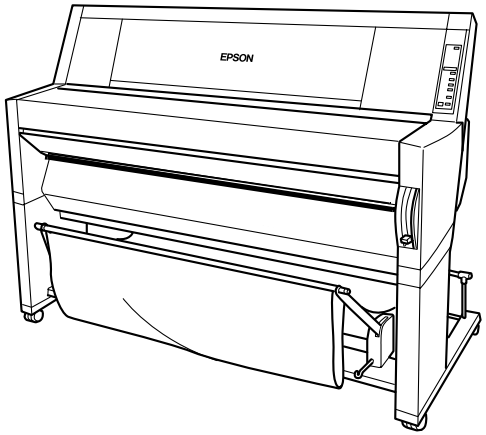
Service Manual



Wide-Format Professional Inkjet Printer

EPSON Stylus Pro 9000

TM-PRO9000

Guide to Using This Manual

Before servicing the EPSON Stylus Pro 9000, read the precautions on page 5. Then turn to one of these chapters:

CHAPTER 1. Printer Basics

Refer to this chapter for details on control panel operation.

CHAPTER 2. Technical Overview

Read this chapter if you want to know more about how the major systems of this printer work.

CHAPTER 3. Troubleshooting

Use this chapter to troubleshoot typical printer problems.

CHAPTER 4. Disassembly and Assembly

Follow these step-by-step instructions to disassemble and assemble the printer. Refer to the "Maintenance" section of this chapter when you need to replace the Waste Ink Pads and other consumable parts.

CHAPTER 5. Adjustments

When you remove or replace parts, read the beginning of this chapter to find out which adjustments are required and how to perform them.

CHAPTER 6. Maintenance

Follow these routine inspection and maintenance procedures each time you service the printer.

CHAPTER 7 Appendix

Provides the following additional information for reference:

- ***Setup instructions***
- ***Detailed product specifications***
- ***Parts list***
- ***Exploded diagrams***
- ***Electrical circuit boards schematics***

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July 1999

FCC COMPLIANCE STATEMENT
FOR AMERICAN USERS

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels that exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the printer.

FOR CANADIAN USERS

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le materiel brouilleur du Canada.

PRECAUTIONS

Precautionary notes throughout the text are categorized with respect to: (1) personal injury and (2) damage to equipment.

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

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

Always observe the precautions listed below when performing repair and maintenance procedures.

WARNING

1. Always disconnect the product from both the power source and the host computer before performing any maintenance or repair procedure.
2. No work should be performed on the unit by persons unfamiliar with basic safety measures dictated for all electronics technicians in their line of work.
3. In performing testing described in 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 the power supply and other electronic components.

CAUTION

1. Repairs on EPSON products should be perfomed only by an EPSON-certified repair technician.
2. Make certain that the source voltage is the same as the rated voltage listed on the serial number/rating plate. If the EPSON product has a primary AC rating different from the 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 or individual chips.
4. To protect sensitive microprocessors and othe circuitry, use static discharge equipment, such as anti-static wrist straps, when accessing internal components.
5. Replace malfunctioning components only with those components recommended by the manufacturer; introduction of second-source ICs or other nonapproved components may damage the product and void any applicable EPSON warranty.

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1 Printer Basics

2 Technical Overview

3 Troubleshooting

4 Disassembly & Assembly

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6 Maintenance

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CHAPTER

1

PRINTER BASICS

1.1 Features

The EPSON Stylus Pro 9000 is an ultra-wide, 6-color ink jet printer with professional color output. It provides the color printing features listed below. (For additional details, see **Specifications** on page 156.)

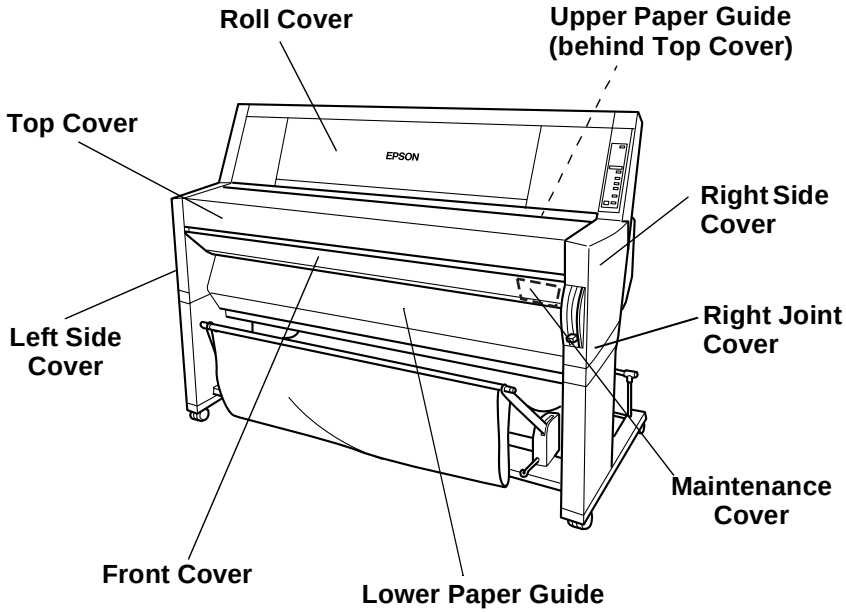


Figure 1-1. Exterior View of the EPSON Stylus Pro 9000

- **Large printing**
  Up to B0-wide paper (44 inches [1,118 mm]), including print registration marks
- **Excellent photo-quality printing**
  1440 (H) × 720 (V) dpi combined with EPSON's Microdot printing
- **High-speed printing**
  64 nozzles per color
  RISC-CPU and high-speed color raster ASIC quickly process detailed print data
  approx. 10 minutes (360 × 360 dpi/speed) on A0/normal paper
  approx. 30 minutes (720 × 720 dpi/quality) on A0/glossy paper
  approx. 55 minutes (1440 × 720 dpi/superfine) on A0/glossy paper
- **Low operating costs**
  6 separate ink cartridges so only the empty ink cartridge is replaced
  Auto Rotate feature saves paper by automatically rotating an image if the width is shorter than the height
- **Alternative interface compatibility**
  IEEE-1284 bidirectional parallel interface (supports ECP mode)
  Macintosh serial interface (approximately 1.8 Mbps)
  Type-B expansion slot for an optional interface
- **User friendly**
  2 roll holders for easily switching between paper types
  Standard roll paper cutter
  Optional roll paper take-up reel for automatically winding up your long printouts

1.2 Control Panel Operations

The EPSON Stylus Pro 9000 control panel displays status and error messages, and the lights indicate when a problem occurs or if any ink cartridge is low or runs out. This section provides information on the control panel buttons, LEDs, and liquid crystal display (LCD).

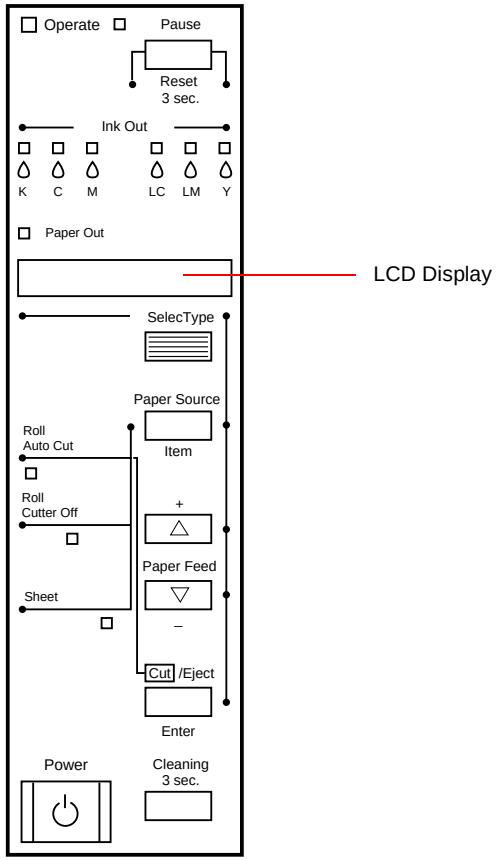


Figure 1-2. EPSON Stylus Pro 9000 Control Panel

1.2.1 Control Panel Buttons

Pressing a control panel button executes the functions listed in Table 1-1 and Table 1-2.

1.2.1.1 Operation in Normal Mode

Table 1-1. Operation in Normal Mode

Button (Second function)	Function
Power	Power ON and OFF
Pause (Reset)	Switches between online and offline. Resets the printer if pressed for 3 seconds.
SelecType	Enters SelecType mode (when printer is in Standby)
Cut/Eject (Enter)*	• Cuts and ejects paper if Roll Auto Cut is selected • Ejects paper if Roll Cutter Off or Sheet is selected
Paper Feed▲	Feeds paper backward**
Paper Feed▼	Feeds paper forward***
Paper Source (Item)	Selects paper source: • Roll Auto Cut • Roll Cutter Off • Sheet
Cleaning	Cleans both heads if pressed for 3 seconds

* Interrupts the ink-drying time, if taking place.
** 1.27 cm/second paper feed for 2 seconds after key is pressed.
7.62 cm/second paper feed if pressed for over 2 seconds.
Maximum feed of 20 cm when the button is pressed once.
*** 1.27 cm/second paper feed for 2 seconds after key is pressed.
7.62 cm/second paper feed if pressed for over 2 seconds.

1.2.1.2 Operation at Power On

Pressing these buttons at power on puts the printer in one of the following service-related modes. See **Service-Related Modes** on page 17 for details.

Table 1-2. Operation at Power On

Button (Second function)	Function
Power	—
Pause (Reset)	Maintenance Mode See **Maintenance Mode** on page 17
SelecType	—
Cut/Eject (Enter)	
Paper Feed⬆	
Paper Feed⬇	
Paper Source (Item)	
Cleaning	
Paper Source, Paper Feed⬇, Cut/Eject	Maintenance Mode 2 See **Maintenance Mode 2** on page 17
Paper Source, Cut/Eject, Cleaning	Firmware Update Mode See **ROM Backup and Updating** on page 105
Paper Feed⬇, Cut/Eject, Cleaning	Self-Diagnostic Mode See **Self-Diagnostics** on page 107

1.2.2 SelecType Mode

The SelecType menus allows you to configure printer settings and perform certain maintenance operations from the control panel. To access these menus, press the SelecType button while the printer is not printing. The printer enters the SelecType mode and cannot print.

1.2.2.1 Control Panel Operation in SelecType Mode

The control panel buttons have the following functions in this mode:

Table 1-3. Operation in SelecType Mode

Button (Second function)	Function
Power	—
Pause (Reset)	
SelecType	Selects menu
Cut/Eject (Enter)	Confirms and saves value
Paper Feed⬆	Increases a value
Paper Feed⬇	Decreases a value
Paper Source (Item)	Selects item within a menu
Cleaning	—

1.2.2.2 Main Menu Options in SelecType Mode

Table 1-4 lists the menus and where to find additional information.

Table 1-4. SelecType Menus

Menu	Description	For more information
Printer Setting	Configure the printer	page 14
Test Print	Print a nozzle check or status check	page 15
Printer Status	Check ink levels and component life	page 15

Table 1-4. SelecType Menus (continued)

Menu	Description	For more information
Paper Configuration	Register paper thickness and drying time, and select registered configurations	page 16
Cutter Replacement	Replace the paper cutter blade	page 16
Head Alignment	Align the printhead	page 16

PRINTER SETTING MENU

The bold item is the default setting.

Table 1-5. Printer Setting Menu

Message	Item	Explanation
PLATEN GAP	**AUTO**	Adjusts the platen gap. Normally leave set to AUTO.
	THICK	
PAGE LINE	**ON**	When AUTO CUT OFF is selected on the control panel, this setting determines whether a line for manual cutting is printed
	OFF	
INTERFACE	**AUTO**	Determines which interface the printer checks for data. AUTO continuously checks all interfaces and is good for normal use. MAC is the serial interface.
	PARALLEL	
	MAC	
	OPTION	
PARA. I/F	**COMPAT***	Determines the data transfer rate when using this interface. Normally leave set to COMPAT*.
	ECP	
CODE PAGE	**PC437**	Character code setting. PC437 is for expanded graphics. PC850 is for multi-lingual.
	PC850	
ROLL MARG	**T/B15MM***	Top and bottom margins are 0.59 in. (15 mm). The left and right margins are 0.12 in. (3 mm).
	15MM	All margins are 0.59 in. (15 mm).
	3MM	All margins are 0.12 in. (3 mm).
INIT. PANEL	EXEC.	Initialize control panel setup values

* The printed image is the same size as the printed image using the 0.12 inch (3 mm) setting. However, the printer adds 0.47 inch (12 mm) of paper clearance (for a total margin of 0.59 inch [15 mm]) to the top and bottom edges to make paper feeding more stable and to prevent the paper from rubbing the printheads.

TEST PRINT MENU

Table 1-6. Test Print Menu

Message	Item	Explanation
NOZZLE CHECK	PRINT	Check the printout. Any missing lines mean the nozzle(s) are clogged.
STATUS CHECK	PRINT	Prints the amount of ink left or the component life as follows: • E*****F = full (or full life remaining) • E ****F = ¾ full (or ¾ life remaining) • E ***F = ½ full (or ½ life remaining) • E **F = ¼ full (or ¼ life remaining) • E *F = nearly empty (or service life near end) • E F = empty (or service life ended)

PRINTER STATUS MENU

Use this menu to view the printer status on the control panel display without printing a status check. While in this menu, press the **Item** button to view the messages in Table 1-7.

Table 1-7. Printer Status Menu

Message	Explanation
VERSION <number>	Shows the firmware version
INK LEFT-C	Amount of cyan ink remaining
INK LEFT-M	Amount of magenta ink remaining
INK LEFT-LC	Amount of light cyan ink remaining
INK LEFT-LM	Amount of light magenta ink remaining
INK LEFT-Y	Amount of yellow ink remaining
INK LEFT-K	Amount of black ink remaining
CUTTER LIFE	Useful life of the cutter remaining
TOTAL PRINTS	Total number of printed documents

Table 1-7. Printer Status Menu (continued)

Message	Explanation
WASTE INK	Ink pad maintenance information
CR MOTOR	Carriage motor maintenance information
PF MOTOR	Paper feed motor maintenance information
HEAD UNIT	Printhead maintenance information
CLEANER	Maintenance information

Continue pressing the **Item** button to display the amount remaining for each of the 6 inks or service life remaining for the part. The indicator reads as follows:

E*****F = full (or full life remaining)

E ****F = ¾ full (or ¾ life remaining)

E ***F = ½ full (or ½ life remaining)

E **F = ¼ full (or ¼ life remaining)

E *F = nearly empty (or service life near end)

E F = empty (or service life ended)

PAPER CONFIGURATION MENU

The bold item is the default setting.

Table 1-8. Paper Configuration Menu

Message	Item	Explanation
PAPER NUMBER	**STD***	Select STD for Epson special paper
	1	Select the appropriate number for thick paper. Use the + or – to select the registered number up to 4.
THICK. PAT	PRINT	Prints a pattern to detect the paper thickness. If PAPER NUMBER is set to STD, the message does not appear.
PAPER THICK	1	If PAPER NUMBER is set to STD, the message does not appear. Use the + or – to select the registered number up to 17.
DRYING TIME	0MIN	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. Use the + or – to select the registered number up to 30MIN.

CUTTER REPLACE MENU

Follow the order in Table 1-9 to replace the cutter.

Table 1-9. Cutter Replacement Menu

Step	Message	Item	Explanation
1	CUT. REPLACE	EXEC.	Prepare a replacement cutter
2	OPEN LOWER COVER	—	Open the front cover
3	REPLACE CUTTER	—	Remove the old cutter and install a new one
4	CLOSER LOWER COVER	—	Close the front cover. READY appears on the display.

HEAD ALIGNMENT MENU

Table 1-10. Head Alignment Menu

Messages	Item	Explanation
ADJUST. PATT	**ALL**	Prints a full series of patterns. To print a single pattern, use the + and – until the registered pattern appears.
PAPER THICK	STD	Leave on STD for EPSON paper. For other media, use the + and – to select the thickness in 0.1-mm increments.

1.2.3 Service-Related Modes

Press and hold down the buttons listed in Table 1-2 at power on to enter one of these service-related modes:

- **Maintenance Mode**

  Lets you print a hex dump or change the language used for LCD display messages. See Table 1-11 on this page.

- **Maintenance Mode 2**

  Lets you clear maintenance counters after replacing consumable parts. See Table 1-12 on this page.

- **Self-Diagnostic Mode**

  Lets you adjust printer settings, check and reset certain counters, make test prints, and clean the printhead. See Self-Diagnostics on page 107.

- **Firmware Update Mode**

  Lets you update the printer's firmware after replacing the Main Board. See ROM Backup and Updating on page 105.

The operations described in this section are for service and support only. Avoid sharing this information with the end user.

NOTE: *In Maintenance Mode and Maintenance Mode 2, press the Paper Source button to select a menu item, and press Enter save a setting.*

1.2.3.1 Maintenance Mode

Press the **Pause** button while turning on the printer.

Table 1-11. Maintenance Mode Menu

Message	Menu Item	Explanation
HEX DUMP	PRINT	Print data printed in hexadecimal form
LANGUAGE	ENGLISH, PORTUGUESE, SPANISH, GERMAN, ITALIAN, FRENCH	Determines language used for LCD display messages

1.2.3.2 Maintenance Mode 2

Press the **Paper Source, Cut/Eject,** and **Paper Feed**⬇ buttons while turning on the printer.

Table 1-12. Maintenance Mode 2 Menu

Message	Menu 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 MOTOR	EXEC.	Initializes CR motor (after replacing ink tubes)
INIT. PF MOTOR	EXEC.	Initializes PF motor
INIT. HEAD UNIT	EXEC.	Initializes head unit
INIT CLEANING UNIT	EXEC.	Initializes cleaning unit
INIT. TOTAL PRINTING	EXEC.	Initializes total print counter
INIT. INK	EXEC.	Initializes ink counter
INIT. WASTE INK	EXEC.	Initializes waste ink counter
DETECT INK LABEL	ON OFF	Determines whether the Ink ID sensor checks the ink ID label on the ink cartridge.

1.3 LED Indicators and Error Messages

The printer displays status messages and error codes using its LED indicators and LCD panel. Interpret these messages using the tables on the following pages.

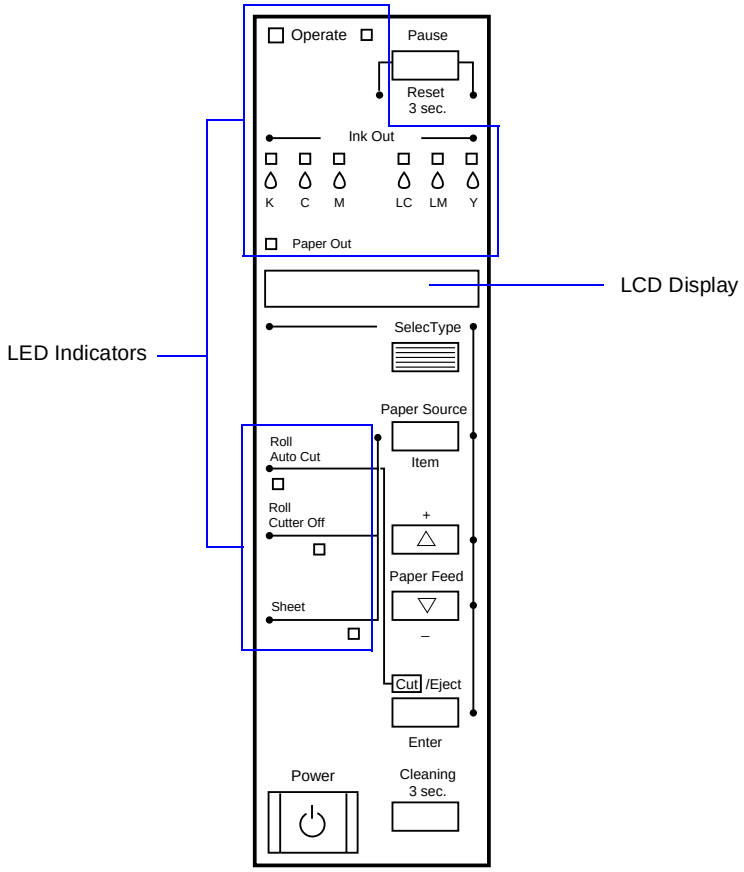


Figure 1-3. Control Panel Indicators and LCD Display

1.3.1 LED Indicators

Table 1-13. LED Indicators

LED	Status	Explanation
Operate	On	Power on
	Flashing	Receiving data or performing power-down sequence
Paper Out	On	No paper loaded
	Flashing	Paper jam
Pause	On	Printer ready
	Flashing	Performing head cleaning. Printer is in ink-drying phase. Performing ink-charging operation.
Ink Out Y	On	Ink out (also occurs if no or wrong cartridge is installed)
	Flashing	Ink low
Ink Out LM	On	Ink out (also occurs if no or wrong cartridge is installed)
	Flashing	Ink low
Ink Out LC	On	Ink out (also occurs if no or wrong cartridge is installed)
	Flashing	Ink low
Ink Out M	On	Ink out (also occurs if no or wrong cartridge is installed)
	Flashing	Ink low
Ink Out C	On	Ink out (also occurs if no or wrong cartridge is installed)
	Flashing	Ink low
Ink Out K	On	Ink out (also occurs if no or wrong cartridge is installed)
	Flashing	Ink low
Paper Source (Auto Cut)	On	Roll paper will automatically be cut
Paper Type (Cut Off)	On	Roll paper will not be cut (select this setting when using the optional take-up Roller)
Paper Type (Single Sheet)	On	Single sheet printing mode

1.3.2 LCD Display

Table 1-14. LCD Display Messages

Message	Explanation
COVER OPEN	Lower cover is open
INK COMPART. OPEN	Replacing ink cartridge when the ink compartment cover is open
INK DRY FOR <number> MIN*	Printer is paused for minutes shown to let ink dry
INK LOW	Ink cartridge(s) are nearly empty. Printing continues.
INK OUT	Ink cartridge(s) are empty. Printing stops.
LOAD PAPER	Wrong paper is loaded or the paper set lever is up while loading paper
LOAD ROLL PAPER	Paper source setting in print options is different from control panel
LOAD SHEET PAPER	
MAINTENANCE REQ. 0100	Waste Ink Pads are nearly full. See **LCD Error Messages** on page 40.
NO INK CARTRIDGE	Ink cartridge(s) not installed
OPTION I/F ERROR	Wrong interface card is installed
PAPER JAM	Paper is jammed inside printer.
PAPER NOT CUT	Roll paper was not cut completely (when Auto Cut is selected)
PAPER NOT STRAIGHT	Paper slipped and fed into the printer at an angle. Printing stops.
PAPER OUT	No paper is loaded or paper has run out
	Cut paper did not fall off
	The paper detect sensor may have dust or grime blocking its operation
PAUSE	Pause state
PRESS PAUSE BUTTON	Press Pause to continue

Table 1-14. LCD Display Messages (continued)

Message	Explanation
PRINTING*	Printer is receiving data
PUSH LEVER DOWN	Paper release lever is in the release position
READY*	Printer is ready to print
RELOAD PAPER	Paper could not be reversed into the printing position
	Paper is set out of the printable area or out of the horizontal cutting area
	Paper is not fully ejected
	PAPER NOT CUT error was not cleared
REMOVE PAPER	Paper is too thick for head cleaning
RESET	Printer is resetting
SERVICE REQ. <error number>	A fatal error has occurred. See **LCD Error Messages** on page 40.
SWITCHING POWER OFF	Preparing to shut down
TURN PWR OFF AND ON	Tried to print a test pattern while in an error condition or the ink compartment cover was open
WAIT*	Resetting timer IC
	Clearing NVRAM
	Performing reset operation
	Performing ink sequence operation
	Initializing the printer
	Dealing with initial paper operation
WRONG CARTRIDGE	Wrong ink cartridge(s) installed

* If the platen gap setting is set to Thick, a “W” appears in the last space on the LCD display.

For a listing of LCD error messages and how to read them, see **LCD Error Messages** on page 40.

1.4 Options and Consumables

The table below lists the consumable items and options available for the EPSON Stylus Pro 9000.

Table 1-15. Optional Items

Item	Part Number	Description
Paper cutter blade	C815131	Consumable item
Roll feed spindle 2 inch	C811021*	2 in. diameter roll paper
Roll feed spindle 3 inch	C811031**	3 in. diameter roll paper
Auto take-up reel unit	C81508*	Printed roll paper option
	C815091 (core only)	
Glossy photo paper	S041225	36 in. (914 mm) wide 68.9 ft (21 m) long
	S041224	44 in. (1,118 mm) wide 68.9 ft (21 m) long
Semigloss photo roll paper	S041222	36 in. (914 mm) wide 16.4 ft (5 m) long
	S041223	44 in. (1,118 mm) wide 82 ft (25 m) long
Matte roll paper	S041221	36 in. (914 mm) wide 82 ft (25 m) long
	S041220	44 in. (1,118 mm) wide 82 ft (25 m) long
Photo quality ink jet paper	S041079	A2
	S041068/S041045	A3
	S041069/S041043	A3 Wide/B
	S041070/S041044	B

Table 1-15. Optional Items (continued)

Item	Part Number	Description
Photo paper	S041142	A3
	S041143	A3 Wide/B
	S041156	B
Photo quality glossy film	S041073	A3
	S041074	A3 Wide/B
	S041075	B
Rip Station 5100 PS Server Series	EAI - C850092 Other - C850093	Fiery Adobe® PostScript® 3™ Server
Multi-protocol Ethernet interface card	C823622	Type-B 10BaseT
100 Mbps multiprotocol Ethernet interface card	C823632	Type-B 100BaseT

* Two rolls can be installed at the same time.
** Can be installed only in the upper spindle holder.

Table 1-16. Consumables

Item	Part Number	Description
Ink cartridge	T407011	Black ink
	T410011	Cyan ink
	T409011	Magenta ink
	T408011	Yellow ink
	T412011	Light Cyan ink
	T411011	Light Magenta ink

CHAPTER

2

TECHNICAL OVERVIEW

2.1 Location of Components

The following figures show the main components of the EPSON Stylus Pro 9000.

CARRIAGE MECHANISM

For more information, see **Carriage Mechanism** on page 24.

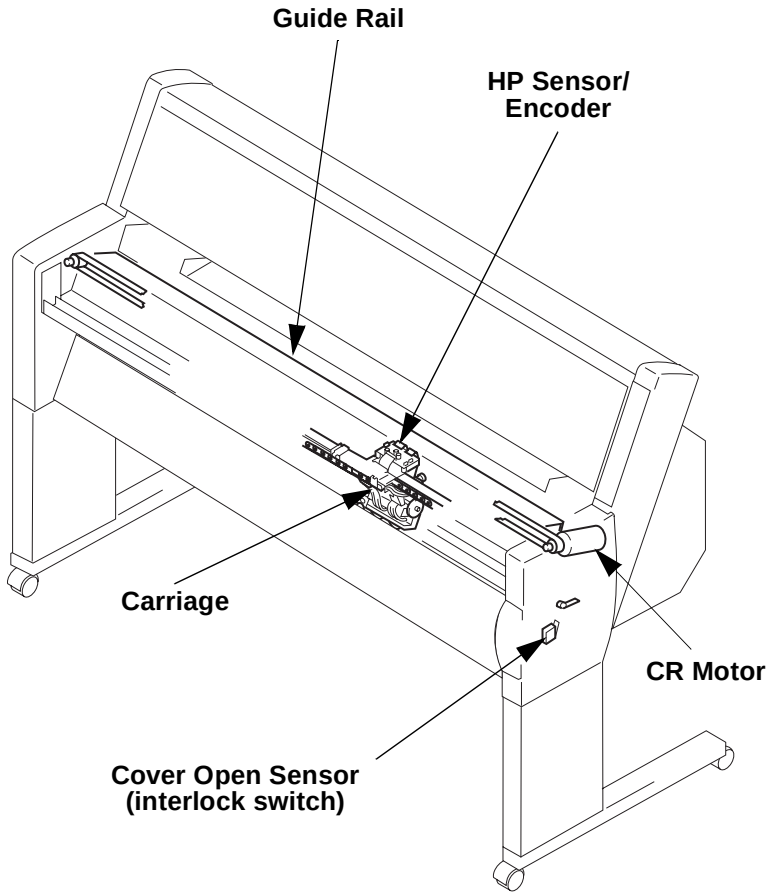


Figure 2-1. Carriage Mechanism

PAPER FEED MECHANISM

For more information, see **Paper Feed Mechanism** on page 28.

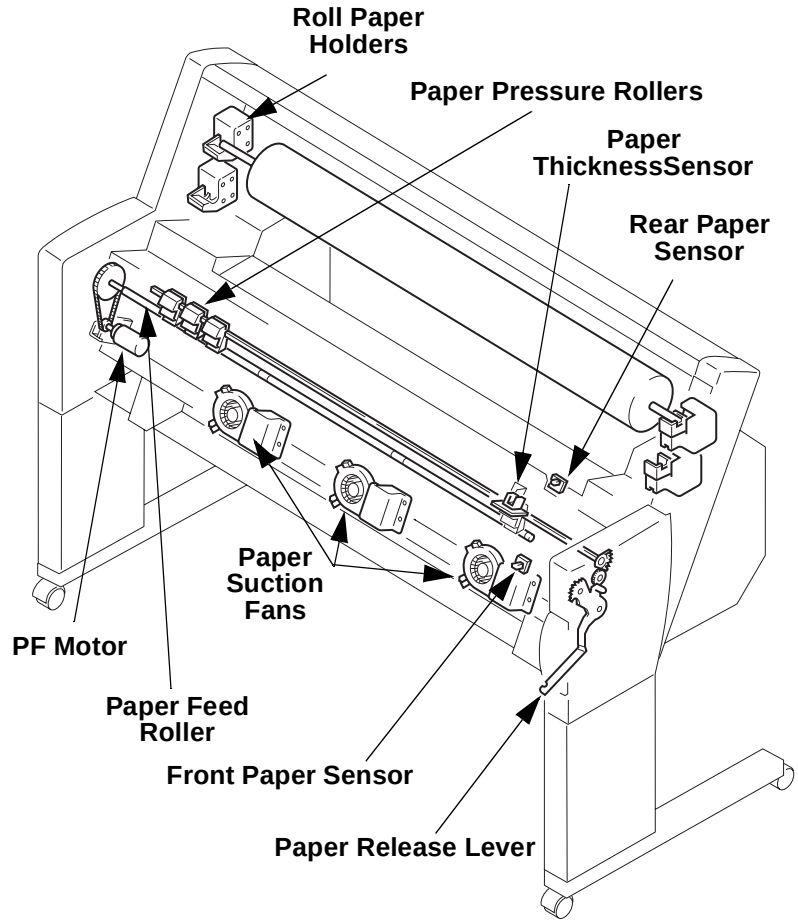


Figure 2-2. Paper Feed Mechanism

INK SYSTEM

For more information, see **Ink Supply Mechanism** on page 34.

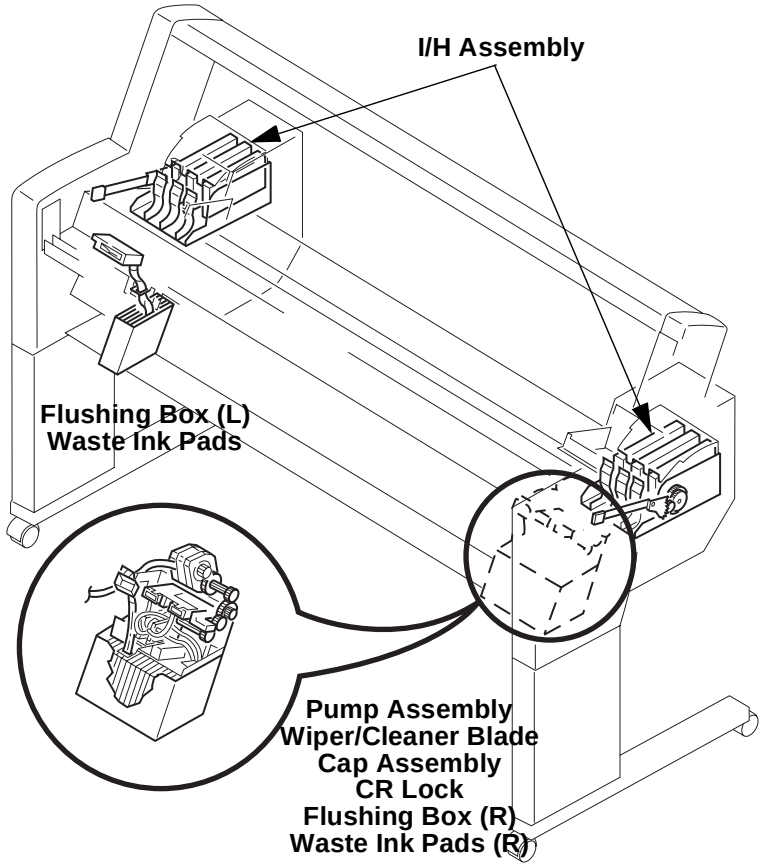


Figure 2-3. Ink System

CIRCUIT BOARDS

For more information, see **Control Circuit** on page 37.

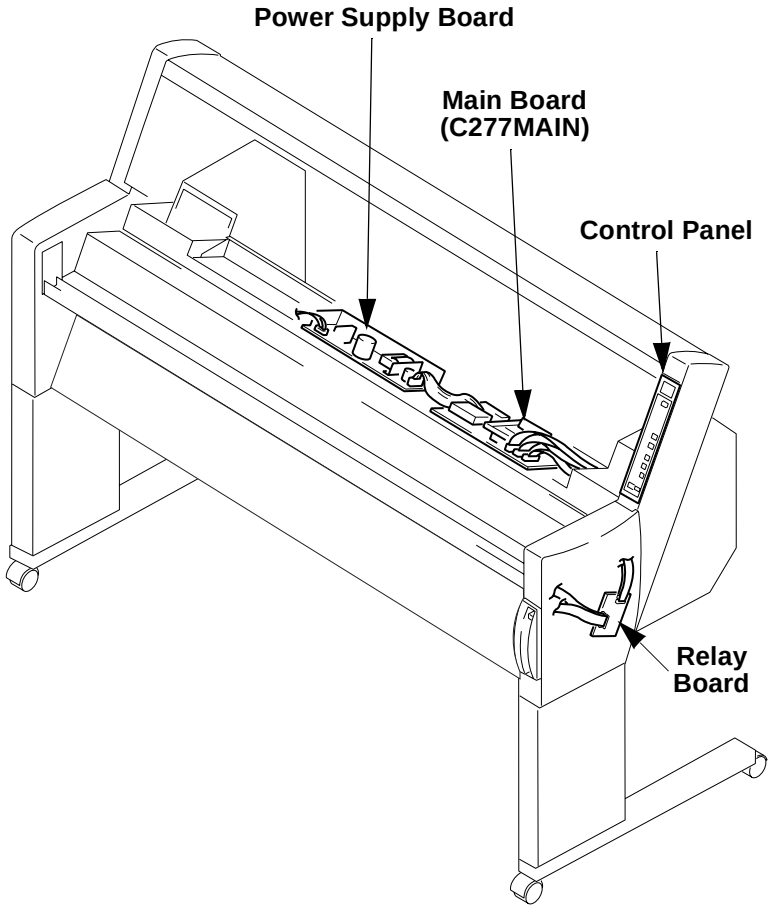


Figure 2-4. Circuit Boards

2.2 Operation

The following sections describe how the printer's main components operate.

2.2.1 Carriage Mechanism

The carriage mechanism includes the parts shown in Figure 2-5. Their operation is described below.

CARRIAGE (CR) GUIDE RAIL

To print on paper as wide as B0, 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 Stylus Pro 9000.

Every EPSON ink jet printer until now has used a carriage guide shaft to stabilize the carriage during printing and horizontal movement. The Stylus Pro 9000 does away with the carriage guide shaft and relies on the printer frame for its stability.

As shown in Figure 2-5, the Carriage attaches to the CR Guide Rail with eight bearings, and the carriage in turn holds the subcarriage. The subcarriage holds the printheads.

PLATEN GAP (PG) MECHANISM

Unlike previous models, the Stylus Pro 9000 uses a special system to ensure that the distance between the printhead nozzles and paper remains the same for all supported paper thicknesses. The subcarriage can be moved using the PG Cam which is driven by the PG Gear; this causes the subcarriage and all its components to move slightly nearer to or farther from the platen. The subcarriage moves because the PG Cam is mounted off-center, so one side of the cam pushes the subcarriage closer to the platen than the other side.

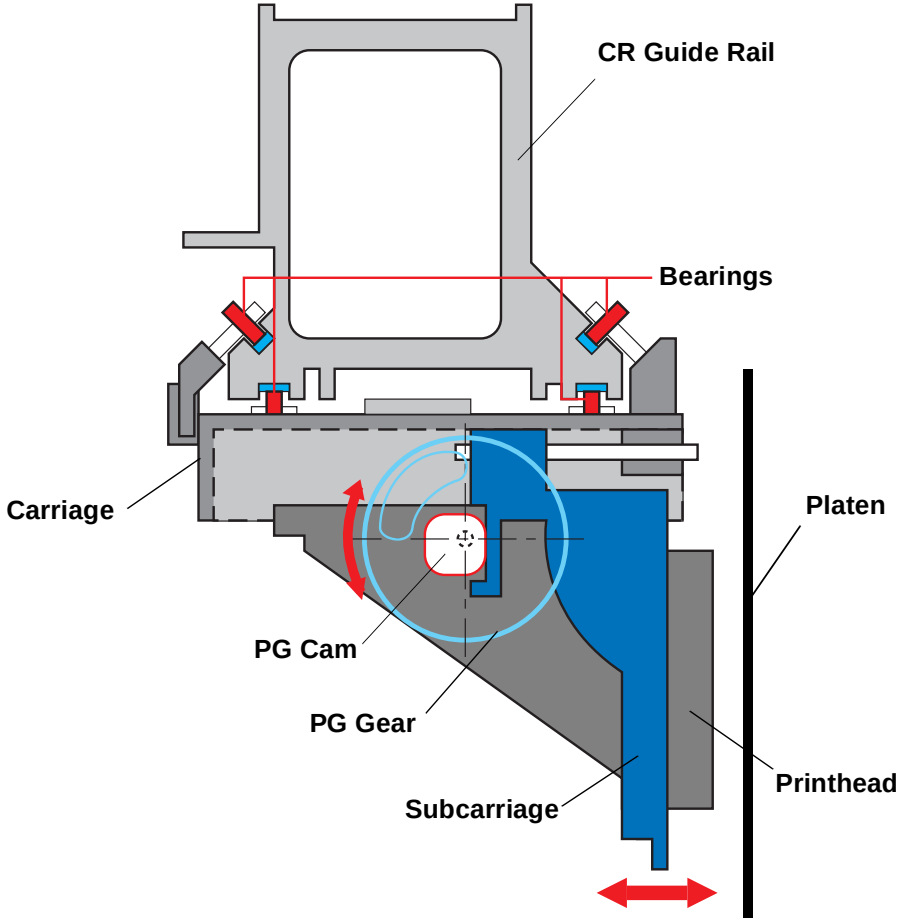


Figure 2-5. CR Guide Rail and PG Mechanism (side view)

To maintain a constant distance between the printhead nozzles and the paper, the printer measures the thickness of the paper and adjusts the height of the carriage accordingly. The printhead has three platen gap (height) settings, as described in the table below.

Table 2-1. Platen Gap Settings

Platen Gap Setting	Gap Distance
PG "Small"	1.3mm
PG "Medium"	2.2mm
PG "Large"	2.7mm

The actual platen gap position used during printing depends on both the detected paper thickness and the user's paper thickness setting on the control panel.

Table 2-2. Platen Gap Setting Determination

Control Panel Setting	Paper Thickness Sensor	Platen Gap Position
Wide	Wide	PG "Large"
	Standard	PG "Medium"
Auto	Wide	PG "Large"
	Standard	PG "Small"

The printer uses two sensors in setting the platen gap:

- Paper Thickness Sensor

  This sensor physically gauges whether the paper falls into the normal/thin category or the thick category. The Pressure Roller unit closest to home position has a thin metal flag on top. When the Paper Release Lever is in the Lock position and thin paper is loaded, this flag pivots into the space between the sensor's light emitter and receiver. However, when thick paper is loaded, the flag is forced forward out of the sensor area.

  Sensor signal = ON at 0.7 V or less: Normal or thin paper
  Sensor signal = OFF at 2.4 V or more:Thick paper

- PG Sensor

  This light-reflecting sensor detects whether the subcarriage is in the thick paper position or normal paper position. The PG Gear rotates with the PG Cam, and the PG Sensor determines the subcarriage's position from the position of the PG Gear, using the hole in the gear's side as a reference.

PAPER WIDTH SENSOR

This sensor locates the right and left edges of the paper. The light emitted from the sensor is reflected back to the sensor where paper exists. In this way the sensor determines where the paper's edge is and how wide the paper is.

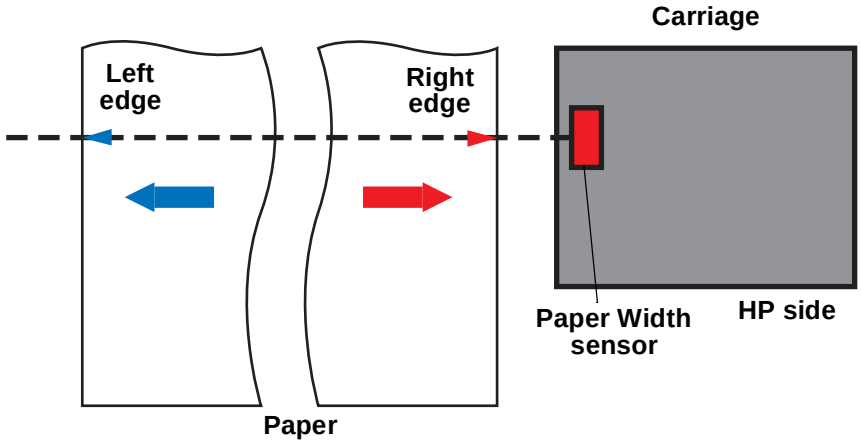


Figure 2-6. Paper Width Sensor

CARRIAGE MOTOR AND POSITION CONTROL

For the greatest possible print accuracy and to minimize vibration, the printer uses a DC motor to move the carriage. Because a rubber timing belt would stretch over the long distance the carriage must travel during printing, the Stylus Pro 9000's timing belt is made from steel.

The following sensors are located on the carriage and control the carriage's position (see **Figure 2-7**):

- HP Sensor
  This optical sensor activates when the CR Guide Rail flag enters the space between the sensor's light emitter and the light receiver. The flag is located just above home position, and the HP sensor sends an ON signal when the carriage is in home position.
- Linear Encoder Sensor
  This sensor determines the position of the carriage by counting bands on the timing fence (timing strip) while the carriage is in motion. The bands have a distance equal to 180 dpi. For every band the Linear Encoder passes over, it sends a print timing pulse to the software servo system. The software servo forms a closed-loop with the CR motor and Encoder Sensor. It receives feedback from the Encoder Sensor and adjusts the current to the CR motor to maintain constant carriage speed.

Carriage Speed and Acceleration

- Carriage Speed

The carriage speed during printing is described below.

Table 2-3. Carriage Speed

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

- Carriage Acceleration

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

- CR Motor Motion Failure

During operation, the encoder measures the distance the carriage travels. If the CR speed as determined by the encoder varies too much from the speed set by the Software Servo, a fatal error occurs (Service Call 00010005).

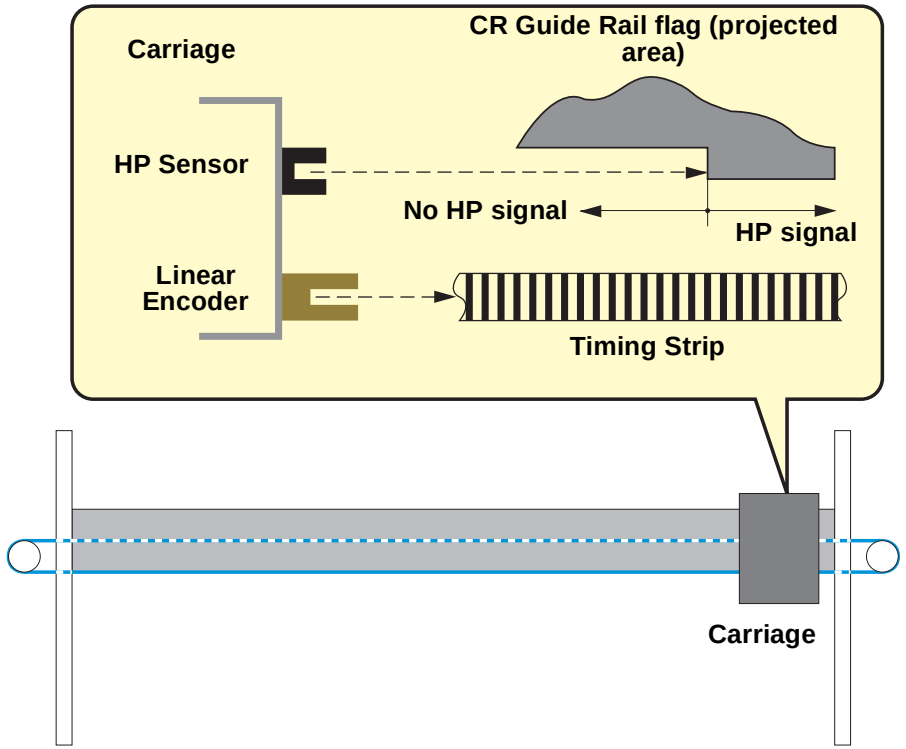


Figure 2-7. Carriage Mechanism Sensors

CUTTER MECHANISM

To make a paper cut, the cutter solenoid plunges the cutter blade into the paper. To cut the paper evenly, the following method is used:

1)The cutter cuts from the left of center (when facing the printer) to the left edge.

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

3)The cutter cuts the remaining center portion, from right to left.

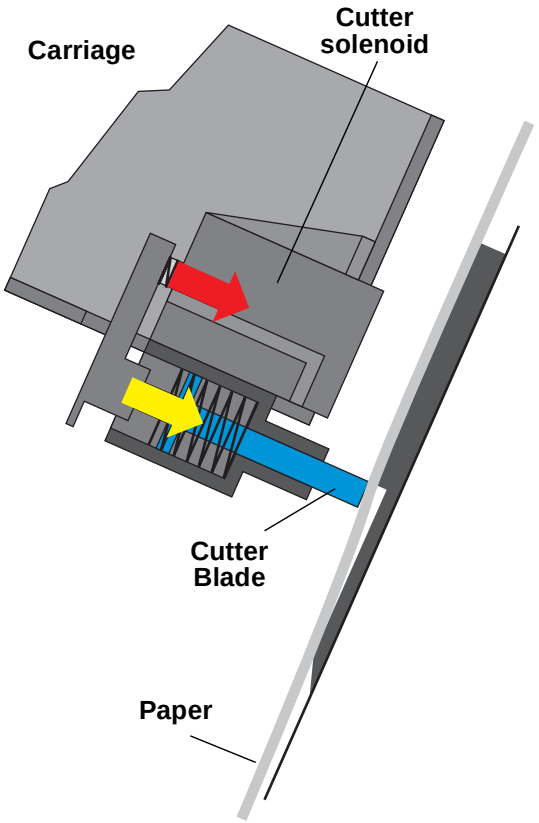


Figure 2-8. Cutter Mechanism

PRINTHEADS

The printheads are the same type used in the EPSON Stylus Pro 5000, and are installed in the same way. Three levers are provided to make sure the heads are lined up vertically and that neither head leans one way or the other.

2.2.2 Paper Feed Mechanism

The main components of the paper feed mechanism are described below.

PAPER FEED MOTOR AND ROLLERS

When paper is loaded, it's held against the Paper Feed Roller by the Paper Pressure Rollers. Raising the Paper Release Lever (see **Figure 2-10**) moves the Paper Pressure Rollers away from the Paper Feed Roller, and releases any loaded paper. The Paper Feed Roller Assembly is made up of three equal lengths of rollers and their coupling.

The PF Motor uses a DC motor, which has a built-in optical rotary encoder. The encoder sends signals to the software servo system, which regulates the speed of the motor. Motion is transferred through a timing belt to the Speed-Reduction Gear, which improves the accuracy of paper feeding.

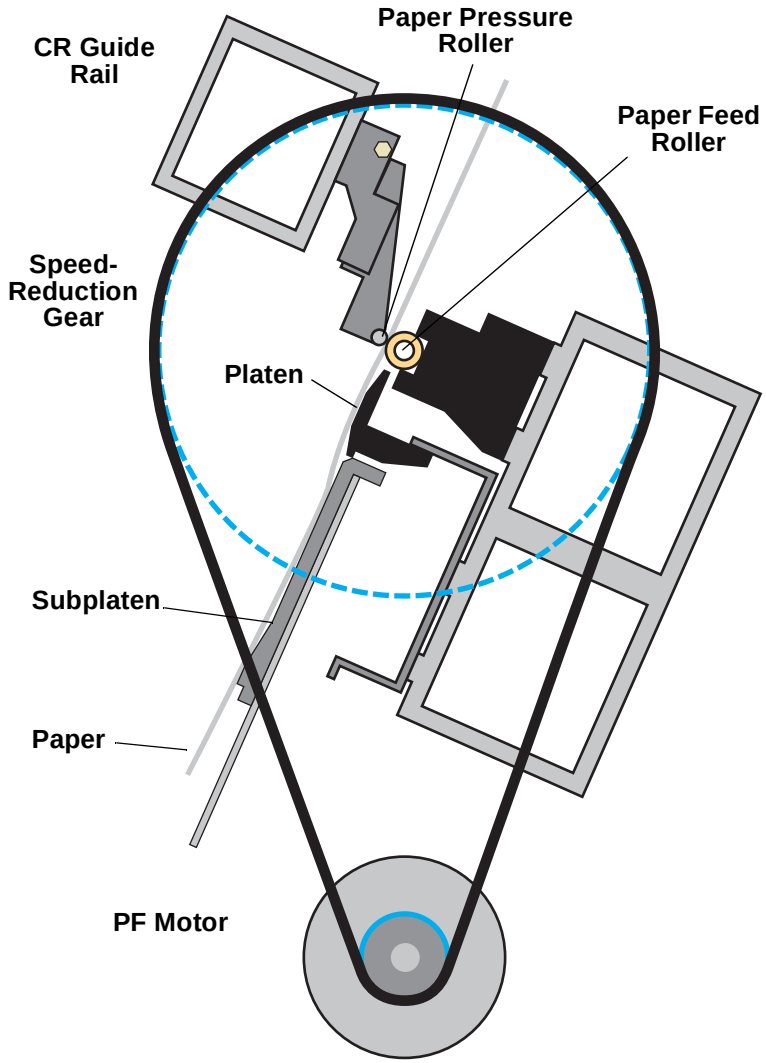


Figure 2-9. Paper Feed Mechanism

PAPER FEED SENSORS

The printer relies on the following sensors for paper feeding:

- Front Paper Sensor
  This optical sensor is attached to the back side of the Lower Paper Guide, and detects the front edge (top or leading edge) of the paper.
- Rear Paper Sensor
  This optical sensor is attached to the back side of the Lower Paper Guide, and detects the rear edge (bottom or trailing edge) of the paper.
- Paper Release Lever Position Sensor
  The Paper Release Lever is located on the right side of the printer, and the sensor attaches to the bottom of the lever, inside the right-side frame. This sensor's signal is ON when the lever is in down, which allows the printer to print.

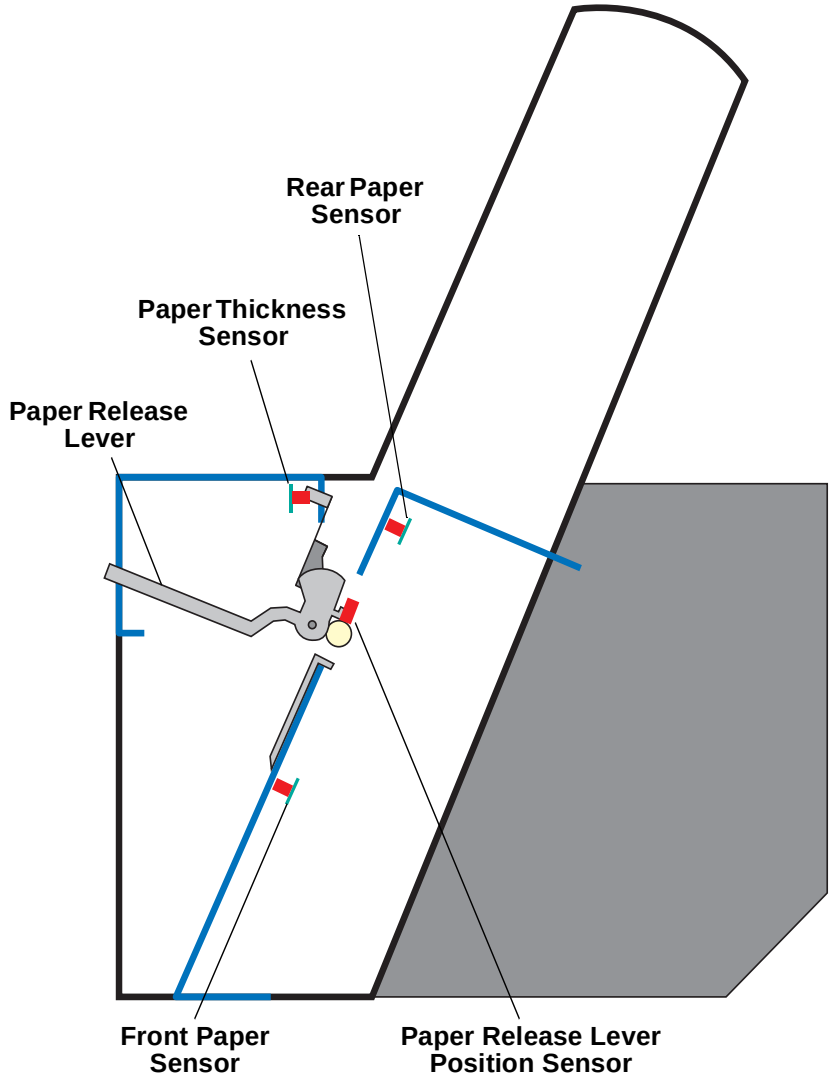


Figure 2-10. Paper Feed Sensors

PAPER SUCTION FAN

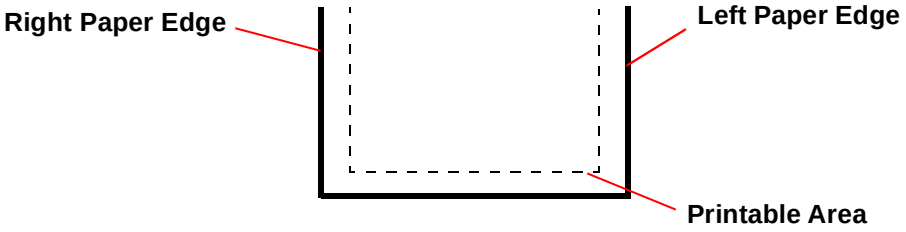
The Paper Suction Fans are located behind the lower paper guide and suck air through the holes in the guide. This keeps the paper from bulging as it feeds through the printer and prevents ink smears. The table below relates fan speed to various printer states and user actions.

Table 2-4. Fan Speeds

Fan speed	User action	Printer action	Sensor state	LCD message
Level 1 (low)	User begins to load paper	—	Rear Paper Sensor ON Front Paper Sensor OFF	"Load Paper" if Paper Release Lever UP "Paper Out" if Paper Release Lever DOWN
Level 2 (medium)	User continues loading paper	—	Rear Paper Sensor ON Front Paper Sensor ON	"Load Paper" if Paper Release Lever UP "Press Pause Button" if Paper Release Lever DOWN
Fan goes from Level 3 (high) to Off, and then back to Level 3 (high) during paper setting sequence	User lowers Paper Release Lever and presses Pause, or user allows several seconds to pass after lowering Paper Release Lever and printer automatically ends "Pause" state	Printer sets paper	Depends on paper's location while being set	"Wait"
Off	—	Paper loaded and printer waiting for print data	Rear Paper Sensor ON Front Paper Sensor ON	"Ready"
Level 3 (high)	User sends print data	Printing	Depends on paper's location while printing	"Printing"

PAPER WIDTH DETERMINATION (LEFT AND RIGHT EDGE DETECTION)

Before printing, the printer sets the platen gap and then flushes the printheads to make sure no ink smears the paper. The printer then detects the left and right edges of the paper. Note how “left” and “right” are defined below:



To detect the left and right edges, the printer performs the following steps:

Table 2-5. Left and Right Edge Detection

Purpose	Step	Action
To make sure paper is loaded correctly	1	The carriage moves just to the inside of where the left edge should be, if the paper is loaded correctly.
	2	The Paper Width Sensor checks for paper. If paper is detected, go to step 3; otherwise report “Reload Paper” error.
To establish sensor signal level	3	The printer registers the sensor’s “paper present” (ON) signal level.
To make sure paper is loaded correctly	4	The carriage moves just to the outside of where the left edge should be, if the paper is loaded correctly.
	5	The Paper Width Sensor checks for paper. If paper is not detected, go to step 6; otherwise report “Reload Paper” error.
To establish sensor signal level	6	The printer registers the sensor’s “no paper” (OFF) signal level.

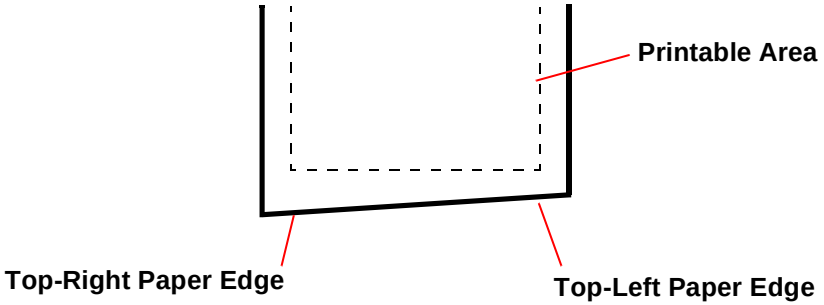
Table 2-5. Left and Right Edge Detection (continued)

Purpose	Step	Action
To determine position of left edge	7	The carriage moves to the left paper edge and registers its position.
To determine position of right edge	8	The carriage moves to the right edge of the paper.
	9	The Paper Width Sensor checks for paper. If paper is not detected, go to step 10; otherwise, report “Reload Paper” error.
	10	The printer registers the position of the right edge of the paper.
To verify left edge position and determine paper width	11	The carriage returns to the left paper edge.
	12	The Paper Width Sensor checks for paper. If paper is not detected, go to step 13; otherwise, report “Reload Paper” error.
	13	The printer verifies the edge position and registers the distance from one edge of the paper to the other.

PAPER SIZE DETERMINATION (DETECTION OF TOP EDGE)

If the printer is in Roll Auto Cut or (Cut) Sheet mode, it determines the location of the top (leading) edge of the paper before printing. Note that the printer skips this procedure if Roll Cutter Off is selected.

The “top-left” and “top-right” edges are as shown below. Note that the top edge may not be straight across.



After determining the position of the left and right edges of the paper (see **Paper Width Determination (Left and Right edge Detection)** on page 31), the printer performs the following steps to locate the top edge and correctly position the paper for printing:

Table 2-6. Top Edge Detection and Positioning

Purpose	Step	Action
To make sure paper is loaded correctly	1	Printer reverse feeds (pulls paper back up) a maximum distance of 200 mm.
	2	The Front Paper Sensor checks for paper. If, during reverse feeding, it detects the top edge of the paper, go to step 3; otherwise, report “Reload Paper” error.
To determine top-left edge position	3	Carriage moves from home position to 30 mm inside left edge of paper.
	4	Printer reverse feeds 200 mm max.
	5	The Paper Width Sensor checks for paper. If, during reverse feeding, it detects the top edge of the paper, go to step 6; otherwise, report “Reload Paper” error.
	6	Printer registers top-left edge position.
To determine top-right edge position	7	Carriage moves to 30 mm inside right edge.
	8	The Paper Width Sensor checks for paper. If it detects paper, the printer reverse feeds paper until Paper Width Sensor detects top-right edge. If paper not detected, printer advances paper until Paper Width Sensor detects top-right edge.
To ready carriage for printing	9	Carriage returns to home position.
To set paper for printing	10	Printer advances paper so that the shorter of the two edges (top-left or top-right) aligns with a position approximately 1 cm below the level of the Front Paper Sensor.

PAPER LOADING ERRORS

- “Reload Paper” Error

  After paper is loaded in the printer, the printer performs the left, right, and leading edge detection operations described above. If the operations fail at any point, a “Reload Paper” error occurs.

- “Paper Not Straight” Error

  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 each page. If the printer determines that the paper is skewed 3 mm or more from the position previously detected, a “Paper Not Straight” error occurs.

To avoid paper loading errors, make sure the paper’s left edge (near HP) is lined up with the vertical line of holes in the Lower Paper Guide. Paper loaded within 10 mm 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 10 mm zone causes an error.

2.2.3 Carriage Lock Mechanism

The printer uses an electromagnetic solenoid to release the carriage lock. When the carriage lock does not receive any signal, the actuator rises into the opening at the bottom of the subcarriage, restricting carriage movement. To release the carriage for printing, the printer signals the actuator which then moves down, releasing the carriage.

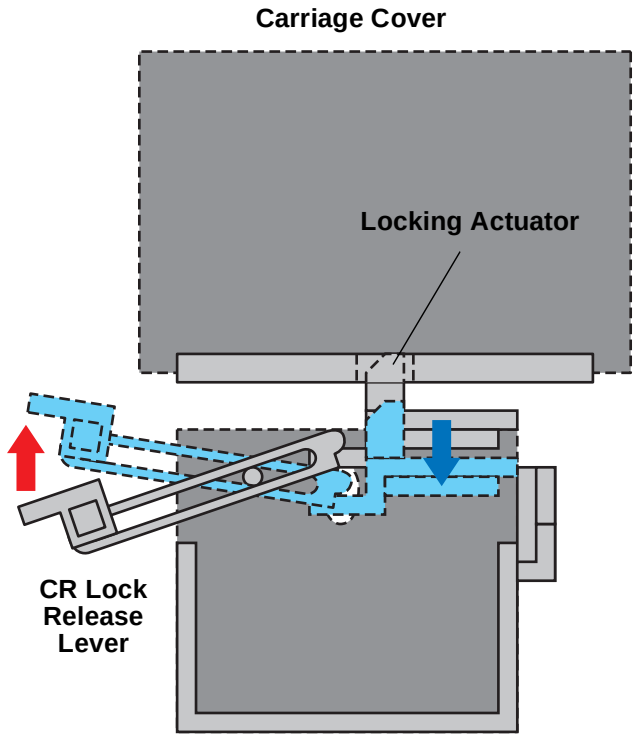


Figure 2-11. Carriage Lock Mechanism

2.2.4 Ink Supply Mechanism

The two ink cartridge holders each hold three cartridges, K, C, and M on one side and Lc, Lm, and Y on the other side. The design of the holders makes it quite easy to install and replace ink cartridges from the front of the printer. The I/H Lever opens and closes the I/H door, and at the same time it changes the angle of the Ink Cartridge Holder Assembly as shown in **Figure 2-12** on page 34. To prevent users from accidently installing a color ink cartridge in the wrong slot, the cartridges have slightly different designs.

Another important feature of the ink cartridge holders is the ink valve, which is located on the outer sides of the ink cartridge holders. It can be used to shut off the flow of ink during printer transportation. The valve is closed when:

- the user turns the valve to the “CLOSE” position
- the I/H lever is lifted to install cartridges

When the valves are open, the ink flows out of the ink cartridges, through the stainless steel pipes, through the ink tubes, and finally into the printheads.

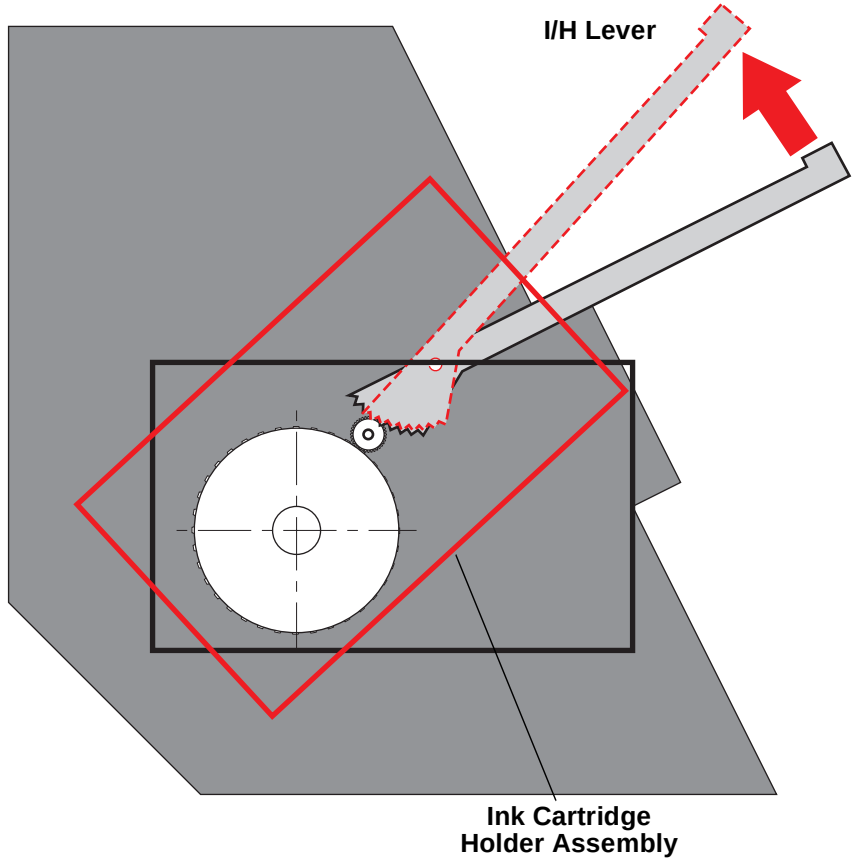


Figure 2-12. Ink Supply Mechanism

INK-RELATED SENSORS

The following sensors are located in the I/H compartment:

- I/H Assembly sensor
  This optical sensor detects the whether the door is open and the I/H Assembly is in the install position or the door is closed and the I/H Assembly is in the print position.

  When the I/H door is open, the signal = ON

  When the I/H door is closed, the signal = OFF

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

  When the I/C is installed, switch = closed

  When the I/C 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

- Ink ID sensor
  This optical sensor is located on the side of all six ink cartridge slots and detects which market the cartridge is for. Although not currently implemented, the sensor can also detect the type of ink (presently dye only) and any special color (if new colors are introduced in the future).
  The Ink ID sensor looks for the following marks on the ink cartridge.

Market:	No mark, white = Overseas/Global
Ink type:	No mark, white = dye-based ink
Special color:	No mark, white = N/A (may be available in future)

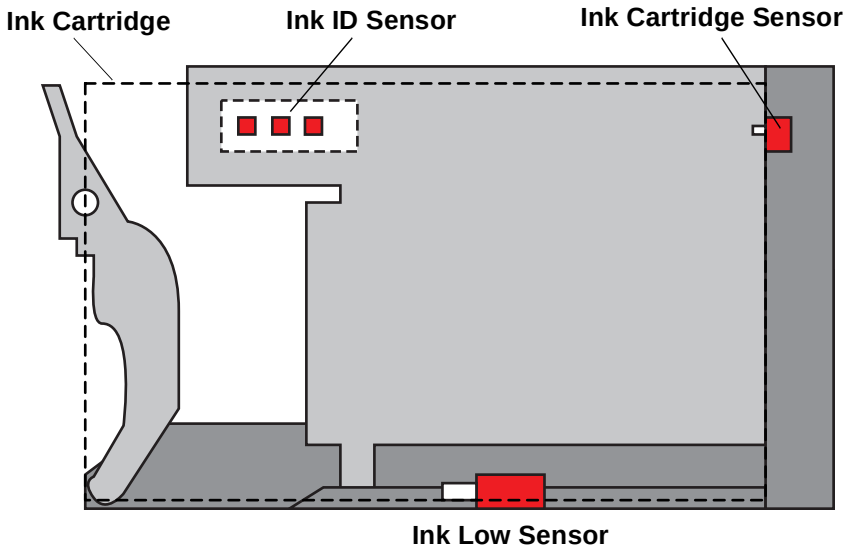


Figure 2-13. Ink Cartridge Holder Sensors

2.2.5 Cover Open Sensor

There are two cover open sensors, or safety interlock switches, one on each side of the printer, that detect when the cover is open. When the cover is open, relays that control current to the CR motor and PF motor cut off the flow of current. As shown in Figure 2-15, a bypass capacitor prevents current spikes from damaging drivers and other circuitry when the relays shut off.

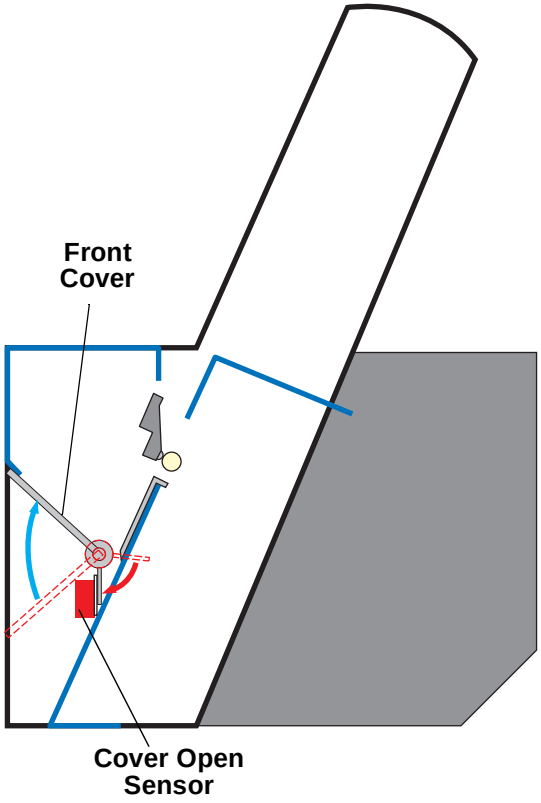


Figure 2-14. Cover Open Sensor

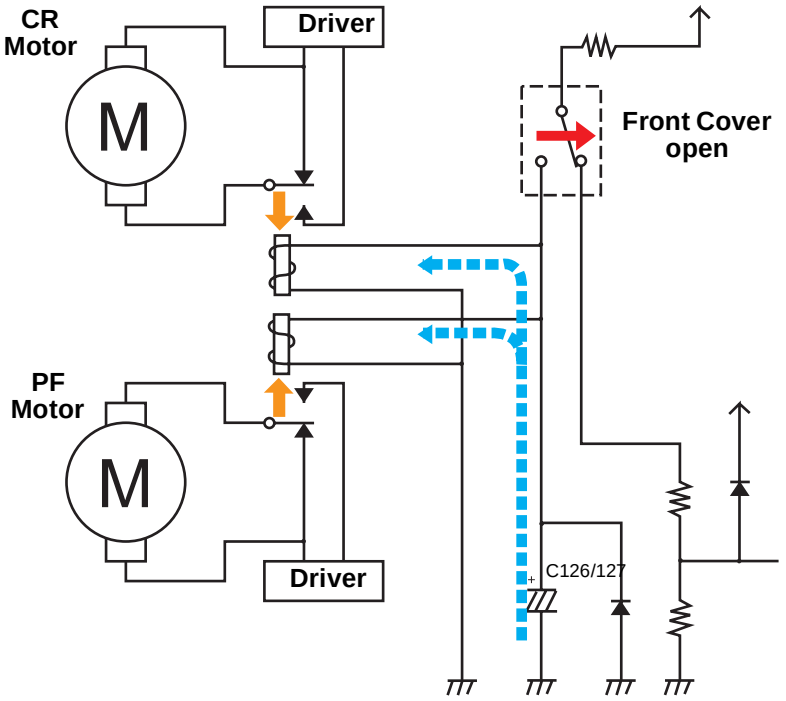


Figure 2-15. Relay Circuit Between Cover Open Sensors and Printer Motors

2.2.6 Control Circuit

This section summarizes the functions of the (C277MAIN) Main Board.

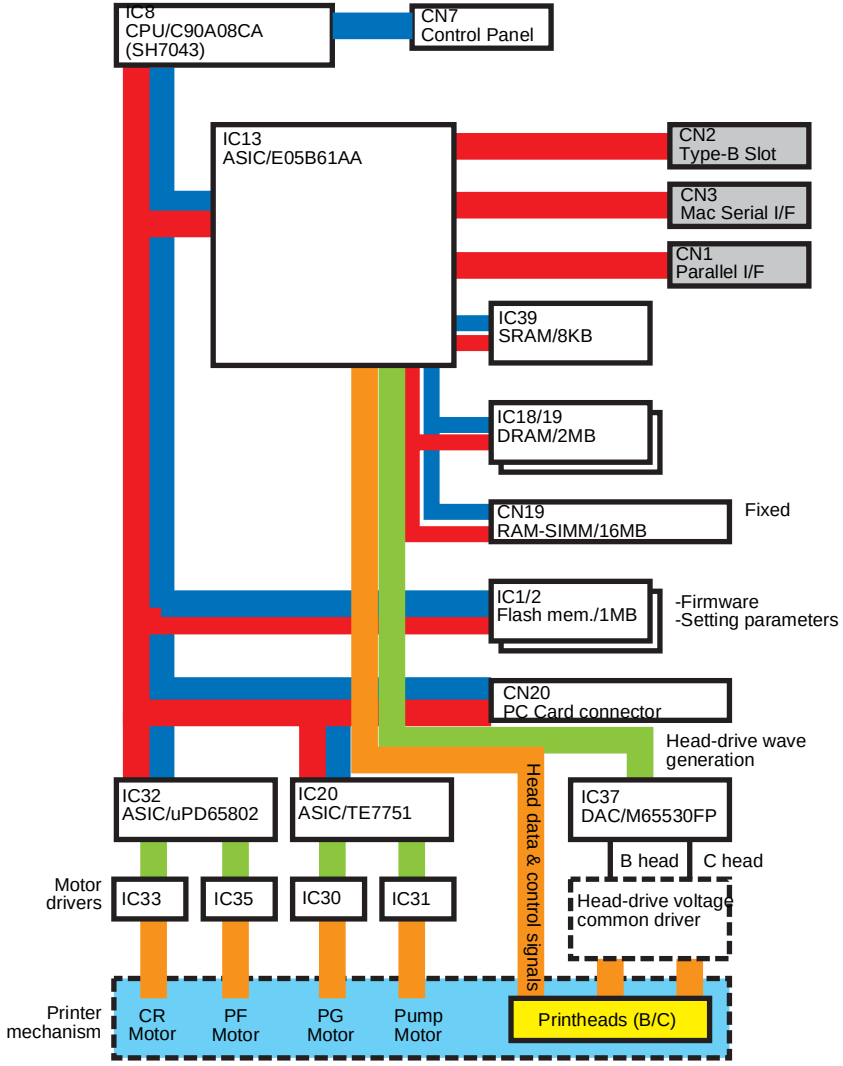


Figure 2-16. C277MAIN Board-Circuit Block Diagram

Table 2-7. C277MAIN Board Main Components

Name/Code	Location	Function
CPU (C90A08CA) SH7043	IC8	☐ 32 bit RISC-CPU Clock speed = 33MHz 128KB PROM internal
ASIC (E05B61AA)	IC13	☐ Regulates print data Command handling Rasterizer (image data handling) Head drive regulation (DAC) Print timing regulation ☐ Memory (DRAM/SRAM) ☐ I/F Circuit Control Parallel interface (IEEE1284) Macintosh Serial interface Type-B
ASIC (TE7751)	IC20	☐ Regulates Motor Pump Motor PG Motor (PG setting) Fan (PS, Paper Suction)
ASIC (uPD65802)	IC32	☐ Regulates motor (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 setting parameters
DRAM (EDO)	IC18/19	☐ EDO RAM 2Mbyte 16Mbtye (CN19 mounted SIMM)
SRAM (LC3564SM-10)	IC39	☐ 64Kbit SRAM External data ring buffer type
Driver IC (L6203)	IC33/35	CR/PF Motor Driver
Driver IC (LB1845)	IC30/31	PG/Pump Motor Driver

CHAPTER

3

TROUBLESHOOTING

3.1 Overview

To troubleshoot printer problems, turn to one of these sections:

- If the LCD display shows an error message, see **Troubleshooting Using LCD Error Messages** on page 39.
- Since an LED or LCD error message may indicate a loose cable connector, see also **Connector-Related Errors** on page 52.
- If you notice problems with print quality such as missing dots or lines, misaligned vertical lines, or banding (faint white lines), see **Print Quality Troubleshooting** on page 49.

3.2 Troubleshooting Using LCD Error Messages

The EPSON Stylus Pro 9000 performs self-diagnostic tests using the data supplied by its sensors, and if an error is detected by one or more sensors, an error message appears on the control panel display.

When the printer displays an error, look it up in **Table 3-1** or **Table 3-2** and follow the link in the table to the appropriate troubleshooting section of this chapter.

3.2.1 LCD Error Messages

When a part reaches the end of its useful life, an error code appears on the printer's LCD display. For example, MAINTENANCE REQ. 0100 appears on the display to warn that the Waste Ink Pads are about 99% full. The printer continues to print while this message appears. When the Waste Ink counter determines that the Waste Ink Pads are completely full, the printer displays SERVICE REQ. 00000100 and stops printing.

Error codes also alert the user to fatal errors and other printer problems. Refer to the tables below to determine the meaning of each code.

Table 3-1. Error Message List for Service Technicians

Error	Code	Description	Refer to
Maintenance Req. nn	0100	Waste Ink pads is almost full (less than 1% remaining)	page 41
Service Req. nnnnnnnn	00000100	Waste Ink pads must be replaced	page 41
	00000101	Ink Tube worn out	page 41
	00010000	PF motor encoder check error	page 41
	00010001	PF motor out of step	page 41
	00010002	PF motor overcurrent	page 42
	00010003	PF in-position time-out	page 42
	00010004	CR motor encoder check error	page 42
	00010005	CR motor out of step	page 42
	00010006	CR motor overcurrent	page 43
	00010007	CR in-position time-out	page 43
	00010008	Servo interrupt watchdog time-out error	page 43
	00010009	System interrupt watchdog time-out error	page 43
	0001000A	CR origin sensor malfunction	page 43
	0001000C	PG origin sensor malfunction	page 43
	0001000D	Cover sensor malfunction (00)	page 44
	0001000E	Cover sensor malfunction (01)	page 44
	0001000F	CR motor PWM output error	page 44
	00010010	PF motor PWM output error	page 44
Service Req. nnnnnnnn	00020000	NVRAM error	page 44

Table 3-1. Error Message List for Service Technicians (continued)

Error	Code	Description	Refer to
	00020001	Internal RAM check error	page 44
	00020002	SRAM check error	page 44
	00020003	DRAM check error	page 44
	0002000B	Mail Box receiving error	page 44
	10000004	CPU vector 4 - General illegal instruction	page 44
	10000006	CPU vector 6 - Slot illegal instruction	page 44
	10000009	CPU vector 9 - CPU address error	page 44
	1000000A	CPU vector 10 - DMAC/DTC address error	page 44
	1000000B	CPU vector 11 - Watchdog time-out error	page 44
	100000""	CPU vector 32 to 63 - Wrong trap	page 44

Table 3-2. General Error Message List

Error Type	Message	Refer to
Warning	Ink Low	page 45
Error	Paper Out	page 45
	Load xxx Paper	page 45
	Load Paper	page 45
	Paper Jam	page 46
	Cover Open	page 46
	Paper Not Cut	page 46
	Paper Not Straight	page 46
	Reload Paper	page 47
	Push Lever Down	page 47
	Compartment Open	page 47
	Ink Out	page 48
	No Ink Cartridge	page 48
	Remove Paper	page 48
	Option I/F Error	page 48

3.2.2 Errors that require a service technician

This section describes the errors listed in **Table 3-1** on page 40 in detail.

MAINTENANCE REQ. 0100

- Problem
  The Waste Ink Pads have absorbed 99% of their ink capacity. The printer can continue printing, but the “Maintenance Req. 0100” message appears instead of the “Ready” or “Printing” messages.
- Solution
  Replace the Waste Ink Pads along with the replaceable parts of the Mainenance Assembly as described in **Maintenance Procedures** on page 67.

SERVICE REQ. 00000100

- Problem
  The waste ink pads are completely full, causing a fatal error. The printer stops printing.
- Solution
  See the solution for Maintenance Req. 0100, above.

SERVICE REQ. 00000101

- Problem
  This error occurs when the CR Motor has reached 2.5 million passes, which indicates that the Ink Tubes should be replaced due to excessive wear and tear.
- Solution
  Replace the Ink Tubes as explained in **Removing the Ink Tubes** on page 92.

SERVICE REQ. 00010000

- Problem
  PF motor encoder check error
  When the PF motor turns, the printer checks the rotary encoder output signals to make sure the motor is turning at the correct speed and distance. If the encoder doesn’t send the expected output data, an error occurs.
- Solution
  Make sure there is nothing blocking the PF Roller. 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 REQ. 00010001

- Problem
  PF motor out of step
  The length of the pulse generated by the PF motor’s internal encoder is too long or too short compared to the normal pulse.
- Solution
  See the solution for Service Request 00010000, above.

SERVICE REQ. 00010002

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

SERVICE REQ. 00010003

- Problem
  PFin-position time-out
  The in-position time is the amount of time the printer waits to make sure the PF Roller is not moving when the motor comes to a stop. If the rotary encoder sends a pulse during the in-position time, then the PF Roller is moving even though it's supposed to be at a full stop, and this generates an error.
- Solution
  - Replace the PF motor
  - Replace the Main Board

SERVICE REQ. 00010004

- Problem
  CR motor (linear) encoder check error
  When the CR motor turns, the printer checks the linear encoder output signals to make sure the motor is turning at the correct speed and distance. If the encoder doesn't send the correct output data, an error occurs.
- Solution
  Make sure there is nothing blocking the carriage. If that does not solve the problem, check the linear encoder's connections. If there still is a problem, try the following.
  - Check the plastic encoder strip (timing fence) for soiled areas, obstructions, and damage
  - Replace the linear encoder sensor
  - Replace the CR motor
  - Replace the Main Board

SERVICE REQ. 00010005

- Problem
  CR motor out of step
  The length of the CR motor's pulse is too long or too short compared to the normal pulse.
- Solution
  See the solution for Service Request 0010004, above.

SERVICE REQ. 00010006

- ❑ Problem
  CR motor overcurrent
  Feedback from the CR motor driver (IC33) indicates that the CR motor's current is irregular.
- ❑ Solution
  - ■ Replace the CR motor
  - ■ Replace the Main Board

SERVICE REQ. 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. If the linear encoder sends a pulse during the in-position time, then the carriage is moving even though it's supposed to be at a full stop, and this generates an error.
- ❑ Solution
  - ■ Replace the linear encoder sensor
  - ■ Replace the CR motor
  - ■ Replace the Main Board

SERVICE REQ. 00010008

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

SERVICE REQ. 00010009

- ❑ Problem
  System interrupt watchdog time-out error due to sensor-related error
- ❑ Solution
  Replace the Main Board

SERVICE REQ. 0001000A

- ❑ Problem
  CR origin (home position) sensor malfunction
- ❑ Solution
  - ■ Check the HP sensor for obstructions, and clean using compressed air
  - ■ Replace the HP sensor
  - ■ Replace the Main Board

SERVICE REQ. 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's connections. If there still is a problem, try the following:
  - ■ Replace the PG sensor
  - ■ Replace the PG motor
  - ■ Replace the Main Board

SERVICE REQ. 0001000D
SERVICE REQ. 0001000E

- ❑ Problem
  Cover sensor malfunction
  One or both Cover Open sensors (interlock switches) located at either end of the cover shaft is malfunctioning.
  D: right sensor (HP side)
  E: left sensor
- ❑ Solution
  Make sure each sensor is properly installed. If that does not solve the problem, check the Cover Open sensor's connections. If there still is a problem, try the following:
  - ■ Replace the malfunctioning sensor or sensors
  - ■ Replace the Main Board

SERVICE REQ. 0001000F

- ❑ Problem
  CR motor PWM output error
- ❑ Solution
  - ■ Replace the Main Board

SERVICE REQ. 00010010

- ❑ Problem
  PF motor PWM output error
- ❑ Solution
  - ■ Replace the Main Board

SERVICE REQ. 00020000 (NVRAM ERROR)
SERVICE REQ. 00020001 (INTERNAL RAM ERROR)
SERVICE REQ. 00020002 (SRAM ERROR)
SERVICE REQ. 00020003 (DRAM ERROR)
SERVICE REQ. 0002000B (MAIL BOX RECEIVING ERROR)

- ❑ Problem
  Unusual condition detected.
- ❑ Solution
  - ■ Write down the error code, and then turn the printer off and back on to confirm that the error recurs. If the error recurs, replace the Main Board.
  - ■ For "Service Req. 00020003" (DRAM error), replace the SIMM installed in CN19 and then check whether the error recurs.

SERVICE REQ. 10000004 (CPU GNRL ILLEGAL INSTRCTNS)
SERVICE REQ. 10000006 (CPU SLOT ILLEGAL INSTRCTNS)
SERVICE REQ. 10000009 (CPU CPU ADDRESS ERROR)
SERVICE REQ. 1000000A (CPU DMAC/DTC ADDRESS ERROR)
SERVICE REQ. 1000000B (CPU WATCHDOG TIME-OUT ERROR)
SERVICE REQ. 100000## (CPU VECTOR 32~63)

- ❑ Problem
  Unusual condition detected.
- ❑ Solution
  - ■ Write down the error code, and then turn the printer off and back on to confirm that the error recurs. If the 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.

3.2.3 General Errors

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

INK LOW

- ❑ Problem
  Each ink cartridge has a mechanical ink level gauge. One of them has detected that the corresponding ink cartridge is almost empty. With the remaining ink, the user can still print at about 100% duty on B1 size paper, but the cartridge should be replaced as soon as possible.
- ❑ Solution
  Replace the ink cartridge with a new one. Do not try to reuse the old cartridge; 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.”

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 from the control panel. See Maintenance Mode 2 on page 17.

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 Rear Paper Sensor’s surface. Clean the sensor’s surface (hole in the Upper Paper Guide) with a clean, dry cloth or using compressed air.

Never use a wet cloth or soap to clean optical sensors.

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’s operation and connectors. If that doesn’t work, replace the Main Board.

PAPER JAM

- Problem
  A paper jam occurs when during printing, paper feeding, or paper cutting, and 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 Front and Rear Paper sensors are ON but the carriage motor is out of step or drawing too much current.
- Solution
  - After removing the jammed paper, 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 printer operation to stop. If the carriage is not in home position and the cover is left open too long, the printheads may dry out and become damaged. (To avoid this problem, press the Pause button before opening the cover. Note that if you continue printing, a stripe or band may appear where printing resumes; this is because the previously printed section has had more time to dry than the freshly deposited ink.)
- 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 Front Paper 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.
  - If the paper was cut, but not cut straight across, you may need to adjust the cutter position. See **Cutter Position Adjustment** on page 131 for details.

PAPER NOT STRAIGHT

- Problem
  This error occurs when the printer detects that the paper is skewed (loaded at an angle) by more than 3 mm. 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 be marred on the back.
- Solution
  - Remove the paper loaded in the printer and properly reload it so that it's edge is aligned with the vertical line of holes in the Lower Paper Guide.
  - If using roll paper, remove the roll and carefully squeeze the sides of the roll to make sure they're lined up and flat.

RELOAD PAPER

❑ Problem
This error occurs when:

1) The user loads the paper too far down (more than 200 mm below the Front Paper Sensor).

2) The paper was loaded in such a way that the left edge is not within 10 mm of the vertical line of holes in the Lower Paper Guide.

3) The right edge is outside the printable area (due to mis-loading or because the paper is too wide).

4) After printing has finished, the right or left edge is outside the area where the cutter can cut the paper.

5) 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.)

6) A cutter error occurred after the paper was ejected.

❑ Solution

- for 1 through 4, above
  Reload paper properly. If the front edge of the paper is not straight and clean, cut the paper.
- for 5 and 6, above
  Cut off the ejected portion of the paper 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 the “Roll Auto Cut” setting, you can cut off the ejected portion of the paper using the Cut button.
- If the error recurs even after reloading the paper, make sure the Rear Paper Sensor is installed correctly and working properly.

PUSH LEVER DOWN

❑ Problem
The printer cannot operate because the lever is in the release position.

❑ Solution

- Push the lever down. Note that 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.

CAUTION

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

  - 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 Out and Ink ID sensors.

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.

CAUTION

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

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

REMOVE PAPER

- Problem
  Printer cannot perform cleaning because thick paper is installed, causing the printheads to be too far away from the Capping Assembly. This error occurs under the following conditions.
  - Thick paper is loaded when an automatic cleaning operation is supposed to begin.
  - The printer attempts to print on thick paper when an automatic 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 operation to start and “Wait” appears on the display). After the cleaning operation is finished, “Paper Out” appears. Reload thick paper and continue printing as usual.

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 card with the correct specifications.

3.3 Print Quality Troubleshooting

Use this section to solve the following problems if they appear in your printouts:

Table 3-3. Print Quality Problems

Description	Refer to
Missing dot or dots	page 49
No ink output from one or both printheads	page 50
Uneven printing or poor resolution	page 50
Smudged or marred printout on front side	page 51
Smudged or marred printout on reverse side	page 51
White or black banding	page 51

If you need to print a nozzle check pattern, press the SelecType button while the printer is on but not printing. Press the Paper Source button until “Test Print” appears, and then press Enter to select “Nozzle Check.” The nozzle check pattern prints.

MISSING DOTS OR LINES

When the printer is not used for a long period of time, the ink in the nozzles can dry up and clog the nozzles. You can clean the nozzles in both printheads from the printer’s control panel. While the printer is on but not printing, press the Cleaning button and hold it for 3 seconds. This starts the cleaning operation.

If the printhead nozzles don’t clear after attempting multiple cleaning operations, check the following:

1. If there is no output at all or only some of 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.” If the valves are open but there is still no output, see **No Ink Output from One or Both Printheads** on page 50.
2. Perform ink charging again
   Select the “Cleaning” function on the control panel’s Self-Diagnostic menu. See **Cleaning menu** on page 128. This sends a lot of ink into the printheads and forces out the old ink that is clogging the nozzles.

CAUTION

Do not clean the printheads unnecessarily, as doing so consumes a lot of ink. Each head consumes about 90 ml per operation.

3. If the cleaning operation does not clear the clogged nozzles, check the following:
   - Is there damage to or foreign material in the rubber seal of the Capping Assembly?
   - Is the Capping Assembly valve operating normally?
   - Is the Capping Assembly retention spring working properly?
   - Are the ink tubes and pipes between the ink cartridges and printheads properly connected and undamaged? (Check the nuts for tightness, the O-rings for warping, and the tubes and 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 recheck the printout:
   - Main Board
   - Printhead(s)

CAUTION

- **Before you uninstall the Main Board or a printhead, make sure the printer is unplugged from the wall outlet.**
- **After installing the new components, make sure all cables are properly connected; if cable connectors not completely inserted, they can damage circuits or the printheads when power is turned on.**
- **Make sure you replace the correct printhead: Head B (left) or Head C (right).**

NO INK OUTPUT FROM ONE OR BOTH PRINTHEADS

If there is no ink output from one or both printheads, try each of these steps in succession until the problem is resolved:

1. Make sure the ink valve on the outer side of each I/H assembly is open. (The small arrow should point to "OPEN.") Then perform an initial ink charge as described in **Cleaning menu** on page 128. Run a test print and check for output.
2. There may be a problem with the ink valve or tubing. To test, place a syringe on the end of one of the dampers (see **Figure 4-27** on page 73). Try to draw ink through it. If ink cannot be drawn through the damper, the ink valves may be defective or the ink tubing blocked. Service these parts as needed.
3. The Capping Assembly may be damaged or clogged. Remove the Capping Assembly and rinse it in cold water. Inspect the edges of the rubber seal. If damaged, replace the Capping Assembly.

   Place a syringe on the tubing leading from the bottom of the Capping Assembly and try to draw water through it. If water cannot be pulled through, replace the Capping Assembly.
4. Reinstall the Capping Assembly, Pump Mechanism, and tubing in the printer. Make sure the tubing from the Capping Assembly isn't pinched or crimped. Then move the carriage to home position.

   Place a syringe on the end of the tubing that leads to the Flushing Box (Right). Slowly (to avoid damaging the printhead) try to draw ink through the tubing. If ink cannot be drawn through the tubing, there is a problem with the seal between the Capping Assembly and the printhead.
5. The Pump Mechanism may be defective. Turn the printer on and perform the capping position adjustment. See **Cap Position Adjustment** on page 116. Turn the printer off, turn it back on, and then run a cleaning cycle as described in **Cleaning menu** on page 128. While the cleaning cycle is running, watch the end of the tubing leading to the Flushing Box (Right). If ink does not flow through the tubing, replace the Pump Mechanism.

If these steps do not restore printhead operation, the problem is probably not mechanical. Check the electrical connections between the Main Board and the printheads. Check that the Main Board is producing printhead driving signals and that the signals are reaching the printheads. Replace the Main Board or printheads as needed.

UNEVEN PRINTING OR POOR RESOLUTION

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

1. Perform the Head Gap and Bi-D Adjustments
   See **Head LR Adjustment (Head Gap Timing)** on page 123 and **Bi-D Adjustment** on page 121.
2. If the printing problem occurs only when the user prints on thick paper, press the SelecType button until the "Paper Configuration" menu appears and set the correct paper thickness. (Depending on the paper-thickness setting, the location where the ink strikes the paper may change.) See **Paper Configuration Menu** on page 16.
3. If the printout quality still has not improved, perform the following adjustments in the order listed below:
   - **B Head Slant/C Head Slant Adjustment (Head Angle)** on page 119
   - **BC Head Slant Adjustment (Head Height)** on page 120
   - **Head LR Adjustment (Head Gap Timing)** on page 123
   - **Bi-D Adjustment** on page 121

CAUTION

Even if you performed the Head Gap and Bi-D Adjustments in step 1, you must perform them again after doing the Head Angle and Head Height Adjustments in step 3.

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, check 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 15 mm on the control panel. (If a print job uses heavy ink coverage and the top and bottom margins are set to 3 mm, the high volume of ink can cause the paper to warp and rub against the printhead surface.)
2. If this problem recurs, check the Capping Assembly retention spring. If the spring is broken or comes off its hook, the Capping Assembly cannot clean ink off the printhead properly, and the ink will smudge the printout. Fix or replace the 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
- Paper Feed Roller
- Paper Pressure Rollers
- Lower Paper Guide

If the problem is not caused by ink on these parts, 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. Run a printhead cleaning cycle. Press the Cleaning button and hold it for 3 seconds. For more intensive cleaning procedures, see **Cleaning menu** on page 128.
2. If multiple cleaning cycles don't eliminate the banding, perform the following adjustments in the order listed below:
   - **B Head Slant/C Head Slant Adjustment (Head Angle)** on page 119
   - **BC Head Slant Adjustment (Head Height)** on page 120
   - **Head LR Adjustment (Head Gap Timing)** on page 123
   - **Bi-D Adjustment** on page 121

3.4 Connector-Related Errors

If you suspect a loose connector or faulty cable, you can use the following table to isolate the specific problem:

Table 3-4. Connector-Related Errors

LCD errors	LED errors	Symptom	Connector description	From	To
(display is blank)	—		CN7 ribbon cable	Main Board	Control Panel
—	—	Printhead comes in contact with middle of paper and smears ink	CN15	Relay Board	Suction Fan
—	—	Printhead comes in contact with edge of paper	CN14	Relay Board	Suction Fan
—	—	Printhead comes in contact with edge of paper	CN16	Relay Board	Suction Fan
—	—	Little or no ink output during printing; dry capping sponge	CN7 ribbon cable (blue end)	Relay Board	Printhead Board
—	—	Poor print quality due to incorrect platen gap	CN12	Relay Board	Paper Thickness Sensor
—	—	Poor print quality, or little or no ink output, due to priming or cleaning problem	CN19 (white cable)	Relay Board	Pump Motor
May see “Paper Not Cut” error	—	Paper doesn’t cut	CN6	Printhead Board	Cutter Solenoid
—	—		CN10	Main Board	PSB Fan (Left)
—	—		CN15	Main Board	Relay Board CN3
—	—		CN26	Main Board	PSB Fan (Right)
Ink Compart. Open	C, M, K=Solid		CN21	Main Board	Ink Housing (Left)
Ink Compart. Open	LC, LM, Y=Solid		CN8	Relay Board	Ink Housing (Right)
Ink Compart. Open	LC, LM, Y=Solid and Paper Out=Solid		CN9 flat cable (blue end)	Main Board	Relay Board CN7
Load Paper	LC, LM, Pause, Paper Out=Solid	No carriage movement	CN8 flat cable (white)	Main Board	Relay Board CN6
Load Paper	—	Release Lever doesn’t change display	CN10	Relay Board	Paper Release Lever Sensor
Paper Out	—	Suction fans don’t begin	CN11	Main Board	Rear Paper Sensor
Paper Out	—	Suction fans don’t go from low to medium speed	CN11	Relay Board	Front Paper Sensor

Table 3-4. Connector-Related Errors (continued)

LCD errors	LED errors	Symptom	Connector description	From	To
Reload Paper	—		CN5	Printhead Board	Paper Width Sensor
Service Req. 00010000	—	(Error code doesn't match problem)	CN27	Main Board	Left Cover Open
Service Req. 00010000	—	(Error code doesn't match problem)	CN13	Relay Board	Right Cover Open
Service Req. 00010000	—		CN13	Main Board	PF Encoder
Service Req. 00010000	—		CN14	Main Board	Relay Board CN5
Service Req. 00010000	—		CN18	Main Board	PF Motor
Service Req. 00010004	—		CN17	Main Board	CR Motor
Service Req. 00010004	—	Carriage slams right	CN2	Printhead Board	CR Linear Encoder Sensor
Service Req. 00010004	—	Carriage slams right	CN6 ribbon cable (white)	Relay Board	Printhead Board
Service Req. 0001000A	—		CN4	Printhead Board	Home Position Sensor
Service Req. 0001000C	—		CN17	Relay Board	Platen Gap Origin Sensor
Service Req. 0001000C	—		CN18 (light blue cable)	Relay Board	Platen Gap Motor
Service Req. 0001000C	—		CN24	Main Board	Relay Board CN4
Service Req. 0001000F	—	Carriage doesn't move out of home position	CN9	Relay Board	CR Lock Solenoid

CHAPTER

4

DISASSEMBLY & ASSEMBLY

4.1 Overview

This section provides disassembly and assembly instructions for the EPSON Stylus Pro 9000. Except as otherwise noted, you can reassemble the printer by reversing the order in which you took it apart.

4.1.1 Precautions

In addition to reading the precautions that appear throughout this chapter, read and keep in mind the following:

- **To prevent electric shock or damage to the printer, always turn off the power switch and unplug the power cable before servicing the printer.**
- **If you have to remove the printer housing while the printer is on to view internal operations, be very careful around moving parts such as the fans, gears, carriage, and carriage drive belt.**
- **Keep in mind that the steel carriage drive belt and cutter blade have sharp edges and can be dangerous.**
- **The printer is very heavy (about 200 lbs). If you need to separate the printer from its stand or lift the printer, four people are needed.**
- **For safety reasons, the front cover's position, up or down, is detected by the cover-open sensors, located under the left and right side covers of the printer. Do not block or modify these sensors.**
- **If ink gets on your hands, wash them thoroughly with soap and water. If ink gets in your eyes, rinse them immediately with water.**
- **Because the main board includes a lithium battery for memory backup purposes, keep the following in mind:**
  —Avoid shorting the battery, which can make it very hot or cause it to explode.
  —When replacing the battery, make sure the positive and negative sides are correctly installed.

- **Because ink may leak from the printer when servicing ink-related parts, remove the paper hammock and put a sheet or cloth under the printer when performing such repairs.**
- **Static electricity can damage sensitive printer components, especially on the main board. Use an anti-static wrist band or similar grounding device to prevent static electricity buildup.**
- **The cutter blade is very hard and can damage or scratch printer parts. Also, it can be easily chipped or damaged. Be careful when handling or replacing the cutter.**

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	Regular, every-day tools are OK, no special tools needed	No. 1 and no. 2 sizes needed
(-) Standard screwdriver		—
Needle-nosed pliers		—
Tweezers		—
Hex (Allen) wrench		• 1.5 mm (CR motor) • 2.5 mm (PF motor and CR belt) • 4.0 and 5.0 mm for setting up printer only

4.1.3 Screw List

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

Table 4-2. Screws

Type	Color	Description
CP(W2)M3x6	black	(+) Crosshead Pan, spring washer, flat washer
CP(W2)M4x12	silver	(+) Crosshead Pan, spring washer, flat washer
CP(W2)M4x6	silver	(+) Crosshead Pan, spring washer, flat washer
CP(W2)M4x12	black	(+) Crosshead Pan, spring washer, flat washer
CP(W2)M3x8	silver	(+) Crosshead Pan, spring washer, flat washer
CP(W2)M3x6	silver	(+) Crosshead Pan, spring washer, flat washer
CP(W2)M4x5	silver	(+) Crosshead Pan, spring washer, flat washer
CBF3x6	silver	(+) Bind screw, flange
CPM2x4	silver	(+) Crosshead Pan
CBM3x6	silver	(+) Bind screw
Hex screw	silver	Six-sided hex screw, 1.5 and 2.5 mm

4.1.4 Order of Disassembly

For efficient disassembly and assembly, refer to the following flowchart.

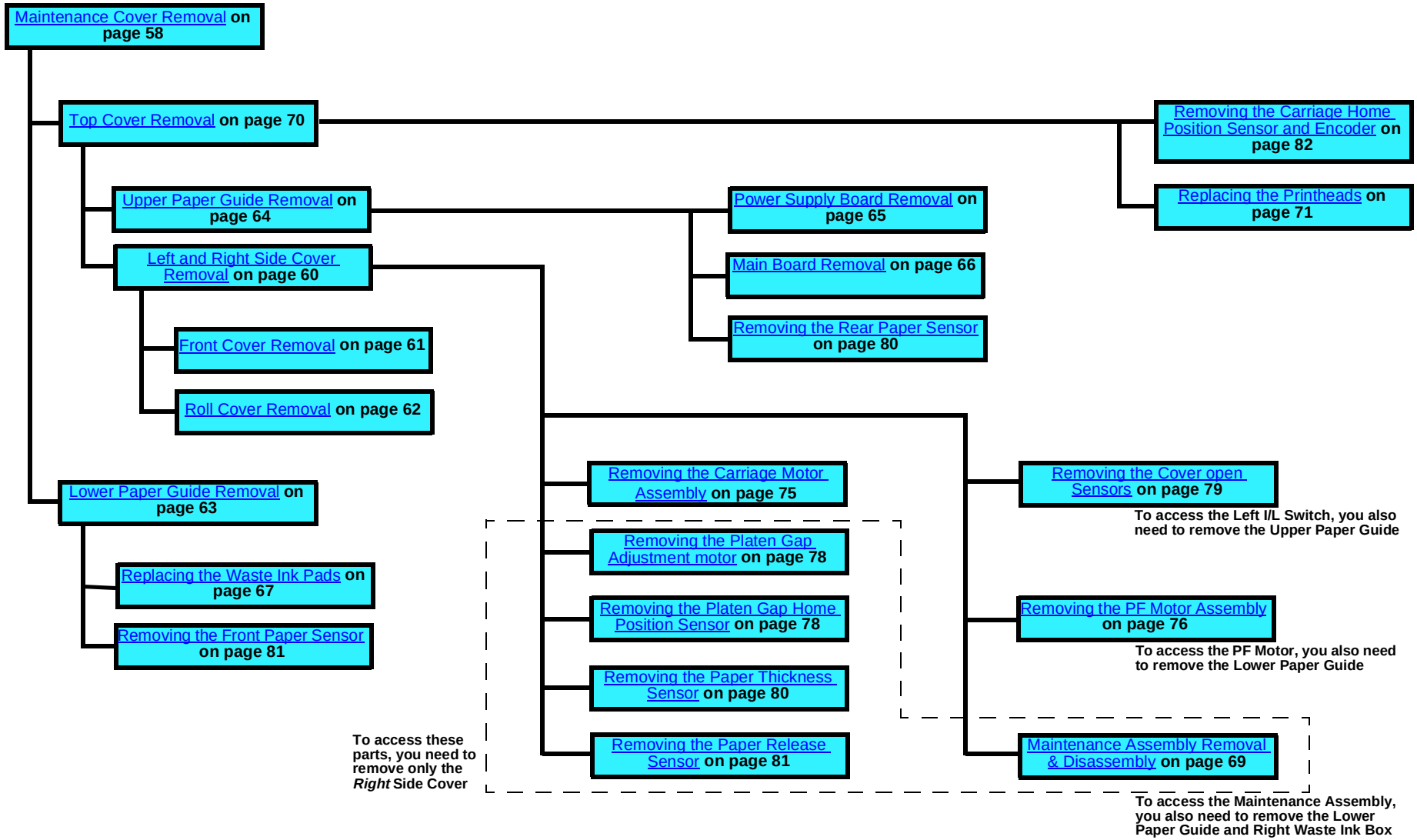


Figure 4-1. Disassembly Process Flowchart

4.1.5 Housing Parts

Refer to the figure below to locate the housing parts described throughout this chapter.

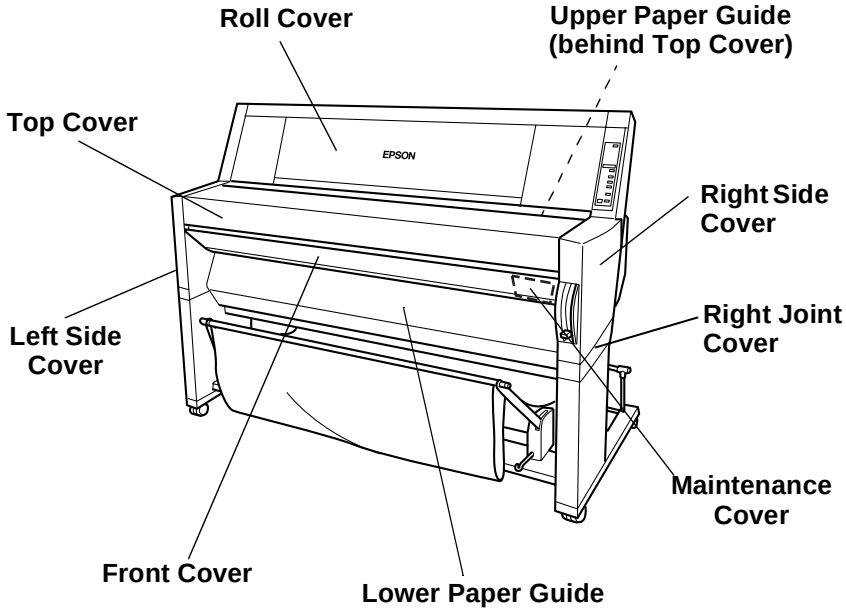


Figure 4-2. Housing Parts

4.2 Housing Removal

Follow the steps below to remove the printer's housing.

MAINTENANCE COVER REMOVAL

1. Open the Front Cover.
2. Remove 2 screws, CP(W2) M3x6, and then remove the Maintenance Cover.

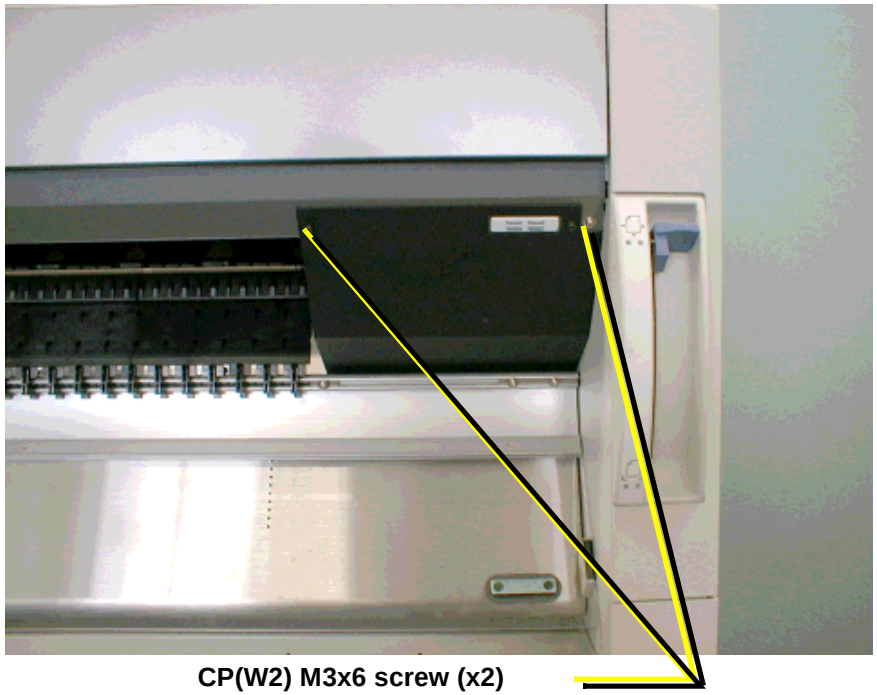


Figure 4-3. Maintenance Cover Removal

TOP COVER REMOVAL

Preparation: Remove the Maintenance Cover. See Maintenance Cover Removal on page 58.

1. Remove the four screws, CP(W2) M4x12, that secure the left-side lower mounting bracket (spindle holder) and remove the bracket. Repeat for the right-side lower mounting bracket.

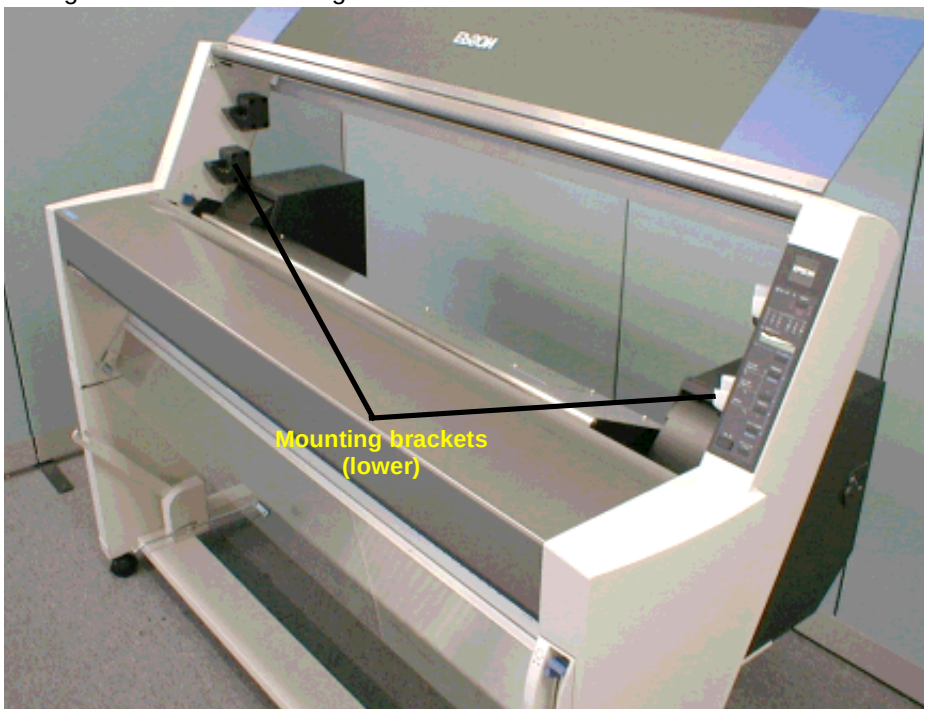


Figure 4-4. Lower Mounting Bracket Removal

2. Remove the four screws securing the Top Cover to the printer.

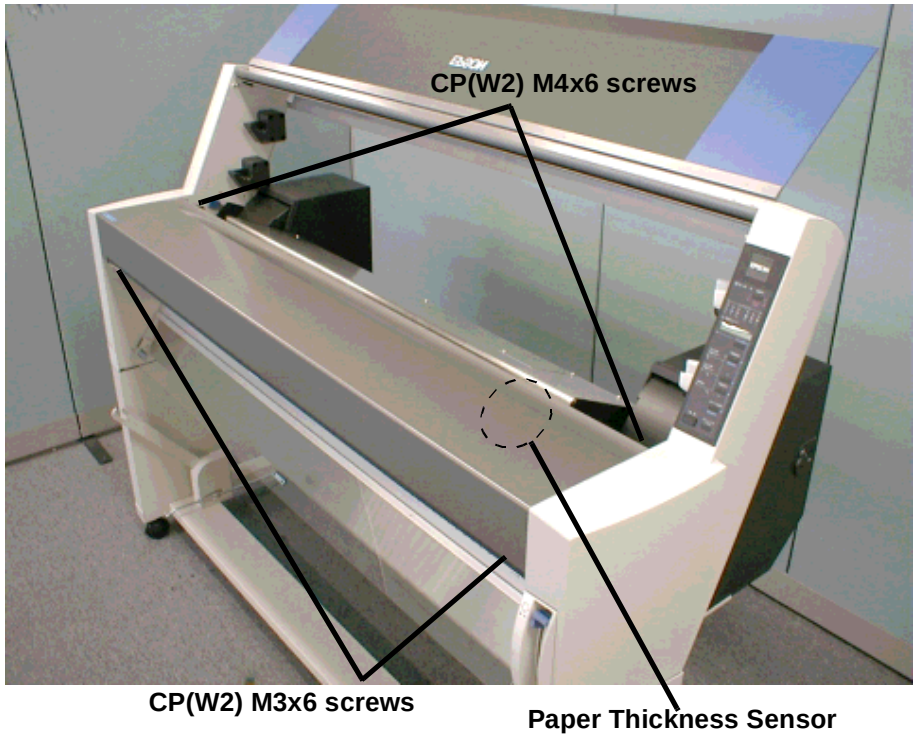


Figure 4-5. Top Cover Removal

3. Lower the Paper Release Lever.
4. Slide the Top Cover slightly forward to free it from its mounting brackets in back. Then lift the Top Cover from the rear, tilting it forward, and lift it away from the printer.

CAUTION

When removing the Top Cover, avoiding catching its rear edge on the Paper Thickness sensor, which may knock it out of adjustment. The sensor's approximate location is shown in the figure above. You can also flex the back side of the Top Cover slightly outward, toward the rear of the printer, while removing the cover.

LEFT AND RIGHT SIDE COVER REMOVAL

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.

1. Remove the left and right Joint Covers, as shown in Figure 4-7.
2. Remove the seven screws (five silver CP(W2) M4x12 and two black CP(W2) M4x12) securing the Left Side Cover, and remove the Left Side Cover. Repeat for the Right Side Cover.

NOTE: *The control panel is attached to the Right Side Cover. When removing the Right Side Cover, detach the flat cable from the control panel.*

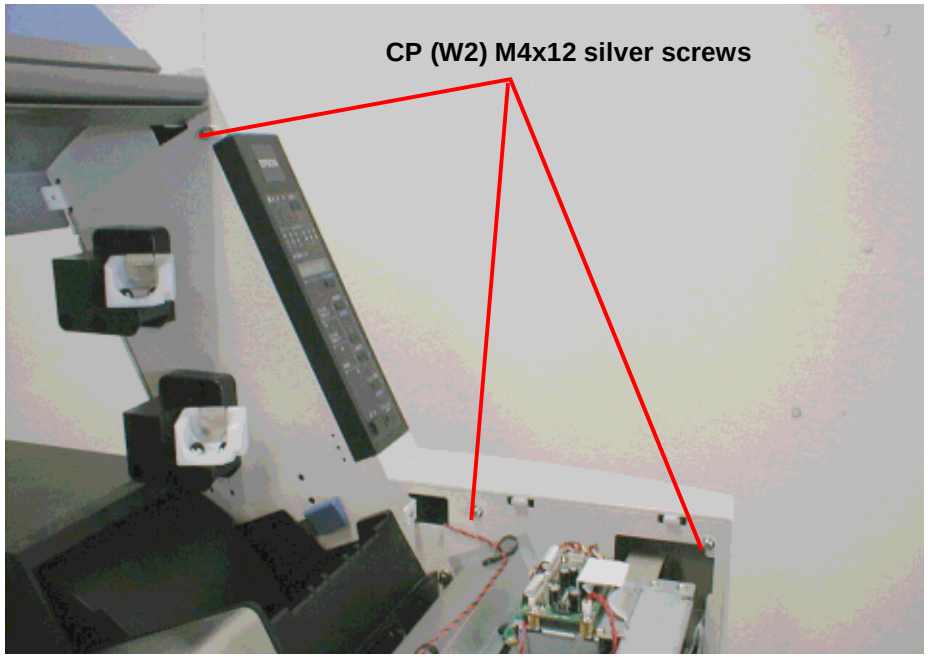


Figure 4-6. L/R Side Cover Inner Screw Location

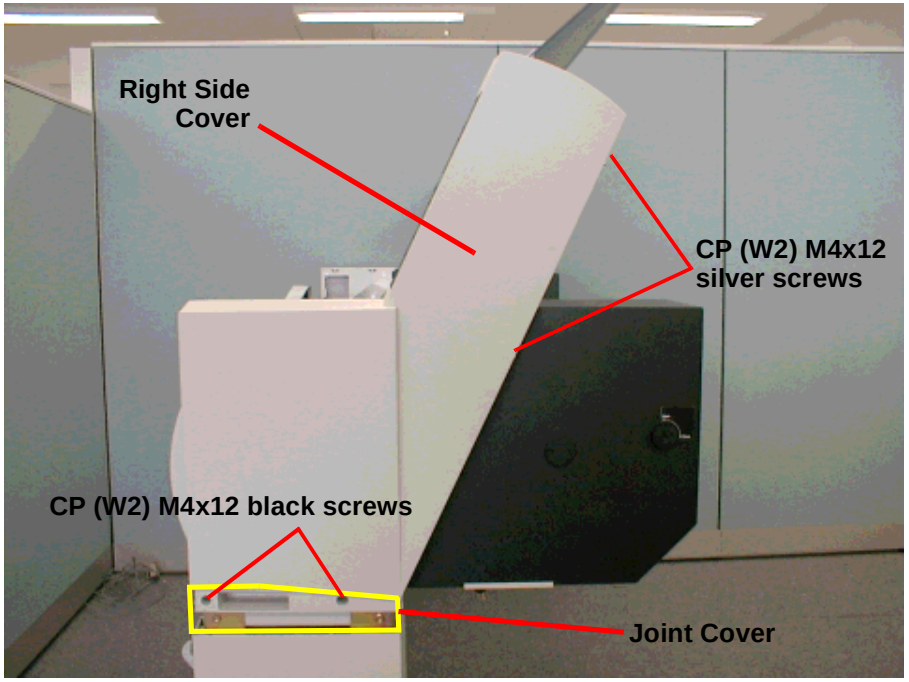


Figure 4-7. L/R Side Cover Outer Screw Location

FRONT COVER REMOVAL

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.
- ❑ Remove the Left and Right Side Covers as described in Left and Right Side Cover Removal on page 60.

1. Remove the two screws (CP(W2) M3x8) securing the damper assembly on the left side of the printer, and then remove the damper assembly.

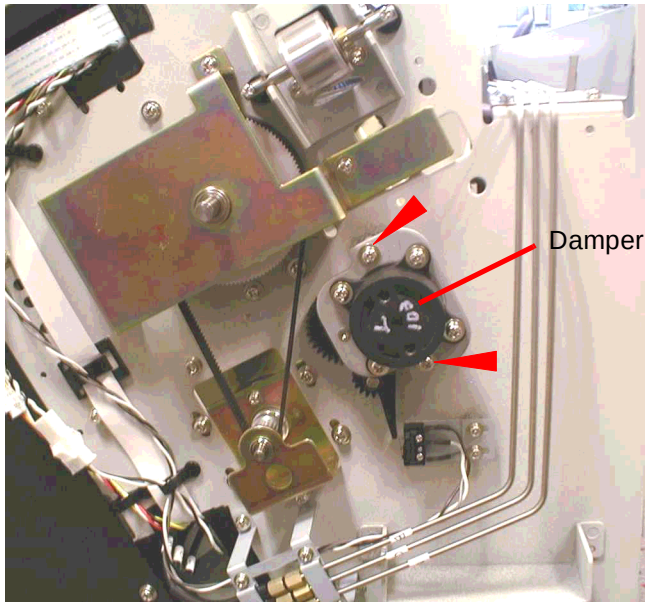
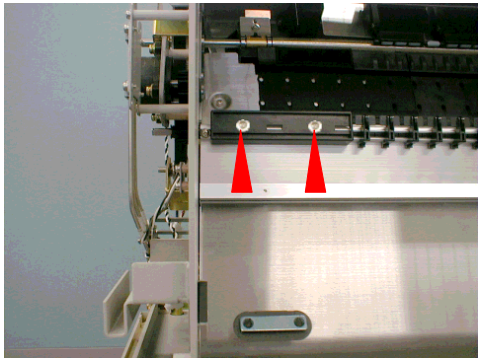


Figure 4-8. Removing the Damper Assembly

2. The Front Cover Assembly hinges on a mounting pin at each end. Remove the four screws securing the mounting pins as shown below.

Left side



CP(W2) M3x8 screws

Right side

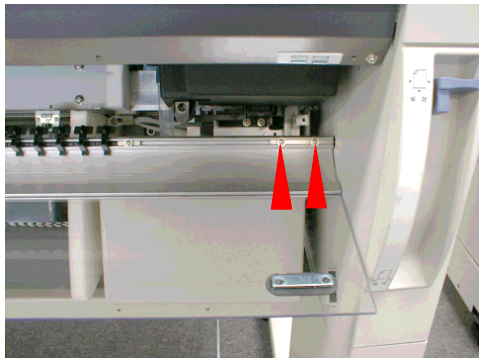


Figure 4-9. Locations of Front Cover Shaft Screws

CAUTION

When removing the Front Cover, avoid tilting it down to the left. The little wheels mounted on the cover's shaft are not secured and may slide off.

3. While supporting the Front Cover, pull out the mounting pins, and then remove the Front Cover from the printer.

ROLL COVER REMOVAL

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.
- ❑ Remove the Left and Right Side Covers as described in Left and Right Side Cover Removal on page 60.

1. Remove the two screws securing each damper assembly, and then remove the damper assemblies.
2. Remove the four screws (CP(W2) M3x8), two on each end, that secure the mounting pins to the Roll Cover shaft.
3. While supporting the Roll Cover, pull out the mounting pins, and then remove the Roll Cover from the printer.

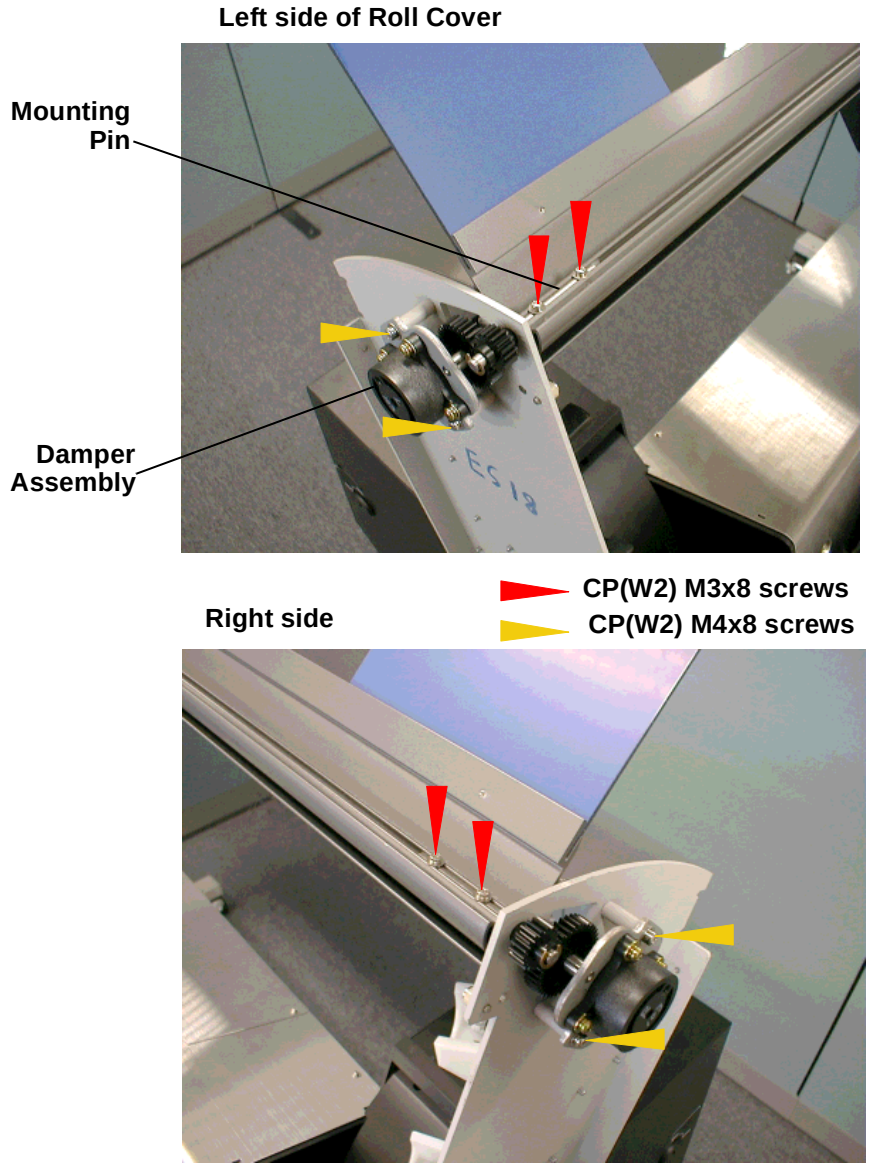


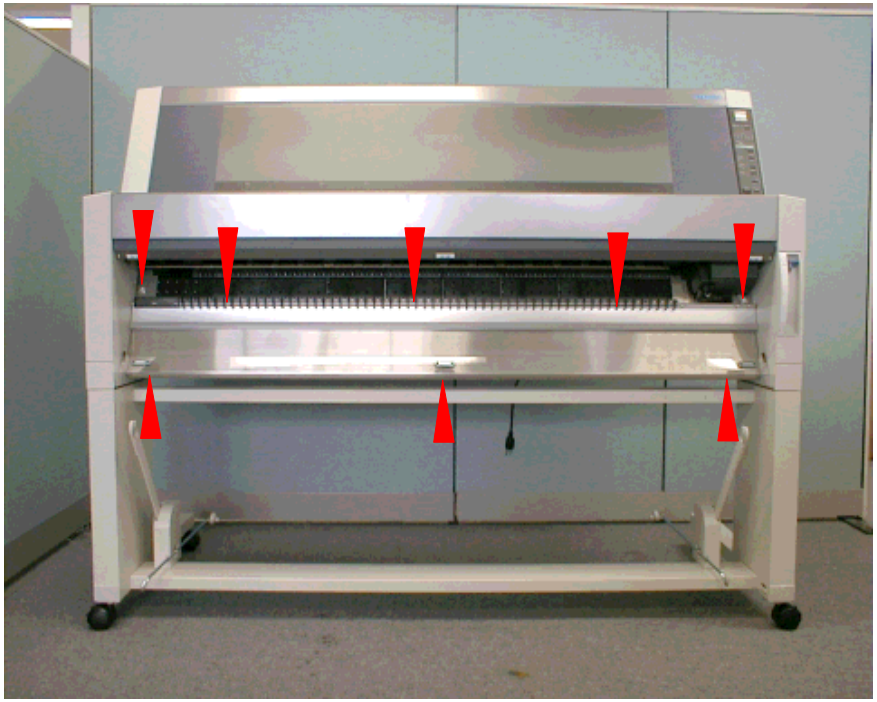
Figure 4-10. Roll Cover Removal

LOWER PAPER GUIDE REMOVAL

After reinstalling the Lower Paper Guide, you must perform the Cutter Position Adjustment.

Preparation: Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.

1. Remove the eight screws (CP(W2) M3x6) securing the Lower Paper Guide.



CP(W2) M3x6

Figure 4-11. Lower Paper Guide Screws

2. While supporting the Front Cover with your hands, lower the Lower Paper Guide as shown below. You may find it helpful to move the Front Cover up and down while removing the Lower Paper Guide.

When installing the Lower Paper Guide, push it all the way up before tightening the screws; this is most likely the correct position for the Guide in relation to the cutter blade. However, you should also verify its position by performing the Cutter Position Adjustment as described in Chapter 5.

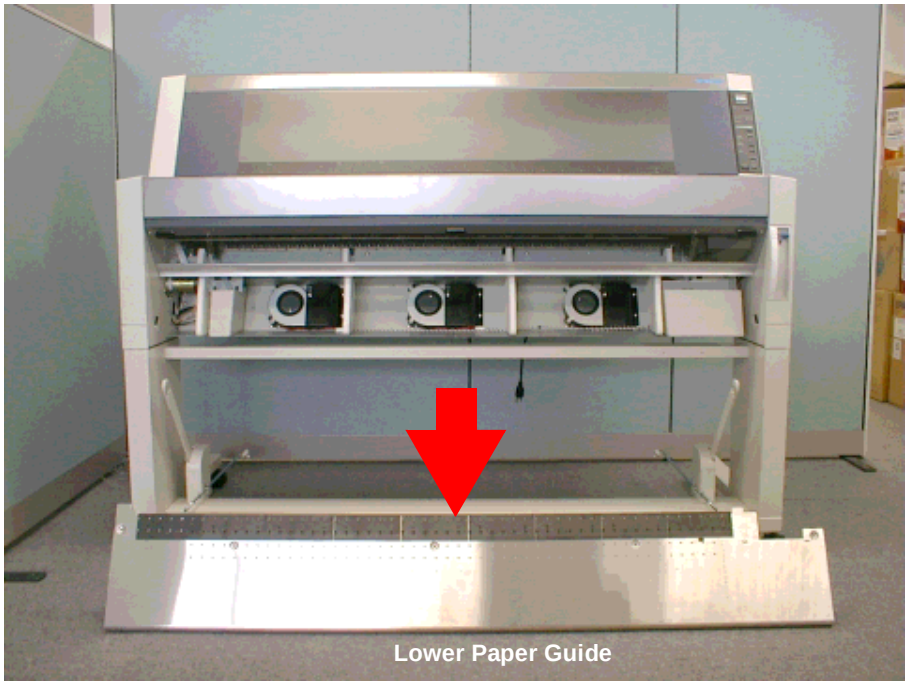


Figure 4-12. Lower Paper Guide Removal

UPPER PAPER GUIDE REMOVAL

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.

1. Open the Roll Cover.
2. Remove the seven screws (CP(W2) M3x6) that secure the Upper Paper Guide to the printer frame, and then remove the Upper Paper Guide.

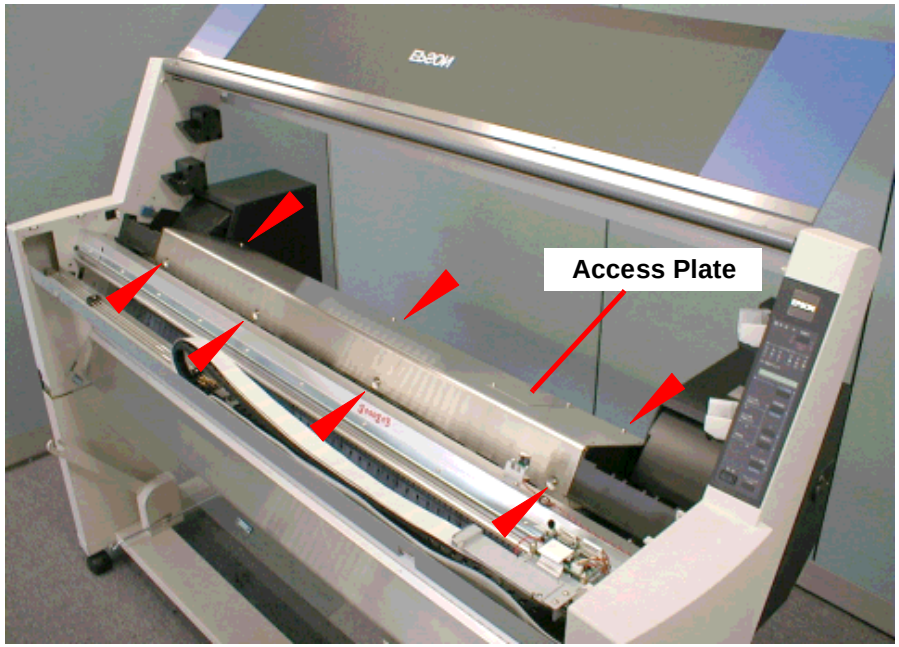


Figure 4-13. Upper Paper Guide Removal

NOTE: *When removing or re-installing the Upper Paper Guide, be sure the Paper Release lever is set to the lower position as shown; otherwise the paper pressure rollers will get in the way.*

Figure 4-14. Paper Release Lever

4.3 Circuit Board Removal

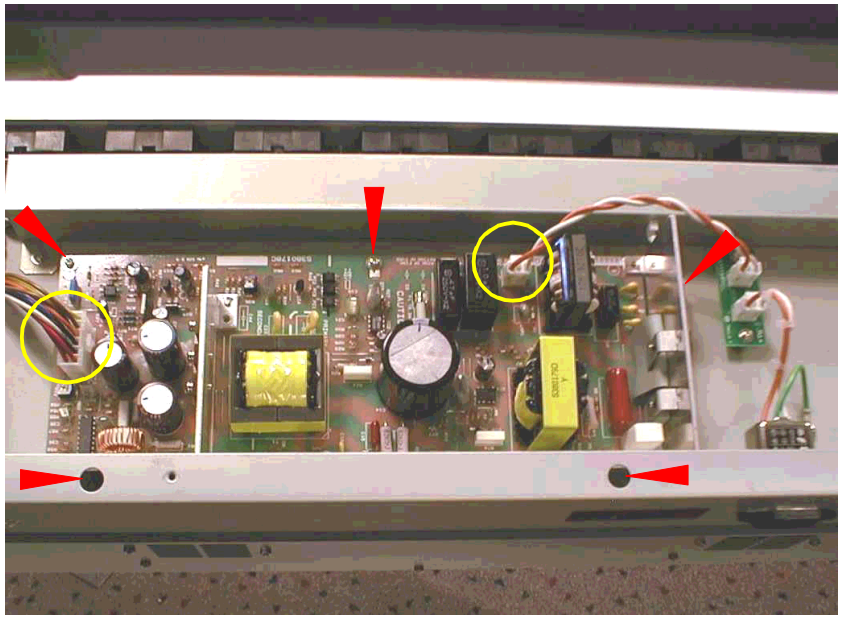
Follow the steps below to remove the power supply board (C277PSU) and the main board (C277MAIN).

POWER SUPPLY BOARD REMOVAL

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.
- ❑ Remove the Upper Paper Guide as described in Upper Paper Guide Removal on page 64.

1. Remove the two cables connected to the Power Supply Board as shown.
2. Remove the five screws that secure the Power Supply Board, and then remove the board.



CBF M3x6 screw

Figure 4-15. Power Supply Board Removal (viewed from in back of printer)

MAIN BOARD REMOVAL

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.
- ❑ Remove the Upper Paper Guide as described in Upper Paper Guide Removal on page 64.

1. Disconnect all cables from the C277MAIN Board. During reassembly, it may help to note that CN10 is the connector for the power supply fan.
2. Remove the two screws securing the Type-B Interface Cover, and remove the cover.
3. Remove the twelve screws securing the Main Board:
   — from overhead: nine CBF M3x6 screws
   — from the back: three CP M2x4 screws

   Then remove the Main Board.

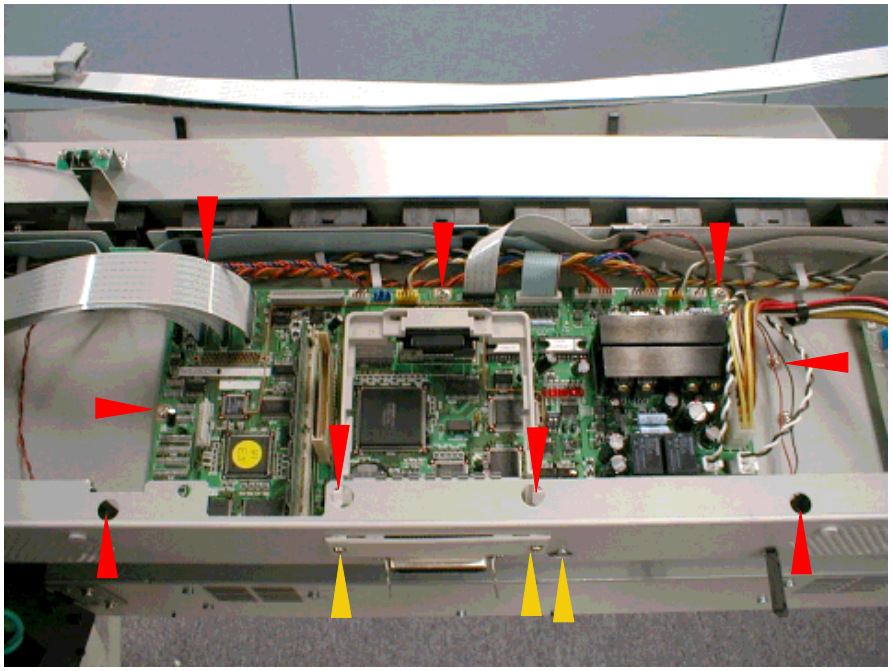


Figure 4-16. C277MAIN Board Removal (viewed from behind the printer)

4.4 Maintenance Procedures

To keep the printhead clean and maintain print quality, the printer periodically flushes ink through the printhead, and the flushed ink drains into one of two Waste Ink Boxes. Once a predetermined amount of ink has drained into the Waste Ink Boxes, the printer displays the service call error—"00000100."

When the service call error occurs, you need to replace the following parts:

- ❑ the Waste Ink Pads in the left and right Waste Ink Boxes
- ❑ the Flushing Boxes (right and left)
- ❑ the Pump Assembly
- ❑ the Capping Assembly
- ❑ the Head Cleaner Blade

In addition to replacing these parts, you also need to do the following:

- ❑ perform the Cutter Position Adjustment after reinstalling the Lower Paper Guide, as described in Cutter Position Adjustment on page 131
- ❑ reset the waste ink counter ("Init. Waste Ink") as described in Maintenance Mode 2 on page 17
- ❑ reset the cleaning unit counter ("Init. Cleaning Unit") as described in Maintenance Mode 2 on page 17

Refer to the steps below to replace the Waste Ink Pads and other parts that are mounted on the Maintenance Assembly.

REPLACING THE WASTE INK PADS

Refer to the figure below to locate the left and right Waste Ink Boxes:

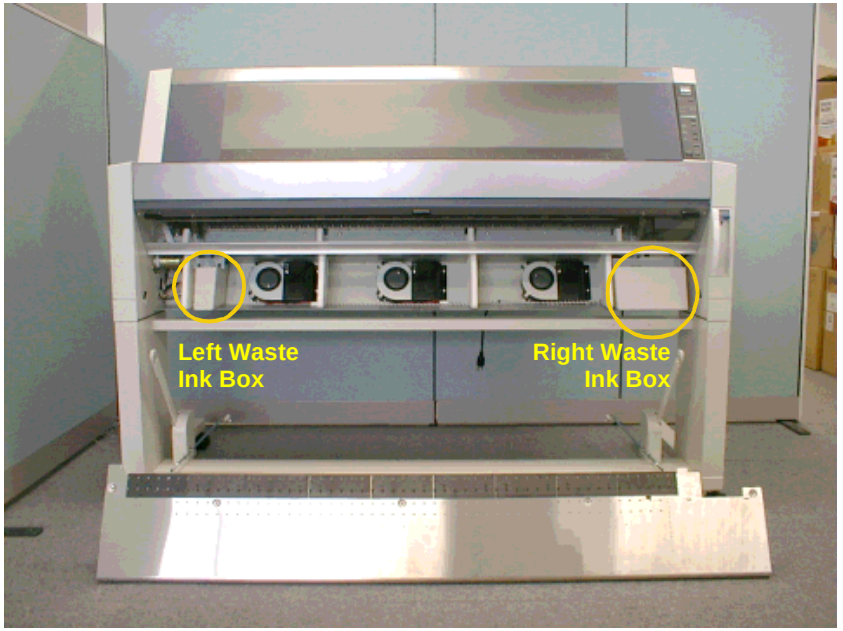


Figure 4-17. Waste Ink Box Locations

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Lower Paper Guide as described in Lower Paper Guide Removal on page 63.

1. Remove the screws that secure the Waste Ink Boxes to the printer (see the figures below), and then remove the Waste Ink Boxes.

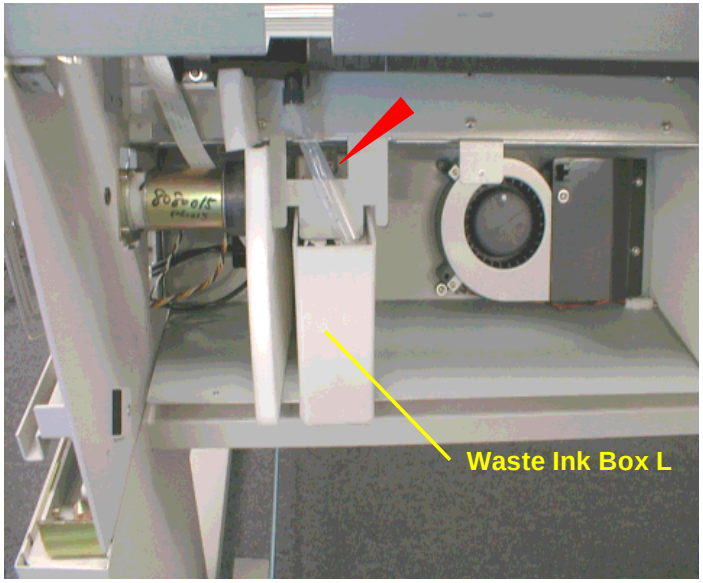


Figure 4-18. Left Waste Ink Box

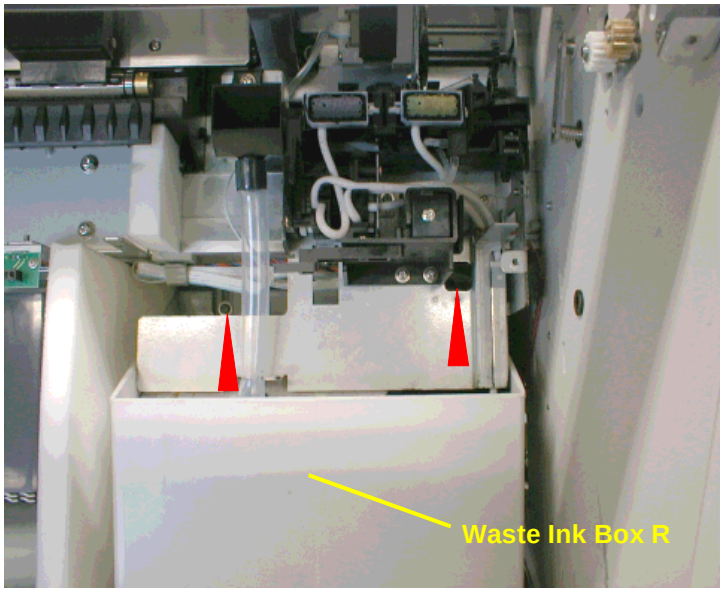


Figure 4-19. Right Waste Ink Box

2. Remove the Waste Ink Pads from the left and right Waste Ink Boxes.

CAUTION

Prepare a vinyl bag beforehand for disposing of the pads.

ADJUSTMENT REQUIRED

After replacing the Waste Ink Pads, perform the following adjustments:

- **reset the waste ink counter**
- **reset the initial cleaning flag [???right name???]**
- **perform the Cutter Position Adjustment**

MAINTENANCE ASSEMBLY REMOVAL & DISASSEMBLY

When replacing the Waste Ink Pads, you also have to replace other parts (see Maintenance Procedures on page 67). Refer to the steps below to replace the following:

- ❑ Right Flushing Box
- ❑ Pump Mechanism
- ❑ Capping Mechanism
- ❑ Head Cleaning Blade

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.
- ❑ Remove the Right Side Cover as described in Left and Right Side Cover Removal on page 60.
- ❑ Remove the Lower Paper Guide as described in Lower Paper Guide Removal on page 63.
- ❑ Remove the right-side Waste Ink Box as described in Replacing the Waste Ink Pads on page 67.

1. Disconnect CN9 and CN19 from the relay board on the right side of the printer. See Figure 4-21.
2. Remove two screws (CP(W2) M4x6) securing the Maintenance Assembly to the printer as shown below. Access the screws from underneath the Maintenance Assembly. (The screw on the right is hidden, so you may have to get down very low to see it.)

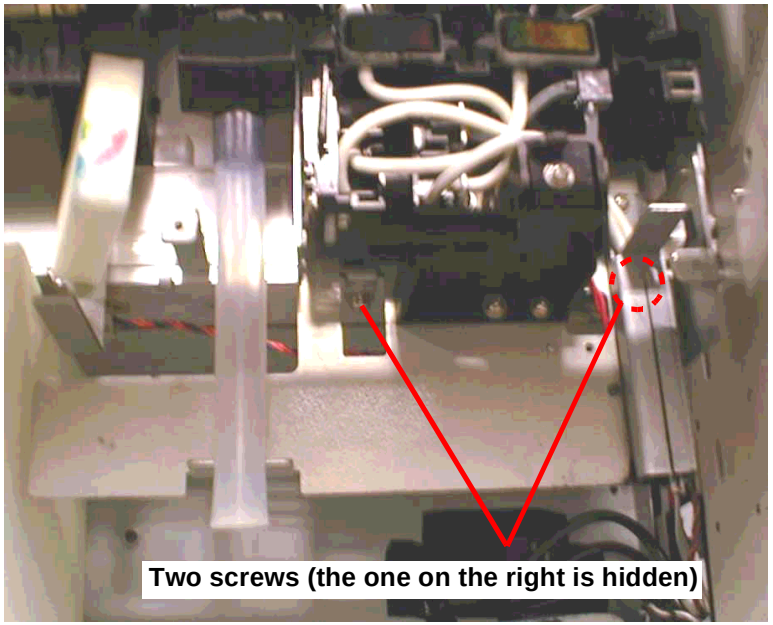


Figure 4-20. Maintenance Assembly Removal - 1

3. From the right side of the printer, remove the one remaining screw (CP(W2) M3x6) securing the Maintenance Assembly to the printer, and then remove the Maintenance Assembly.

CAUTION

When removing the Maintenance Assembly, the tubes that drain ink into the Waste Ink Pads may leak or drip ink. It's a good idea to wipe off the ends of these tubes before removing the Maintenance Assembly.

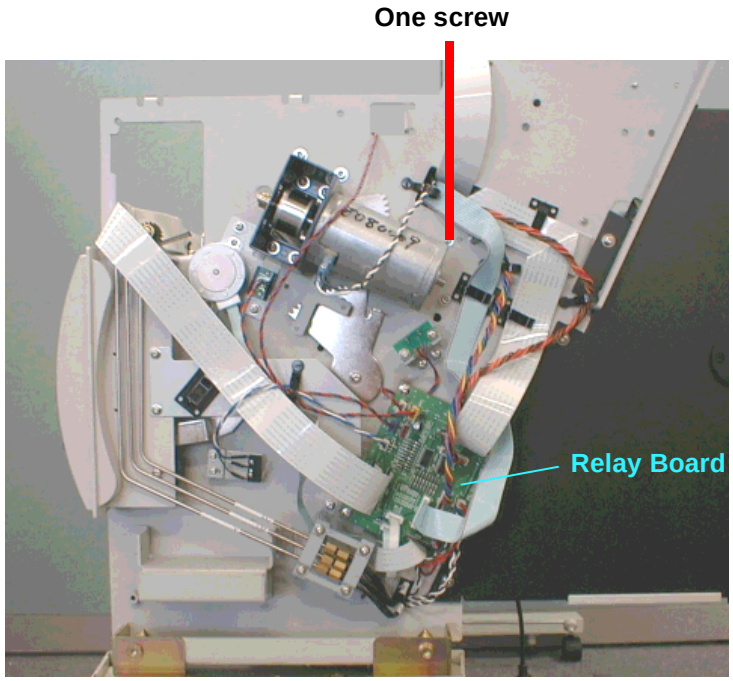


Figure 4-21. Maintenance Assembly Removal - 2

4. Remove the two screws (CP(W2) M3x6) securing the Carriage Lock to the Maintenance Assembly, and then remove the Carriage Lock.

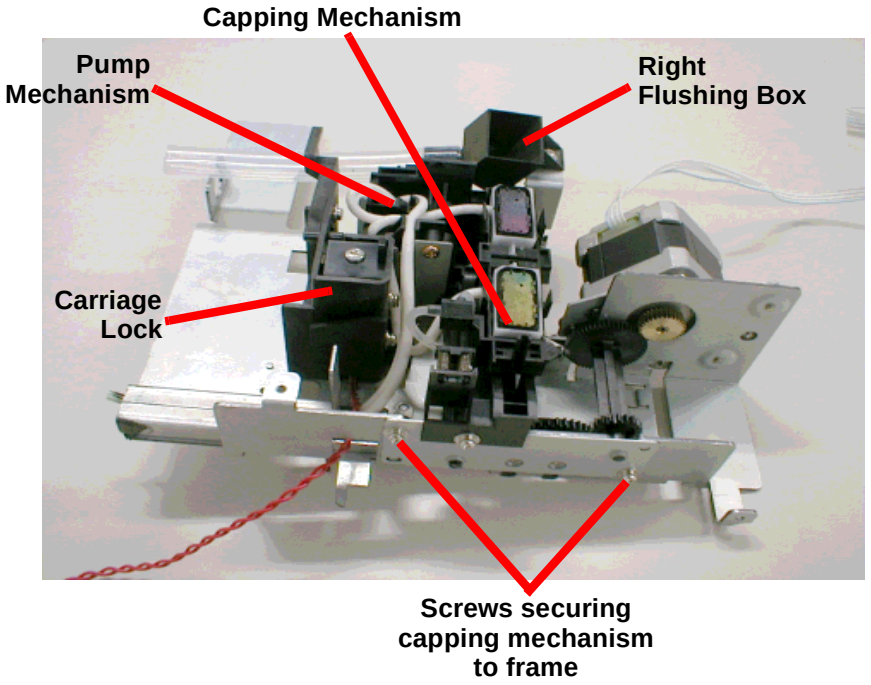


Figure 4-22. Disassembling the Maintenance Assembly - 1

5. Remove the two screws (CP(W2) M3x6) securing the Capping Mechanism to the frame of the Maintenance Assembly. Lift the Capping Mechanism off the frame (it's still attached to the Pump Mechanism by the ink tubing).
6. Remove the Pump Drive Shaft.
7. Remove the screw (CP(W2) M3x6) securing the Pump Mechanism to the frame of the Maintenance Assembly, and then remove the Pump Mechanism along with the Capping Mechanism.
8. Remove the screw securing the Flushing Box to the frame of the Maintenance Assembly, and then remove the Flushing Box.

REASSEMBLY

If you re-install the same Capping Mechanism, be sure to check the following:

- **After re-installing the springs that hold the Capping Mechanism in place, try sliding the mechanism by hand to make sure it operates smoothly.**
- **Make sure the air bleed valve seals properly when the Capping Mechanism pushes all the way against it.**

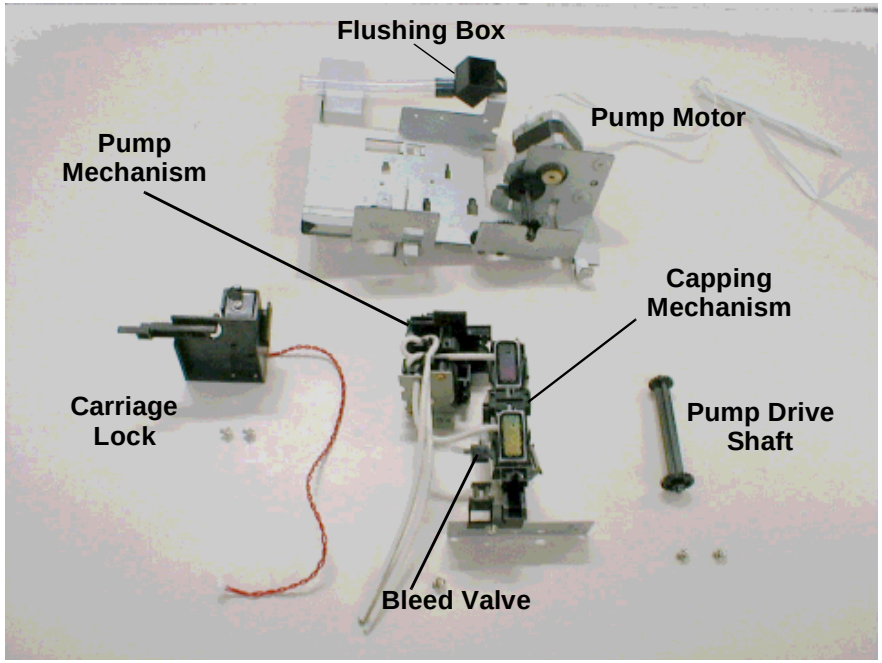


Figure 4-23. Disassembling the Maintenance Assembly - 2

ADJUSTMENT REQUIRED

When replacing the Lower Paper Guide, you need to perform the Cutter Position Adjustment.

4.5 Printer Mechanism Disassembly

Follow the steps below to remove the main components of the printer mechanism.

CAUTION

Do not attempt to disassemble any components other than those described below. Certain repairs can be done only at the factory and can permanently damage the printer if not done correctly.

REPLACING THE PRINTHEADS

CAUTION

The printer uses two printheads, Head B and Head C. Although they are similar, they are not interchangeable. One is for dark ink, the other for light ink. Make sure you install the correct replacement head accordingly:

- **Head B (for dark ink; goes on the left) F055040: "Printhead, IJ192-OAD"**
- **Head C (for light ink; goes on the right) F055050: "Printhead, IJ192- OAE"**

ADJUSTMENT REQUIRED

When replacing the printheads, you have to perform various adjustments. See Required Adjustments on page 103.

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ *Optional:* Remove the Top Cover as described in Top Cover Removal on page 59. Although this is an extra step, it provides more light and room.

1. Turn the ink valve knob located on the sides of the Ink Cartridge Holders to the “Close” position, or depress and then lift up the I/C Holder levers. Both operations perform the same function of shutting off the flow of ink from the ink cartridges.
2. Manually release the Carriage Lock by pulling up on the release lever as shown below, and then move the carriage away from the capping position.

Figure 4-24. Carriage Lock Release

3. Remove two screws (CB M3x6) as shown below, and remove the carriage cover.

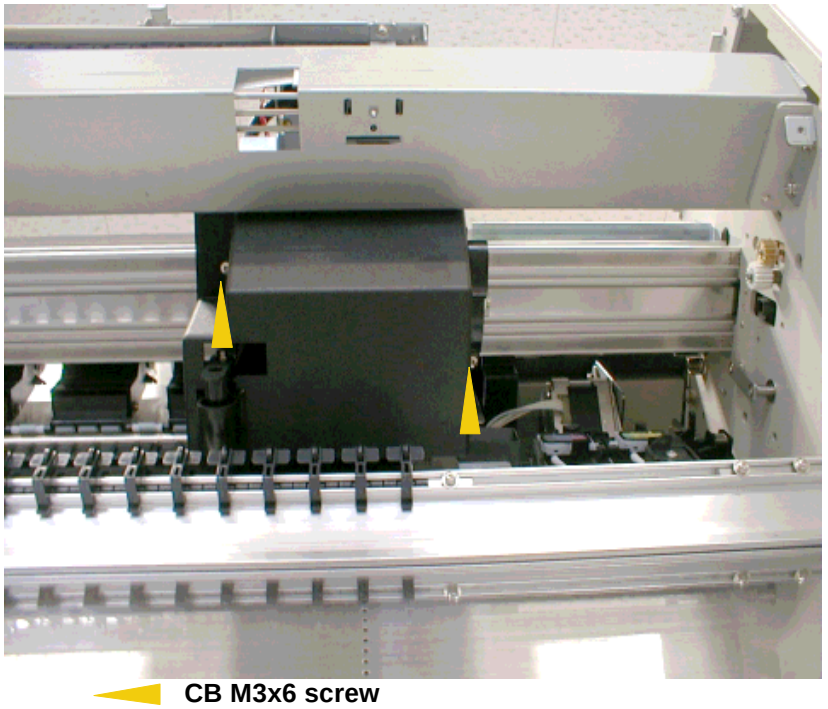


Figure 4-25. Carriage Cover Removal

4. Unhook the ink tubes from the damper holder.

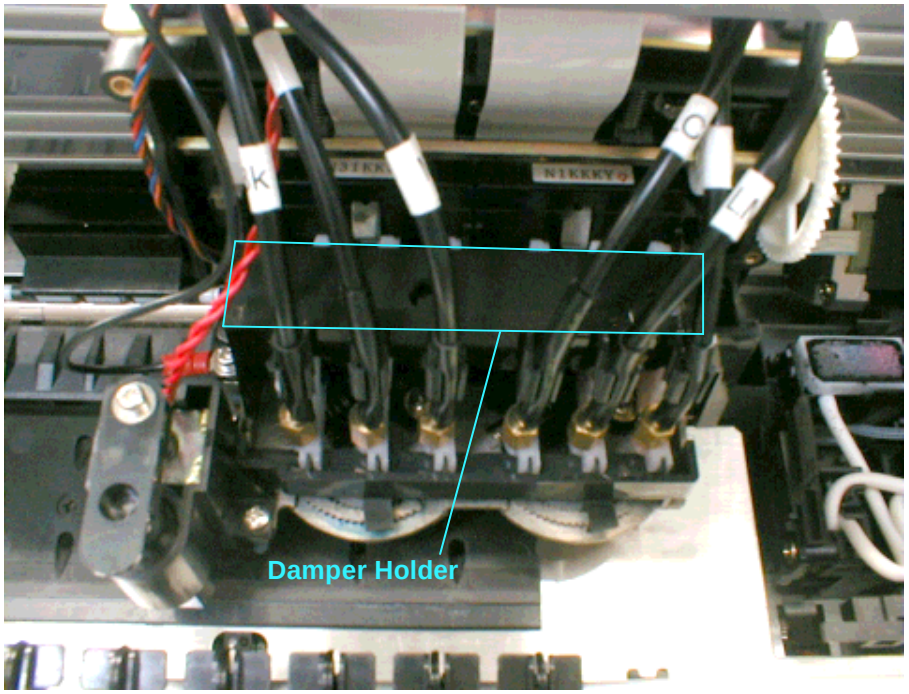


Figure 4-26. Damper Holder Removal

5. Remove the screw (CP(W2) M3x6) securing the damper holder and ground wire. Then remove the Damper Holder by first pulling its left side out toward you (forward), and then sliding the whole unit out toward the right.

REASSEMBLY

The ground wire connector attaches to the carriage between the head of the screw and the plastic Damper Holder.

6. Pull out the dampers. To remove them, place the tip of a flat-head screwdriver under rear-most (or upper-most) portion of each damper as shown, and gently pry it out.

CAUTION

Avoid squeezing the dampers. Handle them only by their edges. If pressure is applied to the middle of the dampers, the ink inside will squirt out.

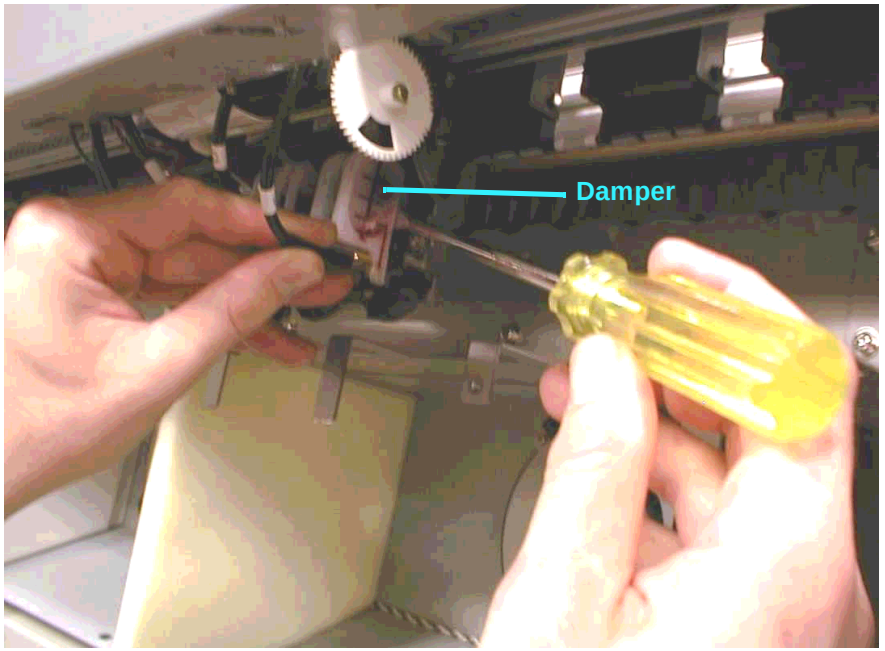


Figure 4-27. Damper Removal

7. Using needle-nosed pliers, remove the Tension Spring.

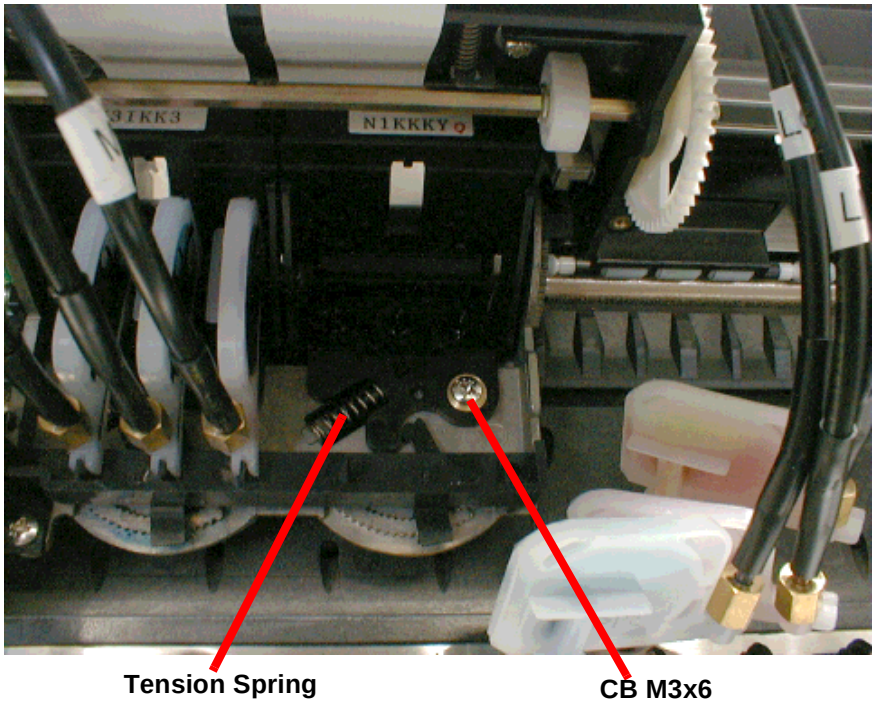


Figure 4-28. Printhead Tension Spring and Screw Removal

8. Remove the CB M3x6 screw, and then remove the printhead from the carriage.
9. Remove the flat cable from the back of the printhead.
10. Repeat steps 10 and 11 for the other printhead if necessary.

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 is 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 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.**

REMOVING THE CARRIAGE MOTOR ASSEMBLY

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.
- ❑ Remove the Left and Right Side Covers as described in Left and Right Side Cover Removal on page 60.

1. Manually release the Carriage Lock and move the carriage away from the capping position, as shown in Figure 4-24.
2. On the Left Side Frame, loosen the two screws shown below to reduce tension on the CR Drive Belt.

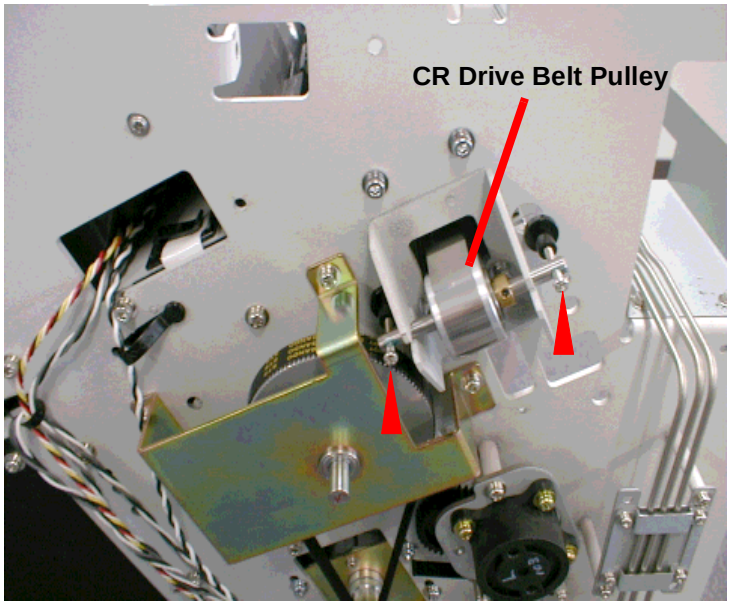


Figure 4-29. Loosening the CR Drive Belt

3. Remove the hex screw that secures the CR Drive Belt to the right side of the carriage assembly.

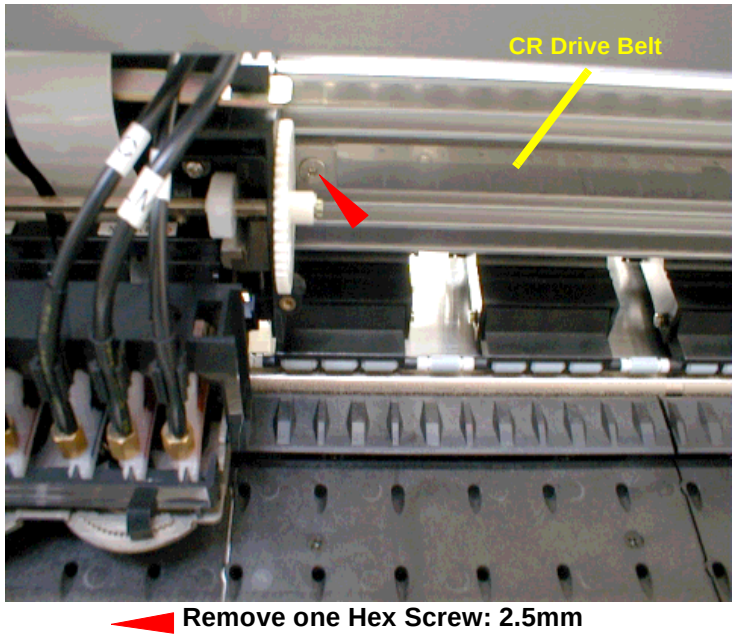
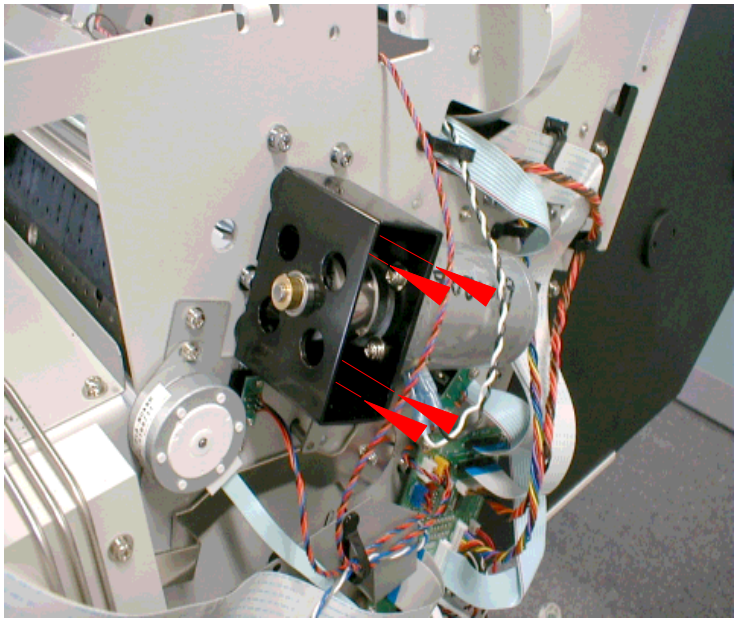


Figure 4-30. Removing the CR Drive Belt

4. Pull the loose end of the Carriage Drive Belt out through the Right Side Frame.

The edges of the CR drive belt may be sharp. Exercise caution when removing the belt.

5. Remove the four screws securing the CR Motor Assembly to the Right Side Frame, and then remove the CR Motor Assembly.



Four CP(W2) M4x8

Figure 4-31. CR Motor Removal

REASSEMBLY

■ **When re-assembling the CR Motor Assembly, move the carriage back and forth by hand, and adjust the screws in Figure 4-29 until the CR Drive Belt is centered on the pulley. (The belt must be within 1 mm of the center of the pulley.)**

■ **The white CR Motor lead connects to the terminal marked "+" and the black lead connects to the terminal marked "-".**

ADJUSTMENT REQUIRED

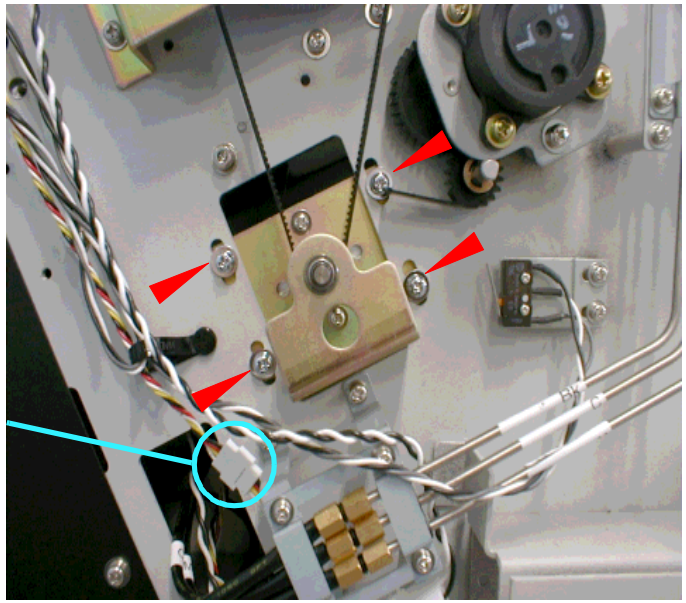
After removing the CR Motor, you must perform the CR Drive Belt Tension Adjustment.

REMOVING THE PF MOTOR ASSEMBLY

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.
- ❑ Remove the Left Side Cover as described in Left and Right Side Cover Removal on page 60.
- ❑ Remove the Lower Paper Guide as described in Lower Paper Guide Removal on page 63.

1. Loosen the four screws (CP(W2) M4x12) on the PF Motor Mounting Bracket as shown below to reduce the tension on the timing belt.

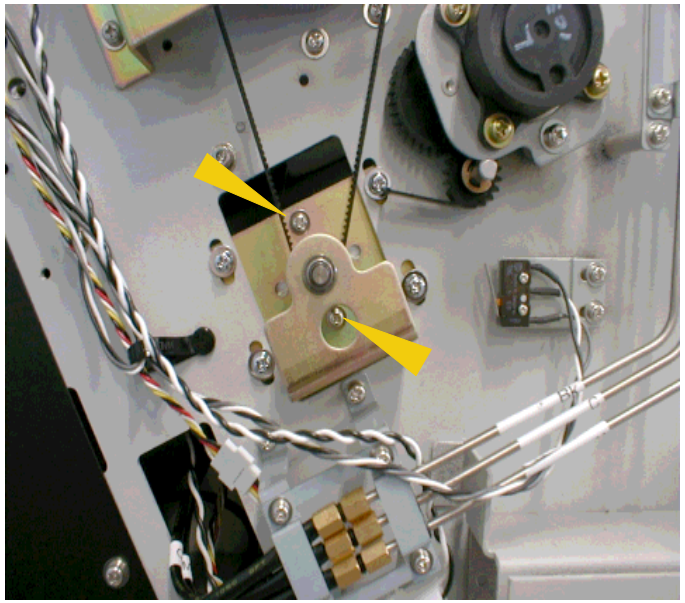


CP(W2) M4x12 screws: only loosen

Figure 4-32. Loosening the Timing Belt

2. Disconnect the PF Motor cable connector as shown in the figure above (black and white wires).

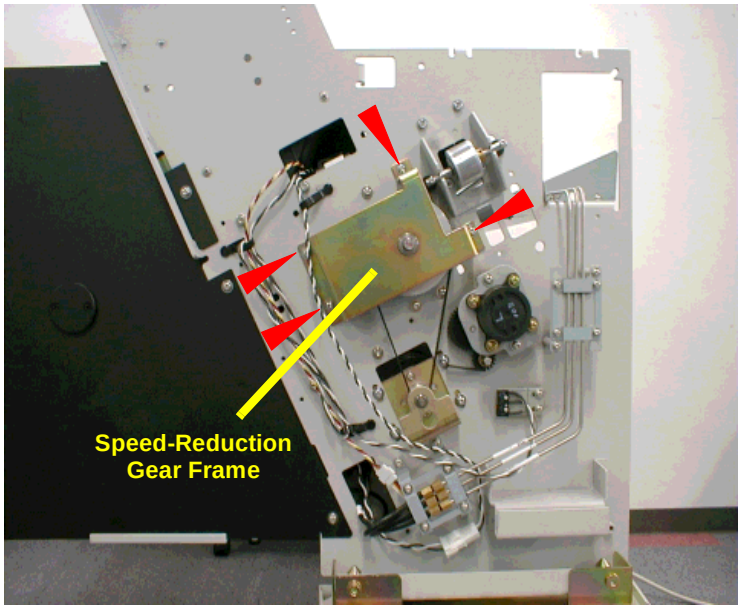
3. Disconnect the PF Motor Encoder cable connector (black, gray, and white wires).
4. Remove the two CP(W2) M3x8 screws securing the PF Motor to the PF Motor Mounting Bracket, and then remove the PF Motor. If necessary, raise up the PF Motor Mounting Bracket to reduce belt tension while removing the motor.



CP(W2) M3x8

Figure 4-33. PF Motor Removal

5. If you need to remove the timing belt, remove the four screws (CP(W2) M4x8) securing the Speed-Reduction Gear Frame, and then remove the frame and the belt.



CP(W2) M4x8

Figure 4-34. Timing Belt Removal

ADJUSTMENT REQUIRED

After reinstalling the Lower Paper Guide, perform the Cutter Position Adjustment.

REMOVING THE PLATEN GAP ADJUSTMENT MOTOR

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.
- ❑ Remove the Right Side Cover as described in Left and Right Side Cover Removal on page 60.

1. Disconnect the cables from CN17 and CN18 on the relay board.
2. Remove the two screws (CP(W2) M3x8) securing the PG Motor to the side frame, and then remove the motor.

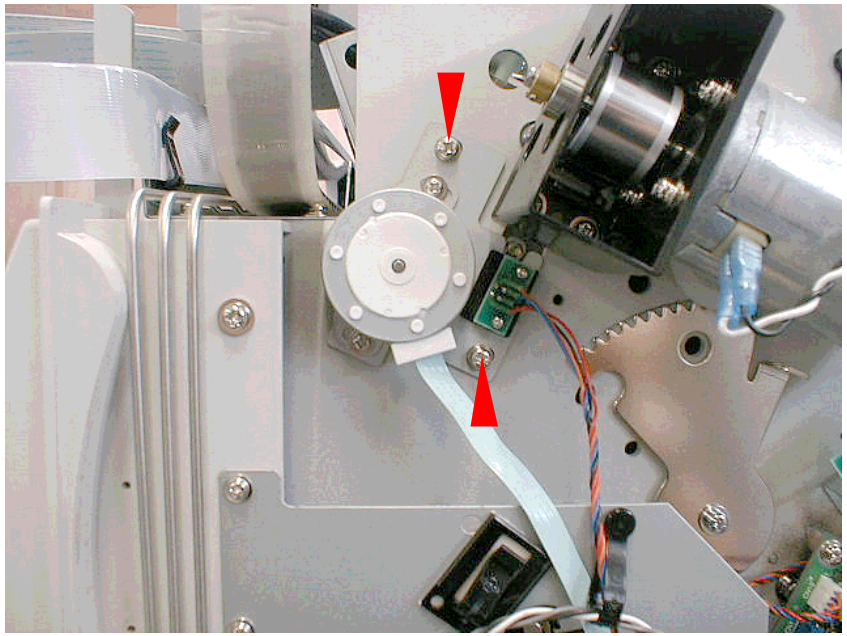


Figure 4-35. PG Motor Removal

ADJUSTMENT REQUIRED

After reinstalling the PG Motor, perform the gear backlash adjustment.

REMOVING THE PLATEN GAP HOME POSITION SENSOR

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.
- ❑ Remove the Right Side Cover as described in Left and Right Side Cover Removal on page 60.

1. Disconnect the cable from CN17 on the relay board on the right side of the printer.
2. Remove the two screws securing the Platen Gap HP Sensor to the PG Adjustment Motor mounting plate, and then remove the sensor.

NOTE: *A No. 1 (small) Phillips screwdriver is needed to remove these screws.*

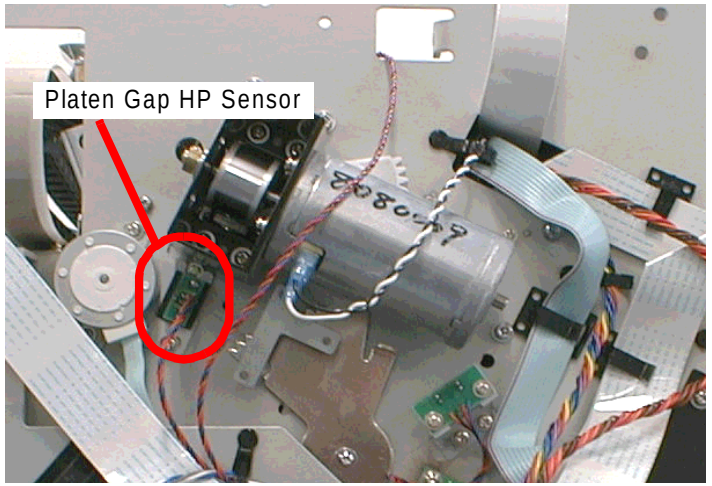


Figure 4-36. Removing the Platen Gap HP Sensor

REMOVING THE COVER OPEN SENSORS

The Cover Open Sensors (interlock switches) are a safety feature to detect the position of the Front Cover (open or closed). There are two switches (right and left). Printing stops when the cover is open.

Preparation (to remove the right interlock switch):

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.
- ❑ Remove the Right Side Cover as described in Left and Right Side Cover Removal on page 60.

To remove the left interlock switch, also do the following:

- ❑ Remove the Left Side Cover as described in Left and Right Side Cover Removal on page 60.
- ❑ Remove the Upper Paper Guide as described in Upper Paper Guide Removal on page 64.

1. To remove the Right Interlock Switch, disconnect the cable from CN13 on the relay board as shown below.

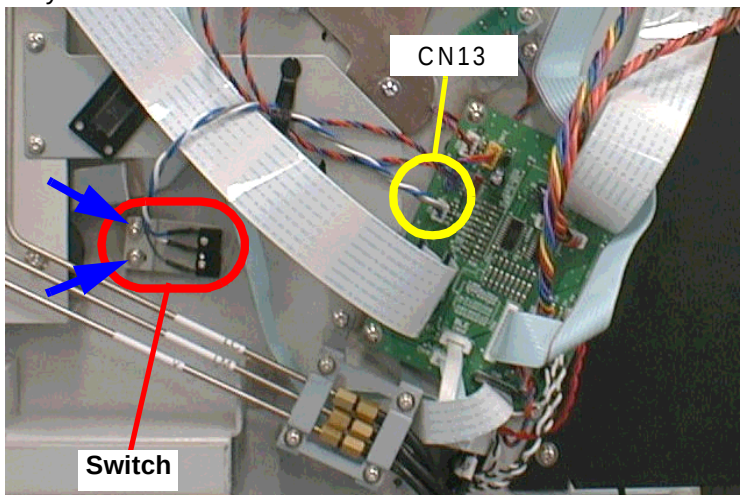


Figure 4-37. Interlock Switch (R) Removal

2. Remove the two screws (CP(W2) M3x6) securing the Interlock Switch mounting plate to the side frame, and remove the Interlock Switch together with the plate.
3. To remove the Left Interlock Switch, disconnect the cable from CN27 on the C277MAIN board.
4. Remove the two screws (CP(W2) M3x6) securing the Interlock Switch mounting plate to the side frame, and remove the Interlock Switch together with the plate.

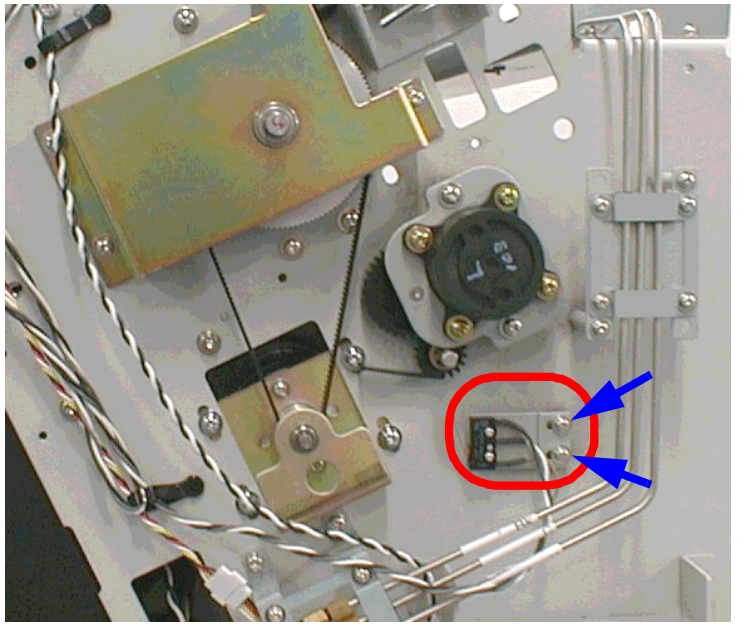


Figure 4-38. Interlock Switch (L) Removal

ADJUSTMENT REQUIRED

Perform the adjustment for the Cover Open Sensor Assembly (Right and left) on page 135.

REMOVING THE PAPER THICKNESS SENSOR

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.
- ❑ Remove the Right Side Cover as described in Left and Right Side Cover Removal on page 60.

1. Disconnect the cable from CN12 on the relay board on the right side of the printer.
2. Remove the two screws (CP(W) M3x6) securing the Paper Thickness Sensor, and remove the sensor.

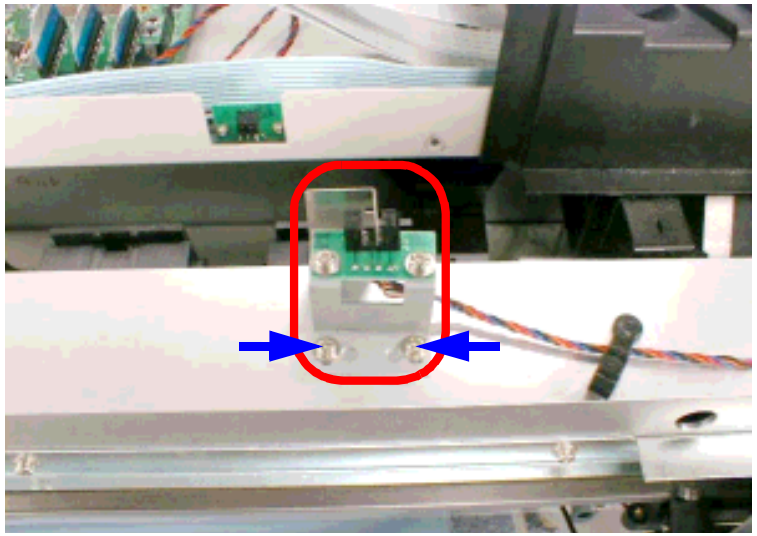


Figure 4-39. Paper Thickness Sensor Removal

ADJUSTMENT REQUIRED

Perform the Paper Thickness Sensor Adjustment on page 134.

REMOVING THE REAR PAPER SENSOR

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.
- ❑ Remove the Upper Paper Guide as described in Upper Paper Guide Removal on page 64.

1. Disconnect the cable from CN11 on the C277MAIN board.
2. Remove the screw (CP(W) M3x6) securing the Rear Paper Sensor, and remove the sensor.

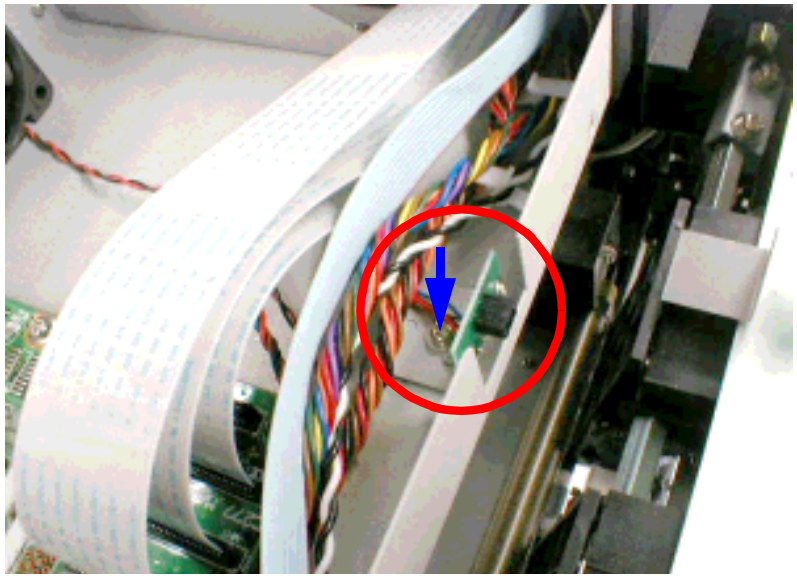


Figure 4-40. Rear Paper Sensor Removal

ADJUSTMENT REQUIRED

Perform the Rear Sensor Position Adjustment on page 126.

REMOVING THE FRONT PAPER SENSOR

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Lower Paper Guide as described in Lower Paper Guide Removal on page 63.

1. Disconnect the cable from CN11 on the relay board.
2. Remove the screw (CP(W) M3x6) securing the Front Paper Sensor, and remove the sensor.

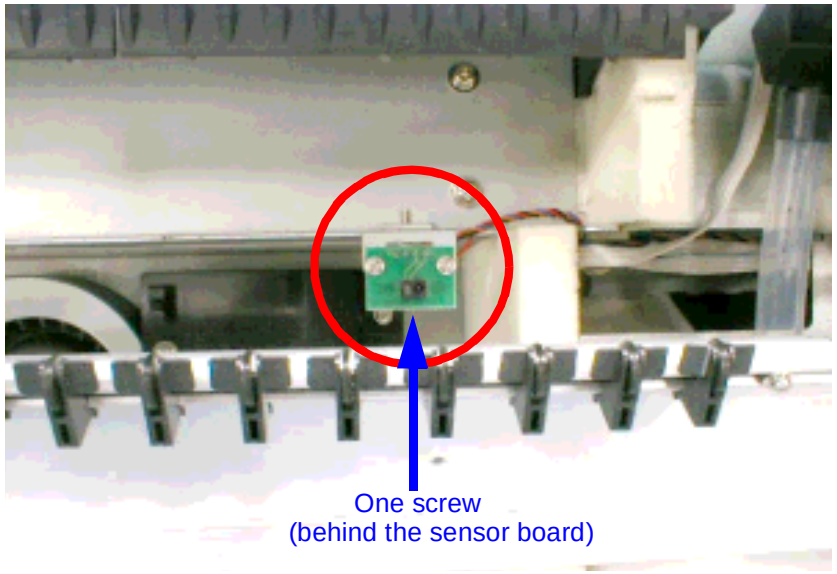


Figure 4-41. Front Paper Sensor Removal

ADJUSTMENT REQUIRED

After reinstalling the Lower Paper Guide, you need to perform the Cutter Position Adjustment on page 131.

REMOVING THE PAPER RELEASE SENSOR

The Paper Release Sensor detects the position of the Paper Release Lever.

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.
- ❑ Remove the Right Side Cover as described in Left and Right Side Cover Removal on page 60.

1. Disconnect the cable from CN10 on the relay board.
2. Remove the two screws (CP(W) M3x6) securing the Paper Release Sensor, and remove the sensor.

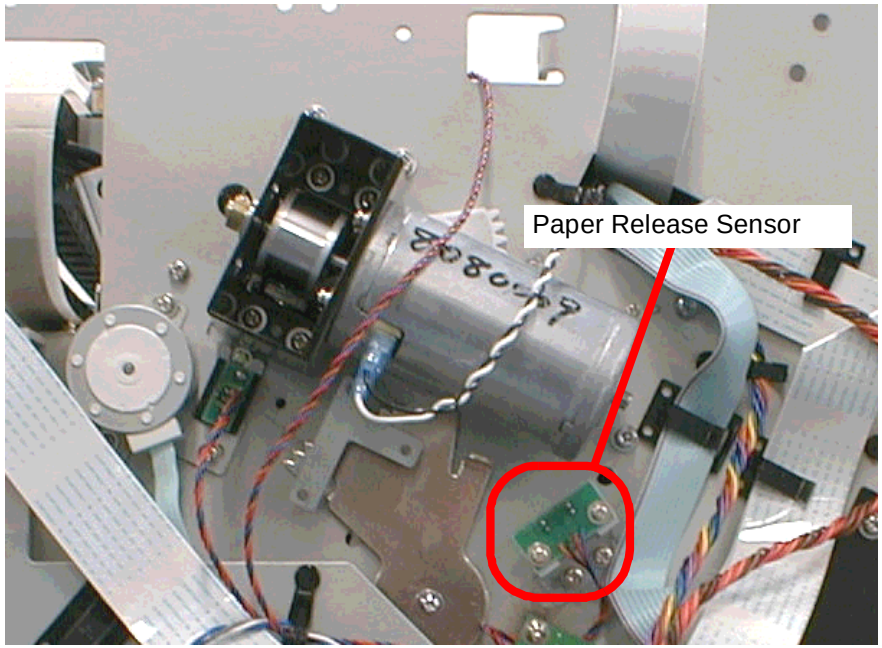


Figure 4-42. Paper Release Sensor Removal

REMOVING THE CARRIAGE HOME POSITION SENSOR AND ENCODER

Preparation:

- ❑ Remove the Maintenance Cover as described in Maintenance Cover Removal on page 58.
- ❑ Remove the Top Cover as described in Top Cover Removal on page 59.

1. Disconnect the cables from CN2 (Encoder) and CN4 (HP Sensor) on the carriage circuit board.

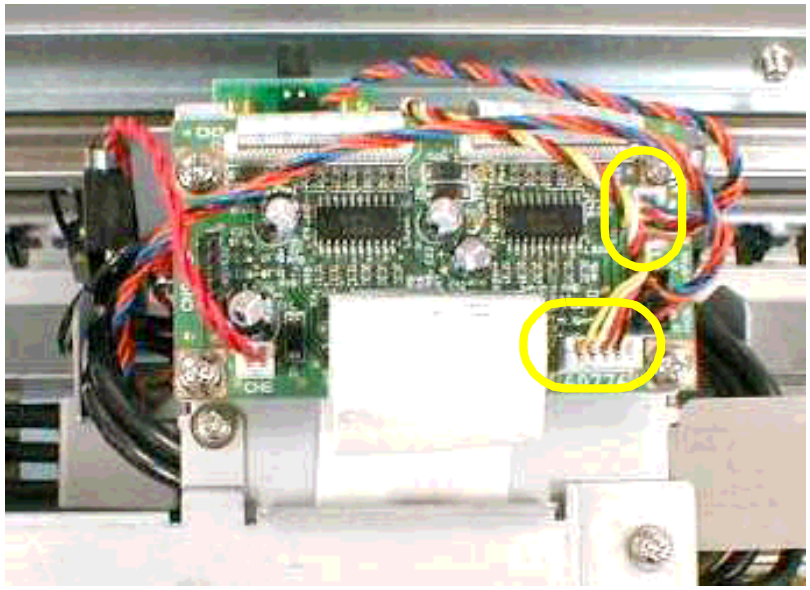


Figure 4-43. Disconnecting the Cables

2. Remove the two screws (CP(W2) M3x6) securing the circuit board mounting frame to the carriage assembly.

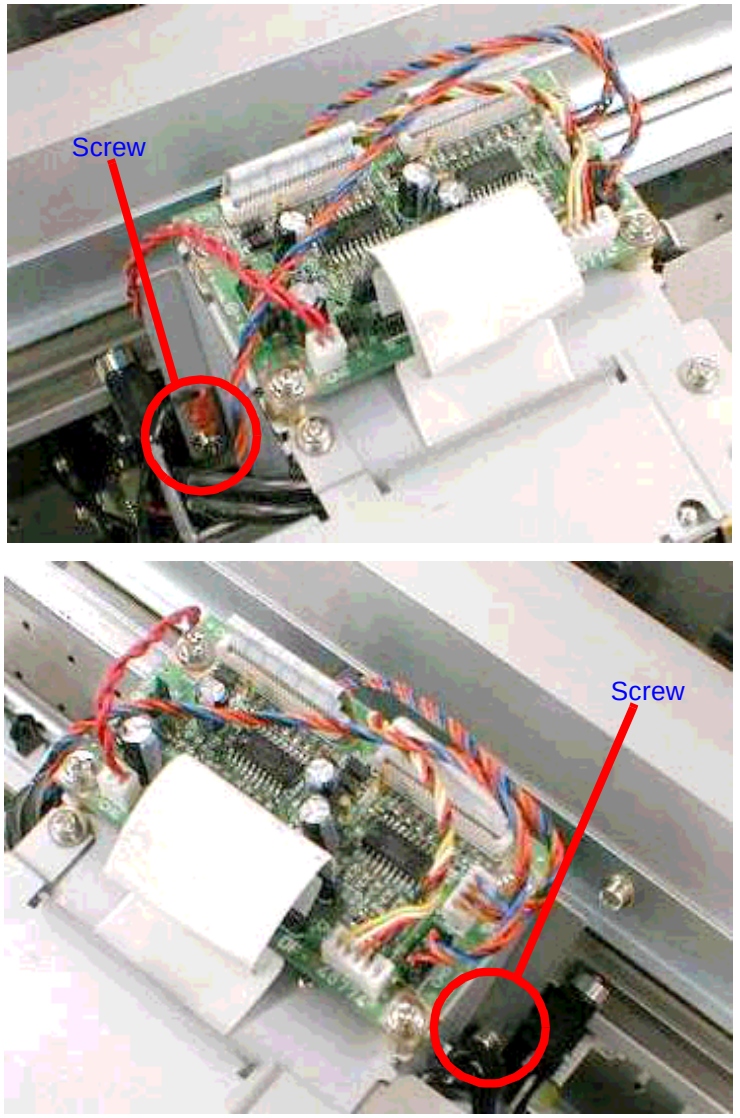


Figure 4-44. Removing the Circuit Board Mounting Frame Screws

3. Separate the circuit board and its mounting frame from the carriage assembly by lifting them up as shown below.

4. Remove the two screws (CP(W2) M3x6) securing each sensor to the back of the circuit board mounting frame, and remove the sensors.

CAUTION

Avoid scratching the timing fence when removing the Encoder.

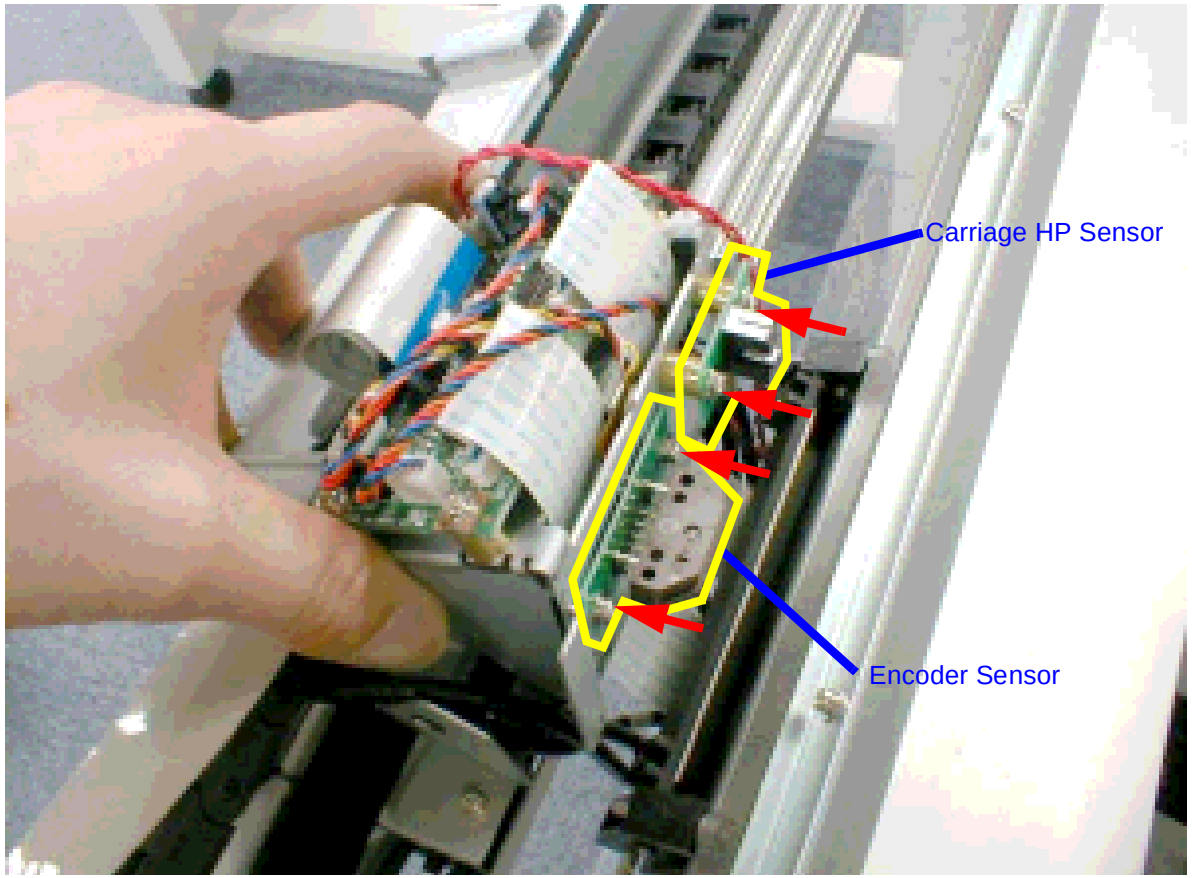


Figure 4-45. Removing the Carriage HP Sensor and Encoder Sensor

4.6 Ink Holder Disassembly

This section describes how to remove and disassemble the Ink Holder Assembly.

CAUTION

- **Before removing the Ink Holder Assembly, you have to discharge all ink from the ink system. See step 1 below.**
- **After reassembling the Ink Holder Assembly, install new ink cartridges and perform the Initial Ink Charge operation. See Cleaning menu on page 128.**

4.6.1 Removing the I/C Holder Assembly

1. Perform the ink discharge operation to eject inks from all ink paths. See Clean Head (Drain Ink) on page 127.
2. Remove the side covers (L/R). See Left and Right Side Cover Removal on page 60.
3. Remove the four screws (CP(W2) M3x6) secureing the ink tube fixing plate, and loosen the lock nut securing the ink tubes to the ink pipes ad disconnect the ink tubes from the ink pipes.
4. Remove the four screws (CP(W2) M2x4) securing the access cover attached at the back of the I/H assembly.

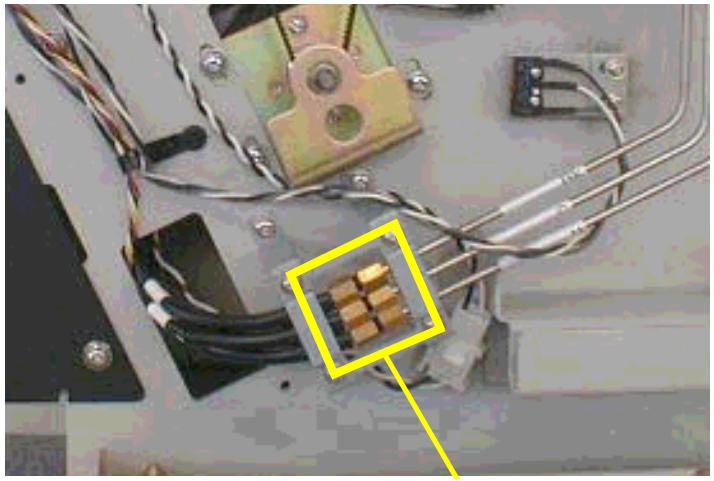


Figure 4-46. Disconnecting the ink tubes

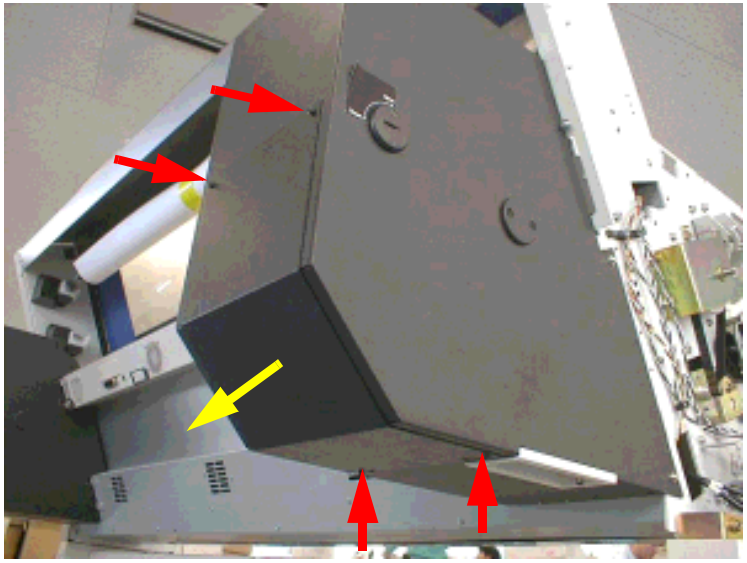


Figure 4-47. Removing the access cover

5. Loosen two screws securing the fixintg plate that holding the ink tubes and a FFC inside the I/H assembly. And unhook two tabs and remove the hand hold cover.
6. Remove the two screws (CP(W2) M3x6) securing the ink tube holder plate, and disconnect the FFC from the connector on the I/H relay board attached at the bottom of the I/H assembly as shown at right.

CHECK POINT

To remove two screws securing the ink tube holder plate, you need a short-neck screwdriver.

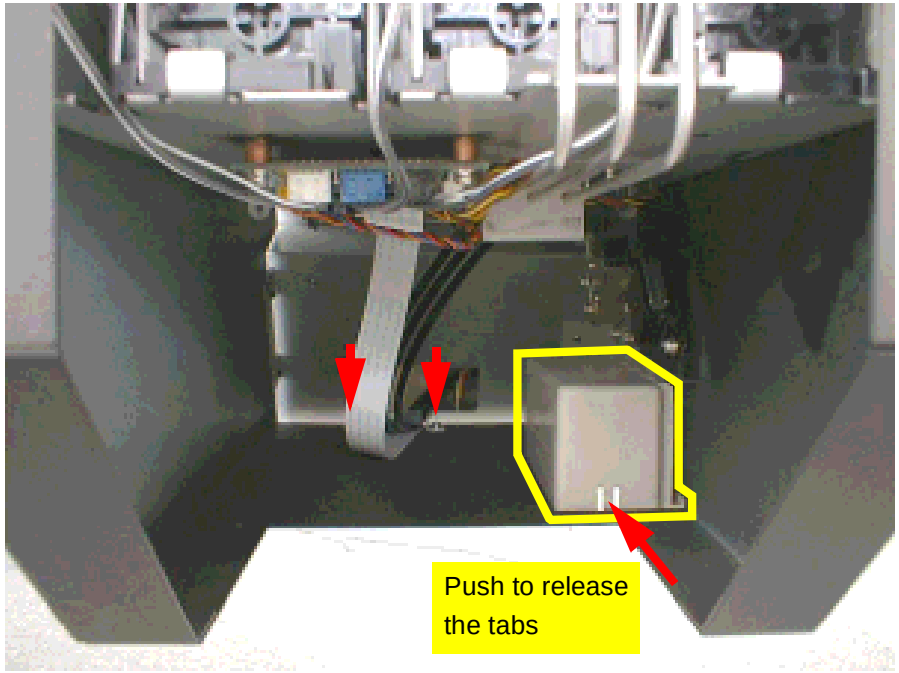


Figure 4-48. Removing the fixing plate

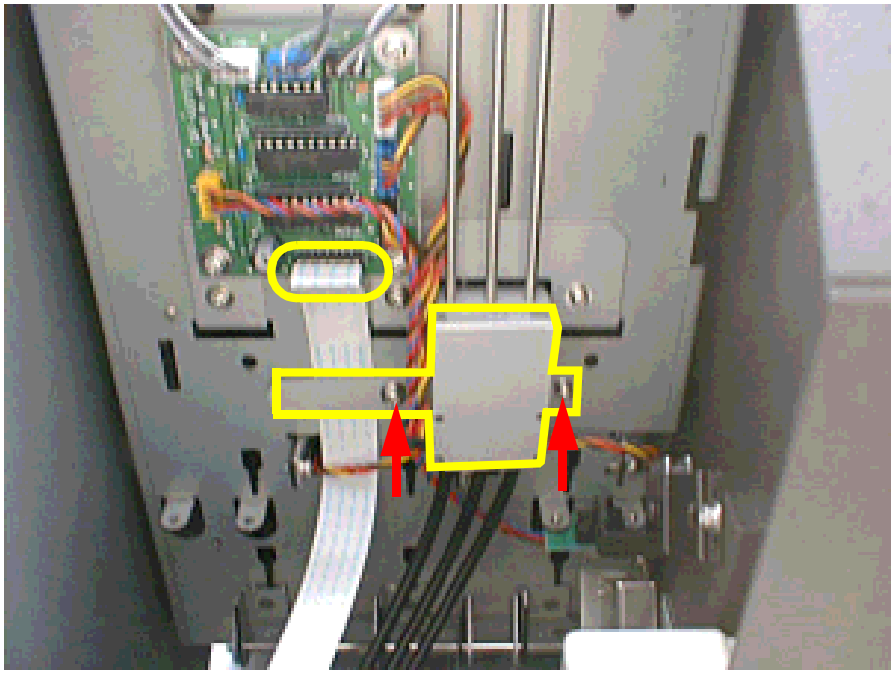


Figure 4-49. Removing the FFC

7. Remove the seven screws (CP(W2) M4x6) securing the I/H assembly to the printer mechanism, and slightly push it up as to unhook the assembly from the side frame of the printer mechanism.

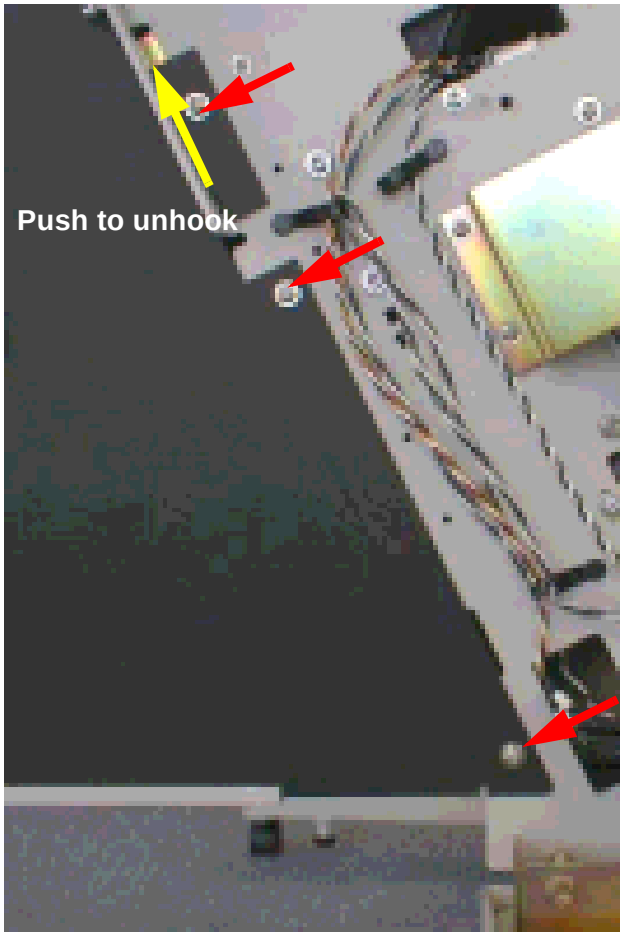


Figure 4-50. Removing the screws (3 pcs)

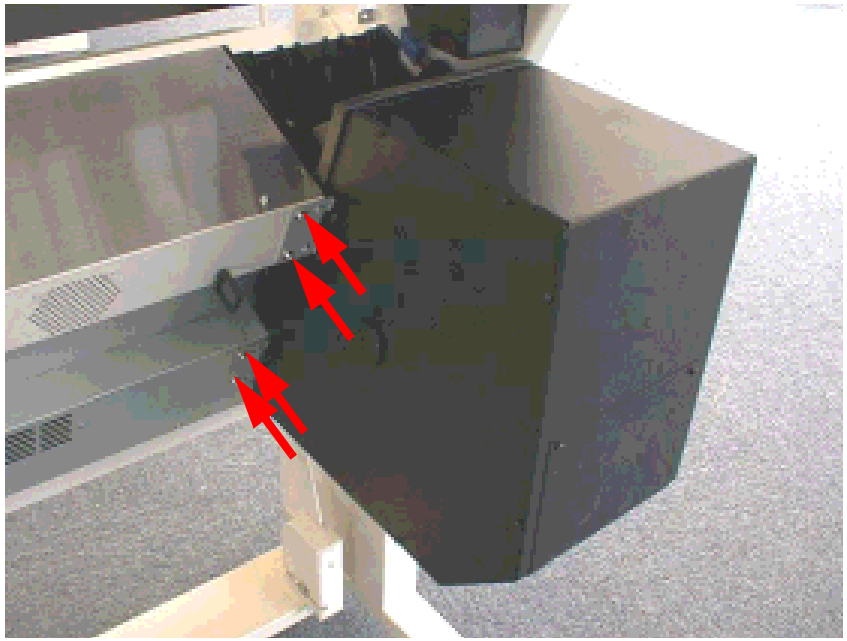


Figure 4-51. Removing the screws (4 pcs)

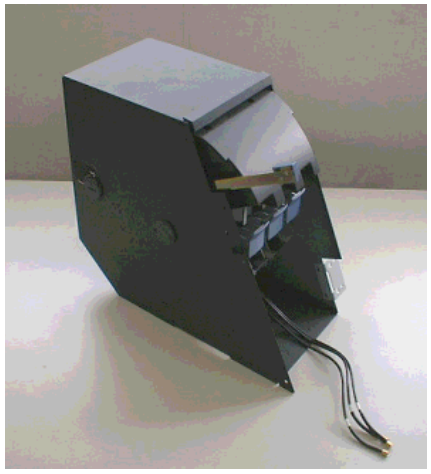


Figure 4-52. I/H Assembly

8. Remove the six screws (CP(W2) M2x4) securing the side cover of the I/H assembly and remove the side cover.
9. Slightly rotate the I/C holder assembly so that the assembly is released from the lock lever unit. Then remove the two screws (CP(W2) M3x6) securing the friction gear assembly and remove the assembly.

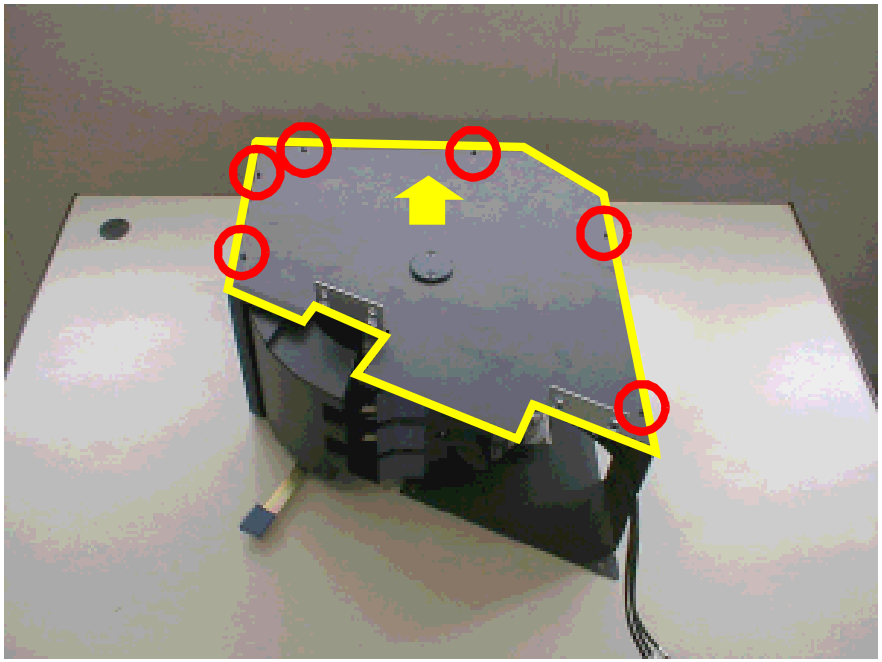


Figure 4-53. Removing the side cover of I/H assembly

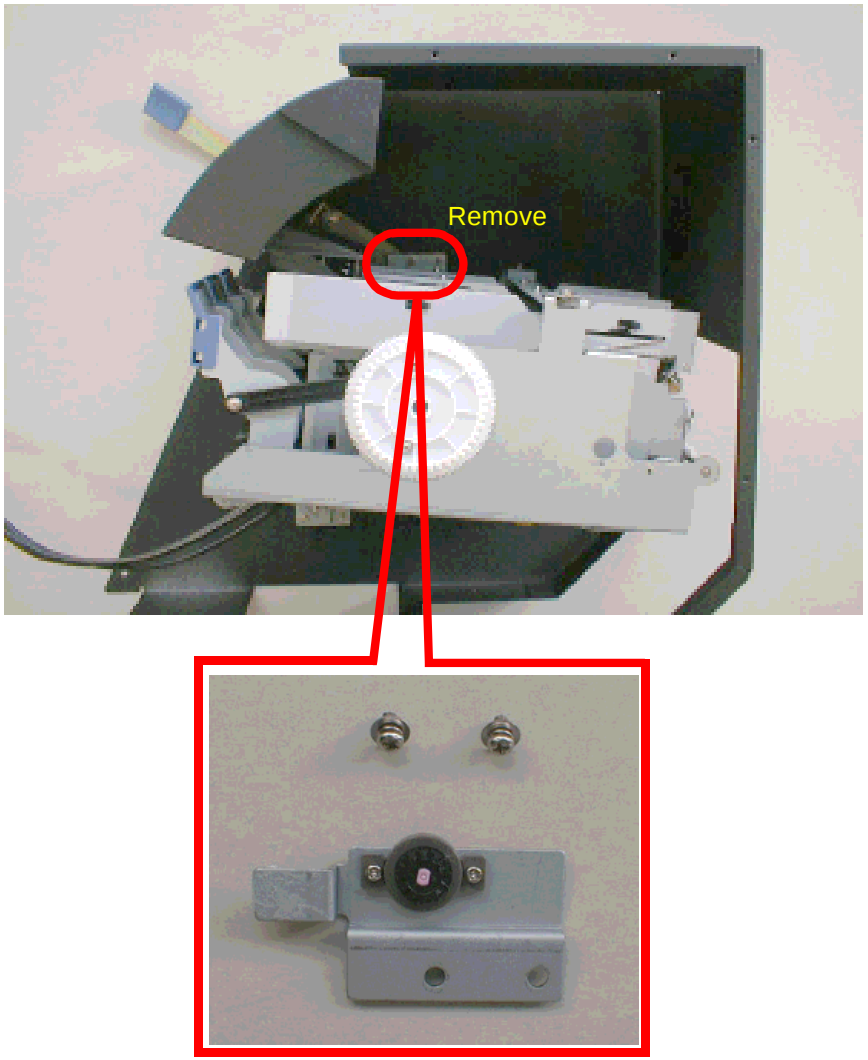


Figure 4-54. Removing the friction gear assembly.

10. Remove the I/C holder assembly from the I/H assembly frame.
11. Remove the two screws (CP(W2) M3x4) securing the I/C cover to the I/C holder assembly. Then, remove the five screws (2 pcs=CP(W2) M3x4, 3 pcs=P-Tight M3x4) securing the I/C holder fixing plate.
12. The I/C holder for each color can be removed individually. To remove one of the I/C holder assembly, remove the one screw (CP(W2) M3x12) securing the I/C holder assembly to a base frame of the I/H assembly.
13. Turn the I/C holder assembly upside down and remove the one screw (CP(W2) M3x4) securing the I/C holder from the back of the base frame.

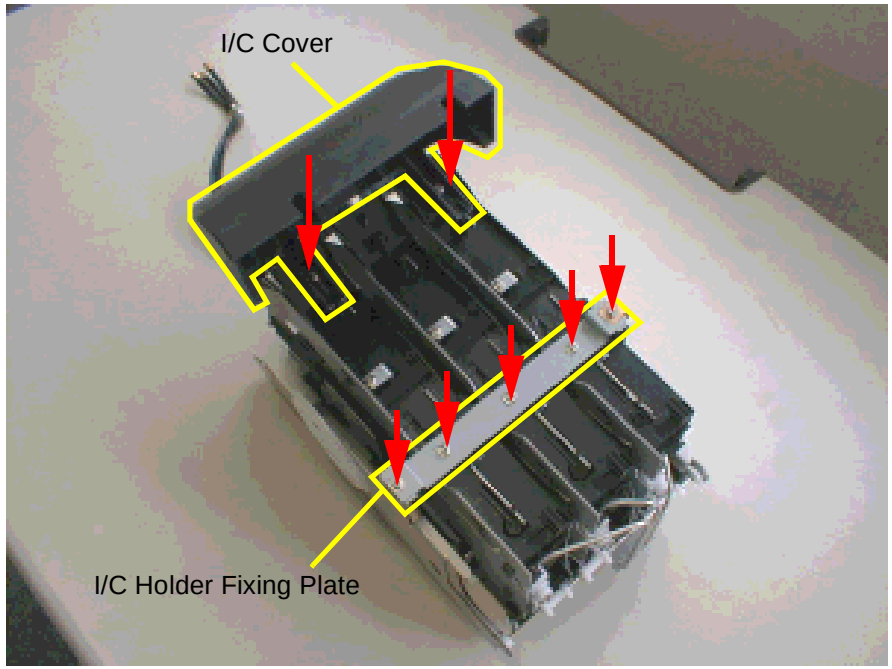


Figure 4-55. Removing the I/C cover and the fixing plate

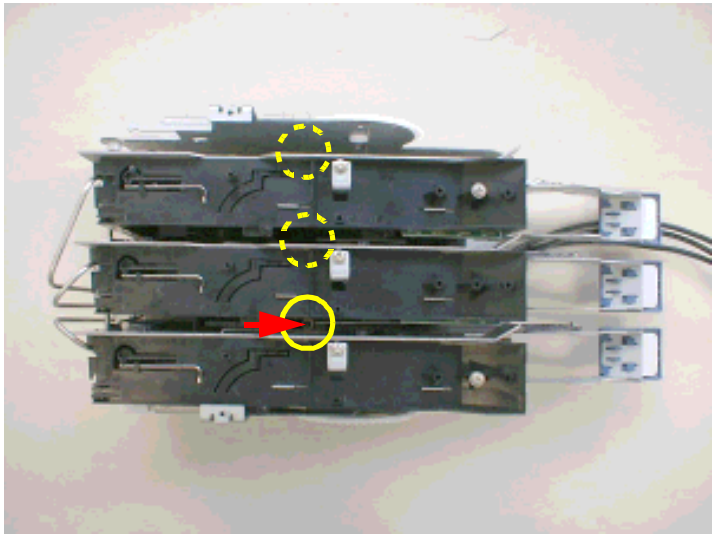


Figure 4-56. Removing the screw (from the top)

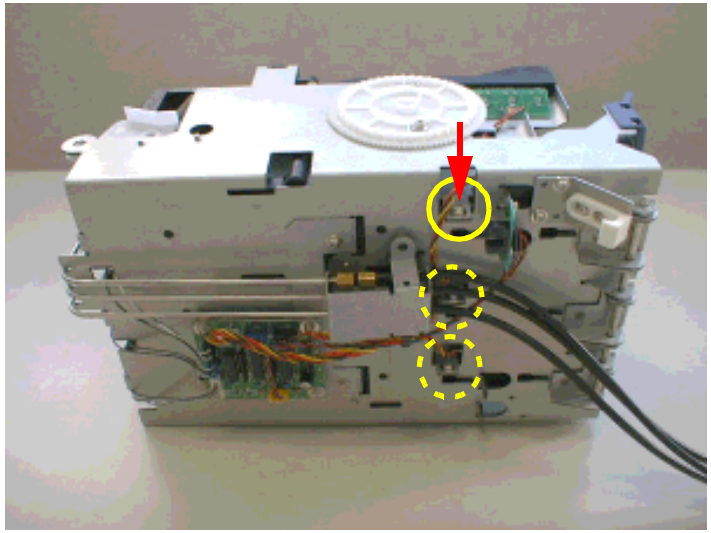


Figure 4-57. Removing the screw (from the bottom)

14. Loosen the lock nut and remove the ink pipe from “HOLDER ASSY., VALVE, A” of the I/C holder.
15. Remove the two cables corresponding to the I/C holder to be removed from the connector on the I/H relay board.

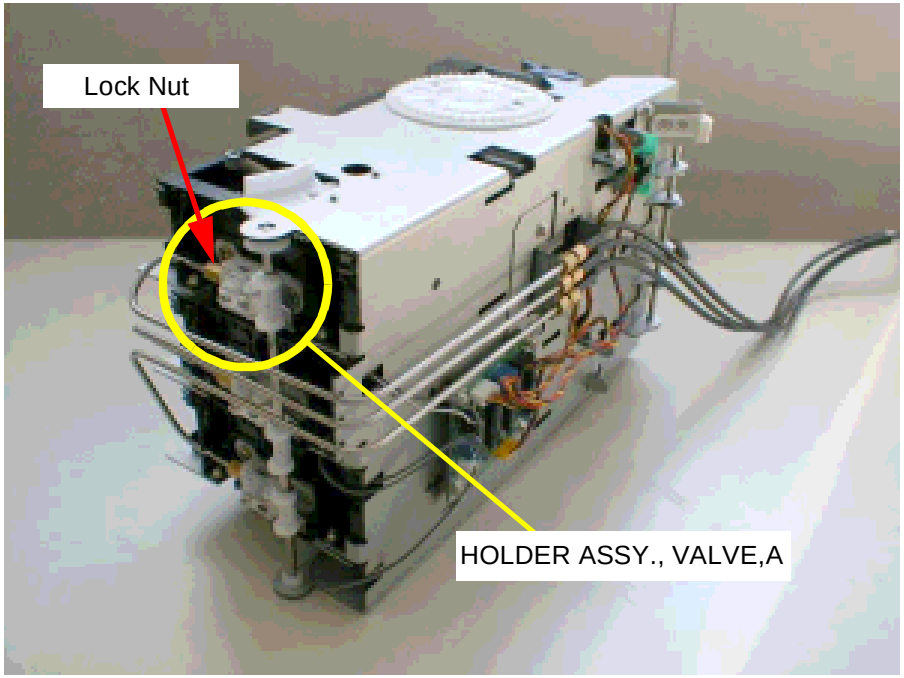


Figure 4-58. Removing the ink pipe

Table 4-3. Connection between each I/C holder and relay board

I/C Holder	I/C ID sensor	I/C sensor and Ink low sensor
Black (Light Cyan)	CN3	CN4
Cyan (Light Magenta)	CN5	CN6
Magenta (Yellow)	CN7	CN8

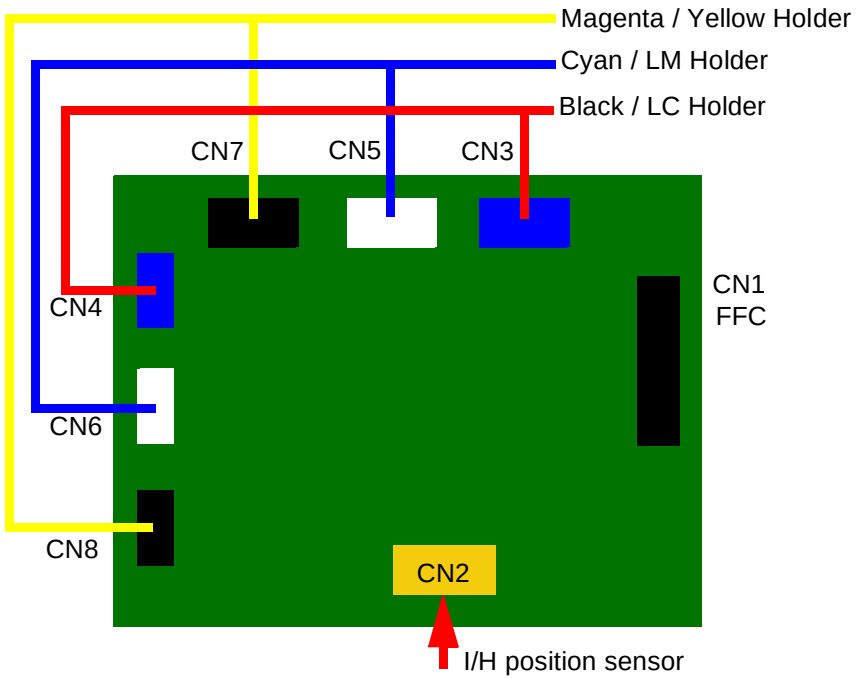


Figure 4-59. Connector location on the I/H relay board

16. Remove the one screw (CP(W2) M2x4 with a metal bushing) securing the I/C link to the I/C eject lever.
17. Remove the I/C holder assembly from the I/H assembly.

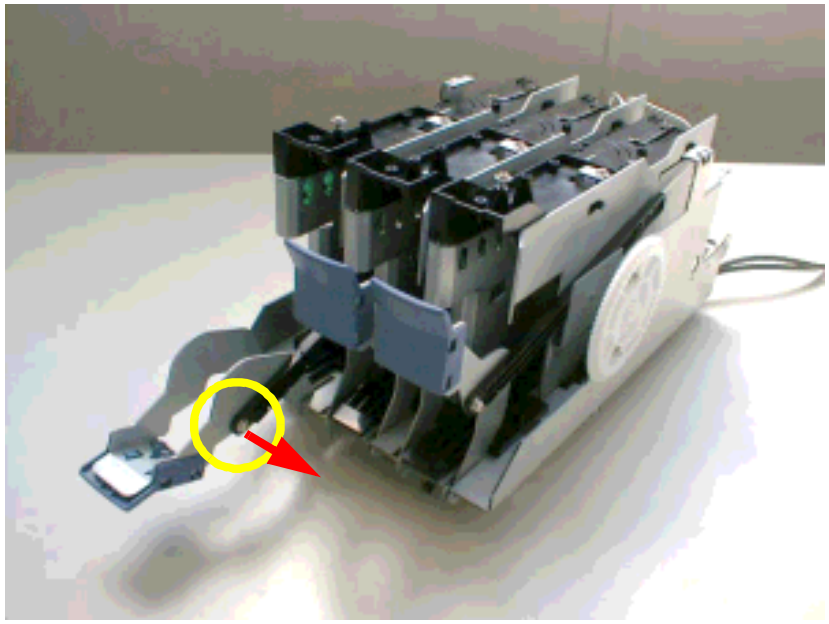


Figure 4-60. Removing the screw (I/C link)

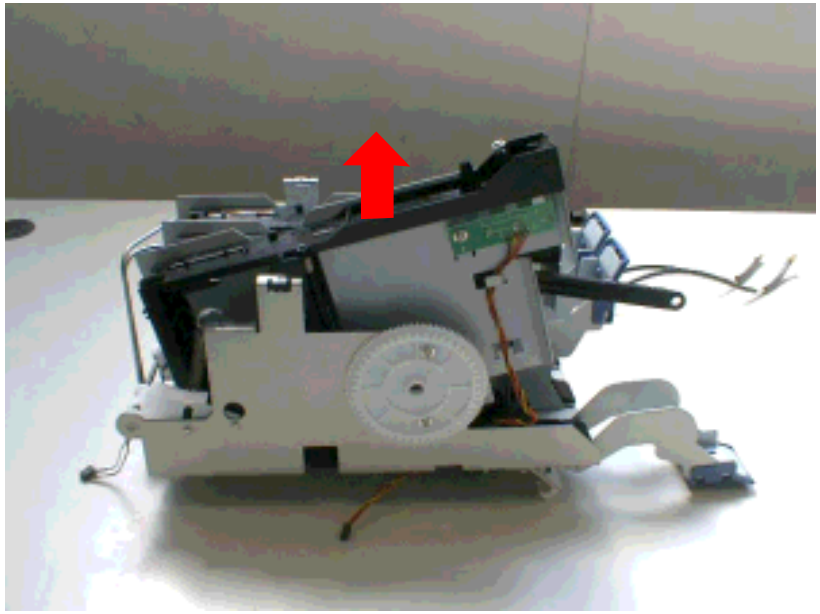


Figure 4-61. Removing the I/C holder

4.6.2 Disassembling the I/C Holder

1. Unhook the hooks fixing the upper I/C guide and slide it backward. Then slide out the metal bracket that holds the I/C ID sensor board.
2. Remove the two screws (CP(W2) M3x4) securing the “HOLDER ASSY., VALVE, A” to a base frame.
3. If necessary, remove the I/C In sensor assembly or the Ink Low sensor assembly.

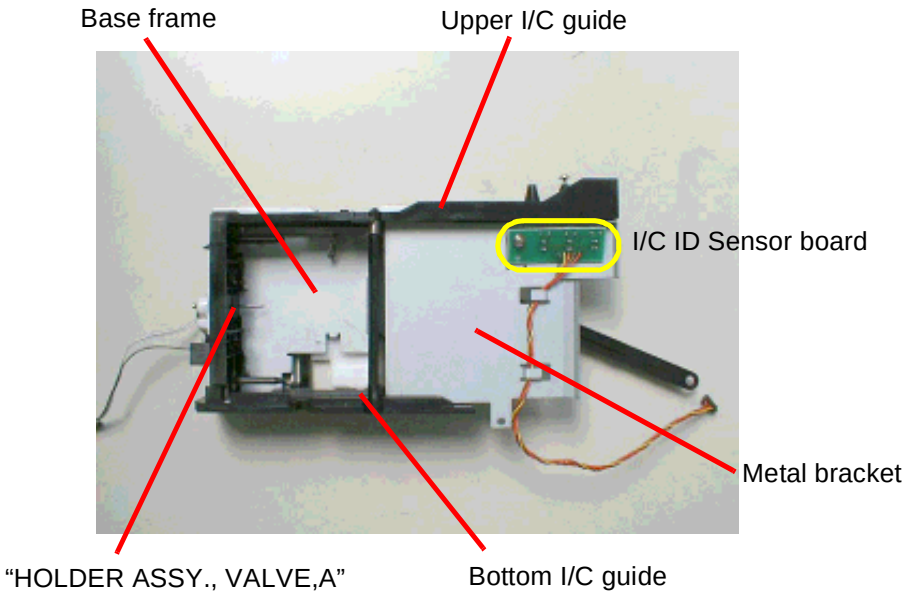


Figure 4-62. I/C Holder

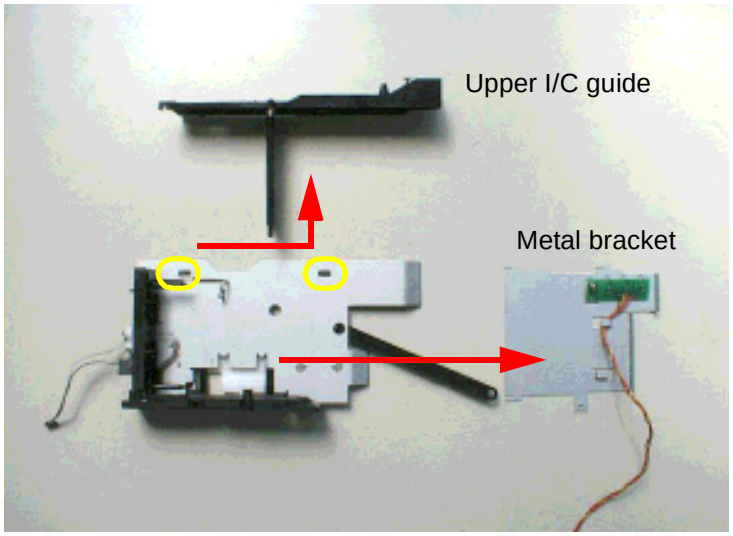


Figure 4-63. I/C Holder Disassembly (1)

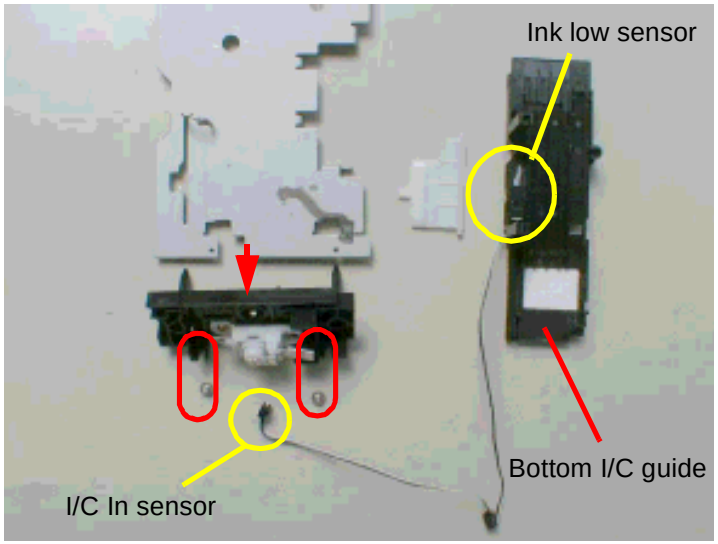


Figure 4-64. I/C Holder Disassembly (2)

4.7 Removing the Ink Tubes

This section describes how to remove the ink tubes connected to the printhead on the carriage assembly.

CAUTION

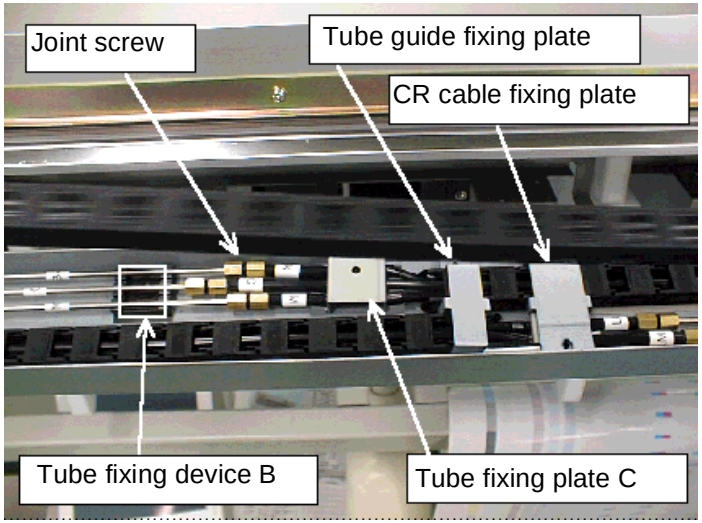
After reassembling the Ink Tubing, install new ink cartridges and perform the Initial Ink Charge operation. See Cleaning menu **on page 128.**

PREPARATION

1. Remove the Maintenance cover, Top Cover, and Right Side Cover.
2. Make sure both I/H Levers are raised to close the ink valves.

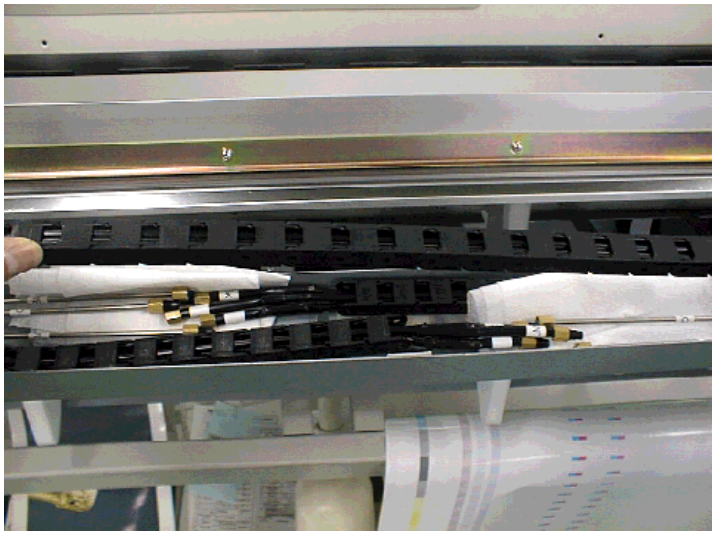
REMOVING THE INK PIPE COVERS

1. Remove two CR cable fixing plates, two tube fixing plates (C), and the tube guide fixing plate.
2. Remove the two center-most ink tube fixing devices (B); one for each set of ink pipes.



SEPARATING THE INK PIPES AND INK TUBES

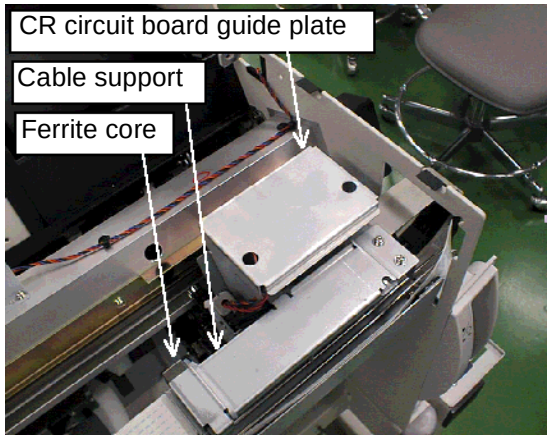
1. Loosen the screws securing the ink tubes to the ink pipes, and separate the tubes from the pipes. The screw and O-rings should remain on the tube ends.



NOTE: *You need one black joint for each tube and pipe connection. If the replacement tubes do not come with the joints, make sure the joints stay in the screws on the pipe side.*

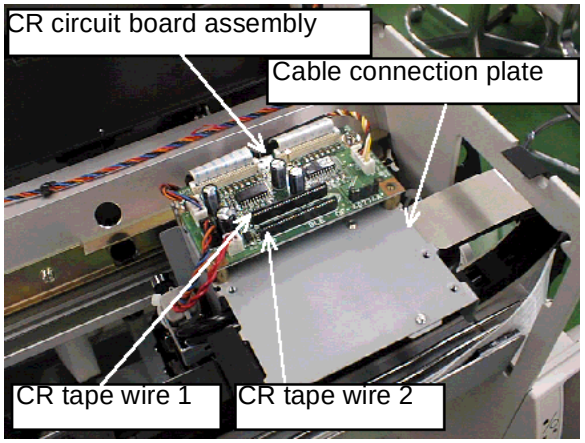
REMOVING THE CR CIRCUIT BOARD

1. Remove the CR circuit board guide plate, cut the insulation (plastic) lock tie next to the Ferrite core, and remove the cable support.



NOTE: *You may dispose of the CR circuit board guide and cable support.*

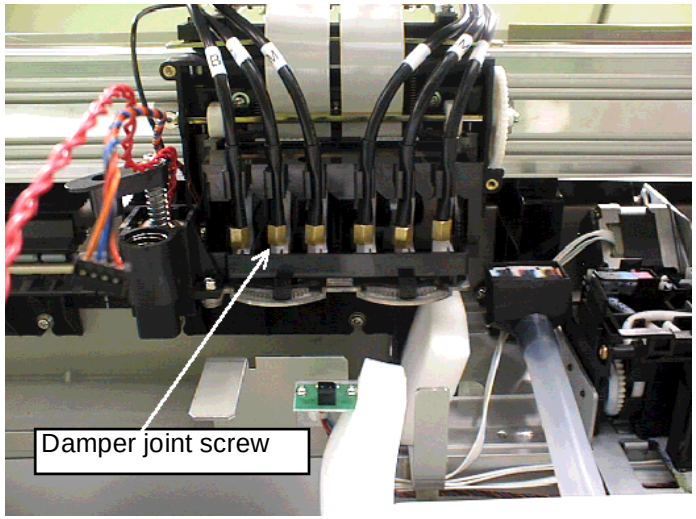
2. Remove two printhead FFCs and four connectors. (CN9 is not in use.)



3. Remove 4 flat core pieces from the tape wires (two from the FFCs to the printheads and two from the FFCs to the junction board). Remove the metal snaps securing the ferrite core and then remove the ferrite core pieces.
4. Remove the CR circuit board.

DISCONNECTING THE INK DAMPERS

1. While holding down the cutter, remove the carriage cover.
2. Remove the cutter and cutter solenoid.
3. Cut the insulation (plastic) lock ties that hold the ink tubes in place.
4. Loosen the damper joint screws and remove the ink tubes from the dampers.



5. Remove the H cable pressing plate (black) that secures the printhead FFCs to the inside of the cable connection plate.

REMOVING THE CABLE CONNECTION PLATE

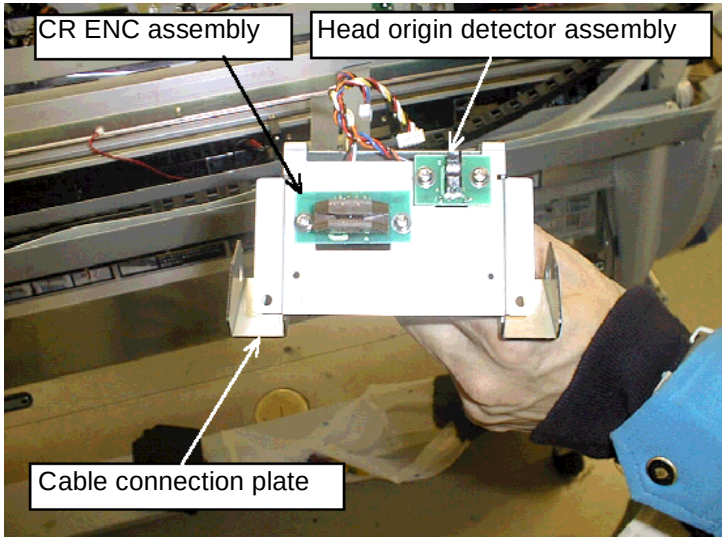
1. Insert a screwdriver through one of the holes in the ink tube support frame, loosen the two screws securing the tube guide fixing plate on the underside of the cable connection plate, and remove the plastic ink tube guide protector on the top-right side of the cable connection plate. (Use a 100 mm to 150 mm length plus/cross head (Phillips) driver.)

CHECK POINT

If the printer has been used, there is a chance the screws at either end of the ink tube support frame may be worn. The ink tube guides and cables rub these screws every time they make a pass. If the heads of the screws are worn, replace the screws.

NOTE: *If the replacement ink tubes do not have a O-rings and screws, remove the O-rings and screws from the old tubes and put them aside for re-use later.*

2. Carefully remove the cable connection plate so as not to scratch or catch the timing fence. The carriage FFCs, tube guides, and tube guide fixing plate will come off with the cable connection plate.
3. Disconnect the FFCs from the junction board, and remove the FFCs.
4. Remove the HP position (head origin) and Linear Encoder (CR ENC) sensor assemblies from the back of the cable connection plate; you will use them again.



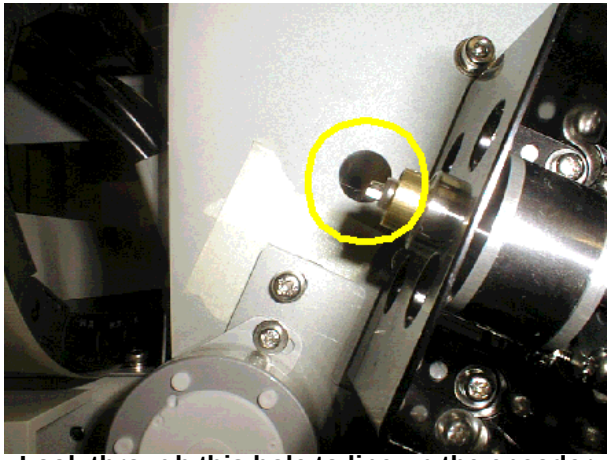
Reverse side of cable connection plate

4.7.1 Ink Tubing Reassembly

This section describes how to re-assemble the ink tubes and related components.

INSTALLING THE CABLE CONNECTION PLATE

1. Attach the HP position and Linear Encoder sensor assemblies to the cable connection plate.
2. Re-attach the cable connection plate while making sure the Timing Fence is in the middle of the Linear Encoder sensor. Lightly secure the cable connection plate with two screws, and connect the ground to the screw on the left. While looking through the hole on the right side frame to make sure the timing fence is exactly in the middle of the sensor, tighten the cable connection plate screws.



Look through this hole to line up the encoder sensor and the timing fence.

3. Pull the printhead FFCs through the uppper-rear slot in the cable connection plate. While pulling the ends of the FFCs to remove any slack, secure the printhead FFCs and the H cable plate with two screws.
4. Fold the right FFC slightly in the middle so the lengths of the two FFCs are the same.

POSITIONING THE TUBE GUIDES AND FFCS

1. Line up the new FFCs and make sure their folds overlap; one FFC will fit into the fold of the other. The double-sided tape (white) on one of the FFC cables must be showing on top.
2. Lay down the FFCs in the H Top frame with the multi-folded end protruding through the hole in the right-side frame. With the double-sided tape facing the front wall of the H Top frame, put the FFCs in the clips. The fold in the middle of the FFCs should be right in the middle of the printer.
3. Lay the left-side bottom layer protective film down on the left side and put the new FFCs on top of that film. Lay the next left-side protective film on top of the FFCs, and then lay the new tube guide for the light ink on top of the film.

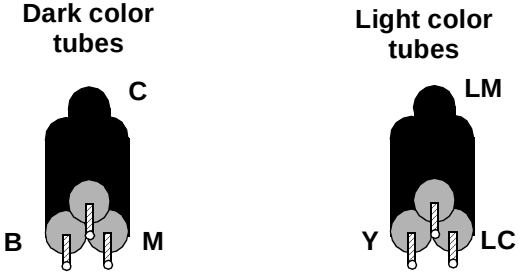
CHECK POINT

The side of the tube guide that has only four joints must attach to the ink pipes in the center. The side with seven joints must attach to the ink dampers in the carriage.

4. Lay down the right side protective film, and put the new tube guide for the dark inks on top of the film. Make sure there are only four joints on the ink pipe end of the tube guide.

CHECK POINT

Make sure the three ink tubes in the tube guides are straight and in a constant triangle throughout the tube guides to prevent the tubes from overlapping, twisting, or pinching.



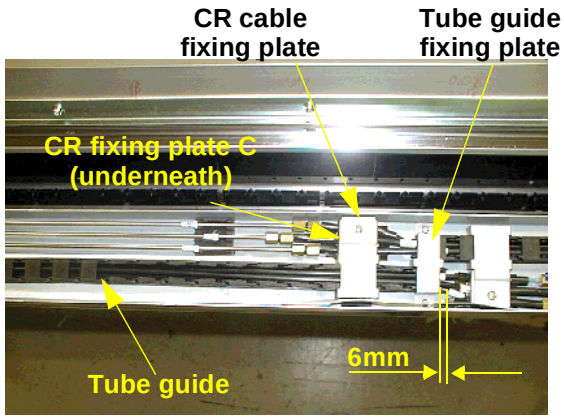
Looking at the tubes from the ink pipes' point of view

CONNECTING THE INK TUBES TO THE INK PIPES

1. Make sure the ink tubes on the ink pipe side are uncovered for about 45 mm.
2. Make sure there is a screw and O-ring on the end of each ink tube. If some are missing, use ones from the old ink tubes.
3. Insert the inner clear tube into the corresponding color ink pipe as far as it will go. Repeat for all six tubes.
4. Secure the joint screws by hand temporally, and use the torque wrench (1.75Å}0.25kgf/cm) to fasten the screws completely. The ink tube must be inserted completely, and the O-ring must not be twisted.

CHECK POINT

Make sure the end of the tube guide that attaches to the ink pipes has only FOUR joints.

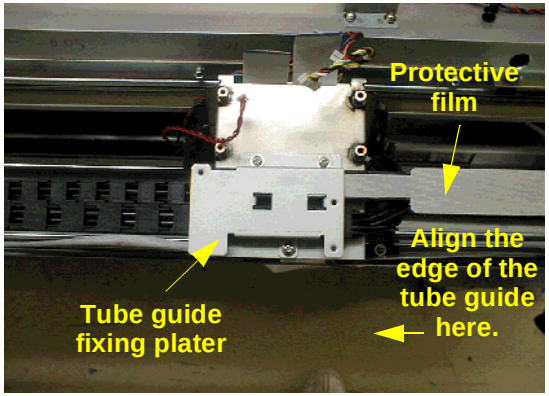


SECURING THE THE INK TUBES AND INK PIPES

1. Slide the UL tube adjuster (on the end of each tube) towards the joint screw side.
2. Place the CR fixing plate over the ink tubes and carefully but firmly press down until all three tubes are secure. Repeat for the other side.
3. Secure the tube guides and ink tubes with the CR cable fixing plates and tube guide fixing plate, then insert and close two screw(3Å~20) to secure the CR cable fixing plates. At this time, the tube guide sticks out about 6mm from the tube guide fixing plate.
4. Place the black tube fixing plate over the ink pipes (over the black pad), and press down to make sure all the pipes are secured by the plate. Secure the plate with a screw (3Å~16), and repear for the other side.

SECURING THE TUBE GUIDES ON THE CR SIDE

1. Place both tube guides on the cable connection plate, aligning the ends of both tube guides with the far edges of the cable connection plate.
2. Put the right-side protective film on top of the cable connection plate and tube guide. Make sure the protective film is not too loose or too tight.
3. Put the new tube guide fixing plate on top of the tube guides and protective film, and secure all with three screws.
4. Make sure there is no gap between the protective film and the tube guide.

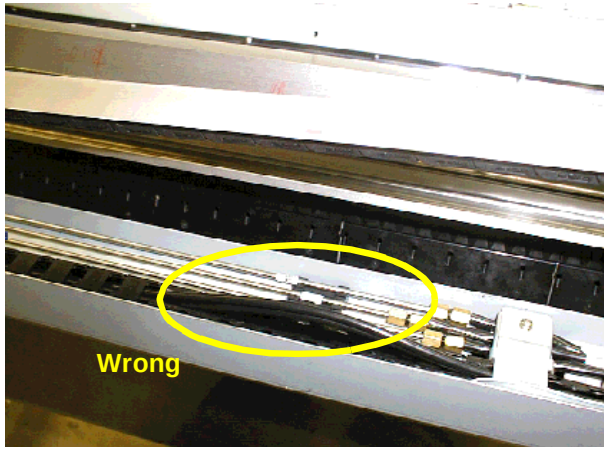


CHECKING THE INK TUBES

Move the carriage all the way back and forth to make sure the tubes do not come loose from the open section of the tube guide when the CR is moving.

CHECK POINT

If a tube sticks out as far as the top of tube guide, check the twisting of the ink tube in the tube guide, and fix as needed.

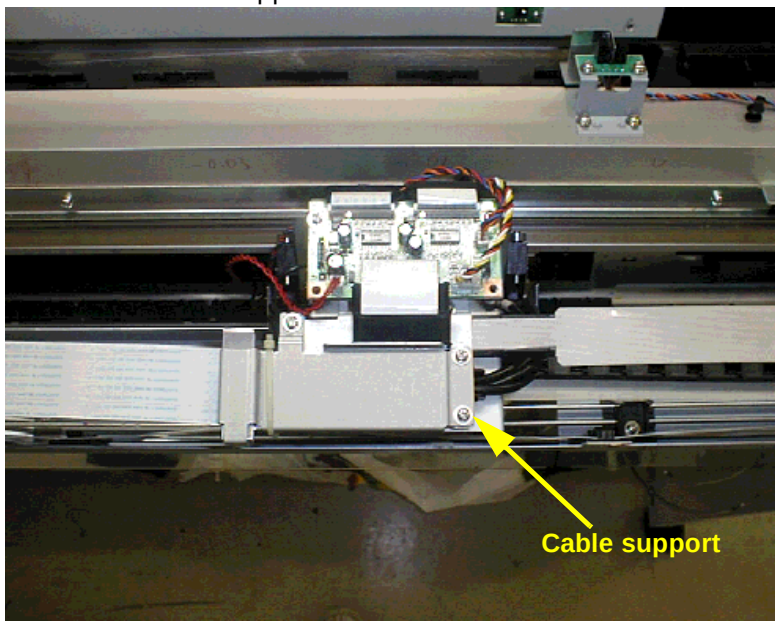


ATTACHING THE CR CIRCUIT BOARD

1. Secure the CR circuit board assembly to the cable connection plate with two screws.
2. Slide the flat core pieces onto the two printhead FFCs and connect the FFCs to the circuit board.
3. Insert the other 4 connectors into the corresponding CR board connectors. CN9 is not used.

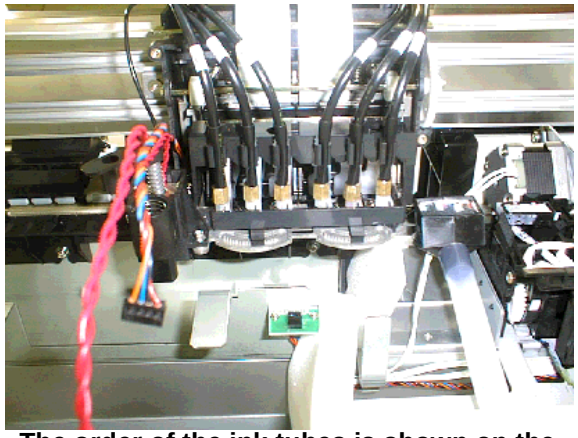
CONNECTING THE CARRIAGE FFCS

1. Make sure the FFCs are properly overlapped; the one with the shorter end should be underneath and the one with the longer end should be on top.
2. Slide the ferrite core pieces onto the FFCs.
3. Put the FFCs on the tube guide fixing plate, and make sure the fold of the FFCs lines up with the FFC connectors on the CR board. Also, make sure there is no gap between the tube guide, FFCs, and protective film sheets.
4. Attach the new cable support.



CONNECTING THE INK TUBES AND DAMPERS

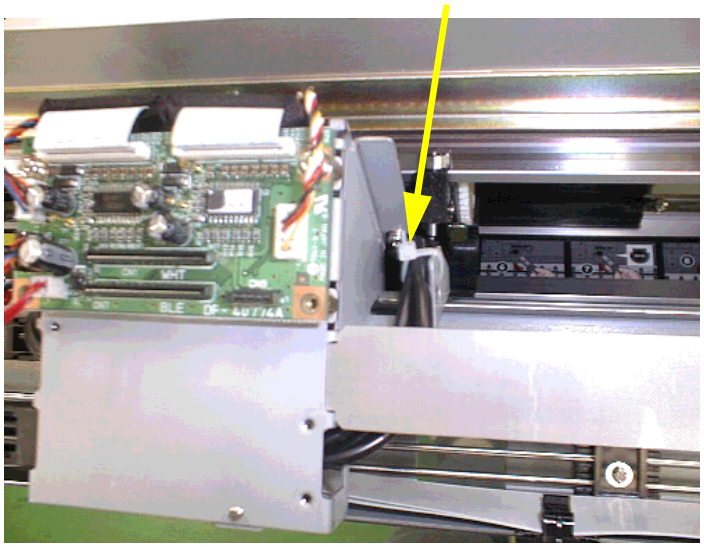
1. Return the carriage to the home position.
2. Arrange the dark series ink tubes from the tube guide to the dampers. The ink tubes should pass through the slot on the left side of the cable connection plate. Be sure not to twist the three tubes.
3. Make sure the tubes all have screws and O-rings on the ends.
4. Take one ink tube and apply cleaning liquid to the O-ring.
5. Insert the ink tube into the corresponding color damper as far as it will go, and close the screw by hand for now.
6. Make sure the ink tube is not twisted or bent and the O-ring is not twisted. Use the torque wrench (1.75Å}0.25kgf•cm) to tighten the screw completely.
7. Slide down the UL tube adjuster to the screw, and press down the tube to make sure it is fully inserted into the screw and damper. The ink tube should be covered completely.
8. Repeat steps four through seven for all dark color ink tubes.
9. Shift the carriage all the way to the left.
10. Arrange the dark series ink tubes from the tube guide to the dampers. The ink tubes should pass through the slot on the right side of the cable connection plate. Be sure not to twist the three tubes.
11. Connect the light color ink tubes as described in steps 3 through 8, substituting light for dark.



The order of the ink tubes is shown on the control panel.

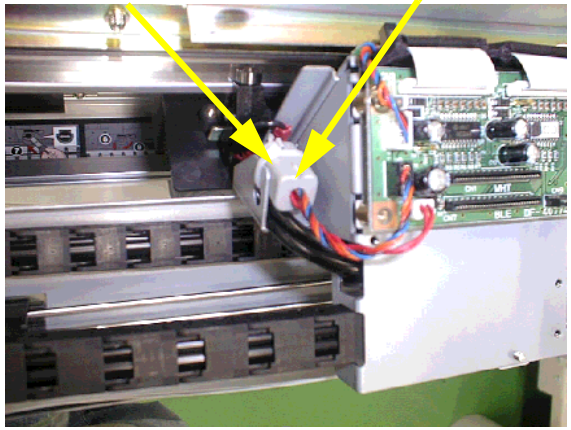
12. Secure the light-colored ink tubes to the cable connection plate with the plastic insulation lock (KI-100M).

Insulation lock (KI-100M)



13. Secure the dark-colored ink tubes and ferrite core to the cable connection plate with the plastic insulation lock (KI-100M).

Insulation lock (KI-100M) **Ferrite core**



NOTE: *At this point in re-assembly, the tube guide assembly (tube guide, FFCs, and protective film) is attached to the cable connection plate with the cable support.*

CONFIRMING THE TUBE GUIDE ASSEMBLY POSITION

1. Move the carriage all the way from one side to the other to make sure the tube guide assemblies stay centered in the carriage path.

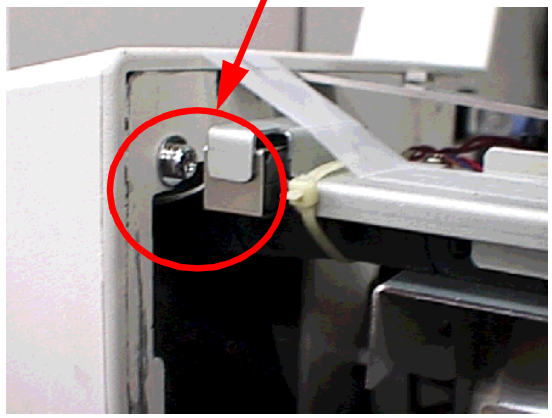
   If any part of the tube guide assembly on the left moves laterally (towards the front or back of the printer), loosen the ink pipe fixing side of the tube guide fixing plate and CR cable pressing plate. Then adjust the tube guide assembly so that it is centered, and secure the tube guide fixing plate and CR cable fixing plate.

   If any part of the tube guide assembly on the right moves laterally, loosen the tube guide cover and CR cable fixing plate. Then adjust the tube guide assembly so that it is centered, and secure the tube guide cover and CR cable fixing plate.

2. Squeeze the FFC ferrite core and the cable support together, and secure them with the plastic insulation lock (T18L).

3. Move the carriage to the left so that the left edge of the CR board is 43 mm from the left-side frame. Make sure the ferrite core and cable support do not touch the frame or screw. Also, make sure the FFC and protective film do not touch or rub against the frame. If there is a problem, loosen the tube guide fixing plates in the center and adjust the position of the edge of the tube guide.

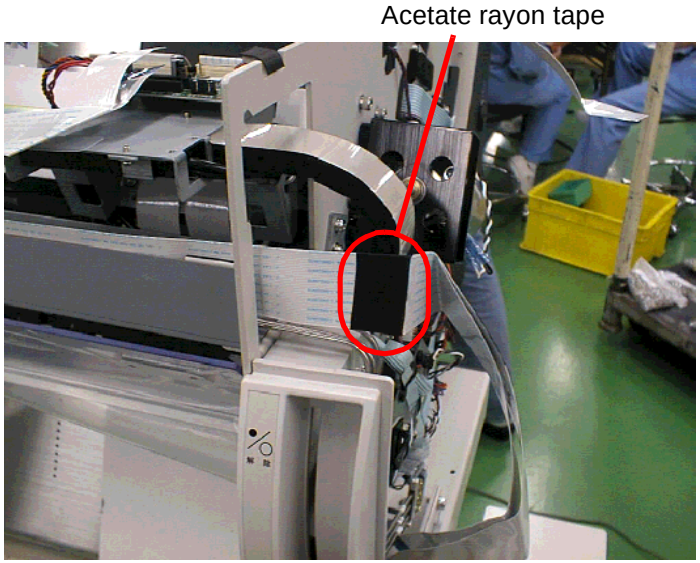
Make sure nothing touches the left-side frame.



4. Attach the new CR board cover.

CONNECTING THE CARRIAGE FFCS TO THE RELAY CIRCUIT BOARD

1. Peel off the backing of the double-sided adhesive tape at two places: the wall surface toward the right frame and the folded section near the center.
2. Make sure the FFCs are aligned and peel off the backing of the double-sided adhesive tape on the second FFC. Attach the second FFC to the back of the first one.
3. Fold the FFCs into three sections as shown below, and attach acetate rayon tape.
4. Connect the FFCs to the relay board connectors.



CHECK POINT

As shown in the photo above, make sure the FFC does not block the tube guide assembly from moving all the way to the right.

RESETTING THE PRINTER

1. Install new ink cartridges in the printer.
2. Enter the Self-Diagnostic Mode (see Using the Self-Diagnostic Mode on page 108) and adjust the capping position (see Cap Position Adjustment on page 116). After the printer automatically adjusts the cap position (a number appears on the LCD), press the Enter button on the control panel.
3. Perform an initial ink charge (“Init. Fill” in the Cleaning menu on page 128 of the Self-Diagnostic Mode). Check the ink discharge condition as well as the amount of ink in the dampers. Make sure there are no bubbles, which would indicate a leak in the ink delivery system.
4. Attach the carriage cover and perform the carriage cover height adjustment. See Carriage Cover Height Adjustment on page 130.
5. Lower the Paper Release Lever to prevent damage to the Paper Thickness Sensor, and then re-attach the Top Cover, being careful not to bump the sensor.
6. Load 44 inch roll paper and print a test pattern (see Check Nozzle on page 118). Check the operation of the printer, and make sure the order of printed colors in the check nozzle pattern is B, C, M, Y, LM, LC from the left.
7. Enter Maintenance Mode 2 as described in Maintenance Mode 2 on page 17. Then reset the Ink Counter (“Init. Ink”) and CR Motor Counter (“Init. CR Motor”).

CHAPTER

5

ADJUSTMENTS

5.1 Overview

Follow the instructions in this section to perform any needed adjustments on the EPSON Stylus Pro 9000. After reading the precautions below, see Table 5-2 on page 103, which lists all possible adjustments and when you need to perform them. Then follow the links in the table to one these sections:

- ROM Backup and Updating on page 105 tells you how to backup the printer's ROM prior to replacing the main board. It also explains how to update the ROM.
- Self-Diagnostics on page 107 explains how to adjust various printer settings through the printer's control panel. You can also use the self-diagnostic functions to clean the printhead, reset various counters, and make test prints.
- Mechanical Adjustments on page 130 explains how to check and adjust gear backlash, belt tension, and other mechanical settings of the motors and sensors.

5.1.1 Precautions

Observe these precautions:

CAUTION

- **Be sure to perform any adjustments in the order as listed in Table 5-2 on page 103.**
- **Avoid strong light (such as sunlight) while performing adjustments. The printer's optical sensors won't work properly under strong lighting.**
- **When performing an adjustment, read and follow the detailed instructions and caution information for that procedure; otherwise you may damage the printer.**

5.1.2 Adjustment Tools

Make sure you have the correct adjustment tools as described below:

Table 5-1. Adjustment Tools

Name	Part Code	Notes
Tension Gauge	B747700300; standard tool acceptable	Max. 4000 g For PF Belt tension adjustment
Tension Gauge #F712	1047744; standard tool acceptable	Max. 200 g For CR Belt tension adjustment
Straight-edge ruler 1000 mm #F713	1047746; standard tool acceptable	Min. length: 1000 mm For adjusting PF distance and other settings; somewhat longer would be better
Vernier scale	1047745; standard tool acceptable	Used in combination with straight-edge ruler for more accurate measurements (0.1 mm scale)
CR Cover Position Adjustment Tool #F724	Special Tool 1049975	—
Self-Training Kit #F708	1047105	CD-ROM based
Flash Memory Card #F727	1050073	2MB flash memory card. Conforms to the 5 V read/write specification and PCMCIA Rel 2.1/JEIDA Ver 4.2 (Type II).

5.1.3 Required Adjustments

When you remove or replace parts, refer to the following table to determine which adjustments you need to perform. Always perform the adjustments in the order listed below.

Table 5-2. Service Parts & Required Adjustments

Service Operation	Adjustment Items
Printhead removal or replacement	1. Enter the Self-Diagnostic Mode (see **Using the Self-Diagnostic Mode** on page 108) 2. **Cap Position Adjustment** on page 116 3. If you replaced the old printhead with a new one, perform the KK1 cleaning cycle as described in **Cleaning menu** on page 128. 4. If you reinstalled the old printhead, perform the KK0 cleaning cycle as described in **Cleaning menu** on page 128. 5. **Check Nozzle** on page 118 6. **B Head Slant/C Head Slant Adjustment (Head Angle)** on page 119 7. **BC Head Slant Adjustment (Head Height)** on page 120 8. **Bi-D Adjustment** on page 121 9. **Head LR Adjustment (Head Gap Timing)** on page 123 10. **Test Print** on page 127 11. **Carriage Cover Height Adjustment** on page 130 12. Turn the printer off. 13. Enter Maintenance Mode 2 as described in **Maintenance Mode 2** on page 17. Select “Init. Head Unit” to reset the printhead unit counter. (Not necessary if you resintalled the old printhead.)
Main Board replacement (using parameter backup)	1. Before replacing the main board, perform the parameter backup. See **Backup Procedure** on page 105. 2. After replacing the main board, perform the parameter download. See **Download Procedure** on page 106. 3. **Firmware Update** on page 106 4. **Sensor Trimmer Adjustment** on page 136 5. **Test Print** on page 127

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

Service Operation	Adjustment Items
Main Board replacement (without parameter backup)	1. After replacing the Main Board, perform the **Firmware Update** on page 106 2. Install new ink cartridges 3. Install new Waste Ink Pads (see **Maintenance Procedures** on page 67) 4. Enter the Self-Diagnostic Mode (see **Using the Self-Diagnostic Mode** on page 108) 5. **Input Rank (Printhead ID) Adjustment** on page 117 6. **Bi-D Adjustment** on page 121 7. **Head LR Adjustment (Head Gap Timing)** on page 123 8. **Flush Point Right and Left Adjustment** on page 124 9. **Feed Adjustment** on page 124 10. **Top & Bottom (Margin) Adjustment** on page 125 11. **Rear Sensor Position Adjustment** on page 126 12. **Sensor Trimmer Adjustment** on page 136 13. **Test Print** on page 127 14. Turn off the printer. 15. Enter Maintenance Mode 2 as described in **Maintenance Mode 2** on page 17. 16. Select “Init. Ink” to reset the ink cartridge counters. 17. Select “Init. Waste Ink” to reset the Waste Ink Pad counter.
PG Motor removal or replacement	**Platen Gap Gear Backlash Adjustment** on page 133
CR Motor removal only	**Carriage Belt Tension Adjustment** on page 132
CR Motor replacement	1. **Carriage Belt Tension Adjustment** on page 132 2. Start the Self-Diagnostic Function (see **Using the Self-Diagnostic Mode** on page 108) 3. **Cap Position Adjustment** on page 116 4. **Bi-D Adjustment** on page 121 5. **Head LR Adjustment (Head Gap Timing)** on page 123 6. **Flush Point Right and Left Adjustment** on page 124 7. **Test Print** on page 127

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

Service Operation	Adjustment Items
PF Motor removal only	PF Belt Tension Adjustment on page 132
PF Motor replacement	1. PF Belt Tension Adjustment on page 132 2. Start the Self-Diagnostic Function (see Using the Self-Diagnostic Mode on page 108) 3. Feed Adjustment on page 124 4. Top & Bottom (Margin) Adjustment on page 125 5. Rear Sensor Position Adjustment on page 126 6. Test Print on page 127
Front Paper Sensor removal or replacement	1. Start the Self-Diagnostic Function (see Using the Self-Diagnostic Mode on page 108) 2. Top & Bottom (Margin) Adjustment on page 125
Paper Edge Sensor removal or replacement	1. Start the Self-Diagnostic Function (see Using the Self-Diagnostic Mode on page 108) 2. Top & Bottom (Margin) Adjustment on page 125
Rear Paper Sensor removal or replacement	1. Start the Self-Diagnostic Function (see Using the Self-Diagnostic Mode on page 108) 2. Top & Bottom (Margin) Adjustment on page 125
Paper Thickness Sensor removal or replacement	1. Start the Self-Diagnostic Function (see Using the Self-Diagnostic Mode on page 108) 2. Paper Thickness Sensor Adjustment on page 134
HP Sensor removal or replacement	1. Start the Self-Diagnostic Function (see Using the Self-Diagnostic Mode on page 108) 2. Cap Position Adjustment on page 116
Cover Open Sensors (R/L) removal or replacement	1. Start the Self-Diagnostic Function (see Using the Self-Diagnostic Mode on page 108) 2. Cover Open Sensor Assembly (Right and left) on page 135
Lower Paper Guide removal or replacement	Cutter Position Adjustment on page 131
I/H Assembly removal or replacement	I/H Lever Position Adjustment on page 133

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

Service Operation	Adjustment Items
Carriage Cover removal or replacement	Carriage Cover Height Adjustment on page 130
Waste Ink Pads	1. Cutter Position Adjustment on page 131 2. Reset the waste ink counter. See Maintenance Mode 2 on page 17. 3. Reset the cleaning unit counter. See Maintenance Mode 2 on page 17. Note that you also have to replace the replaceable parts in the Maintenance Assembly when replacing the Waste Ink Pads. See Maintenance Procedures on page 67.
Maintenance Assembly	1. If you remove the Lower Paper Guide, perform the Cutter Position Adjustment on page 131. 2. Enter the Self-Diagnostic Mode (see Using the Self-Diagnostic Mode on page 108). 3. Cap Position Adjustment on page 116
Ink tube Replacement	See Removing the Ink Tubes on page 92 for complete instructions.

5.2 ROM Backup and Updating

The main board contains a flash ROM memory which stores the adjustment values and firmware commands that control the printer. This information must be correct for the printer to work properly.

Before removing the main board, you should back up the ROM in case you have to replace the main board. You can then transfer the backup copy to the ROM on the new board, which reduces the number of adjustments you'll have to perform.

REQUIREMENTS FOR BACKUP

- ❑ PC Card (2MB flash memory card)
  EPSON Part No. 1050073 (#F727 Flash Memory Card)
  Conforms to PCMCIA Rel 2.1/JEIDA Ver 4.2 (Type II)
- ❑ IPL data
  Before backing up the PC card, the following file must be copied to the PC card: Backup.exe (distributed on the STK CD)

CAUTION

- **The PC card must meet the 5V read/write specification for PC cards.**
- **Do not try to back up the firmware that is stored on the firmware backup PC card. Doing so will result in the loss of firmware data.**

BACKUP PROCEDURE

To backup (upload) data to the PC card, follow these steps:

1. Turn the printer off.
2. Remove the access plate on top of the Upper Paper Guide (see **Figure 4-13** on page 64). Make sure the printer's control panel remains attached.
3. Insert the PC card into the PC card slot connector on the Main Board, and then turn on the printer. The following message appears on the LCD:

   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 will cause the PC card to download its data to the printer's ROM, instead of backing up the ROM. This will erase the contents of the ROM.

5. When the backup procedure is finished, you see the following:

   End [Success]

   Turn off the printer and remove the PC card.

DOWNLOAD PROCEDURE

To download data from the PC card to the printer, follow these steps:

CAUTION

Read the caution note that appears under step 4 before starting this procedure.

1. Turn off the printer.
2. Make sure the access plate is removed from the top of the Upper Paper Guide. Also make sure the printer's control panel remains attached.
3. Insert the PC card containing the backup data into the PC card slot connector on the Main Board, and then turn on the printer. 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

Push the control panel button without delay. If you wait more than 15 seconds after the "Wait:F→M Push:M→F" message appears, the printer starts the backup procedure instead of the download procedure. This overwrites data stored on the PC card with data stored in flash memory on the main board.

5. When the download procedure is finished, you see the following:

   End [Success]

   Turn off the printer and remove the PC card.

POSSIBLE ERRORS DURING BACKUP OR DOWNLOADING

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

End [Error]

If you see this message, 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 using a different PC card does not solve the problem, then there's a problem with the flash memory on the main board and a backup is not possible.

5.2.1 Firmware Update

Since the firmware is stored in the flash ROM on the Main Board, you need to write the firmware to the flash ROM whenever you replace the Main Board with a new one. You can write the firmware to the flash ROM from either a personal computer or a memory card. Follow one of these steps:

UPDATING FROM A PC

1. Turn off the printer.
2. Connect the printer to a PC using either a serial or (standard bidirectional) parallel cable.
3. Turn on the printer while pressing the following buttons:
   Paper Source + Cut/Eject + Cleaning
4. Send the firmware program to the printer (an .MOT file distributed on the STK CD). From the DOS prompt, type "copy /b *[filename]* prn:" and press Enter.
5. When the program has copied, "Update Complete" appears.

6. Turn the printer off, and then back on.

UPDATING FROM A MEMORY CARD

1. Copy the file for uploading to the flash memory card (it's a .BIN file).
2. Turn off the printer.
3. Remove the access cover from the top of the Upper Paper Guide (see Figure 4-13 on page 64). Insert the flash memory card containing the updated firmware into the card slot (CN20 on the Main Board).
4. Turn the printer on.
5. "Update Complete" appears when the all the data has copied.
6. Turn off the printer, remove the memory card, and then turn the printer back on.

CAUTION

- **If the printer loses power during the firmware update, restart the update procedure. This returns the printer to normal status.**
- **The PC card must meet the 5 V read/write specification for PC cards.**

5.3 Self-Diagnostics

To determine which self-diagnostic functions to perform, see the **Service Parts & Required Adjustments** table on page 103. Then follow the links in the table to one of these sections:

- **Test Menu** on page 110. Checks the operation of components such as fans, sensors, and control panel buttons, and displays the ROM version and fatal error history.
- **Adjustment Menu** on page 115. Used to adjust and clean the printhead, calibrate the paper feed sensors, and print a nozzle check pattern or list of current adjustment settings.
- **Cleaning menu** on page 128. Performs printhead cleaning and sets the initial ink charge flag.
- **Print menu** on page 128. Performs the same function as the "Test Pattern Print" option in the Adjustment menu.
- **Parameter menu** on page 129. Updates or clears the adjustment settings.

If you've never used the printer's self-diagnostic functions before, see **Using the Self-Diagnostic Mode** below to get started.

5.3.1 Using the Self-Diagnostic Mode

1. To enter the Self-Diagnostic mode, press the following buttons on the Control Panel while turning on the printer (make sure the Paper Release Lever is lowered):

   Paper Feed ↓ + Cut/Eject + Cleaning

   "Check: Test" immediately appears on the LCD; if any other message appears, the printer has not entered the Self-Diagnostic mode.

2. 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.

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

NOTE:
- ***Unless otherwise indicated, you should not use costly roll paper to print test patterns. Use standard cut-sheet sizes, 11 × 17 inch or larger. For adjustments that require a high degree of precision (Bi-D and head angle adjustments), be sure to use coated ink jet paper.***
- ***All explanations in Self-Diagnostic mode refer to the printheads in the following way:***
  Head B = K/C/M side (left side facing the printer)
  Head C = Lc/Lm/Y side (right side facing the printer)

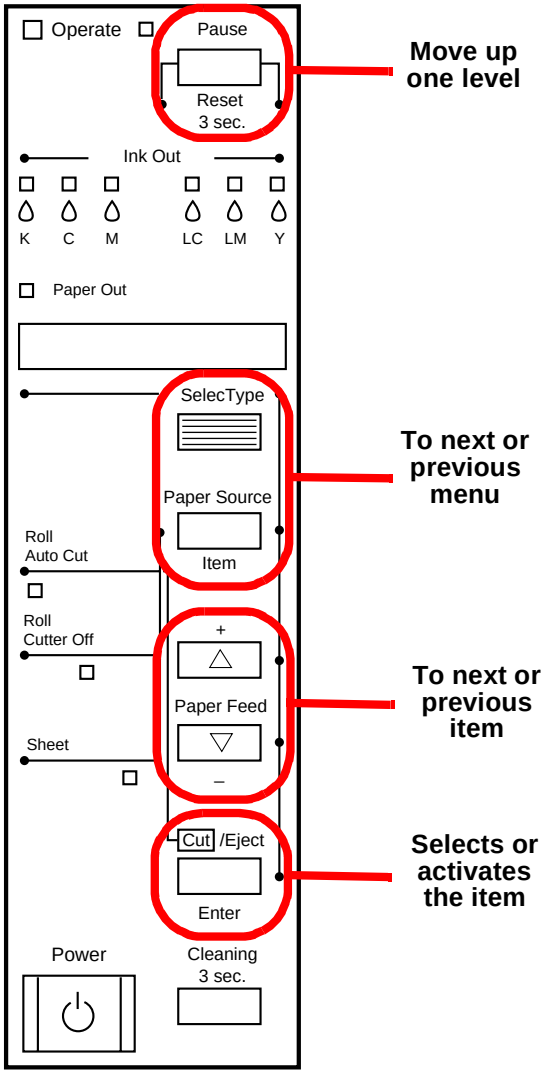


Figure 5-1. Self-Diagnostic Controls

5.3.2 Self-Diagnostic Menus

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

Table 5-4. Self-Diagnostic Menus

LCD Message	Refer to	Description
Check: Test	page 110	Displays information such as the ROM version and fatal error history, and checks the operation of the fans, control panel buttons, and sensors.
Check: Adjustment	page 115	Adjusts certain mechanisms such as printheads and feed path sensors.
Check: Cleaning	page 128	Starts initial ink charge or selected cleaning sequence.
Check: Print	page 128	Prints nozzle check pattern or list of current adjustment settings (parameters).
Check: Parameter	page 129	Updates or clears the adjustment parameters.
Check: Life	—	Tests the operation of printer components. Not used for printer servicing. (See caution below.)

CAUTION

The "Check: Life" menu contains tests that should only be performed at the factory. Do not attempt to use this menu.

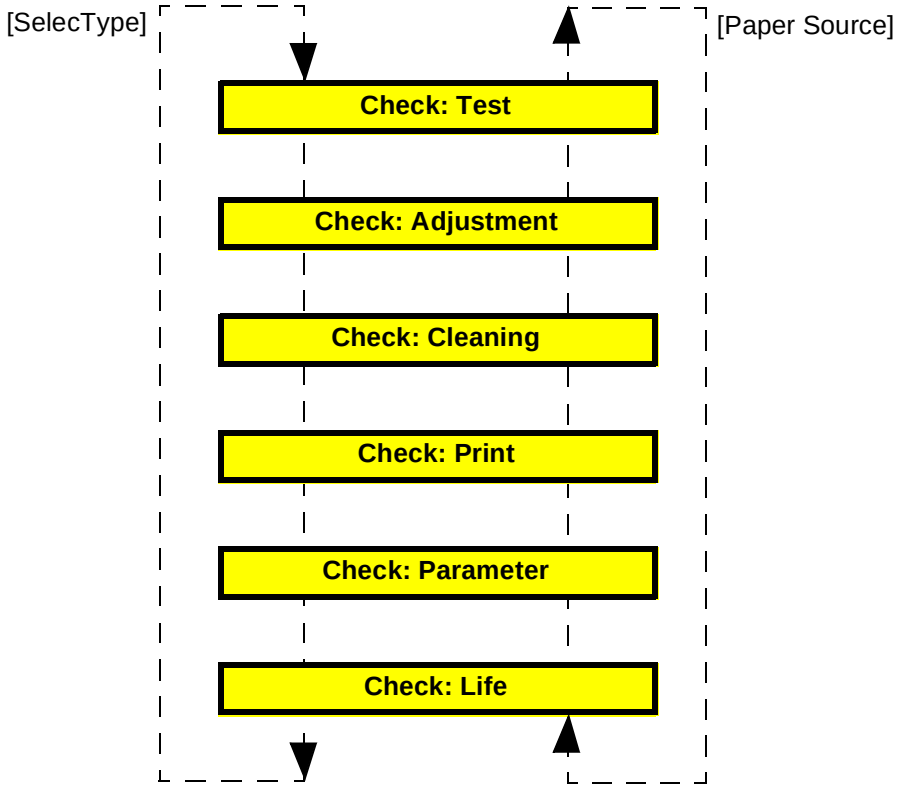


Figure 5-2. Self-Diagnostic Menu Flow

5.3.3 Test Menu

The Test menu lets you check the operation of the control panel, control circuits, and sensors.

Table 5-5. Test Menu Items

LCD Message	Description
Version on page 111	Lets you check: ☐ Firmware version ☐ DIP-SW settings ☐ Control Panel and Main Board version
Control Panel on page 111	Lets you check the operation of: ☐ Control Panel buttons ☐ LCD display ☐ LED indicators
Sensors on page 112	Lets you test the operation of these sensors: ☐ HP Sensor ☐ Cover Open Sensor ☐ Paper Release Lever Sensor ☐ Front Paper Sensor ☐ Rear Paper Sensor ☐ Paper Width Sensor ☐ Paper Thickness Sensor ☐ PG Sensor ☐ Printhead Thermistors ☐ I/C Holder Levers Sensors ☐ Ink ID Sensors ☐ I/C Sensors ☐ Ink Low Sensors
Encoder on page 113	Lets you test the CR Motor and PF Motor encoders
Fan on page 113	Turns the fans on and off
Elec. (Maintenance Records) on page 113.	Lets you check: ☐ Maintenance Record (part usage and wear counters) ☐ Fatal Error Record
D/A Revision	Factory use—Head voltage correction
Head Signal	Factory use—Head pulse check

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

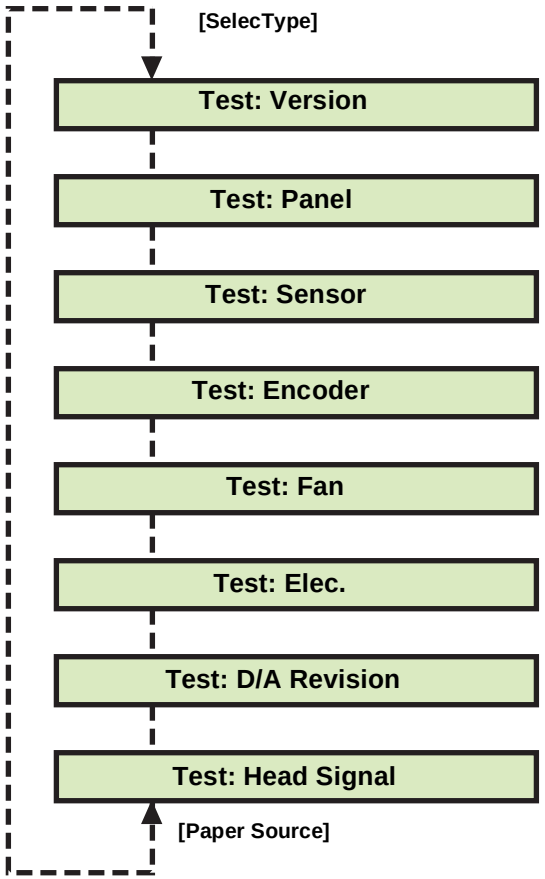
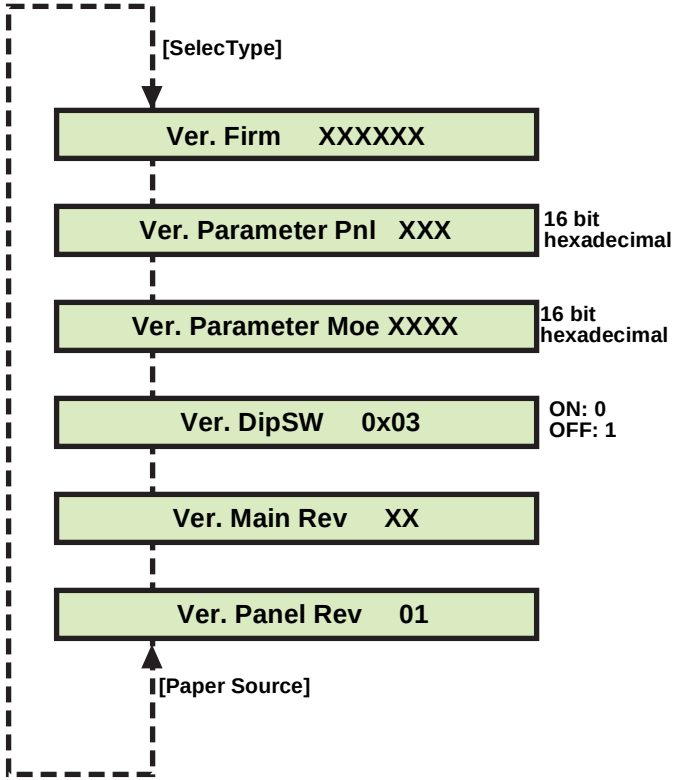


Figure 5-3. Test Menu Items

NOTE: *Some of the items in the Test Menu display results in hexadecimal format. The easiest way to convert hexidecimal to standard decimal notation is the use the Calculator that comes with Windows. After opening Calculator, select Scientific from the View dropdown menu.*

VERSION

This function confirms the firmware version and DIP switch settings.

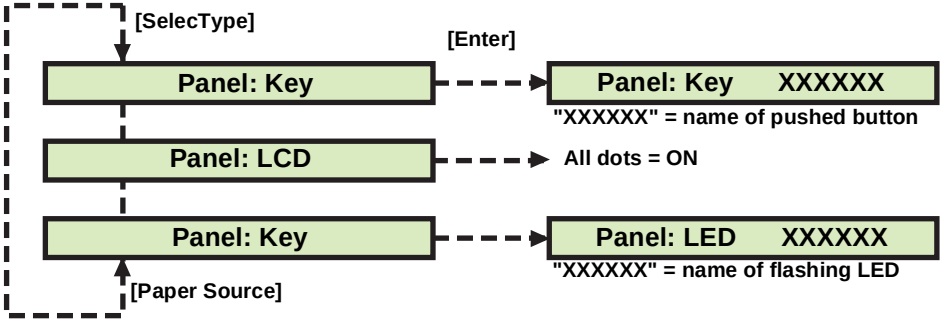


NOTE: *There are two DIP switches on the Main Board for enabling the firmware to adapt to possible mechanical design changes. Their factory settings are OFF and OFF, and in this position the LCD displays "Ver. DipSW 0x03."*

"Ver. Parameter Pnl" and "Ver. Parameter Moe" are not needed for printer servicing.

CONTROL PANEL

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

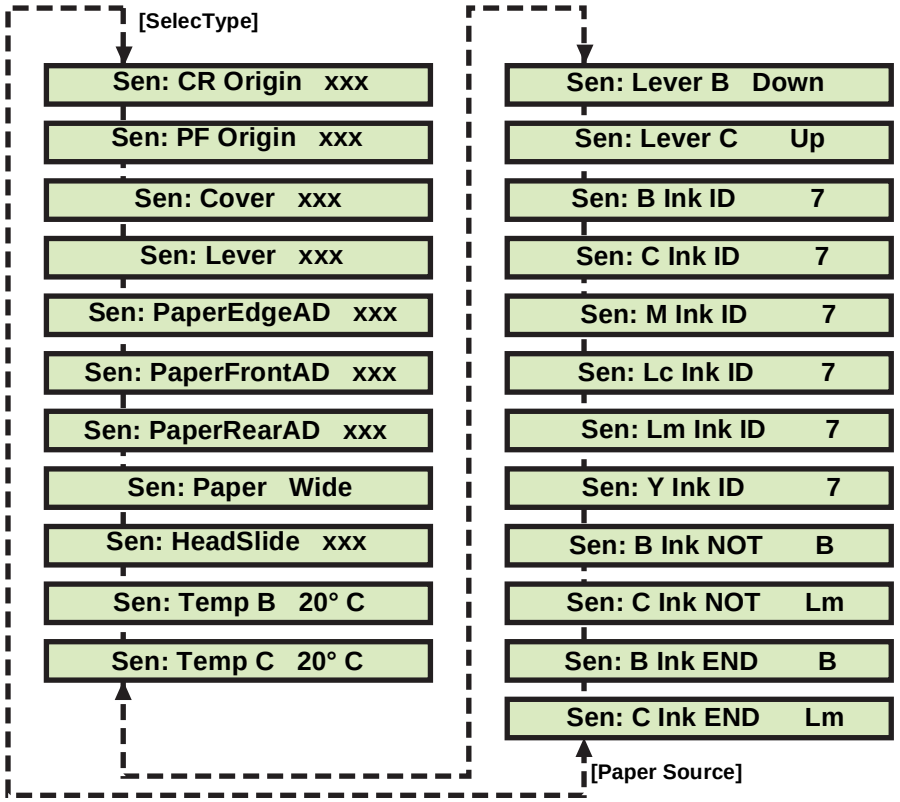


- ❑ "Key" check
  The name of the button that is pressed appears. Press the [Pause] button twice to exit the "Panel: Key" function.
- ❑ "LCD" check
  All dots turn on. If a dot is not on, the LCD is not working properly.
- ❑ "LED" check
  The LED indicators turn on in the following order and the name of the indicator appears on the display: 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 that the sensors are operating properly. The current status of each sensor appears on the LCD display. To check the sensor, you can toggle it physically by hand and watch the display for any changes. For example, to check the Paper Release Lever sensor, select “Sen: Lever” from the Sensor menu and move the lever up and down by hand to check it.

- CR Origin
  Indicates the location of the carriage in relation to home position.
- PF Origin
  PF Motor encoder indicator
- Cover
  Indicates whether the front cover is open or closed.
- Lever
  Indicates whether the Paper Release Lever is up or down.
- Paper Edge AD
  Digitally indicates the Paper Width Sensor’s analog output.
- Paper Front AD
  Digitally indicates the Front Paper Sensor’s analog output.
- Paper Rear AD
  Digitally indicates the Rear Paper Sensor’s analog output.
- Paper
  Paper Thickness Sensor. Recognizes paper as “Std.” or “Wide” (thick).
- HeadSlide
  Platen Gap sensor. ON or OFF, depending on position of PG Gear.
- Temp B/Temp C
  Indicates the temperature detected in each printhead in degrees celcius.
- Ink lever B
  Indicates the position of the black-side (K/C/M) ink holder lever.
- Ink lever C
  Indicates the position of the color-side (Lc/Lm/Y) ink holder lever.
- Ink ID
  The Ink ID sensors detect the ink cartridge type. They are 3-bit sensors, and the ID number appears as 0~7. Sensor ON = 1 and sensor OFF = 2.
- 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.

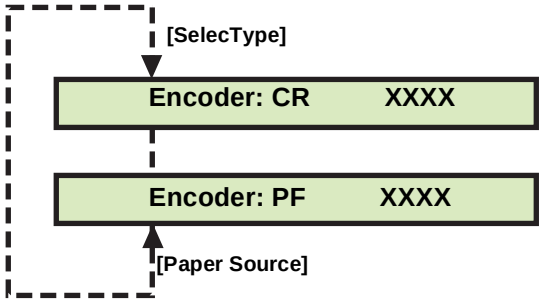


ENCODER

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 Paper Feed Roller by hand

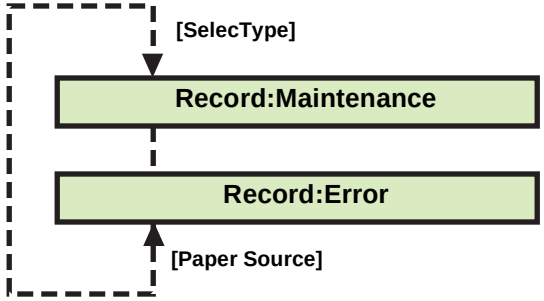


FAN

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

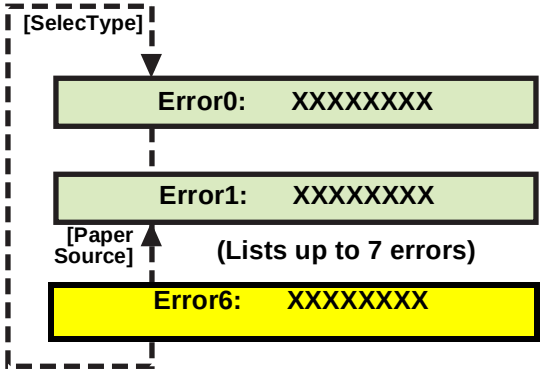
ELEC. (MAINTENANCE RECORDS)

This function allows you to check the printer's history of fatal errors and operating information such as how many times a specific part has been used.



- ❑ Record: Error menu

The printer lists a maximum of the seven most recent fatal errors (Errors 0-6). The errors listed do not include CPU errors (service call errors).



❑ Record: Maintenance menu

See the description of Maintenance Record items in Table 5-6 on the next page.

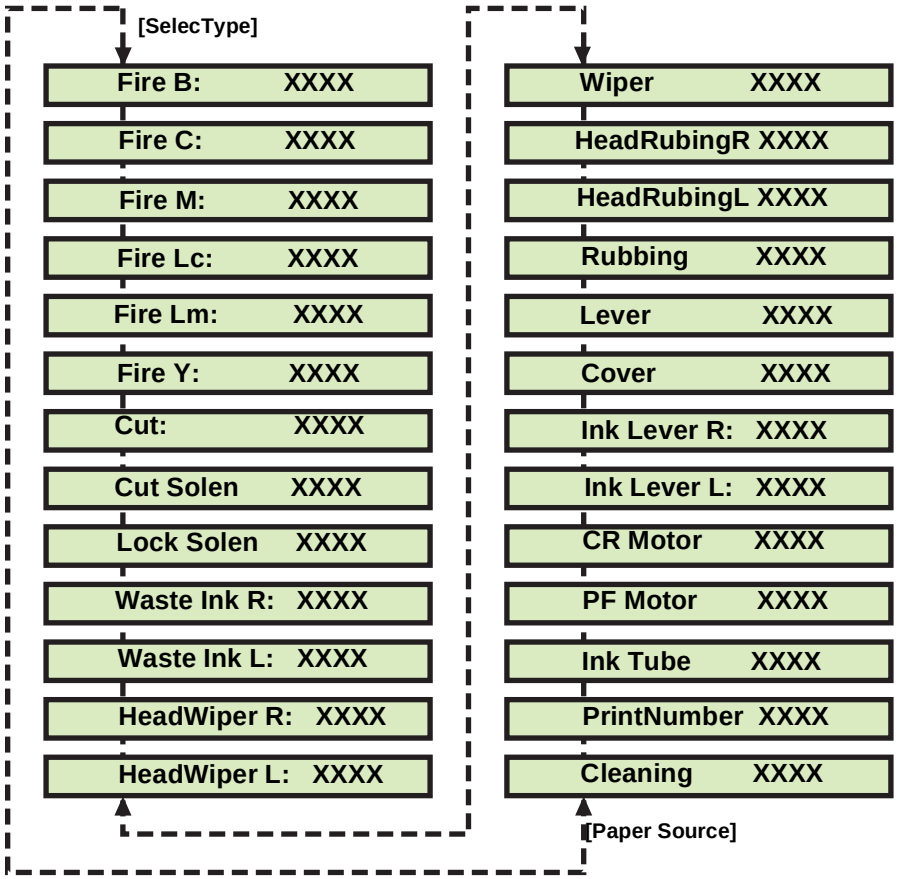


Table 5-6. Maintenance Record Items

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 operated
Lock Solenoid	Number of times CR lock solenoid has been used
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	Number of times I/C Holder has been opened (open and close = one time)
CR Motor	Accumulated travel distance of carriage (in Km)
PF Motor	Accumulated travel distance of paper feed mechanism (in Km)
Print Number	Accumulated printout count (each form-feed code = one unit)
Cleaning	Accumulated number of cleaning operations

5.3.4 Adjustment Menu

The Adjustment menu allows you to make certain adjustments to the printer mechanism and controls.

Table 5-7. Adjustment Menu Items

LCD Message	Description
Cap Position Adjustment on page 116	Sets the capping position (automatic adjustment)
Check Skew on page 117	Checks the skew (slant) of currently loaded paper
Input Rank (Printhead ID) Adjustment on page 117	Lets you set the printhead ID
Check Nozzle on page 118	Prints a nozzle check pattern so you can see whether printhead nozzles are clogged
B Head Slant/C Head Slant Adjustment (Head Angle) on page 119	Prints a test pattern to let you adjust the angle of Head B or Head C (mechanical adjustment)
BC Head Slant Adjustment (Head Height) on page 120	Prints a test pattern to let you adjust Head C to the same height as Head B (mechanical adjustment)
Bi-D Adjustment on page 121	Prints test patterns to let you adjust vertical alignment during bi-directional printing
Head LR Adjustment (Head Gap Timing) on page 123	Prints test patterns to let you set the correct spacing between the printheads
Flush Point Right and Left Adjustment on page 124	Adjusts the flushing positions
Feed Adjustment on page 124	Prints a test pattern to let you verify that the paper feeding distance is correct and adjust it if necessary
Top & Bottom (Margin) Adjustment on page 125	Prints a test pattern to let you verify that the top, bottom, and side margins are correct and adjust them if necessary
Rear Sensor Position Adjustment on page 126	Prints a test pattern to let you verify that the distance from the rear paper-edge is detected correctly and adjust it if necessary

Table 5-7. Adjustment Menu Items (cont.)

LCD Message	Description
Test Print on page 127	Prints either a nozzle check or a list of all adjustment variables (parameters)
Clean Head (Drain Ink) on page 127	Drains all ink from the printer by flushing the printheads and ink delivery system
Counter Clear on page 128	Resets all counters in Table 5-11 on page 128

CAUTION

- **When conducting on-site service or repairs, do not select "Head Cleaning" as this requires a separate head cleaning cartridge to work properly.**
- **Select "Counter Clear" only when replacing the Waste Ink Pads along with all replaceable parts of Maintenance Assembly. See Maintenance Procedures on page 67.**
- **Unless otherwise indicated, you should not use costly roll paper to print the test patterns in this section. Use standard cut-sheet sizes, 11 × 17 inch or larger. For adjustments that require a high degree of precision (Bi-D and head angle adjustments), be sure to use coated ink jet paper.**

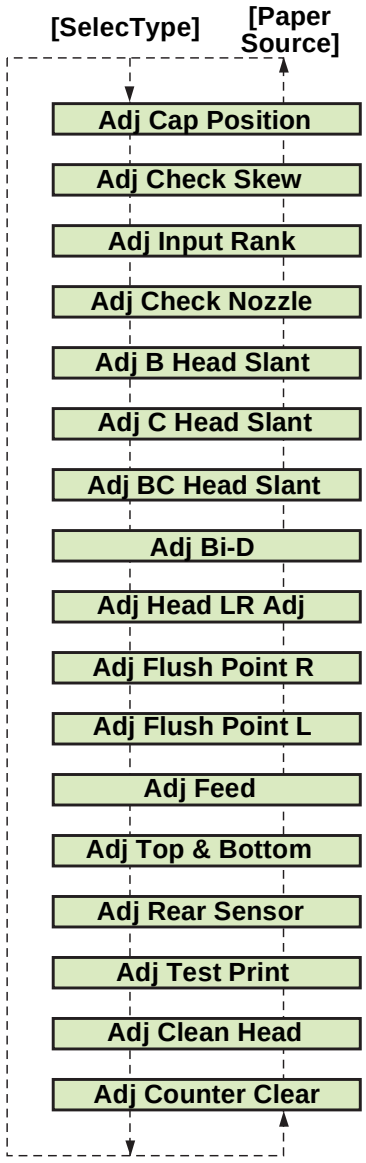
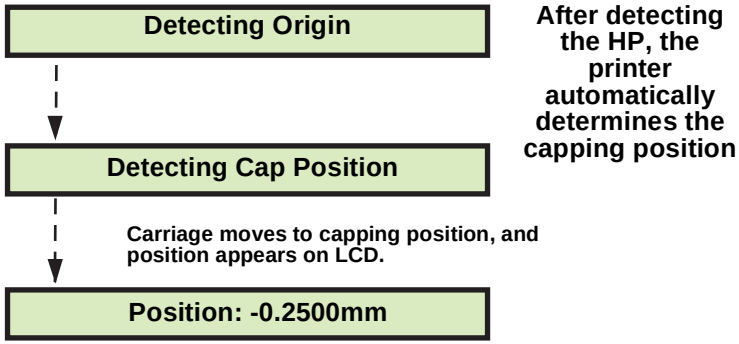


Figure 5-4. Adjustment Menu

CAP POSITION ADJUSTMENT

Use this function to automatically check and update the capping position as stored in printer's memory.

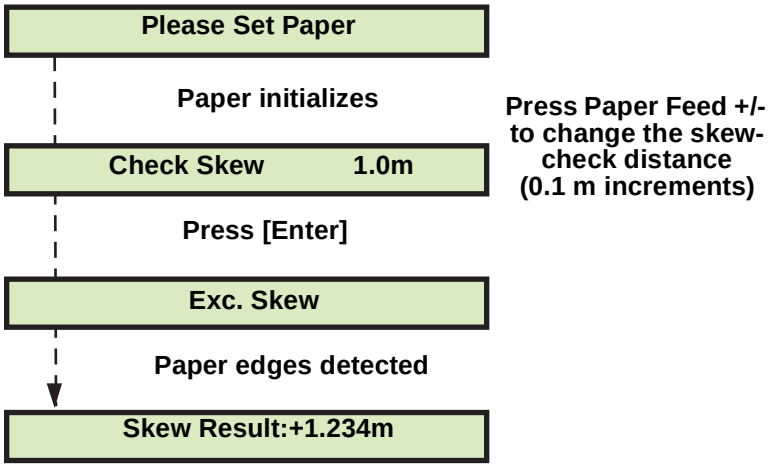
1. Make sure "Adj Cap Position" appears on the LCD and press the Enter button.
2. The printer begins the HP detection sequence and automatically detects the capping position.
3. After the adjustment process is finished, the detected distance between the HP and the capping position is displayed.
4. Pressing the Enter button updates the capping position parameter and displays the next menu item. Pressing the Pause button does not update the capping position parameter and returns you to the beginning of this function; Adj Cap Position appears on the LCD.



CHECK SKEW

This adjustment sets the vertical distance over which paper skew is measured in test prints. This adjustment is for service printouts only and does not affect user printouts.The standard distance is 1 meter; a smaller distance decreases the magnitude of detected skew-error.

1. Make sure "Adj: Check Skew" appears on the LCD and press the Enter button.
2. If the paper is not loaded, "Please Set Paper" appears and you need to load the paper.
3. After paper is loaded, "Check Skew 1.0m" appears. Use the Paper Feed +/- buttons to adjust the vertical distance over which skew is measured in increments of 0.1 m. Note that the distance you set must be less than the length of the paper, if using cut sheets.
4. After setting the distance, press the Enter button to begin the detection operation. After the skew is correctly detected, "Skew Result: xxxx" appears. A "+" before the number indicates the paper is skewed to the HP side; a "-" indicates the paper is skewed away from HP. Note that the result must be read in millimeters (even though the display indicates meters).



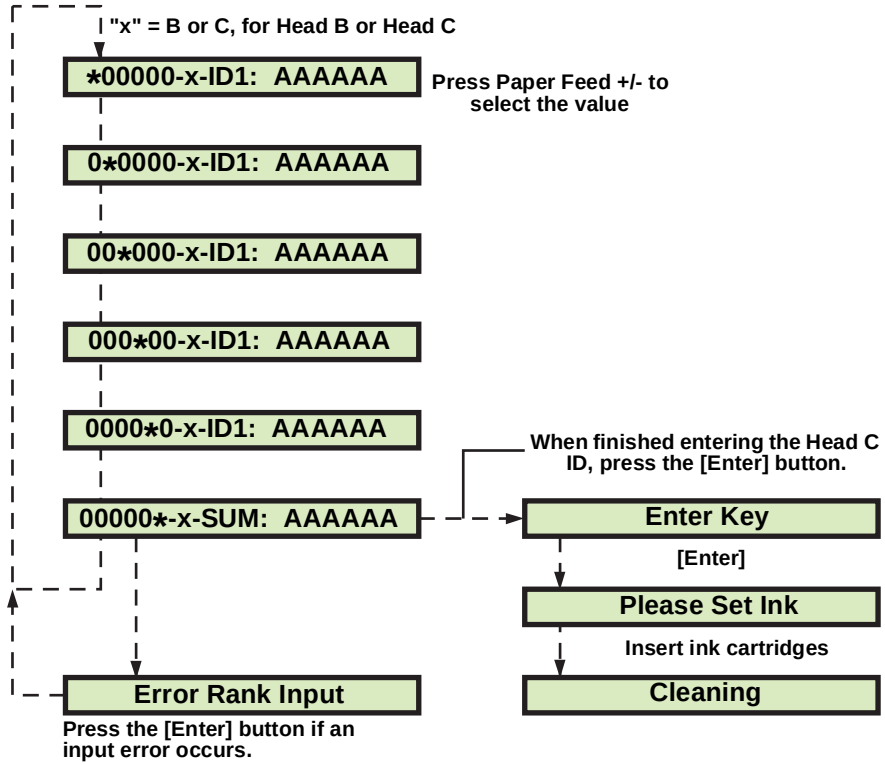
INPUT RANK (PRINTHEAD ID) ADJUSTMENT

This function allows you to write each printhead's ID to the main board.

NOTE: *Perform this adjustment whenever you replace a printhead. You don't need to perform this adjustment when replacing the main board, unless you replace the printheads along with it, or if you don't back up the parameters.*

1. Make sure "Adj: Input Rank" appears on the LCD and press the Enter button.
2. First enter the B head (K/C/M) ID. Press the Paper Feed +/- button to select the ID value. After correctly entering the Head B ID, press the Enter button to enter the Head C ID. If an out-of-range error ("Error Rank Input") occurs, press the Enter button and re-enter the ID.
3. After entering the head ID for both printheads, press the Enter button and "Enter Key" appears on the LCD. Press the Enter button again to write the printhead ID to the Main Board and begin the initial ink charge of the new heads.

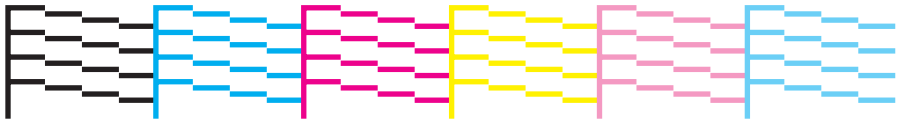
NOTE: If you did not replace the printheads, press the Pause button instead of the Enter button to skip the initial ink charge process. This saves ink.



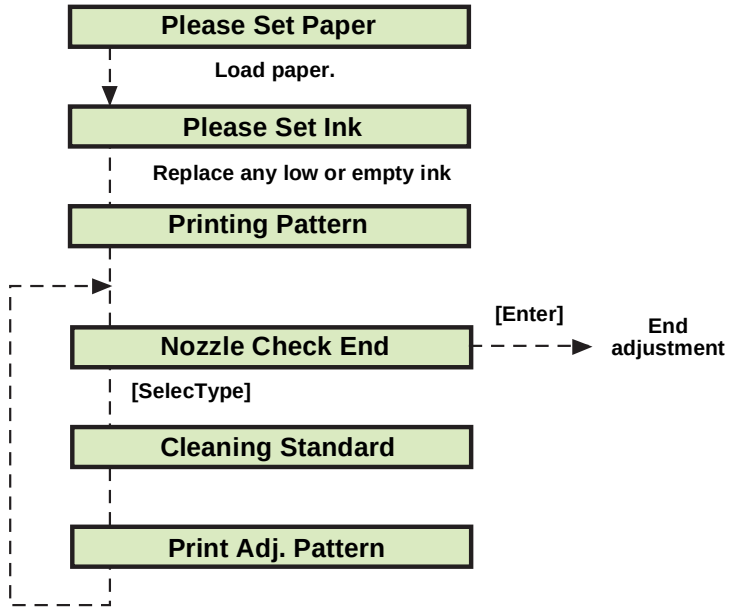
CHECK NOZZLE

Use this function to verify that the all nozzles are firing ink. If you notice missing lines or gaps, 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. The printer prints the following check pattern:



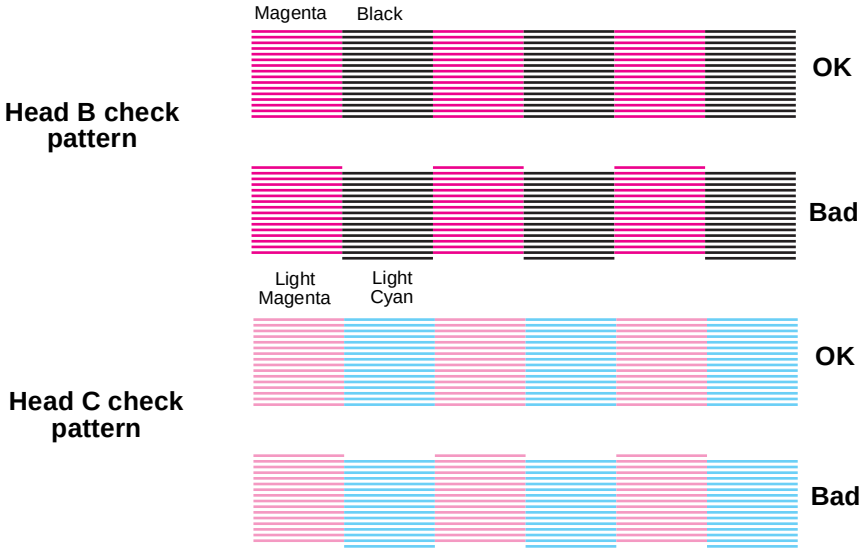
   The pattern includes the following colors from left to right: black, cyan, magenta, yellow, light magenta, and light cyan.
3. When the check pattern finishes printing, "Nozzle Check End" appears on the LCD. If the pattern printed all six colors properly with no missing dots or lines, press the Enter button to end this adjustment procedure. Otherwise, press the SelecType button to start the cleaning cycle.



B HEAD SLANT/C HEAD SLANT ADJUSTMENT (HEAD ANGLE)

This function prints a check pattern that lets you adjust each printhead straight up-and-down. If the pattern shows staggered or uneven lines, the printhead is misaligned. Use the printhead's adjusting lever as shown in Figure 5-5 to straighten it out.

1. Make sure "Adj: x Head Slant" appears on the LCD, and press the Enter button (x = B or C depending on the printhead).
2. Load paper if not already loaded.
3. The check pattern prints and "x Slant Check End" (x = B or C head) appears in the LCD. Compare the printed pattern with the illustration below.
   - Press Enter if the adjustment is correct like the top rows shown below.
   - If the adjustment is incorrect, open the front cover, release the carriage lock by hand, and move the carriage away from home position. Loosen the screw securing the head that is printing at a slant, and then move the Head Adjust Lever left or right depending on the slant direction. Tighten the screw and print another test pattern to check the adjustment.



4. After adjusting both heads, move the carriage back to the capping position by hand and close the front cover. Make sure "x Slant Check End" appears, and press Enter to conclude the adjustment.

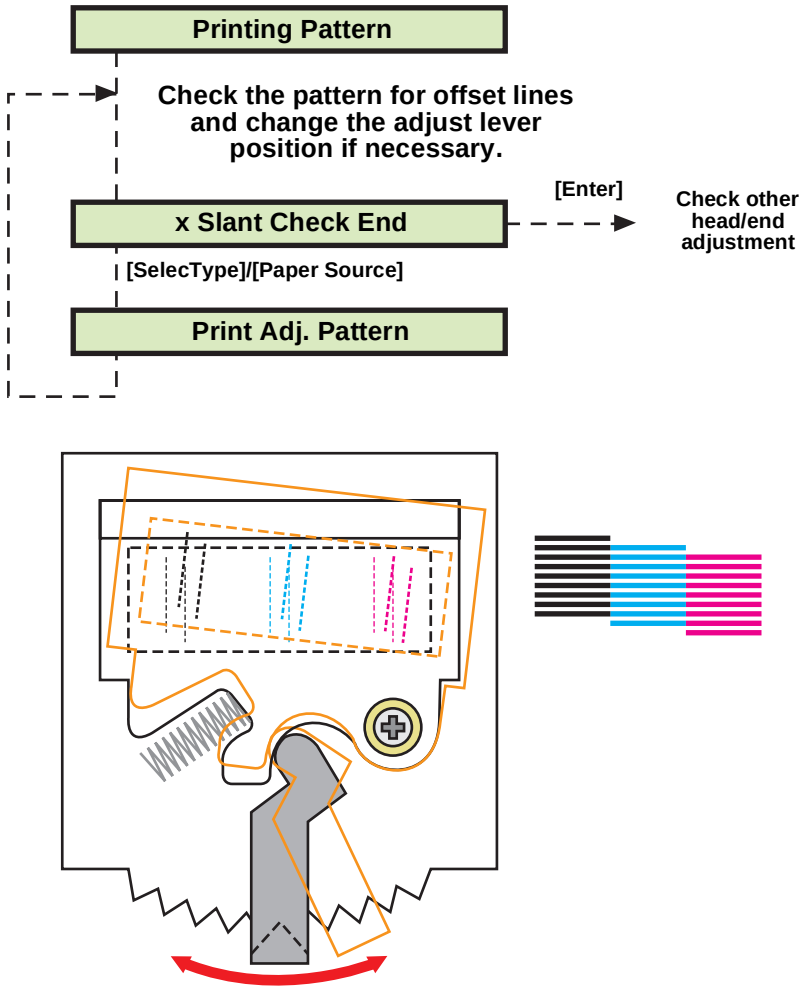


Figure 5-5. Printhead Skew Adjust Lever

BC HEAD SLANT ADJUSTMENT (HEAD HEIGHT)

This function prints a check pattern that lets you adjust the vertical alignment of Head C in relation to Head B. If the lines in the test pattern are not aligned, you need to reposition Head C using the Head Adjust Lever shown in Figure 5-6.

1. Make sure "BC Head Slant" appears on the LCD, and press Enter.
2. Load a sheet of paper into the printer. The test pattern automatically prints.
3. Compare the printed pattern with the illustration below.
   - Press Enter if the adjustment is correct like the top row.
   - Otherwise, if the lines are staggered or uneven, open the front cover, release the carriage lock by hand, and move the carriage away from home position. Loosen the screw securing Head C, and move the Head Adjust Lever left or right. Tighten the screw and then print another test pattern to check the adjustment.

4. When done, make sure "BC Slant Check End" appears and press Enter. Return the carriage to the capping position by hand and close the front cover.

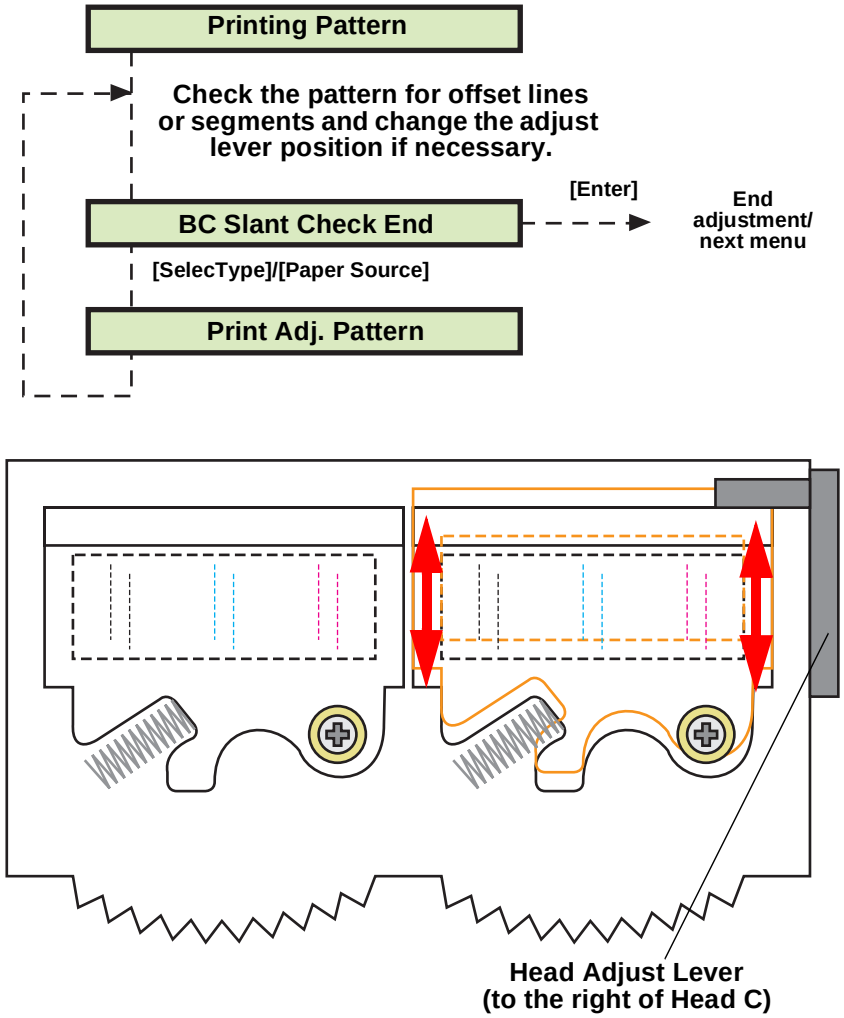


Figure 5-6. BC Slant Adjust Lever

BI-D ADJUSTMENT

This function electronically adjusts the Bi-D print timing for both printheads. The printer prints a test pattern, and lines that do not line up vertically indicate that the Bi-D setting needs adjustment. You must check the Bi-D setting for each of the following modes:

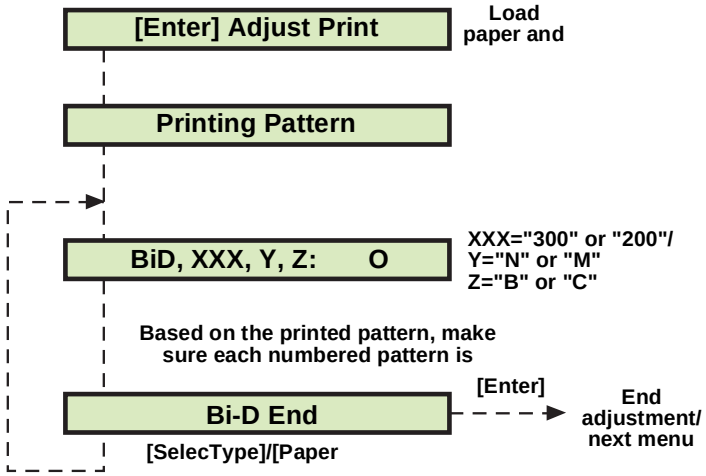
Table 5-8. Bi-D Adjust Modes

Mode	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: “Number” refers to the numbered pattern on the printed Bi-D test pattern.

1. Make sure "Bi-D" appears on the LCD, and press the Enter button.
2. Load a sheet of paper into the printer and press Enter.
3. All the test patterns print, and "BiD, 200, N, B: xxx" appears on the LCD.
4. Check the vertical alignment of the lines on the printed test pattern. In patterns 1-5 and 7, the lines should line up vertically. In patterns 6 and 8, the printed blocks should have even edges as shown in Figure 5-8.
   - If all the lines are correctly lined up as in the above sample, press SelecType or Item until "BiD End" appears on the LCD, and then press Enter to finish.

     NOTE: “BiD End” may appear as the following string of garbled characters: “BiD ïüñ∝ßñ: 0”
   - If some lines are not aligned, select the numbered pattern using the SelecType or Item button and then press Enter. Then use the Paper Feed +/- buttons to correct the pattern as shown in the figures at right. Press Enter to print another test pattern using the setting you just made.
5. Repeat the steps until all numbered patterns are aligned.



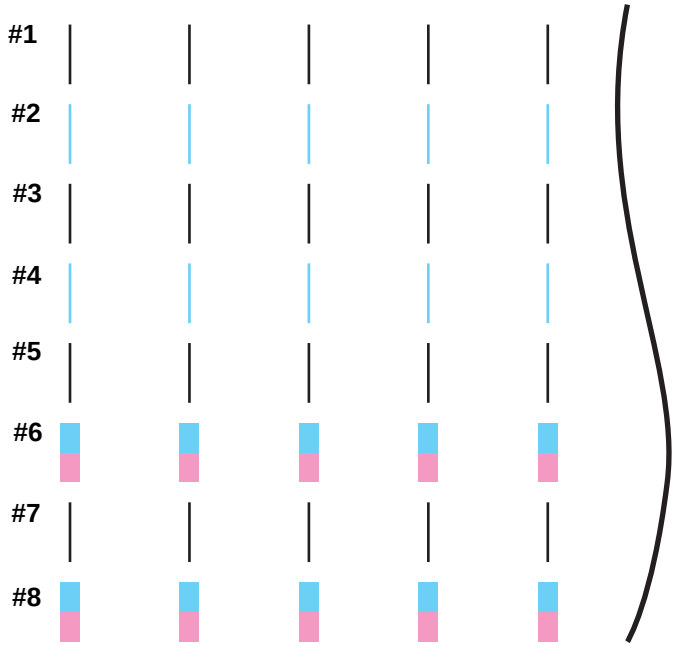


Figure 5-7. Bi-D Adjustment Test Pattern

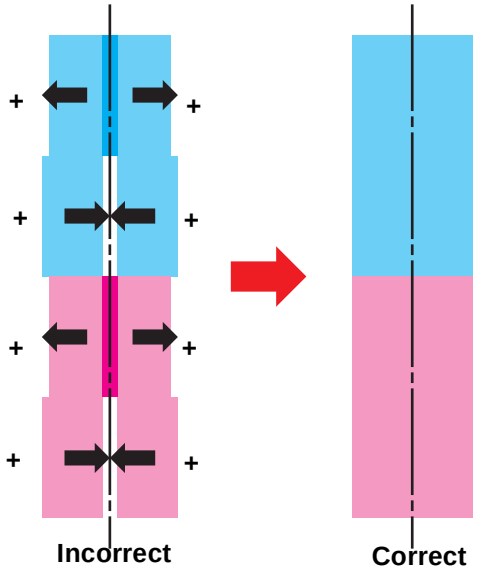


Figure 5-8. Bi-D Adjustment for Patterns #6 and #8
(pressing Paper Feed + corrects the pattern on the left)

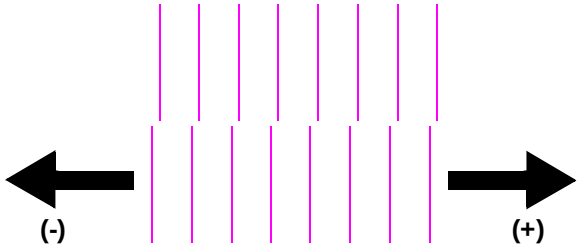


Figure 5-9. Bi-D Adjustment for Patterns 1-5 and 7
(pressing Paper Feed + shifts the lower row to the right)

HEAD LR ADJUSTMENT (HEAD GAP TIMING)

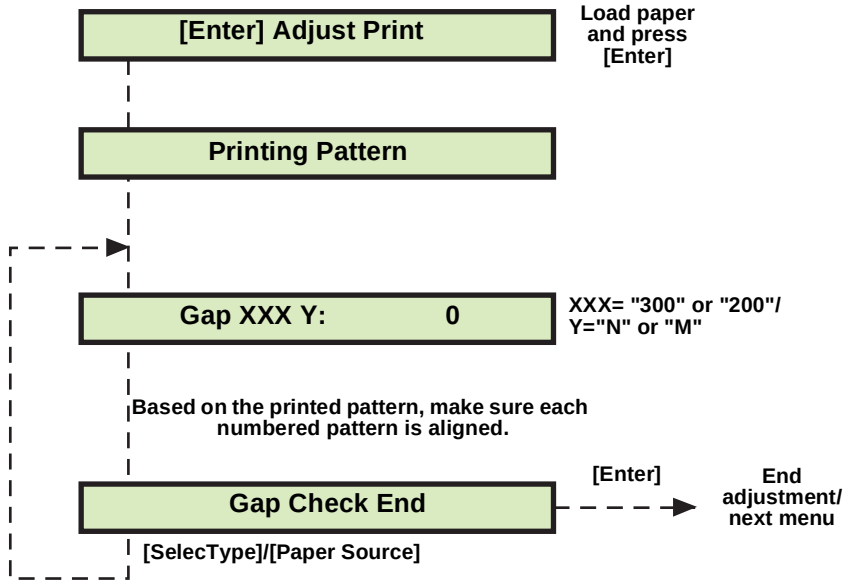
This function electronically compensates for the gap between Head B and Head C. By referring to the printed test pattern, check the adjustment setting and make any needed corrections in each of the following modes:

Table 5-9. Head Gap Adjustment Mode

Mode	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: “Number” refers to the numbered pattern on the printed Head Gap test pattern.

1. Make sure "Adj: Head LR Adj." appears on the LCD, and press Enter.
2. Load paper if not already loaded and press Enter.
3. All the patterns print, and "Gap, 200, N: xxx" appears on the LCD.



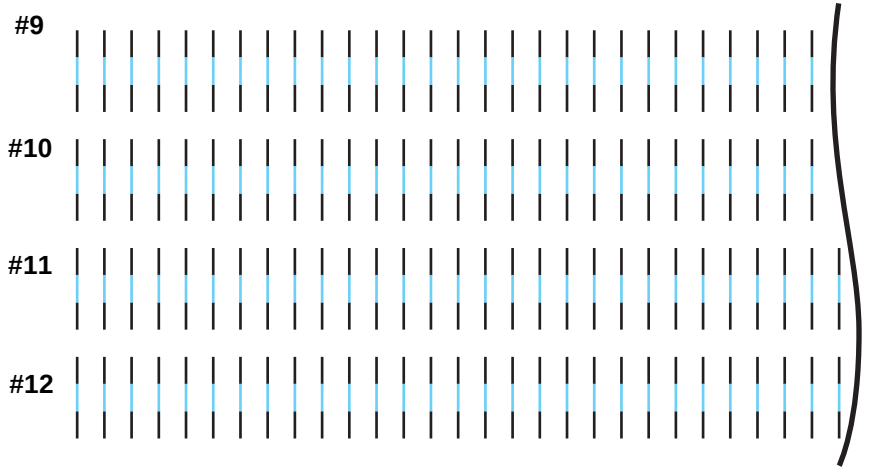


Figure 5-10. Gap Adjustment Test Pattern

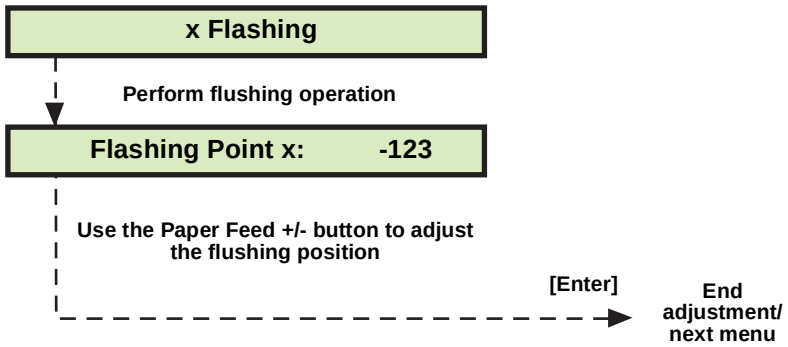
4. Check the alignment of the lines on the printed test pattern.
   - If all the lines are correctly lined up as in the above sample, press SelecType or Item until "Gap End" appears on the LCD, and then press Enter to finish.

     NOTE: “Gap End” may appear as the following string of garbled characters: “Gap ïüñ∝ßñ: 0”
   - If some lines are not aligned, select the numbered pattern using the SelecType or Item button and then press Enter. Then use the Paper Feed +/- buttons to correct the pattern. Press Enter to print another test pattern using the setting you just made.
5. Repeat the steps until all numbered patterns are aligned.

FLUSH POINT RIGHT AND LEFT ADJUSTMENT

This function adjusts the position of the carriage to make sure it's properly positioned over the right or left flushing box during flushing.

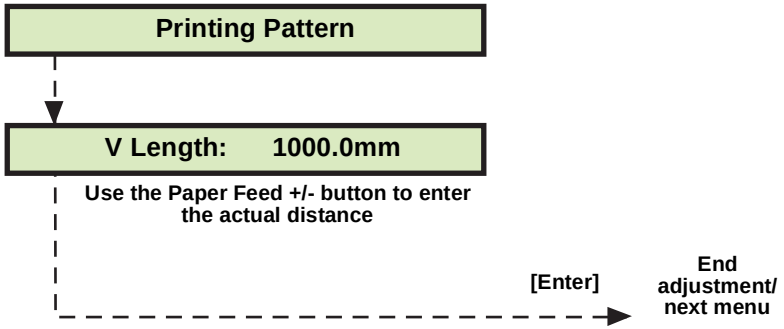
1. Tape a piece of paper over the flushing box you intend to test.
2. Make sure "Adj. Flash Point x" ("x" = R or L) appears in the LCD, and press the Enter button.
3. The carriage moves to the flushing position and begins flushing.
4. After flushing is finished, "Point x NNN" ("x" = R or L, NNN = numeric position) appears. Check the piece of paper you put over the flushing box to make sure ink went into the box. If no ink spilled outside the box, press the Enter button to finish. Otherwise, press the Paper Feed +/- buttons to correct the flushing position. The setting is adjusted as follows:
   Correction distance: One press = 1/720 inch
   Direction: "+" = toward HP and "-" = away from HP



FEED ADJUSTMENT

This function adjusts the printer's ability to keep track of the distance it feeds paper.

1. Make sure "Adj. Feed" appears on the LCD, and press the Enter button.
2. Load roll paper into the printer, and press Enter. Note that you must use roll paper for this adjustment because the printed pattern is 1 meter long.
3. The printer prints a check pattern while feeding the paper at a fixed distance.
4. After the pattern is printed, "V Length 1000.0mm" appears. Using a ruler, measure the printed pattern from the top line to the bottom line. For more accurate measurement, use a ruler with a Vernier scale attached. Then enter this measurement using the Paper Feed +/- buttons in 0.1 mm increments.
5. After entering the measurement, press Enter to finish.



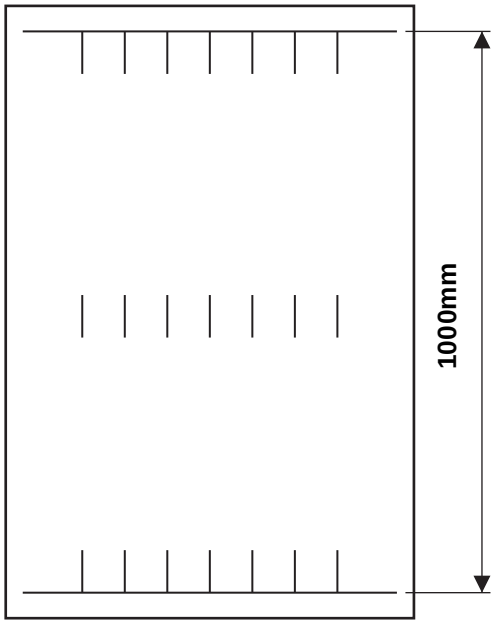
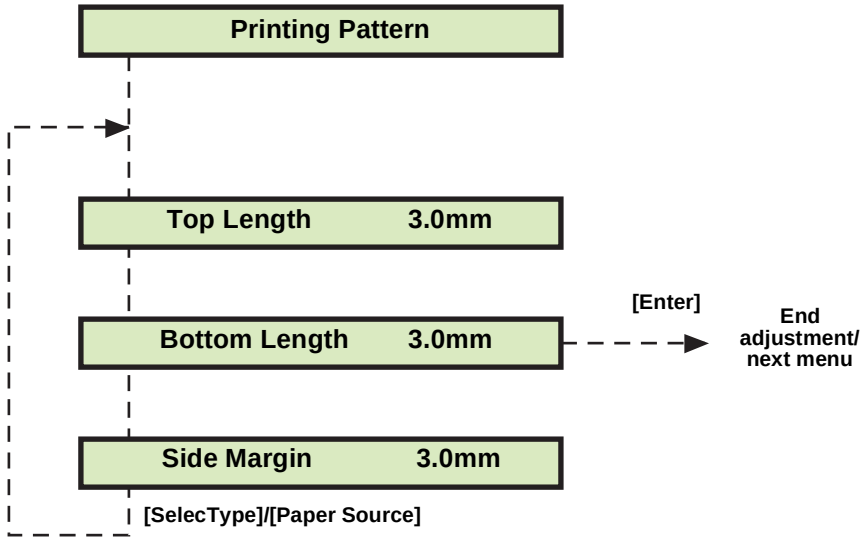


Figure 5-11. Feed Distance Check Pattern



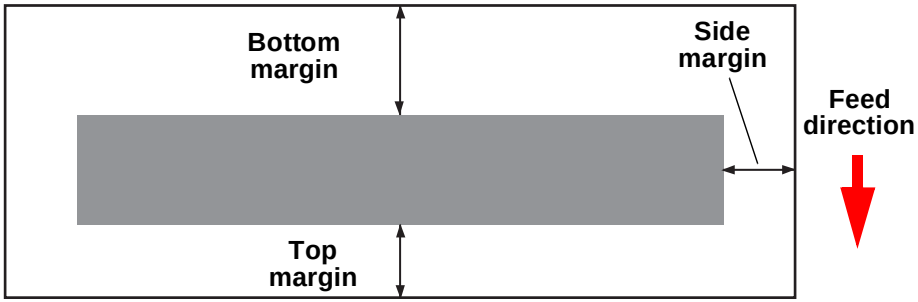


Figure 5-12. Margin Adjustment Pattern

TOP & BOTTOM (MARGIN) ADJUSTMENT

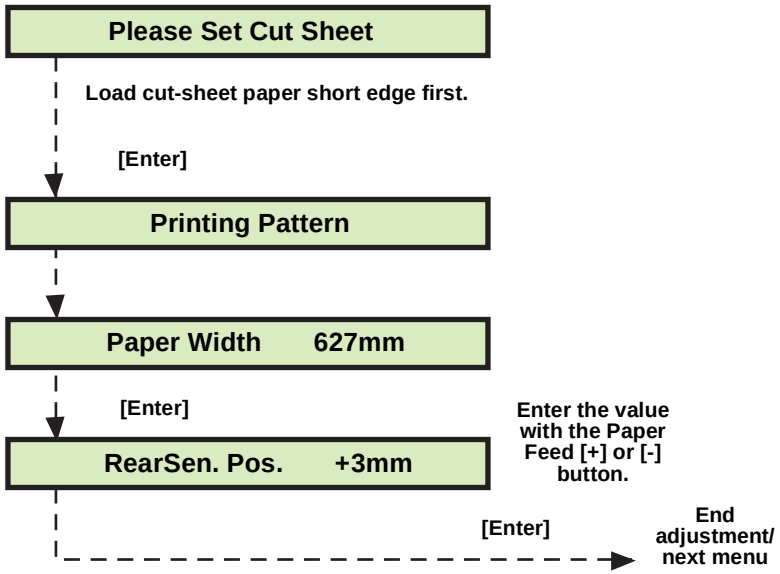
Use this function to adjust the top, bottom, and side margins.

1. Make sure "Adj. Top & Bottom" appears, and press the Enter button.
2. Load a sheet of paper if not already loaded, and press Enter.
3. The printer prints a check pattern and cuts off the paper at a predetermined position.
4. After the printing operation is finished, measure the top, bottom, and right (HP) side margins using a ruler. Press the Paper Feed +/- buttons to enter each of these measurements in 0.1 mm increments when prompted.
5. After entering the measurements, press the SelecType or Item button until "Bottom Length xx.xmm" appears, and then press Enter to finish.

REAR SENSOR POSITION ADJUSTMENT

This function makes sure the Rear Paper Sensor correctly detects the rear edge of cut-sheet paper. After the printer makes a line near the rear edge of the paper, measure the distance from the line to the paper's edge, and then enter this measurement when prompted.

1. Make sure "Adj Rear Sensor Pos." appears, and press the Enter button.
2. When you see the "Please Set Cut Sheet" message, load a sheet of cut-sheet paper, short edge first. After the paper is set, 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 0.1 mm using the Paper Feed +/- buttons.
4. After entering the measurement, press Enter.



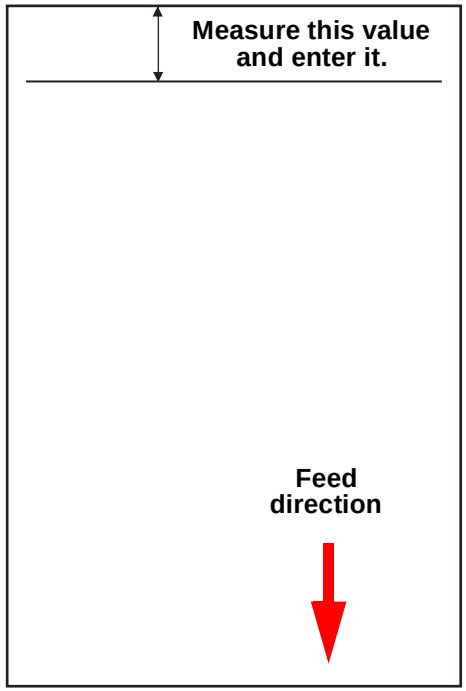


Figure 5-13. Rear Sensor Position Measurement

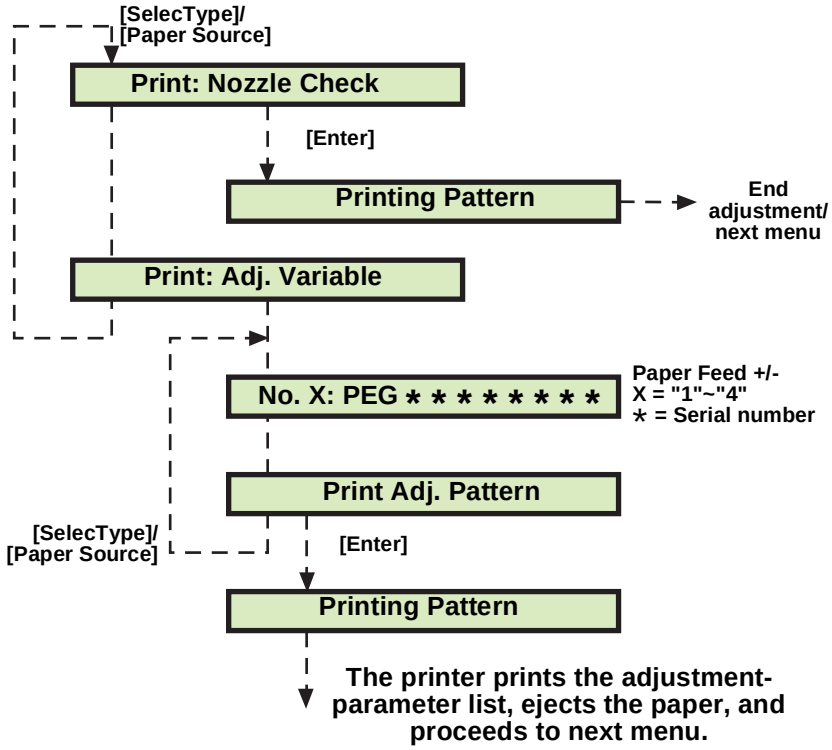
TEST PRINT

This function lets you print all the check patterns used in making adjustments as covered in this chapter. It also lets you print a list of the current settings of all the adjustments.

Table 5-10. Printed Items in the Test Print

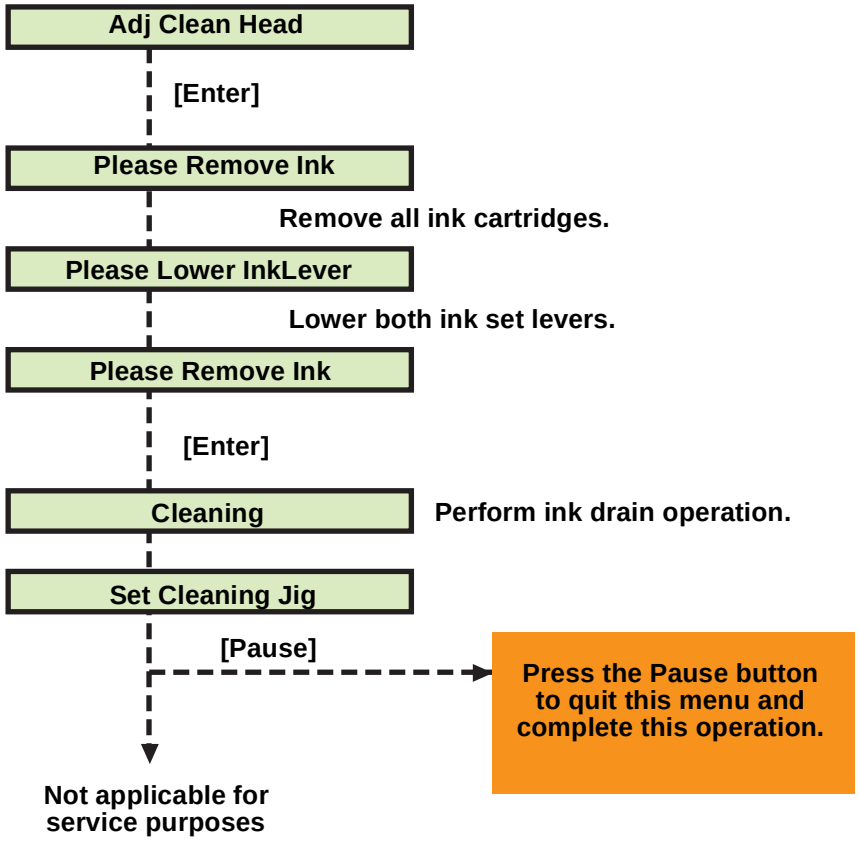
Item	Description
Nozzle Check	Prints all of the check patterns.
Adjustment Variables	Prints a list of all adjustment settings.

To print the list of adjustment variables, 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.



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.



CAUTION

After draining the ink and performing any necessary operations such as moving the printer, be sure to perform the initial ink charge as described in Cleaning menu on page 128, or reset the initial ink charge flag as described in Update on page 129.

COUNTER CLEAR

This function resets all the counters stored in memory on the Main Board to their original condition. Remove the old ink cartridges before resetting the counters; when you turn on the printer, the printer prompts you to install new cartridges.

If you need to reset counters individually, see **Maintenance Mode 2** on page 17.

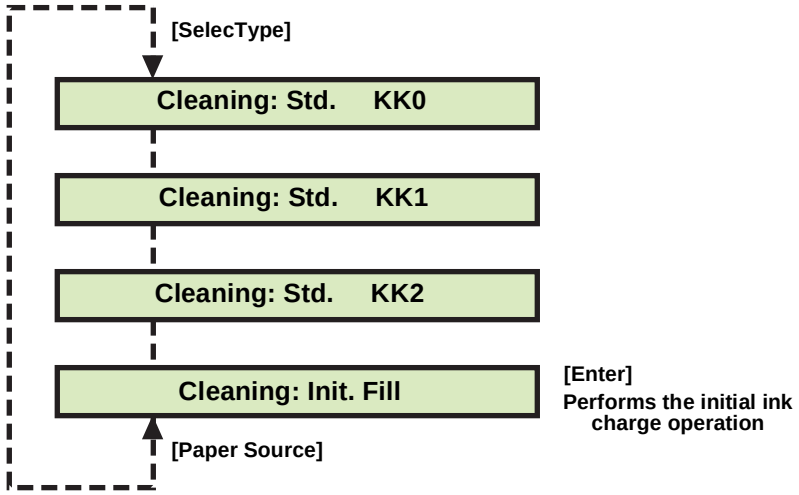
Table 5-11. Counters Reset by "Counter Clear"

Counter	Reset Value
Protection Counter A/B (for waste ink pads)	0
Ink Volume Counter Rb/ Ry/ Rx Rz	0
Consumed Ink Counter Cb/ Cy/ Cm/ Cc/ Cml/ Ccl	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.

5.3.5 Cleaning menu

Using this menu, you can select a cleaning mode and start that cleaning operation. You can also cause the printer to perform the initial ink charge operation without resetting the initial ink charge flag.



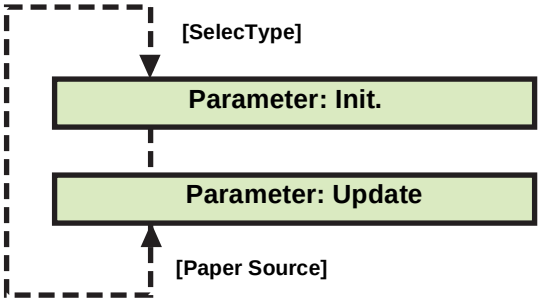
- ❑ Std. KK0 (CL1)
  Normal cleaning cycle — Volume of ink cleared = low
- ❑ Std. KK1 (CL1')
  Strong cleaning cycle — Volume of ink cleared = medium, Rubbing = off
- ❑ Std. KK2 (CL2)
  Strong cleaning cycle — Volume of ink cleared = high, Rubbing = on
- ❑ Init. Fill — Perform initial ink charge sequence

5.3.6 Print menu

The Print menu performs the same functions as the "Test Print" option on the Adjustment menu. For details, see **Test Print** on page 127.

5.3.7 Parameter menu

Using this menu, you can initialize various maintenance records and update (modify) various parameters (adjustment settings). Note that the parameters on this menu can also be modified from the Adjustment menu. You do not need to update the parameters from both menus.



INITIALIZE

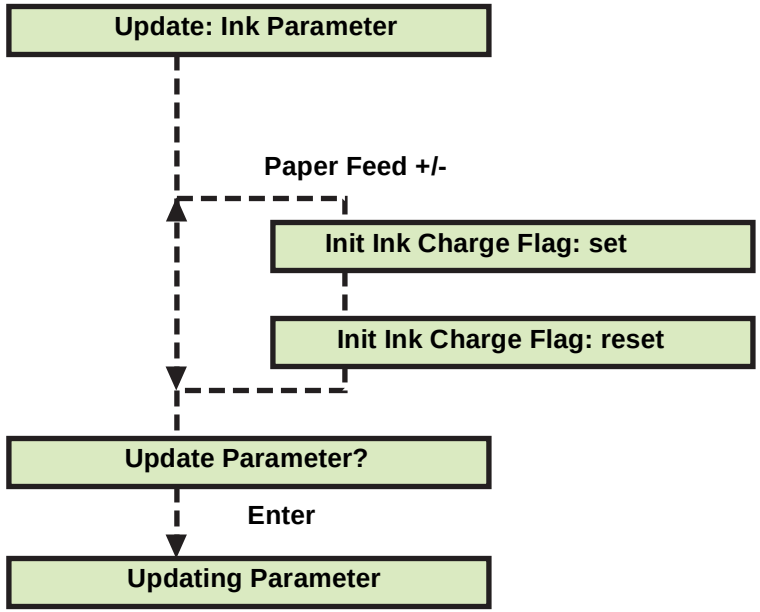
Use this menu to reset (re-initialize) any or all of the items listed below.

- ❑ All
- ❑ Ink Lever C record
- ❑ Ink Lever B record
- ❑ Cover record
- ❑ Lever record
- ❑ PF Motor record
- ❑ CR Motor record
- ❑ Waste Ink record
- ❑ Wiper record
- ❑ C Head record
- ❑ B Head record
- ❑ Serial Number
- ❑ PF Resolution
- ❑ Capping Mechanism

UPDATE

The items you can update are listed below. When you turn the printer off, the new values are stored in flash memory on the printer's main board.

- ❑ Capping Position
- ❑ Head Rank (Printhead ID)
- ❑ Print Position Items (Bi-D and Gap adjustments)
- ❑ Paper Feed Distance
- ❑ Mechanical Parameters (adjustment settings)
- ❑ Ink Parameters
  Lets you reset the Initial Ink Charge flag, causing the printer to perform the initial ink charge the next time it's turned on.



5.4 Mechanical Adjustments

This section describes the mechanical adjustments you need to perform when replacing or removing certain parts.

CARRIAGE COVER HEIGHT ADJUSTMENT

Perform this adjustment whenever you remove the carriage cover. The adjustment sets the travel distance of the cutter blade.

1. Release the Carriage Lock and move the Carriage away from home position.
2. Loosen (but do not remove) the two screws securing the Carriage Cover to the Carriage Assembly.
3. Set the Carriage Cover Position Adjustment Tool on the Subplaten (the upper surface of the Lower Paper Guide) as shown in **Figure 5-14**.
4. Move the Carriage over the tool so that the Cutter Blade fits into the indented gutter of the tool as shown in the figure at right.
5. Push the Carriage Cover down snugly against the Cutter Blade so that the Cutter Blade pushes down against the adjustment tool.
6. Tighten the two Carriage Cover screws, and then return the Carriage to home position.

NOTE: *The standard height from the cutter's bottom surface to the subplaten's upper surface is 9.75 ± 0.25 mm.*

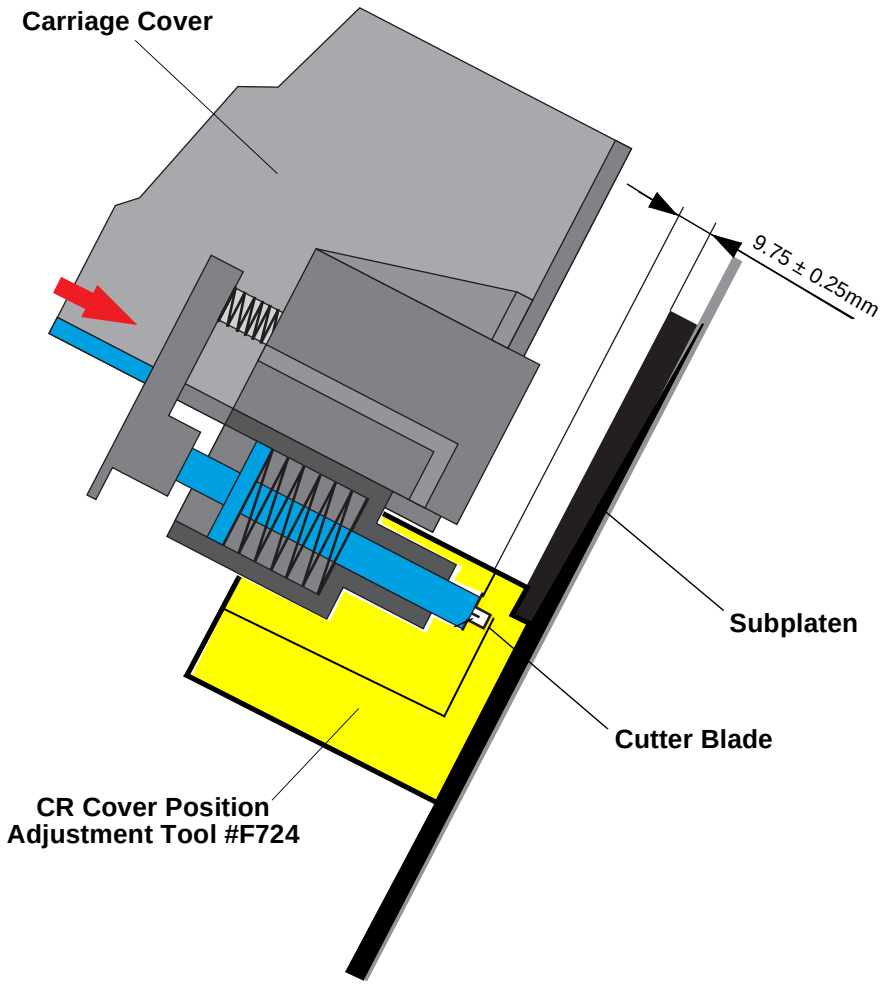


Figure 5-14. Carriage Cover Position Adjustment Tool

CUTTER POSITION ADJUSTMENT

Perform this adjustment whenever you remove the Lower Paper Guide. The upper part of the Lower Paper Guide (the Subplaten) and the Cutter must be aligned properly for the cutting operation to work. The position of the Lower Paper Guide is most likely to be correct if it's pushed all the way up during installation; but you still need to perform this adjustment as a check.

1. Load a sheet of paper in the printer and lock it in place by lowering the Paper Release Lever.

   NOTE: *If using cut sheets or narrow roll paper, you'll have to perform this adjustment three times with the paper positioned on the left, right, and middle portions of the platen.*

2. Release the Carriage Lock and slide the Carriage over to the edge of the paper.
3. While pressing the Cutter down by hand, move the Carriage across the paper to make a cut.
4. Measure the distance between the paper cut and the ridge of the Subplaten as shown in **Figure 5-15**. It should be approximately 0.02 inch (0.5 mm) all the way across. The acceptable distance is approximately 0.01-0.03 inch (0.5-0.7 mm).
5. If using cut sheets, be sure to perform the measurement at all three positions.
6. If the distance between the Cutter and the Subplaten is incorrect, loosen the screws securing the Lower Paper Guide, adjust its position, retighten the screws, and check the Cutter's operation again.
7. When done, return the carriage to home position.

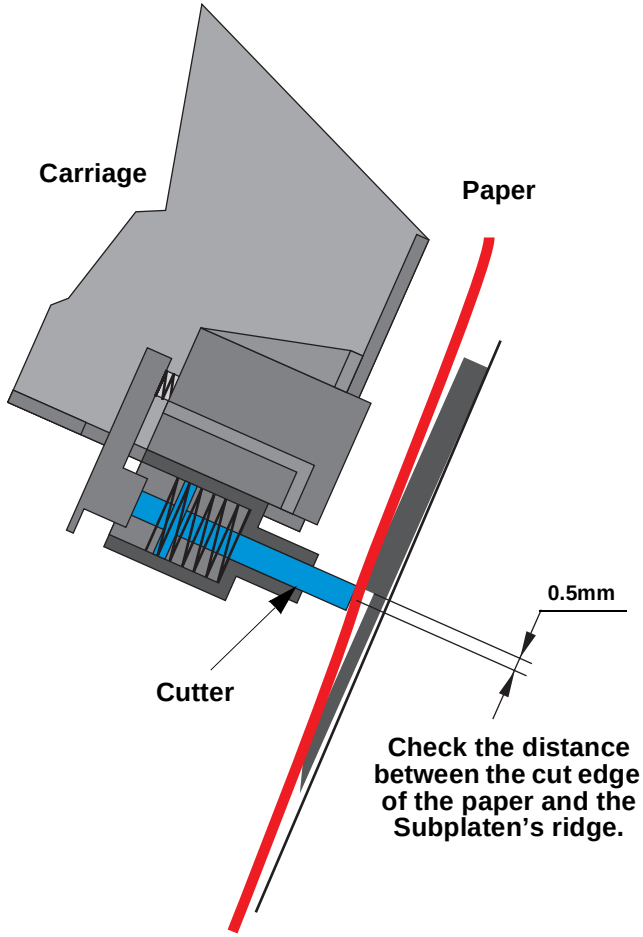
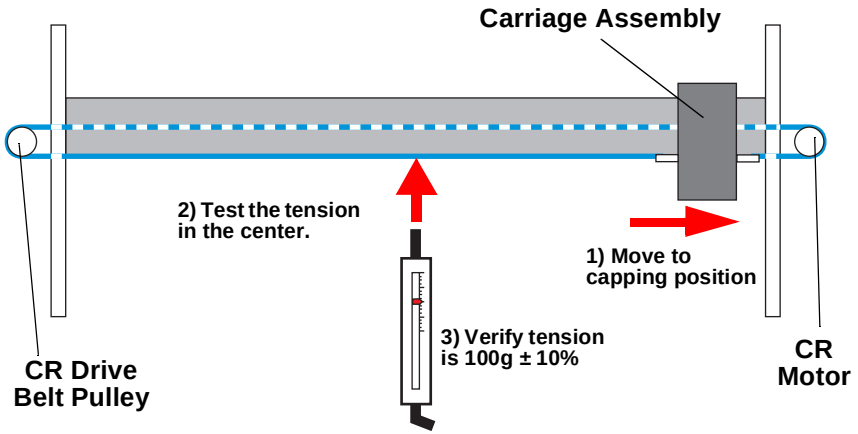


Figure 5-15. Cutter Position Check

CARRIAGE BELT TENSION ADJUSTMENT

Perform this adjustment whenever you remove or loosen the CR Motor or CR Belt.

1. Make sure the Carriage is in home position.
2. Apply the tip of the tension gauge to the underside of the CR Belt in the middle of the printer. While stabilizing the belt with your free hand, push the gauge far enough up so that the belt presses firmly against the underside of the Carriage Guide Rail. You can also place a piece of double-backed tape on the belt while making the measurement to help hold the tip of the gauge in place.
3. Carefully lower the gauge just until the belt loses contact with the underside of the Carriage Guide Rail. The belt tension is correct if the gauge reads 3.5 oz (100 g) ± 10%.

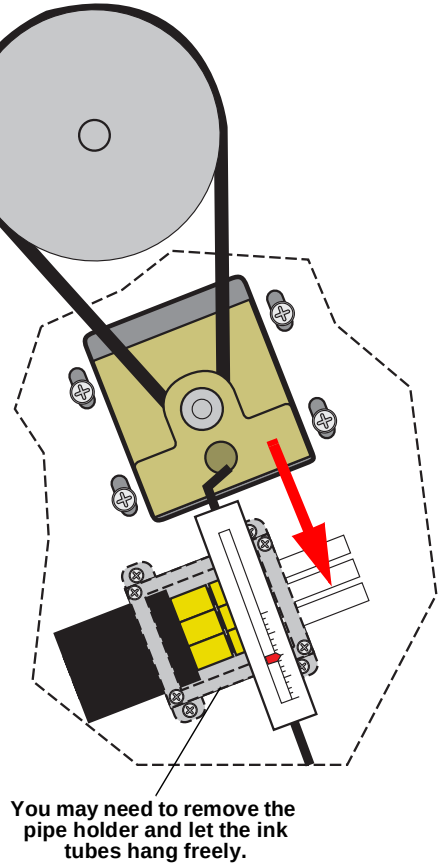


4. If the belt's tension is not correct, adjust the tensioning screws on the CR Drive Belt Pulley located on the left side of the printer. See Figure 4-29 on page 75. Then recheck the tension.

PF BELT TENSION ADJUSTMENT

Perform this adjustment whenever you remove or loosen the PF Motor or PF Belt.

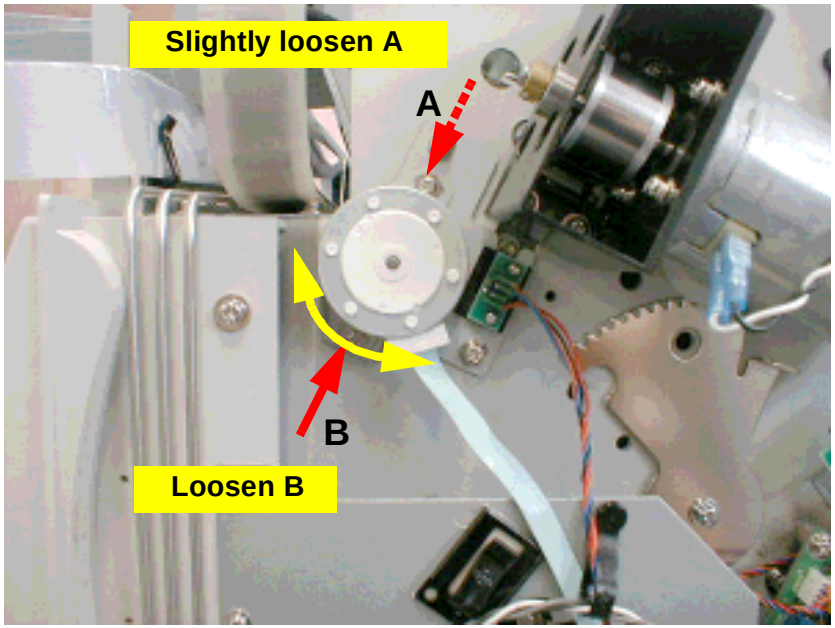
1. Loosen the four screws securing the PF Motor assembly to the printer.
2. Hook the tension gauge in the PF Motor Mounting Bracket, and pull it away from the bracket as shown below. If the ink tubes are in the way, you can remove the pipe holder and let the ink tubes hang freely.
3. The adjustment is correct when the gauge reads 7.7 lb (3500 g) ± 10%. Retighten the screws to complete the adjustment.



PLATEN GAP GEAR BACKLASH ADJUSTMENT

Perform this adjustment whenever you remove or re-install the PG Motor.

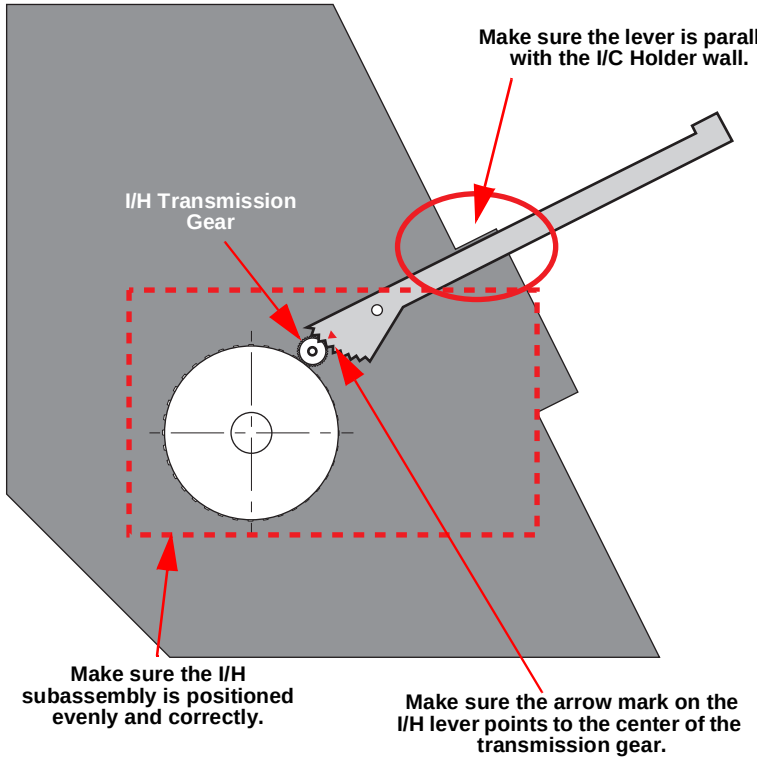
1. Slightly loosen screw A as shown and fully loosen screw B.
2. Adjust the position of the motor by pivoting it at screw A so that the gear turns smoothly when rotated by hand.
3. Retighten the screws.



I/H LEVER POSITION ADJUSTMENT

Perform this adjustment whenever you remove the I/H subassembly, which is located inside the Ink Cartridge Holder.

1. Raise the I/H Lever and check that the arrow mark on it points toward the center of the transmission gear as shown below.



2. Also make sure that the I/H subassembly is positioned evenly and correctly, and that the lever is parallel with the wall of the I/C Holder.

PAPER THICKNESS SENSOR ADJUSTMENT

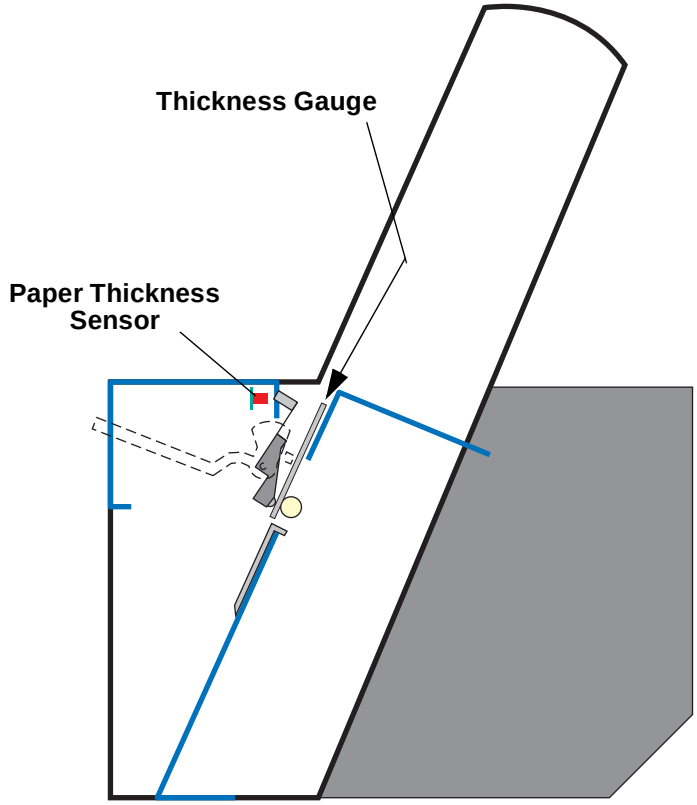
Perform this adjustment whenever you remove or replace the Paper Thickness Sensor.

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 on the LCD, and then press the Enter button.
3. Press the SelecType or Item button until "Test: Sensor" appears, and then press Enter.
4. Press the SelecType or Item button until "Sen: Paper xxxx" appears.
5. Raise the Paper Release Lever, and then verify that "Sen: Paper Thick" appears on the LCD.
6. Insert a thickness gauge near home position between the PF Roller and the Paper Pressure Rollers, and then lower the Paper Release Lever to hold the gauge in place.
7. The LCD message should vary according to the size of gauge as shown in the table below:

Table 5-12. Paper Thickness Sensor Check

Thickness 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, loosen the screws securing the sensor assembly to the printer frame, reposition the sensor, tighten the screws, and check the sensor again.



COVER OPEN SENSOR ASSEMBLY (RIGHT AND LEFT)

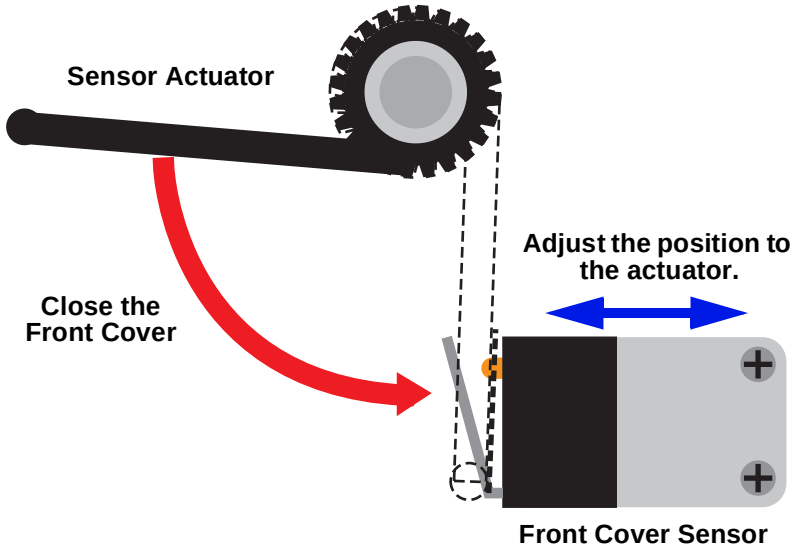
If you remove or replace the Front Cover, it's a good idea to check the operation of the Cover Open sensors as described below.

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 on the LCD, and then press the Enter button.
3. Press the SelecType or Item button until "Test: Sensor" appears on the LCD, and then press Enter.
4. Press the SelecType or Item button until "Sen: Cover xxxx" appears.
5. While opening and closing the Front Cover, check that the LCD display changes depending on the Front Cover position:

Table 5-13. Cover Open Sensor Check

Front Cover	LCD Message
Open	Sen: Cover Open
Closed	Sen: Cover Close

6. If the correct message does not appear, adjust the sensor position as shown in the figure at right, and then retest its operation.



CAUTION

Make sure both Front Cover sensors are on when the Front Cover is closed.

SENSOR TRIMMER ADJUSTMENT

After replacing the C277MAIN board, you need to adjust the sensitivity of three sensors: Paper Edge Sensor, Front Paper Sensor, and Rear Paper Sensor. You also need to perform this adjustment if you replace one or more of these sensors (perform the adjustment only for the sensors that you replace).

To perform the adjustment, you need to access variable resistors VR1-VR3 on the Main Board (see the figure at right). Remove the access plate on top of the Upper Paper Guide (see **Figure 4-13** on page 64). Enter the Self-Diagnostic Mode (see **Using the Self-Diagnostic Mode** on page 108), select "Test Menu," and then select "Sensors" (see **Sensors** on page 112). Then follow the instructions below for each sensor that you need to adjust.

CAUTION

When making this adjustments, avoid strong light (such as sunlight) near the printer. These sensors are photo-sensitive and do not function properly under strong lighting.

☐ **Paper Edge Sensor**

1. Move the carriage left and right manually and make sure that the signal level indicated on the LCD is smaller than 18H (hexadecimal value).
2. Place a sheet of coated ink jet paper in the paper path, and lower the Paper Release Lever to lock the paper in position.
3. Move the carriage over the paper so that the Paper Edge Sensor is located in the middle of the paper.
4. Adjust VR1 on the Main Board so that the signal level indicated on the LCD is 80H ±8H (between 78 and 88, hex).

☐ **Front Paper Sensor**

1. As above, make sure that the signal level indicated on the LCD is smaller than 18H.
2. Place a sheet of coated ink jet paper in front of the Front Paper Sensor located on the Lower Paper Guide; lower the Paper Release Lever to lock the paper in position.
3. Adjust VR2 on the Main Board so that the signal level indicated on the LCD is 87H ±8H (between 7F and 8F, hex).

☐ **Rear Paper Sensor**

1. As above, make sure that the signal level indicated on the LCD is smaller than 18H.
2. Place a sheet of coated ink jet paper over the Rear Paper Sensor located in the Upper Paper Guide, and hold it in place or secure it with tape.
3. Adjust VR3 on the Main Board so that the signal level indicated on the LCD is 8AH ±8H (between 82 and 92, hex).

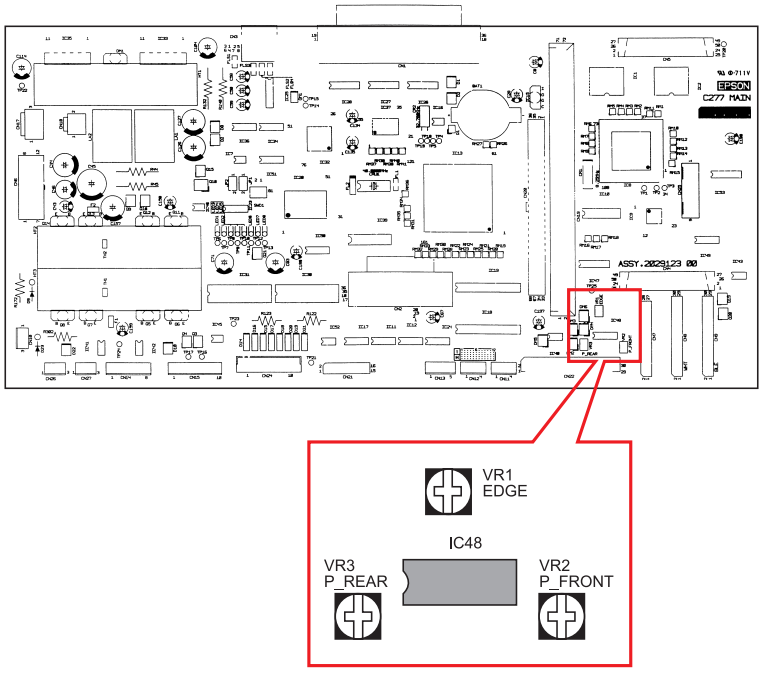


Table 5-14. Sensor Adjustment Values

Sensor	Without Paper	With Paper
Paper Edge Sensor	18H or less	80H ±8H
Front Paper Sensor	18H or less	87H ±8H
Rear Paper Sensor	18H or less	8AH ±8H

CHAPTER

6

MAINTENANCE

6.1 Overview

When servicing the printer, you need to perform certain routine inspection and maintenance procedures:

- ❑ **Examine the parts listed in Physical Inspection and Cleaning on page 138 and perform any maintenance as needed.**
- ❑ **Check the printer's maintenance counters as described in Checking and Clearing Counters on page 139. If a part is at or near the end of its life, replace it as instructed and clear the corresponding counter.**

If the printer displays a Service Call or Maintenance Call error, a part may need to be replaced; see **Service Error Codes and Replaceable Parts** on page 143.

If an Ink Out light is flashing or on, see **Ink Cartridge Replacement** on page 144.

If you notice that the paper doesn't cut cleanly, the cutter blade may need to be replaced. See **Cutter Blade Replacement** on page 144.

If your printouts have jagged or missing lines or gaps, see **Print Quality Troubleshooting** on page 49. This tells you how to:

- print a nozzle check pattern
- clean the printhead
- adjust the printhead alignment

This printer does not require any lubrication. Refrain from applying any oil or grease, since it may damage the printer.

6.2 Physical Inspection and Cleaning

When servicing the printer, inpect the following parts and perform any maintenance as needed:

Table 6-1. Parts to be Checked During Service

Where to look	What to look for	Maintenance
Lower Paper Guide and the surface of the Subplaten	Paper shreds, paper dust, foreign objects, or ink stains	Clean with a moist cloth, if necessary, and then wipe dry
Timing Fence (timing strip used by linear encoder to determine CR position)	Dust, stains, or foreign objects that may interfere with the sensor; also make sure the timing fence is not bent or torn	Clean with a moist cloth, if possible; otherwise replace
CR Guide Rail	Paper shreds or other foreign matter	Remove any foreign matter
Front and Rear Paper Sensors	Paper shreds, paper dust, or other debris on the sensor surface	Clean using compressed air

6.3 Lubrication

This printer requires no additional lubrication.

CAUTION

Never lubricate the printer mechanism since the lubrication may damage mechanical parts and shorten the product's life.

6.4 Checking and Clearing Counters

The printer keeps track of printer component usage by using maintenance counters. When a part exceeds its wear limit, the printer may display a service error code and stop working. See **Service Error Codes and Replaceable Parts** on page 143. After replacing the part requiring service, you need to reset its maintenance counter. See **Clearing Maintenance Counters** on page 140.

Some parts do not cause the printer to display an error code or stop working when they wear out. However, you should always check the counters for these parts when servicing the printer to make sure they haven't exceeded their useful life. If the counter indicates that a part is about to wear out, you should replace the part to avoid having to make additional service calls.

At a minimum, check the following important counters:

Table 6-2. Important Maintenance Counters

Part	Service Limit	Notes	Error
Total printed pages	18,000 pages	printer life; one page = one form feed	—
Printheads	2 billion dots, each nozzle	—	—
Waste Ink Pads	Right: 132,000 points Left: 6,600 points	1 point = 0.02 ml	Service Call 00000100 (See **Service Error Codes and Replaceable Parts** on page 143)
CR Motor	2,500,000 passes	1 pass = 1 round trip (Ink tube life is monitored based on this counter value.)	Service Call 00000101 (See **Service Error Codes and Replaceable Parts** on page 143)
PF Motor	23,000 meters	Paper feed distance	—
Cutter Blade	2,000 operations	1 operation = one page cut	—

To check the counters, see **Checking Maintenance Counters** on page 140.

6.4.1 Checking Maintenance Counters

You can check the printer's maintenance counters in two ways:

❑ **Using the Printer Status Menu**

This is by far the easier method, but it's less precise. To view the Printer Status Menu, press the SelecType button when the printer is turned on but not printing. Press it repeatedly until "Printer Status Menu" appears on the LCD display. Then press the Item button to view the status of the parts listed below:

Table 6-3. Printer Status Menu

Message	Description
VERSION <number>	Shows the firmware version
INK LEFT-K	Amount of black ink remaining
INK LEFT-C	Amount of cyan ink remaining
INK LEFT-M	Amount of magenta ink remaining
INK LEFT-LC	Amount of light cyan ink remaining
INK LEFT-LM	Amount of light magenta ink remaining
INK LEFT-Y	Amount of yellow ink remaining
CUTTER LIFE	Useful remaining life of the cutter remaining
PAGE COUNT	Total number of printed documents; displays in standard decimal notation
INK PAD	Useful remaining life of the Waste Ink Pads
CR MOTOR	Useful remaining life of the Carriage motor
PF MOTOR	Useful remaining life of the Paper feed motor
HEAD UNIT	Useful remaining life of the Printheads
CLEANER	Useful remaining life of the Printhead Cleaner Blade

The indicators read as follows:

E *****F = full life remaining
E ****F = ¾ life remaining
E ***F = ½ life remaining
E **F = ¼ life remaining
E *F = nearly used up
E F = fully used up

Example: new Waste Ink Pads display as E*****F and fully used ones as E F.

❑ **Using the Self-Diagnostic Mode**

In the Self-Diagnostic Mode, you can view most of the maintenance records described above as well as others. The records display as a precise number, but you have to convert the number from hexadecimal to standard decimal notation, which is a hassle. The easiest way to do this is to use a calculator, such as the Calculator utility that comes with Windows.

To view the maintenance records, enter the Test\Elec. menu in the Self-Diagnostic Mode. For more information on the Self-Diagnostic Mode, see **Using the Self-Diagnostic Mode** on page 108.

6.4.2 Clearing Maintenance Counters

After you replace a part that's monitored by a counter, you need to clear or reset its counter. See **Service Parts & Required Adjustments** on page 103 for detailed instructions on which counters you need to clear after replacing certain parts.

This printer provides various ways of clearing its counters:

❑ **from the Self-Diagnostics Mode**

❑ **from Maintenance Mode 2**

See **Table 6-4** on page 141 for a summary of the counters that can be cleared in each mode.

To reset the Initial Ink Charge Flag, use the Parameter\Update\Ink Parameter menu in the Self-Diagnostics Mode. See **Parameter menu** on page 129.

The following table summarizes the different ways of checking and clearing the maintenance counters. For detailed instructions, follow the links in the table header.

Table 6-4. Summary of Ways to Check and Clear Maintenance Counters

Ways to Check Counters		Ways to Clear Counters		
Self-Diagnostics: Test \ Elec. (see Table 5-6 on page 114)	**Printer Status Menu (see Table 1-7 on page 15)**	**Self-Diagnostics: Adjustments \ Counter Clear (resets *all* the following counters); see Table 5-11 on page 128**	**Maintenance Mode 2 (see Table 1-12 on page 17)**	**Self-Diagnostics: Parameter \ Initialize (see Table 5.3.7 on page 129)**
Waste Ink R/L	Waste Ink	protection counter	Init. Wa. Ink	Waste Ink
	Ink Left (remaining ink, each color)	Ink Volume Counter Rb/Ry/Rx/Rz	Ink Counter	
		Consumed ink counter (all colors)		
		Power Cutoff Timer T2	Timer [WHICH TIMER?]	
		CL Timer		
		CL Timer 3		
		Cl Flag		
Print Number (one page = one page feed command)	Total Prints	Accumulated Prints Counter	Total Printing	
CR Motor	CR Motor		CR Motor	CR Motor
PF Motor	PF Motor		PF Motor	PF Motor
Fire x [megadots fired per nozzle]; X = Head B or Head C	Head Unit		Head Unit	Head C
				Head B
Ink Lever R/L				Ink Lever C
				Ink Lever B
Cover (front cover)				Cover
Lever (paper release lever)				Lever
Cleaning (printhead cleaning blade)	Cleaner		Cleaner	
Head Wiper R/L				

Table 6-4. Summary of Ways to Check and Clear Maintenance Counters (continued)

Ways to Check Counters		Ways to Clear Counters		
Self-Diagnostics: Test \ Elec. (see Table 5-6 on page 114)	**Printer Status Menu (see Table 1-7 on page 15)**	**Self-Diagnostics: Adjustments \ Counter Clear (resets *all* the following counters); see Table 5-11 on page 128**	**Maintenance Mode 2 (see Table 1-12 on page 17)**	**Self-Diagnostics: Parameter \ Initialize (see Table 5.3.7 on page 129)**
Wiper				Wiper
Head Rubbing R/L				
Rubbing				
Cut (cutter blade)	Cutter Life			
Cutter Solenoid				
Lock Solenoid				
				Capping Mechanism
				Serial Number
				PF Resolution
			NVRAM	
		Initial Charge Flag		
		Periodic Pseudo-Vacuum Flag		
	Firmware Version			

NOTE: ❑ To enter the **Self-Diagnostic Mode**, press Paper Feed Down + Cut/Eject + Cleaning while turning on the printer.

❑ To enter **Maintenance Mode 2**, press Paper Source + Cut/Eject + Paper Feed Down while turning on the printer.

❑ To view the **Printer Status Menu**, press the SelecType button when the printer is turned on but not printing. Press SelecType repeatedly until “Printer Status Menu” appears. Press the Item button to select the item you want to view.

6.5 Service Error Codes and Replaceable Parts

When some consumable parts reach their predetermined end-of-life, a "Maintenance Call" or "Service Call" message appears. (See **The Difference Between a 'Maintenance Call' and a 'Service Call'** at right.) Follow the maintenance procedures given in the table below.

Table 6-5. Service Error Codes and Replaceable Parts

LCD Message	Maintenance Procedures	Reference
"Maintenance Call 0100" or "Service Call 00000100"	**Replace these parts:** ❑ Waste Ink Pads (R/L) ❑ Pump Assembly ❑ Capping Assembly ❑ Flushing Box (R/L) ❑ Printhead Cleaner Blade **Perform these adjustments:** ❑ Waste Ink Counter Clear (See **Maintenance Mode 2** on page 17.) ❑ Cleaner Counter (See **Maintenance Mode 2** on page 17.) ❑ Cutter Position Adjustment (See **Cutter Position Adjustment** on page 131.)	See **Maintenance Procedures** on page 67 for detailed instructions
"Service Call 00000101"	❑ Replace the Ink Tubes ❑ Clear the CR Motor Counter (see **Maintenance Mode 2** on page 17)	See **Ink Holder Disassembly** on page 84 for detailed instructions

For a list of other service error codes, see **LCD Error Messages** on page 40.

6.5.1 The Difference Between a 'Maintenance Call' and a 'Service Call'

A "Maintenance Call" means that a part needs to be replaced soon, or the printer will no longer operate. A "Service Call" means the printer cannot operate until it receives further attention.

For example, MAINTENANCE CALL 0100 appears on the display to warn that the Waste Ink Pads are about 99% full and need to be replaced soon. The printer continues printing even though this message appears instead of READY or PRINTING.

When the Waste Ink counter determines that the Waste Ink Pads are completely full, SERVICE CALL 00000100 appears and the printer stops printing.

6.6 Ink Cartridge Replacement

When one of the Ink Out lights is flashing and INK LOW is displayed on the control panel, the corresponding cartridge is almost out of ink. When the light stays on and INK OUT is displayed, the cartridge is empty.

Replace the old ink cartridge with one of the following EPSON ink cartridges:

- ❑ **Black T407011**
- ❑ **Cyan T410011**
- ❑ **Megenta T409011**
- ❑ **Light Cyan T412011**
- ❑ **Light Magenta T411011**
- ❑ **Yellow T408011**

Follow these steps to replace an empty cartridge:

1. Make sure the printer is on.
2. Note the color of the Ink Out light that is on or flashing. This is the cartridge you need to replace.
3. Push down on the ink compartment lever and let it “bounce” back up to open the ink compartment.
4. Make sure the replacement cartridge is the correct color, and remove it from its package.
5. Pull the ink cartridge clamp forward and remove the empty cartridge from the printer.
6. Insert the new ink cartridge with the arrow mark face-up and pointing to the rear of the printer.

NOTE: *If you can’t insert the cartridge smoothly, you may have the wrong cartridge. Check the package and product code.*

7. Push the cartridge clamp back and close the ink compartment cover by lowering the lever. Make sure the Ink Out light goes off.

NOTE: *If the Ink Out light remains on, the cartridge may not be installed correctly. Remove the cartridge and then reinsert it as described above.*

NOTE: ***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 from the control panel. See Maintenance Mode 2 on page 17.***

6.7 Cutter Blade Replacement

If you notice that the paper doesn’t cut cleanly, the cutter blade may need to be replaced. You can also check the status the cutter blade by using the Printer Status Menu or the Self-Diagnostic Mode. See **Checking Maintenance Counters** on page 140.

Follow these steps to remove the old cutter blade and replace it with a new one (part number C815131):

1. Make sure the printer is on.
2. Press the SelecType button repeatedly until “Cutter Replace Menu” appears on the display.
3. Press the Item button. “Cut. Replace=Exec.” appears on the display.
4. Press Enter. The carriage moves to the cutter replacement position.
5. Open the lower cover of the printer.
6. Rotate the paper cutter holder to the right while holding the side pin of the cutter down. Be careful not to let go of the cutter, or it may fly out.
7. Carefully remove the cutter blade from the printer. If the spring comes out, be sure to put it back in.
8. Insert the new blade into the printer and rotate the paper cutter holder to the left to secure it in place.
9. Close the lower cover of the printer. The carriage returns to home position and “Ready” appears on the display.

CHAPTER

7

APPENDIX

7.1 Unpacking and Transporting the Printer

Follow these procedures for unpacking and transporting the printer:

- ❑ To set up the printer for initial use, see **Unpacking and Assembly** on page 147.
- ❑ To prepare the printer for transportation, see **Repacking and Transporting the Printer** on page 155.

WARNING

The Stylus Pro 9000 is very heavy (over 200 pounds, including both printer and stand). Use at least 4 people to assemble the printer or lift it onto or off of the stand.

7.1.1 The Packaging

The printer comes from the factory packed in a large box (printer body and accessories), and is delivered with a smaller box on top (for the stand and lower accessories). If possible, save the original packaging in case you need to transport the printer in the future.

BEFORE OPENING THE LARGE & MEDIUM BOXES

See the figure below for the packing condition and contents.

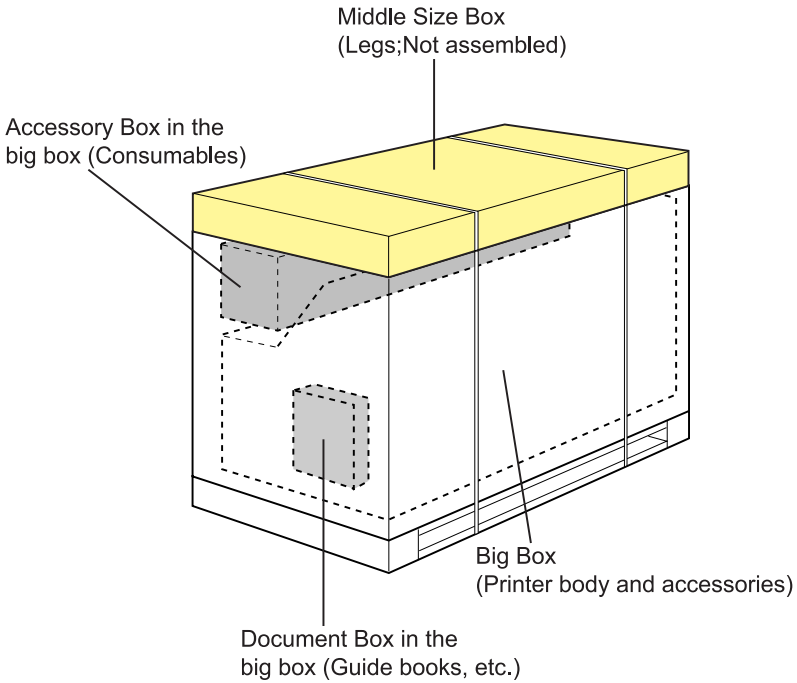


Figure 7-1. The printer and parts shipped in boxes

7.1.2 Contents of the Packaging

See the following for the contents of the large and medium size boxes.

MEDIUM-SIZE BOX

Parts packed in the medium-size box are as follows.

- ❑ Legs x 2 (one for left and right)
- ❑ Leg connections x 2 (for connecting the right and left legs / one each for top and bottom)

- ❑ Paper Eject Tray (Cloth/ metal shafts are attached inside)
- ❑ Tray Hooks x 2 (one each for right and left)
- ❑ Pins x 2
- ❑ Hexagon (Allen) wrench x 2 (large: 5mm / small: 4mm)
- ❑ Bolts (4 kinds)
  - ■ For assembling the stand

    8 bolts with hexagon hole (M6 x 30)

    6 bolts with hexagon hole (M6 x 10)
  - ■ For connecting the printer body and stand

    2 washer bolts with hexagon hole (M6 x 12)

    2 flange bolts with hexagon hole (M6 x 12)

LARGE BOX

The following parts are in the large box.

- ❑ EPSON Stylus Pro 9000 printer body
- ❑ 2 Spindles for roll paper (for 2-inch diameter roll paper)
- ❑ Accessory Box

  Ink Cartridges x 6 (one for each color)

  Roll paper
- ❑ Documentation Box (Guide Books and CD-ROM, etc.)

7.1.3 Unpacking and Assembly

FROM UNPACKING TO ASSEMBLING THE STAND

- ■ **It is recommended at least two people (four for printer body) unpack and assemble the stand. (Weight of stand: approximately 50 lb (22 kg) after assembling.)**
- ■ **Perform unpacking and assembly in a stable, open place, about 12 × 12 ft (4 × 4 m).**
- ■ **If possible, save the original packaging in case you need to transport the printer in the future.**

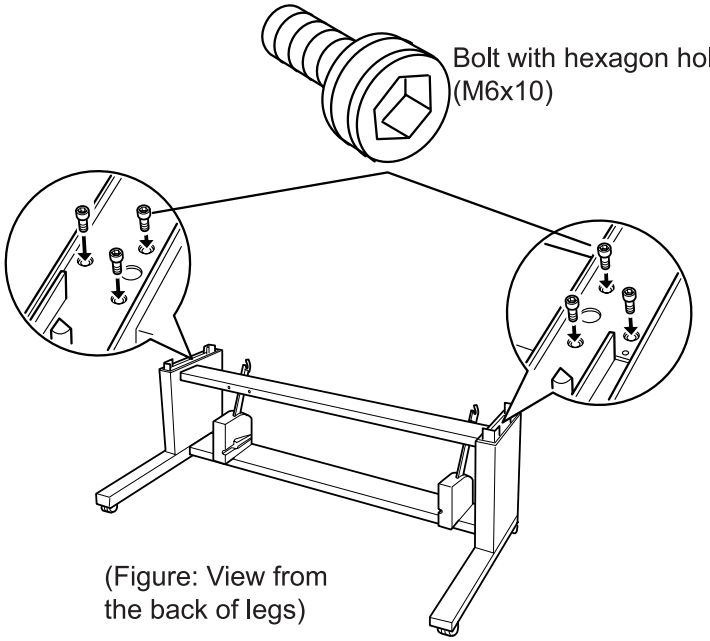
1. Remove the band connecting the large box and medium size box, and take out the medium size box.
2. Open the medium size box and verify the contents. (See the previous page.)

3. Install the top and bottom horizontal stand supports (holes facing correct direction) to the right-side leg and temporarily secure the top support with the hexagonal bolts (M6 x 10). Repeat for the left-side leg

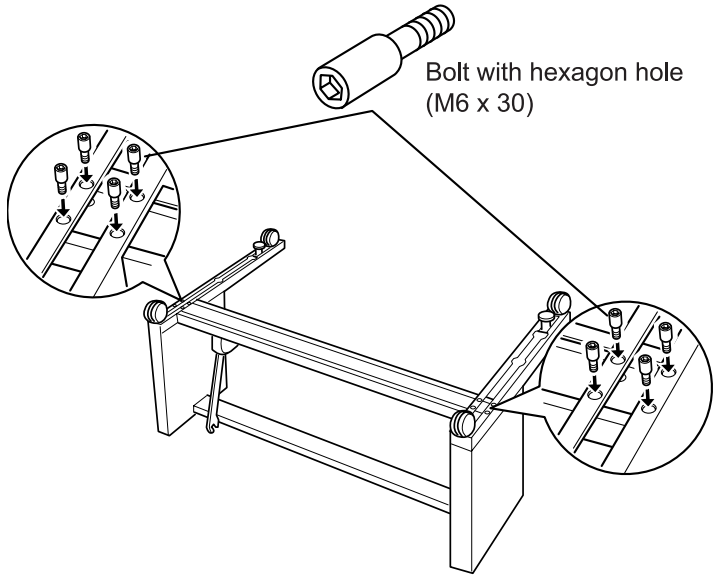
CHECK POINT

Make sure the four holes on the upper support are on the left when facing the rear and on the right when facing the front.

4. Turn over the stand so that the bottom faces up. Then, connect the bottom support and secure the support with the hexagonal bolts (M6 x 30).
5. Turn over the assembled stand again, and completely secure the top-support bolts.



(Figure: View from the back of legs)

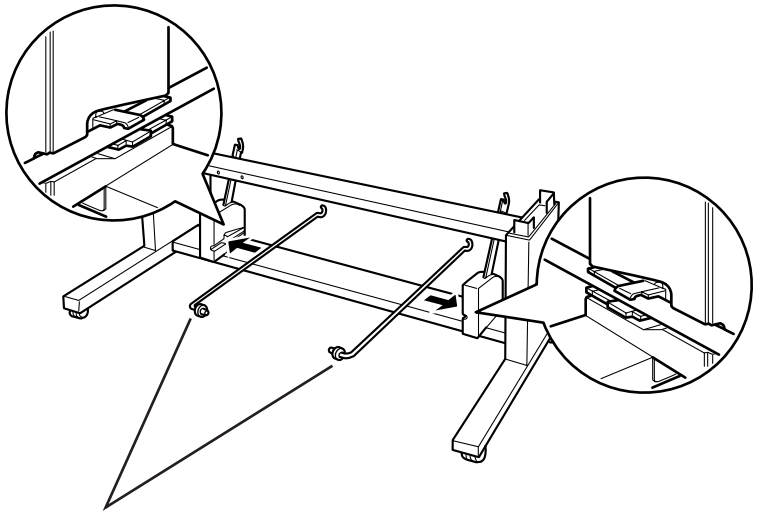


6. Insert the two tray hooks into the slots on the inner sides of the stand.

CHECK POINT

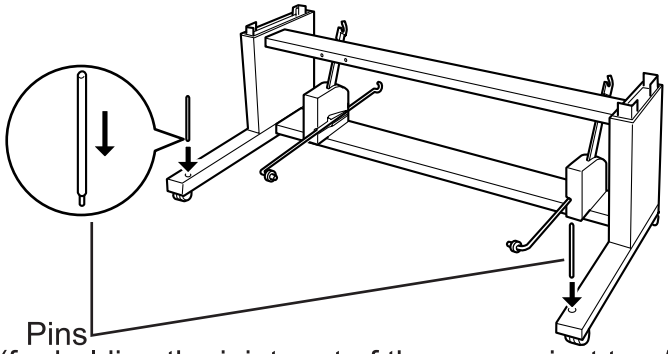
When installing the tray hooks, the sides with the plastic (resin) caps should be toward the rear of the printer and should face inward. (See the figure below.)

Push into the slot.



Tray Hooks
(Resin part should locate the rear of the legs and face inside)

7. Insert the eject tray pins into the holes located toward the rear of the right and left legs.

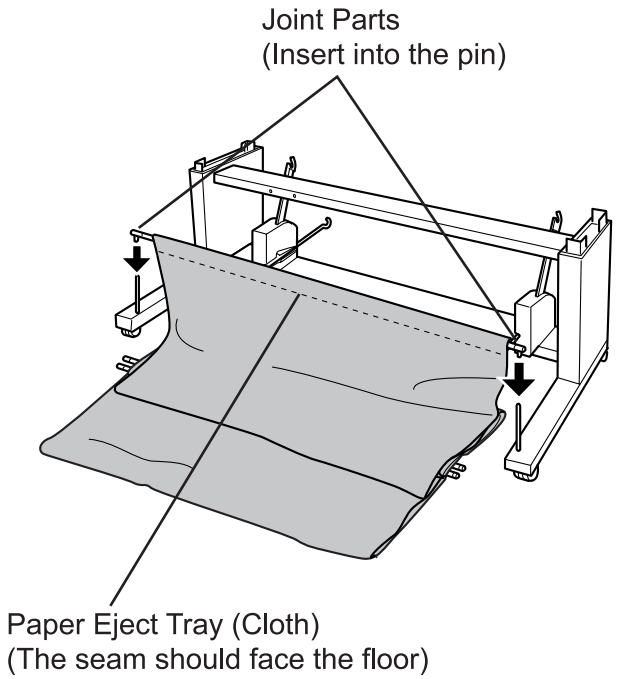


Pins
(for holding the joint part of the paper eject tray/ Push the smaller circle side into the each hole at the rear side of the legs)

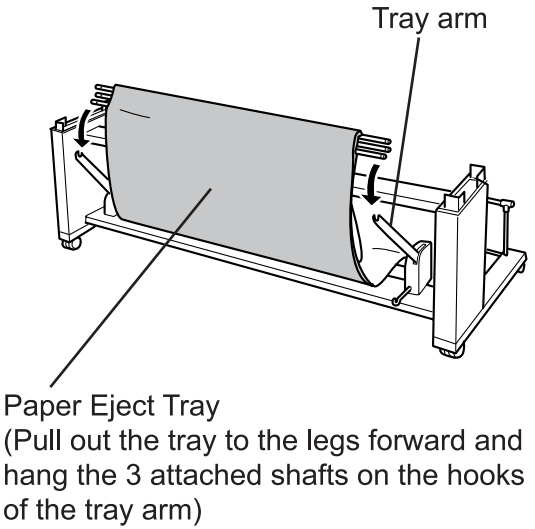
8. Holding the eject tray cloth, locate the shaft which has a joint at both ends and connect those joint ends to the pins you set up in step 7. Connect the joints to the top of the pins and push down securely.

CAUTION

When installing the "Paper Eject Tray" cloth, make sure the seam (folded-fabric side) faces the floor (rear as shown below); otherwise, the printed-paper edge may get stuck on the seam.



9. Move the other three Paper Eject Tray shafts, which are all in the cloth, in front of the stand and hang them on the hooks located at the tips of the right and left "Tray Arms".

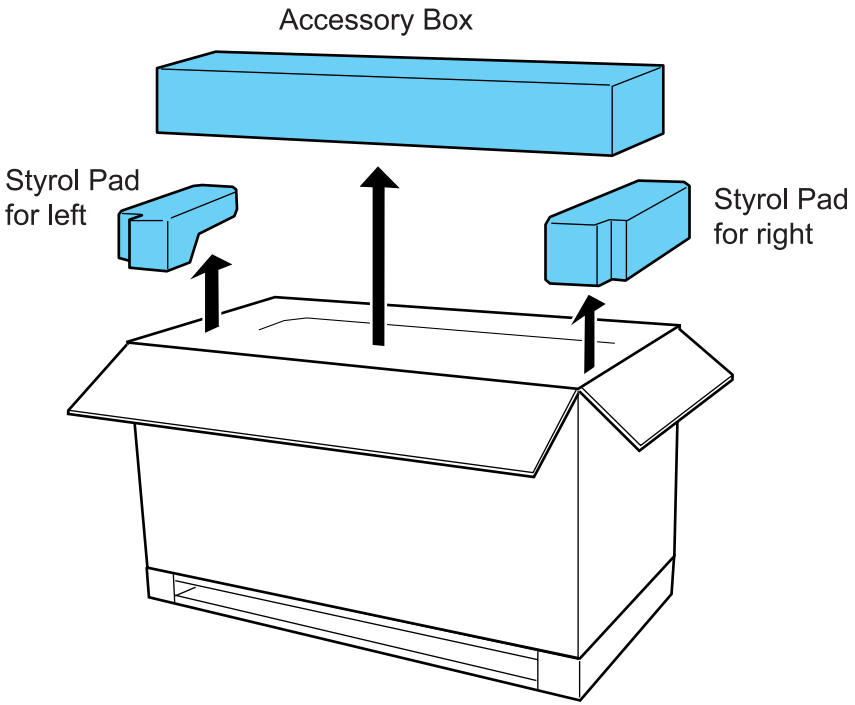


ASSEMBLING THE PRINTER BODY

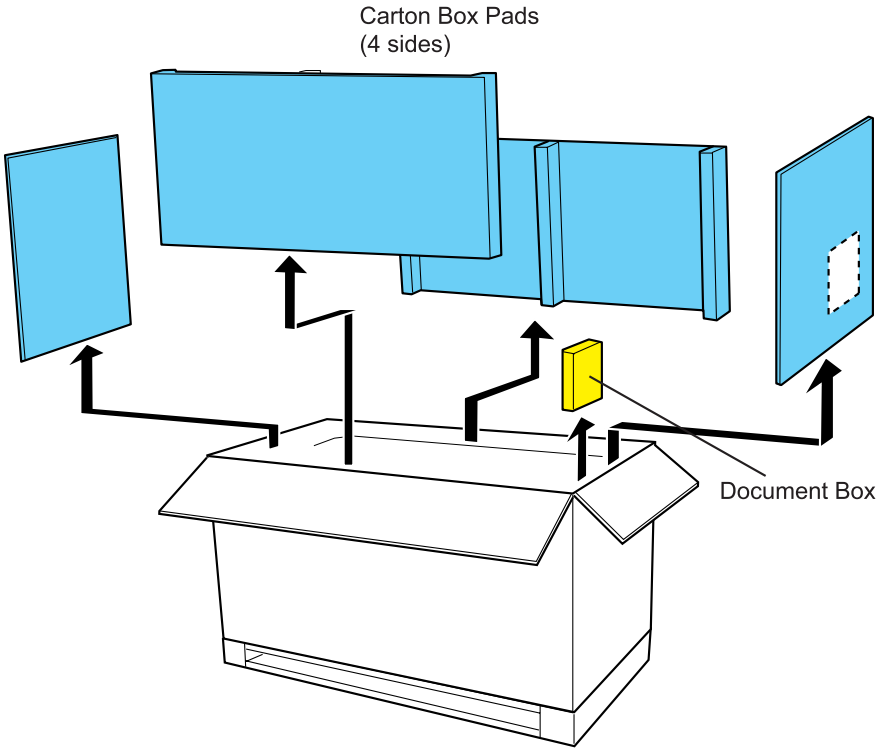
WARNING

- **When lifting or moving the printer body, use at least 4 people, since the printer weighs approximately 160 lb (74 kg).**
- **When removing the large box, be sure that there is enough space overhead (about 7 feet or 2 meters of clearance is required).**

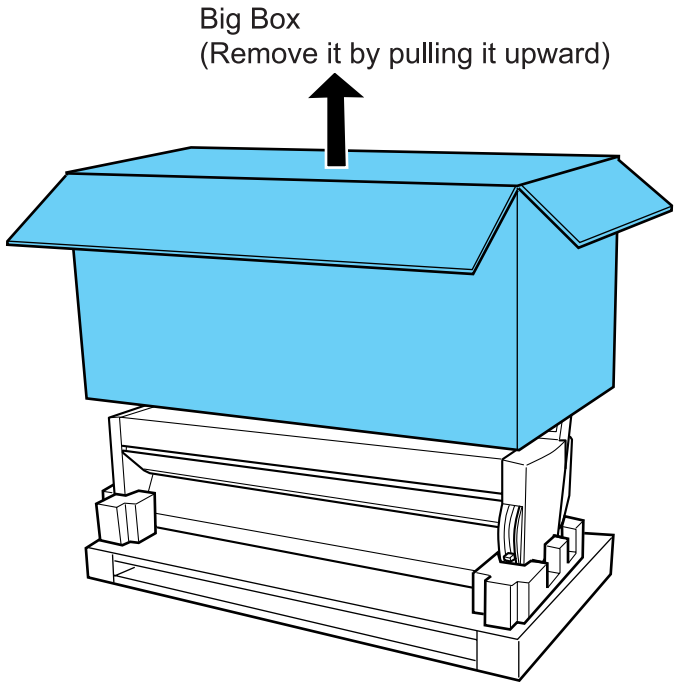
1. Open the large box by cutting the center of the sealed tape and take out the Accessory Box, two spindles and two styrol pads protecting the printer body on the right and left.



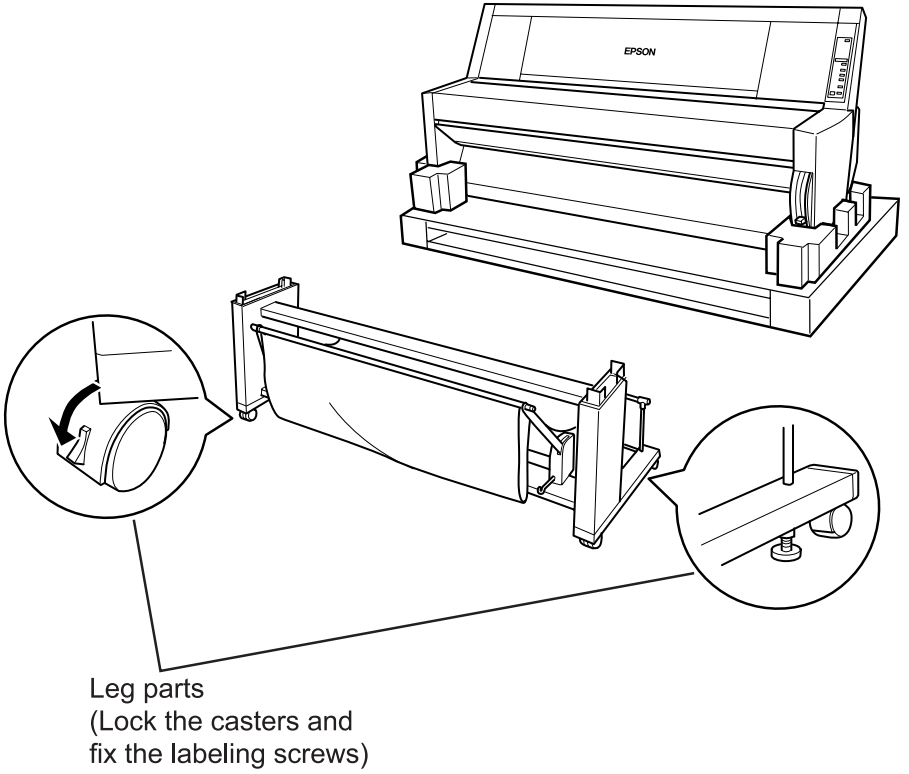
2. Take out the four box panels, one on each side of the box and remove the Documentation box.



3. Pull up the large box and store it.



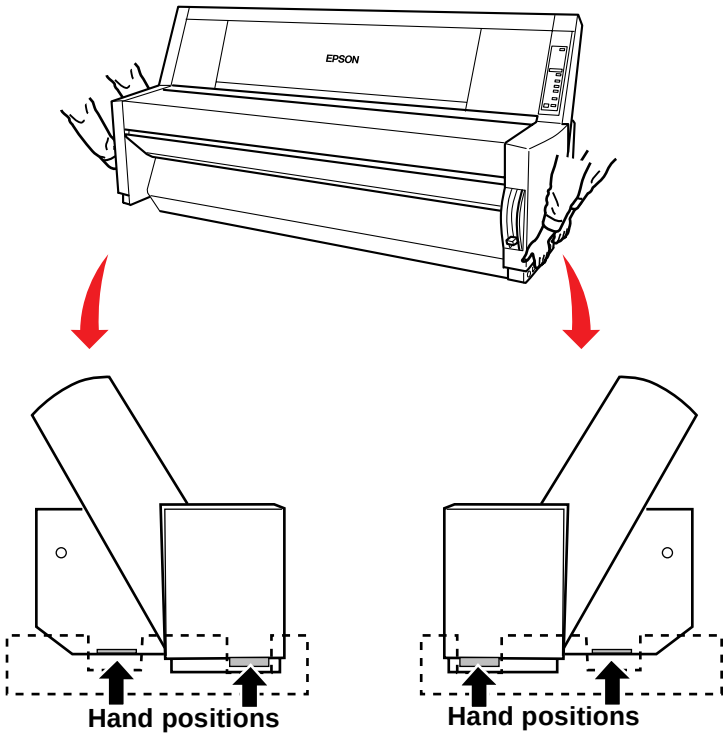
4. As shown in the figure below, place the assembled stand in front of the printer body and lock the (front) right and left casters. Then lower the right and left leveling screws until you are sure they are secure against the floor.



5. Employing four people, lift the printer body as shown in the figure below.

WARNING

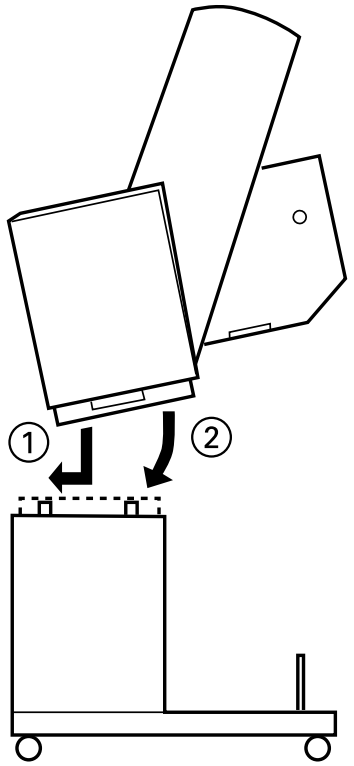
Lifting the printer requires four people, and all four people need to lift the printer by the hand position while supporting/steadying the printer with their free hands.



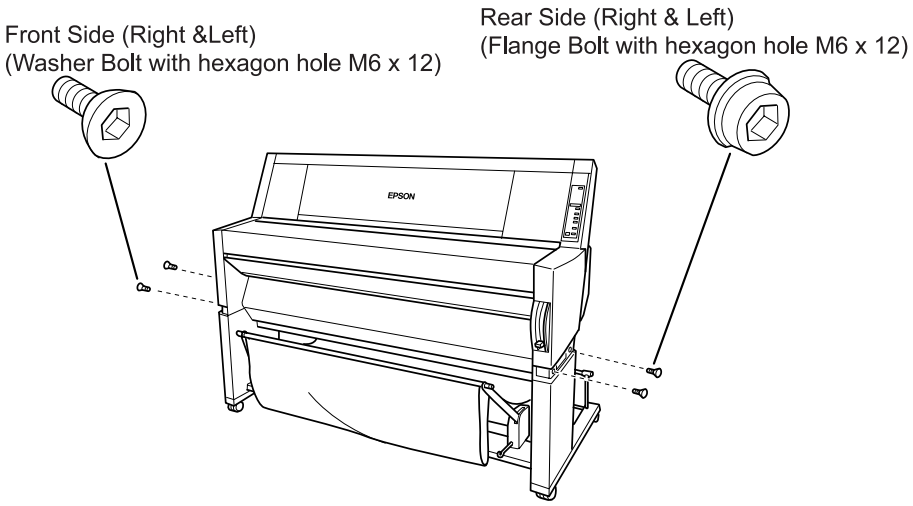
6. To set the printer on the stand, tilt the printer forward and slide the front-bottom section of the printer under the hooks on both sides of the top of the stand. Then carefully lower the rear of the printer so the pegs fit correctly into the holes in the printer.

CAUTION

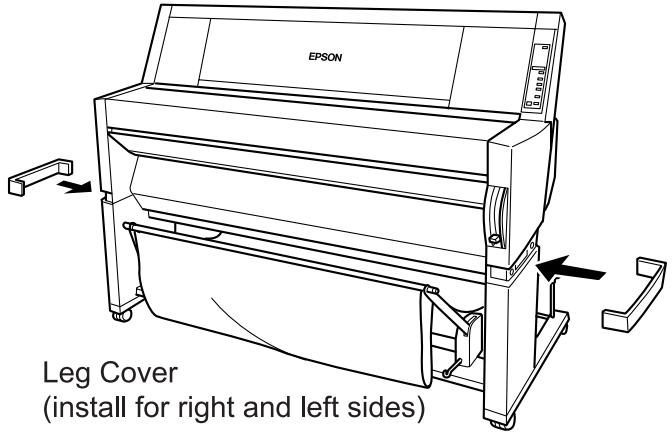
After setting the printer body on the stand correctly, at least one person needs to support the printer body to make sure it does not fall to the rear.
(Once the bolts in step 6 are secured, you no longer need to support the body.)



7. Tighten the engaging part of the printer body and leg parts by 4 bolts for right and left sides.



8. Install the leg cover for the engaged parts of legs.
9. After completing the assembly, release the lock of the casters and labeling screws, then move the printer to the appointed place. (When you settle the printer, lock the caster and labeling screw again)



7.1.4 Repacking and Transporting the Printer

When the printer needs to be transported over a long distance, or if it will not be level during shipping, a service technician must prepare the printer as described in this section.

You must complete the shipping of the printer, including setting it back up and installing new ink cartridges, within 2 days of preparing it for shipping as described below. If shipping takes longer than 2 days, the printheads and ink delivery system may be damaged.

Before Shipping

To prepare the printer for shipping, you must drain all ink from the ink paths. Follow these steps:

1. Lower the Paper Release Lever to the locked position.
2. Enter the Self-Diagnostic Mode by pressing the following buttons on the Control Panel while turning on the printer:

   Paper Feed ↓ + Cut/Eject + Cleaning
3. Select the “Check: Adjustment” menu and press Enter.
4. Select “Adj: Clean Head” and press Enter.
5. Raise the ink holder levers and remove all the ink cartridges.
6. Return the ink holder levers to their lower (locked) position.
7. Press the Enter button. The printer performs the ink drain operation, which takes several minutes.
8. When the “Set Cleaning Jig” message appears on the LCD display, press the Pause button. This lets you skip this step, which is not necessary.
9. Turn the printer off.

To complete the preparation for shipping, do the following:

1. Make sure the carriage is securely locked in home position.
2. Remove any loose parts, such as the paper rolls, hammock, and cables.
3. Close the Front Cover and Roll Paper Cover and secure them with tape.
4. Repack the printer using the original packing materials, if possible.

After Shipping

After setting up the printer at the new location, you have to install new ink cartridges and perform the Initial Ink Charge. This must performed within 2 days of draining ink from the printer. Follow these steps:

1. Because the Initial Ink Charge consumes a great deal of ink, it is advisible to replace the Waste Ink Pads prior to performing this operation. See **Maintenance Procedures** on page 67.
2. Install new ink cartridges in the printer.
3. Enter the Self-Diagnostic Mode by pressing the following buttons on the Control Panel while turning on the printer:

   Paper Feed ↓ + Cut/Eject + Cleaning
4. Select the “Check: Cleaning” menu and press Enter.
5. Select “Cleaning: Init. Fill” and press Enter. The printer starts the Initial Ink Charge, which takes about 7 minutes to complete.

7.2 Specifications

7.2.1 Mechanical

❑ **Printing method**
On-demand MACH (Multi-layer Actuator Head) ink jet E-MACH type

❑ **Nozzle configuration**

Black	64 nozzles
Color	64 nozzles for each color (yellow, magenta, cyan, light magenta, and light cyan)

❑ **Print direction**
Bidirectional with logic seeking (high-speed return and skip only)

❑ **Engine reliability**

Total print volume	18,000 B1 images, 30% coverage
Printhead	2,000,000,000 dots per nozzle
Cutter	2,000 times
Waste ink system	Estimated to require replacement twice during the printer's normal service life

❑ **Emulation mode**
ESC/P® Raster

❑ **Feeding method**
Friction feed

❑ **Line spacing**
1/6 inch or programmable in 1/360-inch increments

❑ **Dimensions**

Width	66.46 in. (1,688 mm)
Depth	27.52 in. (699 mm)
Height	49.57 in. (1,259 mm)

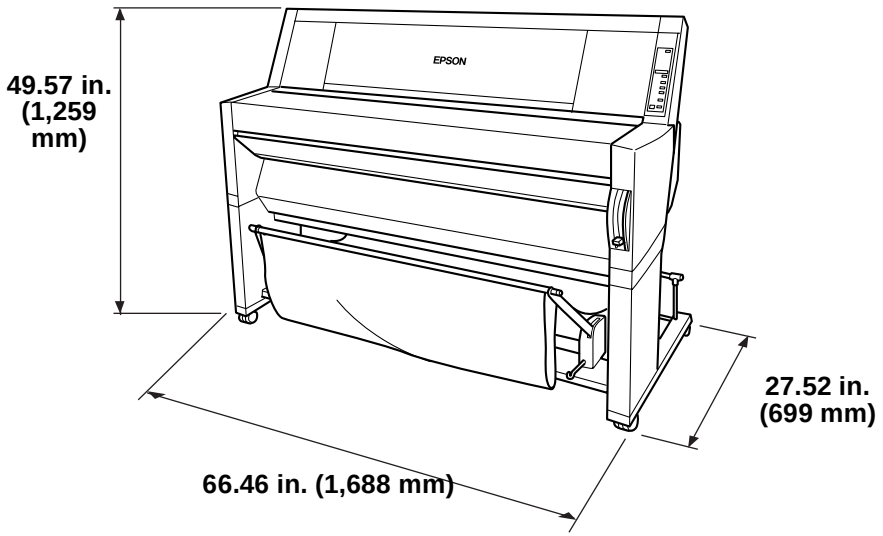


Figure 7-2. Printer Dimensions

❑ **Weight**

Printer and stand	211.91 lb (96 kg)
Printer only	163.32 lb (74 kg)
Stand	48.59 lb (22 kg)

❑ **Print speed**

	A0 Print Time*	Environment
Matte paper	15 minutes	• Speed selected in printer driver • 720 × 360 dpi • Mode = Bi-D/FOL/300cps
Glossy paper	30 minutes	• Quality selected in printer driver • 720 × 720 dpi • Mode = Bi-D/FOL/300 cps
Glossy paper	55 minutes	• Advanced Photo selected in printer driver • 1440 × 720 dpi • Mode = Bi-D/4-pass FOL/300 cps

* All times are approximate

❑ **Paper loading**

Roll paper (two 2-inch rolls can be loaded at the same time)

Single sheets loaded 1 at a time

❑ **Paper volume**

2 inch core roll paper: diameter of paper wound on roll of less than 14.05 inches (357 mm)

3 inch core roll paper: diameter of paper wound on roll of less than 5.9 inches (150 mm)

Single sheets = 1 sheet at a time

❑ **Paper feed speed**

200 ± 10 ms per 1/6-inch line

2.5 inches per second when feeding continuously

❑ **Acoustic Noise**

Approximately 50 dB

7.2.2 Safety Approvals

❑ **120 V**

Safety standards	UL 1950, CSA 22.2 No. 950
EMI	FCC part 15 subpart B class B CSA C108.8 class B

❑ **230V**

Safety standard	EN60950 (VDE)
EMI	EN55022 (CISPR Pub.22) class B AS/NZS 3548 class B

7.2.3 CE Marking

Low voltage directive 73/23/EECEN60950
EMC directive 89/336/EECEN 55022 (CISPR Pub. 22) class B
EN 61000-3-2
EN 61000-3-3
EN 50082-1
IEC 801-2
IEC 801-3
IEC 801-4

7.2.4 Electrical

The electrical specifications are for the 120 and 230 V units.

Rated voltage	120 to 140 VAC
Input voltage range	90 to 264 VAC
Rated frequency range	50 to 60 Hz
Input frequency range	49.5 to 61 Hz
Rated current	120 V: 0.5 A 230 V: 1.0 A (maximum 1.8 A)
Power consumption	Approximately 100 W (operating) Approximately 30 W (standby) (ISO/IEC 10561 letter pattern) Energy Star compliant
Insulation resistance	10 M Ω minimum (between AC line and chassis 500 VDC)
Dielectric strength	1500 V rms 1 minimum (between AC line and chassis)

7.2.5 Environmental

❑ **Temperature**

Operation	59 to 95 °F (15 to 35 °C)
Storage	–4 to 104 °F (–20 to 40 °C)
Transportation	–4 to 140 °F (–20 to 60 °C)

❑ **Humidity (without condensation)**

Operation	30 to 80%
Storage	20 to 85%
Transportation	5 to 85%

❑ **Vibration resistance**

Operation	0.15 G, 10 to 55Hz / X, Y, Z direction
Storage	0.50 G, 10 to 55Hz / X, Y, Z direction

❑ **Shock resistance**

Operation	1 G, within 1 ms / X, Y, Z direction
Storage	2 G, within 2 ms / X, Y, Z direction

NOTE:

- **Less than 1 month at 104 °F (40 °C); less than 120 hours at 140 °F (60 °C)**
- **When storing the printer, make sure the printheads are in the home, capped, position.**
- **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.**
- **When the temperature drops below 5 °F (–15 °C), the ink in the cartridges and printheads freezes. The ink thaws completely after 3 hours at 77 °F (25 °C).**

7.2.6 Ink Cartridge

❑ **Shape**

Each ink cartridge is uniquely shaped so the cartridges cannot be inserted into the wrong slots.

❑ **Ink colors**

Black, cyan, magenta, yellow, light cyan, light magenta

❑ **Ink volume**
7.4 ± 0.17 oz. (220 ± 5 ml)

❑ **Ink available for printing**
6.4 ± 0.47 oz. (190 ± 14 ml)

❑ **Print capacity**
A0 / approximately 28 pages at 720 dpi, 40% duty
A4 / approximately 6,4000 pages at 360 dpi, 5% duty

❑ **Dimensions**

Width	0.98 in. (25 mm)
Depth	10.24 in. (260 mm)
Height	4.13 in. (105 mm)

❑ **Weight**
Approximately 0.82 to 0.85 lb (370 to 385 g)

❑ **Effective period**
2 years from production if unopened; within 2 years after opening the package, at 77 °F (25 °C)

❑ **Environmental***

Operation	–4 to 104 °F (–20 to 40 °C)
Storage	–22 to 104 °F (–30 to 40 °C)
Transportation**	–22 to 140 °F (–30 to 60 °C)

NOTE: * **Less than 1 month at 104 °F (40 °C)**
** **Less than 120 hours at 140 °F (60 °C)**

CAUTION

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

7.2.7 Controller

❑ **CPU**
32-bit RISC-CPU (SH7043) 33 Mhz

❑ **ROM**
[Program]
CPU Internal = 128KB ROM
External = 1MB (Flash ROM/4Mbit x 2)
[Font] not-installed (Windows/Macintosh required)

❑ **RAM**
18MB (fixed)
(16MB: SIMM/2MB: IC18,19)

❑ **Interface**
[Standard]
IEEE1284 Bidirectional Parallel Interface
Macintosh Serial Interface
Type-B Card Slot (x1) for optional interface

7.2.8 Cutter

❑ **Attributes**
Made of steel so the blade can easily be chipped. This is a consumable item that is replaced by the user.

❑ **Life**

Generally, can cut more than 2,000 pages, but the actual wear-and-tear depends on the type and thickness of the paper.

The cutter life can be determined by manually using it to cut a piece of normal paper. If the cutter easily cuts the paper, it is still good.

The cutter position is determined by the carriage cover position; see **Carriage Cover Height Adjustment on page 130** and **Cutter Position Adjustment** on page 131 for more information.

7.2.9 Paper

❑ **Single sheets**

Table 7-1. Specifications for Single Sheets

Paper	Dimensions (W x H)	Thickness
B0 Wide	44 × 62.2 in. (1,118 × 1,580 mm)	0.003 to 0.019 in. (0.08 to 0.5 mm)
B0	40.6 × 57.3 in. (1,030 × 1,456 mm)	
B1	28.7 × 40.5 in. (728 × 1,030 mm)	0.003 to 0.059 in. (0.8 to 1.5 mm)
B2	20.25 × 23.4 in. (515 × 728 mm)	
B3	14.3 × 20.3 in. (364 × 515 mm)	
A0 Wide	36 × 1,292 in. (914 × 1,292 mm)	0.003 to 0.019 in. (0.8 to 0.5 mm)
A0	33.1 × 46.8 in. (841 × 1189 mm)	
A1	23.4 × 33.1 in. (594 × 841 mm)	0.003 to 0.059 in. (0.8 to 1.5 mm)
A2	16.5 × 23.4 in. (420 × 594 mm)	
A3 Wide/B	13 × 19 in. (330 × 483 mm)	
A3	11.7 × 16.5 in. (297 × 420 mm)	
US E	34 × 44 in. (864 × 1,118 mm)	0.003 to 0.019 in. (0.8 to 0.5 mm)

Table 7-1. Specifications for Single Sheets

Paper	Dimensions (W x H)	Thickness
US D	22 × 34 in. (559 × 864 mm)	0.003 to 0.059 in. (0.8 to 1.5 mm)
US C	17 × 22 in. (432 × 559 mm)	
US B	11 × 17 in. (279 × 432 mm)	

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

Weight 17 to 24 lb (64 to 90 gf/m^2)

Quality Normal, recycled paper (load short edge first portrait)

Environment 59 to 77 °F (15 to 25 °C) / 40 to 60% humidity

The printer exerts between 300 to 500 gf to peel off the rear edge of roll paper from the core

Paper feeding is normal until the rear edge of the paper separates from the core. At the point where the rear edge is free, print quality is not guaranteed.

Upper spindle last 15.75 inches (400 mm) not guaranteed

Lower spindle last 11.8 inches (300 mm) not guaranteed

Table 7-2. Printable Area for Roll Paper and Single Sheets

Heading	Roll Paper	Single Sheets
Paper width	7.2 to 44 in. (182 to 1,118 mm)	8.27 to 44.02 in. (297 to 1,118 mm)
Paper length	8.27 to 771.65 in. (720 to 4,500 mm)	16.54 to 62.2 in. (420 to 1,580 mm)
Left margin	0.12 to 0.59 in. (3 or 15 mm*)	0.12 in. (3 mm)
Top margin	0.12 to 0.59 in. (3 or 15 mm*)	0.12 in. (3 mm)
Right margin	0.12 to 0.59 in. (3 or 15 mm*)	0.12 in. (3 mm)
Bottom margin	0.12 to 0.59 in. (3 or 15 mm*)	0.55 in. (14 mm)

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

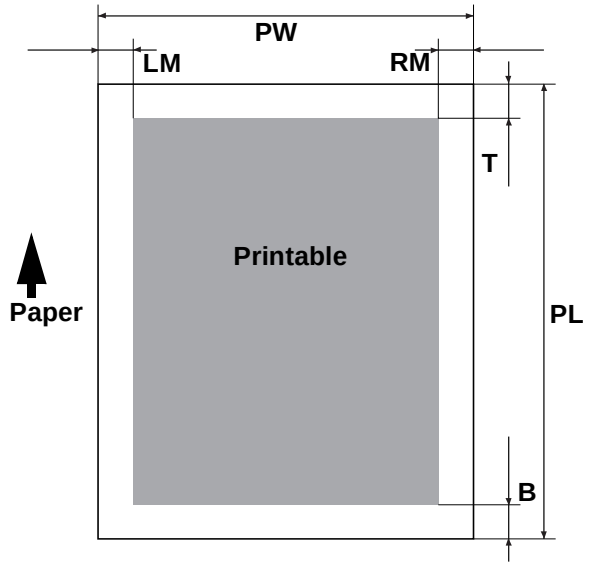


Figure 7-3. Printable Area for Single Sheets

❑ **Roll paper**

Width 8.27 to 44.02 in. (210 to 1,118 mm)

Length 28.35 to 1,771.65 in. (720 to 4,500 mm (2-inch roll: 3.9 in. (100 mm or less) / 3-inch roll: 5.9 in. (150 mm or less)

Thickness 0.0026 to 0.019 in. (0.065 to 0.5 mm)

❑ **Special paper**

For special paper meeting the following requirements, the feeding operation and print quality are optimized.

Table 7-3. Specifications for Special Paper

Paper	Part Number	Paper Size	Roll Size
Presentation matte paper	S041220	44 in. (1,118 mm)	2-inch core. Paper thickness (radius) of 3.9 inches (100 mm) or less.
	S041221	36 in. (914 mm)	
Semi-gloss photo paper	S041223	44 in. (1,118 mm)	
	S041222	36 in. (914 mm)	
Photo paper glossy	S041224	44 in. (1,118 mm)	
	S041225	36 in. (914 mm)	

Use at normal room temperature:

59 to 77 °F (15 to 25 °C)
40 to 60% humidity

Paper feeding is normal until the rear edge of the paper separates from the core. At the point where the rear edge is free, print quality is not guaranteed.

Upper spindle 15.75 inches (last 400 mm) not guaranteed

Lower spindle 11.8 inches (last 300 mm) not guaranteed

For special paper meeting the following requirements, the feeding operation and print quality are optimized:

Table 7-4. Special Paper Specifications

Paper	Dimensions (W x H)	SuperFine*	Glossy Film
A3	11.7 × 16.5 in. (297 × 420 mm)	OK	OK[2]
A3 Wide	13 × 19 in. (329 × 483 mm)	OK	OK
A2	16.5 × 23.4 in. (420 × 594 mm)	OK	—

* Print quality optimized when printing unidirectional printing.

7.2.10 Paper Release Lever

Table 7-5. Print Area and Margin Optimization for Roll Paper

To Optimize For. . .	. . .Select This Setting
Largest printable area and decrease chance of paper rubbing printheads	T/B15MM*
Exact paper size and decrease chance of paper rubbing printheads	15MM
Largest printable area and exact paper size	3MM

If the paper release lever is down, the feed path is open and you can load, remove or change the position of paper in the feed path.

If the paper release lever is up, 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.

7.2.11 Interface

This section describes the interfaces for the EPSON Stylus Pro 9000.

❑ **Transmission mode**
Based on RS-423

❑ **Synchronization**
Synchronous

❑ **Transfer speed**
About 1.8 Mbps

❑ **Data format**
Start bit: 1 bit
Data bit: 8 bits
Parity bit: None
Stop bit: 1 bit

- **Handshaking**
  X-ON/X-OFF, DTR protocol
- **Adaptable connector**
  8-pin mini-DIN
- **Recommended I/F cable**
  Apple system peripheral-8 cable (M0197)

Table 7-6. Serial Interface Pin Assignment

Pin No.	Signal Name	Direction	Description
1	SCLK	Out	Synchronous clock signal
2	CTS	In	Clear To Send
3	TXD-	Out	Transmit Data (-)
4	SG	In	Signal Ground
5	RXD-	In	Receive Data (-)
6	TXD+	Out	Balanced Transmit Data (+)
7	DTR	Out	Data Terminal Ready
8	RXD+	In	Balanced Receive Data (+)

Table 7-7. X-On/X-Off and DTR Protocol

State	Buffer Space	X-ON/X-OFF	DTR
Busy	Less than 3072 bytes	Send X-OFF code	OFF
Ready	More than 5120 bytes	Send X-ON code	ON

7.2.11.1 Parallel interface

- **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)
- **Adaptable connector**
  57-30360 (Amphenol) or equivalent 36-pin

NOTE:
- **Use a twisted-pair cable.**
- **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 state.**

- **BUSY signal**
  HIGH under the following conditions:

  During data entry

  If input data buffer is full

  If $\overline{\text{INIT}}$ signal is LOW

  During hardware initialization

  During a printer error

  If parallel interface is not selected
- **ERROR signal**
  LOW if the following conditions occur:

  Printer hardware error (fatal error)

  Paper out error

  Paper jam error

  Ink out error

NOTE: *The PE signal is HIGH during a paper out error.*

Table 7-8. Pin Assignment For Forward Channel

Pin No.	Signal Name	Return GND Pin	Direction*	Functional Description
1	STROBE	19	In	Data reception pulse, 0.5 uS or greater pulse width required. Usual state is HIGH, and reads data after going to LOW state.
2-9	DATA 0 to 7	20 to 7	In	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	ACKNLG	28	Out	When LOW the printer has finished preparing to receive signals and can accept data. Pulse width is about 1uS or 3uS Printer clock signal.
11	BUSY	29	Out	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	Out	HIGH means no paper is loaded. (LOW means an error.)
13	SLCT	28	Out	Always HIGH. Pulled up to +5V via 1.0 Kohm.
14	AFXT	30	In	Not used.
15	NC			Not connected.
16	GND			Ground for twisted pair return.
17	Chassis			Ground for frame/body.
18	Logic H			Pulled up to +5 V via 3.9 Kohm.
19-30	GND			Ground for twisted pair return.
31	$\overline{\text{INIT}}$	30	In	Pulse width of 50 uS or more means LOW pulse, and the falling edge of LOW signal causes the printer to initialize.
32	ERROR	29	Out	LOW means printer error.
33	GND	—	—	Ground for twisted pair return.
34	NC	—	—	Not connected.
35	+5V	—	Out	HIGH during normal operation. Pulled up to +5V via 1.0K ohm.
36	SLCTIN	30	In	Not used.

* Direction from the printer.

The interface condition is normally TTL Level, and each high/low signal takes 0.2uS or less.

The printer only sends data after receiving the ACKNLG confirmation or when the BUSY signal is low.

7.2.11.2 Nibble Mode

- **Transmission mode**
  EEE-1284 nibble mode
- **Synchronization**
  Refer to IEEE-1284 specification
- **Handshaking**
  Refer to IEEE-1284 specification
- **Signal level**
  TTL level (IEEE-1284 level 1 device)
- **Adaptable connector**
  57-30360 (Amphenol) or equivalent
- **Data transmission timing**
  Refer to IEEE-1284 specification
- **Extensibility request**
  When the printer receives the hexadecimal values 00H or 04H, the printer responds in the following manner:

  00H: The printer enters reverse channel mode, allowing data to be sent to the host.

  04H: The printer sends the device ID to the host
- **Device ID**
  [00H] denotes a hexadecimal value of zero. [SP] equals space code 20H
  <00H><4EH>
  MFG: EPSON
  CMD: ESCPL2, BDC
  MDL: Stylus[SP]Pro[SP]9000
  CLS: PRINTER
  DES: EPSON[SP]Stylus[SP]Pro[SP]9000

7.2.11.3 ECP Mode

- **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**
  57-30360 (Amphenol) or equivalent
- **Data transfer timing**
  Refer to IEEE-1284 specification
- **Extensibility request**
  When the printer receives the hexadecimal values 10H or 14H, the printer responds in the following manner:

  10H: The printer enters reverse channel mode, allowing data to be sent to the host.

  14H: The printer sends the device ID to the host
- **Device ID**
  [00H] denotes a hexadecimal value of zero. [SP] equals space code 20H
  <00H><4EH>
  MFG: EPSON
  CMD: ESCPL2, BDC
  MDL: Stylus[SP]Pro[SP]9000
  CLS: PRINTER
  DES: EPSON[SP]Stylus[SP]Pro{SP]9000

Table 7-9. Pin Assignment for Reverse Channel

Pin No.	Signal Name	Return GND Pin	Direction	Functional Description
1	HostClk	19	In	Host clock signal.
2-9	Data0-7	20-27	In	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	Out	Printer clock signal.
11	PeriphAck/PtrBusy	29	Out	Printer busy signal and reverse channel transfer data bit 3 or 7.
12	AckData Req	28	Out	Acknowledge data request signal and reverse channel transfer data bit 2 or 6.
13	Xflag	28	Out	X-flag signal and reverse channel transfer data bit 1 or 5.
14	HostBusy	30	In	Host busy signal.
15	NC			Not connected.
16	GND			Signal ground.
17	Chassis GND			Chassis ground.
18	Logic-H		Out	Pulled up to +5V via 3.9K ohm resister.
19-30	GND			Ground for twisted pair return.
31	$\overline{\text{INIT}}$	30	In	Not used.
32	$\overline{\text{DataAvail}}$	29	Out	Data available signal and reverse channel transfer data bit 0 or 4.
33	GND			Ground for twisted pair return.
34	NC			Not connected.
35	+5V	—	Out	Pulled up to +5V via 3.3K ohm resister.
36	1284-Active	30	In	1284 Active Signal.

7.2.11.4 Type-B Interface (Optional)

The EPSON Stylus Pro 9000 supports a Type-B interface (level 2).

Reply message (short version):

- When using Co-ax/Twin-ax interface card:
  Main type: MTP48p, PW127cl10cpi, PRG (KAxxxx)rev, AP1200ma
  Product name: Stylus[SP]Pro[SP]9000
  Emulation type: ESCPL2-00
  Entity type: EPSONLQ2
- When not using a different (not Co-ax/Twin-ax) interface card:
  Main type: MTP48p, PW127cl10cpi, PRG (KAxxx)rev, AP1200ma, SPD0fast
  Product name: Stylus[SP]Pro[SP]9000
  Emulation type: ESCPL2-00
  Entity type: ESPONLQ2

7.2.11.5 Interface selection

This section describes how the parallel, serial, and optional Type-B interfaces are selected manually in the default setting mode, or are selected automatically.

❑ Manual Selection

Select the desired interface through the default setting mode. See **Maintenance Mode on page 17** for instructions on how to do this.

❑ Automatic Selection

Automatic interface selection is enabled in the default setting mode. (See **Maintenance Mode on page 17** for instructions). While in this mode, the printer is initialized to the idle state, where it scans which interface to activate. The first interface to receive data is selected. When the host stops data transfer and the printer is in standby for 10 seconds, the printer returns to the idle state. As long as the host sends data or the printer interface is busy, the selected interface remains active.

❑ **Interface state and selection**

When the parallel interface is not selected, it enters a BUSY state and the logic signal is set to LOW. An interrupt signal, such as INIT on this interface, is not effective while that interface is in Nibble or ECP Mode, or is not selected. When the printer is initialized or returns to the idle state, the parallel interface goes into a ready state. The host checks whether the logic signal is LOW or HIGH before requesting data through the reverse channel.

When the serial interface is not selected, the data terminal ready (DTR) signal is set to MARK. When the printer is initialized or returns to the idle state, the serial DTR signal is set to LOW, and the offline bit is set to Main Status Register (MNSTS).

When the optional Type-B interface is not selected, the offline bit is set to MNSTS.

❑ **Preventing data transfer time-out**

Generally, hosts abandon data transfer to peripherals when the peripheral is in the BUSY state for a predetermined length of time. To prevent this time-out, the printer receives data very slowly, several bytes per minute, even when in the BUSY state. This slowdown starts when there are several hundred bytes in the input buffer. Only if the buffer fills completely, does the printer enter the BUSY state.

7.3 Initialization

This section describes the initialization procedures for the EPSON Stylus Pro 9000.

- **Power On 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:

  Activated by the ESC@ command. The following happens:

  Clears the print buffer

  Restores the default values

- Operation initialization

  Activated when the Reset button is pressed or the printer receives an $\overline{\text{INIT}}$ signal (negative pulse) from the parallel interface. The following happen:

  Caps the printheads

  Ejects the paper if a cut sheet is loaded

  Clears the input data buffer

  Clears the print buffer

  Resets the following default values:

  - Page Position
    Current paper position as page-start position
  - Line feed
    1/6 inch
  - Right margin
    440th character
  - Left margin
    1st character
  - Character pitch
    10 CPI
  - Print mode
    Text mode (non-raster graphics mode)

7.4 Jumper and DIP Switch Settings

The jumper and DIP switch settings on the Main Board (C277 MAIN) are as follows:

Table 7-10. Jumper Settings

Type	Number	Setting
Jumper	JP1	Closed
Jumper	JP2	Closed
DIP-SW	SWD1 “1”	OFF
DIP-SW	SWD1 “2”	OFF

7.5 Connector Summary

The following diagram shows how the main circuit boards are connected:

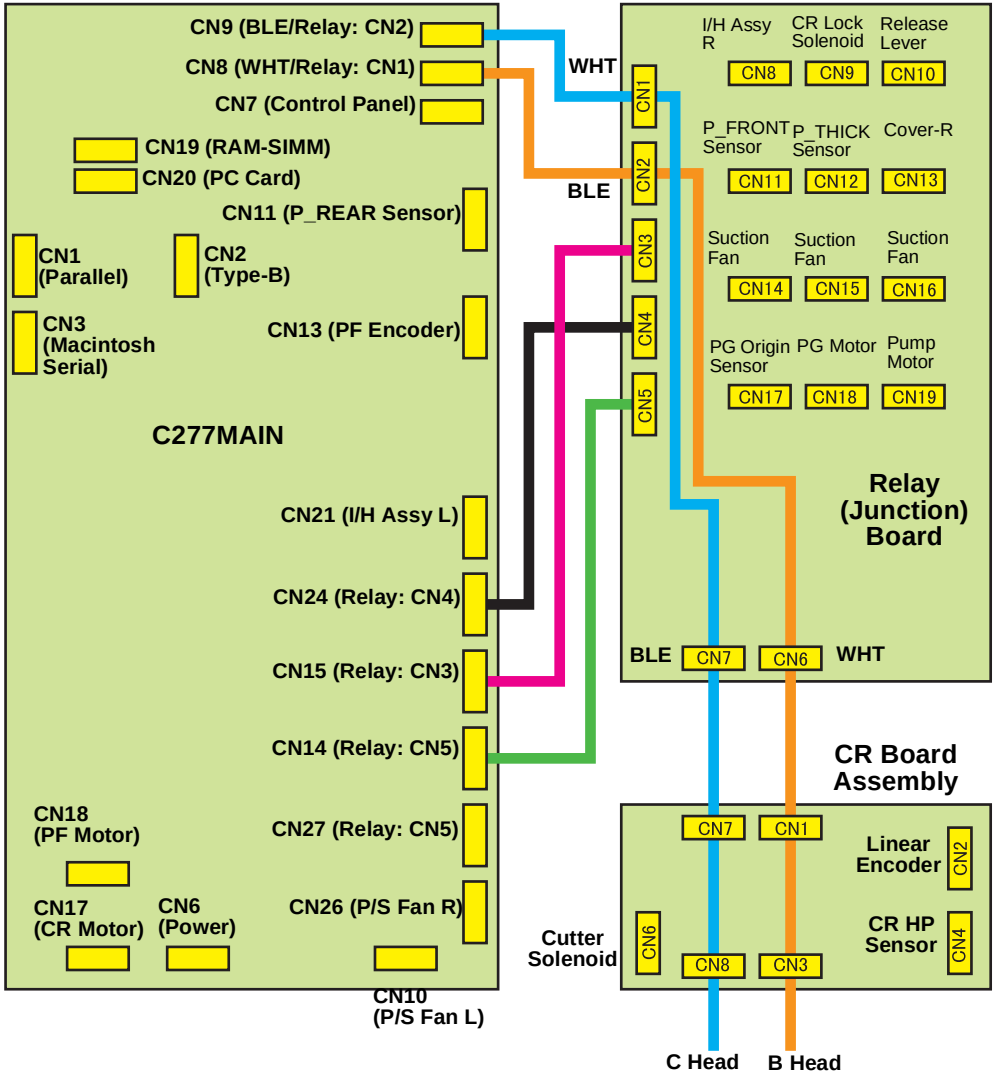


Figure 7-4. Stylus Pro 9000 Connector Summary

Table 7-11. Electrical Circuit Connector List

Board	Connector	Description
C277Main Board	CN1	Parallel Interface
	CN2	Type-B Option Card Connector
	CN3	Macintosh Serial Interface
	CN6	From the Power Supply Unit
	CN7	To the Control Panel
	CN8	To Relay Board/CN2:BLE
	CN9	To Relay Board/CN1:WHT
	CN10	Printer Mechanism:P/S Fan L
	CN11	Printer Mechanism:P_REAR Sensor
	CN13	Printer Mechanism:PF Encoder
	CN14	To Relay Board/CN5
	CN15	To Relay Board/CN3
	CN17	Printer Mechanism:CR Motor
	CN18	Printer Mechanism:PF Motor
	CN19	RAM-SIMM (standard)
	CN20	PC Card Slot
	CN21	Printer Mechanism:I/H Assembly L
	CN24	To Relay Board/CN4

Table 7-11. Electrical Circuit Connector List (continued)

Board	Connector	Description
Relay (Junction) Board	CN1	From C277MAIN/CN9
	CN2	From C277MAIN/CN8
	CN3	From C277MAIN/CN15
	CN4	From C277MAIN/CN24
	CN5	From C277MAIN/CN14
	CN6	To CR Board/CN1:WHT
	CN7	To CR Board/CN7:BLE
	CN8	Printer Mechanism:I/H Assembly R
	CN9	Printer Mechanism:CR Lock Solenoid
	CN10	Printer Mechanism:Release Lever
	CN11	Printer Mechanism:P_FRONT Sensor
	CN12	Printer Mechanism:P_THICK Sensor
	CN 13	Printer Mechanism:Cover Sensor
	CN14-16	Printer Mechanism:Suction Fan
	CN17	Printer Mechanism:PG Origin Sensor
	CN18	Printer Mechanism:PG Motor
	CN19	Printer Mechanism:Pump Motor
CR Board	CN1	From Relay Board/CN6:WHT
	CN2	CR Encoder
	CN3	B Head
	CN4	CR HP Sensor
	CN6	Cutter Solenoid
	CN7	From Relay Board/CN7:BLE
	CN8	C Head

7.6 Parts List

Table 7-12. Parts List

Block Name	Ref No.	Part Code	Description	Qty
CASE BLOCK	180	1046615	LABEL,CAUTION;B	1
CASE BLOCK	181	1046617	LABEL,CUTER CHANGE;B	1
CASE BLOCK	182	1046619	LABEL,PAPER JAMING;B	1
CASE BLOCK	183	1046621	LABEL,CUT PAPER SET;B	1
CASE BLOCK	184	1046623	LABEL,ROLL PAPER SET;B	2
CASE BLOCK	185	1046625	LABEL,PAPER LEVER SET UP;B	1
CASE BLOCK	186	1046626	LABEL,TRANSPORT/ STRAGE,LIGHT;B	1
CASE BLOCK	187	1046628	LABEL,TRANSPORT/ STRAGE,LEFT;B	1
CASE BLOCK	188	1046633	LABEL,INK MODEL NUMBER,LIGHT;B	1
CASE BLOCK	189	1046634	LABEL,INK MODEL NUMBER,LEFT;B	1
CASE BLOCK	190	1046635	LABEL,CAUTION,STEEL BELT;B	1
CASE BLOCK	191	1045247	LABEL,CUT POSITION	1
CASE BLOCK	192	1045248	LABEL,VALVE OPEN AND SHUT;LIGHT	1
CASE BLOCK	193	1045249	LABEL,VALVE OPEN AND SHUT;LEFT	1
CASE BLOCK	194	1046637	LABEL,PAPER EJECT CLOTH SET;B	1
CASE BLOCK	195	1046639	LABEL,CAUTION,CUTER; B	1

Table 7-12. Parts List (continued)

Block Name	Ref No.	Part Code	Description	Qty
CASE BLOCK	196	1046641	LABEL,CAUTION PAPER COVER;B	2
CONTROL CIRCUIT BOAR	200	2029123	BOARD ASSY.,MAIN	1
CONTROL CIRCUIT BOAR	201	2030185	SIMM,16M SET	1
PRINTER MECHANISM	101	1044247	X REDUCTION BELT	1
PRINTER MECHANISM	102	1044248	ROLL SUPPORT L,ASSY	2
PRINTER MECHANISM	103	1044249	ROLL SUPPORT R,ASSY	2
PRINTER MECHANISM	104	1044250	COVER SUPPORT ASSY	4
PRINTER MECHANISM	105	2030086	PF MOTER PULLEY ASSY	1
PRINTER MECHANISM	106	1044252	AIR SHIELD A	4
PRINTER MECHANISM	107	1044253	AIR SHIELD B	4
PRINTER MECHANISM	108	1044254	VACUUM FAN ASSY	3
PRINTER MECHANISM	109	1044255	FAN DUCT	3
PRINTER MECHANISM	110	1044256	VACUUM FAN 1 CABLE ASSY	1
PRINTER MECHANISM	111	1044257	VACUUM FAN 2 CABLE ASSY	1
PRINTER MECHANISM	112	1044258	VACUUM FAN 3 CABLE ASSY	1

Table 7-12. Parts List (continued)

Block Name	Ref No.	Part Code	Description	Qty
PRINTER MECHANISM	115	1044261	COVER DUMPER ASSY	1
PRINTER MECHANISM	116	2030087	TERM BOARD ASSY	1
PRINTER MECHANISM	117	2030088	LEVER DETECTOR ASSY	1
PRINTER MECHANISM	118	1044264	PRESS TRANSMISSION GEAR	1
PRINTER MECHANISM	119	1044265	PRESS TRANSMISSION GEAR	1
PRINTER MECHANISM	120	1044266	COVER R DETECTOR ASSY	1
PRINTER MECHANISM	121	1044267	HD SLIDE DETECTOR ASSY	1
PRINTER MECHANISM	122	1044268	SLIDE DETECTOR GUIDE	1
PRINTER MECHANISM	123	1044269	SLIDE MOTOR GEAR ASSY	1
PRINTER MECHANISM	124	1044270	LEVER COVER	1
PRINTER MECHANISM	125	1044271	PRESS LEVER KNOB	1
PRINTER MECHANISM	126	1044393	COVER L DETECTOR ASSY	1
PRINTER MECHANISM	127	1044394	COVER DAMPER L ASSY	2
PRINTER MECHANISM	131	1044246	POROUS PAD,INK EJECT	34
PRINTER MECHANISM	201	1044272	F BOX L ASSY	1

Table 7-12. Parts List (continued)

Block Name	Ref No.	Part Code	Description	Qty
PRINTER MECHANISM	202	2030089	P FRONT DETECTOR ASSY	1
PRINTER MECHANISM	203	1044274	Y DRIVEN PULLEY ASSY	1
PRINTER MECHANISM	204	1044275	SCREW CAP	2
PRINTER MECHANISM	205	1044276	T FENCE	1
PRINTER MECHANISM	206	2030090	P THICK DETECTOR ASSY	1
PRINTER MECHANISM	207	2030091	CR MOTER PULLEY ASSY	1
PRINTER MECHANISM	208	1044279	DETECTOR ARM	1
PRINTER MECHANISM	209	1044285	STEEL BELT	1
PRINTER MECHANISM	213	1038961	ROLLER,DRIVEN;D	67
PRINTER MECHANISM	302	1044238	DAMPER ASSY.,	6
PRINTER MECHANISM	303	F055050	PRINTHEAD,IJ192-0AE (for light ink—right)	1
PRINTER MECHANISM	304	1044288	HEAD TAPE CABLE	2
PRINTER MECHANISM	305	F055040	PRINTHEAD,IJ192-0AD (for dark ink—left)	1
PRINTER MECHANISM	306	1044290	P EDGE ASSY	1
PRINTER MECHANISM	307	1044291	HEAD ADJUSTOR A	2

Table 7-12. Parts List (continued)

Block Name	Ref No.	Part Code	Description	Qty
PRINTER MECHANISM	308	1044292	HEAD ADJUSTOR B	1
PRINTER MECHANISM	309	1044293	CUTTER CAP	1
PRINTER MECHANISM	310	1044294	SOLONOID SPRING	1
PRINTER MECHANISM	311	1044295	CUTTER SOLONOID ASSY	1
PRINTER MECHANISM	312	1044296	CUTTER SPRING	1
PRINTER MECHANISM	313	1044297	SLIDE ECCENTRIC CAM	2
PRINTER MECHANISM	314	1044298	SLIDE GEAR	1
PRINTER MECHANISM	319	1030787	COMPRESSION SPRING,9.9	2
PRINTER MECHANISM	402	1044300	CR ROCK ASSY	1
PRINTER MECHANISM	403	1045666	CAP ASSY.	1
PRINTER MECHANISM	404	2030410	PUMP MOTOR ASSY	1
PRINTER MECHANISM	405	1035836	PUMP ASSY.	1
PRINTER MECHANISM	406	1033209	CLEANER,HEAD,ASP	1
PRINTER MECHANISM	407	1044302	F BOX R ASSY	1
PRINTER MECHANISM	411	1035198	MOUNTING PLATE,MOTOR,ASF	1

Table 7-12. Parts List (continued)

Block Name	Ref No.	Part Code	Description	Qty
PRINTER MECHANISM	412	1012618	DAMPER,CR	3
PRINTER MECHANISM	413	1038605	PLANE WASHER,3.3*1.5*8,S/NA	3
PRINTER MECHANISM	414	1017596	SHAFT,DAMPER,CR;B	3
PRINTER MECHANISM	415	1037461	FASTEN PLATE,MOTOR,ASF	1
PRINTER MECHANISM	503	1044305	I/C COVER	2
PRINTER MECHANISM	504	1035239	CAM,VALVE	6
PRINTER MECHANISM	505	1044306	BULB GEAR	2
PRINTER MECHANISM	506	1044307	BULB ADJUST GEAR L	1
PRINTER MECHANISM	507	1044308	BULB ADJUST GEAR L	1
PRINTER MECHANISM	508	1044309	I/H BULB SPRING	2
PRINTER MECHANISM	509	2030092	INK BOARD ASSY	2
PRINTER MECHANISM	510	2030093	HODER DETECTOR ASSY	2
PRINTER MECHANISM	511	2024712	DETECTOR,INK END	6
PRINTER MECHANISM	512	2030095	HODER L TAPE CABLE	1
PRINTER MECHANISM	513	2030096	HOLDER R TAPE CABLE	1

Table 7-12. Parts List (continued)

Block Name	Ref No.	Part Code	Description	Qty
PRINTER MECHANISM	514	1044322	I/C LINK	2
PRINTER MECHANISM	515	1044323	I/C LEVER KNOB	6
PRINTER MECHANISM	516	2030097	INK ID BOARD ASSY R	2
PRINTER MECHANISM	517	2030098	INK ID BOARD ASSY C	2
PRINTER MECHANISM	518	2030099	INK ID BORAD ASSY L	2
PRINTER MECHANISM	519	1035844	HOLDER ASSY.,VALVE,A	6
PRINTER MECHANISM	520	2030100	NOT DETECTOR ASSY R	2
PRINTER MECHANISM	521	2030101	NOT DETECTOR ASSY D	2
PRINTER MECHANISM	522	2030102	NOT DETECTOR ASSY L	2
PRINTER MECHANISM	523	1044336	I/H LEVER L	1
PRINTER MECHANISM	524	1044337	I/H LEVER KNOB L	1
PRINTER MECHANISM	525	1044338	I/H LEVER R	1
PRINTER MECHANISM	526	1044339	I/H LEVER KNOB R	1
PRINTER MECHANISM	527	1044343	BULB KNOB	2
PRINTER MECHANISM	528	1044344	BULB MANUAL CAM	2

Table 7-12. Parts List (continued)

Block Name	Ref No.	Part Code	Description	Qty
PRINTER MECHANISM	530	1044346	OIL DAMPER	2
PRINTER MECHANISM	531	1044347	I/H SPACER	4
PRINTER MECHANISM	532	1044348	I/H IDLE GEAR	2
PRINTER MECHANISM	533	1044349	LATCH	2
PRINTER MECHANISM	534	1044350	FRANGE(2 INCH)	2
PRINTER MECHANISM	535	1044351	FLANGE(3 INCH)	1
PRINTER MECHANISM	538	1035266	WIRE SPRING,HOLDER,IC	6
PRINTER MECHANISM	539	1001468	TORSION SPRING,3490	6
PRINTER MECHANISM	540	1035267	COVER,HOLDER,IC	6
PRINTER MECHANISM	541	1035843	HOLDER ASSY.,IC,GUIDE	6
PRINTER MECHANISM	542	1035274	LEVER,INK END	6
PRINTER MECHANISM	601	2030103	CR BOARD ASSY	1
PRINTER MECHANISM	602	2030104	HEAD ORIGIN POINT DETECTOR ASSY	1
PRINTER MECHANISM	603	2030105	CR ENC ASSY	1
PRINTER MECHANISM	604	1044355	CR TAPE CABLE 1	1

Table 7-12. Parts List (continued)

Block Name	Ref No.	Part Code	Description	Qty
PRINTER MECHANISM	605	1044356	CR TAPE CABLE 2	1
PRINTER MECHANISM	606	1033483	O RING,TUBE FASTEN	48
PRINTER MECHANISM	607	1033482	JOINT SCREWS,M6	48
PRINTER MECHANISM	608	1033481	JOINT,BK	18
PRINTER MECHANISM	612	1044239	TUBE,SUPPLY,INK,A	6
PRINTER MECHANISM	613	1044240	TUBE,SUPPLY,INK,B	2
PRINTER MECHANISM	614	1044241	TUBE,SUPPLY,INK,C	1
PRINTER MECHANISM	615	1044242	TUBE,SUPPLY,INK,D	2
PRINTER MECHANISM	616	1044243	TUBE,SUPPLY,INK,E	1
PRINTER MECHANISM	703	2030106	POWER SUPPLY BOARD ASSY	1
PRINTER MECHANISM	704	2030107	P/S FAN ASSY	1
PRINTER MECHANISM	705	2030108	P REAR DETECTOR ASSY	1
PRINTER MECHANISM	706	2030109	POWER SUPPLY DC CABLE	1
PRINTER MECHANISM	707	1044361	PF MOTOR CABLE ASSY	1
PRINTER MECHANISM	708	1044362	CR MOTOR CABLE ASSY	1

Table 7-12. Parts List (continued)

Block Name	Ref No.	Part Code	Description	Qty
PRINTER MECHANISM	709	1044363	STEPPING MOTOR CABLE	1
PRINTER MECHANISM	710	1044364	PANEL TAPE CABLE	1
PRINTER MECHANISM	711	1044365	MAIN TAPE CABLE 1	1
PRINTER MECHANISM	712	1044366	MAIN TAPE CABLE 2	1
PRINTER MECHANISM	713	1044367	FAN CABLE	1
PRINTER MECHANISM	714	1044368	PF ENCORDER CABLE ASSY	1
PRINTER MECHANISM	716	1044370	HEAD COM CABLE	1
PRINTER MECHANISM	717	1044396	COOLING FAN CABLE ASSY	1
PRINTER MECHANISM	720	1011863	GROUNDING PLATE,I/F,UPPER	1
PRINTER MECHANISM	801	2030110	PANEL ASSY	1
PRINTER MECHANISM	805	1044375	R SIDE COVER	1
PRINTER MECHANISM	806	1044376	R LEG COVER	1
PRINTER MECHANISM	807	1044377	ROLL COVER ASSY	1
PRINTER MECHANISM	808	1044378	FRONT COVER ASSY	1
PRINTER MECHANISM	809	1044379	SUB PLATEN	5

Table 7-12. Parts List (continued)

Block Name	Ref No.	Part Code	Description	Qty
PRINTER MECHANISM	810	1046716	SUB PLATEN A	3
PRINTER MECHANISM	811	1046717	SUB PLATEN B	1
PRINTER MECHANISM	812	1044373	L SIDE COVER	1
PRINTER MECHANISM	813	1044374	L LEG COVER	1
PRINTER MECHANISM	901	1044380	LEG ASSY(BOX INCLUDED)	1
PRINTER MECHANISM	902	1044381	PAPER EJECT TRAY ASSY	1
PRINTER MECHANISM	904	1044383	TRAY ROUND CAP(6 PCS)	6
PRINTER MECHANISM	905	1044384	TRAY T CAP(2 PCS)	2
PRINTER MECHANISM	906	1044385	TRAY STAND L ASSY	1
PRINTER MECHANISM	907	1044386	TRAY STAND R ASSY	1
PRINTER MECHANISM	908	1044387	TRAY SUPPORT	2
PRINTER MECHANISM	909	1044388	LEG CAP	4
PRINTER MECHANISM	910	1044389	CASTER(WITH STOPPER)	2
PRINTER MECHANISM	911	1044390	CASTER(WITHOUT STOPPER)	2

Table 7-12. Parts List (continued)

Block Name	Ref No.	Part Code	Description	Qty
PRINTER MECHANISM	912	1044391	4 SCREW & HEXAGON SOCKET SCREW KEY	1
PACKING MATERIAL	NON FIG 4009903	UNPACKING SHEET	1	
PACKING MATERIAL	NON FIG 4010221	SUPPLEMENT	1	

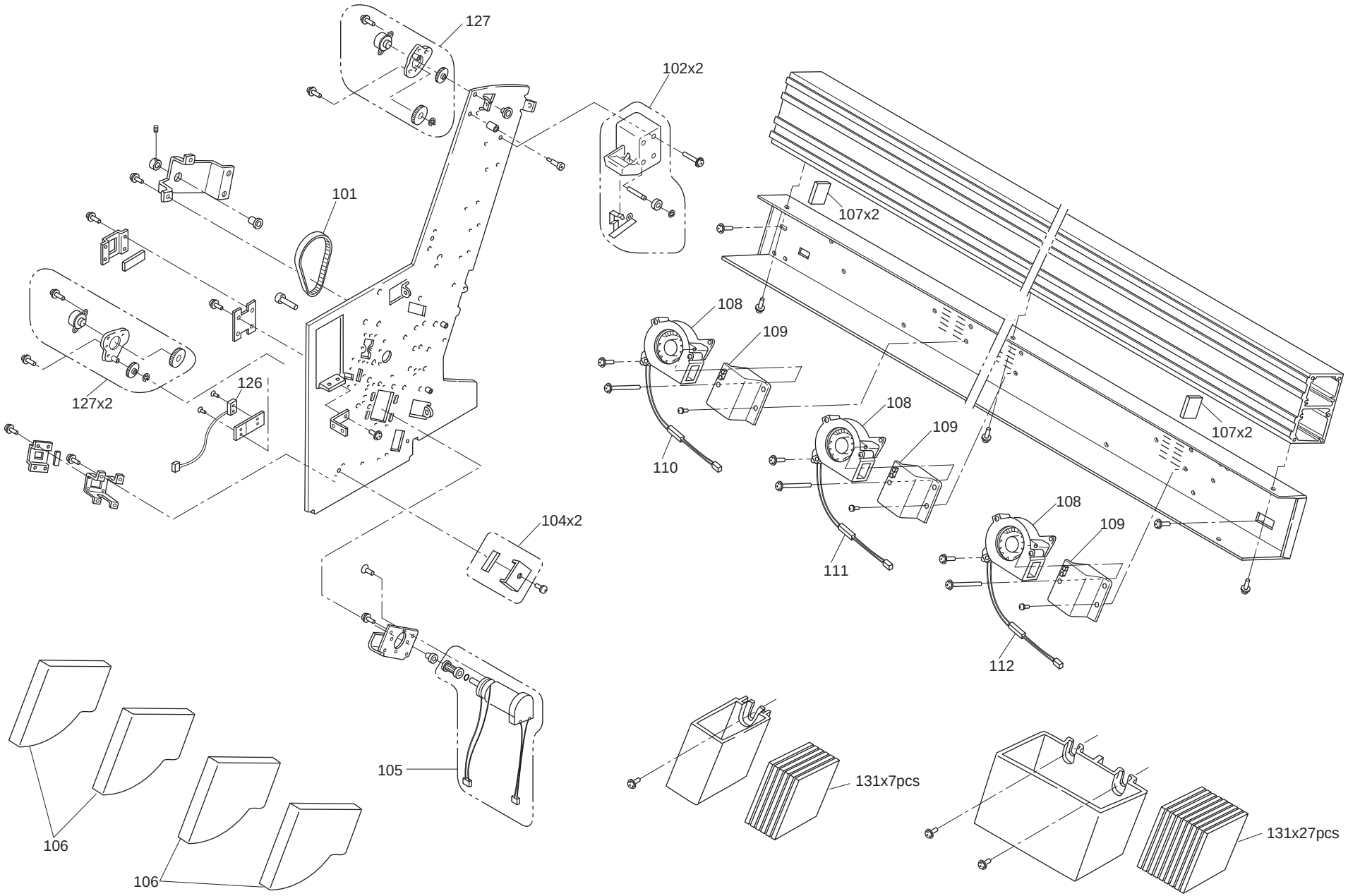
7.7 Exploded Diagrams

The part numbers in the illustrations on the following pages are referenced in **Table 7-12 on page 173**.

- No.1: PF L Frame Assembly, Fan Bracket Assembly
- No.2: R Frame Assembly
- No.3: PF Rail Assembly
- No.4: CR Rail Assembly
- No.5: Carriage Assembly
- No.6: Maintenance Assembly
- No.7: I/H Assembly (1) LEFT
- No.8: I/H Assembly (1) RIGHT
- No.9: I/H Assembly (1) IH Assembly
- No.10: I/H Assembly (2) Holder
- No.11: Tube Assembly (2)
- No.12: Board Assembly
- No.13: Cover Assembly
- No.14: Stand Assembly

PF L Frame Assembly, Fan Bracket Assembly

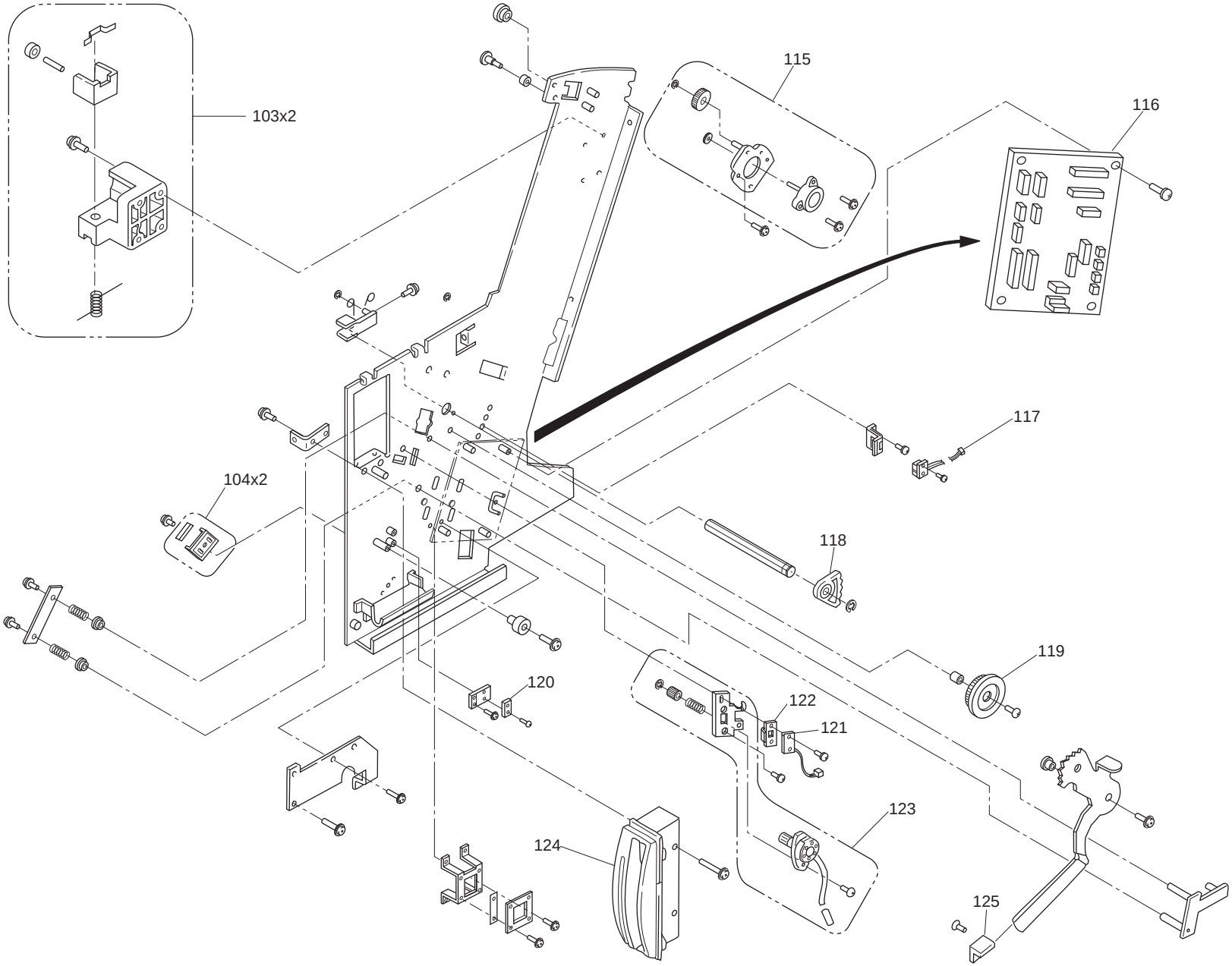
CAT 5001



STYLUS PRO 9000 / PM-9000C No.1

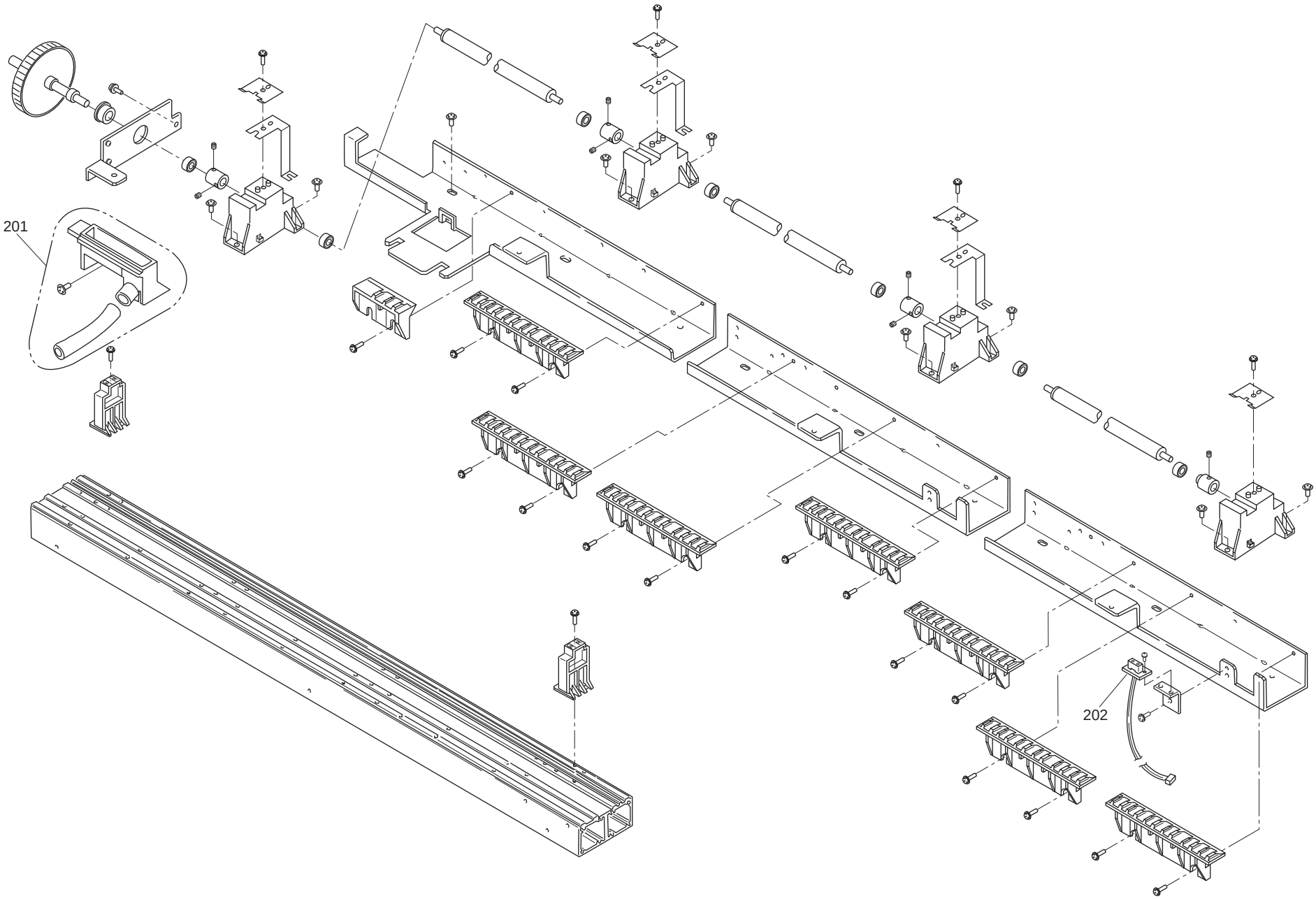
Rev.01 10052

R Frame Assembly



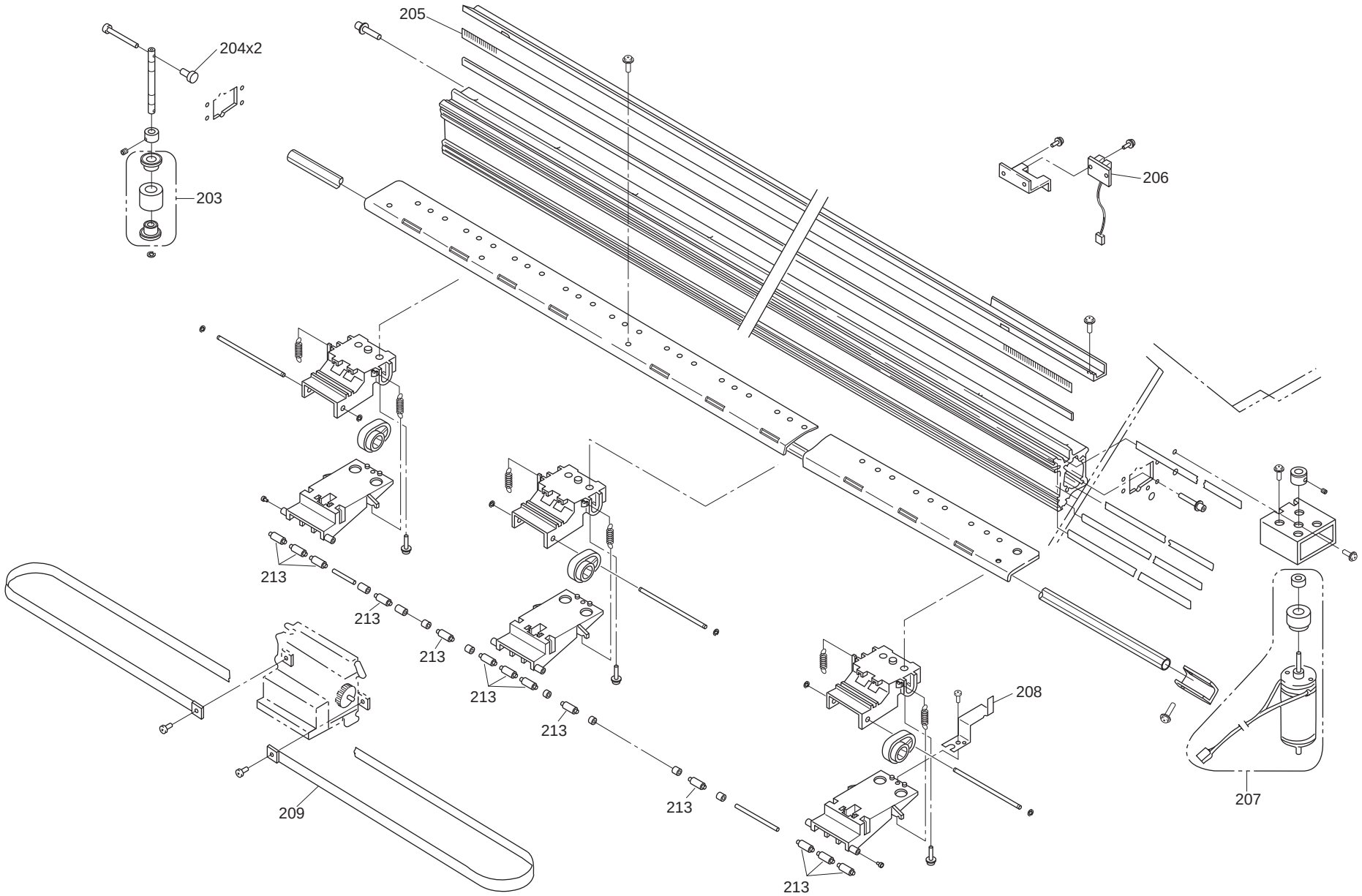
PF Rail Assembly

CAT 5003



STYLUS PRO 9000 / PM-9000C No.3

Rev.01 10052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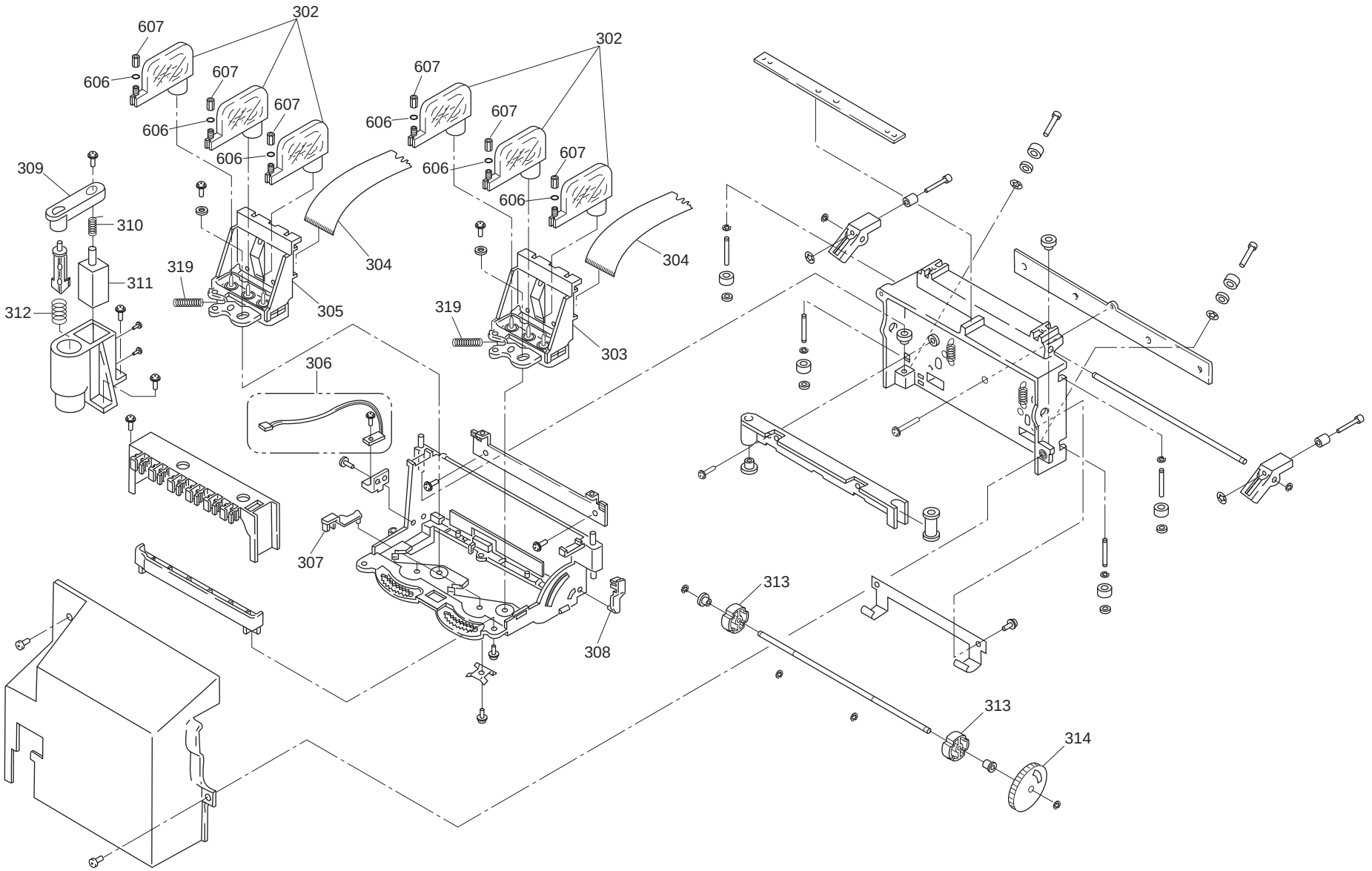
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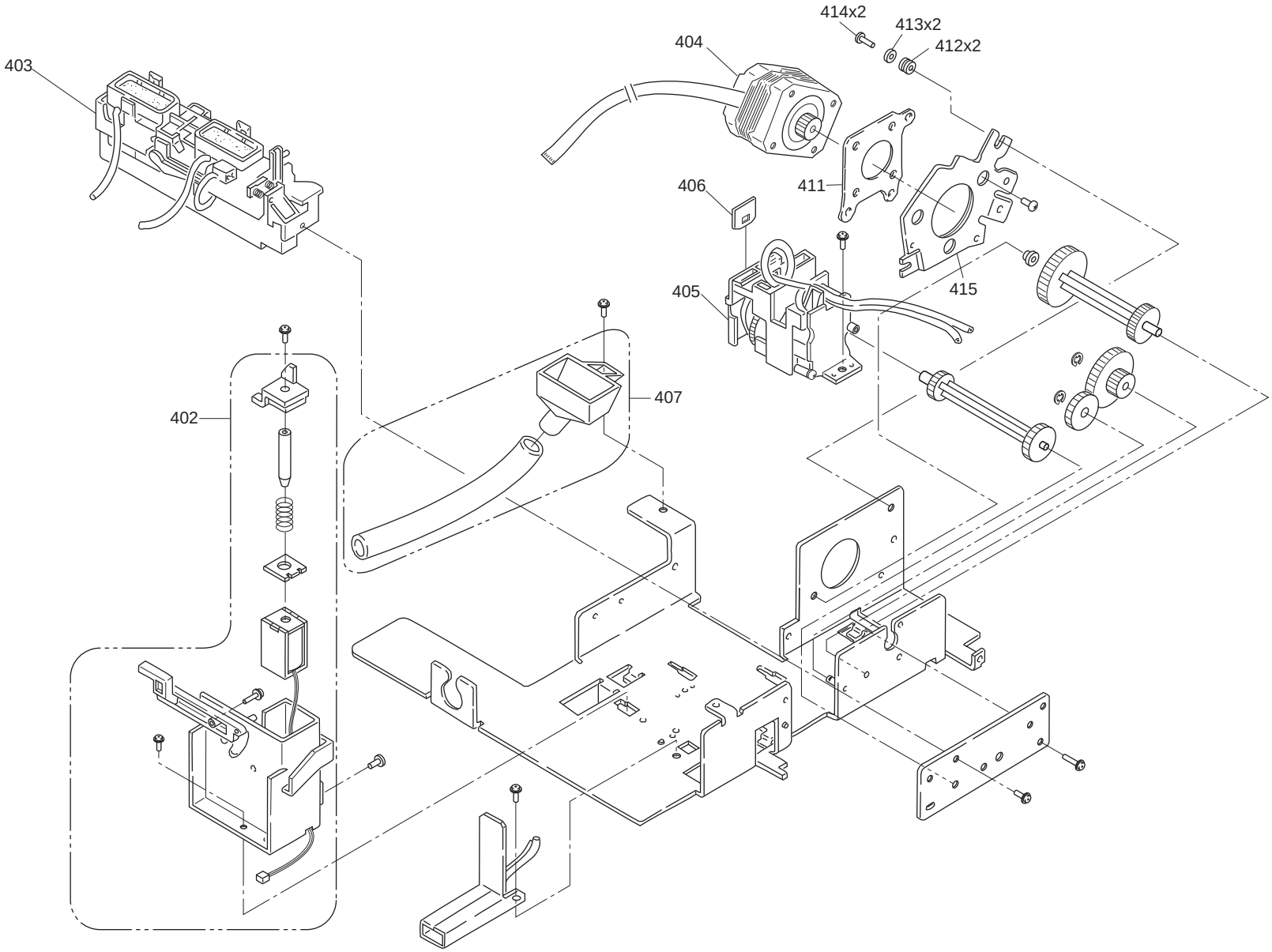
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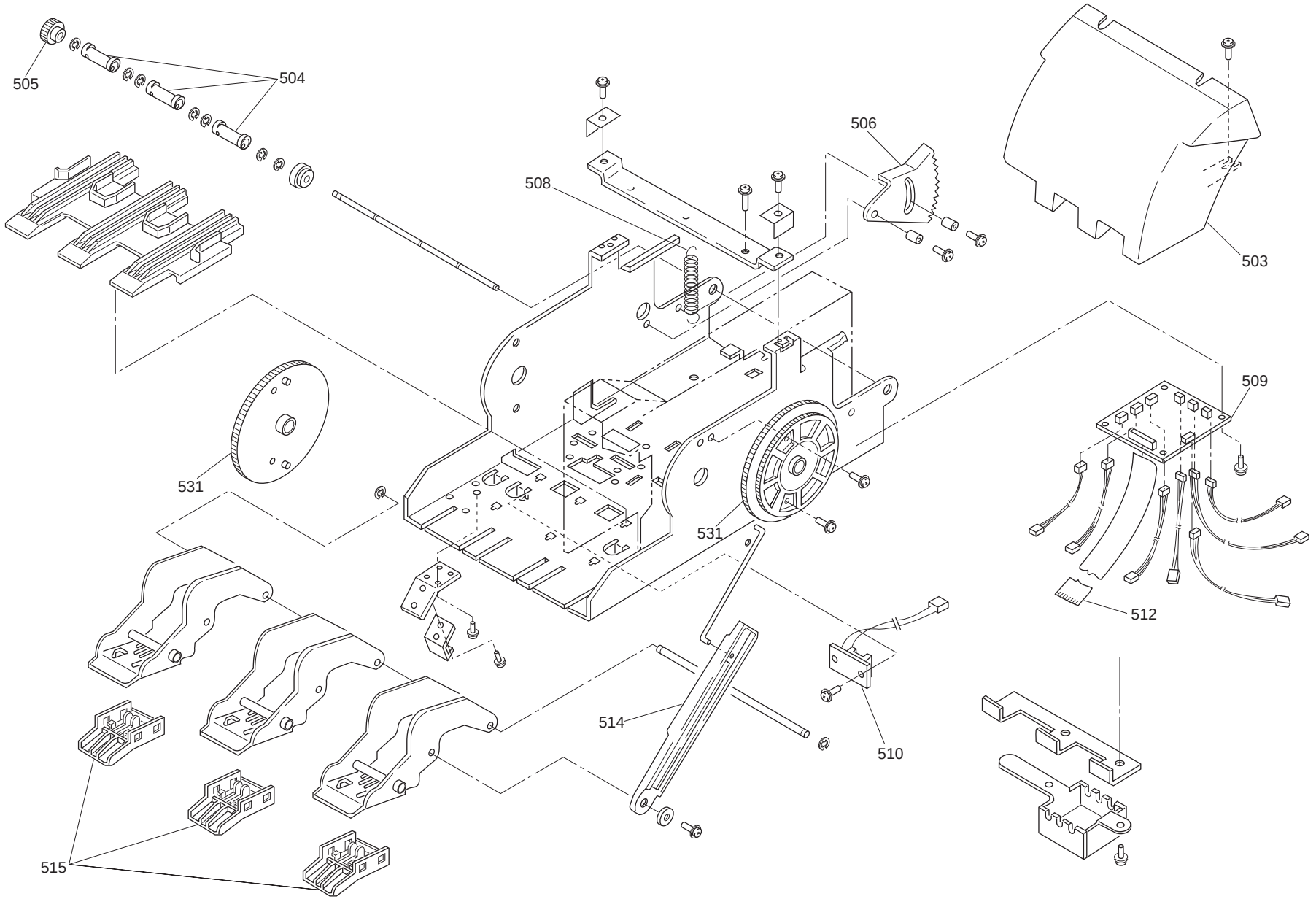
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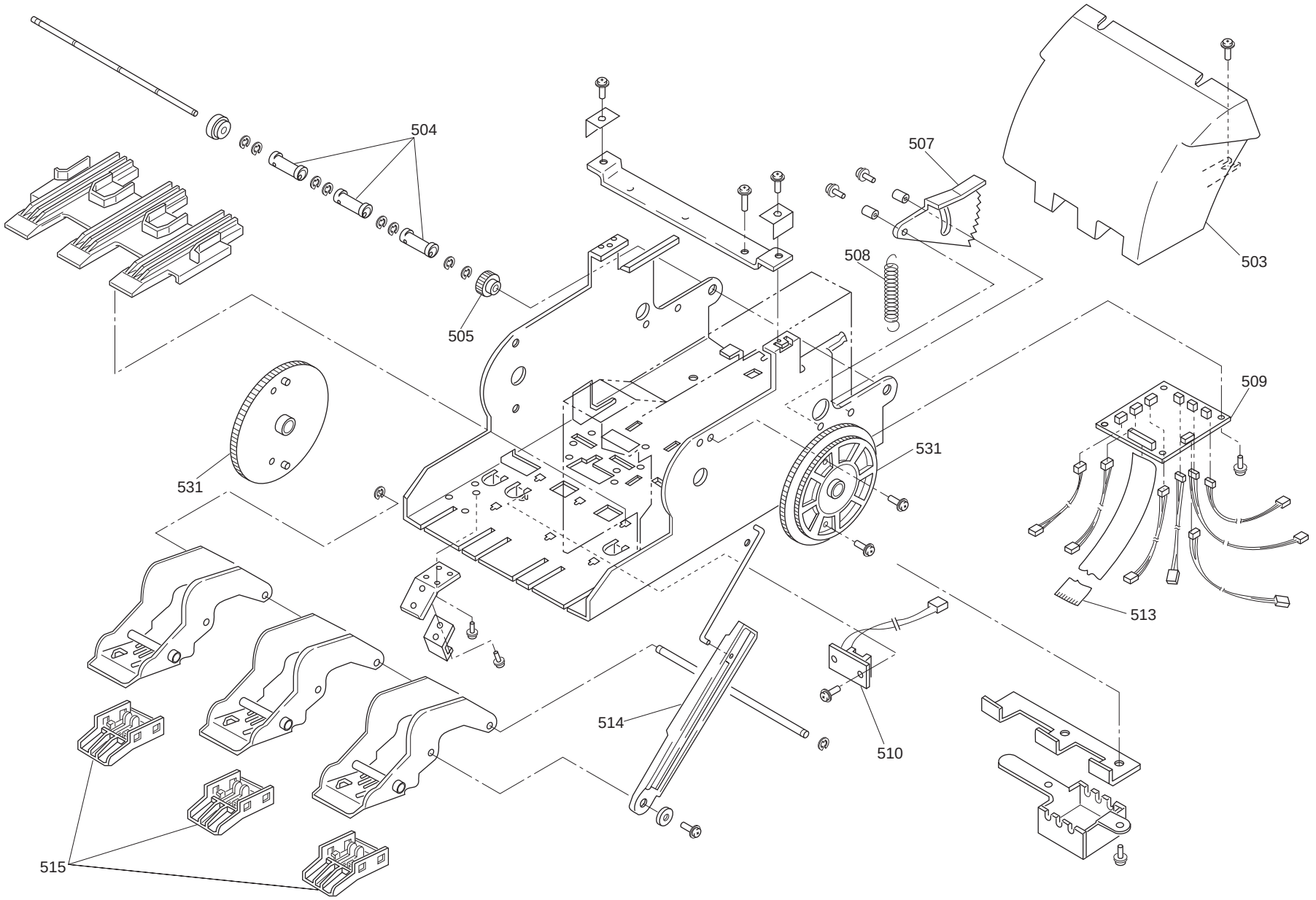
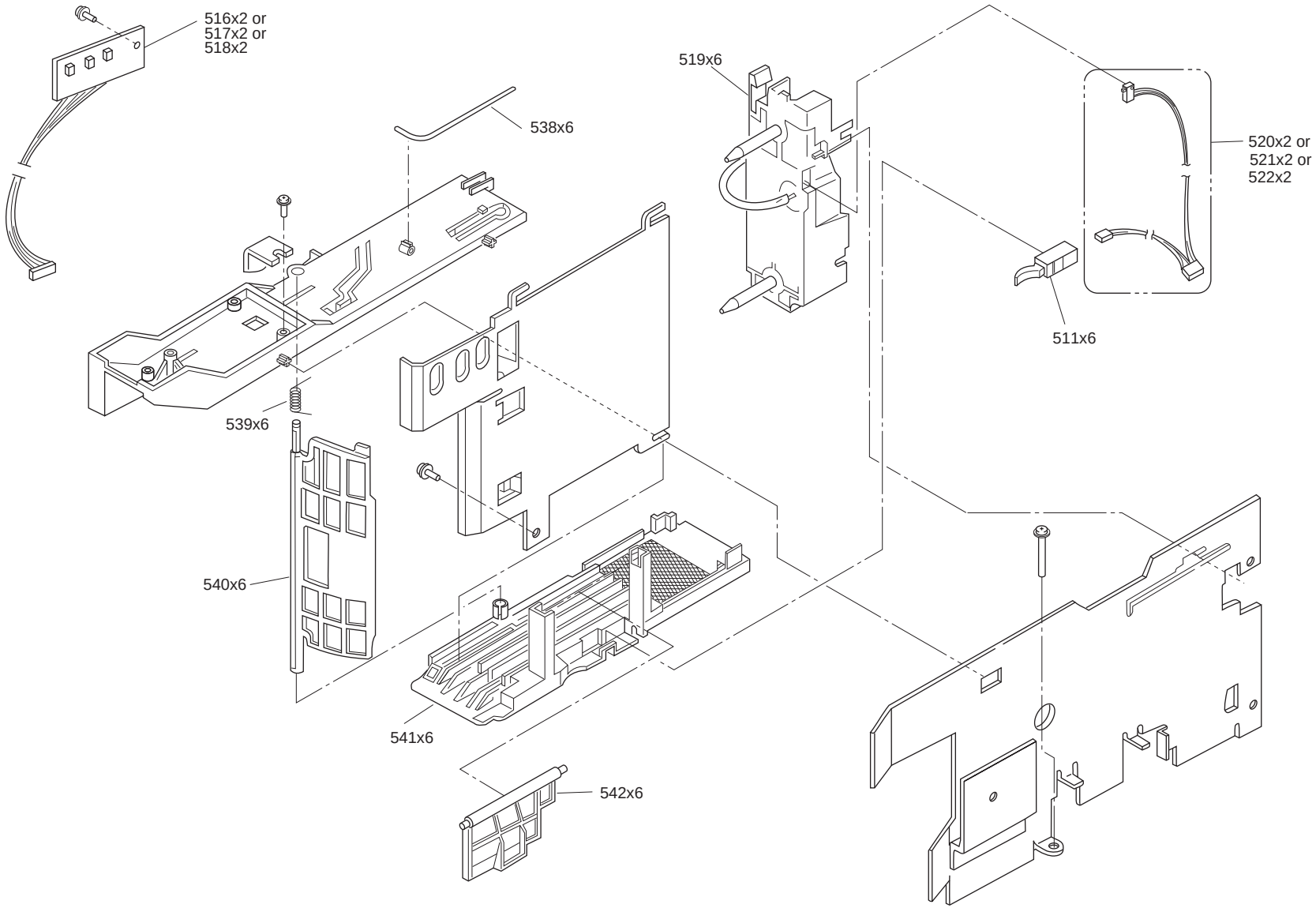
IH Assembly (1) Right

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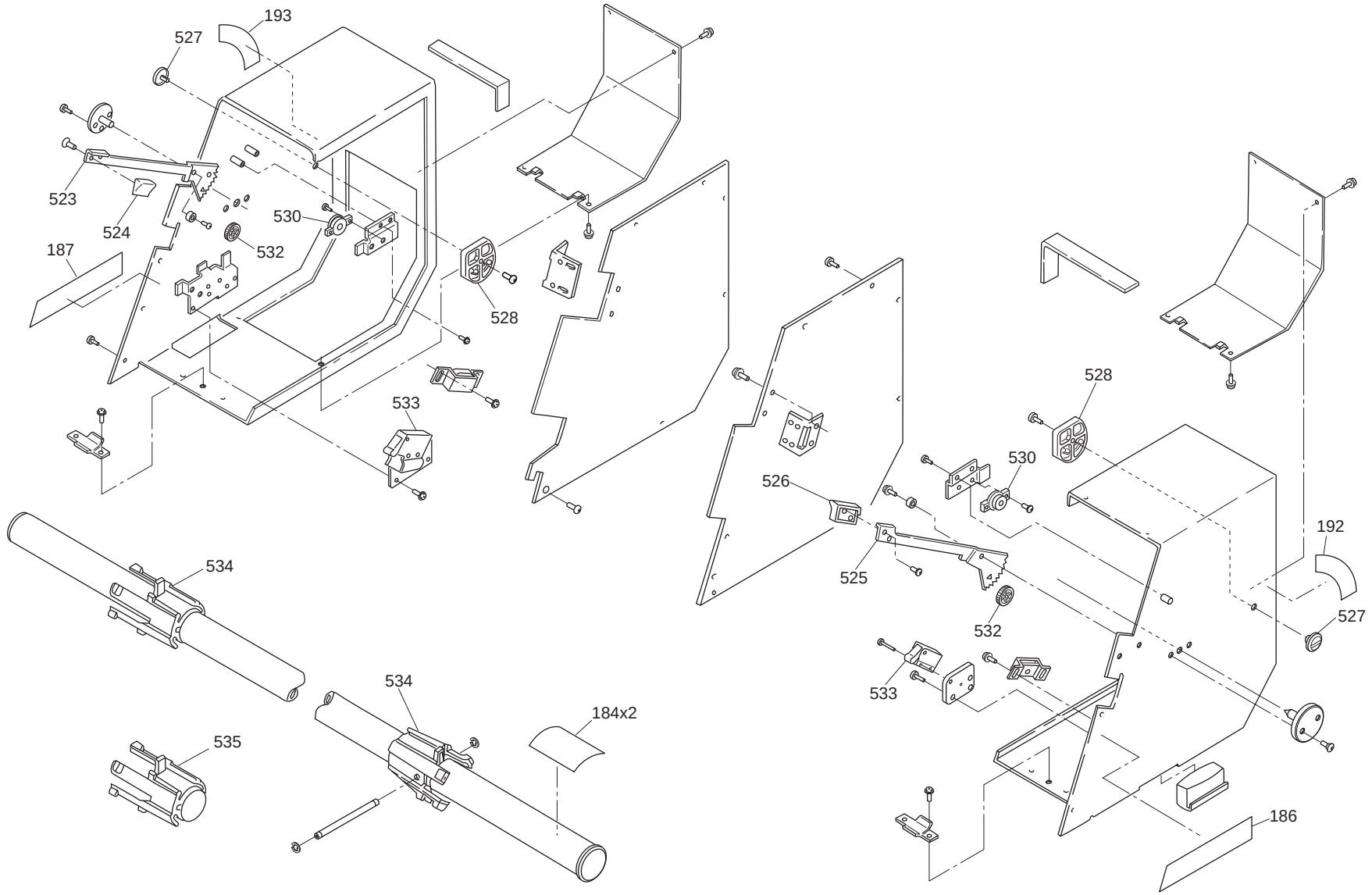
542x6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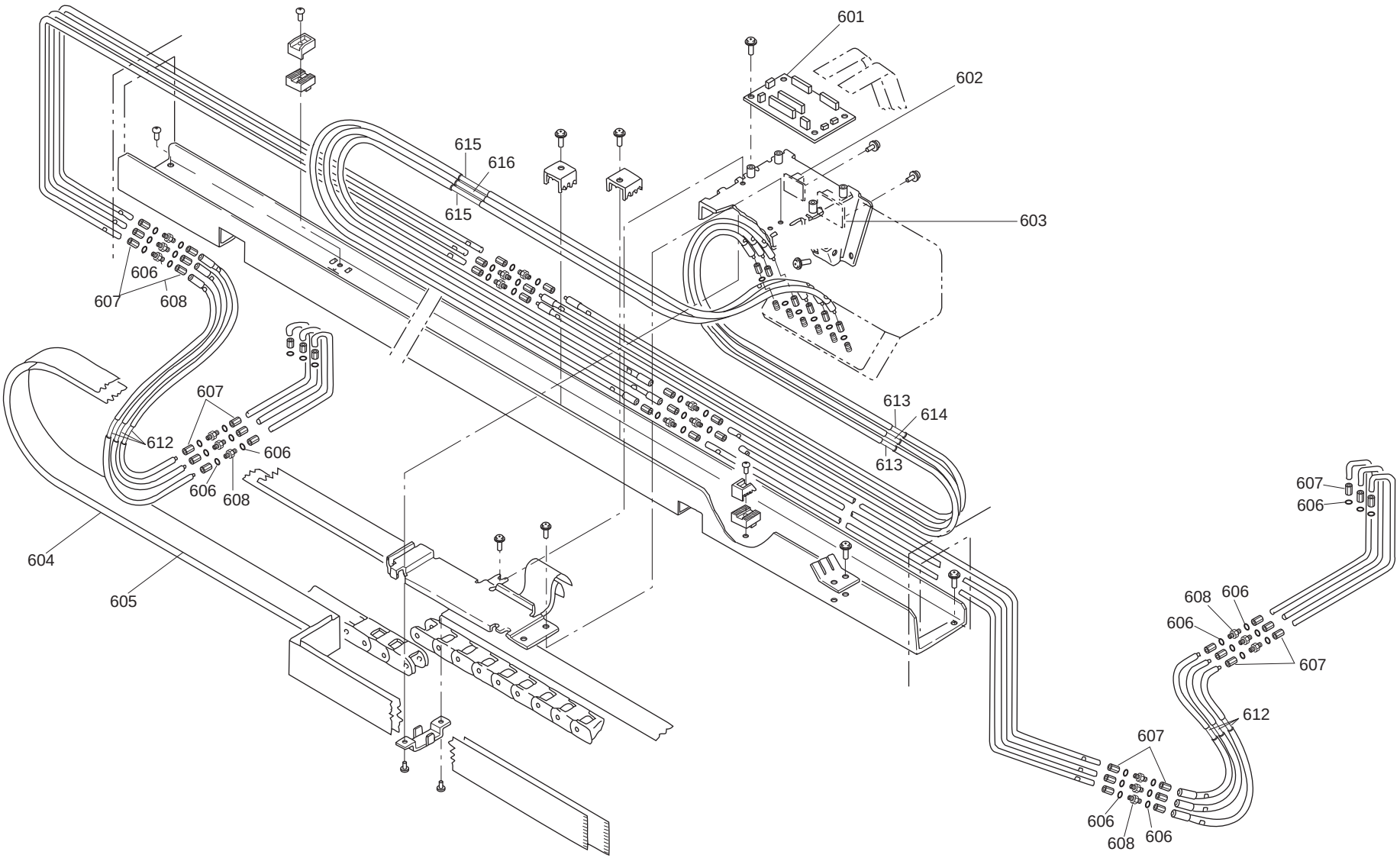
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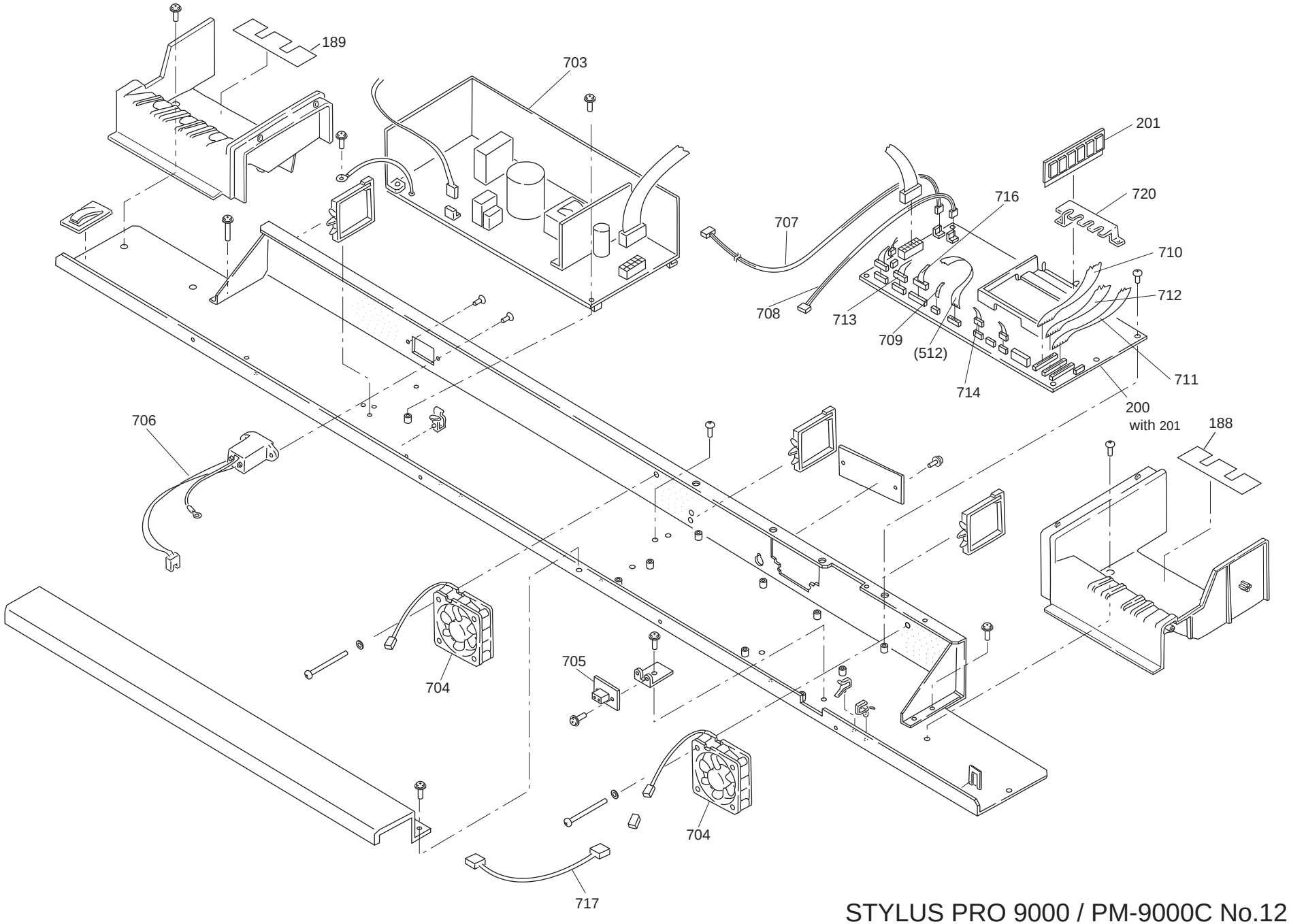
606

Board Assembly



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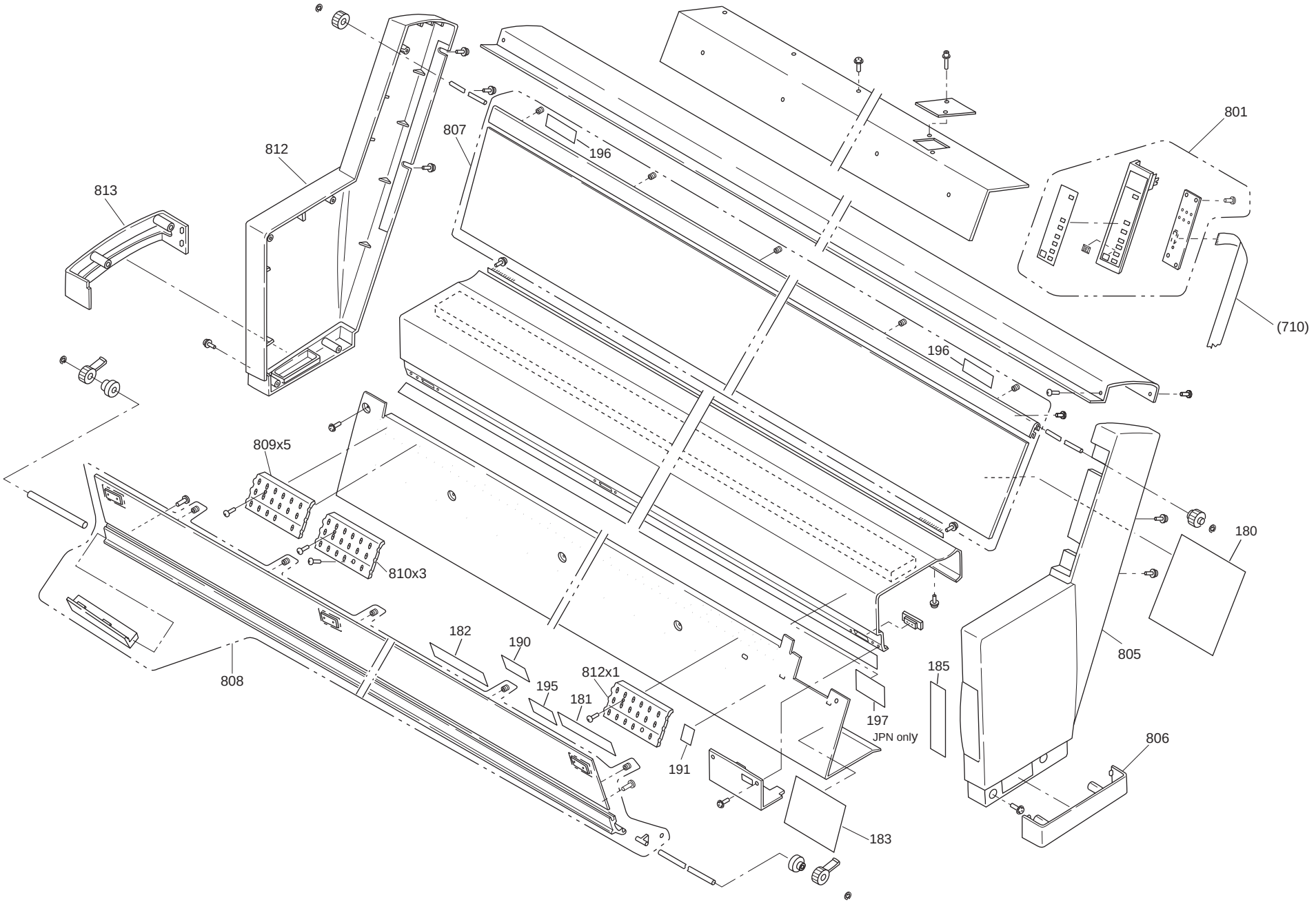
Rev.01 10052



STYLUS PRO 9000 / PM-9000C No.13
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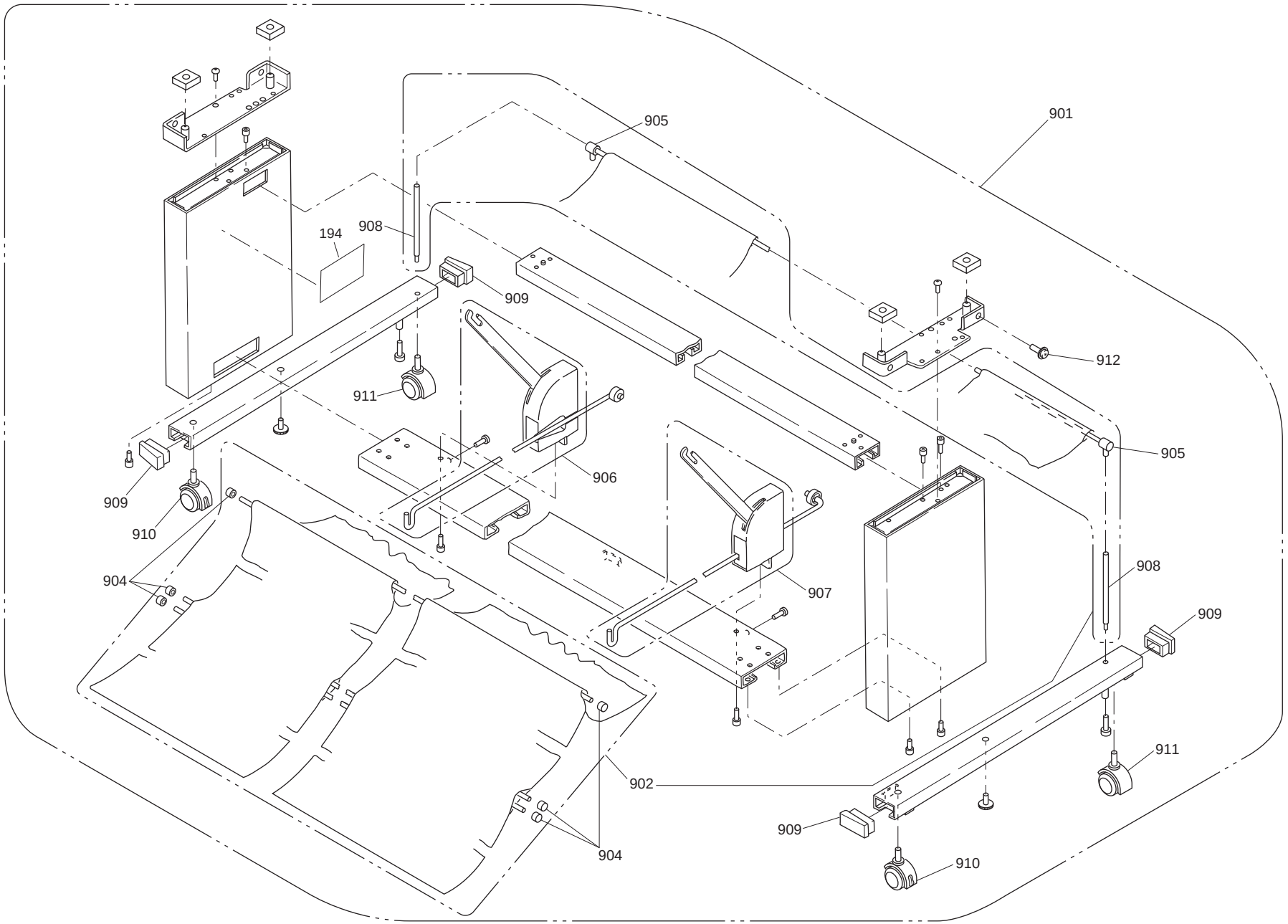
Stand Assembly

CAT 5013



STYLUS PRO 9000 / PM-9000C No.14

Rev.01 10052

7.8 Main Board Component Layout

The illustrations below show the C277MAIN Board component layout.

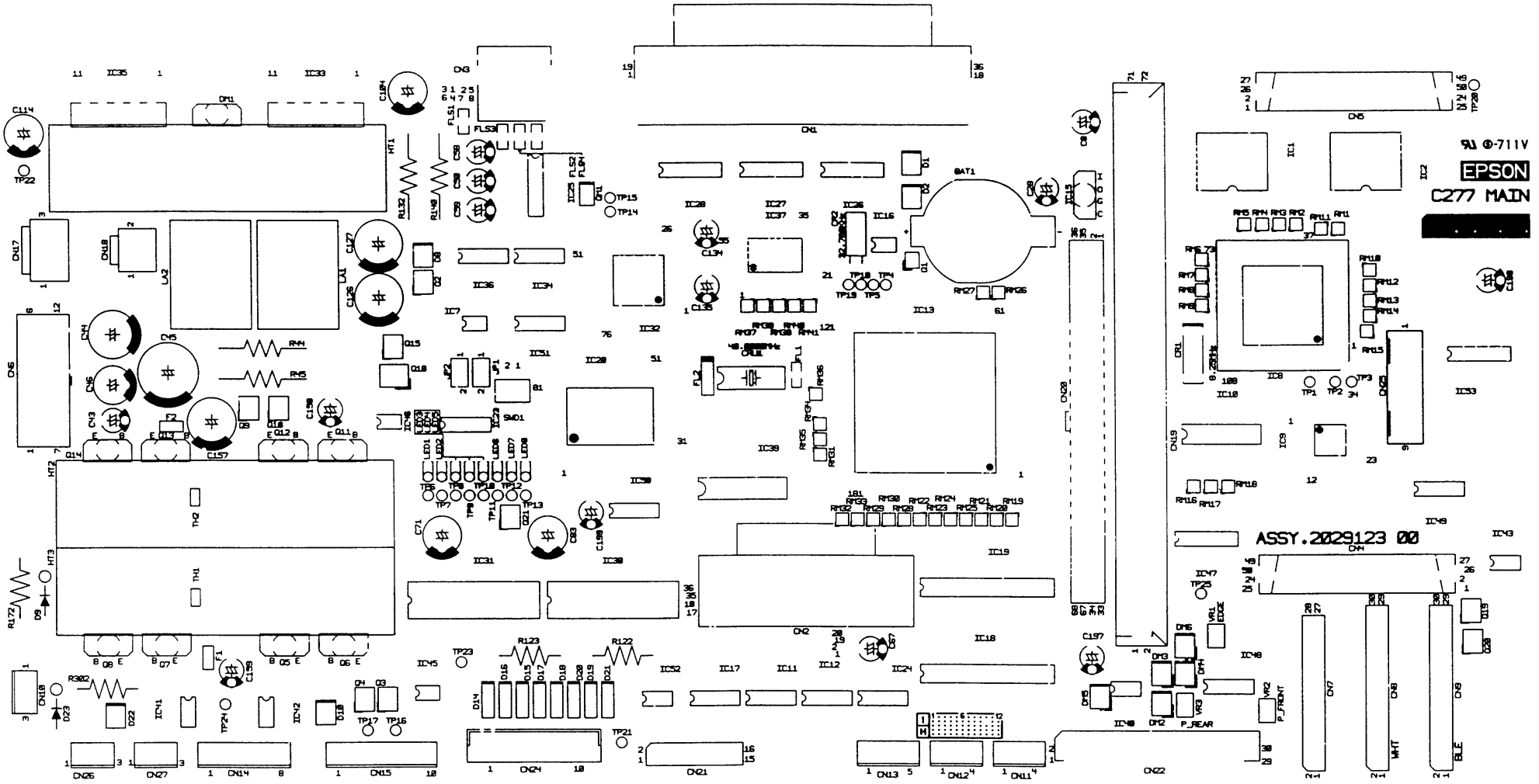


Figure 7-5. C277MAIN Board Component Layout of Component side

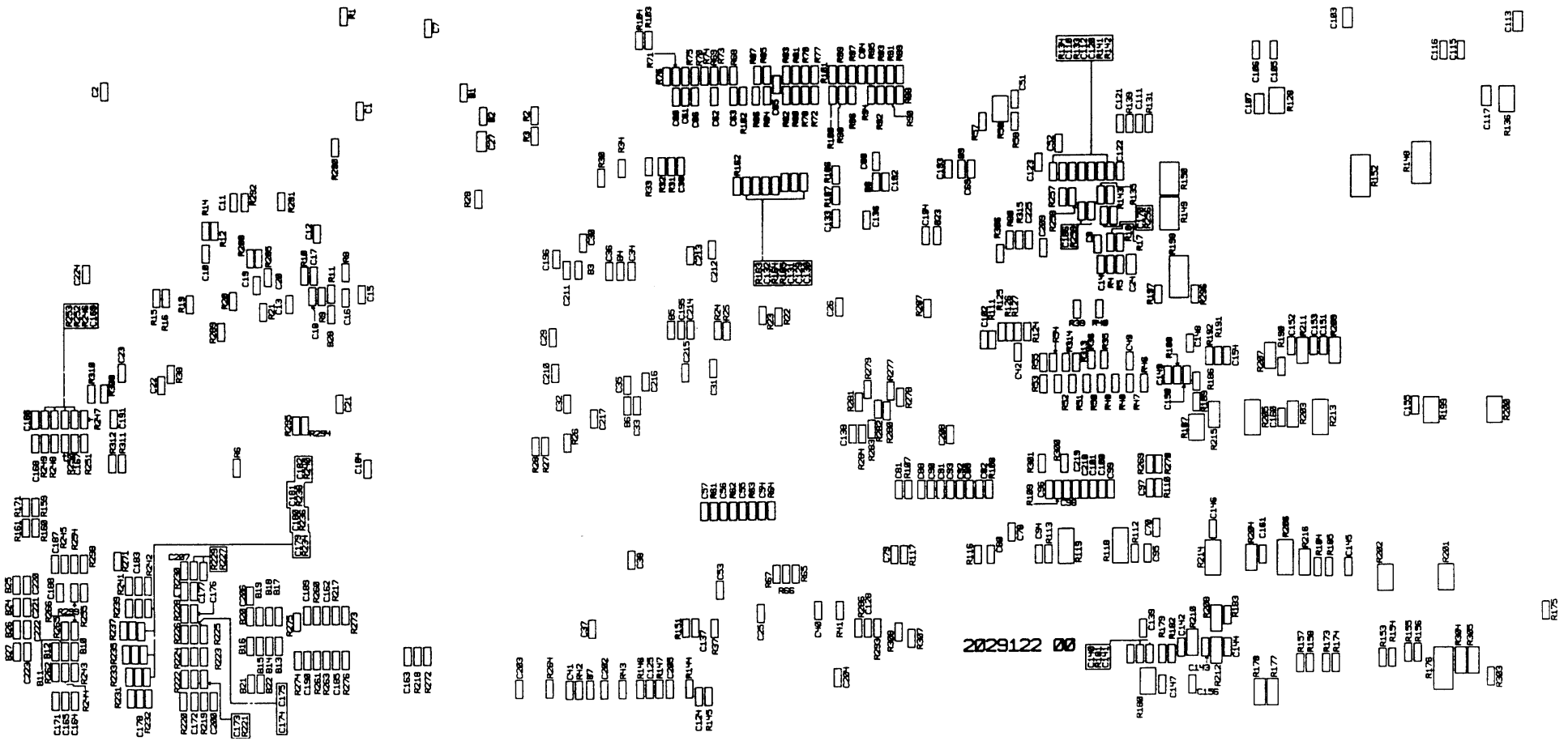
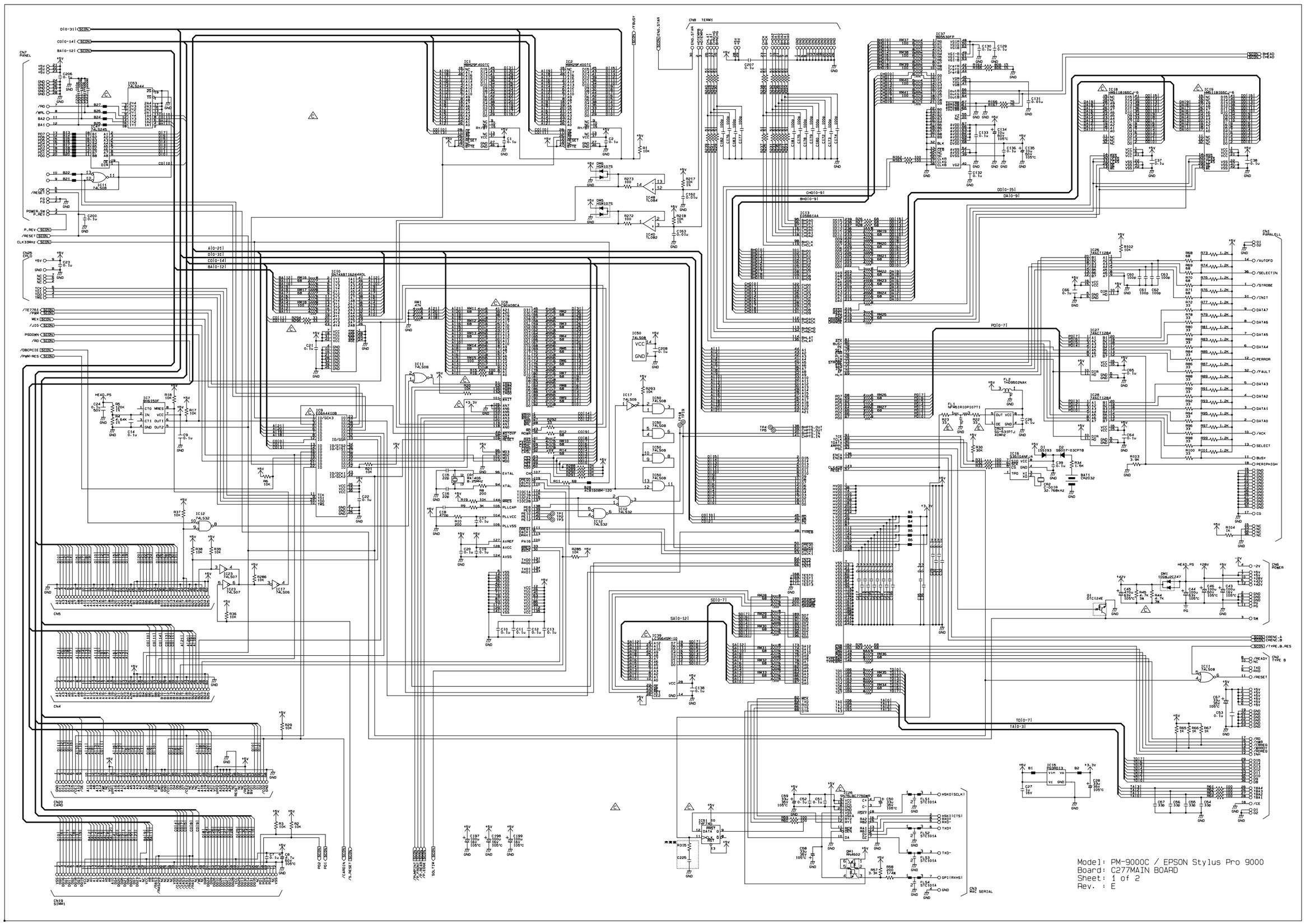


Figure 7-6. C277MAIN Board Component Layout of Soldering Side

7.9 Circuit Diagrams

The circuit diagrams for the C277MAIN Board are provided on the following pages.

- C277MAIN (1/2)
- C277MAIN (2/2)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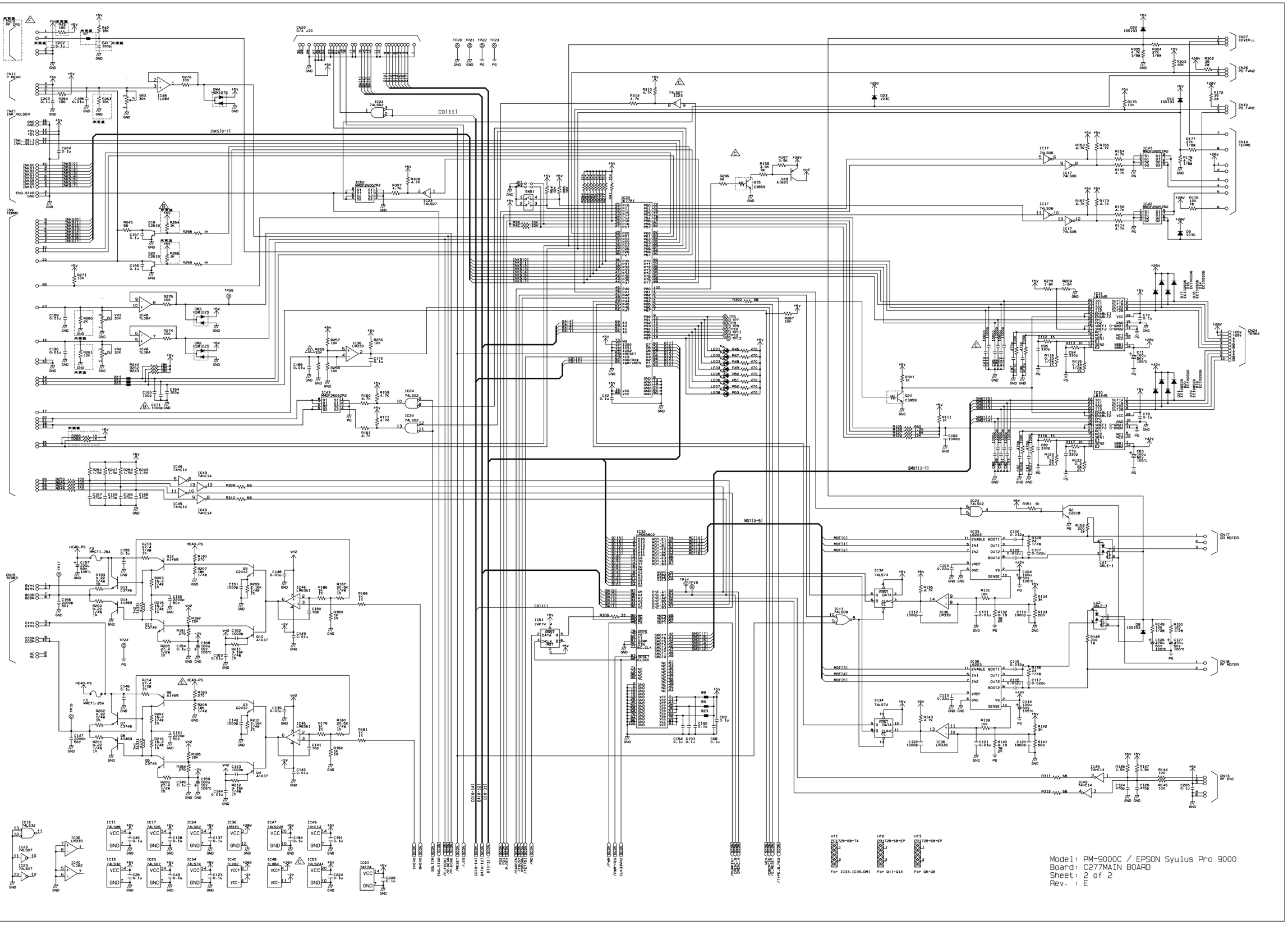
Board: C277MAIN BOARD
Sheet: 1 of 2
Rev. : E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CN11 P REAR
CN21 INK HOLDER
CN9 TERM2
CN22 G/A JIG
TP20 TP21 TP22 TP23
INKS[0-7]
CO[1:1]
SW1
IC52 MBZF2N057R2
IC23 74LS07
IC24 74LS02
IC35 LM339
IC48 TL084
IC49 74HC14
IC99 IC7751
IC32 MB86802
IC51 74F74
IC41 MBZF2N057R2
IC42 MBZF2N057R2
IC17 74LS06
IC31 LB1645
IC30 LB1645
IC33 LB203
IC36 LB203
IC34 74LS74
IC11 74LS08
IC24 74LS02
D22 1SS193
D10 1SS193
D9 V03C
D23 V03C
D15 C3859
D16 A1681
Q21 C3859
Q2 C2618
CN07 COVER_L
CN26 PS FAN2
CN10 PS FAN1
CN14 TERM5
CN24 TERM4
CN17 CR MOTER
CN18 PF MOTER
CN13 PF ENC
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TP24
TP17
TP16
TP15
TP14
HEAD_PS
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Q13 C3746
Q11 C3746
Q10 A1037
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DI[0-31]
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HT2 PBT25-68-EP
HT3 PBT25-68-EP
For IC33.IC35.DM1
For Q11-Q14
For Q5-Q8
Model: PM-9000C / EPSON Syulus Pro 9000
Board: C277MAIN BOARD
Sheet: 2 of 2
Rev. : E