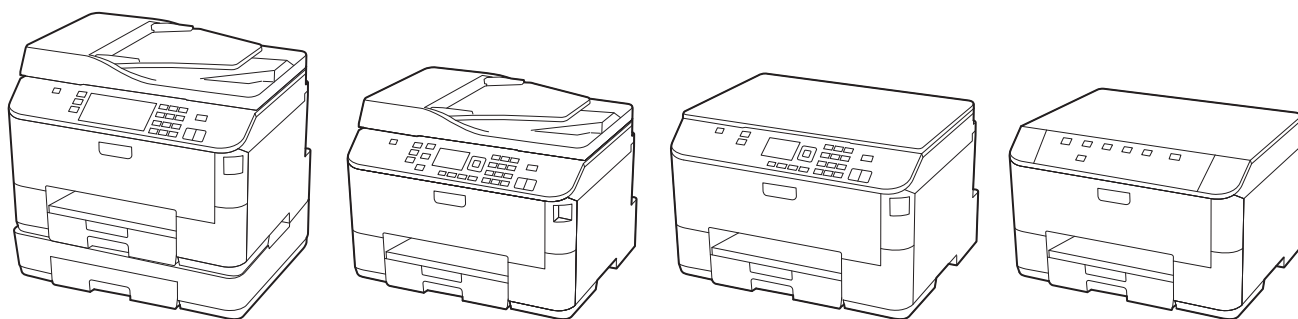


# SERVICE MANUAL



*Color Inkjet Printer*

**Epson WP-4590 series/ Epson WP-4540 series  
Epson WP-4530 series/ Epson WP-4520 series  
Epson WP-4510 series/ Epson WP-4090 series  
Epson WP-4020 series/ Epson WP-4010 series**

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# Safety Precautions

All safety procedures described here shall be strictly adhered to by all parties servicing and maintaining this product.

## **DANGER**

Strictly observe the following cautions. Failure to comply could result in serious bodily injury or loss of life.

1. Always disconnect the product from the power source and peripheral devices when servicing the product or performing maintenance.
2. When performing works described in this manual, do not connect to a power source until instructed to do so. Connecting to a power source causes high voltage in the power supply unit and some electronic components even if the product power switch is off. If you need to perform the work with the power cable connected to a power source, use extreme caution to avoid electrical shock.

## **WARNING**

Strictly observe the following cautions. Failure to comply may lead to personal injury or loss of life.

1. Always wear protective goggles for disassembly and reassembly to protect your eyes from ink in working. If any ink gets in your eyes, wash your eyes with clean water and consult a doctor immediately.
2. 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.

## **PRECAUTIONS**

Strictly observe the following cautions. Failure to comply may lead to personal injury or damage of the product.

1. Repairs on Epson product should be performed only by an Epson certified repair technician.
2. No work should be performed on this product by persons unfamiliar with basic safety knowledge required for electrician.
3. The power rating of this product is indicated on the serial number/rating plate. Never connect this product to the power source whose voltages is different from the rated voltage.
4. Replace malfunctioning components only with those components provided or approved by Epson; introduction of second-source ICs or other non-approved components may damage the product and void any applicable Epson warranty.
5. The capacitors on the Main Board may be electrically charge right after the power turns off or after driving motors which generates counter electromotive force such as when rotating the PF Roller or when moving the CR Unit. There is a risk to damage the Main Board if the Head FFC is short-circuited with the capacitors on the Main Board electrically charged, therefore, after the power turns off or after motors are driven, leave the printer untouched for approximately 30 seconds to discharge the capacitors before starting disassembly/reassembly.
6. To prevent the circuit boards from short-circuiting, be careful about the following when handing FFC or cables.
  - When handling FFC, take care not to let the terminal section of FFC touch metal parts.
  - When connecting cables/FFC to the connectors on circuit board, connect them straight to the connectors to avoid slant insertion.



7. In order to protect sensitive microprocessors and circuitry, use static discharge equipment, such as anti-static wrist straps, when accessing internal components.
8. Do not tilt this product immediately after initial ink charge, especially after performing the ink charge several times. Doing so may cause ink to leak from the product because it may take some time for the waste ink pads to completely absorb ink wasted due to the ink charge.
9. Never touch the ink or wasted ink with bare hands. If ink comes into contact with your skin, wash it off with soap and water immediately. If you have a skin irritation, consult a doctor immediately.
10. When disassembling or assembling this product, make sure to wear gloves to avoid injuries from metal parts with sharp edges.
11. Use only recommended tools for disassembling, assembling or adjusting the printer.
12. Observe the specified torque when tightening screws.
13. Be extremely careful not to scratch or contaminate the following parts.
  - Nozzle plate of the printhead
  - CR Scale
  - PF Scale
  - ASF Scale
  - Coated surface of the PF Roller
  - Gears
  - Rollers
  - LCD
  - Scanner Sensor
  - Exterior parts
14. Never use oil or grease other than those specified in this manual. Use of different types of oil or grease may damage the component or give bad influence on the printer function.
15. Apply the specified amount of grease described in this manual.
16. Make the specified adjustments when you disassemble the printer.
17. When cleaning this product, follow the procedure described in this manual.
18. When transporting this product after filling the ink in the printhead, pack the printer without removing the ink cartridges in order to prevent the printhead from drying out.
19. Make sure to install antivirus software in the computers used for the service support activities.
20. Keep the virus pattern file of antivirus software up-to-date.
21. When disassembling/reassembling this product, if you find adhesive power of the double-sided tape which secure the parts or FFC is not enough, replace the tape with new one and attach it correctly to the specified points where the parts or FFC should be secured.
22. Unless otherwise specified in this manual, the labels attached on the returned product should be transferred to the corresponding attachment positions on the new one referring to the labels on the returned product.

# About This Manual

This manual, consists of the following chapters, is intended for repair service personnel and includes information necessary for properly performing maintenance and servicing the product.

## **CHAPTER 1. PRODUCT DESCRIPTIONS**

Provides a general overview and specifications of the product.

## **CHAPTER 2. OPERATING PRINCIPLES**

Describes the theory of mechanical operations of the product.

## **CHAPTER 3. TROUBLESHOOTING**

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

## **CHAPTER 4. DISASSEMBLY / REASSEMBLY**

Describes the disassembly/reassembly procedures for main parts/units of the product.

## **CHAPTER 5. ADJUSTMENT**

Describes the required adjustments for servicing the product.

## **CHAPTER 6. MAINTENANCE**

Describes maintenance items and procedures for servicing the product.

## **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. Pay attention to all symbols when they are used, and always read explanation thoroughly and follow the instructions.



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



Indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in bodily injury, damage or malfunction 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.

For Chapter 4 “Disassembly/Reassembly”, symbols other than indicated above are used to show additional information for disassembly/reassembly. For the details on those symbols, see "[4.2 Disassembly/Reassembly Procedures \(p58\)](#)".

# Revision Status

Revision	Date of Issue	Description
A	June 17, 2011	First Release
B	March 12, 2013	<p>Revised Contents</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> All Chapter <ul style="list-style-type: none"> <li>■ Description about WP-4590/WP-4090 has been added.</li> </ul> </li> <li><input type="checkbox"/> Chapter 1 <ul style="list-style-type: none"> <li>■ Description about WP-4590/WP-4090 has been added in " <a href="#">Differences between the Models (p10)</a>".</li> <li>■ Description about WP-4590/WP-4090 has been added in " <a href="#">Dimensions (p11)</a>".</li> </ul> </li> <li><input type="checkbox"/> Chapter 3 <ul style="list-style-type: none"> <li>■ Description about WP-4590/WP-4090 has been added in " <a href="#">Error Message List (p41)</a>".</li> </ul> </li> <li><input type="checkbox"/> Chapter 4 <ul style="list-style-type: none"> <li>■ Part code has been added in " <a href="#">Jigs (p57)</a>".</li> <li>■ Description about WP-4590/WP-4090 has been added in " <a href="#">Parts/Units whose Configuration is Different between Models (p60)</a>".</li> <li>■ Made change for description in " <a href="#">Ink Supply Unit (p72)</a>".</li> <li>■ Description about " <a href="#">PCL Sub Board (p65)</a>" has been added in Disassembly Flowchart.</li> <li>■ Added Description of " <a href="#">PCL Sub Board( WP-4590/4090 series ) (p71)</a>".</li> <li>■ Description about WP4590/WP-4090 has been added in " <a href="#">Connector Diagram (p81)</a>".</li> </ul> </li> <li><input type="checkbox"/> Chapter 5 <ul style="list-style-type: none"> <li>■ Part code has been added in " <a href="#">Ink Leak Check (p101)</a>".</li> </ul> </li> </ul>
C	November 7, 2013	<p>Revised Contents</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Chapter 5 <ul style="list-style-type: none"> <li>■ Made change for description in " <a href="#">5.2.1 PF Timing Belt Tension Check (p88)</a>".</li> <li>■ Made change for description in " <a href="#">5.2.2 Rear ASF Timing Belt Tension Check (p89)</a>".</li> </ul> </li> </ul>
D	April 9 , 2014	<p>Revised Contents</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Chapter 5 <ul style="list-style-type: none"> <li>■ Made change for description in " <a href="#">5.2.2 Rear ASF Timing Belt Tension Check (p89)</a>".</li> <li>■ Made change for description in " <a href="#">5.2.7 Ink Leak Check (p101)</a>".</li> </ul> </li> </ul>



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## CHAPTER 1

# PRODUCT DESCRIPTION

## 1.1 Features



**In this manual, the product name is abbreviated to such as “WP-4510 series”, however, the last digit of the actual name may differ. Identify your product with the first three digits and refer to the appropriate sections in this manual.**

WP-4590/4540/4530/4520/4510/4090/4020/4010 series are color inkjet printers that achieve high quality and high speed printing with a new printer mechanism. The main features are as follows.

### □ Common features

#### ■ Printer

- Maximum print speed: 16 ppm (A4, monochrome, draft printing mode)
- F7-Mach Turbo 2 Printhead (Black: 152 nozzles x 4, Color: 152 nozzles x 1 per color)
- Maximum print resolution: 4800 x 1200 dpi
- Duplex printing available using the Duplex Unit that can be removed/installed by users
- Equipped with a panel operation lock function that improves security
- Auto switching for paper trays  
The paper tray to use is automatically selected from the 1st cassette, 2nd cassette\* or the Rear MP Tray (rear ASF) depending on the paper size
- Four newly developed independent ink cartridges are installed (pigment inks)
- Borderless printing is not available

#### ■ Consumables

- Maintenance box (the user can replace the waste ink pad when maintenance error occurs)

Note\*\*\*: When the optional 2nd cassette is installed for WP-4590/4530/4520/4510/4090/4020/4010 series.

### □ Differences between the models

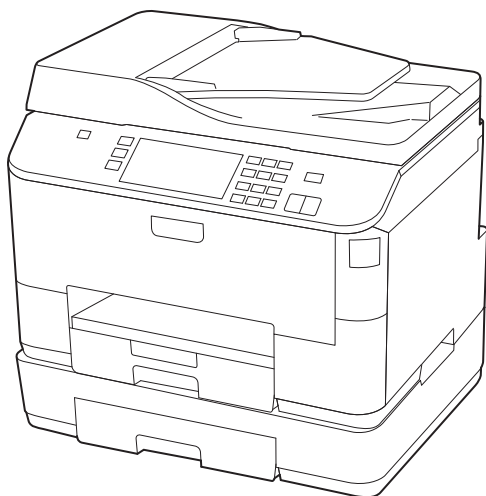
WP-4590/4540/4530/4520/4510/4090/4020/4010 series are different as shown below.

**Table 1-1. Differences between the Models**

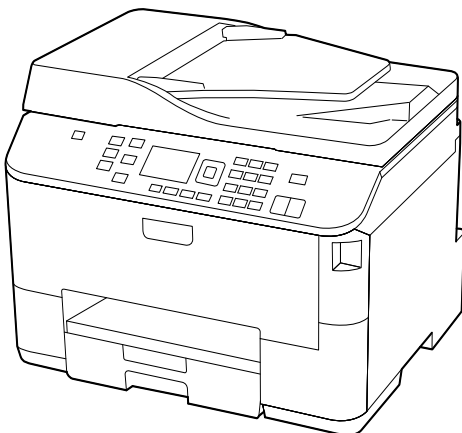
Item	WP-4590 series	WP-4540 series	WP-4530 series	WP-4520 series	WP-4510 series	WP-4090 series	WP-4020 series	WP-4010 series
LCD display size	2.5 inch	3.5 inch	2.5 inch	2.5 inch	2.5 inch	---	---	---
Panel operation	Button	Touch panel	Button	Button	Button	Button	Button	Button
Scanner	Yes	Yes	Yes	Yes	Yes	---	---	---
ADF	Yes	Yes	Yes	Yes	---	---	---	---
Copy	Yes	Yes	Yes	Yes	Yes	---	---	---
USB host	Yes	Yes	Yes	Yes	Yes	---	---	---
FAX	Yes	Yes	Yes	Yes	---	---	---	---
Wi-Fi	---	Yes	Yes	---	---	---	Yes	---
PCL	Yes	---	---	---	---	Yes	---	---
2nd cassette	Option	Yes	Option	Option	Option	Option	Option	Option



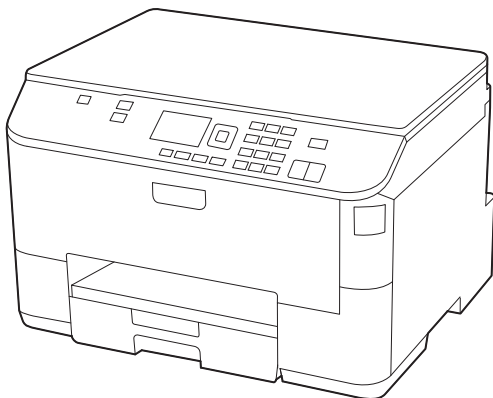




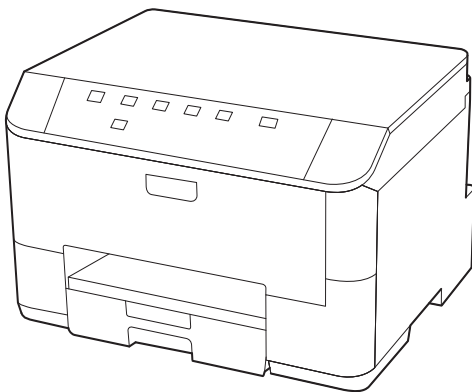
WP-4540 series



WP-4590 series/WP-4530 series/WP-4520 series



WP-4510 series



WP-4090 series/WP-4020 series/WP-4010 series

Figure 1-1. External View

Table 1-2. Dimensions

Model	Dimensions (W x D x H) <sup>*1</sup>	Weight <sup>*2</sup>
WP-4540 series	461.0 mm x 419.5 mm x 420.0 mm	16.50 kg
WP-4590 series	460.0 mm x 419.5 mm x 340.9 mm	TBD
WP-4530 series		11.20 kg
WP-4520 series		13.77 kg
WP-4510 series	460.0 mm x 419.5 mm x 298.5 mm	12.60 kg
WP-4090 series	460.0 mm x 419.5 mm x 283.2 mm	TBD
WP-4020 series		10.90 kg
WP-4010 series		10.87 kg

Note <sup>\*1</sup>: Paper support for rear ASF and stacker are closed. Rubber feet are included.

<sup>\*2</sup>: Excluding the weight of ink cartridges and power cable.



## 1.2 Printing Specifications

### 1.2.1 Basic Specifications

**Table 1-3. Printer Specifications**

Item	Specification
Print method	On-demand ink jet
Nozzle configuration	Black: 608 nozzles (152 nozzles x 4) Color: 456 nozzles (152 nozzles x 1 per color)
Color	Black, Cyan, Magenta, Yellow
Print direction	Bi-directional minimum distance printing, Unidirectional printing
Print resolution	Horizontal x Vertical (dpi) <ul style="list-style-type: none"> <li>• 300 x 300</li> <li>• 600 x 600</li> <li>• 1200 x 600</li> <li>• 600 x 300</li> <li>• 600 x 1200</li> <li>• 4800 x 1200</li> </ul>
Control code	<ul style="list-style-type: none"> <li>• ESC/P Raster command</li> <li>• ESC/P-R (RGB) command</li> </ul>
Input buffer size	132 KBytes
Paper feed method	Friction feed
Paper feed amount <sup>*1</sup>	<ul style="list-style-type: none"> <li>• 1st cassette: 250 pages (plain paper), 30 pages (Legal)</li> <li>• 2nd cassette <sup>*2</sup>: 250 pages (plain paper)</li> <li>• Rear MP Tray (rear ASF): 80 pages (plain paper)</li> </ul>
Paper path	<ul style="list-style-type: none"> <li>• Front feed, front out</li> <li>• Rear feed, front out</li> </ul>
PF interval	0.01693 mm (1/1500 inch)

Note \*1: For paper thickness: 0.10 mm, 75 g/m<sup>2</sup>

\*2: When the optional 2nd cassette is installed for WP-4590/4530/4520/4510/4090/4020/4010 series.



## 1.3 Scanner Specifications (WP-4590/4540/4530/4520/4510 series only)

### 1.3.1 Basic Specifications

**Table 1-4. Basic Specifications**

Item		Specification
Scanner type		Flatbed, color
Scanning method		Moving carriage, stationary document
Home position		The rear left corner
Photoelectric device		CIS
Light source		LED
Maximum document sizes		A4 or US Letter
Scanning range		8.5" x 11.7" (216 mm x 297 mm)
Maximum resolution		Main scan: 1,200 dpi Sub scan: 2,400 dpi
Maximum effective pixels		10,200 x 14,040 pixels (1200 dpi)
Pixel depth	Color	48 bit per pixel (input) and 24 bit per pixel (output)
	Monochrome	16 bit per pixel (input) and 1 bit or 8 bit per pixel (output)

**Table 1-5. ADF Specifications (WP-4590/4540/4530/4520 series only)**

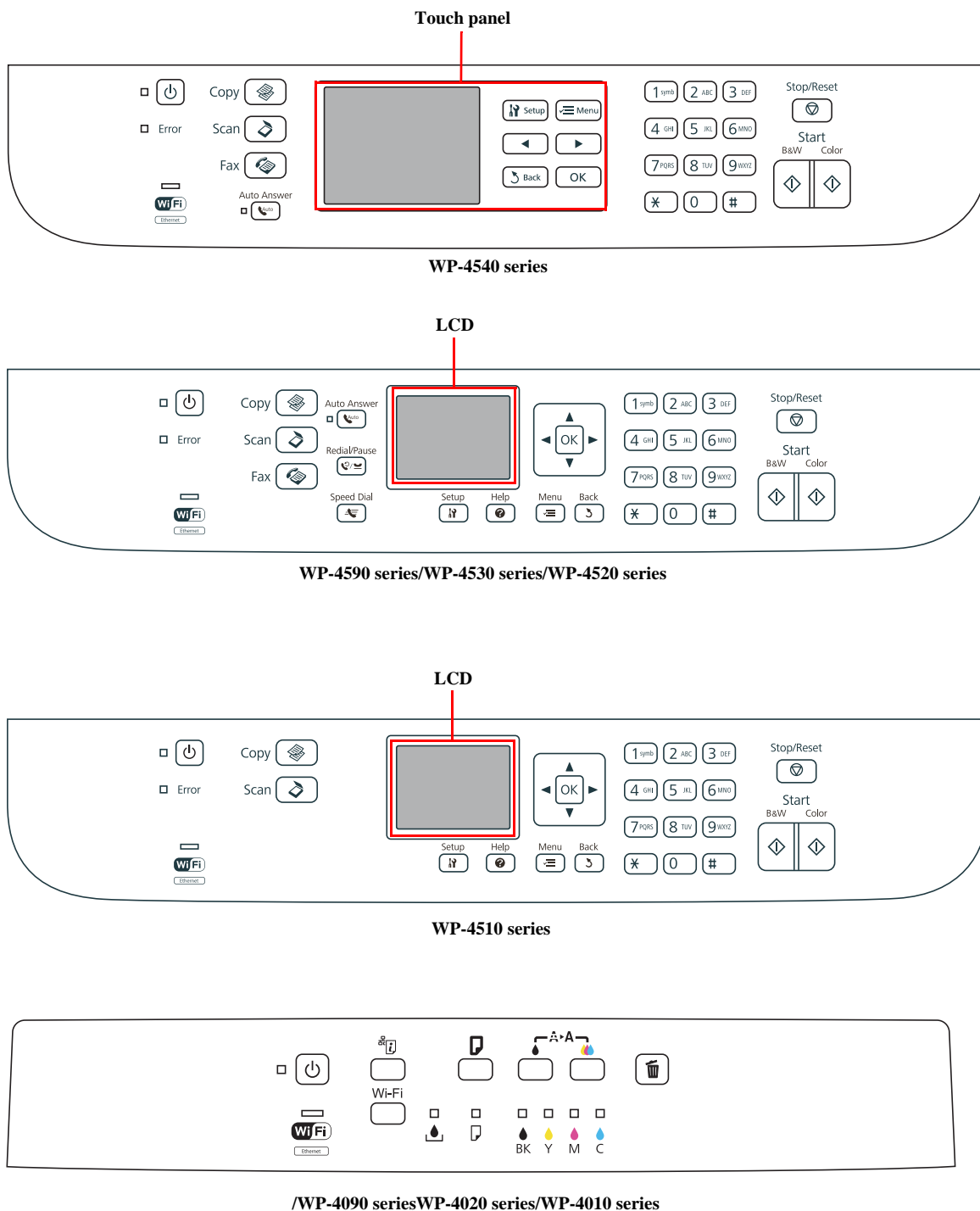
Item	Specification
Document loading	Face-up
Maximum document sizes	A4, US Letter or Legal
Supported paper type	Plain paper only
Paper thickness	64 to 95 g/m <sup>2</sup>
Maximum number of documents which can be set	30 sheets or 3 mm at maximum (A4, US Letter) / 10 sheets (Legal)
Document path	Feeds from upper tray and ejects to lower tray
Document set position	Rear



## 1.4 Control Panel

### 1.4.1 Operation Buttons & LEDs

The operation buttons, touch panel (WP-4540 series only), LEDs, and LCD are shown below. See [Table 1-6](#) and [Table 1-7](#) for the functions.



Note 1: The WiFi logo on the control panel is for WP-4540/4530/4020 series only.  
 2: WP-4090/4010 series do not have the WiFi button.

**Figure 1-2. Control Panel**



The available buttons and LEDs differ between models. Refer to [Figure 1-2](#) for available buttons and LEDs for your model.

**Table 1-6. Operation Buttons, LEDs and LCD (WP-4590/4540/4530/4520/4510 series)**

Item	Icon	Name	Function
LCD			Indicates the printer status, error, and menu screen.
Button/ touch panel		Power	Turns the power on/off.
		Copy	Enters copy mode.
		Scan	Enters scan mode.
		Fax	Enters fax mode.
		Auto Answer	Turns on/off auto answer mode.
		Redial/Pause	<ul style="list-style-type: none"> <li>Displays the last number dialed.</li> <li>Inserts a pause symbol (-) when entering numbers in fax mode.</li> </ul>
		Speed Dial	Displays speed dial/group dial list in fax mode.
		Setup	Enters setup mode.
		Help	Displays help for solutions to problems.
		Arrows *1	Shows next or previous menus.
		Arrows *2	<ul style="list-style-type: none"> <li>Selects menus.</li> <li>Specifies the number of copies.</li> <li>Moves the cursor in fax mode.</li> </ul>
	OK	OK	Activates the setting you have selected.
		Menu	Displays detailed settings for each mode.
		Back	Cancels/returns to the previous menu.
	1-9,*,#	Ten key	<ul style="list-style-type: none"> <li>Specifies the date/time</li> <li>Specifies the number of copies</li> <li>Specifies fax numbers</li> </ul>
		Stop/Reset	Stops printing/copying/scanning/faxing or resets the setting.
		Start (B&W)	Starts copying/scanning/faxing in black and white.
		Start (Color)	Starts copying/scanning/faxing in color.
LED		Power	<ul style="list-style-type: none"> <li>Lights when the printer is on.</li> <li>Flashes when the printer is in process.</li> </ul>
	Error	Error	On when error has occurred.
		Network	Indicates the network connection status.
		Auto Answer	On when the fax is in auto answer mode.












Note : See "1.4.2 LEDs and LCD Indications (p17)" for more details about the LCD.

Note \*1: WP-4540 series only.

\*2: WP-4590/4530/4520/4510 series only.



Table 1-7. Operation Buttons, LEDs (WP-4090/4020/4010 series)

Item	Icon	Name	Function
Button		Power	Turns the power on/off.
		Network status sheet	Prints a network status sheet.
	Wi-Fi	Wi-Fi	Configures the wireless network.
		Paper feed/eject	<ul style="list-style-type: none"> <li>• Loads or ejects paper.</li> <li>• Resumes printing after a paper out error, multiple page feed error.</li> </ul>
		Head cleaning (monochrome)	Starts head cleaning (black only).
		Head cleaning (color)	Starts head cleaning (all except black).
		Cancel	Cancels printing during a print job.
LED		Power	<ul style="list-style-type: none"> <li>• Lights when the printer is on.</li> <li>• Flashes when the printer is in process.</li> </ul>
		Network	Indicates the network connection status.
		Maintenance box	Indicates error status for maintenance box.
		Paper	Indicates error status for paper.
		Ink*	Indicates error status for ink.

Note : See "1.4.2 LEDs and LCD Indications (p17)" for more details about the LEDs.

Note \*: The corresponding color LED is indicated.

## 1.4.2 LEDs and LCD Indications

Table 1-8. LEDs and LCD Indications


Status		WP-4090/4020/4010 series						WP-4590/4540/4530/4520/4510 series
		LED status						LCD message <sup>*2</sup>
		Power	Wi-Fi <sup>*1</sup>	Ethernet	Maintenance box	Paper	Ink (BK/C/M/Y)	
Operating	Printer fatal error	Flash at high speed	Flash at high speed	Flash at high speed	Flash at high speed	Flash at high speed	Flash at high speed	Printer error. Turn power off and then on again. For details, see your documentation or visit Epson.com.
								Paper jam inside, in back, or in ADF. Press [OK] to see to see how to remove jammed paper.
								Remove while and orange transportation locks by following instructions.
	Scanner fatal error <sup>*3</sup>	---	---	---	---	---	---	Scanner error. Turn power off and then on again. If the error is not fixed, visit Epson.com for technical support.
	ADF fatal error <sup>*4</sup>	---	---	---	---	---	---	Automatic Document Feeder (ADF) error.
	Fax error <sup>*4</sup>	---	---	---	---	---	---	Fax error. Turn power off and then on again.
	Maintenance box full	Flash <sup>*5</sup>	---	---	ON	---	---	Maintenance box is at the end of its service life. You need to replace it. <Maintenance Box> XXXXX <sup>*6</sup>
	Maintenance box CSIC error	Flash <sup>*5</sup>	---	---	ON	---	---	Cannot recognize maintenance box. Install it correctly. <Maintenance Box> XXXXX <sup>*6</sup>
	No maintenance box error	Flash <sup>*5</sup>	---	---	ON	---	---	Cannot recognize maintenance box. Install it correctly. <Maintenance Box> XXXXX <sup>*6</sup>
	Paper jam error <sup>*7</sup>	Flash <sup>*5</sup>	---	---	---	Flash	---	Paper jam. Press OK to see how to remove jammed paper.
	Paper jam error (front cover open) <sup>*7</sup>	Flash <sup>*5</sup>	---	---	---	Flash	---	Paper jam. Press OK to see how to remove jammed paper.
	Paper out error	Flash <sup>*5</sup>	---	---	---	ON	---	Paper out or paper jam. Check paper size and load paper in paper cassette XX <sup>*6</sup> .
	Paper out error (front cover open)	Flash <sup>*5</sup>	---	---	---	ON	---	Paper out or paper jam. Check paper size and load paper in rear MP tray.
	No paper cassette error	Flash <sup>*5</sup>	---	---	---	ON	---	Load Cassette XX <sup>*6</sup> correctly and press  or  .
	Multi-feed error	Flash <sup>*5</sup>	---	---	---	ON	---	Multi-page feed error. Remove and reload the paper, then press  or  .
	Paper length mismatch error for duplex printing	Flash <sup>*5</sup>	---	---	---	ON	---	Incorrect paper size detected. Load correct paper size and press  or  .

Table 1-8. LEDs and LCD Indications




Status		WP-4090/4020/4010 series						WP-4590/4540/4530/4520/4510 series
		LED status						LCD message <sup>*2</sup>
		Power	Wi-Fi <sup>*1</sup>	Ethernet	Maintenance box	Paper	Ink (BK/C/M/Y)	
Operating	Paper size mismatch error	Flash <sup>*5</sup>	---	---	---	ON	---	No paper source matches paper size setting. Load appropriate paper in Rear MP Tray. Press  (B&W) or  (Color).
	Printer/printer driver mismatch error	Flash <sup>*5</sup>	---	---	---	Flash at high speed	Flash at high speed	Error. Press  .
	Front cover open error	Flash	---	---	---	Flash2	---	Front cover is open.
	Ink end error	Flash <sup>*5</sup>	---	---	---	---	Flash/ON <sup>*8</sup>	You need to replace the following ink cartridge(s). <Ink Cartridges> XXX <sup>*6</sup>
	Ink cartridge detection error	Flash <sup>*5</sup>	---	---	---	---	Flash/ON <sup>*8</sup>	Cannot recognize the following cartridge(s). Try installing them again. <Ink Cartridges> XXX <sup>*6</sup>
	Ink cartridge detection error (non-Epson cartridge)	Flash <sup>*5</sup>	---	---	---	---	Flash/ON <sup>*8</sup>	Ink cartridge is not recognized. Please replace the cartridge. <Ink Cartridges> XXX <sup>*6</sup>
	No ink cartridge error	Flash <sup>*5</sup>	---	---	---	---	Flash/ON <sup>*8</sup>	The cartridge is installed incorrectly. Press it until it clicks into place. <Ink Cartridges> XXX <sup>*6</sup>
	Starting initialization (starting initial filling of ink)	Flash	---	---	---	---	---	Install ink cartridges that came with this product. Close front cover. Initialization starts.
	Initializing (during initial filling of ink)	Flash	---	---	---	---	---	Initializing. Please wait... Do not open front cover and do not turn power off until initialization completes. This takes about 12 minutes.
	Requiring ink cartridges for initial filling	Flash	---	---	---	---	---	Open front cover and replace cartridge(s).
	Checking ink cartridges	Flash	---	---	---	---	---	Checking the ink cartridges...
	Drying 1st side (printing from PC)	Flash	---	---	---	---	---	Printing 2-sided document. Do not touch the paper in the output tray until printing is complete.
	Printing (PC)	Flash	---	---	---	---	---	Printing...
	Printing nozzle check pattern	Flash	---	---	---	---	---	Printing...
	Printing printer status sheet	Flash	---	---	---	---	---	Printing...
	Printing (UPNP)	Flash	Flash	Flash	---	---	---	Printing...
	Receiving data	Flash	Flash	Flash	---	---	---	Receiving data...



Table 1-8. LEDs and LCD Indications

Status		WP-4090/4020/4010 series						WP-4590/4540/4530/4520/4510 series
		LED status						LCD message <sup>*2</sup>
		Power	Wi-Fi <sup>*1</sup>	Ethernet	Maintenance box	Paper	Ink (BK/C/M/Y)	
Operating	Canceling	Flash	---	---	---	---	---	Canceling...
	Cleaning (PC)	Flash	---	---	---	---	---	Cleaning print head. Please wait... Do not open front cover.
	Print head cleaning	Flash	---	---	---	---	---	Cleaning print head. Please wait... Do not open front cover.
	Canceling nozzle check pattern print	Flash	---	---	---	---	---	Canceling...
	Canceling printer status sheet print	Flash	---	---	---	---	---	Canceling...
	Initializing network	Flash <sup>*5</sup>	Alternate Flash2	Alternate Flash1	---	---	---	Processing... Please wait.
	Waiting for network initialization	Flash <sup>*5</sup>	---	---	---	---	---	---
	Network initialization (LED ON)	OFF <sup>*5</sup>	ON	ON	---	---	---	---
	Network initialization (LED OFF)	OFF <sup>*5</sup>	OFF	OFF	---	---	---	---
	Configuring wireless LAN <sup>*9</sup>	ON	Alternate Flash2	Alternate Flash1	---	---	---	Establishing a Wi-Fi connection with Push-Button mode...
	Configuring PINCODE <sup>*9</sup>	ON	Simultaneous Flash	Simultaneous Flash	---	---	---	Establishing a Wi-Fi connection with WPS PIN code mode... PIN Code XXXXXXXX <sup>*10</sup>
	Preparing to update firmware (cancel)	ON <sup>*5</sup>	Simultaneous Flash	Simultaneous Flash	---	---	---	Preparing to update...
	Updating firmware	ON to flash	OFF	OFF	OFF	OFF	OFF	Updating firmware... Do not turn power off. It turns off and on automatically when complete.
	Preparing to update firmware	ON <sup>*5</sup>	Simultaneous Flash	Simultaneous Flash	---	---	---	Preparing to update...
	Canceling firmware update	ON <sup>*5</sup>	Simultaneous Flash	Simultaneous Flash	---	---	---	Canceling...
	Powering OFF	Flash at high speed	---	---	---	---	---	Turning off...

Table 1-8. LEDs and LCD Indications

Status		WP-4090/4020/4010 series						WP-4590/4540/4530/4520/4510 series
		LED status						LCD message <sup>*2</sup>
		Power	Wi-Fi <sup>*1</sup>	Ethernet	Maintenance box	Paper	Ink (BK/C/M/Y)	
Operating	Resetting	Flash at high speed	---	---	---	---	---	Restarting product from other device...
	Powering ON	Flash	Alternate Flash2	Alternate Flash1	---	---	---	---
	Feeding a paper (load/eject)	Flash	---	---	---	---	---	---
Standby	No error	ON	---	---	---	---	---	---
	Maintenance box near full	ON <sup>*5</sup>	---	---	Flash	---	---	Maintenance box is nearing end of its service life.
	Ink level low	ON <sup>*5</sup>	---	---	---	---	Flash <sup>*8</sup>	Ink low.
	Front cover open error	Flash	---	---	---	Flash2	---	Front cover is open.
	Maintenance box full	ON <sup>*5</sup>	---	---	ON	---	---	Maintenance box is at the end of its service life. You need to replace it. <Maintenance Box> XXXXX <sup>*6</sup>
	Maintenance box CSIC error	ON <sup>*5</sup>	---	---	ON	---	---	Cannot recognize maintenance box. Install it correctly. <Maintenance Box> XXXXX <sup>*6</sup>
	No maintenance box error	ON <sup>*5</sup>	---	---	ON	---	---	Cannot recognize maintenance box. Install it correctly. <Maintenance Box> XXXXX <sup>*6</sup>
	Ink end error	ON <sup>*5</sup>	---	---	---	---	ON <sup>*8</sup>	You need to replace the following ink cartridge(s). <Ink Cartridges> XXX <sup>*6</sup>
	No ink cartridge error	ON <sup>*5</sup>	---	---	---	---	ON <sup>*8</sup>	The cartridge is installed incorrectly. Press it until it clicks into place. <Ink Cartridges> XXX <sup>*6</sup>
	Ink cartridge detection error	ON <sup>*5</sup>	---	---	---	---	ON <sup>*8</sup>	Cannot recognize the following cartridge(s). Try installing them again. <Ink Cartridges> XXX <sup>*6</sup>
	Ink cartridge detection error (non-Epson cartridge)	ON <sup>*5</sup>	---	---	---	---	ON <sup>*8</sup>	Ink cartridge is not recognized. Please replace the cartridge. <Ink Cartridges> XXX <sup>*6</sup>
	Access point setting error (security information exchange) <sup>*9</sup>	ON	---	Flash at high speed	---	---	---	Security error while setting Wi-Fi with your access point. Try again.
	Access point setting error (general) <sup>*9</sup>	ON	---	Flash	---	---	---	Error while setting Wi-Fi with your access point. Try again.

Table 1-8. LEDs and LCD Indications

Status		WP-4090/4020/4010 series						WP-4590/4540/4530/4520/4510 series
		LED status						LCD message <sup>*2</sup>
		Power	Wi-Fi <sup>*1</sup>	Ethernet	Maintenance box	Paper	Ink (BK/C/M/Y)	
Standby	Access point setting error (registration) <sup>*9</sup>	ON	---	Flash	---	---	---	Registration error. The access point is busy. Try again.
	Access point setting error (PINCODE authentication) <sup>*9</sup>	ON	---	Flash	---	---	---	PIN code authentication error. Make sure the PIN code is correct.
	Wireless LAN connection error <sup>*9</sup>	ON	---	Flash	---	---	---	The Wi-Fi/network connection failed. Print the check report?
	Network connection time out error <sup>*9</sup>	ON	---	Flash	---	---	---	The Wi-Fi/network connection failed. Print the check report?

Note : -- No change  
Flash: turns on and off at intervals of 1.25 seconds.  
Flash 2: On for 0.5 sec., Off for 0.5 sec., On for 0.5 sec. and Off for 1.0 sec.  
Flash at high speed: turns on and off at intervals of 0.5 seconds.  
Simultaneous Flash: same as "Flash"  
Alternate flash 1: same as "Flash"  
Alternate flash 2: turns on and off at intervals of 1.25 seconds.

Note \*1: WP-4020 series only

\*2: The message WP-4540 series indicates is different but the meaning is the same.

\*3: WP-4590/4540/4530/4520/4510 series only

\*4: WP-4590/4540/4530/4520 series only

\*5: Flashes if the status arises when printing starts or when the printer starts up, but lights if the status arises when printing is complete.

\*6: The corresponding maintenance box, ink cartridge product number or cassette number is indicated.

\*7: Occurs in any paper path.

\*8: The corresponding ink LED flashes after the ink falls in the ink low status, and lights when it reaches the ink end status.

\*9: WP-4540/4530/4020 series only

\*10: The corresponding PIN number is indicated.

## 1.5 Various Settings

### 1.5.1 Panel Operation

#### 1.5.1.1 Setup Menu Configuration (WP-4590/4540/4530/4520/4510 series only)

The following explains the setup menu structure and the outline of the menu functions.

**Table 1-9. Menu Configuration**

Menu			Description
Setup	Ink Levels	---	Displays the status of ink cartridges and maintenance box.
	Maintenance	Nozzle Check	Prints a nozzle check pattern.
		Head Cleaning	Runs a print head cleaning.
		Head Alignment	Adjusts the alignment of the printhead.
	Printer Setup	Paper Size Loaded	Selects the paper size (1st cassette/2nd cassette*/Rear MP Tray).
		Thick Paper	Turn this on when printing on thick paper.
		Dry Time	Sets the dry time when duplex printing.
		Sound	Turns the sound on/off.
		Date/Time	Selects display format for data/time.
		Daylight Saving Time	Selects daylight saving time.
		Country/Region	Selects country/region.
		Language	Selects the language displayed on the LCD.
		Paper Size Notice	Checks the paper size and selects whether to alert users when an error occurs (Off/On).
	Wi-Fi/Network Settings	Wi-Fi Setup	Selects a connection method for wireless LAN.
		Manual Wi-Fi/Network Setup	Configures the connection setting for manual setup.
		Wi-Fi/Network Connection Check	<ul style="list-style-type: none"> <li>• Checks the network connection status.</li> <li>• Prints the connection check result.</li> </ul>
		Confirm Wi-Fi/Network Settings	<ul style="list-style-type: none"> <li>• Displays the network information.</li> <li>• Prints a network status sheet.</li> </ul>
	File Sharing Setup	USB	Sets the access priority when accessing the storage device connected to the USB host port to USB or Wi-Fi/Network.
		Wi-Fi/Network	
	Fax Settings	Send Settings	Configures fax send settings.
		Receive Settings	Configures fax receive settings.
		Communication	Configures the details of the fax communication.
		Check Fax Connection	Prints the fax connection settings.
	Print Status Sheet	---	Prints a printer status sheet.
	Lock Settings	On ("Off" when panel operation is locked)	Changes the setting of the panel operation lock. (See " <a href="#">1.5.1.2 Panel Operation Lock Setting (WP-4590/4540/4530/4520/4510 series only) (p23)</a> ".)
		Change Password	Changes the password. (See " <a href="#">1.5.1.2 Panel Operation Lock Setting (WP-4590/4540/4530/4520/4510 series only) (p23)</a> ".)
	Restore Default Settings	Fax Send/Receive Settings	Initializes the fax send/receive settings.
		Fax Data Settings	Deletes the fax data settings.
		Wi-Fi/Network Setting	Initializes the Wi-Fi/network settings.
		All except Wi-Fi/Network & Fax Settings	Initializes the settings except Wi-Fi/network/fax settings.
		All Settings	Initializes the all settings.

Note : The setting items for Wi-Fi is for WP-4540/4530 series only.

Note \*: When the optional 2nd cassette is installed for WP-4590/4530/4520/4510/4090/4020/4010 series.

### 1.5.1.2 Panel Operation Lock Setting (WP-4590/4540/4530/4520/4510 series only)

For WP-4590/4540/4530/4520/4510 series, the panel operation for the following can be locked after setting the password.



- The same password is also required when configuring the printer settings through EPSON NetConfig.
- All settings will be initialized when resetting the password.

**Table 1-10. Panel Operation Lock Setting**

ON	The password is required for the following settings. <ul style="list-style-type: none"> <li>Lock settings</li> <li>Printer setup</li> <li>Wi-Fi/Network settings</li> <li>File sharing setup</li> <li>Restoration of individual settings such as network setting (except initializing the all settings)</li> </ul>
OFF	Entering the password is not required to go to the setting screen even the password is registered.

#### □ Password setting method

1. Select “Setup” - “Lock Settings” - “On”, and then press “OK”.
2. Enter the password, and then press “OK”.
3. To verify the password, enter the password again and press “OK”.

**Table 1-11. Password Setting**

Item	Description	
	WP-4540 series	WP-4590/4530/4520/4510 series
Digit of the password	Within 1 to 20	
Available characters	Space, !"#%&'()*+,-./, 0-9, ;<=>?@ A-Z, \]^_`, a-z, {}~	
Method	Select characters with arrows or ten key. When a password is already set, the following three password entries are required: “Enter Current Password”, “Enter New Password”, and “Verify New Password”.	Select characters with the arrow buttons. When a password is already set, the following three password entries are required: “Enter Current Password”, “Enter New Password”, and “Verify New Password”.

Note 1: The password is not set when shipping from the factory.

- 2: If the entries “Enter New Password” and “Verify New Password” are different, the message “Password is incorrect. Enter correct password.” is displayed and the menu screen returns to the password entering screen.
- 3: If the entries up to “Verify New Password” are complete successfully, the change will be reflected and the LCD display returns to the setup menu.
- 4: The password is stored on the EEPROM, and kept even the power is off.

#### □ Panel operation lock method

1. Select “Setup” - “Lock Settings” - “On”, and then press “OK”.
2. Enter the password, and then press “OK”.
3. When “Free access limited” displays, press “OK”. Then the panel lock setting becomes valid.

□ Resetting the password/unlocking the panel operation lock

If you need to reset the password or unlock the panel operation because of forgetting the password and such, follow the steps below to reset them.

■ Resetting/unlocking method

1. Select “Setup” - “Restore Default Settings” - “All Settings”, and press “OK”.
2. When “Restore all settings to defaults” displays, select “Yes”.

■ Settings after reset

- Password: Not set
- Panel operation lock: OFF

### 1.5.1.3 Forced Power OFF

For WP-4590/4540/4530/4520/4510/4090/4020/4010 series, the power can be turned off forcibly by the following panel operation. If the power is turned off forcibly, the same process of the normal power-off is executed.

□ Operation method

1. Press the power button and then stop button, and hold down the buttons for seven seconds or more.
2. When the LCD display changes, release the buttons.



### 1.5.1.4 Printer Status Sheet

WP-4590/4540/4530/4520/4510/4090/4020/4010 series print the printer status sheet by the following operation.

**Table 1-12. Status Sheet**

Model	Procedure
WP-4590/4540/4530/4520/4510 series	<ol style="list-style-type: none"> <li>1. Press the setup button.</li> <li>2. Select “Print Status Sheet” from the setup menu.</li> <li>3. Press the start button.</li> </ol>
WP-4090/4020/4010 series	Turn the power on while pressing the paper feed/eject button.

Note : When printing the network status sheet to check the network information, follow the procedure below.

- WP-4590/4540/4530/4520/4510 series: Select “Wi-Fi/Network Settings” - “Confirm Wi-Fi/Network Settings”, and press  or . (See "1.5.1.1 Setup Menu Configuration (WP-4590/4540/4530/4520/4510 series only) (p22)".)
- WP-4090/4020/4010 series: Press the “network status sheet” button. (See "1.4.1 Operation Buttons & LEDs (p14)".)





## CHAPTER 2

# OPERATING PRINCIPLES

## 2.1 Overview



In this manual, the product name is abbreviated to such as “WP-4510 series”, however, the last digit of the actual name may differ. Identify your product with the first three digits and refer to the appropriate sections in this manual.

This chapter describes the operating principles of WP-4590/4540/4530/4520/4510/4090/4020/4010 series printer mechanism.

## 2.2 Printhead

This section describes the printhead.

- ☐ Print method: On-demand inkjet  
(F7-Mach Turbo 2)
- ☐ Nozzle configuration

Color	Bk, C, M, Y (4 colors)
Number of nozzles	1064 nozzles (Bk: 152 nozzles x 4, C, M, Y: 152 nozzles per color)
Nozzle pitch	0.169 mm (1/150 inch)

The nozzle layout as seen from behind the Printhead is shown below.

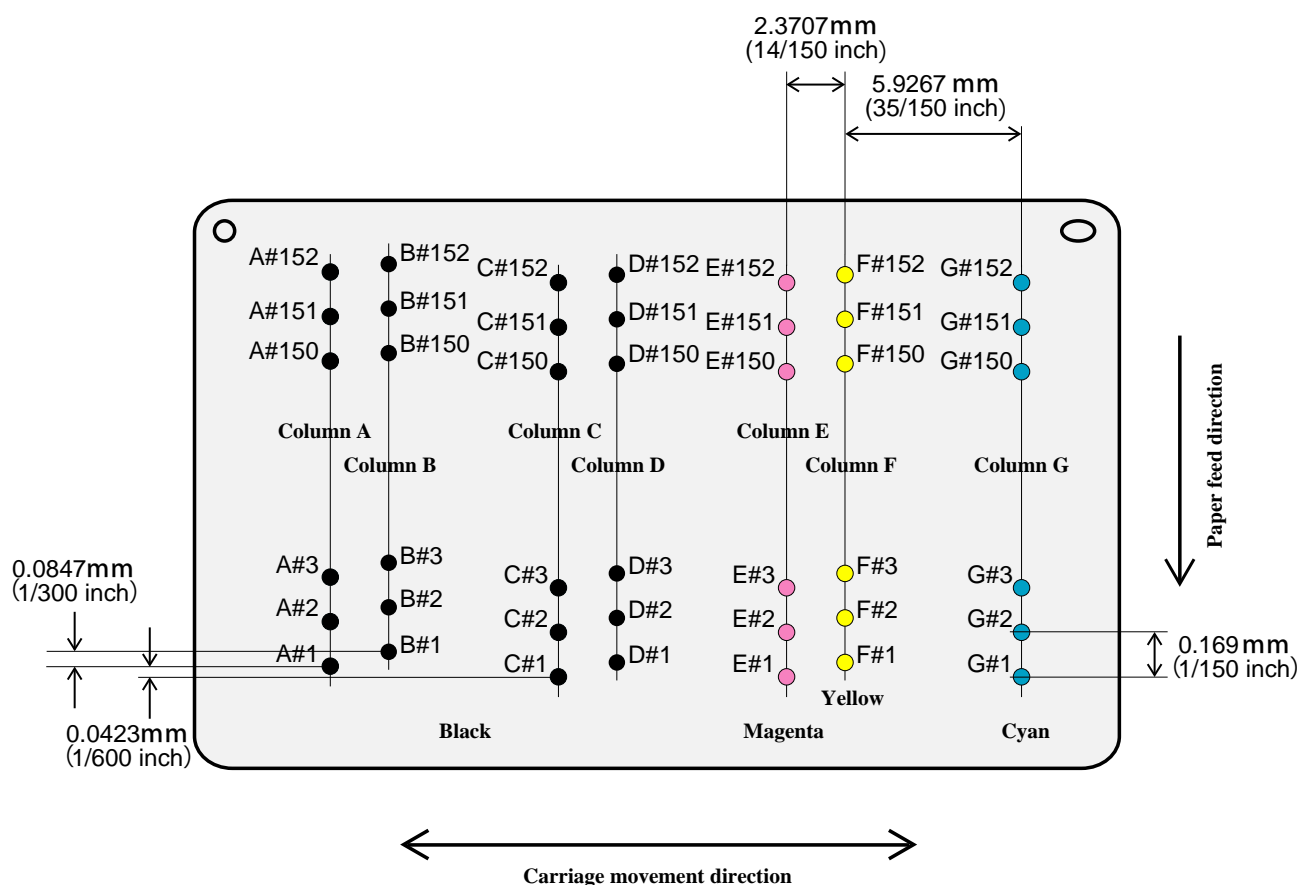


Figure 2-1. Nozzle Layout



2.3 Motors and Sensors

The following table lists the motors and sensors of WP-4590/4540/4530/4520/4510/4090/4020/4010 series.

□ Printer Mechanism

Table 2-1. List of Motors & Sensors (Printer Mechanism)

Mechanism	Motor or Sensor	No.
Printhead		---
Carriage mechanism	CR Motor	A
	CR Encoder	1
	PW Sensor	2
	Cover Open Sensor	3
Ink supply mechanism	Decompress Pump Motor	B
Paper loading/feed mechanism	PF Motor	C
	PF Encoder	4
	PE Sensor	5
	Paper Stopper Lever Sensor	6

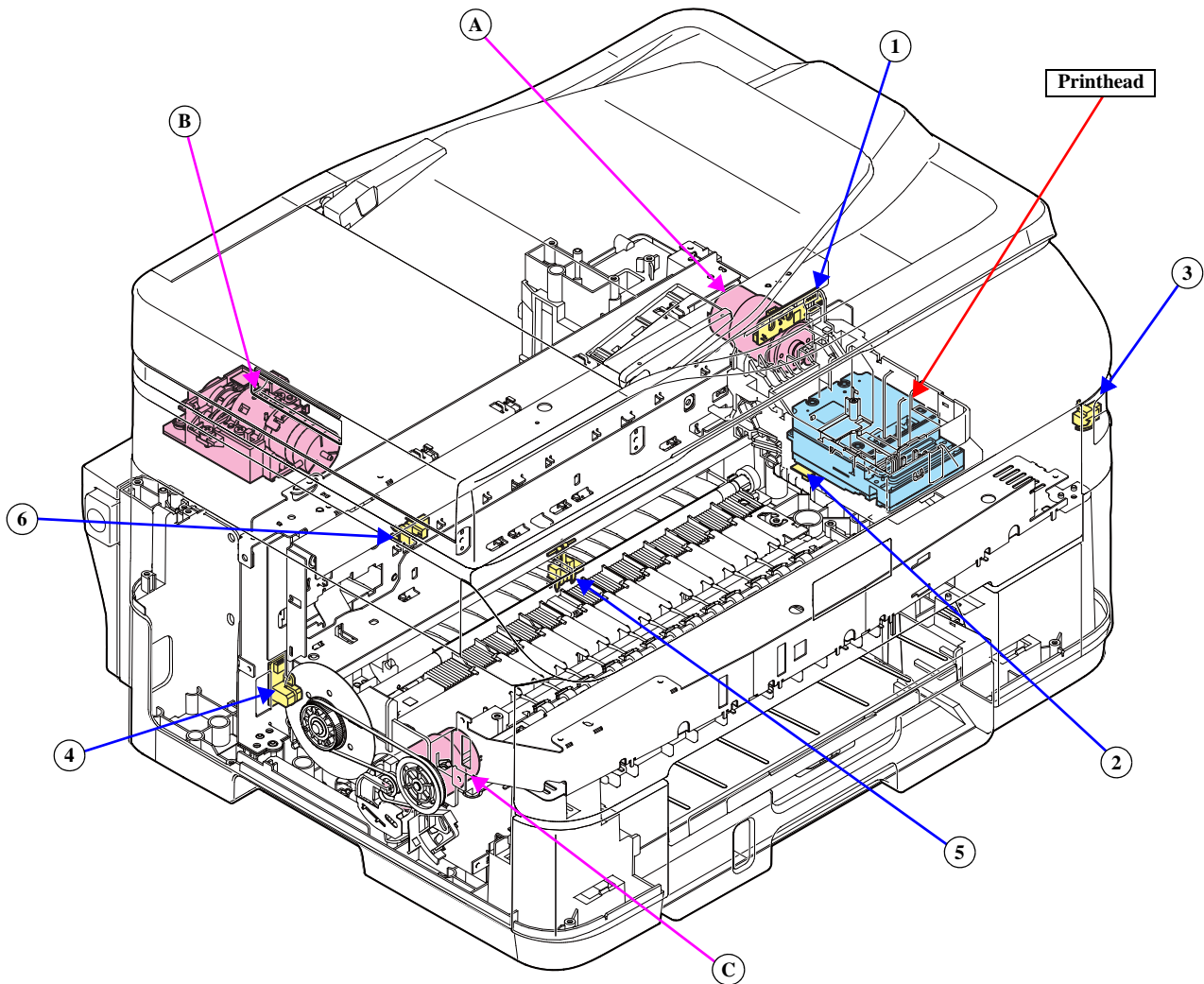


Figure 2-2. Motors & Sensors (Printer Mechanism)

□ Scanner (WP-4590/4540/4530/4520/4510 series only)

Table 2-2. List of Motors & Sensors (Scanner)

Mechanism	Motor or Sensor	No.
Scanner mechanism	Scanner Motor	A
	CIS Unit	1

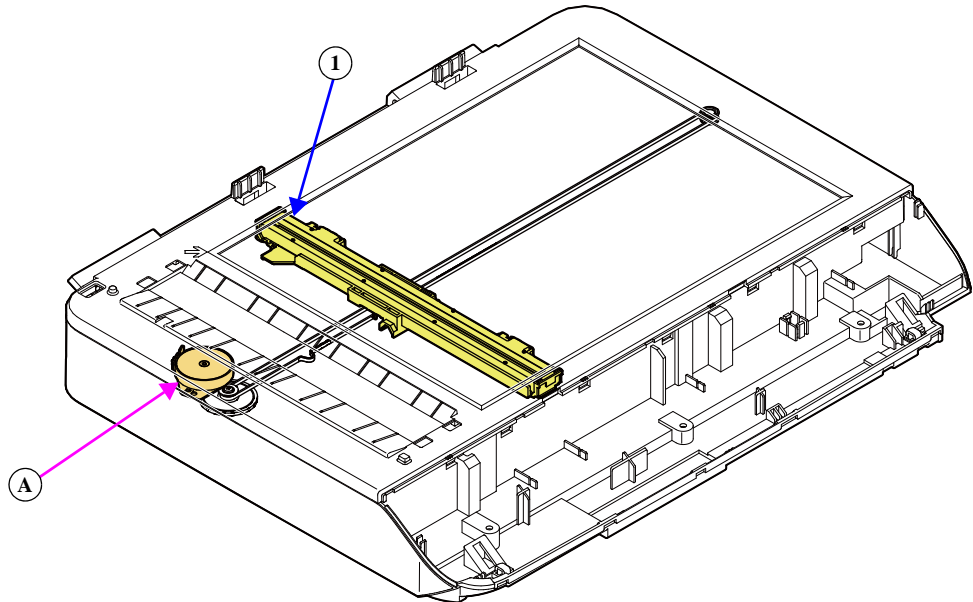


Figure 2-3. Motors & Sensors (Scanner)

□ ADF (WP-4590/4540/4530/4520 series only)

Table 2-3. List of Motors & Sensors (ADF)

Mechanism	Motor or Sensor	No.
ADF mechanism	ADF Motor	A
	PE Sensor	1
	Document Sensor	2
	ADF Encoder	3

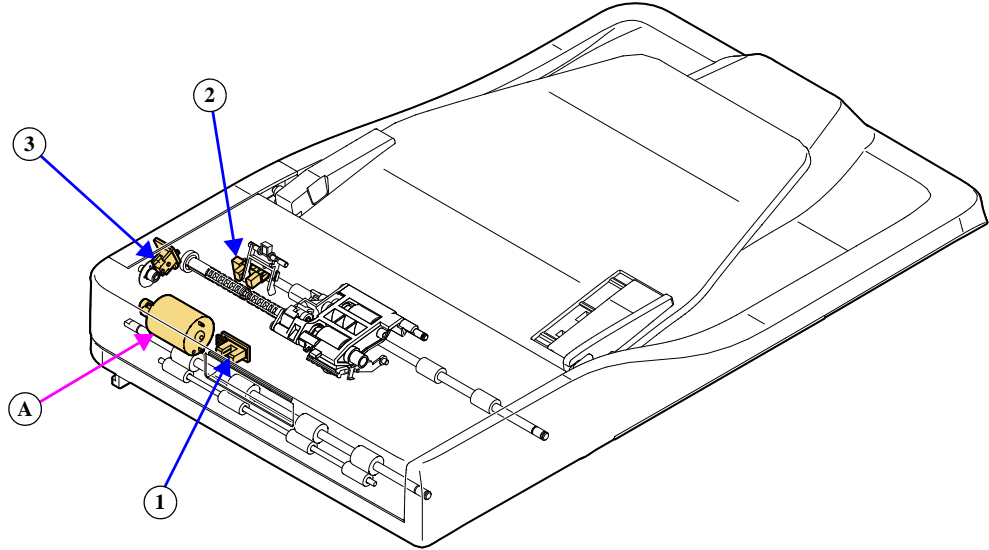


Figure 2-4. Motors & Sensors (ADF)

□ 2nd cassette

This unit is installed for WP-4540 series, and option for WP-4590/4530/4520/4510/4090/4020/4010 series.

Table 2-4. List of Motors & Sensors (2nd Cassette)

Mechanism	Motor or Sensor	No.
2nd cassette	ASF Motor	A
	Paper Stopper Lever Sensor	1
	ASF Encoder	2

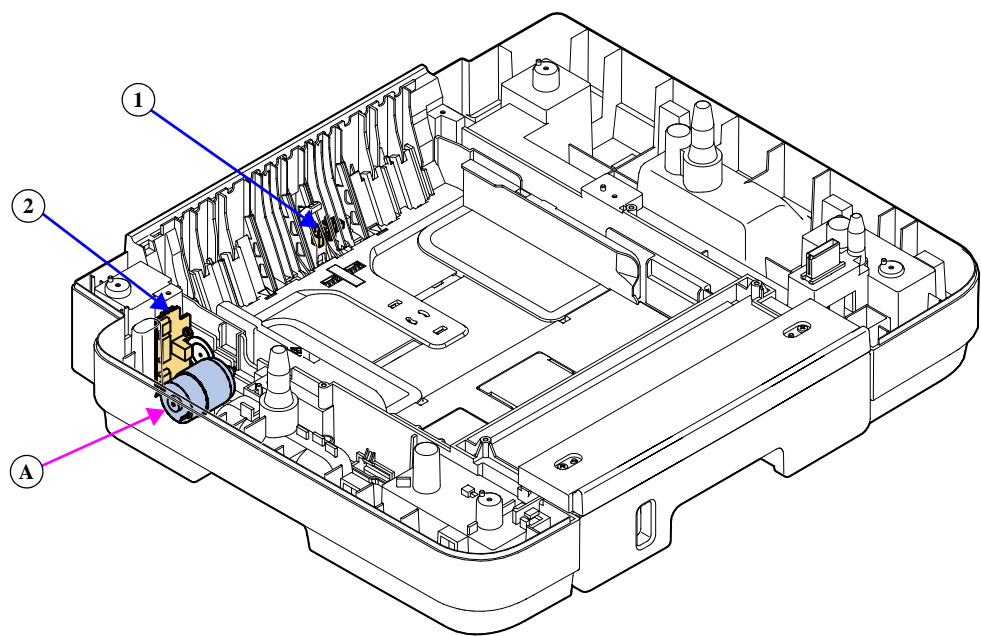


Figure 2-5. Motors & Sensors (2nd Cassette)

## 2.4 Optical Sensor Control

WP-4590/4540/4530/4520/4510/4090/4020/4010 series uses the optical sensor to control itself. The following describes the operating principles of optical sensor control.

### □ Control method

To ensure accurate printing, each part must be controlled to make an adequate amount (time) of movement. The optical sensors read the amount (time) of movements as follows to printer to control it for achieving accurate printing.

1. Rotates the motors for control of the printer, and transmits drive force to the each part via the gear or the timing belt.
2. The encoder reads the drive amount of each part from the scale one by one to printer to monitor that the part drives for an adequate amount (time).

### □ Controlled parts

The following table lists where the optical sensor control is used.

**Table 2-5. Controlled Parts**

Item	Motor	Scale	Encoder	Transmission method
<div>■ Paper feed/load mechanism</div> <div>■ Front ASF mechanism (1st cassette)</div> <div>■ Rear ASF mechanism</div>	PF Motor	PF Scale	PF Encoder	<div>■ PF Timing Belt</div> <div>■ ASF Timing Belt</div>
Carriage mechanism	CR Motor	CR Scale	CR Encoder	CR Timing Belt
Front ASF mechanism (2nd cassette <sup>*1</sup> )	ASF Motor	ASF Scale	ASF Encoder	Gear
ADF mechanism <sup>*2</sup>	ADF Motor	ADF Scale	ADF Encoder	Gear

Note \*1: Installed on WP-4540 series, and option for WP-4590/4530/4520/4510/4090/4020/4010 series.

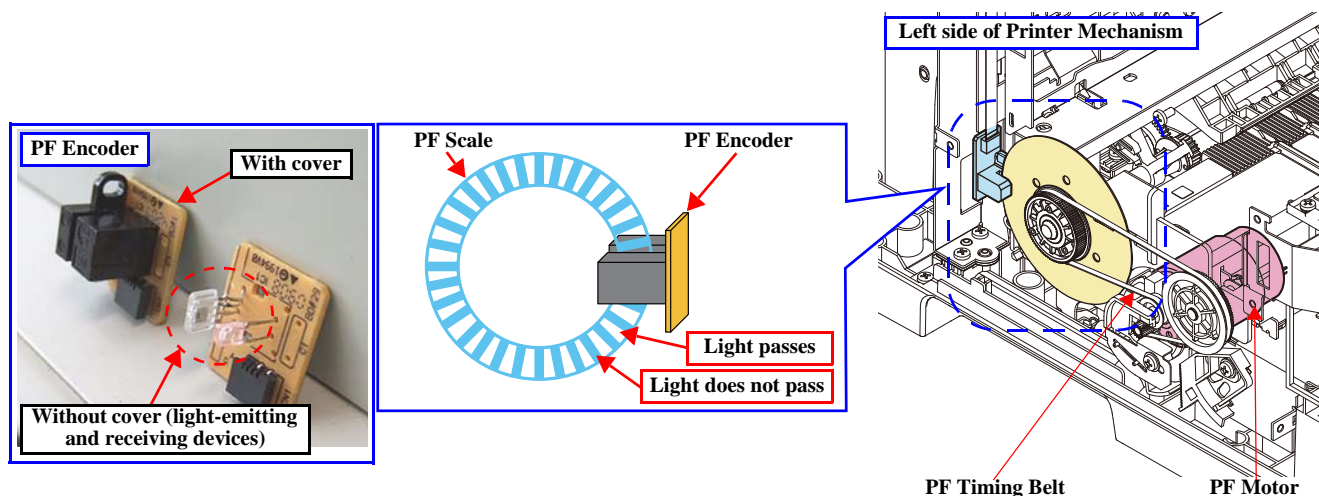
\*2: WP-4590/4540/4530/4520 series only.

### □ Operating principles

The following describes the paper feed mechanism drive control as an example of the actual operation for the optical sensor.

The PF scale consists of light-passing and light-blocking portions on its surface, and runs through the slit between the encoder's light-emitting and light-receiving devices. While the printer is operating, the encoder always emits light from light-emitting device toward the light-receiving device, and the light-receiving device detects light when the light is transmitted through the light-passing portion of the scale, and does not detect light when the light is blocked by the light-blocking portion of the scale. According to the counts of light-detected and non detected times, the printer controls paper feed drive direction and amount.

When the encoder cannot read light-emitting/blocking counts correctly due to the misalignment, broken or contaminated scale, paper jam, foreign object and increasing a load, the fatal error occurs and the printer stops.



**Figure 2-6. PF Drive Control Section**

## 2.5 Ink Supply Mechanism

The following shows configurations of the ink supply mechanism.

The ink supply mechanism consists of the Decompress Pump Unit and the Ink Supply Unit composed of the Ink Supply Tube, Diaphragm Pump, Buffer and Ink Cartridge Holder.

As the Decompress Pump Unit reduces the pressure inside the Diaphragm Pump, the Diaphragm Pump can suck the ink inside the Ink Cartridge, and then the sucked ink is supplied to the Printhead through the Buffer and Ink Supply Tube.

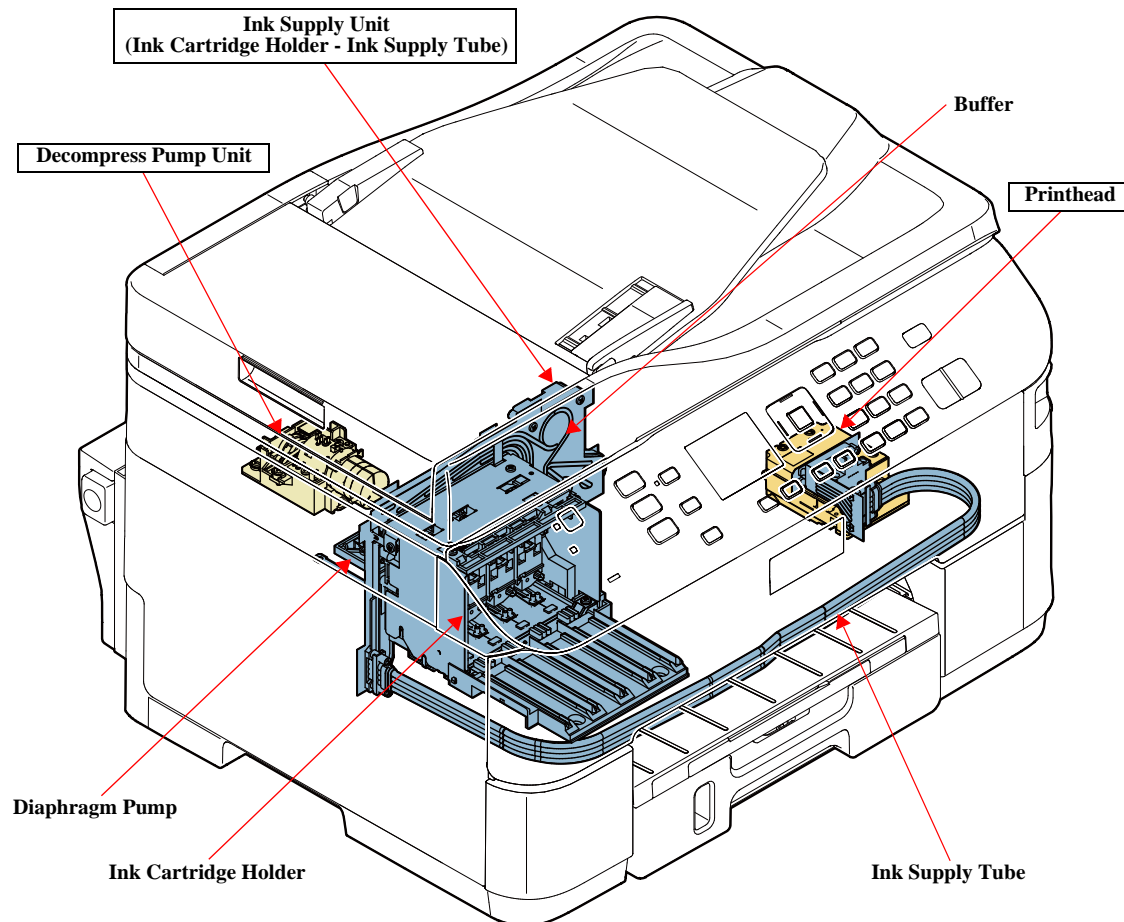


Figure 2-7. Ink Supply Mechanism

## 2.6 Ink System Mechanism

The following shows configurations of the ink system mechanism.

The ink system mechanism consists of the Ink System Unit composed of the Cap, Valve Unit, Pump Unit, Waste Ink Tube and similar parts, and the Maintenance Box that stores the ink from the Printhead sucked by the Ink System Unit.

The caps for color and monochrome are separately mounted and can be sucked individually. The Cap to use is switched by the Valve Unit.

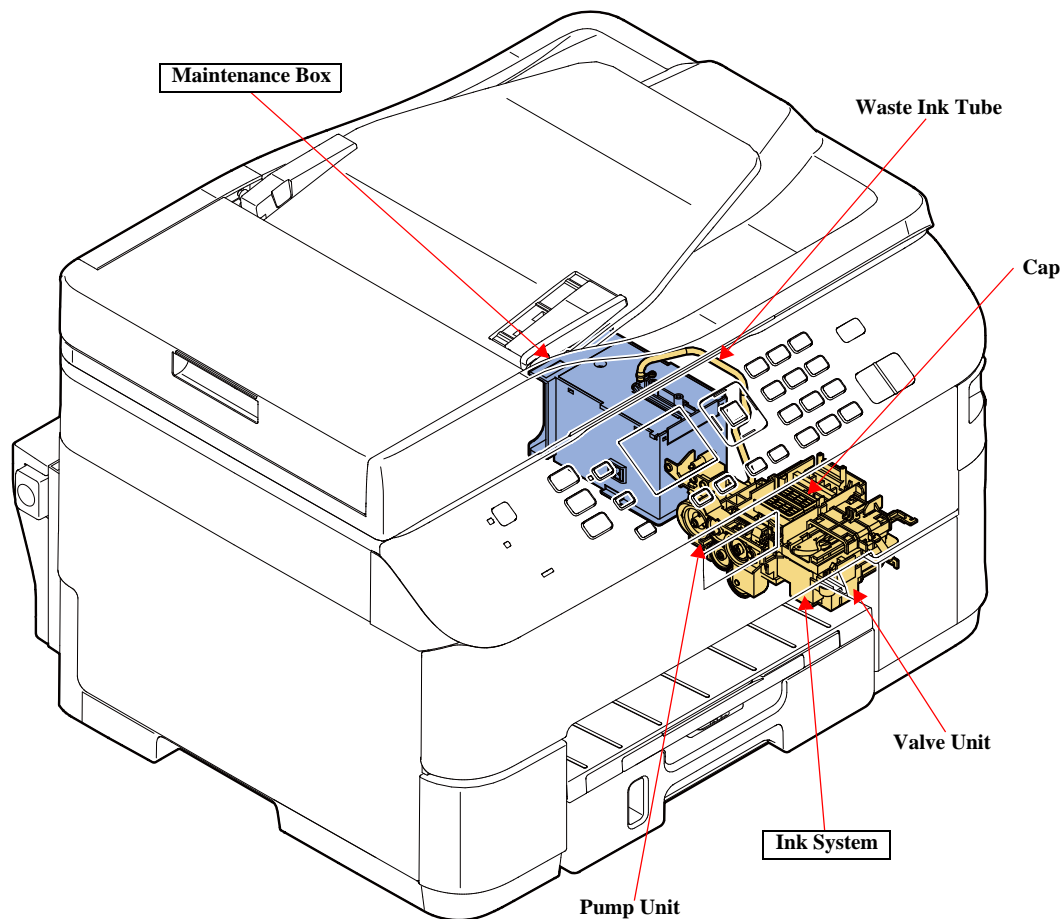


Figure 2-8. Ink System Mechanism





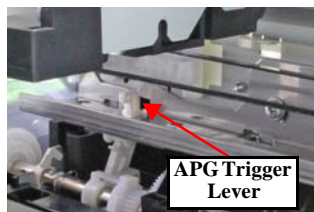
## 2.7 Power-On Sequence

Initializing operations of this printer at power-on differ between when powered off normally ("Simple Sequence (p33)") and when powered off abnormally ("Normal Power-On Sequence (p36)"). This section describes how this printer operates in the simple sequence and in the normal power-on sequence under certain conditions.



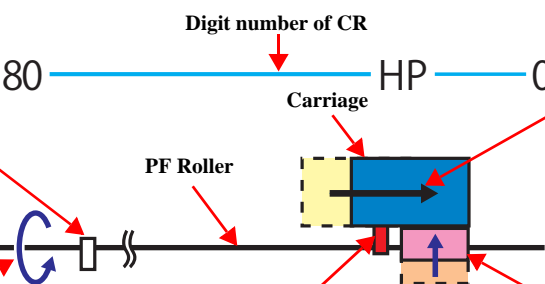
The following explains how to use the simplified diagrams in Table 2-6 or Table 2-7. The diagrams show the movement of each component as seen from the front of the printer.

**The condition of the APG Trigger Lever**  
 Red: APG Trigger Lever is set  
 White: APG Trigger Lever is released  
 The figure shows the APG Trigger Lever is released.



APG Trigger Lever

**The rotation direction of the PF Motor**  
 Clockwise:  
 Paper is fed normally  
 Counterclockwise:  
 Paper is fed backward  
 The above shows clockwise rotation.



**The condition of the CR lock**  
 Red: CR lock is set  
 White: CR lock is released  
 The above shows the CR lock is set.

**Valve Unit position**  
 On PF Roller: Up  
 Below PF Roller: Down  
 The above shows the Valve Unit is up.

**Carriage movement**  
 Right-pointing arrow:  
 Moves to the 0-digit side  
 Left-pointing arrow:  
 Moves to the 80-digit side  
 The figure shows the carriage is moving to the 0-digit side.

Figure 2-9. Movement of Components

### □ Condition 1: Simple sequence (Table 2-6)

- After powered off normally without any paper jam or fatal error.
- After the ink charge is complete and sufficient ink remains.
- No paper is on the paper path.
- The Printhead is capped with the Cap of the Ink System.
- The Carriage is locked by the CR lock.
- No heat control was executed for the CR Motor or the PF Motor at the previous use, or a long time has passed since the last power off.
- PG position is set to PG 1.

Table 2-6. Simple Sequence

Operation	Movement of Components	Front ASF drive condition	Decompress Motor	I/S Clutch <sup>*1</sup>
<b>1. Printhead initialization and fuse inspection</b> 1-1. Initializes the Printhead, and checks the fuse on the printer control circuit board.		OFF	---	OFF
<b>2. Seeking the home position</b> 2-1. The carriage moves to the 0-digit side slowly and confirms it touches the Right Frame.		↓	---	ON
2-2. Regards the position where the carriage touches the Right Frame as the position of the specified steps from the home position, and set it as the origin position.		↓	---	OFF

Table 2-6. Simple Sequence

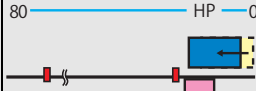

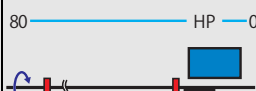
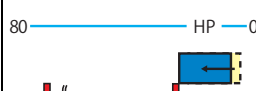
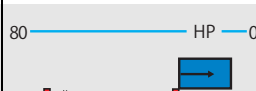



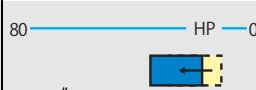

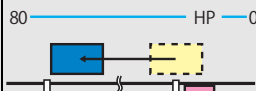

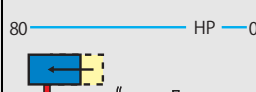

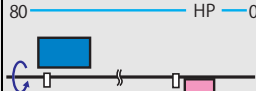



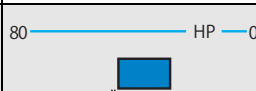




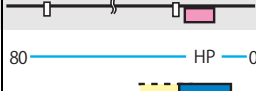
Operation	Movement of Components	Front ASF drive condition	Decompress Motor	I/S Clutch <sup>*1</sup>
2-3. The carriage slowly moves to the CR lock set position.		OFF	---	OFF
2-4. The PF Motor rotates clockwise and releases the CR lock.		↓	---	↓
2-5. The PF Motor rotates counterclockwise and sets the CR lock.		↓	---	↓
2-6. The carriage moves to the 80-digit side slowly and confirms it touches the CR lock.		↓	---	↓
2-7. The carriage returns to its home position.		↓	---	↓
2-8. The PF Motor rotates clockwise and releases the CR lock.		↓	---	↓
<b>3. Switching front ASF drive</b>				
3-1. The carriage moves to the 80-digit side slowly up to the position where the Front ASF turns on.		ON	---	↓
3-2. The carriage moves to the 0-digit side slowly up to the position where the Front ASF turns off.		OFF	---	↓
3-3. The carriage moves to the 80-digit side slowly and passes by the CR lock.		↓	---	↓
<b>4. APG reset</b>				
4-1. To reset the APG Trigger Lever, the PF Motor rotates clockwise and the PF Roller makes one turn.		↓	---	↓
4-2. The carriage moves to the 80-digit side quickly up to the APG reset stand-by position.		↓	---	↓
4-3. To set the APG Trigger Lever, the PF Motor rotates counterclockwise and the PF Roller makes one turn.		↓	---	↓
4-4. The carriage moves to the 80-side slowly up to the APG reset completion position.		↓	---	↓
4-5. After the carriage slightly moves to the 0-digit side, the PF Motor rotates clockwise quickly and the PF Roller makes one turn to reset the APG Trigger Lever.		↓	---	↓



Table 2-6. Simple Sequence

Operation	Movement of Components	Front ASF drive condition	Decompress Motor	I/S Clutch <sup>*1</sup>
<b>5. PF initialization</b>				
5-1. The PF Motor rotates clockwise for approximately one second.		OFF	---	OFF
5-2. The PE sensor checks if paper exists, and the PF Motor rotates clockwise for approximately 0.5 seconds.		↓	---	↓
<b>6. Low temperature operation sequence<sup>*2</sup></b>				
6-1. The carriage slowly moves to the 0-digit side.		↓	---	↓
6-2. The carriage moves back and forth between CR lock and the Left Frame two times.		↓	---	↓
<b>7. Checking waste ink overflow</b>				
7-1. Reads out the waste ink counter value of the Maintenance Box to check waste ink overflow.		↓	---	↓
<b>8. Detecting ink cartridge and initializing ink system</b>				
8-1. The carriage moves slowly to the ink detection position.		↓	---	↓
8-2. The Decompress Motor is driven and the Diaphragm Pump sucks the ink in the ink cartridges.		↓	Decompress and vent to atmosphere	↓
8-3. While monitoring the ink end sensor, the Decompress Motor is driven again and the Diaphragm Pump sucks the ink.		↓	Decompress and vent to atmosphere	↓
8-4. Detects the ink remaining. <sup>*3</sup>		↓	---	↓
8-5. The carriage returns to its home position. <sup>*4</sup>		↓	---	↓

Note : On the premise on this table, PG does not change and the Rear ASF does not operate during the sequence.

Note \*1: The I/S Clutch is located in the Ink System, and transmits the drive force of the PF Motor to move the Valve Unit up and down.

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

\*3: If this occurs when the timer cleaning (once a year) is scheduled, the cleaning (equivalent to CL3) is executed for black or color, or for both of them.

\*4: The Printhead is capped with the Cap of the Ink System but the Carriage is not locked by the CR lock in order to shorten the time before printing starts. The Carriage is locked when the printer enters the power saving mode without any operation after it is turned on.

- Condition 2: Normal power-on sequence (Table 2-7)
- When a paper jam error occurred during the previous power-on, and also the printer could not turn off normally.
  - After the ink charge is complete and sufficient ink remains.
  - No paper is on the paper path.
  - The Printhead is not capped with the Cap of the Ink System.
  - The Carriage is not locked by the CR lock, and also the APG Trigger Lever is not set.
  - PG position is set to PG 1.

Table 2-7. Normal Power-On Sequence

Operation	Movement of Components	Front ASF drive condition	Decompress Motor	I/S Clutch*1
<b>1. Printhead initialization and fuse inspection</b> 1-1. Initializes the Printhead, and checks the fuse on the printer control circuit board.		OFF	---	OFF
<b>2. Seeking the home position</b> 2-1. The carriage moves to the 0-digit side slowly and confirms it touches the Right Frame.		↓	---	↓
2-2. The carriage slowly moves to the 80-digit side.		↓	---	↓
2-3. To ensure the CR lock and APG Trigger Lever are reset, the PF Motor rotates clockwise and the PF Roller makes one turn.		↓	---	↓
2-4. The carriage moves to the 0-digit side slowly and confirms it touches the Right Frame.		↓	---	↓
2-5. To engage the I/S Clutch of the Ink System, the PF Motor rotates clockwise and the PF Roller makes approximately one turn.*2		↓	---	↓
2-6. To turn on the clutch of the Ink System, the PF Motor rotates counterclockwise and the PF Roller makes approximately half turn.		↓	---	ON
2-7. The carriage returns to its home position.		↓	---	↓
2-8. The PF Motor rotates clockwise, and releases the CR lock.		↓	---	↓
2-9. The carriage moves to the 80-digit side slowly up to the position where the Front ASF turns on.		ON	---	↓
2-10. The carriage moves to the 0-digit side slowly up to the position where the Front ASF turns off.		OFF	---	↓
2-11. The carriage moves to the 80-digit side slowly up to the Valve Unit initialization position.		↓	---	↓

Table 2-7. Normal Power-On Sequence

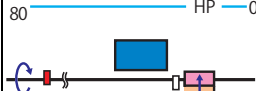
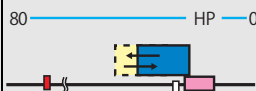






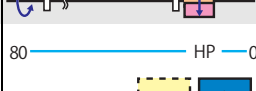
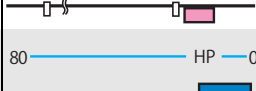
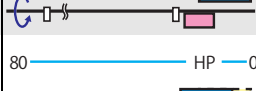
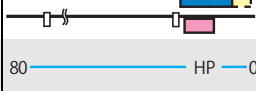
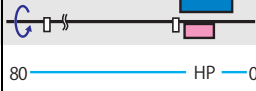
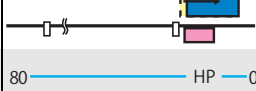
Operation	Movement of Components	Front ASF drive condition	Decompress Motor	I/S Clutch <sup>*1</sup>
2-12. The PF Motor rotates counterclockwise, and the Valve Unit goes up.		OFF	---	ON
2-13. To check if the protrusion of the Valve Unit has been set in the groove of the carriage, the carriage slightly moves to the 0-digit side, and then returns to its original position.		↓	---	↓
2-14. The PF Motor rotates clockwise, and the Valve Unit goes down.		↓	---	↓
2-15. The carriage slightly moves to the 0-digit side.		↓	---	↓
2-16. The PF Motor rotates counterclockwise, and the Valve Unit goes up.		↓	---	↓
2-17. The carriage moves to the 80-digit side.		↓	---	↓
2-18. The carriage moves to the 0-digit side slightly, and sets the choke valve of the Valve Unit to the position where the Printhead nozzles for both color and monochrome can be sucked.		↓	---	↓
2-19. The PF Motor rotates clockwise, and the Valve Unit goes down.		↓	---	↓
2-20. The carriage moves to the 0-digit side slowly and confirms it touches the Right Frame.		↓	---	↓
2-21. To turn off the clutch of the Ink System, the PF Motor rotates clockwise and the PF Roller makes approximately half turn.		↓	---	OFF
2-22. The carriage returns to its home position.		↓	---	↓
2-23. To release the Pump Unit, the PF Motor rotates clockwise approximately one second.		↓	---	↓
2-24. The carriage slowly moves to the 0-digit side to the CR lock set position.		↓	---	↓
2-25. The PF Motor rotates counterclockwise and sets the CR lock.		↓	---	↓

Table 2-7. Normal Power-On Sequence

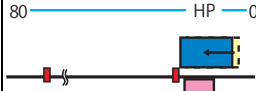
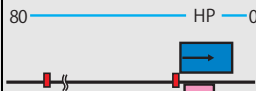


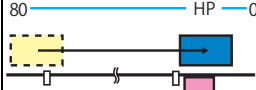


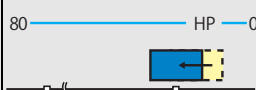
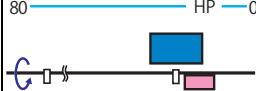
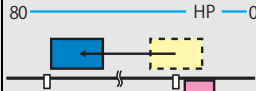
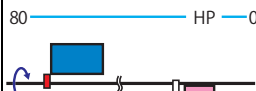
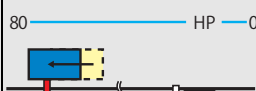

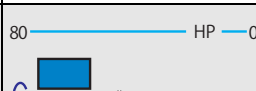
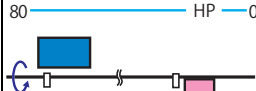
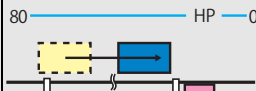






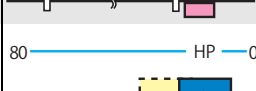
Operation	Movement of Components	Front ASF drive condition	Decompress Motor	I/S Clutch <sup>*1</sup>
2-26. The carriage moves to the 80-digit side slowly and confirms it touches the CR lock.		OFF	---	OFF
2-27. The carriage returns to its home position.		↓	---	↓
2-28. The PF Motor rotates clockwise and releases the CR lock.		↓	---	↓
<b>3. Detecting remaining paper</b>				
3-1. The carriage moves to the 80-digit side, and check if paper exists. <sup>*3</sup>		↓	---	↓
3-2. The carriage returns to its home position.		↓	---	↓
<b>4. Switching front ASF drive</b>				
4-1. The carriage moves to the 80-digit side slowly up to the position where the Front ASF turns on.		ON	---	↓
4-2. The carriage moves to the 0-digit side slowly up to the position where the Front ASF turns off.		OFF	---	↓
4-3. The carriage moves to the 80-digit side slowly and passes by the CR lock.		↓	---	↓
<b>5. APG reset</b>				
5-1. To reset the APG Trigger Lever, the PF Motor rotates clockwise and the PF Roller makes one turn.		↓	---	↓
5-2. The carriage moves to the 80-digit side quickly up to the APG reset stand-by position.		↓	---	↓
5-3. To set the APG Trigger Lever, the PF Motor rotates counterclockwise and the PF Roller makes one turn.		↓	---	↓
5-4. The carriage moves to the 80-side slowly up to the APG reset completion position.		↓	---	↓
5-5. After the carriage slightly moves to the 0-digit side, the PF Motor rotates clockwise quickly and the PF Roller makes one turn to reset the APG Trigger Lever.		↓	---	↓
<b>6. PF initialization</b>				
6-1. The PF Motor rotates clockwise for approximately one second.		↓	---	↓

Table 2-7. Normal Power-On Sequence

Operation	Movement of Components	Front ASF drive condition	Decompress Motor	I/S Clutch <sup>*1</sup>
6-2. The PE sensor checks if paper exists, and the PF Motor rotates clockwise for approximately 0.5 seconds.		OFF	---	OFF
<b>7. Low temperature operation sequence <sup>*4</sup></b>				
7-1. The carriage slowly moves to the 0-digit side.		↓	---	↓
7-2. The carriage moves back and forth between CR lock and the Left Frame two times.		↓	---	↓
<b>8. Checking waste ink overflow</b>				
8-1. Reads out the waste ink counter value of the Maintenance Box to check waste ink overflow.		↓	---	↓
<b>9. Detecting ink cartridge and initializing ink system</b>				
9-1. The carriage moves slowly to the ink detection position.		↓	---	↓
9-2. The Decompress Motor is driven and the Diaphragm Pump sucks the ink in the Ink Cartridges.		↓	Decompress and vent to atmosphere	↓
9-3. While monitoring the ink end sensor, the Decompress Motor is driven again and the Diaphragm Pump sucks the ink.		↓	Decompress and vent to atmosphere	↓
9-4. Detects the ink remaining. <sup>*5</sup>		↓	---	↓
9-5. The carriage returns to its home position. <sup>*6</sup>		↓	---	↓

Note : On the premise on this table, PG does not change and the Rear ASF does not operate during the sequence.

Note \*1: The I/S Clutch is located in the Ink System, and transmits the drive force of the PF Motor to move the Valve Unit up and down.

\*2: Initializes the Ink System. This sets the Valve Unit down completely.

\*3: The judgment standard is as follows. If judged as “paper exists”, the paper jam occurs again.

Paper exists: The carriage touches paper, or the PW Sensor detects the paper.

Paper does not exist: The carriage does not touch paper, but can move to the Left Frame position and touch the frame.

\*4: Executes when the detected temperature is under 5 °C (41°F) by the thermistor on the Printhead.

\*5: If this occurs when the timer cleaning (once a year) is scheduled, the cleaning (equivalent to CL3) is executed for black or color, or for both of them.

\*6: The Printhead is capped with the Cap of the Ink System but the Carriage is not locked by the CR lock in order to shorten the time before printing starts. The Carriage is locked when the printer enters the power saving mode without any operation after it is turned on.



## CHAPTER 3

# TROUBLESHOOTING

## 3.1 Troubleshooting



In this manual, the product name is abbreviated to such as “WP-4510 series”, however, the last digit of the actual name may differ. Identify your product with the first three digits and refer to the appropriate sections in this manual.

This section describes the error message list, troubleshooting workflow, fatal error code and FAX Troubleshooting.

### 3.1.1 Error Message List

Table 3-1. Error Message List

Status	WP-4090/4020/4010 series						WP-4590/4540/4530/4520/4510 series
	LED status						LCD message <sup>*2</sup>
	Power	Wi-Fi <sup>*1</sup>	Ethernet	Maintenance box	Paper	Ink (BK/C/M/Y)	
Printer fatal error	Flash at high speed	Flash at high speed	Flash at high speed	Flash at high speed	Flash at high speed	Flash at high speed	Printer error. Turn power off and then on again. For details, see your documentation or visit Epson.com.
							Paper jam inside, in back, or in ADF. Press [OK] to see to see how to remove jammed paper.
							Remove while and orange transportation locks by following instructions.
Scanner fatal error <sup>*3</sup>	---	---	---	---	---	---	Scanner error. Turn power off and then on again. If the error is not fixed, visit Epson.com for technical support.
ADF fatal error <sup>*4</sup>	---	---	---	---	---	---	Automatic Document Feeder (ADF) error.
Fax error <sup>*4</sup>	---	---	---	---	---	---	Fax error. Turn power off and then on again.
Maintenance box full	ON <sup>*5</sup>	---	---	ON	---	---	Maintenance box is at the end of its service life. You need to replace it. <Maintenance Box> XXXXX <sup>*6</sup>
Maintenance box CSIC error	ON <sup>*5</sup>	---	---	ON	---	---	Cannot recognize maintenance box. Install it correctly. <Maintenance Box> XXXXX <sup>*6</sup>
No maintenance box error	ON <sup>*5</sup>	---	---	ON	---	---	Cannot recognize maintenance box. Install it correctly. <Maintenance Box> XXXXX <sup>*6</sup>
Paper jam error <sup>*7</sup>	Flash <sup>*5</sup>	---	---	---	Flash	---	Paper jam. Press OK to see how to remove jammed paper.
Paper jam error (front cover open) <sup>*7</sup>	Flash <sup>*5</sup>	---	---	---	Flash	---	Paper jam. Press OK to see how to remove jammed paper.
Paper out error	Flash <sup>*5</sup>	---	---	---	ON	---	Paper out or paper jam. Check paper size and load paper in paper cassette XX <sup>*6</sup> .
Paper out error (front cover open)	Flash <sup>*5</sup>	---	---	---	ON	---	Paper out or paper jam. Check paper size and load paper in rear MP tray.
No paper cassette error	Flash <sup>*5</sup>	---	---	---	ON	---	Load Cassette XX <sup>*6</sup> correctly and press  (B&W) or  (Color).
Multi-feed error	Flash <sup>*5</sup>	---	---	---	ON	---	Multi-page feed error. Remove and reload the paper, then press  (B&W) or  (Color).

Table 3-1. Error Message List

Status	WP-4090/4020/4010 series						WP-4590/4540/4530/4520/4510 series
	LED status						LCD message <sup>*2</sup>
	Power	Wi-Fi <sup>*1</sup>	Ethernet	Maintenance box	Paper	Ink (BK/C/M/Y)	
Paper length mismatch error for duplex printing	Flash <sup>*5</sup>	---	---	---	ON	---	Incorrect paper size detected. Load correct paper size and press  (B&W) or  (Color).
Paper size mismatch error <sup>*8</sup>	Flash <sup>*5</sup>	---	---	---	ON	---	No paper source matches paper size setting. Load appropriate paper in Rear MP Tray. Press  (B&W) or  (Color).
Printer/printer driver mismatch error <sup>*9</sup>	Flash <sup>*5</sup>	---	---	---	Flash at high speed	Flash at high speed	Error. Press .
Front cover open error	Flash	---	---	---	Flash2	---	Front cover is open.
Ink end error	ON <sup>*5</sup>	---	---	---	---	ON <sup>*10</sup>	You need to replace the following ink cartridge(s). <Ink Cartridges> XXX <sup>*6</sup>
No ink cartridge error	ON <sup>*5</sup>	---	---	---	---	ON <sup>*10</sup>	The cartridge is installed incorrectly. Press it until it clicks into place. <Ink Cartridges> XXX <sup>*6</sup>
Ink cartridge detection error	ON <sup>*5</sup>	---	---	---	---	ON <sup>*10</sup>	Cannot recognize the following cartridge(s). Try installing them again. <Ink Cartridges> XXX <sup>*6</sup>
Ink cartridge detection error (non-Epson cartridge)	ON <sup>*5</sup>	---	---	---	---	ON <sup>*10</sup>	Ink cartridge is not recognized. Please replace the cartridge. <Ink Cartridges> XXX <sup>*6</sup>
Access point setting error (security information exchange) <sup>*11</sup>	ON	---	Flash at high speed	---	---	---	Security error while setting Wi-Fi with your access point. Try again.
Access point setting error (general) <sup>*11</sup>	ON	---	Flash	---	---	---	Error while setting Wi-Fi with your access point. Try again.
Access point setting error (registration) <sup>*11</sup>	ON	---	Flash	---	---	---	Registration error. The access point is busy. Try again.
Wireless LAN connection error <sup>*11</sup>	ON	---	Flash	---	---	---	The Wi-Fi/network connection failed. Print the check report?
Network connection time out error <sup>*11</sup>	ON	---	Flash	---	---	---	The Wi-Fi/network connection failed. Print the check report?

Note : --

Flash:

Flash 2:

Flash at high speed:

No change

turns on and off at intervals of 1.25 seconds.

On for 0.5 sec., Off for 0.5 sec., On for 0.5 sec. and Off for 1.0 sec.

turns on and off at intervals of 0.5 seconds.



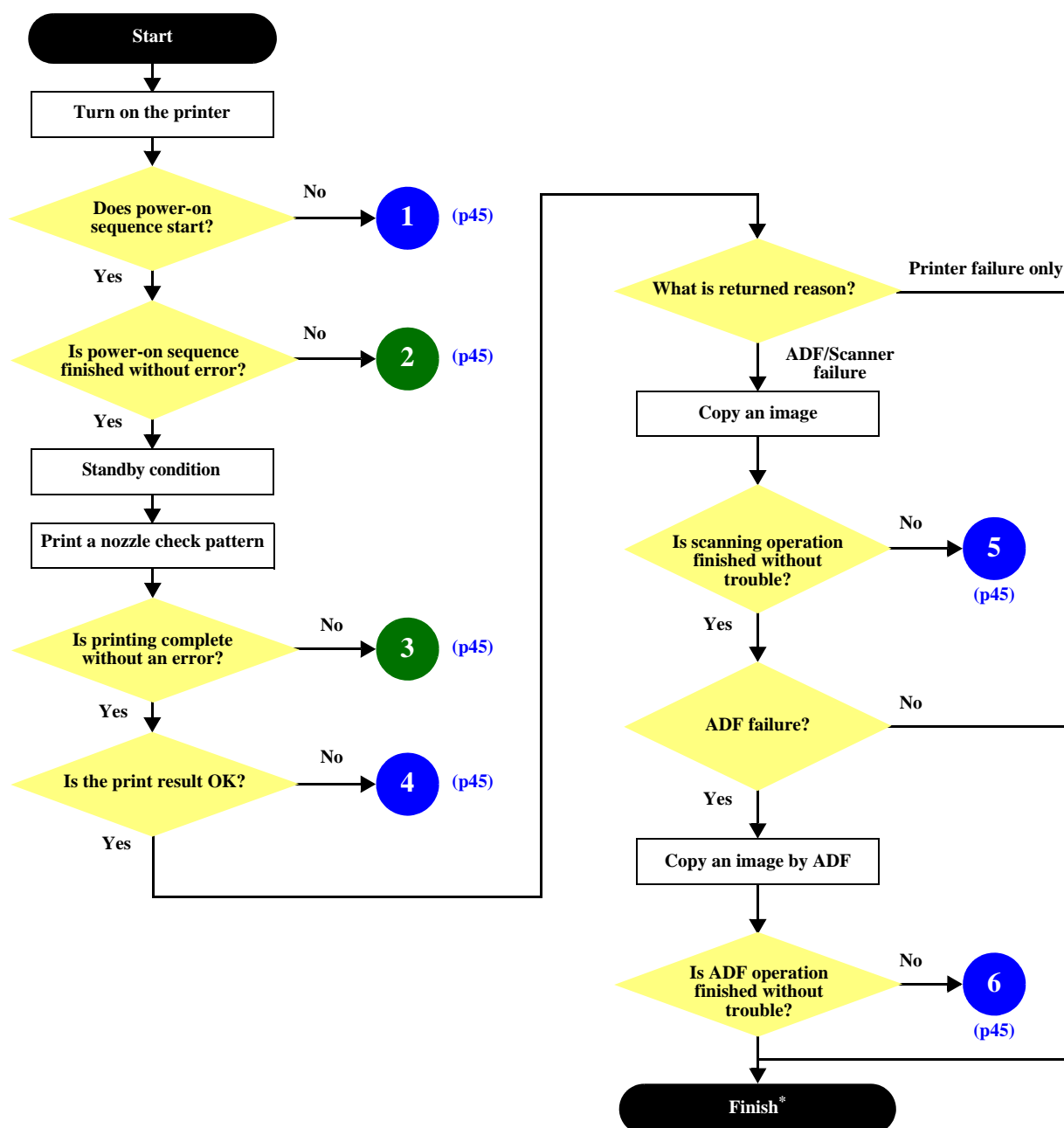
- Note \*1: WP-4020 series only
- \*2: The message WP-4540 series indicates is different but the meaning is the same.
- \*3: WP-4590/4540/4530/4520/4510 series only
- \*4: WP-4590/4540/4530/4520 series only
- \*5: Flashes if the status arises when printing starts or when the printer starts up, but lights if the status arises when printing is complete.
- \*6: The corresponding maintenance box, ink cartridge product number or cassette number is indicated.
- \*7: Occurs in any paper path.
- \*8: If this error occurs, set the correct paper size from “Printer Setup” - “Paper Size Loaded” to solve this error.
- \*9: If this error occurs, install the appropriate printer drive to solve the error.
- \*10: The corresponding ink LED flashes after the ink falls in the ink low status, and lights when it reaches the ink end status.
- \*11: WP-4540/4530/4020 series only

### 3.1.2 Troubleshooting Workflow

The following page describes the troubleshooting workflow. Follow the flow when troubleshooting problems.

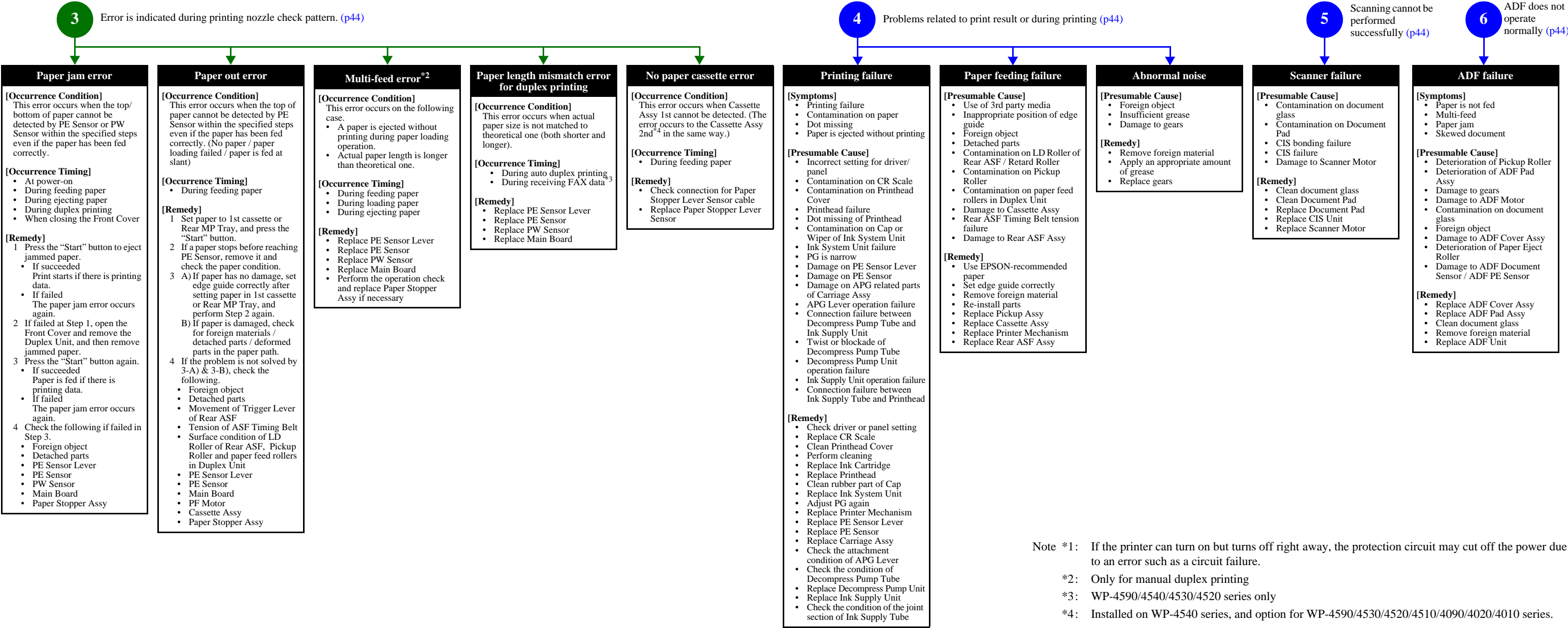
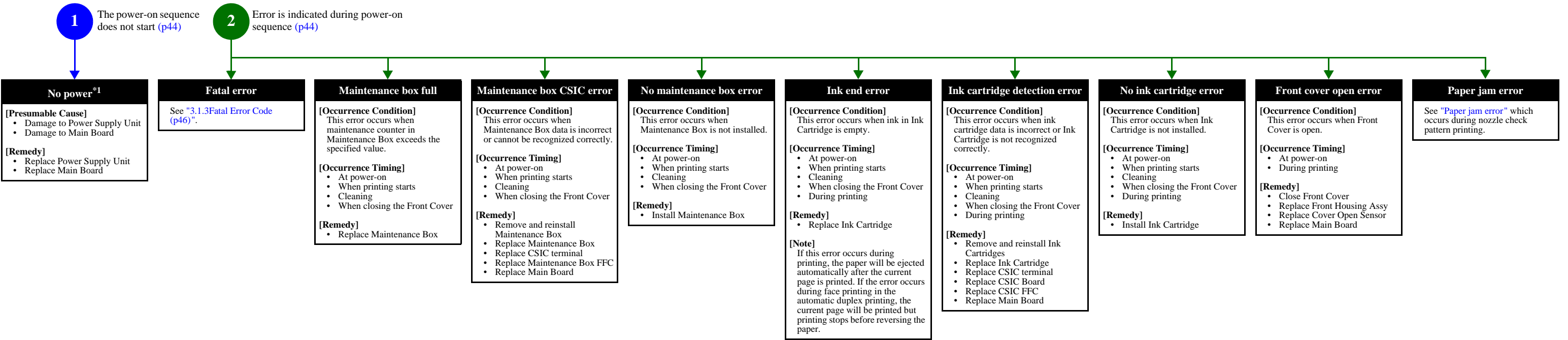


- This flowchart is compiled based on the following contents.
  - Our experience regarding the quality problem.
  - Printer Mechanism specification for WP-4590/4540/4530/4520/4510/4090/4020/4010 series
- See "[3.1.1 Error Message List \(p41\)](#)" for the error indication on the control panel.
- WP-4090/4020/4010 series are not equipped with the Scanner / ADF unit, therefore, the troubleshooting related to the Scanner / ADF unit is not applied.
- WP-4510 series are not equipped with the ADF unit, therefore, the troubleshooting related to the ADF unit is not applied.
- When FAX related error occurs, see "[3.1.4 FAX Troubleshooting \(WP-4590/4540/4530/4520 series only\) \(p49\)](#)".



\*: In case of "Not Trouble Found", check fatal error code.

Figure 3-1. Troubleshooting Workflow (1)



### 3.1.3 Fatal Error Code

This section describes the fatal error code and the possible cause for this product.

□ Printer fatal error list

**Table 3-2. Fatal Error List (Printer)**

Error type	Error code	Error name	Possible cause
DC motor error	01H	CR PID excess load error	<ul style="list-style-type: none"> <li>• CR Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>• CR Motor failure</li> <li>• Carriage overload error (paper jam/foreign object)</li> <li>• Cable disconnection</li> </ul>
	02H	CR PID excess speed error	<ul style="list-style-type: none"> <li>• CR Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>• Motor driver failure (Main Board failure)</li> <li>• Tooth skip of the CR Timing Belt</li> <li>• Improper tension of the CR Timing Belt</li> </ul>
	03H	CR PID reverse error	<ul style="list-style-type: none"> <li>• CR Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>• Tooth skip of the CR Timing Belt</li> <li>• Improper tension of the CR Timing Belt</li> <li>• Paper jam</li> </ul>
	04H	CR PID lock error	<ul style="list-style-type: none"> <li>• CR Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>• CR Motor failure</li> <li>• Carriage overload error (paper jam/foreign object)</li> <li>• Cable disconnection</li> </ul>
	05H	CR PID speed degradation error	<ul style="list-style-type: none"> <li>• CR Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>• Motor driver failure (Main Board failure)</li> <li>• Tooth skip of the CR Timing Belt</li> <li>• Improper tension of the CR Timing Belt</li> <li>• Paper jam</li> </ul>
	08H	CR load position reverse error	<ul style="list-style-type: none"> <li>• CR Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>• Tooth skip of the CR Timing Belt</li> <li>• Improper tension of the CR Timing Belt</li> <li>• Paper jam</li> </ul>
	09H	CR load position excess speed error	<ul style="list-style-type: none"> <li>• CR Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>• Motor driver failure (Main Board failure)</li> <li>• Tooth skip of the CR Timing Belt</li> <li>• Improper tension of the CR Timing Belt</li> </ul>
	0AH	CR load position excess load error	<ul style="list-style-type: none"> <li>• CR Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>• CR Motor failure</li> <li>• Carriage overload error (paper jam/foreign object)</li> <li>• Cable disconnection</li> </ul>
	11H	ASF PID excess load error	<ul style="list-style-type: none"> <li>• ASF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>• ASF Motor failure</li> <li>• 2nd Cassette Unit overload error (paper jam/foreign object/inappropriate installation of Pickup Assy 2nd)</li> <li>• Cable disconnection</li> </ul>
	12H	ASF PID excess speed error	<ul style="list-style-type: none"> <li>• ASF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>• Motor driver failure (Main Board failure)</li> </ul>
	13H	ASF PID reverse error	<ul style="list-style-type: none"> <li>• ASF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>• Paper jam</li> </ul>
	14H	ASF PID lock error	<ul style="list-style-type: none"> <li>• ASF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>• ASF Motor failure</li> <li>• 2nd Cassette Unit overload error (paper jam/foreign object/inappropriate installation of Pickup Assy 2nd)</li> <li>• Cable disconnection</li> </ul>

Table 3-2. Fatal Error List (Printer)

Error type	Error code	Error name	Possible cause
DC motor error	18H	ASF load position reverse error	<ul style="list-style-type: none"> <li>ASF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>Paper jam</li> </ul>
	19H	ASF load position excess speed error	<ul style="list-style-type: none"> <li>ASF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>Motor driver failure (Main Board failure)</li> </ul>
	1AH	ASF load position excess load error	<ul style="list-style-type: none"> <li>ASF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>ASF Motor failure</li> <li>2nd Cassette Unit overload error (paper jam/foreign object/inappropriate installation of Pickup Assy 2nd)</li> <li>Cable disconnection</li> </ul>
	F1H	PF PID excess load error	<ul style="list-style-type: none"> <li>PF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>PF Motor failure</li> <li>PF drive mechanism overload (paper jam/foreign object)</li> <li>Cable disconnection</li> </ul>
	F2H	PF PID excess speed error	<ul style="list-style-type: none"> <li>PF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>Motor driver failure (Main Board failure)</li> <li>Tooth skip of the PF Timing Belt</li> <li>Improper tension of the PF Timing Belt</li> </ul>
	F3H	PF PID reverse error	<ul style="list-style-type: none"> <li>PF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>Tooth skip of the PF Timing Belt</li> <li>Improper tension of the PF Timing Belt</li> <li>Paper jam</li> </ul>
	F4H	PF PID lock error	<ul style="list-style-type: none"> <li>PF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>PF Motor failure</li> <li>PF drive mechanism overload (paper jam/foreign object)</li> <li>Cable disconnection</li> </ul>
	F8H	PF load position reverse error	<ul style="list-style-type: none"> <li>PF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>Tooth skip of the PF Timing Belt</li> <li>Improper tension of the PF Timing Belt</li> </ul>
	F9H	PF load position excess speed error	<ul style="list-style-type: none"> <li>PF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>Motor driver failure (Main Board failure)</li> <li>Tooth skip of the PF Timing Belt</li> <li>Improper tension of the PF Timing Belt</li> </ul>
	FAH	PF load position excess load error	<ul style="list-style-type: none"> <li>PF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> </ul>
	FCH	PF load position error	<ul style="list-style-type: none"> <li>PF Motor failure</li> <li>PF drive mechanism overload (paper jam/foreign object)</li> <li>Cable disconnection</li> </ul>
Motor drive time error	D1H	CR (PID) driving time error	<ul style="list-style-type: none"> <li>Main Board failure</li> </ul>
	D2H	CR (load position) driving time error	
	D3H	PF (PID) driving time error	
	D4H	PF (BS) driving time error	
	D5H	ASF (PID) driving time error	
	D6H	ASF (BS) driving time error	
	D8H	I/S driving time error	<ul style="list-style-type: none"> <li>PF Motor failure</li> <li>PF drive mechanism overload (paper jam/foreign object)</li> <li>Cable disconnection</li> </ul>
Printhead system error	40H	Transistor temperature error	<ul style="list-style-type: none"> <li>Main Board failure</li> </ul>
	41H	X-Hot detect error (pre printing)	<ul style="list-style-type: none"> <li>Printhead failure</li> <li>Main Board failure</li> </ul>
	42H	X-Hot detect error (after flushing)	
	43H	Head temperature error	

Table 3-2. Fatal Error List (Printer)

Error type	Error code	Error name	Possible cause
Sequence error	50H	Home position error	<ul style="list-style-type: none"> <li>Paper jam</li> <li>Foreign object</li> <li>Deformation of the Main Frame</li> </ul>
	51H	Deadlock avoidance error	
	52H	Impossible contact detection error	
	57H	Valve initialization contact point detection error	<ul style="list-style-type: none"> <li>Carriage overload error (paper jam/foreign object)</li> </ul>
	58H	I/S clutch operation contact point detection error	
Sensor error	60H	PW detector error	<ul style="list-style-type: none"> <li>PW Sensor failure</li> <li>Main Board failure</li> </ul>
	61H	PW detector confusion error	
	62H*	Hot-plug disconnection paper jam fatal error	<ul style="list-style-type: none"> <li>2nd Cassette Unit has been removed during feeding (when the ASF Motor is operating).</li> <li>Contact failure of the connector which connects 2nd Cassette Unit and the printer.</li> </ul>
Ink device error	B0H - CFH	Ink device error	<ul style="list-style-type: none"> <li>Ink Cartridge failure</li> <li>CSIC terminal failure</li> <li>CSIC Board failure</li> <li>Main Board failure</li> <li>CSIC FFC connection failure</li> </ul>
Circuit error	80H	Circuit error (include blowout of a fuse)	<ul style="list-style-type: none"> <li>Main Board failure</li> </ul>

Note \*: When the optional 2nd cassette is installed for WP-4530/4520/4510/4020/4010 series.

☐ Scanner fatal error list (WP-4590/4540/4530/4520/4510 series only)

Table 3-3. Fatal Error List (Scanner)

Error code	Error name	Possible cause
10H	Scanner HP detection error	<ul style="list-style-type: none"> <li>CIS Unit failure</li> <li>Scanner Housing failure</li> <li>Main Board failure</li> </ul>
20H	Scanner LED light error	<ul style="list-style-type: none"> <li>CIS Unit failure</li> <li>Main Board failure</li> </ul>

☐ ADF fatal error list (WP-4590/4540/4530/4520 series only)

Table 3-4. Fatal Error List (ADF)

Error code	Error name	Possible cause
01H	ADF PID excess speed error	<ul style="list-style-type: none"> <li>ADF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>Motor driver failure (Main Board failure)</li> </ul>
02H	ADF PID reverse error	<ul style="list-style-type: none"> <li>ADF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>Paper jam</li> </ul>
03H	ADF PID lock error	<ul style="list-style-type: none"> <li>ADF Encoder failure (contaminated/detached scale, Encoder Board failure)</li> <li>ADF Motor failure</li> <li>ADF drive mechanism overload (paper jam/foreign object)</li> <li>Cable disconnection</li> </ul>
05H	ADF PID excess load error	
06H	ADF PID driving time error	<ul style="list-style-type: none"> <li>Main Board failure</li> </ul>
30H	ADF option error	<ul style="list-style-type: none"> <li>Main Board failure</li> </ul>
36H	ADF paper jam error	<ul style="list-style-type: none"> <li>Paper jam</li> </ul>

### 3.1.4 FAX Troubleshooting (WP-4590/4540/4530/4520 series only)

#### 3.1.4.1 FAX Log

When an error related to fax occurs, it is not only indicated on the LCD but also saved as a log file. The error code is recorded in it, and according to this log, the contents of the error can be confirmed.

**Table 3-5. FAX Log (1)**

Log Name	Description	Save Destination
Latest log <sup>*1</sup> (Last Transaction)	The latest communication log of sending / polling reception	Nonvolatile memory
Communication log (Fax Log)	The following information is stored.	Nonvolatile memory

Note \*1: The latest communication log for all destinations are printed in a list form when the sequential broadcast is executed. Cancellation is treated as a normal termination, therefore, if it is cancelled, the latest log is printed when the auto print setting is "always print", and not printed when the setting is "only when an error occurs". If "only when an error occurs" is selected, the log is printed even when an error occurs for just one destination.

\*2: The power failure log when the sequential broadcast is being executed is not printed for the destinations to which the transmission log is already complete then. If the power failure occurs before the scheduled sending time when a broadcast is scheduled, the scheduled sending time is recorded.



**The communication log is not stored under the following conditions:**

- When the sending operation is canceled while storing B&W image or waiting for redialing.
- In the case of a power failure during the operation of sending/polling reception including waiting status for redial, or during receive operation.
- When the receiving operation is canceled before the fax signal is detected.
- If the fax signal is not detected during receiving operation.
- If cancelled during the sequential broadcast.  
(The log for the destinations of "not dialed yet" or "waiting for re-dial" is not saved except for those of which the communication is complete.)

Table 3-6. FAX Log (2)

Log Name	Description	Save Destination																		
Protocol trace	The following information of the latest communication is stored.	Volatile memory																		
	<table><tr><th>Item</th><th>Information</th></tr><tr><td>Communication start date / time</td><td>Year/month/day/hour/minute</td></tr><tr><td>Communication type</td><td>Sending/receiving/polling reception</td></tr><tr><td>Communication ID</td><td><b>Sending/polling reception:</b><ul style="list-style-type: none"><li>Destination name of speed dial (first 20 characters)</li><li>Telephone number (last 20 characters)</li><li>Destination fax ID (20 characters)</li></ul><b>Receiving:</b><ul style="list-style-type: none"><li>Destination fax ID (20 characters)</li></ul></td></tr><tr><td>Airtime</td><td>Hour/minute/second</td></tr><tr><td>Communication pages</td><td>0 to 100</td></tr><tr><td>Communication result</td><td><b>Common:</b> Normal/cancel/error code <b>Sending/polling reception:</b> No dial tone detected/No fax signal detected/Busy tone detected</td></tr><tr><td>Diagnosing code</td><td>10 bytes</td></tr><tr><td>Protocol data</td><td>The latest 43 commands/responses*<ul style="list-style-type: none"><li>Time stamp</li><li>Sending / receiving</li><li>Command /response code (See <a href="#">Table 3-8. Command/Response Code (p.52)</a>)</li><li>FCF/FIF (first 33 octets).</li></ul></td></tr></table>		Item	Information	Communication start date / time	Year/month/day/hour/minute	Communication type	Sending/receiving/polling reception	Communication ID	<b>Sending/polling reception:</b> <ul style="list-style-type: none"><li>Destination name of speed dial (first 20 characters)</li><li>Telephone number (last 20 characters)</li><li>Destination fax ID (20 characters)</li></ul> <b>Receiving:</b> <ul style="list-style-type: none"><li>Destination fax ID (20 characters)</li></ul>	Airtime	Hour/minute/second	Communication pages	0 to 100	Communication result	<b>Common:</b> Normal/cancel/error code <b>Sending/polling reception:</b> No dial tone detected/No fax signal detected/Busy tone detected	Diagnosing code	10 bytes	Protocol data	The latest 43 commands/responses* <ul style="list-style-type: none"><li>Time stamp</li><li>Sending / receiving</li><li>Command /response code (See <a href="#">Table 3-8. Command/Response Code (p.52)</a>)</li><li>FCF/FIF (first 33 octets).</li></ul>
	Item		Information																	
	Communication start date / time		Year/month/day/hour/minute																	
	Communication type		Sending/receiving/polling reception																	
	Communication ID		<b>Sending/polling reception:</b> <ul style="list-style-type: none"><li>Destination name of speed dial (first 20 characters)</li><li>Telephone number (last 20 characters)</li><li>Destination fax ID (20 characters)</li></ul> <b>Receiving:</b> <ul style="list-style-type: none"><li>Destination fax ID (20 characters)</li></ul>																	
	Airtime		Hour/minute/second																	
	Communication pages		0 to 100																	
	Communication result		<b>Common:</b> Normal/cancel/error code <b>Sending/polling reception:</b> No dial tone detected/No fax signal detected/Busy tone detected																	
	Diagnosing code		10 bytes																	
Protocol data	The latest 43 commands/responses* <ul style="list-style-type: none"><li>Time stamp</li><li>Sending / receiving</li><li>Command /response code (See <a href="#">Table 3-8. Command/Response Code (p.52)</a>)</li><li>FCF/FIF (first 33 octets).</li></ul>																			
Note *: If a large amount of FIF is received, the recorded command/response may be less than 40.																				

☐ Error codes

Table 3-7. Error Code List

Error Code (HEX)	Phenomenon	LCD Display	Print Example
000	Successful completion (Monochrome)	Complete	OK
C000	Successful completion (Color)	Complete	OK Color
400	Communication error	Communication error	Error code
401	Communication error	Communication error	Error code
402	Communication error	Communication error	Error code
403	Communication error	Communication error	Error code
404	Communication error	Communication error	Error code
405	Communication error	Communication error	Error code
407	Communication error	Communication error	Error code
408	Communication error	Communication error	Error code
409	Communication error	Communication error	Error code
410	Communication error	Communication error	Error code
412	Communication error	Communication error	Error code
416	Communication error	Communication error	Error code
417	Communication error	Communication error	Error code
418	Communication error	Communication error	Error code
420	Fax signal was not detected during receive operation. (The call was a telephone call)	Not displayed	---
421	Communication error	Communication error	Error code
422	Communication error	Communication error	Error code
427	Communication error	Communication error	Error code
433	Communication error	Communication error	Error code



Table 3-7. Error Code List

Error Code (HEX)	Phenomenon	LCD Display	Print Example
434	Communication error	Communication error	Error code
436	Communication error	Communication error	Error code
459	Communication error	Communication error	Error code
490	Communication error	Communication error	Error code
494	Communication error	Communication error	Error code
495	Communication error	Communication error	Error code
496	Communication error	Communication error	Error code
501	Communication error	Communication error	Error code
502	Communication error	Communication error	Error code
503	Communication error	Communication error	Error code
504	Communication error	Communication error	Error code
505	Communication error	Communication error	Error code
540	Communication error	Communication error	Error code
541	Communication error	Communication error	Error code
542	Communication error	Communication error	Error code
543	Communication error	Communication error	Error code
544	Communication error	Communication error	Error code
550	Communication error	Communication error	Error code
554	Communication error	Communication error	Error code
620	Communication error	Communication error	Error code
621	Communication error	Communication error	Error code
623	Communication error	Communication error	Error code
624	Communication error	Communication error	Error code
630	A busy tone was detected after dialing	Talking (Line Busy)	Talking (Line Busy)
631	Communication error	Communication error	Error code
632	Communication error	Communication error	Error code
633	Communication error	Communication error	Error code
634	A fax signal was not detected for a given length of time after dialing	No Answer	No Answer
637	A dial tone was not detected before dialing	No Dial Tone	No Dial Tone
638	A power failure occurred during communication	Not displayed	Power Fail
700	The communication was canceled by an operation	Canceled	Canceled
706	System error	System Error	Error code
709	Communication error	Communication error	Error code
815	Communication error	Communication error	Error code
870	The image memory is full	Memory Full	Memory Full
871	The maximum number of files was exceeded	Error code	Error code
873	Communication error	Communication error	Error code
874	Communication error	Communication error	Error code
875	Communication error	Communication error	Error code
880	System error	System Error	Error code
881	System error	System Error	Error code
882	System error	System Error	Error code
883	System error	System Error	Error code
884	System error	System Error	Error code
928	Collision (A call signal was detected when shifting to dial operation)	Not displayed	---
F0B	Communication error	Communication error	Error code
F1E	Communication error	Communication error	Error code
F20	Communication error	Communication error	Error code
F21	System error	System Error	Error code

Table 3-7. Error Code List

Error Code (HEX)	Phenomenon	LCD Display	Print Example
F23	Communication error	Communication error	Error code
F24	Communication error	Communication error	Error code
F25	Communication error	Communication error	Error code
F27	System error	System Error	Error code
F28	System error	System Error	Error code
F29	Communication error	Communication error	Error code
F2A	Communication error	Communication error	Error code
F2B	No image data for reprint exists	No Image	---
F2F	System error	System Error	Error code
F3A	Communication error	Communication error	Error code
F51	System error	System Error	Error code
F57	Communication error	Communication error	Error code
F58	Communication error	Communication error	Error code
F59	System error	System Error	Error code
F60	A scanner fatal error occurs	Same message when a scanner fatal error occurred*	Error code
F61	A printer fatal error occurs	Same message when a printer fatal error occurred*	Error code
F62	Reserved	---	Error code
F63	ADF misfeed or paper jam occurred	Same message when an ADF fatal error occurred*	ADF Jam
F64	The memory for printing received image is full	Error code	Error code

Note \*: Confirm the fatal error code with the Adjustment Program to check which error occurred. (See " 3.1.3 Fatal Error Code (p46)".)

#### □ Command/response code

Table 3-8. Command/Response Code

Command/response code	FCF value (HEX) (LSB first: X=0)		Content
	First	Second	
DIS	80	-	Digital Identification Signal
CSI	40	-	Called Subscriber Identification
NSF	20	-	Non-Standard Facilities
DTC	81	-	Digital Transmit Command
CIG	41	-	CallInG subscriber identification
NSC	21	-	Non-Standard facilities Command
PWD	C1	-	PassWorD
SEP	A1	-	Selective Polling
Reserved (PSA)	61	-	Polled SubAddress
Reserved (CIA)	E1	-	Calling subscriber Internet Address
Reserved (ISP)	11	-	Internet Selective Polling address
DCS	82	-	Digital Command Signal
TSI	42	-	Transmitting Subscriber Identification
NSS	22	-	Non-Standard facilities Set-up
SUB	C2	-	SUBaddress
SID	A2	-	Sender IDentification
TRN	E6	-	Training
TCF	F0	-	Training Check
CTC	12	-	Continue To Correct
Reserved (TSA)	62	-	Transmitting Subscriber internet Address
Reserved (IRA)	E2	-	Internet Routing Address
CFR	84	-	ConFirmation to Receive

Table 3-8. Command/Response Code

Command/response code	FCF value (HEX) (LSB first: X=0)		Content
	First	Second	
FTT	44	-	Failure To Train
CTR	C4	-	Response for Continue To correct
Reserved (CSA)	24	-	Called Subscriber internet Address
EOM	8E	-	End Of Message
MPS	4E	-	MultiPage Signal
EOP	2E	-	End Of Procedure
PRI-EOM	9E	-	Procedure Interrupt-End Of Message
PRI-MPS	5E	-	Procedure Interrupt-MultiPage Signal
PRI-EOP	3E	-	Procedure Interrupt-End Of Procedure
Reserved (EOS)	1E	-	End Of Selection
PPS-EOM	BE	8E	Partial Page Signal-End Of Message
PPS-MPS	BE	4E	Partial Page Signal-MultiPage Signal
PPS-EOP	BE	2E	Partial Page Signal-End Of Procedure
PPS-PRI-EOM	BE	9E	Partial Page Signal-Procedure Interrupt- End Of Message
PPS-PRI-MPS	BE	5E	Partial Page Signal-Procedure Interrupt- MultiPage Signal
PPS-PRI-EOP	BE	3E	Partial Page Signal-Procedure Interrupt- End Of Procedure
PPS-EOS	BE	1E	Partial Page Signal-End Of Selection
PPS-NULL	BE	00	Partial Page Signal-partial page boundary
EOR-EOM	CE	8E	End Of Retransmission-End Of Message
EOR-MPS	CE	4E	End Of Retransmission-MultiPage Signal
EOR-EOP	CE	2E	End Of Retransmission-End Of Procedure
EOR-PRI-EOM	CE	9E	End Of Retransmission-Procedure Interrupt-End Of Message
EOR-PRI-MPS	CE	5E	End Of Retransmission-Procedure Interrupt-MultiPage Signal
EOR-PRI-EOP	CE	3E	End Of Retransmission-Procedure Interrupt-End Of Procedure
EOR-EOS	CE	1E	End Of Retransmission-End Of Selection
EOR-NULL	CE	00	End Of Retransmission- partial page boundary
RR	6E	-	Receive Ready
MCF	8C	-	Message ConFirmation
RTP	CC	-	ReTrain Positive
RTN	4C	-	ReTrain Negative
PIP	AC	-	Procedure Interrupt Positive
PIN	2C	-	Procedure Interrupt Negative
PPR	BC	-	Partial Page Request
RNR	EC	-	Receive Not Ready
ERR	1C	-	Response for End of Retransmission
Reserved (FDM)	FC	-	File Diagnostic Message
DCN	FA	-	DisCoNnect
CRP	1A	-	Command RePeat
Reserved (FNV)	CA	-	Field Not Valid
PIX	FF	-	PIXel image
Space	Other combinations		Unknown command/response

### 3.1.4.2 Error Code/Superficial Phenomenon-Based Troubleshooting

This section explains the troubleshooting procedures based on the error codes and superficial phenomenon.



- When an error occurs, it may be displayed on the LCD panel with a message instead of an error code. To check the error code, print out a fax log.
- If the problem is not solved even after carrying out the remedy shown in the [Table 3-9](#), print out a protocol trace to analyze the cause of the error.

**Table 3-9. Troubleshooting Based on the Error Code/Superficial Phenomenon**

Error code (LCD Message)/Phenomenon	Description	Remedy
Communication Error (The error is indicated with error code on the fax log.)	Communication error	Turn off v.34 and try again. Turn off ECM and try again. When using xDSL, check the connection from “Line” jack to the fax via the xDSL splitter. When using TAM, check the connection from “Line” jack to the TAM via the fax. Check if the telephone line makes any sounds.
Line Busy	The line is busy.	Try again later.
No answer	The other end of the line does not answer.	Check the number and dial again.
	The other end of the line answered but no answer tone is detected.	
Power fail	Power failure occurred during sending/receiving/printing/redialing.	Confirm the P/S Board Connector Cable or P/S Board is not damaged, and retry.
706,880-884,F21,F27-F28,F2F,F51,F59	A system error (fax circuit failure) occurs	Replace the FAX board with a new one.
Memory full	Out of Memory	Ask the sender to resend the fax in several batches.
871	Maximum number of files is exceeded	
F60	A scanner fatal error occurred	<ul style="list-style-type: none"> <li>• See <a href="#">Table 3-2 "Fatal Error List (Printer)"</a> (p.46).</li> <li>• See <a href="#">Table 3-3 "Fatal Error List (Scanner)"</a> (p.48).</li> </ul>
F61	A printer fatal error occurred	
F62	Reserved	---
F63	ADF document mis-feed or paper jam occurs	<ul style="list-style-type: none"> <li>• Set the documents and try again.</li> <li>• If a paper jam error occurs, remove the jammed paper and try again.</li> </ul>
F64	The memory for printing received image is full	Ask the sender to resend the fax in several batches.
Cannot receive faxes	The telephone cable is not connected properly.	Connect the telephone cable properly.
	The telephone line is not working.	Verify if the phone line works by connecting to a phone to it.
	Auto answer is set to “N”.	Set to “Y”.
	DRD setting is incorrect.	Set the setting to “ALL” and try again. Should other ring patterns be selected, contact the telephone company.
	Calling signal cannot be detected.	Contact the telephone company or obtain the fax log for more analysis.
Cannot dial	The telephone cable is not connected properly.	Connect the telephone cable properly.
	The telephone line is not working.	Verify if the phone line works by connecting to a phone to it.
	Pulse/Tone dial setting error	Turn the setting to the other one and try again.
Cannot receive/send faxes in color	ECM is set to off.	Set to on and try again.
	Fax mode is set to “B&W only”.	Set to “B&W/Color”.

**Table 3-9. Troubleshooting Based on the Error Code/Superficial Phenomenon**

Error code (LCD Message)/Phenomenon	Description	Remedy
Cannot print all the received data when printing data stored in memory	The size of the memory is 2.0 Mbyte. If the data becomes over the set threshold, oldest data are deleted to make room for new ones.	Ask the sender to resend the data if necessary because the data deleted from the memory can not be restored.
Images run off the paper	Auto reduction is set to off.	Set auto reduction to on and reprint the data.
	Paper size setting does not match the size of the received data.	Choose the correct setting and reprint the data.
	Paper size setting does not match the size of papers in the tray.	Choose the correct setting or load correct sized papers in the tray and reprint the data.



## CHAPTER 4

# DISASSEMBLY/REASSEMBLY

## 4.1 Overview



**In this manual, the product name is abbreviated to such as “WP-4510 series”, however, the last digit of the actual name may differ. Identify your product with the first three digits and refer to the appropriate sections in this manual.**

This chapter describes procedures for disassembling the main parts/units of WP-4590/4540/4530/4520/4510/4090/4020/4010 series. Unless otherwise specified, disassembled parts/units can be reassembled by reversing the disassembly procedure. See the cautions or tips for disassembly/reassembly described in ["4.3 Detailed Disassembly/Reassembly Procedure for each Part/Unit \(p68\)"](#).

Read the ["Safety Precautions \(p3\)"](#) before disassembling and reassembling.

When you have to remove units or parts that are not described in this chapter, see the exploded diagrams of SPI (Service Parts Information).

### 4.1.1 Tools

Use only specified tools to avoid damaging the printer.

Name	Availability	EPSON Part Code
(+) Phillips screwdriver #1	O	1080530
(+) Phillips screwdriver #2	O	---
Flathead screwdriver	O	---
Flathead Precision screwdriver #1	O	---
Tweezers	O	---
Longnose pliers	O	---
Acetate tape	---	1003963

Note 1: Some of the tools listed above are commercially available.

2: EPSON provides the tools listed with EPSON part code.

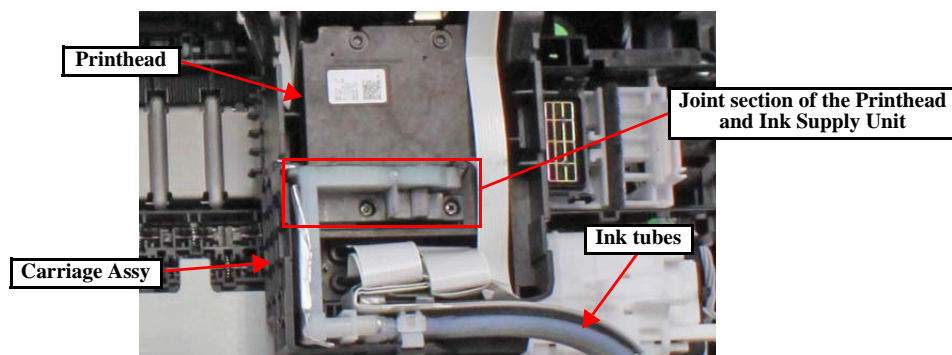
### 4.1.2 Jigs

Name	Quantity	EPSON Part Code
Thickness gauge (2 mm)	1	---
Ink Leak Measurement Jig	1	1430064
Ink Leak Check Cartridge	1	1565785
I/S Supply Unit Support Jig	1	1568075

## 4.2 Disassembly/Reassembly Procedures

### 4.2.1 Caution when Replacing the Printhead/Ink Supply Unit

For stable ink supply, this product employs a mechanism where the ink in the ink path is pressurized even the power is off. Therefore, if the joint section of the printhead and the Ink Supply Unit is simply disconnected, the ink in the ink tube will spill over.



**Figure 4-1. Joint Section of the Printhead and Ink Supply Unit**

To prevent this from happening, before separating the Printhead and Ink Supply Unit to replace the Printhead or the Ink Supply Unit, make sure to release the pressure inside the ink path using the Adjustment Program. The following explains the procedure.



- **This is not necessary when replacing the Printhead and Ink Supply Unit together with the Ink System Supply Assy supplied as an ASP.**
- **Approximately six minutes are required to release the applied pressure.**
- **The ink in the ink path is pressurized in the power-off sequence again, therefore, make sure not to turn the power off by the power button after the applied pressure is released.**

#### ☐ Tools

- Ink Cartridges (four colors: cyan, magenta, yellow, black)  
Do not use user's ink cartridges since the ink in the ink cartridges is consumed when releasing the pressure. Prepare ink cartridges supplied as consumables for this procedure. (Hereafter, an ink cartridge for this purpose is called as an "ink cartridge (for service use)").
- Maintenance box  
Do not use user's maintenance box since the ink the ink path flows to the maintenance box when releasing the pressure. Prepare maintenance box supplied as a consumable for this procedure. (Hereafter, a maintenance box for this purpose is called as a "maintenance box (for service use)").

#### ☐ Procedure

1. Remove the ink cartridges and maintenance box in the returned unit, and install the ink cartridges (for service use) and maintenance box (for service use).
2. Connect the printer and the PC installed the Adjustment Program with the USB cable, and turn the power on.
3. Start the Adjustment Program, and select the "Ink Pressure Release" from the menu.
4. Click "Execute" in the displayed screen to release the applied pressure.
5. When the completion message appears, unplug the computer power cable.

Afterward, remove the parts referring to "[4.2.2 Parts/Units Need to be Removed in Advance \(p59\)](#)" and replace them referring to "[4.2.3 Disassembly Flowchart \(p60\)](#)".



- **When separating the Printhead and the Ink Supply Unit, make sure to perform "[5.2.7 Ink Leak Check \(p101\)](#)" to check if ink is leaking.**
- **After disconnecting the Printhead and the Ink Supply Unit, ink may spill over even if the pressure is released. Therefore, be careful not to contaminate the surroundings.**

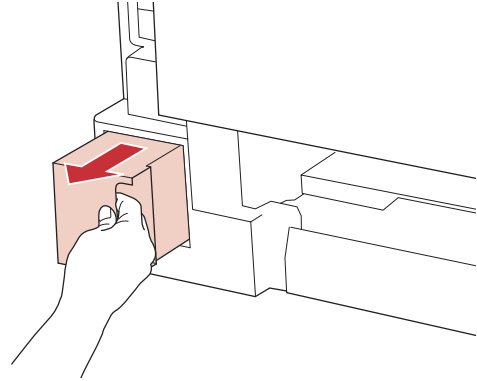
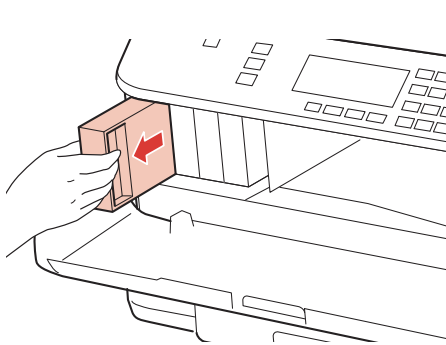


## 4.2.2 Parts/Units Need to be Removed in Advance

In [Chapter 4 "Disassembly Flowchart \(p60\)"](#), the procedures are indicated on the premise that some parts/units are removed in advance. Make sure to remove the following parts/units before starting disassembly.

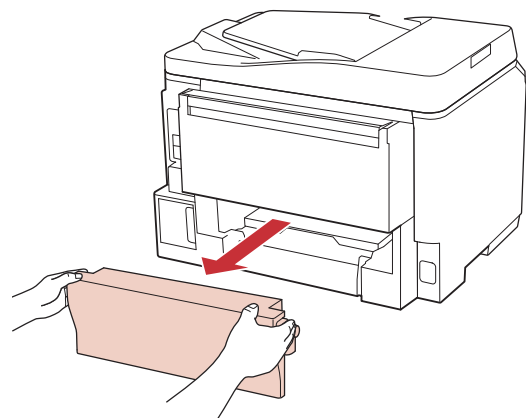
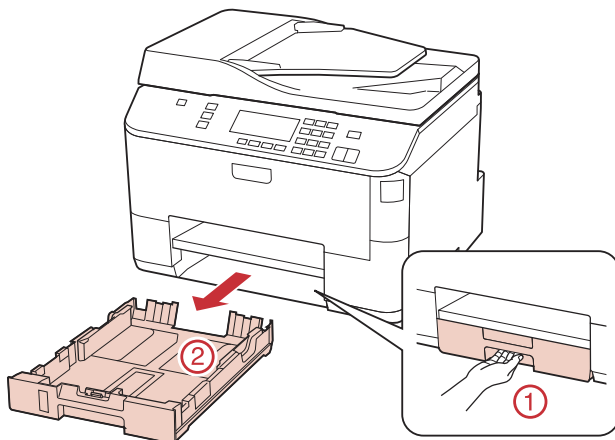
☐ Ink Cartridges (x4)

☐ Maintenance Box

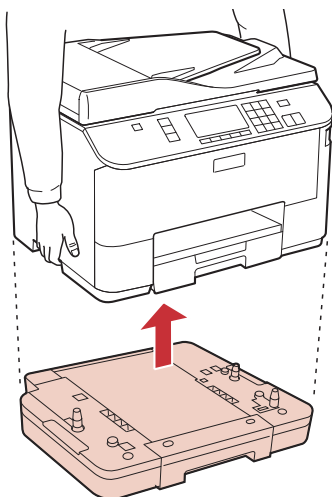


☐ Cassette Assy 1st

☐ Duplex Unit



☐ Cassette Assy 2nd\*



Note "\*": When the optional Cassette Assy 2nd is installed for WP-4590/4530/4520/4510/4090/4020/4010 series.

## 4.2.3 Disassembly Flowchart

This section describes procedures for disassembling the parts/units in a flowchart format. For some parts/units, detailed procedures or precautions are provided (accordingly indicated by icons and cell's color). Refer to the explanations in the example chart below and perform an appropriate disassembling and assembling procedure. (See ["4.3 Detailed Disassembly/Reassembly Procedure for each Part/Unit \(p68\)"](#).)

For routing cables, see ["4.4 Routing FFCs/cables \(p77\)"](#).

### 4.2.3.1 Parts/Units whose Configuration is Different between Models in the Flowchart

The models describe in this manual employ the same printer mechanism but they have different printing related functions and structures shown in [Chapter 1 "Product description \(p9\)"](#). Therefore, the parts/units vary and the shape of them differs even they have the same parts name.

In the flowchart in this section, the parts are in two colors: black for the common parts or units, and blue for the parts or units which differ between models. For the parts or units which differ between models, confirm the composition of the parts for the printer whose disassembly procedure you want to check, and then see the disassembly flowchart.

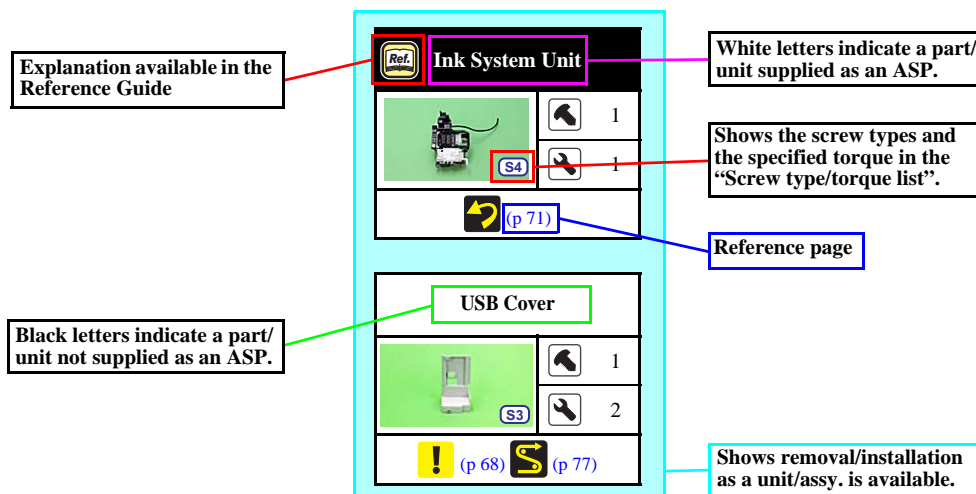
**Table 4-1. Parts/Units whose Configuration is Different between Models**

Model Name	Exterior Parts	Main Board Related Parts	Control Panel Components	Wireless LAN Related Parts	PCL Related Parts.
WP-4540 series	<input type="checkbox"/> "Scanner Unit (p63)" <input type="checkbox"/> "ADF Unit (p63)" <ul style="list-style-type: none"> <li>■ "ADF Cover Assy (p63)"</li> <li>• "ADF Cover Housing Upper (p63)"</li> <li>• "LD Cover (p63)"</li> <li>• "LD Shaft (p63)"</li> <li>• "Extension Spring 0.99 (p63)"</li> <li>• "ADF LD Assy (p63)"</li> </ul>	<input type="checkbox"/> "Main Board Shield Plate Upper Assy (p65)" <ul style="list-style-type: none"> <li>■ "Interface Board Shield Plate (p65)"</li> <li>■ "FAX FFC (p65)"</li> <li>■ "Interface Board (p65)"</li> </ul>	<input type="checkbox"/> "Panel FFC (p62)" <input type="checkbox"/> "Panel Assy (p62)" <ul style="list-style-type: none"> <li>■ "Panel Board (p63)"</li> <li>■ "Panel Housing Upper Assy (p63)"</li> <li>■ "Touch Panel (p63)"</li> <li>■ "Panel Sheet (p63)"</li> <li>■ "LCD Module (p63)"</li> <li>■ "Panel Frame (p63)"</li> <li>■ "Panel Optical Plate (p63)"</li> </ul>	<input type="checkbox"/> "Wireless LAN Module (p64)"	---
WP-4590 series	<ul style="list-style-type: none"> <li>■ "ADF Rear Cover (p63)"</li> <li>■ "ADF Document Support Assy (p63)"</li> </ul>	---	<input type="checkbox"/> "Panel FFC (p62)" <input type="checkbox"/> "Panel Assy (p62)" <ul style="list-style-type: none"> <li>■ "Panel Board (p63)"</li> <li>■ "Sub Board Assy (p63)" <ul style="list-style-type: none"> <li>• "Sub Board (p63)"</li> <li>• "Sub Board FFC (p63)"</li> <li>• "LCD Cover (p63)"</li> <li>• "LCD Module (p63)"</li> </ul> </li> <li>■ "Panel Housing Upper Assy (p63)"</li> </ul>	---	<input type="checkbox"/> "PCL Sub Board (p65)"
WP-4520 series	<ul style="list-style-type: none"> <li>■ "ADF Pad Assy (p62)"</li> </ul>		<input type="checkbox"/> "Wireless LAN Module (p64)"	---	---
WP-4530 series	<input type="checkbox"/> "FAX Cover (p62)"				
WP-4510 series	<input type="checkbox"/> "Document Cover (p62)" <input type="checkbox"/> "Scanner Unit (p62)" <input type="checkbox"/> "FAX Cover (p62)"		<input type="checkbox"/> "Panel FFC (p62)" <input type="checkbox"/> "Panel Assy (p62)" <ul style="list-style-type: none"> <li>■ "Panel Board (p63)"</li> <li>■ "Panel Housing Upper Assy (p63)"</li> </ul>	---	<input type="checkbox"/> "PCL Sub Board (p65)"
WP-4090 series	<input type="checkbox"/> "Housing Upper Assy (p62)"				
WP-4010 series	<input type="checkbox"/> "USB Cover (p62)"				
WP-4020 series			<input type="checkbox"/> "Wireless LAN Module (p64)"		---

Note: The 2nd Cassette Unit is installed for WP-4540 series, and option for WP-4590/4530/4520/4510/4090/4020/4010 series.

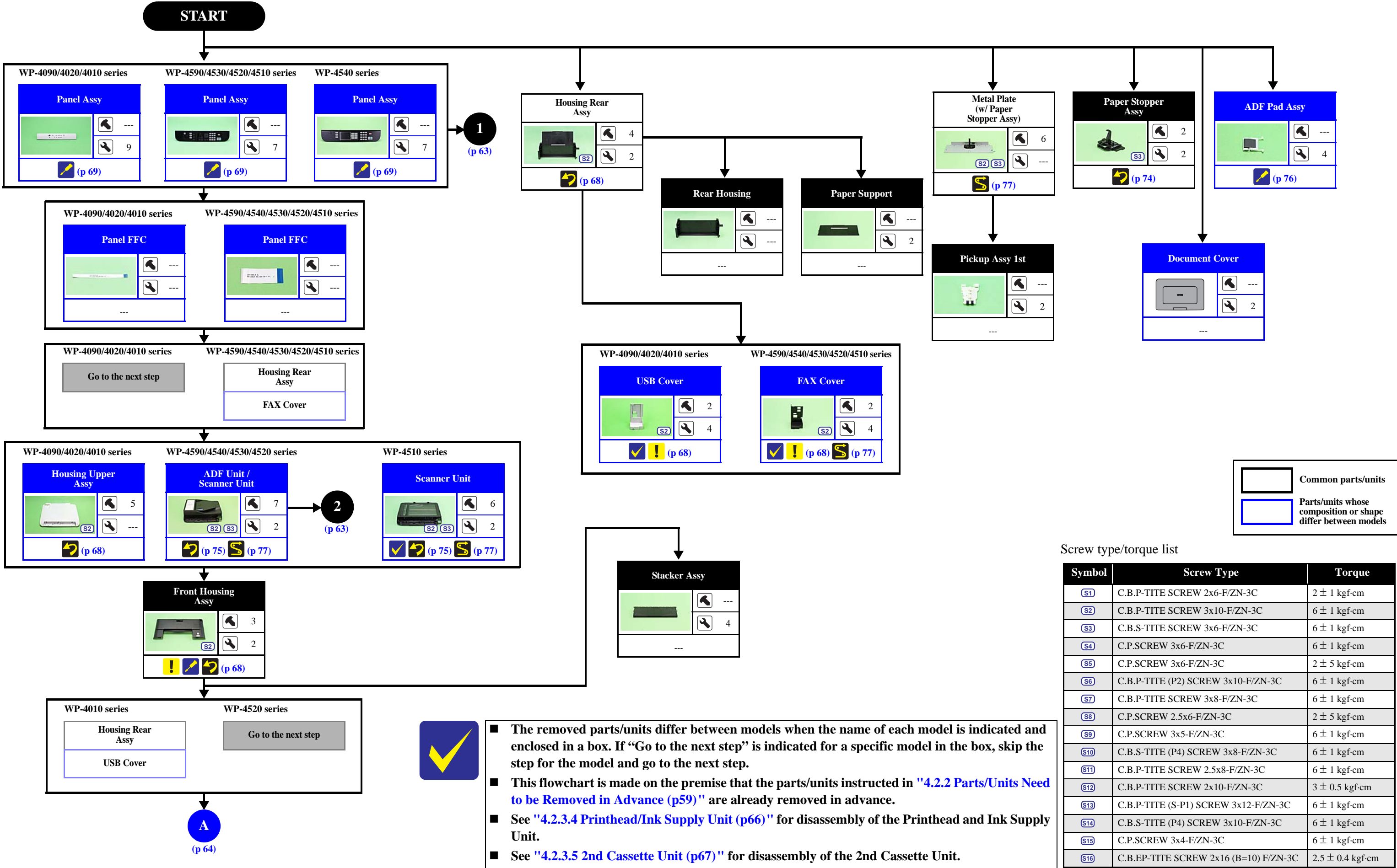


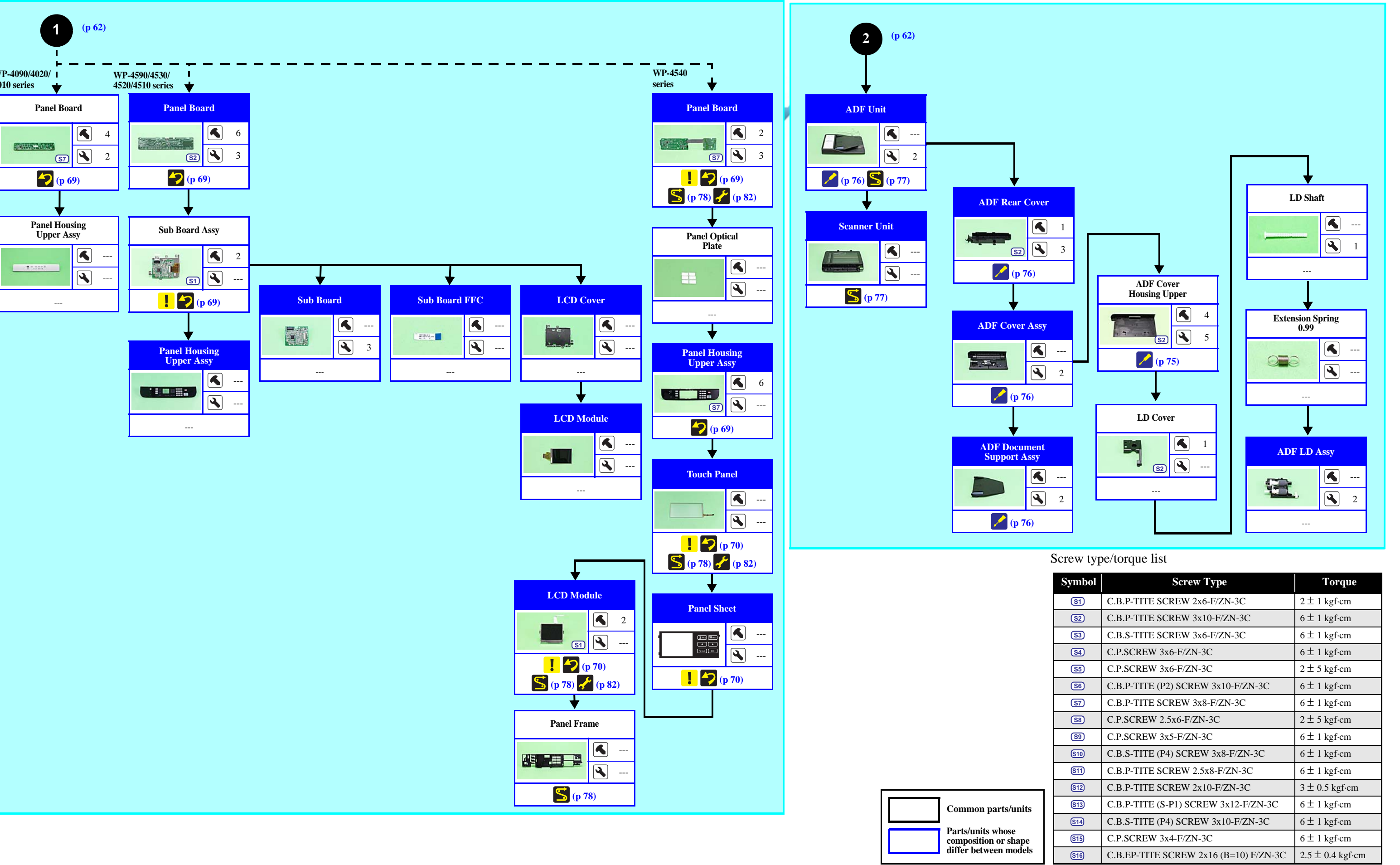
The example below shows how to see the charts on the following pages.



Item		Description	Reference
Parts/unit name	White-letter	Part/unit supplied as an ASP	---
	Black-letter	Part/unit not supplied as an ASP	---
Icon		Indicates a practice or condition that could result in injury or loss of life if not strictly observed.	Indicates the reference page in blue-letter
		Indicates a practice or condition that could result in damage to, or destruction of equipment if not strictly observed.	Indicates the reference page in blue-letter
		Indicates the parts that are inevitably broken in the disassembling procedure, and should be replaced with a new one for reassembly.	---
		Indicates necessary check items in the disassembling/ assembling procedure.	Indicates the reference page in blue-letter
		Indicates supplementary explanation for disassembly is given.	Indicates the reference page in blue-letter
		Indicates particular tasks to keep quality of the units are required.	Indicates the reference page in blue-letter
		Indicates particular routing of cables is required.	Indicates the reference page in blue-letter
		Indicates particular adjustment(s) is/are required.	Chapter 5 "Adjustment (p82)"
		Indicates lubrication is required.	Chapter 6 "Maintenance (p104)"
		Indicates the number of screws securing the parts/ units.	---
		Indicates the points secured with other than a screw such as a hook, rib, dowel or the like.	---

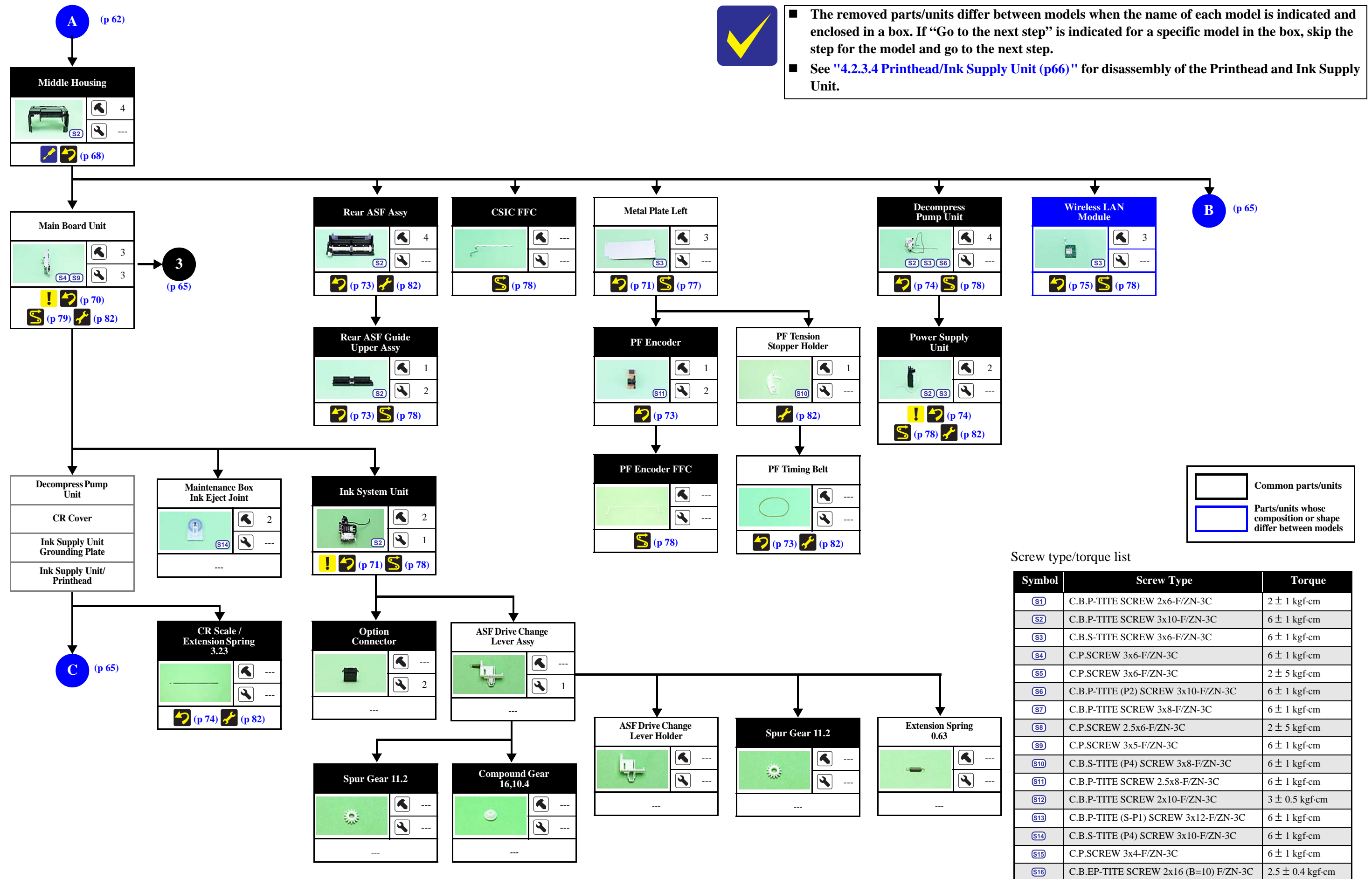
4.2.3.2 Exterior Parts





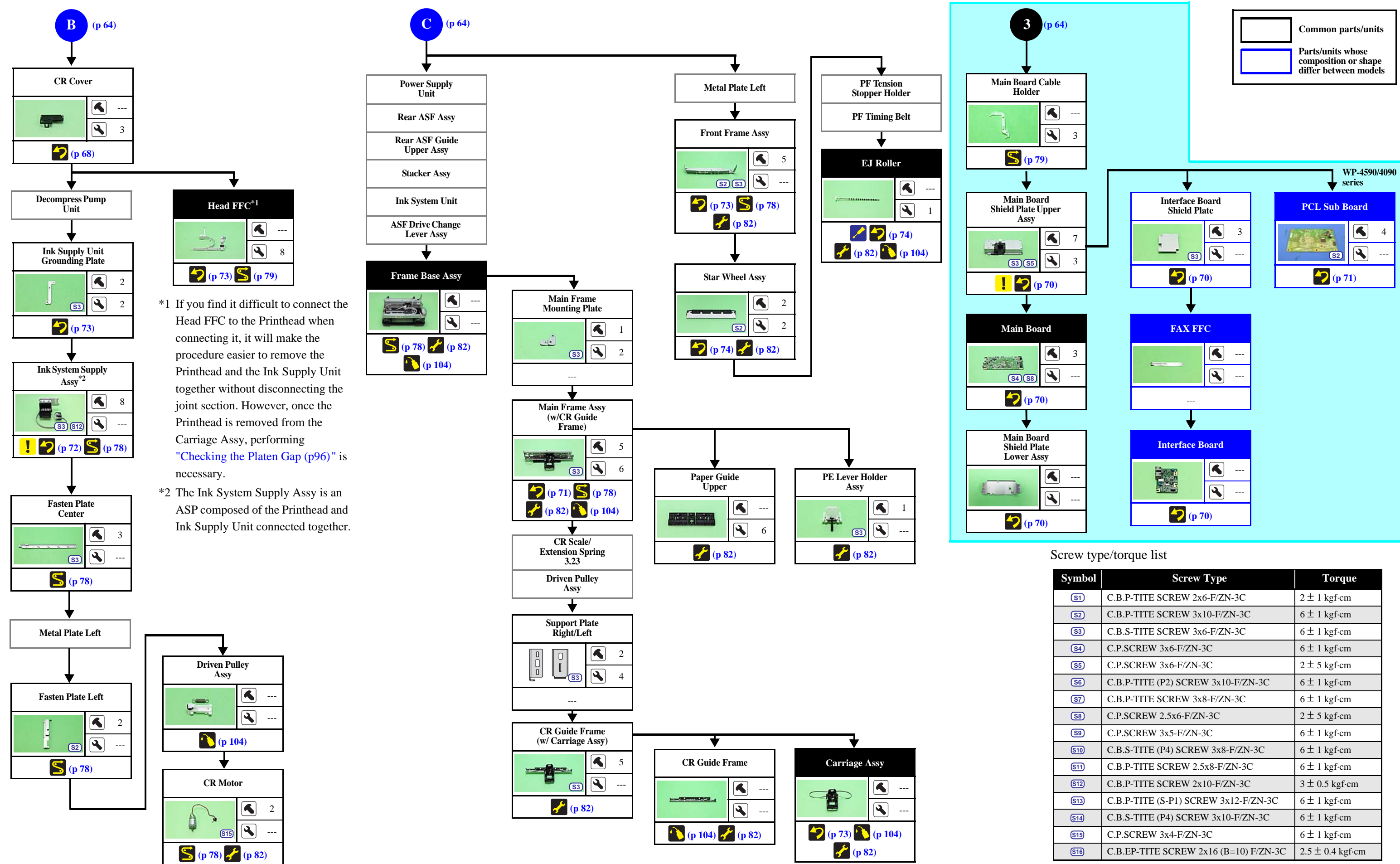
Flowchart 4-2. Disassembling Flowchart of Exterior Parts (2)

#### 4.2.3.3 Printer Mechanism



### Flowchart 4-1. Disassembling Flowchart of Printer Mechanism (1)



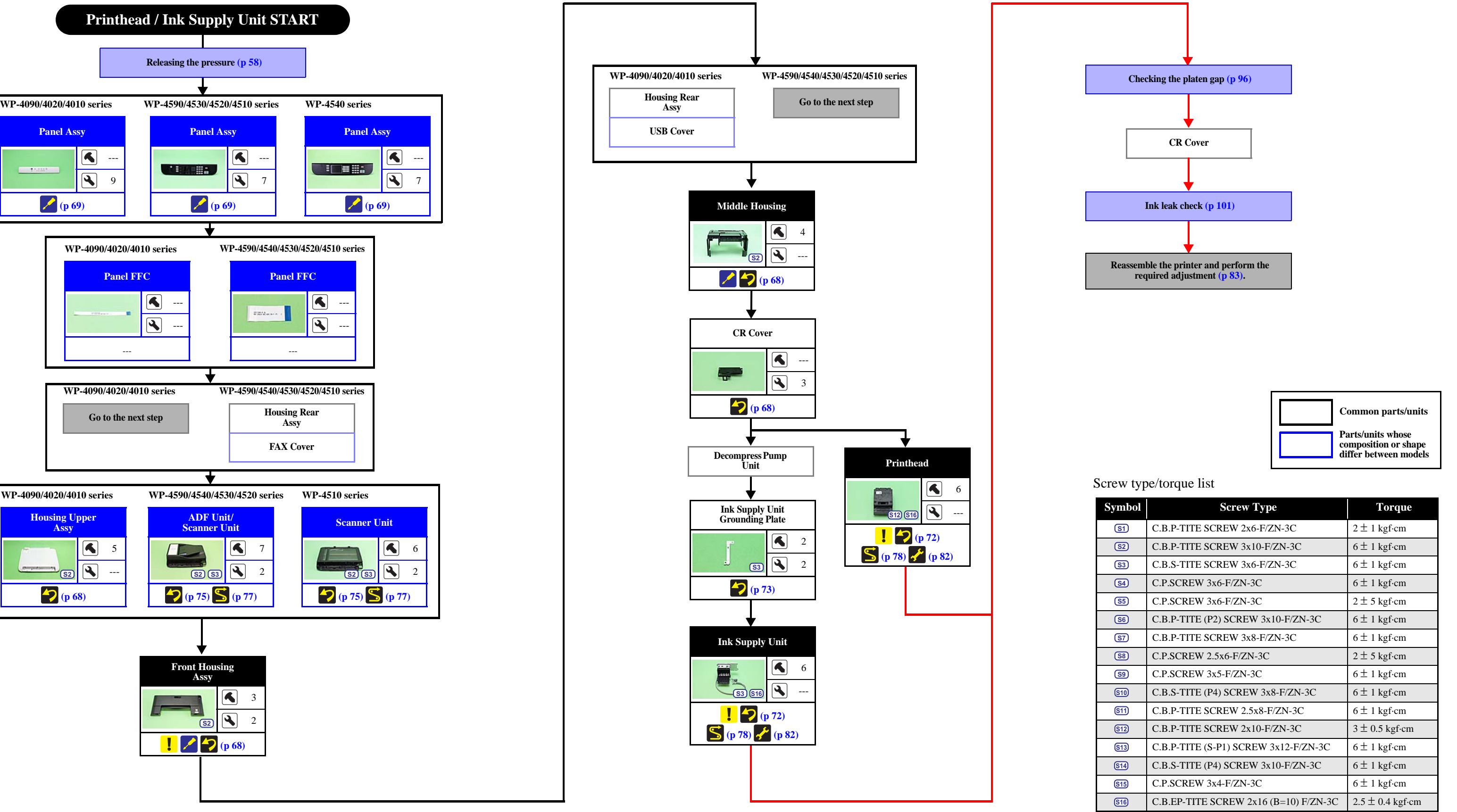


Flowchart 4-2. Disassembling Flowchart of Printer Mechanism (2)

4.2.3.4 Printhead/Ink Supply Unit

The disassembling and reassembling procedure of the Printhead/Ink Supply Unit requires additional steps before and during the procedure. Therefore, the whole flow from disassembling to reassembling is provided below.

Note: The black arrows (➡) indicate disassembling, and the red arrows (➡) show reassembling.



WP-4090/4020/4010 series

Housing Upper Assy

 S2

 5

 ---

 (p 68)

WP-4590/4540/4530/4520 series

ADF Unit/Scanner Unit

 S2 S3

 7

 2

 (p 75)

 (p 77)

WP-4510 series

Scanner Unit

 S2 S3

 6

 2

 (p 75)

 (p 77)

Front Housing Assy

 S2 3 2   (p 68)

WP-4090/4020/4010 series

Housing Rear Assy

USB Cover

WP-4590/4540/4530/4520/4510 series

Go to the next step

Middle Housing

 S2 4 ---  (p 68)

CR Cover

 --- --- 3 (p 68)

Decompress Pump Unit

Ink Supply Unit Grounding Plate

 S3 2 2 (p 73)

Ink Supply Unit

 S3 S10 6 ---  (p 72) (p 78) (p 82)

Printhead

 S12 S16 6 ---  (p 72) (p 78) (p 82)

Checking the platen gap (p 96)

CR Cover

Ink leak check (p 101)

Reassemble the printer and perform the required adjustment (p 83).

Common parts/units

Parts/units whose composition or shape differ between models

Screw type/torque list

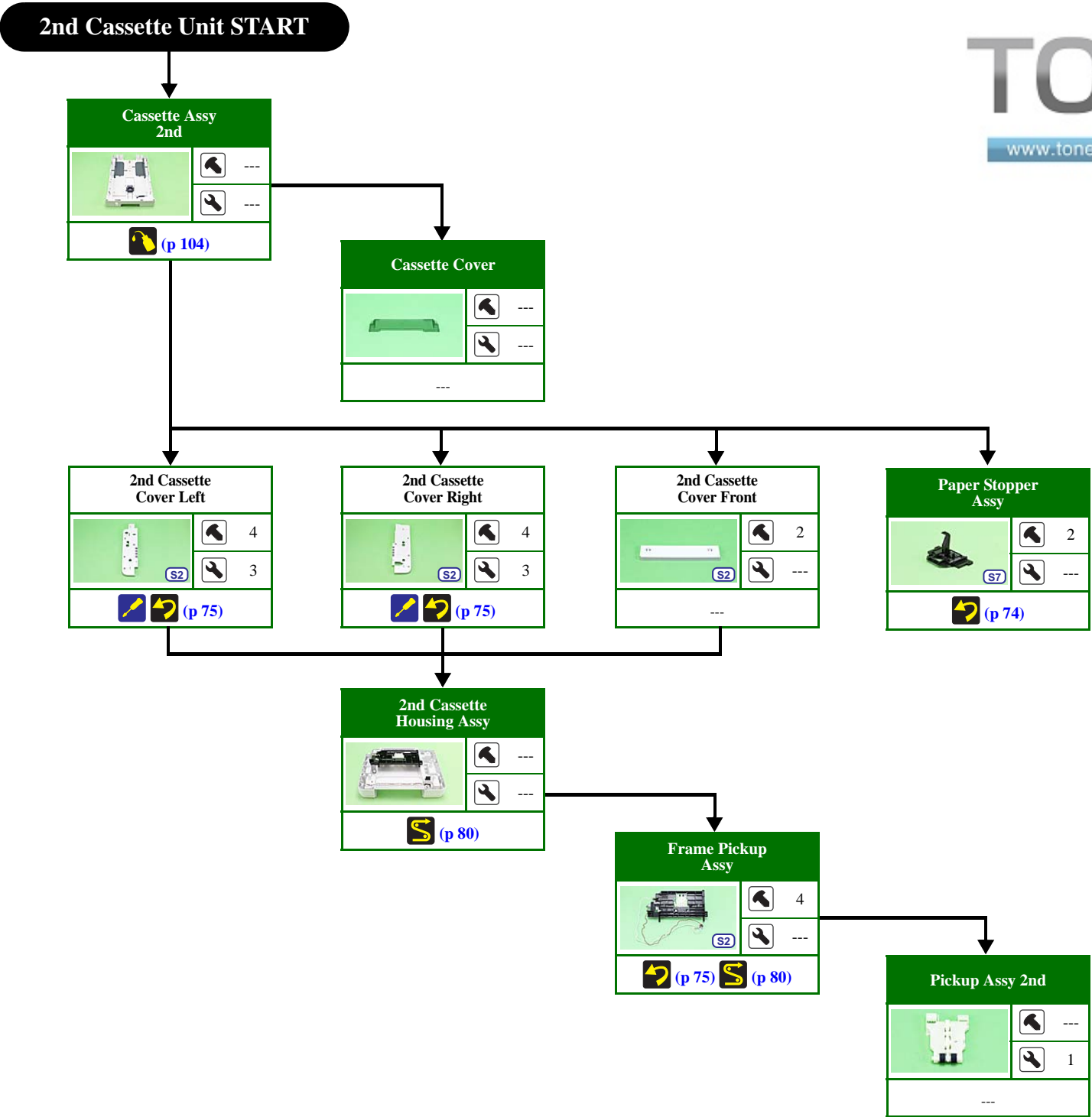
Symbol	Screw Type	Torque
S1	C.B.P-TITE SCREW 2x6-F/ZN-3C	2 ± 1 kgf·cm
S2	C.B.P-TITE SCREW 3x10-F/ZN-3C	6 ± 1 kgf·cm
S3	C.B.S-TITE SCREW 3x6-F/ZN-3C	6 ± 1 kgf·cm
S4	C.P.SCREW 3x6-F/ZN-3C	6 ± 1 kgf·cm
S5	C.P.SCREW 3x6-F/ZN-3C	2 ± 5 kgf·cm
S6	C.B.P-TITE (P2) SCREW 3x10-F/ZN-3C	6 ± 1 kgf·cm
S7	C.B.P-TITE SCREW 3x8-F/ZN-3C	6 ± 1 kgf·cm
S8	C.P.SCREW 2.5x6-F/ZN-3C	2 ± 5 kgf·cm
S9	C.P.SCREW 3x5-F/ZN-3C	6 ± 1 kgf·cm
S10	C.B.S-TITE (P4) SCREW 3x8-F/ZN-3C	6 ± 1 kgf·cm
S11	C.B.P-TITE SCREW 2.5x8-F/ZN-3C	6 ± 1 kgf·cm
S12	C.B.P-TITE SCREW 2x10-F/ZN-3C	3 ± 0.5 kgf·cm
S13	C.B.P-TITE (S-P1) SCREW 3x10-F/ZN-3C	6 ± 1 kgf·cm
S14	C.B.S-TITE (P4) SCREW 3x10-F/ZN-3C	6 ± 1 kgf·cm
S15	C.P.SCREW 3x4-F/ZN-3C	6 ± 1 kgf·cm
S16	C.B.EP-TITE SCREW 2x16 (B=10) F/ZN-3C	2.5 ± 0.4 kgf·cm

Flowchart 4-1. Disassembling Flowchart of Printhead/Ink Supply Unit



4.2.3.5 2nd Cassette Unit

This unit is installed for WP-4540 series, and option for WP-4590/4530/4520/4510/4090/4020/4010 series.



Screw type/torque list

Symbol	Screw Type	Torque
S1	C.B.P-TITE SCREW 2x6-F/ZN-3C	2 ± 1 kgf·cm
S2	C.B.P-TITE SCREW 3x10-F/ZN-3C	6 ± 1 kgf·cm
S3	C.B.S-TITE SCREW 3x6-F/ZN-3C	6 ± 1 kgf·cm
S4	C.P.SCREW 3x6-F/ZN-3C	6 ± 1 kgf·cm
S5	C.P.SCREW 3x6-F/ZN-3C	2 ± 5 kgf·cm
S6	C.B.P-TITE (P2) SCREW 3x10-F/ZN-3C	6 ± 1 kgf·cm
S7	C.B.P-TITE SCREW 3x8-F/ZN-3C	6 ± 1 kgf·cm
S8	C.P.SCREW 2.5x6-F/ZN-3C	2 ± 5 kgf·cm
S9	C.P.SCREW 3x5-F/ZN-3C	6 ± 1 kgf·cm
S10	C.B.S-TITE (P4) SCREW 3x8-F/ZN-3C	6 ± 1 kgf·cm
S11	C.B.P-TITE SCREW 2.5x8-F/ZN-3C	6 ± 1 kgf·cm
S12	C.B.P-TITE SCREW 2x10-F/ZN-3C	3 ± 0.5 kgf·cm
S13	C.B.P-TITE (S-P1) SCREW 3x12-F/ZN-3C	6 ± 1 kgf·cm
S14	C.B.S-TITE (P4) SCREW 3x10-F/ZN-3C	6 ± 1 kgf·cm
S15	C.P.SCREW 3x4-F/ZN-3C	6 ± 1 kgf·cm
S16	C.B.EP-TITE SCREW 2x16 (B=10) F/ZN-3C	2.5 ± 0.4 kgf·cm

Flowchart 4-1. Disassembling Flowchart of 2nd Cassette Unit



4.3 Detailed Disassembly/Reassembly Procedure for each Part/Unit

FAX Cover/USB Cover

The name and the shape of this part differ, but the disassembly procedure for this part is the same. The names are FAX Cover for WP-4590/4540/4530/4520/4510 series and USB Cover for WP-4090/4020/4010 series.

Remove the FAX Cover/USB Cover by sliding it in the direction of the arrow shown above carefully not to damage the rib A (x4) that secure the FAX Cover/USB Cover.

Housing Upper Assy (WP-4090/4020/4010 series)

Tighten the screws in the order indicated in the figure above.

Front Housing Assy

The structure of the rib A on the Front Housing Assy is as shown in the cross-section above, and it is extremely fragile. Therefore, be careful not to damage the rib A when removing the Front Housing Assy.

The positions of the rib A (x3) and rib B (x7) of the Front Housing Assy are shown in the figure above.

When releasing the hooks (x2) of the Front Housing Assy, insert a screw driver or the like from the hole on the bottom of the printer and release them.

Tighten the screws in the order indicated in the figure above.

Middle Housing

When removing the Middle Housing on the way to the target parts, remove it also by removing the screw securing the grounding wire, but leave the grounding wire attached on the Middle Housing with the acetate tape then. (WP-4510 series only)

When replacing the Middle Housing, remove the grounding wire from the Middle Housing. After replacing the Middle Housing, route the grounding wire as shown in the figure above and secure it with acetate tape (x3). (WP-4510 series only)

After reassembling the Middle Housing, make sure the ribs of the Frame Base are aligned and fit in with the Middle Housing without any gap.

Tighten the screws in the order indicated in the figure above.

Housing Rear Assy

Tighten the screws in the order indicated in the figure above.

CR Cover

After installing the CR Cover to the Carriage Assy, make sure the CR Cover is firmly secured with the hooks (x3) shown above.



Panel Assy (WP-4590/4540/4530/4520/4510 series)

When removing the Panel Assy, follow the procedure below.

1. Open the Front Cover, and release the hook A (x2) of the Panel Assy from the bottom of the Scanner Unit.
2. Release the hook B (x5) of the Panel Assy.
3. Lift the Panel Assy in the direction of the arrow and release the ribs (x5) and hook C (x2) on the top of the Panel Assy, and then remove the Panel Assy.

Panel Assy (WP-4090/4020/4010 series)

When removing the Panel Assy, follow the procedure below.

1. Open the Front Cover, and release the hook A of the Panel Assy from the bottom of the Housing Upper Assy.
2. Release the hook B (x5) and rib A (x3) of the Panel Assy.
3. Slide the Panel Assy slightly in the direction of the arrow and release the rib B (x2), and remove the Panel Assy.

Panel Board (WP-4590/4530/4520/4510/4090/4020/4010 series)

Tighten the screws in the order indicated in the figure above.

When installing the Panel Board, align the positioning holes (WP-4590/4530/4520/4510 series: x3, WP-4090/4020/4010 series: x2) of the Panel Board with the dowels (WP-4590/4530/4520/4510 series: x3, WP-4090/4020/4010 series: x2) of the Panel Housing Upper.

After installing the Panel Board, press all buttons on the Panel Board Assy to check if they click and do not come off.

Sub Board Assy (WP-4590/4530/4520/4510 series)

Before removing the Sub Board Assy, unlock the connector lock on the Sub Board Assy that secures the LCD FPC.

Tighten the screws in the order indicated in the figure above.

When connecting the LCD FPC, make sure to insert the LCD FPC into the connector to the full and secure it with the connector lock.

Panel Board (WP-4540 series)

Before removing the Panel Board, unlock the connector lock on the Panel Board that secures the Touch Panel FPC.

Tighten the screws in the order indicated in the figure above.

When connecting the Touch Panel FPC, make sure to insert the Touch Panel FPC into the connector to the full and secure it with the connector lock.

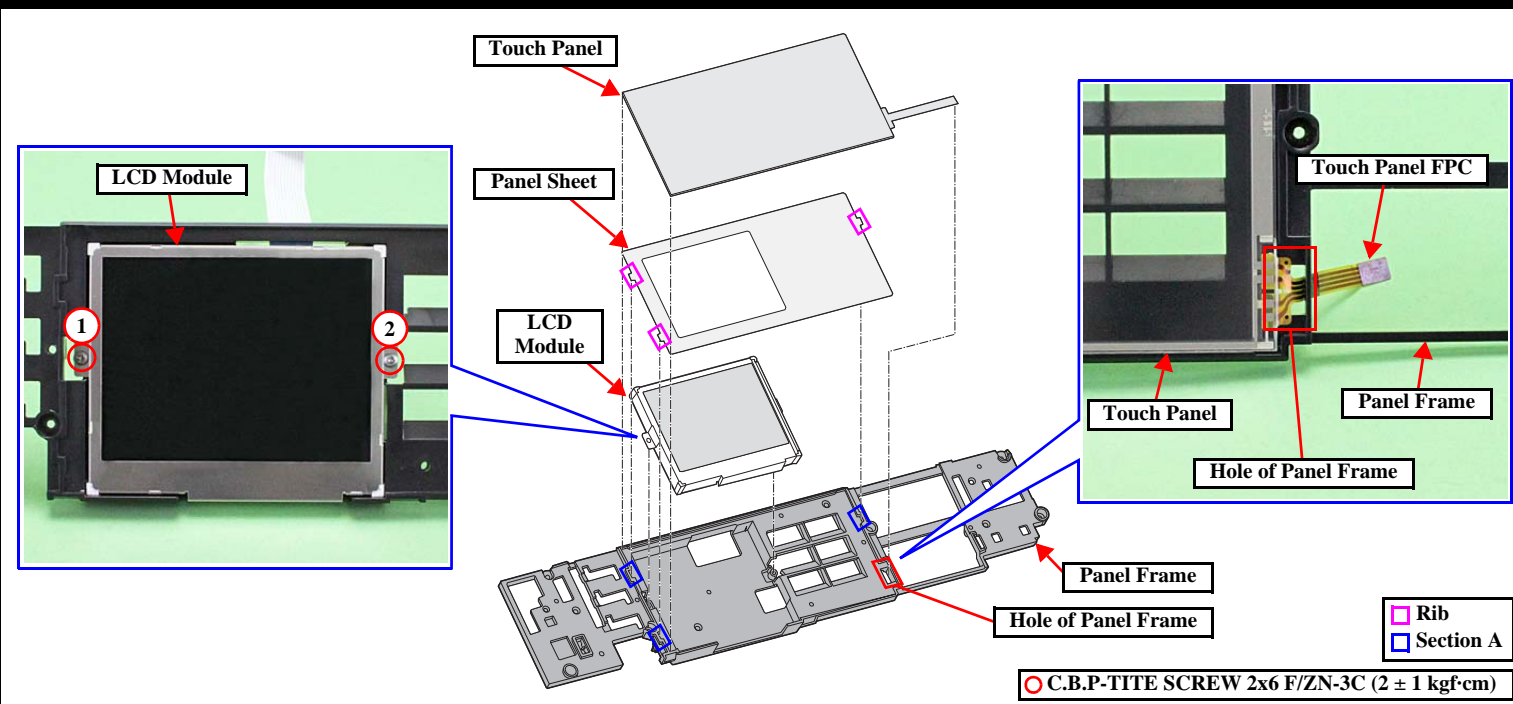
Panel Housing Upper (WP-4540 series)

When attaching the Panel Cushioning Materials, align them with the reference lines shown above, and attach them keeping the gap between the lines and materials less than 1 mm.

Attach the Panel Frame by engaging the hooks (x4) on the upper side first of the Panel Housing Upper and the hooks (x4) on the lower side next, then tighten the screws (x6) in the order indicated in the figure above.

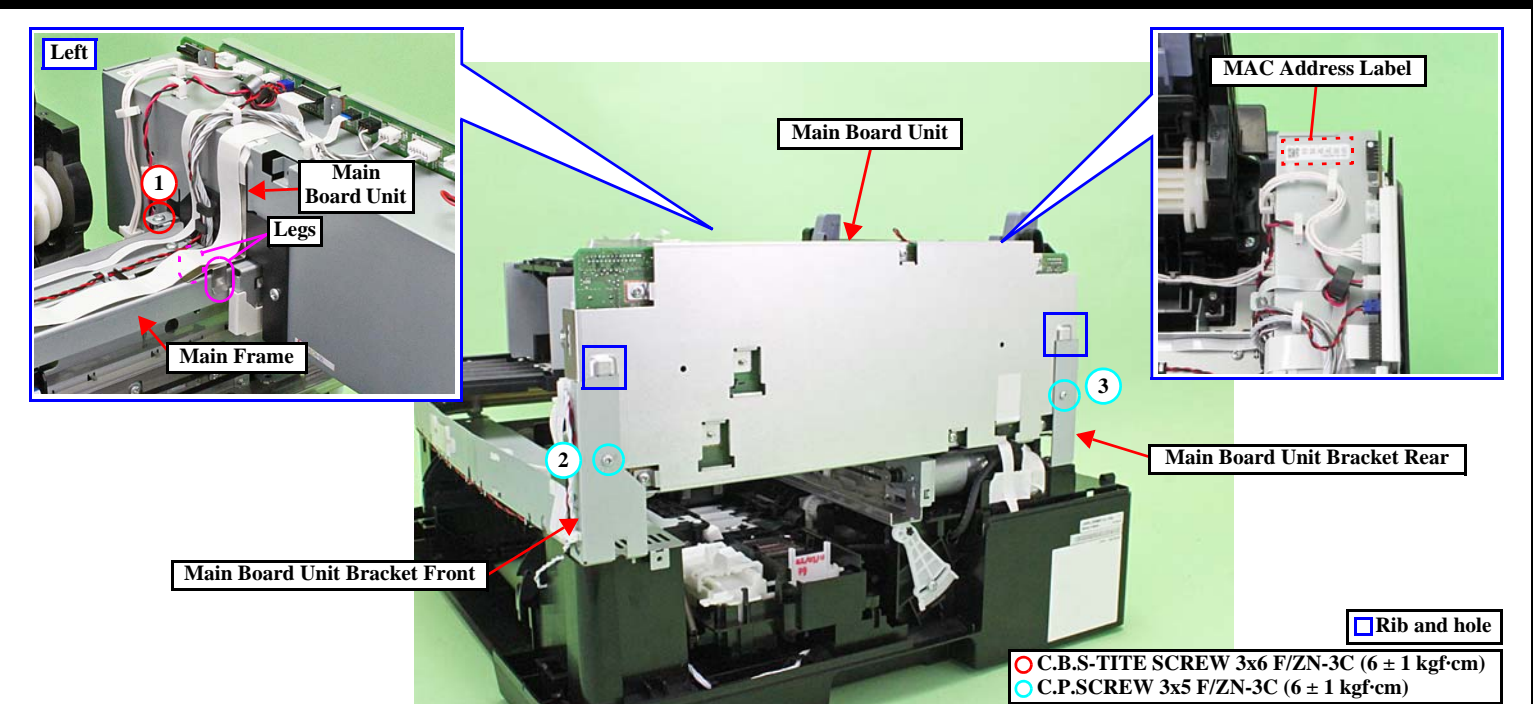


LCD Module / Panel Sheet / Touch Panel (WP-4540 series)



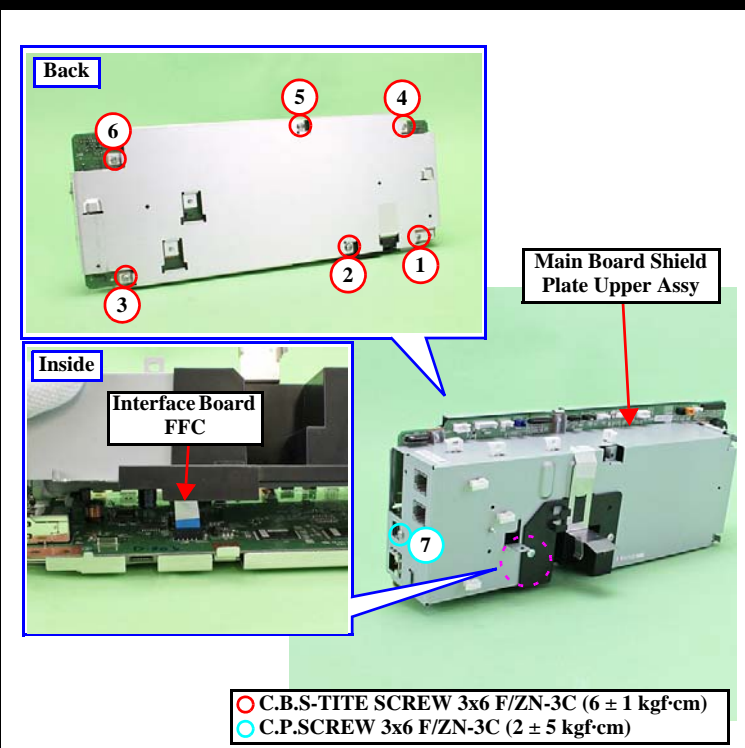
- !** When attaching the Panel Sheet, make sure to hold the edges of it and do not touch the surface of the sheet.
- ↶** When installing the LCD Module, Panel Sheet and Touch Panel, follow the procedure below.
1. Install the LCD Module to the Panel Frame, and tighten the screws (x2) in the order indicated in the figure above to secure the LCD Module to the Panel Frame.
  2. Peel off the protection sheet from the Panel Sheet, and attach the Panel Sheet aligning the ribs (x3) of it with the section A (x3) of the Panel Frame.
  3. Route the Touch Panel FPC through the hole on the Panel Frame, then attach the Touch Panel aligning it with the frame of the Panel Frame.

Main Board Unit



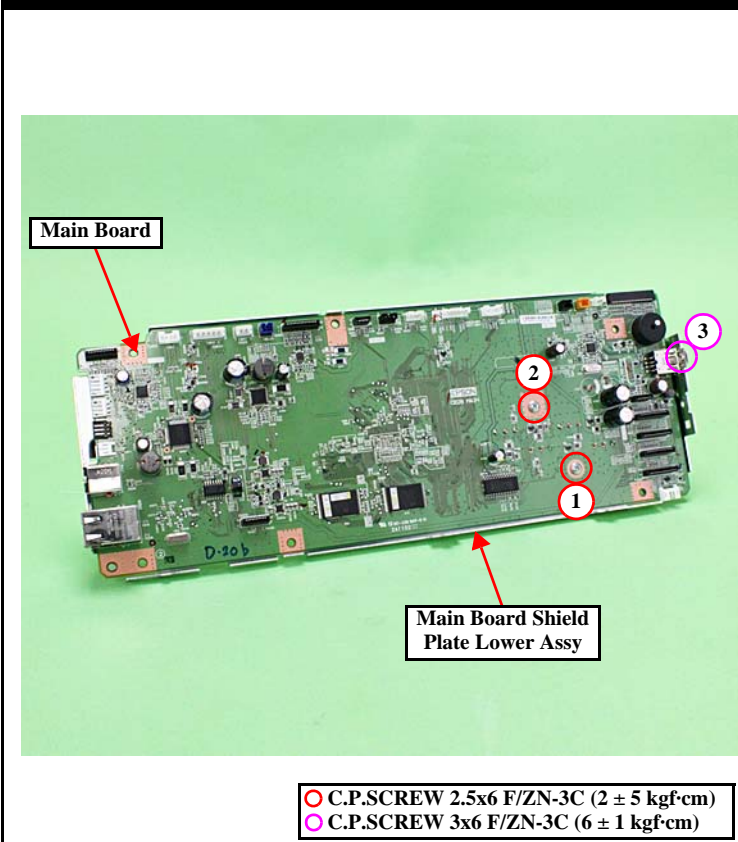
- !** Be careful not to damage or contaminate the MAC Address Label.
- ↶** When installing the Main Board Unit, insert the ribs of the Main Board Unit Bracket Front/Main Board Unit Bracket Rear into the holes of the Main Board Unit.
- Tighten the screws in the order indicated in the figure above.
  - After installing the Main Board Unit, make sure the legs of the Main Board Unit Grounding Plate touch the Main Frame.

Main Board Shield Plate Upper Assy



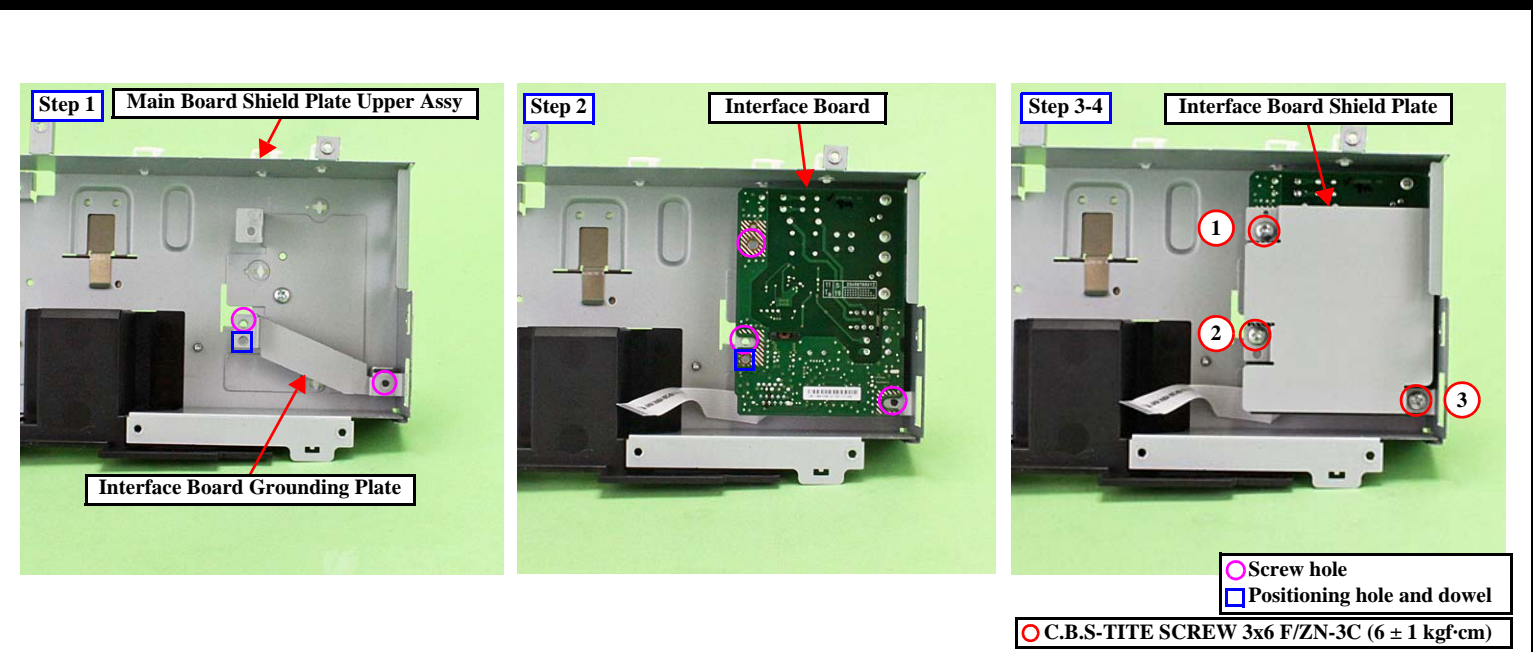
- !** The Interface Board FFC is connected to the back of the Main Board Shield Plate Upper Assy, therefore, be careful of it when removing the Main Board Shield Plate Upper Assy.
- ↶** Tighten the screws in the order indicated in the figure above.

Main Board / Main Board Shield Plate Lower Assy



- ↶** Tighten the screws in the order indicated in the figure above.

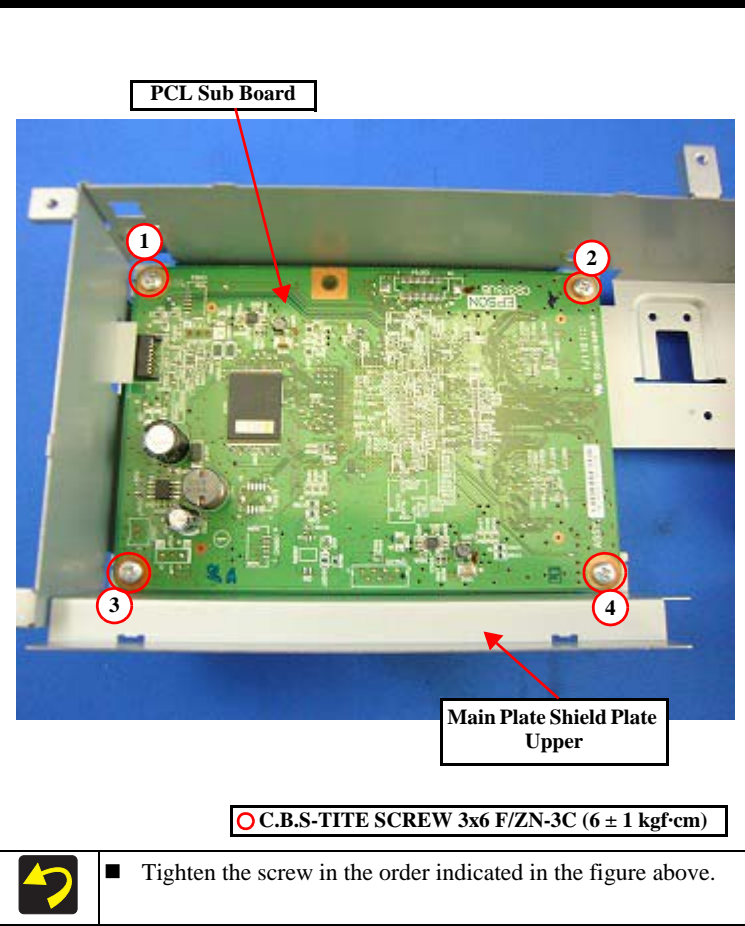
Interface Board (WP-4540/4530/4520 series)



- ↶** When installing the Interface Board, follow the procedure below.
1. Place the Interface Board Grounding Plate on the Main Board Shield Plate Upper Assy aligning the positioning hole of the Interface Board Grounding Plate with the dowel on the Main Board Shield Plate Upper Assy.
  2. Place the Interface Board on the Interface Board Grounding Plate aligning the screw holes on the Interface Board, Interface Board Grounding Plate and Main Board Shield Plate Upper Assy.
  3. Place the Interface Board Shield Plate on the Interface Board aligning the screw holes on the Interface Board Shield Plate and the Interface Board.
  4. Tighten the screws (x3) in the order indicated in the figure above to secure the Interface Board Grounding Plate, Interface Board and Interface Board Shield Plate together.



PCL Sub Board( WP-4590/4090 series )



The diagram shows the PCL Sub Board being installed into the Main Plate Shield Plate Upper. Four screws are indicated by numbered circles (1, 2, 3, 4) around the board. A legend at the bottom left shows a yellow arrow icon and a list of instructions.

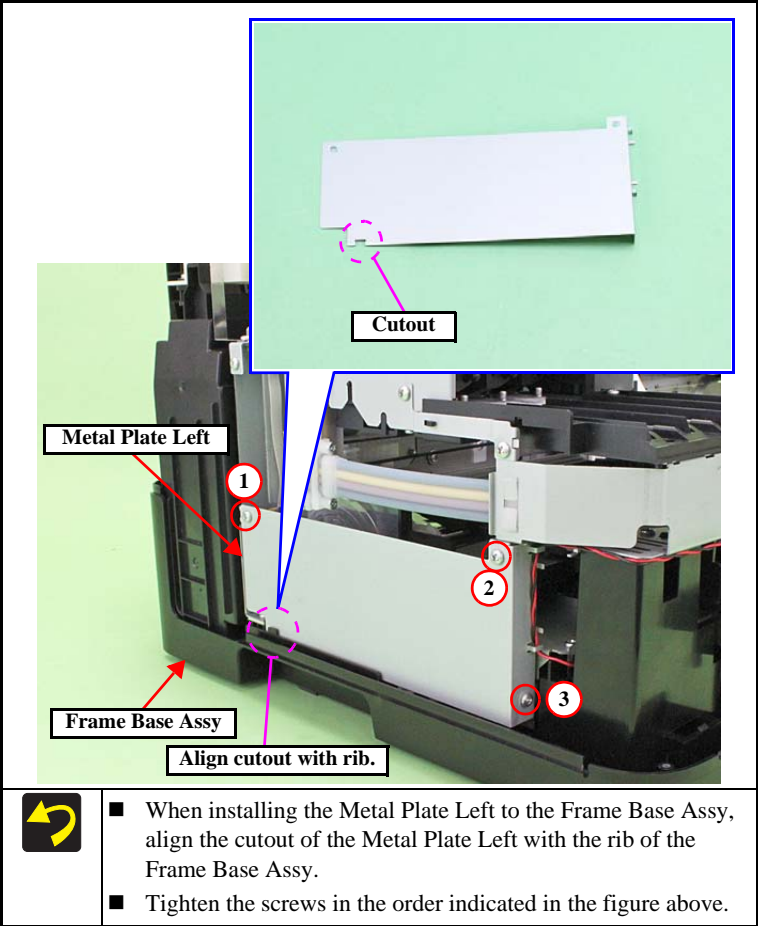
**Legend:**

- Tighten the screw in the order indicated in the figure above.

**Legend:**

- C.B.S-TITE SCREW 3x6 F/ZN-3C (6 ± 1 kgf·cm)

Metal Plate Left



The diagram shows the Metal Plate Left being installed onto the Frame Base Assy. A cutout in the metal plate is shown being aligned with a rib on the frame base. A legend at the bottom left shows a yellow arrow icon and a list of instructions.

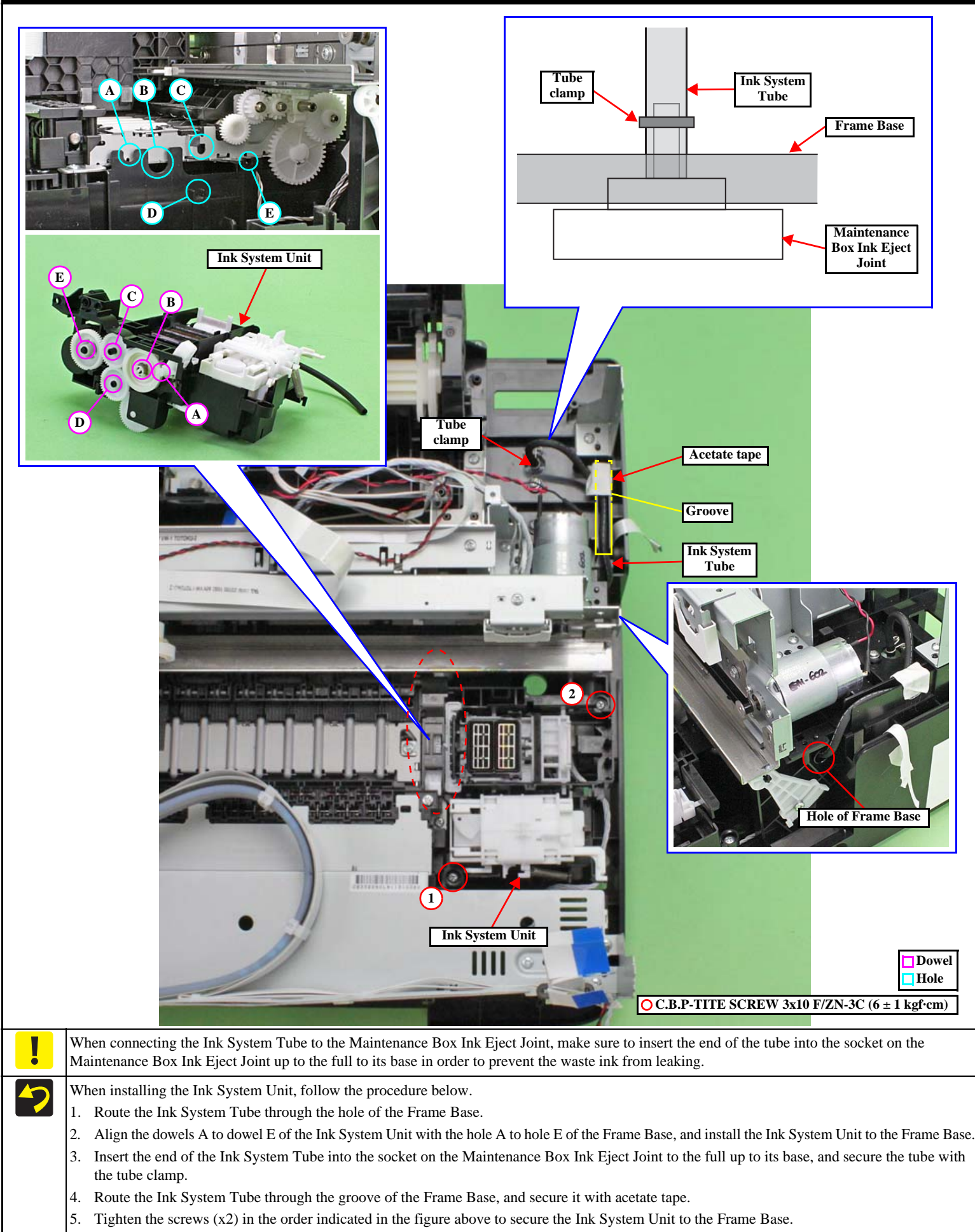
**Legend:**

- When installing the Metal Plate Left to the Frame Base Assy, align the cutout of the Metal Plate Left with the rib of the Frame Base Assy.
- Tighten the screws in the order indicated in the figure above.

**Legend:**

- C.B.S-TITE SCREW 3x6 F/ZN-3C (6 ± 1 kgf·cm)

Ink System Unit



The diagram shows the Ink System Unit being installed onto the Frame Base. It includes a detailed view of the unit's components (A-E) and a cross-section view of the tube connection. A legend at the bottom left shows a yellow arrow icon and a list of instructions.

**Legend:**

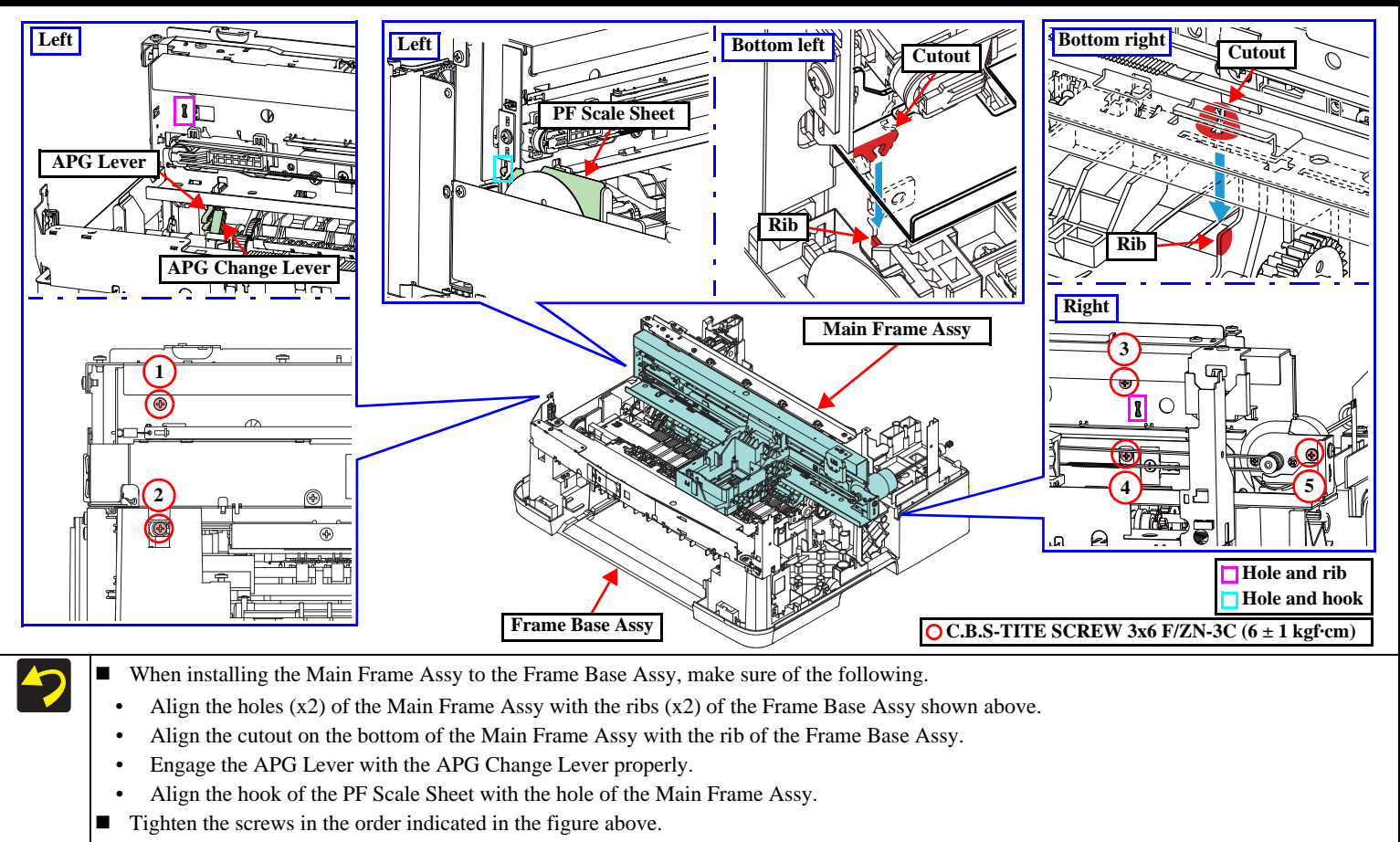
- When connecting the Ink System Tube to the Maintenance Box Ink Eject Joint, make sure to insert the end of the tube into the socket on the Maintenance Box Ink Eject Joint up to the full to its base in order to prevent the waste ink from leaking.
- When installing the Ink System Unit, follow the procedure below.

1. Route the Ink System Tube through the hole of the Frame Base.
2. Align the dowels A to dowel E of the Ink System Unit with the hole A to hole E of the Frame Base, and install the Ink System Unit to the Frame Base.
3. Insert the end of the Ink System Tube into the socket on the Maintenance Box Ink Eject Joint to the full up to its base, and secure the tube with the tube clamp.
4. Route the Ink System Tube through the groove of the Frame Base, and secure it with acetate tape.
5. Tighten the screws (x2) in the order indicated in the figure above to secure the Ink System Unit to the Frame Base.

**Legend:**

- C.B.P-TITE SCREW 3x10 F/ZN-3C (6 ± 1 kgf·cm)

Main Frame Assy (w / CR Guide Frame)



The diagram shows the Main Frame Assy being installed onto the Frame Base Assy. It includes a detailed view of the assembly and a cross-section view of the tube connection. A legend at the bottom left shows a yellow arrow icon and a list of instructions.

**Legend:**

- When installing the Main Frame Assy to the Frame Base Assy, make sure of the following.

- Align the holes (x2) of the Main Frame Assy with the ribs (x2) of the Frame Base Assy shown above.
- Align the cutout on the bottom of the Main Frame Assy with the rib of the Frame Base Assy.
- Engage the APG Lever with the APG Change Lever properly.
- Align the hook of the PF Scale Sheet with the hole of the Main Frame Assy.

**Legend:**

- Tighten the screws in the order indicated in the figure above.

**Legend:**

- C.B.S-TITE SCREW 3x6 F/ZN-3C (6 ± 1 kgf·cm)



Ink System Supply Assy (Ink Supply Unit w/ Printhead)

Section A

Do not remove.

Section A

Positioning hole and dowel

C.B.S-TITE SCREW 3x6 F/ZN-3C (6 ± 1 kgf·cm)

C.B.P-TITE SCREW 2x10 F/ZN-3C (3 ± 0.5 kgf·cm)

!

■ When removing/installing the Printhead, move the Carriage Assy to the center of the printer, and place the thickness gauge (2 mm) between the Carriage Assy and Star Wheel Assy in order to prevent the CR Guide Frame and Main Frame from being deformed. (See " [Printhead \(p72\)](#) ".)

■ To prevent ink leakage, make sure not to separate the ink tubes from the I/C Holder Unit by removing the screws (x2) in section A shown above. Loosening the screws even just once will cause ink leakage, therefore, make sure to replace the Ink System Supply Assy with a new one.

↶

When installing the Ink System Supply Assy, see " [Printhead \(p72\)](#) " and " [Ink Supply Unit \(p72\)](#) ".

Printhead

Printhead

Carriage Assy

Star Wheel Assy

1

2

3

4

Attach tape on the yellow box to protect the area from ink.

Position for thickness gauge (2 mm)

Thickness gauge (2 mm)

C.B.P-TITE SCREW 2x10 F/ZN-3C (3 ± 0.5 kgf·cm)

!

■ To replace the Printhead, it is necessary to disconnect the joint section of the Printhead and the ink tubes of the Ink Supply Unit. Before disconnecting the joint section, perform "Ink Pressure Release" in advance. (See "4.2.1 Caution when Replacing the Printhead/Ink Supply Unit (p58)" and " [Ink Supply Unit \(p72\)](#) ".)

■ When disconnecting the joint section of the ink tubes of the Ink Supply Unit and the Printhead, ink may slightly spill over from the ink tubes even if "Ink Pressure Release" has been performed. To protect the Printhead from the damage caused by the spilled ink if the ink reaches up to the control board of the Printhead, make sure to attach tape over the connectors to protect them beforehand, then disconnect the joint section of the ink tubes of the Ink Supply Unit and the Printhead.

■ When disconnecting the ink tubes of the Ink Supply Unit from the Printhead to replace the Printhead, make sure to replace the rubber packing between the ink tubes and the Printhead with a new one in order to prevent ink leakage. (See " [Ink Supply Unit \(p72\)](#) ".)

■ When removing/installing the Printhead, move the Carriage Assy to the center of the printer, and place the thickness gauge (2 mm) between the Carriage Assy and Star Wheel Assy in order to prevent the CR Guide Frame and Main Frame from being deformed.

↶

■ Tighten the screws in the order indicated in the figure above.

■ After installing the Printhead, make sure to connect the ink tubes to the Printhead. (See " [Ink Supply Unit \(p72\)](#) ".)

🔧

When replacing the Printhead, make sure to perform "5.2.7 Ink Leak Check (p101)".

Ink Supply Unit

I/S Supply Unit Support Jig

1

2

I/C Holder Unit

Carriage Assy

Ink tube

3

4

Tube Holder B

Positioning hole and dowel

Step 1

Step 2

Tube Holder A

Step 4

Align Tube Holder C with groove of Carriage Assy.

End of ink tube

Joint section

Rubber packing

Holes of Printhead

Rubber packing

Step 5

Ink tube

Tube Spacers

Attachment positions of Tube Holder B

C.B.EP-TITE SCREW 2x16(B=10) F/ZN-3C (2.5 ± 0.4 kgf·cm)

C.B.S-TITE SCREW 3x6 F/ZN-3C (6 ± 1 kgf·cm)

!

■ Before disconnecting the joint section of the Printhead and the ink tubes of the Ink Supply Unit, it is necessary to perform "Ink Pressure Release" in advance. Make sure to perform "Ink Pressure Release", otherwise, the ink in the ink tube will spill over. (See "4.2.1 Caution when Replacing the Printhead/Ink Supply Unit (p58)".)

■ When disconnecting the joint section of the ink tubes of the Ink Supply Unit and the Printhead, ink may slightly spill over from the ink tubes even if "Ink Pressure Release" has been performed. To protect the Printhead from the damage caused by the spilled ink if the ink reaches up to the control board of the Printhead, make sure to attach tape over the connectors to protect them beforehand, then disconnect the joint section of the ink tubes of the Ink Supply Unit and the Printhead. (See " [Printhead \(p72\)](#) ".)

■ When disconnecting the ink tubes from the Printhead, make sure to replace the rubber packing between the ink tubes and the Printhead with a new one in order to prevent ink leakage.

■ When connecting the ink tubes to the Printhead, place the thickness gauge (2 mm) between the Carriage Assy and Star Wheel Assy in order to prevent the CR Guide Frame and Main Frame from being deformed. (See " [Printhead \(p72\)](#) ".)

■ When Ink Supply Unit fixed, I/S Supply Unit Support Jig put on between Ink Supply Unit and Front Flame to prevent the defect of reading CSIC caused by transformation of main Flame and Ink Supply Unit.

↶

When installing the Ink Supply Unit, follow the procedure below.

1. Align the positioning holes (x2) and dowels (x2) shown above, and tighten the screws (x4) of the I/C Holder Unit in the order indicated in the figure above.

2. Secure the ink tubes with the Tube Holder A (x3).

3. Move the Carriage Assy to the center of the printer.

4. While aligning the Tube Holder C attached on the ink tubes with the groove of the Carriage Assy, insert the joint section on the end of the ink tubes into the holes of the Printhead, and then secure the end of the ink tubes with the screws (x2).

5. Secure the ink tubes with the Tube Holder B (x3), and then adjust their attachment positions to between the Tube Spacers.

🔧

Once you loosen the screws on the joint section of the ink tubes to the Printhead, make sure to perform "5.2.7 Ink Leak Check (p101)".

Disassembly/Reassembly

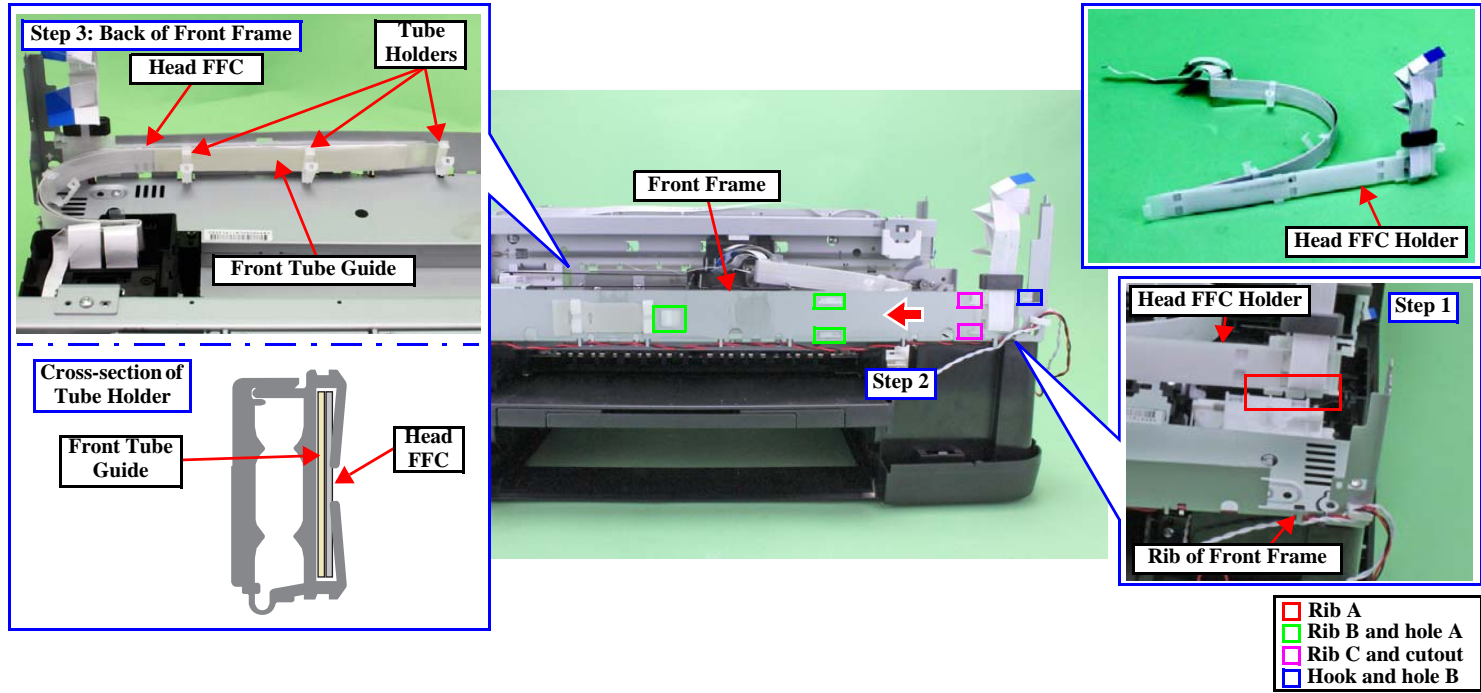
Detailed Disassembly/Reassembly Procedure for each Part/Unit

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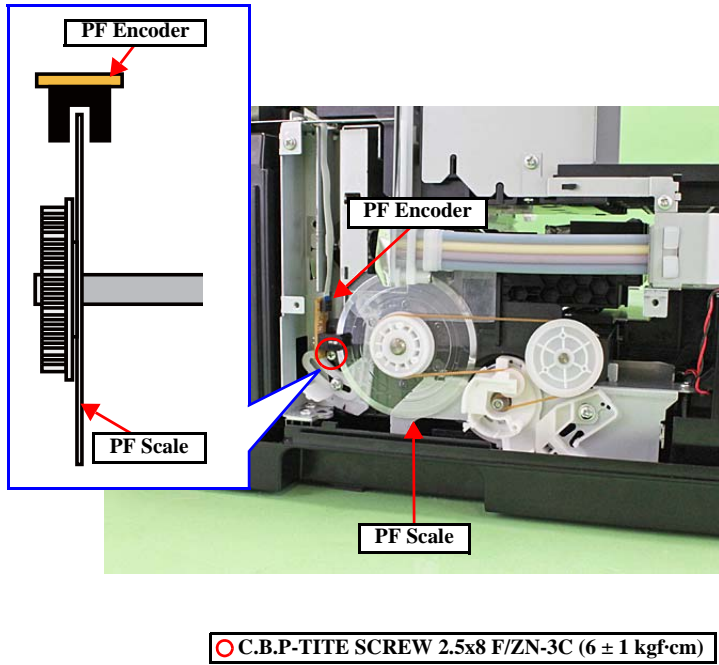


Head FFC



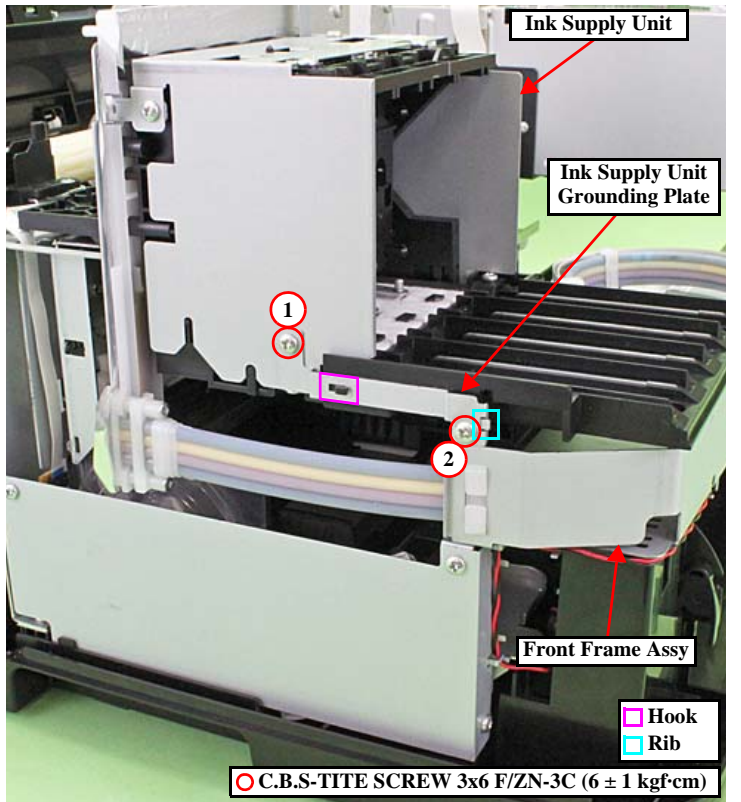
- When installing the Head FFC, follow the procedure below.
1. Fit in the rib of the Front Frame to the space between the rib A (x3).
  2. Align the rib B (x3), rib C (x2) and hook of the Head FFC Holder with the hole A (x3), cutouts (x2) and the hole B of the Front Frame, and slide the Head FFC Holder in the direction of the arrow to secure it to the Front Frame.
  3. Insert the Front Tube Guide between the Tube Holder and Head FFC.

PF Encoder / PF Timing Belt



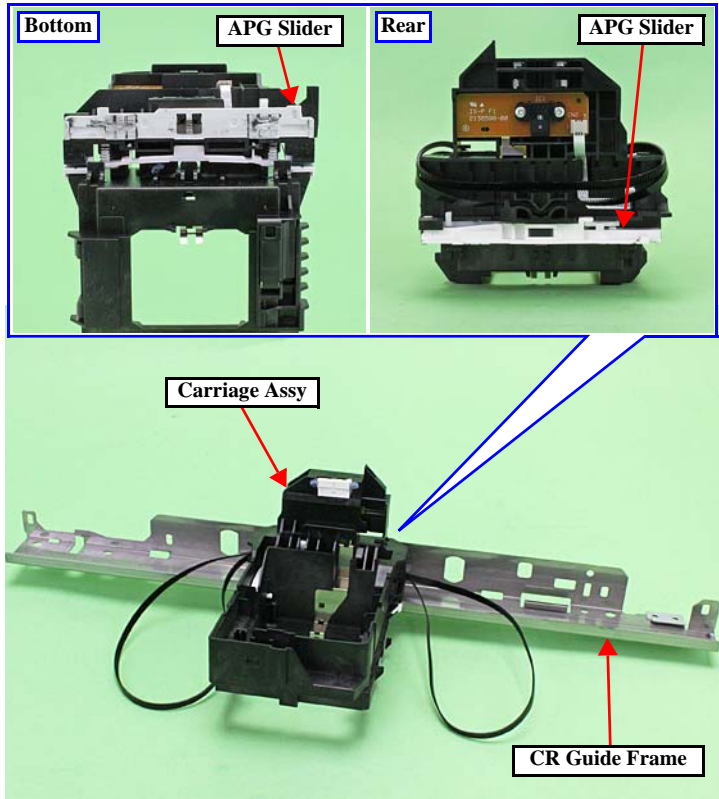
- When installing the PF Encoder, set the encoder over the PF Scale with the scale in the slit as shown in the figure above. After installing PF Encoder, make sure it does not touch the PF Scale.
- Install the PF Timing Belt as shown above and make sure the belt is correctly attached to the gears and pulley.

Ink Supply Unit Grounding Plate



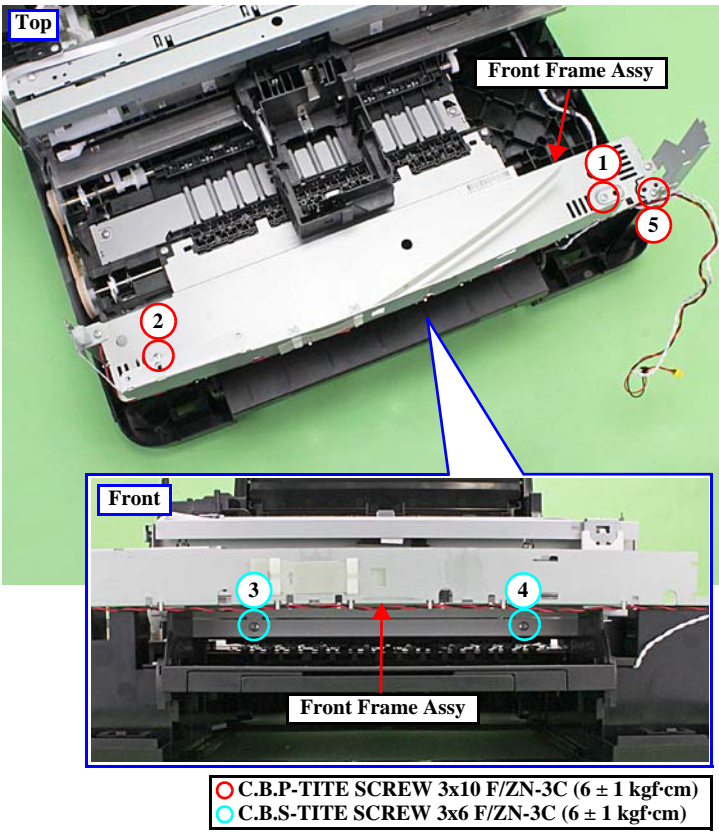
- When installing the Ink Supply Unit Grounding Plate, secure it with the hook of the Ink Supply Unit and rib of the Front Frame, and tighten the screws (x2) in the order indicated in the figure above.

Carriage Assy



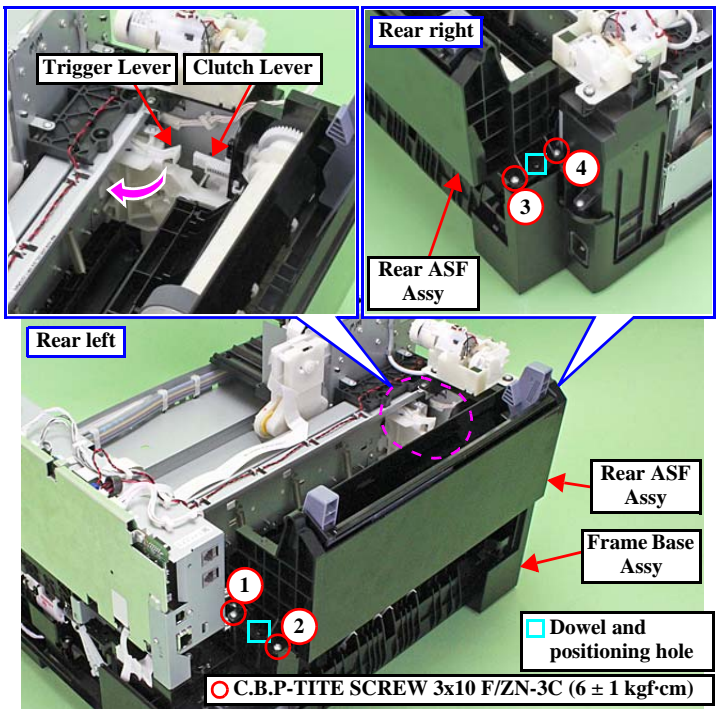
- Before installing the Carriage Assy to the CR Guide Frame, make sure the APG Slider is correctly installed to the Carriage Assy as shown above.

Front Frame Assy



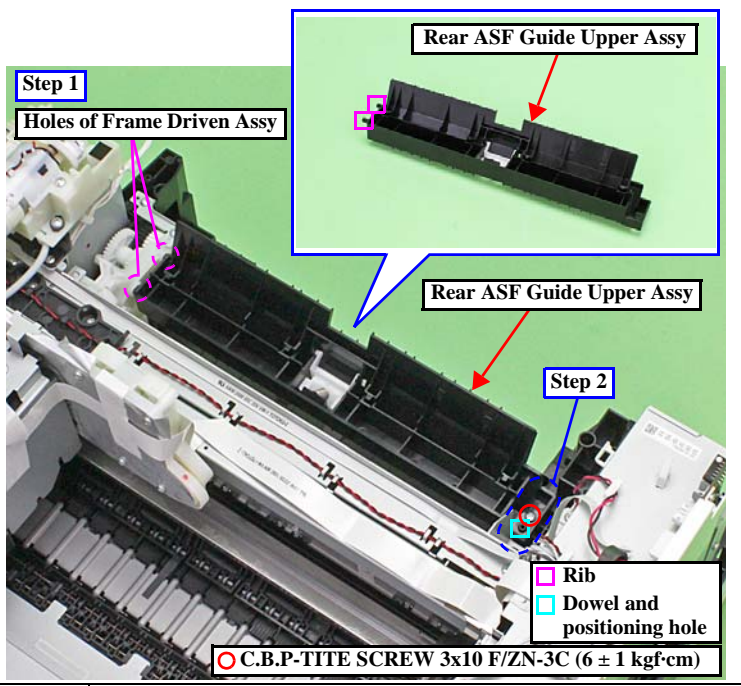
- Tighten the screws in the order indicated in the figure above.

Rear ASF Assy



- When installing the Rear ASF Assy to the Frame Base Assy, move the Trigger Lever in the direction of the arrow to prevent it from touching the Clutch Lever, and align the positioning holes (x2) of the Rear ASF Assy with the dowels (x2) of the Frame Base Assy.
- Tighten the screws in the order indicated in the figure above.

Rear ASF Guide Upper Assy



- When installing the Rear ASF Guide Upper Assy, follow the procedure below.
1. Insert the ribs (x2) on the 80-digit side of the Rear ASF Guide Upper Assy into the holes (x2) of the Frame Driven Assy.
  2. Align the positioning hole on the 0-digit side of the Rear ASF Guide Upper Assy with the dowel of the Frame Base Assy, and secure the Rear ASF Guide Upper Assy with the screw.



CR Scale

Black mark

Slit of CR Encoder

Carriage Assy

CR Scale

Carriage Assy

- Install the CR Scale with the black mark section up.
- Make sure to put the CR Scale through the slit of the CR Encoder.

Star Wheel Assy

Paper Guide Front Assy

Star Wheel Assy

Dowel and positioning hole

C.B.P-TITE(S-P1) SCREW 3x12 F/ZN-3C (6 ± 1 kgf·cm)

When installing the Star Wheel Assy, align the positioning holes (x2) on the bottom of the Star Wheel Assy with the dowels (x2) of the Paper Guide Front Assy, and tighten the screws (x2) in the order indicated in the figure above.

Power Supply Unit

Power Supply Unit

C.B.S-TITE SCREW 3x6 F/ZN-3C (6 ± 1 kgf·cm)

C.B.P-TITE SCREW 3x10 F/ZN-3C (6 ± 1 kgf·cm)

When removing the Power Supply Unit, the Power Supply Unit cable may touch the Frame. Be careful not to damage the Power Supply Unit cable then.

Tighten the screws in the order indicated in the figure above.

Decompress Pump Unit

Back

Ink Supply Unit

Joint of Ink Supply Unit

Hooks

Decompress Pump Unit

C.B.P-TITE(P2) SCREW 3x10 F/ZN-3C (6 ± 1 kgf·cm)

C.B.P-TITE SCREW 3x10 F/ZN-3C (6 ± 1 kgf·cm)

C.B.S-TITE SCREW 3x6 F/ZN-3C (6 ± 1 kgf·cm)

- Tighten the screws in the order indicated in the figure above.
- Route the Decompress Pump Tube through the hooks (x2) of the Ink Supply Unit, and insert the end of the tube into the joint on the Ink Supply Unit to the full up to its base.

EJ Roller

Grounding spring

EJ Roller

Bush, 5

EJ Roller

Dowel

Release the dowel of the Bush, 5, and detach it from the frame by rotating it in the direction of the arrow, and then remove the EJ Roller.

Make sure the grounding spring touches the EJ Roller on the position shown above.

Paper Stopper Assy 1st

Metal Plate

Paper Stopper Assy 1st

Dowel and positioning hole

C.B.S-TITE SCREW 3x6 F/ZN-3C (6 ± 1 kgf·cm)

When installing the Paper Stopper Assy 1st, align the positioning holes (x2) of the Paper Stopper Assy 1st with the dowels (x2) of the Metal Plate, and tighten the screws (x2) in the order indicated in the figure above.

Paper Stopper Assy 2nd\*

2nd Cassette Unit

Paper Stopper Assy 2nd

Dowel and positioning hole

C.B.P-TITE SCREW 3x8 F/ZN-3C (6 ± 1 kgf·cm)

When installing the Paper Stopper Assy 2nd, align the positioning holes (x2) of the Paper Stopper Assy 2nd with the dowels (x2) of the 2nd Cassette Unit, and tighten the screws (x2) in the order indicated in the figure above.

Paper Stopper Assy 1st / 2nd

Compression Spring 0.188

Secure springs (x4) with dowels.

Compression Spring 0.9

Paper Stopper

Slider Cassette

Slider Base

Cam Slider

If any of the parts of the Paper Stopper Assy 1st/2nd comes off when removing it, be sure to reassemble the Paper Stopper Assy 1st/2nd as shown above.



2nd Cassette Cover Left\*

Rear

Front

2nd Cassette Cover Left

1

2

3

4

Cross-section

2nd Cassette Cover Left

Hook

Hole

C.B.P-TITE SCREW 3x10 F/ZN-3C (6 ± 1 kgf·cm)

When releasing the hooks (x3) of the 2nd Cassette Cover Left, release them in the order from the front side to the rear side of the printer by inserting a screw driver or the like into the holes of the 2nd Cassette Cover Left and then pushing the hooks in the direction of the arrow.

Tighten the screws in the order indicated in the figure above.

Note "": When the optional 2nd cassette is installed for WP-4590/4530/4520/4510/4090/4020/4010 series.

2nd Cassette Cover Right\*

Front

Rear

2nd Cassette Cover Right

1

2

3

4

Cross-section

2nd Cassette Cover Right

Hook

Hole

C.B.P-TITE SCREW 3x10 F/ZN-3C (6 ± 1 kgf·cm)

When releasing the hooks (x3) of the 2nd Cassette Cover Right, release them in the order from the front side to the rear side of the printer by inserting a screw driver or the like into the holes of the 2nd Cassette Cover Right and then pushing the hooks in the direction of the arrow.

Tighten the screws in the order indicated in the figure above.

Frame Pickup Assy

2nd Cassette Housing Assy

1

2

3

4

Frame Pickup Assy

Dowel and positioning hole

C.B.P-TITE SCREW 3x10 F/ZN-3C (6 ± 1 kgf·cm)

When installing the Frame Pickup Assy to the 2nd Cassette Housing Assy, align the positioning holes (x2) of the Frame Pickup Assy with the dowels (x2) of the 2nd Cassette Housing Assy.

Tighten the screws in the order indicated in the figure above.

Wireless LAN Module (WP-4540/4530/4020 series)

Front right of printer

Wireless LAN Module Mounting Plate

Align cutout with rib.

Align positioning hole with dowel.

1

2

Wireless LAN Module

C.B.P-TITE(S-P1) SCREW 3x12 F/ZN-3C (6 ± 1 kgf·cm)

When installing the Wireless LAN Module, make sure of the following.

Align the cutout of the Wireless LAN Module with the rib of the Wireless LAN Module Mounting Plate.

Align the positioning hole of the Wireless LAN Module with the dowel of the Wireless LAN Module Mounting Plate.

Tighten the screws in the order indicated in the figure above.

ADF Unit / Scanner Unit (WP-4590/4540/4530/4520/4510 series)

Rear left

Rear right

4

5

1

2

3

6

Scanner Unit

C.B.P-TITE SCREW 3x10 F/ZN-3C (6 ± 1 kgf·cm)

C.B.S-TITE-SCREW 3x6 F/ZN-3C (6 ± 1 kgf·cm)

WP-4510 series do not have the ADF Unit but the disassembly/reassembly procedure is the same as that for the others.

Tighten the screws in the order indicated in the figure above.

ADF Cover Housing Upper (WP-4540/4530/4520 series)

ADF Cover Housing Upper

Hook

Rib

C.B.P-TITE SCREW 3x10 F/ZN-3C (6 ± 1 kgf·cm)

The figures above indicate the hooks (x2), ribs (x3) and screws (x4) that secure the ADF Cover Housing Upper.

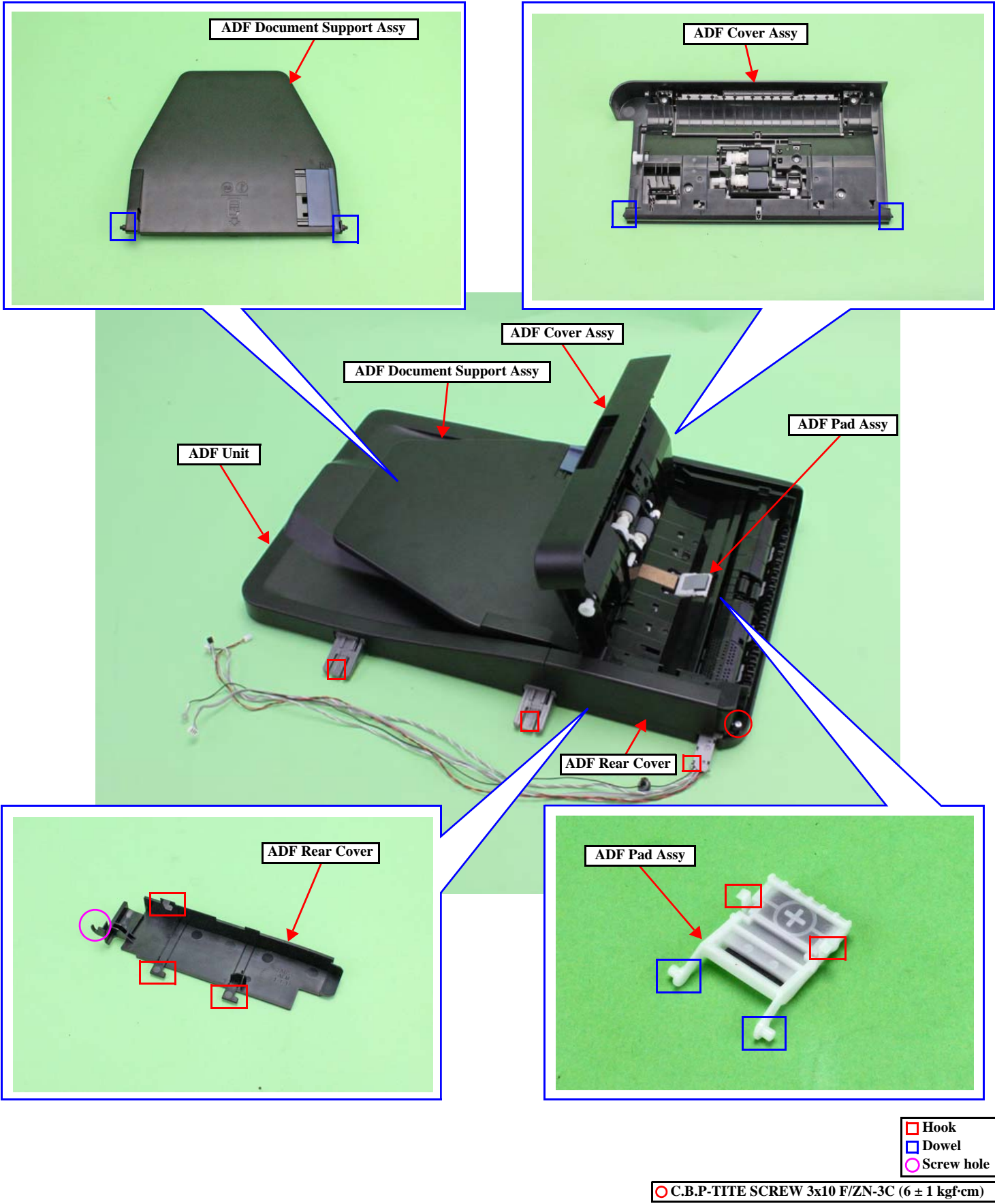
Note"":When the optional 2nd cassette is installed for WP-4590/4530/4520/4510/4090/4020/4010 series.

Disassembly/Reassembly

Detailed Disassembly/Reassembly Procedure for each Part/Unit

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ADF Unit (WP-4540/4530/4520 series)



The figures above indicate the hooks, dowels and screws that secure the parts and units.



4.4 Routing FFCs/cables

Top of the Scanner Unit  
(WP-4590/4540/4530/4520/4510 series)

Ferrite core

Shield plate of Main Board Assy

Scanner grounding wire

Rib

C.B.S-TITE-SCREW-3 x 6-F/ZN-3C (6 ± 1kgf·cm)

Route the Scanner grounding wire through the ribs (x4) of the Scanner Unit and insert the ferrite core of it into the position shown above, and then secure the end of the grounding wire to the shield plate of the Main Board Assy with the screw.

Bottom of the Frame Base

Hole of Frame Base

Bottom

Metal Plate

Clamp

Paper Stopper Lever Sensor cable

Hook

Route the Paper Stopper Lever Sensor cable through the hooks (x3) and clamp of the Metal Plate, and then route it through the hole of the Frame Base.

Bottom of the Scanner Unit  
(WP-4590/4540/4530/4520/4510 series)

Pull out Scanner Motor cable here.

Pull out Scanner FFC here.

Secure ferrite core with hook.

Scanner Motor cable

Scanner FFC

Pull out ADF cables (x5) here.

Scanner Unit

Hook

Rib

- Pull out the Scanner Motor cable from the hole of the Scanner Unit as shown above, and then route it through the hooks (x4) of the Scanner Unit.
- Pull out the Scanner FFC from the hole of the Scanner Unit as shown above, and then route it through the hooks (x4) of the Scanner Unit.
- Secure the ferrite core of the Scanner FFC on the position shown above with the hook.
- Route the following cables related to the ADF through the space between the ribs and the rim on the rear side of the printer as shown above, and secure them with the hooks (x4). (WP-4590/4540/4530/4520 series only)
  - ADF PE Sensor cable
  - ADF Document Sensor cable
  - ADF Motor cable
  - ADF Encoder cable
  - ADF grounding wire

Inside the FAX Cover (WP-4590/4540/4530/4520/4510 series)

Scanner Motor cable

CN55

Scanner FFC

CN37

Scanner Unit

ADF Document Sensor cable

ADF Encoder cable/ADF PE Sensor cable  
Route them through rib on the right side of screw boss on Middle Housing.

ADF grounding wire

ADF Encoder cable

ADF PE Sensor cable

ADF Motor cable

CN38

CN39

CN40

CN54

C.B.S-TITE-SCREW-3 x 6-F/ZN-3C (6 ± 1kgf·cm)

ADF Motor cable/ADF Document Sensor cable/ADF grounding wire  
Route them through rib on the left side of screw boss on Middle Housing.

Middle Housing

Rear

CN#	Name
CN37	Scanner FFC
CN38	ADF PE Sensor cable
CN39	Document Sensor cable
CN40	ADF Encoder cable
CN54	ADF Motor cable
CN55	Scanner Motor cable

- Route the Scanner FFC and Scanner Motor cable as shown above, and connect them to the connectors on the Main Board as indicated in the above table.
- Route the following cables related to the ADF as shown above, and connect them to the connectors on the Main Board as indicated in the above table. (WP-4590/4540/4530/4520 series only)
  - ADF PE Sensor cable
  - ADF Motor cable
  - ADF grounding wire (secure it to the shield plate on the Main Board with the screw)
  - Document Sensor cable
  - ADF Encoder cable

Front of the Printer

Bottom left

PF Motor cable

Front Frame

Metal Plate Left

PF Motor cable

Clamp

PF Motor cable

ASF Motor relay cable

Front Frame

Frame Base

PF Motor cable

Hook

Rib

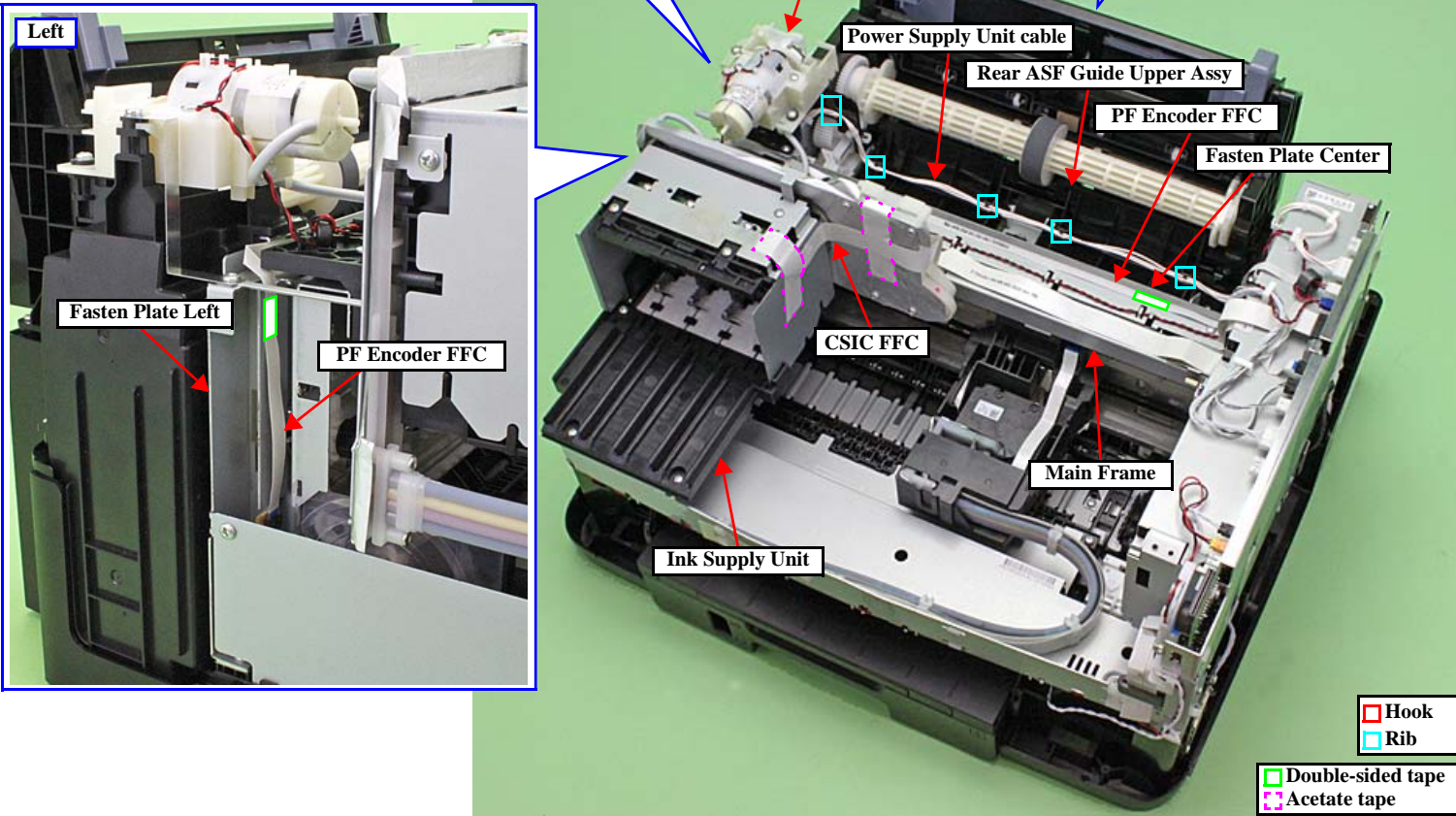
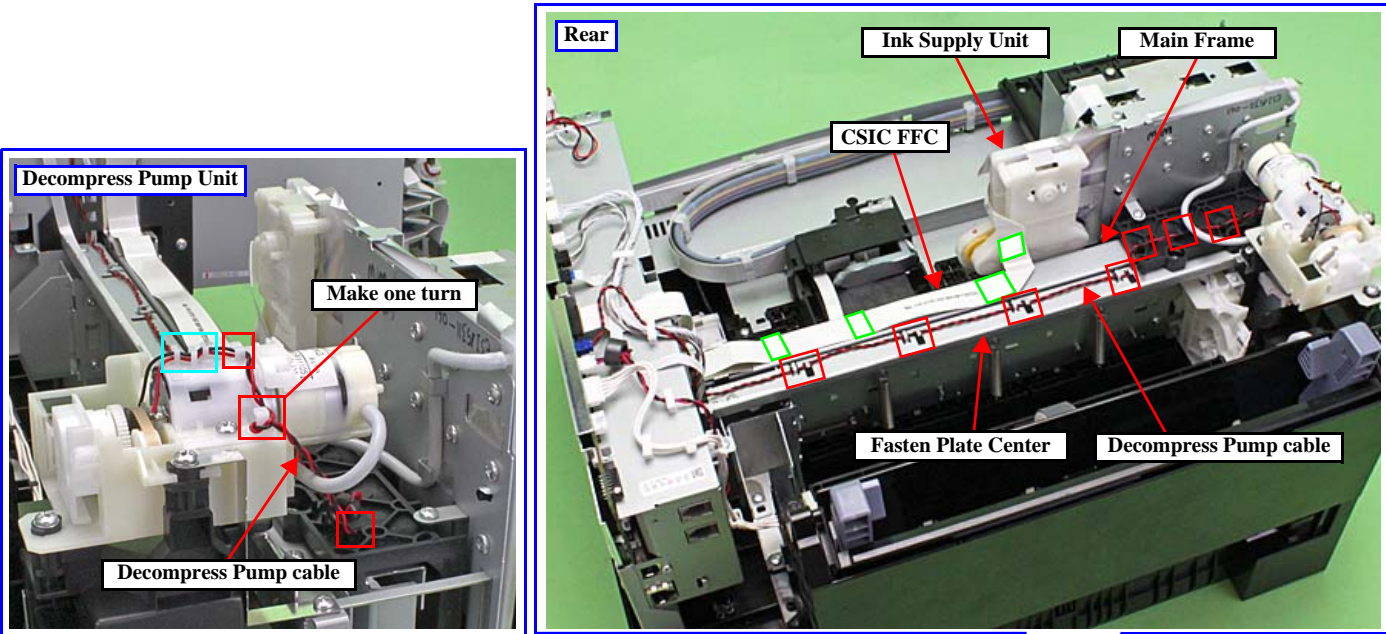
- PF Motor cable
- ASF Motor relay cable

Route it through the hooks (x2) of the Frame Base and the hooks (x2) of the Metal Plate Left, and then route it through the hooks (x7), rib and clamp of the Front Frame.

Route it under the rib of the Frame Base and rib of the Front Frame, and then route it through the clamp.

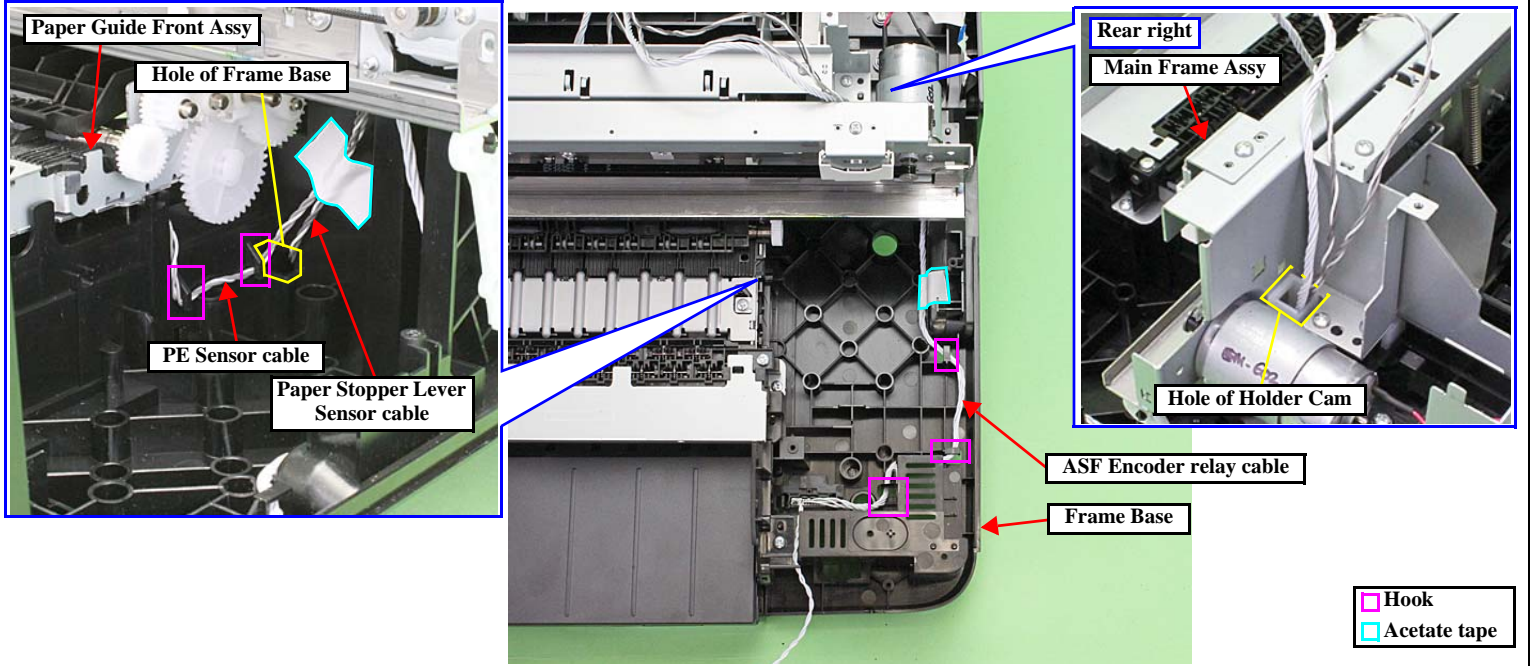


Top of the Printer



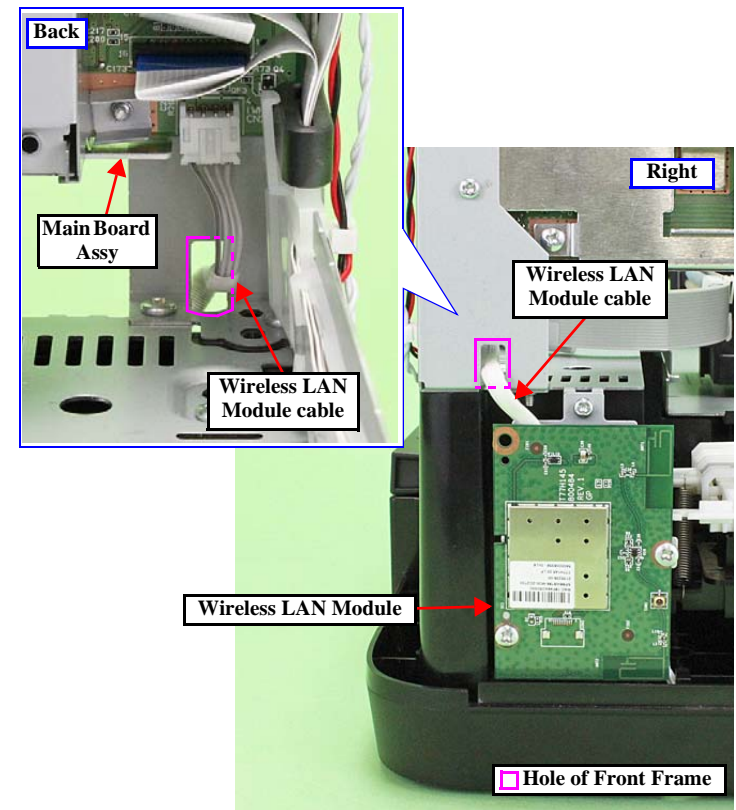
- Power Supply Unit cable Route it through the ribs (x5) of the Rear ASF Guide Upper Assy.
- Decompress Pump cable Route it through the ribs (x3) and hooks (x2) of the Decompress Pump Unit, hooks (x3) of the Ink Supply Unit, and the hooks (x8) of the Fasten Plate Center.
- CSIC FFC Form the CSIC FFC back by folding it on the original fold lines, and route it on the Ink Supply Unit and Main Frame, and then secure it on the positions shown above with acetate tape and double-sided tape.
- PF Encoder FFC Form the PF Encoder FFC back by folding it on the original fold lines, and route it on the Fasten Plate Left and Fasten Plate Center, and then secure it on the position shown above with double-sided tape.

Bottom of the Ink System Unit



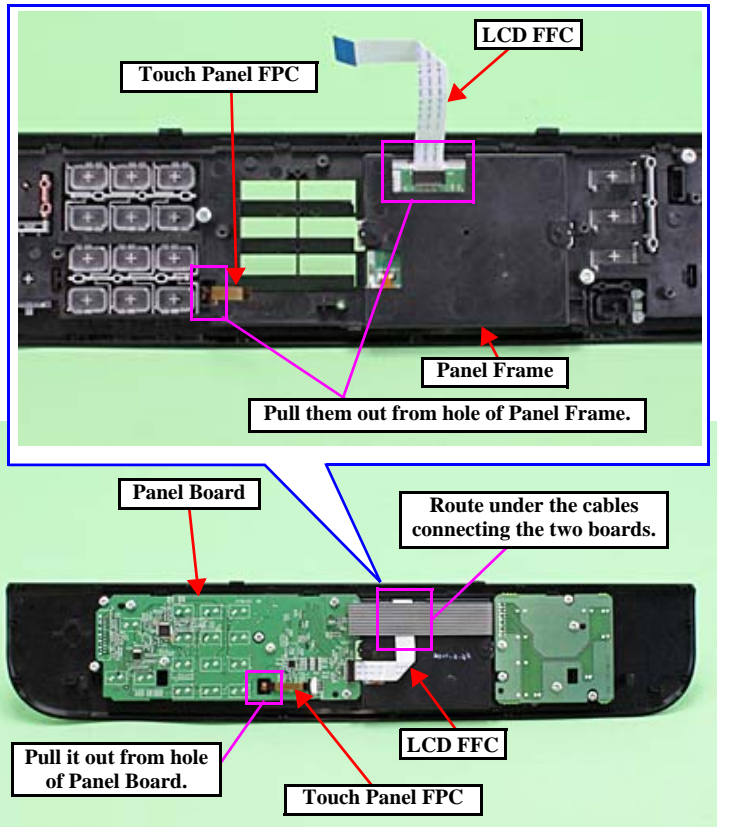
- Route the Paper Stopper Lever Sensor cable, PE Sensor cable and ASF Encoder relay cable as follows, and then route them under the Main Frame Assy and pull them out from the hole of the Holder Cam Assy.
- Paper Stopper Lever Sensor cable Pull it out from the hole of the Frame Base, and secure it on the position shown above with acetate tape.
  - PE Sensor cable Pull it out under the Paper Guide Front Assy and route it through the hooks (x2) of the Frame Base, and then secure it on the position shown above with acetate tape.
  - ASF Encoder relay cable Route it through the hooks (x3) of the Frame Base, and then secure it on the position shown above with acetate tape.

Wireless LAN Module (WP-4540/4530/4020 series)



Route the Wireless LAN Module cable through the hole of the Front Frame, and then connect it to the connector on the Main Board. (TBD)

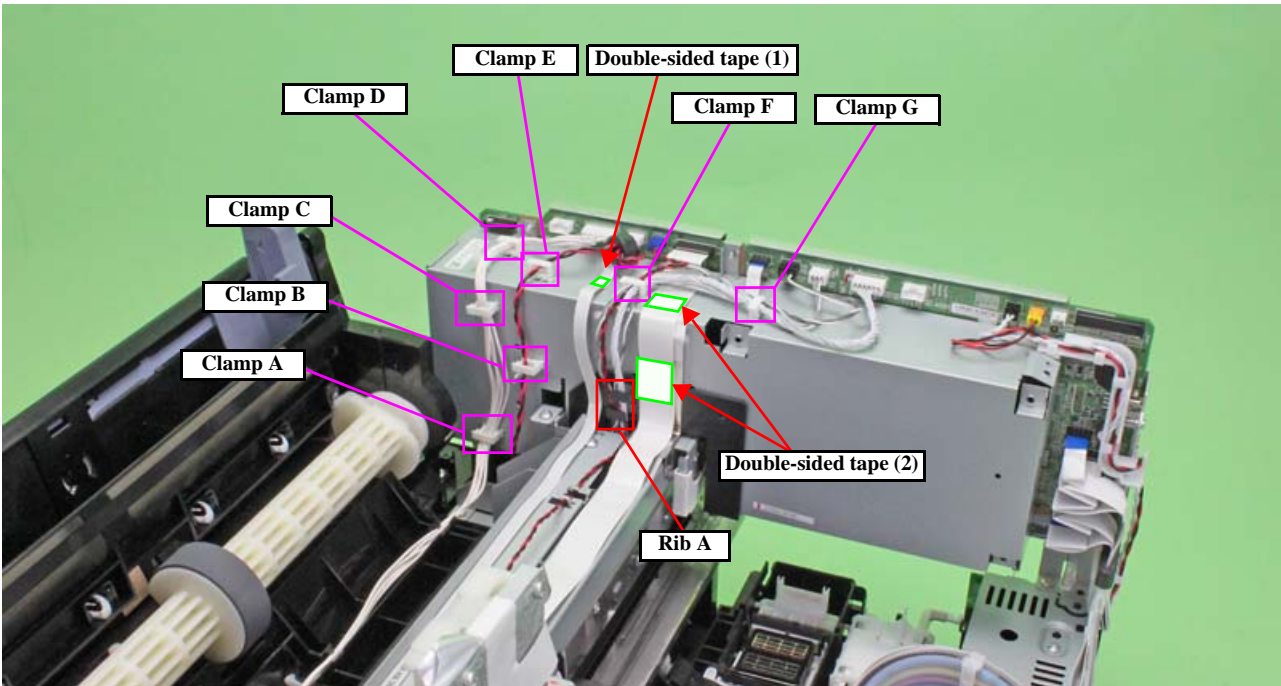
LCD FFC / Touch Panel FPC (WP-4540 series)



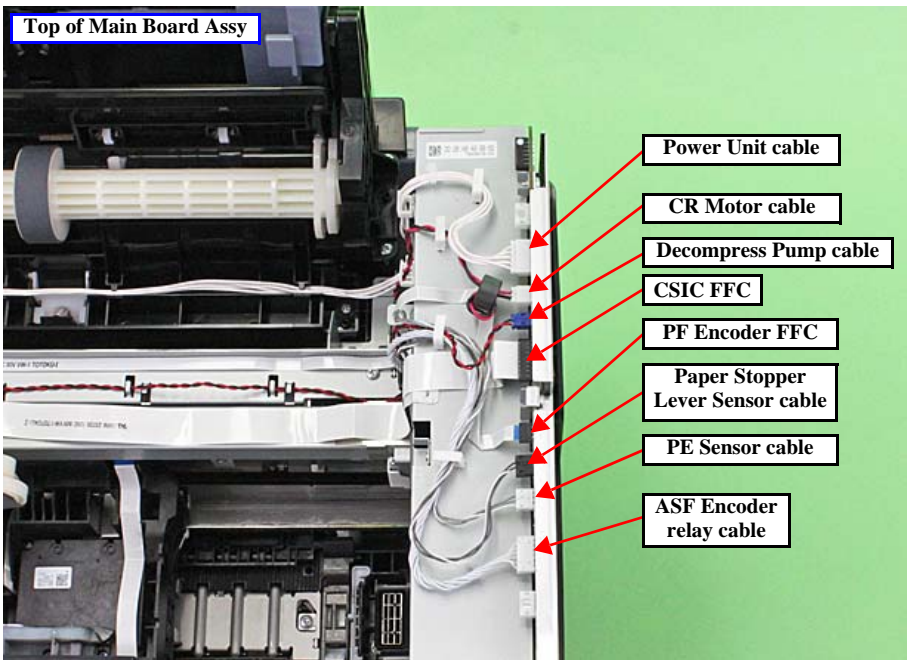
Route the LCD FFC and Touch Panel FPC as shown above, and then connect them to the connectors on the Panel Board.



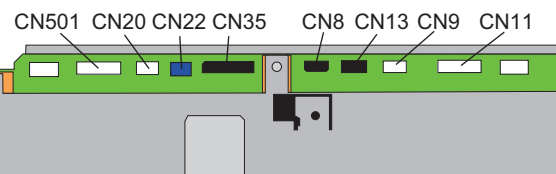
Main Board Assy (1)



Top of Main Board Assy



Connector positions on Main Board Assy

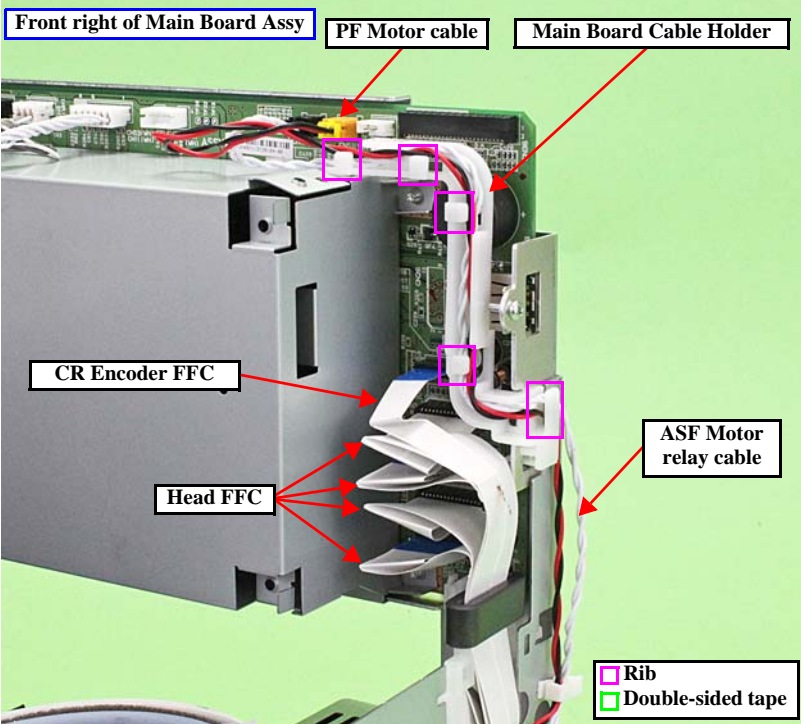


CN#	Name
CN8	PF Encoder FFC
CN9	PE Sensor cable
CN11	ASF Encoder relay cable
CN13	Paper Stopper Lever Sensor cable
CN20	CR Motor cable
CN22	Decompress Pump cable
CN35	CSIC FFC
CN501	Power Unit cable

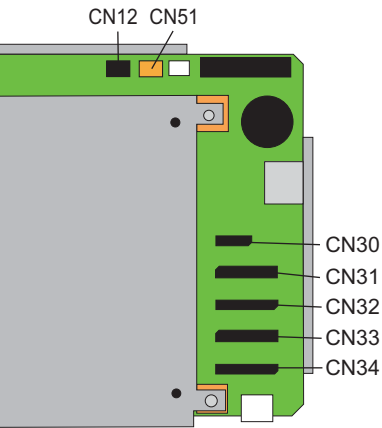
- Power Unit cable (CN501) Route it through the clamp A, clamp C and clamp D as shown above, and then connect it to the connector on the Main Board.
- CR Motor cable (CN20) Route it through the clamp B and clamp E as shown above, and then connect it to the connector on the Main Board.
- PF Encoder FFC (CN8) Secure it on the double-sided tape (1) as shown above with a piece of double-sided tape and fold it on the fold lines of the FFCs, and then route and connect it to the connector on the Main Board.
- CSIC FFC (CN35) Secure it on the double-sided tape (2) as shown above with double-sided tape (x2) and fold it on the fold lines of the FFCs, and then route and connect it to the connector on the Main Board.
- Paper Stopper Lever Sensor cable (CN13)/ PE Sensor cable (CN9)/ ASF Encoder relay cable (CN11) Route them through the rib A, clamp F and clamp G of the Main Board Assy, and then connect them to the connectors on the Main Board.
- Decompress Pump cable (CN22) Route it through the rib A and clamp F of the Main Board Assy, and then connect it to the connector on the Main Board.

Main Board Assy (2)

Front right of Main Board Assy



Connector positions on Main Board Assy

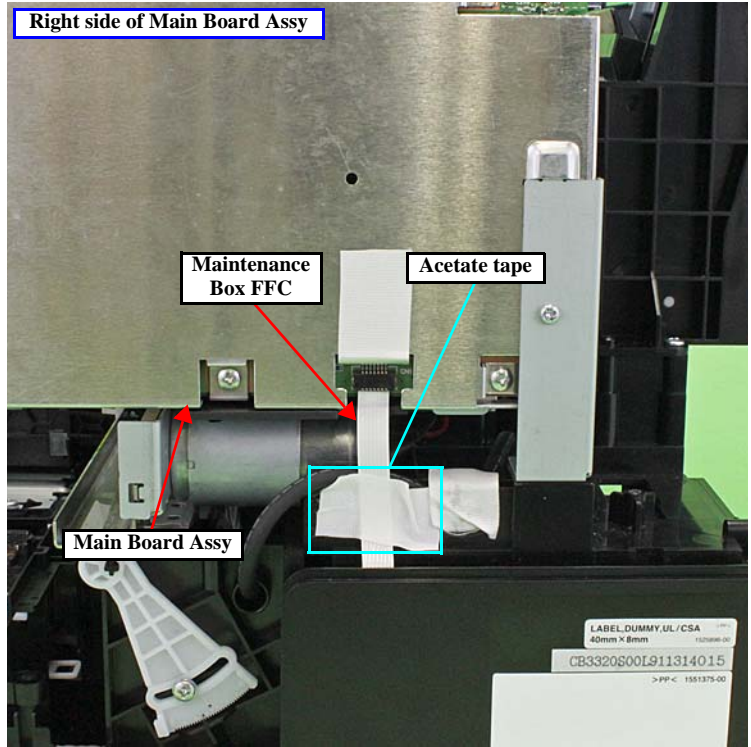


CN#	Name	CN#	Name
CN30	CR Encoder FFC	CN34	Head FFC
CN31	Head FFC	CN12	ASF Motor relay cable
CN32	Head FFC		
CN33	Head FFC	CN51	PF Motor cable

- ASF Motor relay cable (CN12)/ PF Motor cable (CN51) Route them through the ribs (x5) of the Main Board Cable Holder, and then connect them to the connectors on the Main Board.
- Head FFC (CN31, CN32, CN33, CN34)/ CR Encoder FFC (CN30) Fold them on the fold lines of the FFCs, and route and connect them to the connectors on the Main Board.

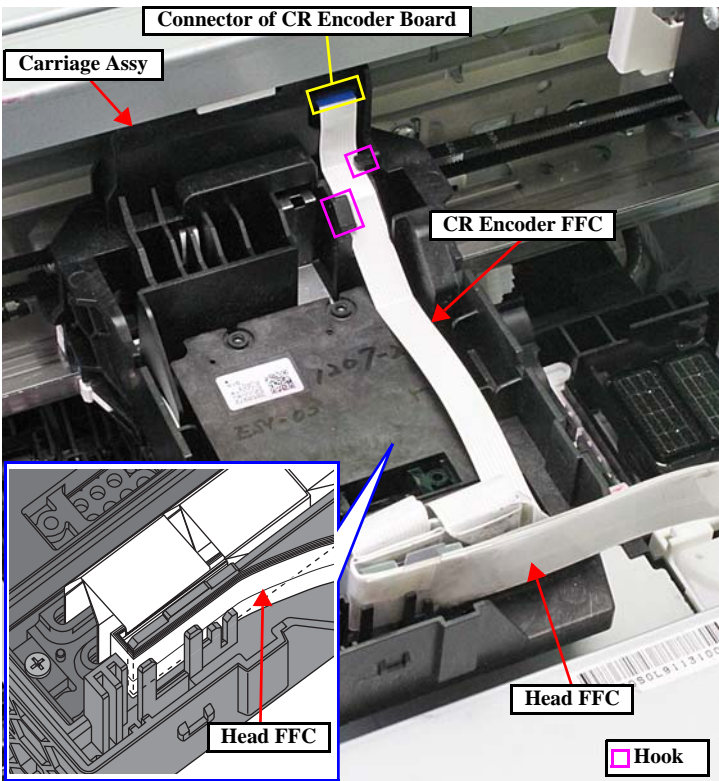
Main Board Assy (3)

Right side of Main Board Assy



Secure the Maintenance Box FFC on the position shown above with acetate tape, and then connect it to the connector (CN1) on the Main Board.

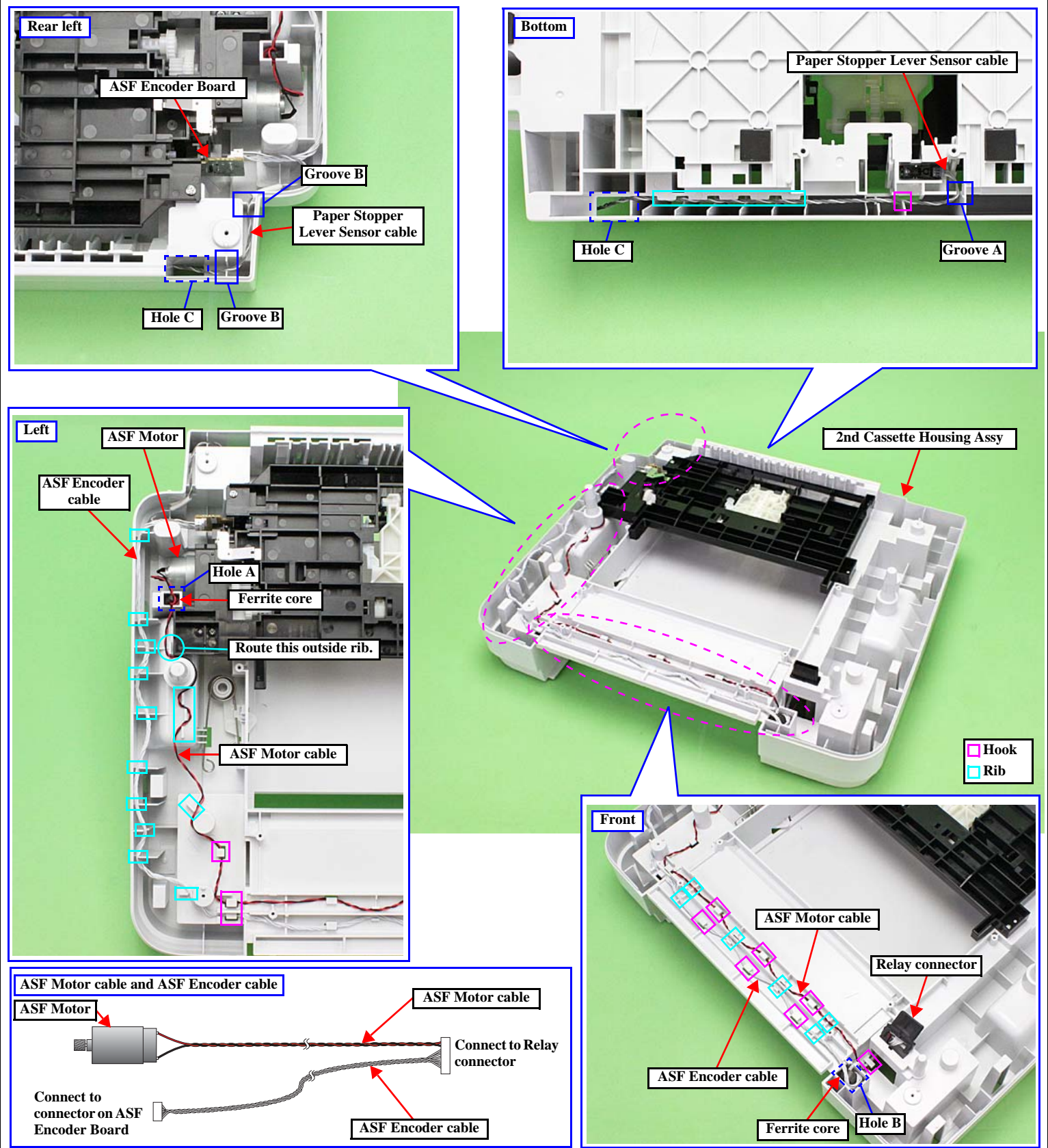
Head FFC



- Route the Head FFC as shown above.
- Connect the CR Encoder FFC to the connector on the CR Encoder Board, and then route it under the hooks (x2) of the Carriage Assy.



2nd Cassette Housing Assy\*

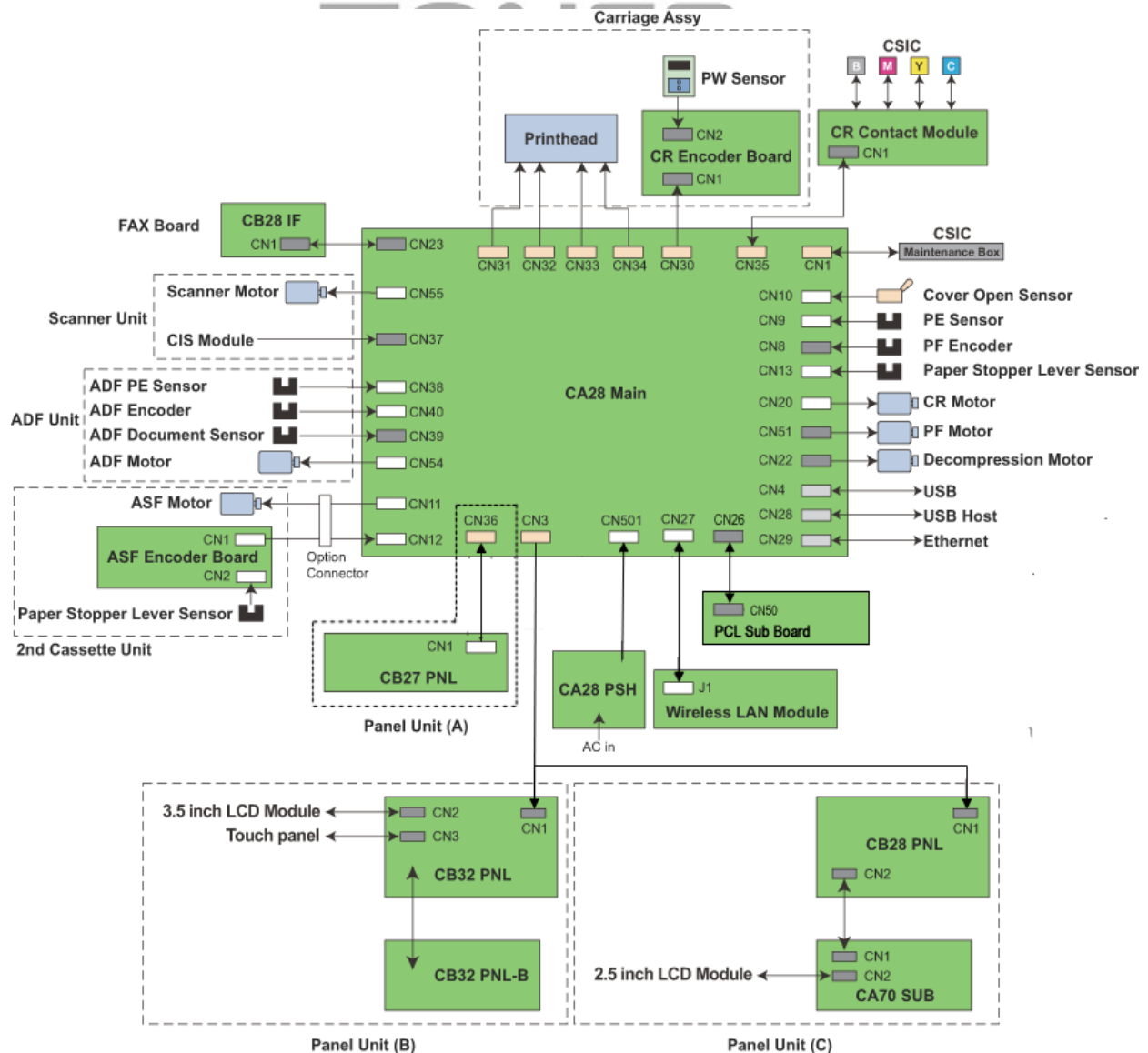


- Insert the ferrite core of the ASF Motor cable into the hole A of the 2nd Cassette Housing Assy, and route the cable through the hooks and ribs as shown above.
- Insert the ferrite core of the ASF Encoder cable in the hole B of the 2nd Cassette Housing Assy, and route the cable through the hooks and ribs as shown above.
- When connecting the Paper Stopper Lever Sensor cable to the ASF Encoder Board, follow the procedure below.
  1. Route it through the groove A of the 2nd Cassette Housing Assy, and then route it through the hook and ribs as shown above.
  2. Pull it out from the hole C of the 2nd Cassette Housing Assy, and route it through the groove B of the 2nd Cassette Housing Assy.

Note "※": When the optional 2nd cassette is installed for WP-4590/4530/4520/4510/4090/4020/4010 series.

## 4.5 Connector

Cable connections of this printer are shown below.



Model	ADF Unit	Scanner Unit	Wireless LAN Module	FAX Board	USB Host	PCL Sub Board	Panel Unit type
WP-4590 series	Yes	Yes	---	Yes	Yes	Yes	C
WP-4540 series	Yes	Yes	Yes	Yes	Yes	---	B
WP-4530 series	Yes	Yes	Yes	Yes	Yes	---	C
WP-4520 series	Yes	Yes	---	Yes	Yes	---	C
WP-4510 series	---	Yes	---	---	Yes	---	C
WP-4090 series	---	---	---	---	---	Yes	A
WP-4020 series	---	---	Yes	---	---	---	A
WP-4010 series	---	---	---	---	---	---	A

Figure 4-2. Connector Diagram



## CHAPTER 5

# ADJUSTMENT



## 5.1 Required Adjustments

The table from the following page 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.



- After all required adjustments are complete, 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 replacing the Main Board and the Printer Mechanism (Frame Base Assy) at the same time, the adjustment should be made after performing the initial setting.



- In this manual, the product name is abbreviated to such as “WP-4510 series”, however, the last digit of the actual name may differ. Identify your product with the first three digits and refer to the appropriate sections in this manual.
- The table items and marks used in the “Required Adjustment List” provided on the following pages have the following meanings.
  - “O” indicates that the adjustment must be carried out.
  - “---” indicates that the adjustment is not required.
  - The “Mechanism Adjustment” should be performed just after reinstalling or reassembling the part or unit. (See "[Table 5-1 Required Adjustment List \(Mechanism adjustment\) \(p84\)](#)".)
  - The “Adjustments using the Adjustment Program” need to be performed after reassembling the printer completely. (See "[Table 5-2 Required Adjustment List \(p85\)](#)".)
- 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 them out in the order given in the “Priority” row.

Table 5-1. Required Adjustment List (Mechanism adjustment)

Adjustment Type			Mechanism adjustment					
Priority			1	2	3	4	5	6
Adjustment Item			PF Timing Belt tension check	Rear ASF Timing Belt tension check	PG adjustment	Checking the platen gap	Touch Panel adjustment*	Ink leak check
Purpose			Check if the tension of the PF Timing Belt is within the standard.	Check if the tension of the Rear ASF Timing Belt is within the standard.	Adjusts the PG to within the standard.	Check if the PG is within the standard.	Adjusts the relative positions between the Touch Panel detection points and displayed positions on the Control Panel.	Check if ink is leaking.
Part Name	Touch Panel	Remove	---	---	---	---	O	---
		Replace	---	---	---	---	O	---
	Panel Board	Remove	---	---	---	---	---	---
		Replace	---	---	---	---	---	---
	Sub Board	Remove	---	---	---	---	---	---
		Replace	---	---	---	---	---	---
	Main Board	Remove	---	---	---	---	---	---
		Replace (Read OK)	---	---	---	---	---	---
		Replace (Read NG)	---	---	---	---	O	---
	Carriage Assy	Remove	---	---	O	---	---	---
		Replace	---	---	O	---	---	---
	Printhead	Remove	---	---	---	O	---	---
		Replace	---	---	---	O	---	O
	Ink Supply Unit	Remove	---	---	---	---	---	---
		Replace	---	---	---	---	---	O
	Frame Base Assy	Replace	O	O	O	O	---	---
	EJ Roller	Remove	O	---	---	---	---	---
		Replace	O	---	---	---	---	---
	Main Frame	Remove	---	---	O	---	---	---
		Replace	---	---	O	---	---	---
	PF Motor	Remove	O	---	---	---	---	---
		Replace	O	---	---	---	---	---
	Front Frame Assy	Remove	---	---	---	---	---	---
		Replace	---	---	O	O	---	O
	Paper Guide Front Assy	Remove	O	---	---	---	---	---
		Replace	O	---	O	O	---	O
	PF Holder / PF Timing Belt	Remove	O	---	---	---	---	---
		Replace	O	---	---	---	---	---
How to judge			See "5.2.1 PF Timing Belt Tension Check (p88)" for the details.	See "5.2.2 Rear ASFTiming Belt Tension Check (p89)"for the details.	See "5.2.3 PG Adjustment (p90)" for the details.	See "5.2.4 Checking the Platen Gap (p96)" for the details.	See "5.2.6 Touch Panel Adjustment (WP-4540 series only) (p98)" for the details.	See "5.2.7 Ink Leak Check (p101)" for the details.
Adjustment program			---	---	---	---	---	---
Tool			Sonic tension gauge	Sonic tension gauge	Thickness gauge	Thickness gauge	Touch pen	Ink Leak Measurement Jig/Ink Leak Check Cartridge

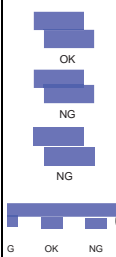
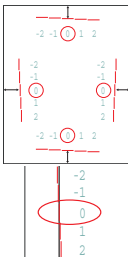
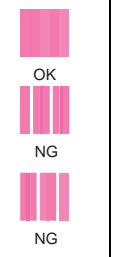
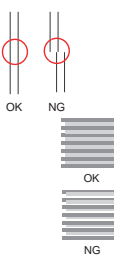
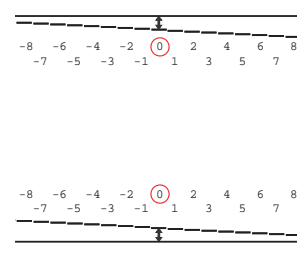


Note 1: The mechanism adjustment is not necessary for the parts which are not mentioned above.

2: After the mechanism adjustment is performed, make sure to execute the adjustment using the Adjustment Program.

(See "Table 5-2 Required Adjustment List (p85)".)

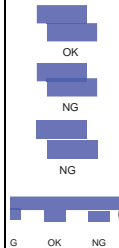
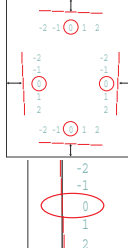
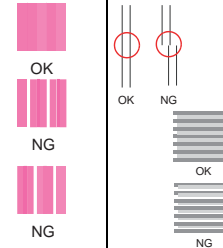
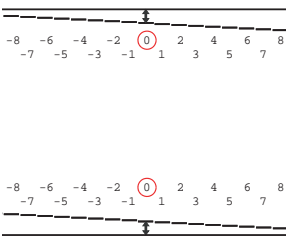

Note \*: WP-4540 series only

Table 5-2. Required Adjustment List

Adjustment Type			Adjustment using the Adjustment Program																					
Priority			1	2	3	4	5	6	7		8	9	10			11	12	13	14	15	16	17	18	
Adjustment Item			EEPROM data copy	Initialize Setting (MAC address setting)	Maintenance counter	Ink charge	Head ID input	PF / EJ adjustment	First dot position / PW adjustment		Bi-D adjustment	Head angular adjustment	PE adjustment			Paper skew adjustment	PF / EJ deterioration offset	PW deterioration offset	PF band adjustment	PE adjustment detection check	CR motor heat protection control	PF motor heat protection control	ASF motor heat protection control	
									Rear ASF	Front ASF (1st cassette)			Rear ASF (Top edge)	Rear ASF (Rear edge)	Front ASF (1st Cassette)									
Purpose			To copy adjustment values or the like stored on the old Main Board to the new board when the Main Board needs to be replaced.	To write sale-destination-specific settings and the serial number into the Main Board after replacing it.	To reset the tube durability counter after replacing the Ink Supply Unit.	To fill ink throughout the ink path to make all the nozzles ready for printing.	To correct characteristic variation of the replaced Printhead by entering its Printhead ID (Head ID).	To correct variations in paper feed accuracy to achieve higher print quality.	To correct the print start position in the carriage moving direction through software control.		To correct print start timing in bidirectional printing through software control.	To correct tilt of the Printhead caused at the installation through software control.	To correct the paper detection positions and the mounting positions of the PE Sensor by software control.			To align print start position at 0-digit side with that at 80-digit side in bi-directional band printing, timing of firing ink droplet is adjusted through software control.	To reset the counter or set it to its maximum according to the replaced parts.	To reset the counter according to the replaced parts.	To correct variations in paper feed accuracy to achieve higher print quality in band printing.	To confirm the chattering ends within the specified time after the PE Sensor detects the rear edge.	To measure and correct the electrical variation of the CR Motor and the Power Supply Board.	To measure and correct the electrical variation of the PF Motor and the Power Supply Board.	To measure and correct the electrical variation of the ASF Motor and the Power Supply Board.	
Part Name	LCD Module	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		Replace	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
	Touch Panel	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		Replace	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Panel Board	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		Replace	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Sub Board	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		Replace	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Main Board	Remove	O	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		Replace (Read OK)	O	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		Replace (Read NG)	---	O	O	---	O	O	O	O	O	O	O	O	O	O	O	O*	O	---	O	O	O	
	Power Supply Unit	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		Replace	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O	O	O
	Carriage Assy	Remove	---	---	---	---	---	---	O	O	---	---	O	O	O	---	---	---	O	---	---	---	---	---
		Replace	---	---	---	---	---	---	O	O	O	O	O	O	O	O	---	O	O	---	O	---	---	---
	Printhead	Remove	---	---	---	O	---	---	---	---	O	O	---	---	---	O	---	---	O	---	---	---	---	---
		Replace	---	---	---	O	O	O	O	O	O	O	O	O	O	O	---	---	O	---	O	---	---	---
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.	■PW Adjustment Examine the misaligned lines printed on top, bottom, left, and right of the paper, and enter the number beside the line that is exactly 5 mm away from the paper edge for each side. ■1st dot adjustment Examine the lines on the left side of paper, and enter the number beside the line that overlaps with the horizontal line.	Examine the printout patterns for each of the four modes, and enter the value for the pattern with no gap and overlap for each mode.	■Band pattern Enter the values of the most straight lines. ■Microweave pattern Enter the value for the group of which the gaps between the two color bars are the smallest.	Examine the misaligned lines printed on top and bottom of the paper, and enter the number beside the line that is exactly 5 mm away from the paper edge for each side.			Examine the printout pattern and enter the number of the one with the least gap and overlap between the two different colored lines.	---	---	Examine the printout patterns and enter the value for the pattern with no overlap and gap between the two rectangles.	---	---	---	---		
Adjustment program			O	O	O	O	O	O	O	O	O	O			O	O	O	O	O	O	O	O	O	
Tool			---	---	---	---	---	---	Ruler	---	---	Ruler			---	---	---	---	---	---	---	---	---	

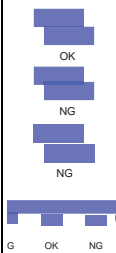
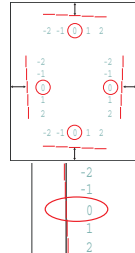

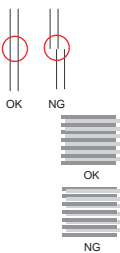
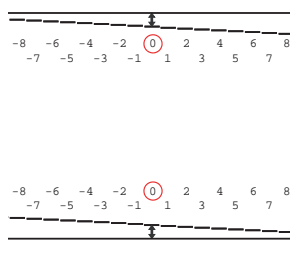
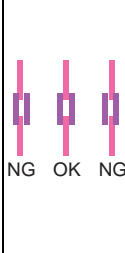
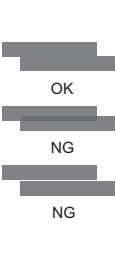
Note \*: When the data in EEPROM on the Main Board cannot be read out and the Main Board is replaced, the PW deterioration offset is reset. Therefore, replacing the Carriage Assy (PW Sensor) is required with a new one.

Table 5-2. Required Adjustment List

Adjustment Type			Adjustment using the Adjustment Program																				
Priority			1	2	3	4	5	6	7		8	9	10			11	12	13	14	15	16	17	18
Adjustment Item			EEPROM data copy	Initialize Setting (MAC address setting)	Maintenance counter	Ink charge	Head ID input	PF / EJ adjustment	First dot position / PW adjustment		Bi-D adjustment	Head angular adjustment	PE adjustment			Paper skew adjustment	PF / EJ deterioration offset	PW deterioration offset	PF band adjustment	PE adjustment detection check	CR motor heat protection control	PF motor heat protection control	ASF motor heat protection control
									Rear ASF	Front ASF (1st cassette)			Rear ASF (Top edge)	Rear ASF (Rear edge)	Front ASF (1st Cassette)								
Purpose			To copy adjustment values or the like stored on the old Main Board to the new board when the Main Board needs to be replaced.	To write sale-destination-specific settings and the serial number into the Main Board after replacing it.	To reset the tube durability counter after replacing the Ink Supply Unit.	To fill ink throughout the ink path to make all the nozzles ready for printing.	To correct characteristic variation of the replaced Printhead by entering its Printhead ID (Head ID).	To correct variations in paper feed accuracy to achieve higher print quality.	To correct the print start position in the carriage moving direction through software control.		To correct print start timing in bidirectional printing through software control.	To correct tilt of the Printhead caused at the installation through software control.	To correct the paper detection positions and the mounting positions of the PE Sensor by software control.			To align print start position at 0-digit side with that at 80-digit side in bi-directional band printing, timing of firing ink droplet is adjusted through software control.	To reset the counter or set it to its maximum according to the replaced parts.	To reset the counter according to the replaced parts.	To correct variations in paper feed accuracy to achieve higher print quality in band printing.	To confirm the chattering ends within the specified time after the PE Sensor detects the rear edge.	To measure and correct the electrical variation of the CR Motor and the Power Supply Board.	To measure and correct the electrical variation of the PF Motor and the Power Supply Board.	To measure and correct the electrical variation of the ASF Motor and the Power Supply Board.
Part Name	Duplex Unit	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Replace	---	---	---	---	---	O	O	O	---	---	O	O	O	---	---	---	---	---	---	---	---
	CR Scale	Remove	---	---	---	---	---	---	O	O	---	---	---	---	---	---	---	---	---	---	---	---	---
		Replace	---	---	---	---	---	---	O	O	O	---	---	---	---	O	---	---	---	---	---	---	---
	Cassette Assy 1st	Remove	---	---	---	---	---	---	---	O	---	---	---	O	O	---	---	---	---	---	---	---	---
		Replace	---	---	---	---	---	---	---	O	---	---	---	O	O	---	---	---	---	---	---	---	---
	Frame Base Assy	Remove	---	---	---	---	---	---	O	O	O	O	O	O	O	O	---	---	O	---	---	---	---
		Replace	---	---	---	---	---	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	Rear ASF Assy	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Replace	---	---	---	---	---	---	O	---	---	---	---	O	O	---	---	---	---	---	---	---	---
	Ink Supply Unit	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Replace	---	---	O	O	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	EJ Roller	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Replace	---	---	---	---	---	O	O	O	---	---	O	O	O	O	O	---	---	---	---	O	---
	Main Frame	Remove	---	---	---	---	---	---	O	O	---	---	O	O	O	---	---	---	---	---	---	---	---
		Replace	---	---	---	---	---	O	O	O	O	O	O	O	O	O	---	---	---	---	O	---	---
	Paper Guide Upper	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Replace	---	---	---	---	---	O	---	---	O	O	---	---	---	O	---	---	---	---	---	---	---
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.	■PW Adjustment Examine the misaligned lines printed on top, bottom, left, and right of the paper, and enter the number beside the line that is exactly 5 mm away from the paper edge for each side. ■1st dot adjustment Examine the lines on the left side of paper, and enter the number beside the line that overlaps with the horizontal line.	Examine the printout patterns for each of the four modes, and enter the value for the pattern with no gap and overlap for each mode.	■Band pattern Enter the values of the most straight lines. ■Microweave pattern Enter the value for the group of which the gaps between the two color bars are the smallest.	Examine the misaligned lines printed on top and bottom of the paper, and enter the number beside the line that is exactly 5 mm away from the paper edge for each side.	Examine the printout pattern and enter the number of the one with the least gap and overlap between the two different colored lines.	---	---	---	---	---	---	---			
Adjustment program			O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Tool			---	---	---	---	---	Ruler	---	---	Ruler	---	---	---	---	---	---	---	---	---	---	---	

Note \*: When the data in EEPROM on the Main Board cannot be read out and the Main Board is replaced, the PW deterioration offset is reset. Therefore, replacing the Carriage Assy (PW Sensor) is required with a new one.

Table 5-2. Required Adjustment List

Adjustment Type			Adjustment using the Adjustment Program																				
Priority			1	2	3	4	5	6	7		8	9	10			11	12	13	14	15	16	17	18
Adjustment Item			EEPROM data copy	Initialize Setting (MAC address setting)	Maintenance counter	Ink charge	Head ID input	PF / EJ adjustment	First dot position / PW adjustment		Bi-D adjustment	Head angular adjustment	PE adjustment			Paper skew adjustment	PF / EJ deterioration offset	PW deterioration offset	PF band adjustment	PE adjustment detection check	CR motor heat protection control	PF motor heat protection control	ASF motor heat protection control
									Rear ASF	Front ASF (1st cassette)			Rear ASF (Top edge)	Rear ASF (Rear edge)	Front ASF (1st Cassette)								
Purpose			To copy adjustment values or the like stored on the old Main Board to the new board when the Main Board needs to be replaced.	To write sale-destination-specific settings and the serial number into the Main Board after replacing it.	To reset the tube durability counter after replacing the Ink Supply Unit.	To fill ink throughout the ink path to make all the nozzles ready for printing.	To correct characteristic variation of the replaced Printhead by entering its Printhead ID (Head ID).	To correct variations in paper feed accuracy to achieve higher print quality.	To correct the print start position in the carriage moving direction through software control.		To correct print start timing in bidirectional printing through software control.	To correct tilt of the Printhead caused at the installation through software control.	To correct the paper detection positions and the mounting positions of the PE Sensor by software control.			To align print start position at 0-digit side with that at 80-digit side in bi-directional band printing, timing of firing ink droplet is adjusted through software control.	To reset the counter or set it to its maximum according to the replaced parts.	To reset the counter according to the replaced parts.	To correct variations in paper feed accuracy to achieve higher print quality in band printing.	To confirm the chattering ends within the specified time after the PE Sensor detects the rear edge.	To measure and correct the electrical variation of the CR Motor and the Power Supply Board.	To measure and correct the electrical variation of the PF Motor and the Power Supply Board.	To measure and correct the electrical variation of the ASF Motor and the Power Supply Board.
Part Name	PE Sensor Holder Assy	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Replace	---	---	---	---	---	O	---	---	---	---	O	O	O	---	---	---	---	O	---	---	---
	PE Sensor	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Replace	---	---	---	---	---	---	---	---	---	---	O	O	O	---	---	---	---	O	---	---	---
	CR Motor	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Replace	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---
	PF Motor	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Replace	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---	O	---
	Front Frame Assy	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Replace	---	---	---	---	---	---	O	O	O	O	O	O	O	O	---	---	---	---	---	---	---
	Star Wheel Assy	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		Replace	---	---	---	---	---	O	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Paper Guide Front Assy	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Replace	---	---	---	---	---	O	---	---	O	O	---	---	---	O	---	---	---	---	---	---	O	
PF Holder / PF Timing Belt	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Replace	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O	---	
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.	■PW Adjustment Examine the misaligned lines printed on top, bottom, left, and right of the paper, and enter the number beside the line that is exactly 5 mm away from the paper edge for each side. ■1st dot adjustment Examine the lines on the left side of paper, and enter the number beside the line that overlaps with the horizontal line.	Examine the printout patterns for each of the four modes, and enter the value for the pattern with no gap and overlap for each mode.	■Band pattern Enter the values of the most straight lines. ■Microweave pattern Enter the value for the group of which the gaps between the two color bars are the smallest.	Examine the misaligned lines printed on top and bottom of the paper, and enter the number beside the line that is exactly 5 mm away from the paper edge for each side.			Examine the printout pattern and enter the number of the one with the least gap and overlap between the two different colored lines.	---	---	---	Examine the printout patterns and enter the value for the pattern with no overlap and gap between the two rectangles.	---	---	---	
Adjustment program			O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Tool			---	---	---	---	---	Ruler	---	---	Ruler	---	---	---	---	---	---	---	---	---	---	---	---

Note \*: When the data in EEPROM on the Main Board cannot be read out and the Main Board is replaced, the PW deterioration offset is reset. Therefore, replacing the Carriage Assy (PW Sensor) is required with a new one.

## 5.2 Details of Adjustments

This section provides adjustment procedures for which explanation in details is necessary. See "5.1 Required Adjustments (p83)" for the adjustments not explained here.

### 5.2.1 PF Timing Belt Tension Check

This section describes PF Timing Belt tension check.



- This printer is designed so that the tension of the PF Timing Belt falls within the expected range if you correctly reassemble the unit according to this manual. However, deformation of any related part(s) can cause improper tension of the belt. In such case, replace the Printer Mechanism (Frame Base Assy).
- The standard tension range of the PF Timing Belt is as follows:
  - Standard:  $5.0 \pm 1.0$  N

#### Tools

- ☐ Sonic tension gauge
- ☐ Plastic tweezers

#### Adjustment procedure



When performing the PF Timing Belt tension measurement, make sure of the following.

- Perform PF Timing Belt tension measurement before installing the Metal Plate Left.
- Bring the microphone of the sonic tension gauge within 5 mm from the PF Timing Belt but do not let it touch the belt.
- Flip the PF Timing Belt as weak as the sonic tension gauge can measure it.
- Be careful not to damage the PF Timing belt when flipping it with the plastic tweezers.

1. Set the following parameters to the sonic tension gauge:
  - Weight: 0.96 g/m
  - Width: 2.5 mm
  - Span: 51 mm
2. Bring the microphone of the sonic tension gauge close to the lower center of the PF Timing Belt as shown in Figure 5-1.
3. Press the "MEASURE" button of the sonic tension gauge and flip the PF Timing Belt with plastic tweezers and measure the tension of the belt.
4. Rotate the EJ Pulley a half turn in the direction of the arrow, and measure the tension of the belt. Repeat the same measurement five times (including the first one). After measuring it six times in total, check the average of the measured values falls within the standard range.

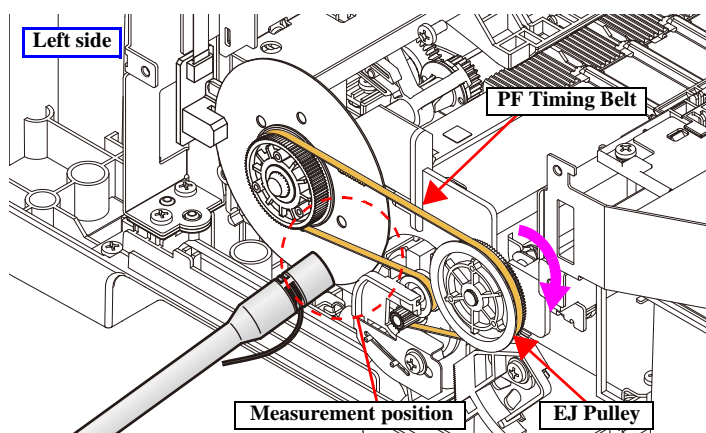


Figure 5-1. PF Timing Belt Tension Check



## 5.2.2 Rear ASF Timing Belt Tension Check

This section describes Rear ASF Timing Belt tension check.



- This printer is designed so that the tension of the Rear ASF Timing Belt falls within the expected range if you correctly reassemble the unit according to this manual. However, deformation of any related part(s) can cause improper tension of the belt. In such case, replace the Printer Mechanism (Frame Base Assy).
- The standard tension range of the Rear ASF Timing Belt is as follows:
  - Standard: 6.0 ~ 7.5N

### Tools

- ☐ Sonic tension gauge
- ☐ Plastic tweezers

### Adjustment procedure



When performing the Rear ASF Timing Belt tension measurement, make sure of the following.

- Perform Rear ASF Timing Belt tension measurement before installing the Rear ASF Assy.
- Bring the microphone of the sonic tension gauge within 5 mm from the Rear ASF Timing Belt but do not let it touch the belt.
- Flip the Rear ASF Timing Belt as weak as the sonic tension gauge can measure it.
- Be careful not to damage the Rear ASF Timing belt when flipping it with the plastic tweezers.

1. Set the following parameters to the sonic tension gauge:
  - Weight: 1.3 g/m
  - Width: 4 mm
  - Span: 73.4 mm
2. Bring the microphone of the sonic tension gauge close to the Rear ASF Timing Belt on the position shown in Figure 5-2.
3. Press the “MEASURE” button of the sonic tension gauge and flip the Rear ASF Timing Belt with plastic tweezers and measure the tension of the belt.
4. Rotate the PF Roller one turn in the direction of the arrow, and measure the tension of the belt. Repeat the same measurement four times (including the first one). After measuring it five times in total, check the average of the measured values falls within the standard range.

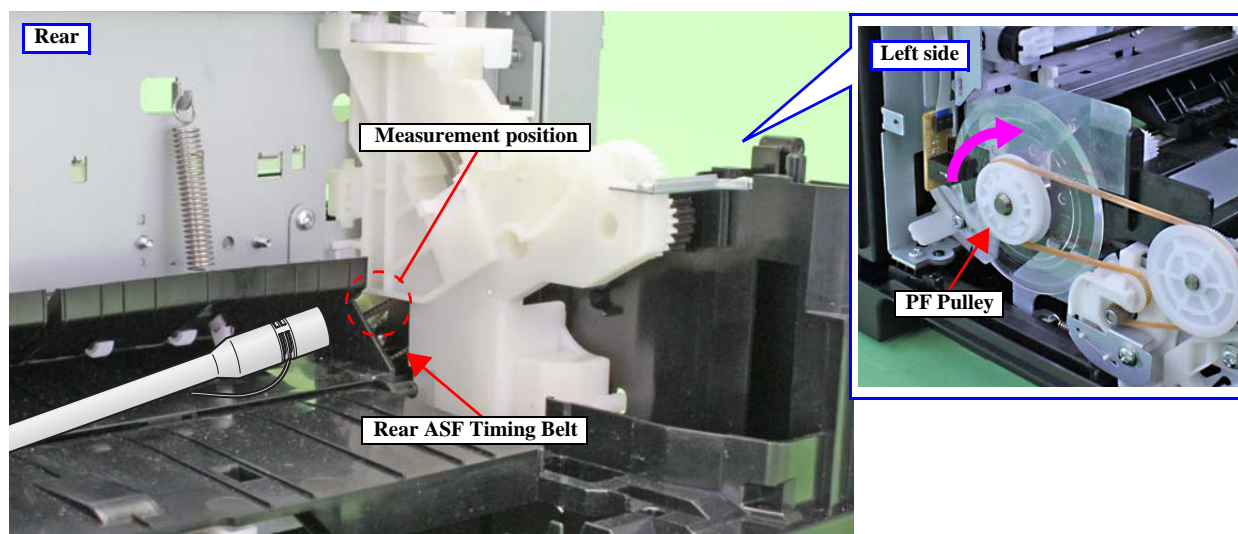


Figure 5-2. Rear ASF Timing Belt Tension Check

### 5.2.3 PG Adjustment

This section describes the procedure for the platen gap (PG) adjustment.



**When performing the PG adjustment, make sure of the following.**

- Move the Carriage Assy by pulling the Timing Belt.
- Be careful not to damage the nozzle surface of the Printhead with the thickness gauge.
- Be careful not to damage the PF Scale when removing/installing the PG Cam Left.



- The PG position of this printer can be set to four points, from PG 1 to PG 4. Perform the PG adjustment with the PG position set to PG 1.

Position	PG (mm)	Application
PG 1	1.60	Printing plain paper/EPSON special paper, PG adjustment, Bi-d adjustment
PG 2	1.85	Select when PG 1 is too narrow, printing envelopes/matte paper
PG 3	2.50	Select when PG 2 is too narrow
PG 4	3.00	Printing envelopes

- The standard range of the PG and the adjustment pitch are as follows.
  - Standard:  $1.6 \pm 0.1$  mm (PG position: PG 1)
  - Adjustment pitch: 0.05 mm (distance between notches on the PG Cam)
- When performing the PG adjustment, install the Printhead to the Carriage Assy, and remove the following parts beforehand.
  - Exterior parts
  - Main Board Unit
  - Ink Supply Unit
  - Metal Plate Left
  - CR Cover
- When replacing the Ink System Supply Assy (Ink Supply Unit with Printhead), perform the PG adjustment with the Ink Supply Unit connected to the Printhead.

#### Tools

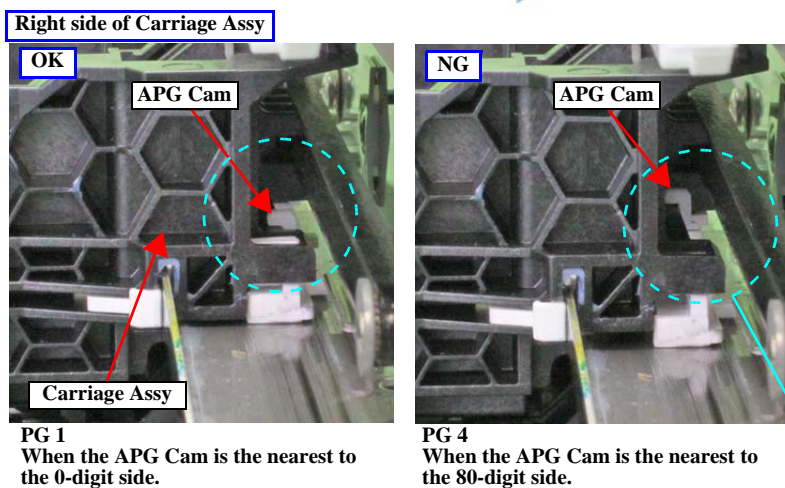
- Thickness gauge: 1.5 mm (x2), 1.7 mm (x2)



## Check before the adjustment

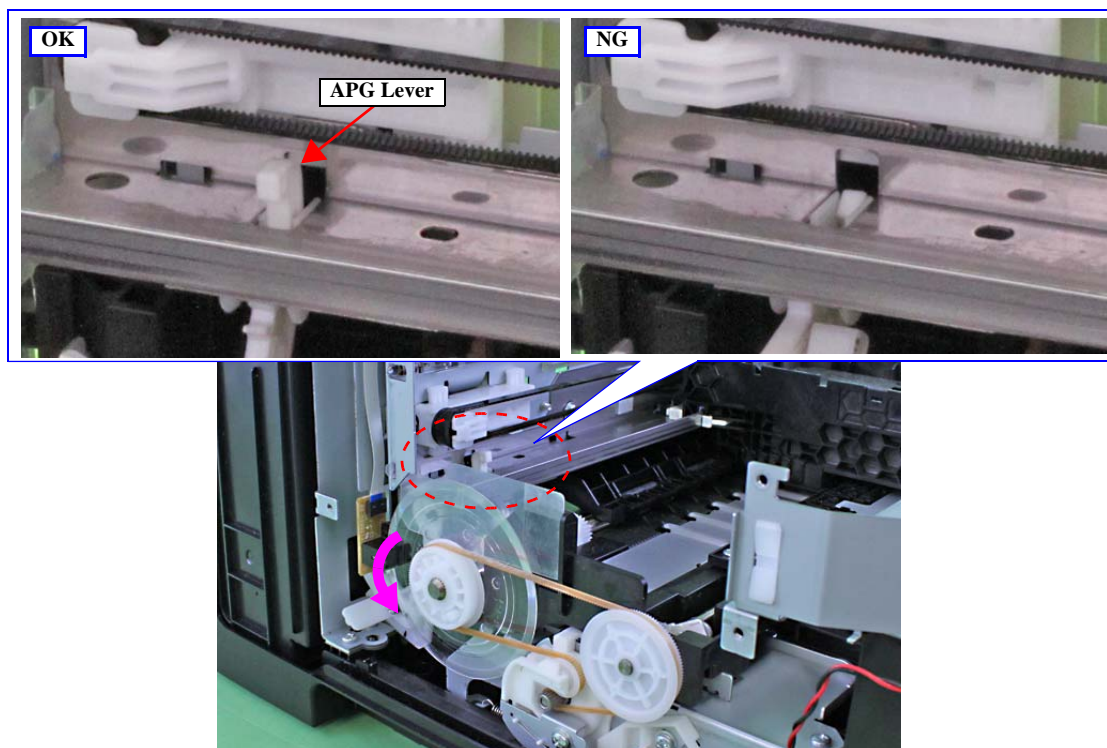
Perform the following to check if the PG position is surely set to PG 1.

1. Move the Carriage Assy to the center of the printer.
2. From the 0-digit side between the Main Frame and Carriage Assy, check the APG Cam is as shown in "PG 1" in Figure 5-3.
  - When PG position is set to PG 1: Go to "Adjustment procedure (p92)".
  - If PG position is not set to PG 1: Go to Step 3. (p 91).



**Figure 5-3. PG Position**

3. Move the Carriage Assy to the 0-digit side.
4. Rotate the PF Roller counterclockwise to move the APG Lever out of the hole of the Main Frame.



**Figure 5-4. APG Lever**

5. Move the Carriage Assy to the 80-digit side until it touches the APG Lever.
6. Return the Carriage Assy to the center of the printer.
7. Confirm the PG position is set to "PG 1" (see Step 2. (p 91)), and go to "Adjustment procedure (p92)".

## Adjustment procedure

1. Remove the screws (one each) that secure the PG Cam Left and PG Cam Right on both sides of the printer, and remove the PG Cam Left and PG Cam Right.

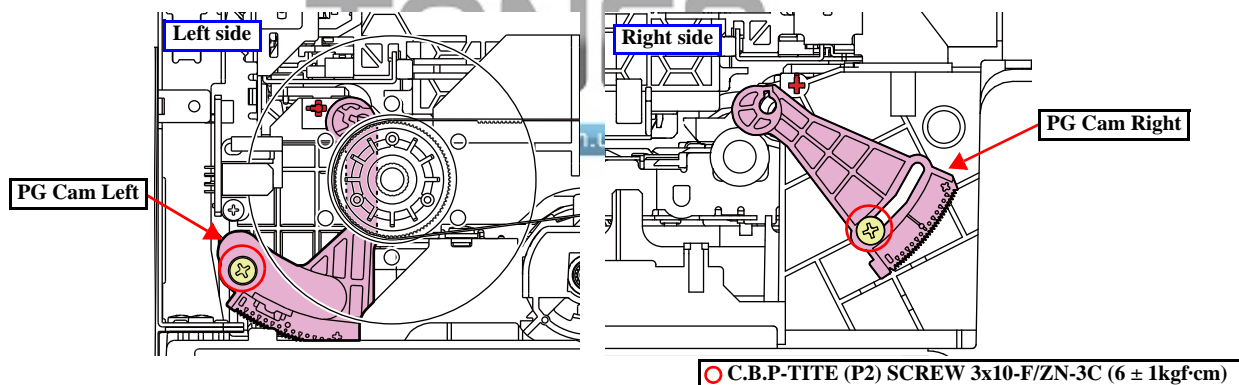


Figure 5-5. PG Cam Left/PG Cam Right

2. Loosen the screws (x3) that secure the CR Guide Frame.

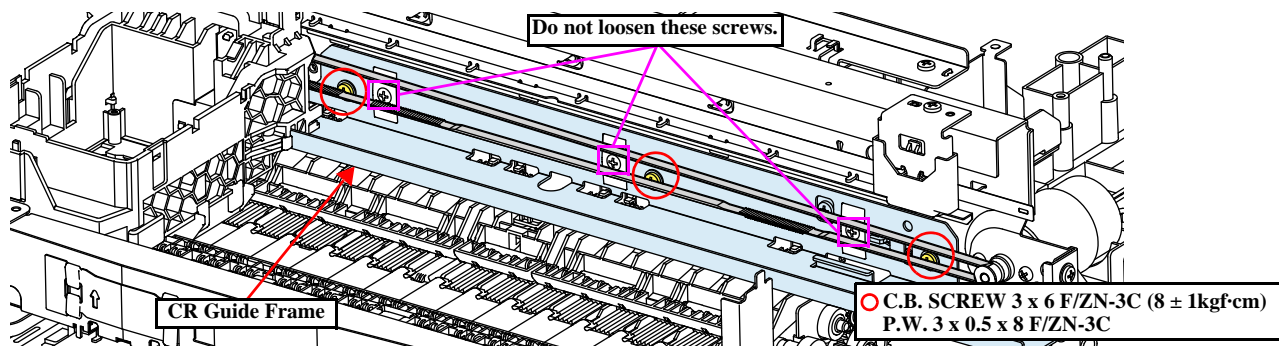


Figure 5-6. CR Guide Frame

3. Set the PG Cam Left to the dowel of the Paper Guide Front Assy, and set the PG Cam Right to the dowel of the Frame Base.
4. Align the “+” marked notches of the PG Cams with the ribs of the Frame Base so as to make the PG the widest.

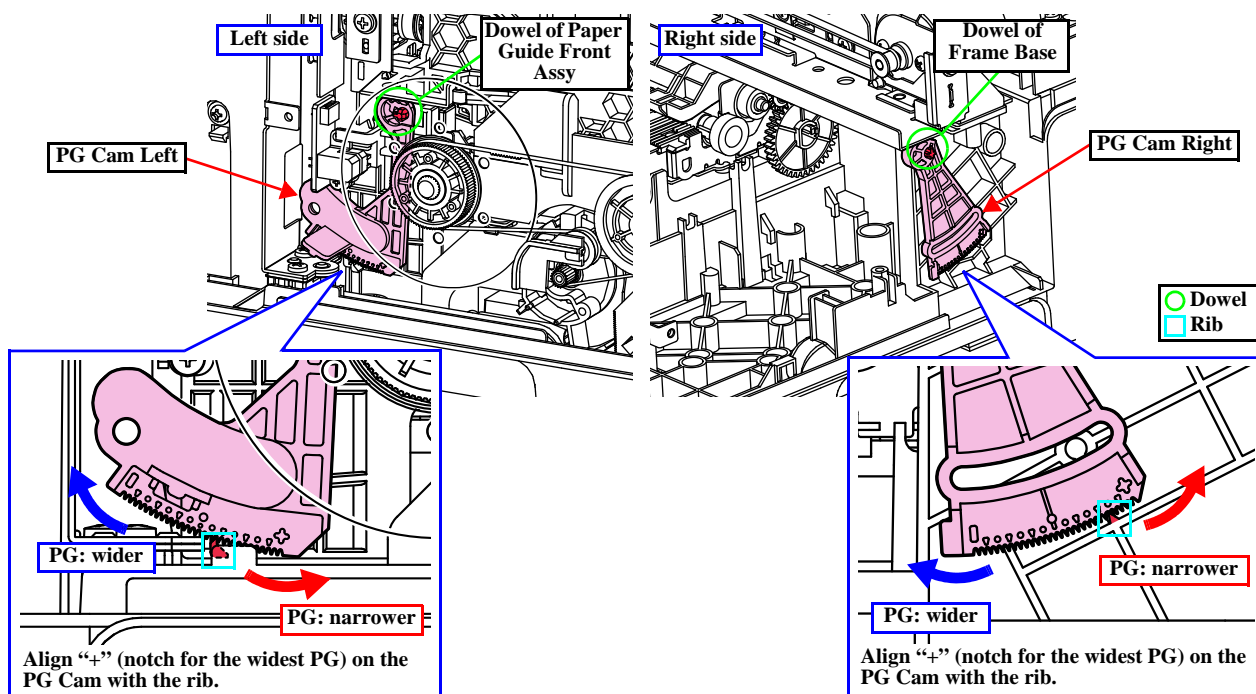


Figure 5-7. Installing the PG Cam Left/PG Cam Right

5. Press the two points down vertically on the Carriage Assy shown in [Figure 5-3](#) simultaneously, and make sure of the following.
- The Carriage Assy is installed correctly without any gap between the Carriage Assy and CR Guide Frame.
  - The PG Cam Right/PG Cam Left touch the CR Guide Frame.

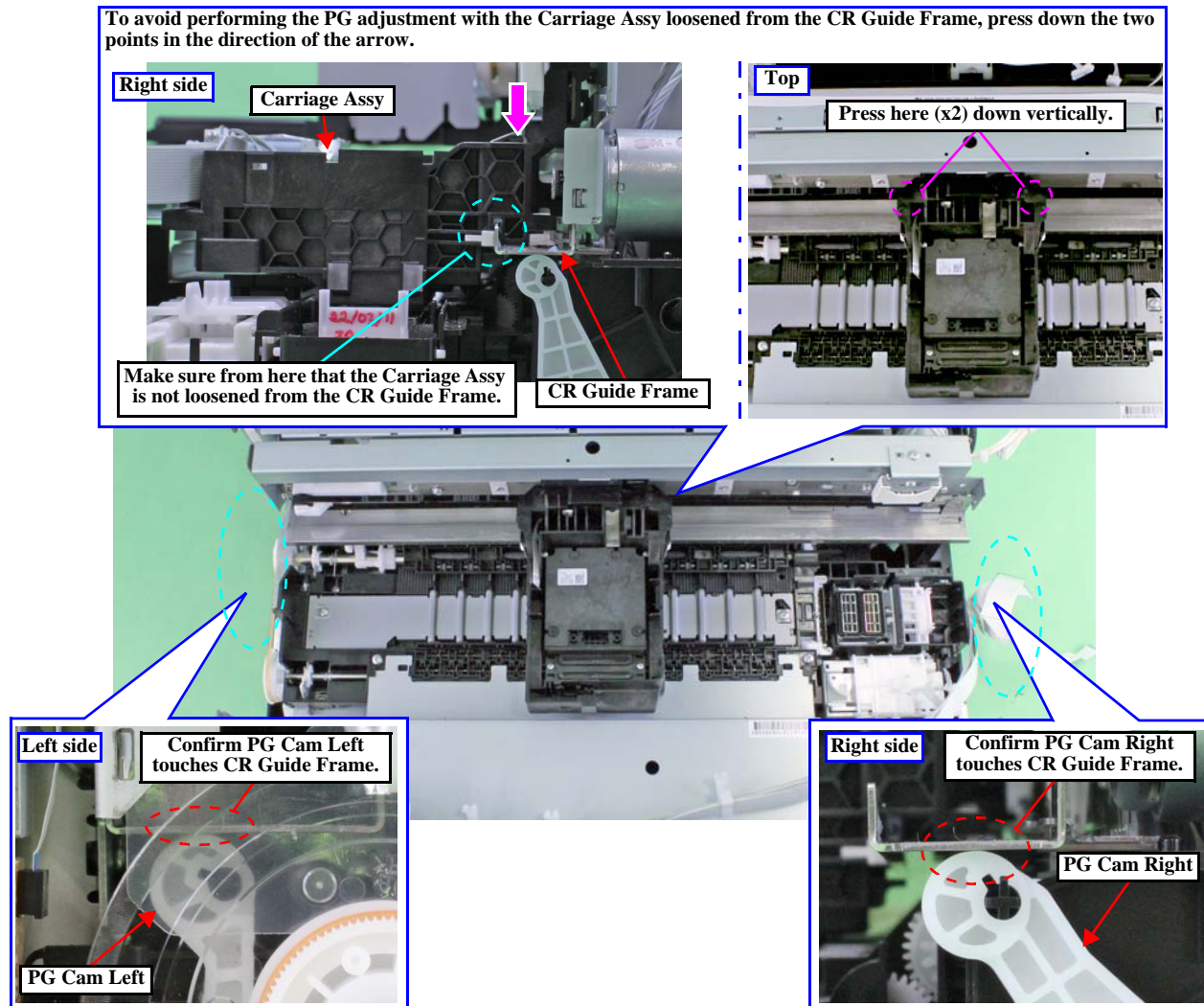
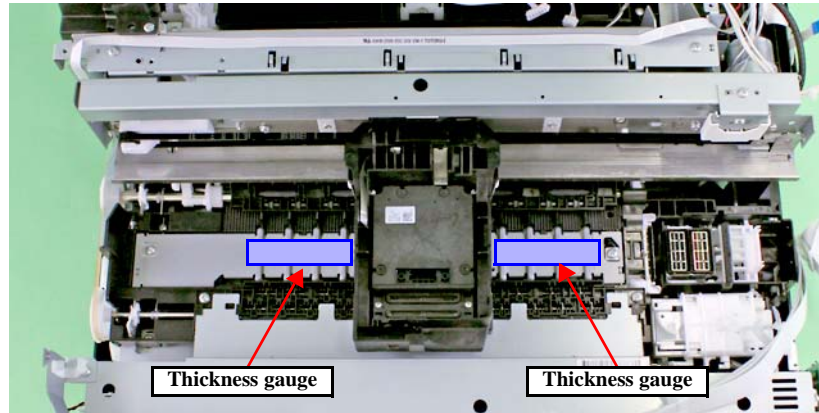


Figure 5-8. The PG Cam Right/PG Cam Left and CR Guide Frame



6. Place the thickness gauges (1.7 mm) on the positions shown in [Figure 5-9](#).

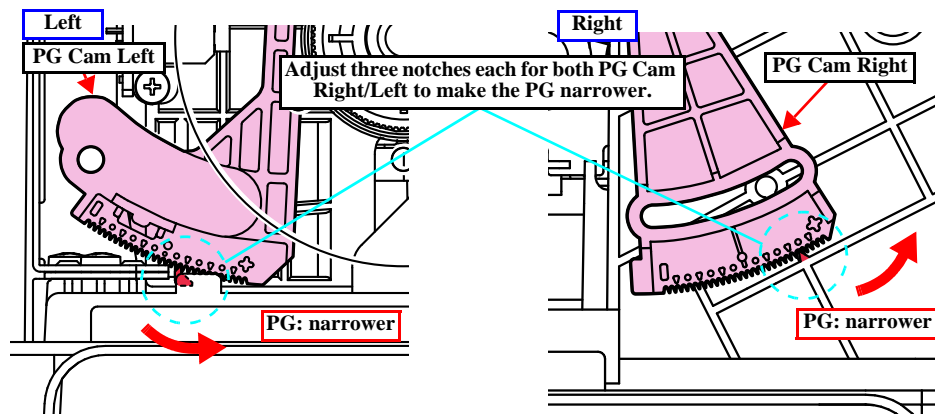


**Figure 5-9. Position of the Thickness Gauge**



**When adjusting the PG Cam Right/PG Cam Left in the following steps, make sure to adjust the same amount for both right and left.**

7. With the Carriage Assy in the center of the printer, adjust three notches each for both PG Cam Right and PG Cam Left to make the PG narrower.
8. Pull the Timing Belt to move the Carriage Assy to 0-digit side and 80-digit side and check if the Carriage Assy touches the thickness gauges. If the Carriage Assy does not come in contact with the thickness gauges, adjust the PG Cam Right and PG Cam Left to make the PG narrower until the Carriage Assy touches the thickness gauges.



**Figure 5-10. PG Adjustment**



In the following steps, make sure the PG Cam Right/PG Cam Left always touch the CR Guide Frame. (See [Figure 5-8 \(p 93\)](#).)

9. Follow the flowchart below to perform the PG adjustment.

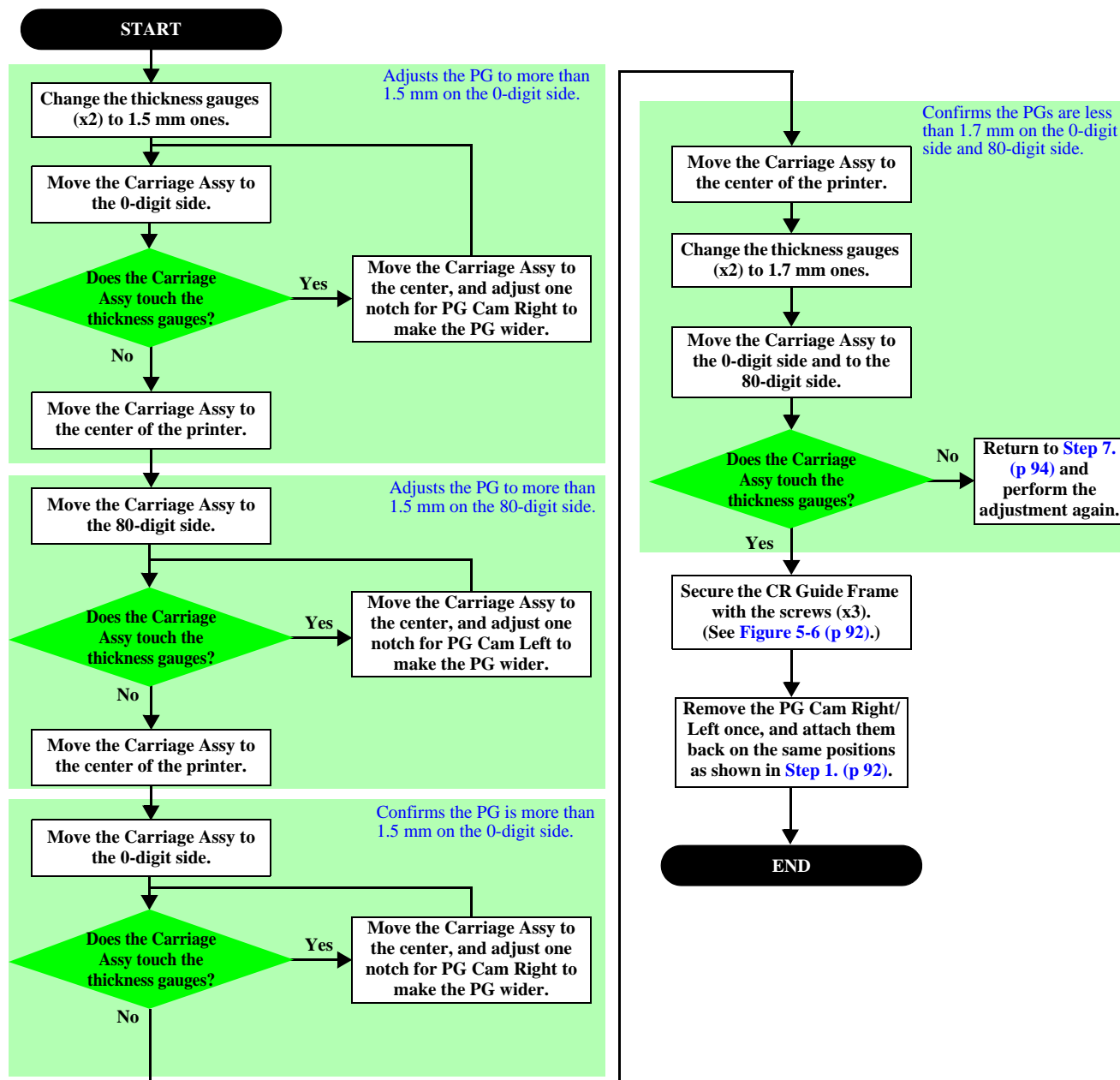


Figure 5-11. PG Adjustment Flow

## 5.2.4 Checking the Platen Gap

This section describes the procedure for checking the platen gap (PG) necessary when removing the Printhead or in a similar case.



**When checking the PG, make sure of the following.**

- **Move the Carriage Assy by pulling the Timing Belt.**
- **Be careful not to damage the nozzle surface of the Printhead with the thickness gauge.**

---

### Tools

---

- ☐ Thickness gauge: 1.5 mm (x2), 1.7 mm (x2)

---

### Checking procedure

---

1. Check the PG position is set to PG 1. (See ["Check before the adjustment \(p91\)"](#).)
2. Move the Carriage Assy to the center of the printer.
3. Place the thickness gauges (1.5 mm) on the positions shown in [Figure 5-9 \(p 94\)](#).
4. Pull the Timing Belt to move the Carriage Assy to both ends and confirm the Carriage Assy does not touch the thickness gauges. If the Carriage Assy comes in contact with the thickness gauges, the PG is narrower than the standard value, therefore, perform ["5.2.3 PG Adjustment \(p90\)"](#).
5. Move the Carriage Assy to the center, and replace the thickness gauges (1.5 mm) with the thickness gauges (1.7 mm) on the same positions as [Step 3](#).
6. Pull the Timing Belt to move the Carriage Assy to both ends and confirm the Carriage Assy touches the thickness gauges. If the Carriage Assy does not come in contact with the thickness gauges, the PG is wider than the standard value, therefore, perform ["5.2.3 PG Adjustment \(p90\)"](#).

## 5.2.5 MAC Address Setting



- This setting is not necessary when the data in EEPROM on the Main Board can be read out.
- To avoid a conflict of MAC address on a network, make sure to correctly follow the MAC address setting flowchart given on the following.
- The user should be notified of the change of MAC address because of the following reasons.
  - If the user has set the printer's MAC address on a router, the repaired printer with a new MAC address cannot be connected to the network.
  - The default printer name on a network consists of "EPSON" and the last six digits of the MAC address. Therefore, the printer name becomes different from the previous one.
- You are required to enter the last six digits of the MAC address (xx:yy:zz) on the Adjustment Program.

MAC address example: 00:00:48:xx:yy:zz

("xx, yy, zz" represents a value unique to each printer)

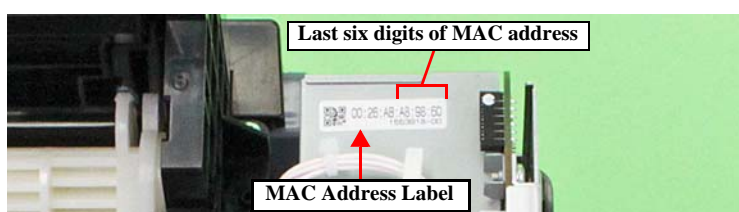


Figure 5-12. MAC Address Label

### Setting procedure

1. After replacing the Main Board, note down the MAC address written on a label on the Main Board Shield Plate Upper Assy.
2. Reassemble the printer, and connect the printer and the PC with the USB cable.
3. Start the Adjustment Program.
4. Select the "Initial Setting" from the menu. The initial setting screen appears.
5. Enter the last six digits of MAC address into the MAC address entry field, and click the MAC Address input button. (Enter the address again into the second entry field to confirm it.)
6. Select the network status sheet from the printer's control panel, and print the sheet. Check the MAC address printed on the sheet to see if it is correct.

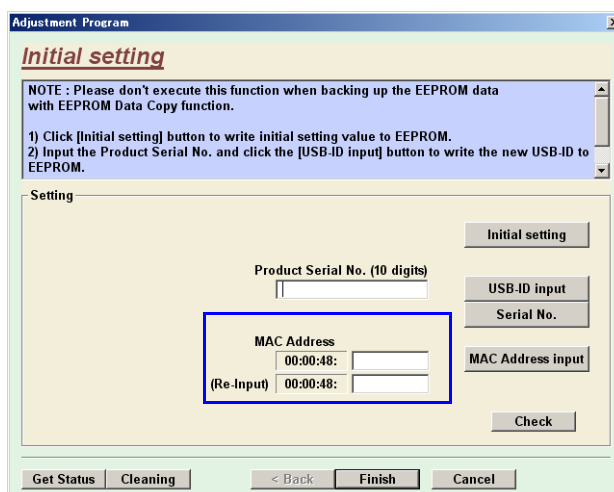


Figure 5-13. MAC Address Setting Screen

## 5.2.6 Touch Panel Adjustment (WP-4540 series only)

This section describes Touch Panel adjustment.

☐ Purpose

This adjustment is made to adjust the relative positions between the Touch Panel detection points and displaying positions on the Control Panel.

☐ Tools

Touch pen (without a sharp end such as a plastic stick)

☐ Adjustment procedure

1. Press and keep pressing the Copy, ✕, and Stop buttons, then press the Power button to start WP-4540 series in the inspection mode.

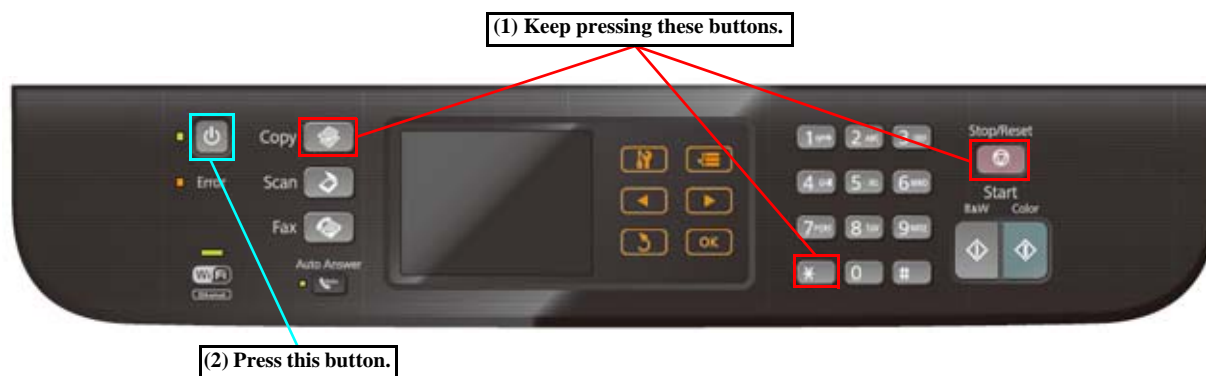


Figure 5-14. Touch Panel Adjustment (1)



While in the inspection mode, you can operate selection of each menu, etc. by pressing the following buttons.



Figure 5-15. Panel Operation in Special Inspection Mode

2. Select “Touch Screen Inspection” and press the Color button.

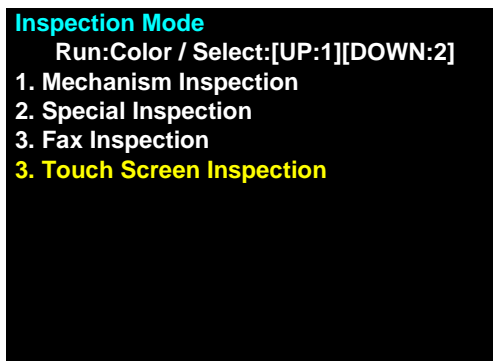


Figure 5-16. Touch Panel Adjustment (2)



3. Select “Touch Screen Calibration” and press the Color button.

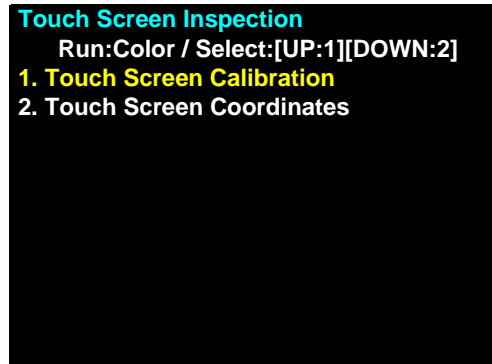


Figure 5-17. Touch Panel Adjustment (3)

4. Press LCD to display the adjustment screen. When aborting the adjustment, press the Stop button.

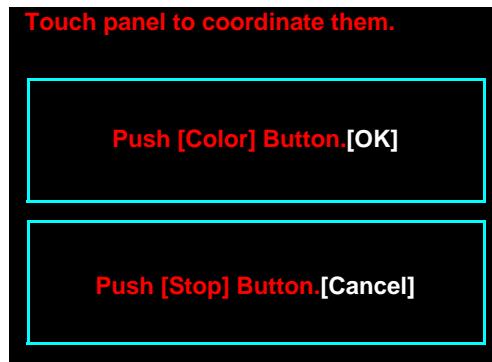


Figure 5-18. Touch Panel Adjustment (4)

5. Press “+” displayed on the four corners in order using the touch pen.

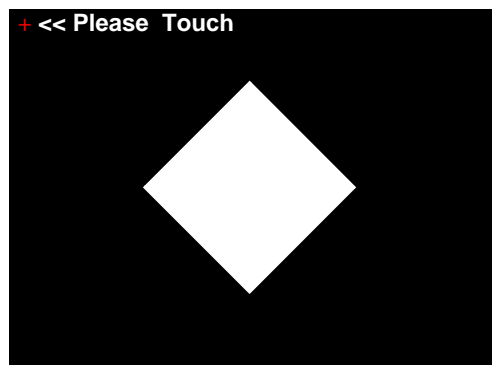


Figure 5-19. Touch Panel Adjustment (5)

6. If you retry the adjustment, press the Stop button and start from [Step 5](#) once again. When saving the result of adjustment, press the Color button.

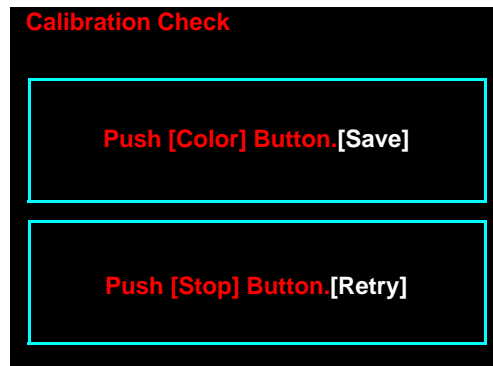


Figure 5-20. Touch Panel Adjustment (6)

7. When the confirmation pattern appears, press “+” displayed in the middle of the panel.

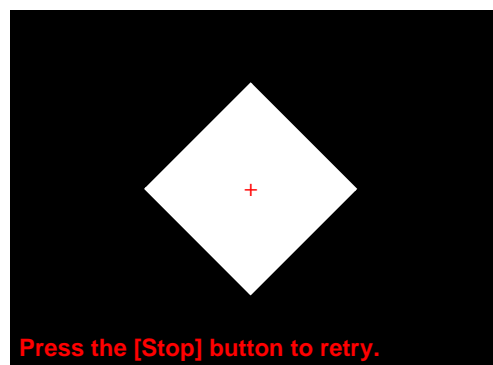


Figure 5-21. Touch Panel Adjustment (7)

8. When “Complete!” appears on LCD, press the Color button to return to the menu, and press the “Color” button to complete the adjustment.  
If “Retry Check” is displayed, press Color button and start from [Step 5](#) once again.

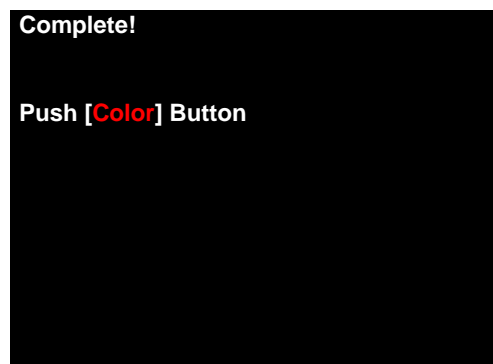


Figure 5-22. Touch Panel Adjustment (8)

## 5.2.7 Ink Leak Check

This section describes the procedure for ink leak check necessary when disconnecting the Ink Supply Unit from the Printhead or in a similar case.

### Tools

- Ink Leak Measurement Jig (with digital pressure gauge GC66) (Parts code: 1430064)  
Battery type: CR2016 (3 V) x1

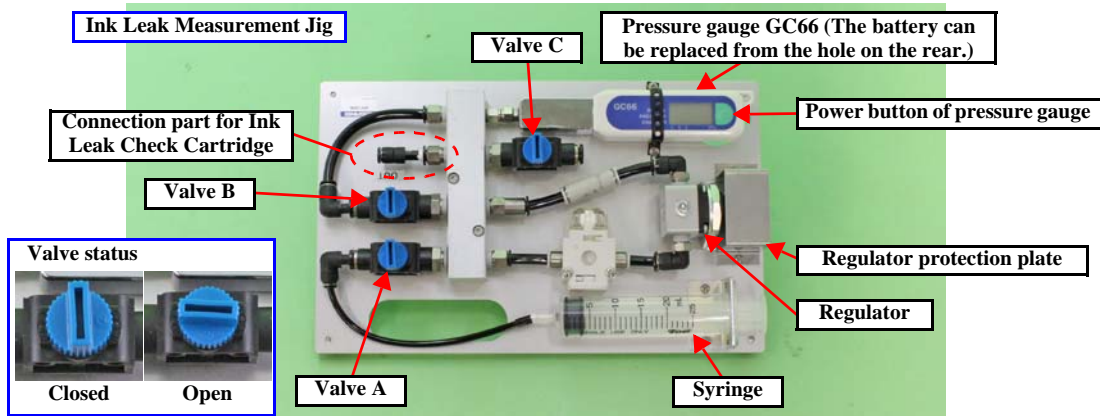


Figure 5-23. Ink Leak Measurement Jig

- Ink Leak Check Cartridge (Parts code: 1565785)

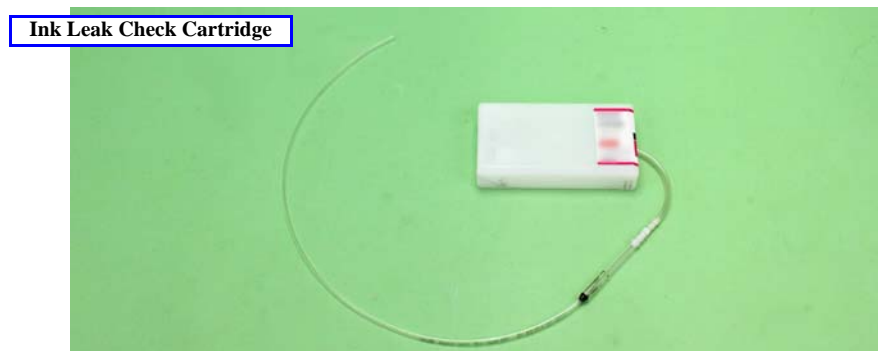


Figure 5-24. Ink Leak Check Cartridge



Do not touch or press the regulator located under the regulator protection plate of the Ink Leak Measurement Jig.



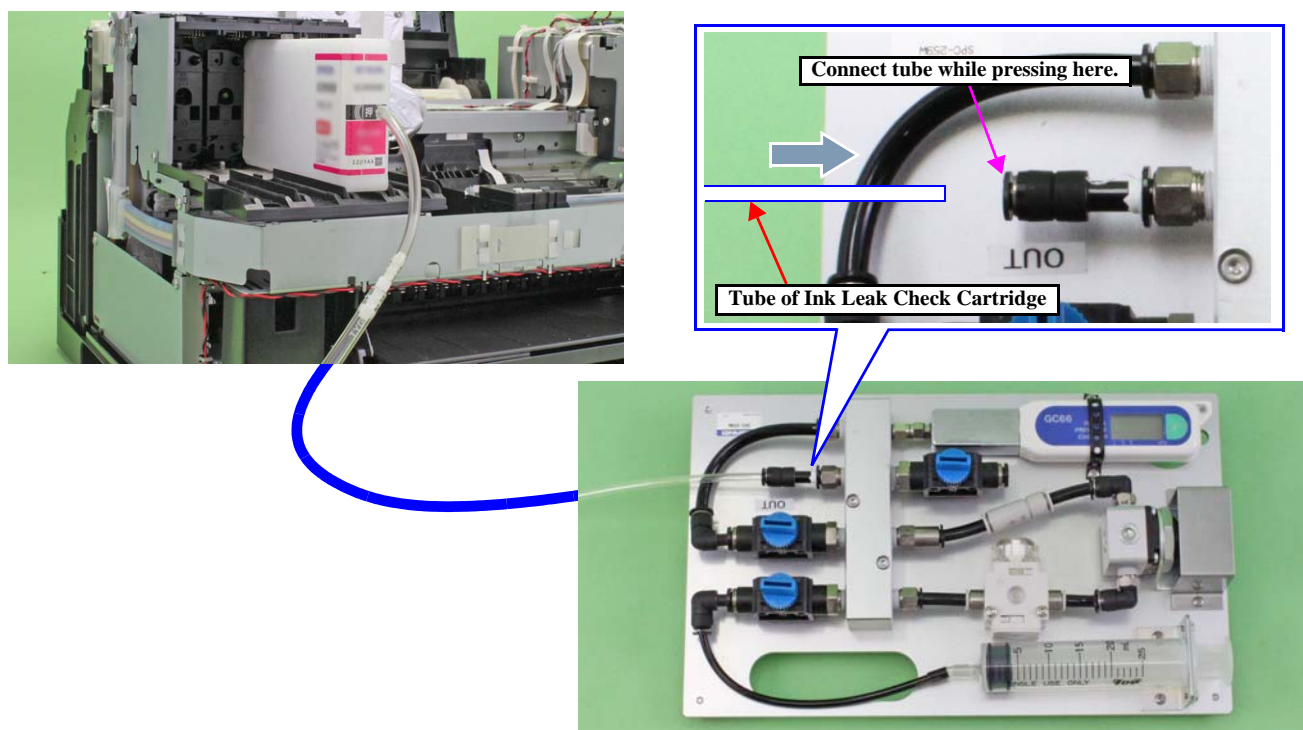
- The Ink Leak Measurement Jig applies pressure by sending air using a syringe into the ink path, and detects the variation of pressure in the ink path between the self-sealing valve in the Printhead and the ink supply holes of the ink cartridges to check the presence of ink leakage. If air leak occurs in the Ink Leak Measurement Jig, the leak check itself cannot be done. Therefore, before performing the leak check, perform **"Checking procedure (p102)"** without inserting the Ink Leak Check Cartridge to the printer to test air leak from the Ink Leak Measurement Jig itself. (If the Ink Leak Check Cartridge is not loaded to the printer, the valve in the cartridge is shut. Therefore, the air leak check from the Ink Leak Measurement Jig itself becomes possible.)
- The ink leak check should be done with the ink tubes secured with the tube clamps and the CR Cover attached after the joint section of the Printhead and the Ink Supply Unit has been secured. (See **"Ink Supply Unit (p72)"**.)

## Ink Leakage inspection Condition

- Air pressure power :  $48 \pm 2$  Kpa
- Air pressure time : 10 sec
- Air pressure hold time : 30 sec
- Air pressure judgement standard : Less than 0.4 Kpa

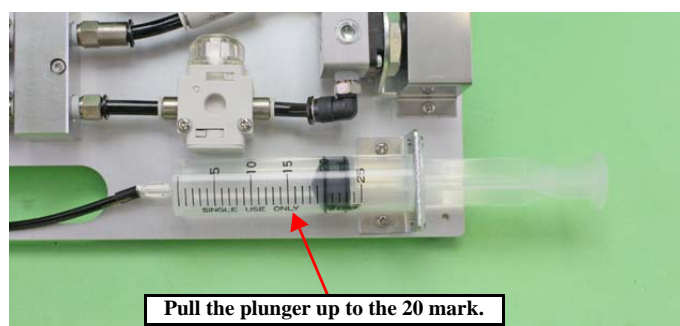
## Checking procedure

1. Turn each valve of the Ink Leak Measurement Jig as follows:
  - Valve A: Open
  - Valve B: Open
  - Valve C: Open
2. Connect the Ink Leak Check Cartridge to the Ink Leak Measurement Jig.



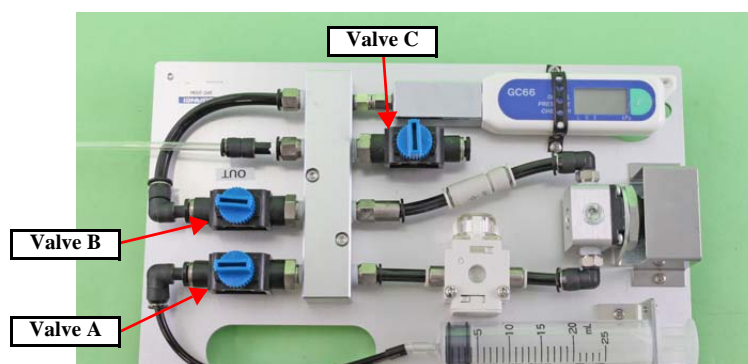
**Figure 5-25. Ink Leak Check (1)**

3. Install the Ink Leak Check Cartridge into the ink cartridge slot of the printer to check.
4. Press the power button of the pressure gauge.
5. Confirm the value on the pressure gauge is 0.0 kPa. Otherwise, restart the pressure gauge.
6. Pull the plunger up to the 20 mark.



**Figure 5-26. Ink Leak Check (2)**

7. Close the valve C of the Ink Leak Measurement Jig.
8. Push the plunger to inject the air out, and confirm the pressure gauge indicates  $48 \pm 2$  kPa, then after the value has stabilized, shut the valve A. If the value is less than  $48 \pm 2$  kPa, open the valve A and pull out and push in the plunger several times until the value reaches  $48 \pm 2$  kPa, then after the value has stabilized, shut the valve A.



**Figure 5-27. Ink Leak Check (2)**

9. Close the valve B, and after waiting 10 seconds for the pressure to stabilize, record the value displayed on the pressure gauge.
10. After about 30 seconds have passed, check the value on the pressure gauge, and compare it with the recorded value.
  - Difference is less than 0.4 kPa: No problem. Go to [Step 11](#).
  - Difference is 0.4 kPa or more: Air may be leaking. Disconnect the ink tubes of the Ink Supply Unit from the Printhead, and connect them again correctly. (See "[Ink Supply Unit \(p72\)](#)".) Then, start the check again from [Step 3](#).
11. Open the valve C to release the air pressure in the jig.
12. After confirming the value on the pressure gauge is 0.0 kPa, remove the Ink Leak Check Cartridge from the printer.
13. Repeat from [Step 3](#). to [Step 12](#). for the rest of the ink cartridge slots to check.
14. After checking all the ink cartridge slots, press and hold the power button of the pressure gauge for about four to five seconds to turn off.



## CHAPTER 6

# MAINTENANCE

## 6.1 Overview



In this manual, the product name is abbreviated to such as “WP-4510 series”, however, the last digit of the actual name may differ. Identify your product with the first three digits and refer to the appropriate sections in this manual.

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

### 6.1.1 Cleaning

Except for the printhead, there are no other mechanical parts or units that require periodic cleaning. However, if need arises, clean the component observing the following instructions.

#### ☐ Instructions for cleaning

##### ■ Exterior parts such as housing

Wipe dirt off with a soft clean cloth moistened with water. For glossy or transparent parts, use of unwoven cloth is recommended to avoid scratching those parts.

##### ■ Inside of the printer

Remove paper dust with a vacuum cleaner.

##### ■ Rubber or plastic rollers such as an LD roller/Pickup Roller used to feed paper

If paper dust adhered to the rollers decreases the frictional force of the rollers and the rollers cannot properly feed paper, wipe off the paper dust with a soft cloth moistened with diluted alcohol.

#### ☐ Instructions for cleaning ink stains

Wipe the stains off with a cloth wrung out of diluted alcohol.



- Do not use alcohol for cleaning the transparent parts. Doing so may cause them to get cloudy.
- When wiping paper dust off the LD roller/Pickup Roller, be careful not to rub against the surface asperity.
- To minimize the effect on the parts, use diluted alcohol such as 70% diluted ether.
- After using alcohol for cleaning, make sure to wipe the part off with a soft dry dust-free cloth to remove alcohol traces fully.

### 6.1.2 Lubrication

The type and amount of the grease used to lubricate the printer parts are determined based on the results of the internal evaluations. Therefore, refer to "[6.2 Lubrication Points and Instructions \(p106\)](#)" for the repairing procedures below, and apply the specified type and amount of the grease to the specified part of the printer mechanism.

#### ☐ Grease

Type	Name	EPSON Part Code	Supplier
Grease	G-71	1304682	EPSON
Grease	G-74	1409257	EPSON

#### ☐ Tools

Name	Availability	EPSON Part Code
Injector	O *	---
Brush	O *	---

Note \*: Use tools whose specifications are specified in "[6.2 Lubrication Points and Instructions \(p106\)](#)".



The new Printer Mechanism (Frame Base Assy) supplied as an ASP is not lubricated on the two points described in "[6-3 Lubrication of the Main Frame \(p106\)](#)" and "[6-4 Lubrication of the CR Guide Frame \(p106\)](#)" of "[6.2 Lubrication Points and Instructions \(p106\)](#)". Therefore, make sure to lubricate the Printer Mechanism (Frame Base Assy) on the specified points when replacing it.



6.2 Lubrication Points and Instructions

<Lubrication Point> Edges on the rear of the Cassette Assy 1st / 2nd
<Type> G-74
<Application Amount> Appropriate amount
<Remarks> Apply with brush.

Figure 6-1. Lubrication of the Cassette Assy 1st / 2nd

<Lubrication Point> Shaft hole of the Driven Pulley
<Type> G-71
<Application Amount> φ 1 mm x 1 mm
<Remarks> Apply with injector.

Figure 6-2. Lubrication of the Driven Pulley Assy

<Lubrication Point> Contact point on the Main Frame with the Carriage Assy
<Type> G-71
<Application Amount> 0.3 g
<Remarks> Using brush, apply grease on the Main Frame 7.5 mm from the edge as shown in the figure.

Figure 6-3. Lubrication of the Main Frame

<Lubrication Point> Contact points (x3) on the CR Guide Frame with the Carriage Assy
<Type> G-71
<Application Amount> 1. φ 2 mm x 420.7 mm 2. φ 2 mm x 420.7 mm 3. φ 2 mm x 420.7 mm
<Remarks> <input type="checkbox"/> Apply as follows using injector. 1. Move the Carriage Assy to the 0-digit side, and apply grease on the CR Guide Frame from the center to the 80-digit side. 2. Move the Carriage Assy to the 80-digit side, and apply grease on the CR Guide Frame from the center to the 0-digit side.

Figure 6-4. Lubrication of the CR Guide Frame

<Lubrication Point> 1. Contact points (x2) on the EJ Roller with the Paper Guide Front Assy 2. Contact points (x3) on the Paper Guide Front Assy with the EJ Roller 3. Contact point between the bushings of the Paper Guide Front Assy and EJ Roller 4. Contact point on the EJ Roller with the grounding spring
<Type> 1, 2. G-74 3, 4. G-71
<Application Amount> 1, 2. Appropriate amount 3. φ 2 mm x appropriate amount 4. φ 1 mm x appropriate amount
<Remarks> <input type="checkbox"/> 1, 2. Apply with brush. <input type="checkbox"/> 3. Using injector, apply grease all over the upper side of the bearing. <input type="checkbox"/> 4. Using injector, apply grease on the whole circumference evenly while rotating the EJ Roller. <input type="checkbox"/> Stir G-74 before use.

Figure 6-5. Lubrication of the EJ Roller



Left

Application point 5

Contact surface of Carriage Assy with CR Guide Frame

Application point 6

CR Front Slider Left

Carriage Assy

Application point 4

CR Sub Slider

Application point 5

Contact surface of Carriage Assy with CR Guide Frame

CR Front Slider Right

Application point 6

CR Front Slider Right

Bottom

Application point 3

APG Slider

CR Rear Slider

Application point 2

Apply on steps

APG Cam

Application point 7

CR Rear Slider

Application point 1

Apply on projections

<Lubrication Point>

1. Contact surfaces (x2) of the Carriage Assy with the APG Cam

2. Contact points (x2) on the APG Cam with the APG slider

3. Contact points (x4) on the APG Slider with the CR Guide Frame

4. Contact point on the CR Sub Slider with the Main Frame

5. Contact surfaces (x2) of the Carriage Assy with the CR Guide Frame

6. Contact points (x2) on the CR Front Slider Left/Right with the CR Guide Frame

7. Contact points (x2) on the CR Rear Slider with the CR Guide Frame

<Type>

G-71

<Application Amount>

1. 0.02 g

2. 0.02 g

3. 0.05 g

4. 0.02 g

5.  $\phi$  1 mm x 0.05 g

6. 0.05 g

7. 0.05 g

<Remarks>

☐ Apply with injector.

☐ For 1, 2, 3, 4, 6 and 7, spread grease with brush as shown in the figure after application with injector.

Figure 6-6. Lubrication of the Carriage Assy

Maintenance

Lubrication Points and Instructions

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