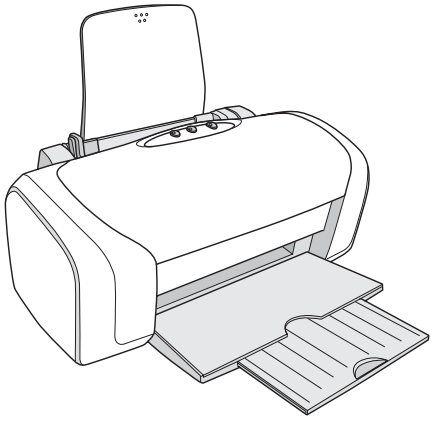
SERVICE MANUAL



Color Inkjet Printer

EPSON Stylus C87/C88/D88

EPSON

SEIJ05-002

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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 NON-APPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.
6. WHEN USING COMPRESSED AIR PRODUCTS; SUCH AS AIR DUSTER, FOR CLEANING DURING REPAIR AND MAINTENANCE, THE USE OF SUCH PRODUCTS CONTAINING FLAMMABLE GAS IS PROHIBITED.

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.

APPENDIX Provides the following additional information for reference:
- Exploded Diagram
- Parts List
- Circuit Diagrams

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 is necessary to keep the product's quality.

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.

Indicates 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	Date of Issue	Description
A	August 1 , 2005	First Release

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Chapter 6 MAINTENANCE

Chapter 7 APPENDIX

CHAPTER

1

PRODUCT DESCRIPTION

1.1 Features

The major features of EPSON Stylus C87/C88/D88 are:

- ☐ High color print quality
  - ■ 4-color pigment ink installed
  - ■ High quality printing on plain papers
  - ■ 2880 (H) x 1440 (V) dpi printing (Max resolution)
- ☐ Supports two types of I/F
  - ■ Bidirectional parallel I/F
  - ■ USB
- ☐ Windows/Macintosh exclusive
- ☐ Built-in auto sheet feeder (ASF)
  - ■ Comes equipped with the ASF that supports from postcard-sized papers to A4-sized papers
- ☐ CSIC compatible fully independent ink cartridges
- ☐ Borderfree printing for all sides
- ☐ Prevents printing on platen with the optical sensor
- ☐ Cancel print jobs function
- ☐ Reduced noise during paper feeding

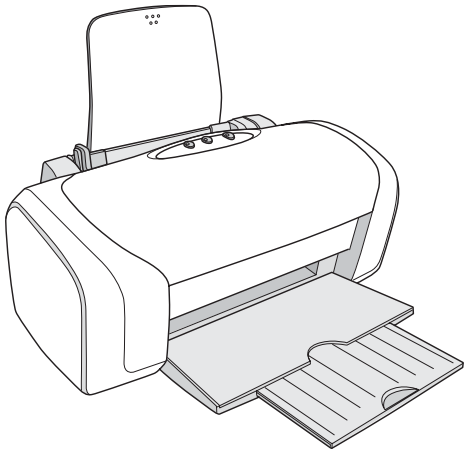


Figure 1-1. Product Appearance

1.2 Specifications

This section covers specifications of the printer.

1.2.1 Physical Specification

- Weight: 4.2 kg (without the ink cartridges)
- Dimension
  - Storage: 460 mm (W) x 242 mm (D) x 191.2 mm (H)
  - Printing: 460 mm (W) x 437 mm (D) x 309 mm (H)

1.2.2 Printing Specification

- Print method
  - On demand ink jet
- Nozzle configuration
  - monochrome: 180 nozzles
  - color: 59 nozzles x 3 (Cyan, Magenta, Yellow)
- Print direction
  - Bi-direction with logic seeking
- Print speed & Printable columns

Table 1-1. Character Mode

Character Quality	Character Pitch	Printable Columns	CR Speed
High quality	10 CPI (Pitch)	80 digits	622.3 mm/s (245 CPS)

Table 1-2. Raster Graphics Mode

Horizontal resolution	Printable area	Available dot	Dot size	CR speed
360 dpi	209.8 mm (8.26 inch)	2976	Eco	863.6 mm/s (340 CPS)
			VSD1	622.3 mm/s (245 CPS)
			VSD2 (Color)	622.3 mm/s (245 CPS)
			VSD4	571.5 mm/s (225 CPS)
720 dpi	209.8 mm (8.26 inch)	5952	VSD2	622.3 mm/s (245 CPS)
			VSD2' (Black)	622.3 mm/s (245 CPS)
			VSD3' (Color)	736.6 mm/s (190 CPS)
1440 dpi	209.8 mm (8.26 inch)	11904	VSD3	736.6 mm/s (190 CPS)
			VSD3' (Black)	736.6 mm/s (190 CPS)

- Control Code
  - ESC/P2 expanded raster graphics code
  - EPSON Remote command
- Character tables
  - none (ASCII 20H to 7FH code support)
- Internal fonts
  - Alphanumeric characters: Courier 10 CPI

1.2.3 Paper Feeding

- ☐ Paper feeding method
  - ■ Friction feed with ASF
- ☐ PF interval
  - ■ Programmable in 0.0175 mm (1/1440 inch)
- ☐ Paper loading method
  - ■ Friction feed
- ☐ Feed speed
  - ■ 196.39 mm/sec (19.05 mm (0.75 inch) feed) (T.B.D)
  - ■ 352.8 mm/sec (High speed /Continuous feed) (T.B.D)

1.2.4 Input Data Buffer

- ☐ Input buffer size: 128 KB

1.2.5 Electric Specification

- ☐ Rated voltage: AC100 V - 240 V
- ☐ Input voltage range: AC90 - 264 V
- ☐ Rated frequency range: 50 - 60 Hz
- ☐ Input frequency range: 49.5 - 60.5 Hz
- ☐ Rated current: 0.4 A - 0.2 A
- ☐ Power consumption: ISO10561 Letter Pattern: 19W
Sleep Mode: 4.5 W
Power Off Mode: 0.8 W
- ☐ Dielectric resistance: 10 MΩ or more
(between AC line and chassis at DC 500 V)
- ☐ Dielectric strength: AC 1500 V rms. 1 second
(between AC line and chassis)
- ☐ Safety approvals

UPS version:

Safety standards	:	UL1950
		CSA C22.2 No.950
	:	EN 60950(VDE)
EMI	:	FCC part15 subpart B class B
		CSA C108.8 class B
	:	EN 55022(CISPR Pub.22) class B
	:	AS/NZS 3548 class B

- ☐ CE Marking

UPS version:

Low Voltage Directive 73/23/EEC	:	EN60950
EMC Directive 89/336/EEC	:	EN55022 Class B
		EN61000-3-2
		EN61000-3-3
		EN55024

☐ Environmental Condition

Table 1-3. Environmental Condition

	Operating	Non-operating*2	Remarks
Temperature*1	10~35 °C*3	-20~60 °C	1 month at 40 °C 120 hours at 60 °C
Humidity (should be no condensation)	20~80 % RH	5~85 % RH	---
Resistance to shock (X, Y, and Z directions)	1 G, within 1 ms	2 G, within 2 ms	---
Resistance to vibration (X, Y, and Z directions)	0.15 G	0.50 G	---

Note *1: One month at 40°C and 120 hours at 60°C

*2: Packed in the shipment container

*3: Under the following conditions

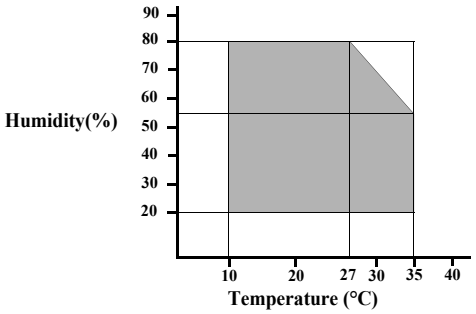


Figure 1-2. Temperature/Humidity Range

CAUTION

- **Printhead must be capped during storage.**
- **When transporting the printer, make sure that the printhead is capped and the ink cartridges are installed in the printer.**
- **If the printhead is not capped when the printer is turned off, turn the printer on with the ink cartridges installed, cap the printhead, and turn the power off.**
- **Ink inside the ink cartridges freezes if it is left to stand at temperature of -4°C or less. If this is the case, allow the ink to stand for about three hours at 25°C temperature.**

1.2.6 Reliability

☐ Total print volume: 50,000 pages (A4, Letter) or five years, whichever comes first.

☐ Print Head Life: Three billion shots (per nozzle) or five years, whichever comes first.

1.2.7 Acoustic Noise

☐ Level: Approx. 42 db (A)

1.2.8 Black Ink Save Mode

"Black ink save mode" allows you to print images with color ink only when the remaining amount of black ink is low. This mode can be selected when the remaining amount of color ink is sufficient since black areas of the images are printed with a mixture of other colors.

- ☐ Supported OS: Windows NT4.0, 95, 98, ME, 2000, XP
- ☐ Printing mode: Plain Paper & Text Mode (360 dpi)
- ☐ Operating procedure

1. User carries out printing from an application.
2. The printer driver checks both the printing mode and the amount of remaining ink, and displays the specific window if the conditions described below are all satisfied.
   - ■ Selected printing mode supports black ink save mode.
   - ■ Remaining amount of black ink is less than 5 %, or the status of the black ink is "ink low".
   - ■ Remaining amount of all the color ink is more than 10 %, or the status of all the color ink is NOT "ink low".

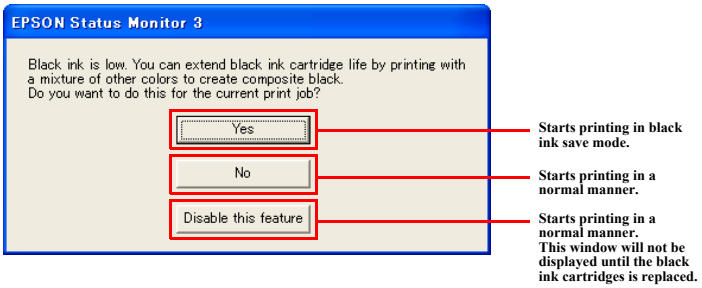


Figure 1-3. Black Ink Save Mode Window

1.3 Operator Controls

1.3.1 Operation Switch

Operation switch is located on top center of the main unit.

1.3.1.1 Switches

There are three non-lock type push switches and three LEDs.

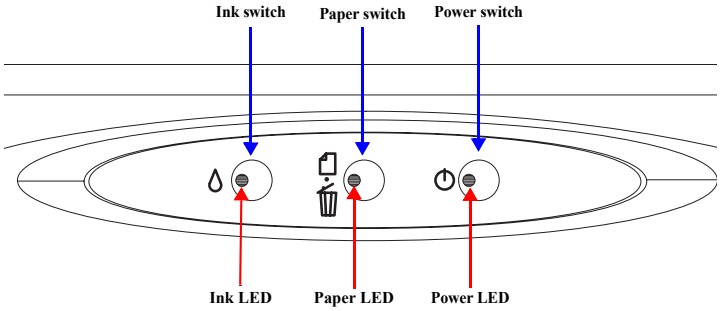


Figure 1-4. Control Panel

1.3.1.2 Indicators

- **Power LED** [Green]
  Lights when the power switch is "ON" and AC power is supplied.
  Flashes when data is processed or ink system is operating.
- **Paper LED** [Red]
  Lights during the paper out/multi-feed condition, and flashes during the paper jam condition.
- **Ink LED** [Red]
  Lights during no ink condition, and flashes during ink low condition.

1.3.2 Panel Functions

Table 1-4. Panel Functions

Switch	Function
Paper	• Loads or ejects paper. • Restarts when paper jam occurred. • In the condition of printing, cancel the print job.
Ink	• Starts the ink cartridge change sequence. Moves the carriage to cartridge change position. • In the condition of 'Ink Low', 'Ink Out' or 'No Ink Cartridge', moves the carriage to the ink check position. • When the carriage is on the ink check position, moves carriage to next ink check position or cartridge change position. • When carriage is on the ink change position, returns carriage from ink cartridge change position.
Ink (Holding down for three seconds)	• Starts the cleaning of head. • In the condition of 'Ink Low', 'Ink Out' or 'No Ink Cartridge', starts the ink cartridge change sequence.

Table 1-5. Panel functions with power on

Switch	Pressing with Power On function*
Paper + Power	Starts status printings.

Note *: Holding down the [Paper] switch, press [Power].

Table 1-6. Panel functions with power off

Switch	Pressing with Power Off function*
Ink + Power*	Compulsory power off.

Note *: Holding down the [Power] switch, press [Ink] for about seven seconds.

1.3.3 Printer Condition and LED Status

Table 1-7. Printer Condition and LED Status

Printer status	Indicators			Priority
	Power LED	Paper LED	Ink LED	
Power on	On	--	--	11
Ink level low	--	--	Flashes	10
Data processing	Flashes	--	--	9
No ink cartridge or ink end	--	--	On	8
CSIC Error	--	--	On	8
Ink sequence	Flashes	--	--	7
Ink cartridge change mode	Flashes	--	--	6
Paper out	--	On	--	5
Multi-feed	---	On	---	5
Paper jam condition	--	Flashes	--	4
Maintenance request (Waste ink counter overflow)	Off	Flashes alternately	Flashes alternately	3
Fatal error	Off	Flashes on high speed	Flashes on high speed	2
Power off	Flashes on high speed	Off	Off	1
Reset request	On	On	On	--

Note *: "---" indicates that the indicator status varies according to the printer condition at that time.

1.3.4 Duplex Printing

Select the duplex printing mode from the printer driver, and follow the steps below to perform the duplex printing.

1. Print all the odd pages.
2. Turn over the ejected pages on the paper eject tray, and load them on the ASF.
3. Print all the even pages.

1.3.5 Errors

Errors that may occur with this printer are described below.

Table 1-8. Error Status

Error	Description
Ink out	The predetermined level of ink is used.
Paper out	The printer fails to load a sheet.
Paper jam	Occurs under the following conditions: • Papers could not be ejected after the specified number of times of paper feed operation. • Papers could not be ejected by FF command or pressing the Paper switch.
Multi-feed	Multiple papers are fed to the printer.
No ink-cartridge / Cartridge Error	Occurs under the following conditions: • Ink cartridge is not installed or removed. • CSIC information could not be read/written normally.
Maintenance request	Total quantity of waste ink has reached the specified level.
Fatal errors	Non-recoverable error such as carriage control error.

1.4 Paper

1.4.1 Paper Support

☐ Cut sheets

Table 1-9. Cut sheets

Paper size	Dimensions		Thickness (mm)	Weight (g/m^2)	Quality
	Width (mm)	Length (mm)			
A4	210	297	0.08-0.11	64-90 (17-24(lb))	Common paper Recycled paper
A5	148	210			
A6	105	148			
Half Letter	139.7 (5.5")	215.9 (8.5")			
B5	182	257			
Letter	215.9 (8.5")	279.4 (11")			
Legal	215.9 (8.5")	355.6 (14")			
User defined	50.8-329	127-1117.6			

CAUTION

- **It is necessary that there is no winkle, nap, tear, fold and so on in the form.**
- **The curve of form must be five mm or below.**
- **The printer only accepts A4-sized papers for borderfree printing.**

☐ Envelopes

Table 1-10. Envelopes*1

Paper type	Dimensions (mm)		Weight (g/m^2)	Quality
	Width	Length		
#10*2	104.8	241.3	75-90 (20-24 (lb))	Bond paper PPC paper
DL *2	110	220		
C6 *2	114	162		

Note *1: Borderfree printing is not supported for envelops.

*2: There is flap in the long side part, and it is fold down.

CAUTION

- **Use paper under normal conditions.**
  - **Temperature 15 to 25°C (59 to 77°F)**
  - **Humidity 40 to 60% RH**
- **It is necessary that there is no winkle, nap, tear, fold and so on in the form.**
- **The curve and swell of the form must be three mm or below.**
- **Don't use the adhesive envelope.**
- **Don't use sleeve insert envelope and cellophane window envelope.**
- **As for double-flap envelope, if the envelope is damaged or bent during printing, load the envelope with its flap facing in the opposite direction. (Feeding direction should be changed as well from the printer driver.)**
- **If the printed images are skewed or misaligned from the proper position, fold four sides of the envelope tightly.**
- **If multi-feed occurs, press the [Paper] switch to feed the envelope before starting printing again.**

☐ Exclusive papers
Quality: EPSON Exclusive paper

Table 1-11. Exclusive papers

Item	Size	Dimensions		Thickness (mm)	Weight (g/m^2)
		Width (mm)	Length (mm)		
Premium Ink Jet Plain Paper	A4	210	297	0.11	80
Bright White Ink Jet Paper	A4	210	297	0.13	92.5
Photo Paper	A4	210	297	0.23	194
	4" x 6"	101.6	152.4		
Premium Glossy Photo Paper	Letter	215.9	279.4	0.27	255
	A4	210	297		
	8" x 10"	203.2	254		
	5" x 7"	127	178		
	4" x 6"	101.6	152.4		
	3R	89	127		
Premium Semigloss Photo Paper	Letter	215.9	279.4	0.27	250
	A4	210	297		
	4" x 6"	101.6	152.4		
Matte Paper-Heavyweight	Letter	215.9	279.4	0.23	167
	A4	210	297		
Double-sided Matte Paper	Letter	215.9	279.4	0.25	178
	A4	210	297		
Economy Photo Paper	A4	210	297	0.23	188
Photo Quality Ink Jet paper*1	Letter	215.9	279.4	0.12	102
	A4	210	297		
Glossy Photo Paper	Letter	215.9	279.4	0.23	188
	4" x 6"	101.6	152.4		
Premium Glossy Photo Paper (RC-X)	4" x 6"	101.6	152.4	0.25	238
Ultra Glossy Photo Paper*2 Ultra Premium Glossy Photo Paper*3	Letter	215.9	279.4	0.29	290
	A4	210	297		
	8" x 10"	203.2	254		
	5" x 7"	127	178		
	4" x 6"	101.6	152.4		

Note *1: Borderfree printing is not supported for Photo Quality Ink Jet Paper.
*2: For Stylus C87/D88 only.
*3: For Stylus C88 only.

CAUTION

- **Use paper under normal conditions.**
  - **Temperature 15 to 25°C (59 to 77°F)**
  - **Humidity 40 to 60% RH**
- **It is necessary that there is no winkle, nap, tear, fold and so on in the form.**
- **The curve of form must be five mm or below.**

1.4.1.1 Printable Area

☐ Cut sheet (standard printing)

■ Printable area
For paper width (PW) and paper length (PL), refer to 1.4.1 Paper Support (p16).

Table 1-12. Applicable Paper/Printing Area

	Paper type	LM	RM	TM	BM
Cut Sheet	A4	3 mm	3 mm	3 mm	12.5 mm/ 3 mm*1
	A5				
	A6				
	B5				
	Letter				
	Legal				
	User defined				
Exclusive papers	Premium Inkjet Plain Paper				
	Bright White Ink Jet Paper				
	Photo Paper				
	Premium Glossy Photo Paper				
	Premium Semigloss Photo Paper				
	Matte Paper-Heavyweight				
	Double-sided Matte Paper				
	Economy Photo Paper				
	Photo Quality Ink Jet Paper				
	Glossy Photo Paper				
	Premium Glossy Photo Paper (RC-X)				
	Ultra Glossy Photo Paper Ultra Premium Glossy Photo Paper				

Note *: It is possible to set the margins for all sides to zero under the special conditions.

Note *1: Bottom margin is expanded to 3 mm when paper dimension is defined by using command (ESC (S and Remote "SN"), otherwise it is not expanded (12.5 mm). From a form lower end 3 mm as for 12.5 mm area a printing may scramble.

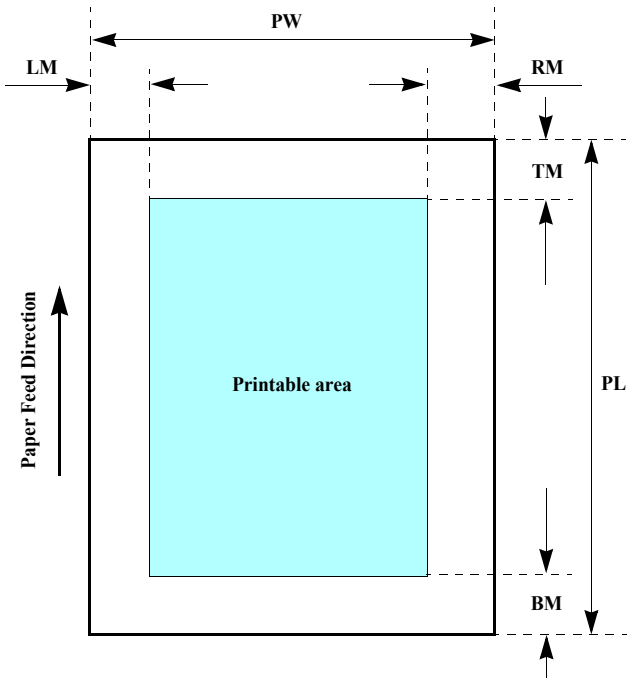


Figure 1-5. Printable Area for Cut Sheet (Standard Printing)

- Envelopes
  - Printable area
    For paper width (PW) and paper length (PL), refer to 1.4.1 Paper Support (p16).

Table 1-13. Applicable Paper/Printing Area

Paper type	LM	RM	TM	BM
#10	3 mm	3 mm	3 mm	20 mm
DL				
C6				

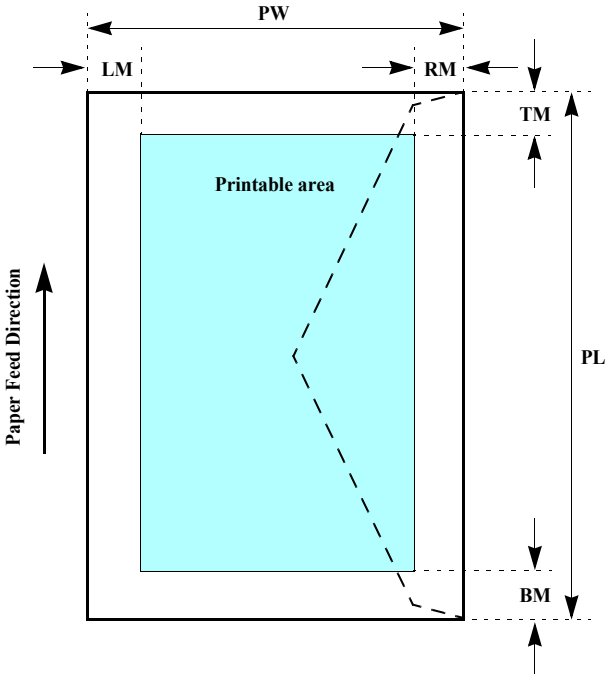


Figure 1-6. Printable Area for Envelopes

- Cut sheet (border-free printing)
  - Printable area
    For paper width (PW) and paper length (PL), refer to 1.4.1 Paper Support (p16).

Table 1-14. Applicable Paper/Printing Area

	Paper type	Size	LO	RO	TO	BO
Exclusive papers	Photo Paper	A4	2.54	2.54	2.96	4.02
		4" x 6"	2.54	2.54	1.34	2.54
	Premium Glossy Photo Paper	Letter	2.54	2.54	2.96	4.02
		A4	2.54	2.54	2.96	4.02
		8" x 10"	2.54	2.54	2.96	4.02
		5" x 7"	2.54	2.54	2.96	4.02
		4" x 6"	2.54	2.54	1.34	2.54
		3R	2.54	2.54	1.34	2.54
	Premium Semigloss Photo Paper	Letter	2.54	2.54	2.96	4.02
		A4	2.54	2.54	2.96	4.02
		4" x 6"	2.54	2.54	1.34	2.54
	Matte Paper-Heavyweight	Letter	2.54	2.54	2.96	4.02
		A4	2.54	2.54	2.96	4.02
	Double-sided Matte Paper	Letter	2.54	2.54	2.96	4.02
		A4	2.54	2.54	2.96	4.02
	Economy Photo Paper	A4	2.54	2.54	2.96	4.02
	Glossy Photo Paper	Letter	2.54	2.54	2.96	4.02
	Premium Glossy Photo Paper (RC-X)	4" x 6"	2.54	2.54	1.34	2.54
	Ultra Premium Glossy Photo Paper Ultra Glossy Photo Paper	Letter	2.54	2.54	2.96	4.02
		A4	2.54	2.54	2.96	4.02
		8" x 10"	2.54	2.54	2.96	4.02
		5" x 7"	2.54	2.54	2.96	4.02
		4" x 6"	2.54	2.54	1.34	2.54

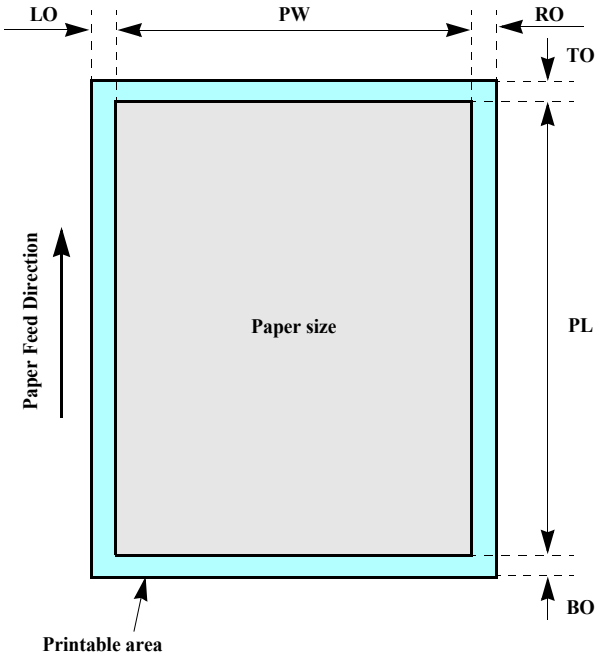


Figure 1-7. Printable Area for Cut Sheet (Border-free Printing)

1.5 Ink Cartridge

1.5.1 Ink Cartridge Specification

☐ Type/Color: Separate ink cartridges for each color

Table 1-15. Ink Cartridge

Color	Size	EAI	Latin/Asia/ Pac	EUR
Black	SS Size	---	T0631	T0611
	S Size	T0601	T0621	T0641
Cyan	SS Size	---	T0632	T0612
	S Size	T0602	---	---
Magenta	SS Size	---	T0633	T0613
	S Size	T0603	---	---
Yellow	SS Size	---	T0634	T0614
	S Size	T0604	---	---

☐ Ink life:

■ Black ink cartridge

Print capacity
S size: 430 pages /A4 (360 dpi, 5% duty each color)
SS size: 250 pages /A4 (360 dpi, 5% duty each color)

■ Color ink cartridge

Print capacity
S size: 470 pages /A4 (360 dpi, 5% duty each color)
SS size: 280 pages /A4 (360 dpi, 5% duty each color)

☐ Expiration date: Two years
(include both the time interval that the ink cartridge is unopened and the period after it is unpacked)

☐ Storage temperature

Table 1-16. Storage Temperature

Situation	Storage temperature	Limit
When transported in individual boxes	-30°C ~ 50°C	Within 10 days at 50°C
When stored in individual boxes	-30°C ~ 40°C	Within 1 month at 40°C
When installed in main unit	-20°C ~ 40°C	Within 1 month at 40°C Temperature difference should be less than 45°C in this period.

- Dimension: 12.7 mm (W) x 73.46 mm (D) x 55.25 mm (H)

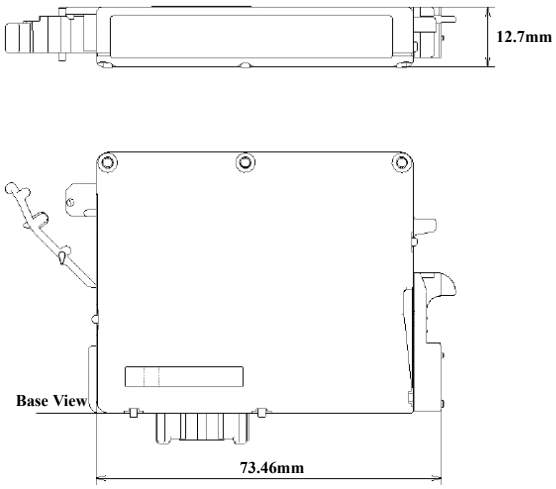


Figure 1-8. Ink Cartridge

CAUTION

- **Ink cartridge can not re-fill, only ink cartridge is prepared for article of consumption.**
- **Do not use the ink cartridge which has expired.**
- **Ink will be frozen under -16 °C environment, however it will be usable after placing it more than three hours at room temperature.**

CHAPTER

2

OPERATING PRINCIPLES

2.1 Overview

This section describes the operating principles of the printer mechanism and electrical circuit boards.

2.2 Printer Mechanism

Printer mechanism of Stylus C87/C88/D88 consists of printhead, carriage mechanism, paper loading mechanism, paper feeding mechanism, and ink system.
As in the case of conventional models, Stylus C87/C88/D88 has two DC motors; one is for paper loading/feeding mechanism and the pump mechanism, and the other is for carriage mechanism.
Papers are fed from the backside and ejected from the front side of the printer.
Paper feeding mechanism, which is also similar to conventional models, feeds papers using the LD roller and the retard roller.

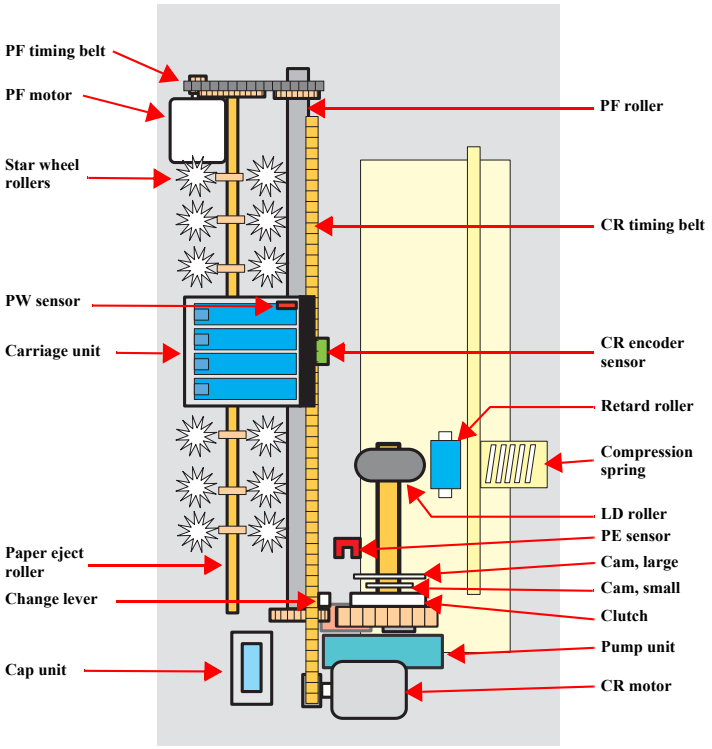


Figure 2-1. Printer Mechanism Outline

2.2.1 Printhead Specifications

This printer employs P-Match type printhead, which enables the product to perform both the variable dot printing and the economy dot printing.

- Nozzle configuration
  - Monochrome: 180 nozzles
  - Color: 59 nozzles x 3 rows/color (Cyan, Magenta, Yellow)

The following shows the arrangement of the nozzles and the color arrangement of each nozzle line when viewed the printhead from behind.

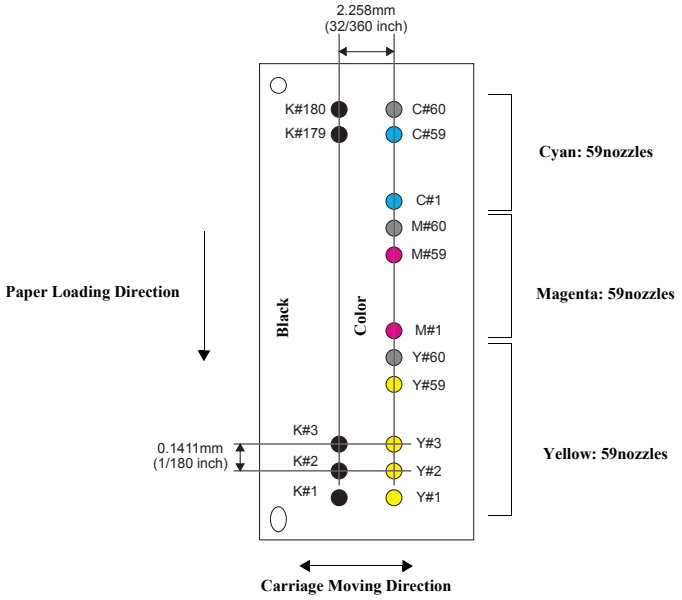


Figure 2-2. Nozzle Rear View

NOTE: *#60 nozzles of each color are not used for printing, but for flushing.*

2.2.2 Carriage Mechanism

Main components of the carriage mechanism are carriage unit (including printhead, CR encoder sensor, PW sensor), CR motor, timing belt, and CR scale.

2.2.2.1 CR Motor Specifications

Table 2-1. CR Motor Specifications

Item	Specification
Type	Motor with DC brush
Drive voltage	+42 V ± 5% (applied voltage to the driver)
Electric resistance	22.65 Ω ± 10%
Inductance	17.3 mH ± 25%
Drive method	PWM, constant-current chopping
Drive IC	A6615

2.2.3 Paper Loading/Feeding Mechanism

Paper loading/feeding mechanism consist of switching lever inside the ink system, holder shaft unit (including clutch mechanism), and ASF unit.

Switching lever and clutch mechanism play an important role in paper loading mechanism. Refer to 2.2.3.2 Drive Process (p26) for details.

2.2.3.1 PF Motor Specifications (For both ASF and Pump motor)

Table 2-2. PF Motor Specification

Item	Specification
Type	4-phase, 200-pole HB stepping motor
Drive voltage	+42 V ± 5 % (applied voltage to the driver)
Wire wound resistance	3.0 Ω ± 10% (per one phase at 25 °C)
Inductance	3.5 mH ± 20% (1KH, 1Vrms)
Drive method	Bipolar drive 2-2 phase, 1-2 phase, W1-2, 2W1-2, 4W1-2 phase constant-current drive
Drive IC	A6628

2.2.3.2 Drive Process

1. Drive of the PF motor is transmitted to the paper eject roller and the PF roller via the PF timing belt, however, it is not transmitted to the LD roller and the retard roller owing to the clutch of the holder shaft unit.
2. The carriage unit moves to the ASF trigger position once the paper loading command is received.
3. PF motor is rotated counter clockwise, and the clutch is released by the change lever.
4. After the clutch is released, the PF motor rotates clockwise. Drive is transmitted to the LD roller and the paper loading operation begins.
5. During paper loading operation, papers are fed from the ASF unit to inside the printer by the rotating movement of the two cams of the LD roller.
   - Cam, large: releases hopper
   - Cam, small:releases paper back lever
6. Once a sheet of paper is fed, the hopper and the paper back lever bring back rest of the papers to the position in readiness by the rotating movement of the two cams mentioned above.
7. When the LD roller is turned a full circle, the change lever release the clutch and the drive to the LD roller is interfered.

2.2.4 Ink System Mechanism

The Ink system mechanism consists of pump mechanism and capping mechanism with wiper mechanism.

2.2.4.1 Pump Unit Mechanism

The PF motor is a source of power to activate the pump unit.

Table 2-3. PF Motor Rotational Direction & Ink System Mechanism

Directions*	Functions
Counterclockwise	• Absorbs the ink by the Pump Unit
Clockwise	• Release pump.

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

2.2.4.2 Capping Mechanism

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

2.3 Electrical Circuit Operating Principles

The electric circuit of the Stylus C87/C88/D88 consists of the following boards.

- ☐ Main board: C528 MAIN Board
- ☐ Power supply board: C528 PSB/PSB board
- ☐ Panel board: C528 PNL board

This section provides block diagram of both C528 MAIN Board and C528 PSB/PSE Board,C528 PNL board.

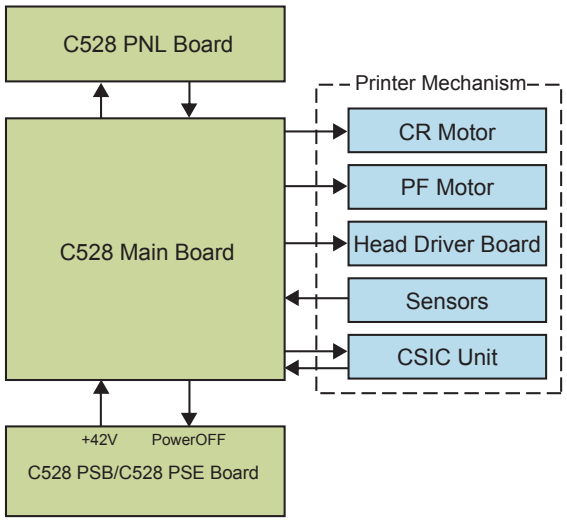


Figure 2-3. Electrical Circuit Block Diagram

2.3.1 C528 PSH Board

PSH board of Stylus C87/C88/D88 employs ZC-RRC circuit method, and supplies +42 VDC/+5VDC to the drive line.
AC voltage input from AC inlet first goes through filter circuit that removes high frequency components and is then converted to DC voltage via the rectifier circuit and the smoothing circuit.

2.3.2 C528 Main Board

The logic circuit of the C528 Main Board is composed of the following;

- Logic line (CPU-ASIC 4 in 1, DRAM and so on)
- Motor control/drive circuit (CR Motor, PF Motor)
- Head control/drive circuit
- Parallel interface control circuit
- Sensor circuit
- Reset circuit
- EEPROM circuit

Table 2-4. C528 MAIN Board Major Components and Primary Functions

IC	Location	Function
Parallel I/F Controller	IC2	Transceiver for centronics IF that responds to IEEE1284 and ECP or more, data transfer, and 3.3 V drive.
Reset Regulator	IC1	Reset signal is generated under the following conditions. • Pressure reduction from 42 V line to 35.8 V. • Pressure reduction from 5 V line to 4.2 V line.
DRAM	IC8	16 Mbit DRAM with 2 CAS-type page access function. 3.3 V drive.
EEPROM	IC4	Makes back up of default setting values and parameters.
Motor Driver	IC6	Drives CR/PF motors, controls PWM by the program timer, drives 42 V.
Head Driver	IC7	Generates trapezoidal waveform, drives 42 V.
ASIC	IC10	Drives CPU (H8S/2323 base), internal 8 K bit RAM, internal MASK ROM, 24 Mhz, 3.3 V drive.

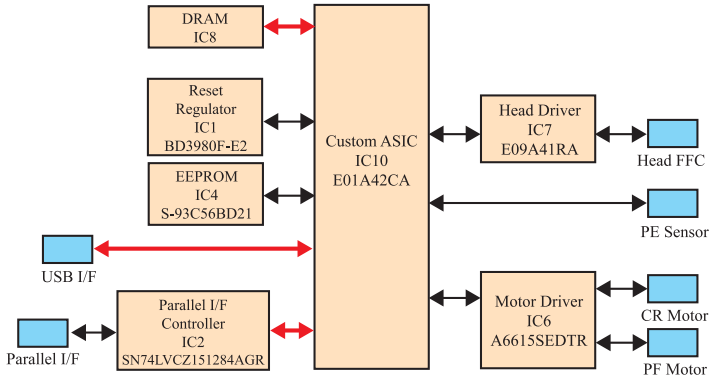


Figure 2-4. C528 Main Board Block Diagram

ICHAPTER

3

TROUBLESHOOTING

3.1 Overview

This chapter describes how to solve problems.

WARNING

- **Be careful to avoid electric shocks when checking the electrical circuit boards (C528 MAIN and C528 PSE boards) while the power is turned on.**
- **Touching an FET, transistor or heat sink with one hand while touching a metal part of the mechanism with the other hand could result in an electric shock, so carefully avoid this.**
- **After initial filling of ink has been repeated several times, immediate moving or tilting of the printer could result in leaking of ink that has not been completely absorbed by the Waste Ink Pad. When initial filling of ink has been repeated several times, check the ink remaining in the tip of the Waste Ink Tube and the waste ink not absorbed by the Waste Ink Pad before moving the printer.**

CHECK POINT

- **Disassembly and reassembly of parts is often required when identifying the causes of problems. The parts should be disassembled and re-assembled correctly while referring to Chapter 4 "DISASSEMBLY/ASSEMBLY" *(p.36)* so that the operation and status of each check item can be correctly verified.**
- **Some individual part and units may require adjustment once they are removed or replaced. If removing or replacing parts which have specific instructions for adjustment included in Chapter 4 "DISASSEMBLY/ASSEMBLY" *(p.36)*, be sure to make these adjustments after repairing the problem location.**

3.1.1 Specified Tools

This printer does not require any specified tools for troubleshooting.

3.1.2 Preliminary Checks

Before starting troubleshooting, be sure to verify that the following conditions are all met:

- ☐ The power supply voltage must be within the specification limits. (Measure the voltage at the wall socket.)
- ☐ The power code must be free from damage, short circuit or breakage, or miswiring in the power code.
- ☐ The printer must be grounded properly.
- ☐ The printer should not be located in a place where it can be exposed to too high or low temperature, too high or low humidity, or abrupt temperature change.
- ☐ The printer should not be located near waterworks, near humidifiers, near heaters or near flames, in a dusty atmosphere or in a place where the printer can be exposed to blast from an air conditioner.
- ☐ The printer should not be located in a place where volatile or inflammable gases are produced.
- ☐ The printer should not be located in a place where it can be exposed to direct rays of the sun.
- ☐ The printer must be located in a well-ventilated place.
- ☐ The printer must be placed on a strong and steady level table (without an inclination larger than five degrees).
- ☐ The paper used must conform to the specification.
- ☐ There is no error in handling of the printer.
- ☐ Check the inside of the printer, and remove foreign matters if any, such as paper clips, staples, bits of paper, paper dust or toner.
- ☐ Clean the inside of the printer and the rubber rolls.

3.2 Troubleshooting With LED Error Indications

LED error display, cause, and remedy are explained here.

Table 3-1. Troubleshooting With LED Error Indications

Error	LED status			Cause	Remedy
	Power	Paper	Ink		
Ink end/ No ink cartridge/ CSIC error	---	---	On	• Ink inside Bk, Y, M, C ink cartridges has run out. • Ink cartridge(s) is not installed. • Non-genuine ink cartridge(s) is installed.	• Check the ink cartridge(s) and reinstall it correctly. • Replace the ink cartridge(s) with a genuine one. • If there is a possibility of CSIC error, see 3.3 Troubleshooting for Motors and Sensors (p35).
Paper Out	---	On	---	• Paper loading operation is executed when there is no paper. • Papers stopped before the PE Sensor or could not be fed. • Papers are fed without being placed against the right edge guide. • Connector of the PE sensor is disconnected.	1. If there is no paper on the paper tray, load papers. 2. If the paper has stopped halfway, remove the paper, check if the paper is not bent, fan the paper, and load it against the edge guide. 3. Press the [Paper] switch to release the error.
Multi-feed error	---	On	---	• When performing duplex printing, blank paper is ejected. • The printer detected that the paper is too long upon ejection.	1. Remove the blank paper, or check the paper size. 2. Press the [Paper] switch to eject the paper and release the error.

Table 3-1. Troubleshooting With LED Error Indications

Error	LED status			Cause	Remedy
	Power	Paper	Ink		
Paper jam	---	Flashes	---	Even though paper feeding operation is carried out for predetermined times, leading edge or back-end of the paper could not be detected.	1. Press the [Paper] switch on the panel. 2. If paper jam occurred again after pressing the switch, open the printer cover and remove all the papers inside the printer and papers set on the hopper. 3. Making sure there is no paper inside the printer, load paper on the hopper and press [Paper].
Maintenance request (Waste ink overflow)	Off	Flashes alternately	Flashes alternately	As a result of cleaning and flushing, total emission of ink has exceeded the specific level.	Replace the waste ink pad, and reset the waste ink counter (protection counter A) using the adjustment program. Refer to **Chapter 6 "MAINTENANCE" *(p.92)*** for details.
Fatal error	Off	Flashes on high speed	Flashes on high speed	• Home position of the carriage could not be detected. • Abnormal external pressure is applied to the printer when the power is on. • Carriage movement is interfered during printing.	1. Turn the power off, wait for a few seconds, and turn the power back on again. 2. If the fatal error still appears, turn the power off, remove the papers on the hopper, and check the following: • Open the printer cover, check the ink cartridges, and reinstall them correctly. • Check is there is no foreign material or papers inside the printer. If there is any, remove them. 3. Turn the printer power on. 4. If the fatal error appears again, refer to 3.2.1 Fatal Error (p33) and examine/replace the parts.

3.2.1 Fatal Error

CHECK POINT

As the most recent fatal error (fatal error code) is stored in the EEPROM (Address: 0AH), it is possible to check the error by using the adjustment program.

Check the parts according to the contents of the fatal error, and replace the parts as necessary.

Classification	Item	Description	Remedy
DC Error	PID aveTi max Error	Something is wrong with the CR motor.	Check the parts listed below, and replace them as necessary. • CR Motor • CR Encoder • CR Encoder Scale • Timing Belt • Main Board • Connectors and harnesses of each motor or encoder
	PID Overspeed Error	Carriage movement speed is abnormal.	
	PID Lock Error	Carriage has been locked for a certain period of time due to external factors.	
	PID Reverse Rotation Detection Error	The number of the carriage reverse rotation has exceeded the predetermined times due to external factors.	
	Encoder Abnormality Error (CR Driving Time Over Error)	One-pass movement cannot be completed though the CR motor has been driving longer than the specified time.	
	Load Positioning Overspeed Error	Abnormal carriage movement speed is detected during load positioning control.	
	Load Positioning Lock Error	It is detected that the carriage has been locked for a certain period of time during load positioning control.	
	Load Positioning Cumulative Movement Distance Error	The cumulative movement distance during the load positioning control has exceeded the given level	
Head Error	Transistor Environment Temperature Abnormality Error	The environment temperature of the transistor that generates head driving waveform on the Main board is abnormal.	Check the parts listed below, and replace them as necessary. • Printhead • Head FFC • Main Board
	Pre-printing X-HOT Detection Error	During pre-printing X-Hot detection, the temperature of the head driver IC has exceeded the given level for more than two seconds.	
	Post-flushing X-HOT Detection Error	During post-printing X-Hot detection, the temperature of the head driver IC has exceeded the given level for more than two seconds.	

Classification	Item	Description	Remedy
Sequence Error	Left Frame Shock Detection Error	Abnormal pressure has being added to the carriage due to external factors.	Make sure that there is no obstruction on the carriage moving path, check the parts listed below, and replace them as necessary. • CR Motor • CR Encoder • CR Encoder Scale • Timing Belt • Main Board
	Between Left Frame and [TF] Shock Detection Error		
	Between [TF] and [HOME] Shock Detection Error		

3.3 Troubleshooting for Motors and Sensors

☐ Motor

Table 3-2. Motor Resistance and Check Points

Motor name	Type	Location	Check point	Resistance
CR motor	Motor with DC brush	CN5	Pin 1&3	22.65 Ω ± 10%
PF motor	4-phase, 200-pole HB stepping motor	CN6	Pin 1&3 Pin 2&4	3.0 Ω ± 10%

☐ Sensor

Table 3-3. Sensor Check

Sensor name	Detecting system	Location	Signal level	Sensor status
PE sensor	Transmission photo interrupter	CN9 pin 1&2	2.4 V or more	Paper loaded
			0.4 V or less	No paper
PW sensor	Reflective photo interrupter	T.B.D	Low	Low: Paper loaded
			High	High: No paper

CHAPTER

4

DISASSEMBLY/ASSEMBLY

4.1 Overview

This section describes procedures for disassembling the main components of the product. Unless otherwise specified, disassembled units or components can be reassembled by reversing the disassembly procedure.

Procedures which, if not strictly observed, could result in personal injury are described under the heading "WARNING".

"CAUTION" signals a precaution which, if ignored, could result in damage to equipment.

Important tips for procedures are described under the heading "CHECK POINT".

If the assembly procedure is different from the reversed disassembly procedure, the correct procedure is described under the heading "REASSEMBLY".

Any adjustments required after reassembly of components or parts are described under the heading "ADJUSTMENT REQUIRED".

When you have to remove any components or parts that are not described in this chapter, refer to the exploded diagrams in the appendix.

4.1.1 Precautions

See the precautions given under the handling "WARNING" and "CAUTION" in the following columns when disassembling or assembling EPSON Stylus C87/C88/D88.

- **Disconnect the power cable before disassembling or assembling the printer. If you need to work on the printer with power applied, strictly follow the instructions in this manual.**
- **Always wear gloves for disassembly and reassembly to avoid injury from sharp metal edges.**
- **To protect sensitive microprocessors and circuitry, use static discharge equipment, such as anti-static wrist straps, when accessing internal components.**

- **Make sure that there is enough work space for disassembly/ reassembly.**
- **Use only recommended tools for disassembling, assembling or adjusting the printer.**
- **Observe the specified torque when tightening screws.**
- **Apply lubricants as specified.**
  (See Chapter 6 "Lubrication" *(p.95)* for details.)
- **The pictures of the product in this manual are of prototype model. There may be differences in configurations or colors compared to the actual model, however, it has no effect on dissasembly/assembly.**
- **When using compressed air products; such as air duster, for cleaning during repair and maintenance, the use of such products containing flammable gas is prohibited.**

4.1.2 Tools

Use only specified tools to avoid damaging the printer.

Table 4-1. Tools

Name	Supplier	Parts No.
(+) Phillips screwdriver #0	EPSON	1080531
(+) Phillips screwdriver #1	EPSON	1080530
Flathead screwdriver	EPSON	1080527
Tweezer	EPSON	1080561
Longnose pilers	EPSON	1080564
Hexagonal Box Driver [B741700100]	EPSON	1080584

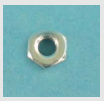
4.1.3 Screws (T.B.D)

Screws used on the Stylus C87/C88/D88 are shown below.

Table 4-2. Screws

No.	Image	Name	Type
1		C.B.S. 3 x 6	C.B.S-TITE SCREW
2		C.B.S. 3x 10	C.B.S-TITE SCREW
3		C.B.S. 3 x 14	C.B.S-TITE SCREW
4		C.B.S.(P4) 3 x 6	C.B.S-TITE (P4) SCREW
5		C.B.P. 2.5 x 8	C.B.P-TITE SCREW
6		C.B.P. 3 x 8	C.B.P-TITE SCREW
7		C.B.P. (P2) 3 x 8	C.B.P-TITE (P2) SCREW

Table 4-2. Screws

No.	Image	Name	Type
8		C.P. 3 x 4	C.P. SCREW
9		C.P.B. (P1) 1.7 x 5	T.B.D
10		Hexagon nut, normal, M3	T.B.D

4.1.4 Work Completion Check

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

Table 4-3. Work Completion Check

Classification	Item	Check Point	Status
Main Unit	Self-test	Is the operation normal?	Checked Not necessary
	ON-line Test	Is the printing successful	Checked Not necessary
	Printhead	Is ink discharged normally from all the nozzles?	Checked Not necessary
	Carriage Mechanism	Does it move smoothly?	Checked Not necessary
		Is there any abnormal noise during its operation?	Checked Not necessary
		Is there any dirt or foreign objects on the CR Guide Shaft?	Checked Not necessary
		Is the CR Motor at the correct temperature? (Not too hot to touch?)	Checked Not necessary
	Paper Feeding Mchanism	Is paper advanced smoothly? No paper jamming? No paper skew? No multiple feeding? No abnormal noise?	Checked Not necessary
		Is the PF Motor at correct temperature?	Checked Not necessary
		Is the paper path free of any obstructions?	Checked Not necessary
Adjustment	Specified Adjustment	Are all the adjustment done correctly?	Checked Not necessary
Lubrication	Specified Lubrication	Are all the lubrication made at the specified points?	Checked Not necessary
		Is the amount of lubrication correct?	Checked Not necessary

Table 4-3. Work Completion Check

Classification	Item	Check Point	Status
Function	ROM Version	Version:	Checked Not necessary
Packing	Ink Cartridge	Are the ink cartridges installed correctly?	Checked Not necessary
	Protective materials	Have all relevant protective materials been attached to the printer?	Checked Not necessary
Others	Attachments, Accessories	Have all the relevant items been included in the package?	Checked Not necessary

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've basically forbidden to remove Housing, Lower 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.
For this reason, if you want to replace Ink system/PF motor, we recommend to replace with new Printer mechanism with Housing, Lower. On these models, you have to remove Housing, Lower from printer mechanism when replacing Waste Ink Pad with a new one.
Therefore, we clarify caution regarding assembling/disassembling of the printer mechanism without Housing, Lower, and how to ensure of quality on repaired products in 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.

[Service treatment]

Confirm that there is no gap between main frame and Housing, Lower.

[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.
- Make sure that there is no gap between main frame and Housing, Lower.

[Y-axis direction]

Make sure that cut-out portion of main frame is correctly placed on the square protrusion of Housing, Lower.

[Z-axis direction]

- Make sure that there is no gap between main frame and Housing, Lower.
- Make sure that the left side of Printer mechanism is correctly fixed by two tabs.

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

[Reason]

There is a possibility that printing failure/operation failure occurs by guide rail deformation.

[Service treatment]

- Do not remove [Mounting Plate, M/B] from Printer mechanism.
- Hold up the specified position of main frame to avoid the deformation.

(c) How to assemble of ASF unit/Circuit 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 with 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) IC holder

(a) Handling of IC holder

[Reason]

If IC holder is damaged in assembling/disassembling of your repair, there is a possibility that vital problem occurs in user's further operation.

[Service treatment]

Released two hooks of IC holder from the inside of IC holder by the 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 Dissasembly Procedures

This section explains the procedures for disassembling the product.
Unless otherwise stated, reassembly should be carried out in the reverse order of the disassembly procedure.
For detailed engagement relations among main components, refer to the exploded diagrams in the Appendix.
When disassembling each unit, refer to the pages described in the chart below.

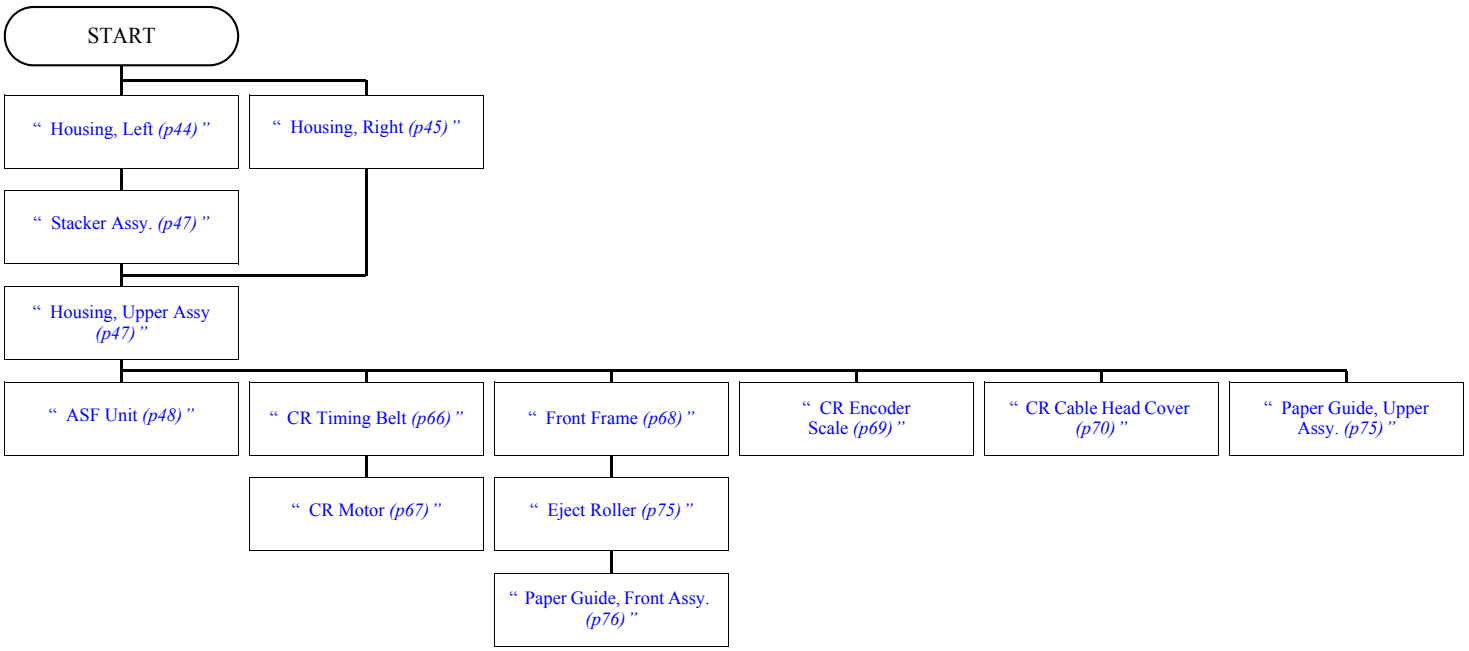
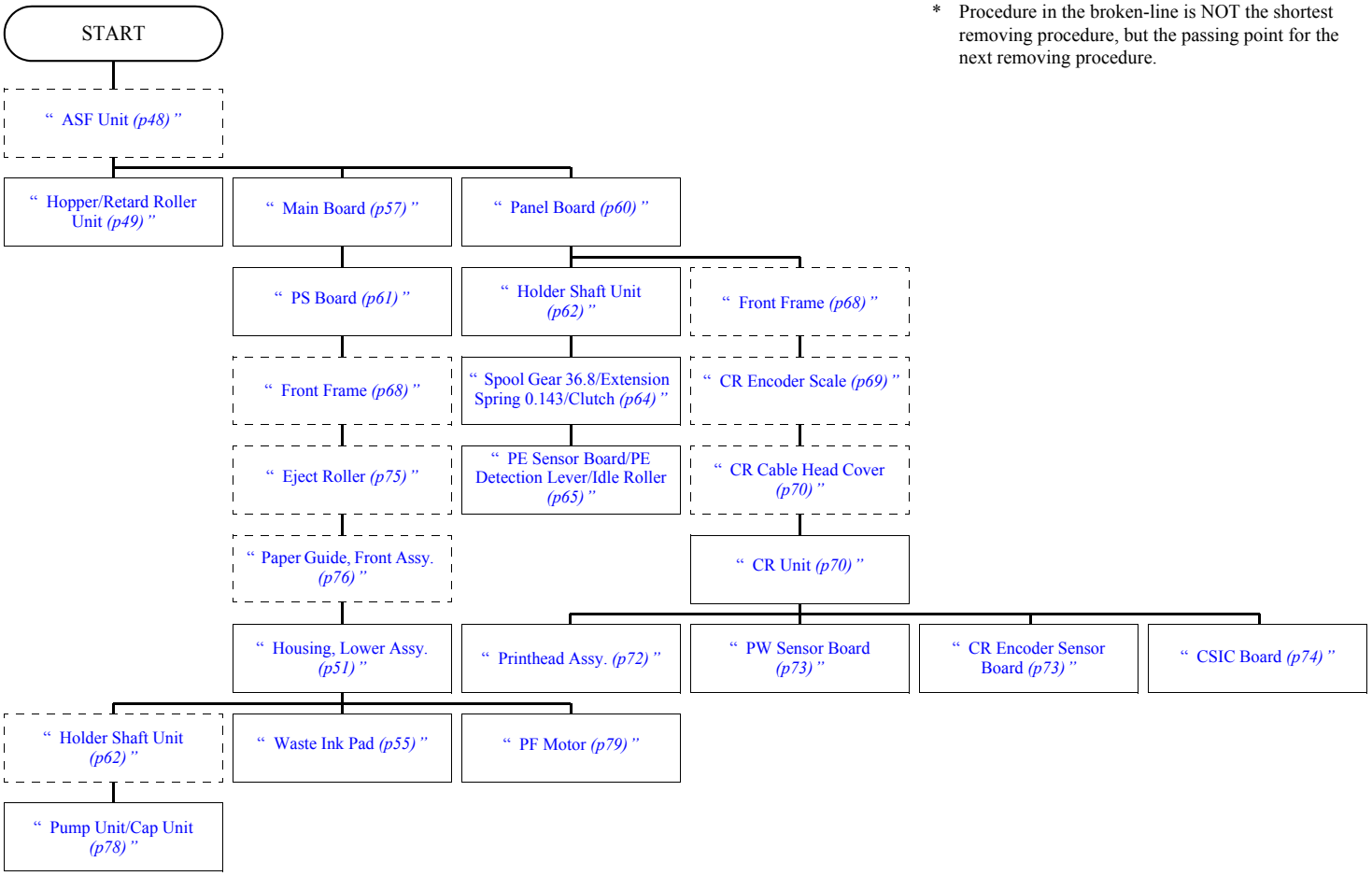


Figure 4-1. Disassembling Flowchart (1)



* Procedure in the broken-line is NOT the shortest removing procedure, but the passing point for the next removing procedure.

Figure 4-2. Disassembling Procedure (2)

4.3.1 Removing Housings

CAUTION

- **Do not damage the tabs in removing the Housings.**
- **Do not tilt the printer too much when removing the Housings because ink may flow if the Carriage unit is not at the home position.**

4.3.1.1 Housing, Left

1) Insert a ruler or a similar tool to the notch on the bottom of the main unit to release the tab of the I/F cover, and remove the I/F cover.

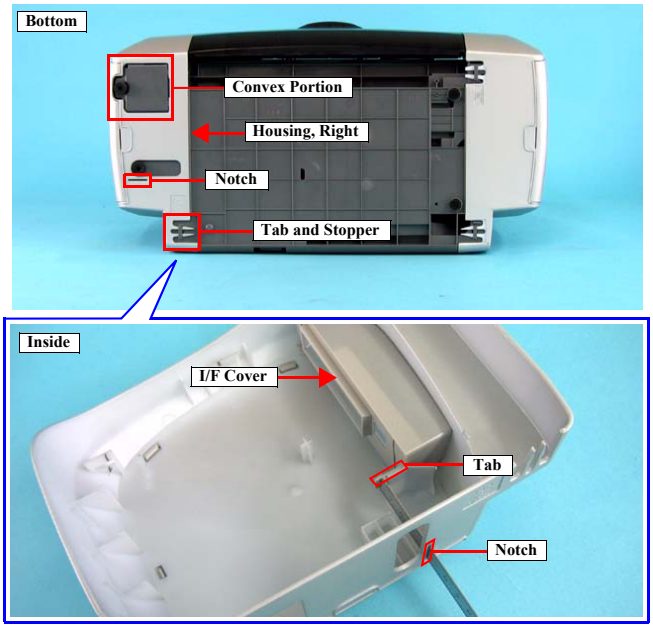


Figure 4-3. Removing Housing, Left (1)

2) Insert a flathead driver or a similar tool to the notch on the backside of the main unit, and release the tab.

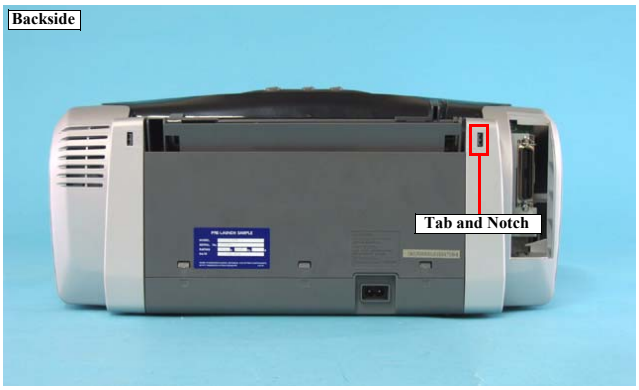


Figure 4-4. Removing Housing, Left (2)

3) Release the tab on the bottom of the main unit from the stopper.

4) Open the cover of the Housing, Upper Assy, release the two tabs, and remove the Housing, Left.

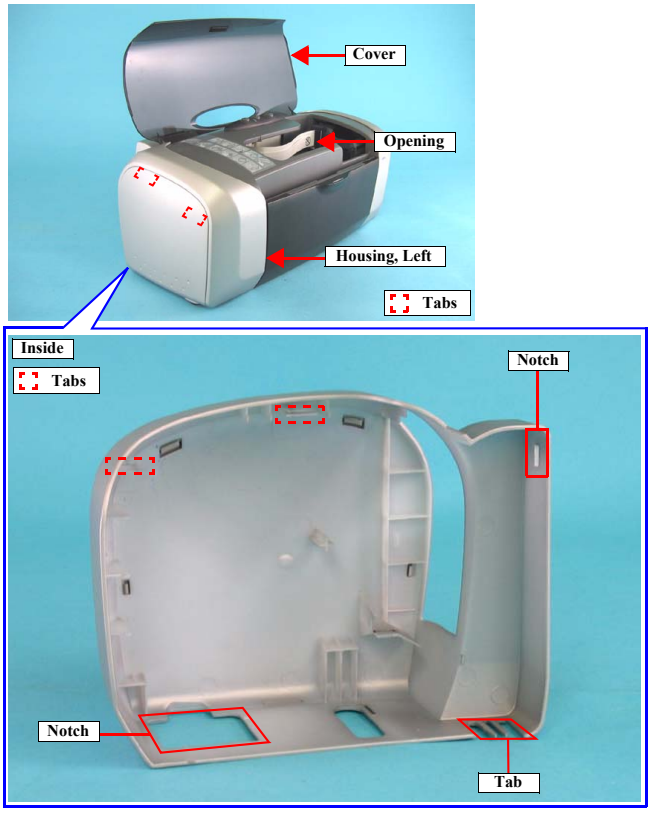


Figure 4-5. Removing Housing, Left (3)

4.3.1.2 Housing, Right

1) Insert a flathead screwdriver or a similar tool to the notch on the backside of the main unit, and release the tab.

Figure 4-6. Removing Housing, Right (1)

2) Release the two tabs on the bottom of the main unit from the stopper.

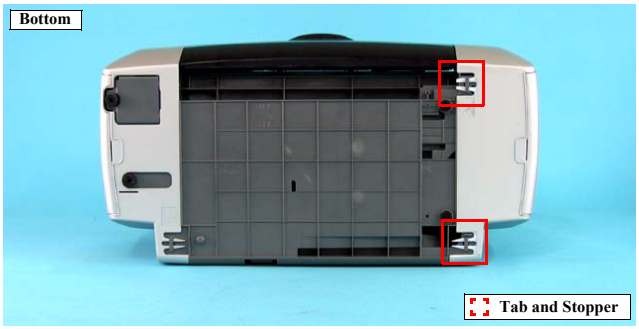


Figure 4-7. Removing Housing, Right (2)

3) Open the cover of the Housing, Upper Assy.

4) Press the CR lock lever to the rear of the main unit to release the lock, and move the CR unit to the center of the printer.

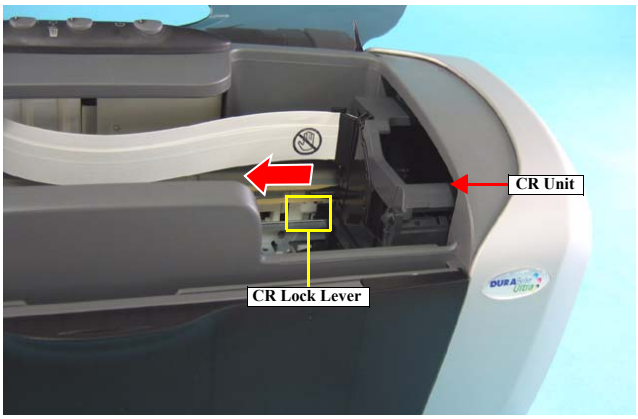


Figure 4-8. Releasing CR Lock Lever

5) Release the two tabs and remove the Housing, Right.

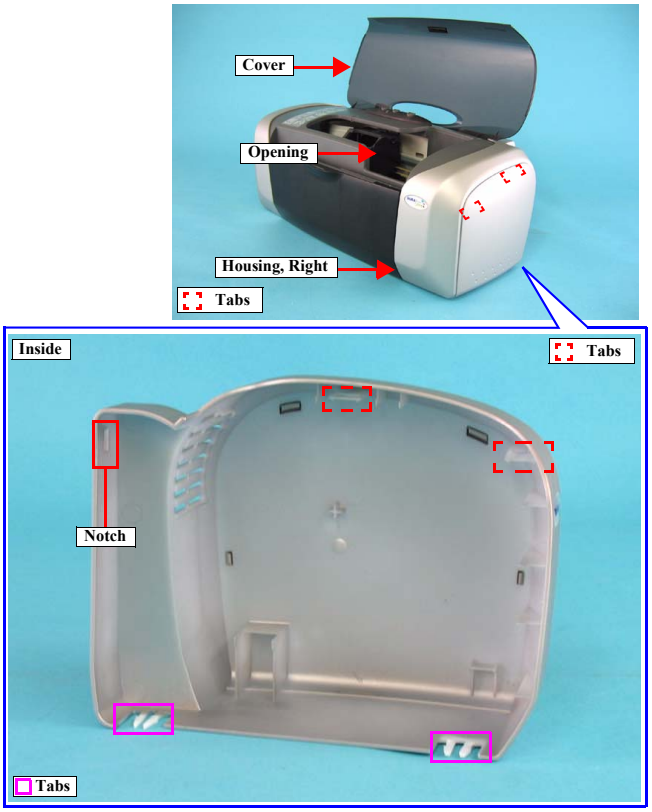


Figure 4-9. Removing Housing, Right (3)

4.3.1.3 Stacker Assy.

1) Remove the Housing, Left. (p44)
2) Open the Stacker Assy.
3) Push the shaft located on the left side of the Stacker Assy. with a flathead screwdriver or a similar tool, release the shaft from the slot of the Housing, Lower, and remove the Stacker Assy.

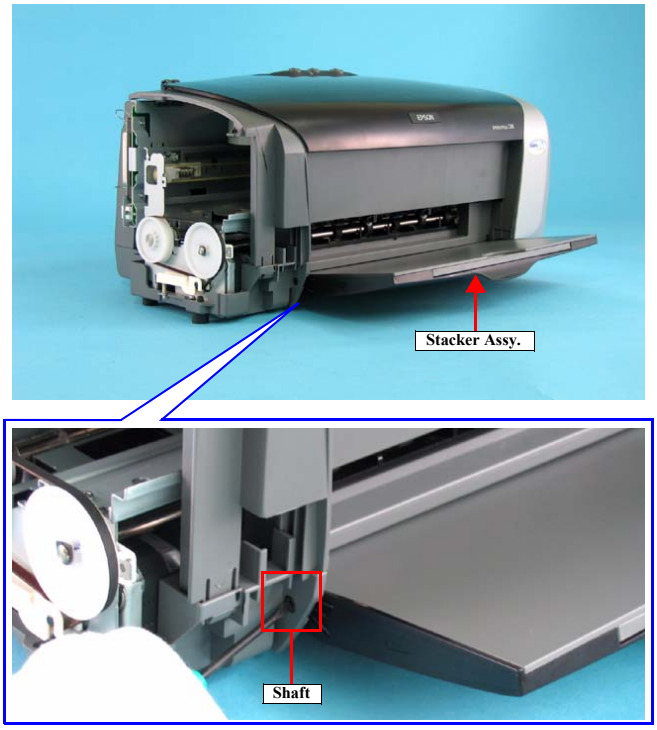


Figure 4-10. Removing Stacker Assy.

4.3.1.4 Housing, Upper Assy

1) Remove the Housing, Right. (p45)
2) Remove the Stacker Assy.. (p47)
3) Release the two tabs on the front side of the main unit.

Figure 4-11. Removing Housing, Upper Assy. (1)

4) Insert a flathead screwdriver or a similar tool to the notch on the backside of the main unit, release the three tabs, and remove the Housing, Upper Assy.

Figure 4-12. Removing Housing, Upper Assy. (2)

4.3.1.5 ASF Unit

1) Remove the Housing, Upper Assy. (p47)

2) Remove the three screws that secure the ASF Unit to the main unit, and remove the ASF unit.

- C.B.S. 3 x 6: 1
- C.B.S. (P4) 3 x 6 1
- C.B.P. 3 x 8: 1

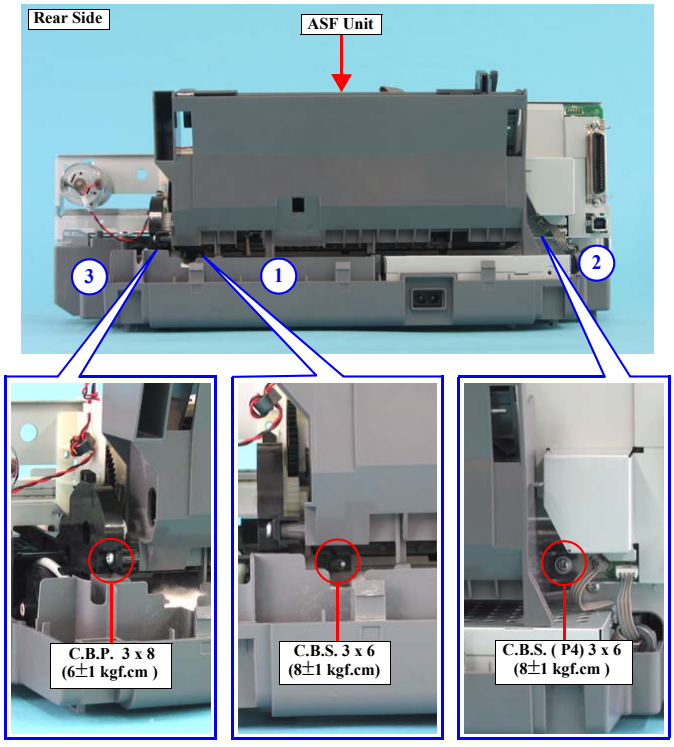


Figure 4-13. Removing ASF Unit

REASSEMBLY

When installing the ASF Unit to the main unit, follow the steps described below.

1. **Make sure to match the shaft of the ASF Unit with the bearing of the Pump Unit.**
2. **Make sure to match the guide pin of the ASF Unit with the positioning hole of the main unit.**
3. **Secure the screws in the order shown in Figure 4-13.**

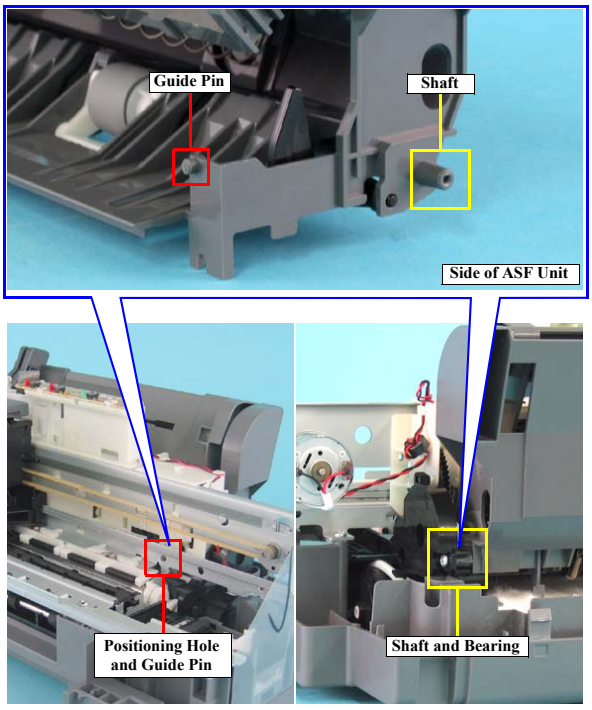


Figure 4-14. Installing ASF Unit

ADJUSTMENT REQUIRED

- **When I/C Holder or Printhead Assy. is removed or replaced with a new one, the following adjustment must be performed in the order below.**
  1) **Top Margin Adjustment**
  2) **First Dot Adjustment**
  3) **PF Adjustment**
- **When you replace the ASF unit with a new one, lubricate it as specified. See Chapter 6 "Lubrication" *(p.95)* for details.**

4.3.1.6 Hopper/Retard Roller Unit

CAUTION

Do not touch the cork on the Retard Roller and the Hopper.

1) Remove the ASF Unit. (p48)
2) Lift up the Hopper toward the direction of the arrow, release the two tabs, and remove the spring and the hopper from the ASF Frame.

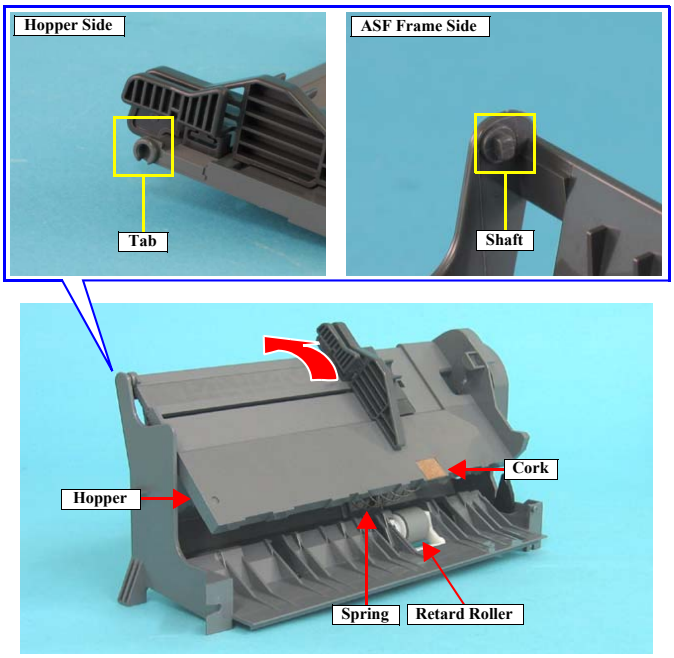


Figure 4-15. Removing Hopper

3) Remove Extension Spring 0.585 from both the ASF Frame and the Paper Back Lever.
4) Remove the Paper Back Lever from the bearing of the ASF frame.
5) Remove Compression Spring 1.88 from the ASF Frame, and remove the Retard Roller Unit.

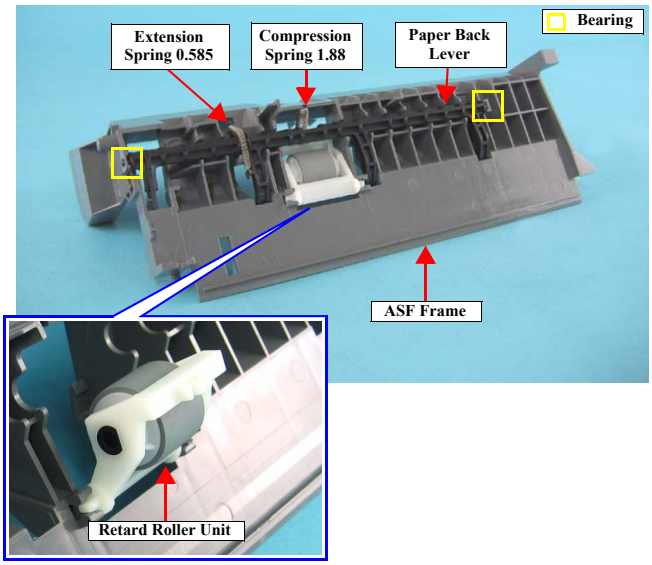


Figure 4-16. Removing Retard Roller Unit

REASSEMBLY

■ **When installing the Retard Roller or the Paper Back Lever, attach the two springs as described below.**
- **Extension Spring 0.585**
  Attach the spring to the tab of the ASF Frame and the one of the Paper Back Lever.
- **Compression Spring 1.88**
  Attach the spring to the boss of the ASF Frame and the one of the Retard Roller Unit.

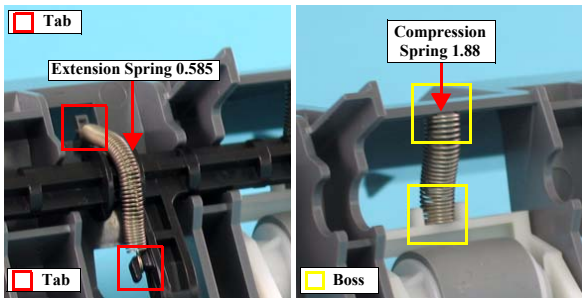


Figure 4-17. Assembling ASF Frame(1)

■ **When installing the spring between the Hopper and the ASF Frame, match the spring with the positioning hole (circular dent) of the Hopper and the one of the ASF Frame.**

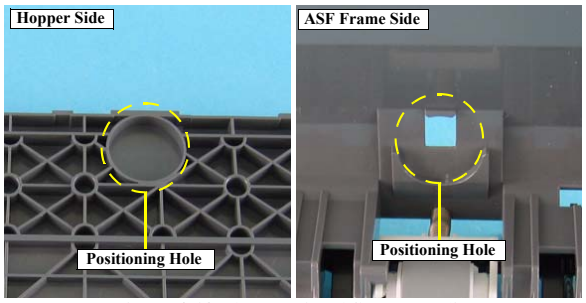


Figure 4-18. Assembling ASF Frame (2)

4.3.1.7 Housing, Lower Assy.

CAUTION

Do not remove the Housing, Lower Assy. more than is necessary.

1) Remove the Paper Guide, Front Assy.. (p76)
2) Peel and remove the Right Frame Sheet from the printer mechanism.

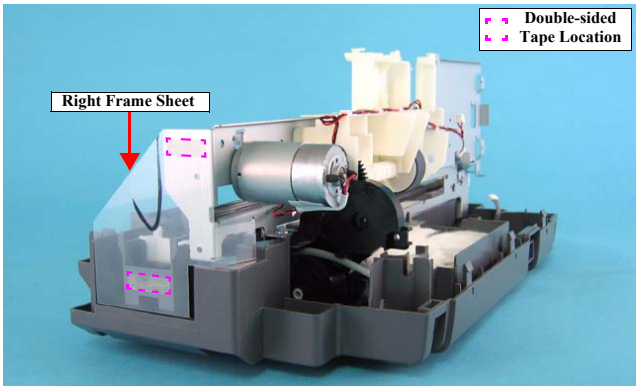


Figure 4-19. Removing Right Frame Sheet

3) Remove the two rubber feet on the PF Motor side.

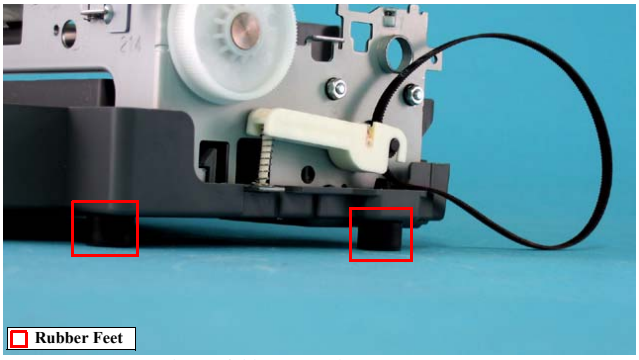


Figure 4-20. Removing Rubber Feet

CAUTION

When removing the Waste Ink Tube from the Waste Ink Pad, pay attention not to spill the ink.

4) Remove the Waste Ink tube from both the groove of the Housing, Lower Assy and the Waste Ink Pad.

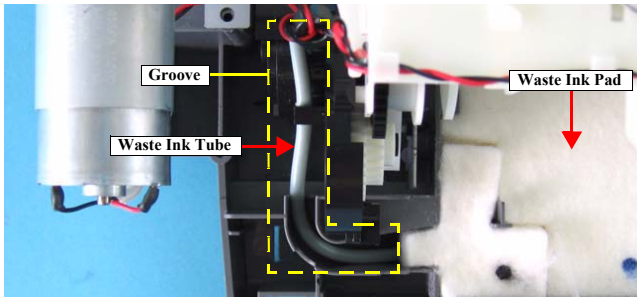


Figure 4-21. Removing Waste Ink Tube

5) Remove the Cap Unit from the two guide pins of the Housing, Lower Assy.

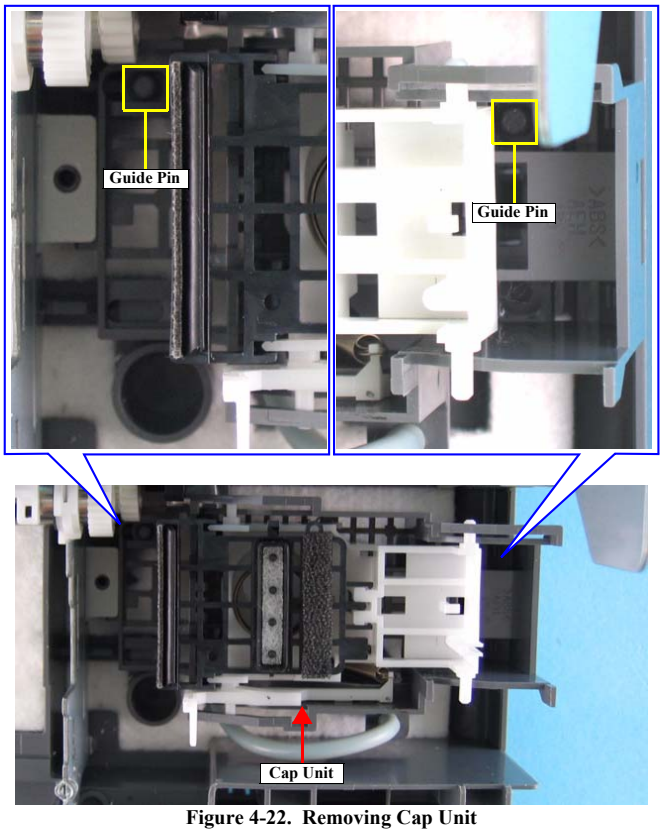


Figure 4-22. Removing Cap Unit

6) Remove the four screws that secure the Printer Mechanism to the Housing, Lower Assy.

- C.B.P. 3 x 8: 3
- C.B.P.(P2) 3 x 8: 1

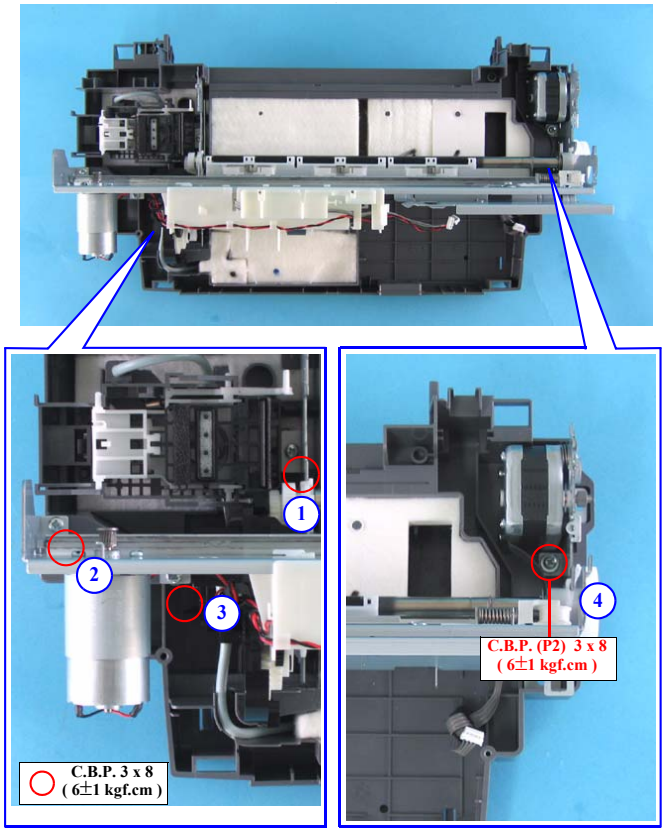


Figure 4-23. Removing Housing Lower Assy. (1)

CAUTION

When performing the following work, be sure to hold the places indicated with dotted circles to avoid deformation of the Main Unit Frame.

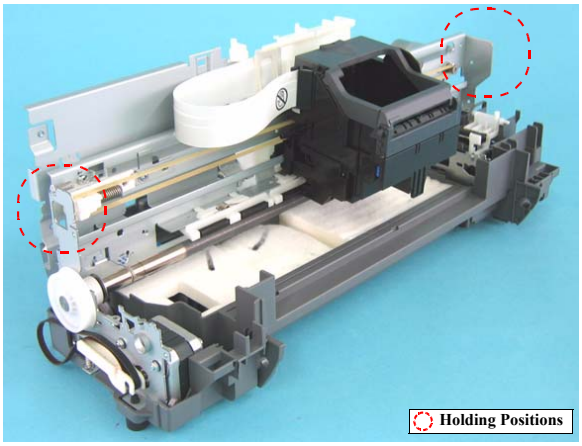


Figure 4-24. Holding Positions of Housing, Lower Assy.

7) Release the two tabs on the PF Motor side of the Housing, Lower Assy, and remove the Housing, Lower Assy.

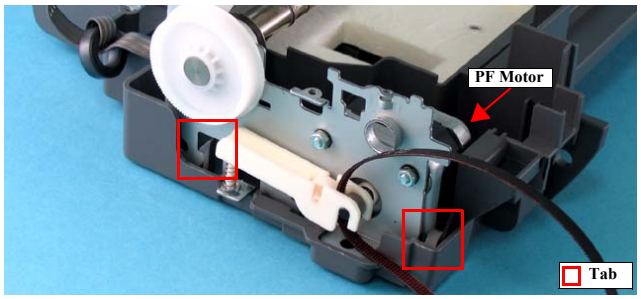


Figure 4-25. Removing Housing, Lower Assy. (2)

REASSEMBLY

■ **To ensure the assembling accuracy, you have to control the assembled standard position of the Main Frame against X/Y/Z-axis direction as follows.**

[X-axis direction]

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

[Y-axis direction]

- **Make sure that cut-out portion of main frame is correctly placed on the square protrusion of Housing, Lower.**

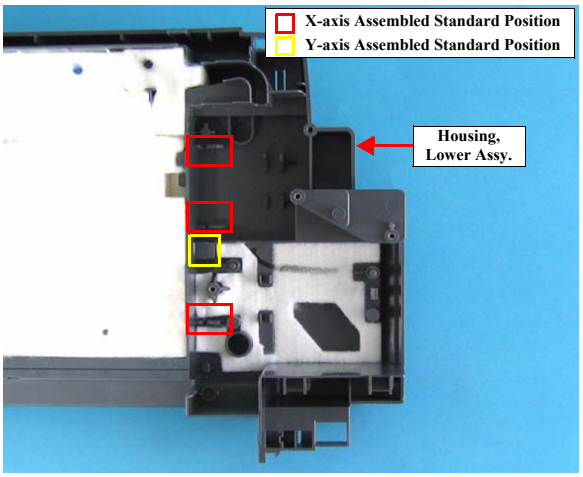


Figure 4-26. X and Y-axis Assembled Standard Position

REASSEMBLY

[Z-axis direction]

- Make sure that there is no gap between main frame and Housing, Lower.
- Make sure that the left side of Printer Mechanism is correctly fixed with two tabs.

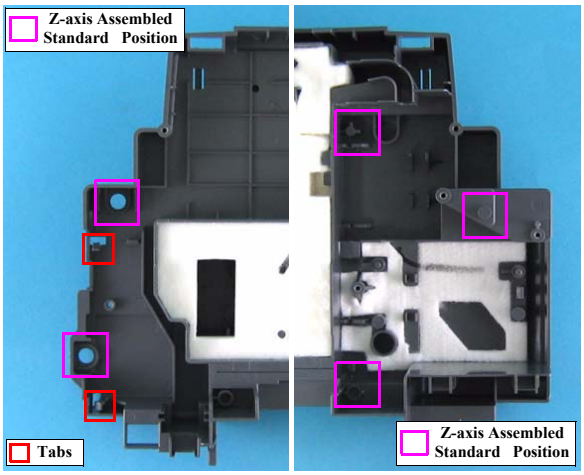


Figure 4-27. Z-axis Assembled Standard Position

REASSEMBLY

■ When installing the Cap Unit, pay attention to the following instructions:

- Route the Ink Tube so that the tube is fixed with the tabs of the Housing, Lower Assy.
- Make sure that the two bosses of the Cap Unit are located under the Main Unit Frame.

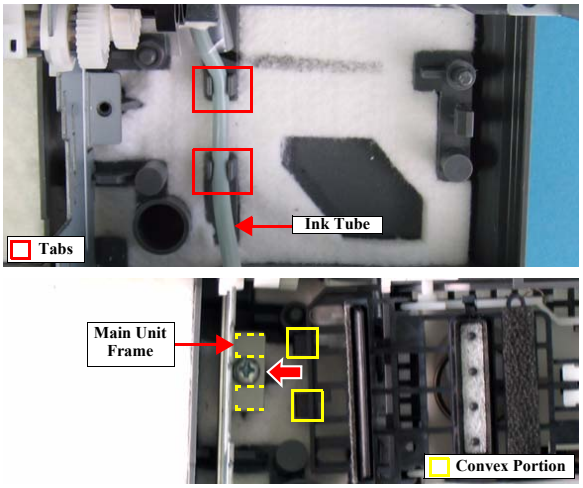


Figure 4-28. Installing Cap Unit

REASSEMBLY

- When installing the Pump Unit, route the Waste Ink Tube as shown below, and place it under the protective sheet.

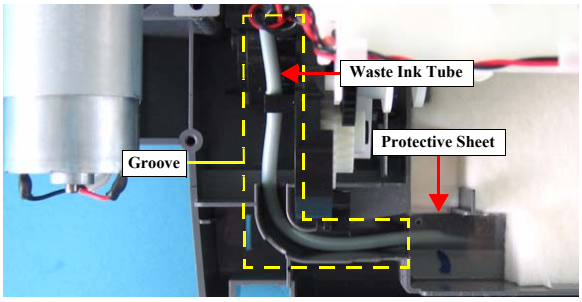


Figure 4-29. Routing Waste Ink Tube

- When installing the Main Frame, match the two guide pins with the two positioning holes, and secure them with screws in the order shown in Figure 4-23.

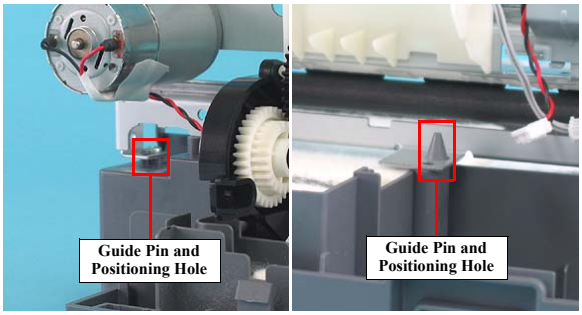


Figure 4-30. Installing Printer Mechanism

- Attach the Right Frame Sheet with double-sided tape as shown in Figure 4-19.

4.3.1.8 Waste Ink Pad

1) Remove the Housing, Lower Assy.. (p51)
2) Remove the nine Waste Ink Pad and the protective sheet from the Housing, Lower Assy.

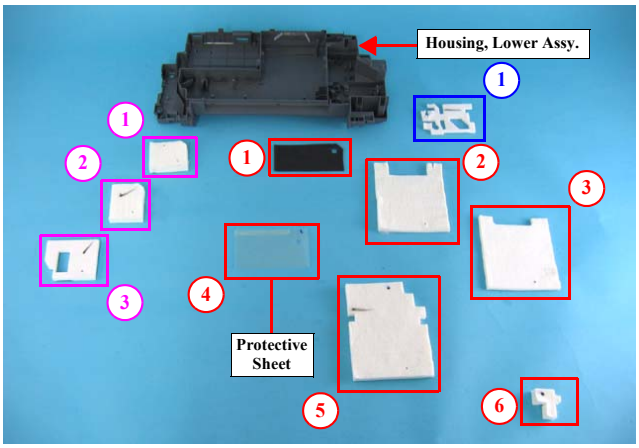


Figure 4-31. Removing Waste Ink Pad

REASSEMBLY

Attach the Waste Ink Pads in the order shown in Figure 4-31, Figure 4-32, and Figure 4-33.
Waste Ink Pads ② and the Protective Sheet should be secured with double-sided tape as shown in Figure 4-32 and Figure 4-33.

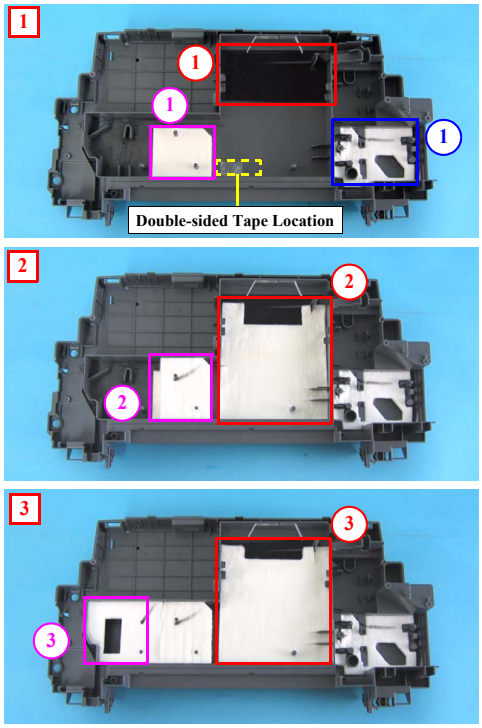


Figure 4-32. Installing Waste Ink Pad (1)

REASSEMBLY

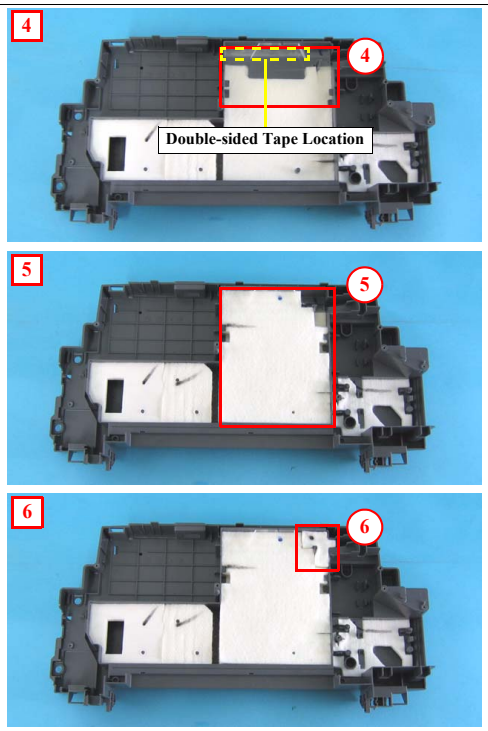


Figure 4-33. Installing Waste Ink Pad (2)

4.3.2 Removing Boards

4.3.2.1 Main Board

1) Remove the ASF Unit. (p48)
2) Remove the Clump Core from the Main Unit.

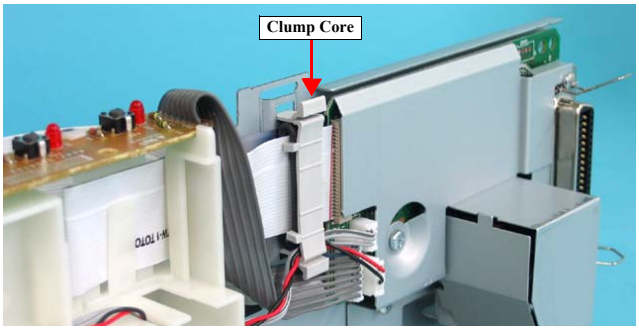


Figure 4-34. Removing Clump Core

3) Disconnect all the connectors from the Main Board.

CN2: Power Supply Cable
CN4: Panel Board Connector
CN5: CR Motor Connector
CN6: PF Motor Connector
CN7: CR Encoder FFC
CN8: Head FFC
CN9: PF Sensor Cable

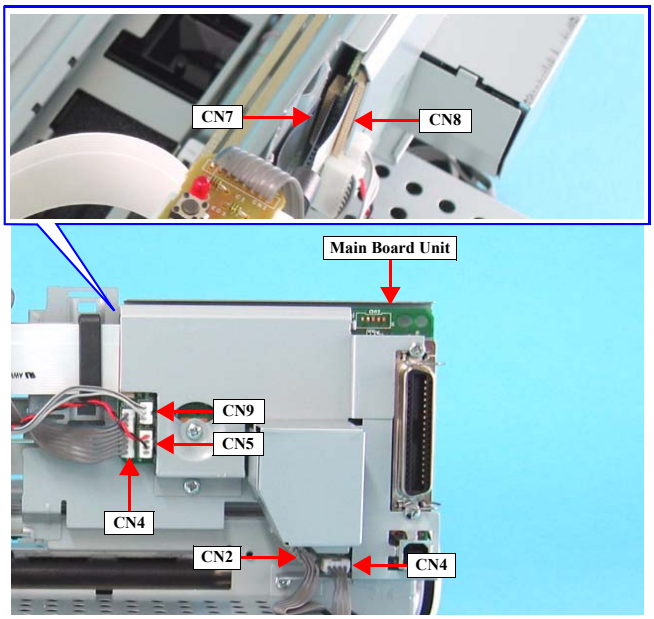


Figure 4-35. Removing Main Board (1)

4) Remove the four screws that secure the Main Board Unit to the Main Unit, and remove the Main Board Unit.

- C.B.S. 3 x 14: 2
- C.B.S. 3 x 10: 1
- C.B.S. 3 x 6: 1

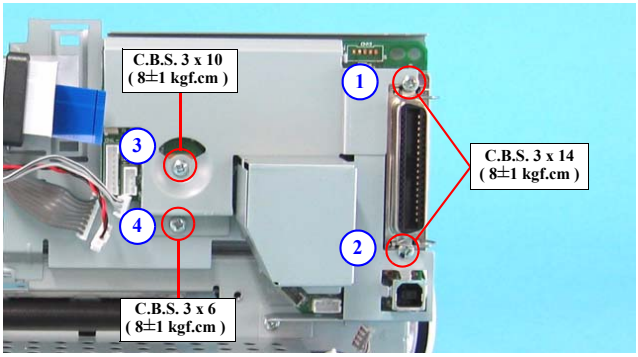


Figure 4-36. Removing Main Board (2)

5) Remove the Main Board Cover from the Main Board Unit.

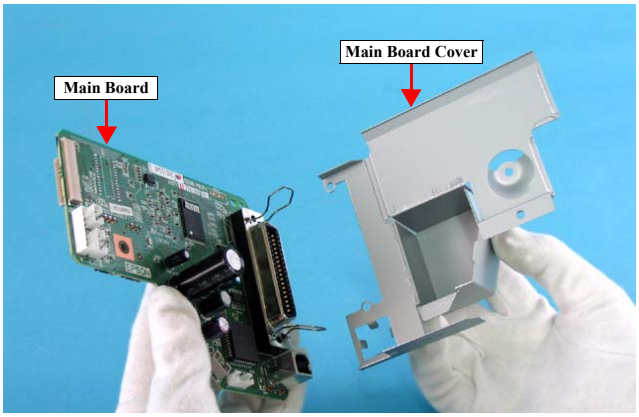


Figure 4-37. Removing Main Board (3)

REASSEMBLY

- **When installing the Main Board Unit to the Main Unit, Secure the screws in the order shown in Figure 4-36.**
- **The Clump Core should be attached together with the connector cables (CN5, CN7, CN8, and CN9) and the Ferrite Core. When attaching the Clump Core, pay attention not to confuse left and right.**

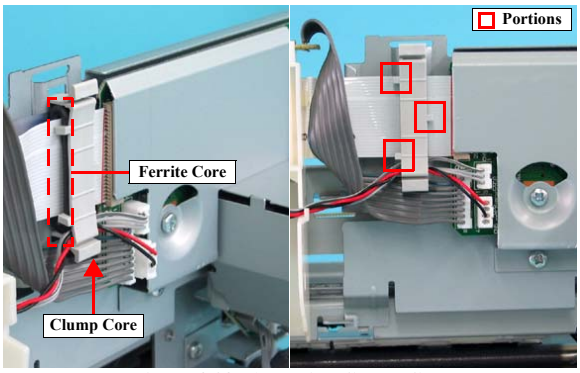


Figure 4-38. Attaching Clump Core

ADJUSTMENT REQUIRED

When replacing the Main board with new one, perform the following service items.

- **If the read-out operation succeeds by adjustment program from defective main board, replace with new board and write the read out data to new one.**
  1. **Ink consumption counter**
  2. **Waste ink pad counter**
  3. **Head ID Input**
  4. **Bi-D Adjustment**
  5. **Top Margin Adjustment**
  6. **First Dot Adjustment**
  7. **PW Sensor adjustment**

ADJUSTMENT REQUIRED

8. **USB ID Input**
9. **Market ID Setting**
10. **Head Angular Adjustment**
11. **PF Adjustment**
12. **Offset input for CR Motor Calorific Limitation**

■ **If the read-out operation is not able to succeed by adjustment program from defective main board, perform the following service items after replacing main board with new one.**

1. **Replace the Waste drain ink pad with a new one.**
2. **Head ID Input**
3. **Bi-D Adjustment**
4. **Top Margin Adjustment**
5. **First Dot Adjustment**
6. **PW Sensor adjustment**
7. **USB ID Input**
8. **Market ID Setting**
9. **Head Angular Adjustment**
10. **PF Adjustment**
11. **Offset input for CR Motor Calorific Limitation**

4.3.2.2 Panel Board

1) Remove the ASF Unit. (p48)
2) Remove the Clump Core from the fromt the Main Unit (See 4.3.2.1 Removing Main Board Step 2).
3) Disconnect the three connectors from the Main Board (See 4.3.2.1 Removing Main Board Step 3).

   CN5: CR Motor Connector
   CN9: PE Sensor Cable
   CN4: Panel Board Connector
4) Release the Panel Board from the two tabs and the notch of the Holder Shaft Unit.

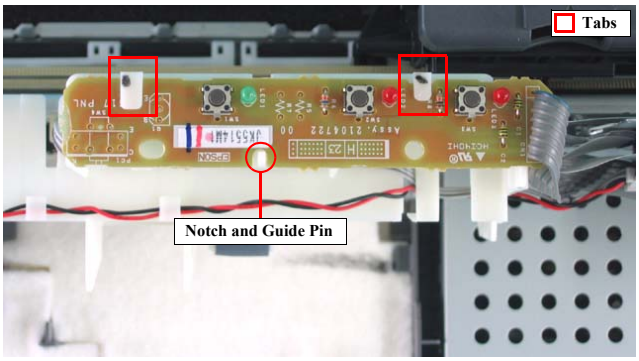


Figure 4-39. Removing Panel Board

When installing the Panel Board, make sure to hitch the Panel Board Connector to the tab of the Holder Shaft Unit.

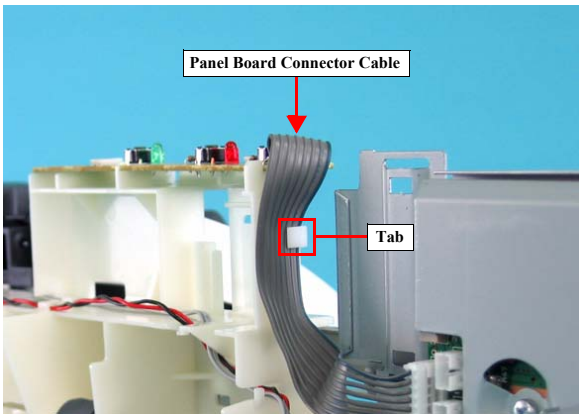


Figure 4-40. Routing Panel Board Connector

4.3.2.3 PS Board

1) Remove the Main Board. (p57)

2) Remove the three screws that secure the PS Board Unit to the Main Unit, and remove the PS Board Unit.

- C.B.P. 3 x 8: 2
- C.B.S. 3 x 6: 1

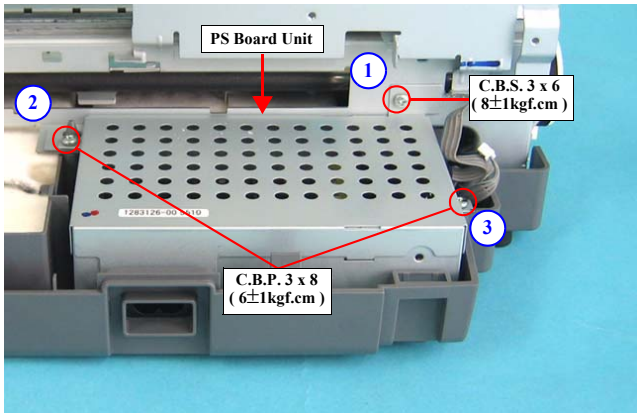


Figure 4-41. Removing PS Board

3) Release the two tabs on both sides of the PS Board Unit, and remove the PS Board Frame, Upper.

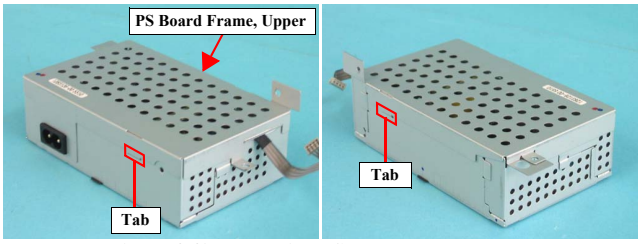


Figure 4-42. Removing PS Board Frame, Upper

4) Remove the four screws that secure the PS Board to the PS Board Frame, Lower, and remove the PS Board.

- C.B.S. 3 x 6: 4

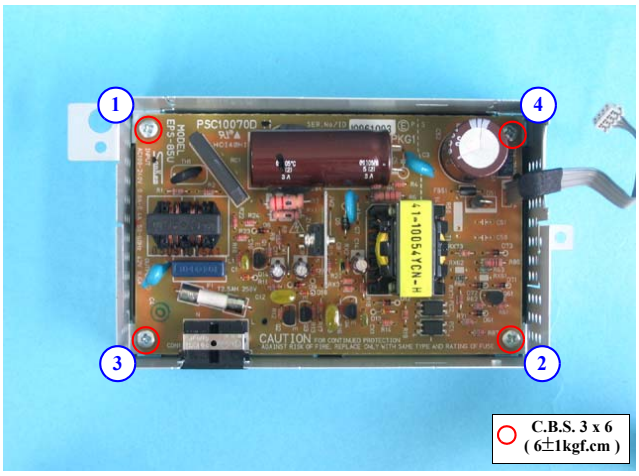


Figure 4-43. Removing PS Board

REASSEMBLY

- **When installing the PS Board to the PS Board Frame, Lower, secure the screws in the order shown in Figure 4-43.**
- **When installing PS Board Unit to the Main Unit, secure the screws in the order shown in Figure 4-41.**

ADJUSTMENT REQUIRED

When PS board unit is removed or replaced with new one, the following adjustment must be performed.

- **Offset input for CR Motor Calorific Limitation**

4.3.3 Disassembling Printer Mechanism

4.3.3.1 Printer Mechanism

Follow the following steps to bring out the Printer Mechanism.

1) Remove the ASF Unit. (p48)
2) Remove the Main Board. (p57)
3) Remove the Panel Board. (p60)
4) Remove the PS Board. (p61)
5) Remove the Housing, Lower Assy.. (p51)

4.3.3.2 Holder Shaft Unit

1) Remove the Panel Board. (p60)
2) Move the CR Unit to the left side of the printer.

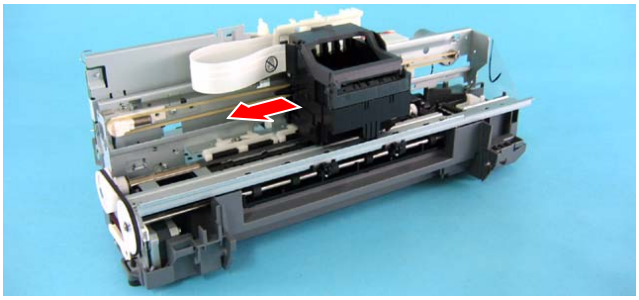


Figure 4-44. Moving CR Unit

3) Disconnect the two connectors from the Main Board. (See 4.3.2.1 Removing Main Board Step 3)

   CN7: CR Encoder FFC
   CN8: Head FFC

4) Release both the CR Encoder FFC and the Head FFC from the tab of the Holder Shaft Unit.

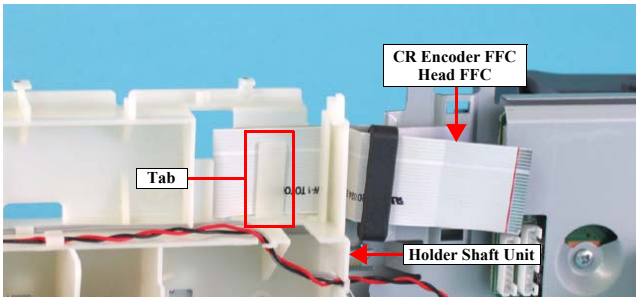


Figure 4-45. Removing Holder Shaft Unit (1)

5) Release the CR Motor Cable from the three tabs of the Holder Shaft Unit.

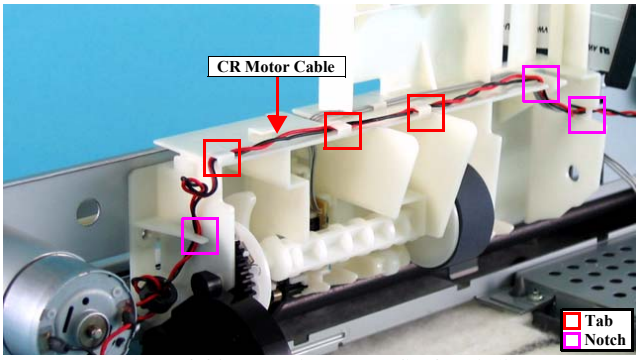


Figure 4-46. Removing Holder Shaft Unit (2)

6) Slide the concave portion of the Pump Unit toward the direction of the arrow, and release the convex portion of the Holder Shaft Unit.

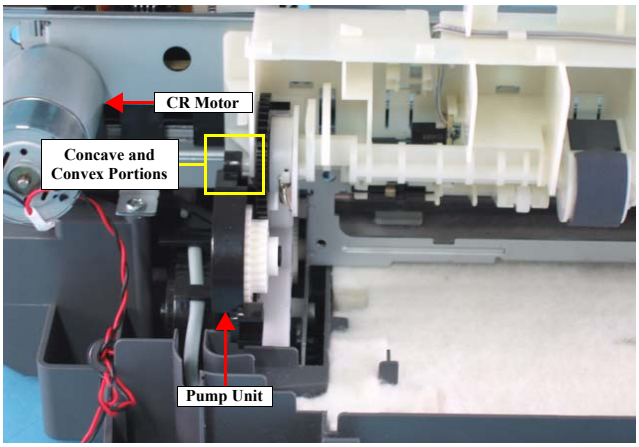


Figure 4-47. Removing Holder Shaft Unit (3)

7) Releasing two tabs that secure the Holder Shaft Unit to the Main Unit, Remove the Holder Shaft Unit upward.

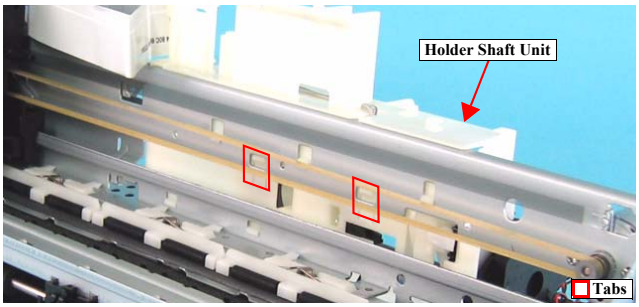


Figure 4-48. Removing Holder Shaft Unit (4)

REASSEMBLY

When installing the CR Motor Cable to the Holder Shaft Unit, be sure to route the cable as shown in Figure 4-46.

ADJUSTMENT REQUIRED

When Holder shaft unit is removed or replaced with a new one, the following adjustment must be performed.

- **Top Margin Adjustment**

4.3.3.3 Spool Gear 36.8/Extension Spring 0.143/Clutch

CAUTION

- **Never touch the LD Roller.**
- **When removing the LD Roller Shaft Unit, pay attention not to drop the Spool Gear 36.8, Extension Spring, and Clutch.**

1) Remove the Holder Shaft Unit. (p62)
2) Remove the LD Roller Shaft Unit from the Holder Shaft Frame.
3) Remove the Spool Gear 36.8 from the LD Roller Shaft Unit.
4) Release the Extension Spring 0.143 that joins the LD Roller Shaft Unit and the Clutch, and remove the Clutch.

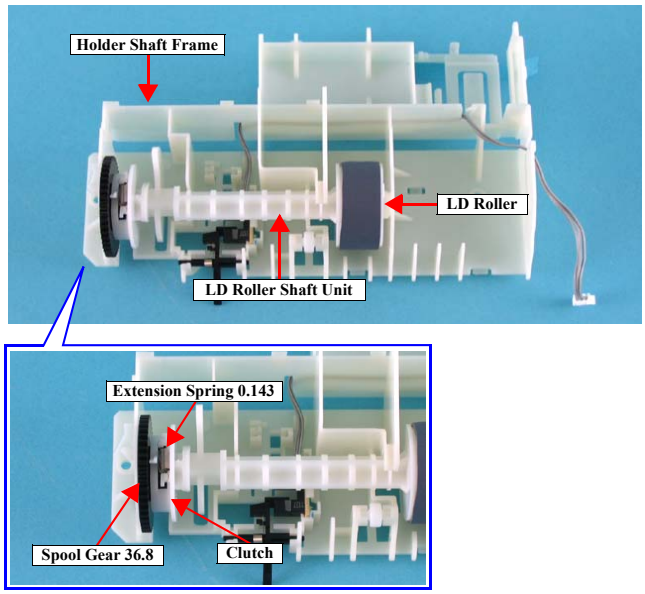


Figure 4-49. Removing LD Roller Shaft Unit

REASSEMBLY

The LD Roller Shaft Unit should be reassemble as shown below.

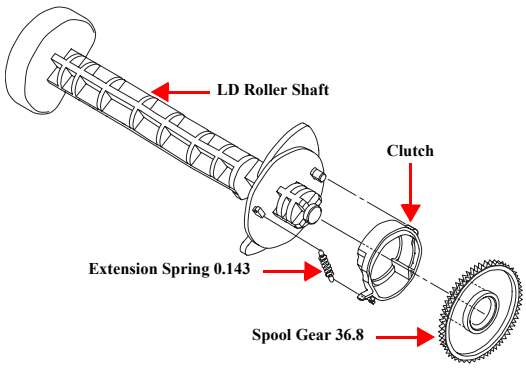


Figure 4-50. Assembling LD Roller Shaft Unit

4.3.3.4 PE Sensor Board/PE Detection Lever/Idle Roller

1) Remove the Spool Gear 36.8/Extension Spring 0.143/Clutch. (p64)
2) Release the PE Sensor Board Cable from the Holder Shaft Frame, and remove the PE Sensor board.
3) Release the shaft of the PE Detection Lever from the bearings of the Holder Shaft Frame, and remove Torsion Spring 0.22 from the PE Detection Lever.
4) Release the Idle Roller from the bearings of the Holder Shaft Frame.

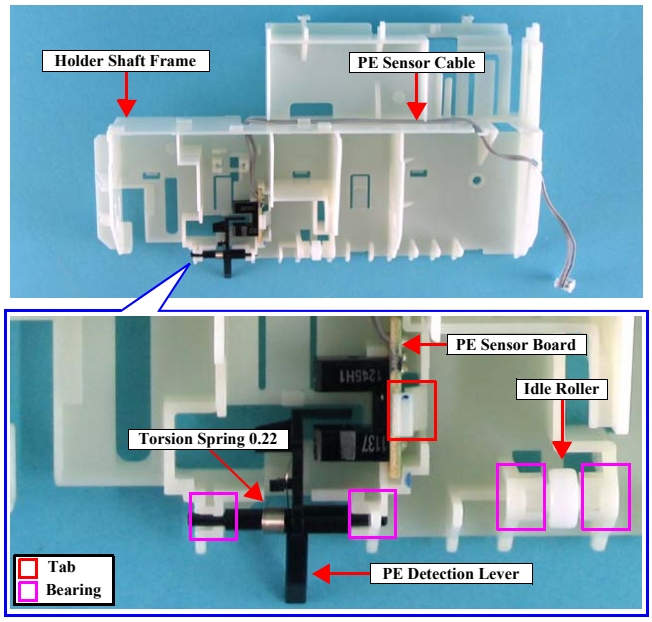


Figure 4-51. Removing PE Sensor Board/PE Detection Lever/Idle Roller

REASSEMBLY

- **When installing the PE Detection Lever, attach Torsion Spring 0.22 as shown below.**

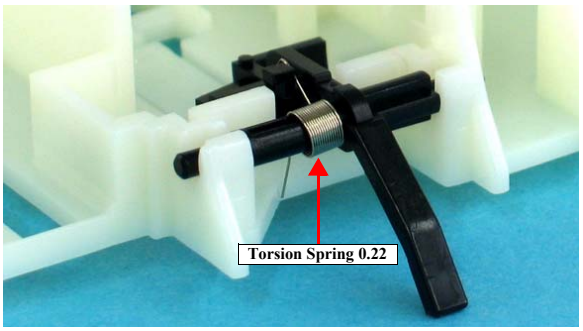


Figure 4-52. Attaching Torsion Spring 0.22

- **When installing the PE Sensor Cable to the Holder Shaft Frame, route the cable as shown below.**

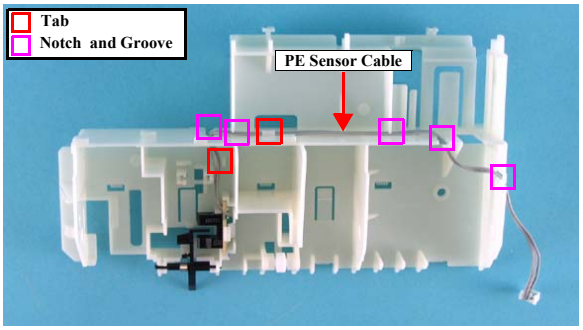


Figure 4-53. Routing PE Sensor Cable

4.3.3.5 CR Timing Belt

1) Remove the Housing, Upper Assy. (p47)
2) Loosen the screw that secures the Drive Pulley Holder Stopper to the Main Unit.
   - C.B.S. (P4) 3 x 6: 1
3) Press the Drive Pulley Holder toward the direction of the arrow, pull the CR Timing Belt toward you, and remove the belt from the Drive Pulley Holder.

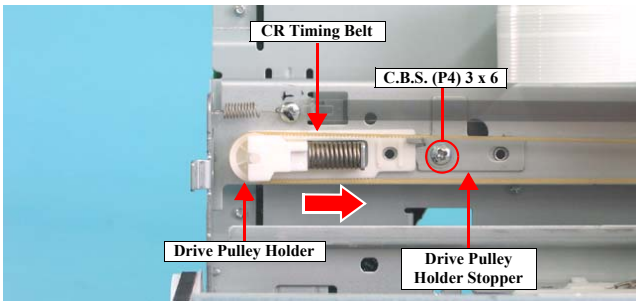


Figure 4-54. Removing CR Timing Belt (1)

4) Remove the CR Timing Belt from the CR Motor.

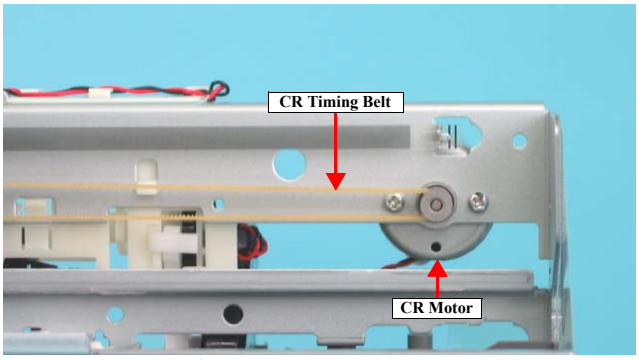


Figure 4-55. Removing CR Timing Belt (2)

5) Remove the CR Unit. (p70)
6) Remove the CR Timing Belt from the CR Unit.

REASSEMBLY

When installing the CR Timing Belt to the CR Unit, make sure to attach the belt to the positioning jag as shown below.

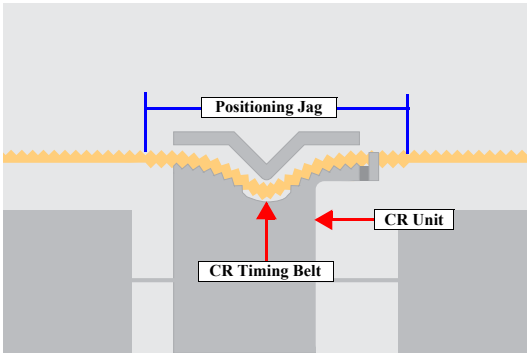


Figure 4-56. Installing CR Timing Belt

ADJUSTMENT REQUIRED

- **When CR motor is removed or replaced with a new one, the following adjustment must be performed.**
  - **CR Timing Belt Tension adjustment**
- **After the Drive Pulley is replaced or removed, lubricate it as specified. See Chapter 6 "Lubrication" *(p.95)* for details.**

4.3.3.6 CR Motor

1) Remove the CR Timing Belt. (4.3.3.5 Removing CR Timing Belt Step 1 through Step 4)
2) Disconnect the CR Motor Connector (CN5) from the Main Board. (See 4.3.2.1 Removing Main Board Step 3)
3) Remove the CR Motor Cable from the Holder Shaft Unit. (See 4.3.3.2 Removing Holder Shaft Unit Step 5)

CAUTION

Make sure to support the CR Motor with your hands when removing the screws.

4) Remove the two screws that secure the CR Motor to the Main Unit, and remove the CR Motor.

- C.P. 3 x 4: 2

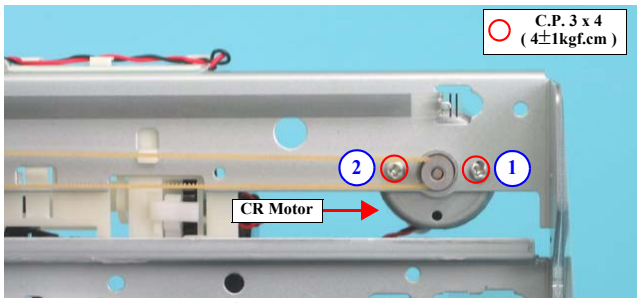


Figure 4-57. Removing CR Motor

REASSEMBLY

When installing the CR Motor, follow the steps described below.

1. **Positioning hole of the CR Motor should be on the downside.**

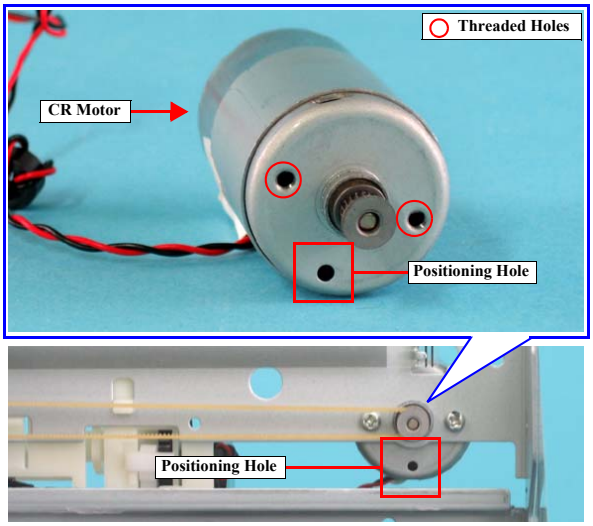


Figure 4-58. Installing CR Motor

2. **Secure the screws in the order shown in Figure 4-57.**
3. **When installing the CR Motor Cable to the Holder Shaft Unit, route the cable as shown in Figure 4-46.**

ADJUSTMENT REQUIRED

When CR motor is removed or replaced with new one, the following adjustment must be performed.

- **Offset input for CR Motor Calorific Limitation**
- **CR Timing Belt Tension adjustment**

4.3.3.7 Front Frame

1) Remove the Housing, Upper Assy. (p47)
2) Move the CR Unit to the center of the printer. (See 4.3.3.2 Removing Holder Shaft Unit Step 2)
3) Remove both the two screws that secure the Front Frame to the Main Unit and the Front Frame Stopper.
   - C.B.S. 3 x 6: 2
4) Lift up the CR Unit, and remove the Front Frame.

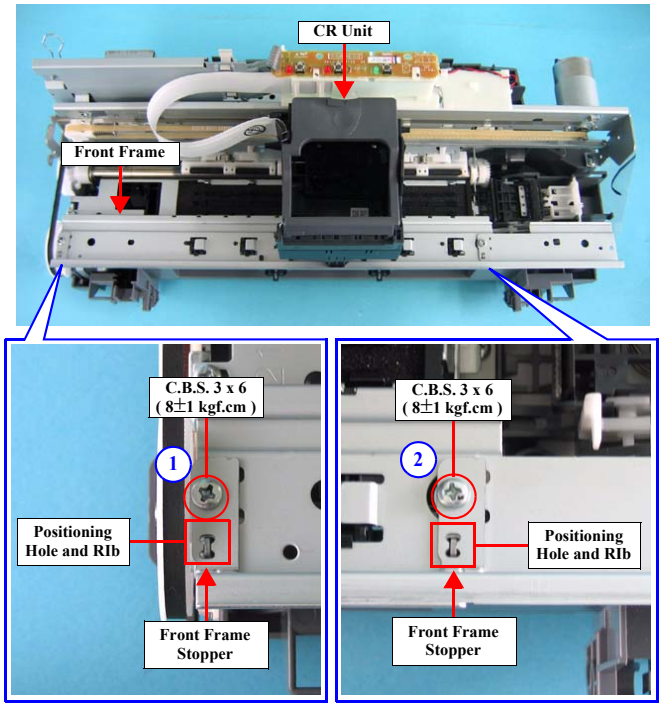


Figure 4-59. Removing Front Frame

REASSEMBLY

- **Match the positioning hole with the rib as shown in Figure 4-59 when installing the Front Frame.**
- **Secure the screws in the order shown in Figure 4-59.**

ADJUSTMENT REQUIRED

- **When Front frame is removed or replaced with new one, the following adjustment must be performed in the order below.**
  1. **First Dot Adjustment**
  2. **Head Angular Adjustment**
  3. **Bi-D Adjustment**
- **When you replace Front frame with new one, lubricate it as specified. See Chapter 6 "Lubrication" *(p.95)* for details.**

4.3.3.8 CR Encoder Scale

1) Remove the Housing, Upper Assy. (p47)

2) Release the slit on the right side of the CR Encoder Scale from the tab of the Main Unit.

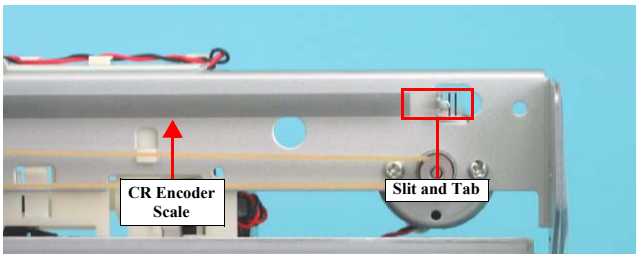


Figure 4-60. Removing CR Encoder Scale (1)

3) Disconnect the CR Encoder Scale from the slit of the CR Unit.

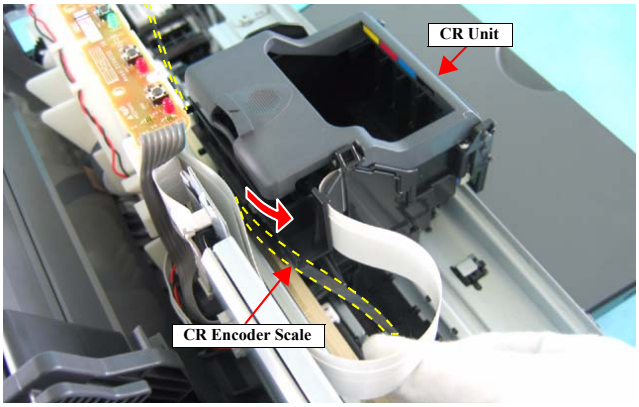


Figure 4-61. Removing CR Encoder Scale (2)

4) Release Extension Spring 1.494 on the left side of the CR Encoder Scale from the tab of the Main Unit.

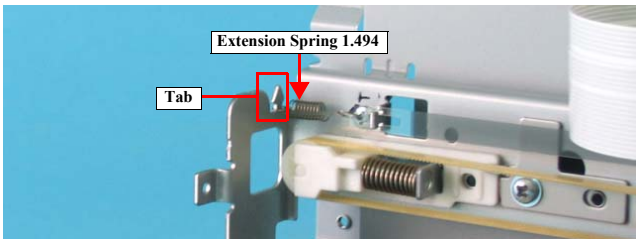


Figure 4-62. Removing CR Encoder Scale (3)

5) Turn the CR Encoder Sensor 90 degrees as shown in the figure, and remove the CR Encoder sensor.

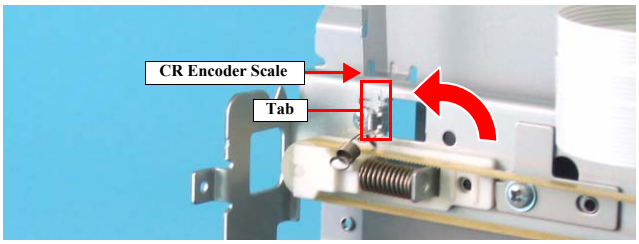


Figure 4-63. Removing CR Encoder Scale (4)

When installing the CR Encoder Scale, place the scale so that the chipped part is facing upper left as shown in the figure below.

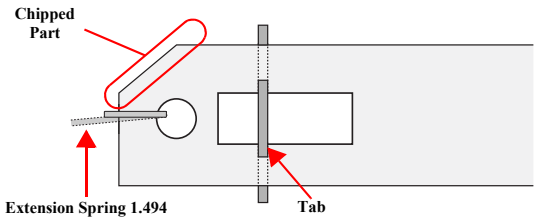


Figure 4-64. Installing CR Encoder Scale

4.3.3.9 CR Cable Head Cover

1) Remove the Housing, Upper Assy. (p47)
2) Slide the CR Cable Head Cover downward, and remove the CR Cable head Cover.

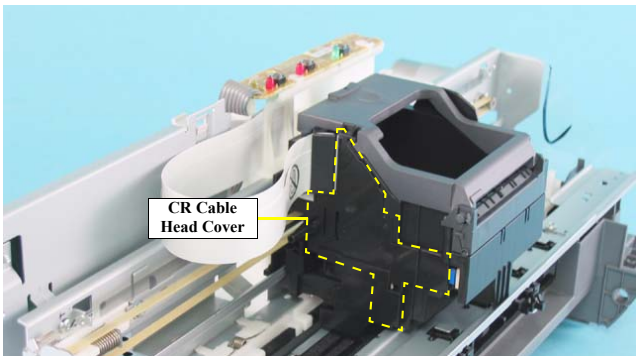


Figure 4-65. Removing CR Cable Head Cover

4.3.3.10 CR Unit

1) Remove the Panel Board. (p60)
2) Remove the Front Frame. (p68)

CAUTION

As the Head FFC and the CR Encoder FFC is attached to each other with glue, be careful not to remove them separately.

3) Disconnect the two connectors from the Main Board. (See 4.3.2.1 Removing Main Board Step 3)

   CN7: CR Encoder FFC
   CN8: Head FFC

4) Disconnect the CR Encoder FFC and the Head FFC from the Holder Shaft Unit. (See 4.3.3.2 Removing Holder Shaft Unit Step 4)
5) Remove the CR Timing Belt. (4.3.3.5 Removing CR Timing Belt Step 1 through Step 4)
6) Remove the CR Encoder Scale. (p69)
7) Remove the CR Cable Head Cover. (p70)
8) Remove the Shield Plate FFC from the Main Unit Frame.

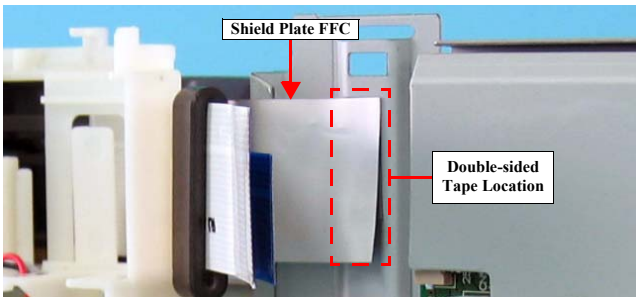


Figure 4-66. Removing Shield Plate FFC

9) Use a flathead screwdriver or a similar tool to release the two tabs of the CR Unit.

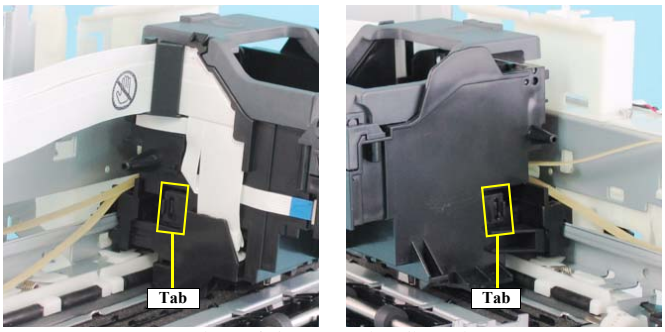


Figure 4-67. Removing CR Unit

10) Slide the IC Holder toward you, and remove the CR Unit and the CR Timing Belt from the Main Unit.

11) Remove the Timing Belt from the CR Unit. (See 4.3.3.5 Removing CR Timing Belt Step 6)

REASSEMBLY

- **When installing the CR Unit to the Main Unit Frame, engage them as shown in Figure 4-67.**
- **The Shield Plate FFC should be attached to the location shown in Figure 4-66 with double-sided tape.**

ADJUSTMENT REQUIRED

- **After replacing or removing the CR Timing Belt, make sure to perform the following adjustment.**
  - **CR Timing Belt Tension adjustment**
- **After replacing or removing the CR Unit, make sure to perform the following adjustments.**
  1. **Head ID Input**
  2. **Top Margin Adjustment**
  3. **PF Adjustment**
  4. **Bi-D Adjustment**
  5. **Head Angular Adjustment**
  6. **First Dot Adjustment**
  7. **PW Sensor adjustment**
  8. **Offset input for CR Motor Calorific Limitation**
- **After replacing or removing the IC Holder/Printhead Assy., lubricate it as specified. See Chapter 6 "Lubrication" *(p.95)* for details.**

4.3.3.11 Printhead Assy.

1) Remove the CR Unit. (p70)

CHECK POINT

Before starting the following work, make sure that the two tabs shown in Figure 4-67 are already released.

2) Remove the PW Sensor Cover while releasing the tab.

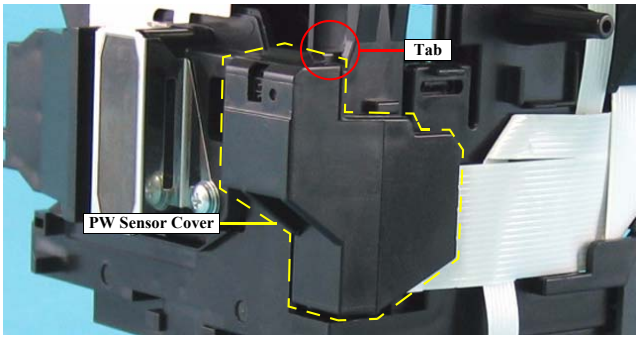


Figure 4-68. Removing PW Sensor Cover

3) Disconnect the two Head FFCs from the Printhead Assy.

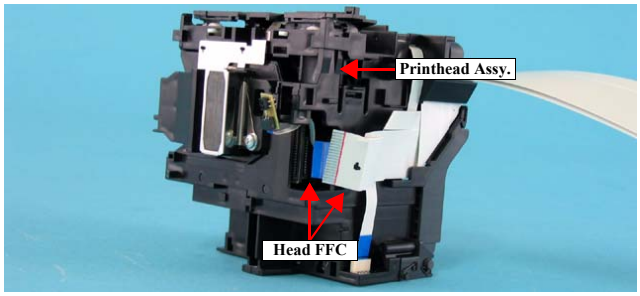


Figure 4-69. Removing Printhead Assy. (1)

4) Remove the Printhead Assy from the IC Holder.

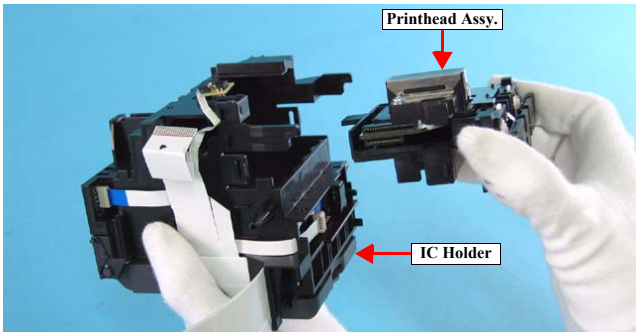


Figure 4-70. Removing Printhead Assy. (2)

ADJUSTMENT REQUIRED

- **When the IC Holder is replaced or removed, make sure to perform the following adjustments.**
  1. **Top Margin Adjustment**
  2. **PF Adjustment**
  3. **Bi-D Adjustment**
  4. **Head Angular Adjustment**
  5. **First Dot Adjustment**
  6. **PW Sensor adjustment**
- **After the IC Holder or the Printhead Assy is replaced or removed, lubricate it as specified. See Chapter 6 "Lubrication" *(p.95)* for details.**

4.3.3.12 PW Sensor Board

1) Remove the CR Unit. (p70)
2) Remove the PW Sensor Cover. (See 4.3.3.11 Removing Printhead Assy. Step 2)
3) Disconnect the PW Sensor FFC, and remove the PW Sensor Board.

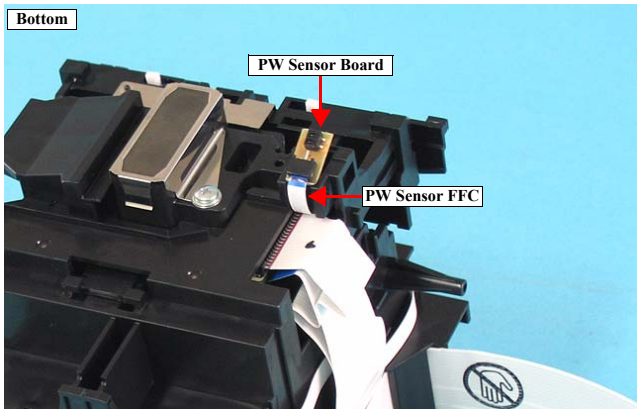


Figure 4-71. Removing PW Sensor Board

ADJUSTMENT REQUIRED

When replacing or removing the PW Sensor Board, make sure to perform the following adjustments in the order shown below.

1. **Top Margin Adjustment**
2. **PF Adjustment**
3. **Bi-D Adjustment**
4. **Head Angular Adjustment**
5. **First Dot Adjustment**
6. **PW Sensor adjustment**

4.3.3.13 CR Encoder Sensor Board

1) Remove the CR Unit. (p70)
2) Disconnect the CR Encoder Sensor FFC and the PW Sensor FFC from the CR Encoder Sensor Board.
3) Remove the two screws that secure the CR Encoder Sensor Board to the IC Holder, and remove the CR Encoder Sensor Board.
   - C.P.B. (P1) 1.7 x 5:2

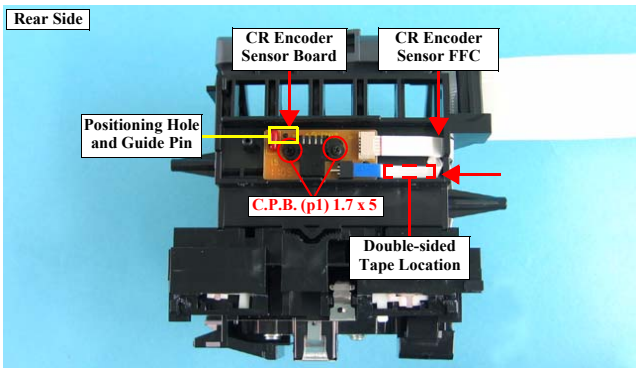


Figure 4-72. Removing CR Encoder Sensor Board

REASSEMBLY

- **When installing the CR Encoder Sensor Board, match the positioning hole with the rib as shown in Figure 4-72.**
- **The PW Sensor FFC should be attached to the location with double-sided tape as shown in Figure 4-72.**

ADJUSTMENT REQUIRED

After replacing or removing the CR Encoder Sensor Board, make sure to perform the following adjustments.

1. **Top Margin Adjustment**
2. **PF Adjustment**
3. **Bi-D Adjustment**
4. **Head Angular Adjustment**
5. **First Dot Adjustment**
6. **PW Sensor adjustment**

4.3.3.14 CSIC Board

1) Remove the CR Unit. (p70)

2) Open the IC Holder Cover, remove the two screws that secure the IC Holder Cover to the IC Holder.

- C.B.P. 2.5 x 8: 2

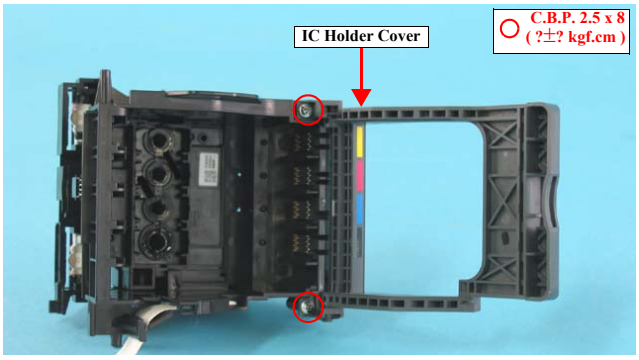


Figure 4-73. Removing IC Holder Cover (1)

3) Release the tab and remove the IC Holder Cover.

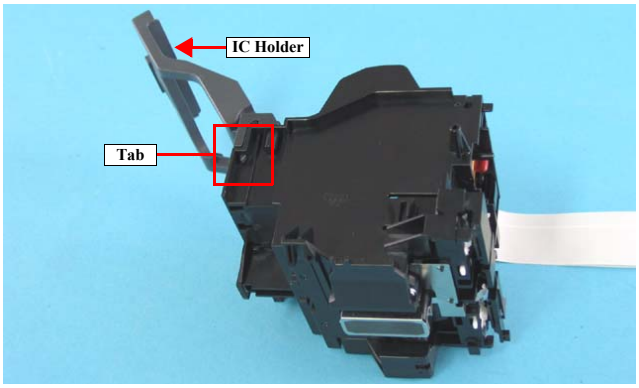


Figure 4-74. Removing IC Holder Cover (2)

4) Disconnect the CSIC FFC from the CSIC Board.

Figure 4-75. Removing CSIC FFC

5) Insert a flathead screwdriver or a similar tool into the notches located on bottom of the IC Holder, and remove the CSIC Board.

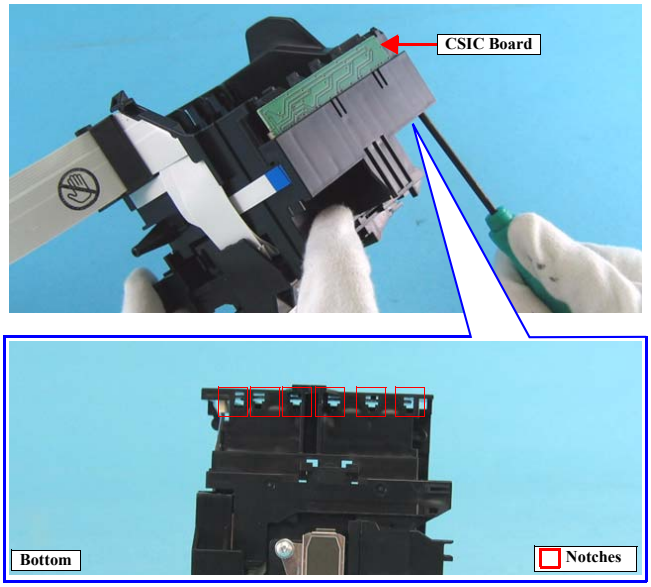


Figure 4-76. Removing CSIC Board

4.3.3.15 Paper Guide, Upper Assy.

1) Remove the Housing, Upper Assy. (p47)
2) Move the CR Unit to the CR Motor Side. (See 4.3.3.2 Removing Holder Shaft Unit Step 2)
3) Push the two guide pins on the Paper Guide, Upper Assy. with a flathead screwdriver or a similar tool, and remove the Paper Guide, Upper Assy. toward you.

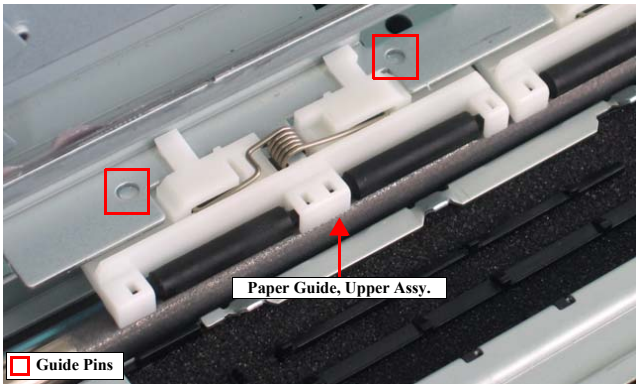


Figure 4-77. Removing Paper Guide, Upper Assy.

4) Repeat the steps above, and remove all the Paper Guide, Upper Assys.

ADJUSTMENT REQUIRED

When Paper guide upper is removed or replaced with new one, the following adjustment must be performed in the order below.

1. **Top Margin Adjustment**
2. **PF Adjustment**

4.3.3.16 Eject Roller

1) Remove the Front Frame. (p68)
2) Remove the PF Timing Belt from the PF Drive Pulley.
3) Remove the spacer, and remove the Eject Drive Pulley.

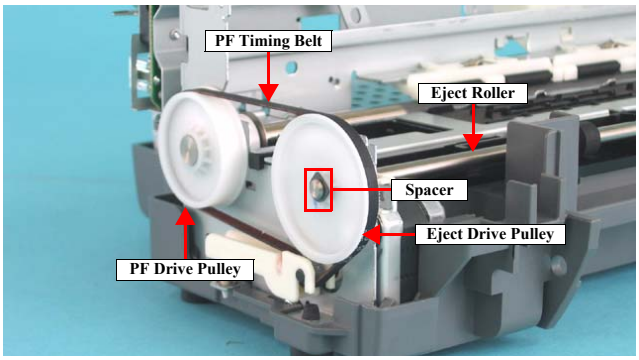


Figure 4-78. Removing Eject Roller (1)

4) Remove the spacer that secures Bush, 6 on the right side of the printer.
5) Rotate Bush, 6 to the direction of the arrow using a longnose pliers, and remove the Bush, 6 from the Main Unit.

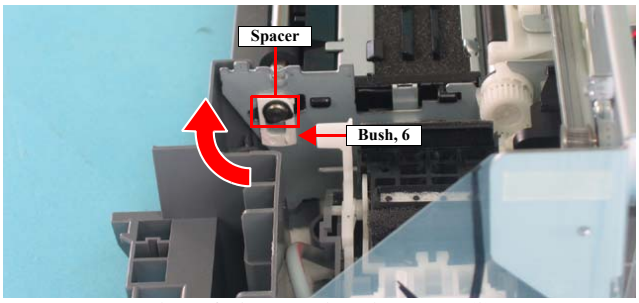


Figure 4-79. Removing Eject Roller (2)

CAUTION

Be careful not to damage the rubber area when performing the following work.

6) Slide the Eject Roller toward right, lift up the left edge of the Eject Roller, slide the Eject Roller toward left to remove the Eject Roller.

REASSEMBLY

When installing the Eject Roller, make sure to match the notch of the Eject Drive Pulley with the tab of the Eject roller as shown below.

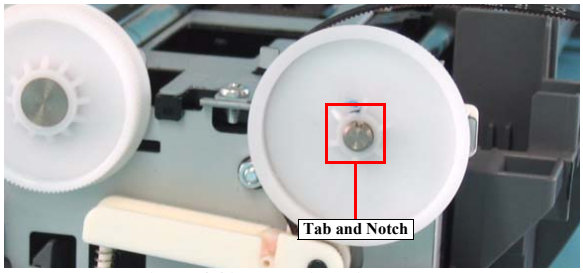


Figure 4-80. Installing Eject Roller

ADJUSTMENT REQUIRED

- **When you replace Paper eject roller with new one, lubricate it as specified. See Chapter 6 "Lubrication" *(p.95)* for details.**
- **After replacing or removing the PF Timing Belt, make sure to perform the following adjustment.**
  - **CR Timing Belt Tension adjustment**
- **After replacing or removing the Eject Roller, make sure to perform the following adjustment.**
  - **PF Adjustment**

4.3.3.17 Paper Guide, Front Assy.

CAUTION

- **Never touch the rib on the Paper Guide, Front Assy.**

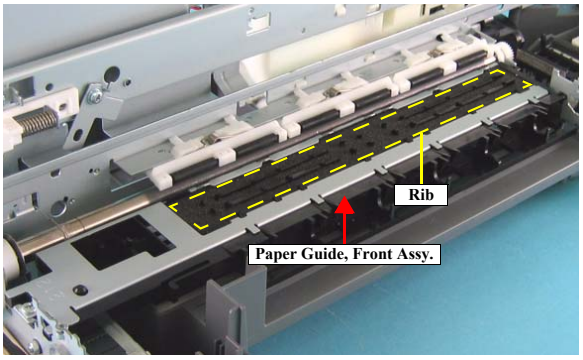


Figure 4-81. Rib on Paper Guide, Front Assy.

- **Be careful not to bent the four Paper Guide, Front Absorbent Protections.**

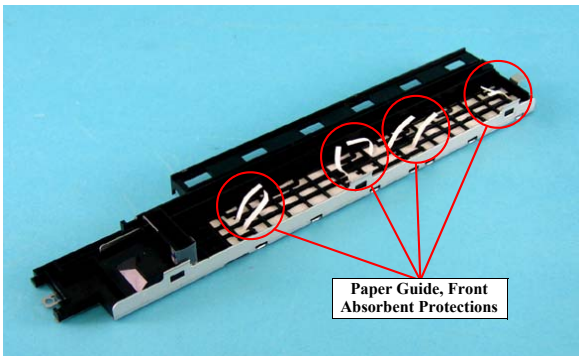


Figure 4-82. Paper Guide, Front Absorbent Protections

1) Remove the Eject Roller. (p75)

2) Remove the screw that secures the Paper Guide, Front Assy. to the Main Unit.

- C.B.S. 3 x 6: 1

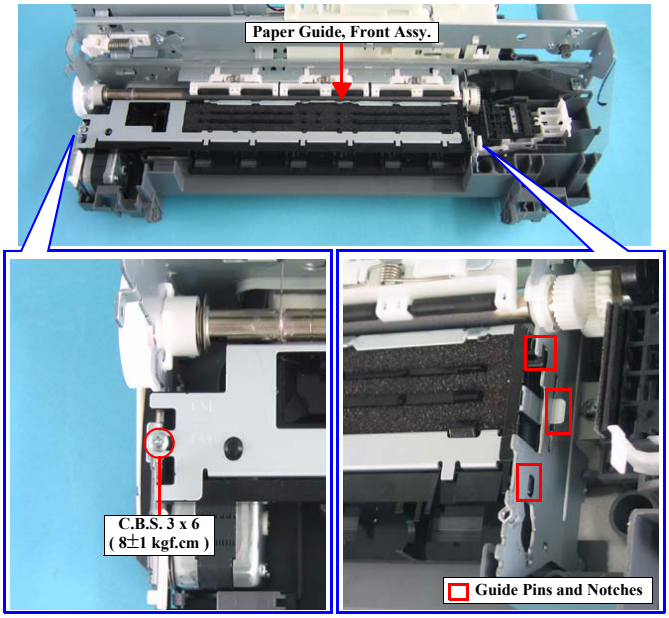


Figure 4-83. Removing Paper Guide, Front Assy.

3) Lift up the left side of the Paper Guide, Front Assy., release the three convex portions on the right, and remove the Paper Guide, Front Assy.

ADJUSTMENT REQUIRED

After replacing or removing the Paper Guide, Front Assy., make sure to perform the following adjustment.

1. **Top Margin Adjustment**
2. **PF Adjustment**
3. **Bi-D Adjustment**
4. **First Dot Adjustment**
5. **PW Sensor adjustment**

4.3.3.18 Pump Unit/Cap Unit

CAUTION

When removing the Pump Unit and the Cap Unit, pay attention not to drop the CR Lock Lever and the Gear.

1) Remove the Housing, Lower Assy.. (p51)
2) Remove the Holder Shaft Unit. (p62)
3) Release the three tabs that secure the Pump Unit to the Main Unit, and remove both the Pump Unit and the Cap Unit.

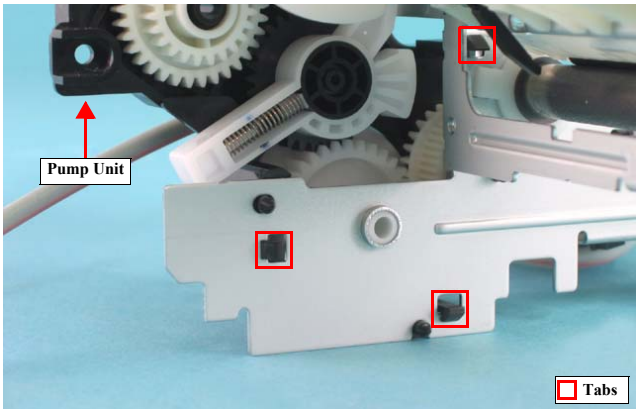


Figure 4-84. Removing Pump Unit/Cap Unit (1)

4) Remove the Ink Tube that connects the Pump Unit and the Cap Unit.

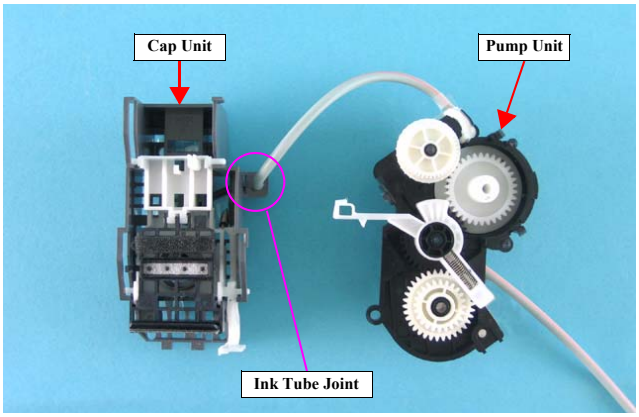


Figure 4-85. Removing Pump Unit/Cap Unit (2)

REASSEMBLY

Be sure to assemble the Pump Unit as shown below.

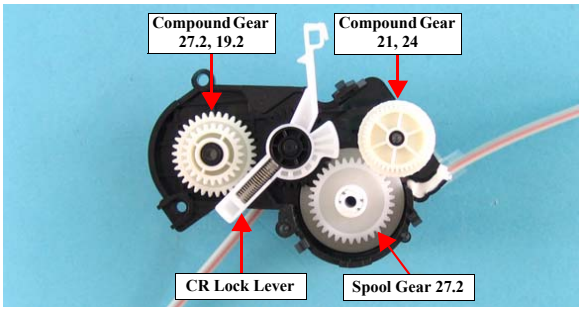


Figure 4-86. Assembling Pump Unit

4.3.3.19 PF Motor

1) Remove the Housing, Lower Assy.. (p51)

2) Remove the PF Timing Belt, Idle Roller Assy, and Compression Spring 1.13 from the Main Unit.

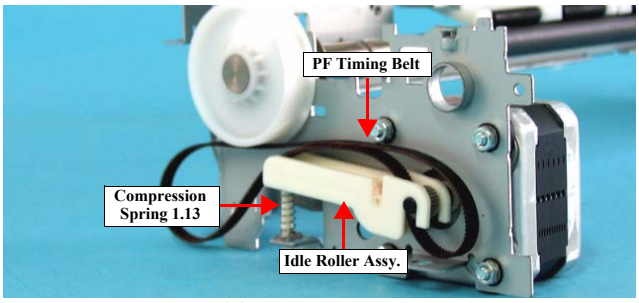


Figure 4-87. Removing PF Motor (1)

3) Remove the four hexagon nuts that secure the PF Motor to the Main Unit.

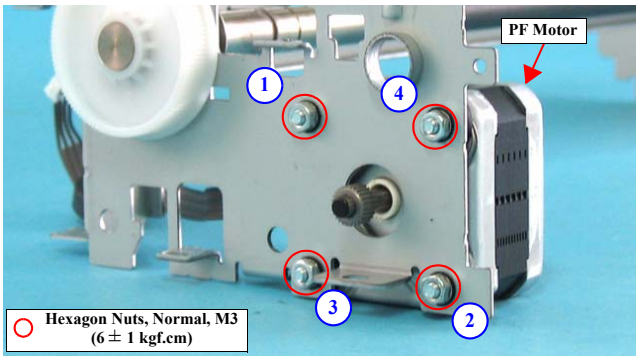


Figure 4-88. Removing PF Motor (2)

4) Remove Compression Spring 1.53, and remove the PF Motor.

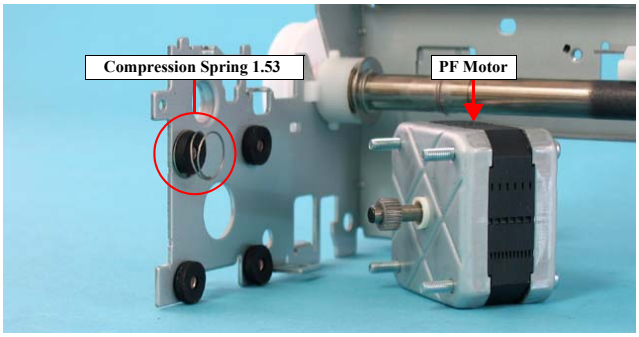


Figure 4-89. Removing PF Motor (3)

REASSEMBLY

- **When installing the PF Motor, make sure to attach Compression Spring 1.53 to the part shown in Figure 4-89.**
- **When installing the PF Motor, secure the hexagon nuts in the order shown in Figure 4-88.**

ADJUSTMENT REQUIRED

- **When PF motor is removed or replaced with new one, the following adjustment must be performed in the order below.**
  1) **Top Margin Adjustment**
  2) **PF Adjustment**

CHAPTER

5

ADJUSTMENT

5.1 Adjustment Items and Overview

This chapter describes adjustments to be made after the disassembly/reassembly of this product.

CHECK POINT

In case that any parts are removed and assembled on the repair product while running the Adjustment program, make sure to turn off the printer.

5.1.1 Servicing Adjustment Item List

The adjustment items of this product are as follows. For details of the adjustment items, refer to the detailed procedures and sketches of the adjustment items.

Table 5-1. Servicing Adjustment Items

Function Item		Purpose	Method Outline	Tool	Used Media
Main adjustment items	Market setting	At the time of Main board replacement, this adjustment is made to write the board common information on a destination basis.	Select and execute this function in the exclusive servicing program to save the following data into the EEPROM. Market ID, CSIC printer ID, D4 setting (USB, parallel), First Dot adjustment fixed value.	Exclusive servicing program	Non-target
	Head ID input	At the time of head replacement, this adjustment is made to correct head manufacturing variations and eliminate the individual differences of print quality.	Enter the ID of the head QR code label applied to the Printhead into the exclusive servicing program to save it to the EEPROM on the Main board. (Supplement: Read the QR code label from left to right on the top row and from top to bottom in due order.)	Exclusive servicing program	Non-target
	Offset input for CR motor calorific limitation.	When the Main board, CR motor, PS board or Print head assy is changed individually, this adjustment is made to write the maximum offset to prevent the occurrence of damage to the motor at the time of CR motor heat generation.	Select and execute this function in the exclusive servicing program to save the offset into the EEPROM.	Exclusive servicing program	Non-target
	Head angular adjustment	This adjustment is made to correct the error in the Head mounting position (angle of the Head to the paper surface) to keep the nozzle intervals uniform in the CR main scanning direction.	Select this function in the exclusive servicing program and print the adjustment pattern. Check the displacement amount of the pattern. Print the exclusive pattern again and adjust the displacement amount.	Exclusive servicing program	Photo Quality Ink Jet Paper (A4)
	PF adjustment	This adjustment is made to correct the variations of paper feed accuracy in the band printing mode to improve print quality.	Select this function in the exclusive servicing program and print the adjustment patterns (9 patterns). Select and enter the pattern that has the smallest gap and overlap. The correction value is saved to the specific EEPROM address on the Main Board.	Exclusive servicing program	Photo Quality Ink Jet Paper (A4)

Table 5-1. Servicing Adjustment Items

	Function Item	Purpose	Method Outline	Tool	Used Media
Main adjustment items	PW sensor adjustment	This adjustment is made to correct the mounting position of the PW Sensor on a software basis to minimize the paper detection error caused by the variations of the mounting position.	Select this function in the exclusive servicing program and print the adjustment pattern. Select the pattern number 5mm away from each edge, and enter that number in the program. The correction value is saved at the specific EEPROM address of the Main Board.	Exclusive servicing program	Photo Paper/ Glossy Photo Paper (A4)
	Bi-D adjustment	This adjustment is made to correct the print timing in the go and return paths in bi-directional printing.	Select this function in the exclusive servicing program and print the adjustment patterns to check the displacement amounts of the patterns. Select/enter the pattern number that has the smallest displacement amount in the program. Print the exclusive patterns again and adjust the displacement amount. The correction value is saved into the EEPROM.	Exclusive servicing program	Plain paper (A4)
	USB ID input	This adjustment is made to allow the PC to recognize the connected printers individually when multiple printers of the same model are connected and used with the PC via a USB hub.	Select this function in the exclusive servicing program and enter the serial numbers of the printers. The correction value is saved to the specific EEPROM address on the Main board.	Exclusive servicing program	Non-target
	First Dot adjustment	This adjustment is made to correct the first dot position in the CR main scanning direction.	Select and execute this function in the exclusive servicing program. Enter the correction value in the program using the rule position of the print pattern as a reference. The correction value is saved to the specific EEPROM address on the Main board.	Exclusive servicing program	Plain paper (A4)
	Top Margin adjustment	This adjustment is made to correct the printout position in the paper feeding direction.	Select and execute this function in the exclusive servicing program. Enter the correction value in the program using the rule position of the print pattern as a reference. The correction value is saved to the specific EEPROM address on the Main board.	Exclusive servicing program	Plain paper (A4)

	Function Item	Purpose	Method Outline	Tool	Used Media
Maintenance items	Head Cleaning	This function is used to execute CL efficiently when ink is not delivered from the Head properly, e.g. dot missing or skewed injection. This function is used together with the nozzle check pattern to confirm the CL effects.	Select this function in the exclusive servicing program, and execute CL 3.	Exclusive servicing program	Non-target
	Ink Charge	This function is used to drain the Shipping Liquid in the ASP head flow path and simultaneously fill ink in the head flow path to make all nozzles printable and stabilize the ink in the Head.	Select this function in the exclusive servicing program, and execute the ink sucking operation equivalent to the initial charge.	Exclusive servicing program	Non-target

Table 5-2. Maintenance Functions

	Function Item	Purpose	Adjustment Outline	Tool	Used Media
Maintenance items	Waste ink pad counter	This function is used after repair to read the Waste ink counter, and if the value is close to the predetermined near-end value or end value, to recommend Pad replacement to the user in order to prevent the repaired printer from being returned again for repair in a short time. The reset function is used to reset the Waste ink counter from the exclusive program after Waste ink pad replacement.	Select this function in the exclusive servicing program, read/display the current data from the specific EEPROM address on the Main board, and check whether the current counter value is close to the upper limit or not. For the reset function, select this function in the exclusive servicing program after Waste ink pad replacement, and reset the corresponding data at the specific address in the EEPROM on the Main board.	Exclusive servicing program	Non-target
	EEPROM data copy	This function is used to read the above necessary information from the EEPROM of the faulty Main board using the D4 function to reduce the auxiliary adjustment items at the time of Board replacement.	Select this function in the exclusive servicing program, and read the data from the faulty board. After that, change the Main board and then write the read data to a new board.	Exclusive servicing program	Non-target

Table 5-3. Check Pattern Printing

	Function Item	Purpose	Adjustment Outline	Tool	Used Media
Check pattern items	A4 Photo Quality Ink Jet Paper print	This pattern is used to check whether all adjustment results are normal.	Select this function in the exclusive servicing program, print the print patterns, and check the adjustment result in each pattern.	Exclusive servicing program	Photo Quality Ink Jet Paper (A4)
	A4 Normal Paper print	This pattern is used to check whether all adjustment results are normal.	Select this function in the exclusive servicing program, print the print patterns, and check the adjustment result in each pattern.	Exclusive servicing program	Plain paper (A4)
	Nozzle check pattern print	This pattern is used to check simply whether all nozzles deliver ink or not.	This pattern is used to make a simple print check at the EPSON service company.	Exclusive servicing program	Plain paper (A4)
Others	Save all EEPROM data	This function is used to analyze defective products.	Save the data of all EEPROM addresses.	Exclusive servicing program	Non-target

Table 5-4. Adjustment Other Than Adjustment Program

Function Item	Purpose	Adjustment Outline
CR timing belt tension adjustment	This adjusts the belt tension in order to prevent jumpiness between the CR motor pinion and the CR timing belt.	Check the tension of the CR timing belt with a digital tension gauge.

5.1.2 Replacement Part-Based Adjustment Priorities

The following table indicates the adjustment items and priorities on a replacement part basis.

Note: "applicable" in the table indicates the adjustment items required after removing/replacing the parts.

Performance Priority	1	2	3	4	5	6	7	8	9	10	11	12	13
	EEPROM data copy	Market setting	USB ID input	Waste ink pad counter	Ink charge	Head ID input	Top margin adjustment	First dot adjustment	PW sensor adjustment	Head angular adjustment	Bi-D adjustment	PF adjustment	Offset input for CR motor calorific limitation
ASF unit removal	---	---	---	---	---	---	applicable	applicable	---	---	---	applicable	---
ASF unit replacement	---	---	---	---	---	---	applicable	applicable	---	---	---	applicable	---
CR motor removal	---	---	---	---	---	---	---	applicable	applicable	applicable	applicable	---	---
CR motor replacement	---	---	---	---	---	---	---	applicable	applicable	applicable	applicable	---	applicable
Paper guide upper removal	---	---	---	---	---	---	applicable	---	---	---	---	applicable	---
Paper guide upper replacement	---	---	---	---	---	---	applicable	---	---	---	---	applicable	---
Frame front (only) removal	---	---	---	---	---	---	---	applicable	---	applicable	applicable	---	---
Frame front (only) replacement	---	---	---	---	---	---	---	applicable	---	applicable	applicable	---	---
I/C holder removal	---	---	---	---	---	---	applicable	applicable	applicable	applicable	applicable	applicable	---
I/C holder replacement	---	---	---	---	---	---	applicable	applicable	applicable	applicable	applicable	applicable	---
Print Head assy. removal	---	---	---	---	---	---	applicable	applicable	applicable	applicable	applicable	applicable	---
Print Head assy. replacement	---	---	---	---	applicable	applicable	applicable	applicable	applicable	applicable	applicable	applicable	applicable
Main board removal	---	---	---	---	---	---	---	---	---	---	---	---	---
Main board replacement (Read OK)	applicable	---	---	---	---	---	---	---	---				
Main board replacement (Read NG)	---	applicable	applicable	--- (Pad replacement)	---	applicable	applicable	applicable	---	applicable	applicable	applicable	applicable
Holder shaft unit removal	---	---	---	---	---	---	applicable	---	---	---	---	---	---
Holder shaft unit replacement	---	---	---	---	---	---	applicable	---	---	---	---	---	---

5.2 Adjustment by Using Adjustment Program

The procedures of the adjustment items will be explained here. The intended item is as follows.

- ☐ Market setting
- ☐ USB ID input
- ☐ Head ID input
- ☐ Head angular adjustment
- ☐ Bi-d adjustment
- ☐ PF adjustment
- ☐ PW sensor adjustment
- ☐ First dot adjustment
- ☐ Top margin adjustment
- ☐ Offset input for CR motor calorific limitation
- ☐ A4 Normal Paper print
- ☐ A4 Photo Quality Inkjet Paper print

5.2.1 Market ID Setting

[Adjustment Procedure]

1. Select the Market ID of the adjustment program.
2. Click the [OK] button to write the specific data into EEPROM.
3. Click the [Check] button to check market and model name.

5.2.2 USB ID Input

[Adjustment Procedure]

1. Select USB ID input in the adjustment program.
2. Enter the 10-digits serial number from the label applied to the bottom side of the Upper housing.

5.2.3 Head ID Input

[Adjustment Procedure]

1. Select the Head ID of the adjustment program.
2. Enter the 16-digits code of the Head ID label applied to the Printhead. Enter the Head ID from left to right on the top row and from top to bottom in due order.

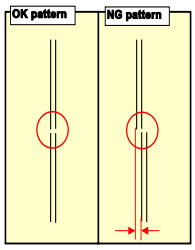
5.2.4 Head Angular Adjustment

[Adjustment Procedure]

1. Select Head Angular adjustment in the adjustment program.
2. Click the [Print] button to print Head Angular adjustment pattern of checked items.
3. Select the pattern value of straight line in the printed lines.
4. Click the [Input] button to write the adjustment value of checked items. (Note: The range of the adjustment value is -4 to 4.)

[Treatment procedure for NG product]

Step1) Replace the print head with new one again.
Step2) Print the check pattern, and check the adjustment result.
Step3) If the result is NG level, confirm the installation condition of removed parts during disassembly.
Step4) Perform step2) again.



[Judging Standard]
- The printed line should be straight line.

[Reference:Standard value in manufactory]
- Standard : ±50µm

Figure 5-1. Head Angular Printing Pattern

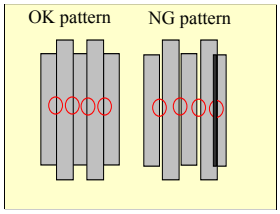
5.2.5 Bi-D Adjustment

[Adjustment Procedure]

1. Select Bi-D adjustment in the adjustment program.
2. Click the [Print] button to print Bi-D adjustment pattern of checked items.
3. Select the pattern that has the smallest displacements in each variable dot, and click the [Go to print page] button in the adjustment program.
4. Click the [Input] button to write the adjustment value of checked items.
5. Click [Go to print page].

[Treatment procedure for NG product]

Step1) Replace the print head with new one again.
Step2) Print the check pattern, and check the adjustment result.
Step3) If the result is NG level, confirm the installation condition of removed parts during disassembly.
Step4) Perform step2) again.



[Judging Standard]
- No gap/overlap between short block pattern and long one.

[Reference:Standard value in manufactory]
- VSD1:60µm, VSD2:60µm, VSD3: 40µm, VSD4:40µm, ECO:85µm.

Figure 5-2. Bi-D Adjustment Pattern

CAUTION

Please perform Bi-d adjustment keeping all "Housing" attached.

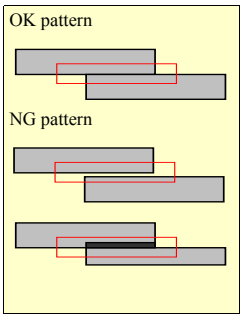
5.2.6 PF Adjustment

[Adjustment Procedure]

1. Select PF adjustment in the adjustment program.
2. Click the [Print] button to PF adjustment pattern.
3. Select the pattern that has the smallest displacements in each variable dot,
4. Click the [Input] button to write the adjustment value of checked items.
5. If the smallest displacements is [*] or [**], and click the corresponded button.
6. Check that [*] or [**] is best of the three, input 4 in case of [*] and -4 in case of [**].

[Treatment procedure for NG product]

Step1) Replace the repaired (replaced) part with new one.
Step2) Print the check pattern, and check the adjustment result.
Step3) If the result is NG level, confirm the installation condition of removed parts during disassembly.



[Judging Standard]
- No gap/overlap between short block pattern and long one.

[Reference:Standard value in manufactory]
- Standard : ±35µm

Figure 5-3. PF Adjustment Pattern

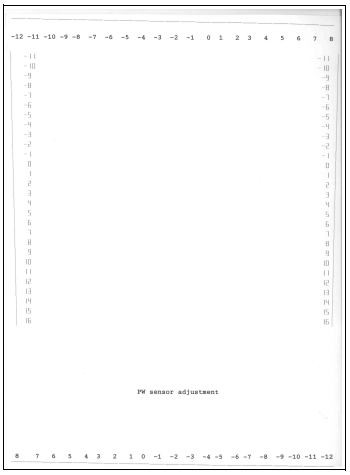
5.2.7 PW Sensor adjustment

[Adjustment Procedure]

1. Select PW Sensor adjustment in the adjustment program.
2. Click the [Print] button to print PW adjustment pattern.
3. Select the pattern number 5mm away from each edge.
4. Click the [Input] button to write the adjustment value of checked items.

[Treatment procedure for NG product]

Step1) Replace the Detector PH or Encorder with new one again.
Step2) Print the check pattern, and check the adjustment result.
Step3) If the result is NG level, confirm the installation condition of removed parts during disassembly.
Step4) Perform step2) again.



[Judging Standard]
- Top / Bottom : 5+0.5/-1.0 mm
- Right / Left : 5+0.3/-1.0 mm

Figure 5-4. PW Sensor Pattern

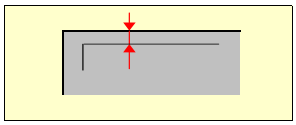
5.2.8 First Dot Adjustment

[Adjustment Procedure]

1. Select First Dot adjustment in the adjustment program.
2. Click the [Print] button to print First Dot adjustment pattern.
3. Determine the adjustment value in the shifting direction for the pattern printed on the left margin. Input can be made in 0.0176mm increments for the adjustment value of 1.
4. Click the [Input] button to write the adjustment value of checked items.

[Treatment procedure for NG product]

Step1) Replace the repaired (replaced) part with new one.
Step2) Print the check pattern, and check the adjustment result.
Step3) If the result is NG level, confirm the installation condition of removed parts during disassembly.



[Judging Standard]
- Standard : 3.6 ± 1.0 mm away from top edge.

Figure 5-5. First Dot Pattern

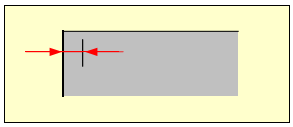
5.2.9 Top Margin Adjustment

[Adjustment Procedure]

1. Select Top Margin adjustment in the adjustment program.
2. Click the [Print] button to print Top Margin adjustment pattern.
3. Determine the adjustment value in the shifting direction for the pattern printed on the top margin. (Note: [+] input < 2.6mm, 4.6mm < [-] input)
4. Click the [Input] button to write the adjustment value of checked items.

[Treatment procedure for NG product]

Step1) Replace the repaired (replaced) part with new one.
Step2) Print the check pattern, and check the adjustment result.
Step3) If the result is NG level, confirm the installation condition of removed parts during disassembly.



[Judging Standard]
- Standard : 3 ± 1.5 mm away from left edge.

Figure 5-6. Top Margin Pattern

5.2.10 Offset input for CR Motor Calorific Limitation

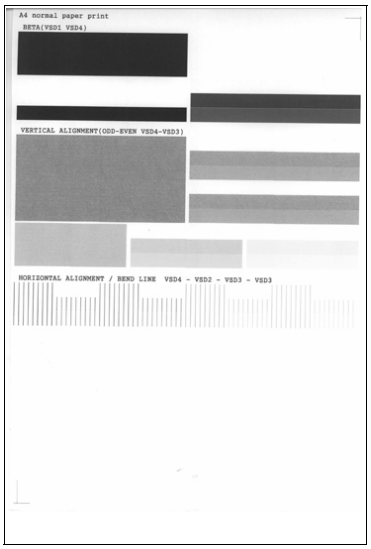
[Adjustment Procedure]

1. Select Offset input for CR motor calorific limitation in the adjustment program.
2. Click the [Input] button to write the specific data in EEPROM.

5.2.11 A4 Normal Paper print

[Adjustment Procedure]

1. Select A4 Normal Paper print in the adjustment program.
2. Click the [Print] button to print A4 Normal Paper print pattern.



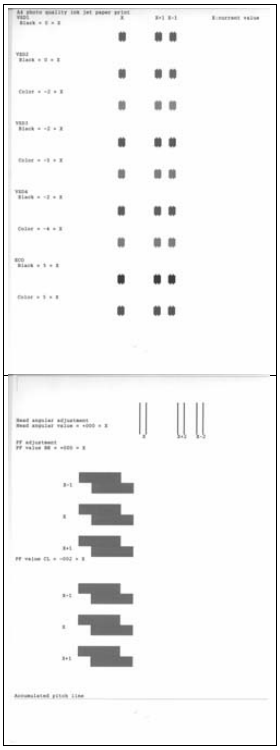
[Judging Standard]
- PW Sensor adjustment
  Top / Bottom : 5.0+0.5/-1.0mm
  Right / Left : 5.0+0.3/-1.0mm
- Beta pattern
  No uneven printing / white line.
- Vertical alignment
  No thin dot or thick dot / vertical alignment.
- Horizontal alignment
  No displacement between the vertical rules of each VSD.

Figure 5-7. A4 Normal Paper Print Pattern

5.2.12 A4 Photo Quality Inkjet Paper Print

[Adjustment Procedure]

1. Select A4 Photo Quality Inkjet Paper print in the adjustment program.
2. Click the [Print] button to print A4 Photo Quality Inkjet Paper print pattern.
3. Check the adjustment result in each pattern.



[Judging Standard]
- Bi-D adjustment
  Make sure that "X" is the best pattern of the three.
- Top Margin adjustment
  3 ± 1mm from top edge.
  (This standard is different from that of individual Top Margin adjustment. The standard of individual Top Margin adjustment is added about 0.6mm by the circumstance.)
- First Dot adjustment
  3 ± 1.5mm from left edge.
- Head Angular adjustment
  Make sure that "X" is the best pattern of the three.
- PF adjustment
  Make sure that "X" is the best pattern of the three.
- Accumulated Pitch Line
  259.5 ± 1mm from top line.

Figure 5-8. A4 Photo Quality Inkjet Paper Print Pattern

5.3 Adjustment Except Adjustment Program

Following is adjustment except adjustment program .

5.3.1 CR Timing Belt Tension adjustment

[Purpose]

This adjustment is to optimize the timing belt tension for preventing tooth skip between the pinion of CR motor and the CR timing belt. This adjustment must be made when the CR timing belt is removed.

CAUTION

- **Don't damage timing belt while pushing it with the tail plastic of ballpoint pen / plastic tweezers.**
- **Perform this adjustment in quiet environment in order to avoid that the measured result affects by other frequency.**
- **Sensor should be set vertically on CR timing belt.**

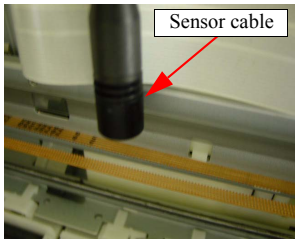
[Adjustment Procedure]

1. Install the CR timing belt to the printer mechanism.
2. Check the CR timing belt tension by using Digital Tension Gauge.
   [Note]
   Before this adjustment, the following data should be inputted into Digital Tension Gauge.

   [UNITTA : Setting of Digital Tension Gauge]
   - Weight : Input "0.4"
   - Width : Input "8"
   - Span : Input "377"
3. Return to CR unit to have position.
4. Set the sensor cable to the center of the timing belt vertically.
   (This time, the distance between the surface of the sensor cable on the timing belt is 10 ± 5mm.)
5. Push the upside of the timing belt with the tail plastic of ballpoint pen / plastic tweezers and check the timing belt tension on display of Digital Tension Gauge.
6. Check the result of tension value on the display.

[Treatment for NG product]

Step1) Replace the CR timing belt with new one again.
Step2) Check the adjustment result again.
Step3) If the result is NG level, confirm the installation condition of removed parts during disassembly.
Step4) Perform step2) again.



[Judging Standard]
- CR Timing Belt Tension : 9 ± 1.5N

Figure 5-9. CR Timing Belt Tension adjustment

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 Printhead. 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. 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 the PF roller. 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.**
- **When using compressed air products; such as air duster, for cleaning during repair and maintenance, the use of such products containing flammable gas is prohibited.**

☐ 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.

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.

☐ Printhead cleaning
When dot missing or banding phenomenon has occurred, you need to perform the printhead cleaning operation*1 by using the printhead 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 Error reset button on the control panel for more than 3 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 printhead cleaning from the printer driver utility.
As for the operation of the Adjustment program, refer to
Chapter5"ADJUSTMENT" *(p.80)*.

*1: The Stylus C87/C88/D88 has four modes for manual cleaning, and even during printing, the appropriate cleaning mode is automatically selected and performed according to various conditions. Therefore the ink consumption amount for manual cleaning varies depending on each mode.

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.

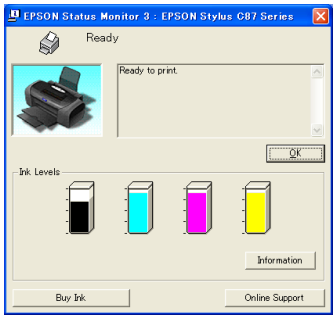


Figure 6-1. Status monitor 3 indication

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

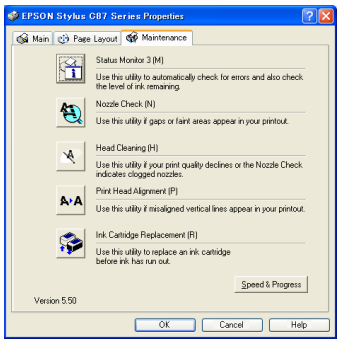


Figure 6-2. Head cleaning function in the printer driver utility

☐ Maintenance request error (Maintenance call error)
Ink is used for the printhead cleaning operation as well as the printing operation. When the ink is used for the printhead cleaning operation, the ink is drained to the Waste drain ink pad 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 max counter has reached the limit of the absorbing capability of the Waste drain ink pad*,) the Maintenance call error is indicated on Status monitor 3 as following figure. But waste ink max counter is chenged by usage, therefore waste ink max counter is not necessarily right.

*): The range of the waste ink counter is
16,000 ~ 33,800. (__ means initial maximam value of mon-used printer.)

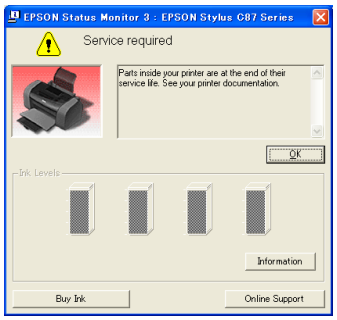


Figure 6-3. Maintenance error indication in STM3

In this case, replace to new Waste drain ink pad and clear the waste ink counter stored into the EEPROM. The waste ink counter can be reset only from the Adjustment program because this printer dose not have the waste ink counter reset function by the control panel SW. As for the procedure, refer to Chapter5“ADJUSTMENT” *(p.80)*.
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 drain ink pad 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

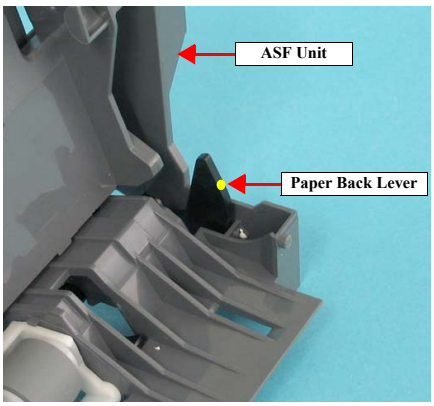
- **Never use oil or grease other than those specified in this manual. Use of different types of oil or grease may damage the component or give bad influence on the printer function.**
- **Never apply larger amount of grease than specified in this manual.**

CHECK POINT

- **G-58/G-26 is already on the printer mechanism for service part in the manufactory.**

Type	Name	EPSON code	Supplier
Grease	G-58	1082176	EPSON
Grease	G-26	1080614	EPSON

☐ Refer to the following figures for the lubrication points.



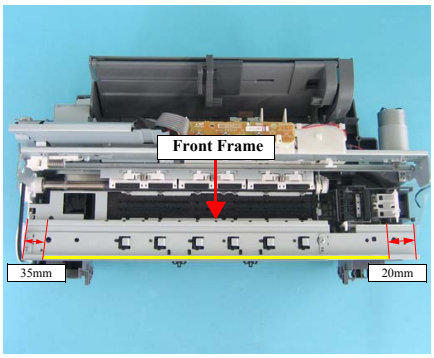
<Lubrication Point>
Paper Back Lever Surface

<Lubrication Type>
G-26

<Lubrication Amount>
ϕ1 x 1 mm

<Remarks>
- G-26 must not be adhered to other parts.

Figure 6-4. Lubrication on Paper Back Lever



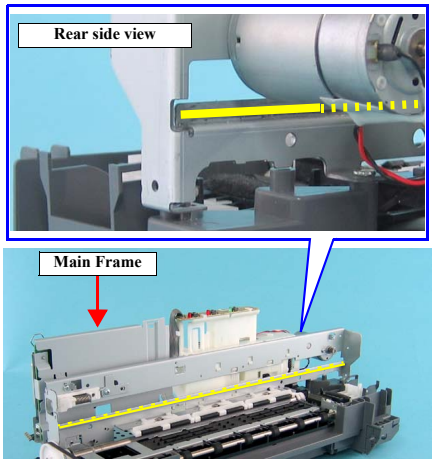
<Lubrication Point>
Front Frame Surface

<Lubrication Type>
G-58

<Lubrication Amount>
ϕ1mm x 365mm

<Remarks>
- G-58 must not be adhered to the printer mechanism and other parts.

Figure 6-5. Lubrication on Front Frame



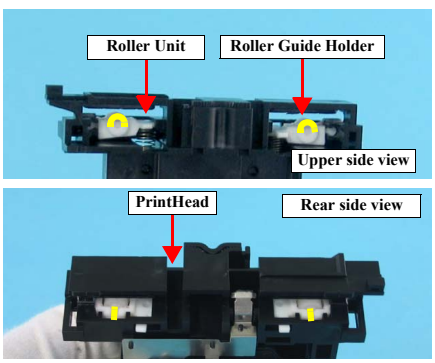
<Lubrication Point>
Front and rear faces of the Main Frame Carriage Slide

<Lubrication Type>
G-58

<Lubrication Amount>
360 mm x 2 face

<Remarks>
- G-58 moust not be adhered to other parts.

Figure 6-6. Lubrication on Main Frame



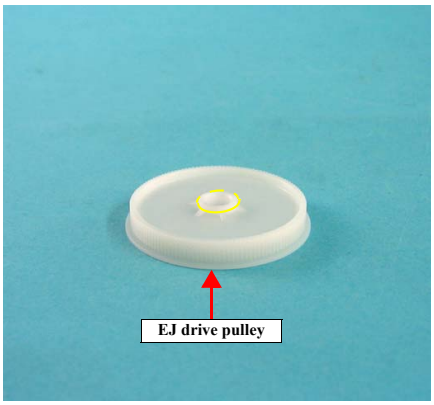
<Lubrication Point>
Contact point between Roller Guide and Roller Guide Holder

<Lubrication Type>
G-58

<Lubrication Amount>
ϕ1 mm x 4 points

<Remarks>
Use a injector to apply.
- G-58 moust not be adhered to other parts.

Figure 6-7. Lubrication on Roller Guide Holder



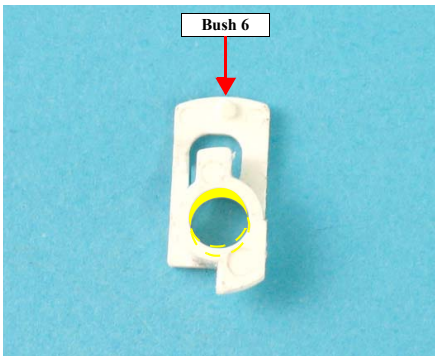
<Lubrication Point>
EJ drive pulley Shaft Surface

<Lubrication Type>
G-58

<Lubrication Amount>
ϕ1 mm x diameter of EJ drive pulley

<Remarks>
- G-58 moust not be adhered to other parts.

Figure 6-8. Lubrication on EJ drive pulley



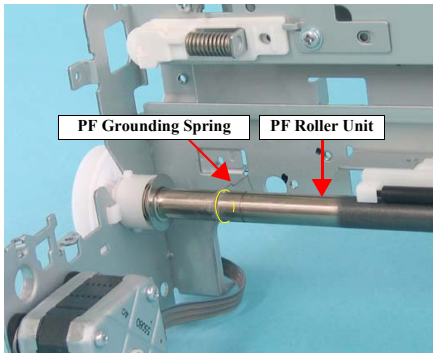
<Lubrication Point>
Bush 6 Inside diameter

<Lubrication Type>
G-58

<Lubrication Amount>
- ϕ1 x 1 circle

<Remarks>
- G-58 moust not be adhered to other parts.

Figure 6-9. Lubrication on Bush 6



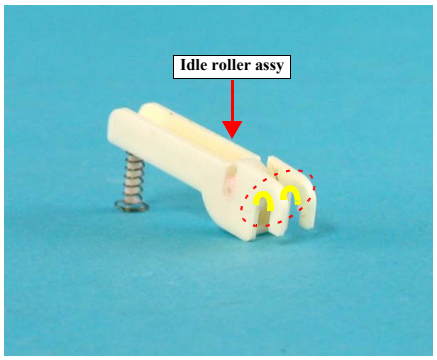
<Lubrication Point>
Contact point between the PF Grounding Spring and the PF Roller Unit

<Lubrication Type>
G-58

<Lubrication Point>
ϕ 1 mm x 0.5 mm

<Remarks>
Use a brush to apply.
- G-58 moust not be adhered to other parts.

Figure 6-10. Lubrication on PF Roller Unit



<Lubrication Point>
U-shaped part for the Idle roller assy

<Lubrication Point>
G-58

<Lubrication Amount>
U-shaped part : f 1 mm x 2 points

<Remarks>
- G-58 must not be adhered to other parts such as pinion face of the PF Motor or the Timing Belt

Figure 6-11. Lubrication on Idle Roller Assy

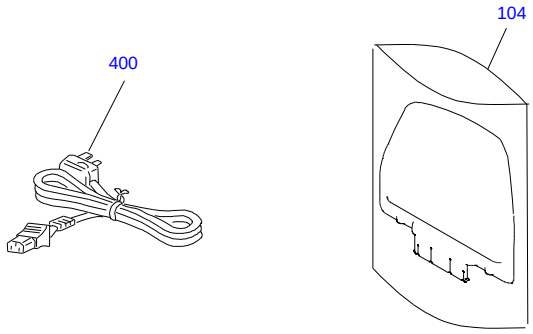
CHAPTER

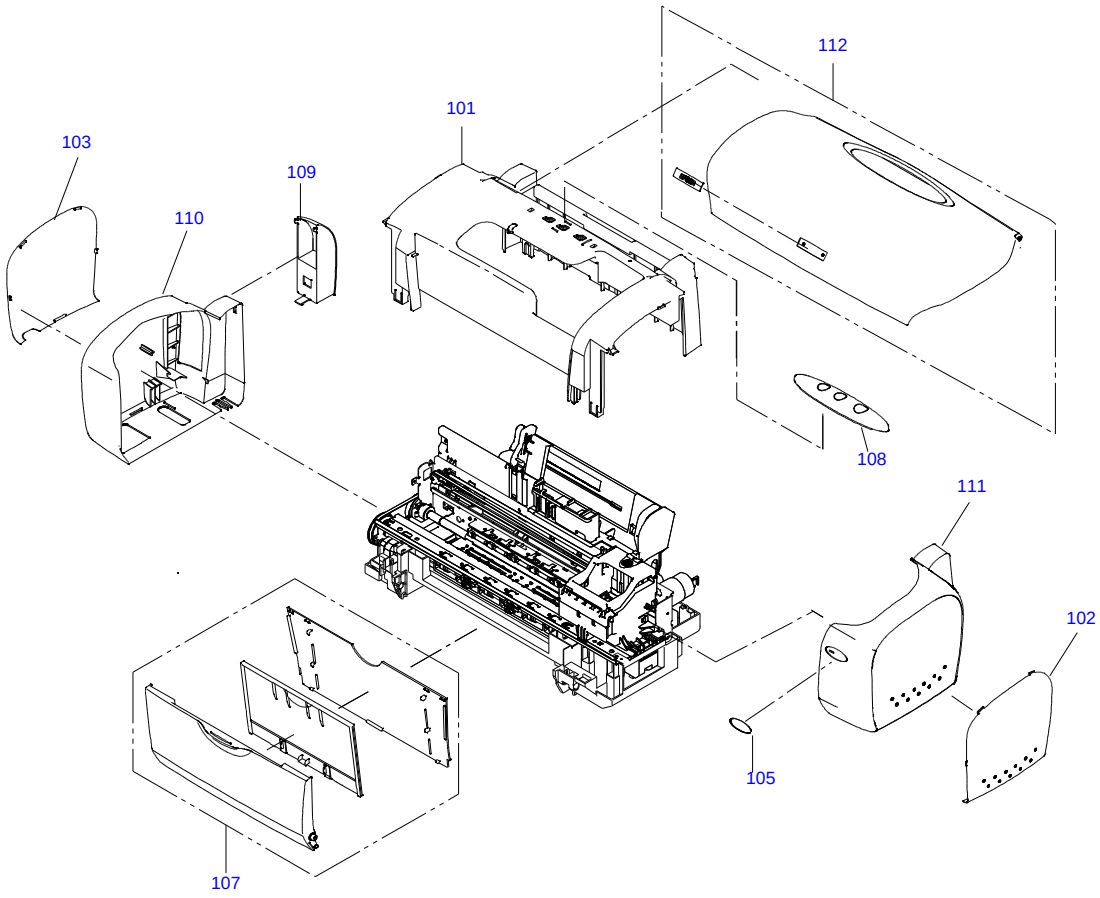
7

APPENDIX

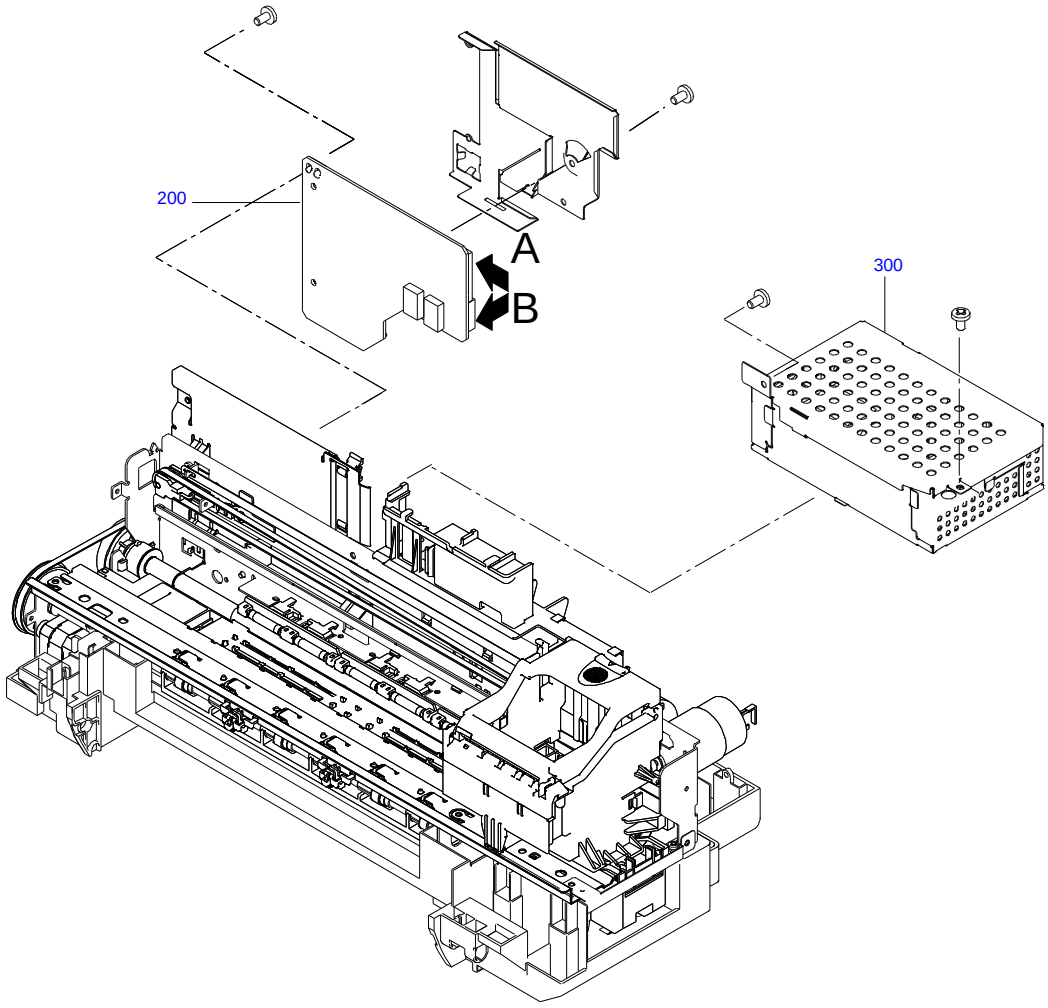
7.1 Exploded Diagram

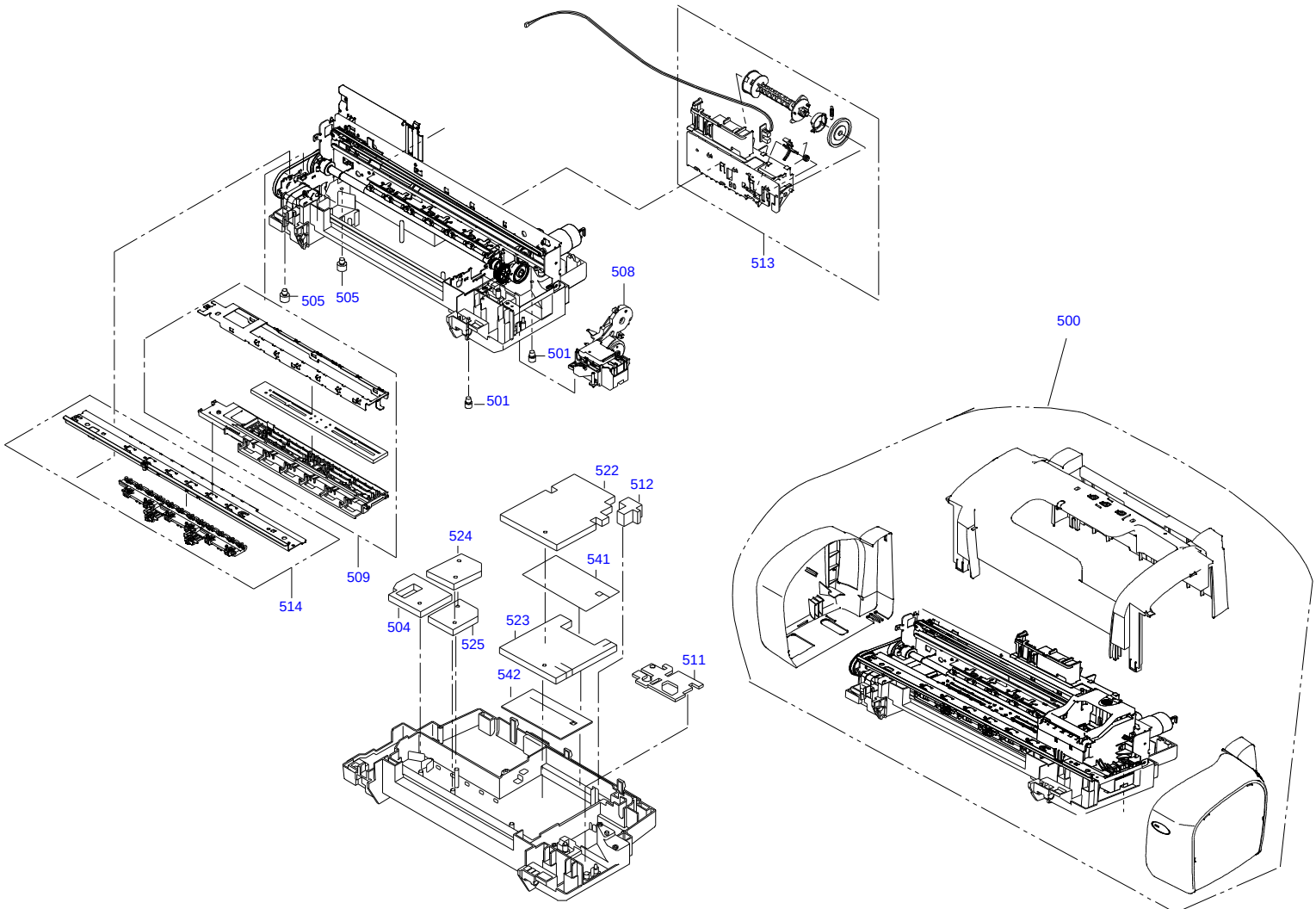
The exploded diagram of this product are shown on the following pages.



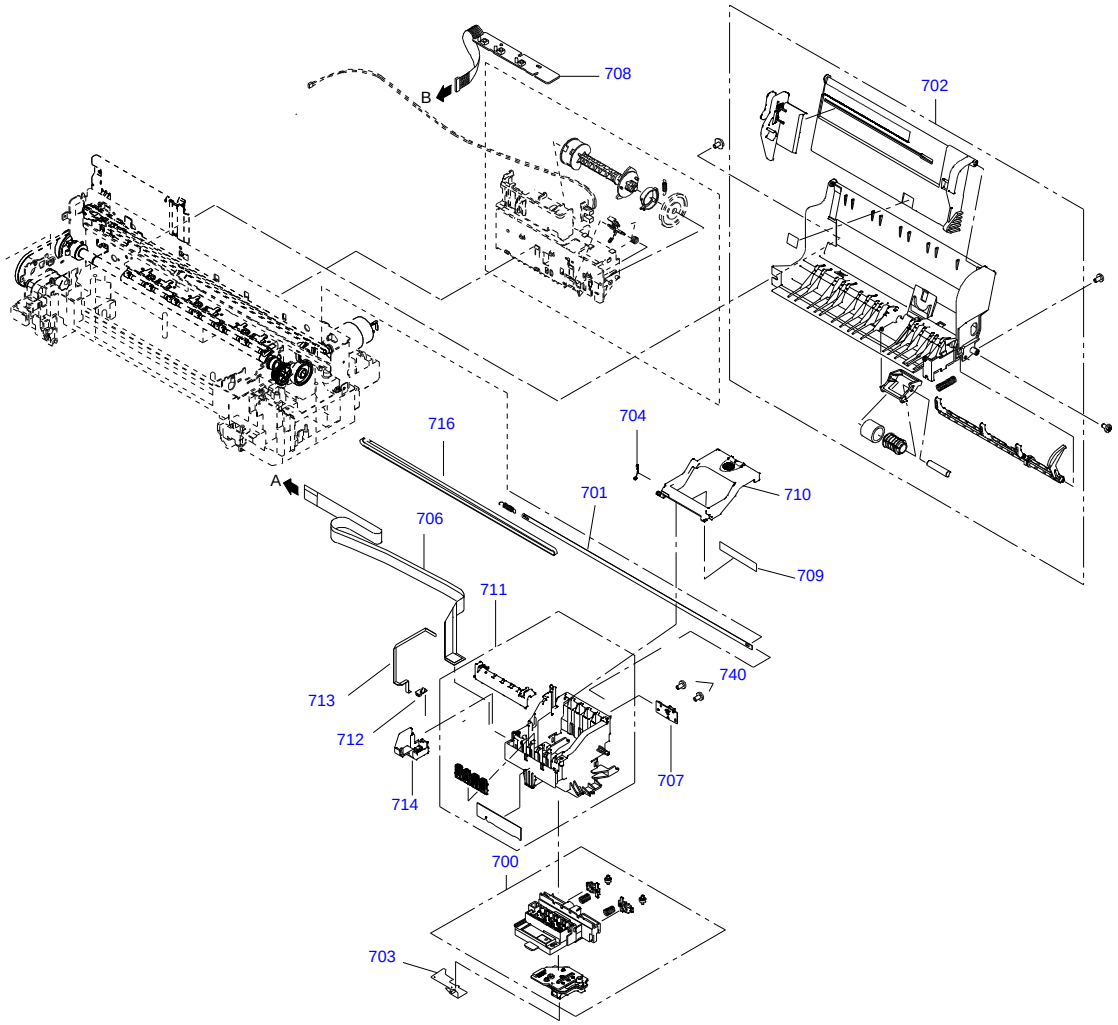


PX-V630 / EPSON Stylus C88/D88/D88 Photo Edition/C87 No.2 Rev.01 C617-CASE-001





PX-V630 / EPSON Stylus C88/D88/D88 Photo Edition/C87 No.4 Rev.01 C617-MECH-001



PX-V630 / EPSON Stylus C88/D88/D88 Photo Edition/C87 No.5 Rev.01 C617-MECH-002

7.2 Parts List

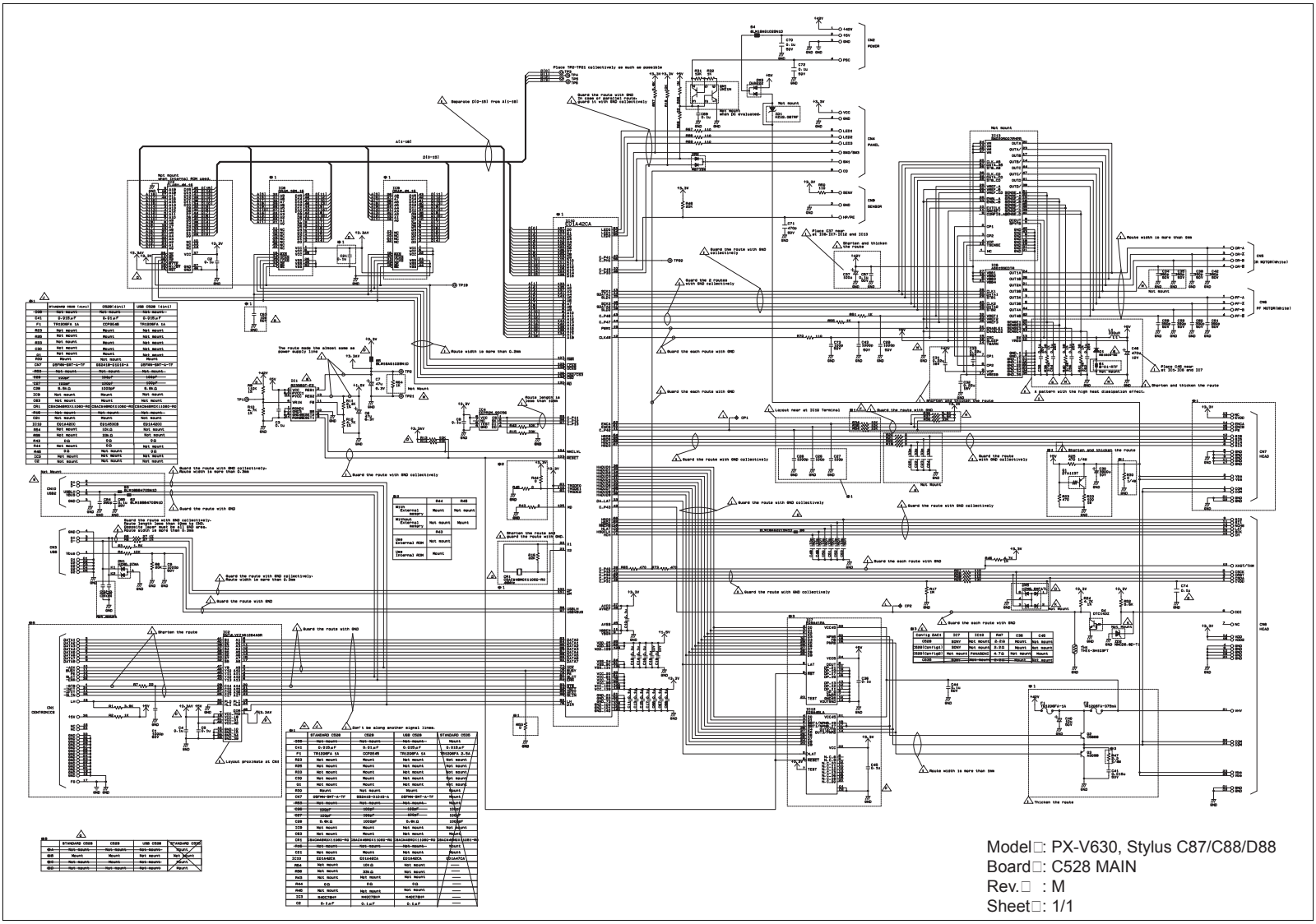
☐ Parts list for EPSON Stylus C87/C88/D88

Ref No.	Part Name
100	HOUSING, RIGHT; ENM3
101	HOUSING, LEFT; ENM3
102	HOUSING, FRAME; EDG2
103	COVER, I/F; ENM3
104	STACKER, EFS2 ASSY.
105	COVER, PRINTER, EFS2; C87 ASSY.
106	BUTTON, SW; B ASSY.
107	PAPER SUPPORT ASSY.; EFS3
108	COVER HOUSING, RIGHT, NO TEXTURE; ENM3-P
109	COVER HOUSING, LEFT, NO TEXTURE; ENM3-P
200	BOARD ASSY., MAIN
300	POWER SUPPLY ASSY.; B
400	POWER CABLE
500	PRINTER MECHANISM(ASP)MAE12-103
501	FOOT
504	POROUS PAD, INK EJECT, FB
505	INSULATOR, FRAME, MAIN
508	INKSYSTEM ASSY.
509	PAPER GUIDE, FRONT ASSY.; B
511	PROUS PAD, CAP, LOWER, SMALL
512	POROUS PAD, TUBE, FASTEN
513	HOLDER, SHAFT ASSY.; B
514	FRAME, FRONT ASSY.
522	POROUS PAD, INK EJECT, UPPER
523	POROUS PAD, INK EJECT, LOWER; E
524	POROUS PAD, INKEJECT, UPPER, SMALL
525	POROUS PAD, INKEJECT, LOWER, SMALL
541	SHEET, POROUS PAD, COVER
542	DIFFUSION SHEET, INK EJECT, LOWER, ASP
700	PRINT HEAD ASSY.
701	SCALE, CR
702	ASF UNIT
703	GROUNDING PLATE, HEAD
704	TORSION SPRING, LEVER, CARTRIDGE
706	Shield Plate, Cable Head Assy.
707	BOARD ASSY., ENCODER
708	BOARD ASSY., PNL
709	LABEL, POSITION, CARTRIDGE
710	LEVER, CARTRIDGE
711	HOLDER, I/C ASSY.
712	BOARD ASSY., DETECTOR, PW
713	HARNESS, PW
714	CAP, DETECTOR, PW
716	TIMING BELT; E
NON FIG	INK CART.UNBOXED, BK-SS, PIGT; G38K, A/A, AS
NON FIG	INK CART.UNBOXED, C-SS, PIGT; G38K, A/A, AS
NON FIG	INK CART.UNBOXED, M-SS, PIGT; G38K, A/A, AS
NON FIG	INK CART.UNBOXED, Y-SS, PIGT; G38K, A/A, AS
NON FIG	SOFTWARE CD, EAI-LATIN
NON FIG	SETTING UP MANUAL
NON FIG	USERS GUIDE
NON FIG	SETTING UP MANUAL
NON FIG	USERS GUIDE

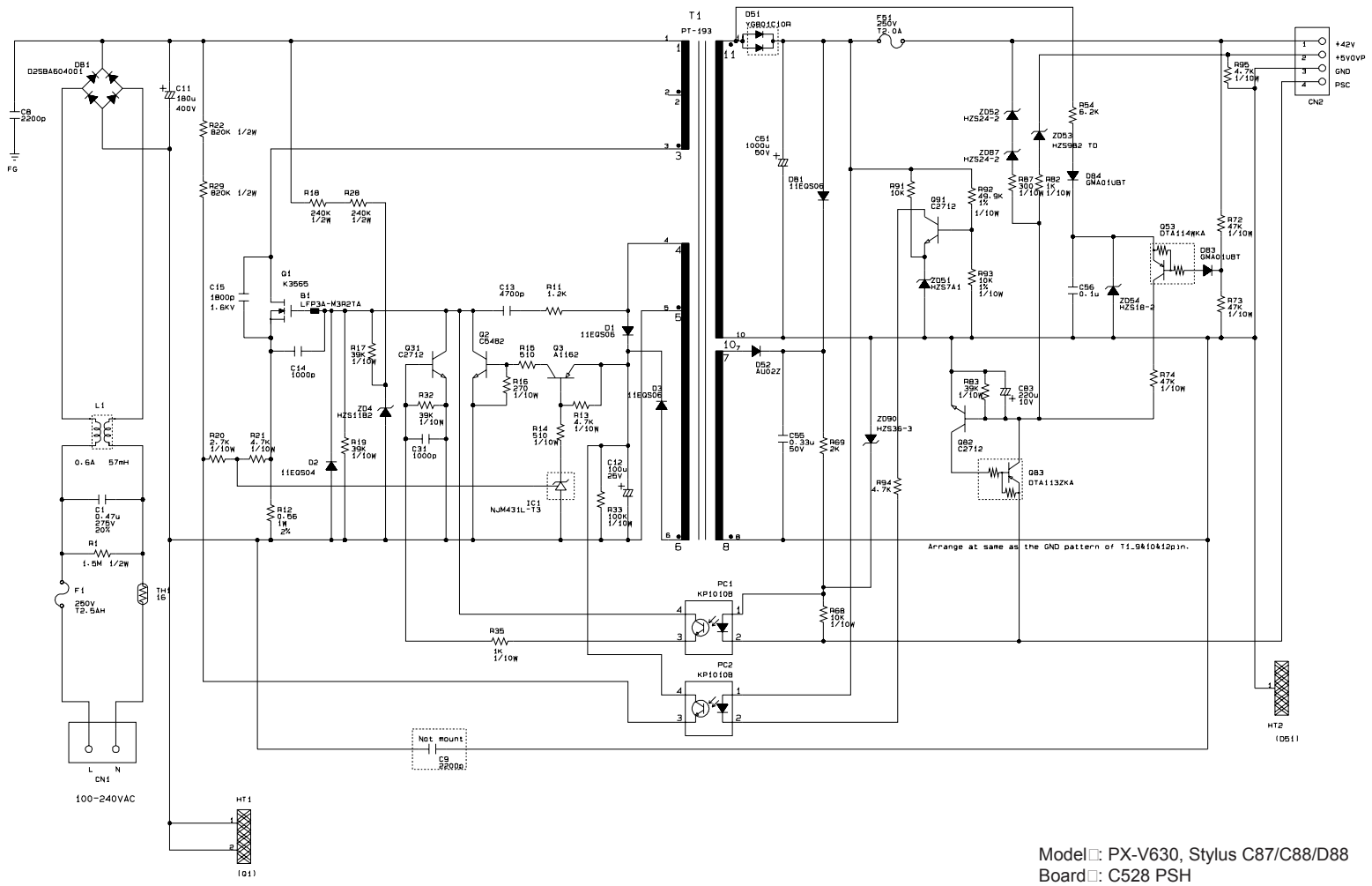
7.3 Circuit Diagram

The control electrical circuit diagrams of this product are shown on the following pages.

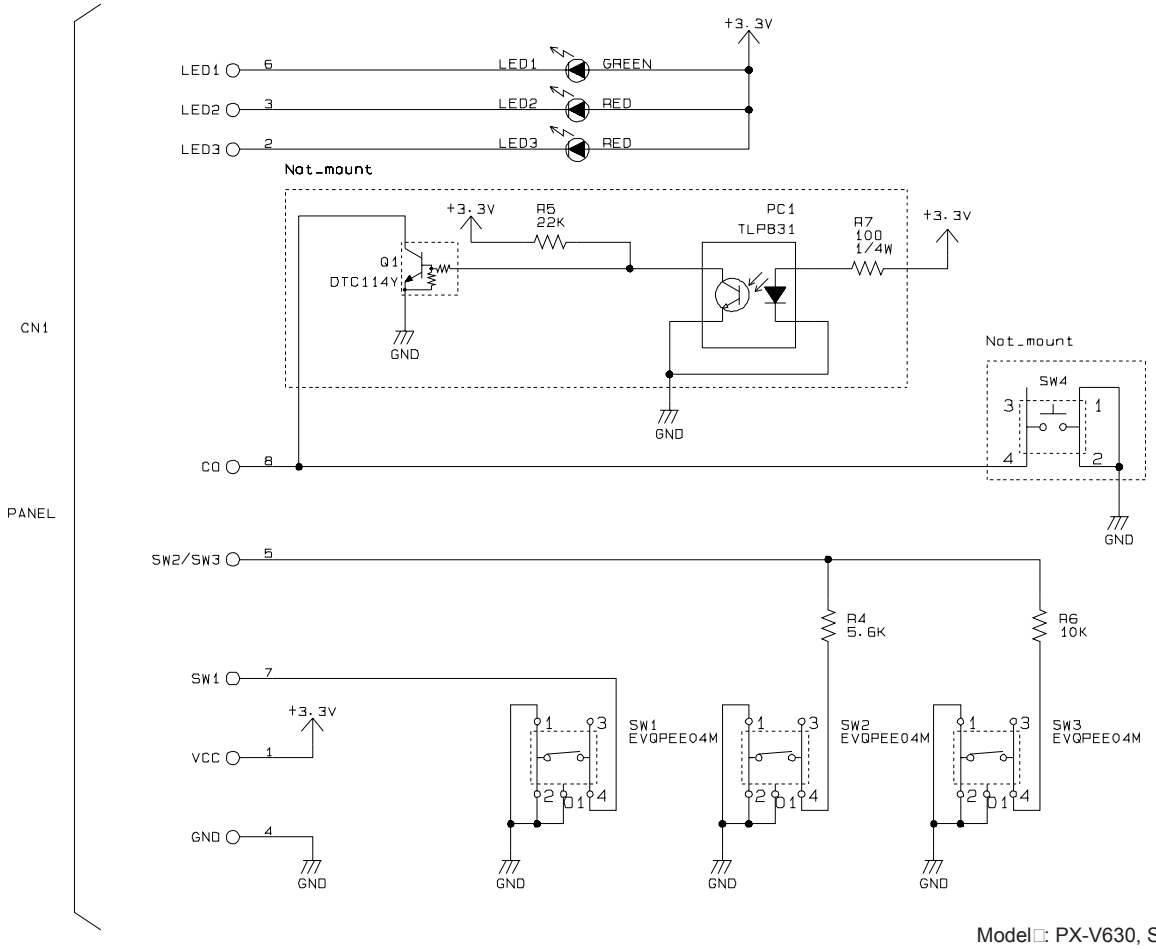
- Main Board: C528 Main Board
- Power Supply Board: C528 PSH Board
- Panel Board: C528 PNL Board



Model□: PX-V630, Stylus C87/C88/D88
Board□: C528 MAIN
Rev.□ : M
Sheet□: 1/1



Model□: PX-V630, Stylus C87/C88/D88
Board□: C528 PSH
Rev.□ : A
Sheet□: 1/1



Model□: PX-V630, Stylus C87/C88/D88
Board□: C528 PNL
Rev.□ : A
Sheet□: 1/1