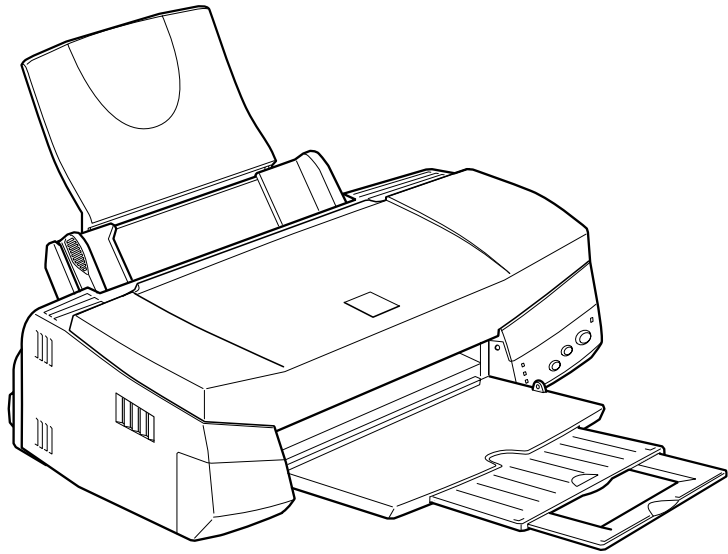


SERVICE MANUAL



Color Inkjet Printer

EPSON EPSON Stylus COLOR 670



EPSON®

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PRECAUTIONS

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

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

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

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

DANGER

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

WARNING

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

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of EPSON EPSON Stylus COLOR 670. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Contents

This manual consists of six chapters and Appendix.

CHAPTER 1. PRODUCT DESCRIPTIONS

Provides a general overview and specifications of the product.

CHAPTER 2. OPERATING PRINCIPLES

Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3. TROUBLESHOOTING

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

CHAPTER 4. DISASSEMBLY AND ASSEMBLY

Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 5. ADJUSTMENTS

Provides Epson-approved methods for adjustment.

CHAPTER 6. MAINTENANCE

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

APPENDIX

Provides the following additional information for reference:

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

Symbols Used in This Manual

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



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



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



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

Revision Status

Revision	Issued Date	Description
Rev. A	January 27, 2000	First Release

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CHAPTER

1

PRODUCT DESCRIPTION

1.1 Overview

The EPSON Stylus COLOR 670 is a color ink jet printer based on the EPSON Stylus COLOR 660.

1.1.1 Features

Major features of EPSON Stylus COLOR 670 are as follows:

- High color print quality
 - 1440x720 (HxV) dpi printing
 - 4 color printing (YMCK)
 - Traditional and New Microweave
- Built-in auto sheet feeder
 - Holds 100 cut-sheets (64g/m²)
 - Holds 10 envelopes
 - Holds 30 transparency film sheets
- Two built-in interfaces
 - Bi-directional parallel I/F (IEEE-1284 level 1 device)
 - USB (Universal Serial Bus)
- Windows/Macintosh exclusive
- ROM version: YUXXXX



Figure 1-1. External View

1.2 Basic Specifications

1.2.1 Printing Specifications

PRINTING METHOD

- On demand ink jet

NOZZLE CONFIGURATION

- Black: monochrome 64 nozzles (32 x 2 rows staggered)
- Color: 32 nozzles per color row x 3 colors (Cyan, Magenta, Yellow)

PRINTING DIRECTION

- Bi-direction with logic seeking

PRINTING SPEED AND PRINTABLE COLUMNS

Table 1-1. Character Mode

Character pitch	Printable columns	LQ speed
10 cpi	80	200 CPS**

* This is not open to the user.

** This value is the speed of normal-dot printing.

Table 1-2. Printing Speed (Raster Graphics Mode)

Horizontal Resolution	Printable Area	Available Dot	CR Speed
180 dpi	209.8mm (8.26 inch)	1488	508mm/s (20 IPS)
360 dpi	209.8mm (8.26 inch)	2976	508mm/s (20 IPS)
720 dpi	209.8mm (8.26 inch)	5952	508mm/s (20 IPS)

CONTROL CODE

- ESC/P Raster command
- EPSON Remote command

CHARACTER TABLES

- 2 international character sets
 - PC437 (US, Standard Europe)
 - PC850 (Multilingual)

TYPEFACE

- Bit map LQ font
- EPSON Courier 10 cpi

1.2.2 Paper Feeding

- Feeding method: Friction feed with ASF
- Paper path: Cut-sheet ASF (Top entry/Front exit)
- Feed speed: 8.47mm (1/3inch) feed:190ms
Continuous feed: 51mm/s

1.2.3 Input data buffer

- Input data buffer: 32KB

1.2.4 Electric Specification

- 120 V Version
 - Rated voltage: AC 100V
 - Input voltage range: AC 99 -132V
 - Rated frequency range: 50 - 60Hz
 - Input frequency range: 49.5-60.5 Hz
 - Rated current: 0.4A
 - Power consumption: Approx.18W(ISO 10561 Letter pattern
Approx. 2.5W in standby mode
Energy Star compliant)
 - Insulation Resistance: 10 M ohms min.
(between AC line and chassis, DC 500V)
 - Dielectric: AC 1000 V rms. 1 minute or
AC 1200 V rms 1 second
(between AC line and chassis)

- 220-240 V Version
 - Rated voltage: AC 220 - 240V
 - Input voltage range: AC 198 - 264V
 - Rated frequency range: 50 - 60Hz
 - Input frequency range: 49.5-60.5 Hz
 - Rated current: 0.2A
 - Power consumption: Approx.18W(ISO 10561 Letter pattern
Approx. 2.5W in standby mode
Energy Star compliant)
 - Insulation Resistance: 10 M ohms min.
(between AC line and chassis, DC 500V)
 - Dielectric: AC 1500 V rms. 1 minute
(between AC line and chassis)

1.2.5 Environmental Conditions

TEMPERATURE

- Operating: 10 to 35°C (see Figure 1-2, "Environmental Condition")
- Non-operating: -20 to 60°C (With shipment container)
(within 120 hours at 60°C / within 1 month at 40°C)

HUMIDITY

- Operating: 20 to 80% RH (without condensation)
- Non-operating: 5 to 85% RH (without condensation)
(With shipment container)

The environmental condition should be within the range shown in the figure below.

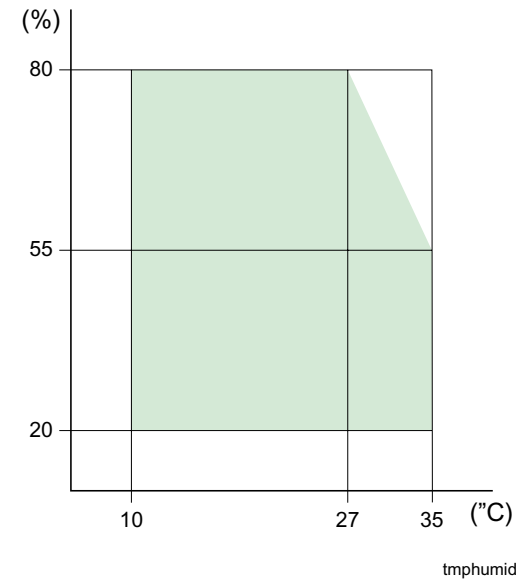


Figure 1-2. Environmental Condition

RESISTANCE TO SHOCK

- Operating: 1 G, within 1ms (operating)
- Non-operating: 2 G, within 2 ms (with shipment container)

RESISTANCE TO VIBRATION

- Operating: 0.15 G
- Non-operating: 0.50 G (with shipment container)

1.2.6 Reliability

- Total print volume: 25,000 pages (A4, Letter)
- Printhead Life: 3 billion dots / nozzle

1.2.7 Safety Approvals

- 120V version:
Safety standards: UL 1950
CSA22.2 subpart B class B
CSA C 108.8 class B
- 220 - 240V version:
Safety standards: EN 60950 (VDE)
EMI: EN 55022 (CISPR Pub. 22) class B
AS/NZS 3548 class B

1.2.8 Acoustic noise

- Level: Approx. 47 dB (A)
(According to ISO 7779)
- CE marking
220 - 240 V version
Low voltage directive 73/23/EEC: EN60950
EMC Directive 89/336/EEC: EN55022 class B
EN61000-3-2
EN61000-3-3
EN50082-1
IEC801-2
IEC801-3
IEC801-4

1.3 Interface

1.3.1 Hardware interface

This printer provides USB and parallel interface as standard.

1.3.1.1 Parallel interface

- Transmission mode: 8-bit parallel, IEEE-1284 compatibility mode
- Synchronization mode: By STROBE pulse
- Handshaking: By BUSY and ACKNLG signal
- Signal level: TTL compatible level
- Adaptable connector: 57-30360 (amphenol) or equivalent

BUSY signal is set high before setting either -ERROR low or PE high and held high until all these signals return to their inactive state.

BUSY signal is at high level in the following cases.

- During data entry (see Figure 1-3, "Data Transmission Timing Chart")
- When input data buffer is full.
- When -INIT signal is at low level or during hardware initialization
- During printer error (see the ERROR signal explanation below)
- When the parallel interface is not selected

ERROR signal is at low level when the printer is in one of the following states.

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

PE signal is at high level during paper-out error.

The figure below shows the timing chart of the parallel interface.

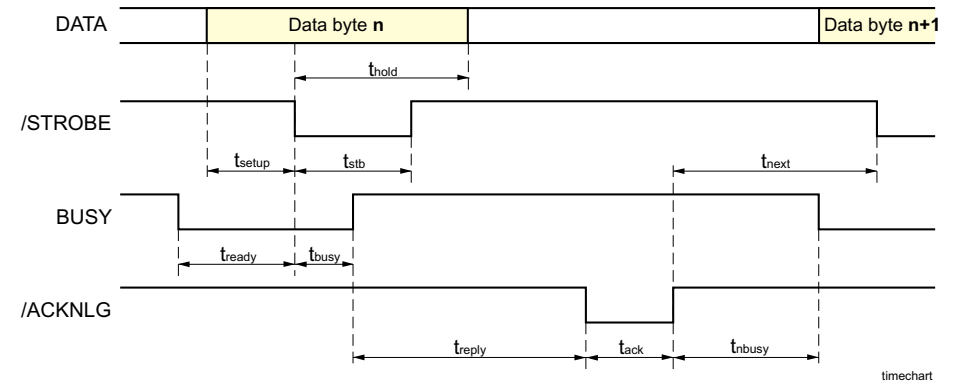


Figure 1-3. Data Transmission Timing Chart

On the above timing chart, T_{act} rated period is shown below.

Table 1-3. t_{act} Rated Period

Parallel I/F Mode	T_{act} Rated Period
High speed (default)	1 μ s
Normal speed	3 μ s

Table 1-4. Signal Level: TTL compatible (IEEE-1284 level 1 device)

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

NOTE: * A low logic level on the Logic H signal is 2.0 V or less when the printer is powered off and this signal is equal or exceeding 3.0V when the printer is powered on. The receiver shall provide an impedance equivalent to 7.5 K ohm to ground.

Table 1-5. Connector Pin Assignment and Signals (F-Channel)

Table 1-5. Connector Pin Assignment and Signals (F-Channel)

Pin No.	Signal Name	Return GND Pin	In/Out	Function Description
1	-STROBE	19	In	The strobe pulse. Read-in of data is performed at the falling edge of this pulse.
2	DATA0	20	In	The DATA0 through DATA7 signals represent data bits 0 to 7, respectively. Each signal is at high level when data is logical 1 and low level when data is logical 0.

Pin No.	Signal Name	Return GND Pin	In/Out	Function Description
3	DATA1	21	In	
4	DATA2	22	In	
5	DATA3	23	In	
6	DATA4	24	In	
7	DATA5	25	In	
8	DATA6	26	In	
9	DATA7	27	In	
10	-ACKNLG	28	Out	This signal is a negative pulse indicating that the printer can again accept data.
11	BUSY	29	Out	A high signal indicated that the printer cannot receive data.
12	PE	28	Out	A high signal indicates paper-out error.
13	SLCT	28	Out	Always at high level when the printer is powered on.
14	-AFXT	30	In	Not used.
31	-INIT	30	In	The falling edge of a negative pulse or a low signal on this line causes the printer to initialize. Minimum 50 us pulse is necessary.
32	-ERROR	29	Out	A low signal indicates printer error condition.
36	-SLIN	30	In	Not used.
18	Logic H	-	Out	Pulled up to +5V via 3.9K ohm resistor.
35	+5V	-	Out	Pulled up to +5V via 3.3K ohm resistor.

Table 1-5. Connector Pin Assignment and Signals (F-Channel)

Pin No.	Signal Name	Return GND Pin	In/Out	Function Description
17	Chassis GND	-	-	Chassis GND.
16, 33 19-30	GND	-	-	Signal GND.
15, 34	NC	-	-	Not connected.

NOTE: * In/Out refers to the direction of signal flow from the printer's point of view.

1.3.2 IEEE-1284 Parallel I/F (Reverse Channel)

Reverse channel is used to transfer the information data from the printer side to the PC side.

Table 1-6. Parallel I/F Specification (R-Channel)

Item	Specification
Transmission mode	IEEE-1284 nibble mode
Synchronization	Comply with the IEEE-1284 specification
Handshaking	Comply with the IEEE-1284 specification
Data trans. timing	Comply with the IEEE-1284 specification
Signal Level	TTL level (IEEE-1284-Level 1 device)

□ Device ID

- When IEEE-1284.4 protocol is enabled:
[00H] [5AH]
MFG: EPSON;
CMD: ESCPL2, BDC, D4;
MDL: Stylus[SP]COLOR[SP]670;
CLS: PRINTER;
DES: EPSON[SP]Stylus[SP]COLOR[SP]670;
- When IEEE1284.4 protocol is NOT enabled:
[00H] [57H]
MFG: EPSON;
CMD: ESCPL2, BDC;
MDL: Stylus[SP]COLOR[SP]670;
CLS: PRINTER;
DES: EPSON[SP]Stylus[SP]COLOR[SP]670;

NOTE: [00H] denotes a hexadecimal value of zero.
MDL value depends on the EEPROM setting.
CMD value depends on the IEEE1284.4 setting.

Table 1-7. Connector Pin Assignment and Signals (F-Channel)

Pin No.	Signal Name	Return GND Pin	In/Out	Functional Description
1	HostClk	19	In	Host clock signal.
2	DATA0	20	In	The DATA 0 through DATA7 signals represent data bits 0-7 respectively. Each signal is at high level when data is logical 1 and low level when data is logical 0. These signals are used to transfer the 1284 extensibility request to the printer.
3	DATA1	20	In	
4	DATA2	20	In	
5	DATA3	20	In	
6	DATA4	20	In	
7	DATA5	20	In	
8	DATA6	20	In	
9	DATA7	20	In	
10	PtrClk	28	Out	Printer clock signal.
11	PtrBusy/ DataBit-3,7	29	Out	Printer busy signal and reverse channel transfer data bit 3 or 7.
12	AckDataReq/ DataBit-2,6	28	Out	Acknowledge data request signal and reverse channel transfer data bit 2 or 6.
13	Xflag/ DataBit-1,5	28	Out	X-flag signal and reverse channel transfer data bit 1 or 5.
14	HostBusy	30	In	Host busy signal.
31	-INIT	30	In	Not used.
32	-DataAvail/ DataBit-0,4	29	Out	Data available signal and reverse channel transfer data bit 0 or 4.
36	1284-Active	30	In	1284 active signal
18	Logic H	-	Out	Pulled up to +5V via 3.9K ohm resistor.
35	+5V	-	Out	Pulled up to +5V via 3.3 K ohm resistor.

Table 1-7. Connector Pin Assignment and Signals (F-Channel)

Pin No.	Signal Name	Return GND Pin	In/Out	Functional Description
17	Chassis	-	-	Printer chassis GND.
16, 33 19-30	GND	-	-	Twist pair return GND.
15, 34	NC	-	-	Not used.

NOTE: * In/Out refers to the direction of signal flow from the printer's point of view.

1.3.3 USB (Universal Serious Bus)

Following shows specification.

- Standard:
 - Universal Serial Bus Specifications Revision 1.0
 - Universal Serial Bus Device Class Definition for Printing Devices version 1.0
- Bit rate: 12Mbps (Full Speed Device)
- Data encoding: NRZI
- Adaptable connector: USB Series B
- Recommended cable length: max. 2 meters

Table 1-8. Connector Pin Assignment and Signals

Pin. No	Signal Name	I/Out	Function Description
1	VCC	--	Cable power. Maximum power consumption is 100mA.
2	-Data	I/O	Data
3	+Data	I/O	Data. Pull up to +3.3V via 1.5K ohm resistor.
4	Ground	--	Cable ground.

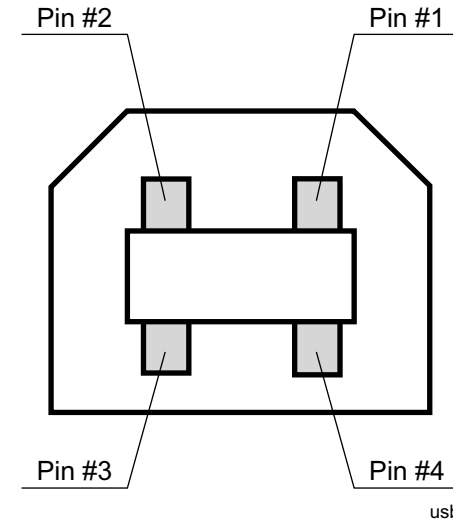


Figure 1-4. USB Interface Port

1.3.4 Miscellanea

1.3.4.1 Receive Data Buffer Full Operation

Generally, hosts abandon data transfer to peripherals when a peripheral is in the busy state for dozens of seconds continuously. To prevent hosts from this kind of time-out, the printer receives data very slowly, several bytes per minute, even if the printer is in busy state. This slowdown is started when the rest of the input buffer becomes several hundreds of bytes. Finally, the printer is in the busy state continuously when the input buffer is full. USB and IEEE-1284.4 on the parallel interface do not require this function.

1.3.4.2 Interface Selection

The printer has 2 built-in interfaces; the USB and parallel interface. These interfaces are selected automatically.

AUTOMATIC SELECTION

In this automatic interface selection mode, when the printer is initialized to the idle state scanning which interface receives data when it is powered on. Then the interface that receives data first is selected. When the host stops data transfer and the printer is in the stand-by state for the seconds, the printer is returned to the idle state. As long as the host sends data or the printer interface is in the busy state, the selected interface is let as it is.

INTERFACE STATE AND INTERFACE SELECTION

When the parallel interface is not selected, the interface got into the busy state. When the printer is initialized or returned to the idle state, the parallel interface got into the ready state. Caution that the interrupt signal such as the -INIT signal on the parallel interface is not effective while that interface is not selected.

1.3.4.3 IEEE 1284.4 protocol

The packet protocol described by IEEE1284. 4 standard allows a device to carry on multiple exchanges or conversations which contain data and / or control information with another device at the same time across a single point-to-point link. The protocol is not, however, a device control language. It does provide basic transport-level flow control and multiplexing services. The multiplexed logical channels are independent of each other and blocking of one has no effect on the others. The protocol operates over IEEE 1284.

- Automatic selection
An initial state is compatible interface and starts IEEE12844 communication when magic strings (1284.4 synchronous commands) are received.
- On
An initial state is IEEE1284.4 communication and data that received it by the time it is able to take synchronization by magic string (1284.4 synchronous commands) is discarded.
- Off
An initial state is compatible interface and never starts IEEE1284. communication even if magic strings (1284.4 synchronous commands) are received.

1.3.5 Printer Language and Emulation

- Printer language: ESC/P Raster
 EPSON Remote

- Printing mode: Printing mode ESC(K
- Color: Printing color ESC r, ESC(r

1.3.5.1 Control codes

CHARACTER MODE

- General Operation: Initialize Printer ESC@
- Paper feeding: Form Feed FF
 Line Feed LF
 Carriage Return CR
- EEPROM control: EEPROM control ESC|

GRAPHICS MODE

- General operation: Initialize Printer ESC@
 Unidirectional Printing ESC U
 CSF Mode Control ESC EM
- Paper feeding: Form Feed FF
 Line Feed LF
 Line Spacing ESC+
 Carriage Return CR
- Page format: Page Length ESC(C
 Top / Bottom Margin ESC(c
 Paper side ESC8S
- Print position motion: Horizontal Print Position ESC\$, ESC\, ESC(\$,
 ESC(
 Vertical Print Position ESC(V, ESC(v
- Spacing: Define Unit ESC(U
- Graphics: Graphics Mode ESC(G
 Raster Graphics ESC., ESC(D, ESC i
 Microweave control ESC(i
 Dot size control ESC(e
 Print a image ESC ACK

1.4 Operator Controls

1.4.1 Operate Switch

Operate switch is located on the control panel.

1.4.2 Control Panel

1.4.2.1 Switches

There are 2 non-lock type push switches, 1 lock type push switch and 4 LED.

1.4.3 Indicators

- Power
Lit when the operate switch is ON, and AC power is supplied.
- Paper Out
Lit during the paper-out condition and blinks during the paper-jam condition.
- Ink Out (Black)
Lit during no Black ink condition, and blinks during the Black ink low condition.
- Ink Out (Color)
Lit during no Color ink condition, and blinks during the Color ink low condition.

1.4.4 Panel Functions

Table 1-9. Panel Functions

Switch	Function
Load / Eject (Pushing within 2 seconds*)	<ul style="list-style-type: none"> • Loads or Ejects the paper. • When the carriage is on the ink cartridge change position, return carriage from ink cartridge change position.
Load / Eject (Pushing for 2 seconds*)	<ul style="list-style-type: none"> • Starts the ink cartridge change sequence.** Moves the carriage to the cartridge change position.
Cleaning (Pushing for 2 seconds*)	<ul style="list-style-type: none"> • Starts the cleaning of head. • In the condition of "Ink Low" or "Ink Out" or "No Ink Cartridge", starts the Ink Cartridge change sequence.**
Cleaning (Pushing within 2 seconds*)	<ul style="list-style-type: none"> • When carriage is on the Ink Cartridge change position, return carriage from Ink cartridge change position.

NOTE: * Described as 3 seconds required in the User's guide.

** This function is not available in printing status.

Table 1-10. Panel Functions with Power On

Switch	Pressing with Power on Function
Load / Eject	<ul style="list-style-type: none"> • Starts status sheet printing.
Cleaning	<ul style="list-style-type: none"> • Change code pages / Select IEEE 1284.4 mode for parallel I/F. *1
Cleaning + Load / Eject	<ul style="list-style-type: none"> • Enters the special settings mode. (Factory use only.)

NOTE: *1 Not described in the User's manual.

Table 1-11. Special Setting Mode

Switch	Function
Load / Eject	• Initialize EEPROM and reset timer IC.
Cleaning (Pushing for 10 seconds*)	• Reset the ink overflow counter in EEPROM

1.4.5 Printer Condition and Panel Status

Table 1-12. Printer Condition & Indicator Status

Printer Status	Indicators				Priority
	Power	Ink Out (Black)	Ink Out (Color)	Paper Out	
Power on condition	On	--	--	--	9
Ink sequence	Blink	--	--	--	6
Ink Cartridge change mode	Blink	--	--	--	5
Data processing	Blink	--	--	--	8
Paper Out	--	--	--	On	4
Paper jam condition	--	Off	Off	Blink	3
No ink cartridge or ink end (black)	--	On	--	--	7
Ink level low (black)	--	Blink	--	--	7
No ink cartridge or ink end (color)	--	--	On	--	7
Ink level low (color)	--	--	Blink	--	7
Enter EEPROM and Timer IC reset	--	On (only for 1 second)			-
Maintenance request	Blink	Blink	Blink	Blink	2
Fatal error	Blink	On	On	Blink	1

1.4.6 Printer Initialization

There are three kinds of initialization method.

- Power-on initialization
This printer is initialized when turning the printer power on, or printer recognized the cold-reset command (remote RS command). When the printer is initialized following action is performed.
 - Initializes printer mechanism.
 - Clears input data buffer.
 - Clears print buffer.
 - Sets default values.
- Operator initialization
This printer is initialized when turning the printer power on again within 10 seconds from last power off, or printer recognized the -INIT signal (native pulse) of parallel interface. When printer is initialized, following action is performed.
 - Cap the printhead.
 - Eject a paper.
 - Clears input data buffer.
 - Clears print buffer.
 - Sets default values.
- Software initialization
The ESC@ command also initializes the printer. When printer is initialized, following action is performed.
 - Clears print buffer.
 - Sets default values.

1.4.7 Errors

- Ink End
When the printer runs out the most parts of the ink of any one color, it warns ink-low and keeps printing. When the printer runs out the whole ink of any one color, it stops printing and indicates ink-out error. User is requested to install a new ink-cartridge in this state. A ink-cartridge once taken out should never be used again. Re-installation of the cartridge not filled fully upsets the ink level detection and may cause a serious problem in the printhead as a result.
- Paper Out
When the printer fails to load a sheet, it goes paper out error.
- Paper Jam
When the printer fails to eject a sheet, it goes paper jam error.
- No Ink Cartridge
When the printer detects ink-cartridge is not installed or off, it goes this error mode.
- Maintenance request
When the total quantity of ink wasted through the cleaning and flushing is reaches to the limit, printer indicates this error and stops. The absorber in the printer enclosure is needed to be replaced with a new one by a service person.
- Fatal Errors
Carriage control error or CG access error.

1.4.8 Paper Handling

Do not perform reverse feed more than 9.5mm (0.38").

1.4.9 Paper Specification

- Cut Sheet
 - Size:
 - A4 (210 x 297 mm)(8.3 x 11.7")
 - Letter (216 x 279 mm)(8.5 x 11.0")
 - B5 (182 x 257 mm)(7.2 x 10.1")
 - Legal (216 x 356 mm)(8.5 x 14.0")
 - Statement (139.7 x 215.9mm)(5.5 x 8.5")
 - Executive (184.2 x 266.7 mm)(7.25 x 10.5")
 - A5 (148 x 210 mm)
 - A6 (105 x 148 mm)
 - Thickness:
 - 0.08mm to 0.11mm(0.003 to 0.004")
 - Weight:
 - 64g/m² to 90g/m² (17lb to 24lb / 55 to 78 kg)
 - Paper quality:
 - exclusive paper, bond paper, PPC
- Transparency, Glossy paper
 - Size:
 - A4 (210 x 297 mm)(8.3 x 11.7")
 - Letter (216 x 279 mm)(216 x 279 mm)(8.5 x 11.0")
 - Thickness:
 - 0.075mm to 0.085mm(0.003 to 0.0033")

NOTE: Transparency printing is only available at normal temperature.

Envelope

- Size:
No.10 (241.3 mm x 104.8 mm)(9.5 x 4.125")
DL (220 mm x 110 mm)(8.7 x 4.3")
C6 (162 mm x 114 mm)(6.4 x 4.5")
Paper Type/Weight/Flap
- Thickness:
0.16mm to 0.52mm(0.006 to 0.02")
- Weight:
45g/m² to 75g/m² (12lb to 20lb)
- Paper quality:
bond paper, plain paper, air mail

NOTE: *Envelope printing is only available at normal temperature.
*Keeping the longer side of the envelope horizontally at setting.

 Index card

- Size:
A6 (105 x 148 mm)(4.1 x 5.8")
A5 (148 x 210 mm)(5.8 x 8.3")
5x8" index card (127 x 203mm)
10x8" index card (154 x 203mm)
- Thickness:
Less than 0.23mm (0.0091")

1.4.10 Printable Area

1.4.10.1 Cut Sheet

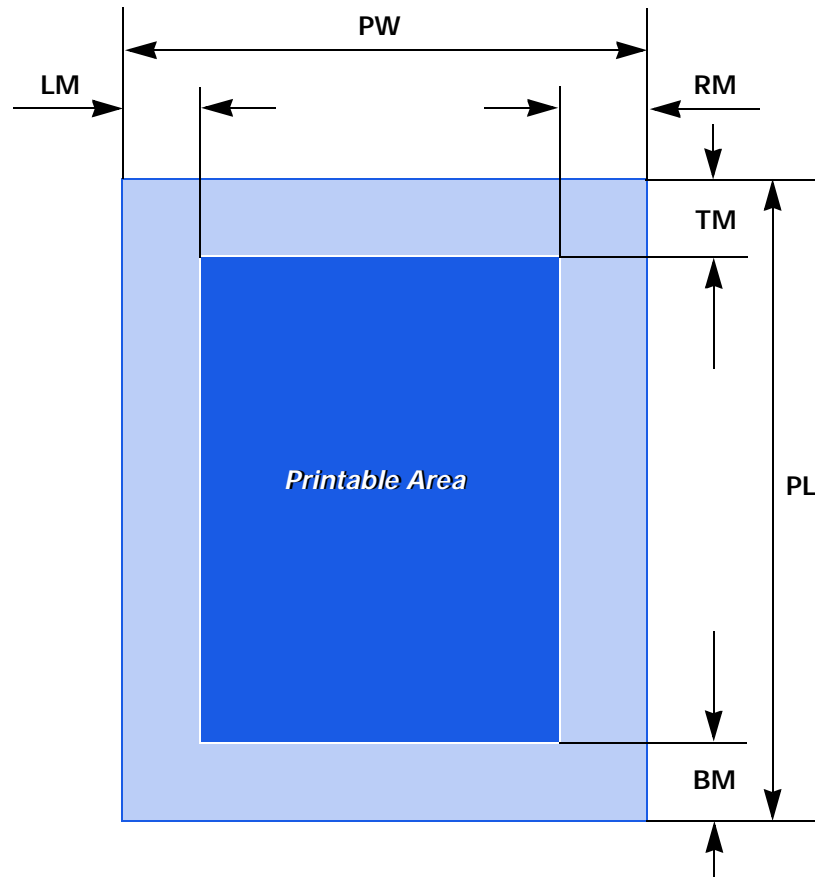


Figure 1-5. Printable Area for Cut Sheet

Table 1-13. Margins in Character Mode

Paper Size	Left Margin	Right Margin	Top Margin	Bottom Margin
A4	3mm (0.12")	3mm (0.12")	3mm (0.12")	14mm (0.54")
Letter	3mm (0.12")	9mm (0.35")	3mm (0.12")	14mm (0.54")
B5	3mm (0.12")	3mm (0.12")	3mm (0.12")	14mm (0.54")
Legal	3mm (0.12")	9mm (0.35")	3mm (0.12")	14mm (0.54")
Statement	3mm (0.12")	3mm (0.12")	3mm (0.12")	14mm (0.54")
Executive	3mm (0.12")	3mm (0.12")	3mm (0.12")	14mm (0.54")

Table 1-14. Margins in Raster Graphics Mode

Paper Size	Left Margin	Right Margin	Top Margin	Bottom Margin
A4	3mm (0.12")	3mm (0.12")	3mm (0.12")	14 or 3mm (0.54 or 0.12")
Letter	3mm (0.12")	3mm (0.12")	3mm (0.12")	14 or 3mm (0.54 or 0.12")
B5	3mm (0.12")	3mm (0.12")	3mm (0.12")	14 or 3mm (0.54 or 0.12")
Legal	3mm (0.12")	3mm (0.12")	3mm (0.12")	14 or 3mm (0.54 or 0.12")
Statement	3mm (0.12")	3mm (0.12")	3mm (0.12")	14 or 3mm (0.54 or 0.12")
Executive	3mm (0.12")	3mm (0.12")	3mm (0.12")	14 or 3mm (0.54 or 0.12")

NOTE: * Bottom margin is expanded to 3mm when paper dimension is defined by using command, otherwise it is not expanded (14mm).

**From a form lower end 3mm as for 14mm area, a printing may scramble.

1.4.10.2 Envelope

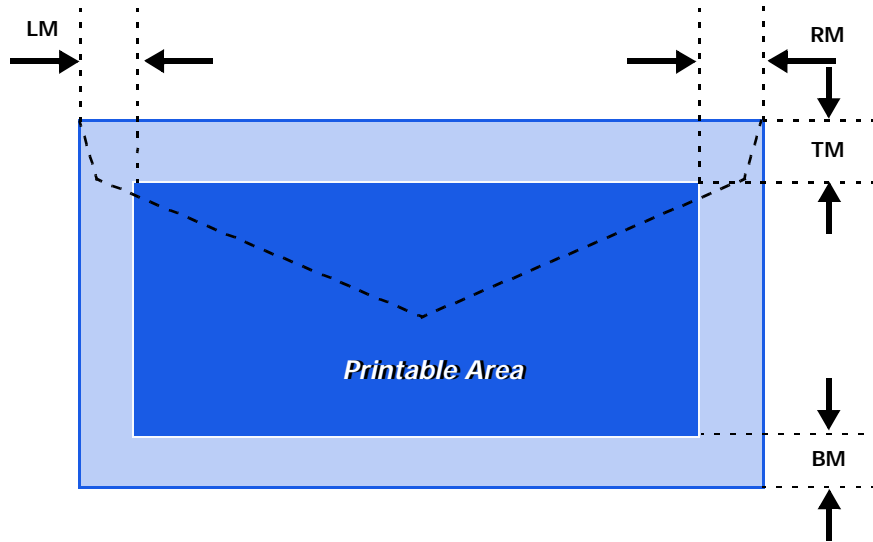


Figure 1-6. Printable Area for Envelopes

Table 1-15. Envelope Margin

Size	Left Margin (minimum)	Right Margin (minimum)	Top Margin (minimum)	Bottom Margin (minimum)
#10	3 mm (0.12")	28 mm (1.10")	3 mm (0.12")	14 mm (0.55")
DL	3 mm (0.12")	7 mm (0.28")	3 mm (0.12")	14 mm (0.55")
C6	3 mm (0.12")	3 mm (0.12")	3 mm (0.12")	14 mm (0.55")

1.4.11 Ink Cartridge

BLACK INK CARTRIDGE

- Type: Exclusive cartridge
- Color: Black
- Print capacity: 540 pages / A4 (ISO/IEC10561 Letter pattern at 360 dpi)
- Ink life: 2 years from production date
- Storage temperature:
 - -20°C to 40°C
Storage, within a month at 40°C
 - -30°C to 40°C
Packing storage, within a month at 40°C
 - -30°C to 60°C
Transit, within a month at 60°C
- Dimension: 19.8mm (W) x 52.7 mm (D) x 38.5mm (H)

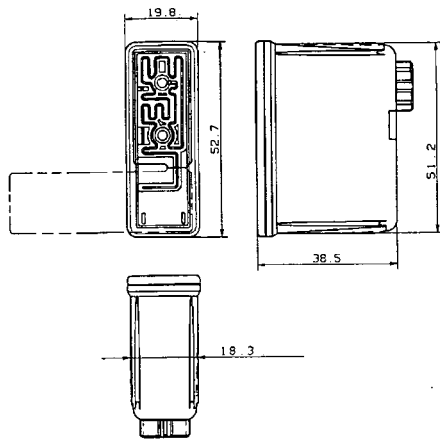


Figure 1-7. Black Ink Cartridge

COLOR INK CARTRIDGE

- Type: Exclusive cartridge
- Color: Magenta, Cyan, Yellow
- Print capacity: 300 pages/A4 (360 dpi, 5% duty each color)
- Ink life: 2 years from production date
- Storage temperature:
 - -20°C to 40°C
Storage, within a month at 40°C
 - -30°C to 40°C
Packing storage, within a month at 40°C
 - -30°C to 60°C
Transit, within a month at 60°C
- Dimension: 42.9mm (W) x 52.7 mm (D) x 38.5mm (H)

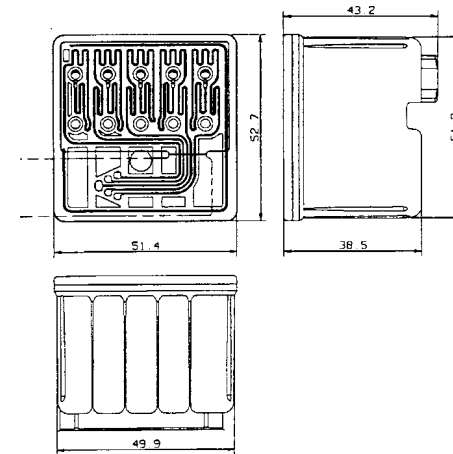


Figure 1-8. Color Ink Cartridge

NOTE: Ink cartridges cannot be refilled, properly dispose of after use. Do not use the ink cartridge which is beyond its production date plus two years. Ink will be frozen under -4° C environment, however it will be usable after placing it more than 3 hours at room temperature.

1.5 Physical Specification

- Weight: 5.2 kg without the ink cartridges
- Dimensions
 - Stylus Photo 720: 429 x 261 x 167 mm (WxDxH) (Storage)
429 x 613 x 295 mm (WxDxH) (Printing)

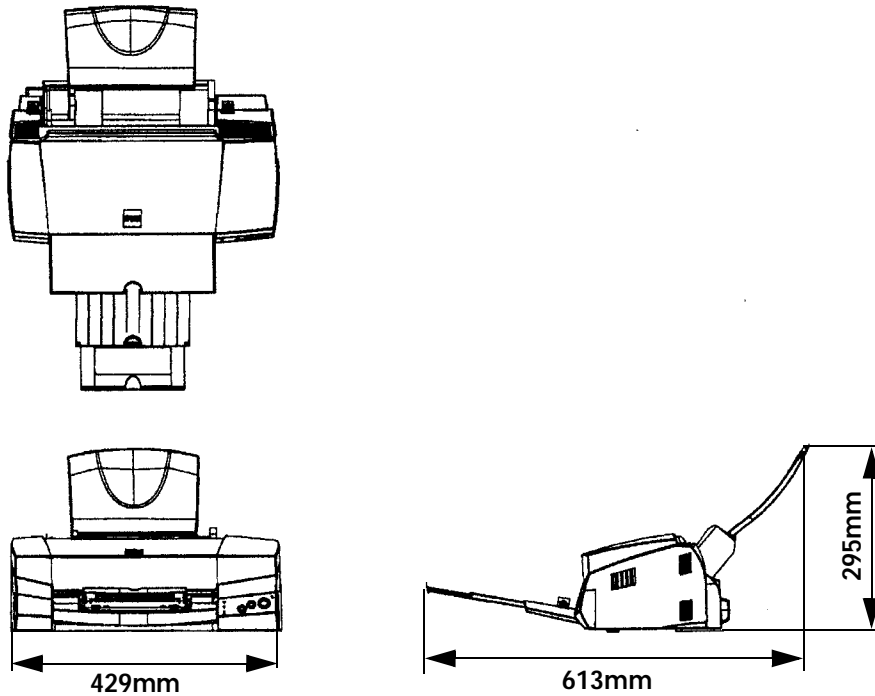


Figure 1-9. EPSON Stylus COLOR 670 Dimensions

1.6 Accessories

- User's manual: 1
- Driver disk: 1
- Black ink cartridge: 1
- Color ink cartridge: 1
- Power cord: 1 (220-240 version only)

CHAPTER

2

OPERATING PRINCIPLES

2.1 Overview

This section describes the operating principles of the printer mechanism and electrical circuit boards. The EPSON Stylus COLOR 670 has the following boards:

- Main board: C301MAIN
- Power supply board: C301PSB/PSE
- Panel board: C209PNL Board

2.1.1 Printer Mechanism

EPSON Stylus COLOR 670 is based on Stylus COLOR 660 and the basic specifications for its mechanism are almost same as Stylus COLOR 660.

This printer consists of Print Head, Carriage Mechanism, Paper Feeding Mechanism, Paper Loading Mechanism, Ink System (Pump Mechanism, Cap Mechanism, and Carriage Lock Mechanism).

Like other EPSON ink jet printers, the EPSON Stylus COLOR 670 is equipped with two stepping motors; one for ASF/ paper feeding/ pump mechanism, and one for CR mechanism. ASF unit uses rear entry front eject system; this design is the same as Stylus COLOR 660.

For cap assembly, EPSON Stylus COLOR 670 uses valveless mechanism; new design for this model.

Figure 2-1 on page 32 shows the outline of the printer mechanism.

The table below shows the compatibility of the mechanical units among , Stylus COLOR 660 and EPSON Stylus COLOR 670.

Table 2-1. Printer Mechanism Comparison

Item	Stylus COLOR 660	Stylus COLOR 670
Printhead	E-CHIPS	E-CHIPS +
CR motor (coil resistance)	7.8Ω	7.8Ω
PF moto (coil resistance)	7Ω	7Ω
ASF unit	Quiet noise type	Quiet noise type
Paper feeding mechanism	Bottom edge: 14mm enabled	Bottom edge: 3mm enabled
Pump unit		
Capping unit	Valve type	Valve less type
Frame parts	SC640 Type	SC 640 type
Main board	C256MAIN-B	C301MAIN
PSB/PSE board	C206PSB\PSE	C301PSB/PSE

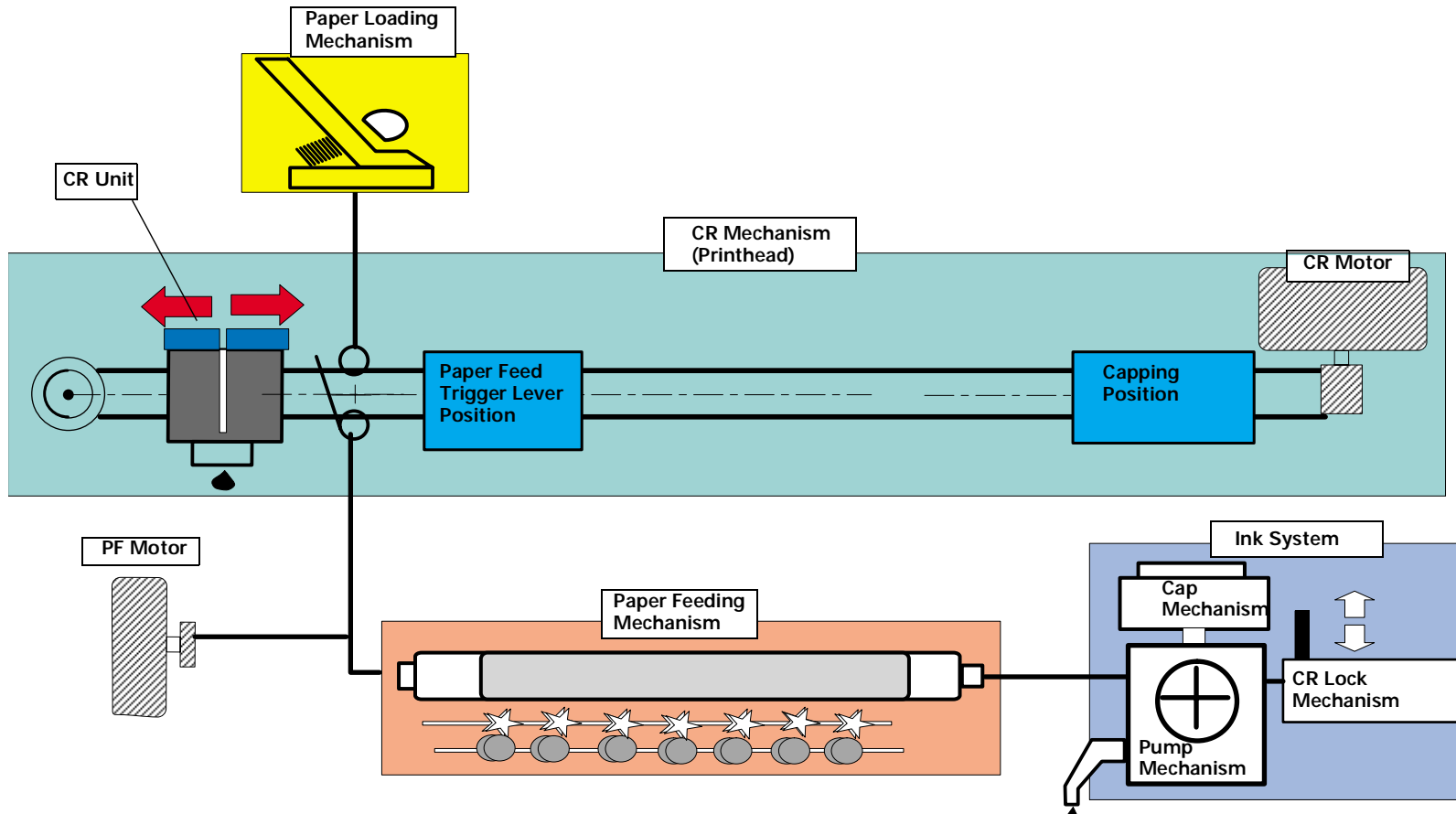


Figure 2-1. Printer Mechanism Block Diagram

2.1.2 Printhead

The printhead uses a new developed E-CHIPS+ 1 head method and EPSON Stylus COLOR 670 can perform multiple shot printing and variable printing. Printhead nozzle configuration is as follows.

- 32 nozzles x 5 rows (nozzle pitch of each row: 1/90 inch)
For black nozzles : 2 rows x 32 nozzles
For color nozzles : 3 rows x 32 nozzles
- Ink configuration: black, cyan, magenta, yellow (aligned in this order)

The basic operating principles of the printhead, which plays a major role in printing, are the same as previous models; on-demand method which uses PZT (Piezo Electric Element). In order to uniform the amount of ejecting ink, each printhead has its own head ID (10 figures for EPSON Stylus COLOR 670) which adjust PZT voltage drive features. The printhead stores the head ID to EEPROM and generates appropriate PZT drive voltage to prevent amount of ink from varying by printheads.

Following explains printhead basic components.

- PZT
PZT is an abbreviation of Piezo Electric Element. Certain amount of voltage expands and contracts PTZ. The drive wave generated on MAIN board drives PZT and PZT pushes the top cavity which has ink stored to discharge the ink from each nozzle on the nozzle plate.
- Ink Cavity
The ink absorbed from the ink cartridge goes through the filter and then is stored temporarily in this tank called "cavity" until PZT is driven.
- 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 needle is absorbed into the head, there is a great possibility of causing nozzle clog and disturbance of ink flow, and finally causing alignment failure and dot missing. To prevent this problem, a filter is set below the cartridge needle, where ink is filtered.

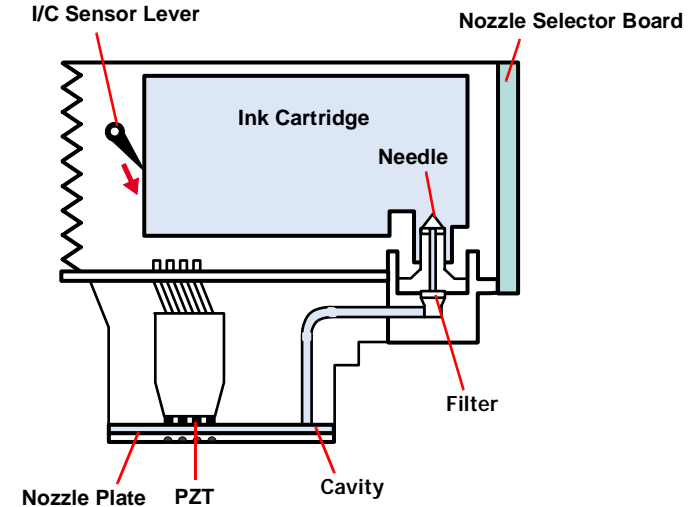


Figure 2-2. Printhead Sectional Drawing

2.1.2.1 Printing Process

This section explains the process in which the printheads of On-Demand inkjet printers eject ink from each nozzle.

1. Normal State:

When no printing signal is sent from PC, or no PZT drive voltage is applied, PZT does not change shape, therefore PZT does not squeeze the cavity. Ink pressure inside the cavity is kept normal.
(Refer to Figure 2-3.)

2) Ejecting State:

When the print signal is output from the C301MAIN board, IC (Nozzle Selector) located on the printhead unit latches data once by 1-byte unit. An appropriate PZT latched by the nozzle selector is pushed into the cavity by the common voltage applied from the main board. By this operation, ink stored in the cavity spurts out from nozzles.
(Refer to Figure 2-3.)

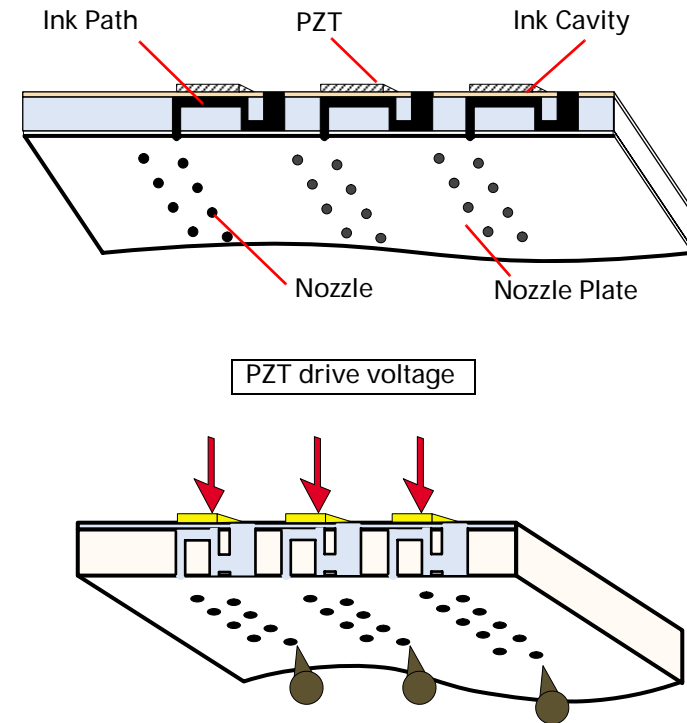


Figure 2-3. Print Head

2.1.2.2 Printing Method

For print dot system, EPSON Stylus COLOR 670 has the following two types of printing modes.

- Multiple shot printing
- Variable dot printing

The above two printing modes are automatically selected depending on the media and the resolution setting. The following explains each printing mode.

- Multiple shot printing
This printing mode is developed to improve the print quality on plain paper or transparencies in low resolution. The multiple shot printing mode uses normal dot and the number of dot shots varies from 1 shot to maximum 3 shots depending on the print data to enable sharp image output even in a low resolution.
- Variable dot printing
This printing mode is developed to improve the print quality on exclusive paper. This mode is basically the same as variable dot printing mode used by EPSON Stylus COLOR 720; micro dot, middle dot, and large dot compose this mode. Print dot size varies according to print data and this mode enables even sharper image output on exclusive paper.

2.1.3 Carriage Mechanism

The carriage mechanism consists of carriage motor (CR motor), carriage unit (including printhead), CR timing belt, CR guide shaft, CR guide frame, CR home detector (HP sensor) etc.

The carriage mechanism moves the carriage back and forth according to the drive from the carriage motor. (See Figure 2-4)

The following stepping motor is mounted to drive CR mechanism. (See the table below.)

Table 2-2. Carriage Motor

Items	Specifications
Type	4-Phase/ 200-Pole HB Stepping motor
Drive Voltage	+42 V +/- 5% (DRV IC voltage)
Coil Resistance	7.8 Ω +/- 10% (per phase)
Inductance	14 mH +/- 20%
Drive Method	Bi-Polar drive
Driver IC	LB11847

The drive from CR motor is transferred to the CR unit via CR timing belt.

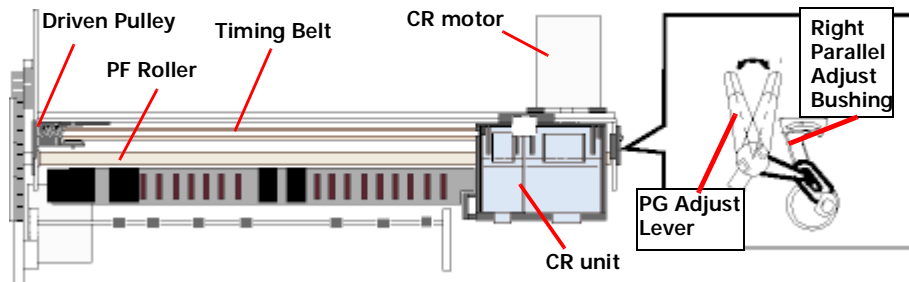


Figure 2-4. Carriage Mechanism (Top view)

2.1.3.1 Platen Gap (PG) Adjustment Mechanism

The PG adjustment mechanism is designed to keep the platen gap correct for the paper thickness to prevent ink from smearing.

The PG support lever joins the CR guide shaft, which has an eccentricity toward PG support lever. Switching the lever from “0” to “+” rotates the CR shaft and changes the platen gap from narrow to wide (within the range of 1.14mm to 2.04mm).

Table 2-3. Platen Gap Adjustment

Paper	Lever Position	PG adjustment value
All Media	Front (0)	1.14mm between head and platen
If you find any print problems or you use thick paper.	Rear (+)	2.04mm between head and platen

2.1.4 Paper Feeding Mechanism

The paper feeding mechanism consists of paper feed motor (PF motor), PF roller, paper eject roller, paper guide, and so on.

The paper feeding mechanism feeds paper loaded from ASF using the PF roller and paper eject roller.

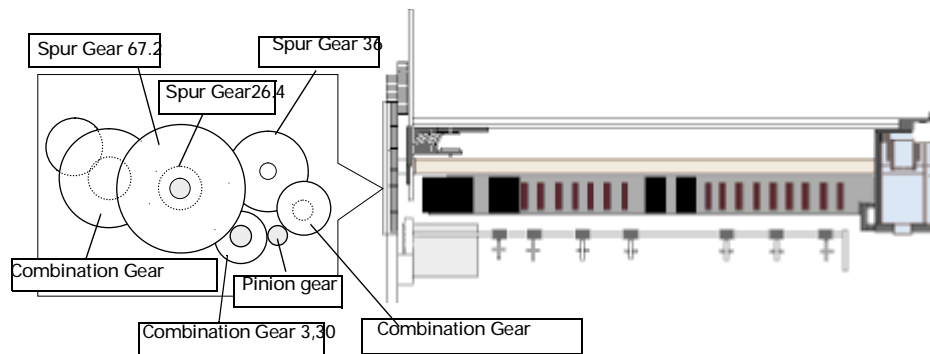


Figure 2-5. Paper Feeding Mechanism (Top View)

The following stepping motors are used to drive the paper feeding mechanism.

Table 2-4. Paper Feed Motors

Item	Description
Motor type	4-Phase/ 48-Pole PM Stepping motor
Drive voltage	+42 V +/- 5% (DRV IC voltage)
Coil Resistance	7.8 Ω +/- 10% (per phase)
Inductance	14 mH +/- 20%
Driving method	Bi-Polar drive
Driver IC	LB11847

When DE (disengage) lever is at normal position, torque from the PF motor is sent to the PF roller and paper eject roller as described below.

- To the PF roller:
PF motor pinion gear → Combination gear (3, 30) → Spur gear (67.2) → PF roller
- To the paper eject roller:
PF motor pinion gear → Combination gear (6, 34.4) → Spur gear (36) → Paper eject roller

EPSON Stylus COLOR 670 allows printing up to the last 3mm like EPSON Stylus Photo 720 / EPSON Stylus Photo EX3. The star-wheel roller assembly has been shifted 5 degrees from directly on the top of the eject roller towards the paper feed roller. This suppresses the tailing edge of the paper so that the old minimum margin of 14mm has been reduced to only 3mm.

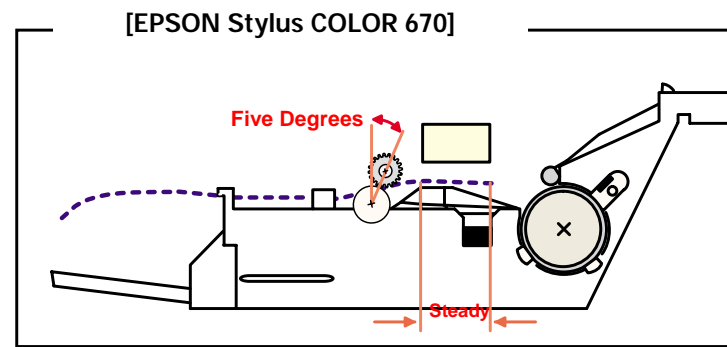
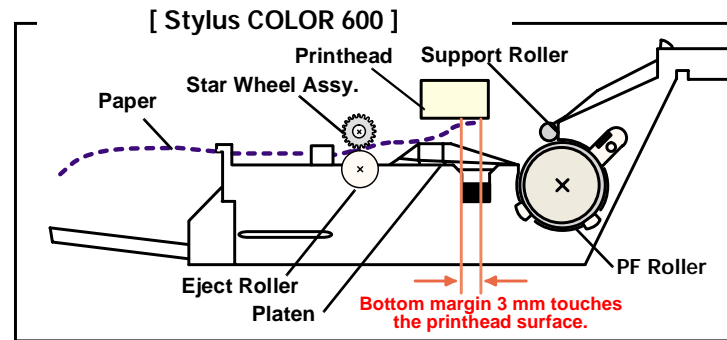


Figure 2-6. Paper Transportation (Right side view)

2.1.5 Paper Loading Mechanism (ASF Unit)

The paper loading mechanism is positioned at the printer rear and consists of paper load roller, paper return lever, hopper, and so on. The paper loading mechanism loads paper at the ASF unit and feeds paper to the PF roller. The ASF unit uses a PF motor. Drive sent from this motor is switched between the ASF unit side and Pump/PF roller side by the disengage mechanism when the CR unit moves to the left end of the CR guide shaft.

Drive from the PF motor is transmitted to the ASF as described below:

- Drive sent from PF motor is switched to ASF unit
The CR unit moves to the left end of the CR shaft → the DE lever is pushed to the left end → the Spur gear 26.4 moves to the left side → the Spur gear 26.4 revolves PF motor CCW (counterclockwise).
- Drive transmission to the ASF unit
PF Motor pinion gear → Combination gear (3, 30) → Spur gear (67.2) → Spur gear (26.4) → Combination gear (16,40.8) → Spur gear (23.2) → Spur gear (34) → ASF paper load roller shaft

Figure 2-7 shows the disengage mechanism and the parts involved.

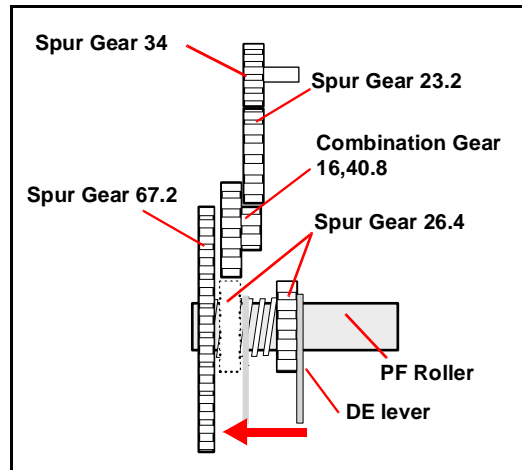


Figure 2-7. Disengage Mechanism (Top view)

When the PF motor torque is switched to the ASF unit side by the disengage mechanism, the function of the ASF mechanism varies depending on the rotational direction of the PF motor, as shown in the table below.

Table 2-5. PF Motor Drive & Function

Directions	Corresponding Functions
Clockwise (*1)	• Picks up and loads paper
Counterclockwise (*1)	• Resets paper to the correct paper set position using the Return Lever.

(*1): The PF Motor rotational direction = seen from the PF motor pinion gear.

ASF unit stops the paper loading operation when the PE sensor detects that the paper is loaded to the PF roller.

Torque sent from the ASF/Pump motor to the ASF unit via the disengage mechanism. ASF paper loading sequence is described below.

□ Paper loading operation

Like previous product, ASF of this printer has the multiple paper loading prevention mechanism to provide steady paper loading. This mechanism prevents a sheet of paper from falling from the paper set position into the paper path. After and before loading paper, by revolving the PF motor CCW, a paper return lever in the mechanism pushes paper that may have fallen off back onto the hopper. After this motion is completed, the LD roller starts loading paper. The paper loading mechanism, including the multiple paper loading prevention mechanism, is described in the following steps.

1. When the printer is powered on, the CR unit moves to the DE lever switching position and switches DE position to the ASF side. PF motor revolves CW and ASF home position is detected by ASF HP sensor. Then PF motor revolves CCW, drives paper return lever and return the paper to the stand-by position.
2. When the print signal is sent from the PC or the Load/Eject button is pressed, CR unit moves to the DE lever switching position and switches DE position to the ASF side. PF motor revolves CW to let the LD roller load paper.
3. When PE sensor detects paper loaded from ASF is transported to the PF roller, the ASF unit stops loading paper. LD roller of ASF stops at ASF HP when ASF HP sensor detects ASF HP. CR unit switches from DE switching position to CR HP side and disengages PD roller drive from ASF unit.
4. When the PF roller ejects paper, CR unit moves to the DE switching position and switches DE lever to the ASF side. PF motor revolves CCW to drive paper return lever and returns paper to the stand-by position.

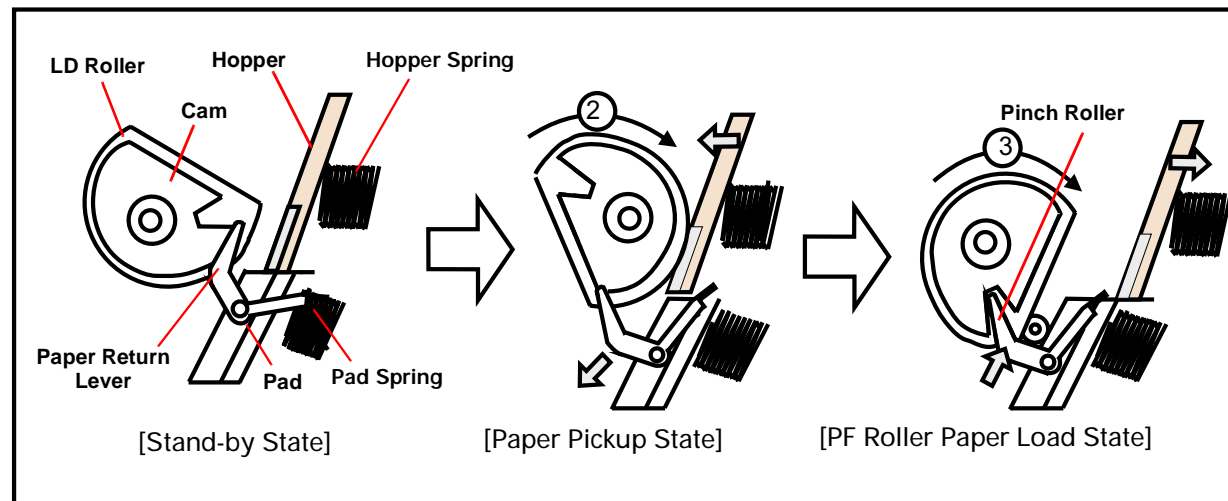


Figure 2-8. Multiple Paper Loading Prevention Mechanism (right side view)

2.1.6 Ink System Mechanism

Ink system mechanism consists of Pump unit (including CR lock mechanism) and Capping mechanism.

Ink system mechanism drives the Pump unit that presses cap to the Printhead and ejects ink from Ink cartridge, Head cavity and Cap to the Waste ink pad.

CR lock mechanism assembled in the Pump unit locks the printhead to prevent the head from slipping off the capping position so that the Printhead nozzle surface is kept clean and wet.

2.1.6.1 Pump Unit and CR Lock Mechanism

The Pump unit is driven by PF motor. PF motor drive is always transmitted to the Paper feeding mechanism and Pump unit, and therefore Pump unit and CR lock mechanism drives according to the PF motor rotational direction, as shown in the table below.

Table 2-6. Pump Motor Direction & ASF Function

Directions	Corresponding ASF Functions
Clockwise (*1)	<ul style="list-style-type: none"> Retracts the wiper. Releases the CR lock lever.
Counterclockwise (*1)	<ul style="list-style-type: none"> Absorbs ink by the pump unit Sets the wiper. Sets CR lock lever

(*1): The PF Motor rotational direction = seen from the PF motor pinion gear.

Figure 2-9 shows the operating principles of the pump mechanism.

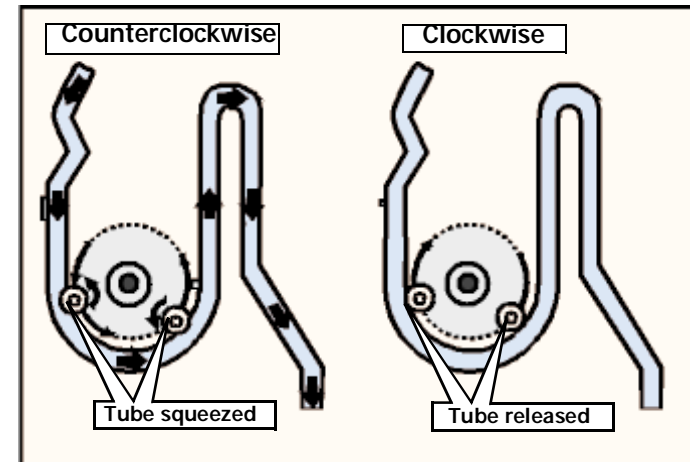


Figure 2-9. Pump Mechanism

2.1.7 Capping Mechanism

The Capping mechanism covers the Printheads with the cap holder to prevent the ink around the nozzles from increasing viscosity when the printer is in stand-by mode or when the printer is off.

Capping mechanism moves up when the CR unit moves to the right end of the CR guide shaft and covers the printhead nozzle plate.

Stylus COLOR 660 has built-in air valves in the capping unit but Stylus COLOR 670 uses valveless system.

Air valve function used for the previous models pumps and ejects ink only inside the cap by sucking ink with the valve open. Valveless system is developed by changing the ink sequence.

When sucking ink only inside the cap (false absorption), this printer moves printhead to the left from the cap unit (out of the cap) and drives pump to perform false absorption.

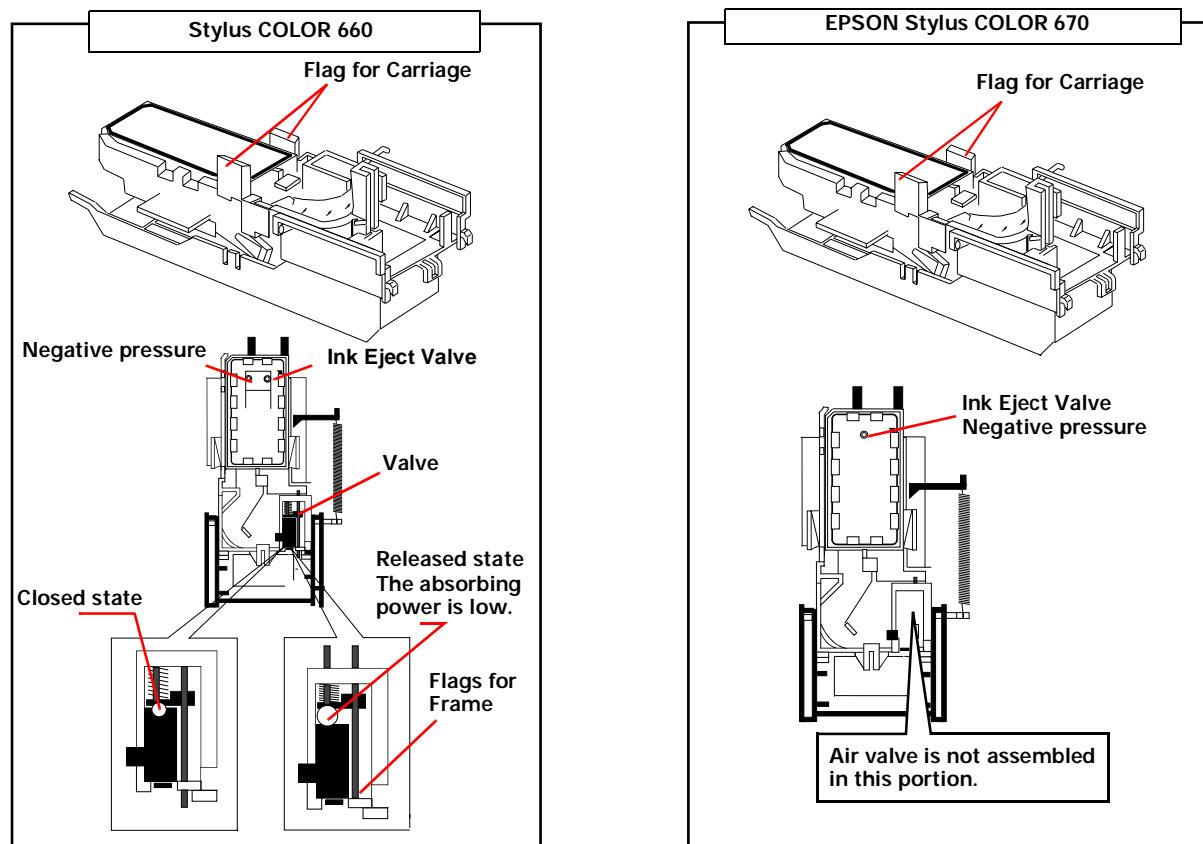


Figure 2-10. Valveless Capping Mechanism

2.1.8 Ink Sequence

□ Initial ink charge

After the product is purchased and the printer is turned on for the first time, the printer performs the initial ink charge and charges ink inside the head cavity. When the initial ink charge is completed properly, the printer releases the flag inside the EEPROM and no initial ink charge will be performed next time the power is turned on. Stylus COLOR 670 takes about 85 seconds to complete initial ink charge sequence.

□ Manual cleaning

When the dot missing by printhead is occurred, Stylus COLOR 670 provides three types of manual CL to clean air bubbled or clogged ink with viscosity or foreign substances.

The following manual CL sequences can be executed by panel operation or from the printer driver utility.

■ CL1

- Ink absorption (Black Ink: 0.16ml, Color Ink: 0.26ml)

-Wiping operation (Wipes nozzle plate by the rubber part on the right half of the wiper.)

-Flashing operation (Prevents color from mixing. Stabilizes ink surface inside the nozzle)

■ CL1'

- Ink absorption (Black Ink: 0.40ml, Color Ink: 0.63ml)

-Wiping operation (Wipes nozzle plate by the rubber part on the right half of the wiper.)

-Flashing operation (Prevents color from mixing. Stabilizes ink surface inside the nozzle)

■ CL2

- Ink absorption (Black Ink: 0.47ml, Color Ink: 0.73ml)

-Wiping operation (Wipes nozzle plate by the rubber part on the right half of the wiper.)

-Rubbing operation (Wipes nozzle plate by the felt part on the left half of the wiper.)

-Flashing operation (Prevents color from mixing. Stabilizes ink surface inside the nozzle)

The above mentioned manual CL is executed by performing nozzle check pattern and manual CL alternately. The cleaning order is CL1→CL1'→CL2→CL1. If no test print is executed between each manual CL, only CL1 is to be performed. Like previous models, when the power is turned ON, the printer executes power on CL automatically according to power OFF period and the counter value of the cleaning timer. Power on CL sequence is designed to prevent the ink viscosity and dot missing caused by foreign substances. According to each counter value, certain amount of ink (Black: max. 0.12ml, Color: max. 0.58ml) is consumed by power on CL when the power is applied.

2.2 Electrical Circuit Operating Principles

The electric circuit of the Stylus COLOR 670 consists of the following boards.

- Main board: C301MAIN Board
- Power supply board: C301PSB/PSE Board
- Panel board: C209PNL Board

This section provides operating principles of C301PSB/PSE Board and C301MAIN Board. Refer to Figure 2-11 for the major connection of the three boards and their roles.

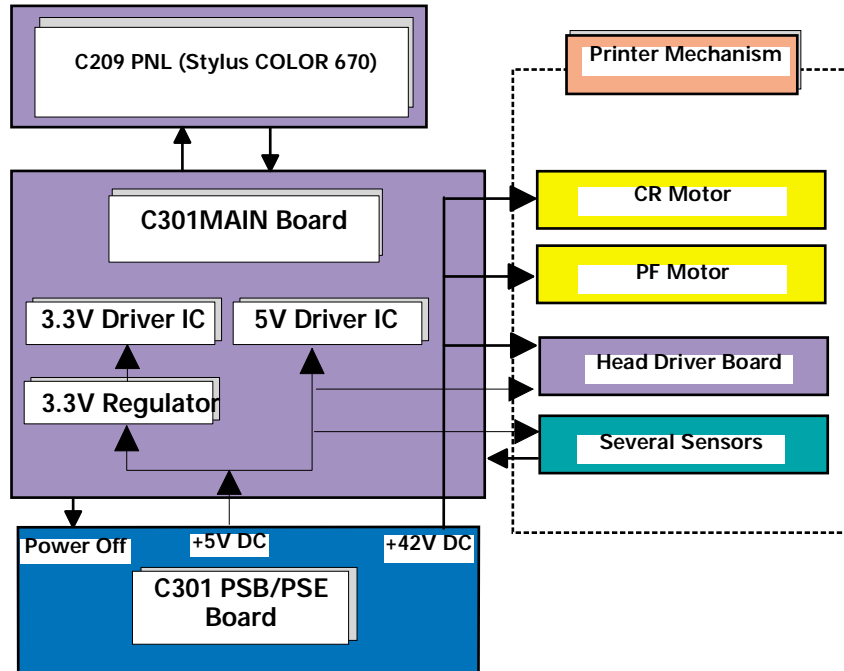


Figure 2-11. Electric Circuit of Stylus COLOR 670

2.2.1 C301PSB/PSE Board

The power supply boards of Stylus COLOR 670 use a RCC (Ringing Chalk Converter) circuit, which generates +42VDC for drive line and +5VDC for logic line to drive the printer. The application of the output voltage is described below.

Table 2-7. C301 PSB Board

Voltage	Application
+42VDC	<ul style="list-style-type: none"> • Motors (CR Motor, ASF/Pump Motor, PF Motor) • Printhead common voltage • Printhead nozzle selector 42V drive voltage
+5VDC	<ul style="list-style-type: none"> • C301MAIN control circuit logic • C301MAIN IC16 3.3V generating regulator • C209 PNL board • Sensors

Stylus COLOR 670 uses the delay circuit (secondary side power switch). Use of the secondary switch enables the circuit to keep supplying voltage to 5 V line and 24 V line for approximately 30 seconds if the printer power is turned off through the panel switch. Even if the printer is turned off through the panel switch while it is in operation, the printer turns the power supply off after performing the capping operation to prevent ink leakage or dry printhead nozzles that may be caused when the printhead is left without capping.

AC voltage input from AC inlet first goes through filter circuit that removes high frequency components and is then converted to DC voltage via the rectifier circuit and the smoothing circuit. DC voltage is then lead to the switching circuit and FET Q1 preforms the switching operation. By the switching operation of the primary circuit, +42VDC is generated and stabilized at the secondary circuit. This +42VDC generated by the secondary circuit is converted to +5VDC by the chopping regulator IC of the secondary circuit.

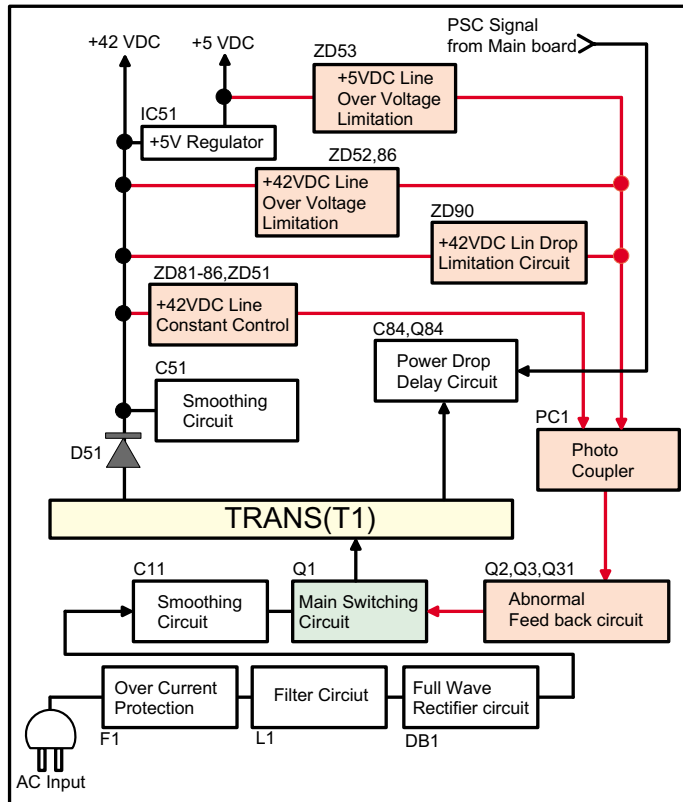


Figure 2-12. C301PSB/PSE Board Block Diagram

The C301PSB/PSE board has the various control circuits to stop voltage output if a malfunction occurs on the power supply board or the main board while the printer mechanism is on duty. Following explains each control and protection circuit.

- +42V line constant voltage control circuit:
The output level of +42V line is monitored by a detection circuit composed of the seven Zener diodes. When the output voltage becomes less than 35V, this circuit prevents the voltage from dropping by driving the primary circuit switching FET.

- +5V line constant voltage control circuit:
The output level of the +5VDC line voltage is monitored by the regulator IC51. If abnormal voltage is detected, the information is fed back to the internal comparator.
- +42VDC line over voltage protection circuit:
The output voltage line is monitored by two Zener diodes. If the output level of the voltage level of +42VDC line exceeds +48V, this circuit halts the operation of the switching FET and prevents high voltage from applied to the secondary side.
- +5V line over voltage/ line over current protection circuit:
This protection circuit is in the same line as the +42V over voltage protection circuit is located. The output voltage level of the +5V line is monitored by a Zener diode. This circuit shuts down the +5V line forcefully when the voltage level exceeds +9V.
- +42VDC line over current protection circuit:
The output voltage is monitored by two transistors. When the output voltage is dropped abnormally, this circuit regards this as short circuit and halts the operation of the primary switching FET via photocoupler to prevent over current from flowing.

2.2.2 C301MAIN Board

See Figure 2-13 for the C301MAIN board block diagram.

The printer mechanism is controlled by C301MAIN. The 3.3V regulator IC 16 is mounted on the MAIN board and generates +3.3V from 5V. +3.3V is to drive the main elements on the logic circuit.

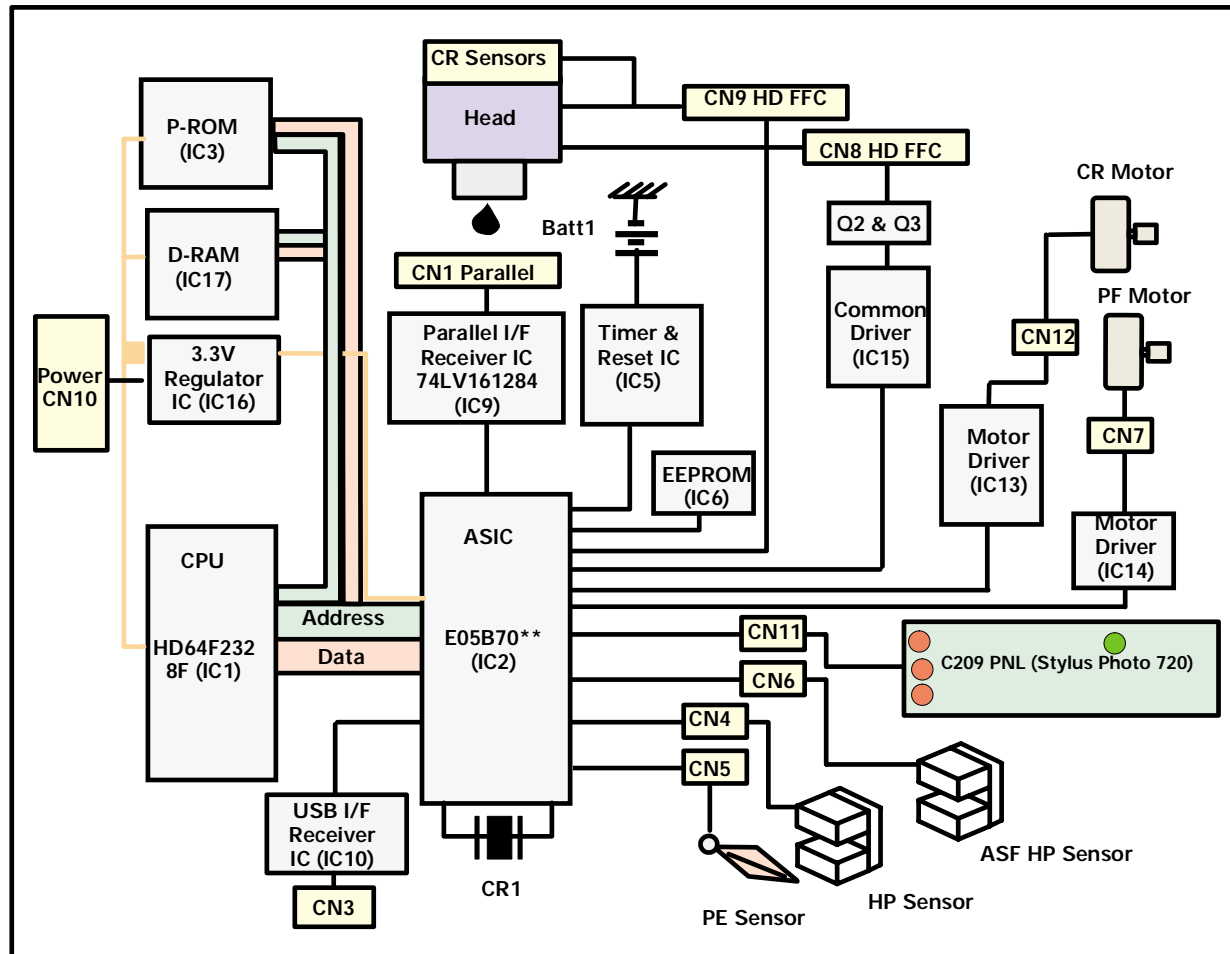


Figure 2-13. Block Diagram for the C301MAIN Board

2.2.2.1 Main elements

Table 2-8 shows the main elements on C301MAIN.

Table 2-8. Main Elements

IC	Location	Function
CPU HD64F/2328F	IC1 (3.3V)	16bit CPU mounted on the MAIN board is driven by clock frequency 24MHz and controls the printer.
Gate Array E05B70**	IC2 (3.3V & 5.0V)	<ul style="list-style-type: none"> • Motor Control • Head voltage control • EEPROM control • Sensor supervise • Timer IC supervise • Parallel I/F, USB I/F control
PROM	IC3 (3.3V)	<ul style="list-style-type: none"> • Capacity 4/8/16MB, Bus= 16 bit EEPROM • Program or program + CG (Character generator)
RAM	IC17 (3.3V)	Bus= 16 bit, 4Mbit DRAM
AT93C56	IC6 (5.0V)	2kbit EEPROM <ul style="list-style-type: none"> • Default value setting • Parameter backup
RTC-9810SA	IC5 (5.0V)	Reset/ Timer IC <ul style="list-style-type: none"> • For +5V; reset when +4.3V is detected • For +42V, reset when +35.5 is detected • Timer function is attached powered by lithium battery.
74V161284	IC9 (5V)	IEEE1284 parallel I/F transceiver IC
PDIUSBP11A	IC10 (3.3V)	USB Rev1 transceiver
LB11847	IC13	CR motor drive IC
LB11847	IC14	PF/ PUMP/ ASF motor drive IC
CXA2128S	IC15	Head drive control HIC <ul style="list-style-type: none"> • Generates head common voltage.

2.2.2.2 Printhead Driver Circuit

The printhead driver circuit consists of the following two components:

- Head common driver circuit
(Common driver IC15 & Wave amplifier transistor Q2, 3)
- Nozzle selector IC on the printhead driver board.

The common driver (IC15) generates a reference drive waveform according to the output signals from the ASIC (IC2). The reference drive waveform is amplified by the transistors Q2 and Q3 and then transferred to the nozzle selector IC on the head board. Print data is converted to serial data by the ASIC and then sent to the nozzle selector IC on the head board. Based on the serial data, the nozzle selector IC determines the nozzles to be actuated. The selected nozzles are driven by the drive waveforms produced by the common driver. See Figure 2-14 for the printhead driver circuit block diagram.

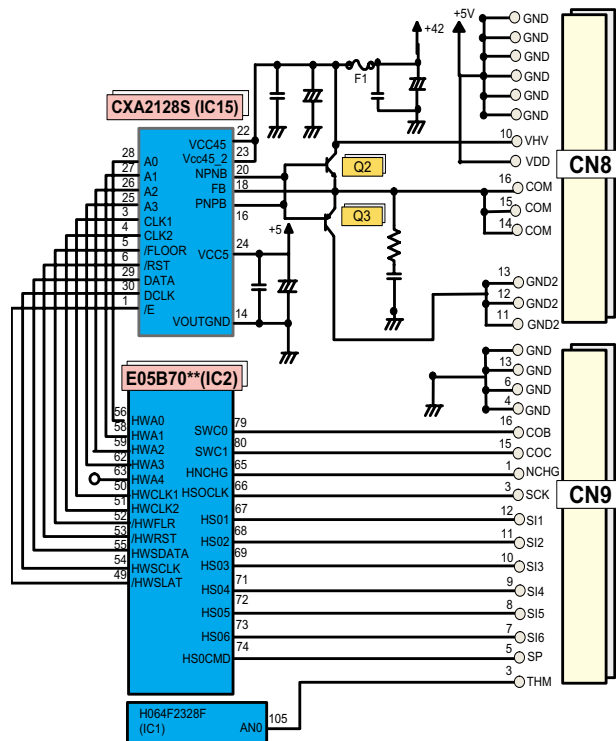


Figure 2-14. Printhead Drive Circuit

- Printhead Driver CircuitHead common driver circuit
The reference head drive waveform is produced in the common driver (IC15) based on the following 12 signal lines output from the ASIC (IC2); A0-A4, CLK1, CLK2, FLOOR, RST, DATA, DCLK, and E. Based on the DATA signal output from the ASIC (IC2), the original data for the head drive waveform is written in the memory in the common driver (IC15). The addresses for the written data are determined by the A0 - A4 signals, and, of among, data used to determine the waveform angles is selected and appropriate head driver waveform is generated. Generated head driver waveform is transferred to nozzle selector IC on the head driver board and applied to the nozzle PZT specified by nozzle selector IC.
- Head nozzle selector circuit
Printing data are allocated to the six rows, the number of the head nozzle rows, and converted into serial data by the ASIC (IC2). Then the converted data is transferred to the nozzle selector IC through the seven signal lines (SI0 to SI5. SI6 is not used in this product). Data transmission from the ASIC to the nozzle selector synchronizes with the SCK clock signal and the LAT signal. Referring to the transferred data, nozzles to be activated are selected, and the PZTs of the selected nozzles are driven by the drive waveform output from the head common driver.

2.2.2.3 PF Motor (PF/ PUMP/ ASF Motor) Driver Circuit

The motor driver IC (IC14) on C301MAIN drives PF/ PUMP/ ASF motor. Stylus COLOR 670 uses 4-phase 48-pole hybrid type stepping motor and performs constant current bi-polar drive.

ASIC (IC2) converts PF motor phase control signal to LB11847 micro step drive form and outputs to motor driver IC (IC14) LB11847 from port 107, 118. Based on this signal, IC14 determines the phase mode.

The current value on each phase is determined by ASIC (IC2) and outputs from port 109, 110, 111, 113, 114, 115 to driver IC (IC14). Motor driver IC generates motor driver waveform based on these input signals and controls the motor.

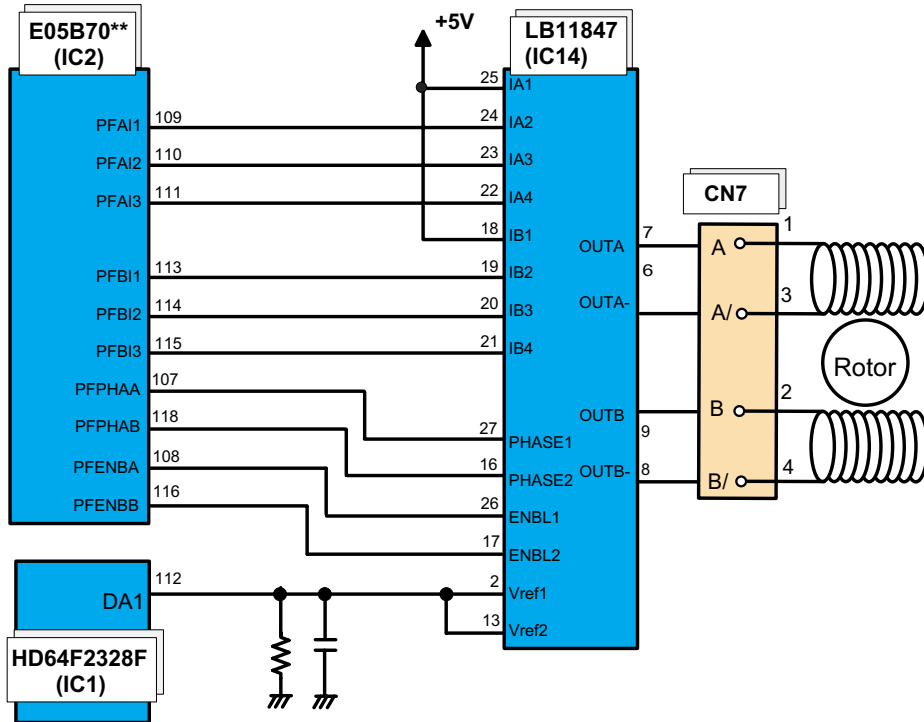


Figure 2-15. PF Motor Driver Circuit Block Diagram

2.2.2.4 CR Motor Driver Circuit

Motor driver IC (IC13) on C301MAIN board drives CR motor.

Stylus COLOR 670 uses 4-phase 200-pole hybrid type stepping motor and performs constant current bi-polar drive.

ASIC (IC2) converts CR motor phase control signal to LB11847 micro step drive form and outputs to motor driver IC (IC13) LB11847 from port 93, 105. Based on this signal, IC13 determines the phase mode.

The current value on each phase is determined by ASIC (IC2) and outputs from port 95 - 112 to driver IC (IC13). Motor driver IC generates motor driver waveform based on these input signals and controls the motor.

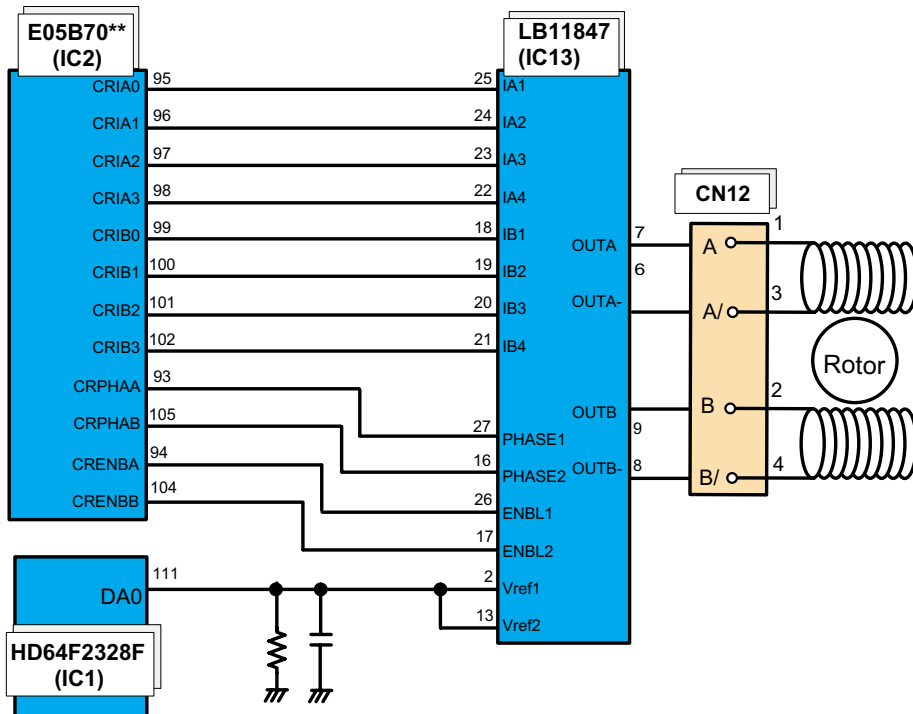


Figure 2-16. CR Motor Driver Circuit Block Diagram

2.2.2.5 Reset Circuit

Reset circuits consist of reset/ timer IC (IC5) and peripheral elements. Reset circuits are attached on the C301MAIN board to monitor the two voltages: +5V for the logic line and +42V for the drive line. When each circuit detects abnormality on the corresponding line, it outputs a reset signal to reset CPU (IC1) and ASIC (IC2). This function is necessary to prevent the printer from operating abnormally. This IC monitors both +5V and +45 lines but can reset them independently. The reset circuits outputs reset signal when +5V line becomes 4.3V or lower or +42V line becomes 35.5V or lower.

Reset ICs have built-in timer function, which manages timer control based on lithium battery.

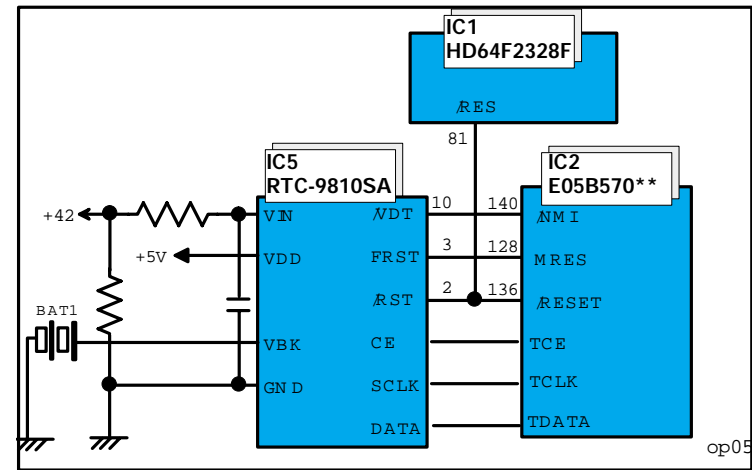


Figure 2-17. Reset Circuit Block Diagram

Main signal lines are explained below;

- RST: Reset line
- CE: Chip enable line
- VIN: +42V line supervising line
- VDD: +5V line supervising line
- VBK: Lithium battery backup voltage line
- DATA: Timer data line

2.2.2.6 EEPROM Control Circuit

Since EEPROM is nonvolatile memory, it keeps written information if the printer power is turned off. When the printer is turned ON, ASIC reads data from EEPROM (IC6) and when the power is turned OFF it stores data to EEPROM.

Information stored in EEPROM is listed below.

- Various ink counter (I/C consumption counter, waste pad counter, etc.)
- Mechanical setting value (Head ID, Bi-D adjustment, USB ID, etc.)
- Destination data (printable area setting, CG setting, etc.)
- Option setting (CPSI password, etc.)

See Appendix for EEPROM Address Map that provides detailed information on the values stored in EEPROM.

EEPROM is connected to ASIC with 4 lines and each line has the following function.

- CS: Chip selection signal
- CK: Data synchronism clock pulse
- DI: Data writing line (serial data) at power off.
- DO: Data reading line (serial data) at power on.

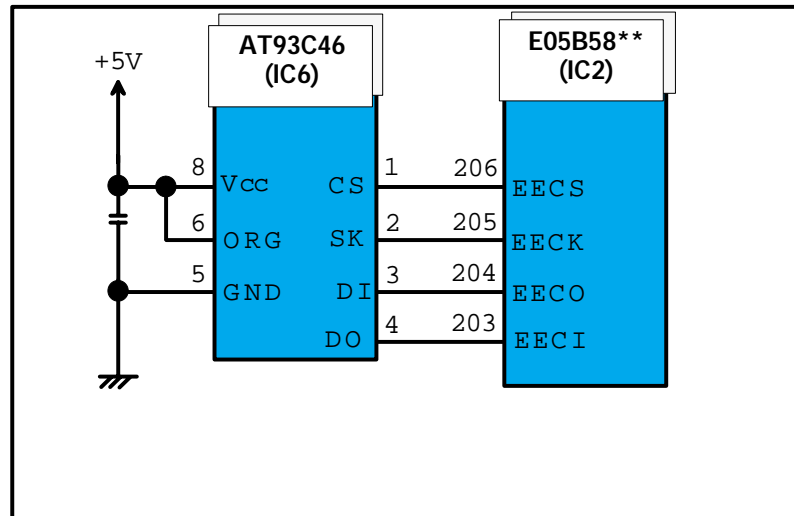


Figure 2-18. EEPROM Circuit Diagram

2.2.2.7 Sensor Circuit

C301MAIN is equipped with the following five sensors to detect the status of the printer.

- ❑ HP Sensor
 HP sensor uses photo interrupter method. HP sensor detects the carriage HP (home position). HP is the standard position for the print start position. When CR unit is within the home position, the sensor outputs +5V: When CR unit is out of the home position, the sensor outputs 0V.
- ❑ PE sensor
 PE sensor uses photo interrupter method. PE sensor detects paper on paper path of the printer. If paper passes, PE sensor outputs 0V. If there is no paper, the sensor outputs +5V. The signal output from this sensor and the stepping pulse of PF motor determines the paper top position and the bottom position and it is reflected to the printable area of paper feed direction.
- ❑ ASF HP sensor
 ASF HP sensor uses photo interrupter method. This sensor consists of the ASF HP detector wheel, which is attached on the ASF LD roller shaft, and a photo sensor. The ASF HP detector wheel has a small window and when this part is positioned between photo sensor terminals, the sensor detects ASF HP. When this window is within the ASF HP, the sensor outputs 0V, and when it is out of ASF HP, +5V is output. This sensor detects the ASF return lever position at the power on and detects standby state of the ASF LD roller.
- ❑ Thermistor (TH)
 The thermistor is attached directly on the printhead driver board. It monitors the temperature around the printhead and determines the proper head drive voltage according to the ink viscosity that varies by the temperature. This information is fed back to the ASIC analog port. When the temperature rises, the head drive circuit lowers the drive voltage: When the temperature lowers, the head drive circuit rises the drive voltage.

- ❑ Black/ Color cartridge sensor (COB/ COC)
 Cartridge sensor uses mechanical method. This sensor detects whether a black or color ink cartridge is installed in the CR unit. When an I/C is installed, this sensor outputs 0V: When no I/C is installed, the sensor outputs +5V.

The block diagram for the sensor circuit is shown below:

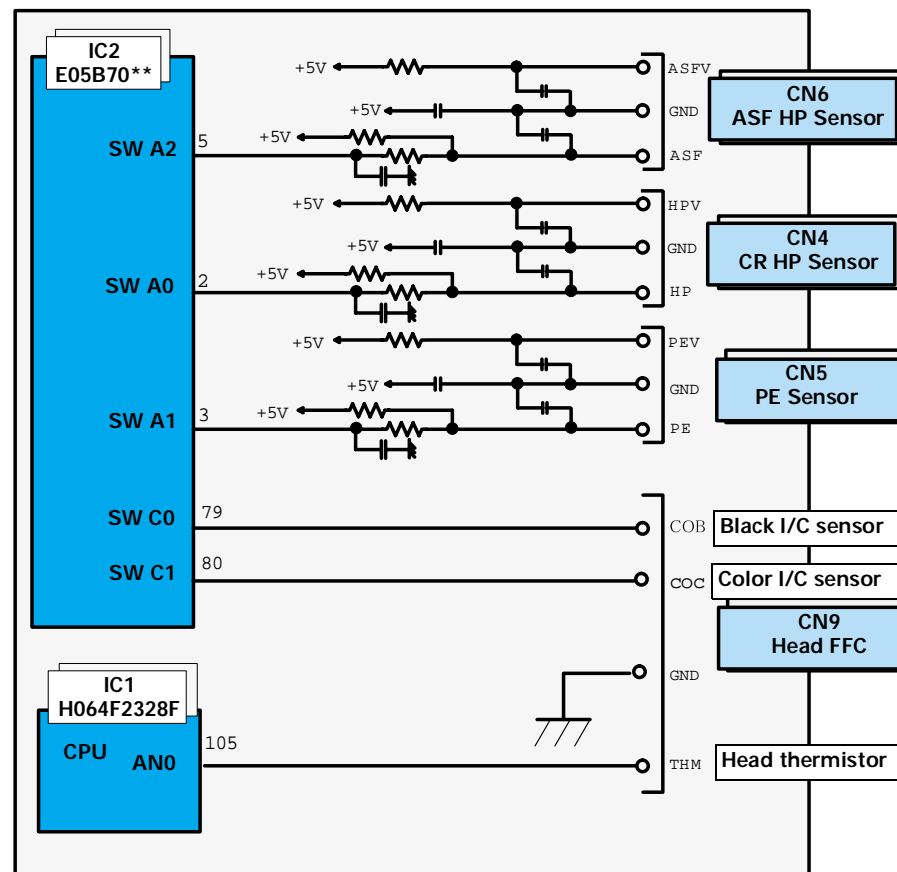


Figure 2-19. Sensor Circuit Diagram

CHAPTER

3

TROUBLESHOOTING

3.1 Overview

This chapter describes how to identify troubles in two levels: unit level repair and component level repair. Refer to the flowchart in this chapter to identify the defective unit and perform component level repair if necessary. This chapter also explains motor coil resistance, sensor specification and error indication.

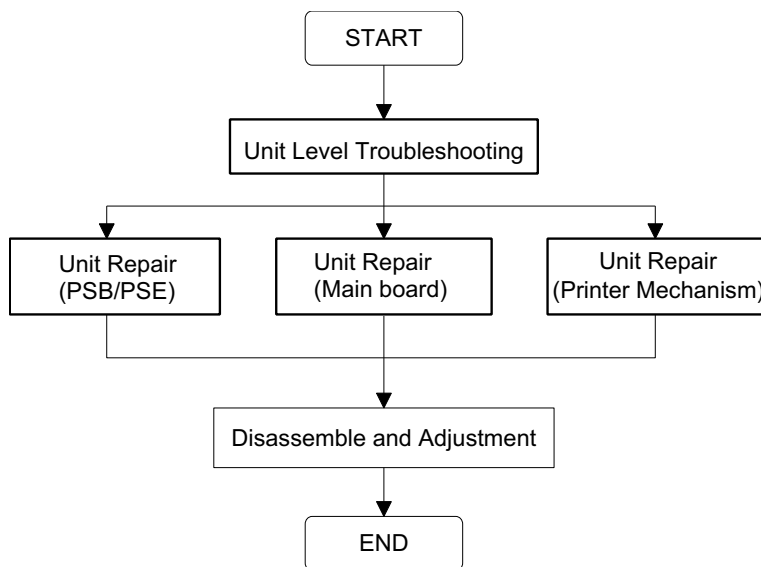


Figure 3-1. Troubleshooting Flowchart

Table 3-1. Motor Coil Resistances

Motor	Location	Check Point	Resistance
CR Motor	CN12	Pin 1 and 3 Pin 2 and 4	7.8 Ohms ±10% (at 25 °C/ phase)
PF Motor	CN7	Pin 1 and 3 Pin 2 and 4	7 Ohms ±10% (at 25 °C/ phase)

Table 3-2. Sensor Specifications

Sensor Name	Check Point	Signal Level	Switch Mode
HP Sensor	CN4/Pin 1 and 2	Less than 0.7V	Open (Out of HP range)
		More than 2.4V	Close (Within HP range)
PE Sensor	CN5/Pin 1 and 2	Less than 0.7V	Open (Paper exists)
		More than 2.4V	Close (No paper)
ASF HP Sensor	CN6/ Pin 1 and 2	Less than 0.7V	Open (Paper feed roller is at the home position)
		More than 2.4V	Close (Out of home position)
Thermistor (THM)	Head side CN9/ Pin 14 and 4	Analog signal	10 K (at 24 °C)
Black cartridge sensor (COB)	Head side CN9/ Pin 16 and 4	Open (No Cartridge): High	
		Close (Cartridge is installed): Low	
Color cartridge sensor (COC)	Head side CN9/ Pin 15 and 4	Open (No Cartridge): High	
		Close (Cartridge is installed): Low	

Table 3-3. LED Indicators

Condition	LED Indication				Remedy
	Power	Paper Check	Ink End (Black)	Ink End (Color)	
No Paper	--	On	--	--	Set paper
Paper Jam	--	Blink	Off	Off	Remove jammed paper
Ink End / No Cartridge (black)	--	--	On	--	Close the cartridge cover properly or replace the ink cartridge with new one.
Ink End / No Cartridge (color)	--	--	--	On	Close the cartridge cover properly or replace the ink cartridge with new one.
Ink Low (black)	--	--	Blink	--	Replace the ink cartridge with new one.
Ink Low (color)	--	--	--	Blink	Replace the ink cartridge with new one.
Maintenance Request	Blink	Blink	Blink	Blink	Replace the waste ink pad and reset the waste ink counter stored in EEPROM.
Fatal Error	Blink	Blink	On	On	Turn off and back on the printer. If the problem still remains, repair the related units.

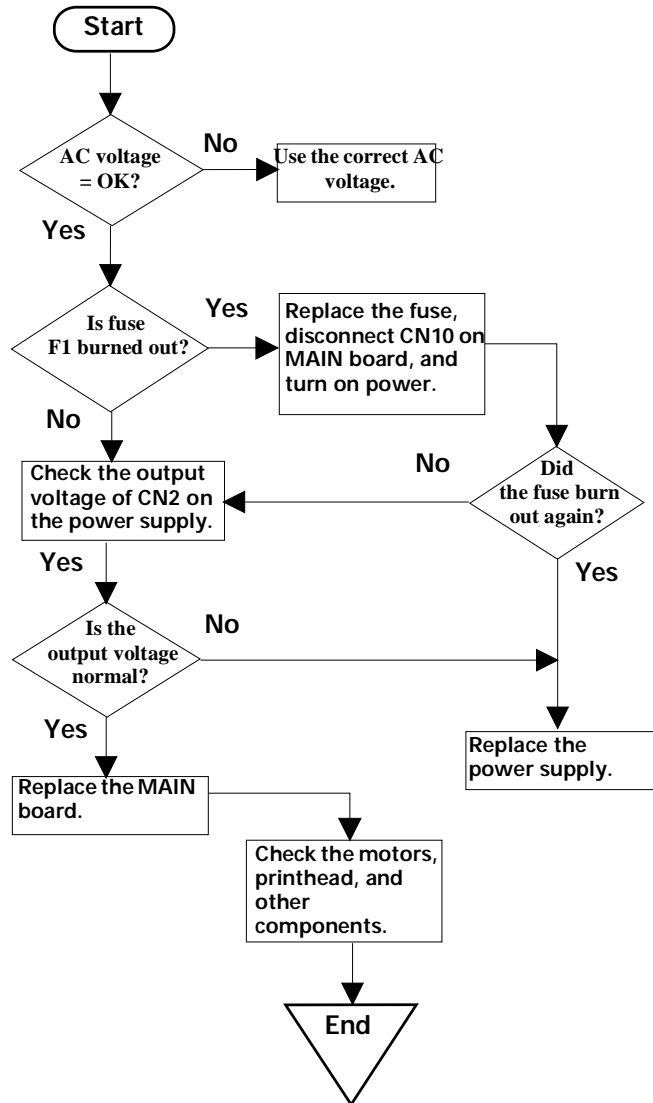
3.2 Unit Level Troubleshooting

You can identify the troubles, using flowcharts in this section and then find defective unit. When you find out defective unit, refer to "Unit Repair (Printer Mechanism)" to find defective components and replace them.

Table 3-4. Top-Level Troubleshooting

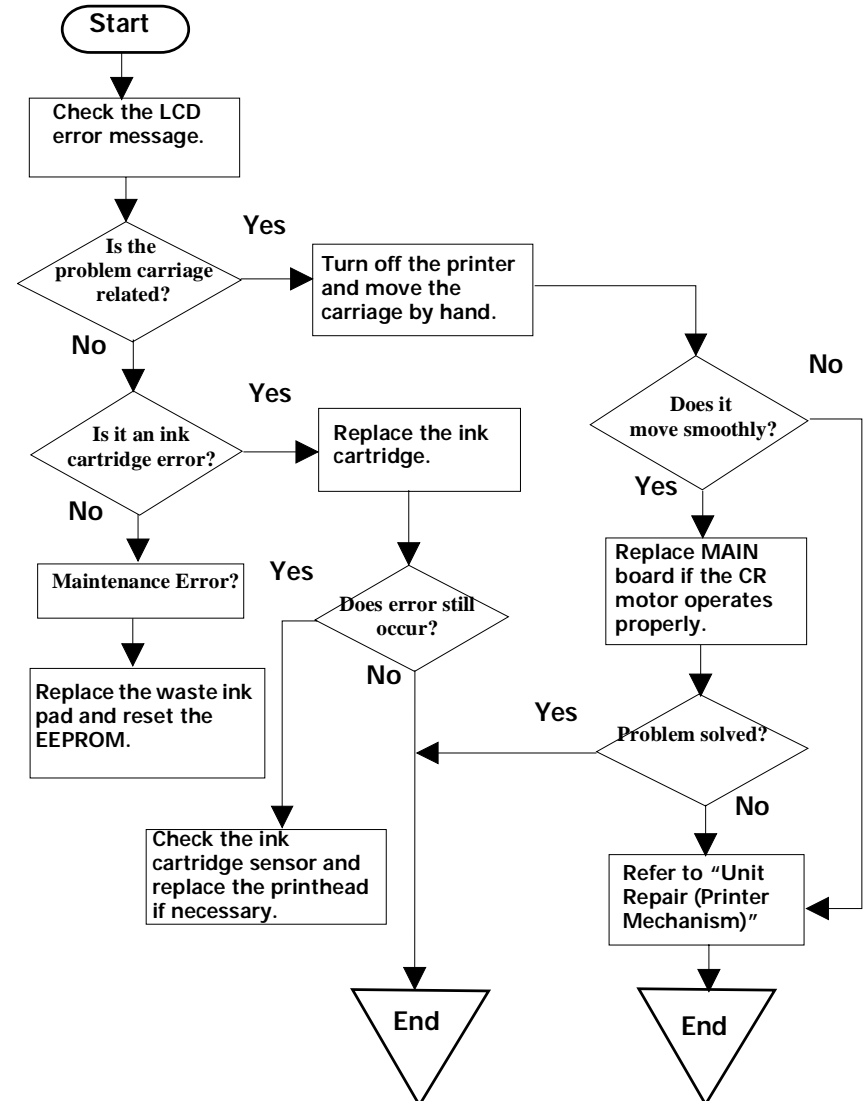
Symptom	Problem	Flowchart No.
Printer does not operate at power on.	LEDs do not light. Printer mechanism does not operate.	Flowchart 3-1
Error is detected	Error is indicated by LED indication.	Flowchart 3-2
Failure occurs during printing.	Printing is not performed. Abnormal printing (dot missing, etc.) Print quality is poor.	Flowchart 3-3
Printer does not feed paper correctly.	No paper is fed. Paper feed is irregular. Paper jam occurs.	Flowchart 3-4
Control panel operation is abnormal.	No response to button access.	Flowchart 3-5

3.2.1 Printer does not operate at power on



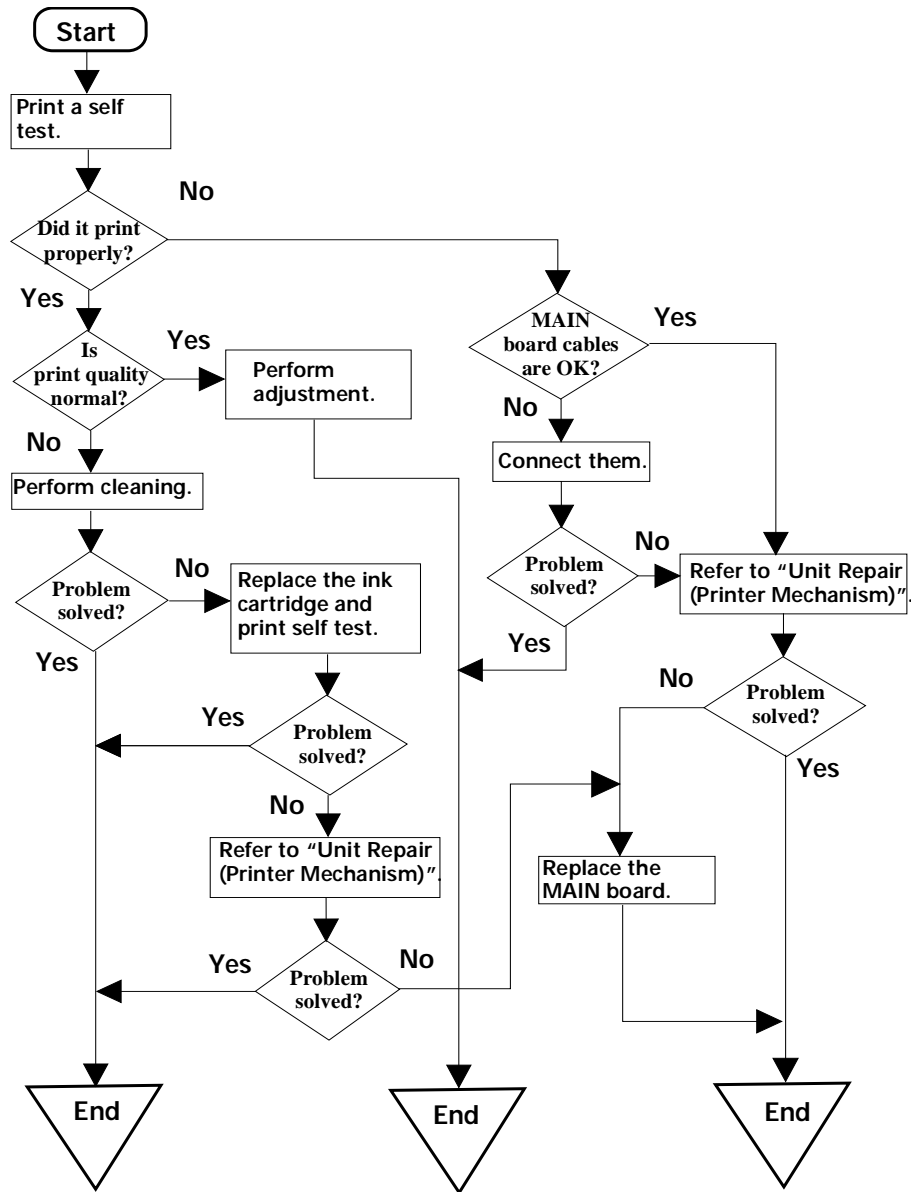
Flowchart 3-1.

3.2.2 Error is detected



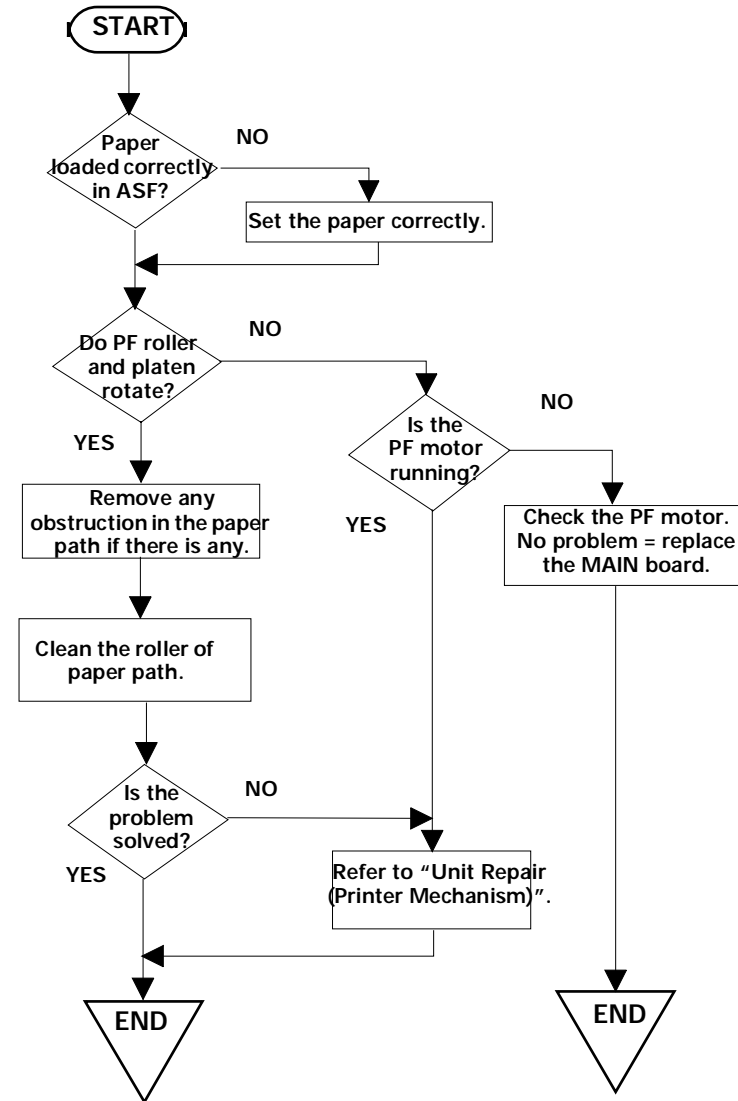
Flowchart 3-2.

3.2.3 Failure occurs during printing



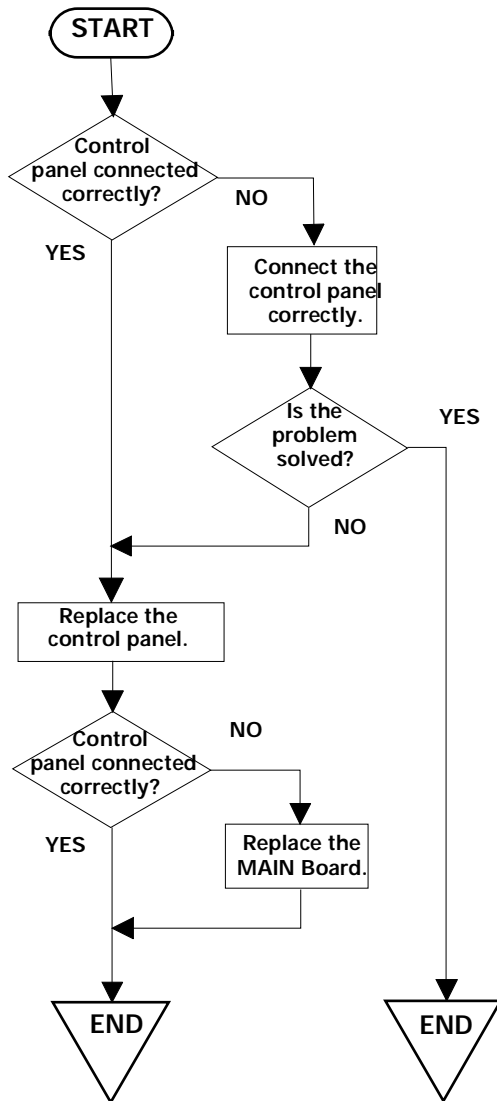
Flowchart 3-3.

3.2.4 Printer does not feed paper correctly



Flowchart 3-4.

3.2.5 Control panel operation is abnormal



Flowchart 3-5.

3.3 Unit Repair (Power Supply Board)

This section provides in-depth information for repairing the power supply board so that you can repair the board to the small parts level. The table below lists the probable causes for each symptom: you can select appropriate symptom from the table and check each parts and its function as described in the checkpoint.

Table 3-5. PSB Troubleshooting

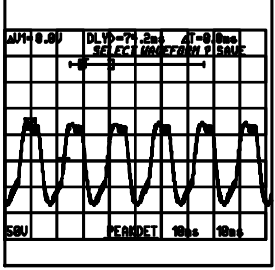
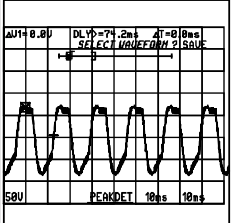
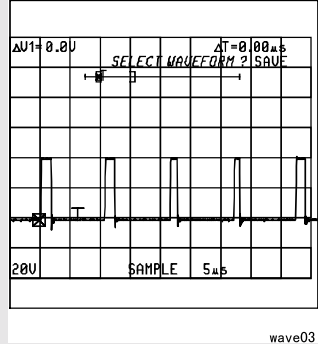
Symptom	Condition	Cause	Check point	Solution
The printer does not operate at all.	+42VDC line does not work.	F1 is open.	Check F1 is normal or not by using a multimeter.	Replace F1.
		Trans T1 is open.	Check T1 is normal or not by using a multimeter.	Replace T1.
		FET(Q1) is broken.	Check the drain waveform. 	Replace Q1.
		Q2 or Q3 is broken.	Check the collector wave. 	Replace Q2 or Q3.
		PC1 is broken.		Replace PC1.

Table 3-5. PSB Troubleshooting (continued)

Symptom	Condition	Cause	Check point	Solution
The printer does not operate at all.	+5VDC line does not work.	IC51(FA36 35P) is broken.	Check the output waveform (pin 8). 	Replace IC51.

3.4 Unit Repair (Control Board)

This section provides in-depth information for repairing C301MAIN board so that you can repair the board to the small parts level. The table below lists the probable causes for each symptom: you can select appropriate symptom from the table and check each parts and its function as described in the checkpoint.

Table 3-6. Control Board Troubleshooting

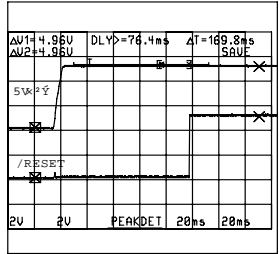
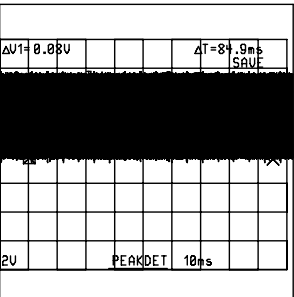
Symptom	Condition	Cause	Check point	Solution
The printer does not operate at all.	CPU does not work.	Reset circuit is broken.	Check +5VDC line (Pin 7 of IC5) and reset signal (Pin 2 of IC5). 	Replace IC8.
		ROM is not selected correctly.	Check that the waveform of Pin 11 of IC3 reverses High/Low.	Replace IC3.
		CPU is broken.	Check the signal waveform Pin 86 of IC1. 	Replace IC2.

Table 3-6. Control Board Troubleshooting (continued)

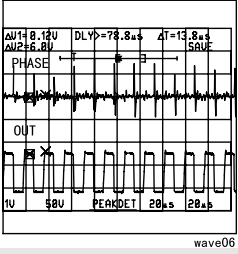
Symptom	Condition	Cause	Check point	Solution
Carriage does not operate correctly.	CR motor does not operate properly.	IC2 is broken.	Check the PHASE (Pin 16 and 27) of IC13 and signal waveform of OUT (Pin 7,6,9,8). 	If PHASE-DATA is not input, replace IC2.
		IC13 is broken.	Check if waveform of OUT (Pin 7,6,9,8) is output from IC13.	If OUT is not output from IC13, replace IC13.

Table 3-6. Control Board Troubleshooting (continued)

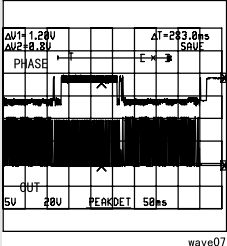
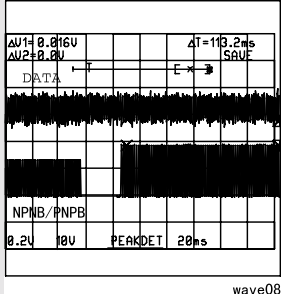
Symptom	Condition	Cause	Check point	Solution
Paper feed operation is abnormal.	PF motor does not revolve.	IC2 is broken.	Check the PHASE (Pin 16,27) of IC 14, and signal waveform of OUT (Pin 7,6,9,8). 	If PHASE signal is not input, replace IC2.
		IC14 is broken.	Check if waveform of OUT (Pin 7,6,9,8) is output from IC14.	If OUT is not output from IC14, replace IC14.

Table 3-6. Control Board Troubleshooting (continued)

Symptom	Condition	Cause	Check point	Solution
Abnormal printing	Printing is not performed or the print data is turned to the set of unrecognizable characters.	IC2 is broken.	Check the signal waveform of DATA (Pin 29) of IC15 and Common NPNB/PNPB(Pin 20/16). 	If DATA is not input, replace IC2.
		IC15 is broken.	Check the output waveform of NPNB/ PNPB, FB of IC15.	If no output signal of NPNB/ PNPB, FB from IC15, replace IC15.

3.5 Unit Repair (Printer Mechanism)

This section provides in-depth information for repairing the printer mechanism so that you can repair the printer mechanism to the small parts level. The table below lists the probable causes for each symptom: you can select appropriate symptom from the table and check each parts and its function as described in the checkpoint.

Table 3-7. Printer Mechanism Troubleshooting

Symptom	Condition	Cause	Check Point	Solution
Abnormal pump mechanism	Abnormal PF motor operation when the power is turned on.	Foreign substances are loaded in the PF gears.	Manually drive the PF drive gear and check if it rotates normally.	Remove any foreign substances.
		The PF motor is defective.	Check the inner coil resistance and see if there is any disconnection of the coil. (Refer to Table 3-1, "Motor Coil Resistancs," on page 53.)	Exchange the PF motor.
Defective pump absorption	-Dot missing is not solved even after cleaning operation. -Used ink is not drained to the waste ink pad.	The pump tube is squashed.	Check the tube visually.	Exchange the tube.
		The cap is damaged or deformed.	Check the cap visually.	Exchange the cap mechanism.

Table 3-7. Printer Mechanism Troubleshooting (continued)

Symptom	Condition	Cause	Check Point	Solution
Abnormal carriage operation	Carriage operation is abnormal when tuning on the power.	CR HP sensor is defective.	-Does panel LED indicate fatal error? -Check if the connector of CR HP sensor is properly connected to the sensor or CN4 on the MAIN board? -Check if CR HP sensor operates properly.	-Connect CR HP sensor connector. -Exchange CR HP sensor.
		The CR motor is defective.	Check the inner coil resistance and see if there is any disconnection of the coil. (Refer to Table 3-1, "Motor Coil Resistancs," on page 53.)	Exchange the CR motor.

Table 3-7. Printer Mechanism Troubleshooting (continued)

Symptom	Condition	Cause	Check Point	Solution
Abnormal carriage operation.	Carriage operation is abnormal when tuning on the power.	CR lock lever is not released.	-Check if the drive of PF motor is transmitted to paper eject roller. -If paper eject roller revolves by the drive from PF motor, check if the pump unit, paper eject roller and right end gear are engaged properly.	
	Carriage operation is abnormal during the printing operation.	Carriage movement is not smooth.	Manually move the carriage and check if it moves smoothly.	Clean the carriage guide shaft and lubricate it.
			Check the tension of the timing belt.	Repair the tension mechanism or replace it.
			Check if there is any foreign substances on the carriage path.	Remove any foreign objects.

Table 3-7. Printer Mechanism Troubleshooting (continued)

Symptom	Condition	Cause	Check Point	Solution
Printing is not performed.	Carriage moves but no printing is performed.	Head FFC is not connected properly.	Check visually if the head FFC on the carriage or on the board is connected properly.	Connect FFC properly.
		FFC is disconnected inside.	Check the FFC by using a multimeter if there is any electric conductivity.	Replace the FFC.
		I/C is defective.	Install a new I/C and perform the self-test.	Replace I/C.
		Head Unit is defective.	If the condition does not improve even after 2 or 3 times of cleaning operation, replace the head unit and perform the self-test.	Replace the head unit.

Table 3-7. Printer Mechanism Troubleshooting (continued)

Symptom	Condition	Cause	Check Point	Solution
Abnormal printing	Only a particular dot causes abnormal printing.	Printhead surface is not clean.	Check the printing quality after performing the cleaning several times.	Perform cleaning.
		Head unit is defective.	Check the printing quality after performing the cleaning several times.	Replace the head, if the print quality does not recover.
		Absorber in the cap is touching the head surface.	Visually check the condition of the head absorber.	Replace the absorber in the cap if it is deformed.

Table 3-7. Printer Mechanism Troubleshooting (continued)

Symptom	Condition	Cause	Check Point	Solution
Abnormal Printing	Sometimes printing is not performed.	Printhead surface is not clean.	Perform cleaning several times and check the print quality.	Perform cleaning.
		FFC is disconnected inside.	Check the FFC by using a multimeter if there is any electric conductivity.	Replace the head FFC.
		Head FFC is out of connection.	Check if head FFC on the carriage or on the board is connected properly.	Connect Head FFC firmly.
		Head Unit is defective.	Perform cleaning operation 2 or 3 times and perform the self-test.	Replace the head unit, if it does not recover after performing cleaning.
		I/C is defective.	Install the new I/C and perform self-test.	Replace I/C.
	The print data is turned to the set of unrecognizable characters.	The head FFC is out of connection.	Check the FFC by using a multimeter if there is any electric conductivity.	Connect FFC properly.
		The head unit is defective.	Check connection with the head FFC.	Replace the head if there is no connection problem with the FFC.

Table 3-7. Printer Mechanism Troubleshooting (continued)

Symptom	Condition	Cause	Check Point	Solution
Abnormal Printing.	A vertical line is not aligned.	Bi-directional alignment is not adjusted.	Perform Bi-D adjustment.	Refer to Chapter 5 "Adjustment".
	White line appears in the image data.	Head angle is not correct.	Perform head angle adjustment.	Refer to Chapter 5 "Adjustment".
		Platen gap is not right.	Perform Platen Gap adjustment.	Refer to Chapter 5 "Adjustment".
		Dot shooting direction is tilted because head surface is not clean.	Perform cleaning several times and check the print quality.	Perform the cleaning operation.
		I/C is defective.	Install a new I/C and perform self-test.	Replace I/C.
		Head unit is defective.	Head unit is broken.	Replace the head unit.
	Print irregularity appears along with CR scanning direction.	-Abnormal CR guide surface -Top frame CR holder rail is deformed.	-Check CR guide surface. -Check the form of top frame CR holder rail.	Replace the CR guide shaft and top frame.

Table 3-7. Printer Mechanism Troubleshooting (continued)

Symptom	Condition	Cause	Check Point	Solution
Abnormal Paper Feeding.	Paper is not fed.	Friction of the LD roller.	Load paper and check if the LD roller revolves smooth when picking up paper.	Clean the LD roller with the cleaning sheet. Replace the LD roller if it does not recover.
		Abnormal operation of the hopper.	Check the movement of the ASF hopper visually.	Replace the ASF.
		Malfunction of ASF drive switching function.	Insert DE lever to the left side of the CR shaft and check if drive from PF roller is transmitted to the ASF.	Replace the DE lever and ASF drive switching gear.
		Friction of PF roller	Check if the PF roller slips during the paper feeding.	Clean the PF roller by the cleaning sheet. Replace the PF roller if the problem is not solved.
	Page heading position is wrong.	PE sensor is defective.	-Check if PE sensor lever moves smoothly. -Check if the assembly with the right paper guide is made correct and check if there is any foreign substances.	-Replace the PE sensor assembly. -Re-assemble each part and remove foreign substances.

Table 3-7. Printer Mechanism Troubleshooting (continued)

Symptom	Condition	Cause	Check Point	Solution
Printer stops during initialization	Fatal error appears.	ASF sensor is defective.	Check the signal level of the ASF sensor.	Replace ASF sensor.
		HP sensor is defective.	Check the signal level of the HP sensor.	Replace HP sensor.
		CR motor is defective.	Check the CR motor cable is connected properly.	Replace the CR motor if there is no problem in the cable connection.
		PF motor is defective.	Check if the PF motor cable is connected properly.	Replace the PF motor if there is no problem in the cable connection.

CHAPTER

4

DISASSEMBLY AND ASSEMBLY

4.1 Overview

This section describes procedures for disassembling the main components of EPSON Stylus COLOR 670. Unless otherwise specified, disassembly units or components can be reassembled by reversing the disassembly procedure. Things, if not strictly observed, could result in injury or loss of life are described under the heading "Warning". Precautions for any disassembly or assembly procedures are described under the heading "Caution". Chips for disassembling procedures are described under the heading "Check Point". Any adjustment required after disassembling the units are described under the heading "Adjustment Required". When you have to remove any units or parts that are not described in this chapter, refer to the exploded diagrams in the appendix.

Read precautions below before starting.

4.1.1 Precautions

A lithium battery is installed on the MAIN Board of this printer for backing up the system clock. Mishandling the battery may cause explosion or short. Read carefully the following precautions.



- **Disconnect the power cable before disassembling or assembling the printer.**
- **Wear protective goggles to protect your eyes from ink. If ink gets in your eye, flush the eye with fresh water and see a doctor immediately.**
- **If ink comes into 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 serving 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. The leakage may affect other devices close to the battery.)**
 - **Do not charge the battery. (An explosion 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 may also be resulted.)**
 - **Do not install the battery in the wrong direction. (This may cause burning or explosion.)**
- **Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacture. Dispose the used batteries according to government's law and regulations.**



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



- **Never remove the ink cartridge from the carriage unless this manual specifies to do so.**
- **When transporting the printer after installing the ink cartridge, be sure to pack the printer for transportation 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 the specified adjustments when you disassemble the printer. (See Chapter 5 for details.)**
- **When assembling, if an ink cartridge is removed and needs to be installed again, be sure to install a new ink cartridge because of the following reasons;**
 - **Once the ink cartridge mounted on the printer is removed, air comes in and creates bubbles in the cartridge. These bubbles clog ink path and cause printing malfunction.**
 - **If an ink cartridge in use is removed and is reinstalled, ink quantity will not be detected correctly since the counter to check ink consumption is cleared.**
- **Because of the reasons above, make sure to return the printer to the user with a new ink cartridge installed.**

4.1.2 Tools

Use only specified tools to avoid damaging the printer.

Table 4-1. Required Tools

Name	Supplier	Parts No.
Phillips Screw Driver (No.1)	EPSON	B743800100
Phillips Screw Driver (No.2)	EPSON	B743800200
Nipper	EPSON	B740500100
Tweezers	EPSON	B741000100
Thickness Gauge	EPSON	B776702201

4.1.3 Work Completion Check

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

Table 4-2. Check List

Classification	Item	Check Point	Status	
Main Unit	Self-test	Is the operation normal?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary	
	On-line Test	Is the printing successful?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary	
	Printhead	Is ink discharged normally from all the nozzles?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary	
	Carriage Mechanism		Does it move smoothly?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary
			Is there any abnormal noise during its operation?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary
			Is there any dirt or foreign objects on the CR Guide Shaft?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary
			Is the CR Motor at the correct temperature? (Not too heated?)	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary
	Paper Feeding Mechanism		Is paper advanced smoothly? • No paper jamming? • No paper skew? • No multiple feeding? • No abnormal noise?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary
			Is the PF Motor at correct temperature?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary
			Is the paper path free of any obstructions?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary

Table 4-2. Check List (continued)

Classification	Item	Check Point	Status
Adjustment	Specified Adjustment	Are all the adjustment done correctly?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary
Lubrication	Specified Lubrication	Are all the lubrication made at the specified points?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary
		Is the amount of lubrication correct?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary
Function	ROM Version	Version:	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary
Packing	Ink Cartridge	Are the ink cartridges installed correctly?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary
	Protective Materials	Have all relevant protective materials been attached to the printer?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary
Others	Attachments, Accessories	Have all the relevant items been included in the package?	<input type="checkbox"/> Checked <input type="checkbox"/> Not necessary

4.2 Disassembly

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

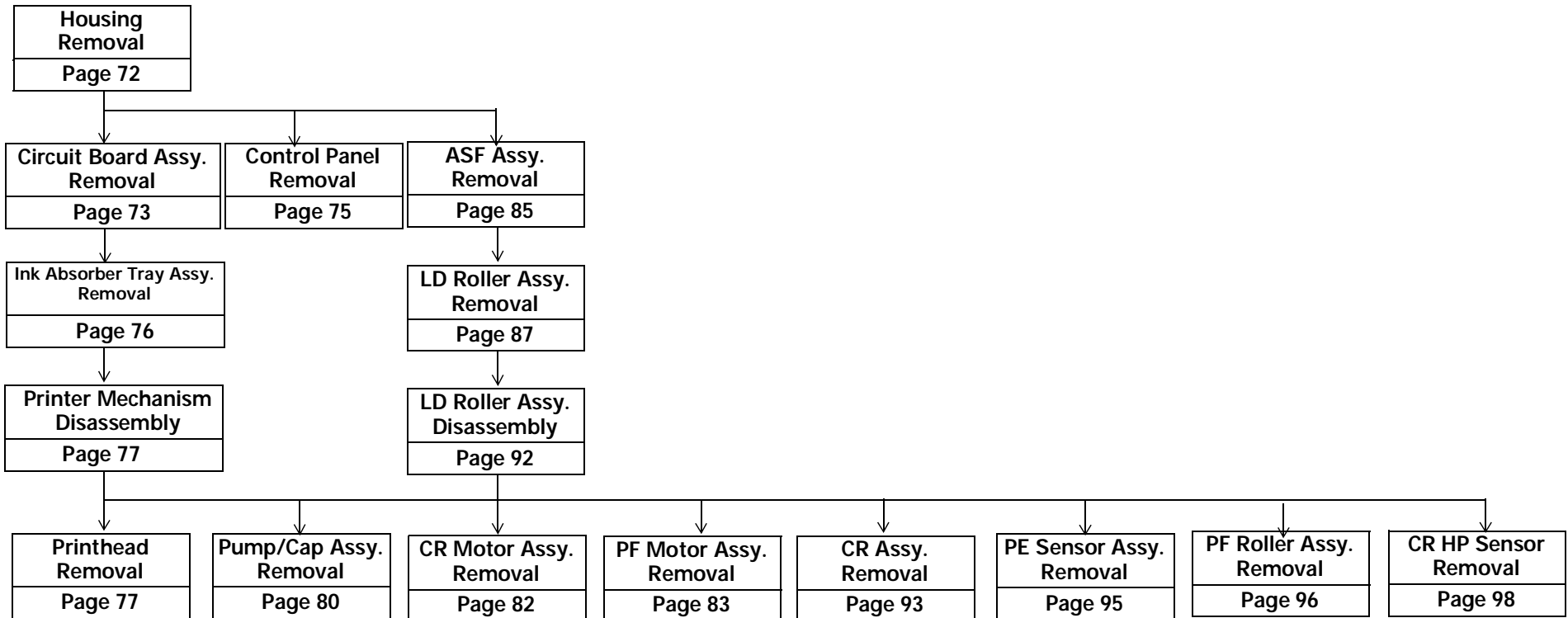


Figure 4-1. Flowchart

4.2.1 Housing Removal

Since this printer has no lower Housing, the Printer Mechanism is exposed just by removing the Housing.

1. Open the Printer Cover and set the PG Adjust Lever to (+) position.
2. Remove 4 screws and remove the Housing.



When removing the Housing, be sure to keep the Housing out of carriage: Pull the Housing toward the printer front side and lift it upward.



When installing the Housing, be careful not to pinch the cable with the screw at the rear side of the Housing. Make sure the Head FFC is set properly inside the rail on the back of the Housing.

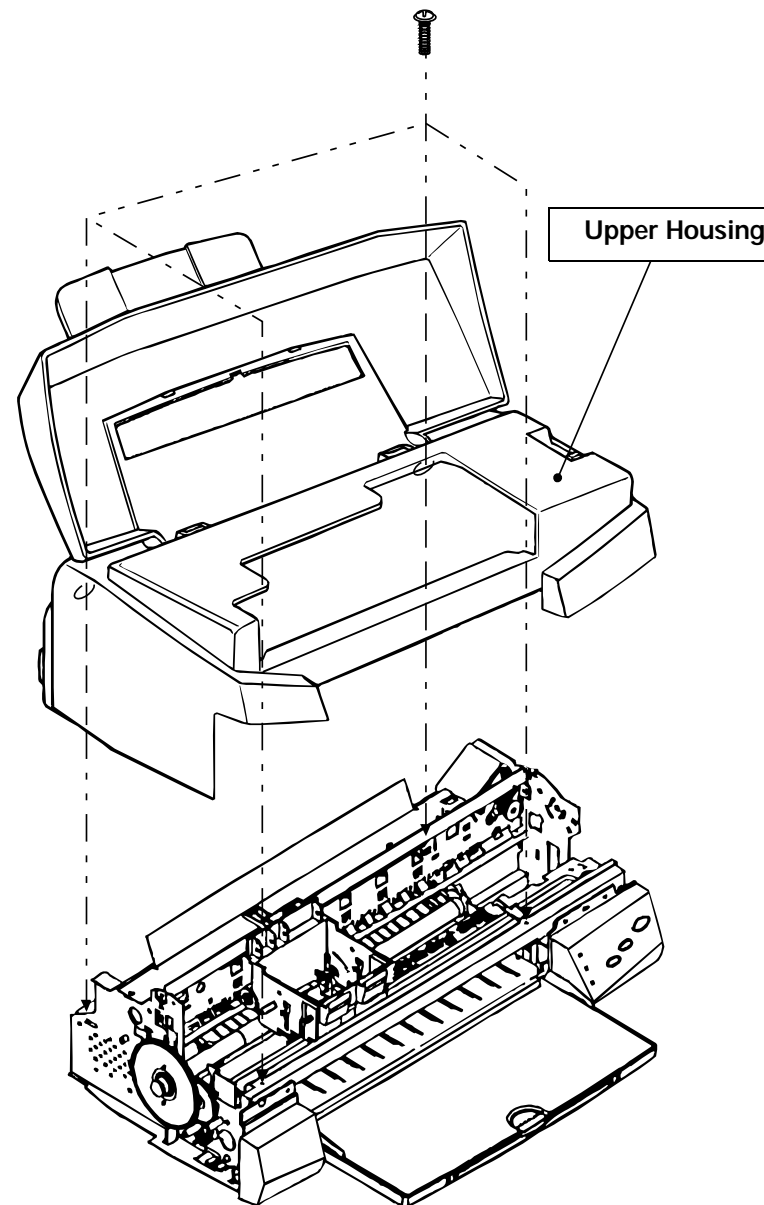


Figure 4-2. Housing Removal

da02

4.2.2 Circuit Board Assembly Removal

1. Remove the Housing. ("Housing Removal" on page 72)
2. Remove 5 screws securing the Printer Mechanism to the M/B Shield Plate.

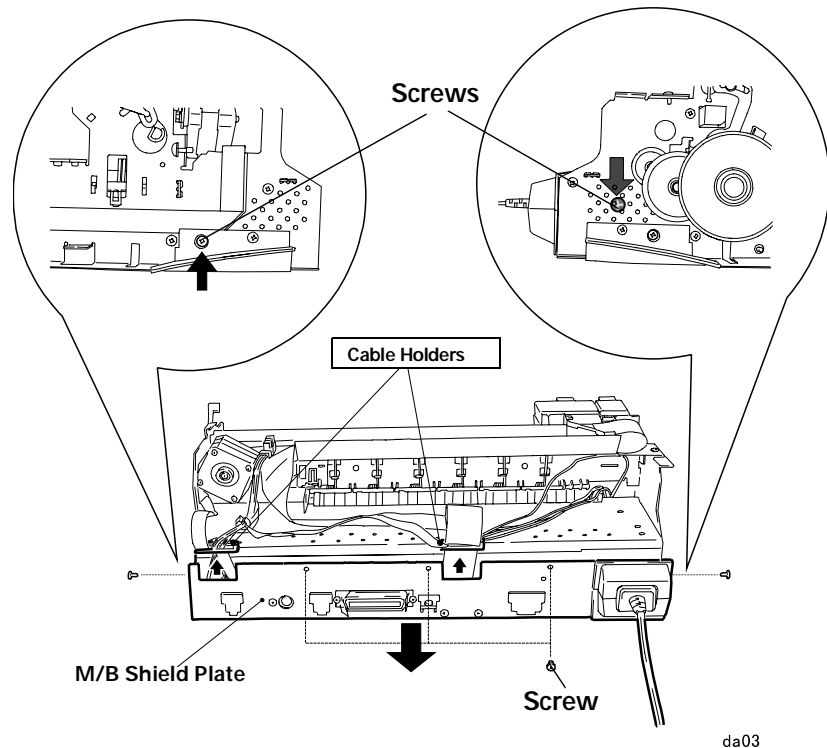


Figure 4-3. M/B Shield Plate Removal

3. Slightly pull out the M/B Shield Plate and remove the cable holder installed on the M/B Shield Plate.
4. Disconnect all the cables from the connectors on the C301MAIN Board.
5. Remove the Circuit Board Assembly from the Printer Mechanism.

6. When removing each board unit from M/B Shield Plate, remove screws securing each board (C301MAIN Board: 10 screws, C301PSB/PSE: 4 screws) and remove the boards respectively.

NOTE: When removing each board separately, release the lock of the connector CN10 and pull the cable out of CN10.

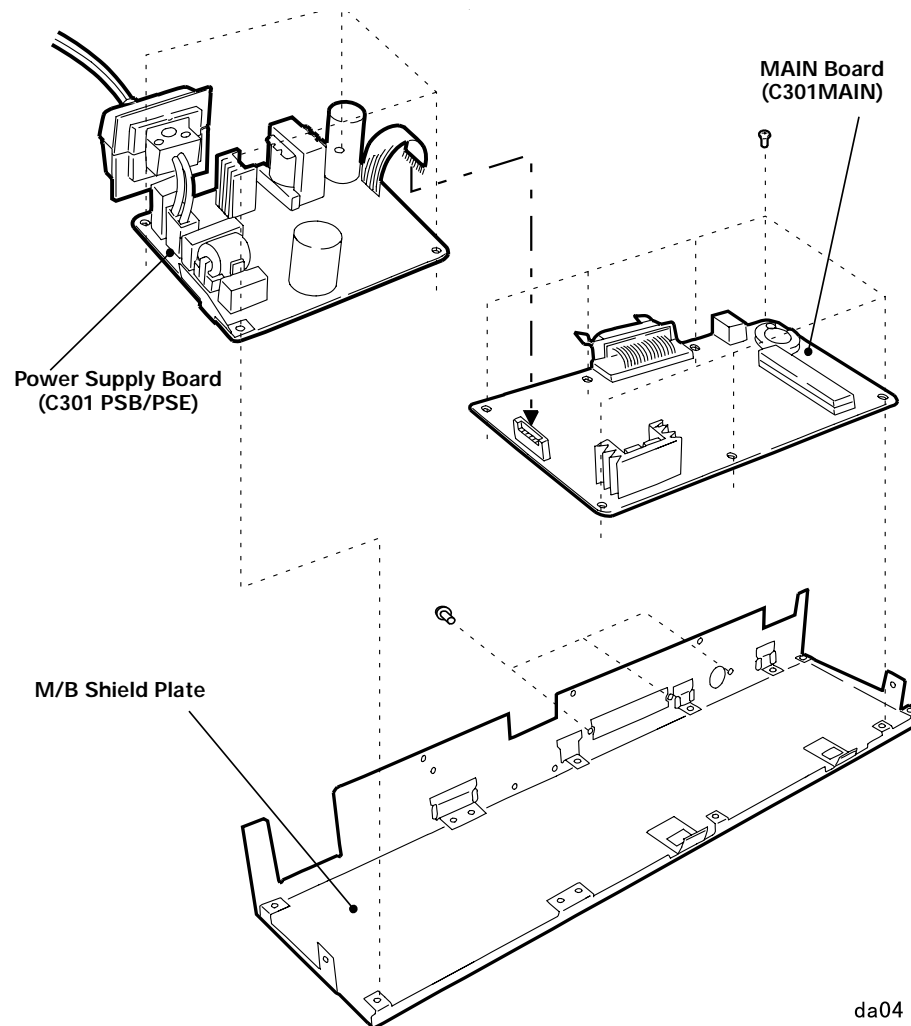


Figure 4-4. C301MAIN / C301PSB/PSE Removal



After replacing C301MAIN Board, perform the following adjustments.

- Head ID Input (See “Head ID Input” on page 107)
- Bi-D Adjustment (See “Bi-D Adjustment” on page 112)
- USB ID Input (See “USB ID Input” on page 115)



When the MAIN Board is replaced, the value of Ink Cartridge Consumption Counter and the Waste Pad Counter is reset.

So, replace the following parts as well.

(Refer to “Special Setting Mode” on page 26 and “Protection Counter Indication / Reset” on page 119.)

- Ink Cartridge
- Waste Ink Pad

4.2.3 Control Panel Removal

1. Remove the Housing. (See "Housing Removal" on page 72)
2. Remove 2 screws securing the Control Panel, then remove the Control Panel from the Printer Mechanism.
3. Remove the screw securing the Left Housing Panel to the Printer Mechanism.
4. Remove 2 screws securing the Panel Board Assembly to the Printer Mechanism, then remove C209PNL Board from the Panel Assembly.
5. Remove FFC from the connector on the C209PNL Board.



By removing the Control Panel, the Stacker Assembly can be also detached from the Printer Mechanism, since it is held by the Control Panel Assembly.

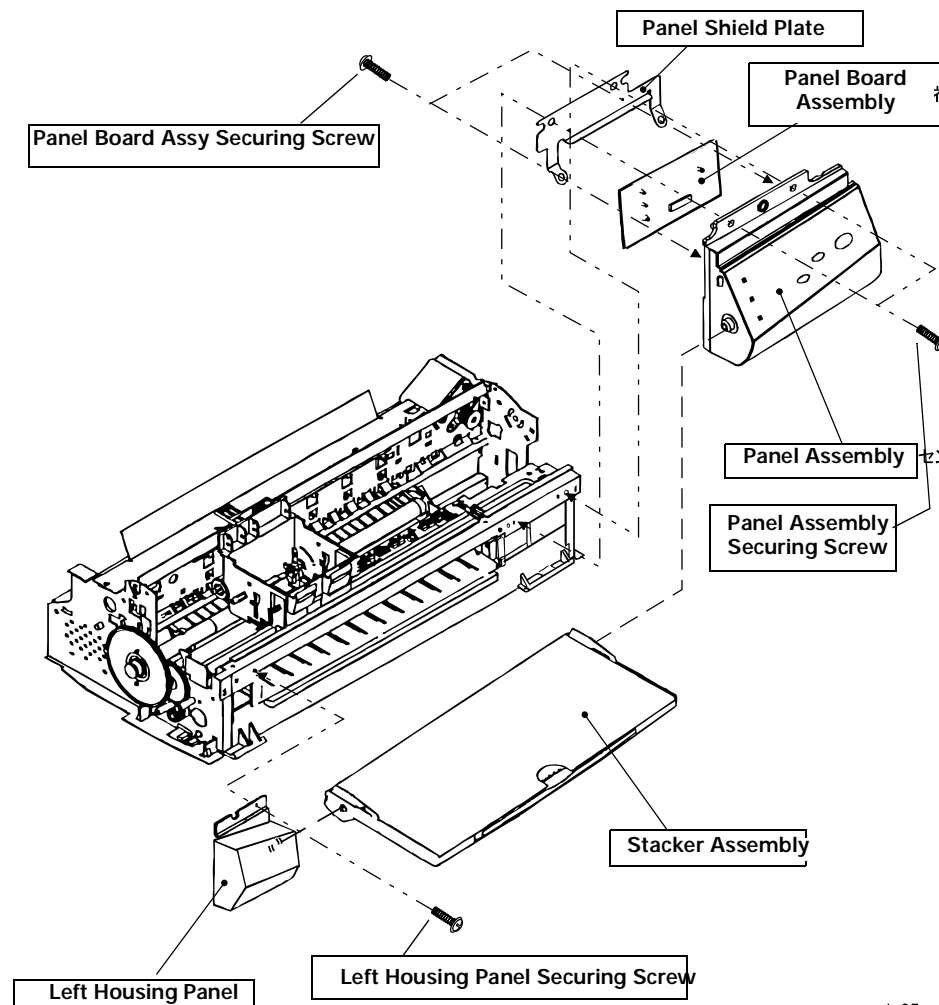


Figure 4-5. Control Panel Removal

da05

4.2.4 Ink Absorber Tray Assembly (Waste Ink Pad) Removal

1. Remove the Housing. (See "Housing Removal" on page 72)
2. Remove the Control Panel. (See "Control Panel Removal" on page 75)
3. Remove one screw securing the Ink Absorber Tray Assembly to the right side of the Printer Mechanism.

Remove the Spacer Tray securing the Ink Absorber Tray Assembly at the left side of the Printer Mechanism and remove the Ink Absorber Tray Assembly by pulling it downward.

CAUTION



Be sure to reset the Waste Ink Counter, when replacing the Ink Absorber Tray Assembly or Ink Absorber (Ink Pad) inside. The Waste Ink Counter is reset by the special setting mode of the panel operation or by the adjustment program. (See "Special Setting Mode" on page 26, "Protection Counter Indication / Reset" on page 119.)

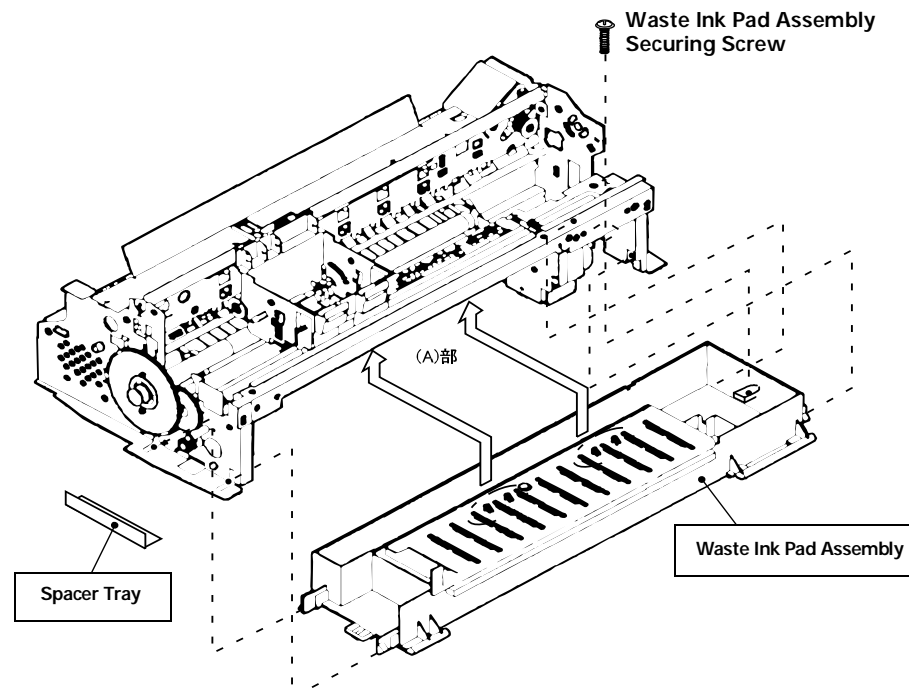


Figure 4-6. Ink Absorber Tray Assembly Removal

4.2.5 Printer Mechanism Disassembly

4.2.5.1 Printhead Removal

1. Remove the Housing. (See "Housing Removal" on page 72)
2. Rotate Combination Gear, 6, 34.4 toward the front side of the printer and release the CR Lock Lever from the CR Assembly. Then, move the CR Assembly to the left side.
3. Remove Black and Color Ink Cartridges.
4. Remove Black I/C Cover and Color I/C Cover from the CR Assembly.
5. Remove the Torsion Spring, 49 from the CR Assembly and remove 1 screw securing Head Fastener from the right side of the CR Assembly.
6. Remove two hooks securing the Head FFC Holder at the back side of the CR unit and remove the Head FFC holder.
7. Lift the Printhead upward and remove it from CR Assembly. Carefully remove 2 Head FFCs from the connector on the Printhead Board.

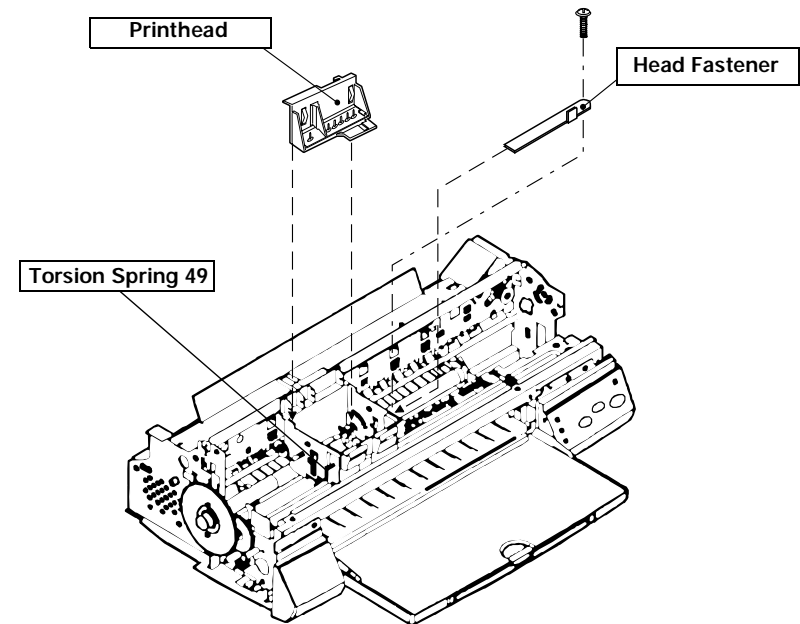


Figure 4-7. Printhead Removal

CAUTION

- When removing the Head FFCs from the Printhead Board, do not pull two FFCs together. As shown in the figure below, one of the Head FFCs is inserted to the connector on the Head Board horizontally and if you pull this FFC upward, FFC may be broken. (See Figure 4-8, "Head FFC Removal")

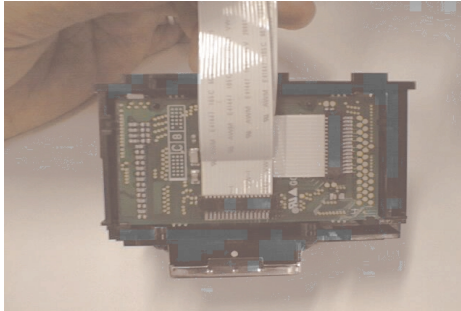


Figure 4-8. Head FFC Removal

- When removing the securing screw of the Head Fastener, be sure to hold the CR Assembly by hand. If you do not hold CR Assembly when loosening or tightening the screw, the Top Frame may be deformed, resulting in low quality print.
- When you assemble the Head FFC holder, be sure that the two hooks of the Head FFC holder and the one joint portion are secured to the CR unit. See Figure 4-9.

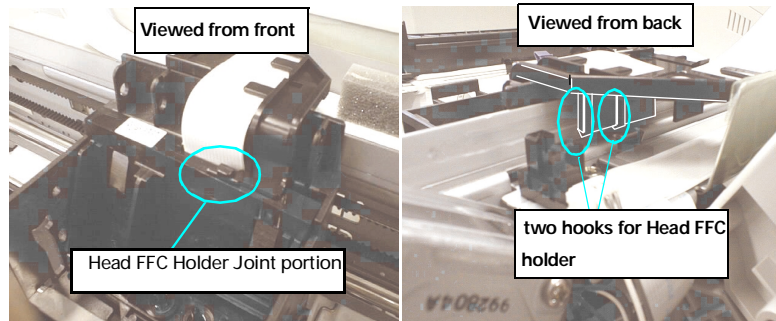


Figure 4-9. Head FFC Holder



- Be sure that the Head Grounding Plate is installed to the carriage correctly. (There are 2 position marking pins on the carriage.)
- After installing the printhead to the carriage, make sure that the position marking pin at the carriage side is correctly located into the cutoff of the printhead.



- Install a new cartridge before sending back the printer to the user, since the ink cartridge once taken out can not be used again.
- Installation of I/C must be carried out by I/C replacement sequence. Otherwise, ink may not be ejected properly.
- When you return the printer to the user, pack the printer with ink cartridges installed.
- When you return the printer to the user, make sure CR Lock Lever is set properly and then pack the printer.



Perform the following adjustment after replacing the printhead in the order below;

1. Ink Initial Charge (See "Initial Ink Charge" on page 118)
2. Head ID Input (See "Head ID Input" on page 107)
3. Head Angular Adjustment (See "Head Angular Adjustment" on page 109)

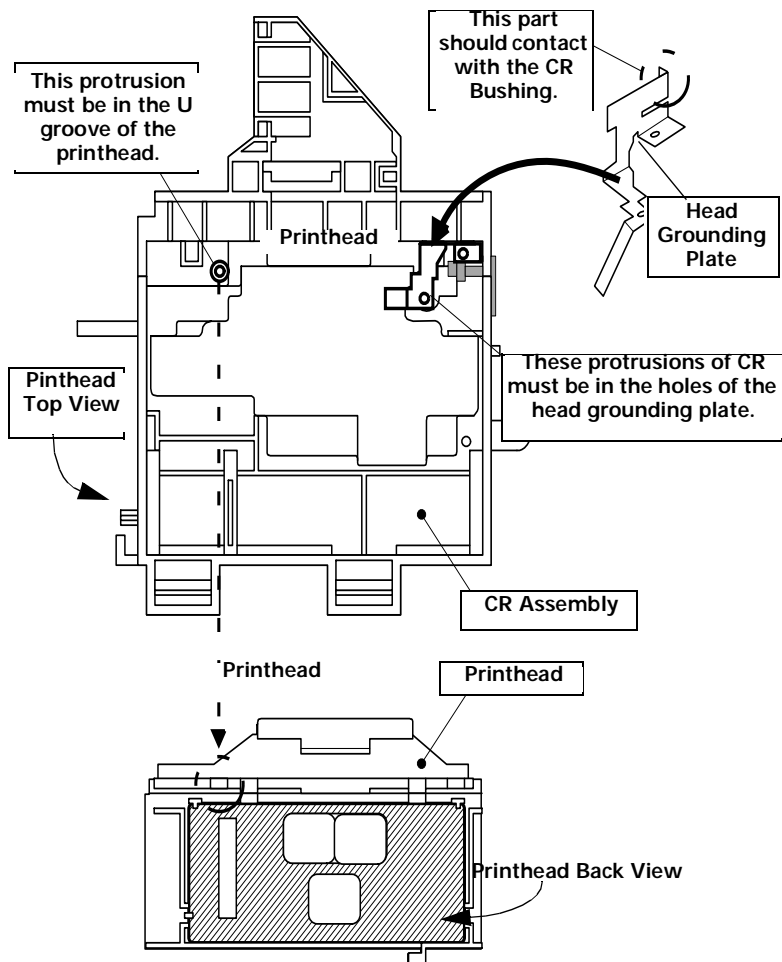


Figure 4-10. Printhead Installation

da0R

4.2.5.2 Pump Assembly / Cap Assembly Removal

1. Remove the Housing. (See "Housing Removal" on page 72)
2. Remove the Control Panel. (See "Control Panel Removal" on page 75)
3. Remove the Ink Absorber Tray Assembly (See "Ink Absorber Tray Assembly (Waste Ink Pad) Removal" on page 76)
4. Remove screws securing the Front Frame. (See Figure 4-17.)
5. Remove screws securing the Paper Eject Frame Assembly to the R/L Frame. (See Figure 4-17.)
6. Shift the CR Assembly to the left end of the CR Shaft and remove it from the right side of the Paper Eject Frame Assembly towards the front of the printer. Then shift CR Assembly to the center of the CR Shaft and carefully remove the left side of the Paper Eject Frame Assembly towards the front of the printer.
7. Remove 3 hooks securing the Cap Assembly at the right side of the frame. Remove 2 protrusions securing the Cap Assembly to the Middle Frame and release the engagement with the frame by lifting up the right side of Cap Assembly.
8. Carefully pull out the Cap Assembly toward the top of the Printer Mechanism. (However, Cap Assembly is still connected to the "Pump Assembly" by the ink tube.)
9. Remove the Ink Tube from the bottom of the Cap Assembly.
10. Stand up the Printer Mechanism so that you can see the bottom of the Printer Mechanism.
11. Remove 2 screws securing the Pump Assembly to the frame and remove the Pump Assembly.

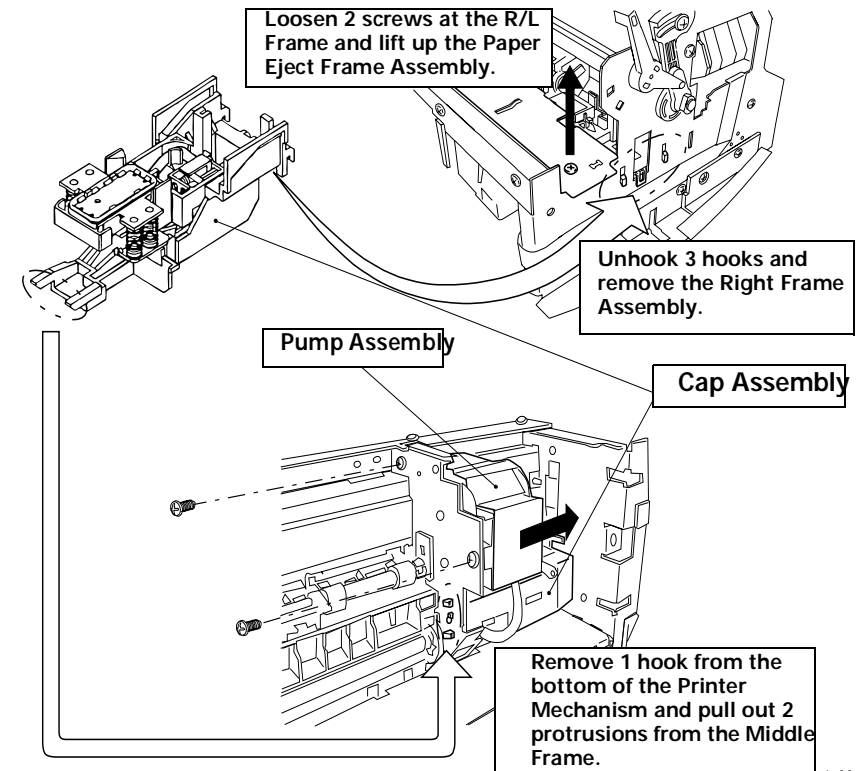


Figure 4-11. Cap Assembly and Pump Assembly Removal da09

CAUTION



Be careful when removing the Pump Assembly, because the spring and gear of the Pump Assembly may pop out during the disassembly.

CAUTION



- Do not touch the rubber part and sponge part of the cap.
- When handling the Head Cleaner installed at Pump Assembly, be careful for the following points.
 - Do not touch the Head Cleaner by bare hand. Use globe and tweezers.
 - Install Head Cleaner as its black rubber side faces to the right side of the frame.



- Since the spring is included among the gears in the Pump Assembly, be careful that the parts do not pop out during disassembly and assembly. (Refer to the Figure 4-12 below.)
- When assembling, be careful not to crush nor leave any stress on the ink tube connecting the Pump Assembly and the Cap Assembly. (Refer to the Figure 4-13.) After installing the Pump Assembly, rotate the Combination Gear, 6, 34.4 and check if the Head Cleaner moves back and forth. (Perform this check while holding the Cap Assembly to the right of the frame.)

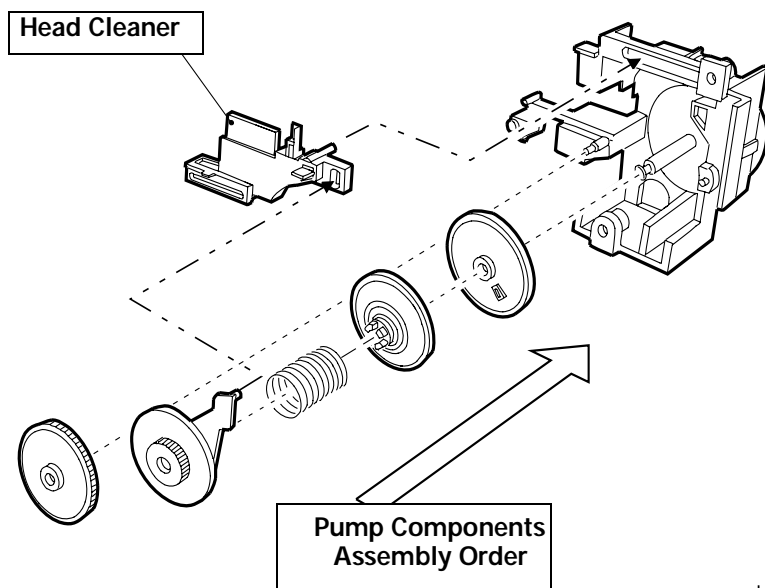


Figure 4-12. Components of Pump Assembly

da10

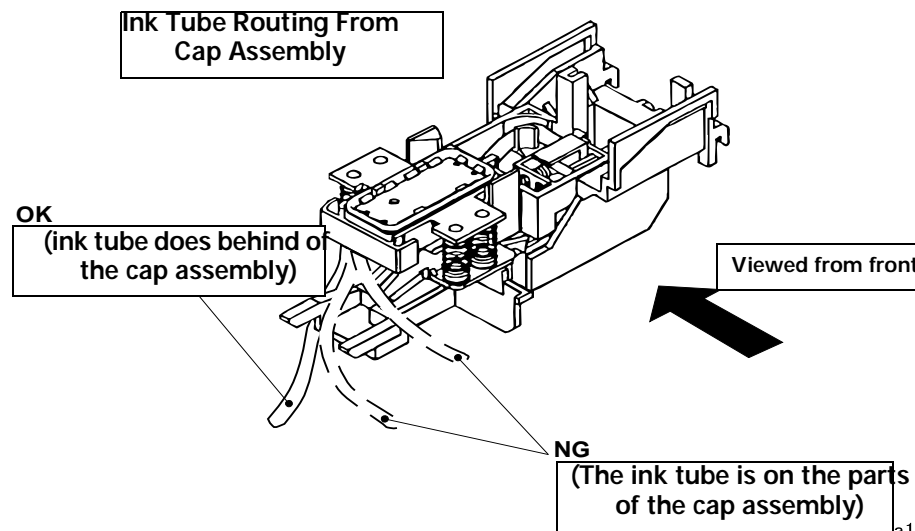


Figure 4-13. Ink Tube Routing

da11

4.2.5.3 CR Motor Assembly Removal

1. Remove the Housing. (See "Housing Removal" on page 72)
2. Rotate Combination Gear, 6, 34.4 toward the front of the printer and disengage the CR Lock Lever. Then, manually move the CR Assembly to the center of the platen.
3. Push the Driven Pulley Holder toward the interior of the Left Frame and loosen the Timing Belt. Remove the Timing Belt from the CR Motor Pinion Gear or pull the Driven Pulley Assembly diagonally from the Driven Pulley Holder to the top (refer to the arrow in the figure below.).

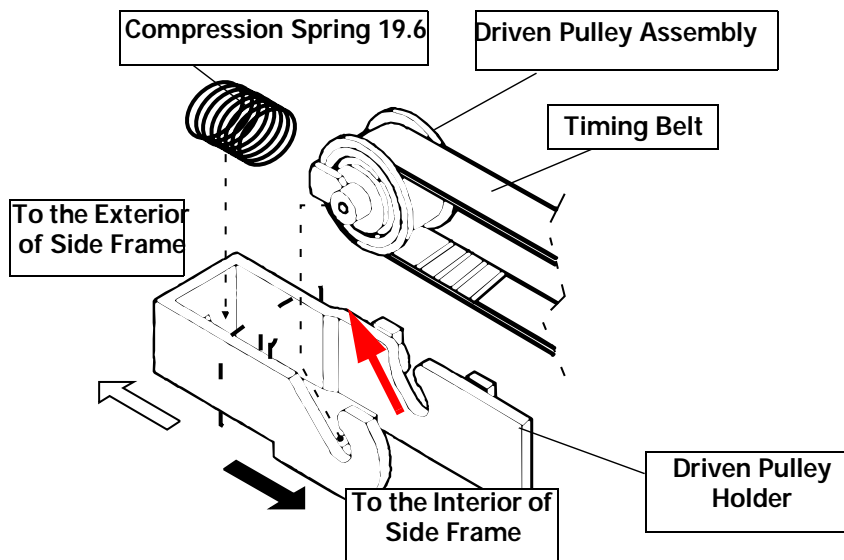
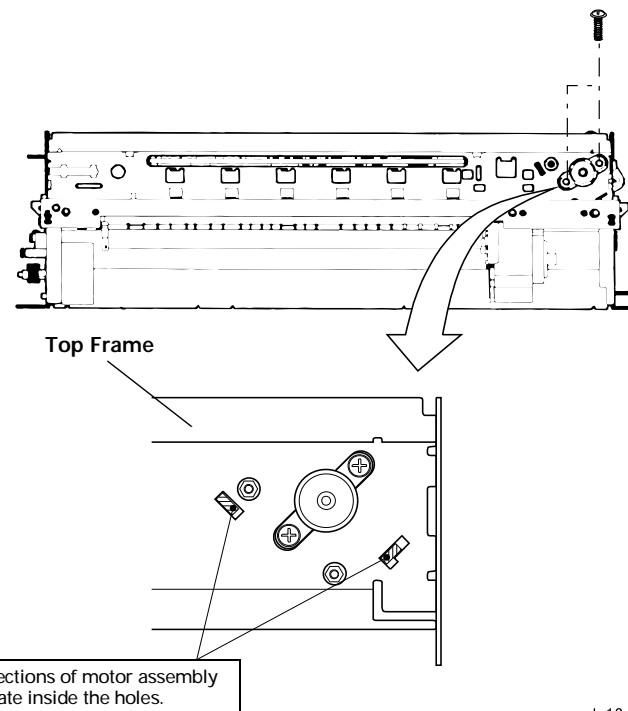


Figure 4-14. Timing Belt Removal

4. Remove 2 screws securing the CR Motor, and remove CR Motor Assembly.



When installing CR Motor Assembly, be sure that 2 projections of the Motor Bracket are inserted to the position marking holes of the frame.



da13

Figure 4-15. CR Motor Assembly Removal



After replacing CR Motor Assembly, perform the Bi-D adjustment. (See "Bi-D Adjustment" on page 112)

4.2.5.4 PF Motor Assembly Removal

1. Remove the Housing. (See "Housing Removal" on page 72)
2. Remove the Ink Absorber Tray Assembly. (See "Ink Absorber Tray Assembly (Waste Ink Pad) Removal" on page 76)
3. Remove the Plastic C Ring with tweezers and remove the Combination Gear 6, 34.4.

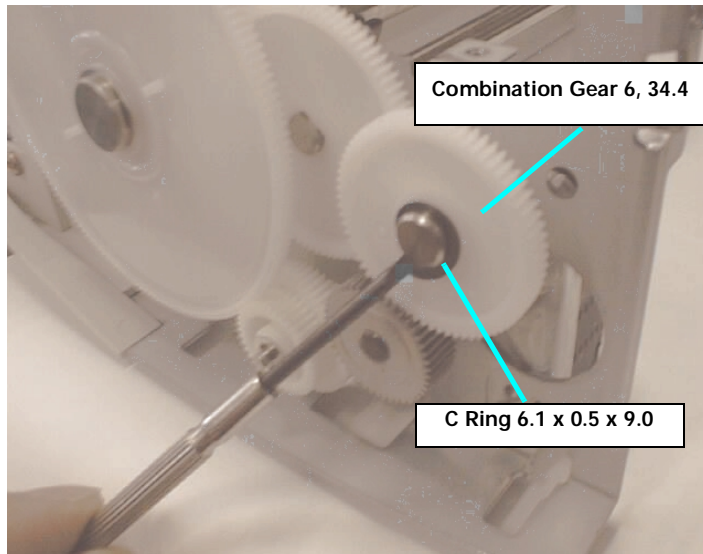


Figure 4-16. Combination Gear 6, 34.4 Removal

4. Remove 3 screws and remove the Front Frame from the Printer Mechanism. (Refer to Figure 4-17.)
5. Remove 2 screws and remove the Paper Eject Frame from the Printer Mechanism. (Refer to Figure 4-17.) When removing the Paper Eject Frame from the Printer Mechanism, shift the CR Unit manually to the left side of the CR Shaft and remove it from the right side of the Paper Eject Frame towards the front side of the printer. Then move the CR Unit to the center of the CR Shaft and remove the left side of the Paper Eject Frame towards the front side of the printer. (Refer to Figure 4-17.)

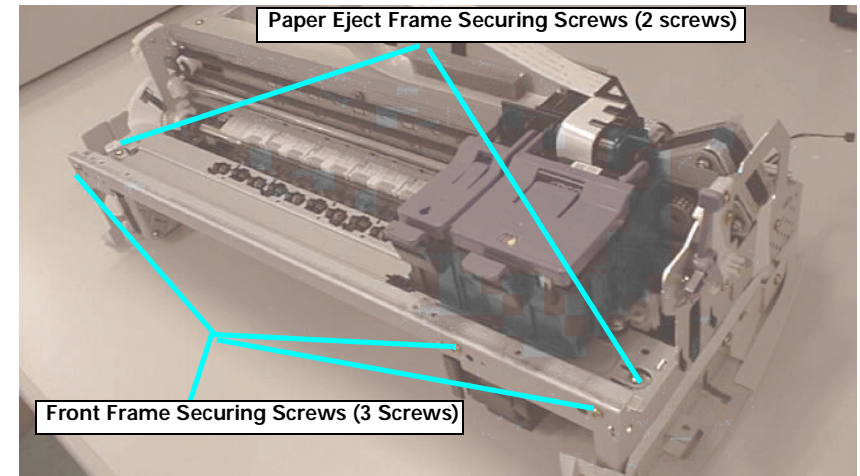


Figure 4-17. Front Frame and Paper Eject Frame Removal

6. Release 2 hooks attaching the Front Paper Guide to the Paper Eject Roller and remove the Front Paper Guide to the front side of the printer. (Refer to Figure 4-18.)
7. Release the hook of the Bushing 6 securing the Paper Eject Roller to the Printer Mechanism, rotate the Bushing 6 to the top and remove the Paper Eject Roller. (Refer to Figure 4-18.)

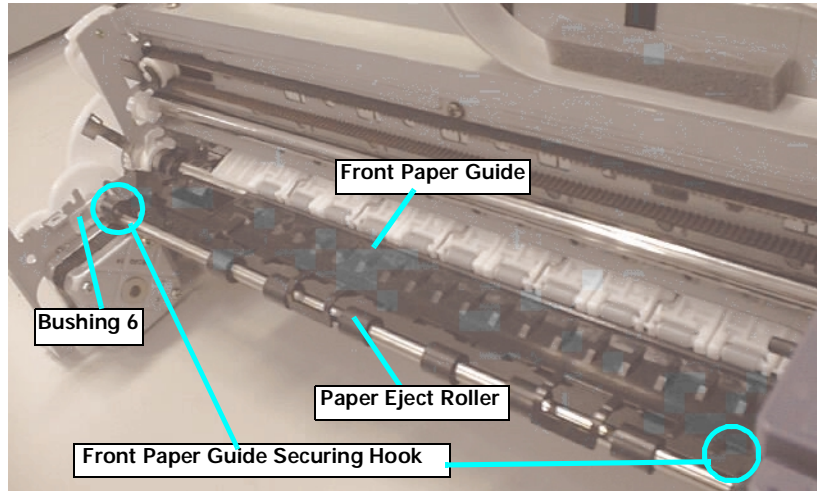


Figure 4-18. Front Paper Guide and Paper Eject Roller Removal

8. Remove 2 screws securing the PF motor from the inside of the Left Frame and shift the PF Motor Assembly to the front side of the printer to remove it. (Refer to Figure 4-19.)

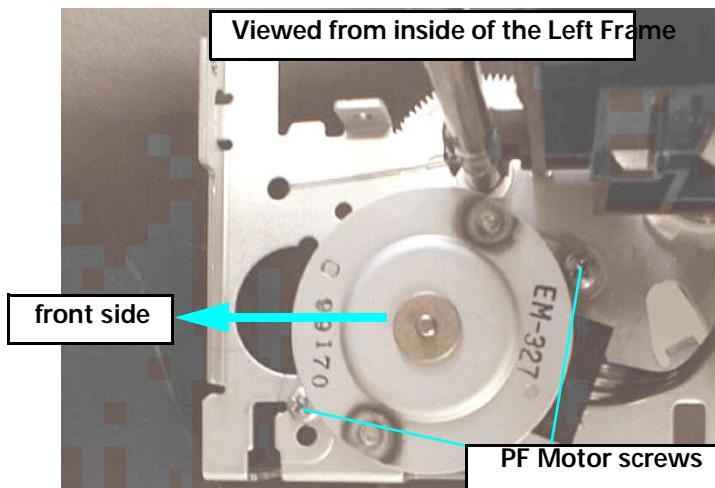


Figure 4-19. 2 Screws Securing the PF Motor



- When removing the PF Motor Assembly, first slightly pull out the PF Motor Assembly from the frame and slide the Motor Shaft to a larger cutoff of the frame and remove it.
- Be careful for the routing direction of the cable from the PF Motor Assembly. (Refer to Figure 4-20.)

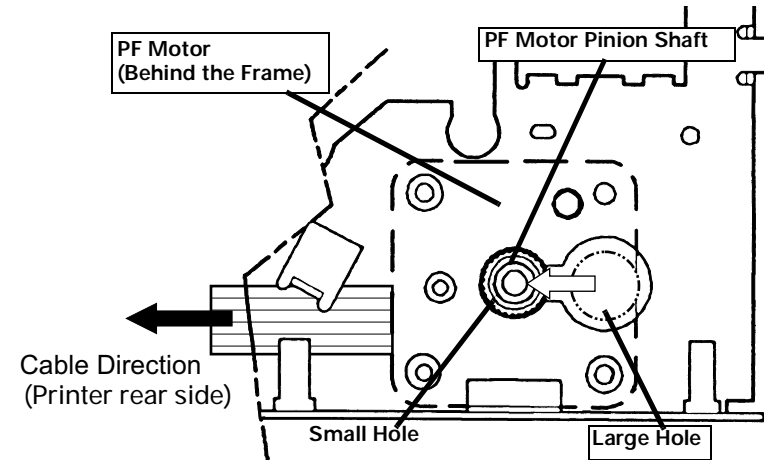


Figure 4-20. PF Motor Assembly Installation

4.2.5.5 ASF Assembly Removal

1. Remove the Housing. (See "Housing Removal" on page 72)
2. Release the hook and remove the Spur Gear 34 from the Roller Shaft of the ASF Assembly.

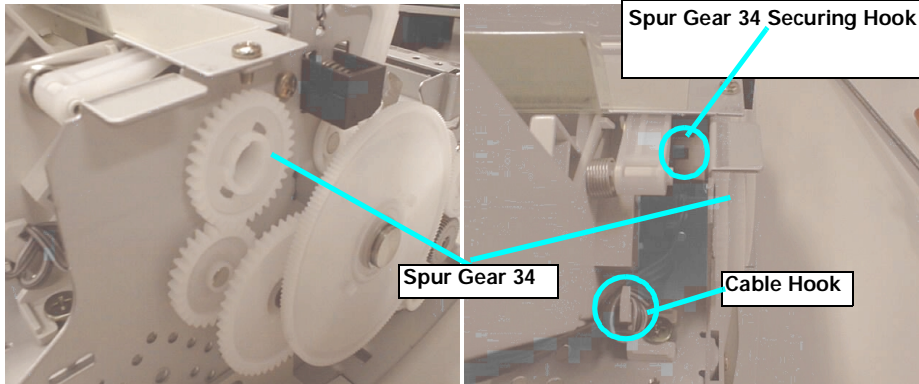


Figure 4-21. Spur Gear 34

3. Remove the cable from the Cable Hook of the ASF Assembly. (The Cable Hook is located at the right side seen from the back side of the printer.)
4. Remove 1 screw (with washer) securing the ASF Assembly to the Printer Mechanism and ASF securing screw.

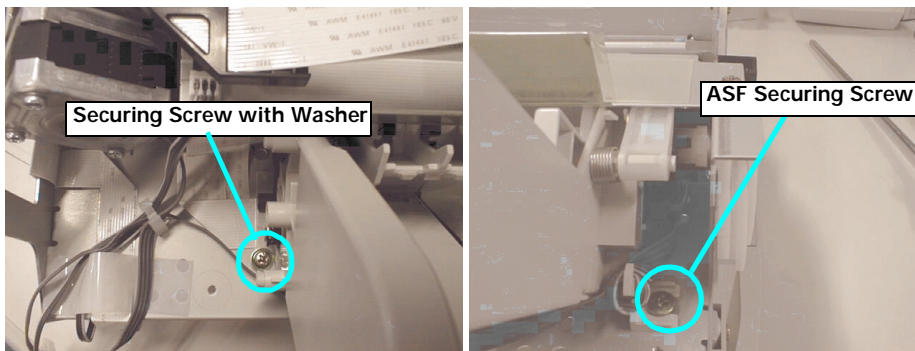


Figure 4-22. ASF Securing Screw Removal

5. Shift the ASF Assembly to the right (seen from the back side of the printer) and while lifting the Sub Paper Support, remove the ASF Assembly to the back side of the printer.

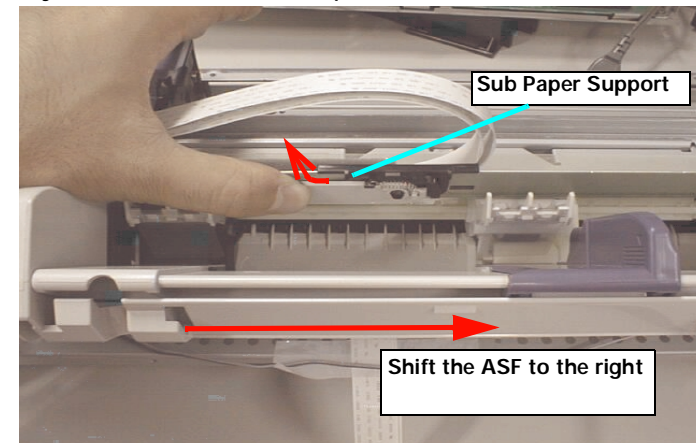


Figure 4-23. ASF Assembly Removal



- When installing the ASF Assembly, make sure that the protrusion at the right side of ASF Assembly is firmly inserted to the cutout of the Middle Frame.
- Use the ASF Assembly securing screws at the specified positions below. (The position is seen from the back side of the printer.)
 - *ASF right side: ASF Securing Screw
 - *ASF left side: Screw with Washer
 (Refer to Figure 4-22.)

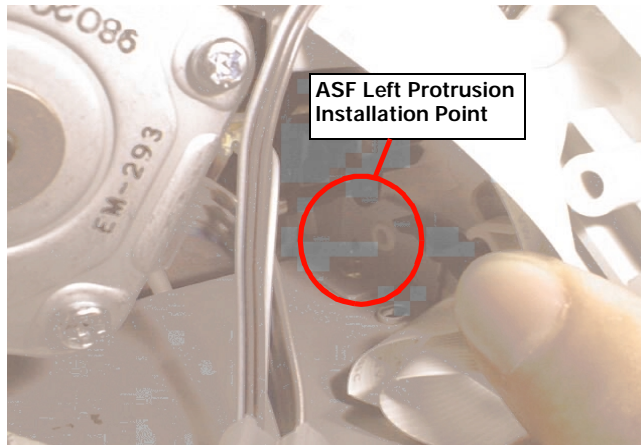


Figure 4-24. ASF Assembly Installation Point



- When installing the ASF Assembly, be careful not to pinch any motor or sensor cables under the ASF. Especially if the cables from the motor are pinched, there is a danger of short-circuit and possibly causes hazardous problem such as over-heating or burning of components.
- Head FFC goes under the ASF. When installing the ASF, be careful not to damage FFC. (Refer to Figure 4-25.)

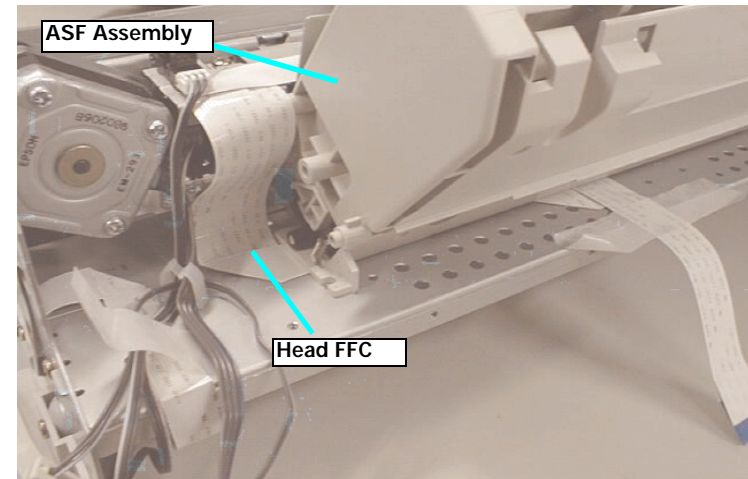


Figure 4-25. Head FFC Routing

4.2.5.6 ASF LD Roller Assembly Removal

1. Remove the ASF Assembly. (See "ASF Assembly Removal" on page 85)
2. Remove the ASF LD Roller Shaft Fixing Bushing and remove the Right Hopper Release Lever.

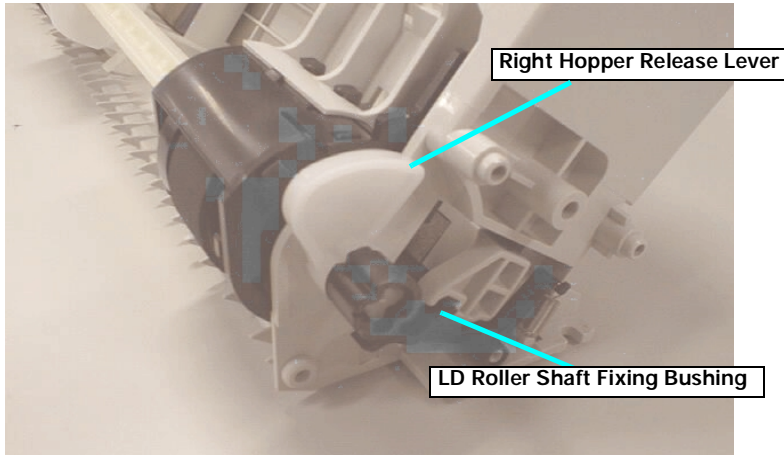


Figure 4-26. LD Roller Shaft Fixing Bushing Removal

3. Shift the Left ASF LD Assembly on the left to the center and remove the Left ASF LD Roller Shaft Fixing Bushing (white). (Refer to Figure 4-27.)

4. Push the LD Roller Shaft to the left and remove the ASF HP Detection Wheel from the end of the shaft. (Refer to Figure 4-27.)

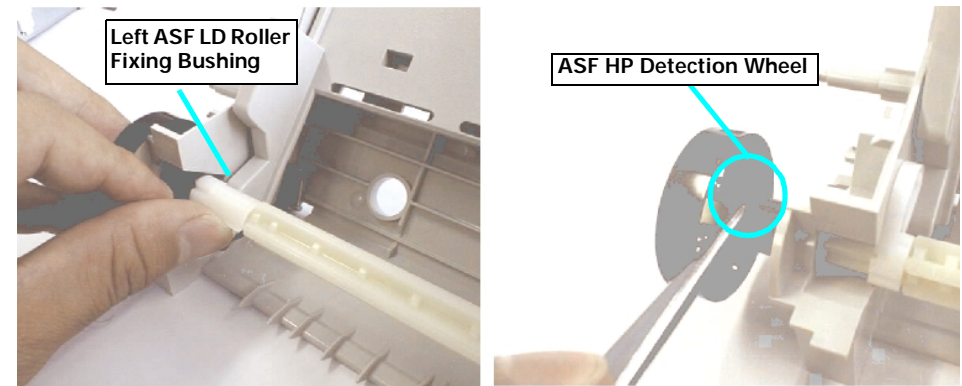


Figure 4-27. ASF LD Roller Fixing Bushing and ASF HP Detection Wheel

5. Release the protrusion of the ASF Frame from the ASF Hopper Assembly installation point at the upper left.

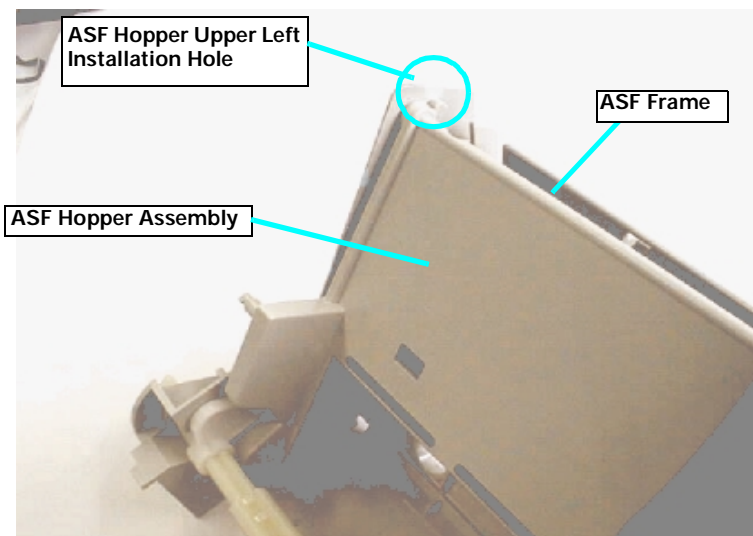


Figure 4-28. ASF Hopper Assembly Removal

6. Align the right cam part of the ASF Hopper Assembly to the cutoff (rectangle) of the ASF Frame assembly. Lift the left side of the ASF Hopper Assembly and carefully remove the ASF Hopper Assembly.

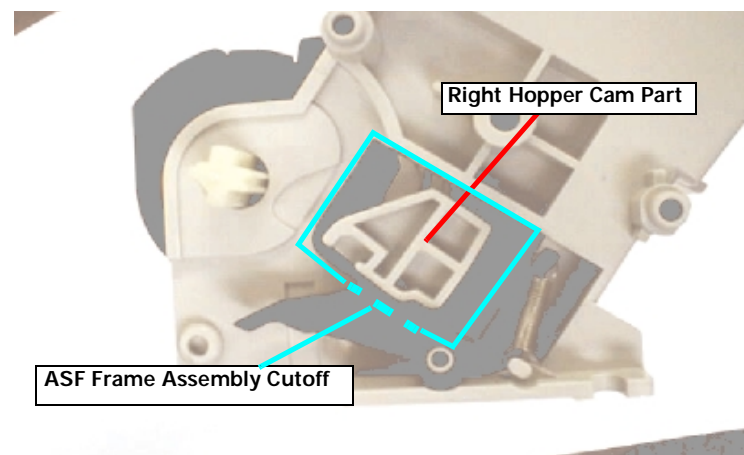


Figure 4-29. ASF Hopper Assembly Cam Part Aligning Point

CAUTION



When removing ASF Hopper Assembly from the ASF Frame Assembly, be careful not to damage the Compression Spring 1.961 of the LD Roller Assembly and transparent plastic film. Refer to Figure 4-35.

7. Carefully remove the Compression Spring 1.961. (Refer to Figure 4-35) from both sides between the ASF Hopper Assembly and the R/L ASF LD Roller Assembly.
8. Shift the ASF LD Roller Shaft to the left and remove the LD Roller Shaft from the ASF LD Roller Shaft hole of the right side of the ASF Frame.
9. Remove the LD Roller Assembly from the LD Roller Shaft.

The following is the ASF Assembly exploded diagram.

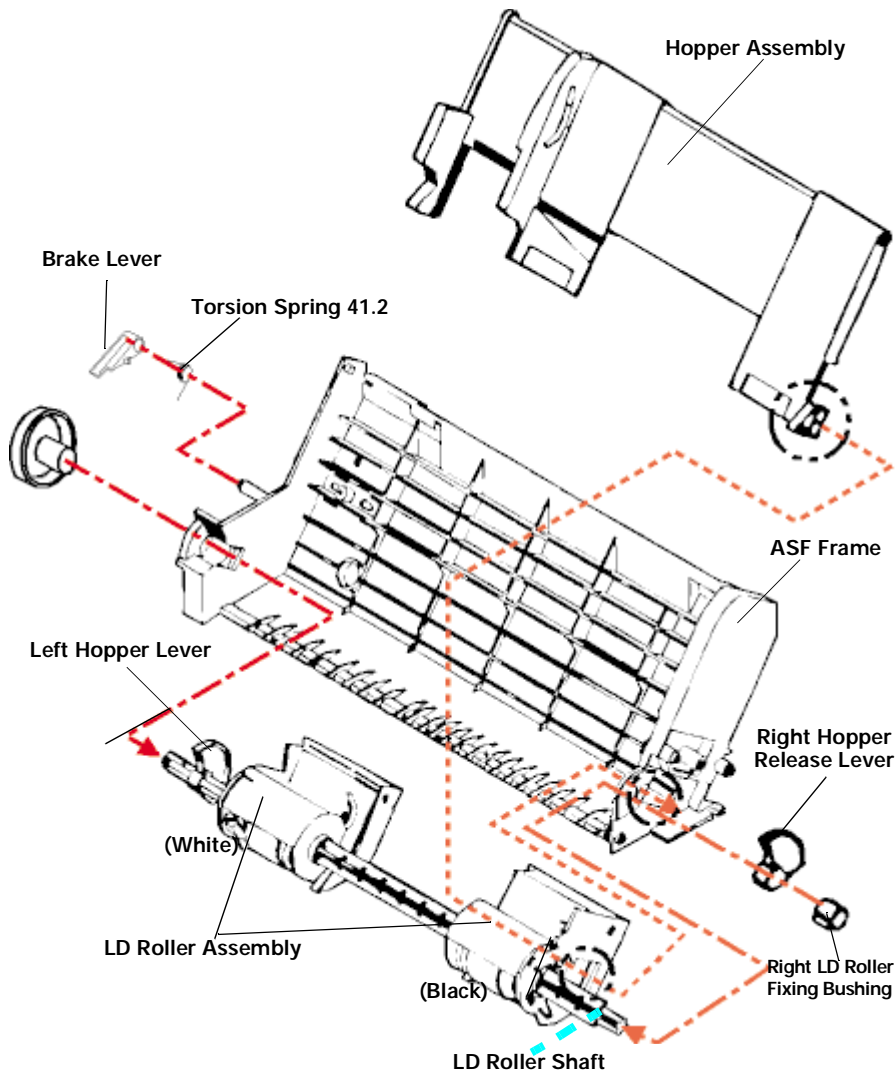


Figure 4-30. ASF Disassembly



- During disassembly and assembly of the ASF Hopper Assembly, do not let the grease on the cam parts touch other parts. Wipe off any grease smeared on other parts.
- Be careful of the direction of the Hopper Release Lever when installing it. (Refer to Figure 4-31.)
- Make sure the LD Roller Assembly is installed firmly to the rail of the ASF Frame. (Refer to Figure 4-32.)
- Make sure the Left Frame of the left LD Roller Assembly is set to the cutoff of the Paper Edge Guide. (Refer to Figure 4-33.)
- When installing the right and left LD Roller Fixing Bushings, make sure the bushings are firmly installed and do not slip off. Also, make sure the Black LD Roller Assembly goes on the right side of the shaft. (Refer to Figure 4-31 below.)

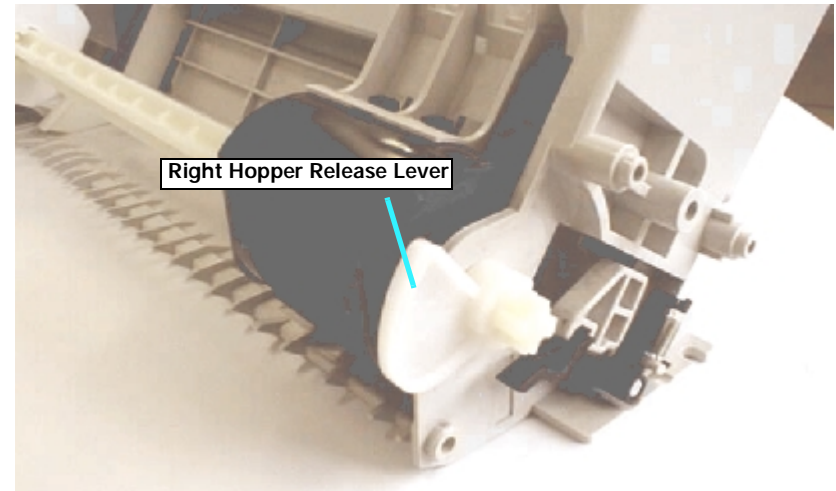


Figure 4-31. Hopper Release Lever Installation Direction

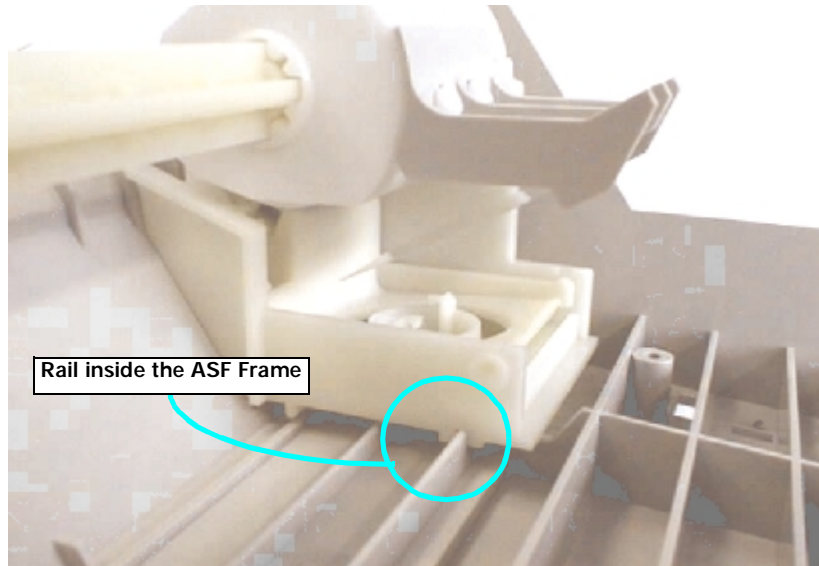


Figure 4-32. LD Roller Assembly Installation Point

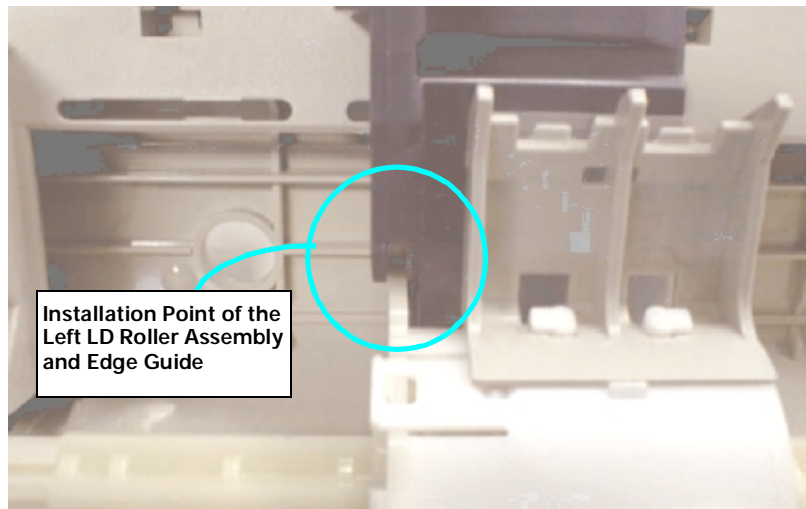


Figure 4-33. Left LD Roller Assembly Installation Point



- When installing the Right LD Roller Assembly to the ASF Frame, make sure the Right LD Roller Assembly is locked by the hook on the back of the right side of the ASF Frame. (Refer to Figure 4-34.)
- Before installing the ASF Hopper Assembly to the LD Roller Assembly, set the Compression Spring 1.961 to the spring installation hook of the LD Assembly temporarily. After assembling, move the LD Roller Assembly to the hole on the back of the ASF Frame and release the Compression Spring 1.961 from the Temporary Fixing Hook through the hole. (Refer to Figure 4-35.)

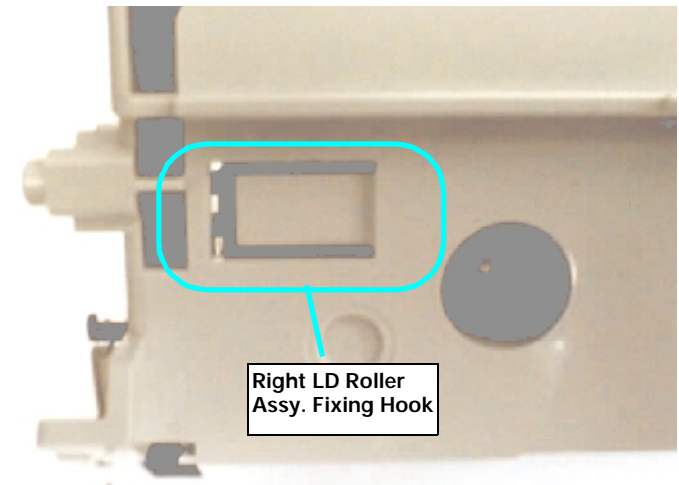


Figure 4-34. Right LD Roller Assembly Fixing Hook Position

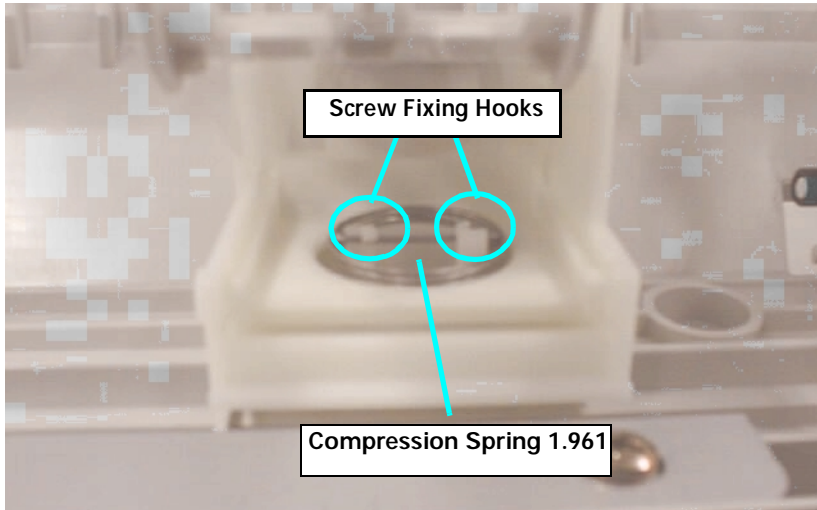


Figure 4-35. Compression Spring 1.961 Temporary Fixing Position

4.2.5.7 LD Roller Assembly Disassembly

1. Remove the ASF Assembly. (See "ASF Assembly Removal" on page 85)
2. Remove the LD Roller Assembly. (See "ASF LD Roller Assembly Removal" on page 87)
3. Release 2 hooks securing the LD Roller Cover to the LD Roller Assembly.
4. Remove 2 hooks securing the LD Roller Assembly to the frame around the shaft hole of the LD Roller Assembly.
5. Remove the LD Roller Assembly.

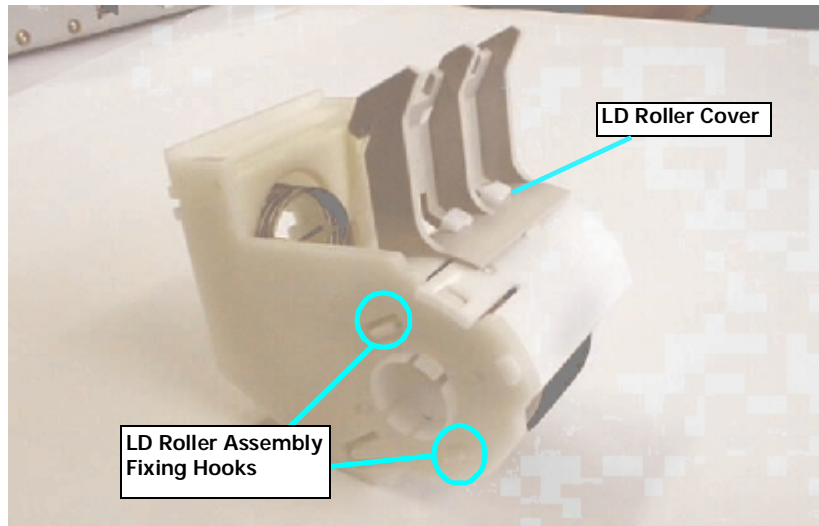


Figure 4-36. LD Roller Assembly Removal Hook Position

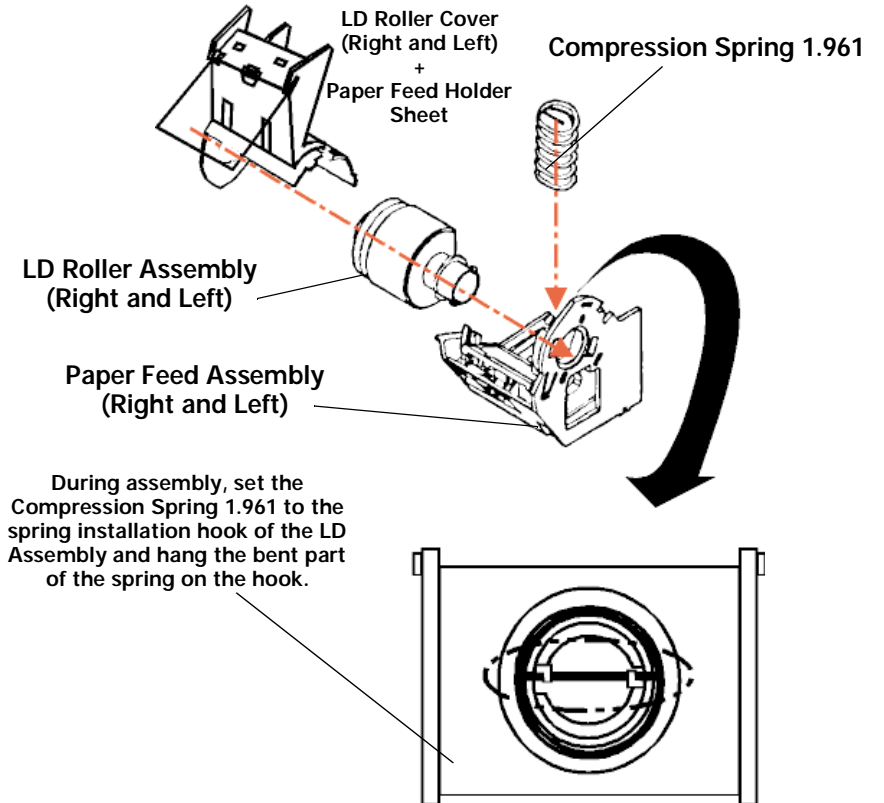


Figure 4-37. Disassembly of LD Roller Assembly



- Before installing the ASF Hopper Assembly to the LD Roller Assembly, set the Compression Spring 1.961 to the spring installation hook of the LD Assembly and hang the bent part of the spring on the hook. After assembling the unit, do not forget to unhook the springs by rotating the spring from the holes located at the back of the ASF Assembly.
- Do not touch the surface of the roller of the LD Roller Assembly.

4.2.5.8 CR Assembly Removal

1. Remove the Housing. (See "Housing Removal" on page 72)
2. Push the Driven Pulley Holder to the right (seen from the front side of the printer) to loosen the Timing Belt and detach the Timing Belt from the CR Motor Pinion Gear.

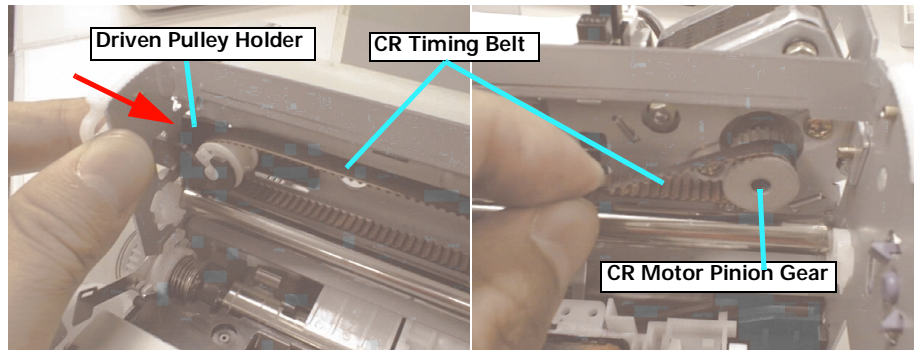


Figure 4-38. CR Timing Belt Removal

3. Take out the Compression Spring 19.6 from the Driven Pulley Holder.
4. Remove the Driven Pulley Assembly with the Timing Belt from the Driven Pulley Holder. (Pull the Driven Pulley Assembly diagonally to the upper left.)

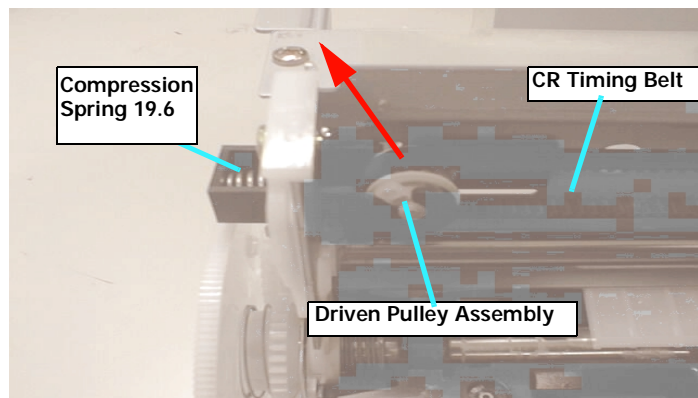


Figure 4-39. Driven Pulley Assembly Removal

5. Move the Driven Pulley Holder to the right and remove it from the frame.
6. Release 2 PG Lever securing hooks from the Right Frame and remove the PG Lever.

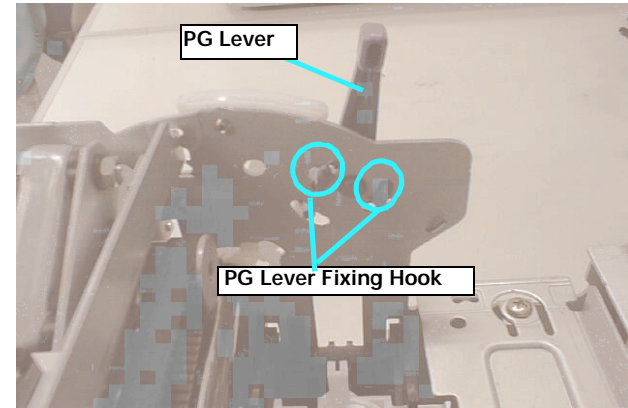


Figure 4-40. PG Lever Hook Release

7. Release 1 hook of Sub PG Lever and remove the Sub PG Lever and Spring Washer from the right end of the CR Guide Shaft.
8. Remove 1 screw securing the Right Parallelism Adjust Bushing to the Right Frame.

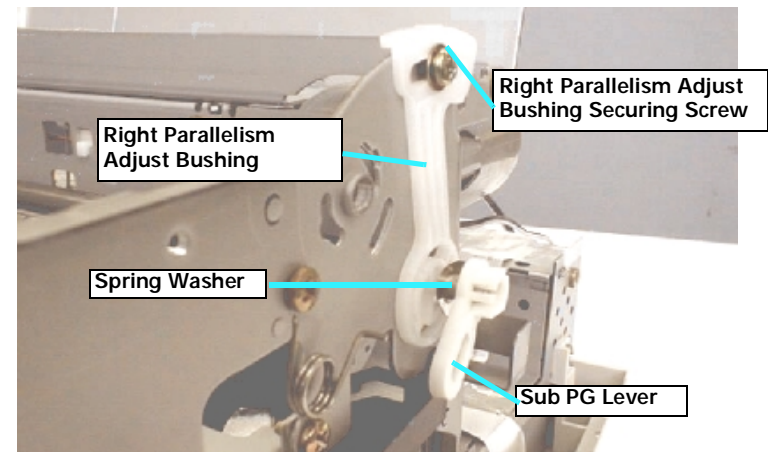


Figure 4-41. Sub PG Lever and Spring Washer Removal

9. Rotate the Right Parallelism Adjust Bushing to the front side of the printer to align the cutoff of the frame and remove it.

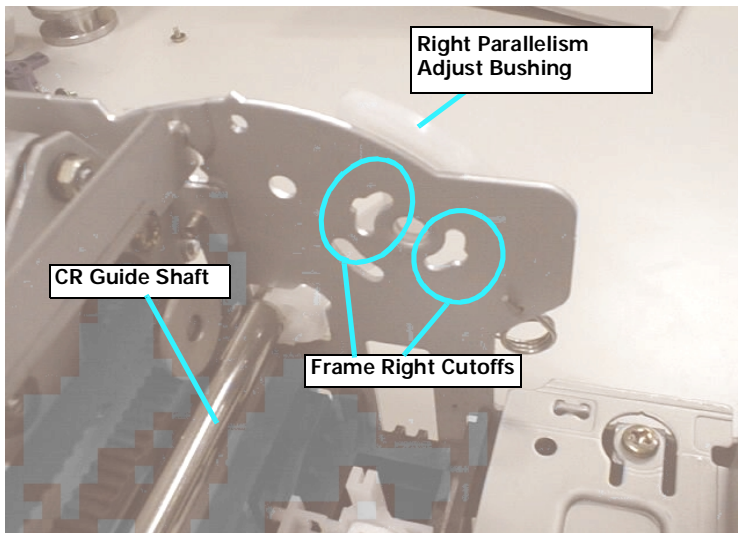


Figure 4-42. Right Parallelism Adjust Bushing Removal

10. Shift the CR Guide Shaft to the right and remove the left end of the CR Guide Shaft from the Left Parallelism Adjust Bushing. Remove the CR Assembly with CR Guide Shaft.



Perform following adjustments after removing the Carriage Assembly.

- PG Adjustment (See "PG Adjustment" on page 101)
- Bi-D Adjustment (See "Bi-D Adjustment" on page 112)

Also, when you have replaced the Carriage Assembly, perform Head Angular Adjustment (See "Head Angular Adjustment" on page 109) in addition to the adjustment items described above.

CHECK
POINT



- When installing the Spring Washer, convex side should face to the Right Parallelism Adjust Bushing. Be careful not to install it in wrong direction. (See Figure 4-41.)
- When installing the CR Assembly to the CR Guide Shaft, make sure the Oil Pad is set to the specified position of the CR Assembly.
- When the Oil Pad is especially dirty, replace the Oil Pad with a new one which is lubricated with the specified amount of oil.

4.2.5.9 PE Sensor Assembly Removal

1. Remove the Housing. (See "Housing Removal" on page 72)
2. Remove the ASF Assembly. (See "ASF Assembly Removal" on page 85)
3. Release 2 PE Sensor Assembly Securing Hooks from the Top Frame Cutoffs and remove PE Sensor Assembly by sliding it upward.



When installing the PE Sensor Assembly, make sure that the sensor lever is correctly inserted into the hole of Paper Guide Assembly.

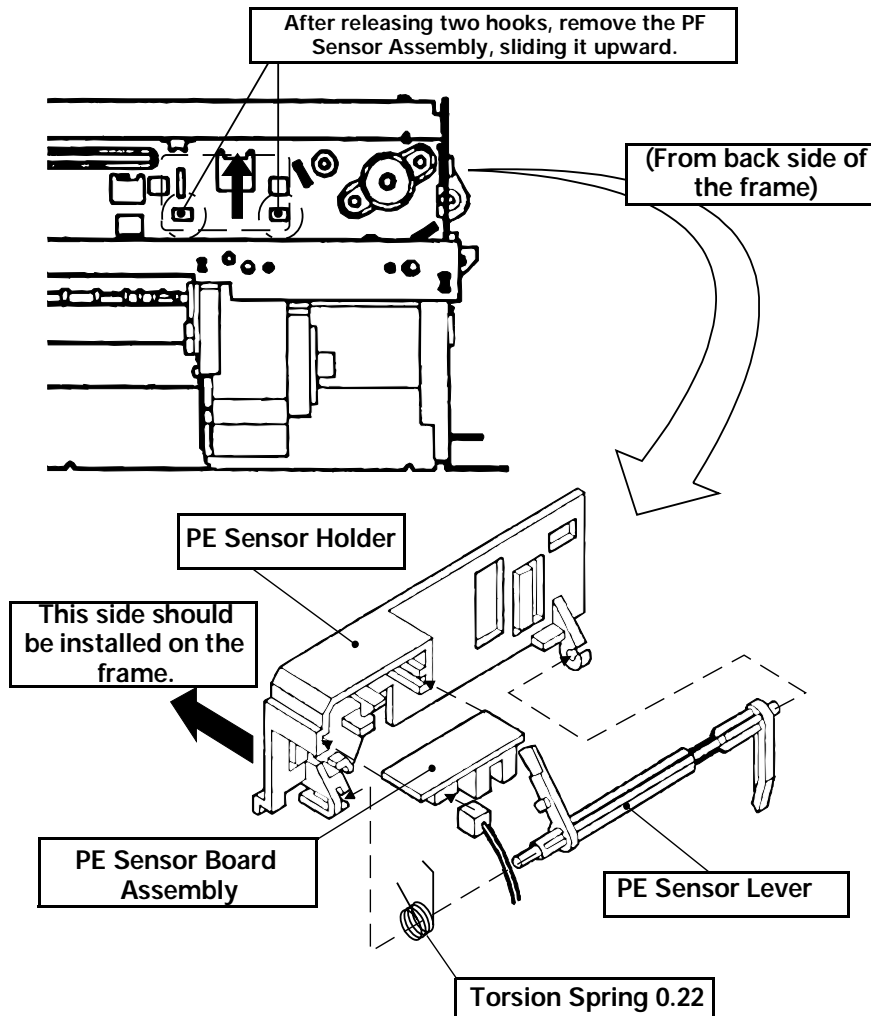


Figure 4-43. PE Sensor Assembly Removal

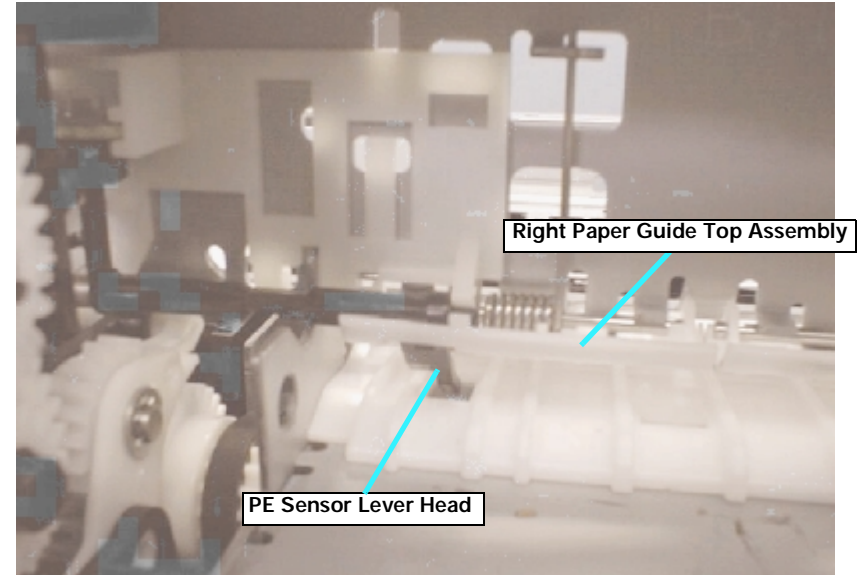


Figure 4-44. PE Sensor Lever Head Setting Position

4.2.5.10 PF Roller Assembly Removal

1. Remove the Housing. (See "Housing Removal" on page 72)
2. Remove the ASF Assembly. (See "ASF Assembly Removal" on page 85)
3. Remove the Torsion Spring117.6 from the rear side of the Top Frame and remove the Upper Paper Guide Assembly toward the rear side of the printer.
When removing the Upper Right Paper Guide Assembly, be careful for PE Sensor Lever Head and remove it toward the front side of the printer.

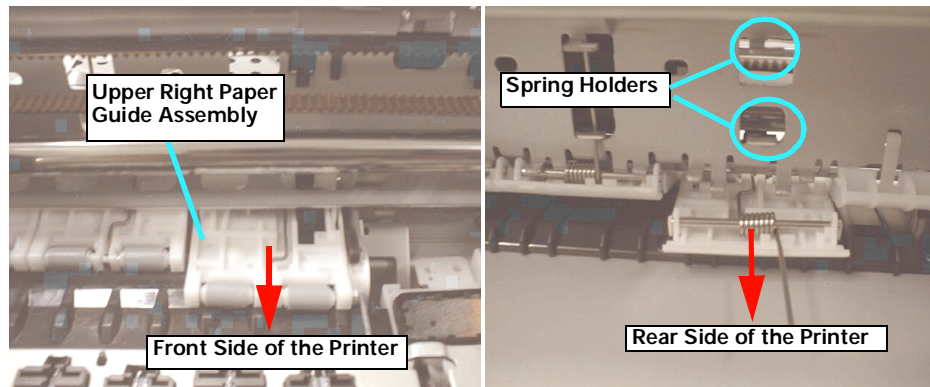


Figure 4-45. Paper Guide Assembly Removal

4. Remove 3 screws and remove the Front Frame from the Printer Mechanism. (See Figure 4-46.)
5. Remove 2 screws to remove the Paper Eject Frame from the Printer Mechanism. When removing the Paper Eject Frame from the Printer Mechanism, shift the CR Unit to the CR Shaft left direction by hand and remove it from the Paper Eject Frame toward the front side of the Printer Mechanism. Then shift the CR Unit to the center of the CR Shaft and remove the left side of the Paper Eject Frame toward the front side of the printer. (See Figure 4-46.)

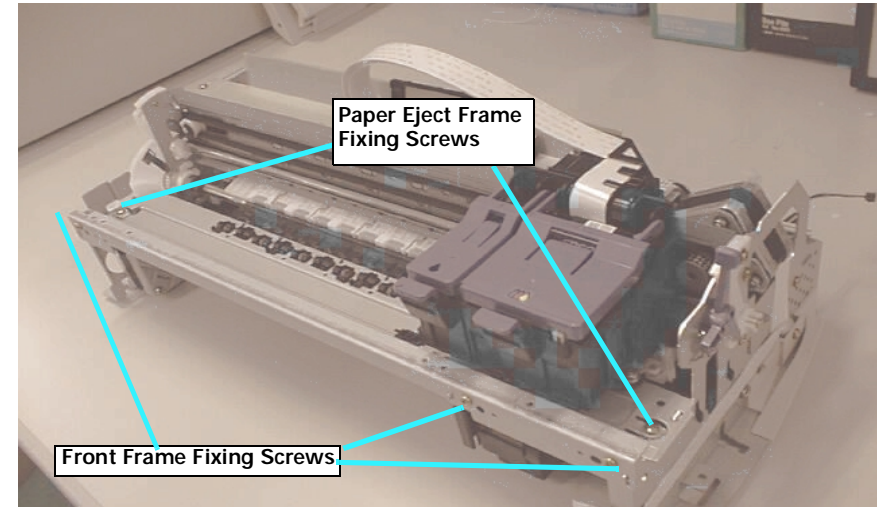


Figure 4-46. Front Frame and Paper Eject Frame Removal

6. Release 2 hooks securing the Front Paper Guide to the Paper Eject Roller and remove it to the front side of the printer.

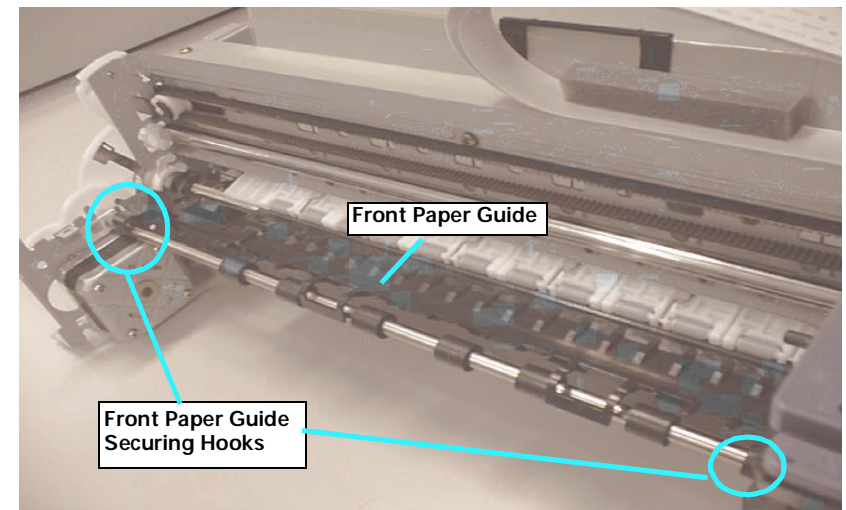


Figure 4-47. Front Paper Guide Removal

7. Release hooks securing the Left Bushing 12 to the Left Frame and rotate the Left Bushing 12 to the front side of the printer. Align the protrusion of the Left Bushing 12 and the cutoffs of the frame. Shift the bushing with PF roller to the left and remove the PF roller.

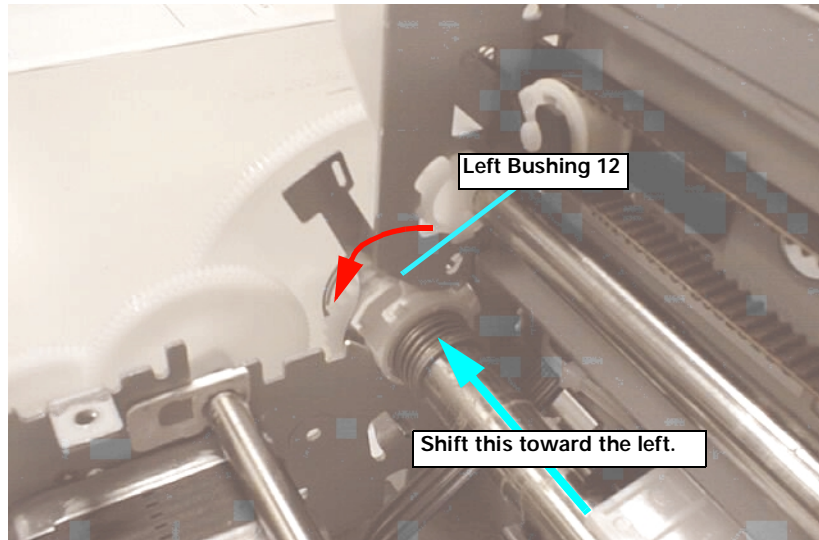


Figure 4-48. Left Bushing 12 and PF Roller Removal

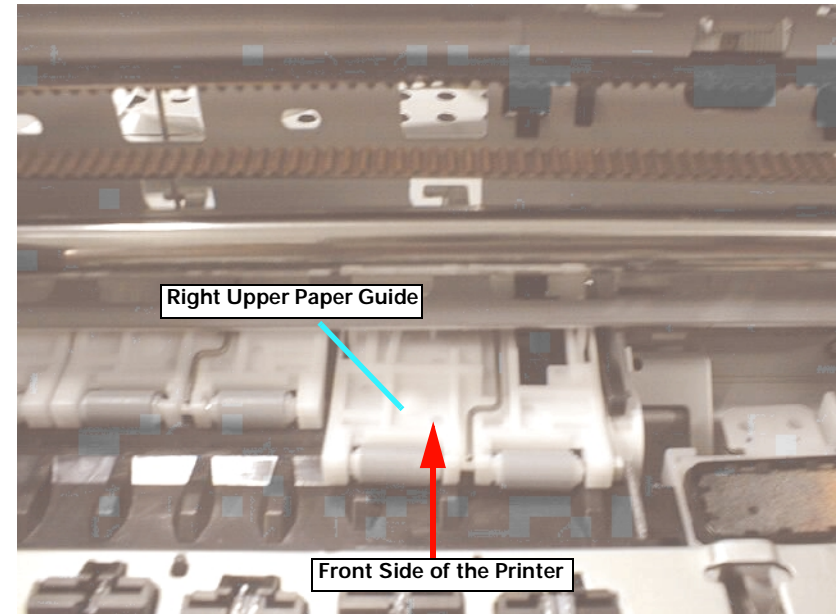


Figure 4-49. Right Upper Paper Guide Installation



- When reinstalling the Right Upper Paper Guide, let the head of the PE Sensor Lever go through the cutoff of the Right Upper Paper Guide from the front side of the printer.
- Be careful not to damage the hook, when removing or installing the Front Paper Guide.
- Be careful not to damage the gray coated part of PF Roller Assembly during disassembly and assembly.
- Be careful not to damage any gears. Especially be careful at handling the Spur Gear 67.2
- installed at the left side of the PF Roller Assembly because it is a precision gear.

4.2.5.11 CR HP Sensor Removal

1. Remove the Housing. (“Housing Removal” on page 72)
2. Disconnect the cable from the CR HP Sensor and remove it by releasing its hook.

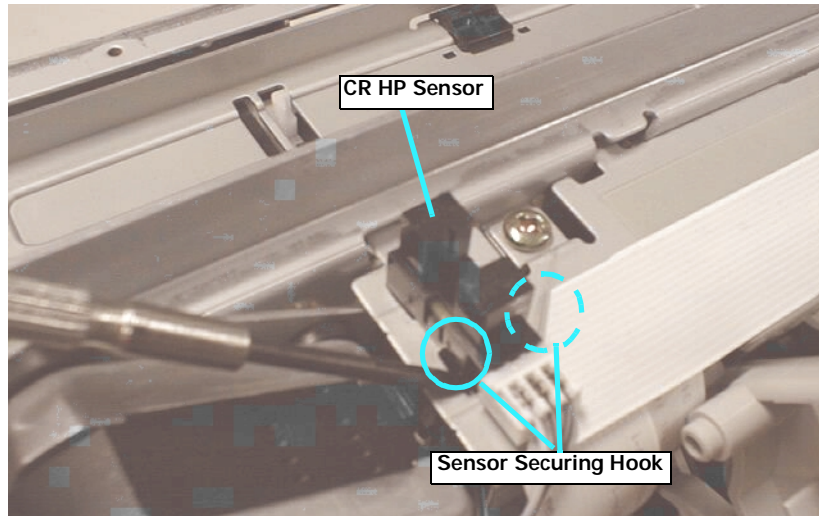


Figure 4-50. HP Sensor Removal

CHAPTER

5

ADJUSTMENT

5.1 Overview

This section describes the procedure for adjustments required when the printer is disassembled and assembled for repair or service.

5.1.1 Required Adjustments

Table 5-1 lists all the necessary adjustments for this printer. If any service listed in this table is carried out, all adjustments corresponding to that service should be performed to ensure proper operation of the printer.

Table 5-1. Required Adjustments

Performance Priority	1	2	3	4	4	5
Service/Replacing parts	PG Adjustment	Initial Ink Charge	Head ID Setting	Head Angular Adjustment	Bi-D Adjustment	USB ID Input
Replacing the printer mechanism.	NA	①	②	NA	③	NA
Replacing the Main Board.	NA	NA	①	NA	②	③
Replacing the printhead unit.	NA	①	②	③	④	NA
Replacing the CR motor.	NA	NA	NA	NA	①	NA
Replacing or removing the CR assembly.	①	NA	NA	②*	③	NA

NOTE: "O": Required Adjustment. The number in the circle shows the required adjustment order.
 "NA": Not applicable.

NOTE: *: When the CR assembly is replaced with a new one, Head Angular Adjustment is required. When the CR assembly is removed but not replaced, only PG Adjustment and Bi-D Adjustment are required.

5.2 Adjustment

This section describes the detailed procedures of each adjustment.

5.2.1 PG Adjustment

When replacing or removing the Carriage Assembly during Printer Mechanism disassembly, perform the PG adjustment when assembling it back and get the standard distance from the printhead surface to the paper surface.



- Do not scratch special coated surface of the PF Roller and rib surface of the Front Paper Guide.
- Be careful not to leave any dirt or scars on the surface of the printhead.
- Never use a bent (curved or tilted) or rusty thickness gauge. Such a thickness gauge may cause clogged printhead nozzle.



- Thickness gauge = 1.14mm
- Do not use 1.04mm thickness gauge used for Stylus Photo 700.

□ Paper Gap Adjustment

1. Install the Right and Left Parallelism Adjust Bushing for Right and Left Frame and align the standard mark of Parallelism Adjust Bushing with the protrusion of the Upper Frame side.
2. Set the PG Lever front. (Gap: "0")

3. Move the carriage to the center and set the thickness gauge (1.14mm thick) on the flat face of the specified rib of the front paper guide as you see in the figure5-1. Perform the PG adjustment from the right (HP side) front paper guide.

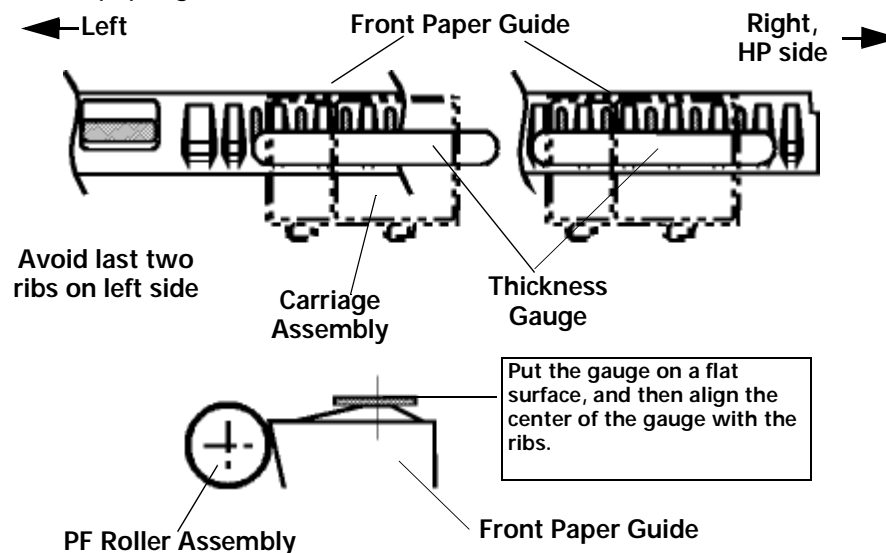


Figure 5-1. PG Adjustment - Use of Thickness Gauge

4. Move the CR Unit to the position that the Printhead Nozzle Plate overlaps the thickness gauge.



- Put the thickness gauge on the flat side of the rib of the front paper guide.
- When you move the carriage, pull the timing belt by your hand.

5. Move the Right Parallelism Adjust Bushing to the rear until the thickness gauge is enabled to move with the carriage when you move the carriage about 20mm right and left. (When you move the Right Parallelism Adjust Bushing to the rear, gap will be narrowed.) If the thickness gauge already moves with the carriage, move the Right Parallelism Adjust Bushing to the front (=gap will be widen.).

6. Adjust until the thickness gauge starts moving with the carriage. From the point where the thickness gauge starts moving with the carriage, move the Right Parallelism Adjust Bushing by one notch toward you. (Gap will be wider.)

At this point, make sure that the thickness gauge does not move.

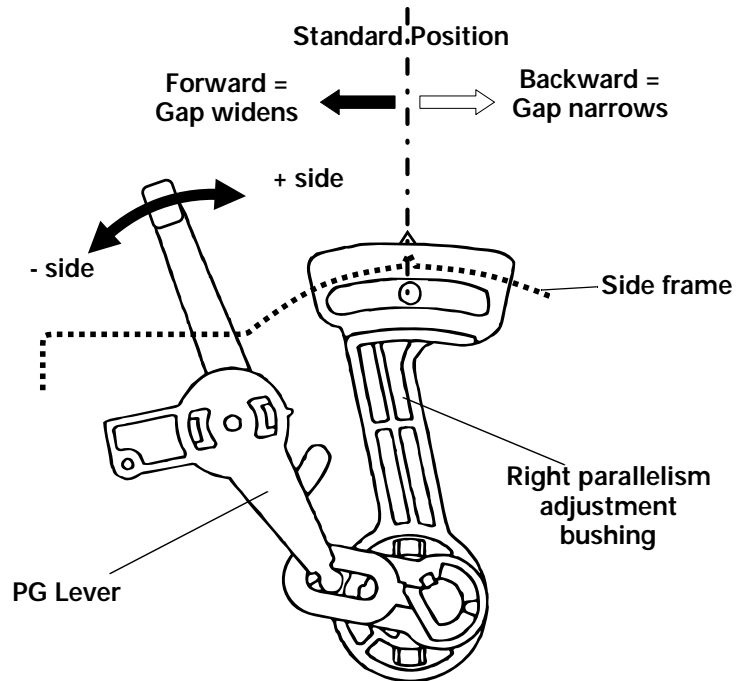


Figure 5-2. Paper Gap Adjustment -Adjusting Method

7. Perform the same procedures above (from 1 to 6) for the Left Parallelism Adjust Bushing.
- Check the Gap
After completing the adjustment for Left Parallelism Adjust Bushing, check the PG at the right side one more time.
 - Fixing right/ Left Parallelism Adjust Bushing
After completing the PG adjustment, fix the Right/ Left Parallelism Adjust Bushing with screws.

5.3 Using the Adjustment Program

In this printer, it is necessary to set the adjusting information for each printer mechanism in order to maintain consistent printing function and quality, eliminating differences of each printer mechanism's characteristics. Therefore, in case that the combination of the printer mechanism and main board changes or the print head is replaced during the repair service, you must set and save the correct information to the MAIN board, using the exclusive adjustment program.

5.3.1 Adjustment Program Installation Procedure

This adjustment program is in the 3.5 2HD FD. The first FD is the installer disk. When you execute Setup.exe, the installation of the program will be started under Windows 95/98. After installation is completed, the EPSON Stylus COLOR 670 icon will be automatically made in the program menu. Go "Start" -> "Program" and click the icon to start this program.

5.3.2 Adjustment Program

This adjustment program is exclusive for Windows: the OS that allows operation of this program is Windows 95/98. The following shows programs included in this program.



- This adjustment program operates only under Windows 95/98: This program does not operate under DOS or Windows 3.X.
- This adjustment program automatically installl the appropriate program according to your OS.
- Perform this adjustment program using parallel I/F port.

5.3.3 Adjustment Program Initial Setting Screen

You have to input the following two settings before entering the main menu.

- Model name
- Market Destination

Follow the procedure below to input the initial settings.

1. When you execute the program, the following screen appears. Select the appropriate model and market in the screen below.

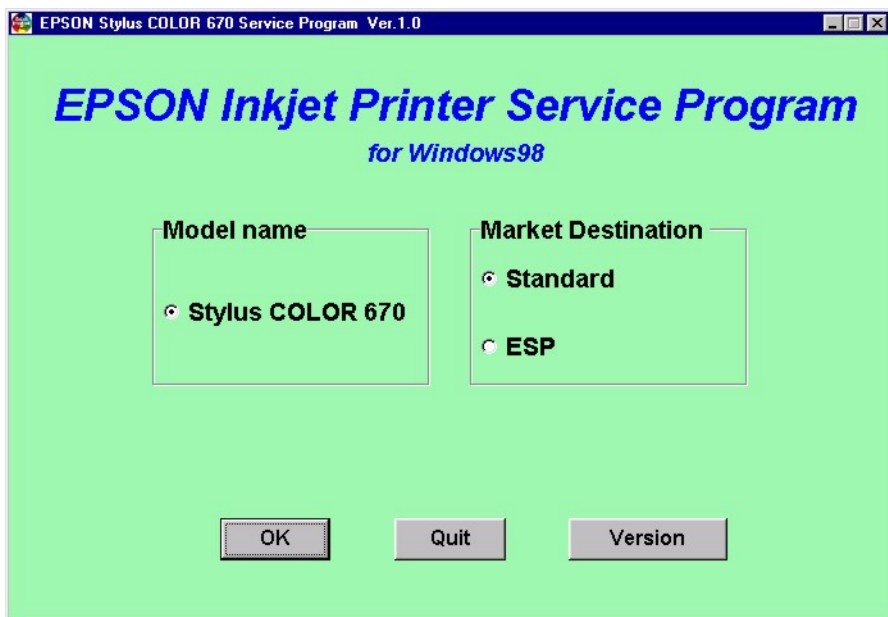


Figure 5-3. Model Name Selection



If a problem occurs, make sure the driver is installed, the printer is connected to the host PC, and the printer is turned on. If the problem is not solved, check the task bar tray for resident programs that may have locked up the printer port, for example EPSON Scanner Monitor. Close these programs.

NOTE: This printer stores the model name in the PROM. Therefore, even after selecting the model name in the screen above, the model name will not be stored in the EEPROM. Selecting the model name in the screen above determines certain special commands for each model.

NOTE: The version information can be found by clicking the Version button.

2. Click OK to proceed to the main window, which is described below and shown on the next page. If you mistake the model name or market destination, the program may not operate properly.

Table 5-2. Adjustment Program

Main Menu	Service
Adjustment	Head ID input
	Head angular adjustment
	Bi-d adjustment
	USB ID input
Maintenance	Head cleaning
	Initial ink charge
	Protection counter check / reset
A4 check pattern print	A4 check pattern print
Recovery for clogged nozzle	Attempts to clear clogged nozzles

The main window of the program is shown on the next page.

Click a menu tab to access the corresponding menu.

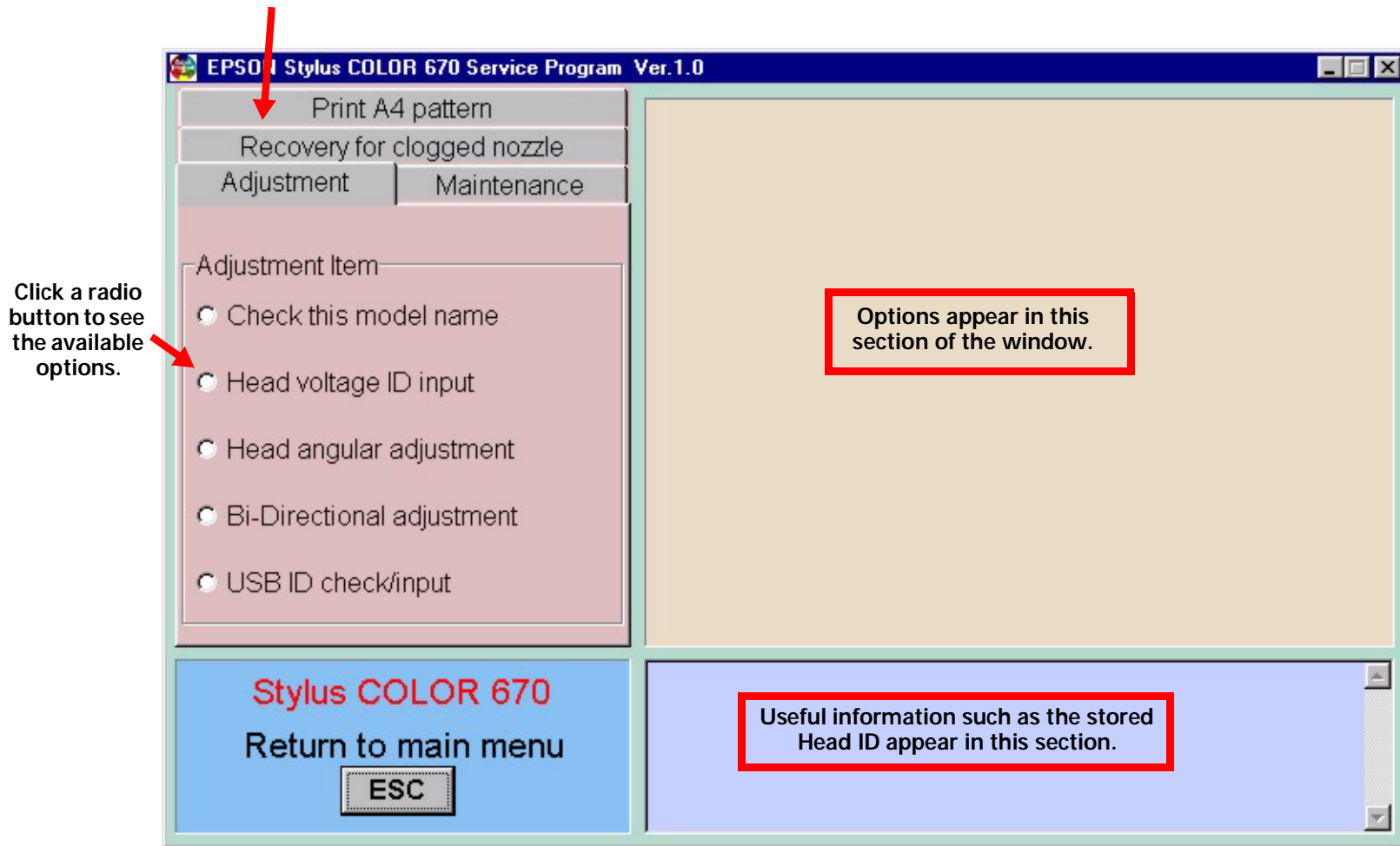


Figure 5-4. EPSON Stylus COLOR 670 Service Program Main Window

5.3.4 Check This Model Name

Click the "Check this model name" radio button to confirm the model name that is written in the PROM.

5.3.5 Head ID Input

This program adjusts the driving characteristics of the PZT for each head to unify the amount of ejecting ink. Input the head ID determined by the measurement of PZT driving characteristics to EEPROM by this program.



- **Perform this adjustment when the following repair / service is done.**
 - Replacing the head
 - Replacing MAIN board
 - Replacing printer mechanism
- **Perform the adjustment items described in Table 5-1 according to the replacement parts in the specified order.**

1. Select "Head voltage ID Input" from the Adjustment menu. The screen below appears.

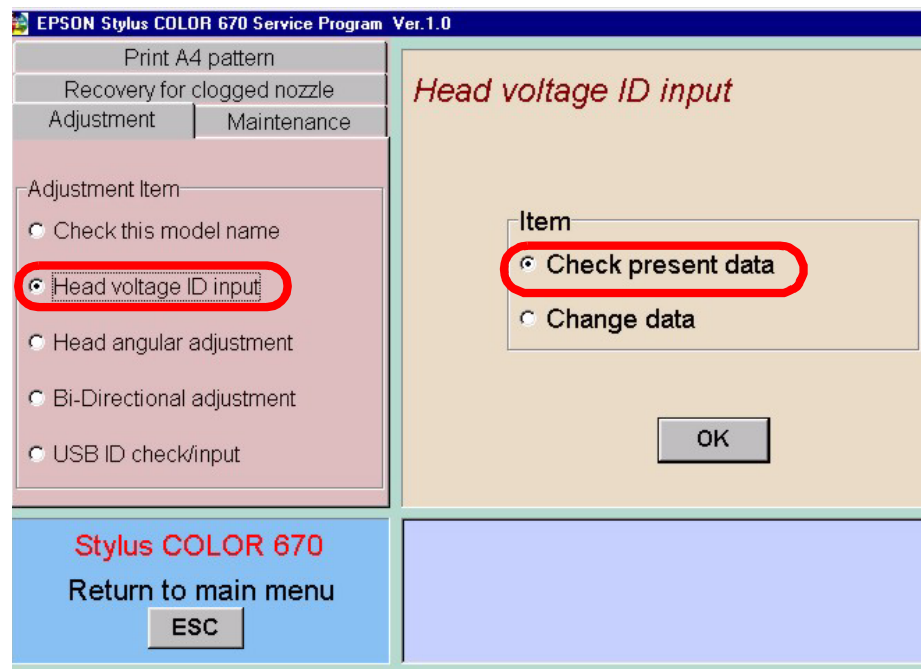


Figure 5-5. Head ID Input Main Menu

2. Before replacing the MAIN board, select "Check present data" in the screen above and click OK:

- Click OK in the screen below. The current head ID stored in EEPROM appears at the bottom of the window. For adjustments requiring you to input the head voltage ID, go to step 4. Otherwise, click Previous and you are finished.

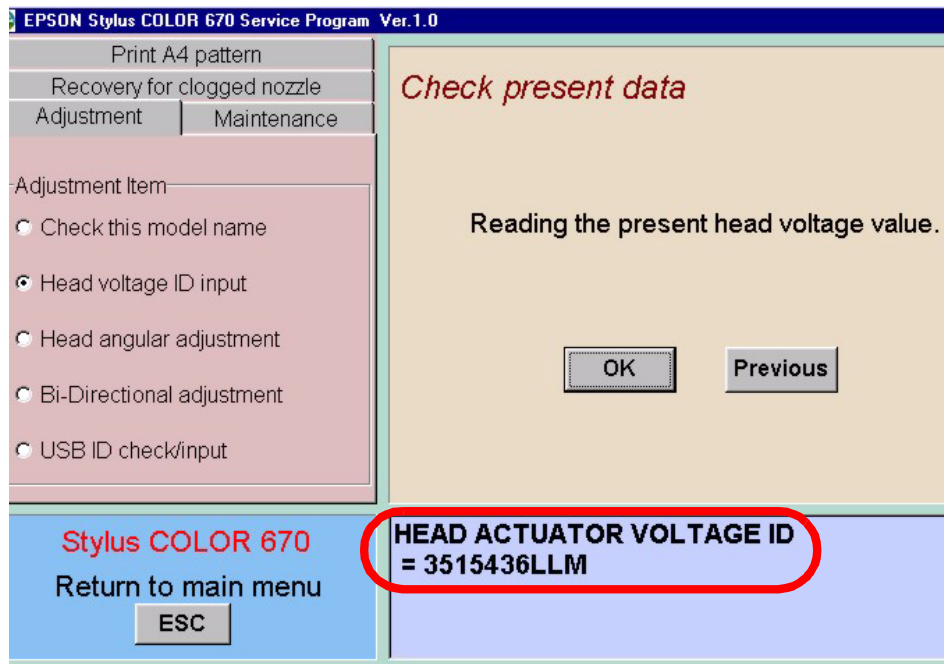


Figure 5-6. Check the Current Data



- Check the current head ID before you replace the MAIN board. If the logic circuit is normal, you can read the current data and you do not have to check the head ID visually.
- When you read the head ID by the “Check present data” function, write down the head ID and input the data in the EEPROM using the “Change data” function after you have replaced the new board or head.
- If necessary, you can visually find the head ID by shifting the CR unit to the I/C replacement position without using the “Check present data” function.

- Click Previous to return to the Head Voltage ID Input screen. To input the head ID, select “Change data” and click OK. The screen below appears allowing you to input the 10 character head ID (necessary after printhead replacement).

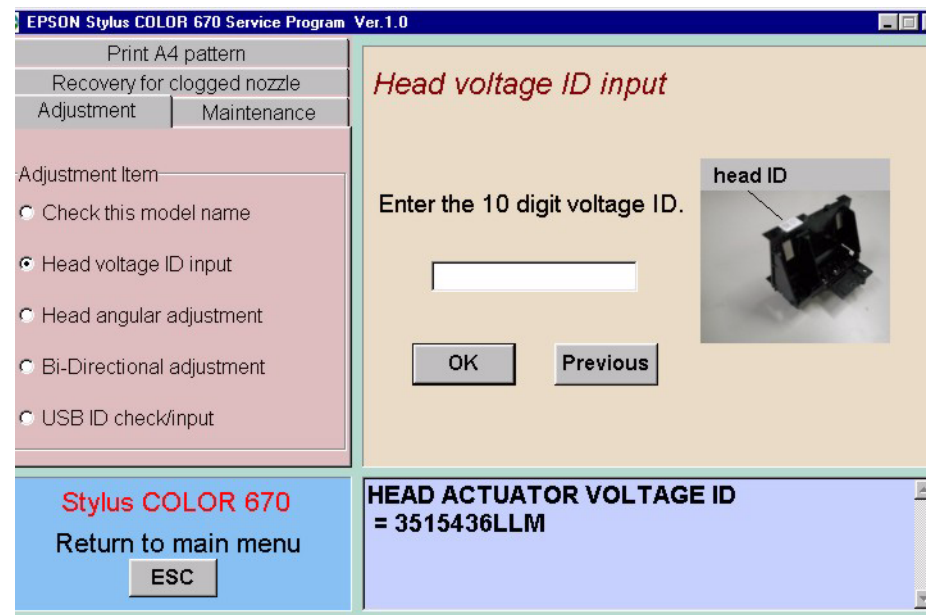


Figure 5-7. Head voltage ID input Screen

- Click OK when finished entering the ID to store the ID in EEPROM.

NOTE: Read head ID from the QR code label from the left side to the right on the top line and then the left to the right of the bottom line.

If the head ID is not correctly input, one of the following errors will be indicated on the bottom of the screen according to the error type.

- The number of input figure is incorrect.
- The parameter is not within the input range.
- Check ID is incorrect.

5.3.6 Head Angular Adjustment

During production, slight variations are created in the printhead and carriage (which is used as a printhead base). If these differences are not adjusted, they would adversely influence the printhead angle, resulting in poor print quality.

Head angular adjustment adjusts the head angle against the horizontal direction by the adjustment lever, and after adjustment is made, you check the adjustment value by printing the special pattern print. The following is the adjustment procedure.



- **Perform this adjustment when the following repair / service is made.**
 - Replacing or removing the head
 - Replacing head angular lever
- **Perform the adjustment items described in Table 5-1 according to the replacement parts in the specified order.**
- **When performing this adjustment, use of super fine paper is recommended.**
- **If you do not complete the adjustment within five minutes, the printer becomes unable to move the carriage due to a loss of magnetism in the motor. If you see an error message describing this condition, click OK in the message box to recover the printer.**

1. Select "Head angular adjustment" on the Adjustment menu. The following screen appears.

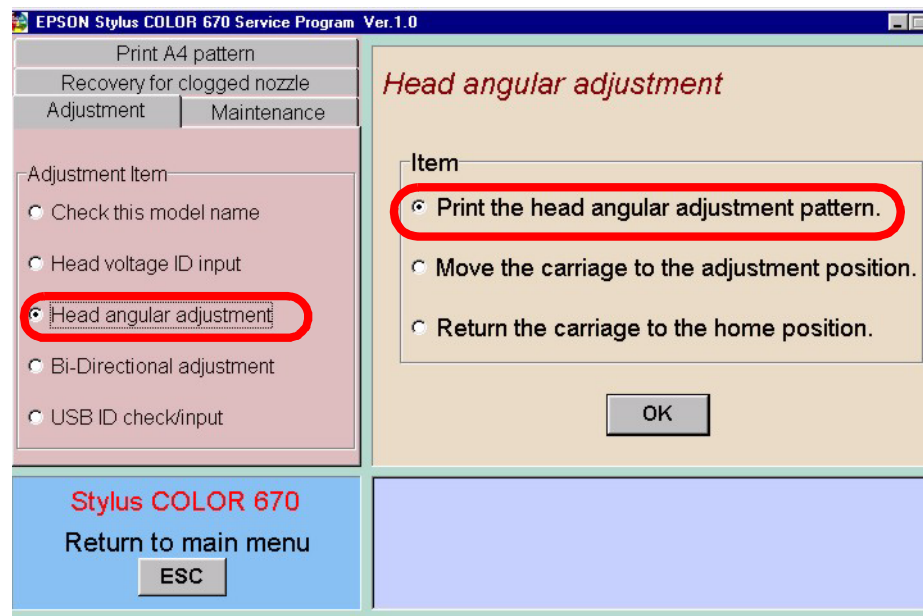


Figure 5-8. Head Angular Adjustment

2. Select "Print the head angular adjustment pattern" and click OK. The following pattern will be printed, but the paper is ejected only far enough for you to see the pattern.

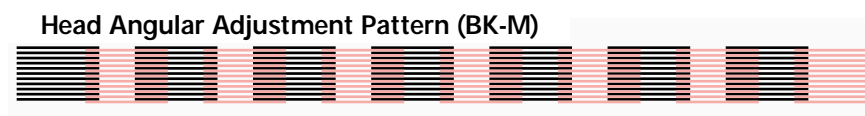


Figure 5-9. Head Angular Adjustment Pattern

3. Check the printed pattern. If the series of magenta lines are not printed directly in the center between the series of black lines, select "Move the carriage to the adjustment position" and click OK. The carriage moves to the center so you can manually adjust the head angle.

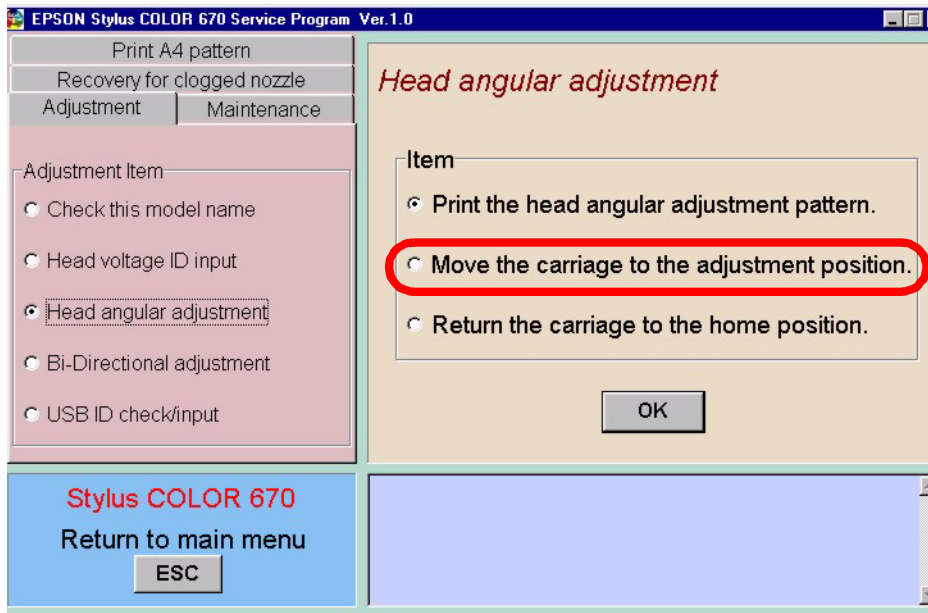


Figure 5-10. Move the carriage to adjust the head angle

- At the head angular adjustment position, loosen the screw fixing the printhead which is located at the right side of the CR.

NOTE: When loosening / tightening the head securing screw, hold the CR unit. If you do not hold the CR unit, the upper frame may be deformed, resulting in poor image quality.

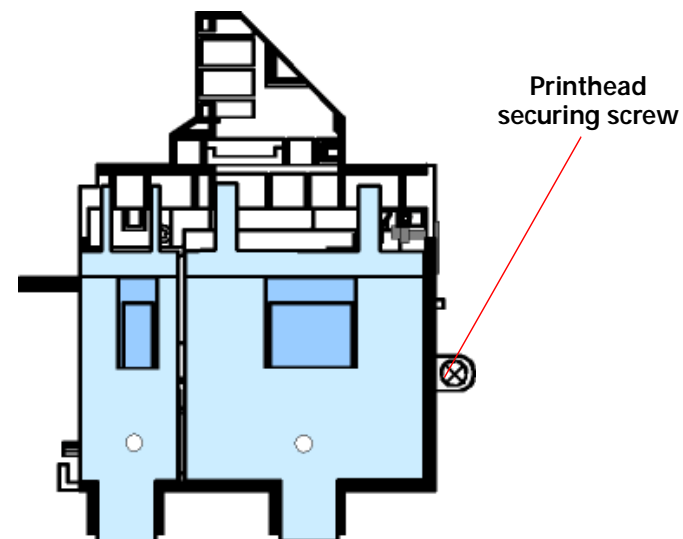


Figure 5-11. Screw Position for Fixing the Printhead

- Look very closely at the black/magenta lines in the printed pattern and move the adjustment lever to center the magenta lines between the black lines. The figure below shows how to move the lever to correct a misaligned pattern.

If the series of magenta lines are below the center of the series of black lines, shift the adjustment lever position toward the front of the printer. If the series of magenta lines are above the center between the series of black lines, shift the adjustment lever position toward the rear of the printer.

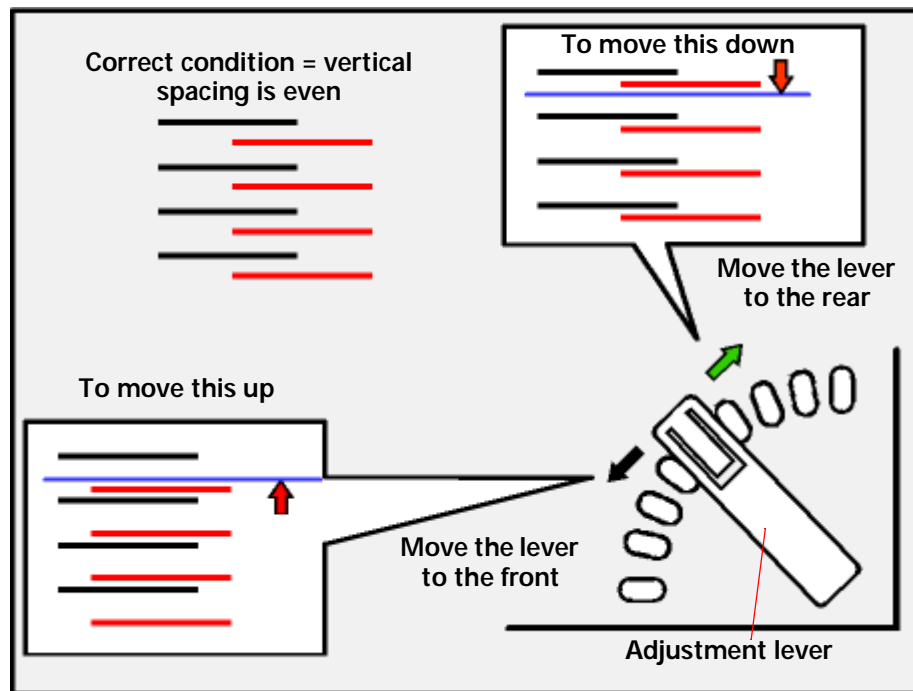


Figure 5-12. Head Angular Adjustment Lever - Adjusting Method

- Select "Print the head angular adjustment pattern" and perform the test print. If more adjustment is necessary, repeat steps 2 to 5; otherwise proceed to step 7.

- After finishing the adjustment, tighten the head screw while holding the unit. (If necessary, select "Move the carriage to the adjustment position", click OK, and then tighten the screw.)
- Select "Return the carriage to the home position" and click OK. When the carriage stops moving, the adjustment is finished.

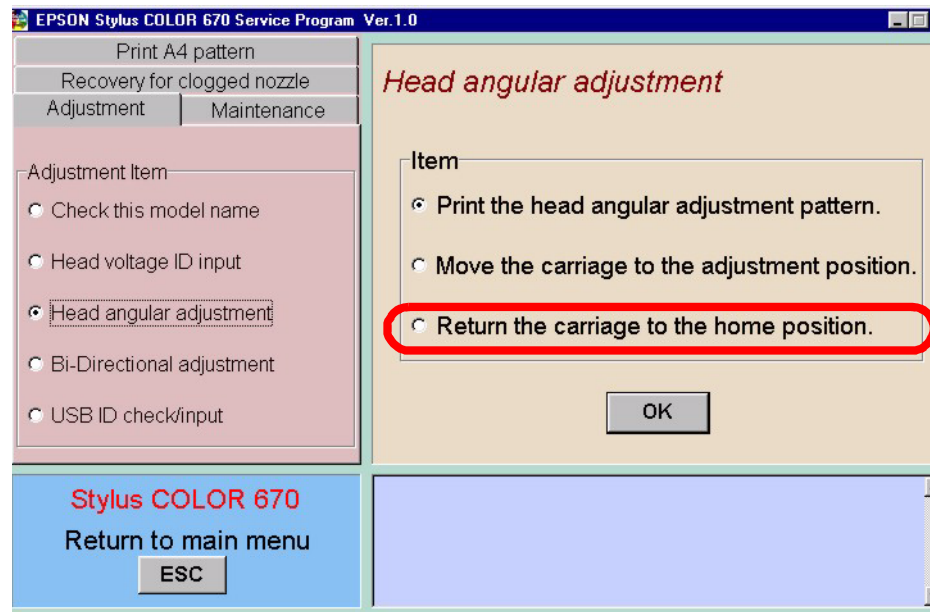


Figure 5-13. Move the carriage to the home position

5.3.7 Bi-D Adjustment

This adjustment is to correct differences in printing positions, which is caused by slippage of printing timing in right and left directions during the Bi-directional printing. Print the check pattern of the adjustment program and write the corrected value in the EEPROM. The following is the adjustment procedure.



- **Perform this adjustment when the following repair / service is made.**
 - Replacing or removing the head
 - Replacing or removing the CR unit
 - Replacing or removing the CR motor
 - Replacing or removing the timing belt
 - Replacing the printer mechanism
 - Replacing the MAIN board
- **When performing this adjustment, use of super fine paper is recommended.**

1. From the Adjustment menu, select “Bi Directional adjustment” and then select “Print the Bi-D adjustment pattern. Click OK.

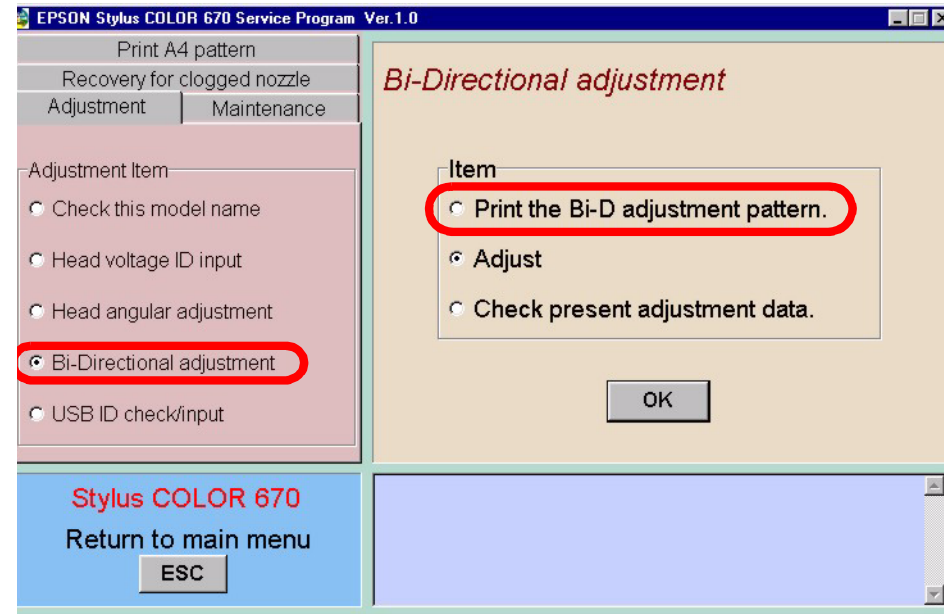


Figure 5-14. Bi-d Adjustment Selection

2. Click OK in the next screen to print the patterns.

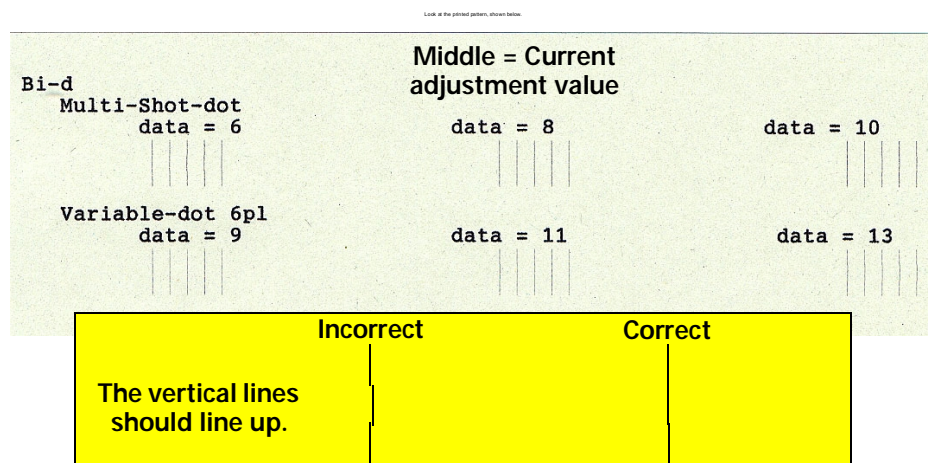


Figure 5-15. Bi-d Print Patterns

NOTE: Two rows of three samples are printed. The upper row corresponds to the Multi-shot adjustment values, with the current value printed in the middle and a sample that is a little higher or lower on either side. The lower row repeats this process for the variable dot values.

3. Check the vertical lines in the current pattern (middle of the three sets).
 - If all lines are vertically aligned, adjustment is not required.
 - If the center (current) set of lines is not aligned, select "Adjust" and click OK.

4. The following screen appears and select the kind of Bi-D adjustment that is required while referring to the printed patterns.
 - Select "Multi-Shot-dot" from the Item box if the Multi-Shot-dot pattern in the center is not vertically aligned.
 - Select "Variable-dot 6pl" from the Item box if the Variable-dot 6pl pattern in the center is not vertically aligned.

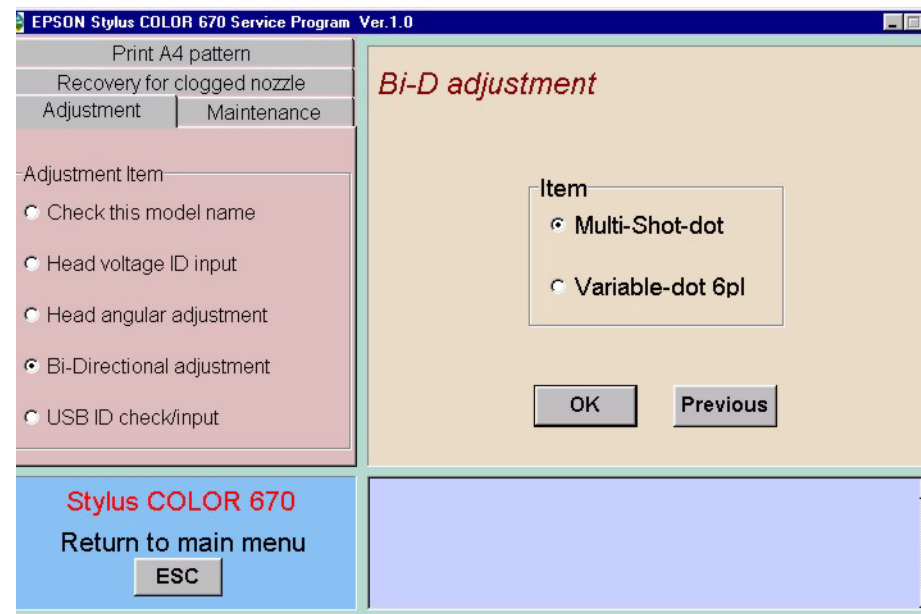


Figure 5-16. Print Bi-d Adjustment menu

5. Click OK and the following screen appears.

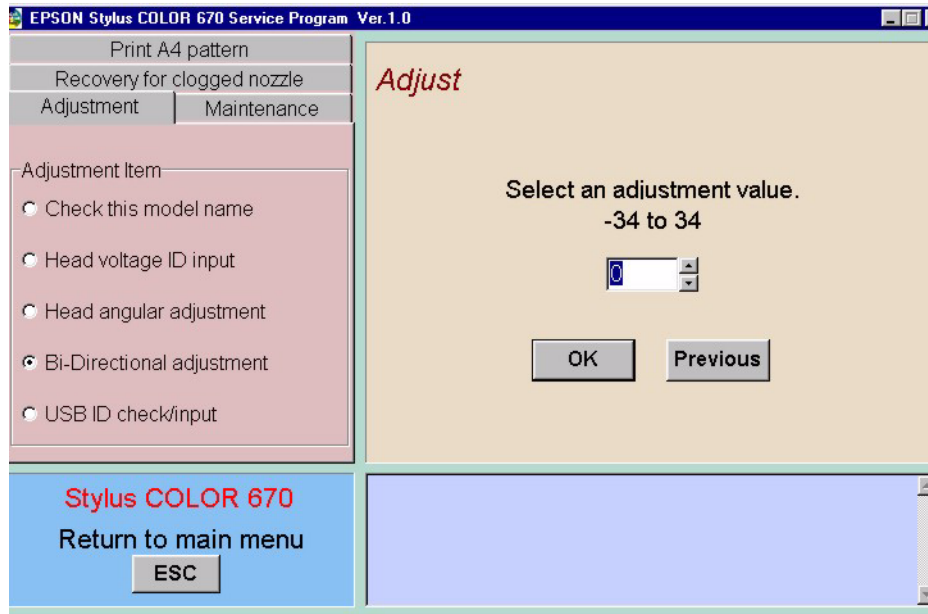


Figure 5-17. Bi-d Adjustment Value Input Screen

6. Enter the number of the correct adjustment pattern. If none of the patterns are correct, estimate a number based on a comparison of the current pattern and the two samples and enter that number. Click OK.
7. To print the pattern again, click Previous two times to get back to the correct screen. Then select "Print the Bi-D adjustment pattern" and click OK.
8. If the central three lines of the adjustment pattern are not aligned, repeat from step 3 to step 7.

NOTE: You can check the current adjustment data by the following operation.
 Select "Check present adjustment data" and click OK, then click OK in the next screen.

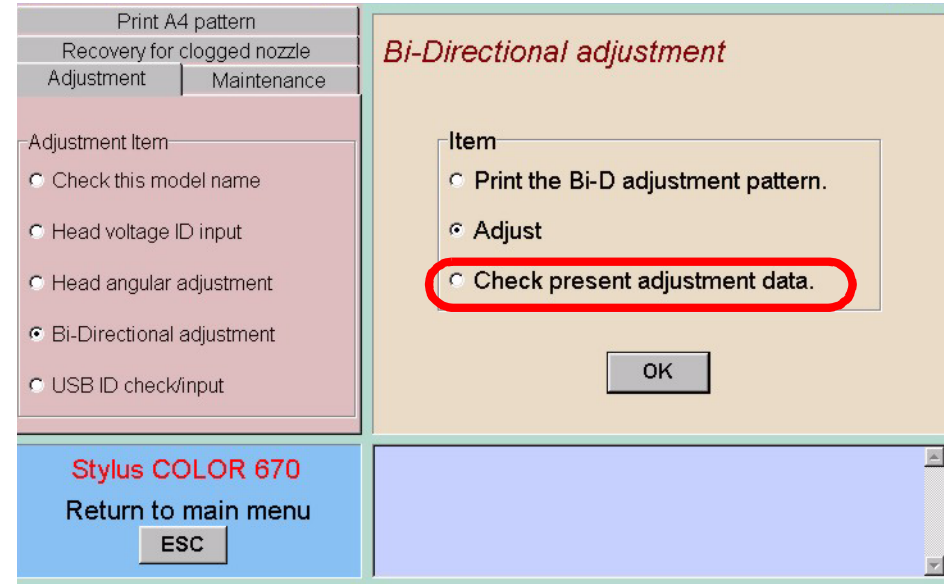


Figure 5-18. Checking present adjustment values

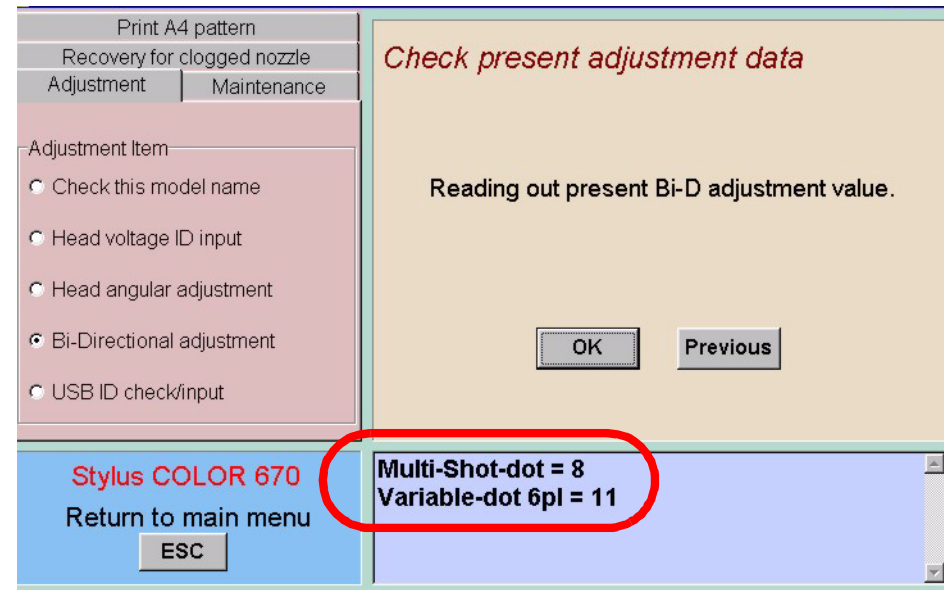


Figure 5-19. Current bi-d adjustment values appear on screen

5.3.8 USB ID Input

Perform this adjustment when the MAIN board is replaced. EPSON Stylus COLOR 670 stores 18-figure USB ID unique to the machine in EEPROM on the MAIN board. USB ID is the data used when USB port is generated when the printer is connected to the PC. Because the printer has the USB ID, even if several printers with the same name are connected to the one PC, the hard device driver can generate individual USB port based on USB ID to supervise each port correctly. The following is the procedure of inputting USB ID.



- When inputting the USB ID, input the data referring to the 10-digit product serial number labeled on the back of the printer. The rest 8-digit will be automatically generated by the adjustment program.
- This data input is required only when the MAIN board is replaced.
- USB is the valid interface only under Windows98 environment.

1. Select and click "USB ID check/input" from the Adjustment menu. The following screen appears.

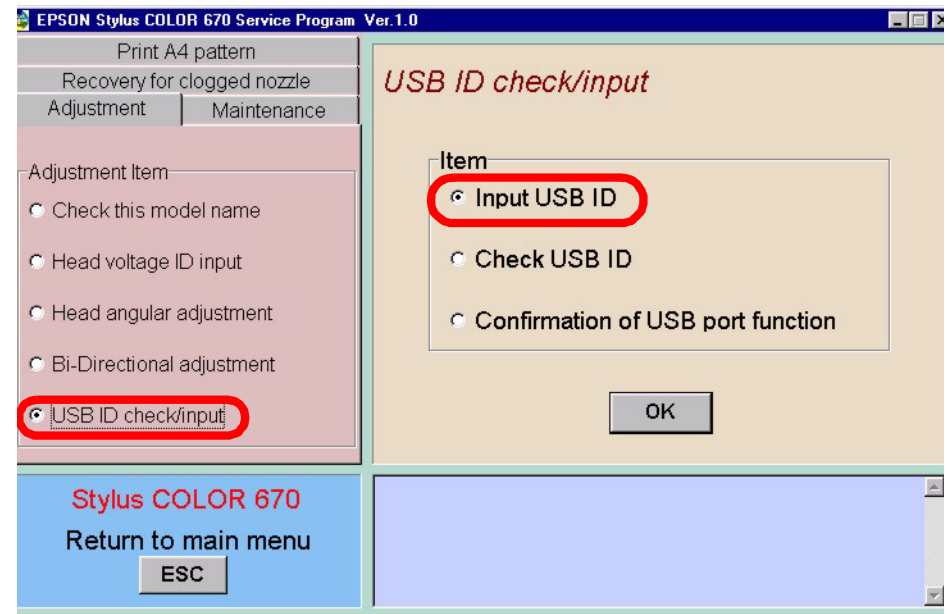


Figure 5-20. Main USB ID check/input Screen

2. Select "Input USB ID" from USB ID Input main menu and click OK.

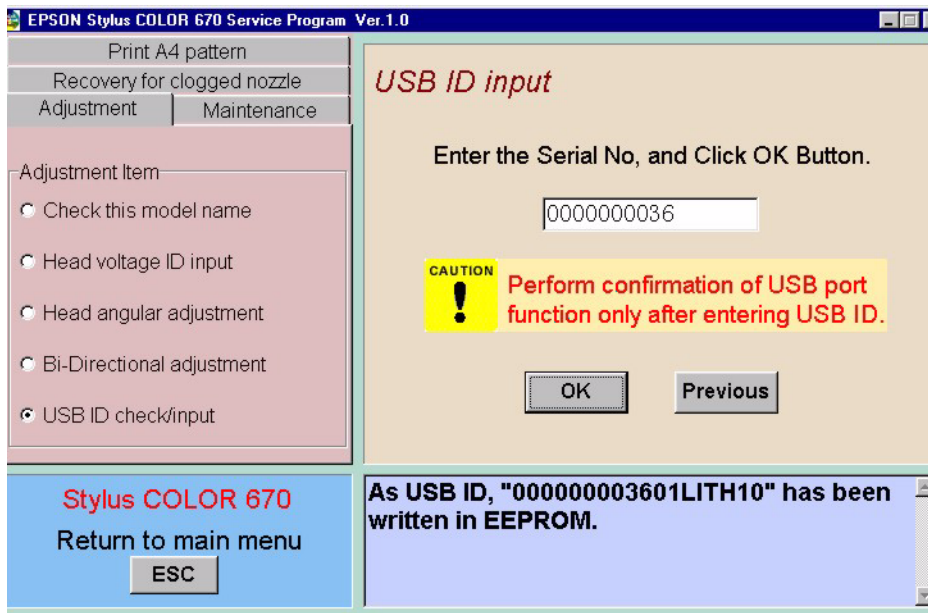


Figure 5-21. Actual Input Screen

3. Check the serial number on the back of the printer and input the 10-digit serial number. After inputting the serial number, click OK and the remaining 8 digits will be automatically generated by the program and the total 18 figures will appear in the lower box.
4. Click Previous to return the the main USB screen, shown below.

TO ONLY CHECK THE USB ID

To just check the USB ID without having to enter anything, select the "Check USB ID" radio button and click OK.

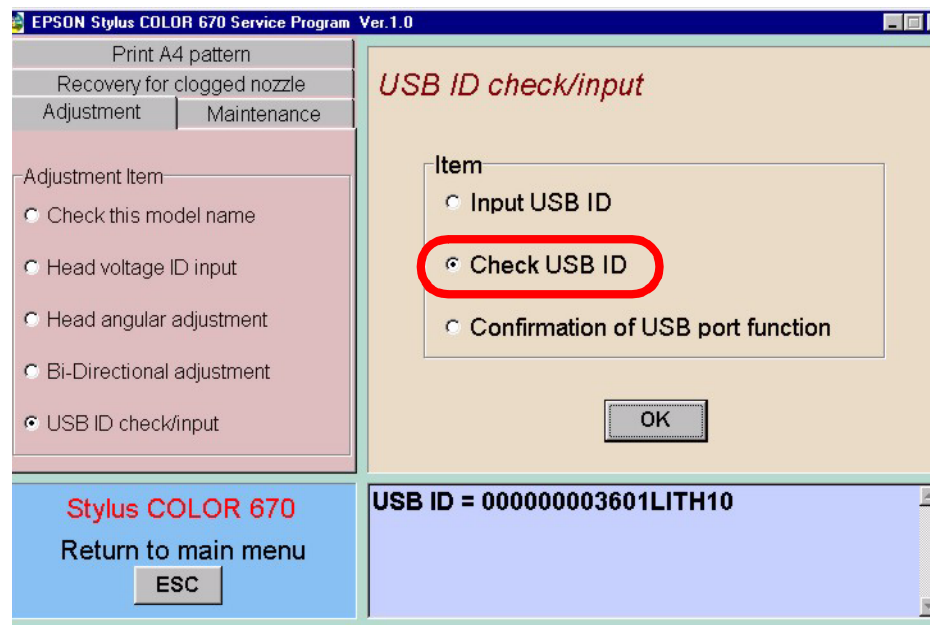


Figure 5-22. USB ID Input Screen 3

NOTE: - If you use Windows 98, you can verify the USB port is communicating properly with the "Confirmation of the USB Port is performed normal, using the "Check USB port function" menu from the USB ID input menu, and select the port you want to verify in the next screen. Then click OK.
 - Note this menu is valid only under Windows98 environment. By selecting this menu, A4 check pattern will be printed.

5.3.9 Head Cleaning

This item is selected from the maintenance menu. Head cleaning is used when the dot missing is occurred to perform the head cleaning more effectively. By selecting / performing this sequence, the powerful cleaning (CL' which consumes ink the most among manual CL + rubbing) is performed constantly.

1. Select "Head Cleaning" from the Maintenance menu. The following screen appears.

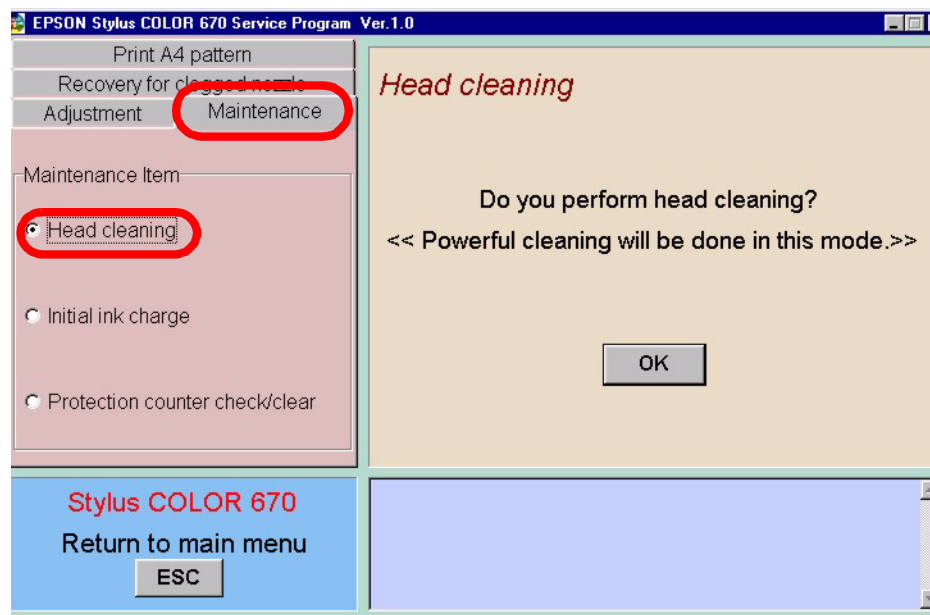


Figure 5-23. Head Cleaning

2. Click OK in the screen above and CL2 cleaning will be performed.

5.3.10 Initial Ink Charge

There is no ink charged in the ink path of a spare print head and printer mechanism. Therefore, after you replace any of the following units, perform initial ink charge and return the printer to the user after making sure that ink is ejected correctly from the print head.



- **Perform this adjustment when the following repair / service is made.**
 - Replacing the head
 - Replacing the printer mechanism
- **Perform the adjustment items described in Table 5-1 in the appropriate order according to the replaced parts.**
- **Before performing this sequence, make sure to replace I/C with a new one.**
- **By performing this sequence, 1/10 of each I/C will be consumed.**

1. From the Maintenance menu, select "Initial Ink Charge". The following screen appears.

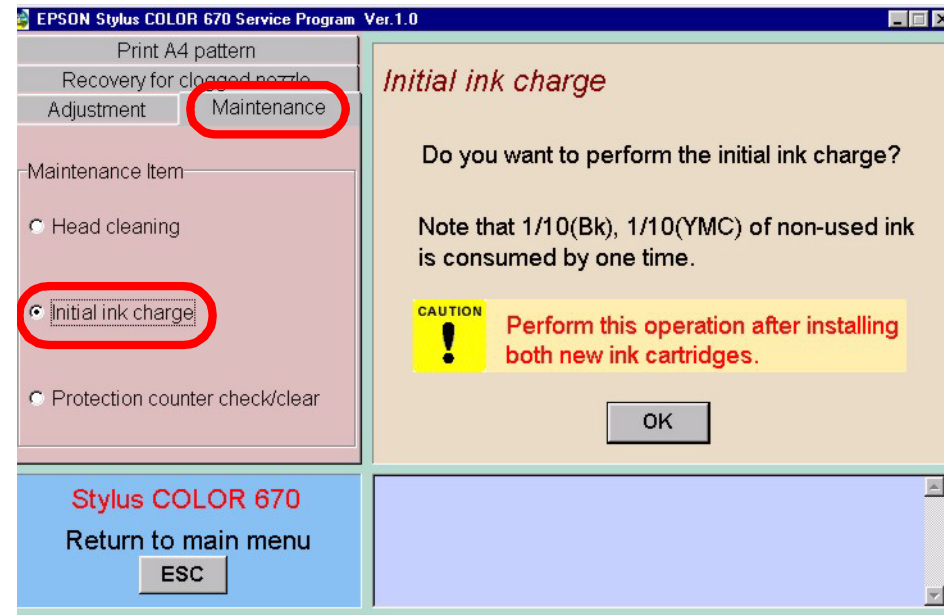


Figure 5-24. Initial Ink Charge

2. Click OK in the screen above and the initial ink charge will be performed.

5.3.11 Protection Counter Indication / Reset

This function is to check the protection counter value for the waste ink absorber and resetting the counter value.



- After resetting the protection counter value, replace the ink waste pad with a new one.
- When repairing the printer, check the protection counter using this function. If the counter value reaches 25000 points, advise the customer to replace the ink waste pad. After replacing the ink waste pad, reset the waste counter value.

1. From the Maintenance menu, select "Protection counter check/clear". The following screen appears.

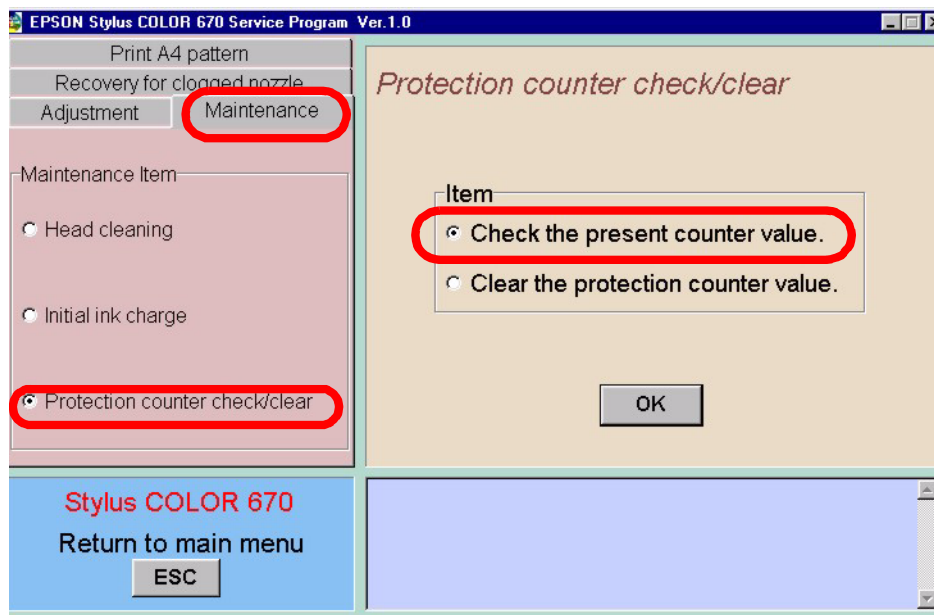


Figure 5-25. Indication of the Protection Counter Value

2. In the screen above, select "Check the present counter value" and click OK.

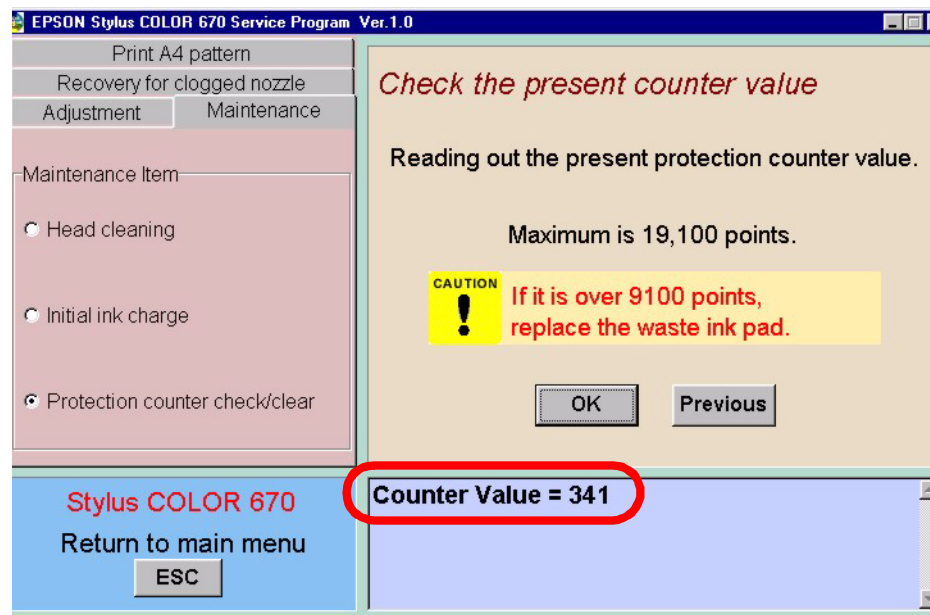


Figure 5-26. Check the Current Counter Value

3. Click OK in the screen above. The current counter value will be read from EEPROM and will be indicated in the lower box.
4. If the counter value exceeds 25000 points or if you replace the waste ink pad (absorber), clear the protect counter.
5. To clear the protect counter, click "Previous" in the screen above to return to the "Protection counter check / clear" screen.
6. Select "Clear the protection counter value" and click OK.

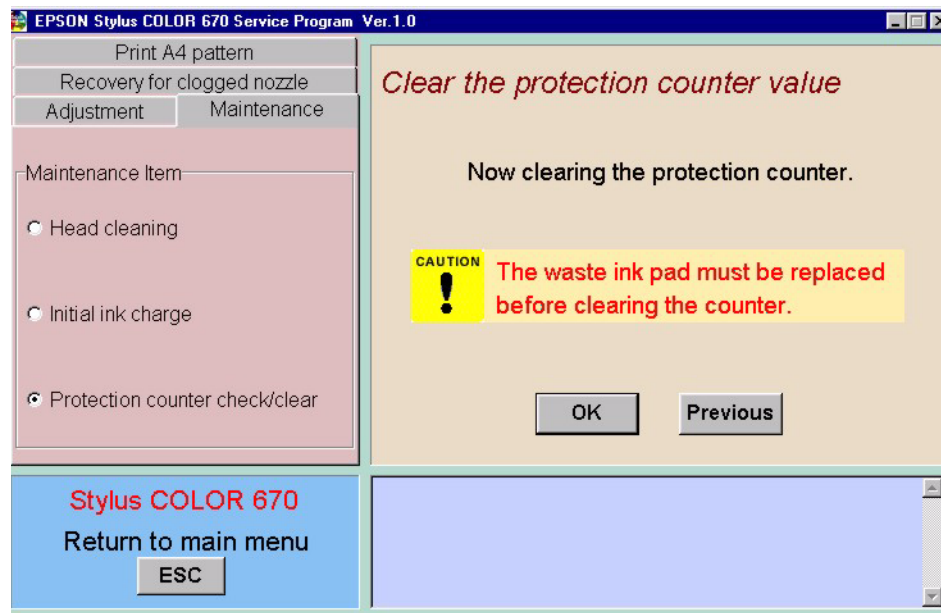


Figure 5-27. Current Counter Value Indication

7. In the screen above, click OK to clear the waste ink counter.

5.3.12 Print A4 Check Pattern

This function is to check the adjustment result comprehensively on the plain paper. By performing this function, the following items are printed.

- 360dpi Black / Color Pattern print
If there is no print blur or white lines on the print pattern, the adjustment is completed.
- Nozzle Check Pattern print
If dot is not missing and each nozzle print pattern is uniformly printed, it is OK.
- Alignment Pattern print
Check the alignment on each nozzles on Uni-d print and the alignment of black and each color.
- Head Angular Adjustment
- Head Actuator Voltage ID
- Ink Waste Pad Counter Value
- Bi-d Adjustment result



When performing this function, use plain paper. If you use any special paper, white line will be generated on 360dpi print pattern.

1. To print out the A4 check pattern, click the "Print A4 Pattern" tab.
2. Click the "A4 pattern will print" radio button, and then click OK.

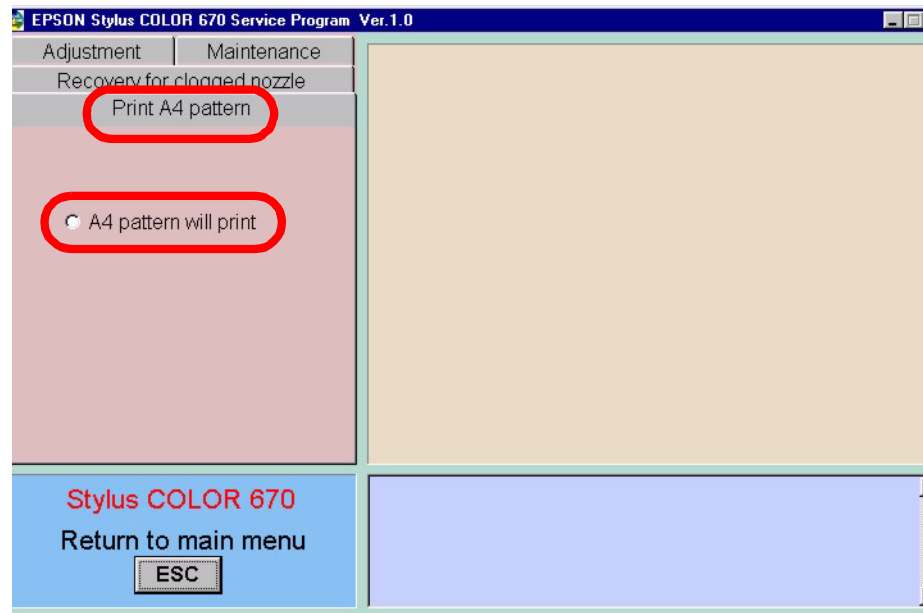


Figure 5-28. A4 Check Pattern Menu

3. Click OK in the screen that appears.

CHAPTER

6

MAINTENANCE

6.1 Overview

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

6.1.1 Cleaning

This printer has no mechanical components which require regular cleaning except the printhead. Therefore, when returning the printer to the user, check the following parts and perform appropriate cleaning if stain is noticeable.



- Never use chemical solvents, such as thinner, benzine, and acetone to clean the exterior parts of printer like the housing. These chemicals may deform or deteriorate the components of the printer.
- Be careful not to damage any components when you clean inside the printer.
- Do not scratch the surface (coated part) of PF roller assembly. Use soft brush to wipe off any dusts. Use a soft cloth moistened with alcohol to remove the ink stain.
- Do not use cleaning sheet included in the media for normal usage. It may damage the coated surface of PF roller.

- Exterior parts
Use a clean soft cloth moistened with water and wipe off any dirt. If the exterior parts are stained with ink, use a cloth moistened with neutral detergent to wipe it off.
- Inside the printer
Use a vacuum cleaner to remove any paper dust.
- ASF LD Roller
If paper dust on the surface of ASF LD Roller lowers the friction, set the adhesive surface of the cleaning sheet included in the media to the surface of the ASF roller and repeat loading paper from the ASF.

6.1.2 Service Maintenance

If any abnormal print (dot missing, white line, etc.) has occurred or the printer indicates "Maintenance Request Error", take the following actions to clear the error.

□ Head Cleaning

When any abnormal print has occurred, it is necessary to perform printhead cleaning, using the built-in head cleaning function. This function can be executed from the control panel, printer driver utility and adjustment program. EPSON Stylus COLOR 670 has 3 modes for manual cleaning and even during printing, appropriate cleaning mode is automatically selected and executed according to various conditions. When you select and execute manual cleaning, the most appropriate cleaning mode is selected and therefore the cleaning completion period varies depending on the mode. (Refer to "Ink Sequence" on page 42.)

The following is the process to perform the head cleaning from the control panel.

1. Make sure that the printer is in stand-by state (the Power indicator is not blinking), and press "Maintenance" button on the control panel.
2. After performing the head cleaning sequence, perform the print check. If you repeat cleaning without print check, the weakest cleaning, CL1 will be repeated.

□ Maintenance Request Error

Ink is used for cleaning operation as well as printing. When ink is used for cleaning, the ink is drained to Waste Ink Pad (Ink Absorber Tray Assembly) and the amount of waste ink is recorded in the EEPROM on the MAIN board. Due to this, when the waste ink has reached the limit of the absorbing capability of the Waste Ink Pad, Maintenance Request Error is indicated on LED.

In this case, replace the Waste Ink Pad and clear the Waste Ink Counter stored in EEPROM. Waste Ink Counter can be reset from the control panel and the adjustment program. The following is the process to reset the Ink Counter by the control panel.

1. Replace Ink Absorber Tray Assembly.
2. Turn the printer ON while pressing Load/Eject and Ink Maintenance buttons.
3. While Paper Out LED is blinking (for 3 seconds), keep pressing the Ink Maintenance button.
4. When the Waste Ink Counter is reset, all the panel LED starts blinking and it returns to ON line condition.

6.1.3 Lubrication

The characteristics of the oil or grease have great affects on the mechanical function and durability, especially does the characteristics about temperature environment. The type and amount of oil and grease used to lubricate the printer parts are determined based on the results of internal evaluations. Therefore, be sure to apply the specified type and amount of oil or grease to the specified part of the printer mechanism during servicing.



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

Table 6-1. Lubrication Types

Type	Name	EPSON Code	Supplier
Grease	G-26	B702600001	EPSON
Oil	O-12	1038991	EPSON
Lubrication Devices	Flags Dispenser	1049533	EPSON

Table 6-2. Lubrication Points

No.	Lubrication Type/Point	Remarks
1	<Lubrication Point> • Contact point between PF roller and the rear paper guide. <Lubrication Type> G-26 <Lubrication Amount> • A half turn of PF roller.	<ul style="list-style-type: none"> • Apply grease while rotating spur gear 36 attached at the left end of PF roller. • Do not attach the grease to the paper path. • Use a syringe to apply it.

Table 6-2. Lubrication Points (continued)

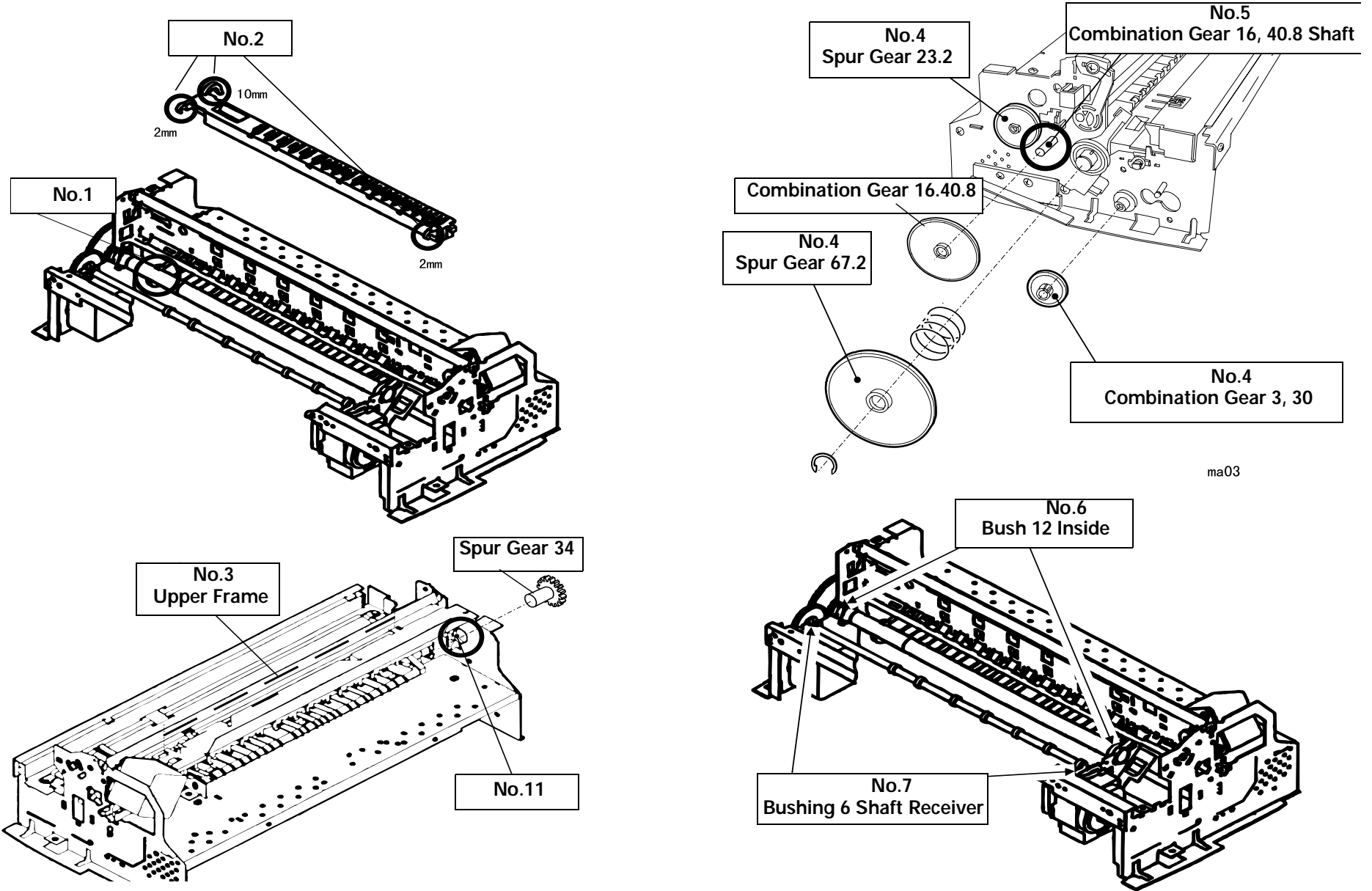
No.	Lubrication Type/Point	Remarks
2	<Lubrication Point & Amount> • Contact point between PF roller of the front paper guide and hook. (1 point, lubrication amount: 10mm) • Contact point between paper eject roller of the front paper guide and hook. (2 points, lubrication amount: 2mm) <Lubrication Type> G-26	<ul style="list-style-type: none"> • Lubricate the contact points between the hooks on the front paper guide and each roller. • Do not attach the grease to the paper path. • Use a syringe to apply it.
3	<Lubrication Point> • Contact point between the CR unit and the upper frame. <Lubrication Type> G-26 <Lubrication Amount> • Range from the HP sensor installation point to the full width of the FFC guide board: approximately 270 mm	<ul style="list-style-type: none"> • After lubrication, make sure that the carriage moves smoothly. • Use a syringe to apply it.
4	<Lubrication Point & Amount> • 1/4 of Spur Gear 67.2 • Combination Gear 3, 30 installation shaft: 1mm x 5mm • 1/3 of Spur gear, 23.2 <Lubrication Type> G-26	<ul style="list-style-type: none"> • Rotate gears after applying grease to evenly distribute it. • Use a syringe to apply it.
5	<Lubrication Point> Combination gear, 16, 40.8 of the left frame Installation shaft <Lubrication Type> G-26 <Lubrication Amount> Approximately 5 mm	<ul style="list-style-type: none"> • Use a syringe to apply it.

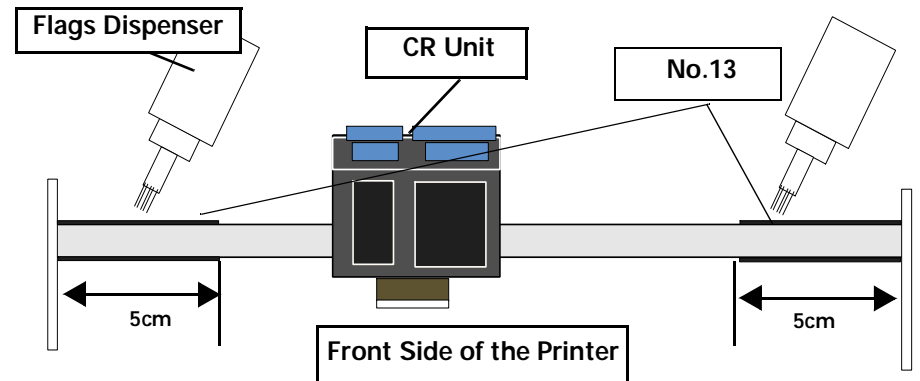
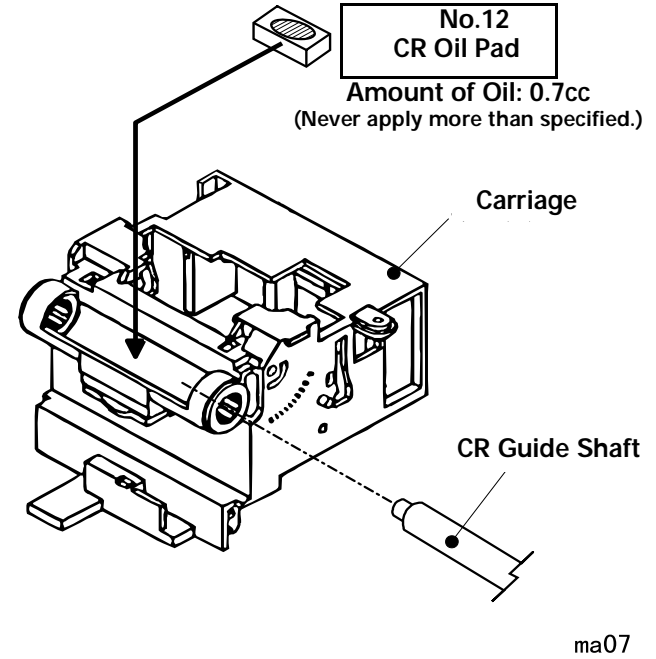
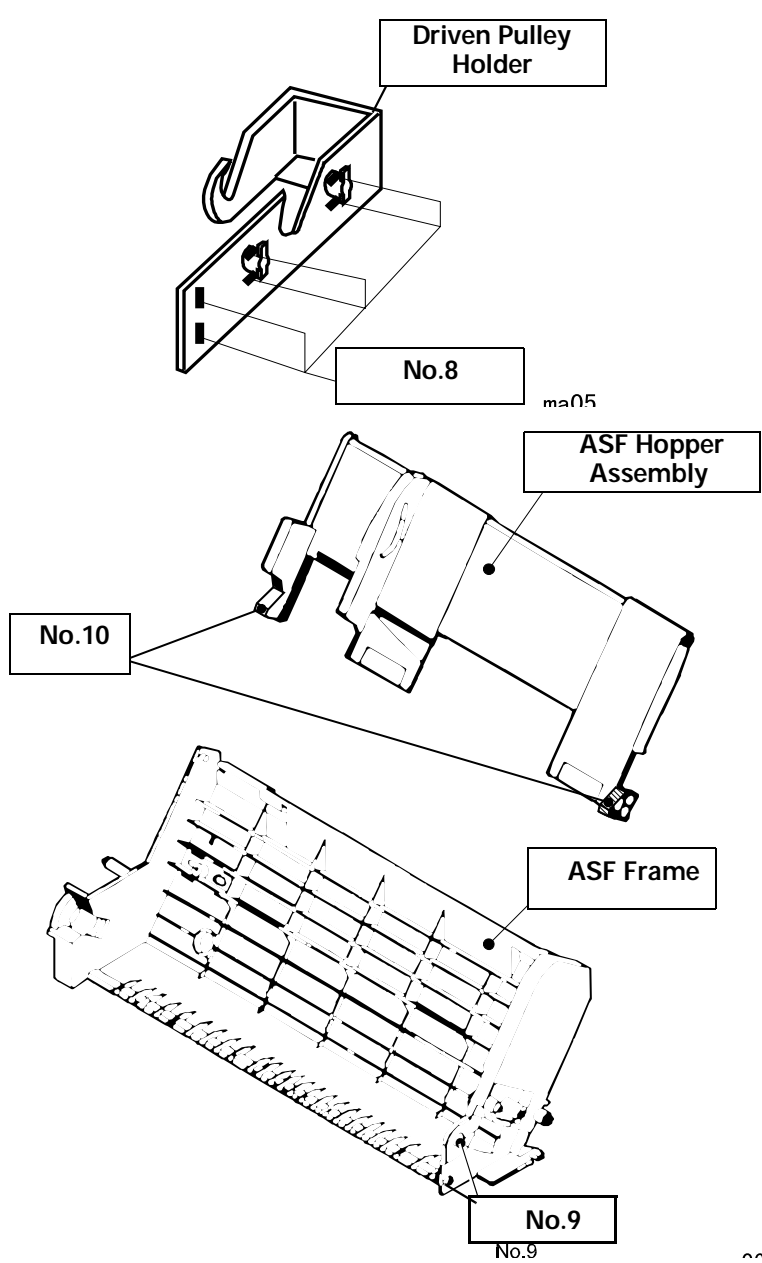
Table 6-2. Lubrication Points (continued)

No.	Lubrication Type/Point	Remarks
6	<p><Lubrication Point></p> <ul style="list-style-type: none"> Inside the PF roller assembly installation bushing 12: <p>Left: Inside the left bushing 12 Right: Inside the right bushing 12</p> <p><Lubrication Type> G-26 <Lubrication Amount> Approximately 3 mm diametrically</p>	<ul style="list-style-type: none"> For the right bushing (pump assembly shaft bushing), apply it from the paper path side, and wipe off any grease sticking out to the cap assembly side. Rotate PF roller after applying grease to evenly distribute it in the bushing. Use a syringe to apply it.
7	<p><Lubrication Point></p> <ul style="list-style-type: none"> Contact point with both left / right bushings (bushing 6) for paper eject roller. <p><Lubrication Type> G-26 <Lubrication Amount></p> <ul style="list-style-type: none"> Evenly apply inside the bushings. 	<ul style="list-style-type: none"> Evenly apply inside the bushings contacting the shafts. Do not attach the grease to the paper path. Use a syringe to apply it.
8	<p><Lubrication Point></p> <ul style="list-style-type: none"> Contact points between driven pulley holder and upper frame <p><Lubrication Type> G-26 <Lubrication Amount></p> <ul style="list-style-type: none"> 2 mm long for each point. 	<ul style="list-style-type: none"> After applying grease, make sure that the holder slides only by spring force. Use a syringe to apply it.
9	<p><Lubrication Point></p> <ul style="list-style-type: none"> ASF; The round hole in the right frame of ASF (to hold the roller shaft) (installation point to the middle frame) <p><Lubrication Type> G-26 <Lubrication Amount> Evenly apply inside the hole.</p>	<ul style="list-style-type: none"> Evenly apply inside the hole. Avoid applying grease to LD roller assembly.

Table 6-2. Lubrication Points (continued)

No.	Lubrication Type/Point	Remarks
10	<p><Lubrication Point></p> <p>ASF; Contact points between hopper and hopper release lever.</p> <p><Lubrication Type> G-26 <Lubrication Amount> Evenly apply lubrication to the points.</p>	<ul style="list-style-type: none"> Evenly apply lubrication to the contact point with hopper release lever (cam). Completely wipe off any grease sticking out to the inner side of ASF.
11	<p><Lubrication Point></p> <p>The round cutout in the left frame of ASF (Spur gear, 34 is inserted to the cutout)</p> <p><Lubrication Type> G-26 <Lubrication Amount> Evenly apply inside the hole.</p>	<ul style="list-style-type: none"> Evenly apply inside the hole.
12	<p><Lubrication Point></p> <p>Oil pad in the carriage assembly.</p> <p><Lubrication Type> O-12 <Lubrication Amount> 0.7cc</p> <p>Note: This is the amount to be applied to a new oil pad. Do not add oil to the oil pad in use.</p>	<ul style="list-style-type: none"> Lubricate the oil pad only when; -Replacing the carriage assembly. -Replacing the oil pad Use a precise syringe to apply it. If you accidentally apply too much oil to the oil pad, throw the pad away and take a new one. Leave the oil pad for a while to wait until oil is evenly infiltrated, then install it on the carriage assembly.
13	<p><Lubrication Point></p> <p>5cm from the both ends of CR guide shaft. Apply oil up and down side of the shaft.</p> <p><Lubrication Type> O-12 <Lubrication Amount></p> <p>Push the flags dispenser and moist the end with oil. Apply oil to the range of 5cm from the both ends of the shaft.</p>	<ul style="list-style-type: none"> Do not lubricate with pressing the flags dispenser. Too much oil may result in oil leakage. After lubrication, shift the timing belt to the left and to the right and evenly distribute it around the CR unit shaft bushing and CR guide shaft.





CHAPTER

7

APPENDIX

7.1 Connector Summary

7.1.1 Major Component Unit

Major component unit of this printer is as follows.

- MAIN Board (C301MAIN)
- Power Supply Board (C301PSB/PSE)
- Control Panel (C209PNL)

The figure below shows how these components are connected.

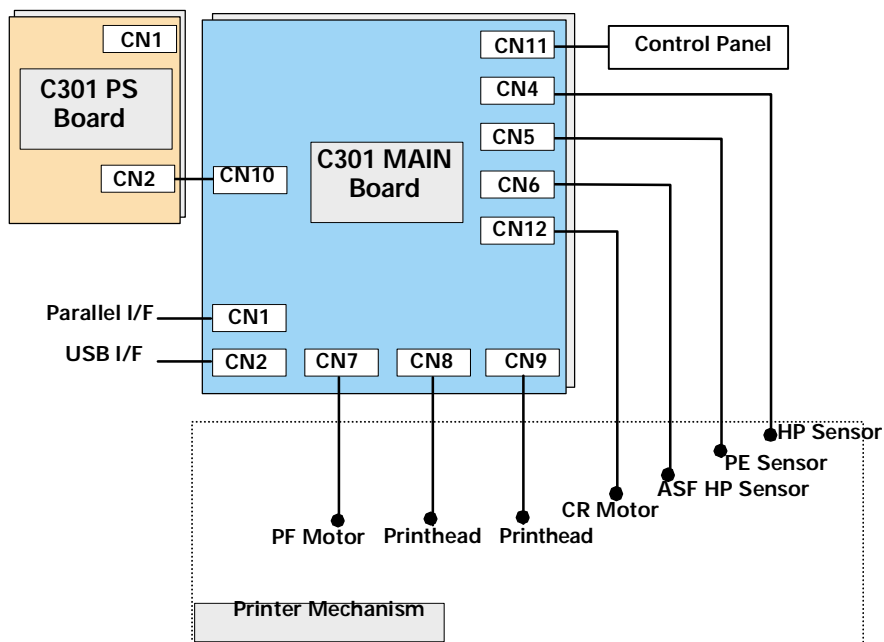


Figure 7-1. Connection of the Major Components

Table 7-1. Connector Summary for C259Main

Connector	Function	Table to refer.
CN1	Parallel Interface Connector	Refer to "IEEE-1284 Parallel I/F (Forward Channel)" on page 18
CN3	USB Interface Connector	Refer to "USB (Universal Serious Bus)" on page 22
CN4	HP Sensor	Table 7-2
CN5	PE Sensor	Table 7-3
CN6	ASF Sensor	Table 7-4
CN7	PF Motor	Table 7-5
CN8	Printhead	Table 7-6
CN9	Printhead	Table 7-7
CN10	Power Supply Connector	Table 7-8
CN11	Control Panel	Table 7-9
CN12	CR Motor	Table 7-10

Table 7-2. Connector CN4

Pin	Signal Name	I/O	Function
1	HP	In	Sensor detect signal
2	GND	---	Ground
3	HPV	---	Sensor Power Supply

Table 7-3. Connector CN5

Pin	Signal Name	I/O	Function
1	PE	In	Sensor detect signal
2	GND	---	Ground
3	PEV	---	Sensor power supply

Table 7-4. Connector CN6

Pin	Signal Name	I/O	Function
1	ASF	In	Sensor detect signal
2	GND	---	Ground
3	ASFV	---	Sensor power supply

Table 7-5. Connector CN7

Pin	Signal Name	I/O	Function
1	PFA	Out	Phase drive signal (A)
2	PF-A	Out	Phase drive signal (-A)
3	PFB	Out	Phase drive signal (B)
4	PF-B	Out	Phase drive signal (-B)

Table 7-6. Connector CN8

Pin	Signal Name	I/O	Function
1	GND	---	Ground
2	GND	---	Ground
3	GND	---	Ground
4	LAT	Out	Serial data latch signal
5	GND	---	Ground
6	CH	Out	MS/VS trapezoid waveform select signal
7	GND	---	Ground
8	VDD	Out	+ Nozzle selector 5V power supply
9	GND	---	Ground
10	VHV	Out	+ Nozzle selector +42V power supply
11	GND2	---	Ground

Table 7-6. Connector CN8

Pin	Signal Name	I/O	Function
12	GND2	---	Ground
13	GND2	---	Ground
14	COM	Out	PZT drive signal
15	COM	Out	PZT drive signal
16	COM	Out	PZT drive signal

Table 7-7. Connector CN9

Pin	Signal Name	I/O	Function
1	NCHG	Out	All nozzle drive signal
2	GND	---	Ground
3	SCK	Out	Serial data clock signal
4	GND	---	Ground
5	SP	Out	CH signal select signal
6	SI6	Out	Serial data (This data line is not used)
7	SI5	Out	Serial data
8	SI4	Out	Serial data
9	SI3	Out	Serial data
10	SI2	Out	Serial data
11	SI1	Out	Serial data
12	GND	---	Ground
13	GND	---	Ground
14	THM	In	Head temperature signal
15	COC	In	Color ink cartridge sensor signal
16	COB	In	Black ink cartridge sensor signal

Table 7-8. Connector CN10

Pin	Signal Name	I/O	Function
1	+42V	---	Mechanism drive power supply
2	+42V	---	Mechanism drive power supply
3	GND	---	Ground
4	ESAVE	In	Energy saving signal
5	PSC	In	Power supply switch output signal
6	GND	---	Ground
7	GND	---	Ground
8	+5V	---	Logic power supply

Table 7-9. Connector CN11

Pin	Signal Name	I/O	Function
1	SW2	In	Panel switch on/off signal
2	SW0	In	Panel switch on/off signal
3	PSC	In	Power on/off switch
4	SW1	In	Panel switch on/off signal
5	LED3	Out	Panel LED signal
6	+5V	Out	+5V panel board power supply
7	+5V	Out	+5V panel board power supply
8	LED2	Out	Panel LED signal
9	GND	---	Ground
10	LED1	Out	Panel LED signal
11	GND	--	Ground
12	LED0	Out	Panel LED signal

Table 7-10. Connector CN12

Pin	Signal Name	I/O	Function
1	CRA	Out	Phase drive signal (A)
2	CR-A	Out	Phase drive signal (-A)
3	CRB	Out	Phase drive signal (B)
4	CR-B	Out	Phase drive signal (-B)

7.1.2 EEPROM Address Map

Table 7-11. EEPROM Address Map

Address	Explanation	Settings	QPIT Settings	Factory Settings
00H	Password		0FH	-
01H			5AH	-
02H	EEPROM mapping revision		42H	-
03H	Reserved		00H	-
04H	Interface selection	0: Auto 1: Parallel 3: USB	00H	00H*2
05H	Interface time-out	0 to 255 (by second, value of 0 means 10 seconds)	0AH	0AH
06H	Compatibility speed	0: Fast 1: Slow 2: Special-1 3: Special-2	00H	00H
07H	ECP speed *a	0: Fast 1: Slow	00H	00H
08H	IEEE1284.4 for Parallel	0: Auto 1: On 2: Off	00H	01H
09H	IEEE1284.4 for USB	0: Auto 1: On 2: Off	00H	01H
0AH	I/F Control flags	bit1: ECP mode (0=Off, 1=On) *b bit0: IEEE1284 mode (0=On, 1=Off) *c	00H	00H
0BH	Reserved		00H	-
0CH	Reserved		00H	-
0DH	Reserved		00H	-
0EH	Reserved		00H	-
0FH	Reserved		00H	-
10H	CPSI password		00H	00H
11H	CPSI password		00H	00H
12H	CPSI password		00H	00H

Table 7-11. EEPROM Address Map (continued)

Address	Explanation	Settings	QPIT Settings	Factory Settings
13H	CPSI password		00H	00H
14H	CPSI password		00H	00H
15H	CPSI password		00H	00H
16H	Print direction control	0: Bi-D 1: Uni-D 2: Auto	02H	02H
17H	CG table	0: PC 437 1: PC 850	00H	00H
18H	Font	0: Courier	00H	00H
19H	Pitch	0: 10cpi	00H	00H
1AH	Auto LF, Network I/F mode	bit1: Network I/F mode (0=Off, 1=On) bit0: Auto line feed (0=Off, 1=On)	00H	00H
1BH	Check mode control	bit7: Self test mode bit6: Hex dump mode	00H	00H
1CH	Reserved		00H	-
1DH	Reserved		00H	-
1EH	Reserved		00H	-
1FH	Reserved		00H	-
20H	Bi-D Adjustment for Multi-Shot (Bk)	-36<=n<=+36 (by 1/1440 inch)	00H	(*1)
21H	Bi-D Adjustment for 6pIVSD (Bk)	-36<=n<=+36 (by 1/1440 inch)	00H	(*1)
22H	Reserved		00H	-
23H	Reserved		00H	-
24H	Reserved		00H	-
25H	Reserved		00H	-
26H	1st Dot Position Adjustment	-36<=n<=+36 (by 1/1440 inch)	00H	(*1)
27H	Reserved		00H	-

Table 7-11. EEPROM Address Map (continued)

Address	Explanation	Settings	QPIT Settings	Factory Settings
28H	Reserved for Carriage phase on home		00H	-
29H	Reserved for PE Sensor adjustment data		00H	-
2AH	Reserved		00H	-
2BH	Error Code		00H	00H
2CH	Reserved		00H	-
2DH	Reserved		00H	-
2EH	Reserved		00H	-
2FH	Reserved		00H	-
30H	Top margin	42 to 44 x 360 (by 1/360 inch)	00H	00H
31H			78H	78H
32H	Bottom margin	1244 to 44 x 360 (by 1/360 inch)	1EH	1EH
33H			F0H	F0H
34H	Page length	1244 to 44 x 360 (by 1/360 inch)	1EH	1EH
35H			F0H	F0H
36H	Reserved		00H	-
37H			00H	-
38H	Reserved		00H	00H
39H			00H	00H
3AH			00H	00H
3BH			00H	00H
3CH			00H	-
3DH	Reserved		00H	-
3EH	Reserved		00H	-
3FH			00H	-

Table 7-11. EEPROM Address Map (continued)

Address	Explanation	Settings	QPIT Settings	Factory Settings
40H	Password		0FH	-
41H			5AH	-
42H	Ink flag 1	bit7: Reserved bit6: Black one-time bit5: Color one-time bit4: Initial fill required bit3: Reserved bit2: Ink cleaning seq. bit1: Bk CL required bit0: Color CL required	00H	10H
43H	Ink flag2	bit2: YMC cartridge changed and cleaned bit1: Black cartridge changed and cleaned bit0: Black cartridge changed and cleaned	00H	00H
44H	Ink counter Cb		00H	00H
45H			00H	00H
46H			00H	00H
47H			00H	00H
48H	Ink counter Cy		00H	00H
49H			00H	00H
4AH			00H	00H
4BH			00H	00H
4CH	Ink counter Cm		00H	00H
4DH			00H	00H
4EH			00H	00H
4FH			00H	00H

Table 7-11. EEPROM Address Map (continued)

Address	Explanation	Settings	QPIT Settings	Factory Settings
50H	Ink counter Cc		00H	00H
51H			00H	00H
52H			00H	00H
53H			00H	00H
54H	Reserved		00H	00H
55H			00H	00H
56H			00H	00H
57H			00H	00H
58H	Reserved		00H	00H
59H			00H	00H
5AH			00H	00H
5BH			00H	00H
5CH	Ink counter A0		00H	00H *3
5DH			00H	00H *3
5EH	Ink counter A80		00H	00H
5FH			00H	00H
60H	Ink counter Rb0		00H	00H
61H			00H	00H
62H	Ink counter Rb80		00H	00H
63H			00H	00H
64H	Ink counter Ry0		00H	00H
65H			00H	00H
66H	Ink counter Rv80		00H	00H
67H			00H	00H
68H	CL time		00H	- *2
69H			00H	- *2

Table 7-11. EEPROM Address Map (continued)

Address	Explanation	Settings	QPIT Settings	Factory Settings
6AH	Reserved		00H	00H
6BH			00H	00H
6CH	Power off time		00H	00H*2
6DH			00H	00H*2
6EH	Reserved		00H	-
6FH			00H	-
70H	Accumulated printing time		00H	00H
71H			00H	00H
72H	Reserved		00H	00H
73H			00H	00H
74H			00H	00H
75H			00H	00H
76H			00H	00H
77H			00H	00H
78H			00H	00H
79H			00H	00H
7AH			00H	00H
7BH			00H	00H
7CH			00H	00H
7DH			00H	00H
7EH			00H	00H
7FH	00H	00H		
80H	Password		0FH	-
81H			5AH	-
82H	Reserved		00H	-
9FH			00H	-

Table 7-11. EEPROM Address Map (continued)

Address	Explanation	Settings	QPIT Settings	Factory Settings
A0H	Head Actuator Rank ID for VhN	+1<=n<=+32	00H	(*1)
A1H	Head Actuator Rank ID for Vhm	+1<=n<=+40	00H	(*1)
A2H	Head Actuator Rank ID for VhL	+1<=n<=+37	00H	(*1)
A3H	Reserved		00H	00H
4AH	Reserved		00H	00H
A5H	Reserved		00H	00H
A6H	Head Actuator Rank ID for AR	0<=n<=+6	00H	(*1)
A7H	Microweave ID	+1<=n<=+9	00H	(*1)
A8H	Head Actuator Rank ID for lwAB	+30<=n<=+70	00H	(*1)
A9H	Head Actuator Rank ID for lwCD	+30<=n<=+70	00H	(*1)
AAH	Head Actuator Rank ID for lwEF	+30<=n<=+70	00H	(*1)
ABH	Reserved		00H	00H
ACH	Reserved		00H	00H
ADH	Reserved		00H	00H
AEH	Reserved		00H	-
BFH			00H	-
C0H	Password		0FH	-
C1H			5AH	-
C2H	USB ID		00H	(*1)
D3			00H	(*1)

Table 7-11. EEPROM Address Map (continued)

Address	Explanation	Settings	QPIT Settings	Factory Settings
D4	Reserved		00H	-
D7H			00H	-
D8H	Custom EEPROM sub number		00H	00H
D9H			00H	00H
DAH			00H	00H
DBH			00H	00H
DCH	Panel mask function	bit7: Entry Self-Test bit6: Entry Hex-Dump bit5: Extended settings bit4: Reserved bit3: Reserved bit2: Cleaning bit1: Replace I/C bit0: Load/Eject	00H	00H
DDH	Reserved		00H	-
DEH			00H	-
DFH			00H	-
E0H	Market ID	0:STD 2:Custom	00H	00H
E1H	Reserved		00H	-
E2H	Model Name		00H	-
FFH			00H	-

*a: Change busy signal delay time from STB.
(Fast: Max1Mb/S, Slow: Max. 600Kb/S)

*b: Set IEEE 1284 nibble mode or ECP mode.

*c: Set IEEE 1284 nibble mode reverse channel to invalid.

*1: This item is set at the factory. (set by manufacturing process program)

*2: This item is initialized by EEPROM reset.

*3: This item is initialized by waste counter reset.

7.2 Component Layout

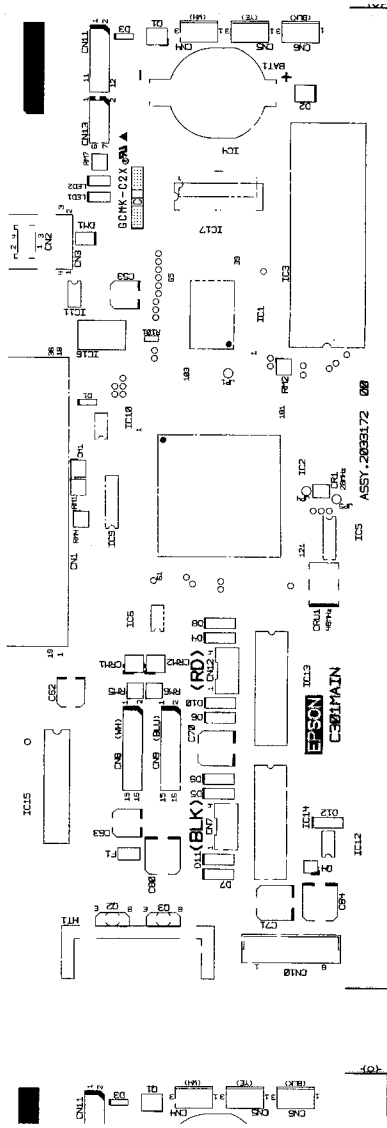


Figure 7-2. C301MAIN Component Layout (Parts Side)

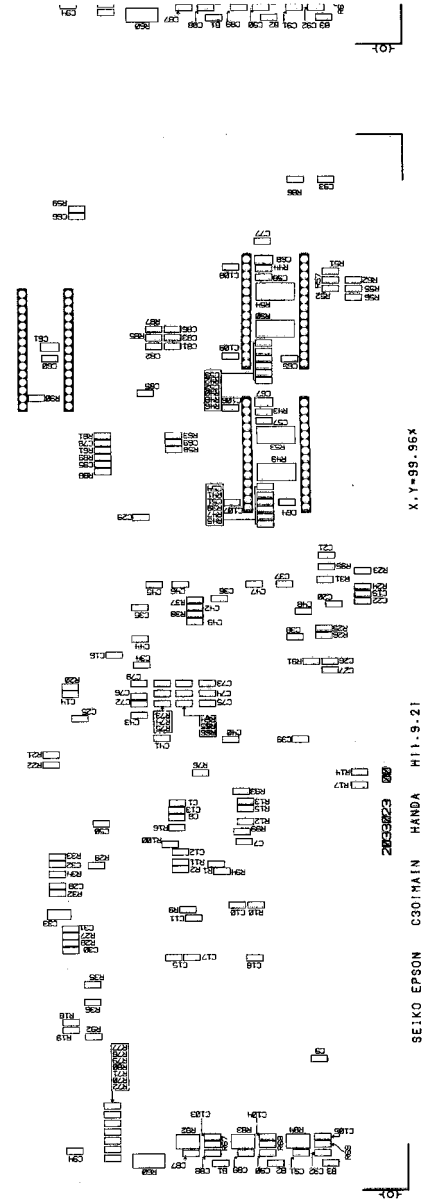


Figure 7-3. C301MAIN Component Layout (Soldered Side)

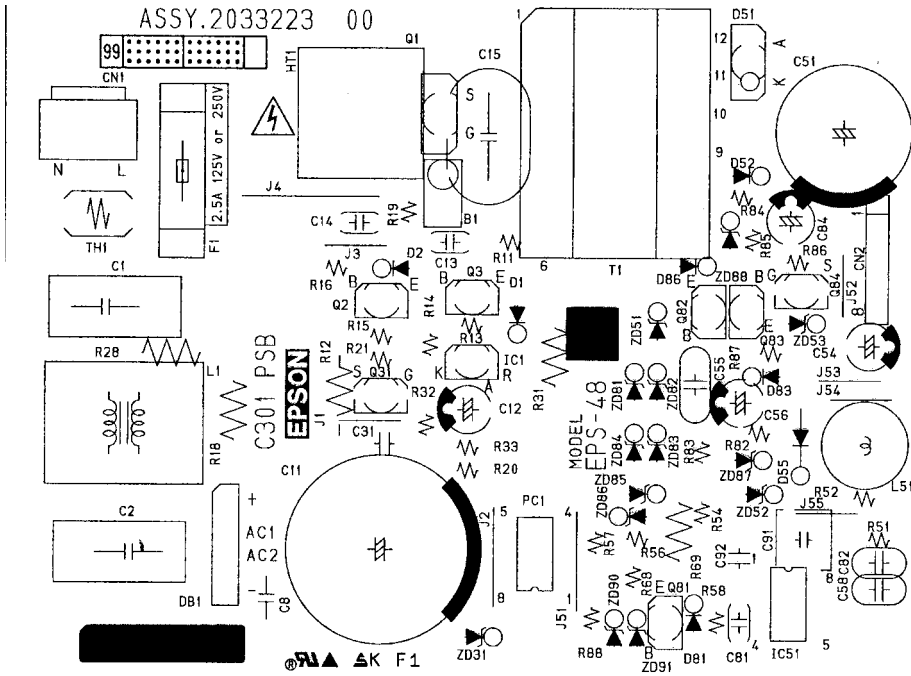


Figure 7-4. C301PSB Component Layout

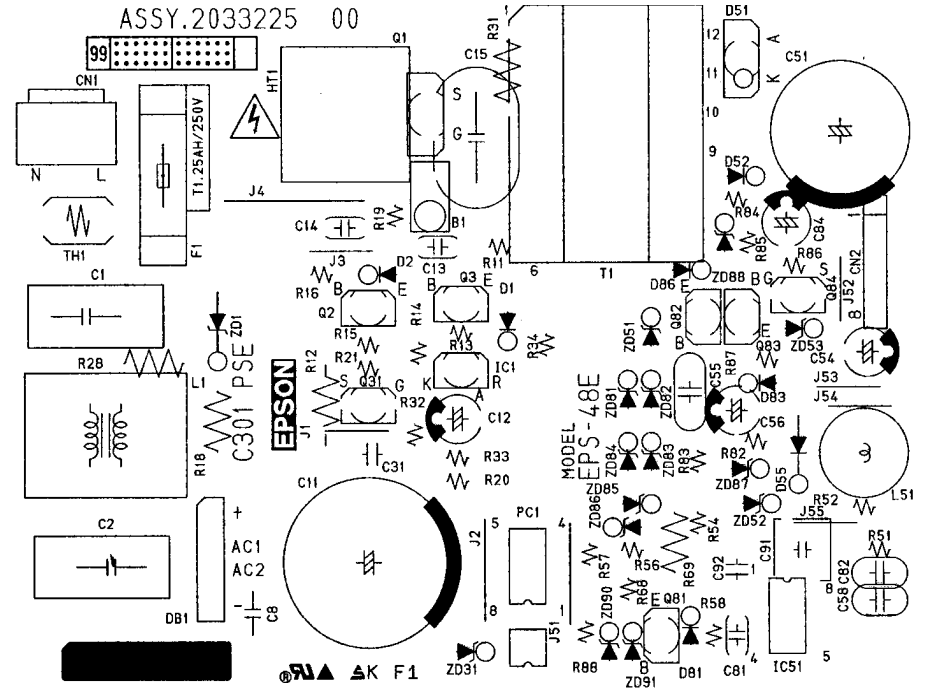


Figure 7-5. C301PSE Component Layout

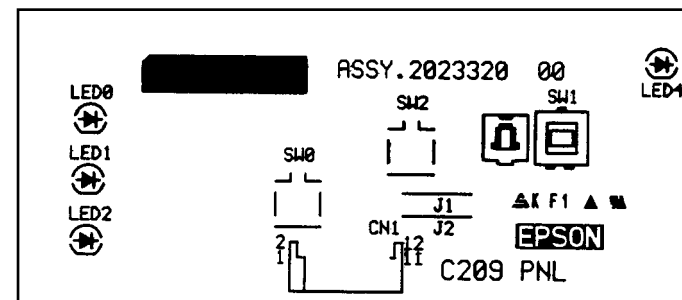
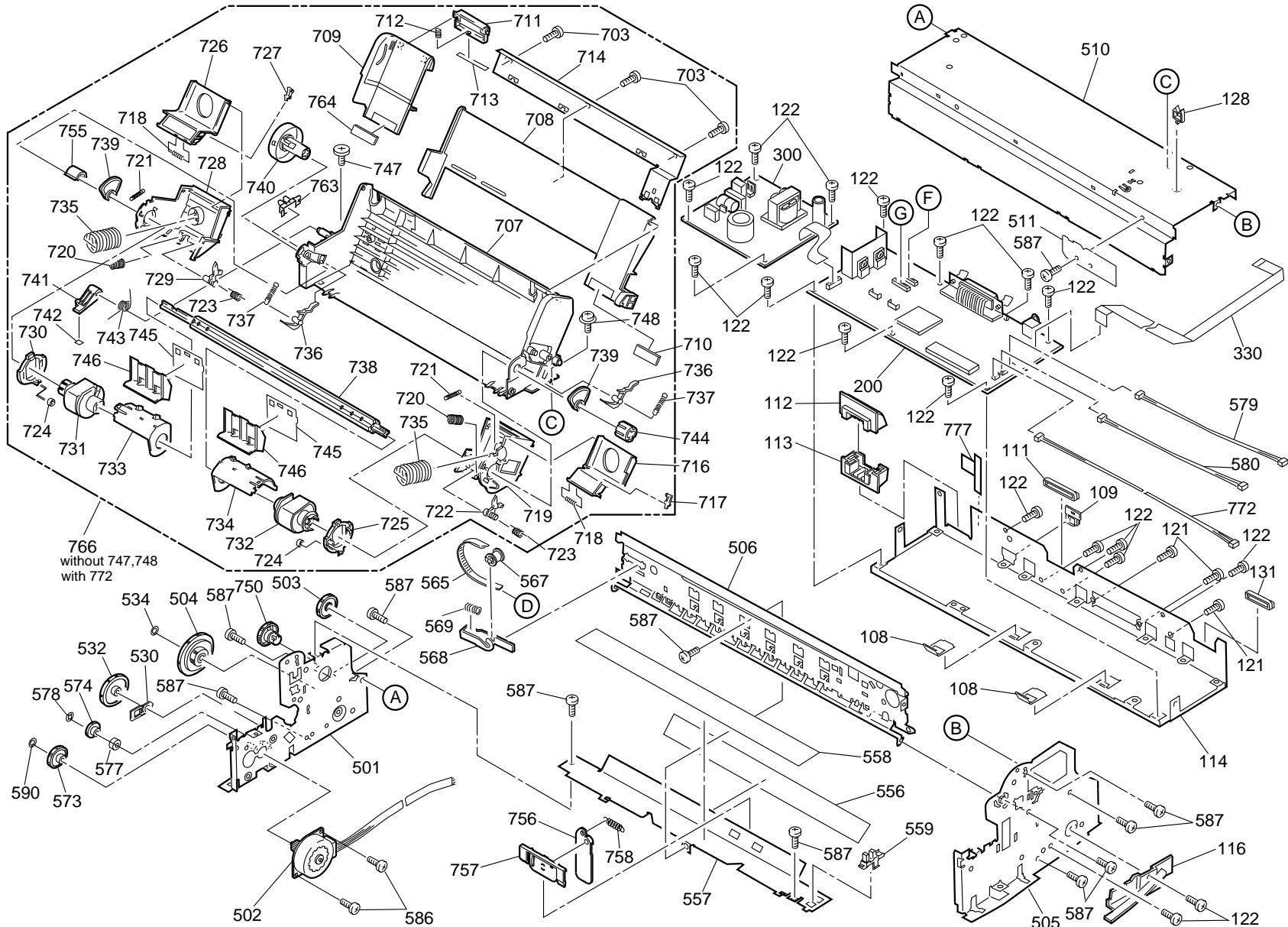


Figure 7-6. C209 PNL Component Layout



EPSON STYLUS COLOR 670 NO.2 REV.01 10189
Figure 7-8. Stylus COLOR 670 Exploded Diagram 2

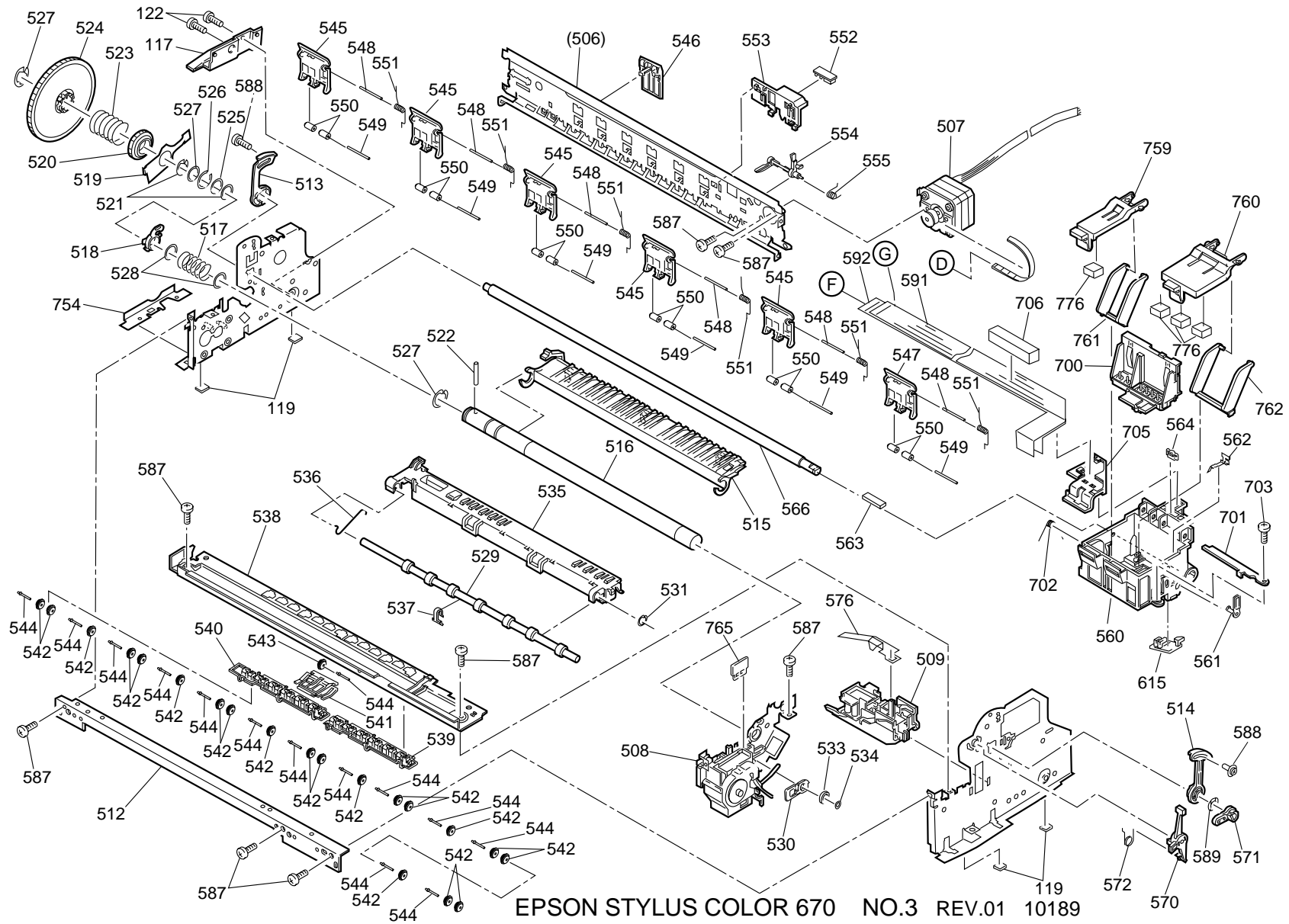
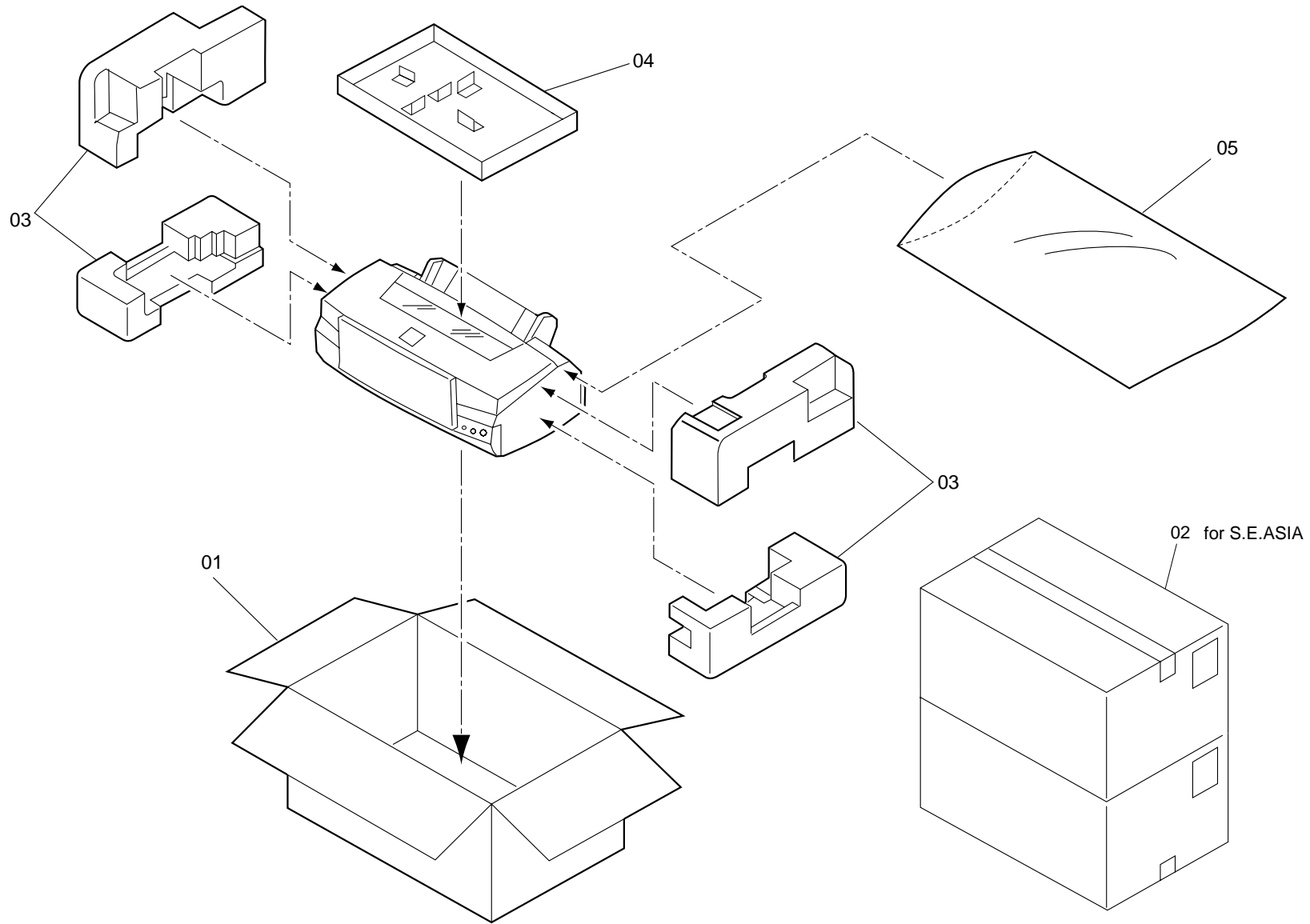


Figure 7-9. Stylus COLOR 670 Exploded Diagram 3



PACKING MATERIAL FOR EPSON STYLUS COLOR 670

Rev.01 10168

Figure 7-10. Stylus COLOR 670 Packing Material

7.4 Parts List

Table 7-12. Stylus Color 670 Parts List

Part Number	Description
100	HOUSING
101	COVER,PRINTER
102	PAPER SUPPORT;B
103	STACKER ASSY
104	PANEL ASSY
105	SHIELDPLATE,PANEL
106	HOUSING,PANEL,LEFT
108	GROUNDING PLATE
109	COVER,SHIELD PLATE,M/B,RIGHT
111	COVER,CABLE;B
112	COVER,INLET,UPPER;B
113	COVER,INLET,LOWER;B
114	SHIELD,PLATE,M/B
115	LOGO PLATE
116	HOUSING,SUPPORT,RIGHT;B
117	HOUSING,SUPPORT,LEFT;B
119	FOOT

Table 7-12. Stylus Color 670 Parts List (continued)

Part Number	Description
121	C.P.SCREW
122	C.B.S. SCREW
123	C.B.(O) SCREW,4X5,F/ZG
124	C.B.S. SCREW
125	C.B.P-TITE SCREW,3X8,F/ZN
126	C.B.P-TITE,3X10,F/ZN
128	MINI CLAMP
129	C.B.S.(P) SCREW
Q2	C.B.SCREW,2.6X8,F/ZN
Q3	C.B.SCREW,2.6X8,F/ZN
300	BOARD ASSY., POWER SUPPLY
330	WIRE HARNESS
400	POWER CABLE ASSY.
450	BOARD ASSY.,PANEL
500	PRINTER MECHANISM(ASP)M4L10-100
501	FRAME ASSY.,LEFT
502	MOTOR,ASSY,PF
503	SPUR GEAR,23.2
504	COMBINATIONGEAR,16,40.8

Table 7-12. Stylus Color 670 Parts List (continued)

Part Number	Description
505	FRAME,RIGHT
506	FRAME,TOP
507	MOTOR,ASSY,CR
508	PUMP ASSY.
509	CAP ASSY.
510	FRAME,BOTTOM
511	SHEET,PROTECTION,HEAD
512	FRAME,FRONT
513	BUSHING,PARALLELISM ADJUST,LEFT
514	BUSHING,PARALLELISM ADJUST,RIGHT
515	PAPERGUIDE,REAR
516	ROLLER,PF
517	COMPRESSION SPRING,5.85
518	BUSHING,12,LEFT
519	LEVER,CHANGE
520	SPURGEAR,26.4
521	SPACER,C-RING
522	SCALLOP SPRING PIN-AW,2X16,F/B
523	COMPRESSION SPRING,0.9

Table 7-12. Stylus Color 670 Parts List (continued)

Part Number	Description
524	SPURGEAR,67.2
525	SPACER,FASTEN,ROLLER,PF
526	SPACER,FASTEN,ROLLER,PF;B
527	C-RING
528	PLANE WASHER,12.2X0.5X15
529	ROLLER,ASSY.,PAPEREJECT
530	BUSHING,6
531	RETAINING RING
532	SPURGEAR,36
533	SUPRGEAR,11
534	PLANE WASHER,4.1X0.5X6.5
535	PAPER GUIDE,FRONT;B
536	GROUNDING WIRE,EJ
537	GUIDE,PAPER EJ
538	FRAME, PAPER EJECT
539	HOLDER,STAR WHEEL,RIGHT
540	HOLDER,STAR WHEEL,LEFT
541	HOLDER,STARWHEEL,FRONT
542	STARWHEEL ASSY.,8;E

Table 7-12. Stylus Color 670 Parts List (continued)

Part Number	Description
543	STARHWEEL,8;B
544	ROD SPRING,STAR WHEEL
545	PAPER GUIDE,UPPER
546	PAPER GUIDE,LEFT
547	PAPER GUIDE,RIGHT
548	SHAFT,PAPER GUIDE,UPPER
549	SHAFT,ROLLER,DRIVEN
550	ROLLER,DRIVEN;D
551	TORSION SPRING,117.6
552	CIRCUIT ASSY,PE
553	HOLDER,PE
554	LEVER,PE
555	TORSION SPRING,0.22
556	SHEET,GUIDE PLATE,CABLE
557	GUIDEPLATE,CABLE
558	SHEET,CABLE
559	DETECTOR,HP;E
560	CARRIAGE ASSY.
561	LEVER,ADJUST

Table 7-12. Stylus Color 670 Parts List (continued)

Part Number	Description
562	GROUNDINGPLATE,HEAD
563	OIL PAD
564	SLIDER,CR
565	TIMING BELT
566	SHAFT,CR,GUIDE
567	PULLEY ASSY.,DRIVEN
568	HOLDER,PULLEY,DRIVEN
569	COMPRESSION SPRING,19.6
570	LEVER,PG
571	LEVER,PG,SUPPORT
572	TORSION SPRING,63.7
573	COMBINATION GEAR 6,34.4
574	COMBINATION GEAR 8,30
576	POROUS PAD,SLIDER,CAP
577	BUSHING,FASTEN,COMBINATION GEAR
578	PUSHING NUT,2
579	HARNESS,HP
580	HARNESS,PE
586	C.C.S.SCREW

Table 7-12. Stylus Color 670 Parts List (continued)

Part Number	Description
587	C.B.S. SCREW
588	C.P.S-TITE(P4),3X6,F/ZN
589	LEAF SPRING
590	PLANE WASHER,2.6X0.5X8
591	CABLE,HEAD,A
592	CABLE,HEAD,B
615	PLATE,SLIDER,CLEANER
700	PRINT HEAD
701	FASTENER,HEAD
702	TORSION SPRING,49
703	C.B.P-TITE SCREW,3X6,F/ZN
705	HOLDER,CABLE
706	SPACER,CABLE HEAD
707	FRAME,ASF;B
708	HOPPER
709	EDGEGUIDE
710	CORK
711	SLIDER,EDGEGUIDE
712	COMPRESSION SPRING,3.23

Table 7-12. Stylus Color 670 Parts List (continued)

Part Number	Description
713	PAD,BREAK,EDGE GUIDE
714	REINFORCEMENT PLATE,HOPPER
716	PAD ASSY.,RIGHT
717	LEVER,PAD,RELEASE,RIGHT
718	ROD SPRING,HOLDER,PAD
719	HOLDER,EDGEGUIDE,RIGHT
720	COMPRESSION SPRING,1.17
721	EXTENSION SPRING,0.62
722	LEVER,PAPERRETURN,RIGHT
723	EXTENSION SPRING,0.294
724	ROLLER,LD,SUPPORT
725	HOLDER,ROLLER,LD,SUPPORT,RIGHT
726	PAD ASSY.,LEFT
727	LEVER,PAD,RELEASE,LEFT
728	HOLDER,EDGEGUIDE,LEFT
729	LEVER,PAPERRETURN,LEFT
730	HOLDER,ROLLER,LD,SUPPORT,LEFT
731	ROLLER ASSY.,LD,LEFT
732	ROLLER ASSY.,LD,RIGHT

Table 7-12. Stylus Color 670 Parts List (continued)

Part Number	Description
733	COVER,ROLLER,LD,LEFT
734	COVER,ROLLER,LD,RIGHT
735	COMPRESSION SPRING,1.961
736	LEVER,FASTEN,EDGEGUIDE;B
737	EXTENSION SPRING,0.088
738	SHAFT,ROLLER,LD
739	LEVER,HOPPER,RELEASE
740	WHEEL,DETECT
741	LEVER,BRAKE
742	PAD,BREAK
743	TORSION SPRING,41.2
744	BUSHING,FASTEN,SHAFT
745	SHEET,PAPERFEED
746	HOLDER,SHEET,PAPERFEED
747	SHAFT,MOUNT,CR
748	C.P.S-TITE(P4),3X6,F/ZN
750	SPURGEAR,34
751	PAPERGUIDE,LOWER
752	POROUPAD,INKEJECT,LARGE

Table 7-12. Stylus Color 670 Parts List (continued)

Part Number	Description
753	TRAY,PORUSPAD
754	SPACER,TRAY
755	BUSHING,FASTEN,SHAFT,LEFT
756	PAPER SUPPORT,SUPPORT,UPPER
757	HOLDER,PAPER SUPPORT,SUPPORT,UPPER
758	EXTENSION SPRING,0.29
759	COVER,CARTRIDGE,BK;B
760	COVER,CARTRIDGE,C;C
761	SEPARATOR,CARTRIDGE,BK
762	SEPARATOR,CARTRIDGE,C
763	DETECTOR,HP;E
764	CORK;B
765	CLEANER,HEAD,ASP
766	ASF UNIT;C
769	SPACER,TRAY,POROUPAD
772	HARNESS,ASF
776	SPACER,COVERCARTRIDGE;B
777	SHEET,PROTECTION,CABLE
3	PAD SET,PRINTER

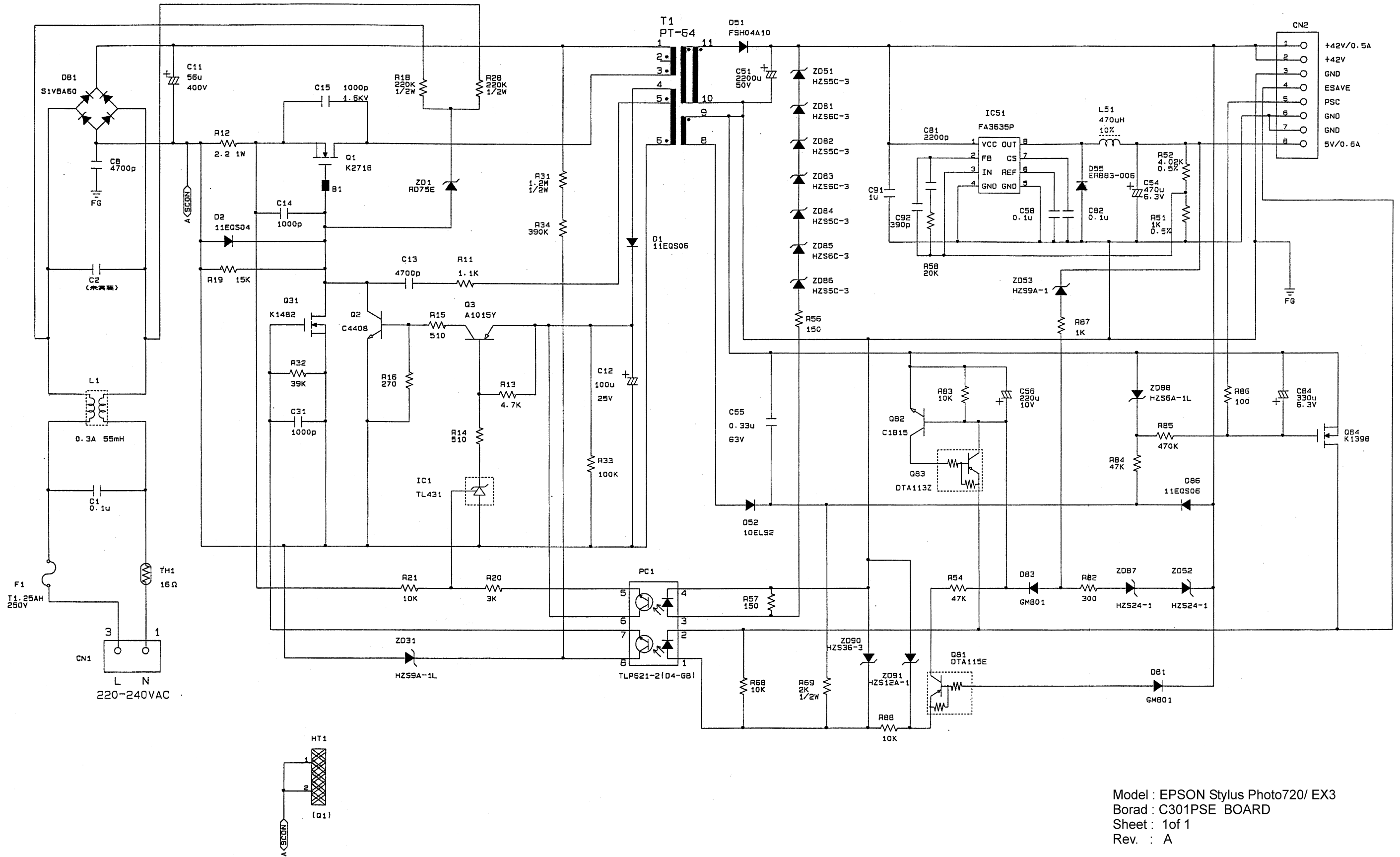
Table 7-12. Stylus Color 670 Parts List (continued)

Part Number	Description
4	PAD,ACCESSORY
5	PLASTIC PROTECTIVE BAG
NON FIG	INK CARTRIDGE,B,AS
NON FIG	INK CARTRIDGE,C,AS
NON FIG	SPECIAL COATED PAPER,006,OVERSEAS
NON FIG	SUPPLEMENT

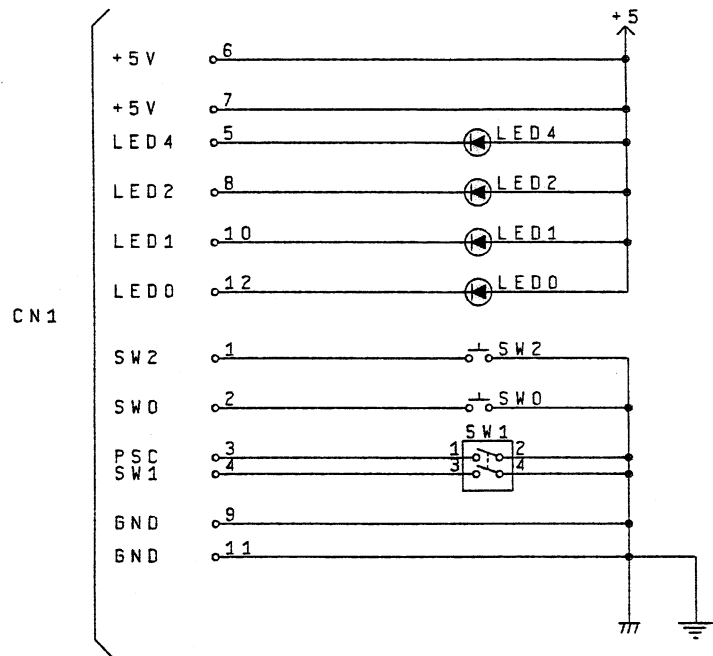
7.5 Electric Circuit Diagrams

The following pages show the following electric circuits.

- C301 MAIN Control Circuit
- C301 PSB Power Supplu Circuit
- C301 PSE Power Supply Circuit
- C209PNL Circuit



Model : EPSON Stylus Photo720/ EX3
 Borad : C301PSE BOARD
 Sheet : 1of 1
 Rev. : A



Model : EPSON Stylus Photo 720
 Board : C209 PNL BOARD
 Sheet : 1 of 1
 Rev. : A