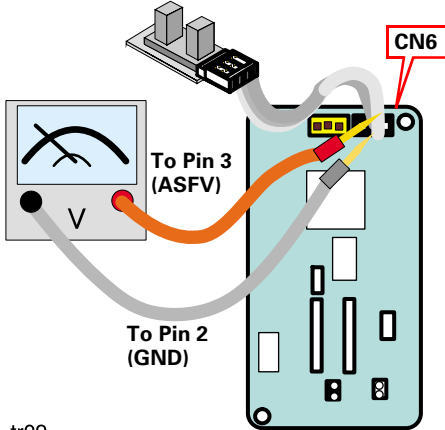| Step	Problem	Check & Actions
1	The printer is powered on and the CR unit leaves its home position and then collides with the right/left frame. After that, a fatal error is displayed.	Check the linear encoder board visually for the following: • Is the linear encoder board properly installed to the carriage? If not, install it properly. • Is the encoder FFC connected to the connector? If not, connect it properly. **Linear Encoder Board** tr07
2	Ditto	• Check that the linear encoder belt passes through the slot in the sensor. • Check that the sensor is free from dust and paper debris.

Table 3-9. Remedies for Fatal Error (continued)

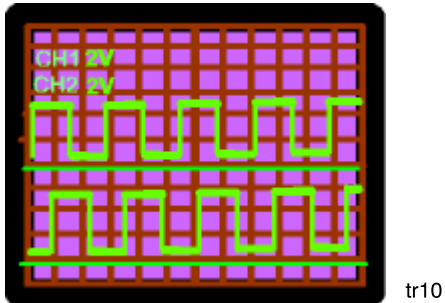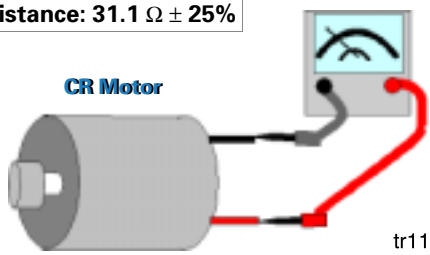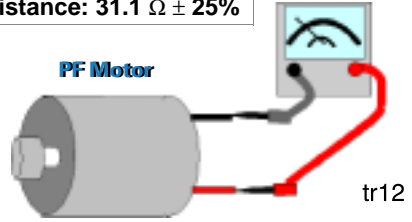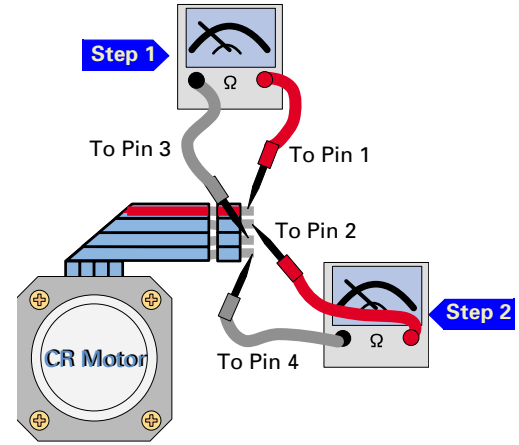| Step	Problem	Check & Actions
3	When the Printer is turned on, the CR moves a little and you hear the ASF Hopper moving. After that, a fatal error is displayed.	• Referring to the figure below, check that the ASF sensor is attached to the correct position. • Check that both connectors 1 and 2 are securely connected. **ASF Frame (Left)** **ASF Sensor** **Control Board** **Connector 1** **Connector 2** tr08
4	Ditto	Turn the printer on and check for the correct voltages at the pins shown in the figure below: **CN6** **To Pin 3 (ASFV)** **To Pin 2 (GND)** tr09 • **When the ASF HP detector wheel is in home position, the voltage is 0.7 V or less.** • **When the ASF HP detector wheel is out of home position, the voltage is 2.4 V or more.**

Table 3-9. Remedies for Fatal Error (continued)

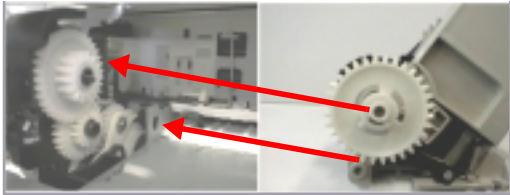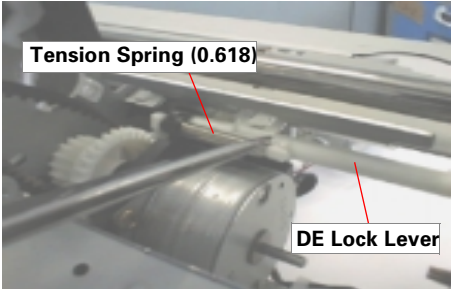| Step	Problem	Check & Actions
5	The printer is turned on and the carriage and the PF motor move a little. After that, a fatal error is displayed.	Check for the signal output from the PF encoder at either pair of the following pins on the main control board: • Pin 1 an Pin 4 of CN12 • Pin 1 and Pin 2 of CN12 Check for the signal output from the linear encoder at either pair of the following pins on the main control board: • Pin 1 an Pin 4 of CN12 • Pin 1 and Pin 2 of CN12 tr10 **Encoder Output Waveform**
6	The printer is turned on but the CR motor does not operate at all. After that, a fatal error is displayed.	Measure the coil resistance of the CR motor using a meter as shown below: **Resistance: 31.1 $\Omega \pm$ 25%** tr11

Table 3-9. Remedies for Fatal Error (continued)

Step	Problem	Check & Actions
7	The printer is turned on but the PF motor does not operate at all. After that, a fatal error is displayed.	Measure the coil resistance of the PF motor using a meter as shown below: **Resistance: 31.1 $\Omega \pm$ 25%** tr12
8	The printer is turned on but the ASF hopper does not make noises. After that, a fatal error is displayed.	Measure the coil resistance of the ASF/Pump motor. **Resistance: 10.4 $\Omega \pm$ 10%** **NOTE:** Be sure to measure the resistance at each pair of points shown above.

Table 3-9. Remedies for Fatal Error (continued)

Step	Problem	Check & Actions
9	The Printer is turned on but: • ASF makes no noises. • ASF does not move but its gear is making noises. After that, a fatal error is displayed.	Check that the ASF unit is properly installed by the correct points as shown below: tr14
10	The printer is turned on but the ASF dose not move at all. After that, a fatal error is displayed.	Check that the torsion spring is securely attached to the DE lock lever and DE unit. tr15

3.1.2 Isolating the Faulty Part on the Power Supply Board

This section explains how to troubleshoot the following problems:

- The printer is turned on but it does not perform initialization and no LED indicators come on.
- Problems occurs after the printer is turned on.

Be sure to troubleshoot in the order specified since the steps are listed in the disassembly order to facilitate the job.

NOTE: *If you answer "Yes" to a question listed under "Checkpoint", take the action described to the right under "Action". If "No", proceed to the next step.*

Table 3-10. Isolating the Faulty Part on the Power Supply Board

Step	Checkpoint	Action
1	Is the Panel FFC disconnected from the connector on the panel board?	The power switch for this printer is in the secondary side. Therefore, if the FFC does not transmit signals, the power supply board is not active despite the main board operates properly.
2	Is the Panel FFC disconnected from CN11 (black, 12-pin) on the Main Board?	The power switch for this printer is in the secondary side. Therefore, if the FFC does not transmit signals, the power supply board is not active despite the main board operates properly.
3	Has the Pin 3 of the panel FFC broken?	Check for the Pin 3 using a circuit tester.
4	Has the fuse (F1) on the power supply board blown out?	Check if the F1 located beside CN1 on the power supply board has blown out.
5	Is CN1 on the power supply board disconnected?	Check if CN1 is properly connected. CN1 supplies AC power to the primary side of the power supply board.
6	Is CN10 on the main board disconnected?	Check if CN10 on the main board is properly connected. CN10 supplies DC voltage to the control circuit.

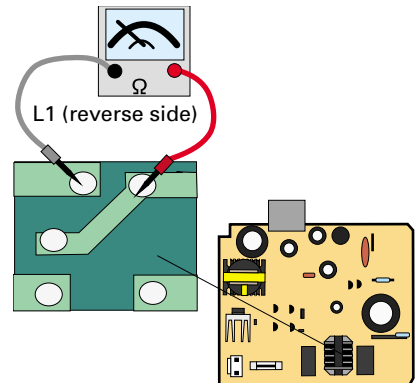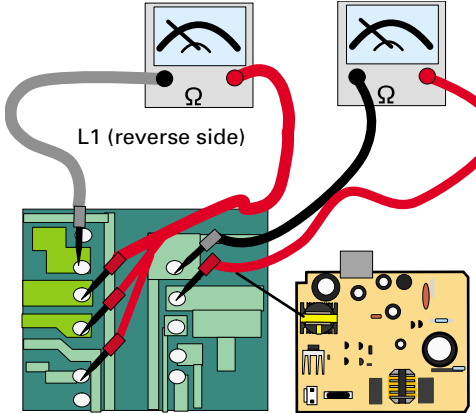**Table 3-10. Isolating the Faulty Part on the Power Supply Board**

Step	Checkpoint	Action
7	Is the choke coil L1 broken?	Turn the power supply board up side down and check for the electrical continuity at the two points below: L1 (reverse side) tr16
8	Is the transformer (T1) broken?	Referring to the figure below, check if the transformer is disconnected from the pole. Try every combination. L1 (reverse side) tr17

Table 3-10. Isolating the Faulty Part on the Power Supply Board

Step	Checkpoint	Action
9	Is the switching FET (Q1) defective?	Check the electrical continuity of the switching FET by trying the four patterns below. If the main switching FET is good, the results should be as shown under the figure. **NOTE:** *Be sure to pay attention to the polarity.*
10	Is an NPN junction transistor defective?	Check the electrical continuity of an NPN junction transistor on the power supply board. **NOTE:** *Be sure to pay attention to the polarity.*

Table 3-10. Isolating the Faulty Part on the Power Supply Board

Step	Checkpoint	Action
11	Is a PNP junction transistor defective?	Check the electrical continuity of a PNP junction transistor on the power supply board in the same manner described in the previous step. **NOTE:** *Be sure to pay attention to the polarity.*
12	Is the regulator IC (IC51) defective?	Using an oscilloscope, check the output waveform at Pin 8 of IC51. The output waveform should be as shown below:

3.1.3 Isolating the Faulty Part according to the Phenomenon

Refer to this section if you could not solve the problem in Section 3.1.1.1 or Section 3.1.2 or need more information to isolate the cause according to the exhibited phenomenon. This section mostly covers the problems relating to the main control circuit and other parts.

Table 3-11. Phenomenons Exhibited

No.	Phenomenon Exhibited	Table to refer to
1	CR motor does not rotate.	Table 3-12
2	PF motor does not rotate.	Table 3-13
3	Pump/ASF motor does not rotate.	Table 3-14
4	Cleaning does not solve the print problem.	Table 3-15

Table 3-12. CR Motor does not Work
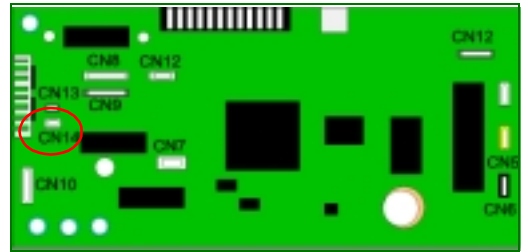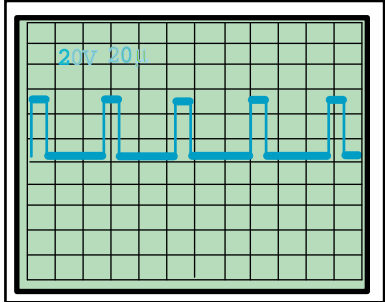
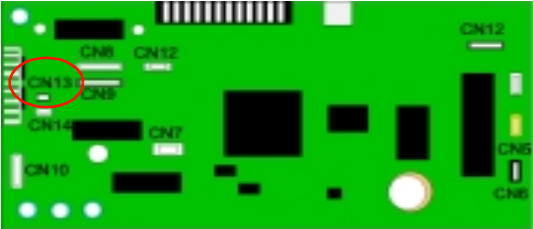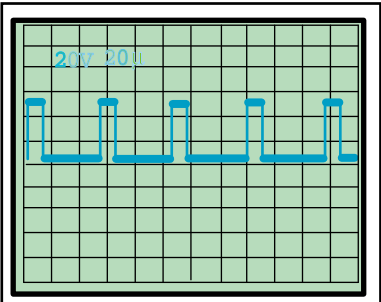| Step	Checkpoint	Action
1	Getting ready for checking waveforms.	Using an oscilloscope, check the outputwaveform at CN14 (CR motor connector) on the main board. For checking, press the Load/Eject button to drive the CR motor. **NOTE:** *Be sure to disconnect the CR motor cable.* **NOTE:** *Ground one of the probes to the frame. The connector itself has no ground line since the CR motor is a bi-polar motor.* tr22
2	Checking the waveforms to solve the problem.	Drive the CR motor and check that the waveform shown below is output from each pin of CN14. tr23 • If the waveform appears as shown, replace the CR motor. • If not, replace the main control board or the CR motor driver IC (IC18).

Table 3-13. PF Motor does not Work

Step	Checkpoint	Action
1	Getting ready for checking waveforms.	Using an oscilloscope, check the outputwaveform at CN13 (PF motor connector) on the main board. For checking, press the Load/Eject button to drive the PF motor. *NOTE:* *Be sure to disconnect the PF motor cable.* *NOTE:* *Ground one of the probes to the frame. The connector itself has no ground line since the PF motor is a bi-polar motor.* tr24
2	Checking the waveform to solve the problem.	Drive the PF motor and check that the waveform shown below is output from each pin of CN13. tr23 • If the waveform appears as shown, replace the PF motor. • If not, replace the main control board or the PF motor driver IC (IC19).

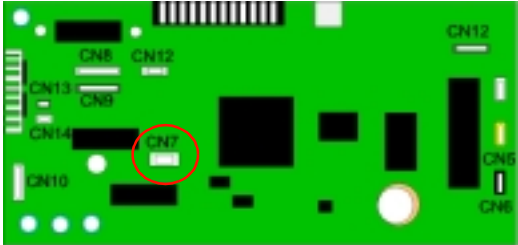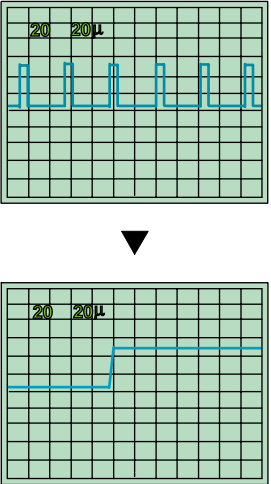### Table 3-14. Pump/ASF Motor does not Work

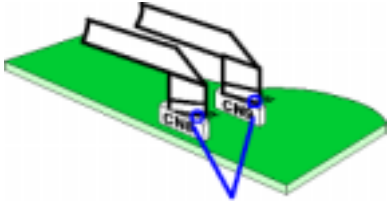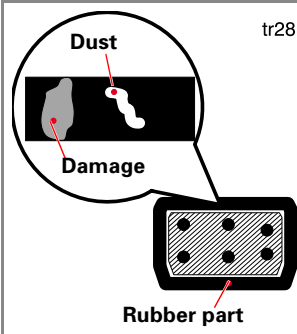| Step	Checkpoint	Action
1	Getting ready for checking waveforms.	Using an oscilloscope, check the outputwaveform at CN7 (Pump/ASF motor connector) on the main board. For checking, press the Load/Eject button to drive the Pump/ASF motor. *NOTE:* *Be sure to disconnect the* Pump/ASF *motor cable.* *NOTE:* *Ground one of the probes to the frame. The connector itself has no ground line since the PF motor is a bi-polar motor.* tr25
2	Checking the waveform to solve the problem.	Drive the Pump/ASF motor and check that the waveform shown at right is output from each pin of CN7. • If the waveform appears as shown, replace the Pump/ASF motor. • If not, replace the main control board or the Pump/ASF motor driver IC (IC12). tr26

Table 3-15. Cleaning Does not Solve the Problem

Step	Checkpoint	Action
1	Run the head cleaning 7 or 8 times repeatedly.	Run the head cleaning by pressing the Cleaning button.
2	Perform the initial ink charge operation.	You can perform the initial ink charge operation in the manner described below: 1. Using the adjustment program, perform the initial ink charge operation (= resets the initial ink charge flag in the EEPROM). 2. Turn the printer off and back on.
3	Printhead FFC is disconnected.	Take out the main board and check if the head FFCs are connected to CN8 and CN9. If they are connected aslant as shown below, reconnect them, and then run a print check. **Check that the connectors are not connected aslant.** tr27
4	Check the cap for any foreign matter, dirt, or damage.	Remove the printer mechanism and release the carriage lock to move the carriage unit away from home position. Then, examine the cap rubber closely for any problem in the figure at right. tr28 · Dust · Damage · Rubber part

Table 3-15. Cleaning Does not Solve the Problem (continued)
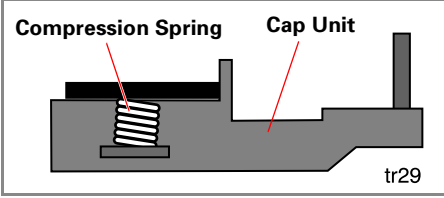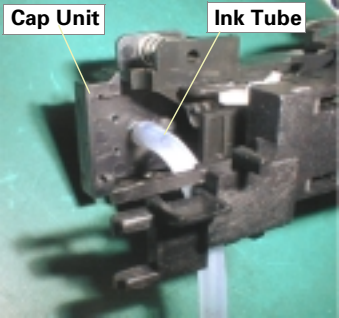
Step	Checkpoint	Action
5	Check if the compression spring has come off the cap unit.	Check if the compression spring is correctly assembled in the cap unit as shown below. **Compression Spring** **Cap Unit** tr29 Note if the compression spring has come off the cap unit, the cap can not cover the head closely with enough air tightness, and ink will not be absorbed as a result.
6	Check if any ink tubes are disconnected from the cap unit.	Referring to the figure below, check the following: • Are all ink tubes securely connected to the cap unit? • Are any ink tubes damaged? **Cap Unit** **Ink Tube** tr30

Table 3-15. Cleaning Does not Solve the Problem (continued)

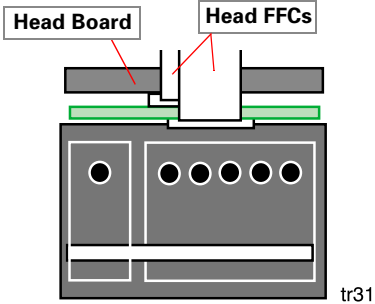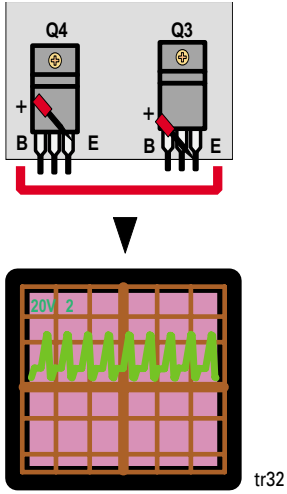| Step	Checkpoint	Action
7	Check if the head FFCs have come off the printhead.	Remove the head FFC holder from the CR unit, and check that both FFCs are properly connected. Even if they appear to be properly connected (not slant), try disconnecting and then connecting them. Head Board Head FFCs tr31
8	Check if the head driver is defective.	The common driver transistors Q3 and Q4 are attached the heat sink on the main board. To check their conditions, check the sawtooth waveform at the emitter terminals the transistors using an oscilloscope. Q4 Q3 + + B E B E 20V 2 tr32

Table 3-15. Cleaning Does not Solve the Problem (continued)

Step	Checkpoint	Action
9	Check if the pre-driver IC (IC10, IC11, or IC13) is defective.	If the waveform is not output in the previous step, check for the waveform at the base of Q3 and Q4. Check for the sawtooth waveform output from the pre-driver IC. • If the correct waveform is output, transistor Q3/Q4 is defective. • If the correct waveform is not output, the pre-driver IC is defective.

3.2 FAQ

The following table shows frequently asked questions and answers.

Table 3-16. FAQ (Ink / Ink Cartridge)

Questions	Answers
Are the cartridge of Stylus PHOTO1270 and Stylus PHOTO 2000P compatible?	You can install the cartridge of Stylus PHOTO1270 to the carriage of Stylus PHOTO 2000P or vise versa. The printer does not print. Ink end is detected by CISC and thereby not displayed nor printed.
If I mistakenly install the cartridge of Stylus PHOTO1270 to Stylus PHOTO 2000P or vise versa, is there any affect on the printer?	Even if the ink is attached on the ink supplying pin of the head, there is no affect such as ink becoming adhesive.
What is the feature of the pigment ink?	1. Saturation is high because of microparticle structure. 2. Pigment ink is covered with resin. When it is dropped onto the paper, it will be coated. Then the surface becomes smooth and saturation becomes high. Also, the bearing force against scratch becomes high and it allows versatile media usage. 3. Strong against the light discomposure and has high climate-resistance. See "Ink" on page -33.
How long is the weather-resistance of the pigment ink?	About 100 years or more inside the house. • Condition: Under fluorescent light 24°C, 60%, over glass (cf. photographs: 60 years)
What should I do when the pigment ink is attached on the hand.	Do the same as you do for dye ink used for Stylus PHOTO1270.

Table 3-16. FAQ (Ink / Ink Cartridge)

Questions	Answers
How long the expiration date of the ink cartridge for use?	Within half a year after the pack is opened. Within 1.5 years after ink cartridge production. If the ink is expired, the printing quality is not guaranteed.
Is there anything I should be careful about the ink cartridge?	• Keep the following items for ink cartridge storage. - Keep the ink supplying port down. - Be careful that no water or dust may attach on the ink supplying port. - Ink supplying port has a valve inside: ink does not leak out. Still, be careful not to smear anything around the ink. • If you kept ink with its side down for more than 3 months: - Keep the ink with ink supplying port down for more ato stable the printing quality, then use the ink. • If you kept ink upside for more than 1.5 months: - Keep the ink with ink supplying port down for long time. Otherwise printing quality does not recover.
Dye ink requires 1 ~ 2 days for color to be stabilized. How about pigment ink?	It goes less than $\Delta E=1$ within an hour.

Table 3-17. FAQ (Paper)

Questions	Answers
Do we have to use the EPSON exclusive paper?	Printer driver supports plain paper mode on the paper setting. When printed on the plain paper, the printing generally becomes faint. For better quality printing, use the special paper recommended by EPSON.
Is the cleaning sheet used for paper eject roller is as same as of inkjet cleaning sheet (Ink Jet Cleaning Sheets 100)?	No. • Stylus PHOTO 2000P Cleaning sheet is a half size of A3+. Also can be replaced by plain paper. • **Never use ink jet cleaning sheet for it affects on the paper feed mechanism.** • **Never use cleaning sheet included in the special paper.**
What should we be careful about on the special paper usage.	When printing 2000 ~ 3000 sheets on Archival Matte Paper or Glossy Paper-Photo Weight, paper dust may attach on the ASF roller and it may become difficult to feed paper. • Use cleaning assembly of this printer and clean the ASF roller. (Refer to Section 6.1.2.3.)
What would happen if I mistakenly print on the OHP sheet when intended to print on the special paper.	Since ink does not dry out, it may smear the paper eject roller. • Clean the paper eject roller. (Refer to Section 6.1.2.2.)

Table 3-18. FAQ (Printing)

Questions	Answers
Does pigment ink have any affect on hue compared with dye ink?	The exclusive paper for pigment ink is contrived for pigment ink to develop good color. Due to this, pigment ink produce the same image quality with dye ink does when compared on their exclusive paper.
Why does paper eject roller changed from sawtooth roller to round roller?	Pigment ink does not infiltrate paper and only pigment attaches on the surface of paper. sawtooth roller may hurt the printing surface.
In normal use, what is the cleaning interval of the paper eject roller?	Even for the normal printing, the ink will be gradually attached on the paper eject roller. Cleaning should be done about 1000 ~ 2000 sheets each.

DISASSEMBLY AND ASSEMBLY

4.1 Overview

This chapter describes procedures for disassembling the main components of the EPSON Stylus PHOTO 2000P. Unless otherwise specified, disassembly units or components can be reassembled by reversing the disassembly procedure. Therefore, no assembly procedures are included in this chapter. Precautions for any disassembly or assembly procedure are described under the heading "CAUTION" and "CHECK POINT". Any adjustments required after disassembling the units are described under the heading "REQUIRED ADJUSTMENT".

4.1.1 Precaution for Disassembling the Printer

See the precautions given under the heading "WARNING" and "CAUTION" in this section when disassembling or assembling EPSON Stylus PHOTO 2000P.

WARNING

- **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 serving the battery:**
  1. **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.**
  2. **Do not heat the battery or put it near fire.**
  3. **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.)**
  4. **Do not charge the battery. (An explosion may be generated inside the battery, and cause burning or explosion.)**
  5. **Do not dismantle the battery. (The gas inside the battery may hurt your throat. Leakage, burning or explosion may also be resulted.)**
  6. **Do not install the battery in the wrong direction. (This may cause burning or explosion.)**
- **Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacture. Dispose the used batteries according to government's law and regulations.**

CAUTION

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

CAUTION

◼ **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 4 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;**

  1. 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.

  2. 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 new ink cartridges 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

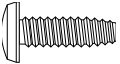| Tools	Commercially Available	Code
(+) Driver No.2	O.K.	B743800200
(+) Driver No.1	O.K.	B743800100
Tweezers	O.K.	B741000100
Hexagon Box Driver (Paired side: 5.5mm)	O.K.	B741700100
Scale PF unit Assembling tool	EPSON exclusive	1050767
Mounting Plate Scale Attachment tool	EPSON exclusive	1051765
Cleaning Assembly	EPSON exclusive	1056368

CHECK POINT ✔

Shipping liquid (S46) is the same as of the previous model.

4.1.3 Specifications for Screws

Table 4-2 shows screw specifications. During assembly and disassembly, make sure that the specified types of screws are used at proper locations, referring to the table below.

Table 4-2. Screw Specifications

Body	Name	Size
(screw)	+Bind S-tite (CBS)	M3x6
(screw)	+Bind P-tite (CBP)	M3x6
	+Bind P-tite (CBP)	M3x8
	+Bind P-tite (CBP)	M2.5x5
(screw)	+Pan head (C.P.)	M3x6
---	+Pan head B-tite Sems	M3X8
(screw)	+Bind S-tight Sems (CBS Sems)	M3x6
(screw)	+Bind S-tight (CBS)	M3x10
---	+Pan head B-tite Sems	1.7 x 5

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 4-3. Inspection Checklist for Repaired Printer

Category	Component	Item to check	Is Check Required?
Printer units	Self-test	Is the operation normal?	☐Checked / ☐Not necessary
	On-line test	Was the on-line test successful?	☐Checked / ☐Not necessary
	Printhead	Is ink ejected normally from all nozzles?	☐Checked / ☐Not necessary
	Carriage mechanism	Does the carriage move smoothly?	☐Checked / ☐Not necessary
		Any abnormal noise during movement?	☐Checked / ☐Not necessary
		Any dirt or obstacles around the shaft of carriage guide?	☐Checked / ☐Not necessary
		Is the CR motor at the correct temperature (not over heating)?	☐Checked / ☐Not necessary
	Paper feeding mechanism	Is paper fed smoothly?	☐Checked / ☐Not necessary
		Does paper get jammed?	☐Checked / ☐Not necessary
		Does paper get skew during paper feeding?	☐Checked / ☐Not necessary
		Are papers multi fed?	☐Checked / ☐Not necessary
		Does the PF motor get overheated?	☐Checked / ☐Not necessary
		Abnormal noise during paper feeding?	☐Checked / ☐Not necessary
		Is the paper path clear of all obstructions?	☐Checked / ☐Not necessary
Adjustment	Specified adjustment items	Are adjusted conditions all right?	☐Checked / ☐Not necessary
Lubricant	Specified lubricated item	Is lubrication applied to the specified locations?	☐Checked / ☐Not necessary
		Is the quantity of lubrication adequate?	☐Checked / ☐Not necessary
Function	ROM version	Newest version:	☐Checked / ☐Not necessary
Shipment package	Ink cartridges	are the ink cartridges installed correctly?	☐Checked / ☐Not necessary
	Protection conditions during transport	Is all the pointed parts firmly fixed?	☐Checked / ☐Not necessary
Others	Attached items	Are all attached items from users included?	☐Checked / ☐Not necessary

4.2 Disassembly Procedures

The flowchart below shows procedures for disassembly.

```
                        START
                          │
                  ┌───────────────┐
                  │ HOUSING Removal│
                  └───────────────┘
                          │
   ┌──────────────┬───────┼────────────────┬──────────────────┬──────────────────┐
   ▼              ▼       │                ▼                  ▼                  ▼
┌──────────┐ ┌──────────┐ │ ┌──────────────┐ ┌──────────────┐ ┌──────────────┐
│Circuit   │ │Printhead │ │ │MOTOR         │ │ASF Unit      │ │Carriage Unit │
│Board     │ │Unit      │ │ │ASSEMBLY,     │ │Removal       │ │Removal       │
│Assembly  │ │Removal   │ │ │ASF Removal   │ │              │ │              │
│Removal   │ │          │ │ │              │ │              │ │              │
└──────────┘ └──────────┘ │ └──────────────┘ └──────────────┘ └──────────────┘
   │                      │                        │                  │
   │    ┌─────────────────┼──────────────────┐     ▼                  ▼
   ▼    ▼                 ▼                        ┌──────────────┐ ┌──────────────┐
┌──────────┐ ┌──────────┐ ┌──────────────┐         │SHAFT, ROLLER,│ │ROLLER, PF    │
│MOTOR     │ │Panel Unit│ │BOARD         │         │LD Removal    │ │Removal       │
│ASSEMBLY, │ │Removal   │ │ASSEMBLY,     │         └──────────────┘ └──────────────┘
│CR Removal│ │          │ │ENCODER       │                │                  │
└──────────┘ └──────────┘ │Removal       │                ▼                  ▼
   │            │          └──────────────┘         ┌──────────────┐ ┌──────────────┐
   ▼            ▼                                    │ROLLER        │ │MOTOR         │
┌──────────┐ ┌──────────┐                            │ASSEMBLY, LD, │ │ASSEMBLY,     │
│DE Unit   │ │TRAY,     │                            │RIGHT/LEFT    │ │PF Removal    │
│Removal   │ │ABSORBER  │                            │Removal       │ │              │
└──────────┘ │ASSEMBLY  │                            └──────────────┘ └──────────────┘
   │         │Removal   │
   ▼         └──────────┘
┌──────────┐    │
│PE Sensor │    ▼
│Unit      │ ┌──────────┐
│Removal   │ │Ink Unit  │
└──────────┘ │Removal   │
             └──────────┘
```
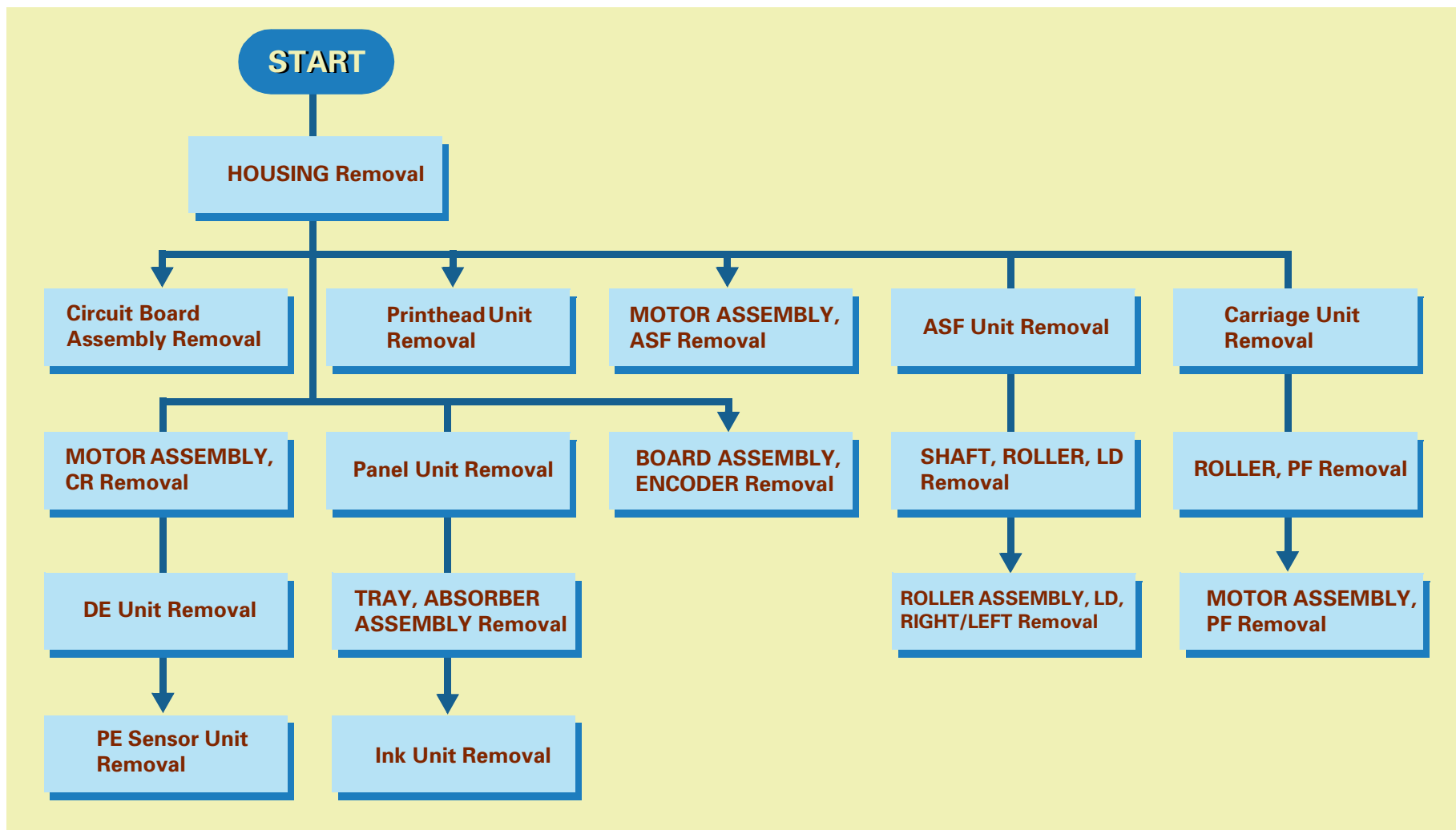
Figure 4-1. Flowchart of Disassembly

4.2.1 HOUSING Removal

Since the printer mechanism itself structures the bottom part, it appears just by removing HOUSING.

1. Open the printer cover and set the PG adjustment lever to (+).

2. Remove the four screws (CBS, 3x10) securing HOUSING, and remove it.

CAUTION !	When removing HOUSING, push it to the rear a little first, and then lift it up.

CHECK POINT ✓	■ When installing HOUSING, make sure the PG adjustment lever is set to (+). ■ After assembling HOUSING, ensure the head FFC is not caught in the back of HOUSING.

CBS (3x10)

CBS (3x10)
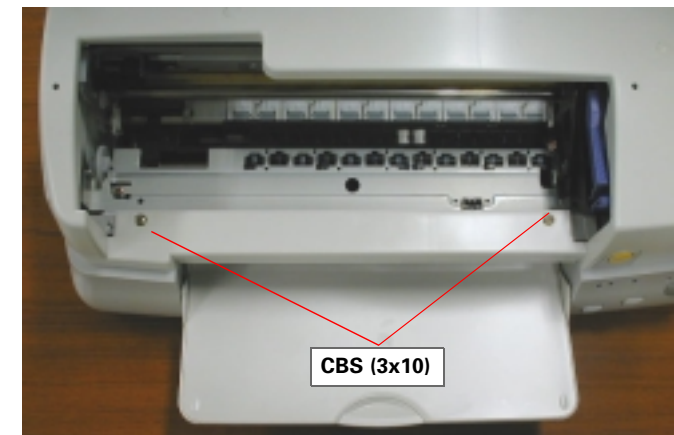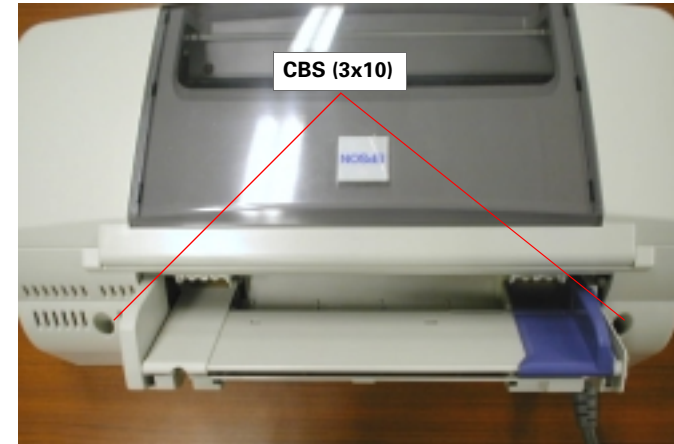
dis12

Figure 4-2. HOUSING Removal

4.2.2 Circuit Board Assembly Removal

Since BOARD ASSEMBLY, MAIN and BOARD ASSEMBLY, POWER SUPPLY are built in a bracket separated from the Printer Mechanism, they can be removed as one unit.

NOTE: *The Main board and the Power Supply Board equipped with the and Stylus PHOTO 1270 are the same, as listed below:*
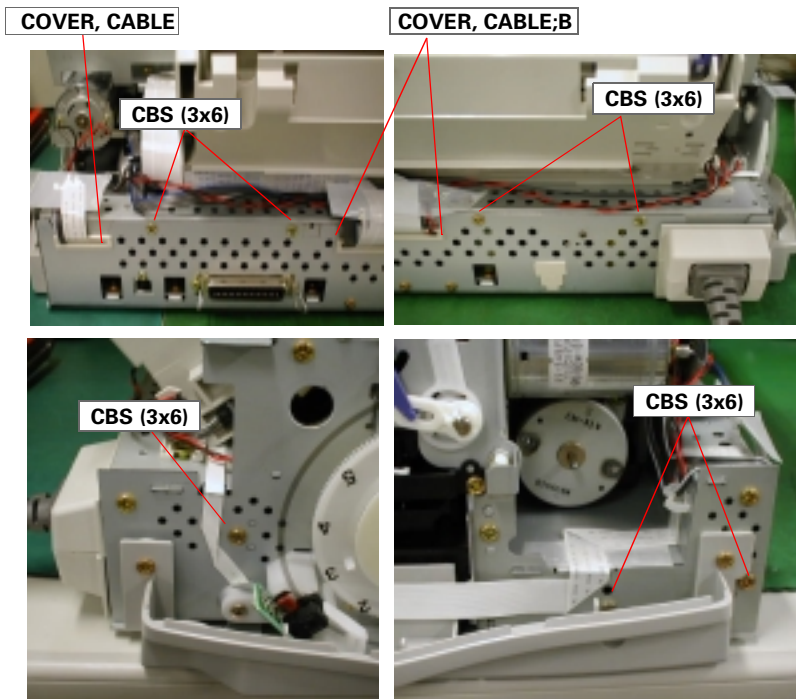*Main board: C304MAIN*
Power Supply board: C298PSB/PSE

1. Remove HOUSING. (Refer to Section 4.2.1.)

2. Remove the screws* (CBS, 3x6) securing the M/B Unit to the printer mechanism. Refer to Figure 4-3.

    * *Stylus PHOTO 870: Seven screws*
       Stylus PHOTO 1270: Eight screws

3. Lifting up SHIELD PLATE, M/B Unit a little, remove COVER, CABLE and COVER, CABLE; B together with the cables.

4. Disconnect all cables from the connectors on the main board and power supply board.

    ■ CN1(AC Source connector on the power supply board)

    ■ CN5 (PE sensor)

    ■ CN6 (ASF HP sensor)

    ■ CN7 (ASF/Pump motor

    ■ CN8 (Head FFC1)

    ■ CN9 (Head FFC2)

    ■ CN10 (from the secondary side of the PS board)

    ■ CN11 (Panel Unit)

    ■ CN12 (PF Encoder Sensor)

5. Remove SHIELD PLATE, M/B Unit from the printer mechanism.

dis03

Figure 4-3. Removing the M/B Shield Plate
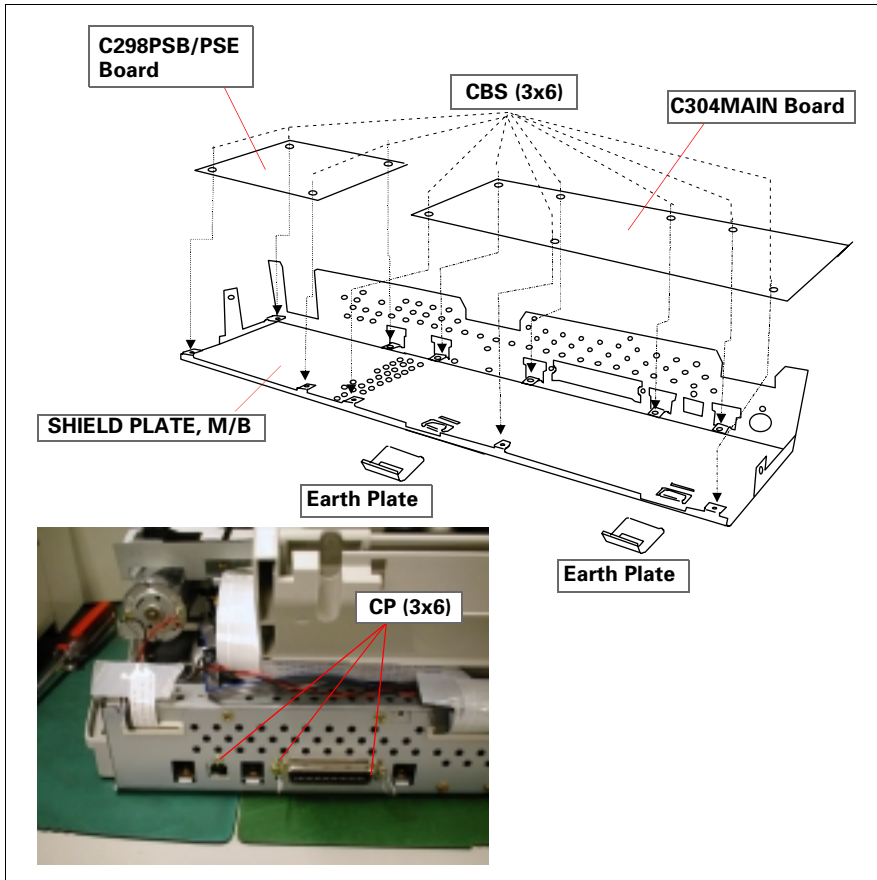
Figure 4-4. Circuit Board Removal

CAUTION

■ Since the CN10 is a locking connector, be sure to unlock it before disconnecting the cables.

■ Since the head FFCs have the same number of pins, be sure to connect them to the right connectors.

■ When connecting the cables, connect them to the correct connectors paying attention to the number of the pins.

ADJUSTMENT REQUIRED

■ Be sure to perform the following adjustments when you replace the Main Board:
1. Initial ink charge
2. Head drive voltage input
3. Head angular adjustment
4. Bi-D adjustment
5. USB ID data input (Refer to Chapter 5.)

■ Be sure to replace the following parts when replace the Main Board:
1. Waste ink absorbers
2. Ink cartridge (BK & Color)

Note this part replacement is required since several counters stored in the EEPROM are lost with a Main board replacement.

6. For removing each circuit board assembly from the M/B Shield Plate, remove the screws securing each unit and shield plate.

■ C304MAIN Board: Total 12 screws
      9 screws: CBS (3x6)
      3 screws: CP (3x6)

■ C298PSB/PSE Board: Total 4 screws (CBS, 3x6)

CHECK POINT ✓
When installing SHIELD PLATE, M/B to the printer mechanism, set the cables, COVER CABLE, and COVER, CABLE; B as shown in the figure below:

COVER, CABLE

Opening

COVER, CABLE; B

Opening
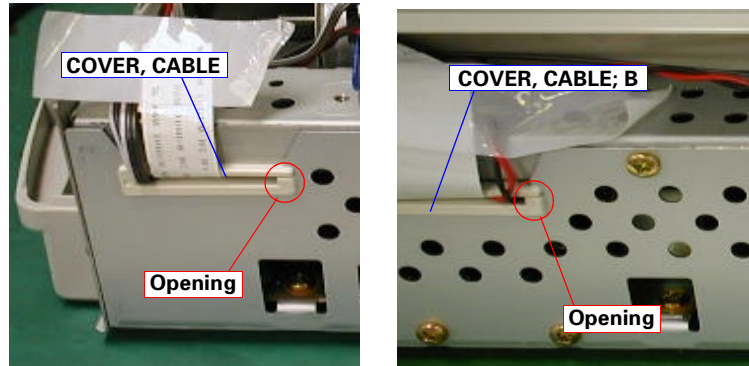
dis05

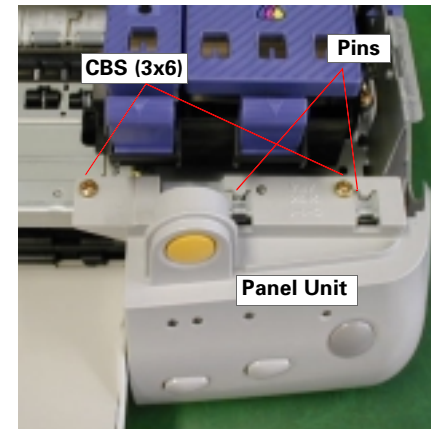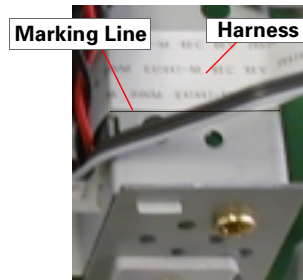**Figure 4-5. Setting the Cables to the Cable Covers**

4.2.3 Panel Unit Removal

1. Remove HOUSING. (Refer to Section 4.2.1.)

2. Remove the harness for the Panel Unit from the frame in the printer
   mechanism.

> **CHECK POINT** ✔
>
> **When installing the harness to the printer mechanism, be
> sure to stick it along the marking line on the frame.**

3. Remove the four screws (CBS, 3x6) securing the Panel Unit together
    with HOUSING, REINFORCING, RIGHT to the printer mechanism.

4. Release the hook for the for HOUSING, REINFORCING, RIGHT from
    the square cutout in the printer mechanism.

5. Release the pins fit in the printer mechanism, and then remove the
    Panel Unit along with HOUSING, REINFORCING, RIGHT.
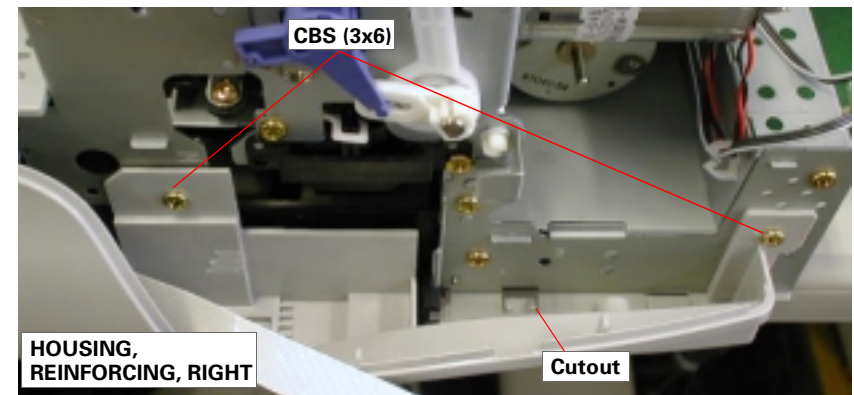
dis07a

dis07b

Figure 4-6. Panel Unit Removal

6. Remove the two screws (CBP, 3x8) securing SHIELD PLAT, PANEL to the Panel Unit, and then remove SHIELD PLATE, PANEL.

SHIELD PLATE, PANEL

CBP (3x8)

CBP (3x8)

BOARD ASSEMBLY, PANEL

Cup P-Tite (3x6)

CBP (3x8)

Harness

dis08
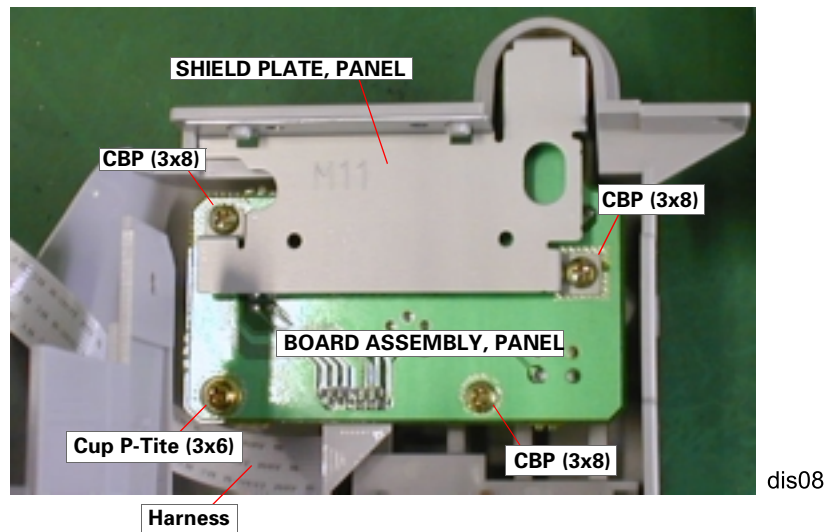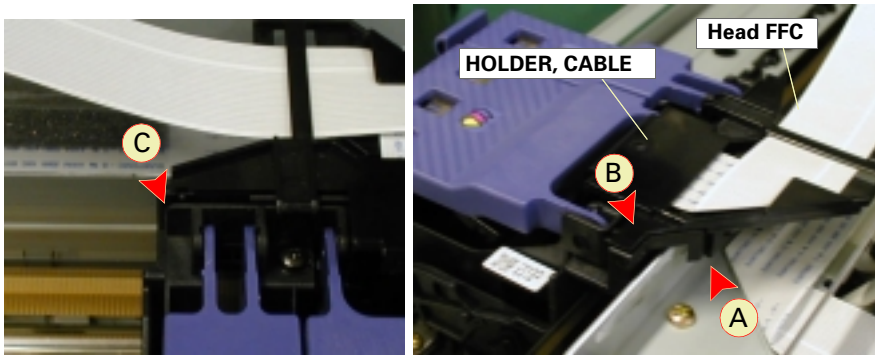
Figure 4-7. BOARD ASSEMBLY, PANEL Removal

7. Remove the two screws (CBP, 3x8 / Cup P-Tite, 3x6) securing BOARD ASSEMBLY PANEL to the Panel Unit.

8. Disconnect the harness from BOARD ASSEMBLY, PANEL.

CAUTION

!

When removing the Panel Unit, watch out for the stacker assembly. Since the stacker assembly is attached to the Panel Unit and HOUSING, PANEL, LEFT, if you remove the Panel Unit, the stacker assembly will also come off.

4.2.4 Printhead Unit Removal

1. Remove HOUSING. (Refer to Section 4.2.1.)

2. Set the PG lever to the rear.

3. Using tweezers, put the CR lock lever down to unlock the carriage.

4. Release the three hooks (A, B, C) fixing HOLDER, CABLE to the carriage, and remove HOLDER, CABLE.

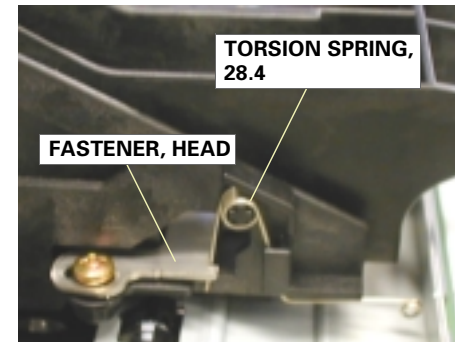dis09

Figure 4-8. Printhead Removal

5. Disconnect the head FFC from the connector on the printhead.

6. Remove the FFC from the BOARD ASSEMBLY, ENCODER.
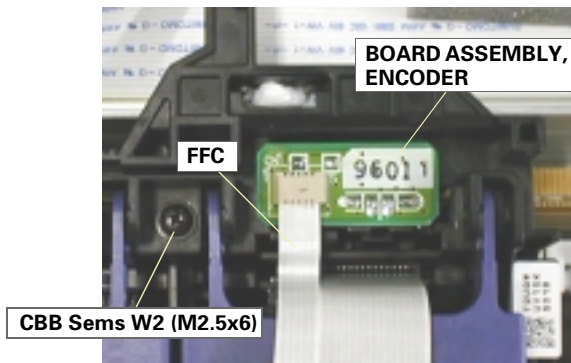
dis11

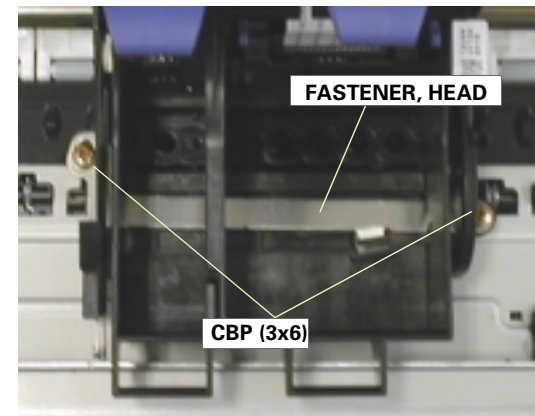**Figure 4-9. Encoder FFC Removal**

7. Remove the TORSION SPRING, 28.4 hung to the carriage and FASTENER, HEAD.

dis12

Figure 4-10. TORSION SPRING, 28.4 Removal

8. Remove the six screws (CBP, 3x6) securing FASTENER, HEAD to the carriage, and remove FASTENER, HEAD.

dis10

Figure 4-11. FASTENER, HEAD Removal

9. Move the carriage to the left end of the printer manually.

10. Remove the one screw (CCB Sems W2, 2.5x6) (Refer to Figure 4-9) securing the printhead to the carriage, and remove the printhead.

ADJUSTMENT REQUIRED

When you replace the Printhead Unit, perform the following adjustments:

1. **Initial ink charge (Refer to Chapter 5/Section 5.1.1.)**
2. **Head Voltage ID Input (Refer to Chapter 5/Section 5.1.2.)**
3. **Head Angular Adjustment (Refer to Chapter 5/Section 5.1.3.)**
4. **Bi-D Adjustment (Chapter 5 /Section 5.1.4.)**

CHECK POINT

■ **When installing FASTENER, HEAD, first fasten the two screws (CBP, 3x6) securing FASTENER, HEAD and the CBB Sems W2 (M2.5x6) temporarily, and then attach the torsion spring. After that, fasten the screws tightly.**

■ **When installing FASTENER, HEAD to the Carriage Unit, fasten the screws in the following order:**
   1) CBP (3x6) on the right
   2) CBP (3x6) on the left
   3) CBB Sems W2 (M2.5x6)

4.2.5 TRAY, ABSORBER ASSEMBLY Removal

1. Remove HOUSING. (Refer to Section 4.2.1.)
2. Remove the Panel Unit. (Refer to Section 4.2.3.)
3. Remove the two screws (CBS, 3x6) securing HOUSING, PANEL, LEFT to the front left part of the printer mechanism.
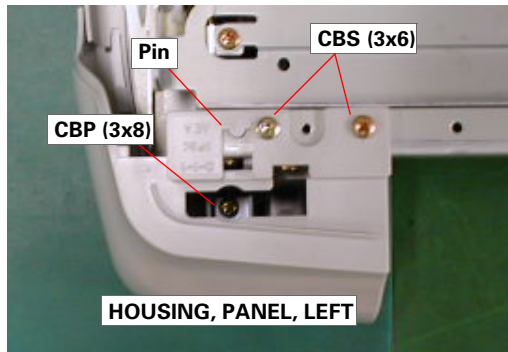
dis13

Figure 4-12. HOUSING, PANEL, LEFT Removal

4. Remove the one screw (CBP, 3x8) securing HOUSING, PANEL, LEFT to the HOUSING, SUB, LEFT.
5. Release the pin fixing HOUSING, PANEL, LEFT to the printer mechanism, and then remove HOUSING, PANEL, LEFT toward the front.

CAUTION

!

When removing HOUSING, PANEL, LEFT, watch out for the Stacker Assembly. Since the Stacker Assembly is fixed by the Panel Unit and HOUSING, PANEL, LEFT, it will come off as HOUSING, PANEL, LEFT is removed.

6. Remove the two screws (CBS, 3x6) securing HOUSING, SUB, LEFT to the printer mechanism.
7. Release the three hooks (two at the bottom and one in the front) fixing HOUSING, SUB, LEFT to the printer mechanism, and remove HOUSING, SUB, LEFT.
8. Remove the one screw (CBP, 3x6) securing PAPER GUIDE, LOWER to TRAY, ABSORBER ASSEMBLY at the middle of the printer mechanism, and then remove PAPER GUIDE, LOWER.
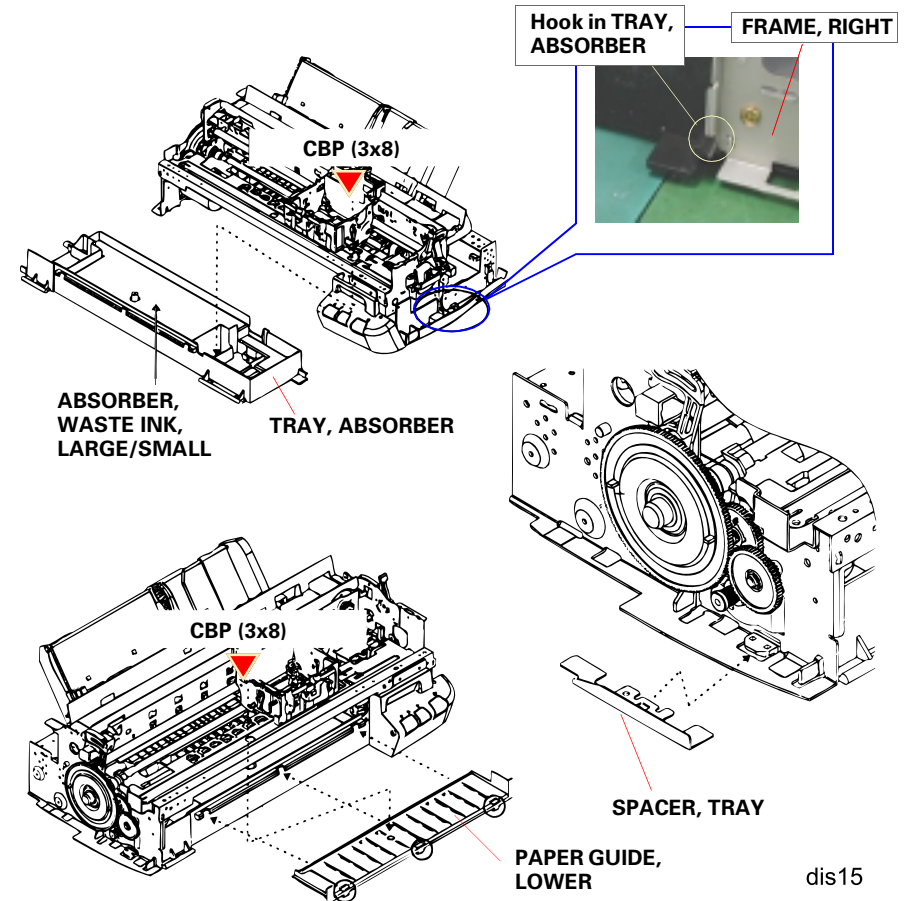

dis15

Figure 4-13. TRAY, ABSORBER ASSEMBLY Removal

9. Removing the one screw (CBP, 3x8) securing TRAY, ABSORBER ASSEMBLY to the right part of the printer mechanism.

10. Remove SPACER, TRAY securing TRAY, ABSORBER to the left side of the printer mechanism, and then remove TRAY, ABSORBER by moving it downward.

11. Remove ABSORBER, WASTE INK, LARGE/ SMALL from TRAY, ABSORBER.

CAUTION

!

- ■ **When installing TRAY, ABSORBER ASSEMBLY to the printer mechanism, make sure they are securely jointed with SPACER, TRAY. Refer to Figure 4-14.**
- ■ **Be careful not to damage SCALE, PF, (loop scale) when installing SPACER, TRAY.**

ADJUSTMENT REQUIRED

- ■ **If you replace TRAY, ABSORBER ASSEMBLY, be sure to perform the Waste ink counter reset operation. (Refer to Chapter.)**
- ■ **When installing TRAY, ABSORBER ASSEMBLY to the printer mechanism, make sure it securely joins to FRAME, RIGHT by its hook in the right.**

4.2.6 Ink Unit Removal

NOTE: *Ink Unit consists of the Pump Unit, Cleaner Head, and Cap Assembly.*

1. Remove HOUSING. (Refer to Section 4.2.1.)

2. Remove the Panel Unit. (Refer to Section 4.2.3.)

3. Remove TRAY, ABSORBER ASSEMBLY. (Refer to Section 4.2.5.)

4. Remove the three screws (CBS, 3x6) securing the Ink Unit to the FRAME, MIDDLE.

5. Remove the one screw (CBS, 3x6) securing the Ink Unit to FRAME, TOP. Then remove the Ink System Assembly.

6. Release the hook fixing the Cap Assembly to the Ink Unit, and then remove the Cap Assembly.

7. Disconnect the tube from the Cap Assembly.
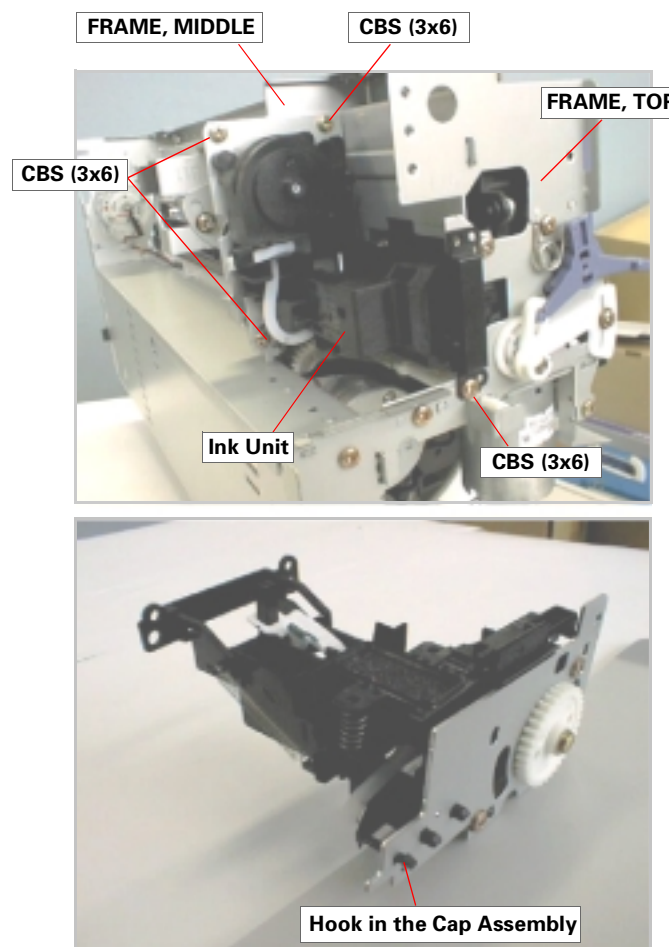
dis16

Figure 4-14. Ink Unit Removal

CAUTION
!

1. When handling CLEANER, HEAD, note the points below:
    ■ Do not touch CLEANER, HEAD with your bare hands. Ware gloves or use tweezers.
    ■ Do not smear CLEANER, HEAD with oil or grease.
    ■ When installing CLEANER, HEAD, set the rubber side (black side) facing to the right.
2. When replacing the Cap Assembly, do not touch its sealing rubber part.

CHECK POINT ✔

1. When assembling the Cap Assembly to the Ink System Assembly, make sure ABSORBER, SLIDER, CAP is assembled in the cap assembly. ABSORBER, SLIDER, CAP should be set as shown in Figure 4-15 in advance.
2. Check that the ink tube is securely connected to the connection part of the Cap Assembly. (See Figure 4-16.) Also, make sure the tube is not bent or crushed by the connection area. (See Figure 4-17.)
3. Check that the ink tube is placed correctly in the Ink System. (See to Figure 4-16.) Pay special attention in connecting the tube to the Pump Unit. Connect the tube by strictly following the instruction given in Figure 4-18.
4. When assembling, be careful not to crush or leave any stress on the ink tube that connects the Pump Unit and Cap Assembly. Also,
5. After installing the Pump Unit, ensure that CLEANER, HEAD moves back and forth with rotation of the gear.
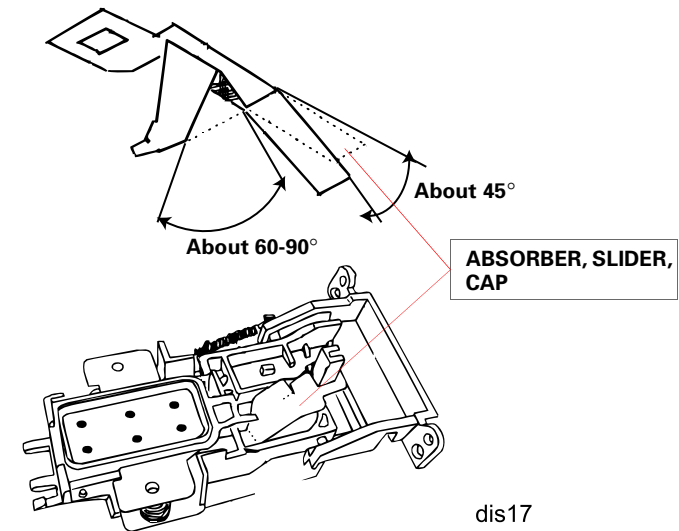

About 45°

About 60-90°

ABSORBER, SLIDER, CAP

dis17

Figure 4-15. Setting the ABSORBER, SLIDER, CAP
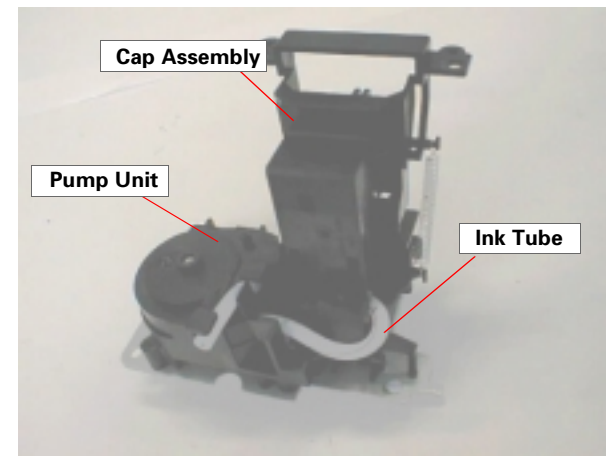

Cap Assembly

Pump Unit

Ink Tube

dis18

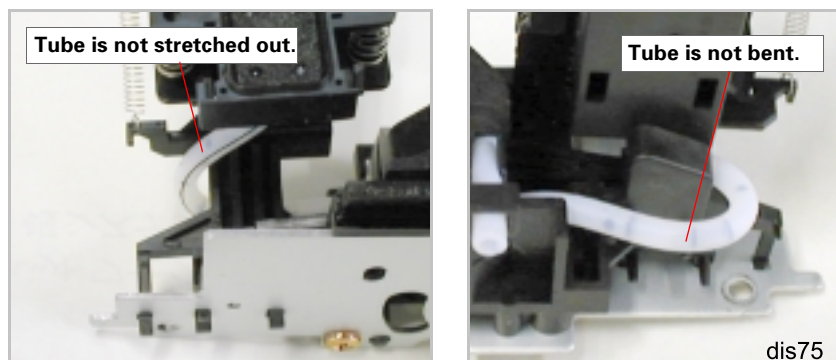**Figure 4-16. Ink Tube Installation (1)**

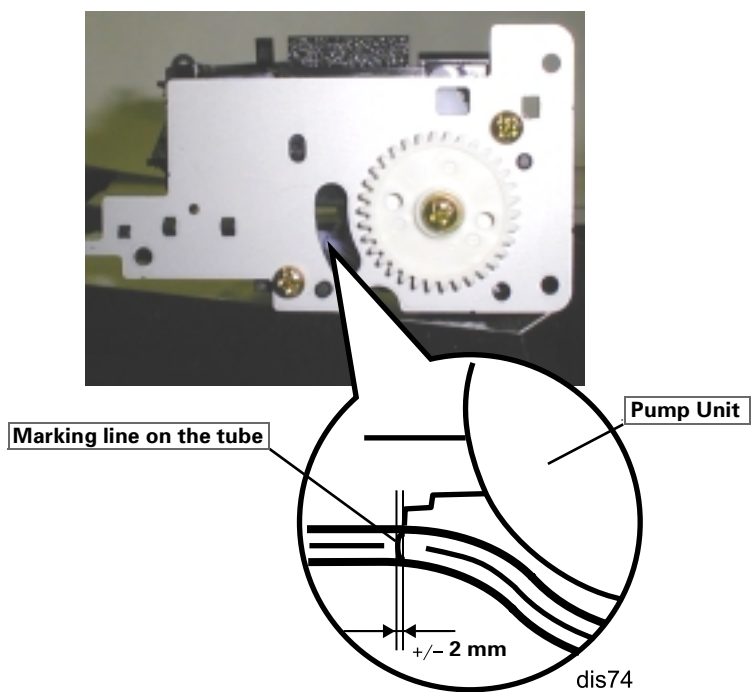**Figure 4-17. Ink Tube Installation (2)**

Figure 4-18. Connedtign the Tube to the Pump Unit
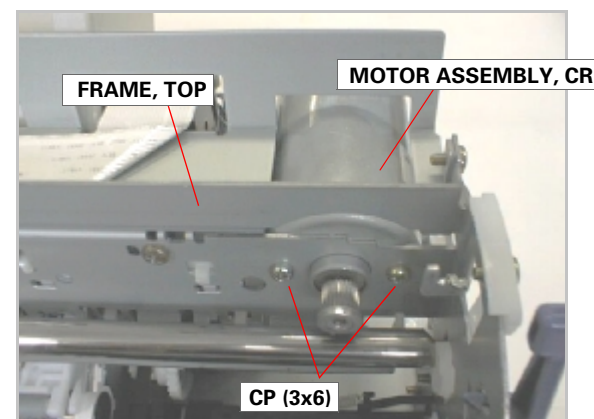
4.2.7 MOTOR ASSEMBLY, CR Removal

1. Remove HOUSING. (Refer to Section 4.2.1)

2. Using tweezers or a small screw driver, put the carriage lock lever down to the front, and then slide the carriage to the middle of the printer mechanism.

3. Push the HOLDER, PULLEY, DRIVEN to loosen the CR Timing Belt, and then disengage the timing belt from the pulley on the CR motor.
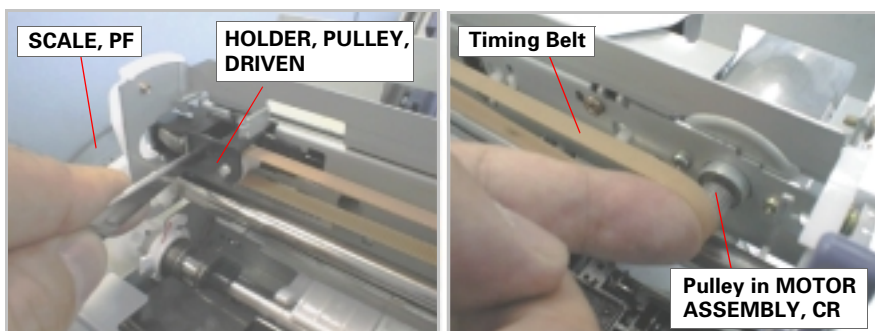
dis19

Figure 4-19. Timing Belt Removal

4. Disconnect the connector for MOTOR ASSEMBLY, CR from the connector on the main board. (Refer to Section 4.2.2.)

5. Remove the two screws (CP, 3x6) securing MOTOR ASSEMBLY, CR to FRAME, TOP, and then remove MOTOR ASSEMBLY, CR.

dis20

Figure 4-20. MOTOR ASSEMBLY, CR Removal

CAUTION !	■ When pushing HOLDER, PULLEY, DRIVEN, be careful not to damage SCALE, PF (loop scale). ■ When releasing the timing belt, be careful not to damage SCALE, CR (linear encoder). ■ When removing MOTOR ASSEMBLY, CR, be sure not to hit the edge of the installation hole with the motor's pulley.

4.2.8 MOTOR ASSEMBLY, ASF Removal

1. Remove HOUSING (Refer to Section 4.2.1.)

2. Remove the harness for MOTOR ASSEMBLY, ASF from the main board. (Refer to Section 4.2.2.)

3. Lower LEVER, PLANETARY UNIT.

LEVER, PLANETARY UNIT

dis23

[Lever is held up.]　　　　　　[Lever is lowered.]
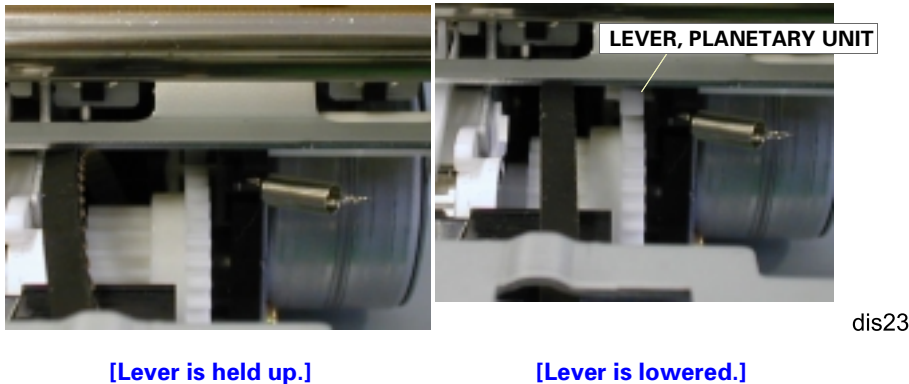
Figure 4-21. Setting LEVER, PLANETARY UNIT

4. Remove the two screws (CBP, 3x8) securing MOTOR ASSEMBLY, ASF to BRACKET, MOTOR, ASF. Then push the motor assembly to the rear and then to the right to remove it.

BRACKET, MOTOR, ASF

MOTOR ASSEMBLY, ASF

CBP (3x8)

dis24

Figure 4-22. MOTOR ASSEMBLY, ASF Removal

CHECK POINT ✔ — When installing MOTOR, ASSEMBLY, ASF5, make sure the DE unit and LEVER, PLANETARY UNIT are set as shown below:

DE Unit (BRACKET, MOTOR, ASF)

LEVER, PLANETARY UNIT

dis28

4.2.9 DE Unit Removal

1. Remove HOUSING (Refer to Section 4.2.2.)

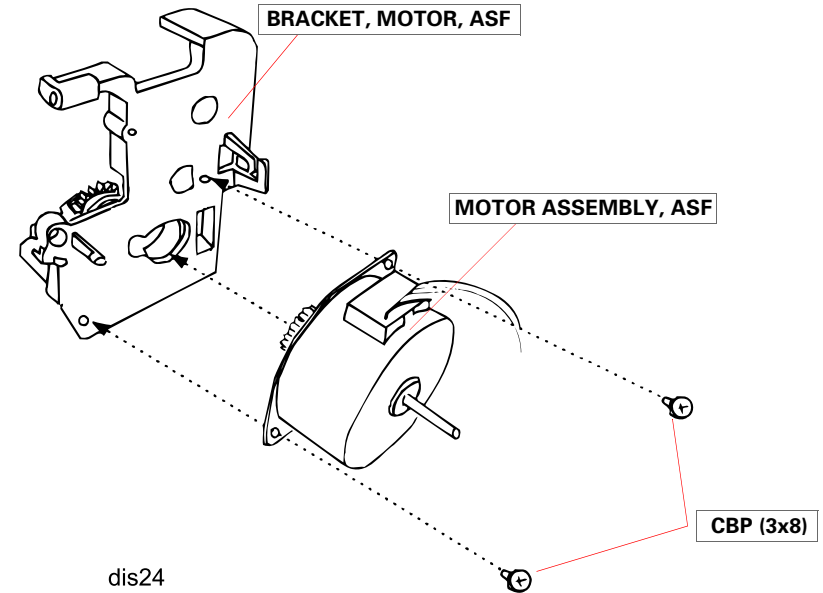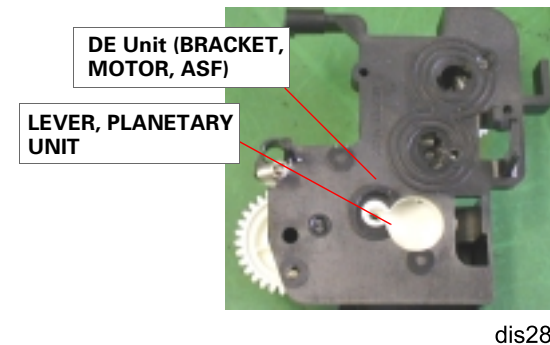2. Remove MOTOR ASSEMBLY, CR. (See Section 4.2.7.)

3. Remove the Ink Unit. (Refer to Section 4.2.6.)

4. Remove the two screws (CBS, 3x6) securing SHEET, PROTECTION INK to FRAME, BOTTOM, and then remove the sheet.

5. Remove MOTOR, CR. (Refer to Section 4.2.7.)

6. Loosen the one screw (CBS, 3x6) securing the LEVER ASSEMBLY, COMBINATION GEAR to FRAME, MIDDLE.
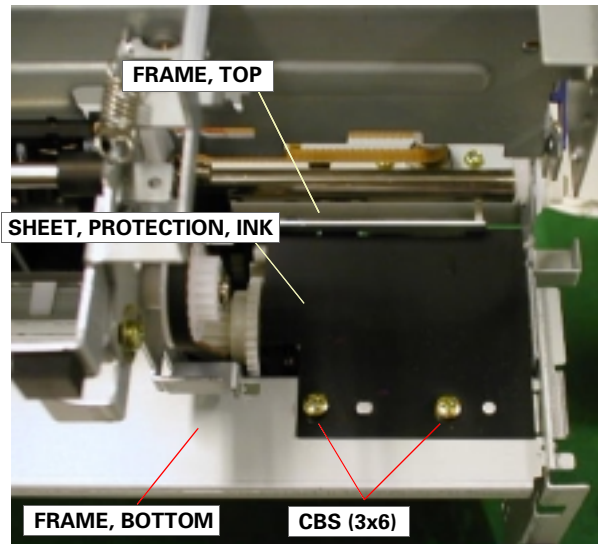
7. Remove the tension sprig (7.37) hung to FRAME MIDDLE and LEVER ASSEMBLY, COMBINATION GEAR, and then remove TENSION BELT, PUMP, TRANSMISSION from the combination gear (12, 22.92).

Figure 4-23. SHEET, PROTECTION, INK Removal
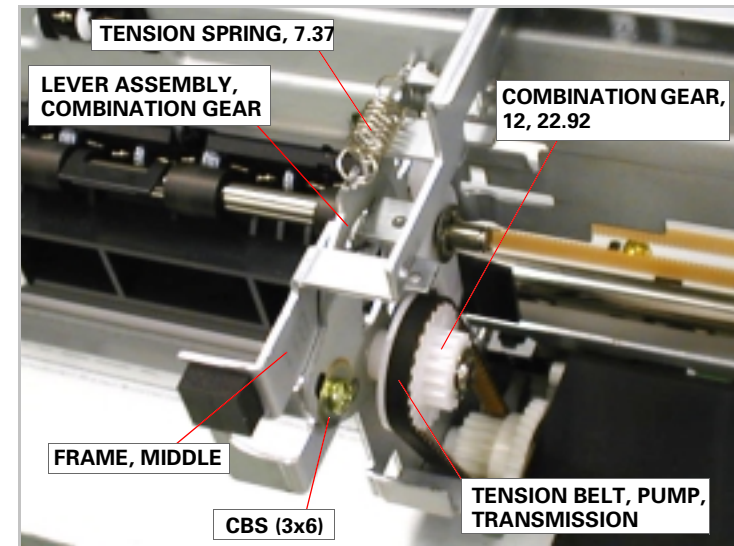
Figure 4-24. TENSION BELT, PUMP, TRANSMISSION Removal

8. Remove the tension spring (0.618) attached to the LEVER, DE, LOCK and DE Unit.

dis27

Figure 4-25. TENSION SPRING, 0.618 Removal

9. Release the hook in the DE Unit (BRACKET, MOTOR, ASF) securing LEVER, DE, LOCK. Then push the lever out to the right to release it from the installation hole in the DE Unit and remove it.
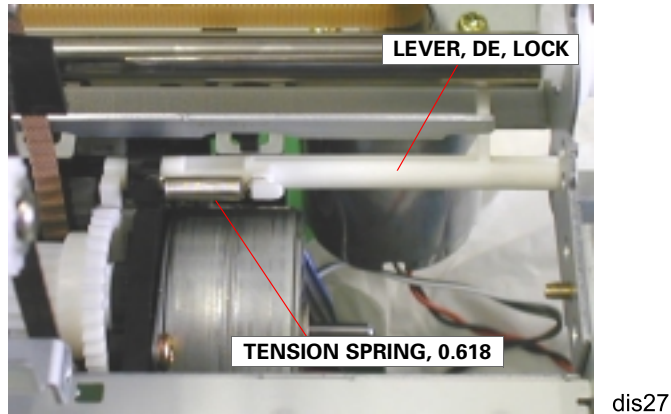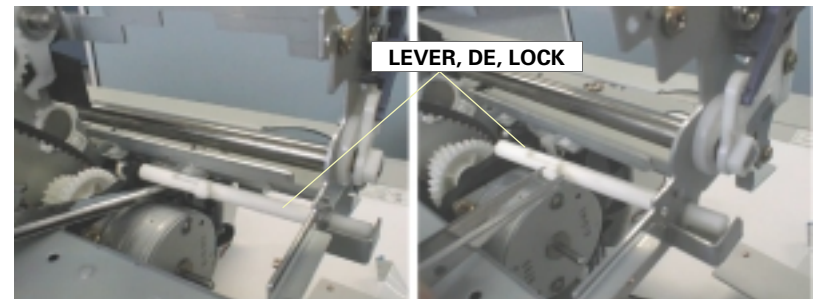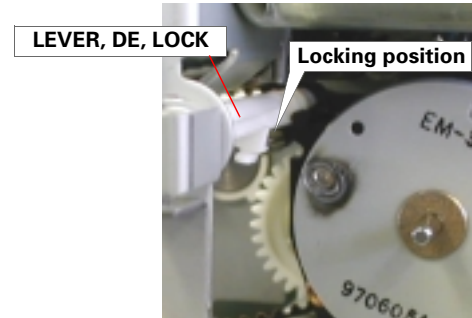

Figure 4-26. LEVER, DE, LOCK Removal

> ⚠ **CAUTION** When removing LEVER, DE, LOCK, be careful not to break the hook in the DE Unit.

10. Remove the CBS screw (3x6) and CBP (3x8) screw securing the DE unit to FRAME, MIDDLE and FRAME, TOP, respectively. Then remove DE unit.
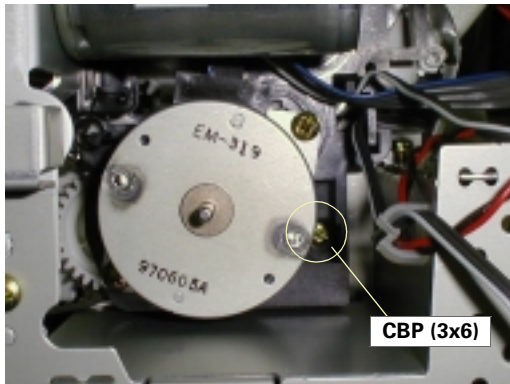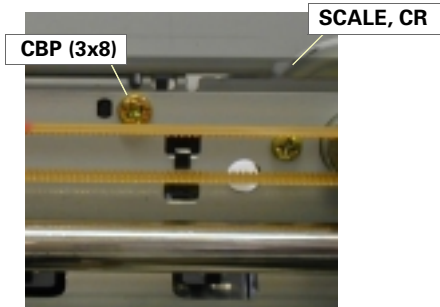
CBP (3x8)

SCALE, CR

Figure 4-27. DE Unit Removal

CBP (3x6)

dis26

11. Remove the harnesses from the harness clamp in the DE Unit.

CAUTION

Be sure to remove the screw (CBP, 3x8) carefully so you do not damage the linear encoder (SCALE, CR).

■ **CHECK POINT** ✔ ■ **Check that all gears are assembled in the DE unit correctly as shown in the figure below:**

Combination Gear, 12, 22.4

Retaining Ring, D8.8

Felt, D3.6

Combination Gear, 17.19, 25.6

Combination Gear, 14, 28

LEVER, PLANETARY UNIT

BRACKET, MOTOR, ASF
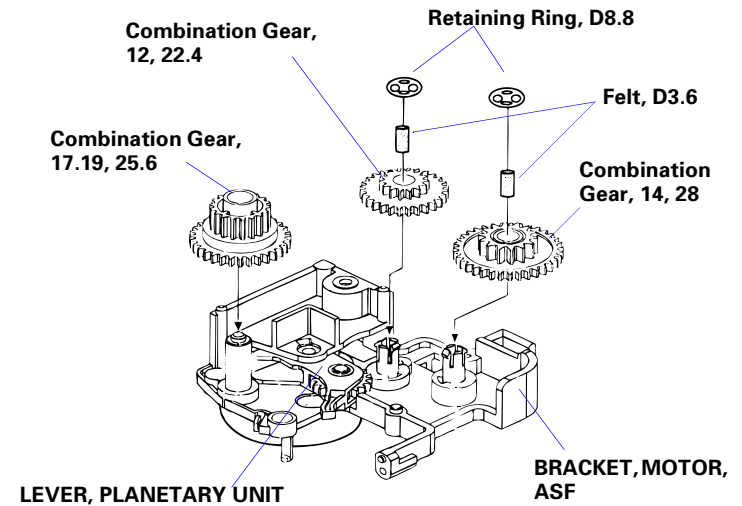
Figure 4-28. Parts Layout in DE Unit

■ Before assembling MOTOR ASSEMBLY, ASF to the DE Unit, set LEVER, PLANETARY UNIT to the pump side. (See Figure 4-28.)

■ Set TENSION BELT, PUMP, TRANSMISSION to the 17.19 gear of the Combination Gear (17.19, 25.6) before securing the DE unit to FRAME, MIDDLE.

Combination Gear, 17.19, 25.6

DE Unit

TENSION BELT, PUMP, TRANSMISSION
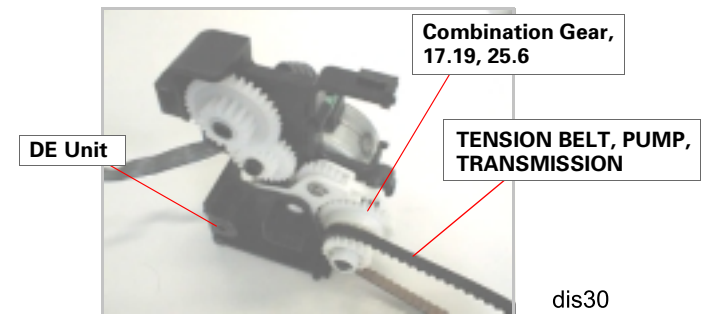
dis30

4.2.10 ASF Unit Removal

1. Remove HOUSING. (Refer to Section 4.2.1.)

2. Remove the following cables from the cable clamp in the left side of the ASF Assembly.

    ■ ASF HP sensor cable

    ■ MOTOR ASSEMBLY, PF cable

3. Disconnect the ASF HP sensor cable from the connector on the sensor.

4. Remove the head FFC from the ASF Unit.

5. Remove the one screw (CBS Sems, 3x6) and SHAFT, MOUNT, CR that are securing the ASF Unit to FRAME, BOTTOM at the rear right and rear left, respectively.

ASF viewed from the right

ASF viewed from the left

CBS Sems (3x6)

SHAFT, MOUNT, CR
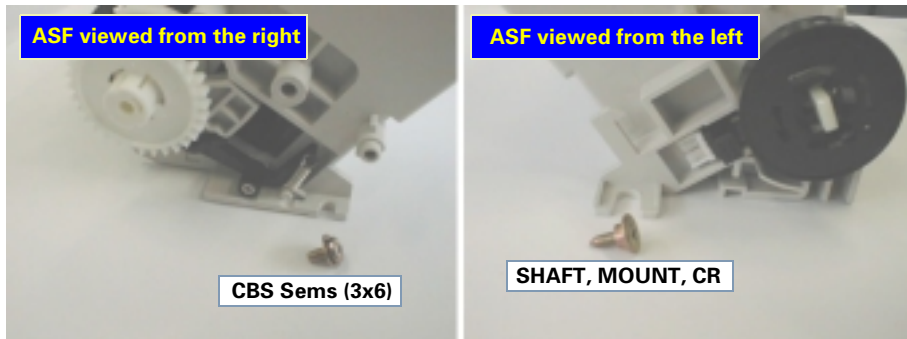
dis31

Figure 4-29. ASF Unit Removal (1)

6. Tilting the paper support sub unit, release the hook fixing the ASF Unit to FRAME, BOTTOM, and remove the ASF Unit toward the rear.

Paper Support Sub Unit
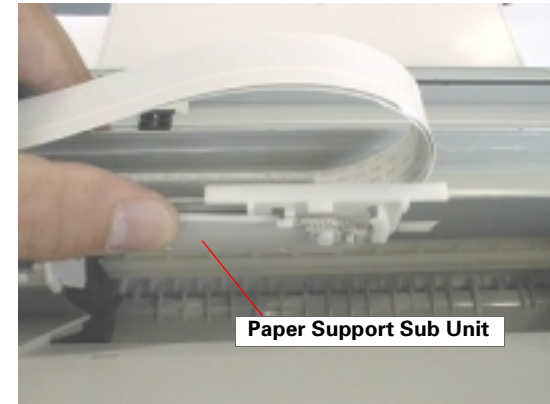
dis32

Figure 4-30. ASF Unit Removal (2)
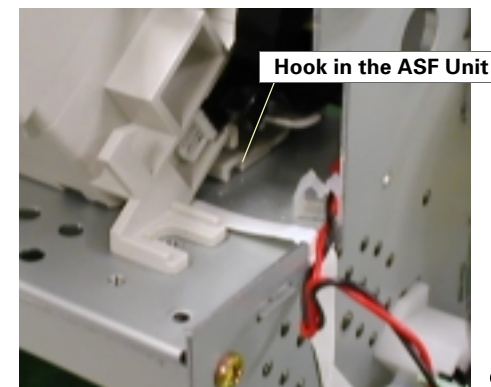
Hook in the ASF Unit

dis49

Figure 4-31. ASF Unit Removal (3)

CHECK POINT ✓

- When installing the ASF assembly to FRAME, BOTTOM, make sure the protrusion on the ASF fits in the installation hole in FRAME, MIDDLE. (See Figure 4-32.)
- When installing the ASF Unit, ensure the spur gear 32 in the ASF Unit and the inner gear of the combination gear (14, 28) in the DE Unit are meshed. (See Figure 4-32.)
- When installing the ASF Unit, make sure the Hopper Assembly is raised.

CHECK POINT ✓

- When connecting the cables for ASF HP sensor and MOTOR ASSEMBLY, PF, set them in the cable clamp in the rear left part of the ASF Unit as shown in the figure below:
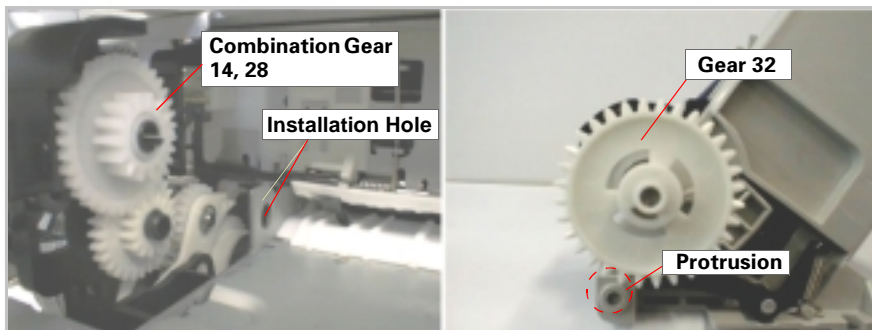
dis34

dis33
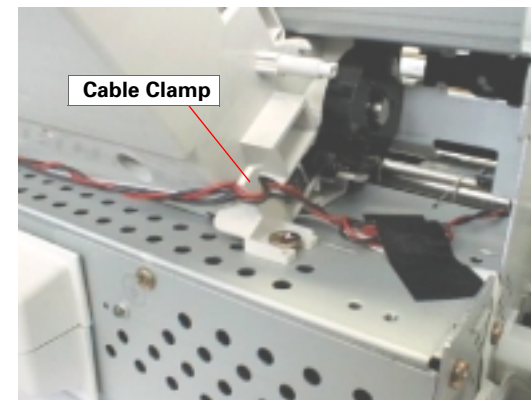
Figure 4-32. Check Points in ASF Assembly

4.2.10.1 SHAFT, ROLLER, LD Removal

1. Remove the ASF Unit. (Refer to Section 4.2.10.)

2. Releasing the hook on Gear, 32, remove the gear from SHAFT, ROLLER, LD.
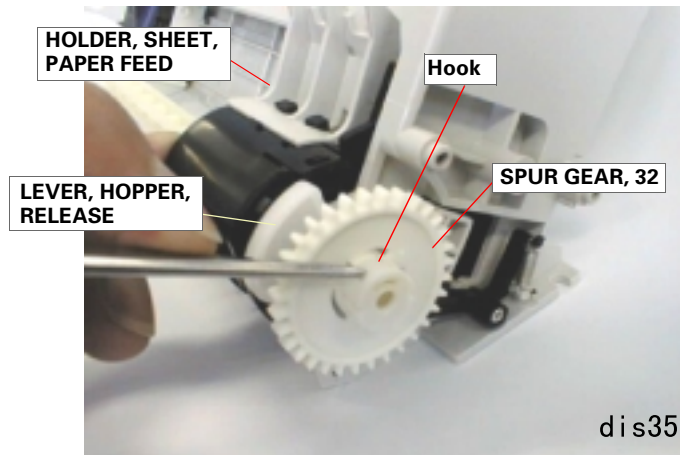
Figure 4-33. SPUR GEAR, 32 Removal

3. Remove LEVER, HOPPER, RELEASE from the right end of SHAFT, ROLLER, LD.

4. Remove HOLDER, SHEET, PAPER FEED from the right and left LD roller units.

5. Move the left LD roller assembly to the middle and then remove the E-ring from the left end of SHAFT, ROLLER, LD.

dis36
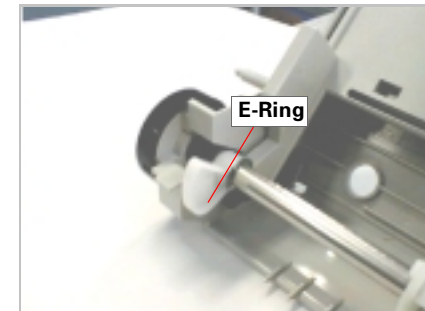
Figure 4-34. BUSHING, FIXING, SHAFT/E-Ring Removal

6. Move SHAFT, ROLLER, LD to the left.

7. Release the fixing tab in WHEEL, DETECTOR, and then remove WHEEL, DETECTOR from SHAFT, ROLLER, LD.

dis37
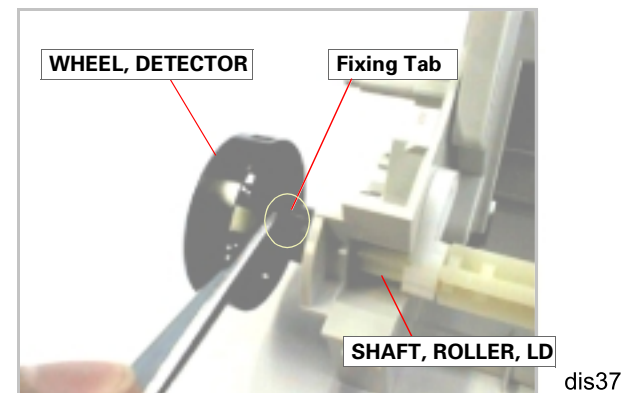
Figure 4-35. WHEEL, DETECTOR Removal

8. Release the Hopper Assembly from the pin in the top left corner of ASF, FRAME; B in the order indicated with arrows in the figure below.

dis38
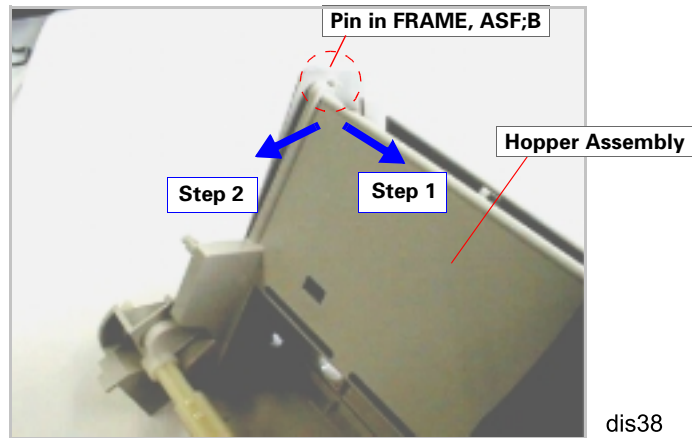
Figure 4-36. Hopper Assembly Removal (1)

9. Releasing the Hopper Assembly from the protrusion at the top right edge of FRAME, ASF; B, detach the arm of the Hopper Assembly from the square cutout in the right frame of FRAME, ASF; B.

dis39
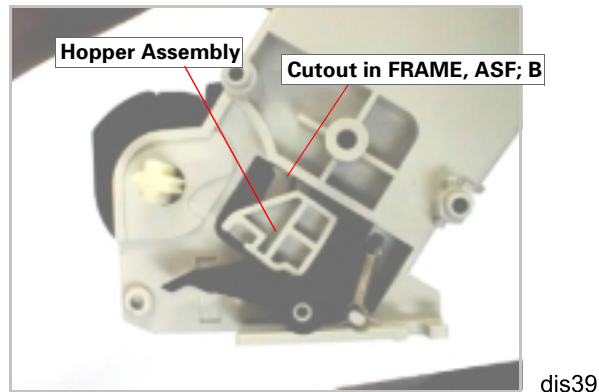
Figure 4-37. Hopper Assembly Removal (2)

10. Using tweezers, remove the left and right compression springs (1.961) from the Hopper Assembly and FRAME, ASF; B. (See Figure 4-38.)

11. Lifting up the right edge of SHAFT, ROLLER, LD a little, remove the shaft by pulling it out to the right along with LD rollers. (See Figure 4-38.)

12. Remove the left LEVER, HOPPER, RELEASE from SHAFT, ROLLER, LD. (See Figure 4-38.)

13. Remove the LD roller assemblies from SHAFT, ROLLER, LD. (See Figure 4-38.)
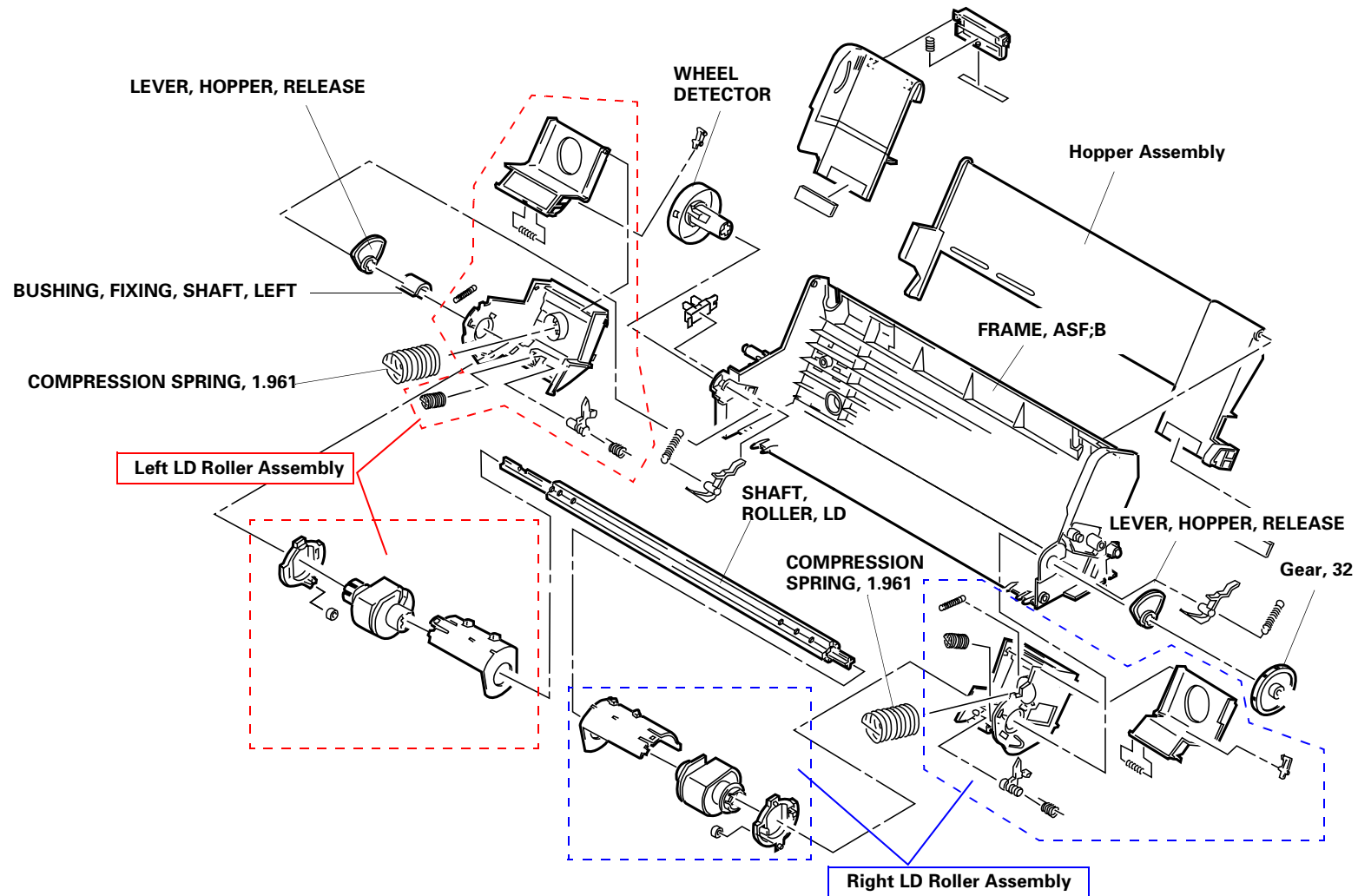
Figure 4-38. Hopper Assembly Removal/ASF Unit Disassembly

CHECK POINT ✓	■ While assembling the ASF Unit, be careful not to smear any parts with oil on the cam parts. If oil gets other parts, it should be wiped off.

■ While assembling the ASF Unit, be careful not to smear any parts with oil on the cam parts. If oil gets other parts, it should be wiped off.

■ When installing LEVER, HOPPER, RELEASE, set it in the correct direction. (See Figure 4-39.)

■ Be sure to attach the following parts to SHAFT, ROLLER, LD securely. (See Figure 4-38.)
  - BUSHING, FIXING, SHAFT, LEFT (white plastic part)
  - WHEEL, DETECTOR (black plastic part)

■ When installing the LD Roller Assemblies to SHAFT, ROLLER, LD, make sure the black one (right LD Roller Assembly) goes to the right.

■ When setting the right and left LD Roller Assemblies, align their grooves with the rail rib in FRAME, ASF; B. (See Figure 4-40.)

LEVER, HOPPER, RELEASE
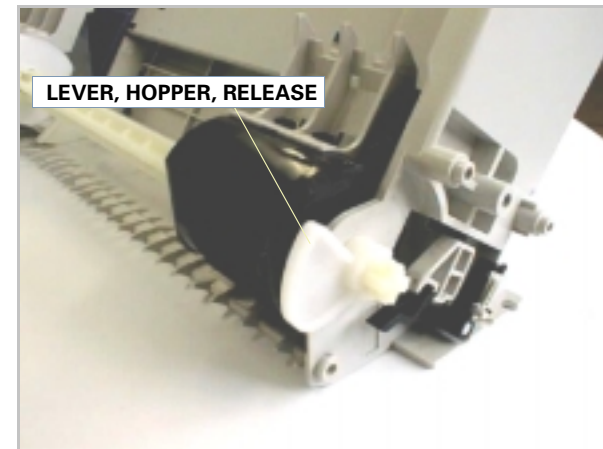
dis41

Figure 4-39. LEVER, HOPPER, RELEASE Installation

Groove in the LD Roller Assembly

Rail Rib in FRAME, ASF; B
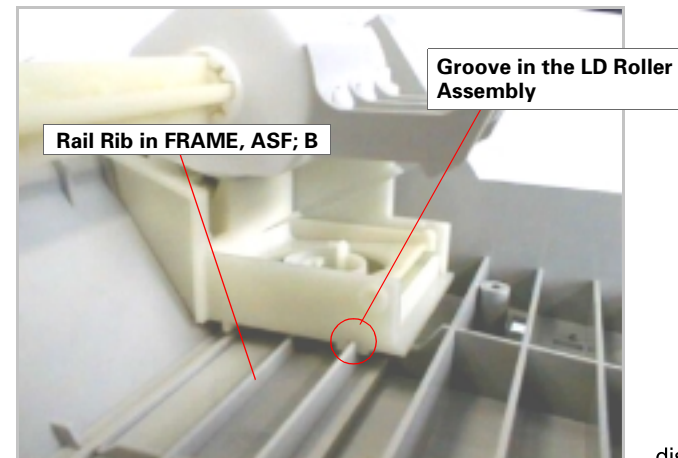
dis42

Figure 4-40. LD Roller Assembly Installation (1)

CHECK POINT ✔

■ When installing the edge guide to the left LD Roller Assembly, ensure that the rib in the LD Roller Assembly fits correctly into the groove in the edge guide. (See Figure 4-41.)

■ Make sure that the right LD Roller Assembly is fixed with the hook in FRAME, ASF; B. You can check its condition from the back of the ASF Unit. (See Figure 4-42.)

■ Before assembling the ASF Unit, hold each compression spring (1.961) with the hook of the spring bearing in the Hopper Assembly. Then, after attaching the Hopper Assembly to FRAME, ASF; B, release the springs from the hooks through the cutouts in the back of the frame. (See Figure 4-43.)

Hook in the FRAME, ASF; B

dis44

Figure 4-42. Hook Fixing the LD Roller Assembly

Groove in the Edge Guide

Rib in the LD Roller Assembly

dis43

Figure 4-41. LD Roller Assembly Installation (2)

Hooks

Compression Spring 1.961
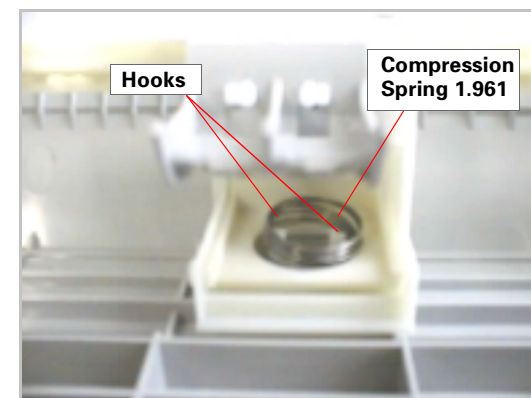
dis45

Figure 4-43. Holding Compression Spring with the Hooks

4.2.10.2 ROLLER ASSEMBLY, LD, RIGHT/LEFT Removal

1. Remove the ASF Unit. (Refer to Section 4.2.10.)

2. Remove SHAFT, ROLLER, LD. (Refer to Section 4.2.10.1.)

3. Release the hooks in COVER, ROLLER, LD, RIGHT/LEFT (two hooks in each) fixing itself to LD ASSEMBLY, RIGHT/LEFT, and then remove the COVER, ROLLER, LD, RIGHT/LEFT.

4. Release the hooks in ROLLER ASSEMBLY, LD, RIGHT/LEFT (two hooks in each) securing itself to LD ASSEMBLY, RIGHT/LEFT. Then remove ROLLER ASSEMBLY, LD, RIGHT/LEFT.

dis46
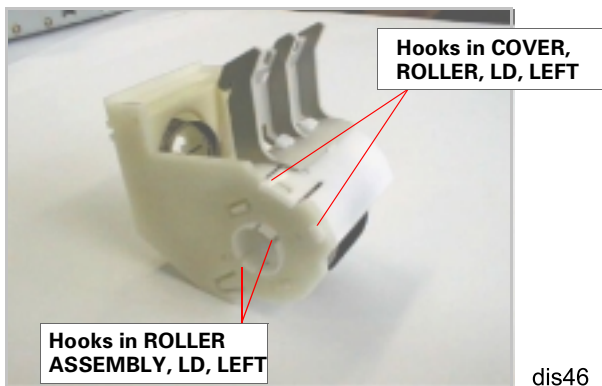
Figure 4-44. Hooks to Release
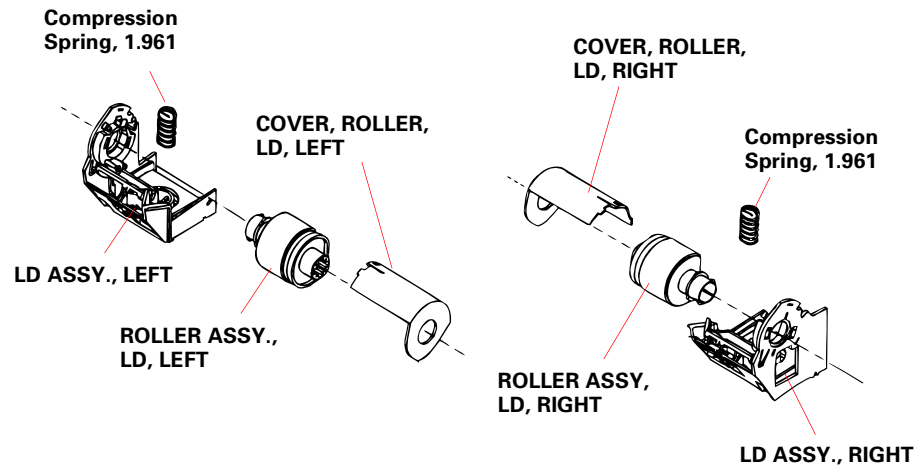
Figure 4-45. ROLLER ASSEMBLY, LD, RIGHT/LEFT Removal

CAUTION !	Do not touch the surface of the ROLLER ASSEMBLY, LD with your bare hands.

4.2.11 Carriage Unit Removal

1. Remove HOUSING. (Refer to Section 4.2.1)

2. Disconnect the head FFC from the printhead. (Refer to Section 4.2.4.)

3. Remove the Tension Spring 1.494 hanging SCALE, CR to the left side of FRAME, TOP. Then remove SCALE, CR.
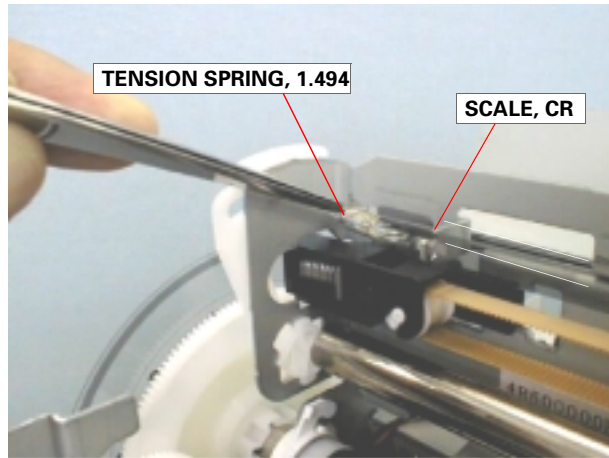
dis50

Figure 4-46. Remove the Tension Spring 1.491& CR Encoder Slit

4. Loosen the Timing Belt by pushing HOLDER, PULLEY, DRIVEN and disengage the belt from the pulley of the CR motor. (Refer to Figure 4-20.)

5. Push PULLEY, DRIVEN down and remove it from HOLDER, PULLEY, DRIVEN.
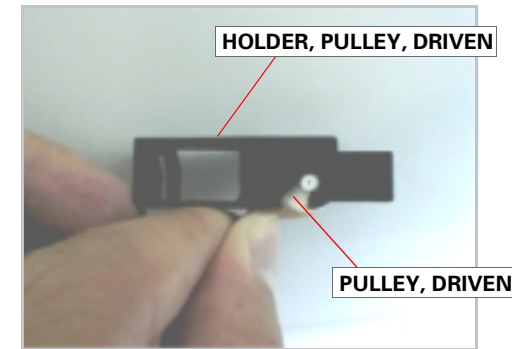
dis50

Figure 4-47. PULLEY, DRIVEN Removal

6. Remove the Timing Belt from PULLEY, DRIVEN.

7. Remove LEVER, PG by releasing its hooks from the cutouts in the right side of FRAME, TOP. Then remove the LEVER, PG.
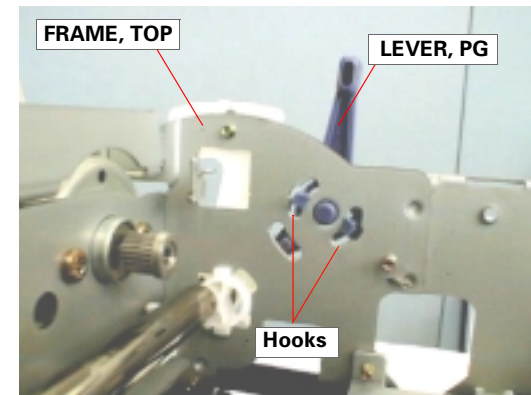
dis52

Figure 4-48. LEVER, PG Removal

8. Remove the torsion spring (63.7) hung onto FRAME, TOP and LEVER, PG.

dis53
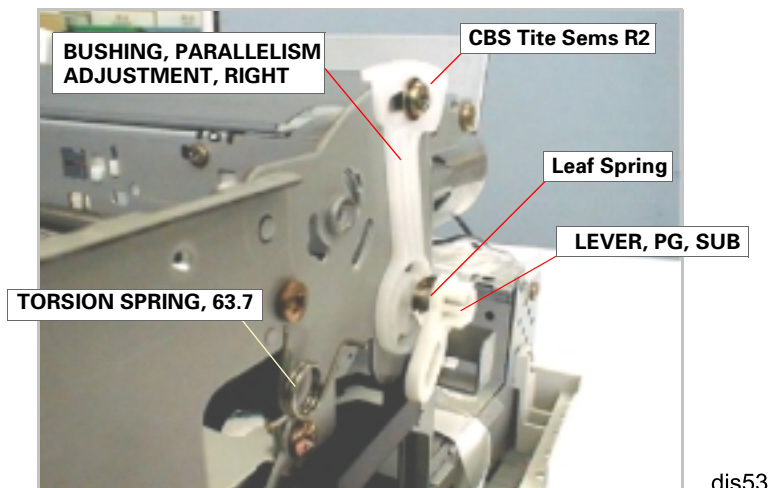
Figure 4-49. LEVER, PG, SUB Removal

9. Remove LEVER, PG from LEVER, PG, SUB.

10. Release the hook fixing LEVER, PG, SUB to SHAFT, CR, GUIDE. Then remove LEVER, PG, SUB and the one leaf spring (6.2x0.15x11).

11. Remove the one screw (CBS Tite Sems R2, 3x6) securing BUSHING, PARALLELISM ADJUSTMENT, RIGHT to FRAME, TOP.

12. Rotate BUSHING, PARALLELISM ADJUSTMENT, RIGHT to align its notch with the cutout in FRAME, TOP. Then remove the bushing.

dis54
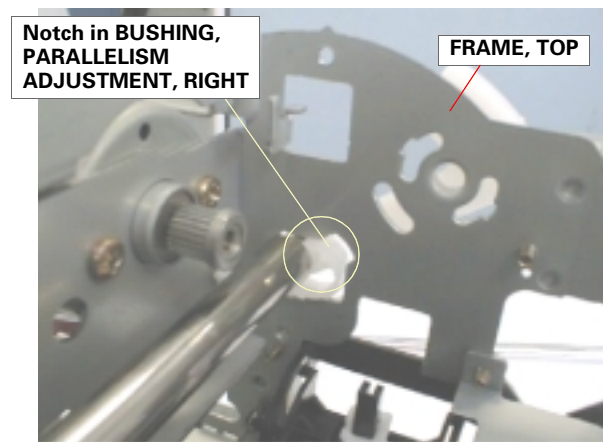
Figure 4-50.
BUSHING, PARALLELISM ADJUSTMENT, RIGHT Removal

13. Remove SHAFT, CR, GUIDE from FRAME, TOP together with the Carriage Unit.

14. Remove SHAFT, CR, GUIDE and the oil pad from the Carriage Unit.

CAUTION !	■ **Do not touch SCALE, CR (linear scale) with your bare hands, because if its surface is dirty or damaged, it will cause the carriage to operate abnormally.** ■ **Do not touch SCALE, PF (loop scale) with your bare hands, because if its surface is dirty or damaged, it will adversely affect paper feeding accuracy.**
ADJUSTMENT REQUIRED	■ **If you replace the Carriage Unit, perform the Platen Gap Adjustment.**

CHECK POINT ✔

- When installing the Leaf Spring (6.2x 0.15x11), set it with its convex side facing inward. Refer to Figure 4-49.
- After setting SCALE, CR through the slot for the sensor in the Carriage Unit, ensure that it is not in contact with either side of the slot by viewing them from the side.

Slit for the sensor

Carriage Unit

SCALE, CR

dis55
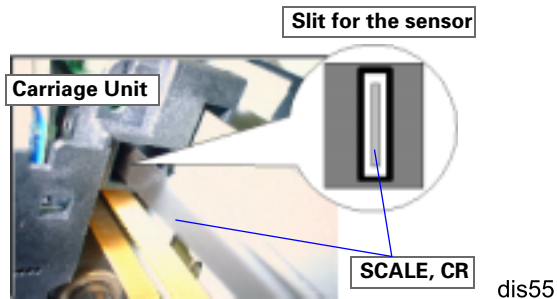
- When installing SHAFT, CR, GUIDE, make sure that the oil pad is set in the correct position.

4.2.12 BOARD ASSEMBLY, ENCODER Removal

1. Remove the head FFC. (Refer to Section 4.2.4.)

2. Pushing BOARD ASSEMBLY, ENCODER (linear encoder) to the rear, remove it upward.

BOARD ASSEMBLY, ENCODER

Carriage Unit

dis56
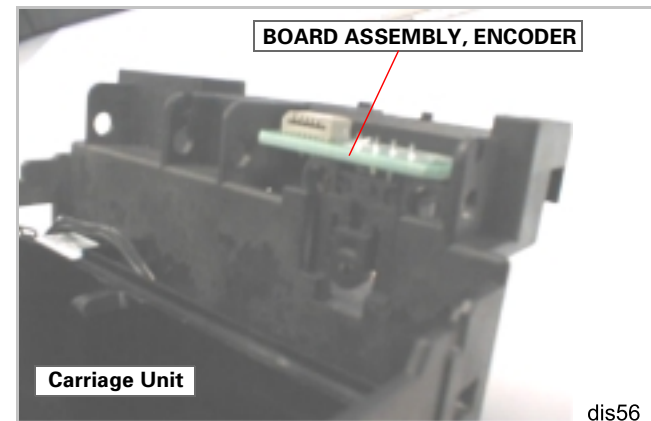
Figure 4-51. BOARD ASSEMBLY, ENCODER Removal

CAUTION !

- When removing BOARD ASSEMBLY, ENCODER, be sure not to force it out using a screw driver or equivalent. Otherwise, the sensor mounting position in the Carriage Unit may be damaged.
- When installing BOARD ASSEMBLY, ENCODER, be careful not to mar SCALE, CR.
- Make sure SCALE, CR and the sensor are not in contact.

4.2.13 ROLLER, PF Removal

1. Remove HOUSING. (Refer to Section 4.2.1)

2. Remove the Panel Unit. (Refer to Section 4.2.3.)

3. Remove HOUSING, PANEL, LEFT. (Refer to Section 4.2.5.)

4. Remove the ASF Unit. (Refer to Section 4.2.10.)

5. Remove the Carriage Unit. (Refer to Section 4.2.11.)

6. Remove the three screws (CBS, 3x6) securing GUIDE PLATE, CR Unit to FRAME, TOP. Then remove GUIDE PLATE, CR Unit.

dis57
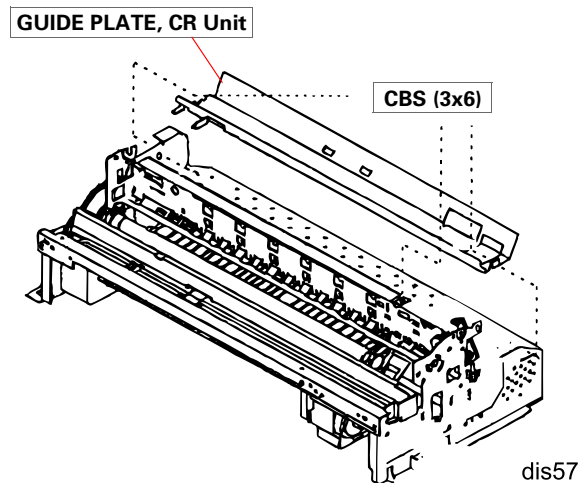
Figure 4-52. GUIDE PLATE, CR Unit Removal

7. Remove PAPER GUIDE, RIGHT Unit and the five PAPER GUIDE, UPPER Unit (eight for Stylus PHOTO 1270) from FRAME, TOP in the manner described below:

   ■ PAPER GUIDE, UPPER Unit
   Remove the torsion spring (117.6). Then remove the unit to the rear.

   ■ PAPER GUIDE, RIGHT Unit
   Remove the torsion spring (117.6). Then remove the unit to the front.

dis58
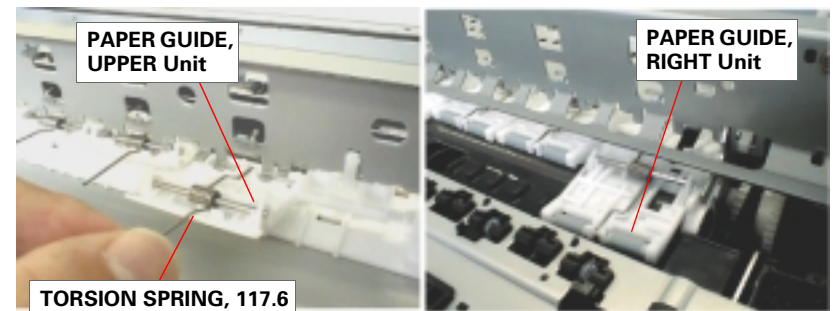
Figure 4-53. PAPER GUIDE, UPPER/RIGHT Unit Removal

8. Release the hook securing PAPER GUIDE, LEFT* to FRAME, TOP. Then shift the unit to the left first, and remove it to the rear.
   * PAPER GUIDE, LEFT is not assembled in Stylus PHOTO 1270.

9. Remove the three screws (CBS, 3x6) securing FRAME, TOP to the printer mechanism. Then remove FRAME, TOP.

10. Remove the three screws (CBS, 3x6) securing FRAME, PAPER EJECT Unit to the printer mechanism, and then remove FRAME, PAPER EJECT Unit.

11. Remove PAPER GUIDE, FRONT from ROLLER, PF by releasing its two U-shaped forks fixing ROLLER, PAPER EJECT.

12. Remove CONTACT SPRING, PAPER EJECT hung to FRAME, LEFT and ROLLER, PAPER EJECT.
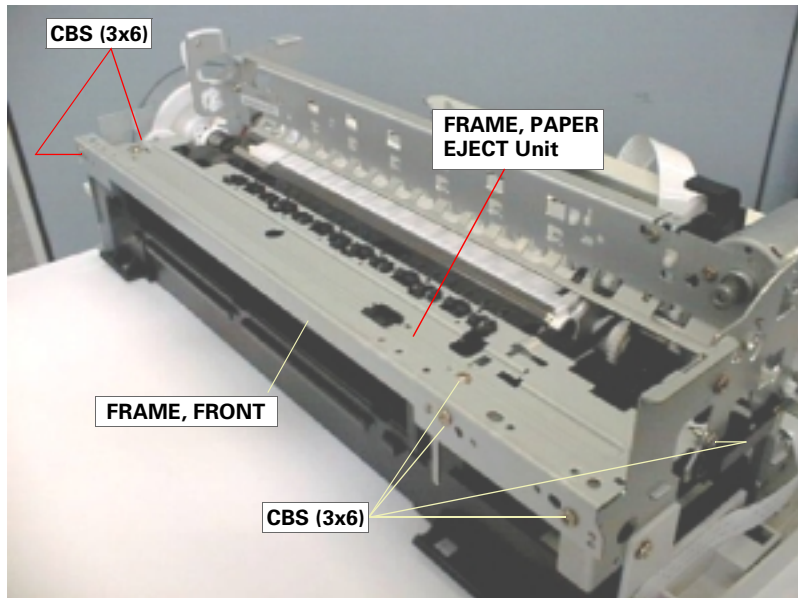
dis60

Figure 4-54. FRAME, FRONT/FRAME, PAPER EJECT Removal
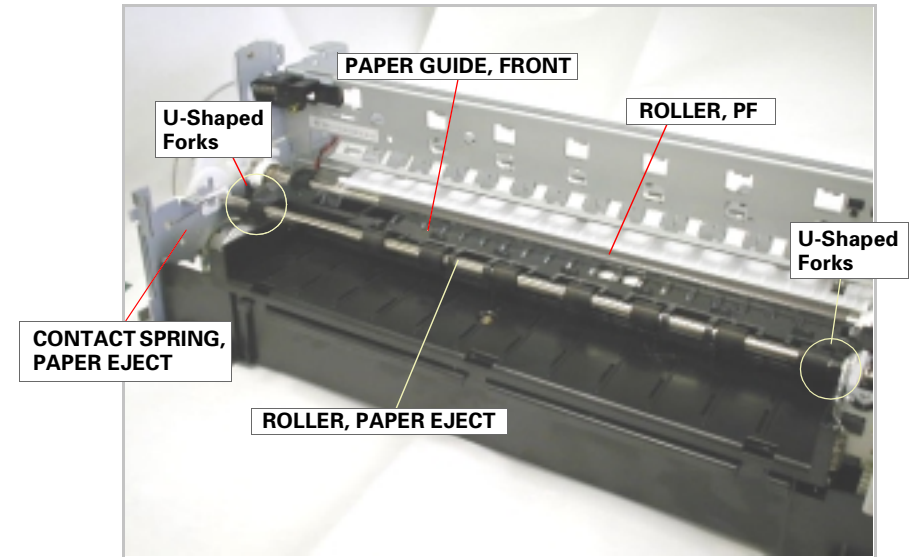
dis61

Figure 4-55. PAPER GUIDE, FRONT Removal

13. Raise the two bushings (6) attached to the right and left ends of ROLLER, PAPER EJECT to release them from FRAME, LEFT and FRAME, MIDDLE. Them remove ROLLER, PAPER EJECT.

dis62
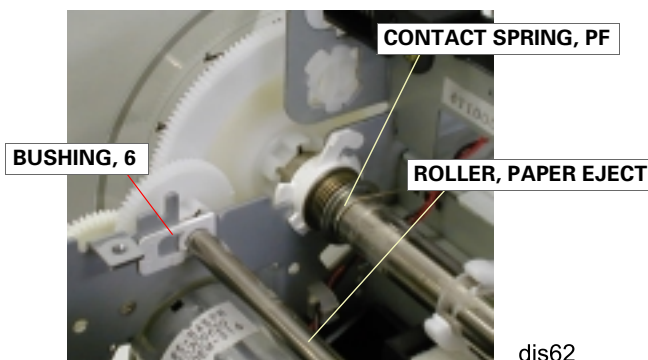
Figure 4-56. ROLLER, PAPER EJECT Removal

14. Remove the one screw (CBS, 3x6) securing BRACKET, BOARD ASSEMBLY to FRAME, LEFT together with BOARD ASSEMBLY, ENCODER (PF Encoder Sensor). Then remove BRACKET, BOARD ASSEMBLY.

dis63
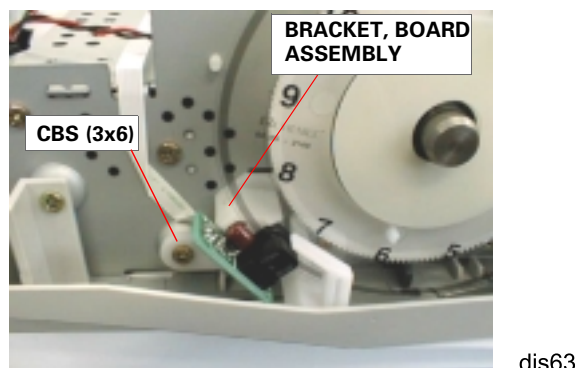
Figure 4-57. PF Encoder Removal

15. Remove CONTACT SPRING, PF hung to ROLLER, PF and FRAME, BOTTOM. (Refer to Figure 4-56.)

16. Unhook BUSHING, 12, LEFT attached to the left end of ROLLER, PF and then turn the bushing until it is aligned with the cutout in FRAME, LEFT.

17. Release ROLLER, PF from the hook in PAPER GUIDE, REAR, and then remove ROLLER, PF.

dis64
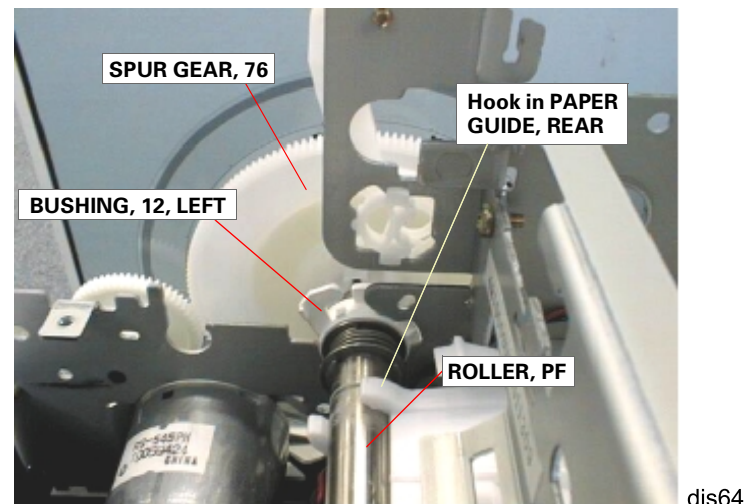
Figure 4-58. ROLLER, PF Removal

> **CAUTION !**
> - During disassembly/assembly, be careful not to bend or damage SCALE, PF.
> - Do not touch SCALE, PF with your bare hands. Also, be careful not to damage its surface since it is coated with special material to improve accuracy in paper feeding.
> - Avoid touching the tooth plane of SPUR GEAR 76 attached to the left end of ROLLER, PF. (See Figure 4-58.)

<table>
<tr>
<td>

CHECK POINT ✔

</td>
<td>

■ **When installing PAPER GUIDE, RIGHT to FRAME, TOP with the torsion spring, insert PAPER GUIDE, RIGHT Unit from the front making sure the PE sensor lever is set in the hole of the paper guide.**

</td>
</tr>
</table>

dis65
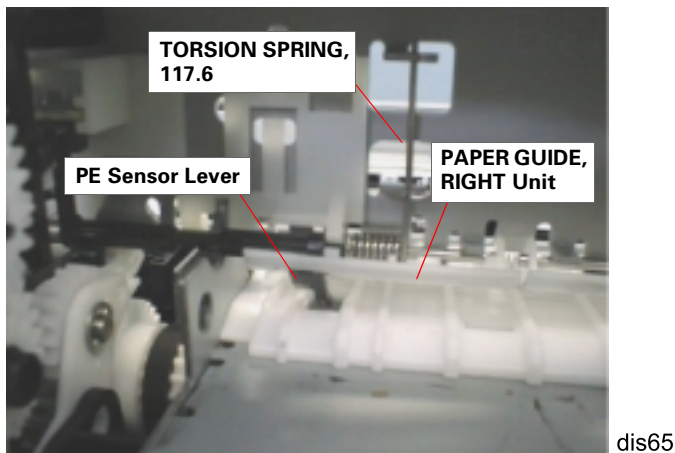
Figure 4-59. PAPER GUIDE, RIGHT Installation

■ **When mounting the torsion springs (117.6) to PAPER GUIDE, UPPER / PAPER GUIDE, RIGHT, fit the arm of each torsion spring (117.6) in the groove of the corresponding paper guide.**

■ **When installing CONTACT SPRING, PF, fit the loop of the spring in the groove near the left end of ROLLER, PF.**

■ **If you replace SCALE, PF (loop scale) or SPUR GEAR (76), you are required to install a new SCALE, PF using the specified tools. (Refer to the next section.)**

4.2.13.1 SCALE, PF Installation

This section describes how to install the following parts:

■ SCALE, PF (Loop Scale)

■ BRACKET, SCALE

■ TAPE, D50 (Double-sided adhesive tape)

1. Get "Mounting Plate Scale Attachment tool". (AS Tool code: 1051765)

2. Place BRACKET, SCALE on the tool with its taped side facing upward.

3. Peel off the protection sheet from the tape on BRACKET, SCALE.

dis69
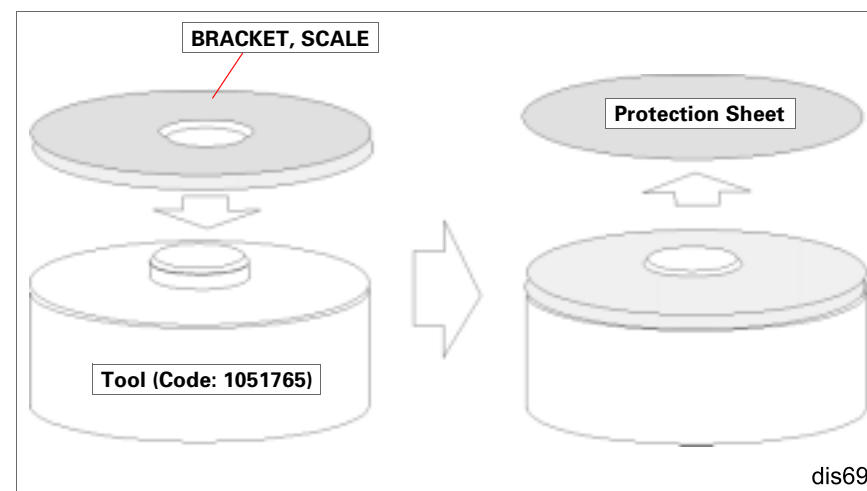
Figure 4-60. Pre-operation for BRACKET, SCALE Installation

4. Set SCALE, PF onto BRACKET, SCALE with its front side facing downward.
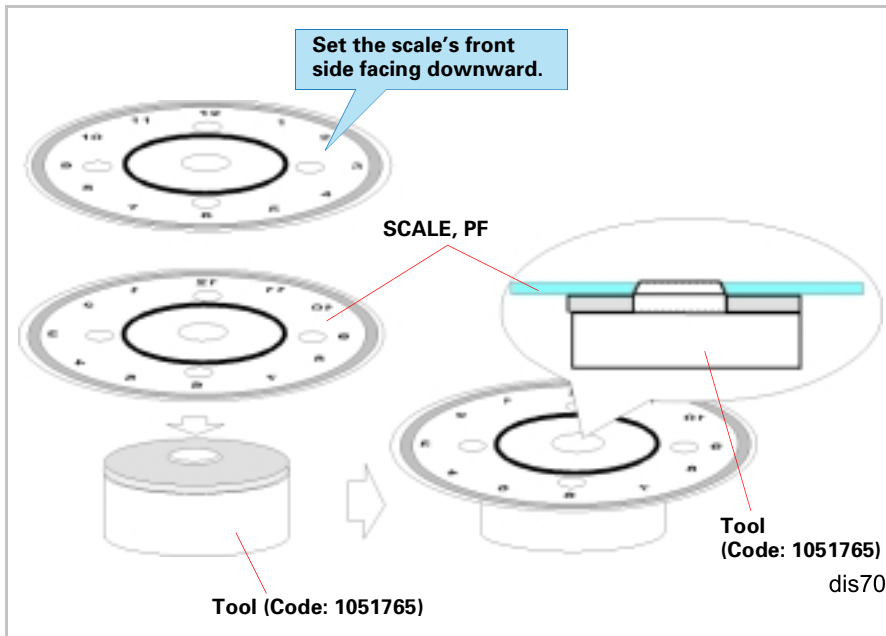
Figure 4-61. Attaching SCALE, PF

> **CAUTION**
> !
> ■ **Do not touch the following areas:**
>   - **Inner side of the SCALE, PF's shaft hole through which the PF Roller Shaft is installed.**
>   - **Printed face of SCALE, PF**
> ■ **If BRACKET, SCALE is not aligned with the circle printed on SCALE, PF, it should not be a problem.**

5. Remove the base sheet of TAPE, D50 and stick it to SCALE, PF.
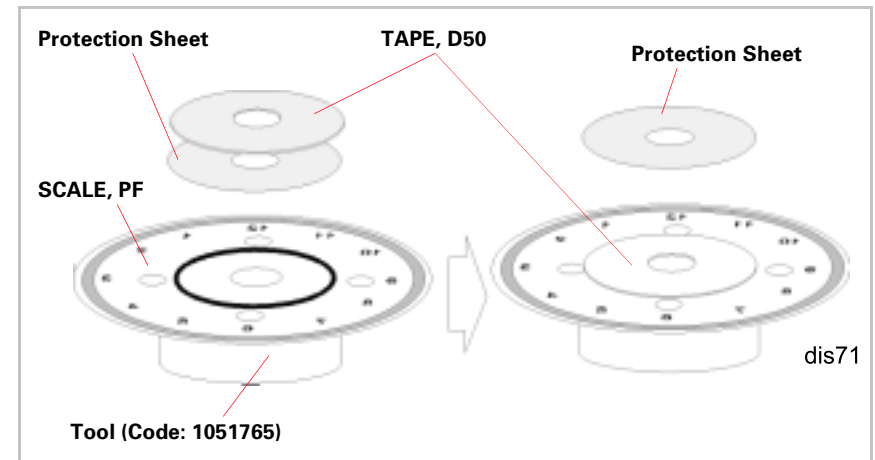
Figure 4-62. TAPE, D50 Installation

> **CAUTION**
> !
> ■ **If TAPE, D50 is not aligned with the circle printed on SCALE, PF, it should not be a problem.**

6. Peel off the protection sheet from TAPE, D50 on SCALE, PF.

7. Fit the round cutouts in SCALE, PF to the protrusions on SPUR GEAR (76) making sure the scale and the gear are parallel. But note you don't attach the scale to the gear yet.

8. Attach SCALE, PF to the gear using "Scale PF unit Assembling tool" (AS tool code: 1051767).
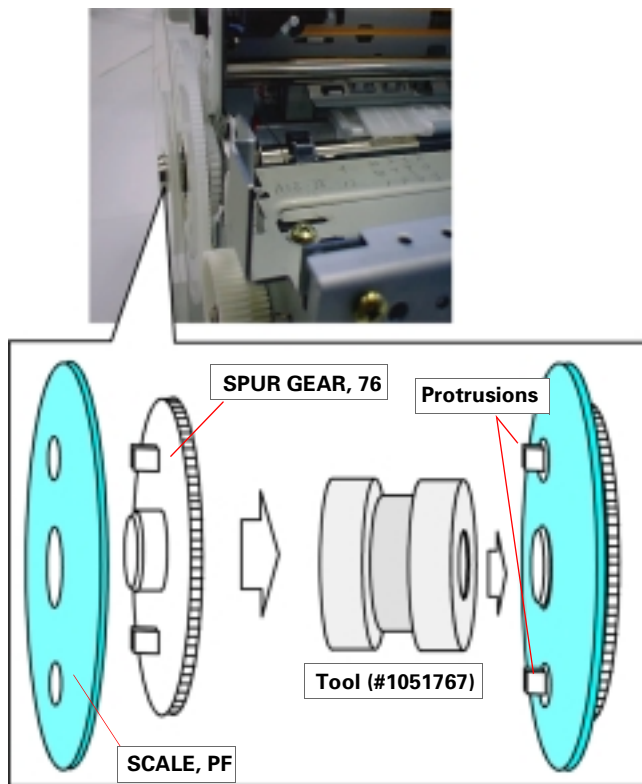
dis72

Figure 4-63. Loop Scale Installation

CHECK POINT ✓

■ **Check that the protrusions on the gear (76) are sticking out from the cutouts in the scale.**
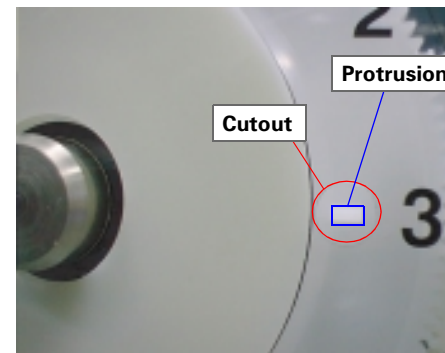
dis73

■ **Ensure SCALE, PF is free form any dirt or damage.**

4.2.14 MOTOR ASSEMBLY, PF Removal

1. Remove HOUSING. (Refer to Section 4.2.1)

2. Remove the ASF Unit. (Refer to Section 4.2.10.)

3. Remove the Carriage Unit. (Refer to Section 4.2.11.)

4. Remove ROLLER, PF. (Refer to Section 4.2.13.)

5. Remove the one plane washer (4.1x0.5x4.5) fixing the combination gear (13.5, 30) to FRAME, LEFT, and then remove the combination gear.
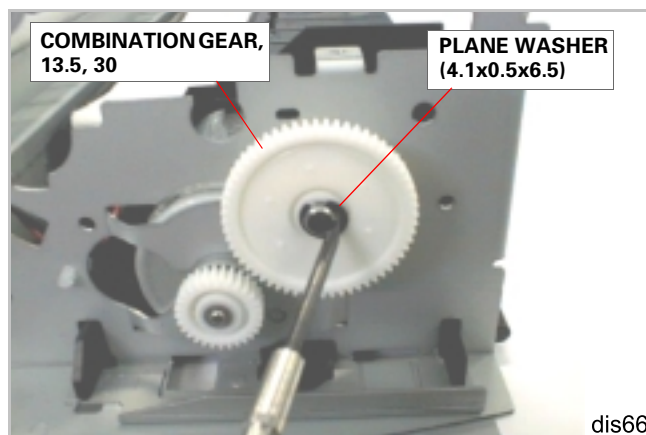
Figure 4-64. Removing COMBINATION GEAR and PLANE WASHER

6. Remove the one screw (CBS, 3x6), plane washer (3.3x0.5x8), and SCREW, MOUNTING, PF that are securing MOTOR ASSEMBLY, PF to FRAME, LEFT. Then remove MOTOR ASSEMBLY, PF.
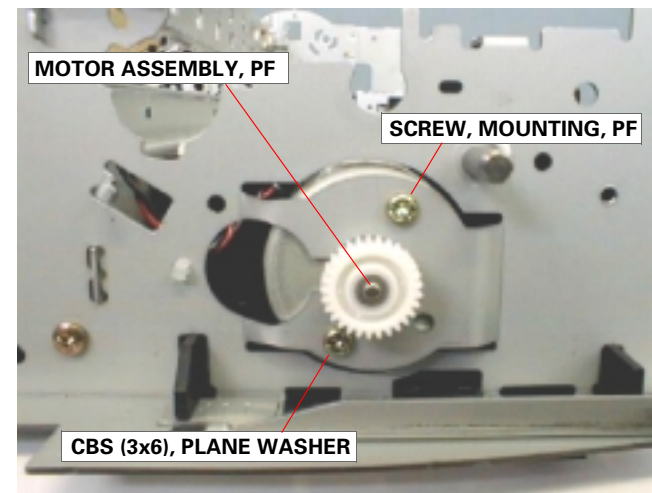
Figure 4-65. PF Motor Removal

CAUTION ⚠	Be careful not to damage the teeth of COMBINATION GEAR, 13.5, 30.

ADJUSTMENT REQUIRED 🔧	If you replace MOTOR ASSEMBLY, PF, adjust backlash for the PF pinion and SPUR GEAR, 76. (See Chapter 5.)

4.2.15 PE Sensor Unit Removal

1.   Remove HOUSING. (Refer to Section 4.2.1)

2.   Remove the ASF Unit. (Refer to Section 4.2.10.)

3.   Remove the DE Unit. (Refer to Section 4.2.9.)

4.   Remove PAPER GUIDE, RIGHT Unit. (Refer to Section 4.2.13.)

5.   Remove the timing belt. (Refer to Section 4.2.11.)

6.   Release the two hooks securing the PE sensor unit to FRAME, TOP, lift
     up the PE sensor unit, and then remove it to the rear.

dis68
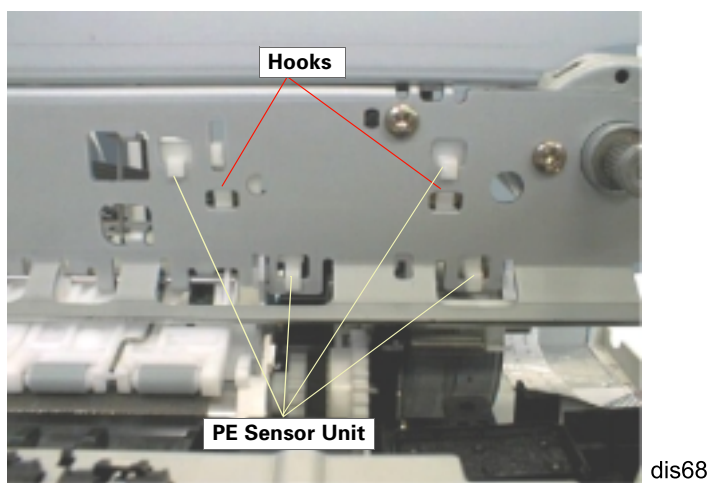
Figure 4-66. PE Sensor Unit Removal

CHECK POINT ✓

**When installing the PE Sensor Unit, ensure that the
sensor lever is set in the square hole in PAPER GUIDE,
RIGHT Unit. (See Figure 4-59.)**

ADJUSTMENT

5.1 Overview

This chapter describes adjustments required after you disassemble or replace Stylus PHOTO 2000P.

5.1.1 Adjustment Items

Table 5-1 lists the required adjustments. Be sure to make the adjustments by carefully following the indicated order and observing the instructions given in the figures.

Table 5-1. Adjustment Item

No.	Item	When to perform
1	**Parallelism Adjsutment**	• When you replace or remove the carriage guide shaft. • When you replace or remove the parallelism adjustment bushing.
2	**Backlash Adjsutment**	• When you replace the PF motor. • When you remove the Gear 76.
3	**Initial ink charge**	• When you replace or remove the printhead.
4	**Head voltage ID input**	• When you replace the printhead. • When you replace the main board. ***NOTE:*** *New head ID is not written until EEPROM is reset.*
5	**Head angular adjsutment**	• When you replace or remove the printhead. • When you change the printhead angular adjusting lever position.
6	**Bi-Directional adjustment**	• When you replace the printhead. • When you replace the main board. • When you replace the CR motor assembly. • When you remove the carriage unit.
7	**USB ID check/input**	• When you replace the main board.
8	**Protection counter check**	• When you replace the waste ink pad.

The table below lists the type of repair and required adjustments in the order to be made.

Table 5-2. Type of Repair and Required Adjustment

No.	Type of repair	Required adjustment
1	Printhead removal	1. **Initial ink charge** 2. **Head angular adjsutment** 3. **Bi-Directional adjustment**
2	Printhead replacement	1. **Head voltage ID input** 2. **Initial ink charge** 3. **Head angular adjsutment** 4. **Bi-Directional adjustment**
3	Main board replacement	1. **Head voltage ID input** 2. **Bi-Directional adjustment**. 3. **USB ID check/input**
4	Carriage unit replacement or removal	1. **Parallelism Adjsutment** 2. **Head angular adjsutment** 3. **Bi-Directional adjustment**
5	CR Motor replacement	1. **Bi-Directional adjustment**
6	Printer mechanism replacement	1. **Head voltage ID input** 2. **Initial ink charge** 3. **Bi-Directional adjustment**
7	Replacement or removal of the following parts. 1) PF motor 2) Gear 76 3) PF roller assembly	1. **Backlash Adjsutment**

5.1.2 Adjustment Tools

The table below shows adjustment tools you need for servicing the Stylus PHOTO 2000P.

Table 5-3. Adjustment Tools

Tool	Type of adjustment	Specifications
Thickness Gauge	**Parallelism Adjsutment**	Thickness: 1.14 mm
Microscope	**Backlash Adjsutment**	Magnified ratio: x 15 Minimum scale: 0.1mm
Service Program	• **Initial ink charge** • **Head voltage ID input** • **Head angular adjsutment** • **USB ID check/input** • **Bi-Directional adjustment** • **Protection counter check**	Two 3.5- inch HD floppy disks

CAUTION

!

■ **Never use a deformed (twisted or warped) or rusty thickness gauge.**

■ **Wipe off any dirt, grease, or foreign matter on the thickness gauge before you use it.**

5.2 Adjustment

This section explains the procedure for each adjustment.

5.2.1 Parallelism Adjsutment

When you remove/replace the carriage unit, make parallelism adjustment because you need to remove the parallelism adjustment bushings. This adjustment enables you to provide an appropriate distance between the printhead and platen as well as to set the CR guide shaft in parallel with the paper.

CAUTION !	■ **Do not scratch the special coated surface of the PF roller assembly and rib surface of the front paper guide;B.**
	■ **Before begin the adjustment, clean the thickness gauges with a clean cloth moistened with alcohol.**
	■ **Be careful not to damage the printhead surface or leave any dirt on it. (Make sure the thickness gauge is free from any stain, and also do not touch the head surface with the thickness gauge.**
	■ **Be sure to perform the Parallelism Adjsutment with the ink cartridges installed.**

1. Install the right and left parallelism adjustment bushings to the printer mechanism by aligning their marks with the notches on the frames.
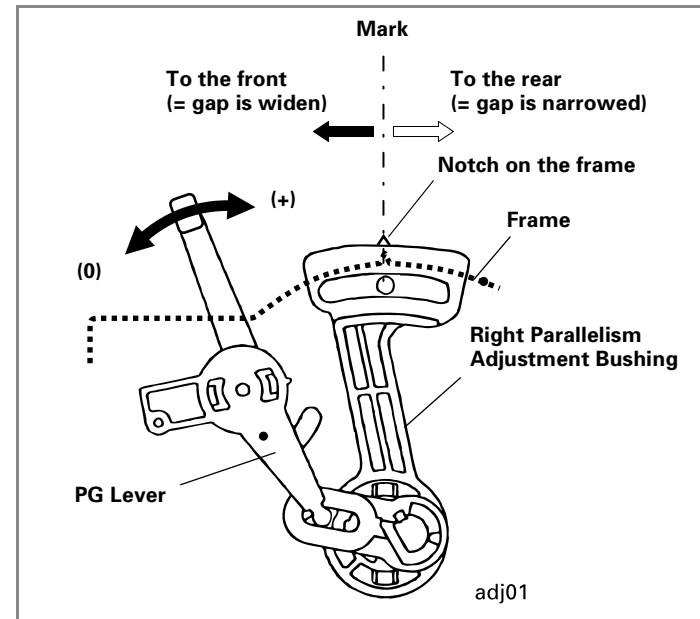
Figure 5-1. Initial Position of the Parallelism Adjustment Bushing

2. Bring the PG lever forward to set it to the (0) position.

3. If the carriage unit is locked, unlock it by pushing down the lock lever using tweezers.

4. Bring the carriage to the center of the printer mechanism. Then place the thickness gauges (1.14 mm) on the front paper guide aligning them with the right and left square cutouts in the front paper guide. (See Figure 5-2.)
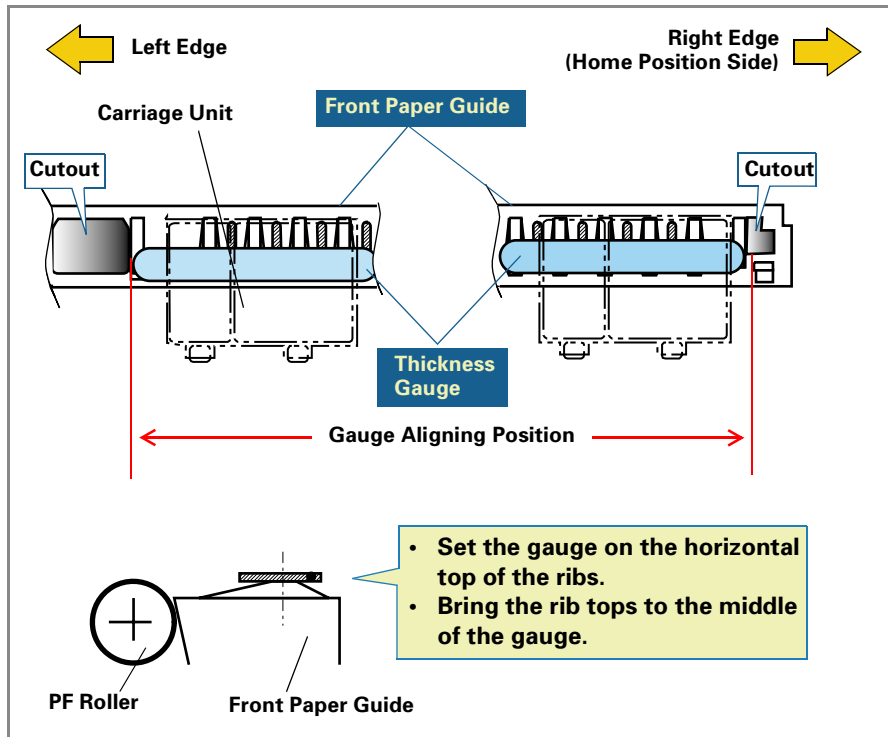
Figure 5-2. Placing the Thickness Gauge

Labels in figure:
- Left Edge
- Carriage Unit
- Front Paper Guide
- Cutout
- Right Edge (Home Position Side)
- Cutout
- Thickness Gauge
- Gauge Aligning Position
- PF Roller
- Front Paper Guide
- • Set the gauge on the horizontal top of the ribs.
- • Bring the rib tops to the middle of the gauge.

5. Move the carriage unit over the gauge on the right.

6. If the printhead does not touch the gauge, turn the bushing to the rear to make the printhead touch the gauge and then, from the touching position, bring the bushing back by one notch. On the other hand, if the printhead already touches the gauge, turn the bushing to the front to make the printhead touch the gauge, and then push the bushing back by one notch.

7. Move the PG lever to the rear (+).

8. Move the carriage unit over the thickness gauge on the left.

9. Bring the PG lever to the font (0).

10. Make the adjustment as in the same manner as in step 6.

11. Bring the PG lever to the rear (+).

12. Move the carriage back over the thickness gauge on the right.

13. Move the PG lever back to the front (0).

14. Make the adjustment again on the right parallelism adjustment bushing. If the result is good, the adjustment is completed.

15. Fix the both bushings with screws.

CHECK POINT ✔

■ **To move the carriage unit, pull the timing belt with your hand.**

■ **Be careful not to damage the CR scale (linear encoder).**

5.2.2 Backlash Adjsutment

This section describes **Backlash Adjsutment** that is to be made after removing the PF motor. This adjustment provides an appropriate backlash (= 0.1 mm or less) for PF motor pinion gear and the gear (76). You need to make this adjustment when you replace any of the following parts:

- PF motor assembly
- Gear 76
- PF roller unit

CAUTION !	Failure in making this adjustment causes the printer to operate abnormally as described below:
	■ **If backlash is too little:**
	    1. **The PF motor dose not rotate correctly and paper feeding accuracy declines.**
	    2. **Gear 76 and the PF pinion gear make abnormal noises during printing.**
	■ **If backlash is too large, the PF motor dose not rotate correctly and paper feeding accuracy declines.**

Before you begin, make sure the following parts are removed:

- COMBINATION GEAR, 13.5, 30
- TRAY, ABSORBER ASSEMBLY
- HOUSING, PANEL, LEFT
- HOUSING, REINFORCING, LEFT

See the following figure for locations.
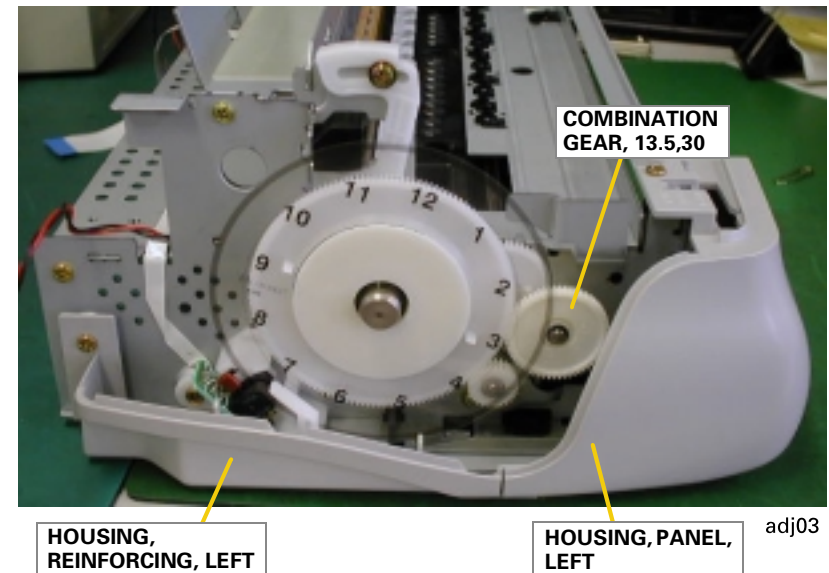
Figure 5-3.   Parts to Remove

CAUTION !	Be careful not to damage the PF Loop scale when removing COMBINATION GEAR, 13.5, 30.

1. Loosen the screw (CBS, 3x6) securing the PF motor assembly to the left frame by rotating it half.

2. Holding the PF motor assembly, get the pinion mesh the gear 76.

3. Press the gear 76 by the point 2 in the figure below lightly and release it to ensure the gear comes back to its original position.

5. Fasten the screw (CBS, 3x6) to secure the PF motor assembly to the left frame.

6. Press the gear 76 by the point 2 and release it again to ensure it returns to its original position.

7. Using a microscope, check for a correct backlash. Backlash at its minimum point should be 0 - 0.1 mm. If larger, repeat the adjustment.
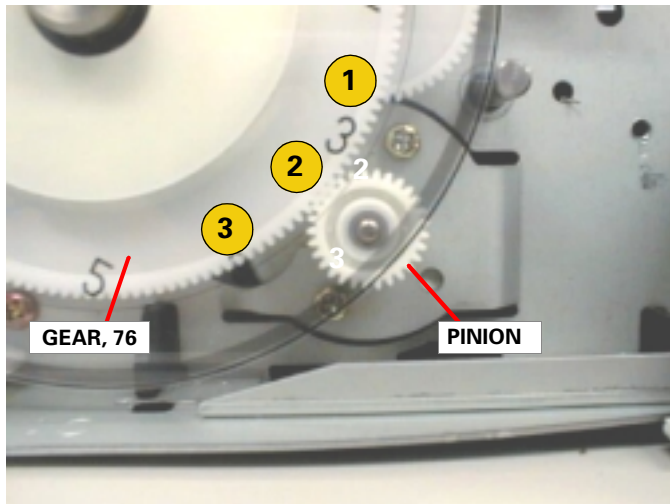
adj04

Figure 5-4. Checking for Gear Engagement

CAUTION ! When pressing the gear 76 together with the PF scale, be careful not to damage or stain the scale.
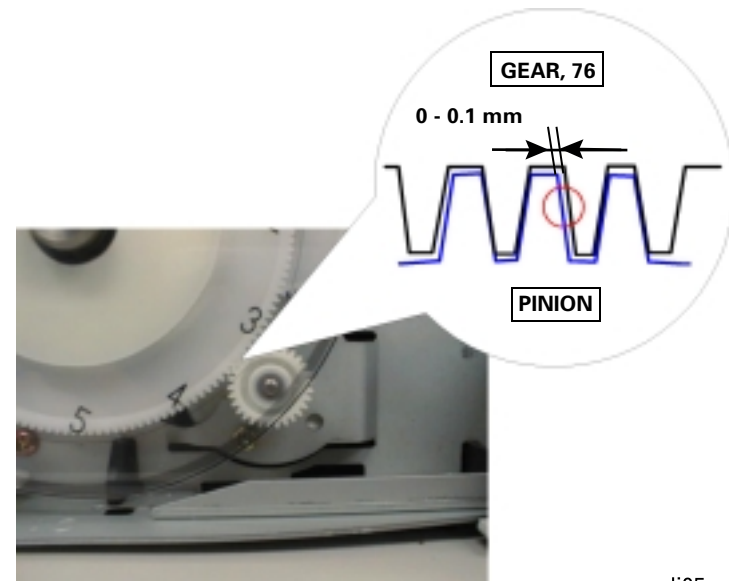
adj05

Figure 5-5. Checking for the Backlash

4) Press the gear by the indicated positions 1 and 3 (each point is 2.5 cm apart from the point 2) and check that the gear squeaks at each point. If not, start over from the step 2.

5.2.3 Using the Adjustment Program

Each product has its unique information on the main board to maintain its print ability and quality at an optimum level. For this reason, you need to write the correct information of the printer mechanism to the main board using the adjustment program whenever you replace either printer mechanism or main board.

5.2.3.1 About the Adjustment Program

The basic adjustment items you can perform using this program are as shown below:

Table 5-4. Adjustments Using the Program

No.	Main Items	Adjustment items
1	Adjustment	Head voltage ID input
		Head angular adjsutment
		Bi-Directional adjustment
		USB ID check/input
2	Maintenance	Head cleaning
		Initial ink charge
		Protection counter check/clear
		CSIC information
3	Recovery for clogged nozzle	Recovery for clogged nozzle
4	Print A4 pattern	Print A4 pattern

5.2.3.2 How to Install the Program

Before installing the program, note the points below:

- Use Windows 95 or 98.

- Use LPT 1 only as the printer port. (Use a USB interface cable only when performing **USB ID check/input**.)

Install the program in the order listed below:

1. Insert "Disk1" to the 3.5" floppy disk drive of your computer, and then execute "Setup.exe".

2. As the wizard askes, insert "Disk2", and the installation is done.

3. Click **Stylus Photo 2000P.exe** icon created in Program Files \ Adjustment Program \ Stylus Photo 2000P folder to execute the program.

> **CAUTION**
>
> - While you are running the service program on Windows 95/98, you can not use EPSON Status Monitor. Therefore, close the printer window on the task bar before you start the program.
> - If you can not start the program because LPT1 is set to *ECP Printer Port*, turn it off in the order below:
>   1. Delete all printer drivers.
>   2. Access *Control Panel>System>Device Manager>Ports* and delete *ECP Printer Port*.)
>   3. Reboot the computer.
> - If you leave the printer in a non-printing status for 5 minutes or more, the carriage automatically returns to home position. In this case, you need to reboot the computer to run the program.
> - Do not change the setting for *Font size* in *Display settings*.
> - Be sure to connect a parallel interface cable to the printer before you start the program. Otherwise, the program freezes.
> - Do not send any command to the printer during a check pattern print.
> - While the service program is running, if the printer is turned off or the interface cable is disconnected, you need to launch the program again.

5.2.3.3 How to Uninstall the Program

Access Control Panel> Add/Remove Programs and uninstall the program.

5.2.3.4 Starting the Adjustment Program

1. Launch the service program. The initial window appears:

Figure 5-6. Initial Window

2. Select the model name and port and click **OK**. The main menu appears:

Figure 5-7. Main Menu

5.2.4 Head voltage ID input

This function lets you write the head ID to the EEPROM on the main board. You need to make this adjustment if you replace any of the following parts:

- Printhead
- Control board
- Printer mechanism

> **CAUTION**
> !
>
> - If you replace the printhead, control board, or printer mechanism, make this adjustment prior to any other adjustment items.
> - This adjustment is very important to keep good printer performance. If an wrong ID is input, the printer will exhibit a dot missing problem or does not print at all.
> - After making this adjustment, perform all other necessary adjustments listed in Table 5-2.

5.2.4.1 Where to Find the Head ID

You can find the head ID on the following units.

☐ Printhead
A 14-digit head ID is marked on the label at the right of the printhead as shown in Figure 5-8:

The ID starts from the top left and continues to the right. So, in the example on the right, the head ID is "**W2XU3Y2UTK1Q1L**".

adj11
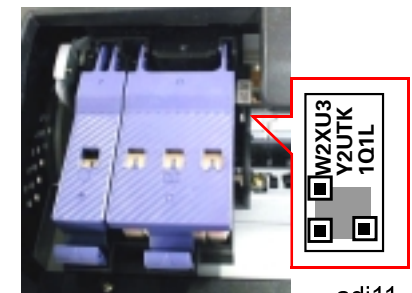
Figure 5-8. Head ID Sample

☐ Printer mechanism
The head ID is shown on the label attached to the packing box surface in the same way as for the printhead.

5.2.4.2 Check Present Data

1. Start the service program and get to the main menu.

2. Select **Head voltage ID input** from the main menu. The Head voltage ID input window appears.

Figure 5-9. Head Voltage ID Input Menu

3. Select **Check present data** and click **OK**. The head ID read from the EEPROM appears as in the example below:
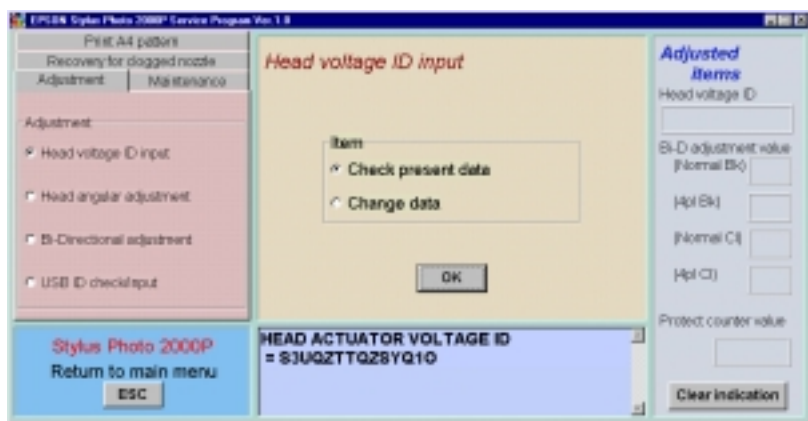
Figure 5-10. Check Present Data Window

5.2.4.3 Change Data

1. Start the service program and get to the main menu.

2. Select **Head voltage ID input** from the menu. The head voltage ID input window appears. (See Figure 5-9.)

3. Select **Change data** and click **OK**. The change data window appears.

4. Type the head ID and click **OK**. You see the typed head ID in the small window:
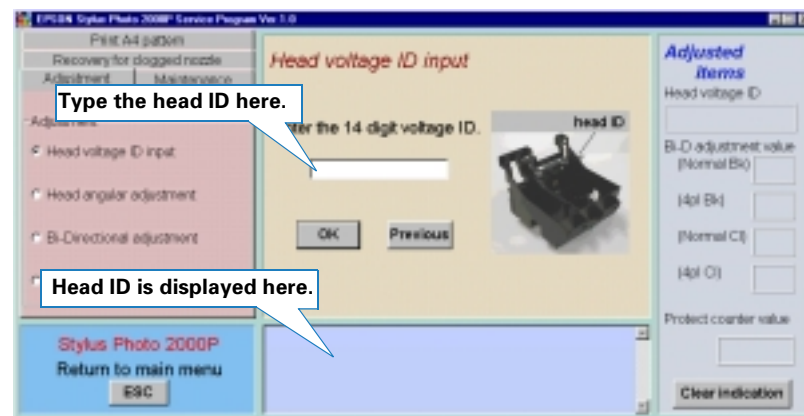
Figure 5-11. Change Data Window

| CAUTION ! | The ID input to EEPROM is not effective until the printer is next turned on. |

5.2.5 Head angular adjsutment

During production process, tolerance in carriage unit and printhead size occurs, which may cause the printhead to be installed at an incorrect angle. Therefore, if you do not make this adjustment, color overlapping is not performed correctly and color/white line problem occurs as a result.

To change the head angle, use the adjust lever on the right side of the carriage unit.

You are required to make this adjustment under any of the following circumstances:

- ■ You replace the printhead.
- ■ You replace the carriage unit.
- ■ You change the adjust lever setting.

The adjustment lets you run a test pattern to which you refer to obtain the suitable head angle.

CAUTION !	Before/after this adjustment, perform all necessary adjustments listed in Table 5-2.

1. Loosen the two screws (CBP, 3x6) securing the head fastener to the carriage and the one screw (CBB Sems W2, 2.5x6) securing the printhead to the carriage. (Refer to Chapter 4.)

2. Start the service program and get to the main menu.

3. Select **Head angular adjsutment** from the main menu. You see the Head angular adjustment window.
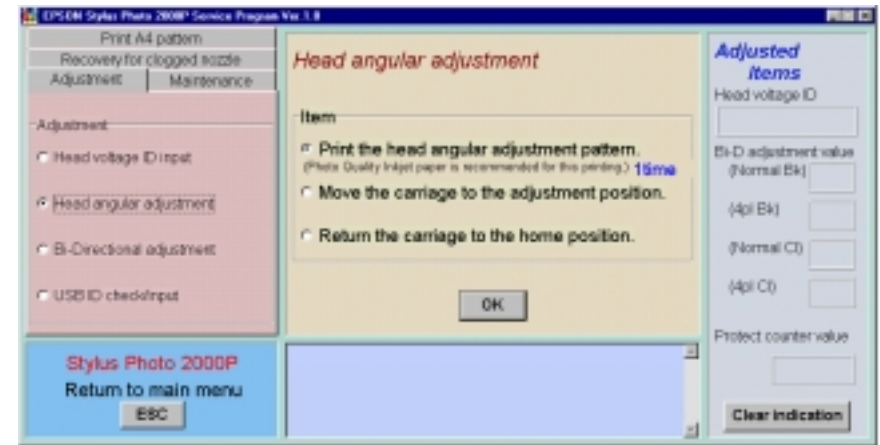
Figure 5-12. Head Angular Adjustment Window

4. From the head angular adjustment menu, select **Print the head angular adjustment pattern** and click **OK**. The following test pattern prints.

adj18
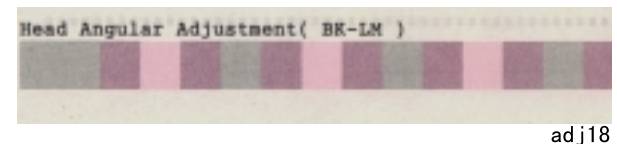
Figure 5-13. Head Angular Adjustment Pattern Example

5. As in the example, the adjustment pattern prints in black and magenta. If the result is not correct as shown in the example in Figure 5-14, select **Move the carriage to the adjustment position,** and the carriage automatically moves to the left end to let you move the adjust lever easily. Then, moving the lever as instructed in Figure 5-14, adjust the printhead angle.

Adjust Lever

Move the lever forward. | Correct condition | Move the lever backward.
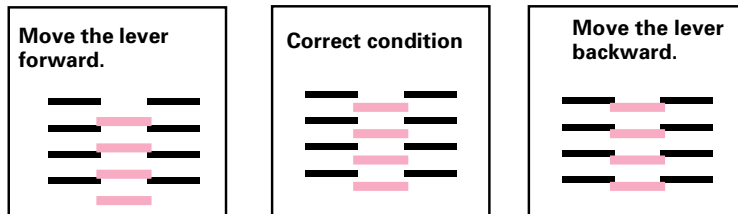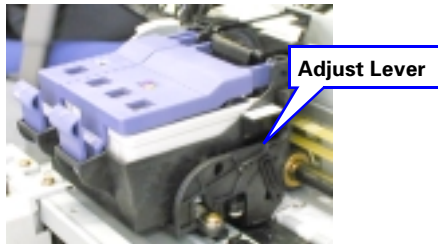
adj17

Figure 5-14. Use of the Adjust Lever

6. After moving the lever, select **Move the carriage to the home position** and click **OK**. The carriage unit returns to the home position.

7. Select **Print** the **head angular adjustment pattern** and click **OK** to print another test pattern.

8. Repeat the steps 5 - 7 until the result is good.

9. When the adjustment is done, fasten the screws.

10. Run the adjustment pattern again for confirmation. If the result is not satisfactory, start over the adjustment.

11. If you need to continue to the next adjustment, return to the **Head angular adjsutment** window and select it from the menu. To exit the program, press the **Esc** button.

CAUTION

■ **Adjustment pattern does not print unless the carriage is in the home position.**

■ **During the adjustment, be careful not to leave the carriage unit out of the home position too long.**

■ **The setting value stored in EEPROM is not effective until the printer is next turned on.**

5.2.6 Bi-Directional adjustment

This adjustment is required when line misalignment (incorrect print timing) between the two directions (from left to right and vice versa) is noticed. The adjustment value is memorized in EEPROM on the main board. You need to make this adjustment under any of the following conditions:

- You replace the printer mechanism.
- You replace the main board.
- You remove the CR motor.
- You remove the CR unit.

Bi-D pattern prints only with color inks.

NOTE: *You are recommended you should make this adjustment if you disassemble the carriage mechanism.*

1. Starts the service program and get to the main menu.

2. Select **Bi-Directional adjustment.** The Bi-Directional adjustment window appears.

Figure 5-15. Bi-Directional Adjustment Window

3. In the Bi-D adjustment window, select **Print the Bi-D adjustment patterns** and click **OK**. The Print the Bi-D adjustment pattern window appears.

4. In the Print the Bi-D adjustment pattern window, click **OK**. The Bi-D pattern begins to print. It prints in the Normal-dot (Black), Normal-dot (Color), Variable-dot 4pl (Black), Variable-dot 4pl (Color) mode, and each of them shows patterns using three data; the center

5. value in the middle and plus and minus 2 of the center value.
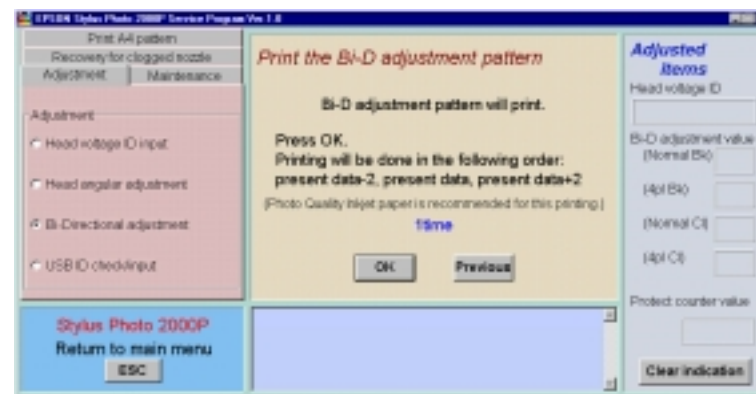
Figure 5-16. Print the Bi-D Adjustment Pattern Window

6. In the Bi-Directional adjustment window, select **Adjust** and click **OK**. The Bi-D adjustment window appears.
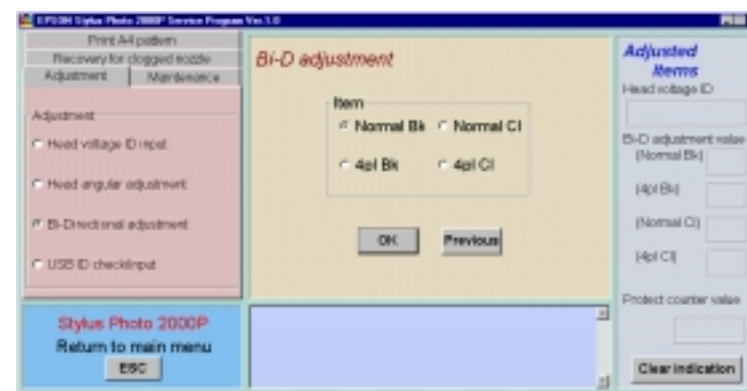
Figure 5-17. Bi-D Adjustment Item

7. In the Bi-D adjustment window, select the desirable item and click **OK**. The Adjust window for the selected print mode appears.
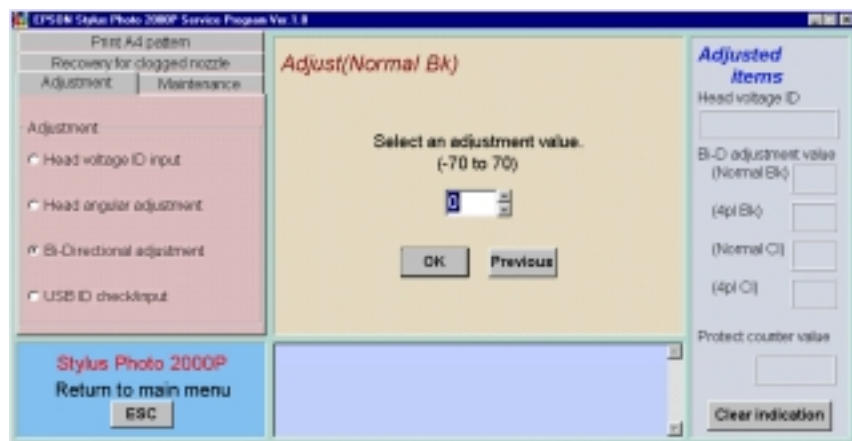
Figure 5-18. Bi-D Value Select Window

8. Referring to the printout, input the setting value using the ↑ or ↓ key or directly type it in.

9. Click **OK**. The setting value is written.

10. Repeat the steps 4 to 8 until you get the best result.

11. In the Adjustment window, select **Check present adjustment data** and click **OK**.

12. The present adjustment value is displayed.
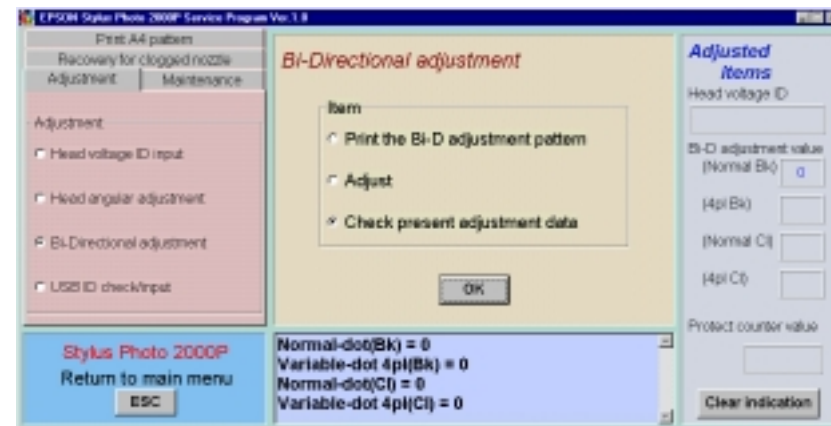
Figure 5-19. Check Present Adjustment Data Window

13. Click **Continue** to go back to the Bi-D adjustment window.

> ⚠ **CAUTION**
>
> **The setting value is not effective until the printer is next turned off and back on. It is because the setting value is stored in EEPROM when the printer is turned off.**

5.2.7 USB ID check/input

You are required to perform **USB ID check/input** whenever you replace the main board.

The Stylus PHOTO 2000P is equipped with the USB interface as standard. In the Windows 98 or iMAC environment, the USB port driver controls its device using the USB ID stored in EEPROM. Therefore, you need to input a unique USB ID for a new main board.

A USB ID, a 18-digit character string, is stored in a specific address of EEPROM. At factory, it is built up as shown below:

■ Factory product line number... 3 digits

■ PC number... 2 digits

■ Year/month/date... 12 digits (Time data in the PC is assigned.)

■ "0"... 1 digit

During a repair service, a new USB ID is formed with a 10-digit product serial number and the rest (8-digit) produced by the service program. You need to input the new USB ID in EEPROM.

CAUTION	**You need to input a new USB ID for the following reasons:**
!	**1. If the main board is replaced, the ID for the board is no longer good.** **2. If the ID is in conflict with an ID used for any other peripheral devices, the printer can not be connected with a USB interface.**

5.2.7.1 Inputting/Checking the USB ID

1. Starts the service program and get to the main menu.

2. Select **USB ID check/input.** The USB ID check/input window appears.

Figure 5-20. USB ID Check/Input Window

3. Select **Input USB ID**. The USB ID input window appears.
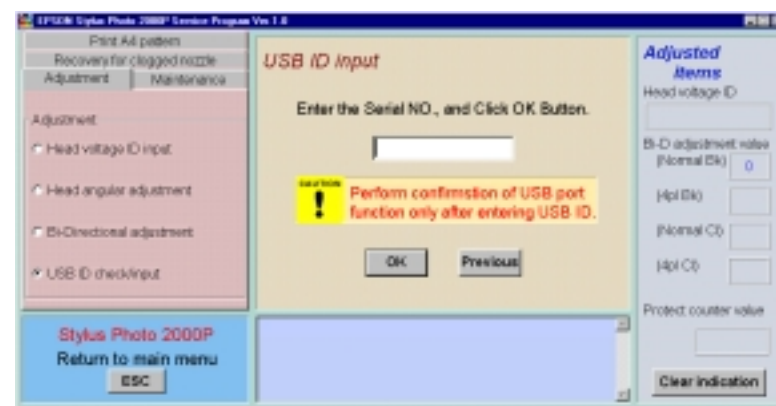
Figure 5-21. USB ID Input Window

4. Get the 10-digit serial number marked on the identification plate at the back of the printer.

5. Input the serial number and click **OK**. A new USB ID is displayed. Verify the USB ID to be stored in EEPROM.

6. If you need to check the USB ID, get to the USB ID Input/Check window, select **Check USB ID**, and click **OK**. The computer reads the USB ID written in EEPROM on the main board and displays it.
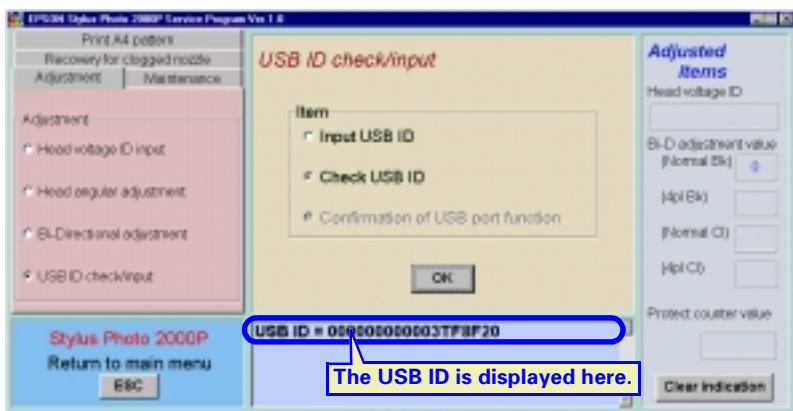
Figure 5-22. USB ID Display Window

7. To check the USB port function, get to the USB ID input window, select **Confirmation of USB port function**, and click **OK**. If the USB port connection is good, an A4 check pattern will print out.

> **CAUTION**
> ⚠️
> - Be sure to input the printer serial number exactly. If you input a wrong number, it is still accepted.
> - Confirmation of USB port function is effective only under the Windows 98 environment.
> - The new ID is not effective until the printer is next turned on since the new ID is store in EEPROM when the printer is turned off.

5.2.8 Head cleaning

Head cleaning is more powerful than the head cleaning performed by pressing the cleaning button. It is effective when a dot missing problem occurs.

1. Starts the service program and get to the main menu.

2. Click the **Maintenance** tab.

3. Select **Head cleaning** from the maintenance menu.

4. Click **OK** in the Head cleaning window.
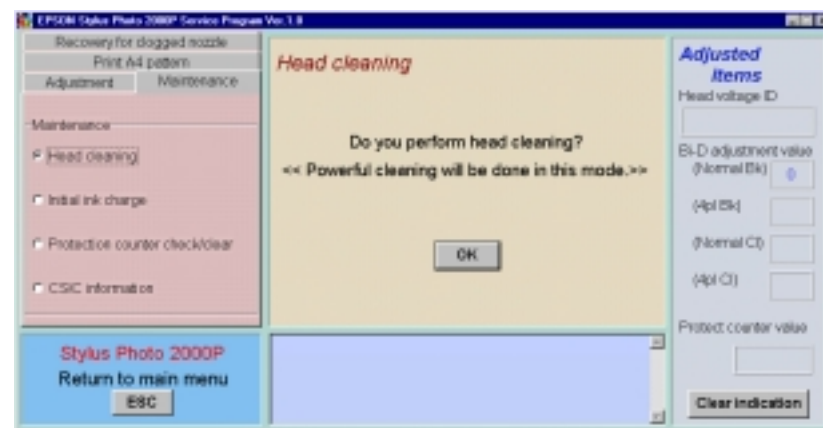
Figure 5-23. Head Cleaning Window

> **CAUTION**
> ⚠️
> **Head cleaning function uses the following amount of ink at a time:**
> *NOTE*: *Note the figures below do not apply when half-size ink cartridges are used.*
> **Black ink cartridge: Approximately 1/82**
> **Color ink cartridge: Approximately 1/66**

5.2.9 Initial ink charge

If the **Head cleaning** is not powerful enough to solve the dot missing problem, perform **Initial ink charge** that consumes more ink.

1. Starts the service program and get to the main menu.

2. Click the **Maintenance** tab.

3. Select **Initial ink charge** from the maintenance menu and click **OK**. The printer begins the initial ink charge operations.
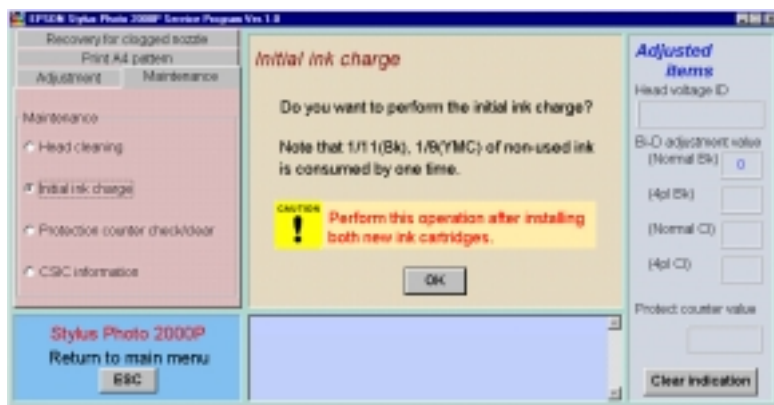
Figure 5-24. Initial Ink Charge Window

■ **The initial ink charge operation consumes the following amount of ink at a time:**
    Black ink cartridge: Approximately 1/10
    Color ink cartridge: Approximately 1/7
■ **Do not perform this function using half-size ink cartridges.**

5.2.10 Protection counter check

This function enables you to check the current value for the protect counter A. The protect counter A monitors the level of waste ink flown into the waste ink absorber. If the wasted ink level passes the limit, it will finally overflow into the printer. To avoid this, the printer indicates "Maintenance Request" when the counter reaches the limit, and stop accepting any data except for the power signal from the control panel. During repair service, you are required to replace the waste ink absorbers and reset the protection counter. For the waste ink absorber replacement procedure, see Chapter 4. Note you can also reset the protection counter by the panel operation.

■ **Protection counter check does not clear "Maintenance Request" but the resets the protection counter only.**
■ **To clear "Maintenance Request", refer to Chapter 1/ Section 1.4.4 or Chapter 3/Section 3.1.1.6.**

5.2.10.1 Check the Present Counter Value

1. Starts the service program and get to the main menu.

2. Click the **Maintenance** tab.

3. Select **Protection counter check** from the maintenance menu. The protection counter check/clear window appears.

Figure 5-25. Protection Counter Check/Clear Window

4. In the protect counter check/clear window, select **Check the present counter values** and click **OK**. The Check the present protection counter values window appears.

5. Click **OK**, and the present protection counter value is displayed.
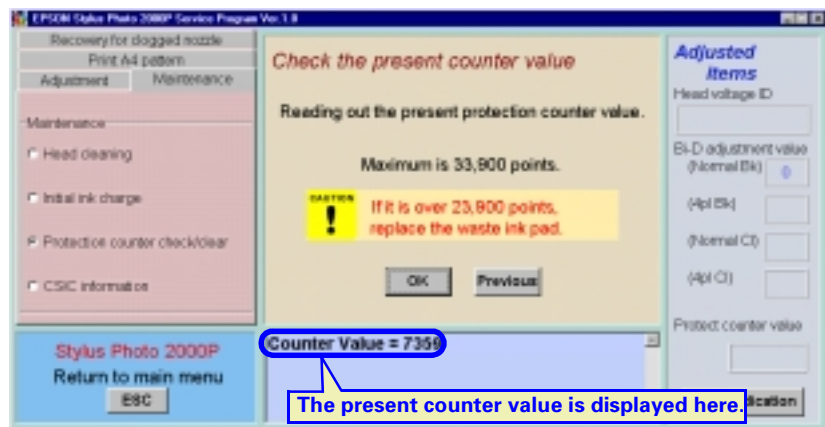
Figure 5-26. Counter Value Display Window

6. Click **Continue** to get to the protection counter check/clear window.

5.2.10.2 Clear the Protection Counter Values

1. Starts the service program and get to the main menu.

2. Click the **Maintenance** tab.

3. Select **Protection counter check** in the maintenance window and click **OK**. The protection counter check/clear window appears.

4. In the protect counter check/clear window, select **Clear the present counter value** and click **OK**. The Clear the protection counter value window appears.
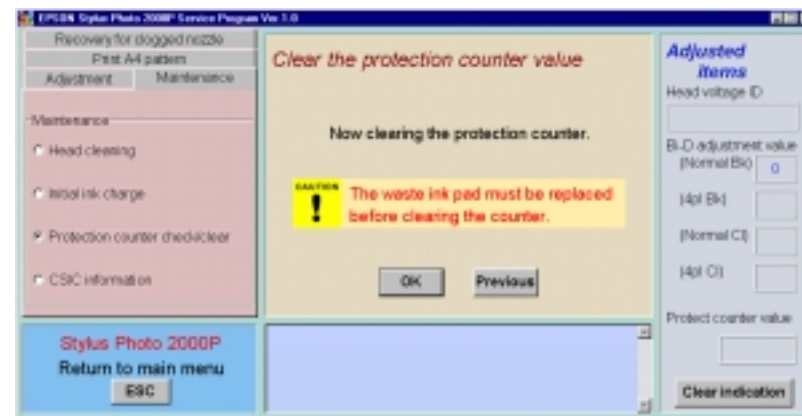
Figure 5-27. Clear the Protection Counter Window

5. In the Clear the protection counter value window, click **OK**. The protection counter value is cleared.

> ⚠️ **CAUTION**
>
> **Whenever you reset the protection counter, be sure to replace the current waste ink pad with a new one. (See Chapter 4.)**

5.2.11 CSIC information

A CSIC is an EEPROM mounted on each black and color cartridge. It stores various data such as ink life. Referring to this data, the printer indicates each ink's life in the status monitor of the printer driver.

1. Starts the service program and get to the main menu.

2. Click the **Maintenance** tab.

3. Select **CSIC information** from the maintenance menu and click **OK**. The CSIC information window appears.
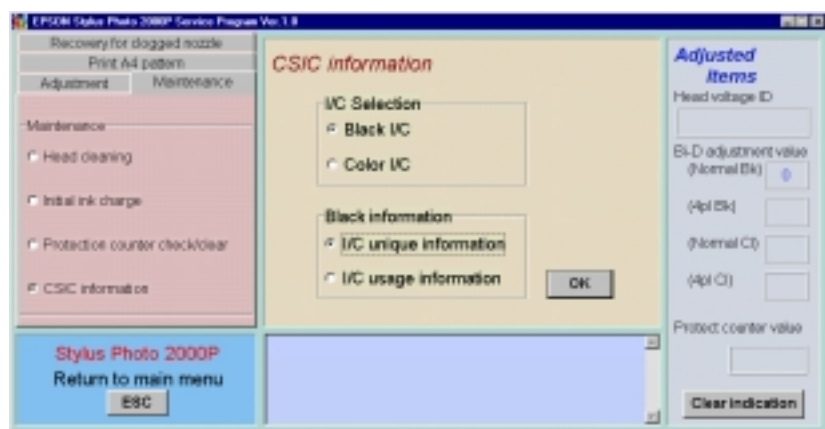
Figure 5-28. CSIC Information Window

Figure 5-29. Print Information

4. Select Black I/C or Color I/C and then I/C unique information or I/C usage information. Then click **OK**. The CSIC information is displayed.

5. If you click **Print**, I/C unique information and usage information for the both cartridges are printed on a A4 paper.

5.2.12 Print A4 pattern

This function lets the printer to print several test patterns on a A4 paper to allow you to check the adjustment results.

1. Starts the service program and get to the main menu.

2. Click the **Print A4 pattern** tab. The Print A4 pattern window appears.

3. Select **Print A4 pattern** and click **OK**. The A4 pattern print begins.
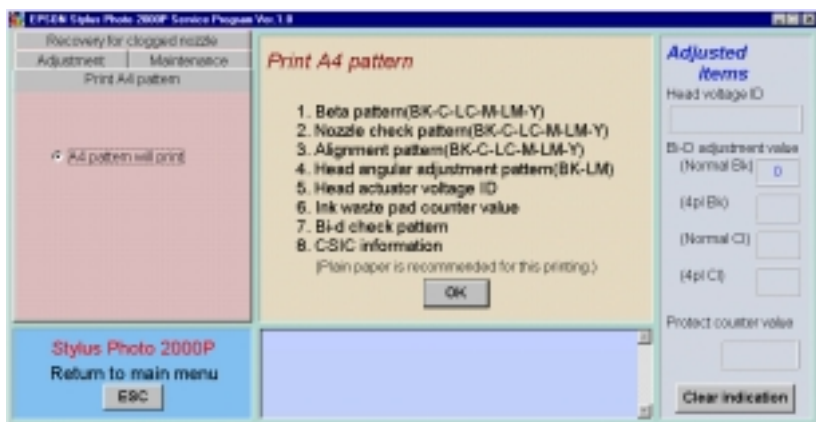
Figure 5-30. Print A4 Pattern

5.2.12.1 Recovery Routine

This function lets the printer to start recovery routine for clogged nozzle.

1. Starts the service program and get to the main menu.

2. Click the **Recovery for clogged nozzle** tab. The Recovery routine for clogged nozzle window appears.

3. Click **OK**. The Recovery routine for clogged nozzle begins.
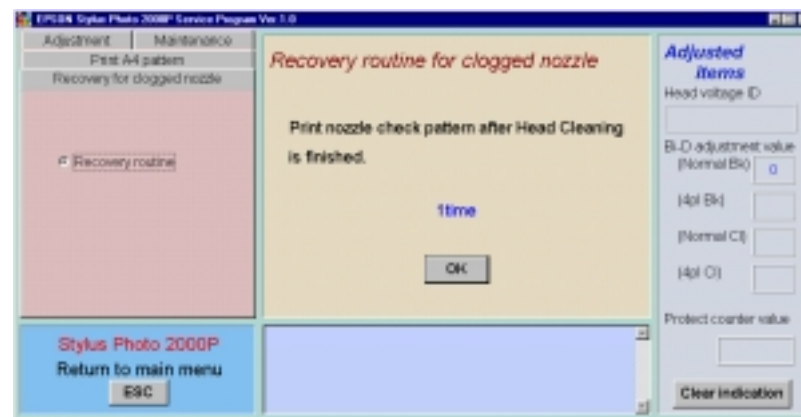
Figure 5-31. Recovery Routine

MAINTENANCE

6.1 Overview

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

6.1.1 Cleaning

The printer has no mechanical components which require regular cleaning. Therefore, note that the points suggested below are only to check for dirt, and cleaning should be performed upon necessity.

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

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

☐ **Inside the Printer:**
Use a vacuum cleaner to remove any paper dust.

6.1.2 Service Maintenance

To keep the function of this product, service maintenance is required besides cleaning. Service maintenance is basically carried out by service person besides head cleaning.

☐ Head cleaning
Should be performed when the print out shoes abnormality such as dot missing and white line. (See Section 6.1.2.1.)

☐ Paper eject roller cleaning
Should be performed when the paper eject roller becomes dirty with ink. (See Section 6.1.2.2.)

☐ ASF roller cleaning
Should be performed when the special paper cannot be loaded or when any skew occurs. (See Section 6.1.2.3.)

☐ Maintenance request error clear
Should be performed when the maintenance request error is indicated. (See Section 6.1.2.4.)

6.1.2.1 Head Cleaning

The printer has a built-in head cleaning function, which is activated through the control panel operation. Run a head cleaning in the following order:

1. Confirm that the printer is in stand-by state. (The power lamp is not blinking.)

2. Hold down the cleaning button on the control panel for 3 seconds or longer. (The power LED blinks during the cleaning.)

6.1.2.2 Paper Eject Roller Cleaning

The following printing may smear the paper eject roller with ink and may lay the line on the print out. In such cases, use the cleaning kit included in the printer and clean the paper eject roller. This operation can be carried out by user.

- When mistakenly printed on the back of the exclusive paper. (except for EPSON exclusive double side print paper)

- When printed on the paper that is not configured on the setting.

- When printed on the special paper that is not appointed by EPSON.

- When printed on the huge amount of paper. (1000 sheets ~ 2000 sheets)

☐ Cleaning kit

- Cleaning assembly
  The felt can be washed when it gets dirty.

- Cleaning sheet
  Can be substituted by plain paper.

☐ Cleaning Method

1. Turn the printer OFF.

2. Drench the felt of the cleaning assembly and softly wring it until water does not drops.

> **CAUTION !**
> - **Do not use the cleaning assembly with the felt dried; it may hurt the paper eject roller.**
> - **Do not use solvent such as alcohol, benzine and thinner.**
> - **Be careful that no water drops on the printer mechanism or electric circuit.**

3. Open the printer cover.

4. Press the power switch while pressing the ink cartridge replacement switch. Printer enters into the paper eject roller cleaning mode.

NOTE: Until the paper check lamp, color / black ink end lamp lights on.

5. Set the cleaning sheet to the printer.

NOTE: The cleaning sheet does not have the front face nor back face.

6. Press the paper eject switch.

7. The cleaning sheet will be ejected slowly. For the meanwhile, press the cleaning assembly to the paper eject roller softly and clean the paper eject roller.
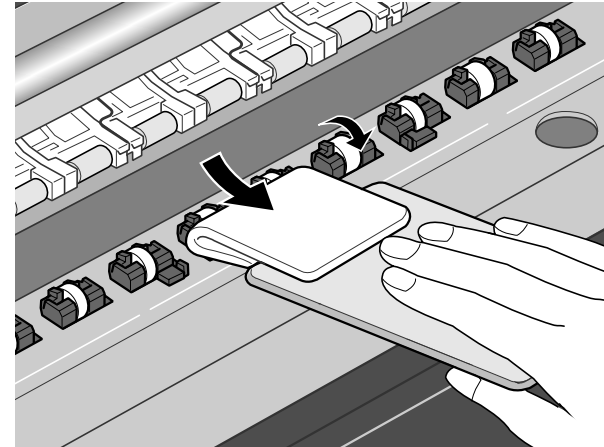
Figure 6-1. Paper Eject Roller Cleaning

8. Keep cleaning until the paper eject roller gets cleaned. If the cleaning sheet is ejected before the paper eject roller gets cleaned, load the cleaning sheet again and keep cleaning.

9. When no dirt does not attach on the cleaning sheet, turn the printer OFF and finishes the paper eject roller cleaning mode.

6.1.2.3 ASF Roller Cleaning

When this product is used for years and years, paper dust may attach on ASF and paper load operation may become not to function at all. In such cases, cleaning the ASF roller recovers paper load operation. (for example: for plain paper = more than 10000 sheets, for Archival Matte Paper = more than 1000 sheets, for Watercolor Paper-Radiant White = more than 3000 sheets)

☐ Cleaning method

1. Turn on the printer.

2. Set the cleaning assembly with the cleaning felt down along with the ASF hopper edge guide.
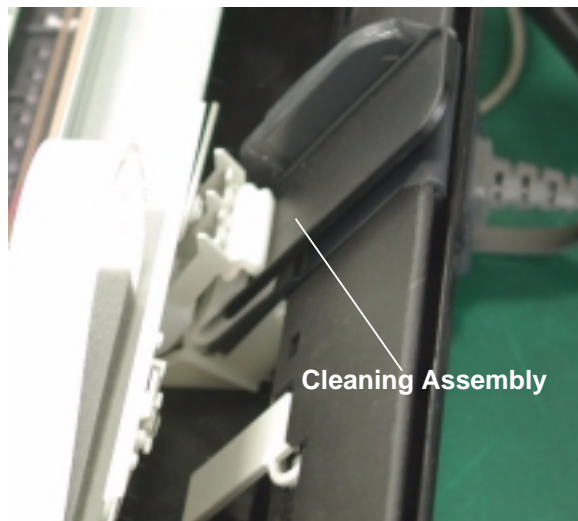
Figure 6-2. Cleaning Plate Assembly Installation

3. Press the paper load button and rotate ASF roller without loading paper to perform the cleaning. (Paper load operation is carried out twice.)

4. Set the cleaning assembly along with the edge guide as you did at step 2.

5. Again press the paper load button and rotate ASF roller without loading paper to perform the cleaning.

6. Remove the cleaning assembly.

7. Since the paper load roller is moisturized, load plain paper via ASF until it becomes dry. (Load 1 ~ 3 sheets of paper.)

> **CAUTION**
>
> **!**
>
> - **Moisture the felt of the cleaning assembly and make sure the felt is soften.**
> - **Moisture level of the felt: wring the well soften felt until no water infiltrates. (Be careful since the cleaning parts is above the electric circuit board.)**
> - **When cleaning the ASF roller, the dirt of the ASF roller attaches on the felt; After cleaning, wash the wad clean.**
> - **If the ASF roller is still wet when printing, print out may become irregular; Load plain paper until the paper load roller becomes dry.**
> - **Felt may go slack by usage; When it is dry, pull the felt to reduce the slack. Do not pull it too much.**
> - **Felt should have thickness of 2mm or more when it is wet. If the thickness is less than 2mm, replace with new one.**

6.1.2.4 Maintenance Request Error Clear

Ink is used for cleaning as well as printing. During cleaning, the printer drains some ink into the waste ink pads. The protection counter A in EEPROM on the main board keeps track of the quantity of ink drained into the waste ink pads. When the counter reaches the predefined service limit, the printer assumes the waste ink pad is full of ink and requests ink pad replacement by indicating a maintenance request error.

☐ **Service limit of the protection counter A:**
  The service limit of the protection counter A = 35400

☐ **Timing for replacing the waste ink pad:**
  When the total amount of the waste ink reaches the predetermined limit, a maintenance error occurs. In this condition, the printer does not accept any input but from the power button.

  ■ Current counter value can be found on a status print sheet that also shows the firmware version, selected code page, and nozzle check pattern. During servicing, you are required to check the counter value and if the counter is close to its limit, notify your customer of the situation and recommend that the waste ink pad be replaced (If the waste ink pad is not replaced at that time, there is a possibility that a maintenance error will occur soon after the printer is returned to the customer). Once you have the confirmation of the customer, replace the waste ink pad and reset the counter.

  ■ The counter limit is generally 25000 pages and 10000 pages for black and color, respectively. In normal use, the counter reaches the limit in 5 years.

☐ **Replacement procedure:**
  Refer to Section 4.2.5.

☐ **Operation after replacement:**
  Perform "Waste ink counter reset". Refer to Chapter 1/Section 1.4.4 for details.

6.1.3 Lubrication

The type and amount of oil and grease used to lubricate 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.

> **CAUTION** ⚠
> ■ **Never use oil and grease other than those specified in this manual. Use of different types of lubricant can damage the printer and its components.**
> ■ **Never apply 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 Point

	Lubrication Point	Lubricant Type & Amount	Refer to:
1	**BUSHING, 12, RIGHT** • Using a brush, apply the grease evenly to the inside surface of the bushing.	G-26 A 3-mm wide bead	Page 144
2	**HOLDER, PULLEY, DRIVEN**	G-26 ϕ 1 x 3mm (for each of the 4 points)	Page 144
3	**BUSHING, 12, LEFT** • Using a brush, apply the grease to the inside surface of the bushing.	G-26 A 3-mm wide bead	Page 145
4	**BUSHING, 6** • Using a brush, apply the grease to the inside surface of the bushing.	G-26 A 1-mm wide bead	Page 145
5	**PULLEY, DRIVEN** • Apply the grease to the flat surface.	G-26 ϕ 1 x 1mm (2 points)	Page 145
6	**SHAFT, PULLEY, DRIVEN**	G-26 ϕ 1 x 1mm	Page 145
7	**COMBINATION GEAR, 12, 22.4** • Using a dispenser, apply the oil to the entire inside circumference of the gear.	O-12	Page 145
8	**COMBINATION GEAR, 14, 28** • Using a dispenser, apply the oil to the entire inside circumference of the gear.	O-12	Page 145
9	**Pole C (2 points)**	G-26, ϕ 1 x 3mm	Page 145
10	**PAD, D3.6 for COMBINATION GEAR 12, 22.4** • Wipe off any excess oil that comes out toward the motor.	O-12 Dip the pad in the oil to soak it.	Page 145

Table 6-2. Lubrication Point (continued)

	Lubrication Point	Lubricant Type & Amount	Refer to:
11	**PAD, D3.6 for COMBINATION GEAR 14, 28** • Wipe off any excess oil that comes out toward the motor.	O-12 Dip the pad in the oil to soak it.	Page 145
12	**Groove on "ROLLER, PF"**	G-26 ϕ 1 x 5mm	Page 146
13	**Contact area for ROLLER, EJECT and GROUND SPRING, EJECT**	G-26 ϕ 1 x 2mm	Page 146
14	**Contact areas for ROLLER, PF and PAPER GUIDE, REAR** • Apply the grease while rotating the shaft. ***NOTE:*** *Do not get the grease on the specially coated area of ROLLER, PF.*	G-26 ϕ 1 x 1/2 of the circumference	Page 146
15	**PAPER GUIDE, FRONT (3 points)** ***NOTE:*** *Do not get the grease on the rubber rollers of the Paper Eject Roller.*	G-26 • ϕ 1 x 2mm (Eject Roller side) • ϕ 1 x 10mm (PF Roller side)	Page 146

16	**Oil pad in the carriage assembly**
	• Lubricate the oil pad only when:
	   1) Replacing the carriage unit
	   2) Replacing the oil pad
	• Use a dispenser to supply oil.
	• After oiling to the pad, leave it for one minute and then mount it to the carriage unit with its oiled side facing the CR guide shaft.
	NOTE: *If you supply too much oil, throw away the pad and start over with a new one.*
		O-12
		0.72 ~ 0.77cc (0.65 ~ 0.69g)	

Table 6-2. Lubrication Point (continued)

	Lubrication Point	Lubricant Type & Amount	Refer to:
17	**The COMBINATION GEAR 13.5, 30 shaft in FRAME, LEFT**	G-26 φ 1 x 5mm	Page 146
18	**The LD roller assembly hole in the FRAME, ASF; B** • Using a brush, apply the grease evenly to the entire inside surface of the hole.	G-26 φ 1 x 1mm	Page 147
19	**The left and right latches in the Hopper assembly along which the hopper release levers turn.** • Use a brush to apply the grease.	G-26 A 2-mm wide bead for each	Page 147
20	**GUIDE PLATE, CR**	G-26 φ 1 (See the figure for length.)	Page 147

WARNING
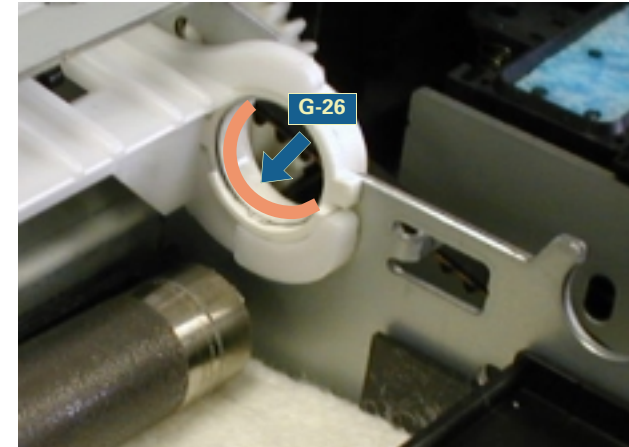
- Never apply oil directly to the CR guide shaft. This may cause fatal damage to the main components of the printer.
- Avoid applying too much oil to the oil pad. Otherwise, you may critically damage the main components of the printer.

Main01

Lubrication Point No.1

HOLDER, PULLEY, DRIVEN

Main02

Lubrication Point No.2

Lubrication Point No.3

G-26

BUSHING, 12, LEFT

SHAFT, CR, GUIDE

Main03

Lubrication Point No.5
Lubrication Point No. 6

SHAFT, PULLEY, DRIVEN

G-26

G-26

Main05

PULLEY, DRIVEN

Lubrication Point No.4

BUSHING, 6

G-26

Main04

Lubrication Points No.7 - No.11

PAD, D3.6

O-12

COMBINATION GEAR, 12, 22.4

O-12

PAD, D3.6

O-12

O-12

COMBINATION GEAR, 17.19, 25.6

COMBINATION GEAR, 14, 28

BRACKET, MOTOR, ASF

G-26

Pole C

Main06

CONTACT SPRING, PAPER EJECT

G-26

Main07

Lubrication Point No.13

ROLLER, PF

PAPER GUIDE, REAR

G-26

G-26
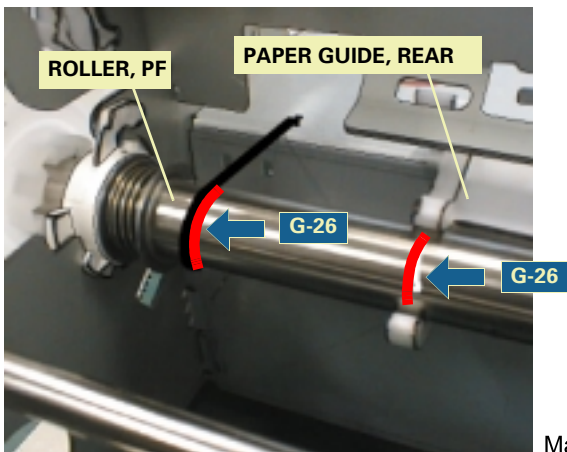
Main08

Lubrication Point No.12
Lubrication Point No.14

Lubrication Point No.15

G-26

G-26

G-26

Main09

Shaft for COMBINATION GEAR 13.5, 30

G-26
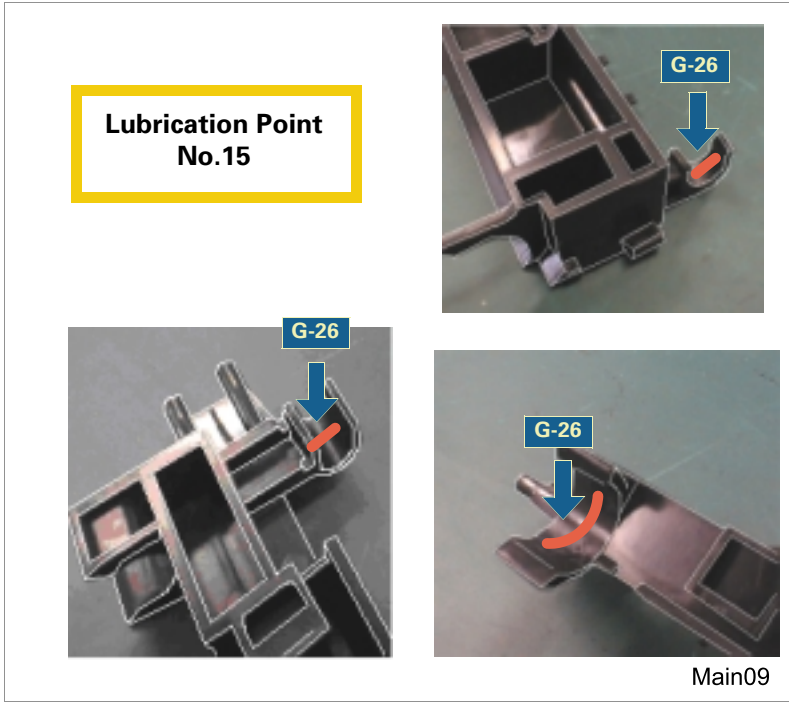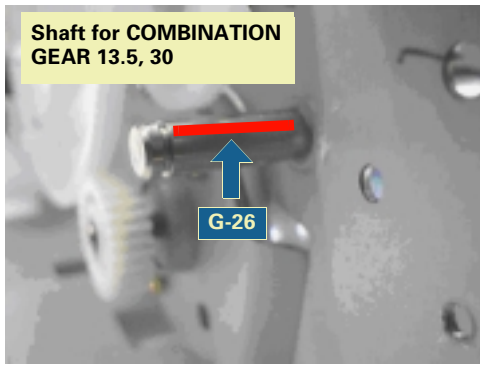
Main10

Lubrication Point No.17
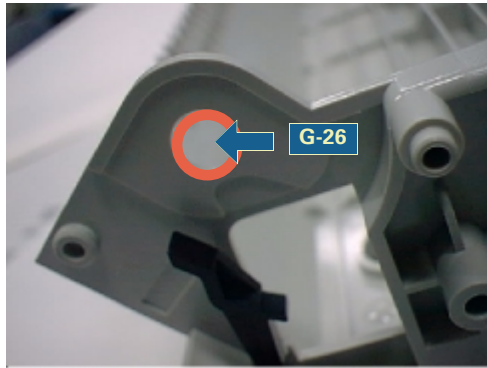
Main11

Lubrication Point No.18

G-26

Lubrication Point No.19

G-26

Main12

Hook for the CR motor linear scale

Screw

G-26
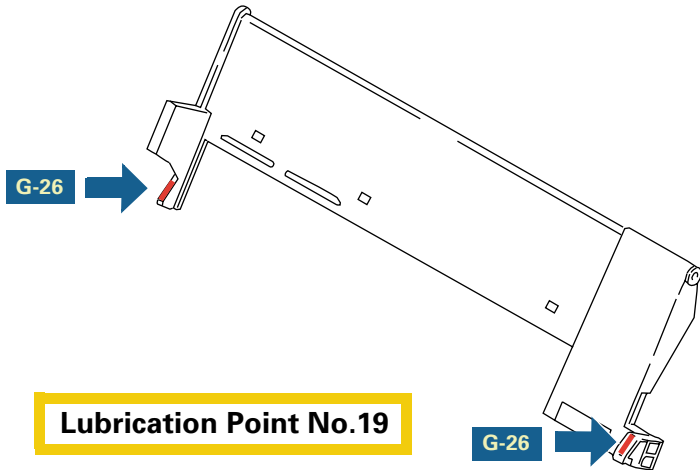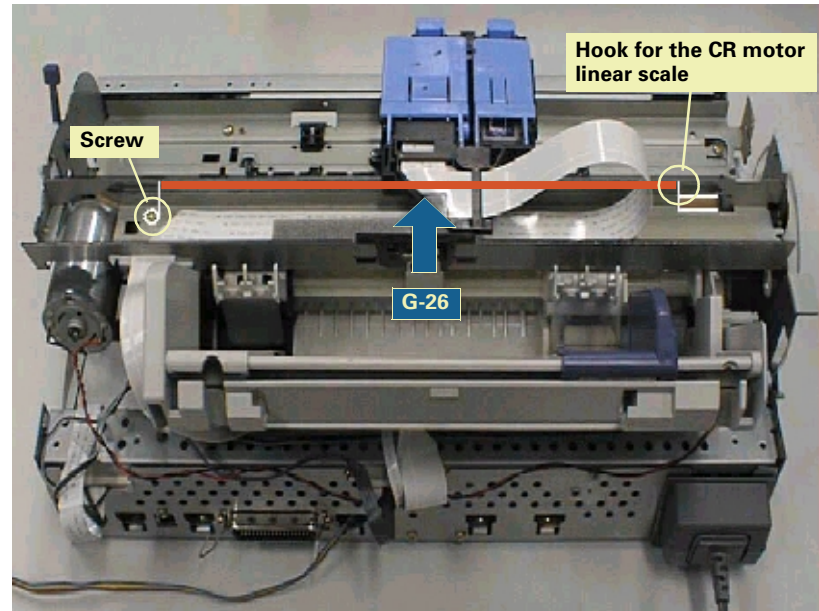
Lubrication Point No.20

APPENDIX

7.1 Connector Summary

This section provides information on connectors connecting main components of the printer.
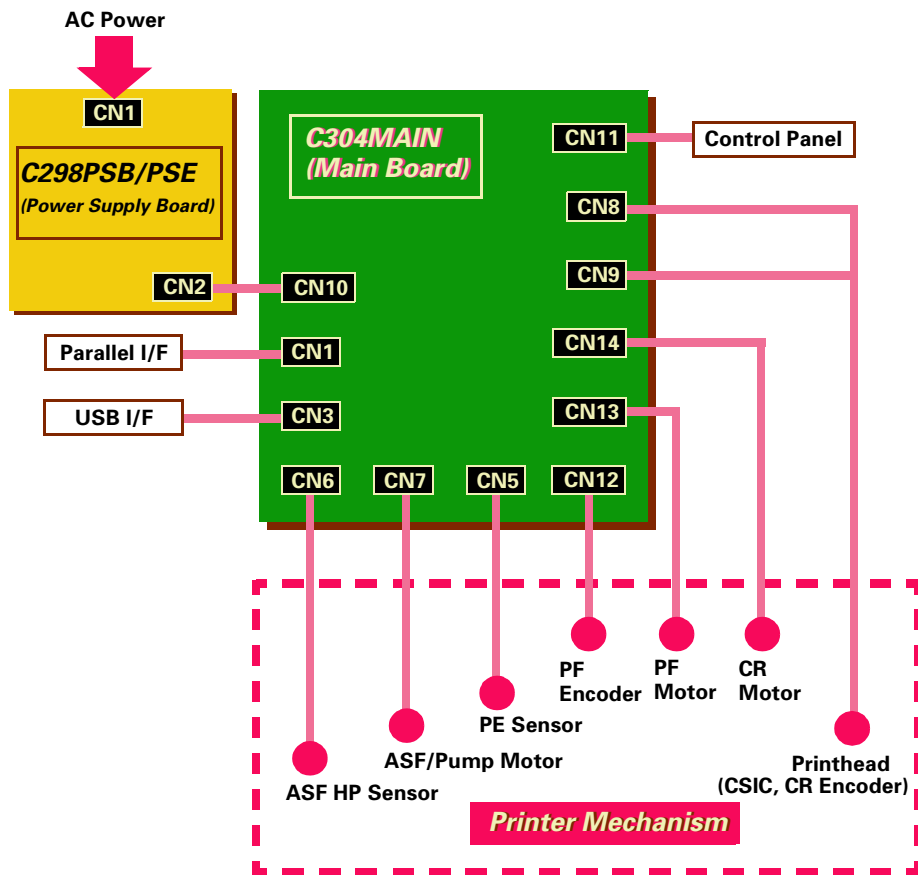
Figure 7-1. Cable Connection

7.1.1 Connector Pin Assignment

Table 7-1. Connector Assignment

Connector	Function	Table to refer to
CN1	Parallel interface connector	
CN3	USB interface connector	
CN5	PE sensor connector	Table 7-2
CN6	ASF HP sensor connector	Table 7-3
CN7	ASF/Pump motor connector	Table 7-4
CN8	Printhead connector (including the CR encoder input line)	Table 7-5
CN9	Printhead connector (including CSIC communication and head temperature detection)	Table 7-6
CN10	Power input from the power supply board	Table 7-7
CN11	Control panel connector	Table 7-8
CN12	PF encoder connector	Table 7-9
CN13	CR motor connector	Table 7-10
CN14	PF motor connector	Table 7-11

Table 7-2. Connector Pin Assignment - CN5

Pin	Signal Name	I/O	Function
1	PE	I	PE signal
2	GND	–	GND
3	PEV	–	+5V

Table 7-3. Connector Pin Assignment - CN6

Pin	Signal Name	I/O	Function
1	ASF	I	ASF HP detection
2	GND	-	GND
3	ASFV	-	+5V

Table 7-4. Connector Pin Assignment - CN7

Pin	Signal Name	I/O	Function
1	ASF-A	O	ASF/Pump motor Phase A
2	ASF-B	O	ASF/Pump motor Phase B
3	ASF-/A	O	ASF/Pump motor Phase /A
4	ASF-/B	O	ASF/Pump motor Phase /B

Table 7-5. Connector Pin Assignment - CN8

Pin	Signal Name	I/O	Function
1	GND	-	GND
2	ENB	I	CR encoder output B
3	VDD	-	+5V
4	ENA	I	CR encoder output A
5	GND	-	Ground
6	GND	-	Ground
7	LAT	O	Head data latch
8	GND	-	Ground
9	CH	O	CH signal
10	GND	-	Ground
11	VDD	-	+5V
12	GND	-	Ground
13	VHV	-	+42V to the nozzle selection circuit
14	GND	-	Ground
15	GND	-	Ground
16	GND	-	Ground
17	GND	-	Ground
18	COM	-	Common voltage
19	COM	-	Common voltage
20	COM	-	Common voltage
21	COM	-	Common voltage

Table 7-6. Connector Pin Assignment - CN9

Pin	Signal Name	I/O	Function
1	COC	I	Color ink cartridge detection
2	GND	-	Ground
3	COB	I	Black ink cartridge detection
4	GND	-	Ground
5	TH	I	Head temperature detection
6	NCHG	O	Head NCHG
7	GND	-	Ground
8	SCK	O	Clock
9	GND	-	Ground
10	SP	O	SP signal
11	SI6	O	Head data
12	SI5	O	Head data
13	SI4	O	Head data
14	SI3	O	Head data
15	SI1	O	Head data
16	SI0	O	Head data
17	GND	-	Ground
18	VDD3.3	-	+3.3V
19	RXD	O	CSIC input
20	SEL	I	Command selectionš
21	TXD	I	CSIC output

Table 7-7. Connector Pin Assignment - CN10

Pin	Signal Name	I/O	Function
1	+42V	-	+42V from the power supply board
2	+42V	-	+42V from the power supply board
3	GND	-	Ground
4	ESAVE	O	Energy save mode
5	PSC	O	Secondary power on/off
6	GND	-	Ground
7	GND	-	Ground
8	+5V	-	+5V supply

Table 7-8. Connector Pin Assignment - CN11

1	SW2	I	Switch signal input
2	SW0	I	Switch signal input
3	PSC	I	Power switch signal input
4	SW1	I	Switch signal input
5	LED3	O	LED output
6	+5V	-	+5V
7	+5V	-	+5V
8	LED2	O	LED output
9	GND	-	Ground
10	LED1	O	LED output
11	SW3	I	Switch signal input
12	LED0	O	LED output

Table 7-9. Connector Pin Assignment - CN12

Pin	Signal Name	I/O	Function
1	GND	-	Ground
2	ENB	I	Rotary encoder Phase B output
3	VCC	-	+5V
4	ENA	I	Rotary encoder Phase A output
5	GND	-	Ground

Table 7-10. Connector Pin Assignment - CN13

Pin	Signal Name	I/O	Function
1	PF-A	O	PF motor Phase A
2	PF-B	O	PF motor Phase B

Table 7-11. Connector Pin Assignment - CN14

Pin	Signal Name	I/O	Function
1	CR-A	O	CR motor Phase A
2	CR-B	O	CR motor Phase B

7.2 EEPROM Address Map

This section provides the EEPROM address map.

Table 7-12. EEPROM Address Map

Address	Explanation	Setting	QPIT Settings	Factory Settings
00H	Pass word		0FH	-
01H			5AH	-
02H	EEPROM mapping revision		42H	-
03H	Reserved		00H	-
04H	Interface selection	0: Auto, 1: Parallel, 2: USB	00H	00H *2
05H	Interface time-out	0 to 255 (by second, value of 0 means 10 seconds)	0AH	0AH
06H	Compatibility speed	0: Fast, 1: Slow, 2: Special-1, 3: Special 2	00H	00H
07H	ECP speed*a	0: Fast, 1: Slow	00H	00H
08H	IEEE1284.4 for Parallel	0: Auto, 1: On, 2: Off	00H	01H
09H	IEEE1284.4 for USB	0: Auto, 1: On, 2: Off	00H	01H
0AH	1/F Control flags	bit1: ECP mode (0=Off, 1=On)*b bit0: IEEE1284 mode (0=On, 1=Off)*c	00H	00H
0BH - 0FH	Reserved		00H	-
10H - 15H	CPSI pass word		00H	00H
16H	Print direction control	0: Bi-D, 1: Uni-D, 2: Auto	02H	02H
17H	CG table	0: PC437, 1: PC850	00H	00H
18H	Font	0: Courier	00H	00H
19H	Pitch	0: 10cpi		

Table 7-12. EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
1AH	Auto LF, Network I/F mode	bit1: Network I/F mode (0=Off, 1=On) bit0: Auto line feed (0=Off, 1=On)		
1BH	Check model control	bit7: Self test mode bit6: Hex dump mode	00H	00H
1CH - 1FH	Reserved		00H	-
20H	Bi-D Adjustment for MultiShot (Bk)	-36<=n<=+36 (by 1/1140 inch)	00H	*1
21H	Bi-D Adjustment for 6pIVSD (Bk)	-36<=n<=+36 (by 1/1140 inch)	00H	*1
22H	Bi-D Adjustment for 4pIVSD (Bk)	-36<=n<=+36 (by 1/1140 inch)	00H	*1
23H	Bi-D Adjustment for MultiShot (Cl)	-36<=n<=+36 (by 1/1140 inch)	00H	*1
24H	Bi-D Adjustment for 6pIVSD (Cl)	-36<=n<=+36 (by 1/1140 inch)	00H	*1
25H	Bi-D Adjustment for 6pIVSD (Cl)	-36<=n<=+36 (by 1/1140 inch)	00H	*1
26H	1st Dot Position Adjustment	-36<=n<=+36 (by 1/1140 inch)	00H	*1
27H	Reserved		00H	-
28H	reserved for CR Phase on Home		00H	-
29H	reserved for Paper Sensor Adjust		00H	-
2AH	Roll paper flag	bit1: Panel Load Mode bit0: Rollpaper Mode		
2BH	Error Code		00H	00H
2CH	PF Measurement Data		00H	00H

Table 7-12. EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
2DH-2FH	Reserved		00H	-
30H	Top margin	42 to 44x360 (by 1/360 inch)	00H	00H
31H			78H	78H
32H	Bottom margin	1244 to 44x360 (by 1/360 inch)	1EH	1EH
33H			F0H	F0H
34H	Page length	1244 to 44x360 (by 1/360 inch)	1EH	1EH
35H			F0H	F0H
36H	Reserved		00H	-
37H			00H-	-
38H	Reserved		00H	-
39H			00H	-
3AH			00H	-
3BH			00H	-
3CH	Reserved		00H	-
3DH			00H	-
3EF	Reserved		00H	-
3FH			00H	-
40H	Password		0FH	-
41H			5AH	-
42H	Ink flag1	bit7: Reserved bit6: black one-time bit5: color one-time bit4: Initial fill required bit3: Reserved bit2: ink cleaning seq. bit1: black LC required bit0: color CL required	00H	10H

Table 7-12. EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
43H	Ink flag2	bit7: Reserved bit6: Black 1st cartridge bit5: YMC 1st cartridge bit4: Reserved bit3: Reserved bit2: YMC cartridge changed and cleaned bit1: Black cartridge changed and cleaned bit0: 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
50H	Ink counter Cc		00H	00H
51H			00H	00H
52H			00H	00H
53H			00H	00H

Table 7-12. EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
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 A0		00H	00H
5DH			00H	00H
5EH	Ink counter A80		00H	00H
5FH			00H	00H
60H	Ink counter Rb0		00H	00H *3
61H			00H	00H *3
62H	Ink counter Rb80		00H	00H *3
63H			00H	00H *3
64H	Ink counter Ry0		00H	00H *3
65H			00H	00H *3
66H	Ink counter Ry80		00H	00H *3
67H			00H	00H *3
68H	CL time		00H	-
69H			00H	-
6AH	Reserved		00H	00H
6BH			00H	00H
6CH	Power off time		00H	00H *2
6DH			00H	00H *2
6EH	Reserved		00H	00H *2
6FH			00H	00H *2

Table 7-12. EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
70H	accumulated printing time		00H	00H
71H			00H	00H
72H	CSIC1_InkName1		00H	00H
73H	CSIC2_InkName2		00H	00H
74H - 79H	Reserved		00H	00H
7AH - 7FH	Reserved		00H	00H
80H	Password		0FH	-
81H			5AH	-
82H	CSIC Control Flag	bit0: Timer IC Stop	00H	00H
82H - 9FH	Reserved		00H	-
A0H	Head Actuator Rank ID for VhN	+1<=n<=+32	*100H	*1
A1H	Head Actuator Rank ID for Vhm	+1<=n<=+40	00H	*1
A2H	Head Actuator Rank ID for VhL	+1<=n<=+37	00H	*1
A3H	Head Actuator Rank ID for VhU	+1<=n<=+43	00H	*1
A4H	Head Actuator Rank ID for VhM2	+1<=n<=+37	00H	*1
A5H	Head Actuator Rank ID for VhB	+1<=n<=+37	00H	*1
A6H	Head Actuator Rank ID for AR	0<=n<=+6	00H	*1
A7H	Microweave ID	+1<=n<=+9	00H	*1
A8H	Head Actuator Rank ID for IwB	+30<=n<=+70	00H	*1

Table 7-12. EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
A9H	Head Actuator Rank ID for lwC	+30<=n<=+70	00H	*1
AAH	Head Actuator Rank ID for lwM	+30<=n<=+70	00H	*1
ABH	Head Actuator Rank ID for lwY	+30<=n<=+70	00H	*1
ACH	Head Actuator Rank ID for lwLC	+30<=n<=+70	00H	*1
ADH	Head Actuator Rank ID for lwLM	+30<=n<=+70	00H	*1
AEH - BFH	Reserved		00H	-
C0H	Password		0F	-
C1H			5AH	-
C2H - D3H	USB ID		00H	*1
D4H - D7H	Reserved		00H	-
D8H	Custom EEPROM sub number		00H	00H
D9H			00H	00H
DAH			00H	00H
DBH			00H	00H
DCH	Panel mask function	bit7: Entry Self-test bit6: Entry Hex-Dump bit5: Extended settings bit4: Reserved bit3: Reserved bit2: Cleaning bit1: Replace I/C bit0: Load/Eject	00H	00H

Table 7-12. EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
DDH	Reserved		00H	-
DEH			00H	-
DFH			00H	-
E0H	Market ID	0: World, 1: Japan, 2: Custom	00H	01H
E1H	Reserved		00H	-
E2H - FFH	Model Name		00H	-

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

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

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

NOTE:

*1: Adjusted at factory.

*2: Initialized by the EEPROM reset of the special setting mode.

*3: Initialized by the Waste ink counter reset of the special setting mode.

7.3 Circuit Board Component Layout

C304MAIN CONTROL CIRCUIT BOARD

Component Side
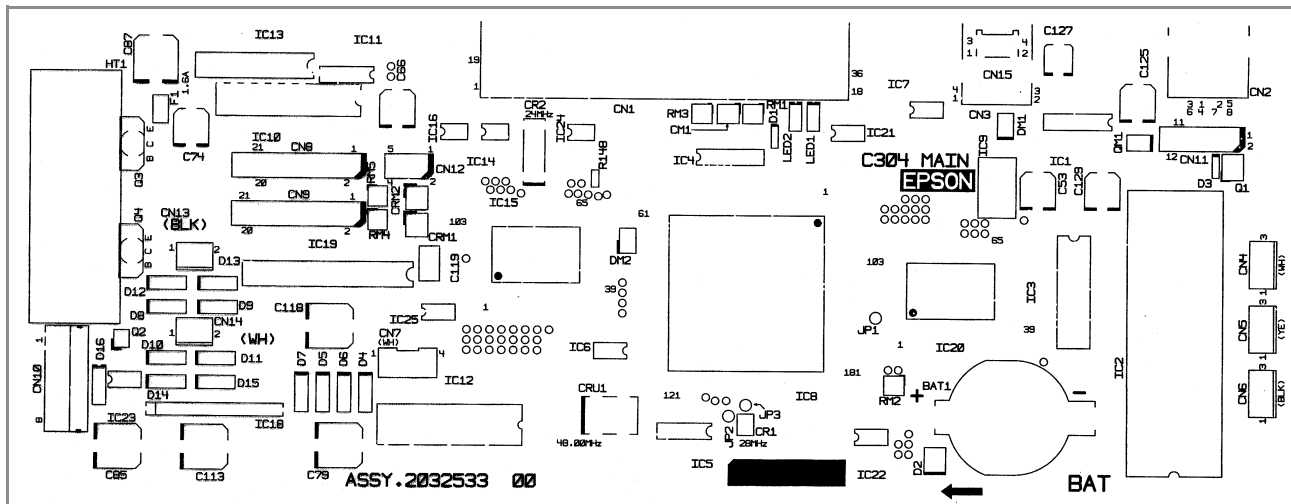
Soldered Side
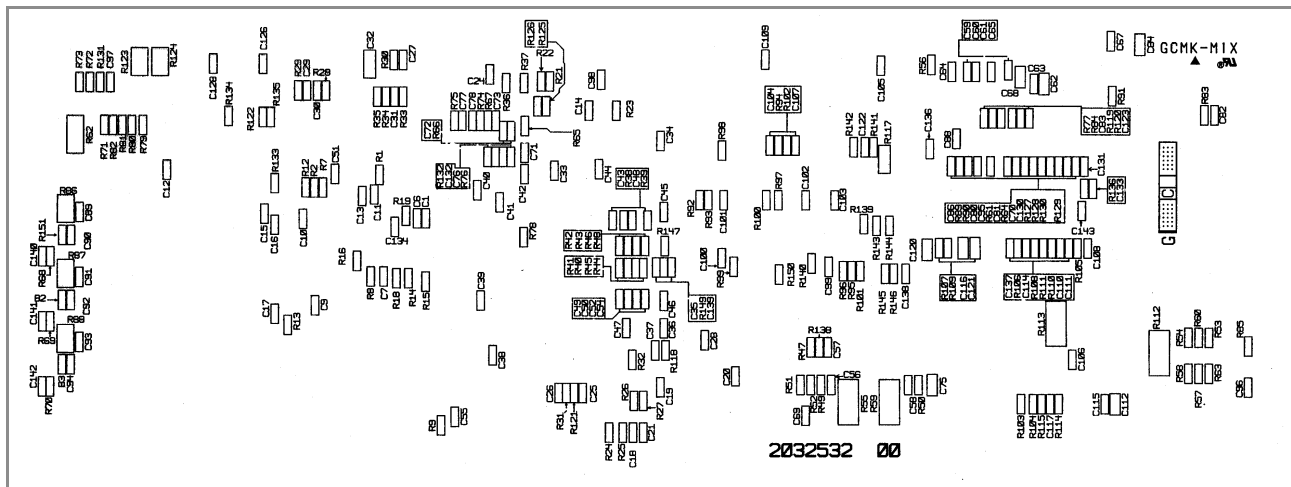
Figure 7-2. Component Layout - C304MAIN

C298PSB/PSE CIRCUIT BOARD
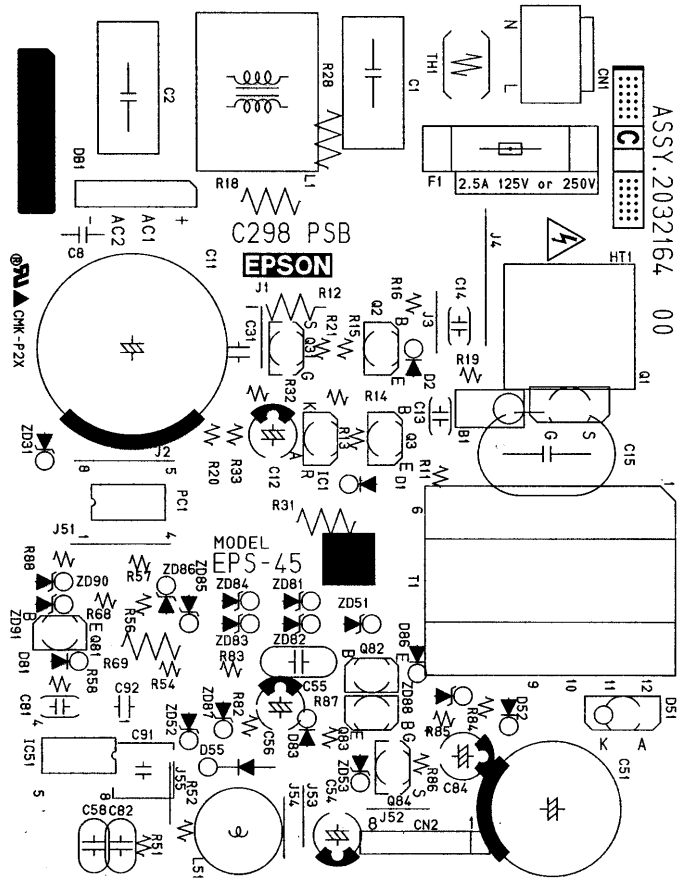
Figure 7-3. Component Layout - C298PSB
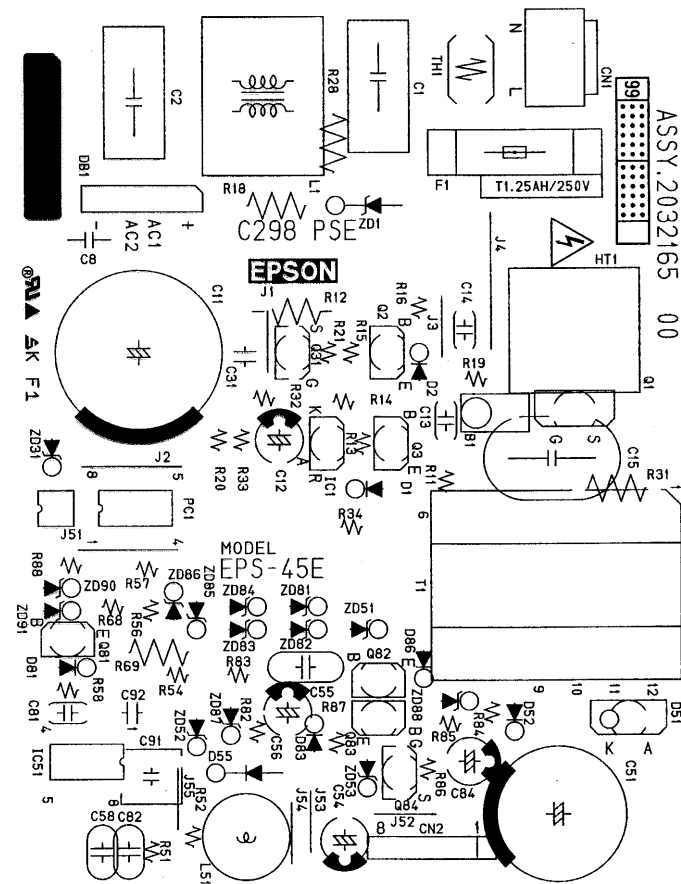
Figure 7-4. Component Layout - C298PSE

C304PNL CIRCUIT BOARD
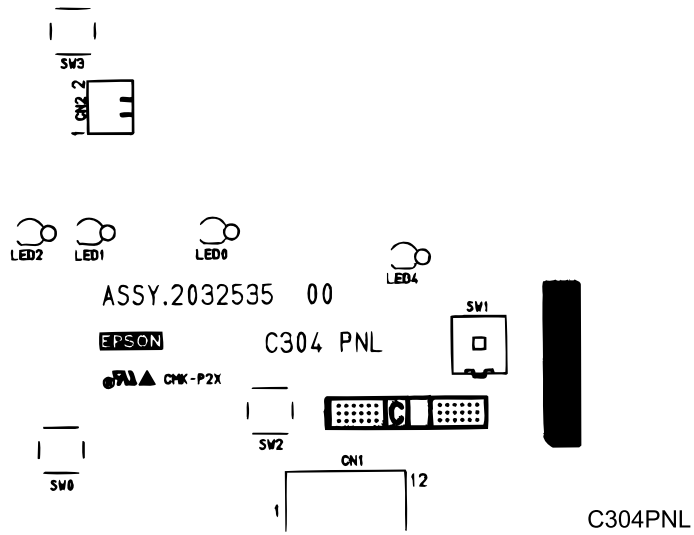
Figure 7-5. Component Layout - C304PNL

7.4 Exploded Diagrams

See the following pages for the exploded diagrams for the EPSON Stylus
PHOTO 2000P.

122

117

125   125

125   186   102   101   115   110

122

774

754   125

126   126

500

106

182 for
EDG,EFS,EIS,
EIB,EUL,EMO

181 for
EUL(MNE),
EAL,SEASIA,
ECC,JPN   120

183

124

180

751   124   124

116   122

103   122   774

400 for EAI/EUL(120V),ETT

743   775

766

752   126   124

134

133

123   126   132   105   125

For EAI(220V),EUR, S.E.ASIA,
EAL,EKL   400 for JPN   125

400   401   753   104   125

123   742

Ⓐ   450

MC-2000 / EPSON STYLUS PHOTO 2000P   No.1   Rev. 01 10206

MC-2000 / EPSON STYLUS PHOTO 2000P   No.2   Rev. 01 10206

MC-2000 / EPSON STYLUS PHOTO 2000P   No.3   Rev. 01 10206

MC-2000 / EPSON STYLUS PHOTO 2000P   No.4   Rev. 01 10206

MC-2000 / EPSON STYLUS PHOTO 2000P   No.5   Rev. 01 10206

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02 for S.E.ASIA

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MC-2000 / EPSON STYLUS PHOTO 2000P   No.6   Rev. 01 10206

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MC-2000 / EPSON STYLUS PHOTO 2000P   No.7   Rev. 01 10206
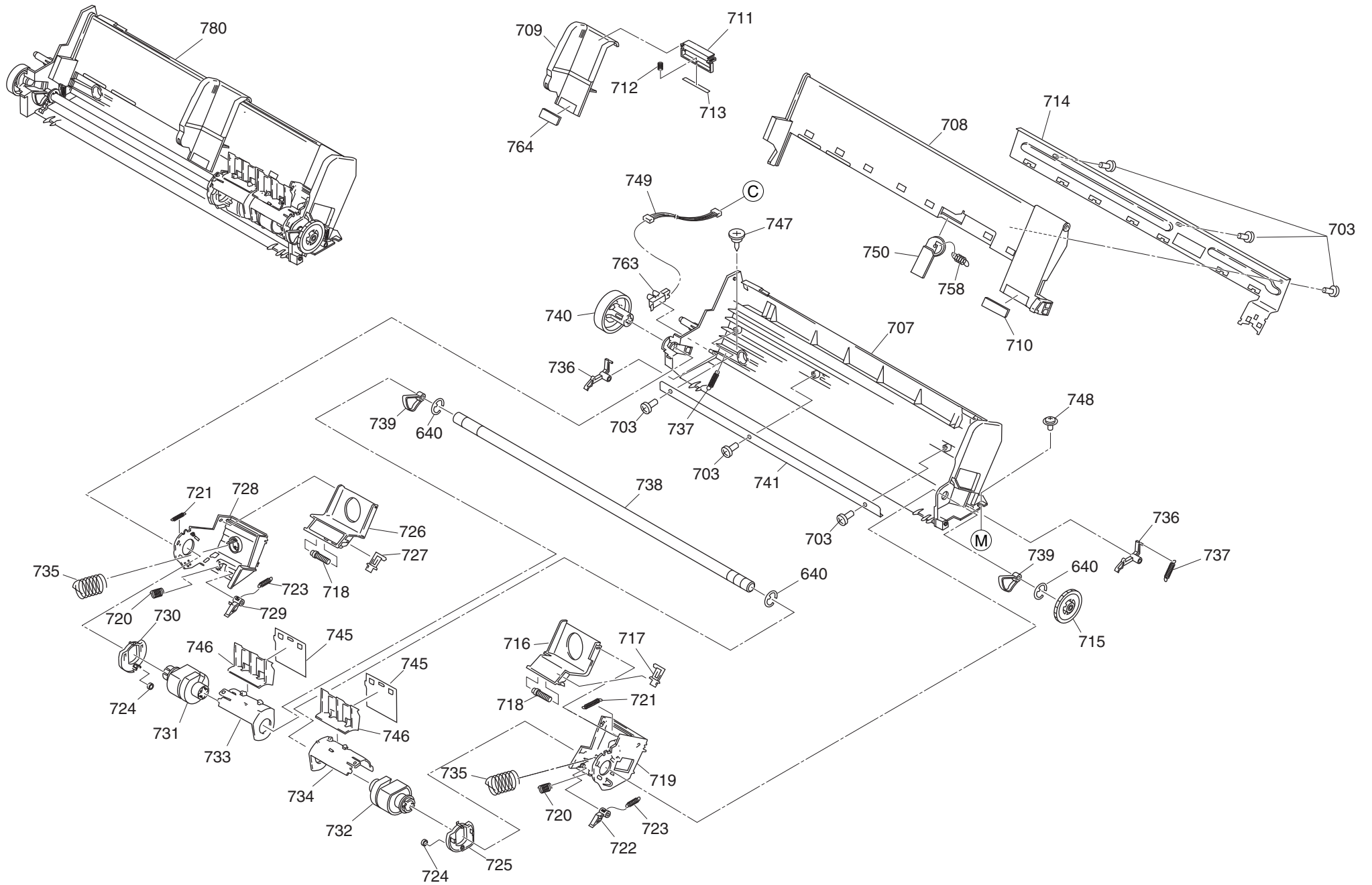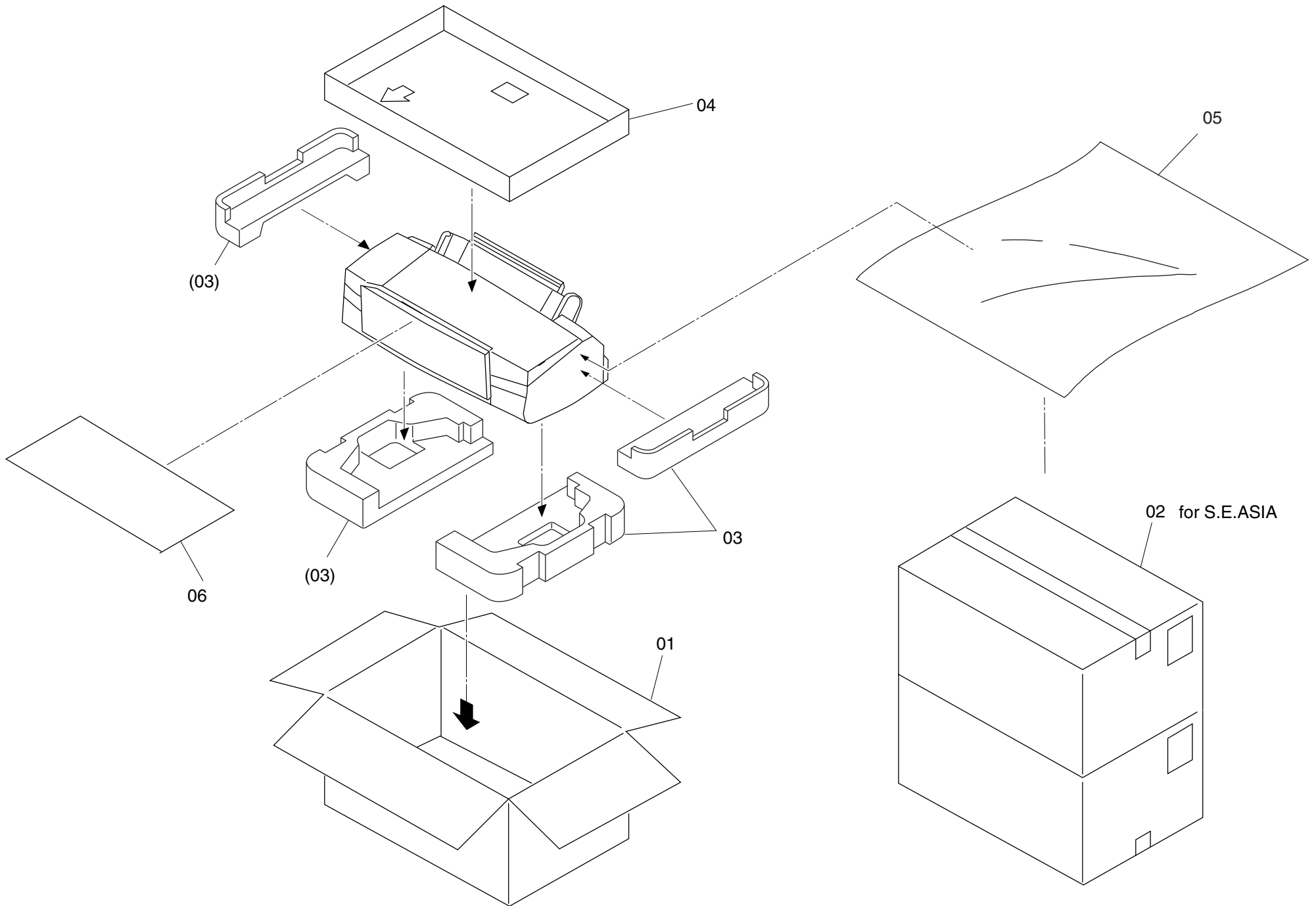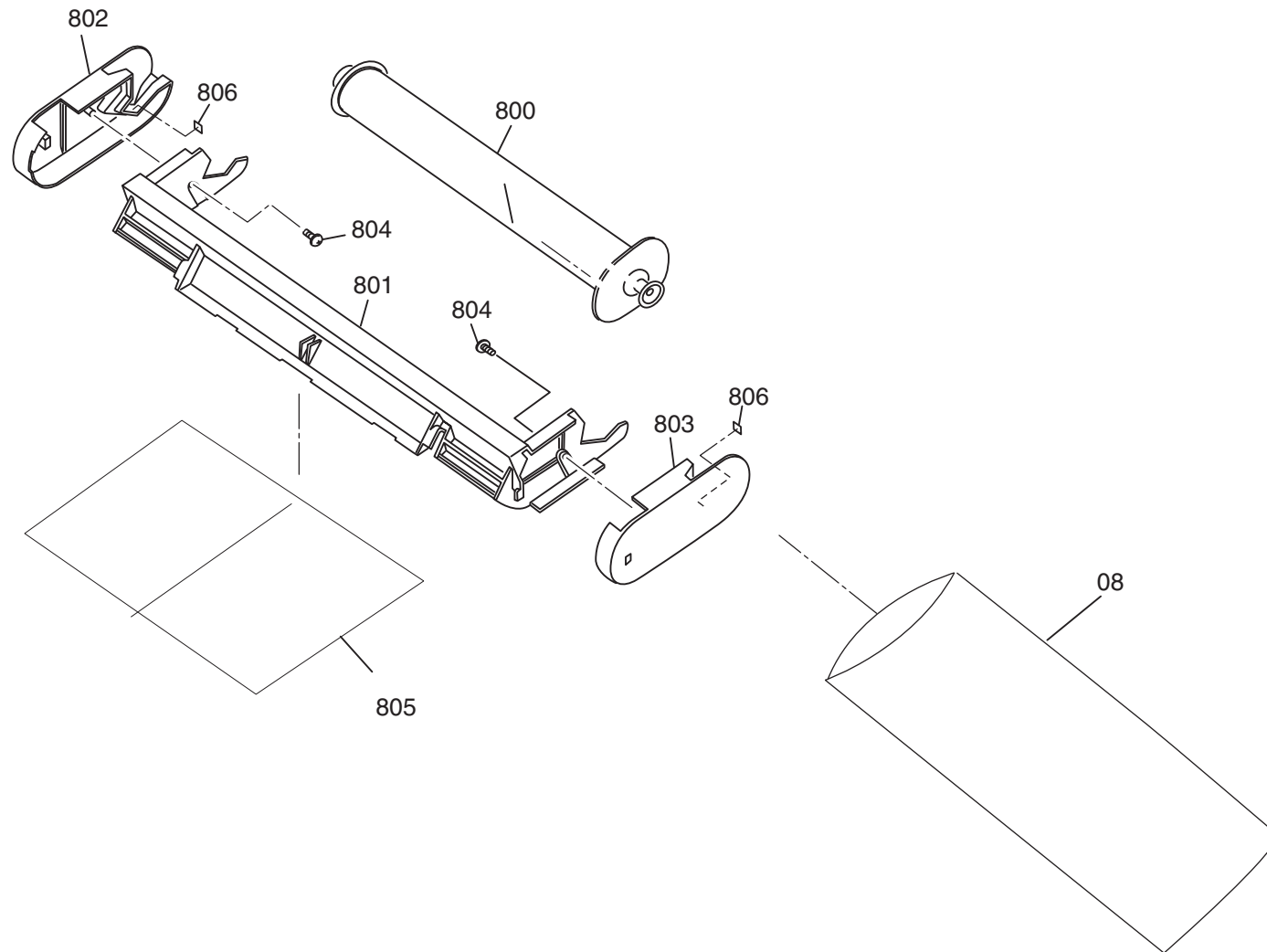
7.5 Parts List

Table 7-13. Parts List

Number	Name
100	HOUSING;B
101	COVER,PRINTER
102	PAPER SUPPORT ASSY.;B
103	STACKER ASSY.;B
104	PANEL ASSY.;B
105	SHIELD PLATE,PANEL
106	PANEL ASSY.,LEFTLEFT;B
108	GROUNDING PLATE
109	COVER,SHIELD PLATE,M/B,RIGHT
110	COVER,SUPPORT
111	COVER,CABLE
112	COVER,INLET,UPPER;D
113	COVER,INLET,LOWER;D
114	SHIELD PLATE,M/B
115	LOGO PLATE,10X40
116	HOUSING,SUPPORT,RIGHT;B
117	HOUSING,SUPPORT,LEFT;B
119	FOOT
120	COVER,SUPPORT,LOWER
121	C.P.SCREW
122	C.B.S. SCREW
123	C.B.(O) SCREW,4X5,F/ZG
124	C.B.S. SCREW

Table 7-13. Parts List

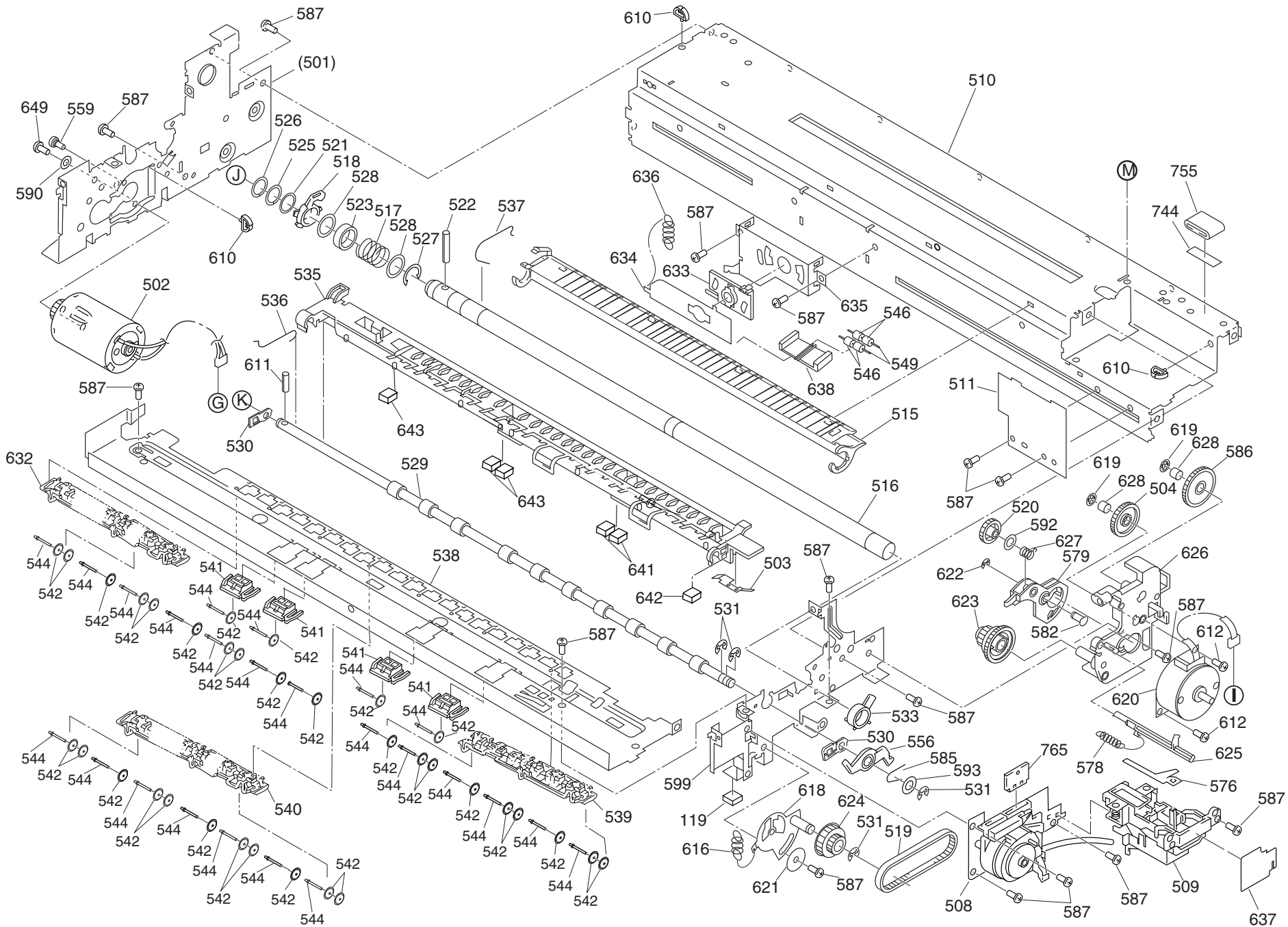| Number	Name
125	C.B.P-TITE SCREW,3X8,F/ZN
126	C.B.S. SCREW
131	COVER,CABLE;B
132	BUTTON,PS
133	BUTTON,CSIC
134	TUBE,LENS
180	LABEL,CAUTION;B
183	LABEL,MODEL NAME
186	LABEL,PAPER SET
200	BOARD ASSY.,MAIN
300	BOARD ASSY.,POWER SUPPLY
330	WIRE HARNESS
400	POWER CABLE ASSY.
450	BOARD ASSY.,PANEL
500	PRINTER MECHANISM(ASP),M4W60-100
501	FRAME ASSY.,LEFT;B
502	MOTOR ASSY.,PF
503	GROUNDING PLATE,PAPER GUIDE,FRONT
504	COMBINATION GEAR,12,22.4
505	FRAME,RIGHT,FRONT
506	FRAME,UPPER
507	MOTOR ASSY.,CR
508	PUMP ASSY.
509	CAP ASSY.
510	FRAME,LOWER

Table 7-13. Parts List

Number	Name
511	SHEET,PROTECTION,INK
512	FRAME,FRONT
513	BUSHING,PARALLELISM ADJUST,LEFT
514	BUSHING,PARALLELISM ADJUST,RIGHT
515	PAPER GUIDE,REAR
516	ROLLER,PF
517	COMPRESSION SPRING,5.86
518	BUSHING,12,LEFT
519	TENSION BELT,PUMP TRANSMISSION
520	SPUR GEAR,15.2
521	SPACER,C-RING
522	SCALLOP SPRING PIN-AW,2X16,F/B
523	SLEEVE,ROLOR,PF
524	SPUR GEAR,76
525	SPACER,FASTEN,ROLLER,PF
526	SPACER,FASTEN,ROLLER,PF;B
527	C-RING
528	PLANE WASHER,12.2X0.5X17
529	ROLLER ASSY.,EJECT OUT
530	BUSHING,6
531	RETAINING RING
532	SPUR GEAR,28
533	BUSHING,12,RIGHT
534	PLANE WASHER,4.1X0.5X6.5
535	PAPER GUIDE ASSY.,FRONT

Table 7-13. Parts List

Number	Name
536	GROUNDING WIRE,EJ
537	GROUNDING SPRING,PF
538	FRAME,PAPER EJECT;B
539	HOLDER,STAR WHEEL,RIGHT
540	HOLDER,STAR WHEEL,LEFT
541	HOLDER,STAR WHEEL,FRONT
542	WHEEL ASSY.,PAPER EJECT
544	RODSPRING,STARWHEEL;B
545	PAPER GUIDE,UPPER
546	ROLLER,DRIVEN
547	PAPER GUIDE,RIGHT
548	SHAFT,PAPER GUIDE,UPPER
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	LEVER,CR,LOCK
557	GUIDE PLATE,CR
558	SHEET,CABLE
559	SCREW,MOUNT,PF
560	CARRIAGE ASSY.
561	LEVER,ADJUST

Table 7-13. Parts List

Number	Name
562	GROUDING PLATE,HEAD;B
563	OIL PAD
564	SLIDER,CR
565	TIMING BELT
566	SHUFT,CR,GUIDE;B
567	PULLEY,DRIVEN
568	HOLDER,PULLEY,DRIVEN
569	COMPRESSION SPRING,23.52
570	LEVER,PG
571	LEVER,PG,SUPPORT
572	TORSION SPRING,63.7
573	HOLDER,PAPER SUPPORT,SUPPORT,UPPER
574	COMBINATION GEAR,13.5,30
575	BUSHING,PULLEY,DRIVEN
576	POROUS PAD,SLIDER,CAP
577	SHAFT,PULLEY,DRIVEN
578	EXTENSION SPRING,0.618
579	LEVER,PLANET
580	HARNESS,PE
582	SHAFT,SPUR GEAR,PLANET
583	PAPER SUPPORT,SUPPORT,UPPER,LEFT
584	PAPER SUPPORT,SUUPPORT,UPPER
585	U-TYPE SPRING,5.2X0.13X10,S/NA
586	COMBINATION GEAR,14,28
587	C.B.S. SCREW

Table 7-13. Parts List

Number	Name
588	C.P.SCREW
589	LEAF SPRING
590	PLAIN WASHER,3.3X0.5X8,F/UC
591	C.B.P-TITE,2.5X5,F/ZN
592	PLAIN WASHER,6.2*0.2*9,L/NA
593	PLAIN WASHER,5.1X0.7X11,S/NA
594	PLAIN WASHER,10.7X0.5X15.5,L/NA
598	EXTENSION SPRING,0.29
599	FRAME,MIDDLE
603	TAPE,D50
604	BOARD ASSY.,ENCODER
605	SCALE,CR
606	SCALE,PF
607	MOUNTING PLATE,SCALE
608	FFC,ENCODER
609	EXTENSION SPRING,1.494
610	MINI CRAMP,UAMS-05SN
611	SCALLOP SPRING PIN-AW,2X10,F/B
612	C.B.P-TITE SCREW,3X8,F/ZN
613	MOUNTING PLATE,BOARD ASSY.
614	FRAME,RIGHT,REAR
615	PLATE,SLIDER,CLEANER
616	EXTENSION SPRING,7.37
618	LEVER ASSEMBLY,COMBINATION GEAR
619	SET RING,D8.8

Table 7-13. Parts List

Number	Name
620	MOTOR ASSY,ASF
621	P.W.,3.1X0.5X12,F/ZN
622	RETAINING RING
623	COMBINATION GEAR,17.19,25.6
624	COMBINATION GEAR,12,22.92
625	LEVER,DE,LOCK
626	MOUNTING PLATE,MOTOR,ASF
627	COMPRESSION SPRIN,3.944
628	FERUTO,D3.6
629	C.P.S-TITE(P4),3X6,F/ZN
630	PLANE WASHER,4.5X0.5X8,L/NA
632	HOLDER,STAR WHEEL,SUPPORT
633	BUSHU,ROLLER PF,SUPPORT
634	LEVER,ROLLER PF,SUPPORT
635	MOUNTIN PLATE,LEVER,ROLLER PF,SUPPORT
636	EXTENSION SPRING,10.1
637	SHEET,INK STOPPER
638	HOLDER,ROLLER PF,SUPPORT
640	RETAINING RING
641	POROUS PAD,PAPER GUIDE FRONT
642	POROUS PAD,PAPER GUIDE FRONT,RIGHT
643	POROUS PAD,PAPER GUIDE FRONT,LEFT MIDDLE
644	+,BIND B-TITE SEMS W2,2.5X6,F/ZB
649	CUP SCREW
702	TORSION SPRING,28.4

Table 7-13. Parts List

Number	Name
700	PRINT HEAD
701	FASNER,HEAD
703	C.B.P-TITE SCREW,3X6,F/ZN
704	CABLE,HEAD,C
705	HOLDER,CABLE
706	SPACER,CABLE HEAD
707	FRAME,ASF;B
708	HOPPER;D
709	EDGE GUIDE;C
710	CORK
711	SLIDER,EDGEGUIDE
712	COMPRESSION SPRING,3.23
713	PAD,BREAK,EDGE GUIDE
714	SUPPORT PLATE,HOPPER;B
715	SPUR GEAR,32
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

Table 7-13. Parts List

Number	Name
726	PAD ASSY.,LEFT
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	STRENGTHEN PLATE,FRAME,ASF
742	C.C.P-TITE SCREW,3X8,F/ZN
743	POLUS PAD,FL
744	TAPE,14X17
745	SHEET,PAPERFEED
746	HOLDER,SHEET,PAPERFEED
747	SHAFT,MOUNT,CR
748	C.P.S-TITE(P4),3X6,F/ZN
749	HARNESS,ASF
750	PAPER SUPPORT,HOPPER

Table 7-13. Parts List

Number	Name
751	PAPER GUIDE,LOWER
752	POLUS PAD,LARGE
753	TRAY,POROUS PAD
754	SPACER,TRAY
755	FERRITE CORE,FSOC240RX01
758	EXTENSION SPRING,0.29
759	COVER,CARTRIDGE,BK
760	COVER,CARTRIDGE,C
761	PLAT SPRING COVER,CARTRIDGE
762	COVER,PLAT SPRING,CARTRIDGE
763	DETECTOR,HP;E
764	CORK;B
765	CLEANER HEAD,ASP
766	POLUS PAD,SMALL
770	CABLE,HEAD,B
774	DUMPER,SUPPORT;B
775	SEAT,PAPER EJECT
780	ASF ASSY.;C
800	SHAFT ASSY.,ROLLPAPER;B
801	FRAME,ROLLPAPER,FRONT;B
802	FRAME,ROLLPAPER,LEFT;B
803	FRAME,ROLLPAPER,RIGHT;B
804	C.B.B. SCREW
805	SHEET,ROLL PAPER
806	SPACER

Table 7-13. Parts List

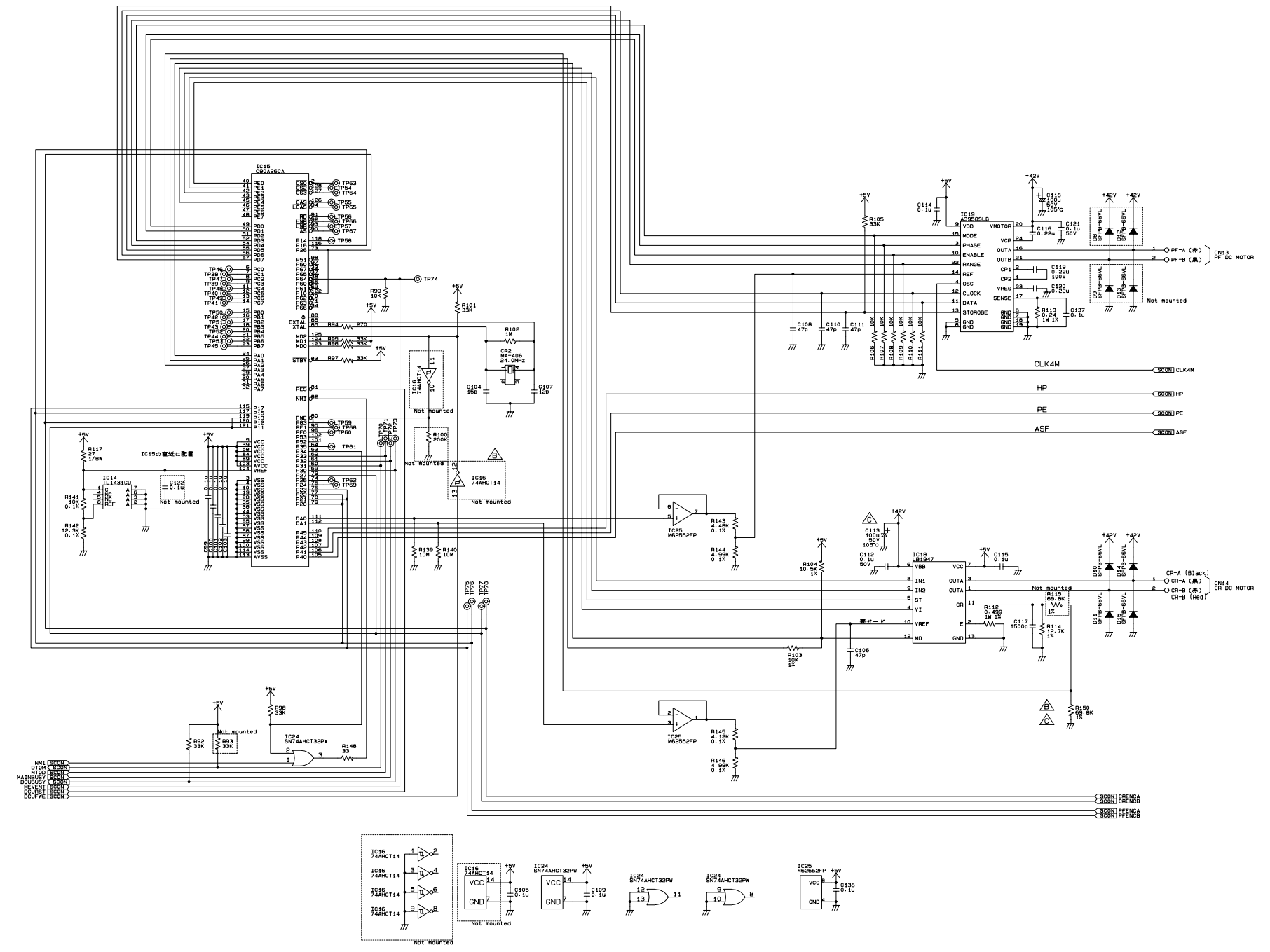| Number	Name
1	INDIVIDUAL CARTON BOX FOR AMERICA
3	PAD,SET,PRINTER
4	PAD,ACCESSORY
5	PLASTIC PROTECTIVE SHEET
6	PLASTIC PROTECTIVESHEET,320X135X0.06T
8	PLASTIC PROTECTIVE BAG,160X530X0.06T

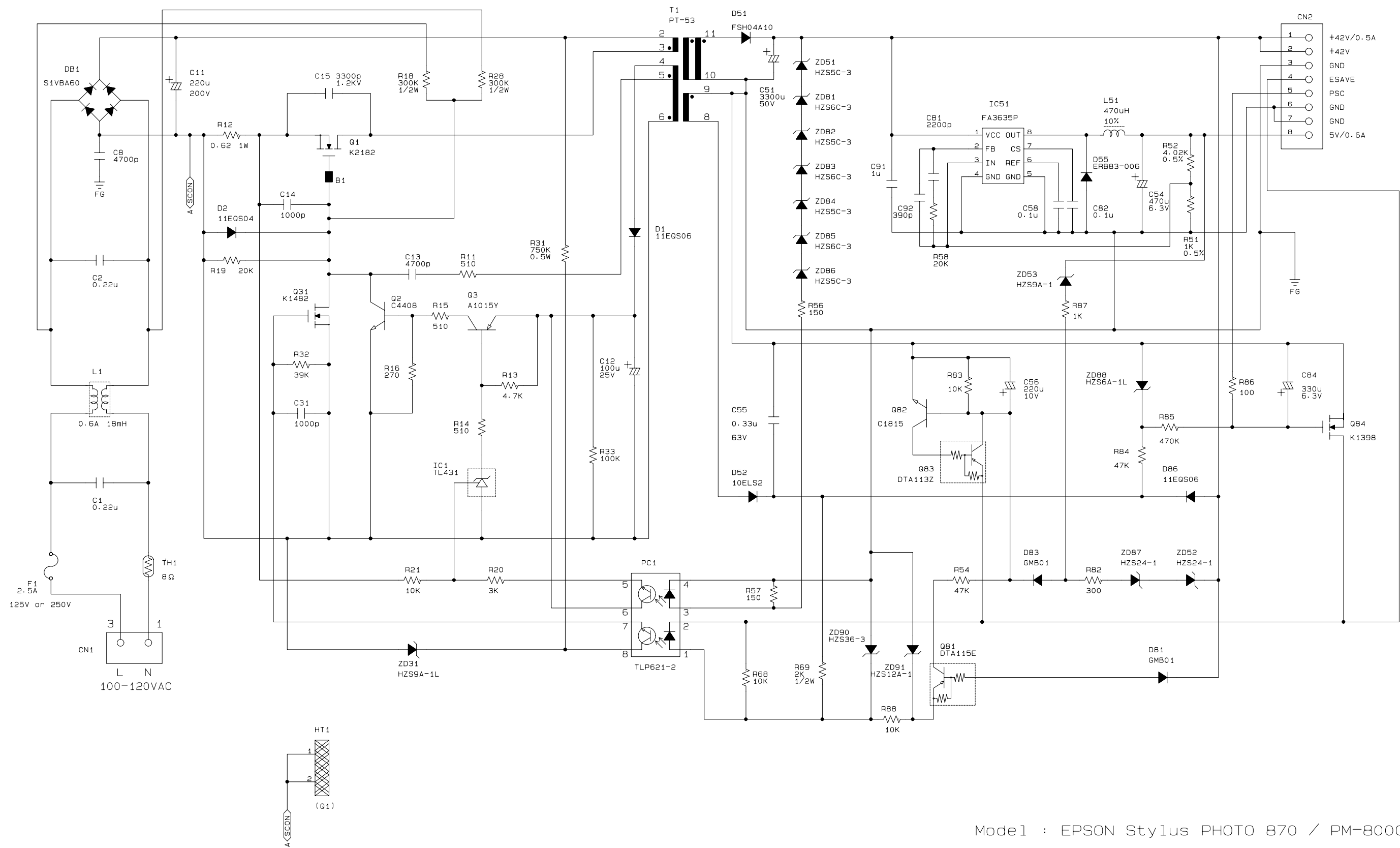## 7.6 Electrical Circuit Board Diagrams

See the following pages for the electrical circuit board diagrams below:

- C304MAIN (1)
- C304MAIN (2)
- C298PSB/PSE

Model : EPSON Stylus PHOTO 870 / PM-800C
Board : C304MAIN BOARD
Sheet : 1 of 2
Rev. : C

Model : EPSON Stylus PHOTO 870 / PM-800C
Board : C304MAIN BOARD
Sheet : 1 of 2
Rev. : C
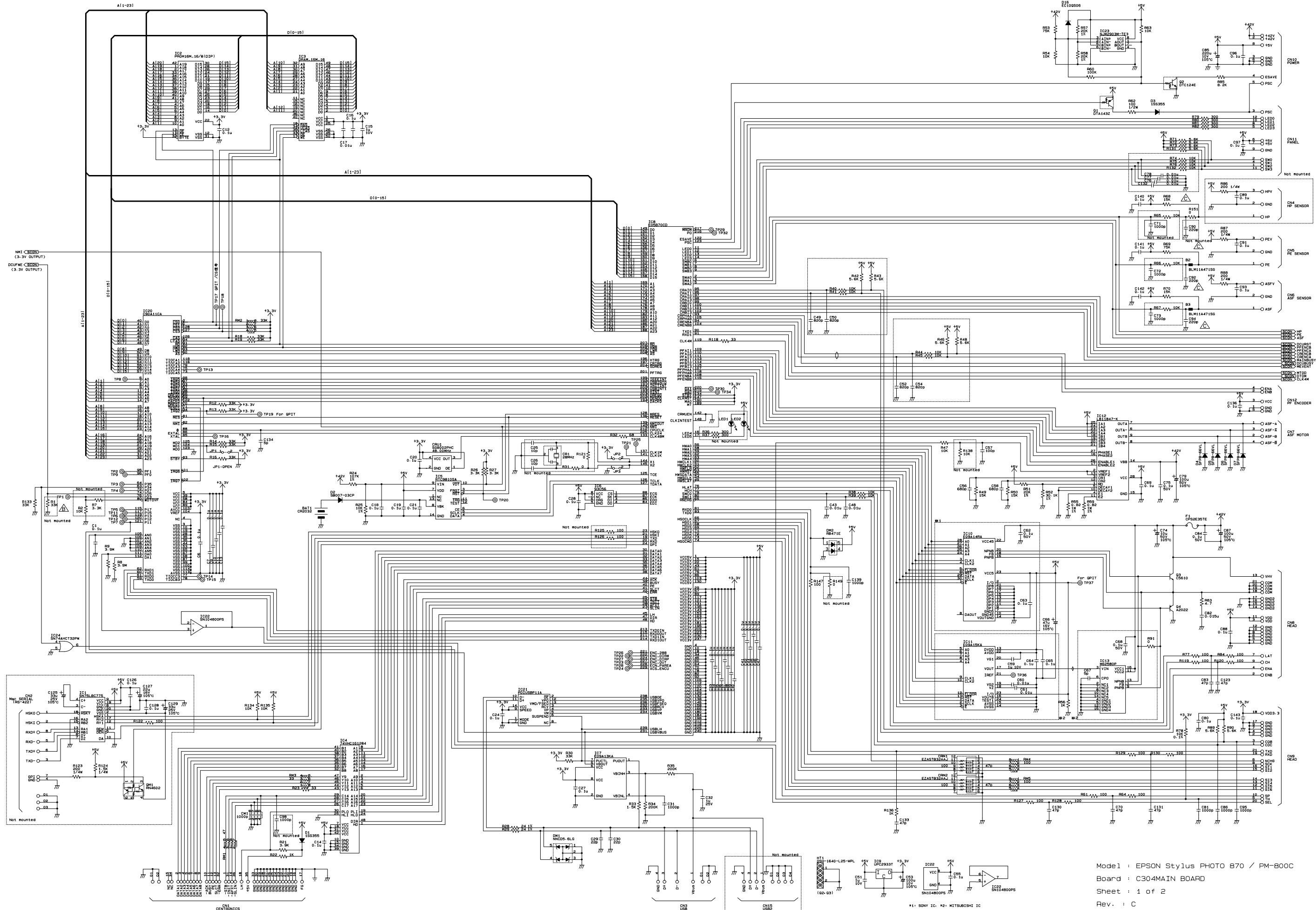
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Board : C304PSB BOARD

Sheet : 1 of 1

Rev. : A
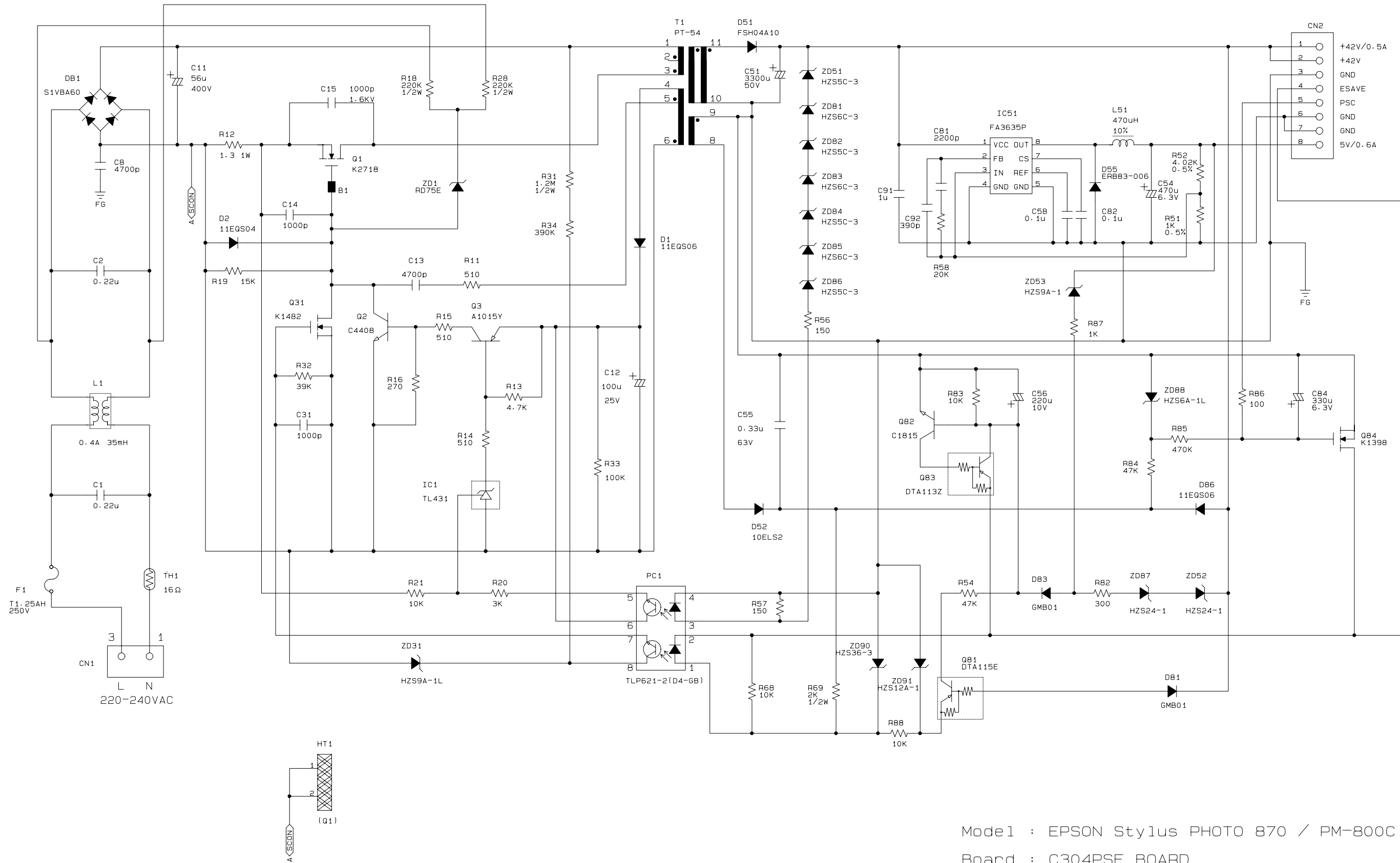
Model : EPSON Stylus PHOTO 870 / PM-800C

Board : C304PSE BOARD

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