SERVICE MANUAL

Color Inkjet Printer

EPSON Stylus Photo R800

EPSON

SEIJ03012

PRECAUTIONS

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

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

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

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

DANGER

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

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGES IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.
3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.
4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.
5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NON-APPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of the printer. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Manual Configuration

This manual consists of six chapters and Appendix.

CHAPTER 1. PRODUCT DESCRIPTIONS
Provides a general overview and specifications of the product.

CHAPTER 2. OPERATING PRINCIPLES
Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3. TROUBLESHOOTING
Describes the step-by-step procedures for the troubleshooting.

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

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

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

APPENDIX Provides the following additional information for reference:

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

Symbols Used in this Manual

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

Indicates an operating or maintenance procedure, practice or condition that is necessary to keep the product's quality.

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

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

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

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

Revision Status

Revision	Date of Issue	Description
A	December 16, 2003	First Release
B	May 27, 2004	Correction of the misspellings

CONTENTS

Chapter 1 PRODUCT DESCRIPTION

1.1 Overview 9
1.2 PG Setting 10
1.3 Functions 11
1.3.1 Control Panel 11
1.3.2 Switches 11
1.3.3 Indicators 11
1.3.4 Switch Functions 11
1.3.5 Indicator Display in Normal Mode 12
1.3.6 Error Status 13
1.4 Casing Specifications 14
1.5 Accessories 14

Chapter 2 OPERATING PRINCIPLES

2.1 Overview 16
2.2 Printer Mechanism 16
2.2.1 Carriage Mechanism 17
2.2.2 Printhead Specifications 20
2.2.3 Paper Feeding Mechanism 20
2.2.4 Paper Loading Mechanism 24
2.2.5 Ink System Mechanism 26
2.2.6 Ink Sequence 28
2.2.7 Paper Cutter Mechanism 30
2.2.8 Power-On Sequence 32
2.3 Electrical Circuitry Operating Principles 33
2.3.1 Power Supply Circuit Operating Principle 33
2.3.2 C550 MAIN Circuit Operating Principle 34

Chapter 3 TROUBLESHOOTING

3.1 Overview 38
3.1.1 Troubleshooting according to panel messages 38
3.1.2 Superficial Phenomenon-Based Troubleshooting 62

Chapter 4 DISASSEMBLY & ASSEMBLY

4.1 Overview 73
4.1.1 Precautions 73
4.1.2 Tools to Be Used 74
4.1.3 Screw List 75
4.1.4 Pre-Shipment Checks 76
4.2 Disassembly 77
4.2.1 Removing the Housings 78
4.2.2 Stacker Assy. 82
4.2.3 Waste Ink Pads 84
4.2.4 ASF Assy. 86
4.2.5 Removing the Boards 90
4.2.6 Disassembling the Printer Mechanism 96
4.2.7 Removing the Motors 130
4.2.8 Removing the Sensors 133

Chapter 5 ADJUSTMENT

5.1 Adjustment Items and Overview 140
5.1.1 Servicing Adjustment Item List 140
5.1.2 Replacement Part-Based Adjustment Priorities 143
5.1.3 Required Adjustment Jigs, Tools and Like 145
5.2 Adjustments 145
5.2.1 PF Belt Tension Adjustment 145
5.2.2 PG Adjustment 147

Chapter 6 MAINTENANCE

6.1 Overview 153
6.1.1 ROM Replacement 153
6.1.2 Cleaning 153
6.1.3 Service Maintenance 154
6.1.4 Lubrication 155

Chapter 7 APPENDIX

7.1 Connector Summary 162
7.1.1 Connectors and Pin Layouts 162
7.2 Exploded Diagram 163
7.3 Parts List for EPSON Stylus Photo R800 170
7.4 Component Layout 172
7.5 Circuit Diagram 174

CHAPTER

1

PRODUCT DESCRIPTION

1.1 Overview

The Stylus Photo R800 is a photo printer designed for a wide range of users from individual users to commercial users. As a successor to the Stylus Photo 950/960, this consumer middle high model is capable of CD-R/DVD-R printing and roll paper cutter functions.
This product has the following features.

FEATURES

- High Color Print Quality
  - High photo quality thanks to Photo Mach technology
  - Achievement of higher quality using microweaves and super microweaves
  - High resolution printing of 5760 x 1440dpi, world's minimum dot 1.5pl MSDT
- High-speed printing
- Two Different Interfaces Supported
  - USB 2.0 (HS compatibility)
  - IEEE-1394
- Compact, space saving
- Windows/Macintosh Exclusive
- Multi-size Capable ASF
  ASF equipped as standard supports forms ranging from business cards to A4.
- CSIC-compatible Independent Ink Cartridge
- Roll paper compatibility
- Fast, 4-side borderless printing compatibility
- Two-sided printing compatibility
- Prevention of platen printing by optical sensor
- CD-R/DVD-R printing compatibility by front loading
- Business card, card photo printing compatibility
- Auto Nozzle Check and Cleaning*1

Note"*1": When user performs the "Auto nozzle check and cleaning", Prints nozzle check pattern and automatically checks print head nozzles. If they are clogged, performs head cleaning. If they are not recovered, and performs head cleaning and detection up to tree times.

Figure 1-1. Product Appearance

1.2 PG Setting

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

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

Table 1-1.

Application	PG Position				
	PG (-)	**PG (0)**	**PG (+)**	**PG (++)**	**Release**
Printing	• Special thick paper	• Plain paper • Special thin paper • PG(-) rub avoidance	• Envelope • PG(0) rub avoidance	• CD-R/Board paper	–
Non-printing	–	• Standby position after power-on (For bottom stacker)	–	• Initialization at power-on • Cleaning (wiping)	• Waiting for CD-R/ Board paper to be fed • Paper jam removal
PG value	1.2mm	1.7mm	2.1mm	4.5mm	–
Sensor	**PG (-)**	**PG (Typ.)**	**PG (+)**	**PG (++)**	**Release**
APG Sensor 1	OFF	OFF	OFF	OFF	OFF
APG Sensor 2	ON	ON	ON	OFF	OFF

1.3 Functions

1.3.1 Control Panel

The appearance of the control panel is shown below.

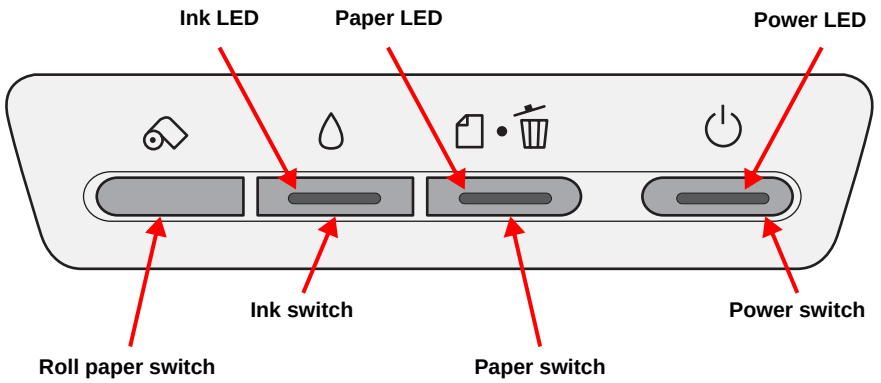


Figure 1-2. Control Panel Appearance

1.3.2 Switches

- ☐ Power switch
- ☐ Paper switch
- ☐ Ink switch
- ☐ Roll paper switch

1.3.3 Indicators

- ☐ Power LED : Green
- ☐ Paper LED : Red
- ☐ Ink LED : Red

1.3.4 Switch Functions

FUNCTIONS IN NORMAL STATUS

Table 1-2. Normal-status Functions

Switch	Function
Power switch	• Power On/Off
Paper switch	• Loads or Ejects the Paper. • In the condition of printing, cancel the print job.
Ink switch	• Starts the Cleaning of head with 3 second pushing. • Moves the Carriage to ink cartridge change position. • When Carriage is on the ink cartridge change position, return carriage from ink cartridge change position.
Roll paper switch	• Loads the Roll paper. • Back out the roll paper with 3 second pushing. • Move to tear off position / Return from tear off position. • When the cutter is set, cuts the paper. • When the photo album is used, ejects the paper forwards only. (At this mode, the printer can't move the cutter and can't move backwards.)

Note : When the printer has frozen, hold down the Power switch and Ink switch for 7 seconds to forcibly switch power off.

FUNCTION AT POWER-ON

Table 1-3. Power-on Function

Switch	Function
Paper switch	Starts status printings.*1

Note "*1": Status printings prints firmware version, ink counter and nozzle check patterns.

1.3.5 Indicator Display in Normal Mode

Table 1-4. Printer Condition and LED Status

Printer status	Error status	Indicators			
		Power	Paper	Ink	Priority
Idle	–	On	–	–	20
Data Processing	–	Blink	–	–	19
Pause *1	Status 05h	–	–	–	18
Ink Sequence Processing	–	Blink	–	–	17
Ink Cartridge Change Mode	–	Blink	–	–	16
PG Release Processing	–	Blink	Blink	Blink	15
Ink Low (warning)	–	–	–	Blink	14
Tear Off Status	11h	–	–	–	13
Paper Mismatch Error	0Ch		Fast Blink	–	12
Paper Out	06h	–	On	–	11
Ink Out	05h	–	–	On	10
No Ink Cartridge or Ink Cartridge Error	05h	–	–	On	9
Paper Jam Error	04h	–	Blink	–	8
Card Loading Error	2Ah	–	Fast Blink	–	7
Cutter Jam Error	1Dh	–|	Blink 2	–	6
Cover Open Error	02h	–	Blink 2	Fast Blink	5
Reset Input	–	On	On	On	Å|
Fatal Error	00h	Off	Fast Blink	Fast Blink	4
Cutter Position Error	1Ch	Off	Blink 2	Blink 2	3
Maintenance Request	10h	Off	Blink Alternately 1	Blink Alternately 2	2
Power Off	–	Fast Blink	Off	Off	1

Note:
- "–" : Don't care
- Blink : 0.5sec on + 0.5sec off repetition
- Blink 2 : 0.2sec on + 0.2sec + 0.2sec on + 0.4sec off repetition
- Fast Blink : 0.1sec on + 0.1sec off repetition
- Blink alternately 1 : 0.5sec on + 0.5sec off repetition
- Blink alternately 2 : 0.5sec off + 0.5sec on repetition

Note"*1": When the Photo album paper is end, the printer goes to this status.

1.3.6 Error Status

If any of the following states is detected, this printer is put in an error status and turns the interface signal -ERROR "Low" and BUSY "High" to inhibit data input. At this time, the printer is automatically disabled from printing. However, when communication is being made using the IEEE1284.4 protocol, communication with the printer is enabled.

☐ General error
After the cause of this type of error is removed, the printer can resume its operation from where it stopped due to the error

Table 1-5. General error

Error Status	Occurring Condition	Resuming Condition
Paper Mismatch Error	If the paper path specified by the print data is different from the printer's real paper path, the printer goes to this error.	Change the printer's paper path to the one specified by the data.
Paper Out	When printer fails to load a sheet, it goes Paper Out Error.	Set the paper to the ASF and push the Paper switch.
Ink Out	When the printer runs out the most part of the ink of any one color, it warns Ink Low and keeps printing. When the printer runs out the whole ink of any one color, it stops printing and indicates Ink Out Error. User is requested to install a new Ink-Cartridge in this state.	Install the new Ink Cartridge.
No Ink Cartridge/ CSIC Error	When printer detects that Ink Cartridge comes off, it goes this error mode.	Install the new Ink Cartridge.
Paper Jam Error	• Failure of ejecting a sheet • Failure of loading a sheet to the loading position	Remove the jammed paper.
Card Loading Error	When the card was loaded to the wrong position, the printer goes this error.	Set an A4 paper to the ASF, and press the Paper switch. If the card couldn't eject at your first try, repeat again the same method.

Table 1-5. General error

Error Status	Occurring Condition	Resuming Condition
Cutter Jam Error	When Cutter can't cut the paper, it goes Cutter Jam Error.	Switch power off and recheck the cutter state. When a paper jam has occurred, clear the paper.
Cover Open Error	When the cover is opened at Economy printing mode, the printer goes this error.	Close the cover.

☐ Fatal error
After the cause of this type of error is removed, the printer cannot return to normal unless it is powered off and then on again

Table 1-6. Fatal error

Error Status	Occurring Condition	Resuming Condition
Fatal Error	When detecting a Fatal Error such as a carriage control error, the printer is placed in an error status.	Turn off and turn on.
Cutter Position Error	When Cutter can't return to cutter home position, it goes Cutter Position Error.	Switch power off and recheck the cutter state. When a paper jam has occurred, clear the paper.
Maintenance Request	When the total quantity of ink wasted through the cleaning and flushing is reaches to the limit, printer indicates this error and stops.	Replace the Waste Ink Pads in the printer enclosure by a service person.

1.4 Casing Specifications

EXTERNAL DIMENSIONS

When tucked : 495 (width) x 305 (depth) x 193 mm (height)

When used : 495 (width) x 644 (depth) x 322 mm (height)

WEIGHT

7.0kg

EXTERNAL DIMENSION DIAGRAM

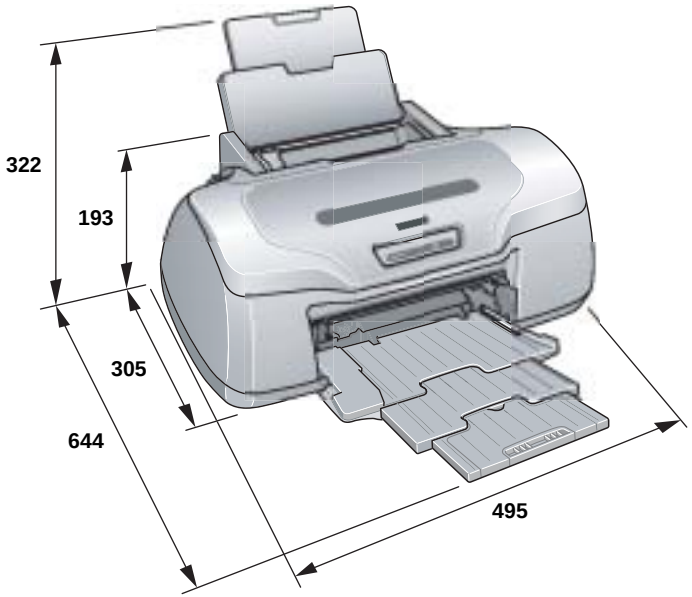


Figure 1-3. External Dimension Diagram

1.5 Accessories

STANDARD ACCESSORIES

- ☐ Setup guide : 1 set
- ☐ Ink Cartridge (one for each of 8 colors) : 1 set
- ☐ CD-ROM (Printer driver utility) : 1 set
- ☐ CD/DVD tray : 1 set
- ☐ CD/DVD print position check sheet : 1 set
- ☐ 8cm CD/DVD attachment : 1 set
- ☐ Roll paper holder : 1 set
- ☐ Power cord : 1 set

CONSUMABLES AND OPTIONS

- ☐ Ink cartridges
  - ■ Gloss Optimizer : T0540
  - ■ Black : T0541
  - ■ Cyan : T0542
  - ■ Magenta : T0543
  - ■ Yellow : T0544
  - ■ Red : T0547
  - ■ Matte Black : T0548
  - ■ Blue : T0549
- ☐ Roll paper auto cutter (Cutter, paper support basket, instruction manual) : PMA4RAC3
- ☐ USB cable : USBCB2

CHAPTER

2

OPERATING PRINCIPLES

2.1 Overview

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

- ☐ Control circuit board : C550 MAIN
- ☐ Power supply circuit board : C550 PSB/PSE
- ☐ Control panel board : C550 PNL

2.2 Printer Mechanism

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

Table 2-1. Various Motors

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

The basic structure of the mechanism has the following features.

- ☐ The sensor dedicated to Auto Bi-D adjustment and auto nozzle check is installed.

The following shows the outline of the printer mechanism.

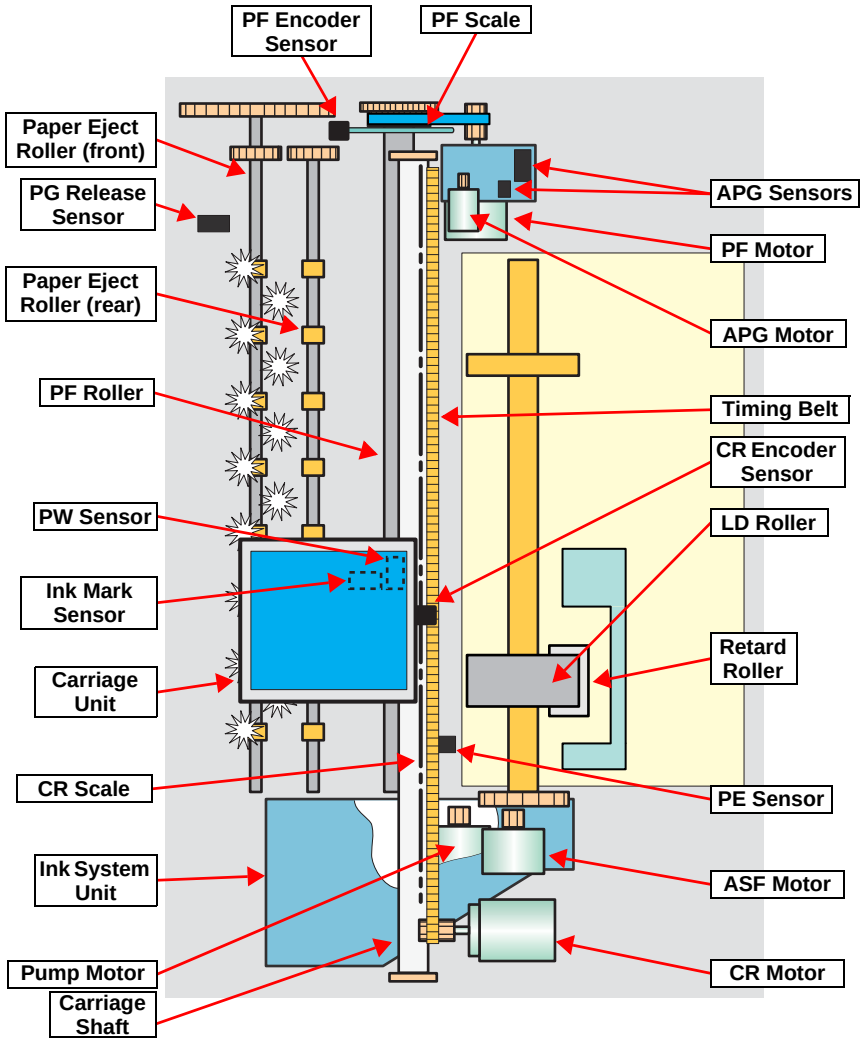


Figure 2-1. Printer Mechanism Outline

2.2.1 Carriage Mechanism

The Carriage mechanism consists of the Carriage Motor (CR Motor), Carriage Shafts, Platen Gap Adjustment Mechanism, Carriage Lock Mechanism, and others.

2.2.1.1 Carriage Mechanism

The following indicates the Carriage driving DC motor specifications.

Table 2-2. CR Motor Specifications

Item	Specifications
Type	DC motor with brushes
Drive voltage	+42V ± 5% (voltage applied to driver)
Winding resistance	24.4Ω ± 15%
Inductance	17.5mH ± 25%
Drive method	PWM, constant-current chopping
Drive IC	A6615

Closed loop control based on the CR Motor (DC Motor) and CR Encoder Sensor has advantages in stabilized print quality and silent operation.

- Heat generation control
  Using low-cost DC motors, this product grasps the variations of the torque constants, coil resistances and power supply board output voltages of the individual DC motors adequately to carry out heat generation control according to individual differences.
- CR variation measurement sequence
  The variations of the torque constant, coil resistance and power supply board output voltage of the motor are measured in a CR variation measurement sequence when the CR mechanical load is in the initial status and saved into the EEPROM (A6<H>). According to the variations (individual differences) measured in this sequence, the voltage is corrected to make the drive current value constant (without an individual difference) according to the variations (individual differences) measured in this sequence.
- CR measurement sequence
  To set the appropriate drive current value according to the variation of the CR mechanical load, the mechanical load is measured in a CR measurement sequence and saved into the EEPROM A4<H>, A5<H> in a power-on or IC change sequence. However, if 46 is saved at the EEPROM A4<H> and 05 at A5<H>, Fatal error will occur since too large load is applied to the CR drive system.

The above control and sequences correct the drive current value of the CR Motor according to not only the mechanical load but also the variations of the motor and like. In addition, the resultant CR drive current value is used to calculate a heating value, and when the specified heating value is reached, wait time is provided per CR path for printing.

2.2.1.2 Carriage Home Position Detection

As in the conventional model, the Carriage Home Position is detected using the drive current of the CR Motor and the speed/position signal of the CR Linear Encoder.
The basic home position detection sequence is as described below.

1. The CR linear encoder pulse counter in the CPU is reset by the initialization operation performed at power-on.
2. When the CR Motor rotates counterclockwise, the Carriage Unit moves from left to right. When the following conditions are satisfied, the CPU assumes that the Carriage Unit made contact with the right frame.
   - The ASIC detects 862/1500 counts or more in the PWM output under CR Motor load positioning control.
   - P1 (number of output pulses from when power is switched on until the Carriage Unit makes contact with the right frame) is 12 steps or less.
3. When the CR Motor rotates clockwise, the Carriage Unit moves from right to left. When the following conditions are satisfied, the CPU assumes that the Carriage Unit reached the CR lock confirmation position.
   - The ASIC detects 483/1500 counts or more in the PWM output under CR Motor load positioning control.
   - A difference between P1 and P2 (number of output pulses from when the Carriage Unit made contact with the right frame until it reaches the Carriage lock confirmation position) is 12 steps or less.
4. When the CR Motor rotates counterclockwise to move the Carriage from left to right and the CPU detects 862/1500 counts or more in the PWM output under CR Motor load positioning control, the printer judges it as contact with the frame.
5. When a difference between P1 and P3 (number of output pulses from when the Carriage Unit reached the Carriage lock confirmation position until it makes contact with the right frame) is 4 steps or less, the printer judges that the Carriage Unit is in the home position.

The IC14 (ASIC) sets the drive current value adequate for the Carriage Unit motion and outputs it to the motor driver.
Based on the signal output from the IC14 (ASIC), the IC5 (Motor Driver) outputs the CR Motor drive current to the CR Motor.

2.2.1.3 Sequence Used for PW Detection

The PW (paper width detection) Sensor installed on the Carriage Unit bottom is used to control the printer according to various sequences.

The following briefly describes the PW Sensor operating principle.

A dark voltage is measured by the PW Sensor in three places on the right end plane (area without the absorber) of the Front Paper Guide every time power is switched on, and the measurement values are saved into the EEPROM as threshold values.

- Threshold value > detection voltage: Paper present
- Threshold value < detection voltage: Paper absent

The following sequences are performed.

- Off-paper printing prevention control
  Before start of printing (immediately after the end of paper locating), or during printing, whether paper is present or not is detected to prevent off-paper printing on the Paper Guide by borderless printing used in a wrong way. (This applies to only the left or right end of the paper.)

  This control applies to only the four-side borderless mode.
- CD-R center detection control
  When printing is not being performed, the PW detector is used to detect the center of CD-R. Refer to *"2.2.3.4 CD-R Printing Mechanism (p.23)"* for details.
- Board paper/roll paper leading edge detection control
  Control exercised to detect the user-preset board paper leading edge, or control carried out to detect the roll paper edge. Therefore, the PW sensor does not detect a paper leading edge at the time of ASF cut sheet feeding.

- Off-range restriction control
  At the time of frameless printing, a paper leading edge is detected using the PW Sensor to restrict the frameless off-range amount.
  - Complete frameless mode
    Control is performed to print the print data 3mm larger at top, 5mm larger at bottom, and 2.5mm lager at left and right than the detected paper size.
  - Roll paper mode
    In the left and right frameless mode, control is performed to print the print data 2.5mm lager at left and right than the detected paper size.
- PW sensor dark voltage (VH) measurement
  PW sensor dark voltage (VH) measurement is performed at the following timings and locations and used to calculate the threshold value of whether paper is present or not.
  - Cut sheets, Roll paper
    The dark voltage is measured and updated at every power-on, and the threshold value (VS) is calculated and saved in the EPROM area as a PW detection level.
    - Threshold value > detection voltage: Paper present
    - Threshold value < detection voltage: Paper absent
  - CD-R Tray
    When a CD-R is used, the dark voltage is measured on the CD-R tray, and the threshold value (VS) is then calculated and saved in the EPROM area as a PW detection level.
    - Threshold value > detection voltage: CD-R present
      (tray home position detected)

    The measurement voltage in the presence of the CD-R is saved into the EEPROM as a white level. The white level value is used to check the sensor deterioration condition during servicing or like.
    - If the measurement value of the white level is close to that of the PW detection level, it means that the sensor is dirty or deteriorated.

2.2.1.4 APG (Auto PG) Mechanism

The following indicates the APG DC motor specifications.

Table 2-3. APG Motor Specifications

Item	Specifications
Type	DC motor with brushes
Drive voltage	+42V ± 5% (voltage applied to driver)
Winding resistance	64.7Ω ± 15%
Inductance	37.6mH ± 25%
Drive method	PWM, constant-current chopping
Drive IC	A6615

The APG Motor (DC Motor) and two APG Sensors automatically adjust the PG amount according to the paper.

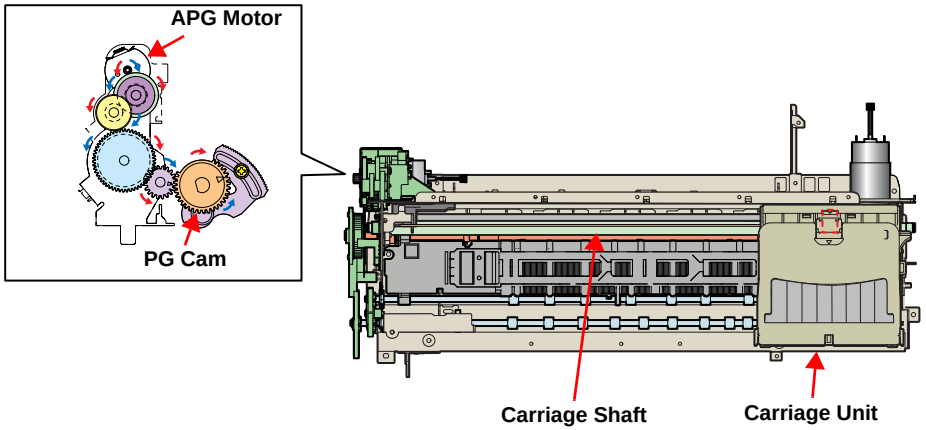


Figure 2-2. APG Mechanism

2.2.2 Printhead Specifications

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

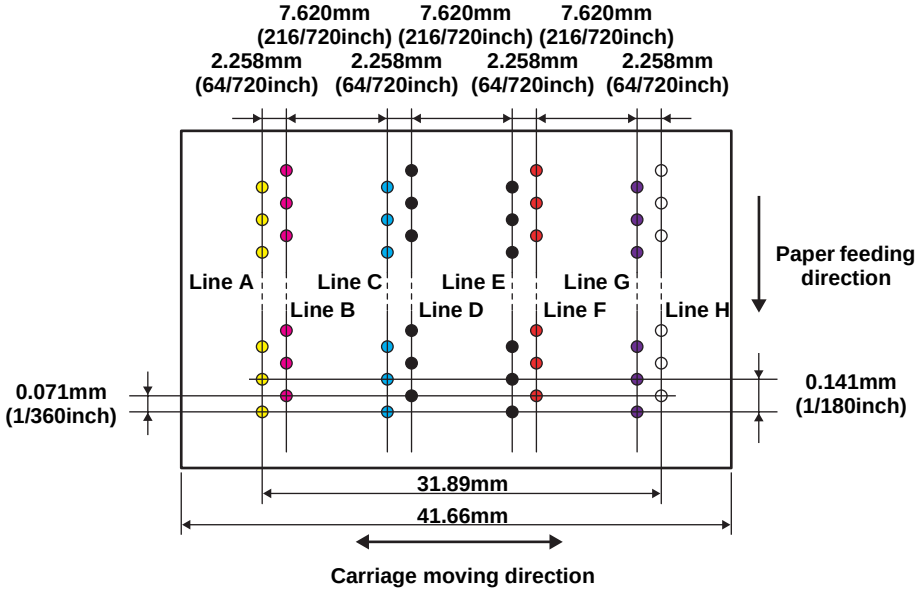


Figure 2-3. Nozzle Rear View

Table 2-4. Relationships between Nozzle Lines and Color Arrangement

Line	Ink
A	Yellow
B	Magenta
C	Cyan
D	Matte-black
E	Photo-black
F	Red
G	Blue
H	Gloss Optimizer

2.2.3 Paper Feeding Mechanism

The paper feeding mechanism indicates the mechanism that feeds paper or CD-R Tray to the PF Roller Shaft.

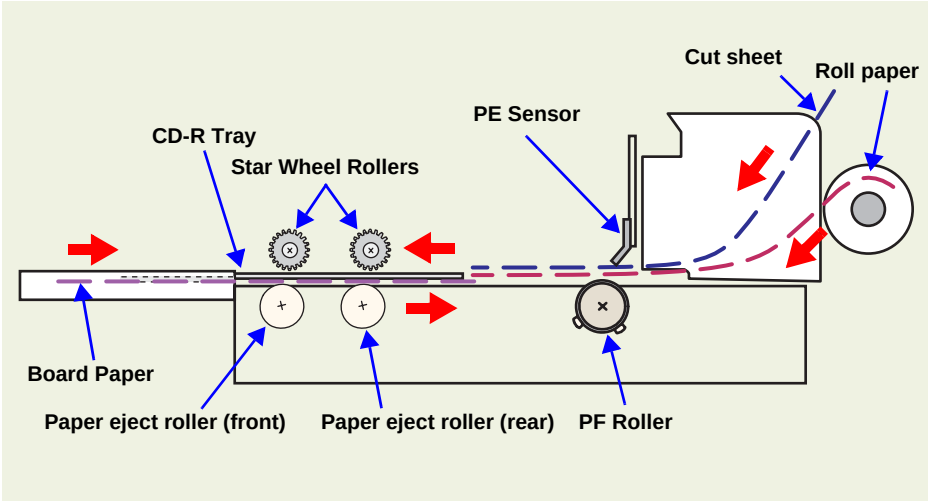


Figure 2-4. Paper Feeding Mechanism

2.2.3.1 ASF Paper Feeding Mechanism

The following indicates the ASF Assy. driving stepping motor specifications.

Table 2-5. ASF Motor Specifications

Item	Specifications
Type	4-phase, 48-pole PM type stepping motor
Drive voltage	Bipolar drive/constant-current drive
Winding resistance	+42V ± 5% (voltage applied to driver)
Inductance	7.4Ω ± 10% (per phase at 25°C)
Drive method	12.0mH ± 20% (1kH, 1Vrms)

The drive of the ASF Motor is transmitted to the LD Roller in the following path.

☐ LD Roller Drive Transmission Path
ASF Motor Pinion Gear ⇒ Combination Gear 29, 11 ⇒ Paper Back Cam ⇒ LD Roller

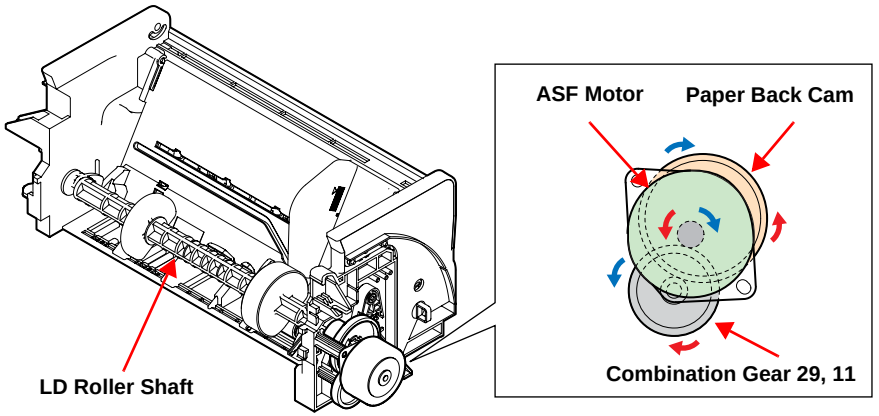


Figure 2-5. LD Roller Drive Transmission Path

Driven by the ASF Motor, the ASF Assy. performs the following feeding operation.

1. When a paper feeding command is issued from the PC or the Paper Switch of the panel is pressed after power-on, the driving force of the ASF Motor begins to be transmitted to the LD Roller.
2. The flag of the Paper Back Cam moves away from the home position of the ASF Sensor and the LD Roller rotates.
3. When the LD Roller rotates one turn and the flag of the Paper Back Cam returns to the home position of the ASF Sensor again, the LD Roller stops rotating.

2.2.3.2 Manual Paper Feeding Mechanism (Board Paper)

To enable direct printing onto thick paper and CD-R label, this product has the mechanism to feed paper from the printer front manually.

1. When the Stacker is lifted, the close signal of the PG Release Sensor is transmitted to the APG Assy. in the following order.
   - ■ PG Release Sensor ⇒ Main Board ⇒ Relay Board ⇒ APG Motor ⇒ APG Assy.
2. Driven by the APG Motor, the APG Assy. sets the PG position to PG release to release the Upper Paper Guide (Driven Roller).
3. Along the Paper Feed Guide of the Stacker, match the leading edge (front side) of the board paper to the marking position of the Stacker.

After the above operation, press the Paper Switch. When the PE Sensor detects that the paper is present, it detects the leading edge of the paper, and the printer performs paper locating and then enters the standby status.

2.2.3.3 Roll Paper Feeding

Since panel operation in the roll paper mode differs from the above operation, the differences of panel operation after roll paper feeding will be described.

1. When roll paper is fed, the PE Sensor detects the paper, and after 3 seconds have elapsed, the paper is fed.
2. The PW Sensor check for the leading edge of the paper, and if it detects the paper, the printer operates in the Cutter Self-Cleaning Mode.
3. The printer back-feeds the paper to the paper print starting position.

At this time, panel Switch operation is invalid, and the definitions of the panel operation and Paper Switch differ between cut sheets and roll paper.

The following describes a difference between Panel Switch operations performed when roll paper is fed and performed when roll paper printing data is received from the PC.

- ☐ When roll paper is fed
  Pressing the Roll Paper Switch for more than 3 seconds back-feeds the leading edge of the roll paper to the PE Sensor (the Paper LED blinks). In this state, draw the roll paper and press the Paper Switch to return to the panel operation that enables paper feeding from the ASF.
- ☐ When roll paper printing data is received (when cutter is fitted)
  - ■ When data is "No auto cut"
    1. After end of printing, press the Roll Paper Switch. This feeds the separation position in the print data to the roll paper cut position.
    2. After the paper is cut, the leading edge of the paper returns to the print starting position.
  - ■ When data is "Standard 1 cut" or "Specific 2 cuts"
    1. The roll paper is cut automatically at every separation of the print data.
    2. After the paper is cut, the leading edge of the paper returns to the print starting position.
- ☐ When roll paper printing data is received (when cutter is not fitted)
  1. After end of printing, press the Roll Paper Switch.
  2. A tear-off line is printed, and the roll paper is fed to the roll paper cut position.
  3. After cutting the roll paper with a pair of scissors or like, Press the Roll Paper Switch. This returns the leading edge of the paper to the print starting position.

2.2.3.4 CD-R Printing Mechanism

☐ CD-R tray home position detection sequence
Lift the Stacker (PG Release Sensor: Close), insert the CD-R Tray into the specified position, and press the Paper Switch. This starts the following operation.

When the close signal of the PG Release Sensor is detected, no paper is fed from the ASF if the Paper Switch is pressed. In this case, the Paper Switch executes a CD-R Tray home position detection sequence.

1. When the APG Assy. is driven, the PG position is set to "++" and the Driven Roller of the Upper Paper Guide presses the CD-R Tray.
2. When the Carriage Unit moves leftward and the PW Sensor detects the CD-R, the Carriage Unit returns to the carriage home position (HP).
3. After waiting for about 5 seconds at the carriage HP, the Carriage Unit moves to the CD-R Tray HP detectable position (right end of the CD-R Tray).
4. The CD-R Tray is pulled in the ASF direction, the PW Sensor detects the CD-R Tray HP, and then the Carriage Unit moves to the center of the CD-R Tray.
5. When the PW Sensor detects the white marking in the center of the CD-R Tray, the CD-R Tray is fed in the paper ejection direction.
6. The Carriage Unit moves leftward, the PW Sensor detects the left side white marking, then the Carriage Unit moves rightward, and the PW Sensor detects the right side white marking.
7. The Carriage Unit moves to the center of the CD-R Tray, and the PW Sensor starts detection in the back-and-forth direction of the CD-R. After the leading edge of the CD-R is detected, the CD-R Tray is fed in the paper ejection direction, and the trailing edge of the CD-R is detected. After that, the CD-R Tray is fed to the center of the CD-R in the paper ejection direction.
8. The Carriage Unit moves leftward, and the PW Sensor starts detection in the horizontal direction of the CD-R. After the left end of the CD-R is detected, the Carriage Unit moves rightward, and the right end of the CD-R is detected.
9. The Carriage Unit moves to the CD-R Tray HP detectable position and stops there, and then the CD-R Tray is fed in the ASF direction.
10. When the CD-R Tray stops operating, the Carriage Unit moves to the carriage HP and stands by.

If the CD-R Tray HP, white marking or CD-R cannot be detected in any specified step operation in the CD-R Tray HP detection sequence, the CD-R Tray is ejected and Paper Out Error is displayed.

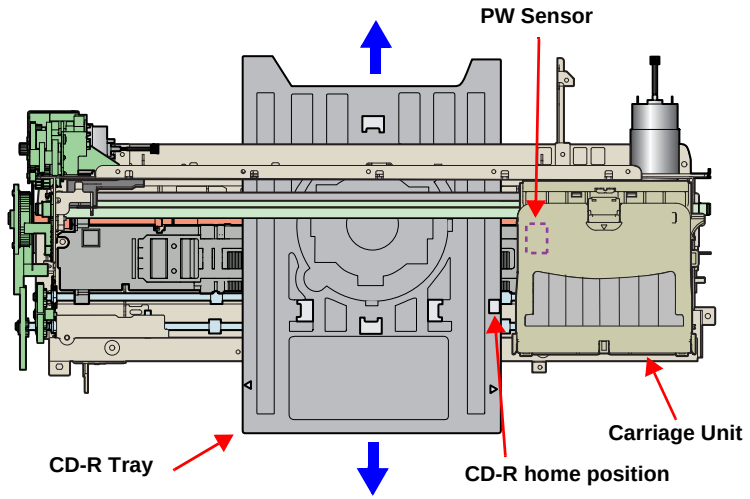


Figure 2-6. CD-R Printing Mechanism

2.2.4 Paper Loading Mechanism

The Paper Loading Mechanism is designed to transfer the paper fed from the ASF, Roll Paper Guide or Board Paper Guide or the CD-R fed from the CD-R Tray according to the print data.

2.2.4.1 Paper Loading Mechanism

The following indicates the paper loading driving DC motor specifications.

Table 2-6. PF Motor Specifications

Item	Specifications
Type	DC motor with brushes
Drive voltage	+42V ± 5% (voltage applied to driver)
Winding resistance	22.3Ω ± 25%
Inductance	17.3mH ± 25%
Drive method	PWM
Drive IC	A6615

Like the CR Motor, a DC motor is used as the PF Motor in this product. Closed loop control based on the DC Motor and Rotary Encoder has the following advantages.

- ☐ Improved paper feed accuracy
- ☐ Paper feed amount control

The driving force of the PF Motor is transmitted to the PF Roller and Paper Eject Roller in the following path.

- ☐ PF Roller Drive Transmission Path
  PF Motor Pinion Gear ⇒ PF Timing Belt ⇒
  Combination Gear 36.294, 45.5 ⇒ PF Roller Shaft
- ☐ Paper Eject Roller (front) Drive Transmission Path
  PF Motor Pinion Gear ⇒ PF Timing Belt ⇒
  Combination Gear 36.294, 45.5 ⇒ Spur 31.5 ⇒ Spur 54 ⇒
  Paper Eject Roller (front)
- ☐ Paper Eject Roller (rear) Drive Transmission Path
  PF Motor Pinion Gear ⇒ PF Timing Belt ⇒
  Combination Gear 36.294, 45.5 ⇒ Spur 31.5 ⇒ Spur 54 ⇒ Spur 18 ⇒
  Spur 15.5 ⇒ Spur 18 ⇒ Paper Eject Roller (rear)

The following shows the part names and outline of the drive transmission path. Paper is transferred in the above driving force transmission path.

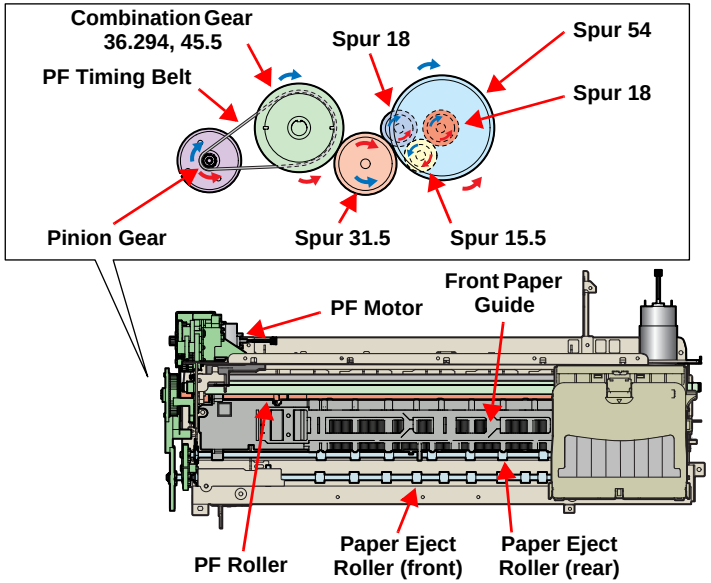


Figure 2-7. Paper Loading Mechanism 1

The fed paper is detected by the PE Sensor, and its leading edge is then transferred to the front of the Front Paper Guide.
To eliminate the deflection of the paper, the paper is then returned toward the ASF Assy. by the specified number of steps according to the paper feed mode. The paper is transferred again to the specified paper locating position of the Front Paper Guide.

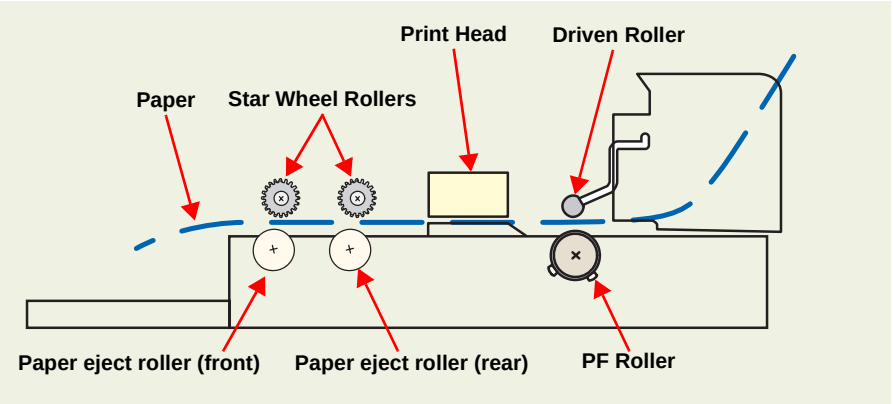


Figure 2-8. Paper Loading Mechanism 2

2.2.4.2 PF Measurement Sequence

- The mechanical load in the paper loading path is measured in the following cases to perform control so that an adequate current value is set according to the mechanical load.
  - When power is switched on
  - When the Ink Cartridge is replaced
  - When the removal or fitting of the cutter is recognized in the paper feed sequence
- When the mechanical load in the paper loading path reaches the specified value, Fatal Error is displayed. (When the cutter is not fitted)
- When the cutter is fitted, the mechanical load when the cutter is fitted is measured and reflected on the control since the mechanical load of the cutter must be taken into consideration to set the adequate current value.

2.2.5 Ink System Mechanism

The Ink System Mechanism consists of the following mechanisms.

- ☐ Pump Unit (including the CR Lock Lever)
- ☐ Cap Unit

2.2.5.1 Pump Unit

The Pump Unit is designed to suck ink from the Print Head or Cap Unit. The Cap Unit has a built-in Head Cleaning Wiper.

The following indicates the Pump Unit driving stepping motor specifications.

Table 2-7. Pump Motor Specifications

Item	Specifications
Type	4-phase, 48-pole PM type stepping motor
Drive voltage	Bipolar drive/constant-current drive
Winding resistance	+42V ± 5% (voltage applied to driver)
Inductance	10.3Ω ± 10% (per phase at 25°C)
Drive method	13.4mH ± 20% (1kH, 1Vrms)

The following operations are performed when the drive of the Pump Motor is transmitted to the Pump Unit.

Table 2-8. Pump Motor Rotation Directions and Functions

Pump Motor Rotation Direction*	Functions
CW direction	• Cap closing • Ink suction • Wiper resetting • CR Lock setting
CCW direction	• Cap opening • Pump release • Wiper setting • CR Lock resetting

Note: As the rotation directions of the motor, CW indicates a clockwise direction, and CCW indicates a counterclockwise direction, as seen from the output shaft side of the motor mounting plate.

2.2.5.2 Drive Transmission Path to Pump Unit

The drive of the Pump Motor is transmitted to the Pump Unit in the following path.

- ☐ Motor Pinion Gear ⇒ Combination Gear 10.2, 21.2 IS ⇒ Spur Gear 20.4 IS ⇒ Pump Unit

The following shows the internal part names and operation outline of the Pump Unit.

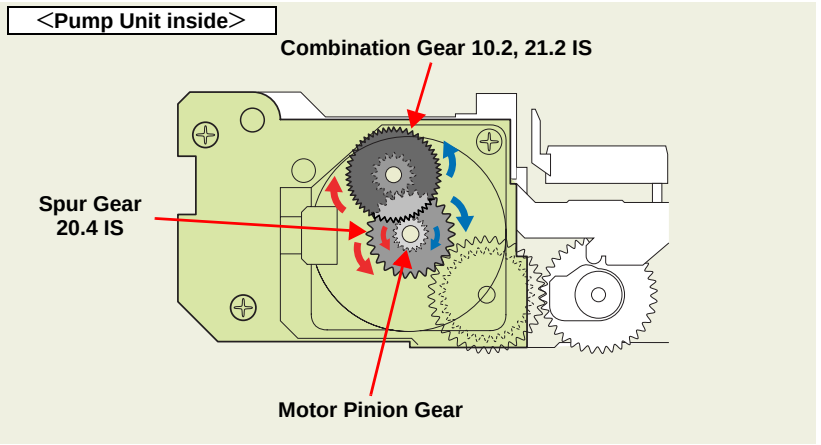


Figure 2-9. Outline of Pump Unit Inside

The following shows the Pump Unit operating principle.

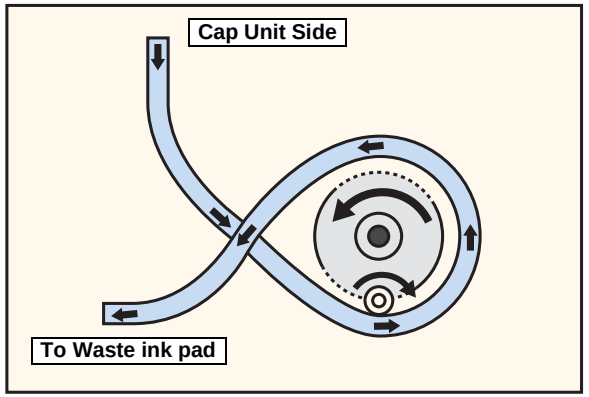


Figure 2-10. Pump Unit Operating Principle

☐ Ink suction

1. The Pinion Gear of the Pump Motor rotates in the CW direction.
2. The Roller turns and simultaneously presses the tube.
3. Ink is fed from the Cap Unit toward the Waste Ink Pad.

☐ Pump release

1. The Pinion Gear of the Pump Motor rotates in the CCW direction.
2. The Roller moves away from the tube and releases the tube.
3. Ink is not sucked.

2.2.5.3 Cap Unit

The Cap Unit is designed to bring the Cap into close contact with the Print Head surface and suck ink by the driving force of the Pump Unit to secure air tightness in the Cap.

When the printer is in a standby status or its power is OFF, the Cap Unit prevents the ink from thickening.

Ink is fed to the Waste Ink Pad in the following path.

☐ Ink Cartridge ⇒ Head Cavity ⇒ Cap ⇒ Waste Ink Pad

The following diagram shows the outline of Cap Unit operation.

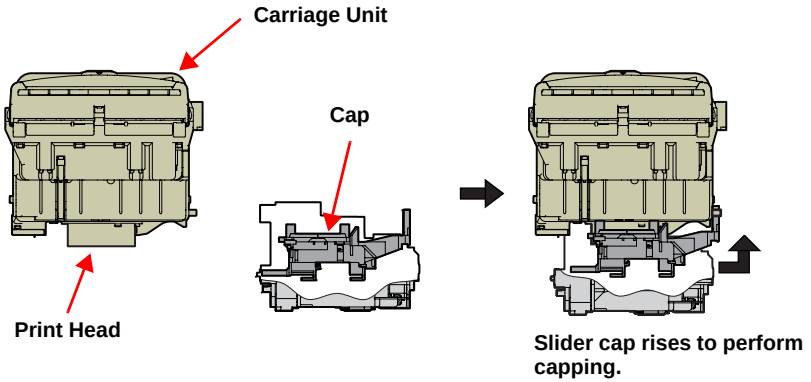


Figure 2-11. Capping Mechanism

2.2.6 Ink Sequence

The following ink sequence is executed according to various timer, counter, flag and other information saved on the EEPROM.

- CSIC-related sequence
  The ink type code stored in the CSIC Memory Chip is identical regardless of the Japanese domestic or overseas cartridges, and is saved at the Main Board EEPROM.
  At power-on, data is read from each color CSIC and the CSIC data status is made valid. If the data read from each CSIC has any problem, Ink cartridge error or Ink end error is displayed.
  After CSIC operation is checked, the ink consumption of the I/C currently installed per color is compared with the ink consumption saved in the printer EEPROM, and control is performed under the following conditions.
  - When current I/C consumption differs (from ink consumption in EEPROM)
    1. On the assumption that the I/C has been changed at power-off, the first I/C flag is reset.
    2. The installation count in the printer EEPROM is updated for the CSIC. In the CSIC information replacement sequence, the CSIC side ink consumption data is updated to the ink consumption data in the printer EEPROM.
    3. The used model name data on the I/C side is rewritten.

    Note: Reason why the used model name data is rewritten from the printer to the I/C: To grasp which printer used the I/C removed.

    4. The change flag 2 (flag that indicates change CL) is set and CL is executed.
  - When current I/C consumption is the same (as ink consumption in EEPROM)
    1. When the initial filling flag is set and the CSIC side ink consumption is 0, the printer judges that initial filling is not yet performed.
       (The printer before initial filling judges that the I/C is fitted in a power-off status.)
    2. Installation count updating, CSIC information replacement, and initial filling are executed in this order.
    3. If the initial filling flag is not set, the printer judges that I/C change was not made at power-off and regards the CSIC data as valid.

  Data is written to the CSIC at the following timings.

  - At power-off
  - In the power saving mode
  - At the time of Ink Cartridge replacement
  - At the time of cleaning
    1. Data is read from the CSIC and developed in the RAM on the Main Board.
    2. The data is compared with the ink consumption in the printer EEPROM. If the data are the same, the data is written to the CSIC. If they are different, only the consumed difference is added and written to the CSIC. When cleaning is performed, the CL count is also written, and when the I/C is changed, the installation count is also written.

- Initial ink filling

  When the printer is powered on for the first time after the purchase of the product, the printer executes the initial ink filling operation to fill the ink cavities of the Head with ink. When the initial ink filling operation is performed properly, the printer clears the flag in the EEPROM so that initial ink filling operation will not be performed when it is powered on next. The Stylus Photo R800 requires about 150 seconds to perform the initial ink filling operation and consumes about 1/ 7 of the new ink cartridge.
  If the sequence does not end normally during initial filling, the initial filling flag is not cleared and the CL operating flag is set. Because of these flags, when powered on next time, the printer assumes that it was powered off for some reason during initial filling and executes CL3 instead of the initial filling sequence. (On the conventional mode, initial filling was executed again. However, when this operation was performed, ink was wasted and therefore CL3 is executed to cover the ink filling performance.)
  When the initial filling flag is set and the CL operating flag is not set, the printer assumes that the initial filling was not executed at all (power was switched on but the cartridges were not set), and when the printer is powered on next time, it executes initial filling.

- Change cleaning

  Change CL1 is executed when Ink Cartridge change is made.

  - Change CL1: 3.4g (0.425g per color)

- Manual cleaning

  This product provides three different manual cleanings to remove ink coagulated by air bubbles, viscous material or foreign matter. Perform the following manual CL operations by operating the panel or using the utility included in the printer driver.
  Independently of the printing path after the previous CL, perform manual CL from CL1 to CL3 in order if the cumulative printing timer counter is less than 7min. Only when the cumulative printing timer counter is more than 7min, execute only CL1.

  - CL1: 1.704g (0.213g per color)
  - CL2: 4.488g (0.561g per color)
  - CL3: 7.120g (0.890g per color)
  - Wiper operation
    Clean the nozzle surface with the right-half rubber part of the wiper.
  - Flushing operation
    Prevent color mixture. Stabilize the ink surface inside the nozzles.

  If the remaining ink amount of the I/C is short or the I/C is in an Ink Low/Out status, all manual cleanings are disabled and STM3 shows the condition.

- Timer cleaning
  Ink is consumed depending on the combination of the cumulative printing timer, cumulative cleaning count and cleaning timer.
- Flushing
  Two different flushing operations are executed for the following reasons.
  - Periodic flushing
    This is done to prevent ink viscosity in the Print Head nozzles from increasing during continuous printing. A specific small amount of ink is discharged into the Cap according to the Periodic flushing timer.
  - Periodic large-amount flushing
    This is done to prevent ink viscosity in the Print Head nozzles from increasing during continuous printing. A large amount of ink is discharged into the Cap according to the Periodic large-amount flushing timer.

2.2.7 Paper Cutter Mechanism

The Paper cutter mechanism consists of such main parts as the Cutter Motor, left and right HP Sensors (2 pcs. in all), Relay Board, Paper Eject Roller and Paper Holddown Flap in the Cutter unit.

- Operation during printing
  - When the Cutter Blade starts cutting, the Paper Hold-down Flap rises.
  - The paper is held and simultaneously cut.
  - The HP Sensors installed on both ends of the Cutter operating area detect the Cutter Blade position.
  - The HP Sensors detect whether the Cutter Blade operates properly, and Cutter Position Error or Cutter Jam Error is displayed according to the operating condition.

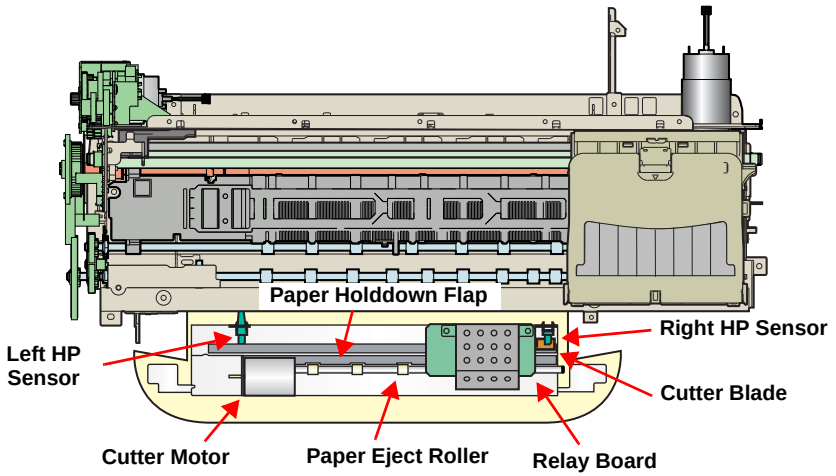


Figure 2-12. Paper Cutter Mechanism

2.2.7.1 Cutter Initialization Sequence

When the Cutter is fitted, the Cutter initialization sequence is executed if the printer has confirmed that the Cutter has been fitted (the Power Switch blinks about 5 seconds).

- Cutter Initialization Sequence
  The initialization sequence is performed to securely put the Cutter Blade in a standby position detected by the right HP Sensor if the Cutter Blade is not detected by the right HP Sensor.
  The initialization operation is not performed if the Cutter Blade is in the right HP Sensor position when the Cutter is fitted.

During Cutter operation, Cutter Position Error or Cutter Jam Error may occur. These errors are explained below.

- If the Cutter Blade cannot reach the left or right HP Sensor, the Cutter Blade is returned to the HP Sensor located in the motion starting position (right HP Sensor).
  - Cutter Jam Error
    Indicates that the Cutter Blade can return to the HP Sensor position in the motion starting position within 3 seconds.
  - Cutter Position Error
    Indicates that the Cutter Blade cannot return to the HP Sensor position located in the motion starting position within 3 seconds.

Paper cutting by the Cutter consists of the basic cutting sequences 1 and 2.

- Basic cutting sequences 1
  Means movement from the right HP Sensor to the left HP Sensor. At this time, as soon as the Cutter Blade starts moving from the right HP Sensor, the Timer starts. If the left HP Sensor does not detect the Cutter Blade within 3 seconds, the Cutter initialization sequence is executed and then Cutter Jam Error or Cutter Position Error occurs.
- Basic cutting sequences 2
  Means movement from the left HP Sensor to the right HP Sensor. At this time, if the Cutter Blade cannot move from the left HP Sensor to the right HP Sensor within 3 seconds, Cutter Position Error occurs.

2.2.7.2 Cutter Self-cleaning

This sequence indicates the operation performed to hold down and remove the ink, which may stick to the Plate above the Paper Hold-down Flap (Plate where the paper print surface comes into contact), with the leading edge of the fed roll paper.
The Cutter Blade must be operated left-to-right to operate the Paper Hold-down Flap. At this time, the Cutter Blade generates operating noise during Cutter self-cleaning when the roll paper is fed.

2.2.7.3 Cutter Cleaning (Driver Side)

This sequence is executed on the driver side. By cutting the roll paper three times at intervals of 7cm, the ink that may stick to the Cutter Blade is removed to clean the Cutter Blade.

2.2.8 Power-On Sequence

The following explains the operation to be performed when the Carriage Unit is inside or outside the HP with the printer powered on.

CARRIAGE UNIT INSIDE HP (CR LOCKED)

1. After power-on, the drive of the APG Motor is transmitted to the Carriage Shaft, and the PG position changes from PG Typ. to PG++.
2. The drive of the CR Motor is transmitted to the Carriage Unit, and the Carriage Unit performs HP detection operation in the following path.
   - Home position ⇒ Right frame ⇒ CR Lock confirmation position ⇒ Right frame ⇒ Home position
3. The drive of the Pump Motor is transmitted to the Cap Unit, the Cap opens (lowers), and the CR Lock is released.
4. After the Carriage Unit has moved leftward by the specified number of steps, the Wiper is driven by the Pump Motor to perform the following operation, and during that period, ink is sucked for about 4 seconds.
   - Wiper setting ⇒ Wiper resetting
5. The Carriage Unit returns to the home position, and the PG position returns from PG++ to PG Typ.
6. The drive of the PF Motor is transmitted to the PF Roller and Paper Eject Rollers (front and rear), which then rotate for about 2 seconds.
7. After moving between the left and right frames twice, the Carriage Unit moves to the right end of the Front Paper Guide.
8. The PF Roller and Paper Eject Rollers (front and rear) rotate.
   - Rotation for about 4 seconds (slow speed) ⇒ Rotation for about 2 seconds
9. The Carriage Unit returns to the home position and is fixed by the CR Lock.

CARRIAGE UNIT OUTSIDE HP

1. When the PG position is other than PG++ after power-on, the drive of the APG Motor is transmitted to the Carriage Shaft, and the PG position changes to PG++.
2. The drive of the CR Motor is transmitted to the Carriage Unit, and the Carriage Unit returns to the home position at slow speed.
3. The drive of the PF Motor is transmitted to the PF Roller and Paper Eject Rollers (front and rear), which then rotate for about 2 seconds.
4. After the Carriage Unit has moved leftward by the specified number of steps, the Wiper is set, driven by the Pump.
5. After the Carriage Unit has returned to the home position, it moves leftward again by the specified number of steps. And, driven by the Pump Motor, ink is sucked for about 4 seconds and then the Wiper is set, and the CR Lock is placed.
6. The Carriage Unit performs HP detection operation in the following path.
   - Home position ⇒ Right frame ⇒ CR Lock confirmation position ⇒ Right frame ⇒ Home position
7. The drive of the Pump Motor is transmitted to the Cap Unit, the Cap opens (lowers), and the CR Lock is released.
8. The Carriage Unit returns to the home position, and the PG position returns from PG++ to PG Type.
9. The drive of the PF Motor is transmitted to the PF Roller and Paper Eject Rollers (front and rear), which then rotate and stop as described below.
   - Rotation for about 3 seconds ⇒ Stop for about 0.5 seconds ⇒ Rotation for about 2 seconds
10. As soon as the operation in step 9 starts, the drive of the ASF Motor is transmitted to the LD Roller, and the LD Roller rotates one turn.
11. The operations in Steps 7 to 9 of *"Carriage Unit inside HP (CR locked) (p32)"* are performed, and the Carriage Unit is locked.

2.3 Electrical Circuitry Operating Principles

The electrical circuitry of Stylus Photo R800 consists of the following circuits.

- ☐ Control circuit board : C550 MAIN
- ☐ Power supply circuit board : C550 PSB/PSE
- ☐ Control panel board : C550 PNL

The following shows how the three circuit boards are connected.

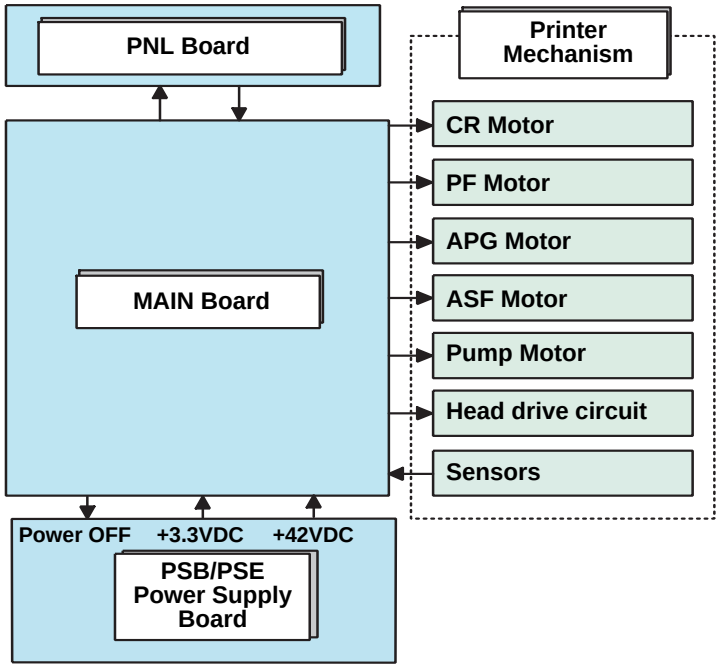


Figure 2-13. Electrical Circuitry Block Diagram

2.3.1 Power Supply Circuit Operating Principle

The power supply circuit board of this product is the C550 PSB/PSE.

- ☐ Basic circuit structure
  - ■ RCC switching regulator system
  - ■ +42VDC and +3.3VDC are supplied to the Printer Mechanism and Control Board

The following indicates the applications of the voltages generated in this power supply circuit.

Table 2-9. Supplied Power

Voltage	Applications
+42VDC Rated output current: 0.45A	• CR Motor • PF Motor • PG Motor • ASF Motor • Pump Motor • Head drive voltage
+3.3VDC Rated output current: 0.5A	• Logic sensor circuit • Sensor circuit • Nozzle selection circuit (above Print Head) • Interface control circuit

The following is the block diagram of the power supply circuit.

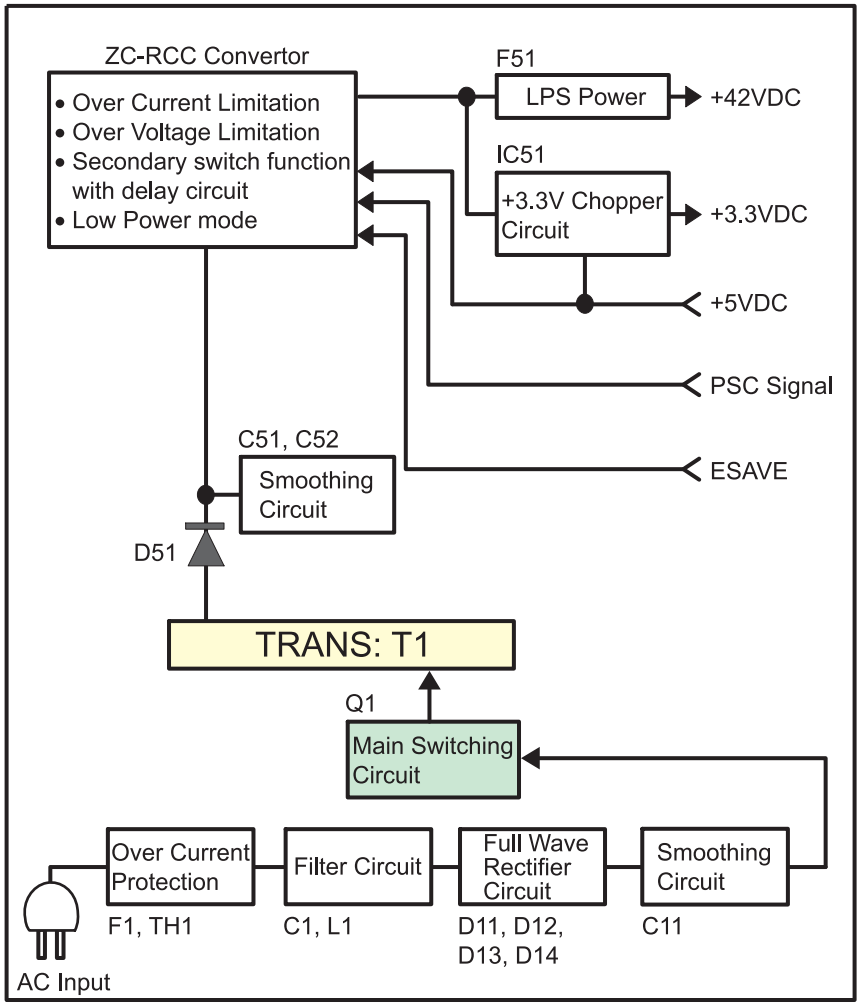


Figure 2-14. Power Supply Circuit Block Diagram

2.3.2 C550 MAIN Circuit Operating Principle

The C550 MAIN Board consists of the following circuits and sensors.

- ☐ Logic Circuits (CPU-ASIC 2 in 1, PROM, SDRAM)
- ☐ Motor control/Drive circuits
  (CR Motor, PF Motor, APG Motor, ASF Motor, Pump Motor)
- ☐ Head control/Drive circuit
- ☐ Interface Circuits
  USB 2.0, IEEE1394
- ☐ Sensor circuits
- ☐ Reset circuits
- ☐ EEPROM circuit
- ☐ D/A converter circuit

The following indicates differences between the control circuits of this product and conventional model.

- Adoption of 1.5V drive logic circuit components
  The 1.5V voltage is generated by the Regulator IC installed on the C550 MAIN Board that reduces +3.3VDC generated by the C550 PSB/PSE Board, and is used to drive multiple components.
  This is done to reduce the power of the logic circuit.

  The following table indicates the 3.3V drive components and 1.5V drive components.

Table 2-10. 3.3V and 1.5V Drive Components

3.3V	1.5V
• Nozzle selection circuit (above Print Head) • CR Encoder Sensor • PE Sensor • PG Release Sensor • CSIC	• CPU-ASIC 2 in 1 • PROM • SDRAM • Motor circuit • Panel LED • Interface circuit • USB 2.0 • Sensors (other than CR Encoder Sensor, PE Sensor, PG Release Sensor)

The following is the block diagram of the C550 MAIN control board.

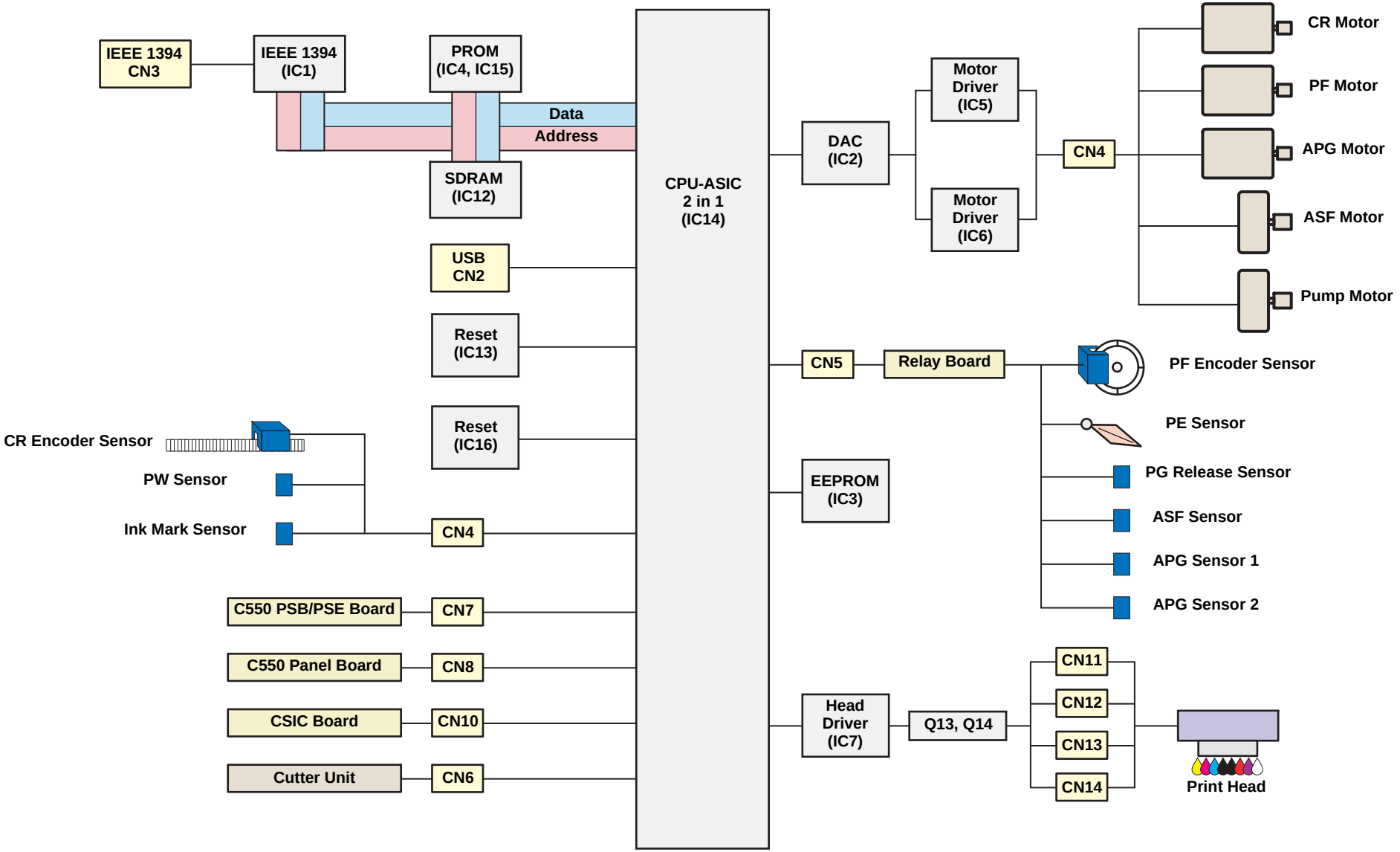


Figure 2-15. C550 MAIN Control Board Block Diagram

CHAPTER

3

TROUBLESHOOTING

3.1 Overview

This chapter describes unit-level troubleshooting.

3.1.1 Troubleshooting according to panel messages

After checking the printer LED and EPW3 error indications, you can grasp the fault location using the check list in this section. When you have found the fault location, refer to Chapter 4 "Disassembly and Reassembly" and change the corresponding part and/or unit. The following table indicates the check point reference tables corresponding to the error states (LED and EPW3).

Table 3-1. Reference Tables of Error States

Error State	Reference Table
Communication Error	*Refer to Table 3-2 "Phenomenon-Based Communication Error Check Points" on page 39*
Model Difference	*Refer to Table 3-2 "Phenomenon-Based Communication Error Check Points" on page 39*
Cover Open Error	*Refer to Table 3-3 "Phenomenon-Based Cover Open Error Check Points" on page 42*
Paper Out Error	*Refer to Table 3-4 "Phenomenon-Based Paper Out Error Check Points" on page 43*
Paper Jam Error	*Refer to Table 3-5 "Phenomenon-Based Paper Jam Error Check Points" on page 48*
Card Loading Error	*Refer to Table 3-6 "Phenomenon-Based Card Loading Error Check Points" on page 49*
Paper Mismatch Error	*Refer to Table 3-7 "Phenomenon-Based Paper Mismatch Error Check Points" on page 50*
Ink Low	*Refer to Table 3-8 "Phenomenon-Based Ink Low Check Points" on page 50*
Ink Out Error	*Refer to Table 3-9 "Phenomenon-Based Ink Out Error Check Points" on page 50*
No Ink Cartridge/CSIC Error	*Refer to Table 3-10 "Phenomenon-Based No Ink Cartridge/Ink Cartridge Error Check Points" on page 51*
Cutter Jam Error	*Refer to Table 3-11 "Phenomenon-Based Cutter Jam Error Check Points" on page 53*
Cutter Position Error	*Refer to Table 3-12 "Phenomenon-Based Cutter Position Error Check Points" on page 54*
Maintenance Request	*Refer to Table 3-13 "Phenomenon-Based Maintenance Request Check Points" on page 55*
Fatal Error	*Refer to Table 3-14 "Phenomenon-Based Fatal Error Check Points" on page 56*

Table 3-2. Phenomenon-Based Communication Error Check Points

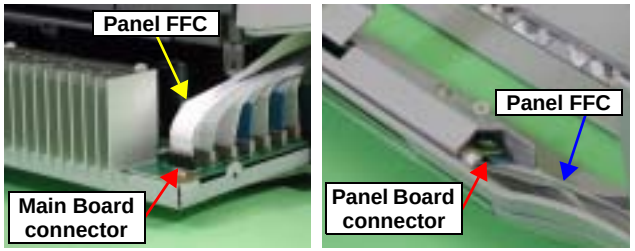
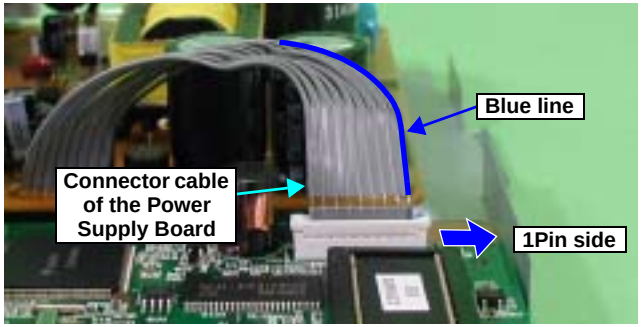
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	The printer does not operate at all.	Panel FFC	1. Check that the Panel FFC is securely connected to the Panel Board connector and Main Board connector (CN8). 	1. Connect the Panel FFC to the Panel Board and Main Board connectors.
			2. Check the Panel FFC for damage.	2. Change the Panel FFC for a new one.
		Panel Board	1. Check the Panel Board for damage.	1. Change the Panel Board for a new one.
		Power Supply Board	1. Check that the Connector cable of the Power Supply Board is securely connected to the Main Board (CN7). 	1. Connect the Connector cable of the Power Supply Board.
			2. Check that the blue line side pin of the Power Supply Board Connector cable is inserted into the 1 Pin. (Refer to the above photo.)	2. Match and connect the blue line of the Power Supply Board Connector cable into the 1 Pin.

Table 3-2. Phenomenon-Based Communication Error Check Points

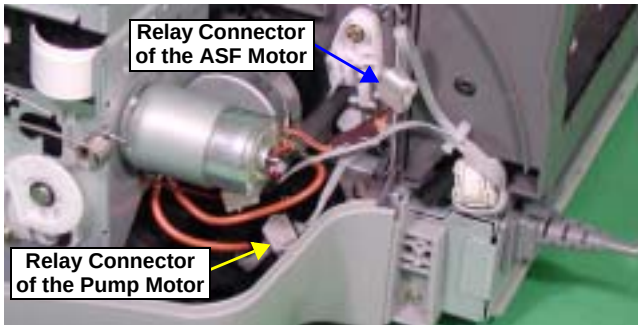
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	The printer does not operate at all.	Power Supply Board	3. Check that the Fuse (F1) on the Power Supply Board is not blown. 	3. Change the Power Supply Board for a new one.
			4. Check the devices on the Power Supply Board for damage.	4. Change the Power Supply Board for a new one.
	After the power-on sequence has started, the LED turns off and the printer does not operate.	Main Board	1. Check that the Relay connector of the ASF Motor and the Relay connector of the Pump Motor are not connected to cause a short circuit. 	1. Change the Main Board for a new one.

Table 3-2. Phenomenon-Based Communication Error Check Points

Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At operation	Operation at power-on is normal, but the error appears when the print jog is sent to the printer.	Interface cable	1. Check that the Interface cable is connected between the PC and printer.	1. Connect the Interface cable to the PC and printer.
			2. Check the Interface cable for wire break.	2. Change the Interface cable for a new one.
		EPSON USB driver	1. When USB is used, check that the EPSON USB driver has been installed in the PC.	1. Install the EPSON USB driver.
		USB	1. Check that the PC and printer are connected via the USB hub.	1. Enter the USB serial No. indicated on the product nameplate. (Refer to Chapter 5 *"ADJUSTMENT"*.)
		IEEE1394	1. Check that the same code as the IEEE1394 QR label code is saved at BA<H> to BE<H> of the EEPROM.	1. Input the code given as the IEEE1394 QR label code. (Refer to Chapter 5 *"ADJUSTMENT"*.)
		Printer driver	1. Check that the Stylus Photo R800 printer driver has been installed.	1. Install the Stylus Photo R800 printer driver.
			2. Check that the connected printer is the Stylus Photo R800.	2. Connect the Stylus Photo R800 printer.
		Main Board	1. Check that a wrong model name has not been input to the EEPROM address (E0<H>) on the Main Board.	1. Using the Adjustment Program, enter the correct model name (save 02 into E0<H>). (Refer to Chapter 5 *"ADJUSTMENT"*.)

Table 3-3. Phenomenon-Based Cover Open Error Check Points

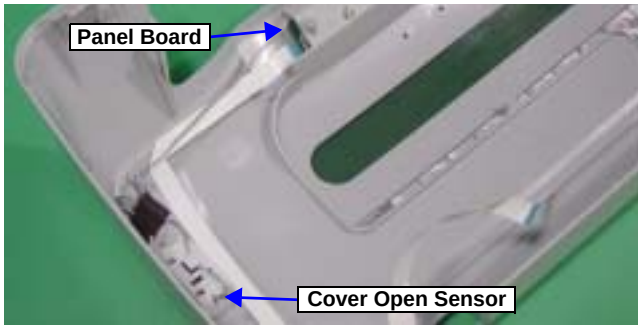
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
During printing	Cover Open Error is displayed during printing in the "Economy" mode.	Printer Cover	1. Check that the Printer Cover is not open.	1. Close the Printer Cover.
	The Printer Cover is in a closed state but Cover Open Error is displayed.	Cover Open Sensor	1. Check that the Connector cable of the Cover Open Sensor is securely connected to the connectors of the Cover Open Sensor and Panel Board. 	1. Connect the Connector cable of the Cover Open Sensor to the connectors of the Cover Open Sensor and Panel Board.
			2. Check the Cover Open Sensor for damage.	2. Change the Cover Open Sensor for a new one.

Table 3-4. Phenomenon-Based Paper Out Error Check Points

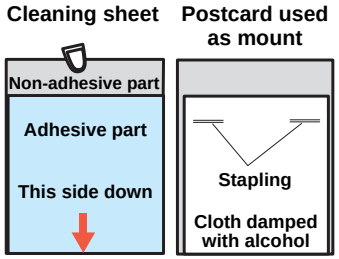
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At operation	When the Paper Switch was pressed, the LD Roller attempt to feed paper but the paper is not fed.	ASF Assy.	1. Check the LD Roller or Retard Roller of the ASF Assy. for paper dust and foreign matter.	1. Using a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

Table 3-4. Phenomenon-Based Paper Out Error Check Points

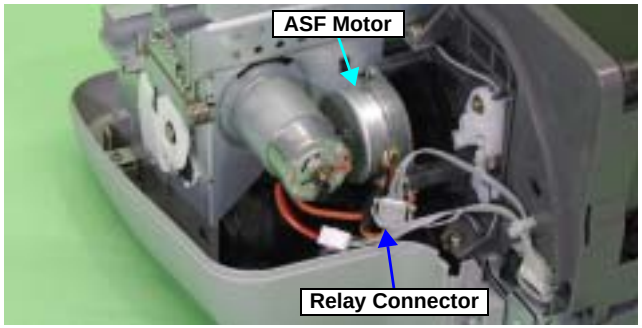
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At operation	Paper is not fed.	ASF Motor	1. Check that the Connector cable of the ASF Motor is connected to the Relay Connector. 	1. Connect the Connector cable of the ASF Motor to the Relay Connector.
			2. Using a tester, check the resistance value of the ASF Motor. Resistance value: 7.4Ω ± 10%	2. If the resistance value is abnormal, change the ASF Motor for a new one.
			3. Check the ASF Motor connector cable for damage.	3. Change the ASF Motor for a new one.

Table 3-4. Phenomenon-Based Paper Out Error Check Points

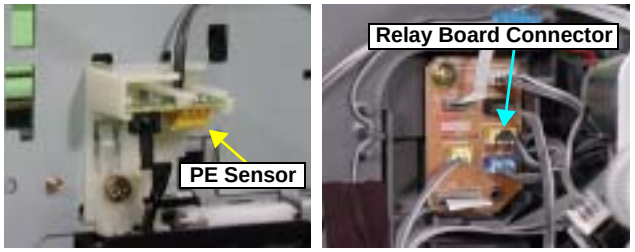
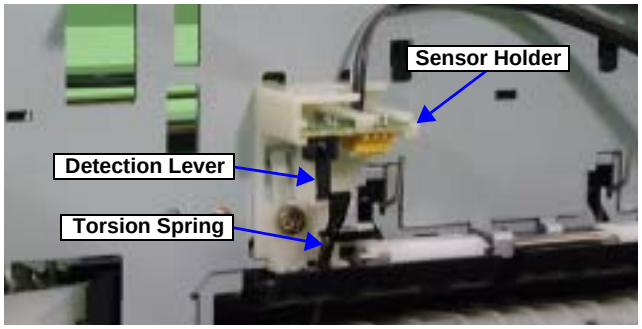
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At operation	Though paper is fed from the ASF Assy., it stops near the PE Sensor Lever.	PE Sensor	1. Check that the Connector cable of the PE Sensor is securely connected to the PE Sensor and Relay Board Connector (CN3). 	1. Connect the Connector cable of the PE Sensor to the PE Sensor and Relay Board Connector.
			2. Check that the Sensor Holder is mounted to the Mechanical frame correctly. 	2. Install the Sensor Holder correctly.
			3. Move the Detection Lever actively by hand in the same state as when the paper passes, and check that the Detection Lever is returned to the original position automatically by the Torsion Spring when released. (Refer to the above photo.)	3. Change the PE Sensor Holder Unit for a new one.
			4. Using a tester, check that the PE Sensor is normal. · Paper present : 2.4V or more · Paper absent : 0.4V or less	4. Change the PE Sensor Holder Unit for a new one.

Table 3-4. Phenomenon-Based Paper Out Error Check Points

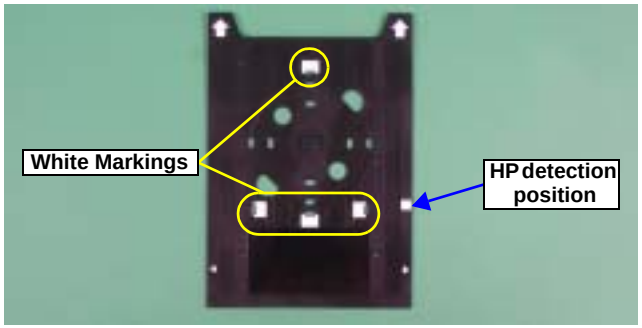
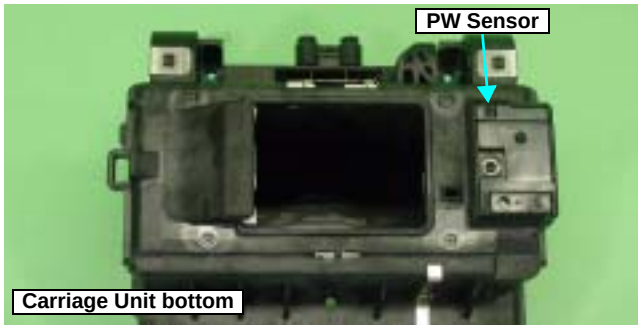
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
The Paper Switch was pressed at the setting of the CD-R Tray.	The CD-R Tray HP detection sequence stops and the Tray is ejected.	CD-R Tray	1. Check the HP detection position or white markings of the CD-R Tray for paper dust and foreign matter. 	1. Remove paper dust and/or foreign matter from the detection portion.
			2. Check the Driven Roller surface for contamination such as paper dust and CD-R coating.	2. Pass plain paper of A4 width from the ASF Assy. several times to remove contamination.
			3. Check that the HP detection position or white markings of the CD-R Tray are not chipped.	3. Change the CD-R Tray for a new one.
The Paper Switch was pressed at the setting of the CD-R Tray or board paper	The CD-R Tray or board paper is fed toward the ASF Assy., but is ejected immediately.	PW Sensor	1. Check the PW Sensor for paper dust, ink, etc. 	1. Clean the PW Sensor surface.
			2. Compare the EEPROM values in two places (50<H> and 51<H>) and check that they are not approximate to each other.	2. Change the PW Sensor for a new one.

Table 3-4. Phenomenon-Based Paper Out Error Check Points

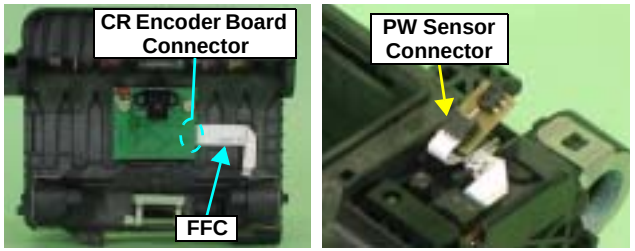
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
The Paper Switch was pressed at the setting of the CD-R Tray or board paper	The trailing edge of the CD-R Tray is fed toward the ASF Assy. up to the Driven Roller of the Upper Paper Guide, and is then fed in an attempt to move it farther, but the Tray is ejected.	PW Sensor	1. Check that the PW Sensor FFC is placed in the specified routing positions and does not make contact with any parts. 	1. Place the PW Sensor FFC in the specified routing positions.
			2. Check that the PW Sensor FFC is not disconnected from the CR Encoder Board and PW Sensor Connectors. (Refer to the above photo.)	2. Connect the FFC to the CR Encoder Board and PW Sensor Connectors.
			3. Check the PW Sensor or PW Sensor FFC for damage.	3. Change the PW Sensor for a new one.

Table 3-5. Phenomenon-Based Paper Jam Error Check Points

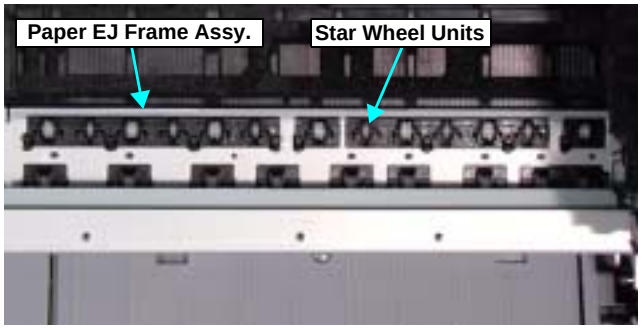
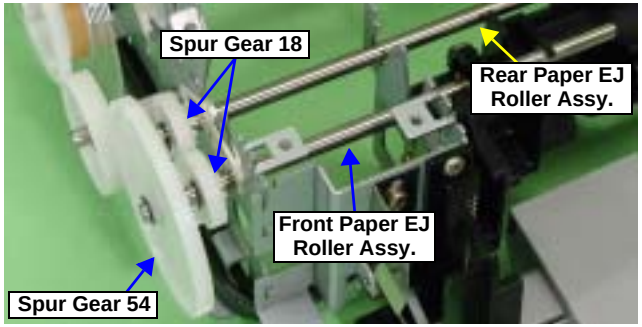
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At operation	At the time of paper ejection, the PF Roller advances the paper but cannot eject it completely.	–	1. Check that the size of the fed paper is not larger than that of the paper set on the driver side.	1. Since the paper length is larger than the specifications, notify the user.
	Paper is not ejected completely and causes a jam near the Paper Eject Frame.	ASF Assy.	1. Check that the paper is fed along the Right Edge Guide.	1. Feed the paper along the Right Edge Guide.
		Paper EJ Frame Assy.	1. Check that the Star Wheel Units have not come off the Paper EJ Frame Assy.  	1. Securely install the Star Wheel Units to the Paper EJ Frame Assy.
			2. Check the Paper EJ Frame Assy. for deformation or damage.	2. Change the Paper EJ Frame Assy. for a new one.
		Spur Gear 54 and Spur Gear 18 (Paper EJ Roller Assy. (front/rear))	1. Check the Spur Gear 54 or Spur Gear 18 for damage.  	1. Change the Front (or Rear) Paper EJ Roller Assy. for a new one.

Table 3-6. Phenomenon-Based Card Loading Error Check Points

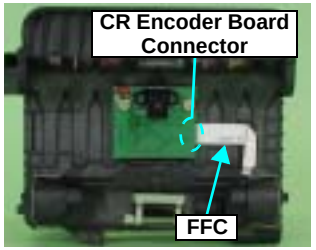
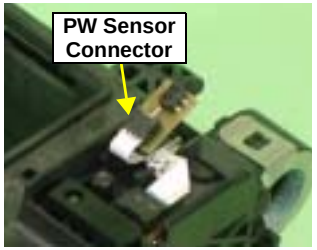
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
During printing	Printing starts but paper is not fed.	–	1. Check that the card size paper is loaded in the portrait orientation.	1. Load the cards of the same size correctly, and press the Paper Switch to eject the jammed paper.
	The card size paper is loaded correctly, but Card Loading Error is displayed.	PW Sensor	1. Check that the PW Sensor FFC is not disconnected from the CR Encoder Board or PW Sensor Connector.  	1. Connect the FFC to the CR Encoder Board or PW Sensor.
			2. Check the PW Sensor or PW Sensor FFC for damage.	2. Change the PW Sensor for a new one.

Table 3-7. Phenomenon-Based Paper Mismatch Error Check Points

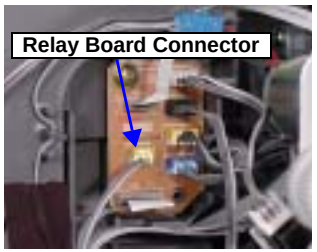
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At operation	When print data are sent, an error is displayed on the LED and EPW3.	Stacker Assy.	1. Check that the Stacker Assy. setting position and paper size set on the driver side are combined correctly.	1. Correctly combine the Stacker Assy. setting position and paper size.
		PG Release Sensor	1. Check that the Connector cable of the PG Release Sensor is securely connected to the PG Release Sensor and Relay Board Connector (CN7).  	1. Connect the Connector cable of the PG Release Sensor to the PG Release Sensor and Relay Board.
			2. Check the PG Release Sensor or Connector cable for damage.	2. Change the PG Release Sensor for a new one.

Table 3-8. Phenomenon-Based Ink Low Check Points

Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At operation or during printing	A message is displayed on the LED and EPW3 during printing.	Ink Cartridge	1. Look at the remaining ink indication of the EPW3 to check the amount of the ink remaining in the Ink Cartridge.	1. Prepare a new Ink Cartridge.

Table 3-9. Phenomenon-Based Ink Out Error Check Points

Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
During printing	After the Carriage has detected the HP, an error is displayed on the LED and EPW3.	Ink Cartridge	1. Look at the remaining ink indication of the EPW3 to check whether the ink remains in the Ink Cartridge.	1. Change the Ink Cartridge for a new one.

Table 3-10. Phenomenon-Based No Ink Cartridge/Ink Cartridge Error Check Points

Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	After the Carriage has detected the HP, an error is displayed on the LED and EPW3.	Ink Cartridge	1. Check that the Ink Cartridge is fitted properly.	1. Fit the Ink Cartridge properly.
			2. Check that the Hook of the Ink Cartridge is not broken. 	2. Change the Ink Cartridge for a new one.
			3. Check that the Memory Chip is not disconnected or not chipped. 	3. Change the Ink Cartridge for a new one.

Table 3-10. Phenomenon-Based No Ink Cartridge/Ink Cartridge Error Check Points

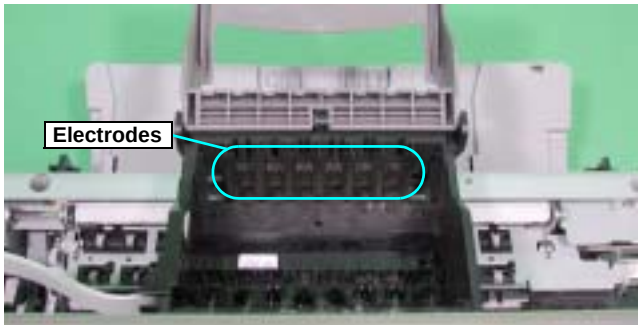
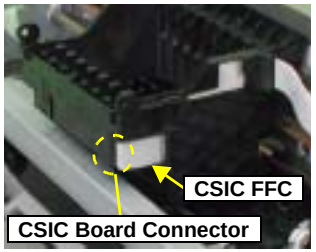
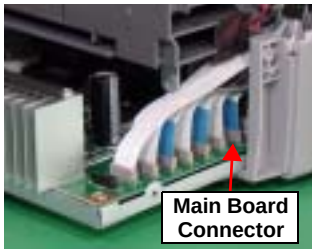
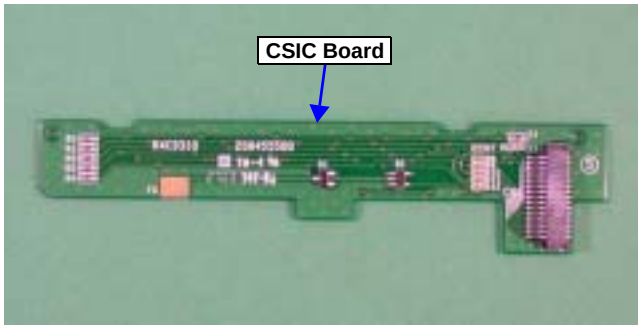
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	After the Carriage has detected the HP, an error is displayed on the LED and EPW3.	Carriage Unit	1. Check that the Electrodes in the Carriage, which make contact with the CSIC Board, are not bent. 	1. Change the Carriage Unit for a new one.
		CSIC FFC	1. Check that the CSIC FFC is connected to the CSIC Board Connector and Main Board Connector (CN10).  	1. Connect the FFC to the CSIC Board and Main Board Connectors.
			2. Check the CSIC FFC for damage.	2. Change the CSIC FFC for a new one.
		CSIC Board	1. Check the CSIC Board for damage. 	1. Change the CSIC Board for a new one.

Table 3-11. Phenomenon-Based Cutter Jam Error Check Points

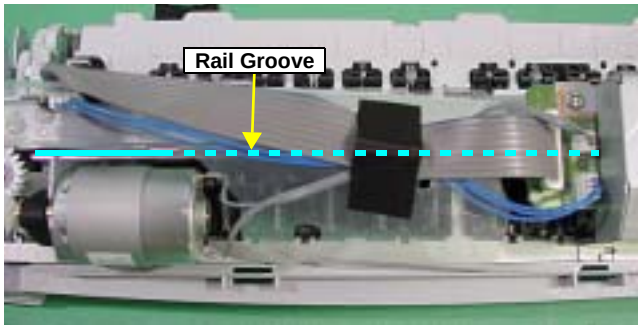
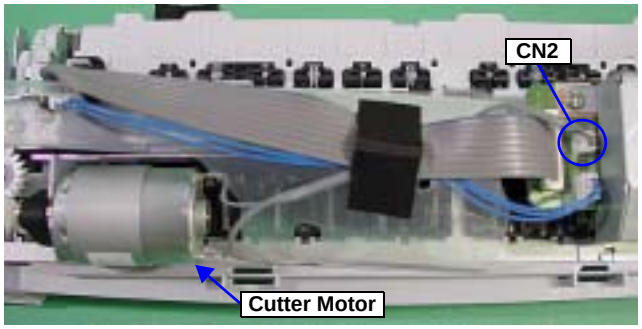
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At roll paper feeding	When the paper roll is fed, the Cutter produces operating noise.	Cutter Unit	1. Check the rail groove of the Cutter for paper dust, foreign matter, etc. 	1. Remove the paper dust, foreign matter, etc. from the rail groove of the Cutter.
After end of printing	The roll paper is not cut after end of printing.	Cutter Motor	1. Check that the Connector cable of the Cutter Motor is connected to the Relay Board Connector (CN2). 	1. Connect the Connector cable of the Cutter Motor to the Relay Board Connector.
			2. Check the Cutter Motor or Connector cable for damage.	2. Change the Cutter Motor for a new one.
At roll paper cutting	The roll paper is cut only halfway.	Cutter Unit	1. Check that the paper used is not other than the EPSON special media.	1. Use the EPSON special media.
			2. Check the Cutter for damage.	2. Change the Cutter Unit for a new one.

Table 3-12. Phenomenon-Based Cutter Position Error Check Points

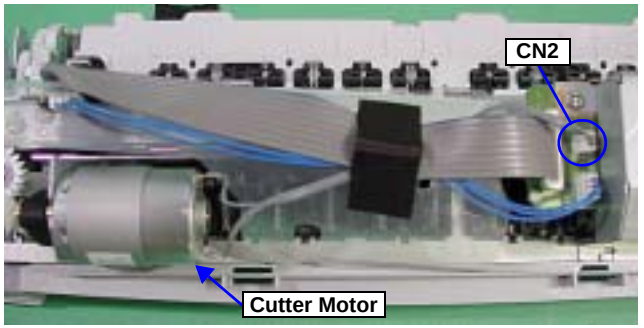
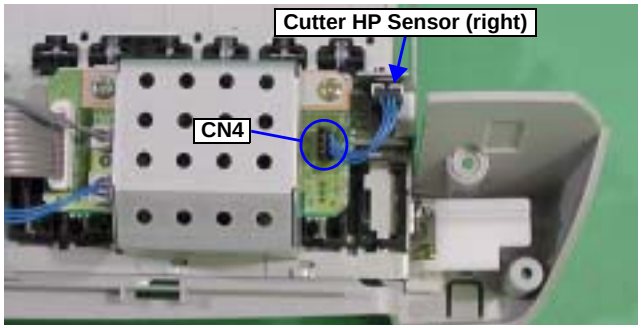
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At Cutter unit fitting (At power-on)	At power-on, an error is displayed on the Paper LED and EPW3.	Cutter Motor	1. Check that the Connector cable of the Cutter Motor is connected to the Relay Board Connector (CN2). (When the Cutter position is other than the HP) 	1. Connect the Connector cable of the Cutter Motor to the Relay Board Connector.
			2. Check the Cutter Motor or Connector cable for damage. (When the Cutter position is other than the HP)	2. Change the Cutter Motor for a new one.
	The Cutter produces operating noise.	Cutter HP Sensor (right)	1. Check the Cutter HP Sensor (right) or the rail groove of the Cutter for paper dust, foreign matter, etc. 	1. Remove the paper dust, foreign matter, etc. from the Cutter HP Sensor (right) or the rail groove of the Cutter.
			2. Check that the Connector cable of the Cutter HP Sensor (right) is connected to the Cuter HP Sensor (right) and Relay Board Connector (CN4).	2. Connect the Connector cable of the Cutter HP Sensor (right) to the Cuter HP Sensor (right) and Relay Board Connector.
			3. Check the Cutter HP Sensor (right) for damage.	3. Change the Cutter HP Sensor (right) for a new one.

Table 3-13. Phenomenon-Based Maintenance Request Check Points

Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the printer does not operate at all.	Waste Ink Pads	1. Using the Adjustment Program, check that the Protection Counter A+B value is the following count or more. ■ Home side : 14787 count or more ■ Opposite-to-home side : 17115 count or more	1. Change the Waste Ink Pads and reset the Protection Counter A+B value with the Adjustment Program. ■ Home side: 24<H>, 25<H> ■ Opposite-to-home side: 26<H>, 27<H>

Table 3-14. Phenomenon-Based Fatal Error Check Points

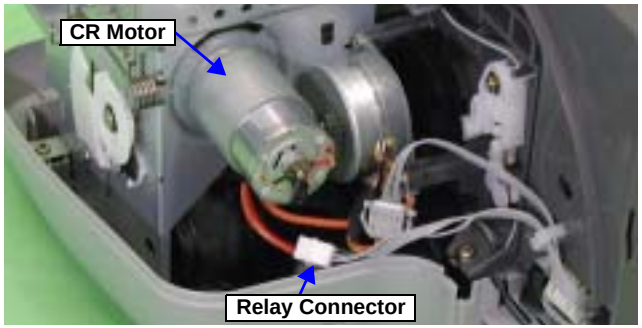
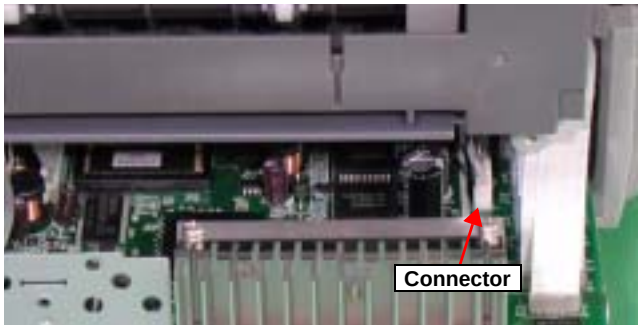
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the CR Motor does not operate at all.	CR Motor	1. Check that the CR Motor connector cable is connected to the Relay Connector. 	1. Connect the CR Motor connector to the Relay Connector.
			2. Using a tester, check the resistance value of the CR Motor. Resistance value: 24.4Ω ± 15%	2. If the resistance value is abnormal, change the CR Motor for a new one.
			3. Check the CR Motor connector cable for damage.	3. Change the CR Motor for a new one.
		Relay Connector Cable	1. Check that the Relay Connector Cable is connected to the Main Board Connector (CN4). 	1. Connect the Relay Connector Cable to the Main Board.
			2. Check the Relay Connector Cable for damage.	2. Change the Relay Connector Cable for a new one.

Table 3-14. Phenomenon-Based Fatal Error Check Points

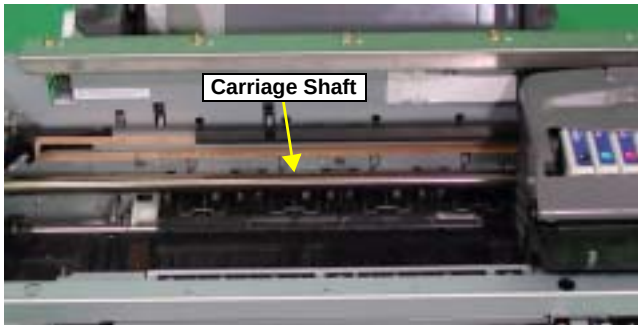
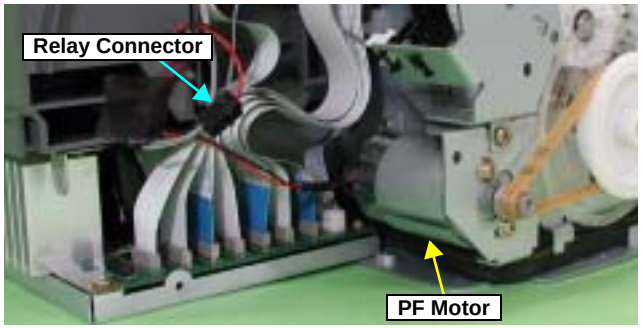
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	The power-on sequence is executed but Fatal error is displayed.	CR drive system	1. Check that the Carriage Shaft is lubricated with grease. 	1. Wipe the surface of the Carriage Shaft with a dry, soft cloth, and lubricate the Carriage Shaft with grease G-70. (Refer to Chapter 6 *"MAINTENANCE"*.)
	At power-on, the PF Motor does not operate at all.	PF Motor	1. Check that the PF Motor connector cable is connected to the Relay Connector. 	1. Connect the PF Motor connector cable to the Relay Connector.
			2. Using a tester, check the resistance value of the PF Motor. Resistance value: 22.3Ω ± 25%	2. If the resistance value is abnormal, change the PF Motor for a new one.
			3. Check the PF Motor connector cable for damage.	3. Change the PF Motor Cable for a new one.

Table 3-14. Phenomenon-Based Fatal Error Check Points

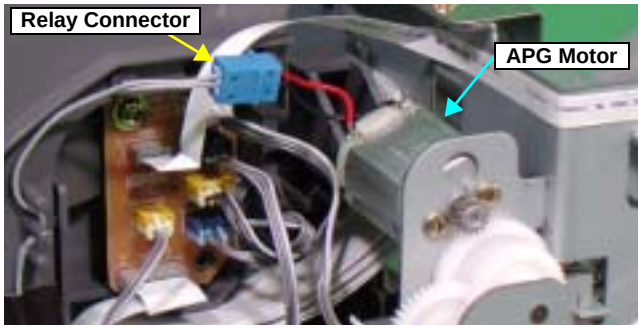
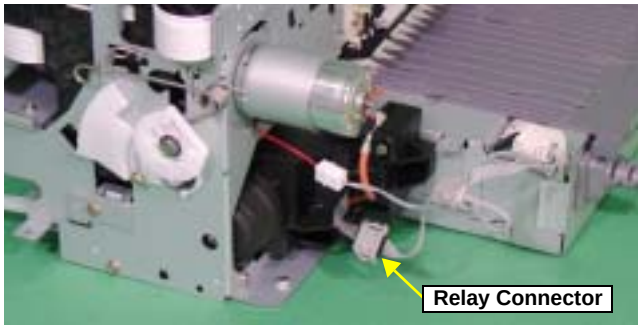
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the APG Motor does not operate at all.	APG Motor	1. Check that the APG Motor connector cable is connected to the Relay Connector. 	1. Connect the APG Motor connector cable to the Relay Connector.
			2. Using a tester, check the resistance value of the APG Motor. Resistance value: 64.7Ω ± 15%	2. If the resistance value is abnormal, change the APG Motor for a new one.
			3. Check the APG Motor connector cable for damage.	3. Change the APG Motor Cable for a new one.
	At power-on, the Pump Motor does not operate at all.	Pump Motor	1. Check that the Pump Motor connector cable is connected to the Relay Connector. 	1. Connect the Pump Motor connector cable to the Relay Connector.
			2. Using a tester, check the resistance value of the Pump Motor. Resistance value: 10.3Ω ± 10%	2. If the resistance value is abnormal, change the Ink System Unit for a new one.
			3. Check the Pump Motor connector cable for damage.	3. Change the Ink System Unit Cable for a new one.

Table 3-14. Phenomenon-Based Fatal Error Check Points

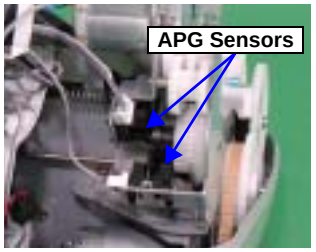
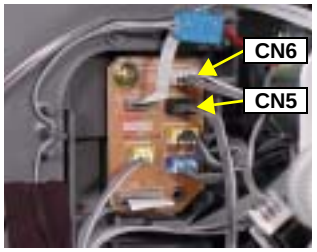
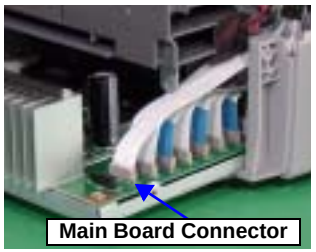
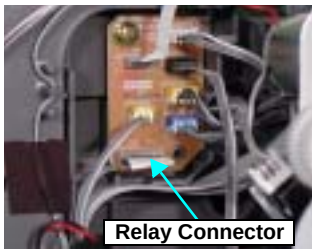
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	While the power-on sequence is being executed, Fatal error is displayed.	APG Sensor	1. Check that the APG Sensor Connector cables are connected to the APG Sensors and Relay Board Connectors (CN5 and CN6).  	1. Connect the APG Sensor Connector cables to the APG Sensors and Relay Board Connectors.
			2. Check the APG Sensors for damage.	2. Change the APG Sensors for new ones.
		Relay FFC	1. Check that the Relay FFC is connected to the Relay Board Connector (CN1) and Main Board Connector (CN5).  	1. Connect the Relay FFC to the Relay Board and Main Board Connectors.
			2. Check the Relay FFC for damage.	2. Change the Relay FFC Cable for a new one.

Table 3-14. Phenomenon-Based Fatal Error Check Points

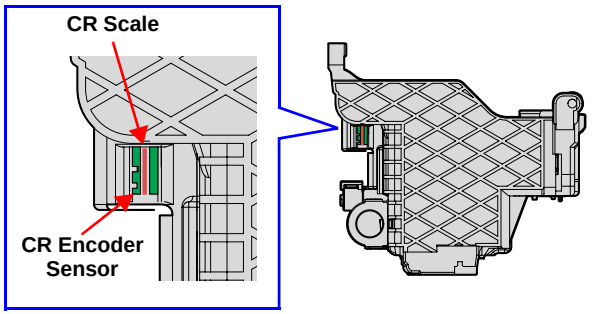
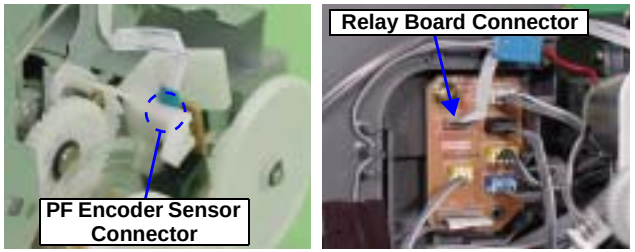
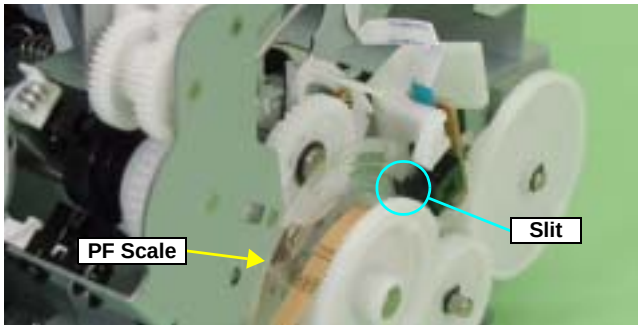
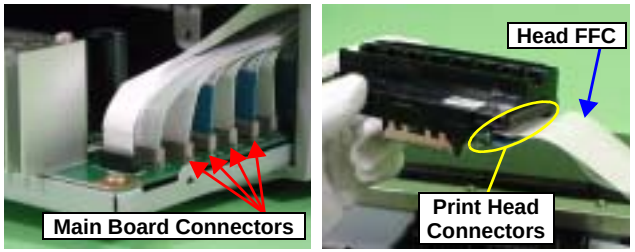
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the Carriage Unit moves away from the home position and collides with the left of the Frame.	CR Scale	1. Check that the CR Scale is inserted in the slit of the CR Encoder Sensor. 	1. Insert the CR Scale into the slit of the CR Encoder Sensor.
			2. Check the CR Scale for damage and contamination.	2. Wipe contamination completely or change the CR Scale for a new one.
		CR Encoder Sensor	1. Check the CR Encoder Sensor for paper dust, etc.	1. Remove the paper dust, etc. from the CR Encoder Sensor.
			2. Check the CR Encoder Sensor for damage.	2. Change the CR Encoder Sensor Cable for a new one.
	At power-on, the PF Roller rotates fast about a half turn.	PF Encoder Sensor	1. Check that the PF Encoder Sensor is mounted correctly.	1. Install the PF Encoder Sensor correctly.
			2. Check that the FFC of the PF Encoder Sensor is securely connected to the PF Encoder Sensor Connector and Relay Board Connector (CN9). 	2. Connect the PF Encoder Sensor FFC to the PF Encoder Sensor and Relay Board Connectors.
			3. Check the PF Encoder Sensor for paper dust, etc.	3. Remove the paper dust, etc. from the PF Encoder Sensor.
			4. Check the PF Encoder Sensor for damage.	4. Change the PF Encoder Sensor Cable for a new one.

Table 3-14. Phenomenon-Based Fatal Error Check Points

Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the PF Roller rotates fast about a half turn.	PF Scale	1. Check that the PF Scale is inserted in the slit of the PF Encoder Sensor.  	1. Install the PF Scale in the slit of the PF Encoder Sensor correctly.
			2. Check the PF Scale for damage or contamination.	2. Change the PF Scale for a new one.
During printing	Before start of printing, Initial Filling is executed and printing is then started. Ink is not delivered and paper stops midway.	Head FFC	1. Check that the Head FFC is securely connected to the Print Head Connectors and Main Board Connectors (CN11, CN12, CN13, CN14).  	1. Connect the Head FFC to the Print Head and Main Board Connectors.
			2. Check the Head FFC for damage.	2. Change the Head FFC for a new one.
	Ink is not delivered from most nozzles.	Print Head	1. Check for occurrence of Head Hot.	1. Change the Print Head for a new one.

3.1.2 Superficial Phenomenon-Based Troubleshooting

This section applies to the fault locations of the error states (print quality fault and abnormal noise) other than the error states (LED and EPW3) in the previous section.

Table 3-15. Print Quality Fault Check Points

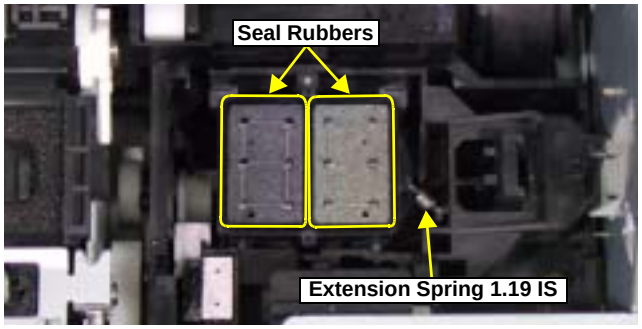
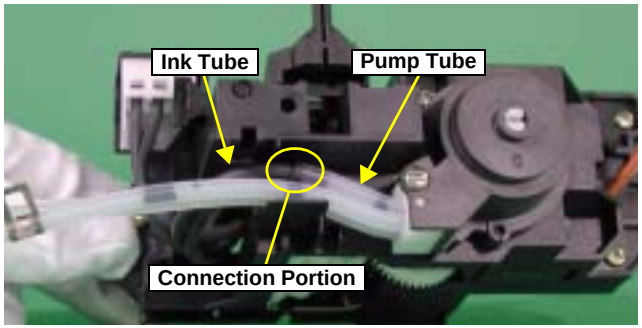
Print Quality State	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
Dot missing and mixed colors	[Phenomenon 1] • In the cleaning sequence, the Ink System Unit operates properly but ink is not ejected to the Waste ink pads. • Ink is not sucked from the Print Head into the Cap at all. Hence, printing is not executed if a print command is given to the printer. (Dot missing)	Ink System Unit (Cap Unit)	1. Check for foreign matter around the Seal Rubber on the Cap Unit. 	1. Remove the foreign matter around the Seal Rubber securely.
			2. Check that the Ink Tube is connected to the Pump Tube. 	2. Connect the Ink Tube to the Pump Tube securely.
			3. Check that the Extension Spring 1.19 IS is correctly installed to the Cap Unit.	3. Change the Ink System Unit for a new one.

Table 3-15. Print Quality Fault Check Points

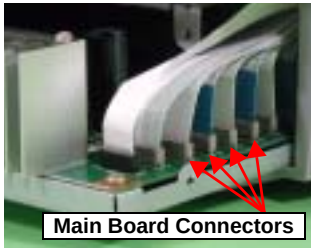
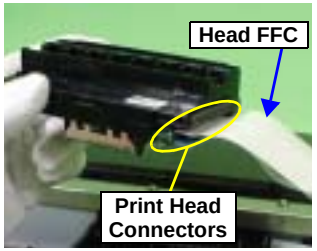
Print Quality State	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
Dot missing and mixed colors (Continued)	[Phenomenon 2] In the cleaning sequence, ink is ejected to the Waste Ink Pads. However, Dot missing/ displacement occurs in all nozzles during printing and this problem is not resolved after several times of cleaning. (Dot missing)	Print Head	1. Check that each segment is printed correctly in the Nozzle Check Pattern	1. Perform Head Cleaning and check the Nozzle Check Pattern.
			2. Check that the Head FFC is securely connected to the Print Head Connectors and Main Board Connectors (CN11, CN12, CN13, CN14).  	2. Connect the Head FFC to the Print Head and Main Board Connectors.
			3. Check the Head FFC for damage.	3. Change the Head FFC for a new one. If the problem still persists, also change the Print Head.
		Main Board	1. Check the Main Board for damage.	1. Change the Main Board for a new one.

Table 3-15. Print Quality Fault Check Points

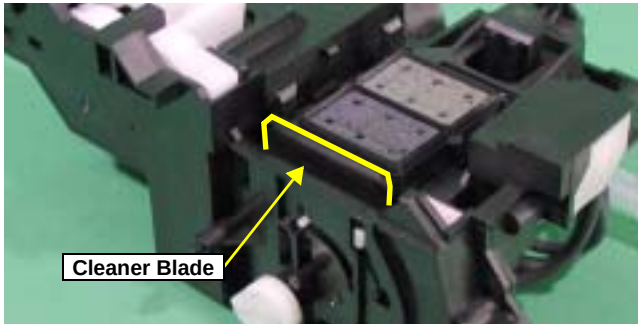
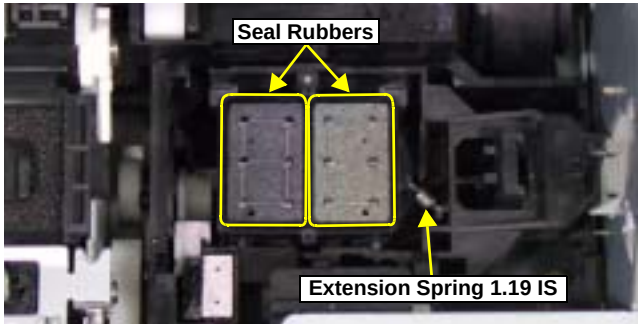
Print Quality State	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
Dot missing and mixed colors (Continued)	[Phenomenon 3] In the cleaning sequence, ink is ejected to the Waste Ink Pads. (This means that the Pump Unit and Cap Unit operate properly.) However, Dot missing is not resolved in indefinite nozzles after cleaning has been executed several times. (Dot missing/ mixed colors) [Phenomenon 4] In the cleaning sequence, ink is ejected to the Waste Ink Pads. However, drawing operation is not performed properly, resulting in mixture of colors. (Mixed colors)	Ink Cartridge	1. Look at the remaining ink indication of the EPW3 to check for the ink remaining in the Ink Cartridge.	1. Change the Ink Cartridge for a new one.
		Ink System Unit (Cap Unit)	1. Check that the Cleaner Blade is mounted on the Cleaning Lever correctly.  	1. Change the Cleaner Blade for a new one.
			2. Check for foreign matter around the Seal Rubber on the Cap Unit.  	2. Change the Ink System Unit for a new one.

Table 3-15. Print Quality Fault Check Points

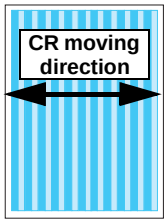
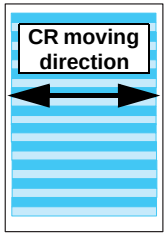
Print Quality State	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
White streak/color unevenness occurrence	Vertical stripes appear relative to the CR moving direction and printing is uneven.  * If the problem is not solved, change the CR Motor for a new one.	Adjustment	1. For printing in the Bi-D mode, check that the Bi-D Adjustment has been performed properly.	1. Perform Bi-D Adjustment to eliminate displacements between the upper and lower rules. (Refer to Chapter 5 *"ADJUSTMENT"*.)
		Print Head	1. Check that each segment is printed correctly in the Nozzle Check Pattern.	1. Perform Head Cleaning and check the Nozzle Check Pattern. (Refer to Chapter 5 *"ADJUSTMENT"*.) If the problem is not solved, change the Print Head for a new one.
		Carriage Shaft	1. Check the surfaces of the Carriage Shaft for foreign matter.	1. Remove foreign matter from the Carriage Shaft.
			2. Check that the Carriage Shaft is fully lubricated with grease.	2. Wipe the grease applied to the Carriage Shaft with a dry, soft cloth, and then apply grease (G-70). (Refer to Chapter 6 *"MAINTENANCE"*.)
			3. Check that the Carriage Shaft are mounted horizontally.	3. Reassemble the Carriage Shaft correctly.
			4. Check the Carriage Shaft for damage.	4. Change the Carriage Shaft for a new one.
	Narrow stripes of the same width appear horizontally relative to the CR moving direction.  * If the problem is not solved, change the PF Motor for a new one.	Printer Driver and Exclusive Paper	1. Check that adequate paper is used according to the setting of the Printer Driver.	1. Use adequate paper according to the setting of the Printer Driver.
		Print Head	1. Check that each segment is printed correctly in the Nozzle Check Pattern.	1. Perform Head Cleaning and check the Nozzle Check Pattern. (Refer to Chapter 5 *"ADJUSTMENT"*.) If the problem is not solved, change the Print Head for a new one.
		PF Roller	1. Check the surface of the PF Roller for foreign matter.	1. Clean the PF Roller surface carefully.
			2. Check the PF Roller for damage.	2. Change the PF Roller for a new one.

Table 3-15. Print Quality Fault Check Points

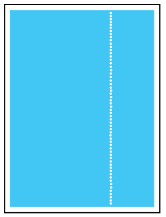
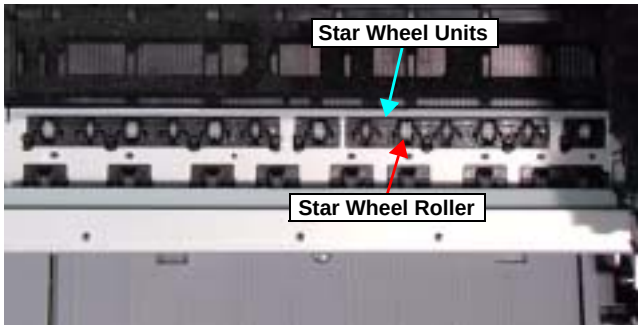
Print Quality State	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
White streak/color unevenness occurrence (Continued)	White streaks/color unevenness occurs horizontally in a fixed cycle during 360dpi printing.	Adjustment	1. Check that PF Adjustment is executed properly.	1. Perform PF Adjustment properly. (Refer to Chapter 5 *"ADJUSTMENT"*.)
			2. Check for Dot missing.	2. Change the Ink System Unit for a new one.
	Star Wheel Rollers traces appear relative to the CR moving direction. 	Paper EJ Frame Assy.	1. Check that the Star Wheel Units have not come off or the Star Wheel Rollers turn. 	1. Install the Star Wheel Units to the Paper EJ Frame Assy. correctly.
	Printing is executed but blur occurs.	Printer Driver and Exclusive Paper	1. Check that adequate paper is used according to the setting of the Printer Driver.	1. Use adequate paper according to the setting of the Printer Driver.
		Print Head	1. Using the Adjustment Program, check that the correct Head ID has been written to the EEPROM.	1. Using the Adjustment Program, enter the 31- digit code of the Head ID to the EEPROM. (Refer to Chapter 5 *"ADJUSTMENT"*.)
Occurrence of Paper EJ Roller traces	Paper EJ Roller traces occur during printing of print paper or CD-R.	Printer Driver and Exclusive Paper	1. Check that adequate paper is used according to the setting of the Printer Driver.	1. Use adequate paper according to the setting of the Printer Driver.

Table 3-15. Print Quality Fault Check Points

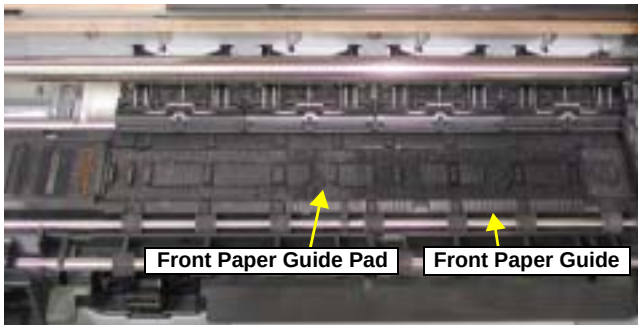
Print Quality State	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
Ink stain of paper	Ink stain occurs at the back or end of the print paper.	Front Paper Guide Pad	1. Check that heaps of ink are not formed on the Front Paper Guide Pad and that the Front Paper Guide Pad is installed securely and evenly in the setting position. 	1. If heaps of ink are formed, replace the Front Paper Guide. If it has been confirmed that the Ink pads have risen, reinstall the Front Paper Guide Pad correctly.
	When the paper size in the sent print data is larger than the size of the fed paper, data are printed on the Front Paper Guide, extending off the paper.	PW Sensor	1. Check that the PW Sensor FFC is connected.	1. Connect the PW Sensor FFC.
			2. Check that the PW Sensor is not faulty.	2. Change the PW Sensor for a new one.
	Ink sticks to other than the print area of the paper, resulting in contamination.	Paper EJ Frame Assy.	1. Check the Star Wheel Rollers for ink stain.	1. Clean the Star Wheel Rollers with a soft cloth.
		Front Paper Guide	1. Check the Front Paper Guide for ink stain.	1. Clean the Front Paper Guide with a soft cloth.
		Front Paper Guide Pad	1. Check that ink heaps are formed on the Front Paper Guide Pad.	1. Change the Front Paper Guide for a new one.

Table 3-15. Print Quality Fault Check Points

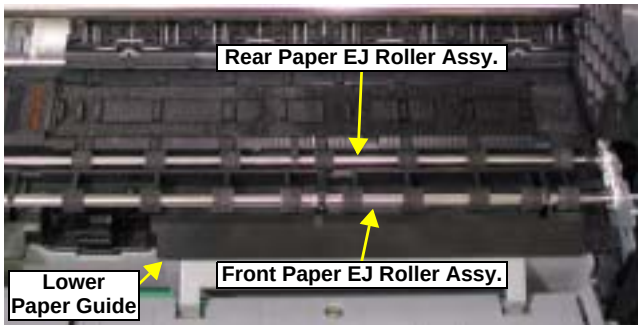
Print Quality State	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
Ink stain of paper (Continued)	Ink sticks to other than the print area of the paper, resulting in contamination.	Lower Paper Guide	1. Check the Lower Paper Guide for ink stain.  	1. Clean the Lower Paper Guide with a soft cloth.
		Paper EJ Roller Assy. (front/rear)	1. Check the Paper EJ Roller Assy. (front/rear) for ink stain.	1. Clean the Paper EJ Roller Assy. (front/ rear) with a soft cloth.
		Driven Rollers	1. Check the Driven Rollers for ink stain.  	1. Clean the Driven Rollers with a soft cloth.

Table 3-15. Print Quality Fault Check Points

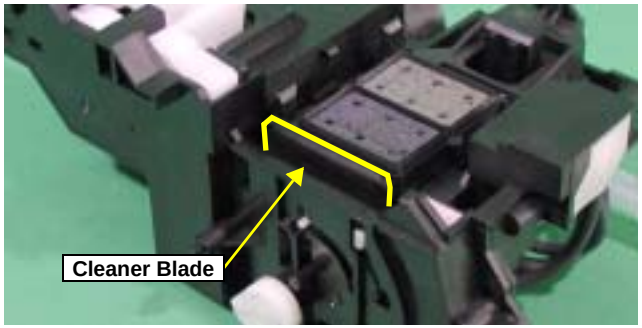
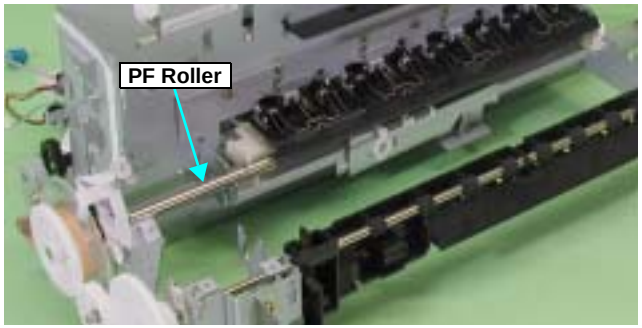
Print Quality State	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
Ink stain of paper (Continued)	Ink sticks to other than the print area of the paper, resulting in contamination.	Ink System Unit	1. Check that wiping operation was performed properly. 	1. Install the Cleaner blade correctly or change it for a new one.
		PF Roller	1. Check the PF Roller for ink stain. 	1. Clean the PF Roller with a soft cloth.

Table 3-15. Print Quality Fault Check Points

Print Quality State	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
Image graininess	The image graininess is poor in all print modes or the image looks rough.	Improper adjustment, Main Board or Print Head	1. Check that PG, Bi-D and Head Angular Adjustments have been made properly.	1. Make adjustments according to the specified adjustment priority. (Refer to Chapter 5 *"ADJUSTMENT"*.)
			2. Print the adjustment check patterns and check how rough the image looks.	2. If the image graininess is not improved after adjustment, change the Main Board for a new one.
	The image graininess is poor only in the 2880dpi print modes or the image looks rough.	Improper adjustment, Main Board or Print Head	1. After making sure that PG, Bi-D and Head Angular Adjustments have been made correctly, check whether PW Sensor has been performed properly.	1. Make adjustments according to the specified adjustment priority. (Refer to Chapter 5 *"ADJUSTMENT"*.)
			2. Print the adjustment check patterns and check how rough the image looks.	2. If the image graininess is not improved after adjustment, change the Print Head and Main Board in this order, and check the image graininess.
Color of image	The whole image is reddish.	Improper adjustment or Print Head	1. Check that the PG Adjustment value is proper.	1. Make adjustments according to the specified adjustment priority. (Refer to Chapter 5 *"ADJUSTMENT"*.)
			2. Check that Bi-D and Head Angular Adjustments have been made properly.	2. Make adjustments according to the specified adjustment priority. (Refer to Chapter 5 *"ADJUSTMENT"*.)
			3. Print the adjustment check patterns and check the image color.	3. If the image color does not change after adjustment, change the Print Head for a new one.
Borderless Printing	Bordered printing is executed for borderless printing.	PW Sensor	1. Check if the paper powder or scrap of the paper is on the Front Paper Guide.	1. Remove the paper powder or scrap of the paper.
			2. Check that the PW Sensor is operating normally. Print the adjustment check patterns with the Adjustment Program, and check that the clip function is executed normally. (The clip function is executed normally if an about 5mm margin is provided on the left of the first gray band pattern in the patterns.)	2. Change the PW Sensor for a new one if it has been confirmed in the adjustment check patterns of the Adjustment Program that the clip function is not executed. (Refer to Chapter 5 *"ADJUSTMENT"*.)

Table 3-16. Phenomenon-Based Abnormal Noise Check Point

Print Quality State	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
–	Printing operation is performed normally but abnormal noise is produced at power-on or between operations.	Carriage Shaft	1. Check that the Carriage Shaft is fully lubricated with grease.	1. Wipe the grease applied to the Carriage Shaft with a dry, soft cloth, and then apply grease (G-70). (Refer to Chapter 6 *"MAINTENANCE"*.)

CHAPTER

4

DISASSEMBLY & ASSEMBLY

4.1 Overview

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

- WARNING
  Procedures that could result in injury or loss of life, if cautions are not taken, are described under the heading "WARNING".
- CAUTION
  Precautions for any disassembly or assembly procedures are described under the heading "CAUTION".
- CHECK POINT
  Tips for disassembling procedures are described under the heading "CHECK POINT".
- REASSEMBLY
  If the assembling procedure is different from the reverse procedure of disassembling, it is described under the heading "REASSEMBLY".
- ADJUSTMENT REQUIRED
  Any adjustments required after disassembling or assembling are described under the heading "ADJUSTMENT REQUIRED".

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

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

4.1.1 Precautions

Before starting the disassembling/reassembling work of this product, always read the descriptions under the following headings "WARNING" and "CAUTION" carefully.

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

CAUTION

- **When the printer model uses the HAV Ink Cartridges, transport it after removing the Ink Cartridges. Especially for air transportation, always remove the Ink Cartridges before transportation since ink will flow into the Cap Unit via the Print Head with the reduction of the atmospheric pressure, causing ink leakage.**
- **Use only the recommended tools for disassembly, reassembly and adjustment. (Refer to *Table 4-1"Tool List"*.)**
- **Tighten screws to the specified torques.**
- **Use the specified lubricants and adhesives.**
  Make the necessary adjustments under the instructions given for disassembling.
  (Refer to Chapter 5 "Adjustment".)

4.1.2 Tools to Be Used

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

Table 4-1. Tool List

Tool Name	Supplier	Code
Phillips Screw Driver (No.1)	○	1080530
Phillips Screw Driver (No.2)	○	1080532
Standard Screwdriver	○	1080527
Tweezers	○	1080561
Needle nose pliers	○	1080564
Acetate Tape	○	1003963
Sonic Tension Meter	○	1231678

○: Available in the market

4.1.3 Screw List

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

Table 4-2. Used Screw List

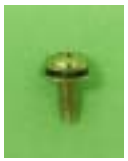
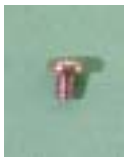
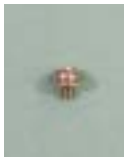
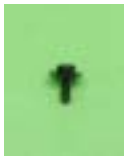
Appearance	Specifications	Appearance	Specifications
	1) C.B.S 3x10		2) C.B.S 3x6
	3) C.B.P 3x6		4) C.B.S 3x8
	5) C.B.P 3x12		6) C.B.P 3x8
	7) C.B.S (P4) 3x8		8) CR Mount Shaft
	9) C.P 3x4		10) C.B.P 2.6x8

Table 4-2. Used Screw List

Appearance	Specifications	Appearance	Specifications
	11) C.B.S (P4) 3x6		12) C.C 3x4
	13) C.P.B (P1) 1.7x5		14) C.B.P 2.6x5

4.1.4 Pre-Shipment Checks

When returning this product to the user after completion of printer repair, check that the work is complete using the following table.

Table 4-3. Servicing Completion Pre-Shipment Check List

Class	Component	Check Item	Check Field
Main Unit	Self-test	Is the operation normal?	☐ Checked / ☐ Not necessary
	On-line Test	Is the printing successful?	☐ Checked / ☐ Not necessary
	Print Head	Is ink discharged normally from all the nozzles?	☐ Checked / ☐ Not necessary
	Carriage Mechanism	Does it move smoothly?	☐ Checked / ☐ Not necessary
		Is there any abnormal noise during its operation?	☐ Checked / ☐ Not necessary
		Is there any dirt or foreign objects on the CR Shaft?	☐ Checked / ☐ Not necessary
		Is the CR Motor at the correct temperature?	☐ Checked / ☐ Not necessary
	Paper Feeding Mechanism	Is paper advanced smoothly?	☐ Checked / ☐ Not necessary
		No paper jamming?	☐ Checked / ☐ Not necessary
		No paper skew?	☐ Checked / ☐ Not necessary
		No multiple feeding?	☐ Checked / ☐ Not necessary
		No abnormal noise?	☐ Checked / ☐ Not necessary
		Is the PF Motor at correct temperature?	☐ Checked / ☐ Not necessary
		Is the paper path free of any obstructions?	☐ Checked / ☐ Not necessary
Adjustment	Specified Adjustment	Are all the adjustment done correctly?	☐ Checked / ☐ Not necessary
Lubrication	Specified Lubrication	Are all the lubrication made at the specified points?	☐ Checked / ☐ Not necessary
		Is the amount of lubrication correct?	☐ Checked / ☐ Not necessary
Function	ROM Version	Version: _____	☐ Checked / ☐ Not necessary
Packing	Ink Cartridge	Have the ink cartridges been removed?	☐ Checked / ☐ Not necessary
	Protective Materials	Have all relevant protective materials been attached to the printer?	☐ Checked / ☐ Not necessary
Others	CD-R Tray	Is the operation normal?	☐ Checked / ☐ Not necessary
	Cutter Unit	Is the operation normal?	☐ Checked / ☐ Not necessary
	Attachments, Accessories	Have all the relevant items been included in the package?	☐ Checked / ☐ Not necessary

4.2 Disassembly

A disassembling flowchart is shown below. When disassembling any unit, refer to the page number shown in the following flowchart.

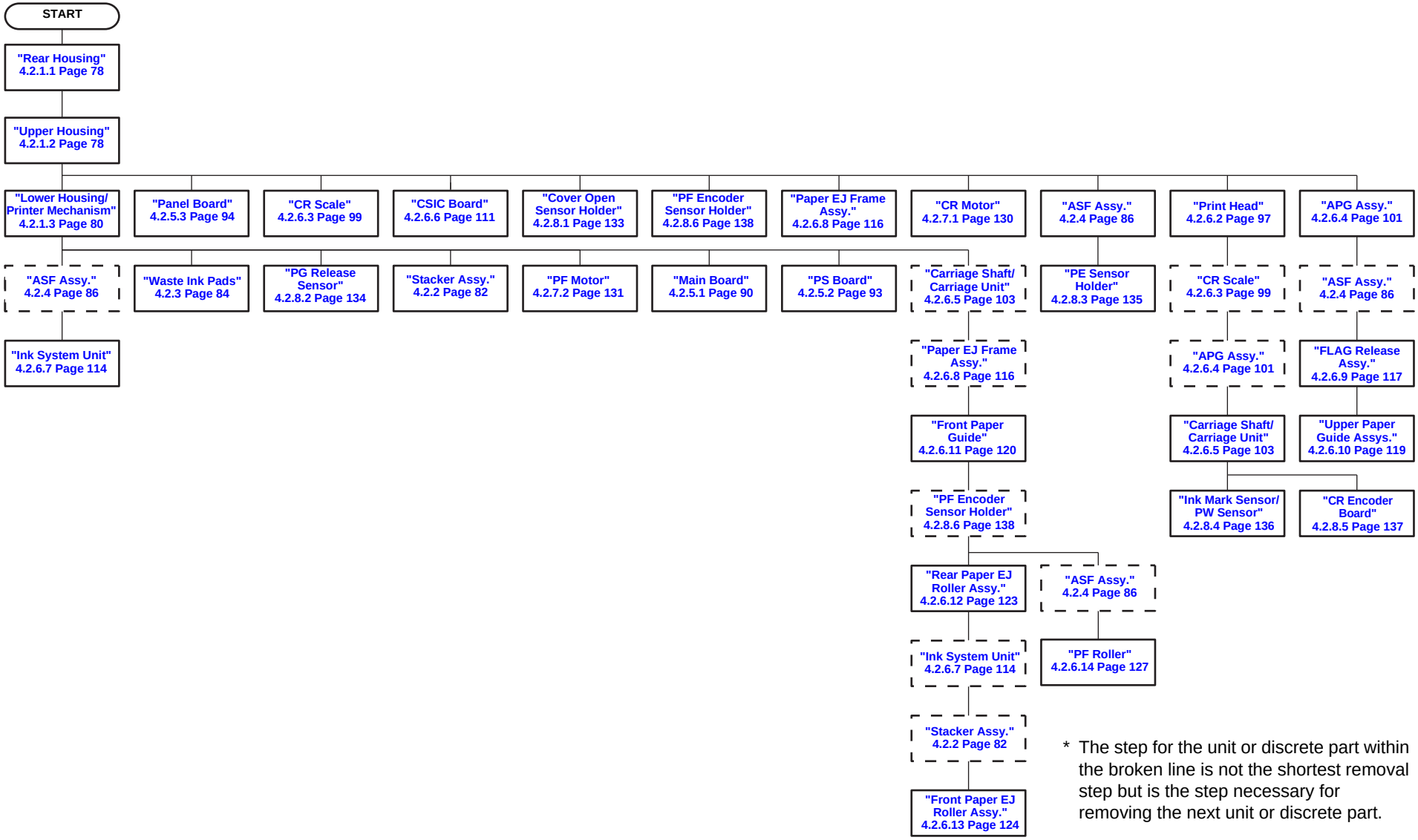


Figure 4-1. Disassembling Procedure Flowchart