SERVICE MANUAL

Color Large Format Inkjet Printer

EPSON Stylus PRO 7000

COLOR IMAGING EPSON

EPSON®

SEIJ99017

Notice:

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 PRO 7000. 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.

CHAPTER 7. 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.

Indicates a reassembly procedure, practice, or condition that, if not strictly adhered to, could result in damage to, or nonoperability of, the equipment.

Revision Status

Revision	Issued Date	Description
Rev. A	February 17, 2000	First Release

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Chapter 1 Product Description

Chapter 2 Operating Principles

Chapter 3 Troubleshooting

Chapter 4 Disassembly & Assembly

Chapter 5 Adjustment

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CHAPTER

1

PRODUCT DESCRIPTION

1.1 Features

The EPSON Stylus Pro 7000 is an 24-inch wide, 6-color ink jet printer with professional color output. It has the same printheads as the EPSON Stylus Pro 9000. The EPSON Stylus Pro 7000 provides the following major features and more.

- ☐ Large Format
  A1, full size
  24 inch-full size printing (A1+size supported)
- ☐ Excellent Photo-quality printing
  1440 (H) x 720 (V) dpi combined with EPSON's Microdot printing
  Same quality as the EPSON Stylus Pro 9000.
- ☐ High-speed throughput

Table 1-1. Throughput Speed

EPSON media	Slide Bar	Resolution	Dot	Mode	Speed
Plain Paper	Speed	360x360dpi	Normal 2 Dot	Bi-D 200cps	6 min.
	Quality	360x360dpi	Normal Dot x 2	Bi-D FOL 300cps	8 min.
Presentation Matte Paper	Speed	720x360dpi	Normal Dot	Bi-D FOL 300cps	8 min.
	Quality	720x360dpi	Normal Dot	Uni-D FOL 300cps	14 min.
Glossy Photo Semigloss Photo	Speed	720x360dpi	Normal Dot	Bi-D FOL 300cps	8 min.
	Quality	720x720dpi	Normal Dot	Bi-D FOL 300cps	15 min.
	Adv. Photo	1440x720dpi	Micro Dot	Bi-D 4P 300cps	30 min.
Photo Quality Glossy Film	Quality	720x720dpi	Micro Dot	Bi-D FOL 300cps	(Max. A3+)
	Adv. Photo	1440x720dpi	Micro Dot	Bi-D 4P 300cps	
Photo Quality Ink Jet	Quality	720x720dpi	Normal Dot	Uni-D FOL 300cps	(Max. A2)
	Adv. Photo	1440x720dpi	Micro Dot	Uni-D 4P 300cps	

- ☐ Low running cost
  - ■ Six separate ink cartridges so you only have to replace the empty ink cartridge (each cartridge holds 100ml of ink) (200ml cartridges also available, but their use requires a special operation - see "Ink Cartridge Select Mode" on page 52)
  - ■ ???Auto Rotate feature saves paper by automatically rotating an image if the width is shorter than the height
- ☐ Complete Software Compatibility With EPSON Stylus Pro 9000
- ☐ Latest RIP Technology
  CPSI Pro (software)
  PS Server
- ☐ Large format, yet provided as a desktop printer (optional stand available)
- ☐ Paper Handling:
  - ■ Standard roll paper feeder
  - ■ Straight paper path
  - ■ Automatic paper cutter

1.1.1 Consumable Products & Options

Table 1-2. Consumables & Options

Name	Code		Product
	100ml	200ml	
Ink cartridges	T460✶✶✶ T463✶✶✶ T462✶✶✶ T461✶✶✶ T465✶✶✶ T464✶✶✶	T407✶✶✶ T410✶✶✶ T409✶✶✶ T408✶✶✶ T412✶✶✶ T411✶✶✶	Black Ink Cyan Ink Magenta Ink Yellow Ink Light Cyan Ink Light Magenta Ink
Stand	C844022		Optional stand
Paper cutter blade	C815131		Consumable item
Roll Feed Spindle 2″	C811092		For two-inch diameter roll paper
Roll Feed Spindle 3″	C811102		For three-inch diameter roll paper
Glossy Photo Paper	S041225		610mm (24 in.) wide/20.7m long
Semigloss Photo Roll Paper	S041223		24 in wide/25m long
Presentation Matte Roll Paper	S041220		24 in wide/25m long
Photo Quality Ink Jet Paper	S041079 S041068/S041045 S041069/S041043 S041070/S041044		A2 A3 A3 Wide/B B
Photo Paper	S041142 S041143 S041156		A3 A3 Wide/B B
Photo Quality Glossy Film	S041073 S041074 S041075		A3 A3 Wide/B B
Rip Station 5100 PS Server Series	EAI - C850092 Other - C850093		Fiery Adobe® PostScript® 3™ Server
Software RIP (CPSI Pro)			Software RIP (CPSI Pro)

Table 1-2. Consumables & Options (continued)

Name	Code	Product
Multi-protocol Ethernet interface card	C82362✶	Type-B 10Base-T
100Mbps Multi-protocol Ethernet interface card	C82363✶	Type-B 100Base-T
IEEE 1394 interface card	C82372✶	IEEE 1394 interface card

Note:
* Signifies a number that varies by market.

STANDARD ACCESSORIES

The following are standard accessories with the SP 7000:

Power cord x1

Roll paper spindle (2″) x1

Ink cartridges x6, one for each color

Printer driver utility set x1

Roll paper sample x1 (44″ semi-gloss Photo roll paper 5m)

Roll paper fixing belt x1

Paper output tray (cloth) x1

Paper cutter x1

User's manual set x1

Set of tools and parts for assembly of main unit set x1

1.1.2 Print Specifications

PRINTING SPECIFICATIONS

- Drop-On-Demand MACH (Multi-layer Actuator Head) inkjet - E-MACH type
- Nozzle configuration
  - 64 nozzles per color (same printhead as the EPSON Stylus Pro 9000)
- Print direction = Bi-direction (high-speed return, high-speed skip only)
- Print Speed and Printable Area
  - Character mode

    Character pitch 10cpi (Pica)

    Printable area 237 characters

    Printing speed 200 cps (one print-pass in which 1/2 of character matrix is printed at 360dpi: 2pass)
  - Graphic mode

Table 1-3. Print Area and Speed

Horizontal resolution (dpi)	Printable area	Max. printable dots	Speed
360	604mm 23.78 inches	8561	20 IPS
720	604mm 23.78 inches	17,123	30 IPS/FOL 30 IPS/4pass
1440	604mm 23.78 inches	34,246	20 IPS/FOL 30 IPS/4pass

CHARACTER SPECIFICATIONS

- Control codes
  ESC/P Raster
  EPSON Remote command
- Character tables (2 international sets)
  PC 437 (US, Standard Europe)
  PC 850 (Multilingual)
- Typeface
  Bitmap LQ font: EPSON Courier 10 CPI

PAPER FEEDING

Paper feeding method: Friction feed

Line spacing: 1/6" or programmable at 1/720"

Paper path: Roll paper/manual

Feed speed: 1/6" 200±10m seconds
Continuous 2.5" (63.5mm)/second

1.1.3 Paper Specifications

ROLL PAPER SPECIFICATIONS

CAUTION

Paper must have no wrinkles, tears, or folds plus the surface should be smooth.

☐ Minimum-Quality Roll Paper

Paper meeting the requirements described below can be used with this printer, but neither the feeding nor printout quality is guaranteed.

•Size = Width 210~610mm (8.4~24.0″)
Length 279mm~90m (within roll size) (11.1″~298.8′)

•Roll Size = 2″ or 3″ core (with optional 3″ spindle) 150mm ext. diameter max.

•Thickness = 0.08~0.5mm (0.003~0.019″)

☐ Normal-Quality Roll Paper

For paper meeting the following requirements, the feeding operation only is guaranteed.

•Size = Width 210~610mm (8.4~24.0″)
Length 279mm~90m (within roll size) (11.1″~30′)

•Roll Size = 2″ or 3″ core (with optional 3″ spindle) 150mm ext. diameter max.

•Thickness = 0.08~0.11mm (0.003~0.0043″)

•Weight = 64~90gf/m^2 (17~24 lb.s)

•Quality = Normal paper, recycled paper

*1: Use at normal room temperature (15~25°C (59~77°F) 40~60% humidity)
*2: The printer exerts between 300~500gf to peel off the rear edge of roll paper from the core
*3: At the point where the rear edge comes free from the core (approx. last 30 cm.), print quality is no longer guaranteed.
*4: If a 3″ core is used, the EPSON-exclusive optional 3″ roll paper spindle is required

☐ EPSON Special Roll Paper

The following special papers meet or exceed EPSON requirements, and paper feeding plus printout quality are assured.

Table 1-4. EPSON Special Paper

Type (US)	Type (outside US)	Paper Size (W x H)	Roll Size
Presentation Matte Paper	Presentation Matte Paper	610mm x 25m (24″ x 83′)	2″ core, maximum 103mm external diameter
Glossy Paper-Heavy Weight	Glossy Photo Paper	610mm x 20.7m (24″ x 68.7′)	
		210mm (same as A4) x 10m (8.4″ x 33.2′)	
		329mm (same as A3+) x 10m (13.1″ x 33.2′)	
Semi Glossy Paper-Heavy Weight	Semigloss Photo Paper	610mm x 25m (24″ x 83′)	
Photo quality glossy Film (TBD)	Photo quality glossy Film (TBD)	610mm x TBD (24″ x TBD)	

*1: Use at normal room temperature (15~25°C (59~77°F) 40~60% humidity)
*2: At the point where the rear edge comes free from the core (approx. last 30 cm.), print quality is no longer guaranteed.

CUT SHEET SPECIFICATIONS

CAUTION

Paper must have no wrinkles, tears, or folds plus the surface should be smooth

- **Paper must be fed short-edge first (portrait)**
- **Use at normal room temperature (15~25°C (59~77°F) 40~60% humidity)**

☐ Minimum-quality paper

Paper meeting the requirements described below can be used with this printer, but neither the feeding nor printout quality is guaranteed.

Size = see the following table

Table 1-5. Supported Cut-Sheet Paper

Size	Dimensions (W x H)
B2	515 x 728mm
A1+	24 x 36″
A1	594 x 841mm
A2	420 x 594mm
A3+	329 x 483mm
A3	297 x 420mm
A4	210 x 297mm
ANSI D	22 x 34″
ANSI C	17 x 22″
ANSI B	11 x 17″
Letter	8.5 x 11″

Thickness = 0.08~1.5mm (for 297~728mm/ 11.8~29.0″ length paper (0.003~0.06″)
0.08~0.5mm (for 728~915mm/ 29.0~36.4″ length paper) (0.003~0.02″)

☐ Plain paper

For paper meeting the following requirements, only the feeding operation is guaranteed.

•Size = see Table 1-5 above (plus the following requirements)

•Thickness = 0.08~0.11mm (0.003~0.0044″)

•Weight = 64~90gf/m^2 (17~24 lb.s)

•Quality: Normal, recycled paper

*1: Load short edge first (portrait)

*2: Use at normal room temperature (15~25°C (59~77°F) 40~60% humidity)

☐ EPSON Special Paper

The following special papers meet or exceed EPSON requirements, and paper feeding plus printout quality are assured.

•Size = see the following table

Table 1-6. Cut-Sheet Availability

Size	Dimensions (W x H)	SuperFine *1	PhotoPrint	Photo Quality Glossy Film	Art Board
A4	210 x 297mm	Yes	Yes	Yes	-
A3	297 x 420mm	Yes	Yes	Yes	-
A3+	329 x 483mm	Yes	Yes	Yes	-
A2	420 x 594mm	Yes	-	-	-
Letter	216 x 279mm	Yes	Yes	Yes	-
B	279 x 432mm	Yes	Yes	Yes	-
C	431 x 558mm	Yes	-	-	-
B2	515 x 728mm	-	-	-	Yes

Table note:
*1: Print quality optimized with uni-direction printing

1.1.4 Printable Area

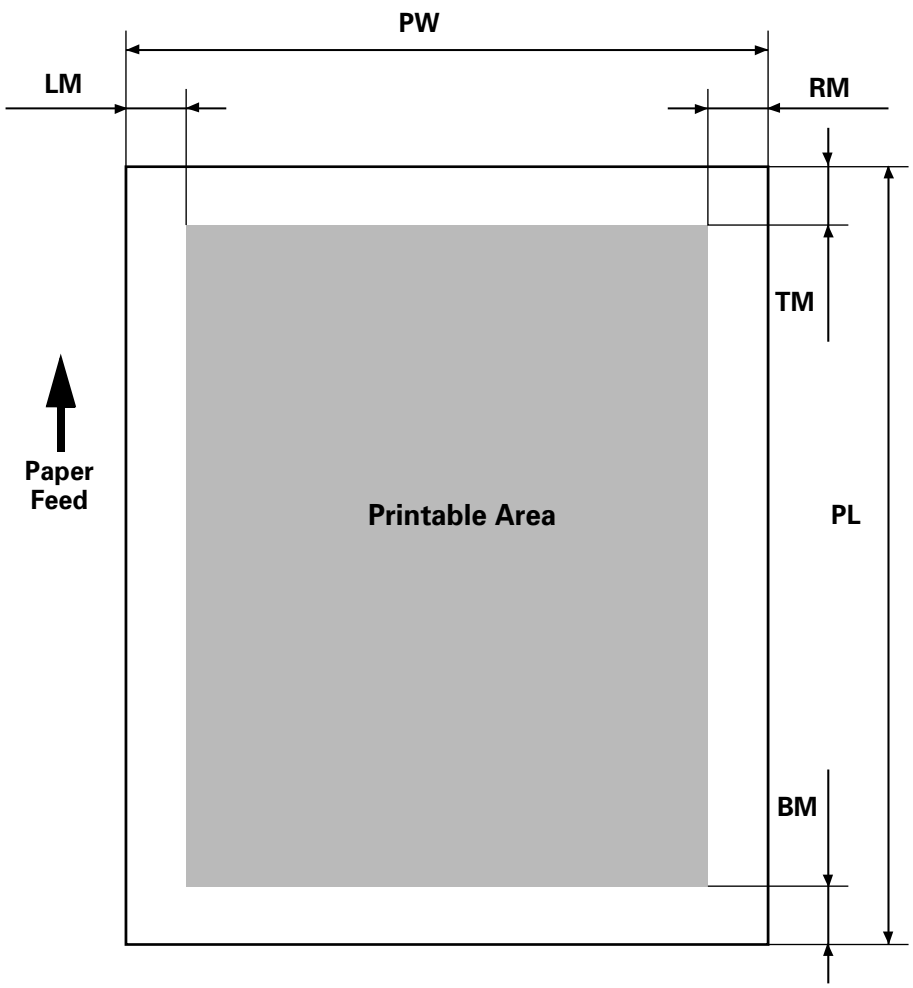


Figure 1-1. Printable Area

Table 1-7. Printable Area

Heading	Roll Paper	Cut Sheets
PW (width)	210 ~ 610mm (8.27 ~ 24″)	210 ~ 610mm (8.27 ~ 24″)
PL (length)	Max. 90m (298.8′)	297~915mm (11.8~36.4″)
LM (left margin)	3mm/15mm* (0.12~0.59″)	3mm
TM (top)	3mm/15mm*	3mm
RM (right)	3mm/15mm*	3mm
BM (bottom)	3mm/15mm*	14mm

Note: *The size of the margin is determined by the control panel setting. ??

There are three margin settings via the control panel; ??

- **3mm = All margins are set to 3mm**
- **15mm = All margins are set to 15mm**
- **T/B 15mm TM and BM are 15mm, while LM and RM are 3mm**

Table 1-8. Optimal Margin Settings

To optimize for	Select this setting
largest printable area and decrease chance of paper rubbing printheads	Top/Bottom 15mm
exact paper size and decrease chance of paper rubbing printheads	15mm
largest printable area and exact paper size	3mm

When the Paper Set Lever is:

- Back
  The feed path is open and you can load, remove or change the position of paper in the feed path.
- Forward
  The feed path is closed and loaded paper is locked in place. You can print on the loaded paper.
  (It is not possible to change the lever position during printing.)

1.1.5 Ink Cartridges

Shape:	Each ink cartridge is uniquely shaped so the cartridges do not fit in the wrong slots.
Ink colors:	Black, Cyan, Magenta, Yellow, Light Cyan, Light Magenta
Ink life:	Two years from production date
Ink volume:	110ml
Weight:	200g
Effective ink:	83.0g
Print capacity:	A1 = approx. 28 pages at 720dpi and 40% coverage A1 = approx. 11 pages at 720dpi and 100% coverage D = approx. 26 pages at 720dpi and 40% coverage A4 = approx. 3,800 pages at 360dpi and 5% coverage
Dimensions:	25.1 x 141.1 x 105.3mm (WxDxH)
Weight:	Approx. 200g
Storage temperature:	See the table below

Table 1-9. Ink Cartridge Specifications

Situation	Temperature	Notes
Transporting	-30~50°C (-22~122°F)	• Less than a month at 40°C (104°F) • Less than 120 hours at 50°C (122°F)
Storage	-20~40°C (-7.6~104°F)	Less than a month at 40°C (104°F)
Installed	-30~40°C (-22~104°F)	Less than a month at 40°C (104°F)

- **Do not refill or reuse cartridges; they are consumable items.**
- **Do not use ink that beyond its expiration date. See above.**
- **To use ink that has been frozen below -15 °C (5 °F), let it thaw at least 3 hours at room temperature.**

OPTIONAL INK CARTRIDGES

The EPSON Stylus Pro 7000 also supports the 220ml ink cartridges for use with the EPSON Stylus Pro 9000. For details, see the EPSON Stylus Pro 9000 Service Manual or User's Guide.

Set the ink cartridge type as described in "Ink Cartridge Select Mode" on page 52.

1.1.6 Electrical Specifications

Table 1-10. Electrical Specifications

	120V Model	220-240V Model
Rated voltage range	AC120V	AC220~240V
Input voltage range	AC90~132V	AC198~264V
Rated frequency range	50~60Hz	
Input frequency range	49.5~60.5Hz	
Rated current	1.0A (Max. 1.6A)	0.5A (Max.0.8A)
Power consumption	standby mode = 15W or less Energy Star Compliant	
Insulation resistance	10MΩ minimum (between AC line and chassis, DC 500 V)	
Dielectric strength	AC 1,000V rms per minute or AC 1,200V rms per second (between AC line and chassis)	AC 1,500V rms per minute (between AC line and chassis)

1.1.7 Reliability

Total print volume: 20,000 pages at A1 size

Printheads: 2,000,000,000 dots/nozzle

Cutter: Approzimately 2,000 sheets (A1)

Maintenance parts: Approximately 12,000 sheets
Ink pad, Pump unit, Flushing box, Cap assembly, and Head Cleaner are all included in the SP-7000 Maintenance Kit (P/N 1054038)

1.1.8 Environmental Conditions

TEMPERATURE/HUMIDITY

See the following table.

Table 1-11. Environmental Conditions

Condition	Temperature	Humidity	Notes
Operating	10~35°C (50~95°F)	20~80%	• Less than a month at 40°C (104°F) • Less than 120 hours at 60°C (140°F) • With no freezing
Storage	-20~40°C (-4~104°F)	20~85%	
Transportation	-20~60°C (-4~140°F)	5-85%	

Notes:

1) When storing the printer, make sure the printheads are in the home (capped) position. If necessary switch power on, wait for the printheads to move to the home position, and then switch power off.

2) Before transporting the printer, remove the ink cartridges and turn the ink valves screws to the closed position. Also make sure the printheads are in the home, capped, position. After transporting the printer, install new ink cartridges.

3) If the temperature drops below -15°C (5°F), the ink in the cartridges and printheads freezes. The ink thaws completely after three hours at 25°C (77°F).

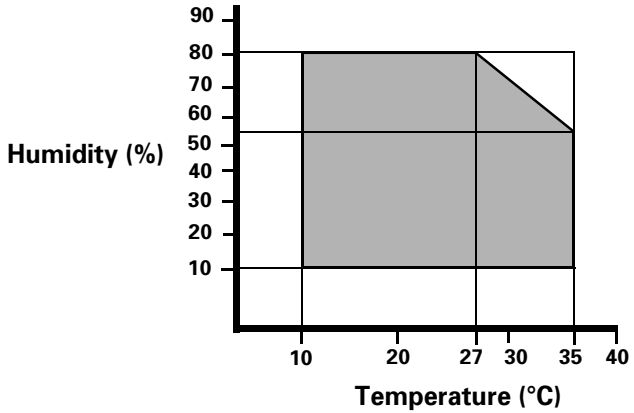


Figure 1-2. Print Temperature and Humidity

VIBRATION & SHOCK

See the following table.

Table 1-12. Vibration and Shock

Condition	Vibration Resistance	Shock Resistance	Notes
Operating	0.15G 10~55Hz	1G maximum 1ms	X/Y/Z directions
Storage	0.5G 10~55Hz	2G maximum 2ms	

Notes:

* Make sure the printhead is capped during transportation and storage. To cap the printhead, turn the power on (with ink cartridges installed) and turn the power off when the printheads are capped.

* To thaw frozen ink in the printer or cartridge, leave the printer out at a temperature of 25°C (77°F) for approximately three hours.

1.1.9 Controller

CPU:	Hitachi SH7043, 33Mhz
RAM:	8MB + 2MB (fixed)
Interfaces:	IEEE1284 USB Type B (one expansion port)
Operating system:	Hitachi HI-SH7 (µ ITRON compatible)

1.1.10 Conformity/Safety Approvals

120V Model

Safety Standards:

UL1950
CSA 22.2 No. 950

EMI:

FCC part 15 subpart B class B
CSA C108.8 class B

220~240V Model

Safety Standards:

EN 60950

EMI:

EN55022 (CISPR Pub. 22) class B
AS/NZS 3548 class B

1.1.11 Acoustic Noise

Approx. 50dB(A) (According to ISO 7779)

1.1.12 CE Marking

220~240V Model

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

1.2 Interfaces

The EPSON Stylus Pro 7000 is equipped with parallel and USB interfaces as well as an expansion slot for an optional Type-B interface. This section provides information on each of these interfaces.

1.2.1 Parallel Interface - Compatibility Mode

Table 1-13. Parallel Interface Specifications

Item	Description
Transmission mode	8-bit parallel, IEEE-1284 compatibility mode
Synchronization	By STROBE pulse
Handshaking	By BUSY and $\overline{\text{ACKNLG}}$ signal
Logic Level	TTL compatible level (IEEE-1284 Level 1 device)
Connector	57-30360 (Amphenol) or equivalent
Note: Use a twisted-pair cable that is as short as possible.	

The BUSY signal is set high before setting the -ERROR signal low or the PE signal high. The BUSY signal remains high until all these signals return to their normal, inactive state.

The BUSY signal is high:

- When receiving data
- When the input data buffer is full
- When the -INIT signal is low, or during hardware initialization
- During a printer error
- When the parallel interface is not selected

The ERROR signal is low when there is a:

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

NOTE: *The PE signal is high during paper-out errors.*

DATA TRANSMISSION TIMING

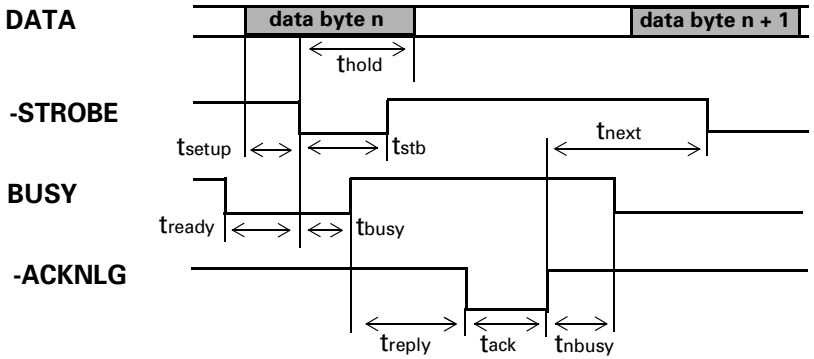


Figure 1-3. Data Transmission Timing

Table 1-14. Data transmission times

Parameter	Minimum	Maximum
tsetup	500 ns	-
thold	500 ns	-
tstb	500 ns	-
tready	0	-
tbusy	-	500 ns
tt-out*	-	120 ns
tt-in**	-	200 ns
treply	0	-
tack	Typical 2 us	
tnbusy	0	-
tnext	0	-

* Rise and fall time of every output signal

** Rise and fall time of every input signal

Table 1-15. Typical tack time

Parallel I/F mode	Time required
High speed (default)	0.5us
Normal speed	2us

Table 1-16. Connector Pin Assignments and signals - Forward Channel

Pin No.	Signal Name	Return Pin	In/ Out	Functional Description
1	-STROBE	19	I	Data reception pulse. Data is read at the falling edge of this pules.
2-9	DATA0~7	20-27	I	The DATA0 through DATA7 signals represent data bits 0 to7, respectively. Each signal is at high level when data is logical 1 and low level when data is logical 0.
10	-ACKNLG	28	O	This signal is a negative pulse indicating that the printer can again accept data.
11	BUSY	29	O	HIGH means the printer cannot receive data. This occurs when the printer is receiving data or when the printer is in an error state.
12	PE	28	O	HIGH means no paper is loaded.
13	SLCT	28	O	Always HIGH when the printer is on.
14	-AFXT	30	I	Not used
15	NC	-	-	Not connected
16	GND			Ground for twisted pair return
17	Chassis GND			Ground for frame/body
18	Logic H			Pulled up to +5V via 3.9Kohm
19-30	GND			Ground for twisted pair return
31	-INIT	30	I	Pulse width of 50uS or more means LOW pulse, and the falling edge of LOW signal causes the printer to initialize.
32	-ERROR	29	O	LOW means printer error
33	GND	----	----	Ground for twisted pair return

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

Pin No.	Signal Name	Return Pin	In/ Out	Functional Description
34	NC	----	----	Not connected
35	+5V	----	O	HIGH during normal operation. Pulled up to +5V via 1.0Kohm
36	-SLIN	30	I	Not used

Note: In (I) and Out (O) refer to the direction of signal flow from the printer's point of view.

1.2.2 Parallel Interface - Nibble Mode

Table 1-17. Transmission Specifications

	Description
Transmission mode	IEEE-1284 nibble mode
Synchronization	Refer to IEEE-1284 specification
Handshaking	Refer to IEEE-1284 specification
Signal level	TTL compatible (IEEE-1284 level 1 device)
Adaptable connector	57-30360 (Amphenol) or equivalent
Data trans. timing	Refer to IEEE-1284 specification
Extensibility request	The printer responds affirmatively when the extensibility request values are 00H or 04H: 00H: Request Nibble Mode Reverse Channel Transfer 04H: Request Device ID; Return Data Using Nibble Mode Reverse Channel Transfer
Device ID	The printer returns the following strings when the device ID is requested: <00H><4EH> MFG: EPSON CMD: ESCPL2, BDC MDL: Stylus[SP]Pro[SP]7000 CLS: PRINTER DES: EPSON[SP]Stylus[SP]Pro{SP]7000 ***Note:*** [00H] denotes a hexadecimal value of zero MDL values depend on the EEPROM setting

Table 1-18. Connector Pin Assignments - Reverse Channel

Pin No.	Signal Name	Return Pin	In/ Out	Functional Description
1	HostClk	19	I	Host clock signal.
2-9	Data0-7	20-27	I	The DATA0 through DATA7 signals represent data bits 0 to7, respectively. Each signal is at high level when data is logical 1 and low level when data is logical 0.
10	PtrClk	28	O	Printer clock signal
11	PtrBusy/ DataBit-3,7	29	O	Printer busy signal and reverse channel transfer data bit 3 or 7.
12	AckDataReq/ DataBit-2,6	28	O	Acknowledge data request signal and reverse channel transfer data bit 2 or 6.
13	Xflag/ DataBit-1,5	28	O	X-flag signal and reverse channel transfer data bit 1 or 5.
14	HostBusy	30	I	Host busy signal.
15	NC			Not connected
16	GND			Signal ground
17	Chassis GND			Chassis ground
18	Logic-H		O	Pulled up to +5V via 3.9K ohm resister.
19-30	GND			Ground for twisted pair return
31	-INIT	30	I	Not used.
32	-DataAvail/ DataBit-0,4	29	O	Data available signal and reverse channel transfer data bit 0 or 4.
33	GND			Signal ground
34	NC			Not connected
35	+5V	----	O	Pulled up to +5V via 1.0K ohm resister.
36	1284-Active	30	I	1284 Active Signal

Note: In (I) and Out (O) refer to the direction of signal flow from the printer's point of view.

1.2.3 Parallel interface - ECP mode

Table 1-19. Transmission Specifications

	Description
Transmission mode	IEEE-1284 ECP mode
Synchronization	Refer to IEEE-1284 specification
Handshaking	Refer to IEEE-1284 specification
Signal level	IEEE-1284 level 1 device
Adaptable connector	See forward channel
Data trans. timing	Refer to IEEE-1284 specification
Extensibility request	The printer responds affirmatively when the extensibility request values are 10H or 14H: 10H: Request ECP Mode Reverse Channel Transfer 14H: Request Device ID; Return Data Using ECP Mode Reverse Channel Transfer
Device ID	The printer returns the following strings when the device ID is requested: <00H><4EH> MFG: EPSON CMD: ESCPL2, BDC MDL: Stylus[SP]Pro[SP]7000 CLS: PRINTER DES: EPSON[SP]Stylus[SP]Pro{SP]7000 ***Note:*** [00H] denotes a hexadecimal value of zero MDL values depend on the EEPROM setting

Table 1-20. Connector Pin Assignments - ECP Mode

Pin No.	Signal Name	Return Pin	In/ Out	Functional Description
1	HostClk	19	I	Data or address information is transferred from the host to the printer.
2-9	Data0-7	20-27	I	The DATA0 through DATA7 signals represent data bits 0 to7, 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 values to the printer.
10	PeriphClk	28	O	Data is transferred from the printer to the host.
11	PeriphAck	29	O	The printer uses this signal for flow control in the forward direction. Also used for data bit 9 which indicates command information and data to be output on the data signal in the forward direction.
12	nAckReverse	28	O	The printer goes to Low and approves the nReverseRequest.Acknowledge data request signal and reverse channel transfer data bit 2 or 6.
13	Xflag	28	O	X-flag signal and reverse channel transfer data bit 1 or 5.
14	HostAck	30	I	The host uses this signal for flow control in the reverse direction. Also used for data bit 9 which indicates command information and data to be output on the data signal in the forward directions.
15	NC			Not connected
16	GND			Signal ground
17	Chassis GND			Chassis ground
18	PeriphLogic-H		O	Always HIGH. Pulled up to +5V via 3.9K ohm resister.
19-30	GND			Ground for twisted pair return

Table 1-20. Connector Pin Assignments - ECP Mode

Pin No.	Signal Name	Return Pin	In/ Out	Functional Description
31	nReverseRequest	30	I	This signal goes low to change to the reverse channel.
32	nPeriphRequest	29	O	This signal produces a host interrupt.
33	GND			Ground for twisted pair return
34	NC			Not connected
35	+5V	----	O	Always HIGH. Pulled up to +5V via 1.0K ohm resister.
36	1284-Active	30	I	1284 Active Signal. HIGH in ECP mode

Note: In (I) and Out (O) refer to the direction of signal flow from the printer's point of view.

1.2.4 USB

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

Suggested cable length :2 meters

Table 1-21. USB connector pin assignments and signals

Pin no.	Signal name	In/Out	Description
1	VCC	-	Cable power, max. power consumption is 100mA
2	-Data	bi-directional	data
3	+Data	bi-directional	data, pull up to +3.3V via 1.5K Ω resistor
4	Ground	-	Cable ground

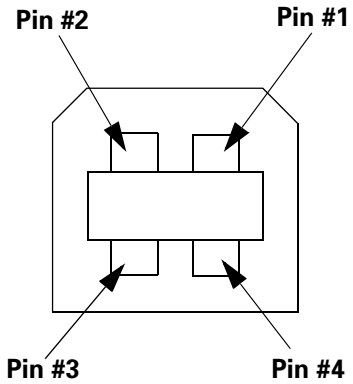


Figure 1-4. USB Pins

Device ID <00H><4EH>
MFG: EPSON
CMD: ESCPL2, BDC
MDL: Stylus[SP]Pro[SP]7000
CLS: PRINTER
DES: EPSON[SP]Stylus[SP]Pro{SP]7000

NOTE: *To use USB interface: set "PARA.I/F=COMPAT." in the Printer Settings Menu.*

1.2.5 TYPE-B Optional Interface

The EPSON Stylus Pro 7000 supports a Type-B interface (level 2).

Reply message (short version):

- When using a Co-ax/Twin-ax interface card:
  Main type: MTP48p, PW127cl10cpi, PRG (B0xxxx)rev, AP1200ma
  Product name: Stylus[SP]Pro[SP]7000
  Emulation type: ESCPL2-00
  Entity type: EPSONLQ2
- When using a card other than a Co-ax/Twin-ax interface card:
  Main type: MTP48p, PW127cl10cpi, PRG (B0xxx)rev, AP1200ma, SPD0fast
  Product name: Stylus[SP]Pro[SP]7000
  Emulation type:ESCPL2-00
  Entity type: ESPONLQ2

1.2.6 Preventing Data Transfer Time-Outs

Generally, hosts abandon data transfer to peripherals when a peripheral is in the busy state for dozens of seconds continuously. To prevent hosts from entering this kind of time-out period, the printer slows down the data reception rate to about one byte per second when there is less than 4kb of free space in the printer buffer. Data reception comes to a complete stop if the free space is less than 32 bytes, but returns to one byte per second when free space reaches 1KB or more.

1.2.7 Interface Selection

The SP 7000 has one slot for an optional Type-B interface and two built-in interfaces; the USB and parallel interfaces.

When the USB interface is connected to the host, the parallel interface is inactive. Therefore, the parallel interface can only be used when the USB interface is not connected to the host. However, the parallel or USB interface can operate even if the optional Type-B interface is installed and connected. The interface in use is selected automatically or manually.

- Manual selection

  The interface can be manually determined using the Printer Setting Menu; see SelecType in the user's guide for details.

  The choices are INTERFACE = PARA/USB or INTERFACE = OPTION.

- Automatic selection

  If the interface setting is set to "AUTO" (default), the printer scans the interfaces for incoming data. The interface that receives data first is selected.

  As long as the host sends data or the printer interface is in the busy state, the interface selection does not change.

  When the host stops transferring data and the printer is in the stand-by state for a certain period of time, the printer returns to the idle state.

- Interface status and selection

When the option interface is selected, the parallel/USB interface goes into the busy state. The LH signal is "L" at this time. "L" means the power is cut, in other words 1284 does not respond. Therefore, the LH check is required via the Reverse channel. The USB interface responds NACK and cannot receive data.

The the option interface is not selected, an off-line bit is set to Main Status Register (MNSTS). When the printer initializes or returns to the idle state, the USB interface is out of the NACK condition and resets the off-line bit of the Main Status Register to option interface.

Be aware that an interrupt signal such as the -INIT signal only takes effect on the parallel interface when the parallel interface is selected.

When the printer is initialized or returns to an idle state, the parallel interface enters a ready condition, the serial DTR signal is set to low, and the off-line bit of the Main Status Register (MNSTS) is reset.

The /INIT signal on the parallel interface is not active while that interface is in Nibble or ECP Mode, or is not selected.

1.3 PHYSICAL SPECIFICATIONS

PRINTER DIMENSIONS & WEIGHT

Dimensions: 1100 x 572 x 560mm (WxDxH)
(43.8 x 22.8 x 22.3 inches)

Weight: 43.5Kg (95.7 lb.s)

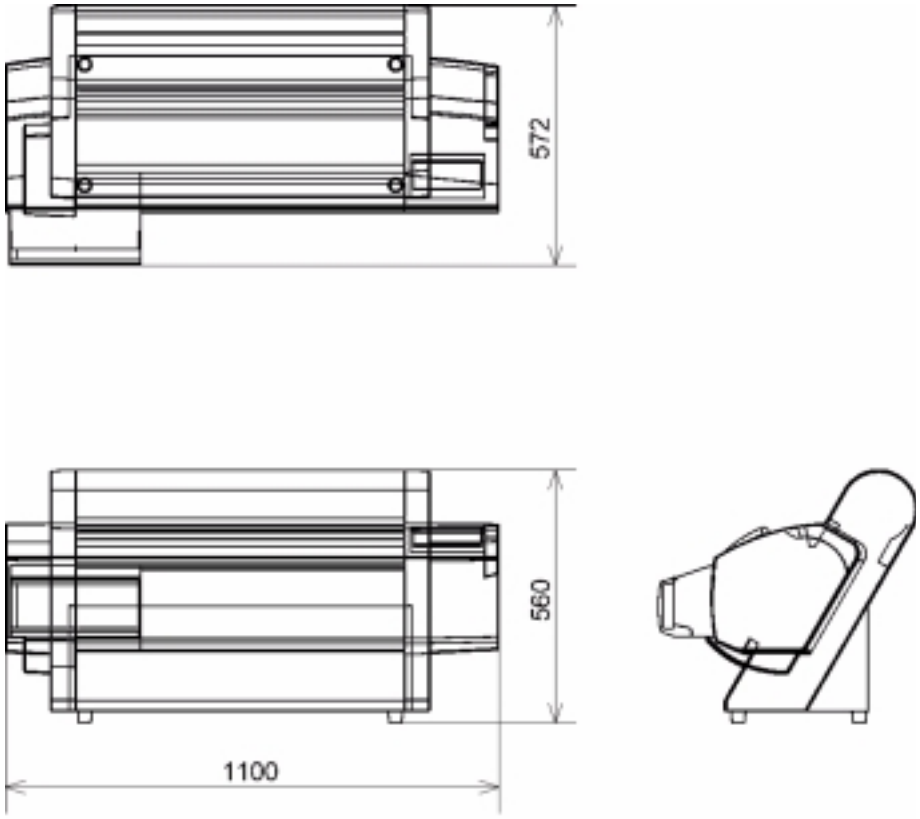
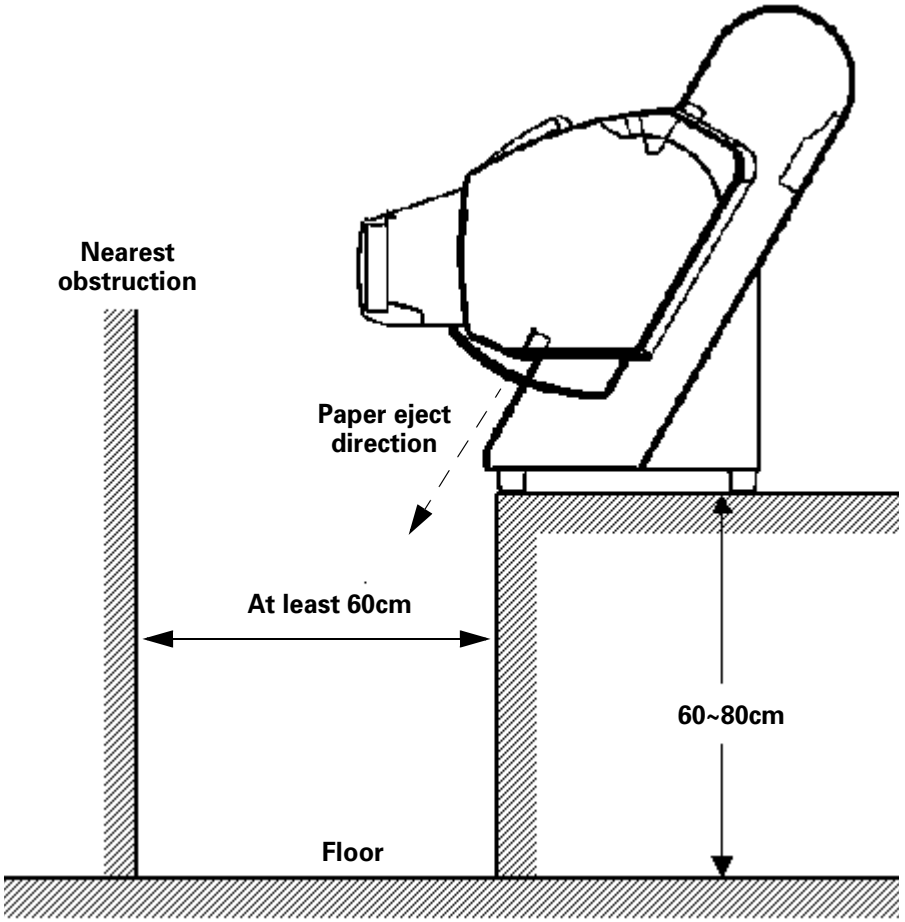


Figure 1-5. Printer Dimensions

SETUP GUIDELINES

When setting up the printer on a desk or table top, refer to the instruction and illustration below. (When setting up the printer using the optional stand, see the setup guide that comes with the stand for details.)

1. Make sure the printer is 60~80cm (24~32") off the floor.
2. Make sure the nearest obstruction in front of the printer is at least 60cm (24") away.



CUTTER SPECIFICATIONS

Attributes:	Consumable item that is replaced by the user, and it is made of very hard steel, so the blade can be chipped. Handle carefully to avoid cuts to yourself and to avoid chipping the blade.
Life:	The cutter can cut well over 2,000 sheets of paper, but the actual wear-and-tear depends on the type and thickness of the paper used. The cutter life can be determined manually; attempt to cut a piece of normal paper and if the cutter easily cuts the paper, it is OK. Unlike the cutter position with the EPSON Stylus Pro 9000, the SP 7000 cutter position is automatically determined by the carriage cover position. No adjustment is needed for the cutter position or the carriage cover height.

1.4 Control Panel

This section describes the control panel, the buttons, the lights, and the way you make settings.

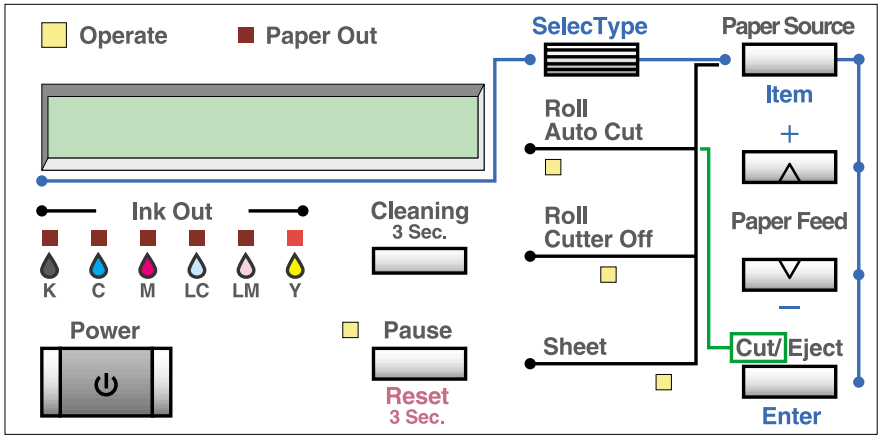


Figure 1-6. Control Panel

BUTTONS

All eight buttons on the control panel and their functions are described below.

Table 1-22. Buttons and Functions

Button (Second function)	Function (Normal)	SelecType Function	Power-On Function
Power	Power on/off	N/A	N/A
Pause (Reset)	• Switch -pause/ready • Reset (press 3 seconds)	N/A	Maintenance Mode
SelecType	• Enters SelecType mode • Opens Cutter Replacement Menu (press for five seconds)	Selects menu or major category	Ink capacity select mode
Cut/Eject (Enter)	Selects *1 • Auto Cut • Cutter Off • Sheet	Confirms and saves setup values	N/A
Paper Feed ↑	Feeds paper backward *2	Cycles backward/ increases value	
Paper Feed ↓	Feeds paper forward *3	Cycles forward/ decrease value	
Paper Source (Item)	Selects paper source	Selects item or minor category	
Cleaning	Cleans both heads (press for three seconds)	N/A	
Paper Source + Cut/Eject + Paper Feed ↓	N/A		Maintenance Mode 2
Paper Source + Cut/Eject + Cleaning			Firmware Update Mode

Notes:

1: Interrupts ink drying and runs the specified operation.

2: 1.27cm/second paper feed for 2 seconds after key is pressed. 7.62cm/second paper feed if pressed for over two seconds. Maximum feed of 20cm with one press of the button.

3: 1.27cm/second paper feed for 2 seconds after key is pressed. 7.62cm/second paper feed if pressed for over two seconds.

LED INDICATORS

Table 1-23. LED Indicator Lights

LED	Status	Condition
Operate	• On • Flashing	• Power on • Receiving data or performing power-down sequence
Paper Out	• On • Flashing	• No paper loaded, end of roll, sheet/roll paper error, paper set lever is in release position, or the loaded paper is too thick for cleaning • Paper jam, paper cutting, paper skew, or paper check error
Pause	• On • Flashing	• Paused • Performing head cleaning or the printer is in ink drying phase. Also flashes during ink charging operation.
Ink Out Y	• On • Flashing	• Ink out* • Ink low
Ink Out LM	• On • Flashing	• Ink out* • Ink low
Ink Out LC	• On • Flashing	• Ink out* • Ink low
Ink Out M	• On • Flashing	• Ink out* • Ink low
Ink Out C	• On • Flashing	• Ink out* • Ink low
Ink Out K	• On • Flashing	• Ink out* • Ink low
Roll Auto Cut	• On • Flashing	• Auto cut selected • Roll paper not set or roll paper and cut sheet sizes are different
Paper Type (Cut Off)	• On • Flashing	• Roll paper will not be cut • Roll paper not set or roll paper and cut sheet sizes are different
Sheet	• On • Flashing	• Single sheet printing mode. • Roll paper not set or roll paper and cut sheet sizes are different

Note: *Also occurs if no cartridge is installed or the wrong cartridge is installed.

1.4.1 Indicator Status in Normal Mode

Table 1-24. Operate Indicator

Printer Status	Indicator
With power on and in any status other than those listed below.	On
While processing data and during power off sequence	Flashing
Fatal error	Flashing
Reset, timer IC reset/NVRAM clear	On

Table 1-25. Paper Out Indicator

Printer Status	Indicator
Out of paper, end of roll	On
Roll paper and sheet sizes are different	On
Paper set lever in release position	On
Paper is too thick to perform cleaning	On
Paper jam	Flashing
Paper cutting error	Flashing
Paper skew	Flashing
Paper check error	Flashing
Problem with paper eject (sheet)	Flashing
Fatal error	Flashing
Reset, timer IC reset/NVRAM clear	On

Table 1-26. Pause Indicator

Printer Status	Indicator
Ready	Off
In SelecType mode	Off
Paused	Off
Ink drying phase	Flashing
Ink charging sequence	Flashing
Other errors	Off
Fatal error	Flashing
Reset, timer IC reset/NVRAM clear	On

Table 1-27. Ink Out Indicators

Printer Status	Indicator
Out of specified ink No I/C for specified ink Wrong I/C for that slot	On
Ink low	Flashing
Fatal error	Flashing
Reset, timer IC reset/NVRAM clear	On

1.4.2 Control Panel Messages

Table 1-28. Paper Source Indicator

Printer Status	Indicator
Selected paper source	On
Fatal error	Flashing
Roll paper and sheet sizes are different	Flashing
Reset, timer IC reset/NVRAM clear	On

Printer status and error messages appear on the control panel display. The table below lists the messages.

Table 1-29. Control Panel Messages

Display Message	Meaning
SERVICE REQ. nnnnnnnn	Fatal error - see “Service Requests” on page 49
TURN PWR OFF AND ON	Turn the printer off and on to reinitialize
RESET	In the process of re-initializing.
TRANSPORT PREP nn%	See “Transportation Mode” on page 54
POWER OFF	Preparing to shut down.
COVER OPEN	The cover is open. The carriage stops in place, and the printhead can be damaged if the head remains out of the capped position for a long period of time.
SECURE PAPER LEVER	Paper Set lever is in the released and cannot continue or begin a print, cleaning, or initialization sequence.
NO INK CARTRIDGE	One or more cartridges are not installed
OPTION I/F ERROR	An unsupported Type-B interface card is installed.
INK OUT	• A predetermined amount of ink has been consumed after the cartridge has entered the near-end condition. • A near-end cartridge has been removed and re-installed.

Table 1-29. Control Panel Messages (continued)

Display Message	Meaning
READY *	Can receive and print data.
WAIT *	Resetting Timer IC Clearing NVRAM Performing reset operation Performing ink sequence operation Initializing the printer Initializing the paper
INK CHARGING nnn%	Initial charging of ink - shown in percent completed
INK DRY xx MIN *	Printer waits xx minutes before the next print job to allow enough time for ink to dry on previous print job.
PRESS PAUSE BUTTON	Waiting for paper initialize start trigger
LOAD xxx PAPER	Wrong paper loaded or wrong paper source selected on control panel.
LOAD PAPER	The Paper Set Lever is in the released position (before printing). Pull the Paper Set lever forward to the set position
PAPER JAM	Both front and rear paper sensors detect paper and there is a carriage over-current or out of step error. This is due to: • Paper is jammed inside the printer • Paper is obstructing the carriage path during feeding or cutting operation.
PAPER NOT CUT	Printer did not cut the paper completely, or the cut piece still remains over the paper sensor
PAPER NOT STRAIGHT	Paper skewed more than 3mm between the leading and following edges. Check the printout for skew and make sure no ink was fired onto the platen.

Table 1-29. Control Panel Messages (continued)

Display Message	Meaning
UNABLE TO PRINT	When trying to print a test or adjustment pattern, one of the following occurs: • Paper not loaded • Ink cartridge not loaded • Paper detection error
RELOAD PAPER	• The paper was loaded too far foward and cannot be backward fed to the proper position. • The paper's horizontal position exceeds the normal printable area when the paper is loaded. • The paper's horizontal position exceeds the normal cuttable area after printing. • The cut sheet is too long and cannot be ejected properly. • Recovery from cutter error.
REMOVE PAPER	Loaded paper is too thick to perform timer cleaning
PAUSE	Pause state.
INK LOW	• 100ml cartridge when total dots fired = 90%, cartridge enters near-end condition. Remaining ink = A1 at 100% duty • 200ml cartridge when the I/C ink-low flag activates the ink-low sensor, cartridge enters near-end condition. Remaining ink = B1 at 100% duty
MAINTENANCE REQ. nnnn	Printer requires maintenance - see "Maintenance Request" on page 48
PRINTING *	Processing print data.
PAPER OUT	• No paper loaded • End of roll paper (printer stops feeding) • End of sheet paper (when paper feeds to eject position, put hand under the sheet and press Cut/Eject to release)

Notes*: If the printer's platen gap setting is set to Thick, a "H" will appear in the last space on the LCD display.

1.4.3 Panel Display Priority

High priority to low priority

- Fatal errors/restart required
- Reset, timer IC rest/NVRAM clear
- Entering or in power-off sequence/transport preparation sequence
- Entering or in ink-cartridge-replacement sequence
- Cover open
  Paper set lever released during operation
- Type B interface error
  No ink cartridge
  Wrong ink cartridge
  Ink out
- Roll paper and sheet sizes are different
  Paper jam
  Paper set lever in release position
  Paper cutting error
  Paper not straight
  Paper check error
  Roll paper end
  Paper eject error
- Initializing
  Paper is too thick for cleaning
  Entering or in ink sequence
  Waiting for paper-initialization trigger
  Paused
  Entering or in paper initialization
  Entering or in ink drying timeout
  Ink low/Maintenance required
- Processing data/printer ready
- Out of paper

1.5 Loading Paper

☐ To automatically cut off the printed roll paper after printing:

1. Push back the paper set lever to the release position. The printer is incapable of printing.
2. Select Roll, Auto Cut using the Paper Source button.
3. Load the paper from the paper insertion slot and align it with the paper guideline.
4. Pull the paper set lever forward to the set position.
5. If the surface of the paper is dirty or indented anywhere, use the Paper Feed buttons to skip over that area. When that area passes the cut off line, press the Cut/Eject button. This trims the unusable section of paper, and the printer is now ready to print.
6. Push the Pause button or wait ten seconds to automatically feed the paper back to the standby position. The printer is ready to receive print data, print it, and cut off the paper.

☐ To print and not cut off the roll paper:

1. Pull up the paper set lever to the release position. The printer is incapable of printing.
2. Select Roll, Cutter Off using the Paper Source button.
3. Load the paper from the paper insertion slot and align it with the paper guideline.
4. Pull the paper set lever forward to the set position.
5. If the surface of the paper is dirty or indented anywhere, use the Paper Feed buttons to skip over that area. When that area passes the cut off line, press the Cut/Eject button. This trims the unusable section of paper, and the printer is now ready to print.
6. Push the Pause button or wait ten seconds to automatically feed the paper forward to the standby position. The printer is ready to receive print data and print.

☐ To use cut sheets

■ smaller than A3+ size cut sheets

1. Select Sheet using the Paper Source button.
2. Make sure the paper set lever is in the forward (set) position, and load a sheet in the paper insertion slot
3. Push the Paper Feed or Pause button (you need to press one) to feed the paper forward to the standby position. The printer is ready to receive print data.

■ A3+ or larger size cut sheets

1. Push back the paper set lever to the release position. The printer is incapable of printing.
2. Select Sheet using the Paper Source button.
3. Load the paper from the paper insertion slot and align it with the paper guideline.
4. Pull the paper set lever forward to the set position.
5. Push the Pause button or wait ten seconds to automatically feed the paper forward to the standby position. The printer is ready to receive print data.

1.6 SelecType Settings

☐ Entering SelecType mode

To access the control panel settings, press the SelecType button while the printer is not printing. The printer enters the SelecType mode and cannot print.

☐ Using SelecType mode

1. Repeatedly press the SelecType button to view the SelecType menus which appear in the order shown below.

Table 1-30. SelecType Menus

Display Message	For details, see
PRINTER SETTING MENU	"Printer Setting Menu" on page 42
TEST PRINT MENU	"Test Print Menu" on page 43
PRINTER STATUS MENU	"Printer Status Menu" on page 45
PAPER CONFIG. MENU	"Paper Configuration Settings" on page 45
CUTTER REPLACE MENU	"Cutter Replacement Menu" on page 46
HEAD ALIGNMENT MENU	"Head Alignment Menu" on page 47

2. Press the Item button to select the choice shown in the LCD display.
3. Press the SelecType button to view the options for that Item.
4. Press the "+" button or "-" button to view the available values for an option.
5. Press the Enter button to record the current option or to execute the operation shown in the display.

☐ Exiting SelecType mode

Select one of the following methods to exit SelecType mode:

- Press the Pause button while in SelecType mode; the printer is ready to print.
- Perform the printer initialization.
- Print a status sheet.
- Print a nozzle check pattern.
- Replace the cutter.
- Press the SelecType button several times at the top level of SelecType menus.
- Press the SelecType button one time at the second level of SelecType menus.

1.6.1 Printer Setting Menu

Table 1-31. Printer Setting Menu

Display Message	Options	Notes
PLATEN GAP	Auto Wide	Adjusts the platen gap. (Normally, leave set to Auto.)
PAGE LINE	ON OFF	When Auto Cut Off is selected on the control panel, this setting determines whether a line for manual cutting is printed.
INTERFACE	Auto Parallel/USB Option	Determines which interface the printer checks for data. Auto continuously checks all interfaces and is good for normal use.
PARA. I/F	Compat ECP	Determines the data transfer rate when using this interface.(Normally, leave set to Compatible.)
CODE PAGE	PC437 PC850	Character code setting. (PC437: expanded graphics/PC850: multi-lingual)
ROLL MARG	T/B 15MM 15MM 3MM	Roll sheet margin setting. • Top/Bottom 15mm* top and bottom margins = 15mm left and right margins = 3mm • 15mm: all margins = 15mm • 3mm all margins = 3mm
PAPER SIZE CHK	ON OFF	Determines whether the paper size check is enabled
PAPER ALIGN CHK	ON OFF	Determines whether the paper skew check is enabled
INIT. PANEL	Exec.	Initializes control panel setup values to their defaults

Notes:

* The printed image is the same size whether the margin is 15mm or 3mm. The difference is 12mm of paper clearance is added to the top and bottom edges to make paper feeding more stable and to prevent the paper from rubbing the printheads.

The underlined item equals the default.

☐ Platen gap

You can adjust the platen gap using this option. (See "Platen Gap Mechanism" on page 71 for details.)

Table 1-32. Platen Gap Settings

Option	Command Setup	Detected Thickness	Actual Value	Application
Wide	Wide PG	Thick Paper	2.7mm	Thick paper
		Thin Paper	2.7mm	Thick paper
	Default PG	Thick Paper	2.7mm	Thick paper
		Thin Paper	2.2mm	Thin paper - wider than normal to reduce smearing
Auto	Wide PG	Thick Paper	2.7mm	Thick paper
		Thin Paper	2.7mm	Thick paper
	Default PG	Thick Paper	2.7mm	Thick paper
		Thin Paper	2.2mm	Thin paper

☐ Roll paper margin

T/B 15MM = the printed image is the same size whether the margin is 15mm or 3mm. The difference is 12mm of paper clearance is added to the top and bottom edges to make paper feeding more stable and to prevent the paper from rubbing the printheads.

If the print area is greater than the width of the printable area of the paper, the printer ignores the extra print data on the right side of the paper.

☐ Paper size check

You can disable the paper size check to prevent "RELOAD PAPER" errors which may occur when using very thin paper or paper with low reflective qualities such as tracing paper.

The print area is determined manually, and the printheads will fire ink onto the platen if the print area is set larger than the actual paper size.

1.6.2 Test Print Menu

Table 1-33. Test Print Menu

Display Message	Item	Notes
NOZZLE CHECK	Print	Check the printout, any missing lines mean the nozzle(s) are clogged.
STATUS SHEET	Print	Prints the current printer settings.

1.6.2.1 Nozzle check

J0xxxx = Firmware version
Ink Pad xx = Waste ink Counter, xx =% remaining

Note: the actual pattern prints in color: black, cyan, magenta, light cyan, light magenta, and yellow

1.6.2.2 Status sheet

```
xx-xx-xx-xx-xx-xx
Type B                :Installed

========== Current Setting ==========
Head Gap              :Auto
Border Line           :On
Interface             :Parallel
Parallel I/F          :ECP
Code Page             :PC437
Version               :B0xxxx
Ink Left C            :E******F
Ink Left M            :E******F
Ink Left LC           :E******F
Ink Left LM           :E******F
Ink Left Y            :E******F
Ink Left K            :E******F
Cutter Life           :E******F
Page Count            :123456
Ink Pad               :E******F
CR Moter              :E******F
PF Moter              :E******F
Head                  :E******F
Cleaner               :E******F
```

- ☐ Head Gap = see Platen Gap in Printer Status Menu, page 45
- ☐ Border Line = see Page Line in Printer Status Menu, page 45
- ☐ Interface = See Table 1-31, “Printer Setting Menu,” on page 42
- ☐ Parallel I/F = See Table 1-31, “Printer Setting Menu,” on page 42

- ☐ Code page = PC 437 (US/Europe) or PC 850
- ☐ Version = Firmware version
- ☐ Ink Left = see below

E*****	F	100~81% remaining
E****	F	80~61% remaining
E***	F	60~41% remaining
E**	F	40~20% remaining
E*	F	20%~near end
nn%		near end ~ ink end (Ink End LED = flashing)
0%		ink end (Ink End LED = on)

- ☐ Cutter Life

The values are approximate and will vary depending on usage.

Table 1-34. Cutter Life Value

Printed Value	Meaning
E*****F	100-81% remaining
E**** F	80~61% remaining
E*** F	60~41% remaining
E** F	40~20% remaining
E* F	20~1% remaining
E F	less than 1% remaining

When the cutter life = less than 1%, the cutter should be checked (does it cut a straight, clean line?) and replaced if necessary. This is a subjective check and the cutter does not have to be replaced if it still cuts properly.

Users can replace the cutter themselves.

- ☐ Page count = total number of printed pages (max. six digits)
- ☐ Ink Pad = waste ink count, see below

E*****	F	100~81% remaining
E****	F	80~61% remaining
E***	F	60~41% remaining
E**	F	40~21% remaining
E*	F	20~1% remaining
E	F	Less than 1% remaining (Maintenance Req 0100)

when the ink pads are calculated to be full, Service Req. 00000100 occurs and the printer cannot print.

After replacing the waste ink pads, clear the waste ink counter with Maintenance Mode 2. See page 50.

- ☐ CR Motor life = Monitors carriage passes to notify when ink tubes need replacing. See above for count explanation. Service Req. 00000101 occurs when the count equals 0.
- ☐ PF Motor life = Monitors the feed drive mechanism. See above for count explanation. No fatal error.
- ☐ Head = Keeps track of the number of dots fired from the head according to color. The color that has been fired most is shown on the Status Sheet. See above for count explanation. No fatal error. Part replacement is determined on site.
- ☐ Cleaner = Keeps track of the number of head cleaning operations (wiping/rubbing). See above for count explanation. No fatal error. Part replacement is determined on site.

1.6.3 Printer Status Menu

All consumable items and maintenance parts either run out of their contents or wear out. To determine how much contents (ink) or useful life remains, compare the message and value shown on the control panel display to the corresponding value below and the messages in the table below.

E***** F	100~81% full/life remaining
E**** F	80~61% full/life remaining
E*** F	60~41% full/life remaining
E** F	40~21% full/life remaining
E* F	20~1% full/life remaining (generates a warning)
E F	Less than 1% full/life remaining (generates an error)

Table 1-35. Printer Status Menu

Display message	Meaning
VERSION	Shows the firmware version.
INK LEFT-K	Shows the amount of remaining ink - Black
INK LEFT-C	Shows the amount of remaining ink - Cyan
INK LEFT-M	Shows the amount of remaining ink - Magenta
INK LEFT-LC	Shows the amount of remaining ink - Light Cyan
INK LEFT-LM	Shows the amount of remaining ink - Light Magenta
INK LEFT-Y	Shows the amount of remaining ink - Yellow
CUTTER LIFE	Shows the remaining useful life of the cutter
TOTAL PRINTS	Shows the total number of printed documents
WASTE INK	Maintenance information
CR MOTOR	Maintenance information
PF MOTOR	Maintenance information
HEAD UNIT	Maintenance information
CLEANER	Maintenance information

1.6.4 Paper Configuration Settings

Table 1-36. Paper Config. Menu

Display Message	Item	Notes
PAPER NUMBER	STD 1~4	Select Standard for EPSON special paper. Select the appropriate number for thick paper.
THICK. PAT.*	Print	Prints a pattern to detect the paper thickness. If “Paper Number” is set to “Standard”, this message does not appear.
PAPER THICK. NO.	1~17	Select the paper thickness number. If “Paper Number” is set to “Standard”, this message does not appear.
DRYING TIME	0 MIN ~30 MIN	Determines the length of time the printer allows the ink to dry. When printing on roll paper, the printer will wait the specified time after printing
SUCTION	NORM LOW	The vacuum setting.

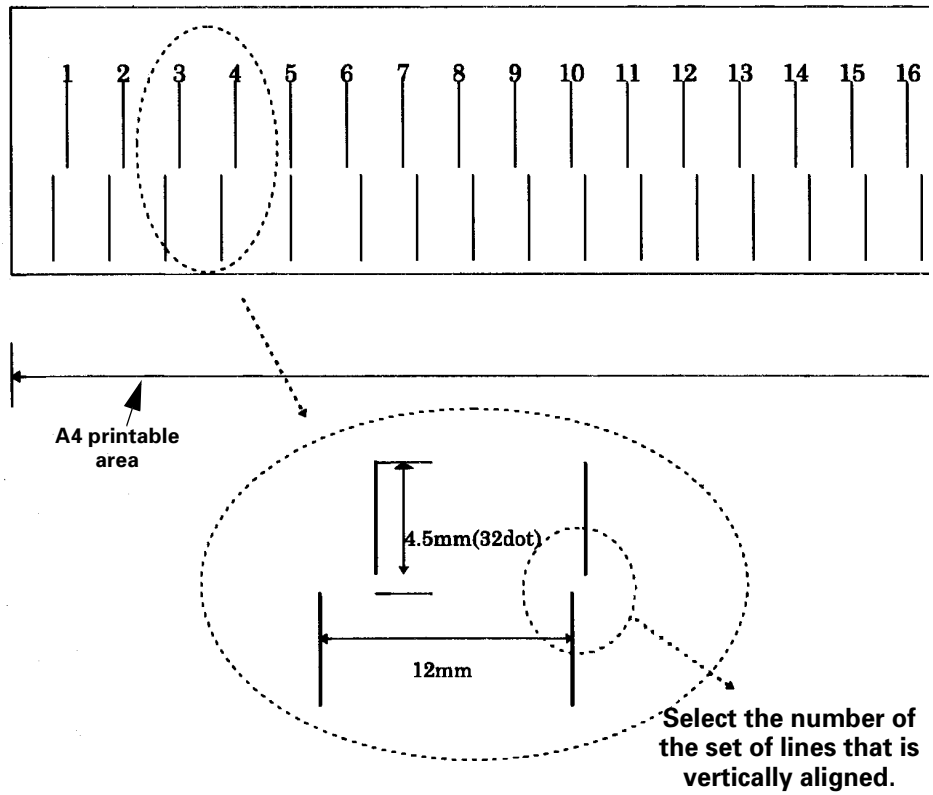
Note: The underlined item equals the default.
* The paper thickness detection function is enabled only when PAPER NUMBER equals something other than standard.

1.6.4.1 Detecting Paper Thickness

This option allows the user to detect the thickness of available paper, and register up to four user-defined paper types. Ink drying time can also be registered.

1. Load a sheet of A4 or larger size paper.
2. Press the SelecType button to enter SelecType mode.
3. Select the Paper Config. menu.
4. Select a paper number, one to four. (If you use EPSON media, select STD and proceed to step 4.)

5. Print the paper thickness pattern, and enter the number of the vertically aligned pair of lines. (#5 is correct in the example below.).



The numbers above represent 0.1mm increments between the head and platen, with "1" being 0.0mm and "17" being 1.6mm.

6. Set the ink drying period, 0~30 minutes.
7. Make the paper-suction fan setting; Norm (normal) or Low.

1.6.5 Cutter Replacement Menu

Print the Status Sheet from the Test Print menu in SelecType mode and see page 44 for information on determining when the cutter needs to be replaced.

The following table includes the steps/messages that must be followed to replace the cutter.

Table 1-37. Cutter Replace Menu

Display Message	Item	Notes
CUT. REPLACE	EXEC.	Prepare a replacement cutter and
OPEN LOWER COVER	-	Open the front cover.
REPLACE CUTTER	-	Remove the old cutter and install a new one.
CLOSE LOWER COVER	-	Close the front cover. The printer is ready.

If you need to replace the cutter:

1. Press the SelecType button to enter SelecType mode, and select the cutter replacement menu. (You can automatically enter the cutter replacement menu by pressing the SelecType button for five seconds.)
2. Open the Lower Cover (as shown on the LCD).
3. While pushing down the cutter (the lower of the two extensions on the left), slide the cutter actuator extension up and to the right.
4. Remove the old cutter and replace with a new one.
5. Close the Lower Cover (as shown on the LCD).

1.6.6 Head Alignment Menu

The head alignment function allows you to perform the parallelism adjustment. See the illustrations and table below for details.

To perform the parallelism adjustment:

1. Load A1-size roll paper.
2. Press the SelecType button and select the Head Alignment Menu.
3. If using EPSON special media (paper thickness = 0.2~1.2mm), select "STD". If using other media, enter the paper thickness in 0.1mm increments. (See "Detecting Paper Thickness" on page 45 if necessary.)
4. Select the pattern #1~12 or patterns "ALL" that you want to print. See the table below for details. Press the Enter button to print the test patterns.
5. There are twelve sections in the printout, and for each section determine which pattern is vertically aligned and enter the corresponding value (1~7). You will notice in the printout that sections six through eight are a little different than the others.

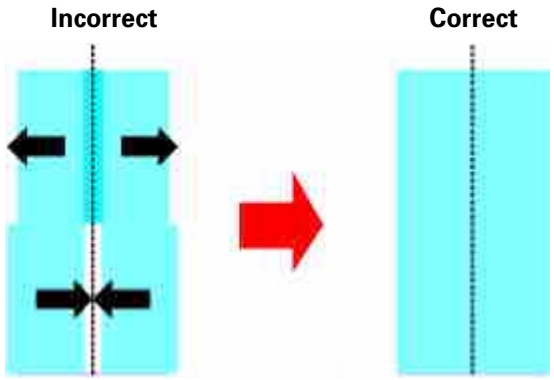


Figure 1-7. Head Alignment sections 6~8

6. Repeat steps 4 and 5 until all values are correct.

The adjustment values for head parallelism are stored in NVRAM.

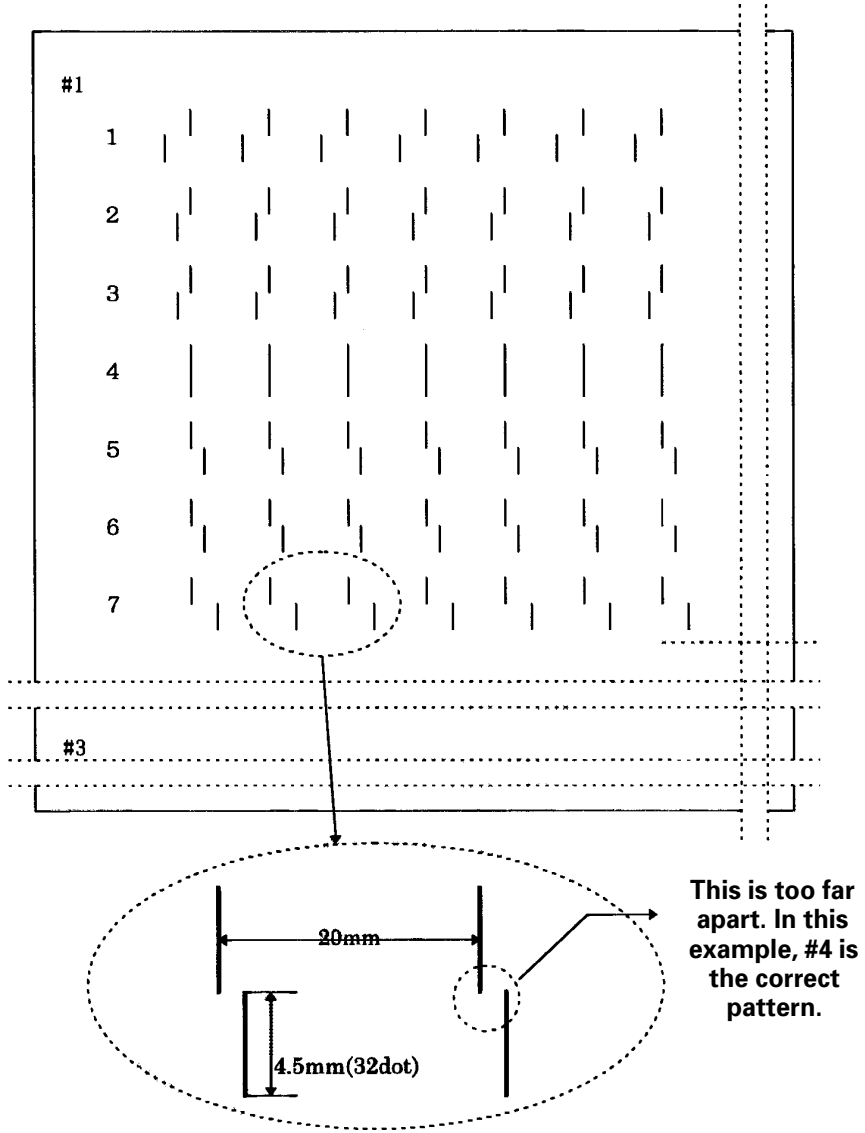


Figure 1-8. Head alignment printout

Table 1-38. Head Alignment Menu

Display Messages	Item	Notes
PAPER THICK	STD 0.0~1.6mm	Select the thickness, to 0.1mm, of the paper you are using to check the platen gap. Normally, leave set to Standard.
ADJUST. PATT.	All #1~12	Selects which patterns to print. (All patterns or selected patterns only.)
#1	1~4~7	Bi-D adjust 1 (200cps, Normal Dot, left)
#2	1~4~7	Bi-D adjust 2 (200cps, Normal Dot, right)
#3	1~4~7	Bi-D adjust 3 (200cps, Micro Dot, left)
#4	1~4~7	Bi-D adjust 4 (200cps, Micro Dot, right)
#5	1~4~7	Bi-D adjust 5 (300cps, Normal Dot, left)
#6	1~4~7	Bi-D adjust 6 (300cps, Normal Dot, right)
#7	1~4~7	Bi-D adjust 7 (300cps, Micro Dot, left)
#8	1~4~7	Bi-D adjust 8 (300cps, Micro Dot, right)
#9	1~4~7	L/R adjust 1 (200cps, Normal Dot)
#10	1~4~7	L/R adjust 2 (200cps, Micro Dot)
#11	1~4~7	L/R adjust 3 (300cps, Normal Dot)
#12	1~4~7	L/R adjust 4 (300cps, Micro Dot)

Note: The underlined item equals the default.

1.7 Maintenance Request

There are several consumable parts in the printer, and the printer employs separate counters to keep track of each one. The “Maintenance Req. 0100” message appears on the display to warn the user when the Waste Ink pads are about 99% full.

The printer can continue to print even though the “Maintenance Req. 0100* message appears instead of the “Ready” or “Printing” message. However, when the waste ink counter determines the Waste Ink pads are 100% full, the “Service Req 00000100” message appears and the printer can no longer print.

To clear this condition, perform the following.

Replace: The following items must be replaced.

- Waste Ink Pads
- Pump Assembly
- Cap Assembly
- FBox
- Cleaner, Head

The above mentioned items are available as a kit.

Description: MAINTENANCE KIT
Parts code: 1054038

Required Adjustments: Perform the following adjustments after replacing the maintenance parts.

- Waste Ink Counter Clear
(See “Maintenance Mode 2” on page 50)

- Cleaner Counter
(See “Maintenance Mode 2” on page 50)

1.8 Service Requests

When "Service Req nnnnnnnn" appears on the LCD display, a fatal error requiring a service technician has occurred. The nnnnnnnn indicates what needs to be fixed to return the printer to a working state.

Table 1-39. Service Errors

Service Code	Explanation
0001000	PF Motor encoder check error
0001001	PF Motor out of step
00010002	PF Motor overcurrent
00010003	PF Motor in-position time-out error
00010004	CR Motor encoder check error
00010005	CR Motor out of step
00010006	CR Motor overcurrent
00010007	CR Motor in-position time-out error
00010008	Servo interrupt watchdog time-out error
00010009	System interrupt watchdog time-out error
0001000A	CR origin sensor error
0001000B	PF origin sensor error
0001000C	PG origin sensor error (Head slide error)
0001000D	Cover sensor error (00)
0001000E	Cover sensor error (01)
0001000F	CR motor PWM output error
00010010	PF motor PWM output error
00020000	NVRAM Error
00020001	Internal RAM Check Error
00020002	SRAM Check Error
00020003	DRAM Check Error
0002000B	Mail box receiving error

Table 1-39. Service Errors (continued)

Service Code	Explanation
100000004	CPU Vector 4 - General illegal instruction
100000006	CPU Vector 6 - Slot illegal instruction
100000006	CPU Vector 9 - CPU address error
10000000A	CPU Vector 10 - DMAC\DTC address error
10000000B	CPU Vector 11 - Watchdog time-out error
1000000**	CPU Vector 32~63; wrong trap

When replacing the following parts to clear "Service Req. 00000100" error, you need to clear the corresponding counter using "Maintenance Mode 2".

[Affected parts] (Maintenance Kit SP7000)

- **Waste Ink Pads**
- **Flushing Box**
- **Pump Assembly**
- **Cap Assembly**
- **Cleaner, Head**

[Affected counters]

- **Init. Waste Ink**
- **Init. Cleaning Unit**

The above mentioned parts are also available as a KIT.

Description: MAINTENANCE KIT
Parts code: 1054038

1.8.1 Maintenance And Diagnostic Modes

When the printer is not functioning properly, there are three modes that help you detect what is wrong and can help you fix the problem. These modes are "Maintenance Mode", "Maintenance Mode 2", and "Self-Diagnostic Mode". To enter a mode, press and hold down the appropriate button (described below) while turning on the printer.

For details on how to make settings, see "SelecType Settings" on page 41. To exit a mode, turn the printer off and on again.

The following explanations regarding control panel service functions are for service and support purposes only; do not share this information with the user.

MAINTENANCE MODE

To enter: While pressing the Pause button, turn the printer on.

Table 1-40. Maintenance Mode

Message	Item	Explanation
Hex Dump	Print	Prints the print data in hexadecimal form, allowing you to confirm whether the print data from the host PC is properly sent/received. Press the Pause key to stop printing and turn off the printer to exit.
Language	English, French, Italian, German, Spanish, Portuguese	Determines which language is used to display messages on the LCD display.

MAINTENANCE MODE 2

To enter: While Pressing the Paper Source + Cut/Eject + Paper Feed ↓ buttons, turn the printer on.

Table 1-41. Maintenance Mode 2 - top level

Panel Display	Description
VIEW COUNTERS MENU	Counter indication menu
CLEAR COUNTERS MENU	Counter initialization menu
SERVICE CONFIG MENU	Adjustment/setup menu

Table 1-42. Maintenance Mode 2 - (NVRAM) counter value menu

LCD Message	Item (decimal)	Description
INK K	0~4294967295	Ink remaining value (K)
INK C	0~4294967295	Ink remaining value (C)
INK M	0~4294967295	Ink remaining value (M)
INK LC	0~4294967295	Ink remaining value (LC)
INK LM	0~4294967295	Ink remaining value (LM)
INK Y	0~4294967295	Ink remaining value (Y)
CUTTER	0~4294967295	Cutter life value
TTL PAGES	0~4294967295	Total printed pages value
WAST. INK A	0~4294967295	Waste ink A value
WAST INK B	0~4294967295	Waste ink B value
CR MOTOR	0~4294967295	CR motor life value
PF MOTOR	0~4294967295	PF motor life value
HEAD K	0~4294967295	Head unit (K)
HEAD C	0~4294967295	Head unit (C)
HEAD M	0~4294967295	Head unit (M)
HEAD LC	0~4294967295	Head unit (LC)

Table 1-42. Maintenance Mode 2 - (NVRAM) counter value menu

LCD Message	Item (decimal)	Description
HEAD LM	0~4294967295	Head unit (LM)
HEAD Y	0~4294967295	Head unit (Y)
CLEANER	0~4294967295	Cleaning unit life value

Table 1-43. Maintenance Mode 2 - counter initialize menu

Message	Item	Explanation
INIT. ALL	Exec	Initializes NVRAM, Timer, life counters, and mechanical counters
INIT. NVRAM	Exec	Initializes NVRAM
INIT. TIMER	Exec	Initializes timer
INIT. CR MTR	Exec	Initializes CR Motor counter (after replacing ink tubes)
INIT. PF MTR	Exec	Initializes PF Motor counter
INIT. HEAD	Exec	Initializes Head unit counter
INIT. CLEANER	Exec	Initializes cleaning unit counter
INIT. TTL PR	Exec	Initializes total print counter
INIT. INK	Exec	Initializes ink counter
INIT. WA. INK	Exec	Initializes waste ink counter
CLR HEAD ERROR	Exec	Clear head error

Table 1-44. Maintenance Mode 2 - Adjustment/setup menu

LCD Message	Item	Description
BID OFFSET #1	-4~0~+4	Right head Bi-D offset setting #1 (for Normal Dot 300cps)
BID OFFSET #2	-4~0~+4	Right head Bi-D offset setting #2 (for Micro Dot 300cps)

SELF-DIAGNOSTIC MODE

Power-on button: Paper Feed ↓ + Cut/Eject + Cleaning

This mode is used primarily for replacing worn-out printer parts and adjustment operations. For details, see Chapter 5, "Adjustment".

1.9 Ink Cartridge Select Mode

The printer cannot detect the size of the ink cartridge; therefore the user must manually select the size with this mode. To enter this mode:

Power-on button: SelecType

For details on how to make settings, see “SelecType Settings” on page 41. To exit a mode, turn the printer off and on again.

Table 1-45. Ink Cartridge Select Mode

LCD Message	Item
CARTRIDGE SIZE	100ml, 200ml

1.10 Firmware Update

The information contained in this section is not to be shared publicly.

The firmware contained on the Main Board is Flash ROM; therefore if you need to update the firmware or replace the Main Board, see “Parameter Backup” on page 157 and “Firmware Update” on page 160 for details.

1.11 Jumper Settings

The factory default settings for jumper and DIP switch on the Main Board (C277MAIN) are as follows.

Table 1-46. Jumper Settings

Type	Number	Setting
Jumper	JP1	Jumpered
Jumper	JP2	Jumpered
DIP-SW	SWD1 "1" (1-4)	OFF (Open)
DIP-SW	SWD1 "2" (2-3)	OFF (Open)

1.12 Initialization

There are three ways to initialize the EPSON Stylus Pro 7000:

- Hardware initialization:
  When the power is turned on or a cold-reset command is sent to the printer (remote RS command), the printer does the following:
  - Initializes the printer mechanism
  - Clears the input data buffer
  - Clears the print buffer
  - Restores the default values
- Software initialization:
  When the printer receives an ESC @ command, it does the following:
  - Clears the print buffer
  - Restores the default values
- Control panel (operator) initialization:
  When the Pause button is pressed for more than two seconds or the printer receives an -INIT signal (negative pulse) from the parallel interface, the printer:
  - If a single sheet is loaded, the printer ejects the sheet. If roll paper is loaded and Auto Cut is selected, the printer cuts the printed area off and reverse feeds the paper. If roll paper is loaded and Cutter Off is selected, the printer reverse feeds the paper.
  - Caps the printheads
  - Clears the input data buffer
  - Clears the print buffer
  - Resets the default values

The default values are shown below.

Page Position:	Current paper position as page-start position
Line feed:	1/6"
Right margin:	237th character
Left margin:	1st character
Character pitch:	10 CPI
Print mode:	Text mode (non-raster graphics mode)

1.13 Transportation Mode

To prepare the printer for transportation (drain ink), the user must enter the transportation mode as follows.

1. With the printer turned on, remove all ink cartridges.
2. Turn off the printer. The printer automatically drains the ink and shows the progress as a percent on the LCD panel.

- **The Paper Set lever must be in the set position; otherwise the ink drain sequence won't execute.**
- **When setting up again, the printer will perform an initial ink charge.**

CHAPTER

2

OPERATING PRINCIPLES

2.1 Component List & Illustrations

This section explains the print mechanism and operating principles for the EPSON Stylus Pro 7000.

2.1.1 Print Mechanism Components

The printer mechanism of EPSON Stylus Pro 7000 consists of the following mechanism parts.

Table 2-1. Printer Mechanism Components

Part	Drive voltage	Description
Carriage components		
B printhead C printhead	+42VDC, +28VDC, -2VDC	B/C/M printhead, LC/LM/Y printhead
Head thermistor	+5VDC	One in each printhead, B and C
CR motor	+42VDC	DC motor
CR_HP sensor	+5VDC	Photo interrupter active= CR out of HP interrupted = CR in HP
CR encoder sensor	+5VDC	Linear encoder two channel A phase/B phase
Pump motor (PG adjustment)	+42VDC	4 phase 200 cycle HB type stepping motor also used for cleaning
PG (HD_SLID) sensor	+5VDC	Photo reflector reflected = in PG HP unreflected = out of PG HP
P_Edge sensor	+5VDC	Photo reflector over threshold = paper exists under threshold = no paper
Cutter solenoid	+28VDC	solenoid, cutter drive
Paper feed components		
PF motor	+42VDC	DC Servo motor
PF encoder sensor	+5VDC	Rotary encoder two channel A phase/B phase in PF motor
Paper suction fans (x2)	+28VDC	DC motor fan
P_Front sensor	+5VDC	Photo reflector over threshold = paper exists under threshold = no paper
P_Rear sensor	+5VDC	Photo reflector over threshold = paper exists under threshold = no paper
P_Thick sensor	+5VDC	Photo interrupter active= thick paper interrupted = normal paper
Paper set lever position sensor	+5VDC	Photo interrupter active= thick paper interrupted = normal paper
Ink delivery components		
Pump motor (cleaning)	+42VDC	4 phase 200 cycle HB type stepping motor also used for cleaning
I/C sensors (B/C/M/Ic/Im/Y)	+5VDC	Microswitch 1/ slot Open = no I/C Closed = I/C installed
Ink end sensors (B/C/M/Ic/Im/Y)	+5VDC	Mechanical switch 1/ slot Open = near end Closed = ink remains
Other components		

Table 2-1. Printer Mechanism Components (continued)

Part	Drive voltage	Description
Cover open sensor	+5VDC	Mechanical switch Open = cover open Closed = cover closed
Panel unit	+5VDC	
C299MAIN board	+42VDC, +28VDC, +5VDC, -2VDC	Printer control/drive circuit board
Power supply board	-	

EPSON STYLUS PRO 7000 BODY & STAND

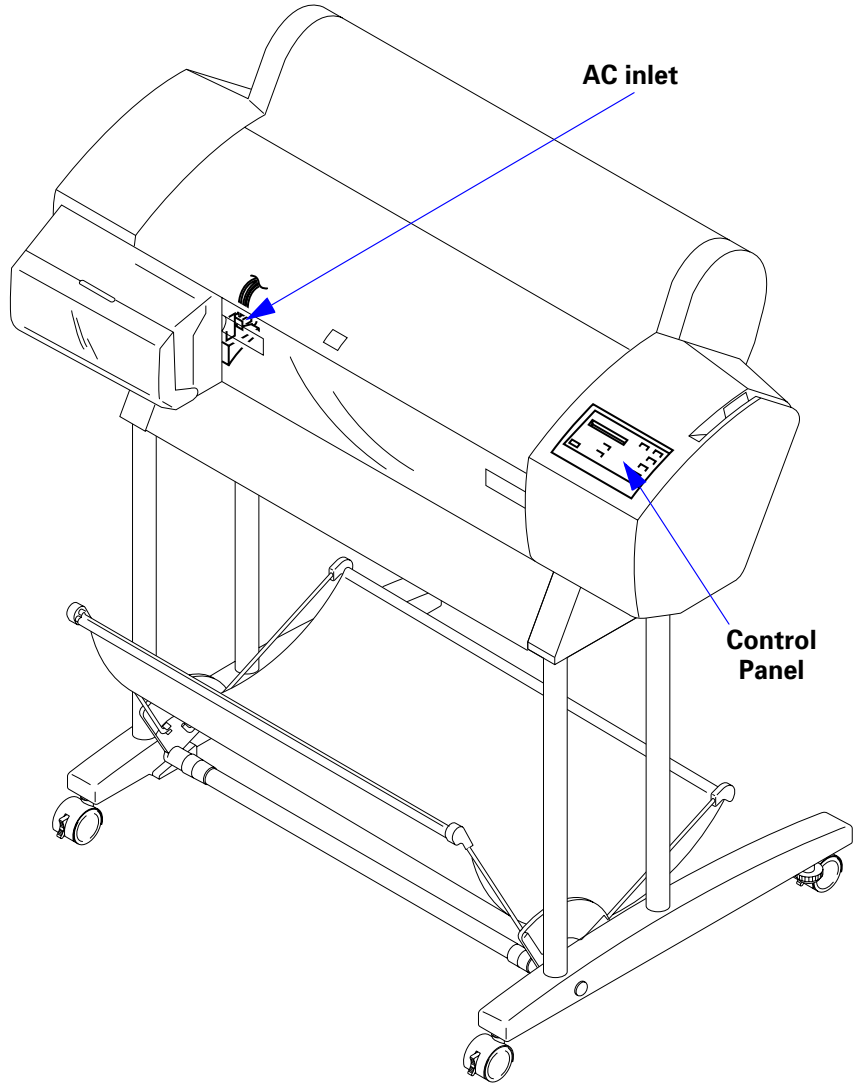


Figure 2-1. Panel and AC inlet

CARRIAGE COMPONENTS

The carriage component functions are described in detail on page 61.

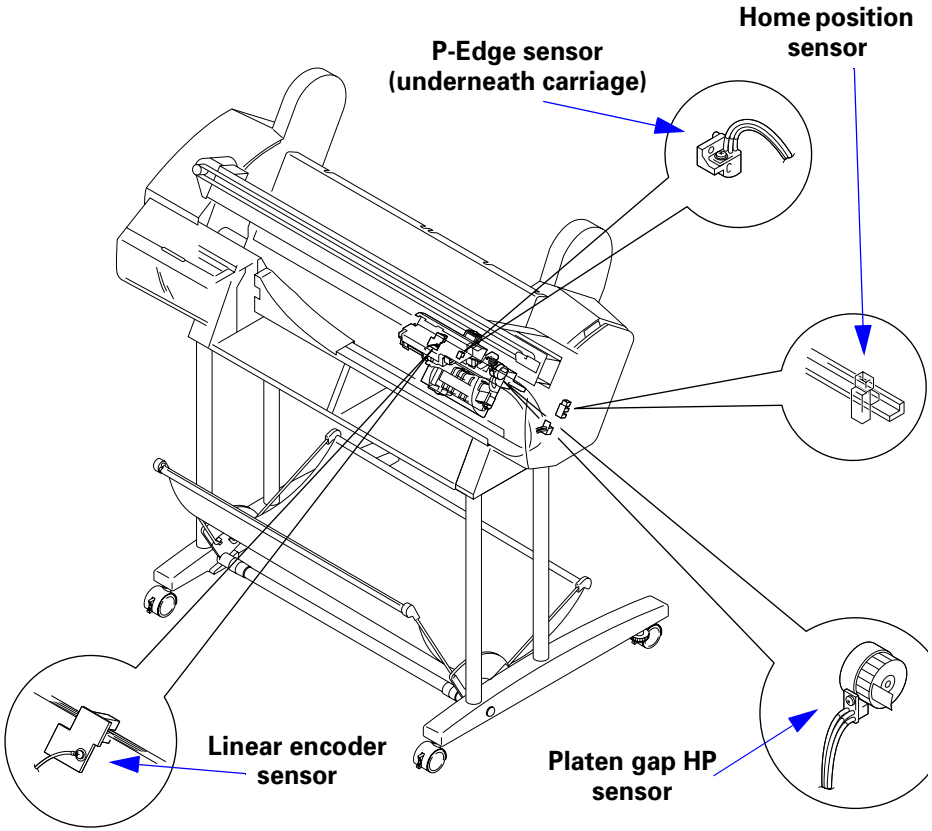


Figure 2-2. Carriage Components/Main Parts

PAPER FEED PATH & COMPONENTS

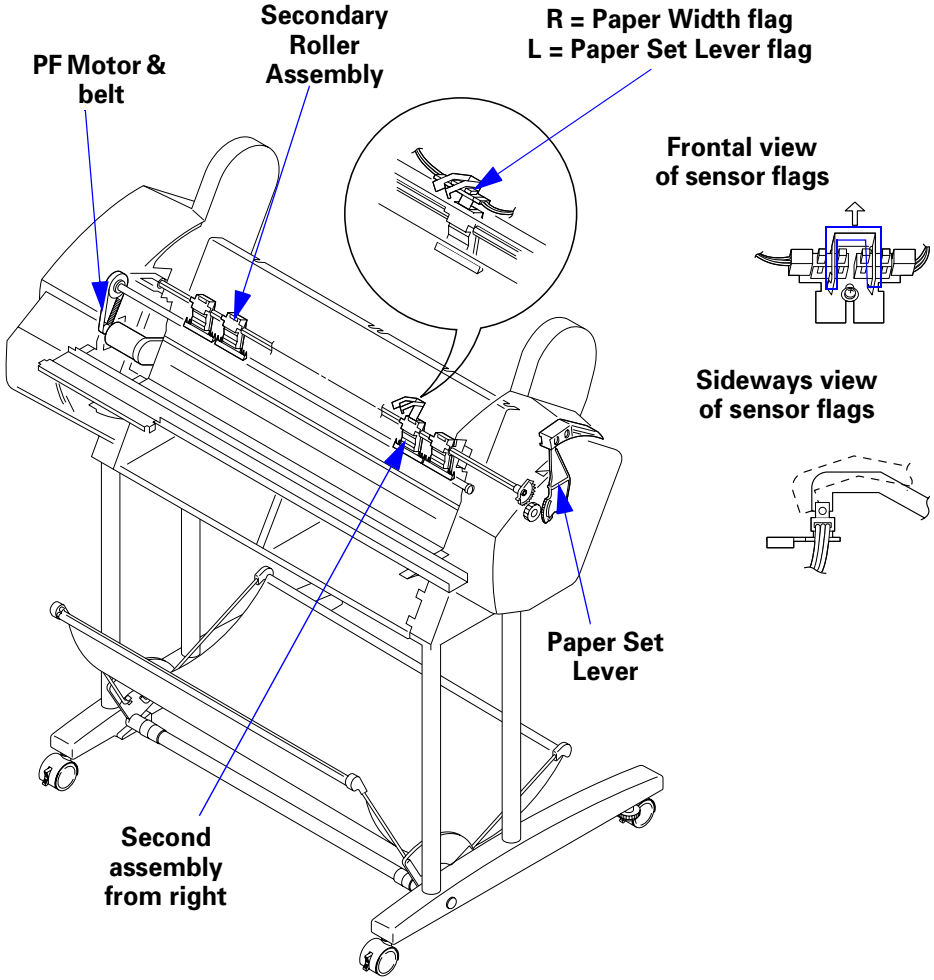


Figure 2-3. Paper Feed Components - 1

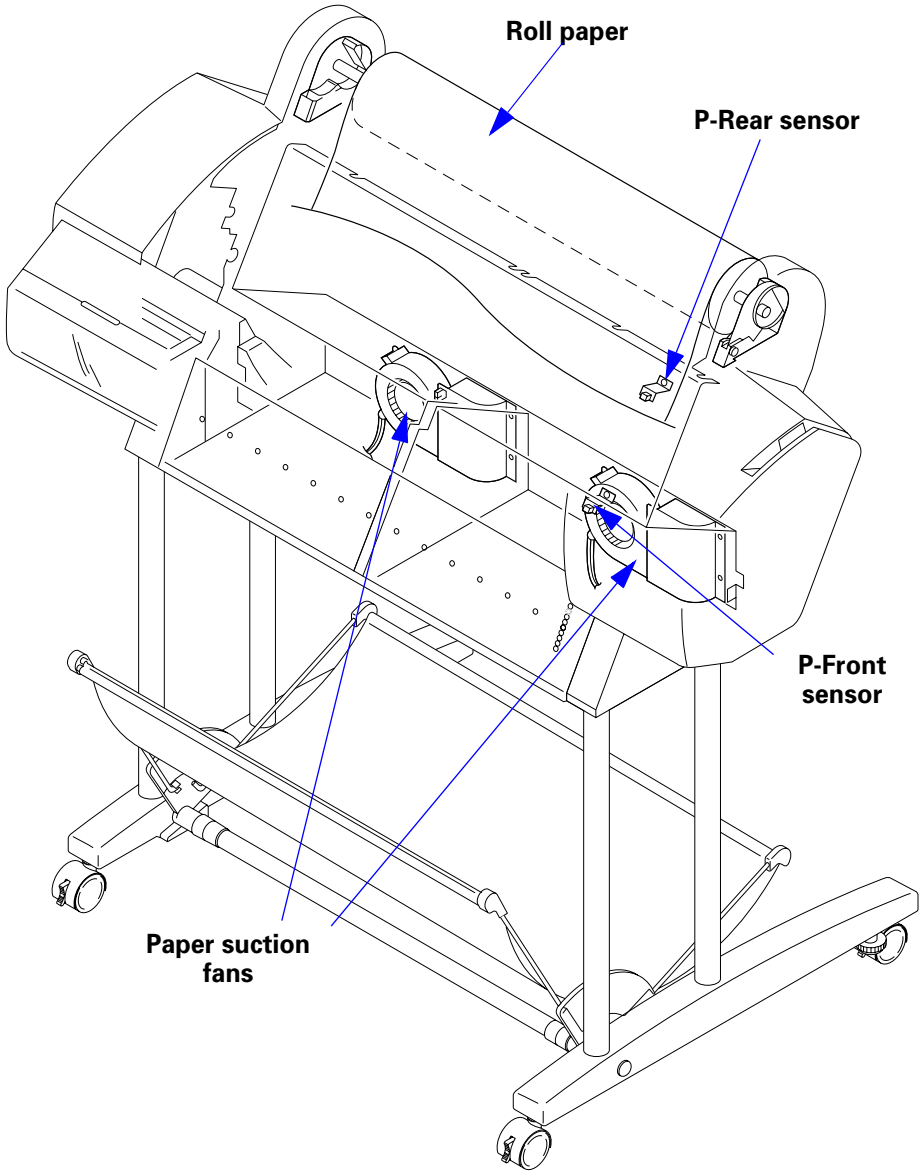


Figure 2-4. Paper Feed Components - 2

INK SYSTEM COMPONENTS

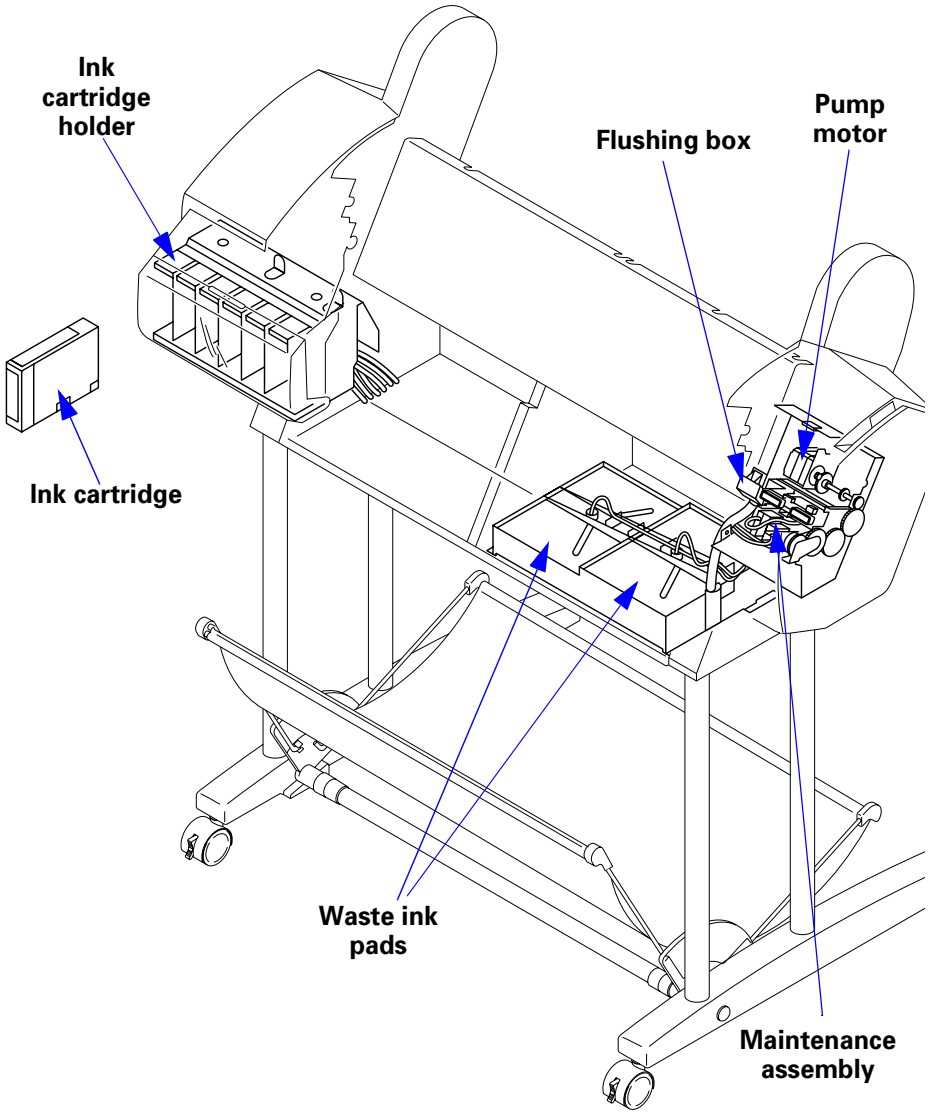


Figure 2-5. Ink System - Main Parts

ELECTRICAL CIRCUIT BOARDS

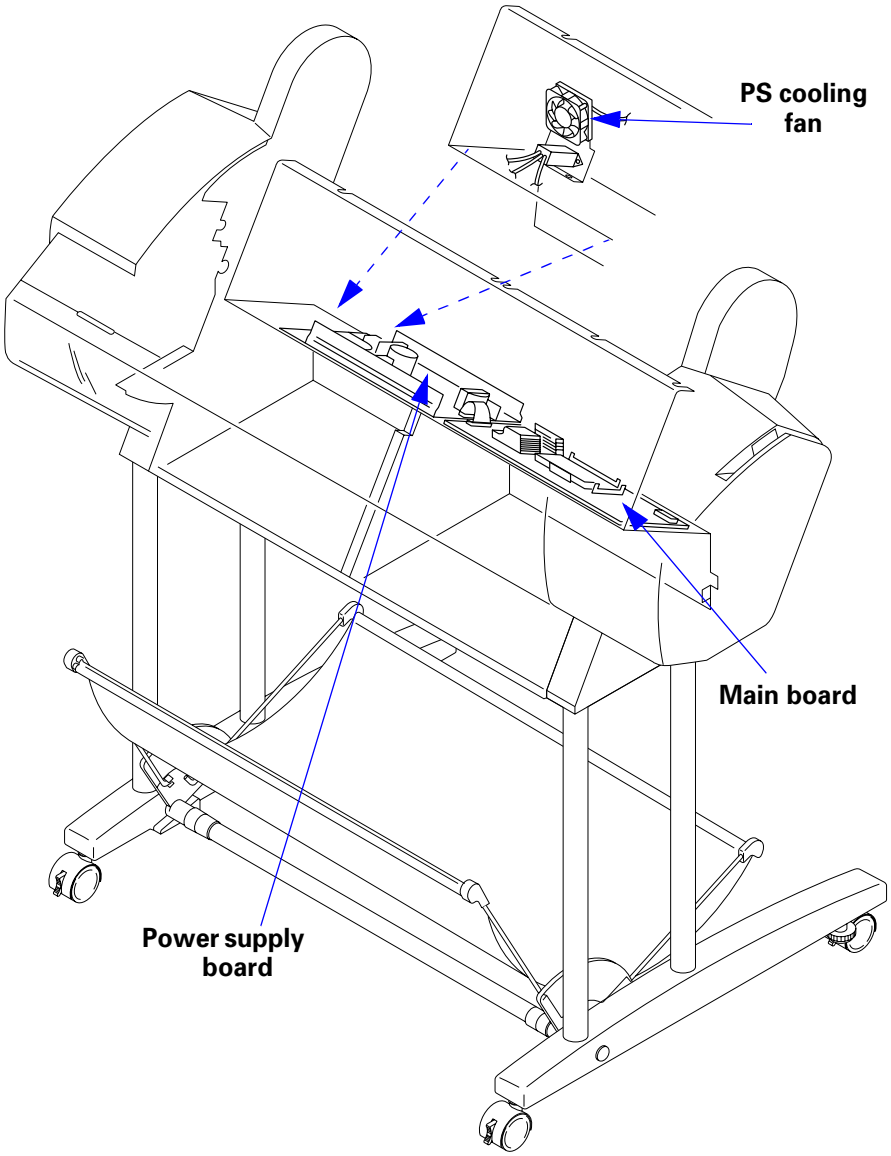


Figure 2-6. Electrical Circuit Board locations

2.2 Description of Components

2.2.1 Carriage Movement

To print on paper as wide as A1+ (24 inches), the printhead carriage must be more stable and must travel further than the usual carriage. To make the printheads more stable, EPSON added the CR Guide Rail to the SP 7000.

Like the EPSON Stylus Pro 9000, the SP 7000 does away with the carriage guide shaft and relies on the printer frame for its stability. The carriage comes into direct contact with the printer frame through the use of the carriage bearings.

The CR motor uses a DC motor to drive the carriage and the Linear Encoder sensor, in combination with the Step Ruler (plastic timing fence), determines the lateral position of the carriage. As shown in Figure 2-7 below, the Linear Encoder reads the shaded stripes to determine the position of the carriage as well as the carriage speed, and this data is sent to the software servo.

The following sensors are used in combination with the CR Guide Rail components:

- HP Sensor
  This optical sensor activates when the CR Guide Rail flag enters the space between the light emitter and the light receiver. The flag is located just above the home position, and the HP sensor sends an "On" signal when the carriage is in the home position.
- Linear Encoder sensor
  This sensor is located on the back of the carriage, lower than the HP sensor. For every shaded section the Linear Encoder passes over, the LE sends a pulse to the CR motor as a PTS (Print Timing Signal). The shaded sections have a distance equal to 180 dpi, and the software controls use this spacing for reference purposes.

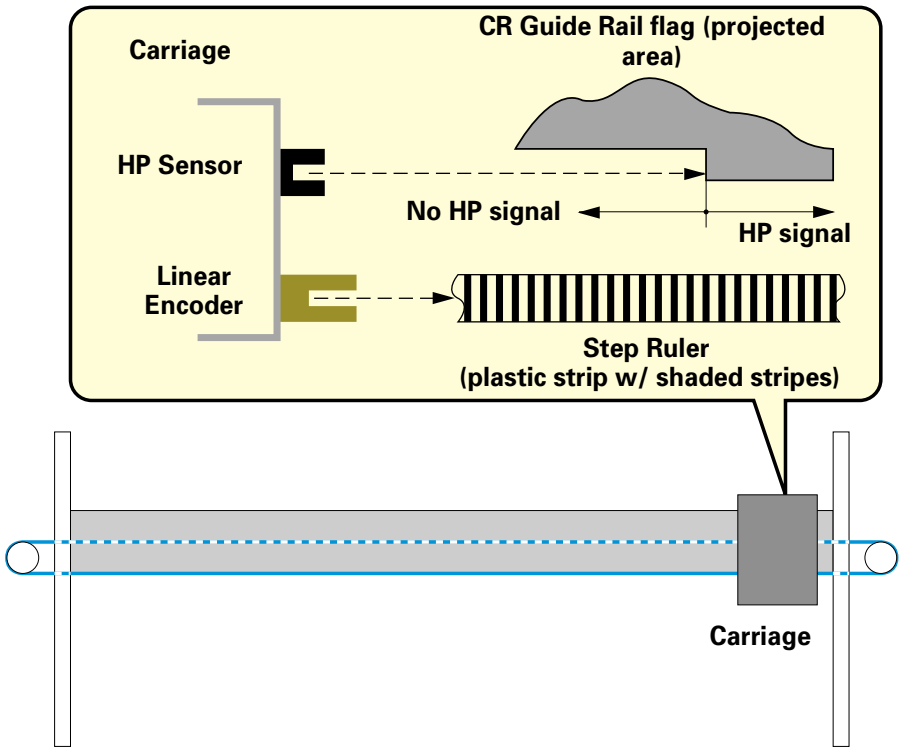


Figure 2-7. Carriage Mechanism & CR Guide Rail

CARRIAGE & CARRIAGE COMPONENTS

Like the EPSON Stylus Pro 9000, the SP 7000 uses a special system to ensure the distance between the printhead nozzles and paper remains the same for all supported paper types. The carriage is composed of two sections; main carriage and subcarriage. The main carriage attaches to the CR Guide Rail using bearings and supports the subcarriage. The subcarriage contains the ink cavities, printheads, and so on.

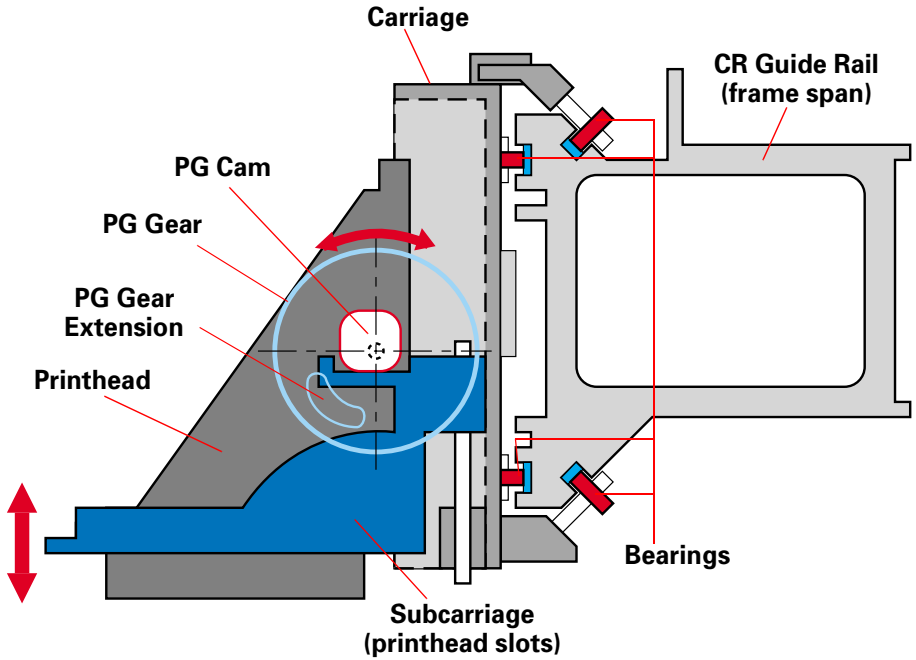


Figure 2-8. Carriage Mechanism & CR Guide Rail (side view)

The subcarriage can be moved closer or further away from the platen using the PG Cam which is driven by the PG Gear. The distance changes according to the position of the PG Cam.

CAUTION

Do not remove or loosen the screws that secure the CR guide rail, also do not remove the carriage. These parts are adjusted to 1/100th of a mm at the factory.

The printheads are the same type used in the EPSON Stylus Pro 9000 and are installed in the same way. Therefore, after replacing the printheads, perform head parallelism adjustment and height adjustment to make sure neither head leans one way or the other and make sure the printhead nozzles are exactly even. To adjust the heads, separate adjust levers are provided.

Other sensors and components attached to or related to the carriage are:

- ☐ P-EDGE sensor
  This sensor measures the distance between the right and left edges of the paper. Where paper exists, the light emitted from the sensor is reflected back to the sensor. In this way the sensor determines the right and left paper-edge positions and the width of the paper. For more details, see “Paper size detection - right and left edges” on page 74.

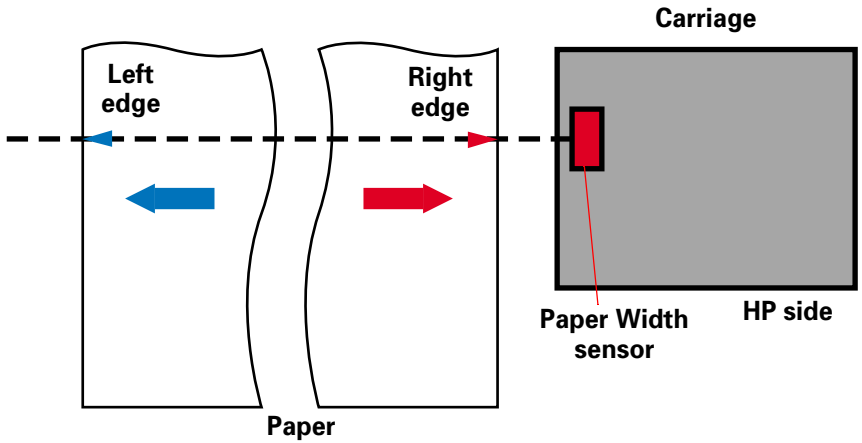


Figure 2-9. Paper width sensor

- PG origin sensor
  This reflective sensor determines the PG position, thick or normal, according to the position of the PG gear extension.
- Cutter solenoid
  The solenoid is attached to the carriage on the opposite side of the home position and it activates the cutter to cut roll paper. In order to cut roll paper evenly, the following method is used:

  1) The cutter cuts from the right of center (when facing the printout) to the right edge.

  2) The cutter cuts from several centimeters inside the left edge to the left edge.

  3) The cutter cuts the remaining uncut portion, in the center, from the left side to the right.
- Cutter guide

An important change in the cutter and cutter solenoid assembly is the addition of the cutter guide; this cutter guide automatically stops the cutter at the correct height so no carriage cover position adjustment is necessary.

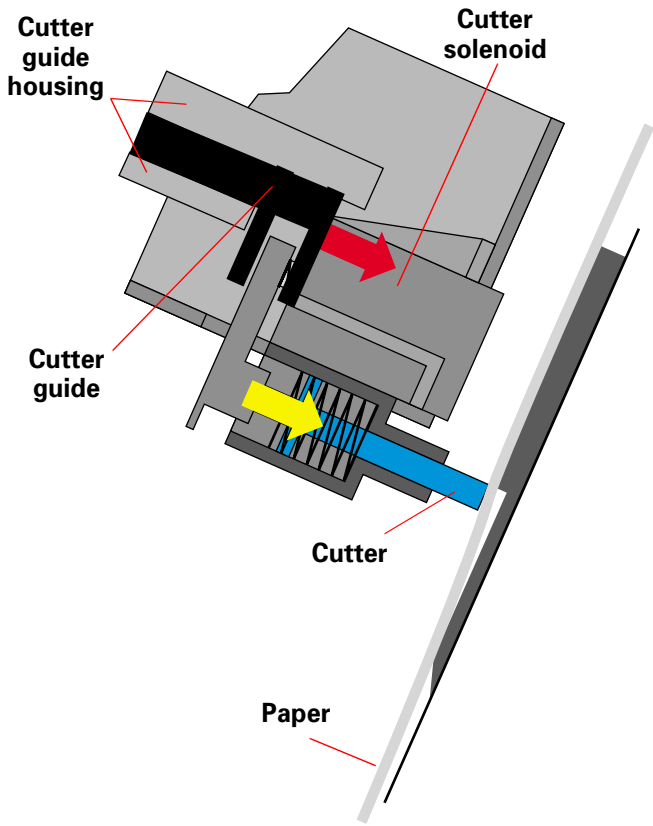


Figure 2-10. Carriage and Cutter Solenoid

2.2.2 Paper Feed Assembly

PF RAIL

The main paper feed components are the CR Guide Rail, the Grid Roller Assembly which is attached to the PF Rail, and the Secondary Roller Assembly which attaches to the back of the CR Guide Rail and faces the Grid Roller Assembly. The Grid Roller Assembly is made up of three equal lengths of rollers and their coupling.

The PF Motor is a DC Motor that is controlled by the software servo system, and the servo receives a pulse from the built-in optical rotary encoder. This rotary encoder allows for minute paper feeding.

The PF Roller torque is transferred through the PF Roller shaft edge (left frame), and turns the PF motor pinion gear and timing belt.

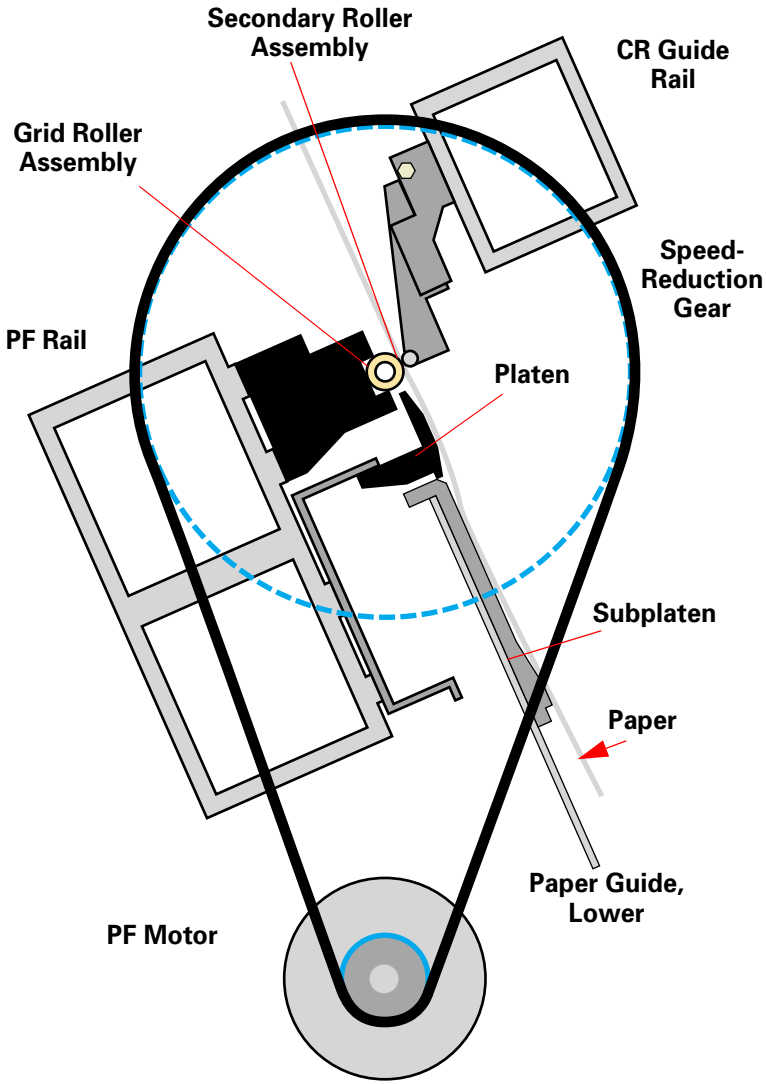


Figure 2-11. Paper Feed Path

PAPER-FEEDING-RELATED SENSORS

The following sensors aid in the paper feeding process.

- P-FRONT sensor
  This sensor is attached to the back side of the Lower Paper Guide and is an optical (photo-reflective) sensor. This sensor detects the front edge of the paper after paper has been loaded but before it is set and ready to print.
- P-REAR sensor
  This sensor is attached to the back side of the Upper Paper Guide and is an optical (photo-reflective) sensor. This sensor detects the rear edge of the paper and detects the front edge when the paper is first loaded in the paper path.
- P-THICK sensor
  This optical sensor physically gauges whether the paper falls into the normal/thin category or the thick category. For details, see "Platen Gap Mechanism" on page 71.

Table 2-2. Paper Thickness Detection

Detected Thickness	Sensor Signal	Output Signal Strength
0.6mm or less	On	0.7V or more
0.7mm or more	Off	2.4V or more

- Paper Set Lever sensor
  The Paper Set Lever sensor is located on the right side of the printer, and this optical sensor determines whether or not the Paper Set lever is in the set (print) position.

Note that the P-Thick and Paper Set Lever sensors as well as flags are next to each other. The sensors employ the two metal flags on top of the Secondary Roller unit (second from the HP side when facing the printer). The left flag is used to determine the paper thickness and the right flag is used to determine the Paper Release Lever position.

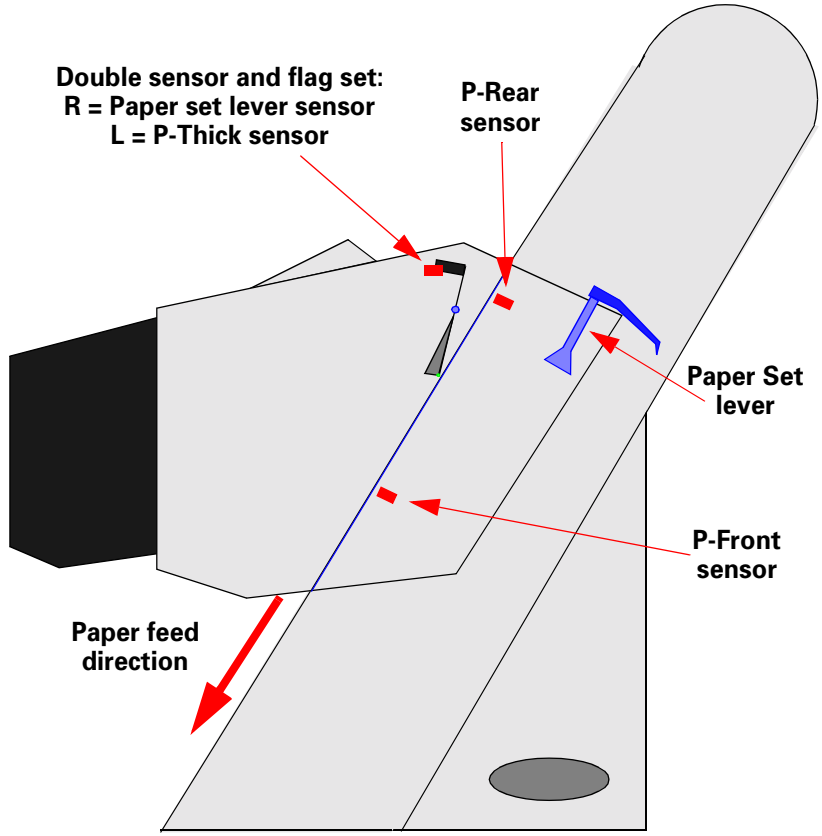


Figure 2-12. Paper Feed Sensors

2.2.3 Cleaning Mechanism

The cleaning mechanism for the SP 7000 is similar to the mechanism in the EPSON Stylus Pro 9000. Figure 2-5 on page 59. The main components are:

- Pump Assembly (head cleaner)
- Pump Motor (stepping motor)
- Cap Assembly (B head/C head independent)
- Flushing Box
- Waste Ink pads

The cleaning mechanism components are installed above the subframe and some are fixed on the main frame as shown below.

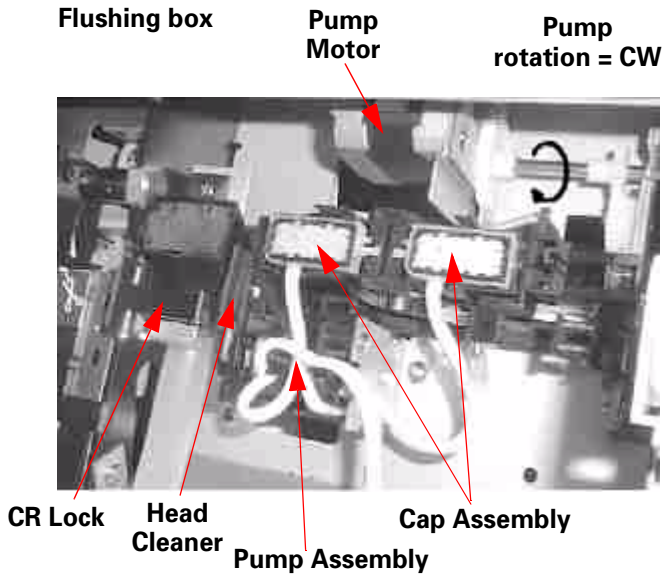


Figure 2-13. Cleaning Mechanism Components

☐ Pump assembly (head cleaner)

When the head is in the capped position (valve closed), the pump motor creates a vacuum that sucks ink from the nozzles. This is used for removing ink from the nozzles and nozzle plate, initial ink charge, as well as cleaning. The waste ink flows through two small tubes to the waste ink pads.

Head cleaner

The head cleaner has felt on one side and rubber on the other, and is used to wipe or rub off ink and foreign materials from the nozzle surface.

☐ Pump motor

Clockwise rotation = pump assembly drive for cleaning and so on

Counter clockwise rotation = platen gap adjustment

☐ Cap assembly (one pad for each printhead)

When not printing, the printheads (should) rest on the cap assembly to make sure the nozzles don't clog. Also, the printheads are in the capped position during ink charging, cleaning, and so on.

☐ Flushing box

Flushing (dummy printing) is performed over the flushing box, and the flushed ink flows through the large diameter tube to the waste ink pads.

☐ Waste ink pads

The waste ink pads absorb ejected ink through the pump assembly ink tubes and the flushing box tubes.

When the pads near full, the LCD displays Maintenance Call 0100. When the pads are completely full, the LCD displays Service Call 00000100. The pads must be replaced at this time.

2.2.4 CR Lock Mechanism

The printer uses a spring to activate the carriage lock and an electromagnetic solenoid to release it. The spring forces the carriage lock up into the opening at the bottom of the subcarriage when the carriage is in the home position. However, when the CR Motor is running, the solenoid prevents the lock from engaging the carriage. To release the carriage from the capping position, the printer activates the cutter solenoid which pushes down the CR lock releasing the carriage.

To manually release the carriage when it is locked in the home position, press down the cutter and push the carriage to the left.

2.2.5 Ink Supply Mechanism

There is only one ink cartridge holder for all six cartridges. The design of the holder makes it quite easy to install and replace ink cartridges from the front of the printer. To prevent users from accidently installing a color ink cartridge in the wrong slot, the cartridges have slightly different designs.

One of the main differences between the EPSON Stylus Pro 9000 and 7000 is that there is no ink tube valve. So no more embarrassing tales about tearing the printer apart only to realize that the valve on the side was closed. On the other hand, before moving the printer you or the user now has to flush the ink system as described in “Transportation Mode” on page 54.

Another difference is that the ink tubes are clear, allowing you to check ink flow visually.

INK-RELATED SENSORS

The following sensors are located in the ink cartridge compartments.

- Ink Cartridge sensor
  This mechanical sensor (microswitch) is built in all six ink cartridge slots.

  When a cartridge is installed, switch = closed

  When a cartridge is not installed, switch = open

- Ink Low sensor
  This mechanical sensor (microswitch) is at the bottom of all six ink cartridge slots and detects when ink is running out.

  When the I/C is nearly empty, the switch = open

  When the I/C is not low (normal), the switch = closed

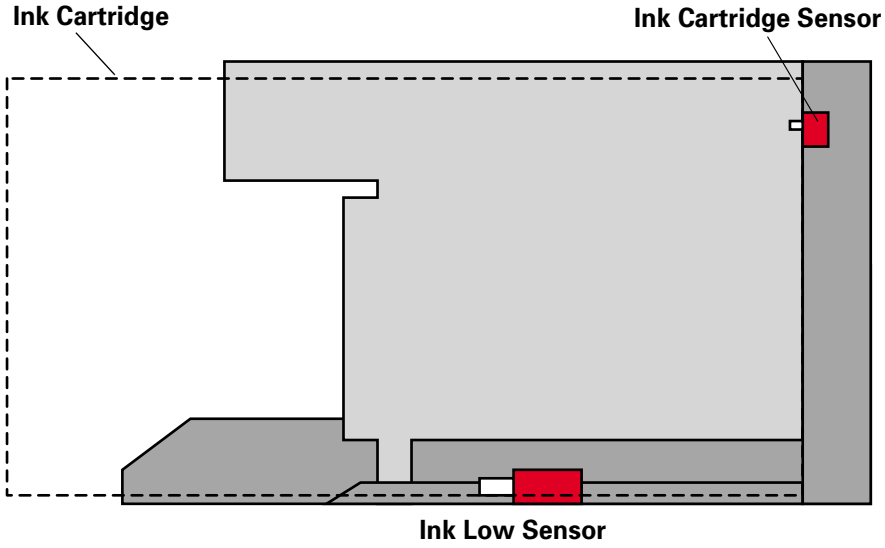


Figure 2-14. Ink Cartridge Holder Sensors

☐ Cover open sensor

To ensure proper paper feeding and to prevent paper jams, the front cover must be closed during printing. There is one cover-open sensor that detects when the cover is open using an interlock switch, and this sensor is located near the left side of the main printer opening. When the cover is open, the relay that controls the current to the CR motor and PF motor cuts off the flow of that current. When this happens, the motors lose their electromagnetized state.

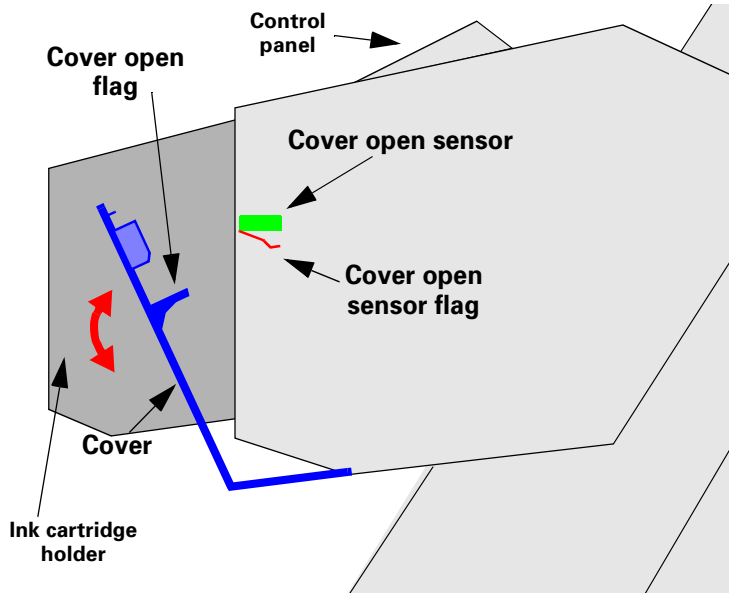


Figure 2-15. Cover Open Sensor

The sudden loss of current to the motors can cause problems and may even damage the motors or the printhead. To prevent this, a discharge from the capacitor connected to the current circuit is used to slow down the current before it is totally cut off. This process ensures that printing stops when the cover is open without causing any damage to printer parts.

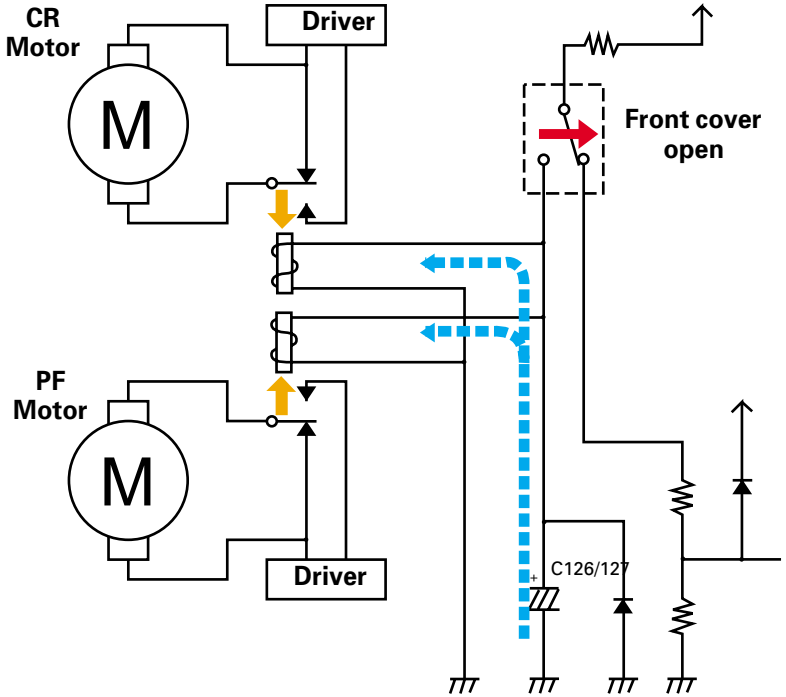


Figure 2-16. Cover-Open-Motor Control Circuit

2.3 Printer Mechanism Operation Outline

This section describes the various parts of the printer mechanism and how those parts work.

2.3.1 Carriage Mechanism

The carriage speed is determined by a software servo system. This software servo is a closed-loop system where the CR motor (a DC motor) must provide constant torque to keep the carriage speed even. For this purpose a timing fence (or step ruler) and an encoder sensor are employed to measure the carriage speed/location and to provide feedback to the motor controller accordingly.

- Print Control

  The carriage speed during printing is described below.

Table 2-3. Print Speed

Print Mode	Carriage Speed
720dpi & Normal M/W	200cps
4 Pass FOL printing	300cps
unidirectional	400cps

Note: Due to the carriage's quick acceleration process, even after the heads reach and maintain normal speed, they are not stable enough to print for the next 10mm.

- Stop Control (stop position)
  The encoder determines the carriage position by counting the dark stripes on the Step Ruler. When the carriage reaches the predetermined position (depends on paper width), the carriage stops. To make sure the carriage has come to a complete stop, the printer checks the encoder for a certain time (in-position time-out) to make sure no signal is generated.

- CR Motor Abnormality Detection
  The software servo sends a series of pulses to the CR Motor to drive the carriage a certain distance (depends on current operation, paper size, and so on). At the same time the encoder measures the distance the carriage travels. If the position of the carriage according to the Software Servo is different from the position according to the encoder, a fatal error occurs (Service Call 00010005).

See page 61 for details on carriage sensors and other parts.

PLATEN GAP MECHANISM

To produce high quality printouts, the printer must maintain a constant distance between the printhead nozzles and the paper. To do this the printer measures the thickness of the paper and adjusts the height of the carriage accordingly.

The carriage is composed of two parts; the main carriage which is secured to the CR guide rail via bearings, and the subcarriage which holds the printheads. The subcarriage is secured with a cam, and due to the cam's shape, the subcarriage can be raised or lowered depending on the rotation of the cam. See Figure 2-17.

The platen gap adjustment is linear; the nozzle surface is constantly parallel to the paper surface.

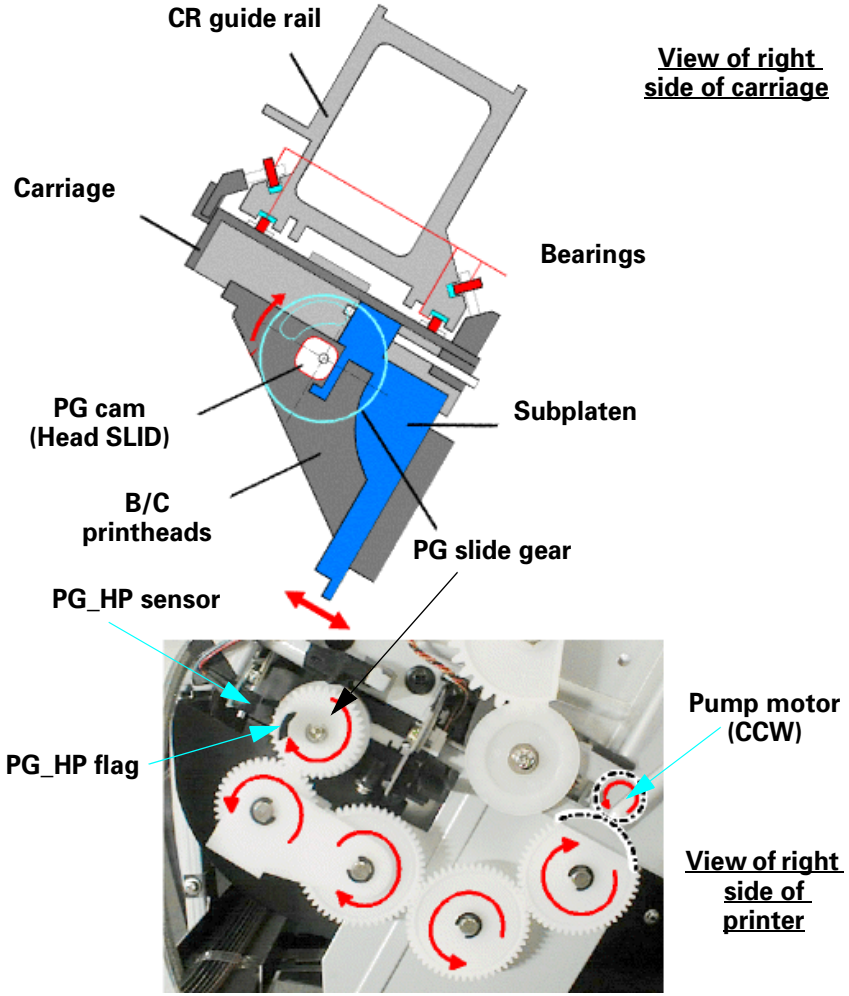


Figure 2-17. Platen Gap Control

When the carriage is in the home position, the PG motor can drive the cam via a series of gears. The motor turns counter clockwise to turn the cam and raise or lower the subcarriage to a set height. The printhead has three platen gap (height) settings, as described in the table below.

Table 2-4. Platen Gap Settings

Platen Gap Setting	Gap Distance
Narrow	1.3mm
Medium	2.2mm
Wide	2.7mm

The actual platen gap position used during printing depends on the paper thickness as well as the control panel Platen Gap setting.

NOTE: *You can manually set the platen gap. See Platen Gap in "Printer Setting Menu" on page 42 for information on making this setting.*

Table 2-5. Determining PG Settings

Control Panel Setting	Command Setup	Platen Thickness Sensor	Actual Platen Gap Position
Wide	Wide PG	Wide	Wide
		Thin	Wide
	Default PG	Wide	Wide
		Thin	Medium
Auto	Wide PG	Wide	Wide
		Thin	Wide
	Default PG	Wide	Wide
		Thin	Narrow

PAPER FEED MECHANISM

The EPSON Stylus Pro 7000 feeds roll paper and cut-sheet paper using friction, and the two sensors along the paper feed path provide all necessary information for controlling the paper feed process. The sensors are the P-Rear sensor located on the right near the top of the paper feed path and the P-Front sensor located on the right under the carriage path. See Figure 2-12, "Paper Feed Sensors" on page 65. Another important point to remember about the paper-feed mechanism is the paper suction fans.

The paper suction fans are located behind the lower paper guide and are necessary to keep the roll paper flat against the lower paper guide, which prevents ink smears. The fans create a vacuum through the holes in the lower paper guide, pulling the paper flat against the guide. The strength of the vacuum is adjusted according to the media type setting.

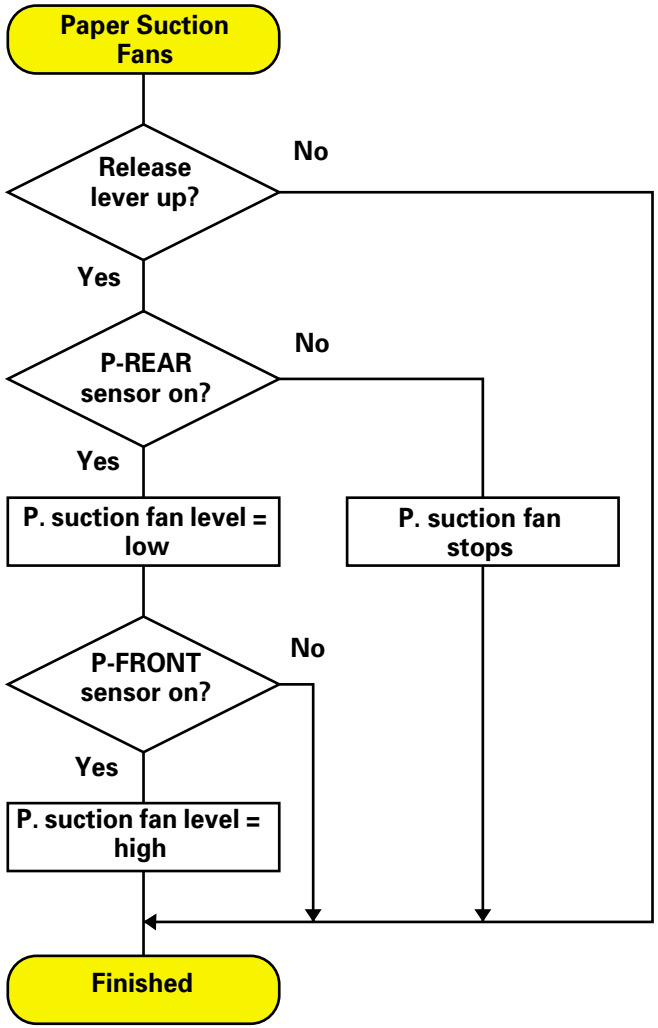


Figure 2-18. Paper Suction Fan Operation

☐ Paper size detection - right and left edges

Before printing the printer needs to determine the distance from the right and left paper edges to the right frame and left frame (home position). As shown in the following flowchart, the printer flushes the heads to make sure no ink smears the paper as the printheads move across the paper. Then the carriage moves to where paper should definitely be (if loaded properly), near the vertical guide line. There the Paper Width sensor determines the brightness level (high) of the light reflected off the paper. (If no light is reflected, paper is not loaded or is not loaded properly and a "Reload Paper" error occurs.) The carriage moves back toward the home position, where paper definitely should not be if loaded properly, and determines the brightness level (low) when light is not reflected off the paper. This procedure is necessary to set the high/low levels when adjusting for different media types, such as glossy or plain paper.

Next the carriage moves from the home position toward the opposite frame and measures the distance from the home position to the opposite (right) edge of the paper according to the brightness high and low levels. If the paper edge has not been determined by a certain point (outside of the printheads' print range), the paper is loaded too far to the right and a "Reload Paper" error occurs

Once the opposite-side paper edge has been found, the carriage moves from the opposite frame to the home position and measures the distance from the opposite frame to the HP-side (left) edge of the paper.

Figure 2-19. Paper Size Detection - R/L edges

☐ Paper size detection - leading edge

Before printing the printer needs to determine the location of the front edge.

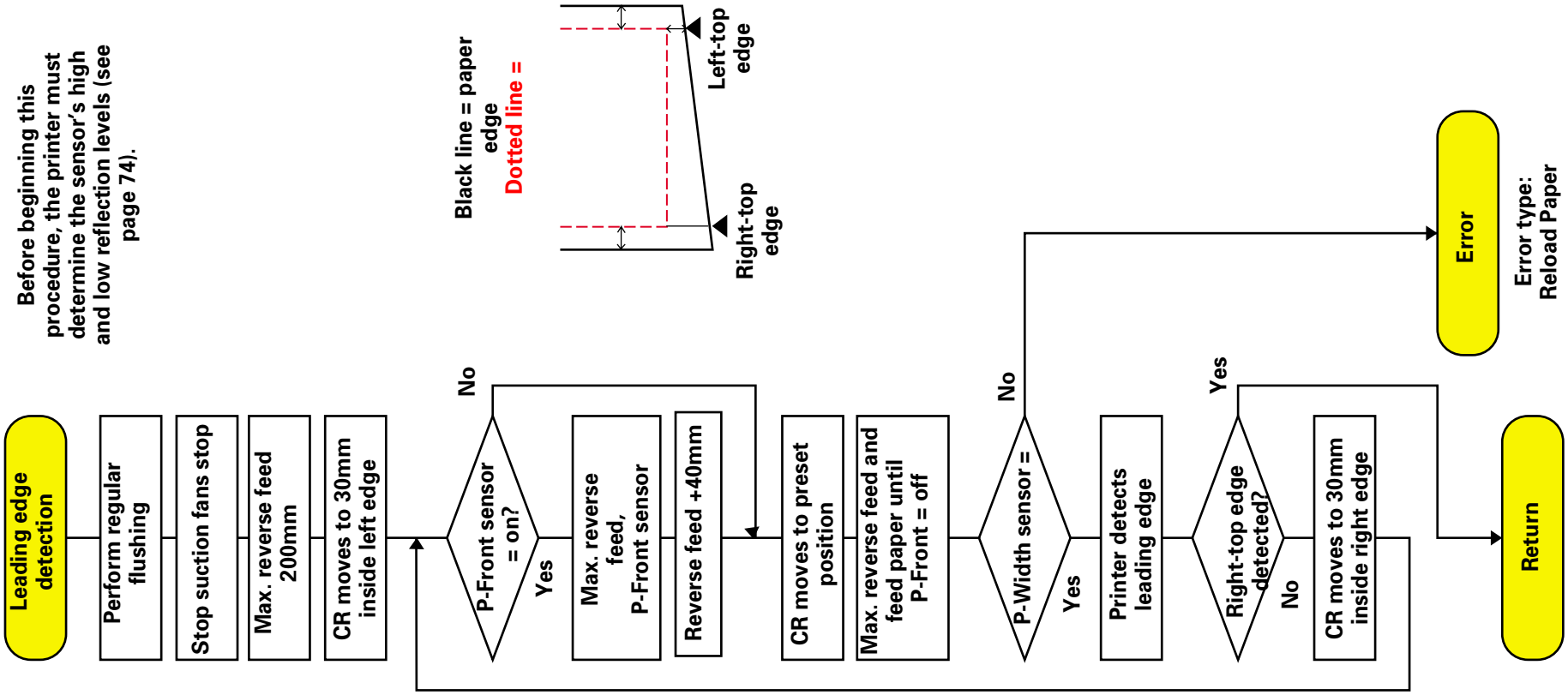


Figure 2-20. Paper-size detection of leading edge

After paper is loaded in the printer, the printer performs the above left, right, and leading edge detection operations to make sure the paper is inside the printable range of the printheads. If any of these edges is outside of this area, a “Reload Paper” errors.

- Basic loading procedure
  Make sure the left edge (near the HP) is lined up with the vertical line of holes in the Lower Paper Guide.
- Normal loading area
  Paper loaded within 10mm of the center of the vertical line of holes in the Lower Paper Guide is considered in the printable zone; however, paper loaded outside that 10mm zone causes an error.

☐ Paper skew
In order to avoid printing on paper that is skewed or fed at a slant too far to the right or left, the printer detects the right and left edges at the leading edge of every page. If the printer determines that the paper is skewed 3mm or more compared to the previous page, a “Paper Not Straight” error occurs.

- Basics
  The right and left edge positions are checked at the top of every page.
- Degree of skew
  Any change in the edge position (from the originally detected position) over 3mm causes an error.

2.4 Summary of Control Circuit Operations

This section summarizes the functions of the (C299MAIN) Main Board and the controls used to operate the printer.

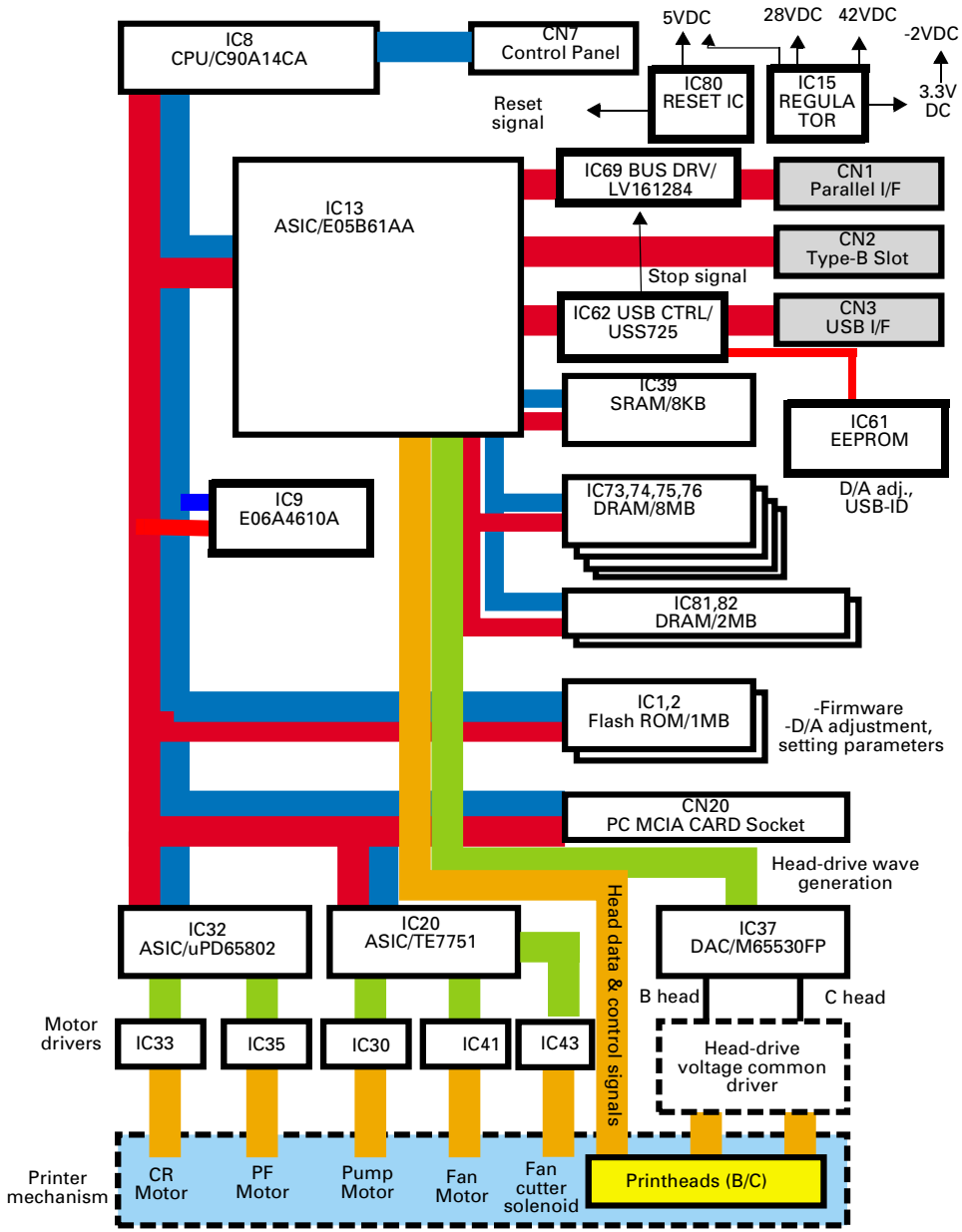


Figure 2-21. C299MAIN Board-Circuit Block Diagram

Table 2-6. Control Circuit Operation

Name/Code	Location	Function
CPU (C90A14CA) SH7043	IC8	32 bit RISC-CPU • Clock speed = 33MHz • 128KB PROM (IPL) internal
ASIC (E06A4610A)	IC9	I/O port expansion
ASIC (E05B61AA)	IC13	1) Regulates print data • Command handling • Rasterizer (image data handling) • Head drive regulation (DAC control) • Print timing regulation 2) Memory (DRAM/SRAM) 3) I/F Circuit Control • Parallel interface (IEEE1284) • USB interface • Type-B
ASIC (TE7751)	IC20	Motor regulation • Pump Motor (pump/PG) • Cutter solenoid • Fan (Paper suction) x2
ASIC (uPD65802)	IC32	Motor regulation (PWM regulation) • CR Motor • PF Motor
DAC (M65530FP)	IC37	3 channel 10 bit DA converter • head-drive voltage control
Flash Memory (MBM29F400TC)	IC1/2	Flash Memory (1Mbyte) • Save firmware • Register D/A, user defined, and factory default setting parameters
DRAM (EDO)	IC81, IC82 IC73~76	EDO RAM • 10Mbyte (onboard)
SRAM (LC3564SM-10)	IC39	64Kbit SRAM • External data ring buffer type

Table 2-6. Control Circuit Operation (continued)

Name/Code	Location	Function
EEPROM	IC61	Serial EEPROM Head drive D/A factory adjustment parameters USB-ID factory settings
M51953BFP	IC80	Reset IC
Driver IC (L6203)	IC33, IC35	CR/PF Motor Drivers
Driver IC (LB1845)	IC30	Pump Motor Driver
Driver IC (MMDF205ZR2)	IC41, IC43	Suction fan x2 and cutter solenoid driver
PQ3RD13	IC15	+3.3V regulator

2.4.1 Power Supply Board Summary

Depending on the printer model, either 100V AC or 220V AC is supplied to the printer when the printer is plugged into an live outlet.

When plugged into a live power outlet, the power supply board is working.

CAUTION

Even after pressing the power switch to turn off the printer, power is supplied to and from the power supply board. During the power-down sequence, power is supplied to the CR motor to move the printheads to the capped position to prevent ink from clogging the nozzles.
Always turn off the printer using the power switch - do not remove the power cable from the wall outlet while the printer is on or while internal parts are moving.

To prevent over-current damage to the PS board, the following fuser is supplied on the PS board.

100V AC ± 10% = 125V AC/6.3A

The C299MAIN board has three control signals, described in detail in the table below.

Table 2-7. PS Board Signal Summary

Signal Name	Condition	Function
+28V/+42V REM_ON (MAIN ->PS)	During operation	The On/Off status is controlled from the C299MAIN board.
	Printer off	When this terminal is released (=L), the 28VDC and 42VDC lines drop to 0VDC.
AC_OFF (MAIN<-PS)	During operation (= H)	When turned on, the PS board is enabled and all lines go active. After that, the “H” signal is sent to the C299MAIN board.
	Printer off (=L)	When turned off, the PS board is still enabled, but all lines go inactive. After that the “L” signal is sent to the C299MAIN board (this also occurs if the incoming power drops below the rated voltage).
POWER_SW (Panel/MAIN -> PS)	Turning on	This terminal closes and the PS board is activated.
	Turning off	This terminal releases and remains active anywhere from10+ seconds to several minutes.

CHAPTER

3

TROUBLESHOOTING

3.1 Outline

See this chapter for detailed troubleshooting instructions if the printer is not working properly.

3.1.1 First...

Before starting, confirm or attempt the following:

- There are no foreign materials inside the printer.
- If the LCD display displays "Ready" when the power is on, print a status sheet. Press the SelecType button twice to access the "Test Print Menu", press the Item + button until you see "Print Status Sheet", and then press Enter.
  By checking the Status Sheet you can determine whether the cause of the problem is the printer itself (ie. a part has been used beyond its useful life) or a user-defined control panel setting.

If necessary, you can restore the factory default settings in the NVRAM on the C299MAIN board as follows.
From "Maintenance Mode 2" select "Counter Init. Menu" and then "NVRAM Init.".

- The printer is not abnormally dirty. Clean if necessary.
- The printer parts are original or Epson replacement parts and no part of the printer is disformed or out of shape in any way.
- The connectors are properly fixed with no damage to them or any of the harnesses.
- The cams and gears inside the printer are not worn, not wearing out unevenly, and are connecting properly/turn freely.
- The rubber pads on the rollers are not dirty. Clean if necessary.
- The rubber pads on the rollers are not worn, not wearing out unevenly, and are connecting properly/turn freely.

3.1.2 Remember

Before beginning disassembly turn the printer off, wait for a few seconds after the LCD panel goes blank, and then remove the power cord from the outlet. Also remove any interface cables.

- **The printer tools mentioned in the following pages have been tested and are proven to preserve the quality of the printer. The use of other, non-standard tools is not supported.**
- **Only use the type of oils and lubricants described in this manual.**
- **Always perform adjust procedures as described in this manual.**

3.1.3 Diagnosing the Problem

This section describes how to diagnose printer errors. Troubleshooting is divided into the following categories.

☐ "Troubleshooting Using the Error Messages" on page 84
☐ "Troubleshooting Based on Your Printout" on page 103

3.1.4 Maintenance Errors

There are several consumable parts in the printer, and the printer employs separate counters to keep track of each one. The “Maintenance Req. 0100” message appears on the display to warn the user when the Waste Ink pads are about 99% full.

The printer can continue to print even though the “Maintenance Req. 0100* message appears instead of the “Ready” or “Printing” message. However, when the waste ink counter determines the Waste Ink pads are 100% full, the “Service Req 00000100” message appears and the printer can no longer print.

To clear this condition, perform the following.

Replace: The following items must be replaced.

- Waste Ink Pads
- Pump Assembly
- Cap Assembly
- FBox
- Cleaner, Head

The above mentioned items are available as a kit.

Description: MAINTENANCE KIT
Parts code: 1054038

Required Adjustments: Perform the following adjustments after replacing the maintenance parts.

- Waste Ink Counter Clear
(See “Maintenance Mode 2” on page -50.)

- Cleaner Counter
(See “Maintenance Mode 2” on page -50.)

3.1.5 Service Errors

When "Service Req nnnnnnnn" appears on the LCD display, a fatal error requiring a service technician has occurred. The nnnnnnnn indicates what needs to be fixed to return the printer to a working state.

Table 3-1. Service Errors

Service Code	Explanation
00010000	PF Motor encoder check error
00010001	PF Motor out of step
000100002	PF Motor overcurrent
000100003	PF Motor in-position time-out error
000100004	CR Motor encoder check error
000100005	CR Motor out of step
000100006	CR Motor overcurrent
000100007	CR Motor in-position time-out error
000100008	Servo interrupt watchdog time-out error
000100009	System interrupt watchdog time-out error
00010000A	CR origin sensor error
00010000B	PF origin sensor error
00010000C	PG origin sensor error
00010000D	Cover sensor error (00)
00010000E	Cover sensor error (01)
00010000F	CR motor PWM output error
000100010	PF motor PWM output error
000200000	NVRAM Error
000200001	Internal RAM Check Error
000200002	SRAM Check Error
000200003	DRAM Check Error
100000004	CPU Vector 4 - General illegal instruction

Table 3-1. Service Errors (continued)

Service Code	Explanation
100000006	CPU Vector 6 - Slot illegal instruction
100000006	CPU Vector 9 - CPU address error
10000000A	CPU Vector 10 - DMAC\DTC address error
10000000B	CPU Vector 11 - Watchdog time-out error
1000000**	CPU Vector 32~63

When replacing the following parts to clear "Service Req. 00000100" error, you need to clear the corresponding counter using "Maintenance Mode 2".

[Affected parts] (Maintenance Kit SP7000)

- **Waste Ink Pads**
- **Flushing Box**
- **Pump Assembly**
- **Cap Assembly**
- **Cleaner, Head**

[Affected counters]

- **Init. Waste Ink**
- **Init. Cleaning Unit**

The above mentioned parts are also available as a KIT.

Description: MAINTENANCE KIT
Parts code: 1054038

3.2 Troubleshooting Using the Error Messages

The EPSON Stylus Pro 7000 performs self-diagnostic tests using the data supplied by its various sensors, and if an error is detected by one or more sensors, a corresponding error message appears on the control panel display. No matter what kind of error occurs, use Table 3-2, "LCD Panel Error Messages," on page 84 or Table 3-3, "Messages That Indicate Service is Necessary," on page 85 to determine what and where the problem is, as well as where to look for directions on fixing the problem.

- ☐ Table 3-2 lists the printer errors that users can check and troubleshoot by themselves.
- ☐ Table 3-3 lists the printer errors that require service technicians to check and troubleshoot, such as failed part replacement.

Table 3-2. LCD Panel Error Messages

LCD message	Status	Type	Refer to page
Ink Cartridge Replace	Ink End, Wrong Ink Cartridge	Error	
Ink Drying nn min.	Ink drying	Status	
Ink Low	Ink low	Warning	86
Ink Charge nnn	Initial Ink Charge	Status	
Replace Ink Cartridge	Performing ink cartridge replacement	Error	91
Press Pause	Waiting for the paper-initialization trigger	Status	
Ready	Printer is ready	Status	
Cannot Print	There is a problem.	Error	92
Printing	Printing the current print job.	Status	
Option I/F Error	Type-B interface error	Error	92

Table 3-2. LCD Panel Error Messages

LCD message	Status	Type	Refer to page
No Cartridge	One or more ink cartridges not installed	Error	92
Cover Open	The cover is open	Error	89
Turn off/on	The printer needs to re-initialize.	Status	
Service Call nnnnnnnn	Fatal error occurred	Error	93
Please Wait	Initializing printer, initializing paper, charging ink, resting timer IC, or clearing NVRAM	Status	
Power Off	Performing power-off sequence	Status	
Pause	Printer paused	Status	
Maintenance Call nnnn	Maintenance required (waste ink pad replacement)	Warning	87
Transport Drain nnn%	Draining transport fluid (100% = end)	Status	
Paper Not Cut	Paper cut error	Error	89
Paper Skew	Paper fed at a slant	Error	90
Paper Jam	Paper jam occurred	Error	88
Load Paper	No paper loaded or roll paper end	Error	88
Return Paper Lever	The Paper Set Lever was moved to the Released position during printing and must be returned to the Set position.	Error	91

Table 3-2. LCD Panel Error Messages

LCD message	Status	Type	Refer to page
Set Paper Lever	Paper is loaded but the Paper Set Lever is not in the Set position. Move it to the Set position.	Error	
Please Reload Paper	Paper recognition error or paper feed/exit error (cut sheets only)	Error	90
Remove Paper	Paper is too thick for cleaning and must be removed for cleaning.	Error	
Reset	Re-initializing the printer	Status	
Please Load xxx	Roll paper/cut sheet size error	Error	88

Table 3-3. Messages That Indicate Service is Necessary

Error	Code	Description	Refer to
Maintenance Call nnnn	0100	Waste Ink pads is almost full (less than 1% remaining)	page 94
Service Call nnnnnnnn	00000100	Waste Ink pads must be replaced	page 94
	00000101	Ink Tube worn out	page 94
	00010000	PF motor encoder check error	page 94
	00010001	PF motor out of step	page 95
	00010002	PF motor overcurrent	page 95
	00010003	PF in-position time-out	page 95
	00010004	CR motor encoder check error	page 96
	00010005	CR motor out of step	page 96
	00010006	CR motor overcurrent	page 96
	00010007	CR in-position time-out	page 96

Table 3-3. Messages That Indicate Service is Necessary

Error	Code	Description	Refer to
	00010008	Servo interrupt watchdog time-out error	page 96
	00010009	System interrupt watchdog time-out error	page 97
	0001000A	CR origin sensor malfunction	page 97
	0001000C	PG origin sensor malfunction	page 97
	0001000D	Cover sensor malfunction (00)	page 97
	0001000E	Cover sensor malfunction (01)	page 97
	0001000F	CR motor PWM output error	page 97
	00010010	PF motor PWM output error	page 97
	00020000	NVRAM error	page 98
	00020001	Internal RAM check error	page 98
	00020002	SRAM check error	page 98
	00020003	DRAM check error	page 98
	10000004	CPU vector 4 - General illegal instruction	page 98
	10000006	CPU vector 6 - Slot illegal instruction	page 98
	10000009	CPU vector 9 - CPU address error	page 98
	1000000A	CPU vector 10 - DMAC/DTC address error	page 98
	1000000B	CPU vector 11 - Watchdog time-out error	page 98
	100000””	CPU vector 32~63	page 98

Table 3-4. Warning/Error Messages

Error Type	Message	Refer to
Warning	Ink Low	page 99
Error	Paper Out	page 99
	Load xxx Paper	page 100
	Load Paper	page 100
	Paper Jam	page 100
	Cover Open	page 100
	Paper Not Cut	page 101
	Paper Not Straight	page 101
	Reload Paper	page 101
	Push Lever Down	page 102
	Compartment Open	page 102
	Ink Out	page 102
	No Ink Cartridge	page 102
	Remove Paper	page 103
	Option I/F Error	page 103

Note: “Maintenance Call nnnn” is described in Table 3-3.

WARNINGS

Warning messages appear on the LCD display to warn users that a problem may occur. The printer can still print and there is no effect on print quality; however the messages do not go away until the possible problem is taken care of or the printer enters the corresponding error condition. For example, the Waste Ink Pads Near Full message will remain until the pads are replaced and the counter is reset or until the pads become full and the printer enters an error state.

Table 3-5. Ink Low

Item	Description
LCD message	Ink Low
LED indicator status	The LED indicator for the ink cartridge that is low flashes.
Details	The printer has received the Near-End signal from one of the ink low sensors. After the LCD displays the Ink Low warning, the printer can print about one A1 sheet at 100% duty. By all means, change the ink cartridge as soon as possible. Once a “low-ink” cartridge has been removed, it will automatically cause an ink-end error if replaced in the printer. Only replace empty or low cartridges with new, full cartridges; otherwise the ink counter cannot perform correctly.
Recovery	Replace the old ink cartridge with a new one.

Table 3-6. Maintenance Call nnnn

Item	Description
LCD message	Maintenance Call nnnn nnnn = the replacement part code (see "Service Call 00000100" on page 94)
LED indicator status	No change.
Details	Maintenance required. The corresponding part described by the nnnn has almost reached the end of its effective life. Service is required.
Recovery	Replace the old part(s) with new ones and clear the corresponding counter(s).

ERRORS

Error messages appear on the LCD to notify the user that the printer cannot print properly under the current conditions. When an error message appears, printing stops and data transfer from the host PC stops. (The parallel interface signal = /ERROR -> "LOW" and BUSY -> "HIGH" and data cannot be entered.)

Table 3-7. No Paper Loaded

Item	Description
LCD message	No Paper Loaded
LED indicator status	Paper Check indicator is on
Details	No paper loaded or the end of the roll paper. When printing on roll paper, if the Paper End sensor detects the end of the roll paper, paper feeding stops and the paper is held in place. When printing on cut sheets, if the Paper End sensor detects the end of the paper, printing as well as feeding stop and the paper is held in place.
Recovery	Load paper. For cut sheets, remove the printed sheet and load a new one. After loading the new sheet, the error is cleared. If data from the previous print job remains, the data is printed on the new sheet according to the original paper-size data. If this error occurs even if paper is properly loaded, check the P-REAR sensor for obstruction or dust. Also make sure there is no foreign material blocking the hole in the Paper Guide U where the P-Rear sensor is located.

Table 3-8. Please Load xxx

Item	Description
LCD message	Please Load xxx
LED indicator status	Paper check indicator is on and the currently selected paper path indicator flashes. The paper path information is supplied by the PP remote command.
Details	Roll paper and cut sheet size settings differ. The PP remote command determines the paper path, and when this setting and the paper setting made via the control panel differ, this (paper mismatch) error occurs.
Recovery	Load the correct paper size, or change the setting in the control panel/driver to match the size of the paper loaded in the printer. When this error clears, printing begins.

Table 3-9. Paper Path Command and LED Indicators

PP Command	Roll Auto Cut	Roll No Cut	Sheet
Roll Paper	Flashing	Flashing	On
Cut Sheets	On	On	Flashing

Table 3-10. Please Load Paper

Item	Description
LCD message	Please Load Paper
LED indicator status	The Paper Check indicator in on.
Details	The Paper Set Lever is in the release position. While loading paper, the Paper Set Lever was pushed to the release position.
Recovery	Pull the Lever forward to the paper set position to clear the error. If the error doesn't clear, check the Paper-Set-lever position sensor for dust or foreign material. Also make sure the sensor is properly connected to the Main board.

Table 3-11. Paper Jam

Item	Description
LCD message	Paper Jam
LED indicator status	Paper Check sensor flashes
Details	There is a paper jam. During a printing, feeding, or cutting operation the paper jammed on a printer part. A paper jam is detected when one of the paper-edge sensors is on and the CR motor has an out-of-step error or an overcurrent error is detected.
Recovery	Remove the paper from the printer, turn the printer off and back on, and try to print again. If the error recurs, make sure nothing blocks the carriage path and there are no foreign objects inside the printer.

Table 3-12. Cover Open

Item	Description
LCD message	Cover Open
LED indicator status	N/A
Details	The front cover is open.When the cover is open the CR cannot move and no printer operations such as cleaning can be performed. If the cover is left open for a long period of time, the printheads may be affected adversely.
Recovery	Close the front cover. The printer automatically returns to the pre-error state; ie. “Ready” or “Paused”. If the cover is opened during printing, printout quality may suffer. If you have to open the cover for some reason while the printer is printing, first press the Pause button to decrease the chance of adversely affecting printout quality. If this error occurs even though both sides of the cover are securely closed, check the cover-open sensor (interlock switch) on the left side for proper operation and position.

Table 3-13. Paper Not Cut

Item	Description
LCD message	Paper Not Cut
LED indicator status	Paper Check indicator flashes.
Details	Paper cut error occurred. The page was not cut entirely or the page was cut unevenly and part of it still covers the P-FRONT sensor.
Recovery	Open the front cover and remove any cut paper that has not fallen. If necessary, cut the paper above the P-FRONT sensor with scissors. The LCD will display the “Set Paper Correctly” message. Move the Paper Set Lever to the release position and after making sure the leading edge is even, properly reload the paper. If the error is due to a worn cutter blade, replace the blade. Make sure the cutter and cutter solenoid are installed and working properly.

Table 3-14. Paper Skew

Item	Description
LCD message	Paper Skew
LED indicator status	Paper Check indicator flashes.
Details	Paper skew error occurred. The lateral (horizontal) position of the leading edge and rear edge are off by over 3mm. When this error occurs, there is the possibility that ink has been fired onto the platen; make sure the platen is clean. Also, you may need to reprint your print job if the degree of skew is too much.
Recovery	Set the paper correctly to clear this error. Follow the directions in the user's guide carefully. If the roll paper is curved or bent near the edge, line up the leading edge on both sides. If reloading the paper correctly does not clear the error, turn the printer off and back on.

Table 3-15. Correctly Load Paper

Item	Description
LCD message	Correctly Load Paper
LED indicator status	Paper Check indicator flashes.
Details	There was a paper recognition error or cut sheet feeding error, which can happen under the following conditions: 1) The user loaded the leading edge of the paper too far into the printer. The printer can only backfeed the paper a set distance, and if the paper is loaded too far, it will not backfeed far enough. 2) The printer detected that the paper was loaded outside of the printable area/carriage path. 3) After printing, the printer detected that the paper is outside of the cuttable area/carriage path. 4) The printer detected that the cut sheet loaded in the printer is too long/unsupported and could not be fully ejected. This may occur if roll paper is loaded but the control panel is set to cut sheets. 5) This error may occur after a Paper Not Cut error.
Recovery	1-3 above) Correctly set the paper as described in the user's guide. If the front edge is not clean and straight, cut it evenly. 4-5 above) For roll paper cut off the section of the paper that has been ejected and properly reload the paper. For cut sheets eject the remaining paper and select Sheets on the control panel or load supported paper depending on the cause of the error. If after correctly reloading paper the same error occurs, check the operation and connection of the P-EDGE sensor located on the carriage.

Table 3-16. Return Paper Lever

Item	Description
LCD message	Return Paper Lever
LED indicator status	N/A
Details	The Paper Set Lever was moved to the release position during operation. Similar to leaving the front cover open for long periods of time, leaving the Paper Set Lever in the release position (during operation) can have an adverse affect on the printheads.
Recovery	Return the Paper Set Lever to the set (forward) position. The printer automatically returns to the pre-error state; ie. “Ready” or “Paused”. Moving the Paper Set Lever during printing may cause a decline in printout quality and is not supported by EPSON. If after returning the Lever to the set position this error does not clear, check the operation and connection of the Paper Set Lever sensor.

Table 3-17. Load Ink Cartridge

Item	Description
LCD message	Load Ink Cartridge
LED indicator status	N/A The Ink End indicators only function when the ink is low/empty, when there is no ink cartridge, or when an ink cartridge is loaded in the incorrect slot.
Details	Only occurs during ink cartridge replacement.
Recovery	Finish replacing the ink cartridge(s) and close the ink cartridge holder door.The printer automatically returns to the pre-error state; ie. “Ready” or “Paused”.

Table 3-18. Replace Ink Cartridge

Item	Description
LCD message	Replace Ink Cartridge
LED indicator status	The Ink End indicator for the incorrect slot (if an ink cartridge is installed in the wrong slot) or empty ink cartridge is on.
Details	The ink-end error appears after the ink-end sensor detects the near-end condition and then a predetermined amount of ink is ejected. Also, if an ink cartridge that is already in the near-end condition is loaded, the printer will automatically produce this error. In cases where an ink cartridge is loaded in the wrong slot or an unsupported ink cartridge is loaded, this error also occurs.
Recovery	If an ink cartridge is empty, replace it with a new cartridge. Do not load a previously used ink cartridge; otherwise the ink counter will not work properly. If the wrong cartridge is loaded, replace it with the correct cartridge. If this error occurs even after replacing the old cartridge with a new cartridge, check the operation and connection of the corresponding ink-out sensor.

Do not insert used ink cartridges into the printer. Doing so will cause the ink counter to function improperly.

Table 3-19. No Cartridge

Item	Description
LCD message	No Cartridge
LED indicator status	The Ink End indicator is on for the ink cartridge that is missing or improperly installed.
Details	No ink cartridge installed or the ink cartridge is not fully installed.
Recovery	Open the ink cartridge holder and install a new cartridge in the empty slot. Do not use cartridges after removing them even one time. If the cartridge is installed, and installed correctly, check the operation and connection of the I/C detection sensor.

Do not insert used ink cartridges into the printer. Doing so will cause the ink counter to function improperly.

Table 3-20. Option I/F Card

Item	Description
LCD message	Option I/F Card
LED indicator status	N/A
Details	An unsupported optional interface card is installed but cannot be used.
Recovery	Turn off the printer, remove the unsupported option card, and turn the printer back on. Install a supported option card if necessary.

Table 3-21. Remove Paper

Item	Description
LCD message	Remove Paper
LED indicator status	Paper Check LED is on.
Details	Paper is too thick to allow for head cleaning. The currently loaded paper is too thick to allow for timed cleaning.
Recovery	Move the Paper Set Lever to the release position, remove the paper, and return the Lever to the set position. Cleaning starts and “Please Wait” appears on the LCD panel. When “No Paper Loaded/Load Paper” appears, reload the thick paper to begin printing.

Table 3-22. Cannot Print

Item	Description
LCD message	Cannot Print
LED indicator status	Same as before this error arose.
Details	Cannot perform test print. Due to one or more of the following reasons the printer cannot print a nozzle check pattern, status sheet, PG adjustment pattern, or paper thickness pattern: 1) No paper loaded 2) Ink cartridge missing 3) Paper recognition error This error appears on the LCD panel for about three seconds, and then the display returns to its previous state.
Recovery	Exit SelecType mode and clear the error that appears on the LCD panel. Then return to SelecType mode and print.

FATAL ERRORS

Fatal error messages appear on the LCD panel to warn users that an unrecoverable error has occurred. However, in some cases the printer may recover if turned off and back on.

Table 3-23. Fatal Error

Item	Description
LCD message	Service Call nnnnnnnn
LED indicator status	All LED indicators flash.
Details	A fatal error occurs for one of the following reasons. 1) A problem occurred that the user cannot solve by himself. 2) A maintenance part has exceeded its useful life and if not replaced may cause damage to the printer or printer parts. 3) An illegal function was attempted or illegal command received and the operation is impossible.
Recovery	Turn off the printer and turn it back on. If the error does not recur, continue normal operation. If the same fatal error occurs when you turn the printer back on, see the following table and perform the necessary service.

Table 3-24. Fatal Error Code List

Code	Description	Refer to page
00000100	Waste ink pads are full	94
00000101	Ink tubes have reached their predetermined	94
00010000	PF motor/ encoder check error (out of step error)	94
00010001	PF motor/motor out of step	95
00010002	PF motor/overcurrent	95
00010003	PF motor/ in position timeout error	95

Table 3-24. Fatal Error Code List (continued)

Code	Description	Refer to page
00010004	CR motor/ encoder check error (out of step error)	96
00010005	CR motor/motor out of step	96
00010006	CR motor/overcurrent	96
00010007	CR motor/ in position timeout error	96
00010008	Servo watchdog timeout error	96
00010009	System watchdog timeout error	97
0001000A	CR home position sensor error	97
0001000B	PF home position sensor error	
0001000C	Head slide (PG) home position sensor error	97
0001000D	Cover open sensor error (00)	97
0001000E	Cover open sensor error (01)	97
0001000F	CR motor/PWM output malfunction	97
00010010	PF motor/PWM output malfunction	97
00020000	NVRAM error	98
00020001	Internal RAM check error	98
00020002	SRAM check error	98
00020003	DRAM check error	98
0002000B	Mail box error (memory error)	98
10020004	CPU vector 4 general illegal instruction	98
10020006	CPU vector 6 slot illegal instruction	98
10020009	CPU vector 9 CPU address error	98
1002000A	CPU vector 10 DMAC/DTC address error	98
1002000B	CPU vector 11 watchdog timeout error	98
100200**	CPU vector 32~63 (incorrect trapping)	98

3.3 Errors That Require a Service Technician

MAINTENANCE CALL 0100

- Problem
  The waste ink pads are almost full, causing a warning error. The printer can continue printing, but this messages overrides status messages such as Ready or Printing.
- Solution
  Replace the following parts and reset the counters as described below
  - Waste Ink Pads
  - F Box
  - Pump Assembly
  - Cap Assembly
  - Cleaner, Head
  - From Maintenance Mode 2 enter the Counter Init. Menu and initialize the Waste Ink counter and Cleaning counter.

SERVICE CALL 00000100

- Problem
  The waste ink pads are completely full, causing a fatal error. The printer stops printing.
- Solution
  Replace the following parts and reset the counters as described below
  - Waste Ink Pads
  - F Box
  - Pump Assembly
  - Cap Assembly
  - Cleaner, Head
  - From Maintenance Mode 2 enter the Counter Init. Menu and initialize the Waste Ink counter and Cleaning counter.

SERVICE CALL 00000101

- Problem
  A printer part has exceeded its useful life, and to prevent damage to other parts as well as abnormal operations/printouts, an error occurs. This error occurs when the CR Motor has reached 2.5 million passes, and this indicates the ink tubes should be replaced due to excessive wear and tear.
- Solution
  To make sure the ink tubes are not worn out, verify no part of any of the tubes shows wear, is loose, or leaks ink anywhere, especially the tube area between the printheads and the ink pipes.

SERVICE CALL 00010000

- Problem
  PF motor encoder check error
  The PF motor makes small revolutions clockwise and counter-clockwise. When it turns, the printer checks the rotary encoder output signals to make sure the motor is turning at the correct speed/ distance. If there the encoder doesn't send the correct signal or output data, an error occurs.
- Solution
  Make sure there is nothing blocking the grid rollers. If that does not solve the problem, check the PF motor encoder connection. If there still is a problem, try the following.
  - Check and adjust the PF Belt tension
  - Replace the PF motor
  - Replace the Main Board

SERVICE CALL 00010001

- Problem
  PF motor out of step - the length of the PF motor internal encoder's pulse is too long or too short compared to the regular pulse.
- Solution
  Make sure there is nothing blocking the grid rollers. If that does not solve the problem, check the PF motor encoder connection. If there still is a problem, try the following.
  - Check and adjust the PF Belt tension
  - Replace the PF motor
  - Replace the Main Board

SERVICE CALL 00010002

- Problem
  PF motor overcurrent - Feedback from the PF motor (IC35) driver's 10-pin output (sensor signal) indicates that the PF motor's current is irregular.
- Solution
  - Replace the PF motor
  - Replace the Main Board

SERVICE CALL 00010003

- Problem
  PF in-position time-out - The in-position time is the amount of time the printer waits to make sure the carriage is not moving when the carriage comes to a stop. The rotary encoder is activate for the predetermined "in-position time" and if the encoder sends a pulse, this means the carriage is moving even though it is supposed to be at a full stop, this generates an error.
- Solution
  - Replace the PF motor
  - Replace the Main Board

SERVICE CALL 00010004

- Problem
  CR motor encoder check error
  The CR motor makes small revolutions clockwise and counter-clockwise. When it turns, the printer checks the encoder output signals to make sure the motor is turning at the correct speed/ distance. If the encoder doesn't send the correct signal or output data, an error occurs.
- Solution
  Make sure there is nothing blocking the carriage. If that does not solve the problem, check the CR motor encoder connection. If there still is a problem, try the following.
  - Check the plastic step ruler for soiled areas, obstructions, and damage
  - Replace the encoder sensor
  - Replace the CR motor
  - Replace the Main Board

SERVICE CALL 00010005

- Problem
  CR motor out of step - the length of the CR motor's pulse is too long or too short compared to the regular pulse.
- Solution
  Make sure there is nothing blocking the carriage. If that does not solve the problem, check the CR motor encoder connection. If there still is a problem, try the following.
  - Check the plastic step ruler for soiled areas, obstructions, and damage
  - Replace the encoder sensor
  - Replace the CR motor
  - Replace the Main Board

SERVICE CALL 00010006

- Problem
  CR motor overcurrent - Feedback from the CR motor (IC33) driver's 10-pin output (Sense signal) indicates that the PF motor's current is irregular.
- Solution
  - Replace the CR motor
  - Replace the Main Board

SERVICE CALL 00010007

- Problem
  CR in-position time-out - The in-position time is the amount of time the printer waits to make sure the carriage is not moving when the carriage comes to a stop. The linear encoder is activate for the predetermined "in-position time" and if the encoder sends a pulse, this means the carriage is moving even though it is supposed to be at a full stop, this generates an error.
- Solution
  - Replace the encoder sensor
  - Replace the CR motor
  - Replace the Main Board

SERVICE CALL 00010008

- Problem
  Servo interrupt watchdog time-out error due to motor-drive control related error
- Solution
  Replace the Main Board

SERVICE CALL 00010009

☐ Problem
System interrupt watchdog time-out error due to sensor-related error

☐ Solution
Replace the Main Board

SERVICE CALL 0001000A

☐ Problem
CR origin sensor malfunction - CR home position sensor malfunction

☐ Solution

- Replace the CR HP sensor
- Replace the Main Board

SERVICE CALL 0001000B

☐ Problem
PF origin sensor malfunction - PF home position sensor malfunction

☐ Solution

- Replace the PF HP sensor
- Replace the Main Board

SERVICE CALL 0001000C

☐ Problem
PG origin sensor malfunction (may indicate PG motor malfunction)

☐ Solution
Make sure there is no ink or dust on the surface of the sensor. If this does not solve the problem, check the PG sensor connection. If there still is a problem, try the following.

- Replace the PG sensor
- Replace the PG motor
- Replace the Main Board

SERVICE CALL 0001000D
SERVICE CALL 0001000E

☐ Problem
Cover sensor malfunction - one or both cover open sensors (interlock switch) located at either end of the cover shaft is malfunctioning.
(00): right sensor (HP side)
(01): left sensor

☐ Solution
Make sure the sensor(s) are properly installed. If that does not solve the problem, check the cover open sensor connection. If there still is a problem, try the following.

- Replace the malfunctioning cover sensor
- Replace the Main Board

SERVICE CALL 0001000F

☐ Problem
CR motor PWM output error

☐ Solution

- Replace the Main Board

SERVICE CALL 00010010

☐ Problem
PF motor PWM output error

☐ Solution

- Replace the Main Board

SERVICE CALL 00020000 (NVRAM ERROR)
SERVICE CALL 00020001 (INTERNAL RAM ERROR)
SERVICE CALL 00020002 (SRAM ERROR)
SERVICE CALL 00020003 (DRAM ERROR)
SERVICE CALL 0002000B (MAIL BOX MEMORY ERROR)

☐ Problem
Unusual condition detected.

☐ Solution

- Write down the error code, turn the printer off and back on again to confirm whether the error recurs. If the same error recurs, replace the Main Board.
- For "Service Call 00020003" (DRAM error), replace the SIMM installed in CN19 and confirm whether the error recurs.

SERVICE CALL 10020004 (CPU GNRL ILLEGAL INSTRCTNS)
SERVICE CALL 10020006 (CPU SLOT ILLEGAL INSTRCTNS)
SERVICE CALL 10020009 (CPU ADDRESS ERROR)
SERVICE CALL 1002000A (CPU DMAC/DTC ADDRESS ERROR)
SERVICE CALL 1002000B (CPU WATCHDOG TIME-OUT ERROR)
SERVICE CALL 100200## (CPU VECTOR 32~63)

☐ Problem
Unusual condition detected.

☐ Solution

- Write down the error code, turn the printer off and back on again to confirm whether the error recurs. If the same error recurs, replace the Main Board.
- Send a different print job to make sure the error wasn't due to electrical noise or bad print data.

3.4 General Errors

This section describes error that can be solved by the user.

CHECK POINT

By using "Check: Test" function in the built-in self-diagnostic mode, you can check control panel, sensors, encorders function. Refer to Chapter 5, Adjustment, for more details.

INK LOW

☐ Problem
An ink end sensor has detected that the corresponding ink cartridge is almost empty (ever ink cartridge has an ink level gauge). It is possible to print about 100% duty on B1 size paper with the remaining ink, but the cartridge should be replaced as soon as possible.
If you re-install an ink cartridge that was detected as being in a "Near End" state, the status will immediately go to "Ink Out". Only install new cartridges.

☐ Solution
Replace the ink cartridge.

CHECK POINT

If for any reason you replace an ink cartridge before it reaches the ink-low or ink-out state with a new ink cartridge, you need to reset the ink counter using the control panel and Maintenance Mode 2.

PAPER OUT

☐ Problem

- Paper is not loaded.
- The rear edge of roll paper has been detected.
- The print job using cut sheets is finished or the rear edge of cut-sheet paper has been detected.

☐ Solution

- If paper has run out, remove the printer paper and load new paper. If print data remains in the printer, the data will be printed.
- If this error occurs even though paper is properly loaded, there may be something on the P-Rear sensor's surface. Clean the sensor's surface (hole in the Paper Guide, Upper) with a clean, dry cloth.

CAUTION

Use a clean, dry cloth when cleaning sensors; never use a wet cloth or soap.

LOAD XXX PAPER

- Problem
  The selected paper source (according to the remote PP command) and the paper type selected on the control panel do not match.
- Solution
  Load the correct paper or change the panel setting to match the type of paper loaded in the printer.

LOAD PAPER

- Problem
  While paper is loaded, the Paper Release lever was pushed up to the Release position.
- Solution
  - Make sure paper is loaded properly and push down the Release lever to lock the paper in place.
  - If this error occurs even when the lever is down, in the Lock position, there may be a problem with the Paper Release lever sensor. Check the sensor operation, sensor connection, and board.

PAPER JAM

- Problem
  A paper jam occurs when during printing, paper feeding, or paper cutting the carriage is not able to move properly (due to paper catching on some part). The printer determines a paper jam has occurred if the P-Front sensor and P-Rear sensors are in the "on" state but the CR motor is out of step or has overcurrent.
- Solution
  - After removing the paper stuck in the printer, the "TURN OFF AND ON" message appears on the display. The printer is ready after you turn the printer off and back on again.
  - If a paper jams occurs again after removing the original paper jam, check to make sure nothing is blocking the feed path or blocking the carriage.

COVER OPEN

- Problem
  The front cover is open.
  This error occurs when the cover is opened during carriage operation or a cleaning operation, causing the CR/PF operation and ink sequences to stop. If the cover is left open too long, the printheads may be damaged. (To avoid this problem, press the Pause button before opening the cover. But be aware that a stripe may appear on the printout indicating the different drying times.)
- Solution
  - Close the cover as soon as possible.
  - If the cover is fully closed when this error occurs, make sure the left and right cover-open sensors are correctly installed and are operating properly.

PAPER NOT CUT

- Problem
  The paper that was supposed to be cut was not cut completely, or the paper was cut but is still in front of the P-Front sensor.
  - Solution
    Remove the cut paper if it is on or near the Front Cover and Lower Paper Guide.
  - Replace the cutter if it is worn out.

PAPER NOT STRAIGHT

- Problem
  This error occurs when the printer detects the front and rear edges to be skewed (the paper is loaded at an angle/slant) by more than 3mm. If the printer prints on paper that is loaded at a slant, the printer may print outside of the printable area and may fire ink onto the platen. If this happens, the next sheets loaded in the printer may have marred reverse sides.
- Solution
  - Remove the paper loaded in the printer and properly reload it according to the instructions in the user's guide.
  - For roll paper, the edges of the paper may not be lined up; (remove the paper) and carefully squeeze the sides of the roll to make sure the edges are lined up and flat.

RELOAD PAPER

- Problem
  This error occurs when,

  1) The front edge is loaded too far and the paper is not in the loading position after it is reverse fed.

  2) The paper was loaded in such a way that the left and/or right edge is out of the printable area (due to mis-loading or because the paper is too wide).

  3) After printing has finished, the right or left edge is out of the area where the cutter can cut the paper.

  4) The loaded paper was longer than the selected paper, and the paper was not fully ejected. (For example, roll paper is loaded in the printer but cut sheet is selected on the control panel.)

  5) A cutter error occurred after the paper was ejected.
- Solution
  - 1~3 above
    Properly reload paper. If the front edge of the paper is not straight and clean, cut the paper.
  - 4~5 above
    Cut of the section of the paper that has ejected/protruded and reload the rest of the paper. For paper that is automatically cut, lift up the Release Lever (the "Load Paper" message appears), fix the position of the paper, and lower the Release Lever. If you select you "Roll Paper/Auto Cut" setting, you can cut off the protruding part of the paper using the Cut button.
  - If the error recurs even after reloading the paper, make sure the paper-end sensor on top of the carriage is installed correctly and working properly.

PUSH LEVER DOWN

☐ Problem
The printer is not able to continue paper feeding/initializing, printing, or ink sequencing because the Release lever was moved to the Release position. Or, the printer cannot begin printing because the lever is in the release position.

☐ Solution

- Push down the lever. However, if printing was interrupted because the lever was pushed to the release position and the paper shifted, the print job may be marred.
- If the lever is down and this error still occurs, check the Release-Lever position sensor.

COMPARTMENT OPEN

☐ Problem
An Ink Holder (I/H) compartment door is open.

☐ Solution

- Push the I/H lever down to the lock position.
- If the lever is down and this error still occurs, check the lever position sensor.

INK OUT

☐ Problem
One or more ink cartridges have run out of ink, a near-end cartridge has been reinstalled, or an unsupported ink cartridge has been installed.

☐ Solution

- Replace the empty ink cartridge.

When replacing an empty ink cartridge, always replace it with a new ink cartridge; otherwise the printer cannot determine how much ink remains.

- Make sure the ink cartridge is the proper type of cartridge for the printer and the proper color for that slot.
- If the proper cartridge is installed and this error still occurs, check the Ink-End sensor and the Ink ID sensor.

NO INK CARTRIDGE

☐ Problem
An ink cartridge is not installed or is not installed properly.

☐ Solution

- Install the proper ink cartridge in the empty slot.

When replacing an empty ink cartridge, always replace it with a new ink cartridge; otherwise the printer cannot determine how much ink remains.

- If the proper cartridge is installed and this error still occurs, check the Ink-Cartridge sensor.

REMOVE PAPER

- ☐ Problem
  Printer cannot perform cleaning because of thick paper. (The printheads are too far away from the Cap Assembly.) This error occurs under the following conditions.
  - ■ Thick paper is loaded when the periodic/timer cleaning operation is supposed to begin.
  - ■ The printer attempts to print on thick paper when the periodic/timer cleaning operation is supposed to begin.
  - ■ You turn on the printer and the thick paper is loaded.
  - ■ You attempt to perform a manual cleaning operation when thick paper is loaded.
- ☐ Solution
  Remove thick paper and push the Release lever down. (This causes the cleaning to operation to start and “Wait” appears on the display.) After the cleaning operation is finished, “Paper Out” appears. Load thick paper.

OPTION I/F ERROR

- ☐ Problem
  An unsupported Type-B interface card is installed.
- ☐ Solution
  Turn off the printer, remove the unsupported card, and install a supported card.

3.5 Troubleshooting Based on Your Printout

This section describes conceivable print quality problems that may occur with this printer and the troubleshooting points for those errors.

Table 3-25. Diagnosing trouble based on printout

Description	Refer to
Dot missing	page 103
Uneven printing/poor resolution	page 104
Smudged or marred printout on front side	page 105
Smudged or marred printout on reverse side	page 105
White/black banding	page 105

DOT MISSING

When the printer is not used for a long period of time, the ink in the nozzles can dry up and clog the nozzles. Clogged nozzles cannot fire ink and cause the dot-missing problem in printed documents. If the printhead nozzles do not clear after attempting multiple cleaning operations, check the following points.

1. If there is no output at all or only some the colors print, check the ink valves on either side of the printer I/H Assemblies to make sure the knobs are set to “Open”. (Also, see the user’s guide or printer software.)
2. Perform ink charging again
   Select the “Cleaning” function on the control panel’s Self-Diagnostic menu. This sends a lot of ink into the heads and forces out the old ink that is clogging the nozzles.

Do not charge ink too often as this operation consumes a lot of ink. Each head consumes about 88.58ml per operation.

3. If the extra ink charge does not clear the clogged nozzles, confirm the following.
   - There is no damage to or foreign materials in rubber of the Cap Assembly
   - The Cap Assembly valve is operating normally (if it is not, the Cap Assembly will not properly absorb ink
   - The Cap Assembly retention spring is working properly.
   - The ink tubes and pipes between the ink cartridges and printheads are properly connected and are not damaged (check the nuts for tightness, the O-rings for warping, and the tubes/pipes for ink leakage)
4. If after following the above steps the printout still shows missing dots, replace one of the parts listed below and check the print out.
   - Main Board
   - Printhead(s)

CAUTION

- **Before you uninstall the Main Board or a printhead, make sure all cables are disconnected. After installing the new board or head, make sure all cables are properly connected; if cable connectors not completely inserted, they can damage circuits or the heads when current is turned on.**
- **Make sure you replace the correct head, B head or C head.**

UNEVEN PRINTING/POOR RESOLUTION

If printout quality suffers from unevenness, poor quality, or similar problems, check the following.

1. Perform platen gap adjustment
   Using the control-panel setting or the diagnostic-program function, check the platen gap (bi-directional printing position as well as PG adjustment).
2. If this error occurs only when the user prints on custom or thick paper, (Use the control panel paper thickness setting to correct the paper size and the print position (depending on the paper-thickness setting, the location where the ink strikes the paper may change))
3. If after following the above steps the printout quality has not improved, verify the following.
   - Head angle adjustment
   - Head height adjustment

CHECK POINT

When using the "Adj.B (or C) Head Skew" as well as the "Adj:PG Check Height" functions, always perform the Gap Adjustment or Bi-directional Position Adjustment operation.

SMUDGED OR MARRED PRINTOUT (FRONT)

The front, or top, side of the paper can become smudged or marred if it rubs against the printhead surface. If this happens, verify the following.

1. If the smudged area is just around the front or rear edge of roll paper, make sure the margins (top and bottom) are set to 15mm on the control panel.
   (When printing high-duty print jobs with the top and bottom margins set to 3mm, the high volume of ink can cause the paper to warp and rub against the printhead surface.)
2. If this problem recurs, check the Cap Assembly retention spring. If this spring is broken or comes off its hook, the Cap Assembly cannot wipe ink off the printhead surface, and that ink will smudge the printout. Fix or replace this spring.

SMUDGED OR MARRED PRINTOUT (REVERSE SIDE)

The reverse side of the paper can become smudged or marred if there is ink on the printer parts. Make sure there is no ink on the following parts, and if there is ink, wipe off the affected parts.

- Sub-platen surface
- Grid roller surface
- Lower Paper Guide surface

If the problem is not caused by the above, most likely the paper jammed in the printer or curled up after being ejected.

WHITE OR BLACK BANDING

If white or black banding (lines across the page) appear on your printout, try the following.

1. Cleaning
2. If multiple cleaning cycles don't clear the banding problem, try adjusting the heads as described below.
   - Head slant adjustment (B head/C head)
     If all the nozzles in the B head and C head are not perfectly lined up, the raster lines will overlap. The unprinted area between one line and the next line (where a nozzle was supposed to fire but missed) is banding.
   - Head height adjustment (B head/C head)
   - Bi-directional print position adjustment
   - Gap adjustment opening

CHAPTER

4

DISASSEMBLY & ASSEMBLY

4.1 Summary

This section describes the disassembly and assembly methods for the EPSON Stylus Pro 7000. However, full assembly instructions are not given apart from following the disassembly instructions in reverse order, and where special instructions are necessary, reassembly points are provided.

Where “Caution” and “Reassembly” notes are given, be sure to confirm these contents BEFORE starting the corresponding procedure. Where adjustment procedures are necessary, “Adjustment Required” notes describe what you need do to. These adjustment procedures are absolutely necessary and are described in detail in Chapter 5.

4.1.1 Warnings

Before proceeding with any disassembly or assembly work, make absolutely sure of the following.

- **The power switch is located on the control panel. Any time the printer is plugged into a power outlet, power is flowing through the PS board. Unless otherwise stated, always turn off the printer, wait several seconds, and then unplug the power cable from the outlet before servicing a printer.**
- **For safety reasons, the front cover position is automatically detected by the cover-open sensor which is an interlock switch. Do not block or modify this sensor.**
- **Because the Main Board houses a Lithium battery for memory backup purposes, you must keep the following in mind when handling the Main Board.**
  - Be careful to avoid damaging the Lithium electrodes due to short circuits.
  - When replacing the battery, make sure the positive/ negative sides are installed correctly
  - The battery can become very hot, so be careful when touching it
- **If ink gets on your hands, wash them thoroughly with soap and water. If ink gets in your eyes, rinse them immediately with water.**
- **If it is necessary to remove external printer parts while the printer is turned on, be very careful around movable or spinning parts such as the carriage and fans.**
- **Keep in mind that the carriage drive belt and cutter blade can be dangerous.**

CAUTION

- Before servicing or performing maintenance on the printer, make sure you have enough space. If you need to move the printer, be sure the space you move to is safe.
- Because the printer is much heavier than most printers (about 44Kg for the printer body/ 53Kg for the printer and stand), you need to take extra care. If you need to take apart the printer and stand or lift the printer, two people are necessary.
- After removing any of the ink related parts, double check to make sure all parts are secured; otherwise you're going to be in big trouble.
- Ink may leak onto other printer parts or the printer basket when removing printer parts, so it is recommended to put a sheet or cloth under the printer, especially when working on or near ink-related parts.
- When working on the electrical circuit boards, be careful concerning static electricity which can cause damage to the board. It is recommended you use an anti-static wrist band or similar grounding device to prevent static electricity buildup.
- When removing/re-inserting the flat-cable (FFC) from/to a connector, make sure to pull/insert the cable at a 90 degree angle to the connector. Otherwise, internal contact of the leads may be damaged and this can cause a short-circuit.
- When replacing connector wires, be careful to replace the entire length of the wire exactly as you found it; rubbing against edges or moving parts can cause noise in the wires.
- The cutter blade is very hard and can damage or scratch printer parts, and it can also be chipped or damaged. Be careful when handling or replacing the cutter.
- If you have to loosen a screw that has blue screw-lock applied to its head, make sure you apply blue screw-lock again when re-assembling.

CHECK POINT

- If you find it is necessary to perform service on a part not described in this chapter, be sure to check the after-service parts situation before beginning the service.
- If you need to remove the ink tubes or other ink related parts, see "Transportation Mode" on page 54 to drain the ink before removing anything.
- If necessary (i.e. when transporting the printer) use the above mentioned mode to drain ink, install transportation fluid cartridges (P/N1045585), and then perform an initial ink charge with the fluid. Enter the transportation mode again to remove the fluid (user can do) and then perform initial ink charge with ink.
- The directional instructions in this chapter are given as if viewing the printer from the front. See the illustration below.

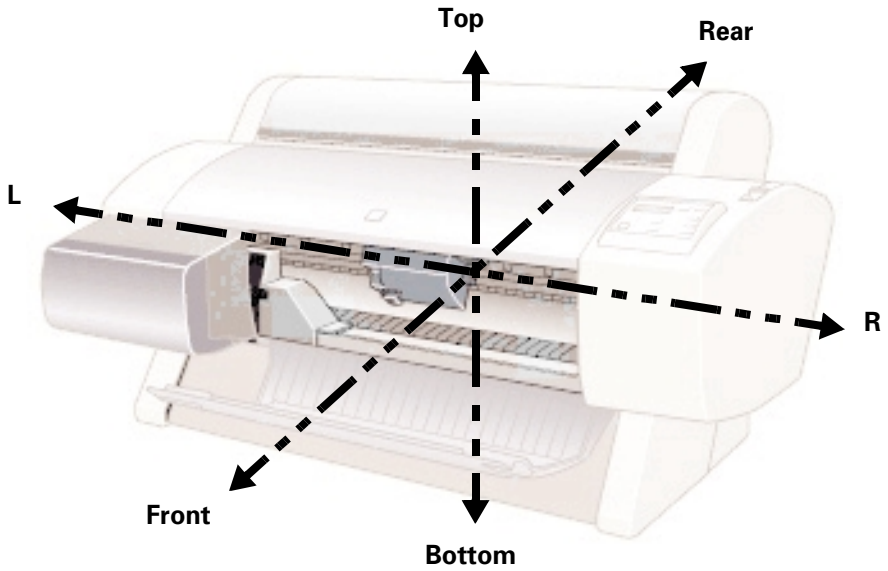


Figure 4-1. Directional View of the Printer

4.1.2 Tools

This section lists the tools necessary to disassemble or assemble the printer.

Table 4-1. Necessary Tools

Tool	Part Code	Notes
(+) Phillips screwdriver #2	commonly available tools, no special tools necessary	longer than 250mm is helpful
(+) Phillips screwdriver #1		
(-) Standard screwdriver		-
Round-nosed pliers		-
Tweezers		-
Hex (Allen key) wrench	Comes with stand, commonly available tools also OK	5.5 mm for stand assembly only
#E589 torque wrench (6mm x 1Kg)	B765106901	Tube lock tightener
#F733 Self Training Kit	1053426	CD-ROM based service tool
transportation fluid cartridges, S46, recycle	1045585	Transportation fluid cartridges = six units required
Maintenance Kit SP7000	1054038	Replacement parts for periodic maintenance

4.1.3 Screw List

The following table lists all the screws used in this printer.

Table 4-2. Screws

Type	Color	Description
CB M3x6	white	(+) Bind
CBP M3x6	silver	(+) Bind P-tight
CBP M4x10	black	(+) Bind P-tight
CBS M3x10	white	(+) Bind S-tight
CBS M4x6	white	(+) Bind S-tight
CBS M2x8	white	(+) Bind S-tight
CBS M3x6	white	(+) Bind S-tight
CBS M4x8	white	(+) Bind S-tight
CUPS M3x6	white	(+) Cup S-tight
CUPS M4x6	white	(+) Cup S-tight
CUPS M4x8	white	(+) Cup S-tight
CUPS M3x6	white	(+) Cup S-tight
CPP M3 x8	white	(+) Crosshead Pan P-tight
CPS M3x12	white	(+) Crosshead Pan S-tight
CP M3x6	white	(+) Crosshead Pan
CP(W) M2x12	silver	(+) Crosshead Pan, washer
CP(W) M2x8	silver	(+) Crosshead Pan, washer
CP(W) M3x6	silver	(+) Crosshead Pan, washer
CP(W)M3x8	silver	(+) Crosshead Pan, washer
CP(W)M3x25	silver	(+) Crosshead Pan, washer
CP(W)M4x8	silver	(+) Crosshead Pan, washer
CP(W)M4x10	silver	(+) Crosshead Pan, washer
CP(W)M4x40	silver	(+) Crosshead Pan, washer
Dish screw M3x6	white	(+) Dish

Table 4-2. Screws (continued)

Type	Color	Description
Truss screw M4x8	white	(+) Truss screw
Toothed washer M3	white	outer teeth
Toothed washer M4	white	outer teeth

4.2 Disassembly Flow

Refer to the following flowchart when determining the disassembly flow.

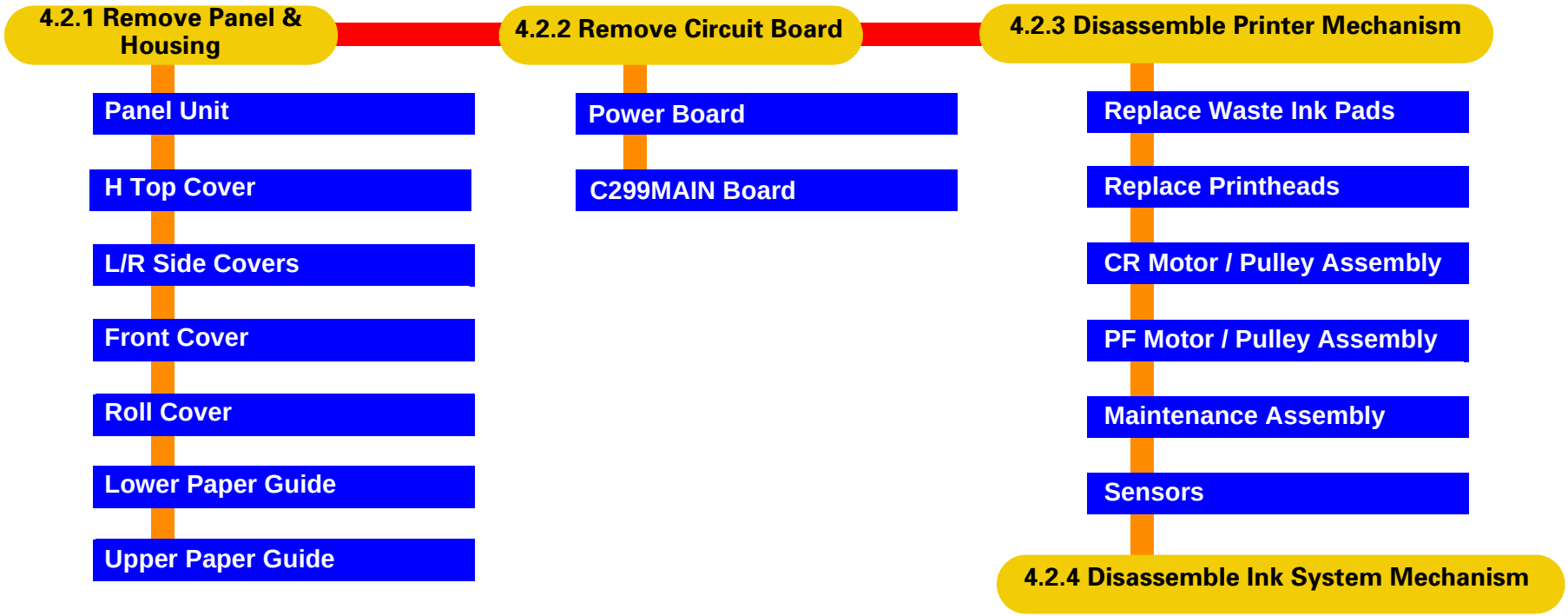


Figure 4-2. Disassembly Process Flowchart

4.2.1 Removing the Housing

This sections describes the removal procedure for printer housing parts. See below for an illustration of the housing parts.

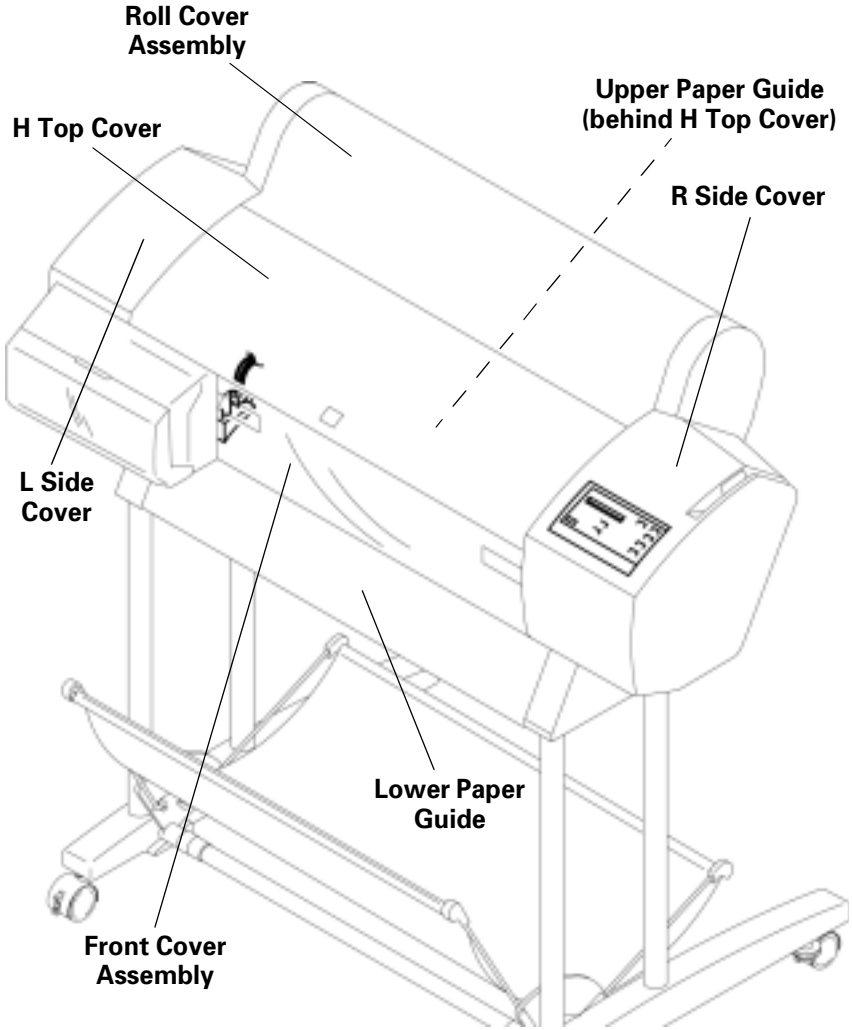


Figure 4-3. Housing Part Diagram

4.2.1.1 Panel Unit Removal

1. Release the clips on both sides of the control panel unit and pull slightly away from the R Side Cover.

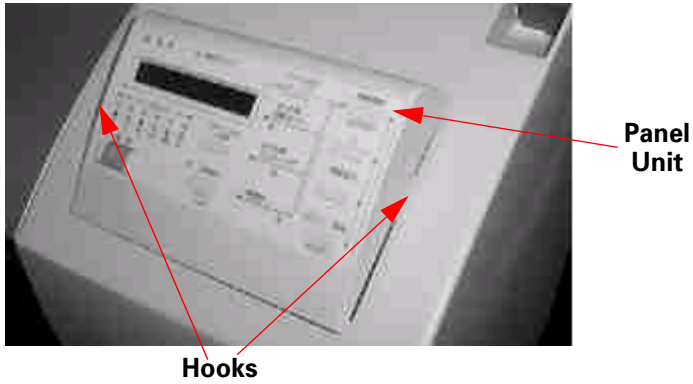


Figure 4-4. Panel Unit Removal 1/2

2. Remove the FFC cable from the connector and hook.

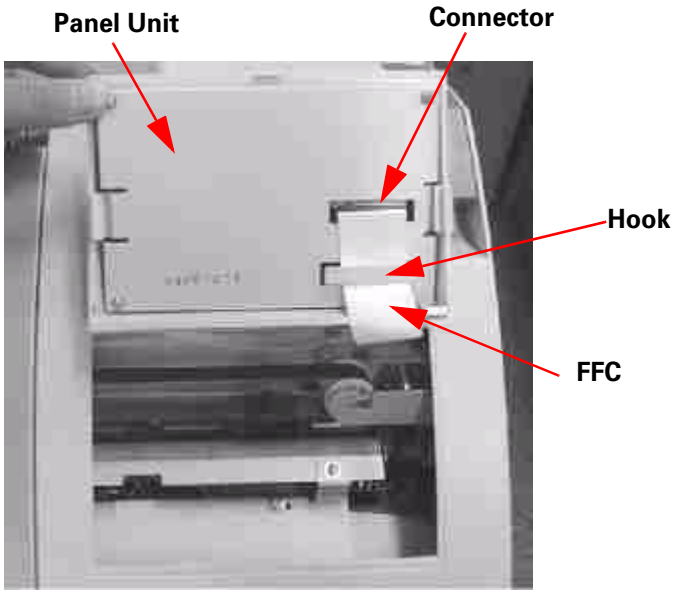


Figure 4-5. Panel Unit Removal 2/2

When replacing the control panel and FFC, make sure you push the FFC cable slack towards the rear of the printer to avoid interfering with carriage movement.

4.2.1.2 R Side Cover Removal

1. Remove the control panel unit as described in 4.2.1.1 “Panel Unit Removal”.
2. Open the roll paper cover.
3. Push back the Paper Set Lever to the released position, remove two black screws (CBP: M4x10) from the lever handle, and remove the handle.
4. Using a (-) driver or similar tool, remove the lever opening cap. The cap may fall through the hole, so it is recommend you secure the cap between your finger and the driver as you remove the cap.

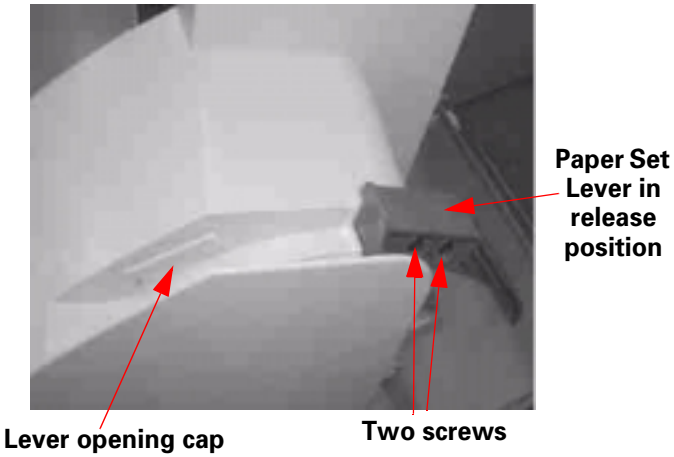


Figure 4-6. Paper Set Lever Handle Removal

5. Open the Roll Cover and from the inner side, remove one black screw (CBP:M4x10).

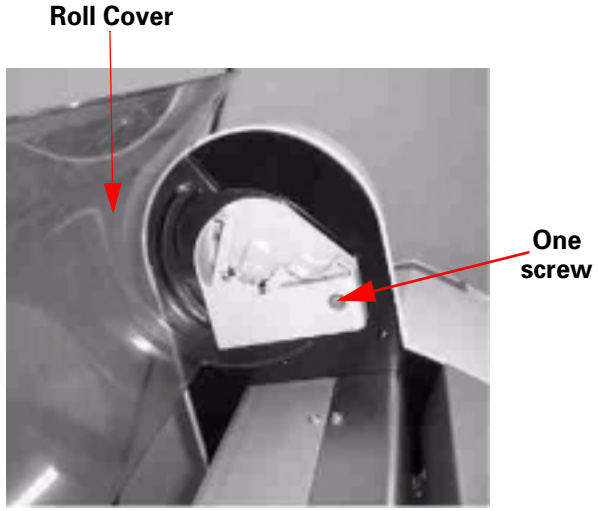


Figure 4-7. R Side Cover Removal 1/3

6. From the rear side, remove one white screw (CUPS:M4x8) and from the right side remove two white screws (CUPS:M4x8).

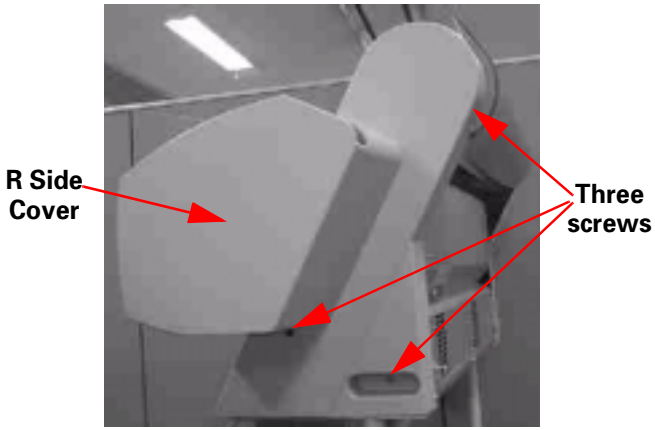


Figure 4-8. R Side Cover Removal 2/3

7. Return the Paper Set Lever to the set position, and pull off the R Side Cover to the right.

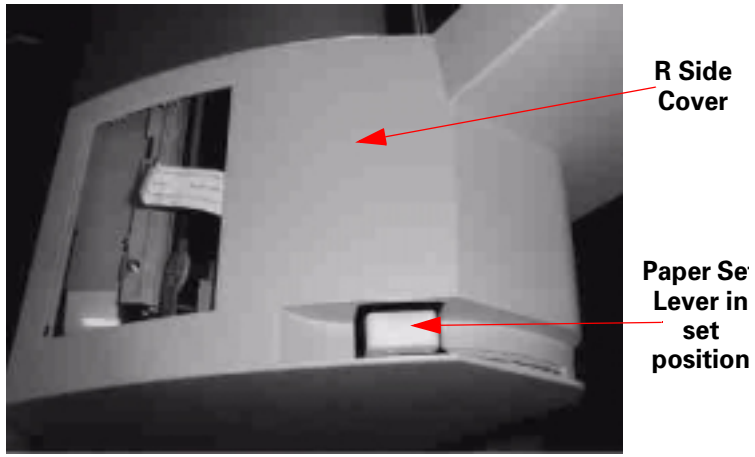


Figure 4-9. R Side Cover Removal 3/3

4.2.1.3 L Side Cover Removal

1. Open the roll paper cover.
2. From the inner side, remove one black screw (CBP:M4x10).

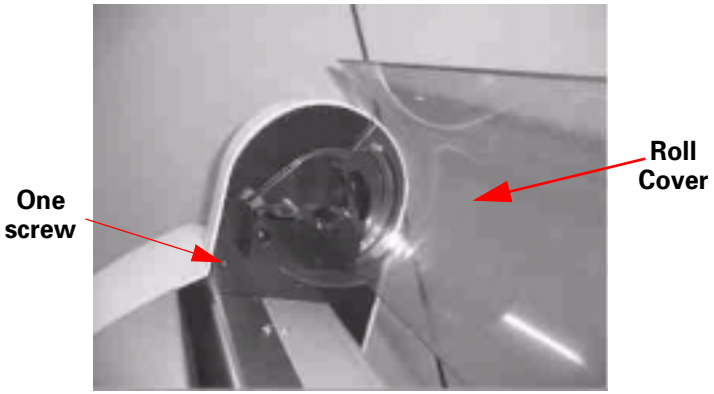


Figure 4-10. L Side Cover Removal 1/2

3. From the rear side, remove one white screw (CUPS:M4x8) and from the left side remove two white screws (CUPS:M4x8).

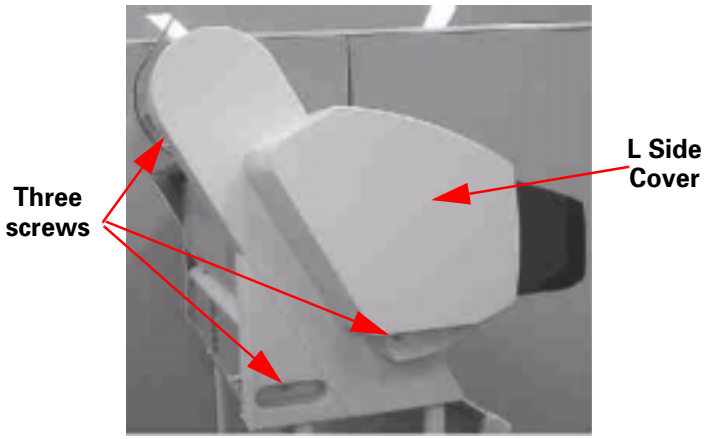


Figure 4-11. L Side Cover Removal 2/2

4. Pull off the L Side Cover to the left.

4.2.1.4 I/C Holder Cover Removal

1. Remove the L Side cover as described in 4.2.1.3 “L Side Cover Removal”.
2. Open the I/C Holder Cover.
3. Remove two white screws (CBS:M3x10).

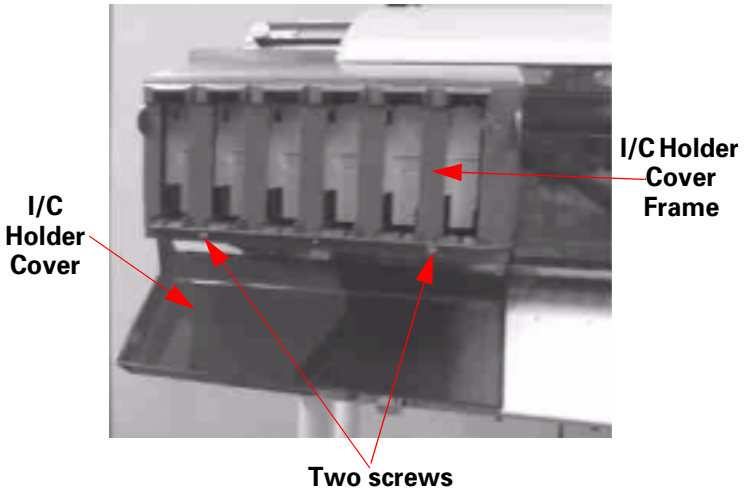


Figure 4-12. I/C Holder Cover Removal

4. Remove the cover and frame.

4.2.1.5 H Top Cover Removal

1. Remove the R Side Cover as described in 4.2.1.2 “R Side Cover Removal”.
2. Remove the L Side Cover as described in 4.2.1.3 “L Side Cover Removal”.
3. Remove the I/C Holder Cover as described in 4.2.1.4 “I/C Holder Cover Removal”.
4. Open the Front Cover
5. From the right side, remove two screws (CUPS:M4x8) and from the left side, remove three screws (CUPS:M4x8).

Figure 4-13. H Top Cover Removal on right side

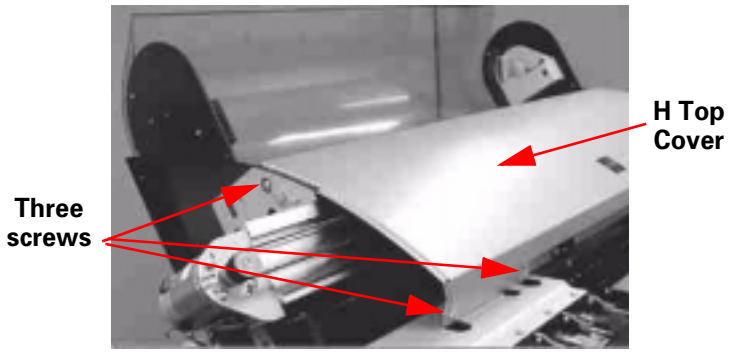


Figure 4-14. H Top Cover Removal on left side

6. Remove the cover by pulling up and toward the rear.

4.2.1.6 Rear Cover Removal

1. From the rear, remove two white screws (CPS:M3x12) securing the optional interface cover, and remove the optional interface cover.

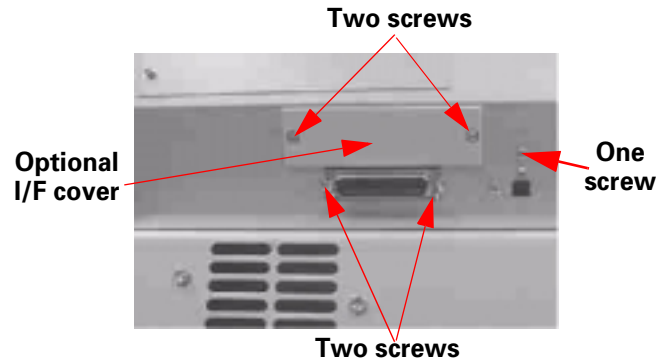


Figure 4-15. Interface Cover and Screw Removal

2. Remove the two white screws (CP:M3x6) securing the parallel interface and remove the one white screw (CBS:M3x6) securing the USB interface.
3. Remove the one white screw (CBS:M3x6) securing the AC inlet.

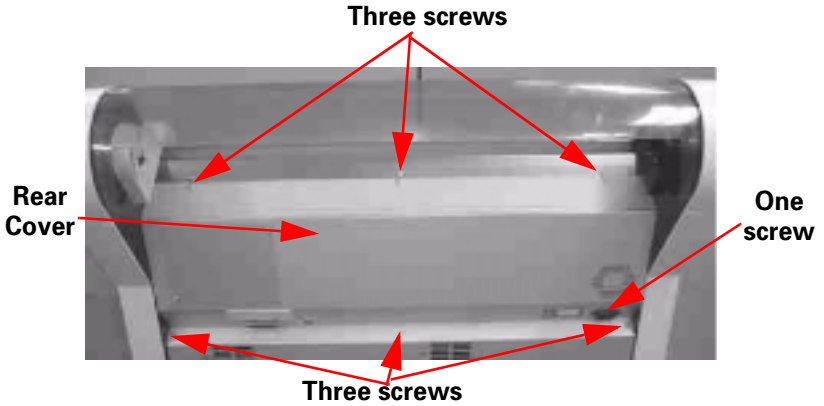


Figure 4-16. Rear Cover Removal

4. Remove three white screws (CBS:M4x8) securing the lower section of the cover, and remove three white screws (CBS:M4x8) securing the upper section of the cover.
5. Remove the Rear Cover by pulling to the rear (lift and pull if necessary).

4.2.1.7 Paper Guide L2 Removal

1. From the front, remove four white screws (Truss:M4x6), and remove the Paper Guide L2.

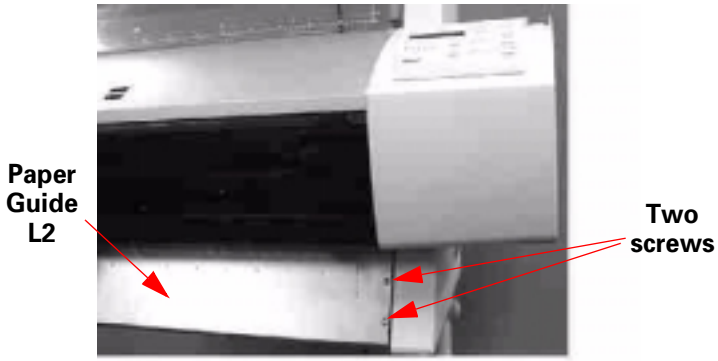


Figure 4-17. Paper Guide L2 removal on right side

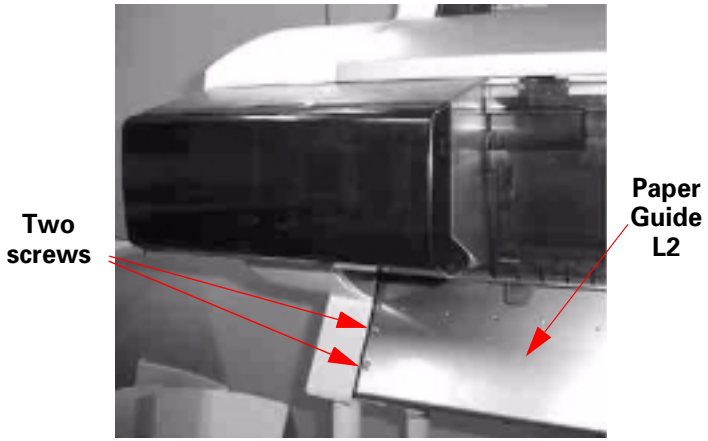
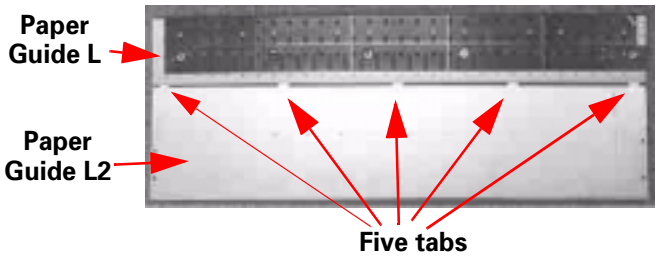


Figure 4-18. Paper Guide L2 removal on left side

REASSEMBLY

When replacing the Paper Guide L2, make sure the five tabs at the top of the guide slide in between the metal and black cushion. Then secure with the screws.



4.2.1.8 Roll Paper Cover Removal

1. Open the Roll Paper Cover.
2. Remove two white screws (CPS:M4x8) securing the black spindle support on the left, and then remove the spindle support.

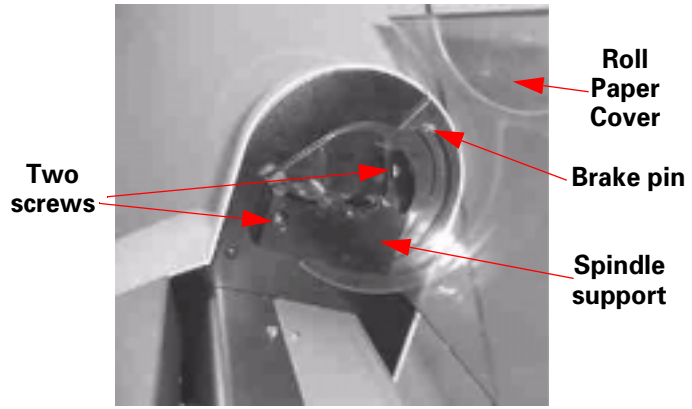


Figure 4-19. Roll Paper Cover removal on left side

3. Remove two white screws (CPS:M4x8) securing the gray spindle support on the right, and then remove the spindle support.

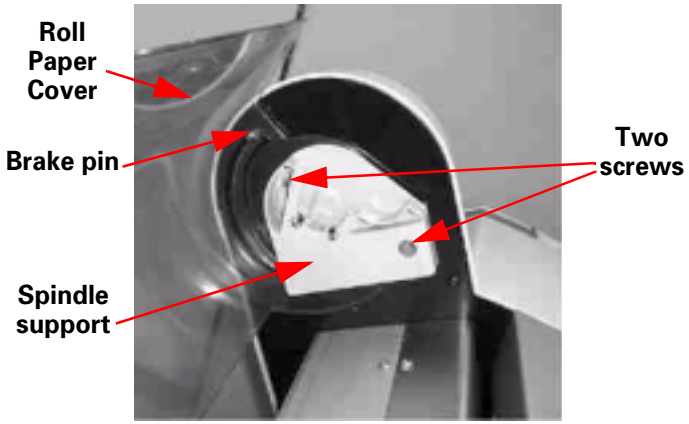


Figure 4-20. Roll Paper Cover removal on right side

4. Remove the cover brake pin from either the left or right side, and remove the cover.

4.2.1.9 Front Cover Removal

1. Open the Front Cover.
2. Push in the two hooks to the left of the cover and remove the front shaft cover.

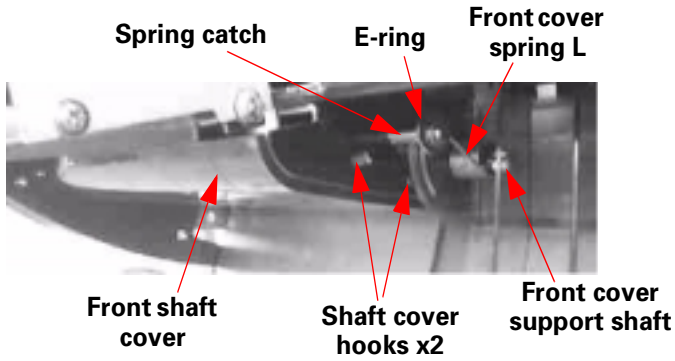


Figure 4-21. Front Cover Removal 1/3

3. On the right, remove the E-ring and the spring.

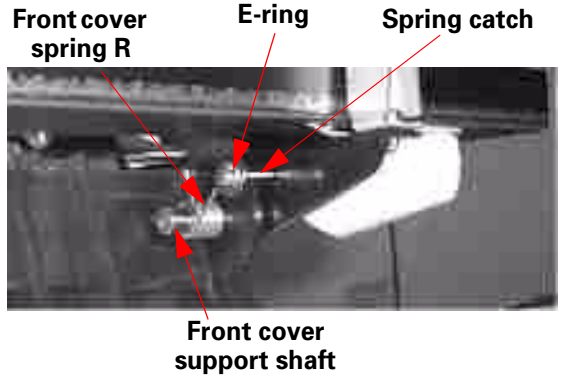


Figure 4-22. Front Cover Removal 2/3

4. Remove the two resin stopper clips (white plastic) from the front cover support shaft on the left, and then pull out the front cover support shaft to the left. Be aware that the front cover spring L and Front Cover come free at this time.

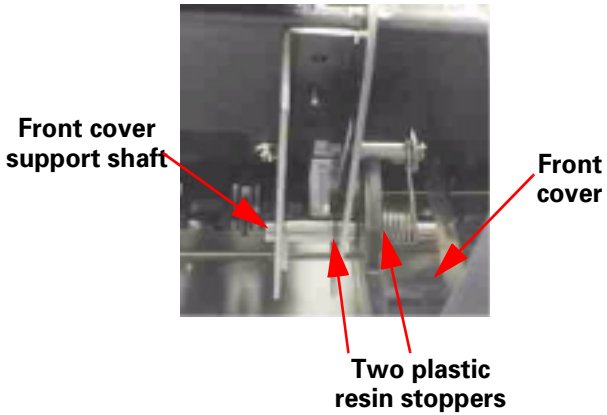


Figure 4-23. Front Cover Removal 3/3

5. Remove the Front Cover and front cover spring R from the front cover support shaft.

ADJUSTMENT REQUIRED

- **Make sure you replace the front cover springs correctly.**
- **Confirm the movement of the cover and operation of the cover-open sensor. See "Cover Open Sensor Assembly" on page 192 for details.**

4.2.2 Circuit Board Removal

This section explains how to remove the Circuit Board (C299PSU) and the Main Board (C299MAIN).

4.2.2.1 Power Board Removal

WARNING

Unplug the AC power cable and wait at least five minutes before removing the power supply board to make sure there is no residual power left in the board's condensers.

1. Remove the Rear Cover as described in "Rear Cover Removal" on page 116.
2. Remove the two cables connected to the Power Board as shown below.

Table 4-3. Power Supply Board Connectors

Connector #	Pins	Color	Connection	Notes
CN001	3	white	AC inlet	lock type
CN3	12	white	C299MAIN	lock type

3. Remove the four white screws (CPS:M4x8) securing the Power Board, and then remove the Power Board.

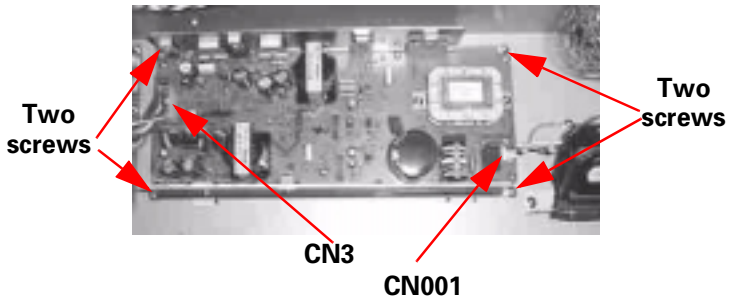


Figure 4-24. Power Supply Board Removal

4.2.2.2 C299MAIN Board Removal

1. Remove the Rear Cover as described in "Rear Cover Removal" on page 116.
2. Remove the cables from the following connectors.

Table 4-4. C299MAIN Board Connectors

Connector #	Pins	Color	Clamp location	Connection	Notes
CN'	28	white	special	Panel Unit	lock type
CN25	6	white	-	unused	-
CN43	2	black	1	suction fan	-
CN44	2	yellow	1	suction fan	-
CN36	3	black	1	Paper Set Lvr snsr	-
CN37	3	red	1	P_Thick snsr	-
CN38	3	yellow	1	Front cover snsr	-
CN41	3	white	2	CR_HP snsr	-
CN42	4	red	1	PG_HP snsr (Head_Slide)	-
CN39	4	yellow	2	P_Front snsr	-
CN11	4	red	2	P_Front snsr	-
CN13	5	white	3	PF Motor encoder	-
CN32	4	blue	3	ink snsr M	-
CN35	5	red	3	ink snsr Y	-
CN9	30	white	special	CR board Assy 2	lock type
CN8	30	white	special	CR board Assy 1	lock type
CN31	4	yellow	4	ink snsr C	-
CN34	5	red	3	ink snsr LM	-
CN30	4	white	4	ink snsr Bk	-
CN33	5	blue	3	ink snsr LC	-
CN10	2	white	4	PS fan	-

Table 4-4. C299MAIN Board Connectors

Connector #	Pins	Color	Clamp location	Connection	Notes
CN24	4	white	3	Pump motor	lock type #1 pin=blue-
CN18	2	white	3	PF motor	-
CN17	3	white	4	CR motor	-
CN6	12	white	-	PS board	lock type

For an explanation of the clamp locations, see the illustration below.

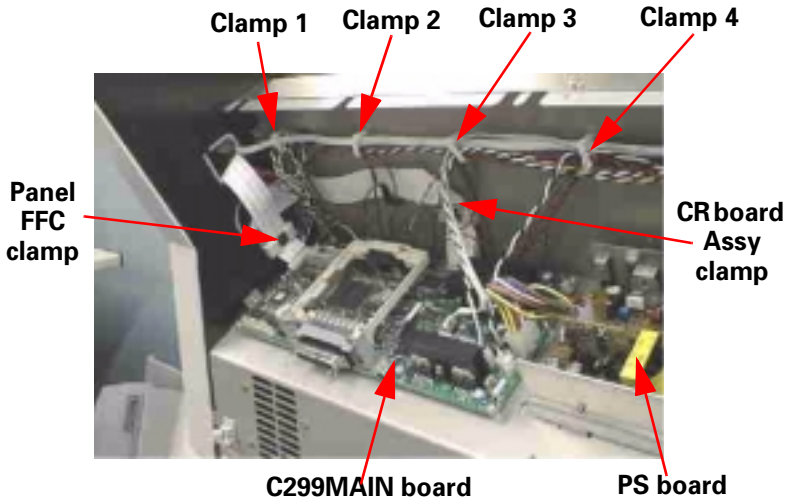


Figure 4-25. Connector Harness/Clamp Locations

CAUTION

When removing or replacing the FFC cables, always do so carefully. Tearing of folding of the leads can damage the circuit boards. Check the leads and never insert at an angle.

3. Remove the two screws (CP(W) M3x8) securing the Type-B Option Slot Cover, and remove the cover. Then remove seven screws (CP(W) M3x6) securing the Main board and remove the board.

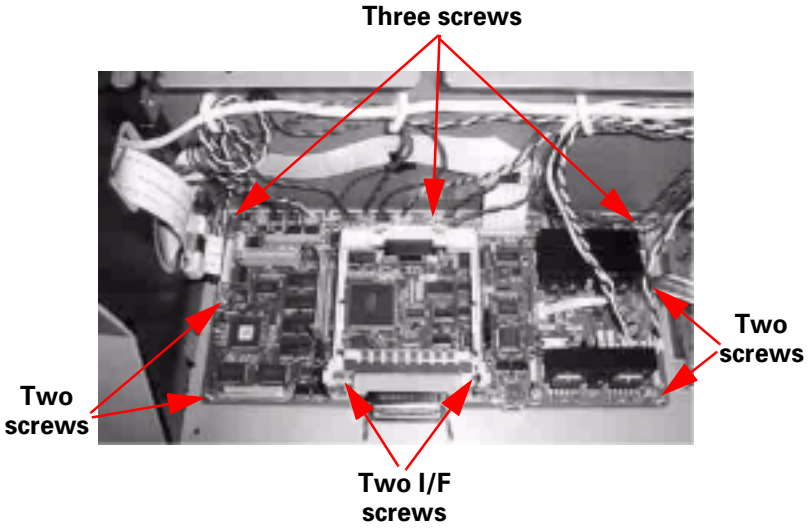


Figure 4-26. C299MAIN Board Removal

CAUTION

When removing/re-inserting the flat-cable (FFC) from/to a connector, make sure to pull/insert the cable straight. Otherwise, internal contact of the connector may be damaged and this causes a short-circuit to destroy the electrical circuitries.

ADJUSTMENT REQUIRED

After replacing the main board, various adjustments are required. For details about these adjustments, refer to Chapter 5, Adjustment, on page 155.

4.2.2.3 AC Inlet and PS Fan Removal

1. Remove the Rear Cover as described in "Rear Cover Removal" on page 116.
2. Remove the connector from CN001 on the PS board.
3. Remove the PS Fan's connector from the relay connector (white, 2-pin).
4. Remove one white screw (CUPS:M4x8) securing the AC inlet, the AC inlet ground cable, and the toothed washer (M4).
5. Remove one white screw (CUPS:M4x8) securing the PS fan holder, and slide the PS fan holder to the right. After removing the holder from the hook on the printer, remove the PS fan.

Figure 4-27. PS Fan Holder Removal

4.2.2.4 Removal of PS Fan From Holder

1. Remove the holder from the printer as described in "AC Inlet and PS Fan Removal" on page 122.
2. Remove two white screws (CP(W):M3x25) securing the fan, and remove the fan.

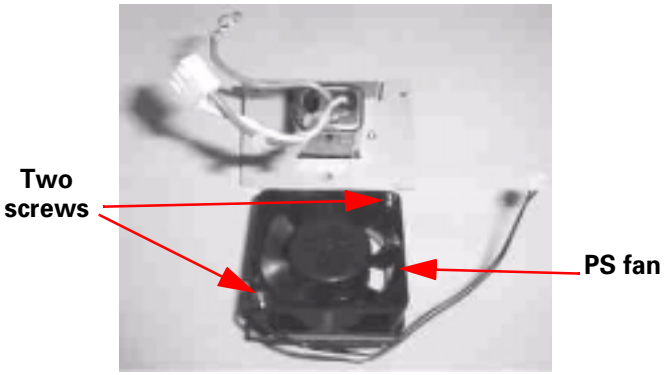


Figure 4-28. Removing the PS Fan from its holder

When replacing the PS fan, make sure the label side faces the outside of the printer and the cable protrudes from the left and top.

4.2.2.5 Removal of the AC inlet

1. Remove the holder from the printer as described in "AC Inlet and PS Fan Removal" on page 122.
2. Remove two white screws (Dish:M3x6) securing the AC inlet and remove the inlet.

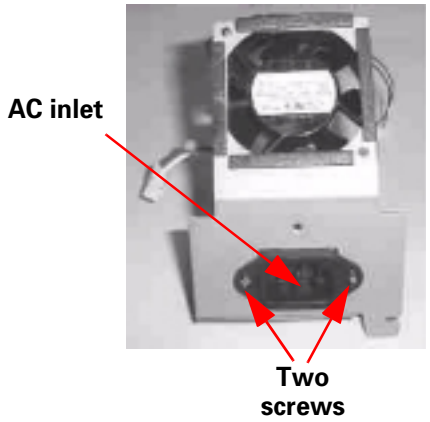


Figure 4-29. AC Inlet Removal

When replacing the AC inlet, make sure the label faces up.

4.2.3 Printer Mechanism Disassembly

This section describes the Printer Mechanism components and the procedure for disassembly.

CAUTION

- **Do not remove or loosen the screws that secure the CR guide rail, also do not remove the carriage. These parts are adjusted to 1/100th of a mm at the factory.**
- **Do not attempt any kind of service or adjustment to the frame or parts attached directly to the frame. See the Parts List in Chapter 7 for a list of parts that you can service/replace. Other parts can only be assembled and adjusted at the factory.**

4.2.3.1 Replacing the Waste Ink Pads

To keep the printhead clean and maintain quality, the printer drains waste ink away from the printhead surface and nozzles into the Waste Ink Pads. Once a predetermined amount of waste ink has been drained, the printer displays the "Maintenance Call 0100" message to indicate the pads are 99% full and then displays the "Service Call 00000100" message to indicate the pads are completely full and need to be replaced before printing can continue.

CAUTION

When the waste ink counter indicates the ink pads need to be replaced, the following parts all need to be replaced at the same time.

- **Waste Ink Pads**
- **Pump Assembly**
- **Cap Assembly**
- **Head Cleaner**
- **Flushing Box**

CHECK POINT

The above mentioned parts are available as a kit.

Description: MAINTENANCE KIT SP 7000
Parts code: 1054038

1. Remove Paper Guide L2 as described in "Paper Guide L2 Removal" on page 117.
2. Remove the two waste ink tubes (white, small diameter) and the one flushing tube (clear, large diameter) from the tubes clamps.

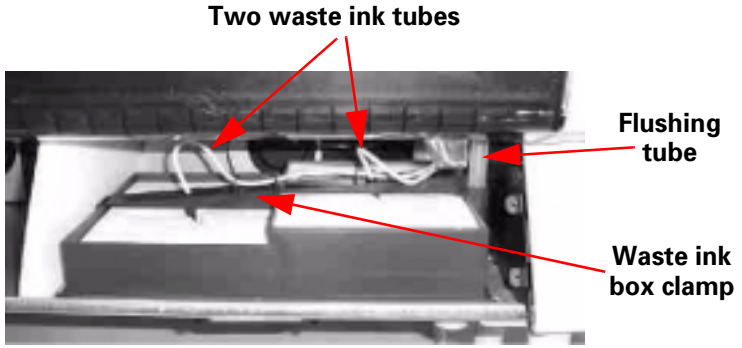


Figure 4-30. Remove the tubes

3. Remove the Waste Ink Box by sliding it forward so the hooks on both sides release and then pull up.

Figure 4-31. Waste Ink Box

4. The waste ink box clamp is held on by hooks. While pulling out the hooks to release them, remove the clamp from the box.

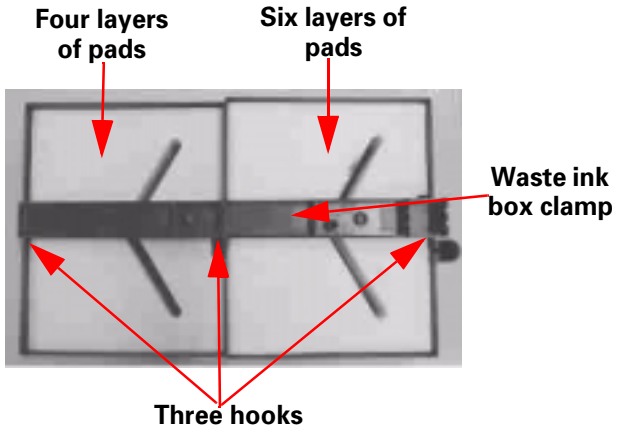


Figure 4-32. Disassembly of the Waste Ink Box

5. Remove the old waste ink pads and dispose of them properly.

CHECK POINT

When replacing the Waste Ink Pads, prepare a vinyl bag beforehand for disposing the Pads.

6. Insert new waste ink pads, and re-install the Waste Ink Box in the printer.

ADJUSTMENT REQUIRED

When replacing the Waste Ink Pads, the following adjustment procedures are required. See "Maintenance Mode 2" on page 50.

- **INIT. WASTE INK**
- **INIT. CLEANING**

REASSEMBLY

To reassemble the waste ink box and related parts, follow the above steps in reverse order and make sure you keep the following in mind:

- **Four pads in the lower side, six pads in the upper side**
- **The waste ink tubes should be inserted into the box so that the ends are about 20mm (a little under one inch) from the bottom of the box.**
- **After inserting the waste ink tubes the proper distance from the bottom, properly attaching them to the notches in the clamp, push any tube slack through the frame towards the pump assembly.**
- **Make sure the tubes are not twisted or pinched.**

4.2.3.2 Removing the Suction Fans

1. Remove Paper Guide L2 as described in “Paper Guide L2 Removal” on page 117.
2. Remove the Waste Ink Box from the printer as described in steps 1 to 3 only of “Replacing the Waste Ink Pads” on page 125.
3. Remove the two screws (CP(W):M4x8) and one screw (CP(W):M4x40) securing the fan duct, and then remove the fan duct.

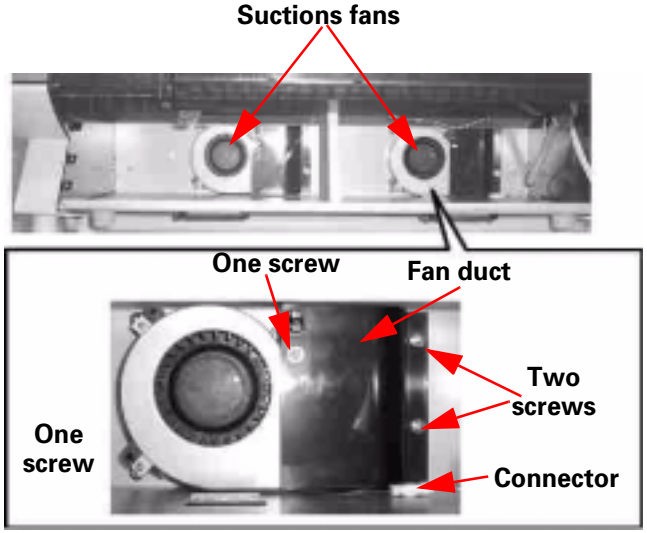


Figure 4-33. Suction Fan Removal

4. Disconnect the fan connector and harness.
5. Remove the one screw (CP(W):M4x8) securing the fan, and remove the fan.

4.2.3.3 Replacing the Printheads

CAUTION

The printer uses two printheads, B Head and C Head, and although they are similar you need to make sure you do not mix the heads. One is for dark inks and the other is for light inks. Therefore make sure you prepare and install the correct replacement head.

- **B head**
  F055040: “Printhead, IJ192-OAD”
  (damper order = B>C>M)
- **C head**
  F055050: “Printhead, IJ192-OAE”
  (damper order = LC>LM>Y)

The printheads are the same for the EPSON Stylus Pro 9000 and EPSON Stylus Pro 7000.

Before replacing the printheads you will need to drain the ink as described in the Clean Head section of “Adjustment Menu” on page 171.

After replacing the printheads, you will need to perform an initial ink charge as described in “Cleaning Menu” on page 187.

ADJUSTMENT REQUIRED

When replacing the printheads, the following adjustment procedures are required.

- **Self-diagnostic function/adjustment**
- **Head unit counter reset**

1. Drain the ink as described in the Clean Head section of “Adjustment Menu” on page 171.
2. Remove the R Side Cover as described in “R Side Cover Removal” on page 113.

3. Press down the cutter to release the carriage lock, and move the carriage away from the home position.

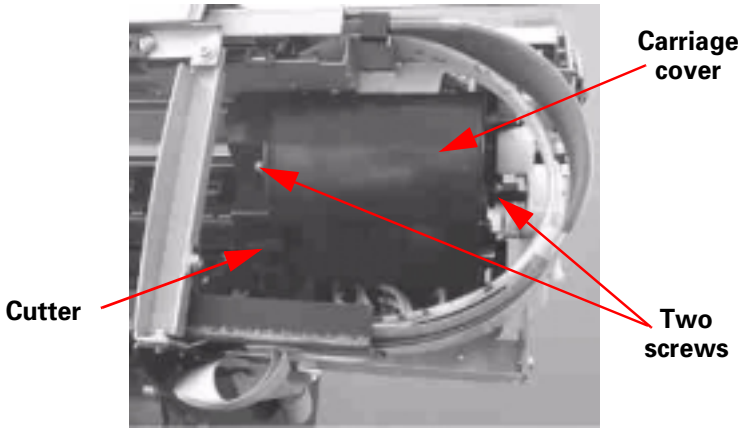


Figure 4-34. Carriage Lock Release & Cover Removal

4. Remove the two screws (CP(W):M3x6) securing the carriage cover and remove the carriage cover.

5. Remove one screw (CP(W) M3x6) securing the damper holder, unhook the ink tubes from the damper holder, and then remove the damper holder.

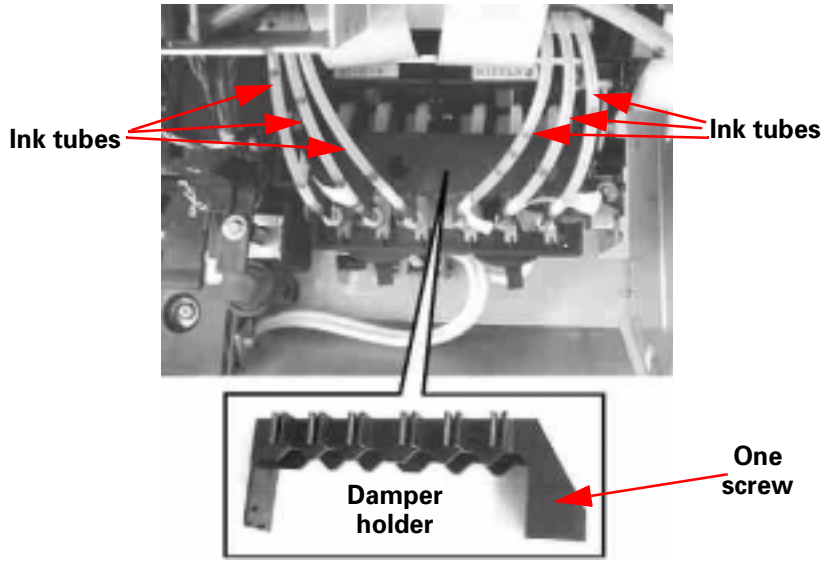


Figure 4-35. Damper Holder

6. Pull out the dampers. To pull out the dampers, place the tip of a flat-head screwdriver or similar tool under the protrusion on the left side of a damper and steady the damper with the forefinger of your other hand. Gently but firmly pull the damper straight out.

CHECK POINT

If you only need to replace one head, you only need to perform the following steps in regards to that printhead.
B head = left side; B, C, M
C head = right side; LC, LM, Y

CAUTION

Do not squeeze the dampers and try to only touch the edges of the dampers. If pressure is applied to the middle of the dampers, the ink inside will squirt out.

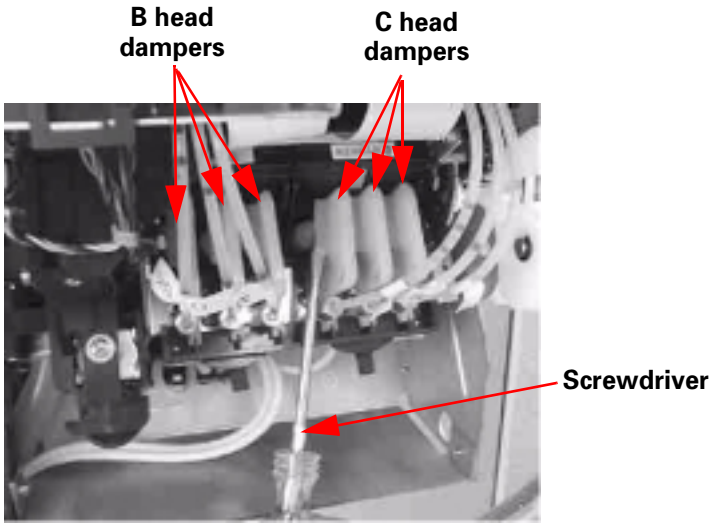


Figure 4-36. Damper Removal

7. Using round-nosed pliers, remove the "Tension Spring, 9.9" from the C head on the right.

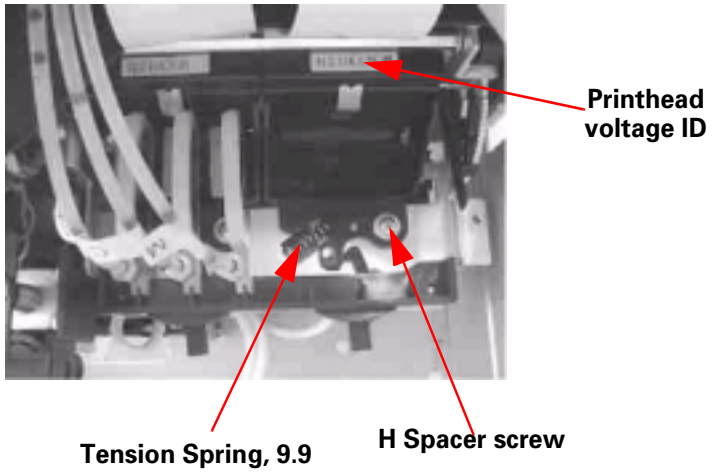


Figure 4-37. Printhead Tension Spring and Screw Removal

8. Remove one screw (CB M3x6), also called the "H Spacer" screw, and then remove the printhead from the carriage.
9. Remove the flat cable from the back of the printhead.

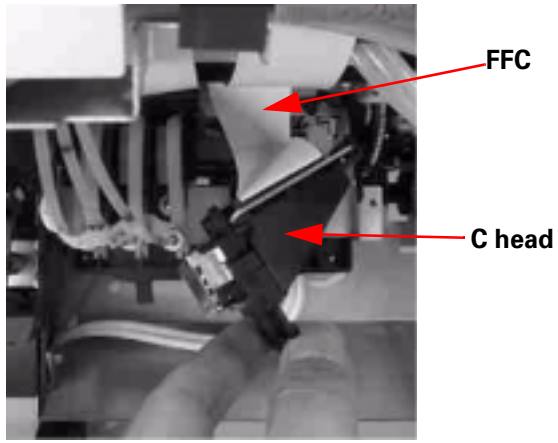


Figure 4-38. Printhead Removal

10. Repeat steps 7 through 9 for the B head.

CHECK POINT

- **When replacing the printheads, fold the flat cable behind the printhead and make sure the printhead snaps fully into place. When properly installed, the printhead ID will be directly behind and at the same height as the PG Cam Shaft. If the PG Cam Shaft does not partially block the line of sight of the printhead ID (when looking at the ID level/ from straight in front), the printhead is not installed properly.**
- **When attaching the dampers to the printhead, follow the same order, left to right, as shown on the control panel: K, C, M, LC, LM, Y.**

4.2.3.4 Removing the CR Board Assembly

1. Remove the R Side Cover as described in “R Side Cover Removal” on page 113.
2. Remove the L Side Cover as described in “L Side Cover Removal” on page 115.
3. Remove the I/C Holder Cover as described in “I/C Holder Cover Removal” on page 115.
4. Remove the H Top Cover as described in “H Top Cover Removal” on page 116.

You may find it helpful to manually release the Carriage Lock by pushing down the cutter and move the carriage away from the capping position.

5. Remove and three screws (CPPM3x6)securing the CR board.

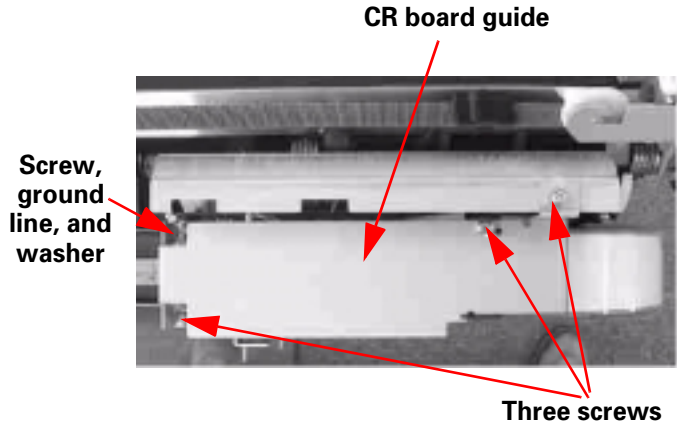


Figure 4-39. CR Board Guide Removal

6. Remove one screw (CP(W)M3x6) securing the ground line, washer (M3), and CR board guide.
7. While holding down the CR Board (left edge), remove two FFC cables from the FFC lock-type connectors.

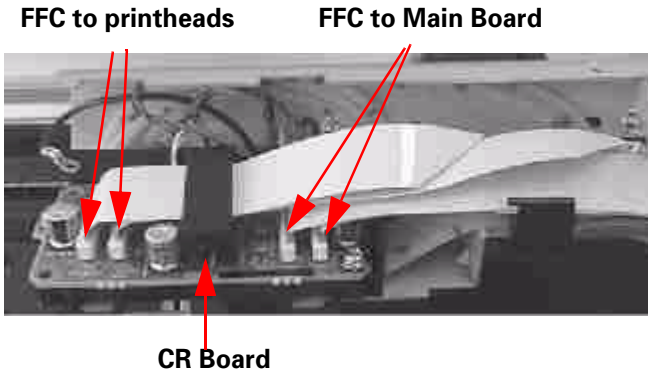


Figure 4-40. CR Board FFC Removal

8. While holding down the CR Board (left edge), remove three connectors from the CR Board.

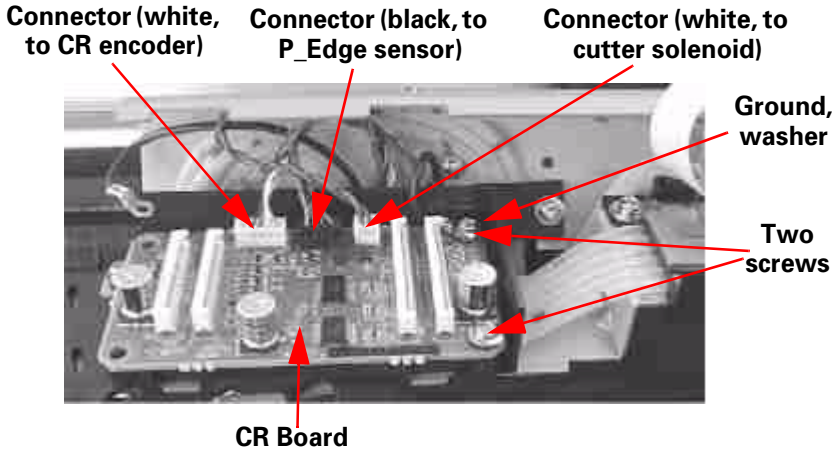


Figure 4-41. Connector and CR Board Removal

9. Remove two screws (CPP M3x8), the ground, and washer (M3). Then remove the CR Board.

4.2.3.5 Removing the Cutter Housing

1. Follow the instructions up to step 8 in "Removing the CR Board Assembly" on page 130.
2. Cut the plastic band near the front of the cutter housing and pull the sensor cables free.

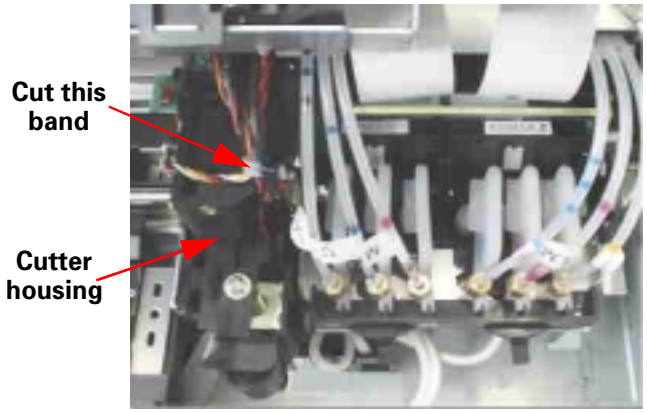


Figure 4-42. Cutter Housing Removal 1/2

3. Remove the four screws (CP(W)M3x8) securing the cutter housing, and slowly pull the cutter housing to the left to release it from the carriage. See Figure 4-45 for a photo of the housing/carriage lock mechanism.

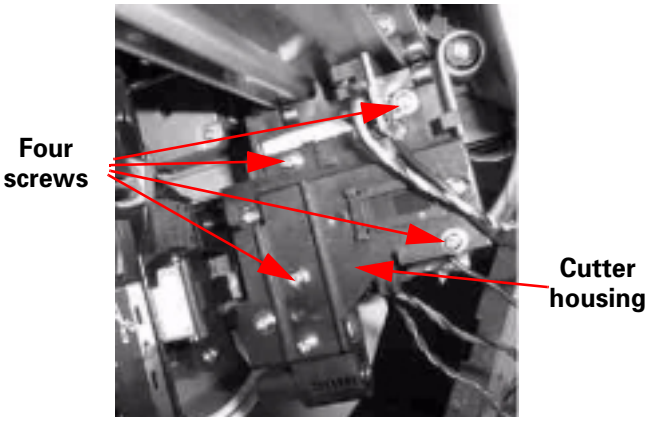


Figure 4-43. Cutter Housing Removal 2/2

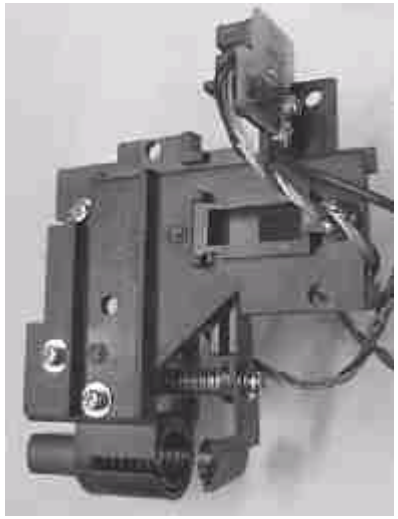


Figure 4-44. Cutter Housing Outer Face

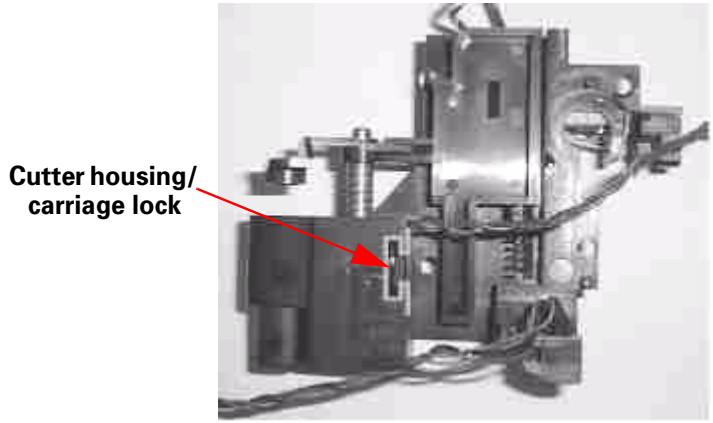


Figure 4-45. Cutter Housing Inner Face

4.2.3.6 Removing the Cutter Solenoid

1. Remove the cutter housing as described in "Removing the Cutter Housing" on page 132.
2. Push the cutter down (second tab from top) while moving the cutter cap (first tab from top) to the right to release it from the CR lock guide. Remove the cutter and cutter spring.
3. Remove the cutter cap, cutter solenoid core, and cutter solenoid spring.

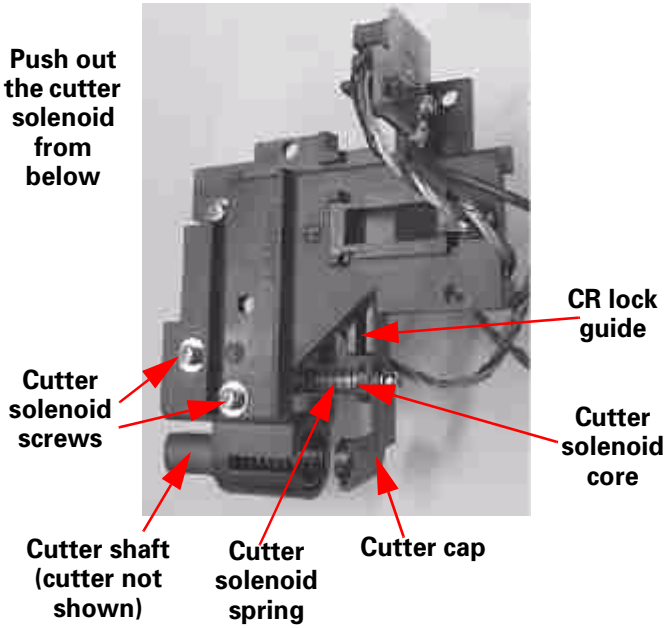


Figure 4-46. Cutter Solenoid Removal

Make sure you correctly reassemble the cutter assembly; otherwise the cutter will not disengage the CR lock and the carriage will not release from the home position.

4. Remove two screws (CP(W)M3x6) securing the cutter solenoid, and then using a (+) driver or similar tool, push the solenoid out from underneath the Cutter Assembly.

4.2.3.7 Removing the CR Encoder Sensor

1. Remove the cutter housing as described in “Removing the Cutter Housing” on page 132.
2. Remove one screw (CPP M3x8) securing the CR Encoder Sensor, ground, and washer (M3). Then remove the CR Encode Sensor.

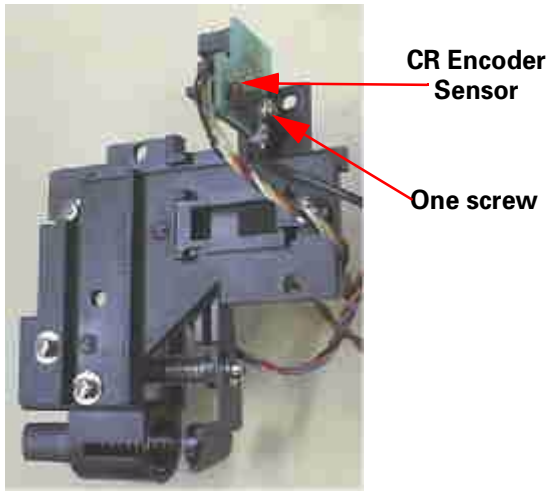


Figure 4-47. CR Encoder Sensor Removal

4.2.3.8 Removing the P_Edge Sensor

1. Remove the cutter housing as described in “Removing the Cutter Housing” on page 132.
2. Remove one screw (CBP M3x6) securing the P_Edge sensor and remove the sensor.

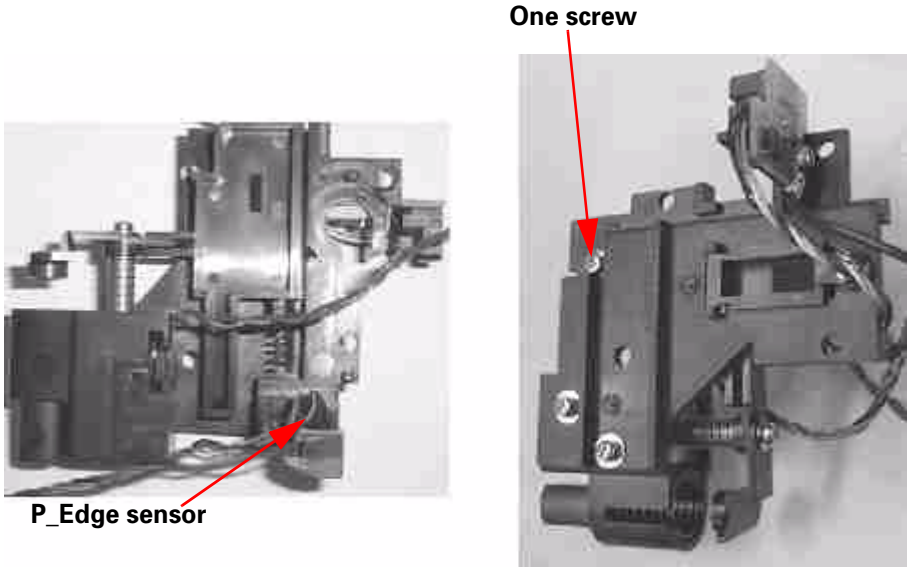


Figure 4-48. P_Edge Sensor Removal

4.2.3.9 Removing the Ink Cartridge Holder & Slots

The Ink Cartridge Holder is made up of six individual slots, one for each color of ink. The following instructions describe how to access and remove one of those slots.

CAUTION

- **Before removing and ink cartridge slot, drain the ink as described in the Clean Head section of "Adjustment Menu" on page 171.**
- **To manually perform an initial ink charge, see "Cleaning Menu" on page 187**

ADJUSTMENT REQUIRED

After disassembly and reassembly of the cover-open sensor, perform the cover-open sensor adjustment as described in "Cover Open Sensor Assembly" on page 192.

1. Drain the ink as described in the Clean Head section of "Adjustment Menu" on page 171.
2. Remove the R Side Cover as described in "R Side Cover Removal" on page 113.
3. Remove the L Side Cover as described in "L Side Cover Removal" on page 115.
4. Remove the I/C Holder Cover as described in "I/C Holder Cover Removal" on page 115.
5. Remove the H Top Cover as described in "H Top Cover Removal" on page 116.
6. Remove the Cover-Open sensor cable and six Ink Cartridge sensor cables from the C299MAIN board (refer to Table 4-4, "C299MAIN Board Connectors," on page 121 for details), and then remove the cables from their harness clamps.
7. Pull out the cables through the opening in the L Side frame, and remove the cables from the four clamps.

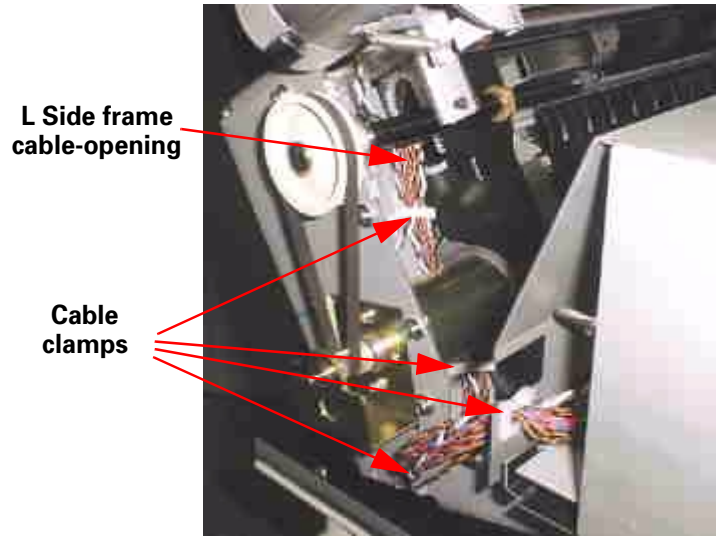


Figure 4-49. Ink Sensor Harness Removal

8. Remove two screws (CPP M3x8) securing the ink tube cover and remove the cover.

Figure 4-50. Ink Tube Cover Removal

9. Remove one screw (CUPS M3x6) securing the Cover-open sensor to the rear of the I/C Holder Frame. Then remove the Cover-open sensor.

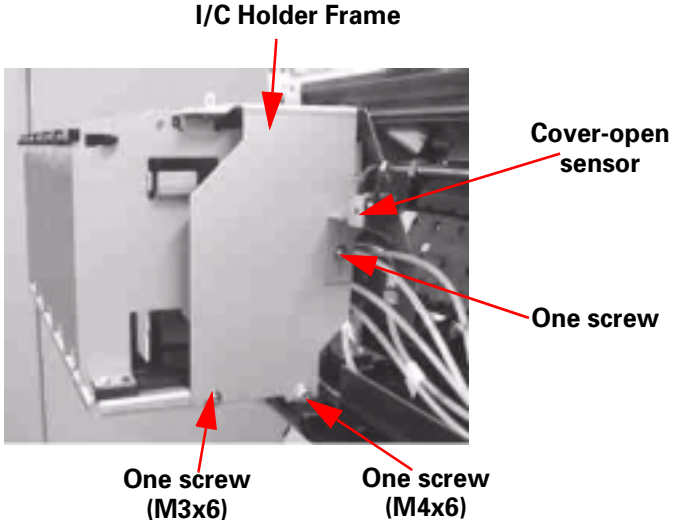


Figure 4-51. Cover-Open Sensor & Holder Frame Removal - R side

10. Remove one screw (CUPS M3x6) and one screw (CUPS M4x6) securing the I/C Holder Frame on the right side.
11. Remove one screw (CUPS M3x6) and one screw (CUPS M4x6) securing the I/C Holder Frame on the left side.

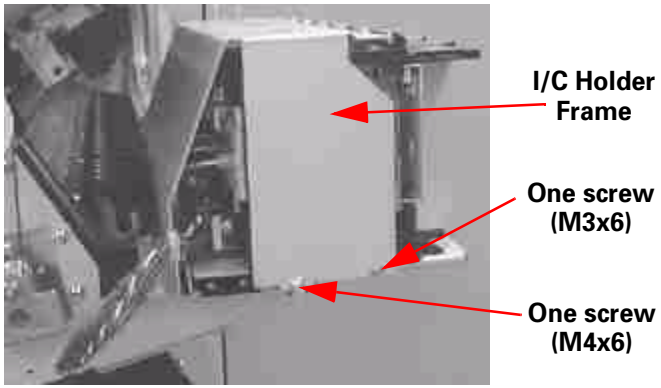


Figure 4-52. Holder Frame Removal - L side

12. Remove six screws (CUPS M3x6) and two screws (CUPS M4x6) securing the I/C Holder Frame on the top.

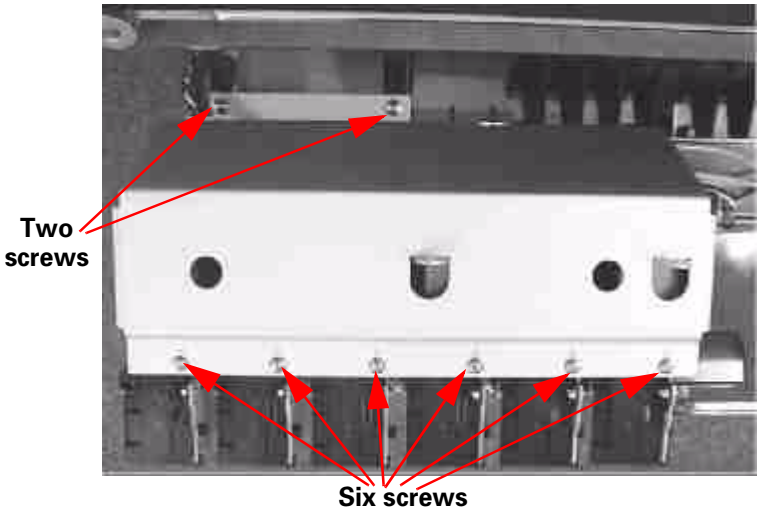


Figure 4-53. Holder Frame Removal - top

13. Remove the Ink Cartridge sensor cables from their harness connectors and separate them.

14. Unscrew the six ink tube screws (M6) between the ink pipes and ink cartridge holder slots. Also remove the O-rings.

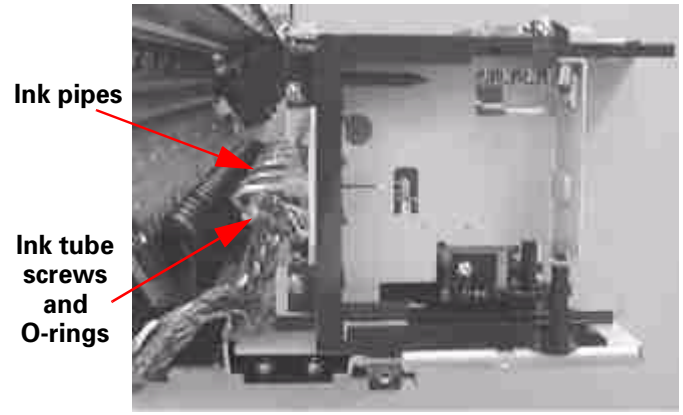


Figure 4-54. Disconnecting the Ink Pipes

15. For the slot you want to remove, remove the corresponding two screws (CPS M3x12) securing the slot frame to the base. Remove that slot frame.

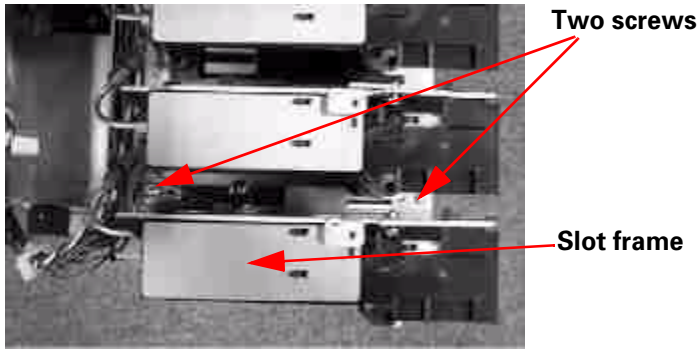


Figure 4-55. Slot Frame Removal (top view)

4.2.3.10 Removing the Ink Cartridge Sensor

1. Remove the Ink Cartridge Slot as described in "Removing the Ink Cartridge Holder & Slots" on page 135.
2. Remove the Ink Cartridge Sensor cable from the hooks as shown below, and then remove the cable completely through the bottom.

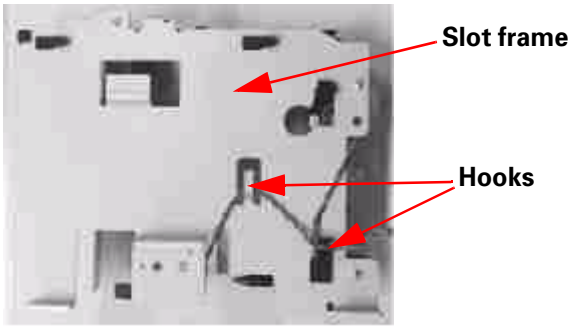


Figure 4-56. Ink Cartridge Sensor Cable Removal

3. Remove the screw (CBS M3x10) securing the Ink Low sensor and remove the sensor.

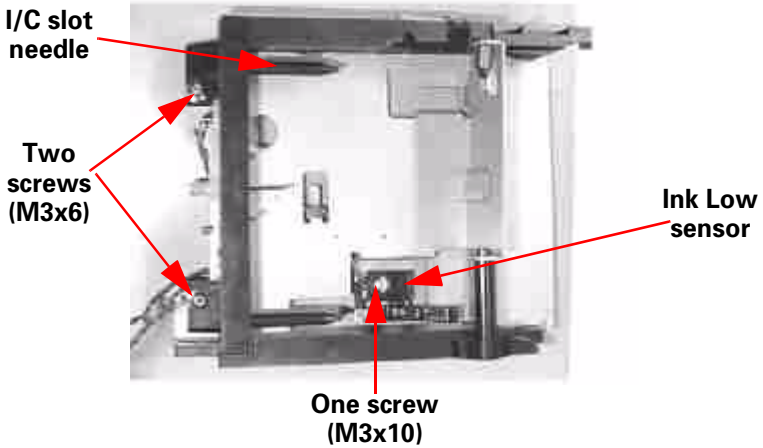


Figure 4-57. Ink Low Sensor Removal

4. Remove two screws (CUPS M3x6) securing the needle frame and remove the frame.
5. Remove one screw (CBS M2x8) securing the I/C sensor to the needle frame and remove the I/C sensor.

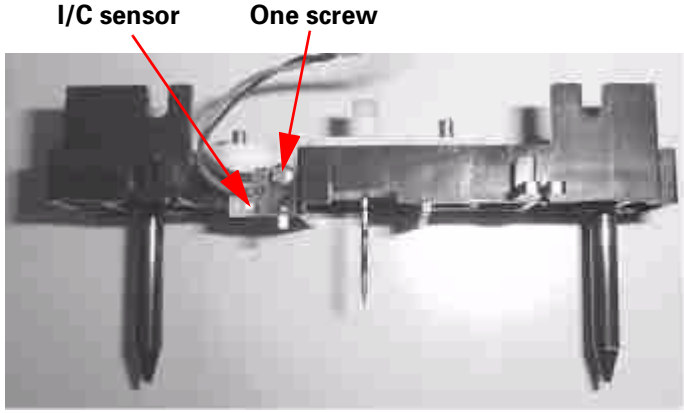


Figure 4-58. I/C Sensor Removal

4.2.3.11 Removing the CR Motor/Pulley Assembly

1. Remove the R Side Cover as described in "R Side Cover Removal" on page 113.
2. Remove the L Side Cover as described in "L Side Cover Removal" on page 115.
3. Remove the Rear Cover as described in "Rear Cover Removal" on page 116.
4. Remove the CR Motor cable from the C299MAIN board connector (refer to Table 4-4, "C299MAIN Board Connectors," on page 121 for details) and harness clamps. Then pull out the cable through the L Side frame opening.
5. Push down the cutter to release the CR lock and move the carriage away from the home position.

CHECK POINT

Before loosening the CR timing belt tension, confirm and write down the current tension. See "CR Timing Belt Tension Adjustment" on page 190 for information on confirming the tension.

6. Loosen the CR Tension shaft on the right side of the printer to release the tension on the CR Timing belt.

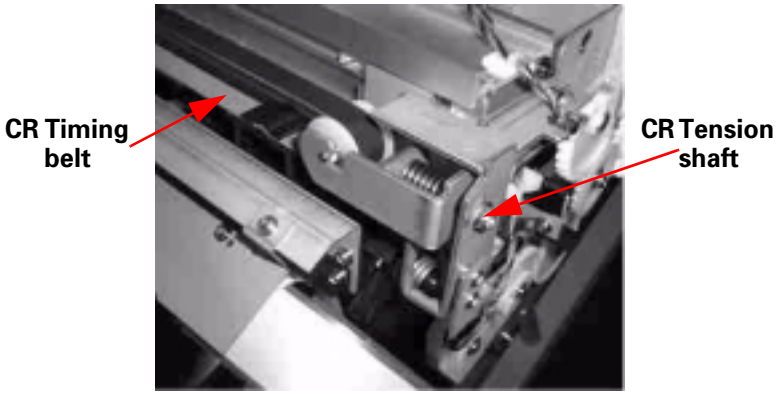


Figure 4-59. Loosening the CR Tension Belt

7. Pull off the CR Timing Belt from the CR Motor pulley on the left side of the printer.
8. Remove the four screws (CP(W) M4x10) securing the CR motor and remove the CR motor.

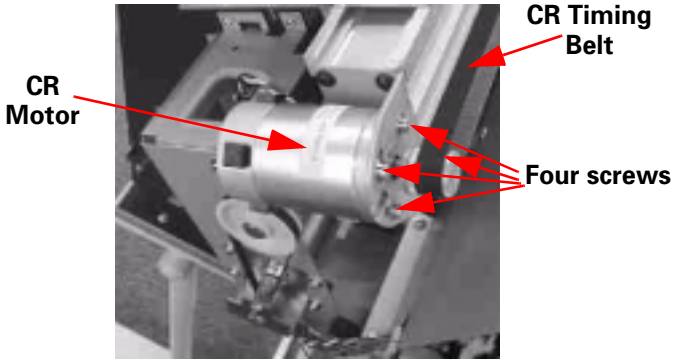


Figure 4-60. CR Motor Removal

ADJUSTMENT REQUIRED

When removing the CR Motor, the following adjustment procedures are required.

- **"CR Timing Belt Tension Adjustment" on page 190**

CAUTION

When reassembling the CR Motor and pulley, move the carriage back-and-forth by hand to make sure the timing belt is exactly in the middle of the pulley and evenly rotating.

4.2.3.12 Removing the PF Motor Assembly

1. Remove the R Side Cover as described in “R Side Cover Removal” on page 113.
2. Remove the L Side Cover as described in “L Side Cover Removal” on page 115.
3. Release the PF Motor harnesses from the harness clamp attached to the inner side of the L Side Frame. Then, disconnect their connectors and take them out from the hole in the L Side Frame.

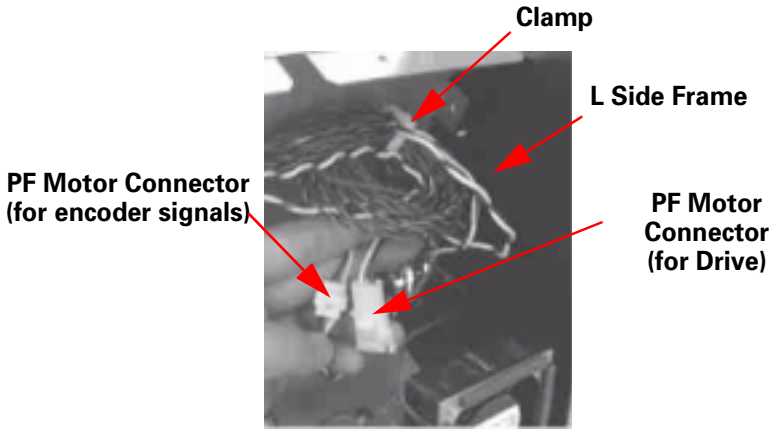


Figure 4-61. Removing the Connectors for the PF Motor Assembly

4. Release the PF motor harnesses from the clamp on the outer side of the L Side Frame.
5. Remove the four (CP(W) M4x10) screws securing the PF motor bracket to the L Side Frame.
6. Remove the PF timing belt from the reduction gear by moving the belt inward.
7. Remove the two (CP(W) M3x8) screws securing the PF Motor Assembly to the PF motor bracket, and then remove the PF motor bearing, PF motor spacer, and PF motor in that order.

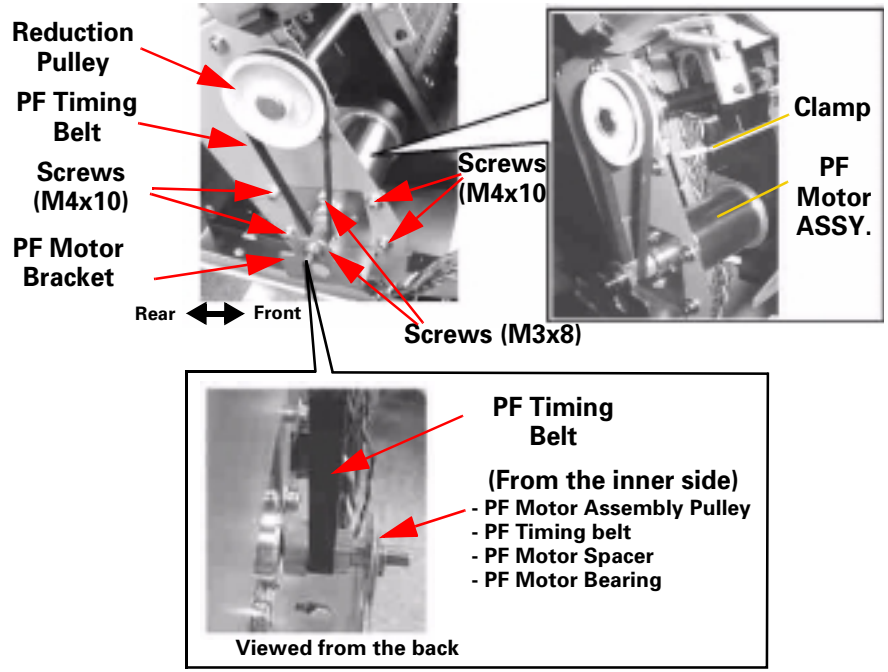


Figure 4-62. Removing the PF Motor Assembly

CAUTION

When assembling the PF Motor Assembly, move the PF timing belt manually and check that the PF timing belt revolves arounds the center of the reduction pulley.

ADJUSTMENT REQUIRED

If you remove the PF motor, make the necessary adjustments listed in “PF Timing Belt Tension Adjustment” on page 190.

4.2.3.13 Removing the Maintenance Assembly

ADJUSTMENT REQUIRED

If you replace the waste ink absorbers because the service call error 0000100 occurs, you need to replace the specified parts* in the Maintenance Assembly. After replacing them, be sure to initialize the following counters:

- **Waste ink counter**
- **Cleaning unit counter**

** Parts to be replaced: Pump Motor, Cap Assembly, Pump Assembly, Cleaner Head, and Flushing Box Assembly*

NOTE: The above mentioned parts are available as a kit:
[Description] MAINTENANCE KIT
[Parts code] 1054038

CAUTION

When you replace the Maintenance Assembly, ink may spill from the ink tube connected to the pump assembly. Therefore, wipe the ink around the ends of the ink tubes preliminarily.

1. Remove the R Side Cover as described in “R Side Cover Removal” on page 113.
2. Remove the Rear Cover as described in “Rear Cover Removal” on page 116.
3. Disconnect the harness for the Pump Motor Assembly from its connector on the main board, and take the harness out from the hole in the R side frame.
4. Release the one Pump Motor Assembly harness and two sensor harnesses from the clamp on the Maintenance Base Assembly.

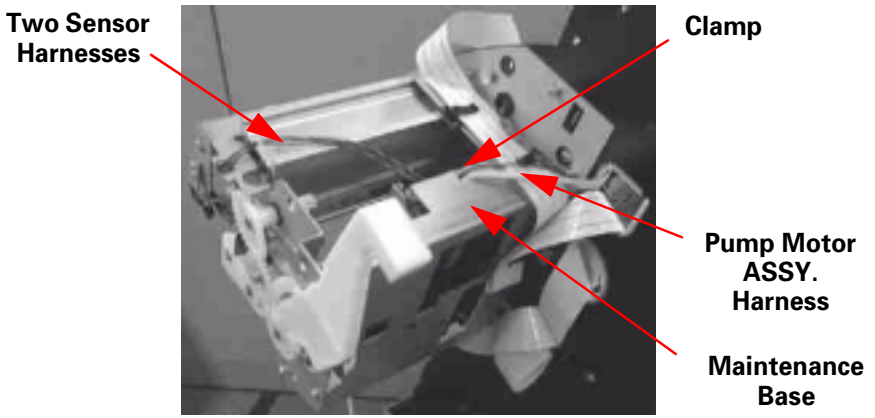


Figure 4-63. Removing the Harnesses - 1

5. Release the panel FFC and CR FFC from the cable clamps at the back and bottom of the Maintenance Base Assembly, respectively.

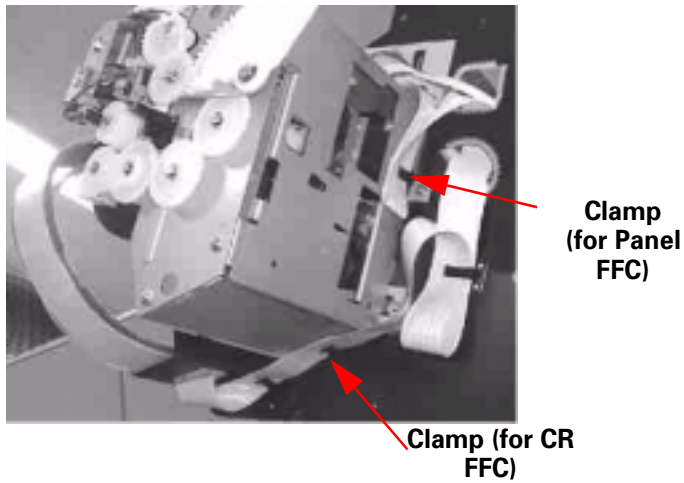


Figure 4-64. Removing the Harnesses - 2

6. Perform steps 1 and 2 of the “Replacing the Waste Ink Pads” on page 125.
7. Remove the four (CUPS M4x6) screws securing the Maintenance Base Assembly to the printer main body and remove the Maintenance Base Assembly.

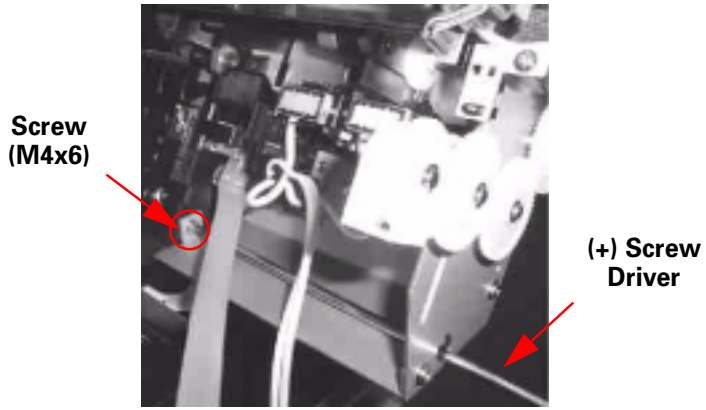


Figure 4-65. Removing the Maintenance Base Assembly - 1

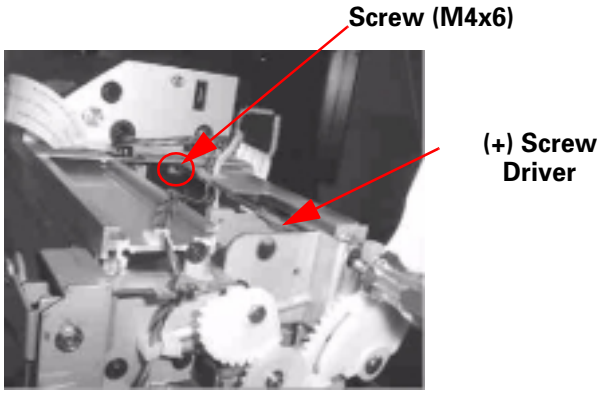


Figure 4-66. Removing the Maintenance Base Assembly - 2

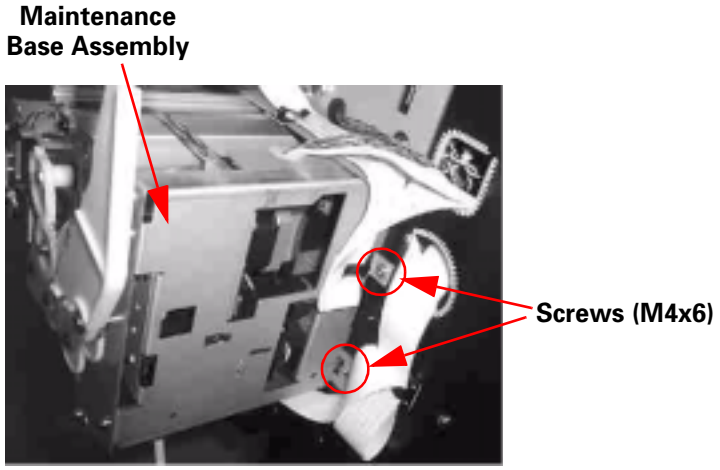


Figure 4-67. Removing the Maintenance Base Assembly - 3

8. Shift the Maintenance Base Assembly to the left to release the joint with the R Side Frame. Then, watching out for the harnesses, lower the Maintenance Base Assembly and remove it.

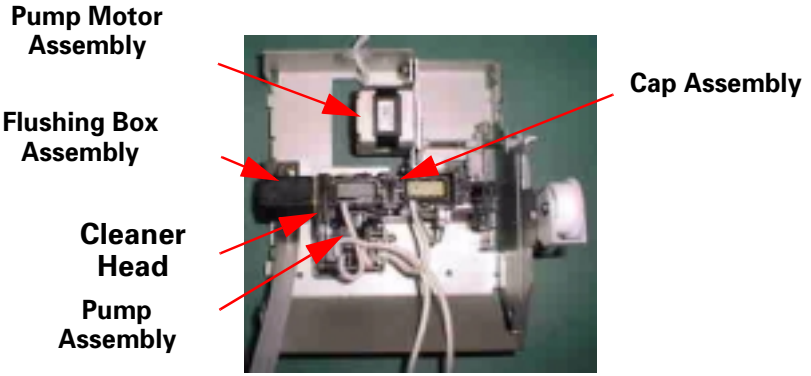


Figure 4-68. Maintenance Base Assembly

4.2.3.14 Removing the Pump Motor Assembly

1. Remove the Maintenance Assembly as described in “Removing the Maintenance Assembly” on page 141.
2. Release the harness for the Pump Motor Assembly from the cable clamp.
3. Remove the three (CP(W) M3x8) screws securing the Pump Motor Assembly to the Maintenance Base Assembly and remove the Pump Motor Assembly.

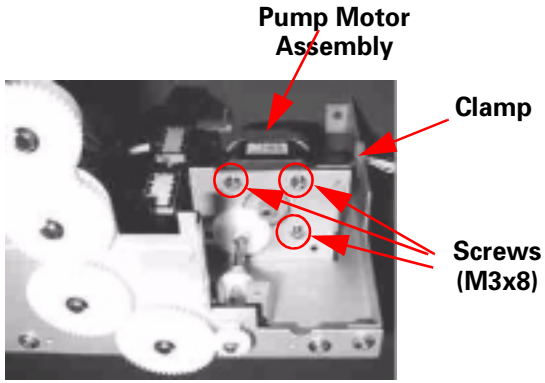


Figure 4-69. Removing the Pump Motor Assembly

4.2.3.15 Removing the Cap Assembly

1. Remove the Maintenance Assembly as described in "Removing the Maintenance Assembly" on page 141.
2. Remove the four (CUPS M4x3) screws securing the R Side Frame Sub Assembly and remove the R Side Frame Sub Assembly.

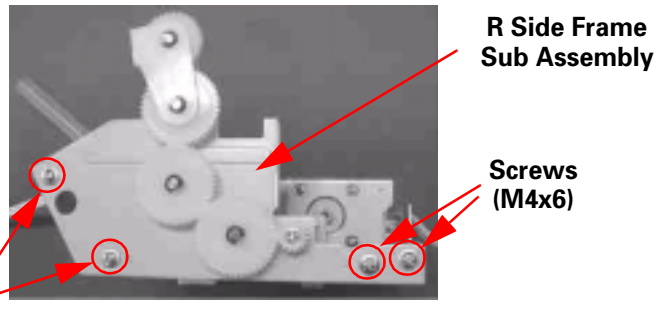


Figure 4-70. Removing the R Side Frame Sub Assembly

3. Remove the one (CUPS M3x6) screw securing the Cap Assembly, disconnect the two tubes from the Pump Assembly, and remove the Cap Assembly.

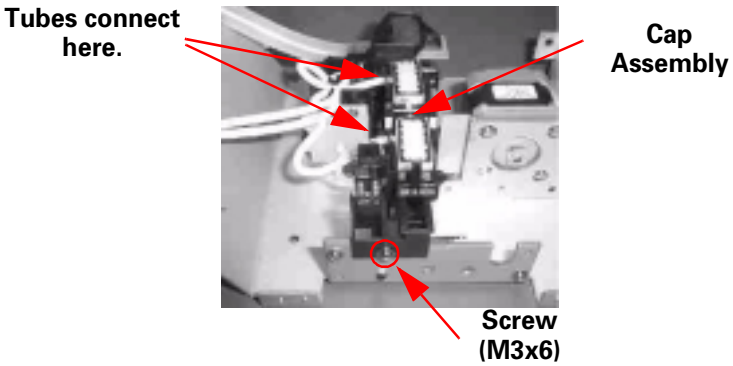


Figure 4-71. Removing the Cap Assembly

CAUTION

Check for the points below when removing/mounting the Cap Assembly.

- **Push the cap part down to the valve part and check that the cap part rebounds with spring force.**
- **Check that the valve part is not dislocated.**

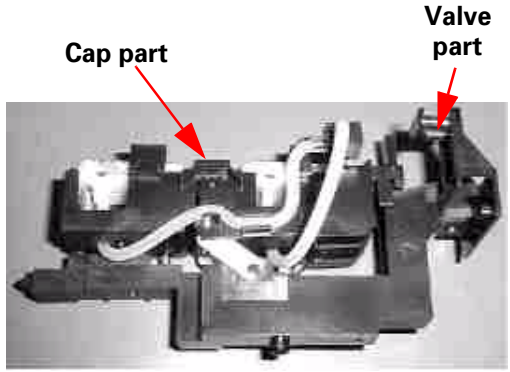


Figure 4-72. Cap Assembly

4.2.3.16 Removing the Pump Assembly

1. Remove the Maintenance Assembly as described in "Removing the Maintenance Assembly" on page 141.
2. Remove the Cap Assembly as described in "Removing the Cap Assembly" on page 144.
3. Remove the two (CUPS M3x6) screws securing the pump reduction gear bracket and remove the pump reduction gear bracket and pump gear.

NOTE: *When mounting the pump reduction gear, make sure the reduction gear mesh with the corresponding gear.*

4. Remove the one (CUPS M3x6) screw securing the Pump Assembly and remove the Pump Assembly.

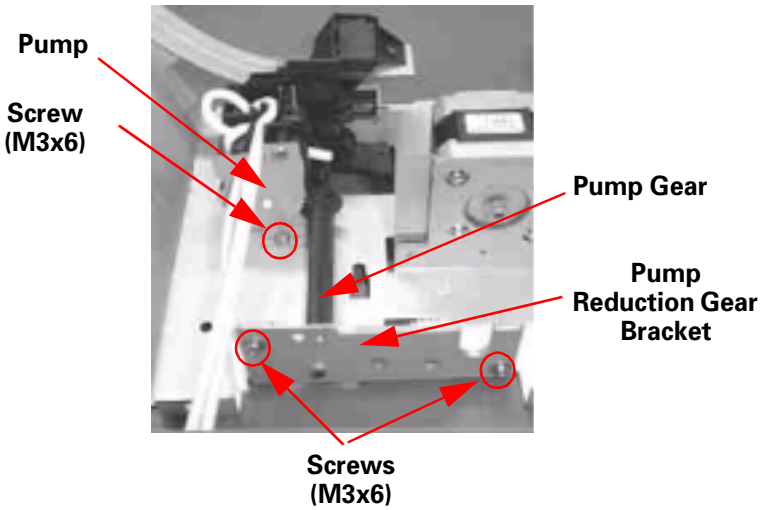


Figure 4-73. Removing the Pump Assembly

4.2.3.17 Removing the Cleaner Head

1. Remove the Maintenance Assembly as described in "Removing the Maintenance Assembly" on page 141.
2. Remove the Cap Assembly as described in "Removing the Cap Assembly" on page 144.
3. Using tweezers, release the joint for the concave part of the Cleaner Head and the convex part of the Cleaner Head support part in the Pump Assy. Then remove the Cleaner Head by pulling it upward.

NOTE: *Set the Cleaner Head in the correct direction.*

NOTE: *Do not touch the Cleaner Head with your bare hands.*

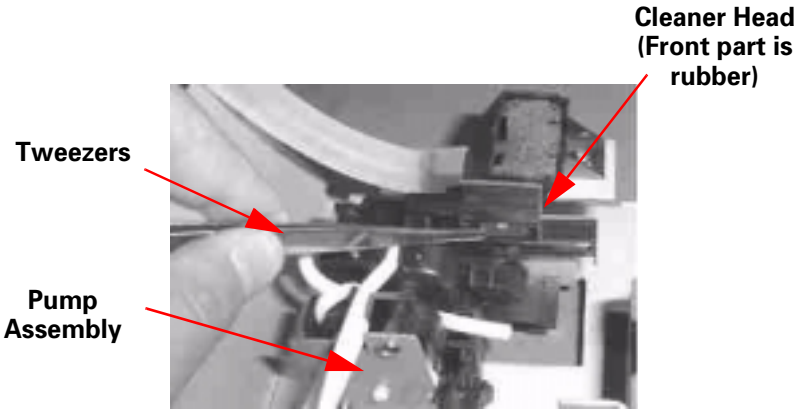


Figure 4-74. Removing the Cleaner Head

4.2.3.18 Removing the Flushing Box Assembly

1. Remove the Maintenance Assembly as described in “Removing the Maintenance Assembly” on page 141.
2. Using tweezers, remove the Cleaner Head from the Pump Assembly.

NOTE: *Make sure the Cleaner Head surface is free from any dirt, dust, or grease. Also, when mounting it, use tweezers to keep the wiping side of the Cleaner Head clean.*

3. Remove the one (CUPS M3x6) screw securing the Flushing Box Assembly and remove the Flushing Box Assembly.

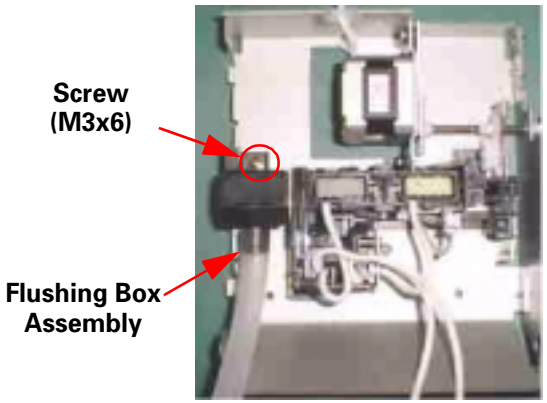


Figure 4-75. Removing the Flushing Box Assembly

4.2.3.19 Removing the HEAD_SLIDE Sensor Assembly

1. Remove the R Side Cover as described in “R Side Cover Removal” on page 113.
2. Remove the Rear Cover as described in “Rear Cover Removal” on page 116.
3. Disconnect the harness for the HEAD_SLIDE Sensor Assembly from its connector on the main board and take the harness out from the hole in the R Side Frame.
4. Push the carriage lock using your finger to unlock the carriage and move the carriage from the home position to the left.
5. Remove the one (CP(W) M3x6) screw securing the HEAD_SLIDE Sensor Assembly and remove the HEAD_SLIDE Sensor Assembly.
6. Release the harness for the HEAD_SLIDE Sensor Assembly from the four cable clamps on the Maintenance Assembly and CR Rail Assembly.

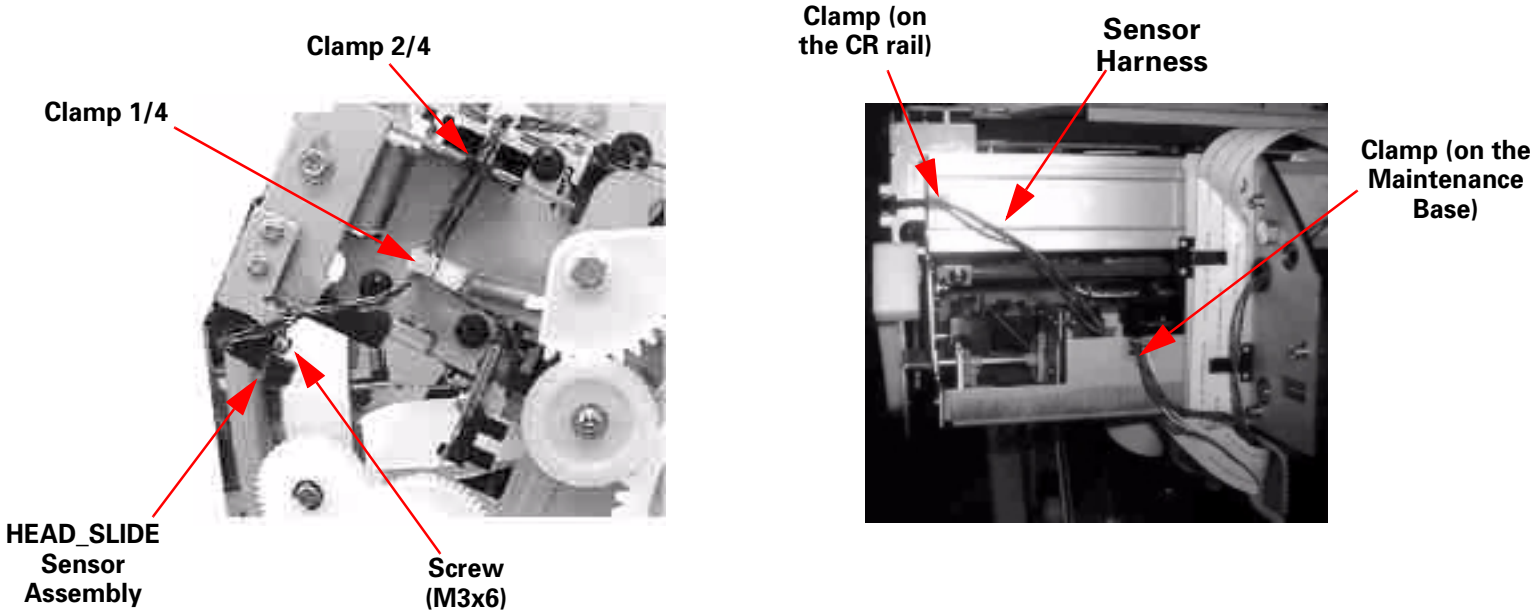


Figure 4-76. Removing the HEAD_SLIDE Sensor Assembly

4.2.3.20 Removing the CR_HP Sensor

1. Remove the R Side Cover as described in “R Side Cover Removal” on page 113.
2. Push the carriage lock using your finger to unlock the carriage and move the carriage from the home position to the left.
3. Disconnect the harness from the CR_HP Sensor connector.
4. Release the hook fixing the CR_HP Sensor and remove the CR_HP Sensor.

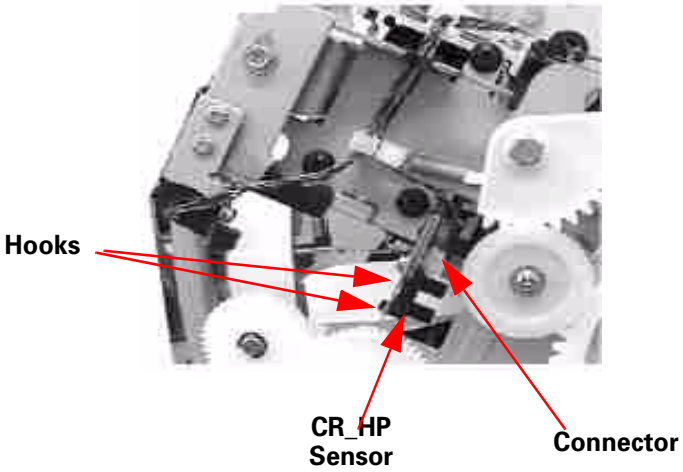


Figure 4-77. Removing the CR_HP Sensor

4.2.3.21 Removing the Release Sensor/P_THICK Sensor

Right: Release Sensor that detects the paper hold sensor condition (set or released).

Left: P_THICK Sensor that detects paper thickness (normal or thick)

1. Remove the R Side Cover as described in "R Side Cover Removal" on page 113.
2. Remove the L Side Cover as described in "L Side Cover Removal" on page 115.
3. Remove the I/C Holder Cover as described in "I/C Holder Cover Removal" on page 115.
4. Remove the H Top Cover as described in "H Top Cover Removal" on page 116.
5. Push the paper hold lever down to the rear.
6. Remove the one (CUPS M3x6) screw securing the sensor bracket and remove the bracket along with the both sensors.

NOTE: *Sensor bracket position is adjusted at factory. Therefore, be sure to mark its current position before removing the screw.*

7. Remove the harness from the connector of the Release/P_THICK Sensor.
8. Unhook the sensor from the sensor bracket and remove the sensor.

ADJUSTMENT REQUIRED

If you move the sensor bracket position, perform the necessary adjustment listed in Table 5-2, "Service Parts & Required Adjustments," on page 155.

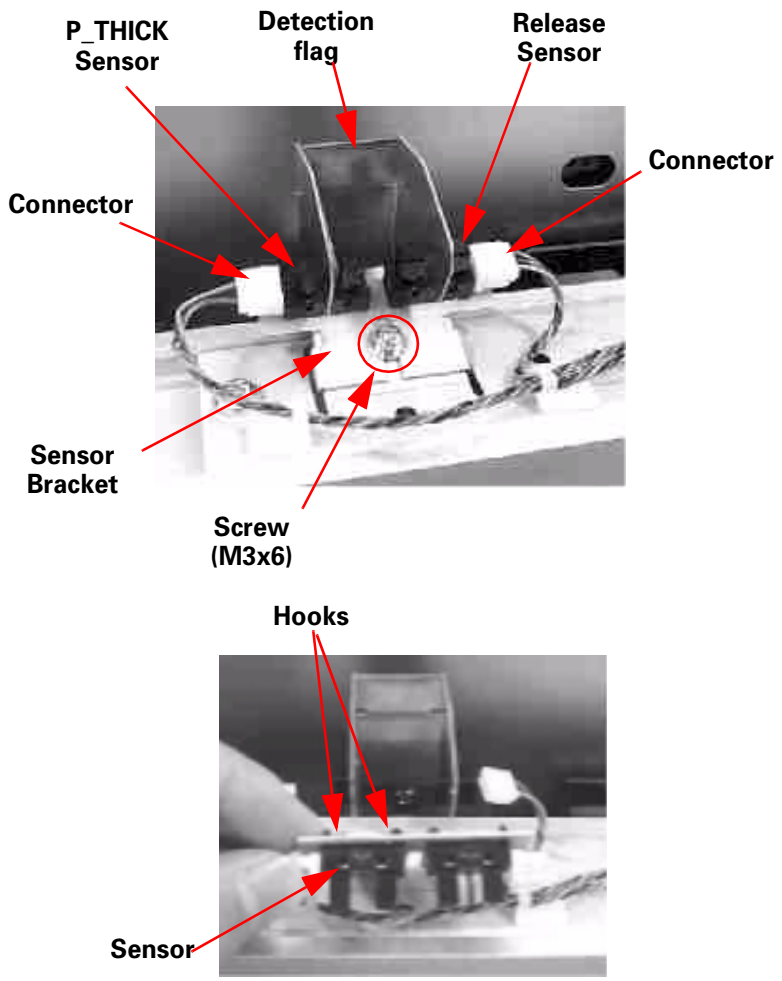


Figure 4-78. Removing the Release Sensor/P_THICK Sensor

4.2.3.22 Removing the P_FRONt Sensor Assembly

1. Remove the R Side Cover as described in “R Side Cover Removal” on page 113.
2. Remove the L Side Cover as described in “L Side Cover Removal” on page 115.
3. Remove the I/C Holder Cover as described in “I/C Holder Cover Removal” on page 115.
4. Remove the H Top Cover as described in “H Top Cover Removal” on page 116.
5. Remove the Rear Cover as described in “Rear Cover Removal” on page 116.
6. Remove the paper Guide L2 as described in “Paper Guide L2 Removal” on page 117.
7. Disconnect the harness for the P_FRONT Sensor Assembly from the connector on the main board and drop the harness in the hole on the right.
8. Push the paper hold lever down to the front.
9. Remove the three (CUPS M4x6) screws securing the Paper Guide L, and remove the Paper Guide L by slowly taking it out toward upper front.

NOTE: *To remove the left screw, insert a screw driver from the space of the I/H Assembly, the third one from the right.*

10. Remove the two (CP(W) M2x8) screws securing the P_FRONT Sensor Assembly and remove the P_FRONT Sensor Assembly.

NOTE: *P_FRONT Sensor Assembly position is adjusted at factory. Therefore, be sure to mark its current position before removing the screws.*

ADJUSTMENT REQUIRED

If you replace the P_FRONT Sensor Assembly, perform the necessary adjustment listed in Table 5-2 in Chapter 5.

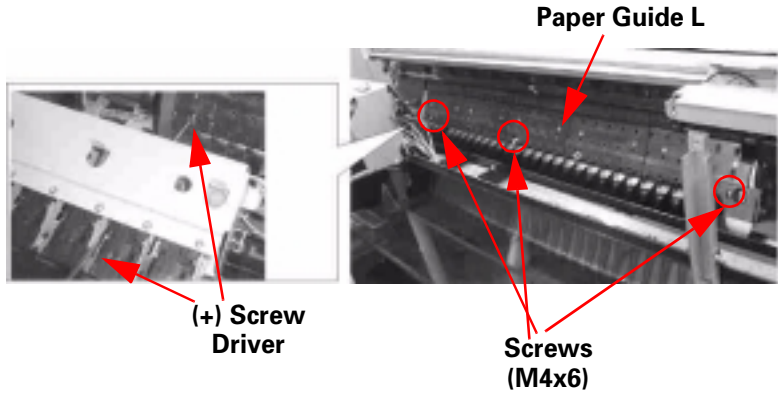


Figure 4-79. Removing the Paper Guide L

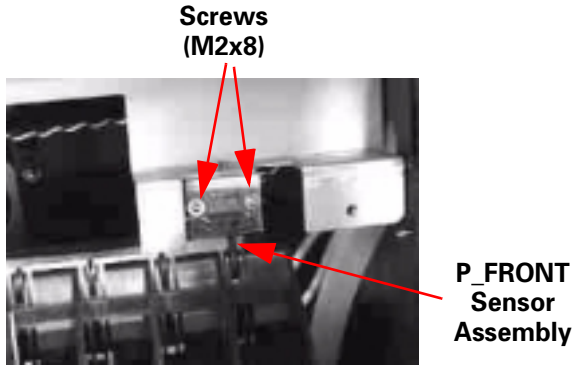


Figure 4-80. Removing the P_FRONT Sensor Assembly

4.2.3.23 Removing the P_REAR Sensor Assembly

1. Remove the R Side Cover as described in “R Side Cover Removal” on page 113.
2. Remove the L Side Cover as described in “L Side Cover Removal” on page 115.
3. Remove the I/C Holder Cover as described in “I/C Holder Cover Removal” on page 115.
4. Remove the H Top Cover as described in “H Top Cover Removal” on page 116.
5. Remove the Rear Cover as described in “Rear Cover Removal” on page 116.
6. Disconnect the harness for the P_REAR Sensor Assembly from its connector on the main board and drop the harness in the hole on the right.
7. Push the paper hold lever down to the front.
8. Remove the five (CBS M4x6) screws securing the Paper Guide U, and remove the Paper Guide U by slowly taking it out toward the upper front.

NOTE: *When removing/installing the Paper Guide U, be careful not to mar the P_REAR Sensor Assembly with the edge of the sensor inspection window.*

9. Remove the two (CP(W) M2x8) screws securing the P_REAR Sensor Assembly and remove the P_REAR Sensor Assembly.

NOTE: *P_REAR Sensor Assembly position is adjusted at factory. Therefore, be sure to mark its current position before removing the screws.*

ADJUSTMENT REQUIRED

If you replace the P_REAR Sensor Assembly, perform the necessary adjustment listed in Table 5-2 in Chapter 5.

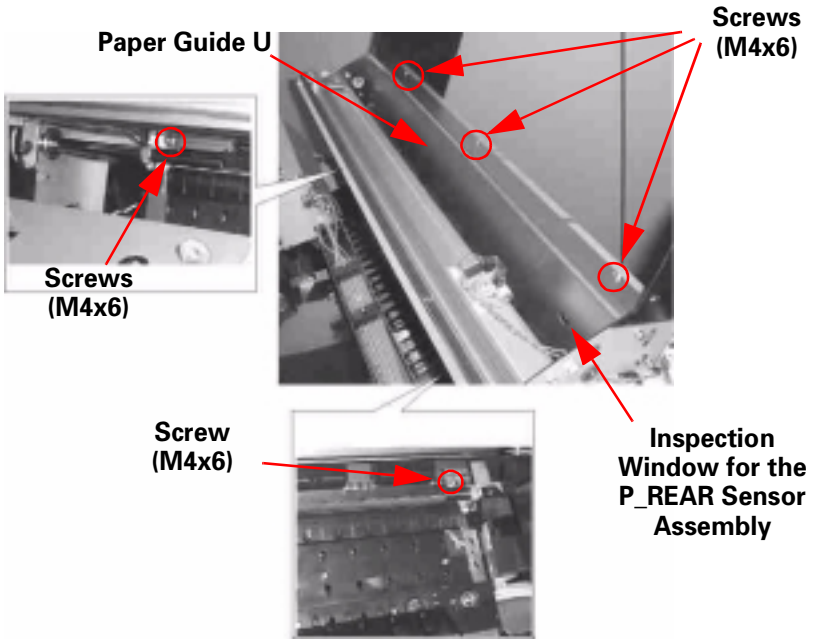


Figure 4-81. Removing the Paper Guide U

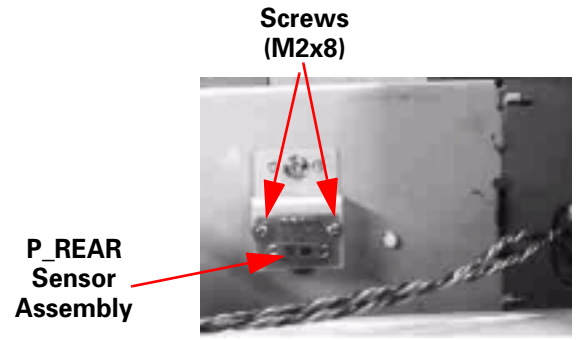


Figure 4-82. Removing the P_REAR Sensor Assembly

4.2.3.24 Removing the Cover Sensor Assembly

1. Perform the Steps 1 to 13 in "I/C Holder Cover Removal" on page 115.
2. Separate the harnesses for the Cover Sensor Assembly from the six harness connectors for the Ink Cartridge Sensor and harness bundle for the Cover Sensor Assembly.
3. Remove the two (CP(W) M2x12) screws securing the Cover Sensor Assembly and Cover SW Holder, and remove the Cover Sensor Assembly.

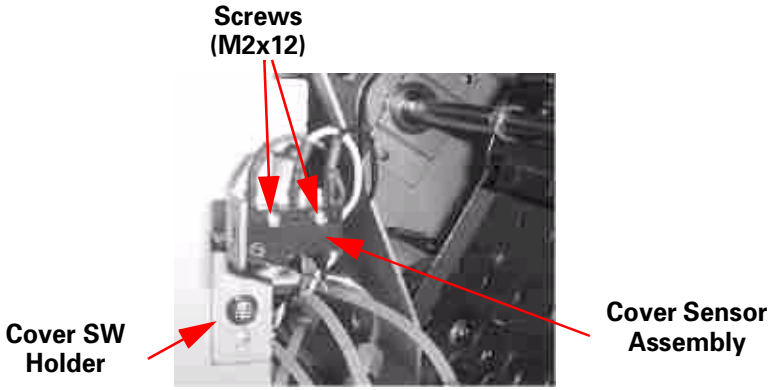


Figure 4-83. Removing the Cover Sensor Assembly

ADJUSTMENT REQUIRED

Perform the necessary adjustment listed in Table 5-2 in Chapter 5. This adjustment is required to make the Cover Sensor Assembly work interlocking with the close/open status of the Front Cover.

CHAPTER

5

ADJUSTMENT

5.1 Adjustment Outline

This section describes the adjustment procedures necessary after replacing certain parts and explains how to perform those adjustment procedures.

Before beginning any adjustment procedure, make sure of the following.

CAUTION

- **Before starting any adjustment procedure, find the adjustment procedure you need to perform in Table 5-2 on page 155 and verify the order or the tasks you need to perform.**
- **When performing an adjustment procedure, double-check the detailed instructions and caution information for that procedure; otherwise you may damage the printer.**
- **To make proper adjustment, make sure to avoid strong light (sun-light) around the printer. Since this printer uses photo-sensitive devices (photo-sensors), the printer may not function properly if it is operated under such conditions.**
- **When replacing the following, always install a new ink cartridge.**
  - **Printheads**
  - **Main Board**
  - **"Holder, Assembly, Valve"**

5.1.1 Adjustment Tools

The necessary tools for performing adjustment procedures on this printer are shown below.

Table 5-1. Adjustment Tools

Name	Part Code	Notes
Tension Gauge	1054053/ standard tool acceptable	Max. 10,000g
Tension Gauge #F712	B747700300/ standard tool acceptable	Max. 2500g
Straight edge/ruler 1000mm #F713	1047746/ standard tool acceptable	Length: 1000mm
Scale Stopper	1047745/ standard tool acceptable	Used in combination with #F713 (0.1mm scale)
Flash Memory Card #F727	1050073 standard PC card acceptable	Type: 2MB Flash memory card Standard: Type-II (PCMCIA Rel 2.1/ JEIDA Ver. 4.2) Voltage: 5V Read/Write
Self-Training Kit #F708	1047105	CD-ROM based

5.1.2 Adjustment Items

All parts that require adjustment when replaced are listed in the table below.

Table 5-2. Service Parts & Required Adjustments

Service Operation	Step Number	Adjustment Items	Refer to
Printhead replacement		<Start the Self-Diagnostic Function>	page 161
	1	• Capping position adjustment	page 173
	2	• Head rank input (and initial ink charge)	
	3	• Head nozzle check	
	4	• Head slant adjustment (B/C heads)	page 176
	5	• Head Height (Linear) adjustment	page 177
	6	• Bi-D adjustment	
	7	• Head Gap adjustment	
	8	• Test print	
	9	<Reset the Head unit counter>	
C299 Main Board replacement	1	<Parameter backup> *1	
	2	<Firmware update>	page 160
		<Self-Diagnostic Function>	page 161
	3	• Capping position adjustment	page 173
	4	• Write D/A Value	
	5	• Head rank input (initial ink charge not necessary)	page 166
	6	• Bi-D adjustment	
	7	• Head Gap adjustment	
	8	• Flush point adjustment	
	9	• Feed adjustment	
	10	• Top/bottom adjustment	
	11	• Adjust Rear Sensor position	
	12	• Paper-Related Sensors adjustment	
	13	• Test print	
	14	<Replace the Waste Ink Pads and clear the counter>	
	15	• Write USB-ID	

Table 5-2. Service Parts & Required Adjustments (continued)

Service Operation	Step Number	Adjustment Items	Refer to
CR Motor replacement	1	<CR Steel belt tension adjustment>	page 190
		Required tool: 10,000g Tension Gauge	
		<Self-Diagnostic Function>	page 161
	2	• Capping position adjustment	page 173
	3	• Bi-D adjustment	
	4	• Head Gap adjustment	
	5	• Flush point adjustment (L/R)	
	6	• Top/bottom adjustment	
	7	• Test print	
PF Motor replacement	1	<CR Steel belt tension adjustment>	page 190
		Required tool: 2,500g Tension Gauge	
		<Self-Diagnostic Function>	page 161
	2	• Feed adjustment	page 182
	3	• Top/bottom adjustment	
	4	• Adj Rear Sensor position	
	5	• Test print	
Sensor assembly replacement • P Front • P Edge	1	<Self-Diagnostic Function> • Top/bottom adjustment	page 161 page 183
Sensor assembly replacement P Rear	1	<Self-Diagnostic Function> • Top/bottom adjustment	page 161 page 183
Sensor assembly replacement P Thick	1	<Self-Diagnostic Function> • From the "Test" menu select "Sensor" and then "Paper Thickness" •Required tool: Schema Gauge	page 161 page 191

Table 5-2. Service Parts & Required Adjustments (continued)

Service Operation	Step Number	Adjustment Items	Refer to
Sensor assembly replacement CR HP Sensor	1	<Self-Diagnostic Function> • Capping position adjustment	page 161 page 173
Sensor assembly replacement Cover Sensor	1	<Self-Diagnostic Function> • From the "Test" menu select "Sensor" and then "Cover"	page 161 page 192

*1: If you can backup the parameters, replace the main board and upload the parameters into the new board. I successful backup means no adjustment is required using the self-diagnostic function.

5.2 Adjustment Steps

This section describes the detailed steps for performing the adjustment procedures listed in Table 5-2.

5.2.1 Parameter Backup

The Main Board contains NVRAM (EEPROM) which is used to store the parameter information and firmware commands that control the printer. For all corresponding printer parts, the individual and unique adjustment information and part codes are stored here, which allows the Main Board and Printer Mechanism to work together smoothly. This information includes adjustment parameters and must be kept up to date for the printer to work properly.

Therefore, to replace the Main Board, you need to

- ☐ back up the parameters as described below
- ☐ replace the C299 Main board as described in Chapter 4
- ☐ download the parameters as described on the next page
- ☐ upload the firmware as described on page 160
- ☐ adjust the sensors as described on page 166.

REQUIREMENTS FOR BACKUP

- ☐ #F727 Flash Memory Card (1050073))
  (Conforms to PCMCIA Rel 2.1/JEIDA Ver 4.2 (Type II) / 5V Read/Write operation)
  Part # 1050073 (Fujitsu: MB98A81183-15)
- ☐ Memory card writing utility
  (i.e. Adtech CardUT97)
- ☐ PC with memory card writer or stand alone memory card writer
- ☐ IPL contained in the #F733 Self-Training Kit
  Self-Training Kit code: 1053426
  Folder: \Tool\Backup\
  File: Pbuset_B.Bin
  Before backing up the parameters to the PC card, the above file must be copied to the Flash Memory Card:

The backup card you use in these steps only works with the Stylus Pro 7000; do not attempt to use it with other printers.

BACKING UP DATA FROM THE MAIN BOARD TO THE PC CARD

1. Remove the access cover from the rear of the printer, and make sure the Control Panel unit is attached.
2. Insert the PC card (top facing the outside of the printer) into the PC card slot connector on the Main Board, and then turn on the printer.
3. Make sure the following message appears on the LCD, and wait for the procedure to begin.

Wait:F->M Push:M->F

4. The backup procedure starts about 15 seconds after the message appears.

Flash -> Mcard

CAUTION

Do not touch the Control Panel buttons during this procedure. Doing so causes the PC card to download its data to the Main Board's Flash memory instead of backing up the data in Flash memory. This overwrites the Flash memory so be careful.

5. When the backup procedure is finished, the following message appears.

End [Success]

6. After making sure the printer is finished, turn off the printer and remove the PC card.

DOWNLOADING THE DATA FROM THE PC CARD TO NEW BOARD

1. Make sure the access cover is removed from the top of the Upper Paper Guide, and make sure the Control Panel is attached.
2. Insert the PC card containing the backup data (top facing the outside of the printer) into the PC card slot connector on the Main Board, and turn on the printer.
3. Make sure the following message appears on the LCD.

Wait:F->M Push:M->F

4. Press any button on the Control Panel to start the download procedure.

Mcard -> Flash

CAUTION

You need to press one of the Control Panel buttons within 15 seconds; otherwise the printer will start the backup procedure instead of the download procedure. This overwrites data stored in the PC card with data stored in the Main Board Flash memory.

5. When the download procedure is finished, the following message appears.

End [Success]

6. After making sure the printer is finished, turn off the printer and remove the PC card.
7. Replace the access cover on the rear of the printer.

BACKUP/DOWNLOAD ERROR RECOVERY

If an error occurs during the backup or download procedure, the following message appears on the LCD.

End [Error]

If you see the message above, one of the following errors has occurred.

- Flash memory/ write error
- Flash memory/ erase error
- PC card/ write error
- PC card/ erase error

Using a different PC card, try the operation again. If a different PC card does not solve the problem, there is a problem with the flash memory on the Main Board and a backup is not possible.

RANGE OF BACKED UP PARAMETERS

The following parameters on the C299 Main Board are backed up during the back up operation.

Flash ROM addresses 000~5FF (except for 120~13F)

5.2.2 Firmware Update

Since the firmware is written into the Flash ROM on the Main Board, to replace the Main Board you need to write the firmware to the new Flash ROM on the new Main Board as described below.

CAUTION

- **After updating the firmware, the printer must perform and initial ink charge. For this purpose, always follow the instructions below after updating the firmware.**
  1. Turn the printer on and start the self test function. Then select: "Test: Parameter" -> "Parameter: update"
  2. Select "Update: Ink Parameter"
  3. Select "Init. Ink Flag" and then "Reset".
  4. Turn the printer off and back on.
- **The backup and card you use in these steps only works with the Stylus Pro 7000; do not attempt to use it with other printers.**

CHECK POINT

Use the appropriate firmware update tool for the method you use:
PC parallel interface (Compatibility mode): xxxxxxxx.IPL
PC memory card: xxxxxxxx.ROM

UPDATING FIRMWARE VIA THE PC

1. Make sure the printer is in the ready state; Ready appears on the LCD.
   Press the SelecType button multiple times until "Printer Status Menu" appears. Then press the Item button.
   "Version B xxxxx" appears.
   Write down the version number.
2. Turn off the printer, remove the power cable, and connect the interface cable (Parallel/Compatible Mode) between the PC and printer.
3. While pressing the following buttons, turn on the printer.

   [Paper Source] + **[Cut/Eject]** + **[Cleaning]**

   The LCD panel displays the following message:
   "IPL Start" -> "Data Send"
4. From the PC, send the firmware program to the printer as follows.
   From the DOS prompt, type "**copy /a *[filename]* lpt1:**" and press Enter.
   The data transfer operation takes between five and seven minutes, and the ink plus the Pause indicators flash during the transfer.
   "FLASH ERASE" -> "FLASH WRITE" -> "PROGRAM LOAD END"
5. Turn the printer off, and then back on.
6. Verify the Firmware version according to the directions in step 1.
7. Turn off the printer and see the Caution at the top of this page.

UPDATING FIRMWARE FROM A MEMORY CARD

1. Make sure the printer is in the ready state; Ready appears on the LCD.
   Press the SelecType button multiple times until "Printer Status Menu" appears. Then press the Item button.
   "Version B xxxxx" appears.
   Write down the version number.
2. Turn off the printer.
3. Remove the access cover from the rear of the printer, and insert the prepared firmware card (xxxxxxxx.ROM) into slot CN20. The top surface of the card faces the outside of the printer.
   The card is EPSON service tool #F727 Flash memory card.
4. Turn on the printer.
5. "Update Complete" appears when the firmware update has finished.
6. Turn off the printer, remove the memory card, and then turn on the printer.
7. Verify the Firmware version according to the directions in step 1.
8. Turn off the printer and see the Caution at the top of this page.

5.3 Self-Diagnostics

This section gives detailed descriptions of all adjustments necessary to properly service and maintain this printer.

1. Make sure the Paper Set Lever is in the Set (forward) position.
2. Press the following buttons on the Control Panel while turning on the printer.

   [Paper Feed +] + [Paper Feed -] + [Enter]

3. When "Check: Test" appears on the LCD, the printer has entered the Self-Diagnostic mode.

To exit the Self-Diagnostic mode, turn off the printer.

Use the Control Panel buttons to activate a Self-Diagnostic function, as described in the table below.

Table 5-3. Self-Diagnostic Mode Controls

Normal Function	Self-Diagnostic Function	Meaning
Pause	Return up one level	Moves up one level (without selecting at item).
SelecType	Next menu	Displays the next menu.
Paper Source	Previous menu	Displays the previous menu.
Paper Feed +	Next item or value	Displays the next item or increases the value of the item shown on the LCD.
Paper Feed -	Previous item or value	Displays the previous item or decreases the value of the item shown on the LCD.
Cut/Eject	Enter	Selects/activates the item.

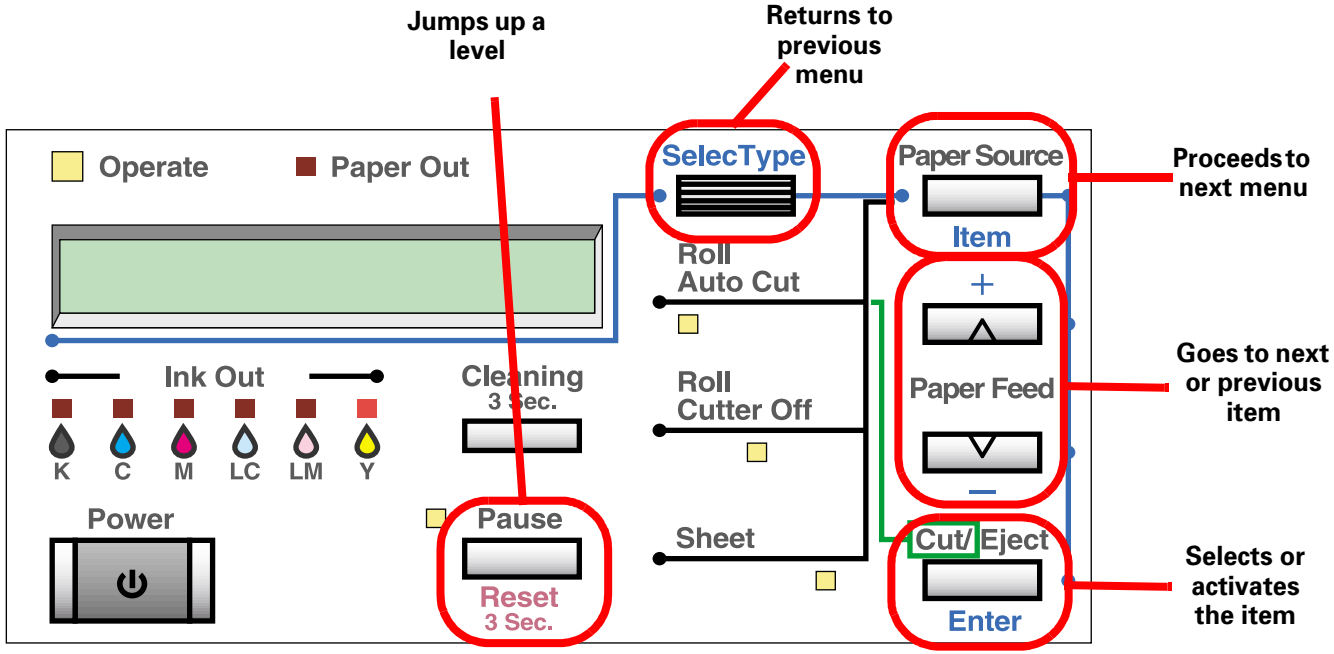


Figure 5-1. Self-Diagnostic Controls

5.4 Self-Diagnostic Mode Menus

In the Self-Diagnostic mode, you can select from the following menus.

Table 5-4. Self-Diagnostic Menus

Message	Description
Check: Test	Verifies certain information such as RAM, version number, panel, sensors, fatal-error history and encoder.
Check: Adjustment	Adjusts certain mechanism such as printheads, sensors, and feed path.
Check: Cleaning	Starts initial ink charge or predetermined cleaning sequence
Check: Print	Prints nozzle check pattern or adjustment parameter list
Check: Parameter	Updates or clears all of the adjustment parameters
Check: Life	Tests the operation of the printer components.

CAUTION

- **The "Check: Life" menu contains tests that should only be performed at the factory, so do not attempt to use this menu accept where written in this manual.**
- **In Self-Diagnostic mode, all of the tests except for one (Rear Sensor adjustment) assume that you have loaded roll paper. Be aware that the printer handles the paper as if it were roll paper even if you load cut sheets.**
- **All explanations in this mode refer to the printheads in the following way:**
  B head = K/C/M side (left head when facing the printer)
  C head = Lc/Lm/Y side (right head when facing the printer)

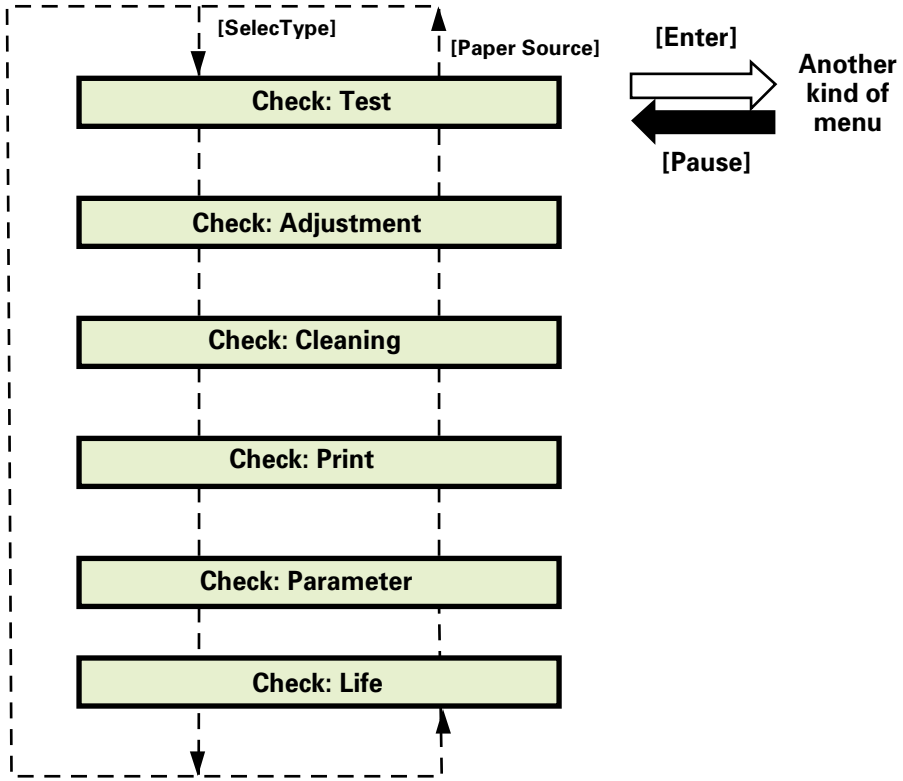


Figure 5-2. Self-Diagnostic Menu Flow

5.4.1 Test Menu

The Test menu tests or checks the operation of the control circuit board.

Table 5-5. Test Menu Items

Test Item	Description
Version	• Program • Backup parameters • DIP-SW • Board Rev.
Control Panel	• Panel buttons • LCD panel display • LED indicators
Sensors	HP, Cover Open, Paper Set Lever, P_FRONT, P_Rear, Paper Thickness, PG, Thermistor, I/C Holder Levers, Ink ID, I/C, and Ink Low
Encoder	CR Motor, PF Motor
Fan	On/Off confirmation
Elec.	• Maintenance Record • Fatal Error Record
D/A Revision	Factory use for Head voltage correction - do not attempt
Head Signal	Factory use for Head pulse check - do not attempt

CAUTION

Do not attempt the D/A Revision or Head Signal test. These tests are only performed with special equipment during the manufacturing process. Any changes will mar print quality

The menu items and their order in the menu are shown below.

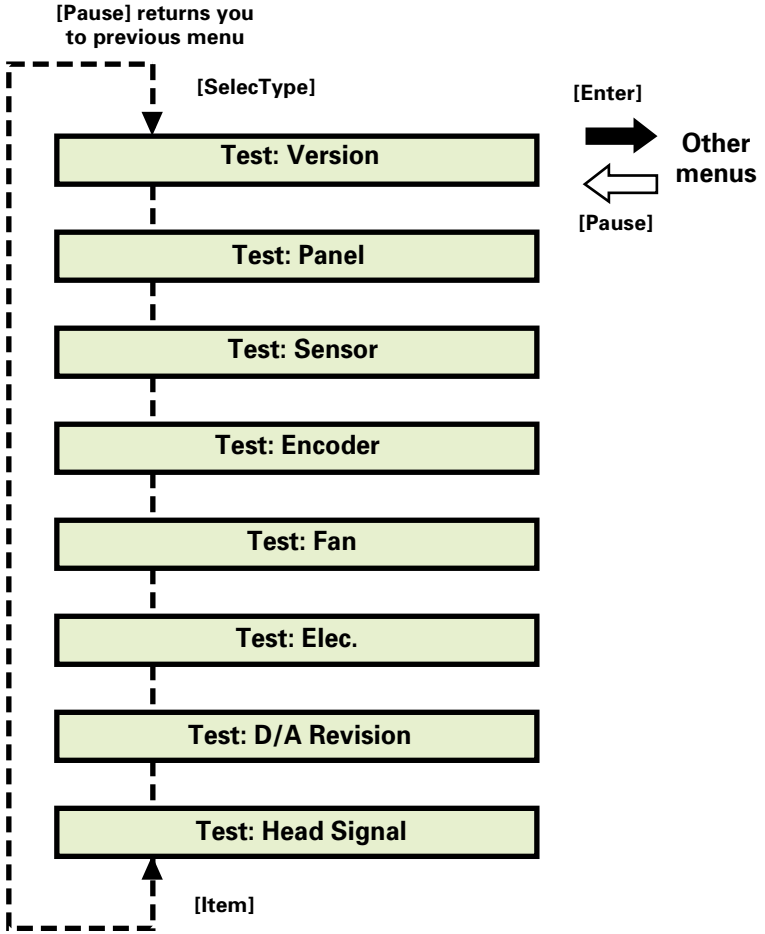


Figure 5-3. Test Menu

VERSION

This function confirms the firmware version and dip switch settings.

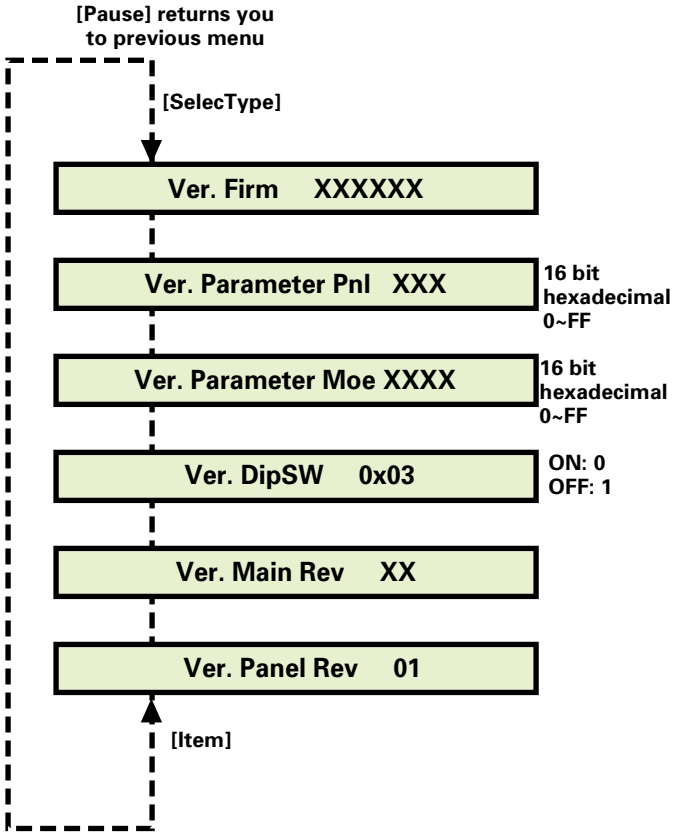


Figure 5-4. Version Menu Options

NOTE: The Dip switch

The dip switch located on the Main Board is a 2-bit switch, SW-1 is LSB (Least Significant Bit) and SW-2 is MSB (Most Significant Bit). For example, if JP1 = jumpered/ JP2 = jumpered, the LCD will display "Ver. DipSW 0x03".

Parameter Moe is for the mechanism version.

CONTROL PANEL

This function allows you to check the operation of the control panel buttons, LED indicators, and LCD panel.

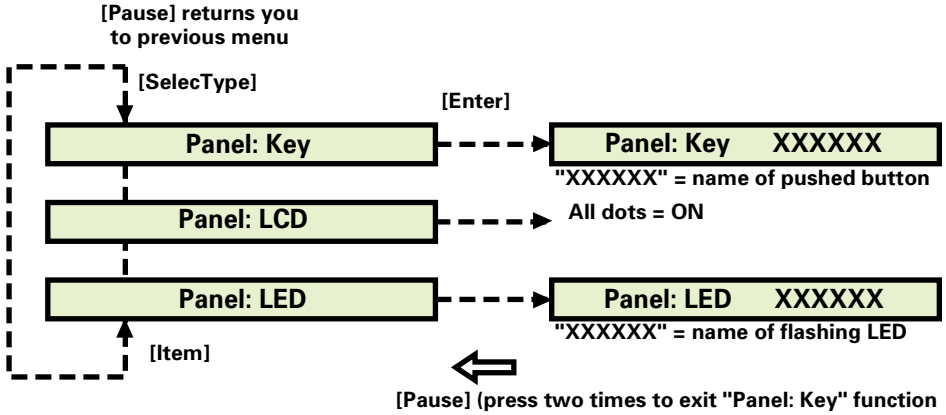


Figure 5-5. Control Panel Check

- ☐ "Key" check
  The name of the button that is pressed appears. Press the [Pause] button twice to exit the "Panel: Key" function.
- ☐ "LCD" check
  All dots turn on. If a dot is not on, the LCD is not working properly.
- ☐ "LED" check
  The LED indicators turn on in the following order and the name of the indicator appears on the LCD when that indicator turns on.
  Power, Pause, Ink End (K, C, Lc, M, Lm, and Y), Paper Out, Roll Auto Cut, Roll Cut Off, and Sheet

SENSORS

This function allows you to confirm whether the sensors are operating properly. The current status (ON or OFF) of the sensors (one at a time) is shown in the LCD display, and you need to check the sensor operation by hand. For example, to check the Paper Set Lever position sensor, move the lever up and down.

Some, but not all, explanations:

- ☐ EdgeAD
  Displays the status of the P_EDGE sensor.
- ☐ FrontAD
  Displays the status of the P_FRONT sensor.
- ☐ RearAD
  Displays the status of the P_REAR sensor.
- ☐ Ink lever B
  Displays the status of the black-side (K/C/M) ink holder lever.
- ☐ Ink lever C
  Displays the status of the color-side (Lc/Lm/Y) ink holder lever.
- ☐ Ink ID
  The Ink ID sensor is a 3-bit sensor, and the ID number appears as 0~7.
  Sensor on = 1 and sensor off = 0.
- ☐ X Ink NOT yy
  Describes which cartridge is not installed if a missing cartridge is detected.
  X = "B" or "C" head and yy = ink color such as Lc.
- ☐ X Ink END yy
  Describes which cartridge is empty if an empty cartridge is detected.
  X = "B" or "C" head and yy = ink color such as Lc.

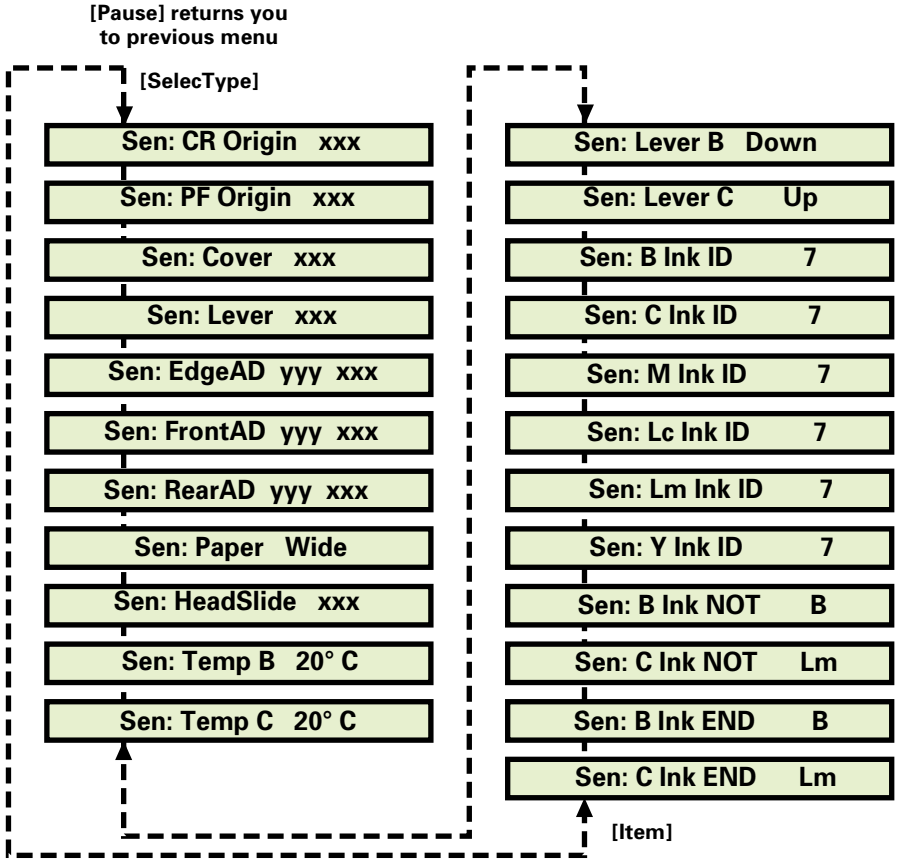


Figure 5-6. Sensor Menu Options

CHECK POINT

You need to perform the "Sensor Adjustment" as described on the next page after replacing the Main board as well as any of the P-THICK, P-REAR, and P-FRONT sensors.

SENSOR ADJUSTMENT

After replacing the C299 MAIN board or one of the sensors: P_EDGE, P_FRONT and P_REAR, you need to adjust the corresponding volume (variable resistor) on the main board to determine the correct detection level of sensors.

1. Remove the access cover on the rear cover and enter the "Test Menu" in the self-diagnostic mode. Select "Sensors" check mode and proceed to the detailed description for each sensor if you replace the main board or the individual section for a sensor if you only replace that sensor.

CAUTION

- **When you make these adjustments, make sure to avoid strong light (sun-light) around the printer. These sensors are light-sensitive and may not function properly under such conditions. It is recommended to remove the housing before performing this adjustment to ensure light is refelected evenly off the paper.**
- **Make sure there is no dust or foreign substance on both the paper and sensor.**
- **When performing sensor adjustment, make sure paper is loaded and parked above the sensor (above the guide lines as well as the platen).**
- **If you need to adjust the volume of the sensors on the Main board, make sure the driver does not touch the metal part of the board. (Preferably, use a non-conductive screwdriver.)**
- **Before adjusting the sensor volume, make sure the printer has firmware version "B0298C" or later. Earlier versions do not support sensor volume adjustment. See "Firmware Update" on page 160 for more information. To determine the release date of the firmware, see the explanation below.**
  B0298C:
  B0 = SP-7000
  28 = day of month
  9 = last digit of year
  C = month (16-decimal; 1 = January, 2 = February, ... A = October, B = November, C = December)

☐ **P_EDGE Sensor**

2. Select "Sen:PaperEdgeAD" from the sensor menu.
3. Push the Paper Set Lever back and load a sheet of A3-size normal copy paper using the guide on the right side of the roll paper cover. Pull the Paper Set Lever forward to lock the paper in place.
4. Open the front cover, and press down the cutter and move the carriage over the paper. Close the front cover.

CHECK POINT

The LCD will display "Sen:EdgeAD YYY XXX"
YYY = current paper volume 0E0~0E8; ideal = 0E0
XXX = current no-paper volume 040 or more
Make sure that the XXX signal level indicated on the LCD is over 040 and the YYY signal level indicated on the LCD is between 0E0~0E8.

Table 5-6. P_Edge, P_Front, and P_Rear Sensor Adjustment

Sensor	YYY Parameter (no paper)	XXX Parameter
P_Edge	040 or higher	0E0~0E8
P_Front & P_Rear	040 or higher	~095

Table 5-7. Sensor Volume Adjustment

Sensor	Volume
P_Edge	VR1 & VR5
P_Front	VR2 & VR6
P_Rear	VR3 & VR4

5. Through the access cover, adjust the volume on **VR1** (roughly) and **VR5** (precisely) so that XXX = 0E0~0E8. However, if YYY = less than 040, adjust XXX to 0E8.

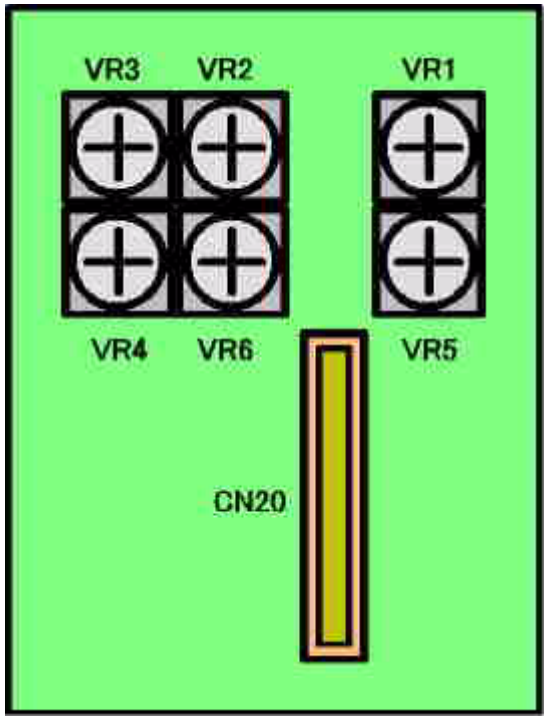


Figure 5-7. VR1~VR6 Positions Viewed Through Access Cover

NOTE: *If the signal level cannot be adjusted properly, check the position of the sensor and if this does not correct the signal level, replace the sensor.*

6. Open the front cover, and move the carriage back to the home position.
7. Release the Paper Set Lever, remove the paper, and return the Lever to the Set position. Then press the SelecType button and proceed to the next sensor adjustment (if necessary).

☐ **P_FRONT Sensor**

1. See step 1 on page 166.
2. Select "Sen:PaperFrontAD" from the sensor menu.
3. Push the Paper Set Lever back and load a sheet of A3-size tracing paper using the guide on the right side of the roll paper cover. Pull the Paper Set Lever forward to lock the paper in place. The printer initializes the paper.

CHECK POINT

The LCD will display "Sen:EdgeAD YYY XXX"
YYY = current no-paper volume
XXX = current volume 040~043
Make sure that the XXX signal level indicated on the LCD is 040~043.

4. Through the access cover, adjust the volume on **VR2** (roughly) and **VR6** (precisely) so that XXX = 040~043.
5. Release the Paper Set Lever, remove the paper, and return the Lever to the Set position. Then make sure that the XXX signal level indicated on the LCD is 01D or more.

NOTE: *If the signal level cannot be adjusted properly, check the position of the sensor and if this does not correct the signal level, replace the sensor.*

6. Repeat step 3.
7. Through the access cover, adjust the volume on **VR2** (roughly) and **VR6** (precisely) so that XXX = 095 or less and YYY = 040 or more.

NOTE: *If the signal level cannot be adjusted properly, check the position of the sensor and if this does not correct the signal level, replace the sensor.*

8. Release the Paper Set Lever, remove the paper, and return the Lever to the Set position. Then press the SelecType button and proceed to the next sensor adjustment (if necessary).

☐ **P_REAR Sensor**

1. See step 1 on page 166.
2. Select “Sen:PaperRearAD” from the sensor menu.
3. Push the Paper Set Lever back and load a sheet of A3-size tracing paper using the guide on the right side of the roll paper cover. Pull the Paper Set Lever forward to lock the paper in place. The printer initializes the paper.

CHECK POINT

The LCD will display “Sen:EdgeAD YYY XXX”
YYY = current no-paper volume
XXX = current volume 040~043
Make sure that the XXX signal level indicated on the LCD is 040~043.

4. Through the access cover, adjust the volume on **VR3** (roughly) and **VR4** (precisely) so that XXX = 040~043.
5. Release the Paper Set Lever, remove the paper, and return the Lever to the Set position. Then make sure that the XXX signal level indicated on the LCD is 01D or more.

NOTE: *If the signal level cannot be adjusted properly, check the position of the sensor and if this does not correct the signal level, replace the sensor.*

6. Repeat step 3.
7. Through the access cover, adjust the volume on **VR3** (roughly) and **VR4** (precisely) so that XXX = 095 or less and YYY = 040 or more.

NOTE: *If the signal level cannot be adjusted properly, check the position of the sensor and if this does not correct the signal level, replace the sensor.*

8. Release the Paper Set Lever, remove the paper, and return the Lever to the Set position. Then press the SelecType button.

ENCODER

This function confirms the operation of the CR Motor and PF Motor encoders.

To check an encoder, follow the instructions below for the corresponding encoder.

- ☐ CR encoder: Move the carriage left and right by hand
- ☐ PF encoder: Turn the Grid Roller by hand

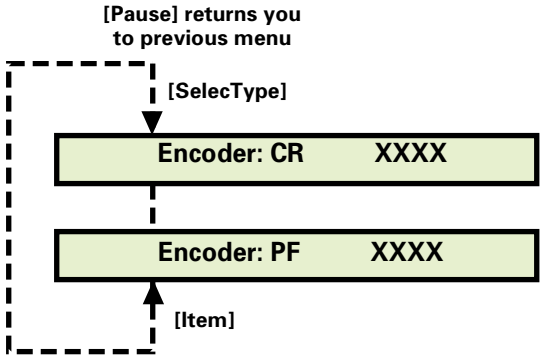


Figure 5-8. Encoder Confirmation Process

FAN

This function confirms the operation of the paper vacuum fans (x2). When this item is selected, the fan turns on. Press the Pause button to turn the fan off and proceed to the next item.

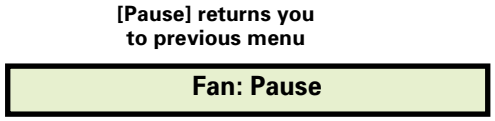


Figure 5-9. Fan Operation Check

ELEC.

This function allows you to check the maintenance record and fatal-error record stored in the control circuit. See the Table 3-3, “Messages That Indicate Service is Necessary,” on page 85 for details on the error messages.

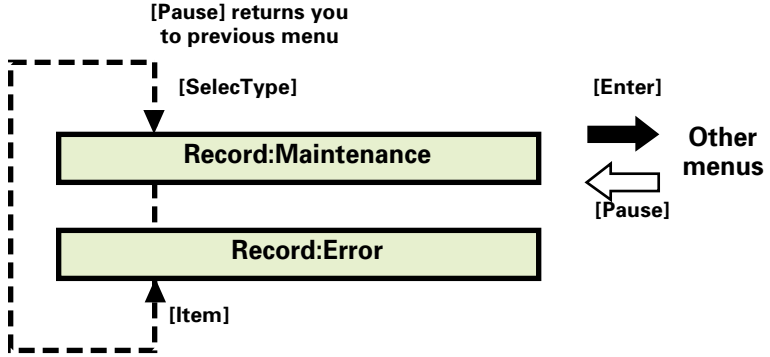


Figure 5-10. Record Menu Options

- ☐ Record: Error menu

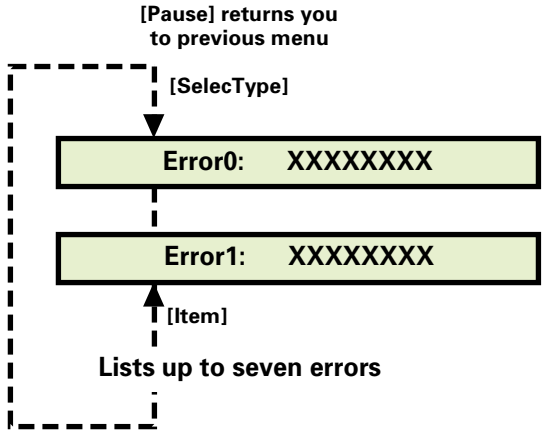


Figure 5-11. Error Record Function

The errors listed here do not include CPU errors (service call errors), and the printer lists a maximum of the most recent seven fatal errors, Error 0~6.

☐ Record: Maintenance menu

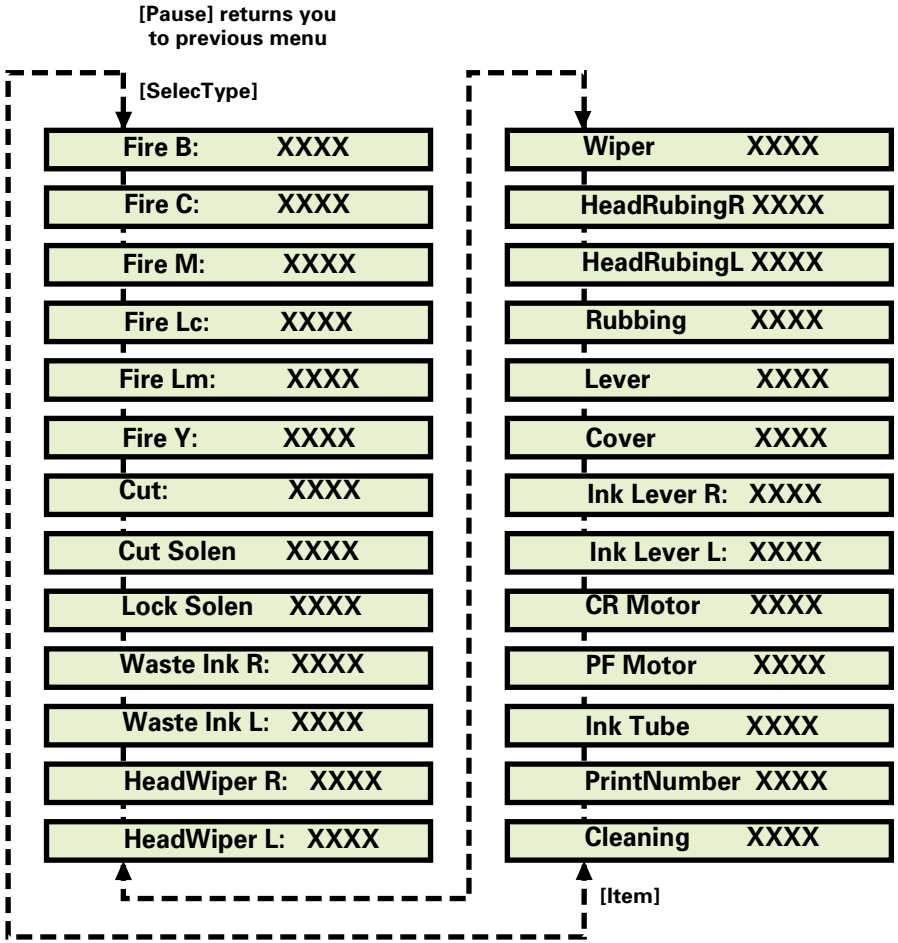


Figure 5-12. Maintenance History Menu

NOTE: *The options above appear on the LCD starting from "Waste Ink R".*

Table 5-8. Maintenance Record Items

Item	Description
Fire x	Amount of ink fired from nozzles in number of megadots (x = which color)
Cut	Number of times cutter has been used
Cutter Solenoid	Number of times cutter solenoid has been activated
Lock Solenoid	Number of times CR lock solenoid has been activated
Waste Ink R/L	Amount of waste ink (right or left)
Head Wiper R/L	Number of times head wiping operation has occurred
Wiper	Number of times wiper has been used
Head Rubbing R/L	Number of times B/C head rubbing operation has occurred
Rubbing	Number of times rubbing pad has been used
Lever	Number of times paper has been set (up and down = one time)
Cover	Number of times front cover has been opened (open and close = one time)
Ink Lever R/L	Not used
CR Motor	Accumulated travel distance of carriage (in Km)
PF Motor	Accumulated travel distance of paper feed mechanism (in Km)
Ink Tube	Number of carriage passes
Print Number	Accumulated printout count (each Form-Feed code = one printout)
Cleaning	Accumulated number of cleaning operations

D/A REVISION AND HEAD SIGNAL

For factory use only to check the head voltage and pulse. Do not use.

5.4.2 Adjustment Menu

The Adjust menu allows you to make certain adjustments to the printer mechanism and controls, for example head angle adjustment, print position adjustment, paper feeding correction, and firmware-control setting.

Table 5-9. Adjustment Menu Items

Adjustment Item	Description
Capping Position	Sets the Capping position (automatic Adjustment)
Paper Skew Check	Verifies the degree of skew (slant) allowed during printing
Head Rank Input	Sets the printhead ID
Head Nozzle Check	Prints the check pattern to make sure the nozzles are not clogged
B Head Angle	Adjusts the angle of the B Head (mechanism adj.)
C Head Angle	Adjusts the angle of the C Head (mechanism adj.)
BC Head Height	Verifies the B/C Head nozzles are at the same height (mechanism adj.)
Bi-D Print Position	Verifies the printed lines match up when performing bi-directional printing.
Head Gap	Adjusts the B/C Head Gap as well as sets the left margin
R Flush Point	Adjusts the flush position on the HP side
L Flush Point	Adjusts the flush position on the opposite side
Feed Correction	Checks paper feeding (w/ruler)
Top & Bottom	Checks the top and bottom margins (w/ruler)
Rear Paper Sensor Position	Sets the detection position of the rear paper-edge sensor

Table 5-9. Adjustment Menu Items (continued)

Adjustment Item	Description
Test Pattern Print	Checks print quality (prints setting information, check pattern and so on)
Clean Head	Initiates cleaning/flushing of the heads and ink path 1) Ink drain 2) Fill with transportation fluid (1 time = 15ml) 3) Drain transportation fluid 4) Reset the ink charge flag
Counter Clear	Resets all counters in Table 5-13 on page 187

CAUTION

- **When conducting on-site service/repairs, do not select "Head Cleaning" as this requires a separate head cleaning cartridge to work properly.**
- **Only select "Counter Clear" when replacing the Waste Ink Pads and related parts.**

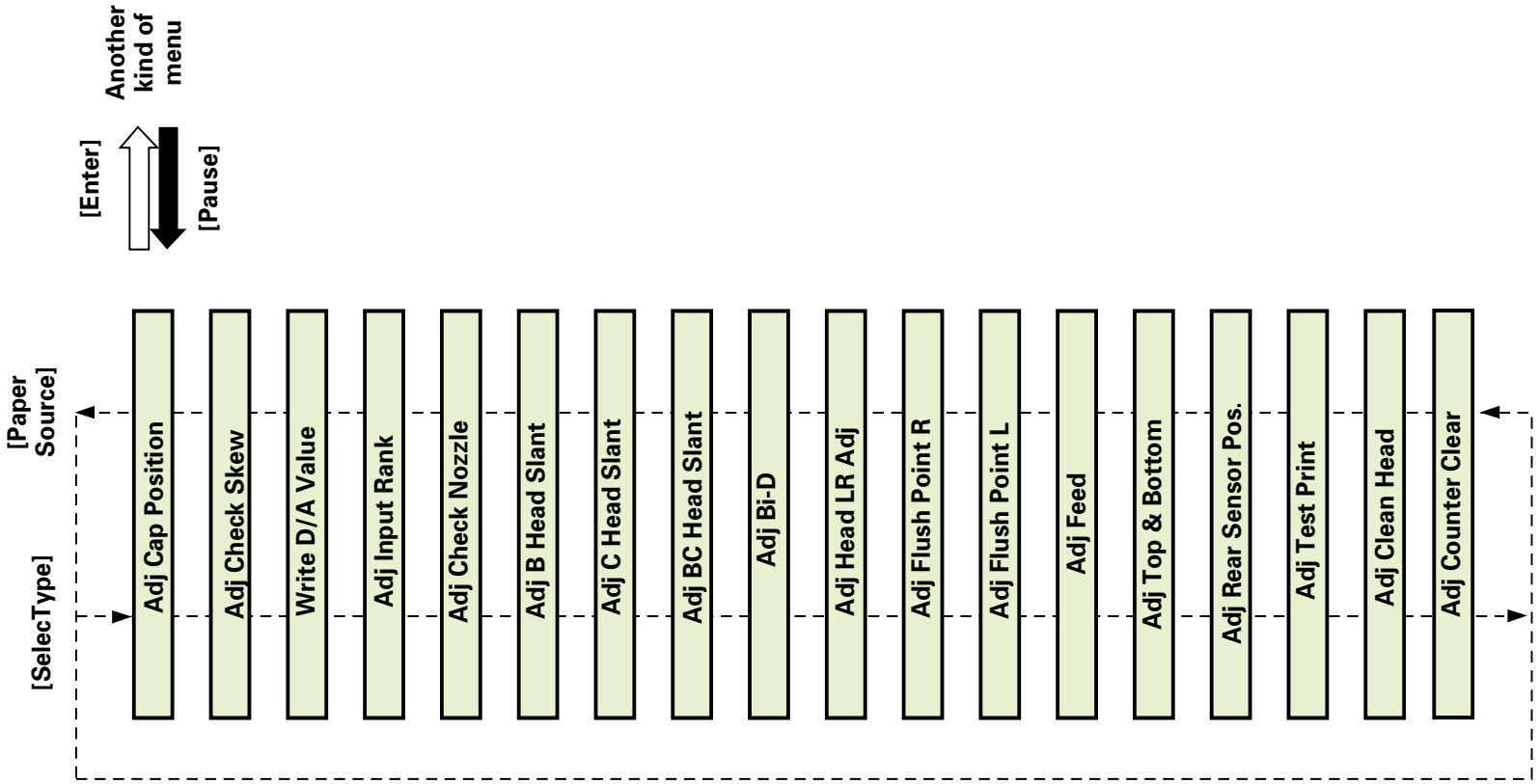


Figure 5-13. Adjustment Menu

ADJ CAP POSITION

Use this function to check the actual capping position and correct the capping position parameter in the firmware if necessary.

There may be very small differences between printers. Although the difference may only be a few pulses closer or further on the linear encoder, this is necessary to correct for any differences between one mechanism and another.

1. Make sure "Adj Cap Position" appears on the LCD and press the Enter button.
2. The printer begins the HP detection sequence and automatically detects the capping position, adjusting the logical position if necessary.
3. After the adjustment process is finished, the detected distance between the HP and the capping position is displayed.
4. Do one of the following:
   > Press the Enter button to update the capping position parameter and proceed to the next menu item, or
   > Press the Pause button to avoid updating the capping position parameter and return to the beginning; “Adj Cap Position” appears on the LCD

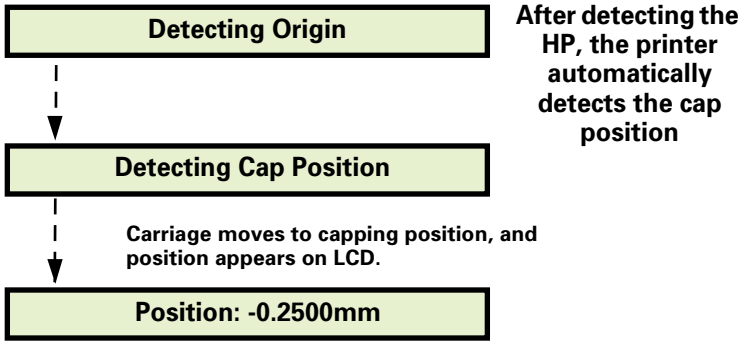


Figure 5-14. Cap Position Check Operation

ADJ CHECK SKEW

When the band turns a predetermined amount (during printing), the printer detects the paper edge using the P EDGE sensor. This value is compared to the originally detected value for the paper-edge position to determine if the paper is feeding at a slant.

Any change you make to the Check Skew distance only affects service-related printouts; the skew-check operation for user printouts does not change.

1. Make sure "Adj: Check Skew" appears on the LCD and press the Enter button.
2. If the paper is not loaded correctly, "Reload Paper" appears indicating you need to properly load the paper. If the paper is set correctly, the printer initializes the paper.
3. After paper is loaded and initialized, "Check Skew 1.0m" appears. Use the Paper Feed + and Paper Feed - buttons to adjust the paper-skew detection distance, then press Enter to begin the skew check.
4. After the skew is correctly detected, "Skew Result: xxxx" appears. Press Enter to proceed to the next menu item, or press Pause to return to the beginning; “Adj: Check Skew” appears on the LCD.

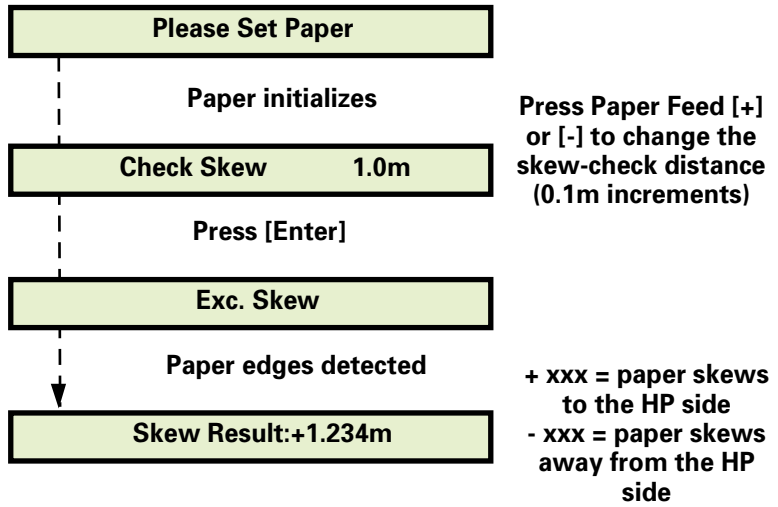


Figure 5-15. Skew Check Operation

WRITE D/A VALUE

During the C299MAIN board production process, the head drive circuit parameters are written to the USB EEPROM.

During service, these parameters must be transferred to the Flash-ROM.

CAUTION

This operation must be performed before sending a print job; otherwise print quality will most likely suffer.

1. Make sure “Write D/A Value” appears on the LCD and press Enter.
2. Press Enter again when “Press Enter to write” appears.
3. Turn off the printer when “Please turn off” appears.

ADJ INPUT RANK

This function allows you to enter the B head and C head ID’s.

1. Make sure "Adj: Input Rank" appears on the LCD and press the Enter button.
2. First enter six characters for the B head (K/C/M) ID. Press the Paper Feed + or Paper Feed - button to select the ID value.
3. After correctly entering the B head ID, press the Enter button and enter the C head ID in the same way.

If an out-of-range error ("Error Rank Input") occurs at any time during this process, press the Enter button and re-enter the head ID.

4. After entering the head ID for both printheads, press the Enter button and "Enter Key" appears on the LCD.

After entering B & C head ID’s, "Enter Key" appears on the LCD. If you do not replace the printheads, you can avoid wasting ink by pressing the Pause button instead of the Enter button to skip the initial-ink charge process.

5. Press the Enter button again to write the printhead ID value to the Main Board and begin the initial-ink charge in the heads

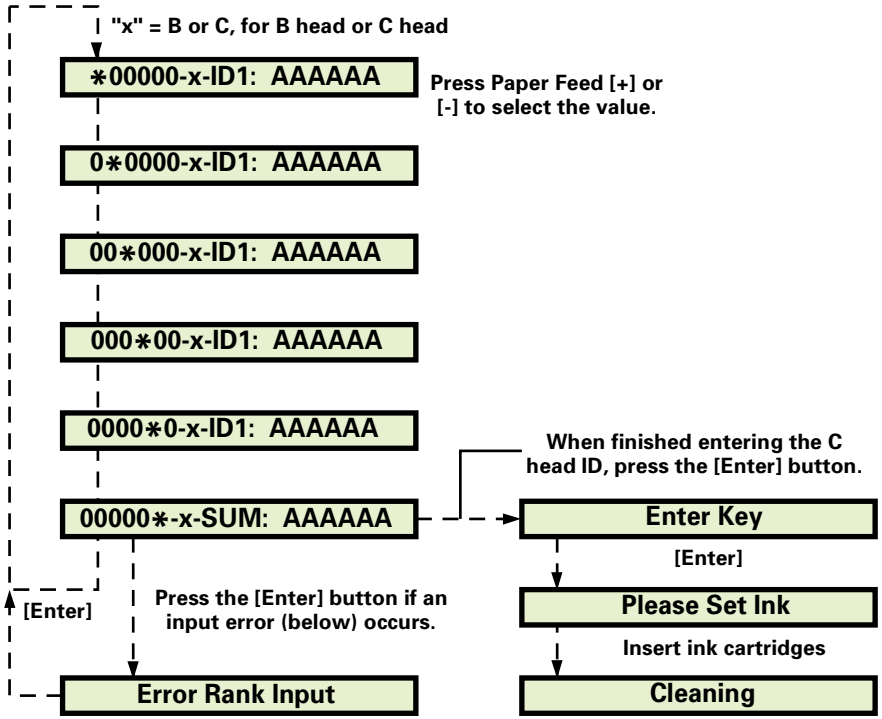


Figure 5-16. Head ID Input Process

ADJ CHECK NOZZLE

After the initial ink charge, this function verifies that the nozzles are properly firing ink If the some nozzles are not firing correctly or at all, you can run the cleaning operation from this menu.

1. Make sure "Adj: Check Nozzle" appears on the LCD and press the Enter button.
2. Load paper if not already loaded and replace any low or empty ink cartridges if detected. If these conditions are OK, the printer prints the following check pattern

Figure 5-17. Head Nozzle Check Pattern

The pattern includes the following colors from left to right; black, cyan, magenta, yellow, light magenta, and light cyan.

3. When the check pattern is finished printing, "Nozzle Check End" appears on the LCD. If the pattern printed all six colors properly with no lines or dots missing, press the Enter button to end this adjustment procedure. If lines or dots are missing, press the SelecType button to start the cleaning cycle.

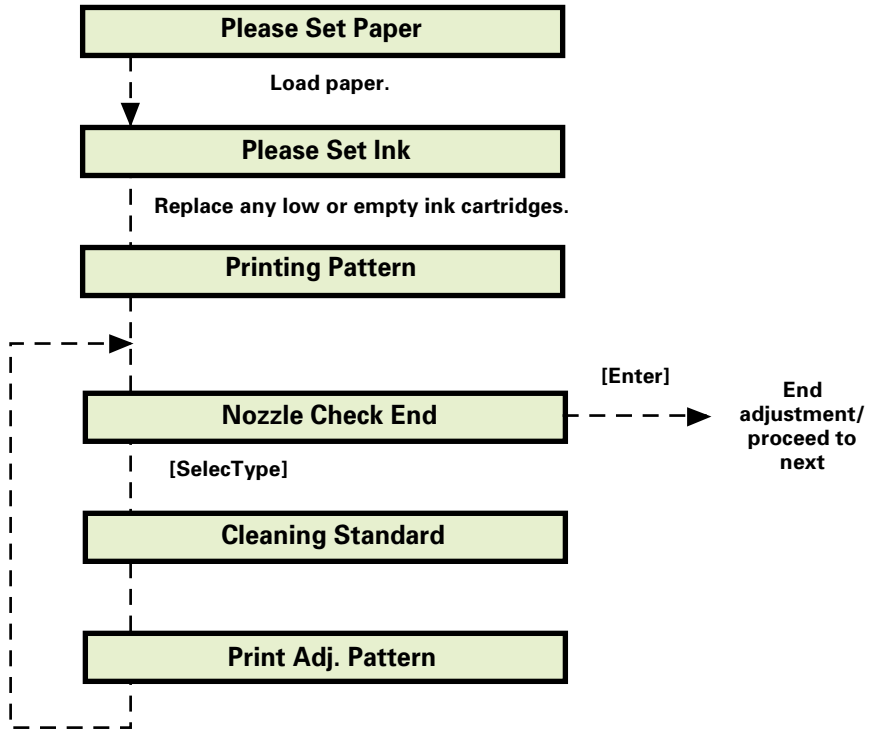


Figure 5-18. Nozzle-Check Printing Operation

ADJ X HEAD SLANT (B/C HEADS)

This function prints a check pattern (one-at-a-time for each head) to make sure the printheads are installed straight up-and-down. Use the patterns to determine whether one or both printheads need adjustment. To correct any slant, use "Head Adjust Lever A" as described below.

1. Make sure "Adj: x Head Slant" appears in the LCD, and press the Enter button. (x = B or C depending on the printhead) After the check pattern prints, "x Slant Check End" (x = B or C head) appears in the LCD.
2. Compare the printed pattern with the illustration below. Press Enter if the lines are parallel, as shown in the "OK" examples below. If there is a slant, open the front cover, release the carriage lock by hand, and move the carriage away from the carriage cap position. Next, loosen the screw securing the head that is printing at a slant, and move the Head Adjust Lever A left or right depending on the slant direction. See Figure 5-21 for reference. Tighten the screw.

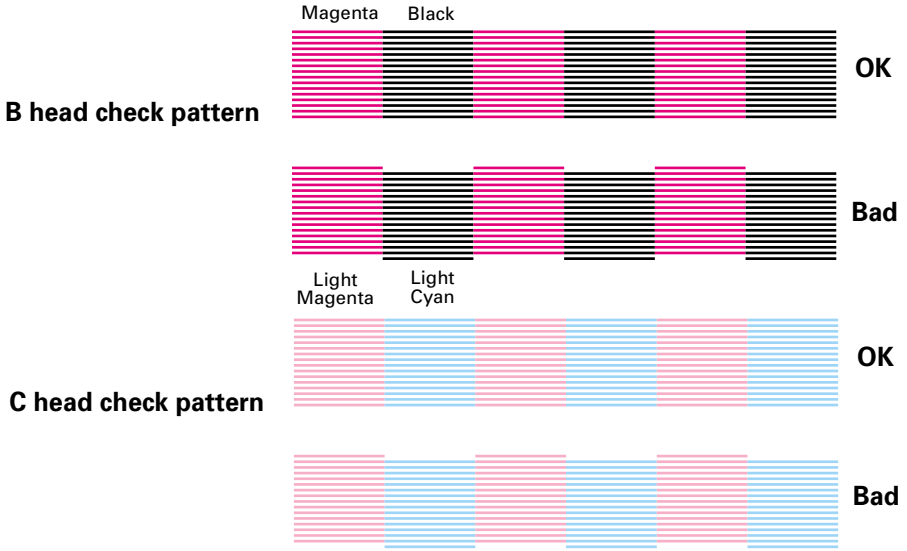


Figure 5-19. Head Slant Check Printout

3. After making sure both heads are correctly installed, move the carriage back to the capping position by hand and close the front cover.
4. Select "Print Adj Pattern" with the SelecType or Item button, and print the pattern again to make sure there is no slant. Adjust again if necessary. If there is no slant, press Enter.

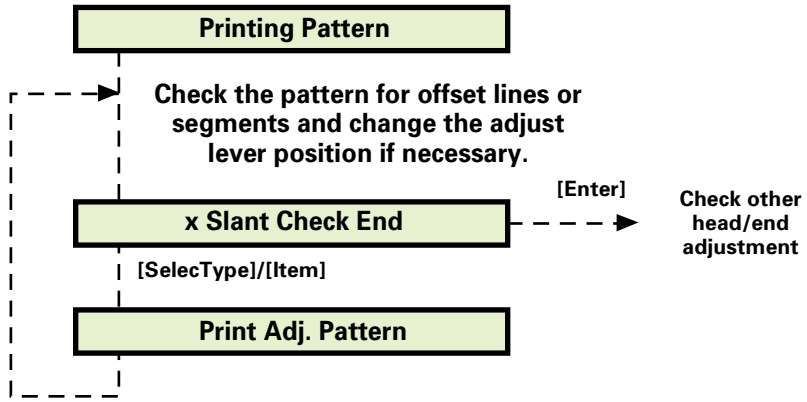


Figure 5-20. Head Slant Check Operation

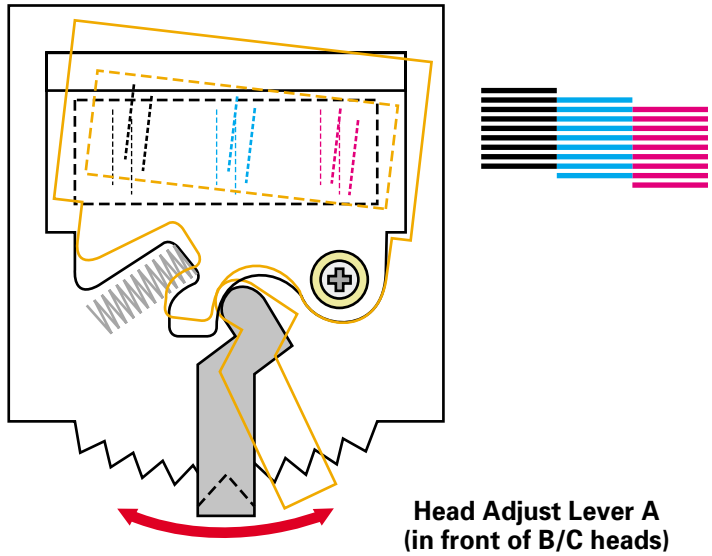


Figure 5-21. B/C Head Skew Adjust Lever

ADJ B/C HEAD HEIGHT

This function matches the height of the B head nozzles and C head nozzles. Assuming the B head nozzles are correct, The printer prints a test pattern and if the two sets of lines do not match up vertically, you need to adjust the height of the C head using the Head Adjust Lever B.

1. Make sure "BC Slant Check End" appears in the LCD, and press Enter.
2. After the check pattern prints, "BC Slant Check End" appears in the LCD. Compare the printed pattern with the illustration below. Press Enter if the level is OK like the top row. If there is a slant, open the front cover, release the carriage lock by hand, and move the carriage away from the carriage cap position. Next, loosen the screw securing the printhead on the right. Move the Head Adjust Lever B up or down to match the height of the two heads. Tighten the screw.

Figure 5-22. Head Parallelism Check Printout

3. After finishing the Head Height adjustment procedure, move the carriage back to the capping position by hand and close the front cover.
4. Select “Print Adj Pattern” with the SelecType or Item button, and print the pattern again to make sure the heads are lined up. Adjust again if necessary. If there is no slant, press Enter.

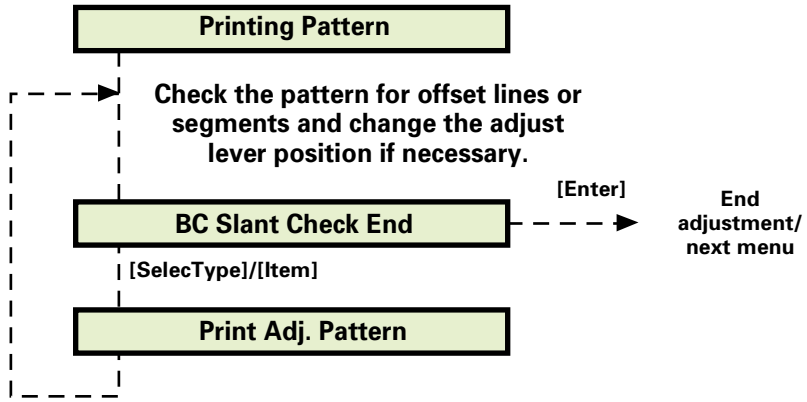


Figure 5-23. Head Parallelism Check Operation

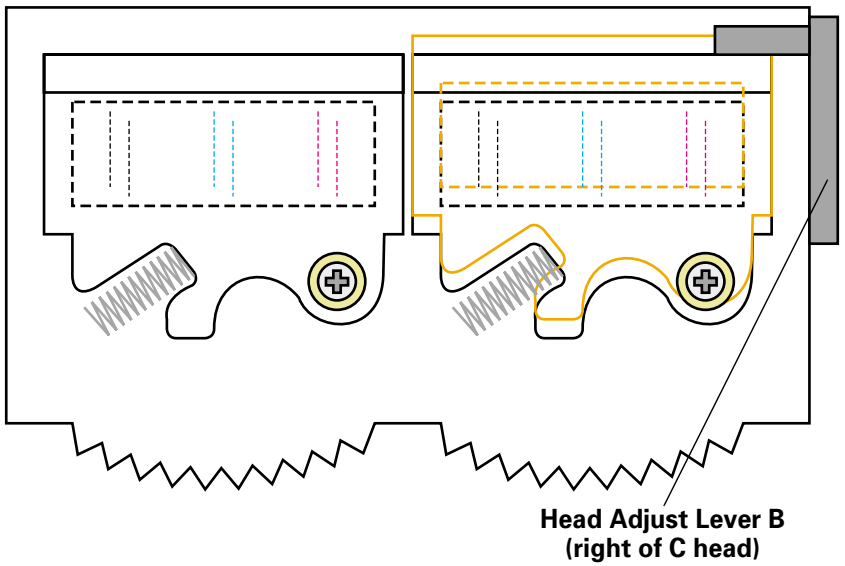


Figure 5-24. B/C Height Adjust Lever

ADJ BI-D

This function adjusts the Bi-D print settings for both printheads. The printer prints several vertical test patterns. Lines that do not line up vertically indicate the heads need Bi-D adjustment. The Bi-D adjustment items are shown in the table below.

Table 5-10. Bi-D Adjustment Items

Item	Description	Number
BiD/200/N/B	Bi-D adjustment/200cps/Normal-dot/B head	1
BiD/200/N/C	Bi-D adjustment/200cps/Normal-dot/C head	2
BiD/200/M/B	Bi-D adjustment/200cps/Micro-dot/B head	3
BiD/200/M/C	Bi-D adjustment/200cps/Micro-dot/C head	4
BiD/300/N/B	Bi-D adjustment/300cps/Normal-dot/B head	5
BiD/300/N/C	Bi-D adjustment/300cps/Normal-dot/C head	6
BiD/300/M/B	Bi-D adjustment/300cps/Micro-dot/B head	7
BiD/300/M/C	Bi-D adjustment/300cps/Micro-dot/C head	8

Note: The number refers to the numbered pattern on the printed Bi-D test pattern.

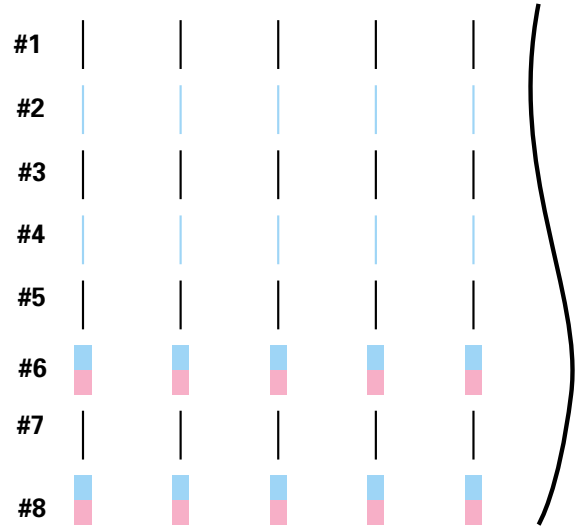


Figure 5-25. Bi-D Adjustment Test Pattern

1. Make sure "Bi-D" appears on the LCD, and press the Enter button.
2. After all the patterns print, "BiD, 200, N, B: xxx" appears in the LCD.

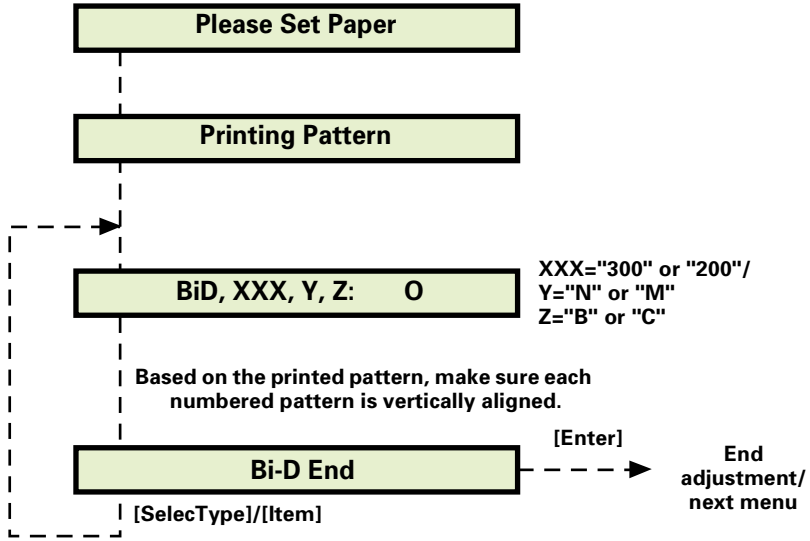


Figure 5-26. Bi-D Adjustment Operation

3. At this point, you need to check the vertical alignment of the lines on the printed test pattern.

   - If all the lines are correctly lined up as in the above sample, (make sure "BiD End" appears in the LCD and) press the Enter button to finish.
   - If some lines are not aligned, select the numbered pattern using the Paper Feed +/- buttons.

     Correction increment: 1/2880 inch
     Correction direction: "+" = toward HP and "-" = away from HP
     Aim:
     #1~5, #7 = Align the lines vertically
     #6, #8 = Make sure light cyan and light magenta are equal width without overlapping (see the illustration below)

     After you finish correcting a pattern, press the Enter button to print another test pattern of that number only with your new settings in effect.

4. Repeat the steps until all numbered patterns are aligned.

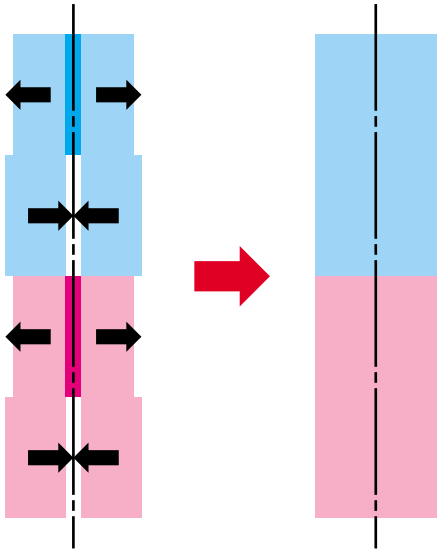


Figure 5-27. Bi-D Adjustment for Patterns #6 and #8

HEAD GAP ADJUSTMENT

This function corrects the gap between the B head and the C head. The adjustment pattern is printed in one direction, and referring to the printed test patterns, you can correct any gap between the heads. The adjustment items are as follows.

Table 5-11. Head Gap Adjustment Items

Item	Description	Number
Gap/200/N	Gap adjustment/200cps/Normal-Dot	9
Gap/200/M	Gap adjustment/200cps/Micro-Dot	10
Gap/300/N	Gap adjustment/300cps/Normal-Dot	11
Gap/300/M	Gap adjustment/300cps/Micro-Dot	12

Note: The number refers to the numbered pattern on the printed Bi-D test pattern.

1. Make sure "Adj: Head LR Adj." appears in the LCD, and press the Enter button. After all the patterns print, "Gap, 200, N: xxx" appears in the LCD.

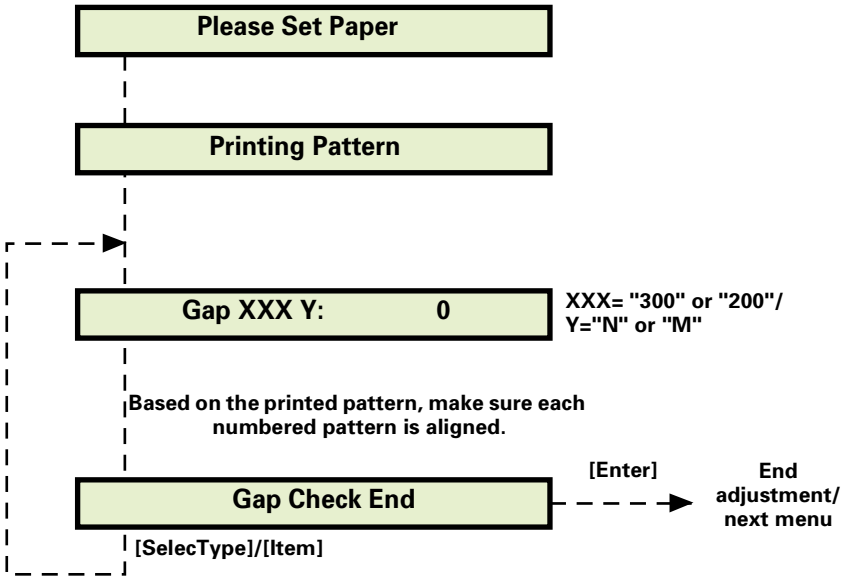


Figure 5-28. Head Gap Adjustment Operation

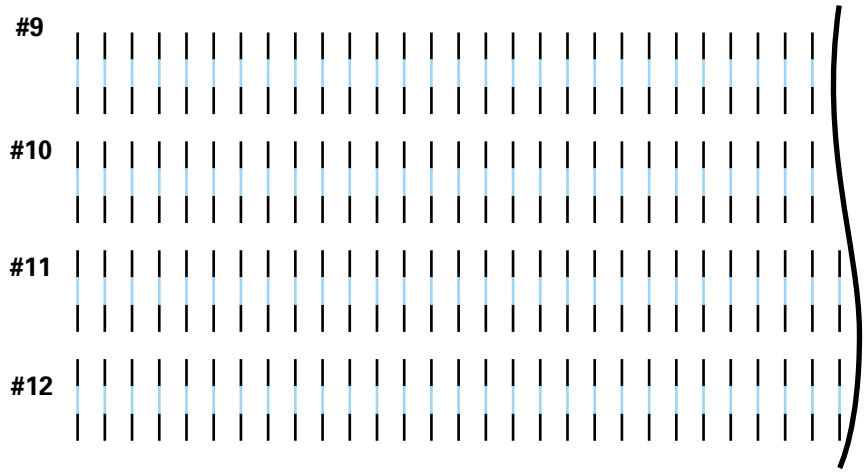


Figure 5-29. Gap Adjustment Test Pattern

2. At this point, you need to check the alignment of the lines on the printed test pattern.
   - If all the lines are correctly lined up as in the above sample, (make sure "BiD End" appears in the LCD and) press the Enter button to finish.
   - If some lines are not aligned, select the numbered pattern using the Paper Feed +/- buttons.
     Correction distance: One press = 1/2880 inch
     Correction direction: "+" = toward HP and "-" = away from HP
     Aim = Black and light cyan lines are vertically aligned

     After you finish correcting a pattern, press the Enter button to print another test pattern of that number only with your new settings in effect.
3. Repeat the steps until all numbered patterns are aligned.

FLUSH POINT ADJUSTMENT

This function corrects the flushing position of the carriage to make sure the carriage is properly positioned over the F Box during the flushing operation.

1. Put a piece of paper over the flushing box.
2. Make sure "Adj. Flush Point R" appears in the LCD, and press the Enter button.
3. The carriage moves to the flushing position and begins flushing.
4. After flushing is finished, "Point R NNN" (NNN = numeric position) appears. Check the piece of paper you put over the flushing box to confirm the ink is ejected into the flushing box. If the ink-flushing position is correct, press the Enter button to finish. Otherwise, press the SelecType or Item button to correct the flushing position. The settings increment as follows.
   Correction distance: One press = 1/720 inch
   Direction: "+" = toward HP and "-" = away from HP

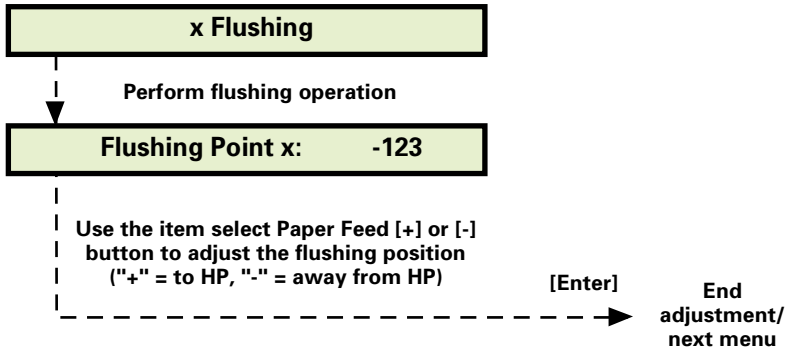


Figure 5-30. Flushing Point Check Operation

FEED ADJUSTMENT

This function adjusts the distance the printer feeds paper by correcting the printer's distance-measurement setting.

1. Make sure "Adj. Feed" appears in the LCD, and press the Enter button.
2. The printer prints a check pattern (lines) while feeding the paper at a fixed distance.
3. After the pattern is printed, "V Length 1000.0mm" appears. Using a regular ruler (and the Scale Stopper, code number 1047746/1047745), measure the printed pattern from the top line to the bottom line. Then enter this measurement using the item select +/- buttons in 0.1mm increments.
4. After entering the measurement, press the Enter button to finish.

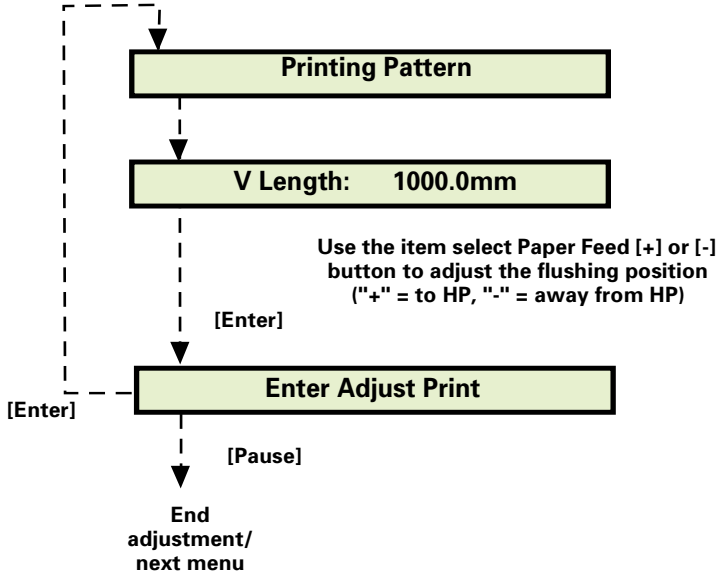


Figure 5-31. Feed Distance Check Operation

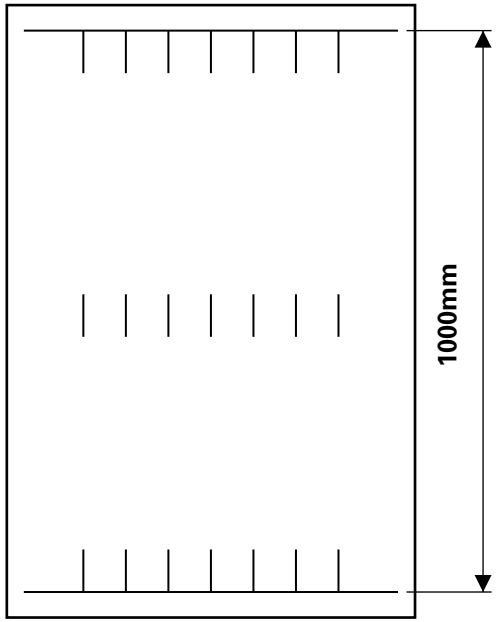


Figure 5-32. Feed Distance Check Pattern

ADJ TOP & BOTTOM

This function sets the distances between the P FRONT sensor and heads, cutter and heads, as well as the P EDGE sensor and heads. You can also use this function to adjust the top, bottom, and side margins.

1. Make sure "Adj. Top & Bottom" appears, and press the Enter button.
2. The printer prints a check pattern (lines) and cuts off the paper at a fixed distance.
3. After the printing operation is finished, measure the top, bottom, and right (HP) side margins using a ruler. Press the item select (Paper Feed) +/- buttons to enter each of these measurements in 0.1mm increments.
4. After entering the measurements, press the SelecType or Item button until "Bottom Length xx.xmm" appears, and then press the Enter button.

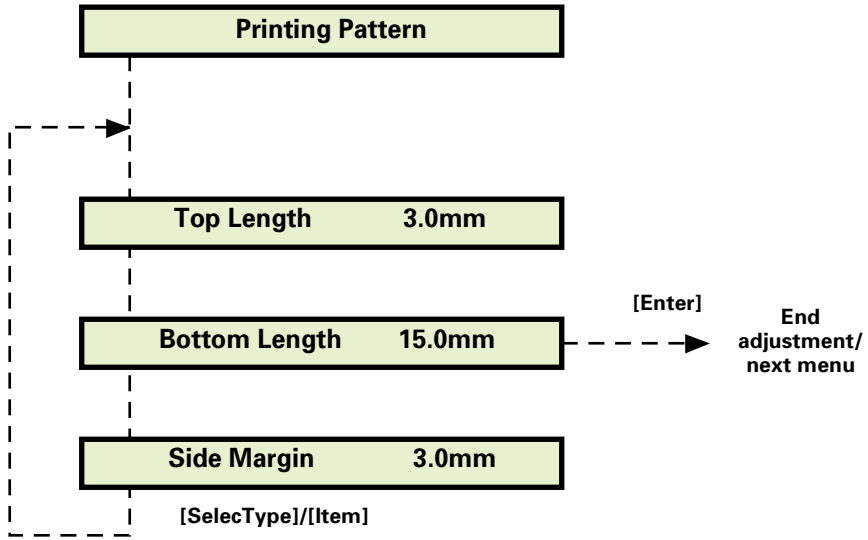


Figure 5-33. Margin Adjustment Operation

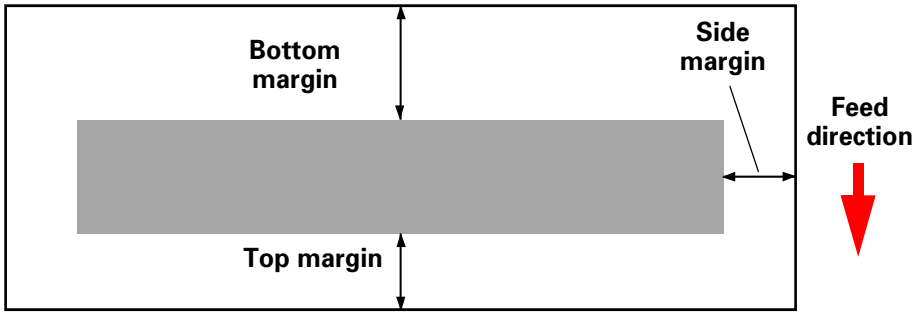


Figure 5-34. Measuring Sections/Margin Adjustment Pattern

ADJ REAR SENSOR POSITION

This function makes sure the P REAR sensor correctly detects the rear edge of cut-sheet paper to allow the user to print with the largest possible printable area but without printing off the edge of the paper and marring future printouts. The printer prints an A3-size test pattern. Using a ruler, measure the distance from the rear edge of the pattern to the rear edge of the paper, and then enter this measurement when prompted. This value is stored in the printer's firmware to be referenced against the printhead nozzle position.

1. Make sure "Adj Rear Sensor Pos." appears, and press the Enter button.
2. Load A3-size paper in portrait (short edge first) orientation when you see the "Please Set CutSheet" message. After the paper initializes, press the Enter button to print the check pattern.
3. After printing is finished, measure the distance from the rear edge of the printed pattern to the rear edge of the paper. Press the SelecType or Item button until you see "RearSen. Pos. xx.xmm", and then enter the measurement in increments of 0.1mm using the item select (Paper Feed) +/- buttons. After entering the measurement, press the Enter button.

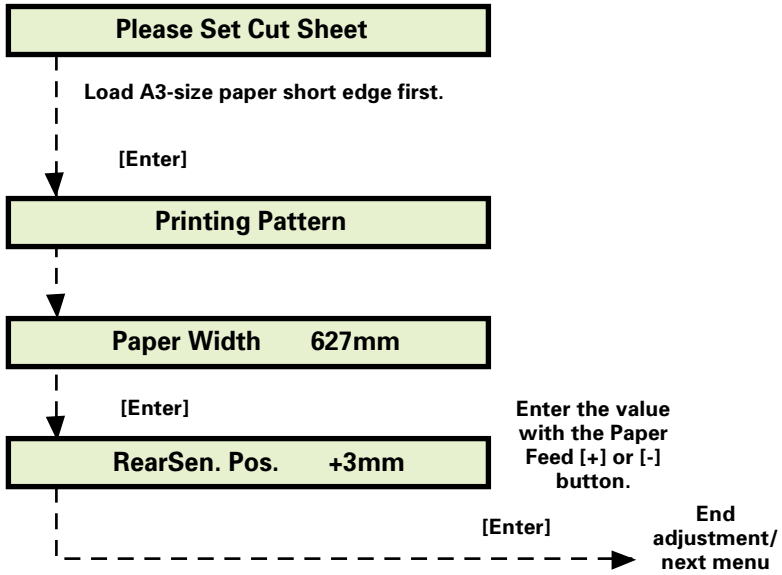


Figure 5-35. Rear Sensor Adjustment Operation

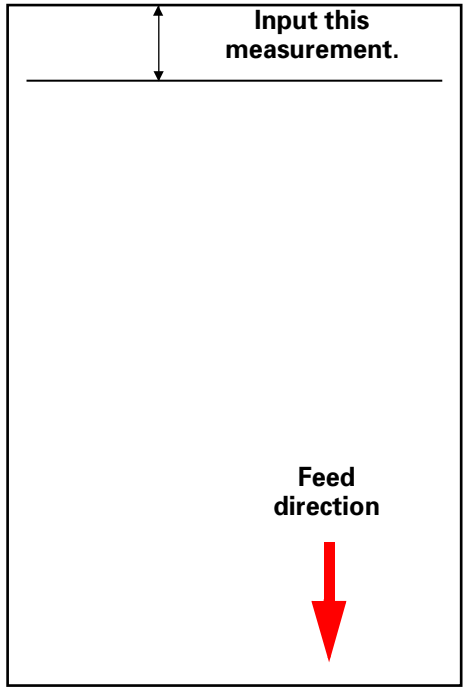


Figure 5-36. Rear Sensor Position Adjustment/Measurement

TEST PATTERN PRINT

This function prints a test pattern plus certain printer information/settings that you can refer to when performing printer adjustment procedures. For a list of the information that is printed, see the following table.

Table 5-12. Printed Items in the Test Pattern

Item	Description
Nozzle Check	Prints all of the check/test patterns that are available from the "Adjustment" menu.
Adjustment Variables	Prints a list of all the adjustable items from the "Adjustment" menu.

To print the list of variable items you need to enter the printer's serial number when prompted. The serial number is located on the back of the printer, next to the power connector.

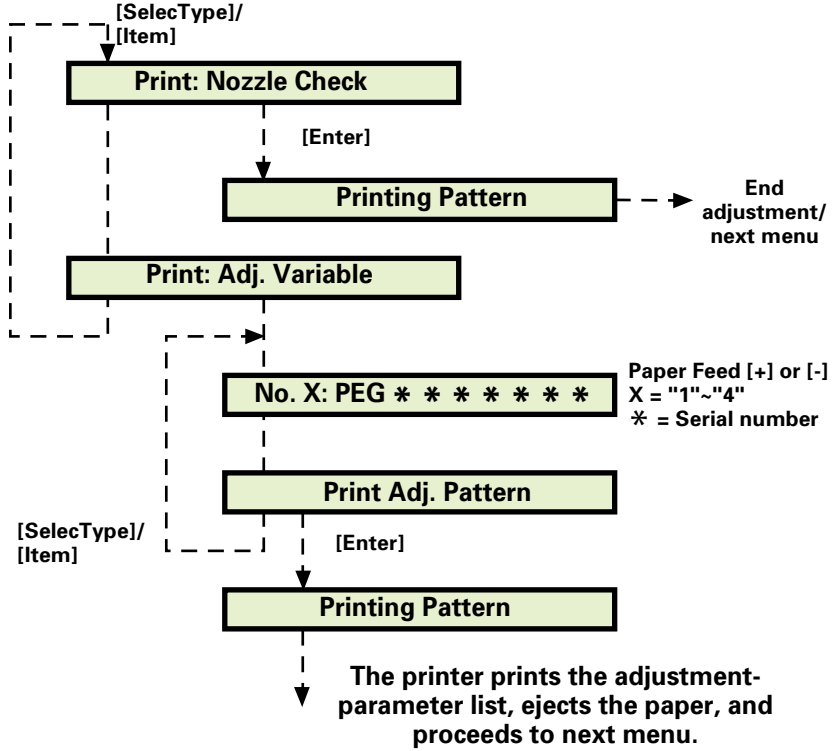


Figure 5-37. Test Pattern Printing Operation

CLEAN HEAD (DRAIN INK)

This function allows you to drain the ink from the ink delivery system including the printheads. Perform the Clean Head function before moving the printer.

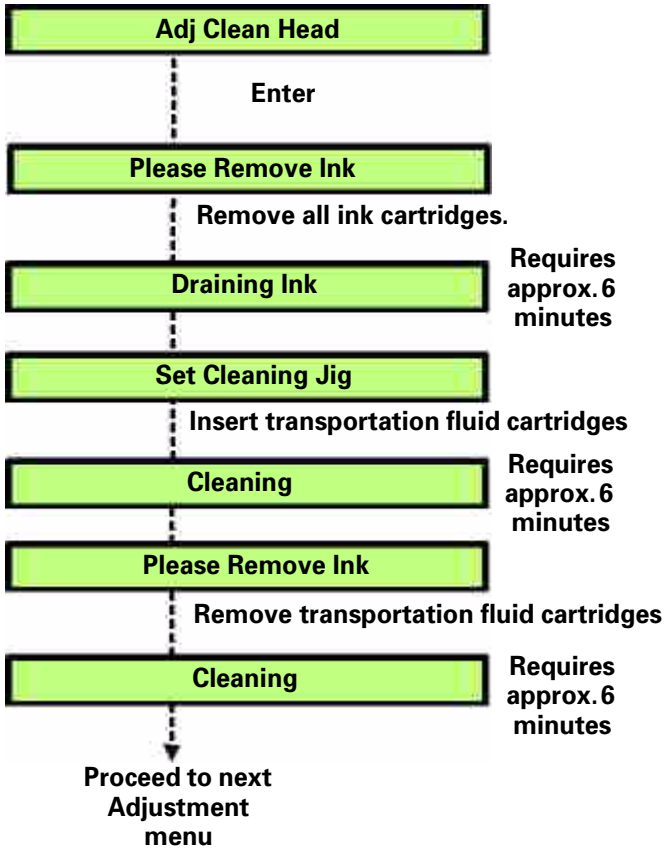


Figure 5-38. Ink Drain Operation

CAUTION

- **After draining the ink and performing any necessary operation and/or moving the printer, be sure to perform the initial ink charge as described in "Cleaning Menu" on page 187.**
- **The term cleaning jig means the EPSON original transportation fluid cartridge (x6 per operation). P/N = 1045585**
- **After transporting/servicing the printer, install new ink cartridges.**

COUNTER CLEAR

This function resets (to the original condition) the following counters which are stored in memory on the Main Board.

Table 5-13. Counters Reset by "Counter Clear"

Counter	Reset Value
Protection Counter A/B	0
Ink Volume Counter Rb/ Ry/ Rx/Rz	0
Consumed Ink Counter Cb/ Cy/ Cm/ Cc/ Cll/ Clc	0
Power Cutoff Timer T2	0
Accumulated Prints Timer	0
CL Timer	0
CL Timer 3	0
CL Flag	0
Initial Charge Flag	1*
Periodic Pseudo-Vacuum Flag	0

Note *: "1" means the flag is set, and the next time power is turned on the printer will perform an initial ink charge.

CAUTION

Before clearing the Waste Ink Counter or the Consumed Ink Counter, make sure you replace the following parts with new parts.

- **Waste Ink Pads**
- **Flush Box**
- **Pump Assembly**
- **Cap Assembly**
- **Head Cleaner**

The above parts are provided as [Maintenance Kit, SP-7000 1054038].

5.4.3 Cleaning Menu

Using this menu you can select a cleaning mode and initiate that cleaning operation. Also you can select whether or not the printer performs the initial-cleaning cycle as well as forcefully start the initial-cleaning cycle.

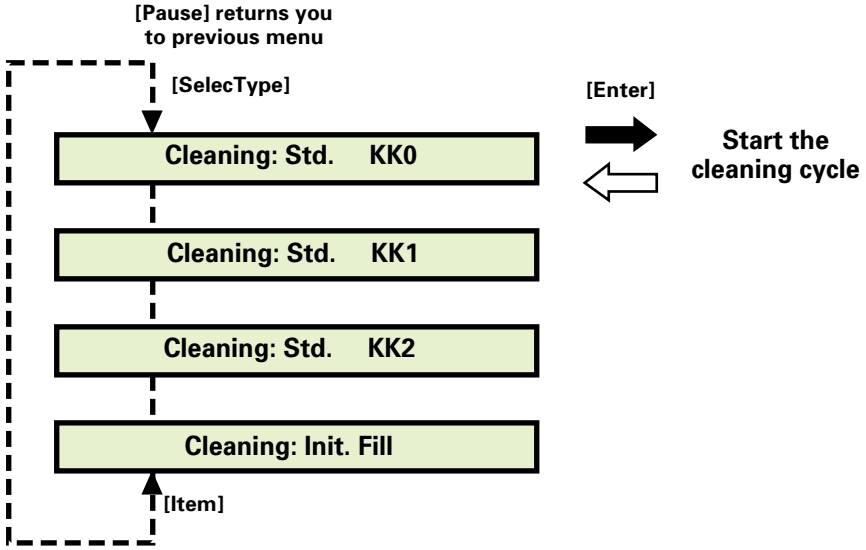


Figure 5-39. Cleaning Menu Options

- ☐ Std. KK0 (CL1)
  Normal cleaning cycle — Volume of ink cleared = low
- ☐ Std. KK1 (CL1')
  Strong cleaning cycle — Volume of ink cleared = medium
  rubbing = off
- ☐ Std. KK2 (CL2)
  Strong cleaning cycle — Volume of ink cleared = high
  rubbing = on
- ☐ Init. Fill — Perform Initial charge sequence

5.4.4 Print Menu

The Print menu performs the same test-printing functions as the "Test Print" option on the Adjustment menu. For details, see “Test Pattern Print” on page 185.

5.4.5 Parameter Menu

Using this menu you can reset or change the parameters for the printer mechanism controls. However, the parameters on this menu can also be modified from the Adjust menu. When servicing the printer, you do not need to separately update or reset the parameters from this menu.

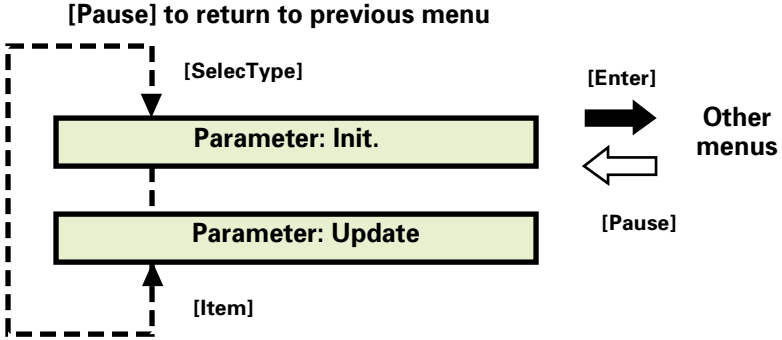


Figure 5-40. Parameter Menu Options

"INITIALIZE" ITEMS

The items you can reset (re-initialize) using this menu are described below.

- ☐ Capping Position (see “Adj Cap Position” on page 173)
- ☐ Paper Feed Distance (see “Feed Adjustment” on page 182)
- ☐ Serial No. (see “Test Pattern Print” on page 185 for more information)
- ☐ Maintenance Record (see Table 5-8, “Maintenance Record Items,” on page 170)

"UPDATE" ITEMS

The items you can update are described below.

CHECK POINT

The parameters will update and be stored in the Flash memory on the Main Board the next time the printer is turned off.

- ☐ Capping Position (see “Adj Cap Position” on page 173)
- ☐ Head Rank voltage (see “Adj Input Rank” on page 174)
- ☐ Print Position Items (Bi-D Adjustment/Gap Adjustment)
- ☐ Paper Feed Distance (see “Feed Adjustment” on page 182)
- ☐ Mechanism Parameters (see the next page)
- ☐ Ink Parameters (see the following)

☐ Ink Parameters
You can reset the Initial Ink Charge flag, causing the printer to perform the initial ink charge the next time the printer is turned on.

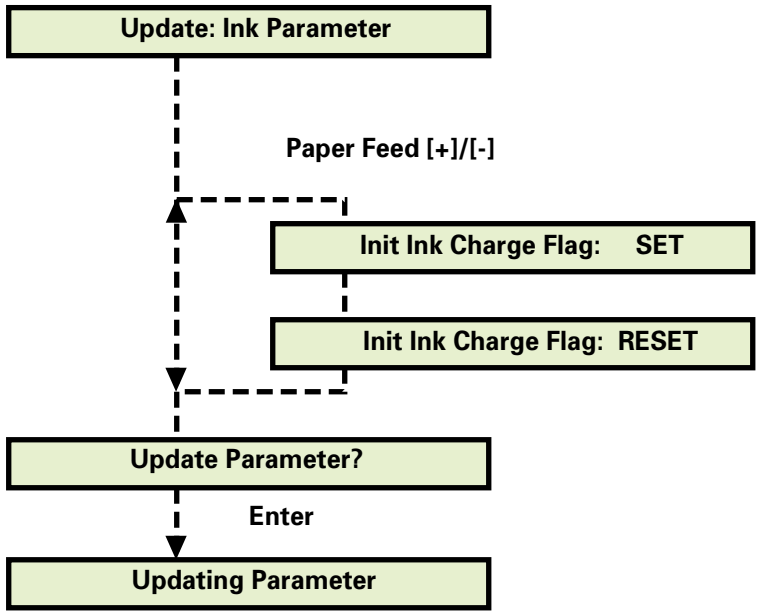


Figure 5-41. Ink Parameter Update Operation

5.5 Mechanism Adjustment

This section describes the mechanism adjustments you need to perform when replacing or removing certain parts. The parts and their corresponding adjustments are as follows.

Table 5-14. Necessary Mechanism Adjustments

Parts	Adjustment	Necessary Tools	Refer to
CR Motor	CR Steel Belt Tension	Tension Gauge #F712 code: 1047744 Standard: 8,000g	page 190
PF Motor	PF Belt Tension	Tension Gauge code: B747700300 Standard: 4,000g	page 190
P THICK sensor	Self-diagnostic test - "Paper Thickness"	-	page 191
Cover Open R/L sensor	Self diagnostic test - "Cover"	-	page 192

CR TIMING BELT TENSION ADJUSTMENT

This adjustment is necessary for service operations that require you to remove/loosen the CR Motor or CR Steel Belt. When replacing or re-installing the CR Steel Belt, you need to confirm the tension of the CR Steel Belt. Tighten or loosen the screws on the Driven Pulley to increase or decrease the tension.

Standard: 8000g ± 10% (at the point where the CR Steel Belt contacts the CR Rail)

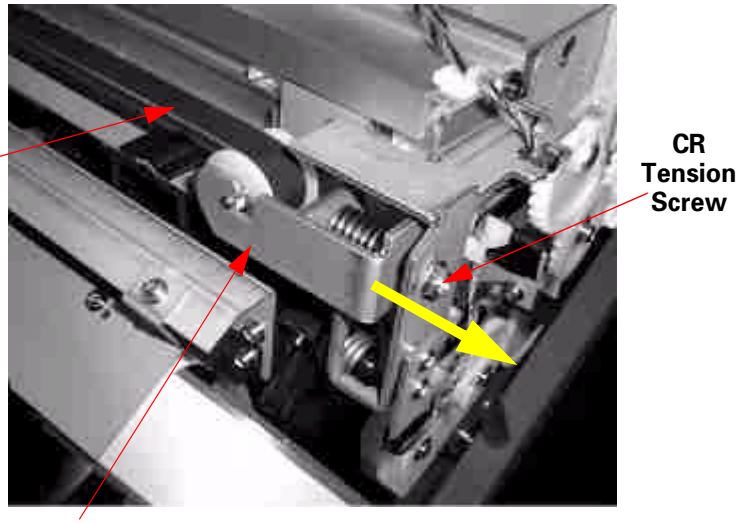


Figure 5-42. CR Timing Belt Tension Adjustment

PF TIMING BELT TENSION ADJUSTMENT

This adjustment is necessary for service operations that require you to remove/loosen the PF Motor or PF Belt. When replacing or re-installing the PF Belt, you need to confirm the tension of the PF Belt.

Standard: 2,200g ± 10%

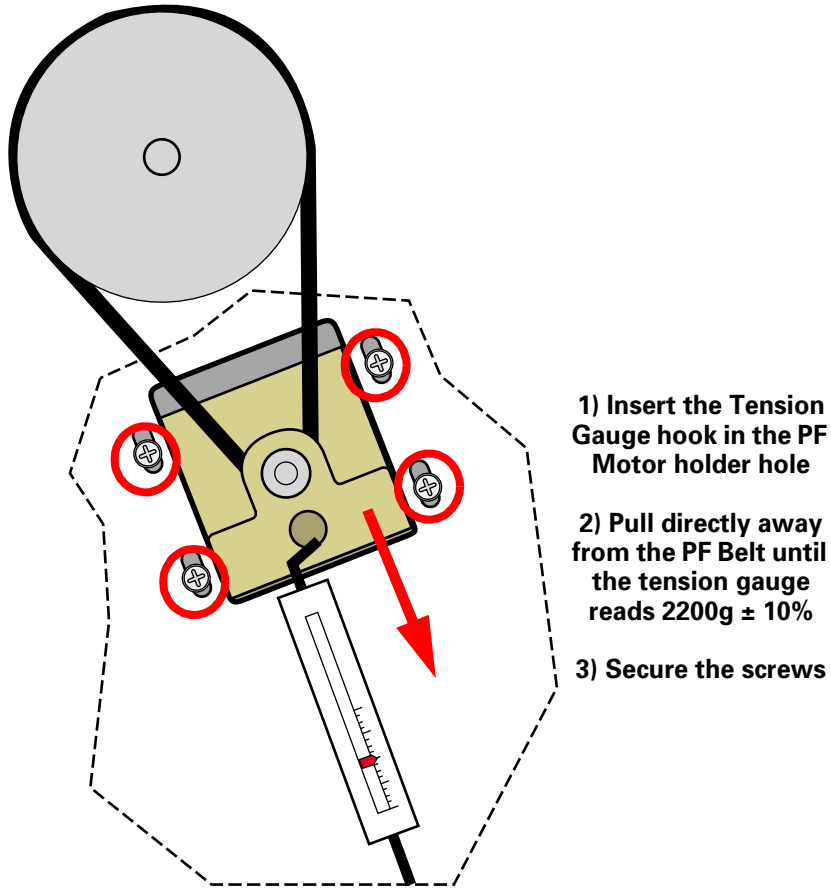


Figure 5-43. PF Belt Tension

P THICK SENSOR ASSEMBLY ADJUSTMENT

When removing/replacing the P THICK sensor, verify the sensor operation using the Self-Diagnostic mode as described below.

1. Remove the Top Cover as described in Chapter 4.
2. Press the following buttons and turn on the printer to enter the Self-Diagnostics mode.

   [Paper Feed ↓] + [Cut/Eject] + [Cleaning]

3. Press the SelecType or Item button until "Check: Test" appears in the LCD, then press the Enter button to select the Test menu.
4. Press the SelecType or Item button until "Test: Sensor" appears in the LCD, then press the Enter button to select the Test Item menu.
5. Press the SelecType or Item button until "Sen: Paper xxxx" appears.
6. Push back the Paper Set Lever to the "Release" position, and verify that "Sen: Paper Thick" appears in the LCD.
7. Insert a schema gauge (0.6mm/0.7mm) between the set of PF Grid Rollers and Driven Rollers nearest the HP. Return the Paper Set Lever to the "Set" position. The LCD message will vary according to the schema gauge as shown in the table below.

Table 5-15. P THICK Sensor Operation Check

Schema Gauge	LCD Message
0.7mm (thick paper)	Sen: Paper Wide
0.6mm (standard paper)	Sen: Paper Std

8. If the correct message does not appear or any other message appears, verify the P THICK sensor is installed correctly and check the operation again. If necessary, loosen the screw securing the sensors and adjust the position forward and back until both the P THICK sensor and Paper Set Lever Position sensor operate correctly. Then tighten the screw.

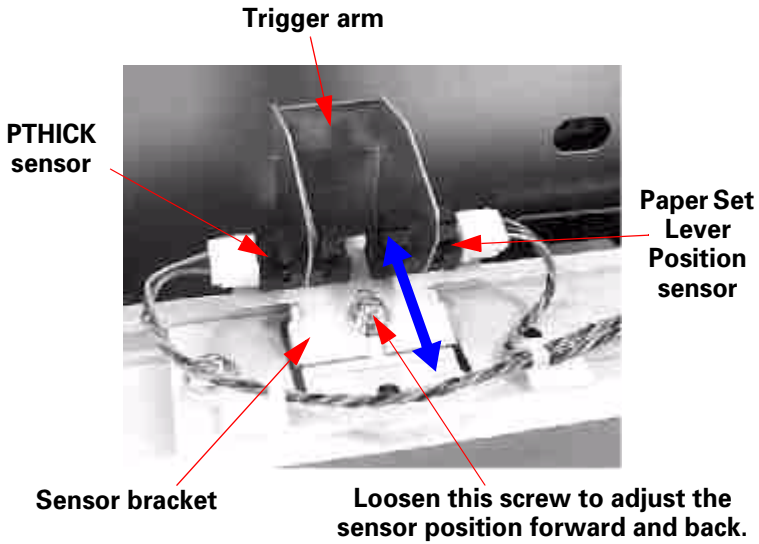


Figure 5-44. P THICK Sensor Position Adjustment

COVER OPEN SENSOR ASSEMBLY

When removing/replacing the Cover Assembly or the Front Cover, verify the sensor operation using the Self-Diagnostic mode as described below.

1. Press the following buttons and turn on the printer to enter the Self-Diagnostics mode.

   [Paper Feed ↓] + [Cut/Eject] + [Cleaning]

2. Press the SelecType or Item button until "Check: Test" appears in the LCD, then press the Enter button to select the Test menu.
3. Press the SelecType or Item button until "Test: Sensor" appears in the LCD, then press the Enter button to select the Test Item menu.
4. Press the SelecType or Item button until "Sen: Cover xxxx" appears.
5. Open and close the Front Cover, checking the LCD to make sure the message changes depending on the Front Cover position.

Table 5-16. Cover Sensor Assembly Check

Front Cover	LCD Message
Open	Sen: Cover Open
Closed	Sen: Cover Close

6. If the correct message does not appear or any other message appears, verify the Cover Sensor is installed correctly and check the operation again. If necessary, loosen the screw securing the sensor and adjust the position up or down until the cover open sensor operates correctly. Then tighten the screw.

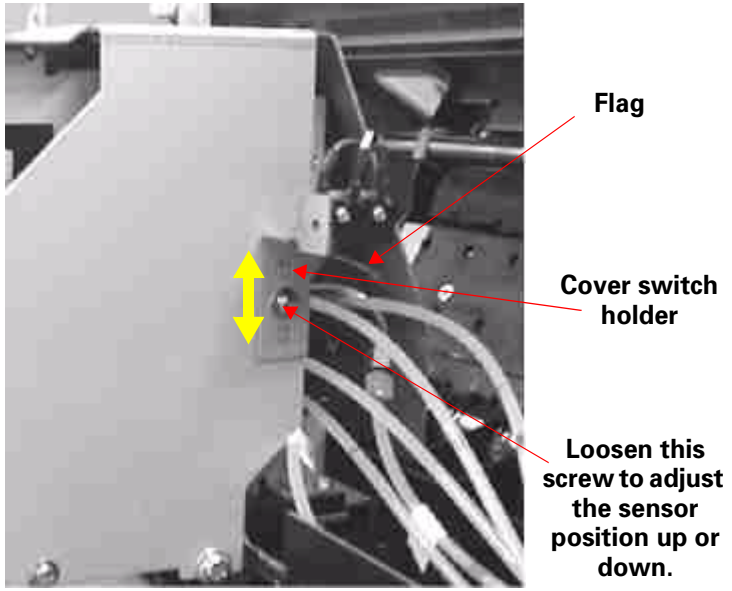


Figure 5-45. Interlock Switch Mechanism

5.6 USB ID Copy/Backup

Each printer has a unique USB ID which is stored in the NVRAM (EEPROM) on the C299MAIN board. The USB ID is unique for each printer in the same way a serial number is unique.

Example USB-ID: NE001XXXXXXXXXXXX0 (X =0~9 or A~Z)

If you need to replace the C299MAIN board during service, then you first need to copy and back up the USB ID. This operation requires the exclusive SP7000 USB-ID Copy Program as well as:

- PC with MS-DOS or Windows 95
- Parallel interface connection (compatible mode)

EXTRACTING THE USB-ID COPY PROGRAM

☐ SP7000 USB-ID Copy Program

Found on the #F733: Self Training Kit (P/N: 1053426)

File:/AD_PRO_E/SP7K10E.EXE (self-extracting file)

extract the file to a folder you make on the root directory of your hard drive (example: C:/SP7000/)

☐ PC equipped with Windows 95 or MS-DOS6.2 or above

☐ Parallel interface connection

AFTER EXTRACTING THE PROGRAM

1. After extracting the program, confirm that the following files exist:
   - SP7000.PDF file (Readme file)
   - SP7000 versionlist.PDF file (tracks upgrades)
   - SP7000.EXE file (program file)
2. Read the SP7000.PDF file before using the program
3. See the next page.

5.6.1 Running the Program

There are two ways to use the program, the first one is given in the next section and it described how to copy the USB ID from the old C299MAIN board and copy it to the new board. If for some reason that does not work, write a new USB ID to the new board as described on the next page.

COPYING THE ID TO THE NEW BOARD

1. While the old C299MAIN board is still installed in the printer, make sure the printer is on, paper is loaded, and "Ready" appears on the LCD. If Ready does not appear, see "Writing New ID to the New Board" on page 194.
2. Double-click the SP7000.EXE icon to start the program, and then select "USB-ID Copy/Write" from the menu that appears.
3. From the next menu, select "Write USB-ID to file".
4. Enter a name for the file, up to eight characters. Press the Enter key, and after about 85 seconds the USB-ID file appears in the same folder as the program file with the name [filename.dat]

NOTE: *The USB-ID consists of 18 characters as follows:*
NE001XXXXXXXXXXXX0 (X =0~9 or A~Z)

5. Turn off the printer and close the program.
6. Replace the main board as described in Chapter 4, plus do the adjustments described in Table 5-2, "Service Parts & Required Adjustments," on page 155.
7. Turn the printer on and restart the program.
8. Select "USB-ID Copy/Write" from the menu that appears.
9. Select "Write USB-ID to EEPROM".
10. Enter the name of the file you created in step 4 and press the Enter key. After about 85 seconds, the "USB-ID is..." message disappears and the USB-ID is written to the new board.
11. Press the ESC key to return to the previous menu, and select "USB Structure Settings".
12. Press the Enter key and the USB structure settings are written to the new board. When "Settings finished" appears, turn off the printer.

WRITING NEW ID TO THE NEW BOARD

1. Replace the main board as described in Chapter 4, plus do the adjustments described in Table 5-2, "Service Parts & Required Adjustments," on page 155.
2. Turn on the printer.
3. Double-click the SP7000.EXE icon to start the program, and then select "USB-ID New Settings" from the menu that appears.
4. Press the Enter key and the new USB-ID settings are automatically written to the new C299MAIN board. When "Settings Finished" appears, press the ESC key to return to the previous menu.
5. Select "USB Structure Settings", and press the Enter key. The USB structure settings are written to the new board.
6. When "Settings finished" appears, turn off the printer.

CHAPTER

6

MAINTENANCE & SETUP

6.1 General Maintenance Issues

This section explains necessary maintenance items and their details for this product. Basically for this product, service technicians are required to visit the user's location where the EPSON Stylus Pro 7000 is used, and perform necessary maintenance/service on-site while following the precautions below. Service technicians have to be extra careful not to cause any accident to the product or the user's environment.

- **Since the power switch is mounted on the secondary circuit of the power supply circuit, unless otherwise specified, always turn off the printer using the power switch. After all moving parts have stopped, wait several seconds and then disconnect the power cable from the AC plug socket to prevent electric shock or circuit damage during service operations.**
- **The cover open sensor for detecting the open/close condition of the front cover has an interlock switch that functions as a safety device. Therefore, it is prohibited to turn off this switch.**
- **A lithium battery is used to back up memory and is mounted on the control circuit board. To prevent accidents, follow the precautions below when handling the board.**
  ***Do not short the battery.**
  ***Do not set the battery on the wrong poles, double check the plus and minus sides when installing the battery.**
  ***Do not heat up or place the battery neat a heat source.**
  ***Do not place the main board on top of any conductive material or surface.**
- **Be careful not to let ink get into your eyes or your skin. If ink gets in your eye, flush the eye with water, and see a doctor if you feel discomfort in your eye.**

- **Due to the printer's size, when performing any service or maintenance operations, confirm there is plenty of space for the operation.**
- **Due to the printer's size and weight, make sure any area you move the printer to or any surface you place the printer on is stable.**
- **Since the EPSON Stylus Pro 7000 is quite heavy (approximately 43.5 Kg for the printer body plus another 8.5 Kg for the stand), be careful when handling it. When separating or setting up the printer body and stand, you need two people.**
- **When removing parts, ink may drip on the floor or lower sections of the printer. Therefore, spread a sheet or similar object when removing ink-related parts.**
- **When handling the electric circuit boards, do not touch the elements on the board by your bare hands to prevent the elements from being damaged by static electricity. Wearing an earth band is highly recommended.**
- **If it is necessary to turn on the printer after removing various covers, be especially careful around the carriage and fans to avoid injury.**
- **Keep in mind that the cutter blade is made of very hard material and may easily break if it contacts metal parts.**
- **If the printer needs to be transported for any reason, refer to Chapter 9 of the *Users Guide* to put the printer into printer-transport mode. Also, only use original packing materials and pack the printer as shown in the *Start-Up Guide* or *Assembly and Setup Guide*.**

6.1.1 Periodic Maintenance Items

The printer uses sensors and counters to determine when consumable items need to be replaced. When a consumable part has reached its predetermined end-of-life according to the corresponding counter, a message appears. See the table below for parts which require periodic replacement.

Table 6-1. Parts That Require Periodic Replacement

Items	LCD Message	Description
Waste Ink Pads (Maintenance Kit SP7000, #1054038)	"Maintenance Call 0100" or "Service Call 00000100"	Solution Replace the following parts with the parts in the Maintenance Kit; • Waste Ink Pads • Pump Assembly • Cap Assembly • Flushing Box • Cleaner, Head *Required Adjustment • Waste Ink Counter Clear (See "Counter Clear" on page 187.)
Ink Tubes	"Service Call 00000101"	Solution • Check the ink tube (The printer indicates this error when the carriage has made a predetermined number of passes; this indicates the ink tubes should be replaced before they wear out, causing air to enter the ink tube or ink to leak.)

CAUTION

When replacing the waste ink pads, replace the pads in the waste ink tank and not the whole tank. Put the old pads in a plastic bag and throw away the used ink pads according to the laws and rules in your area.

6.1.2 Product Life Information

The table below shows the product life about the printer body, each mechanism and various parts. Information regarding to the product life can be checked by the following way.

☐ Panel Setting: "Printer Status Menu"
The amount of ink remaining is indicated on the LCD. ("F*****E" - F = full, E = empty, and each asterisk * represents a percentage of the total ink.)
Also, the counters which record these values can be initialized by "Maintenance Mode 2".

CAUTION

Do not perform the counter initialization without replacing the corresponding parts and checking their operation. Since the counters for "Waste Ink Life" and "Ink Remaining Quantity" influence printer operations, do not clear them unnecessarily.

☐ Self-Diagnostic Function: from the "Test" menu select "Check: Maintenance"

Table 6-2. Product Life Information

Items	Setting value	Notes	Result = Error
Printer	20,000 pages	A1 paper	No
Printheads	2 billion dots	Each nozzle	No
Waste Ink Pads	Right head: 84779 points Left head: 56519 points	1 point = 0.02ml	Yes
CR Motor	5,000,000 passes	1 pass =1 round trip *Ink tube life is monitored based on this counter value.	Yes
PF Motor	23,000 meters	Paper feed distance	No
Cutter	2,000 operations	1 operation = cut one page	No

6.1.3 Important Maintenance Items During Service Operations

Check the following items during printer maintenance/service and perform any necessary operations.

Table 6-3. Items to be Checked During Maintenance/Service

Items	Check Points	Remedy
Lower Paper Guide and the surface of the Subplaten	Make sure no paper, dust, or foreign objects are attached or have accumulated.	Cleaning (If there is an ink stain, wipe with dry, clean cloth after cleaning the ink stain with damp cloth.)
Step Ruler (Striped plastic sheet used by Linear Encoder to determine CR position)	Make sure no dust or foreign objects are attached or have accumulated, and make sure it is not ripped, bent, or stained.	1) Cleaning 2) Replace if there are any rips or stains
Rail on the CR guide frame	Make sure there are no foreign objects attached.	Cleaning
P_REAR sensor and P_FRONT sensor surface	Make sure no paper, dust, or foreign objects are attached or have accumulated.	Cleaning

6.1.4 Lubrication and Glue

Unlike the EPSON Stylus Pro 9000, this printer requires some grease and glue as described below.

Table 6-4. Lubrication and Glue

Type	Name	Amount	Companay	Part #	Location
Grease	Super-Multi Oil #32	n/a		n/a	
	Plalex 1	n/a		n/a	
	G-26 (Molicoat EM-60L)	40g (n/a)	EPSON (Dow Corning Asia)	B702600001	Other printer parts
Glue	Screw lock	1,000g	EPSON	B730200200	Screw lock (blue)

CAUTION

Do not apply any other oils, lubricants, or glues than those described in this manual; otherwise printer parts may be damaged or their useful life may be shortened.

CHAPTER

7

APPENDIX

7.1 Wiring Diagrams

The following illustration shows the connection between the printer mechanism and the electrical circuits.

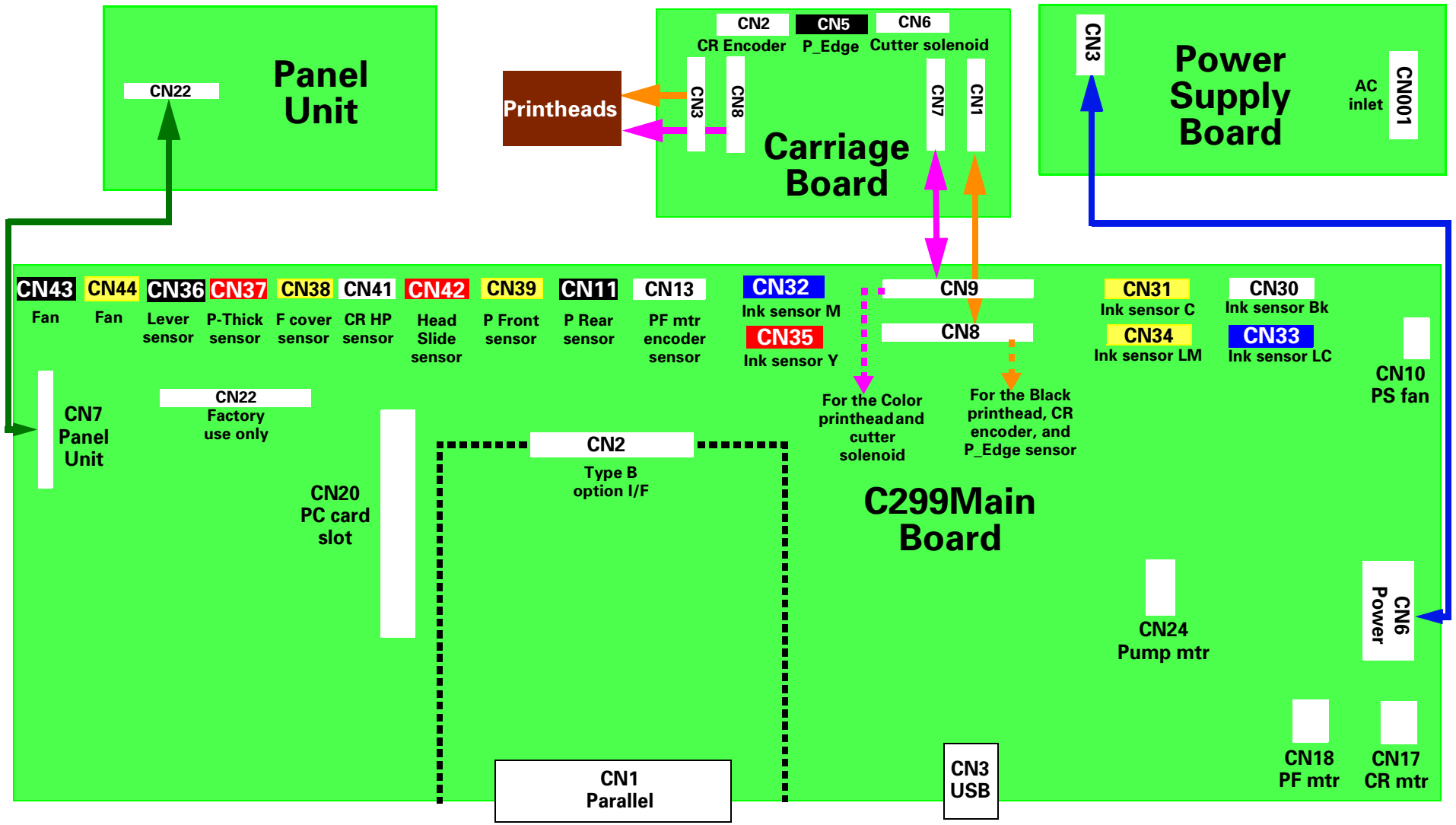


Figure 7-1. EPSON Stylus Pro 7000 Wiring Diagram

Table 7-1. Electrical Circuit Connector List

Board	Connector	Description
C299Main Board	CN1	Parallel Interface
	CN2	Type-B Option Card Connector
	CN3	USB Interface
	CN6	From and to the Power Supply Unit
	CN7	To and from the Control Panel
	CN8	For the black printhead, CR Encoder sensor, and P_Edge (width) sensor
	CN9	For the color printhead, and cutter solenoid
	CN10	Power supply fan
	CN11	P_REAR Sensor
	CN13	PF motor encoder sensor
	CN17	CR Motor
	CN18	PF Motor
	CN20	PC Card Slot
	CN22	Factory use only
	CN24	Pump motor
	CN30	Ink sensor black
	CN31	Ink sensor cyan
	CN32	Ink sensor magenta
	CN33	Ink sensor light cyan
	CN34	Ink sensor light magenta
	CN35	Ink sensor yellow
	CN36	Lever sensor
	CN37	P_Thick sensor

Table 7-1. Electrical Circuit Connector List (cont.)

Board	Connector	Description
C299Main Board (continued)	CN38	Front cover sensor
	CN39	P_Front sensor
	CN41	CR HP sensor
	CN42	Head slide (PG) sensor
	CN43	Paper Suction Fan
	CN44	Paper Suction Fan
Panel Unit Board	CN22	From and to C299MAIN Board/CN7
Carriage Board	CN1	From and to C299MAIN Board/ CN8:WHT
	CN2	CR Encoder sensor
	CN3	To light-color printhead
	CN5	P_Edge Sensor
	CN6	Cutter Solenoid
	CN7	To and from Main Board/CN9 BLE
	CN8	To dark-color printhead
Power Supply Board	CN001	From AC inlet
	CN3	To Main Board

7.1.1 Connector Pin Assignment

Tables in this section provide connector pin assignment of the Stylus Scan 2500.

Signals of each connector on the B102 MAIN Board are listed below.

Connectors CN1 and CN3 are described in detail in Chapter 1.

Table 7-2. Connector Pin Assignments for CN2

Pin No.	Signal Name	I/O	Function
1	+5V	O	Logic power source
2	+5V	O	Logic power source
3	+5V	O	Logic power source
4	+5V	O	Logic power source
5	+5V	O	Logic power source
6	+5V	O	Logic power source
7	TXD	O	
8	/READY	O	
9	RXD	O	
10	NC	-	Neutral circuit (not used)
11	/RESET	O	
12	INH		
13	/CMREQ	O	
14	/WRRDY	O	
15	/RDREQ	O	
16	/HWR		
17	/RD		
18	/CE		
19	SG	-	Signal ground
20	SG	-	Signal ground
21	SG	-	Signal ground
22	SG	-	Signal ground

Table 7-2. Connector Pin Assignments for CN2 (cont.)

Pin No.	Signal Name	I/O	Function
23	SG	-	Signal ground
24	SG	-	Signal ground
25	TBA4		
26	TBA3		
27	TBA2		
28	TBA1		
29	TD7		
30	TD6		
31	TD5		
32	TD4		
33	TD3		
34	TD2		
35	TD1		
36	TD0		

Table 7-3. Connector Pin Assignments for CN6

Pin No.	Signal Name	I/O	Function
1	+5V	O	Logic Power Source
2	SG	-	Signal ground
3	POWER_SW	O	Power on/off signal
4	-2V	I	Trapezoidal wave form control
5	PG	-	Ground
6	+42V	I	Motor power source
7	AC_OFF	O	Secondary side overcurrent signal
8	SG	-	Signal ground
9	+28V/+48VREM_ON		

Table 7-3. Connector Pin Assignments for CN6

Pin No.	Signal Name	I/O	Function
10	+28V	I	Printhead power source
11	PG	-	Ground
12	+42V	I	Motor power source

Table 7-4. Connector Pin Assignments for CN7

Pin No.	Signal Name	I/O	Function
1	SG	-	Signal ground
2	SG	-	Signal ground
3	POWER_SW	I	Signal from power button
4	P_REV		
5	NC	-	Neutral circuit (not used)
6	/RESET		
7	/RD		
8	/WRL		
9	/PANEL		
10	SO		
11	BA2		
12	BA1		
13	D7	O	Data signal
14	D6	O	Data signal
15	D5	O	Data signal
16	D4	O	Data signal
17	D3	O	Data signal
18	D2	O	Data signal
19	D1	O	Data signal
20	D0	O	Data signal
21	+5V	O	Logic Power Source
22	+5V	O	Logic Power Source

Table 7-4. Connector Pin Assignments for CN7 (cont.)

Pin No.	Signal Name	I/O	Function
23	+5V	O	Logic Power Source
24	SG	-	Signal ground
25	SG	-	Signal ground
26	SG	-	Signal ground
27	SG	-	Signal ground
28	SG	-	Signal ground

Table 7-5. Connector Pin Assignments for CN8

Pin No.	Signal Name	I/O	Function
1	BVHV	O	Dark head dot control reference voltage
2	BVHV	O	Dark head dot control reference voltage
3	BVHV	O	Dark head dot control reference voltage
4	+28V	O	Printhead power source
5	+28V	O	Printhead power source
6	BCOM	O	Common pulse (trapezoidal wave)
7	SG	-	Signal ground
8	BCOM	O	Common pulse (trapezoidal wave)
9	SG	-	Signal ground
10	BCOM	O	Common pulse (trapezoidal wave)
11	SG	-	Signal ground
12	BHNCHG	O	Dark head charge pulse (trapezoidal wave-form)
13	SG	-	Signal ground
14	BHLAT		Dark head print data latch control signal
15	SG	-	Signal ground
16	BHCK		Dark head clock signal for data transmission

Table 7-5. Connector Pin Assignments for CN8

Pin No.	Signal Name	I/O	Function
17	SG	-	Signal ground
18	BHDATA0	O	Dark head data 0
19	SG	-	Signal ground
20	BHDATA1	O	Dark head data 1
21	SG	-	Signal ground
22	BHDATA2	O	Dark head data 2
23	SG	-	Signal ground
24	HDTEMPB	I	Head temperature for dark inks
25	+5V	O	Sensor power source
26	CRENC_A	I	Encoder signal phase A for measuring paper width
27	CRENC_B	I	Encoder signal phase B for measuring paper width
28	NC	-	Neutral circuit (not used)
29	P_EDGE	I	Paper width sensor signal
30	SG	-	Signal ground

Table 7-6. Connector Pin Assignments for CN9

Pin No.	Signal Name	I/O	Function
1	CCOM	O	Common pulse (trapezoidal wave-form)
2	SG	-	Signal ground
3	CCOM	O	Common pulse (trapezoidal wave-form)
4	SG	-	Signal ground
5	CCOM	O	Common pulse (trapezoidal wave-form)
6	SG	-	Signal ground
7	CVHV	O	Light head dot control reference voltage

Table 7-6. Connector Pin Assignments for CN9

Pin No.	Signal Name	I/O	Function
8	CVHV	O	Light head dot control reference voltage
9	CVHV	O	Light head dot control reference voltage
10	C_SOL	O	Cutter solenoid signal
11	C_SOL	O	Cutter solenoid signal
12	SG	-	Signal ground
13	CHNCHG	O	Light head charge pulse (trapezoidal wave-form)
14	SG	-	Signal ground
15	CHLAT		Light head print data latch control signal
16	SG	-	Signal ground
17	CHCK		Light head clock signal for data transmission
18	SG	-	Signal ground
19	CHDATA0	O	Light head data 0
20	SG	-	Signal ground
21	CHDATA1	O	Light head data 1
22	SG	-	Signal ground
23	CHDATA2	O	Light head data 2
24	SG	-	Signal ground
25	HDTEMPC	I	Head temperature for light inks
26	+5V	O	Sensor power source
27	HEAD_ERR	I	Head error signal
28	+3.3V	O	Cutter solenoid power source
29	/LED_ON	I	Encoder signal source
30	SG	-	Signal ground

Table 7-7. Connector Pin Assignments for CN10

Pin No.	Signal Name	I/O	Function
1	VCC	I	PS cooling fan power supply
2	PG	-	Ground

Table 7-8. Connector Pin Assignments for CN11

Pin No.	Signal Name	I/O	Function
1	A	I	
2	K	I	
3	E	I	
4	C	I	

Table 7-9. Connector Pin Assignments for CN13

Pin No.	Signal Name	I/O	Function
1	PFENC_A	I	Encoder signal phase A for PF encoder
2	PFEENC_B	I	Encoder signal phase B for PF encoder
3	+5V	O	Sensor power source
4	SG	-	Signal ground
5	SG	-	Signal ground

Table 7-10. Connector Pin Assignments for CN17

Pin No.	Signal Name	I/O	Function
1	CRMOT_A	O	Drive signal phase A for the CR motor
2	NC	-	Neutral circuit (not used)
3	CRMOT_B	O	Drive signal phase B for the CR motor

Table 7-11. Connector Pin Assignments for CN18

Pin No.	Signal Name	I/O	Function
1	PFMOT_A	O	Drive signal phase A for the PF motor
2	PFMOT_B	O	Drive signal phase B for the PF motor

Table 7-12. Connector Pin Assignments for CN20

Pin No.	Signal Name	I/O	Function

Table 7-13. Connector Pin Assignments for CN24

Pin No.	Signal Name	I/O	Function
1	PUMP_A	O	Drive signal phase A for the pump motor
2	PUMP_B	O	Drive signal phase B for the pump motor
3	PUMP_/A	O	Drive signal phase /$\overline{A}$ for the pump motor
4	PUMP_/B	O	Drive signal phase /B for the pump motor

Table 7-14. Connector Pin Assignments for CN30

Pin No.	Signal Name	I/O	Function
1	K_NOT	O	Black I/C not installed
2	SG	O	Signal ground
3	K_END	O	Black ink out
4	SG	O	Signal ground

Table 7-15. Connector Pin Assignments for CN31

Pin No.	Signal Name	I/O	Function
1	C_NOT	O	Cyan I/C not installed
2	SG	-	Signal ground
3	C_END	O	Cyan ink out
4	SG	-	Signal ground

Table 7-16. Connector Pin Assignments for CN32

Pin No.	Signal Name	I/O	Function
1	M_NOT	O	Magenta I/C not installed
2	SG	-	Signal ground
3	M_END	O	Magenta ink out
4	SG	-	Signal ground

Table 7-17. Connector Pin Assignments for CN33

Pin No.	Signal Name	I/O	Function
1	LC_NOT	O	Light cyan I/C not installed
2	SG	-	Signal ground
3	LC_END	O	Light cyan ink out
4	SG	-	Signal ground

Table 7-18. Connector Pin Assignments for CN34

Pin No.	Signal Name	I/O	Function
1	LM_NOT	O	Light magenta I/C not installed
2	SG	-	Signal ground
3	LM_END	O	Light magenta ink out
4	SG	-	Signal ground

Table 7-19. Connector Pin Assignments for CN35

Pin No.	Signal Name	I/O	Function
1	Y_NOT	O	Yellow I/C not installed
2	SG	-	Signal ground
3	Y_END	O	Yellow ink out
4	SG	-	Signal ground

Table 7-20. Connector Pin Assignments for CN36

Pin No.	Signal Name	I/O	Function
1	LEVERUP	I	Lever signal
2	SG	-	Signal ground
3	+5V	O	Sensor power source

Table 7-21. Connector Pin Assignments for CN37

Pin No.	Signal Name	I/O	Function
1	P_THICK	I	Paper thickness signal
2	SG	-	Signal ground
3	+5V	O	Sensor power source

Table 7-22. Connector Pin Assignments for CN38

Pin No.	Signal Name	I/O	Function
1	COVL_NO	I	Cover open signal
2	COM	O	Sensor power source
3	COVL_NC	I	Cover closed signal

Table 7-23. Connector Pin Assignments for CN39

Pin No.	Signal Name	I/O	Function
1	A	I	
2	K	I	
3	E	I	
4	C	I	

Table 7-24. Connector Pin Assignments for CN41

Pin No.	Signal Name	I/O	Function
1	C	I	CR home position signal
2	SG	O	Signal ground
3	+5V	O	Sensor power source

Table 7-25. Connector Pin Assignments for CN42

Pin No.	Signal Name	I/O	Function
1	A	I	
2	K	I	
3	E	I	
4	C	I	

Table 7-26. Connector Pin Assignments for CN43

Pin No.	Signal Name	I/O	Function
1	VCC	O	Fan power source
2	FAN1	-	Ground

Table 7-27. Connector Pin Assignments for CN44

Pin No.	Signal Name	I/O	Function
1	VCC	O	Fan power source
2	FAN2	-	Ground

7.2 Exploded View Diagram

The illustrations in the following pages show the printer components and arrangement. The part numbers in the illustrations refer to the illustration numbers in Table 7-2, page 162.

- ☐ No.1: Frame Assembly
- ☐ No.2: Paper Feed Assembly
- ☐ No.3: Head Assembly
- ☐ No.4: Carriage Assembly
- ☐ No.5: Frame Assembly
- ☐ No.6: Maintenance Assembly
- ☐ No.7: Ink Cartridge Holder Assembly
- ☐ No.8: Cable Guide
- ☐ No.9: Board Base Assembly
- ☐ No.10: Cover Assembly

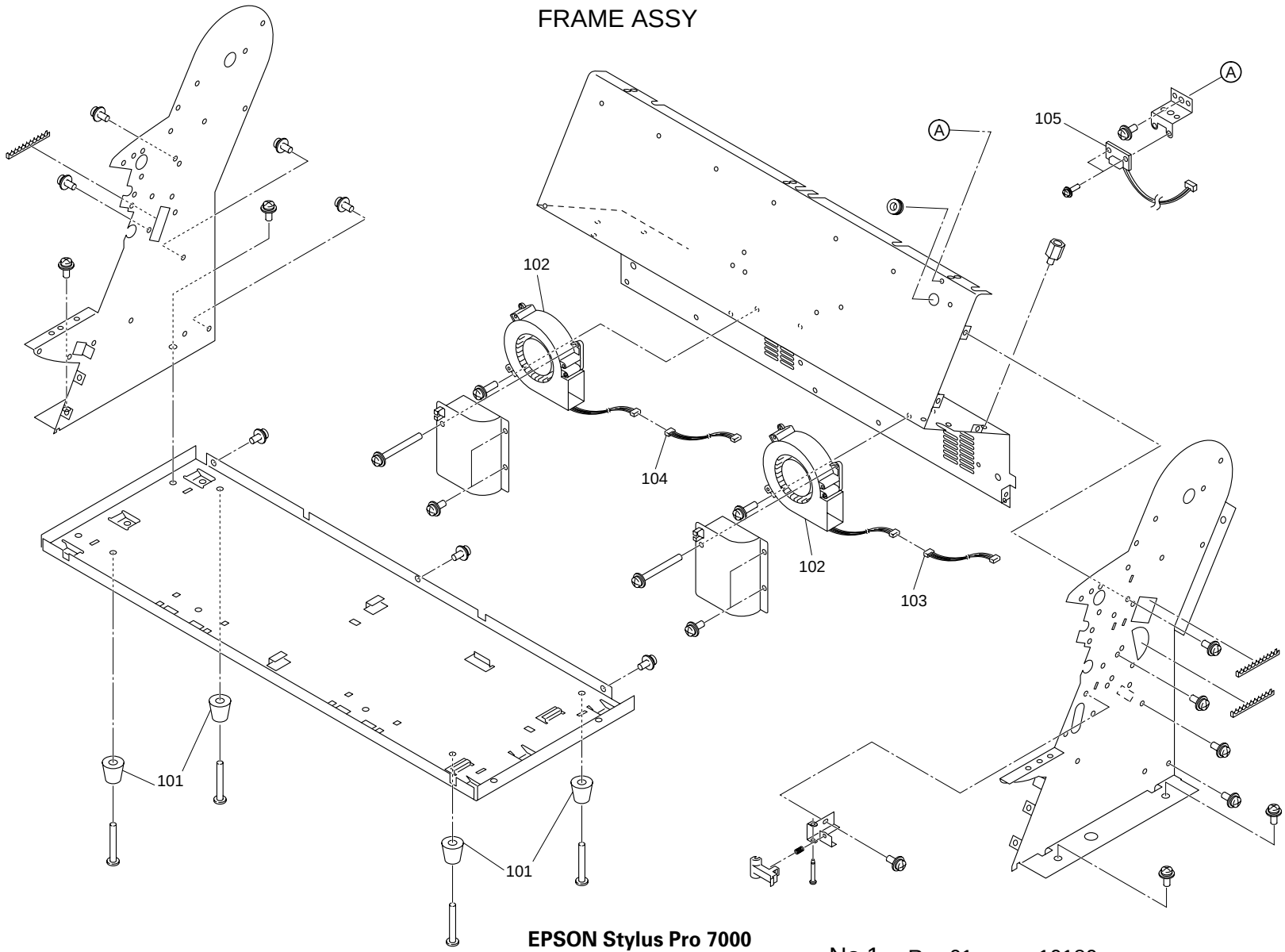


Figure 7-2. Frame Assembly

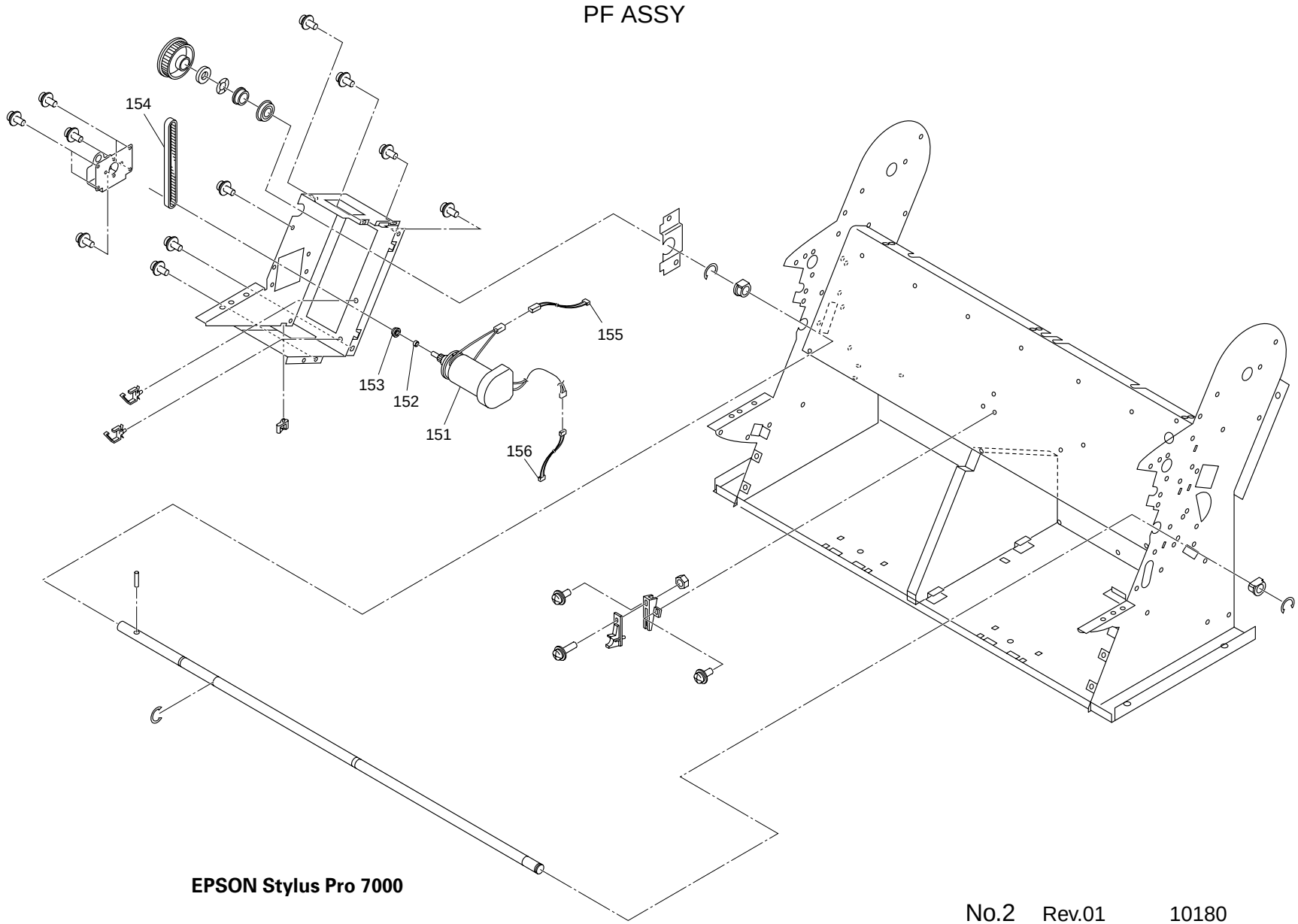


Figure 7-3. Paper Feed Assembly

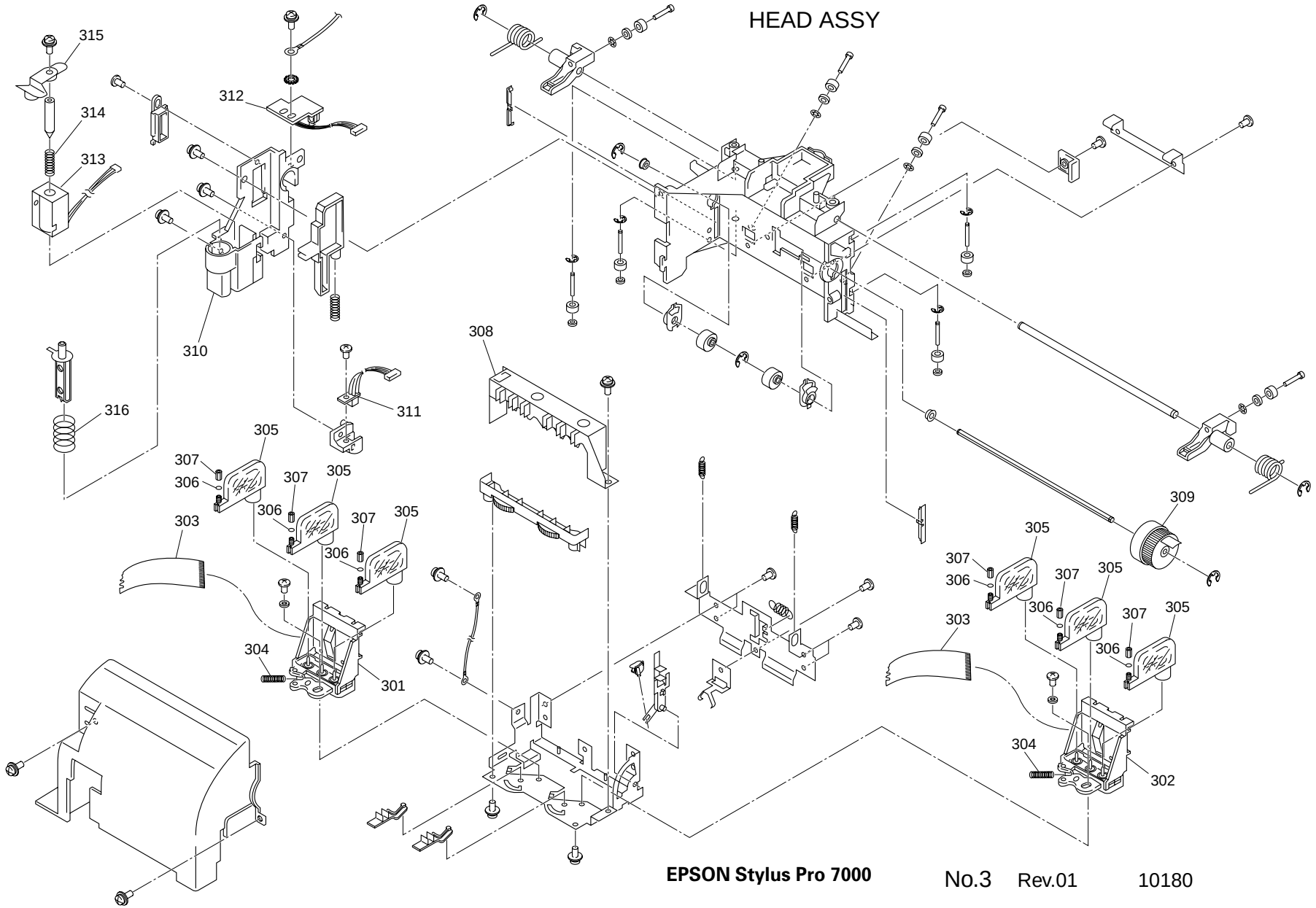


Figure 7-4. Head Assembly

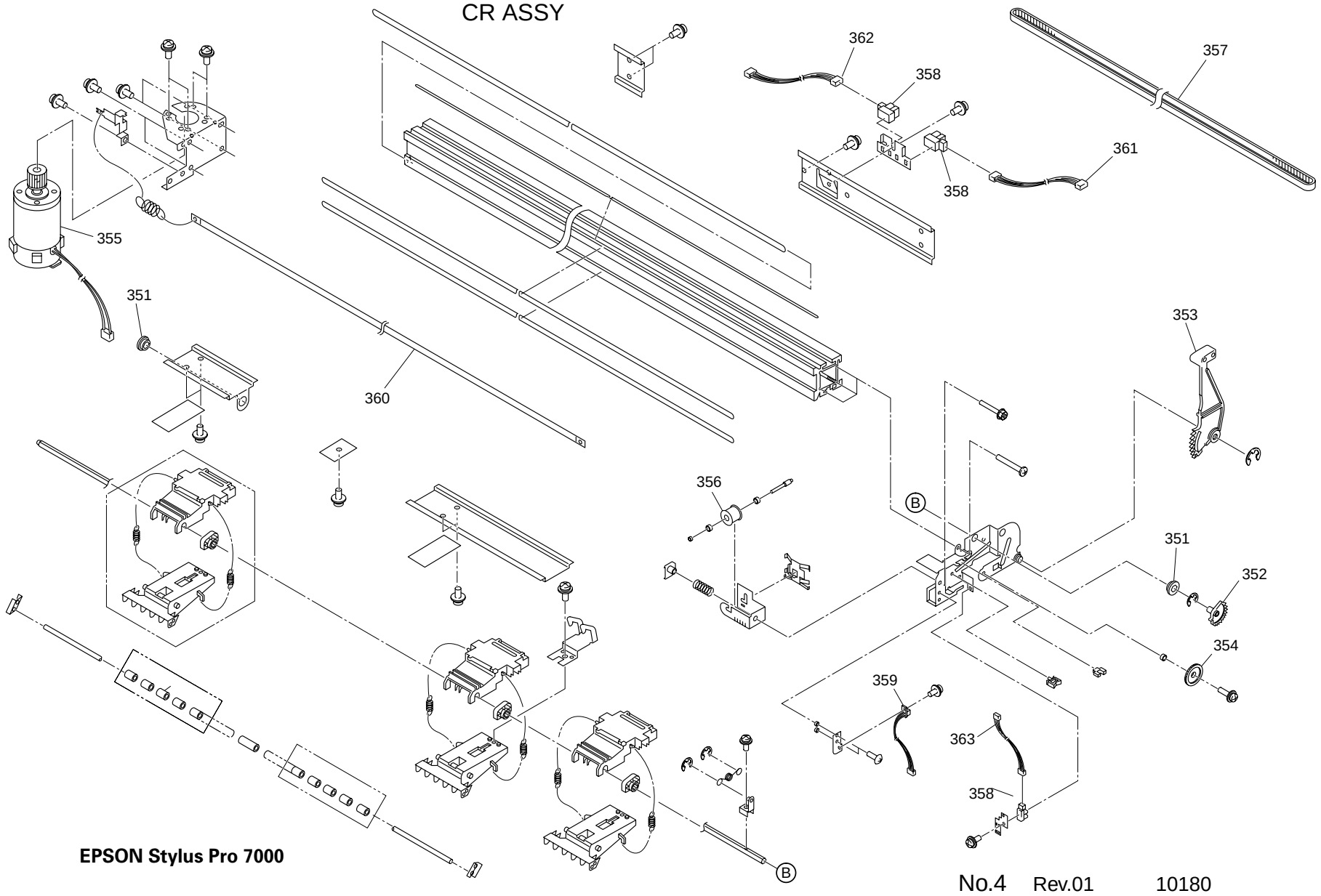


Figure 7-5. Carriage Assembly

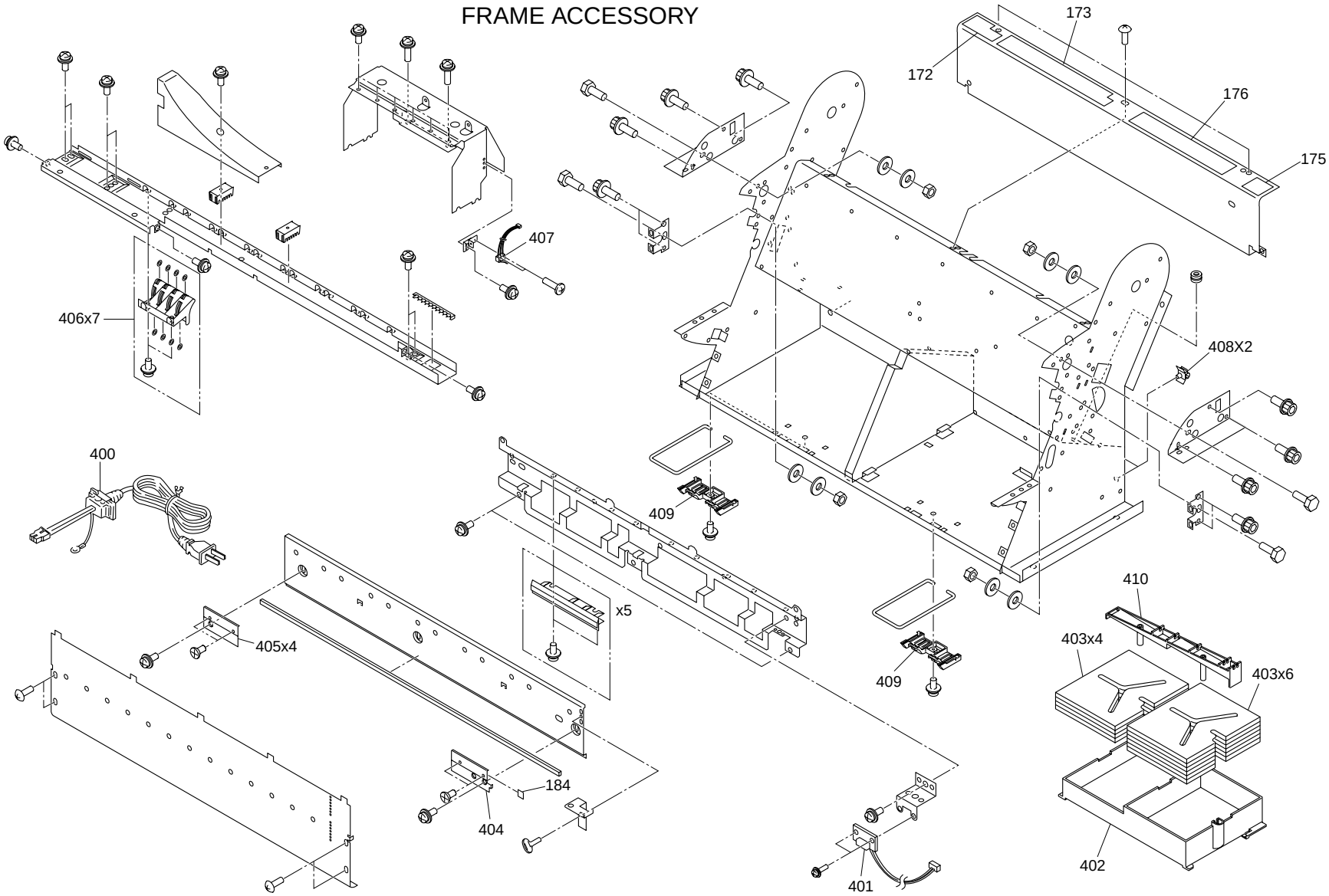


Figure 7-6. Frame Accessory

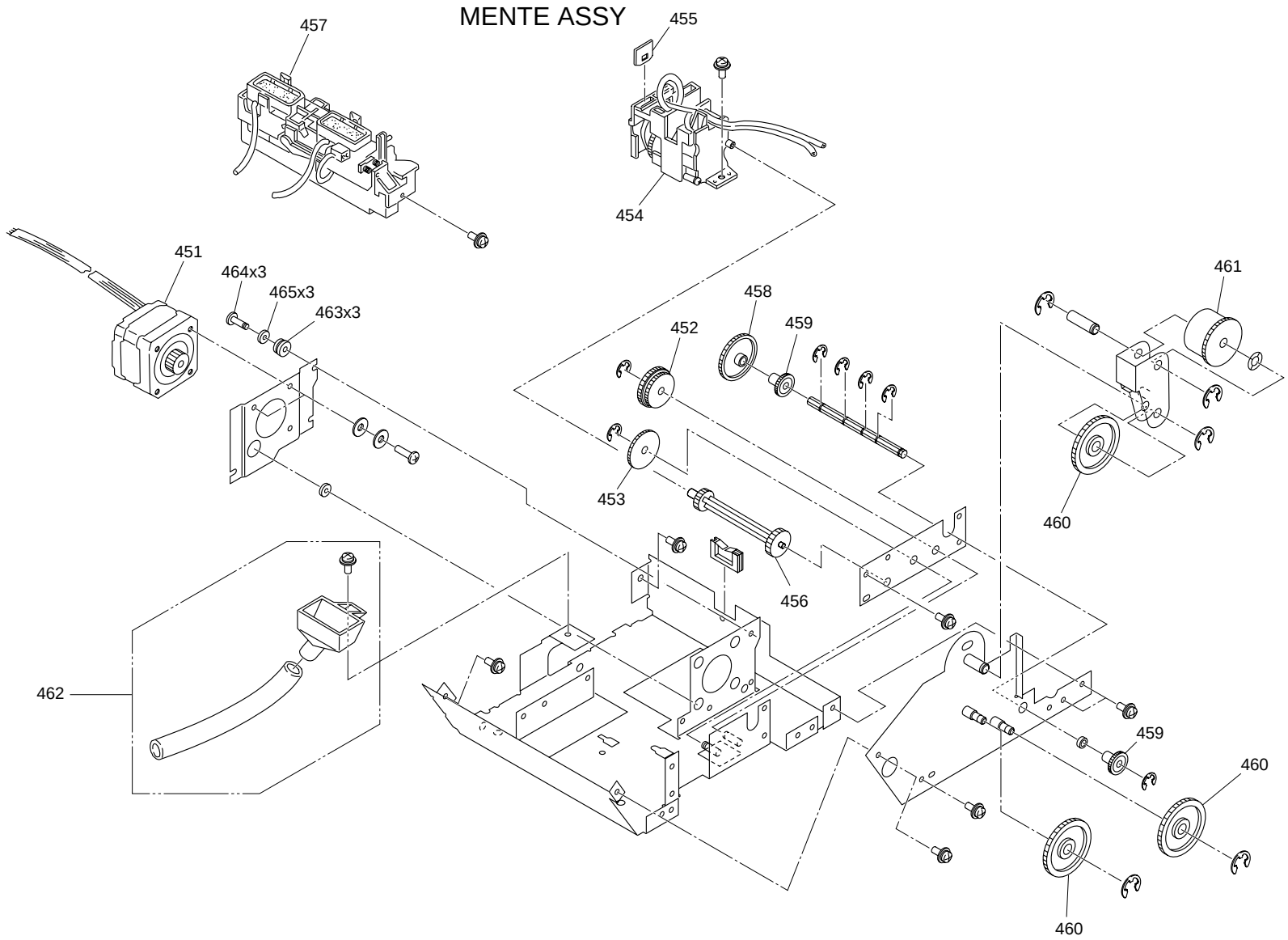


Figure 7-7. Maintenance Assembly

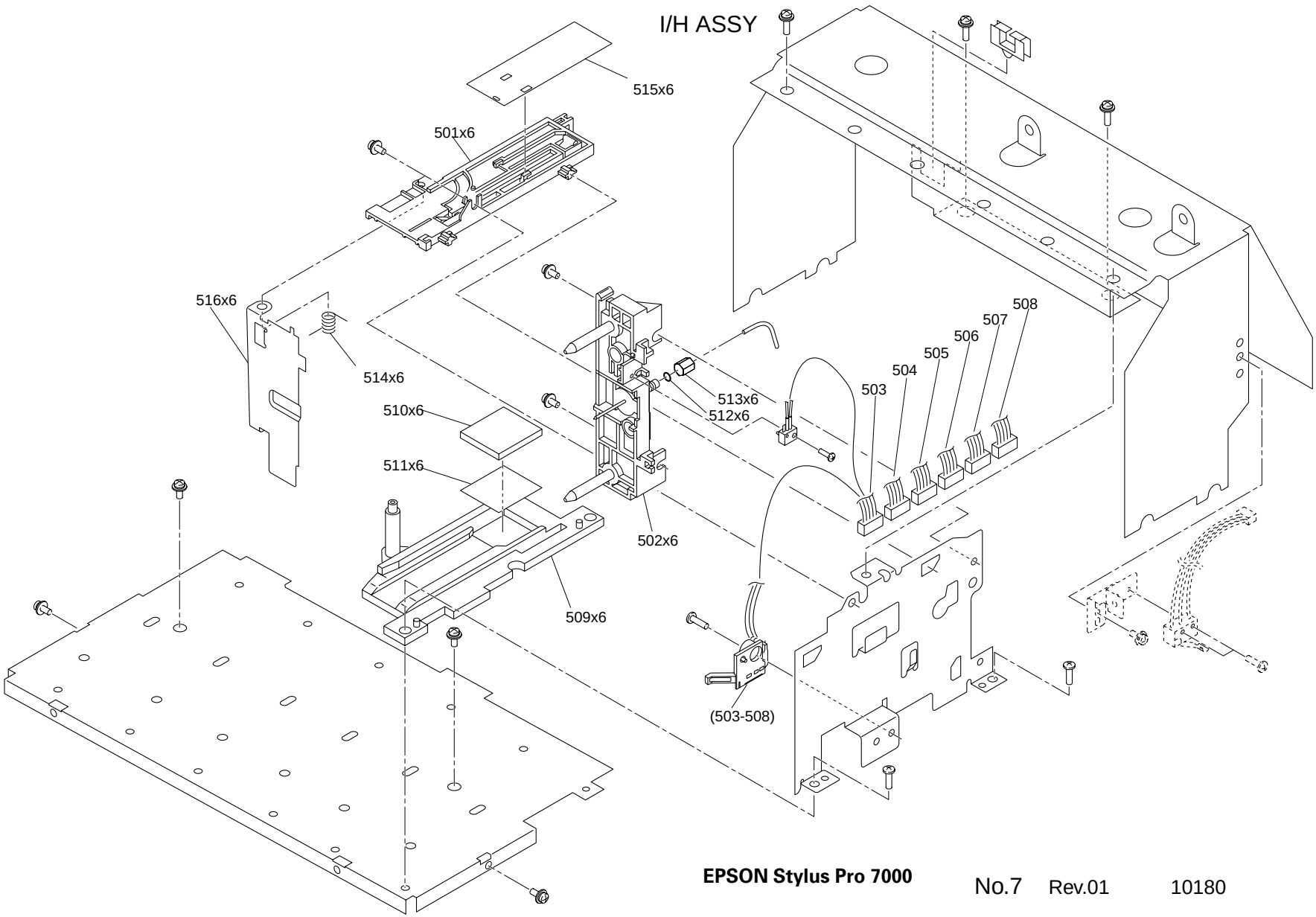


Figure 7-8. Ink Cartridge Holder Assembly

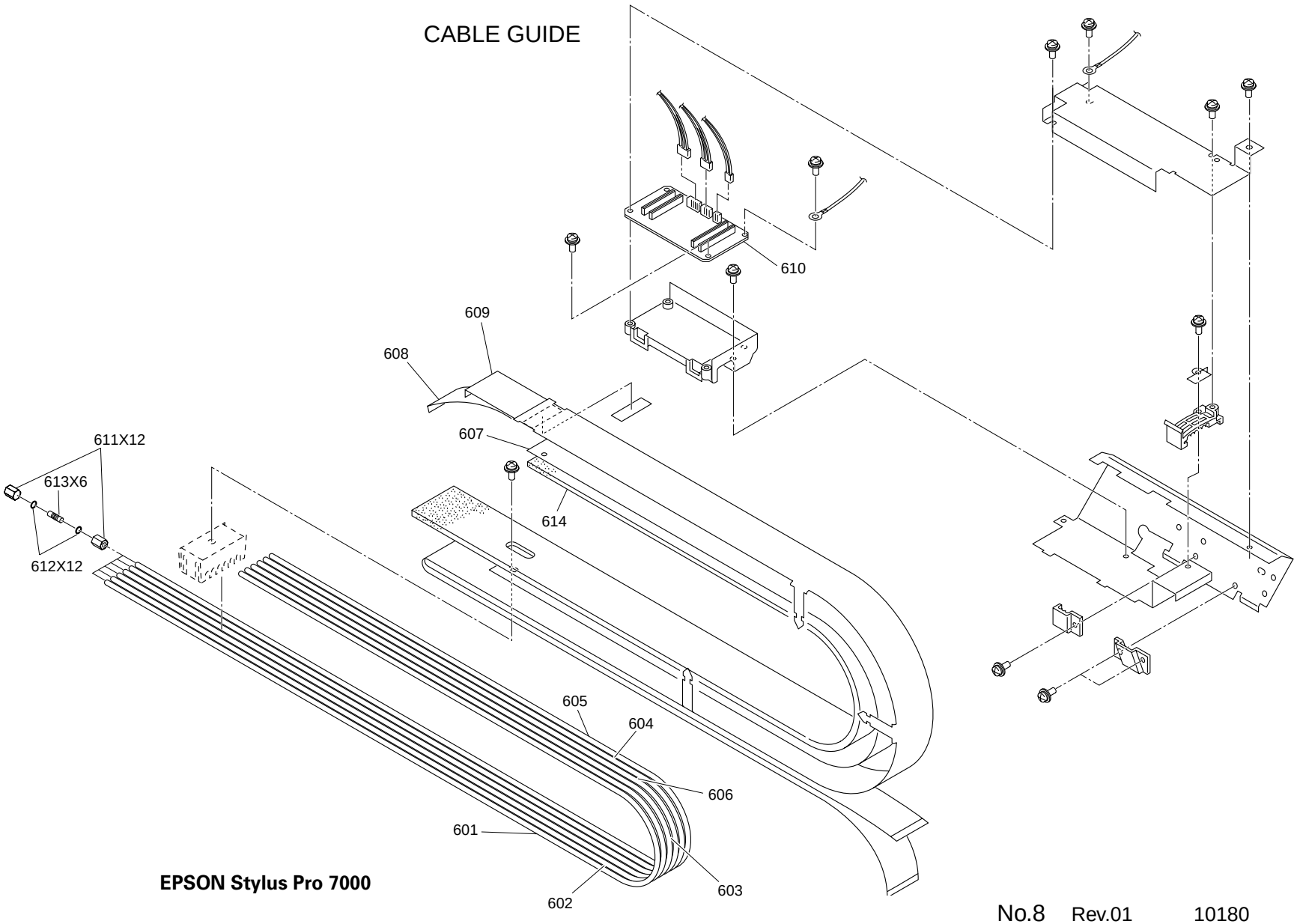


Figure 7-9. Cable Guide

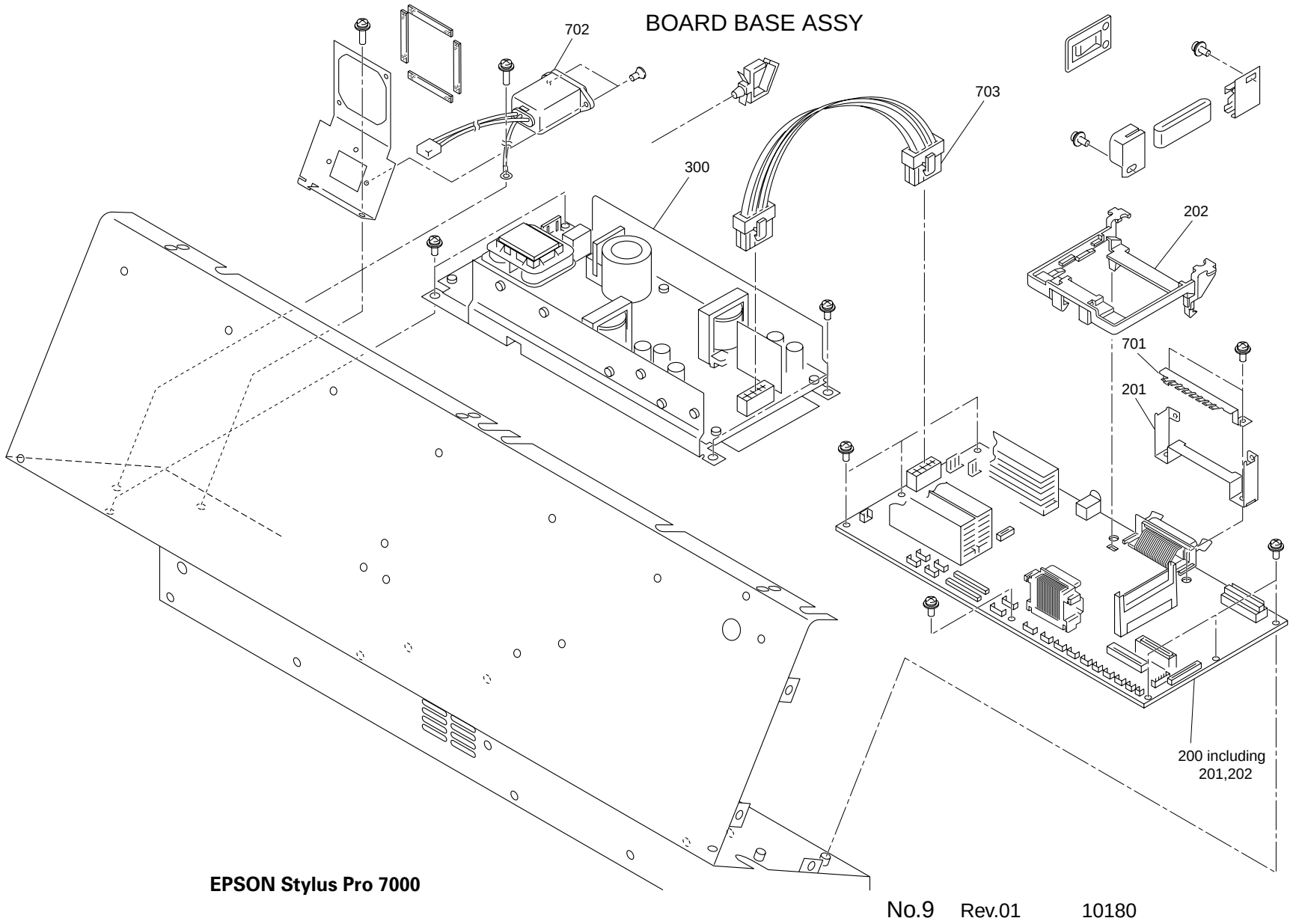


Figure 7-10. Board Base Assembly

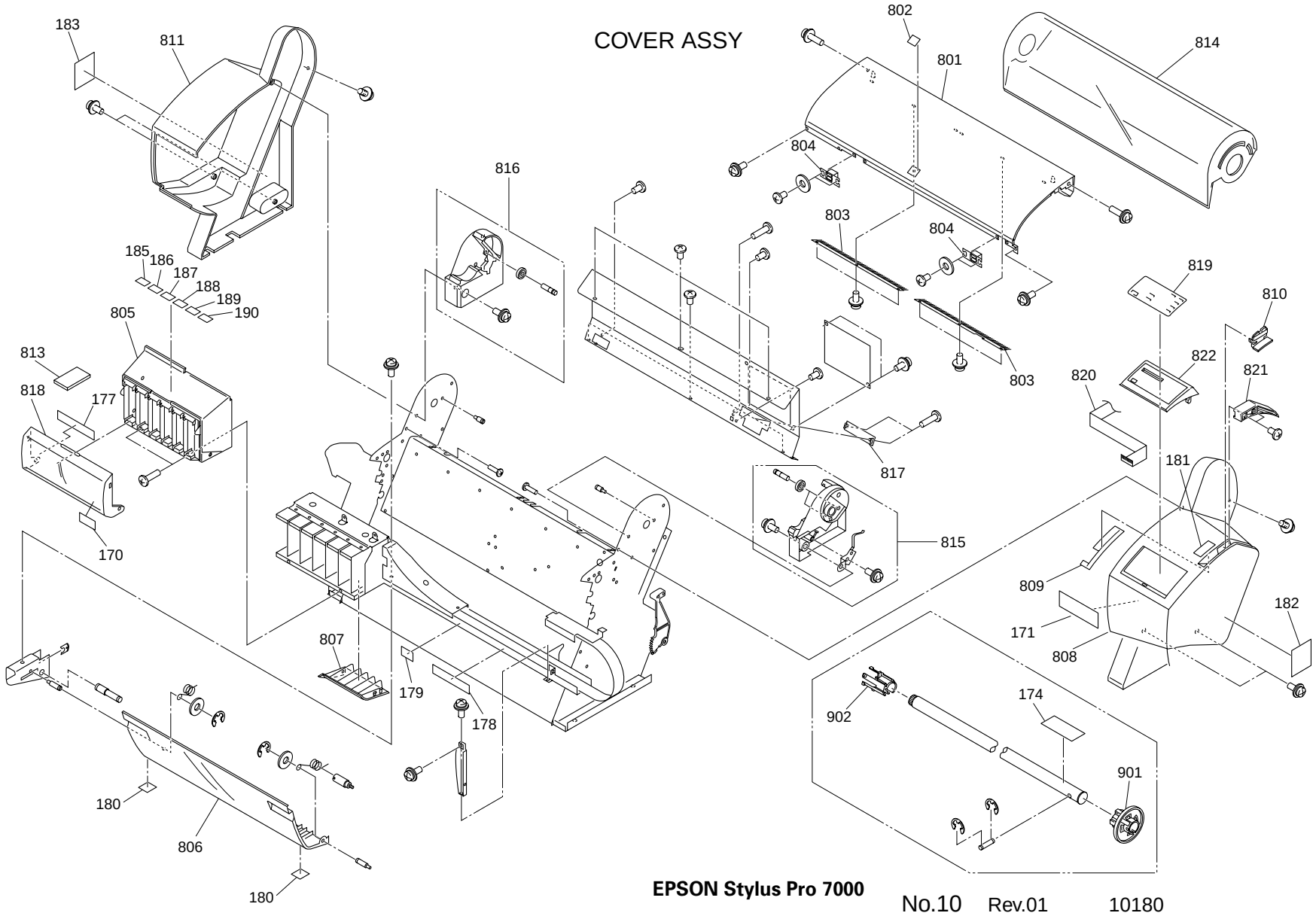


Figure 7-11. Cover Assembly

7.3 Component Layout

The illustrations below show the C299MAIN Board component layout.

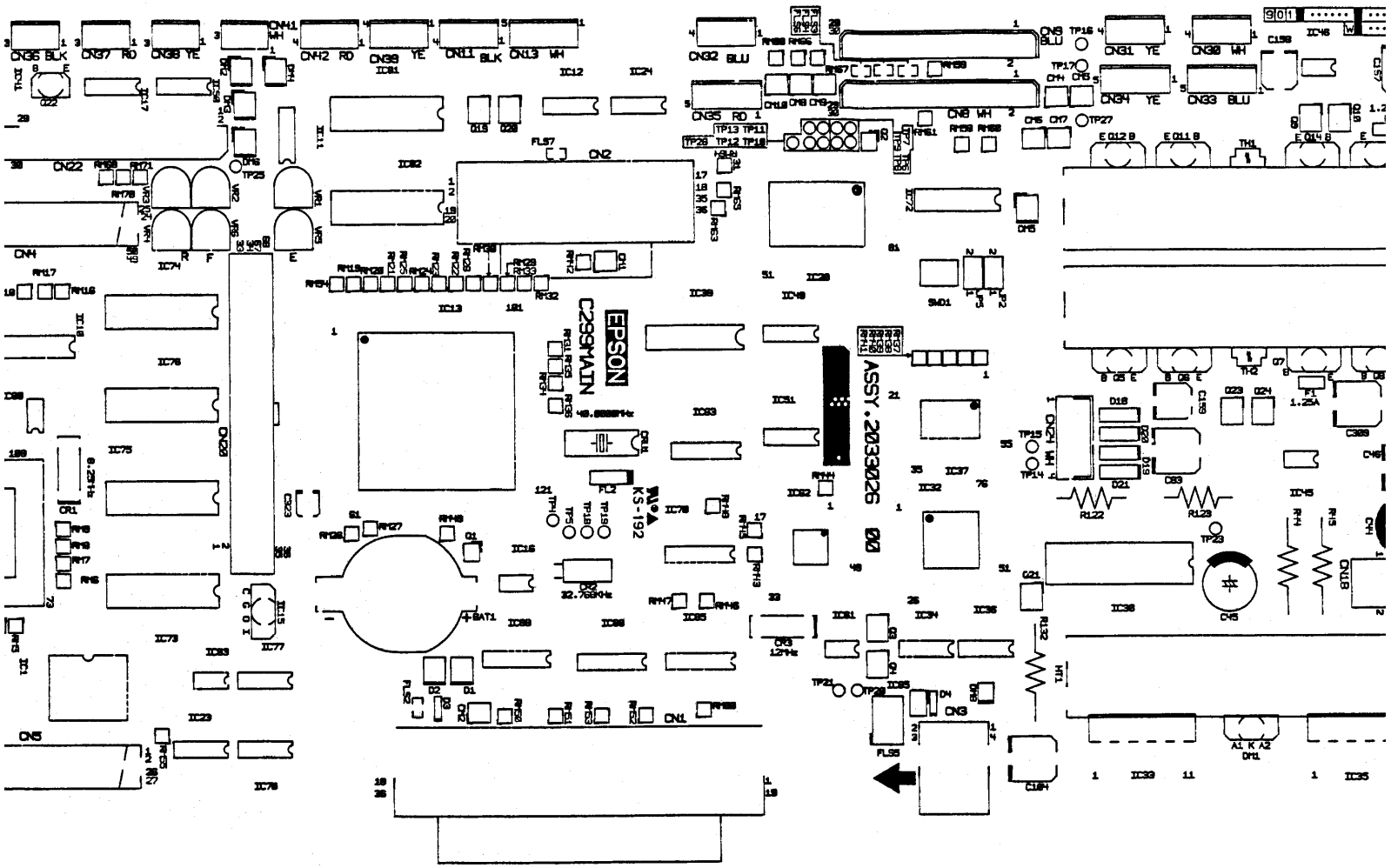


Figure 7-12. C299MAIN Board Component Layout of Component side

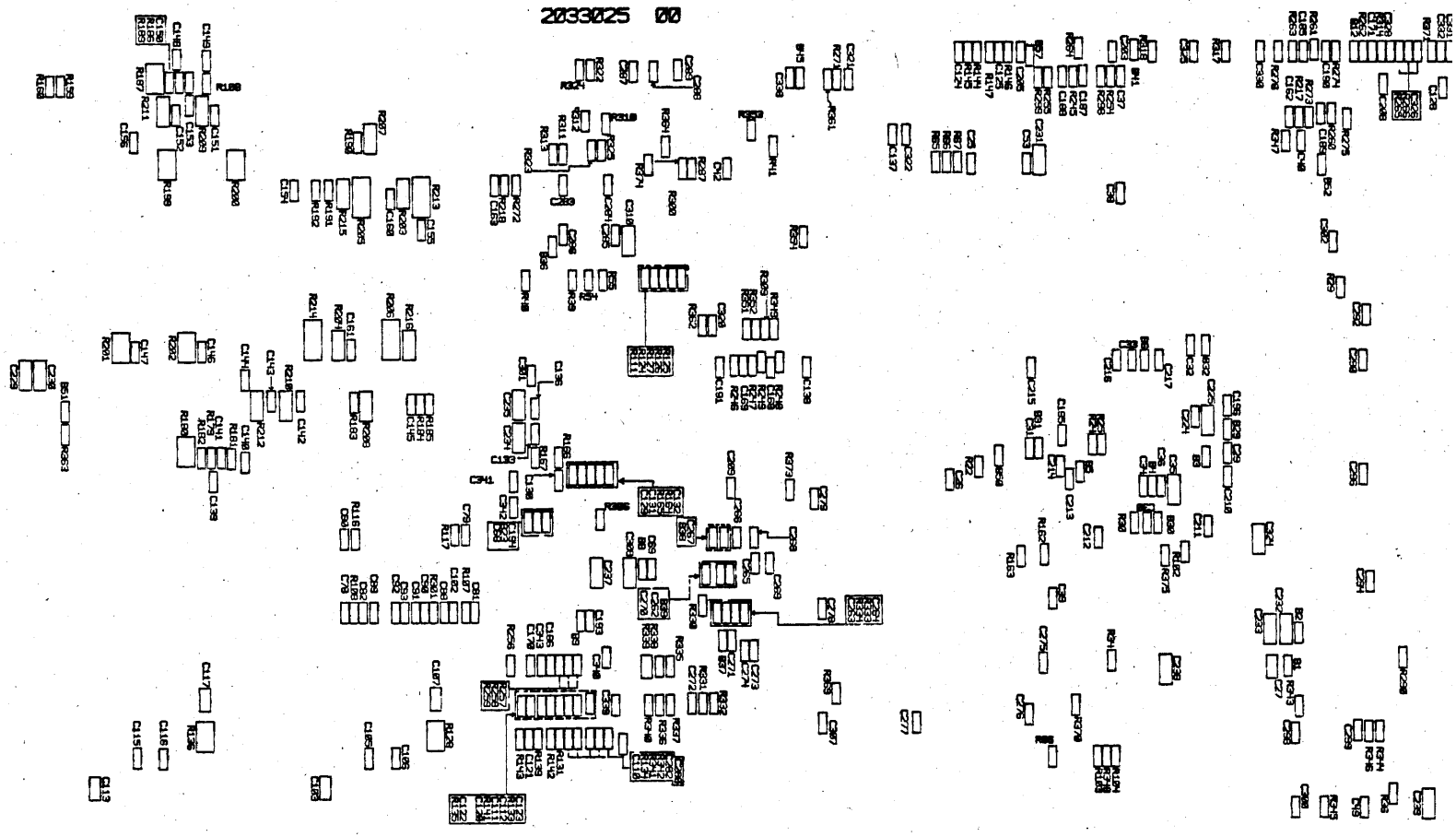


Figure 7-13. C299MAIN Board Component Layout of Soldering Side

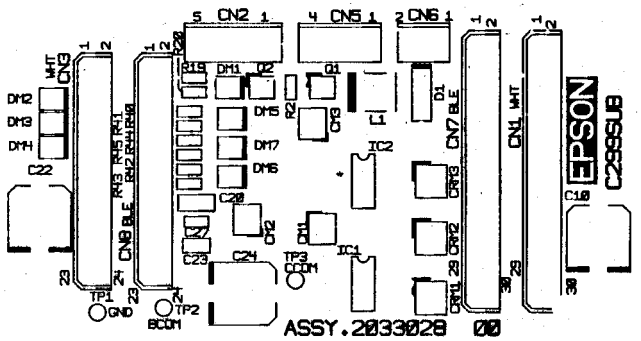


Figure 7-14. C299SUB Board Component Side

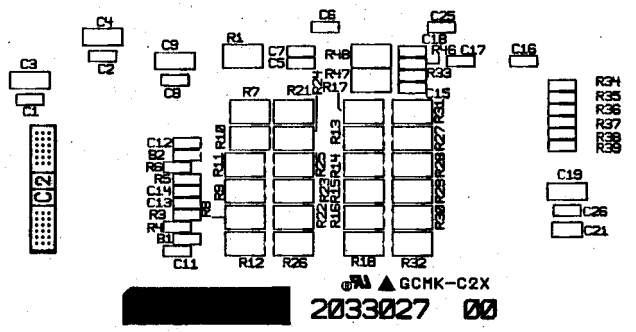


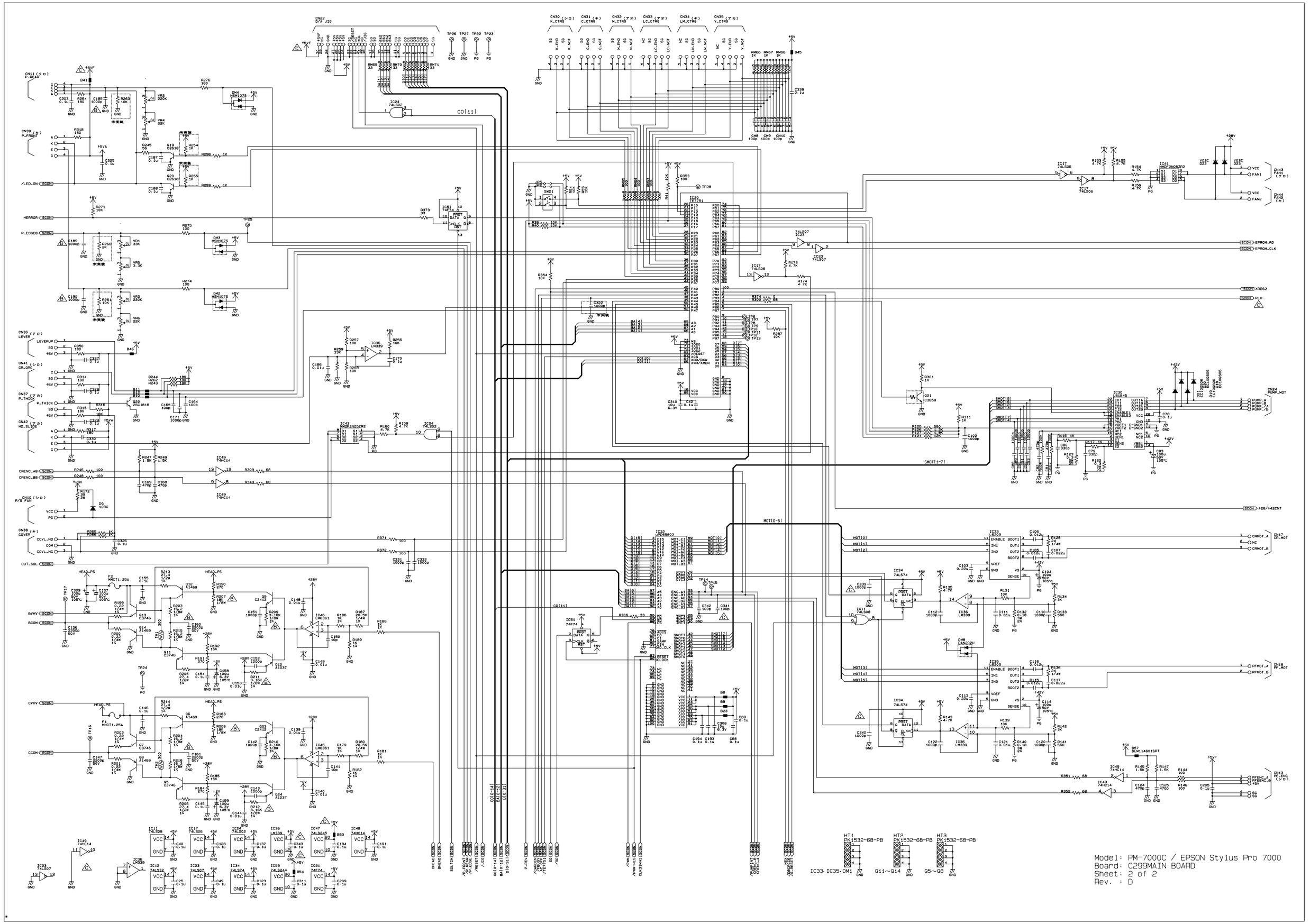
Figure 7-15. C299SUB Board Soldering Side

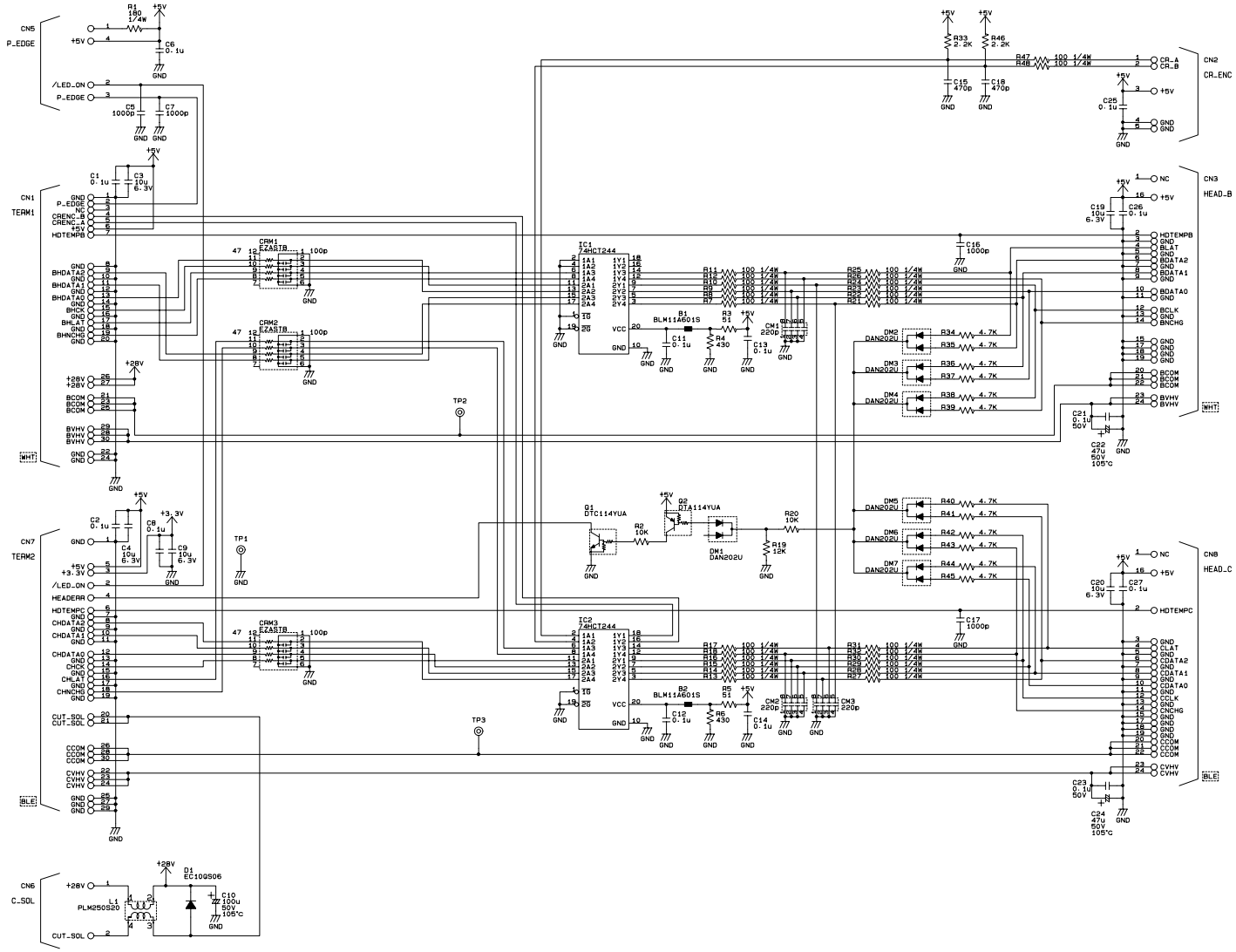
7.4 Circuit Diagrams

The circuit diagrams for the C299MAIN Board are provided in the following pages.

- C299MAIN (1/2)
- C299MAIN (2/2)
- C299SUB

Model: PM-7000C / EPSON Stylus Pro 7000
Board: C299MAIN BOARD
Sheet: 1 of 2
Rev. : D


CN22 D/A VIG
CN30 (シロ) K_CTRG
CN31 (＊) C_CTRG
CN32 (アオ) M_CTRG
CN33 (アオ) LC_CTRG
CN34 (＊) LM_CTRG
CN35 (アカ) Y_CTRG
CN11 (クロ) P_REAR
CN39 (＊) P_FRONT
CN36 (クロ) LEVER
CN41 (シロ) CR_ORG
CN37 (アカ) P_THICK
CN42 (アカ) HD_SLIDE
CN10 (シロ) P/S FAN
CN38 (＊) COVER
CO[11]
/LED_ON
HERROR
P_EDGEB
CRENC_AB
CRENC_BB
CUT_SOL
BVHV
BCOM
CVHV
CCOM
SMOT[1-7]
MOT[0-5]
EPROM_RD
EPROM_CLK
XRES2
PLH
+28/42CNT
CN43 FAN1 (クロ)
CN44 FAN2 (＊)
CN17 CR_MOT
CN18 PF_MOT
CN24 PUMP_MOT
CN13 PF_ENC (シロ)
Model: PM-7000C / EPSON Stylus Pro 7000
Board: C299MAIN BOARD
Sheet: 2 of 2
Rev. : D



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Board: C299SUB BOARD
Sheet: 1 of 1
Rev. : A