SERVICE MANUAL

Scanner • Printer • Copier

EPSON Stylus CX1500
ME100

EPSON

SEOT04-006

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PRECAUTIONS

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

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

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

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

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.
3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.
4. WHEN DISASSEMBLING OR ASSEMBLING A PRODUCT, MAKE SURE TO WEAR GLOVES TO AVOID INJURIER FROM METAL PARTS WITH SHARP EDGES.

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.

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of the printer. 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.

Manual Configuration

This manual consists of six chapters and Appendix.

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
Describes the step-by-step procedures for the troubleshooting.

CHAPTER 4. DISASSEMBLY / ASSEMBLY
Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 5. ADJUSTMENT
Provides Epson-approved methods for adjustment.

CHAPTER 6. MAINTENANCE
Provides preventive maintenance procedures and the lists of Epson-approved lubricants and adhesives required for servicing the product.

CHAPTER 7. APPENDIX
Provides the following additional information for reference:

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

Symbols Used in this Manual

Various symbols are used throughout this manual either to provide additional information on a specific topic or to warn of possible danger present during a procedure or an action. Be aware of all symbols when they are used, and always read NOTE, CAUTION, or WARNING messages.

Indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.

Indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in damage to, or destruction of, equipment.

May indicate an operating or maintenance procedure, practice or condition that is necessary to accomplish a task efficiently. It may also provide additional information that is related to a specific subject, or comment on the results achieved through a previous action.

I.ndicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.

Indicates that a particular task must be carried out according to a certain standard after disassembly and before re-assembly, otherwise the quality of the components in question may be adversely affected.

Revision Status

Revision	Issued Date	Description
A	2004/9/1	First Release

NOTE: *Since the Stylus CX1500/ME100 are OEM products, the contents of the specification differ from those of EPSON products.Therefore, the structure and the contents of this service manual differ partly from usual manual.*

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CHAPTER

1

PRODUCT DESCRIPTION

1.1 Overview

The major features of EPSON color inkjet dot matrix printer EPSON Stylus CX1500/ME100 are:

1.1.1 Features

- Printer functions
  - Maximum print resolution : 1440 (H) x 720 (V) dpi
  - ASF (Auto Sheet Feeder) holds up to 100 cut sheets (65g/m^2)
- Scanner functions
  - Maximum optical resolution : 600 x 1200dpi
  - Scan gradations : 16bit/pixel/color
    - Data output from AFE : 16bit/pixel/color
    - Data output from Twain : 8bit/pixel/color or 1bit/pixel/color
- Stand-alone copy functions
  - Paper size can be selected from 2 options.
  - Paper type can be selected from 2 options, plain paper or photo paper, which also defines copy quality.
  - Enlarge/Reduce factor can be selected from 2 options, actual size (100%) or “Fit to page”.
- Scan functions
  This unit provides scan mode so that data can be scanned and transferred to a connected computer or to e-mail via application software like the EPSON SMART PANEL.

Figure 1-1. Product’s external view

1.2 Specifications

1.2.1 Printer specifications

This section covers specifications of the printer.

1.2.1.1 Physical Specification

- Weight : 5.1kg
- Dimension (Including rubber feet)
  - Storage : 430mm (W) x 302mm (D) x 188.5mm (H)

1.2.1.2 Printing Specification

- Print Method
  - On demand ink jet
- Nozzle Configuration
  - Monochrome 48 nozzles
  - Color 15 nozzles x 3 (Cyan, Magenta, Yellow)

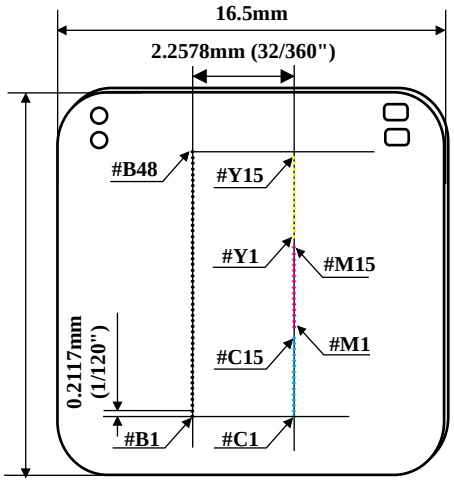


Figure 1-2. Nozzle configuration

- Print Direction
  - Bi-directional minimum distance printing (with logic seeking)
- Print Speed

Table 1-1. Print Speed

Paper Type	Print Mode	e-Memo (A4)		J1	J6	8x10 Bike
		Black	Color			
Plain Paper	Draft 360x120dpi	12ppm	5.3ppm	—	—	—
	Default (Text) 360x360dpi	5.3ppm	1.3ppm	—	—	—
	Photo RPM 720x720dpi	—	—	—	—	—
Photo Paper	Default (Text & Image) 360x720dpi	—	—	—	—	291sec
	Photo 720x720dpi	—	—	—	—	630sec
	Photo RPM 1440x720dpi	—	—	—	—	2010sec

- Control Code
  - ESC/P Raster command
  - EPSON Remote command
- Internal fonts
  - Courier Regular font
  - ASCII from 0x20 to 0x7E
- Input buffer size
  - 128KByte for USB buffer

1.2.1.3 Paper Feed Specifications

- Paper feed method
  Friction feed, using one ASF (Auto Sheet Feeder)

- Paper path
  Top feed, front out
- Paper feed rates
  - 110mm/sec (4.3inch/sec): 10.16mm feed
  - 140mm/sec (5.5inch/sec): continuous feed
- CR interval
  0.035mm (1/720inch) steps

1.2.1.4 Paper Support

- Cut sheets

Table 1-2. Cut sheets

Paper size	Dimensions		Thickness	Weight	Paper type
	Width	Length			
A4	210mm	297mm	0.08-0.11mm	64-90g/m^2 (17-24(lb))	Plain paper Reclaimed paper
A5	148mm	210mm			
B5	182mm	257mm			
Letter	215.9mm (8.5")	279.4mm (11")			
Legal	215.9mm (8.5")	355.6mm (14")			
Executive	184.2mm (7.25")	266.7mm (10.5")			
Half Letter	139.7mm (5.5")	215.9mm (8.5")			
User defined	89-215.9mm	89-1117.6mm			

CAUTION

- **Poor quality paper may reduce print quality and cause paper jams or other problems. If you encounter problems, switch to a higher grade of paper.**
- **It is necessary that there is no wrinkle, nap, tear, fold, so on in the form.**
- **The curve of form must be 5mm or below.**
- **Use paper under normal conditions**
  - **Temperature 15 to 25°C (59 to 77°F)**
  - **Humidity 40 to 60% RH**

☐ Envelopes

Table 1-3. Envelopes

Paper size	Dimensions		Thickness	Weight	Paper type*
	Width	Length			
No.10	241.3 (9.5")	104.8 (4.125")	N/A	75-90g/m^2 (20-24(lb))	Bond paper Air mail PPC
DL	220	110			
C6	162	114			
220x132	220	132			

Note "*": Check that the flap is on the long side and be sure to fold it down.

CAUTION

- **Use paper under normal conditions**
  - **Temperature 15 to 25°C (59 to 77°F)**
  - **Humidity 40 to 60% RH**
- **Poor quality paper may reduce print quality and cause paper jams or other problems. If you encounter problems, switch to a higher grade of paper.**
- **It is necessary that there is no wrinkle, nap, tear, fold, so on in the form.**
- **Don't use the adhesive envelopes.**
- **Don't use sleeve insert envelopes and cellophane window envelopes.**

☐ Exclusive papers

Quality: EPSON Exclusive paper

Transparency printing is only available at normal temperature.

Table 1-4. Exclusive papers

Item	Size	Width (mm)	Length (mm)	Thickness (mm)	Weight (g/m²)
Bright White Ink Jet Paper	A4	210	297	0.11	80
Premium Bright White Paper	Letter	215.9	279.4	TBD	TBD
Photo Quality Ink Jet Paper	Letter	215.9	279.4	0.13	102
	Legal	215.9	355.6		
	A4	210	297		
	Index card 8"x10"	203.2	254		
	Index card 5"x8"	127	203.2		
	Index card A6	105	148		
Matte Paper Heavy weight	Letter	215.9	279.4	0.23	167
	A4	210	297		
	8"x10"	203.2	254		
Photo Paper/ Glossy Photo Paper	Letter	215.9	279.4	0.23	188
	A4	210	297		
	10x15	101.6	152.4		
	4"x6" No Perforations	101.6	152.4		
	4"x6" Perforations	101.6	152.4		
Economy Photo Paper	A4	210	297	0.23	188
Photo Sticker 4/16	A6	105	148	0.19	N/A
Premium Glossy Photo Paper	4"x6" No Perforations	101.6	152.4	0.23	188
	10x15	101.6	152.4		
	5"x7"	127	178		

Table 1-4. Exclusive papers

Item	Size	Width (mm)	Length (mm)	Thickness (mm)	Weight (g/m²)
Iron-on Cool Peal Transfer Paper	Letter	215.9	279.4	0.18	124
	A4	210	297		
Photo Quality Self Adhesive Sheet	A4	210	297	0.19	167
Double-Sided Matte Paper	Letter	215.9	279.4	0.25	178
	A4	210	297		
Ink Jet Transparencies	Letter	215.9	279.4	0.13	N/A
	A4	210	297		

CAUTION

- **Use paper under normal conditions.**
  - **Temperature 15 to 25°C (59 to 77°F)**
  - **Humidity 40 to 60% RH**
- **Poor quality paper may reduce print quality and cause paper jams or other problems. If you encounter problems, switch to a higher grade of paper.**
- **It is necessary that there is no wrinkle, nap, tear, fold, so on in the form.**
- **The curve of form must be 5mm or below.**

1.2.1.5 Printing Area

☐ Cut sheet (standard printing)

■ Printable area
The print quality is guaranteed for the print area above the 12.5mm bottom margin. For paper width (PW) and paper length (PL), refer to "1.2.1.4 Paper Support" *(p.11)*.
Refer to the following table. As for each margin area, refer to Figure 1-3 *(p.14)*.

Table 1-5. Applicable paper/Printing area

	Paper type	Left margin	Right margin	Top margin	Bottom margin
Cut sheets	A4	3mm (0.12")	3mm (0.12")	3mm (0.12")	12.5mm (0.49")
	A5				
	B5				
	Letter				
	Legal				
	Executive				
	Half Letter				
	User defined				
Exclusive papers	Bright White Ink Jet Paper	3mm (0.12")	3mm (0.12")	3mm (0.12")	12.5mm (0.49")
	Premium Bright White Paper				
	Premium Ink Jet Plain Paper				
	Photo Quality Ink Jet Paper				
	Matte Paper Heavy weight				
	Photo Paper/Glossy Photo Paper				
	Economy Photo Paper				
	Photo Sticker				
	Premium Glossy Photo Paper				
	Iron-on Cool Peal Transfer Paper				
	Photo Quality Self Adhesive Sheet				
	Double-Sided Matt Paper				
	Ink Jet Transparencies				

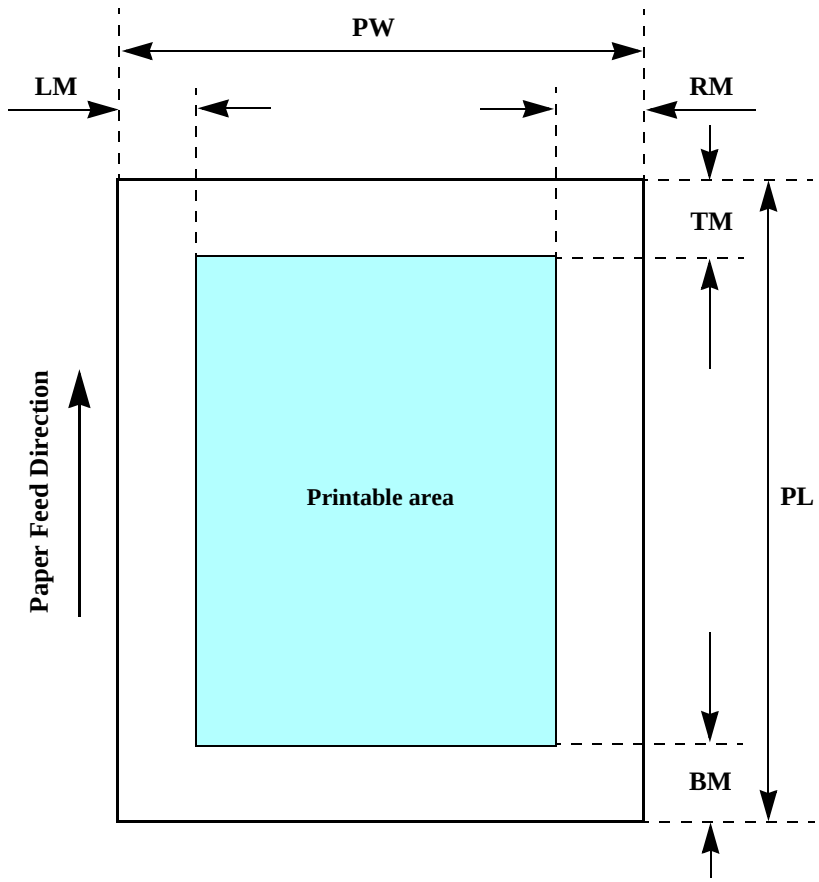


Figure 1-3. Printable area Cut sheet (standard printing)

- Envelopes
  - Printable area
    For paper width (PW) and paper length (PL), refer to "1.2.1.4 Paper Support" (p.11).
    Refer to the following table. As for each margin area, refer to Figure 1-4 (p.15).

Table 1-6. Applicable paper/Printing area

Paper type	Left Margin	Right Margin	Top Margin	Bottom Margin
No.10	3mm (0.12")	3mm (0.12")	3mm (0.12")	12.5mm (0.49")
DL				
C6				
220x132				

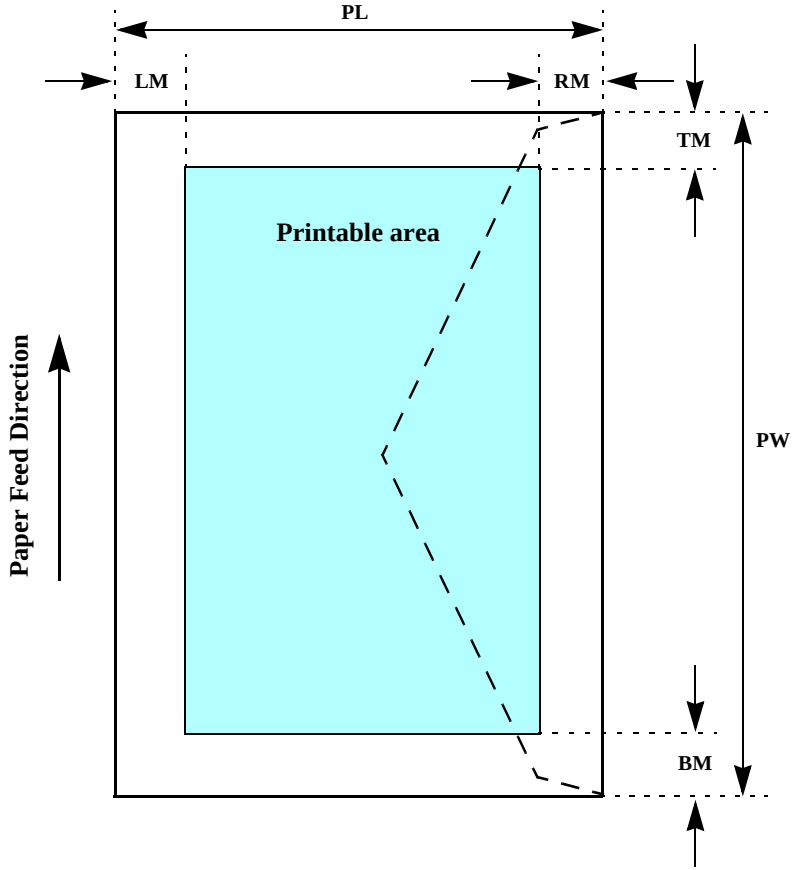


Figure 1-4. Printable area for envelopes

1.2.1.6 Ink Cartridge Specification

- Type : Exclusive cartridge
- Color
  - Black ink cartridge : Black
  - Color ink cartridge : Magenta, Cyan, Yellow

Table 1-7. Ink Cartridge

Color	Stylus CX1500	ME100
Black	T038	T057
Color	T039	T058

- Print capacity
  - Black ink cartridge : 330 pages / A4 (ISO/IEC10561 Letter Pattern at 360 dpi)
  - Color ink cartridge : 180 pages /A4 (360 dpi, 5% duty each color)
- Ink life : 2 years from production date
- Storage temperature

Table 1-8. Storage Temperature

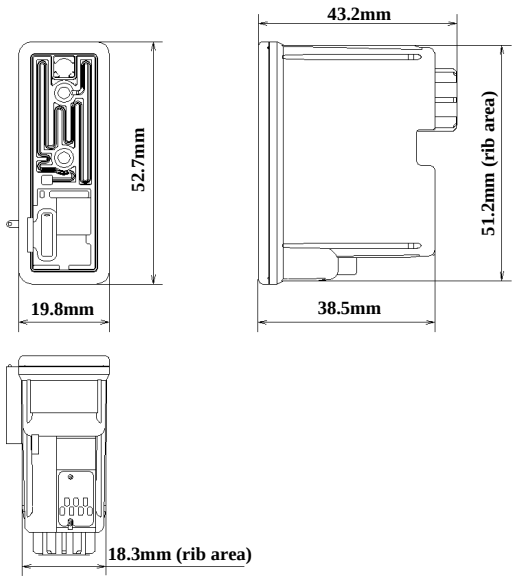
Situation	Storage Temperature	Limit
Storage	-20°C to 40°C	Within a month at 40°C
Packing storage	-30°C to 40°C	
Transit	-30°C to 60°C	Within 120 hours at 60°C and within a month at 40°C

- Dimension
  - Black : 19.8mm (W) x 52.7mm (D) x 38.5mm (H)
  - Color : 42.9mm (W) x 52.7mm (D) x 38.5mm (H)

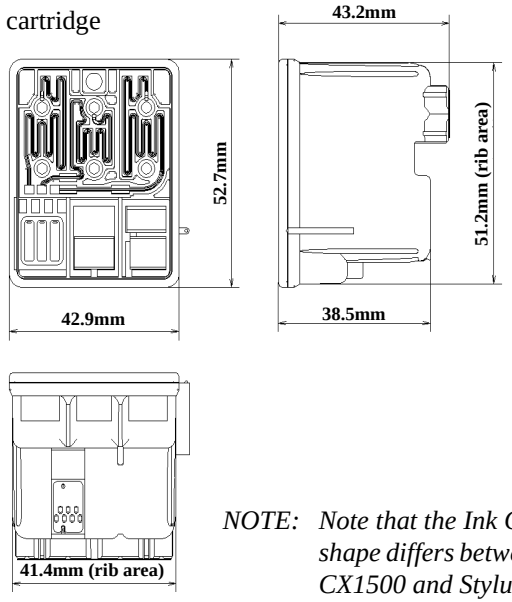
CAUTION

- **The ink cartridge cannot be refilled.**
- **The ink cartridge that passes the expiration date should not be used.**
- **The ink in the ink cartridge freezes when leaving it in the environment of -16°C or under. It takes 3 hours that the frozen ink becomes usable when moving it from the environment of -20 °C to the environment of 25°C.**

- Black ink cartridge



- Color ink cartridge



NOTE: Note that the Ink Cartridge shape differs between Stylus CX1500 and Stylus ME100.

Figure 1-5. Ink cartridge

1.2.2 Scanner specifications

This section covers specifications of the scanner.

1.2.2.1 Basic Specifications

- Product type : Flatbed color image scanner
- Scanning method : Scanning of fixed document with mobile scan head
- Sensor : CIS
- Maximum scan area : 8.5" x 11.7" (216mm x 297mm)
- Document sizes : A4 or US letter
- Max. effective pixels : 5,100 x 7,020pixels (600dpi)
- Resolution
  - Main scan : 600dpi
  - Sub scan : 1200dpi with Micro Step
- Scanning resolution : 50 to 2400dpi (selectable in 1-dpi steps), 7200dpi, 9600dpi
- Gradations (pixel depth) : Each color pixel has 16-bit input and either 1-bit or 8-bit output.
- Scanning speed : 600dpi
  - Color : Approx. 15msec/line
  - Monochrome : Approx. 5msec/line
- Light source : RGB Three Color LED

1.2.2.2 Detailed Specifications

- Control commands : ESC/I D7
- Gamma correction : Two user-defined levels

1.2.2.3 Image scanning area

Table 1-9. Image scanning area

RW (readable width)	OLM (out-of-range left margin)	RL (readable length)	OTM (out-of-range top margin)
216mm (8.5")	2.5mm ± 1mm	297mm (11.7")	2.5mm ± 1mm

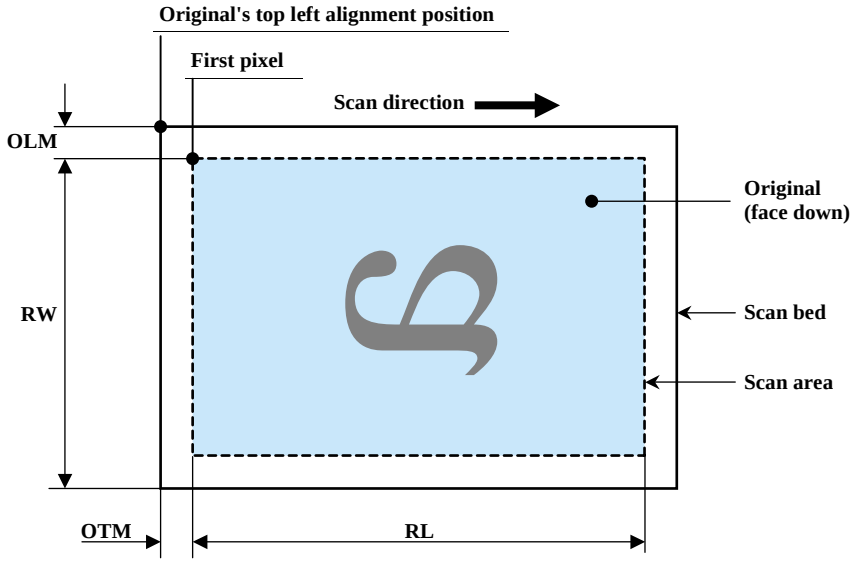


Figure 1-6. Image scanning area

1.2.3 Common

1.2.3.1 Electric Specification

☐ Power input

Table 1-10. Power input

		100-120V model	220-240V model
Rated power supply voltage (ACV)		100 ~ 120	220 ~ 240
Input voltage range (ACV)		90 ~ 132	198 ~ 264
Rated current (A)		0.41 (Typ), 0.6 (Max)	0.24 (Typ), 0.35 (Max)
Rated frequency (Hz)		50 ~ 60	
Input frequency range (Hz)		47 ~ 63 for rated input frequency 50 ~ 60	
Power consumption (W)	Standby	4.2 (Typ), 5 (Max)	4.6 (Typ), 5 (Max)
	Idle	7.5 (Typ), 8 (Max)	8 (Typ), 8.5 (Max)
	Scanning	11.5 (Typ), 12 (Max)	12.0 (Typ), 12.5 (Max)
	Printing	• 14.5 (Text Black Plain Paper) (Typ) • 27 (Draft Color Plain Paper) (Max)	• 15.2 (Text Black Plain Paper) (Typ) • 27.0 (Draft Color Plain Paper) (Max)
	Copying	• 17.0 (Normal BK Mode) (Typ) • 32.5 (Draft BK Mode) (Max)	• 17.5 (Normal BK Mode) (Typ) • 32.5 (Draft BK Mode) (Max)

Note : This product complies with the “Energy Star” standards.

☐ Insulation resistance
10MΩ minimum (tested between AC line and chassis, test voltage: DC500V)

☐ Dielectric strength
AC1500Vrms for one minute

1.2.3.2 Environmental Performance

Table 1-11. Environmental Performance

Condition	Temperature	Humidity *2	Impact	Vibration
Operating	10 ~ 35°C *3	20 ~ 80% *3	1G, 1 x 10^{-3} seconds	1.5G
Not operating *1	-20 ~ 60°C	5 ~ 85%	2G, 2 x 10^{-3} seconds	1.5G

Note *1: When packed for shipping
*2: No condensation
*3: Under the following conditions

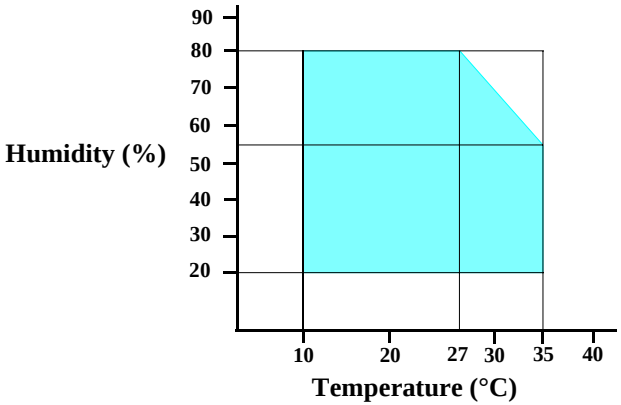


Figure 1-7. Temperature/Humidity range

1.2.3.3 Durability

☐ Total print life : 20,000 pages (A4), or 5 years (whichever comes first)

☐ Print Head Life : 4 billion shots (per nozzle) or 5 years (whichever comes first)

☐ Scanner head : MCBF (18,000 cycles)

1.2.3.4 Safety Standards/EMC/CE Marking

- CSA108.8 Class B
- UL CSA C22.2 No.60950
- UL60950 / CSA C22.2No.60950
- CCC
- IEC60950
- Korea EMC
- Korea
- Singapore safety standard/SS Mark
- TUV-S Argentina safety
- FCC15B Class B
- CE
  - EN55022 (CISPR Pub22) Class B
  - EN61000-3-2
  - EN61000-3-3
  - EN55024
- EPSR
- C-TICK-ASINZS 3548 Class B
- NOM
- CNS13438 Class B

1.2.3.5 Acoustic Noise

- Noise level
  48.5dB (approx.) (according to ISO7779 when for copying)

1.3 Interface

The EPSON Stylus CX1500/ME100 provides the following interface.

1.3.1 USB Interface

- Standards
  - "Universal Serial Bus Specifications Revision 2.0"
  - "Universal Serial Bus Device Class Definition for Printing Devices Version 1.1" (printer unit)
  - "Universal Serial Bus Mass Storage Class Bulk-Only Transport Revision 1.0" (storage unit)
- Transfer rate : 12Mbps (Full Speed Device)
- Data format : NRZI
- Compatible connector : USB Series B
- Recommended cable length : 2 [m] or less
- Device ID

Table 1-12. Device ID

Model Name	Device ID	Model Name	Device ID
Stylus CX1500	@EJL[SP]ID[CR][LF]; MFG:EPSON; CMD:ESCPL2,BDC; MDL:Stylus[SP]CX1500; CLS:PRINTER; DES:EPSON[SP]Stylus[SP]CX1500; [FF]	ME100	@EJL[SP]ID[CR][LF]; MFG:EPSON; CMD:ESCPL2,BDC; MDL:ME[SP]100; CLS:PRINTER; DES:EPSON[SP]ME[SP]100; [FF]

- Connector signal layout

Table 1-13. Connector pin assignment and signals

Pin No.	Signal name	I/O	Function description
1	VCC	-	Cable power. Max. power consumption is 2mA.
2	-Data	Bi-D	Data
3	+Data	Bi-D	Data, pull up to +3.3V via 1.5K ohm resistor.
4	Ground	-	Cable ground

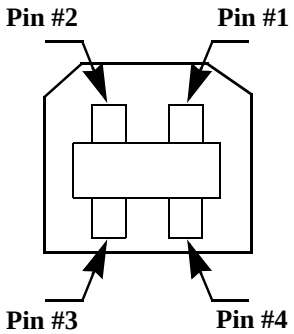


Figure 1-8. USB pin Assignment

- Product ID: 0x081
- Endpoint attribute

Table 1-14. Endpoint attribute

Endpoint Address	Endpoint Type	Linked Interface
0x01	Bulk In	Scanner
0x02	Bulk Out	
0x03	Bulk In	Printer
0x04	Bulk Out	

1.4 Stand-alone Copy

1.4.1 Basic Specifications

1.4.1.1 Supported paper sizes, types and qualities

Table 1-15. Supported paper sizes, types and qualities

Paper type		Quality *1	Paper size
Paper name	Panel Indication		
Plain Paper	Plain Paper	Plain Paper	A4/Letter
Premium Glossy Photo Paper	Photo Paper	Photo Paper	10x15/4"x6"

Note : The quality of draft copy is not affected by “Paper type” selection.

Note *1: Connected with Paper type.

1.4.1.2 Zoom function

The zoom function provides enlarged or reduced copies of originals. The either of the following can be selected from the operation panel.

- ☐ Actual (The state which “Fit to page” is not selected. It is the power-on default.) The zoom factor is set to 100%.
- ☐ Fit to page
  This function detects the image size of the original and automatically sets the zoom factor of the copy according to the copy paper’s printable area.

1.4.1.3 Number of copies setting

This function sets the number of copies. The setting range is 1 to 3.

1.4.1.4 Maximum copy size

- ☐ 216 x 297mm

1.4.1.5 Copy layout

The following copy layout is provided according to “Media Select (Paper type & Paper size)” and zoom selections.

- ☐ Standard copy
  Provided for ordinary use with 3mm copy margin from every side.

1.4.2 Copy Speed

Table 1-16. Copy Speed

Mode	Paper Type	Black/ Color	e-memo Pattern (A4, Epson Matter Paper)	8x10 Bike on Epson PGPP	Note
Draft	Plain Paper	Black	10cpm	–	Copy on Epson A4 size premium plain paper
		Color	4cpm	–	
Normal	Plain Paper	Black	4cpm	–	Copy on Epson A4 size premium plain paper
		Color	1cpm	–	
Photo	PGPP	Black/Color	–	400sec	Copy on Epson 4"x6" PGPP

1.4.3 Copy Mode

Table 1-17. Copy Mode

Mode	Paper Type	Scan Input Resolution	Scan Input Color	Print Output Resolution	High Speed	Ink Cartridge Usage	Back-ground Removal	Dot Size	Interlace Method
Draft Black	Plain Paper	600x150	Gray	360x120	On	Black	On	ND3	1x1
Draft Color	Plain Paper	600x150	RGB	360x120	On	Both	On	ND3	1x1
Normal Black	Plain Paper	600x300	Gray	480x240	On	Black	On	MS1	1x2
Normal Color	Plain Paper	600x300	RGB	360x360	On	Both	On	MS2	1x3
Photo Black	PGPP	600x600	RGB	720x720	Off	Both	Off	VD	2x6
Photo Color	PGPP	600x600	RGB	720x720	Off	Both	Off	VD	2x6

1.4.4 Relation between original and copy

The following table shows the relative positioning of the original and copy.

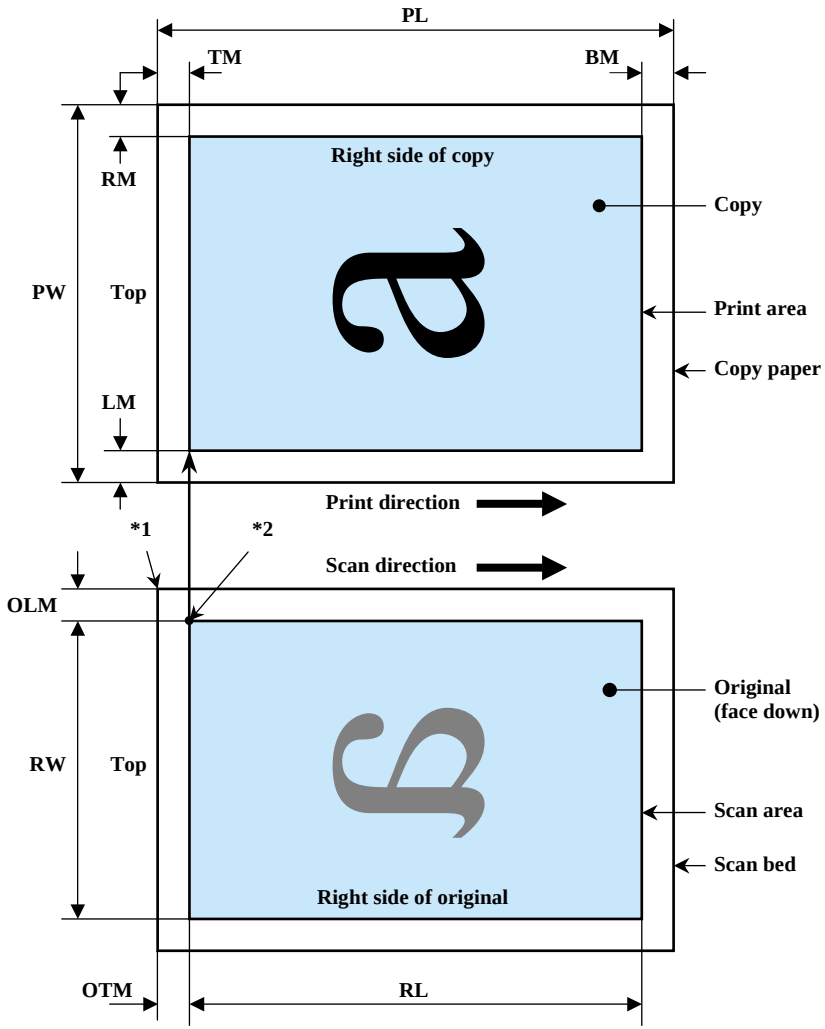
Table 1-18. Original (scanner)

RW (readable width)	OLM (out-of-range left margin)	RL (readable length)	OTM (out-of-range top margin)
216mm (8.5")	2.5mm ± 1mm	297mm (11.7")	2.5mm ± 1mm

Table 1-19. Copy (printer)

RM	LM	TM	BM
3mm (0.12")	3mm (0.12")	3mm (0.12")	3mm (0.12")

Note : Refer to "1.2.1.4 Paper Support" *(p.11)* for paper width (PW) and paper length (PL).



Note *1: This indicates the top left corner of the original. Normally, this corner is aligned with the scan bed's top right corner as the reference point.

*2: This indicates the scan start position at the top left of the original, which corresponds to the print start position at the top left of the copy. The bottom right corner position of the copy is within the print area but varies according to the enlarge/reduce setting.

Figure 1-9. Standard copy

1.5 Control Panel

1.5.1 Buttons

The control panel contains following 8 buttons, which are used to set and execute various operations.
All of them are non-lock type buttons.

Table 1-20. Buttons

Button	Function
Power Button	Execute turning on/off this unit.
Ink Maintenance Button	Execute exchanging ink cartridges or head cleaning.
Number of copies Button	Sets number of copies.
Media Select Button	Select paper type.
Fit to Page Button	Setting On/Off of Fit-to-Page
B&W Start Button *1	Start monochrome copy.
Color Start Button	Start color copy.
Stop Button	Stop job of copying or printing or sometimes work as shift button.

Note *1: B&W means “Black and White”.

Refer to “1.5.3.1 Normal Operation” *(p.25)* for details about each button.

1.5.2 Indicators

The control panel contains following 8 LEDs, which are used to indicate various status.

Table 1-21. Indicators

LED	Function
Power LED [Green]	Light at stand-by. Blink while some operation is proceeding.
Paper Error LED [Red]	Light or blink while some error or warning is occurring.
Ink Error LED [Red]	Light when some ink is out. Blink when some ink is near empty or in the ink cartridge exchanging procedure.
Number of Copies LED 2, 3	Indicate number of copies.
2nd [Green]	Number of Copy = 2
3rd [Green]	Number of Copy = 3
Paper Type LED 1, 2	Light one of them showing which paper size below is selected.
1st [Green]	Plain Paper (A4/Letter)
2nd [Green]	Photo Paper (10x15/4"x6")
Fit to Page LED [Green]	Light when “Fit to Page” function is effective in copy mode.

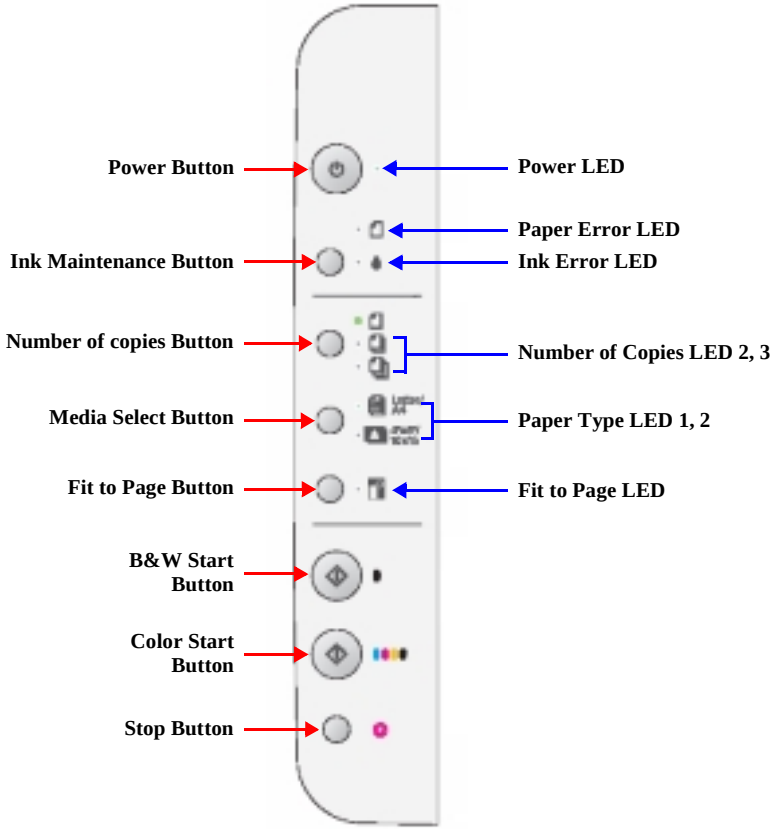


Figure 1-10. Control panel

1.5.3 Operations

1.5.3.1 Normal Operation

Table 1-22. Normal Operation

Button	Condition	Function
Power Button	At Standby	☐ Enter Power On State ☐ Power LED blink until enter Idle state. ☐ At Idle state, Power LED keeps On.
	At other state except Standby	☐ Enter Power Off State ☐ Power LED blink until enter Standby state. ☐ At Standby state, all LEDs keep Off.
Ink maintenance Button	• Idle state • Ink Low • Ink Out	☐ Press less than 3 sec 1. If no Paper in Printer, load paper (Idle state, Ink Low) 2. If Paper in Printer, eject paper (Idle state, Ink Low) ■ Exchange Ink Cartridge (Ink Out) ☐ Press between 3 to 6 sec ■ Head Cleaning (Idle state) ■ Exchange Ink Cartridge (Ink Low, Ink Out) ☐ Press over 6 sec ■ Force to exchange Ink Cartridge
	Paper Error	Push to recover Paper Error
Number of Copy Button*1	Power On Setting	Number of Copy = 1
	Number of Copy	☐ Add 1 and the number becomes 2 to 3. ☐ Reset to “1”.
	Error release	Reset to “1”.
Media Select Button*1	Power On Setting	Plan paper
	Media Type	Alternate paper type of “Plain Paper” and “PGPP”.
Fit to page Button*2	Factory Setting	OFF
	Fit-to-Page	Alternate Fit-to-Page of On and Off.

Table 1-22. Normal Operation

Button	Condition	Function
B&W copy start Button	In Idle state	☐ B&W copy start. 1. Paper size & type, Fit-to-Page settings are stored. 2. Based on the setting, do B&W copy. 3. When Copy finished, restore Number of copies, Paper size & type, Fit-to-Page setting to Panel. Number of Copy Reset to “1”. 4. If paper out error is happened in 2nd or 3rd copies, stop the copy operation, cancel the paper out error automatically and enter Idle state.
	In Error state	Continue processing
Color copy start Button	In Idle state	☐ Color copy start. 1. Paper size & type, Fit-to-Page settings are stored. 2. Based on the setting, do B&W copy. 3. When Copy finished, restore Number of copies, Paper size & type, Fit-to-Page setting to Panel. Number of Copy Reset to “1”. 4. If paper out error is happened in 2nd or 3rd copies, stop the copy operation, cancel the paper out error automatically and enter Idle state.
	In Error state	Continue processing
Stop Button*3	In Copying state	1. Stop and cancel the job of copy. 2. If there is a paper, or there might have a paper, discharge the paper. 3. Restore the Number of copies, Paper size & type, Fit-to-Page setting to Panel. Number of Copy Reset to “1”.
	In Error state	1. Cancel current 2. Number of Copy Reset to “1”.

Note *1: Only valid in idle state and paper out error.

*2: Only valid in idle state.

*3: Not valid for Scanning, Printing, Head Cleaning, Ink Cartridge Exchange and Power On/Off.

1.5.3.2 Maintenance Operation

Nozzle check pattern print

- Condition
  Press Ink maintenance button with Power button to turn on this unit
- Function
  - Nozzle check pattern is printed standalone.
  - Remaining ink quantities of each color are printed.
  - Enter Idle mode after printing completed.

  The example of nozzle check pattern is below.

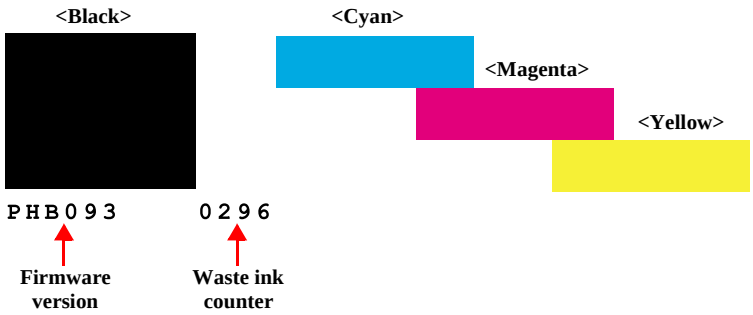


Figure 1-11. Nozzle check pattern

Paper size exchange mode

- Condition
  Press B&W (Color) Start button with Media Select button at the same time
- Function
  - Paper Size selection is change to A4/4"x6" (Letter/4"x6") mode.
  - Confirm the setting by flushing all LEDs once.

NOTE: Only valid in idle state.

1.5.3.3 Service Operation

The ink overflow counter can be reset using the steps below.

1. Number of copies button with Power button-ON
   - Enter to maintenance setting mode.
   - Make all LED turn on for 1 second.
   - The contents of initialization when each button is pressed are shown in the Step 2.
   - Return to the mode if the button other an in the Step 2 is pressed.
2. B&W start button is pressed more than 3 seconds and less than 10 seconds.
   - Reset ink overflow counter while in maintenance mode.

1.5.4 Printer Condition and Panel Status

Table 1-23. Printer Condition and Panel Status

Printer status	Indicators								Priority
	Power	Paper Error	Ink Error	Number of Copies		Paper Type		Fit to Page	
				1	2	1	2		
Ink out or No Ink cartridge	—	—	On	—	—	—	—	—	4
Incorrect I/C	—	—	On	—	—	—	—	—	
Paper out	—	On	—	—	—	—	—	—	3
Paper jam	—	On	—	—	—	—	—	—	
Maintenance request	Off	Off	On	Off	Off	Off	Off	Off	2
Fatal error	On	On	On	On	On	On	On	On	1

Note : "—": Don't care

1.5.4.1 Error Status

- **Ink out error**
  When the printer runs out the most amount of the ink of any one color, it indicates ink low and keeps printing. When the printer runs out the whole ink of any color, it stops printing and indicates ink end error. User is then requested to install a new ink cartridge in this state.
- **Paper out error**
  When the printer fails to load a sheet, it goes into a paper out error.
- **Paper jam error**
  When the printer fails to eject a sheet, it goes into a paper jam error.
- **No ink cartridge**
  When the printer detects that ink cartridge comes off, or failed to read or write CSIC data, it goes into this error mode.
- **Maintenance request**
  When the total amount of ink wasted through cleanings and flushing reaches to the limit, printer indicates this error and stops. In such a case, the absorber in the printer enclosure needs to be replaced with new one by a service person.
- **Fatal error**
  Carriage control error.

1.5.5 Printer Initialization

There are four kinds of initialization method, and the following explains each initialization.

1. Power-on initialization
   This printer is initialized when turning the printer power on, or printer recognized the cold-reset command (remote RS command).
   When printer is initialized, the following actions are performed.
   (a) Initializes printer mechanism
   (b) Clears input data buffer
   (c) Clears print buffer
   (d) Sets default values

2. Operator initialization
   This printer is initialized when turning the printer power on again within 10 seconds from last power off, or printer recognized the -INIT signal (negative pulse) of parallel interface.
   When printer is initialized, the following actions are performed.
   (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 initialize the printer.
   When printer is initialized, the following actions are performed.
   (a) Clears print buffer
   (b) Sets default values

4. Power-on initialization except I/F
   The printer recognized the IEEE 1284.4 “rs” command.
   When printer is initialized, the following action is performed.
   (a) Initializes printer mechanism
   (b) Clears input data buffer
   (c) Clears print buffer
   (d) Sets default values except I/F

CHAPTER

2

OPERATING PRINCIPLES

2.1 Overview

This section describes the operating principles of the Printer Mechanism, Scanner Mechanism and Electrical Circuit Boards.

- Main Board
  - C572 Main Board
- Power Supply Board
  - C5xx PSB/PSE Board (TBD)
- Panel Board
  - C5xx PNL Board (TBD)

2.1.1 Printer Mechanism

The Printer Mechanism for the Stylus CX1500/ME100 is newly designed. But, the basic component of the Printer Mechanism is almost the same as the previous printer (Stylus C41/C42/C43/C44/C45/C46).
This printer consists of Print Head, Carriage Mechanism, Paper Loading Mechanism, Paper Feeding Mechanism, Ink System.
Like the previous printers (Stylus C41/C42/C43/C44/C45/C46), the Stylus CX1500/ME100 is equipped with two stepping motors; one for the Paper Loading/Feeding Mechanism and the Pump Mechanism with the CR Lock Mechanism, and one for the CR Mechanism. The ASF Unit for the Paper Loading Mechanism uses rear entry front eject system. And, single LD Roller in Holder Shaft Unit loads a paper to the Printer Mechanism.

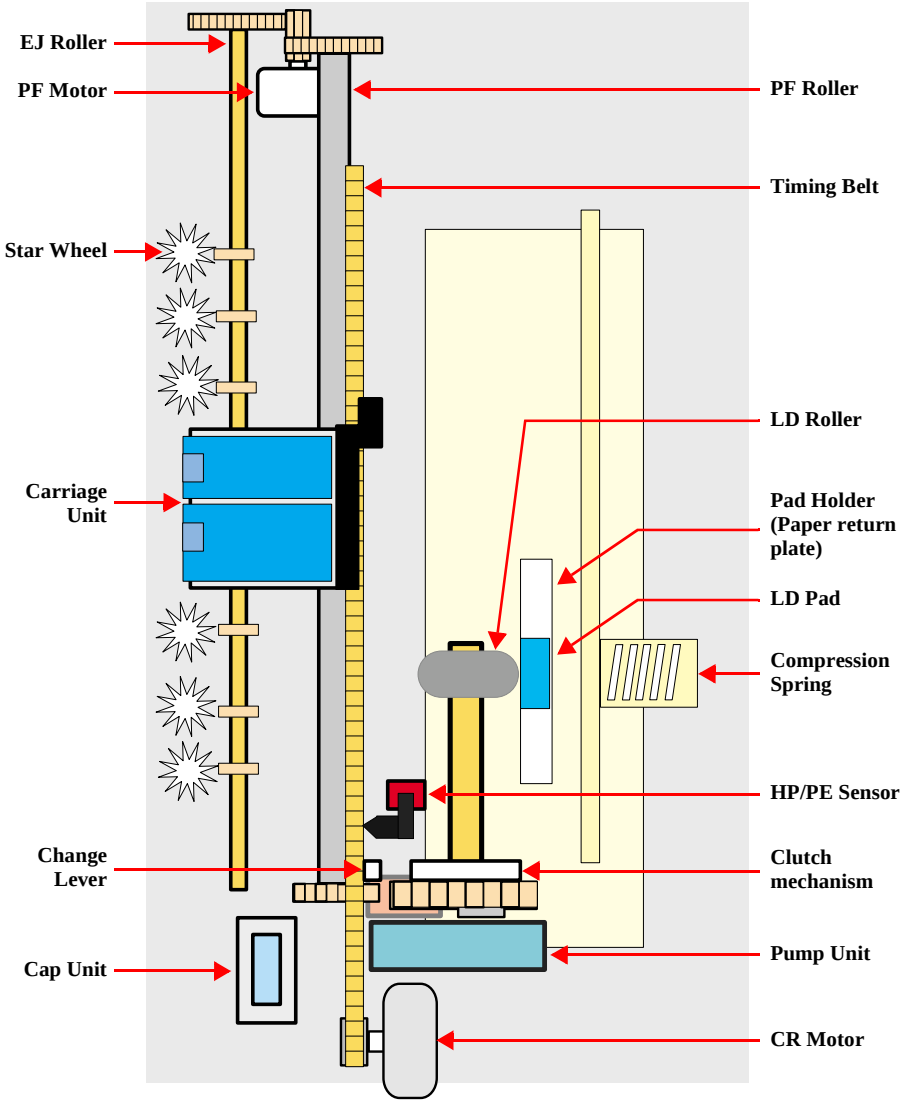


Figure 2-1. Printer mechanism block diagram

2.1.2 Print Head

The Print Head is the same U-CHIPS type as the previous printer (Stylus C41/C42/C43/C44/C45/C46), and makes it possible to perform multiple shot printing and variable dot printing.

The Print Head nozzle configuration is as follows.

- Nozzle layout
  Black : 48 nozzles x 1 row (nozzle pitch of row: 1/120 inch)
  Color : 45 nozzles x 1 row (nozzle pitch of row: 1/120 inch)

The nozzle layout when viewed from the back surface of the Print Head is shown below.

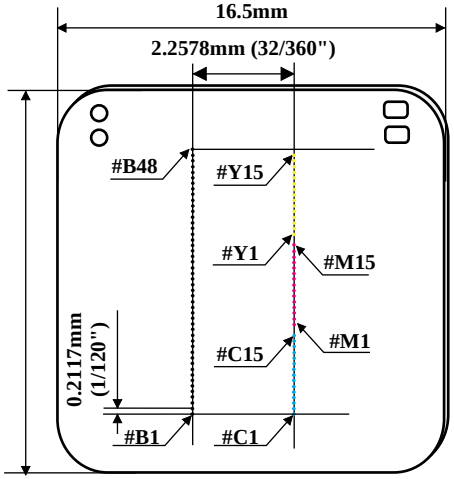


Figure 2-2. Nozzle layout

The Print Head has the Electric Poles (CSIC Connectors) to store the ink consumption amount data into the CSIC chip mounted on the Ink Cartridge. By storing the ink consumption amount data, this printer can detect the ink consumption status, such as Ink Low/Out condition.

The basic operating principles of the Print Head, which plays a major role in printing, are the same as the previous printer (Stylus C41/C42/C43/C44/C45/C46); on-demand method which uses PZT (Piezo Electric Element). In order to uniform the ejected ink amount, the Print Head has its own Head ID (6-digits code for this Print Head **for Stylus CX1500/ME100**) which adjusts PZT voltage drive features.
So, you are required to store the Head ID pasted on the Print Head into the EEPROM by using the Adjustment program when replacing the Print Head, the Main Board Unit, the Printer Mechanism with new one. (Note: there are no resistor arrays to determine the Head ID on the Main Board.) And then, based on the stored Head ID into the EEPROM, the Main Board generates appropriate PZT drive voltage.

Following explains the basic components for the Print Head.

- PZT
  PZT is an abbreviation of Piezo Electric Element. Based on the drive waveform generated on the Main Board, the PZT selected by the nozzle selector IC on the Print Head pushes the top of the ink cavity, which has ink stored, to eject the ink from each nozzle on the nozzle plate.
- Electric Poles for CSIC
  This Electric Poles connects the CSIC chip mounted on the Ink Cartridge. By using this poles, current ink consumption amount data is red out from the CSIC chip. And, the latest ink consumption amount data is written into the CSIC chip.
- Nozzle Plate
  The plate with nozzle holes on the Print Head surface is called Nozzle Plate.
- Filter
  When the Ink Cartridge is installed, if any dirt or dust around the cartridge needle is absorbed into the Print Head, there is a great possibility of causing nozzle clog and disturbance of ink flow, and alignment failure and dot missing finally. To prevent this problem, a filter is set under the cartridge needle.
- Ink Cavity
  The ink absorbed from the Ink Cartridge goes through the filter and then is stored temporarily in this tank called “ink cavity” until PZT is driven.

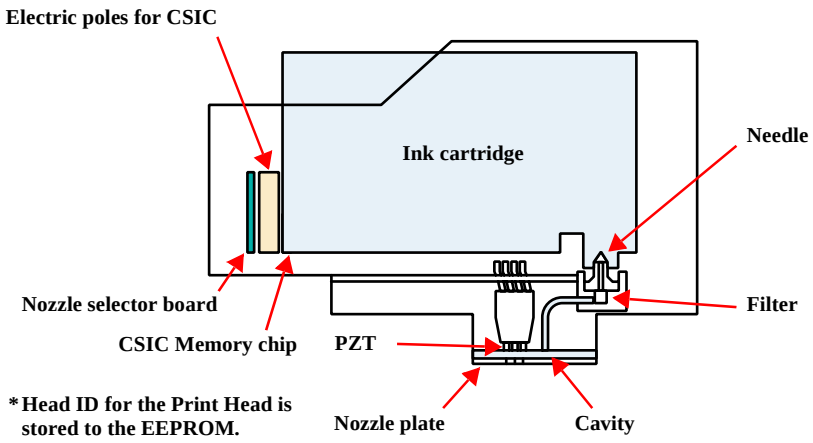


Figure 2-3. Print Head sectional drawing

2.1.2.1 Printing Process

This section explains the process which the Printheads of On-Demand inkjet printers eject ink from each nozzle.

1. **Normal state:**
   When the printing signal is not output from the Main Board (C572 Main), or the PZT drive voltage is not applied, the PZT does not change the shape. Therefore, the PZT does not push the ink cavity. The ink pressure inside the ink cavity is kept normal.(refer to Figure 2-4 *(p.33)*: Normal state)

2. **Ejecting state:**
   When the print signal is output from Main board (C572 Main), the nozzle selector IC located on the Print Head latches the data once by 1-byte unit. Based on the drive waveform (common voltage) generated on the Main Board, the PZT selected by the nozzle selector IC pushes the top of the ink cavity. By this operation, the ink stored in the ink cavity is ejected from nozzles. (refer to Figure 2-4 *(p.33)*: Ejecting state)

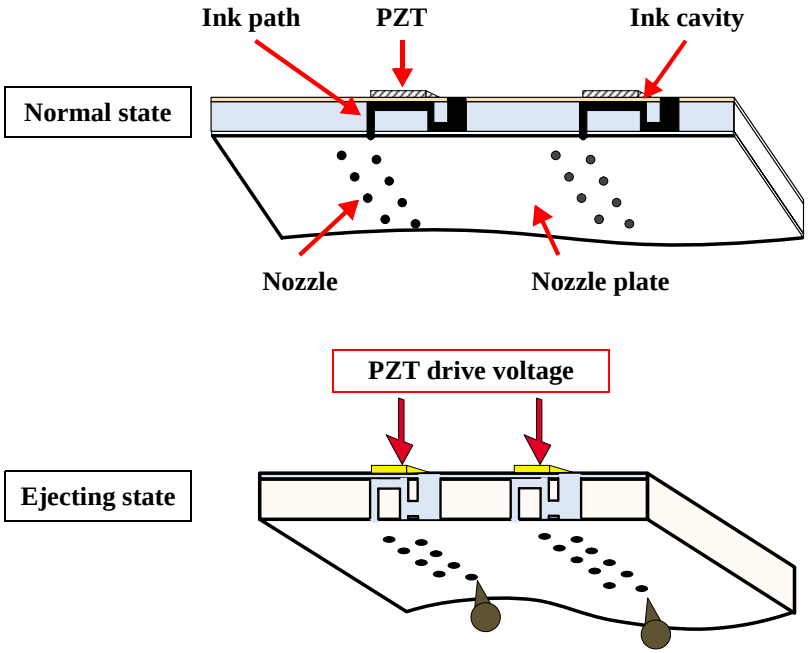


Figure 2-4. Print Head printing process

2.1.2.2 Printing Method

For printing dot system, the Stylus CX1500/ME100 has the following two kinds of printing mode.

- Multiple shot printing
- Variable dot printing

The above two printing modes are automatically selected depending on the media and the resolution setting of the printer driver. The following explains each printing mode.

- ☐ Multiple shot printing
  This printing mode is developed to improve the print quality on plain paper or transparencies in low resolution. The multiple shot printing mode uses normal dot, and the number of dot shot varies from 1 shot to maximum 3 shots depending on the print data to enable to output sharp image even in a low resolution.

- ☐ Variable dot printing
  This printing mode is developed to improve the print quality on exclusive paper. This mode is basically the same as variable dot printing mode used on other products; micro dot, middle dot and large dot compose this mode. The printing dot size varies according to the print data and this mode enables to output even sharper image on exclusive paper.

2.1.3 Carriage Mechanism

The Carriage Mechanism consists of CR Motor, Carriage Unit (including the Print Head), Timing Belt and CR Home Position Sensor (HP/PE Sensor) etc. Following figure shows you each component for the CR mechanism.

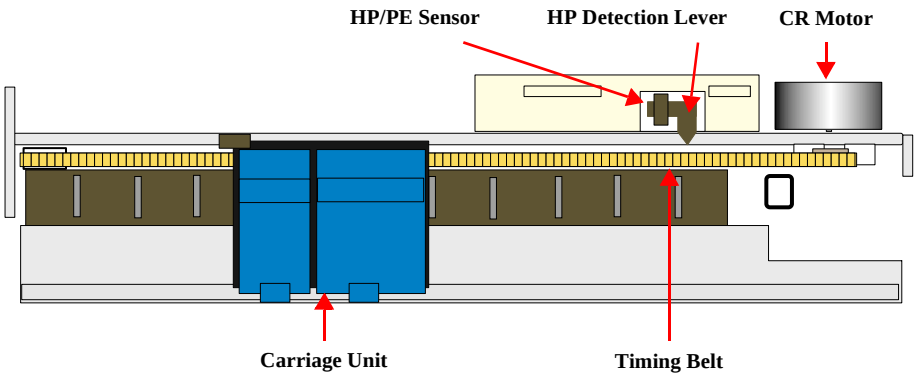


Figure 2-5. Carriage Mechanism (Top view)

The following stepping motor controls the CR mechanism on this printer.

Table 2-1. Carriage Motor Specification

Items	Specifications
Type	4-Phase/ 48-Poles PM Stepping motor
Drive Voltage	+35.9V ± 5% (DRV IC voltage)
Coil Resistance	11.5Ω ± 10% (per phase at 25 degrees)
Inductance	15mH ± 20% (1KH 1Vrms)
Drive Method	Bi-Polar drive
Driver IC	A6615

The drive of the CR Motor is transmitted to the Carriage Unit via the Timing Belt. And, the CR Home Position is detected with the HP/PE Sensor. This sensor is available as the CR Home Position Sensor while the CR Motor operates in each sequence. (The function of this sensor varies depending on the running condition of the motors. It is available as the PE Sensor when the PF Motor operates in each sequence.)

When the detection plate molded on the Carriage Unit pushes down the HP Detection Lever and the CR home position is detected with HP/PE Sensor, HIGH signal is output to the CPU.

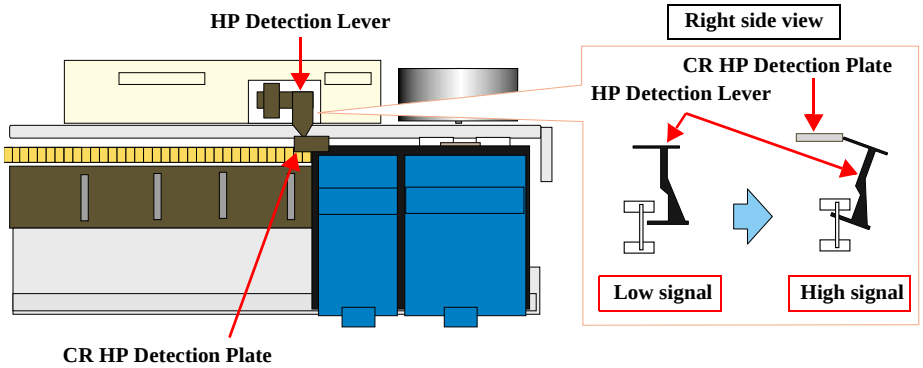


Figure 2-6. CR Home Position Detection

For your reference, in case that the CR home position is not detected with the HP/PE Sensor although the Carriage Unit moves correctly, the printer indicates the “Fatal error”. And also, in case that the Carriage Unit cannot move outside the home position and the CR home position is not detected with the HP/PE Sensor, the printer indicates the “Paper jam error”.

2.1.4 Paper Loading/Feeding Mechanism

The following stepping motor controls the Paper loading/feeding mechanism on this printer.

Table 2-2. PF Motor Specifications

Item	Description
Motor type	4-Phase/ 96-Poles PM Stepping motor
Drive voltage	+35.9V ± 5% (DRV IC voltage)
Coil Resistance	6.1Ω ± 10% (per phase at 25 degrees)
Inductance	8.7mH ± 20% (1kH 1Vrms)
Driving method	Bi-Polar drive
Driver IC	A6615

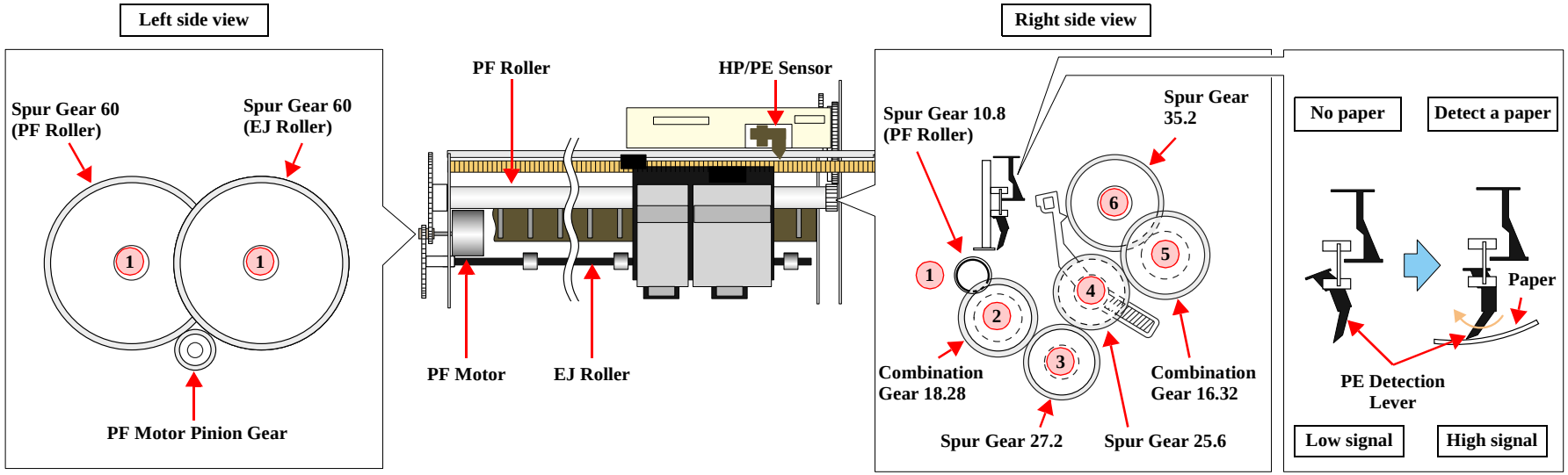
The drive of the PF Motor is transmitted to the LD Roller Shaft and the PF Roller through gears for the Paper loading/feeding mechanism. The Paper loading mechanism plays a role in loading a paper from the ASF Unit to the PF Roller. And also, the Paper feeding mechanism plays a role in feeding a paper loaded from the ASF Unit. The functions of the Paper loading/feeding mechanism varies depending on the rotational direction of the PF Motor as the table below.

Table 2-3. ASF Unit Function & PF Motor Rotational Direction

Directions *2	Corresponding functions
Clockwise	• Release the Change Lever from the Clutch mechanism
Counterclockwise	• Pick up and feed a paper • Set the Change Lever on the Clutch mechanism

*2: The PF Motor rotation direction = seen from the left side of the printer.

Following shows you the transmission path of the PF Motor drive to the LD Roller, the PF Roller and the EJ Roller. (The numbers in the following figure show you the order of transmission path.)



Note: The Clutch Gear is molded on the backside of the Spur Gear 35.2 such as Combination Gear.

Figure 2-7. Paper Loading/Feeding Mechanism

For your reference, the top or the end of a paper is usually detected with the HP/PE Sensor. In case that the HP/PE Sensor cannot detect the top of a paper in the paper loading sequence, the printer indicates the “Paper out error”. If the HP/PE Sensor cannot detect the end of a paper in the paper feeding sequence, the printer indicates the “Paper jam error”. As for the details, refer to Chapter 3 “Troubleshooting”.

2.1.4.1 Paper Loading Mechanism (ASF Unit)

The Paper loading mechanism consists of the Change Lever in the Pump Unit, the Holder Shaft Unit (including the Clutch mechanism) and the ASF Unit.
The Change Lever and the Clutch mechanism play a major role in the Paper loading mechanism as follows.

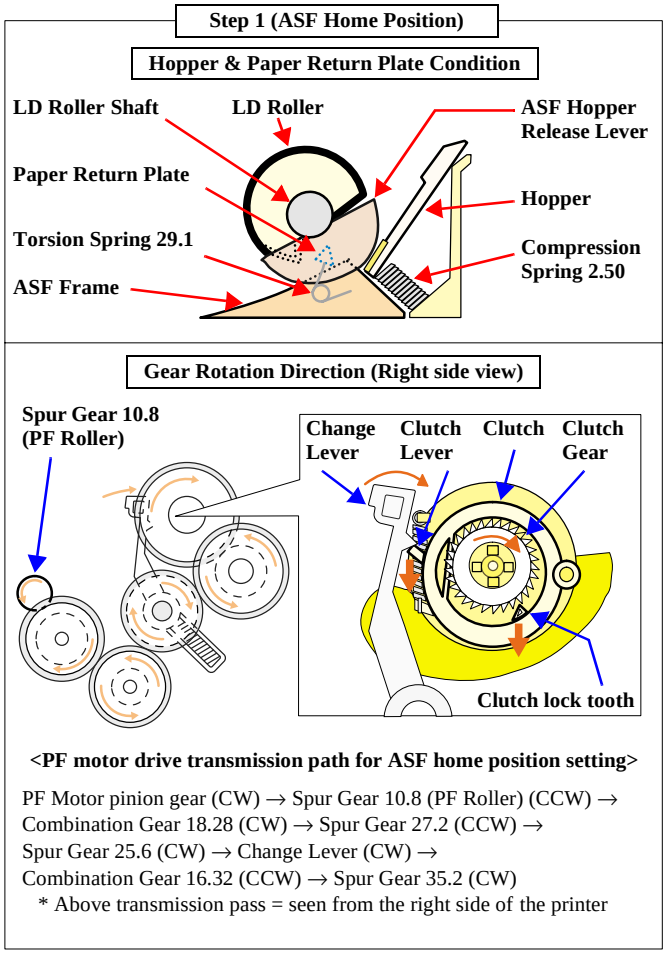
1. ASF home position detection function
   The ASF Unit on this printer does not have the ASF Home Position Sensor. Instead of the ASF Home Position Sensor, the Change Lever and the Clutch mechanism is used to detect the ASF home position.
   When the Change Lever is set on the Clutch mechanism with the counterclockwise rotation of the PF Motor pinion gear, the ASF home position is detected by this lever for the paper loading operation. In this time, the printer cannot load a paper from ASF Unit because the drive of the PF Motor is not transmitted to the LD Roller Shaft.
2. Paper loading function
   When the Change Lever is released from the Clutch mechanism with the clockwise rotation of the PF Motor pinion gear, the ASF home position detection function is changed over to the paper loading function. Therefore, the printer can load a paper from ASF Unit because the drive of the PF Motor is transmitted to LD Roller Shaft.

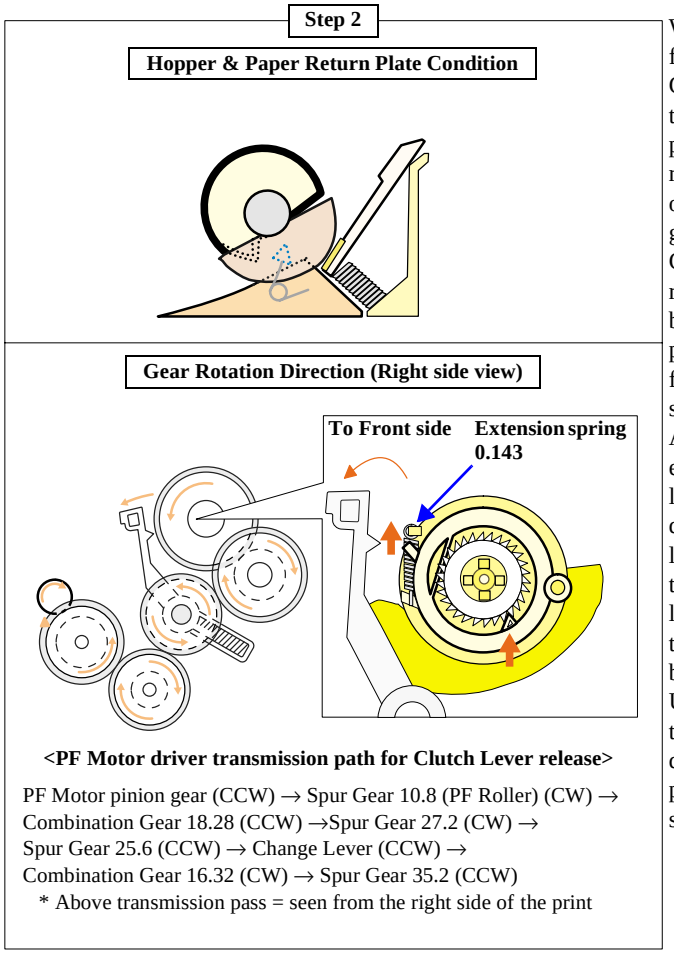
On this printer, the Paper Return Plate is built in ASF Unit instead of the Paper Return Lever. The LD Pad is stacked on the Paper Return Plate, and it works with the tension force of the Torsion Spring 29.1 mounted on the ASF Frame.
When an arc portion of the LD Roller pushes down this plate into the ASF Frame during the paper loading sequence, a paper is loaded from the ASF Unit. A cutout portion of the LD Roller releases this lever and this plate returns papers to the stand-by position for next paper loading operation.

Following figures (refer to Figure 2-8 *(p.37)*/Figure 2-9 *(p.38)*) show you the ASF paper loading sequence and the operation of each mechanism.

When the PF Motor pinion gear rotates CW direction (Right side view), the Change Lever pushes down the Clutch Lever as right figure and the Clutch lock tooth is disengaged from the Clutch Gear. As the result, the LD Roller Shaft dose not rotate at all because the drive of the PF Motor is not transmitted. In this time, the ASF Hopper is also pushed down by the ASF hopper release lever on the LD Roller Shaft, and the Paper Return Plate is set to avoid that papers are slipped down from the paper set position.

This position is the ASF home position.

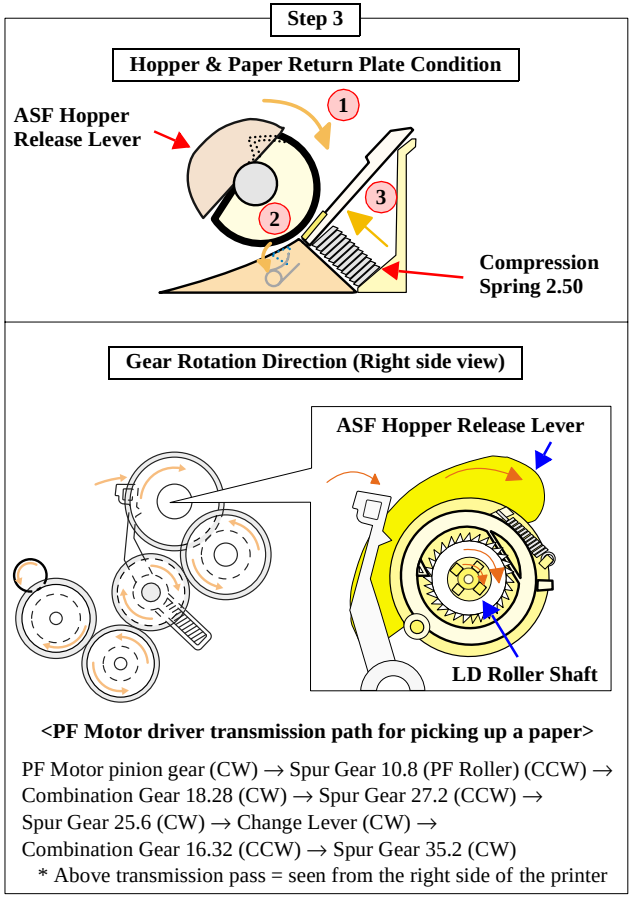


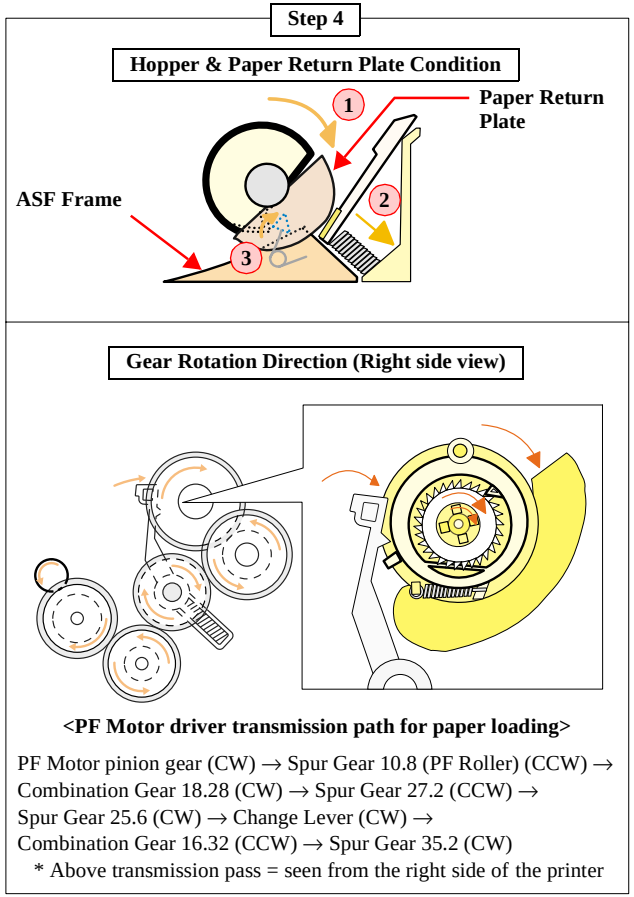


When a paper is loaded from the ASF Unit, the Change Lever moves to the front side of the printer with the CCW rotation (right side view) of the PF Motor pinion gear and releases the Clutch Lever. As the result, the Clutch turns back to the engagement position by the tension force of the Extension spring 0.143.
And, the Clutch Gear is engaged with the Clutch lock tooth to transmit the drive of the PF Motor as left figure. In this time, the Change Lever is locked instantaneously by the protrusion on the backside of the Carriage Unit to change over from the ASF home position detection function to the paper loading function surely.

Figure 2-8. ASF Paper Loading Sequence (Step 1, 2)

The PF Motor pinion gear rotates CW direction (right side view), and the drive of the PF Motor is transmitted to the LD Roller Shaft through the Clutch lock tooth and the Clutch Gear. After the LD Roller pushes down the Paper Return Plate into the ASF Frame, the ASF Hopper is released by the tension force of the Compression Spring 2.50. And, a paper is picked up with the frictional force between the LD Roller and the Pad Hopper.





While the LD Roller rotates CW direction (right side view) continuously, the top of a paper is loaded to the PF Roller. In this rotation, the ASF Hopper returns to the open position and the Paper Return Plate is released from the LD Roller. In this time, this plate returns papers to the stand-by position in ASF Unit for next paper loading operation.
Then, when the rolling LD Roller & the Clutch come at the above “Step 1” position, the Clutch Lever is locked with the Change Lever again. In this time, the drive of the PF Motor is interrupted and the drive is transmitted only to the PF Roller side for the paper feeding sequence.

Figure 2-9. ASF Paper Loading Sequence (Step 3, 4)

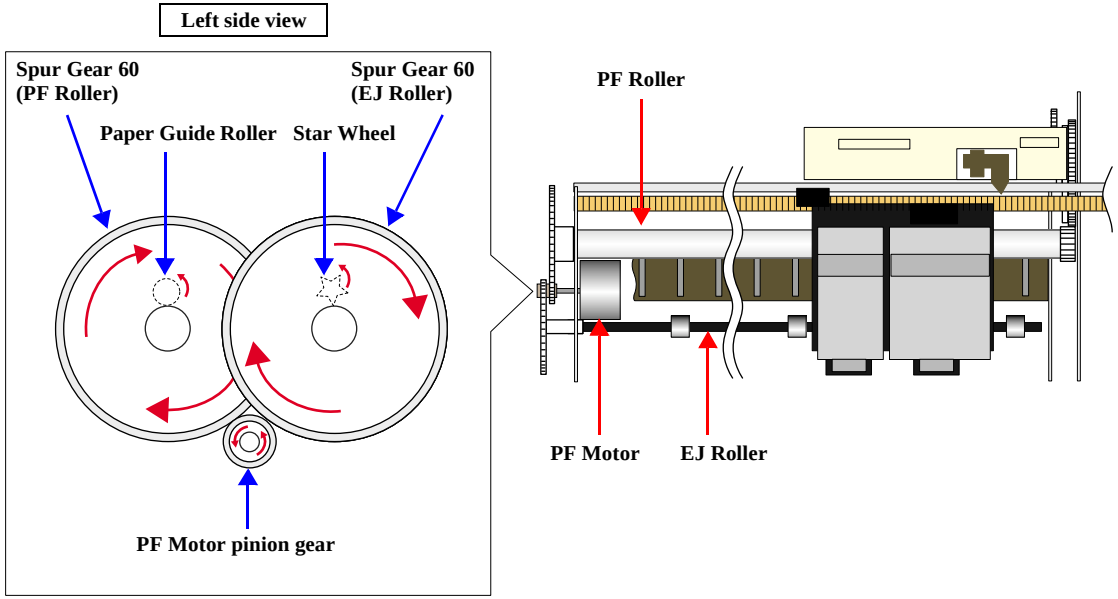
2.1.4.2 Paper Feeding Mechanism

The Paper feeding mechanism consists of PF Motor, PF Roller, EJ Roller, Paper End Sensor (HP/PE Sensor) etc. The Paper feeding mechanism feeds a paper loaded from ASF Unit by using pairs of rollers.

1. One pair is the PF Roller and the Paper Guide Roller which is assembled in the Paper Guide Upper/Left. The drive of the PF Motor is transmitted to the Paper Guide Roller through the PF Roller.
2. Another pair is the EJ Roller and the Star Wheel which is assembled on the Front Frame. The drive of the PF Motor is transmitted to the Star Wheel through the EJ roller.

Following figure shows you the transmission path for the PF Roller & the Paper Guide Roller and the EJ Roller & the Star Wheel.

The top of a paper is loaded to the PF Roller from the ASF Unit in the paper loading sequence. And then, when the PF Motor pinion gear rotates CCW direction (left side view), a paper is fed by the PF Roller & the Paper Guide Roller and the EJ Roller & the Star Wheel in the printing operation & the paper feed sequence.



Transmission path (Left side view): PF Motor pinion gear (CCW) → Spur Gear 60 (PF Roller /EJ Roller) (CW)

Figure 2-10. Paper Feeding Mechanism

2.1.5 Ink System Mechanism

The Ink system mechanism consists of Pump mechanism with Carriage lock mechanism and Capping mechanism with Wiper mechanism. Following table lists the function for each mechanism.

Table 2-4. Function For Each Mechanism

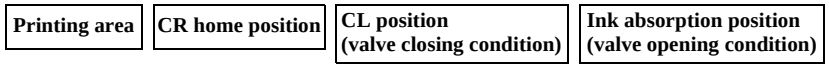
Mechanism	Function
Capping mechanism *	This is to cover the surface of the Print Head with the cap in order to prevent the nozzle from increasing viscosity.
Wiper mechanism	This is to remove the foreign material and unnecessary ink on the nozzle plate of the Print Head.
Pump mechanism	This is to eject the ink from the Ink Cartridge, the ink cavity and the cap to the Waste Ink Pad.
Carriage lock mechanism	This is to lock the Carriage Unit with the Change Lever while the Carriage Unit is at the home position.

Note "*": Like the previous SPC (Stylus CX3500/CX3600/CX3650), this printer adopts the valveless cap system. The air valve system used for the previous printer (Stylus COLOR 740) have two functions by the CR position in the capping condition as follows.

1) Valve closing condition (CL position)
   By closing the air valve, the ink is forcibly absorbed from the ink cartridge or the ink cavity by the Pump Unit and is ejected to the Waste Ink Pad while the Carriage Unit is in the CL position.

2) Valve opening condition (Ink absorption position)
   By opening the Air valve, the negative pressure is decreased and only the ink inside the Cap is ejected while the Carriage Unit is in the further right side than the CL position. (the ink is not absorbed from the ink cartridge or the ink cavity.)

The following shows you the Carriage Unit position for each condition easily.



But, on the valveless cap system, the above 2) operation is done outside the capping position. The Carriage Unit moves outside the CR home position and the pump absorbs the ink inside the Cap.

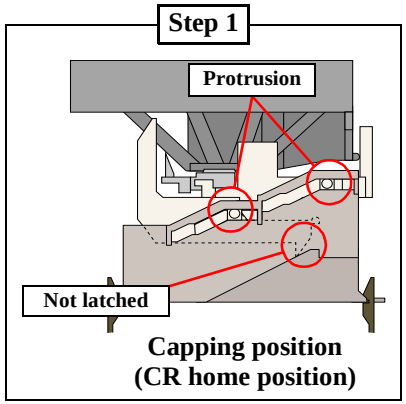
2.1.5.1 Capping Mechanism

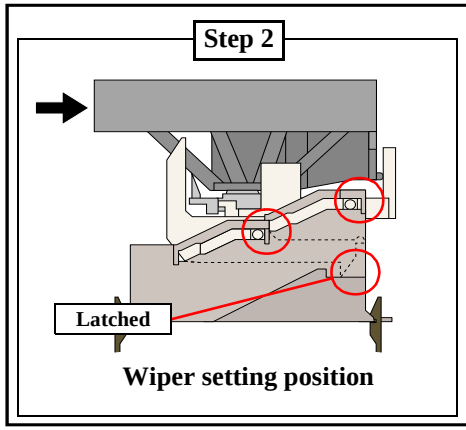
The Capping mechanism covers the Print Head with the Cap to prevent the nozzle from increasing viscosity when the printer is in stand-by state or when the printer is off.

☐ Wiper with the Cap Unit

The wiping operation is controlled by the Carriage Unit movement. This operation is usually performed with every CL sequence which is to absorb the ink from the ink cartridge, the ink cavity by the Pump Unit. Following figure shows you the mechanism for the wiping operation.

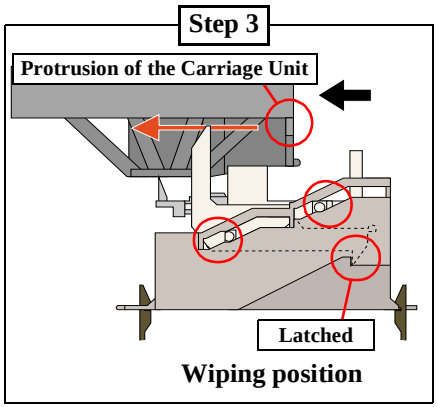
When the Carriage Unit is in the home position, the hook of the Slider Lock Lever is not latched to the dent of the Cap Frame.
In this time, the protrusion of the Cap Slider does not reach the rightmost position of the Cap Frame.

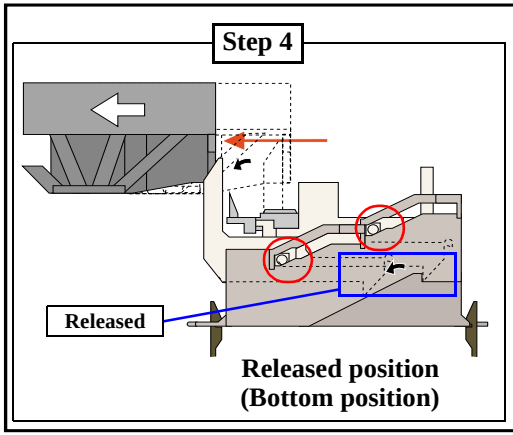




The Carriage Unit moves to the wiper setting position on the rightmost position of the Cap Frame with keeping the cap covered.
In this time, the hook of the Slider Lock Lever is latched to the dent of the Cap Frame.

When the Carriage Unit moves to the left side from the wiper setting position, the Cap Unit is pulled back by the tension force of the Extension Spring 0.523.
In this time, the Cap Unit is automatically set to the wiping position because the hook on the Slider Lock Lever is latched to dent of the Cap Frame. And, the wiping operation is performed according to the Carriage Unit movement.





When the wiping operation is finished and the Carriage Unit moves further to the left side, the hook of the Carriage Unit hits to the Slider Lock Lever.
In this time, the Slider Lock Lever is released and the Cap Slider returns to the bottom position completely.
(The broken line is the position of the Carriage Unit & the Slider Lock Lever just before being released.)

Figure 2-11. Wiper Mechanism

2.1.5.2 Pump Unit Mechanism

The PF Motor also controls the Pump Unit mechanism (including the Change Lever) as well as the Paper loading/feeding mechanism. The drive of the PF Motor is always transmitted to the Pump Unit. (And also, its drive is transmitted to the LD Roller through the Clutch mechanism & the Change Lever.)

On this printer, the Pump Unit mechanism including the Change Lever plays a major role expecting the ink eject operation. And, these operations control depending on the PF Motor rotational direction as the following table below.

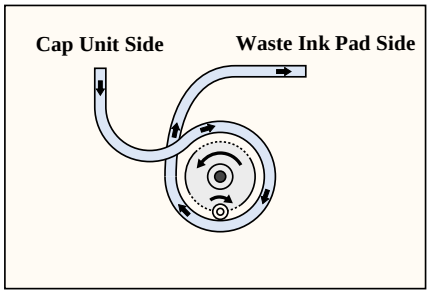
Table 2-5. PF Motor Rotational Direction & Ink System Mechanism

Directions *	Functions
Clockwise	• Absorbs the ink by the Pump Unit • Release the Change Lever from the Clutch mechanism
Counterclockwise	• Non operation

Note "*": The PF Motor rotational direction = seen from the left side of the printer.

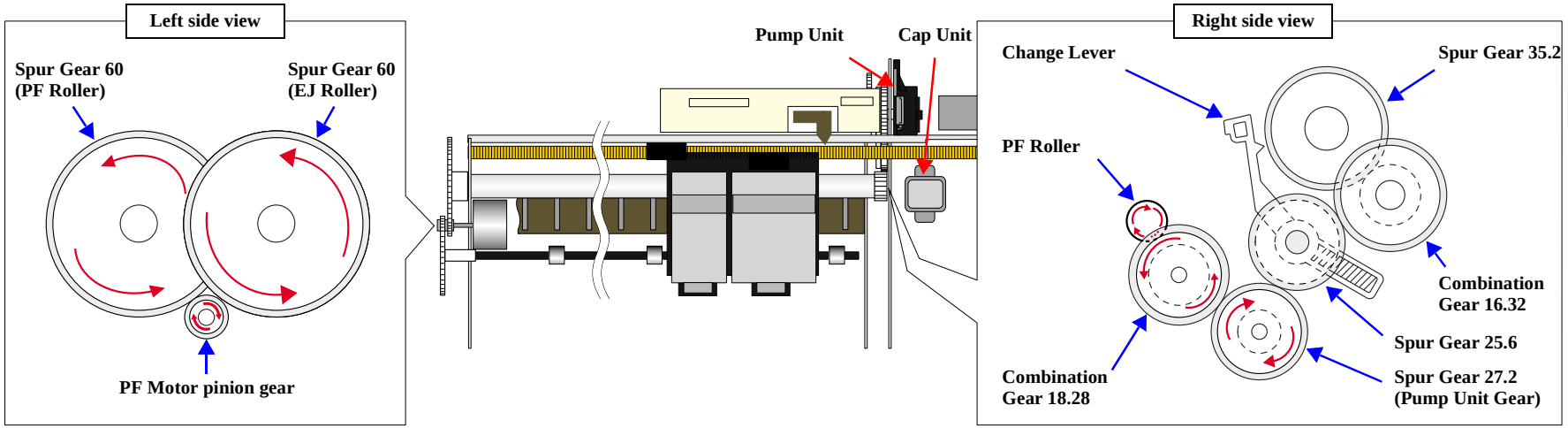
1. Ink eject operation (usual operation)
   The ink is absorbed from the ink cartridge, the ink cavity and is ejected to the Waste Ink Pad from the Cap when the Ink Tube is pressed by a roller in the Pump Unit.

   Following figure shows you the overview of the Pump Unit mechanism operation



Note "*": The PF Motor rotational direction = seen from the right side of the printer.

Figure 2-12. Pump Mechanism



Transmission Path: PF Motor pinion gear (CCW) → Spur Gear 60 (PF Roller & EJ Roller) (CW)→ Spur Gear 10.8 (CCW) → Combination Gear 18.28 (CW) → Spur Gear 27.2 (Pump Unit Gear) (CCW)
(* Above transmission pass = seen from the right side of the printer)

Figure 2-13. PF Motor Drive Transmission Path To The Pump Unit

2. Carriage lock operation by the Change Lever
   Unlike the previous printer (Stylus COLOR 680), this printer does not have the Carriage Lock Lever with the Wiper.
   Instead of the Carriage Lock Lever, the Change Lever is set to the front side of the printer while the Carriage Unit is in the CR home position.
   (As for the detailed mechanism for setting the Change Lever, refer to Figure 2-8 *(p.37)* Step 2)

2.1.6 Ink Sequence

- Initial ink charge
  After the printer is purchased and the power is turned on for the first time, the printer must perform the Initial Ink Charge to charge the ink inside the ink cavity. When the Initial Ink Charge is completed properly, the printer releases the flag inside the EEPROM. Initial Ink Charge will take about 90 seconds for Stylus CX1500/ME100. If the power is turned off during the Initial Ink Charge, the CL1' will be performed at next power on timing.

- Manual Cleaning
  The Stylus CX1500/ME100 provides four types of manual cleaning to clean air bubbles, clogged ink with viscosity or foreign substances.
  The following manual CL can be performed by the control panel operation, the printer driver utility and the Adjustment program.

  - Wiping operation
    Wipes the nozzle plate by the rubber part on the Cap Unit.

  - Flashing operation
    Prevents color from mixing, and stabilizes ink surface inside the nozzle.

  Independently of the printing path after the previous CL, perform manual CL from CL1 to CL2 in order if the cumulative printing timer counter is less than 10min. Only when the cumulative printing timer counter is more than 10min, execute only CL1.
  Additionally, if the I/C is Ink Low or Out condition, any manual cleaning is prohibited and it is displayed on the LED indicators.

- Timer Cleaning
  Like the previous SPC (Stylus CX3500/CX3600/CX3650), this printer dose not have Timer IC and Lithium battery which is used for the backup power source for Timer IC. So, this printer manages the printer off period or cleaning cycle by using the following method.
  The Printer Driver sends the timer command to the printer before printing. The timer command is generated based on the PC's timer and it consists of year, month date, hour, minute and second. As soon as the printer receives the timer command from the Printer Driver, the printer stores its command in the EEPROM. Then, it is compared with the latest CL time which is stored in the EEPROM. And, in case that the timer cleaning period is over the specific period, the printer performs the timer cleaning automatically. In this time, the printer stores the timer command in the EEPROM.

- Flashing
  Two different flushing operations are executed for the following reasons.

  - Pre-printing flushing
    This is done before a start of printing to eliminate ink viscosity in the Print Head nozzles.

  - Periodic flushing
    This is done during printing to prevent ink viscosity in the Print Head nozzles from increasing.

2.2 Scanner Mechanism

The Scanner Mechanism of Stylus CX1500/ME100 is constructed of a Scanner Carriage Unit, Scanner Motor, etc., in the same way as previous A4 size scanners.

2.2.1 Scanner Carriage Mechanism

2.2.1.1 Scanner Carriage Unit Overview

The Scanner Carriage Unit is constructed of a CIS Board (including linear CCD), Rod Lens Array, LED (light source), etc.

- CIS Board
  This takes the light information read from the document by the Rod Lens Array and converts it to digital information using the linear CCD.
- Rod Lens Array
  Many rod-shaped lenses are arranged in parallel, and the upright multiple images of each lens is overlapped to form a single continuous image. Compared to a regular lens, this has the special ability to reduce the distances between images. It can project at 1 to 1 size for imaging a linear CCD with a width identical to an A4 size document.
- LED
  The unit uses an LED for an exposure light source. Using an LED eliminates the need for an inverter board, and power consumption is reduced.

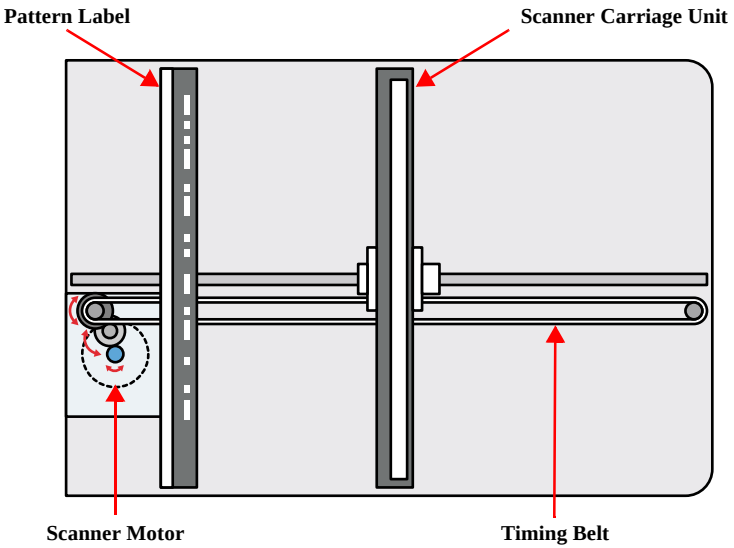


Figure 2-14. Scanner Mechanism

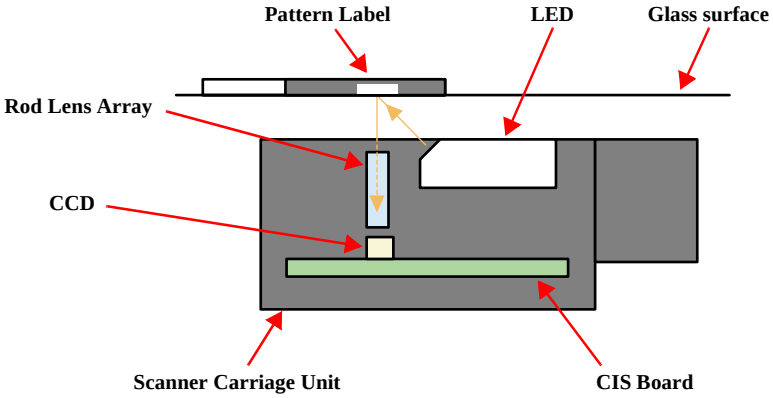


Figure 2-15. Scanning Image

2.2.1.2 Scanner Carriage Unit Movement Overview

Scanning image is performed in the main scan direction (=1 line) by the CCD sensor and in the sub-scan direction (=several lines) combined with Scanner Carriage Unit movement. (refer to the figure below)
Line type, color CCD sensor can scan 1 line in main scan direction (parallel to the Scanner Carriage Unit) by one time. When scanning next lines after the second line in sub-scan direction, CR driving moves the Scanner Carriage Unit, which has CCD sensor inside, and scan the other lines. The scanned data is sent to the control board. The scanned data for “n” lines and “n-1” line are processed consecutively.

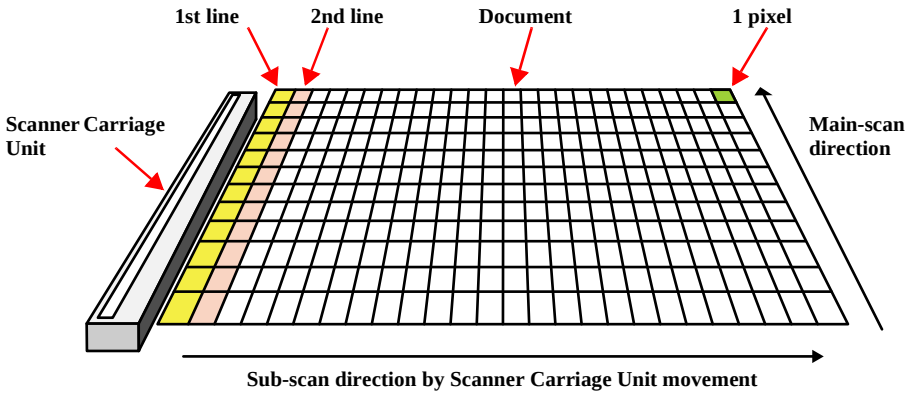


Figure 2-16. Scanner Carriage Unit movement

The table below shows the specifications for the stepping motor that controls the Scanner Carriage Mechanism.

Table 2-6. Scanner Motor specifications

Item	Description
Motor type	TBD
Drive voltage	TBDV (DC)
Coil resistance	TBDΩ ± TBD% (per phase at 25 degrees)
Inductance	TBDmH ± TBD% (1KH 1Vrms)
Driving method	TBD
Driver IC	TBD

Drive of the Scanner Motor is transferred to the Scanner Carriage Unit by the Scanner Timing Belt. The Scanner Carriage Unit slides in the secondary scanning direction. The Scanner Motor uses a stepping motor and drives using open loop control.

This scanner has no sensor mounted to detect the home position, which is a difference from previous A-4 size scanners. When pattern label data fastened to the rear side of Scanner Housing Upper is read, the Scanner Carriage Unit is determined to be in the home position. (Refer to Figure 2-14 *(p.45)*/Figure 2-15 *(p.45)*)

CHAPTER

3

TROUBLESHOOTING

3.1 Overview

This chapter describes unit-level troubleshooting. Refer to the flowchart in this chapter to identify the defective unit and perform component level repair if necessary. This chapter also explains motor coil resistance, sensor specification and error indication.

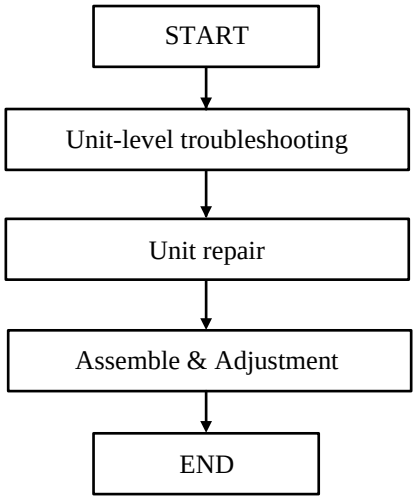


Figure 3-1. Troubleshooting Flowchart

Table 3-1. Motor, Coil Resistance

Motor	Location	Check point	Resistance
CR Motor	J10	Pin 1 and 3 Pin 2 and 4	11.5Ω ± 10% (at 25°C/phase)
PF Motor	J9	Pin 1 and 3 Pin 2 and 4	6.1Ω ± 10% (at 25°C/phase)
Scanner Motor	J6	Pin 1 and 3 Pin 2 and 4	TBDΩ ± TBD% (at 25°C / phase)

Table 3-2. Sensor Check Point

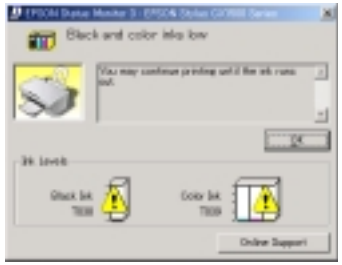
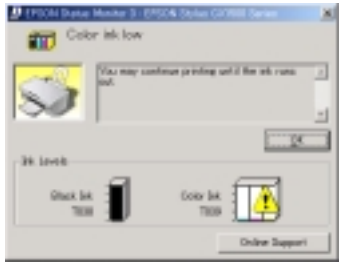
Sensor name	Check point	Signal level	Switch mode
HP/PE Sensor	J11 / Pin 1 and 2	Less than 0.7V	Off • Out of CR home position • No paper
		More than 2.4V	On • Within CR home position • Detect the paper
Thermistor (THM)	TH1 (on the Head driver board)	—	10K (at 25°C)

3.2 Error Indications and Fault Occurrence Causes

This section describes the LED indications, STM3 messages and fault occurrence causes at occurrence of the following errors during any sequence/operation (e.g. power-on sequence, paper feeding/loading sequence, ink sucking sequence).

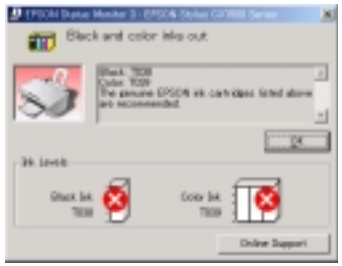
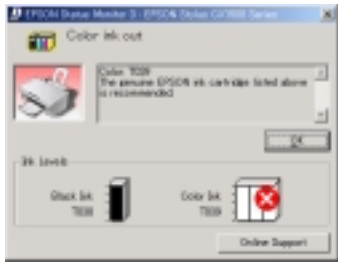
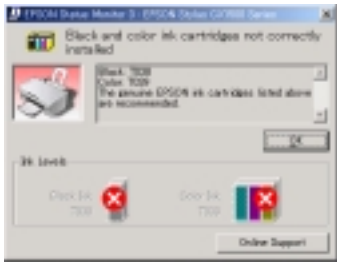
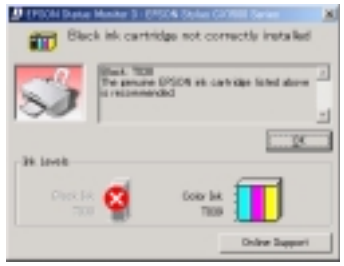
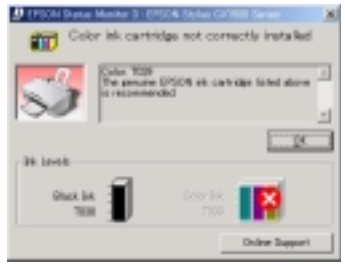
NOTE: Errors caused by the Scanner Unit are not displayed on the STM3. (STM3 displays the Printer's errors only)

Table 3-3. Error Indications and Fault Occurrence Causes

Printer Status			Communication error	Ink low	Paper out
Indications	**Power**		—	—	—
	Paper		—	—	On
	Ink		—	Blink	—
	Number of copies	**1**	—	—	—
		2	—	—	—
		3	—	—	—
	Paper Type	**1**	—	—	—
		2	—	—	—
	Fit to Page		—	—	—
Status Monitor 3 Message				 	
Fault Occurrence Cause			This error is detected when the SPC cannot communicate with the PC correctly.	This error is detected when the ink consumption amount reaches about 85%. Note : Even if this error is indicated on the STM3, you can continue the printing until I/C becomes Ink Out condition. However, the Head Cleaning operation cannot be done so that the remaining ink is low condition.	This error is detected when the top of a paper is not detected with the PE Sensor in the paper loading sequence.

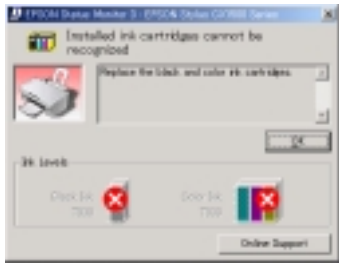
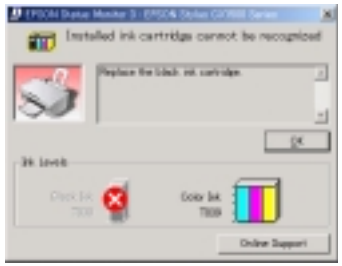
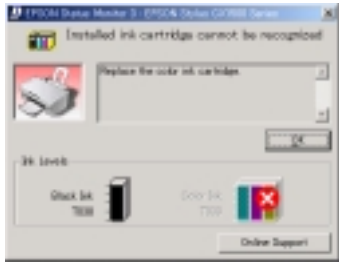
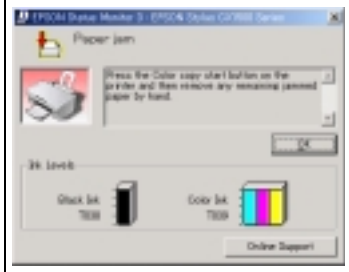
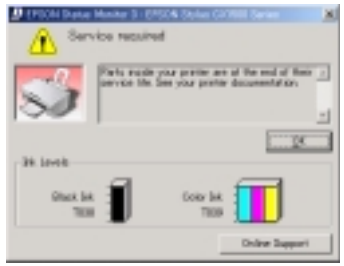
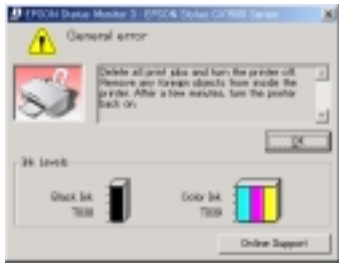
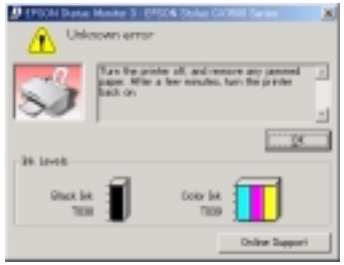
Note : "–" : Don't care

Table 3-3. Error Indications and Fault Occurrence Causes

Printer Status			Ink out or No Ink cartridge	CSIC error
Indications	Power		—	—
	Paper		—	—
	Ink		On	On
	Number of copies	1	—	—
		2	—	—
		3	—	—
	Paper Type	1	—	—
		2	—	—
	Fit to Page		—	—
Status Monitor 3 Message			 	  
Fault Occurrence Cause			This error is detected when; • The ink consumption amount reaches 100%. • The ink cartridge is defective. The slight amount of the ink is remaining in the I/C even if the Ink Out error is detected. This is to prevent the Print Head nozzle from the printing operation without firing the ink.	This error is detected when data from CSIC cannot be read normally or when data cannot be written to CSIC.

Note : "–" : Don't care

Table 3-3. Error Indications and Fault Occurrence Causes

Printer Status			Incorrect I/C	Paper jam	Maintenance request	Fatal error
Indications	Power		—	Blink	Off	On
	Paper		—	On	On	On
	Ink		On	—	Off	On
	Number of copies	1	—	—	Off	On
		2	—	—	Off	On
		3	—	—	Off	On
	Paper Type	1	—	—	Off	On
		2	—	—	Off	On
	Fit to Page		—	—	Off	On
Status Monitor 3 Message			  			 
Fault Occurrence Cause			This error is detected when; • An unsupported ink cartridge has been installed. • An ink cartridge with a different destination has been installed.	This error is detected when the PE Sensor cannot properly detect the paper bottom edge during feeding of paper.	This error is detected when the Waste Ink Counter exceeds the preset counter value.	This error is detected when it is determined that the printer cannot operate properly. (CR error, PF error, etc.)

Note : "–" : Don't care

3.3 Troubleshooting

You can identify the troubles by using the checklist in this section after confirming the LED indication on the SPC. If you connect the SPC to your PC and see an error message on the STM3, you can short the total repair time. And, when you find out the defective parts, replace them by referring the Chapter 4 “Disassembly”. The following tables describe the error check points.

Table 3-4. Check point for the communication error according to each phenomenon

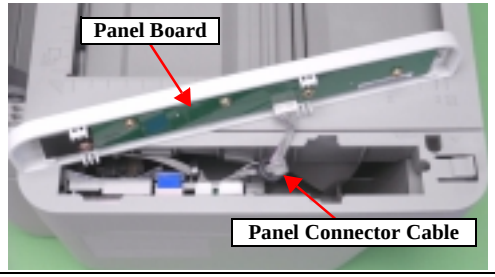
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Anywhere	When turning on the power, the SPC does not operate at all.	Panel Unit	1. Check if the Panel Connector Cable is not damaged. 	1. Replace the Panel Board with a new one.
			2. Check if the Panel Board is not damaged.	2. Replace the Panel Board with a new one.

Table 3-4. Check point for the communication error according to each phenomenon

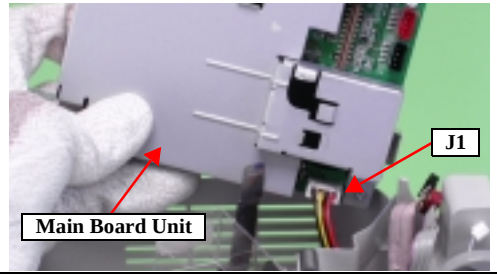
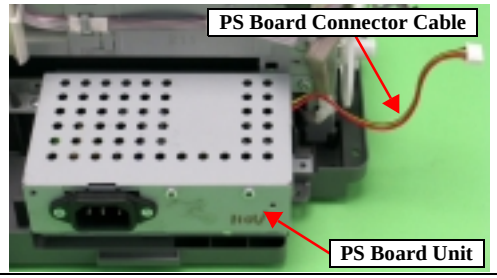
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Anywhere	When turning on the power, the SPC does not operate at all.	PS Board Unit	1. Check if the PS Board Connector Cable is connected to the J1 on the Main Board. 	1. Connect the PS Board Connector Cable to J1 on the Main Board.
			2. Check if the PS Board Connector Cable/PS Board Unit is not damaged. 	2. Replace the PS Board Unit with new one. * If the problem is not solved, replace the Main Board Unit with a new one.

Table 3-4. Check point for the communication error according to each phenomenon

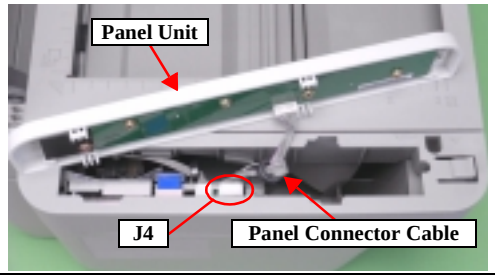
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • –	When turning on the power, the power on sequence is performed correctly. But, when any printer job is sent to the SPC, a communication error is indicated with STM3.	USB Cable	1. Check if the USB Cable is connected between the SPC and the PC.	1. Connect the USB Cable to the SPC and the PC.
		Main Board Unit	1. Check if an incorrect model name is not stored into the address of the EEPROM on the Main Board.	1. Use the Adjustment Program to write the correct value to the EEPROM address.
			2. Check if the Panel Connector Cable is connected to the J4 on the Main Board. 	2. Connect the Panel Connector Cable to J4 on the Main Board.

Table 3-5. Check point for the error before the initial ink charge according to each phenomenon

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Inside HP	The SPC does not perform the initial ink charge and an error is indicated with LEDs and STM3.	Ink Cartridge	1. Check if the Ink Cartridge can be used by installing it to other SPC.	1. Replace the Ink Cartridge with a brand-new one.
		Main Board Unit	1. Check if an incorrect data is not stored into the address of the EEPROM on the Main Board.	1. Set the proper destination by using Adjustment Program.
• Power on • Anywhere	The SPC does not perform the ink replacement CL and an error is indicated with LEDs and STM3.	Ink Cartridge	1. Check if the Ink Cartridge can be used by installing it to other SPC.	1. Replace the Ink Cartridge with a brand-new one.
	The SPC does not perform the printing operation and an error is indicated with LEDs and STM3.	Ink Cartridge	1. Check if the ink is remaining in the Ink Cartridge.	1. Replace the Ink Cartridge with a brand-new one.
			2. Check if the Ink Cartridge can be used by installing it to other SPC.	2. Replace the Ink Cartridge with a brand-new one.

Table 3-6. Check point for the paper out error according to each phenomenon

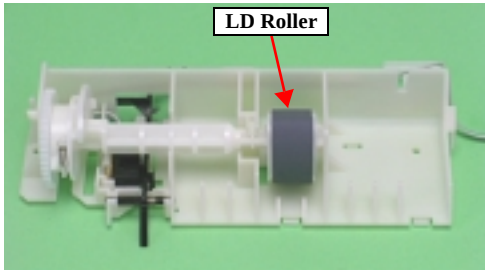
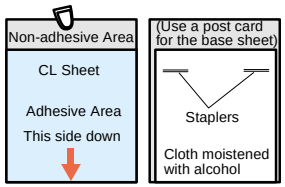
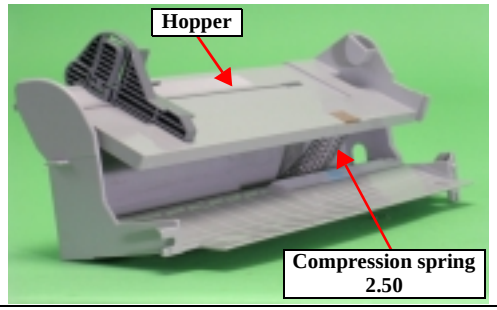
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • _	The LD Roller cannot pick up paper_ although the LD Roller attempt to rotate correctly.	Holder Shaft Unit	1. Check if any paper dust is not adhered to the surface of the LD Roller. 	1. Set a cleaning sheet in the ASF Unit up side down. Then holding the top edge, try to load the paper from the Printer driver. The micro pearl on the LD Roller surface is removed. To remove severe smear, staple a cloth moistened with alcohol to a post card and clean the roller in the same manner.  * If the problem is not solved, replace the Holder shaft unit with new one.
	The Hopper does not operate during the paper loading sequence although the LD Roller rotates to load paper from the ASF Unit.	ASF Unit	1. Check if the Hopper operates correctly in the paper loading sequence. 	1. Reassemble the Compression spring 2.50 between the ASF Frame and the Hopper.

Table 3-6. Check point for the paper out error according to each phenomenon

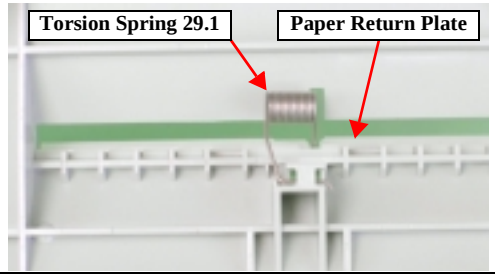
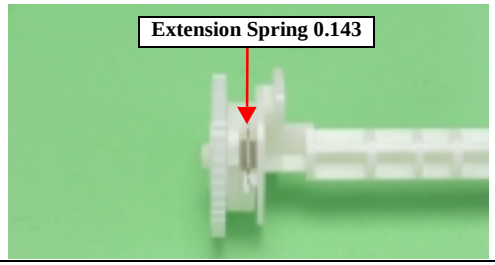
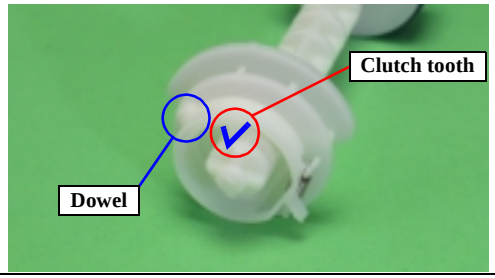
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • –	When a top of a paper at the correct timing during the paper loading sequence, the paper is ejected immediately without setting the paper setting position for printing.	ASF Unit	1. Check if the Paper Return Plate operates correctly in the paper loading sequence. 	1. Set the Torsion Spring 29.1 between the ASF Frame and the Paper Return Plate.
	The drive of the PF Motor is not transmitted to the LD Roller Shaft.	Holder Shaft Unit	1. Check if the Extension Spring 0.143 does not come off in the Clutch mechanism. 	1. Reassemble the Extension spring 0.143 in the Clutch mechanism.
			2. Check if the Clutch does not come off from the dowel of the LD Roller Shaft. 	2. Reassemble the round portion of the Clutch on the dowel of the LD Roller Shaft.
			3. Check if the Clutch tooth is not damaged.	3. Replace the Holder Shaft Unit with a new one.
			4. Check if the Clutch is not damaged.	4. Replace the Holder Shaft Unit with a new one.

Table 3-6. Check point for the paper out error according to each phenomenon

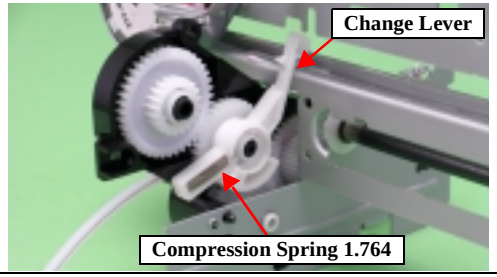
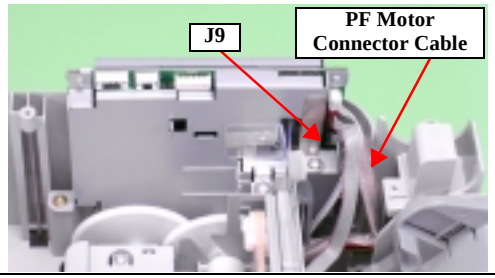
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • –	The drive of the PF Motor is not transmitted to the LD Roller Shaft.	Ink System Unit	1. Check if the Compression Spring 1.764 does not come off in the Change Lever. 	1. Replace the Ink System Unit with a new one.
	The LD Roller is not set to the ASF home position and paper is always loaded from the ASF Unit during the paper loading sequence.	Ink System Unit	1. Check if the tip of the Change Lever is not damaged.	1. Replace the Ink System Unit with a new one.
	Although the printer enters standby mode normally after power-on, the PF Motor does not rotate when a print job is transmitted to the SPC.	PF Motor	1. Check if the PF Motor Connector Cable is connected to J9 on the Main Board. 	1. Connect the PF Motor Connector Cable to J9 on the Main Board.
			2. Check if the coil resistance of the PF Motor is about 6.1Ω by using tester *(refer to Table 3-1)*.	2. Replace the PF Motor with a new one.
			3. Check if the PF Motor Connector Cable is not damaged.	3. Replace the PF Motor with a new one.

Table 3-7. Check point for the No ink cartridge/CSIC error/Incorrect ink cartridge according to each phenomenon

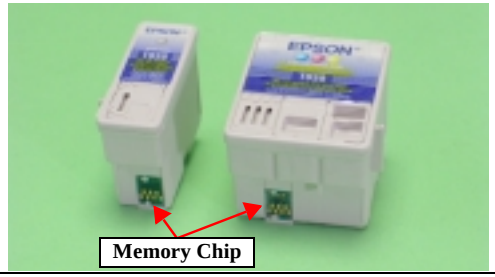
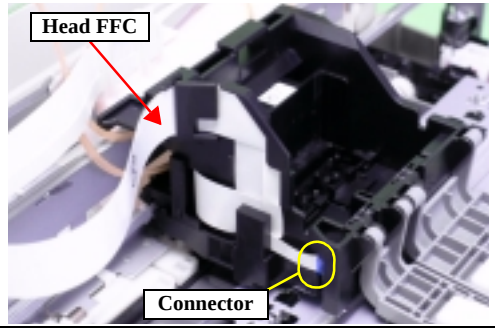
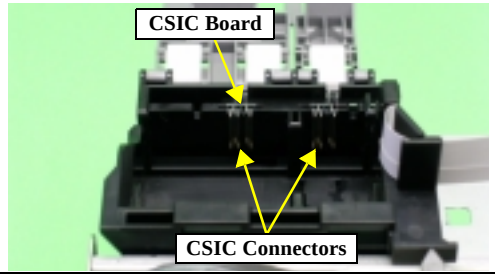
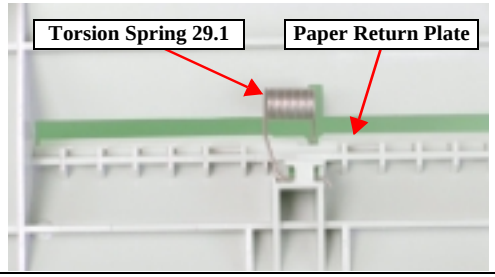
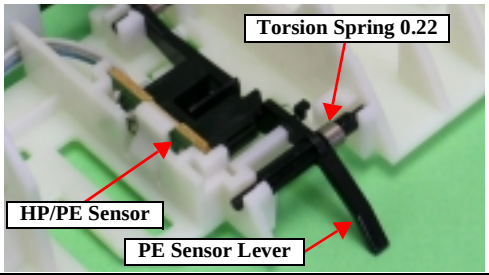
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Inside HP	After the Carriage has detected the HP, an error is displayed.	Ink Cartridge	1. Check if Ink Cartridge is properly installed.	1. Install the Ink Cartridge properly.
			2. Check if the Memory Chip is not disconnected or not chipped. 	2. Replace the Ink Cartridge with a new one.
		CSIC Board	1. Check if the Head FFC is connected to connector on the CSIC Board. 	1. Connect the Head FFC to connector on the CSIC Board.
			2. Check if the CSIC Board is not damaged.	2. Replace the Carriage Unit with a new one.
		CSIC Connector	1. Check if the CSIC Connector is not damaged. 	1. Replace the Carriage Unit with a new one.

Table 3-8. Check point for the paper jam error according to each phenomenon

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • Outside HP	The paper feeding sequence is performed without loading paper in the paper loading sequence.	ASF Unit	1. Check if the ASF Unit is properly installed.	1. Install the ASF Unit properly.
			2. Check if the Paper Return Plate operates correctly in the paper loading sequence. 	2. Set the Torsion Spring 29.1 between the ASF Frame and the Paper Return Plate.
		Holder Shaft Unit	1. Check if the Torsion Spring 0.22 is properly installed. 	1. Set the Torsion Spring 0.22 between the Holder Shaft and the PE Sensor Lever.
	When turning on the power, the Carriage Unit move to the home position correctly. But, the paper feeding sequence is performed without loading paper in the paper loading sequence.	Holder Shaft Unit*	1. Check if the Torsion Spring 0.22 is properly installed.	1. Set the Torsion Spring 0.22 between the Holder Shaft and the PE Sensor Lever.

* The Carriage Unit can move to home position even if the Torsion spring 0.22 comes off or the HP/PE sensor is not correctly placed. However, the HP Sensor lever keeps the high signal condition in the next operation. Therefore, the paper jam error is detected.

Table 3-8. Check point for the paper jam error according to each phenomenon

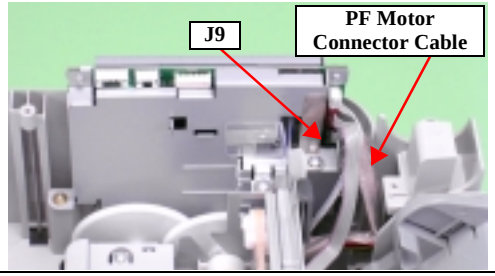
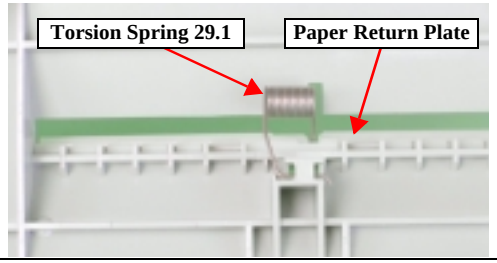
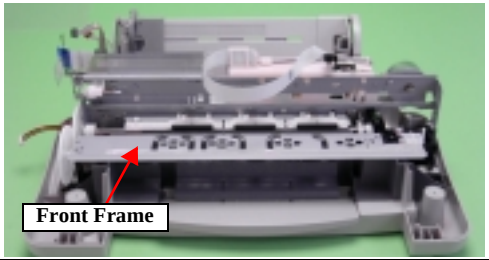
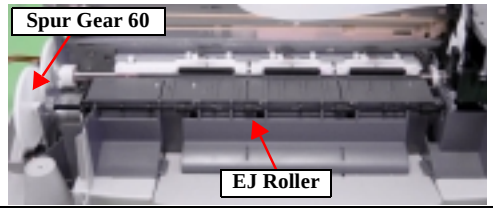
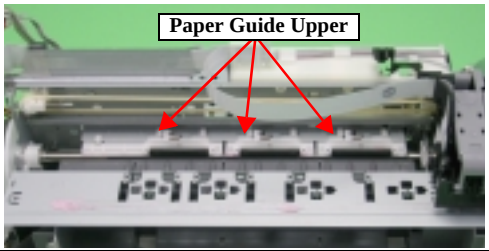
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • Outside HP	The printer starts to perform paper ejection operation at power-on causing an error indication.	PF Motor	1. Check if the PF Motor Connector Cable is connected to J9 on the Main Board. 	1. Connect the PF Motor Connector Cable to J9 on the Main Board.
			2. Check if the coil resistance of the PF Motor is about 6.1Ω by using tester *(refer to Table 3-1)*.	2. Replace the PF Motor with a new one.
			3. Check if the PF Motor Connector Cable is not damaged.	3. Replace the PF Motor with a new one.
• Operation • –	When a top of a paper at the correct timing during the paper loading sequence, the paper is ejected immediately without setting the paper setting position for printing. But, in this time, next paper is loaded to the PE Sensor Lever.	ASF Unit	1. Check if the Paper Return Plate operates correctly in the paper loading sequence. 	1. Set the Torsion Spring 29.1 between the ASF Frame and the Paper Return Plate.

Table 3-8. Check point for the paper jam error according to each phenomenon

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • –	The leading edge of paper does not go through between the EJ Roller and the Star Wheel.	Front Frame**	1. Check if the Star Wheel does not come off. 	1. Replace the Front Frame with a new one.
			2. Check if the Front Frame is correctly assembled.	2. Reassemble the Front Frame correctly.
			3. Check if the Front Frame is not bent down.	3. Replace the Front Frame with a new one.
		EJ Roller	1. Check if the EJ Roller is correctly assembled. 	1. Reassemble the EJ Roller correctly.
			2. Check if the Spur Gear 60 does not come off.	2. Replace the EJ Roller with a new one.
	A paper is loaded from the ASF Unit, and it is fed correctly. But, the paper feeding sequence is performed without loading a paper from the next paper loading sequence.	Holder Shaft Unit	1. Check if the Torsion Spring 0.22 for the PE Sensor Lever does not come off.	1. Set the Torsion Spring 0.22 for the PE Sensor Lever to the suitable position.
• Operation • –	The leading edge of paper is not loaded to the PF Roller Unit.	Paper Guide Upper**	1. Check if the Paper Guide Upper is correctly assembled. 	1. Reassemble the Paper Guide Upper to the Main Frame correctly.

** In case that the paper jam error occurs in each operation, the jammed paper contacts the nozzle surface of the Print Head and the Print Head may be damaged.

Table 3-9. Check point for the Fatal error according to each phenomenon

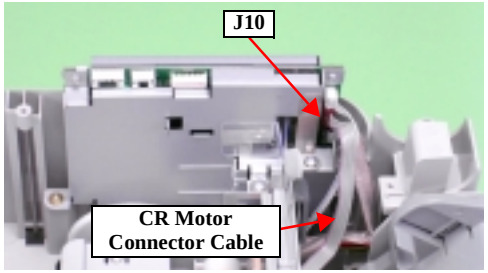
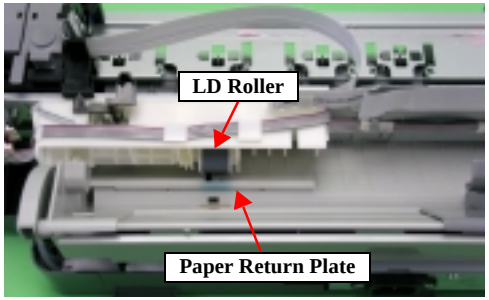
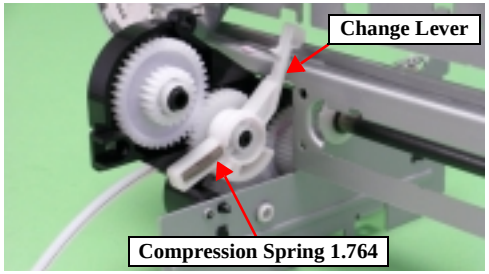
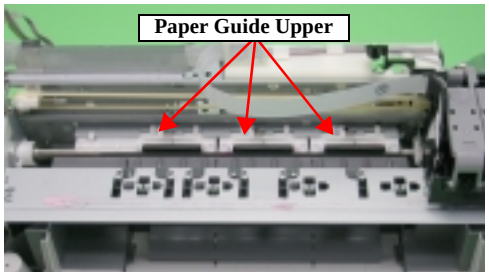
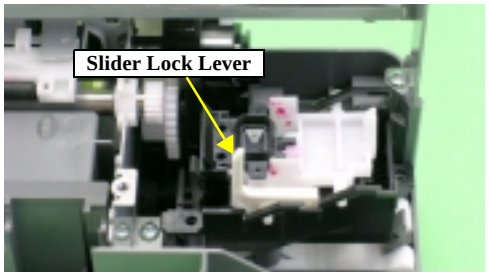
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Anywhere	When turning on the power, the CR Motor does not operate at all.	CR Motor	1. Check if the CR Motor Connector Cable is connected to J10 on the Main Board. 	1. Connect the CR Motor Connector Cable to J10 on the Main Board.
			2. Check if the coil resistance of the CR Motor is about 11.5Ω by using tester *(refer to Table 3-1)*.	2. Replace the CR Motor with a new one.
			3. Check if the CR Motor Connector Cable is not damaged.	3. Replace the CR Motor with a new one.
	When turning on the power, the Carriage Unit collides to the Change Lever located to the front side of the printer.	Holder Shaft Unit	1. Check if the Paper Return Plate disturbs the rotation of the LD Roller. 	1. Reassemble the ASF Unit to the SPC.

Table 3-9. Check point for the Fatal error according to each phenomenon

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Power on • Anywhere	When turning on the power, the Carriage Unit collides to the Change Lever located to the front side of the printer.	Ink System Unit	1. Check if the Compression Spring 1.764 does not come off in the Change Lever. 	1. Replace the Ink System Unit with a new one.
	The Carriage Unit collides with the Paper Guide Upper when power is turned on.	Paper Guide Upper	1. Check if the Paper Guide Upper is correctly assembled. 	1. Reassemble the Paper Guide Upper to the Main Frame correctly.
• Operation • –	The Carriage Unit climbs over the Slider Lock Lever set to the wiping position and the Carriage Unit collides to its lever.	Front Frame	1. Check if the Slider Lock Lever is correctly released by the CR movement. 	1. Replace the Front Frame with a new one.
		Main Frame	1. Check if the Slider Lock Lever is correctly released by the CR movement.	1. Replace the Printer Mechanism with a new one.

3.3.1 Superficial Phenomenon-Based Troubleshooting

This section explains the fault locations of the error states (print quality and abnormal noise) other than the error states (LED and STM3) in the previous section.

Table 3-10. Check point for multiple sheets of paper are always loaded without LEDs and STM3

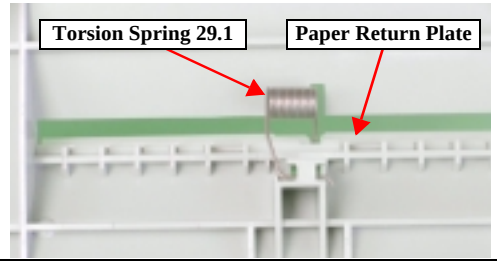
Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Operation • –	The LEDs and STM3 are not indicating error conditions. But, multiple sheets of paper are always loaded from the ASF Unit.	ASF Unit	1. Check if the Paper Return Plate operates correctly in the paper loading sequence. 	1. Set the Torsion Spring 29.1 between the ASF Frame and the Paper Return Plate.

Table 3-11. Check point for the abnormal noise

Occurrence timing CR position	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Anywhen • Anywhere	The abnormal noise occurs at the first power on timing and during each operation although the printing operation is performed.	Front Frame	1. Check if the grease on the Front Frame is sufficient.	1. Wipe off the remaining grease on the Front Frame and lubricate it on its frame.
		Main Frame	1. Check if the grease on the CR Guide Rail is sufficient.	1. Wipe off the remaining grease on the CR Guide Frame and lubricate it on its frame.
		Ink System Unit	1. Check if the Change Lever moves smoothly.	1. Replace the Ink System Unit with a new one.
	The bottom of the Carriage Unit contacts the surface of the Front Frame	Front Frame	1. Check if the Front Frame is not bent up.	1. Replace the Front Frame with a new one.
	The Carriage Unit collides to the Paper Guide Upper during each operation.	Paper Guide Upper	1. Check if the Paper Guide Upper Unit is attached securely. (Check if it interferes with the Carriage Unit)	1. Reassemble the Paper Guide Upper to the Main Frame.

Table 3-12. Check point for poor scanned image quality

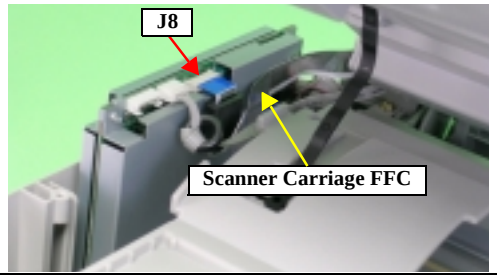
Scanned image Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Scanned image is not clear.	There are dusts on the Document Glass. (white dots appear on the scanned image)	Scanner Housing Upper	1. Check if there is not any dust on the Document Glass.	1. Remove the extraneous matter from the Document Glass. (Refer to the Chapter 6 “MAINTENANCE”.)
	There are dusts on the LED in the Rod Lens Array. (vertical stripes appear on the scanned image)	Scanner Carriage Unit	1. Check if there is not any dust on the LED.	1. Remove the extraneous matter from the Rod Lens Array (blow away the dusts).
	The LED of CIS Unit does not light up.	CIS Unit	1. Check if the LED lights up.	1. Replace the CIS Unit with new one.
• Nothing is scanned.	Making a copy results in all black printout.	Document	1. Check if a document to be copied is set correctly.	1. Set the document correctly.
		Scanner Carriage FFC	1. Check if the Scanner Carriage FFC is connected to J8 on the Main Board. 	1. Connect the Scanner Carriage FFC to J8 on the Main Board.
			2. Check if the Scanner Carriage FFC is not damaged.	2. Replace the Scanner Carriage FFC with a new one.

Table 3-12. Check point for poor scanned image quality

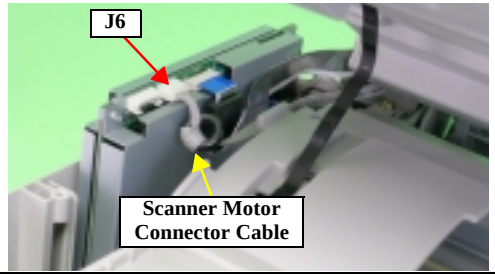
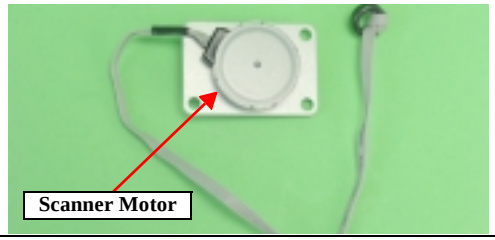
Scanned image Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Nothing is scanned.	When made a copy, the paper is ejected without printing.	Scanner Motor	1. Check if the Scanner Motor Connector Cable is connected to J6 on the Main Board. 	1. Connect the Scanner Motor Connector Cable to J6 on the Main Board.
			2. Check if the coil resistance of the Scanner Motor is about TBDΩ by using the tester *(refer to Table 3-1)*. 	2. Replace the Scanner Motor with a new one.
			3. Check if the Scanner Motor Connector Cable is not damaged.	3. Replace the Scanner Motor with a new one.

Table 3-13. Check point for the poor printing quality

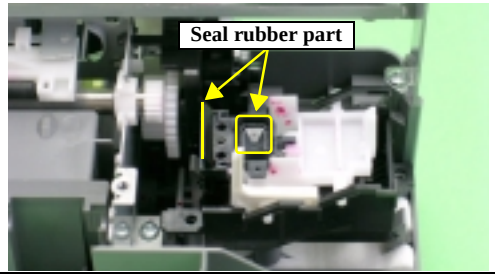
Print Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Dot missing and mixed colors	Ink is scarcely ejected to the Cap from the Print Head.	Ink System Unit (Cap Unit)	1. Check if there is not any foreign material/damage around the seal rubber part on the Cap Unit. 	1. Remove the foreign material around the seal rubber parts carefully.
			2. Check if the Spring under the Cap does not come off.	2. Replace the Ink System Unit with a new one.
	Ink is ejected to the Cap from the Print Head, but the SPC does not recover from the error after cleaning or ink change.	Print Head	1. Check if it returns to normal by performing CL operation or replacing the Ink Cartridge.	1. Perform CL operation and the Ink Cartridge replacement specified times. If it doesn't work, change the Print Head with a new one.
			2. Check if the Print Head is not damaged.	2. Replace the Print Head with a new one.
		Cleaner Blade	1. Check if the Cleaner Blade does not have paper dust or bending.	1. Replace Ink System Unit with a new one.
		Main Board Unit	1. Check if the Main Board Unit is not damaged.	1. Replace the Main Board Unit with a new one.

Table 3-13. Check point for the poor printing quality

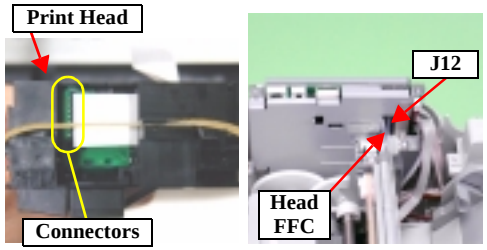
Print Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• White streak / abnormal discharge	Ink is ejected to the Cap from the Print Head, but printing is not done at all after cleaning or ink change, or abnormal discharge occurs.	Head FFC	1. Check if the Head FFC is securely connected to the Print Head Connectors and the Main Board Connectors (J12).  	1. Connect the Head FFC to the Print Head and the Main Board Connectors.
			2. Check if the Head FFC is not damaged.	2. Replace the Head FFC with a new one.
		Print Head	1. Check if it returns to normal by performing CL operation or replacing the Ink Cartridge.	1. Perform CL operation and the Ink Cartridge replacement specified times. If it doesn't work, change the Print Head with a new one.
		Main Board Unit	1. Check if the Main Board Unit is not damaged.	1. Replace the Main Board Unit with a new one.

Table 3-13. Check point for the poor printing quality

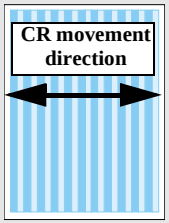
Print Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• White streak/ color unevenness occurrence	Vertical banding appears against the CR movement direction. And, it looks like uneven printing.  [Note] If the problem is not solved, replace the CR Motor with a new one.	Adjustment	1. For printing in the Bi-D mode, check if Bi-D Adjustment has been performed properly.	1. Perform Bi-D Adjustment to eliminate displacements between the upper and lower rules. (Refer to Chapter 5 "ADJUSTMENT".)
		Print Head	1. Check if each segment is printed correctly in the Nozzle Check Pattern.	1. Perform Head Cleaning and check the Nozzle Check Pattern. (Refer to Chapter 5 “ADJUSTMENT”.) If the problem is not solved, replace the Print Head with a new one.
		Carriage Unit / Main Frame	1. Check if there is not any foreign material on the surface of the CR Guide Rail.	1. Remove foreign objects from surface of the CR Guide Rail.
			2. Check if the grease is enough on the surface of the CR Guide Rail.	2. After wiping the grease on the CR Guide Rail and the Carriage with a dry, soft cloth, coat it with grease (G-58). (Refer to Chapter 6 “MAINTENANCE”.)
		Front Frame	1. Check if there is not any foreign material on the surface of the Front Frame.	1. Remove foreign matter from the Front Frame.
			2. Check if the Front Frame is lubricated with enough grease.	2. After wiping the grease on the Front Frame with a dry, soft cloth, coat it with grease (G-58). (Refer to Chapter 6 “MAINTENANCE”.)
			3. Check if the Front Frame has not been deformed.	3. Replace the Front Frame with a new one.

Table 3-13. Check point for the poor printing quality

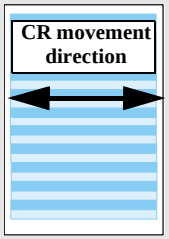
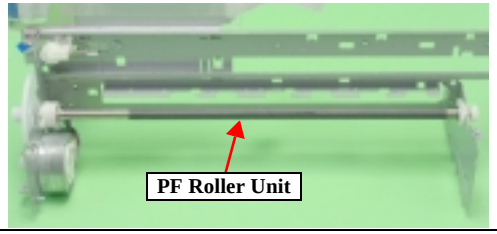
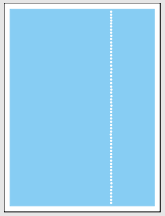
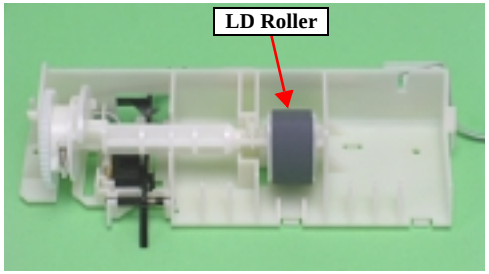
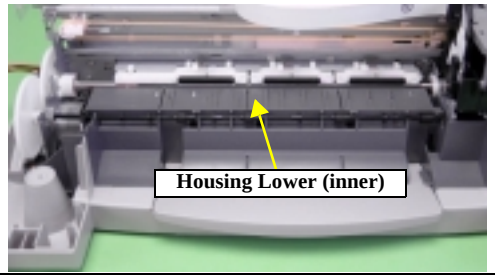
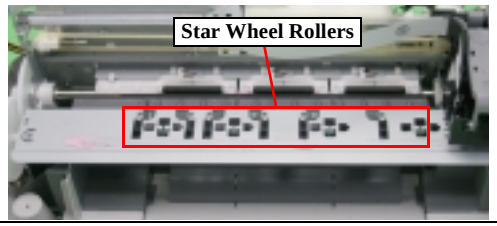
Print Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• White streak/ color unevenness occurrence	Micro banding appears horizontally against the CR movement direction and it appears with the same width.  [Note] If the problem is not solved, replace the PF Motor with a new one.	Printer driver & exclusive paper	1. Check if the suitable paper is used according to the printer driver setting.	1. Use the suitable paper according to the printer driver setting.
		Print Head	1. Check if each segment is printed correctly in the Nozzle Check Pattern.	1. Perform the Head Cleaning and check the Nozzle Check Pattern. (Refer to Chapter 5 “ADJUSTMENT”.) If the problem is not solved, replace the Print Head with a new one.
		PF Roller Unit	1. Check if there is not any foreign material on the surface of the PF Roller Unit.  	1. Clean the surface of the PF Roller Unit carefully with the soft cloth.
			2. Check if the PF Roller Unit is not damaged.	2. Replace the Printer Mechanism with a new one.
	The Star wheel mark against the CR movement direction. 	Front Frame	1. Check if the Star Wheel does not come off.	1. Replace the Front Frame with a new one.
			2. Check if the surface of the Front Frame is flat.	2. Replace the Front Frame with a new one.
	Printing is blurred.	Printer driver & exclusive paper	1. Check if the suitable paper is used according to the printer driver setting.	1. Use the suitable paper according to the printer driver setting.
		Print Head	1. Check if the correct Head ID is stored into the EEPROM by using the Adjustment Program.	1. Input 6 digits code of the Head ID into the EEPROM by using the Adjustment Program.

Table 3-13. Check point for the poor printing quality

Print Quality State	Detailed phenomenon	Defective unit/part name	Check point	Remedy
• Print start position slip	The printing operation is correctly performed. But, the top margin is insufficient than usual one.	Holder Shaft Unit	1. Check if any paper dust is not adhered to the surface of the LD Roller. 	1. Set a cleaning sheet in the ASF up side down. Then holding the top edge, try to load the paper from the Printer driver. The micro pearl on the LD Roller surface is removed. To remove severe smear, staple a cloth moistened with alcohol to a post card and clean the roller in the same manner. As for the cleaning sheet, refer to page 55 "Remedy of the Paper out error" * If the problem is not solved, replace the Holder Shaft Unit with a new one.
• Ink stain of paper	Ink stain occurs at the back, top end or bottom end of the print paper.	Housing Lower (inner)	1. Check if the Housing Lower (inner) does not have ink stain. 	1. Clean the Housing Lower (inner) with a soft cloth.
		EJ Roller	1. Check if the EJ Roller does not have ink stain.	1. Clean the EJ Roller with a soft cloth.
		PF Roller Unit	1. Check if the PF Roller Unit does not have ink stain.	1. Clean the PF Roller Unit with a soft cloth.
	Ink sticks to other than the print area of the paper, resulting in contamination	Paper Guide Upper	1. Check if the Paper Guide Upper does not have ink stain.	1. Clean the Paper Guide Upper with a soft cloth.
		Front Frame	1. Check if the Star Wheels does not have ink stain. 	1. Clean the Star Wheels with a soft cloth.

CHAPTER

4

DISASSEMBLY AND ASSEMBLY

4.1 Overview

This section describes procedures for disassembling the main components of the Stylus CX1500/ME100. Unless otherwise specified, disassembly units or components can be reassembled by reversing the disassembly procedure. Things, if not strictly observed, that could result in injury or loss of life are described under the heading “Warning”. Precautions for any disassembly or assembly procedures are described under the heading “CAUTION”. Chips for disassembling procedures are described under the heading “CHECK POINT”.
If the assembling procedure is different from the reversed procedure of the disassembling, the procedure is described under the heading “REASSEMBLY”.
Any adjustments required after reassembling the units are described under the heading “ADJUSTMENT REQUIRED”. When you have to remove any units or parts that are not described in this chapter, refer to the exploded diagrams in the appendix.

Read precautions described in the next section before starting.

4.1.1 Precautions

See the precautions given under the handling “WARNING” and “CAUTION” in the following column when disassembling or assembling EPSON Stylus CX1500/ME100.

WARNING

- **Disconnect the power cable before disassembling or assembling the main unit.**
- **If you need to work on the main unit with power applied, strictly follow the instructions in this manual.**
- **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.**
- **Always wear gloves for disassembly and reassembly to avoid iujury from sharp metal edges.**
- **To protect sensitive microprocessors and circuitry, use static discharge equipment, such as anti-static wrist straps, when accessing internal components.**
- **Never touch the ink or wasted ink with bare hands. If ink comes into contact with your skin, wash it off with soap and water immediately. If irritation occurs, contact a physician.**

WARNING

- **Avant de commencer, assure vous que l’imprimante soit eteinte et que le cordon d’alimentation soit debranche.**
- **Veillez a jeter les piles usagees selon le reglement local.**

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

- **When transporting this unit 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 main unit.**
- **Observe the specified torque when tightening screws.**
- **Apply lubricants and adhesives as specified. (Refer to Chapter 6 for details.)**
- **Make the specified adjustments when you disassemble the main unit. (Refer to Chapter 5 for details.)**
- **Make sure the tip of the waste ink tube is located at correct position when reassembling the waste ink tube. Otherwise it will cause ink leakage.**

4.1.2 Tools

Use only specified tools to avoid damaging of the main unit.

Table 4-1. Tools

Name	Supplier*	Parts No.
Phillips Screw Driver (No.1)	EPSON	1080530
Phillips Screw Driver (No.2)	EPSON	1080532
Standard Screwdriver	EPSON	1080527
PRECISION SCREW DRIVER #1 (-)	EPSON	1080525
Tweezer	EPSON	1080561
Needle nose pliers	EPSON	1080564
Acetate Tape	EPSON	1003963

Note "*": Available in the market

4.1.3 Work Completion Check

If any service is made to the main unit, use the checklist shown below to confirm all works are completed properly and the main unit is ready to be returned to the user.

Table 4-2. Check List

Classification	Part	Check item	Check column
Printer unit	Self test	Operation is normal?	☐OK / ☐NG
	On line test	Print is normally done?	☐OK / ☐NG
	Print Head (nozzle check pattern print)	Ink gets out normally from all the nozzles?	☐OK / ☐NG
	CR mechanism	CR smoothly operates?	☐OK / ☐NG
		CR makes abnormal sound during its operation?	☐OK / ☐NG
	Paper loading mechanism	Paper is smoothly loaded?	☐OK / ☐NG
		Paper jam does not happen?	☐OK / ☐NG
		Paper does not warp during paper loading?	☐OK / ☐NG
		Multiple papers are not fed?	☐OK / ☐NG
		Abnormal sound is not heard during paper loading?	☐OK / ☐NG
		There is no alien substance at paper route?	☐OK / ☐NG
Scanner unit	Mechanism	Glass surface is not dirty?	☐OK / ☐NG
		Alien substance is not mixed in the CR movement area?	☐OK / ☐NG
	CR mechanism	CR smoothly operates?	☐OK / ☐NG
		CR operates together with scanner unit?	☐OK / ☐NG
		CR makes abnormal sound during its operation?	☐OK / ☐NG
	LED	LED normally turns on and white reflection test is done near home position?	☐OK / ☐NG

Table 4-2. Check List

Classification	Part	Check item	Check column
On line test	On line test	Operation is normal?	☐OK / ☐NG
Copy	Copy	Local copy is normal?	☐OK / ☐NG
Adjustment	Designated adjustment items	Adjustment condition is suitable?	☐OK / ☐NG
Lubrication	Designated lubrication items	Lubrication is done at designated place?	☐OK / ☐NG
		Lubrication volume is suitable?	☐OK / ☐NG
Function	Firmware version	The newest version	☐OK / ☐NG
Dispatch packing	Ink cartridge	Ink cartridge is normally installed?	☐OK / ☐NG
	Waste Ink Pads	Remained life of waste ink pads are sufficient?	☐OK / ☐NG
	Protection during distribution	Printer CR is in the cap position?	☐OK / ☐NG
Others	Attached goods	All of attached goods from users are packed?	☐OK / ☐NG

4.2 Caution regarding assembling/disassembling of the Printer Mechanism, and how to ensure of quality on re-assembled product

On current low end models, we basically forbade to remove Housing Lower (Inner) from Printer mechanism in your repair. This is because there is a possibility of main frame deformation when a part (such as Ink system) is removed from Printer mechanism without Housing Lower (Inner).
Therefore, if you want to replace Ink system/PF motor, we recommend to replace with new Printer mechanism with Housing Lower (Inner).

Therefore, we clarify caution regarding assembling/disassembling of the printer mechanism without Housing Lower (Inner), and how to ensure of quality on repaired production this section.

[Caution regarding assembling/disassembling of the printer mechanism]
1) Main Frame

(a) Control of assembled standard position.

[Reason]
- The assembled accuracy of each part composed of Printer mechanism is based on Housing Lower (Inner).

[Service treatment]
- Confirm that there is no gap between main frame and Housing Lower (Inner).

[Reference]
- To ensure the assembled accuracy, you have to control the assembled standard position of main frame against X/Y/Z-axis direction.

[X-axis direction]
- Make sure that main frame is correctly placed on the groove of Housing Lower (Inner).
- Make sure that there is no gap between main frame and Housing Lower (Inner).

[Y-axis direction]
- Make sure that cut-out portion of main frame is correctly placed on the square protrusion of Housing Lower (Inner).

[Z-axis direction]
- Make sure that there is no gap between main frame and Housing Lower (Inner).
- Make sure that the left side of Printer mechanism is correctly fixed by one hook.

(b) Control of vertical level of guide rail (Guide rail means the portion latched by hooks of Holder IC & Print Head assy.)

[Reason]
- There is a possibility that printing failure/operation failure occurs by guide rail deformation.

[Service treatment]
- Hold up the specified position of main frame to avoid the deformation.

(c) How to assemble of ASF Unit/Main Board/Paper Guide Upper

[Reason]
- There is a possibility that main frame deformation is caused extra force in assembling. As the result, printing failure/operation failure occurs.

[Service treatment]
- Hold the opposite side by hand while you are installing the above parts.

2) Front Frame

(a) Control of vertical level

[Reason]
- There is a possibility that printing failure occurs by Front Frame deformation.

[Service treatment]
- Handle Front Frame in assembling/disassembling carefully.

3) Holder IC

(a) Handling of Holder IC

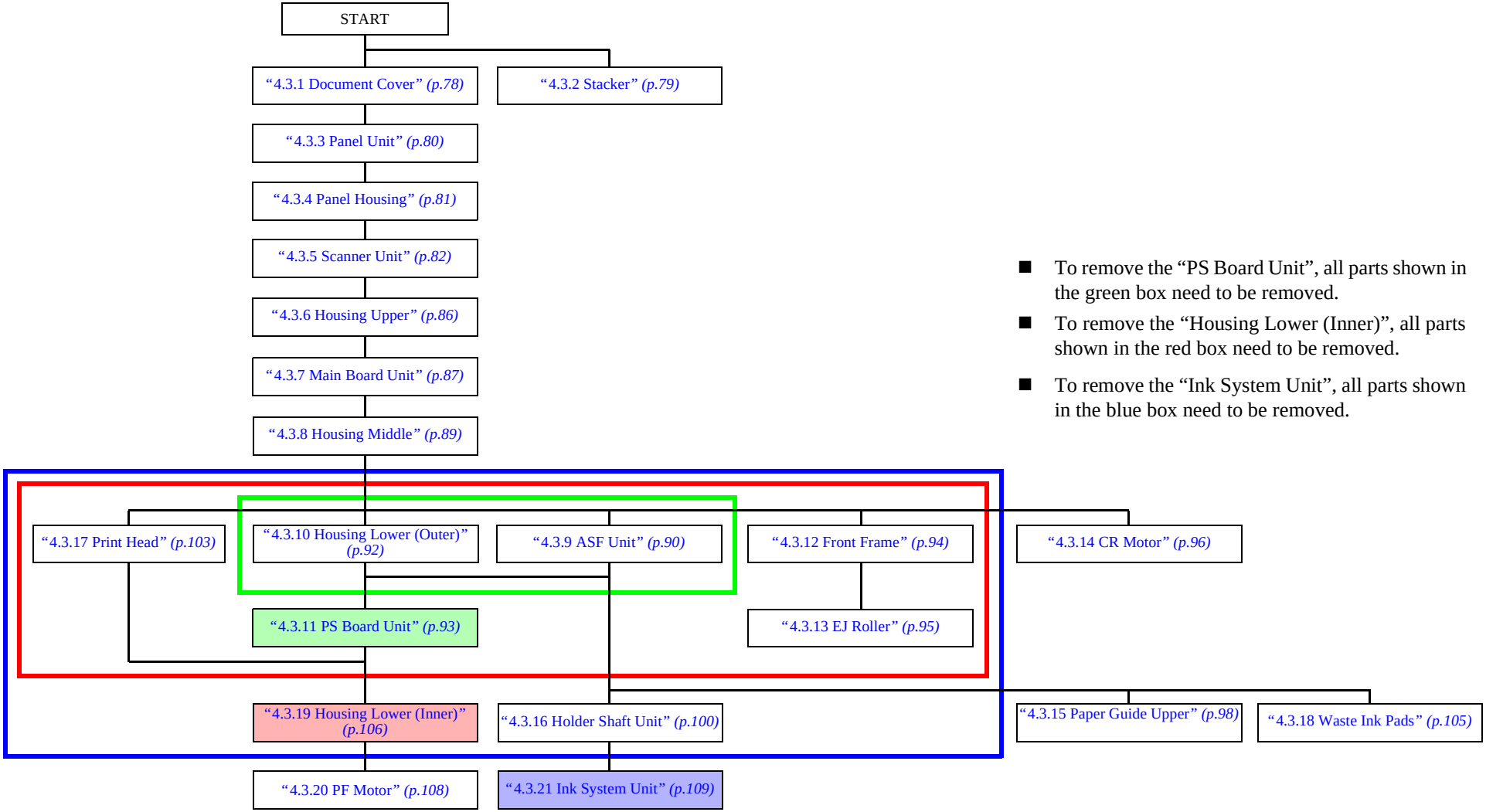
[Reason]
- If Holder IC is damaged in assembling/disassembling of your repair, there is a possibility that vital problem occur in user’s further operation.

[Service treatment]
- Released two hooks of Holder IC from the inside of Holder IC by tweezer.

[How to ensure of quality on re-assembled product]
We judge that the quality of re-assembled product is ensured if there is no problem about the print result by adjustment program.

4.3 Disassembly

The flowchart below shows step-by-step disassembly procedures. When disassembling each unit, refer to the page number shown in the figure.



- To remove the "PS Board Unit", all parts shown in the green box need to be removed.
- To remove the "Housing Lower (Inner)", all parts shown in the red box need to be removed.
- To remove the "Ink System Unit", all parts shown in the blue box need to be removed.

Figure 4-1. Disassembling flowchart

4.3.1 Document Cover

☐ **External View**

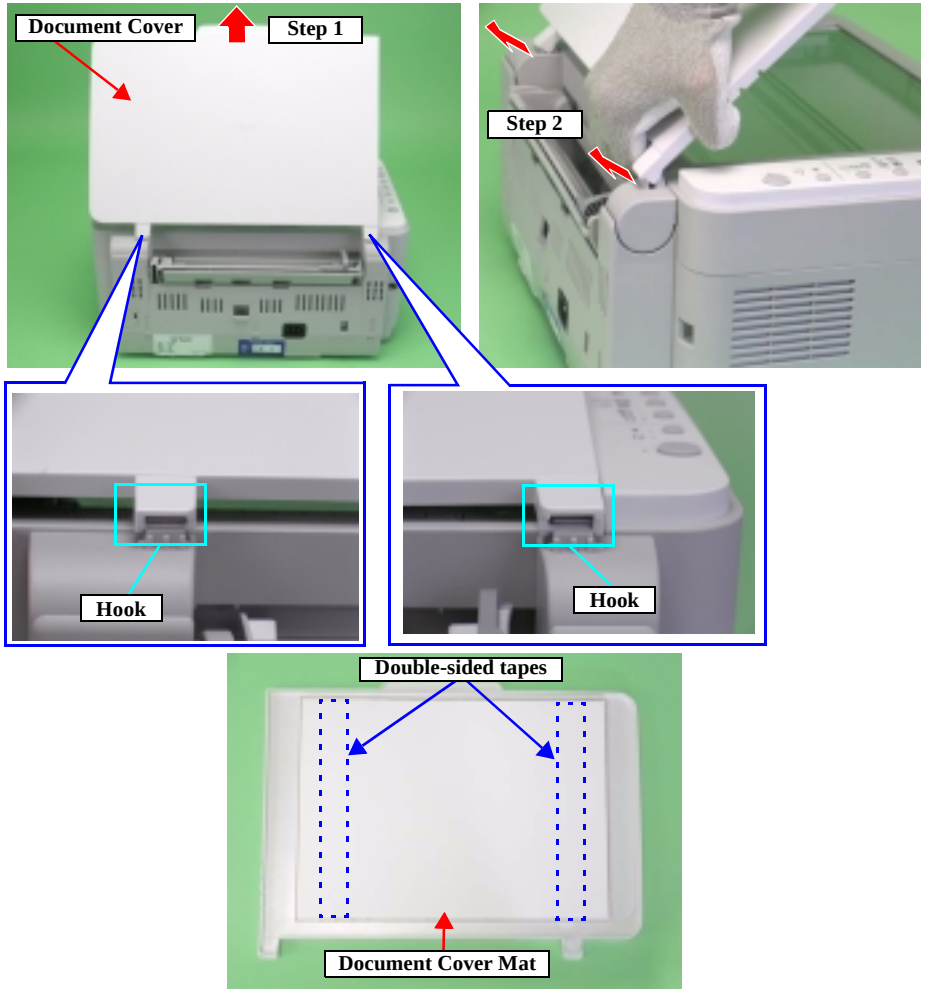


Figure 4-2. Document Cover Removal

☐ **Part/Unit that should be removed before removing Document Cover.**

None

☐ **Removal procedure**

1. Open Document Cover.
2. Remove document cover from the hooks (x2, ☐) of Scanner Unit in direction of arrows.

CAUTION

The Document Cover hinges can be easily broken, so use care when installing or removing Document Cover.

■ **Document Cover Mat Removal**

1. Remove Document Cover Mat secured to Document Cover with the double-sided tapes (x2).

4.3.2 Stacker

☐ **External View**

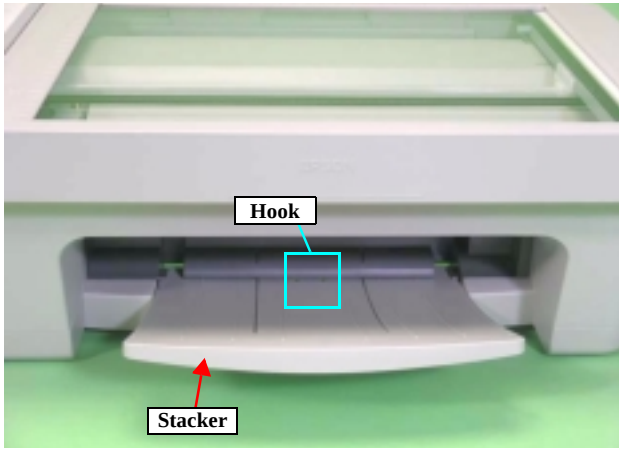


Figure 4-3. Stacker Removal

☐ **Part/Unit that should be removed before removing Stacker**

None

☐ **Removal procedure**

1. Pull out Stacker.
2. Release the hook (x1, ☐) for securing Stacker, and then pull it outward.

4.3.3 Panel Unit

☐ **External View**

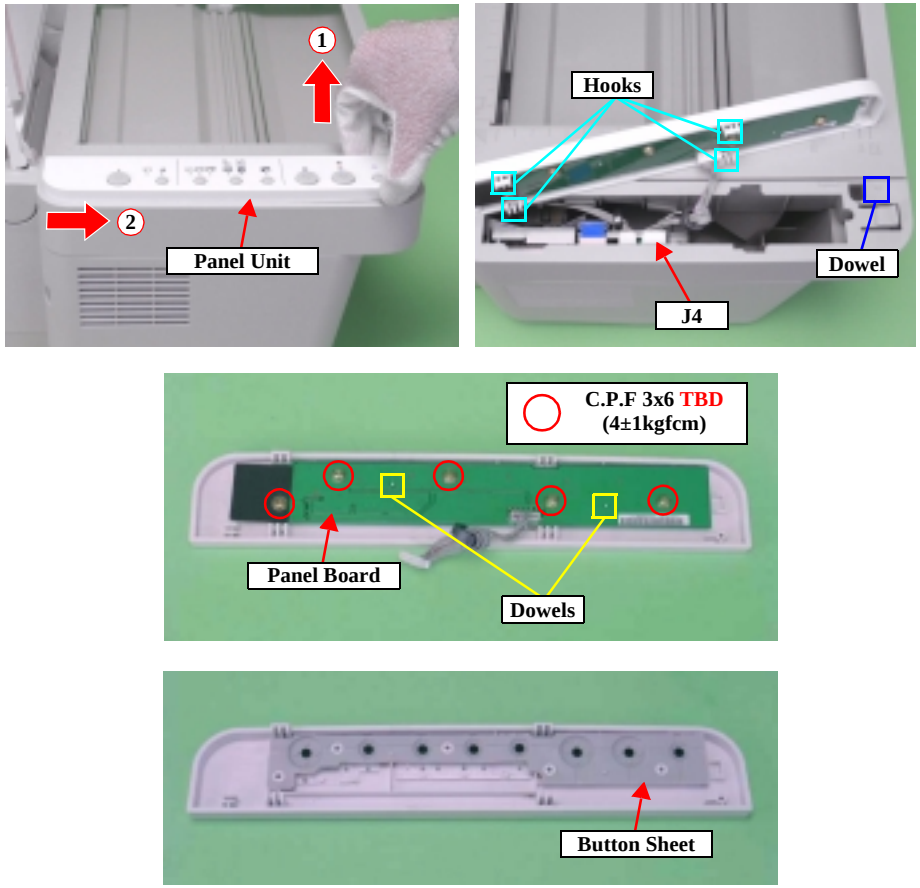


Figure 4-4. Panel Unit Removal

☐ **Part/Unit that should be removed before removing Panel Unit**

None

☐ **Removal procedure**

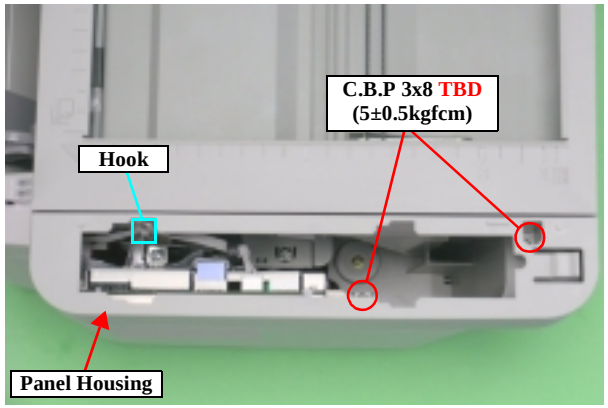
1. Slightly lift front side of Panel Unit, and after releasing the dowel (x1, ☐), slide it in direction of arrow ② and release the hooks (x4, ☐), and then remove upward.
2. Disconnect Panel Connector Cable from Connector (J4) of Main Board.
3. Remove the screws (x5, ○) for securing Panel Board, and then remove Panel Board from Panel Cover.
4. Remove Button Sheet from Panel Cover.

Reassembly

Align the positioning holes (x2) of Panel Board with the dowels (x2, ☐) of Panel Cover.

4.3.4 Panel Housing

☐ **External View**



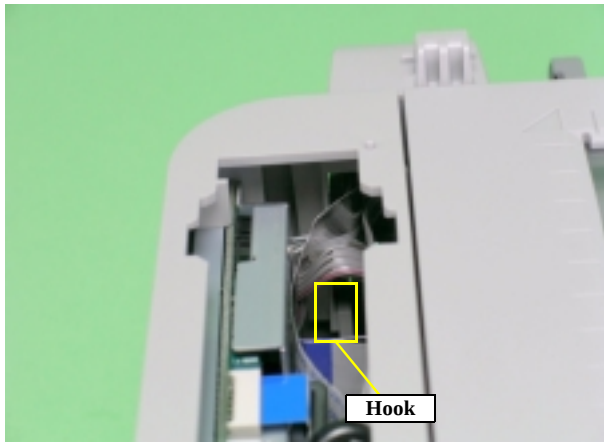


Figure 4-5. Panel Housing Removal

☐ **Part/Unit that should be removed before removing Scanner Unit.**

Document Cover / Panel Unit

☐ **Removal procedure**

1. Remove the screws (x2, ○) for securing Panel Housing.
2. Release Scanner Motor Connector Cable from the hook (x1, □) of Panel Housing.
3. Release Panel Housing from the hook (x1, □) by using a flat-blade screwdriver, and then remove by lifting upward.

Install by aligning Panel Housing notch in a way that will not damage Head FFC.

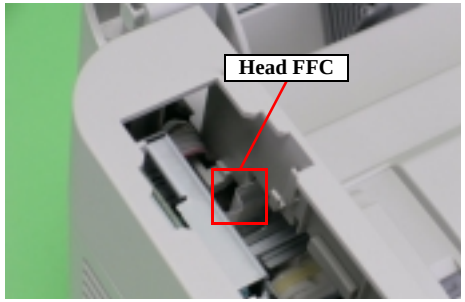


Figure 4-6. Installation of Panel Housing

4.3.5 Scanner Unit

☐ **External View (1)**

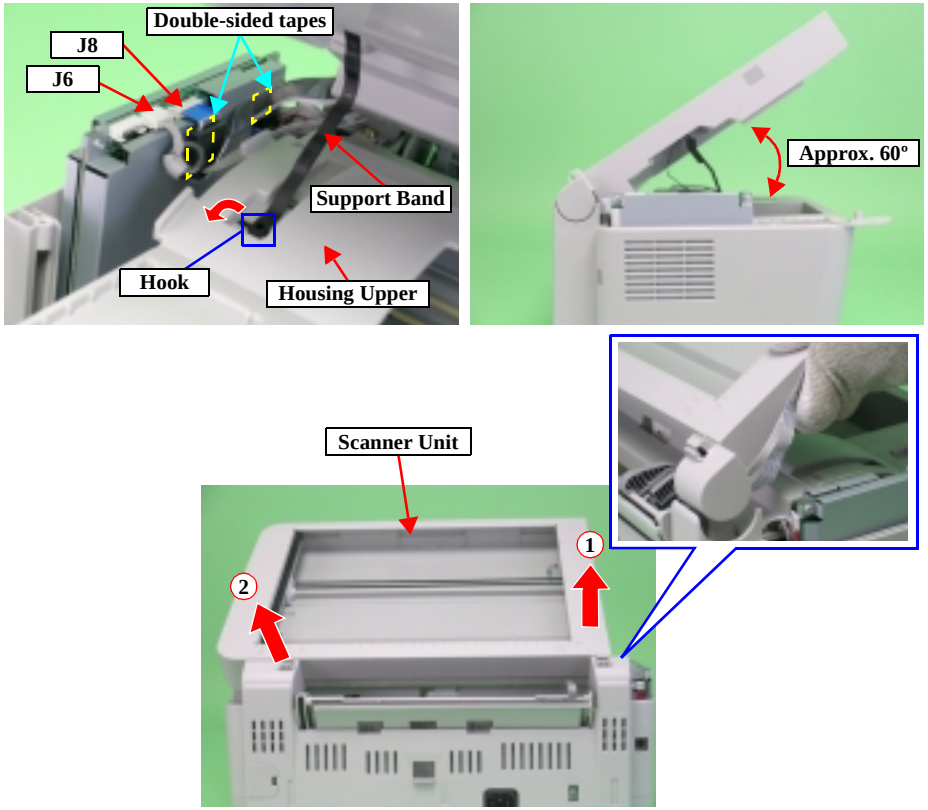


Figure 4-7. Scanner Unit Removal

☐ **Part/Unit that should be removed before removing Scanner Unit.**

Document Cover / Panel Unit / Panel Housing

☐ **Removal procedure**

1. Disconnect the following Connector Cables and FFC from the connectors of Main Board.
   - J6: Scanner Motor Connector Cable
   - J8: Scanner Carriage FFC

CAUTION

The Scanner Carriage FFC is fastened with the double-sided tape, so be careful not to damage FFC when removing it.

2. Rotate lower side of Support Band sideways by 90º, and then release Support Band hook (x1, ☐) from the notch in Housing Upper.
3. Lift the Scanner Unit to the position as shown in the figure (approx. 60º), and while lifting Scanner Motor Connector Cable and Scanner Carriage FFC by hand, remove Scanner Unit using the steps shown in the figure.

Reassembly

■ **Align the positioning hole (x1, ☐) of Scanner Unit with the dowel (x1, ☐) of Housing Middle.**

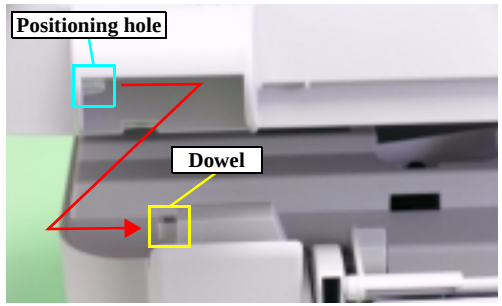
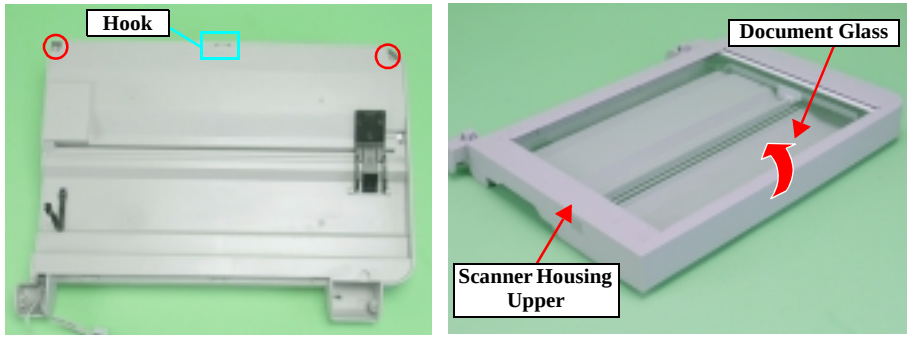


Figure 4-8. Installation of Scanner Unit

■ **Do not pinch Scanner Motor Connector Cable and Scanner Carriage FFC between the Scanner Unit and Housing Upper.**

☐ **External View (2)**



○ C.P.F 3x8 TBD (4±0.5kgfcm)

Figure 4-9. Scanner Housing Upper Removal

■ **Scanner Housing Upper Removal**

CAUTION

- **Perform the following steps in a location free of dirt and dust. A clean room or clean bench is preferred.**
- **Do not damage Document Glass of Scanner Housing Upper.**

1. Remove the screws (x2, ○) for securing Scanner Housing Upper.
2. Release the hooks (x1, □) for securing Scanner Housing Upper, and then remove it upwards from front side of scanner.

☐ **External View (3)**

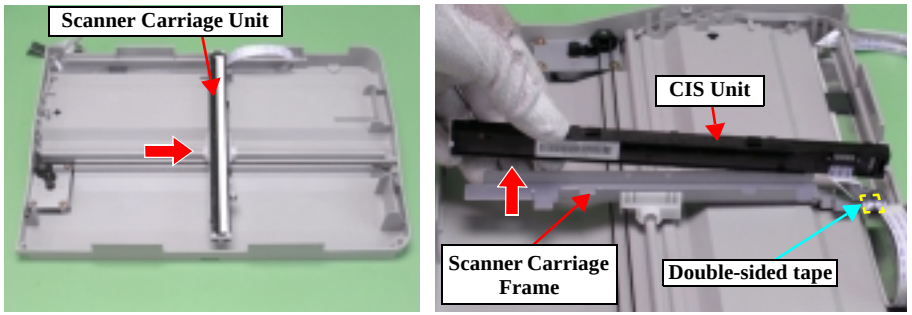


Figure 4-10. Scanner Carriage Unit Removal (1)

■ **Scanner Carriage Unit Removal**

CAUTION

Do not damage Rod Lens Array when removing / installing it.

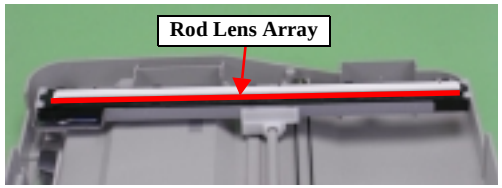


Figure 4-11. Handling of CIS Unit

1. Move Scanner Carriage Unit to the center.
2. Slightly lift CIS Unit from Scanner Carriage Frame.
3. After peeling off double-sided tape that secures Scanner Carriage FFC, disconnect from CIS Unit connector, and remove CIS Unit.

Reassembly

Align the hooks (x2, □) of CIS Unit with the notches (x2) of Scanner Carriage Frame.

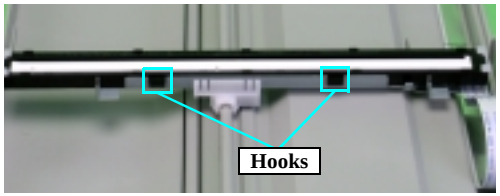


Figure 4-12. Installation of CIS Unit

☐ **External View (4)**

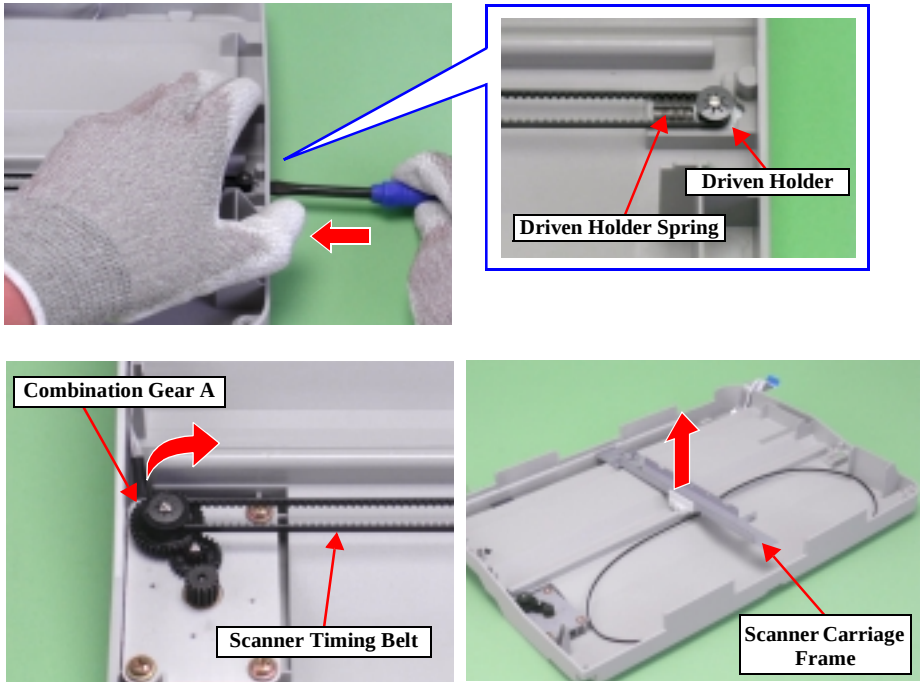


Figure 4-13. Scanner Carriage Unit Removal (2)

4. Use a flat-blade screwdriver to press Driven Holder inward, press out Driven Holder Spring, and then remove Driven Holder and Driven Holder Spring.

CAUTION

The Driven Holder Spring will spring out with much force, so prevent losing it by covering it with your hand while removing it.

Reassembly

Insert Driven Holder Spring into the rib of Driven Holder.

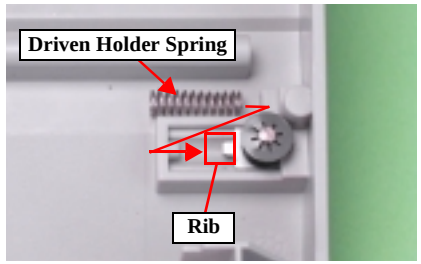


Figure 4-14. Installation of Driven Holder

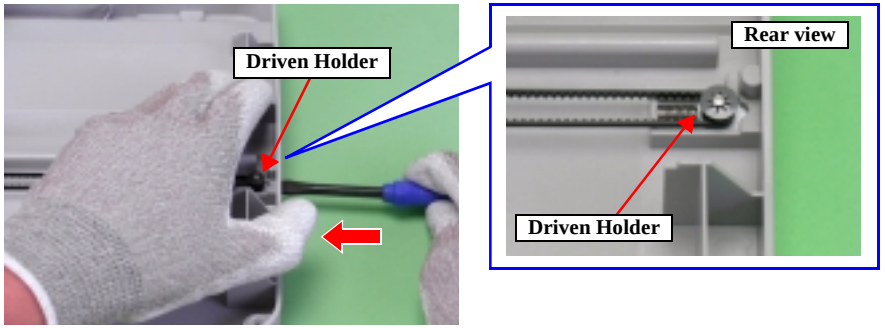
5. Release Scanner Timing Belt from Combination Gear A, and then remove Scanner Carriage Frame with Scanner Timing Belt.

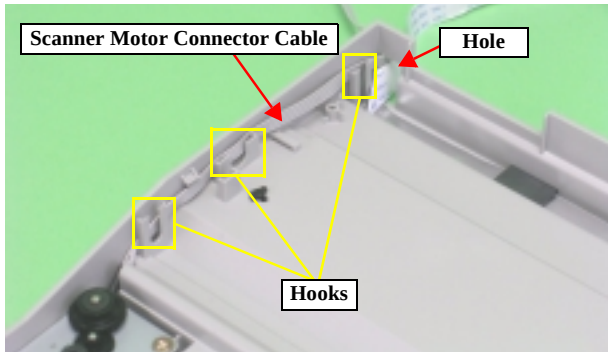
ADJUSTMENT REQUIRED

After replacing Scanner Carriage Frame with a new one, always apply oil EM-50L and TC-551 to the specified portions.

■ **Refer to Chapter 6, Figure 6-6 *(p.119)***

☐ **External View (5)**





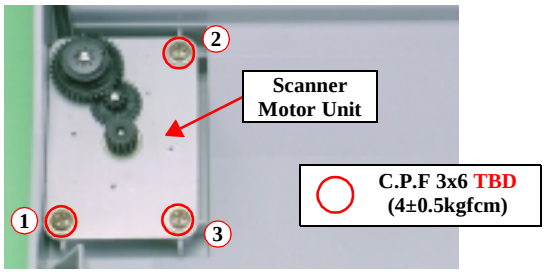


Figure 4-15. Scanner Motor Unit Removal

■ **Scanner Motor Unit Removal**

1. Move Scanner Carriage Unit to the center.
2. Use a flat-blade screwdriver to press Driven Holder inward, press out Driven Holder Spring, and then remove Driven Holder and Driven Holder Spring.

CAUTION

The Driven Holder Spring will spring out with much force, so prevent losing it by covering it with your hand while removing it.

Reassembly

Insert Driven Holder Spring into the rib of Driven Holder.

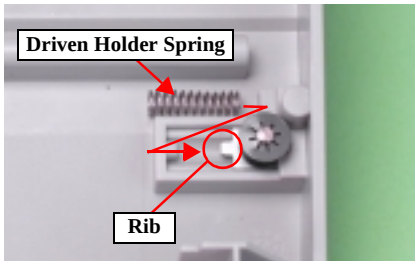


Figure 4-16. Installation of Driven Holder

3. Release Scanner Timing Belt from Combination Gear A.
4. Release Scanner Motor Connector Cable from the hooks (x3, ☐) of Scanner Housing Lower, and then pull from the hole of Scanner Housing Lower.

Reassembly

Place Scanner Motor Connector Cable as shown in the figure.

5. Remove the screws (x3, ○) for securing Scanner Motor Unit, and then remove Scanner Motor Unit.

Reassembly

Tighten the screws in order shown in the figure.

ADJUSTMENT REQUIRED

After replacing Scanner Motor Unit with a new one, always apply oil EM-50L to the specified portions.

■ **Refer to Chapter 6, Figure 6-4 *(p.118)***

4.3.6 Housing Upper

☐ **External View**

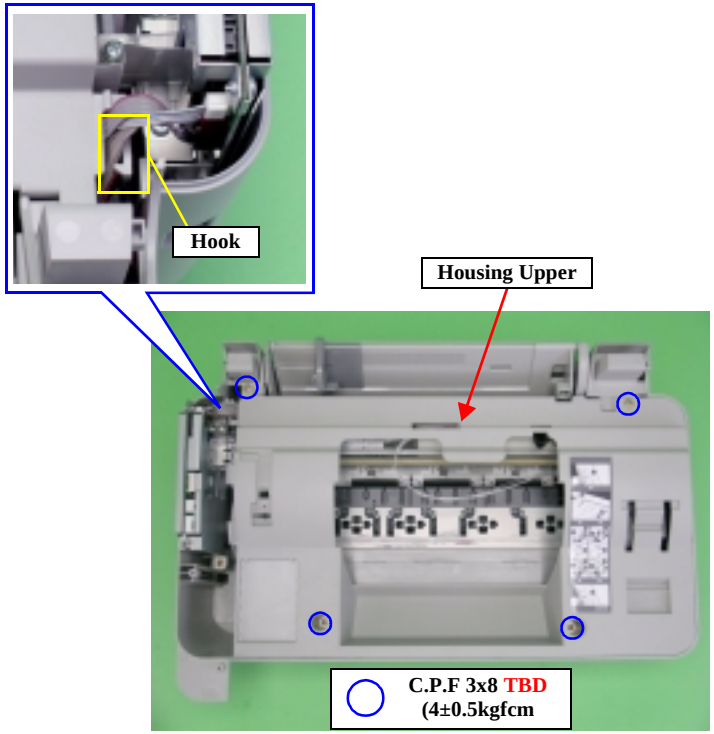


Figure 4-17. Housing Upper Removal

☐ **Part/Unit that should be removed before removing Panel Housing/Housing Upper.**

Document Cover / Panel Unit / Panel Housing / Scanner Unit

☐ **Removal procedure**

1. Remove the screws (x4, ○) for securing Housing Upper.
2. While removing Housing Upper in the upward direction, release connector cables secured to the hook (x1, □).

CAUTION !

Do not damage all connector cables.

4.3.7 Main Board Unit

☐ **External View**

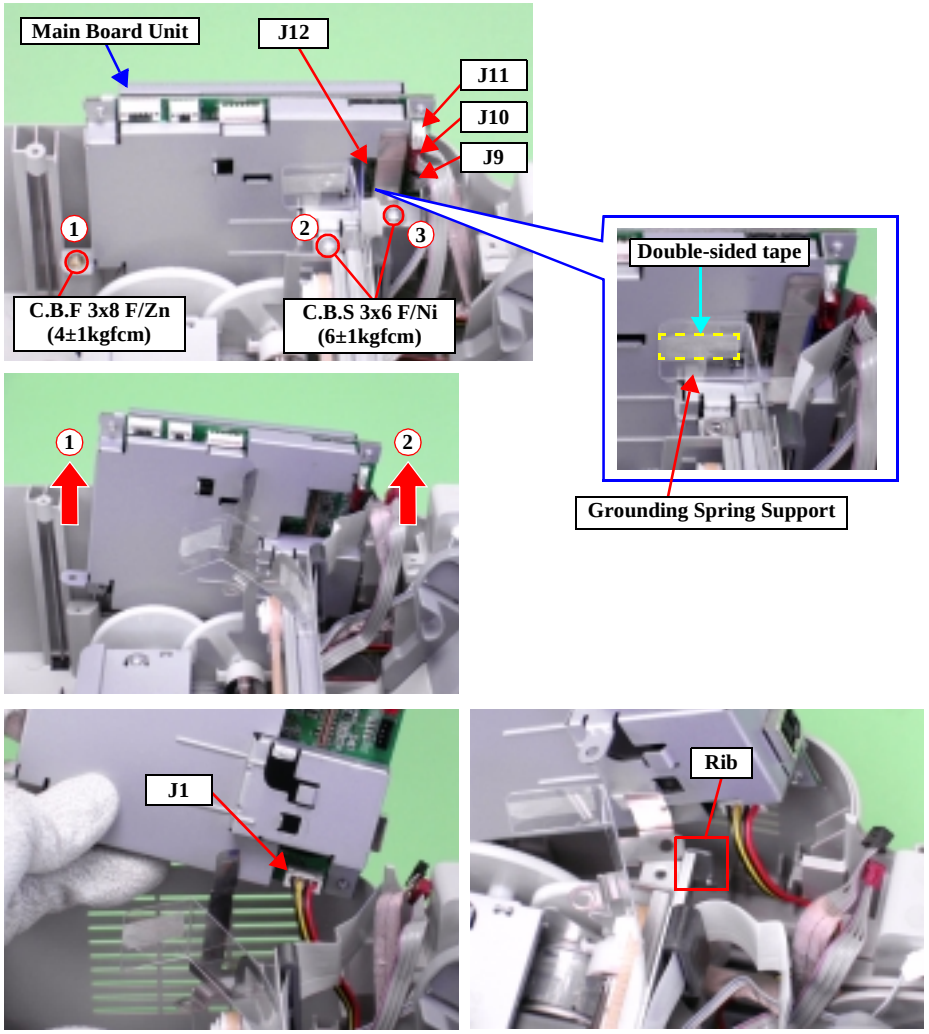


Figure 4-18. Main Board Unit Removal

☐ **Part/Unit that should be removed before removing Main Board Unit.**

Document Cover / Panel Unit / Panel Housing / Scanner Unit / Housing Upper

☐ **Removal procedure**

1. Remove the screws (x3, ○) for securing Main Board Unit.

CAUTION

Do not damage Connector Cables and Head FFC with a screwdriver.

Reassembly

Tighten the screws in order shown in the figure.

2. Disconnect the following Connector Cables and FFC from the connectors of Main Board.
   - J9 : PF Motor Connector Cable
   - J10 : CR Motor Connector Cable
   - J11 : HP/PE Sensor Connector Cable
   - J12 : Head FFC
3. Peel off Grounding Spring Support secured to Main Board Unit by the double-sided tape (x1).
4. Release Main Board Unit from front side of printer, and lift it upwards.

CAUTION

When installing or removing Main Board Unit, do not damage cables on the ribs of Grounding Spring Support and Main Frame.

5. Disconnect PS Connector Cable from connector (J1) of Main Board, and then remove Main Board Unit.

Reassembly

Insert the rib (x1,) of Main Board Unit into Main Frame, and let it ride on the rib (x1,) of Main Frame.

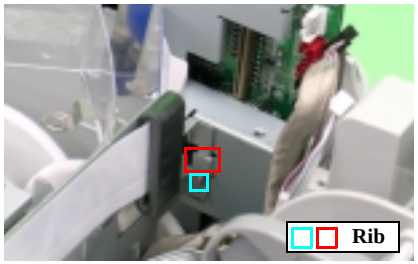


Figure 4-19. Installation of Main Board Unit

ADJUSTMENT REQUIRED

When having replaced Main Board Unit, implement the adjustment in the following order. (Refer to Chapter 5 "ADJUSTMENT")

- **[When possible to read data from the old board]**
  1. **EEPROM parameter back up**
- **[When impossible to read from the old board]**
  1. **EEPROM initial setting**
  2. **Protection counter reset**
  3. **Head ID input**
  4. **Top margin adjustment**
  5. **Bi-D adjustment**
  6. **USB ID input**

4.3.8 Housing Middle

☐ **External View**

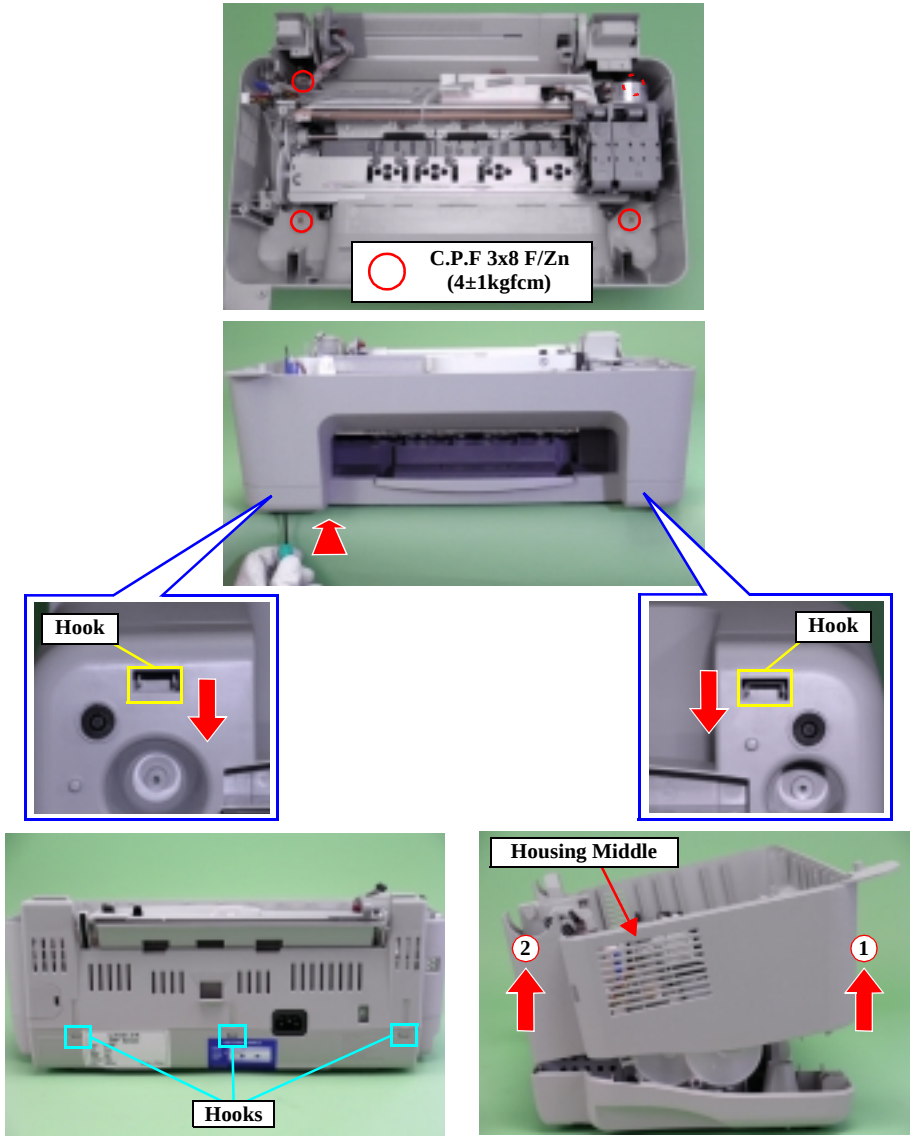


Figure 4-20. Housing Middle Removal

☐ **Part/Unit that should be removed before removing Housing Middle.**

Document Cover / Panel Unit / Panel Housing / Scanner Unit / Housing Upper / Main Board Unit

☐ **Removal procedure**

1. Remove the screws (x4, ○) for securing Housing Middle.
2. Release the front side hooks (x2, □) for securing Housing Middle by using a flat-blade screwdriver, and then lift slightly.

CAUTION

Do not attempt to lift and tilt the printer when the front side hooks (x2, □) are removed.

3. Release the rear side hooks (x3, □) for securing Housing Middle by using a flat-blade screwdriver.
4. Release Housing Middle in the order as shown in the figure.

CAUTION

Do not damage teeth of EJ Roller left side gear on Housing Middle.

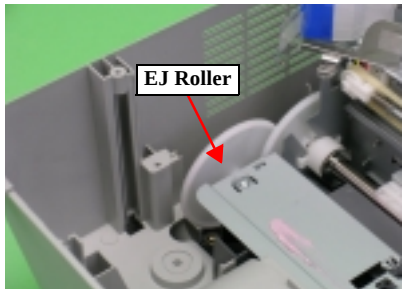


Figure 4-21. Gear of EJ Roller

4.3.9 ASF Unit

☐ **External View (1)**

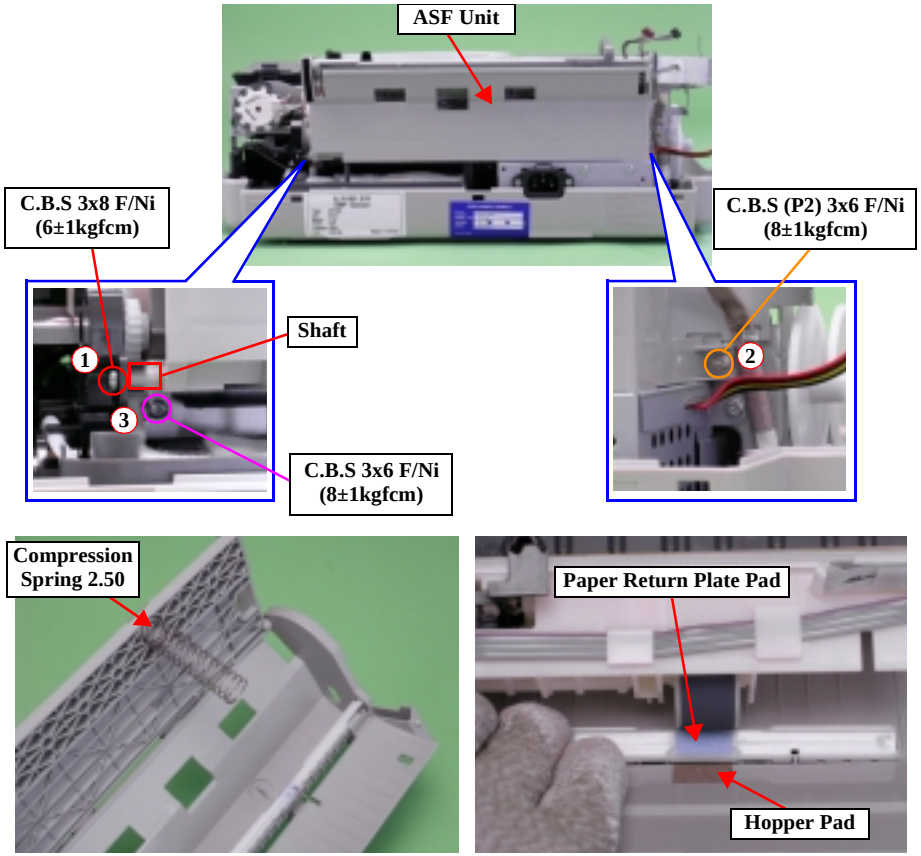


Figure 4-22. ASF Unit Removal (1)

☐ **Part/Unit that should be removed before removing ASF Unit.**

Document Cover / Panel Unit / Panel Housing / Scanner Unit / Housing Upper / Main Board Unit / Housing Middle

☐ **Removal procedure**

CAUTION

Do not touch Hopper Pad and Paper Return Plate Pad.

1. Remove the screws (x3, ○○○) for securing ASF Unit, and then remove ASF Unit from Printer Mechanism.

Reassembly

- **Install ASF Unit while pressing by hand on Paper Return Plate.**
- **Align the positioning hole (x1) of Main Frame with the dowel (x1, □) of ASF Unit.**

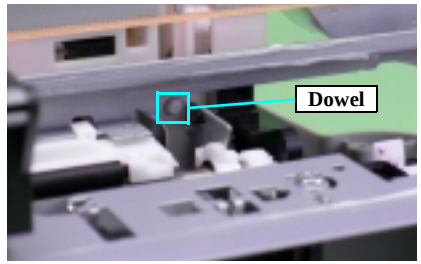


Figure 4-23. Installation of ASF Unit

- **Insert the shaft of ASF Unit into the slot of Ink System Unit.**
- **Tighten the screws in the order as shown in the figure.**

2. Open Hopper, and then remove Compression Spring 2.50.

☐ **External View (2)**

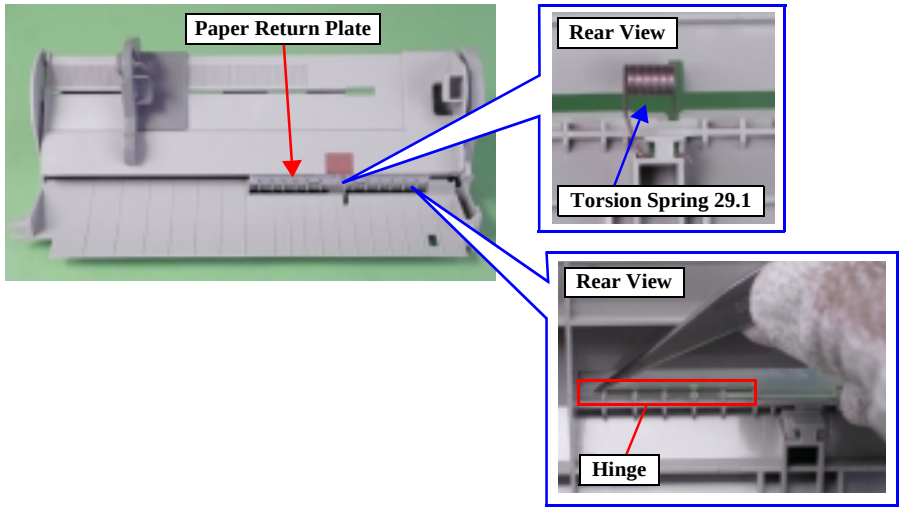


Figure 4-24. ASF Unit Removal (2)

3. Remove Torsion Spring 29.1 from ASF Frame and Paper Return Plate by using tweezers.
4. Remove the hinge of Paper Return Plate by using tweezers, and then remove Paper Return Plate.

Reassembly

Confirm that Paper Return Plate operates smoothly.

ADJUSTMENT REQUIRED

When having removed or replaced ASF Unit, implement the following adjustment. (Refer to Chapter 5 "ADJUSTMENT")

- **Top margin adjustment**

4.3.10 Housing Lower (Outer)

☐ **External View**

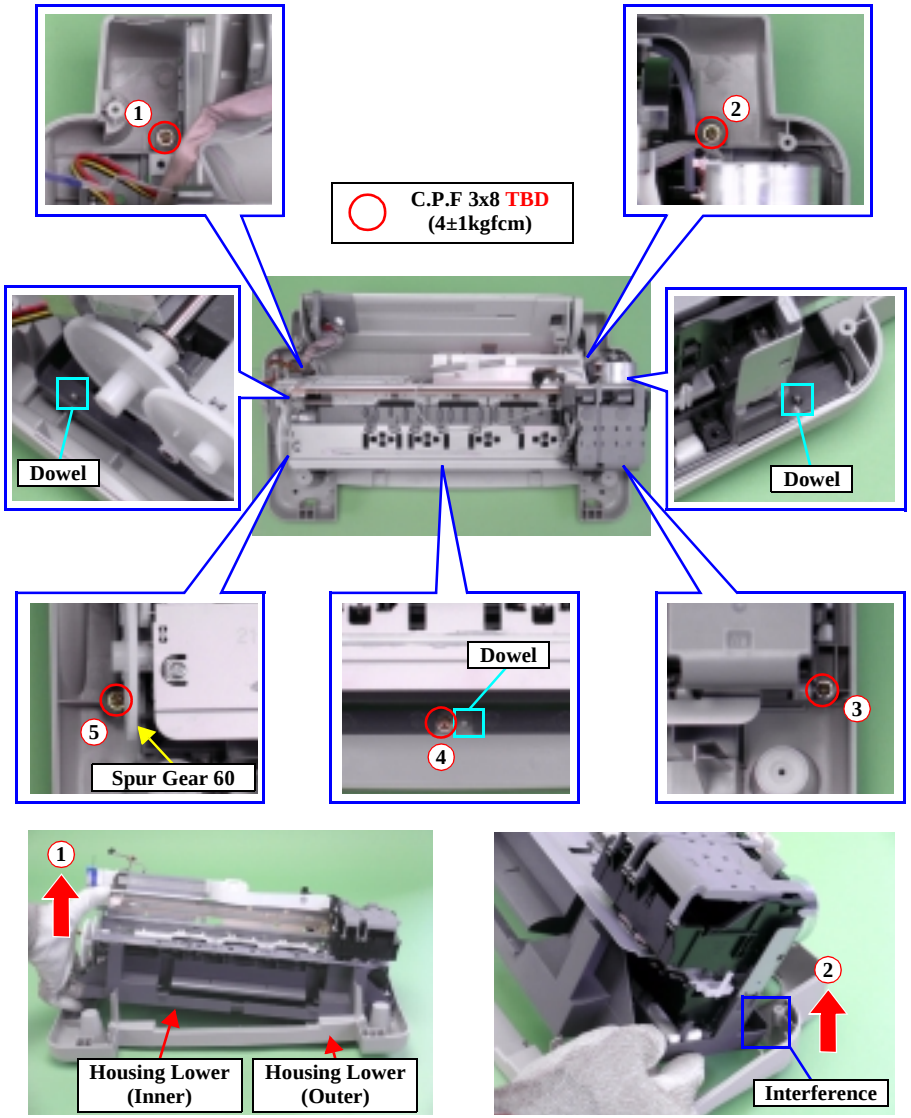


Figure 4-25. Housing Lower (Outer) Removal

☐ **Part/Unit that should be removed before removing Housing Lower (Outer).**

Document Cover / Stacker / Panel Unit / Panel Housing / Scanner Unit / Housing Upper / Main Board Unit / Housing Middle

☐ **Removal procedure**

1. Remove the screws (x5, ○) for securing Housing Lower (Outer).

Reassembly

Tighten the screws in order as shown in the figure.

2. As shown in the steps of the figure, lift Housing Lower (Inner) together with the Printer Mechanism while avoiding interference at the right rear side, and separate Housing Lower (Outer).

CAUTION

Do not damage Spur Gear 60 of EJ Roller when removing/installing the screw (5).

Reassembly

Align the positioning holes (x3) of Housing Lower (Inner) with the dowels (x3, □) of Housing Lower (Outer).

4.3.11 PS Board Unit

☐ **External View**

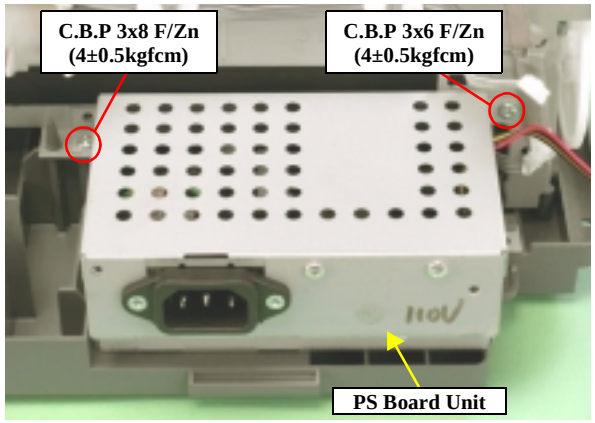


Figure 4-26. PS Board Unit Removal

☐ **Part/Unit that should be removed before removing PS Board Unit.**

Document Cover / Panel Unit / Panel Housing / Scanner Unit / Housing Upper / Main Board Unit / Housing Middle / Housing Lower (Outer) / ASF unit

☐ **Removal procedure**

1. Remove the screws (x2, ○) for securing PS Board Unit.
2. Remove PS Board Unit by sliding it in the rearward direction.

Reassembly

Confirm that PS Board Unit is fastened to the hook of Housing Lower (Inner).

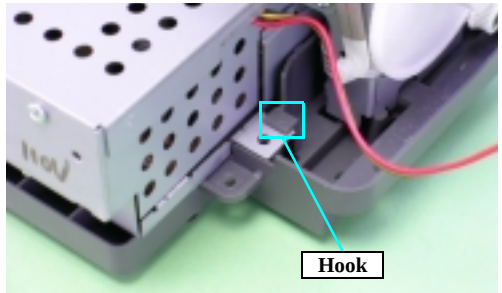


Figure 4-27. Installation of PS Board Unit

4.3.12 Front Frame

☐ **External View**

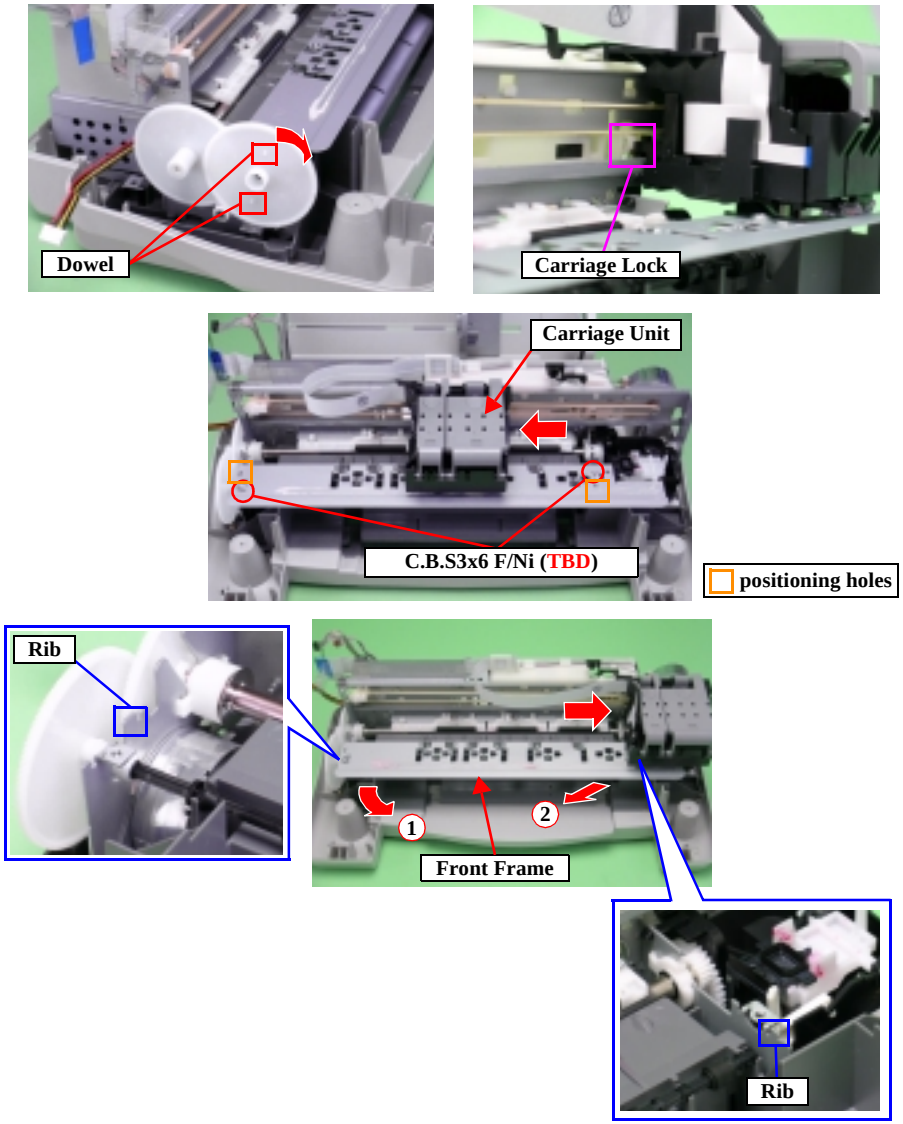


Figure 4-28. Front Frame Removal

☐ **Part/Unit that should be removed before removing Front Frame.**

Document Cover / Panel Unit / Panel Housing / Scanner Unit / Housing Upper / Main Board Unit / Housing Middle

☐ **Removal procedure**

1. Pinch the dowel of EJ Roller's gear, turn it clockwise and release Carriage Lock.
2. Slide Carriage Unit to the center of the printer.
3. Remove the screws (x2, ○) for securing Front Frame.
4. Return Carriage Unit to the home position, and remove Front Frame.

Reassembly

Align the positioning holes (x2, ☐) of Front Frame with the ribs (x2, ☐) of Main Frame.

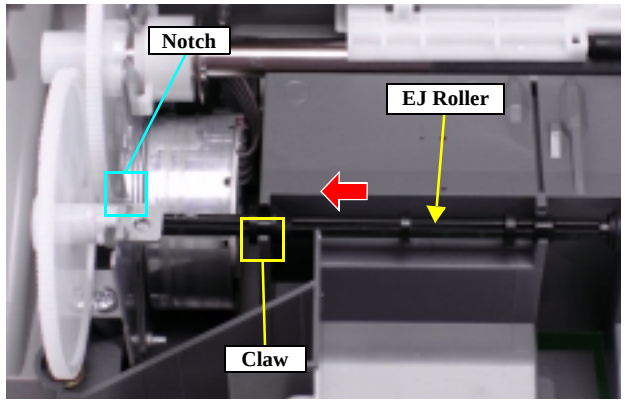
ADJUSTMENT REQUIRED

After replacing Front Frame with a new one, always apply oil G-58 to the specified portions.

■ **Refer to Chapter 6, Figure 6-11 *(p.120)***

4.3.13 EJ Roller

☐ **External View**



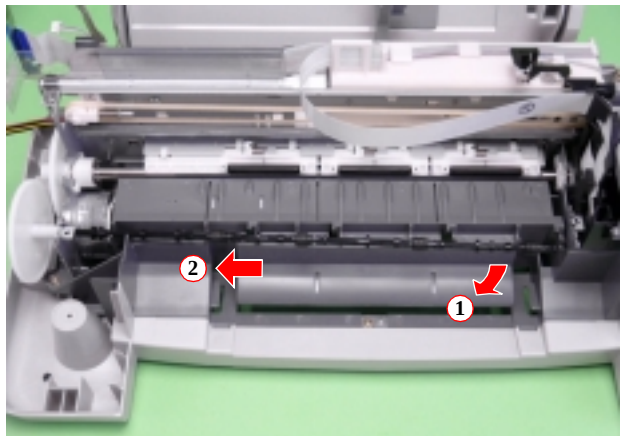


Figure 4-29. EJ Roller Removal

☐ **Part/Unit that should be removed before removing EJ Roller.**

Document Cover / Panel Unit / Panel Housing / Scanner Unit / Housing Upper / Main Board Unit / Housing Middle / Front Frame

☐ **Removal procedure**

1. Slide EJ Roller to the left side, then remove the claw extending from Housing Lower (Inner).
2. Lift left side of EJ Roller, and then remove EJ Roller along notch in left side of Main Frame.

CAUTION

If the EJ Roller's gear and EJ Roller Shaft are removed, make sure that neither of EJ Roller Shaft hooks is damaged.
If either of the hooks is damaged, it should be replaced with a new one.

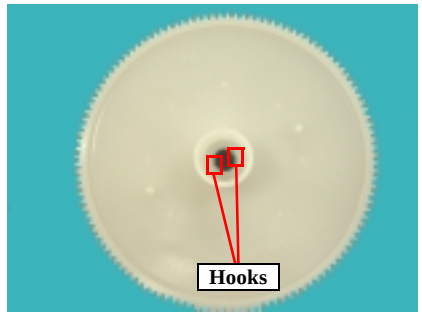


Figure 4-30. Hook of EJ Roller

ADJUSTMENT REQUIRED

After replacing EJ Roller with a new one, always apply oil G-58 to the specified portions.

■ **Refer to Chapter 6, Figure 6-13 *(p.120)***

4.3.14 CR Motor

☐ **External View**

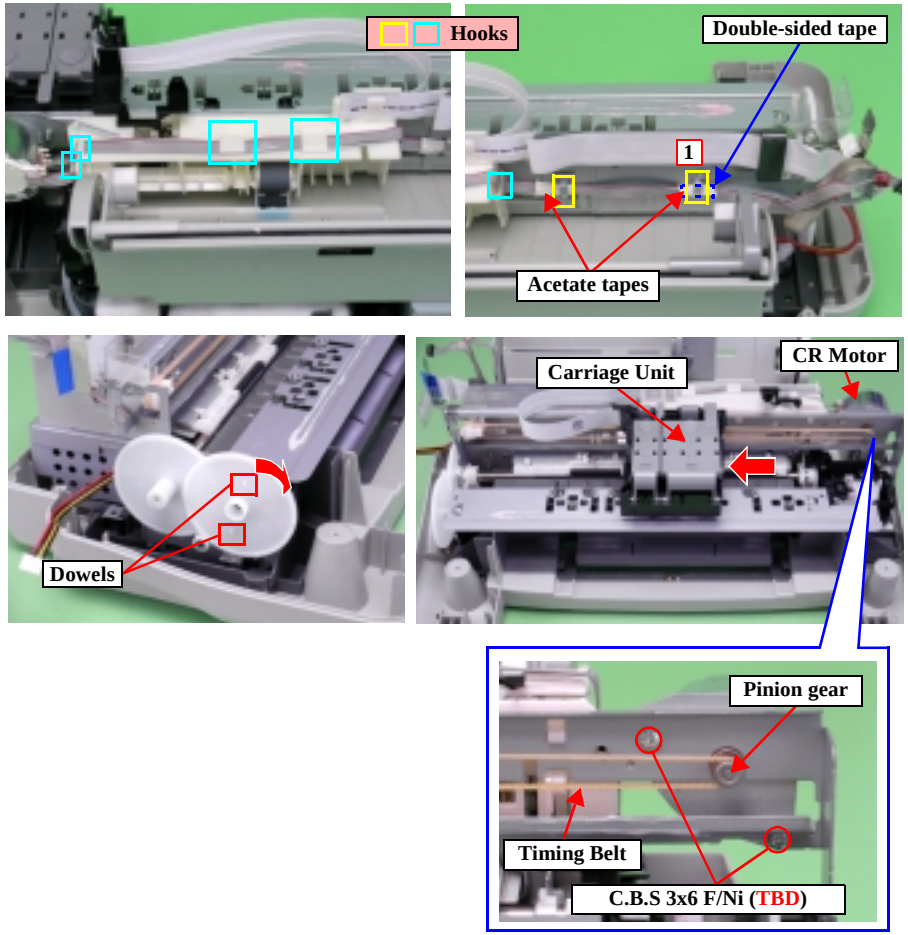


Figure 4-31. CR Motor Removal

☐ Part/Unit that should be removed before removing CR Motor.

Document Cover / Panel Unit/ Panel Housing / Scanner Unit / Housing Upper / Main Board Unit / Housing middle

☐ **Removal procedure**

1. Release CR Motor Connector Cable from the hooks (x2,) of Main Frame and the hooks (x5,) of Holder Shaft Unit.

CAUTION

The CR Motor Connector Cable is secured to the hook 1 position by double-sided tape, so use care not to damage it when removing it.

2. Peel off the acetate tapes (x2) for securing CR Motor Connector Cable and HP/PE Sensor Connector Cable.

Reassembly

To protect the cable, reattach acetate tape at the original position.

3. Pinch the dowel of EJ Roller's gear, turn it clockwise and release Carriage Lock.
4. Slide Carriage Unit to the center of the printer.
5. Remove the screws (x2,) for securing CR Motor, and then remove CR Motor from Main frame.
6. Remove Timing Belt from the pinion gear of CR Motor, and then remove CR Motor.

CAUTION

- **Do not damage the pinion gear of CR Motor.**
- **Do not remove the screw below, fixing Driven Pulley. Because, the screw has been fixed in the static temperature condition. If removed, the Bi-D will be changed in wide temperature range.**

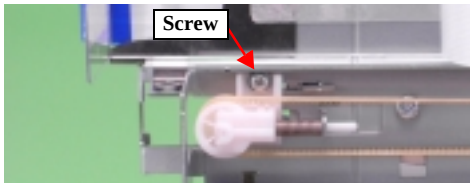


Figure 4-32. Screw of Driven Pulley

StyluC4x のマニュアルにこの記載がありますが、このネジ締め箇所は温度によって変化するのでしょうか？

Reassembly

When reassembling CR Motor, it contacts the dowel of Main Frame after turning clockwise.

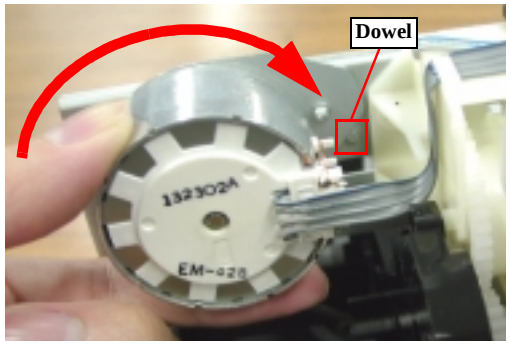
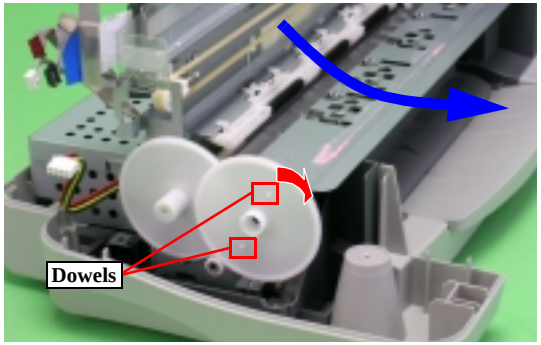


Figure 4-33. Installation of CR Motor

4.3.15 Paper Guide Upper

☐ **External View**



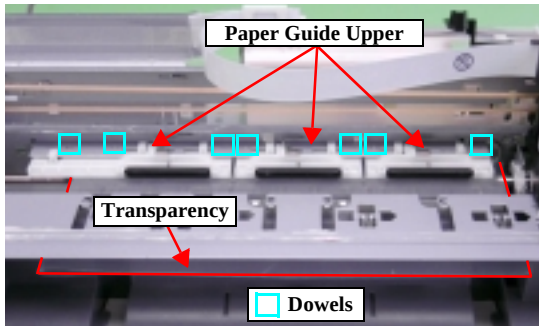


Figure 4-34. Paper Guide Upper Removal

☐ **Part/Unit that should be removed before removing Paper Guide Upper.**

Document Cover / Panel Unit / Panel Housing / Scanner Unit / Housing Upper / Main Board Unit / Housing Middle / ASF Unit

☐ **Removal procedure**

CAUTION

Perform this operation by the following procedures so that the coating material of PF Roller does not damage.

1. Place the transparency between Paper Guide Upper and PF Roller by rotating the protrusion of EJ Roller's gear in clockwise direction.
2. Push the dowels (x2 or 3 each, ☐) for securing Paper Guide Upper (x3) by using tweezers, and then pull Paper Guide Upper (x3) along with Torsion Spring 48.51 (1 each) from Main Frame.

Reassembly

Reassembly of Paper Guide Upper

1. **Insert the tip of Torsion Spring 48.51 to Paper Guide Upper.**

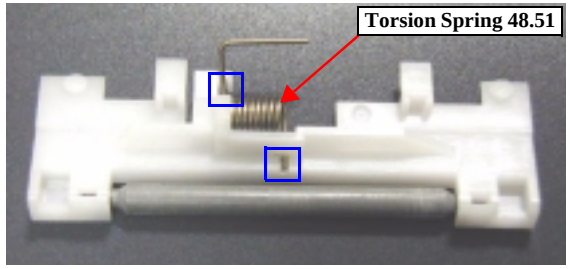


Figure 4-35. Installation of Paper Guide Upper (1)

2. **Place the transparency on PF Roller.**

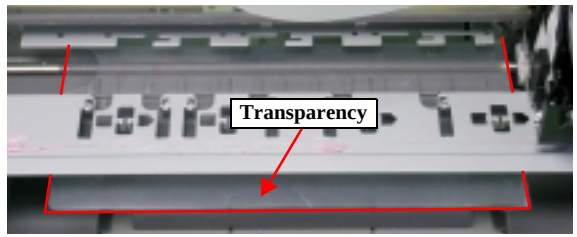


Figure 4-36. Installation of Paper Guide Upper (2)

Reassembly

3. Assemble Paper Guide Upper to the Main Frame.

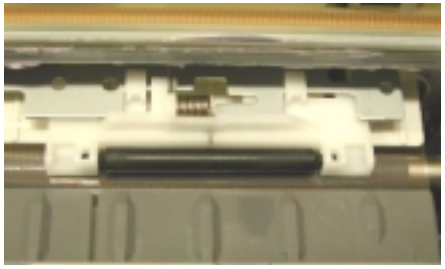


Figure 4-37. Installation of Paper Guide Upper (3)

4. Fix the dowels (x2, □) of Paper Guide Upper to the holes (x2) of Main Frame by sliding Paper Guide Upper to the right side.

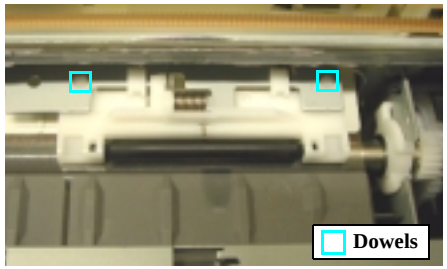


Figure 4-38. Installation of Paper Guide Upper (4)

5. Release Torsion Spring 48.51 from the hook of Paper Guide Upper.

Figure 4-39. Installation of Paper Guide Upper (5)

Reassembly

6. Eject the transparency from the printer by rotating the dowels of EJ Roller's gear in clockwise direction.

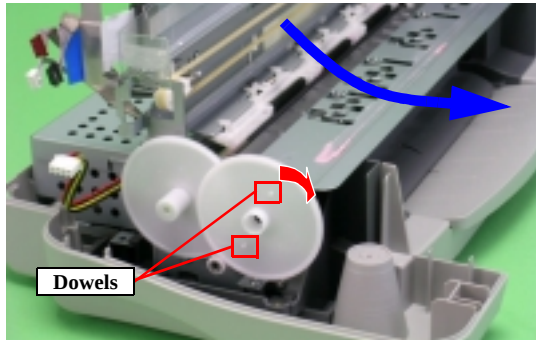


Figure 4-40. Installation of Paper Guide Upper (6)

4.3.16 Holder Shaft Unit

☐ **External View (1)**

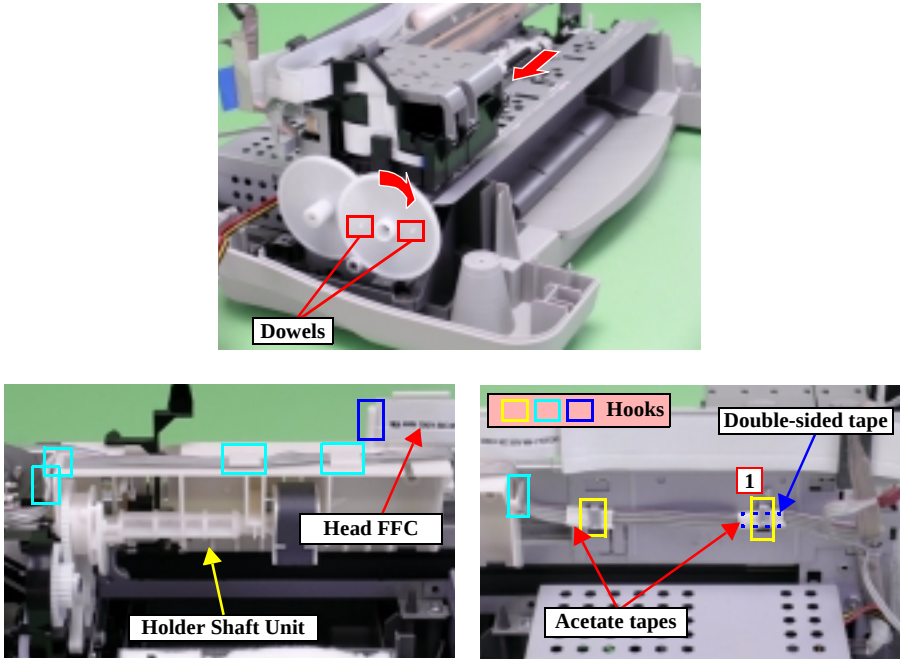


Figure 4-41. Holder Shaft Unit Removal (1)

☐ **Part/Unit that should be removed before removing Holder Shaft Unit.**

Document Cover / Panel Unit / Panel Housing / Scanner Unit / Housing Upper / Main Board Unit / Housing Middle / ASF Unit

☐ **Removal procedure**

1. Pinch the dowel of EJ Roller's gear, turn it clockwise and release Carriage Lock.
2. Slide Carriage Unit to the left side of the printer.
3. Release CR Motor Connector Cable from the hooks (x2, ☐) of Main Frame and the hooks (x5, ☐) of Holder Shaft Unit.

CAUTION

The CR Motor Connector Cable is secured to the hook 1 position by double-sided tape, so use care not to damage it when removing it.

4. Peel off the acetate tapes (x2) for securing CR Motor Connector Cable and HP/PE Sensor Connector Cable.

Reassembly

To protect the cable, reattach acetate tape at the original position.

5. Release Head FFC from the hook (x1, ☐) of Holder Shaft Unit.

☐ **External View (2)**

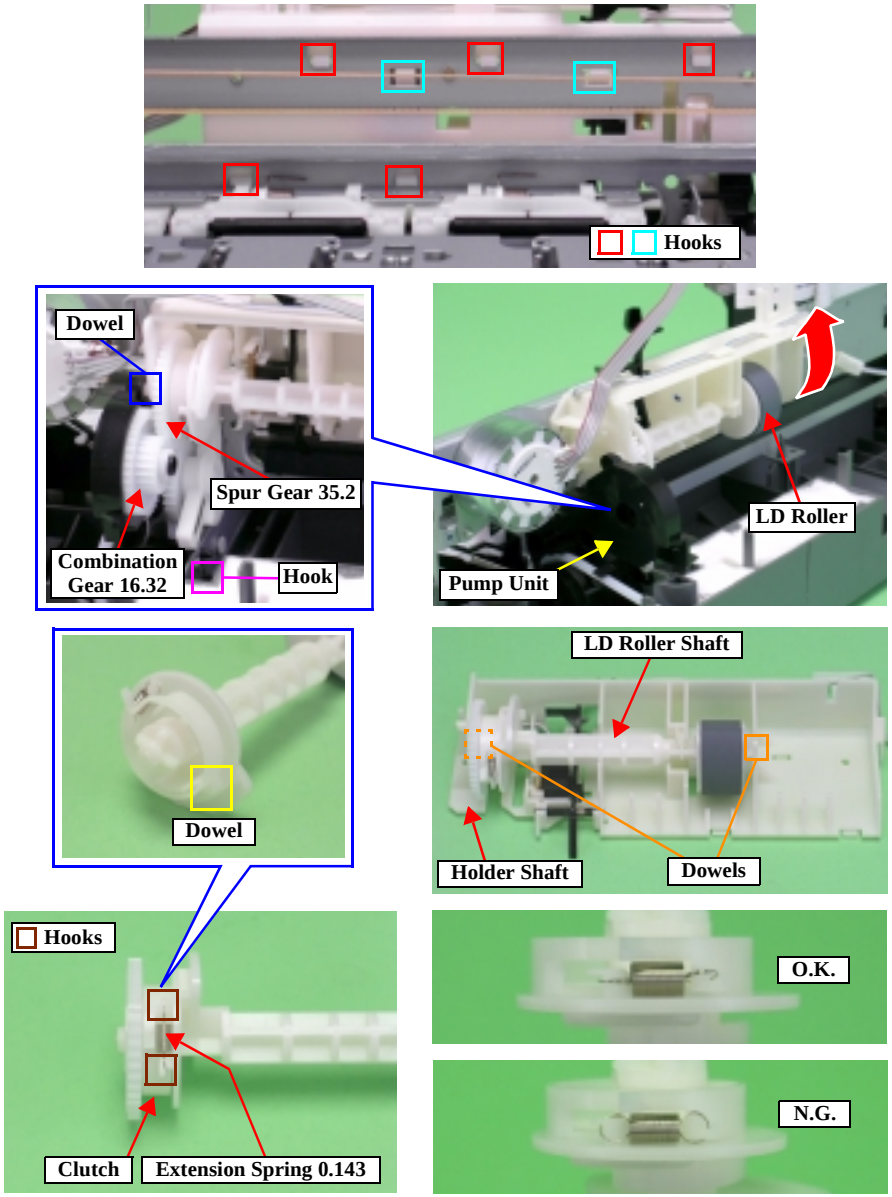


Figure 4-42. Holder Shaft Unit Removal (2)

6. Push the hooks (x2, ☐) of Holder Shaft Unit, and then pull Holder Shaft Unit upward slightly from Main Frame.
7. Move Pump Unit to the right side slightly while holding the whole of Holder Shaft Unit, and then pull the bottom of Holder Shaft Unit toward the backside of the printer.

CAUTION

- **Damage may occur by placing a load on the lower side hook (x1, ☐) of Pump Frame if Pump Frame is spread too wide.**
- **Do not touch LD Roller.**
- **Do not allow damage to gear surface of Spur Gear 35.2 and Combination Gear 16.32.**

Reassembly

- **Engage gear surfaces of Spur Gear 35.2 and Combination Gear 16.32.**
- **Align the positioning hole (x1) of Ink System Unit with the dowel (x1, ☐) of Holder Shaft Unit.**
- **Secure Holder Shaft Unit with the hooks (x7, ☐☐).**

8. Remove LD Roller Shaft along with Clutch mechanism from Holder Shaft.

Reassembly

Align the positioning hole (x2) of Holder Shaft with the dowel (x2, ☐) of LD Roller Shaft.

9. Remove Spur Gear 35.2 from LD Roller Shaft.

Reassembly

Confirm that Clutch mechanism operates smoothly.

10. Remove Extension Spring 0.143 from the hooks (x2, ☐) of Clutch, and remove Clutch from LD Roller Shaft.

Reassembly

- **Align the positioning hole (x1) of Clutch with the dowel (x1, ☐) of LD Roller Shaft.**
- **Install Extension Spring 0.143 in the correct condition as shown in the figure.**

☐ **External View (3)**

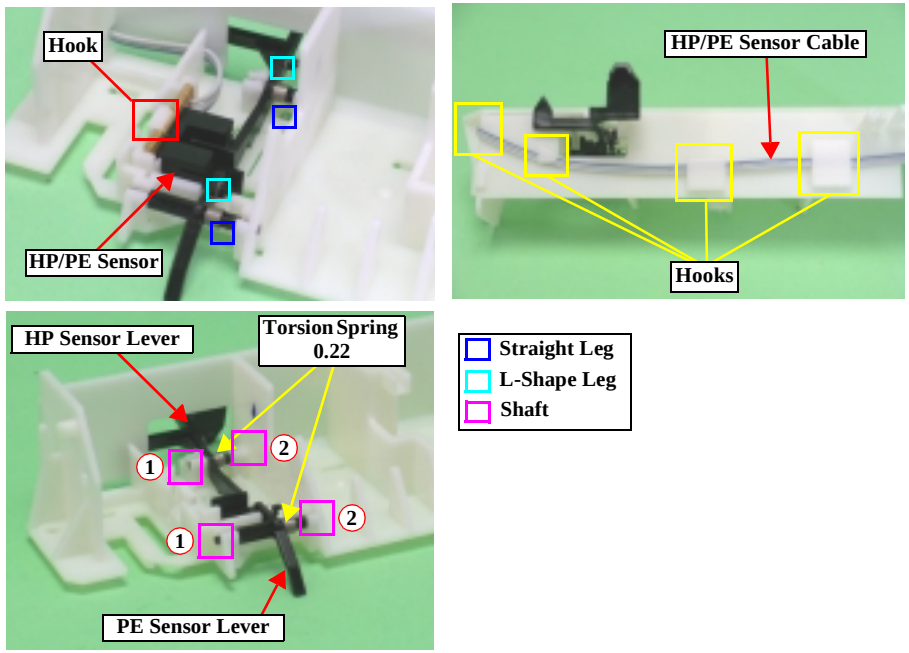


Figure 4-43. Holder Shaft Unit Removal (3)

11. Release HP/PE Sensor Connector Cable from the hooks (x4, ☐) of Holder Shaft.

Reassembly

Make sure to place HP/PE Sensor Connector Cable to the suitable groove on LD Roller Shaft Holder.

12. Release the hook (x1, ☐) for securing HP/PE Sensor, and then remove HP/PE Sensor from Holder Shaft.
13. Following the order shown in the figure, remove shaft of HP Sensor Lever / PE Sensor Lever from Holder Shaft, and then remove HP Sensor Lever / PE Sensor Lever and Torsion Spring 0.22.
14. Remove Torsion Spring 0.22 from PE Sensor Lever.

Reassembly

- **Fasten L-shaped leg of Torsion Spring 0.22 to indentation of HP Sensor Lever / PE Sensor Lever, and fasten straight leg to Holder Shaft.**
- **Confirm that PE Sensor Lever operates smoothly.**

ADJUSTMENT REQUIRED

When having removed or replaced Holder Shaft Unit, implement the following adjustment. (Refer to Chapter 5 "ADJUSTMENT")

- **Top margin adjustment**

4.3.17 Print Head

☐ **External View (1)**

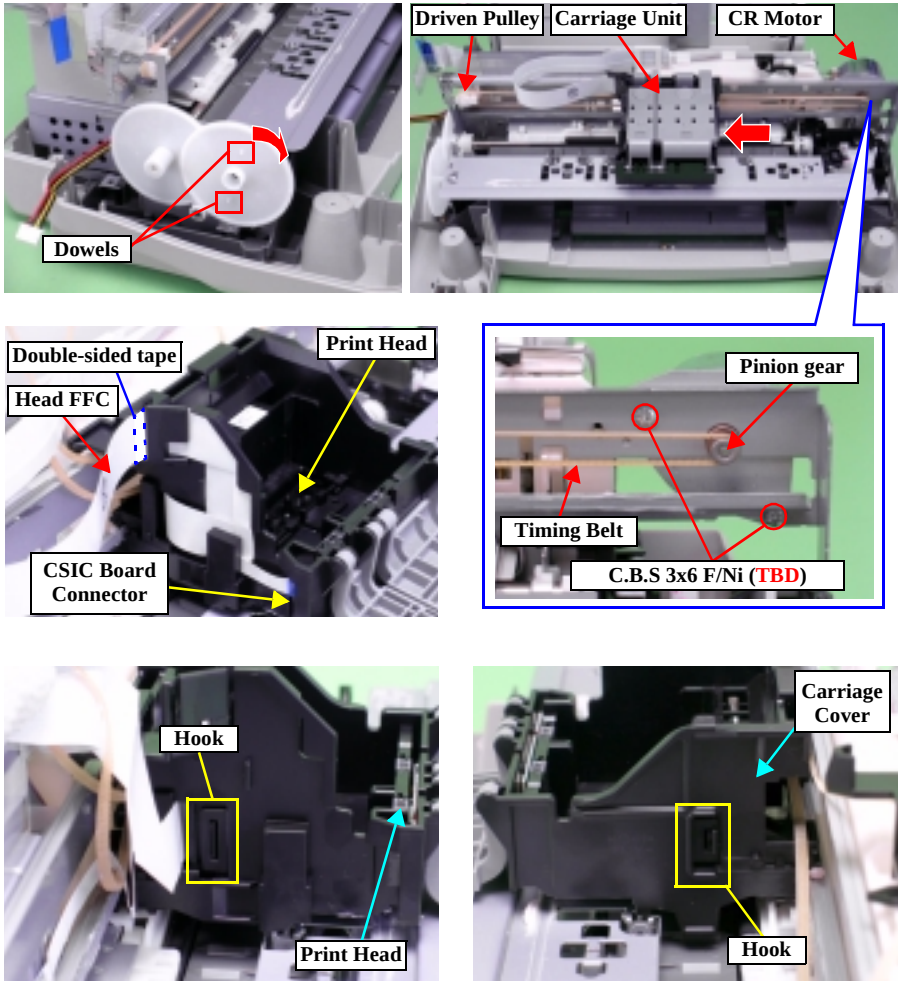


Figure 4-44. Print Head Removal (1)

☐ **Part/Unit that should be removed before removing Print Head.**

Document Cover / Panel Unit / Panel Housing / Scanner Unit / Housing Upper / Main Board Unit / Housing Middle

☐ **Removal procedure**

1. Remove all Ink Cartridges from Carriage Unit.
2. Pinch the dowel of EJ Roller's gear, turn it clockwise and release Carriage Lock.
3. Slide Carriage Unit to the center of the printer.
4. Loosen the screws (x2, ○) for securing CR Motor, and then remove Timing Belt from pinion gear of CR Motor and Driven Pulley.

When reassembling the CR Motor, it contacts the dowel of Main Frame after turning clockwise.

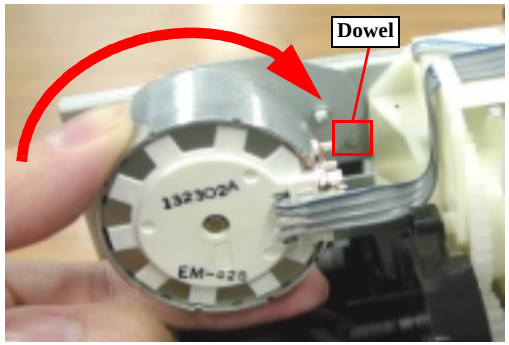
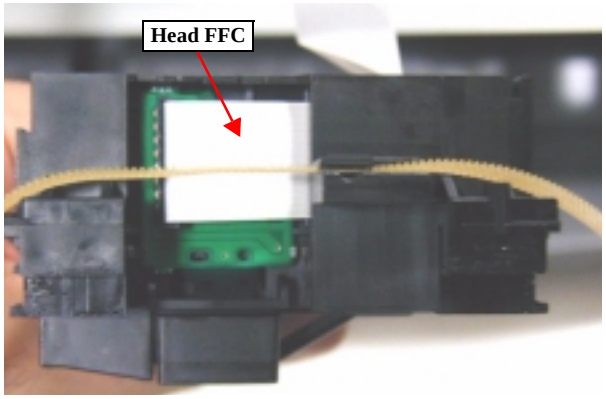


Figure 4-45. Installation of CR Motor

5. Release Head FFC form the fixing points of Carriage Unit and disconnect Head FFC from connector of CSIC Board on Carriage Unit.
6. Release the hook (x2, □), fixing between Print Head and Carriage Cover, on the both sides of Carriage Unit, and then pull the unit forward and remove the cover.
7. Lift Print Head up and remove it.

☐ External View (2)



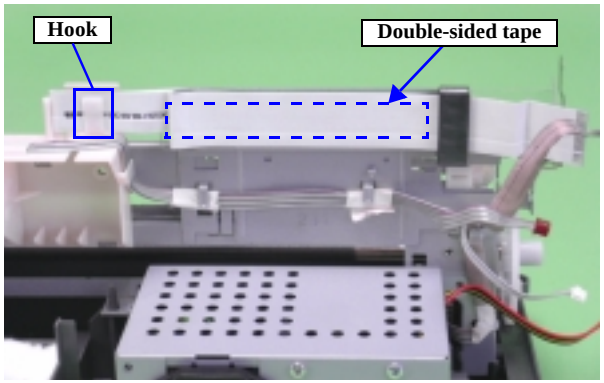
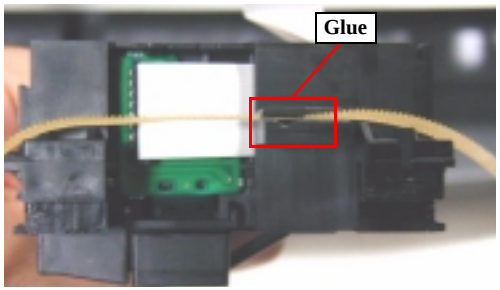


Figure 4-46. Print Head Removal (2)

8. Disconnect Head FFC from the connector of CSIC Board.
9. Peel off Head FFC secured to the hook (x1, ☐) of Holder Shaft Unit and Main Frame by the double-sided tape.

Reassembly

- **If Carriage Unit is disassembled or replaced with a new one, make sure that Timing Belt is set in the assembling groove correctly as following figure.**
- **Apply THREE BOND 1401 (Part Code:1091654) to the Timing Belt insertion part after inserting Timing Belt.**



ADJUSTMENT REQUIRED

After replacing Holder IC with a new one, always apply oil G-58 to the specified portions.

- **Refer to Chapter 6, Figure 6-12 *(p.120)***

ADJUSTMENT REQUIRED

- **When having replaced Print Head, implement the adjustment in the following order. (Refer to Chapter 5 "ADJUSTMENT")**
  1. **Initial ink charge**
  2. **Head ID input**
  3. **Bi-D adjustment**
- **When having removed and reinstalled Print Head, implement only the following adjustment.**
  1. **Head cleaning**
  2. **Bi-D adjustment**

4.3.18 Waste Ink Pads

☐ **External View**

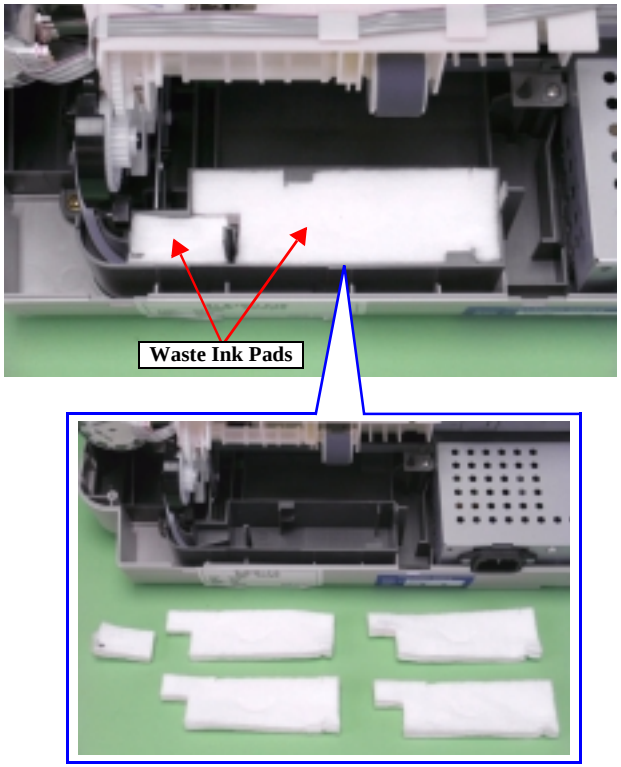


Figure 4-47. Waste Ink Pads Removal

☐ **Part/Unit that should be removed before removing Waste Ink Pads.**

Document Cover / Panel Unit / Panel Housing / Scanner Unit / Housing Upper / Main Board Unit / Housing Middle / ASF Unit

☐ **Removal procedure**

1. Remove Waste Ink Pads (x4) and Tube Stopper.

Reassembly

When assembling Waste Ink Pads, be sure to set the tip of Ink Tube in the correct position of Housing Lower (Inner). Otherwise it will cause ink leakage.

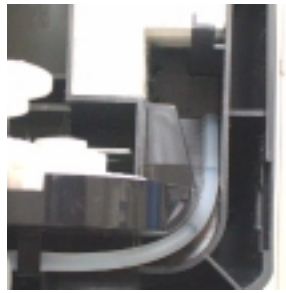


Figure 4-48. Tip of Ink Tube setting position

ADJUSTMENT REQUIRED

When having replaced Waste Ink Pads, implement the following adjustment. (Refer to Chapter 5 "ADJUSTMENT")

- **Protection counter reset**

4.3.19 Housing Lower (Inner)

☐ **External View**

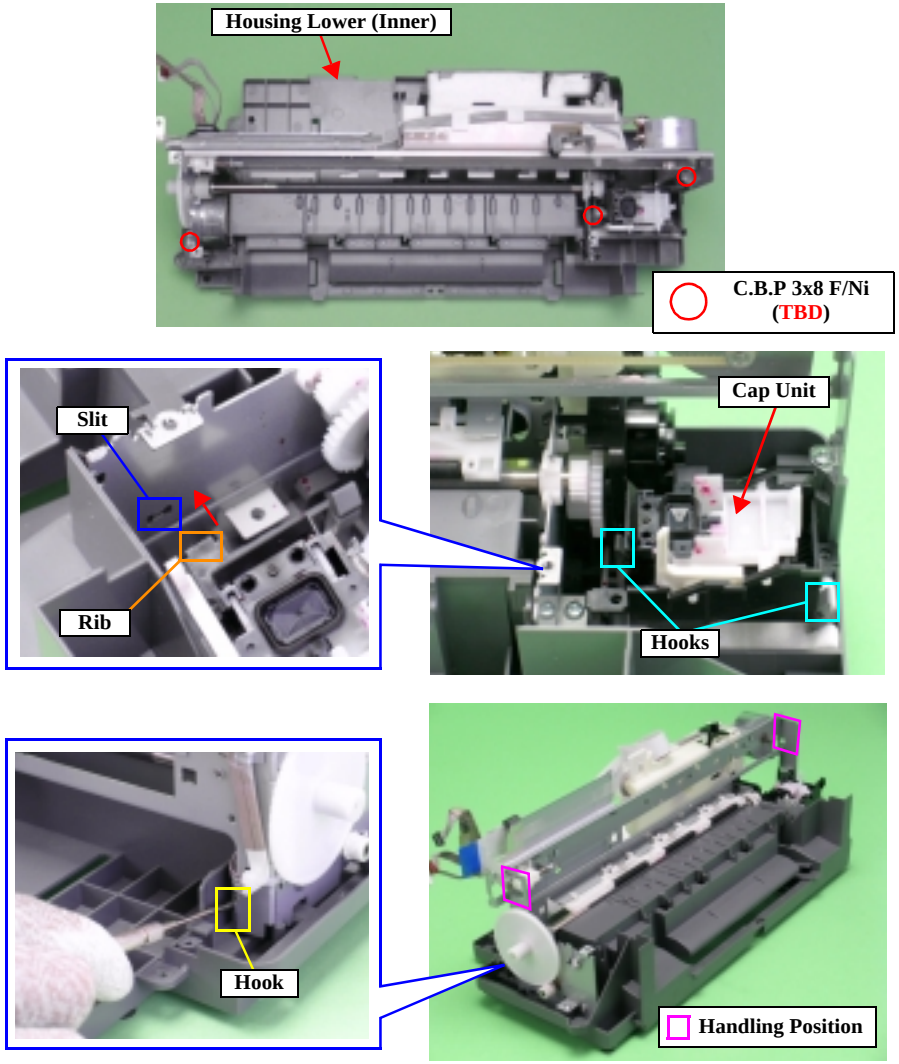


Figure 4-49. Housing Lower (Inner) Removal

☐ **Part/Unit that should be removed before removing Housing Lower (Inner).**

Document Cover / Stacker / Panel Unit / Panel Housing / Scanner Unit / Housing Upper / Main Board Unit / Housing Middle / Housing Lower (Outer) / ASF Unit / PS Board Unit

☐ **Removal procedure**

1. Remove the screws (x3, ○) for securing Housing Lower (Inner).
2. Release the hooks (x2, □) for securing Cap Unit, and then insert the rib (x1, □) of Cap Unit into the slit of Main Frame.
3. Release the hook (x1, □) for securing Printer Mechanism by using a flat-blade screwdriver, and then remove Printer Mechanism by lifting upward.

CAUTION

Hold the designated position and lift Printer Mechanism upward when performing the following step in order to prevent warping of Main Frame.

Reassembly

When assembling Housing Lower (Inner), be sure to set the tip of Ink Tube in the correct position of Housing Lower (Inner). Otherwise it will cause ink leakage.

Figure 4-50. Tip of Ink Tube setting position

Reassembly

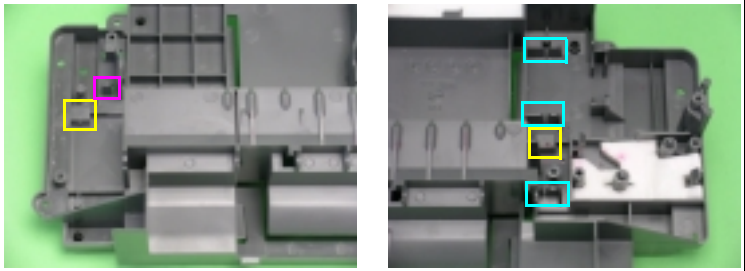
☐ **When assembling Printer mechanism to Housing Lower (Inner),**

■ **On this models, the assembled accuracy of each part composed of Printer mechanism is based on Housing Lower (Inner).**
To ensure the assembled accuracy, you have to control the assembled standard position of main frame against X/Y/Z-axis direction as the following figure.

[X-axis direction]
- **Make sure that main frame is correctly placed on the groove of Housing Lower (Inner).**
- **Make sure that there is no gap between main frame and Housing Lower (Inner).**

[Y-axis direction]
- **Make sure that cut-out portion of main frame is correctly placed on the square protrusion of Housing Lower (Inner).**

[Z-axis direction]
- **Make sure that there is no gap between main frame and Housing Lower (Inner).**
- **Make sure that the left side of Printer mechanism is correctly fixed by one hook.**



Assembled standard position of X-axis direction of main frame

Assembled standard position of Y-axis direction of main frame

Assembled standard position of Z-axis direction of main frame

Figure 4-51. Assembled standard position of main frame

ADJUSTMENT REQUIRED

When having replaced Printer Mechanism, implement the following adjustment. (Refer to Chapter 5 "ADJUSTMENT")
1. **Initial ink charge**
2. **Head ID input**
3. **Top margin adjustment**
4. **Bi-D adjustment**

4.3.20 PF Motor

☐ **External View**

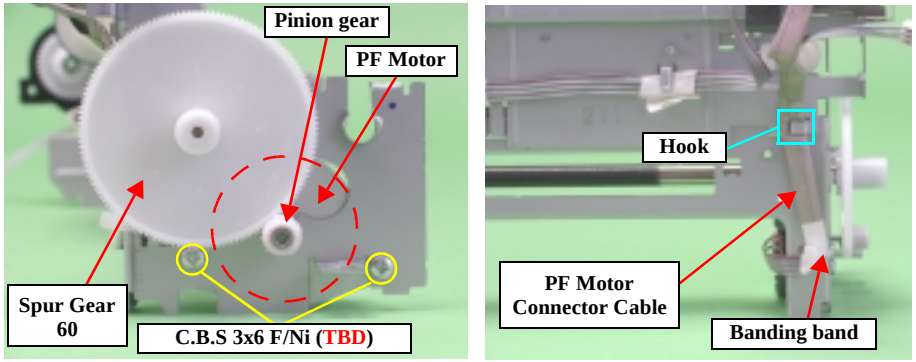


Figure 4-52. PF Motor Removal

☐ **Part/Unit that should be removed before removing PF Motor.**

Document Cover / Stacker / Panel Unit / Panel Housing / Scanner Unit / Housing Upper / Main Board Unit / Housing Middle / Housing Lower (Outer) / ASF Unit / PS Board Unit / Front Frame / EJ Roller / Housing Lower (Inner)

☐ **Removal procedure**

1. Remove the screws (x2, ○) for securing PF Motor.
2. Release the hook (x1, □) for securing PF Motor Connector Cable, and then cut off the banding band.
3. Remove PF Motor from Main Frame.

CAUTION !

Do not damage the following locations.
- **Pinion gear of PF Motor**
- **Spur Gear 60 of PF Roller**

4.3.21 Ink System Unit

☐ **External View**

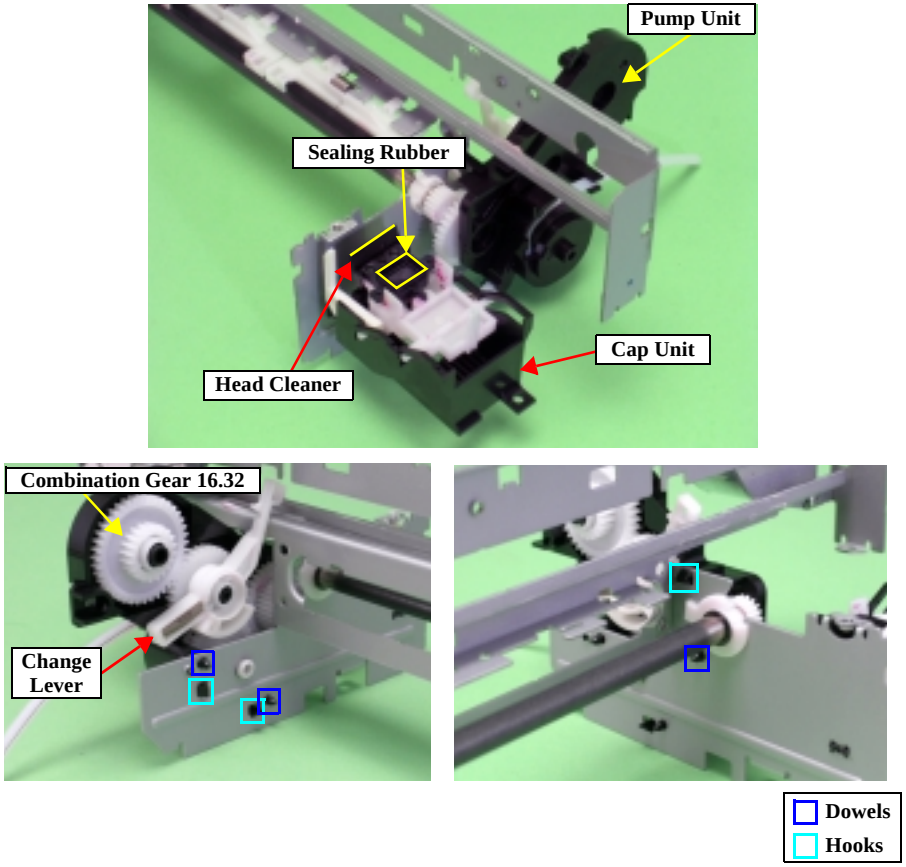


Figure 4-53. Ink System Unit Removal

☐ **Part/Unit that should be removed before removing Ink System Unit.**

Document Cover / Stacker / Panel Unit / Panel Housing / Scanner Unit / Housing Upper / Main Board Unit / Housing Middle / Housing Lower (Outer) / ASF Unit / PS Board Unit / Front Frame / EJ Roller / Housing Lower (Inner)

☐ **Removal procedure**

CAUTION

Do not cause damage by touching Sealing Rubber or Head Cleaner when performing the following steps.

1. Release the hooks (x3, ☐) for securing Pump Unit to Main Frame carefully, and then remove Pump Unit with supporting Change Lever and Combination Gear 16.32 by your finger. (Supporting of Change Lever and gear is to prevent damage by dropping in disassembly.)
2. Remove the whole of Ink System Unit from Printer Mechanism.

Reassembly

- **Align the positioning holes (x3) of Main Frame with the dowels (x3, ☐) of Pump Unit.**
- **Confirm that Cap Unit operates smoothly.**

CHAPTER

5

ADJUSTMENT

5.1 Overview

This section describes the procedure for adjustments required when the printer is disassembled and assembled for repair or service.

5.1.1 Required Adjustment

Table 5-1 lists all the necessary adjustments for this printer. If any service listed in this table is carried out, all adjustments corresponding to that service item should be performed to ensure proper operation of the printer.

Table 5-1. Required Adjustment

Performance Priority	1	2	3	4	5	6	7
Service item / Replacing parts	EEPROM initial setting	Ink pad Counter reset	Initial Ink Charge	Head ID Setting	Top margin Adjustment	Bi-D Adjustment	USB ID Input
Replacing the Main Board Unit	①	②	NA	③	④	⑤	⑥
Removing the Print Head	NA	NA	NA	NA	NA	①	NA
Replacing the Print Head	NA	①	②	③	NA	④	NA
Replacing the Printer Mechanism	NA	NA	①	②	③	④	NA
Replacing the Waste Ink Pad	NA	①	NA	NA	NA	NA	NA
Removing or Replacing the ASF Unit	NA	NA	NA	NA	①	NA	NA
Removing or Replacing the Holder Shaft Unit	NA	NA	NA	NA	①	NA	NA

NOTE 1: *"O" : Required Adjustment. The number in the circle shows the required adjustment order.*

"NA" : Not applicable.

2: *Following adjustments are not required on this product.*

- *Platen Gap adjustment*
- *Head Angular adjustment*

3: *When the Main Board Unit is replaced with new one, you may have to replace the Waste Ink Pad also in case the EEPROM parameter back up function is not available on the defective main board.*

This section describes the detailed procedures of each adjustment by Adjustment Program.

In this printer, it is necessary to set the adjusting information for each printer mechanism in order to maintain consistent printing function and quality, eliminating differences of each printer mechanism's characteristics. Therefore, in case that the combination of the printer mechanism and main board changes or the print head is replaced during the repair service, you must set and save the correct information to the MAIN board, using the exclusive adjustment program.

CHECK POINT

In case any parts is removed and assembled on the repair product while running the Adjustment program, turn off the printer certainly.

5.1.2 Adjustment Program feature

We are now making the Adjustment Program.

5.1.3 Adjustment Except Adjustment Program

Following is adjustment except Adjustment Program.

5.1.4 Timing Belt Tension Adjustment

☐ **Parts to be Removed and Replaced**

- Removal and Replacement of CR Motor
- Removal and Replacement of Print Head

☐ **Adjustment procedure**

1. Make sure that the printer is turned off.
2. Move the Carriage Unit to the right side until the right side of Carriage Unit touches to the flag of Cap Slider (white color).

CAUTION

- **Take care not to push up the Slider Cap of Cap Unit by pushing the Carriage Unit too much.**
- **Place the edge side of HP Sensor Lever as Figure 5-1.**

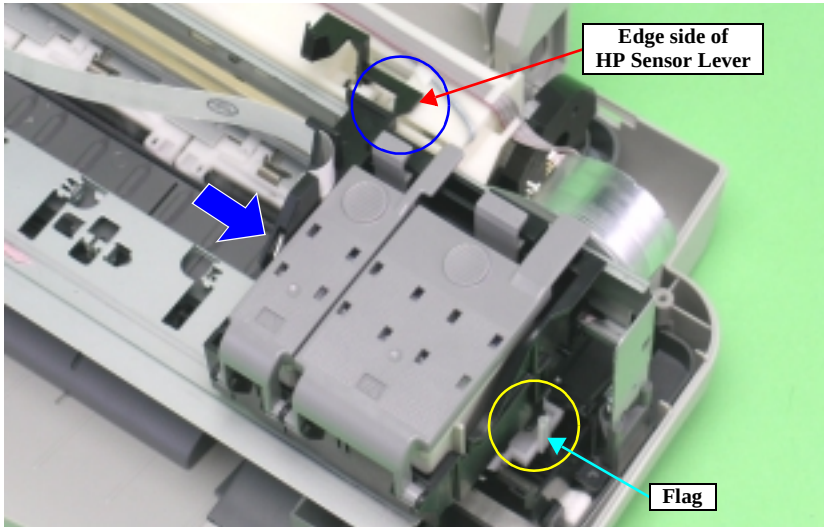


Figure 5-1. Moving the Carriage Unit

3. Press the POWER button of Digital Tension Gauge. (No. 0 or No. 1 will appear in the LCD.)
4. Select the channel for making further settings by pressing the SELECT button for a number from No. 0 ~ No. 9. (Not selecting a number continues default values without a problem.)
5. Press the WEIGHT button. The default value will appear. Enter “0.7g/m” by means of the buttons on the Gauge.
6. Press the WIDTH button. The default value will appear. Enter “3.0mm” by means of the buttons on the Gauge.
7. Press the SPAN button. The default value will appear. Enter “335mm” by means of the buttons on the Gauge.
8. Bend down the sensor cable of Digital Tension Gauge and place it as Figure 5-2.
   - X direction : Above the Timing Belt.
   - Y direction : Match the Gauge position with the hook of Holder Shaft Unit.
   - Z direction : 10±5mm away from the Timeng Belt. (Match the Gauge position with the bending line of Main Frame.)

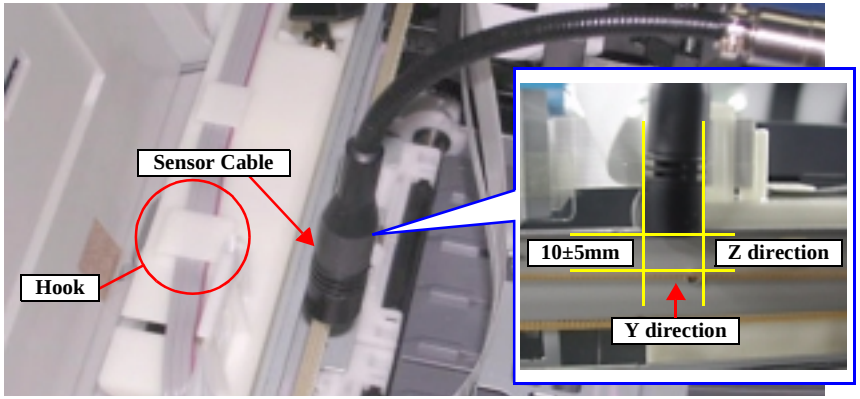


Figure 5-2. Placement position for Digital Tension Gauge

CAUTION

Do not let the Digital Tenshion Gauge contact with the Timing Belt, Head FFC and Main Frame.

9. Press the MEASURE button. ("----" will appear on the LCD.)
10. Flick the upside of Timing Belt with the plastic case of ballpoint pen without ink, head of plastic tweezers, plastic stick. Do not use metal tweezers and hand.

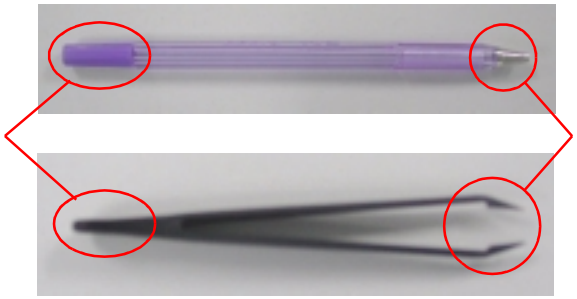


Figure 5-3. Tools

CAUTION

- **Take care not to damage the Timing Belt while flicking it.**
- **If the Timing Belt is damaged by mistake, make sure to repair it.**
- **Flick only upside of the Timing Belt. Do not flick the other side.**
- **Do not flick the Timing Belt to measure while it is vibrating.**
- **While measuring the tension, be as silently as possible.**

11. The "----" on the LCD will undulate when the Timing Belt is flicked with the plastic tool. Then a high-pitched beep will sound and the result of the measurement will be displayed on the LCD in terms of "N" (newton). This Digital Tension Gauge can pick up the tone accurately regardless of the force applied to the Timing Belt.
    - Standard Value: 6.5 to 9N

12. Change the number of measurement times according to the table below.

Table 5-2. Checklist for Measurement Results

Pattern	1 time	2 times	3 times	Result
1	7 to 9N	—	—	OK (total 3 times)
2	6.5 to 7N	6.5 to 9N	—	OK (total 3 times)
3	6.5 to 7N	Out Of Standard	6.5 to 9N	OK (total 3 times)
4	6.5 to 7N	Out Of Standard	Out Of Standard	NG Repair
5	Out Of Standard	6.5 to 9N	6.5 to 9N	OK (total 3 times)
6	Out Of Standard	6.5 to 9N	Out Of Standard	NG Repair
7	Out Of Standard	Out Of Standard	Out Of Standard	NG Repair

☐ **[Treatment procedure for NG product]**

1. Remove the screw of Pulley Driven Holder and fasten it, then measure again.

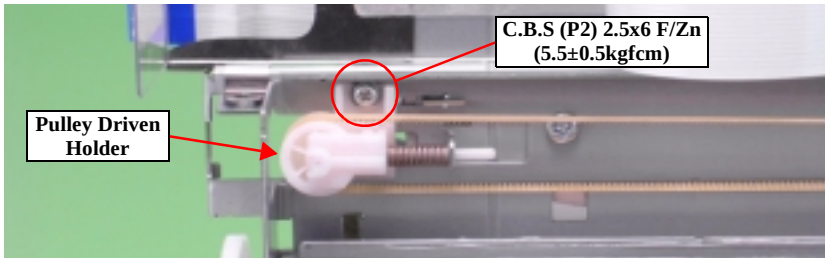


Figure 5-4. Retightening the Screw

2. If step 1's result is NG, remove the screw of Pulley Driven Holder and replace it with a new screw then measure again.
3. If step 2's result is NG, remove the Pulley Driven Holder and change it with a new one then measure again.
4. If step 3's result is NG, remove the Carriage Unit and then remove the Timing Belt from the unit to replace the Belt with a new one.

CHAPTER

6

MAINTENANCE

6.1 Overview

This section provides information to maintain the printer in its optimum condition.

6.1.1 Cleaning

This printer has no mechanical components which require regular cleaning except the Print Head. Therefore, when returning the printer to the user, check the following parts and perform appropriate cleaning if stain is noticeable.

CAUTION

- **Never use chemical solvents, such as thinner, benzine, and acetone to clean the exterior parts of the printer like the Housing. These chemicals may deform or deteriorate the components of the printer.**
- **Be careful not to damage any components when you clean inside the printer.**
- **Do not scratch the coated surface of the PF Roller Unit. Use soft brush to wipe off any dusts. Use a soft cloth moistened with alcohol to remove the ink stain.**
- **Do not use cleaning sheet included in the media for normal usage. It may damage the coated surface of PF Roller Unit. If the adhesive surface of the cleaning sheet is set to the LD Roller shaft side and used to clean the LD Roller surface, it is no problem.**

☐ Exterior parts
Use a clean soft cloth moistened with water, and wipe off any dirt. If the exterior parts are stained by the ink, use a cloth moistened with neutral detergent to wipe it off.

☐ Inside the printer
Use a vacuum cleaner to remove any paper dust.

☐ LD Roller
When paper loading function does not operate because friction of the LD Roller is lowered by any paper dust, set the adhesive side up of the cleaning sheet (included in the media) to remove any paper dust. Repeat loading the cleaning sheet several times.

☐ Document glass
Remove dust or any paper with a clean dry cloth. In case dirt is serious or alien substance is stick, wipe it off with a cloth moistened with neutral detergent. In case Stain is remained, wipe again with a dry clean cloth.

6.1.2 Service Maintenance

If any abnormal print (dot missing, white line, etc.) has occurred or the printer indicates the “Maintenance request error” (This error is displayed as “Maintenance call error” in the STM3), take the following actions to clear the error.

☐ Print Head cleaning
When dot missing or banding phenomenon has occurred, you need to perform the Print Head cleaning operation*1 by using the Print Head cleaning function. This function can be performed by the control panel operation, the printer driver utility and the Adjustment program.
In case that the cleaning sequence is performed by the control panel operation, confirm that the printer is in stand-by state (the Power LED is lighting), and hold down the Ink Maintenance button on the control panel between 3 to 6 seconds. Then, the printer starts the cleaning sequence (the Power LED blinks during this sequence).
In case that you select and perform the manual cleaning by the printer driver utility, the most appropriate cleaning mode is selected. The following is the process to perform the Print Head cleaning from the printer driver utility.
As for the operation of the Adjustment program, refer to Chapter 5 Adjustment.

*NOTE: *1: The Stylus CX1500/ME100 has 3 modes for manual cleaning, and even during printing, the appropriate cleaning mode is automatically selected and perfomrmed according to various conditions. Therefore the ink consumption amount for manual cleaning varies depending on each mode (Refer to Chapter 2).*

1. Select the “EPSON Status Monitor 3” in the printer driver utility, and make sure that the printer is in stand-by state by using the Status monitor 3. If the printer is in stand-by state, the following figure is indicated on the monitor.

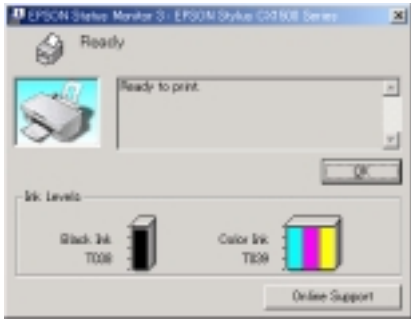


Figure 6-1. Status monitor 3 indication

2. Select the “Head Cleaning” in the printer driver utility, and perform the Print Head cleaning. After performing the Print Head cleaning operation, print a nozzle check pattern by selecting the “Nozzle Check”. If you repeat the Print Head cleaning operation without selecting the “Nozzle Check”, CL1, the weakest cleaning, will be repeated.

Figure 6-2. Head cleaning function in the printer driver utility

- Maintenance request error (Maintenance call error)
  Ink is used for the Print Head cleaning operation as well as the printing operation. When the ink is used for the Print Head cleaning operation, the ink is drained to the Waste ink pads and the amount of the waste ink is stored as the waste ink counter into the EEPROM on the Main Board. Due to this, when the waste ink counter has reached the limit of the absorbing capability of the Waste ink pads, the Maintenance call error is indicated on Status monitor 3 as following figure.

  - Overflow Counter Limit:
    Overflow Counter (Protection Counter A) ≥ 4000

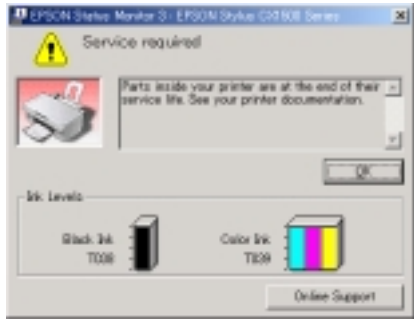


Figure 6-3. Maintenance error indication in STM3

In this case, replace to new Waste Ink Pads and clear the waste ink counter stored into the EEPROM. The waste ink counter can be reset both the control panel operation and the Adjustment program. As for the procedure, refer to “1.5.3.3 Service Operation” *(p.26)* and Chapter 5 Adjustment.
In your repair activity, check the waste ink counter along with the firmware version, Main Board checker program version and nozzle check pattern on the nozzle check pattern printing. If the waste ink counter is closed to its limit, recommend that the Waste Ink Pads will be replaced with new one. This is because the “Maintenance request error” will may occur after returning the repaired product to the customer.

6.1.3 Lubrication

The characteristics of the grease have great affects on the mechanical function and durability, especially does the characteristics about temperature environment. The type and amount of the grease used to lubricate the printer parts are determined based on the results of the internal evaluations. Therefore, be sure to apply the specified type and amount of the grease to the specified part of the printer mechanism during servicing.

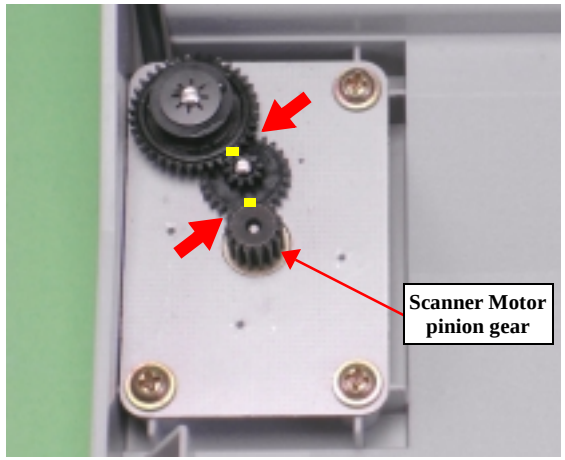
CAUTION

- **Never use oil or grease other than those specified in this manual. Use of different types of grease may damage the component or give bad influence on the printer function.**
- **Never apply larger amount of grease than specified in this manual.**

Table 6-1. Specified lubricants

Type	Name	EPSON code	Supplier
Grease	G-58	1082176	EPSON
Grease	TC-551	TBD	EPSON
Grease	UD-321	TBD	EPSON

☐ Refer to the following figures for the lubrication points.



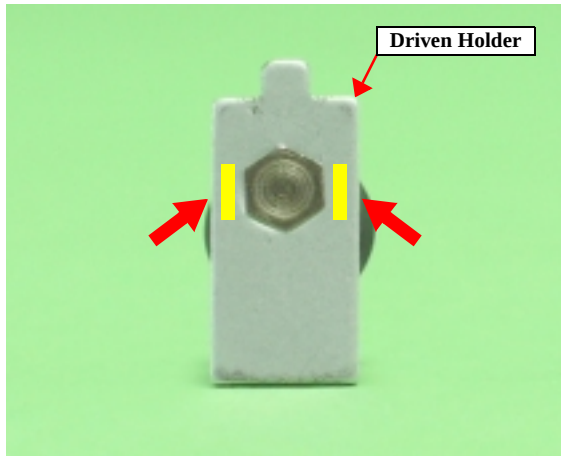
<Lubrication Point>
Contact point of each Scanner Motor gear

<Lubrication Type>
TC-551

<Lubrication Amount>
0.3 ~ 0.5mg x 2 points

<Remarks>
Use a injector to apply it

Figure 6-4. Lubrication



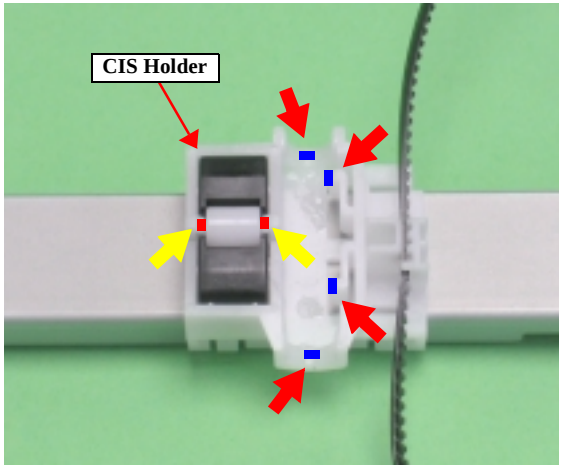
<Lubrication Point>
Both sides of Driven Holder

<Lubrication Type>
TC-551

<Lubrication Amount>
ϕ1mm x 2 points

<Remarks>
Use a injector to apply it

Figure 6-5. Lubrication



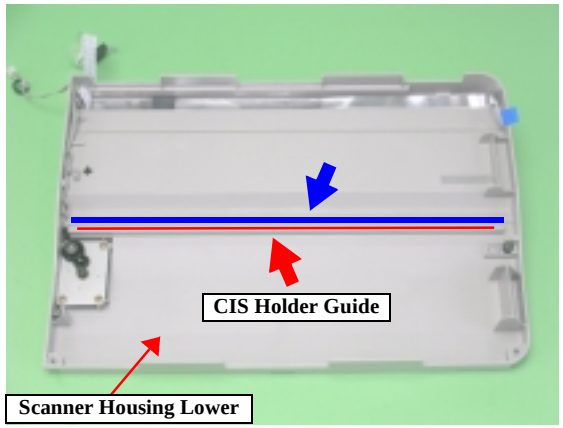
<Lubrication Point>
1. Shaft of CIS Holder Roller
2. Contact points of CIS Holder and Scanner Housing Lower

<Lubrication Type>
1. TC-551
2. TC-551

<Lubrication Amount>
1. ϕ2mm x 2 points
2. ϕ2mm x 4 points

<Remarks>
- Use a injector to apply it
- After lubrication, move the CIS Holder left or right and smooth out the grease on the Scanner Housing Lower.

Figure 6-6. Lubrication



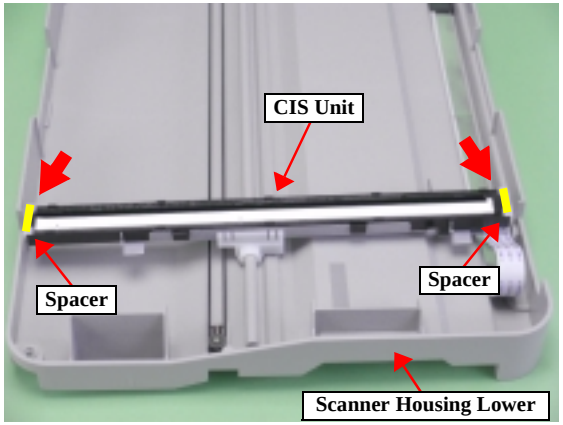
<Lubrication Point>
1. Contact surface of Scanner Housing Lower and CIS Holder Roller
2. CIS Holder Guide of Scanner Housing Lower

<Lubrication Type>
1. TC-551
2. TC-551

<Lubrication Amount>
1. Adequate dose
2. Adequate dose

<Remarks>
1. Use a brush to apply it
2. Use a brush to apply it

Figure 6-7. Lubrication



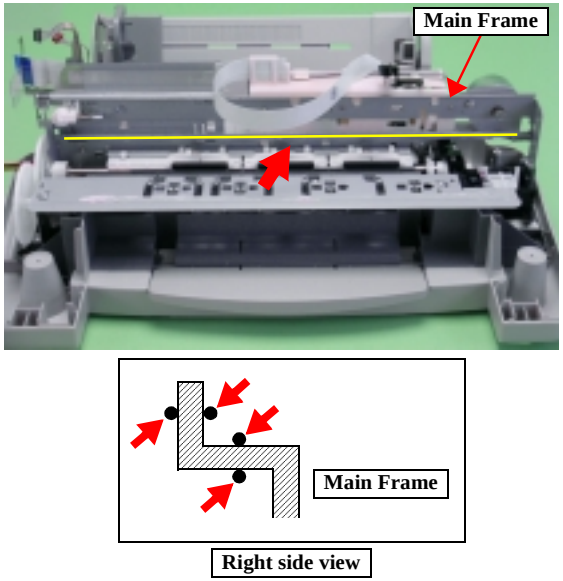
<Lubrication Point>
Upper sides of spacers on both sides of CIS Unit

<Lubrication Type>
UD-321

<Lubrication Amount>
Adequate dose

<Remarks>
Use a brush to apply it

Figure 6-8. Lubrication



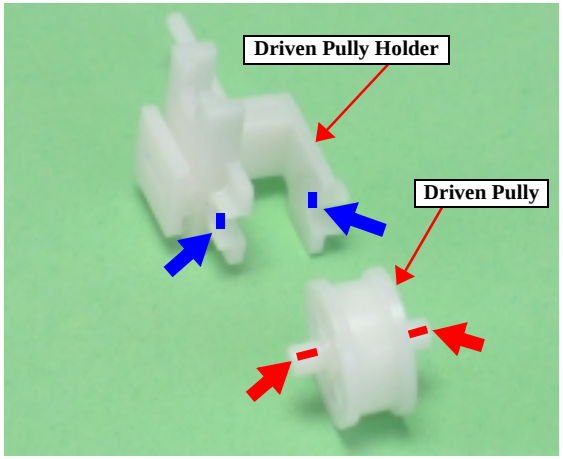
<Lubrication Point>
Contact surface of Main Frame and Carriage Unit

<Lubrication Type>
G-58

<Lubrication Amount>
100mg x 4 points

<Remarks>
- Use a brush to apply it
- After lubrication, move the Carriage unit left or right and smooth out the grease on the Main Frame.

Figure 6-9. Lubrication



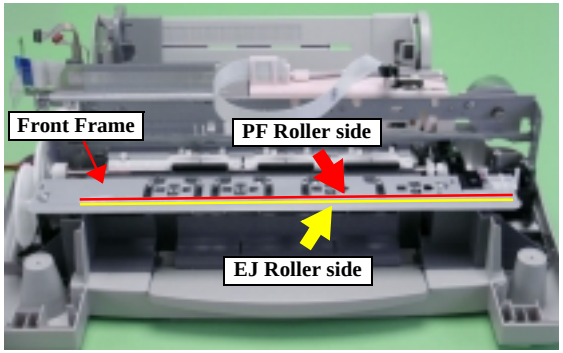
<Lubrication Point>
1. Shaft of Driven Pully
2. Sockets of Driven Pulley Holder

<Lubrication Type>
1. G-58
2. G-58

<Lubrication Amount>
1. ϕ1mm x 2 points
2. ϕ1mm x 2 points

<Remarks>
1. Use a injector to apply it
2. Use a injector to apply it

Figure 6-10. Lubrication



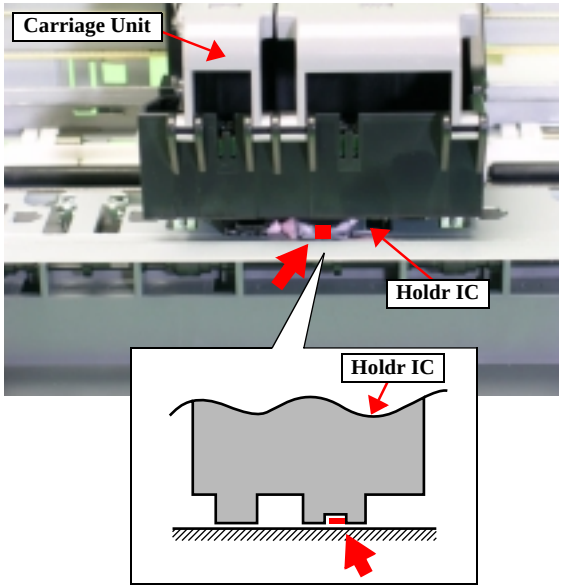
<Lubrication Point>
PF Roller and EJ Roller on upper side of Front Frame

<Lubrication Type>
G-58

<Lubrication Amount>
1mm x 308mm x 2 points

<Remarks>
- Use a brush to apply it
- Make the height of the grease and lubrication amount the same on both the PF Roller side and EJ Roller side.

Figure 6-11. Lubrication



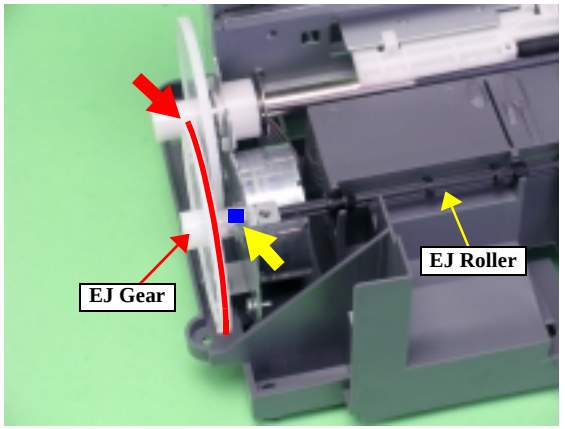
<Lubrication Point>
Bottom channel of Holder IC

<Lubrication Type>
G-58

<Lubrication Amount>
ϕ1mm x 1 point

<Remarks>
- Use a injector to apply it
- Slide Carriage Unit to center and lubricate.

Figure 6-12. Lubrication



<Lubrication Point>
1. Teeth the EJ Gear
2. Socket on Main Frame

<Lubrication Type>
1. G-58
2. G-58

<Lubrication Amount>
1. ϕ1mm x half around
2. Adequate dose

<Remarks>
1. Use a injector to apply it
   - Rotate lubricated teeth to lower side.
2. Use a injector to apply it

Figure 6-13. Lubrication

CHAPTER

7

APPENDIX

7.1 Connector Summary

7.1.1 Major Component Unit

The major component units of this printer are as follows.

- ☐ Main Board (C572 Main)
- ☐ Power Supply Board (C5xx PSB/PSE) (TBD)
- ☐ Panel Board (C5xx PNL) (TBD)

The figure below shows how to connect these components.

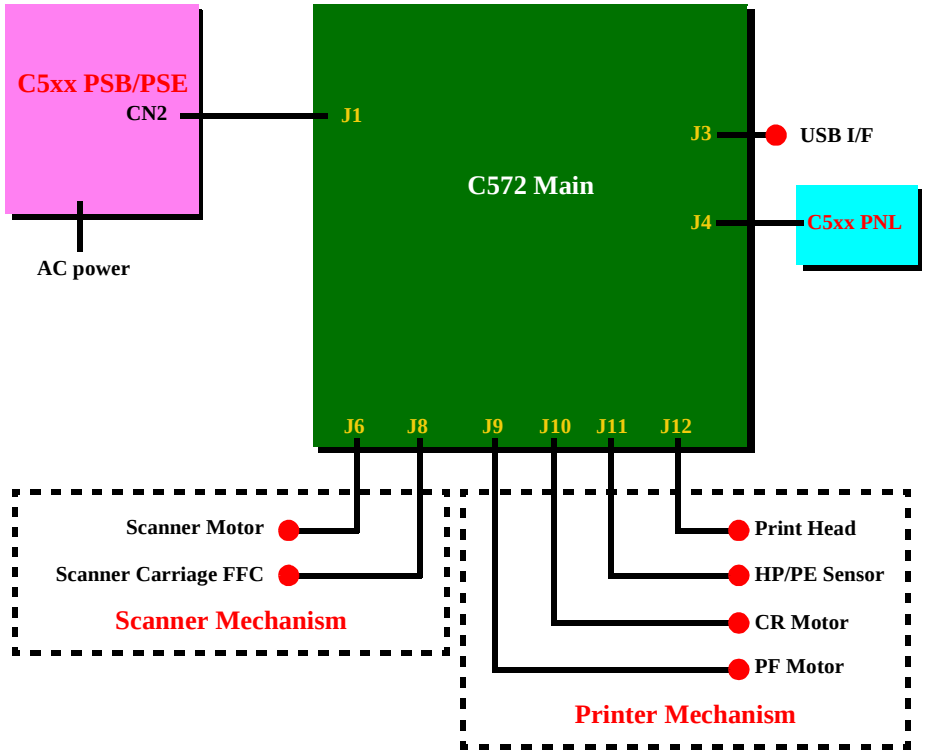


Figure 7-1. Connection of the major components

See the following tables for the connector summary for the C572 Main board and each connector's pin alignment.

Table 7-1. Connector Summary for C572 Main Board

Connector	Function
J1	For connection with the Power Supply Board
J3	For connection with the USB interface
J4	For connection with the Panel Board
J6	For connection with the Scanner Motor
J8	For connection with the Scanner Carriage FFC
J9	For connection with the PF Motor
J10	For connection with the CR Motor
J11	For connection with the HP/PE Sensor
J12	For connection with the Print Head

7.2 Exploded Diagram

Following pages show exploded diagram.

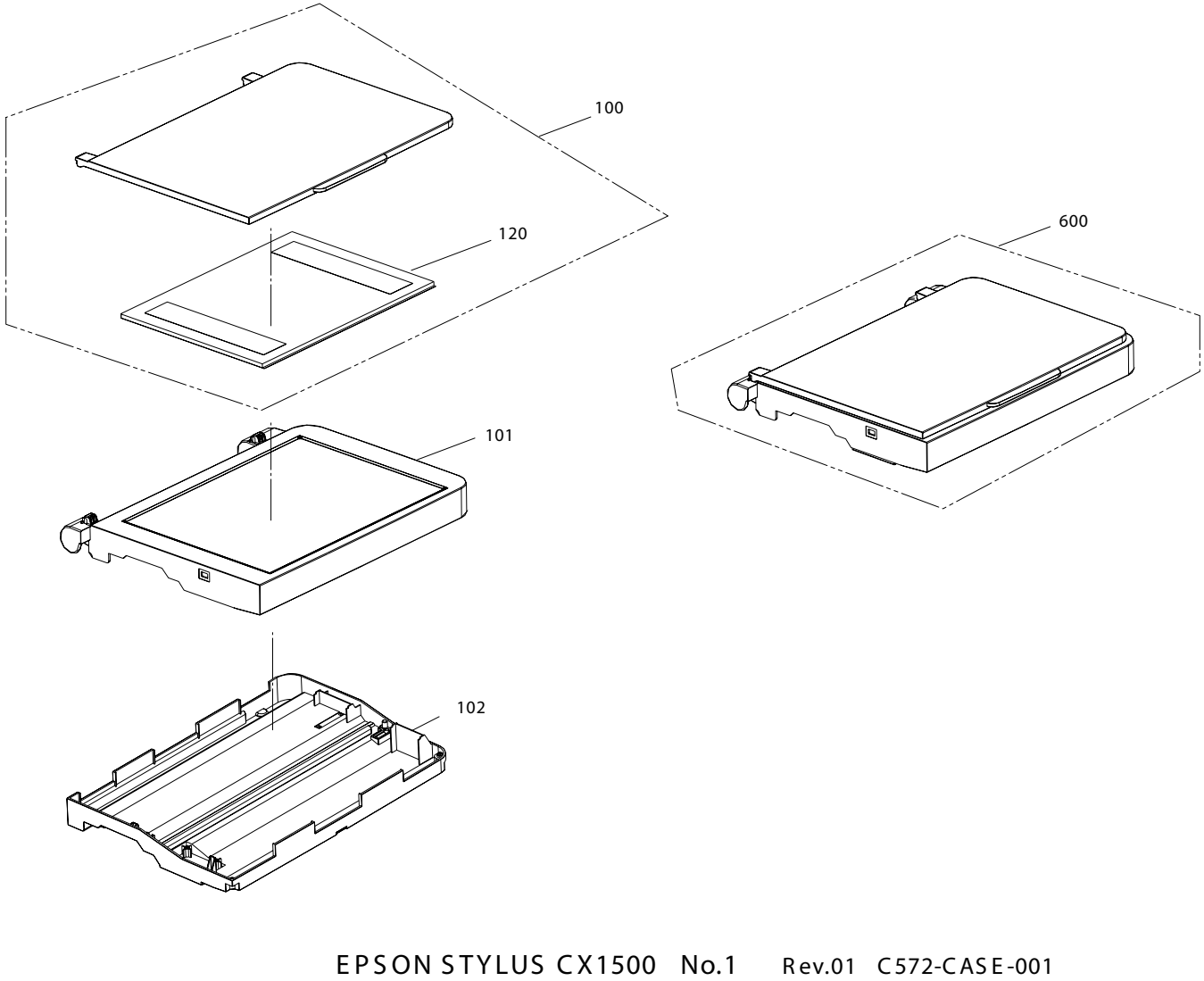
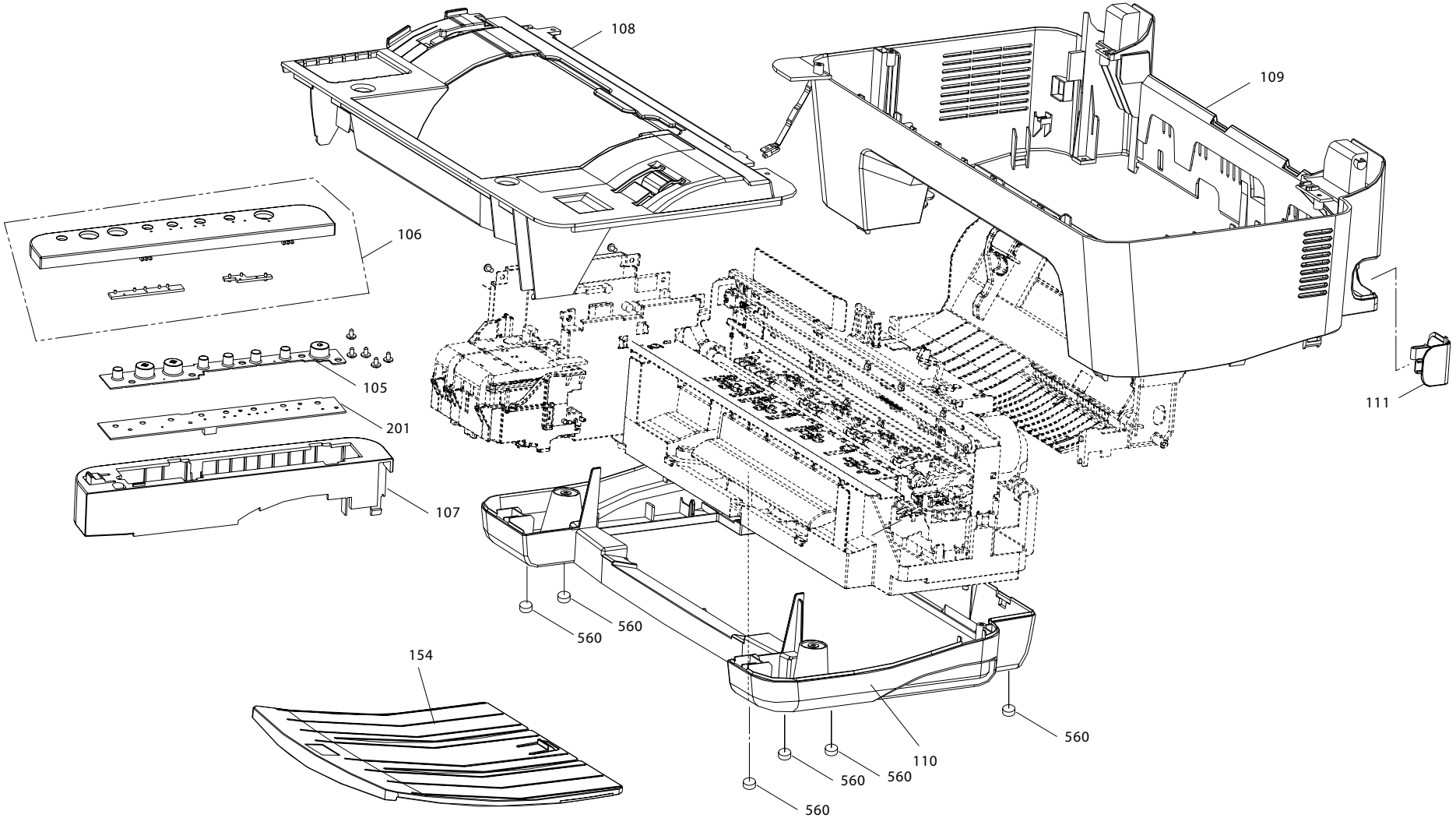
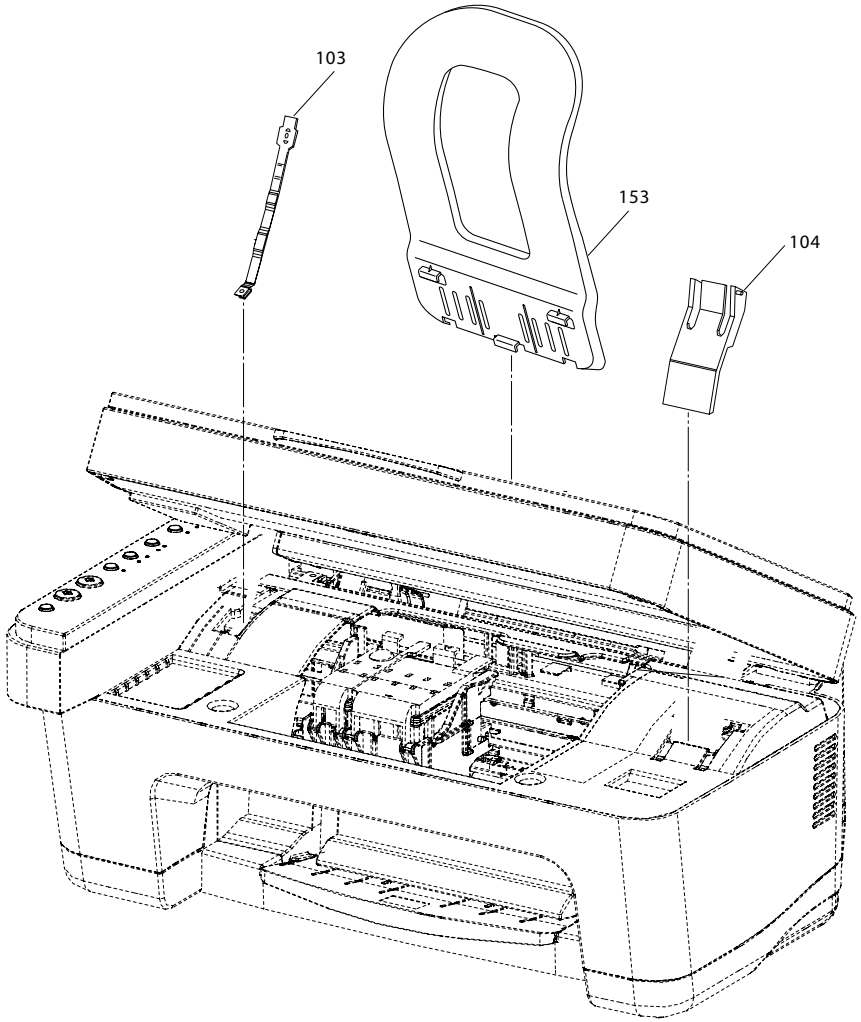


Figure 7-2. Stylus CX1500/ME100 Exploded Diagram 1



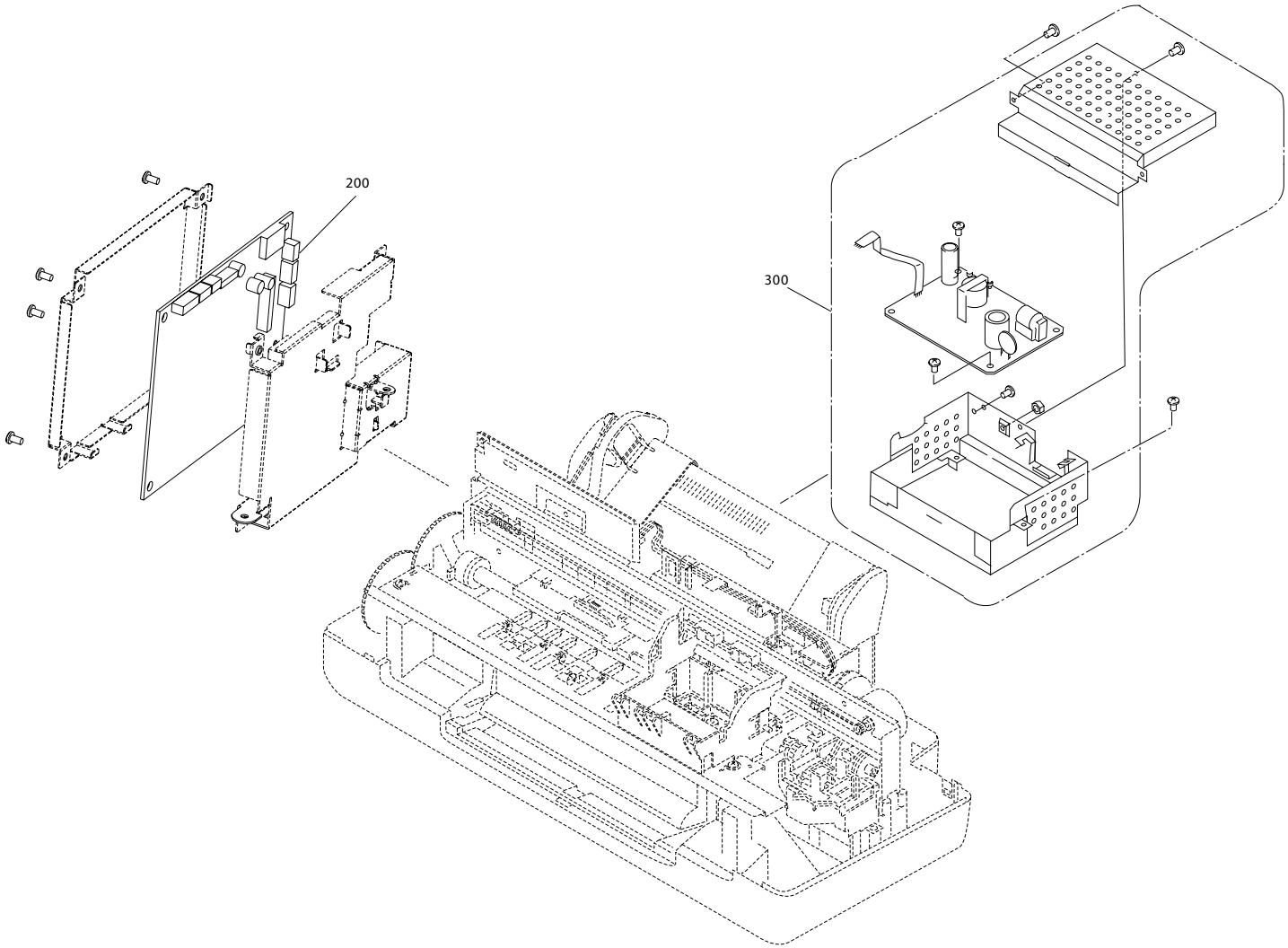
EPSON STYLUS CX1500 No.2 Rev.01 C572-CASE-002

Figure 7-3. Stylus CX1500/ME100 Exploded Diagram 2



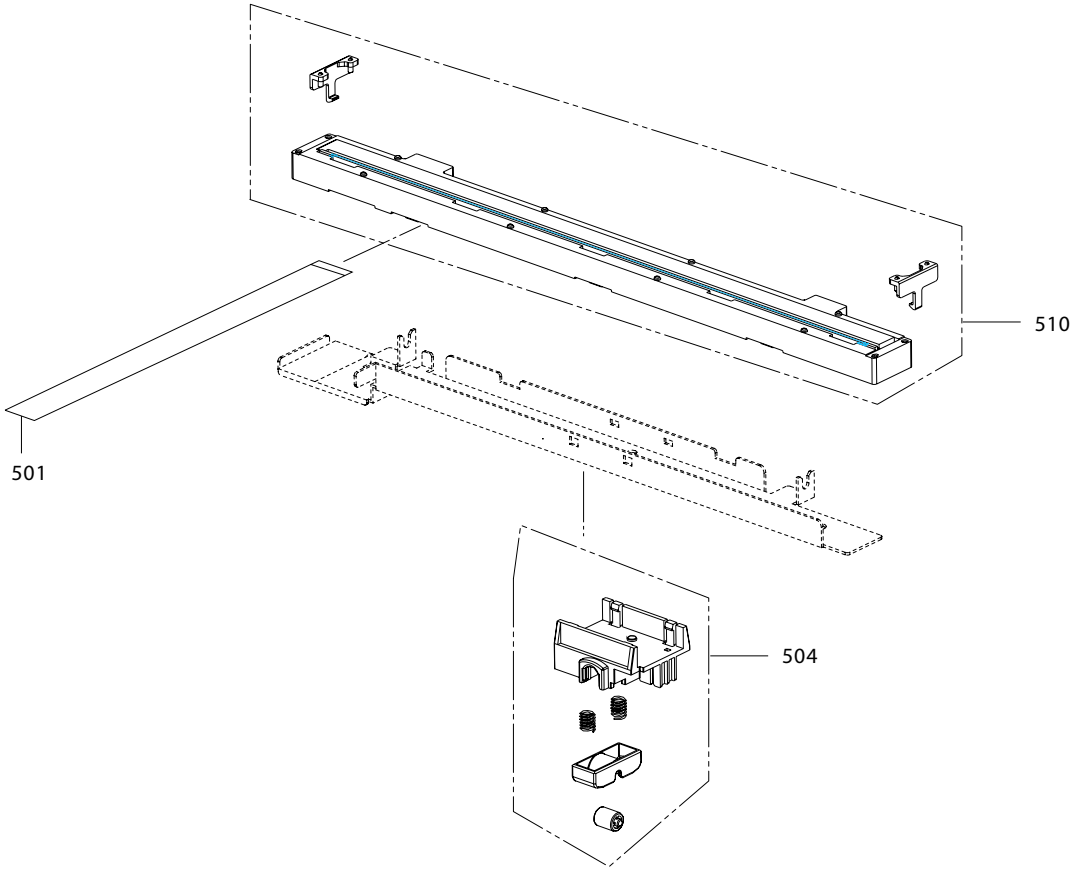
EPSON STYLUS CX1500 No.3 Rev.01 C572-CASE-003

Figure 7-4. Stylus CX1500/ME100 Exploded Diagram 3



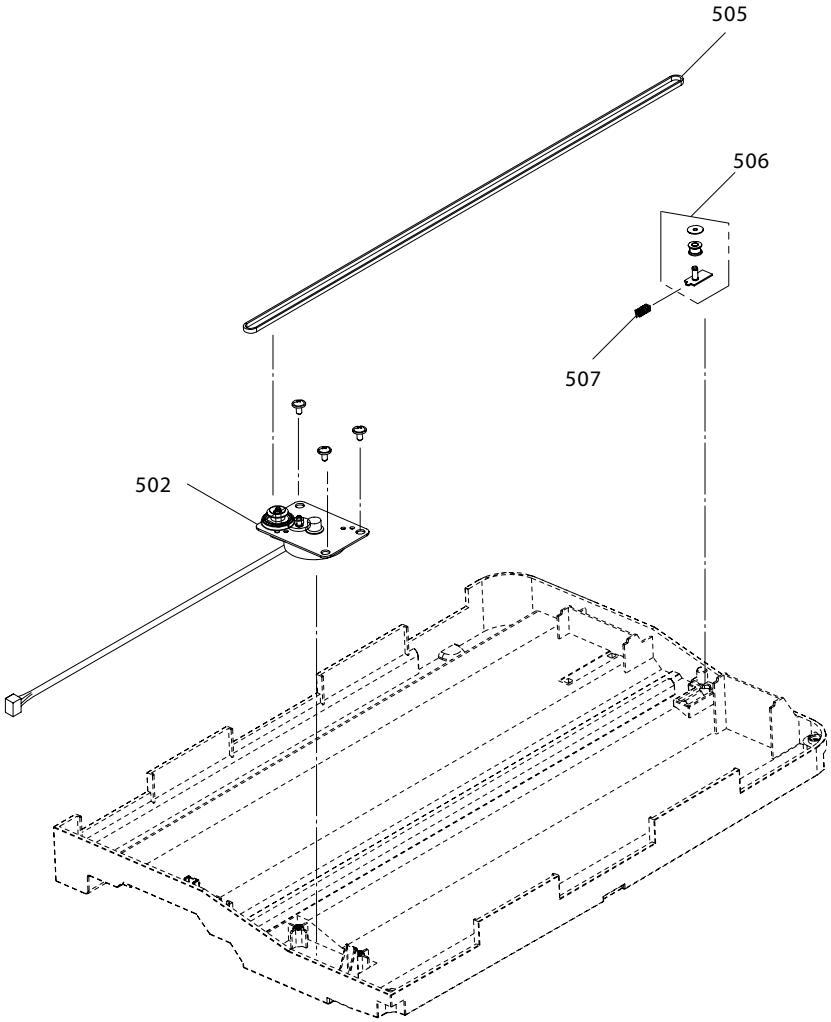
EPSON STYLUS CX1500 No.4 Rev.01 C572-ELEC-001

Figure 7-5. Stylus CX1500/ME100 Exploded Diagram 4



EPSON STYLUS CX1500 No.5 Rev.01 C572-MECH-001

Figure 7-6. Stylus CX1500/ME100 Exploded Diagram 5



EPSON STYLUS CX1500 No.6 Rev.01 C572-MECH-002

Figure 7-7. Stylus CX1500/ME100 Exploded Diagram 6

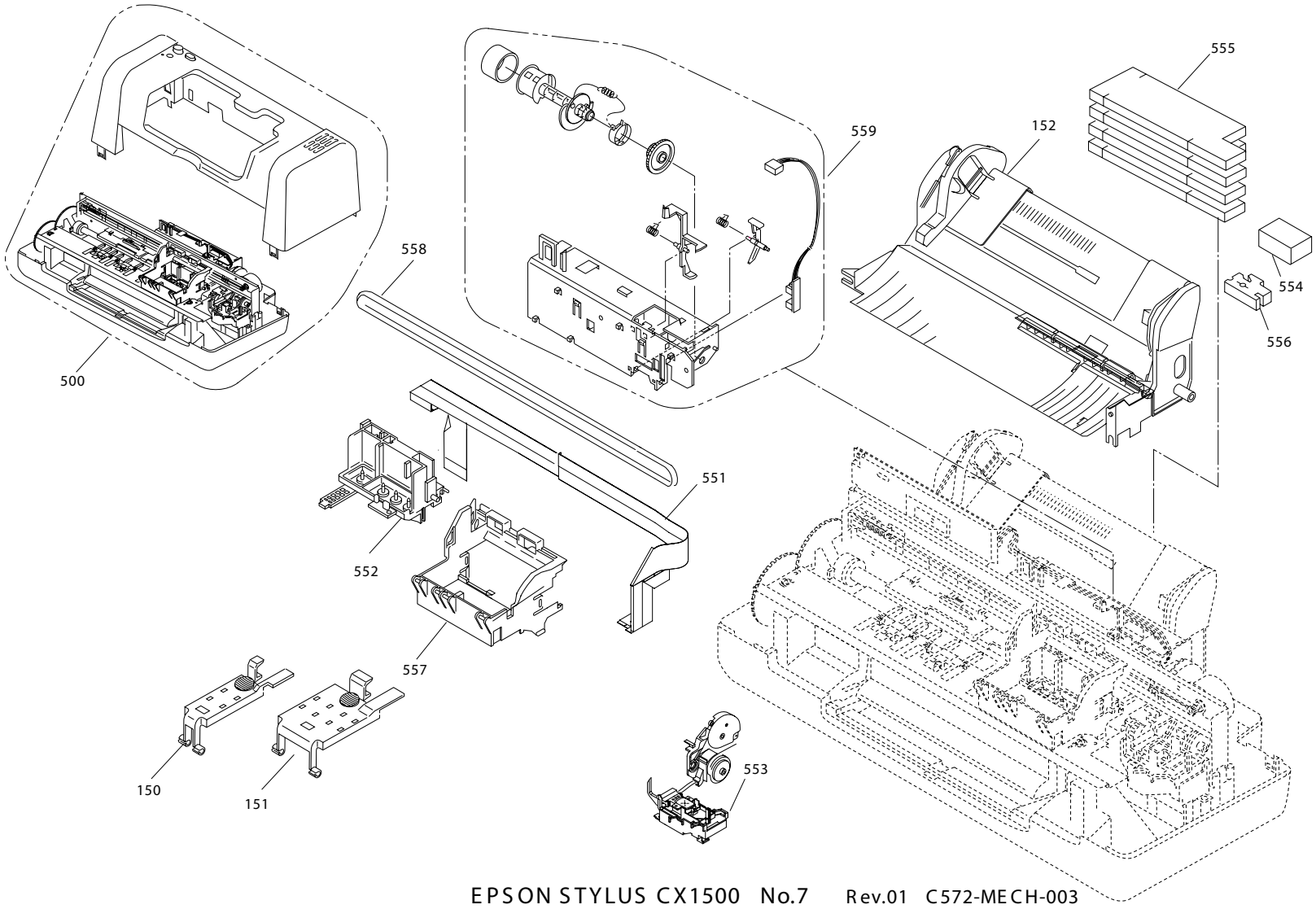


Figure 7-8. Stylus CX1500/ME100 Exploded Diagram 7

7.3 Parts List

Table 7-2. Stylus CX1500/ME100

Code	Parts Name
100	ASSY SP BOOK COVER 8803-CJL
101	ASSY SP U CASE SCN 8803-CJL
102	ASSY SP L CASE SCN 8803-CJL
103	SCN RETAIN STRIP NY66 8803
104	SUPPORT ARM POM 8803
105	BUTTON PAD RUBBER 8803
106	ASSY SUB PANEL LEDGUIDE
107	PANEL CASE HIPS 8803
108	ASSY PLATE MIDDLE 8803-CJL
109	ASSY CASE MIDDLE 8803-CJL
110	ASSY SP OUT L CASE 8803-CJL
111	COVER MAINT TUBE RECYCLE HIPS
120	SPONGE PP SPONGE+PP WHITE 8803
150	COVER,CARTRIDGE,BK ASSY.
151	COVER,CARTRIDGE,C ASSY.
152	ASF UNIT
153	PAPER SUPPORT;ECG
154	STACKER;ECG
560	FOOT
200	ASSY MAIN BD 8803-CJL
201	ASSY SP PANEL BD 8803-CJL
300	ASSY SP 110V POWER 8803-CJL
500	PRINTER MECHANISM(ASP)MA414-100

Table 7-2. Stylus CX1500/ME100

Code	Parts Name
501	CABLE FFC 12P D1 700MM 8803
502	ASSY SP MOTOR SET 8803-CJL
504	ASSY HOLDER SHAFT
505	BELT 356MXL*2.4 PU 8803
506	ASSY SPRING PULLEY SET
507	SPRING D4*0.6 8803
510	ASSY SP DYNA CIS 8803-CJL
551	CABLE,HEAD
552	PRINT HEAD
553	INKSYSTEM ASSY.;D
554	POROUS PAD,TUBE,STOPPER;D
555	POROUSPAD,INKEJECT
556	POROUS PAD,CAP,LOWER;B
557	HOLDER,I/C ASSY.
558	TIMING BELT;B
559	HOLDER,SHAFT ASSY.
600	ASSY SP SCN UNIT DYN 8803-CJL

7.4 Electrical Circuits

The electric circuit diagrams below are shown at the following pages:

- C572 Main control circuit board
- C5xx PSB power supply circuit board
- C5xx PSE power supply circuit board
- C5xx Panel circuit board

C572 Main control circuit board

C5xx PSB power supply circuit board

C5xx PSE power supply circuit board

C5xx Panel circuit board