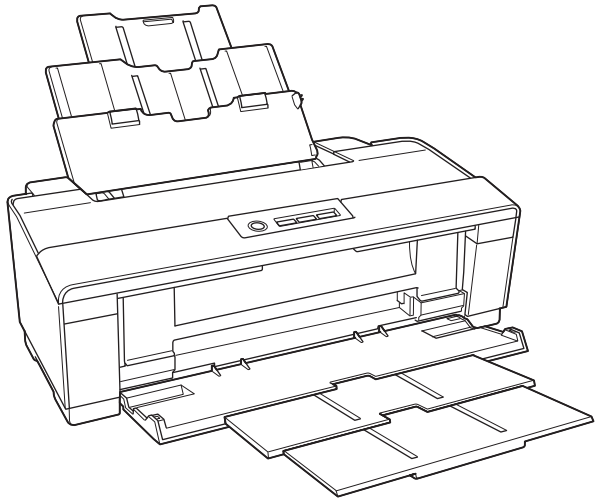
SERVICE MANUAL



Color Inkjet Printer

WorkForce 1100
Epson Stylus Office T1110
Epson Stylus Office B1100
Epson Stylus Office T1100
Epson ME Office 1100

EPSON
EXCEED YOUR VISION

Confidential

SEIJ09-003

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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:

- Connector Summary
- Exploded Diagram
- Parts List

Symbols Used in this Manual

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

Indicates an operating or maintenance procedure, practice or condition that 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 7, 2009	First Release
B	August 3, 2010	Modified the following figures. ☐ Chapter 4 ■ 4.4.1 APG Assy *(p78)* "4-28 Disconnecting the Cables *(p78)*" ■ 4.4.6 ASF Assy *(p96)* "4-83 Releasing the Cables (2) *(p97)*" ■ 4.4.9 Front Paper Guide Pad *(p103)* "4-99 Reinstalling the Front Paper Guide Pad (1) *(p103)*" ■ Disassembling THE FRONT PAPER GUIDE PAD TRAY *(p112)* "4-132 Checking the Front Paper Guide Pad *(p114)*"
C	August 27, 2010	Modified the following figures in the table. ☐ Chapter 3 ■ 3.1.1 Troubleshooting according to Error Messages *(p30)* "3-11 Troubleshooting of Fatal Error *(p41)*" *(p44)* Check Point 2, *(p46)* Check Point 1 Modified the following figure. ☐ Chapter 4 ■ 4.5.2 PF Motor *(p122)* "4-152 Removing the PF Motor *(p122)*"

CONTENTS

Chapter 1 Product Description

Chapter 2 Operating Principles

Chapter 3 Troubleshooting

Chapter 4 Disassembly And Assembly

Chapter 5 Adjustment

Chapter 6 Maintenance

Chapter 7 Appendix

CHAPTER

1

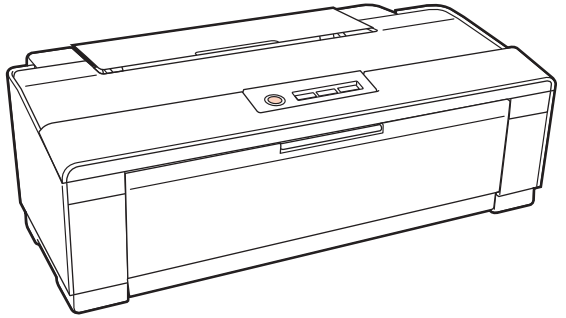
PRODUCT DESCRIPTION

1.1 Features

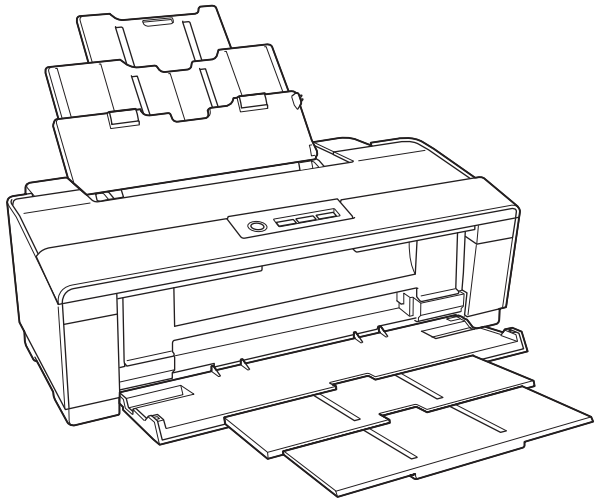
WorkForce 1100/Epson Stylus Office T1110/B1100/T1100/Epson ME Office 1100 is a color ink-jet printer that supports A3+ size.

The main features are;

- ☐ High speed & High quality
  - ■ Maximum print resolution: 5760 (H) x 1440 (V) dpi
  - ■ F3-3 Mach Turbo II Printhead achieves higher black&white print speed than ever.
  - ■ Installs two black ink cartridges as standard.
  - ■ High-speed borderless printing is available.
- ☐ One USB ports for PC connection
- ☐ Control panel
  Simple design with four buttons and three indicators (LED).
- ☐ Dimensions
  - ■ Dimensions: 616 mm (W) x 322 mm (D) x 214 mm (H)
    (Paper support and stacker are closed. Rubber feet are included)
  - ■ Weight: 12 kg (without ink cartridges)



Paper Support & Stacker are Closed



Paper Support & Stacker are Opened

Figure 1-1. External View

1.2 Printing Specifications

1.2.1 Basic Specifications

Table 1-1. Printer Specifications

Item	Specifications
Print method	On-demand ink jet
Nozzle configuration	Black: 180 nozzles x 2 Color: 59 nozzles x 3 (Cyan, Magenta, Yellow)
Print direction	Bi-directional minimum distance printing, unidirectional printing
Print resolution	Horizontal x Vertical (dpi) • 360 x 180 • 1440 x 720 • 360 x 360 • 720 x 1440 • 360 x 720 • 5760 x 1440 • 720 x 720
Control code	• ESC/P Raster command • EPSON Remote command
Input buffer size	T.B.D. Kbytes
Paper feed method	Friction feed, using one ASF (Auto Sheet Feeder)
Paper path	2-way feed
Paper feed rates	170 msec. (at 25.4 mm feed) (T.B.D.)
PF interval	Programmable in 0.01764 mm (1/1440 inch) steps

1.2.2 Ink Cartridge

The product numbers of the EPSON ink cartridges for this printer are shown below.

Table 1-2. Product No. of Ink Cartridges

Color	EAI	Latin	Euro	CISMEA/ Asia	ECC
Black	T0681 (S) T0691 (2S)	T1151 (S)	T0711H (S)	T0731H (S)	T1191 (S) T1091(2S)
Cyan	T0682 (2S) T0692 (3S)	T1032 (S)	T1002 (S)	T1032 (S)	T1232 (S) T1092 (2S)
Magenta	T0683 (2S) T0693 (3S)	T1033 (S)	T1003 (S)	T1033 (S)	T1233 (S) T1093 (2S)
Yellow	T0684 (2S) T0694 (3S)	T1034 (S)	T1004 (S)	T1034 (S)	T1234 (S) T1094 (2S)

☐ Shelf life
Two years from production date (if unopened), six months after opening package.

☐ Storage Temperature

Table 1-3. Storage Temperature

Situation	Storage Temperature	Limit
When stored in individual boxes	-20 °C to 40 °C (-4°F to 104°F)	1 month max. at 40 °C (104°F)
When installed in main unit	-20 °C to 40 °C (-4°F to 104°F)	

☐ Dimension
12.7 mm (W) x 68 mm (D) x 47 mm (H)

CAUTION

- **The ink cartridge cannot be refilled.**
- **Do not use expired ink cartridges.**
- **The ink in the ink cartridge freezes at -16 °C (3.2 °F). It takes about three hours under 25 °C (77°F) until the ink thaws and becomes usable.**

1.2.3 Print Mode

Table 1-4. Print Mode (Color)

Media	Print Mode	Resolution (H x V) dpi	Dot Size (cps*1)	Bi-d	Micro Weave
• Plain paper • Premium Bright White Paper (EAI) • Bright White Inkjet Paper (others)	Draft 1	360x180	Eco (400cps)	ON	OFF
	Draft 2	360x180	Eco (400cps)	ON	OFF
	Normal 2	**360x360**	**VSD1 (320cps)**	**ON**	**OFF**
	Fine	360x720	VSD2 (245cps)	ON	ON
	Photo 2	720x720	VSD3 (245cps)	ON	ON
• Ultra Premium Glossy Photo Paper (EAI) • Ultra Glossy Photo Paper (others)	**Best Photo 2**	**720x1440**	**VSD3 (245cps)**	**ON**	**ON**
	Photo RPM	5760x1440	VSD3 (245cps)	ON	ON
• Premium Photo Paper Glossy (EAI) • Premium Glossy Photo Paper (others)	Fine	360x720	VSD2 (245cps)	ON	ON
	Photo1	**720x720**	**VSD2 (245cps)**	**ON**	**ON**
	Best Photo 2	720x1440	VSD3 (245cps)	ON	ON
	Photo RPM	5760x1440	VSD3 (245cps)	ON	ON
• Photo Paper Glossy (EAI) • Glossy Photo Paper (others) • Premium Photo Paper Semi-Gloss (EAI) • Premium Semigloss Photo Paper (others)	Fine	360x720	VSD2 (245cps)	ON	ON
	Photo 1	**720x720**	**VSD2 (245cps)**	**ON**	**ON**
	Best Photo 2	720x1440	VSD3 (245cps)	ON	ON

Table 1-4. Print Mode (Color)

Media	Print Mode	Resolution (H x V) dpi	Dot Size (cps*1)	Bi-d	Micro Weave
• Premium Presentation Paper Matte (EAI) • Matte Paper - Heavyweight (others) • Photo Quality Inkjet Paper (others)*2	**Photo 1**	**720x720**	**VSD2 (245cps)**	**ON**	**ON**
	Best Photo 1	1440x720	VSD3 (245cps)	ON	ON
• Envelope	**Normal 2**	**360x360**	**VSD1 (320cps)**	**OFF**	**OFF**
	Fine	360x720	VSD2 (245cps)	OFF	ON

Note : The default is indicated by boldface.

Note *1: cps = character per second

*2: Not supported in EAI.

Table 1-5. Print Mode (Monochrome)

Media	Print Mode	Resolution (H x V) dpi	Dot Size (cps*1)	Bi-d	Micro Weave
• Plain paper • Premium Bright White Paper (EAI) • Bright White Inkjet Paper (others)	Draft 3	360x360	Eco (400cps)	ON	OFF
	Draft 4	360x360	Eco (400cps)	ON	OFF
	Normal 1	**360x360**	**VSD1 (320cps)**	**ON**	**OFF**
	Fine	360x720	VSD2 (245cps)	ON	ON
	Photo 2	720x720	VSD3 (245cps)	ON	ON
• Ultra Premium Glossy Photo Paper (EAI) • Ultra Glossy Photo Paper (others)	Best Photo 2	720x1440	VSD3 (245cps)	ON	ON
	Photo RPM	5760x1440	VSD3 (245cps)	ON	ON
• Premium Photo Paper Glossy (EAI) • Premium Glossy Photo Paper (others)	Fine	360x720	VSD2 (245cps)	ON	ON
	Photo1	**720x720**	**VSD2 (245cps)**	**ON**	**ON**
	Best Photo 2	720x1440	VSD3 (245cps)	ON	ON
	Photo RPM	5760x1440	VSD3 (245cps)	ON	ON
• Photo Paper Glossy (EAI) • Glossy Photo Paper (others) • Premium Photo Paper Semi-Gloss (EAI) • Premium Semigloss Photo Paper (others)	Fine	360x720	VSD2 (245cps)	ON	ON
	Photo 1	**720x720**	**VSD2 (245cps)**	**ON**	**ON**
	Best Photo 2	720x1440	VSD3 (245cps)	ON	ON

Table 1-5. Print Mode (Monochrome)

Media	Print Mode	Resolution (H x V) dpi	Dot Size (cps*1)	Bi-d	Micro Weave
• Premium Presentation Paper Matte (EAI) • Matte Paper - Heavyweight (others) • Photo Quality Inkjet Paper (others)*2	**Photo 1**	**720x720**	**VSD2 (245cps)**	**ON**	**ON**
	Best Photo 1	1440x720	VSD3 (245cps)	ON	ON
• Envelope	**Normal 1**	**360x360**	**VSD1 (320cps)**	**OFF**	**OFF**
	Fine	360x720	VSD2 (245cps)	OFF	ON

Note : The default is indicated by boldface.

Note *1: cps = character per second

*2: Not supported in EAI.

1.2.4 Supported Paper

The table below lists the paper type and sizes supported by the printer. The Supported paper type and sizes vary depending on destinations (between EAI, EUR, and Asia).

Table 1-6. Supported Paper

Paper Name	Paper Size		Thickness	Weight		EAI		EUR		Asia	
			mm	g/m²	lb.	P*1	B*2	P*1	B*2	P*1	B*2
Plain paper	A3+/SuperA3	329 x 483 mm	0.08-0.11	64-90	17-24	Y	-	Y	-	Y	-
	A3	297 x 420 mm				Y	-	Y	-	Y	-
	US B	279.4 x 431.8 mm (11” x 17”)				Y	-	-	-	-	-
	B4	257 x 364 mm				Y	-	Y	-	Y	-
	Legal	215.9 x 355.6 mm (8.5” x 14”)				Y	-	Y	-	Y	-
	Letter	215.9 x 279.4 mm (8.5” x 11”)				Y	-	Y	-	Y	-
	A4	210 x 297 mm (8.3” x 11.7”)				Y	-	Y	-	Y	-
	B5	182 x 257 mm (7.2” x 10.1”)				-	-	Y	-	Y	-
	A5	148 x 210 mm (5.8” x 8.3”)				-	-	Y	-	Y	-
	Half Letter	139.7 x 215.9 mm (5.5” x 8.5”)				Y	-	-	-	-	-
	A6	105 x 148 mm (4.1” x 5.8”)				Y	-	Y	-	Y	-
	User Defined	50.8 x 127- 329 x 1117.6 mm				Y	-	Y	-	Y	-
Premium Inkjet Plain Paper	A4	210 x 297 mm (8.3” x 11.7”)	0.11	80	21	-	-	Y	-	Y	-
Premium Bright White Paper	Letter	215.9 x 279.4 mm (8.5” x 11”)	0.11	90	24	Y	-	-	-	-	-
Bright White Inkjet Paper	A3	297 x 420 mm	0.13	92.5	25	-	-	Y	-	Y	-
	A4	210 x 297 mm (8.3” x 11.7”)				-	-	Y	-	Y	-
Ultra Premium Glossy Photo Paper (EAI) Ultra Glossy Photo Paper (others)	Letter	215.9 x 279.4 mm (8.5” x 11”)	0.3	290	77	Y	Y	-	-	-	-
	A4	210 x 297 mm (8.3” x 11.7”)				-	-	Y	Y	Y	Y
	8” x 10”	203.2 x 254 mm				Y	Y	-	-	-	-
	5” x 7”	127 x 178 mm				Y	Y	Y	Y	-	-
	4” x 6”	101.6 x 152.4 mm				Y	Y	Y	Y	Y	Y

Table 1-6. Supported Paper

Paper Name	Paper Size		Thickness	Weight		EAI		EUR		Asia	
			mm	g/m²	lb.	P*1	B*2	P*1	B*2	P*1	B*2
Premium Photo Paper Glossy (EAI) Premium Glossy Photo Paper (others)	A3+/SuperA3	329 x 483 mm	0.27	255	68	Y	Y	Y	Y	Y	Y
	A3	297 x 420 mm				Y	Y	Y	Y	Y	Y
	11” x 14”	279.4 x 355.6 mm				Y	Y	-	-	-	-
	US B	279.4 x 431.8 mm (11” x 17”)				Y	Y	-	-	-	-
	Letter	215.9 x 279.4 mm (8.5” x 11”)				Y	Y	-	-	-	-
	A4	210 x 297 mm (8.3” x 11.7”)				Y	Y	Y	Y	Y	Y
	8” x 10”	203.2 x 254 mm				Y	Y	-	-	-	-
	5” x 7”	127 x 178 mm				Y	Y	Y	Y	Y	Y
	4” x 6”	101.6 x 152.4 mm				Y	Y	Y	Y	Y	Y
	16:9 wide	102 x 181 mm (4” x 7.11”)				Y	Y	Y	Y	Y	Y
Photo Paper Glossy (EAI) Glossy Photo Paper (others)	A3+/SuperA3	329 x 483 mm	0.25	258	68	Y	Y	-	-	-	-
	US B	279.4 x 431.8 mm (11” x 17”)				Y	Y	-	-	-	-
	Letter	215.9 x 279.4 mm (8.5” x 11”)				Y	Y	-	-	-	-
	A4	210 x 297 mm (8.3” x 11.7”)				Y	Y	Y	Y	Y	Y
	5” x 7”	127 x 178 mm				-	-	Y	Y	-	-
	4” x 6”	101.6 x 152.4 mm				Y	Y	Y	Y	Y	Y
Premium Photo Paper Semi-gloss (EAI) Premium Semigloss Photo Paper (others)	A3+/SuperA3	329 x 483 mm	0.27	250	66	Y	Y	Y	Y	Y	Y
	A3	297 x 420 mm				Y	Y	Y	Y	Y	Y
	US B	279.4 x 431.8 mm (11” x 17”)				Y	Y	-	-	-	-
	Letter	215.9 x 279.4 mm (8.5” x 11”)				Y	Y	-	-	-	-
	A4	210 x 297 mm (8.3” x 11.7”)				-	-	Y	Y	Y	Y
	4” x 6”	101.6 x 152.4 mm				Y	Y	Y	Y	Y	Y

Table 1-6. Supported Paper

Paper Name	Paper Size		Thickness	Weight		EAI		EUR		Asia	
			mm	g/m²	lb.	P*1	B*2	P*1	B*2	P*1	B*2
Premium Presentation Paper Matte (EAI) Matte Paper Heavy-weight (others)	11” x 14”	279.4 x 355.6 mm	0.23	167	44	Y	Y	-	-	-	-
	Letter	215.9 x 279.4 mm (8.5” x 11”)				Y	Y	-	-	-	-
	A4	210 x 297 mm (8.3” x 11.7”)				Y	Y	Y	Y	Y	Y
	8” x 10”	203.2 x 254 mm				Y	Y	-	-	-	-
Presentation Paper Matte (EAI) Photo Quality Inkjet Paper/ESF (others)	A3+/SuperA3	329 x 483 mm	0.12	102	27	Y	-	Y	-	Y	-
	A3	297 x 420 mm				-	-	Y	-	Y	-
	US B	279.4 x 431.8 mm (11” x 17”)				Y	-	-	-	-	-
	A4	210 x 297 mm (8.3” x 11.7”)				-	-	Y	-	Y	-
Envelopes	#10	104.8 x 241.3 mm (4.125” x 9.5”)	-	75-100	20-27	Y	-	Y	-	Y	-
	#DL	110 x 220 mm				-	-	Y	-	Y	-
	#C4	229 x 324 mm				-	-	Y	-	Y	-
	#C6	114 x 162 mm				-	-	Y	-	Y	-
Photo Quality Self Adheshive Sheet	A4	210 x 297 mm (8.3” x 11.7”)	0.19	167	44	Y	-	Y	-	Y	-

Note *1: “Y” in the “P” column stands for “the paper type/size is Supported”.

*2: “Y” in the “B” column stands for “Borderless printing is available”.

CAUTION

- **Make sure the paper is not wrinkled, fluffed, torn, or folded.**
- **The curve of paper must be 5 mm or below.**
- **When printing on an envelope, be sure the flap is folded neatly.**
- **Do not use the adhesive envelopes.**
- **Do not use double envelopes and cellophane window envelopes.**

1.2.5 Printing Area

The printing area for this printer is shown below.

Table 1-7. Printing Area (Margins)

Print Mode	Paper Size	Margin*			
		Left	Right	Top	Bottom
Standard print	Any size	3 mm	3 mm	3 mm	3 mm
	Envelopes	5 mm	5 mm	5 mm	20 mm
Borderless print	A4/Letter to 5” x 7”/ 16:9 wide	2.54 mm	2.54 mm	2.96 mm	4.02 mm
	4” x 6”	2.54 mm	2.54 mm	1.34 mm	2.54 mm

Note *: The margins for Borderless print are margins that bleed off the edges of paper.

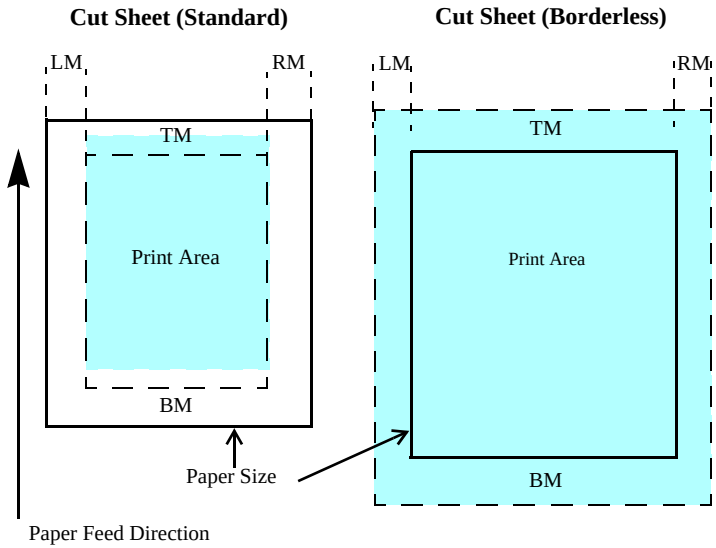


Figure 1-2. Printing Area

1.3 Interface

This printer is equipped with the USB device port on the rear of the printer for connecting with a host such as a computer. The following is the specifications of the port.

- Specification:
  - Universal Serial Bus Specifications Revision 2.0
  - Universal Serial Bus Device Class Definition for Printing Devices Version 1.1
- Transfer rate: 480 Mbps (High Speed Device)
- Data format: NRZI
- Compatible connector: USB Series B
- Max. cable length: 2 [m] or less

Table 1-8. Device ID

When IEEE 1284.4 is Enabled	When IEEE 1284.4 is Disabled
@EJL<SP>ID<CR><LF> MFG:EPSON; CMD:ESCPL2,BDC,D4,D4PX; MDL:*Model Name*; CLS:PRINTER; DES:EPSON<SP>*Model Name*; CID:EpsonStd5;	@EJL<SP>ID<CR><LF> MFG:EPSON; CMD:ESCPL2,BDC; MDL:*Model Name*; CLS:PRINTER; DES:EPSON<SP>*Model Name*; CID:EpsonStd5;

The “Model Name” is replaced as shown in the following table.

Destination	Model Name
North America	WorkForce 1100
Latin America	Epson Stylus Office T1110
Euro	Epson Stylus Office B1100
Asia/CISMEA	Epson Stylus Office T1100
China	Epson ME OFFICE 1100

1.4 General Specifications

1.4.1 Electrical Specifications

☐ Primary power input

Table 1-9. Primary Power Specifications

Item		100-120V model	220-240V model
Rated power supply voltage		100 to 120 VAC	220 to 240 VAC
Input voltage range		90 to 132 VAC	198 to 264 VAC
Rated current		0.7 A (max. 1.5 A)	0.4 A (max. 0.6 A)
Rated frequency		50 to 60 Hz	
Input frequency range		49.5 to 60.5 Hz	
Insulation resistance		AC1000Vrms (for one minute)	
Energy conservation		International Energy Star Program compliant	
Power consumption	Printing	Approx. 26 W	Approx. 26 W
	Sleep mode	Approx. 1.3 W	Approx. 1.7 W
	Standby mode (power-off)	Approx. 0.2 W	Approx. 0.4 W

Note : If the printer is not operated for more than three minutes, it goes into sleep mode within five minutes.

1.4.2 Environmental Conditions

Table 1-10. Environmental Conditions

Condition	Temperature*1	Humidity*1,2	Shock	Vibration
Operating	10 to 35°C (50 to 95°F)	20 to 80%	1G (1 msec. or less)	0.15G, 10 to 55Hz
Storage*3 (unpacked)	-20 to 40°C*4 (-4°F to 104°F)	5 to 85%	2G (2 msec. or less)	0.50G, 10 to 55Hz

Note *1: The combined Temperature and Humidity conditions must be within the blue-shaded range in *Figure 1-3*.

*2: No condensation

*3: Non-operating with unpacked.

*4: Must be less than 1 month under 40°C.

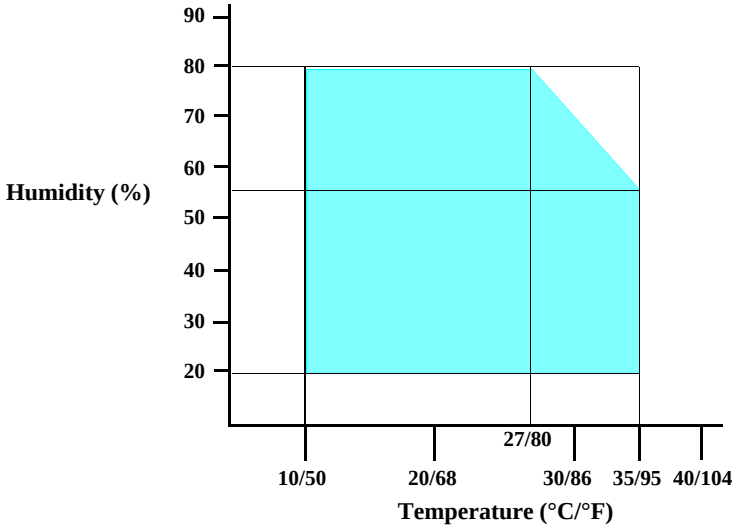


Figure 1-3. Temperature/Humidity Range

CAUTION

- **When returning the repaired printer to the customer, make sure the Printhead is covered with the cap and the ink cartridge is installed.**
- **If the Printhead is not covered with the cap when the printer is off, turn on the printer with the ink cartridge installed, make sure the Printhead is covered with the cap, and then turn the printer off.**

1.4.3 Durability

Item		Durability	Remark
Total print life	Black	36,000 pages, or five years whichever comes first	A4, 3.5% duty (ECMA)
	Color	18,000 pages, or five years whichever comes first	Plain Paper A4, ISO24712 Pattern, Default Mode print
Printhead		Six billions shots (per nozzle) or five years whichever comes first	---

1.4.4 Acoustic Noise

35 dB (when printing from PC, on Premium Glossy Photo Paper, in highest quality)

1.4.5 Safety Approvals (Safety standards/EMI)

USA	UL60950-1
	FCC Part15 Subpart B Class B
Canada	CAN/CSA-C22.2 No.60950-1
	CAN/CSA-CEI/IEC CISPR 22 Class B
Mexico	NOM-019-SCFI-1998
Taiwan	CNS13438 Class B
	CNS14336 (IEC60950)
EU	EN60950-1
	EN55022 Class B
	EN61000-3-2, EN61000-3-3
	EN55024
Germany	EN60950-1
Russia	GOST-R (IEC60950-1, CISPR 22)
Singapore	IEC60950-1
Korea	K60950-1
	KN22 Class B
	KN61000-4-2/-3/-4/-5/-6/-11
China	GB4943
	GB9254 Class B, GB17625.1
Argentina	IEC60950-1
Australia	AS/NZS CISPR22 Class B
Hong Kong	IEC60950-1

1.5 Operation Buttons & Indicators (LEDs)

1.5.1 Operation Buttons

The printer has the following four operation buttons.

Table 1-11. Operation Buttons

Button	Function
Power	Turns the power ON/OFF.
Paper	Feeds or ejects paper.
Ink	Runs a sequence of ink cartridge replacement or cleaning.
Cancel	Cancels job during printing

1.5.2 Indicators (LEDs)

Three indicators (LEDs) are provided to indicate settings or printer status.

Table 1-12. Indicators (LEDs)

LED	Function
Power LED (green)	Lights at power-on. Flashes during some sequence is in progress. Flashes at high speed during power-OFF sequence.
Paper LED (red)	Lights or flashes when an paper-related error occurs.*
Ink LED (red)	Lights or flashes when an ink-related error occurs.*

Note *: See Table 1-14 ?Indicators (LEDs) Function? for the LED status at error occurrence.

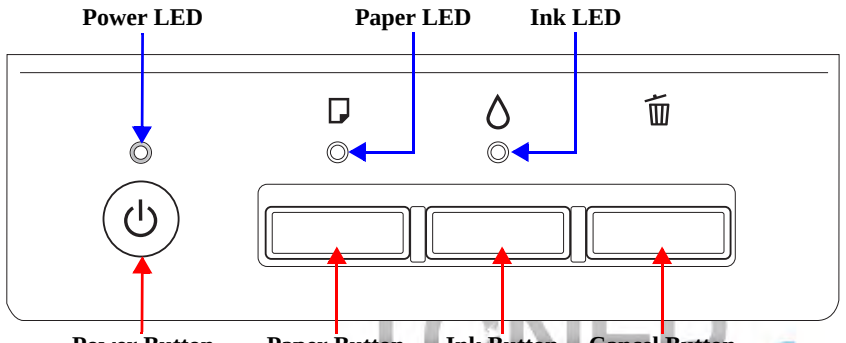


Figure 1-4. Buttons & LEDs

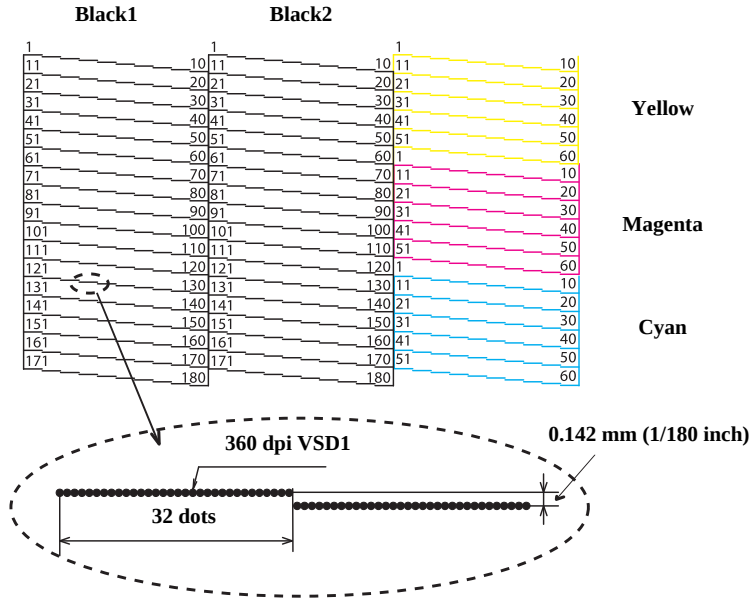
1.5.3 Operation Buttons & LEDs Functions

Detailed information on the buttons and LEDs functions are listed below.

Table 1-13. Operation Button Functions

Button	Printer Status	Function
Power	Off	• Turns the power on.
	On	• Turns the power off.
Paper	On	• Feeds or ejects paper. • Recovers from a multi-feed error and feeds paper to restart the print job. • Feeds paper when paper is loaded after a no-paper error occurs. • Ejects a jammed paper when a paper jam error occurs. • Runs a sequence of ink cartridge replacement when an ink-out error occurs. The carriage moves to set the ink cartridge to the position for replacement. • When the carriage has been set in the ink replacement position, moves the carriage to the home position.
Ink	On	• Runs a sequence of ink cartridge replacement. The carriage moves to set the ink cartridge to the position for replacement. • When an ink cartridge has been set in the ink replacement position, moves the carriage to the home position.
Ink (when held for three seconds or longer)	On	• Runs a head cleaning. • Runs a sequence of ink cartridge replacement when ink level low, ink out, or no ink cartridge error has occurred.
Cancel	On	• Cancels the print job during printing. • When the carriage has been set in the ink replacement position, moves the carriage to the home position.
Power + Ink (combination)	On	• Forcefully turns the power off.
Power + Paper (combination)	At power on	• Prints a nozzle check pattern* when not connected to the PC.

Note *: The nozzle check pattern printed by the printer is shown in *Figure 1-5*.



Note : The numbers shown in the figure are nozzle numbers. The numbers and color names are not printed on an actual nozzle check pattern.

Figure 1-5. Nozzle Check Pattern

Table 1-14. Indicators (LEDs) Function

Printer Status	Indicators (LEDs)			Priority*1
	Power	Paper	Ink	
Power OFF	Flashes at high speed	OFF	OFF	1
Fatal error	OFF	Flashes at high speed	Flashes at high speed	2
Maintenance request	OFF	Flashes alternately 1	Flashes alternately 2	3
Paper jam error	--	Flashes	--	4
Cover open error	--	Flashes	--	
Multi-feed error	--	ON	--	5
No paper error	--	ON	--	
Ink cartridge replacement is in progress	Flashes	--	--	6
Ink sequence is in progress	Flashes	--	--	7
CSIC error	--	--	ON	8
No ink cartridge error or ink-out error	--	--	ON	
Ink level low	--	--	Flashes	9
Power ON	Flashes	--	--	10
Reset request*2	ON	ON	ON	--

Note *1: When two or more errors occur at the same time, the one with higher priority will be indicated.

*2: The all LEDs light for 0.2 seconds when a reset request is received.

Note : --: No change
Flash: Repeats turning On and Off every 1.25 seconds.
Flash at high speed: Repeats turning On and Off every 0.5 seconds.
Flashes alternately 1: Same as the “Flash”
Flashes alternately 2: Repeats turning Off and On every 1.25 seconds.

1.5.4 Errors & Remedies

Table 1-15. Errors & Remedies

Error	Error	Remedies
Fatal error	A mechanical error has occurred.	Turn the power Off and back it On.
Maintenance request	Waste ink pads need to be replaced.	Replace the waste ink pads and reset the counter.
Paper jam	A paper jam has occurred.	Remove the jammed paper and press the Paper button.
No paper	Failed to feed paper.	Load paper correctly and press the Paper button.
Multi-feed	Multiple sheets of paper were fed at the same time.	Press the Paper button to eject the multiple sheets.
Ink-out	The cartridge has run out of ink.	Replace the cartridge with a new one.
No ink cartridge	Ink cartridge(s) was not detected.	Replace the cartridge with a new one.
Wrong ink cartridge	Incorrect ink cartridge(s) was detected.	Replace the cartridge with the correct one.
Cover open error	Printing was executed with the Printer Cover open.	Close the Printer Cover.

Note : For more information on the remedies, see ?3.1.1 Troubleshooting according to Error Messages? *(p.30)*.

CHAPTER

2

OPERATING PRINCIPLES

2.1 Overview

This chapter explains the operating principles of the mechanical sections and electrical circuits in this product. The main components of this product are as follows.

Board Name	Model Number
Control circuit board	CA58 MAIN
Power supply circuit board	C698 PSB/PSE
Control panel board	C698 PNL
Relay Board	CA58 SUB-B
CR Relay Board	CA58 SUB

2.2 Printer Mechanism

Like the conventional model, this product uses DC motors and stepping motors as power sources. The following table describes the motor types and their applications.

Table 2-1. Motors

Motor Name	Type	Applications/Functions
CR Motor	DC motor with brushes	Used for carriage driving. Makes little noise during driving. The CR linear scale and CR encoder sensor are used to control the motor.
PF Motor	DC motor with brushes	Drives the Paper loading rollers at the time of fixed-value paper loading or paper feed/eject operation. To grasp the paper feed pitch, the precision gear surface is fitted with the PF scale and the PF encoder sensor is used to control the motor.
APG Motor	DC motor with brushes	Drives the Carriage Unit at the time of PG setting. The two APG Sensors are driven vertically to control the motor.
ASF Motor	4-phase, 48-pole PM type stepping motor	Drives the paper feed operation of the ASF. Since this is a stepping motor, any scales or photo sensors to know the driving conditions are not required.
Pump Motor	4-phase, 48-pole PM type stepping motor	Drives the pump, wiper, etc. of the Ink System. Since this is a stepping motor, any scales or photo sensors to know the driving conditions are not required.

The basic mechanism is almost same as the Epson Stylus Photo R1900. The schematic diagram below shows the printer mechanism.

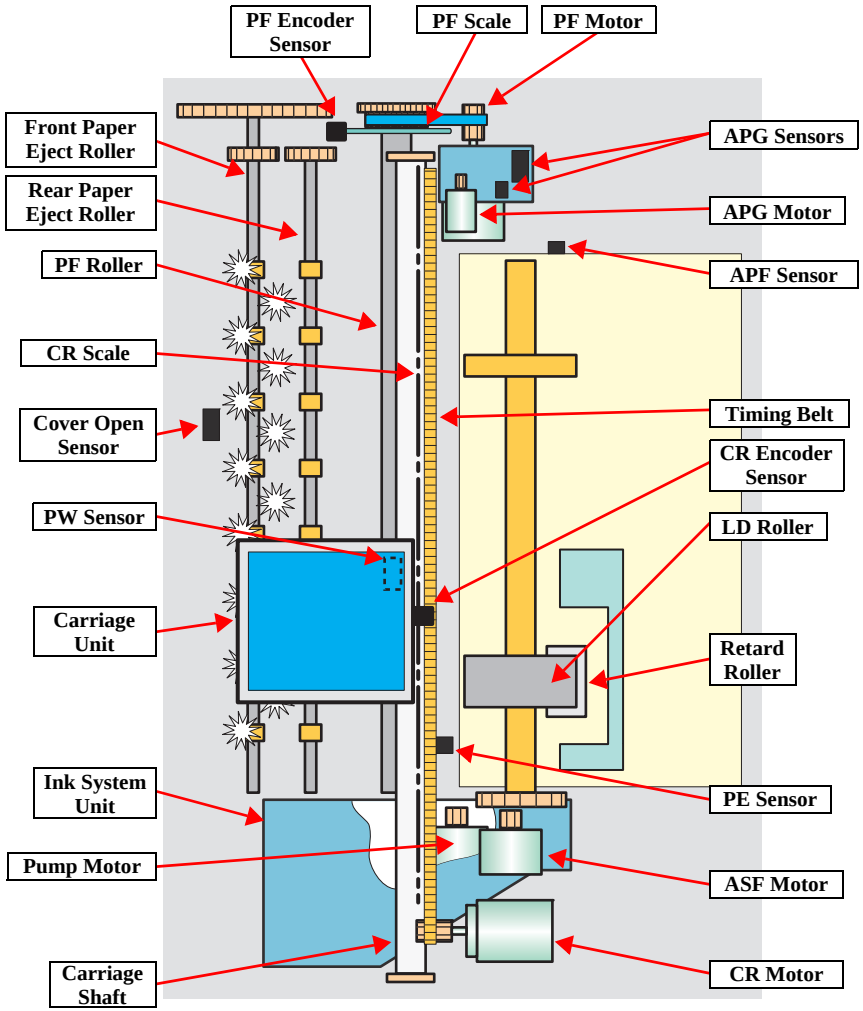


Figure 2-1. Printer Mechanism Outline

2.3 Printhead Specifications

The Printhead of this product is a F-Mach head.
The following shows the arrangement of the nozzles and the color arrangement of each nozzle line when viewed the Print Head from behind.

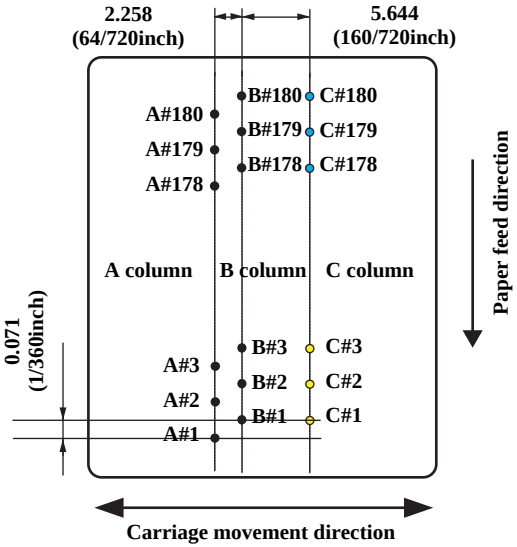


Figure 2-2. Nozzle Arrangement

Table 2-2. Nozzle Lines and the Corresponding Ink Color

Ink	Line
Black	A column: #1 to #180 B column: #1 to #180
Yellow	C column*: #1 to C#60
Magenta	C column*: #61 to C#120
Cyan	C column*: #121 to C#180

Note "*": #1,#61 and #121 nozzles of C column are used only for flushing, and are not used for printing.

2.4 PG Setting

As this printer uses an Auto PG (APG), an appropriate PG position is set according to the used paper type.

The following table indicates the PG positions, the main applications of each position, and the relationships between the two sensors used with the APG.

Table 2-3.

Application	PG Position					
	PG (– –)	**PG (–)**	**PG (Typ)**	**PG (+)**	**PG (++)**	**Release**
Printing	• Photo paper (A4 or more)	• Photo paper (Less than A4)	• Plain paper • Exclusive paper • PG (-) rub avoidance	• Envelope • PG (Typ) rub avoidance	–	–
Non-printing	• Position for phase alignment at reassembly	• PG adjustment position	• Standby position after power-on	–	• Initialization at power-on • Cleaning (wiping) • Ink Cartridge replacement	• Paper jam removal
PG value	1.0mm	1.2mm	1.7mm	2.1mm	4.5mm	–
Sensor	**PG (– –)**	**PG (–)**	**PG (Typ)**	**PG (+)**	**PG (++)**	**Release**
APG Sensor 1*	High	High	High	High	High	High
APG Sensor 2	Low	Low	Low	Low	High	High

Note "*": The signal output is “Low” while the PG positions are changed.

2.5 Motors & Sensors

☐ Motors

Table 2-4. List of Motors

Fig.	Name	Specific
A	PF Motor	Type: DC Motor Armature resistance: 12.2 Ω ± 10% Drive voltage: 42 V DC ± 5%
B	APG Motor	Type: DC Motor Armature resistance: 64.7 Ω ± 15% Drive voltage: 42 V DC ± 5%
C	ASF Motor	Type: 4-phase 48-pole PM type stepping motor Winding resistance: 7.0 Ω ± 10% (per phase at 25°C) Drive voltage: 42 V DC ± 5%
D	CR Motor	Type: DC Motor Armature resistance: 23.6 Ω ± 10% Drive voltage: 42 V DC ± 5%
E	Pump Motor	Type: 4-phase 48-pole PM type stepping motor Winding resistance: 10.3 Ω ± 10% (per phase at 25°C) Drive voltage: 42 V DC ± 5%

☐ Sensors

Table 2-5. List of Sensors

Fig.	Name	Specific
1	PF Encoder sensor	Type: Rotary Encoder Drive voltage: 3.3 V DC ± 5%
2	APG Sensor (1)	Type: Transmissive photo interrupter Sensor output: • High: In the domain of each PG position • Low: Between PG positions Drive voltage: 3.3 V DC ± 5%
3	APG Sensor (2)	Type: Transmissive photo interrupter Sensor output: • High: In the domain of large PG • Low: In the domain of small PG Drive voltage: 3.3 V DC ± 5%
4	ASF Sensor	Type: Transmissive photo interrupter Sensor output: • High: Home position • Low: Other than home position Drive voltage: 3.3 V DC ± 5%
5	PE Sensor	Type: Transmissive photo interrupter Sensor output: • High (2.4 V or more): No paper • Low (0.4 V or less): Paper exists Drive voltage: 3.3 V DC ± 5%
6	CR Encoder sensor	Type: Linear Encoder Drive voltage: 3.3 V DC ± 5%

Table 2-5. List of Sensors

Fig.	Name	Specific
7	PW Sensor	Type: Reflective photo interrupter Sensor output: • High: No paper • Low: Paper exists Drive voltage: 3.3 V DC ± 5%
8	Cover Open Sensor	Type: Mechanical contact Sensor output: • High: Cover closed • Low: Cover open Drive voltage: 3.3 V DC ± 5%

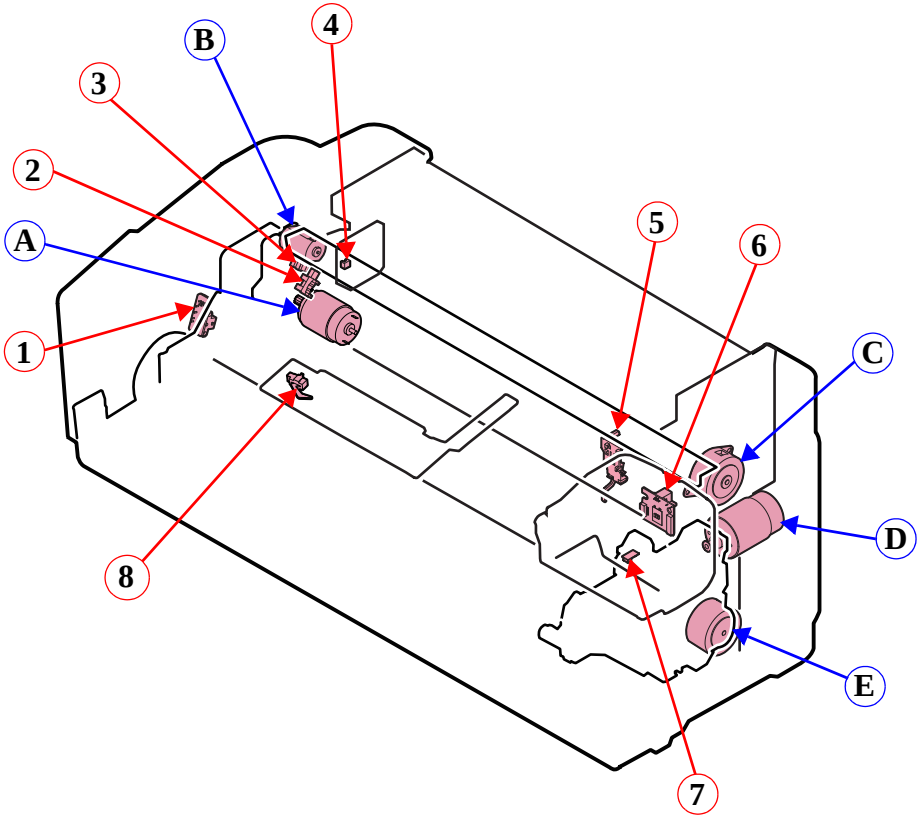


Figure 2-3. Motors and Sensors Layout

2.6 Power-On Sequence

This section describes the power-on sequences.

☐ Condition

- Completing ink charge.
- No paper on the paper path.
- The Printhead is capped with the Cap of the Ink System.
- PG position is set to PG Typ.
- The Carriage is locked by the CR lock.

CHECK POINT

The following explains how to use the simplified diagrams in Table 2-6. The diagrams show the movement of each component as seen from the front of the printer.

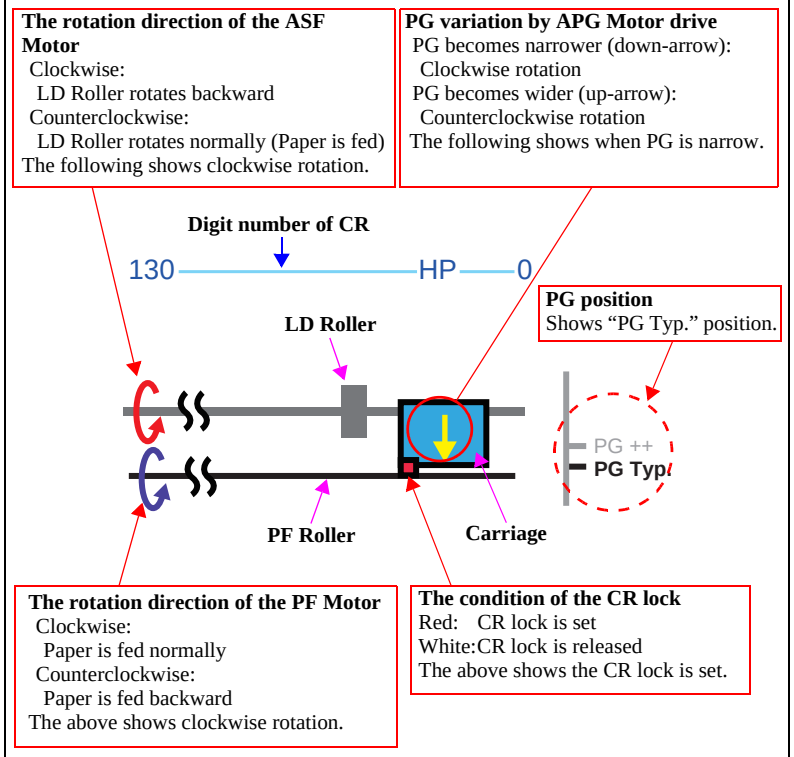
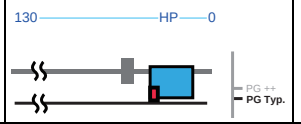
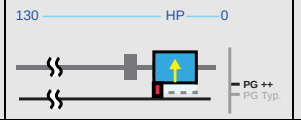
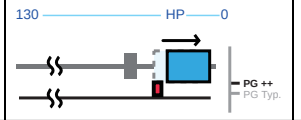
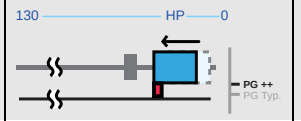
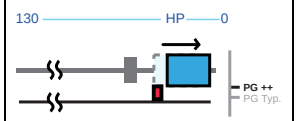
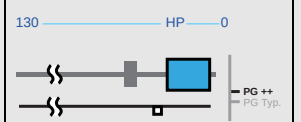
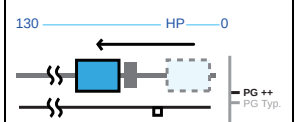
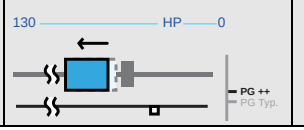


Figure 2-4. Carriage Movement

Table 2-6. Operation of the power-on sequence

Operation	Movement of each component	Pump Motor*1
1. Checking waste ink overflow 1-1. Reads out the protection counter value to check waste ink overflow.		---
2. APG initialization 2-1. The APG Motor rotates counterclockwise until the PG position is set to PG++ to initialize the APG mechanism.		---
3. Seeking the home position 3-1. The carriage moves to the 0-digit side slowly and confirms it touches the Right Frame.		---
3-2. The carriage moves to the 130-digit side slowly and confirms it touches the CR lock.		---
3-3. The carriage moves to the 0-digit side slowly and confirms it touches the Right Frame, and the home position is fixed. Afterward, the carriage position is monitored according to the signals from the CR Encoder.		---
4. Releasing the CR lock 4-1. The Pump motor rotates counterclockwise and releases the CR lock.		CCW
4-2. The carriage slowly moves to the 130-digit side to the CR lock check position.		---
4-3. The carriage slightly moves to the 130-digit side.		---

(Continue to the next page)

Table 2-6. Operation of the power-on sequence

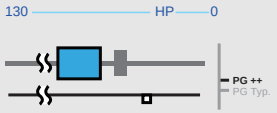
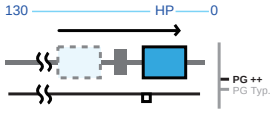
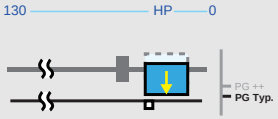
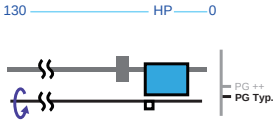
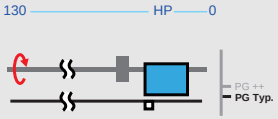
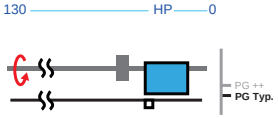
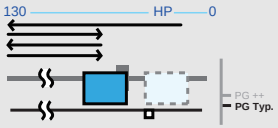
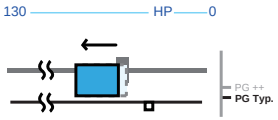
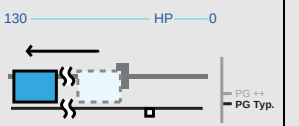
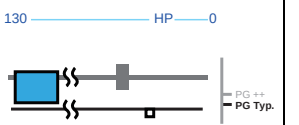
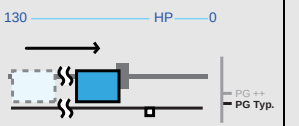
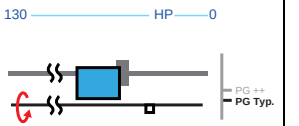
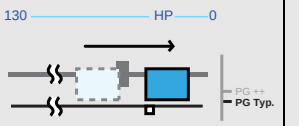
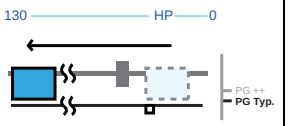
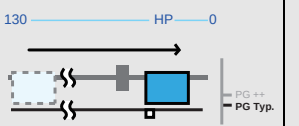
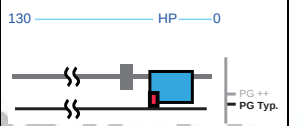
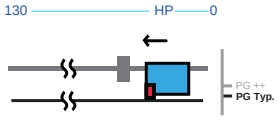
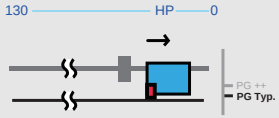
Operation	Movement of each component	Pump Motor*1
4-4. The Pump Motor rotates counterclockwise to set the Wiper of the Ink System, and then the Pump Motor rotates clockwise to retract the Wiper.		CCW →CW
4-5. The carriage slowly returns to its home position.		---
5. Setting the APG to PG Typ.		
5-1. The APG Motor rotates clockwise and sets to PG Typ.		---
6. PF-ASF initialization		
6-1. The PE Sensor detects no paper and the ASF Sensor detects that the ASF is on its home position, and then the PF Motor rotates clockwise for approx. one second.		---
6-2. While monitoring the ASF Sensor, the ASF Motor slowly rotates counterclockwise until the ASF gets out of its home position.		---
6-3. The ASF Motor rotates clockwise and the ASF Sensor detects that the ASF is on its home position.		---
7. Low temperature operation sequence*2		
7-1. The carriage moves back and forth between 0-digit side and the 130-digit side for two times.		---
8. CR Motor measurement		
8-1. The carriage slowly moves to the 130-digit side.		---

Table 2-6. Operation of the power-on sequence

Operation	Movement of each component	Pump Motor*1
8-2. The carriage performs a load measurement while moving to the VH Check position, and records the detected voltage of the PW sensor at the specified three positions, then stops.		---
8-3. The carriage detects the voltage of the PW sensor at the carriage stop position (the black area at the Paper Guide Front).		---
8-4. The carriage performs a load measurement while moving to the 0-digit side, and stops.		---
9. PF Motor measurement		
9-1. The PF motor rotates clockwise for approx. two seconds, and performs a load measurement.		---
9-2. The carriage returns to its home position.		---
10. Detecting ink cartridge and initializing ink system*3		
10-1. The carriage moves to the 130-digit side to check the ink end sensor. The ink remaining is detected after completing the check.		---
10-2. The carriage slowly returns to its home position.		---
11. CR lock setting		
11-1. The Pump Motor rotates clockwise, and sets the CR lock.*3		CW

(Continue to the next page)

Table 2-6. Operation of the power-on sequence

Operation	Movement of each component	Pump Motor*1
11-2. The carriage moves to the 130-digit side slowly and confirms it touches the CR lock.		---
11-3. The carriage returns to its home position.		---

Note "*1": The rotation directions of the Pump Motor and their corresponding functions are as follows.
Clockwise: Cap closing/Pump suction/Wiper retracting/CR locking
Counterclockwise: Cap opening/Pump release/Wiper setting/CR unlocking

"*2": Executes when the detected temperature is under 5 °C (41°F) by the thermistor on the Printhead.

"*3": The empty suction operation may occur depending on the situation.

2.7 Printer Initialization

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

1. Hardware initialization
   This printer is initialized when turning the printer power on, or printer recognized the cold-reset command (remote RS command).
   When printer is initialized, the following actions are performed.
   (a) Initializes printer mechanism
   (b) Clears input data buffer
   (c) Clears print buffer
   (d) Sets default values
2. Operator initialization
   Initialization when resetting the USB software, and the following are performed.
   (a) Clears input data buffer
   (b) Clears print buffer
   (c) Sets default values
3. Software initialization
   The ESC@ command also initialize the printer.
   When printer is initialized, the following actions are performed.
   (a) Clears print buffer
   (b) Sets default values
4. IEEE 1284.4 “rs” command initialization
   The printer recognized the IEEE 1284.4 “rs” command.
   When printer is initialized, the following action is performed.
   - Initialization when an error occurs.
     (a) Initializes printer mechanism
     (b) Clears input data buffer
     (c) Clears print buffer
     (d) Sets default values
   - Initialization in normal operation
     (a) Clears input data buffer
     (b) Clears print buffer
     (c) Sets default values

CHAPTER

3

TROUBLESHOOTING

3.1 Overview

This chapter describes unit-level troubleshooting.

3.1.1 Troubleshooting according to Error Messages

After checking the printer LED and STM3 error indications, you can grasp the fault location using the check list in this section. When you find the fault location, refer to Chapter 4 “Disassembly and Reassembly” and change the corresponding part and/or unit. The following table indicates the check point reference tables corresponding to the error states (LED and STM3).

Table 3-1. List of Error Messages

Error Status	LED Indications			STM3 Message	See the table for Troubleshooting
	Power	Paper	Ink		
Communication error	-	-	-	Communication error Check all connections and make sure all devices are on. If the power was turned off during printing, cancel the print job. If the error does not clear, see your printer documentation.	Refer to Table 3-2 ?Troubleshooting of Communication Error? *(P.32)*
Model Difference	-	-	-	Different device from specified Attempting to connect to a different device from that specified in the driver. Check the driver settings and the device.	
Printer cover open error	-	Flash	-	Printer cover open Close the printer cover.	Refer to Table 3-3 ?Troubleshooting of Printer Cover Open Error? *(P.34)*
Paper out error	-	Light	-	Paper out or not loaded correctly Reload the paper, then press the Paper button on the printer or click the [Continue] button if it appears on the screen. To cancel the print job, click the [Cancel] button if it appears on the screen.	Refer to Table 3-4 ?Troubleshooting of Paper Out Error? *(P.35)*
Paper jam error	-	Flash	-	Paper jam Press the Paper button on the printer or click the [Eject] button when it appears on the screen. Remove any remaining jammed paper by hand.	Refer to Table 3-5 ?Troubleshooting of Paper Jam Error? *(P.37)*
Multi-feed error	-	Light	-	Page not printed or multi-page error A page has not been printed, multiple pages have been fed into the printer at once, or the wrong paper size has been fed into the printer. Remove and reload the paper. Press the Paper button if necessary.	Refer to Table 3-6 ?Troubleshooting of Multi-feed error? *(P.38)*

Table 3-1. List of Error Messages

Error Status	LED Indications			STM3 Message	See the table for Troubleshooting
	Power	Paper	Ink		
Ink low	-	-	Flash	Replace Cartridge	Refer to Table 3-7 ?Troubleshooting of Ink Low? *(P.38)*
Ink-out error	-	-	Light	Black: XXXX* Color: XXXX ..... Epson recommends the genuine Epson cartridges listed above. Click the [How to] button for ink cartridge installation instructions.	Refer to Table 3-9 ?Troubleshooting of No Ink Cartridge/CSIC Error? *(P.39)*
No ink cartridge/ CSIC error	-	-	Light	Ink cartridges cannot be recognized Black: XXXX* Color: XXXX ..... Epson recommends the genuine Epson cartridges listed above. Click the [How to] button for ink cartridge installation instructions.	
Maintenance request	Off	Flashes alternately 1	Flashes alternately 2	Service required The printer's ink pads are at the end of their service life. Please contact Epson support.	Refer to Table 3-10 ?Troubleshooting of Maintenance Request? *(P.40)*
Fatal error	Off	Flashes at high speed	Flashes at high speed	General error Turn the printer off and delete all print jobs. Open the printer cover and remove any paper from inside the printer and turn the printer back on.	Refer to Table 3-11 ?Troubleshooting of Fatal Error? *(P.41)*

Note "*": Represents the part number of the Ink Cartridge. (See ?1.2.2 Ink Cartridge? (p.10))

Note : --: No change
Flash: Repeats turning On and Off every 1.25 seconds.
Flash at high speed: Repeats turning On and Off every 0.5 seconds.
Flashes alternately 1: Same as the “Flash”
Flashes alternately 2: Repeats turning Off and On every 1.25 seconds.

Table 3-2. Troubleshooting of Communication Error

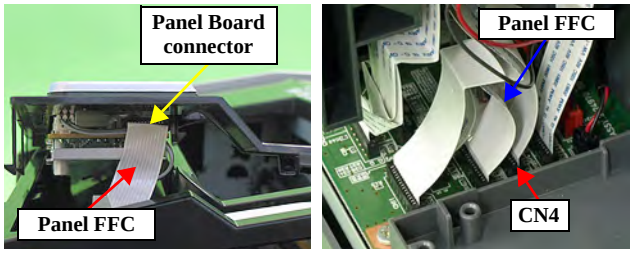
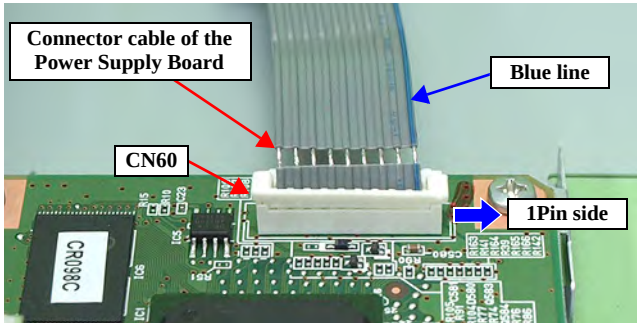
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	The printer does not operate at all.	Panel FFC	1. Check that the Panel FFC is connected to the Panel Board connector and Main Board connector CN4. 	1. Connect the Panel FFC to the Panel Board and Main Board connectors.
			2. Check the Panel FFC for damages.	2. Replace the Panel FFC with a new one.
		Panel Board	1. Check the Panel Board for damages.	1. Replace the Panel Board with a new one.
		Power Supply Board	1. Check that the connector cable of the Power Supply Board is connected to the Main Board connector CN60. 	1. Connect the connector cable of the Power Supply Board to the Main Board connector CN60.
			2. Check that the blue colored pin of the Power Supply Board connector cable is inserted into the 1 Pin of the Main Board connector CN60 as shown in the above picture.	2. Reconnect the Power Supply Board connector cable so that the blue colored pin is inserted into the 1 Pin.

Table 3-2. Troubleshooting of Communication Error

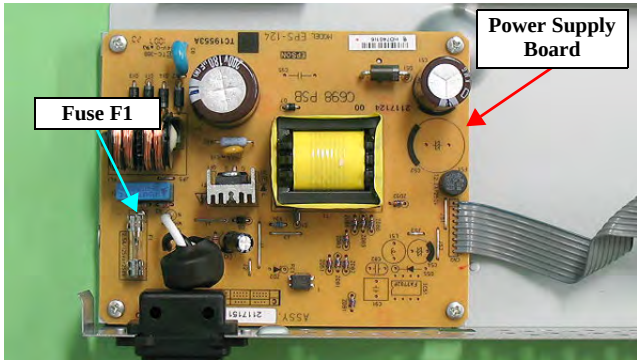
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	The printer does not operate at all.	Power Supply Board	3. Check that the Fuse F1 on the Power Supply Board has not blown.  	3. Replace the Power Supply Board with a new one.
			4. Check the components on the Power Supply Board for damage.	4. Replace the Power Supply Board with a new one.
At operation	Operation at power-on is normal, but the error appears when the print job is sent to the printer.	Interface cable	1. Check that the Interface cable is connected between the PC and printer.	1. Connect the Interface cable to the PC and printer.
			2. Check the Interface cable for breaking.	2. Replace the Interface cable with a new one.
		USB	1. Check that the PC and printer are connected via the USB hub.	1. Configure the USB ID setting. Refer to Chapter 5 ?Adjustment?.
		Printer Driver	1. Check that the printer driver for WorkForce 1100/Epson Stylus Office T1110/B1100/T1100/Epson ME Office 1100 has already been installed.	1. Install the printer driver for WorkForce 1100/ Epson Stylus Office T1110/B1100/T1100/ Epson ME Office 1100.
			2. Check that the connected printer is WorkForce 1100/Epson Stylus Office T1110/B1100/T1100/Epson ME Office 1100.	2. Connect the WorkForce 1100/Epson Stylus Office T1110/B1100/T1100/Epson ME Office 1100 printer.
		Main Board	1. Check that a wrong model name has not been input to the EEPROM on the Main Board.	1. Make the initial setting using the Adjustment Program. Refer to Chapter 5?Adjustment?.

Table 3-3. Troubleshooting of Printer Cover Open Error

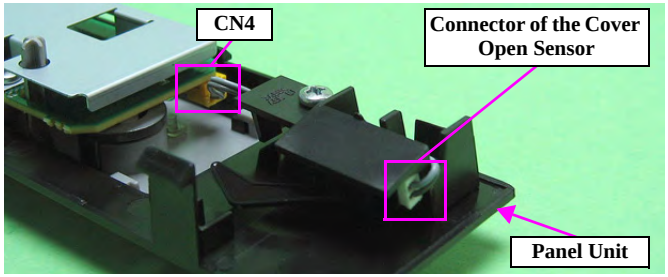
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
During printing	A Printer Cover Open Error is indicated during printing.	Cover Open Sensor	1. Check that the Printer Cover is not open.	1. Close the Printer Cover.
			2. Check that the connector cable of the Cover Open Sensor is connected to the Cover Open Sensor and connector CN4 on the Panel Board.  	2. Connect the connector cable of the Cover Open Sensor to the Cover Open Sensor and connector CN4 on the Panel Board correctly.
			3. Using a tester, check that the Cover Open Sensor is normal. • Paper absent:0V • Paper present:3.3V	3. Replace the Panel Unit with a new one.

Table 3-4. Troubleshooting of Paper Out Error

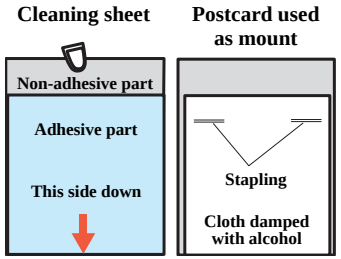
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At operation	When the Paper Switch is pressed, the LD Roller attempt to feed paper but the paper is not fed.	ASF Assy.	1. Check the LD Roller or Retard Roller of the ASF Assy for paper dust and foreign matter.	1. Using a cleaning sheet, clean the LD Roller and Retard Roller. The procedure is as follows. (1) Place the cleaning sheet upside down and put it into the ASF Assy. (2) Press the Paper Switch to start paper feed. (3) Repeat the above steps several times. * To remove persistent contamination, staple an alcohol-dampened cloth to a postcard and clean the rollers in the following method.  (1) Place the alcohol-dampened cloth toward the LD Roller surface of the ASF Assy. (2) Hold the mount top end securely and press the Paper Switch. (3) Repeat the paper feed sequence several times to clean the LD Roller surface of the ASF Assy.

Table 3-4. Troubleshooting of Paper Out Error

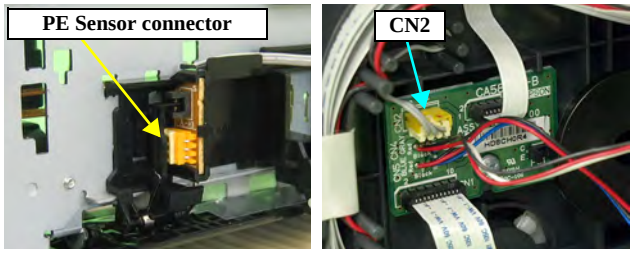
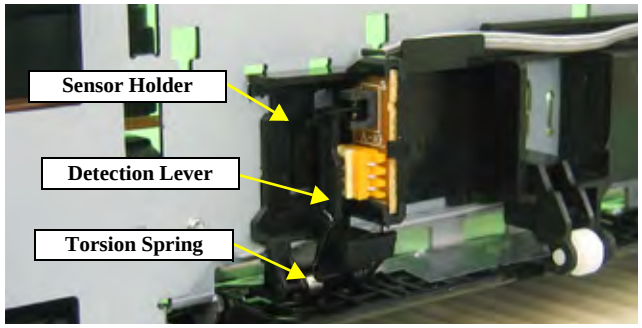
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At operation	Paper Mismatch Error is indicated.	PE Sensor	1. Check that the connector cable of the PE Sensor is securely connected to the PE Sensor and Relay Board connector CN2. 	1. Connect the connector cable of the PE Sensor to the PE Sensor and connector CN2 on the Relay Board correctly.
			2. Check that the Sensor Holder is mounted to the Mechanical frame correctly. 	2. Install the Sensor Holder correctly.
			3. Move the Detection Lever manually as when the paper passes, and check that the Detection Lever returns to the original position automatically by the Torsion Spring when released. Refer to the above photo.	3. Replace the PE Sensor Holder Unit with a new one.
			4. Using a tester, check that the PE Sensor is normal. · Paper absent : 2.4V or more · Paper present : 0.4V or less	4. Replace the PE Sensor Holder Unit with a new one.

Table 3-5. Troubleshooting of Paper Jam Error

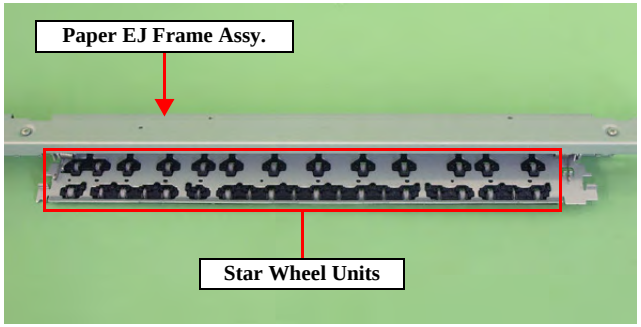
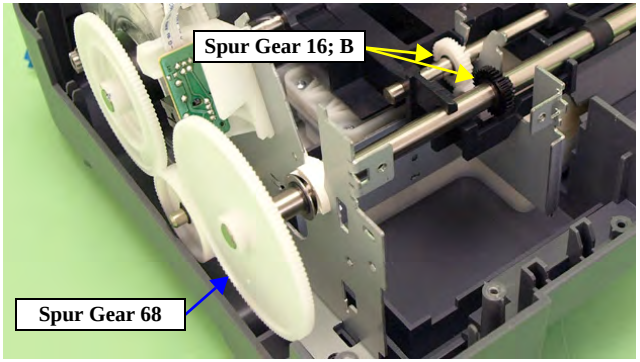
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At operation	At the time of paper ejection, the PF Roller advances the paper but cannot eject it completely.	–	1. Check that the size of the fed paper is not larger than that of the paper specified by the driver.	1. Tell the user that the paper size specified by the driver is not available for the printer.
	Paper is not ejected completely and causes a jam near the Paper Eject Frame.	ASF Assy.	1. Check that the paper is fed along the Right Edge Guide.	1. Feed the paper along the Right Edge Guide.
		Paper EJ Frame Assy.	1. Check that the Star Wheel Units have not come off the Paper EJ Frame Assy.  	1. Securely install the Star Wheel Units to the Paper EJ Frame Assy.
			2. Check the Paper EJ Frame Assy for deformation or damages.	2. Replace the Paper EJ Frame Assy with a new one.
		Spur Gear 68 Spur Gear 16; B Paper EJ Roller Assy.(front/rear)	1. Check the Spur Gear 68 or Spur Gear 16; B for damages.  	1. Replace the Front (or Rear) Paper EJ Roller Assy with a new one.

Table 3-6. Troubleshooting of Multi-feed error

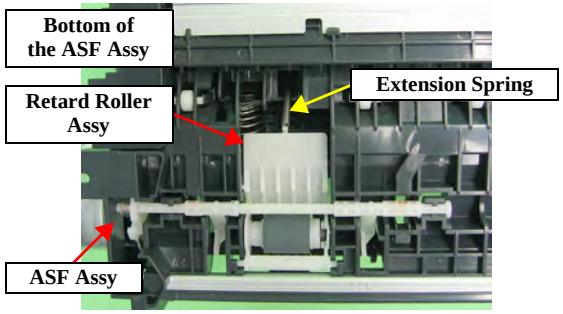
Occurrence Timing	Phenomenon Detail	Faulty Part/Part Name	Check Point	Remedy
Any time	During manual double-sided printing, multiple sheets are fed at a time.	ASF Assy	1. Check that the Retard Roller Assy is moving properly during the feeding operation. 	1. Attach the Extension Spring on the back side of the Retard Roller Assy correctly. Refer to Chapter 4 Retard Roller Assy *(P.101)*.
			2. Check that the position of the ASF Guide Roller LDs has been adjusted correctly.	2. Adjust the position of the ASF Guide Roller LDs. Refer to Chapter 4 ASF Assy *(P.96)*.

Table 3-7. Troubleshooting of Ink Low

Occurrence Timing	Phenomenon Detail	Faulty Part/Part Name	Check Point	Remedy
At operation or during printing	A message is displayed on the LED and STM3 during printing.	Ink Cartridge	1. Look at the remaining ink indication of the STM3 to check the amount of the ink remaining in the Ink Cartridge.	1. Prepare a new Ink Cartridge.

Table 3-8. Troubleshooting of Ink Out Error

Occurrence Timing	Phenomenon Detail	Faulty Part/Part Name	Check Point	Remedy
During printing	After the Carriage has detected the HP, an error is displayed on the LED and STM3.	Ink Cartridge	1. Look at the remaining ink indication of the STM3 to check whether the ink remains in the Ink Cartridge.	1. Replace the Ink Cartridge with a new one.

Table 3-9. Troubleshooting of No Ink Cartridge/CSIC Error

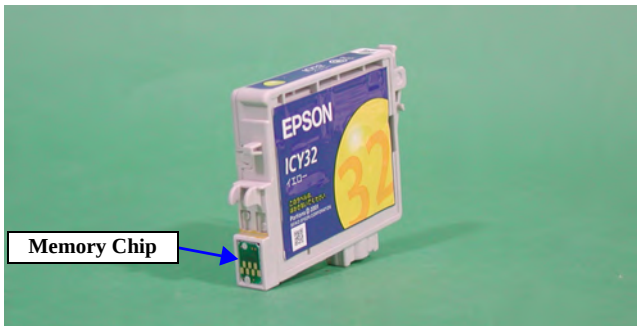
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	After the Carriage has detected the HP, an error is displayed on the LED and STM3.	Ink Cartridge	1. Check that the Ink Cartridge is installed correctly.	1. Install the Ink Cartridge correctly.
			2. Check that the tab of the Ink Cartridge is not broken. 	2. Replace the Ink Cartridge with a new one.
			3. Check that the Memory Chip is not disconnected or not damaged. 	3. Replace the Ink Cartridge with a new one.

Table 3-9. Troubleshooting of No Ink Cartridge/CSIC Error

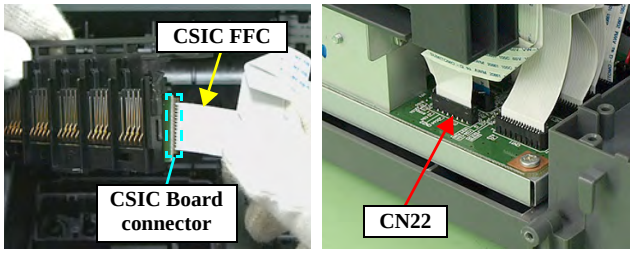
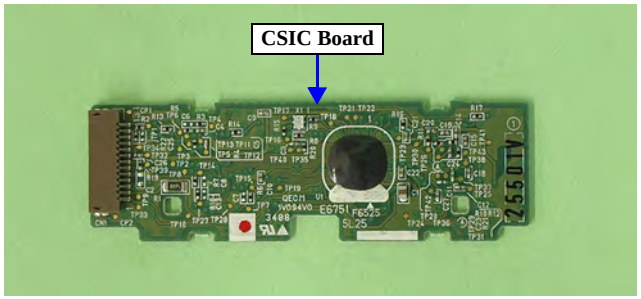
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	After the Carriage has detected the HP, an error is displayed on the LED and STM3.	CSIC FFC	1. Check that the CSIC FFC is connected to the CSIC Board connector and Main Board connector CN22. 	1. Connect the CSIC FFC to the CSIC Board connector and Main Board connector CN22.
			2. Check the CSIC FFC for damage.	2. Replace the CSIC FFC with a new one.
		CSIC Board	1. Check the CSIC Board for damage. 	1. Replace the CSIC Assy with a new one.

Table 3-10. Troubleshooting of Maintenance Request

Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the printer does not operate at all.	Waste Ink Pads	1. Using the Adjustment Program, check if the values of the Protection Counter A and B have exceeded the values shown below. • Protection Counter A*: 12,300 ~ 14,250 • Protection Counter B: 8,900	1. Replace the Waste Ink Pads and reset the Protection Counter A and B value with the Adjustment Program.

Note*: Taking the ink evaporation amount into consideration, the threshold value of the Protection Counter A for the Maintenance Request varies from 12,300 to 14,250 accordingly until 260 days pass from the day the printer receives the first TI from the printer driver (the printer is initially used). The value after 260 days is 14,250.

Table 3-11. Troubleshooting of Fatal Error

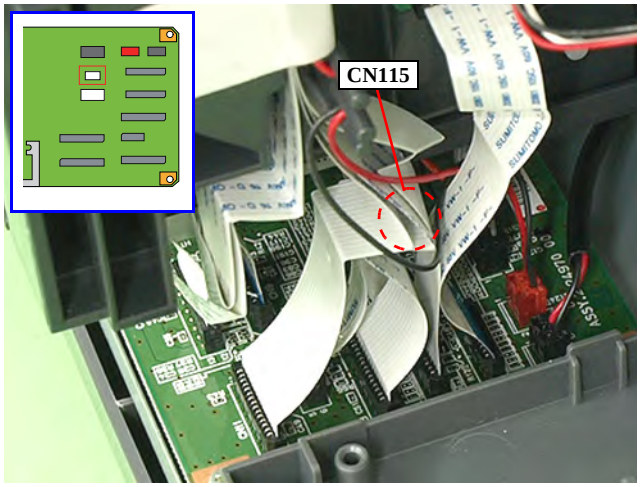
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the CR Motor does not operate at all.	CR Motor	1. Check the CR Motor connector cable for damages.	1. Replace the CR Motor with a new one.
			2. Check if the CR Motor operates normally.	2. Replace the CR Motor with a new one.
			3. Check that the CR Motor connector cable is connected to the Main Board connector CN115. 	3. Connect the CR Motor connector cable to the Main Board connector CN115.

Table 3-11. Troubleshooting of Fatal Error

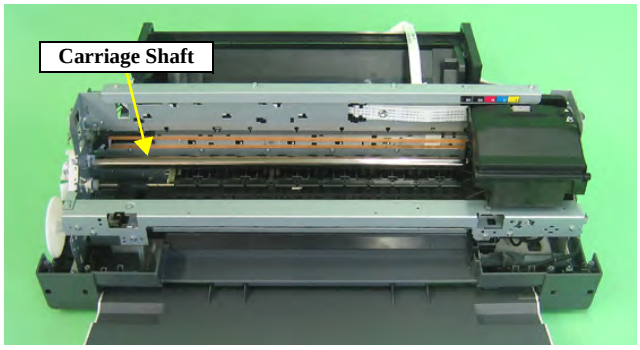
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	The power-on sequence is executed but Fatal error is displayed.	CR drive mechanism	1. Check that the Carriage Shaft is lubricated with grease. 	1. Wipe the surface of the Carriage Shaft with a dry, soft cloth, and lubricate the Carriage Shaft with grease G-71. Refer to Chapter 6 ?Maintenance?.
	At power-on, the PF Motor does not operate at all.	PF Motor	1. Check that the connector cable of the PF Motor is connected to the Main Board connector CN116. 	1. Connect the PF Motor connector cable to the Main Board connector CN116.
			2. Check the PF Motor connector cable for damages.	2. Replace the PF Motor with a new one.
			3. Check if the PF Motor operates normally.	3. Replace the PF Motor with a new one.

Table 3-11. Troubleshooting of Fatal Error

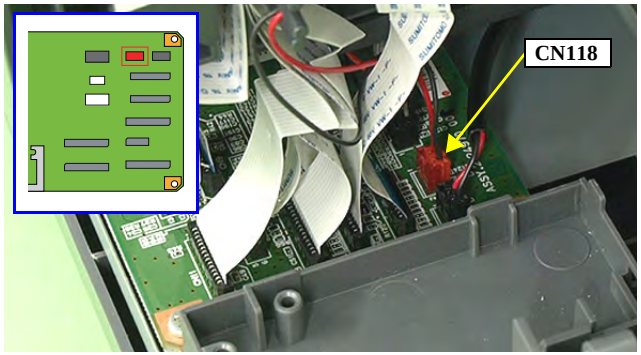
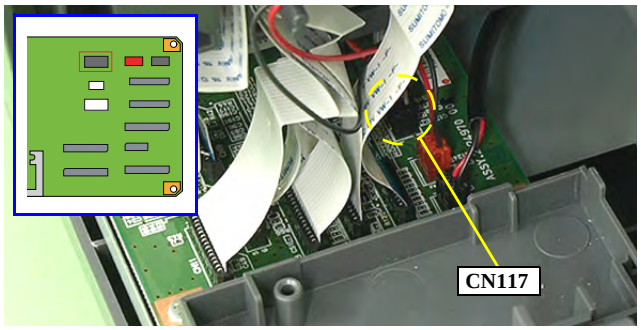
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the APG Motor does not operate at all.	APG Motor	1. Check that the connector cable of the APG Motor is connected to the Main Board connector CN118. 	1. Connect the APG Motor connector cable to the Main Board connector CN118.
			2. Check the APG Motor connector cable for damage.	2. Replace the APG Assy with a new one.
			3. Check if the APG Motor operates normally.	3. Replace the APG Assy with a new one.
	At power-on, the Pump Motor does not operate at all.	Pump Motor	1. Using a tester, check the resistance value of the Pump Motor. Value of resistance: 10.3 Ω ± 10%	1. If the resistance value is abnormal, replace the Ink System with a new one.
			2. Check the Pump Motor connector cable for damages.	2. Replace the Ink System with a new one.
			3. Check that the Pump Motor connector cable is connected to the Main Board connector CN117. 	3. Connect the Pump Motor connector cable to the Main Board connector CN117.
			4. Check the Pump Motor connector cable for damages.	4. Replace the Ink System with a new one.

Table 3-11. Troubleshooting of Fatal Error

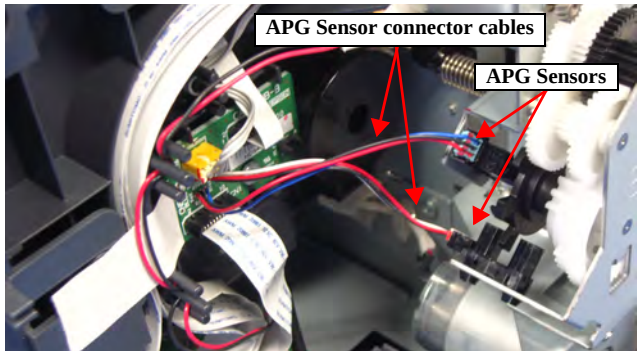
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	While the power-on sequence is being executed, Fatal error is displayed.	APG Sensor	1. Check the APG Sensor connector cables is connected to the APG Sensor connectors. 2. Check if the connector cables of the APG Sensor is broken. 	1. Connect the APG Sensor connector cables to the APG Sensor connectors. 2. Replace the ASF Assy with a new ones.
			3. Check the APG Sensors for damages.	3. Replace the APG Assy with a new one.

Table 3-11. Troubleshooting of Fatal Error

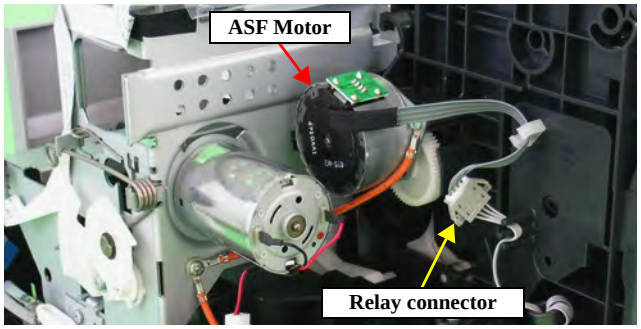
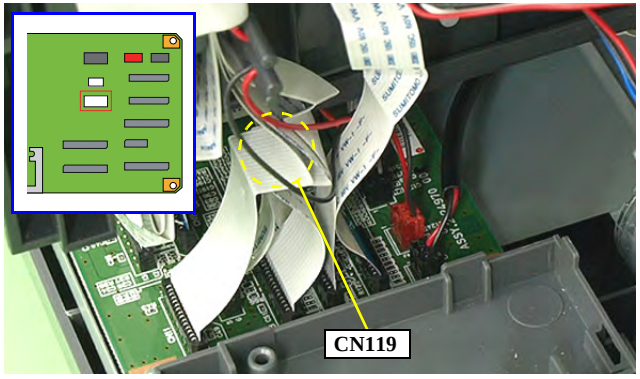
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	While the power-on sequence is being executed, Fatal error is displayed.	ASF Motor	1. Check that the connector cable of the ASF Motor is connected to the Relay connector. 	1. Connect the connector cable of the ASF Motor to the Relay connector.
			2. Using a tester, check the resistance value of the ASF Motor. Value of resistance: 7.0 Ω ± 10%	2. If the resistance value is abnormal, replace the ASF Motor with a new one.
			3. Check the ASF Motor connector cable for damages.	3. Replace the ASF Motor with a new one.
		Relay connector cable	1. Check that the Relay connector cable is connected to the Main Board connector CN119. 	1. Connect the Relay connector cable to the Main Board connector CN119.
			2. Check the Relay connector cable for damages.	2. Replace the Relay connector cable with a new one.

Table 3-11. Troubleshooting of Fatal Error

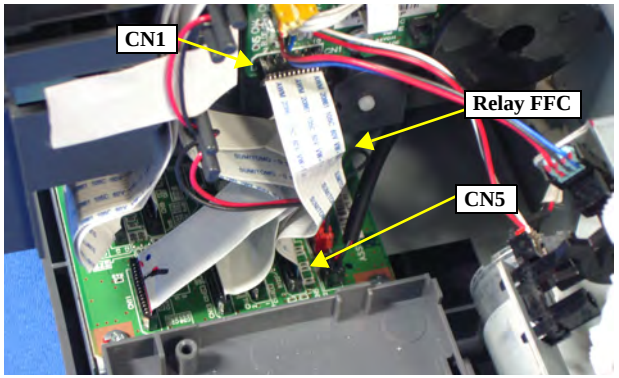
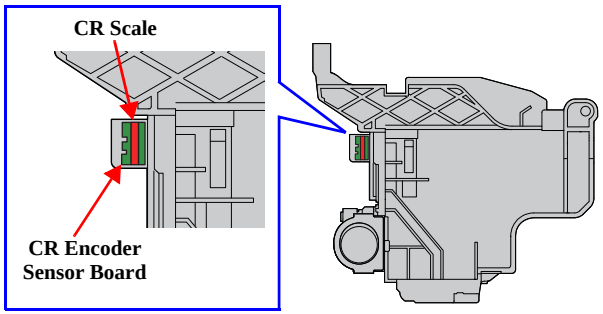
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	While the power-on sequence is being executed, Fatal error is displayed.	Relay FFC	1. Check that the Relay FFC is connected to the Relay Board connector CN1 and Main Board connector CN5. 	1. Connect the Relay FFC to the Relay Board connector CN1 and Main Board connector CN5.
			2. Check the Relay FFC for damages.	2. Replace the Relay FFC cable with a new one.
	At power-on, the Carriage Unit moves away from the home position and bumps against the right of the Frame, then hits the left of the Frame.	CR Scale	1. Check that the CR Scale is inserted in the slit of the CR Encoder Sensor. 	1. Insert the CR Scale into the slit of the CR Encoder Sensor.
			2. Check the CR Scale for damages and dirt.	2. Wipe off the dirt completely or replace the CR Scale with a new one.
		CR Encoder Sensor Board	1. Check the CR Encoder Sensor for paper dust, etc.	1. Remove the paper dust, etc. from the CR Encoder Sensor.
			2. Check the CR Encoder Sensor Board for damages.	2. Replace the CR Encoder Sensor Board with a new one.

Table 3-11. Troubleshooting of Fatal Error

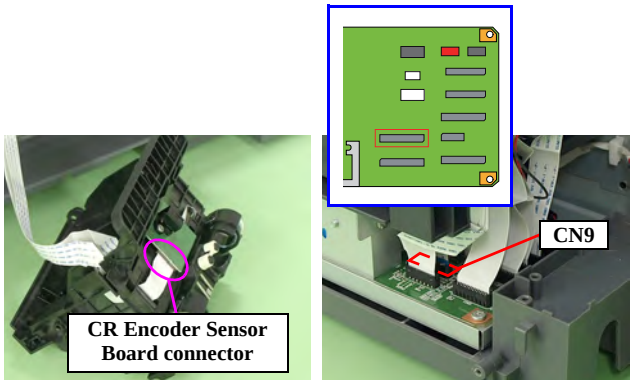
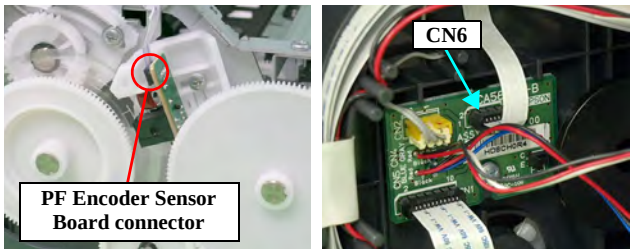
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the Carriage Unit moves away from the home position and bumps against the right of the Frame, then hits the left of the Frame.	Sensor FFC	1. Check that the Sensor FFC is connected to the CR Encoder Sensor Board connector and Main Board connector CN9. 	1. Connect the Sensor FFC to the CR Encoder Sensor Board connector and Main Board connector CN9.
			2. Check the Sensor FFC for damages.	2. Replace the Sensor FFC with a new one.
	At power-on, the PF Roller rotates fast about a half turn.	PF Encoder Sensor Holder	1. Check that the PF Encoder Sensor Holder is mounted correctly.	1. Install the PF Encoder Sensor Holder correctly.
			2. Check that the FFC of the PF Encoder Sensor is securely connected to the PF Encoder Sensor Board connector and Relay Board connector CN6. 	2. Connect the PF Encoder Sensor FFC to the PF Encoder Sensor Board and Relay Board connector CN6.
			3. Check the PF Encoder Sensor for paper dust, etc.	3. Remove the paper dust, etc. from the PF Encoder Sensor.
			4. Check if the PF Encoder or the FFC is damaged.	4. Replace the PF Encoder with a new one.

Table 3-11. Troubleshooting of Fatal Error

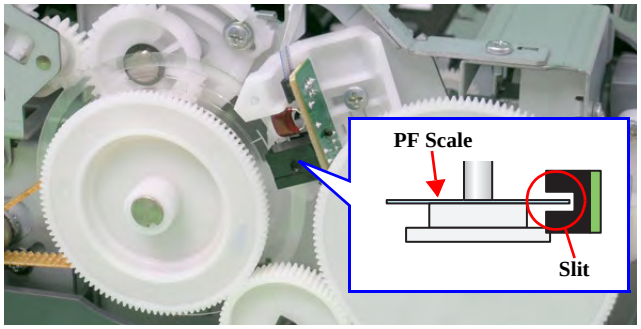
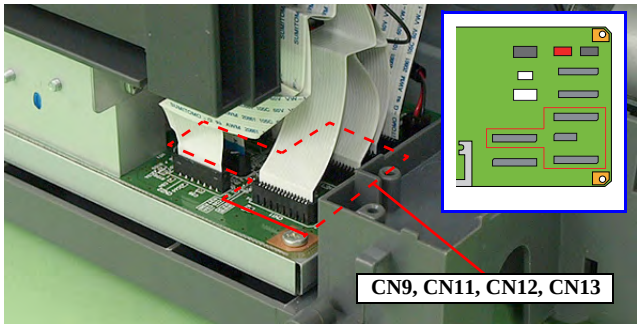
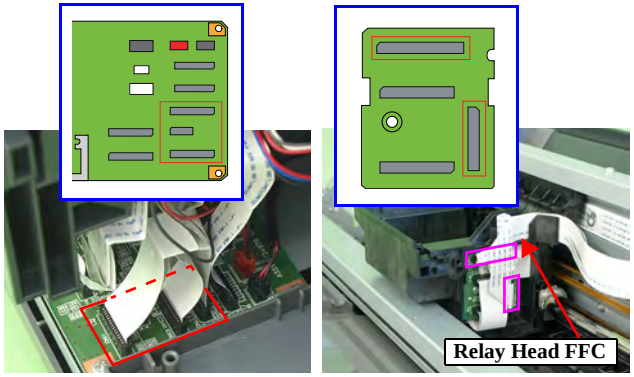
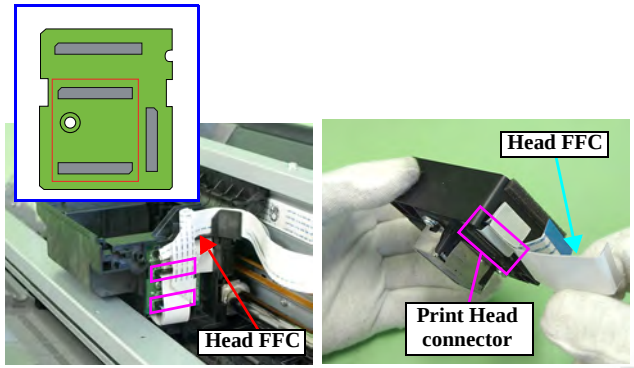
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the PF Roller rotates fast about a half turn.	PF Scale	1. Check that the PF Scale is inserted in the slit of the PF Encoder Sensor. 	1. Install the PF Scale in the slit of the PF Encoder Sensor correctly.
			2. Check the PF Scale for damages and dirt.	2. Replace the PF Scale with a new one.
During printing	After receiving a print data, an error is displayed on the LED and STM3.	Head FFC Sensor FFC	1. Check that the Head FFC and the Sensor FFC are securely connected to the Main Board connectors CN9, CN11, CN12, and CN13. 	1. Connect the Head FFC and the Sensor FFC to the Main Board connectors CN9, CN11, CN12, and CN13.

Table 3-11. Troubleshooting of Fatal Error

Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
During printing	After starting to print, ink is not ejected and paper stops midway.	Relay Head FFC	1. Check that the Relay Head FFC is securely connected to the Main Board connectors CN11, CN12, and CN13. 2. Check that the Relay Head FFC is securely connected to the CR Relay Board connectors CN3 and CN4. 	1. Connect the Relay Head FFC to the Main Board connectors CN11, CN12, and CN13. 2. Connect the Relay Head FFC to the CR Relay Board connectors CN3 and CN4.
			3. Check the Relay Head FFC for damages.	3. Replace the Relay Head FFC with a new one.
		Head FFC	1. Check that the Head FFC is securely connected to the CR Relay Board connectors CN1 and CN2. 2. Check that the Head FFC is securely connected to the Print Head connectors. 	1. Connect the Head FFC to the CR Relay Board connectors CN1 and CN2. 2. Connect the Head FFC to the Print Head connectors.
			3. Check the Head FFC for damages.	3. Replace the Head FFC with a new one.
	Ink is not ejected from most nozzles.	Print Head	1. Check for occurrence of Head Hot.	1. Replace the Print Head with a new one.

3.1.2 Troubleshooting based on Observed Faults

This section provides troubleshooting procedures based on observed faults such as print quality troubles and abnormal noise.

Table 3-12. Print Quality Troubles

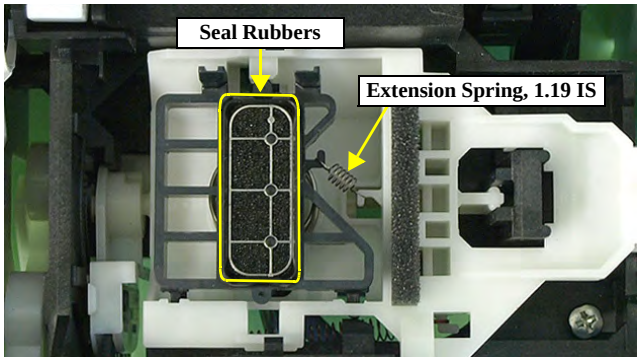
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Dot missing and mixed colors	Inks are not ejected from the Print Head to the Cap.	Ink System Unit (Cap)	1. Check for foreign matter around the Seal Rubber on the Cap Unit.  	1. Remove the foreign matter around the Seal Rubber completely.
			2. Check that the Extension Spring 1.19 IS is correctly installed to the Cap Unit.	2. Replace the Ink System Unit with a new one.
	Although inks are ejected from the Print Head to the Cap, the trouble still occurs after executing a cleaning cycle or replacing the Ink Cartridges.	Print Head	1. Run a Nozzle Check, and check the printed pattern if it has broken lines or missing segments.	1. After running a Head Cleaning, check the Nozzle Check Pattern again.

Table 3-12. Print Quality Troubles

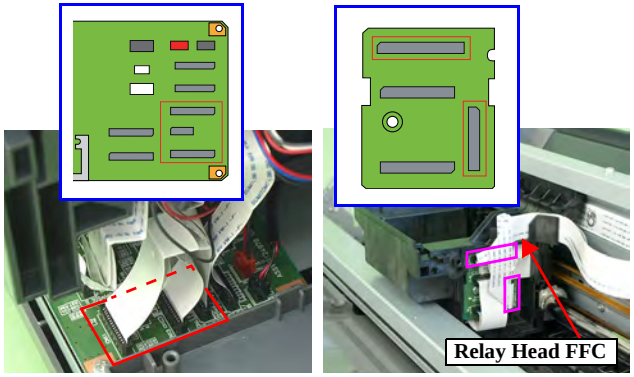
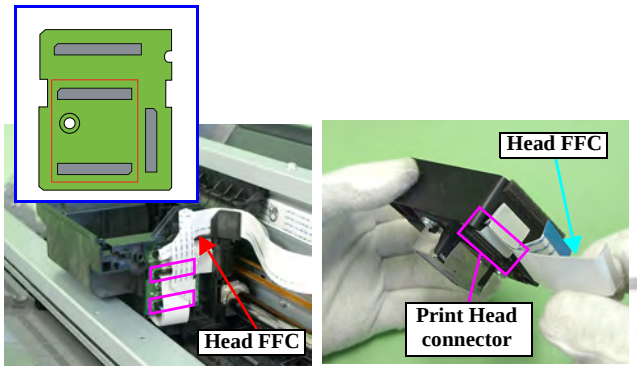
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Dot missing and mixed colors	Although inks are ejected from the Print Head to the Cap, the trouble still occurs after executing a cleaning cycle or replacing the Ink Cartridges.	Relay Head FFC	1. Check that the Relay Head FFC is securely connected to the Main Board connectors CN11, CN12, and CN13. 2. Check that the Relay Head FFC is securely connected to the CR Relay Board connectors CN3 and CN4. 	1. Connect the Relay Head FFC to the Main Board connectors CN11, CN12, and CN13. 2. Connect the Relay Head FFC to the CR Relay Board connectors CN3 and CN4.
			3. Check the Relay Head FFC for damages.	3. Replace the Relay Head FFC with a new one. If the trouble still occurs after replacing it, replace the Print Head with a new one.
		Head FFC	1. Check that the Head FFC is securely connected to the CR Relay Board connectors CN1 and CN2. 2. Check that the Head FFC is securely connected to the Print Head connectors. 	1. Connect the Head FFC to the CR Relay Board connectors CN1 and CN2. 2. Connect the Head FFC to the Print Head connectors.

Table 3-12. Print Quality Troubles

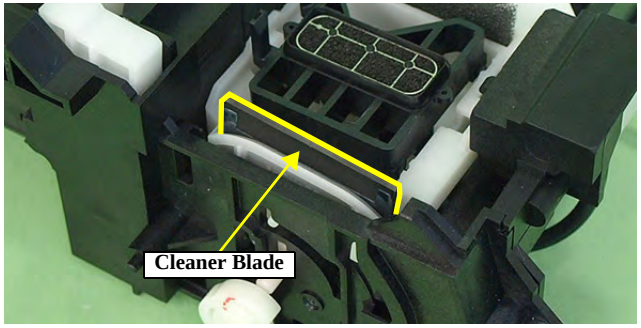
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Dot missing and mixed colors	Although inks are ejected from the Print Head to the Cap, the trouble still occurs after executing a cleaning cycle or replacing the Ink Cartridges.	Head FFC	3. Check the Head FFC for damages.	3. Replace the Head FFC with a new one. If the trouble still occurs after replacing it, replace the Print Head with a new one.
		Ink System Unit Cleaner Blade	1. Check if the Cleaner Blade is covered with paper dust or is bent. 	1. Replace the Ink System Unit with a new one.
		Main Board	1. Check the Main Board for damages.	1. Replace the Main Board with a new one.

Table 3-12. Print Quality Troubles

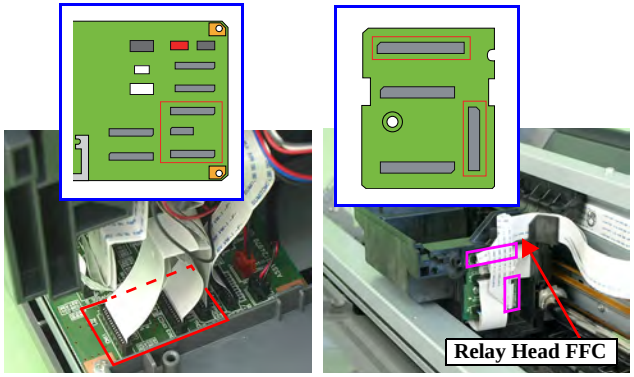
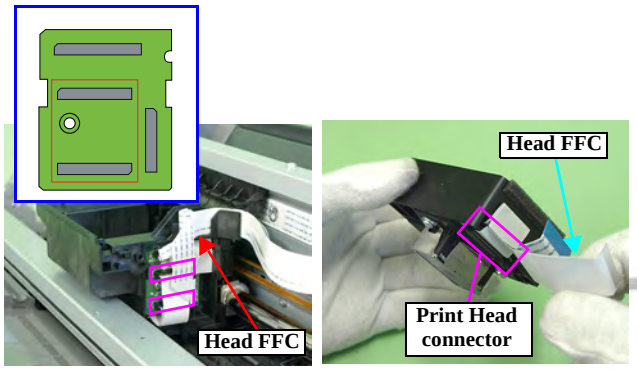
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Horizontal or vertical banding / Getting smeared	Although inks are ejected from the Print Head to the Cap, the trouble still occurs after executing a cleaning cycle or replacing the Ink Cartridges.	Relay Head FFC	1. Check that the Relay Head FFC is securely connected to the Main Board connectors CN11, CN12, and CN13. 2. Check that the Relay Head FFC is securely connected to the CR Relay Board connectors CN3 and CN4. 	1. Connect the Relay Head FFC to the Main Board connectors CN11, CN12, and CN13. 2. Connect the Relay Head FFC to the CR Relay Board connectors CN3 and CN4.
			3. Check the Relay Head FFC for damages.	3. Replace the Relay Head FFC with a new one. If the trouble still occurs after replacing it, replace the Print Head with a new one.
		Head FFC	1. Check that the Head FFC is securely connected to the CR Relay Board connectors CN1 and CN2. 2. Check that the Head FFC is securely connected to the Print Head connectors. 	1. Connect the Head FFC to the CR Relay Board connectors CN1 and CN2. 2. Connect the Head FFC to the Print Head connectors.

Table 3-12. Print Quality Troubles

Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Horizontal or vertical banding / Getting smeared	Although inks are ejected from the Print Head to the Cap, the trouble still occurs after executing a cleaning cycle or replacing the Ink Cartridges.	Head FFC	3. Check the Head FFC for damages.	3. Replace the Head FFC with a new one. If the trouble still occurs after replacing it, replace the Print Head with a new one.
		Print Head	1. Check if the print quality recovers after running a cleaning or replacing the Ink Cartridges.	1. Run the cleaning and replace the Ink Cartridges several times. If the trouble still occurs, replace the Print Head with a new one.
		Main Board	1. Check the Main Board for damages.	1. Replace the Main Board with a new one.

Table 3-12. Print Quality Troubles

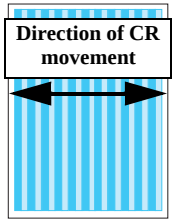
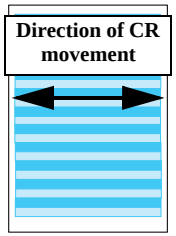
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Vertical or horizontal banding / Color shading	The printout has banding vertical to the CR moving direction and is not evenly colored.  * If the trouble still occurs after doing all measures described in the right-hand columns, replace the CR Motor with a new one.	Adjustment	1. For printing in the Bi-D mode, check that the Bi-D Adjustment has been performed properly.	1. Perform Bi-D Adjustment to eliminate displacements between the upper and lower lines. Refer to Chapter 5 ?Adjustment?.
		Print Head	1. Run a Nozzle Check, and check the printed pattern if it has broken lines or missing segments.	1. Perform the Head Cleaning, then check the Nozzle Check Pattern. Refer to Chapter 5 ?Adjustment?. If the trouble still occurs, replace the Print Head with a new one.
		Carriage Shaft	1. Check the surfaces of the Carriage Shaft for foreign matter.	1. Remove foreign matter from the Carriage Shaft.
			2. Check that the Carriage Shaft is fully lubricated with grease.	2. Wipe the grease applied to the Carriage Shaft with a dry, soft cloth, and then apply G-71 grease. Refer to Chapter 6 ?Maintenance?.
			3. Check that the Carriage Shaft is mounted horizontally.	3. Reassemble the Carriage Shaft correctly.
			4. Check the Carriage Shaft for damages.	4. Replace the Carriage Shaft with a new one.
	Narrow stripes of the same width appear horizontally to the CR moving direction.  * If the trouble still occurs after doing all measures described in the right-hand columns, replace the PF Motor with a new one.	Printer Driver and the Paper	1. Check if appropriate paper is used in accordance with the Printer Driver settings.	1. Use the appropriate type of paper in accordance with the Printer Driver.
		Print Head	1. Run a Nozzle Check, and check the printed pattern if it has broken lines or missing segments.	1. Perform the Head Cleaning, then check the Nozzle Check Pattern. Refer to Chapter 5 ?Adjustment?. If the trouble still occurs, replace the Print Head with a new one.
		PF Roller Shaft	1. Check the surface of the PF Roller Shaft for foreign matter.	1. Clean the PF Roller surface carefully.
			2. Check the PF Roller Shaft for damages.	2. Replace the PF Roller with a new one.

Table 3-12. Print Quality Troubles

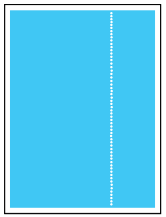
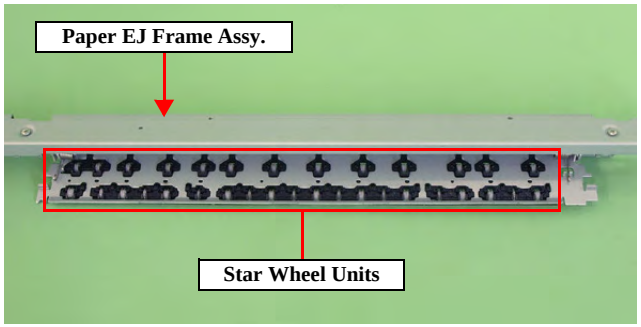
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Vertical or horizontal banding / Color shading	When printing at 360 dpi, horizontal banding and color unevenness appears at a constant frequency.	Adjustment	1. Check that PF Adjustment has executed properly.	1. Perform PF Adjustment properly. Refer to Chapter 5 ?Adjustment?.
			2. Check for Dot missing.	2. Replace the Ink System Unit with a new one.
	Star Wheel Rollers traces appear in the CR moving direction. 	Paper EJ Frame Assy.	1. Check that the Star Wheel Units have not come off or the Star Wheel Rollers turns normally. 	1. Install the Star Wheel Units to the Paper EJ Frame Assy correctly.
	Printout is faint or blurry.	Printer Driver and the Paper	1. Check that adequate paper is used according to the setting of the Printer Driver.	1. Use the appropriate type of paper in accordance with the Printer Driver.
		Print Head	1. Using the Adjustment Program, check that the correct Head ID has been written to the EEPROM.	1. Using the Adjustment Program, enter the 10-digit code of the Head ID to the EEPROM. Refer to Chapter 5 ?Adjustment?.
	The bottom of the printout is not evenly colored.	Adjustment	1. Check if the Positioning Adjustment of PF Roller Shaft Retainer has been performed properly.	1. Make adjustments according to the specified adjustment priority. Refer to Chapter 5 ?Adjustment?.
Paper EJ Roller traces appear on the printout.	Traces of the Paper EJ Roller appear on the printed paper.	Printer Driver and the Paper	1. Check if appropriate paper is used in accordance with the Printer Driver settings.	1. Use the appropriate type of paper in accordance with the Printer Driver.
		Front and Rear Paper EJ Roller Assys.	1. Check if the Paper EJ Roller is clean or not.	1. Clean the Paper EJ Roller with a soft cloth.

Table 3-12. Print Quality Troubles

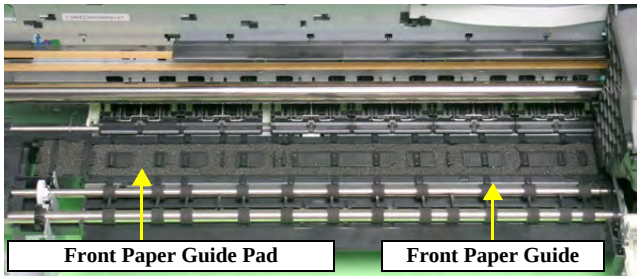
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
The printout is stained with ink.	The non-printed side or the bottom of the printout is dirty with ink.	Front Paper Guide Pad	1. Check that heaps of ink are not formed on the Front Paper Guide Pad and that the Front Paper Guide Pad is installed securely and evenly in the setting position. 	1. If heaps of ink are formed, replace the Front Paper Guide. If it has been confirmed that the Ink pads have risen, reinstall the Front Paper Guide Pad correctly.
	When the paper size in the sent print data is larger than the size of the fed paper, data are printed on the Front Paper Guide, extending off the paper.	PW sensor	1. Check that the PW Sensor FFC is connected.	1. Connect the PW Sensor FFC.
			2. Check that the PW Sensor is not faulty.	2. Replace the PW Sensor with a new one.
	Ink smudges appear on the blank area of the printout.	Paper EJ Frame Assy.	1. Check the Star Wheel Rollers for ink stain.	1. Clean the Star Wheel Rollers with a soft cloth.
		Front Paper Guide	1. Check the Front Paper Guide for ink stain.	1. Clean the Front Paper Guide with a soft cloth.
		Front Paper Guide Pad	1. Check if ink heaps are formed on the Front Paper Guide Pad.	1. Replace the Front Paper Guide with a new one.

Table 3-12. Print Quality Troubles

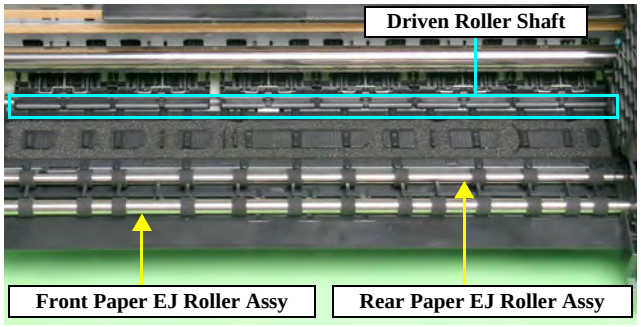
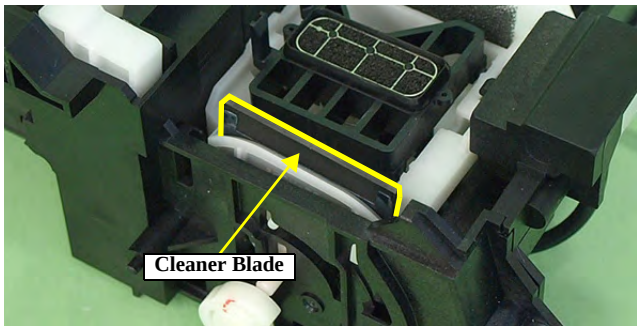
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
The printout is stained with ink.	Ink smudges appear on the blank area of the printout.	Front and Rear Paper EJ Roller Assys	1. Check the Front and Rear Paper EJ Roller Assys for ink stain. 	1. Clean the Front and Rear Paper EJ Roller Assys with a soft cloth.
		Driven Roller Shaft	1. Check the Driven Roller Shaft for ink stain.	1. Clean the Driven Roller Shaft with a soft cloth.
		Ink System Unit	1. Check that wiping operation was performed properly. 	1. Install the Cleaner blade correctly or replace it with a new one.

Table 3-12. Print Quality Troubles

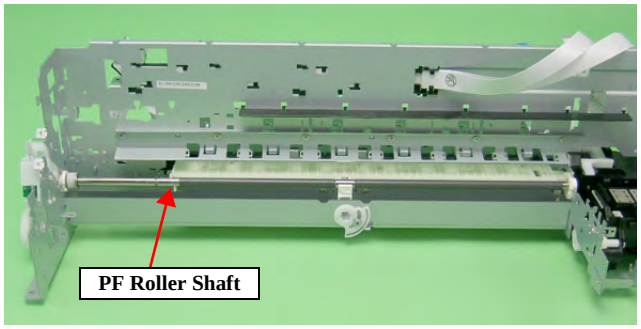
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
The printout is stained with ink.	Ink smudges appear on the blank area of the printout.	PF Roller Shaft	1. Check the PF Roller Shaft for ink stain.  	1. Clean the PF Roller Shaft with a soft cloth.
The printout is grainy.	Images are printed grainy in all print modes. Or the image looks rough.	Adjustment Main Board Print Head	1. Check that PG, Bi-D and Head Angular Adjustments have been made properly.	1. Make the adjustments according to the specified adjustment priority. Refer to Chapter 5 ?Adjustment?.
			2. Print the adjustment check patterns and check if they are grainy.	2. If the images look still grainy after adjustment, replace the Main Board with a new one.
	When printed at 5760 dpi, the printed images are poor or grainy.	Adjustment Main Board Print Head	1. After making sure that PG, Bi-D and Head Angular Adjustments have been made correctly, check whether PW Sensor has been adjusted properly.	1. Make the adjustment according to the specified adjustment priority. Refer to Chapter 5 ?Adjustment?.
			2. Print the adjustment check patterns and check if the printed images are still poor or grainy.	2. If the image quality does not improve after the adjustment, replace the Print Head and Main Board in this order, and check the image graininess.
Regarding hue of images	The whole image is reddish.	Adjustment Print Head	1. Check if the PG has been adjusted properly.	1. Make the adjustment according to the specified adjustment priority. Refer to Chapter 5 ?Adjustment?.
			2. Check that Bi-D and Head Angular Adjustments have been made properly.	2. Make the adjustments according to the specified adjustment priority. Refer to Chapter 5 ?Adjustment?.
			3. Print the adjustment check patterns and check the image color.	3. If the image color does not change after adjustment, replace the Print Head with a new one.

Table 3-12. Print Quality Troubles

Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Borderless Printing	Cannot make a borderless printing (The printer prints with margins despite the borderless setting).	PW sensor	1. Check if the paper dust or scrap of the paper is attached to the Front Paper Guide.	1. Remove the paper dust or scrap of the paper.
			2. Check that PW adjustment has executed properly.	2. If the borderless printing still can not be made after the adjustment, replace the PW Sensor with a new one. Refer to Chapter 5 ?Adjustment?.
Pattern misalignment for vertical lines and such	The vertical lines are not aligned at monochrome draft printing.	Adjustment	1. Check that BAND printing adjustment has executed properly.	3. Make the adjustment according to the specified adjustment priority. Refer to Chapter 5 ?Adjustment?.

Table 3-13. Abnormal Noise

Occurrence Timing	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
–	Printing operation is performed normally but abnormal noise is produced at power-on or during operations.	Adjustment	1. Check that PF Belt Tension Adjustment has been executed properly.	1. Make the adjustment according to the specified adjustment priority. Refer to Chapter 5 ?Adjustment?.
		Carriage Shaft	1. Check that the Carriage Shaft is fully lubricated with grease.	1. Wipe the grease applied to the Carriage Shaft with a dry, soft cloth, and then apply grease (G-71). Refer to Chapter 6 ?Maintenance?.

CHAPTER

4

DISASSEMBLY AND ASSEMBLY

4.1 Overview

This chapter describes procedures for disassembling and assembling this product. Unless otherwise specified, the disassembled units or main components can be reassembled by reversing the disassembling procedure.

- WARNINGs must be followed to avoid personal injury or death.
- CAUTIONs must be followed to avoid damaging the printer or test equipment.
- ADJUSTMENT REQUIRED indicates that specific mandatory adjustments must be carried out to complete the repair.
- CHECK POINTs emphasize a particularly important process or procedure.
- REASSEMBLY notes provide helpful tips on reassembly procedures, especially when correct reassembly differs from simple reverse-assembly.

When you need to disassemble any units or parts that are not described in this chapter, refer to the exploded diagrams in the Appendix.

Before starting your work, always read the precautions described in the next section.

4.1.1 Precautions

Before starting the disassembling/reassembling work of this product, always read the following “WARNING” and “CAUTION” carefully.

- **Before starting the disassembling/reassembling work of this product, always disconnect the power cable.**
  When the power supply cable must be connected for voltage measurement or like, be extremely careful not to get an electric shock and follow the procedures in this manual to do your work.
- **Wear protective goggles to protect your eyes from ink. If ink gets in your eyes, wash your eyes with clean water and see a doctor.**
- **To prevent injury from sharp metal edges, always wear gloves for disassembly and reassembly.**
- **If ink has adhered to your skin, wash it with soap and water. If it has caused skin irritation, see a doctor.**
- **To protect the microprocessors and circuitry, use static discharge equipment, such as anti-static wrist straps when accessing the internal components.**

- **Use only the recommended tools for disassembly, reassembly and adjustment.**
  Refer to Table 4-1 ?List of Tools?.
- **Tighten screws to the specified torques.**
- **Use the specified lubricants and adhesives.**
  Refer to Chapter 6 “Maintenance”.
- **Make the necessary adjustments under the instructions given for disassembling.**
  Refer to Chapter 5 “Adjustment”.
- **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

The following table indicates the tools recommended for use for disassembly, reassembly and adjustment.

Table 4-1. List of Tools

Tool Name	Code
Phillips Screw Driver, No.1	1080530
Phillips Screw Driver, No.2	-
Flathead Screwdriver	-
Tweezers	-
Needle nose pliers	-
Nipper	-
Acetate tape	-
PF Tension Measuring Tool	1294120
Penlight	-

Note : All of the tools listed above are commercially available. EPSON provides the tools listed with EPSON tool code.

4.1.3 Screws

The following table lists the screws used in this product. When disassembling and reassembling the printer, refer to the following table and use the specified screws in the specified positions.

Table 4-2. List of Screw Types

No. Name	No. Name
1) C.B.P. M3x10	11) C.C. M3x4
2) C.B.S. M3x6	12) C.P.B. (P1) M1.7x5
3) C.B.S. (P2) M3x10	13) C.B.P. M2.6x5
4) C.B.P. M3x8	14) C.P. M3x4
5) C.B.S. M3x8	15) C.B.S. (P2) M3x8
6) C.B.S. (P4) M3x8	16) C.B.P. M2x8
7) C.B.P. M2.6x8	17) C.B. M3x6
8) C.B.S. (P4) M3x6	18) C.B.P. 3x12
9) C.B.P. M3x6	19) C.B. M3x4
10) C.B.S. M3x4	

4.1.4 Work Completion Checklist

Whenever the printer is serviced, use the checklist shown below to confirm all work is completed properly and the printer is ready to be returned to the user.

Table 4-3. Work Completion Check

Classification	Item	Check Point	Check Field
Main Unit	Self-test	Is the operation normal?	☐Checked /☐ Not necessary
	On-line Test	Is the printing attempt 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
		Are there any abnormal noises during its operation?	☐Checked /☐ Not necessary
		Are there any dirt or foreign objects on the CR Shaft?	☐Checked /☐ Not necessary
		Is the CR Motor at the correct temperature? (Not too hot to touch?)	☐Checked /☐ Not necessary
	Paper Feeding Mechanism	Is paper advanced smoothly?	☐Checked /☐ Not necessary
		No paper jamming?	☐Checked /☐ Not necessary
		No paper skew?	☐Checked /☐ Not necessary
		No multiple-sheet feeding?	☐Checked /☐ Not necessary
		Is the PF Motor at correct temperature? (Not too hot to touch?)	☐Checked /☐ Not necessary
		No abnormal noises?	☐Checked /☐ Not necessary
		Is the paper path free of obstructions?	☐Checked /☐ Not necessary
Adjustment	Specified Adjustment	Are all the adjustments correctly completed?	☐Checked /☐ Not necessary
Lubrication	Specified Lubrication	Has lubrication been applied at the specified points?	☐Checked /☐ Not necessary
		Is the amount of lubrication correct?	☐Checked /☐ Not necessary
Function	ROM Version	Version: _____	☐Checked /☐ Not necessary
Packing	Ink Cartridge	Have the ink cartridges been installed correctly?	☐Checked /☐ Not necessary
	Protective Materials	Have all relevant protective materials been attached to the printer?	☐Checked /☐ Not necessary
Others	Accessories	Have all the accessories sent by the user been included in the package?	☐Checked /☐ Not necessary

4.1.4.1 Protection for Transportation (Securing the Carriage)

Before packing the printer to be returned to the user, attach a piece of strong tape (length: 250 mm, fold one end: 5 mm) to the carriage to prevent damage during transportation.

1. Attach the unfolded end of the strong tape on the bottom left of the carriage as shown in Figure 4-1.
2. Pull the tape and make it adhere to the left side of the carriage.
3. Move the carriage in the direction of the arrow (130 digit side) in Figure 4-1 until it touches the Carriage Lock.
4. Pull the tape toward the right side of the housing and attach it tightly along the shapes of the housing as shown in Figure 4-1 to secure the carriage.

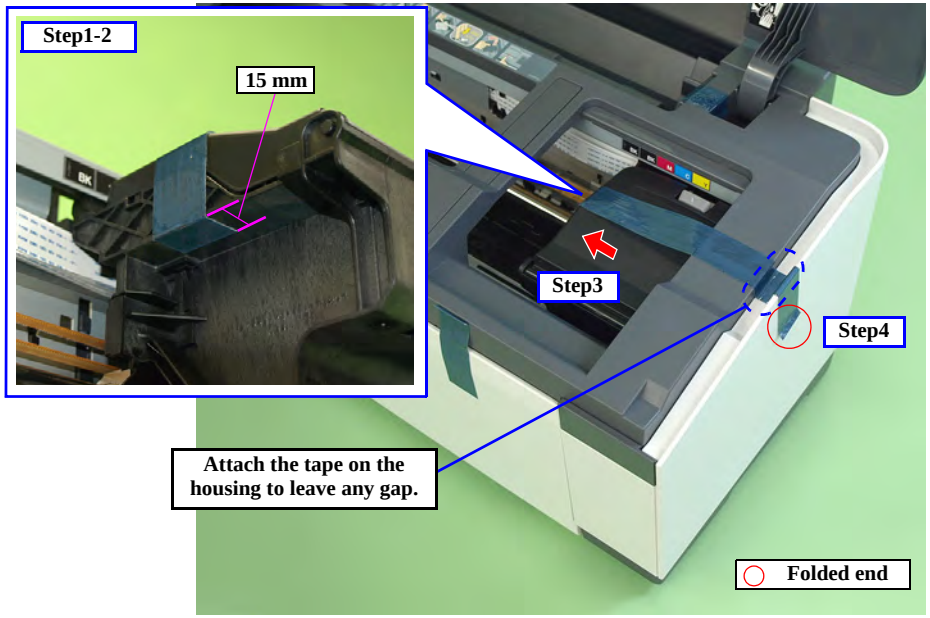


Figure 4-1. Securing the Carriage

4.1.5 Locking/Releasing the Carriage

Locking and releasing the Carriage is shown below.

1. Remove the Decoration Plate Right. *(Refer to 4.2.6 Decoration Plate Left/Right (p.71).)*
2. Insert a phillips screwdriver into the hole on the right side of the frame, and rotate the white shaft of the Ink System Unit.

Table 4-4. Carriage Lock/Release

Direction of Rotation	Carriage
Clockwise (CW)	Locked
Counterclockwise (CCW)	Released

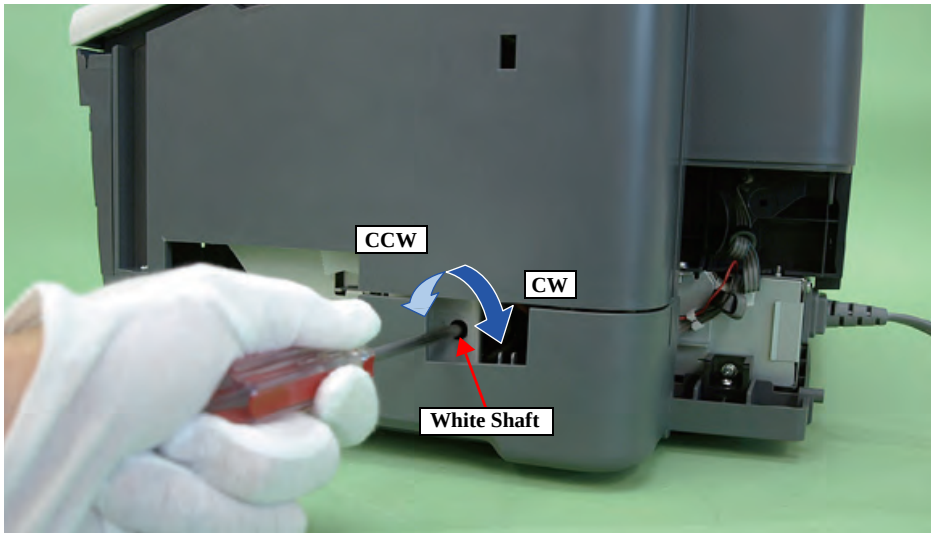


Figure 4-2. Release the Carriage Lock

4.1.6 Disassembly

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

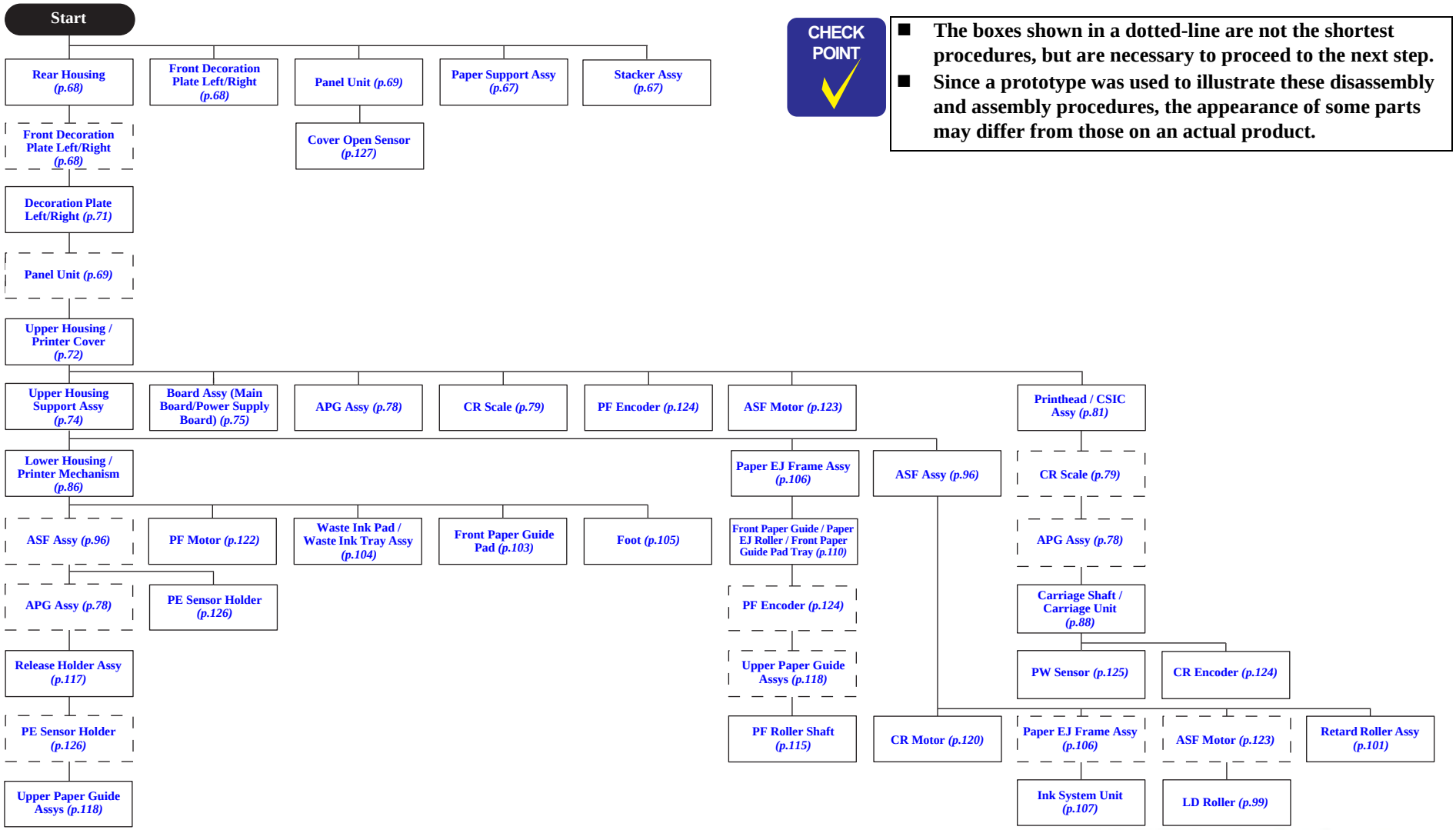


Figure 4-3. Disassembly Flowchart

4.2 Removing the Housings

4.2.1 Paper Support Assy

1. While pulling out the left and right guide pins of the Paper Support Assy, remove the Paper Support Assy.

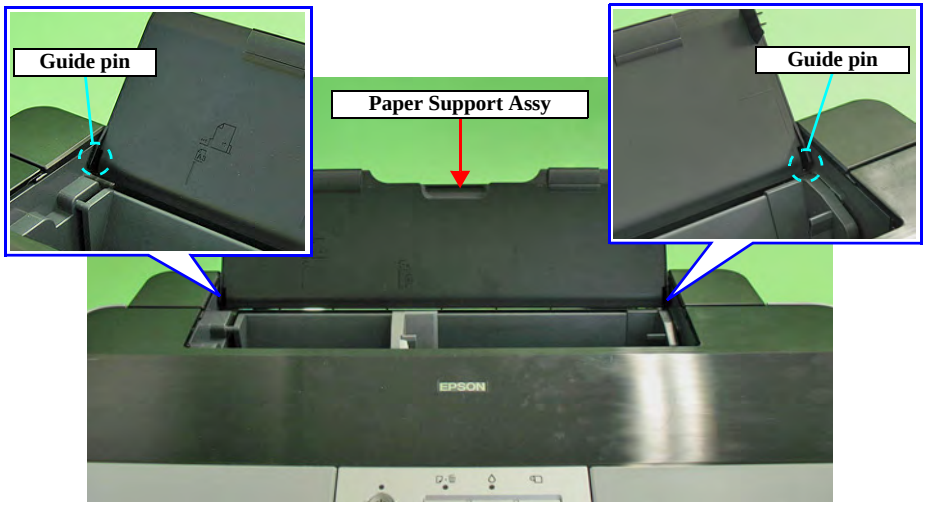


Figure 4-4. Removing the Paper Support Assy

4.2.2 Stacker Assy

1. To disengage the guide pin on the right of the Stacker Assy, push the Stopper in the direction of the arrow with a flathead screwdriver or similar tool.
2. Pull out the left guide pin of the Stacker Assy, and remove the Stacker Assy.

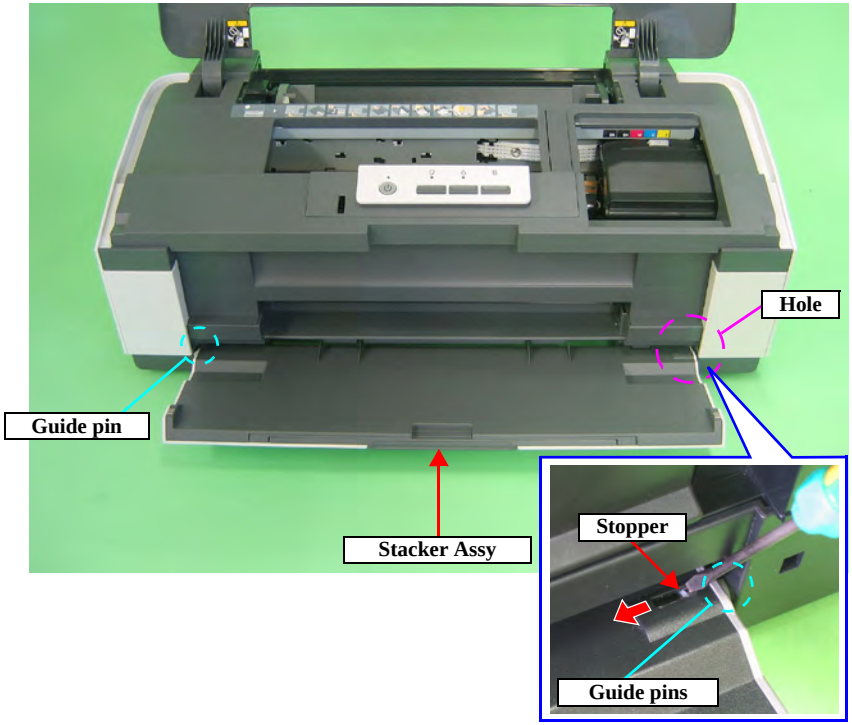


Figure 4-5. Removing Stacker Assy

4.2.3 Front Decoration Plate Left/Right

1. Open the Stacker Assy.
2. While releasing the hook on the Front Decoration Plate Left, open the plate in the direction of the arrow, and remove it.
3. In the same way, remove the Front Decoration Plate Right.

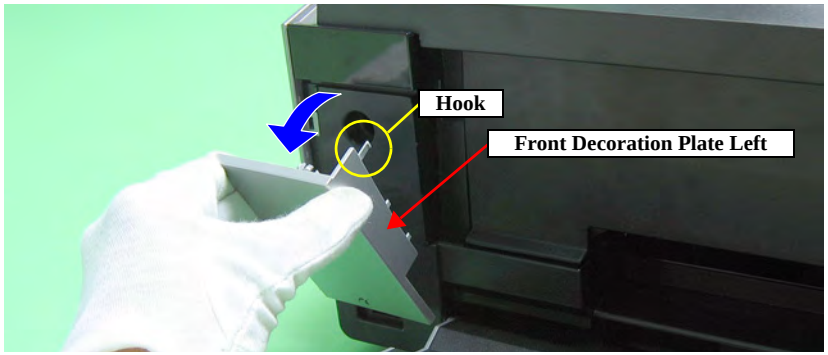


Figure 4-6. Removing the Front Decoration Plate Left/Right

REASSEMBLY

When installing the Front Decoration Plate L/R, insert the two hooks at the bottom of them into the holes of the Lower housing, then secure the Front Decoration Plate L/R with the other hooks.

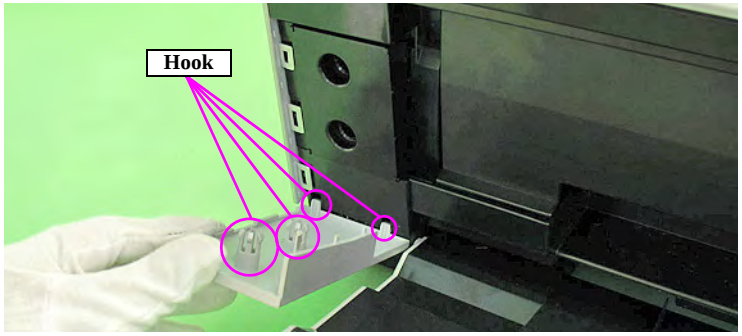


Figure 4-7. Reinstalling the Front Decoration Plate Left/Right

4.2.4 Rear Housing

1. Remove the two C.B.P. M3 x 8 screws and the C.B.S. M3 x 6 screw that secure the Rear Housing.
2. Disengage the two tabs from the Upper Housing and remove the Rear Housing.

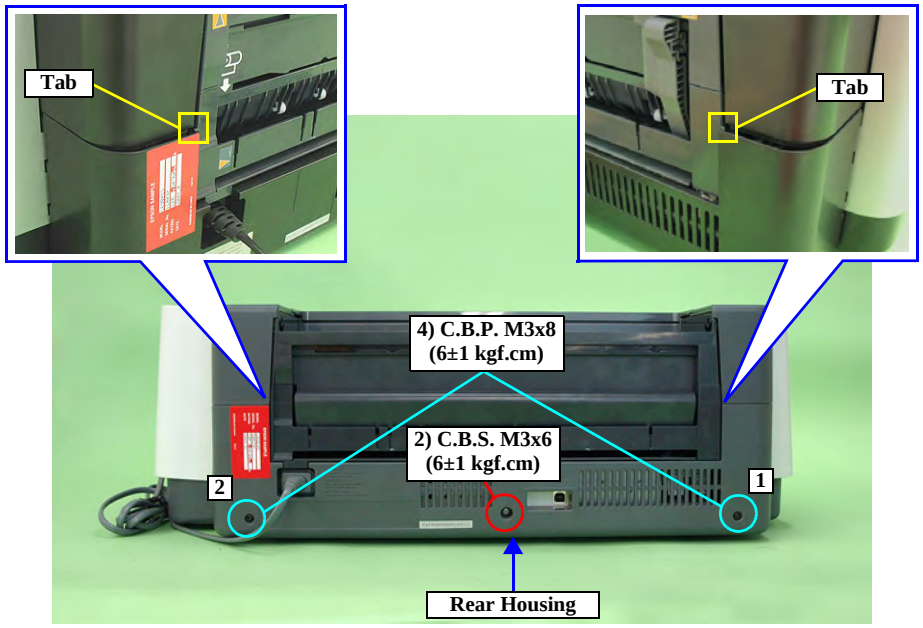


Figure 4-8. Removing the Rear Housing

REASSEMBLY

Tighten the screws in the order shown in Figure 4-8.

REASSEMBLY

- **Align the positioning tabs (one each on the left/right) with the positioning holes (one each on the left/right) on the Upper Housing.**
- **Align the positioning tabs (three each on the left/right) with the positioning holes (three each on the left/right) on the Decoration Plate Left/Right and the Lower Housing.**

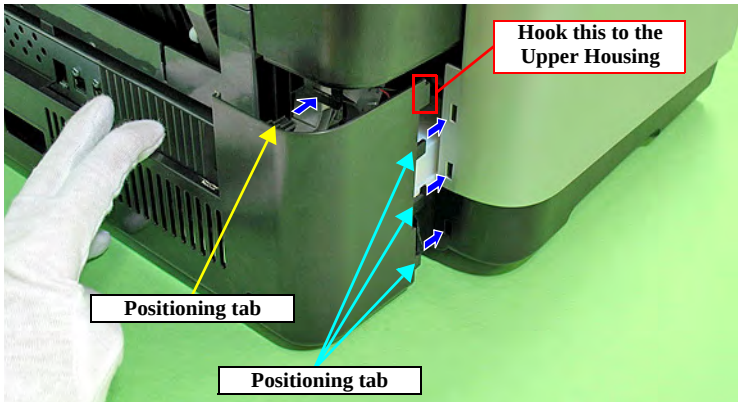


Figure 4-9. Reinstalling the Rear Housing

4.2.5 Panel Unit

1. Open the Printer Cover.

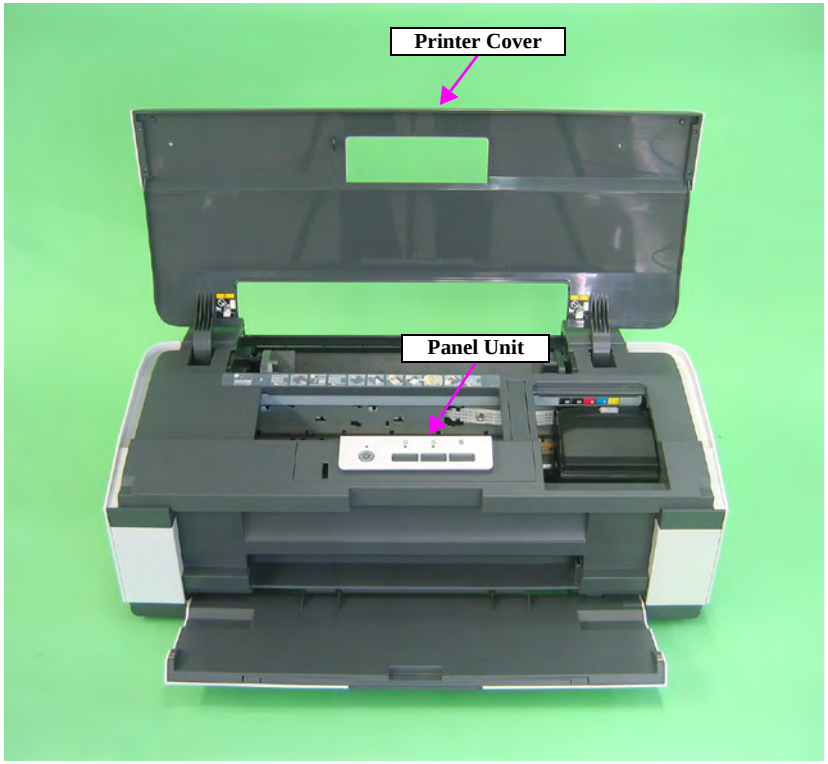


Figure 4-10. Removing the Panel Unit (1)

2. Disengage the nine hooks on the bottom of the Panel Unit, and remove the Panel Unit while pulling out its tab.
3. Disconnect the Panel FFC from the Panel Board connector and remove the Panel Unit.

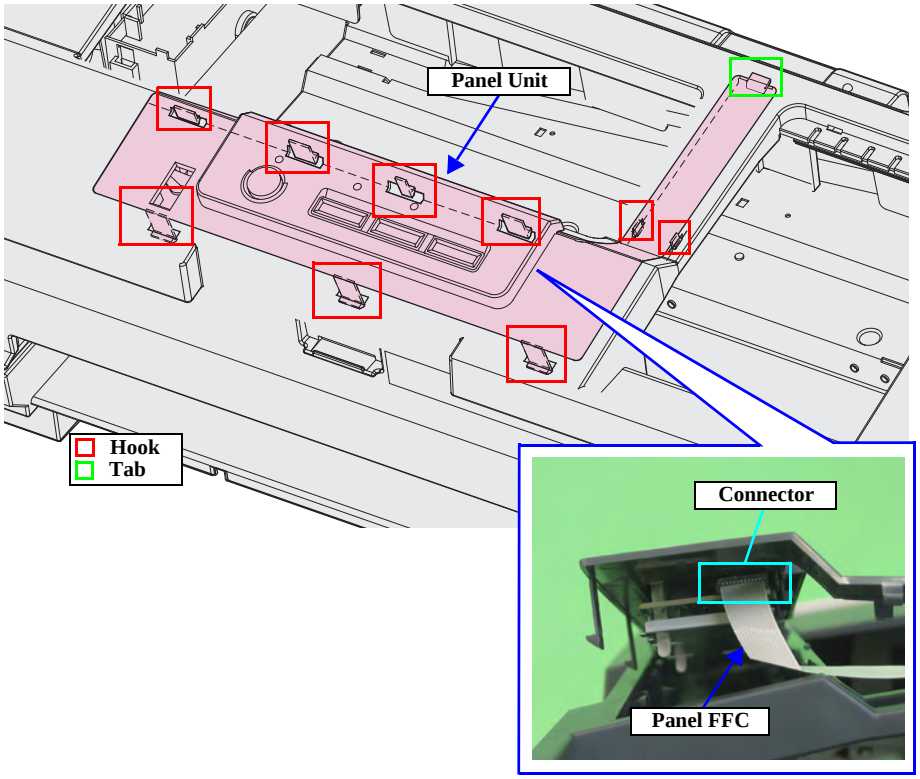


Figure 4-11. Removing the Panel Unit (2)

REASSEMBLY

- **Be careful not to get the Panel FFC caught underneath the hooks on the Panel Unit.**
- **Secure the Panel FFC to the Panel Unit with a piece of double-sided tape.**

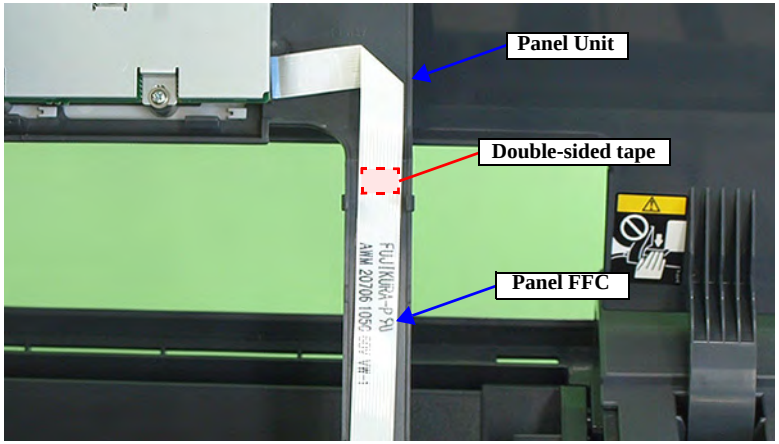


Figure 4-12. Securing the Panel FFC

4.2.6 Decoration Plate Left/Right

1. *Remove the Rear Housing. (p.68)*
2. *Remove the Front Decoration Plate Left/Right. (p.68)*
3. Release the three hooks on the front of the Decoration Plate Right and lift the plate a little to release the tab and the four guide pins on the upper side, then remove the Decoration Plate Right.
4. In the same way, remove the Decoration Plate Left.

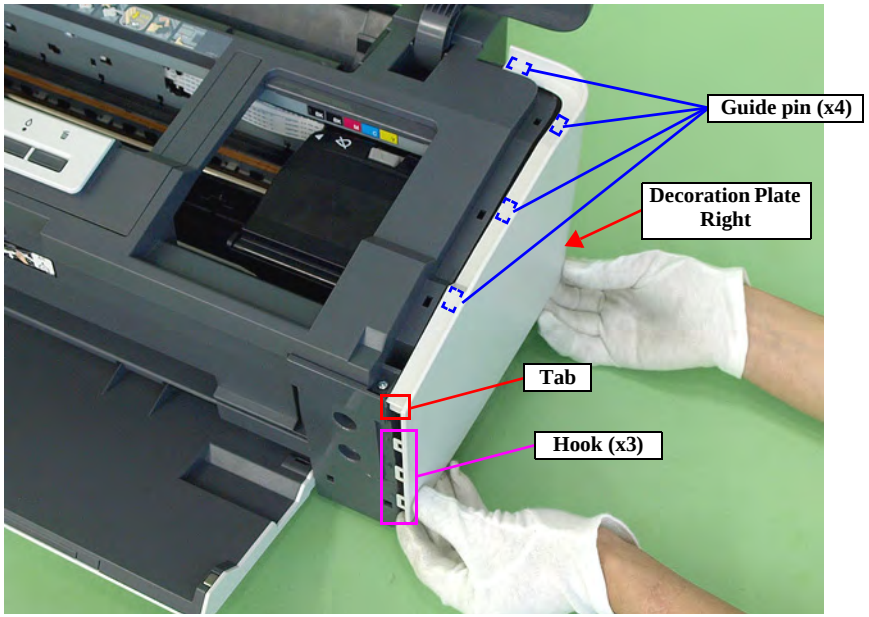


Figure 4-13. Removing the Decoration Plate Left/Right

REASSEMBLY

When installing the Decoration Plate L/R, first align the hooks of the Decoration Plate L/R (two each) with the ribs of the Lower Housing (two each on the left/right), and then align the tab inside the Decotrative Plate L/R (one each) with the positioning hole on the Upper Housing (one each on the left/right).

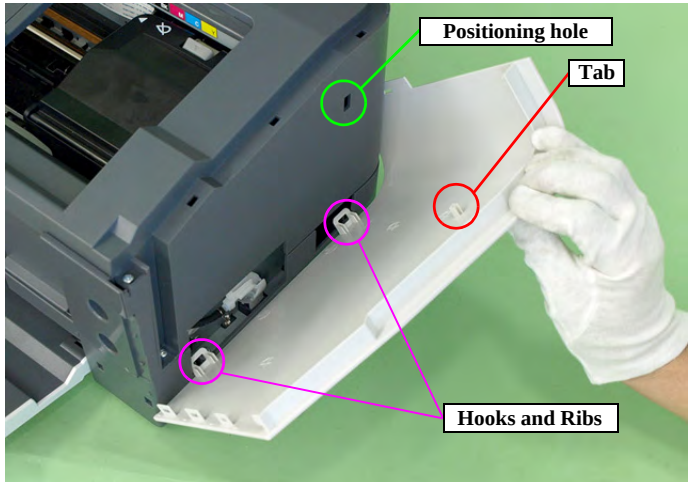


Figure 4-14. Reinstalling the Decoration Plate Left/Right

4.2.7 Upper Housing / Printer Cover

1. *Remove the Decoration Plate Left/Right. (p.71)*
2. *Remove the Panel Unit. (p.69)*
3. Remove the seven C.B.P. M3 x 10 screws that secure the Upper Housing.
4. Remove the Upper Housing while pulling out the Panel FFC through the cutout of the Upper Housing.

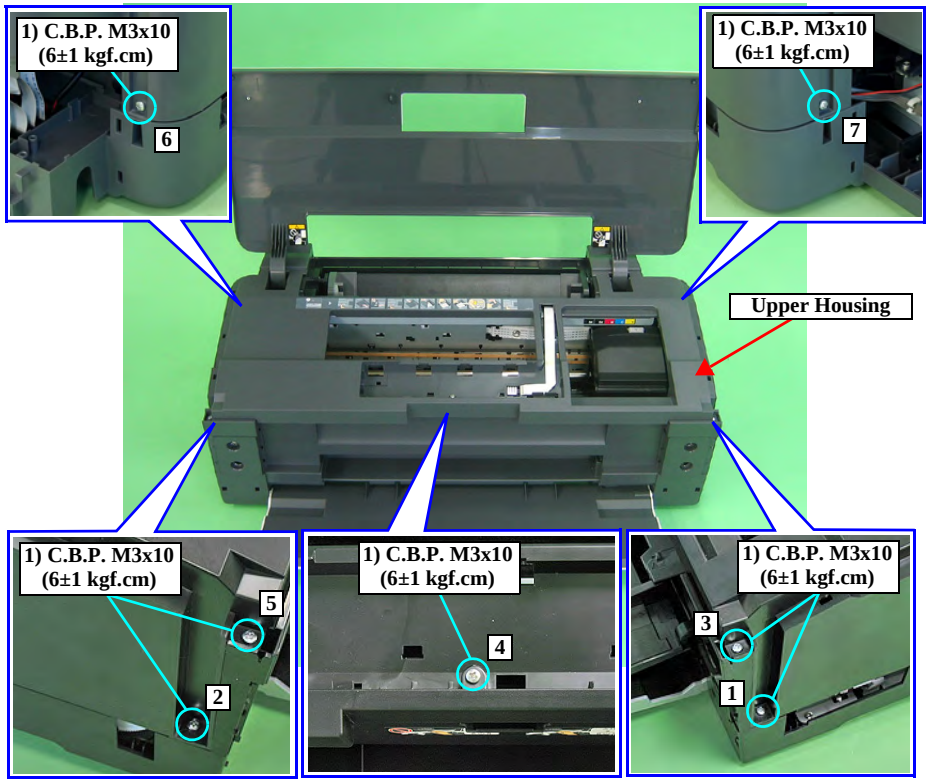


Figure 4-15. Remove the Upper Housing

REASSEMBLY

- **Route the Panel FFC correctly as shown in Figure 4-12.**
- **Install the Upper Housing so that the Grounding Plate properly protrudes through the cutout of the Upper Housing.**

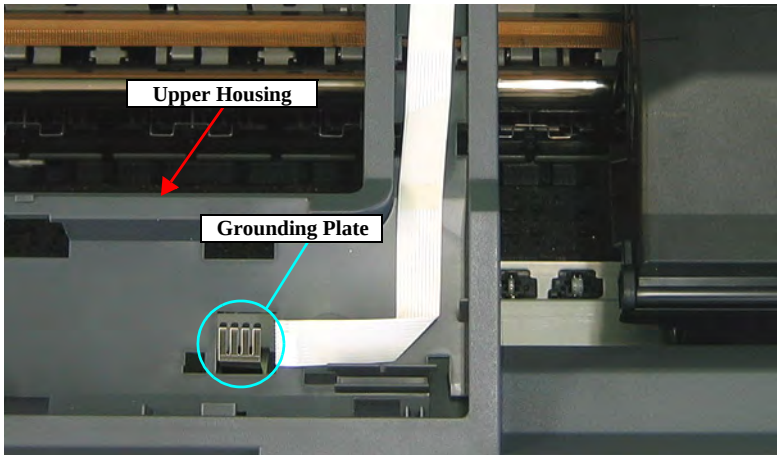


Figure 4-16. Routing the Panel FFC

- **Tighten the screws in the order shown in Figure 4-15.**

ADJUSTMENT REQUIRED

After replacing the following parts, be sure to apply G-74 grease to the area specified for each part.

- **Upper Housing: See Figure 6-14 on page 158.**

REMOVING THE PRINTER COVER

1. *Remove the Upper Housing / Printer Cover. (p.72)*
2. Remove the two C.B.P. M3 x 8 screws that secure Printer Cover Holder Left/ Right.

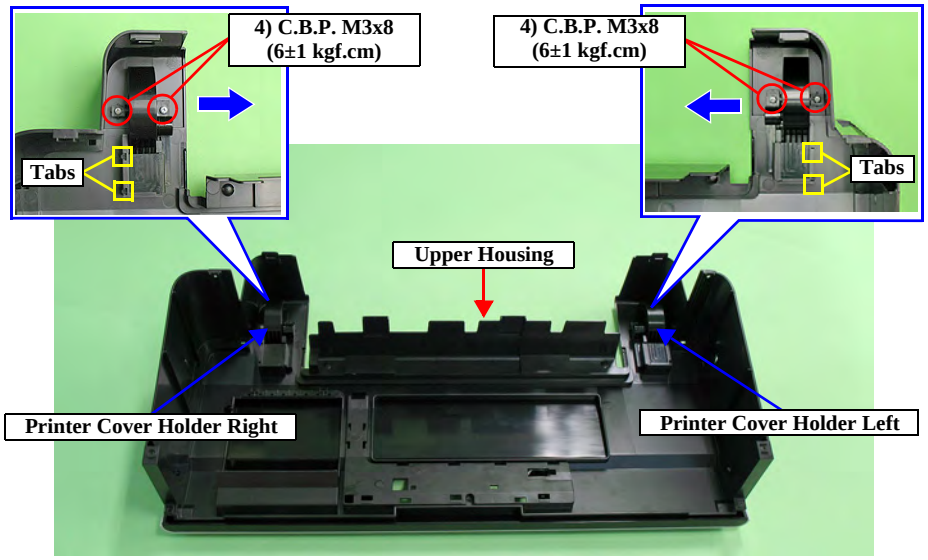


Figure 4-17. Removing the Printer Cover Holder Left/Right

REASSEMBLY

Insert the tabs (two each on the left/right) shown in Figure 4-17 into the holes on the Upper Housing.

CAUTION

Be careful not to damage the surface in step 3 and later.

3. Remove the Printer Cover Holder Right following the steps below.

   3-1. With the Printer Cover open, put the Upper Housing with the rear side up.

CAUTION

When performing the following steps, be careful not to damage the tabs of the Printer Cover Holder Right.

   3-2. Slide the Printer Cover Holder Right in the direction of the arrow while lifting it, and remove the Printer Cover Holder Right from the Upper Housing.

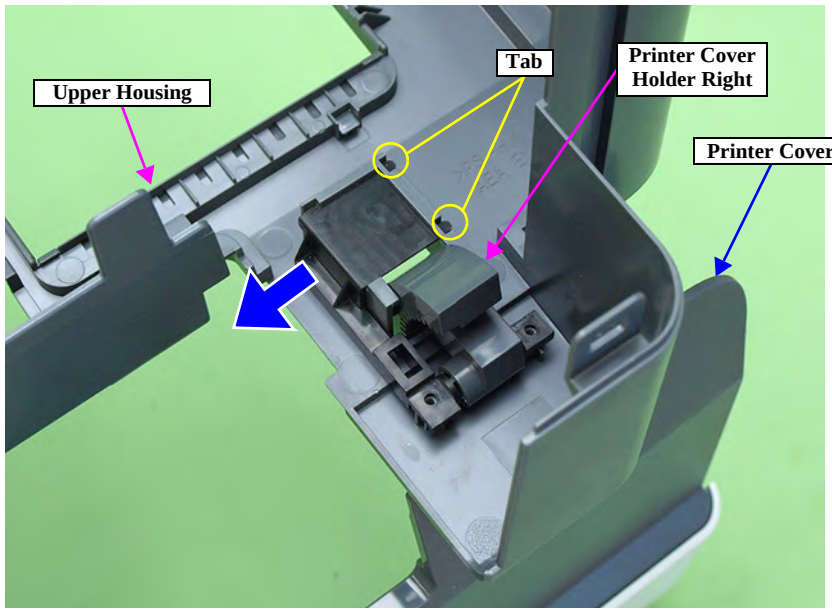


Figure 4-18. Removing the Printer Cover

4. While holding the Printer Cover, remove the Printer Cover Holder Left in the same manner as Step 3-2, and remove the Printer Cover from the Upper Housing.

ADJUSTMENT REQUIRED

After replacing the following parts, be sure to apply G-26 grease to the area specified for each part.

- **Printer Cover Holder Left: Chapter 6 See Figure 6-13 (p.158).**
- **Printer Cover Holder Right: Chapter 6 See Figure 6-13 (p.158).**

4.2.8 Upper Housing Support Assy

1. *Remove the Upper Housing / Printer Cover. (p.72)*
2. Remove the two C.B.S. M3 x 6 screws and two C.B.P. M3 x 10 screws that secure the Upper Housing Support Assy, and remove the Upper Housing Support Assy.

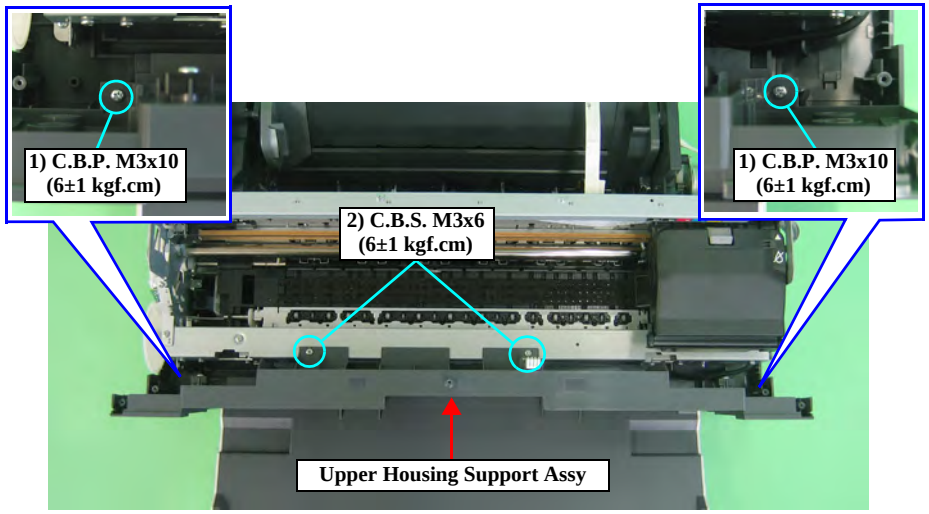


Figure 4-19. Removing the Upper Housing Support Assy

REASSEMBLY

Secure the Grounding Plate with one of the C.B.S. M3 x 6 screws together with the Upper Housing as shown below.

4.3 Removing the Boards

4.3.1 Board Assy (Main Board/Power Supply Board)

1. *Remove the Upper Housing / Printer Cover. (p.72)*
2. Remove the seven screws (four C.B.S. M3 x 6, two C.B.S. (P2) M3 x 8, and one C.B.S. M3 x 8) that secure the Board Assy.

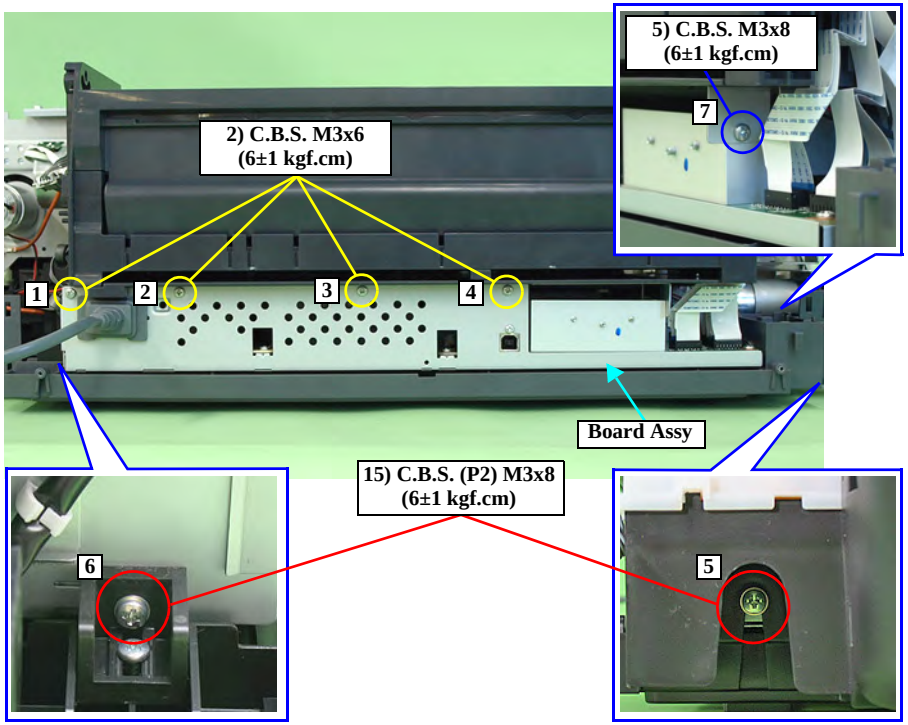


Figure 4-20. Removing the Board Assy (1)

REASSEMBLY

Tighten the screws in the order shown in Figure 4-20.

3. Disconnect all the cables and FFCs connected on the Main Board from the near side one by one.

No.	Connector	No.	Connector
CN4	Panel Bard, Cover Open Sensor	CN22	CSIC
CN5	Relay FFC (for sensor)	CN115	CR Motor
CN9	CR Encoder Sensor, PW Sensor	CN116	PF Motor
CN11	CR Relay Board	CN117	Pump Motor
CN12	CR Relay Board	CN118	APG Motor
CN13	CR Relay Board	CN119	ASF Motor

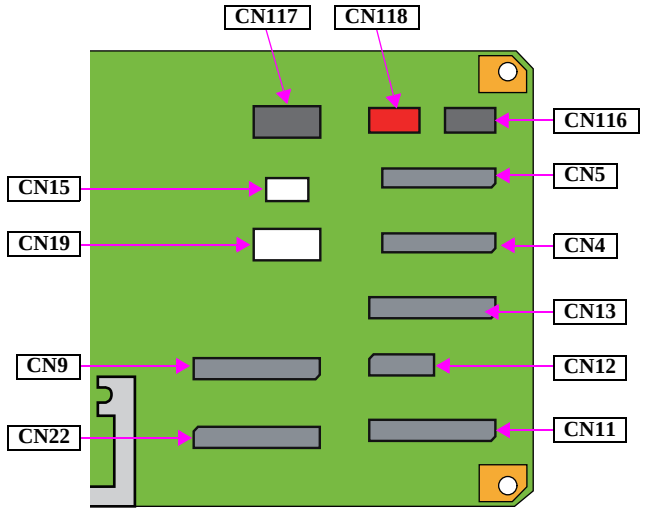


Figure 4-21. Connector Layout of the Main Board (130 Digit Side)

4. Pull out the Board Assy from the Printer.

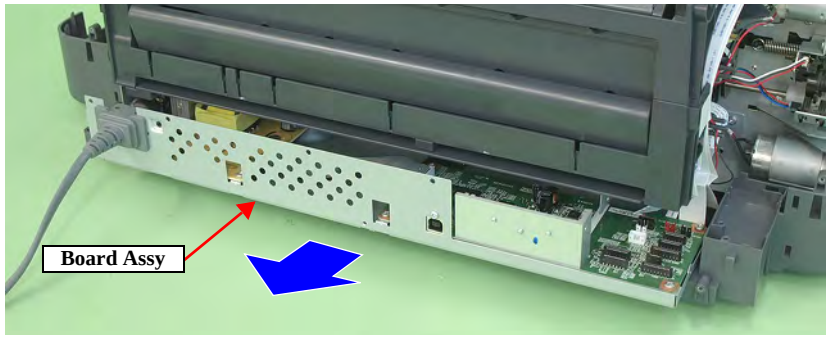


Figure 4-22. Removing the Board Assy (2)

REASSEMBLY

- **Confirm that the FFCs do not cross each other first, then connect the FFCs and the cables to the Main Board while paying attention to the edge of the Shield Plate.**
- **Take care not to place the Board Assy onto the three Ground Plates.**

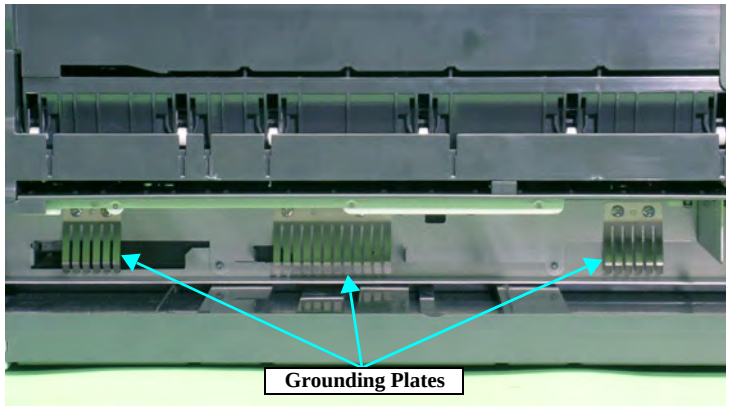


Figure 4-23. Reinstalling the Board Assy

REMOVING THE MAIN BOARD

1. *Remove the Board Assy (Main Board/Power Supply Board). (p.75)*

CAUTION

When disconnecting the Power Board cable, be sure to unlock CN60 on the Main Board.

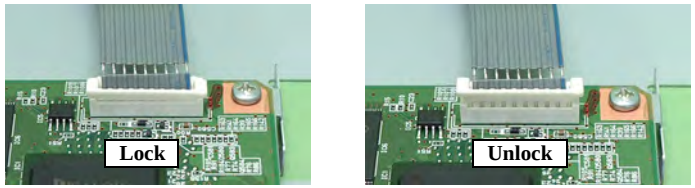


Figure 4-24. Handling the Power Board cable (CN60)

2. Disconnect the Power Board cable from connector CN60 on the Main Board.
3. Remove the four C.B.S. M3 x 6 screws and one C.P. M3 x 4 screw that secure the Main Board and remove the Main Board from the Board Assy.

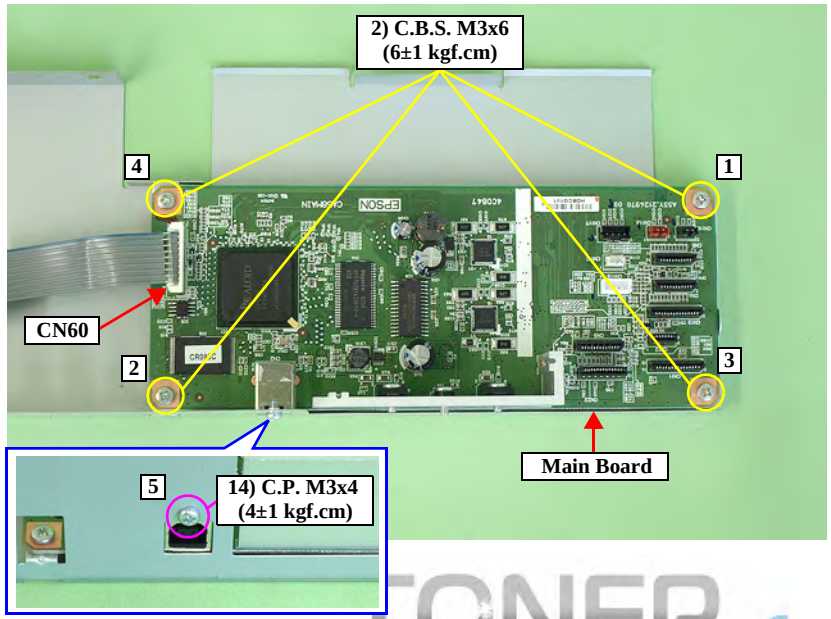


Figure 4-25. Removing the Main Board

REMOVING THE POWER BOARD

1. *Remove the Board Assy (Main Board/Power Supply Board). (p.75)*

When disconnecting the Power Board cable, be sure to unlock CN60 on the Main Board.

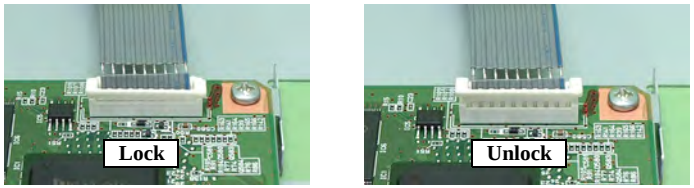


Figure 4-26. Handling the Power Board cable (CN60)

2. Disconnect the Power Board cable from connector CN60 on the Main Board. (p.76)
3. Remove the four C.B.S. M3 x 6 screws that secure the Power Board and remove the Power Board from the Board Assy.

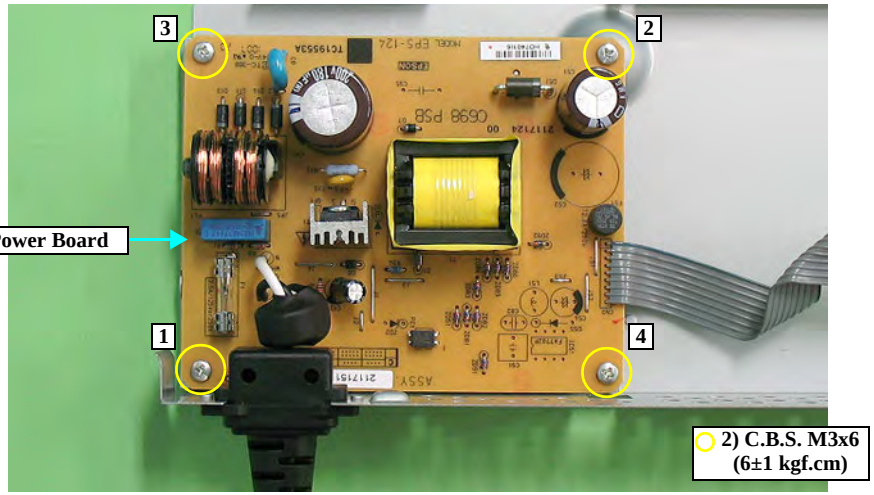


Figure 4-27. Removing the Power Board

Tighten the screws in the order shown in Figure 4-25 and Figure 4-27.

After replacing or removing the Main Board and the Power Board, always make the required adjustments referring to the following.

- **"Chapter 5 Adjustment *(p.128)*"**

4.4 Disassembling the Printer Mechanism

4.4.1 APG Assy

1. *Remove the Upper Housing / Printer Cover. (p.72)*
2. Disconnect the APG Motor connector cable from connector CN118 (red) on the Main Board.
3. Peel off the acetate tape, and remove the APG Motor cable from the ASF Assy.
4. Disconnect the cables from the two APG Sensor connectors.

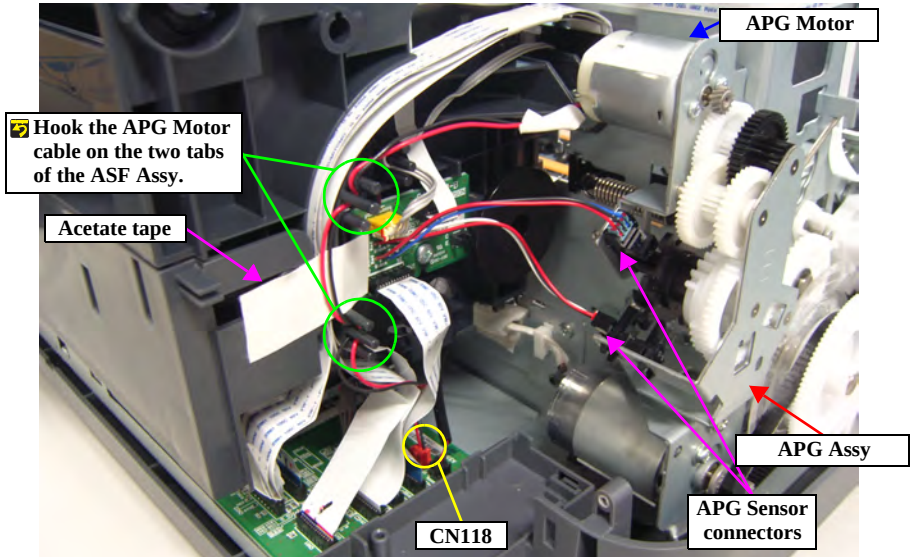


Figure 4-28. Disconnecting the Cables

REASSEMBLY

Referring to Figure 4-28, correctly route the APG connector cable.

5. Remove the three C.B.S. M3 x 6 screws that secure the APG Assy, and remove the APG Assy from the Main Frame.

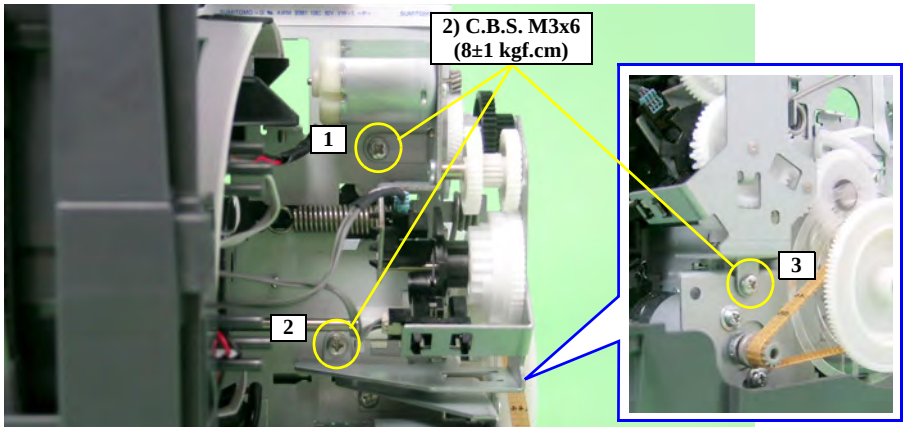
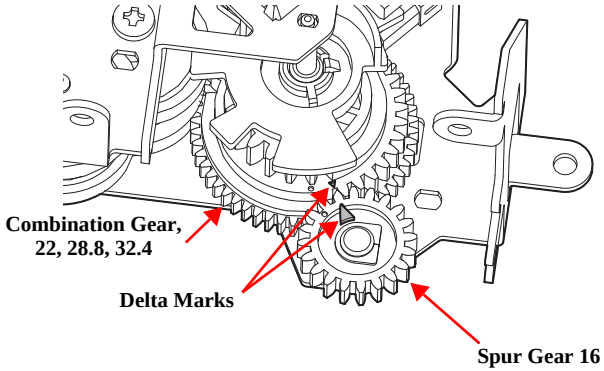


Figure 4-29. Removing the APG Assy

REASSEMBLY

■ **Align the phase of the APG Assy in the following procedure.**

1.Align the delta marks of Spur Gear 16 and Combination Gear 22, 28.8, 32.4.



2. At the position where the tab can be identified through the notch of the PG Frame, align the delta marks of Spur Gear 16 and PG Cam (Left).

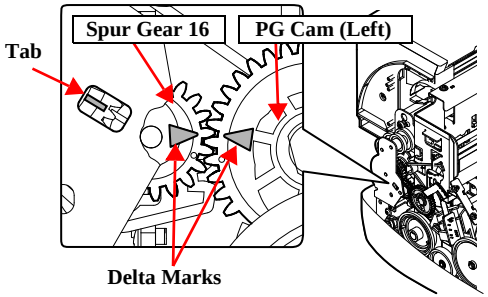


Figure 4-30. Phase Aligning

■ **Tighten the screws in the order shown in Figure 4-29.**

4.4.2 CR Scale

1. *Remove the Upper Housing / Printer Cover. (p.72)*
2. Release the Carriage Lock, and move the Carriage Unit to the center. *(Refer to 4.1.5 Locking/Releasing the Carriage (p.65).)*

CAUTION

When performing the following procedure, take care to prevent both ends of the CR Scale from being broken.

3. Pull the right end of the CR Scale in the direction of the arrow, and remove the CR Scale from the tab on the Right CR Shaft Mounting Plate.
4. Pull out the right end of the CR Scale towards the left direction from the rear of the Carriage Unit.

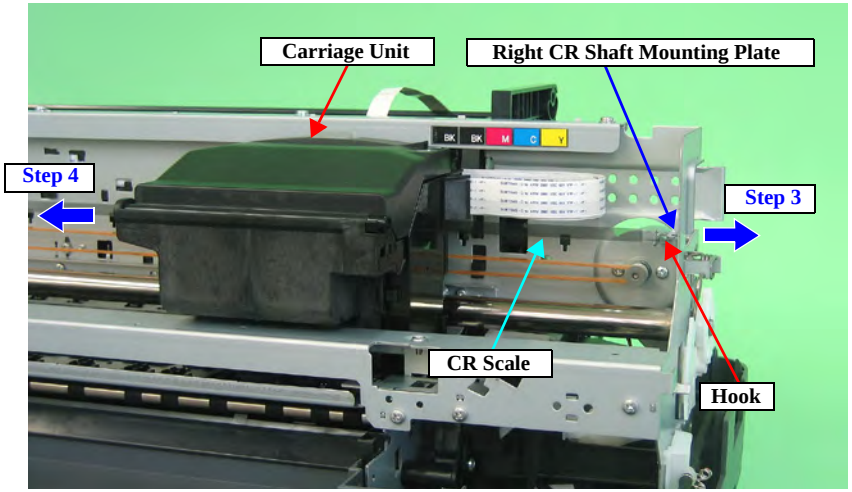


Figure 4-31. Pulling out the CR Scale

5. Remove the coil section of Torsion Spring 24.7 from the tab on the Left CR Shaft Mounting Plate with tweezers.

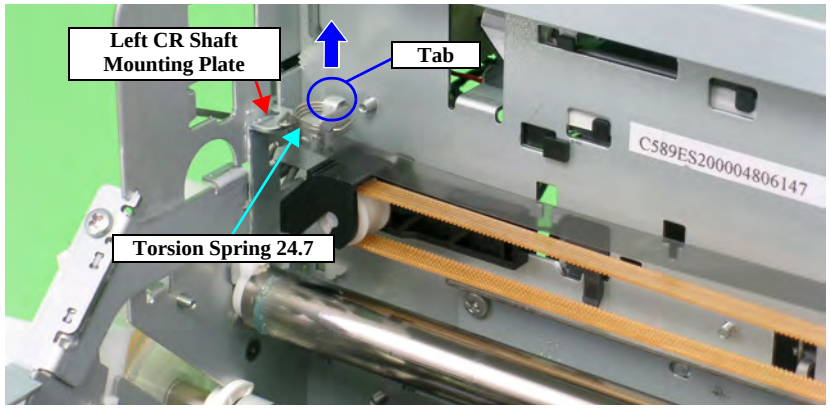


Figure 4-32. Removing the Torsion Spring 24.7 (1)

6. Remove Torsion Spring 24.7 from the CR Scale by the following procedure:
   - 6-1. Stand the coil section.
   - 6-2. Lower the coil section downwards to remove Foot 1 from the notch on the Left CR Shaft Mounting Plate.
   - 6-3. Turn the coil section counterclockwise.
   - 6-4. Remove Torsion Spring 24.7 from the hole on the CR Scale.

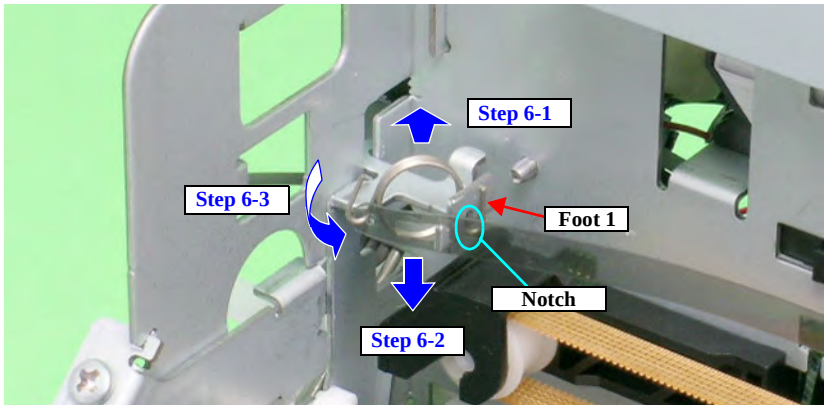


Figure 4-33. Removing the Torsion Spring 24.7 (2)

7. Turn the CR Scale 90º, and remove it from the tab on the Left CR Shaft Mounting Plate.

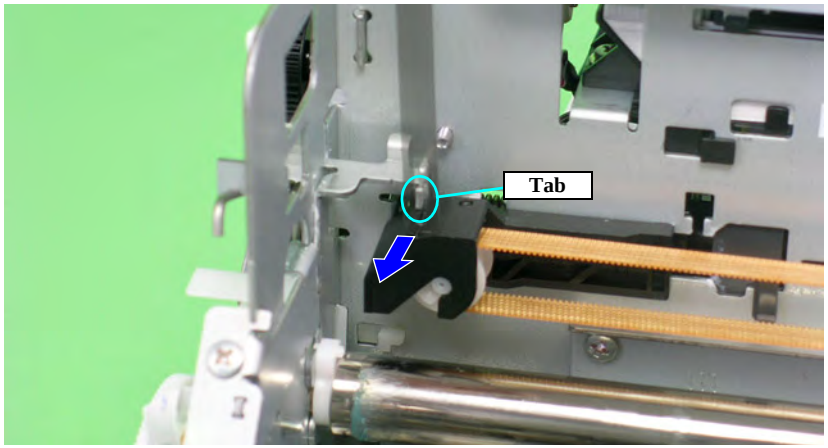


Figure 4-34. Removing the CR Scale

REASSEMBLY

- **Pass the CR Scale through the slot on the CR Encoder.**

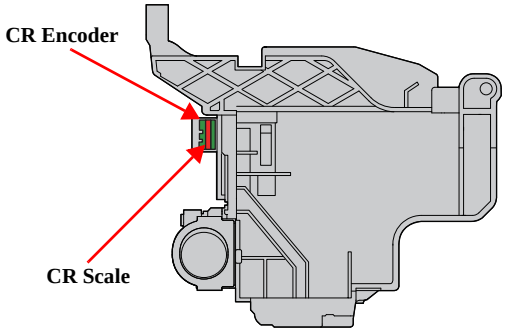


Figure 4-35. Reinstalling the CR Scale (1)

- **Set the left end of the CR Scale with the black mark facing upwards.**

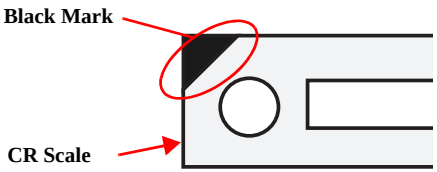


Figure 4-36. Reinstalling the CR Scale (2)

- **Place the right end of the CR Scale correctly so that it is not hooked onto the Right CR Shaft Mounting Plate.**

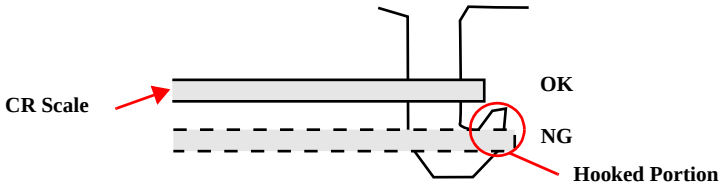


Figure 4-37. Reinstalling the CR Scale (3)

4.4.3 Printhead / CSIC Assy

CAUTION

So as not to damage the FFC, do not use any tools with the sharp ends when removing the Cable Holder.

1. *Remove the Upper Housing / Printer Cover. (p.72)*
2. Release the Carriage Lock, and move the Carriage Unit to the center. *(Refer to 4.1.5 Locking/Releasing the Carriage (p.65).)*
3. Open the Ink Cartridge Cover.
4. Cut the Hinge, Cover Cartridge with a nipper or a similar tool and remove the upper part of the Hinge, Cover Cartridge.
5. Remove the Ink Cartridge Cover from the Carriage Unit.
6. Disengage the hook from the lower part of the Hinge, Cover Cartridge using a pair of Tweezers and remove the lower part of the Hinge, Cover Cartridge.

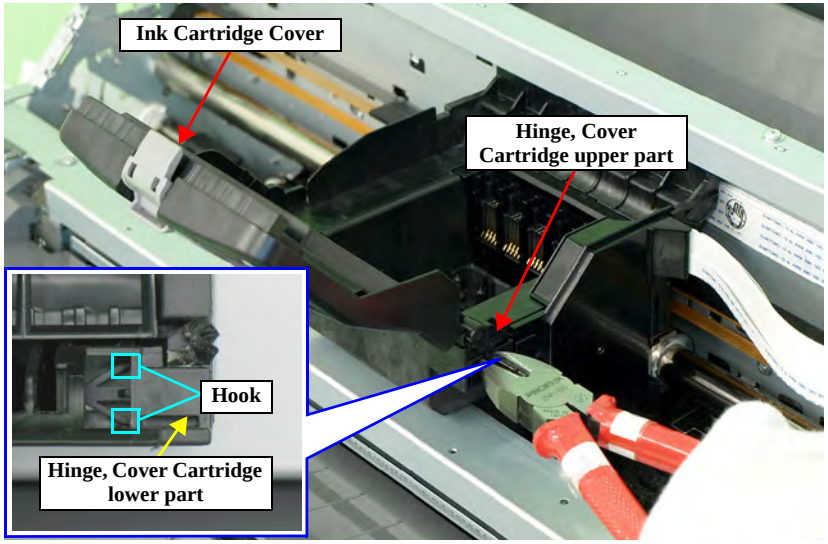


Figure 4-38. Removing the Hinge, Cover Cartridge

CHECK POINT

The Hinge, Cover Cartridge can not be removed without damaging it. Whenever replacing the Printhead, the Hinge, Cover Cartridge must be also replaced with a new one.

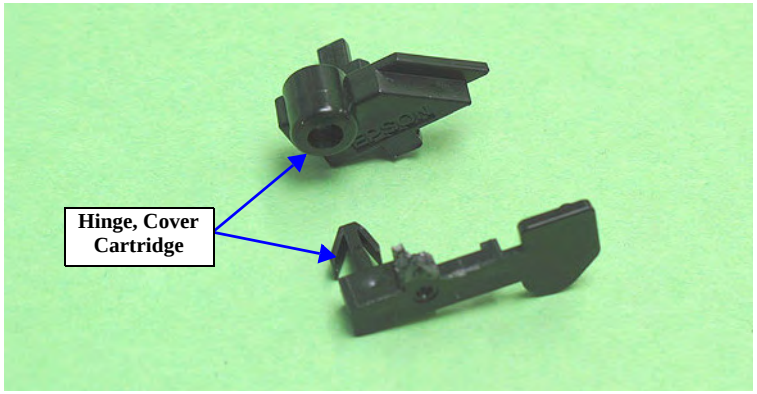
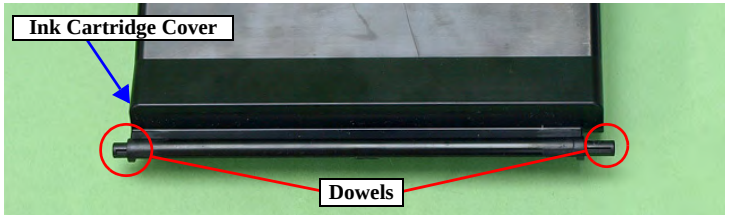


Figure 4-39. Hinge, Cover Cartridge

REASSEMBLY

Engage the two dowels of the Ink Cartridge Cover with the installation holes on the Carriage Unit and Hinge, Cover Cartridge (one each).



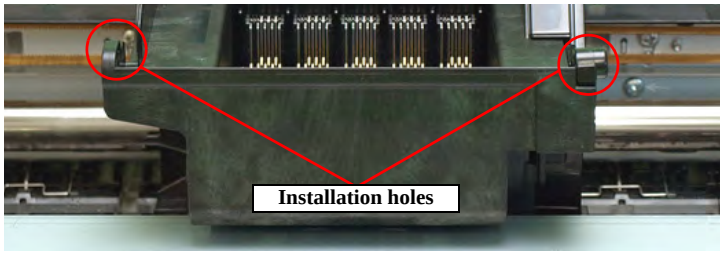


Figure 4-40. Reinstalling the Ink Cartridge Cover

7. Release the hook and two tabs of the Cable Holder, and remove the Cable Holder.

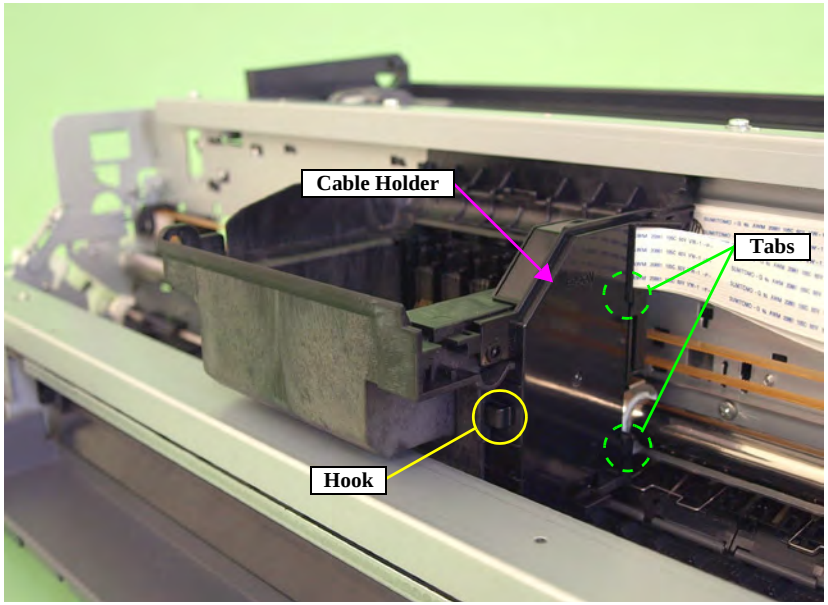


Figure 4-41. Removing the CSIC Assy (1)

8. Disconnect all the FFCs connected on the CR Relay Board.
   - CN1: Printhead
   - CN2: Printhead
   - CN3: Main Board
   - CN4: Main Board

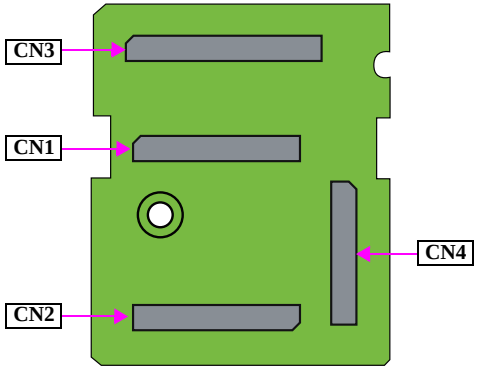


Figure 4-42. Removing the CSIC Assy (2)

9. Remove the C.B.S. M3 x 6 screw that secure the CR Relay Board, and remove the CR Relay Board from the Carriage Unit.

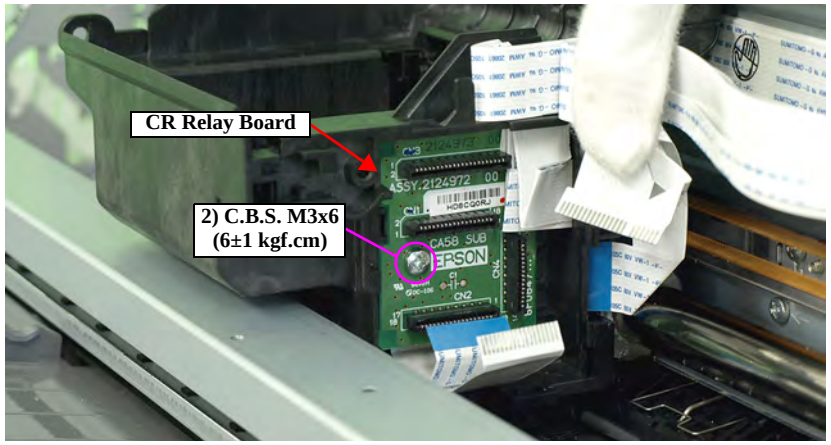


Figure 4-43. Removing the CSIC Assy (3)

10. Release the two hooks; located on both the left side and the right side of the CSIC Assy, and remove the CSIC Assy upward.

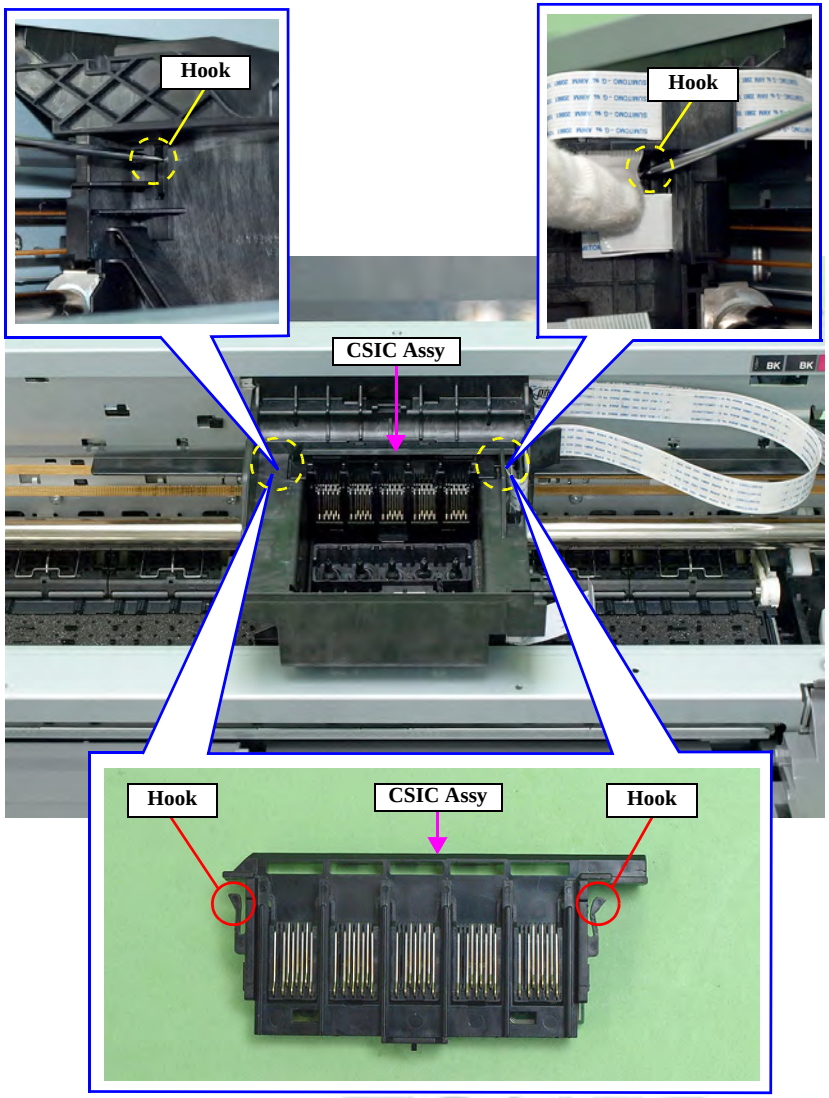


Figure 4-44. Removing the CSIC Assy (4)

11. Disconnect the CSIC FFC from the connector on the CSIC Assy, and remove the CSIC Assy from the Carriage Unit.

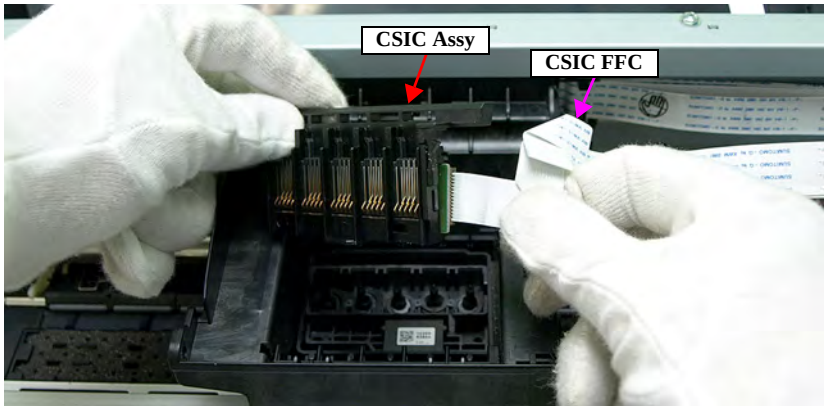


Figure 4-45. Removing the CSIC Assy (5)

12. Remove the three C.B.P. M2.6 x 8 screws that secure the Printhead using the Phillips Screw Driver, No.1, and vertically lift the Printhead to remove it.

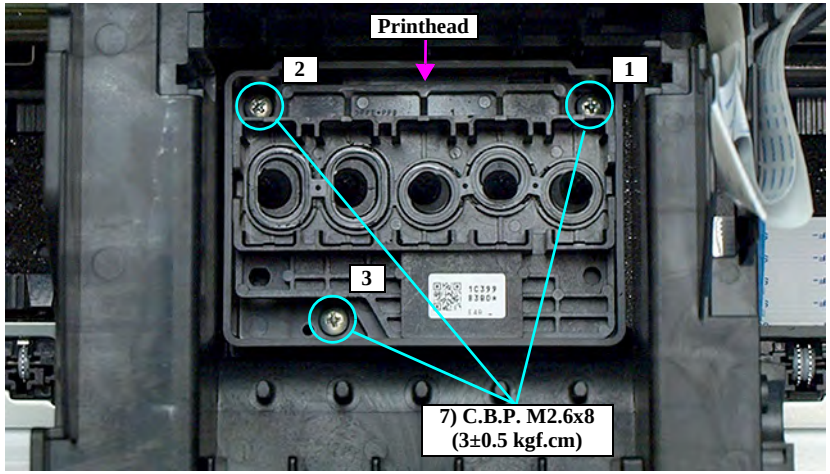


Figure 4-46. Removing the Printhead

13. Peel off the Head FFC from the Printhead.
14. Remove the two Head FFCs from the connectors of the Printhead.

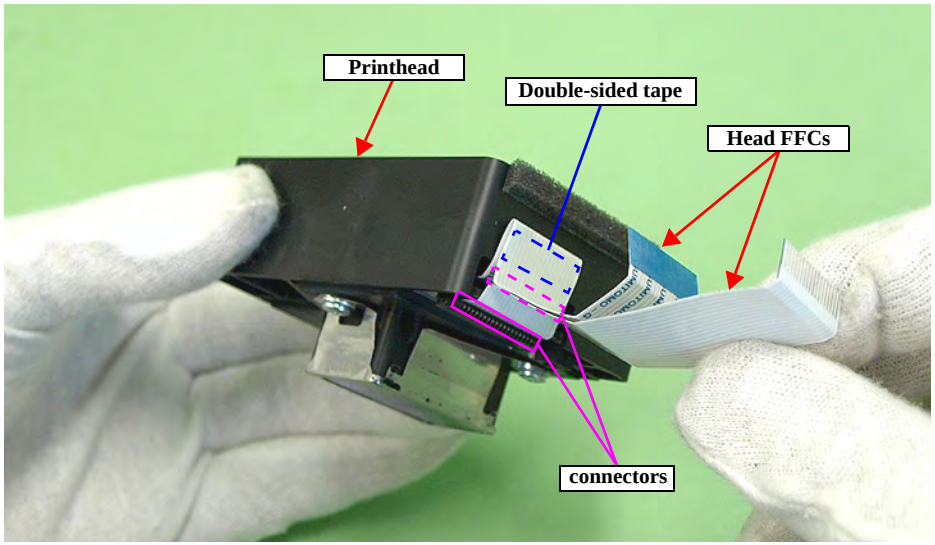


Figure 4-47. Remove the Head FFC

REASSEMBLY

■ **Confirm that the pad is attached at the position in Figure 4-48.**

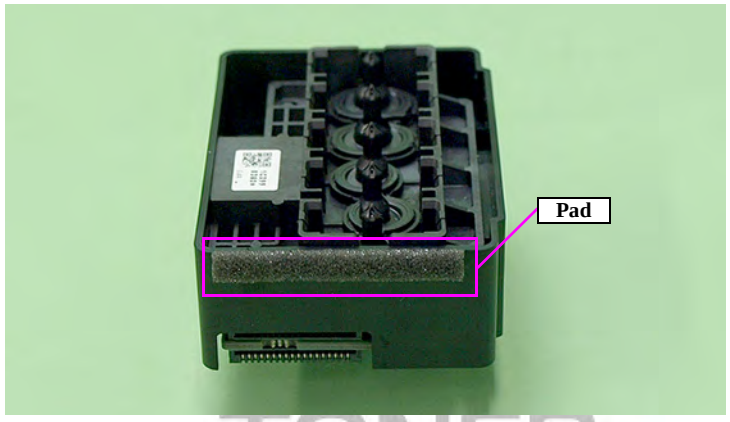
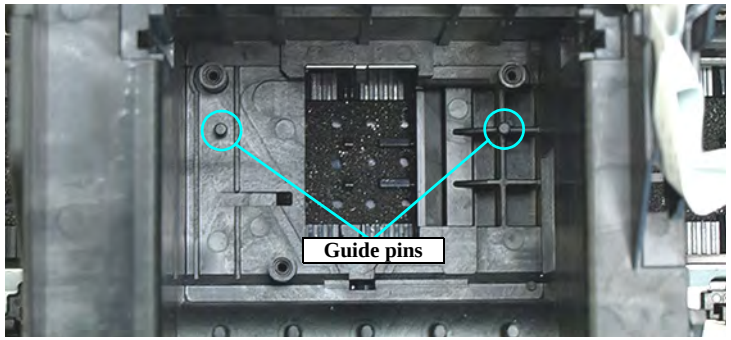


Figure 4-48. Attaching the Pad

REASSEMBLY

■ The Printhead must be installed with its positioning holes aligned with the guide pins of the Carriage Unit.



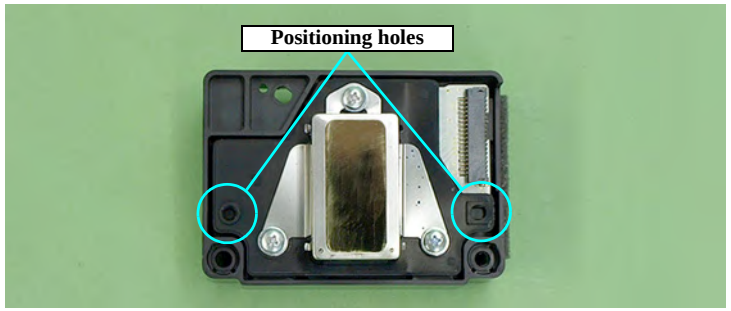


Figure 4-49. Reinstalling the Printhead (1)

■ Route the CSIC FFC through the groove of the Carriage Unit.

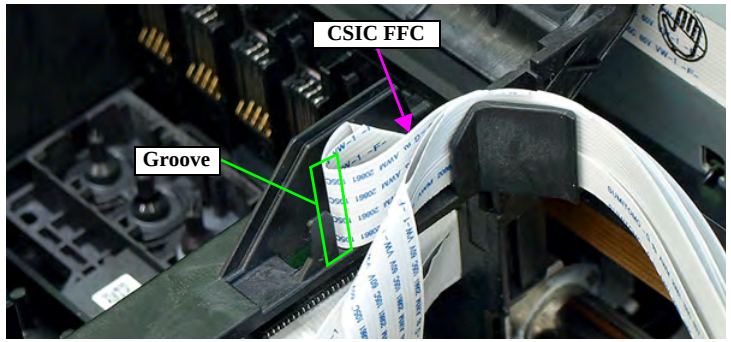


Figure 4-50. Reinstalling the CSIC FFC

REASSEMBLY

■ Tighten the screws in the order shown in Figure 4-46

ADJUSTMENT REQUIRED

After replacing or removing the Printhead, always make the required adjustments referring to the following.

- "Chapter 5 Adjustment *(p.128)*"

4.4.4 Lower Housing / Printer Mechanism

1. *Remove the Upper Housing / Printer Cover. (p.72)*
2. Grip both ends of the Waste Ink Tube Fasteners with your fingers, slide them in the direction of the arrows, and pull out the Waste Ink Tube from the Joint Tube.
3. Remove the C.B.P. M3 x 12 screw and the C.B.S. (P2) M3 x 10 screw that secure the Shield Plate Holder, and remove the Shield Plate Holder.
4. Remove the five screws (four C.B.P. M3 x 10 screws and one C.B.S. (P2) M3 x 10 screw) secure the Printer Mechanism.

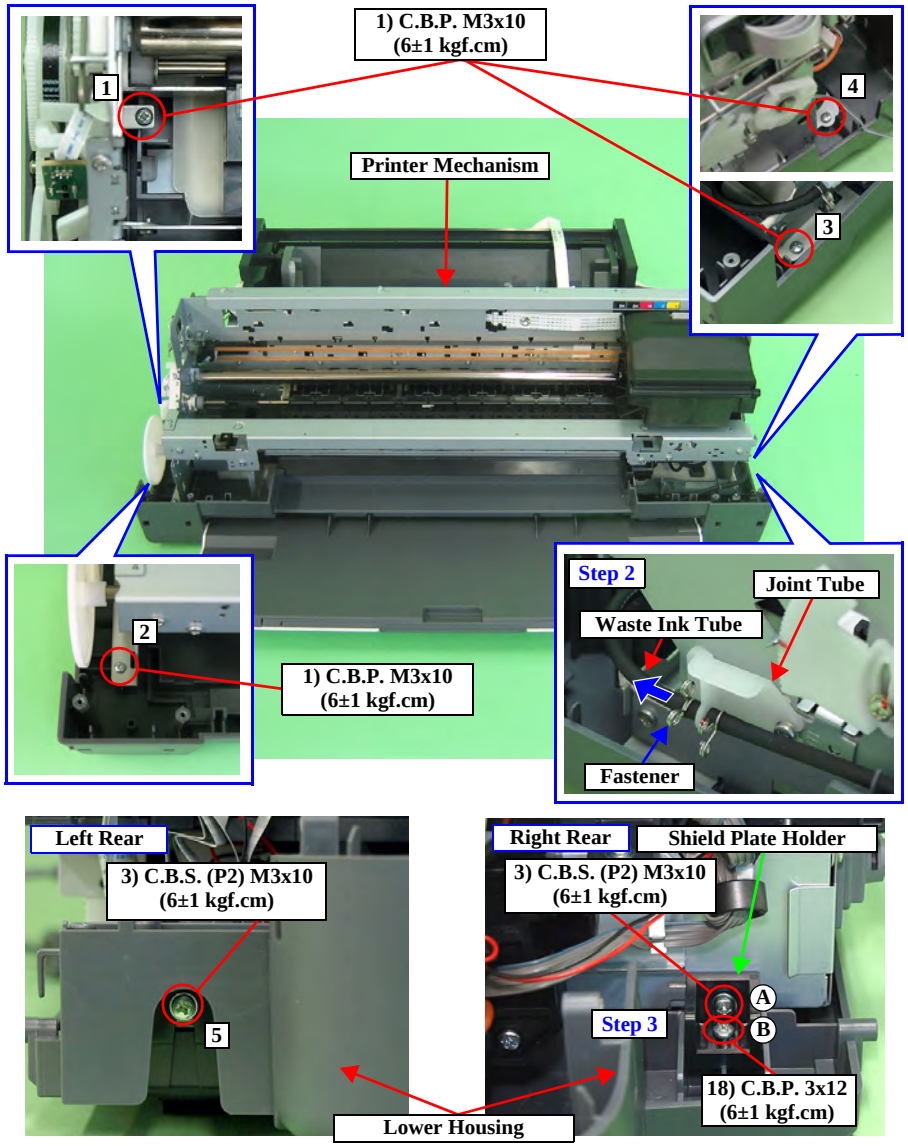


Figure 4-51. Screws that Secure the Printer Mechanism

CAUTION

When performing the following step, make sure to grasp the Printer Mechanism by the specified positions shown below. Otherwise, the frames may become deformed.

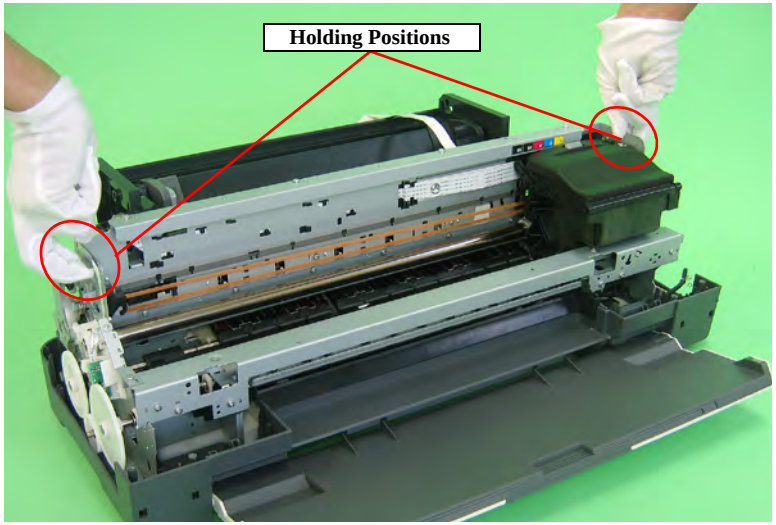


Figure 4-52. Handling the Printer Mechanism

5. Lift the Printer Mechanism grasping it by the holding positions with your hands, and remove it from the Lower Housing.

REASSEMBLY

■ **Install the Printer Mechanism to the Lower Housing as follows. (refer to Figure 4-51)**

1. Align the two guide pins with the positioning holes as shown below.

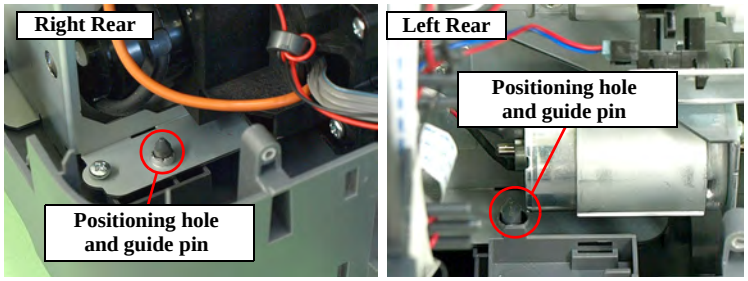


Figure 4-53. Reinstalling the Printer Mechanism

REASSEMBLY

2. Place the Printer Mechanism on the Lower Housing and secure the Shield Plate Holder and the Printer Mechanism with the screw (A).

3. Verify the Printer Mechanism and Lower Housing are tightly engaged (no rattling), and then secure the Shield Plate Holder to the Lower Housing.

4. Secure the Printer Mechanism and Lower Housing with screws (x5). (Tighten the screws in the order shown in Figure 4-51)

5. Secure the electrode cable to the Front Paper Guide with the screw.

■ **Route the Ink Tube and the Waste Ink Tube through the three grooves of the Lower Housing.**

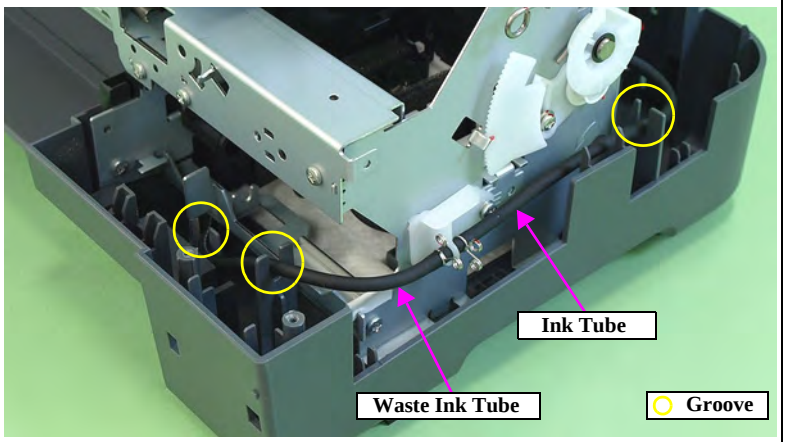


Figure 4-54. Reinstalling the Waste Ink Tube

REASSEMBLY

■ **Attach the Label, Ink Position (parts code: 1510078) at the position in the figure below.**

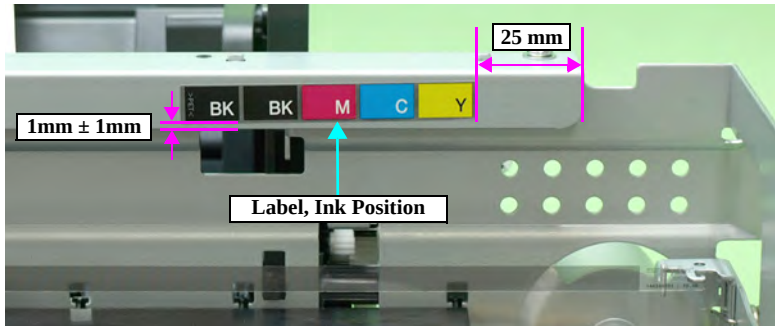


Figure 4-55. Attaching the Label, Ink Position

ADJUSTMENT REQUIRED

After replacing the Printer Mechanism, always make the required adjustments referring to the following.

- **"Chapter 5 Adjustment *(p.128)*"**

4.4.5 Carriage Shaft / Carriage Unit

CHECK POINT

When only removing the Carriage Shaft, you do not need to perform "5.3.2 PG Adjustment (p143)". In that case, mark the position of the rib on the Parallelism Adjust Bushing (Left/Right) before removing them, and make sure to align the markings with the ribs when installing them.

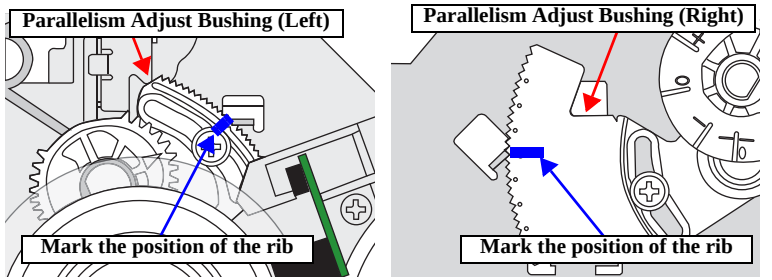


Figure 4-56. Marking Position

1. *Remove the Printhead / CSIC Assy. (p.81)*
2. *Remove the CR Scale. (p.79)*
3. *Remove the APG Assy. (p.78)*
4. Rotate the PG Cam (Right) to adjust its positions other than PG++ downside.

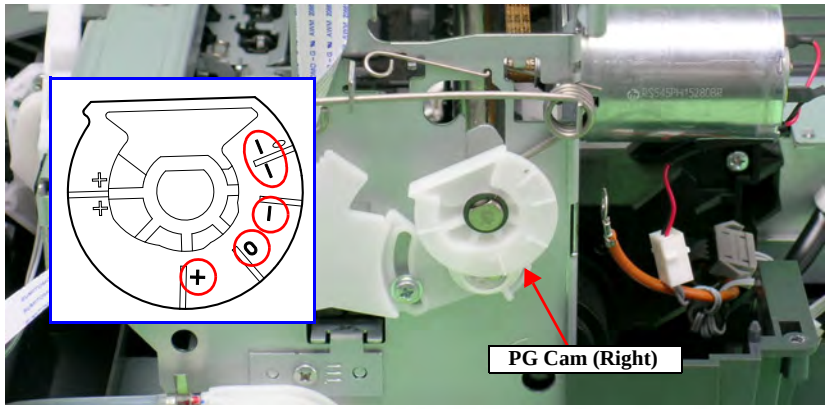


Figure 4-57. Adjusting the PG Cam

5. Remove the two C.B.S. M3 x 6 screws that secure the Frame Support Plate (Left), and remove it.

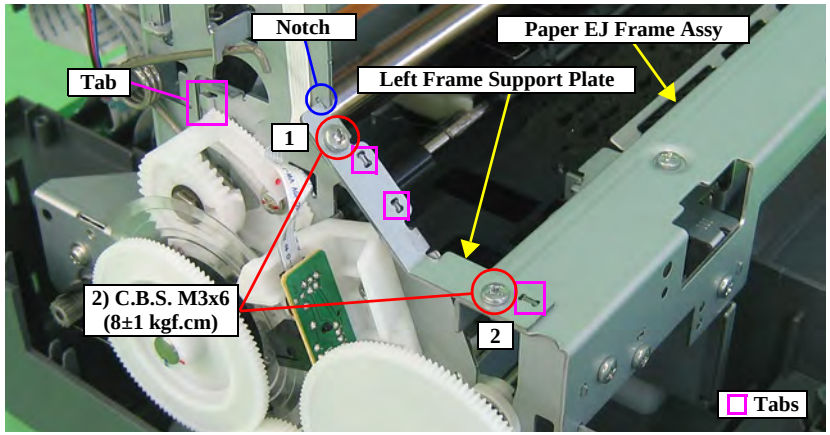


Figure 4-58. Removing the Left Frame Support Plate

REASSEMBLY

- **Insert the Left Frame Support Plate into the notch on the Main Frame. See Figure 4-58 (p.89)**
- **Align the two tabs on the Main Frame and the tab on the Paper EJ Frame Assy with the three positioning holes on the Frame Support Plate (Left). See Figure 4-58 (p.89)**
- **Align the tab (rear side) of the Left CR Shaft Mounting Plate with the outside of the Left CR Shaft Mounting Plate. See Figure 4-58 (p.89)**
- **Tighten the screws in the order shown in Figure 4-58**

6. Remove the foot of Left PG Torsion Spring from tab A, and remove the coil section from tab B to remove Left PG Torsion Spring from the Main Frame.

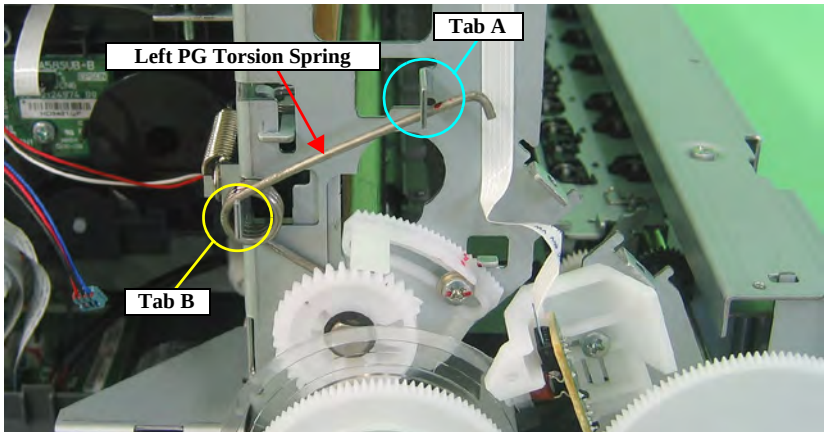


Figure 4-59. Removing the Left PG Torsion Spring

7. Remove the foot of Right PG Torsion Spring from tab A, and remove the coil section from tab B to remove the Right PG Torsion Spring from the Main Frame.

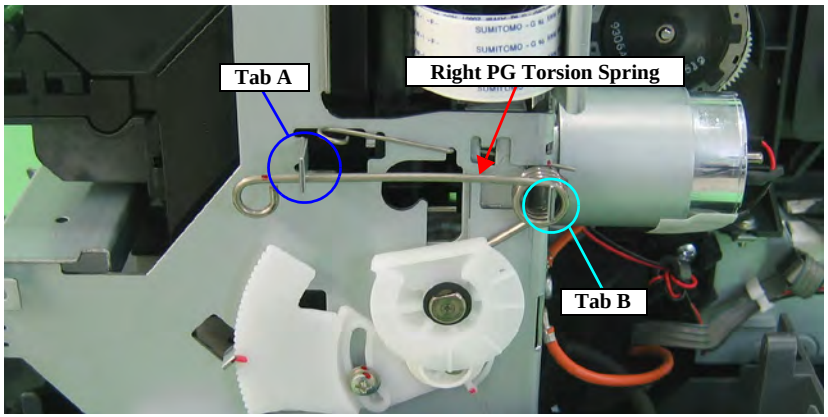


Figure 4-60. Removing the Right PG Torsion Spring

REASSEMBLY

Place the feet of Left PG Torsion Spring and Right PG Torsion Spring on the Carriage Shaft.

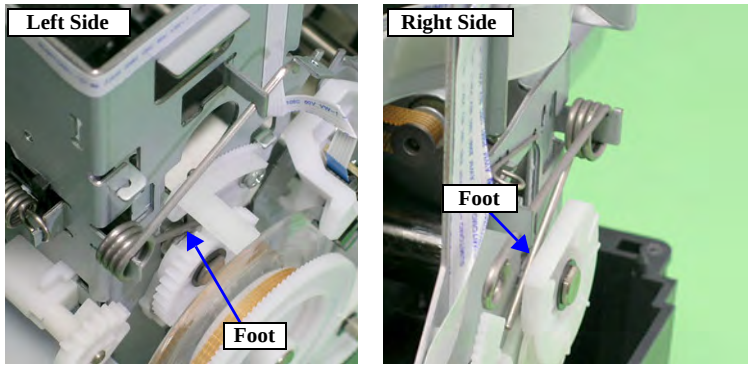


Figure 4-61. Reinstalling PG Torsion Springs

8. Remove CR Shaft Mounting Plate Fixed Spring from the tab and notch on the Main Frame, and pull out the spring in the direction of the arrow.

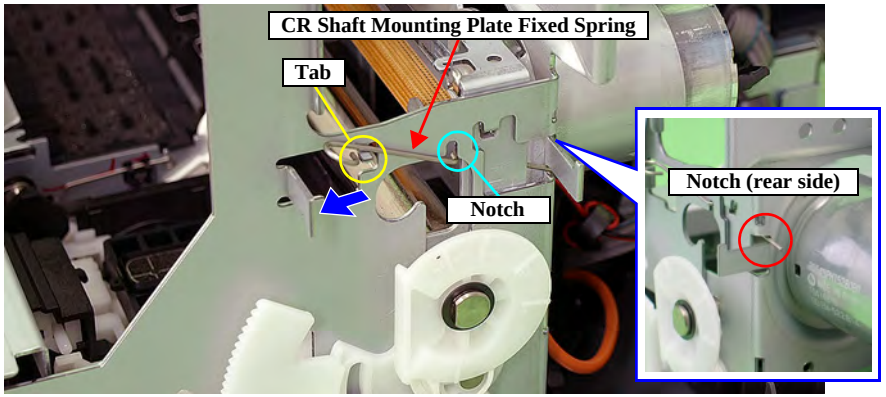


Figure 4-62. Removing CR Shaft Mounting Plate Fixed Spring

REASSEMBLY

Insert the foot of CR Shaft Mounting Plate Fixed Spring into the notch on the Main Frame (rear side). (See Figure 4-62 (p.90))

9. Remove the extension spring for the Driven Pulley Holder from the Main Frame and the tab on the Drive Pulley Holder with needle-nose pliers.

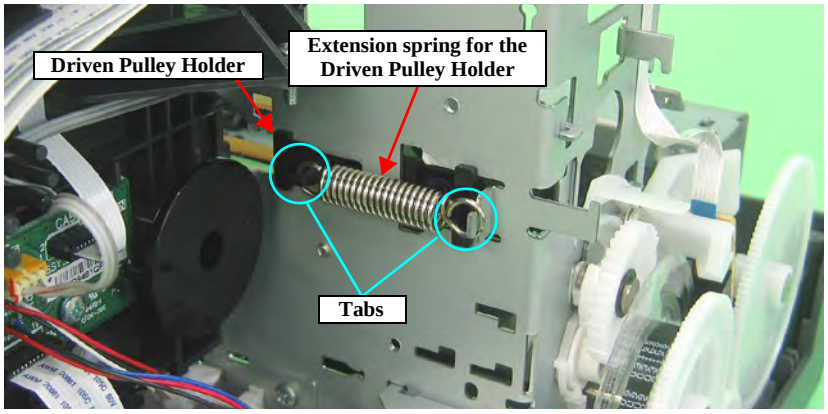


Figure 4-63. Removing the Extension Spring for the Driven Pulley Holder

10. Slide Driven Pulley Holder to the right end of the notch on the Main Frame, and Remove the Driven Pulley Holder toward you.

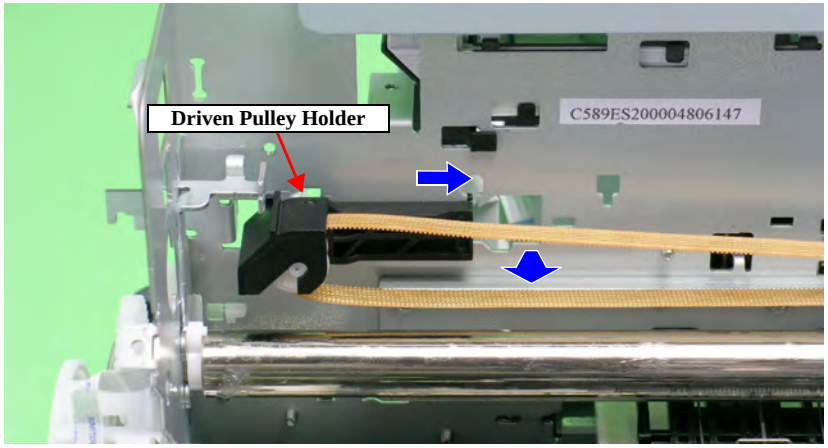


Figure 4-64. Removing the Driven Pulley Holder

11. Remove the CR Drive Belt from the CR Motor Pinion Gear.

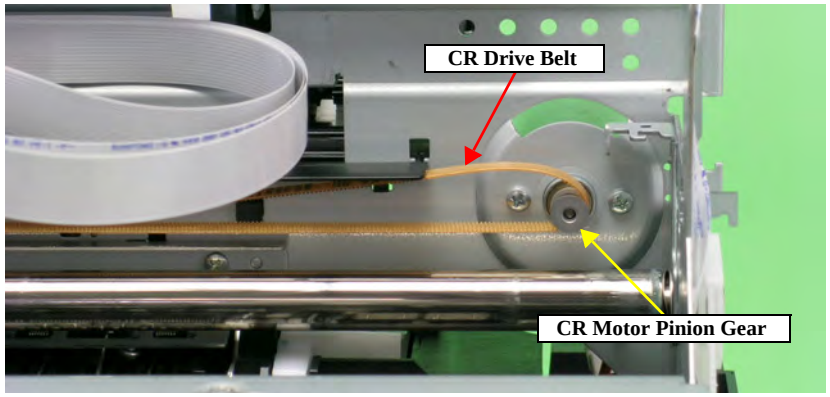


Figure 4-65. Removing the CR Drive Belt

12. Remove the four C.B.S. (P4) M3 x 6 screws that secure the CR Guide Plate, and remove it from the Main Frame.

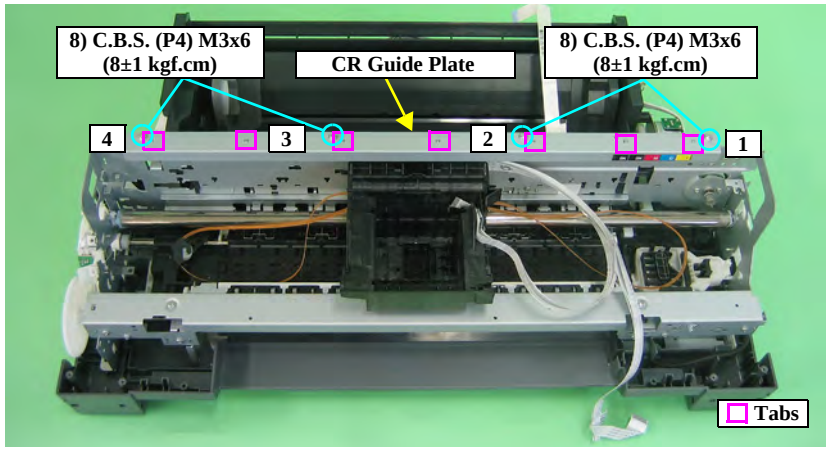


Figure 4-66. Removing the CR Guide Plate

REASSEMBLY

- **Align the positioning holes on the CR Guide Plate with the seven tabs on the Main Frame. See Figure 4-66 (p.91)**
- **Tighten the screws in the order shown in Figure 4-66.**

13. Loosen the C.B.S. (P4) M3 x 8 screw that secures the Left Parallelism Adjust Bushing, and rotate the Bushing toward the front of the Printer Mechanism to prevent interference between the Flag of the Parallelism Adjust Bushing and the Left PG Cam.

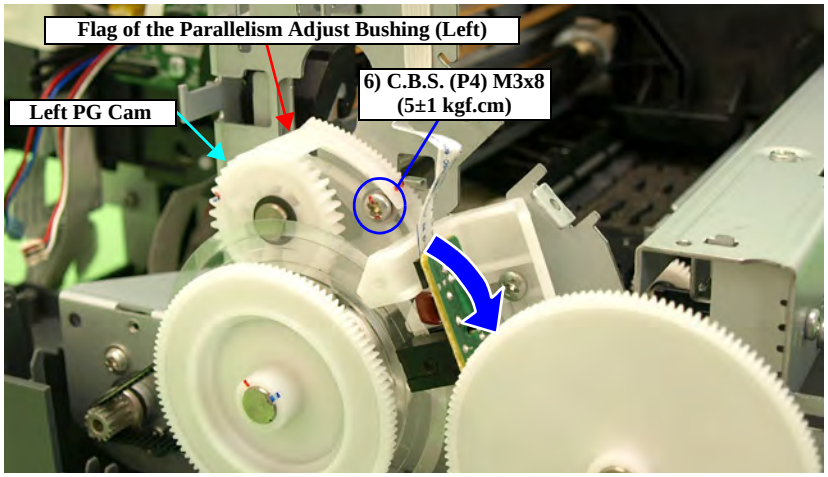


Figure 4-67. Rotating the Left Parallelism Adjust Bushing

14. Slide the Left CR Shaft Mounting Plate upwards, and release the tab on the Left CR Shaft Mounting Plate from the notch on the Main Frame to rotate the Mounting Plate toward you.

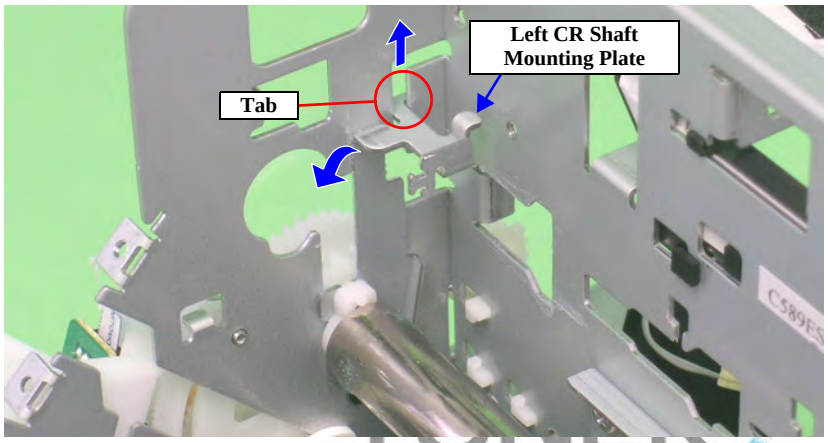


Figure 4-68. Rotating the Left CR Shaft Mounting Plate

15. Lift the Carriage Shaft upwards, and remove the Carriage Shaft Spacer from the Carriage Shaft with tweezers.

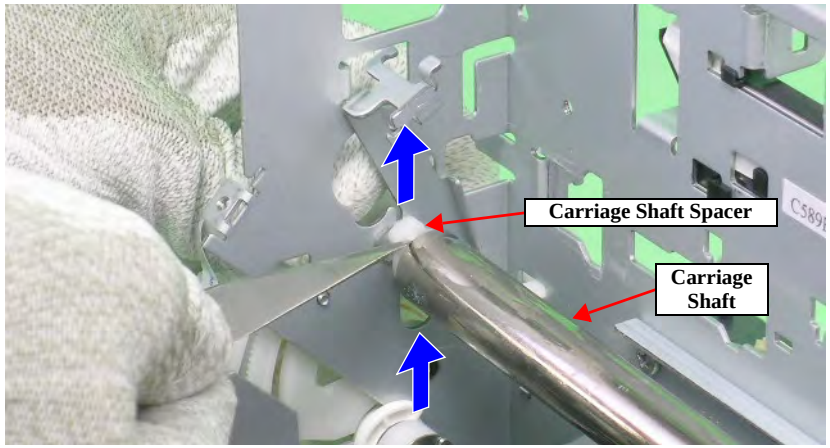


Figure 4-69. Removing the Carriage Shaft Spacer

16. Rotate the Left CR Shaft Mounting Plate toward you to remove the Bushing on the Left CR Shaft Mounting Plate from the Carriage Shaft.

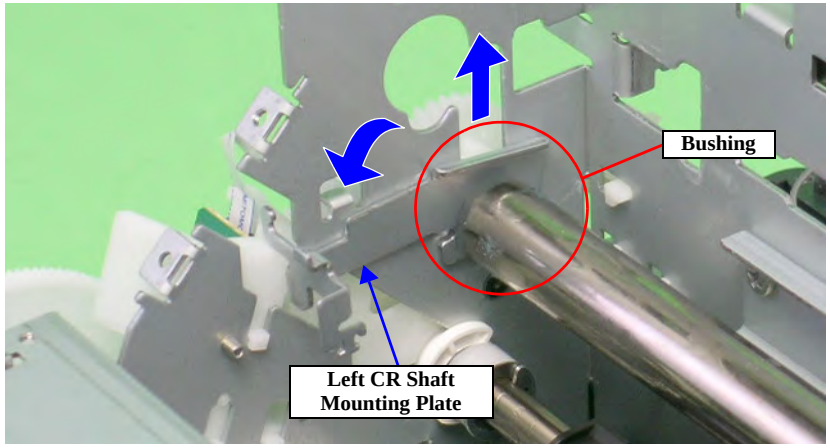


Figure 4-70. Removing the Left CR Shaft Mounting Plate

17. Lift the Carriage Shaft within the hole on the Main Frame, and remove the Spacer and Left PG Cam from the Carriage Shaft.

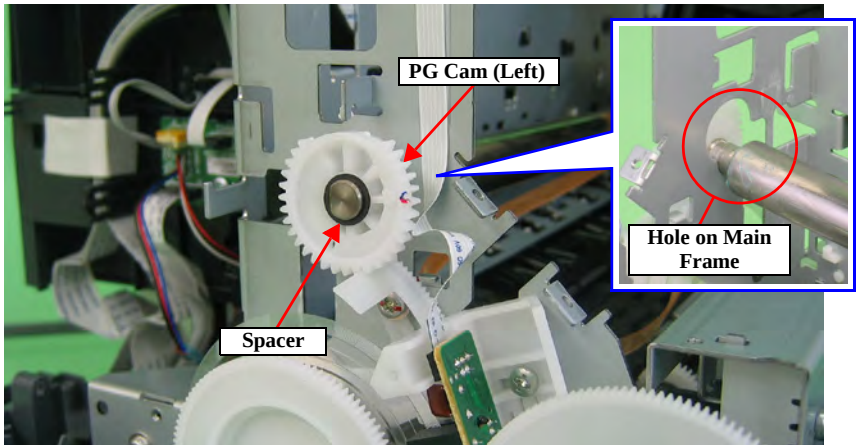


Figure 4-71. Removing Left PG Cam

18. Remove the Spacer and Right PG Cam from the Carriage Shaft.

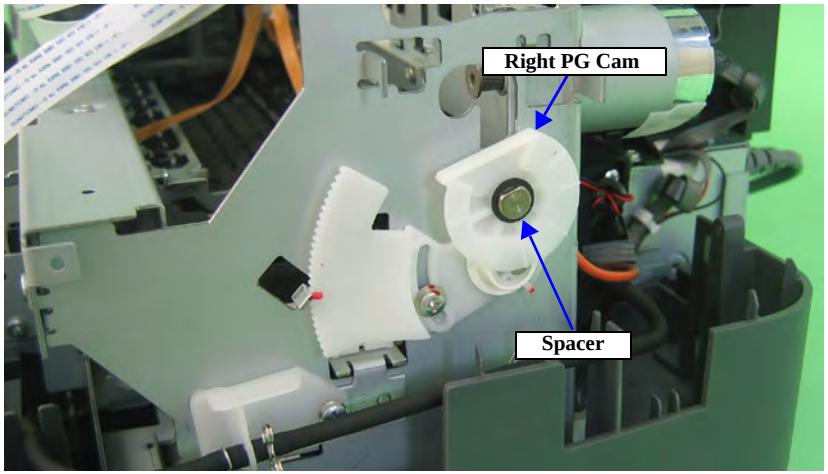


Figure 4-72. Removing Right PG Cam

REASSEMBLY

Install the Right PG Cam so that one of these positions marked "0", "+" or "++" faces downward.

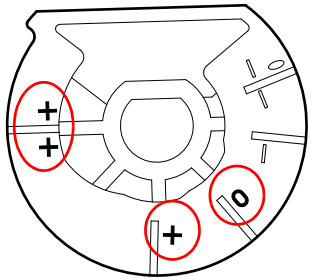


Figure 4-73. Right PG Cam Installation Direction

19. Pull the Right CR Shaft Mounting Plate away from the tab on the Main Frame and rotate toward you.

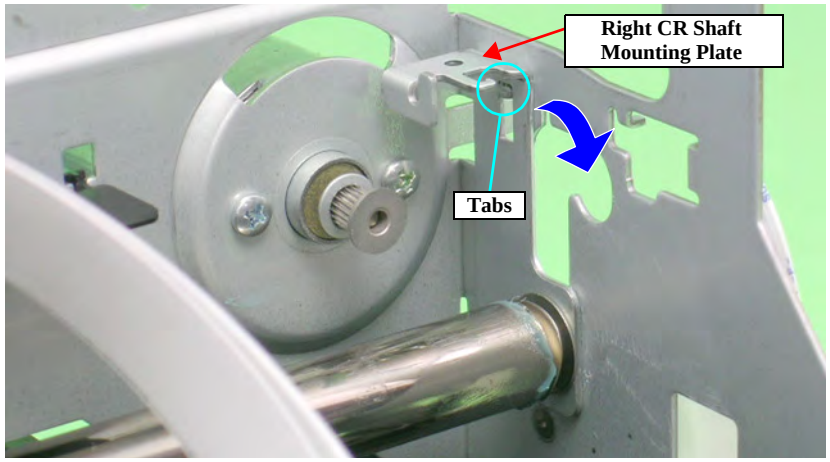


Figure 4-74. Rotating the Right CR Shaft Mounting Plate

CAUTION

When performing the following procedure, take care not to scratch the Carriage Shaft.

20. Slide the Carriage Unit to the left side to prevent the CR Scale Cover from interfering with the rear of the Carriage Unit, slide the Carriage Shaft to the left side and pull out its right end from the Main Frame, and pull out the Carriage Shaft from the Main Frame and Carriage Unit.

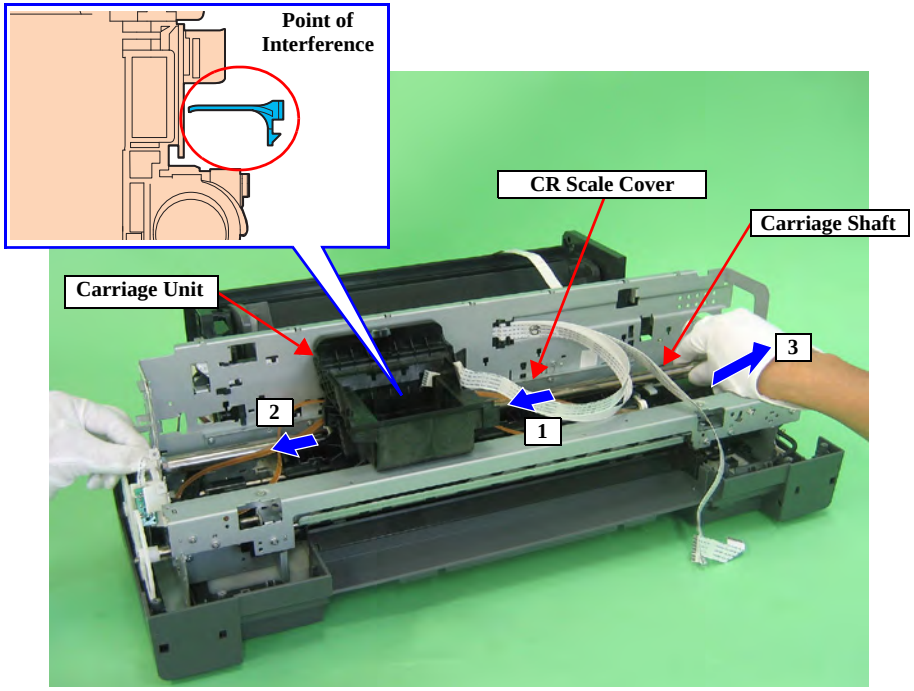


Figure 4-75. Removing the Carriage Shaft

REASSEMBLY

- **Set the longer end of the Carriage Shaft to the left side.**
- **When the Carriage Shaft is removed, the Plain spring and Leaf spring that are attached to the right end of the Carriage Shaft may drop off. In such case, be sure to attach them in the order as shown in the figure below.**

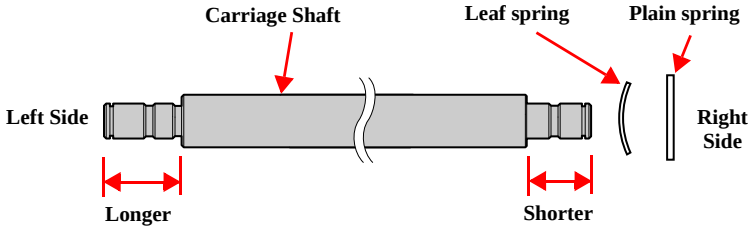


Figure 4-76. Reinstalling the Carriage Shaft

21. Insert the flathead screwdriver and such to the two holes of the Carriage Unit, and release the two tabs of the Ink Guide from the two hooks of the Carriage Unit, and then remove the Ink Guide upward.

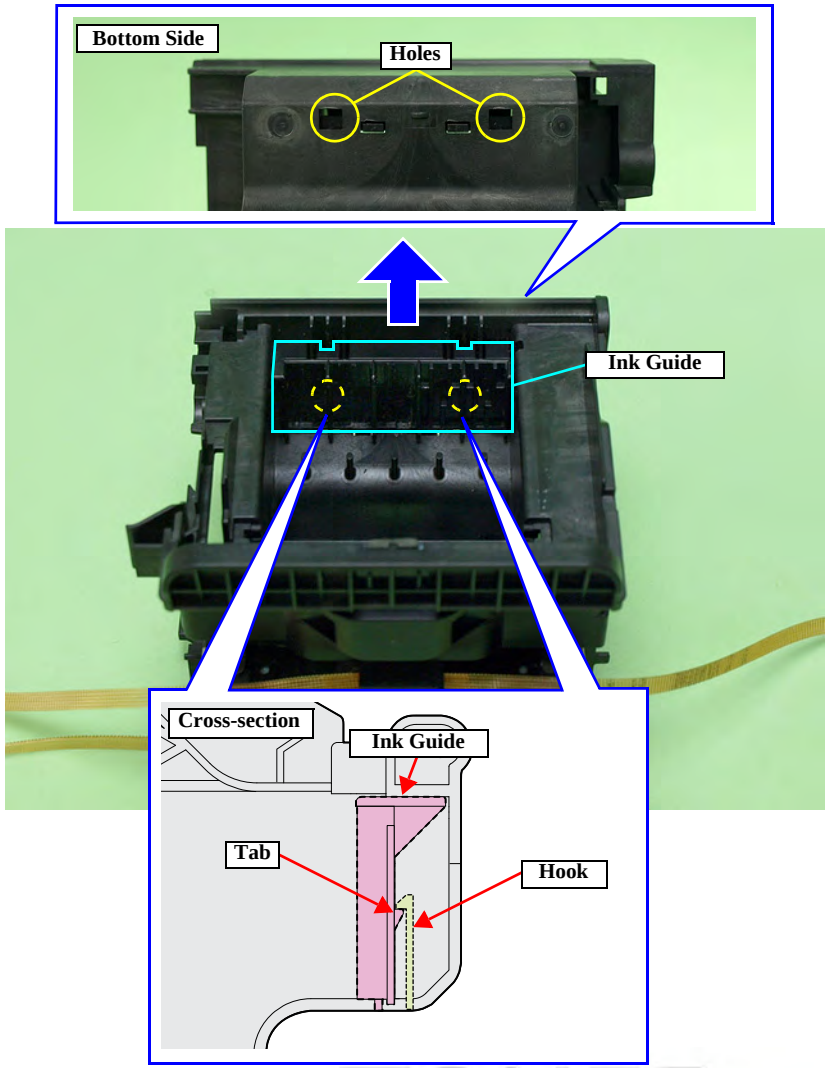


Figure 4-77. Removing the Ink Guide

22. Turn the Belt Holder Mounting Plate in the direction of the arrow, and remove it from the Carriage Unit.

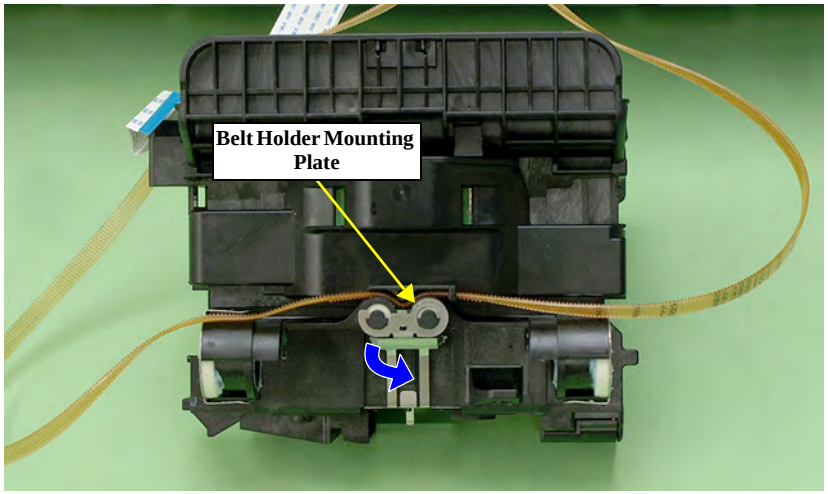


Figure 4-78. Removing the Belt Holder Mounting Plate

23. Remove the Belt Holder from the Carriage unit.

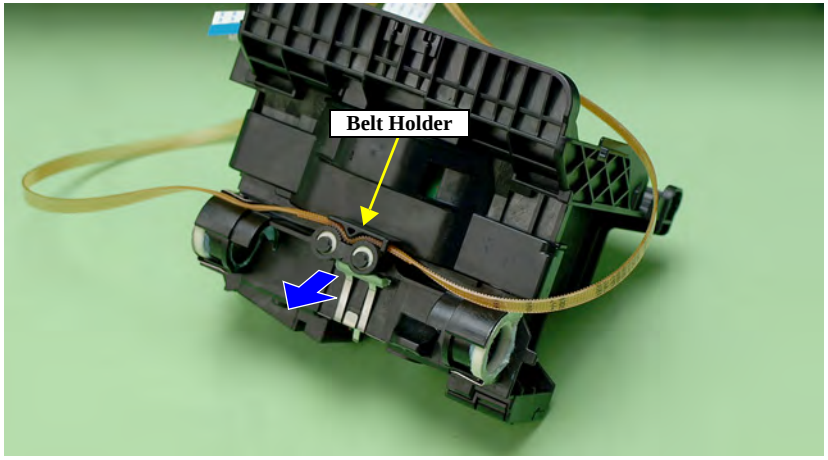


Figure 4-79. Removing the Belt Holder

24. Release the CR Encoder Board Holder from the three Tabs to remove it from the Carriage Unit.

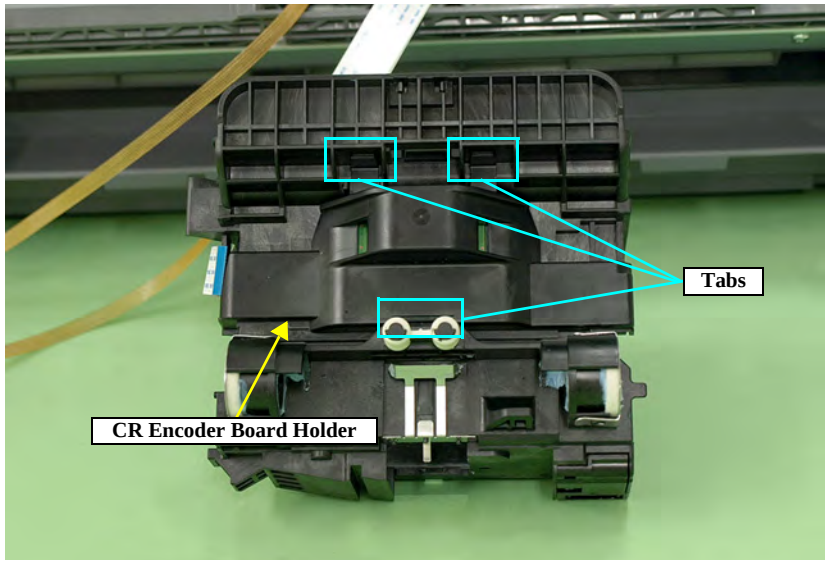


Figure 4-80. Removing the Belt Holder

25. Disconnect the Sensor FFC from the connector on the CR Encoder Board, pull out the Sensor FFC from the Carriage Unit, and remove the Carriage Unit.

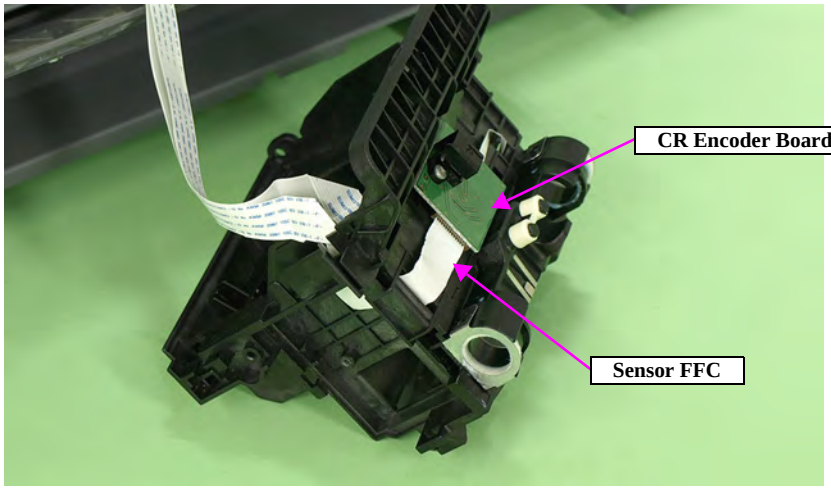


Figure 4-81. Removing the Carriage Unit

ADJUSTMENT REQUIRED

After replacing or removing the Carriage Shaft and Carriage Unit, always make the required adjustments referring to the following.

- **"Chapter 5 Adjustment *(p.128)*"**

ADJUSTMENT REQUIRED

After replacing or removing the Carriage Shaft and Carriage Unit, be sure to perform the required lubrication referring to below.

- **"Chapter 6 Maintenance *(p.152)*"**

4.4.6 ASF Assy

1. *Remove the Upper Housing Support Assy. (p.74)*
2. Remove the C.B.S. M3 x 8 screw that secures the Earth cables on the right rear side of the printer, and remove the Earth cables.
3. Disconnect the ASF Motor connector from the Relay connector.
4. Disconnect the Relay connector cable from the ASF Assy.

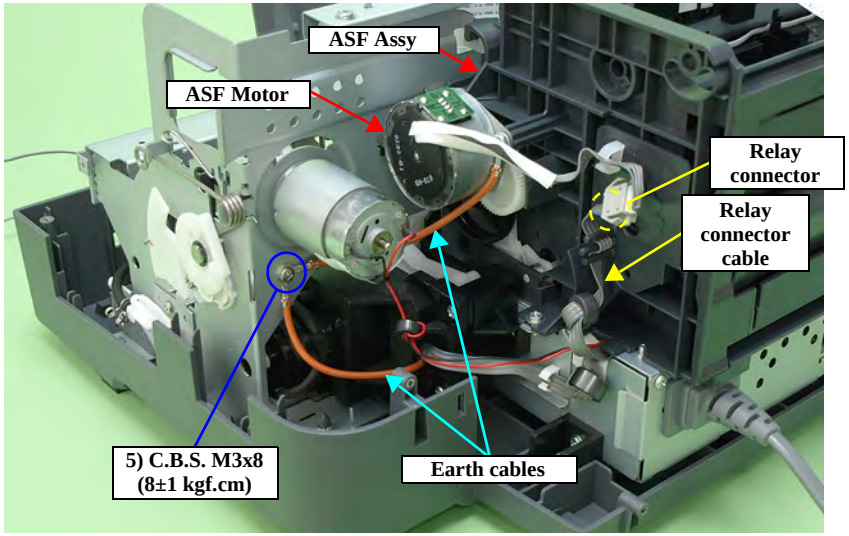


Figure 4-82. Releasing the Cables (1)

REASSEMBLY

- **Secure the two Earth cables together with the screw.**
- **Referring to Figure 4-82, correctly route the Relay connector cable.**

5. Disconnect all the cables and the FFCs from the connectors on the Relay Board.
   - CN1 : Relay FFC
   - CN2 : PE Sensor cable
   - CN6 : PF Encoder Sensor FFC
6. Peel off the acetate tape, and disconnect all the FFCs from the connectors on the Main Board, and release it from the groove on the ASF Assy.
7. Remove the APG Motor cable and PE Sensor cable from the ASF Assy.
8. Peel off the PF Encoder FFC secured by two pieces of double-sided adhesive tape from the ASF Assy.

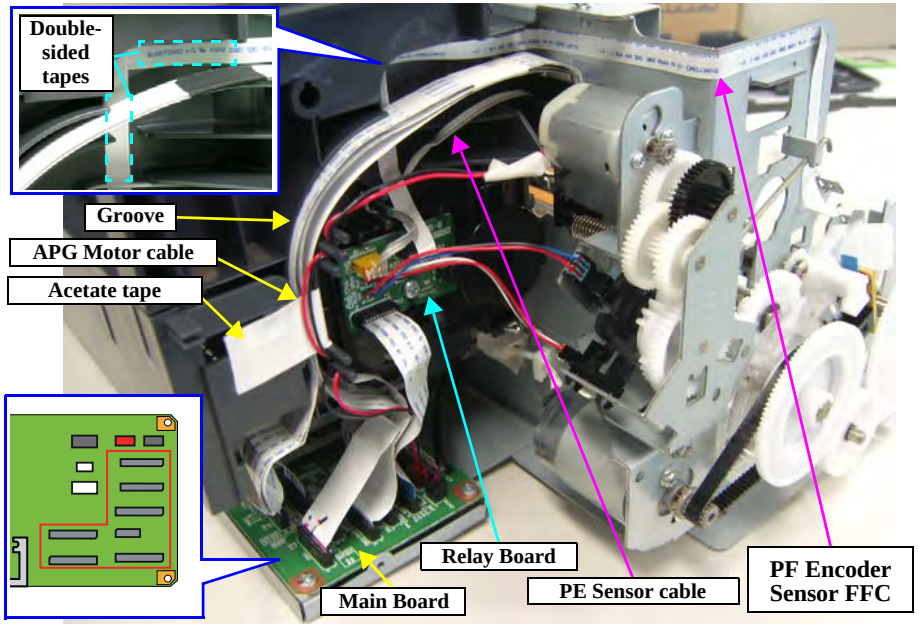


Figure 4-83. Releasing the Cables (2)

REASSEMBLY

Referring to Figure 4-83, correctly route each of the cables and FFCs.

CHECK POINT

When only removing the ASF Assy, you do not need to perform "5.3.5 ASF Guide Roller LDs Position Adjustment (p150)". In that case, mark the installing positions of the Guide Roller LDs before removing them, and make sure to align the markings when installing the Guide Roller LDs.

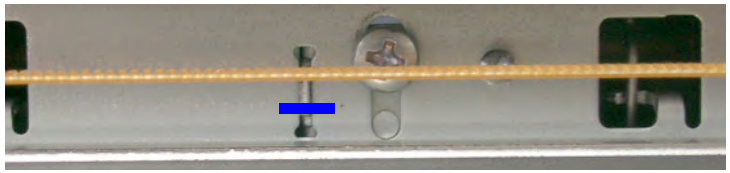


Figure 4-84. Marking Position

9. Remove the two C.B. M3 x 6 screws that secure the two Guide Roller LDs.
10. Gently pull the LD Roller Shaft to the rear of the printer, and remove the Guide Roller LDs.

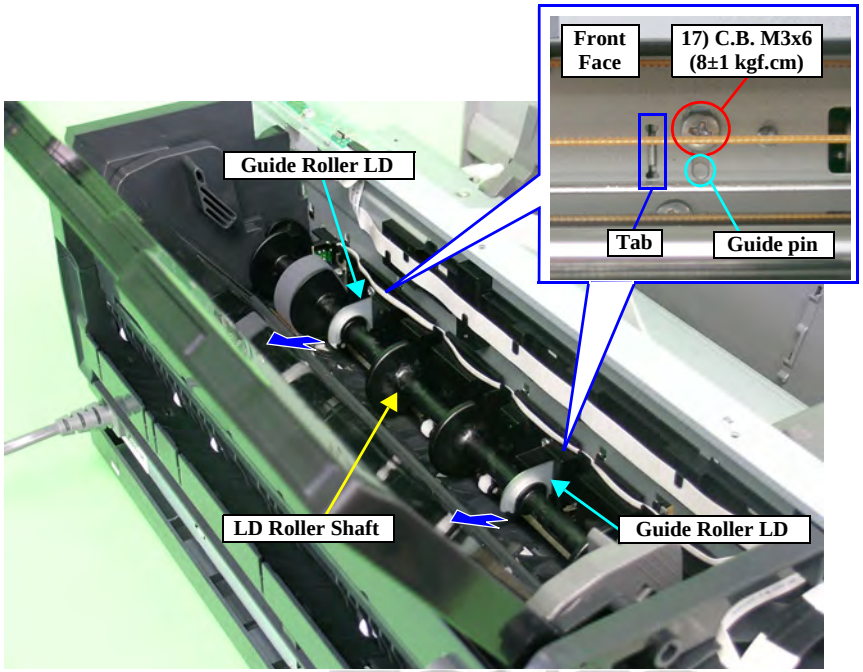


Figure 4-85. Removing the Guide Roller LD

REASSEMBLY

Align the guide pins and tabs on the Guide Roller LDs with the positioning holes on the Main Frame. (Refer to Figure 4-85.)

11. Remove the three C.B.S. (P4) M3 x 8 screws that secure the ASF Assy, and remove the ASF Assy from the Printer Mechanism.

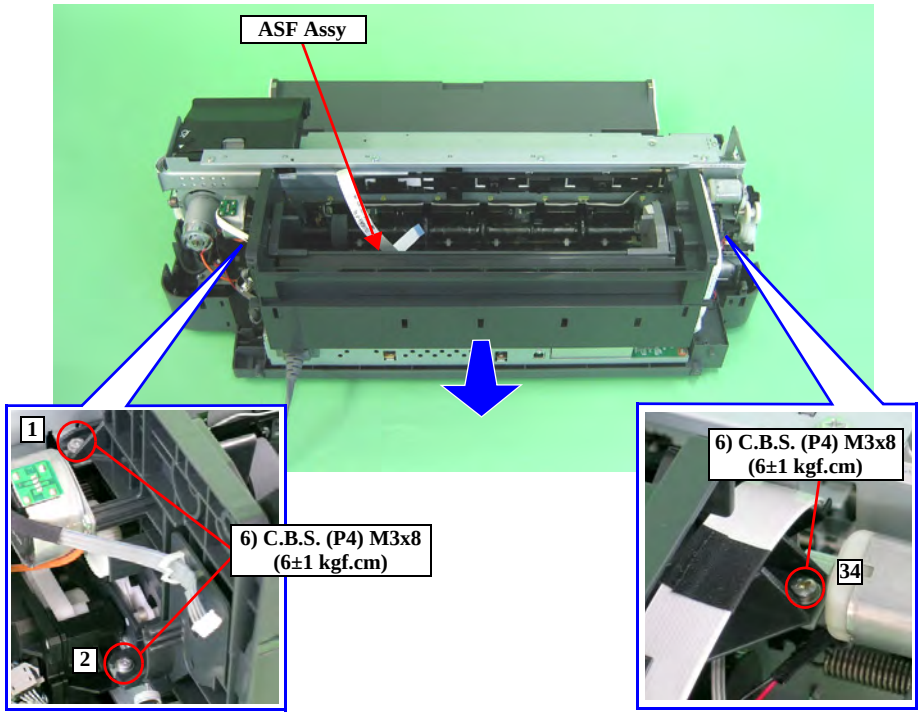


Figure 4-86. Removing the ASF Assy

REASSEMBLY

- **Align the guide pin and four Tabs on the ASF Assy with the positioning holes on the Main Frame so that there is no gap between the ASF Assy and the Main Frame.**

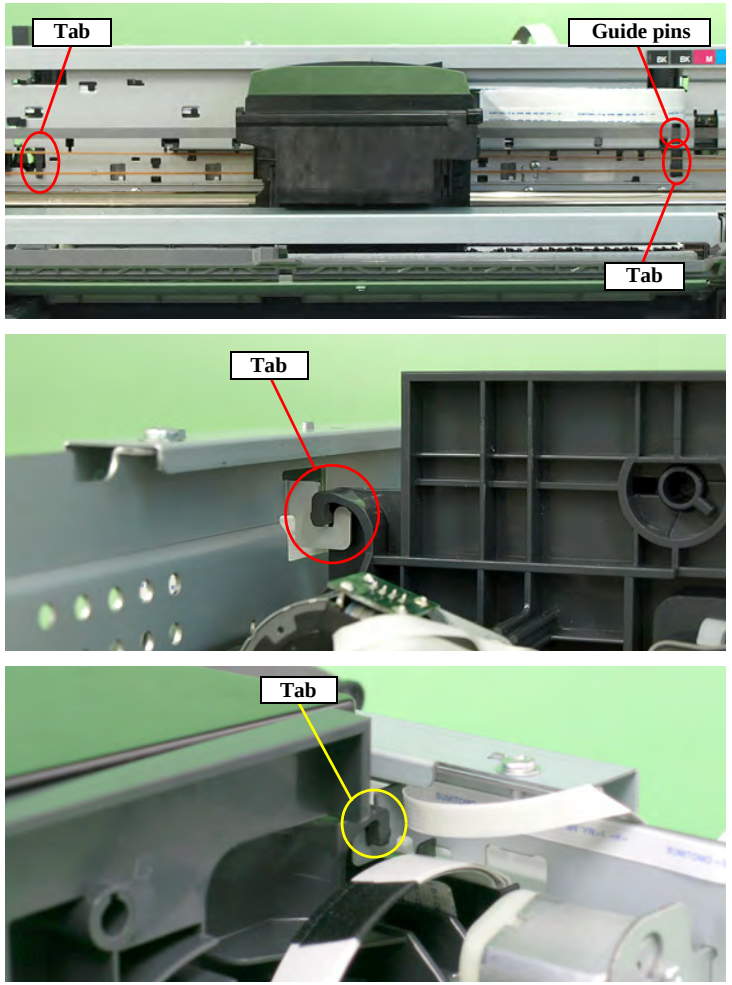


Figure 4-87. Reinstalling the ASF Assy

- **Tighten the screws in the order shown in Figure 4-86.**

ADJUSTMENT REQUIRED

After replacing or removing the ASF Assy, always make the required adjustments referring to the following.

- **"Chapter 5 Adjustment *(p.128)*"**

4.4.7 LD Roller

CHECK POINT

When replacing the LD Roller, replace the Retard Roller Assy together with the LD Roller. *(Refer to 4.4.8 Retard Roller Assy (p.101).)*

1. *Remove the ASF Assy. (p.96)*
2. *Remove the ASF Motor. (p.123)*
3. Remove the Combination Gear 29,11 from the ASF Assy.
4. Release the tab that secure the LD Spur Gear, and remove the LD Spur Gear from the LD Roller Shaft.

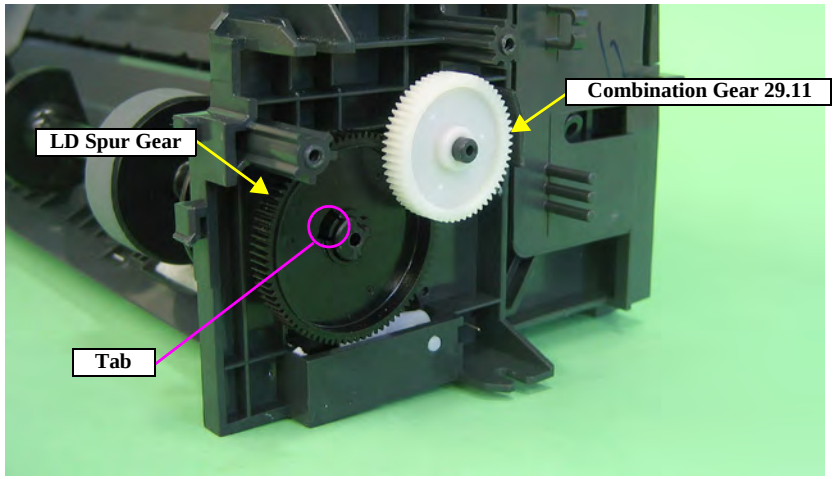


Figure 4-88. Removing the LD Roller (1)

5. Release the two tabs that secure the ASF Sensor Flag from the inside of the ASF Assy, and remove the ASF Sensor Flag from the LD Roller Shaft.

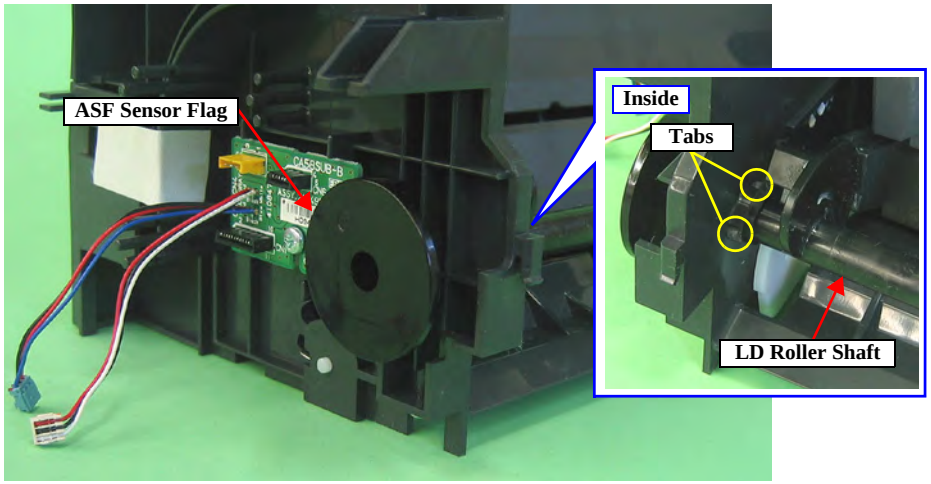


Figure 4-89. Removing the LD Roller (2)

6. Remove the C.B.P. M3 x 8 screw that secure the ASF Support Plate from the bottom side of the ASF Assy, and remove the ASF Support Plate from the ASF Assy.

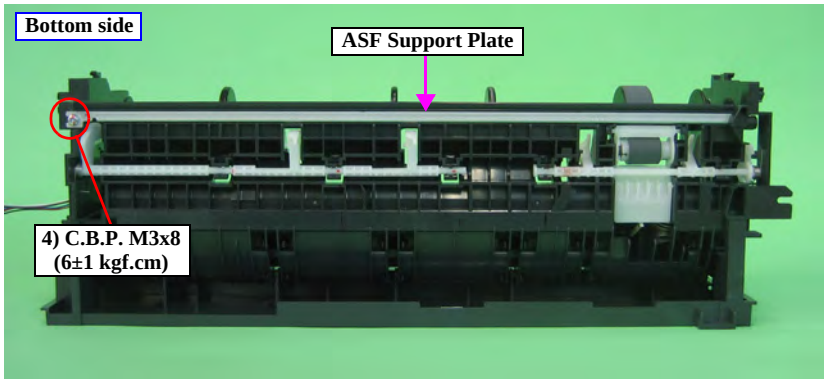


Figure 4-90. Removing the LD Roller (3)

7. While bending the LD Roller Shaft slightly, detach it from the shaft hole on the left side of the ASF Assy, and remove the LD Roller Shaft.
8. Remove the LD Roller from the LD Roller Shaft.

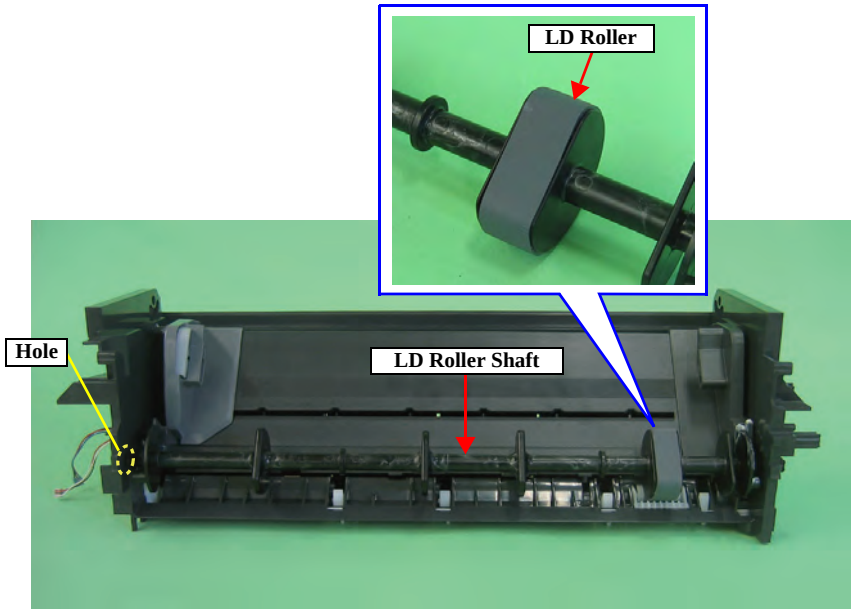


Figure 4-91. Removing the LD Roller (4)

REASSEMBLY

- **Make sure to install the LD Roller with the triangular groove marked inside as shown below.**

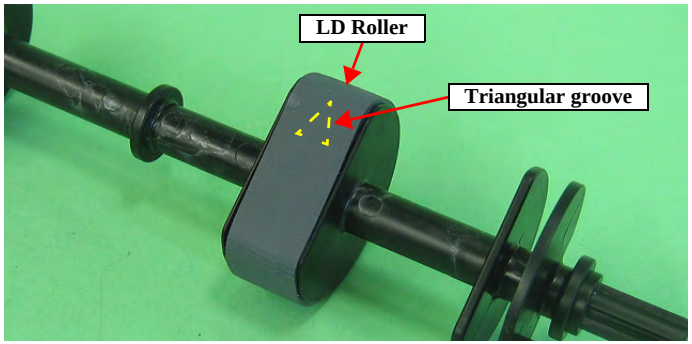


Figure 4-92. Reinstalling the LD Roller

- **Align the phases of the ASF Sensor Flag and LD Roller Shaft as shown below.**

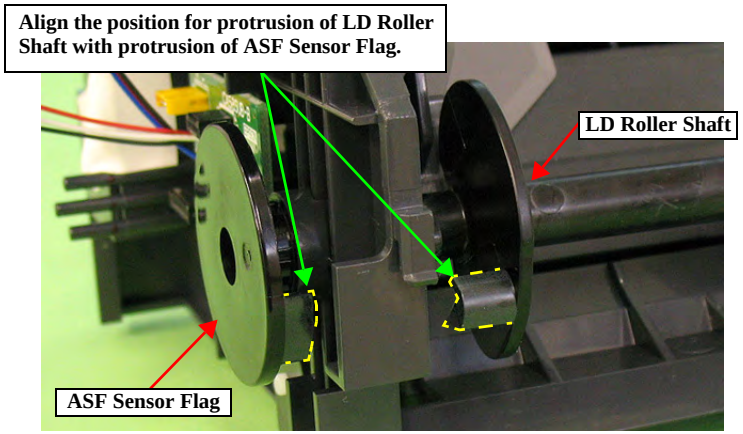


Figure 4-93. Reinstalling the ASF Sensor Flag

ADJUSTMENT REQUIRED

After replacing the following parts, be sure to apply G-26 and G-75 grease to the area specified for each part.

- **ASF Frame:See Figure 6-15 on page 159.**
- **LD Roller Shaft: See Figure 6-16 on page 159.**
- **Hopper: See Figure 6-17 on page 159.**

4.4.8 Retard Roller Assy

CHECK POINT

When replacing the Retard Roller Assy, replace the LD Roller together with the Retard Roller Assy. *(Refer to 4.4.7 LD Roller (p.99).)*

1. *Remove the ASF Assy. (p.96)*
2. Release the Paper Back Lever Right from the two grooves of the ASF Assy.
3. Release the shaft end of the Paper Back Lever Right, and remove the Paper Back Lever Right and the torsion spring from the ASF Assy.

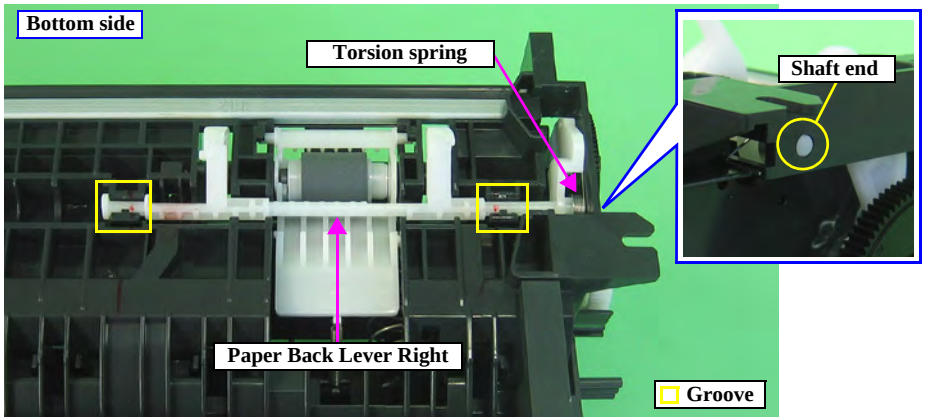


Figure 4-94. Removing the Retard Roller Assy (1)

4. Detach the extension spring from the tab of the Retard Roller Assy, and remove the Retard Roller Assy from the ASF Assy.

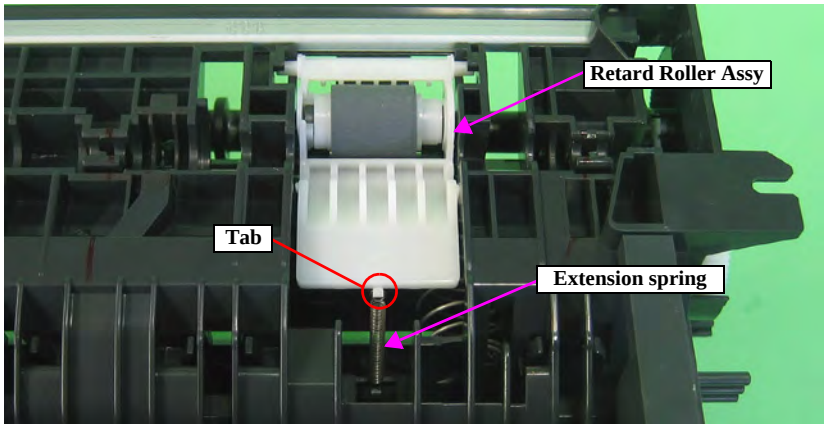


Figure 4-95. Removing the Retard Roller Assy (2)

REASSEMBLY

■ **Insert the two shafts of the Retard Roller Assy to the two holes of the ASF Assy.**

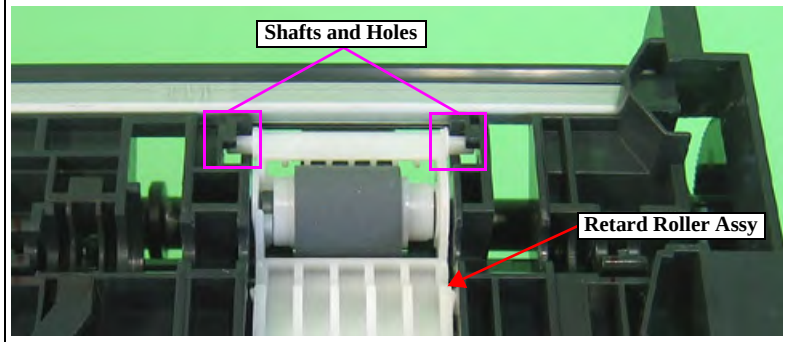


Figure 4-96. Reinstalling the Retard Roller Assy

REASSEMBLY

■ **See below for installing the torsion spring of the Paper Back Lever Right.**

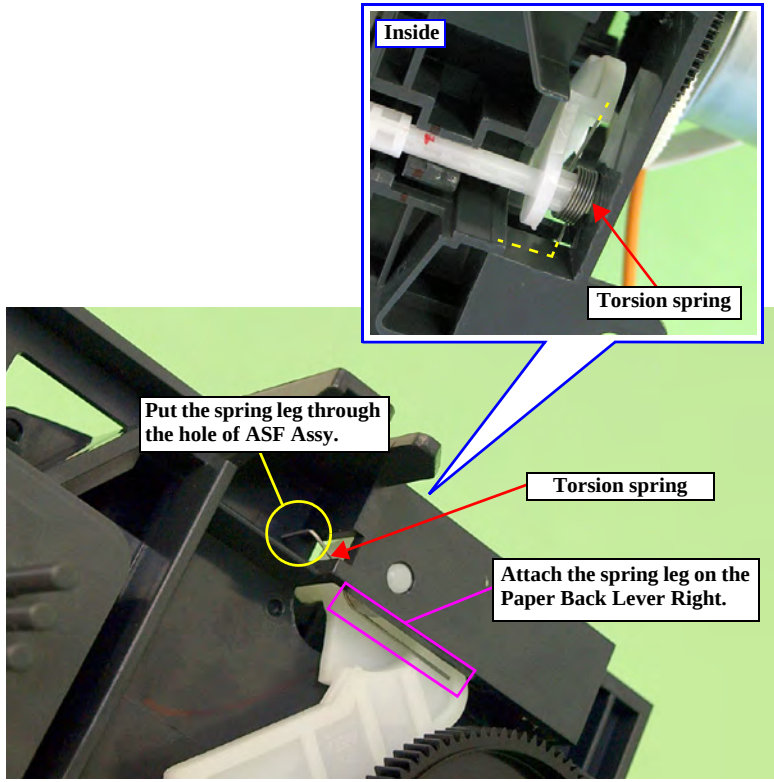


Figure 4-97. Reinstalling the Torsion Spring

4.4.9 Front Paper Guide Pad

1. Remove the Printer Mechanism. *(Refer to 4.4.4 Lower Housing / Printer Mechanism (p.86).)*
2. Remove the Front Paper Guide Pads from the Front Paper Guide with tweezers.

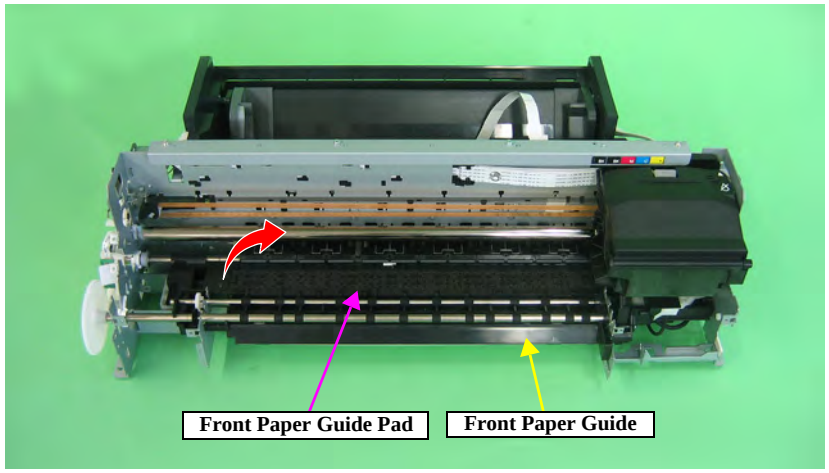


Figure 4-98. Removing the Front Paper Guide Pad

CAUTION

Take care to prevent the grease contained on the Front Paper Guide Pads from sticking to other parts.

REASSEMBLY

After installing the Front Paper Guide Pads, lift the Printer Mechanism, and check the following points.

1. **Make sure that the tabs on the Pads are not cut midway.**
2. **Make sure that all tabs are in place on the Front Paper Guide, and that they are facing down (towards the Waste Ink Pads) without any folds.**
3. **Make sure that the tab foldbacks are protruding completely from the Front Paper Guide.**

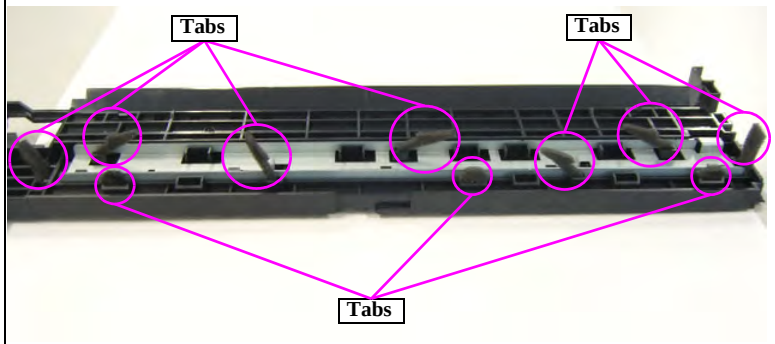


Figure 4-99. Reinstalling the Front Paper Guide Pad (1)

4. **Make sure that the pad is placed under a tab of the Front Paper Guide.**

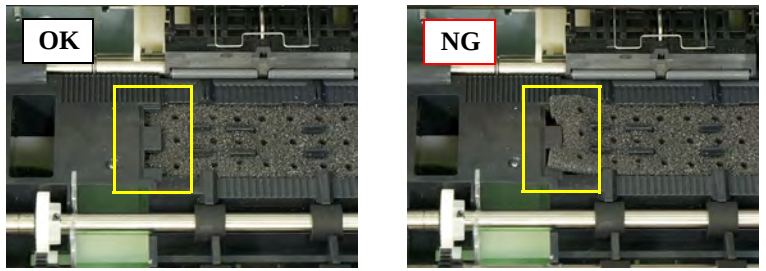


Figure 4-100. Reinstalling the Front Paper Guide Pad (2)

5. **Make sure that all the tabs on the pads are fitted into the securing section under the Front Paper Guide.**

4.4.10 Waste Ink Pad / Waste Ink Tray Assy

1. Remove the Printer Mechanism. *(Refer to 4.4.4 Lower Housing / Printer Mechanism (p.86).)*
2. Peel off the Pad Stopper Sheet from the Lower Housing.
3. Remove the four Waste Ink Pads from the sections indicated with A to D of the Lower Housing.

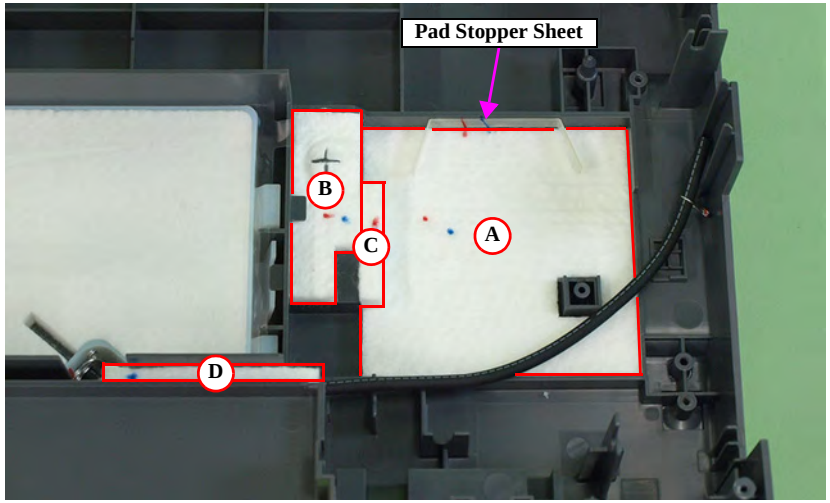


Figure 4-101. Removing the Waste Ink Pad

REASSEMBLY

- **Attach the Pad Stopper Sheet as shown below.**

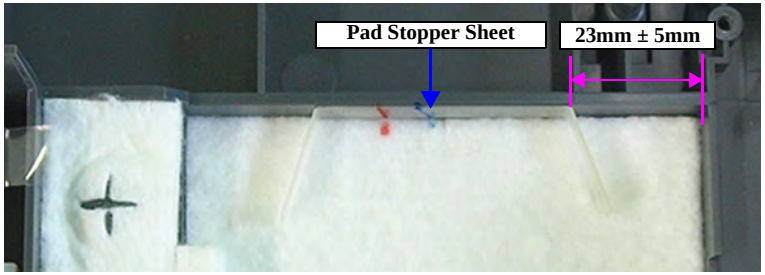


Figure 4-102. Reinstalling the Pad Stopper Sheet

- **Referring to Figure 4-101, correctly attach the four Waste Ink Pads.**

4. Release the tab that secure the Waste Ink Tray Assy, and remove the Waste Ink Tray Assy from the Lower Housing.

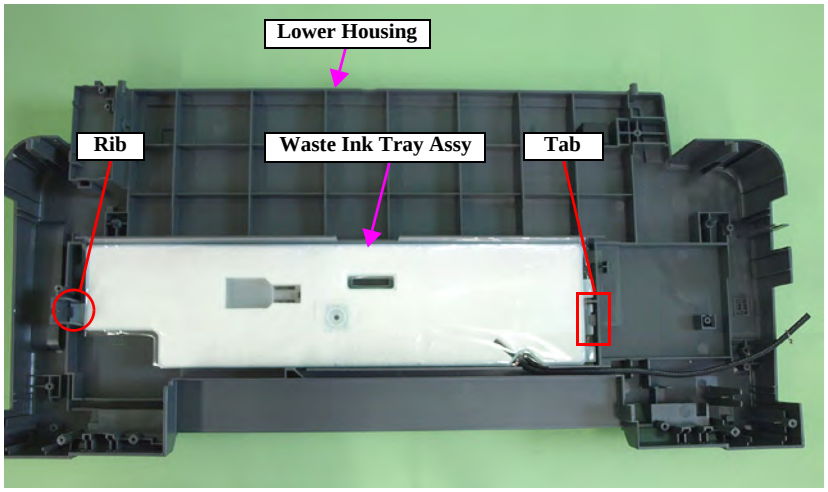


Figure 4-103. Removing the Waste Ink Tray Assy

REASSEMBLY

- **Install the Waste Ink Tray Assy under the rib of the Lower Housing.**
- **Route the Waste Ink Tube through the three grooves of the Lower Housing.**

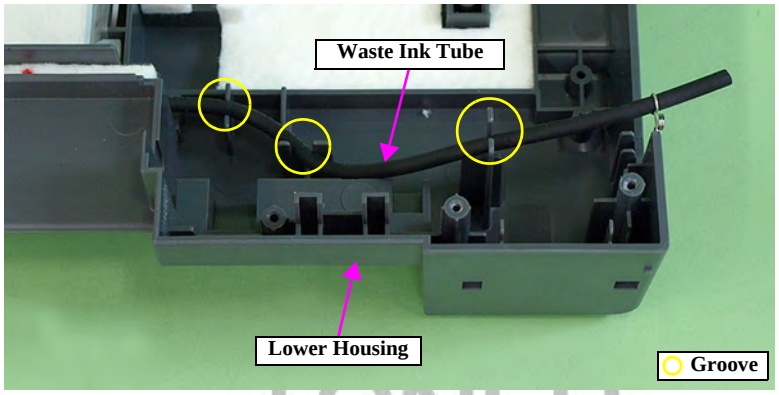


Figure 4-104. Routing the Waste Ink Tube

ADJUSTMENT REQUIRED

After replacing or removing the Waste Ink Pads and the Waste Ink Tray Assy, always make the required adjustments referring to the following.

- **"Chapter 5 Adjustment *(p.128)*"**

4.4.11 Foot

1. Remove the Printer Mechanism. *(Refer to 4.4.4 Lower Housing / Printer Mechanism (p.86).)*
2. Remove the six foot at the backside of the Lower Housing.

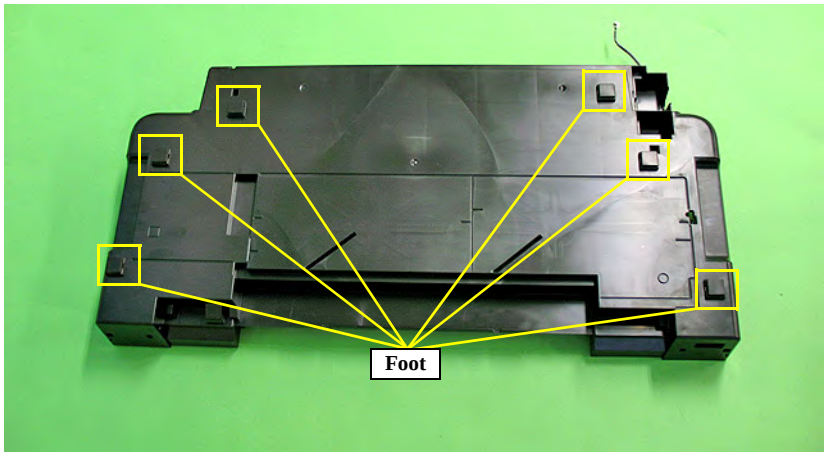


Figure 4-105. Removing the Foot

4.4.12 Paper EJ Frame Assy

1. *Remove the Upper Housing Support Assy. (p.74)*
2. Remove the Left Frame Support Plate. *(Refer to 4.4.5 Carriage Shaft / Carriage Unit Step4 (p88), Step5(p89).)*
3. Return the rotation position of the Right PG Cam.
4. Remove the four C.B.S. M3 x 6 that secure the Paper EJ Frame Assy.

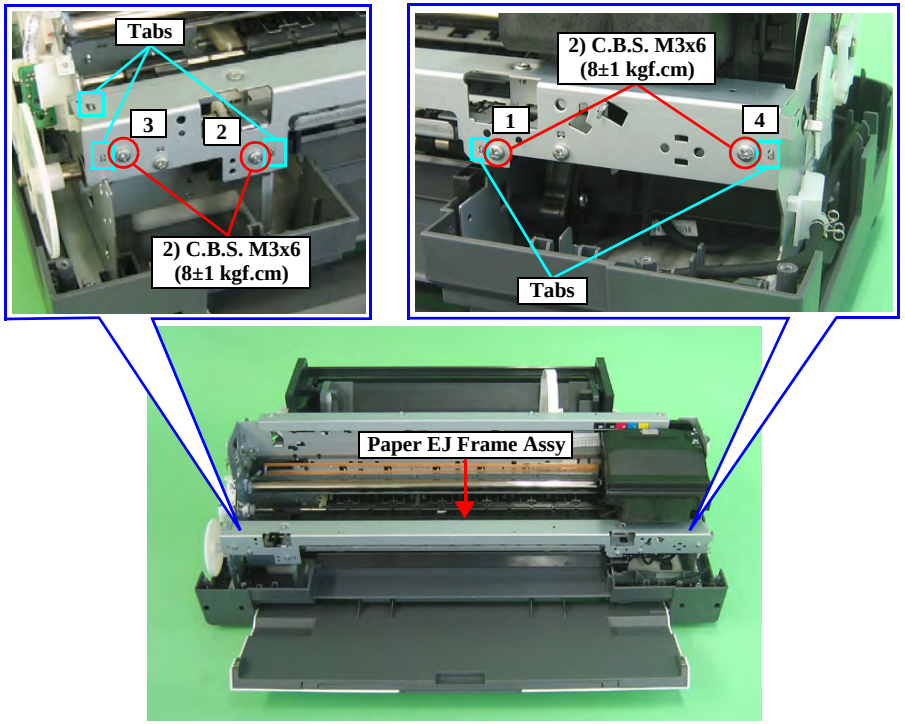


Figure 4-106. Screws that Secure the Paper EJ Frame Assy

CAUTION

When performing the following procedure, take care not to scratch the Star Wheel.

5. Pull frontward the Paper EJ Frame Assy and remove it from the Printer Mechanism.

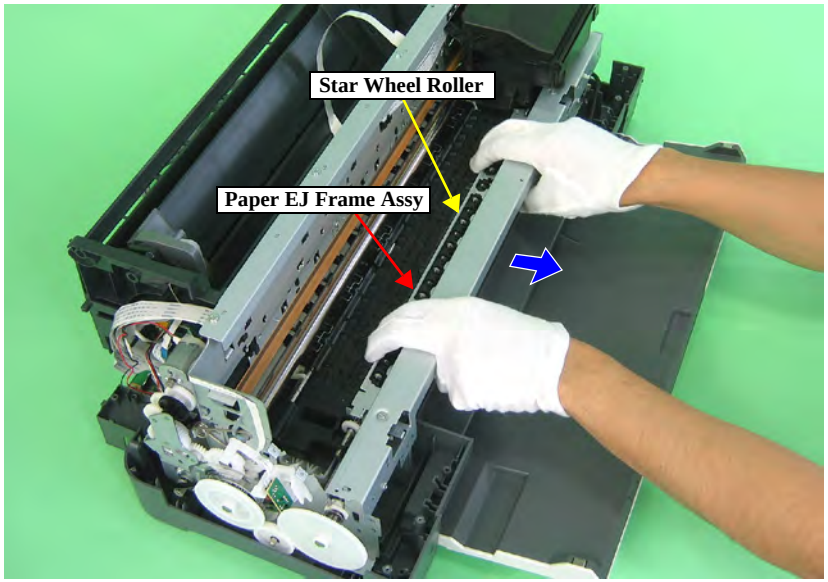


Figure 4-107. Removing the Paper EJ Frame Assy

REASSEMBLY

- **Hook both rear ends of the Paper EJ Frame Assy onto the tabs on the Main Frame.**

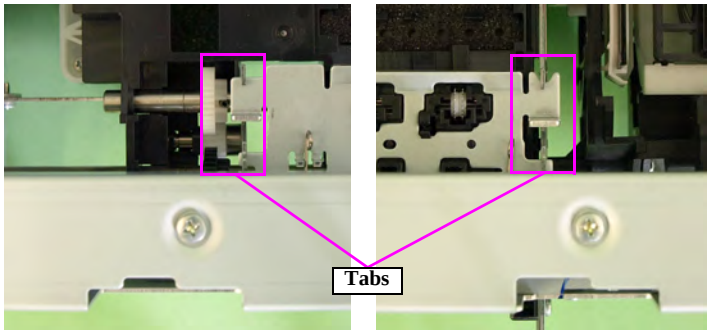


Figure 4-108. Reinstalling the Paper EJ Frame Assy

- **Align the tabs with the five positioning holes.**
  See Figure 4-106 (p.106)
- **Tighten the screws in the order shown in Figure 4-106**

ADJUSTMENT REQUIRED

After replacing or removing the Paper EJ Frame Assy, always make the required adjustments referring to the following.

- **"Chapter 5 Adjustment *(p.128)*"**

4.4.13 Ink System Unit

1. *Remove the Paper EJ Frame Assy. (p.106)*
2. Release the Carriage Lock, and move the Carriage Unit to the center. *(Refer to 4.1.5 Locking/Releasing the Carriage (p.65).)*
3. Release the two tabs that secure the clamps to the Upper Shield Plate, and remove the two clamps.
4. Disconnect the Pump Motor cable from the connector CN117 on the Main Board.
5. Remove the Pump Motor cable from the Cord Keep.

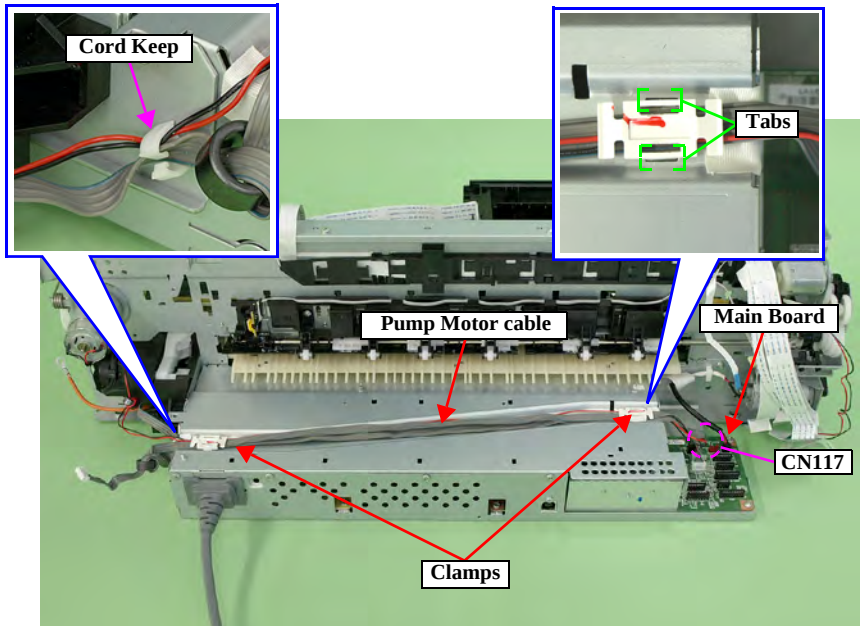


Figure 4-109. Removing the Pump Motor cable

REASSEMBLY

- **Referring to Figure 4-147, attach two pieces of acetate tape to the frame.**
- **Referring to Figure 4-148, route the Pump Motor cable, the Relay connector cable and the CR Motor connector cable.**

6. Remove the two C.B.S. M3 x 4 screws that secure the Ink System Guide Plate, and remove it.

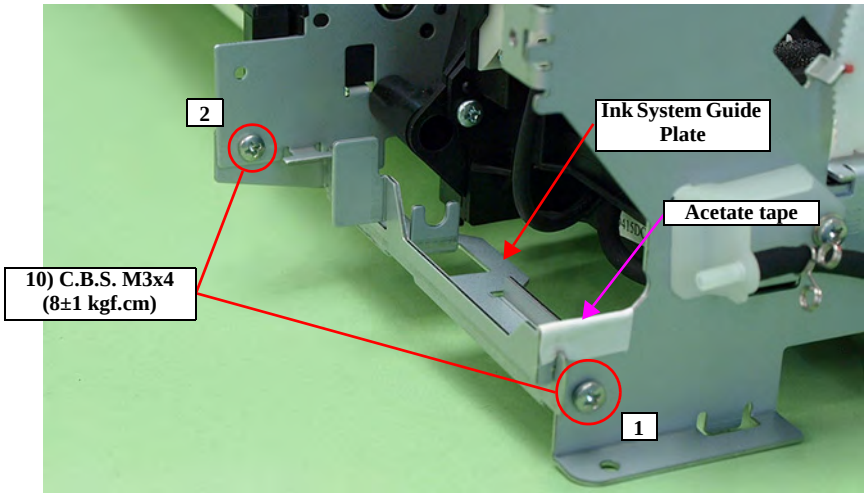


Figure 4-110. Removing the Ink System Guide Plate

REASSEMBLY

- **Align the notch on the Ink System Guide Plate with the notch on the Main Frame.**
- **Referring to Figure 4-110 and Figure 4-111, attach a piece of acetate tape.**

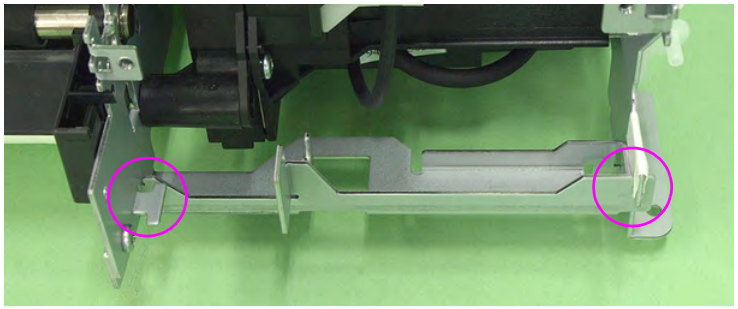


Figure 4-111. Reinstalling the Ink System Guide Plate

- **Tighten the screws in the order shown in Figure 4-110**

7. Grip both ends of the Ink Tube fasteners with your fingers, slide them in the direction of the arrows, and pull out the Ink Tube from the Joint Tube.
8. Squeeze and hold both ends of the fastener attached on Ink Tube and slide it in the direction of the arrow, then pull out the Ink Tube from the Joint Tube.

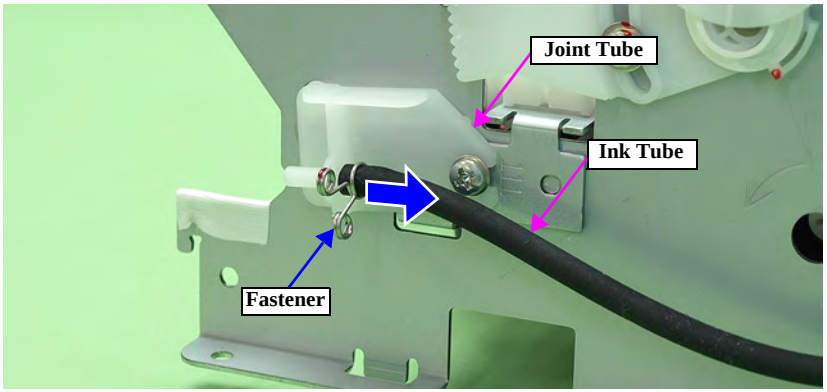


Figure 4-112. Removing the Ink Tube

9. Remove the two C.B.S. M3 x 6 screws that secure the Ink System Unit.

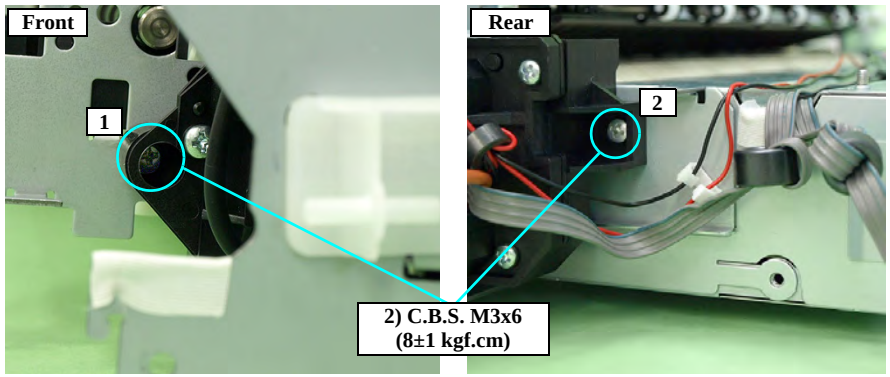


Figure 4-113. Screws that Secure the Ink System Unit

REASSEMBLY

Tighten the screws in the order shown in Figure 4-113

10. Remove the C.B.S. M3 x 6 screw and the C.B.S.(P2) M3x10 screw that secure the Right Support Frame and the Joint Tube, and remove the Right Support Frame and the Joint Tube from the Main Frame.

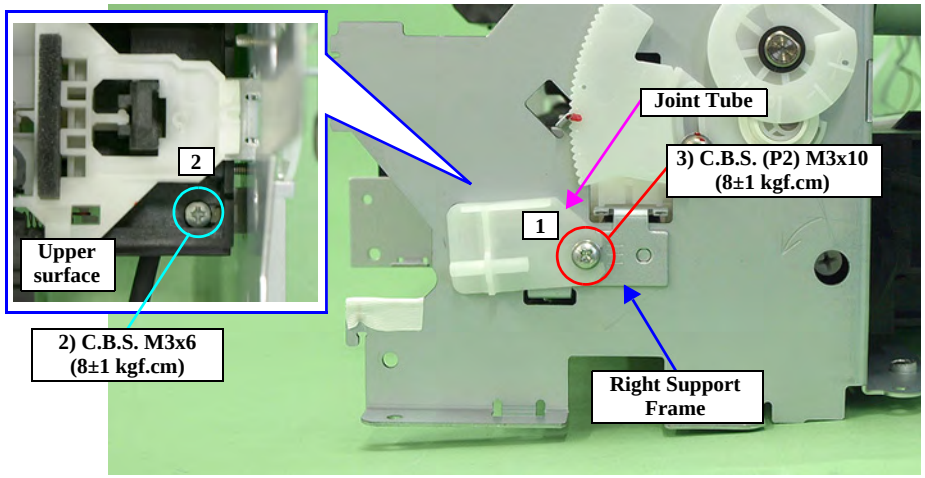


Figure 4-114. Removing the Right Support Frame

REASSEMBLY

- **Align the positioning holes on the Right Support Frame with the guide pins on the Main Frame.**

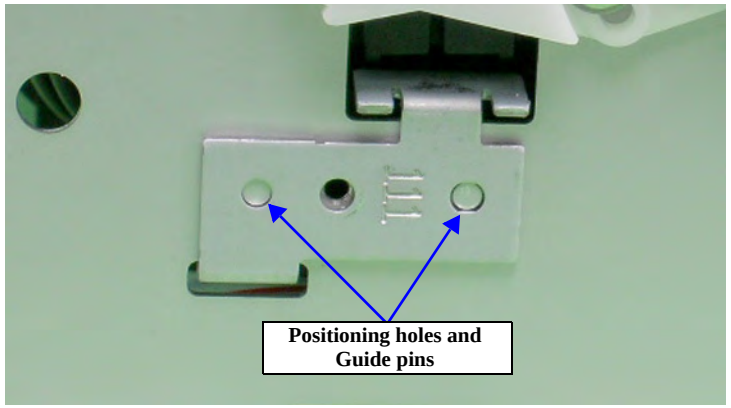


Figure 4-115. Installing the Right Support Frame

REASSEMBLY

- **Align the positioning hole of the Printer Mechanism with the guide pin of the Joint Tube.**

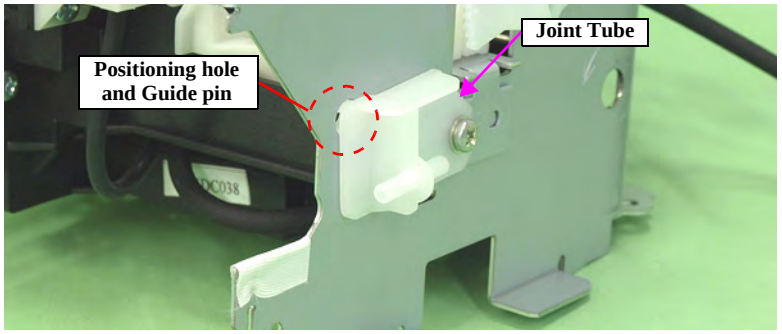


Figure 4-116. Reinstalling the Joint Tube

- **Tighten the screws in the order shown in Figure 4-114**

11. Remove the Ink System Unit downwards from the Main Frame.

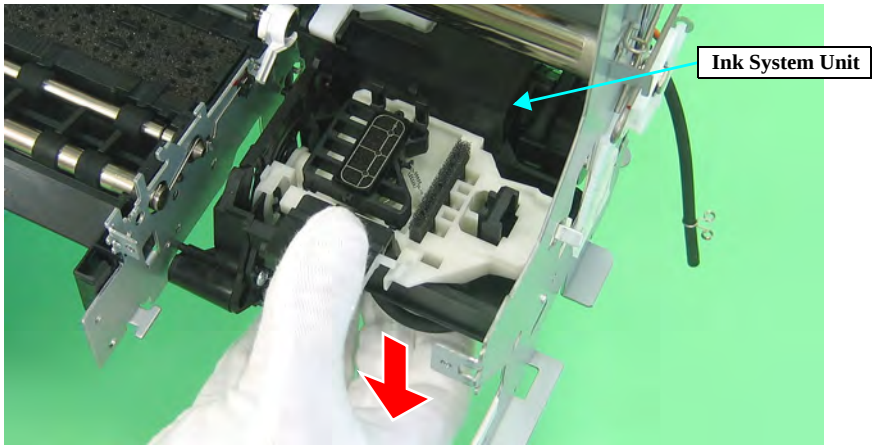
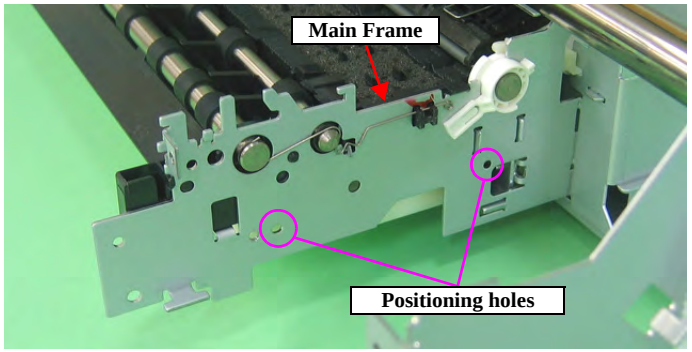


Figure 4-117. Removing the Ink System Unit

REASSEMBLY

Align the positioning two holes on the Main Frame with the two guide pins on the Ink System Unit.



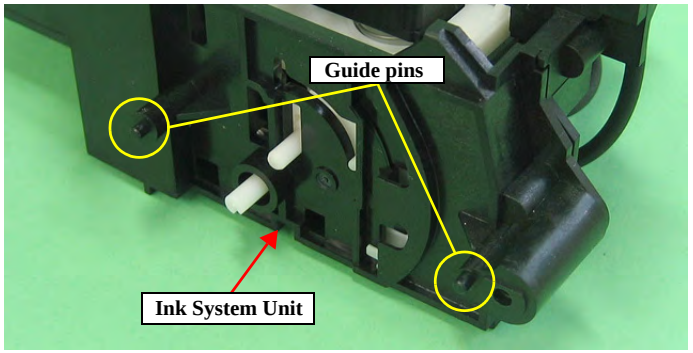


Figure 4-118. Reinstalling the Ink System Unit

4.4.14 Front Paper Guide / Paper EJ Roller / Front Paper Guide Pad Tray

1. *Remove the Paper EJ Frame Assy. (p.106)*
2. Release the Carriage Lock, and move the Carriage Unit to the center. *(Refer to 4.1.5 Locking/Releasing the Carriage (p.65).)*
3. Remove the EJ Grounding Spring from the Main Frame with tweezers.

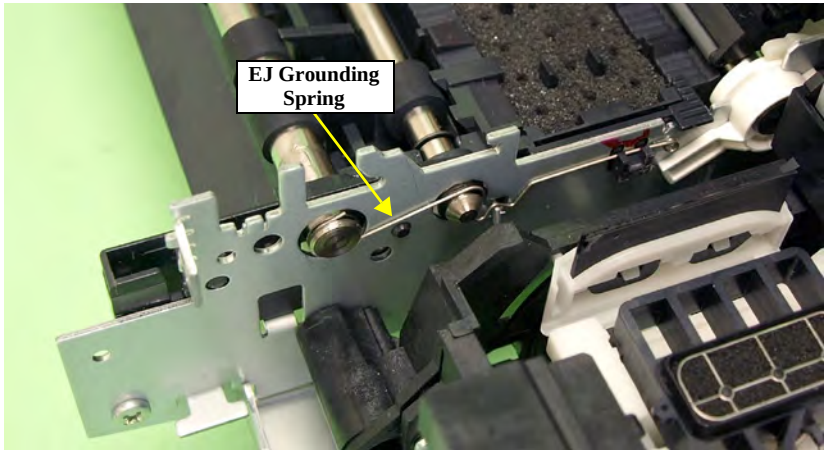


Figure 4-119. Removing the EJ Grounding Spring

REASSEMBLY

Referring to Figure 4-120, correctly install the EJ Grounding Spring.

Figure 4-120. Reinstalling the EJ Grounding Spring

4. Remove the Spacer from the EJ Roller Shaft.
5. Remove the guide pins on Left Bushing 8 from the Main Frame using tweezers, and turn Left Bushing 8 toward you to align with the notches on the Main Frame.

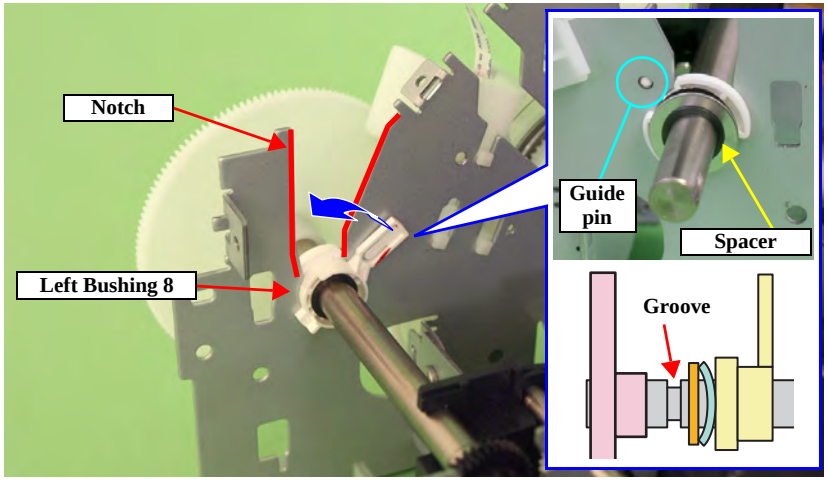


Figure 4-121. Removing the Spacer and Rotating the Left Bushing 8

REASSEMBLY

Insert the spacer into the groove on the Front Paper EJ Roller.

6. Slide the Front Paper EJ Roller to the left, and remove the Left Bushing 8 from the Main Frame.

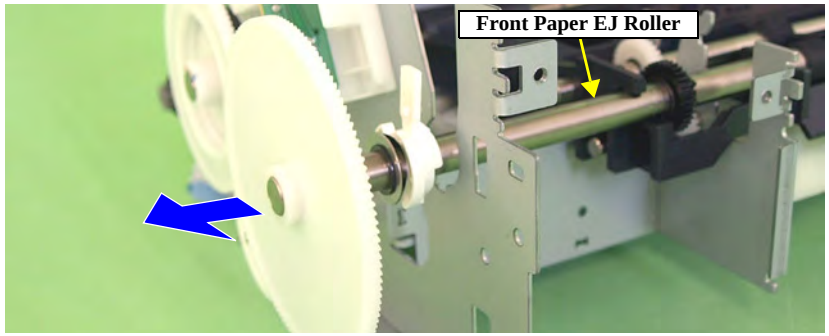


Figure 4-122. Removing the Left Bushing 8

7. Return the Carriage Unit to its home position.
8. Remove the C.B.S. M3 x 6 screw that secure the Left Front Frame.
9. Release the tab that secures the Front Paper Guide from the Main Frame and slide the Front Paper Guide to the left, and turn it until the front side faces up to remove the Front Paper Guide together with the Paper EJ Roller.

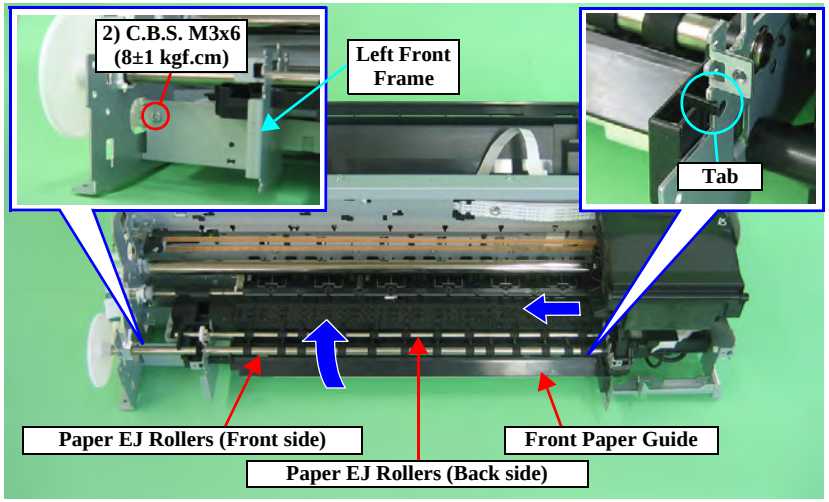


Figure 4-123. Removing the Front Paper Guide and Paper EJ Rollers

10. Pull out the Shaft of the Left Front Frame from the bushing of the Front Paper Guide and remove the Left Front Frame.

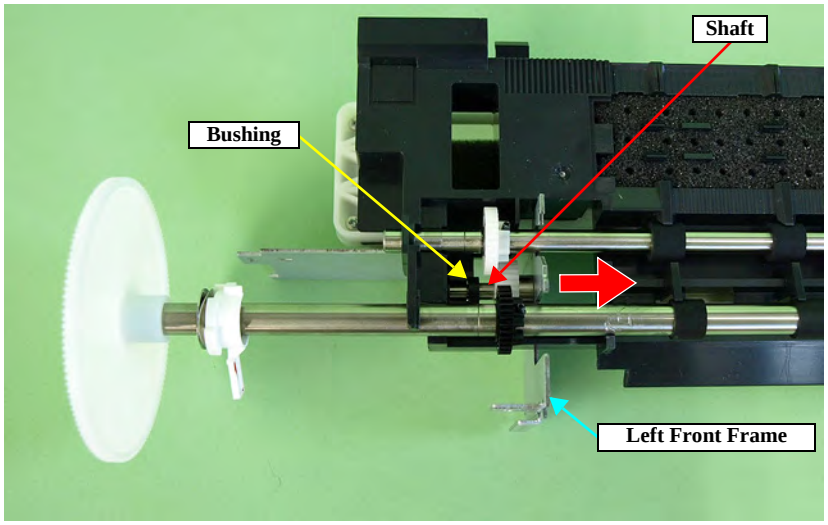


Figure 4-124. Removing the Front Paper Guide/Paper EJ Rollers (2)

11. Remove the Front Paper Guide Pad Tray in the direction of the arrow.

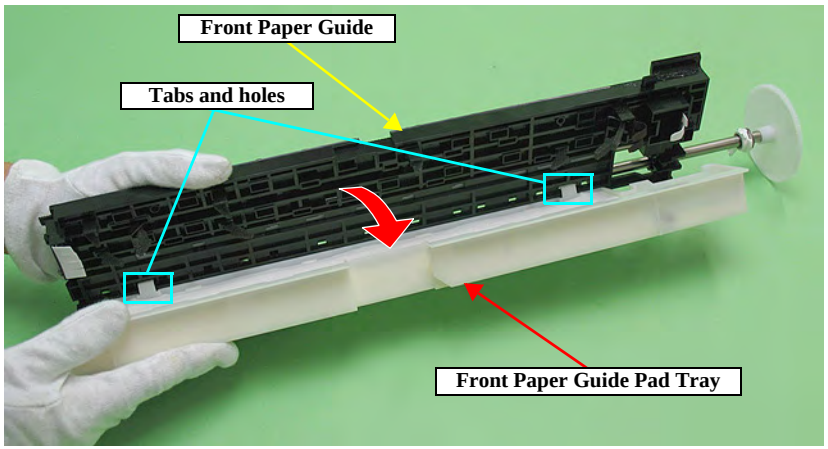


Figure 4-125. Removing the Front Paper Guide Pad Tray

DISASSEMBLING THE FRONT PAPER GUIDE PAD TRAY

1. *Remove the Front Paper Guide Pad Tray in the direction of the arrow. (p.112)*
2. Remove the four C.B.P. M 2 x 8 screws that secure the Front Paper Guide Pad Tray Cover Assy, and remove the Front Paper Guide Pad Tray Cover Assy from the Front Paper Guide Pad Tray.
3. Remove the three Waste Ink Pads (A, B and C shown below) from the Front Paper Guide Pad Tray.

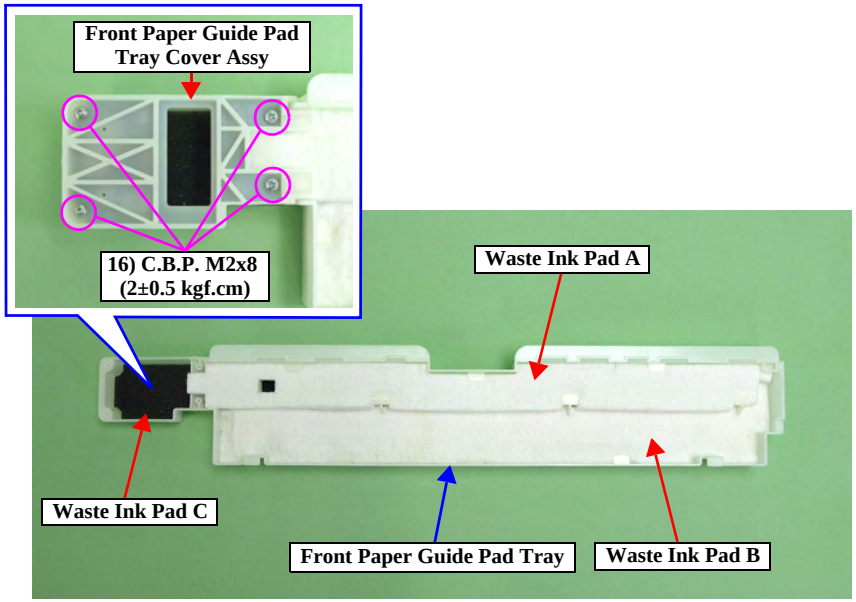


Figure 4-126. Removing the Waste Ink Pad

REASSEMBLY

- Engage the two tabs of the Front Paper Guide Pad Tray with the holes of the Front Paper Guide as shown in Figure 4-125.
- Install the Waste Ink Pad A, B and C in the order shown below.

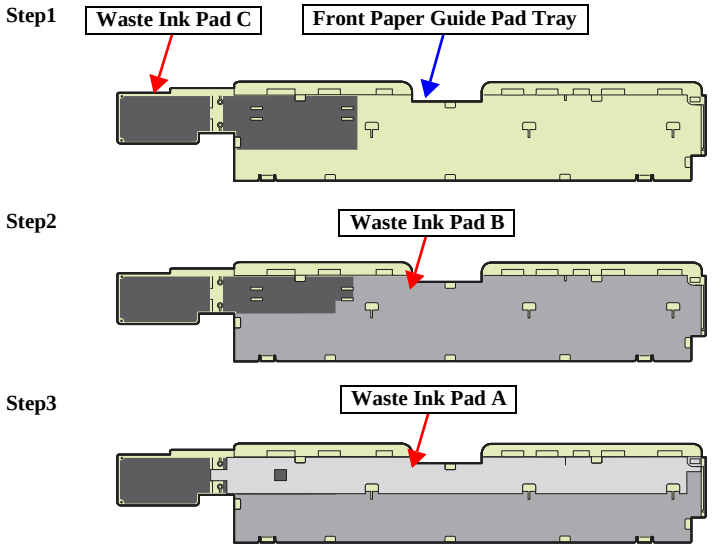


Figure 4-127. Reinstalling the Waste Ink Pads

- When installing the Waste Ink Pads, make sure not to let the tab of the Front Paper Guide get caught between the Front Paper Guide Pad Tray Cover Assy and the Front Paper Guide.
- Confirm that the tab of the Front Paper Guide Pad touches the Waste Ink Pad A.

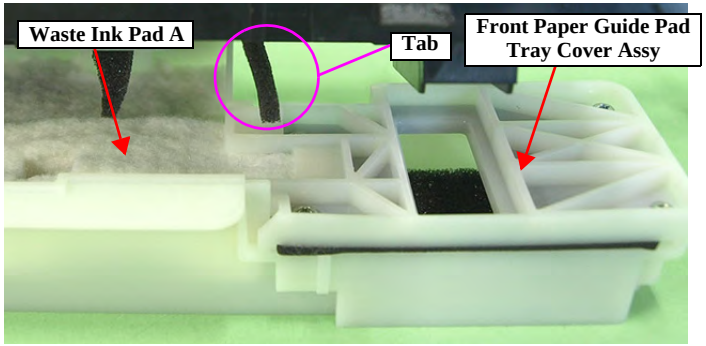


Figure 4-128. Reinstalling the Front Paper Guide Pad Tray

REASSEMBLY

- Do not peel off the Front Paper Guide Pad Tray Seal from the Front Paper Guide Pad Tray Cover Assy. If it is used after once peeled off or damaged, ink leakage may occur. Make sure to replace the Front Paper Guide Pad Tray Cover Assy with a new one when the seal is peeled off or damaged.

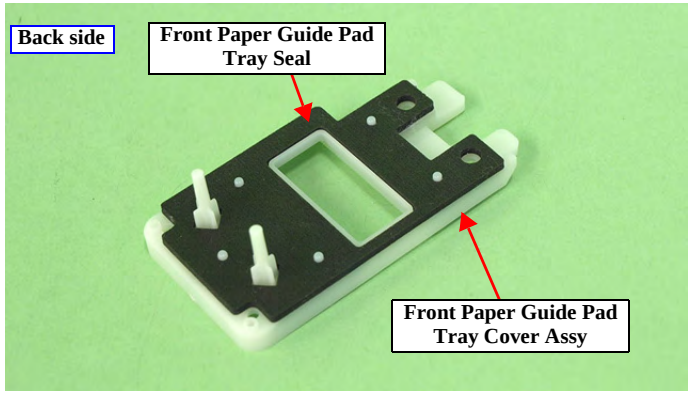


Figure 4-129. Handling for Front Paper Guide Pad Tray Seal

- Align the bushing of the Front Paper Guide with the PF Roller Shaft.

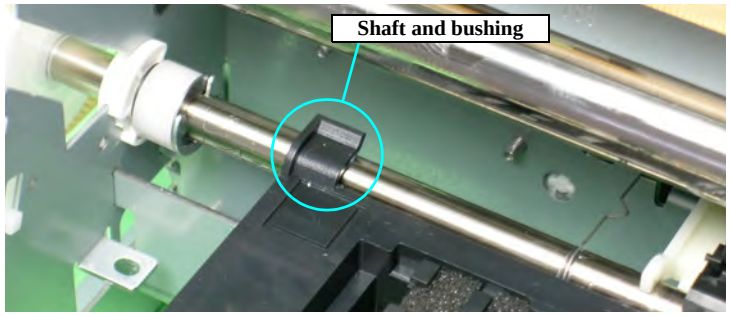


Figure 4-130. The PF Roller Shaft and the bushing of the Front Paper Guide

REASSEMBLY

- Align the positioning holes on the Main Frame with the guide pins on the Front Paper Guide.

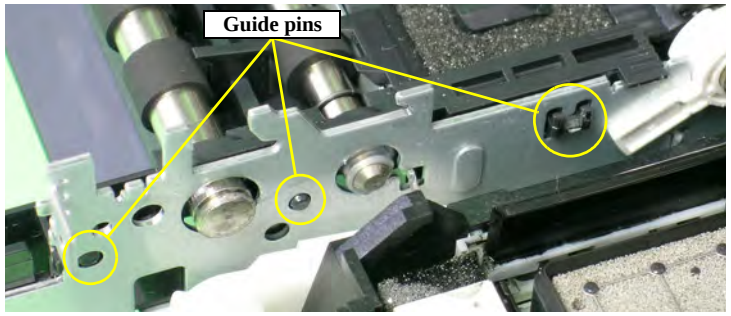


Figure 4-131. Reinstalling the Front Paper Guide

- After installing the Front Paper Guide, lift the Printer Mechanism to check the following points.

1. Make sure that the tabs on the Paper Guide Pad are not cut midway.
2. Make sure that all the tabs are facing down (toward the Waste Ink Pads) without any folds.
3. Make sure that the tab foldbacks are protruding completely from the Front Paper Guide.

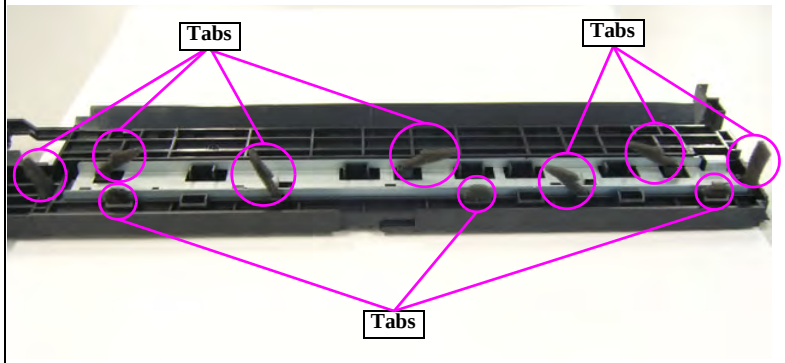


Figure 4-132. Checking the Front Paper Guide Pad

ADJUSTMENT REQUIRED

After replacing the following parts, be sure to apply G-45 grease to the area specified for each part.

- EJ Grounding Spring: See Figure 6-8 on page 157.
- Front Paper Guide and Paper EJ Roller: See Figure 6-9 on page 157.

ADJUSTMENT REQUIRED

After replacing or removing the Front Paper Guide and Paper EJ Roller, always make the required adjustments referring to the following.

- "Chapter 5 Adjustment *(p.128)*"

4.4.15 PF Roller Shaft

1. *Remove the PF Encoder. (p.124)*
2. *Remove the Upper Paper Guide Assys. (p.118)*
3. Loosen the two C.C. M3 x 4 screws that secure the PF Motor, and remove the PF Drive Belt from the PF Motor Pinion Gear.
4. Remove the spacer that secures Spur Gear 31.5, and remove Spur Gear 31.5 from the Printer Mechanism.

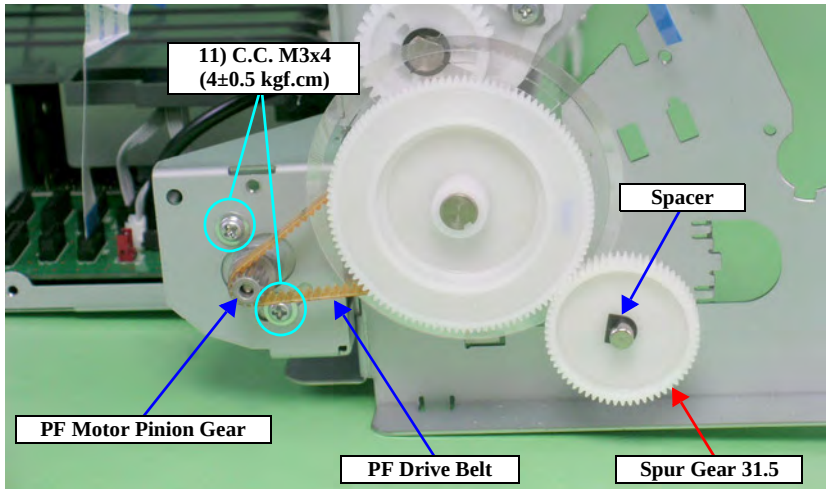


Figure 4-133. Removing the PF Drive Belt and Spur Gear 31.5

5. Remove the PG Grounding Spring from the notch on the Main Frame, and remove the PF Grounding Spring from the groove on the PF Roller Shaft.

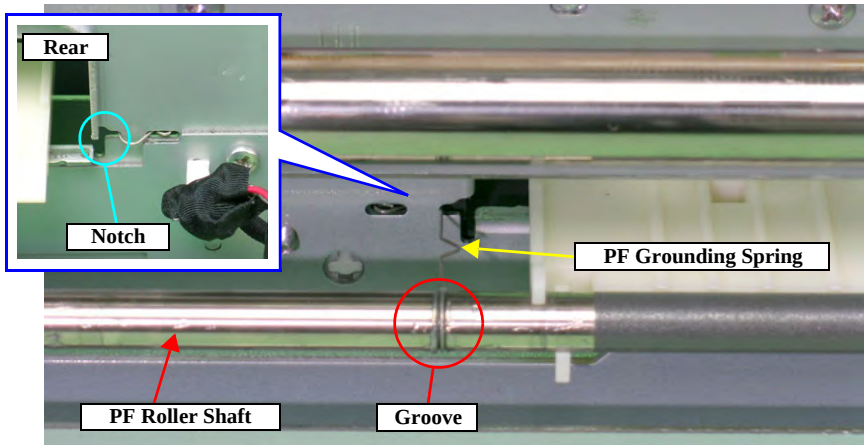


Figure 4-134. Removing the PF Grounding Spring

6. Make sure that the Left Parallelism Adjust Bushing is not protruding from the notch on the Main Frame. If it is protruding, loosen the C.B.S. (P4) M3 x 8 screw that secures the Left Parallelism Adjust Bushing, and slide it to prevent the Left Parallelism Adjust Bushing from becoming hooked on the notch.

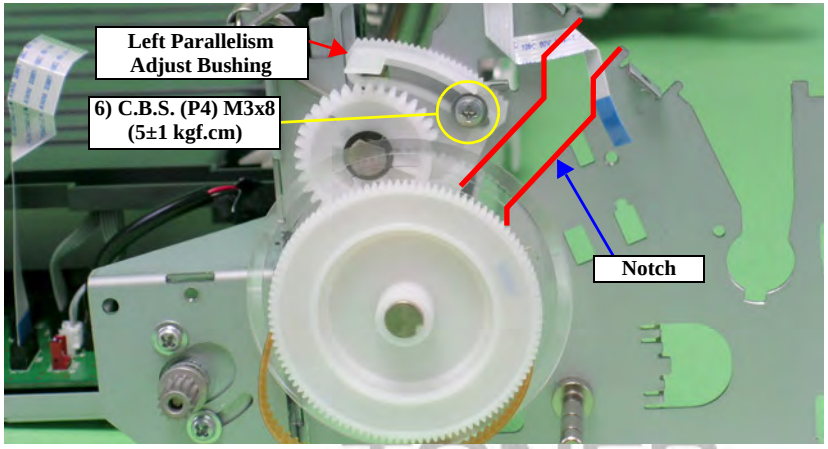


Figure 4-135. Rotating the Left Parallelism Adjust Bushing

7. Remove the guide pin of Left Bushing 8 from the Main Frame using tweezers, and rotate the Bushing upwards to align with the notch on the Main Frame.

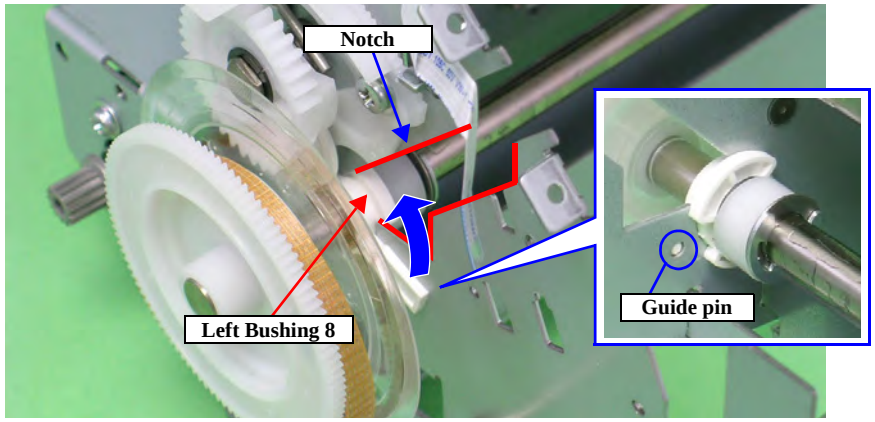


Figure 4-136. Rotating the Left Bushing 8

CAUTION

When performing the following procedure, take care not to lose the E-ring.

8. Remove the E-ring from the PF Roller Shaft with a flathead screwdriver, and slide Left Bushing 8 to the inside of the Printer Mechanism.

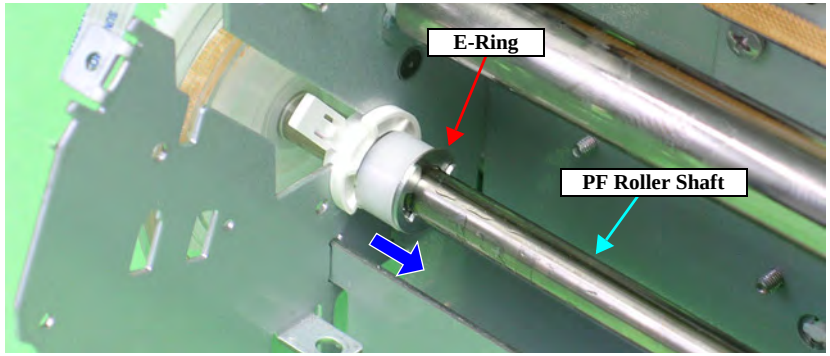


Figure 4-137. Removing the Left Bushing 8

CAUTION

When performing the following procedure, pay attention to the following points.

- **Prevent the coated surface of the PF Roller Shaft from being scratched.**
- **Do not touch the coated surface of the PF Roller Shaft with bare hands.**

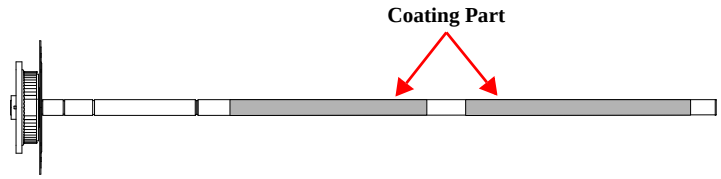


Figure 4-138. Handling the PF Roller Shaft

9. Remove the PF Roller Shaft from the Bushings on the Rear Paper Guide and the Center Support, slide the PF Roller Shaft to the left to remove it from Right Bushing 8, and remove the PF Roller Shaft along the notch of the Main Frame.

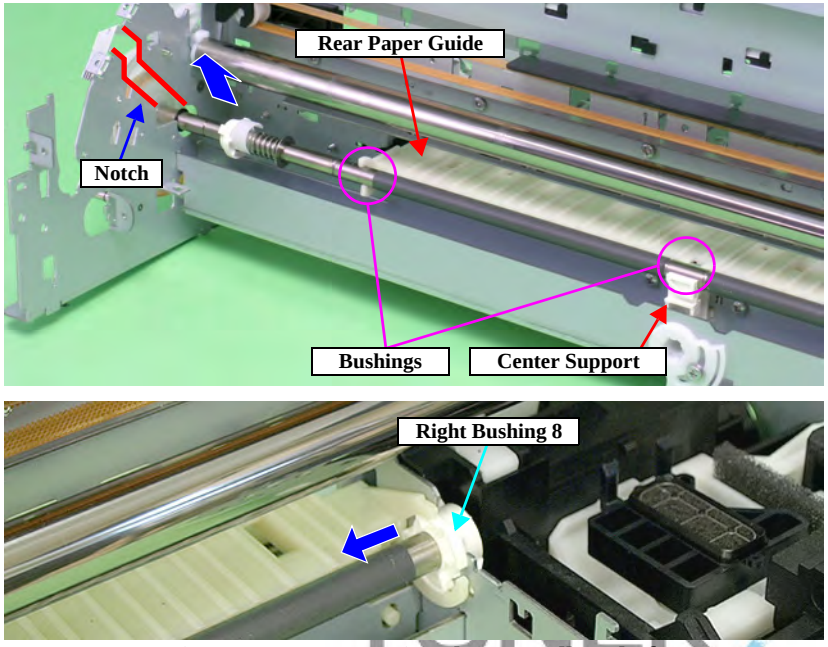


Figure 4-139. Removing the PF Roller Shaft

CAUTION

Be careful not to move Compression Spring 4 and the Leaf Spring on the left side of the PF Roller Shaft to the coated section on the Shaft after removing the PF Roller Shaft.

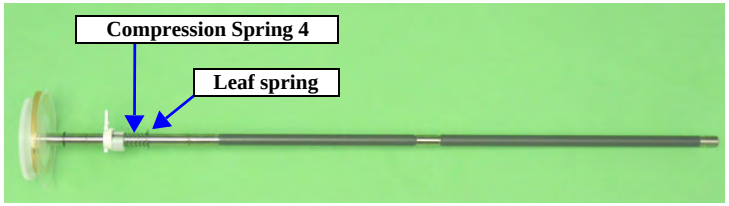


Figure 4-140. Handling the PF Roller Shaft

ADJUSTMENT REQUIRED

After replacing the PF Roller Shaft, always make the required adjustments referring to the following.

- **"Chapter 5 Adjustment *(p.128)*"**

ADJUSTMENT REQUIRED

After replacing the following parts, be sure to apply G-45 grease to the area specified for each part.

- **PF Roller Shaft: Chapter 6 See Figure 6-10 (p.157) - Figure 6-12 (p.158)**

4.4.16 Release Holder Assy

1. *Remove the APG Assy. (p.78)*
2. Release the PE Sensor connector cable from the five tabs on the Release Holder Assy.
3. Remove the three C.B.S. M3 x 6 screws that secure the Release Holder Assy.
4. Remove the three lower tabs of the Release Holder Assy from the Main Frame with a flathead screwdriver, and remove the Release Holder Assy upwards.

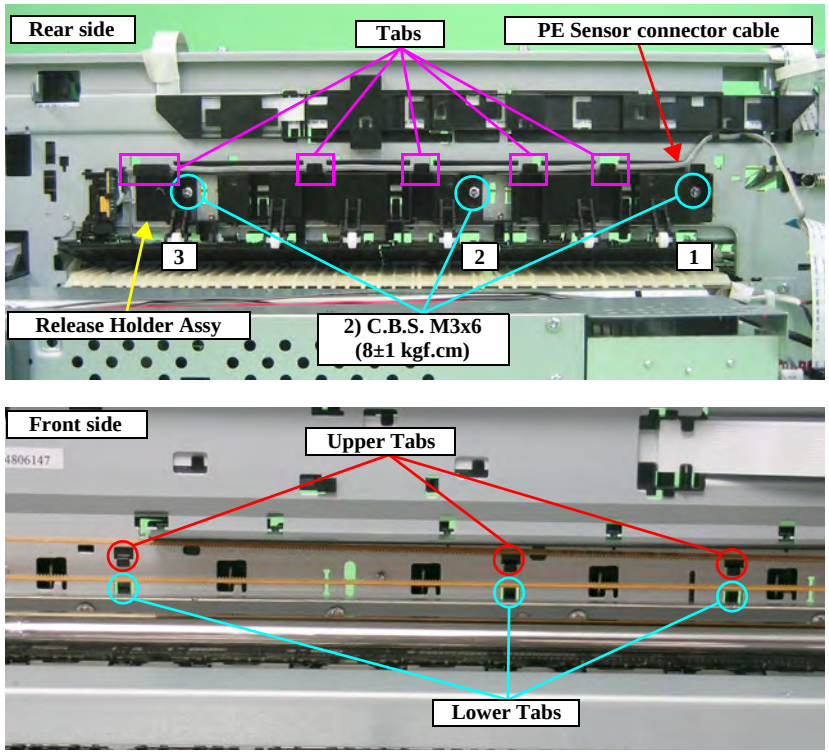


Figure 4-141. Removing the Release Holder Assy

REASSEMBLY

- **Align the three upper tabs on the Release Holder Assy with the positioning holes on the Main Frame. See Figure 4-141 (p.117)**
- **Tighten the screws in the order shown in Figure 4-141**

4.4.17 Upper Paper Guide Assys

1. *Remove the PE Sensor Holder. (p.126)*
2. Pass a sheet of A3 size paper into the gap between the Upper Paper Guide Assy and the Rear Paper Guide.

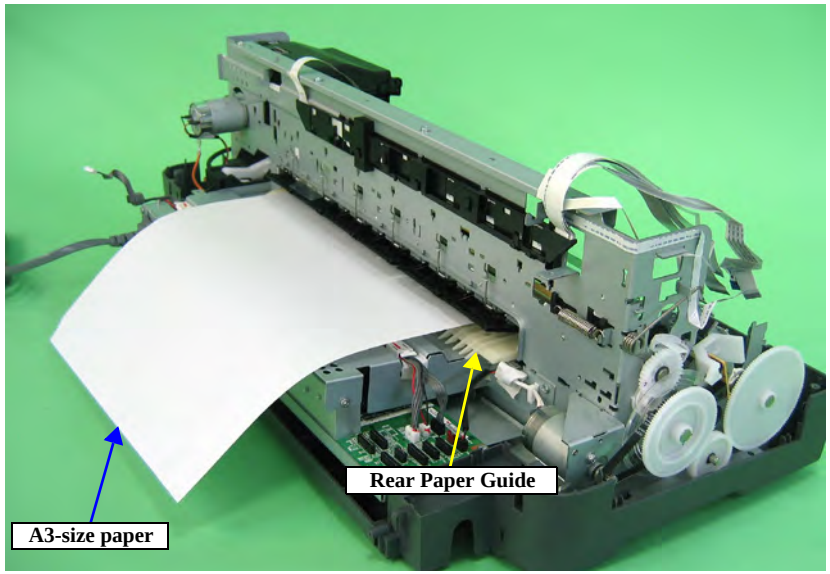


Figure 4-142. Setting the Paper

3. Remove the six Upper Paper Guide Torsion Springs from the tabs on the Main Frame, and pull out the Upper Paper Guide Torsion Springs from the six Upper Paper Guide Assys.

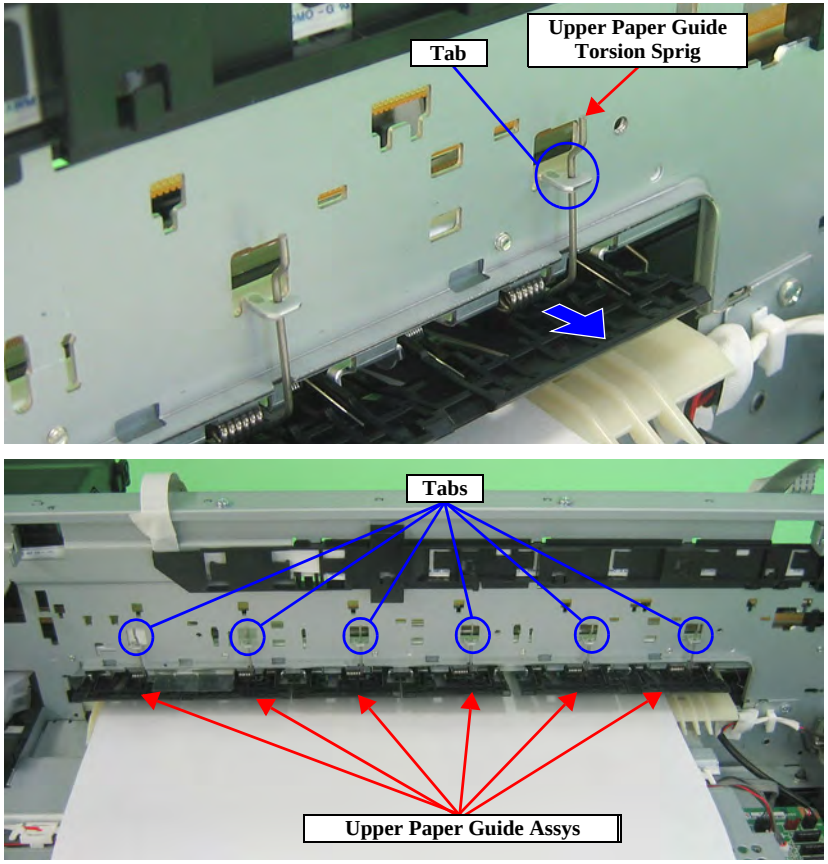


Figure 4-143. Removing the Upper Paper Guide Torsion Spring

REASSEMBLY

Make sure that the leading end of the Upper Paper Guide Torsion Spring can be seen through the hole of the Upper Paper Guide Assy.

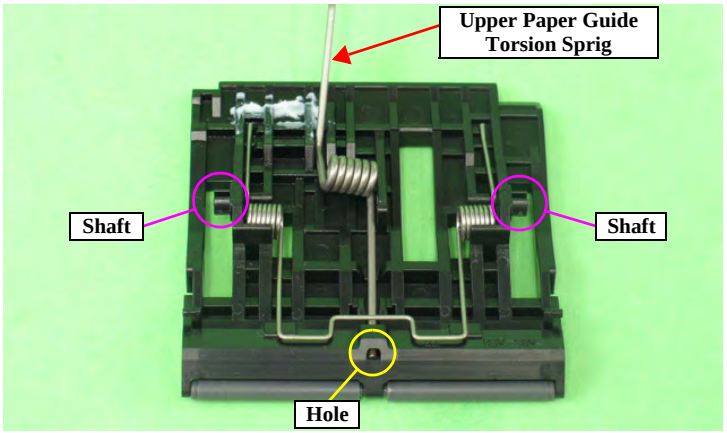


Figure 4-144. Reinstalling the Upper Paper Guide Torsion Spring

4. Lift the six Upper Paper Guide Assys from the Main Frame to release the shaft referring to Figure 4-144, and remove the Upper Paper Guide Assys to the rear.

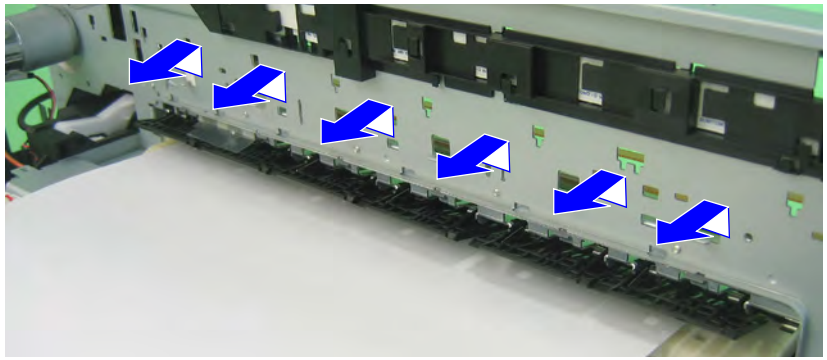


Figure 4-145. Removing the Upper Paper Guide Assy

4.5 Removing the Motors

4.5.1 CR Motor

1. *Remove the ASF Assy. (p.96)*
2. Release the Carriage Lock, and move the Carriage Unit to the center. *(Refer to 4.1.5 Locking/Releasing the Carriage (p.65).)*
3. Remove the two Clamps. *(Refer to 4.4.13 Ink System Unit (p.107).)*
4. Disconnect the CR Motor connector cable from the connector CN115 on the Main Board.
5. Remove the CR Motor connector cable from the Cord Keep.

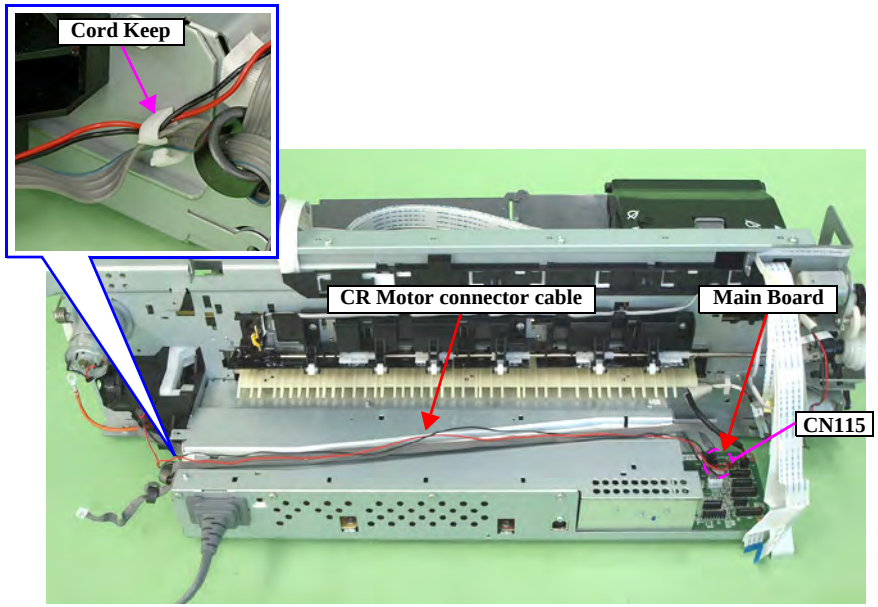


Figure 4-146. Removing the CR Motor connector cable

REASSEMBLY

■ **Attach two pieces of acetate tape (18 mm) on the Upper Shield Plate.**

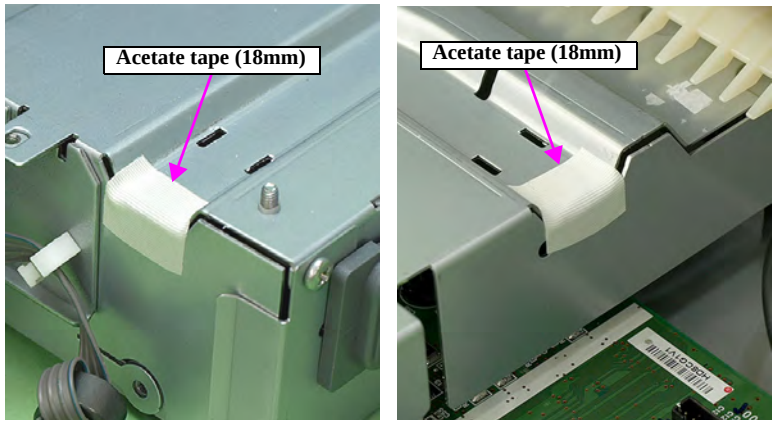


Figure 4-147. Attaching acetate tape

■ **Route the cables as shown below.**

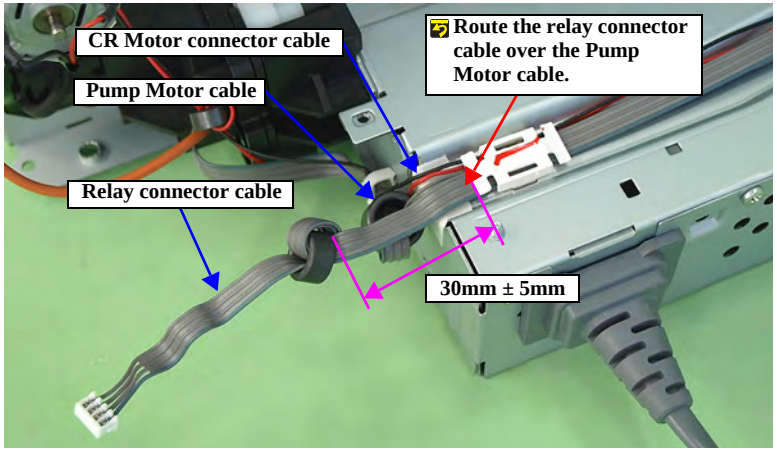


Figure 4-148. Routing the cables

6. .Press the Driven Pulley toward the center to loosen the CR Drive Belt, and remove the CR Drive Belt from the CR Motor Pinion Gear.

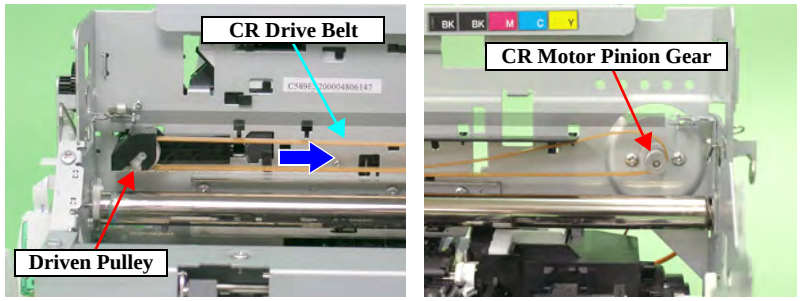


Figure 4-149. Removing the CR Motor

7. Remove the two C.B. M3 x 4 screws that secure the CR Motor, and remove the CR Motor from the Main Frame.

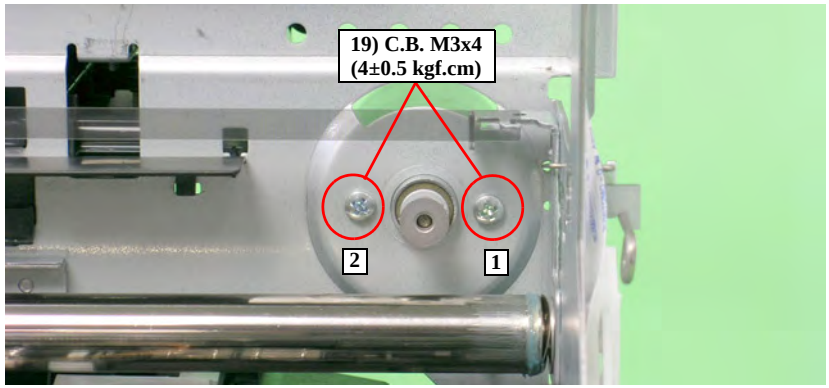


Figure 4-150. Removing the CR Motor

REASSEMBLY

■ **Make the Lot No. printed surface on the CR Motor face the direction shown in the figure below.**

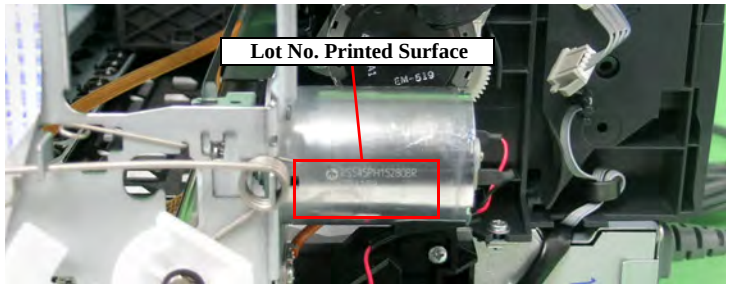


Figure 4-151. Reinstalling the CR Motor

■ **Tighten the screws in the order shown in Figure 4-150**

ADJUSTMENT REQUIRED

After replacing the CR Motor, always make the required adjustments referring to the following.

- **"Chapter 5 Adjustment *(p.128)*"**

4.5.2 PF Motor

1. Remove the Printer Mechanism. *(Refer to 4.4.4 Lower Housing / Printer Mechanism (p.86).)*
2. Disconnect the PF Motor connector cable from connector CN116 (black) on the Main Board, and remove it from the Clamp on the Main Frame.
3. Remove the two C.C. M3 x 4 screws that secure the PF Motor.
4. Remove the PF Drive Belt from the PF Motor Pinion Gear, and remove the PF Motor from the Printer Mechanism.

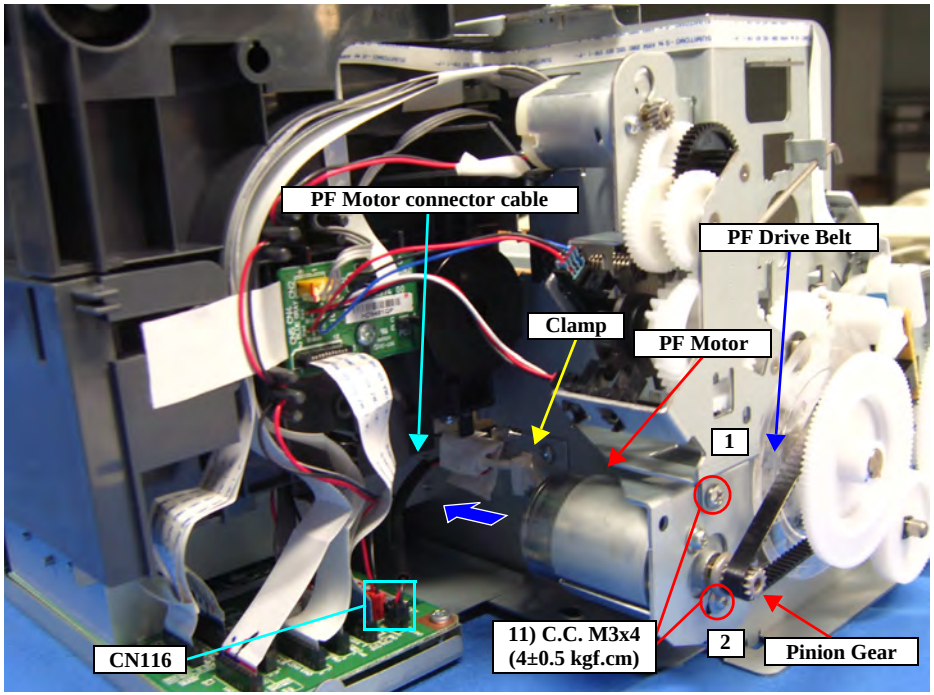


Figure 4-152. Removing the PF Motor

ADJUSTMENT REQUIRED

- **Make the slit on the PF Motor face the direction shown in the figure below.**

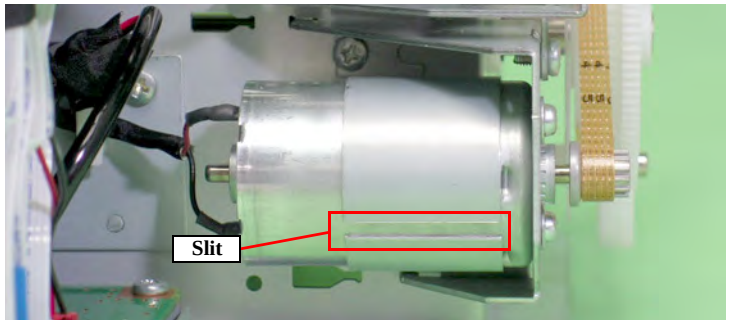


Figure 4-153. Reinstalling the PF Motor

- **Tighten the screws in the order shown in Figure 4-152**

ADJUSTMENT REQUIRED

After replacing or removing the PF Motor, always make the required adjustments referring to the following.

- **"Chapter 5 Adjustment *(p.128)*"**

4.5.3 ASF Motor

1. *Remove the Upper Housing / Printer Cover. (p.72)*
2. Remove the Earth cable. (refer to 4.4.6 ASF Assy Step2 (p96) .)
3. Release the ASF Motor cable from the cable hook and disconnect the relay connector.
4. Remove the two C.B.P. M3 x 8 screws that secure the ASF Motor and remove the ASF Motor.

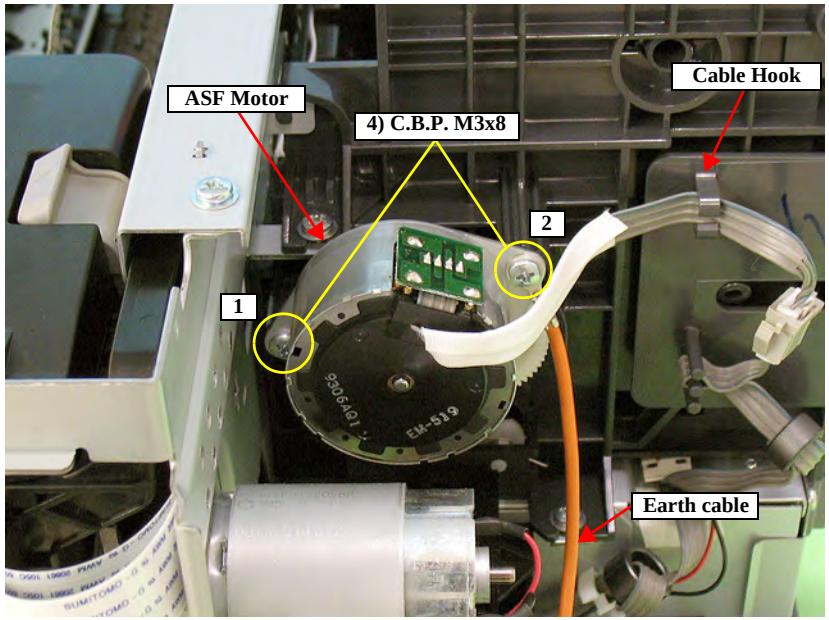


Figure 4-154. Removing the ASF Motor

REASSEMBLY

- **Secure the grounding wire and the ASF Motor together with the screw in the middle of the printer.**
- **Tighten the screws in the order shown in Figure 4-154**

REASSEMBLY

- **Attach a piece of acetate tape (60 mm) on the ASF Motor Cable as shown below.**

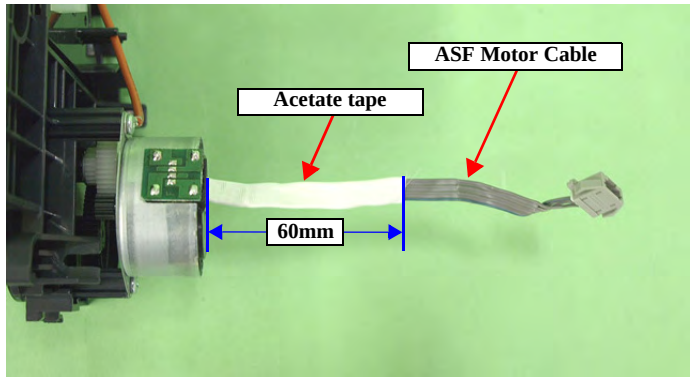


Figure 4-155. Attaching acetate tape

4.6 Removing the Sensors

4.6.1 CR Encoder

1. *Remove the Carriage Shaft / Carriage Unit. (p.88)*
2. Remove the two C.B.P. M2.6 x 5 screws that secure the CR Encoder Sensor Board.
3. Disconnect the PW Sensor FFC from the connector on the CR Encoder Sensor Board, and remove the CR Encoder Sensor Board.

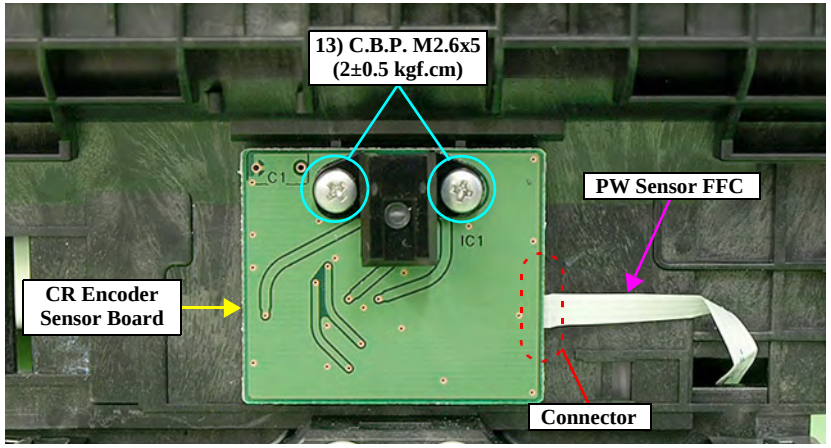


Figure 4-156. Removing the CR Encoder Sensor Board

4.6.2 PF Encoder

1. *Remove the Upper Housing / Printer Cover. (p.72)*
2. Disconnect the FFC from the PF Encoder Sensor Board.
3. Remove the C.B.S. M3 x 8 screw that secures the PF Encoder Sensor Holder.

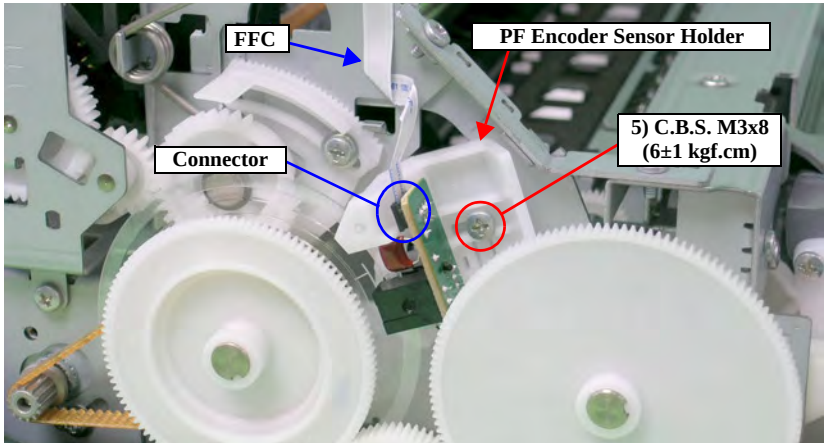


Figure 4-157. Removing the FFC and the Screw that Secures the PF Encoder Sensor Holder

4. While pressing the guide pin on the PF Encoder Sensor Holder using tweezers, slide the holder upwards to release the three tabs, and remove the PF Encoder Sensor Holder.

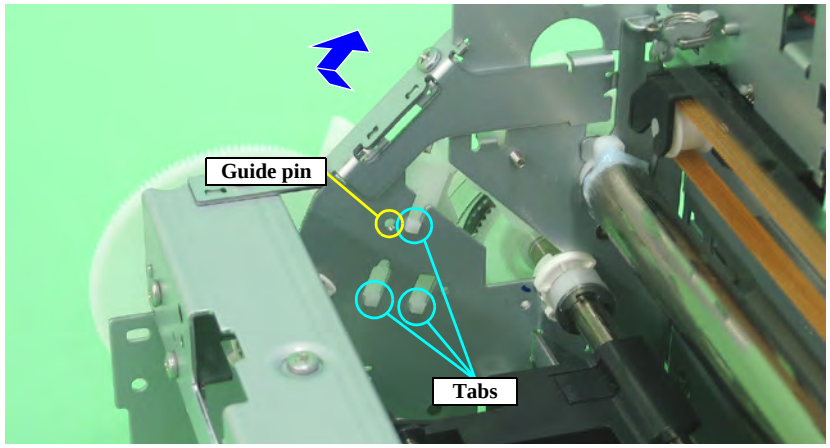


Figure 4-158. Removing the PF Encoder Sensor Holder

REASSEMBLY

Make sure that the PF Scale is in the slit on the PF Encoder Sensor.

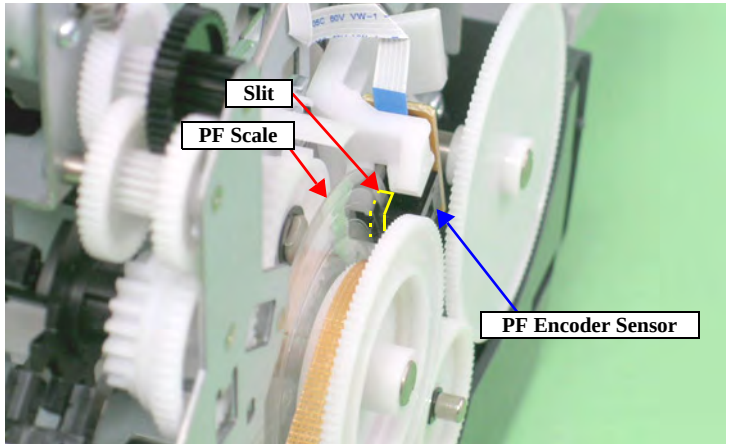


Figure 4-159. Reinstalling the PF Encoder Sensor Holder

4.6.3 PW Sensor

1. *Remove the Carriage Shaft / Carriage Unit. (p.88)*
2. Remove the C.P.B. (P1) M1.7 x 5 screw that secures the PW Sensor Holder, and remove the PW Sensor Holder from the Carriage Unit.

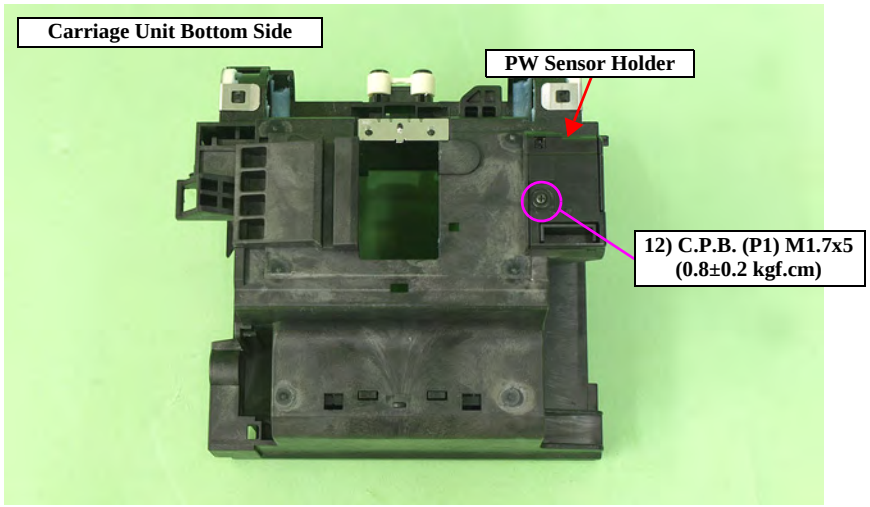


Figure 4-160. Removing the PW Sensor Holder

3. Disconnect the PW Sensor FFC from the PW Sensor connector, and remove the PW Sensor.

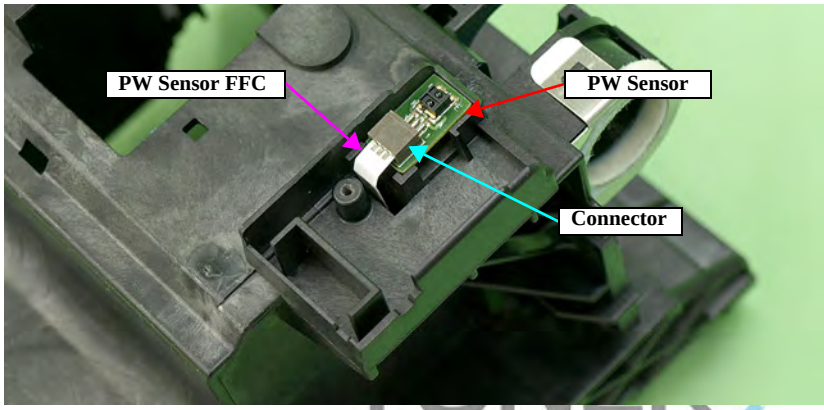


Figure 4-161. Removing the PW Sensor

REASSEMBLY

Make sure that the PW Sensor FFC is routed as shown in Figure 4-161

ADJUSTMENT REQUIRED

After replacing or removing the PW Sensor, always make the required adjustments referring to the following.

- **"Chapter 5 Adjustment *(p.128)*"**

4.6.4 PE Sensor Holder

1. *Remove the ASF Assy. (p.96)*
2. Remove the PE Sensor connector cable from the five tabs on the Release Holder Assy and the two tabs on the Head Cable Cover.

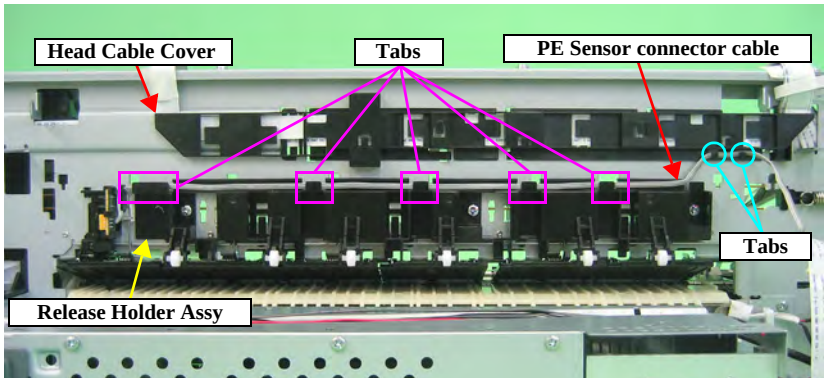


Figure 4-162. Releasing the Cables

3. Release the tabs that secure the PE Sensor Holder from the notch on the Main Frame with a flathead screwdriver, and slide the PE Sensor Holder upwards and then remove it toward you.

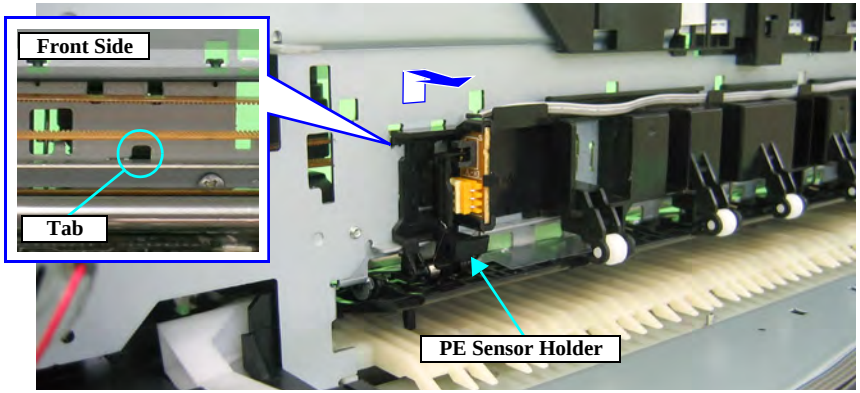


Figure 4-163. Removing the PE Sensor Holder

REASSEMBLY

Align the four tabs and guide pin on the PE Sensor Holder with the positioning holes on the Main Frame correctly so that there is no gap between the PE Sensor Holder and the Main Frame.

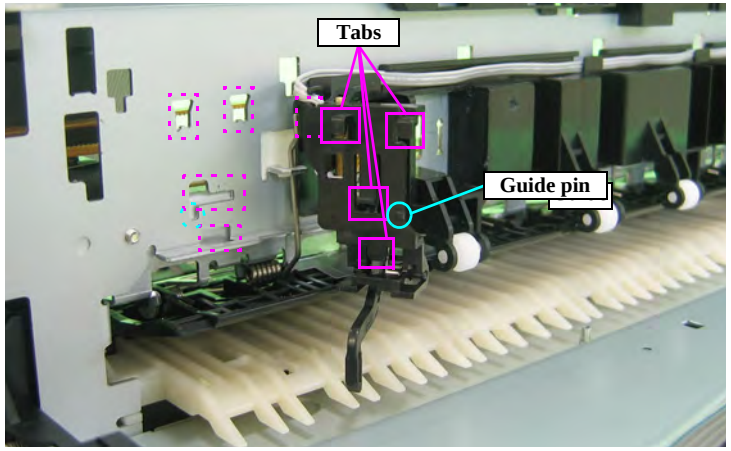


Figure 4-164. Reinstalling the PE Sensor

4.6.5 Cover Open Sensor

1. *Remove the Panel Unit. (p.69)*
2. Remove the C.B.P. M3x10 screw that secures the Cover Open Sensor and remove the Cover Open Sensor.

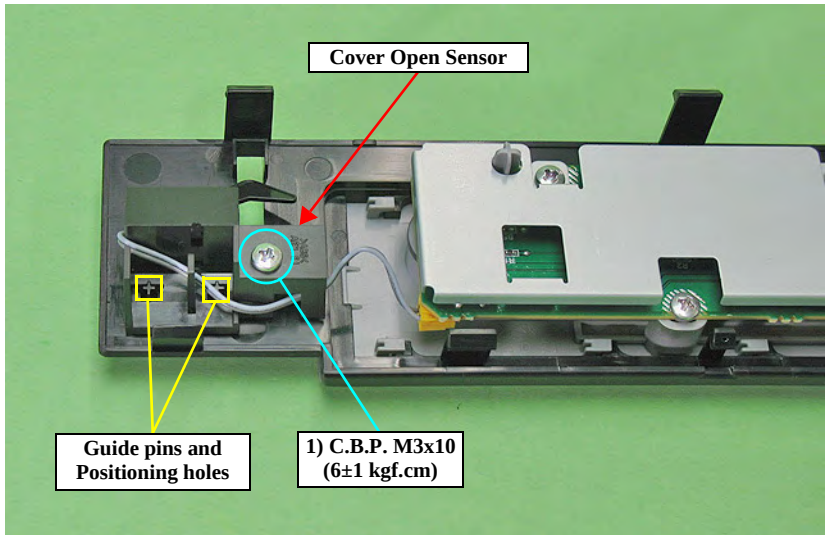


Figure 4-165. Removing the Cover Open Sensor

REASSEMBLY

Align the guide pins with the positioning holes shown in Figure 4-165.

CHAPTER

5

ADJUSTMENT

5.1 Adjustment Items and Overview

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

5.1.1 Servicing Adjustment Item List

The items, purposes and outlines of the Adjustment Program are given in the following table.

Table 5-1. Adjustment Items

Adjustment	Purpose	Method Outline
PF Belt Tension Adjustment	This adjustment is made to reduce the load on the PF motor and to ensure paper feed accuracy.	See ?5.3.1 PF Belt Tension Adjustment? *(p.141)*.
PF Roller Shaft Center Support Position Adjustment	This adjustment is made to compensate the deflection amount on the PF Roller Shaft and to maintain the appropriate paper feed amount.	See ?5.3.3 PF Roller Shaft Center Support Position Adjustment? *(p.146)*.
ASF Guide Roller LDs Position Adjustment	This adjustment is made to optimize the positions of the LD Roller Shaft and Retard Roller in order to maintain the paper feed accuracy.	See ?5.3.5 ASF Guide Roller LDs Position Adjustment? *(p.150)*.
PG Adjustment	This adjustment is made to ensure the correct distance between the head surface and the Front Paper Guide, and to adjust the parallelism between the 0 digit side and the 130 digit side to ensure consistent print quality.	See ?5.3.2 PG Adjustment? *(p.143)*.
EEPROM Data Copy	This adjustment is made to read out the necessary information from the EEPROM using the D4 function. If this copy is completed successfully, all the other adjustments required after replacing the main board are no longer necessary.	1. Select this function in the Adjustment Program. 2. Read out the data from the defective board. 3. After replacing the board with a new one, write the read data to the new board.
Initial Setting	After replacing the Main Board, information common to Main Boards is written by market setting.	1. Select and execute this function in the Adjustment Program. 2. Write the initial settings to the EEPROM.
USB ID Input	A USB ID is given to each printer to identify a specific printer when using multiple printers of same model.	1. Select this function in the Adjustment Program and enter the serial number of the printer. 2. The correction value is saved to the specific EEPROM address of the Main Board.
Head ID Input	When replacing the Print Head, this adjustment is made to reduce head manufacturing variations, which may cause individual differences in print quality.	1. Enter the ID of the Head QR Code Label (10 digits), which is applied to the Print Head, into the program. 2. The ID is stored in the EEPROM of 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.)

Table 5-1. Adjustment Items

Adjustment	Purpose	Method Outline
Initialize PF deterioration offset	The deterioration amount of the PF Roller Shaft is reflected to the paper feed correction amount. Every time a sheet of paper is fed, the deterioration amount is counted on the basis of the original counter value setting.When the PF Roller Shaft or Printer Mechanism has been replaced during repair, the PF deterioration counter must be reset.	1. Select and execute this function in the Adjustment Program. 2. Reset the PF deterioration counter.
Disenable PF deterioration offset	The PF deterioration compensation counter can be reset only when the PF Roller Shaft is new. To reduce the ancillary work in servicing, enter the maximum value (value for which deterioration compensation is not made) if the PF Roller Shaft has not been replaced.	1. Select and execute this function in the Adjustment Program. 2. Reset the PF deterioration counter.
First dot position adjustment	This function adjusts the print starting position in the CR main scanning direction.	1. Select this function in the Adjustment Program and print the adjustment pattern. 2. Enter the value whose printed lines meet the adjustment pattern exactly 5 mm away from the left edge. 3. The correction value is saved to the specific EEPROM address of the Main Board.
PW adjustment	This adjustment is made to correct the PW Sensor mounting position on a software basis to improve a paper detection error caused by the variation of the mounting position.	1. Select this function in the Adjustment Program and print the adjustment pattern. 2. Select a pattern number 5mm away from each edge, and enter that number in the program. 3. The correction value is saved to the specific EEPROM address of the Main Board.
Head angular adjustment	This adjustment is made to correct the error in the Print Head mounting position (Head angle) to make the nozzle line straight with respect to the paper feeding direction. Angular displacement is also checked for.	1. Select this function in the Adjustment Program and print the adjustment pattern. 2. After checking the displacement amount of the pattern, enter the pattern number which has the smallest amount of displacement.
Bi-D adjustment	This adjustment is made to correct the print timing in the go and return paths in bi-directional printing.	1. Select and execute this function in the Adjustment Program. 2. Pattern printing and adjustment are automatically executed. Supplement: Be sure to confirm that there are no dots missing before executing this adjustment.
BAND printing adjustment	This adjustment is made to correct the mis-alignment of vertical lines and timing of printing at monochrome draft printing.	1. Select and execute this function in the Adjustment Program. 2. Pattern printing and select the adjustment value, and write it to the specific EEPROM address on the Main Board.
PF adjustment	This correction is made when the actual paper feed amount differs greatly from the theoretical value due to paper slip, PF roller tolerances, etc. during paper feed for printing.	1. Select this function in the Adjustment Program and print the adjustment pattern. 2. Select or measure the adjustment value, and write it to the specific EEPROM address on the Main Board.
PF band adjustment	This corrects variations in paper feed accuracy in the band print mode to achieve higher print quality.	1. Select this function in the Adjustment Program and print the adjustment pattern. 2. Select the adjustment value, and write it to the specific EEPROM address on the Main Board.

Table 5-1. Adjustment Items

Adjustment	Purpose	Method Outline
CR motor heat protection control	When replacing the Printer Mechanism, this adjustment is made to measure the load of Carriage sliding, and manufacturing variations of the CR Motor and the Power Supply Board to make the most of the motor capabilities in motor heat generation control. When the Power Supply Board, the CR Motor or the Carriage Shaft has been replaced individually or when the correction value of the EEPROM cannot be read out with the main board replacement, the correction value cannot be recalculated since the condition is the different from when it's new, therefore, enter the worst value (on which heat generation limit is easily imposed).	1. Select this function in the Adjustment Program. 2. Select the replacement parts and execute this function to measure automatically the variations and write the measurement values to the EEPROM on the Main Board.
PF motor heat protection control	When replacing the Printer Mechanism, this adjustment is made to measure manufacturing variations of the PF Motor and the Power Supply Board to make the most of the motor capabilities in motor heat generation control. When the Power Supply Board or the PF Motor has been replaced individually, or when the correction value of the EEPROM cannot be read out with the main board replacement, the correction value cannot be recalculated since the condition is the different from when it's new, therefore, enter the worst value (on which heat generation limit is easily imposed).	1. Select this function in the Adjustment Program. 2. Select the replacement parts and execute this function to measure automatically the variations and write the measurement values to the EEPROM on the Main Board.

Table 5-2. Maintenance Functions

Function Item	Purpose	Method Outline
Ink charge	This function is used for Print Head replacement to drain Shipping Liquid of the after-sales service part in the head flow path and simultaneously fill ink in the head flow path to make all nozzles printable and stabilize the ink in the Print Head.	1. Select this function in the Adjustment Program. 2. Transfer the factory-set command (CL execution command (Initial Ink Charge) is used as the command) to the printer to make the printer perform Initial Ink Charge operation.
Head cleaning	This function is used to execute cleaning 3 (CL3) when ink is not delivered from the Print Head properly, e.g. dot missing or skewed injection.	1. Select this function in the Adjustment Program. 2. Execute CL3.
Consumables maintenance counter	This function is used to read and reset the Protection Counters.	1. In the Adjustment Program, select value read or reset from this function. Make sure to replace the Waste Ink Pads managed by the protection counters before resetting the counter.

Table 5-3. Additional Functions

Function Item		Purpose	Method Outline
Final check pattern print	A4 size	Use this to check if the all adjustments have been properly made.	The all adjustment patterns are printed automatically.
	US Letter size		
EEPROM dump		Use this to read out the EEPROM data for analysis.	The all EEPROM data is automatically read out and stored as a file.
Printer information check	Manual CL counter	Use this to read out information on the printer operations.	The printer information is automatically read out.
	I/C exchange CL counter		
	Timer CL counter		
	Print path counter		

5.1.2 Required Adjustments

The table below lists the required adjustments depending upon the parts being repaired or replaced. Find the part(s) you removed or replaced, and check which adjustment(s) must be carried out.

Table 5-4. Required Adjustment List

Priority		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Part Name \ Adjustment Item		PF Belt tension adjustment	PF Roller Shaft Center Support Position adjustment	ASF Guide Roller LDs Position Adjustment	PG Adjustment	EEPROM Data Copy	Initial setting/USB ID Input	Head ID input	Consumables maintenance counter	Ink charge	Initialize PF deterioration offset	Disenable PF deterioration offset	First dot position adjustment	PW adjustment	Head angular adjustment	Bi-D adjustment	BAND printing adjustment	PF adjustment	PF band adjustment	CR motor heat protection control	PF motor heat protection control	Final check pattern print
ASF Assy	Remove	---	---	*1	---	---	---	---	---	---	---	---	O	---	---	---	---	---	---	---	---	O
	Replace	---	---	O	---	---	---	---	---	---	---	---	O	---	---	---	---	---	---	---	---	O
CR Motor	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
Printhead	Remove	---	---	---	O	---	---	---	---	---	---	---	O	O	O	O	O	---	---	---	---	O
	Replace	---	---	---	O	---	---	O	---	O	---	---	O	O	O	O	O	---	---	---	---	O
Main Board	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace (Read OK)	---	---	---	---	O	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace (Read NG)	---	---	---	---	---	O	O	*2	---	---	O	O	O	O	O	O	O	O	O	O	O
PS Board	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O	O	O
Front Paper Guide/ Paper Eject Roller	Remove	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---	---	O	O	---	---	O
	Replace	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---	O	O	O	---	---	O
PF Roller Shaft	Remove	O	O	---	O	---	---	---	---	---	---	---	---	O	---	---	---	O	O	---	---	O
	Replace	O	O	---	O	---	---	---	---	---	---	---	---	O	---	---	---	O	O	---	---	O
PF Motor	Remove	O	O	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	O	O	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O	O

Table 5-4. Required Adjustment List

Priority		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Adjustment Item / Part Name		PF Belt tension adjustment	PF Roller Shaft Center Support Position adjustment	ASF Guide Roller LDs Position Adjustment	PG Adjustment	EEPROM Data Copy	Initial setting/USB ID Input	Head ID input	Consumables maintenance counter	Ink charge	Initialize PF deterioration offset	Disenable PF deterioration offset	First dot position adjustment	PW adjustment	Head angular adjustment	Bi-D adjustment	BAND printing adjustment	PF adjustment	PF band adjustment	CR motor heat protection control	PF motor heat protection control	Final check pattern print
Waste Ink Tray Assy/Front Paper Guide Pad	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	---	---	---	---	---	---	---	O	---	---	---	---	---	---	---	---	---	---	---	---	O
Carriage shaft	Remove	---	---	---	*3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	---	---	---	O	---	---	---	---	---	---	---	O	O	O	O	O	---	---	---	---	O
Carriage Unit	Remove	---	---	---	O	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	---	---	---	O	---	---	---	---	---	---	---	O	O	O	O	O	---	---	---	---	O
Paper EJ Frame Assy	Remove	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---	---	O	O	---	---	O
	Replace	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---	---	O	O	---	---	O
Printer Mechanism	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	O	---	O	O	---	---	---	---	---	O	---	O	O	O	O	O	O	O	O	O	O
PW Sensor	Remove	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---	---	---	---	---	---	O
	Replace	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---	---	---	---	---	---	O

CAUTION

- **When the EEPROM Data Copy cannot be made for the main board that needs to be replaced, the Waste Ink Tray Assy must be replaced after replacing the main board with a new one.**
- **After all required adjustments are completed, use the "Final check pattern print" function to print all adjustment patterns for final check. If you find a problem with the printout patterns, carry out the adjustment again.**
- **When using a new main board for replacing the Printer Mechanism, the Initial setting must have been made to the main board.**

Note : "O" indicates that the adjustment must be carried out. "---" indicates that the adjustment is not required. If you have removed or replaced multiple parts, make sure to check the required adjustments for the all parts. And when multiple adjustments must be carried out, be sure to carry out them in the order given in the "Priority" row.

Note "*1" :When only removing the ASF Assy, you do not need to perform the adjustment. In that case, mark the installing positions before removing them, and make sure to align the markings when installing. See ?4.4.6 ASF Assy? *(p96)*.

"*2" :Replacing the Waste Ink Tray Assy is necessary when resetting waste ink pad counter.

"*3" :When only removing the Carriage Shaft, you do not need to perform the adjustment. In that case, mark on the Parallelism Adjust Bushing (Left/Right) before removing them, and make sure to align the markings when installing. See ?4.4.5 Carriage Shaft / Carriage Unit? *(p88)*.

5.1.3 Required Adjustment Tools

The following table lists the adjustment tools required for adjustment of this product.

Table 5-5. List of Tools

No.	Name	Part Code	Category	Overview
1	Adjustment Program	–	Software	This adjustment program is designed to display the required adjustment items in the appropriate order when a replacement part is selected, and provides workers with the accurate adjustment order.
2	G-26	1080614	Grease	For the Parallelism Adjust Bushing, Lower Paper Guide, Driven Release Shaft, etc.
3	G-45	1033657	Grease	For the PF Roller, Front Paper Guide, Rear Paper Guide and etc.
4	G-71	1304682	Grease	For the Carriage Unit and Carriage Shaft.
5	PG Adjustment Gauge	1276333	Gauge	A gauge exclusively used to make PG Adjustment. Check the correction value by energizing it in the same way as for Stylus Photo R1800.
6	PF Tension Measuring Tool	1294120	Measuring tool	Used to check whether or not the tension of the PF Drive Belt is within the specified value. If load is greater than the specified value, the PF Motor may generate heat, burning off the coil. Reversely, if load is less than the specified value, the paper feed position may shift.
7	PF Roller Shaft Position Adjustment Jig	1304993	Adjusting jig	Used to check whether or not the deflection amount of the PF Roller Shaft is within the specified value. Adjustment values are confirmed in a pair with the level block.
8	Level Block	1304994	Adjusting jig	Used to check whether or not deflection amount of the PF Roller Shaft is within the specified value. Adjustment values are confirmed in a pair with the PF Roller Shaft Position Adjustment Jig.
9	Spanner (M3)	Commercially available	Tool	Used to loosen the screw that secures the Center Support Bushing when performing PF Roller Shaft Center Support Position Adjustment.

Table 5-5. List of Tools

5.2 Adjustment Using Adjustment Program

This section explains the adjustments using the Adjustment Program.

5.2.1 Head angular adjustment

The following pattern is printed. The lines on the top are printed while the carriage moves from the home to the other side (from 1 to 80 digit), and the lines at the bottom are printed while the carriage returns to the home (80 to 1 digit).

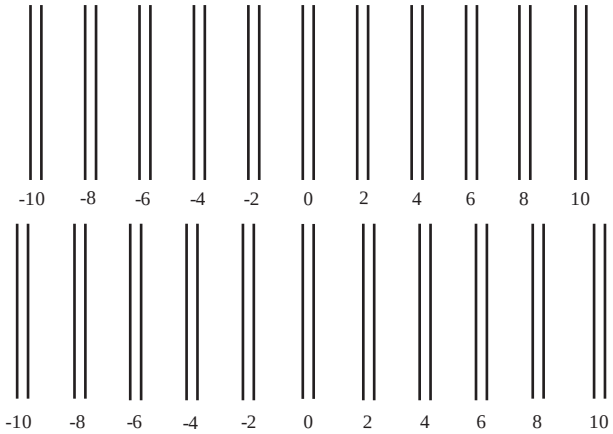


Figure 5-1. Head Angular Adjustment Printout Pattern

How to Judge

Examine the printout patterns and enter the value (-10 to 10) for the most straight lines.

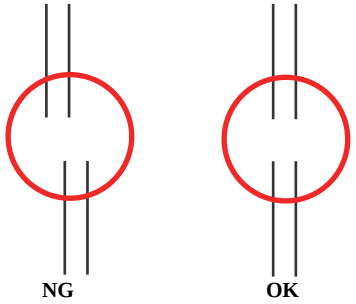
Additional information

In the following cases, reassemble or replace the Printhead and carry out the adjustment again.

- The difference between the adjusted values of 1 -> 80 and 80 -> 1 exceeds 8.
  The larger the difference is, the more the Printhead is tilted in the front-to-back direction. (Not parallel to the paper surface.)
- The average of the values of 1 -> 80 and 80 -> 1 falls outside the range from -4 to +4.
  The further the value is beyond the range, the more the Printhead is tilted in the left-to-right direction. (Not parallel to the paper edge.)

CHECK POINT

Example for judgement



5.2.2 PW Adjustment/First Dot Position Adjustment

Patterns are printed as shown below.

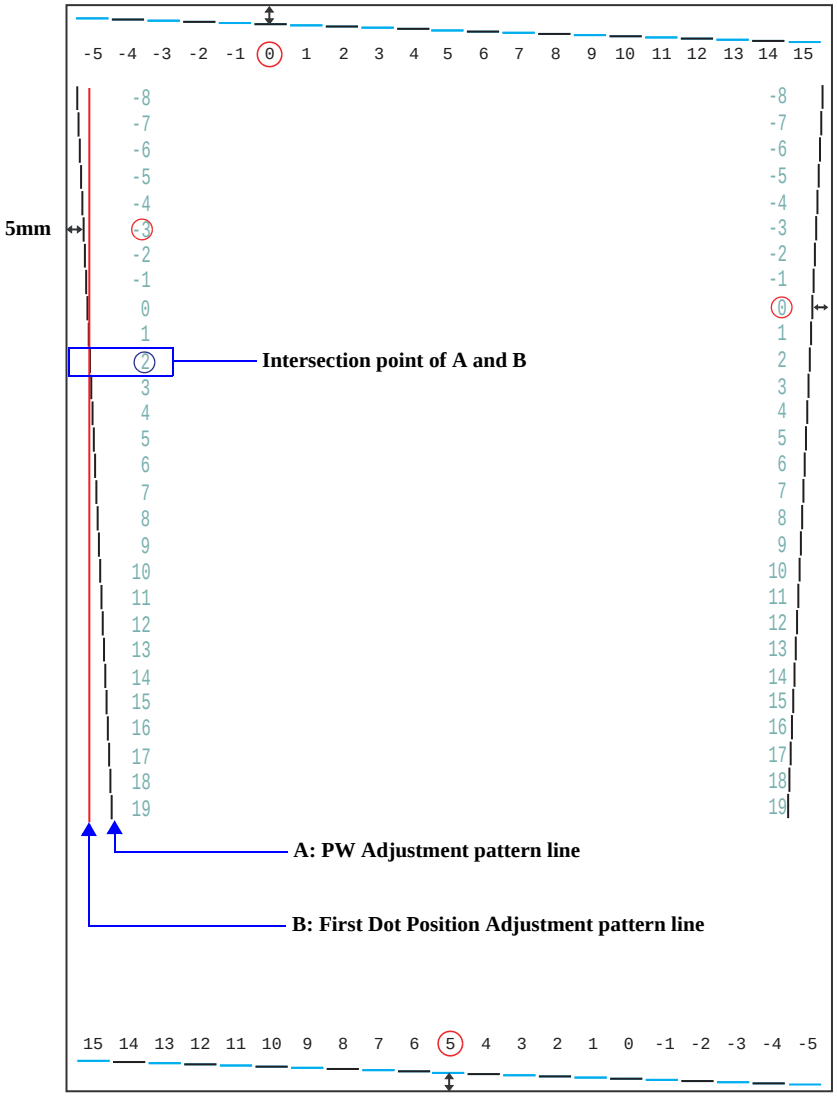


Figure 5-2. PW Adjustment Pattern/First Dot Position Adjustment Pattern

☐ **PW Adjustment**

How to Judge

Enter the value of the line located 5mm away from each edge.

Example: In the left figure, enter “0” (top), “5” (bottom), “-3” (left) and “0” (right).

☐ **First Dot Position Adjustment**

How to Judge

Enter the value of the point of intersection of the PW Adjustment pattern line and First Dot Position Adjustment pattern line on the left.

Measure the distance from the left edge of the paper to the printed line. Enter the value for the line that is exactly 5 mm away from the edge.

Example: In the left figure, enter “2” since the lines intersect at 2.

5.2.3 Bi-D adjustment

The pattern shown below is printed for each of the PG settings.

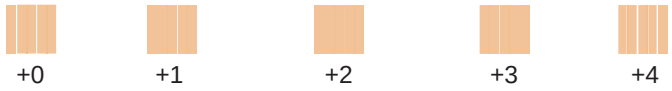


Figure 5-3. Bi-D Adjustment Printout Pattern

How to Judge

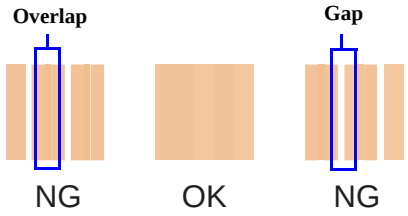
Examine the printout patterns for each of the five modes, and enter the value for the pattern with no gap and overlap for each mode.

Additional information

If no OK pattern is printed, enter the value for the best one, and print the adjustment pattern again.

CHECK POINT

Example for judgement



5.2.4 BAND printing adjustment

The following pattern is printed on two sheets each for Bi-d band adjustment and Pass offset adjustment with two dot sizes (ECO, VSD1).

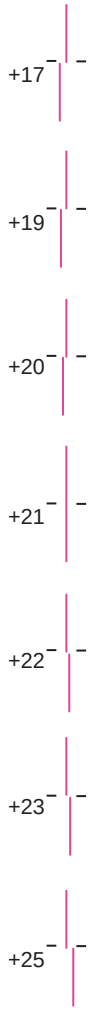


Figure 5-4. BAND printing adjustment Printout Pattern

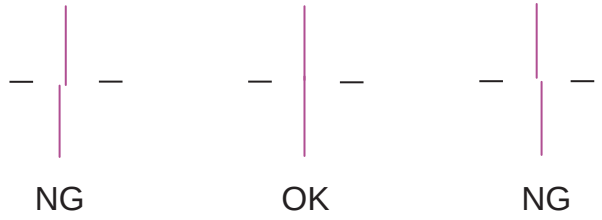
☐ **Bi-d band adjustment**

How to Judge

Examine the printout patterns and enter the values of the most straight lines.

CHECK POINT

Example for judgement



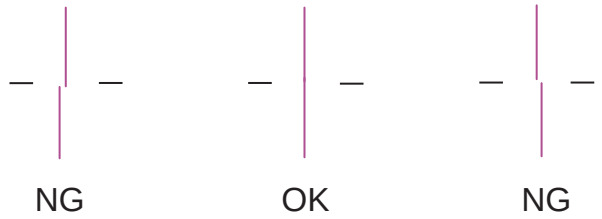
☐ **Pass offset adjustment**

How to Judge

Examine the printout patterns and enter the values of the most straight lines.

CHECK POINT

Example for judgement



5.2.5 PF adjustment

☐ **PF- for standard print area**

The following pattern is printed.

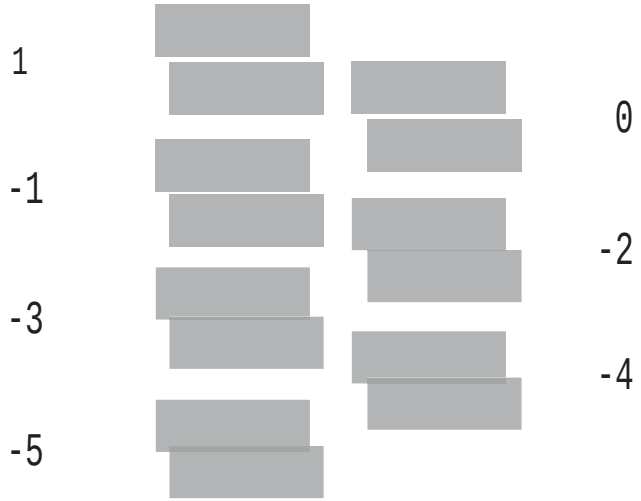


Figure 5-5. PF (standard print area) Adjustment Printout Pattern

How to Judge

Examine the printout patterns, and enter the value for the pattern with no overlap and gap between the upper and lower ones.

CHECK POINT

Example for judgement

☐ **PF- for bottom margin area**

The following pattern is printed.

How to Judge

Examine the printout patterns, and enter the value for the pattern with no overlap and gap between the upper and lower ones.

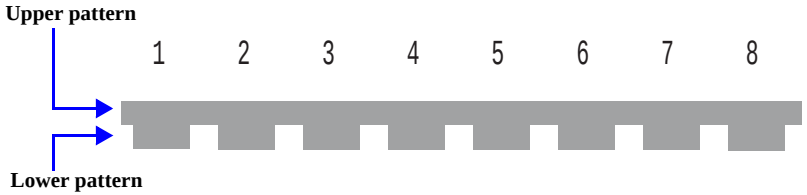


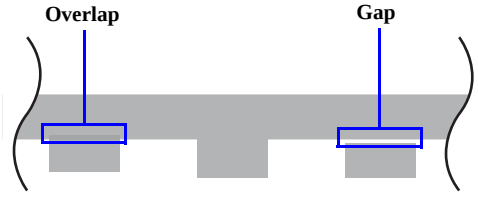
Figure 5-6. PF (bottom margin area) Adjustment Printout Pattern

Additional information

When overlap and gap are observed in the all patterns, enter the value for the best one, and print the adjustment pattern again.

CHECK POINT

Example for judgement



5.2.6 PF band adjustment

The following pattern is printed.

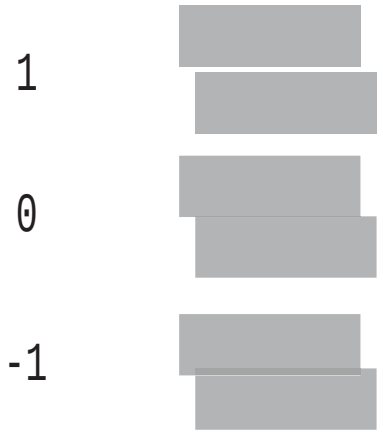


Figure 5-7. PF Band Adjustment Printout Pattern

How to Judge

Examine the printout patterns and enter the value for the pattern with no overlap and gap between the two rectangles.

Additional information

When overlap and gap are observed in the all patterns, enter the value for the best one, and print the adjustment pattern again.

CHECK POINT

Example for judgement

5.3 Adjustment without Using Adjustment Program

This section explains the adjustments that do not use the Adjustment Program.

5.3.1 PF Belt Tension Adjustment

When either of the following parts has been removed or replaced, this adjustment must be performed to reduce load on the PF Motor and to secure paper feed accuracy.

- PF Motor
- PF Roller Shaft
- Printer Mechanism

The PF Tension Measuring Tool is used for this adjustment.

Figure 5-8. PF Tension Measuring Tool

5.3.1.1 PF Belt Tension Adjustment Method

CAUTION

Proper measurement may be interrupted by sounds picked up from around. Make measurement in silent environment.

1. Secure the PF Motor to the Printer Mechanism, and install the Drive Belt on the Gear of the PF Scale and the Pinion Gear of the PF Motor.
2. Press the [POWER] button. The LCD of the Measuring Tool displays No. 0 and No. 1.
3. From among No. 0 to No. 9, select the channel you want to store its setting by pressing the [SELECT] button. The initial value may be selected as the channel.)
4. Press the [WEIGHT] button. The initial value will be displayed. Type the ten-key pad so that “1.2g/m” is displayed.
5. Press the [WIDTH] button. The initial value will be displayed. Enter “5.0 mm” with the ten-keypad.
6. Press the [SPAN] button. The initial value will be displayed. Enter “48mm” with the ten-keypad.
7. Bring the Microphone as close as possible to the center of the Timing Belt.

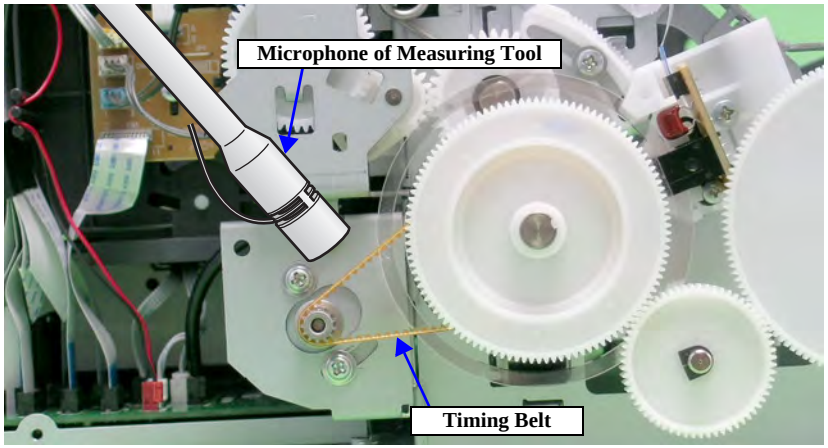


Figure 5-9. Microphone Position

CAUTION

As the Drive Belt is flipped with the tip of tweezers in the following steps, carefully choose the flipping position so that the Belt will not make contact with the Microphone by reaction of flipping.

8. Press the [MEASURE] button. (“----” is displayed on the LCD screen.)
9. Put the tip of the tweezers on the Drive Belt, and flip it downward in that position. The “----” displayed on the LCD will become wave pattern during the measurement. When it has finished, the measurement result will be displayed by “N” (Newton) after the beep. This jig can pick up and measure sounds accurately, regardless of the flipping force.
10. Repeating 8 and 9, delicately shift the variable part of the PF Motor mounting position to adjust the tension until the tension falls within the allowable standard value.

ADJUSTMENT REQUIRED

Standard Value: 10.5 ± 2N (8.5 ~ 12.5N)

CAUTION

- **Even if the Timing Belt is flipped, the LCD screen may not change at all. In this case, flip the Timing Belt again after a few seconds have passed.**
- **If measurement results differ greatly from each other, acoustic sounds may not be picked up properly in any of the measurements. Therefore, flip the Timing Belt again with the tweezers, and record the value at which two measurement results are approximate. Displaying errors in the range 1/100 to 5/100, the Measuring Tool has high reliability.**

5.3.2 PG Adjustment

CHECK POINT

- **Some pictures used in this section are Stylus Photo R1800. The adjustment method for WorkForce 1100/Epson Stylus Office T1110/B1100/T1100/Epson ME Office 1100 is the same as the one for Stylus Photo R1800.**
- **When only removing the Carriage Shaft, you do not need to perform this adjustment. In that case, mark the position of the rib on the Parallelism Adjust Bushing (Left/Right) before removing them, and make sure to align the markings with the ribs when installing them.** *(Refer to 4.4.5 Carriage Shaft / Carriage Unit (p88).)*

When any of the following parts has been removed or replaced, this adjustment must be performed to secure the specified clearance between the print surface of the Print Head and paper.

- Print Head
- PF Roller Shaft
- Carriage Unit
- Carriage Shaft (Including the case when just moved the Parallelism Adjust Bushing)
- Printer Mechanism

In this adjustment, use the same Adjustment Gauge on the left and right sides.

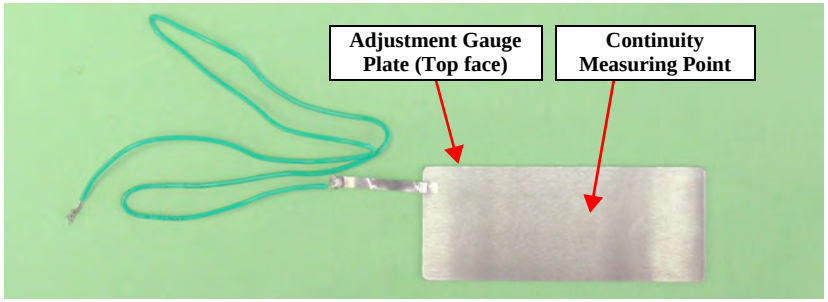


Figure 5-10. Adjustment Gauge

CAUTION

- **Do not touch the Adjustment Gauge Plate surface with bare hands.**
- **If the Adjustment Gauge Plate surface is stained by ink or, etc wipe it with a soft cloth.**

5.3.2.1 PG Adjustment Method

CAUTION

- **Before starting PG adjustment, completely wipe drops of ink around the Print Head. Remaining drops of ink will stick to the continuity measurement portion of the Adjustment Gauge, and generate continuity before the continuity measurement portion makes contact with the metal frame around the Print Head, interrupting accurate PG Adjustment.**
- **As the ink in the Print Head may stick fast and damage the Print Head during PG Adjustment, make the continuity time detected with a tester as short as possible. (Maximum 3 minutes)**

1. Install the printer on a level base.

CAUTION

Place the printer on a level, warp-free table. Normal PG Adjustment cannot be performed on a warped table.

2. Connect the Tester to the printer frame and Adjustment Gauge.

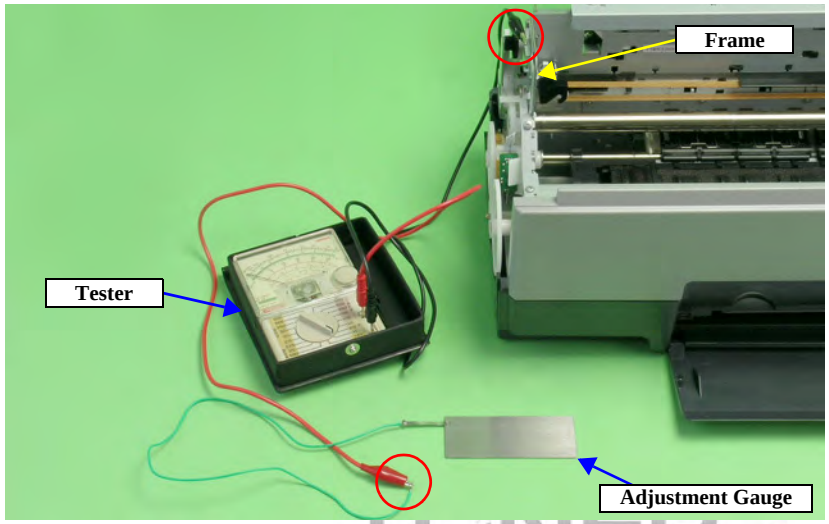


Figure 5-11. Connecting the Tester

3. Load unused Ink Cartridges of all colors into the Carriage Unit.
4. Loosen the screw that secures the Parallelism Adjust Bushing.
5. Turn the Parallelism Adjust Bushing upward to align the frame edge and the bottom of the Parallelism Adjust Bushing gear.

CAUTION

When the Parallelism Adjust Bushing is turned upwards, the frame rises up and PG narrows. Make sure that the frame does not come into contact with the Print Head when performing the following procedure.

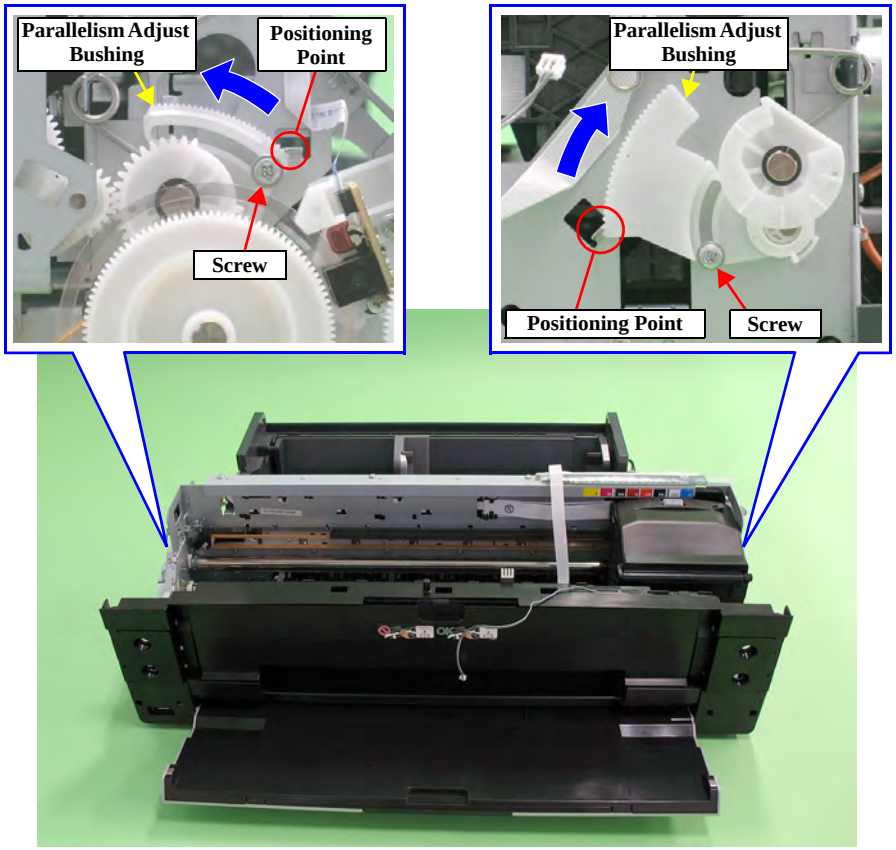


Figure 5-12. Setting the Parallelism Adjust Bushing

6. With its conductor connection portion up, set the Adjustment Gauge in the specified position (on the left side of the Front Paper Guide).
   - Setting Position
     Rear direction: Align the rear end of the Gauge with the Driven Roller Shaft of the Upper Paper Guide.
     Left direction: Release the left end of the Gauge from the Tab on the Front Paper Guide in *Figure 5-13*.

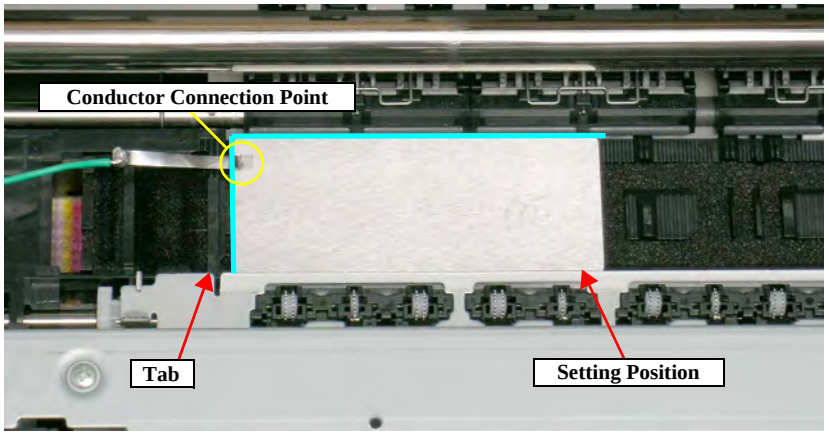


Figure 5-13. Setting the Adjustment Gauge

7. Move the Carriage Unit onto the Adjustment Gauge.
   - Moving position
     Align the left end of the Gauge with the left end of the Carriage Unit.

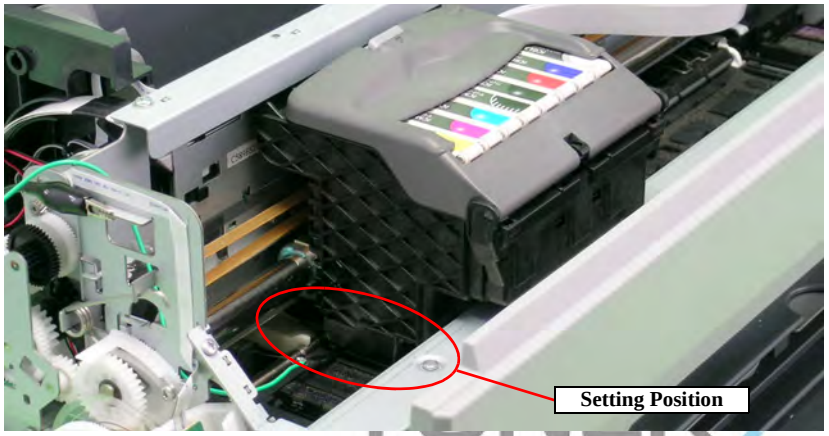


Figure 5-14. Moving the Carriage Unit

8. To set the PG position to the "--" position, turn the PG Cam on the right end of the Carriage Shaft clockwise so that the point marked "--" faces down.

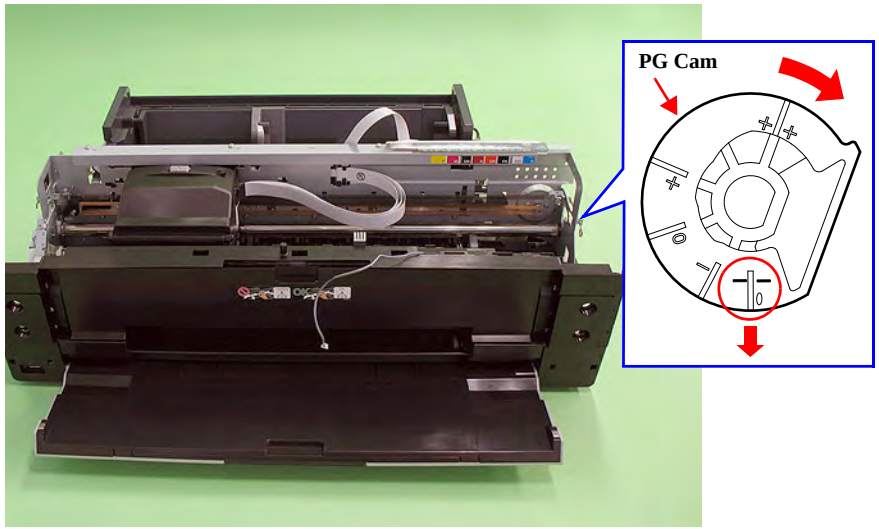


Figure 5-15. Markings of the PG Cam

ADJUSTMENT REQUIRED

- **PG Standard Value**
  - **PG – – (Minus Minus) :1.05mm~1.25mm**
  - **PG – (Minus) :1.2mm~1.4mm**
- **Adjustment Resolution :0.06mm**

9. Lower the Gear of the Parallelism Adjust Bushing on the left side of the frame stepwise, and confirm continuity. When continuity is confirmed, define the position where the Gear was raised one step up from the continuity position (where continuity is lost) as the left side PG position. Move the Parallelism Adjust Bushing at least twice to confirm that the continuity position and the non-continuity position are the same.

CHECK POINT

The following figure shows the states of the Adjust Parallel Bushing of the left side of the frame and the PG. This also applies to the Adjust Parallel Bushing on the right side of the frame.

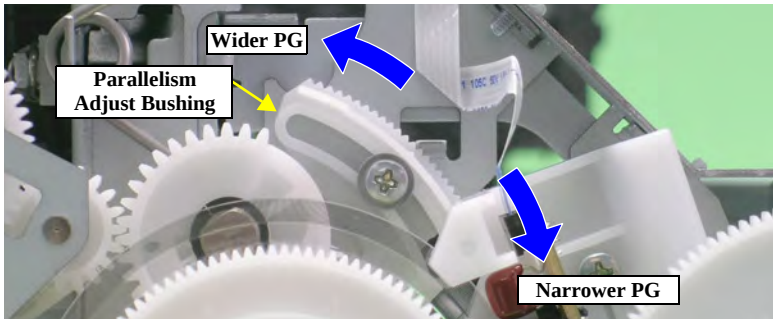


Figure 5-16. Relationship between Parallelism Adjust Bushing and PG

10. To set the PG position to "0" or more, turn the PG Cams on both ends of the Carriage Shaft CCW so that the point marked "0" (or "+" or "++") faces down.

11. With its conductor connection portion up, set the Adjustment Gauge in the specified position (on the right side of the Front Paper Guide).

- Setting Position

  Rear direction: Align the rear end of the Gauge with the Driven Roller Shaft of the Upper Paper Guide.

  Right direction: Release the right end of the Gauge from the Tab on the Front Paper Guide in *Figure 5-17*.

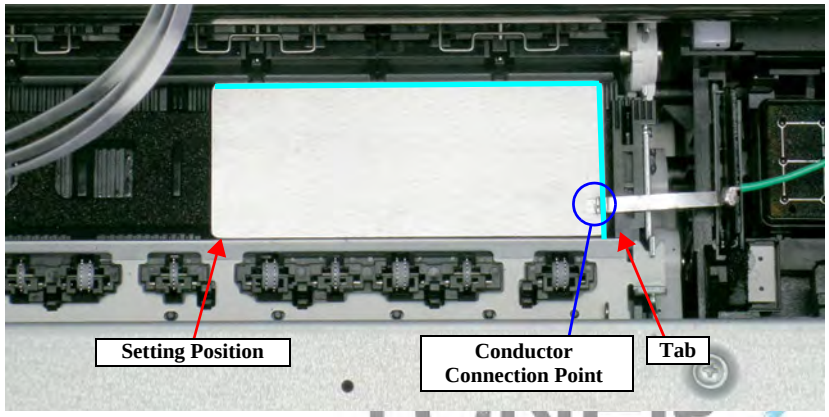


Figure 5-17. Setting the Adjustment Gauge

12. Move the Carriage Unit onto the Adjustment Gauge.
    - Moving position
      Align the right end of the Gauge with the right end of the Carriage Unit.

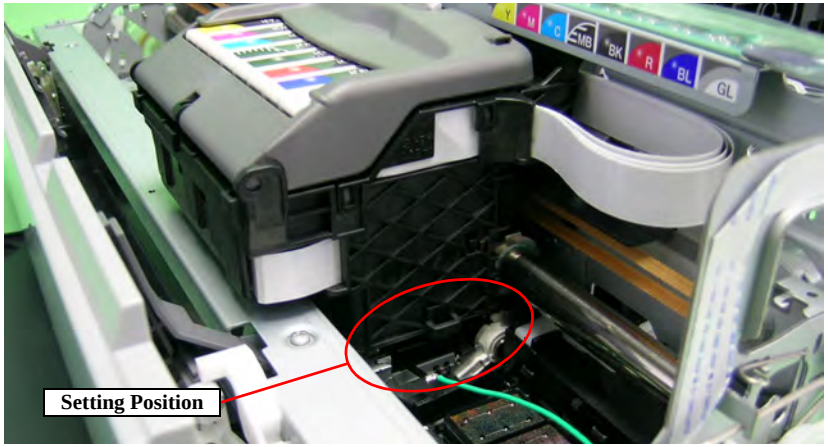


Figure 5-18. Moving the Carriage Unit

13. Return the PG position to "--".
14. As in step 9, move the Parallelism Adjust Bushing on the right side of the frame to set the right side PG position.
15. Set the PG position to 0 or more.
16. Set the Adjustment Gauge on the left side of the Front Paper Guide.
17. Move the Carriage Unit onto the left side Adjustment Gauge.
18. Return the PG position to "--".
19. Check continuity again at the PG position on the left side. If the PG position is not out of position, tighten the Parallelism Adjust Bushing with the screws to end the adjustment. If it is out of position, repeat the adjustment procedure from step 9.

5.3.3 PF Roller Shaft Center Support Position Adjustment

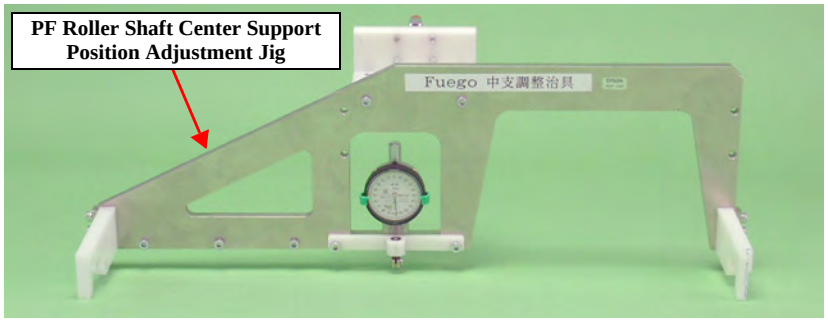
This adjustment must be performed to compensate the deflection amount on the PF Roller Shaft and to maintain an appropriate paper feed amount when the following parts are removed and replaced.

- PF Motor
- PF Roller Shaft

The PF Roller Shaft Position Adjustment Jig and Level block are used for this adjustment.

CHECK POINT

- **A substitute level block can be used if its surface accuracy is within 50μ.**
- **Use a Spanner (M3) to loosen the screw that secures the Center Support Bushing.**



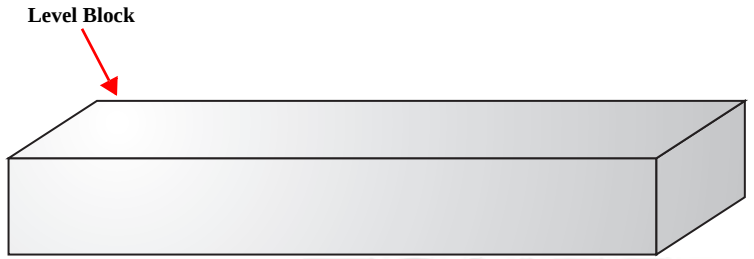


Figure 5-19. PF Roller Shaft Center Support Position Adjustment Jig and Level Block

5.3.4 How to Adjust the PF Roller Shaft Center Support Position

1. Before performing this adjustment, remove the following parts:
   - Lower Housing *(Refer to 4.4.4 Lower Housing / Printer Mechanism (p86).)*
   - ASF Assy *(Refer to 4.4.6 ASF Assy (p96).)*
   - Board Assy *(Refer to 4.3.1 Board Assy (Main Board/Power Supply Board) (p75).)*
   - Carriage Unit *(Refer to 4.4.5 Carriage Shaft / Carriage Unit (p88).)*
2. Install the printer on a level base.

CAUTION

Place the printer on a level, warp-free table. This adjustment cannot be performed correctly if it is performed on a warped table.

3. Set the PF Roller Shaft Position Adjustment Jig in place on the Level block, and perform zero adjustment.
   - Long hand position: Turn the dial to adjust the "0" position on the scale to the long hand position with the jig set in place on the Level block.
   - Short hand position: Check it.

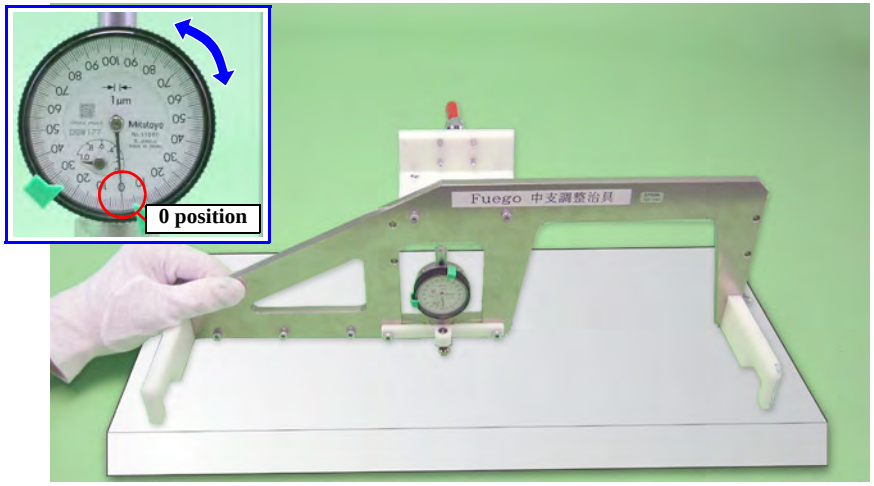


Figure 5-20. Setting the PF Roller Shaft Position Adjustment Jig (1)

4. Tilt the Printer Mechanism at about 45 degrees, and loosen the screws that secure the Center Support Bushing Cam and the Center Support Bush.

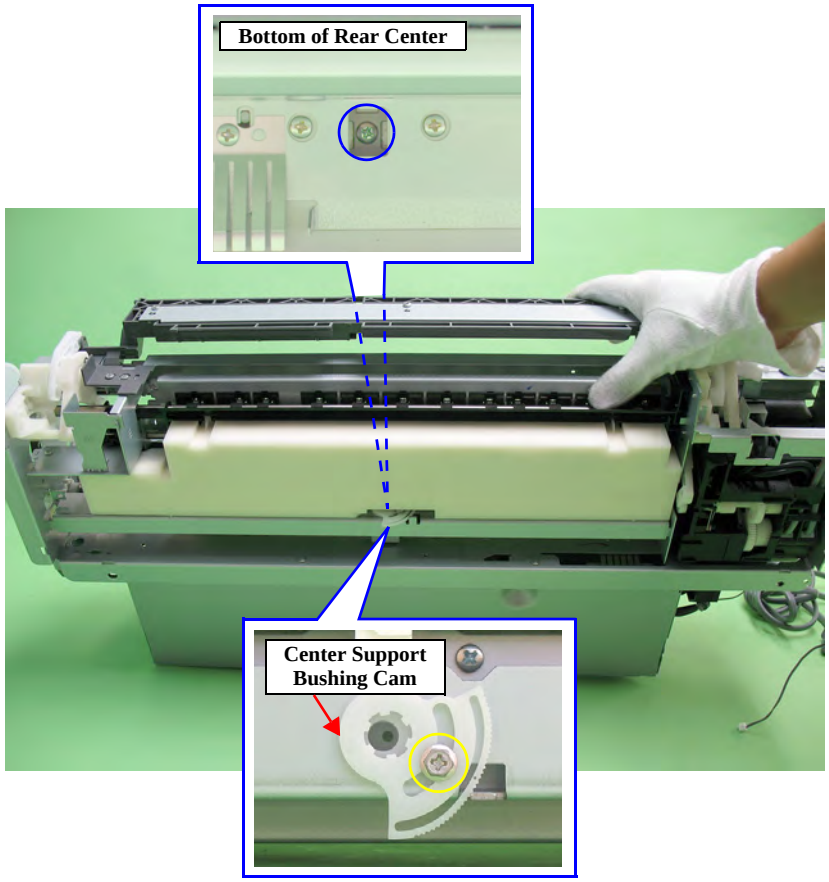


Figure 5-21. Center Support Bushing Cam and the Screw

CAUTION

Check for any dirt on the PF Roller Shaft when performing the following procedure.

5. Set the jig in place on the PF Roller Shaft as shown in the figure below.
   - Left side: Inside of PF Roller left end (E-ring)
   - Right side: Clearance between PF Roller right end (Right Bushing 8) and left end of Upper Paper Guide
   - Center: Clearance between the 2nd Upper Paper Guide and 3rd one from the left

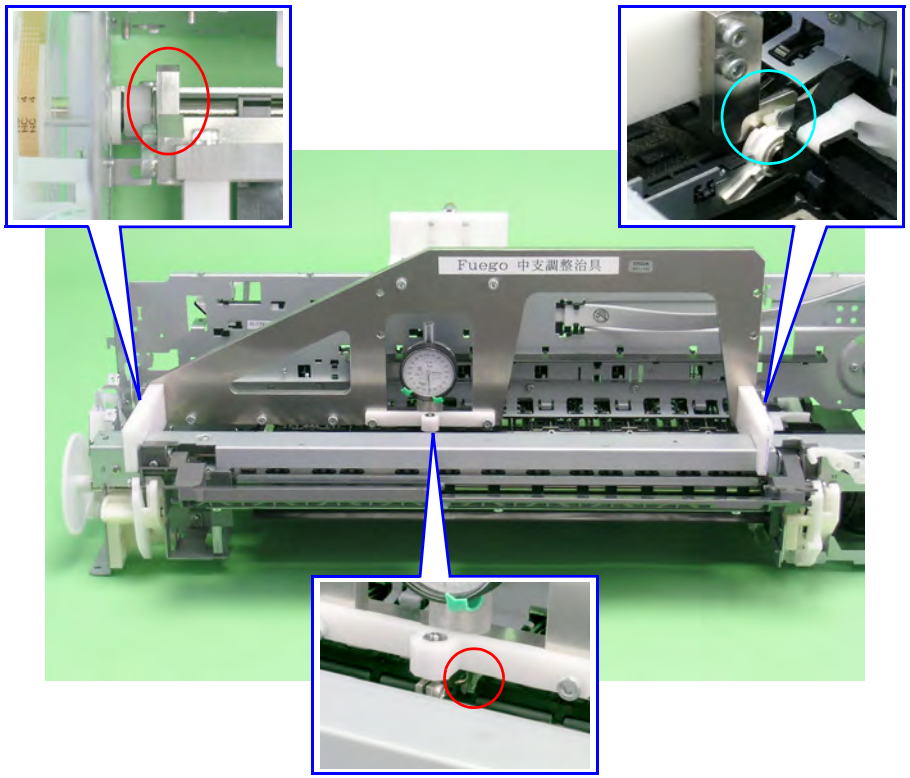


Figure 5-22. Setting the PF Roller Shaft Position Adjustment Jig (2)

6. Turn the Center Support Bushing Cam so that the long hand position is +30μ from the "0" adjustment position.

ADJUSTMENT REQUIRED

- **Standard Value: -10 ~ 40μ**
- **Adjustment Resolution: 50μ**

CAUTION

- **+30μ must be set to compensate for the thickness of the coating on the PF Roller Shaft.**
- **Make sure that the position of the short hand is the same as at "0" adjustment.**

CHECK POINT

The figure below shows the positional relationship between the Center Support Bushing Cam and the Dial Gage.

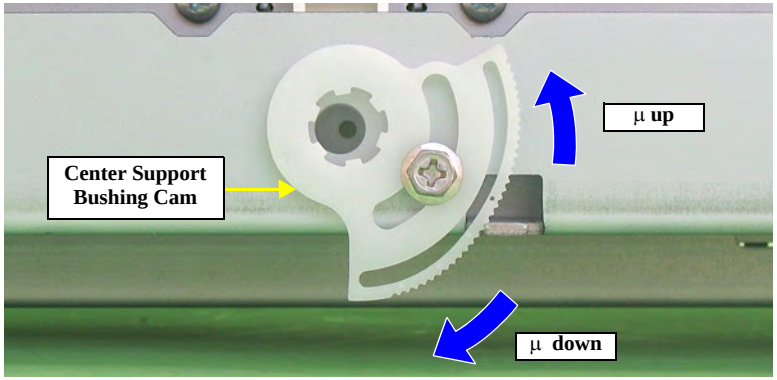


Figure 5-23. Positional Relationship between Center Support Bushing Cam and the Dial Gage

7. Tighten the Center Support Bushing Cam and the Center Support Bushing with the screws.

CAUTION

Check the adjustment value again as it deviates slightly when the screw is tightened.

The following page shows print samples when adjustment of the PF Roller Shaft Center Support Positions are inside and outside the specified value range.

Figure 5-24. Outside the Specified Value Range

Figure 5-25. Inside the Specified Value Range

5.3.5 ASF Guide Roller LDs Position Adjustment

When installing the Guide Roller LDs, the position of the Guide Roller LDs must be adjusted so that the positions of the LD Roller Shaft and Retard Roller are optimized in order to maintain the paper feed accuracy.

5.3.5.1 Adjusting the Position of the ASF Guide Roller LDs

CHECK POINT

When only removing the ASF Assy, you do not need to perform this adjustment. In that case, mark the installing positions of the Guide Roller LDs before removing them, and make sure to align the markings when installing the Guide Roller LDs. *(Refer to 4.4.6 ASF Assy (p96).)*

1. After installing the *?4.4.6 ASF Assy? (p96)*, loosen the two C.B.S. M3x6 screws that secure the Guide Roller LD.

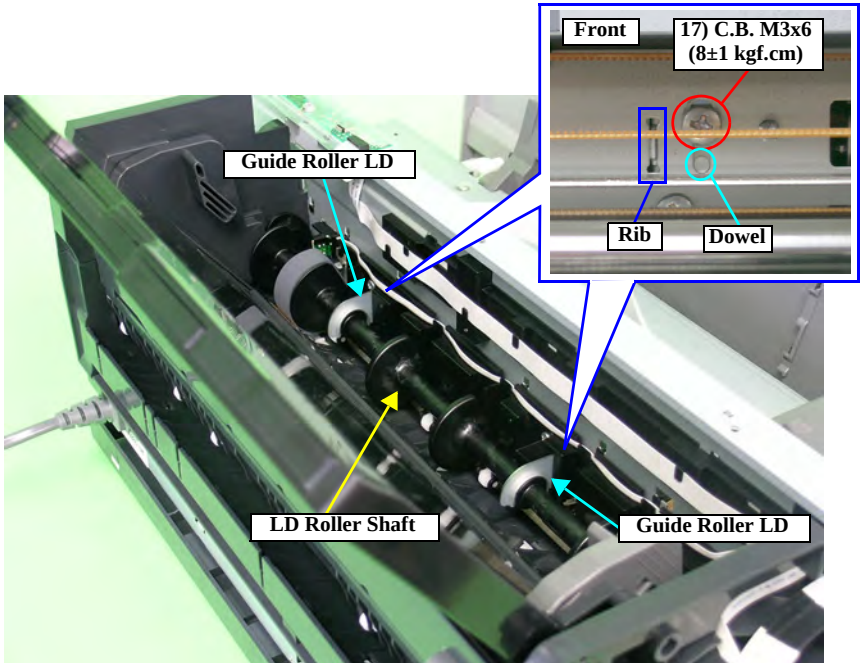


Figure 5-26. Guide Roller LD

2. Turn Combination Gear 29.11 on the right side of the ASF Assy CCW to raise the Hopper to the upper limit position (until the Hopper Pad contacts the LD Roller).

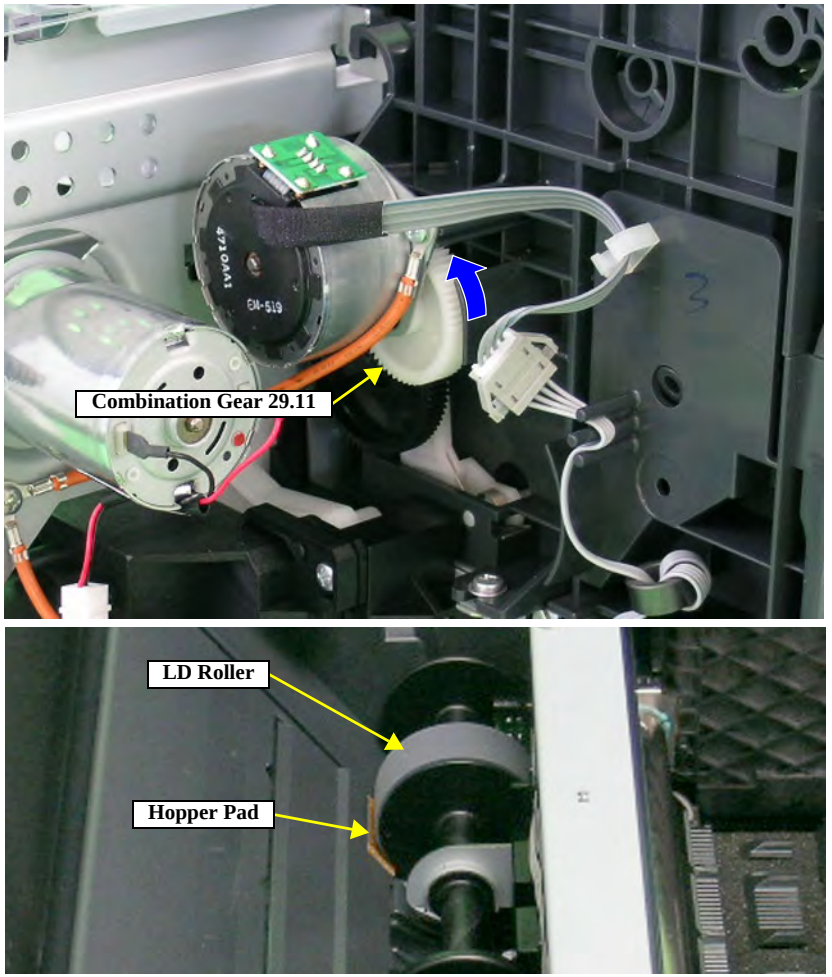


Figure 5-27. Raising the Hopper

3. Light the printer's inside through a gap between the Roll Paper Frame and the ASF Assy with a penlight, and look the tab on the Retard Roller Holder at the back of the two reference tabs on the ASF Assy through the notch. After making sure that the two reference tabs are aligned when viewed edge-on, adjust the position of the Retard Roller Holder Tab by pressing the Guide Roller LD (0 digit side) so that it is placed within the range as shown in the simplified diagram in Figure 5-28.

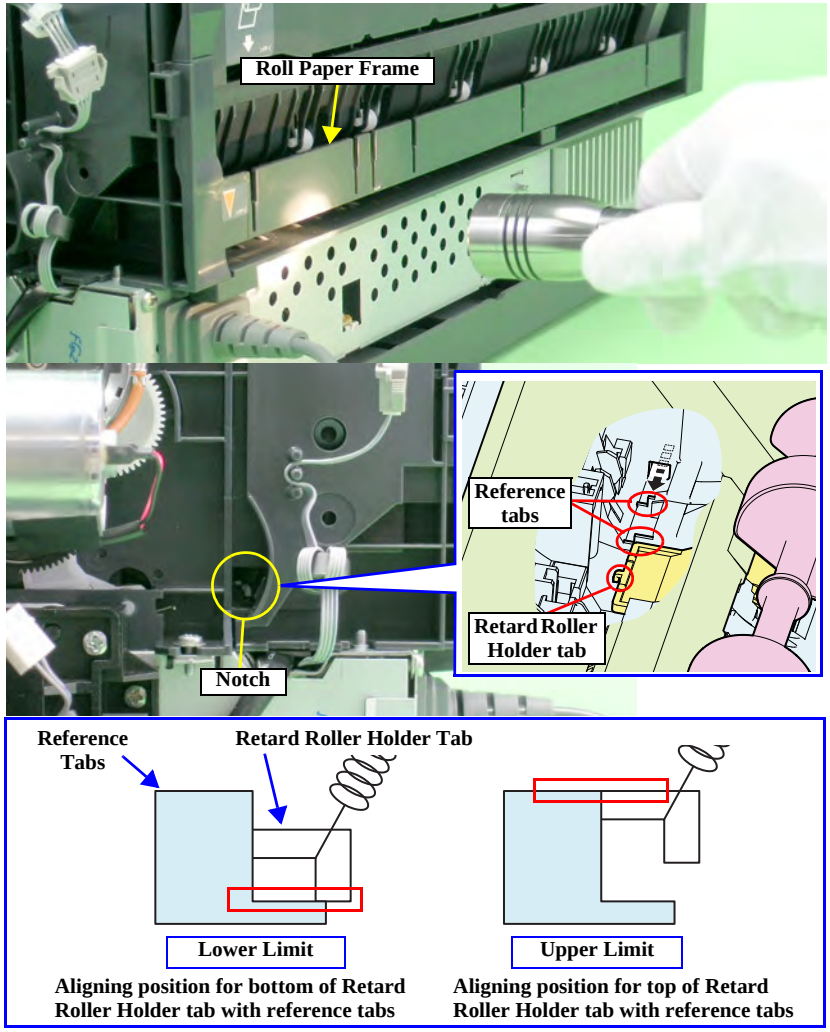


Figure 5-28. Aligning the Position of the Guide Roller LD (0 Digit Side)

4. Align the guide pin and tab on the 0 Digit Side Guide Roller LD with the positioning holes on the Main Frame, and tighten the Guide Roller LD (0 Digit Side) with the screws. *(See Fig.5-29.)*
5. Check the position of the Retard Roller Holder Tab again through the notch. If it is not inside the range, remove the screws on the Guide Roller LD (0 Digit Side), and repeat steps 2 to 4 to set the tab within the range.
6. Check the clearance in both ends of the positioning hole that the Guide Roller LD Tab is inserted. And align Guide Roller LD (130 Digit Side) to the same height, and tighten with the screws.

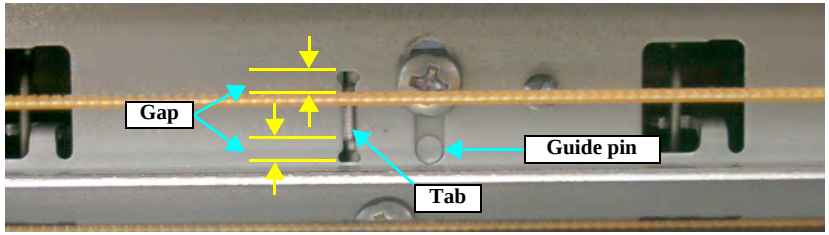


Figure 5-29. Checking the Position of Tab on the Guide Roller LD

CHECK POINT

The following are the possible troubles for misadjustment.

Tab Position	Trouble
Above upper limit	• Paper feed mistakes caused by non-feed • Skewing of business cards
Below lower limit	• Multiple-sheet feeding

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. 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 degrade or deteriorate the quality of this product.**
- **Be careful not to damage any components when you clean inside the printer.**
- **Do not scratch the surface of the PF Roller assembly. Use a soft brush to wipe off dust.**
- **Use a soft cloth moistened with dilute alcohol to remove ink stain.**
- **Do not use the supplied cleaning sheet 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 ASF LD Roller side and used to clean the ASF 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.**

- ☐ Housing
  Use a clean soft cloth moistened with water and wipe off any dirt. If the Housings are stained with ink, use a cloth moistened with neutral detergent to wipe it off.
- ☐ Inside the printer
  Use a vacuum cleaner to remove any paper dust.

6.1.2 Service Maintenance

If print irregularity (missing dot, white line, etc.) has occurred or the printer indicates “Maintenance Error”, take the following actions to clear the error.

6.1.2.1 Head Cleaning

The printer has a built-in head cleaning function, which is activated by operating the control panel.The procedure is given below.

1. Confirm that the printer is in stand-by state.
   Check that the Power LED is not flashing.
2. Hold down the Ink Switch on the control panel for more than 3 seconds.
   The Power LED flashes during the cleaning sequence.

CHECK POINT

For Head Cleaning, it is recommended to run the nozzle check and the cleaning alternately to minimize ink consumption.

6.1.2.2 Maintenance Request

When the ink is used for the Print Head cleaning and such, it is drained via the Cap Unit to the Waste Ink Tray Assy located on the Lower Housing. As for the ink absorbed by the Front Paper Guide Pad when carrying out the borderless printing or flushing operations, it is drained to the ink pads in the Front Paper Guide Pad Tray. The amount of the waste ink is controlled with the Protection Counter A (Waste Ink Tray Assy) and B (Front Paper Guide Pad Tray) in the EEPROM on the Main Board. When the amount reaches the specified value; which indicates that the waste ink has reached the limit of the absorbing capability of the Waste Ink Pads, the “maintenance request error” is displayed.

☐ Protection Counters Upper Limit

Waste Ink Counter	Limits
Protection Counter A*	12,300 - 14,250
Protection Counter B	8,900

Note* : Taking the ink evaporation amount into consideration, the threshold value of the Protection Counter A for the Maintenance Request varies from 12,300 to 14,250 accordingly until 260 days pass from the day the printer receives the first TI from the printer driver (the printer is initially used). The value after 260 days is 14,250.

☐ Timing for Replacing the Waste Ink Pads

- When the Protection Counter reaches the value shown above, a Maintenance Request is indicated.
- When servicing the printer, always check the Protection Counter using the Adjustment Program regardless of whether the Maintenance Request error has been indicated or not. If the counter is close to its upper limit shown above, replace the Waste Ink Pads and reset the counter to “0” with receiving prior approval from the user. This prevents the printer from causing the Maintenance Request error soon after it is returned to the user.

☐ Waste Ink Pads to be replaced

Table 6-1. List of Waste Ink Pads to be replaced

Parts name	Qty.	Reference Pages
Waste Ink Tray Assy	1	4.4.10 Waste Ink Pad / Waste Ink Tray Assy (p104)
POROUS PAD, PAPER GUIDE, INK EJECT, UPPER	1	4.4.14 Front Paper Guide / Paper EJ Roller / Front Paper Guide Pad Tray (p110)
POROUS PAD, PAPER GUIDE, INK EJECT, LEFT	1	
POROUS PAD, PAPER GUIDE, INK EJECT, LOWER	1	

☐ After the Replacement
Reset the Protection Counter (Refer to Chapter 5 ?Adjustment?)

6.1.3 Lubrication

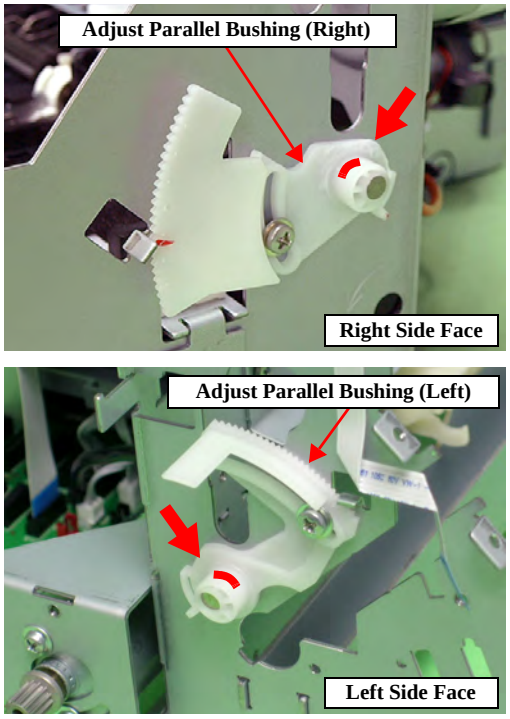
The lubrication used for the components of the printer has been decided on based on evaluation carried out by Epson. Therefore, the specified amount and places of lubrication given in this section should be strictly observed.

CAUTION

- **Never use oil or grease other than those specified in this manual. Use of different types of oil or grease may damage the components or affect the printer functions.**
- **Never apply a larger amount of oil or grease than specified in this manual.**

Table 6-2. Specified Lubricant

Type	Name	EPSON CODE	Supplier
Grease	G-26	1080614	EPSON
Grease	G-45	1033657	EPSON
Grease	G-71	1304682	EPSON
Grease	G-74	1409257	EPSON
Grease	G-75	TBD	EPSON



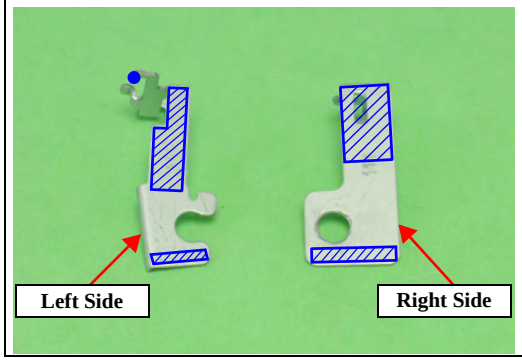
<Lubrication Point>
Left and Right Adjust Parallel Bushings (outer circumference)

<Lubrication Type>
G-26

<Lubrication Amount>
ϕ1mm x 2mm

<Remarks>
- Apply with a syringe. (Pin Head: ϕ1mm)
- After lubrication, install and turn the PG Cam Bush to spread the grease evenly.

Figure 6-1. Lubrication (1)



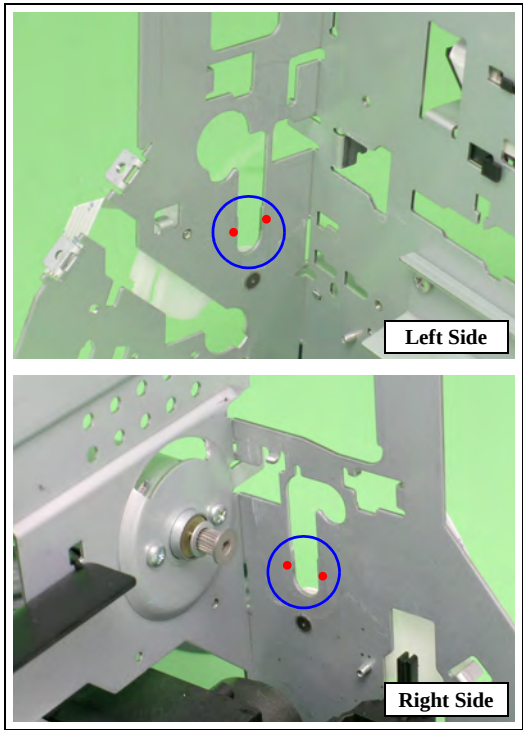
<Lubrication Point>
Contact point of the CR Scale Mounting Plate (Left/Right) and the Main Frame

<Lubrication Type>
G-26

<Lubrication Amount>
Apply evenly.

<Remarks>
Apply with a brush.

Figure 6-2. Lubrication (2)



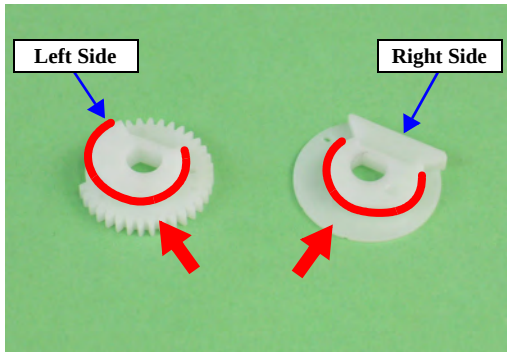
<Lubrication Point>
Contact point of the Main Frame and the CR the Scale Mounting Plate (Left/Right)

<Lubrication Type>
G-26

<Lubrication Amount>
A little at 4 points

<Remarks>
Apply with a brush.

Figure 6-3. Lubrication (3)



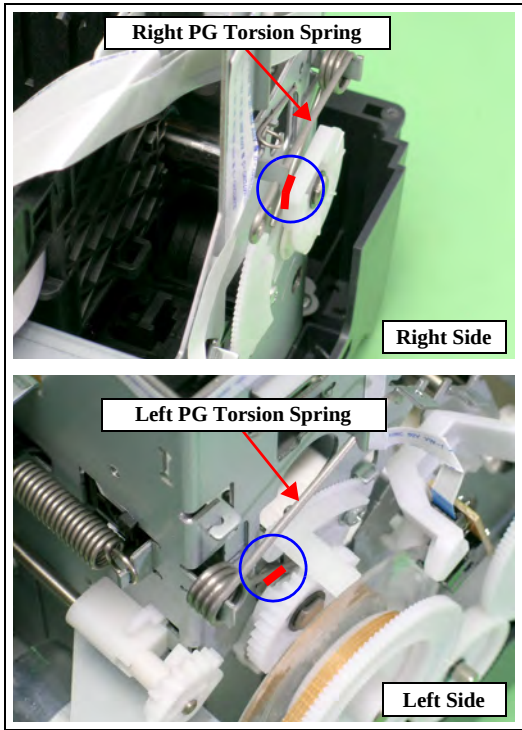
<Lubrication Point>
Bushings of the Left and Right PG Cams (inner circumference)

<Lubrication Type>
G-26

<Lubrication Amount>
1mm diameter of the inner circumference

<Remarks>
- Apply with a brush.
- Be careful not to attach the grease to the PF scale.

Figure 6-4. Lubrication (4)



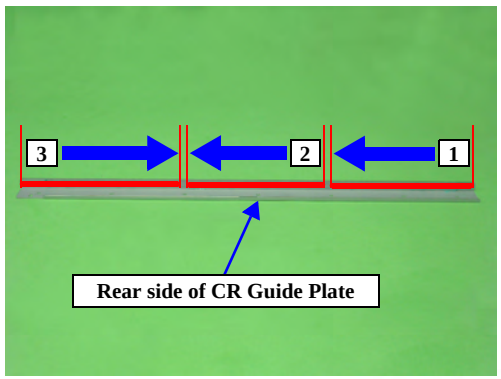
<Lubrication Point>
Contact point of the Left and Right PG Torsion Springs and the Carriage Shaft.

<Lubrication Type>
G-26

<Lubrication Amount>
ϕ1mm x 2mm x 2 points

<Remarks>
Apply with a syringe.
(Pin Head: ϕ1mm)

Figure 6-5. Lubrication (5)



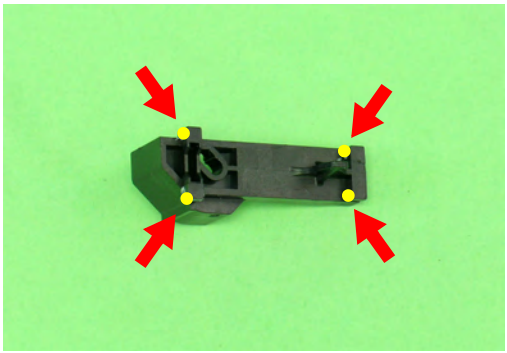
<Lubrication Point>
Contact point of the rear side of CR Guide Plate and the slider of the Carriage Unit

<Lubrication Type>
G-71

<Lubrication Amount>
70 ± 15mg x 3 points

<Remarks>
- Apply with a brush.
- Apply it in the order as shown with the arrows.

Figure 6-6. Lubrication (6)



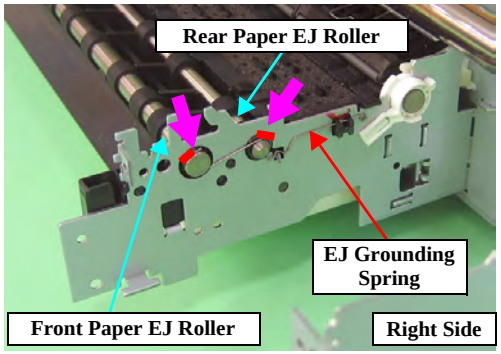
<Lubrication Point>
The Driven Pulley Holder

<Lubrication Type>
G-26

<Lubrication Amount>
ϕ1mm x 2mm x 4 points

<Remarks>
Apply with a syringe.
(Pin Head: ϕ1mm)

Figure 6-7. Lubrication (7)



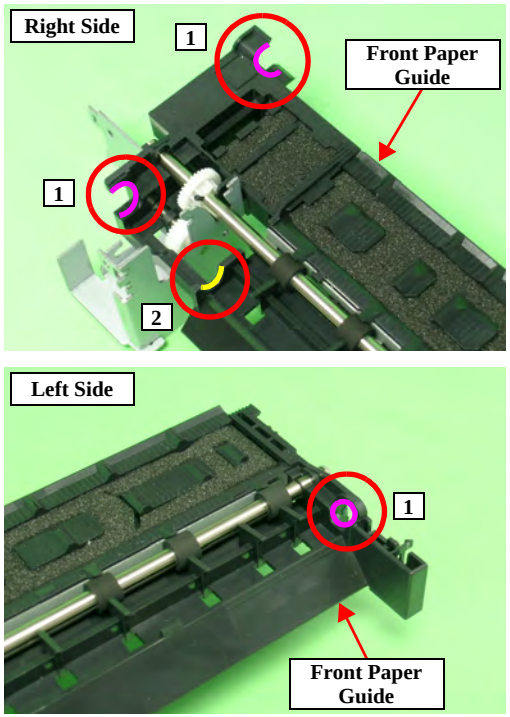
<Lubrication Point>
Contact point of the EJ Grounding Spring and Front and Rear Paper EJ Rollers

<Lubrication Type>
G-45

<Lubrication Amount>
ϕ1mm x 2mm x 2 points

<Remarks>
Apply with a syringe.
(Pin Head: ϕ1mm)

Figure 6-8. Lubrication (8)



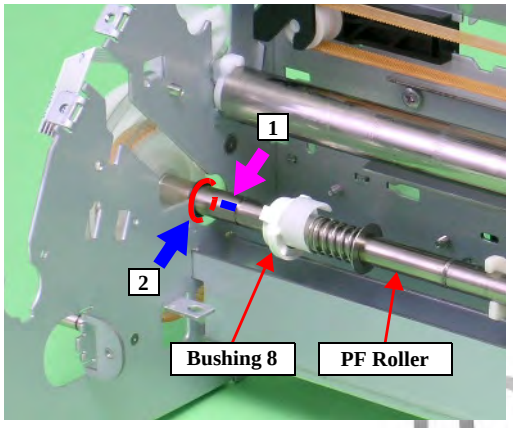
<Lubrication Point>
The bushing of the Front Paper Guide

<Lubrication Type>
G-45

<Lubrication Amount>
1. Apply evenly.
2. ϕ1mm x 2mm

<Remarks>
Apply with a brush.

Figure 6-9. Lubrication (9)



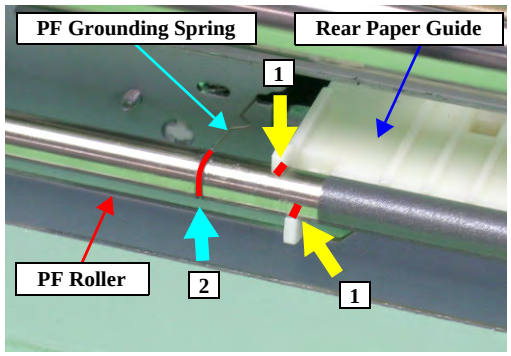
<Lubrication Point>
1. Left side of the PF Roller Shaft (Left of the E-Ring)
2. Mounting location of the Bushing 8

<Lubrication Type>
G-45

<Lubrication Amount>
1. Approx. ϕ1mm x 5mm
2. All around the Shaft

<Remarks>
1. Apply with a syringe.
2. Apply with a brush.

Figure 6-10. Lubrication (10)



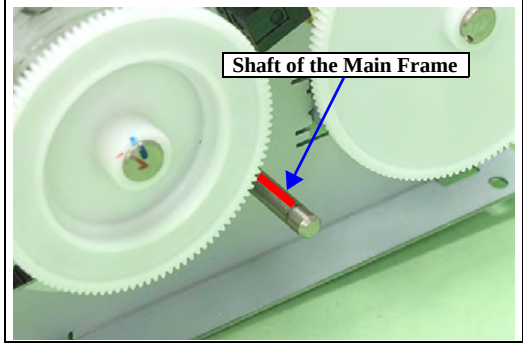
<Lubrication Point>
1. Contact point of the Rear Paper Guide and the PF Roller
2. Contact point of the PF Grounding Spring and the PF Roller

<Lubrication Type>
G-45

<Lubrication Amount>
1. Apply evenly.
2. ϕ1mm x 2mm

<Remarks>
1. Apply with a brush.
2. Apply with a syringe. (Pin Head: ϕ1mm)

Figure 6-11. Lubrication (11)



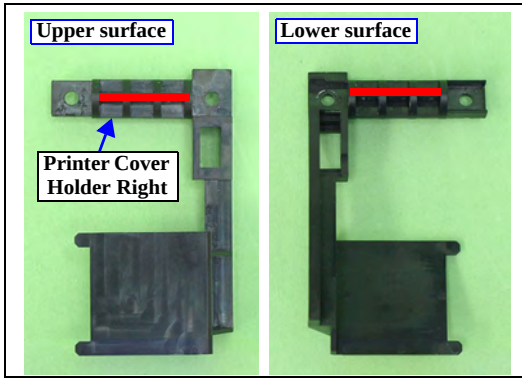
<Lubrication Point>
Contact point of the Shaft of the Main Frame and Spur Gear 31.5

<Lubrication Type>
G-45

<Lubrication Amount>
ϕ1mm x 2mm

<Remarks>
Apply with a syringe.

Figure 6-12. Lubrication (12)



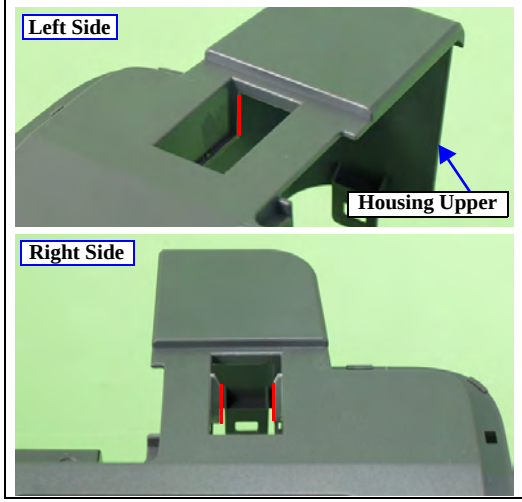
<Lubrication Point>
Contact point of the Printer Cover Holder (Left/Right) and the Printer Cover

<Lubrication Type>
G-26

<Lubrication Amount>
20mm x 2mm x 2 points

<Remarks>
Apply with a brush.

Figure 6-13. Lubrication (13)



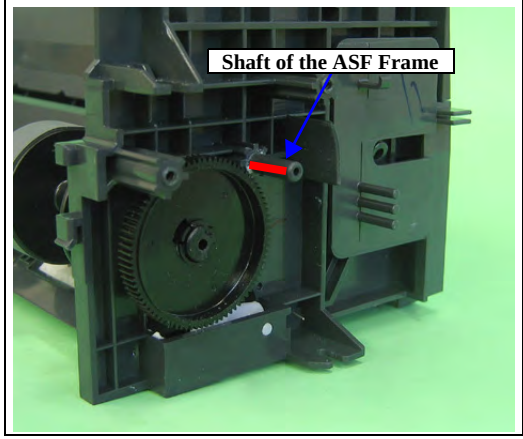
<Lubrication Point>
Contact point of the Housing Upper and the Printer Cover

<Lubrication Type>
G-74

<Lubrication Amount>
Apply evenly.

<Remarks>
Apply with a brush.

Figure 6-14. Lubrication (14)



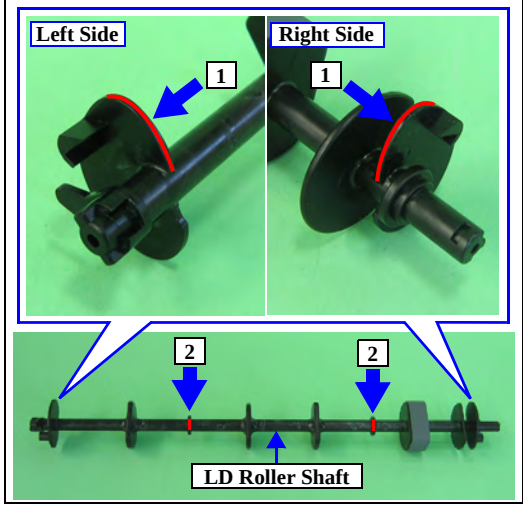
<Lubrication Point>
Contact point of the Shaft of the ASF Frame and the Combination Gear 29.11

<Lubrication Type>
G-26

<Lubrication Amount>
Apply evenly.

<Remarks>
Apply with a brush.

Figure 6-15. Lubrication (15)



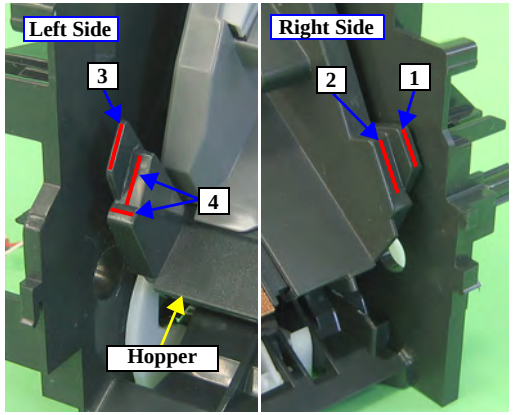
<Lubrication Point>
1. Contact point of the LD Roller Shaft and the Hopper
2. Contact point of the LD Roller Shaft and the Guide Roller LD

<Lubrication Type>
1. G-26
2. G-75

<Lubrication Amount>
Apply evenly.

<Remarks>
Apply with a brush.

Figure 6-16. Lubrication (16)



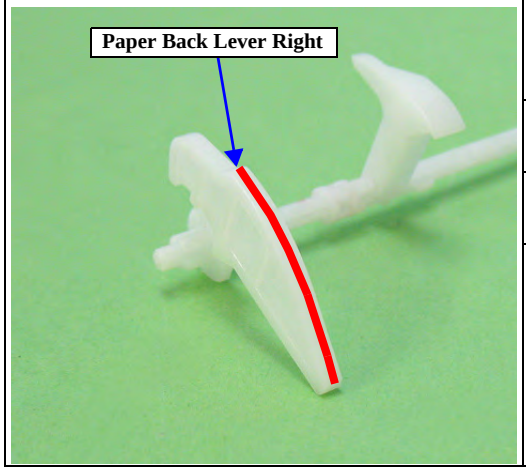
<Lubrication Point>
Contact point of the Housing Upper and the Printer Cover

<Lubrication Type>
G-26

<Lubrication Amount>
1. ϕ1mm x 10mm
2. ϕ1mm x 15mm
3. ϕ1mm x 10mm
4. Apply evenly.

<Remarks>
1. 2. 3. Apply with a syringe.
4. Apply with a brush.

Figure 6-17. Lubrication (17)



<Lubrication Point>
Contact point of the Paper Back Lever Right and the LD Roller Shaft

<Lubrication Type>
G-26

<Lubrication Amount>
ϕ2mm x 15mm

<Remarks>
Apply with a syringe.

Figure 6-18. Lubrication (18)

6.1.3.1 Lubrication of Carriage Shaft

1. Fit the Carriage Unit onto the Carriage Shaft, and move it to the center of the Shaft.

CAUTION

In the following step, do not bring the needle of a syringe into contact with the Carriage Shaft.

2. Using a syringe, lubricate the holes (2 places) at both ends of the Carriage Unit rear side with grease.

Lubrication Type	Lubrication Amount
G-71	140mg ± 10mg x 2 points

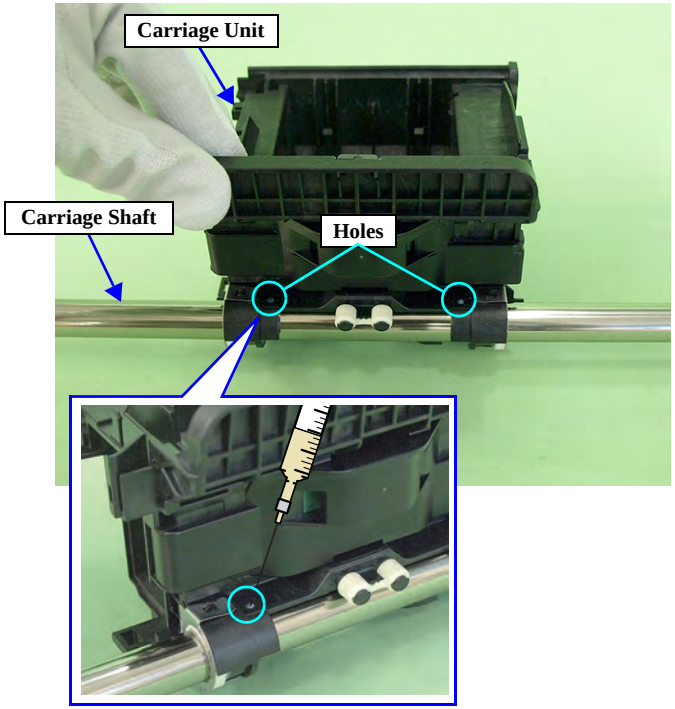


Figure 6-19. Lubricating the Carriage Shaft (1)

3. Hold the Carriage Unit, and while turning the Carriage Shaft clockwise and counterclockwise, move the Carriage Unit to spread the grease evenly.

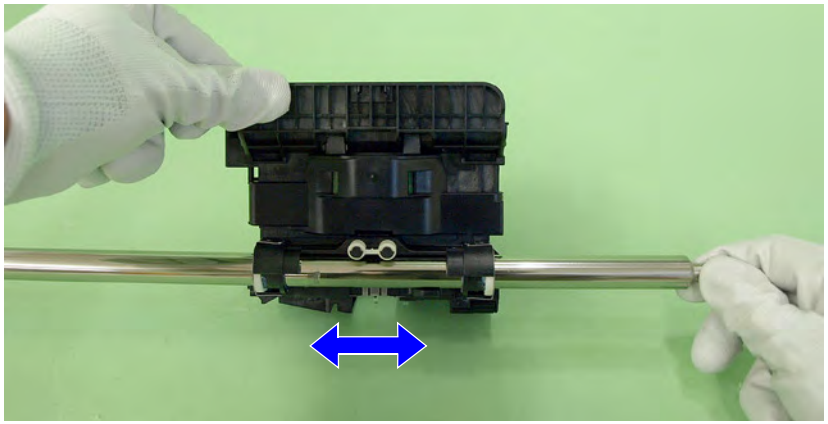


Figure 6-20. Lubricating the Carriage Shaft (2)

4. Move the Carriage Unit to the right end of the Carriage Shaft viewing the Unit from the rear, and lubricate grease with the syringe at the point shown in refer to Figure 6-21.

Lubrication Type	Lubrication Amount
G-71	140mg ± 10mg x 2 points

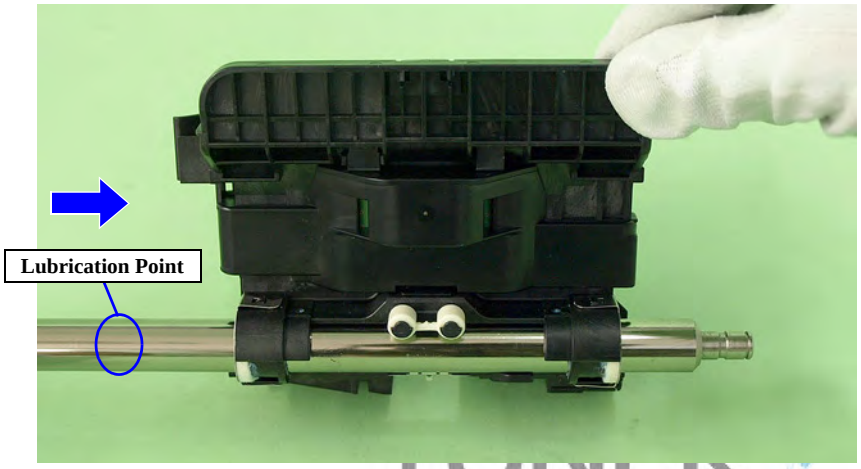


Figure 6-21. Lubricating the Carriage Shaft (3)

5. Hold the Carriage Unit, and while turning the Carriage Shaft, move the Carriage Unit to the left end of the Carriage Shaft to lubricate the grease evenly.
6. Lubricate grease with the syringe at the point shown in refer to Figure 6-22.

Lubrication Type	Lubrication Amount
G-71	140mg ± 10mg

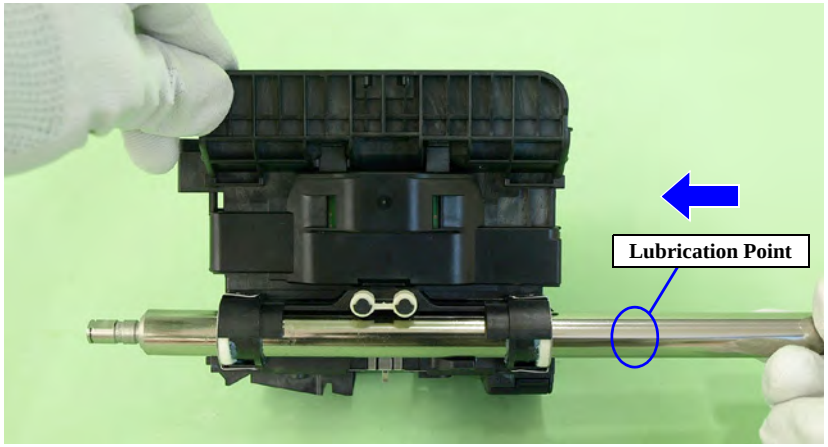


Figure 6-22. Lubricating the Carriage Shaft (4)

7. Hold the Carriage Unit, and while turning the Carriage Shaft, move the Carriage Unit to the right end of the Carriage Shaft to lubricate the grease evenly.

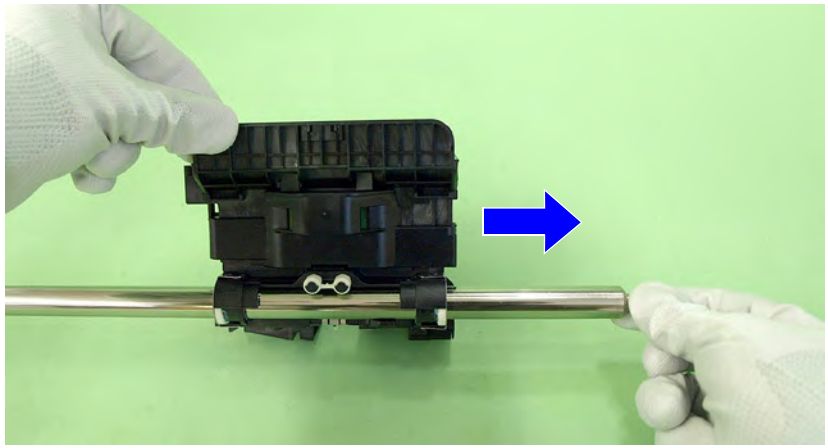


Figure 6-23. Lubricating the Carriage Shaft (5)

8. Repeat step 4 ~ 7.

CHAPTER

7

APPENDIX

7.1 Connector Summary

This section shows the connections between the main components of the printer.

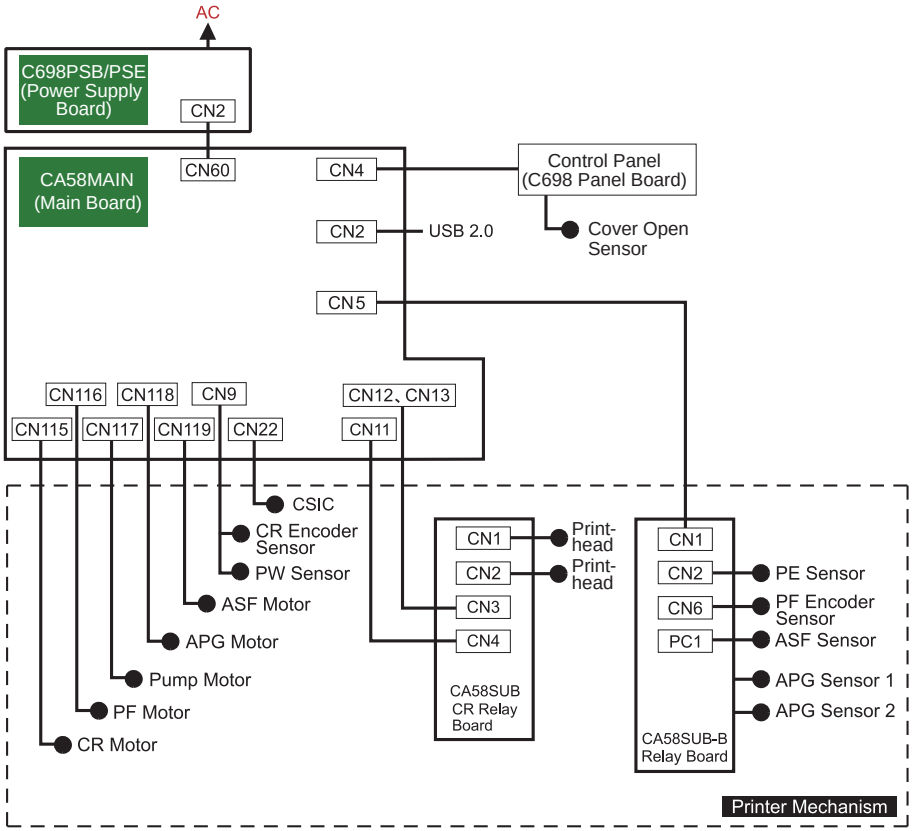


Table 7-1. Connection of the Major Components

7.2 Exploded Diagram / Parts List

This manual does not provide exploded diagrams or parts list.

For the information, see SPI (Service Parts Information).