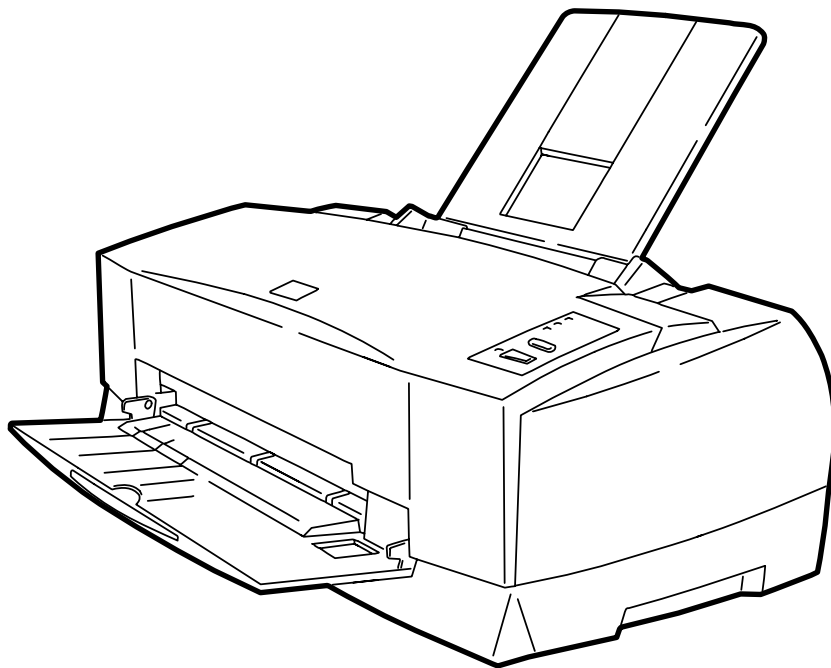


EPSON

COLOR INK JET PRINTER

EPSON Stylus COLOR 800

SERVICE MANUAL



SEIKO EPSON CORPORATION

4007371

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PRECAUTIONS

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

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

CAUTION 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.

WARNING

1. ALWAYS DISCONNECT THE PRODUCT FROM BOTH 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.

CAUTION

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

PREFACE

This manual describes functions, theory of electrical and mechanical operations, maintenance, and repair of EPSON Stylus COLOR 800.

The instructions and procedures included herein are intended for the experience repair technician, and attention should be given to die precautions on the preceding page. The Chapters are organized as follows:

CHAPTER 1. GENERAL DESCRIPTION

Provides a general product overview, lists specifications, and illustrates the main components of the printer.

CHAPTER 2. OPERATING PRINCIPLES

Describes the theory of printer operation.

CHAPTER 3. DISASSEMBLY AND ASSEMBLY

Includes a step-by-step guide for product disassembly and assembly.

CHAPTER 4. ADJUSTMENT

Includes a step-by-step guide for adjustment.

CHAPTER 5. TROUBLESHOOTING

Provides EPSON-approved techniques for troubleshooting.

CHAPTER 6. MAINTENANCE

Describes preventive maintenance techniques and lists lubricants and adhesives required to service the equipment.

APPENDIX

Describes connector pin assignments, circuit diagrams, circuit board component layout and exploded diagram.

The contents of this manual are subject to change without notice.

REVISION SHEET

Revision	Issued Data	Contents
Rev. A	FEBRUARY 17 1997	First issue
Rev. B	MARCH 13 1997	The following chapters have been revised: Chapter 1 (Pages I-I, 1-2, I-6) Chapter 2 (Pages 2-I 4, 2-20, 2-23) Chapter 3 (Page 3-I 0) Chapter 4 (Pages 4-2 through to 4-25)
Rev. B	MAY 22 1997	The following chapters have been revised: Chapter 2 (Pages 2-8, 2-I 6) Chapter 5 (Pages 5-8 through to 5-I 2. 5-I 8)
Rev. C	MAY 22 1997	The following chapter has been revised: Chapter 2 (Pages 2-20)

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CHAPTER 3.	DISASSEMBLY AND ASSEMBLY
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Chapter 1

Product Description

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1.1 Features

The EPSON Stylus COLOR 800 is a high-performance color ink jet printer designed for the small office/home office (SOHO) market. The main features of this printer are:

High print quality for color graphics

- High resolution 1440 (H) x 720 (V) dpi printing
- Colors Cyan, Magenta, Yellow, Black
- Printing method Traditional and new Microweave printing
- Smaller dot diameter for image improvement

High-speed printing

- 400 cps in LQ mode
- 533 cps in Draft mode

Built-in auto sheet feeder with a wide page capability and high capacity

This printer holds:

- 100 cut-sheets (55 g/m²)
- 10 envelopes
- 20 sheets of glossy paper
- 30 index cards
- 50 transparency film sheets
- 70 sheets of special paper

2 interfaces built-in and 1 optional interface card

- Mac serial interface (up to approximately 900K bps)
- Bidirectional parallel interface (IEEE-1284 level 1 device)
- Optional Type-B interface card

4 scalable fonts and 5 LQ fonts:

- Scalable fonts Roman T, Sans Serif H, Roman, Sans Serif
- LQ fonts Roman, Sans Serif, Courier, Prestige, Script

9 usable character tables (NLSP version)

Italic, PC437, PC850, PC437 Greek, PC852, PC853, PC855, PC857, PC866, PC869, MAZOWIA, Code MJK, ISO 8559-7, Latin 1T, Bulgaria, PC774, Estonia, ISO 8859-2, PC866 LAT

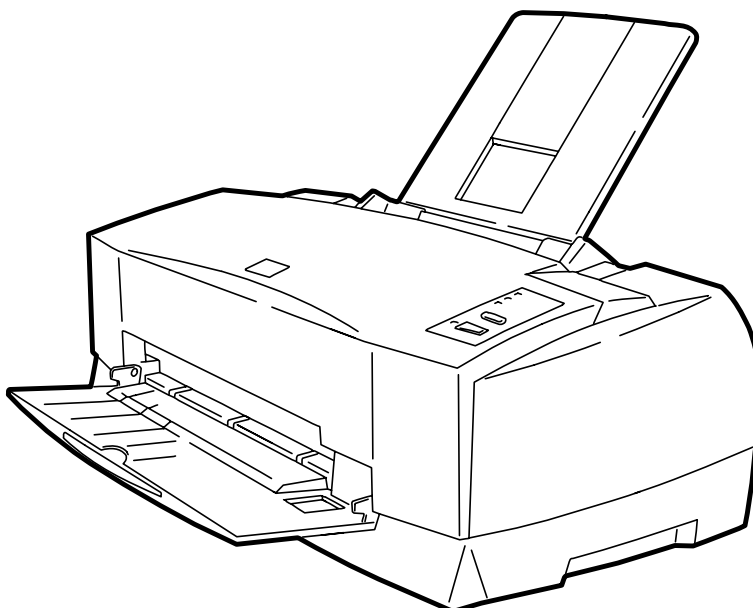


Figure 1- 1. Exterior View of Stylus COLOR 800

1.2 Accessories and Options

Table 1-1. Accessories

Part Number	Description	Quantity
4006678	User's Guide	1
5020108	Ink Cartridge (Black)	1
5020089	Ink Cartridge (Color)	1
	CD ROM (Printer Driver, Utility)	1

Table 1-2. Options and Consumables

Part Number	Description	Quantity
C82305/C82306	Serial interface card	
C82307/C82308	32KB serial interface	
C82310*	32KB parallel interface card	
C82313*	32KB EEE-488 interface card	
C82315*	TWAIN interface card	
C82314*	Coax interface card	
C82312*	LocalTalk™ interface card	
C82331*	Ethernet interface card	
C82345*	Type B bidirectional parallel interface card	
C836021*	Parallel interface cable (shielded) from D-SUB 25-pin to Amphenol 57	
C83603*	Serial interface cable from D-SUB 25-pin to D-SUB 25-pin	
C83604*		
C83605*	Serial interface cable from D-SUB 9-pin to D-SUB 25-pin	
C83606*		
S020108	Black ink cartridge	
S020089	Color ink cartridge	
S041059	EPSON 360 dpi ink jet paper (A4)	100 sheets
S041025		200 sheets
S041060	EPSON 360 dpi ink jet paper (Letter)	100 sheets
S041061	EPSON photo-quality Ink jet paper (A4)	100 sheets
S041026		200 sheets
S041062	EPSON photo-quality ink jet paper (Letter)	100 sheets
S041067	EPSON photo-quality ink jet paper (Legal)	100 sheets
S041054	EPSON photo-quality ink jet card (A6)	50 sheets
S041121	EPSON photo-quality ink jet card (5.8 inches)	
S041122	EPSON photo-quality ink jet card (10.8 inches)	
S041071	EPSON photo-quality glossy film (A4)	15 sheets
S041072	EPSON photo-quality glossy film (Letter)	15 sheets
S041107	EPSON photo-quality glossy film (A6)	10 sheets
S041126	EPSON photo-quality glossy paper (A4)	
S041124	EPSON photo-quality glossy paper (Letter)	
S041063	EPSON ink jet transparencies (A4)	30 sheets
S041064	EPSON ink jet transparencies (Letter)	30 sheets
S041106	EPSON photo-quality self-adhesive sheets (A4)	10 sheets

Note: Asterisk in a part number replaces the last digit of the part number, which varies by country.

1.3 Hardware Specifications

1.3.1 Printing Specifications

Print method On-demand ink jet
 Nozzle configuration Monochrome 128 nozzles (32 x 4 staggered)
 Color (magenta, cyan, yellow) 64 nozzles (32 X 2 staggered, each color)

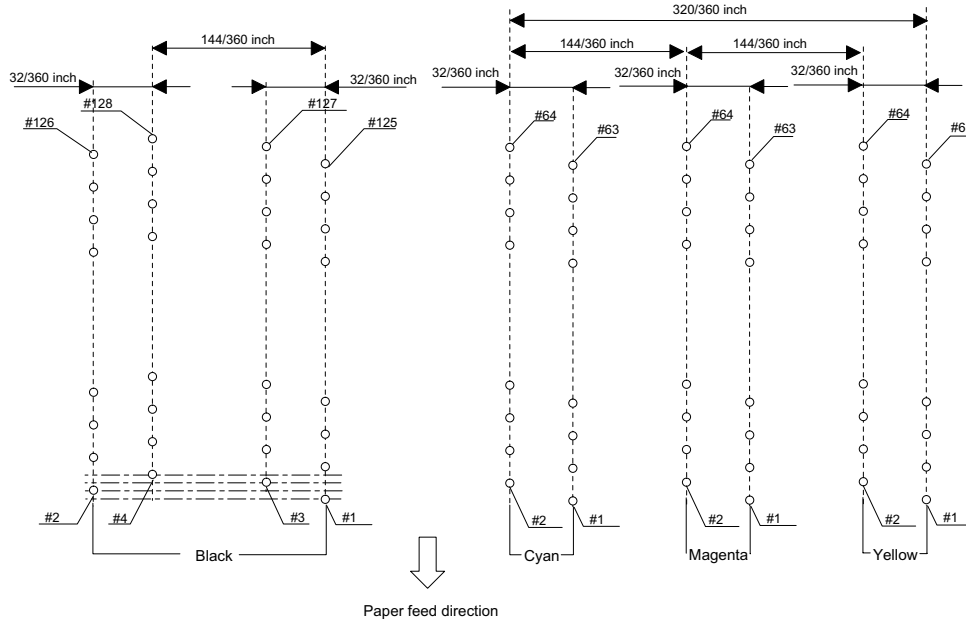


Figure 1- 2. Nozzle Configuration

Print direction Bidirectional with logic-seeking

1.3.2 Print Speed and Printable Columns

Table 1-3. Print Speed and Printable Columns in Character Mode

Character Pitch	Printable Columns	LQ Speed	Draft Speed
10 cpi (Pica)	80	400 cps	533 cps
12 cpi (Elite)	96	480 cps	640 cps
15 cpi	120	600 cps	800 cps
17 cpi (Pica condensed)	137	684 cps	912 cps
20 cpi (Elite condensed)	160	800 cps	1067 cps

Table 1-4. Print Speed and Printable Area for Raster Graphics Mode

Print Mode	Printable Area	Available Dots	CR Speed
180 dpi x 180 dpi	8.27 inch	1488	26.7 ips
360 dpi x 360 dpi	8.27 inch	2976	20 ips
720 dpi x 720 dpi	8.27 inch	5952	20 ips
1440 dpi x 720 dpi *1	8.27 inch	5952 *2	10 ips

*1: Printing at 1440 x 720 dpi is available only using the Microwave driver.

*2: Can be printed by sending following command sequence:

1. Set print speed to 10 ips.
2. Print a 180 x 720 raster image.
3. Advance the paper using an increment of 31/720 inch.
4. Move the print position horizontally using an increment of 1/1440 inch.
5. Print a 180 x 720 raster image.
6. Advance the paper using an increment of 31/720 inch.
7. Repeat steps 2 to 6.

1.3.3 Paper Feeding

- Paper Transport Method** Friction feed with built-in auto sheet feeder (ASF)
- Line Spacing** 1/6, 1/8, or programmable at 1/360 inch
- Paper Path** Top entry (ASF) with semi straight paper path
- Feeding Speed** 1/3 inch 100 ms
Continuous 5.0 inches per second

1.3.4 Paper Specifications

1.3.4.1 Cut Sheets

Table 1-4. Cut Sheet Specifications

Size	Width	Length
A4	210 mm (8.3")	297 mm (11.7")
Letter	216 mm (8.5")	279 mm (11.0")
B5	182 mm (7.2")	257 mm (10.1")
Legal	216 mm (8.5")	356 mm (14.0")
Half Letter	139.7 mm (5.5")	215.9 mm (8.5")
Exclusive	185.2 mm (7.25")	266.7 mm (10.5")
A5	148.5 mm (5.8")	210 mm (8.3")

- Thickness** 0.08 mm (0.003") to 0.11 mm (0.004")
- Paper Weight** 64 g/m² (17 lb.) to 90 g/m² (24 lb.)
- Quality** Exclusive paper, bond paper, PPC

1.3.4.2 Transparencies, Glossy Paper

Table 1-5. Transparency Size

Size	Width	Length
A4	210 mm (8.3")	297 mm (11.7")
Letter	216 mm (8.5")	279 mm (11.0")

- Thickness** 0.075 mm (0.003") to 0.085 mm (0.0033")

Note: Printing on transparencies is available only at normal temperatures.

1.3.4.3 Envelopes

Table 1-6. Envelope Size

Size	Width	Length
No.10	241 mm (9 1/2")	104 mm (4 1/8")
DL	220 mm (8.7")	110 mm (4.3")
C6	114 mm(4.5")	162 mm (6.4")

- Thickness** 0.16 mm (0.006") to 0.43 mm (0.02")
- Paper Weight** 45 g/m² (12 lb.) to 90 g/m² (24 lb.)
- Quality** Bond paper, Plain paper, Airmail

Note: 1. Printing on envelopes is only available at normal temperatures.
2. Insert the longer side of the envelope horizontally.

1.3.4.4 Index Cards

Table 1-7. Index Card Size

Size	Width	Length
A6 index card	105 mm (4.1")	148 mm (5.8)
5" X 8"	127 mm (5.2)	203 mm (8")
8" X 10"	203 mm (8")	254 mm(10")

- Thickness** Less than 0.23 mm (0.0091")

1.3.5 Printable Area

Cut Sheets

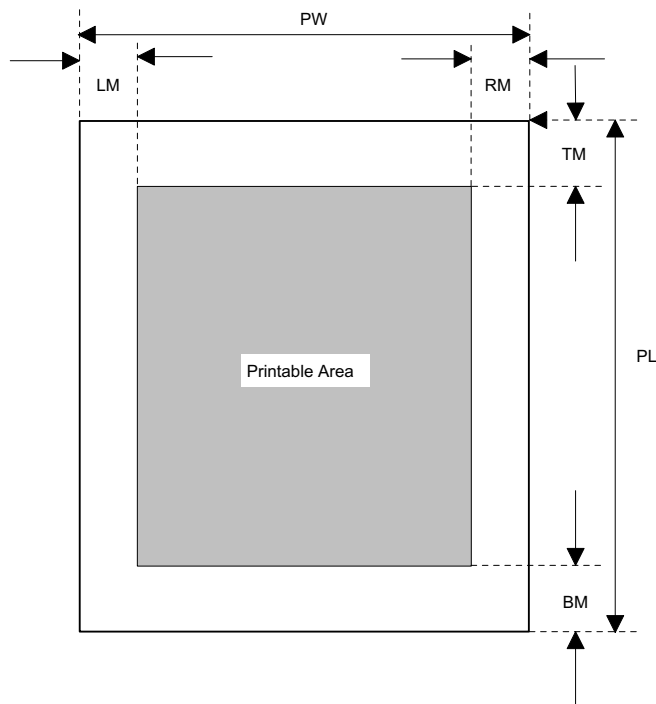


Table 1-8. Margins for Different Cut Sheet Sizes

Figure 1- 3. Printable Area for Cut Sheets

Paper Size	PW (Paper Width) (typical)	PL (Paper Length) (typical)	LM (Left Margin) (Minimum)	RM (Right Margin) (Minimum)	TM (Top Margin) (Minimum)	BM (Bottom Margin) (Minimum)
A4	210 mm (8.3")	297 mm (11.7")	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	14 mm (0.54")
Letter	216 mm (8.5")	279 mm (11.7")	3 mm (0.12")	9 mm (0.35") ^{*1}	3 mm (0.12")	14 mm (0.54")
B5	182 mm (7.2")	257 mm (10.1")	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	14 mm (0.54")
Legal (L)	216 mm (8.5")	536 mm (14.0")	3 mm (0.12")	9 mm (0.35") ^{*1}	3 mm (0.12")	14 mm (0.54")
Statement	139.7 mm (5.5")	215.9 mm (8.5")	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	14 mm (0.54")
Executive	190.5 mm (7.5")	254 mm (10")	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	14 mm (0.54")

*1: 3 mm (0.35") in raster graphics mode.

□ Envelopes

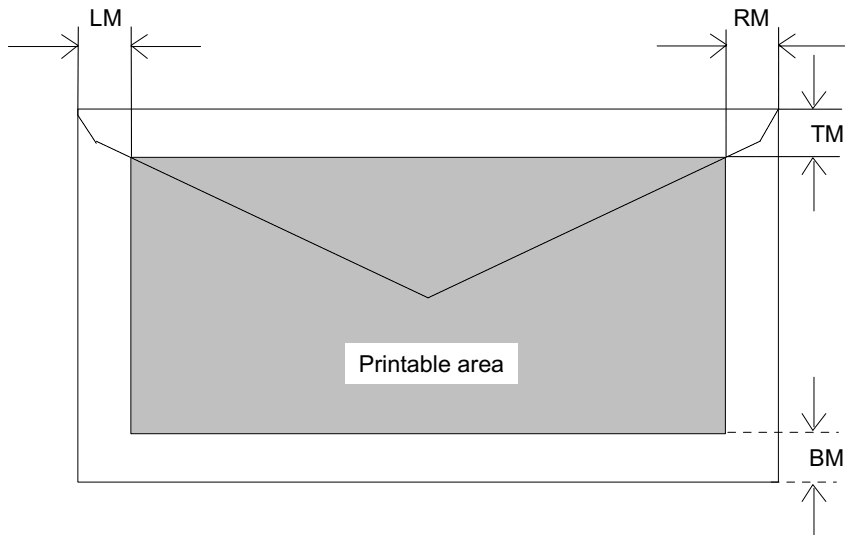


Figure 1- 4. Printable Area for Envelopes

Table 1-9. Minimum Margins for Envelopes

LM (Left Margin)	RM (Right Margin)	TM (Top Margin)	BM (Bottom Margin)
3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	14 mm (0.55")

1.3.6 ASF Paper Capacity

The following table shows the maximum capacity for each paper type you can load in the ASF.

Table 1-10. ASF Paper Capacity

Paper	Capacity
Plain paper (64 g/m ²)	100 sheets
EPSON photo-quality paper	65 sheets
EPSON 360 dpi paper	65 sheets
EPSON photo-quality glossy paper	20 sheets
EPSON photo-quality glossy film	30 sheets *1 *2
EPSON ink jet transparencies	30 sheets *1
EPSON photo-quality cards	30 sheets *2
EPSON photo-quality self-adhesive sheets	1 sheet

*1. When 30 sheets are loaded in the ASF, you must set the TOP margin to more than 30 mm. Otherwise you must load the paper sheet by sheet.

*2. Depending on the paper, you must set the paper feed guide sheet for the last sheet in the ASF.

1.3.7 Ink Specifications

❑ Black Ink Cartridge

Table 1-11. Black Ink Cartridge Specifications

Black Ink Cartridge	
Type	Exclusive cartridge
Color	Black (Quick Penetration)
Print Capacity	900 pages / A4 (ISO/IEC 10561 Letter Pattern at 360 dpi)
Ink life	2 years from indicated production date
Storage Temperatures	Storage -20 to 40° C (-4 to 104° F) ^{*1}
	Storage (packed) -30 to 40° C (-22 to 104° F) ^{*1}
	In transit (packed) -30 to 60° C (-22 to 140° F) ^{*1 *2}
Dimensions	30 mm (W) x 58 mm (D) x 38.5 mm (H) (1.18" x 2.28" x 1.51")

*1 The cartridge must not be kept at 40° C (104° F) for more than a month.

*2 The cartridge must not be kept at 60° C (140° F) for more than 120 hours.

Note:

1. Do not refill the cartridge. The ink cartridge is a consumable item.
2. Do not use a cartridge whose ink life has expired.
3. Ink freezes below -4° C (23° F); however it will be usable again after keeping it for more than 3 hours at room temperature.

❑ Color Ink Cartridge

Table 1-12. Color Ink Cartridge Specifications

Color Ink Cartridge	
Type	Exclusive cartridge
Color	Magenta, Cyan, Yellow (Quick Penetration)
Print Capacity	300 pages A4 (at 360 dpi, 5% duty each color)
Ink life	2 years from indicated production date
Storage Temperatures	Storage -20 to 40° C (-4 to 104° F) ^{*1}
	Storage (packed) -30 to 40° C (-22 to 104° F) ^{*1}
	In transit (packed) -30 to 60° C (-22 to 140° F) ^{*1 *2}
Dimensions	42.9 mm (W) X 52.7 mm (D) X 38.5 mm (H) (1.68" X 2.07" X 1.51")

*1 Do not keep the cartridge at 40° C (104° F) for more than a month.

*2 Do not keep the cartridge at 60° C (140° F) for more than 120 hours.

Note:

1. Do not refill the cartridge. The ink cartridge is a consumable item.
2. Do not use a cartridge whose ink life has expired.
3. Ink freezes below -4° C (23° F); however it will be usable again after keeping it for more than 3 hours at room temperature.

1.3.8 Electric Specifications

120 V Version

- Rated voltage 120 VAC
- Input voltage range 103.5 to 132 VAC
- Rated frequency range 50 to 60 Hz
- Input frequency range 49.5 to 60.5 Hz
- Rated current 0.4 A (Maximum 0.5A)
- Power consumption Approximately 18 W (ISO/IEC 10561 Letter pattern)
Energy star compliant
- Insulation resistance 10M ohms, min. (between AC line and chassis, 500 VDC)
- Dielectric strength 1,000 VAC rms. for 1 minute or
1,200 VAC rms. for 1 second (between AC line and chassis)

220-240 V Version

- Rated voltage 220 to 240 VAC
- Input voltage range 198 to 264 VAC
- Rated frequency range 50 to 60 Hz
- Input frequency range 49.5 to 60.5 Hz
- Rated current 0.2 A (Maximum 0.3A)
- Power consumption Approximately 18 W (ISO/IEC 10561 Letter pattern)
- Insulation resistance 10M ohms, min. (between AC line and chassis, 500 VDC)
Energy star compliant
- Dielectric strength 1,500 VAC rms. for 1 minute (between AC line and chassis)

1.3.9 Reliability

- Total Print Volume 75,000 pages (A4/Letter)
- Printhead Life 2,000 million dots /nozzle

1.3.10 Safety Approvals

120 V Version

- Safety standards UL1950 with D3
CSA C22.2 No.950 with D3
- EMI FCC part15 subpart B class B
CSA C108.8 class B

220 - 240 V Version

- Safety standards EN 60950 (VDE, NEMKO)
- EMI EN 55022 (CISPR Pub.22) class B
AS/NZS 3548 class B

1.3.11 CE Marking

220 - 240 V Version

- Low Voltage Detection 73/23/EEC EN 60950
- EMC Detection 89/336/EEC EN 55022 class B
EN 61000-3-2
EN 61000-3-3
EN 50082-1
IEC801-2
IEC801-3
IEC801-4

1.3.12 Acoustic Noise

- Noise level Approximately 51 dB (A) (According to ISO 7779)

1.3.13 Environmental Conditions

Temperature

- Operating 10 to 35 *¹
- Storage -20 to 40° C (-4 to 104° F) (for less than 1 month at 40°) *²
- Transit -20 to 60° C (-4 to 140° F) (for less than 120 hours at 60°)

Humidity

- Operating 20% to 80% (without condensation) *¹
- Non operating 5% to 85% (without condensation) *²

Resistance to Vibration

- Operating 0.15 G *²
- Non-operating 0.50 G

Resistance to Shock

- Operating 1 G within 1 ms*²
- Non-operating 2 G within 2 ms

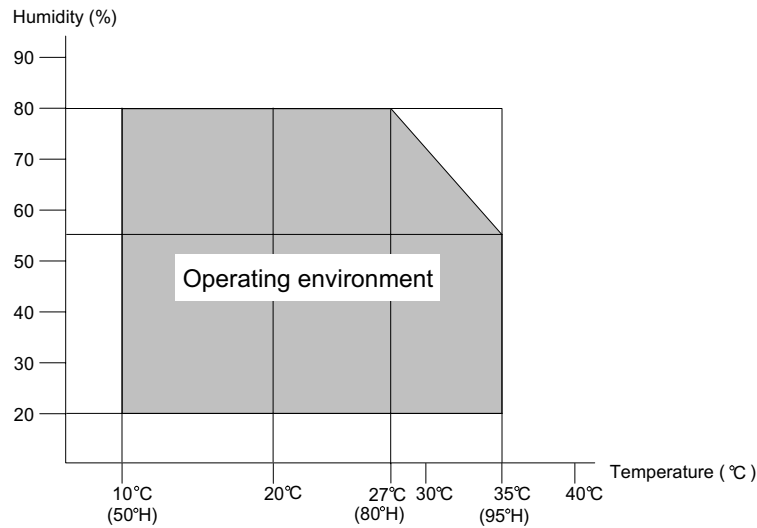


Figure 1- 5. Environmental Conditions

*1 :Refer to the table above.

*2 :In shipment container.

1.3.14 Physical Specifications

- Weight** 6.5 kg
- Dimensions** 475 mm (W) x 274 mm (D) x 177 mm (H) (18.7" x 10.78" x 6.96")

1.4 Firmware Specifications

1.4.1 Control Codes and Character Specifications

- Control Codes**
 - ESC P/2
 - EPSON remote command
 - IBM X 24E emulation

- Character Tables**
 - Legal and 14 international character sets

 - Standard version (11 character tables)
 - Italic table
 - PC 850 (Multilingual)
 - PC 861 (Icelandic)
 - PC 865 (Nordic)
 - BRASCII
 - ISO Latin 1
 - PC 437 (US, Standard Europe)
 - PC 860 (Portuguese)
 - PC 863 (Canadian-French)
 - Abicomp
 - Roman 8

 - NLSP version (19 character tables)
 - Italic table
 - PC 437 (US, Standard Europe)
 - PC 852 (East Europe)
 - PC 855 (Cyrillic)
 - PC 866 (Russian)
 - MAZOWIA (Poland)
 - ISO 8559-7 (Latin, Greek)
 - Bulgaria (Bulgaria)
 - Estonia
 - PC 866 LAT
 - PC850 (Multilingual)
 - PC 437 (Greek)
 - PC 853 (Turkish)
 - PC 857 (Turkish)
 - PC 869 (Greek)
 - Code MJK (CSFR)
 - ISO Latin 1T (Turkish)
 - PC 774
 - ISO8859-2 (ISOLatin2)

Typefaces

- ❑ Bitmap LQ fonts
 - EPSON Roman 10 cpi, 12 cpi, 15 cpi, Proportional
 - EPSON Sans Serif 10 cpi, 12 cpi, 15 cpi, Proportional
 - EPSON Courier 10 cpi, 12 cpi, 15 cpi
 - EPSON Prestige 10 cpi, 12 cpi, 15 cpi
 - EPSON Script 10 cpi, 12 cpi, 15 cpi

- ❑ Scalable fonts
 - EPSON Roman 10.5 pt.; 8 pt. to 32 pt. (2 pt. increments)
 - EPSON Sans Serif 10.5 pt.; 8 pt. to 32 pt. (2 pt. increments)
 - EPSON Roman T 10.5 pt.; 8 pt. to 32 pt. (2 pt. increments)
 - EPSON Sans Serif H 10.5 pt.; 8 pt. to 32 pt. (2 pt. increments)

Note: Each typeface has 4 variations: Normal, Bold, Italic, and Bold Italic

An example of variations for EPSON Roman is as follows:

EPSON Roman normal

EPSON Roman bold

EPSON Roman italic

EPSON Roman bold italic

Combinations of Character Tables and Typefaces

Table 1-13. Character Tables and Fonts

	Character Tables	Bitmap Fonts	Scalable Fonts	Scalable Fonts
		EPSON Roman EPSON Sans Serif EPSON Courier EPSON Prestige EPSON Script	EPSON Roman EPSON Sans Serif	EPSON Roman T EPSON Sans Serif H
Standard Version	Italic table PC 437 (US Standard Europe) PC 850 (Multilingual) PC 860 (Portuguese) PC 861 (Icelandic) PC 863 (Canadian-French) PC 865 (Nordic) BRASCII Abicomp Roman 8 ISO Latin 1	Supported	Supported	Supported
NLSP Version	Italic table PC 437 (US Standard Europe) PC 850 (Multilingual)	Supported	Supported	Supported
	PC 437 (Greek) PC 852 (East Europe) PC 853 (Turkish) PC 855 (Cyrillic) PC 857 (Turkish) PC 866 (Russian) PC 869 (Greek) MAZOWIA (Poland) Code MJK (CSFR) ISO 8859-7 (Latin/Greek) ISO Latin 1T (Turkish) Bulgaria (Bulgaria) PC 774 Estonia ISO 8859-2 (ISO Latin 2) PC 866 LAT			Not Supported

1.4.2 Input Data Buffer

Capacity 32KB

1.5 Interfaces

The EPSON Stylus COLOR 800 is equipped with two interfaces: parallel and Mac serial interface, and a card slot for an optional Type-B interface. This section provides information on each interface.

1.5.1 Parallel Interface (Forward Channel)

Transmission Mode	8-bit parallel, IEEE-P1284 compatibility mode
<input type="checkbox"/> Synchronization	/STROBE pulse
<input type="checkbox"/> Handshaking	BUSY and /ACKNLG signal
<input type="checkbox"/> Signal Level	TTL compatible level (IEEE-P1284 Level 1 device) Refer to Table 1-15.

Table 1-14. Signal Level for TTL-Compatible IEEE-1284 Level 1 Device

Parameter	Minimum	Maximum	Condition
VOH*	—	5.5 V	
VOL*	-0.5 V	—	
IOH*	—	0.32 mA	VOH = 2.4 V
IOL*	—	12 mA	VOL = 0.4 V
CO	—	50 pF	
VIH	—	2.0 V	
VIL	0.8 V	—	
IIH	—	0.32 mA	VIH = 2.0 V
IIL	—	12 mA	VIL = 0.8 V
CI	—	60 pF	

Notes: * A LOW logic level on the Logic H signal line is as follows:
 2.0 V or less when the printer is powered off.
 3.0 V or more when the printer is powered on.
 The receiver provides an impedance equivalent to 7.5K ohms to ground.

Adaptable Connector 57-30360 (Amphenol) or equivalent

The BUSY signal is set HIGH before setting either /ERROR LOW or PE HIGH, and held HIGH until all these signals return to an inactive state. The BUSY signal is HIGH in the following cases:

- During data entry.
- When the input data buffer is full.
- While /INIT signal is at a LOW level or during hardware initialization.
- During a printer error condition (See the /ERROR signal).
- During test printing.
- When the printer is in default setting mode.
- When the parallel interface is not selected.

EPSON Stylus COLOR 800

The ERROR signal is at a LOW level when one of the following errors has occurred:

- Printer hardware error (fatal error)
- Paper-out error
- Paper-jam error
- Ink-out error

The PE signal is HIGH during a paper-out error.

Data Transmission Timing (Forward Channel)

Table 1-15. Data Transmission Timing

Parameter	Minimum	Maximum
tsetup	500 ns	—
thold	500 ns	—
tstb	500 ns	—
tready	0	—
tbusy	—	500 ns
tt-out	—	120 ns
tt-in	—	200 ns
treply	—	—
tack	500 ns	10 μs
tnbusy	0	—
tnext	0	—

Note: *tt-out* shows the rise and fall time of every output signal.
tt-in shows the rise and fall time of every input signal.

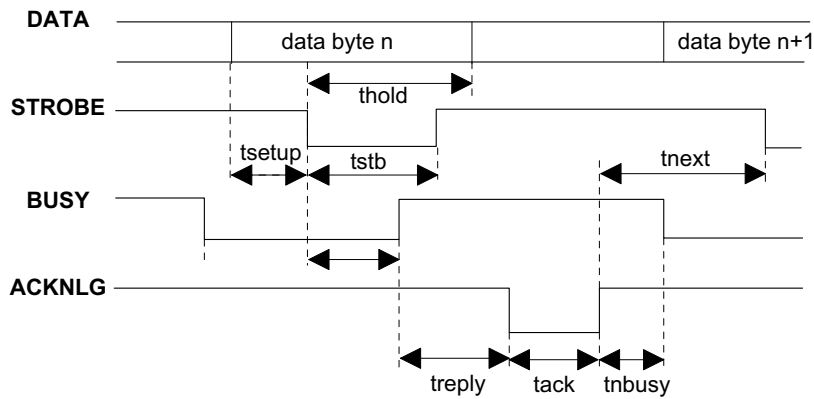


Figure 1- 6. Data Transmission Timing

Connector Pin Assignments and Signals

Table 1-16. Connector Pin Assignments and Signals (Forward Channel)

Pin No.	Signal Name	Return GND Pin	I/O	Description
1	1. /STROBE	19	I	The STROBE pulse. Reading in of data is performed at the falling edge of this pulse.
2-9	2. DATA 0-7	20-27	I	The DATA 0 to DATA 7 signals represent data bits 0 to 7, respectively. Each signal is at a HIGH level when data is logical 1 and a LOW level when data is logical 0.
10	3. /ACKNLG	28	O	This signal is a negative pulse indicating that the printer can again accept data.
11	4. BUSY	29	O	When this signal is at a HIGH level, the printer is not ready to accept data.
12	5. PE	28	O	When this sign is at a HIGH level, the paper empty status is detected.
13	6. SLCT	28	O	Always at HIGH level when the printer is powered on.
14	7. /AFXT	30	I	Not used.
31	8. /INIT	30	I	The falling edge of a negative pulse or a LOW signal on this line causes the printer to initialize. Minimum 50 μ s pulse is necessary.
32	9. /ERROR	29	O	When the printer detects an error, this signal goes LOW.
36	10./SLIN	30	I	Not used.
18	11. Logic H	—	O	Pulled up to +5 V via 3.9K-ohm resistor.
35	12. +5V	—	O	Pulled up to +5 V via 3.3K-ohm resistor.
17	13. Chassis GND	—	—	Chassis ground.
16,33,19-30	14. GND	—	—	Signal ground.
15,34	15. NC	—	—	Not connected.

Note: 1. / at the beginning of a signal means active LOW.
2. The I/O column indicates the direction of the signal as viewed from the printer.

1.5.2 Parallel Interface (Reverse Channel)

- ❑ **Transmission Mode** IEEE-1284 nibble mode
- ❑ **Adaptable Connector** Same as the forward channel
- ❑ **Synchronization** Refer to the IEEE-1284 specification
- ❑ **Handshaking** Refer to the IEEE-1284 specification
- ❑ **Data Transmission Timing** Refer to the IEEE-1284 specification
- ❑ **Signal Level** IEEE-1284 level 1 device (See forward channel.)
- ❑ **Extensibility Request**
 The printer accepts a request when the extensibility request value is 00H or 04H. The description of each value is as follows:
 - 00H Request nibble mode reverse channel transfer
 - 04H Request to return Device ID using nibble mode reverse channel transfer.

Device ID

The printer sends following device ID string upon request:

```
[00H] [43H]
MFG EPSON
CMD ESCPL2E, PRPXL, BDC
MDL STYLUS[SP]COLOR[SP]800
CLS PRINTER
```

Note: [00H] denotes a hexadecimal value of zero.

Table 1-18 shows pin assignments and signals for the parallel interface reverse channel.

Table 1-17. Connector Pin Assignments and Signals (Reverse Channel)

Pin No.	Signal Name	Return GND Pin	I/O	Description
1	HostClk	19	I	Clock signal from the host computer.
2-9	DATA 0-7	20-27	I	These signals represent parallel data on bits 2 to 9. Each signal is HIGH when the data is logical 1 and LOW when the data is logical 0.
10	PtrClk	28	O	Clock signal from the printer
11	PtrBusy/ Data bits 3,7	29	O	Busy signal from the printer. Data bits 3 or 7 in reverse channel.
12	AckDataReq/ Data Bits 2,6	28	O	Acknowledge request signal. Data bits 2 or 6 in reverse channel.
13	Xflag/Data bits 1, 5	28	O	X flag signal. Data bits 1 or 5 in reverse channel.
14	Host Busy	30	I	Busy signal from the host computer
31	/INIT	30	I	Not used
32	/Data Avail/ Data Bit 0,4	29	O	Data available signal. Data bits 0 or 4 in reverse channel.
36	1284-Active	30	I	1284 active signal.
18	Logic-H	—	O	Pulled up to +5 V via 3.9K-ohm resistor.
35	+5V	—	O	Pulled up to +5 V via 3.3K-ohm resistor.
17	Chassis GND	—	—	Chassis ground for the printer.
16, 33, 19-30	GND	—	—	Signal ground.
15, 34	NC	—	—	Not connected.

- Note:**
1. The symbol / at the beginning of a signal means active LOW.
 2. The I/O column indicates the direction of the signal as viewed from the printer.

1.5.3 Mac Serial Interface

- Standard** RS-423 compliant
- Synchronization** Synchronous
- Bit Rate** Approximately 900Kbps/1.8 Mbps
- Word Format**
 - Start bit 1 bit
 - Data bits 8 bit
 - Parity bit No parity bit
 - Stop bit 1 bit
- Handshaking** X-ON/X-OFF, DTR protocol
- Adaptable Connector** 8-pin mini circular connector
- Recommended I/F Cable** Apple System Peripheral-8 cables

Table 1-18. Connector Pin Assignments for Serial Interface

Pin No.	Signal Name	I/O	Functional Description
1	SCLK	O	Synchronous clock
2	CTS	I	Clear to send
3	TxD-	O	Transmit data -
4	S.G.	I	Signal ground
5	RxD-	I	Receive data -
6	TxD+	O	Balanced transmit +
7	DTR	O	Data terminal ready
8	RxD+	I	Balanced receive +

Note: Refer to the figure below for the connector pin arrangement.

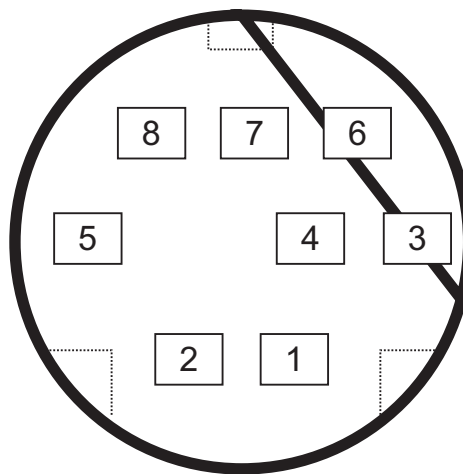


Table 1-19. X-ON/X-OFF, DTR Figure 1- 7. Serial I/F Pin Assignments Protocol

State	Buffer space	X-ON/X-OFF	DTR
Busy	Less than 1024 bytes	Send X-OFF code	Off
Ready	More than 2048 bytes	Send X-ON code	On

1.5.4 Optional Interface

The Stylus COLOR 800 supports an optional Type-B interface (Level 2) with the following characteristics.

Reply Message

- When ESC/P 2 mode is selected:

Main type	MTP48p, PW136cl10cpi, PRG(W0xxxx)rev, SPD0fast
Product name	Stylus COLOR 800
Emulation type	ESCPL2-00
Entity type	EPSONLQ2

- When IBM X24E is selected:

Main type	MTP48p, PW136cl10cpi, PRG(W0xxxx)rev, SPD0fast
Product name	Stylus COLOR 800
Emulation type	PRPXL24-00
Entity type	EPSONPRPXL24

1.5.5 Preventing Hosts from Data Transfer Timeout

Generally, hosts abandon data transfer to peripherals when a peripheral is BUSY continuously for dozens of seconds. To prevent this kind of timeout, the printer receives data very slowly, several bytes per minute, even the printer is in a busy state. This slowdown starts when the remainder of the input buffer drops under several hundred bytes. Finally, the printer is BUSY continuously when the input buffer is full.

1.5.6 Interface Selection

The Stylus COLOR 800 can have three types of interfaces: parallel, serial, and optional Type-B. Each interface can be selected manually or automatically. Both modes are selected through default setting mode.

Manual Selection

One of 3 interfaces selected through the default setting mode. The selected interface is fixed.

Automatic Selection

Automatic interface selection is enabled in default setting mode. In automatic interface selection mode, the printer is initialized to the idle state when it is powered on (*1) scanning which interface is to receive data. Then the interface that receives data first is selected. When the host stops data transfer and the printer is in the standby state for a number of seconds, the printer returns to the idle state. As long as the host sends data or the printer interface is busy state, the selected interface is left as it is.

*1: No interface is selected in this state.

Interface Selection and Interface State

- When an interface other than the parallel interface is selected, the parallel interface goes into the BUSY state.
- When the interface other than serial interface is selected, the serial interface sets the DTR signal MARK.
- When the printer is initialized and returned to idle state, the parallel interface goes into ready state and the serial interface sets the DTR signal SPACE.

Note: An interrupt signal such as the INIT on the parallel interface is ignored while that interface is not selected.

1.6 Operations

This section describes the functions of each button on the control panel and LED printer status indicators.

1.6.1 Control Panel

The control panel for this printer consists of 3 non-lock pushbuttons, 1 lock type pushbutton, and 4 LED indicators. Refer to Figure 1-8.

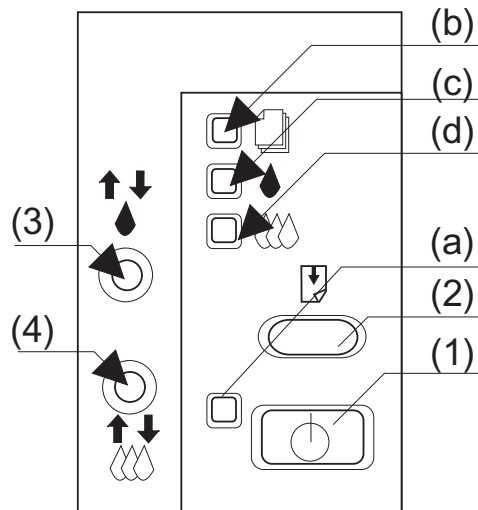


Figure 1- 8. Control Panel

□ Panel Description

See Table 1-21 for the panel buttons and LED descriptions.

Table 1-20. Panel Buttons and LED Descriptions

Description	Buttons				LEDs			
	1	2	3	4	a	b	c	d
	Power	Load/Eject	Cleaning (Black)	Cleaning (Color)	Power	Paper Out	Ink Out (Black)	Ink Out (Color)
Color	—	—	—	—	Green	Red	Red	Red

□ Panel Functions (Normal Usage)

Table 1-21. Panel Functions

Buttons	Functions
Load/Eject	<input type="checkbox"/> Loads or ejects paper. <input type="checkbox"/> Exits ink cartridge change mode.* ¹
Cleaning (Black) (Press for 2 seconds)	<input type="checkbox"/> Performs black ink cartridge cleaning. <input type="checkbox"/> Enters ink cartridge change mode.* ²
Cleaning (Color) (Press for 2 seconds)	<input type="checkbox"/> Performs color ink cartridge cleaning. <input type="checkbox"/> Enters ink cartridge change mode.* ²
Cleaning (Black) + Cleaning (Color) (Press for 2 seconds)	<input type="checkbox"/> Enters ink cartridge change mode. <input type="checkbox"/> In the ink cartridge change mode, the carriage moves to the black cartridge change position by pressing “Cleaning (Black)” button. <input type="checkbox"/> In the ink cartridge change mode, the carriage moves to the color cartridge change position by pressing “Cleaning (Color)” button.

*1: Only effective when the printer is in the ink cartridge change mode.

*2: Only effective when the printer is in the *Ink Low* or *Ink Out* condition.

❑ Panel Functions at Power On

This printer also enters various functions by holding down a specific button and turning on the printer. Each combination and its function are described in Table 1-23.

Table 1-22. Panel Function with Power On

Button Pressed *1 (while turning on the printer)	Function
Load /Eject	<input type="checkbox"/> Starts LQ self-test printing.
Cleaning (Black)	<input type="checkbox"/> Starts Draft self-test printing.
Cleaning (Color)	<input type="checkbox"/> Enters default setting mode.
Load /Eject + Cleaning (Color)	<input type="checkbox"/> Enters Hex-dump mode.
Load /Eject + Cleaning (Black)	<input type="checkbox"/> Enters the printhead alignment mode.
Cleaning (Black) + Cleaning (Color)	<input type="checkbox"/> Enters ink smudge prevention mode.
Load /Eject + Cleaning (Black) + Cleaning (Color) Then press Cleaning (Color) button once again within 3 seconds.	<input type="checkbox"/> Resets a specific area of EEPROM and Timer IC.*2

*1: "+" means to press one button while holding down the other button(s).

*2: Refer to Table 1-28 or the EEPROM map described in the Appendix.

❑ LED Indicators

Several printer conditions can be identified by LEDs on the control panel. Which LED (or LEDs) lights varies, depending on the condition. See Table 1-24 for printer conditions and LED status.

Table 1-23. Printer Conditions and LED Status

Printer Condition	Indicators			
	Power	Ink out (Black)	Ink out (Color)	Paper Out
Power on condition	On	---*1	---	---
Ink sequence	Blinks	---	---	---
Ink cartridge change mode	Blinks	---	---	---
Data processing	Blinks	---	---	---
Paper out	---	---	---	On
Paper jam	---	---	---	Blinks
No ink cartridge or ink end (black)	---	On	---	---
Ink level low (black)	---	Blinks	---	---
No ink cartridge or ink end (color)	---	---	On	---
Ink level low (color)	---	---	Blinks	---
Enter EEPROM and Timer IC reset		On 1 second	On 1 second	On 1 second
Maintenance request	Blinks	Blinks	Blinks	Blinks
Fatal error	Blinks	Blinks	On	On

*1: "---" means no effect.

1.6.2 Default Settings

The printer enters default setting mode when you press the **Cleaning (Color)** button while turning on the printer. The menus available for this printer are shown in Table 1-25.

Table 1-24. Default Setting Menus

Menu	Setting * ¹
Print direction* ²	<u>Auto</u> / Bi-d / Uni-D
Font	Roman / Sans Serif / <u>Courier</u> / Prestige / Script/ Roman T / Sans Serif H / Draft
Pitch	<u>10 cpi</u> / 12 cpi / 15 cpi / 17.1 cpi / 20 cpi / Proportional
I/F mode	<u>Auto</u> / Parallel / Mac Serial / Option
Auto I/F wait mode	<u>10 seconds</u> / 30 seconds
Software	<u>ESC/P2</u> / IBM X24E
Auto CR (IBM mode only)	On / <u>Off</u>
AGM (IBM mode only)	On / <u>Off</u>
Character tables Standard version	Italic USA, Italic France Italic Germany, Italic U.K. Italic Denmark, Italic Sweden Italic Italy, Italic Spain 1 <u>PC 437</u> , PC 850 PC 860, PC 863 PC 865, PC 861 BRASCII, Abicomp Roman 8, ISO Latin 1
Character tables NLSP version	Italic USA, Italic France Italic Germany, Italic U.K. Italic Denmark, Italic Sweden Italic Italy, Italic Spain 1 <u>PC 437</u> , PC 437 (Greek) PC 850, PC 853 PC 855, PC 852 PC 857, PC 866 PC 869, MOZOAWIA Code MJK, ISO 8559-7 ISO Latin 1T, Bulgaria PC 774, Estonia ISO 8859-2, PC 866 LAT
Auto line feed	On / <u>Off</u>
Network I/F mode	This mode is for network environment. <u>Off</u> : Used in usual environment On: Used in network environment
Loading position	3 mm / <u>8.5 mm</u> / Others * ³
Economy mode	On / <u>Off</u>
Parallel I/F transfer rate	<u>Fast</u> / Normal

*1: Underlined parameters in bold letters are factory default settings.

*2: Refer to the following tables 1-26, 1-27.

*3: This is selected when a value other than 3 mm / 8.5 mm is set into EEPROM with the **ESC I** command.

Table 1-25. Print Direction Mode Characteristics

	Black and White Printing	CMYK Printing (Color)
Auto	<input type="checkbox"/> Throughput and quality is better.	<input type="checkbox"/> Throughput is better. <input type="checkbox"/> Color quality with special paper is worse. (Color correction depends on the print direction.)
Bi-D	<input type="checkbox"/> Throughput is the best. <input type="checkbox"/> Print quality may be down.	<input type="checkbox"/> Throughput is the best. <input type="checkbox"/> Color quality with special paper is worse. (Color correction depends on the print direction.)
Uni-D	<input type="checkbox"/> Throughput is worse. <input type="checkbox"/> Print quality is the best.	<input type="checkbox"/> Throughput is worse. <input type="checkbox"/> Color quality is the best.

Table 1-26. Printing Direction and ESC U Command

			Character Mode (for DOS)	Raster Graphics Mode (for Windows / Mac)*1
Default Setting Mode	Auto	ESC U 0	Auto	Bi-D
		ESC U 1	Auto	Uni-D
		ESC U 2	Auto	Auto
		—	Auto	Auto
	Bi-D	ESC U 0	Bi-D	Bi-D
		ESC U 1	Uni-D	Uni-D
		ESC U 2	Auto	Auto
		—	Bi-D	Bi-D
	Uni-D	ESC U 0	Uni-D	Bi-D
		ESC U 1	Uni-D	Uni-D
		ESC U 2	Uni-D	Auto
		—	Uni-D	Uni-D

*1 Printing direction is controlled by a driver in the Windows / Mac environment.

Setting Method

1. See the flowchart below for the default setting method.

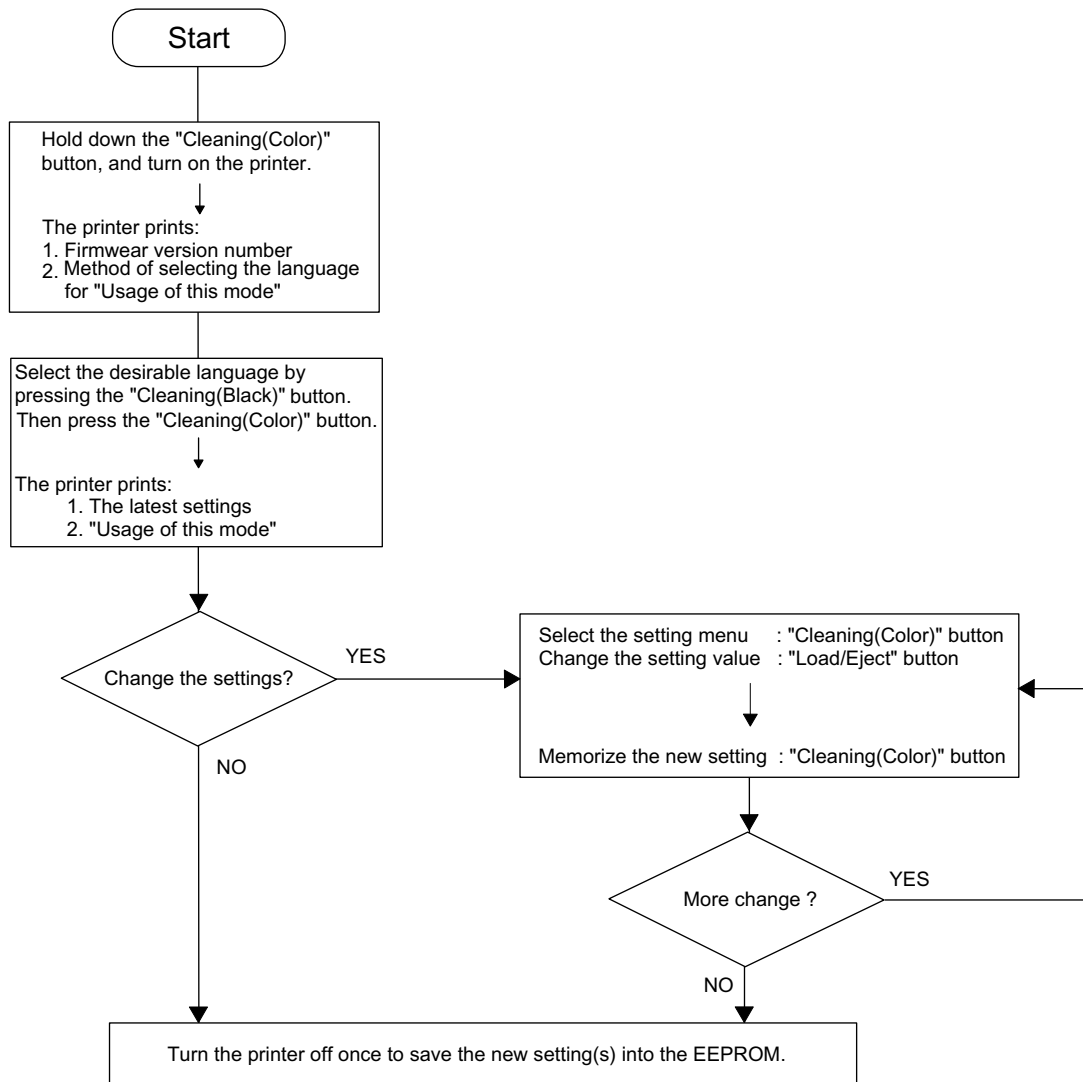


Figure 1-9. Default Setting Flowchart

1.6.3 Printhead Alignment Mode

The Stylus COLOR 800 allows users to perform printhead alignment operation without a special program. The following list shows adjustments performed for this printer.

Table 1-27. Printer Adjustment Patterns

Pattern No.	Menu
1	Bi-d adjustment (533 cps, units: 1-720 inch)
2	Bi-d adjustment at (400 cps, units: 720 inch)
3	Head gap adjustment in main scan direction — from left to right (400 cps, 720 units/inch)
3	Head gap adjustment in main scan direction — from left to right (200 cps, 720 units/inch)

Adjustment Method

1. Press the **Load/Eject** and **Cleaning (Black)** buttons while turning on the printer.
2. The printer prints the adjustment method on A4 paper.
3. Look at the tests printed along with the instruction and press the **Cleaning (Black)** button until the panel lights indicate the appropriate test number.
4. Print the adjustment pattern by pressing the **Load/Eject** button.
5. Look at the test patterns on the new printout and press the **Cleaning (Color)** button until the panel lights indicate the test pattern that is most
6. Press the **Load/Eject** button.
7. Repeat steps 3 to 6 as many times as needed to properly align all the test patterns on the printouts.
8. Turn off the printer.

1.6.4 Ink Smudge Prevention Mode

When the printer is in this mode, the carriage remains at the edge of the carriage for extra time before each return. This extra time allows ink to dry enough to avoid ink smudges caused by bleeding and ink contact with the paper. Note this function is designed as a response to any customer's complaint and is not described in the user's guide. Also, it is necessary to acknowledge to customers in advance that this mode does not provide the fastest throughput for the printer. The printer goes into this mode when you press the **Cleaning (Black)** and **Cleaning (Color)** buttons while turning on the printer.

1.6.5 EEPROM Clear Mode

This mode is used to reset a specific area of EEPROM. Press the **Load/Eject**, **Cleaning (Black)**, and **Cleaning (Color)** buttons while turning on the printer; then press the **Cleaning (Color)** button within 3 seconds. The **Paper Out**, **Ink Out (Black)**, and **Ink Out (Color)** LEDs light for 1 second during the operation. The addresses initialized are specified, and there is no panel operation that initializes data of other addresses in the EEPROM. Table 1-29 lists the specified addresses and their descriptions.

Table 1-28. EEPROM Clear Items

EEPROM Addresses (Hex)	Data Name	Factory Values
22H	Interface	00H Auto
6CH / 6DH	Protection Counter A	00H / 00H
52H / 53H	Color Cleaning Timer	00H / 00H
62H / 63H	Black Cleaning Timer	00H / 00H
6EH / 6FH	Power Off Time	00H / 00H

1.6.6 Printer Initialization

This printer has the following three initialization types: Power-on initialization, Operator initialization, and Software initialization.

Power-on Initialization

- Triggers Turning on the printer
 Cold reset command (remote RS command).
- Actions performed:
 - Initializes the printer mechanism.
 - Clears input data buffer.
 - Clears download character set.
 - Clears print buffer.
 - Refer to Section 1.5.7, *Initialization Items and Values*

Operator Initialization

- Triggers Turning the printer off and back on again within 10 seconds
 The printer recognizes the INIT signal (negative pulse) on the
 parallel interface.
- Actions performed
 - Clears input data buffer.
 - Clears download character set.
 - Clears print buffer.
 - Refer to *Initialization Items and Values*

Software Initialization

- Trigger ESC @ command
- Actions performed
 - Clears print buffer.
 - Refer to *Initialization Items and Values*

1.6.7 Initialization Items and Values

The values used when this printer is initialized are described under *Default Settings*. Values set through the default setting mode or the remote control codes are, however, stored as initialization values only after power off. On the other hand, values set by other methods are cleared at power off, and the printer returns to the initialization values shown in the table when the printer is initialized.

Table 1-29. Initialization Values

Initialization Item	Default Set by Panel Operation?	EPSON Control Codes?	Factory Value
Print direction	Y	Y	Auto
Font	Y	Y	Courier
Pitch	N	Y	10 cpi
I/F	Y	Y	Auto
Auto I/F wait mode	Y	Y	10 seconds
Software	Y	N	ESC/P 2
Auto CR (IBM mode only)	Y	Y	Off
AGM (IBM mode only)	Y	Y	Off
Character table	Y	Y	PC437
Character table for NLSP	Y	Y	PC437
Auto line feed	Y	Y	OFF
Network I/F mode	Y	N	Off
Loading position	Y	Y	8.5 mm
Economy mode	Y	Y	OFF
Parallel I/F mode	Y	N	Fast
Line spacing	N	E	4.23 mm (1/6 inch)
Page length	N	Y	Maximum

Y: Stored after the printer is powered Off.
 E: Effective only while printer power is On.
 N: Cannot change.

1.6.8 Self-test Function

Pressing the **Load/Eject** or **Cleaning (Black)** button while turning on the printer puts the printer in the self-test mode. The self-test is used to check the following:

- Control circuit function
- Printer mechanism function
- Print quality

Turn off the printer to exit this mode.

1.6.9 Hexadecimal Dump Function

Pressing the **Load/Eject** and **Cleaning (Color)** buttons while turning on the printer activates the hexadecimal dump mode. Each line has Hexadecimal codes, along with their corresponding letters printed in the right column. If a received code denotes an unprintable character, such as a control code, "." (period) is printed in the right column. This function enables users to check whether the data from the host is properly transferred. Turn off the printer to exit the mode.

1.6.10 Error Conditions

This printer is in an error condition when any error in Table 1-31 is detected.

Table 1-30. Error Conditions

Error Name	Detection Trigger
Fatal error	<input type="checkbox"/> The carriage moves abnormally. <input type="checkbox"/> The carriage does not move.
Paper out / paper jam error	<input type="checkbox"/> No paper is loaded. <input type="checkbox"/> Paper is jamming.
Ink end error	<input type="checkbox"/> An ink cartridge is not installed. <input type="checkbox"/> Ink end.
Maintenance error	<input type="checkbox"/> Waste ink has exceeded the specified amount.

1.6.11 Monochrome Printing Mode

This printer has 3 printing modes:

- Default mode
- Color mode
- Monochrome mode

Each mode is selected according to printer condition, as described below.

Default Mode

- Color mode is selected automatically when both black and color cartridges are installed and no ink end error has occurred. When color ink ends, the printer can go into monochrome print mode. It is, however, switched by turning the printer off and back on again, or by sending the INIT signal.
- Default mode is selected when the printer is initialized.

Color Mode

- The printer prints normally, based on whether print data is black or color.
- Can be selected through the printer driver.

Monochrome Mode

- The printer prints all data in black only. Color data selection (**ESC r**) is ignored in this mode. After the printer goes into monochrome print mode, you can return it to color mode by turning the printer off and back on or sending an INIT signal after replacing the color cartridge. This mode is also selected through the printer driver. In this case, it is used, regardless of the color ink consumption, because this mode is defined by the **ESC r** command.

1.7 Main Components

The main components of the Stylus COLOR 800 are:

- ❑ Main control board C202 MAIN board
- ❑ Power supply board C202 PSB/PSE board
- ❑ Control panel board C202 panel board
- ❑ Printer mechanism
- ❑ Housing

The following figure shows the main component layout of the Stylus COLOR 800.

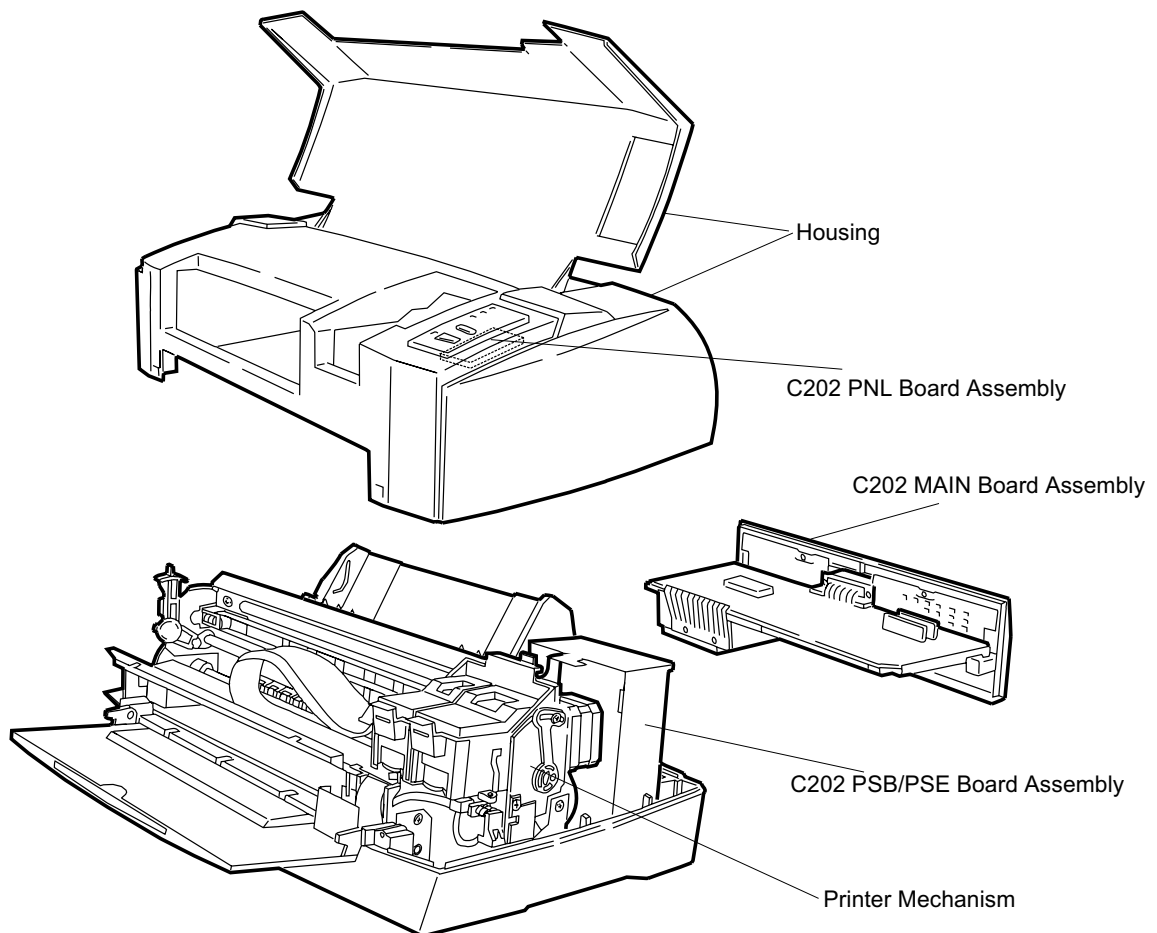


Figure 1-10. Stylus COLOR 800 Component Layout

1.7.1 C202 MAIN Board

The C202 MAIN board controls various printer operations. It consists of an HD6432653 CPU (128-pin, 19.66 MHz), ASIC E05B33CB (208-pin, 19.66 MHz), 8M-bit-type PROM (42-pin, including CG data) or 8M-bit-type PROM + 8M-bit-type CG (NLSP version only), 4M-bit-type DRAM, EEPROM, and several drivers. Because this board is installed into the slot in the rear cover of the printer using 2 screws and several connectors, it is easily removed and installed.

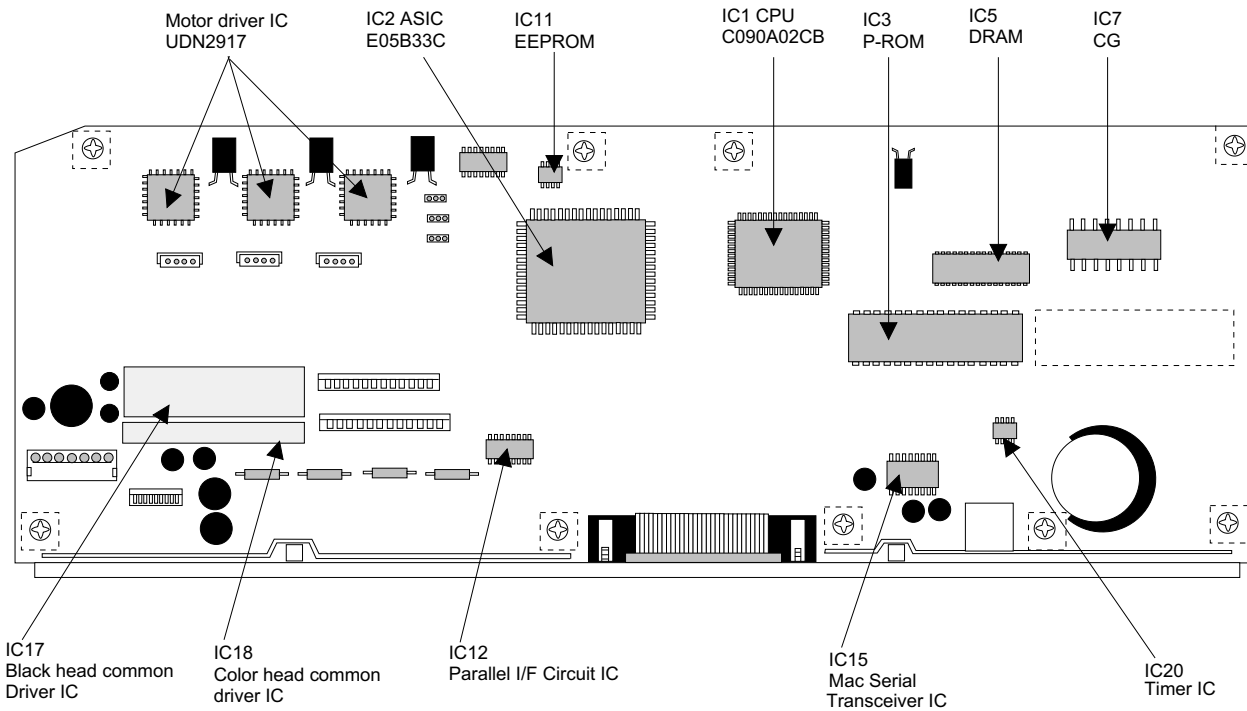


Figure 1-11. C202 MAIN Board

1.7.2 C202 PSB/PSE Board

This board consists of a transformer, switching FET, regulator IC, diode bridge, photo coupler, fuse, various transistors, and so on. It supplies C202 MAIN board with +5 V and +35 V.

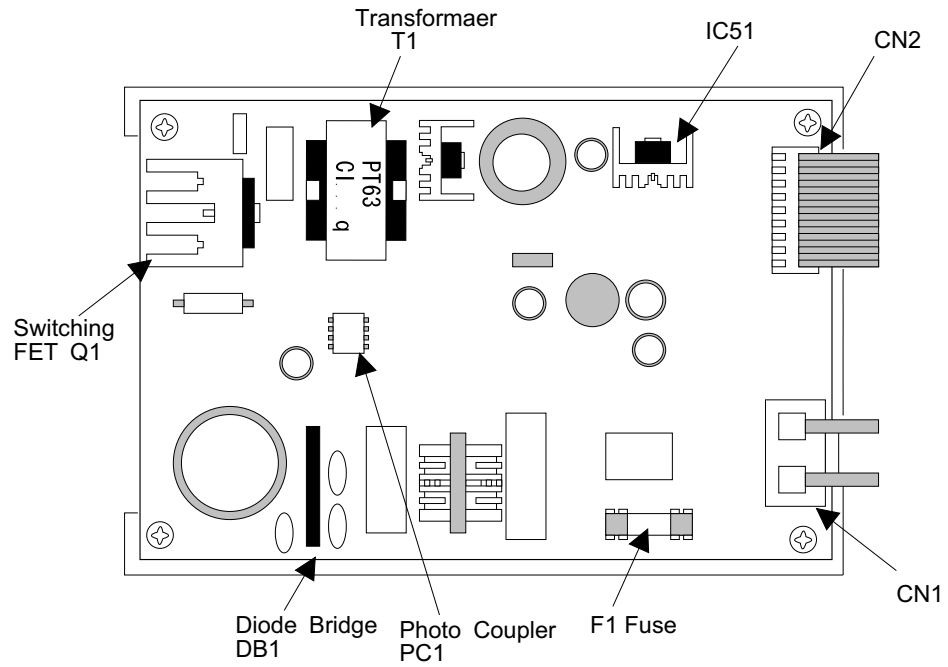


Figure 1-12. C202 PSB/PSE Board

1.7.3 C202 Panel Board

The C202 panel board is the control panel for the Stylus COLOR 800. It has 4 buttons including the power button and 4 LEDs.

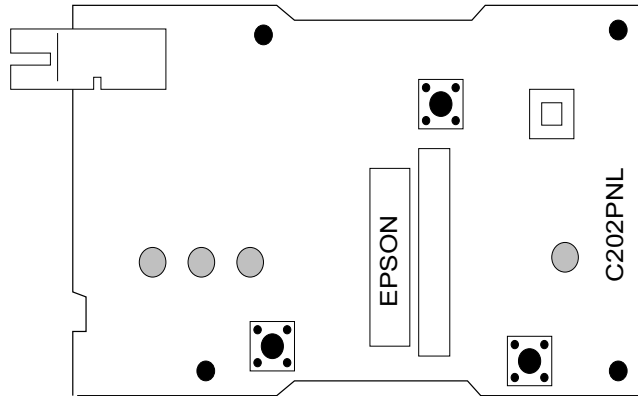


Figure 1-13. C202 Panel Board

1.7.4 Printer Mechanism

This printer mechanism consists of monochrome / color heads; motors, such as the ASF motor, CR motor, and PF motor; sensors, such as the HP sensor, PE sensor, ASF HP sensor, Black Cartridge Out detection sensor, and Color Cartridge Out detection sensor, thermistor, and a pump unit.

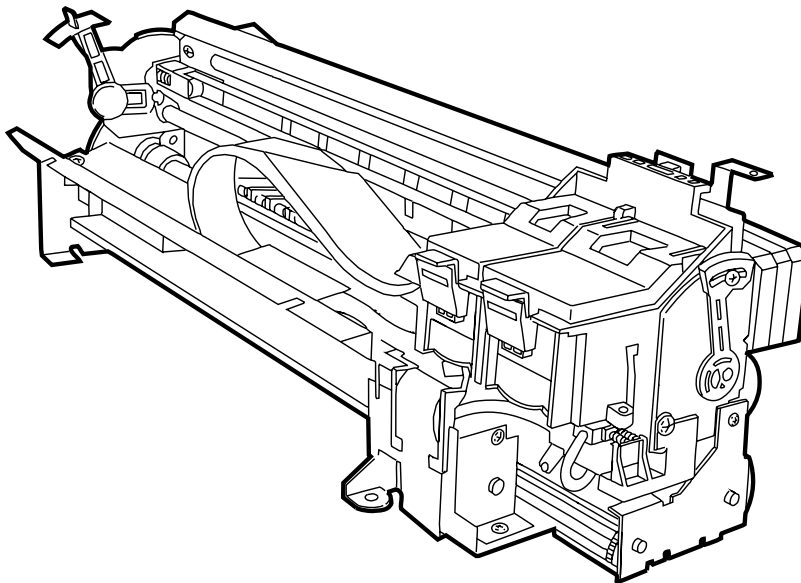


Figure 1-14. Printer Mechanism

1.7.5 Housing

This printer consists of the printer cover, upper housing, and lower housing.

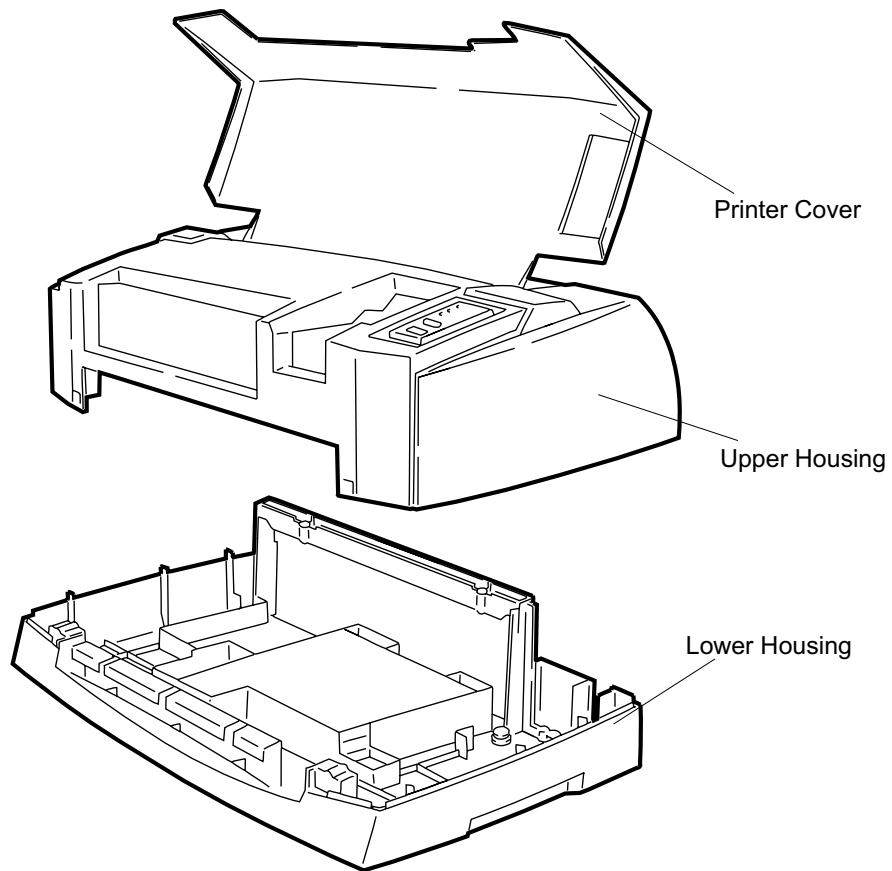


Figure 1-15. Housing

Chapter 2

Operating Principles

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2.1 Overview

This chapter provides information on the printer mechanism, electrical circuit, and ink system. The operating principles for each mechanism in the printer mechanism is described individually. The description for the electrical circuit is divided into 2 parts; C202 PSB/PSE board and C202 MAIN board.

2.2 Printer Mechanism Operating Principles

2.2.1 General Description

This printer is mainly composed of the printing mechanism, paper feed mechanism, carriage mechanism, pump mechanism, and ASF mechanism. There are 3 motors, carriage motor (CR motor), paper feed motor, (PF motor) and pump motor. Table 2-1 shows each motor and corresponding units and assemblies driven.

Table 2-1. Motor and Unit/Assembly Driven

Motor	Unit/Assembly driven
PF motor	PF roller assembly, CR lock lever
CR motor	CR unit, Capping unit
Pump motor	Pump unit, Capping unit, Wiper, ASF unit

When the PF Motor rotates clockwise, the torque is used to drive PF Roller assembly and release CR Lock Lever, while the torque is used to set the CR Lock Lever when the PF Motor rotates counterclockwise.

The CR motor transmit the torque via Timing Belt to shift the CR unit in the both right and left directions in parallel with the Platen. The torque from the Pump Motor, switched by the disengage mechanism, is transmitted to the ASF and the Pump motor. The figure below shows the structure block of the printer mechanism.

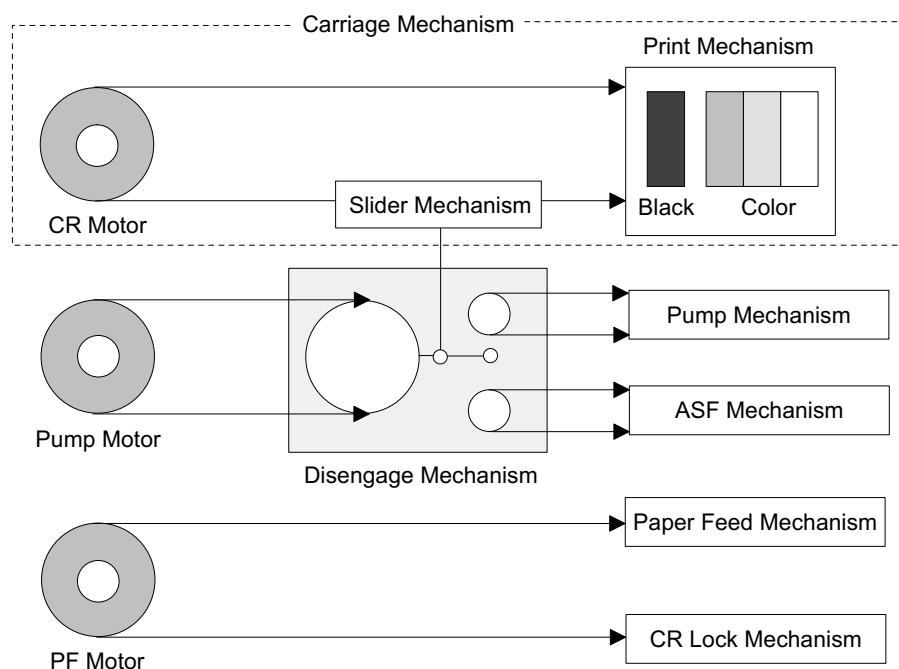


Figure 2-1. Printer Mechanism Block Diagram

2.2.2 Printing Mechanism

The printing method used for this printer is On-demand ink jet system, same as for other EPSON ink jet printers. This printer, however, uses newly designed MACH Head, which ensures a high level of printing quality at a higher speed. This printer is equipped with separate printheads of the same type; one for black and one for each of the three colors (magenta, cyan, and yellow). Quick penetration, the type of black and color ink, is also improved for this printer, which enables the users to have the printing image in the high quality on the normal paper.

□ **Printhead**

The black and color printheads for this printer use the newly designed MACH Head (E-CHIPS Head). The structure of the printhead is the same as for previous CHIPS Head except for the nozzle configuration. The Black Head for this printer has 128 nozzles (32 nozzles for each of 4 rows) which is as twice as many as previous EPSON ink jet printers, and the Color Head has 192 nozzles (32 nozzles for each of 6 rows) which is 3 times as many as previous EPSON ink jet printers. Therefore printing quality as well as the speed for this printer is higher than ever. The nozzle structure for this printhead is shown in the figure below.

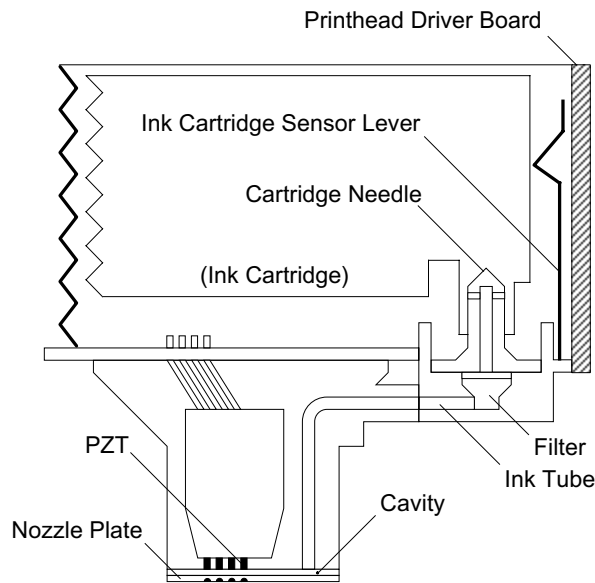


Figure 2-2. Printhead Structure

- **PZT**
PZT is an abbreviation of the Piezo Electric Element. Print signal from C202 MAIN board is sent through the driver board on the Printhead unit and to the PZT. Then, the PZT pushes the top cavity which has ink stored, and makes the ink discharge from each nozzle located on the nozzle plate.
- **Cavity Set**
Ink which is absorbed from ink cartridge goes through the filter and will be stored temporarily in this tank, which is called "cavity" unit driven by PZT.
- **Nozzle Plate**
The board with nozzle holes on the Printhead surface is called Nozzle Plate.
- **Filter**
When the ink cartridge is installed, if any dirt or dust around the cartridge needles are absorbed into the head inside, there is a great possibility of causing nozzle clog and disturbance of ink flow and finally causing alignment failure and dot-missing. In order to prevent this, filter is set at cartridge needle below and ink is once filtered here.

2.2.2.1 Printing Process

Steps below describes how the on-demand ink jet system ejects the ink from each nozzle in the printhead.

<Step 1> Normal state

When the print signal is not output, PZT also dose not move in the waiting state (normal state).

<Step 2> Ejecting state

When the print signal is output from the C202 MAIN board, Nozzle selector IC mounted on the head driver board latches the data once by 1-byte unit. Appropriate PZT latched by nozzle selector is pushed in to the cavity by applying common voltage from the C202 MAIN board. By this operation, ink that is stored in the cavity pops out from nozzles.

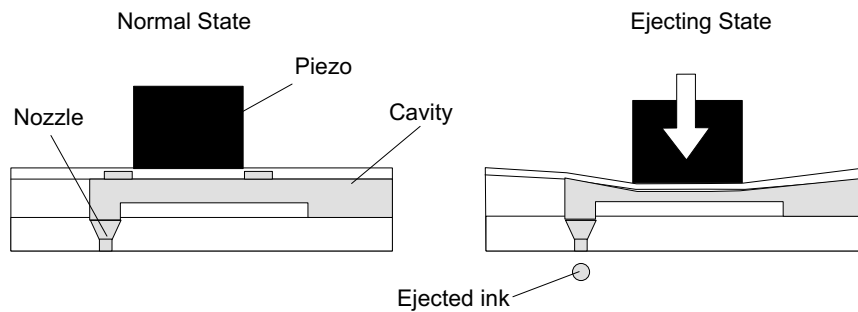


Figure 2-3. Print Process

During the ink charging or cleaning operation, the ink left in the cavity is vacuumed out by the Pump mechanism via Capping unit, then is ejected to the waste ink tank. The cavity is refilled with ink from the Ink Cartridge during the printing or other operations. The viscosity of the ink tends to change according to the temperatures around the heads, and the change in viscosity results in the low printing quality. This is, however, avoided by attaching the thermistor directly to the driver circuit board. It is used to determine the proper drive pulse automatically according to the detected temperature.

2.2.2.2 Printing Methods

This printer has 3 kinds of different dot to compose the print image; Normal dot, Double firing Normal dot, and Micro dot. Each dot is selected to control printing depending on the conditions such as the paper type and the print resolution set through the printer driver.

❑ Normal dot / Double Firing Normal dot printing mode

Normal dot/Double firing Normal dot printing modes are available for the both black and color printings. Normal dot printing mode is designed to form single dot with 2 head drive pulses. With this mode, the dot diameter is expanded to solve the white banding problem which occurs during solid printing at 360 dpi. This printer is, however, designed to use less ink than other printers do to perform printing at 1440 dpi, the maximum solution on the horizontal line. Therefore the Double firing Normal dot and Normal dot used for this printer is considered equivalent to the Normal dot mode and Micro dot mode used for previous ink jet printers respectively. Double firing Normal dot mode is normally selected for printing at 360 dpi, and the Normal dot mode is used for printing in 720 X 360 dpi or 720 dpi X 720 dpi, depending on the paper type.

❑ EPSON Micro dot printing

Both black and color printings can be performed in the Micro dot printing mode. In the Normal dot printing, one dot is formed with 2 pulses. On the other hand, EPSON micro dot printing mode forms one dot with single pulse using less ink. As mentioned above, the Micro dot printing for this printer is controlled to use less ink to create images at 1440 dpi, the maximum solution on the horizontal line. This mode is used for printing at 720 dpi or 1440 dpi by controlling the firing duty of the ink.

❑ Micro Weave Printing

This function is developed to enhance quality in graphic image by eliminating white banding which occurs on each line. This printer is equipped with a new micro weave printing mode and is controlled to form a horizontal line using 2 different types of nozzle. With this mode, the printer can prevents color inks from mixing with each other before drying and can provide clearer colors in the output. The Micro Weave printing can be selected through the printer driver.

2.2.3 Carriage (CR) Mechanism

The CR mechanism is composed of the CR motor, Timing Belt, CR Guide Shaft, Top Frame, and Home Position (HP) sensor. The torque from the CR motor is transmitted to the CR unit via the Timing Belt to move the CR unit along the CR Guide Shaft both right and left, depending on the direction in which the CR motor rotates. When the CR unit returns to the HP position, it is detected by the HP sensor mounted on the right end of the Top Frame, and the information is fed back to the IC2 gate array (E05B33CB). Figure 2-4 illustrates the CR mechanism conception.

The CR motor, which drives the CR mechanism, is a 4-phases/200-pole/HB type stepping motor and is

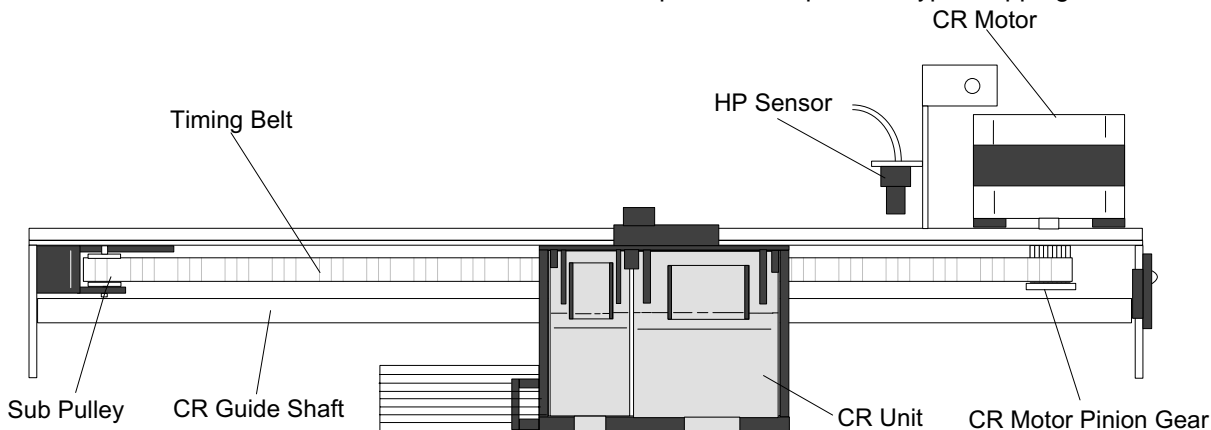


Figure 2-4. Carriage Mechanism

controlled by the constant current bipolar control system. The current control signal for each phase and phase control signal output from the IC2 gate array E05B33CB are converted into the CR motor control signal by the IC13 bipolar driver UDN2917EB to control the CR motor. Refer to Table 2-2 and Table 2-3 which show the CR specification and the drive frequency.

Table 2-2. CR Motor Specification

Item	Description
Motor type	4-phases / 200-pole / HB type stepping motor
Drive voltage	42 VDC \pm 5%
Coil resistance	7.8 Ω \pm 10% (at 25° C per 1 phase)
Inductance	14 mH \pm 20% (1 KHz, 1 Vrms)
Drive frequency	240 ~ 4080 Hz
Excitation mode	Bipolar drive
Minimum step	1/120 inch / pulse (2-2 phase drive), 1/240 inch / pulse (1-2 phase drive) 1-480 inch / pulse (W1-2 phase drive)

Table 2-3. CR Motor Drive Terms

Mode	CR speed (CPS)	Drive frequency (Hz)	Drive system and acceleration/deceleration step			Acceleration/De celeration pulse*1
			A*2:1, D*3:2	A:2, D:2	Constant	
Fast skip	340	4080	64 (W1-2)	164 (2-2)	(2-2)	180
DRAFT	266.7	3200	88 (W1-2)	86 (2-2)	(2-2)	108
LQ	200	2400	432 (W1-2)	—	(W1-2)	108
TEXT LQ	200	2400	240 (W1-2)	—	(W1-2)	60
SLQ	100	1200	432 (W1-2)	—	(W1-2)	108
Capping	90	1080	64 (W1-2)	—	(W1-2)	16
wiping 2	80	960	64 (W1-2)	—	(W1-2)	16
Wiping	40	480	16 (W1-2)	—	(W1-2)	4
Capping (open)	20	240	8 (W1-2)	—	(W1-2)	2
Constant value	20	240	—	—	(W1-2)	—

Note) *1: Step : reduced to 2-2 phase

*2: Acceleration

*3: Deceleration

2.2.4 Paper Feed Mechanism

This printer is equipped with the PF motor which is used to feed paper only to improve feeding speed. The drive from the Pump motor is used to load paper at the ASF and the drive from the PF roller is independently used to feed paper only. The paper feed mechanism is classified to 2 parts; the paper feed part having the PF roller for the main assembly, and the paper eject part having the Paper eject roller for the main assembly. The PF roller is coated with the powdery material, which is used to improve the paper feed accuracy. The PF motor located at the rear left part of the printer mechanism transmits the torque via the Combination gear (14, 31.5) and Gear (70) to the PF roller assembly to feed paper loaded.

The torque is then transmitted from the Gear (17) on the Paper feed roller assembly to the Paper eject roller via the Gear (19) to eject paper. The torque is transmitted in the following order:

□ **Paper feed part**

1) PF motor pinion gear → 2) Combination gear 14, 31.5 → 3) Gear 70 → 4) PF roller assembly

□ **Paper Eject part**

1) PF motor pinion gear → 2) Combination gear 14, 31.5 → 3) Gear 70 → 4) Gear 17 (PF roller assembly) → 5) Gear 19 (Front paper guide assembly) → 6) Paper eject roller assembly (Front paper eject assembly)

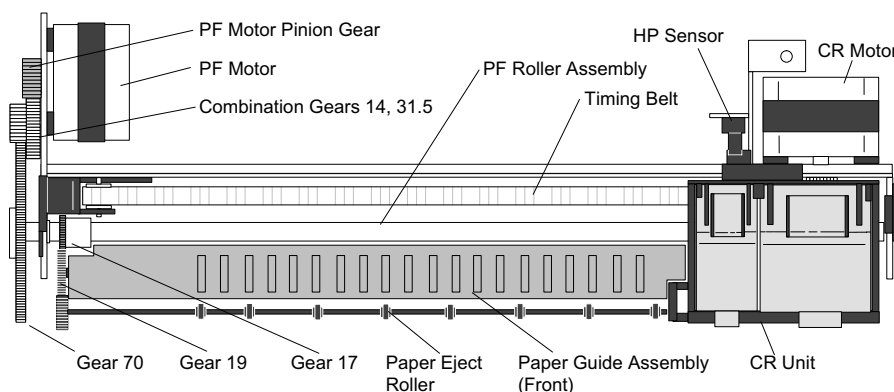


Figure 2-5. Paper Feed Mechanism

This printer uses a 4-phases/96-pole/HB type pulse motor which is controlled by the bipolar constant voltage system for the PF motor. The current control signal for each phase and phase control signal output from the IC2 gate array E05B33CB are converted into the PF motor control signal by the IC16 bipolar driver UDN2917EB to control the PF motor. Since the power switch of this printer is wired to the secondary circuitry, the voltage remains the constant level until the loaded paper is ejected after the printer power is turned off. Table 2-4 and Table 2-5 show the PF motor specification and PF motor drive frequency, respectively.

Table 2-4. PF Motor Specification

Item	Description
Motor type	4-phases / 96-pole / HB type pulse motor
Drive voltage	42 VDC ± 5% (The voltage applied to the driver)
Coil resistance	7.8 Ω ± 10% (at 25° C per 1 phase)
Inductance	14 mH ± 20% (1 KHz, 1 Vrms)
Drive frequency	400 ~ 4320 Hz
Excitation mode	Bipolar drive
Minimum step	1/120 inch / pulse (2-2 phase drive)

Table 2-5. PF Motor Drive Terms

Mode	Feeding speed- (inch/s)	Drive Frequency (Hz)	Pulse interval- (us)	Acceleration step for each phase			Deceleration step for each phase		
				W1-2	2-2	1-2	W1-2	2-2	1-2
Normal feed	5	3600	278	—	50	—	—	50	—
Fast feed	6	4320	231	—	60	—	—	60	—
Slow feed	2.5	1800	556	—	20	—	—	20	—
At loading	3	22160	463	—	30	—	—	30	—
Micro adjust 1	1.25	900	1111	2	—	—	2	—	—
Micro adjust 2	0.55	400	2500	—	—	—	—	—	—

Note) Drive frequency and pulse interval are reduced to 2-2 phase.

2.2.5 Platen Gap (PG) Adjust Mechanism

The PG adjust mechanism, located at the left of the printer mechanism, consists of the PG lever, PF sub lever, right/left parallelism adjust bushings, and CR guide shaft. PG adjust mechanism is equipped to keep the proper platen gap according to the paper thickness to prevent ink from having friction. The PG lever joins to the CR guide shaft which has an eccentricity via PG sub lever, and switching the lever from “0” to “+” rotates the CR shaft and the platen gap changes from narrow to wide. Figure 2-6 show the PG adjust mechanism.

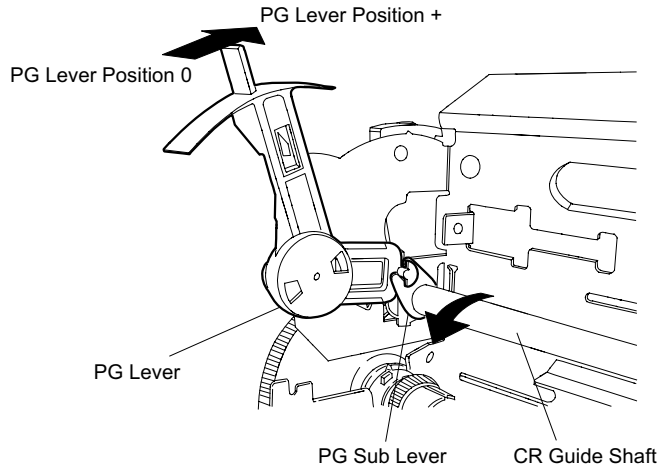


Figure 2-6. PG Adjust Mechanism

2.2.6 CR Lock Mechanism

The CR lock lever, locate at the right side of the printer mechanism, is composed of the PF motor, PF roller assembly, Stopper lever (CR lock lever) and so on. When there is no paper loaded and no data stored, CR lock mechanism fixes the CR unit to the capping position. This operation is accomplished by rotating the PF motor clockwise with the specified steps to set the stopper lever at the right end of the PF roller to the left of the CR unit. The stopper lever is then release when the PF motor rotates counterclockwise with the specified steps. The drive from the PF motor is transmitted in the following order;

- 1) PF motor pinion gear
- 2) Combination gear 14, 31.5
- 3) Gear 70
- 4) PF roller assembly
- 5) Stopper lever

The figure below shows the CR lock mechanism.

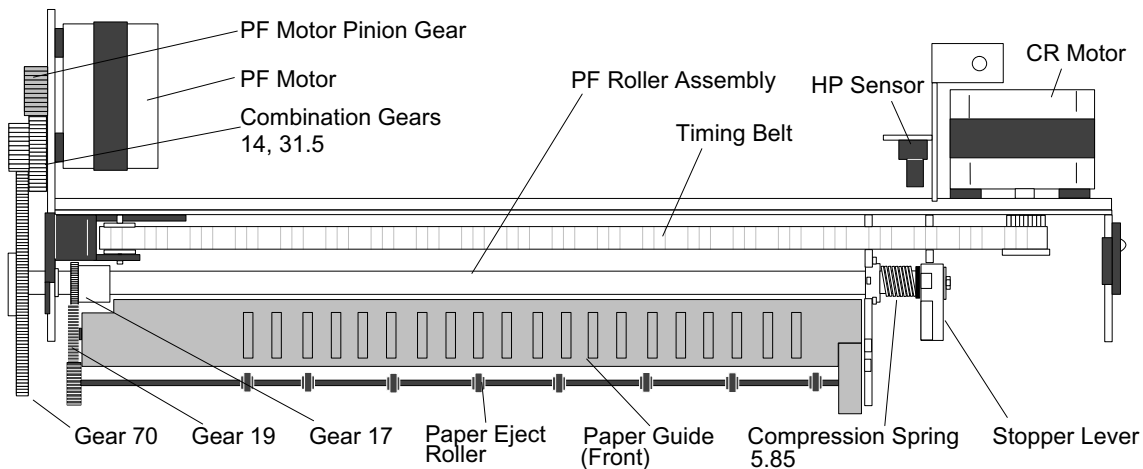


Figure 2-7. CR Lock Mechanism

2.2.7 ASF Mechanism

ASF mechanism, which consists of the Pump motor, slider mechanism, disengage mechanism, and ASF unit, loads paper into the paper feed mechanism. When the CR unit returns to the home position, it pushes the slider in the slider mechanism to the right and the Gear (16) in the slider mechanism then comes to engage with the Change cam in the disengage mechanism. With this motion, the Pump motor rotates with the specified steps in the counter clock wise, which switches the Change cam to the ASF unit side, then the torque from the Pump motor is transmitted to the ASF unit. The process in which the drive from the pump unit is switched to the ASF unit side is described below. Figure 2-8 illustrates the process for the switching operation.

□ Disengage mechanism switch process

- 1) CR shifts to the home position.
- 2) Slider shifts to the right end. (Slider mechanism)
- 3) The Gear (16) is engaged to the Change cam in the disengage mechanism. (Slider mechanism)
- 4) The Change Cam is switched to the ASF side. (Disengage mechanism)
- 5) The Combination Gear (14.4, 21.6) shifts to the left.

The figure below shows movement of above mentioned process 3) to 5).

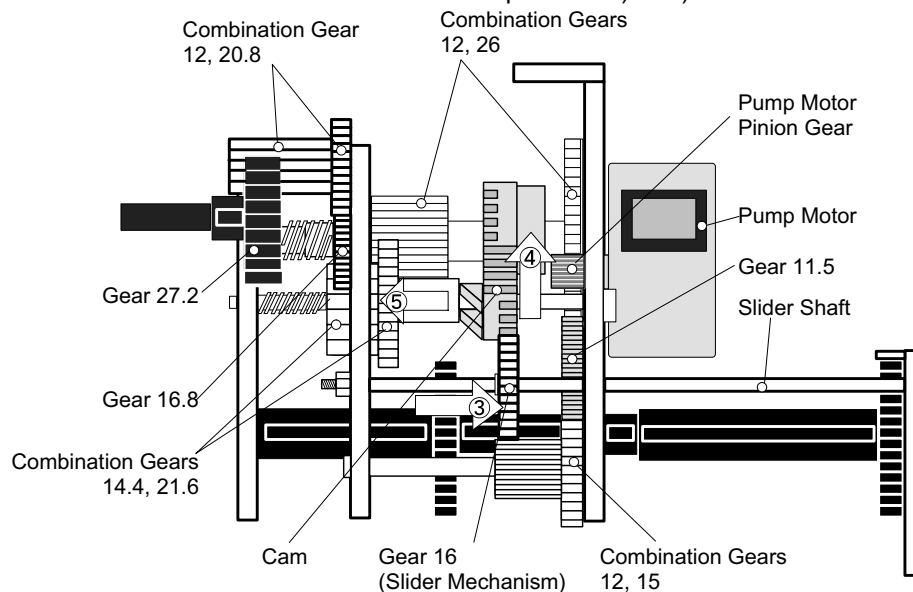


Figure 2-8. ASF Mechanism

□ Transmission process of the Pump motor's torque

- 1) Pump motor pinion gear
- 2) Combination gear 12, 26
- 3) Combination gear 14.4, 21.6
- 4) Gear 16.8
- 5) Combination gear 12, 20.8
- 6) Gear 27.2 (ASF unit)
- 7) LD roller shaft (ASF unit)

Note) This order has no relevance to the order in the figure above.

The ASF home position is sensed by the detection wheel attached to the right end of the LD roller shaft and ASF HP sensor, and the detected condition is fed back to the IC2 E05B33CB. The ASF motor is controlled based on the home position which is detected by the ASF HP sensor. A 4-phase/48 -pole PM type pulse motor is used for the pump motor which is controlled by the constant current bipolar drive. The current control signal for each phase and phase control signal output from the IC2 gate array E05B33CB are converted into the pump motor control signal by the IC6 bipolar driver UDN2917EB to control the PF motor. Table 2-6 and Table 2-7 show the pump motor specification and pump motor drive frequency, respectively.

Table 2-6. Pump Motor Specification

Item	Description
Motor type	4-phases / 48-pole / PM type pulse motor
Drive voltage	42 VDC \pm 5% (The voltage applied to the driver)
Coil resistance	9.3 Ω \pm 10% (at 25° C per 1 phase)
Drive frequency	272 ~ 654 Hz
Excitation mode	Bipolar drive
Minimum step	1/218 inch / pulse (2-2 phase drive)

Table 2-7. Pump Motor Drive Terms

Mode	Frequency	Pulse interval	Feeding speed	Acceleration step		Deceleration step	
				W1-phase	1-2 phase	W1-phase	1-2 phase
Paper back feed	436	2294	2 inch/S	5	—	5	—

❑ **ASF multiple feeding prevention mechanism**

The paper loading assembly in the ASF is composed of the D-cut paper loading roller, C-cut cam, paper feed back lever, and pinch roller. The C-cut cam and the D-cut roller have synchronous movement staying on the same shaft. When they rotate counter clock wise (viewed from the right), the paper feed back lever, moving in accordance with the notch portion of the C-cut cam, pushes the dislocated paper back up to the standby position. Dislocation means the situation in which multiple paper including the paper to be loaded at the next rotation slip off the standby position and fall into the paper path.

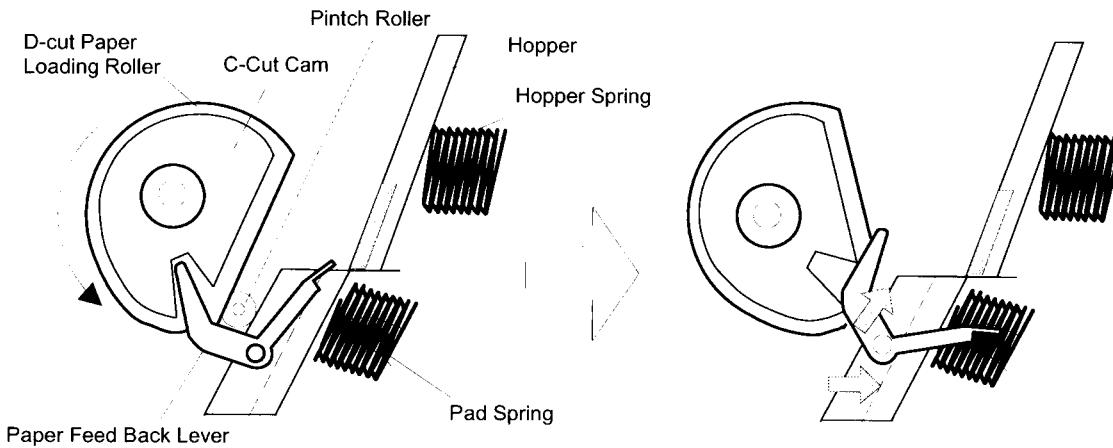


Figure 2-9. ASF Multi Feeding Prevention Mechanism

❑ **ASF multiple feeding prevention mechanism operating principles**

- [Step1] : When the Load/ Eject switch is pressed or printing order is input from the PC, PF motor rotates counterclockwise and makes the C-cut Cam rotates in the same direction.
- [Step2] : The Paper feed back lever clutched to the C-cut cam rises with the counter clock wise rotation to catch the slipped paper. Along with this motion, the pad is pushed backward and the Pinch roller and the D-cut paper loading roller become to no friction condition.
- [Step3] : When the dislocated paper is pushed back up to the standby position by the Paper feed back lever, the counter wise rotation of the Pump motor releases the Release hopper lever and the D-cut paper feed roller begins to load the paper.
- [Step4] : When the ASF finishes to feed the paper to the specified position, the flat part of the D-cut paper loading roller turns around to the paper path side, where the C-cut paper loading roller loses contact with the paper and the Pinch roller supports the paper instead. The paper Pinch roller continues to support the paper until the paper is completely ejected from the ASF with the rotation of the PF roller. The Paper feed back lever ,during this movement, is in the stand by position, as illustrated in the above left figure.

2.2.8 Ink System

The ink system for this printer is composed of the following and performs absorbing and ejecting ink, cleaning the printhead surface, and capping the printheads.

- Ink cartridge
- Pump mechanism
- Wiping mechanism
- Capping mechanism
- Waste ink drain pads

This section describes the operational principles of the pump mechanism and capping mechanism. The figure below shows the structure of the ink system.

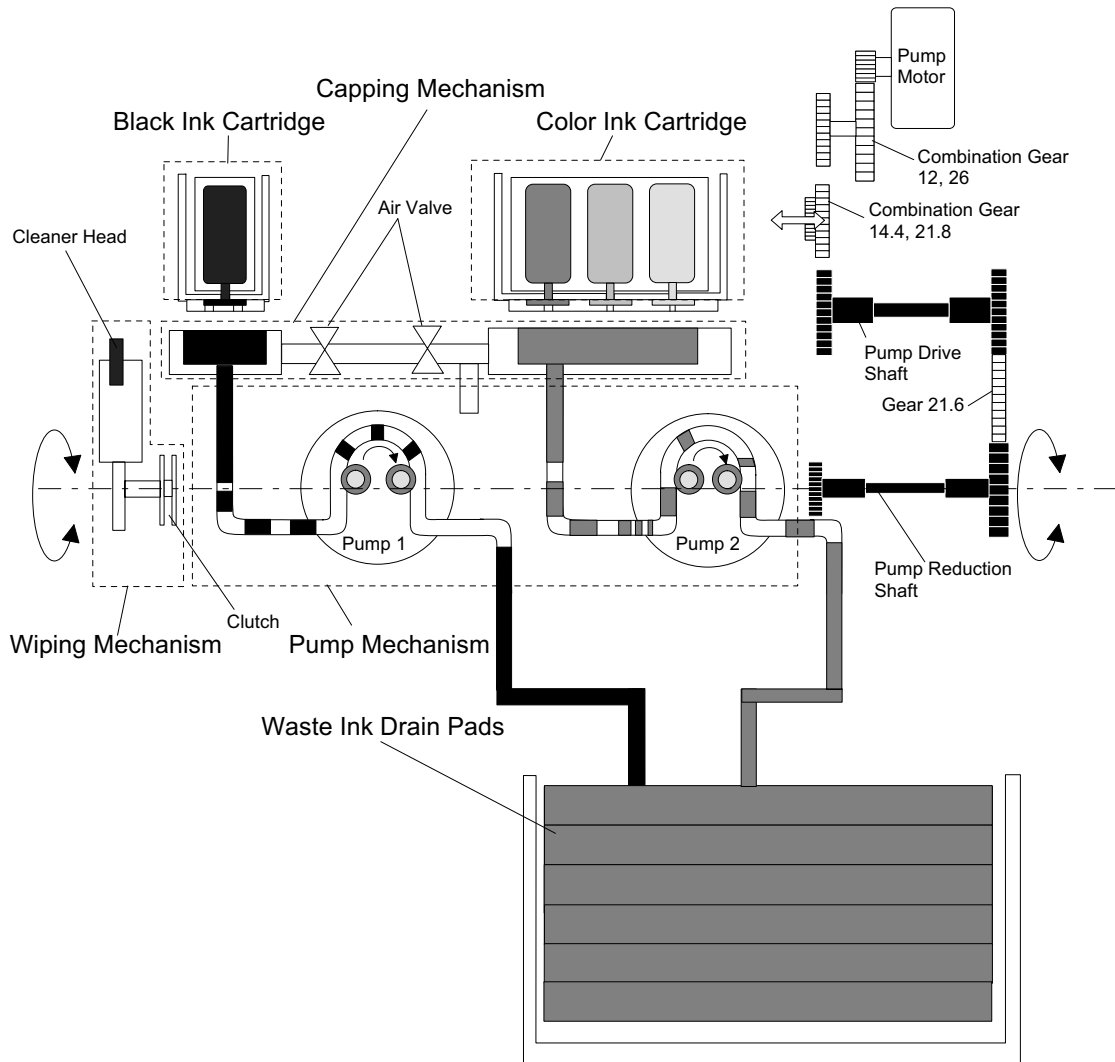


Figure 2-10. Ink System

2.2.8.1 Pump Mechanism

The functions of the Pump mechanism, which is composed of the Pump motor, Slider mechanism, and Disengage mechanism, are Absorbing black/color ink from the capping unit, false absorption, and setting and resetting of the wiper. When the CR returns to the CR home position, it pushes the slider in the Slider mechanism to the right end. That movement engages the Gear 16 in the slider mechanism with the Change Cam in the Disengage mechanism. Then the Change Cam switches to the Pump mechanism side when the Pump motor rotates clock wise with the specified steps, and the drive from the Pump motor is transmitted to the Pump mechanism. The torque is transmitted to the Pump side via the Disengage mechanism in the following order:

1. Disengage mechanism switch process
2. CR shifts to the home position.
3. Slider shifts the right end. (Slider mechanism)
4. The Gear 16 is engaged to the Change Cam. (Slider mechanism)
5. The Change Cam switches to the pump side. (Disengage mechanism)
6. The Combination Gear 14.4, 21.6 shifts to the right. (Disengage mechanism)

The following figure shows how the gears are engaged.

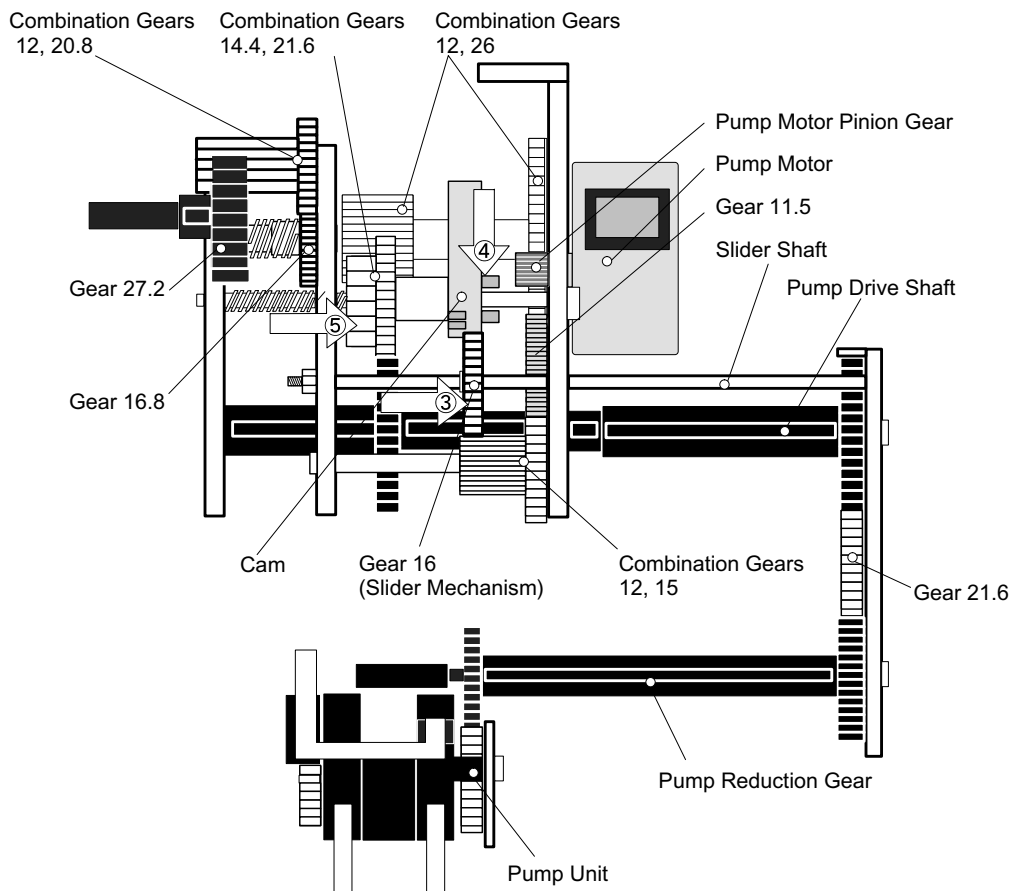


Figure 2-11. Pump Mechanism

□ **Transmission process of the Pump motor's torque**

- | | | |
|---------------------------|----------------------------|--------------------------------|
| 1) Pump motor pinion gear | 2) Combination gear 12, 26 | 3) Combination gear 14.4, 21.6 |
| 4) Pump drive shaft | 5) Gear 21.6 | 6) Pump reduction shaft |
| 7) Pump unit | | |

Note) This order is irrelevant to the order indicated with arrows in the figure above.

The pump unit switches its function depending on the direction in which the pump motor rotates, as show in Table 2-8;

Table 2-8. Pump Motor Rotation and Function

Motor rotation direction	Function
Clock wise direction (Forward)	Color ink absorption, Color ink false absorption, Color ink Micro absorbing, Resetting the wiper
Counter clock wise direction (Reverse)	Black ink absorption, Black ink false absorption, Black ink Micro absorbing, Setting the wiper

Note) The directions for the rotation are described when the motor is viewed from the pinion gear side.

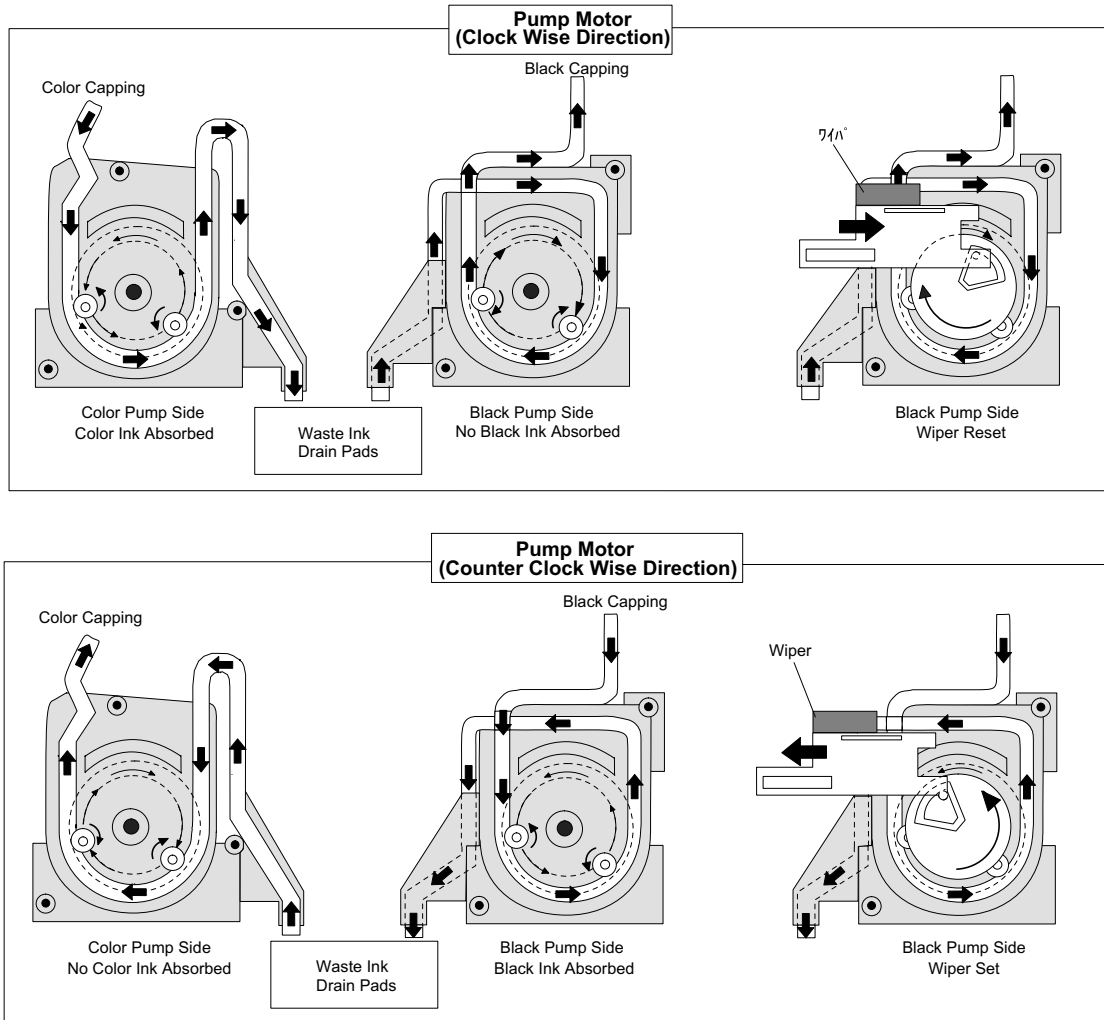


Figure 2-12. Pump Mechanism

The pump motor for this printer also drives the ASF mechanism. See Table 2-6 for its specification. The drive terms for the pump motor in the pump mode is as shown in Table 2-9.

Table 2-9. Pump Motor Drive Terms in the Pump Mode

Absorption Mode	Frequency	Pulse interval	Acceleration step			Deceleration step		
			W1-2 phase	2-2 phase	1-2 phase	W1-2 phase	2-2 phase	1-2 phase
High speed	1350	741	—	30	—	—	30	—
Normal speed	675	1481	—	—	18	—	—	18
Low speed	281	3559	0	—	—	0	—	—
At disengage	141	7092	0	—	—	0	—	—

2.2.8.2 Capping Mechanism

The capping mechanism caps the printheads with the cap holder to prevent the ink around the nozzles from increasing viscosity while the printer is in stand-by status or the printer power is off. It has 2 separate holders; one for the color inks and the other for the black ink. When the CR shifts from the home position to the right end of the CR (Motion 1 in Figure 2-13), they move up into the capping position (Motion 2 in Figure 2-13) to cap the printheads. Moreover, by shifting the CR unit to the right end of the CR shaft, the air valve is shut out completely (Motion 3 in Figure 2-13).

The air valve is released and shut to alternate the false absorption mode and absorption mode. (Refer to Section 2.4 for the details.) Since this printer has the Power supply board on the secondary electrical circuit, capping operation is completely carried out with the constant voltage if the printer power is turned off during the capping operation. The figure below shows the Capping mechanism.

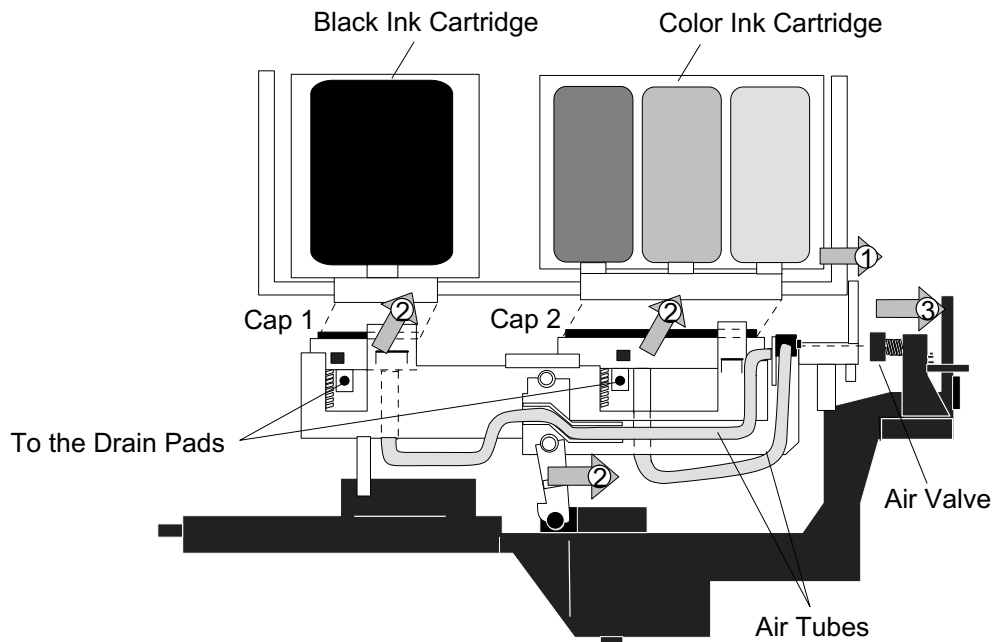


Figure 2-13. Capping Mechanism

2.3 Electrical Circuit Operation Principles

This printer consists of the following circuit boards:

- C202 MAIN board
- C202 PSB/PSE board
- C202 Panel board

In addition to the circuit boards above, the printhead driver circuit is directly attached to each of the black and color heads in the CR unit. This section describes the operational principle of the C202 PSB/PSE board and C202 MAIN board. Table 2-10 shows the input voltages and applications.

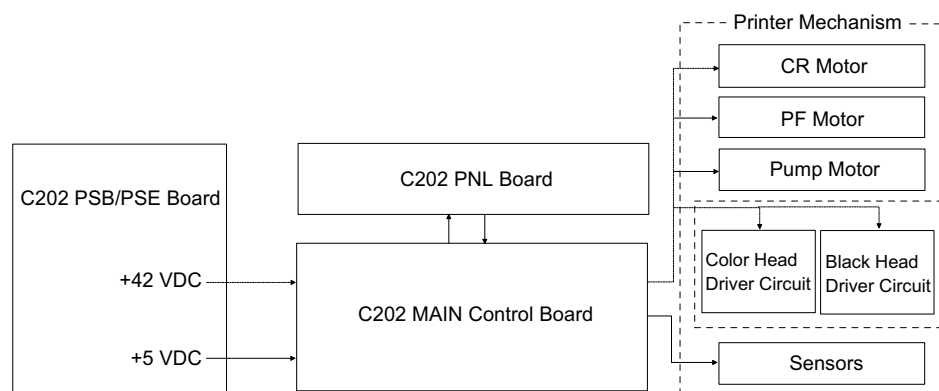


Figure 2-14. Electrical Circuit Block Diagram

2.3.1 C202 PSB/PSE board

The electrical circuit of this printer uses RCC (Riging Choke Converter) which outputs 2 different types of the VDC necessary to operate the printer.

Table 2-10. DC Voltage Distribution

VDC	Application
+42 V	<input type="checkbox"/> Motors <input type="checkbox"/> Printhead common voltage
+5 V	<input type="checkbox"/> C202 MAIN control board (logic) <input type="checkbox"/> C202 panel board <input type="checkbox"/> Sensors (HP sensor, ASF HP sensor, PE sensor)

The power switch of this printer is in the secondary circuit that allows the PSB/PSE board to continue to supply voltage for the power and logic lines for a minimum of 20 seconds until the printhead returns to the capping position even if the printer is turned off during printing. This extra time prevents ink leakage and dried printhead caused by the printhead being left uncapped. The AC voltage from the AC inlet is first input to the filter circuit for higher harmonics absorption and is then input to the rectification and smoothing circuit, converting into DC voltage. This DC voltage is then input to the switching circuit. Along with this switching operation by FET on the primary side, +42 voltage is generated and stabilized on the secondary side, which is then converted into the stable +5 VDC by the chopping regulator IC.

Figure 2-15 shows the block diagram of the electrical circuit.

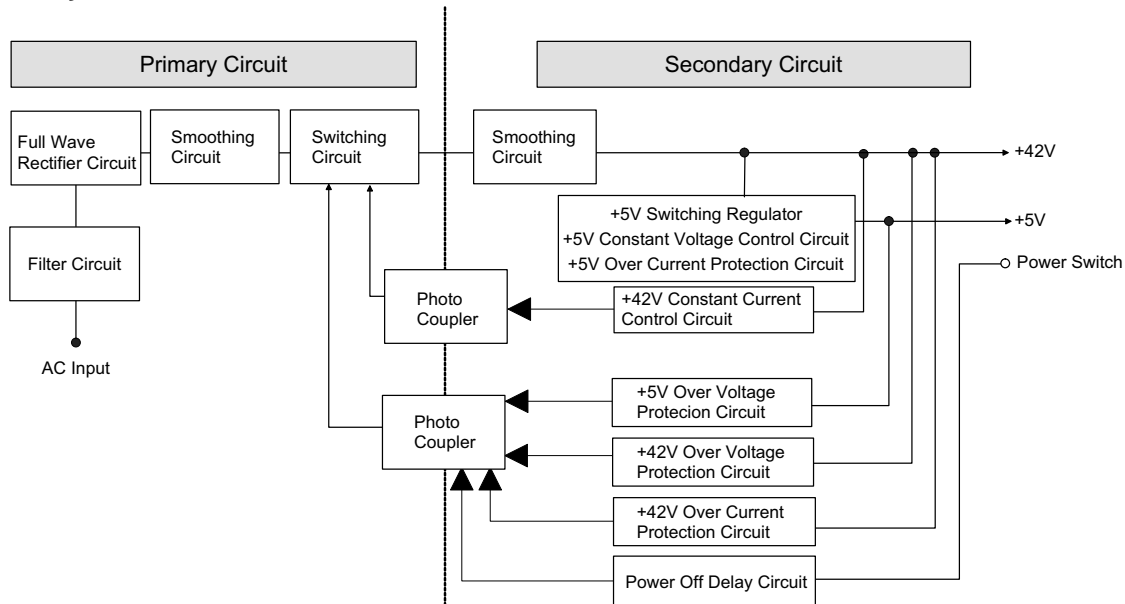


Figure 2-15. VDC Circuit Block Diagram

The operating principles of various protection circuit and controller circuit in the figure above are described below.

- ❑ **+5 VDC line over voltage protection circuit**
 The output voltage level of +5 V is monitored by a Zener diode (AD53) on the secondary circuit. If the voltage level exceeds 9 V, the switching FET Q1 goes Off in the following order, and no induced electromotive is generated and production of +5 VDC and +42 VDC stops as the result.

 - Zener diode (ZD53) detects voltage which exceeds +9 V at +5 V line.
 - Transistor Q81 goes On.
 - Photo coupler PC1 goes On.
 - FET Q31 goes On and the gate current for the switching FET Q1 is cut off.
 - Switching FET Q1 goes Off.

- ❑ **+5 VDC line constant voltage control circuit**
 Voltage at the +5 VDC line is monitored by the regulator IC51. Abnormal voltage at the +5 VDC line is detected and the information is fed back to the +5 V comparator in the IC, then +5 VDC is controlled or cut off.

- ❑ **+5 VDC line over voltage protection circuit**
 The output level of the +42 VDC line is monitored by the 2 Zener diodes ZD52 and ZD87. When the output level of the +42 VDC line exceeds +48 V, the Switching FET Q1 goes Off in the following sequence.

 - Zener diodes (ZD52, ZD87) detect the voltage over 48 V at the +42 V line.
 - Transistor Q81 goes On.
 - Photo coupler PC1 goes On.
 - FET Q31 goes On and the gate current for the switching FET Q1 is cut off.
 - Switching FET Q1 goes Off.

- ❑ **+42 VDC line constant voltage control circuit**
 Voltage at the +42 VDC line is monitored by the Zener diodes ZD51 and ZD81 to ZD86. When the voltage at the +42 VDC line exceeds, the Switching FET Q1 is controlled in the following sequence.

 - Zener diodes (ZD52 and ZD81 to ZD86) detect the voltage over 38V at the +42 VDC line.
 - Transistor Q81 goes On.
 - Photo coupler PC1 goes On.
 - The transistors Q3 and Q2 go off and gate current for the switching FET Q1 is cut off.
 - Switching FET Q1 goes Off.
 - When the voltage level drops under +38 V, the photo coupler PC1 and transistors Q3 and Q2 go Off and the swathing FET Q1 goes back On.

- ❑ **+42 VDC line overcurrent protection circuit**
 The output current is monitored by the transistors Q81 and Q82. When the output current is abnormally low, the information is fed back to the primary circuit via the photo coupler PC1 to stop the switching operation.

2.3.2 C202 MAIN Control Board

C202 MAIN control board consists of the following:

- Logic circuits for PROM, DRAM, CPU, ASIC and EEPROM
- Motor control and driver circuits for CR motor, PF motor, and pump motor
- Head control/ driver circuit for the black and color heads
- Other circuits for the I/F (Parallel I/F, Mac serial, Type B I/F), sensors, RTC timers, and reset

Figure 2-16 shows the circuit block diagram for the main control board.

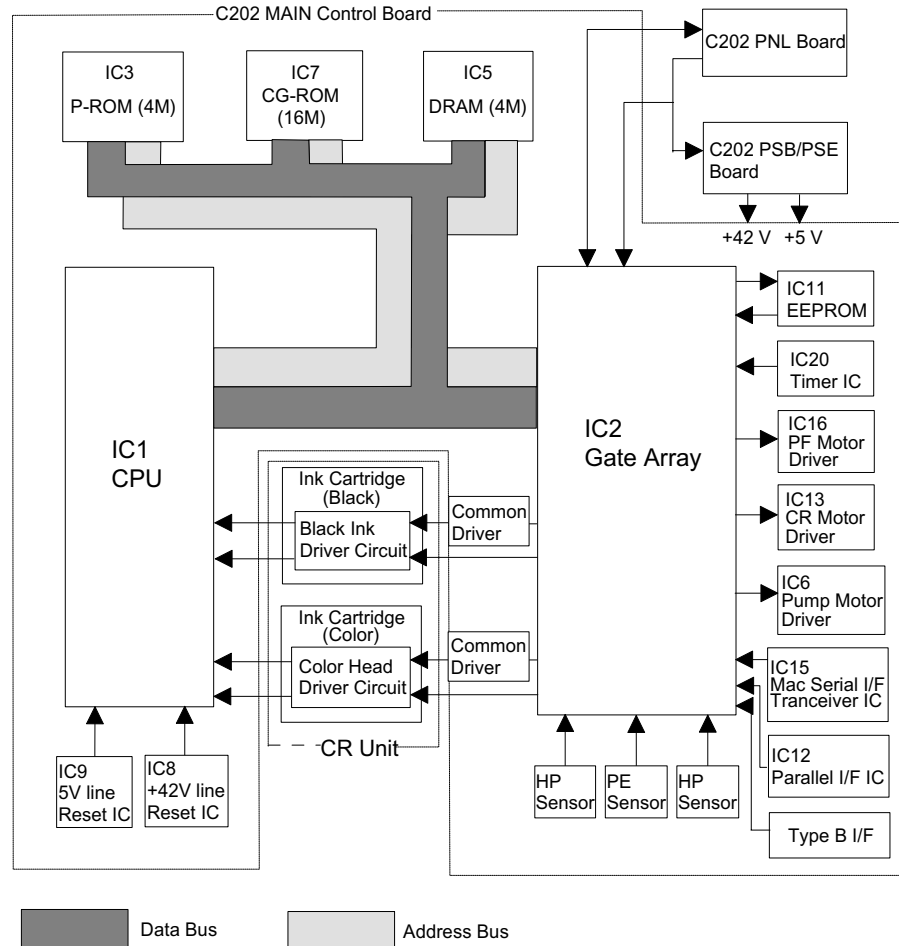


Figure 2-16. C202 MAIN Board Block Diagram

Table 2-11 shows the allocated functions for the CPU and the gate array.

Table 2-11. Allocated Functions for the CPU and the Gate Array

IC	Location	Function
CPU	IC1	<ul style="list-style-type: none"> <input type="checkbox"/> Sets the current value for each motor. <input type="checkbox"/> Outputs the driving trigger pulse for each motor. <input type="checkbox"/> Outputs the driving trigger pulse for each head <input type="checkbox"/> Outputs the system clock. <input type="checkbox"/> Inputs the resistance value for the thermistor. <input type="checkbox"/> Inputs the On/Off signal of installation status for each cartridge. <input type="checkbox"/> Transfers received data from I/F to DRAM <input type="checkbox"/> Controls interruption signals
Gate Array	IC2	<ul style="list-style-type: none"> <input type="checkbox"/> Controls the motor drivers. <input type="checkbox"/> Controls printing data for each head. <input type="checkbox"/> Controls data from I/F and transfers it to the CPU. <input type="checkbox"/> Outputs head driver control pulses. <input type="checkbox"/> Counts dot numbers used for printing. <input type="checkbox"/> Controls voltages for EEPROM, control panel, timers, and heads.

2.3.2.1 Printhead Driver Circuit

The printhead driver circuits, which are separately built in for the black and color heads, consist of the common drivers (black head:IC17, color head:IC18) on the C202 MAIN board and nozzle selectors (Black head:IR2C72C, Color head: IR2C73C) on the head driver boards. Each common driver produces trapezoidal pulses according to the signals sent from the IC2 gate array, and transfer them to the nozzle selector on the head driver board. Printing data is converted into serial data at the gate array and is then transferred to the nozzle selector on the head driver board to select the nozzles to be activated. The PZT common lines are selectively driven simultaneously based on the driver waveform produced at the common driver to activate the nozzles selected by the printing data.

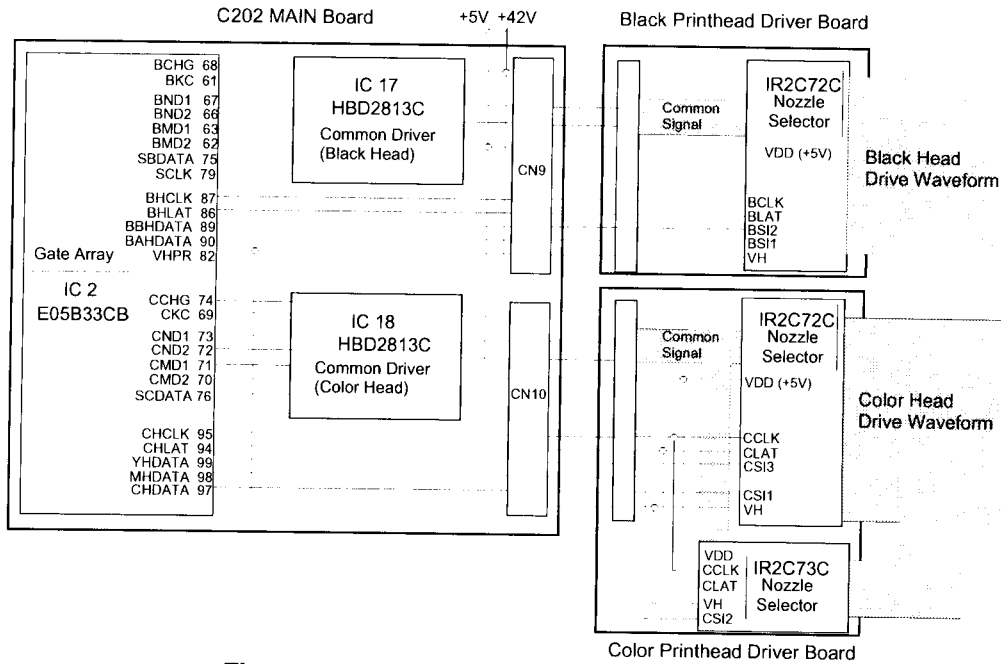


Figure 2-17. Printhead Driver Circuit Diagram

□ **Common driver circuit for the black head**

The common driver IC17 HBD2813C produces trapezoidal waveforms by combining the 6 different signals BCHG, BND1, BND2, BMD1, BMD2 and BKC output from the IC2 E05B33CB gate array using VM voltage as the basis. There are 7 particular types of trapezoidal waveforms produced for the normal dot mode, Micro dot mode and so on, and each form varies depending on the width of the combined signals. The rising form is determined by the BCHG and BKC regardless of the printing mode. The falling form is determined by the 2 different pairs of signals; BND1 and BND2 in the normal dot mode, and by BMD1 and BMD2 in the micro dot mode. The VH voltage adjusting values stored in the EEPROM, which is unique to each head and, is read into the gate array, and then transferred in 8-bit serial data via CBDATA signal to be set in the common driver. With this procedure, the internal resistance is determined and the driver waveform is adjusted as the result.

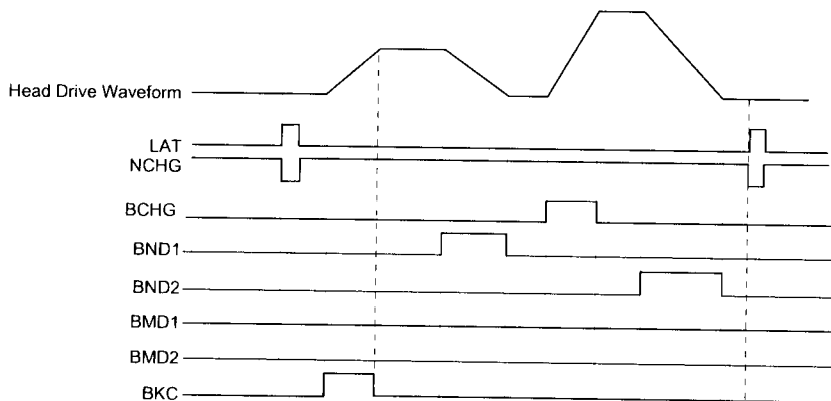


Figure 2-18. Waveform Producing Process for Black Nozzle

❑ **Black head nozzle selector circuit**

The printing data is input from the data input ports D0 to D15 of the IC2 E05B33CB gate array to the gate array to be converted into serial data and output to the nozzle selector from the BBHDATA and BHADATA ports. The data is then separated to 2 sides through the port BBHDATA and BHADATA which are allocated with 2 lines of black nozzles; the lines #1, #3 and #2, #4 respectively. The smaller-numbered nozzle on each line receives data faster. Data is transferred from IC2 gate array to Nozzle selector IC IR 2C72C at 64 bit / 2.5 MHz synchronizing with the BHCLK (Clock signal) and BHLAT (latch signal). On/Off status of each nozzle in the nozzle selector is determined based on the data transferred.

❑ **Common driver circuit for the color head**

The circuit structure for the color head is basically the same as for the black head. The common driver IC18 HBD2813C produces trapezoidal waveforms by combining the 6 different signals CCHG, CND1, CND2, CMD1, CMD2 and CKC output from the IC2 E05B33CB gate array. There are 7 particular types of trapezoidal waveforms produced for normal dot mode, Micro dot mode and so on, and each form varies depending on the width of the combined signals. The rising form is determined by the CCHG and CKC regardless of the printing mode. The falling form is determined by the 2 different pairs of signals; CND1 and CND2 in the normal dot mode, and CMD1 and CMD2 in micro dot mode. The VH voltage adjusting value stored in the EEPROM, which is unique to each head is read into the gate array, and then transferred in 8-bit serial data via SBDATA signal to be set in the common driver. With this procedure, the internal resistance is determined and the driver waveform is adjusted as the result.

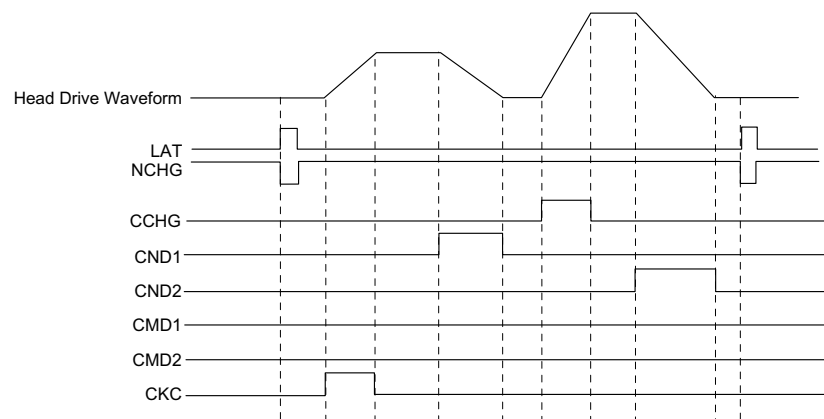


Figure 2-19 Waveform Producing Process for Color Nozzles

❑ **Color head nozzle selector circuit**

The printing data is input from the data input port D0 to D15 of the IC2 E05B33CB gate array to the gate array to be converted into serial data, and output to the nozzle selector from the YHDATA, MHDATA, and CHDATA ports according to the color. The data is then allocated to the corresponding nozzle lines, alternating 2 lines; from #1 to #2. Data is transferred from IC2 gate array to Nozzle selector IC IR 2C72C at 64 bit / 2.5 MHz synchronizing with the BHCLK (Clock signal) and CHLAT (latch signal). On/Off status of each nozzle in the nozzle selector is determined based on the data transferred.

2.3.2.2 Reset Circuits

The C202 MAIN board contains two reset circuits; for logic line (+5 V) and power line (+42 V). The voltages for +5 V and +42 V in each reset circuit are monitored to prevent printer malfunction caused by abnormal voltage levels. When an abnormal condition is detected, a reset signal is sent to the CPU and the gate array. The function of the reset circuit is described below.

Reset circuit for the +5 V line

The +5 V reset circuit monitors voltage level for the +5 V line at the port 3 VCC of IC9 PST592D, and outputs a reset signal from the port 1 VOUT to the CPU gate array when it detects an abnormal voltage level. The IC9 is energized under the conditions below.

- When the printer is turned On, a reset signal is output for 100ms after the +5 V line voltage level rises to 4.2 V.
- During printing operation, when the 5 V line voltage level drops under 4.2 V, a reset signal is output. The reset signal does not go off until 100 ms passed after the +5 V line voltage level recovers to 4.2 V, as described above.

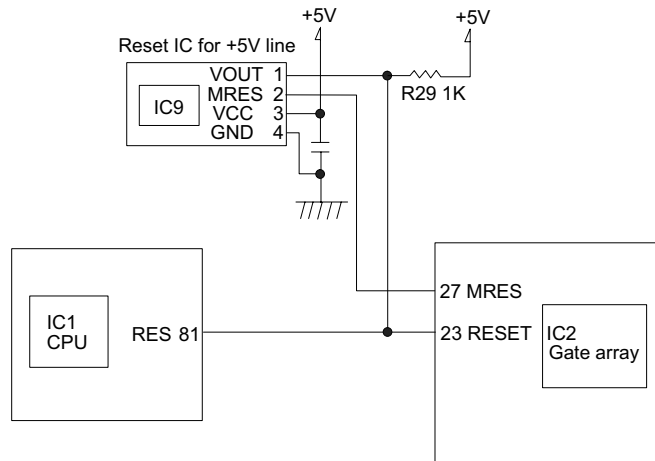


Figure 2-20. Reset Circuit for the +5 VDC line

Reset circuit for the +42 V line

The +42 V reset circuit monitors voltage level of 42 V at the port 3 VCC of IC8 M51955D, and feeds back the information on the Power On/Off status to the CPU according to the detected voltage. When the +42 V line drops under +33.2 V, IC8 detects the Power Off status and outputs a reset signal from the port 6 to the CPU port 82 NMI via OR circuit of the IC19. When the voltage level recovers to 32.2 V, the port 6 of the IC8 stops outputting the signal, which is detected at the port 78 of the CPU.

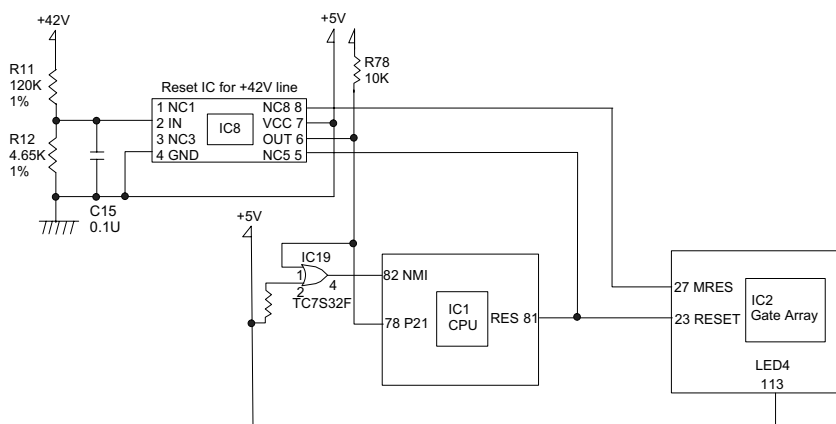


Figure 2-21 Reset Circuit for the +42 VDC line

2.3.2.3 Motor Driver Circuits

This printer is equipped with the 3 motors; CR motor, PF motor, and pump motor. Since they are all driven by the UDN2917EB, they use the same control system.

❑ **CR motor driver circuit**

The phase control signal for the CR motor is converted into the UDN2917EB Micro-step bipolar driver system at the IC2 gate array, then output from the port 55 to the port 43 and 26 of the IC13 UDN2917EB. IC13 determines the phase mode according to the signal sent. The current control signal is also produced in IC2 gate array and output from the port from 51 to 54 to the port 1, 2, 23 and 24 of the IC13 UDN2917EB.

❑ **PF motor driver circuit**

The motor driver circuit for the PF motor is the same as for the CR motor.

❑ **Pump motor driver circuit**

The motor driver circuit for the Pump motor is the same as for the CR motor.

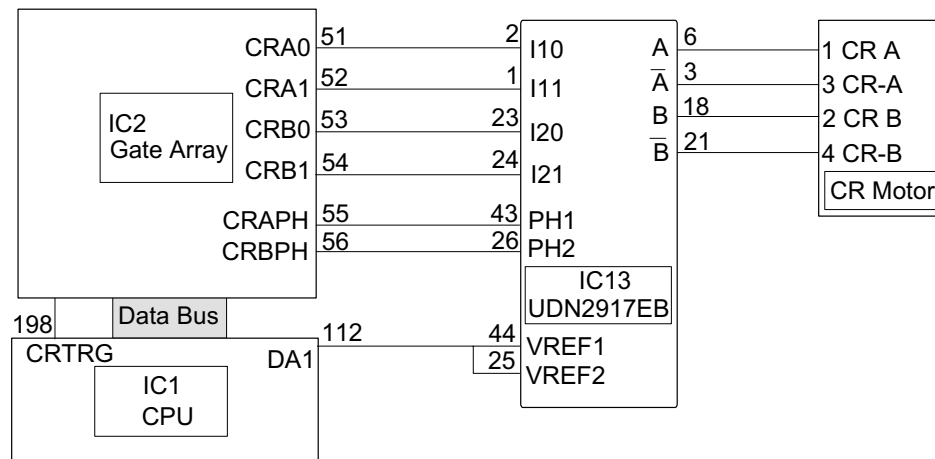


Figure 2-22. CR Motor Driver Circuit

2.3.2.4 Sensor Circuits

The sensors equipped with this printer are as follows:

- 3 photo diode sensors :HP sensor, ASF HP sensor, PE sensor
- 2 mechanism switch sensors :Black and White cartridge sensors
- 1 thermistor for the color head

□ HP sensor

HP sensor, which is mounted to the upper right end of the top frame, determines the CR home position. When the CR returns to the home position, the detector plate attached to the back of the CR unit cuts in between the sensor terminals, and a High signal is output to the CPU. Low signal is then output to the CPU when the CR leaves the home position.

□ ASF HP Sensor

This sensor is mounted to the left end of the ASF to detect the ASF home position. While the printer is in standby status after the printer power is on, the ASF is controlled to be located in the ASF home position, which means the ASF is ready to load paper. ASF HP position is detected by the ASF HP sensor and the ASF detector wheel attached to the left end of the LD roller. The ASF HP detector wheel has a small portion cutout and when the cutout comes into the position between the photo diode terminals, the ASF home position is detected. Under this condition, Low signal is output to the CPU. Therefore when the cutout goes out of the home position, the ASF detector wheel cuts in between the photo diode terminals and High signal is output.

□ PE sensor

PE sensor, which is mounted onto the bottom right end of the Top frame in the printer mechanism, detects paper end condition. The paper end condition is detected when the detector plate on the PE sensor lever cuts in between the photo diode terminals and a High signal is output to the CPU. When the paper was loaded, it pushes up the PE sensor lever. With this motion, the detector plate, along with the PE sensor lever, is upheld so that it does not fall in between the diode terminals, and a Low signal is output to the CPU.

□ Ink cartridge sensor

Ink cartridge sensor which is built into each printhead determines if the black/color ink cartridge is installed. If the cartridge is installed, the sensor plate is pressed down and it connects 2 terminals on the printhead driver board, and then Low signal is output to the CPU. With no cartridge installed, the sensor plate loses contact with the terminals on the printhead driver board, and High signal is output to the CPU.

□ Printhead thermistor

A printhead thermistor is attached directly to the color printhead driver board. This printer, however, only refers to the signal from the thermistor on the color head. The thermistor monitors the temperatures around the printhead and feeds back the information to the analog port 105 of the CPU. This information allows the printer to control the discharge voltage of the head drive pulse according the ink viscosity.

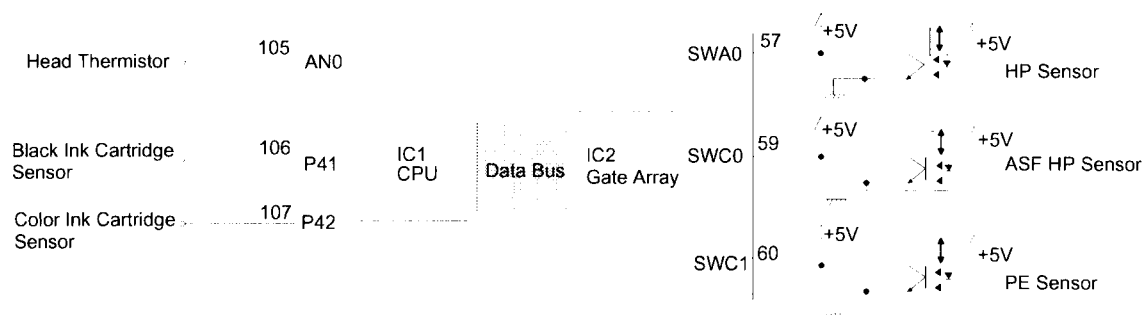


Figure 2-23. Sensor Circuit

2.4 Ink System Management

This section explains how the ink system is controlled to protect the printheads and the ink supply system to ensure high-quality output. This printer has several ink system control sequences which vary depending on the combinations of the basic ink system operations. The printer selects the most suitable sequence by referring to the various printer information such as values for the timers and counters stored in the EEPROM, flag and numbers of sensor signals. This section describes the basic ink operations, timers counters and ink sequences.

2.4.1 Ink System Operations

The basic ink system operations are as described below.

❑ Rubbing

This operation is to rub the printhead surface against the felt part of the head cleaner (left half of the blade) in the pump unit by shifting the CR from left to right. The printer operates this to eliminate ink and dust adhered to the printhead surface to regain normal ink ejection state and ensure firm capping operation. A little amount of ink is absorbed to the nozzle surface before Rubbing operation to let the adhered objects come off easily.

❑ Wiping

During this operation, the CR moves from right to left to rub the printheads against the rubber part of the head cleaner (right half of the blade) in the pump unit. The printer performs this operation prior to ink absorption by eliminating the ink and dust adhered on the printheads to regain normal ink ejection state and ensure firm capping operation.

❑ Ink Absorbing operation

This operation is to absorb ink from the ink cavities by rotating the pump for the both black and color heads with the specified steps while the head surfaces are capped and the air valve is closed. The printer performs this operation to eliminate the ink which has increased viscosity and bubbles around the nozzles.

❑ False Absorbing operation

This operation removes ink remaining inside the caps by rotating the black and color pumps with the specified steps while the head surfaces are capped and the air valve is opened. This operation is accomplished to remove ink from the nozzle plate by vacuuming and ejecting the ink remained after the Ink absorbing operation and Flushing operations.

❑ Micro Absorbing

This operation absorbs ink from the ink cavity by rotating the black and color pumps with the specified steps while the head surfaces are capped and the air valve is opened. The purpose of this sensitive operation is to eliminate bubbles formed in the ink cavities during the Ink absorbing operation.

❑ Flushing operation

This operation is to eject the specified amount of ink from the head when the CR goes into the false absorbing position. This is performed to avoid increase in ink viscosity. There are 3 types of Flushing operations, as listed below;

Table 2-12. Flushing Specification

	Numbers of shots	Driver waveform
Power flushing	4000 shots	+ 2V, Maximum 36V for the correct voltage of the normal dot
Periodical flushing	36 shots	Waveform for the normal dot
Cleaning flushing	1400 shots	Waveform for the normal dot

❑ Micro Vibration

Micro Vibration is performed to prevent ink from increasing viscosity. It adds the micro vibration to the ink inside the cavity by applying driver voltage and pulse which vibrate the piezo elements. The printer only performs this operation while the CR motor is accelerating to move the CR for printing operation.

2.4.2 Timers and Counters

This printer is equipped with numbers of timer counters, soft counters and flag. Their values, which are mostly stored in the EEPROM, are the basis for selecting the ink sequence to be performed.

- CL Timer** (Set individually for the black and color inks.)
 CL Timer manages auto cleaning. It remains active while the printer power is off and is reset when the cleaning sequence is executed.
- Accumulated Printing Timer** (Set individually for the black and color inks.)
 This timer accumulates the period of time spent for printing. The value of this timer is not cleared after the printer is powered off. This timer is activated when the cap is removed and pauses the job when the printer goes into the waiting status. The value of this counter is reset when the Ink Absorbing operation is executed.
- Power Off Timer**
 This timer monitors how long the printer power is off.
- Ink Counter RB, Ry** (Set individually for the black and color inks.)
 This counter monitors the amount of ink used in the cap during the Flushing operation. The value is stored after the printer power is turned off. When the value exceeds the specified value, the printer performs the False Absorbing operation and then resets the counter.
- CL2 Counter Kkb, Kky** (Set individually for the black and color inks.)
 The printer uses the value on this counter for the basis of determining the manual cleaning sequence order operated thorough the control panel. A cleaning is usually performed in the order of CL1, CL1', and CL2. This printer, however, doesn't necessarily follow this order depending on the numbers of pages printed after the latest cleaning sequence was performed.
- Protect Counter A**
 This counter monitors the total amount of ink drained into the wast ink drain pads. When the value exceeds the specified value (counter value:49000), the maintenance error occurs. This counter is reset by performing the EEPROM reset operation.
- Ink Consumption Counter Cb, Cy, Cm, Cc** (Set individually for the black and color inks.)
 Each counter counts the amount of ink consumed thorough out the printing, cleaning, and Flushing operations after the ink cartridge is installed. The printer or the EPW indicates the Ink low and Ink end status according to the value on this counter. Even though the printer is turned off before a cleaning sequence compeletes, the printer regards the job as a full cleaning and adds the specified value of the cleaning to the consumption counter. This counter is reset when the cartridge is removed only in the Cartridge replacement operation mode which is selected by the Panel Operation.

Table 2-13. Ink Consumption Counter

	Black ink cartridge	Color ink cartridge
Ink low counter	37.6×10 ⁷	17.2×10 ⁷
Ink end counter	41.6×10 ⁷	19.2×10 ⁷

2.4.3 Ink System Sequence

The ink system sequences operated in this printer are combinations of the basic ink system operations described in Section 2.4.1. The printer selects the most suitable ink sequence according to the information provided by the various counters, timers, and flags. The major ink system sequences are described in this section.

Manual Cleaning

Manual cleaning is performed by pressing the cleaning button on the control panel. The cleaning mode to be used is selected from following 5 modes according to the CL2 Counter value for KKB, Kky (cleaning selecting counter) and number of the pages printed after the latest cleaning.

- CL1 (Normal cleaning mode) : Wiping, Ink Absorbing, Micro Absorbing, False Absorbing.
- CL1'(Powerful cleaning mode) : Wiping, Ink Absorbing, Micro Absorbing, False Absorbing.
The composed operations are same as for CL1, except the amount of consumed ink.
- CL2 (Powerful cleaning mode) : Wiping, Rubbing Ink Absorbing, Micro Absorbing, False Absorbing.
Every operation except for Rubbing is the same as for CL1'. However, the amount of the consumed ink is larger than CL1'.
- CL3 (False cleaning mode) : Wiping, Micro Absorbing, False Absorbing.
The amount of consumed Ink is very little since Ink Absorbing is not operated.
- One time CL : Wiping, Ink Absorbing, Micro Absorbing, False Absorbing.
The composed operations are same as for CL1, except the amount of consumed ink. This cleaning mode consumes the largest amount of ink.

CL2 counter is used to determine the cleaning mode to be performed when the forcible cleaning is repeated. The counter is reset if the printer is turned off. The printer normally follows the order CL1 → CL1' → CL2, which, however, can vary depending on the conditions, as described below;

- CL3 is selected if no image is printed after the latest cleaning.
- CL1 is selected if 5 pages or less is printed after the latest cleaning.
- CL1, CL1' or CL2 is selected according to the CL2 Counter value for Kkb, Kky under the following conditions;
 - 5 pages or more is printed after the latest cleaning, and the current ink cartridge is a replacement of the old one which was removed according to the Ink End-Low error indication.
- One time CL is performed under the following condition;
 - 5 pages or more are printed after the latest cleaning, and the current cartridge is a replacement of the old one which was removed without the Ink End-Low error indication.

Timer Cleaning

This cleaning is performed automatically based on the value for the CL Timer counter while the printer power is On. This sequence, having 4 separate modes (Timer CL1, Timer CL2, Timer CL3, and Timer CL4) for each black and color ink, differs from the manual cleaning modes in the basic ink system operation sequence. It doesn't contain Ink Absorbing but Wiping and Micro Absorbing operations. Therefore the consumed ink amount is a little compared with the manual cleaning.

Power ON Sequence

During this sequence, the printer performs the following:

- Refers to Protect Counter A.
- Resets CL2 Counter Kkb, Kky.
- Checks if the ink cartridges are installed.
- Checks consumed ink amount.
- Performs necessary cleaning based on the conditions such as Initial charging, HP status, Power Off Timer, and CL timers.
- Resets Power off timer.

❑ **Cartridge Replacement Sequence**

The printer determines which ink cartridge (black or color) needs replacing in Cartridge replacement CL sequence according to the conditions such as cartridge installation, Ink Low and Ink End. Cartridge replacement CL sequence consists of Wiping, Ink Absorbing, Micro Absorbing, and False Absorbing, and consumes less ink than that of the manual cleaning sequence. If the Initial charge flag is not detected during this operation since the printer is new, the printer enters Initial ink charge sequence instead. During Cartridge replacement sequence, One-time flag is reset or set in the EEPROM according to the consumed ink amount for the removed cartridge (If 50% was used or not.). This flag indicates whether the cartridge was removed because of the Ink End status or by accident. The printer stores this information in the EEPROM to refer when selecting the manual cleaning mode to be carried out. In case that the ink cartridge was removed from the CR unit with the condition that less than 50% ink was consumed, the one-time flag is set in the EEPROM and one-time cleaning is carried out at the first manual cleaning operation after completion of Cartridge replacement Sequence.

❑ **Initial Charge Sequence**

The printer performs Wiping, Rubbing, Ink absorbing, Micro absorbing, and False absorbing during Initial charge sequence. This sequence is performed according to the Initial charge flag status. This sequence, which consumes a large amount of ink (about 20 % of total ink amount), requires approximately 7 minutes to execute, and CL timers for each color, Accumulated printing timer, Initial ink charge flag, and One-time flag are reset with the completion of this sequence.

Chapter 3

Disassembly and Assembly

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3.13.9 Ink Drain Pad Removal	3-54

3.1 Overview

This section describes procedures for disassembling main components of the EPSON Stylus COLOR 800. Unless otherwise specified, you can assemble units or components by reversing disassembly. Therefore, no assembly procedures are included. Precautions for disassembly or assembly are described under the heading **POINTS TO NOTE**. Adjustments required after assembling the unit are described under **REQUIRED ADJUSTMENTS**.

3.1.1 Precautions for Disassembling the Printer

See the precaution below when disassembling and assembling EPSON Stylus COLOR 800.

WARNING

- Disconnect the power cable before disassembling or assembling the printer.*
- Wear goggles to protect your eyes from ink. If ink gets in your eye, flush it with fresh water and see a doctor immediately.*
- If ink comes in contact with your skin, wash it off with soap and water. If irritation occurs, contact a physician.*
- A lithium battery is installed on the main board of this printer. Be sure to observe the following instructions when servicing the battery:*
 - Keep the battery away from any metal or other batteries so that electrodes of the opposite polarity do not come in contact with each other.*
 - Do not heat the battery or put it near fire.*
 - Do not solder on any part of the battery. (Doing so may result in leakage of electrolyte from the battery, burning, or explosion.)*
 - Do not charge the battery. (An explosive may be generated inside the battery and cause burning or explosion.)*
 - Do not dismantle the battery. (The gas inside the battery may hurt your throat. Leakage, burning, or explosion also may result.)*
 - Do not install the battery in the wrong direction. (This may cause burning or explosion.)*

CAUTION

- Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to government laws and regulations.*

ATTENTION

- Risque d'explosion si la pile est remplacée incorrectement. Ne remplacer que par une pile fu même type ou d'un type équivalent recommandé par le fabricant. Eliminer les piles déchargées selon lois et les règles de sécurité en vigueur.*

 **CAUTION**

- Never remove the ink cartridge from the carriage unless the manual specifies to do so.*
- When transporting the printer after the ink cartridge has been installed, be sure to pack the printer for transport without removing the ink cartridge.*
- Use only recommended tools for disassembling, assembling, or adjusting the printer.*
- Apply lubricants and adhesives as specified. (See Chapter 6 for details.)*
- Make adjustments specified when you disassemble the printer. (See Chapter 4 for details.)*

3.2 Disassembly and Assembly Procedures

This section describes disassembly or assembly procedures for printer assemblies and parts.



Read precautions in Section 3.1.1 prior to disassembly and assembly.

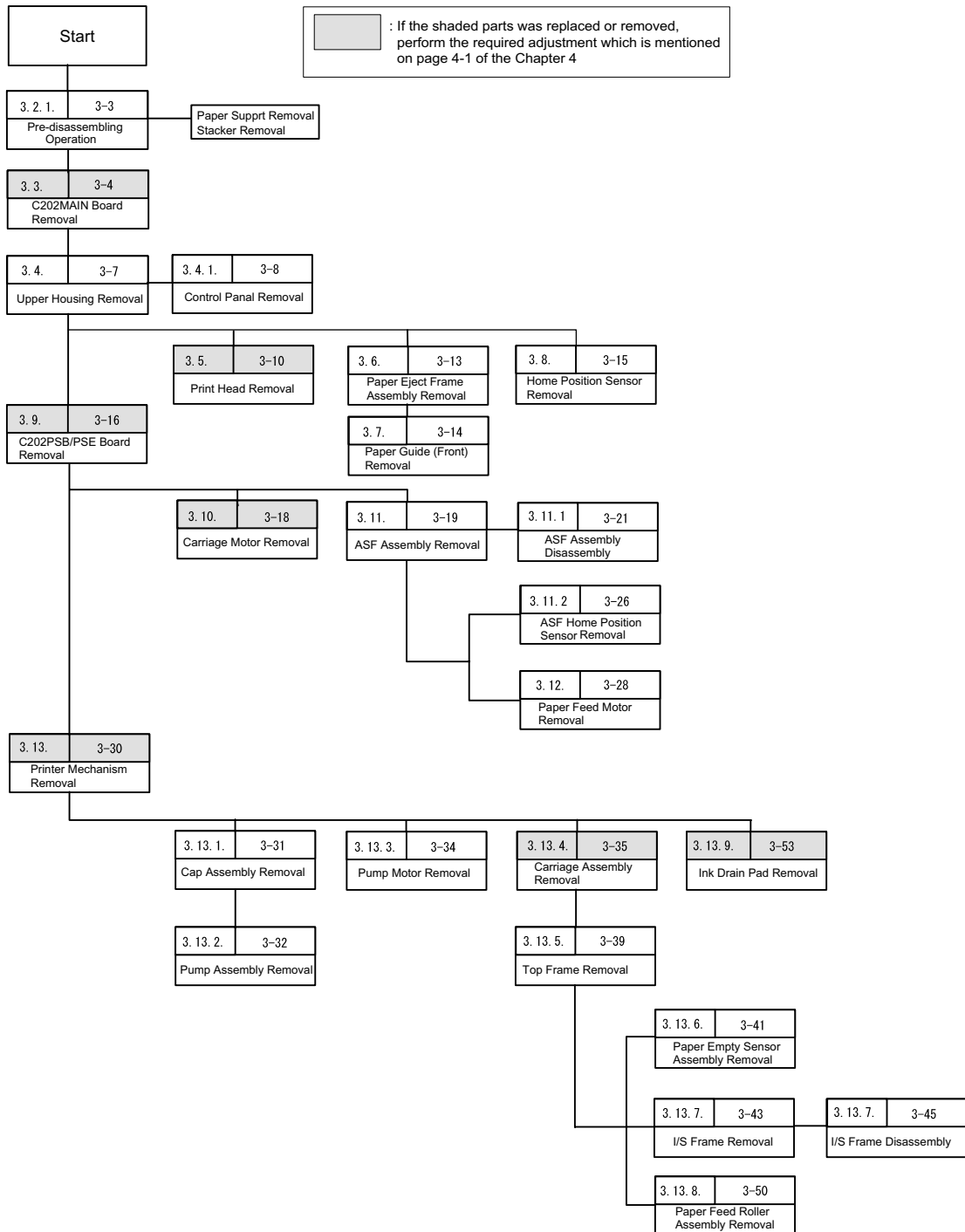


Figure 3-1. Printer Disassembly Procedures

3.2.1 Before Beginning Disassembly

Remove the following parts before beginning disassembly.

- Paper Support
- Output Tray

POINTS TO NOT

To remove the output tray, shift it to the right end, then push the handle on the left edge inward. This will help you to remove it more easily.

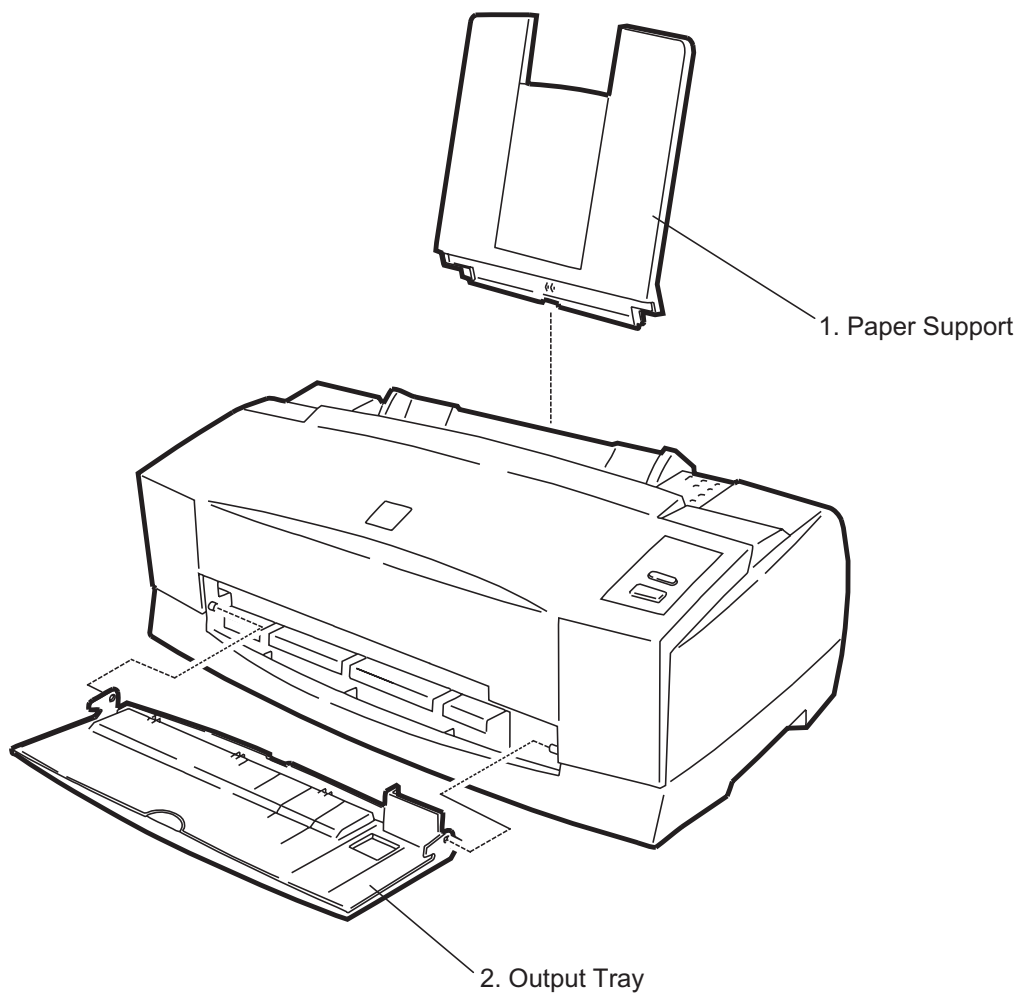


Figure 3-2. Before Beginning Disassembly

3.3 C202 MAIN Board Assembly Removal

1. Remove 2 screws (CBS, 3x8, F/Zn) securing the C202 MAIN board assembly to the back of the printer. (See Figure 3-3.)
2. Move C202 MAIN board about 5 cm (2") out from the back of the printer. (See Figure 3-3.)



C202 MAIN board assembly shield plate edges are sharp. So, be careful handling them.

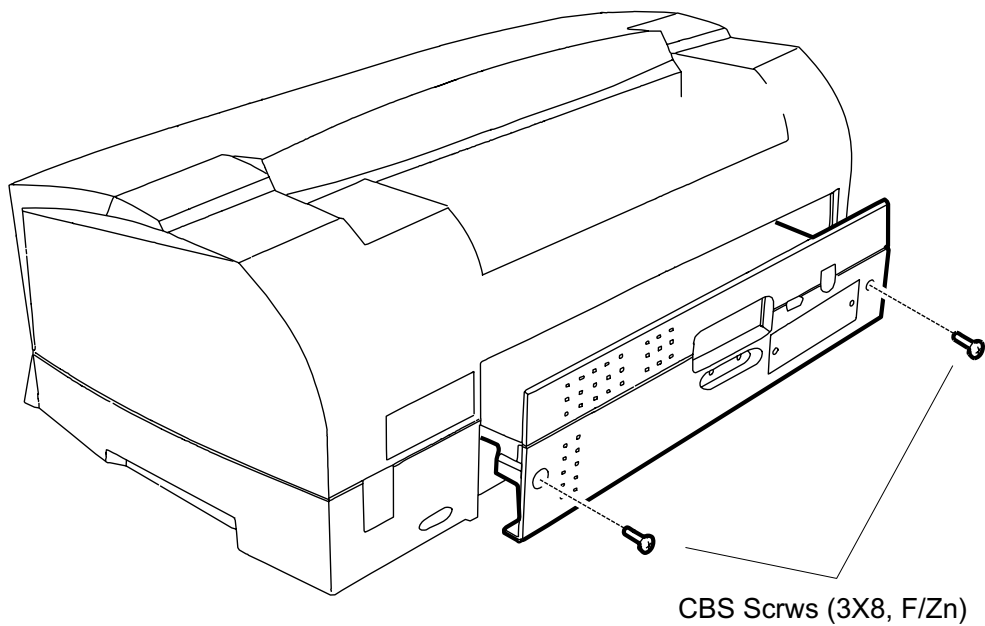
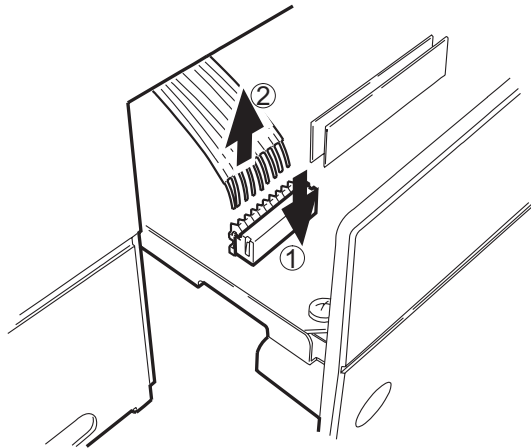


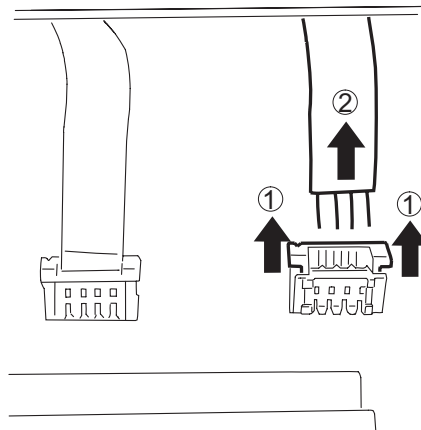
Figure 3-3. C202 MAIN Board Assembly Removal

3. Disconnect all cables (CN4, CN6, CN7, CN8, CN11, CN12, and CN13) and FFCs (CN9 and CN10) from C202 MAIN board assembly. (See Figure 3-4) Use instructions below to disconnect connectors:

- ❑ CN11, CN12, CN13: Release the connector lock lever by pulling it up, and disconnect the cable.
- ❑ CN4: Release the connector lock lever by pressing it down, and disconnect the cable.



Disconnecting CN4



Disconnecting CN11, CN12, CN13

Figure 3-4. Connector Removal

Remove C202 MAIN board from the printer main board slot. (See Figure 3-3.)

POINTS TO NOTE

- ❑ Note the direction when connecting cables for CN11, CN12, CN13, and CN4. Be sure to insert the pin 1 side into the position marked with a "1" on the board.
- ❑ Ensure that the locks for CN11, CN12, CN13 are locked after connection.
- ❑ Hold down the lock lever for CN4 while connecting the cable.
- ❑ Make sure no cables or FFCs are cut by the shield plates.
- ❑ Tightening torque for the screws (CBS, 3X8, F/Zn) is 8 ~10 kg-cm.

3.4 Upper Housing Removal

1. Remove the parts shown in Figure 3-2.
2. remove 2 screws (CBS, 3X8, F/Zn) securing the C202 MAIN board assembly to the printer. Then draw the C202 MAIN board forward about 5 cm.
3. Disconnect the control panel FFC from CN5 on the C202 MAIN board assembly. (See Figure 3-5.)

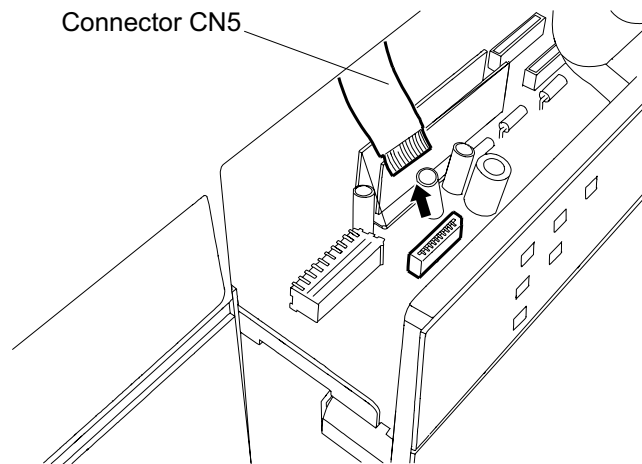


Figure 3-5 Connector for CN5 Removal

4. Remove 4 screws (CCP, 4x12, F/Zn): 2 screws securing the upper housing to the front and 2 screws securing the upper housing to the top rear side of the printer. (Refer to Figure 3-6.)
5. Set the platen gap lever to the “+” position. Then, pull the front part of the upper housing forward, and lift it backward to remove.

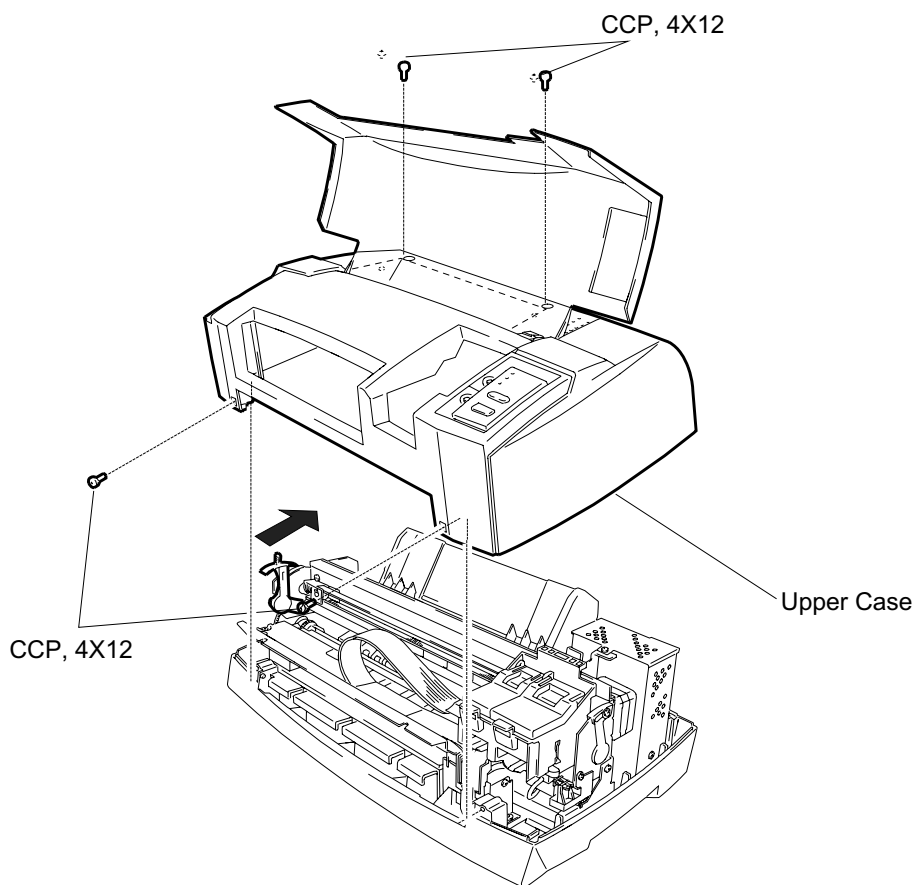


Figure 3-6. Upper Housing Removal

POINTS TO NOTE

- Before installing the upper housing, set the platen gap lever to the “+” position to make the job easier. You must set it back to “0” after the upper housing is securely positioned.
- Tightening torque for the screws (CCP, 4x12, F/Zn) = 10 kg-cm.

3.4.1 C202 Panel Board Assembly Removal

1. Remove the upper housing. (See Section 3.4.)
2. Turn the upper housing up, and release the lock lever for the FFC connector by pushing it out. Then disconnect the FFC.
3. Release 2 hooks attaching the C202 panel board assembly to the upper housing. Then remove the C202 panel board assembly from the upper housing. (See Figure 3-7.)

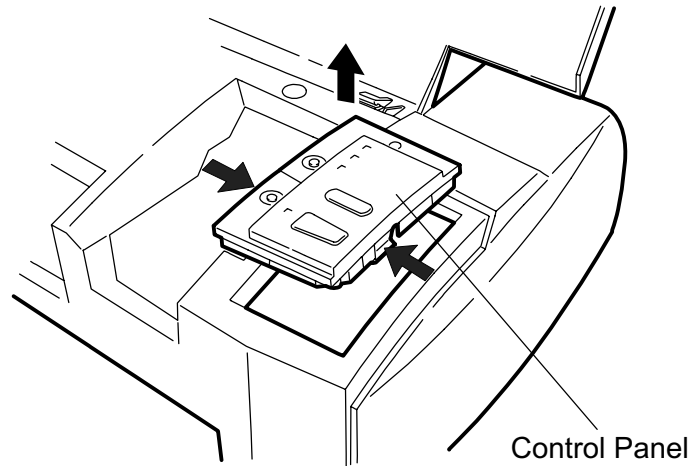


Figure 3-7. Control Panel Removal

POINTS TO NOTE

- During assembly, be careful not to bend the contact plate mounted on the C202 panel board.

3.5 Printhead Removal

1. Remove the upper housing. (Refer to Section 3.4.)
2. Open the ink cartridge covers and remove the ink cartridges from the CR assembly.
3. Using tweezers, release the ink cartridge covers from the pins fixing them to the CR assembly. Then remove the ink cartridge covers. (See Figure 3-8.)

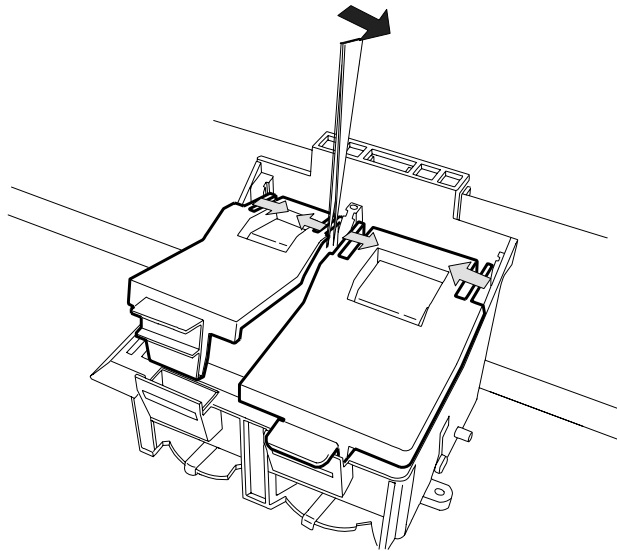


Figure 3-8. Cartridge Cover Removal

4. Remove 2 head fixing screws securing the printheads to the CR assembly at the bottom.
5. Remove 2 compression springs (9.9 g) holding each printhead to the carriage. (See Figure 3-9.)

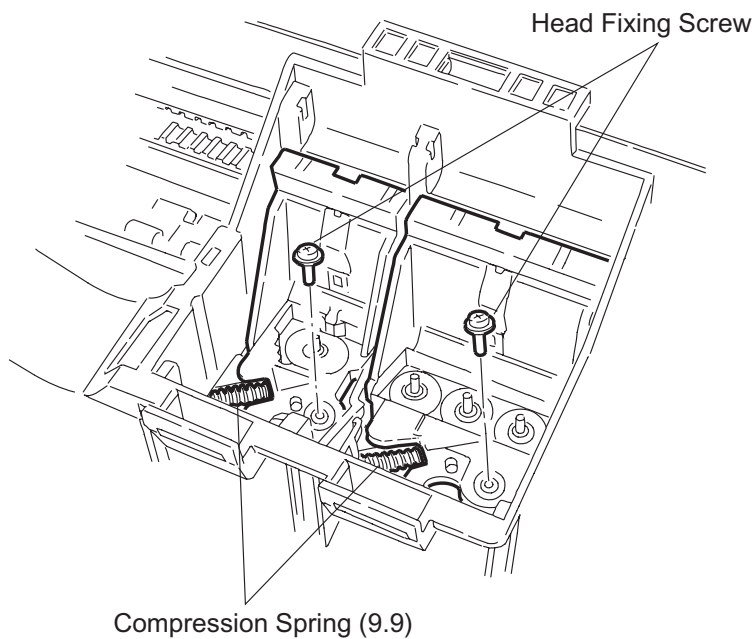


Figure 3-9. Screw and Spring Removal

6. Remove 2 FFCs from the printheads. (See Figure 3-10.)

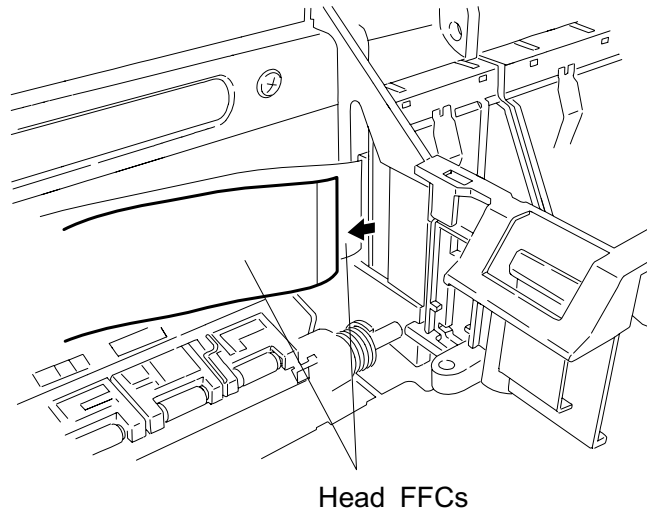


Figure 3-10. Head FFC Removal

7. Shift the printheads forward. Then remove them by lifting upward carefully.

CAUTION

- In handling the printheads, note the following:
 - Ground yourself. The driver IC is attached directly to the printhead unit.
 - Do not touch the printhead surface.
- Before installing a new printhead in the CR assembly, note the voltage ID stamped on the right side of the printhead.
- When tightening and loosening printhead fixing screws, use your hand to support the bottom of the CR assembly.

POINTS TO NOT

- ❑ Before installing the printhead into the CR assembly, move the carriage to the capping position to protect the head surface.
- ❑ Procedures for printhead assembly are described below.
 1. Remove the 2 FFCs from the clips used to attach them.
 2. Insert the color head FFC through the slit in the back of the CR assembly with the exposed terminal facing the rear, and connect it to the color head. Then install the color head in the CR assembly.
 3. Insert the black head in the CR assembly. Then insert the black head FFC through the slit with the exposed terminal facing the rear.
 4. Fasten the printheads in the CR assembly with the compression springs (9.9 g) and head fixing screws.
 5. Place both FFCs back into the clips used to hold them. Be sure they are also placed in the small clip beside the larger one. Be careful not to disconnect the FFCs from the printheads while installing them into the clips. (See Figure 3-11.)
- ❑ Tightening torque for the head fixing screw = 2.5 ~ 3.1 kg-cm.
- ❑ When mounting a head fixing screw, screw carefully with force while supporting the bottom of the carriage so not to strip the screw head.
- ❑ Ensure the head fixing screw washers do not turn after tightening head fixing screws.

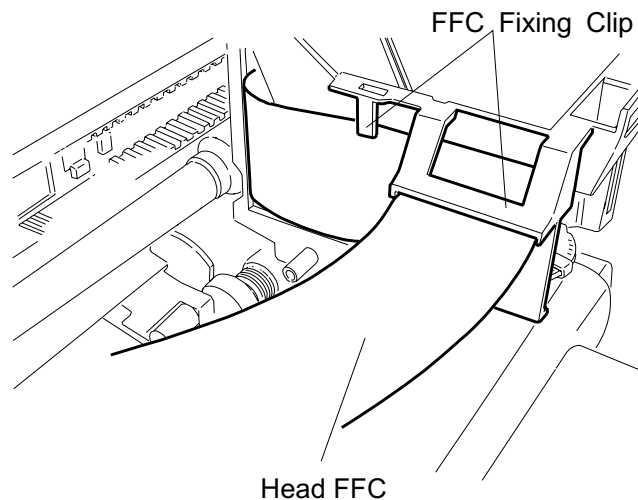


Figure 3-11. Head FFC and FFC Clips

REQUIRED ADJUSTMENT

- ❑ After replacing or removing the printhead, perform the specified adjustment. (See Chapter 4.)

3.6 Paper Eject Frame Assembly Removal

1. Remove the upper housing. (See Section 3.4.)
2. Release the CR lock lever using tweezers. Then shift the CR to the left of the FFC holder.
3. Release 2 hooks for the FFC holder, and remove the FFC holder. (See Figure 3-12.)

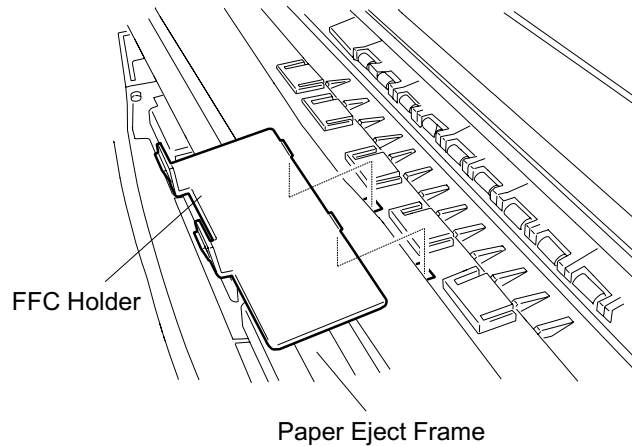


Figure 3-12. FFC Holder Removal

4. Remove the printhead FFCs from the sub holder, and remove the sub holder. Then remove 2 screws (CBS, 3x6, F/Zn) securing the paper eject frame. (See Figure 3-13.)

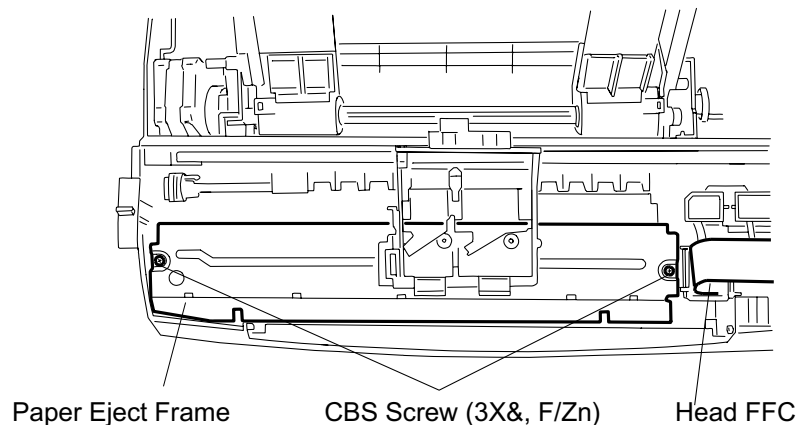


Figure 3-13. Screws Securing the Paper Eject Frame

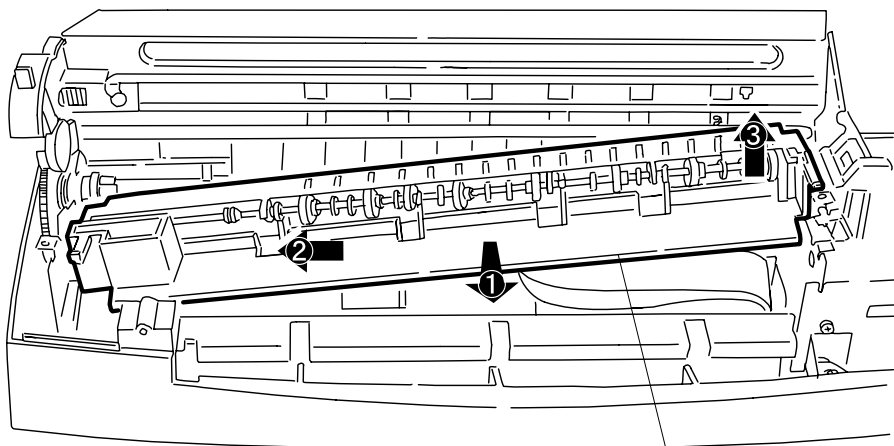
5. Hold down FFC along the paper eject frame, and shift the CR back to the capping position. Then lift the paper eject frame assembly up about 3 mm (0.12") and slide it forward.

POINTS TO NOTE

- In mounting FFCs, be careful not to damage or catch them while sliding the CR unit.
- Make sure the FFC holder is securely hooked to the paper eject frame assembly.
- Tightening torque for the screws (CBS, 3x6, F/Zn) = 8 ~ 10 kg-cm.

3.7 Front Paper Guide Assembly Removal

1. Remove the paper eject frame assembly. (See Section 3.6.)
2. Lift up the front paper guide assembly slightly, and shift it forward while sliding it to the left to release the pins from the cutouts in the right frame. (See Figure 3-14.)



Front Paper Guide Assembly

Figure 3-14. Front Paper Guide Removal

POINTS TO NOTE

- There are 4 pins, 2 on each edge. Be sure to fit them into the cutouts in the right and left frame when installing the front paper guide assembly.
- When engaging the gear (19 mm) on the left edge of the front paper guide assembly and the gear (17 mm) on the left edge of the paper feed roller, be careful not to damage them.

3.8 Home Position (HP) Sensor Removal

1. Remove the upper housing. (See Section 3.4.)
2. Using tweezers, release 2 hooks fixing the HP sensor to the sub pump frame. Then remove the HP sensor by pulling it downward. (See Figure 3-15.)

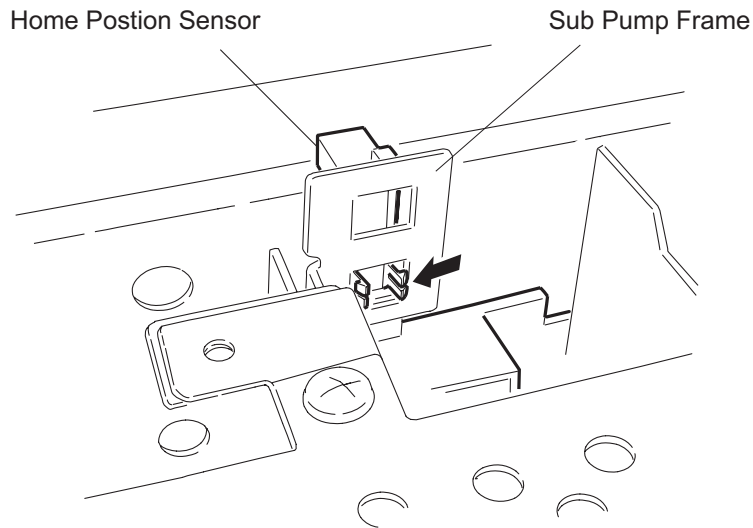


Figure 3-15. HP Sensor Removal

3. Disconnect the HP sensor connector cable from the HP sensor.

POINTS TO NOTE

- Note the direction in which the HP sensor is attached. Place the cable side down.
- Tightening torque for the screws (CBS, 3x8, F/Zn) = 8 ~ 10 kg-cm.

3.9 C202 PSB/PSE Board Assembly Removal

1. Remove the upper housing. (See Section 3.4.)
2. Remove 2 screws (CBS, 3x6, F/Zn) securing the C202 PSB/PSE board assembly to the printer mechanism. (See Figure 3-16.)

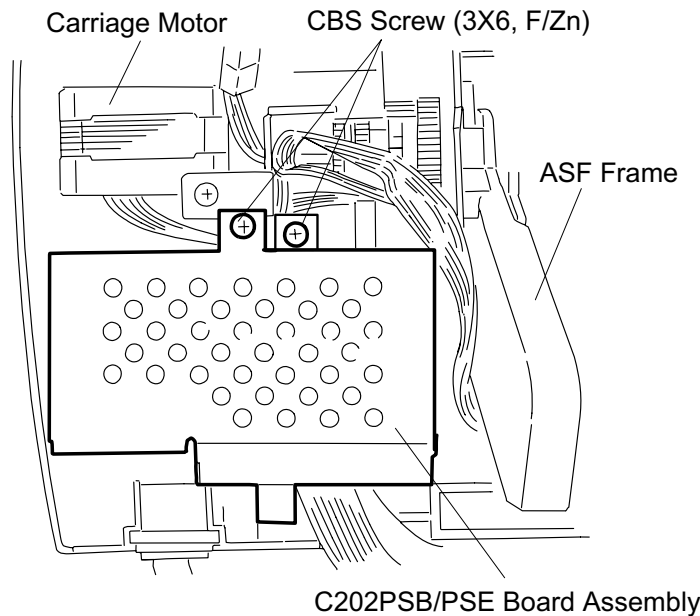


Figure 3-16. C202 PSB/PSE Board Removal

3. Hold down the lock lever for CN4 on the C202 MAIN board assembly, and disconnect the connector cable for the C202 PSB/PSE board.
4. Remove all connectors from the clamp attached to the C202 PSB/PSE board assembly. (See Figure 3-17.)

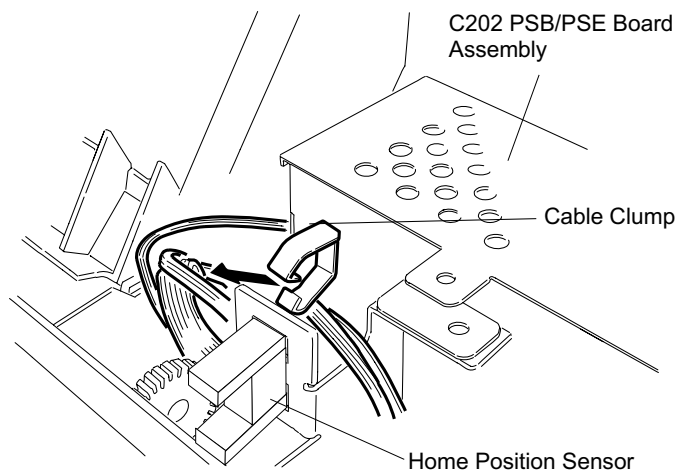


Figure 3-17. Connector Cable Removal

5. Lift up the C202 PSB/PSE board, and remove it from the printer mechanism.

POINTS TO NOTE

- ❑ Place the connectors for the printer mechanism back in the cable clamp after installing the C202 PSB/PSE board assembly.
- ❑ Tightening torque for the screws (CBS, 3X6, F/Zn) = 8 ~ 10 kg-cm.
- ❑ When connecting the cable for the C202 PSB/PSE board to CN4 on the C202 MAIN board, insert the cable through the slot, as shown in Figure 3-18.

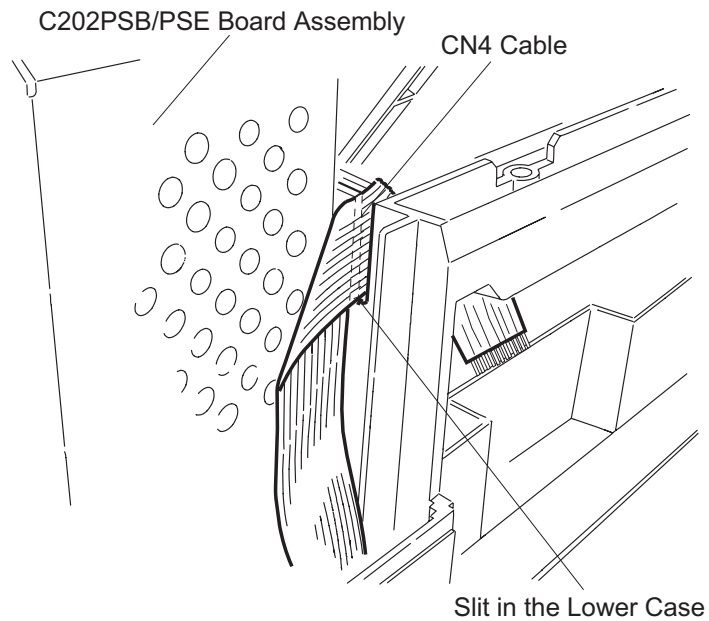


Figure 3-18. Removal of Cable for CN4

3.10 Carriage Motor (CR Motor) Assembly Removal

1. Remove the upper housing. (See Section 3.4.)
2. Release the CR lock lever using tweezers. Then shift the CR assembly from the capping position manually.
3. Remove 2 screws (CBS, 3x6, F/Zn) securing the CR motor assembly to the top frame. (See Figure 3-19.)

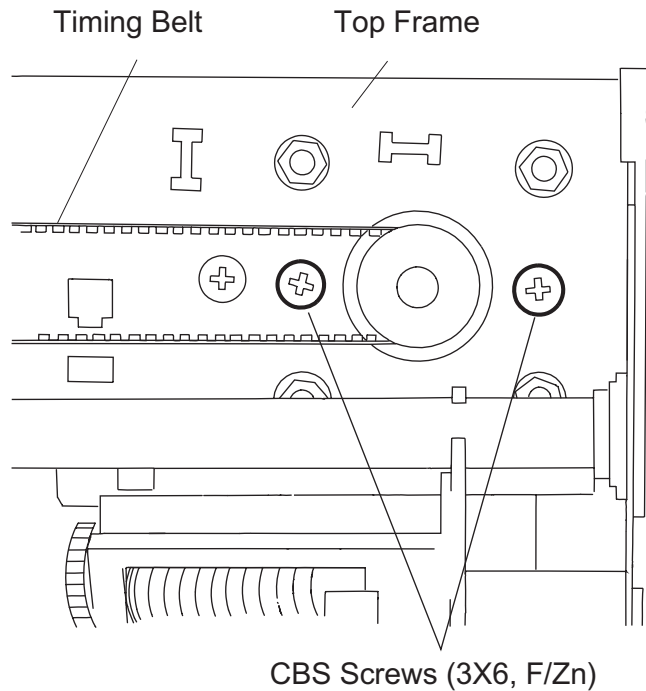


Figure 3-19. Screws Securing the CR Motor Assembly

4. Disengage the timing belt from the pinion gear.
5. Unlock CN12 on the C202 MAIN board by pulling up the lock lever. Then disconnect the CR motor connector cable from CN12.
6. Remove the CR motor assembly from the printer mechanism.

POINTS TO NOTE

- When mounting the CR motor assembly to the top frame, insert the CR motor cable facing the bottom of the printer, and fit the CR motor assembly pins into the cutout in the top frame.
- Tightening torque for the screws (CBS, 3x6, F/Zn) = 8 ~ 10 kg-cm.

REQUIRED ADJUSTMENT

Perform the Bi-d adjustment after reinstalling the CR motor assembly. See Chapter 4.

3.11 ASF (Auto Sheet Feeder) Removal

1. Remove the C202 PSB/PSE board assembly. (See Section 3.4.6.)
2. Remove 2 screws (CPS, 4x10 and ASF fixing screw, F/Zn) securing the ASF to the right frame and to the rear left of the frame, respectively. (See Figure 3-20.)

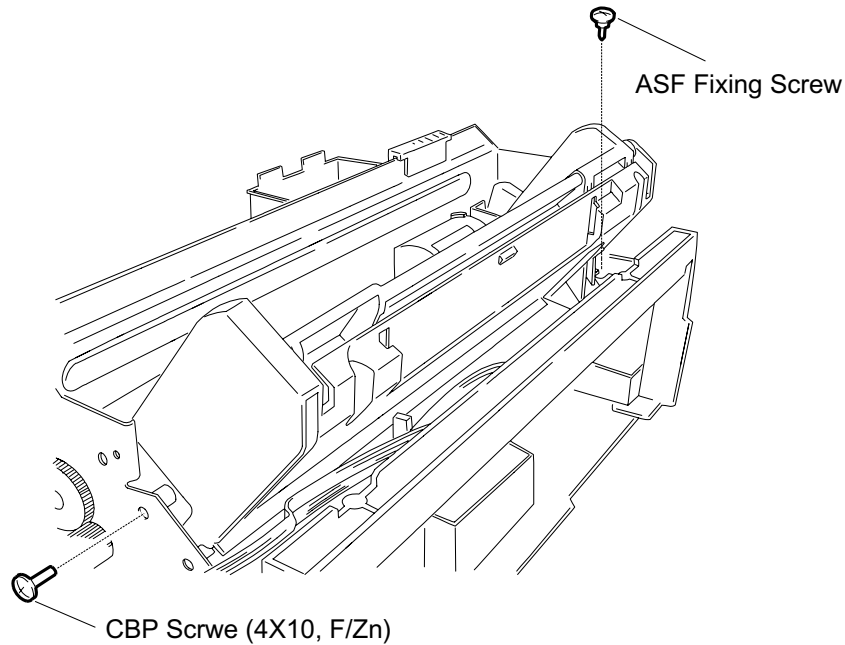


Figure 3-20. Removal of Screws Fixing the ASF

3. Remove 1 gear (27.2 mm) at the right edge of the ASF from the hopper release lever by squeezing with tweezers or prying a Phillips screwdriver into the joint. (See Figure 3-21.)

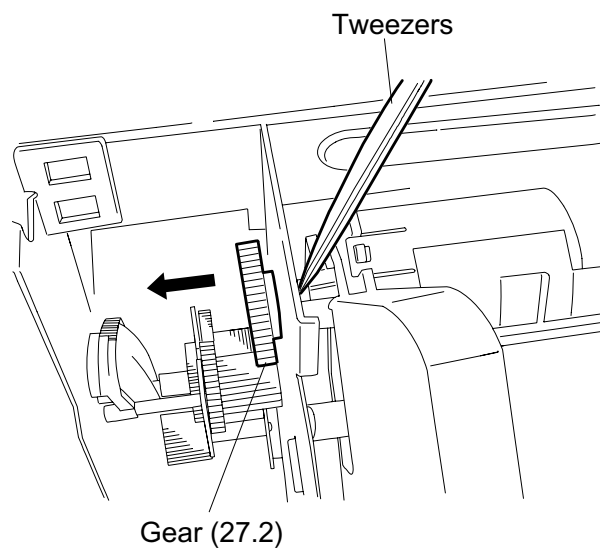


Figure 3-21. Gear (27.2 mm) Removal

- Slide the ASF assembly to the left, then to the rear; and remove the ASF assembly from the printer mechanism. Be sure to disconnect the ASF HP sensor cable from the sensor.

POINTS TO NOTE

- ❑ Connect the ASF HP cable to the connector at the left edge of the ASF before installing the ASF assembly.
- ❑ Several connectors are laid behind the ASF assembly. Make sure they are not cut under the ASF assembly when installing the ASF.
- ❑ Tightening torque for the screws (CBP, 4x10, F/Zn) = 10 ~ 12 kg-cm.
- ❑ When engaging the gear (27.2 mm) and loading (LD) roller shaft, note the side they face. Make sure they are correctly adjusted and securely locked. (See Figure 3-22.)

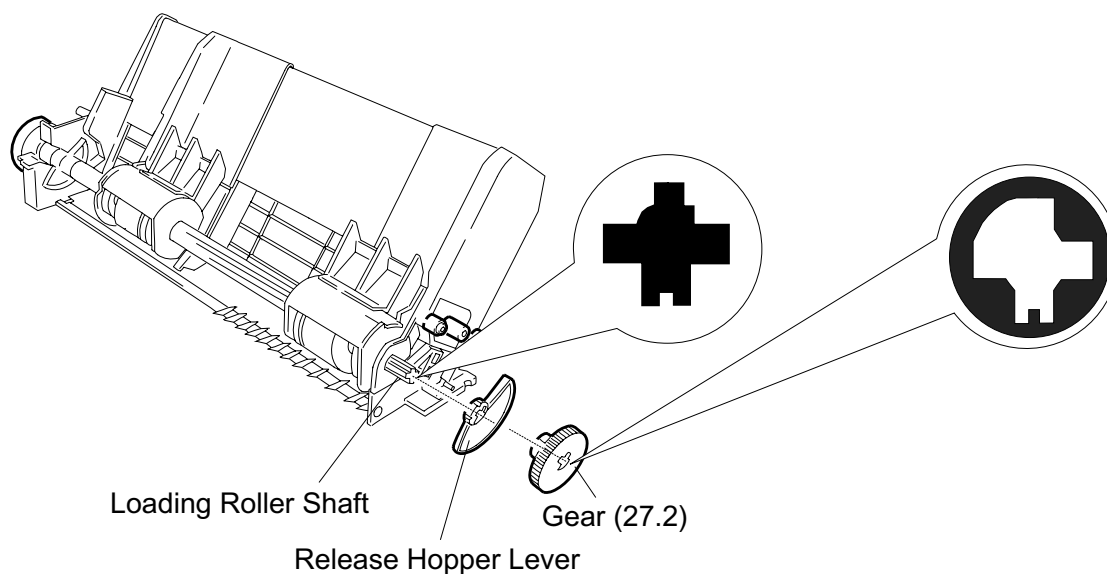


Figure 3-22. Engagement of Loading Roller Shaft and Gear (27.2 mm)

3.11.1 ASF Assembly Disassembly

1. Remove the ASF. (See Section 3.11.)
2. Remove the left shaft bushing, located at the left end of the loading (LD) roller shaft. (See Figure 3-23.)

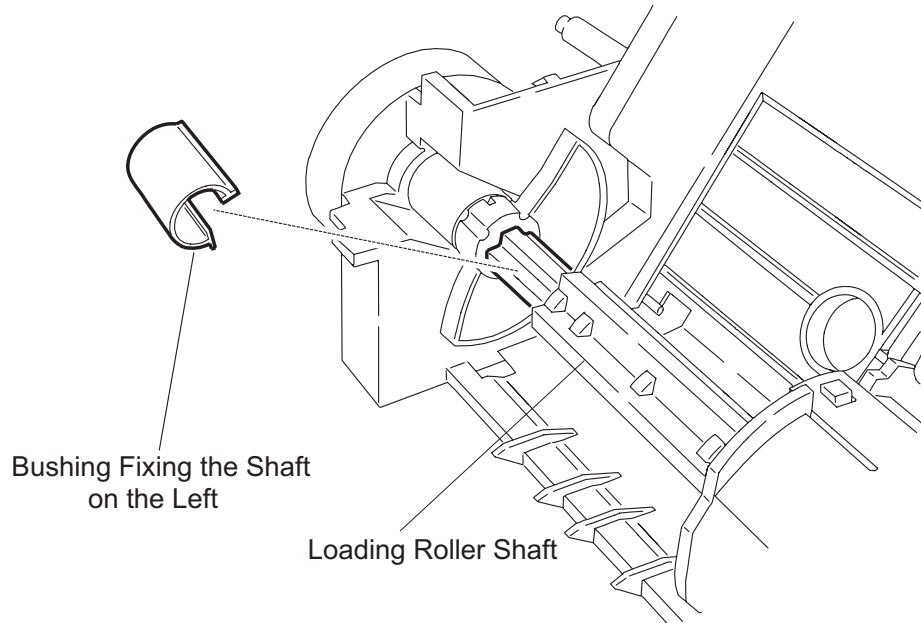


Figure 3-23. Left Bushing Removal



Remove this bushing with care so you do not damage it.

3. Shift the LD roller shaft about 1 cm (half an inch) left, and using tweezers, and release the tab attaching the detection wheel to the left edge of the LD roller shaft. Then remove the detection wheel. (See Figure 3-24.)

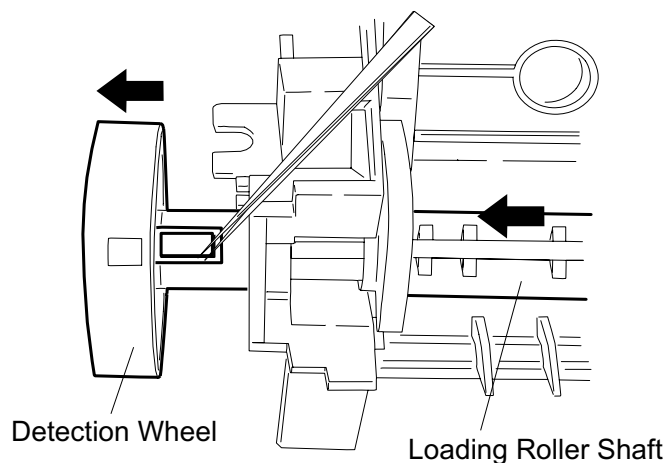


Figure 3-24. Detection Wheel Removal

4. Release the pin at the top left edge of the hopper assembly from the ASF frame. Then align the right arm of the hopper assembly with the cutout in the ASF right frame, and remove the hopper assembly carefully by lifting up the left edge. Be careful not to bend the compression springs in the paper loading assemblies. (See Figure 3-25.)

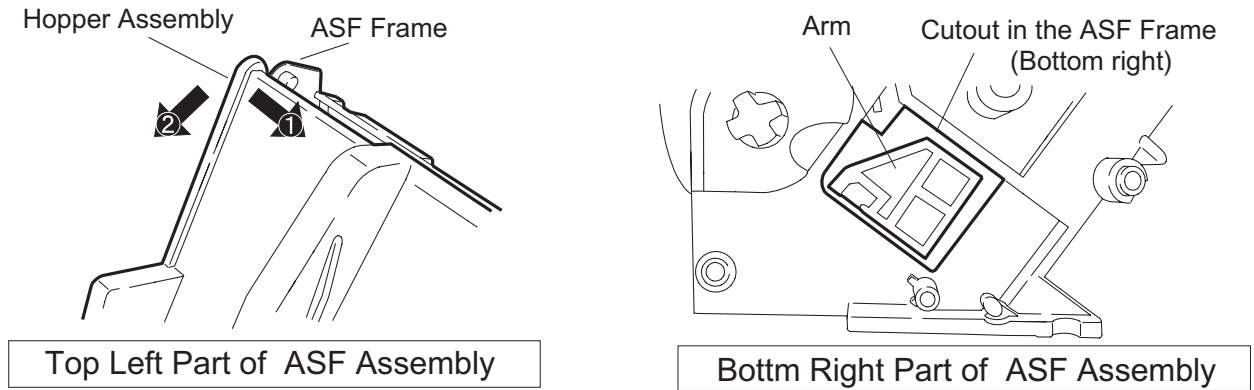


Figure 3-25. ASF Hopper Assembly Removal

5. Shift the LD roller shaft further left, and remove the paper loading assemblies along with the paper loading shaft from the ASF frame.
6. Remove the paper loading assemblies from the LD roller shaft.
7. Release 2 hooks securing the LD roller cover to the paper loading assembly using the tweezers. Then remove the LD roller cover. (See Figure 3-26.)

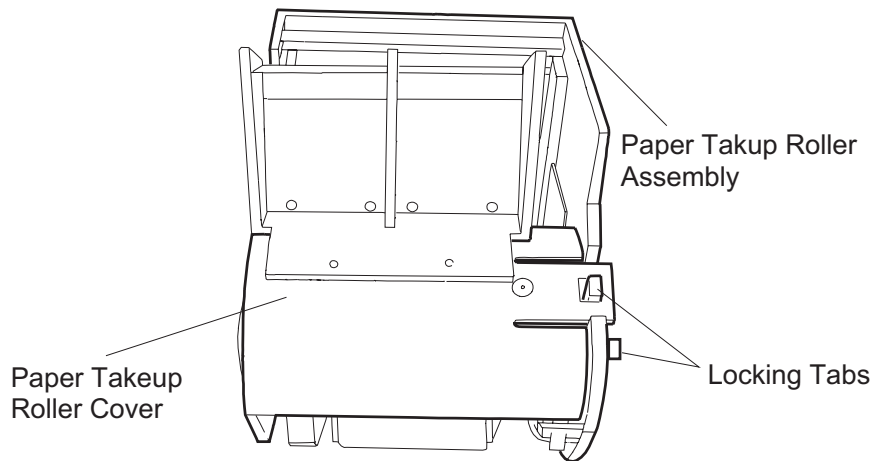


Figure 3-26. LD Roller Cover Removal

8. Release 2 locking tabs securing the LD roller assembly to the paper loading assembly using the tweezers. Then remove the LD roller assembly. (See Figure 3-27).

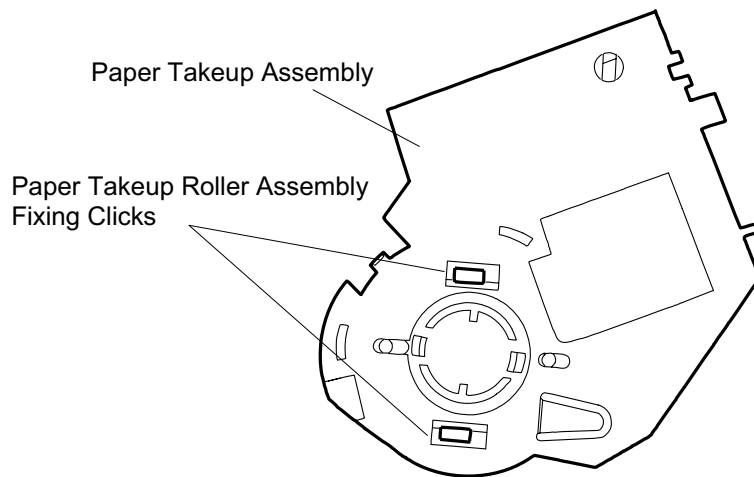


Figure 3-27. Locking Tabs on the LD Roller

CAUTION

Never touch the rubber part of the LD roller assemblies with your bare hands.

POINTS TO NOTE

- Ensure the following are correctly mounted onto the paper loading assembly before assembling. (See Figure 3-28.)
 - 1 torsion spring
 - 1 extension spring
 - 1 compression spring
 - rod spring
- When installing paper loading assemblies, insert the LD roller's narrow edge to the left.

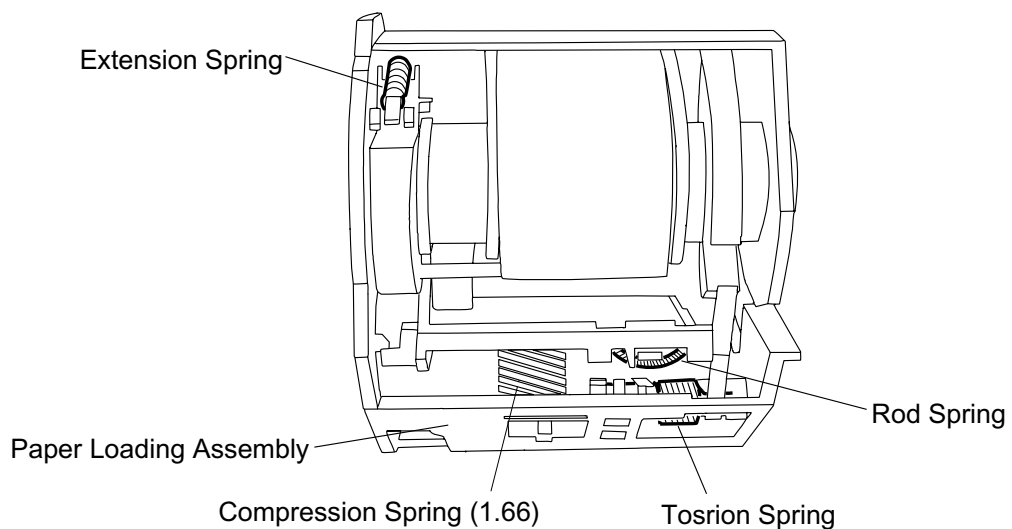


Figure 3-28 Spring Installation

POINTS TO NOTE

- ❑ Follow the instructions below when installing the hopper assembly into the ASF frame with the paper loading assemblies mounted on it: (See Figure 3-29.)
 1. Note the direction to place the compression spring. One end is bent straight inward. Be sure to insert the straight end facing up.
 2. Hook the straight end to the frame as shown in Figure 3-29.
 3. Insert tweezers through the cutout in the back of the ASF frame to release the tabs after mounting the hopper assembly. (See Figure 3-29.)
- ❑ When installing the LD roller shaft into the ASF frame after mounting both paper loading assemblies, shift the right paper loading assembly to the right edge of the ASF frame, then fix it by aligning the groove in the back of the paper loading assembly, however, moves freely from left to right or vice versa. (See Figure 3-30)

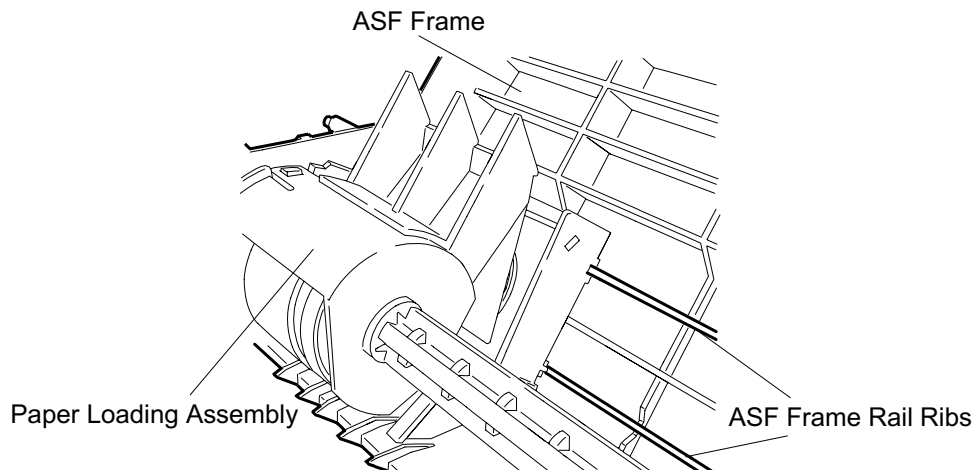


Figure 3-30 Paper Loading Roller Installation

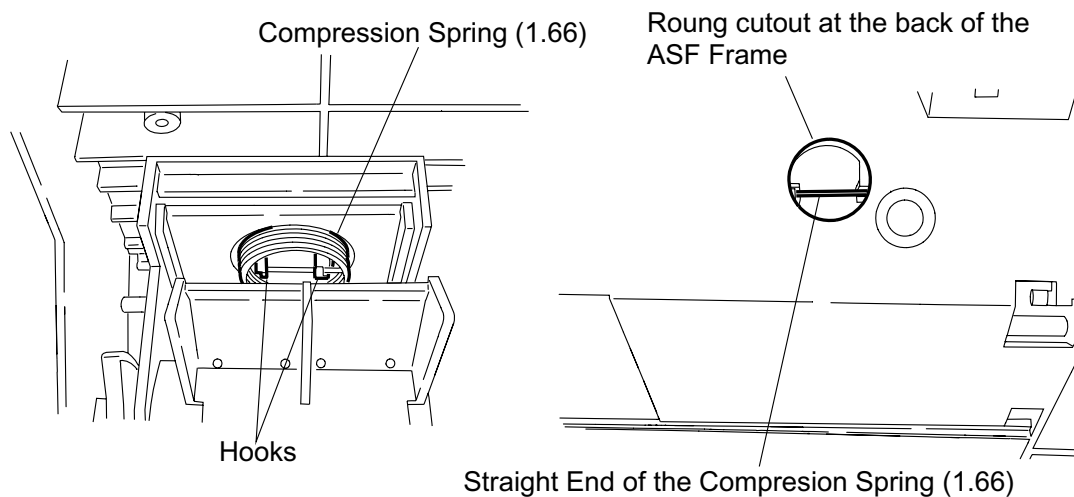


Figure 3-29. Releasing the Compression Spring

POINTS TO NOTE

- ❑ Be sure to fix both right and left pins on the ASF frame securely into the holes in the hopper assembly.
- ❑ When installing the detection wheel onto the left end of the LD roller shaft, be sure to engage it in the right direction. Pay attention to which way the end faces.
- ❑ Ensure that the left frame of the left paper loading assembly fits correctly into the groove in the bottom of the left edge guide for the hopper assembly. (See Figure 3-31.)

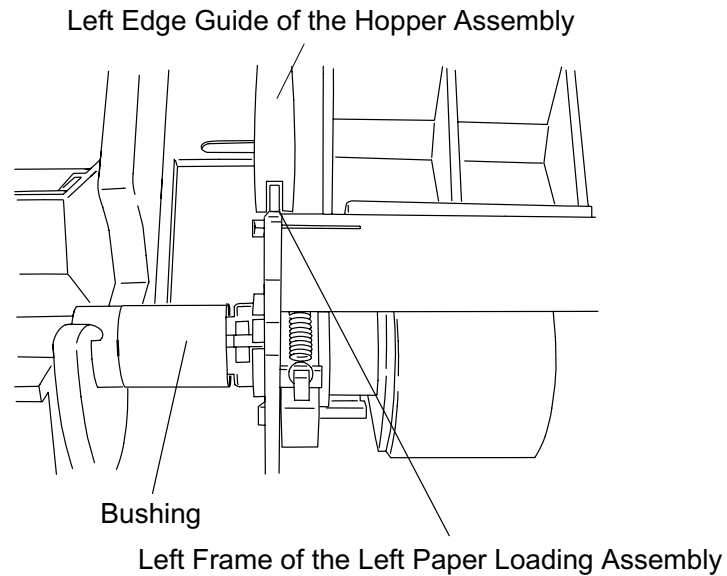


Figure 3-31. Engaging Hopper Assembly and Bushing

3.11.2 ASF HP Sensor Removal

1. Remove the ASF assembly. (Refer to Section 3.11.)
2. Remove the right hopper release lever in the ASF assembly.
3. Remove the bushing from the left edge of the loading (LD) roller shaft in the ASF assembly. (See Figure 3-32.)

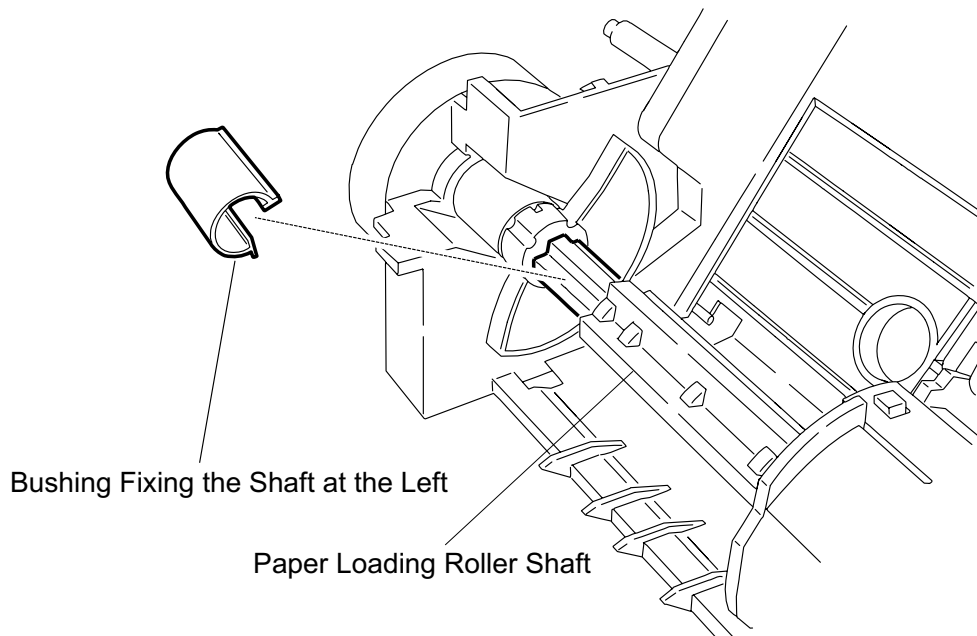


Figure 3-32. Bushing Removal

4. Shift the LD roller shaft left about 2 cm (1"). Then, using tweezers, release the tab fixing the detection wheel at the left edge of the LD roller shaft. (See Figure 3-33.)

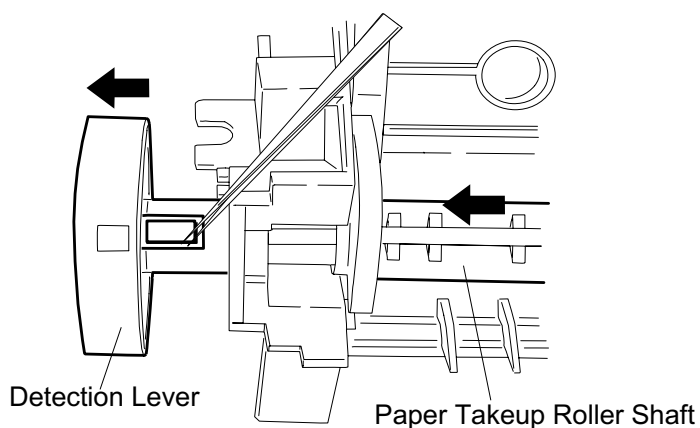


Figure 3-33. Detection Wheel Removal

5. Insert tweezers into the slit in the back of the ASF HP sensor, and release the clips. Then remove the ASF HP sensor. (See Figure 3-34.)

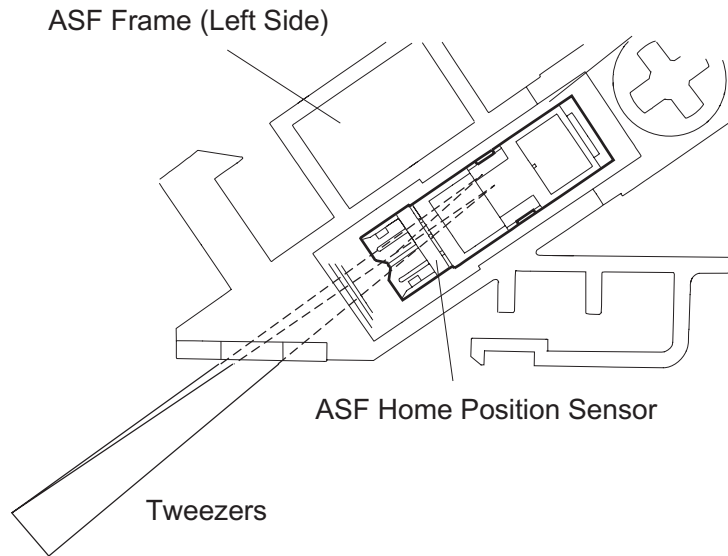


Figure 3-34. ASF HP Sensor Removal

POINTS TO NOTE

- When mounting the detection wheel onto the LD roller shaft, push the wheel into the shaft until it clicks.
- The bushing at left end of the LD roller shaft must be located on the right of the left hopper release lever. (See Figure 3-32.)

3.12 Paper Feed (PF) Motor Assembly Removal

1. Remove the ASF. (Refer to Section 3.11.)
2. Remove 1 C-ring and 1 plain washer securing the combination gear (14 mm, 31.5 mm) to the left frame.
3. Remove 2 screws (CBS, 3x6, F/Zn) securing the PF motor assembly to the left frame. (Refer to Figure 3-35.)

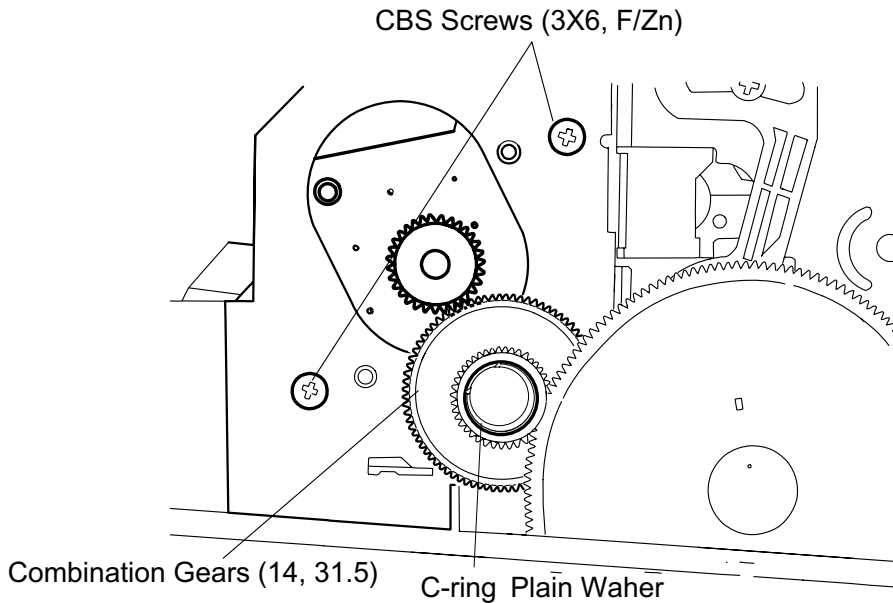


Figure 3-35. PF Motor Assembly Removal (1)

4. Push the PF motor assembly inward, holding the combination gears, and remove the PF motor assembly and the combination gears. (Refer to Figure 3-36.)

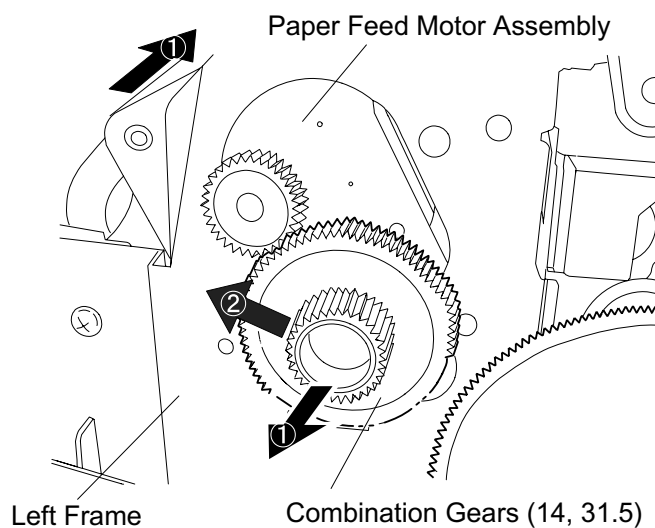


Figure 3-36. PF Motor Assembly Removal (2)

5. Disconnect the paper feed motor cable from the CN13 on the C202 MAIN board assembly.
6. Remove the PF motor from the printer mechanism.

POINTS TO NOTE

- Be careful not to damage the teeth on the combination gear (14 mm, 31.5 mm), paper feed pinion gear, or gear (70 mm) when engaging them.*
- When installing the PF motor assembly in the left frame, be sure to fit the shaft for the combination gear into the cutout in the frame.*
- Tightening torque for the screws (CBS, 3X8, F/Zn) = 8 ~ 10 kg-cm.*

3.13 Printer Mechanism Removal

1. Remove the units and assemblies by following the procedures described in Section 3.9.
2. Disconnect all the connectors and FFCs from the C202 MAIN board assembly.
3. Remove 4 screws (CB, 4x12, F/Zn) securing the printer mechanism to the lower case. (Refer to Figure 3-37.)

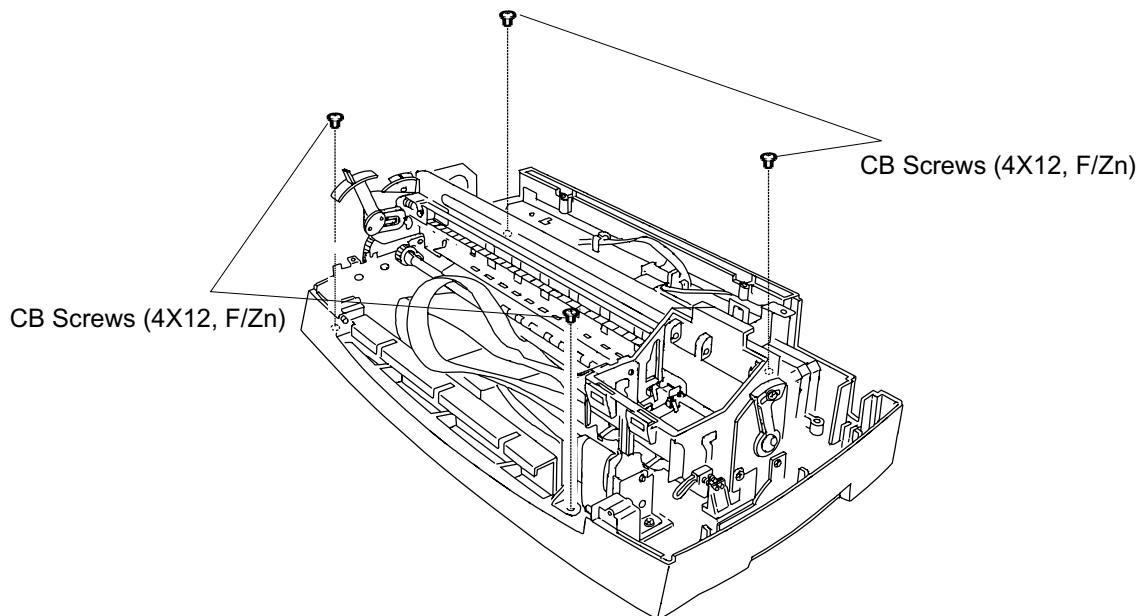


Figure 3-37. Printer Mechanism Screw Removal

4. Lift up the printer mechanism to remove it from the lower case.

POINTS TO NOTE

- Make sure the connectors are not cut when you install the printer mechanism.
- Always hold the upper or rear part of the mechanism, and never touch the gears.
- Do not forget to insert the sub ink drain pad into the printer mechanism before installing the mechanism into the lower case. The mounting location is shown in Figure 3-38.
- Tightening torque for the screws (CB, 4x12, F/Zn) = 4 ~ 5 kg-cm.

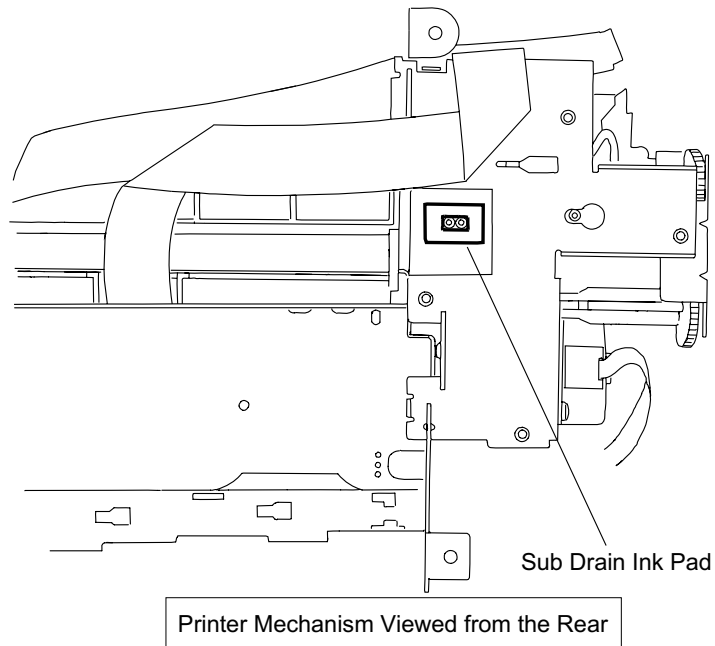


Figure 3-38. Sub Ink Drain Pad

REQUIRED ADJUSTMENT

Perform necessary adjustment and data input referring to Table 4-1 in Chapter 4 when the printer mechanism is replaced with a new one.

3.13.1 Cap Assembly Removal

1. Remove the printer mechanism. (Refer to Section 3.13.)

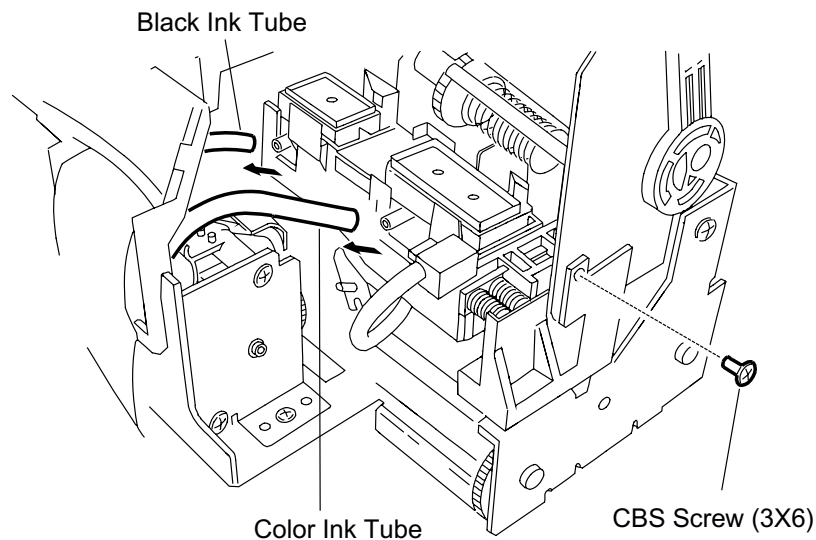


Figure 3-39. Tube Removal

2. Release the CR lock lever using tweezers, and slide the CR assembly left.
3. Remove 1 screw (CBS, 3x6, F/Zn) securing the cap assembly to the top frame.
4. Remove both tubes from the black and color caps carefully. (See Figure 3-39.)
5. Remove the cap assembly from the printer mechanism.

POINTS TO NOTE

- ❑ Tubes linking the pump assembly are made of silicone, and a minor flaw can become a crack. Therefore, use the exclusive tweezers designed for the tubes carefully when positioning the tubes back onto the pins.
- ❑ Handle the cap assembly carefully, and never touch the rubber portion and pad portion of the caps.
- ❑ Align the pin at the left edge with the hole in the right frame when positioning the cap assembly, as show in Figure 3-40.
- ❑ Make sure that the right edge of the cap assembly is located on the right of the left edge of the top frame.
- ❑ Tightening torque for the screws (CBS, 3x6, F/Zn) = 8 ~ 10 kg-cm.

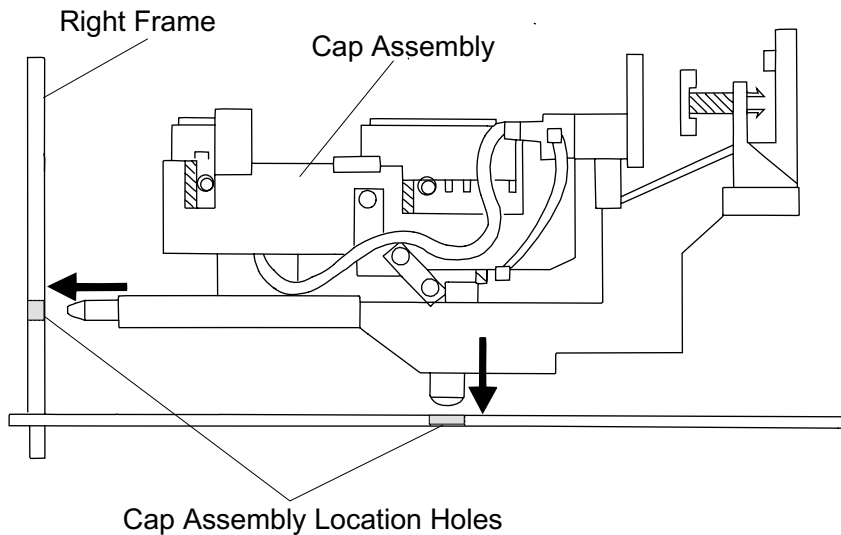


Figure 3-40. Cap Assembly Removal

3.13.2 Pump Assembly Removal

1. Remove the cap assembly. (Refer to Section 3.13.1.)
2. Remove 2 screws (CBS, 3x6, F/Zn) securing the outer sub frame assembly to the middle sub frame assembly and to the slider shaft respectively. Then remove the whole outer sub frame assembly with the pump drive gear and the pump reduction gear. (Refer to Figure 3-41.)

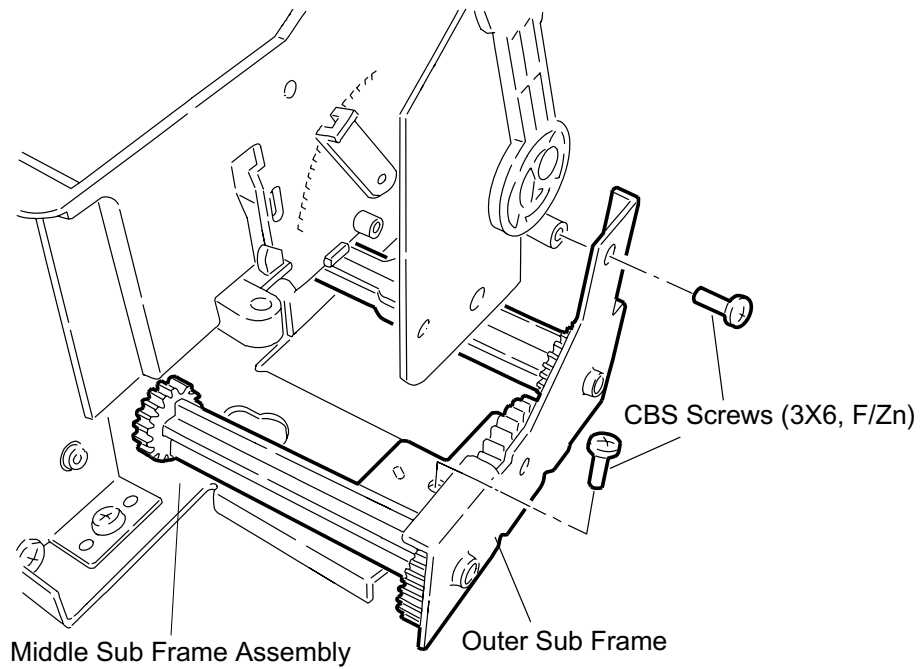


Figure 3-41. Outer Sub Frame Assembly Removal

3. Remove 1 screw (CBS, 3X6, F/Zn) securing the pump assembly to the middle sub frame assembly. (Refer to Figure 3-42.)

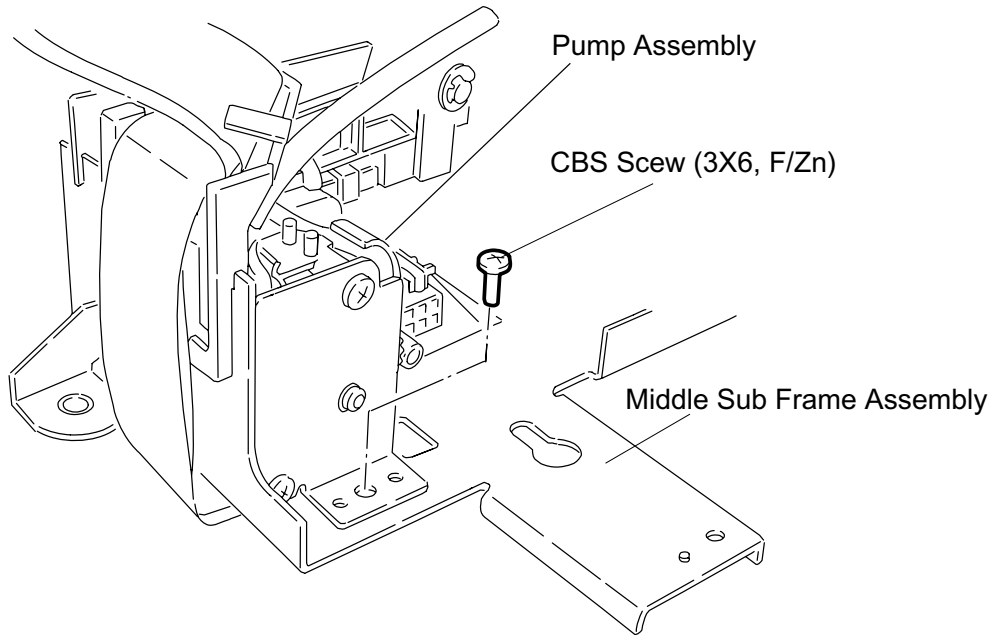


Figure 3-42. Pump Assembly Removal

4. Remove the pump assembly from the middle sub frame assembly.

CAUTION

Be careful not to damage the tubes while removing the pump assembly.

POINTS TO NOTE

- Tightening torque for the screws (CBS, 3x6, F/Zn) = 8 ~ 10 kg-cm.
- Never install the pump assembly into the printer mechanism before mounting the head cleaner on the pump assembly. The head cleaner must not be mounted on the pump assembly alone.
- When mounting the head cleaner on the pump assembly, face the rubber part of the cleaner to the right. Be sure to hook the hole in the head cleaner to the pump assembly, as shown in Figure 3-43.

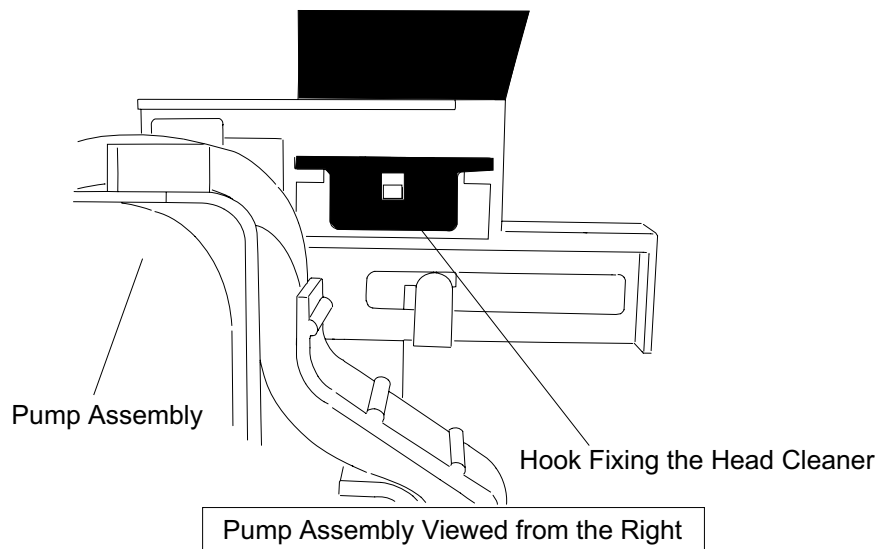


Figure 3-43. Head Cleaner Location

3.13.3 Pump Motor Removal

1. Remove the printer mechanism. (Refer to Section 3.13.)
2. Remove 2 screws (CBS, 3x6, F/Zn) securing the pump motor to the pump sub frame. Then remove the pump motor. (Refer to Figure 3-44.)

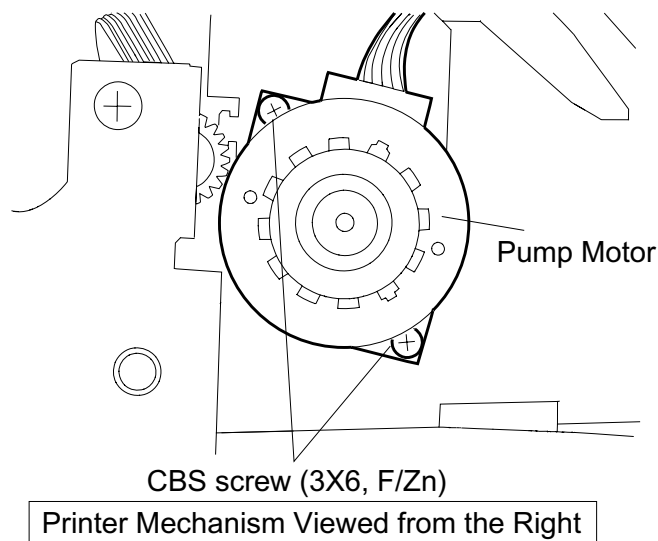


Figure 3-44. Screws Fixing the Pump Motor

POINTS TO NOTE

- Be careful not to damage the combination gear (12 mm, 26 mm) when mounting the pump motor pinion gear into the motor pinion gear mounting hole in the pump sub frame.
- When installing the pump motor onto the pump sub frame, insert the motor harness facing the top.
- Tightening torque for the screws (CBS, 3x6, F/Zn) = 8 ~ 10 kg-cm.

3.13.4 Carriage (CR) Assembly Removal

1. Remove the printer mechanism. (Refer to Section 3.13.)
2. Release the CR lock lever using tweezers. Then manually slide the CR assembly from the capping position.
3. Remove 2 screws (CBS, 3x6, F/Zn) securing the CR motor assembly to the printer mechanism top frame.
4. Disengage the timing belt from the pinion gear in the CR motor assembly. (See Figure 3-45.)

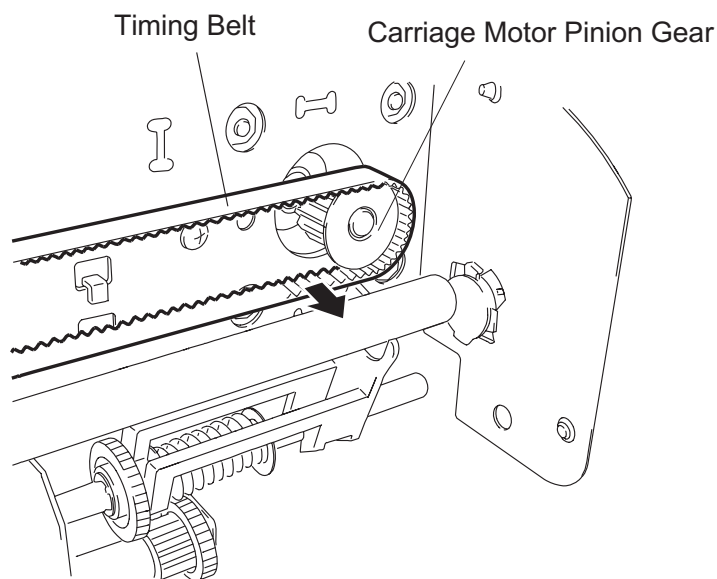


Figure 3-45. Timing Belt Removal

5. Remove the printhead. (Refer to Section 3.5.)



To prevent printhead damage, never disassemble or assemble the CR assembly with the printhead installed in it.

6. Remove 1 E-ring and 1 screw (CBS, 3x6, F/Zn) securing the right parallelism adjustment bushing to the top frame. Then turn the bushing forward until it fits into the cutout in the top frame and slide it to the right. (Refer to Figure 3-46.)

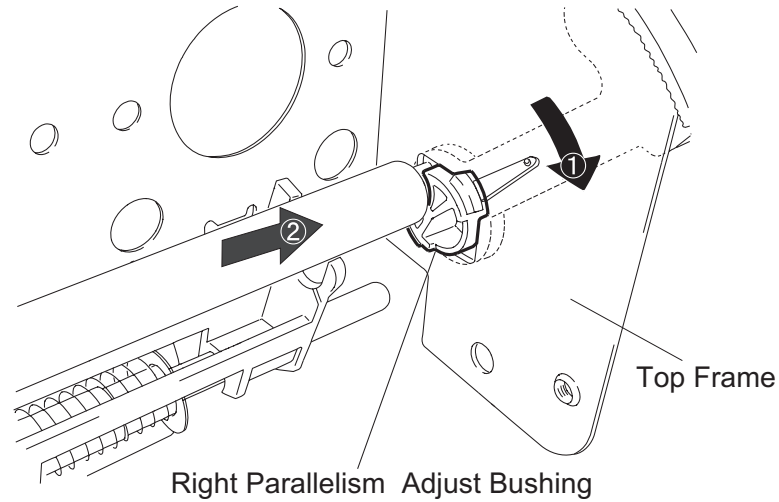


Figure 3-46. Parallelism Adjustment Bushing Removal

7. Remove the compression spring (19.9 g) using tweezers. Then shift the sub pulley holder to the right and remove it from the top frame. (Refer to Figure 3-47.)

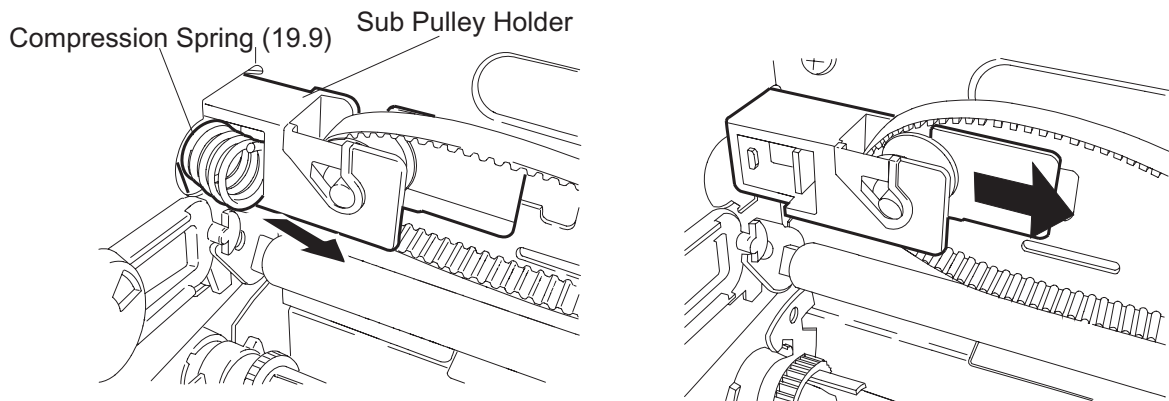


Figure 3-47. Sub Pulley Holder Removal

8. Shift the CR shaft to the right to remove the CR assembly from the platen gap lever and left parallelism adjustment bushing. (See Figure 3-48.)

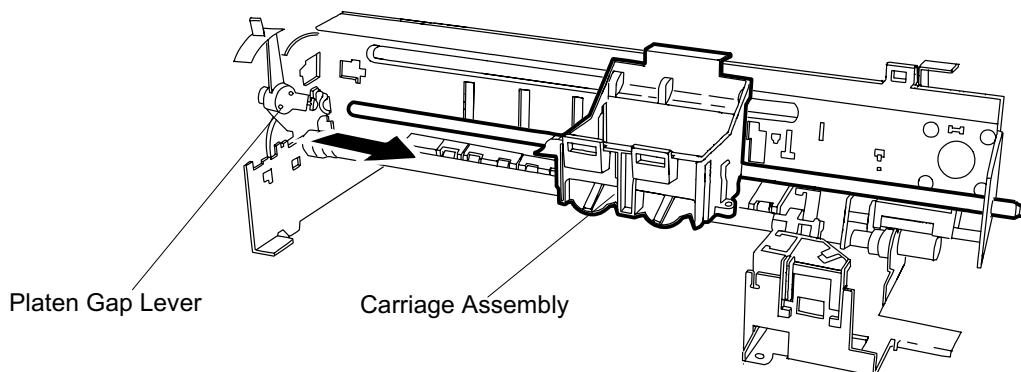


Figure 3-48. CR Assembly Removal

9. Take the CR shaft out from the CR assembly.
10. Remove the oil pad from the CR assembly.

POINTS TO NOTE

- Place the oil pad with the oiled side down onto the CR guide when mounting the oil pad into the CR assembly.
- Install the CR shaft with the edge whose side is cut in a "D" shape to the left.
- When installing the platen gap sub lever onto the CR shaft, insert the side marked with an "O" out, set the platen gap lever to 0, and engage the platen gap sub lever notch with the platen gap lever by slipping it upward. (See Figure 3-49.)
- When installing the CR assembly, make sure the timing belt has no torsion and is correctly placed between the CR assembly and top frame.
- Fit the groove on the upper edge of the CR assembly to the top edge of the top frame. (See Figure 3-49.)
- Fit the CR shaft into the U-cut of the slider. (See Figure 3-51.)
- To turn the right parallelism adjustment bushing to the rear, support it by the bottom and push the top edge outward.
- When mounting the compression spring (19.9 g) onto the sub pulley holder, fit the spring to the pin on the left end of the holder first.

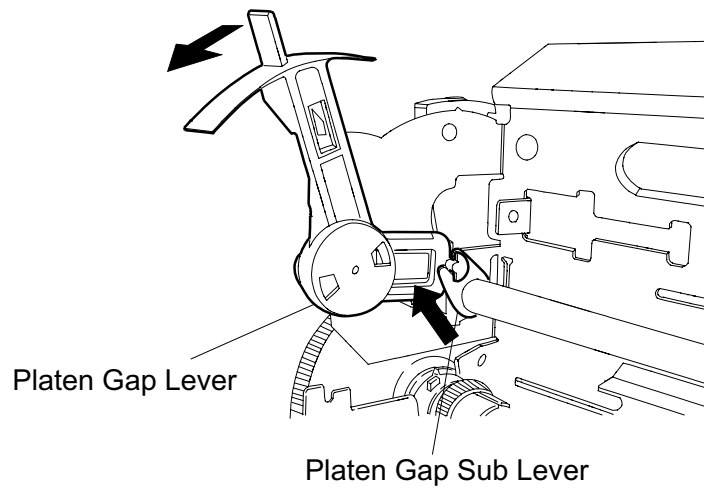


Figure 3-49. Engaging the PG Sub Lever

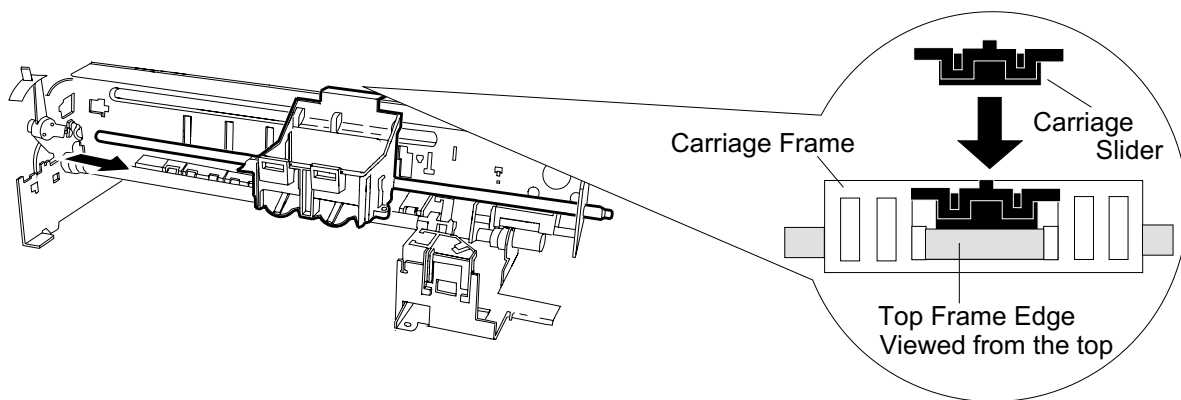


Figure 3-51. Fitting the Carriage Slider to the Upper Edge

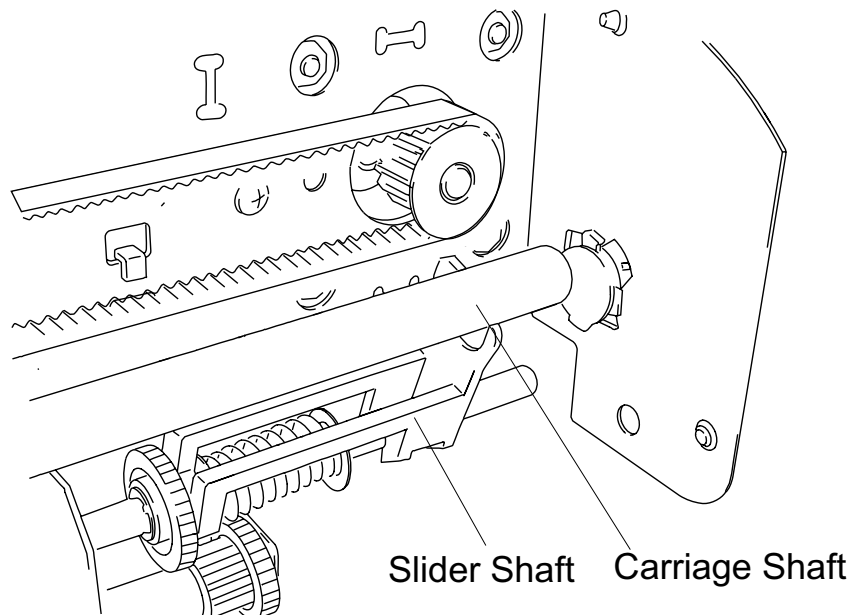


Figure 3-50. Engaging the Carriage Shaft and Slider Shaft

REQUIRED ADJUSTMENT

In case that the CR assembly is replaced, perform necessary adjustment (Refer to Table 4-1 in Chapter 4)

3.13.5 Top Frame Removal

1. Remove the ASF assembly. (See Section 3.11.)
2. Remove the printer mechanism. (See Section 3.13.)
3. Remove the CR assembly. (See Section 3.13.4.)



It is possible to remove the top frame without removing the CR assembly and ASF assembly, but it is highly recommended that you remove these assemblies before removing the top frame. Otherwise the printheads or frames might be damaged or bent.

4. Using tweezers, remove torsion springs (117.6 g) attaching 5 upper paper guide assemblies and 1 right paper guide assembly. Then, take the 5 upper paper guide assemblies out backwards and the right paper guide assembly forward to remove them. (See Figure 3-52.)

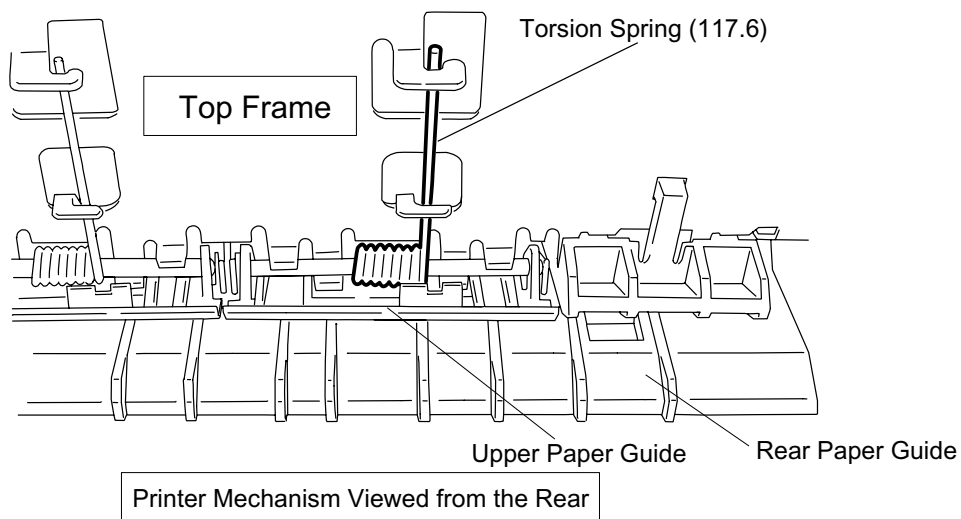


Figure 3-52. Releasing the Torsion Springs

5. Remove 3 screws (CBS, 3x6, F/Zn) securing the top frame to the printer mechanism, and 1 screw CBS, 3x6, F/Zn) securing the top frame and cap assembly. (See Figure 3-53.)

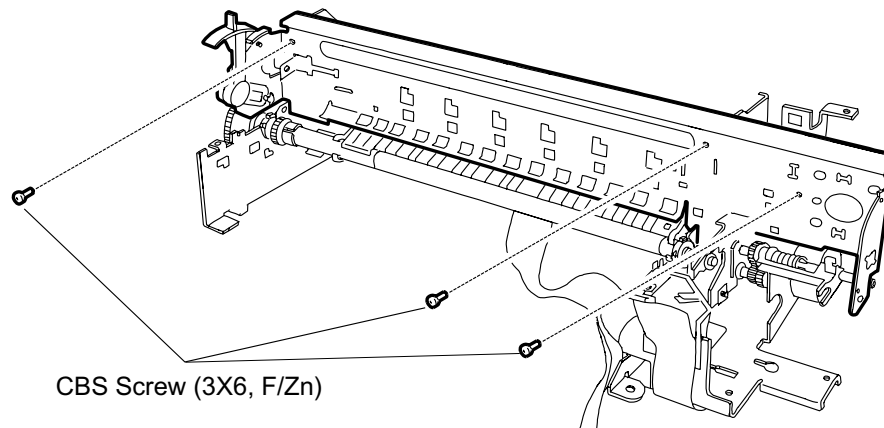


Figure 3-53. Removing the Screws Securing the Top Frame

6. Disconnect the paper end sensor connector cable from the paper end sensor assembly. Then remove the top frame.

POINTS TO NOTE

- In installing the top frame to the printer mechanism, be sure not to damage the gear (70 mm) at the left edge
- Be sure to place the driven roller shafts in the upper paper guide assemblies parallel to the PF roller. Figure 3-54 shows how to engage upper paper guide assembly parts.
- When mounting the right paper guide assembly, insert it into the gap from the front, as shown in Figure 3-55.
- Tightening torque for the screws (CBS, 3x6, F/Zn) = 8 ~ 10 kg-cm

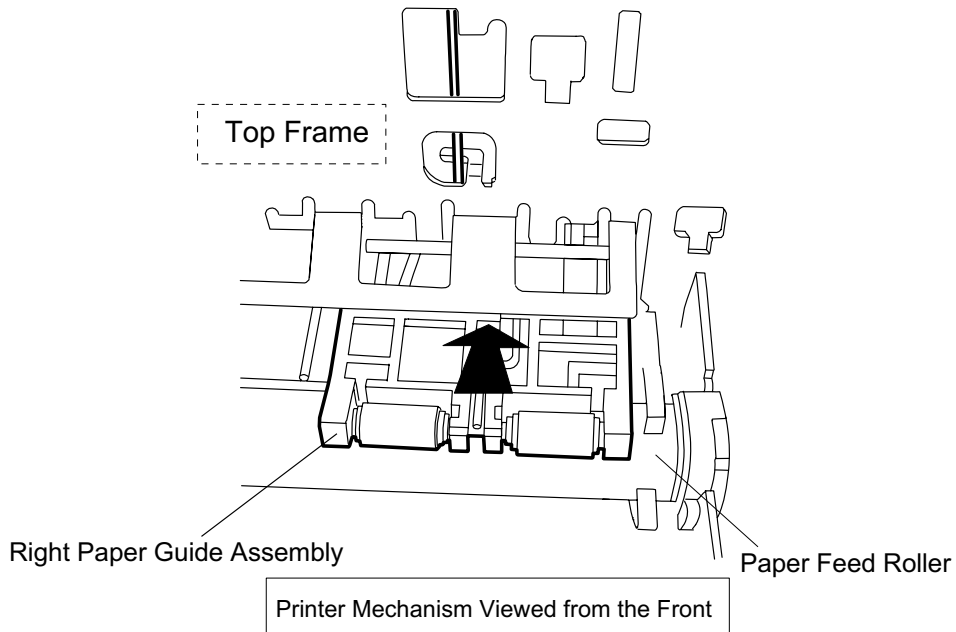


Figure 3-55. Right Paper Guide Installation

3.13.6 Paper Empty (PE) Sensor Assembly Removal

1. Remove the top frame. (Refer to 3.13.5.)
2. Release the hook for the PE sensor assembly using tweezers. Then remove the paper end sensor assembly by lifting upward. (See Figure 3-56.)

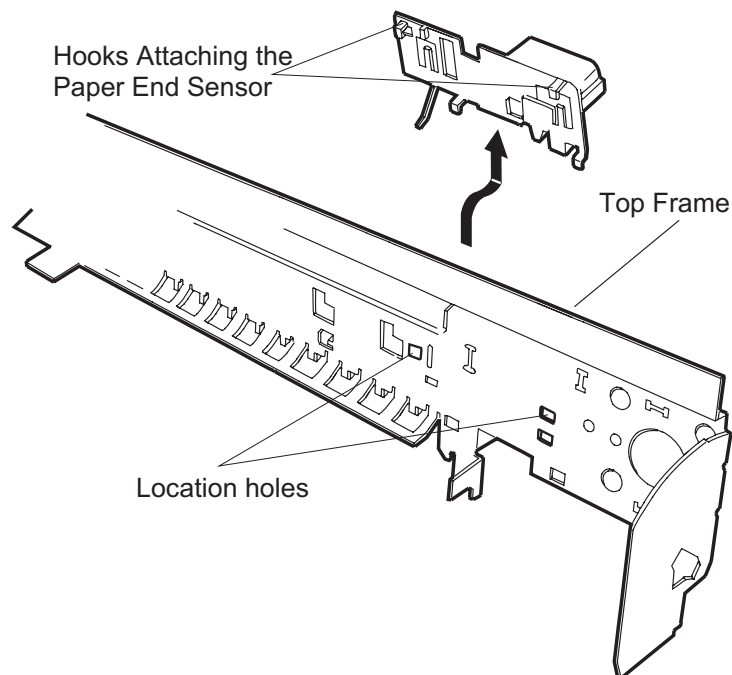
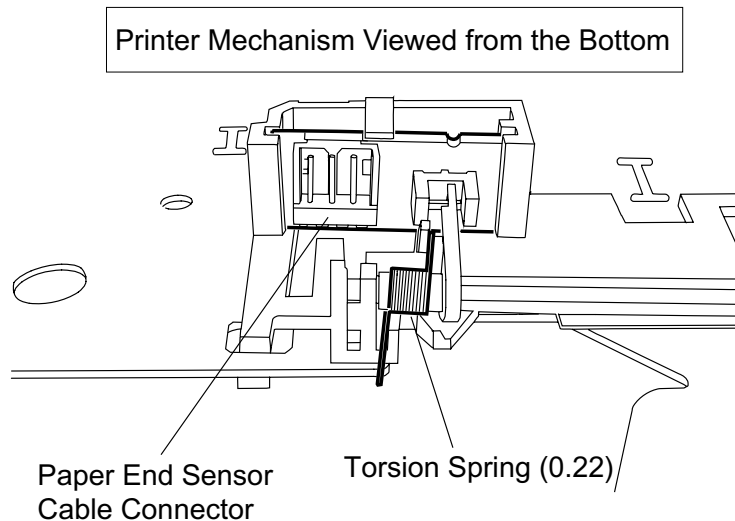


Figure 3-54. Paper End Sensor Assembly Removal

POINTS TO NOT

- ❑ When mounting the paper end sensor assembly on the top frame, be sure to mount the torsion spring correctly at the point shown in Figure 3-57.
- ❑ After installing the paper empty sensor lever, ensure it bounces smoothly.
- ❑ Install the paper empty sensor and right paper guide assembly in the following order:
 - ① Mount the paper empty sensor onto the top frame.
 - ② Align the paper empty sensor lever with the cutout in the upper paper guide assembly.
 - ③ Attach the right paper guide assembly to the top frame, or refer to POINTS TO NOTE in Section 3.13.5.
- ❑ Ensure that the hooks for the PE sensor assembly fit securely into the cutouts in the top frame.

**Figure 3-56. Torsion Spring**

3.13.7 I/S (Ink System) Frame Removal



When releasing joints linking the I/S frame and right frame, be careful not to bend the frames.

1. Remove the pump assembly. (Refer to Section 3.13.2.)
2. Remove the top frame. (Refer to Section 3.13.5.)
3. Remove the head FFCs from the sub cable holder. (See Figure 3-58.)

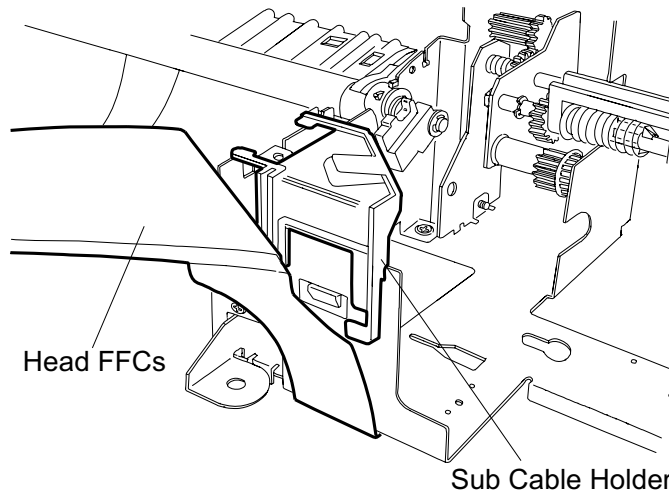


Figure 3-57. Head FFC Removal

4. Remove 2 screws (CBS, 3x6, F/Zn) securing the I/S frame and right frame. (See Figure 3-59.)

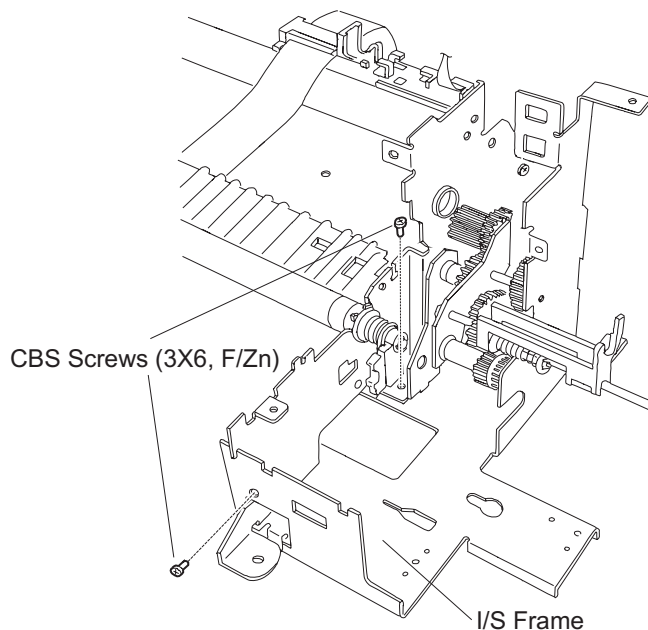


Figure 3-58. I/S Frame Removal (1)

- Slide the I/S frame forward by releasing 3 joints (2 at the back and 1 on the front of the printer mechanism) for the I/S frame and right frame. Then remove the I/S frame by lowering downward. (See Figure 3-60.)

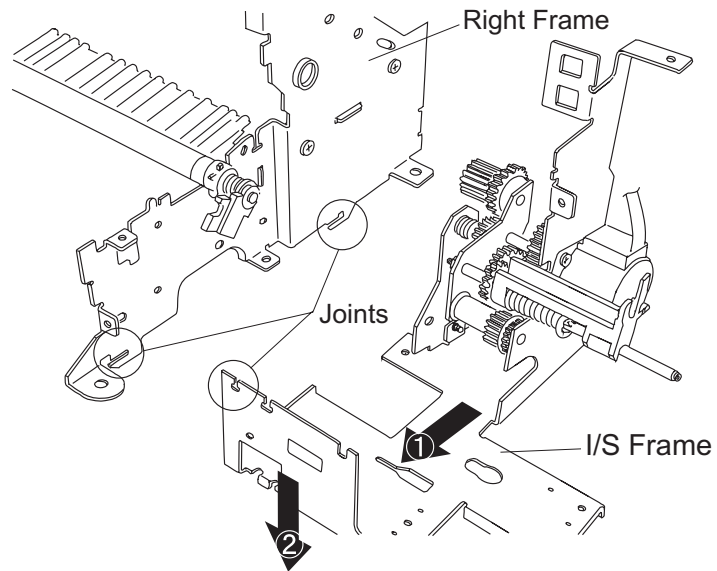


Figure 3-59. I/S Frame Removal (2)

- Remove connector cables for the CR HP sensor and pump motor from the printer mechanism.

POINTS TO NOTE

- ❑ When joining the I/S frame with the right frame, be sure to align it with the slots in the right frame appropriately. Then push until it meets resistance.
- ❑ Pay attention to the 20.8 mm gear in the combination gear (12 mm, 20.8 mm) when connecting the I/S frame to the right frame. It must engage the 16.8 mm gear correctly. ❑
- ❑ Leave some backlash for the combination gear (12 mm, 20.8 mm).
- ❑ When attaching the I/S frame to the right frame, be sure to mount the screw on the front first. Otherwise, the frame will bend. (See Figure 3-61.)
- ❑ After installing the I/S frame onto the printer mechanism, only carry the printer mechanism by holding the bottom frame.
- ❑ Tightening torque for the screws (CBS, 3x5, F/Zn) = 8 ~ 10 kg-cm.

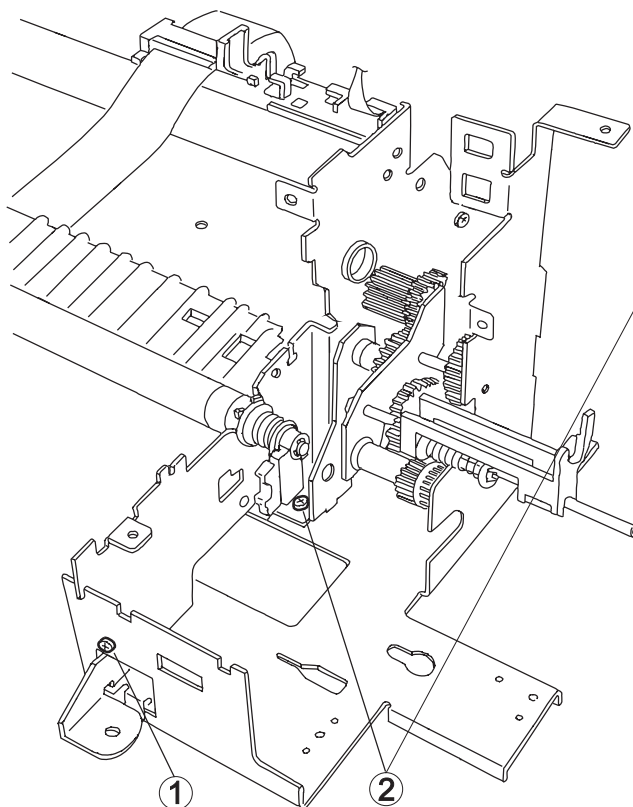


Figure 3-60. Order for Mounting Screws

3.13.7.1 I/S Frame Disassembly (Removing the Pump Motor)

1. Remove the I/S frame. (See Section 3.13.7.)
2. Remove 2 screws (CBS, 3x6, F/Zn) securing the pump motor. (See Figure 3-62.)

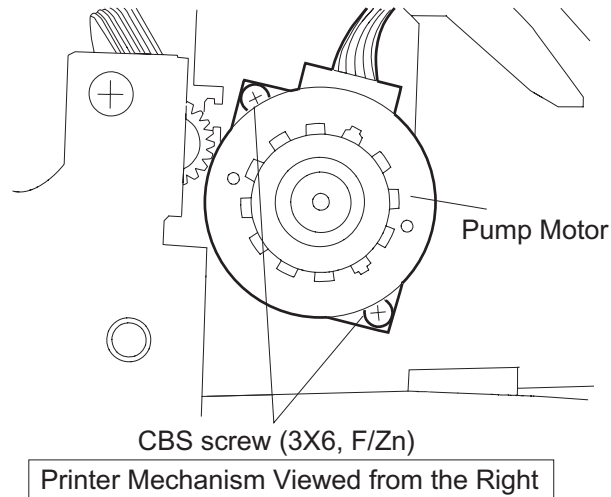


Figure 3-61. Removing the Screws Securing the Pump Motor

3. Remove 1 hexagon nut (6N, class-2, M4) and 1 draft spring (0.4 g) securing the slider shaft to the middle sub frame. Then remove the slider shaft. (See Figure 3-63.)

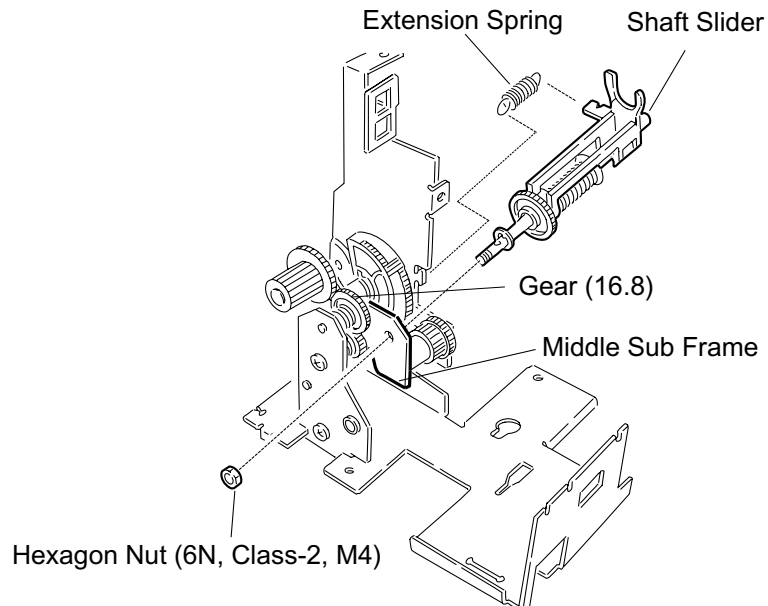


Figure 3-62. Slider Shaft Removal



Be careful not to damage the gear (16.8 mm) when removing the hexagon nut (6N, class-2, M4) securing the slider shaft.

4. Remove 1 hexagon nut (6N, class-2, M4) and 1 draft spring (0.4 g) securing the slider shaft
Remove 2 screws (CBS, 3x6, F/Zn) securing the inner sub frame. Then remove the inner sub frame and following 6 parts from the middle sub frame:

- | | |
|-------------------------------------|-----------------------------------|
| ① Combination gear (12 mm, 20.8 mm) | ② Gear (16.8 mm) |
| ③ Plain washer (7.2x0.3x12, S/Na) | ④ Compression spring (0.26 g) |
| ⑤ Compression spring (0.31 g) | ⑥ Plain washer (5.2x0.2x11, S/Na) |

(See Figure 3-64.)

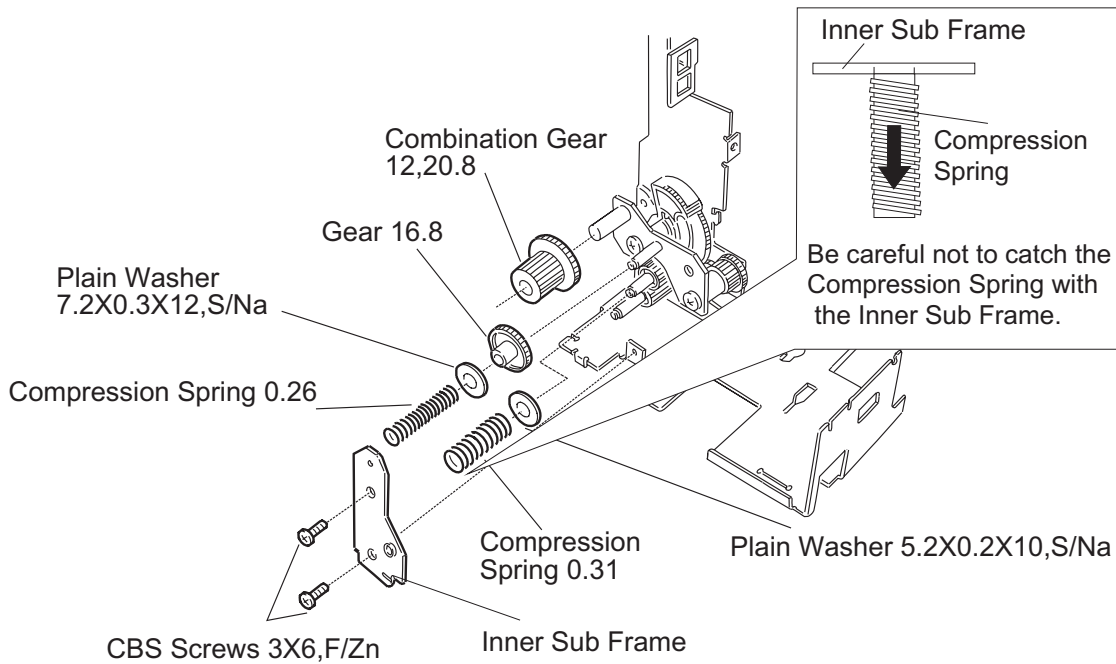


Figure 3-63. Inner Sub Frame Removal

5. Remove 2 screws (CBS, 3X6, F/Zn) securing the middle sub frame, then remove the middle sub frame and the following 11 parts from the sub pump frame:

- | | |
|-------------------------------------|-----------------------------------|
| ① Combination gear (12, 15) | ② Plain washer (5.2x0.3x12, S/Na) |
| ③ Spring washer (5.3x0.07x10, S/Na) | ④ Combination gear (14.4, 21.6) |
| ⑤ Cam | ⑥ Torsion spring (7.3) |
| ⑦ Combination gears (12, 26) | ⑧ Gear (11.5) |
| ⑨ 3 E-rings (4, F/UC) | |

(See Figure 3-65.)

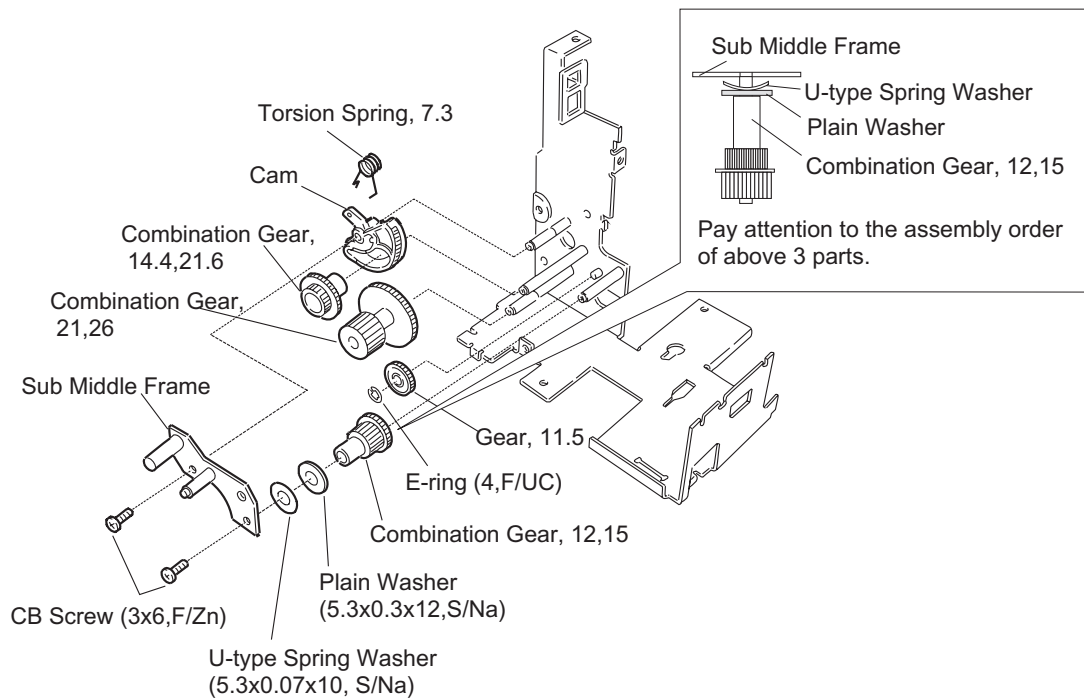


Figure 3-64. Middle Sub Frame Removal

CAUTION

- Do not mount the E-ring before engaging all frames. Otherwise frames and shafts may bend. Be sure to use the exclusive E-ring holder to avoid damaging gears and shafts.
- Notice how gears engage. See figures 3-64 and 3-65.
- Tightening torque for the screws (CBS, 3x6, F/Zn) = 8 ~ 10 kg-cm.
- After tightening screws, make sure the U-shaped spring washer is mounted correctly.

Checklist after Engaging I/S Frame

- ❑ Gear engagement
 Insert the cam in the direction shown in Figure 3-66 (top left illustration), and turn the combination gear right and left. Then check that gears turn smoothly.
- ❑ Engagement of slider and combination gear
 - ① Move slider to the right, and check that it engages the combination gear smoothly. If not, turn combination gear (12 mm, 26 mm) in both directions, and check that they engage the slider properly, as shown in Figure 3-66 (bottom left illustration).
- ❑ Cam changeover (pump side)
 - ① Insert the cam in the direction shown in Figure 3-66 (top left illustration) and shift the slider to the right.
 - ② Turn the combination gear (12 mm, 26 mm) clockwise, and check that the gear (16 mm) engages the combination gear (12 mm, 15 mm) and cam smoothly. Check that the combination gear (14.4 mm, 21.6 mm) turns along with the cam. Make sure gears rotate smoothly and immediately.
- ❑ Cam changeover (ASF side)
 - ① Insert the cam in the direction shown in Figure 3-66 (top right illustration) and shift the slider to the left.
 - ② Turn the combination gears (12 mm, 26 mm) counterclockwise, and check that the gear (16 mm) engages the combination gear (12 mm, 15 mm) and cam smoothly. Check that the combination gear (14.4 mm, 21.6 mm) turns smoothly along with the cam. Make sure the gears rotate smoothly and immediately.

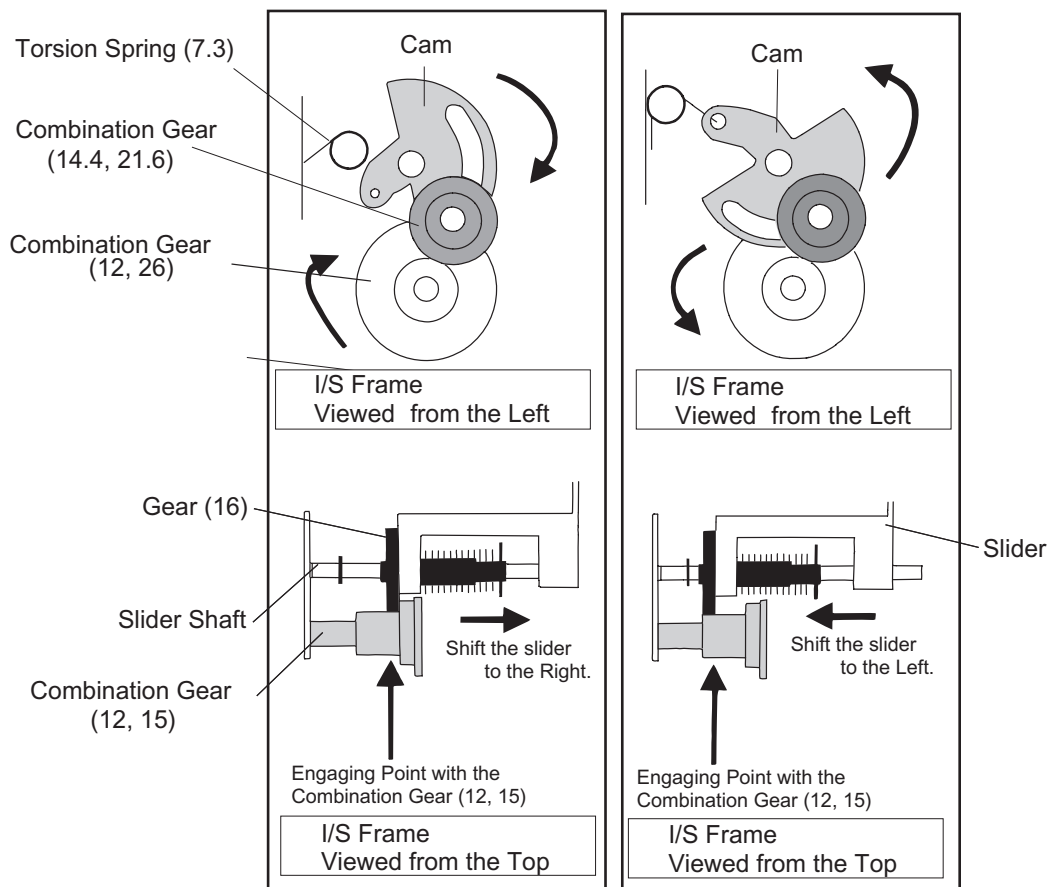


Figure 3-65. Checkpoints for Assembling the I/S Frame

3.13.8 Paper Feed Roller (PF Roller) Assembly Removal

CAUTION

- When releasing or turning lock levers for the paper feed roller bushings, be careful not to damage them.
- When removing the paper feed roller from the right and left frames, be careful not to damage the teeth for the gear (70 mm).
- Never touch the surface of the black-coated roller in the paper feed roller assembly with your bare hands. The roller surface coating is so sensitive that it must be handled cautiously to prevent the coating from peeling.

1. Remove the top frame. (See Section 3.13.5.)
2. Remove the front paper guide. (See Figure 3-14.)
3. Release 3 hooks securing the rear paper guide to the bottom frame. (See Figure 3-67.)

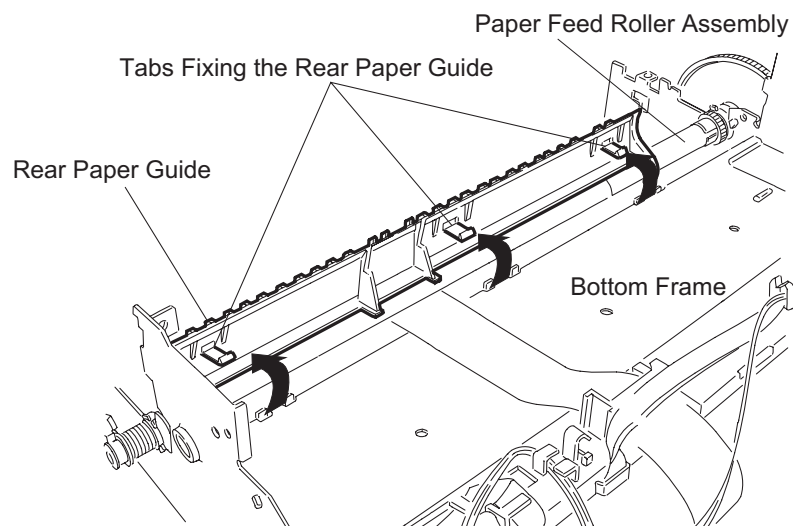


Figure 3-66. Rear Paper Guide Removal

4. Push levers out to release the lock levers for the right and left bushings (12 mm) securing the paper feed roller assembly to the right and left frames. Then turn them forward until they fit through the cutouts in the frames. Shift the paper feed roller assembly left, and remove the paper feed roller assembly and rear paper guide along with the gear (70 mm) by lifting upward. (See Figure 3-68.)

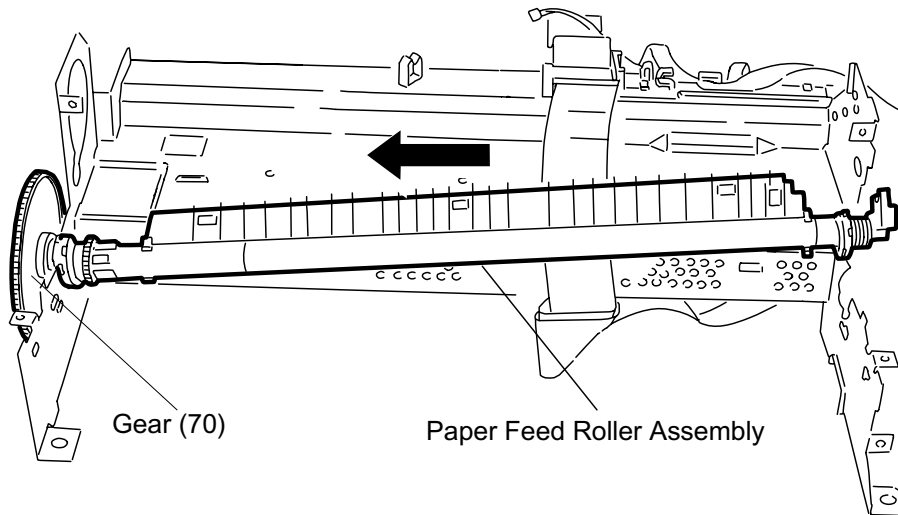


Figure 3-67. Paper Feed Roller Assembly Removal

POINTS TO NOTE

- When installing the paper feed roller assembly into the right and left frames, insert the right and left bushing on the left of each frame. Then align the bushings with the cutouts in the frame, and slide the shaft to the right.
- Make sure that the bumps on each bushing lever fit into the location holes in the frames. (See Figure 3-69.)
- If you dismount the gear (70 mm) after removing the paper feed roller assembly, be sure to press the gear back into the paper feed roller assembly before reinstalling the paper feed roller assembly to the right and left frames. Do not hold the gear by its teeth during this operation.
- Make sure that 3 hooks fixing the rear paper guide to the bottom frame securely fit into the cutouts in the bottom frame.
- Make sure the contact spring on the left is correctly mounted onto the bottom frame, as shown in Figure 3-70.

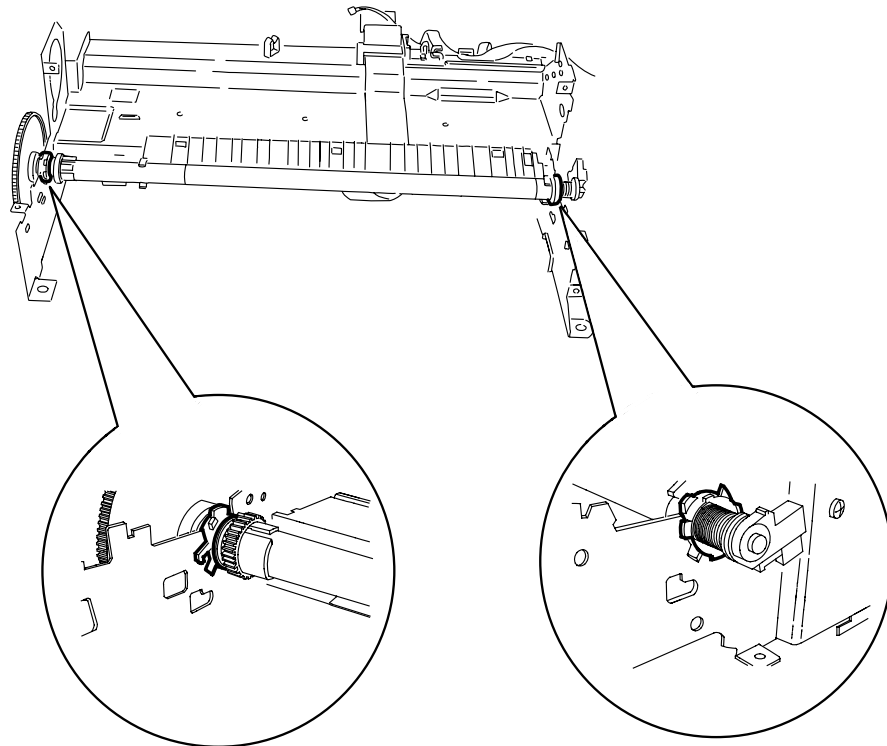


Figure 3-68. Bushing Locations

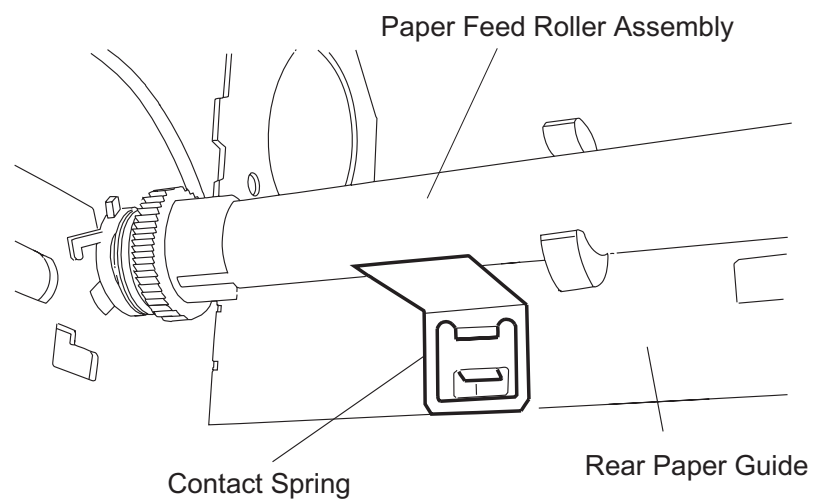


Figure 3-70. Contact Spring Location

3.13.9 Ink Drain Pad Removal

1. Remove the printer mechanism. (See Section 3.13.)
2. Remove the ink drain pad from the lower case.

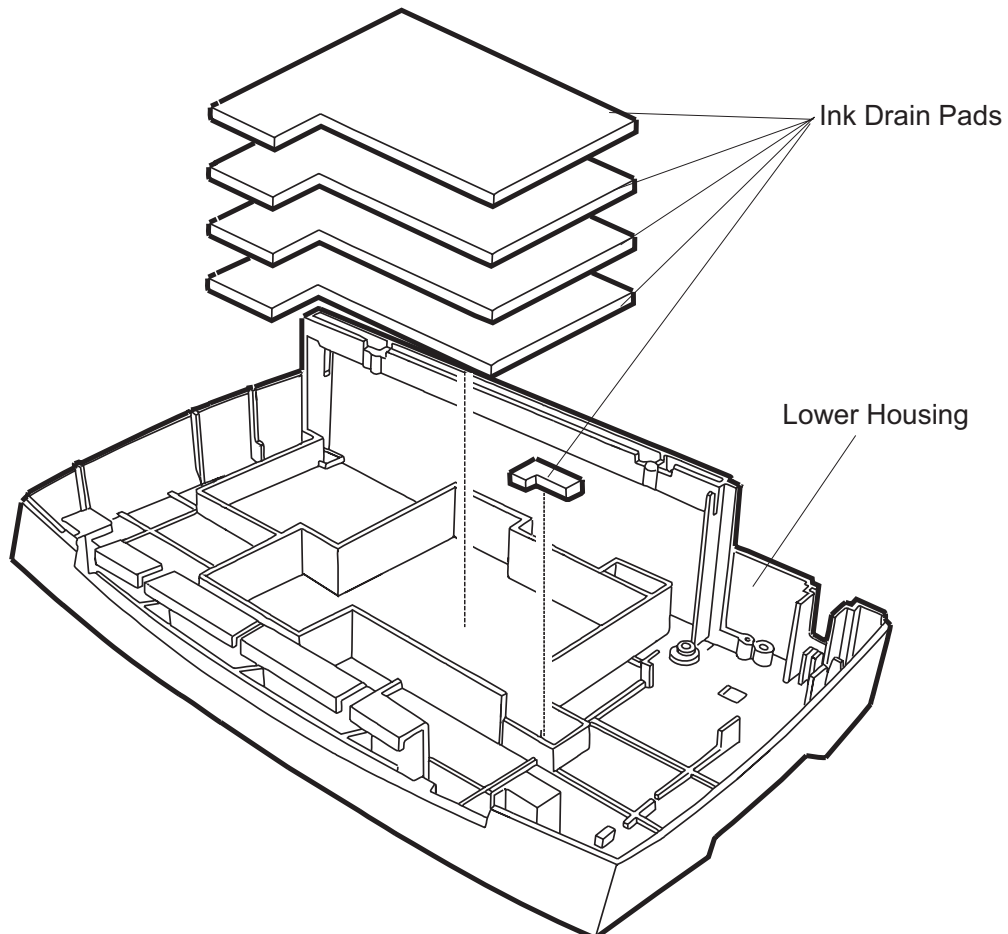


Figure 3-71. Ink Drain Pad Removal

Chapter 4 Adjustment

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4.1 Overview

This section describes adjustment required when the printer is reassembled after repair. Read the instructions headed under "CAUTION" before starting adjustment.



- Always perform adjustment using the program specified for each unit.*
- Ink cartridge used for this printer is one-time-cartridge. If the same cartridge is reinstalled, bubbles are formed in the printhead, which might cause dot missing. Therefore always install a new cartridge after removing the used one for repair.*
- The ink consumption counter is reset when the cartridge is replaced during the ink cartridge change sequence. Therefore be sure not to replace the ink cartridge without putting the printer in the ink cartridge change mode.*
- Use 720 dpi exclusive paper when printing the adjustment pattern.*
- Perform the each adjustment by using exclusive adjustment program.*

4.1.1 Adjustment Required

This section gives information on the adjustment required after disassembling and reassembling. Be sure to perform the specified adjustment whenever you remove or replace the part for repair. Table 4- 1 lists the required adjustments for several units and corresponding adjust items, which must be accomplished in the order instructed in Table 4-1.

Table 4- 1. Required Adjustment

Replaced Unit/Part	Adjustment Item and the Corresponding Menu
Printer Mechanism	1. Customer data writing operation * :Input of Customer data 2. Initial ink charge :Ink charge 3. Head VH voltage input :Write to the Head voltage value 4. Head gap adjustment :Head GAP timing adjustment 5. Bi-d adjustment :Bi-d adjustment
C202 MAIN Board	1. Customer data writing operation * :Input of Customer data 2. Head VH voltage input :Write to the Head voltage value 3. Head gap adjustment :Head GAP timing adjustment 4. Bi-d adjustment :Bi-d adjustment 5. Ink drain pad replacement (Refer to Chapter 6 Maintenance.) <i>Note) Whenever C202MAIN board is replaced with a new one, all stored data of EEPROM is lost. This means that the ink consumption counter is lost. Therefore, whenever C202MAIN Board is replaced, the printer must be equipped with a new ink cartridge. Above listed adjustment items must be executed after replacing the ink cartridge with a new one.</i>
Printhead	1. Customer data writing operation * :Input of Customer data 2. Initial ink charge :Ink charge 3. Head VH voltage adjustment :Write to the Head voltage value 4. Head angular adjustment :Head angular adjustment 5. Black/color head vertical adjustment: BK.-M Linear adjustment 6. Head gap adjustment :Head GAP timing adjustment 7. Bi-d adjustment :Bi-d adjustment
After disassembling and reassembling the CR unit	1. Platen gap adjustment 2. Customer data writing operation * :Input of Customer data 3. Head angular adjustment :Head angular adjustment 4. Black/color head vertical adjustment: BK.-M Linear adjustment 5. Head gap adjustment :Head GAP timing adjustment 6. Bi-d adjustment :Bi-d adjustment
Top frame	1. Platen gap adjustment 2. Customer data writing operation * :Input of Customer data 3. Bi-d adjustment :Bi-d adjustment
CR motor	1. Customer data writing operation * :Input of Customer data 2. Bi-d adjustment :Bi-d adjustment
Ink drain pad	1. EEPROM reset (Refer Chapter 6)

*Note) * The adjusting program doesn't run without inputting the customer data.*

4.1.2 Adjustment Tools

Table 4-2 shows the tools necessary to adjust this printer and the menus to be adjusted.

Table 4- 2. Adjustment Tools

Tools for adjusting	Item to be adjusted
Program disk for adjustment • DOS system • GWBASIC • Adjustment program (Version J70C00E)	<input type="checkbox"/> Customer data writing operation <input type="checkbox"/> Initial ink charge (Ink charge) <input type="checkbox"/> Head voltage adjustment <input type="checkbox"/> Head angular adjustment <input type="checkbox"/> Black/color head vertical adjustment <input type="checkbox"/> Head gap adjustment <input type="checkbox"/> Bi-d adjustment
Thickness gauge (1.1 mm)	<input type="checkbox"/> Platen gap adjustment

The program disk for adjustment consists of the total of 40 files such as DOS system, GWBASIC.EXE, and adjusting programs. The adjusting menus in the program are as shown below:

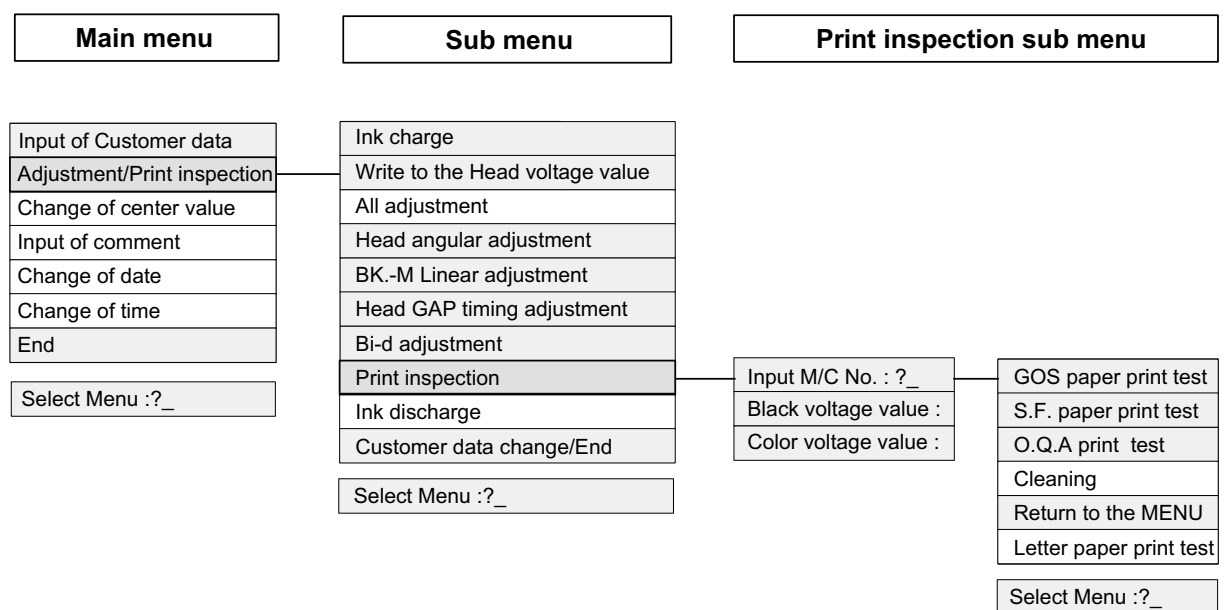


Figure 4-1. Adjustment Program Menu

Select the item in the light gray shaded box to perform necessary adjustment. You can proceed to the sub menu through the item in the dark gray shaded box in the bold line. Selecting “**All adjustment**” in the sub menu enables you to perform the following adjustments consecutively; “**Head angular adjustment**”, “**BK.-M Linear adjustment**” and “**Head GAP adjustment/Bi-d adjustment**” This section, however, only refers to the individual adjustment methods.



- ☑ During adjustment, values such as Customer data, head voltage value, head gap adjustment value, and Bi-d adjustment value are written into the EEPROM at the specified timing as follows;
- Customer data : At performing “**Print Inspection**”.
 - Head voltage value : When the “**Return**” key is pressed after entering the values during “**Write to the Head voltage value**” menu . The data is then transferred to the printer.
 - Bi-d/ Head gap adjustment value: At performing “**Print Inspection**”.

4.2 Adjustment

This section provides detailed information on how to perform the adjustments listed below and the notice headed under "CAUTION".

- Platen gap adjustment
- Customer data writing operation
- Initial ink charge
- Head voltage data writing operation
- Head angular adjustment
- BK-M Liner adjustment
- Head gap adjustment
- Bi-d adjustment

4.2.1 Platen Gap (PG) Adjustment

This adjustment is performed to obtain the appropriate gap between the head nozzle surface and the platen, and is necessary when the parallelism adjust bushing has been set off the position during disassembling and assembling. **The standard value for the platen gap with this printer is 1.1 mm**, which is adjusted by inserting the thickness gauge between the head nozzle surface and platen then turning the both left and right parallelism adjust bushings. This section describes how to adjust the PG gap in the correct order along with cautions.



- Never touch the thickness gauge with your bare hand.
- Make sure there is no oil, foreign object, and rust on the thickness gauge.
- Check if your thickness gauge is not warped by checking it with the flat surface or new gauge.

1. Set the PG lever to "+" (wide) position and shift the CR unit left. Then place the thickness gauge by sliding it from the rear (PF roller side) into the front. In this time, don't contact the thickness gauge to the PF roller surface.



- Be sure to level the thickness gauge when placing it onto the diamond cut rib on the platen plate.

2. Set the PG lever to "0" (narrow) position and shift the CR unit from left to right or vice versa by holding the upper side of the timing belt.

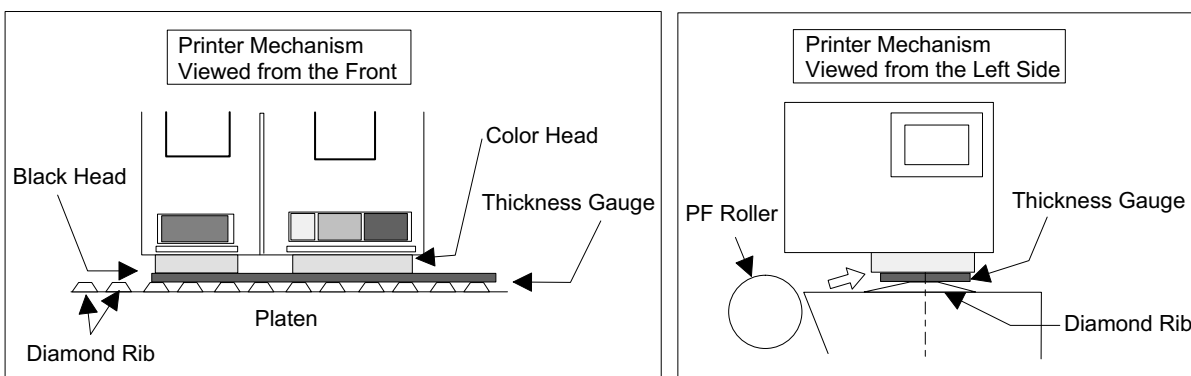


Figure 4-2. Thickness Gauge Setting

- Turn the left parallelism adjust bushing to the rear (narrower) step by step toward the left parallelism adjust bushing set position, where the thickness gauge starts shifting together with the CR unit. Then shift the lever one step back to the front (wider) from the adjusted position.

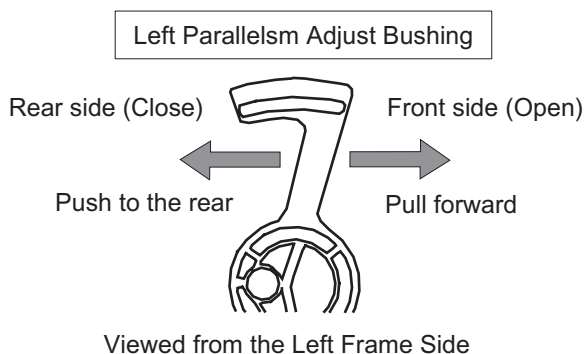


Figure 4-3. Left Parallelism Bushing

- Hold the upper side of the timing belt and slide it to move the CR unit from right to left or vice versa to confirm that the thickness gauge set on the platen does not move.
- Return the PG lever toward "+" (wide) direction to remove the thickness gauge, and slide the CR unit right. Then place the thickness gauge by sliding it from the rear (PF roller side) into the front. During this operation, don't contact the PF roller surface with the thickness gauge.
- Set the PG lever to the "0" (narrower) position and shift the CR unit from left to right or vice versa by holding the upper side of the timing belt.
- Turn the right parallelism adjust bushing to the rear step by step to the right parallelism adjust bushing set position where the thickness gauge starts moving together with the CR unit. Then shift the lever one step back to the front (wider) from the adjusted position.
- Hold the upper side of the timing belt and slide it to move the CR to confirm that the thickness gauge set on the platen does not move.

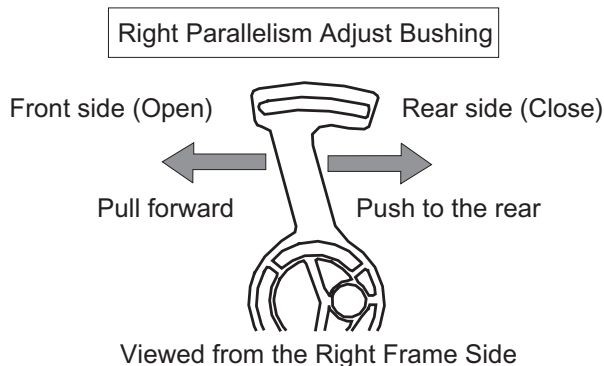


Figure 4-4. Right Parallelism Bushing

- Repeat the steps from 1 to 4 at the left end to confirm that the gap is correctly adjusted.
- If the correct adjustment is confirmed, fix the left and right parallelism adjust bushings with the screws (CBS, 3X6).



- ☑ When fastening the screws, be careful not to dislocate bushings from the adjusted position
- ☑ The tightening torque for the screws (CBS, 3X6) is 4.5 kg ~ 5.5 kg-cm.

CAUTION

☑ After performing the PG gap adjustment, make sure that the “Cleaner Head” and head nose are in contact with each other by the proper portion by following the instruction below.

11. Set the “PG Lever” to the “+” (wide) position.
12. Release the “CR Lock Lever” by turning it forward using the tweezers, and shift the CR unit from the CR home position to the right end of the “Front Paper Guide”. Then set the “Head Cleaner” to the wiping/rubbing position by turning the larger gear of the “Pump Motor Reduction Gear” in counter clock wise direction (forward).

CAUTION

☑ Make sure that the “Change Cam” is set to the pump drive side during this operation. (Refer to Figure 2-10 and 3-66 for the cam position.)

☑ Stop turning the “Pump Reduction Gear” when you feel any resistance while turning the gear.

13. Slide the CR unit from left to right or vice versa by holding the upper side of the “Timing Belt” (or top edge of the CR unit). Then check if the “Head Cleaner” and color head nose (metallic frame part of the head) come in contact with each other by **5 mm** or more.

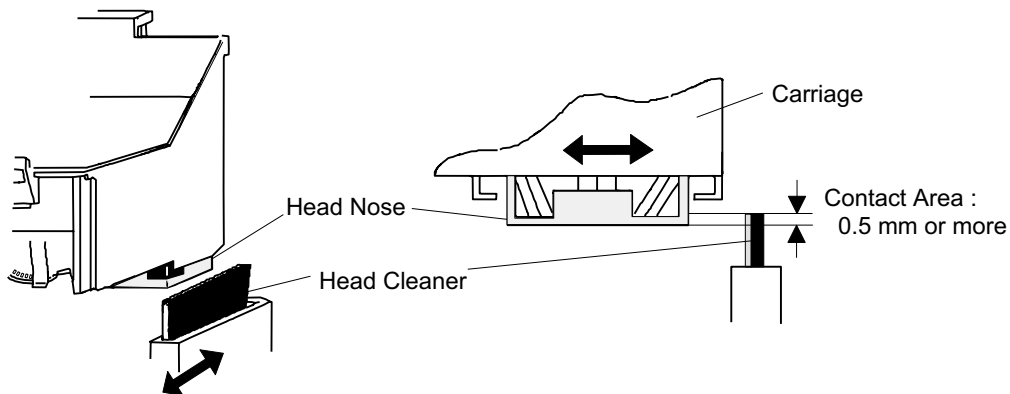


Figure 4-5. Contact Area of the Color Head and Head Cleaner

CAUTION

☑ When sliding the “Head Cleaner” to the metallic frame part of the head, be careful not to slide into the head surface beyond the metal frame.

☑ Check the “Cleaner Head” from the front left of the printer whether the contact portion of the color head and head cleaner is appropriate.

14. If you confirm the proper contact, return the large gear of the “Pump Reduction Gears” in clock wise direction to position the cleaner head under the “Sub Cable Holder” securely. If the portion is not correct, check the positions for the “Head Cleaner” and “Pump Unit”, and replace the parts if necessary.
15. Return the “CR unit” to the home position manually and set the “PG Lever” back to the “0” (narrow) position.

4.2.2 Input of Customer Data

This operation is required when the C202 MAIN board is replaced. The program for this adjustment is used to write the Customer data (set for each destination) into the EEPROM on the ASP C202 MAIN board. If this program is not properly operated, it might cause failure in reading CG data and installing various types of utility using Bi-directional interface. The procedure for this operation is described below.

Customer data writing is programmed to be performed ahead of other adjustments. Therefore you cannot proceed to any other adjustments without executing this operation first.

1. Set this program to FFD on your PC and turn the PC on.
2. The program automatically sets up and the following menu appears on the screen.

```
Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <****> 12-03-1996
```

```
Input Customer data .....1
Adjustment/Print inspection .....2
Changing of center value .....3
Input of comment .....4
Change of date .....5
Change of time .....6
END
```

Select Menu ?_

Figure 4-6. Main Menu

3. Enter "1" for "Select menu :?" to select "Input of Customer data" in the menu.
4. Press "ENTER" key, and the menu below appears.

```
Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <****> 12-03-1996
```

```
Input Customer data .....1
Adjustment/Print inspection .....2
Changing of center value .....3
Input of comment .....4
Change of date .....5
Change of time .....6
END
```

Select Menu : 1

Input the customer data

Memory-SW data (4col data) : ?

Figure 4-7. Input of Customer Data

5. Enter the 4-column code which corresponds to the destination for "Memory-SW data (4 col data)" and press "ENTER" key. The customer codes for each destination is listed below:

```
0000 : EAI, EAI (Latin)
0101 : EDG (NLSP) EDG (NLSP)
0001 : Europe Standard (EDG, EFS, EIS, EIB, EUL)
```

6. After performing necessary adjustments, store the setting values in the EEPROM on the C202 MAIN board by selecting and performing "Print Inspection" in the sub menu.

4.2.3 Ink Charge

You must perform this operation after installing the “ASP Printhead” or ” ASP Printer Mechanism” in which new “Printheads” are installed. “ASP Printheads” or “Printheads” installed in the “ASP Printer Mechanism” has shipping liquid filled in the cavity, and this operation is required to eject the liquid to replace it with the ink. Therefore be sure to perform the initial ink charge operation whenever you replace the printhead, since the lack of this operation might cause dot missing. The procedure and notes for this operation are described below.



- Avoid unnecessary initial ink charge operation, which consumes considerable amount of ink (about one fifth of the ink cartridge capacity is consumed by this operation).
- Do not turn the printer off before this program is completed. Otherwise, the ink dose not filled enough in the cavity of the “Printhead”. in case of the power was turned off while this operation, do this operation again by using this program.
- This initial charge program is difference with the initial charge sequence which is carried out automatically on the first power on time. This program carry out to chage the almost same value of the ink which is used on the first power on initial charge sequence.

1. Set this program to FFD on your PC and turn the PC on.
2. The program automatically sets up and the following menu appears on the screen.

```

Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <****> 12-03-1996

Input Customer data .....1
Adjustment/Print inspection .....2
Changing of center value .....3
Input of comment .....4
Change of date .....5
Change of time .....6
END

Select Menu ?_

```

Figure 4-8. Main Menu

3. Enter “1” for “**Select menu : ?**” to select “**Input of Customer data**” in the menu.
4. Press “**ENTER**” key, and the menu below appears.

```

Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <****> 12-03-1996

Input Customer data .....1
Adjustment/Print inspection .....2
Changing of center value .....3
Input of comment .....4
Change of date .....5
Change of time .....6
END

Select Menu : 1

Input the customer data

Memory-SW data (4col data) : ?

```

Figure 4-9. Input of Customer Data

5. Enter the the 4-column code which corresponds to the destination for “**Memory-SW data (4 col data)**” and press “**ENTER**” key. (See the code list on Page 4-6.)
6. Enter “2” for “**Select menu : ?**” to select “**Adjustment/Print inspection**” in the menu.
7. Press “**ENTER**” key, and the sub menu below appears.

Stylus COLOR 800 J70C00E
Customer : Standard Customer Data <****> 12-03-1996

Ink charge0
Write to the Head voltage value1
All adjustment2
Head angular adjustment3
BK.-M Linear adjustment4
Head GAP timing adjustment5
Bi-d adjustment6
Print inspection7
Ink discharge8
Customer data change/End.....9

Select Menu ?_

BI-D (center value 0,0)
Gap Timing (center value 0,0)

Figure 4-10. “Adjustment/Inspection” Sub Menu

8. Enter “0” for “**Select menu : ?**” to select “**Ink charge**” in the menu.
9. Press “**ENTER**” key, and the menu returns to the sub menu and the Initial ink charge sequence starts. The Power LED on the control panel is blinking during this operation.
10. If you don’t proceed to the next adjustment, enter “9” for “**Select menu : ?**” to select “**Customer data change/End**” in the current menu, and the menu returns to the main menu.
11. Enter “9” for “**Select menu : ?**” then press “**ENTER**” to exit the program.

4.2.4 Write to the Head Voltage Value

This operation is required after installing the “ASP C202 MAIN board”, “ASP Printhead”, or “ASP Printer Mechanism” in which new printheads are already installed. This operation is necessary to correct the head drive pulse which differs from printhead to printhead depending on the piezoelectric elements manufactured unevenly. This program allows you to write individual head voltage value into the EEPROM on the C202 MAIN board. A failure in executing this program will result in inferior printing. The procedure for this operation is described below.



- ☑ Take a note of the 5 columns head VH voltage value which is stamped on the left side of the printhead before installing the new printhead.
- ☑ “ASP Printer Mechanism” is equipped with the printhead. Do not forget to note the head VH voltage value for the equipped printheads. The 5 columns head VH voltage value is stamped on label which is pasted on the printer mechanism package.

1. Set this program to FFD on your PC and turn the PC on.
2. The program automatically sets up and the following menu appears on the screen.

```

Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <****> 12-03-1996

Input Customer data .....1
Adjustment/Print inspection .....2
Changing of center value .....3
Input of comment .....4
Change of date .....5
Change of time .....6
END

Select Menu ?_
    
```

Figure 4-11. Main Menu

3. Enter “1” for “**Select menu : ?**” to select “**Input of customer data**” in the menu.
4. Press “**ENTER**” key, and the menu below appears.

```

Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <****> 12-03-1996

Input Customer data .....1
Adjustment/Print inspection .....2
Changing of center value .....3
Input of comment .....4
Change of date .....5
Change of time .....6
END

Select Menu : 1

Input the customer data

Memory-SW data (4col data) : ?
    
```

Figure 4-12. Input of Customer Data

5. Enter the 4-column code which corresponds to the destination for **“Memory-SW data (4 col data)”** and press **“ENTER”** key. (See the code list on Page 4-6.)
6. Enter **“2”** for **“Select menu : ?”** to select **“Adjustment/Print inspection”** in the menu.
7. Press **“ENTER”** key, and the sub menu below appears.

```
Stylus COLOR 800 J70C00E
Customer : Standard Customer Data <****> 12-03-1996
```

```
Ink charge .....0
Write to the Head voltage value .....1
All adjustment .....2
Head angular adjustment .....3
BK.-M Linear adjustment .....4
Head GAP timing adjustment .....5
Bi-d adjustment .....6
Print inspection .....7
Ink discharge .....8
Customer data change/End.....9
```

```
Select Menu ?_
```

```
BI-D (center value 0,0)
Gap Timing (center value 0,0)
```

Figure 4-13. “Adjustment/Inspection” Sub Menu

8. Enter **“1”** for **“Select menu : ?”** to select **“Write to the Head voltage value”** in the menu.
9. Press **“ENTER”** key, and the following appears.

```
<<<< Write the HEAD Voltage value>>>>
Black Head voltage
Black voltage value (5chr. ID data (ex.18A09)) :
```

```
----Volate value-----
Black voltate value :
Color voltage value:
```

Figure 4-14.

“Write to the Head Voltage Value”

10. Input the correct head voltage with 5 columns and check if the head voltage value was input on the confirmation menu which is shown on the screen. If correct, press **“ENTER”** key. If incorrect, press **“SPACE”** key and replace the incorrect value with the correct one.

EPSON Stylus Color 800

<<<<Write the Head Voltage value>>>>
Black Head voltage
Black Head voltage value (5chr. ID data (ex.18A09)):24B16
Color Head voltage voltage
Color Head voltage value (5chr. ID data (ex. 18A09)): 14B14

OK? <Space> to retry <Return> to write the value & return to the MENU

-----Voltage value-----
Black voltage :
Color voltage :

Figure 4-15. Write to the Head Voltage Value (2)

11. After inputting the correct values, the head voltage values are stored in the EEPROM on the C202 MAIN board by pressing the “**ENTER**” key, and the sub menu appears.
12. If there is no more adjustment to be performed, enter “9” for “**Select menu : ?**” to select “**Customer data change/End**” in the sub menu, then press “**ENTER**” key, and the menu returns to the main menu.
13. Enter “9” for “**Select menu : ?**”, then press the “**ENTER**” key to exit the program.

4.2.5 Head Angular Adjustment

This adjustment must be operated when replacing the printhead or disassembling and assembling the CR unit in order to attach the printheads at the proper angular on the level. This adjustment, performed on physical basis, is accomplished by moving the head angular adjustment lever assembled to the front side of the CR unit. You can identify and adjust the slant according to the result on the test pattern output during the adjusting program. Therefore there is no value to be written into the EEPROM on the C202 MAIN board. The adjustment procedure is as follows;

1. Set this program to FFD on your PC and turn the PC on.
2. The program automatically sets up and the following menu appears on the screen.

```
Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <****> 12-03-1996

Input Customer data ..... 1
Adjustment/Print inspection ..... 2
Changing of center value ..... 3
Input of comment ..... 4
Change of date ..... 5
Change of time ..... 6
END

Select Menu ?_
```

Figure 4-16. Main Menu

3. Enter "1" for "Select menu : ?" to select "Input of customer data" in the menu.
4. Press "ENTER" key, and the menu below appears.

```
Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <****> 12-03-1996

Input Customer data ..... 1
Adjustment/Print inspection ..... 2
Changing of center value ..... 3
Input of comment ..... 4
Change of date ..... 5
Change of time ..... 6
END

Select Menu : 1

Input the customer data

Memory-SW data (4col data) : ?
```

Figure 4-17. Input of Customer Data

5. Enter the suitable 4 columns data for "Memory-SW data (4 col data)" and press "ENTER" key. Regarding the suitable 4 columns data, refer the page 4-6.
6. Enter "2" for "Select menu : ?" to select "Adjustment/Print inspection" in the menu.

- Press “ENTER” key, and the menu below appears.

Stylus COLOR 800 J70C00E
 Customer : Standard Customer Data <****> 12-03-1996

```

Ink charge .....0
Write to the Head voltage value .....1
All adjustment .....2
Head angular adjustment .....3
BK.-M Linear adjustment .....4
Head GAP timing adjustment .....5
Bi-d adjustment .....6
Print inspection .....7
Ink discharge .....8
Customer data change/End.....9
    
```

Select Menu ?_

BI-D (center value 0,0)
 Gap Timing (center value 0,0)

Figure 4-18. “Adjustment/Inspection” Sub Menu

- Enter “3” for “Select menu : ?” to select “Head angular adjustment” in the menu, then press “ENTER” key.
- Enter a dummy number in 3 digits such as “000” or “111” for “MC No.”, and the head angular adjustment pattern is printed out.



When the MC number is entered, the head angular adjustment pattern is printed and the following message appears on the screen;
“Space” key to print again (“Return” to the MENU) (“0” key to cleaning/ “E” key to escape to the error)
 If you identify missing dots on the pattern, you can enter “0” to reprint the adjustment pattern after performing the head cleaning. The black and color head cleaning is executed either individually or together, which you can select. This cleaning is same as CL2 cleaning.

- Look at the output to check if the lines are printed at the regular interval. Figure below shows how to move the head angular adjust lever to adjust different misalignment patterns for each head.

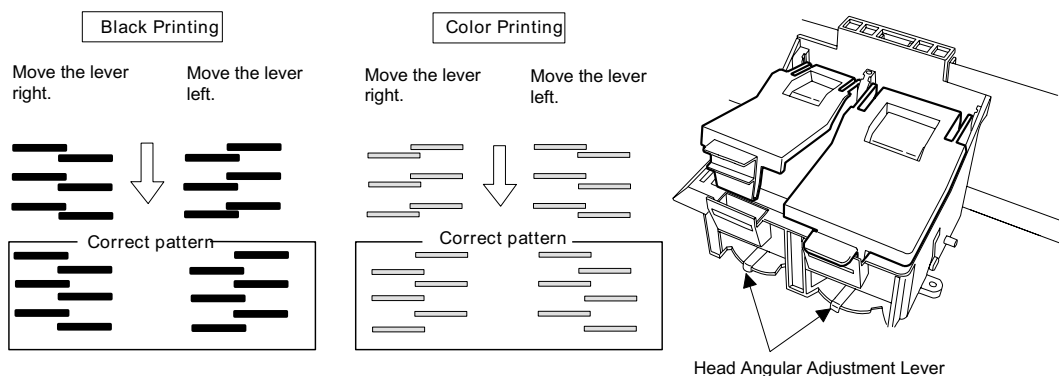


Figure 4-19. Use of the Head Angular Adjust Lever



Slant changes with a unit of 0.02 mm by moving the head angular adjustment lever one step.

11. After adjusting the angular adjustment lever by looking the adjustment pattern sheet, press "**SPACE**" key to print another adjustment pattern sheet.
12. If the lines in the new adjustment patterns are aligned at the regular interval, press "**ENTER**" key, and the sub menu appears on the screen.
13. If you don't proceed to the next adjustment, enter "9" for "**Select menu : ?**" to select "**Customer data change/End**" in the menu, then press "**ENTER**" key to return to the main menu.
14. Enter "9" for "**Select menu : ?**" then press "**ENTER**" key to exit the program.

4.2.6 BK.-Linear Adjustment

BK.-M Linear adjustment is required when replacing the printhead or disassembling and assembling the CR unit, and is performed to adjust the vertical position of the color head by using the black head for the basis. This adjustment, which depends on the physical operation, is accomplished by moving the head vertical adjust lever assembled to the right side of the CR unit. By running this program, the head vertical adjustment pattern is printed to identify the misalignment caused by the vertical gap between the Black Head and Color Head. According to the printed pattern, adjust the gap by moving the head vertical adjustment lever. Therefore this adjustment has no value to be written into the EEPROM on the C202 MAIN board. The adjustment procedure is as follows;

1. Set this program to FFD on your PC and turn the PC on.
2. The program automatically sets up and the following menu appears on the screen.

```

Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <**** > 12-03-1996

Input Customer data ..... 1
Adjustment/Print inspection ..... 2
Changing of center value ..... 3
Input of comment ..... 4
Change of date ..... 5
Change of time ..... 6
Change of time ..... 9
END

Select Menu ?_

```

Figure 4-20. Main Menu

3. Enter "1" for "Select menu : ?" to select "Input of Customer data" in the menu.
4. Press "ENTER" key, and the menu below appears.

```

Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <**** > 12-03-1996

Input Customer data ..... 1
Adjustment/Print inspection ..... 2
Changing of center value ..... 3
Input of comment ..... 4
Change of date ..... 5
Change of time ..... 6
Change of time ..... 9
END

Select Menu : 1

Input the customer data

Memory-SW data (4col data) : ?

```

Figure 4-21. Input of Customer Data

5. Enter the 4-column code which corresponds to the destination for "Memory-SW data (4 col data)" and press "ENTER" key. (See the code list in Page 4-6.)
6. Enter "2" for "Select menu : ?" to select "Adjustment/Print inspection" in the menu.

7. Press “**ENTER**” key, and the sub menu below appears.

Stylus COLOR 800 J70C00E
Customer : Standard Customer Data <****> 12-03-1996

```
Ink charge .....0
Write to the Head voltage value .....1
All adjustment .....2
Head angular adjustment .....3
BK.-M Linear adjustment .....4
Head GAP timing adjustment .....5
Bi-d adjustment .....6
Print inspection .....7
Ink discharge .....8
Customer data change/End.....9
```

Select Menu ?_

BI-D (center value 0,0)
Gap Timing (center value 0,0)

Figure 4-22. “Adjustment/Inspection” Sub Menu

8. Enter “4” for “**Select menu : ?**” to select “**BK.-M Linear adjustment**” in the menu.
9. Press “**ENTER**” key, and the printer prints the adjustment pattern in black and magenta ink.
10. Look at the output to check if the lines for black and magenta are most closely aligned. Figure below shows how to move the head vertical adjust lever to adjust different misalignment patterns.

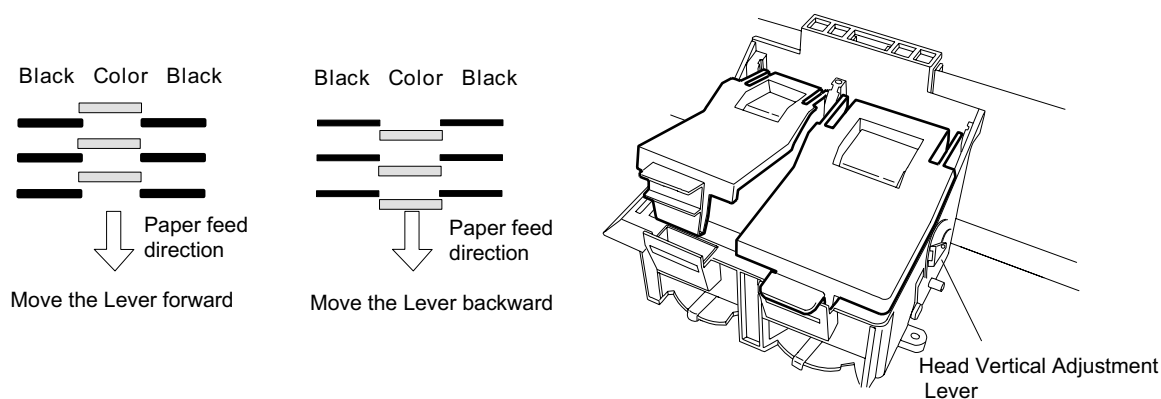


Figure 4-23. Use of the Head Vertical Adjust Lever



Slant changes with a unit of 0.02 mm by moving the head angular adjust lever one step.

11. After adjust the head vertical adjustment lever by looking the adjustment pattern sheet, press “**SPACE**” key to print adjustment pattern sheet again.
12. If the new adjustment patterns is aligned within the specification, press “**ENTER**” key, and the sub menu appears on the screen.
13. If there is no adjustment to be performed, enter “9” for “**Select menu : ?**” to select “**Customer data change/End**” in the menu, then press “**ENTER**” key to return to the main menu.
14. Enter “9” for “**Select menu : ?**” then press “**ENTER**” key to exit the program.

4.2.7 Head GAP Timing Adjustment

Head GAP Timing Adjustment is required when the C202 MAIN board or the Printhead is replaced (or disassembling and assembling the CR unit) to correct the vertical misalignment caused by different print timings between black and color inks. This adjustment, same as for the Bi-d adjustment, is performed by entering the adjusting value. Therefore the adjusting values are stored in the EEPROM on the C202 MAIN board. The adjusting procedure is described below.

1. Set this program to FFD on your PC and turn the PC on.
2. The program automatically sets up and the following menu appears on the screen.

```
Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <****> 12-03-1996

Input Customer data .....1
Adjustment/Print inspection .....2
Changing of center value .....3
Input of comment .....4
Change of date .....5
Change of time .....6
Change of time .....9
END

Select Menu ?_
```

Figure 4-24. Main Menu

3. Enter "1" for "Select menu : ?" to select "Input of Customer data" in the menu.
4. Press "ENTER" key, and the menu below appears.

```
Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <****> 12-03-1996

Input Customer data .....1
Adjustment/Print inspection .....2
Changing of center value .....3
Input of comment .....4
Change of date .....5
Change of time .....6
Change of time .....9
END

Select Menu : 1

Input the customer data

Memory-SW data (4col data) : ?
```

Figure 4-25. Input of Customer Data

5. Enter the 4-column code which corresponds to the destination for "Memory-SW data (4 col data)" and press "ENTER" key. (See the code list in Page 4-6.)
6. Enter "2" for "Select menu : ?" to select "Adjustment/Print inspection" in the menu.

- Press “ENTER” key, and the sub menu below appears.

Stylus COLOR 800 J70C00E
 Customer : Standard Customer Data <****> 12-03-1996

```

Ink charge .....0
Write to the Head voltage value .....1
All adjustment .....2
Head angular adjustment .....3
BK.-M Linear adjustment .....4
Head GAP timing adjustment .....5
Bi-d adjustment .....6
Print inspection .....7
Ink discharge .....8
Customer data change/End.....9
    
```

Select Menu ?_

BI-D (center value 0,0)
 Gap Timing (center value 0,0)

Figure 4-26. “Adjustment/Inspection” Sub Menu

- Enter “5” for “Select menu : ?” to select “Head GAP timing adjustment” in the menu.
- Press “ENTER” key, the menu below appears, along with 6 adjustment patterns (3 for 200 cps and 3 for 100 cps) printed in black and magenta.

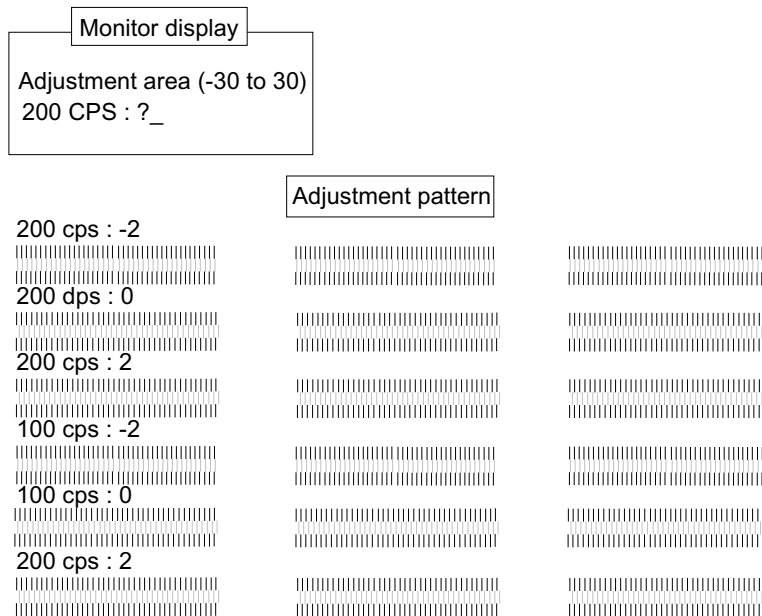


Figure 4-27. Head Gap Adjustment Patterns

- Look at the output to check if the lines for black and color are most closely aligned. If not, input the proper value to adjust the misalignment according to the result, as shown in the figure below.

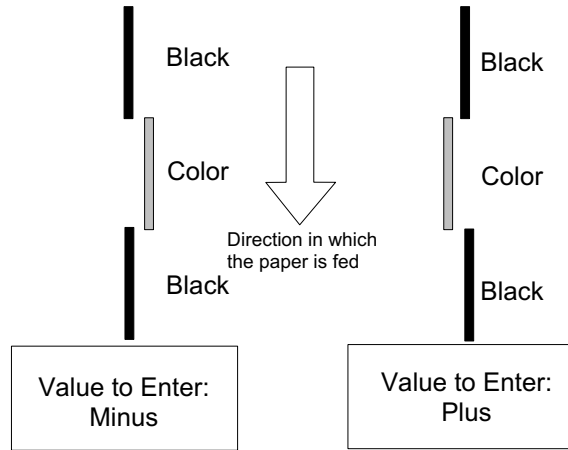


Figure 4-28. Adjusting Value Determination



The printed vertical line shift about 0.07mm by inputting “4” on 200 cps adjustment mode and “2” on 100cps adjustment mode.

- If the value input is incorrect, enter the correct value after pressing the “SPACE” key and press “ENTER” key to set the values, then the menu returns to the sub menu.
- Enter “7” for “Select menu : ?” and press “ENTER” key to proceed to “Print Inspection” in the sub menu in order to check how the set values affect to the outcome. The menu appears is as follows;

Input M/C No. : ?

M/C No. :
 Black voltage value :
 Color voltage value :

Figure 4-29.
 Setting Menu (1) for Print Inspection

Input M/C No. : ?

Black voltage value : 24B16
 Color voltate value : 14B14

OK? ('Return' to NEXT) :

M/C No. :
 Black voltage value :
 Color voltage value :

Figure 4-30.
 Setting Menu (2) for Print Inspection

13. Follow the menu by entering a dummy M/C No. in 3 digits and black/color head voltages corresponding the installed printheads, then press “**ENTER**” key, and the menu below appears.
14. If the value input is incorrect, press “**SPACE**” and enter the correct value. If the input values are

```
Stylus COLOR 800 J70C00E
Customer : Sstandard cistpmer DATA <**** > 12-03-0996

GOS paper print test ..... 1
S.F. paper print test ..... 2
O.Q.A. print test ..... 5
Cleaning ..... 0
Return to the MENU..... 9
Letter paper print test..... 7
Select Menu ?_
```

```
MC/No.           : 000
Black voltage value : 24B16
Color voltage value : 14B14
```

Figure 4-31.

Setting Menu (3) for Print Inspection

correct, proceed to the menu shown below by pressing the “**ENTER**” key.

15. Enter “2” for “**Select menu : ?**” to select “**S.F. paper print test**” in the menu, then press “**ENTER**” key, and the printer outputs the result of the head gap timing adjustment , along with the results of other adjustments.
16. Look at the output to check if the lines are most closely aligned. If not, enter “9” for “**Select menu : ?**” to select “**Return to the MENU**”, then press “**ENTER**” key to return to the sub menu.
17. Repeat the steps from 8 to 16 until the output is satisfactory, then enter “9” for “**Select menu : ?**” in the menu indicated in Figure 4-31 and press “**ENTER**” key to return to the sub menu.
18. If there is no adjustment to be performed, enter “9” for “**Select menu : ?**” to select “**Customer data change/End**” in the menu, then press “**ENTER**”.
19. Enter “9” for “**Select menu : ?**” to exit the program.

4.2.8 Bi-d adjustment

Bi-d adjustment is required when the printer is under the following conditions; the printer mechanism is replaced, the C202 MAIN board is replaced, the CR unit is disassembled and assembled, top frame is replaced, and the CR motor is disassembled. This program enables you to align the vertical line by adjusting the print timing in the Bi-directional black printing mode. The adjustment value is stored in the EEPROM on the C202 MAIN board. The adjusting procedure is described below.

1. Set this program to FFD on your PC and turn the PC on.
2. The program automatically sets up and the following menu appears on the screen.

```
Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <**** > 12-03-1996

Input Customer data .....1
Adjustment/Print inspection .....2
Changing of center value .....3
Input of comment .....4
Change of date .....5
Change of time .....6
Change of time .....9
END

Select Menu ?_
```

Figure 4-32. Main Menu

3. Enter "1" for "Select menu : ?" to select "Input of Customer data" in the menu.
4. Press "ENTER" key, and the menu below appears.

```
Stylus COLOR 800 J70C00E
Customer : Standard Customer DATA <**** > 12-03-1996

Input Customer data .....1
Adjustment/Print inspection .....2
Changing of center value .....3
Input of comment .....4
Change of date .....5
Change of time .....6
Change of time .....9
END

Select Menu : 1

Input the customer data

Memory-SW data (4col data) : ?
```

Figure 4-33. Input of Customer Data

5. Enter the 4-column code which corresponds to the destination for "Memory-SW data (4 col data)" and press "ENTER" key. (See the code list in Page 4-6.)
6. Enter "2" for "Select menu : ?" to select "Adjustment/Print inspection" in the menu.

- Press “ENTER” key, and the sub menu below appears.

Stylus COLOR 800 J70C00E
 Customer : Standard Customer Data <****> 12-03-1996

```

Ink charge .....0
Write to the Head voltage value .....1
All adjustment .....2
Head angular adjustment .....3
BK.-M Linear adjustment .....4
Head GAP timing adjustment .....5
Bi-d adjustment .....6
Print inspection .....7
Ink discharge .....8
Customer data change/End.....9
    
```

Select Menu ?_

BI-D (center value 0,0)
 Gap Timing (center value 0,0)

Figure 4-34. “Adjustment/Inspection” Sub Menu

- Enter “6” for “Select menu : ?” to select “Bi-d adjustment” in the menu.
- Press “ENTER” key, and the menu below appears, along with 6 adjustment patterns, 3 for 267 cps and 3 for 200 cps, are printed in black as shown in Figure 4-35.

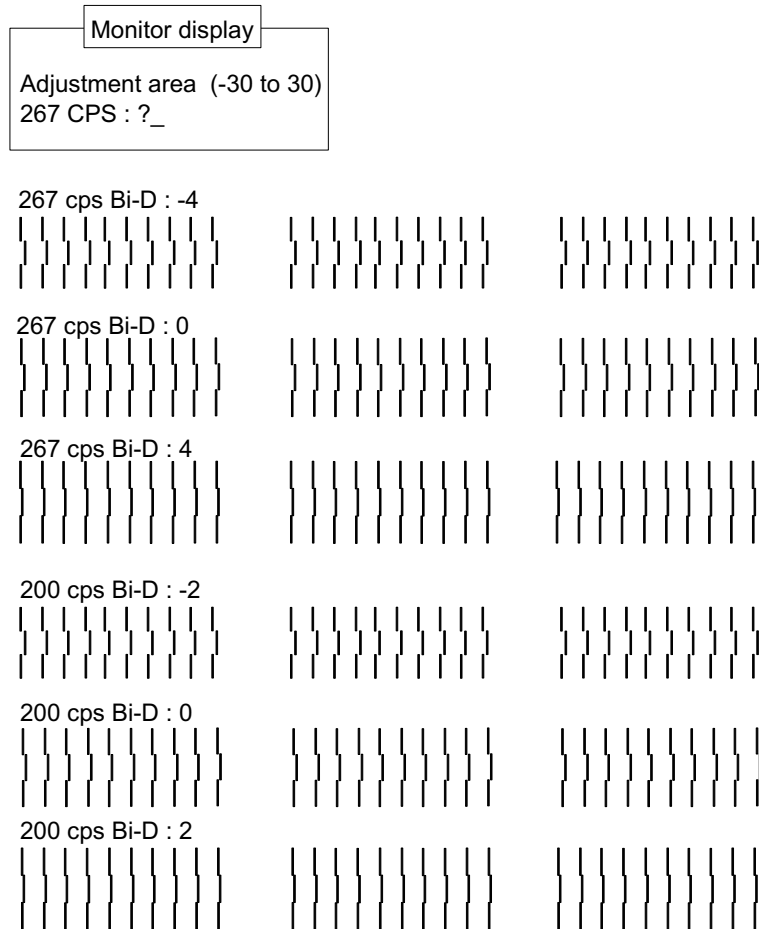


Figure 4-35. Bi-d Adjustment Patterns

- Look at the output to check if the lines are most closely aligned. If not, adjust the misalignment referring to the output result, as shown in the figure below.

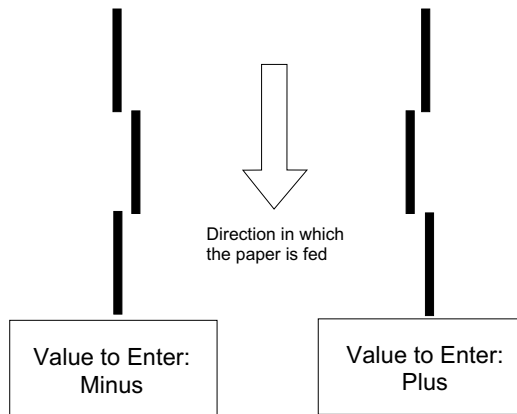


Figure 4-36. Adjusting Value Determination



- ☑ As you change the value with a unit of 4 for 267cps or 2 for 200 cps, the slant moves approximately 0.07 mm or 0.035 mm, respectively.
- ☑ The printed vertical line shift about 0.07mm by inputting "4" on 267cps adjustment mode . On the 200cps adjustment mode, by inputting "2" , the printed vertical line shift about 0.035mm..

- If the value input is incorrect, enter the correct value after pressing the "SPACE" key and press "ENTER" key to set the values, then the menu returns to the sub menu.
- Enter "7" for "Select menu : ?" then press "ENTER" key to proceed to the "Print Inspection" in the sub menu, in order to check how the set values affect to the outcome. The following appears on the screen.

Input M/C No. : ?

M/C No. :
 Black voltage value :
 Color voltage value :

Figure 4-37.

Setting Menu (1) for Print Inspection

- Follow the menu by entering a dummy M/C No. in 3 digits, black voltage, and color voltage corresponding the installed printheads, then press "ENTER" key, and the following menu appears.

Input M/C No. : ?

Black voltage value : 24B16
 Color voltate value : 14B14

OK? ('Return' to NEXT) :

M/C No. :
 Black voltage value :
 Color voltage value :

Figure 4-38.

Setting Menu (2) for Print Inspection

14. If the value input is incorrect, press “**SPACE**” and enter the correct value. If the input values are correct, press the “**ENTER**” key to proceed to the menu shown below.

```
Stylus COLOR 800 J70C00E
Customer : Sstandard cispmer DATA <****> 12-03-0996
```

```
GOS paper print test ..... 1
S.F. paper print test ..... 2
O.Q.A. print test ..... 5
Cleaning ..... 0
Return to the MENU ..... 9
Letter paper print test ..... 7
Select Menu ?_
```

```
MC/No. : 000
Black voltage value : 24B16
Color voltage value : 14B14
```

Figure 4-39 Setting Menu (3) for Print Inspection

15. Enter “2” for “**Select menu : ?**” to select “**S.F. paper print test**” in the menu, then press “**ENTER**” key, and the printer outputs the result of the Bi-d adjustment, along with the results of other adjustments.
16. Look at the output to check if the alignment is satisfactory. If not, enter “9” for “**Select menu : ?**” to select “**Return to the MENU**”, then press “**ENTER**” key.
17. Repeat the steps 8 to 16 until the output is satisfactory, then enter “9” for “**Select menu : ?**” in the menu shown in Figure 4-39 and press “**ENTER**” key to return to the sub menu.
18. If there is no more adjustments to be performed, enter “9” for “**Select menu : ?**” to select “**Customer data change/End**” in the menu, then press “**ENTER**”.
19. Enter “9” for “**Select menu : ?**” to exit the program.

Chapter 5

Troubleshooting

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5.1 General Description

This section describes how to identify and troubleshoot the problems when repairing the printer by dividing the troubles into two levels; repair and replacement of the assemblies and units, and repair of the components. When replacing or repairing the unit or assembly, be sure to refer to the corresponding flow chart which enables you to isolate the defective assembly or unit easily according to the symptom occurred. In repairing the component, refer to Section 5.4 and 5.5 which provide check points listed separately according to the major electric parts.

5.2 Troubleshooting Information

This section provides information on the error modes displayed on the control panel and check lists used to determine if the units in each assembly are normally functioning.

5.2.1 Error mode

The LEDs on the control panel indicate several abnormal status of this printer. Table 5-1 lists the printer errors and corresponding LED status. (Refer to Figure 5-1 for LED arrangement.)

Table 5-1. Printer Error Status

Printer status	LED (a)	LED (b)	LED (c)	LED (d)
Ink sequence is proceeding.	Blinks	---	---	---
Ink cartridge change sequence is proceeding.	Blinks	---	---	---
Paper out	---	On	---	---
Paper jam	---	Blinks	---	---
Black ink cartridge ink end No black ink cartridge installed	---	---	On	---
Black ink cartridge ink low	---	---	Blinks	---
Color ink cartridge ink end No color ink cartridge installed	---	---	---	On
Color ink cartridge ink low	---	---	---	Blinks
Maintenance required (Waste ink pad needs replacing.)	Blinks	Blinks	Blinks	Blinks
Fatal error	Blinks	Blinks	On	On

Note) "—" means no effect.

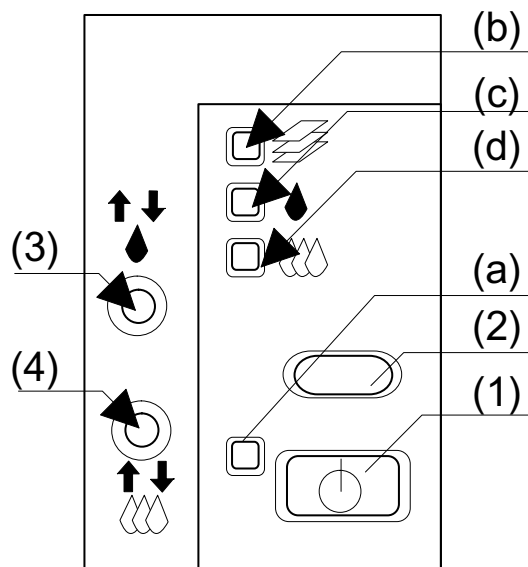


Figure 5-1. Control Panel

5.2.2 Sensor Check Points

Table 5-2 shows the check points for each sensor.

Table 5-2. Check Points for Each Sensor

Sensor Connector No.	Test pin No	Test procedure (Meter is set to the DC voltage.)	Meter reading
CN6 (HP sensor)	1: HP 2: GND 3: HPV	Set the "+" lead of the meter to the pin 1 and "-" lead of the meter to the pin 2.	Outputs High at the home position. Outputs Low at other positions.
CN7 (ASF HP sensor)	1: ASF 2: GND 3: ASFV	Set the "+" lead of the meter to the pin 1 and "-" lead of the meter to the pin 2.	Outputs Low at the home position. Outputs High at other positions.
CN8 (PE sensor)	1: PE 2: GND 3: PEV	Set the "+" lead of the meter to the pin 1 and "-" lead of the meter to the pin 2.	Outputs Low when paper is loaded. Outputs High when there is no paper loaded.
CN9 (Black cartridge detecting sensor)	1: BCO 3: GND	Set the "+" lead of the meter to the pin 1 and "-" lead of the meter to the pin 3.	Outputs Low when the cartridge is installed. Outputs High when the cartridge is not installed.
CN10 (Color cartridge detecting sensor)	1: CCO 3: GND	Set the "+" lead of the meter to the pin 1 and "-" lead of the meter to the pin 3.	Outputs Low when the cartridge is installed. Outputs High when the cartridge is not installed.

5.2.3 Motor Check Points

Table 5-3 shows the check points for each motor.

Table 5-3. Coil Resistance for Each Motor and Check procedure

Sensor Connector No.	Test pin No	Test procedure (Meter is set to Ω .)	Meter reading
CN11 (ASF/Pump motor)	1: ASFA 2: ASF-A 3: ASFB 4: ASF-B	Set one lead of the meter to the pin 1 and the other lead to the pin 3. Set one lead of the meter to the pin 2 and the other lead to the pin 4.	$9.3 \Omega \pm 10 \%$ (at 25 °C/one phase)
CN12 (CR Motor)	1: CRA 2: CR-A 3: CRB 4: CR-B	Set one lead of the meter to the pin 1 and the other lead to the pin 3. Set one lead of the meter to the pin 2 and the other lead to the pin 4.	$7.8 \Omega \pm 10 \%$ (at 25 °C/one phase)
CN13 (PF motor)	1: PFA 2: PF-A 3: PFB 4: PF-B	Set one lead of the meter to the pin 1 and the other lead to the pin 3. Set one lead of the meter to the pin 2 and the other lead to the pin 4.	$5 \Omega \pm 10 \%$ (at 25 °C/one phase)

5.3 Repair and Replacement of the Unit Part

This section contains the flow charts which are used to isolate the faulty unit by following the flow chart according to the problem caused during replacing or repairing the unit. You are to identify the faulty unit based on the primary symptom listed in Table 5-4. Refer to Section 5.4, 5.5 and 5.6 for the information on the repair at the component level such as PSB/PSE and MAIN board and the printer mechanism.

Table 5-4. Symptoms and Corresponding Flow Charts

Symptom	Cause	Flow chart
The printer does not operate at all.	<input type="checkbox"/> No LED goes on. <input type="checkbox"/> LED goes on but the printer mechanism does not operate at all.	1
CR moves abnormally.	<input type="checkbox"/> When the printer is powered on, the CR leaves the home position and a fatal error is indicated. (The printer makes no abnormal noise.) <input type="checkbox"/> When the printer is powered on, the CR motor immediately starts rotating irregularly and a fatal error is indicated. <input type="checkbox"/> When the printer is powered on, the CR does not move at all.	2
The printer feeds paper abnormally.	<input type="checkbox"/> After power on sequence, the printer is in the paper ejecting motion for about 10 seconds and indicates the paper jam error. <input type="checkbox"/> If the load button is pressed or any paper loading operation is activated after power on sequence, the printer loads paper form the ASF and then indicates the fatal error. <input type="checkbox"/> If the load button is pressed or any paper loading operation is activated after power on sequence, the fatal error is indicated.	3-1 3-2
Printing operation is abnormal.	<input type="checkbox"/> No image is printed. <input type="checkbox"/> Faulty printing result (dot missing, uneven printing)	4-1 4-2
The control panel does not function normally.	<input type="checkbox"/> No LEDs on the control panel goes on. <input type="checkbox"/> Buttons on the control panel do not function normally. <input type="checkbox"/> Power on button does not work.	5

□ Flow Chart 1 : The printer does not operate at all.

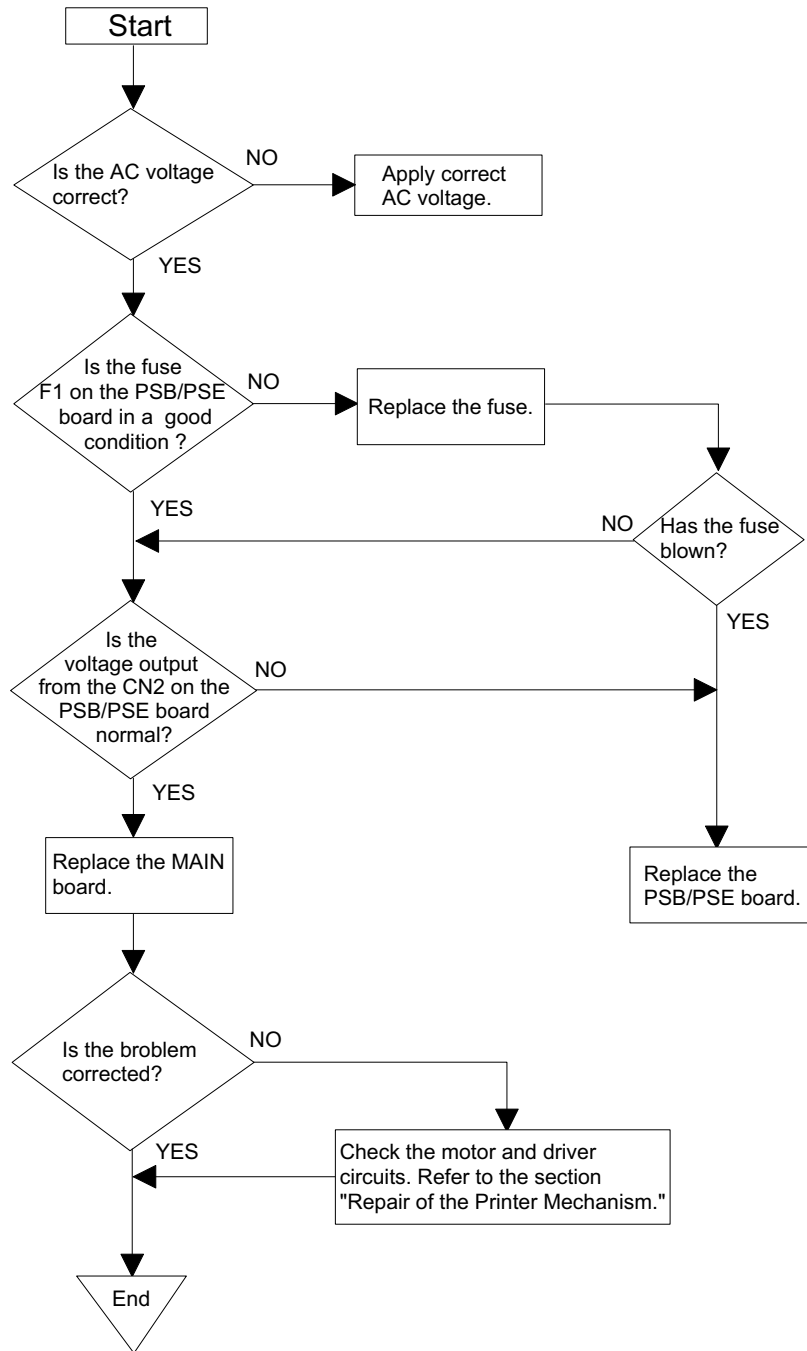


Figure 5-2. Flow Chart 1

□ Flow Chart 2 : CR moves abnormally.

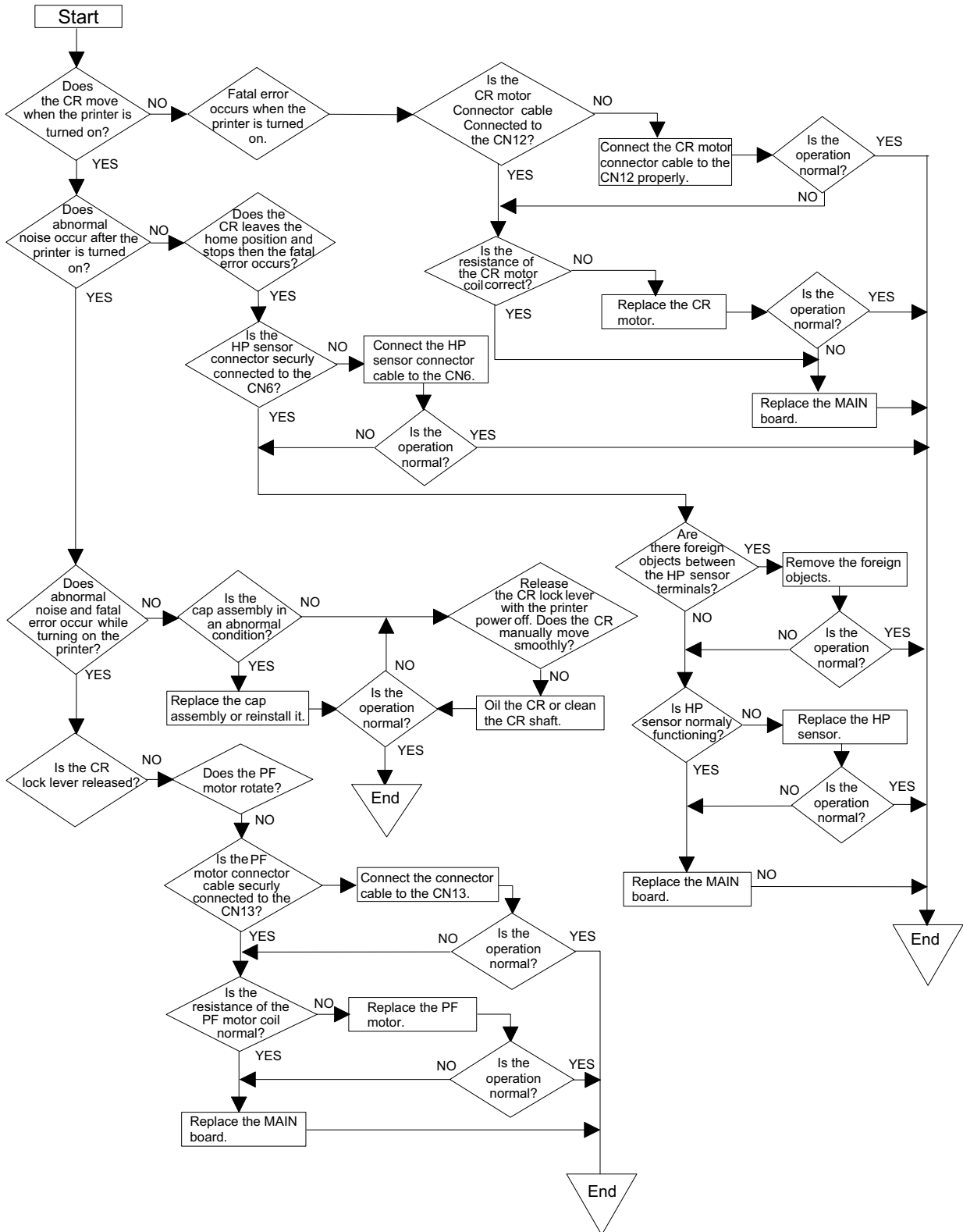


Figure 5-3. Flow Chart 2

□ Flow Chart 3-1 : The printer feeds paper abnormally.

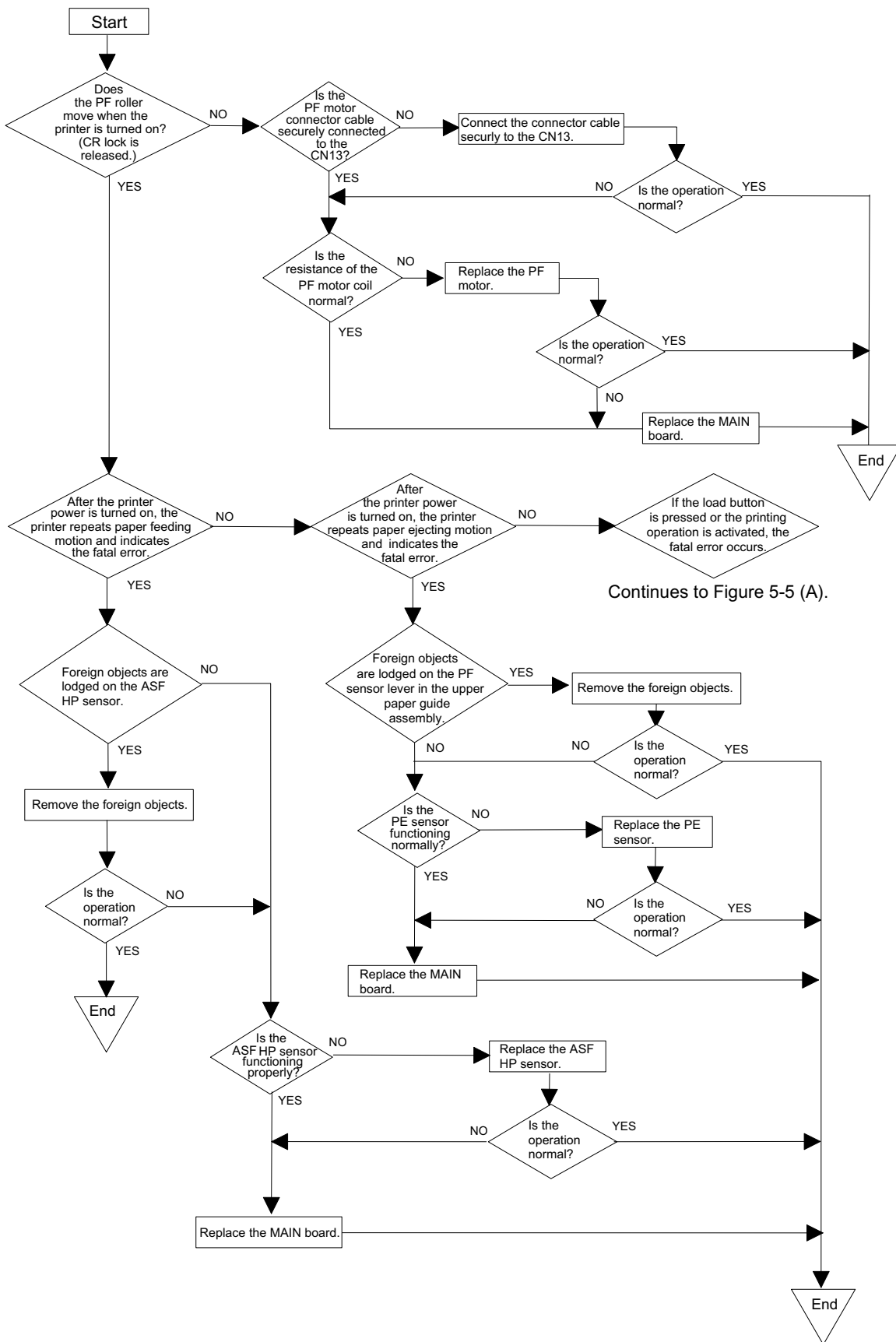


Figure 5-4. Flow Chart 3-1

□ Flow Chart 3-2 : The printer feeds paper abnormally.

Continued from Figure 5-4.

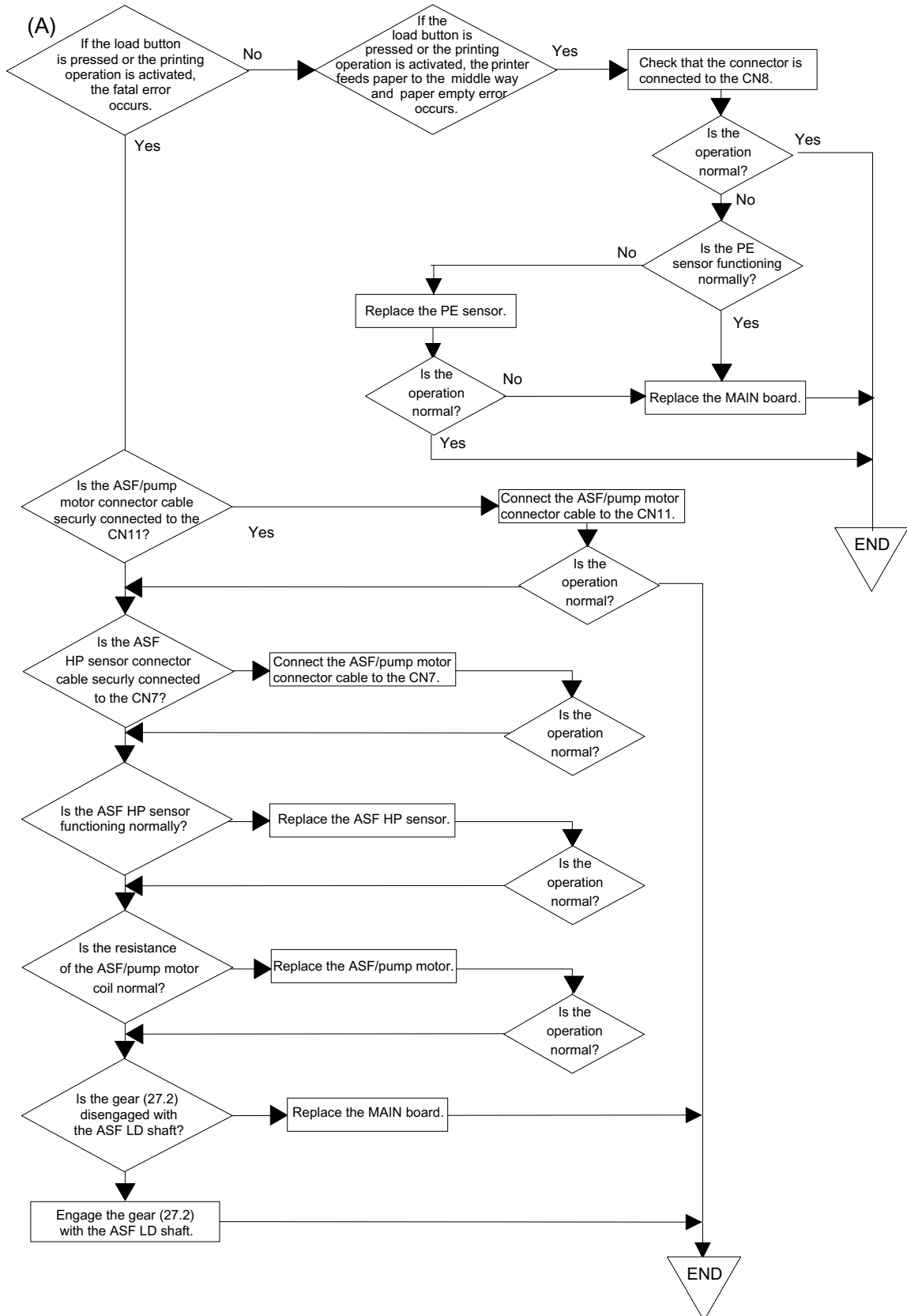


Figure 5-5. Flow Chart 3-2

□ Flow Chart 4-1 : Printing operation is abnormal.

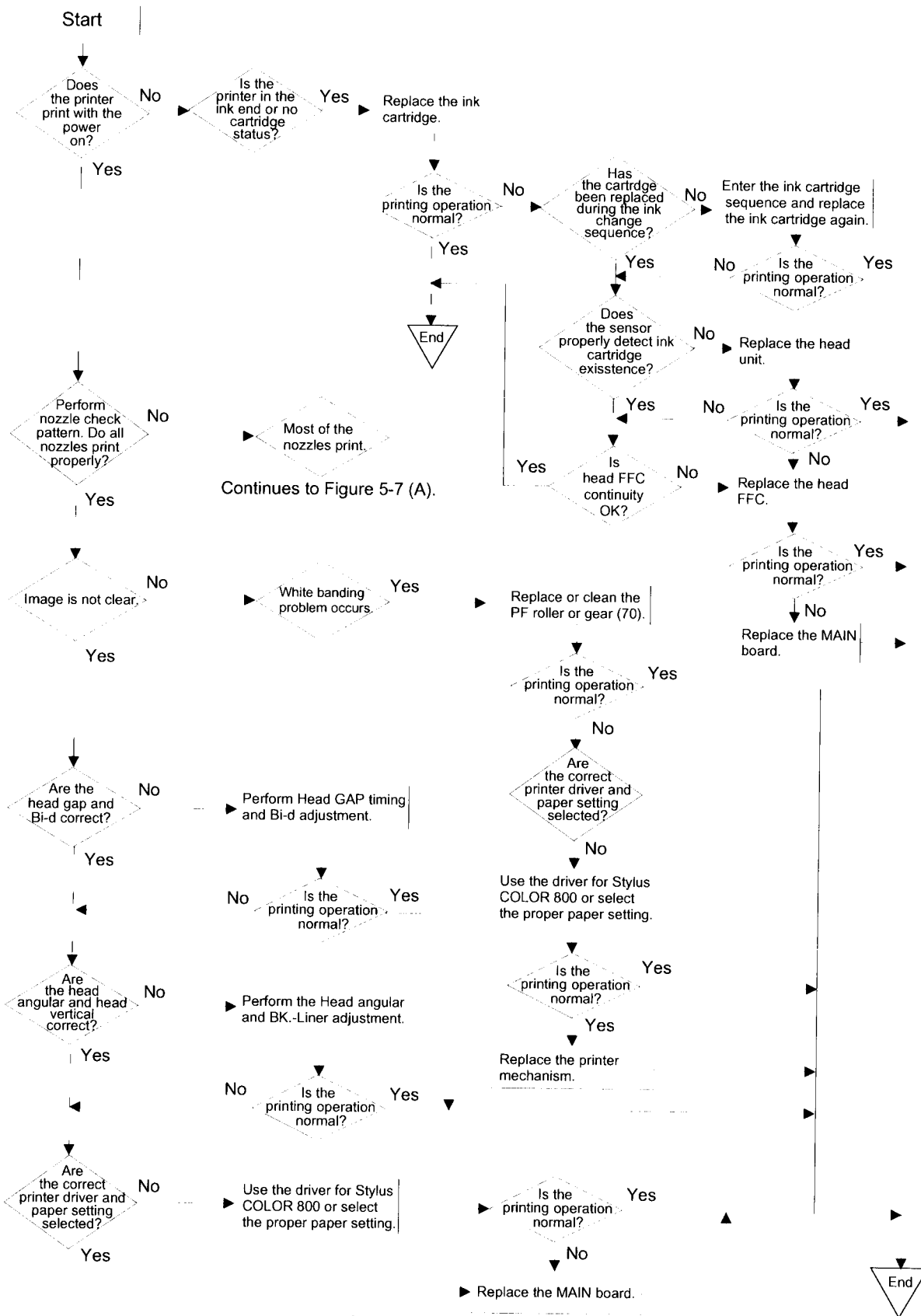


Figure 5-6. Flow Chart 4-1

□ Flowchart 5 : .The control panel does not function normally.

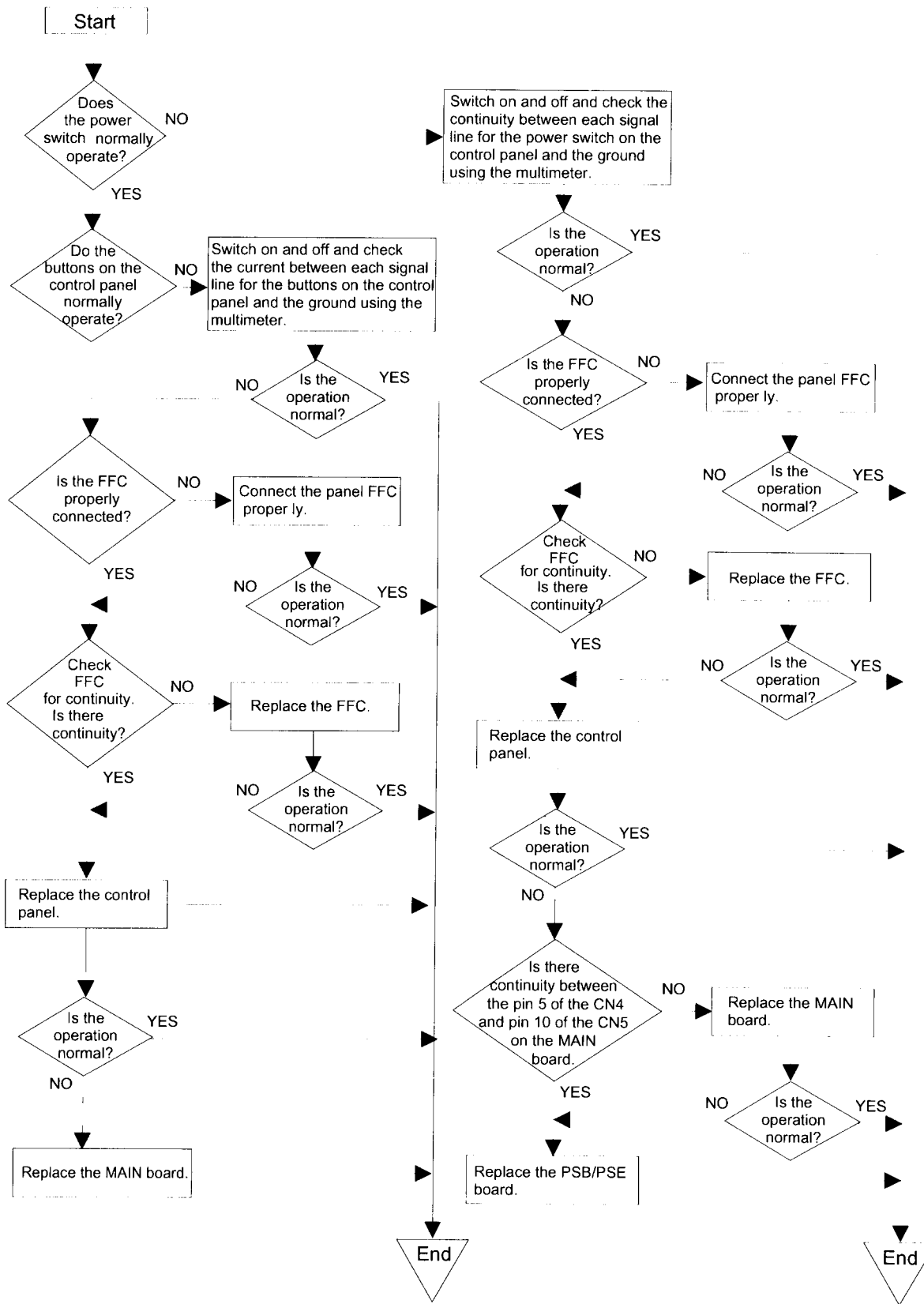


Figure 5-8. Flow Chart 5

5.4 Repair of the C202 PSB/PSE Board Component

This section describes procedures in replacing and repairing the C202 PSB/PSE board at component level. Refer to Table 5-5 and 5-6 which list symptoms, descriptions, causes, check points, and solutions.

Table 5-5. Repair of the C202 PSB/PSE Board Component (1)

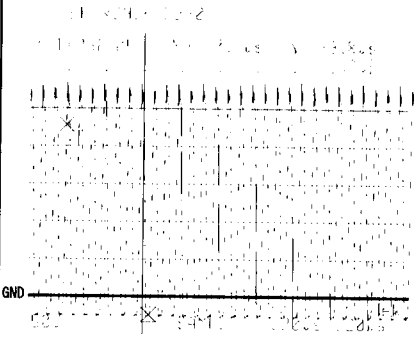
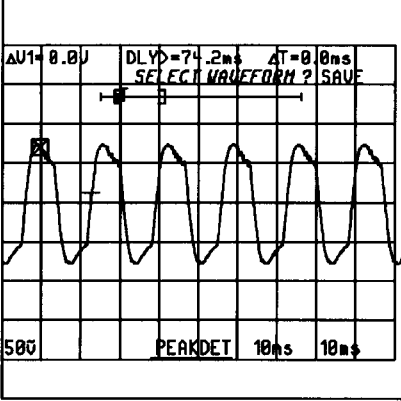
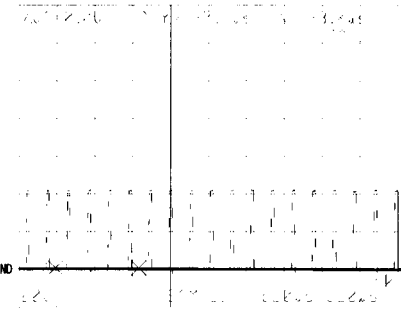
System	Description	Cause	Check points	Solution
The printer does not operate at all.	Neither +45 V nor +5 V is output.	F1 is open.	Check visually if the F1 is in a normal condition.	Replace F1.
		T1 is open.	Check the voltage output by using the meter.	Replace T1.
		Q1 is dead.	<ul style="list-style-type: none"> Check for proper resistance between the source and drain at Q1 FET. Check that the waveform shown below is output form the drain of Q1 FET. 	Replace Q1.
		Q2 is defective.	<ul style="list-style-type: none"> Unplug the AC inlet; then check that there is no continuity between the collector and emitter of the Q2 transistor. Check that the switching of the Q2 is correctly functioning with the printer power on. 	Replace Q2, or check if PC1 is functioning.
		Q31 is defective.	<ul style="list-style-type: none"> Unplug the AC inlet; then check for proper resistance between the source and drain of Q31 FET. Check that the switching of the Q31FET is correctly functioning with the printer power on. 	Replace Q31, or check if PC1 is functioning.

Table 5-6. Repair of the C202 PSB/PSE Board Component (2)

System	Description	Cause	Check points	Solution
The printer does not operate at all.	Neither +42 V and 5v is not output.	PC1 is defective.	<ul style="list-style-type: none"> • Check that there is no continuity between the pins 5 and 6 or the pins 7 and 8 for the PC1 with the printer power on. • Check that the waveform shown below is output from the pin 5 and the pin 7. 	Replace the PC1.
	+5V is not output.	IC51 is defective.	<ul style="list-style-type: none"> • Check that the waveform shown below is output form the pin7 for the IC51. 	Replace IC51.
		L51 is open.	<ul style="list-style-type: none"> • Check that there is continuity between 2 leads of the coil for the L51. 	Replace L51.

5.5 Repair of the C202 MAIN Board Component

This section consists of the procedures for replacing and repairing the C202 MAIN board at the component level. Refer to Table 5-7 which shows symptoms, descriptions causes, check points, and solutions.

Table 5-7. Repair of the C202 MAIN Board Component (1)

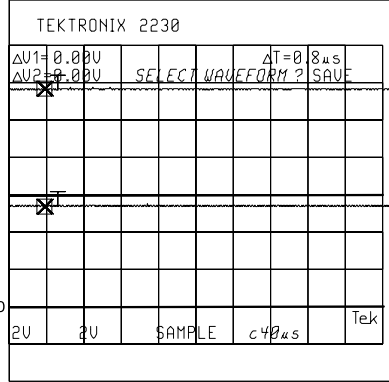
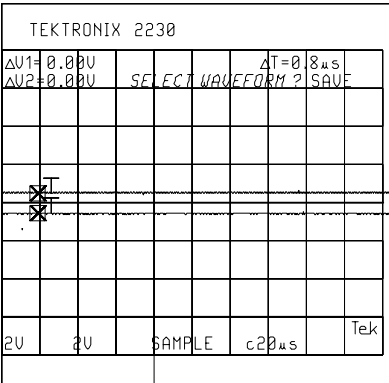
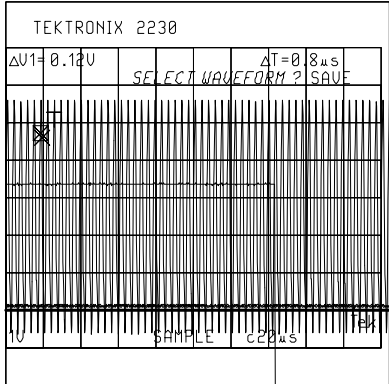
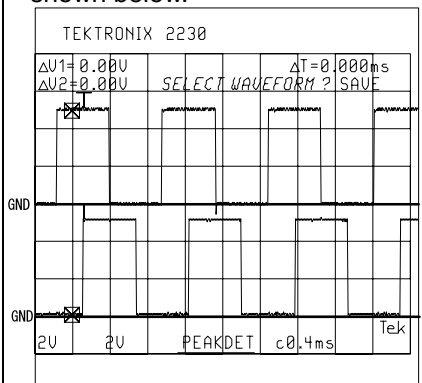
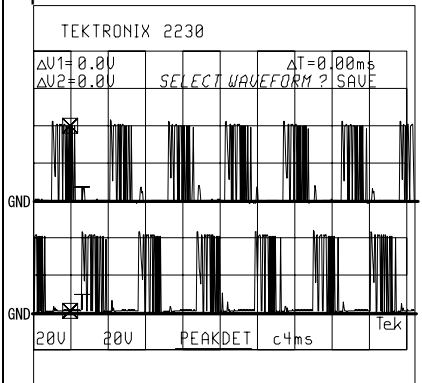
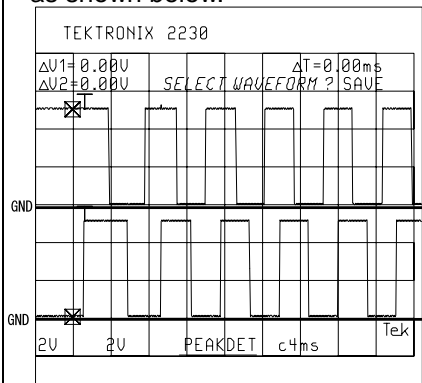
Symptom	Description	Cause	Check points	Solution
The printer does not operate at all.	CPU is not functioning. (The driver mechanism is not functioning correctly when the printer is turned on and off.)	Reset IC for the IC9 logic is defective.	<ul style="list-style-type: none"> Check that 5V is output from the pin 1 and 3 for the IC9 at a normal state. 	Replace the reset IC for the IC9.
		Reset IC for the IC8 42V line or IC19 is defective.	<ul style="list-style-type: none"> Check that +5V is output from the pin 6 for the IC8 and is input to the pin1 for the IC19, and 0V is input to the pin 2 for the IC19 and +5V is output from the pin 4 for the IC19 at a normal state. 	Replace the IC8 or IC19.
		CRU1 or CRU2 is defective.	<ul style="list-style-type: none"> Check that the waveform shown below is output from the both leads of the CRU. 	Replace the defective CRU.

Table 5-8. Repair of the C202 MAIN Board Component (2)

Symptom	Description	Cause	Check points	Solution
CR does not operate properly.	CR does not operate properly.	IC13 or IC2 is defective.	<ul style="list-style-type: none"> Check that the driving waveform for each phase output from the IC13 is as shown below. The figure below represents the waveforms for the phase A and phase -A. 	Replace the IC13.
		IC1 or IC2 is defective.	<ul style="list-style-type: none"> Check that the CR motor phase changeover waveform output from the IC2 to the IC13 is as shown below. 	Replace the MAIN board.
Paper is not fed properly.	PF motor does not operate properly.	IC16 or IC2 is defective.	<ul style="list-style-type: none"> Check that the drive waveform for each phase output from the IC16 is as shown below. The figure below represents the waveforms for the phase A and phase -A. 	Replace the IC16.

Table 5-9. Repair of the C202 MAIN Board Component (3)

Symptom	Description	Cause	Check points	Solution
Paper is not fed properly.	PF motor does not operate properly.	IC16 or IC2 is defective.	<ul style="list-style-type: none"> Check that the PF motor phase changeover waveform output from the IC2 to the IC16 is as shown below. 	Replace the MAIN board.
ASF does not load paper, or the pump mechanism is not driven.	ASF / pump motor is not driven properly.	IC6 or IC2 is defective.	<ul style="list-style-type: none"> Check that the drive waveform for each phase output from the IC6 is as shown below. The figure below represents the waveforms for the phase A and phase -A. 	Replace the IC6.
		IC1 or IC2 is defective.	<ul style="list-style-type: none"> Check that the ASF/pump motor phase changeover waveform output from the IC2 to the IC6 is as shown below. 	Replace the MAIN board.

5.6 Repair of the Printer Mechanism

This section consists of the tables which contains symptoms, descriptions, possible causes, checkpoints, and solutions which you need in troubleshooting the problems with the units in the printer mechanism.

Table 5-10. Repair of the Printer Mechanism (1)

Symptom	Description	Possible cause	Checkpoint	Solution
CR does not move properly.	Fatal error occurs when the printer is turned on and CR motor fails to rotate. (No abnormal noise is heard.)	The CR motor connector is not properly connected.	Check if the CR motor connector cable is properly connected to the CN12.	Connect the CR motor connector cable to the CN12.
		CR motor coil is open.	Check the CR motor coil resistance referring to Table 5-3.	Replace the CR motor.
		The timing belt is dislocated.	Check if the timing belt is engaged with the CR pinion gear or the belt pulley.	Reinstall the timing belt or replace it.
When the printer is turned on, the CR moves away from the home position. Then the fatal error is indicated and the CR stops. (No abnormal noise is heard.)	When the printer is turned on, the CR moves away from the home position. Then the fatal error is indicated and the CR stops. (No abnormal noise is heard.)	HP sensor connector is disconnected.	Check if the HP sensor connector cable is connected to the CN6.	Connect the HP sensor connector cable to the CN6.
		Foreign objects are lodged between the HP sensor terminals.	Check if there are foreign objects lodged between the HP sensor terminals.	Remove the foreign objects.
		HP sensor is defective.	Check if the HP sensor is correctly functioning referring to Table 5-2.	Replace the HP sensor.
When the printer is turned on, the foreign noise is heard and the fatal error occurs.	CR lock lever is not released.	1. Check the PF motor coil resistance referring to Table 5-3. 2. Check if the PF motor connector cable is connected to the CN13. 3. Check if anything is interfering with the CR lock lever movement.	1. Replace the PF motor. 2. Connect the PF motor connector cable to the CN13. 3. Remove the interfering factor.	
When turning on the printer or activating the CR, abnormal noise is heard with the fatal error indicated then the CR stops.	When turning on the printer or activating the CR, abnormal noise is heard with the fatal error indicated then the CR stops.	Oil in the CR oil pad is dried up.	Release the CR lock lever with the printer power off and check if the CR manually moves smoothly.	Oil the oil pad built in the CR unit.
		Sliding part of the CR unit and the top frame is not lubricated or foreign objects are lodged.	Release the CR lock lever with the printer power off and check if the CR manually moves smoothly.	Oil the sliding part of the CR unit and the top frame, or remove the foreign objects.
		Foreign objects are lodged between the CR shaft and the CR unit.	Release the CR lock lever with the printer power off and check if the CR manually moves smoothly.	Replace the CR oil pad. Clean the CR shaft using a soft cloth.

Table 5-11. Repair of the Printer Mechanism (2)

Symptom	Description	Possible cause	Checkpoint	Solution
CR does not move properly.	When the CR returns to the home position, abnormal noise is heard and the fatal error is indicated.	The cap in the cap assembly does not fit the cap frame.	Check if the cap assembly is properly installed.	Reinstall the cap assembly or replace the cap assembly.
Paper is not fed properly.	PF motor does not rotate when the printer is powered on. (CR lock lever is not released and abnormal noise is heard, then the fatal error occurs.)	PF motor connector cable is disconnected.	Check if the PF motor connector cable is connected to the CN13.	Connect the PF motor connector cable to the CN13.
		PF motor coil is open.	Check the PF motor coil resistance referring to Table 5-3.	Replace the PF motor.
	When the printer is turned on, the printer repeats paper loading motion, then indicates the fatal error.	Foreign objects are lodged between the ASF HP sensor terminals.	Check if there is foreign object lodged between the ASF HP sensor terminals.	Remove the foreign objects.
		ASF HP sensor is defective.	Check if the ASF HP sensor is properly functioning referring to Table 5-2.	Replace the ASF HP sensor.
	When the printer is turned on, the printer repeats paper loading motion and indicates the paper jam error.	Foreign objects are lodged on the PE sensor.	Check if foreign objects are lodged at the PE sensor lever and rear paper guide.	Remove the foreign objects.
	When the printer is turned on, the fatal error occurs if the load button or printing operation is activated.	ASF/pump motor connector cable is disconnected.	Check if the ASF/pump motor connector cable is connected to the CN11.	Connect the ASF/pump motor connector cable to the CN11.
		ASF HP sensor connector cable is disconnected.	Check if the ASF HP sensor connector cable is connected to the CN7.	Connect the ASF HP sensor connector cable to the CN7.
		ASF/pump motor coil is open.	Check the ASF/pump motor coil resistance referring to Table 5-3.	Replace the ASF/pump motor.
		The black gear (27.2) on the right edge of the ASF is not engaged with the ASF LD roller shaft.	Check if the gear (27.2) on the right edge of the ASF is engaged with the LD roller shaft.	Reinstall the gear (27.2).
	when the printer is turned of, the printer starts loading paper if the load button is pressed or the printing operation is activated. But the loading motion does not complete and the paper empty error occurs.	PE sensor connector cable is disconnected.	Check if the PE sensor connector cable is connected to the CN8.	Connect the PE sensor connector cable to the CN8.

Table 5-12. Repair of the Printer Mechanism (3)

Symptom	Description	Possible cause	Checkpoint	Solution
Paper is not fed properly.	ASF repeats paper loading motion but the paper is not loaded.	ASF LD roller is worn or paper dust is lodged.	Check the surface of the LD roller.	Replace the LD roller.
	The last sheet of the paper in ASF is not loaded.	The guide sheet is not placed.	Check if the appropriate guide sheet is used.	Use the appropriate guide sheet.
	OHP sheet is not loaded.	OHP adapter is not used.	Check if the OHP adapter is mounted or is correctly used.	Use the OHP adapter correctly.
Abnormal printing	Paper out or Ink end error occurs when turning on the printer despite the cartridge is new.	Ink consumption counter is not reset since the cartridge was not replaced during the ink cartridge change sequence.		Enter the ink cartridge change sequence again to replace the ink cartridge.
		The ink cartridge sensor is defective.	Check if the sensor is functioning referring to Table 5-2.	Replace the printhead.
		Head FFC is disconnected.	Check if the head FFC is connected to the CN9 or CN10.	Connect the correct FFC to the CN9 or CN10.
		Head FFC is damaged.	Check continuity of the pin 1 of each head FFC.	Replace the head FFC.
All dots or most of the dots in the nozzle check pattern are not printed.	Cleaning is performed 5 times or a newly unpacked ink cartridge is installed, but all dots or most of the dots are not printed in the Nozzle check pattern	Bubbles in the cavity.		1. Alternate cleaning and printing operation. (Printer driver utility is useful.) 2. If the ink left in the EPW is more than 2/5, perform the initial ink charge sequence in the adjusting program. 3. Enter the ink cartridge change sequence to install a newly unpacked ink cartridge.
		Head FFC is disconnected.	Check if the head FFC is connected to the CN9 or CN10.	Connect the correct FFC to the CN9 or CN10.
		Head FFC is damaged.	Check the continuity of the each FFC.	Replace the head FFC.
		The head cleaner has not contact with the head.	Check if the head cleaner is in contact with the head with the proper portion.	1. Adjust the head cleaner position. 2. Replace the head cleaner. 3. Adjust the platen gap.

Table 5-13. Repair of the Printer Mechanism (4)

Symptom	Description	Possible cause	Checkpoint	Solution
Abnormal printing	Cleaning is performed 5 times or a newly unpacked ink cartridge is installed, but all dots or most of the dots are not printed in the nozzle check pattern.	Pump unit does not absorb the ink.	1.Check if the ink absorb tubes are properly connected to the cap assembly. 2.Check if the ink absorb tubes are twisted or damaged. 3.Check if the rubber part of the cap assembly is deformed. 4.Check if the air valve in the cap assembly is damaged.	1.Connect the ink absorb tubes to the cap assembly properly. 2.Replace the ink absorb tubes or the pump unit. 3.Replace the cap assembly. 4.Replace the air valve or the cap assembly.
		Printhead is defective.	(In case the problem still occurs after attempting all the checkpoints mentioned above.)	Replace the printhead.
White banding appears.		Dot missing	Check the nozzle condition by performing Nozzle check.	Refer to the solution described in the previous page.
		PF roller is worn or is smudged with the ink.	Check the surface of the PF roller.	Clean the PF roller surface or replace the PF roller.
		Some teeth of the gear (70) broke off or the gear is not engaged with the PF roller shaft properly.	Check the teeth of the gear (70). Check if the gear (70) rotates constantly with the torque from the PF motor.	Replace the gear (70) or reinstall the gear (70) properly.
		The driven roller on the upper paper guide is worn or the torsion spring (117.6) has lack of sufficient tension.	Check if the surface of the driven roller on the upper paper guide is blakish or is lodged with foreign objects.Check if the torsion spring is deformed or hooked securely.	Replace the driven roller or the torsion spring. Remove the foreign objects from the surface of the driven roller.
Image is not clear.		Head gap or Bi-d is no adjusted adequately.	Check the head gap and Bi-d status by using the printer driver utility, adjusting program, or control panel.	Perform adjusting using the adjusting utilities and programs.
		Head angular or head vertical is not adjusted properly.	Refer to 4-12 and 4-15 in Chapter 4.	Refer to 4-12 and 4-15 in Chapter 4.
		PG is too wide.	Check the position of the PG lever.	Set the lever to "0".
		Dot missing	Check if the nozzles are clogged by performing Nozzle check.	Refer to the corresponding solution in the previous page.

Table 5-14. Repair of the Printer Mechanism (5)

Symptom	Description	Possible cause	Checkpoint	Solution
Abnormal printing	Ink smudge	Ink on the driven roller of the upper paper guide or other paper paths.	Feed plain paper and check if it gets ink smudge.	Clean the spot stained with the ink.
		PG is too narrow or the paper loaded does not meet the specification.	Check the position of the PF lever. Check the paper thickens.	Set the PG lever to "+". Use the paper that meets the specification.

Chapter 6 Maintenance

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6.1 General Description

In order to keep the printer in the optimum condition, it is essential to perform several types of maintenance on a regular basis. The maintenance includes cleaning, lubrication, ink drain pad replacement, and printhead cleaning. The cleaning is to wiping off the dirt and dust on the outer cases using denatured alcohol as well as vacuuming debris and dust accumulated in the printer. A printer generally consists of numbers of gears engaged. Therefore it is important to check if the gears are adequately lubricated. In addition to the above mentioned maintenance, this printer, an ink-jet printer, needs an occasional ink pad replacement and printhead cleaning when necessary. This chapter gives information on when and how to maintain the printer.

WARNING

- Be sure to unplug the AC power cable before disassembling and assembling the printer.*
- Be careful not to get ink in your eyes. In case ink gets in your eyes, wash it away with fresh water and see a doctor.*
- Follow the instructions below when handling the lithium battery installed on the C202 MAIN board.*
 - Keep the battery away from any metal materials.*
 - Ensure to mount the battery in the right direction.*
 - Do not heat up or burn the battery.*
- Once the ink cartridge is removed from the ink cartridge holder for servicing, replace it with a new one before returning to the customer.*

6.2 Maintenance

6.2.1 Cleaning

To obtain the optimum condition of this printer, it is indispensable to keep it clean by removing dust and dirt not only on the outer case but inside the printer. Accumulated dust and debris may cause a printer malfunction. Therefore be sure to clean the printer, specially inside, whenever you get a chance. Read the "CAUTION" below before any cleaning operation.

CAUTION

- Never apply thinner, trichloroethylene, and toner-based solvents to any plastic parts. It may deform or degenerate plastic or rubber parts.*
- Do not use a hard brush for cleaning so as cases won't be damaged.*
- Be careful not to damage any interior parts when cleaning inside the printer.*
- If you need to remove the ink remaining on the PF roller, apply alcohol absorbed in the soft cloth. It is, however, required that the PF roller be serviced with a care, since it is coated with powdery material, which might be peeled by impact.*

6.2.2 Lubrication

The lubricants has to be applied to the specified points of the printer. The specified lubrication points and EPSON recommended lubricants are listed in Table 6-1. The recommended lubricants, G-26 and O-8, have been tested and found the most applicable to this printer mechanisms. It is also required to apply an adequate amount of lubricant since excessive application may damage nearby parts. (Refer to Table 6-2.)



- Make sure there is no stain on the surface to be lubricated before lubricating.*
- When applying O-8, use the provided container and be sure not to leave any oil after use.*

6.2.2.1 Recommended Lubricants

Table 6-1 lists the recommended lubricants. You can order the listed grease and oil through the usual servicing parts department.

Table 6- 1. Recommended Lubricants

Type	Product name	Content	Part Code	Applicability
Grease	G-26	40 mg	B702600001	EPSON-exclusive product
Oil	O-8	40 mg	1019753	EPSON-exclusive product

6.2.2.2 Lubrication Points and Amounts

Table 6-2 shows the lubrication points along with the adequate quantity. The listed lubrication points are precisely illustrated on Page 6-3, 6-4 and 6-5 respectively.

Table 6- 2. Lubrication Points and Application

Reference No.	Lubrication Points	Quantity	Lubricant
1	Points where paper guide (front) and paper eject roller shaft engage.	1 mm × 1 mm dot	G-26
2	Illustrated point in the cam	1 mm × 2 mm dot	G-26
3	Both edges of the pump reduction shaft and pump drive shaft	1 mm × 2 mm dot (for each)	G-26
4	Cutouts on the upper frame, where the platen gap lever switches	1 mm × 3 mm dot	G-26
5	Illustrated side of the oil pad	0.6 cc	O-8
6	Illustrated points where the hopper assembly and right/left hopper release levers contact.	1 mm × 2 mm dot	G-26
7	Illustrated range on the upper frame (front side)	1 mm × 2 cm dot	G-26
8	Illustrated range on the upper frame (rear side)	1 mm × 6 cm dot	G-26
9	Illustrated range on the carriage guide shaft	Wipe the specified part once in the both diections with a cloth with the oil O-8 absorbed. Then wipe again to remove surplus oil with a dry cloth.	O-8
10	Contact point of the upper frame and bushing on the right end of the PF roller shaft.	1 mm × 2 mm dot Wipe if extruded.	G-26

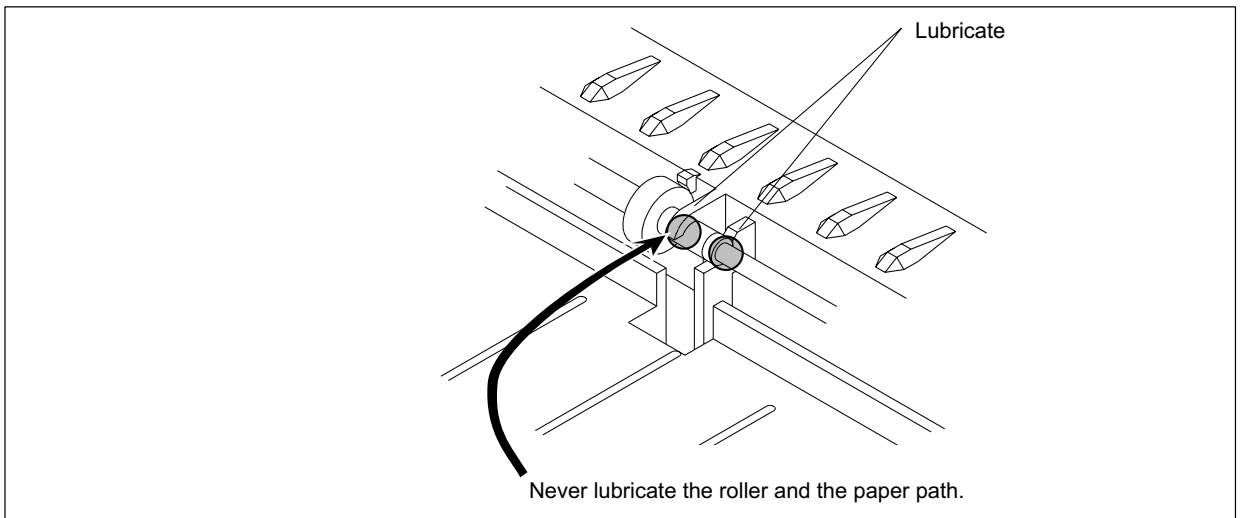


Figure 6-1. Lubrication Point (1)

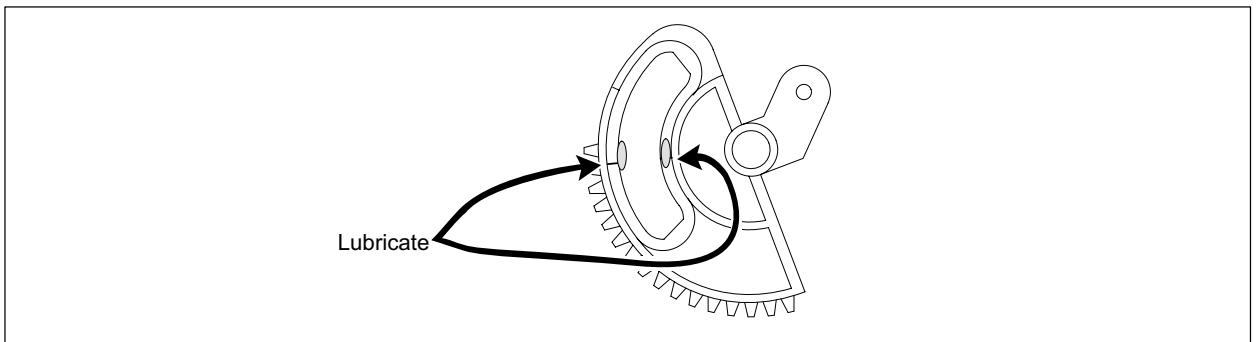


Figure 6-2. Lubrication Point (2)

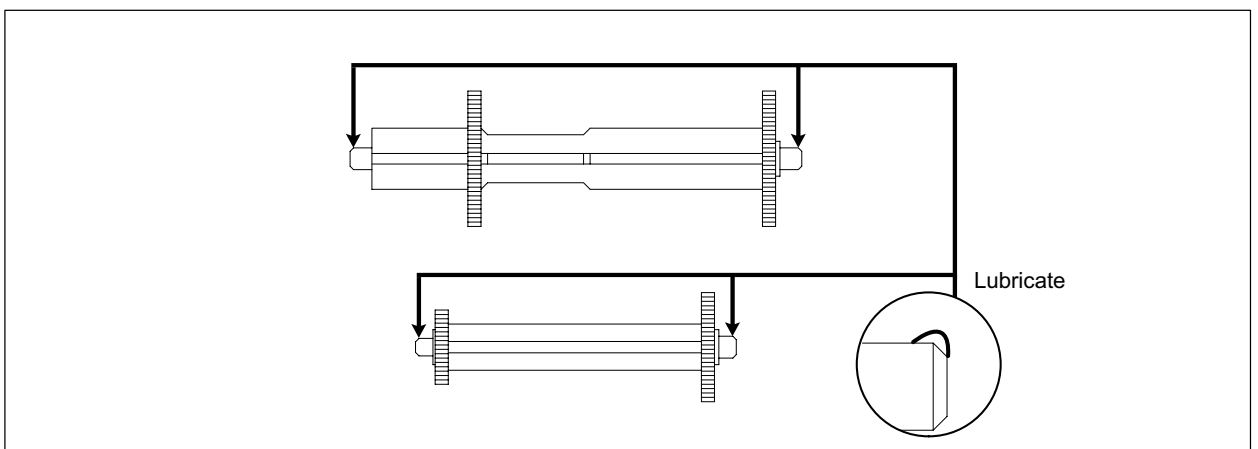


Figure 6-3. Lubrication Point (3)

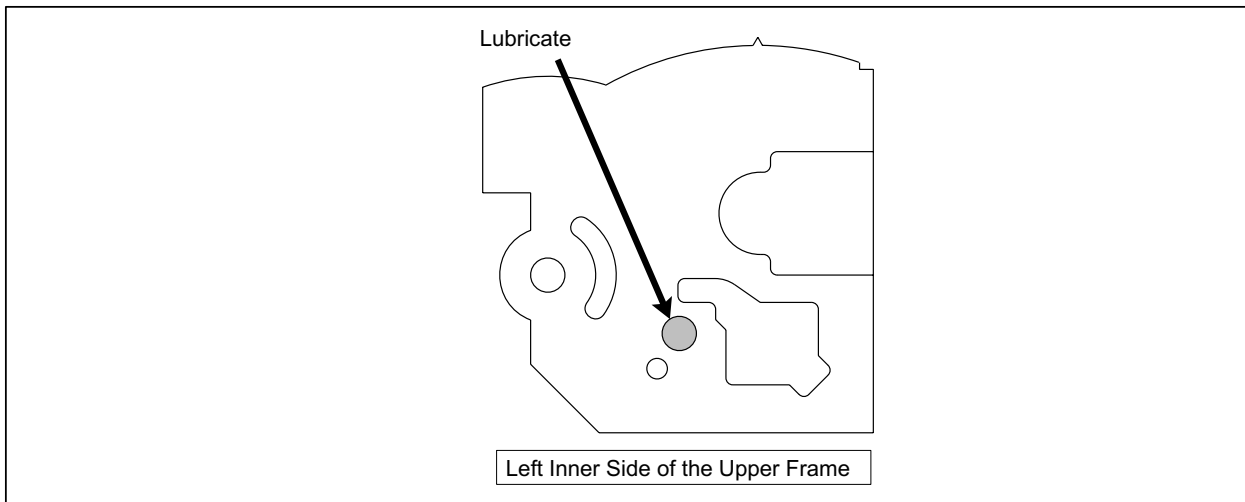


Figure 6-4. Lubrication Point (4)

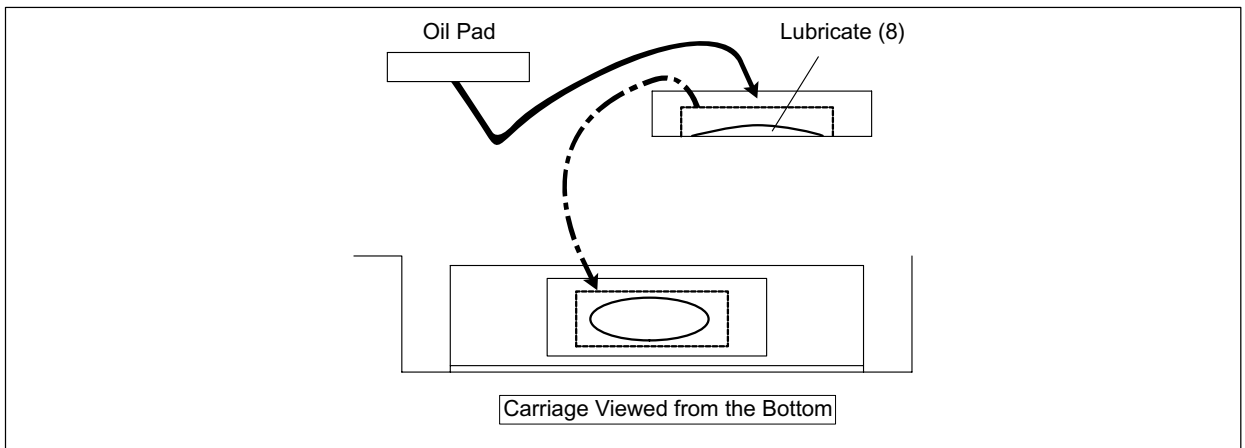


Figure 6-5. Lubrication Point (5)

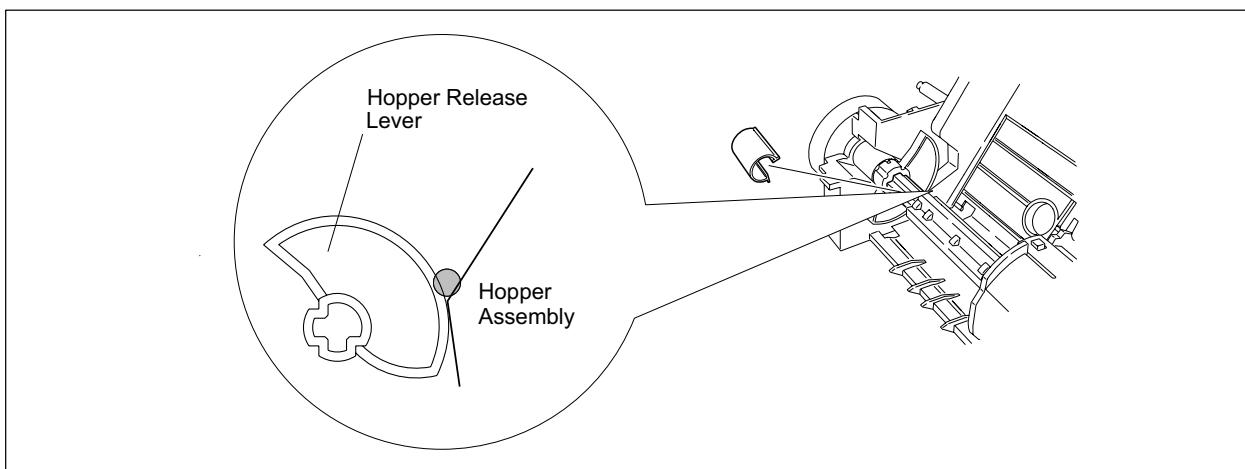


Figure 6-6. Lubrication Point (6)

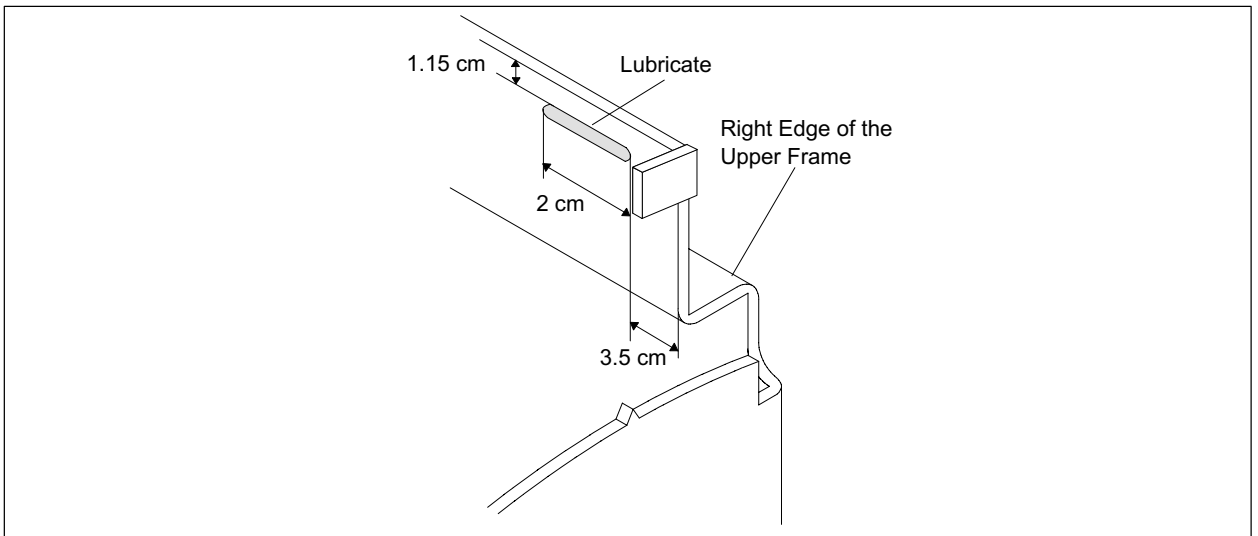


Figure 6-7. Lubrication Point (7)

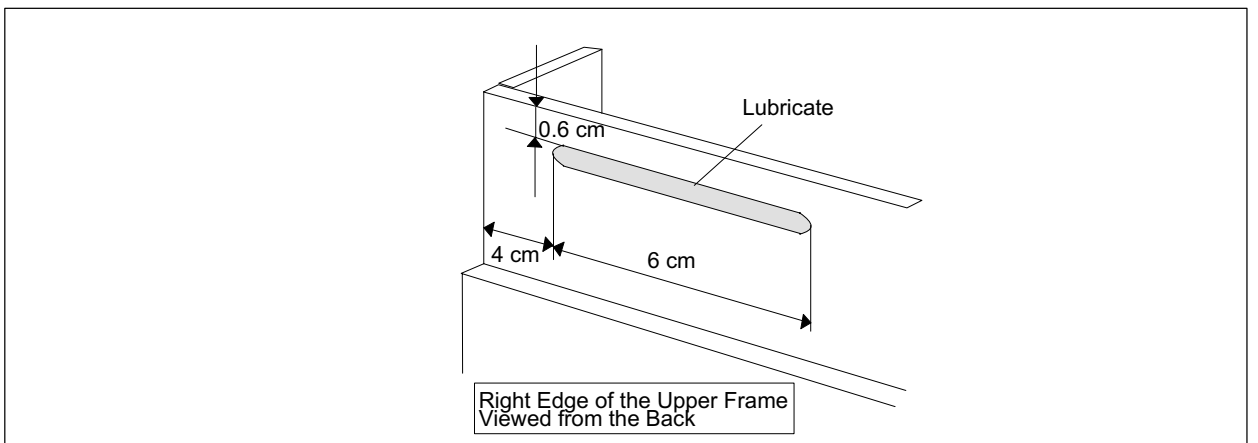


Figure 6-8. Lubrication Point (8)

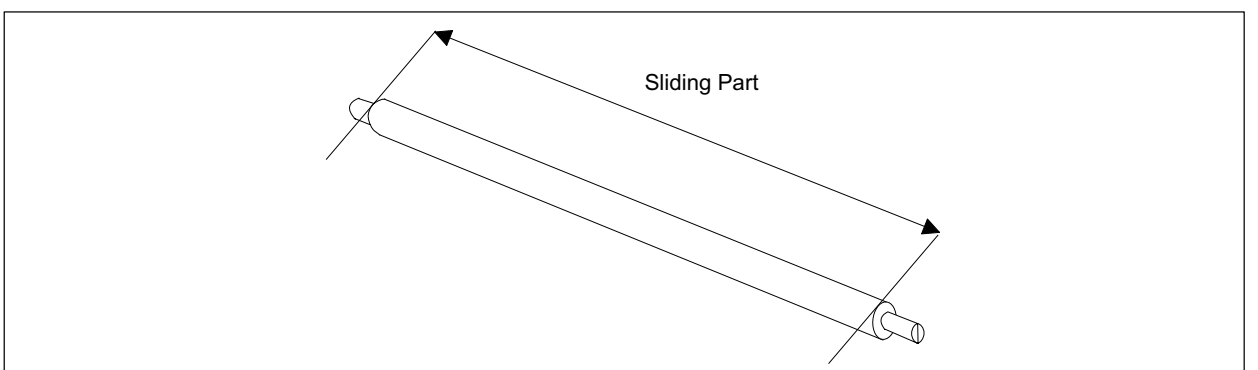


Figure 6-9. Lubrication Point (9)

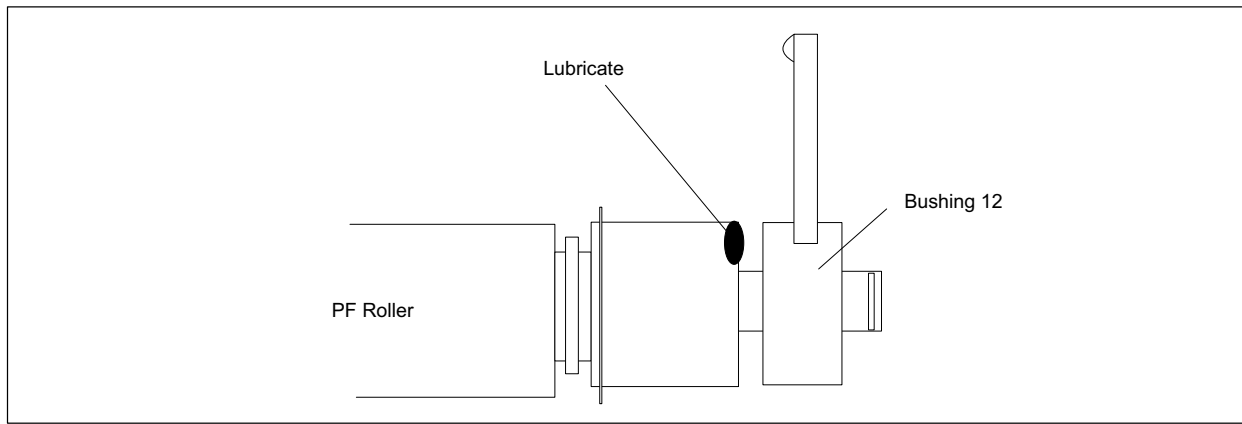


Figure 6-10. Lubrication Point (10)

6.2.3 Ink Drain Pad Replacement

This printer is equipped with an ink drain pad situated at the bottom of the printer mechanisms. Replacement is timed by the amount of the ink used, that is determined in proportion to the numbers of head drive pulses accumulated on the counter. When the counted number has exceeded the specified amount, "Maintenance Error" *¹ occurs and all the LEDs on the Control Panel blink. The occurrence of this error means the end of pad's capacity and urges an immediate pad replacement. The replacement procedures are as follows:

1. Remove the ink drain pad, then replace it with a new one listed as a EPSON exclusive servicing part. (Refer to 3.2.13.10 in Chapter 3.)
2. After the replacement, reset "Protection Counter A" on the EEPROM. The printer will not recover from the error condition until this function is performed. Press "Load/Eject", "Cleaning (Black)", and "Cleaning (Color)" buttons while turning on the printer to enter EEPROM reset mode.



- ☑ *Ensure to replace the ink drain pad whenever the EEPROM is reset. If the printer continues to work without a replacement, the wasted ink overflows the ink pad and it may damage printer parts.*
- ☑ *whenever you replace the EEPROM, replace the waste ink Drain pads also.*

6.2.4 Head Cleaning

This printer has 2 types of built-in cleaning mode: automatic and manual (forcible) cleaning modes. The printer is normally in the automatic cleaning mode and the most suitable mode is automatically selected while printing according to the printer condition. It is, however not effective when the cartridge is left in an abnormal condition for a long period of time. In that case, the manual cleaning must be performed thorough the control pane operation. There are 2 separated cleaning buttons: "Cleaning (Black)" and "Cleaning (White)", and they are effective when the printer power is on and neither of "Ink Low" and "Ink End" condition is detected. The cleaning procedures are as follows:

1. Turn the printer power on.
2. When the power-on sequence is completed, ensure that the printer is in neither "Ink Low" or "Ink End" status, then press the "Cleaning XXX" button for the troubled printhead to enter the mode. The LED next to the power switch blinks during the operation.
3. The LED next to the power switch stops blinking and carriage returns to stand-by status at the home position.



- ☑ *In case you need to repeat a forcible cleaning sequence, always print 1 line or more after each sequence. If there is no printing between cleanings, the printer performs a false cleaning sequence.
Cleaning during the self-test and Nozzle check using the printer driver can be performed for more effective cleaning.*
- ☑ *Forcible cleaning can be accomplished through the printer driver utility as well as through the control panel.*
- ☑ *it is not recommended to perform manual cleaning unless a printing result is obviously abnormal. Excessive cleaning leads a short ink life considerably.*

Appendix

A.1 EEPROM Address Map	A-1
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A.3.3 C202 PSE Board Assembly Layout	A-10

A.1 EEPROM Address Map

Address	Data Name	Data Format	ASP Board	Factory Value
00H	Reserved		0FH	---
01H			5AH	---
02H	Market *1	0 : STANDARD1 : NLSP	0	0 (*1)
03H	Model Name #1 (*1)	0 : Stylus COLOR 1 : MJ-	01H	01H
04H	Bi-d adjustment value (SLQ) *1	-30 – +30 Unit : 1/1440 inch	0	(*1)
05H	Bi-d adjustment value (LQ) *1	-30 – +30 Unit : 1/1440 inch	0	(*1)
06H	Bi-d adjustment value (Draft) *1	-30 – +30 Unit : 1/1440 inch	0	(*1)
07H	Uni-d adjustment value (Draft) *1	-30 – +30 Unit : 1/1440 inch	0	(*1)
08H	Black head voltage 1 (Normal dot) *1		12H	(*1)
09H	Color head voltage 1 (Normal dot) *1		12H	(*1)
0AH	Black head voltage 2 (Micro dot) *1		0EH	(*1)
0BH	Color head voltage 2 (Micro dot) *1		0EH	(*1)
0CH	Black head frequency rank value *1		02H	(*1)
0DH	Color head frequency rank value *1		02H	(*1)
0EH	Reserved		0	---
0FH			0	---
10H	Reserved		0FH	---
11H			05H	---
12H	Customer EEPROM sub Number		0	0
13H			0	0
14H			0	0
15H			0	0
16H	CPSI password		0	0
17H			0	0
18H			0	0
19H			0	0
1AH	CPSI flag	bit 0 : CPSI license status 0=CPSI License delete 1=CPSI License entry bit 1 : Font license status 0=Font License delete 1=Font License entry	0	0
1BH	Reserved		0	---
1CH	Black-Color head gap adjustment value(SLQ) *1	-32 – +32 Unit : 1/1440 inch	0	(*1)
1DH	Black-Color head gap adjustment value(LQ) *1	-32 – +32 Unit : 1/1440 inch	0	(*1)
1EH	Color adjustment value (SLQ) *1	-4 – +4	0	(*1)
1FH	Color adjustment value (LQ) *1	-4 – +4	0	(*1)

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Address	Data Name	Data Format	ASP Board	Factory Value
20H	Reserved		0FH	---
21H			5AH	---
22H	Interface	0 : Auto 1 : Parallel 2 : Serial 3 : Option	0	0 (*3)
23H	Auto I/F wait time	10, 30 Unit : second	0AH	0AH
24H	Panel setting 1 (Font) *2	0 : Courier 1 : Roman 2 : Suns Serif 3 : Prestige 4 : Script 5 : Roman T (PS) 6 : Suns Serif H (PS) 7 : Draft	0	0
25H	Panel setting 2 (Pitch) *2	0 : 10 cpi 1 : 12 cpi 2 : 15 cpi 3 : 17 cpi 4 : 20cpi 5 : Proportional	0	0
26H	Panel setting 3	bit 0 : Economy 0 : Off 1 : On	0	0
27H	Panel setting 4 (Reserved)		0	0
28H	Default setting 1 (CG table)	0 : Italic USA 1 : Italic France 2 : Italic Germany 3 : Italic UK 4 : Italic Denmark 5 : Italic Sweden 6 : Italic Italy 7 : Italic Spain 8 : PC437 9 : PC437Greek 10 : PC850 11 : PC860 12 : PC863 13 : PC865 14 : PC861 15 : BRASCII 16 : Abicomp 17 : Roman 8 18 : ISO Latin 1 19 : PC 853 20 : PC 855 21 : PC852 22 : PC857 23 : PC866 24 : PC869 25 : MAZOWIA 26 : Code MJK 27 : ISO 8859-7 28 : ISO Latin 1T 29 : Bulgaria 30 : PC774 31 : Estonia 32 : ISO 8859-2 33 : PC 866 LAT	08H	08H
29H	Default setting 2	bit 1-0 : Print direction control 0-0 = Bi-direction 0-1 = Uni-direction 1-0 = Auto direction bit 2 : Auto line feed 0 = Off 1 = On bit 3 : Network I/F mode 0 = Off 1 = On	02H	02H
2AH	Default setting 3	bit 0 : Soft ware 0 = ESC/P2 1 = IBM X24E bit 1 : Auto CR (for X24E) 0 = Off 1 = On bit 2 : A.G.M mode (for X24E) 0 = Off 1 = On bit 3 : Zero slash (for X24E) 0 = Off 1 = On	0	0

Address	Data Name	Data Format	ASP Board	Factory Value
2BH	Default setting 4	bit 0 : Auto tear-off 0 = Off 1 = On bit 1 : Skip perforation 0 = Off 1 = On bit 2 : State reply 0 = Off 1 = On bit 3 : Banner mode 0 = Off 1 = On bit 4 : IBM table set (for X24E) 0 = table set 1 1 = table set 2	0	0
2CH	Panel mask function 1 *2	bit 0 : Font bit 1 : Eject bit 2 : Load bit 3 : Condensed bit 4 : Economy bit 5 : Pause bit 6 : LF/FF bit 7 : Micro adjust	0	0
2DH	Panel mask function 2 *2	bit 0 : Cleaning (Black) bit 1 : Cleaning (Color) bit 2 : Reset bit 3 : Changing ink cartridge	0	0
2EH	Panel mask function 3 *2	bit 0 : Hex dump bit 1 : Self-test (Color) bit 2 : Self-test (Black) bit 3 : Default setting	0	0
2FH	Panel mask function 4 (Reserved)		0	0
30H	Reserved		0FH	---
31H			5AH	---
32H	Page length for ASF *2	0 - 360 X 44 Unit : 1/360 inch	1EH F0H	1EH F0H
34H	Top margin for ASF *2	Unit : 1/360 inch	00H 78H	00H 78H
36H	Bottom margin for ASF *2	Unit : 1/360 inch	1EH F0H	1EH F0H
38H-3FH	Reserved			
40H	Reserved		0FH	---
41H			5AH	---
42H-49H	Reserved			
4AH	Model name (#2)		0	38H
4BH			0	30H
4CH			0	30H
4DH			0	00H
4EH			0	00H
4FH			0	00H *1
50H	Reserved		0FH	---
51H			5AH	---
52H	Color cleaning timer		0	0
53H			0	0 (*3)
54H	Cartridge counter (Cm)		0	0
55H			0	0
56H			0	0
57H			0	0

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Address	Data Name	Data Format	ASP Board	Factory Value
58H	Cartridge counter (Cc)		0	0
59H			0	0
5AH			0	0
5BH			0	0
5CH	Cartridge counter (Cy)		0	0
5DH			0	0
5EH			0	0
5FH			0	0
60H	Reserved		0FH	---
61H			5AH	---
62H	Black cleaning timer		0	0
63H			0	0 (*3)
64H	Cartridge counter (Cb)		0	0
65H			0	0
66H			0	0
67H			0	0
68H	Ink value counter (Ry)		0	0
69H			0	0
6AH	Ink value counter (Rb)		0	0
6BH			0	0
6CH	Protection counter (Ar)		0	0
6DH			0	0 (*3)
6EH	Power off time		0	0
6FH			0	0 (*3)
70H	Reserved		0FH	---
71H			5AH	---
72H	Black accumulated printing timer		0	0
73H	Color accumulated printing timer		0	0
74H	Ink sequence flag 1	bit 0 : Protection counter (Bb) bit 1 : Protection counter (By) bit 2 : In black cleaning sequence bit 3 : In color cleaning sequence bit 4 : In black cartridge changing sequence bit 5 : In color cartridge changing sequence bit 6 : Black cartridge one-time flag bit 7 : Color cartridge one-time flag	0	03H (*1)
75H	Ink sequence flag 2	bit 0 : Black 1st cartridge flag bit 1 : Color 1st cartridge flag	0	0
76H	Reserved		0	---
77H			0	---
78H	Protection counter (A1)		0	0
79H			0	0
7AH			0	0
7BH			0	0
7CH	PDEAD number		0	0
7DH	Paper path number		0	0
7EH	Reserved			
7FH				

*1: The value is adjusted in factory.

*2: Following functions can be selected.

Panel mask function 1

Panel mask function 2

Panel mask function 3

Font

Pitch

Page length for ASF

Top margin for ASF

Bottom margin for ASF

Page length for manual insertion

Top margin for manual insertion

Bottom margin for manual insertion

If above function is selected, "custom number area" must be changed.

*3: The value is initialized to factory value by panel function of "EEPROM and Timer IC reset".

A.2 Connector Summary

The figure below shows the interconnection between major components of the Stylus COLOR 800.

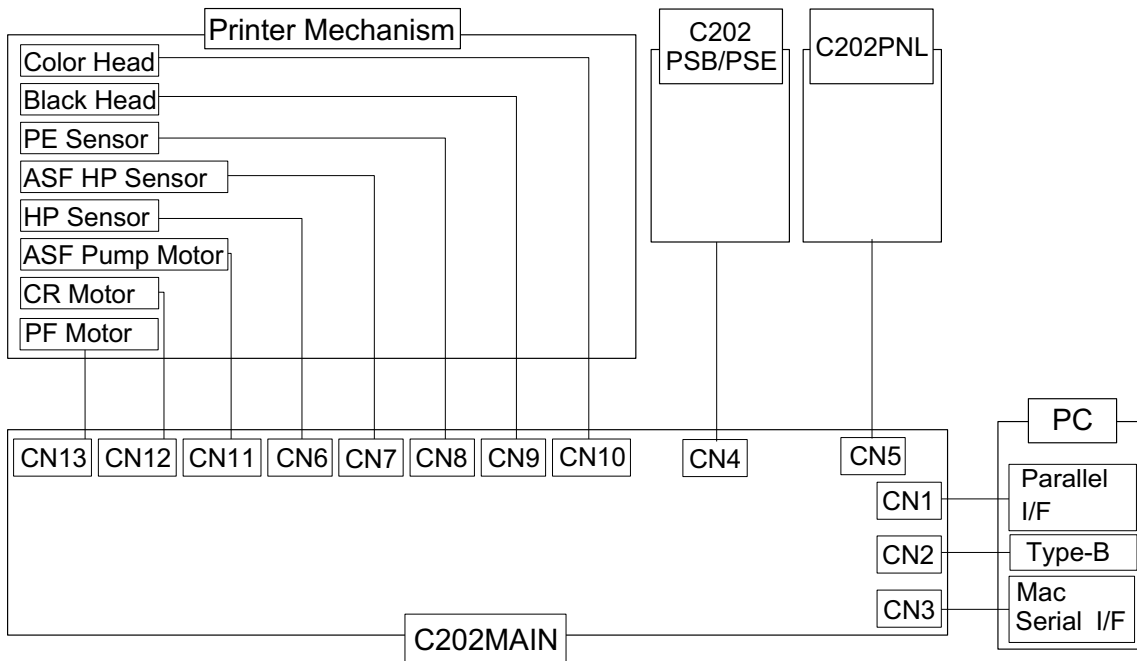


Figure A-1. Interconnection of the Major Components

Table A-1. Connector Summary

MAIN Board Assembly		
Connector Name	Description	Pin #
CN1	Connector for Parallel I/F	36
CN2	Connector for Type-B I/F	36
CN3	Connector for Mac Serial I/F	8
CN4	Connector for C202 PSB/PSE Board	10
CN5	Connector for C202 PNL Board	12
CN6	Connector for HP sensor	3
CN7	Connector for ASF HP sensor	3
CN8	Connector for PE Sensor	3
CN9	Connector for Black head cable	22
CN10	Connector for Color head cable	24
CN11	ASF pump motor	4
CN12	CR motor	4
CN13	PF motor	4

Table A-2. Connector Pin Assignment CN4

Pin #	I/O	Signal Name	Description
1	I	+42V	+42V DC Line
2	---	GND	---
3	---	GND	---
4	I	+5V	+5V DC Line
5	O	PSC	Power ON/OFF signal
6	I	+5V	+5V DC Line
7	---	GND	---
8	---	GND	---
9	I	+42V	+42V DC Line
10	I	PSC	Power ON/OFF signal

Table A-3. Connector Pin Assignment CN5

Pin #	I/O	Signal Name	Description
1	O	+5V	+5V DC Line
2	O	LED0	LED 0 output signal
3	O	LED2	LED 2 output signal
4	O	LED3	LED 3 output signal
5	O	LED4	LED 4 output signal
6	I	SW1	SW 1 input signal
7	I	SW0	SW 0 input signal
8	I	SW2	SW 2 input signal
9	I	PSW	Power switch ON/OFF signal
10	I	PSC	Power ON/OFF signal

Table A-4. Connector Pin Assignment CN6

Pin #	I/O	Signal Name	Description
1	I	HP	HP sensor signal
2	---	GND	---
3	O	HVP	+5V

Table A-5. Connector Pin Assignment CN7

Pin #	I/O	Signal Name	Description
1	I	ASF	ASF HP sensor signal
2	---	GND	---
3	O	ASFV	+5V

Table A-6. Connector Pin Assignment CN8

Pin #	I/O	Signal Name	Description
1	I	PE	PE sensor signal
2	---	GND	---
3	O	PEV	+5V

Table A-7. Connector Pin Assignment CN11

Pin #	I/O	Signal Name	Description
1	O	ASF A	ASF A phase drive waveform
2	O	ASF-A	ASF-A phase drive waveform
3	O	ASF B	ASF B phase drive waveform
4	O	ASF-B	ASF-B phase drive waveform

Table A-8. Connector Pin Assignment CN12

Pin #	I/O	Signal Name	Description
1	O	CRA	CR A phase drive waveform
2	O	CR-A	CR-A phase drive waveform
3	O	CRB	CR B phase drive waveform
4	O	CR-B	CR-B phase drive waveform

Table A-9. Connector Pin Assignment CN 13

Pin #	I/O	Signal Name	Description
1	O	PFA	PF A phase drive waveform
2	O	PF-A	PF-A phase drive waveform
3	O	PFB	PF B phase drive waveform
4	O	PF-B	PF-B phase drive waveform

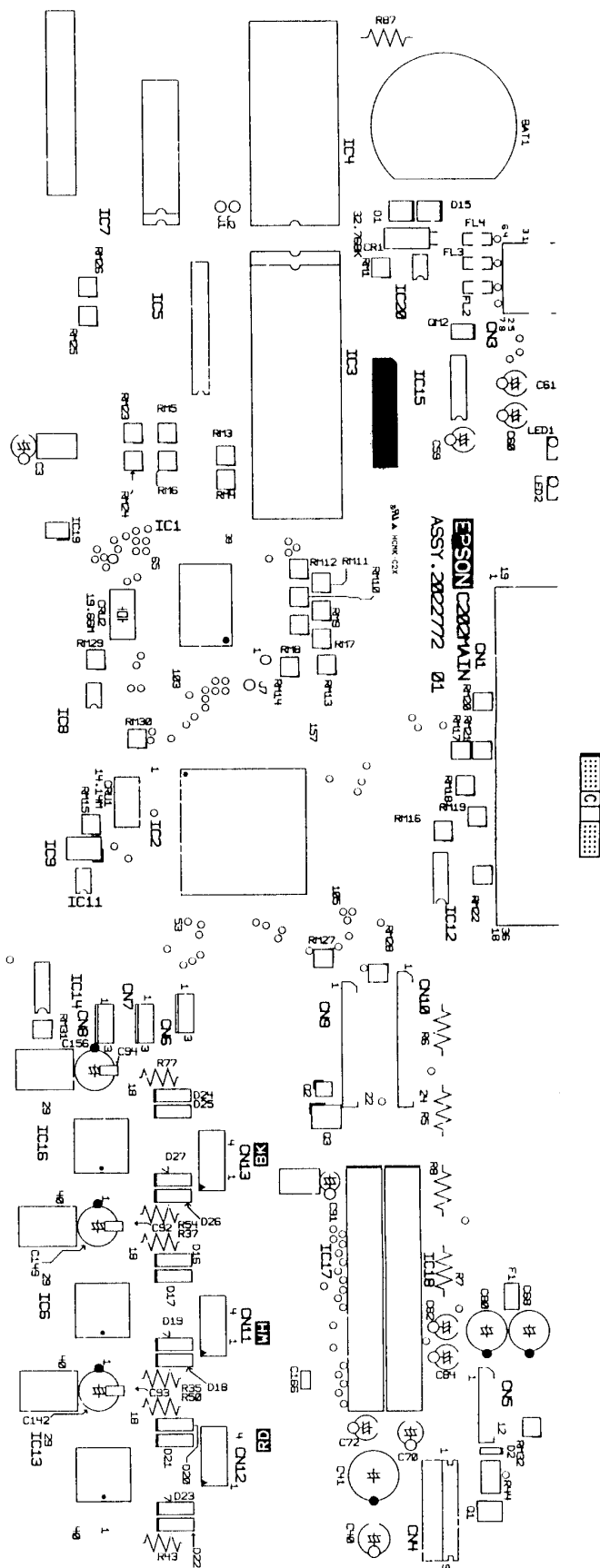
Table A-10. Connector Pin Assignment CN9

Pin #	I/O	Signal Name	Description
1	I	BCO	Black cartridge cover open signal
2	---	BTHM	Not used
3	---	GND	---
4	O	BLAT	Black head data latch signal
5	---	GND	---
6	O	BSI2	Black head data (B)
7	---	GND	---
8	O	BSI1	Black head data (A)
9	---	GND	---
10	O	BCLK	Black head data transfer clock signal
11	---	GND	---
12	O	BNCHG	Black head charge signal
13	---	GND	---
14	---	VDD	+5V line
15	---	GND	---
16	---	GND	---
17	---	GND	---
18	O	COM	+42V common line
19	O	COM	+42V common line
20	O	COM	+42V common line
21	O	VH	VH control signal
22	O	VH	VH control signal

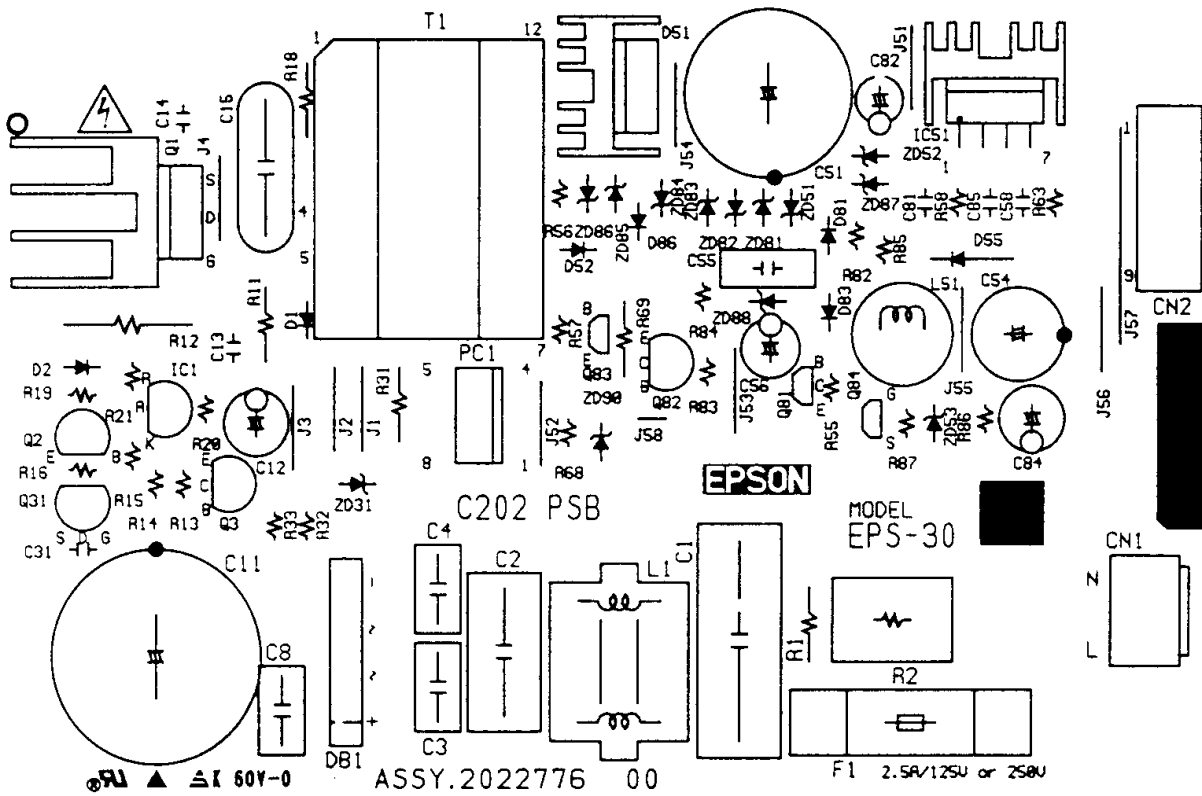
Table A-11. Connector Pin Assignment CN10

Pin #	I/O	Signal Name	Description
1	I	CCO	Color head cover open signal
2	I	CTHM	Color head temperature signal
3	---	GND	---
4	O	CCLAT	Color head data latch signal
5	---	GND	---
6	O	BSI3	Yellow nozzle data
7	---	GND	---
8	O	BSI2	Magenta nozzle data
9	---	GND	---
10	O	CSI1	Cyan nozzle data
11	---	GND	---
12	O	CCLK	Color head data transfer clock signal
13	---	GND	---
14	O	CNCHG	Color head charge signal
15	---	GND	---
16	---	VDD	+5V line
17	---	GND	---
18	---	GND	---
19	---	GND	---
20	O	COM	+42V common line
21	O	COM	+42V common line
22	O	COM	+42V common line
23	O	VH	VH control signal
24	O	VH	VH control signal

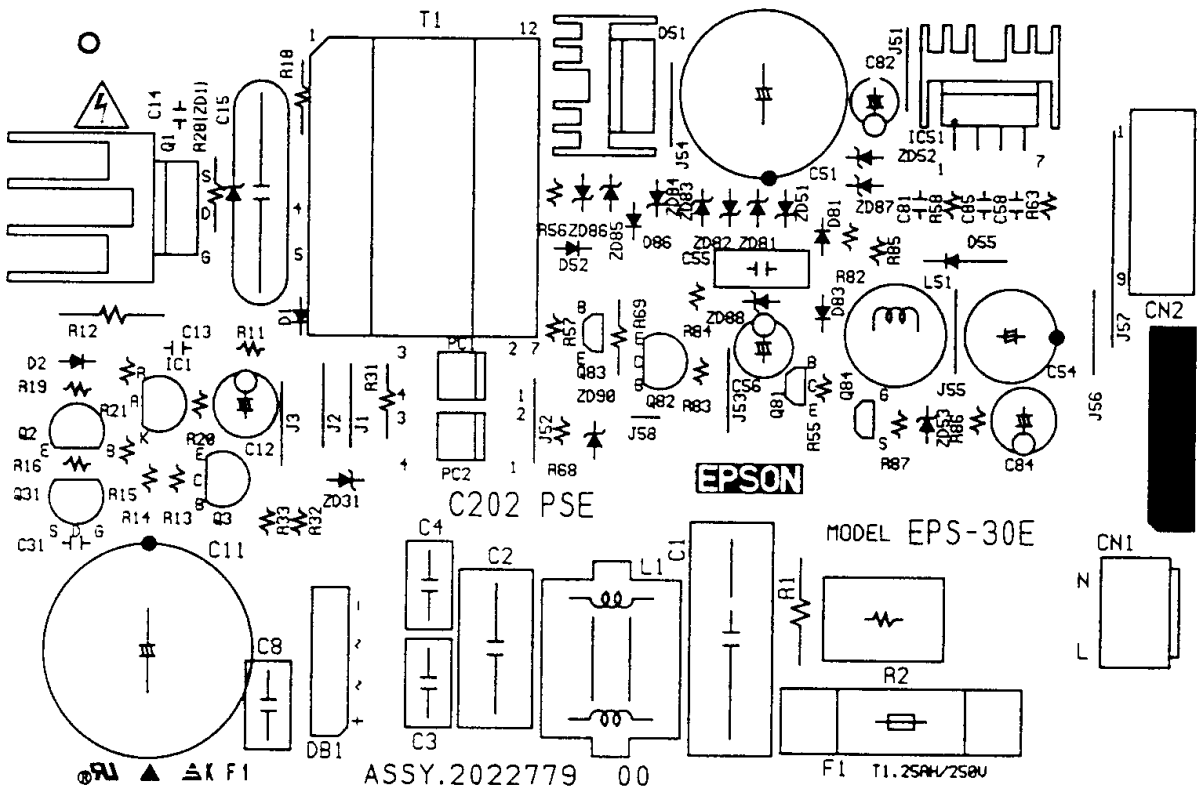
A.3 Circuit Board Component Layout



A.3.1 C202 MAIN Board Assembly Component Layout



A.3.2 C202 PSB Board Assembly Layout



A.3.3 C202 PSE Board Assembly Layout

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