

Service Manual



B0 Wide-Format Professional Inkjet Printer

EPSON Stylus Pro 9000



EPSON®

SEIJ98008

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PRECAUTIONS

There are cautionary notes throughout the text to help you avoid personal injury or equipment damage.



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



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

Always observe the measures listed below when performing repair or maintenance procedures.

WARNING

1. Always disconnect the product from both the power source and 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 performed 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 and/or individual chips.
4. To protect sensitive microprocessors and circuitry, use static discharge equipment, such as anti-static wrist straps, when accessing internal components.
5. Replace malfunctioning components only with those components recommended by the manufacturer; introduction of second-source ICs or other nonapproved components may damage the product and void any applicable EPSON warranty.

Revision Status

Revision	Issued Date	Description
A	1/26/1999	Original
B	5/28/1999	The following chapters are revised: Chapter-1: descriptions for firmware update procedures are corrected. Chapter-2: descriptions for electrical circuit operation are added. Chapter-3: Note on using self-diagnostic mode is added. Chapter-4: instructions on disassembling the ink system components are added. Chapter-5: New tool informaiton is added / "CR Cover position adjustment" procedure is modified. / Paper sensors adjustment is added.

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CHAPTER

1

PRODUCT DESCRIPTION

1.1 Features

The EPSON Stylus Pro 9000 is an ultra-wide, 6-color ink jet printer with professional color output. It has the same printheads as the EPSON Stylus Color 5000. The EPSON Stylus Pro 9000 provides the following major features and more.

1.1.1 Professional Color Printing Features

- Large-size/poster printing
 - up to B0-wide paper (1118 cm/44 inches) including print-registration marks
- Excellent Photo-quality printing
 - 1440 (H) x 720 (V) dpi combined with EPSON's Microdot printing
- High-speed printing
 - 64 nozzles per color (same printhead as the EPSON Stylus Pro 5000)
 - The RISC-CPU and high-speed color raster ASIC quickly process detailed print data
 - A0/Normal Paper: 10 min. approx. (360x360 dpi/Speed)
A0/Glossy Paper: 30 min. approx. (720x720 dpi/Quality)
A0/Glossy Paper: 55 min. approx. (1440x720 dpi/SuperFine)
- Low running cost
 - Six separate ink cartridges so you only have to replace the empty ink cartridge (each cartridge holds 220 ml)
 - Auto Rotate feature saves paper by automatically rotating an image if the width is shorter than the height
- Wide compatibility
 - The following interface alternatives are available:
 - IEEE-1284 bidirectional parallel interface (supports ECP mode)
 - Macintosh serial interface (approx. 1.8Mbps)
 - One Type-B expansion slot for an optional interface

- User-friendly features:
 - Two roll holders for easy switching between paper types
 - Standard roll-paper cutter
 - Optional roll-paper take-up reel for automatically winding up your long printouts

1.1.2 Consumable Products & Options

The following table lists the consumable items and options available for use with the EPSON Stylus Pro 9000.

Table 1-1. Consumable Products & Available Options

Name	Code	Product
Ink cartridges	T407***	Black Ink
	T410***	Cyan Ink
	T409***	Magenta Ink
	T408***	Yellow Ink
	T412***	Light Cyan Ink
	T411***	Light Magenta Ink
Paper cutter blade	C815131	Consumable item
Roll Feed Spindle 2"	C811021*	For two-inch diameter roll paper
Roll Feed Spindle 3"	C811031**	For three-inch diameter roll paper
Auto Take-Up Reel Unit	C81508* C815091 (core only)	Printed roll-paper option
Photo Paper (Glossy)	S041225	36 in. wide/20.7m long
	S041224	44 in. wide/20.7m long
Semigloss Photo Roll Paper	S041222	36 in wide/25m long
	S041223	44 in wide/25m long
Matte Roll Paper	S041221	36 in wide/25m long
	S041220	44 in wide/25m long
Photo Quality Ink Jet Paper	S041079	A2
	S041068/S041045	A3
	S041069/S041043	A3 Wide/B
	S041070/S041044	B
Photo Paper	S041142	A3
	S041143	A3 Wide/B
	S041156	B
Photo Quality Glossy Film	S041073	A3
	S041074	A3 Wide/B
	S041075	B

Table 1-1. Consumable Products & Available Options (continued)

Name	Code	Product
Rip Station 5100 PS Server Series	EAI - C850092 Other - C850093	Fiery Adobe® PostScript® 3™ Server
Multi-protocol Ethernet interface card	C82362*	Type-B 10Base-T
100Mbps Multi-protocol Ethernet interface card	C82363*	Type-B 100Base-T

Note *: Two rolls can be installed at the same time.

Note **: Can only be installed in the upper spindle holder.

1.2 SPECIFICATIONS

PRINT SPECIFICATIONS

Print method:	On-demand MACH (Multi-layer Actuator Head) ink jet E-MACH type
Nozzle configuration:	Black: 64 nozzles Color: 320 nozzles/64 nozzles for each color (Yellow, Magenta, Cyan, Light Magenta, and Light Cyan)
Print direction:	Bi-directional with logic seeking (high-speed return and skip only)
Print speed:	See the following table:

Table 1-2. Print Speed

Print Mode	A0 Print Time	Environment
Matte Paper	Approx. 15 min.	<ul style="list-style-type: none"> Speed selected in printer driver 720 x 360 dpi Mode = Bi-D/FOL/300cps
Glossy Paper	Approx. 30 min.	<ul style="list-style-type: none"> Quality selected in printer driver 720 x 720 dpi Mode = Bi-D/FOL/300cps
Glossy Paper	Approx. 55 min.	<ul style="list-style-type: none"> Advanced Photo selected in printer driver 1440 x 720 dpi Mode = Bi-D/4-pass FOL/300cps

Control code: ESC/P Raster (commands are not open to public)

PAPER-FEED SPECIFICATIONS

Feeding method:	Friction feed
Line spacing:	1/6 or 1/720" programmable
Paper loading:	Roll paper (two 2-inch rolls can be loaded at the same time) Single sheets loaded one at a time
Paper volume:	2" core roll paper = diameter of paper wound on roll of less than 103mm (4.05") 3" core roll paper = diameter of paper wound on roll of less than 150mm (5.9") Single sheets = one sheet at a time
Feed speed:	200 ± 10 ms (when feeding at 1/6") 2.5"/second (when continuously feeding)

PAPER SPECIFICATIONS

Size, roll paper

{Minimum paper requirements}

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

- Paper Size = Width 297~1118mm (8.27~44.02")
Length 720mm~45m (28.35~1771.65")
- Roll Size = 2" or 3" core
paper thickness = 103mm or less (4.05") (two 2" rolls)
150mm or less (5.9") (one 3" roll)
- Paper Thickness = 0.08~0.5mm (0.003~0.019")

{Normal paper}

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

- Paper Size = Width 297~1118mm (8.27~44.02")
Length 720mm~45m (28.35~1771.65")
- Roll Size = 2" or 3" spindle
paper thickness = 103mm or less (4.05") (two 2" rolls)
150mm or less (5.9") (one 3" roll)
- Paper Thickness = 0.08~0.11mm (0.003~0.0043")
- Paper Weight = 64~90gf/m² (17~24 lb.s)
- Paper Quality = Normal paper, recycled paper
- *1: Use at normal room temperature (15~25°C (59~77°F) 40~60% humidity)
- *2: The printer exerts between 300~500gf to peel off the rear edge of roll paper from the core

- *3: 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 400mm (15.75") not guaranteed
 - Lower spindle = last 300mm (11.8") not guaranteed

{Special paper}

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

Table 1-3. Special Paper Specifications

Paper	Code	Paper Size	Roll Size
Matte Paper	S041220	44" x 25m	2" core/ paper thickness (radius) of 103mm or less
	S041221	36" x 25m	
Semigloss Photo Paper	S041223	44" x 25m	
	S041222	36" x 25m	
Photo Paper Glossy	S041224	44" x 25m	
	S041225	36" x 25m	

- *1: Use at normal room temperature (15~25°C (59~77°F) 40~60% humidity)
- *2: 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 400mm (15.75") not guaranteed
 - Lower spindle = last 300mm (11.8") not guaranteed

Size, single sheets

{Minimum paper requirements}

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

{Special paper}

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

Table 1-4. Usable Single Sheet Paper Specifications

Size	Dimensions (W x H)	Size	Dimensions (W x H)
B0 Wide	1118 x 1580mm	A2	420 x 594mm
B0	1030 x 1456mm	A3 Wide/B	329 x 483mm
B1	728 x 1030mm	A3	297 x 420mm
B2	515 x 728mm	ANSI E	34 x 44"
B3	364 x 515mm	ANSI D	22 x 34"
A0 Wide	914 x 1292mm	ANSI C	17 x 22"
A0	841 x 1189mm	ANSI B	11 x 17"
A1	594 x 841mm		

Paper Thickness: 420~728mm (16.54~28.66") long paper = 0.08~1.5mm (0.003~0.059")
 728~1580mm (28.66~62.2") long paper = 0.08~0.5mm (0.003~0.019")

{Normal paper}

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

Paper Thickness = 0.08~0.11mm (0.003~0.0043")

•Paper Weight = 64~90gf/m² (17~24 lb.s)

Paper Quality: Normal, recycled paper

*1: Load short edge first (portrait)

Table 1-5. Special Paper Specifications

Size	Dimensions (W x H)	SuperFine *1	PhotoPrint Paper 2	Glossy Film
A3	297 x 420mm	OK	OK	OK*2
A3 Wide	329 x 483mm	OK	OK	OK
A2	420 x 594mm	OK	-	-

Notes:

*1: Print quality optimized when printing uni-direction printing

*2: Japan only

Printable area: See the following illustration and table for details.

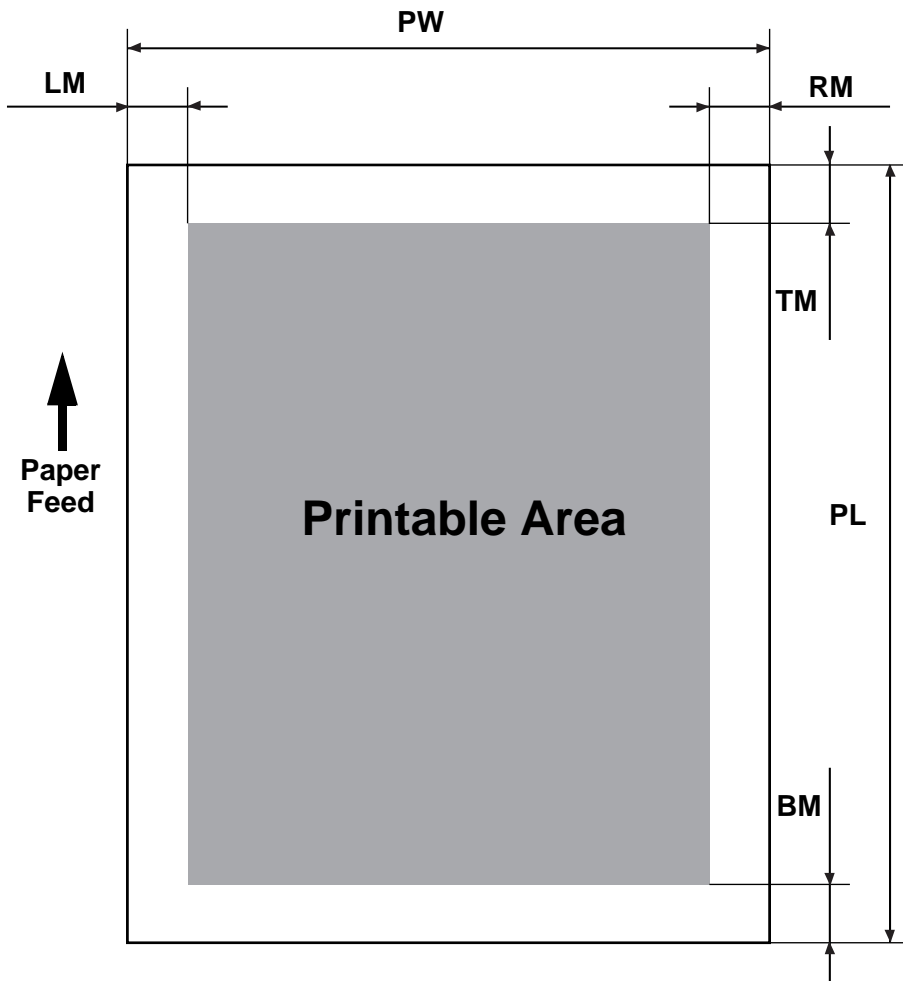


Figure 1-1. Printable Area

Table 1-6. Printable Area

Heading	Roll Paper	Cut Sheets
PW (width)	297 ~ 1118mm (8.27 ~ 44.02")	297 ~ 1118mm (8.27 ~ 44.02")
PL (length)	720mm ~ 45m (8.27~1771.65")	420~1580mm (16.54~62.2")
LM (left margin)	3mm/15mm* (0.12~0.59")	3mm
TM (top)	3mm/15mm*	3mm
RM (right)	3mm/15mm*	3mm
BM (bottom)	3mm/15mm*	14mm

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



There are three margin settings on the control-panel;

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

Table 1-7. Print Area/Margin Optimization for Roll Paper

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

Paper Release Lever: {Release lever is up}
 The feed path is open and you can load, remove or change the position of paper in the feed path.
 {Release lever is down}
 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.)

ELECTRICAL SPECIFICATIONS

Table 1-8. Electrical Specifications

	100V Model	220-240V Model
Rated voltage range	AC100~240V	
Input voltage range	AC90~264V	
Rated frequency range	50 to 60Hz	
Input frequency range	49 to 61Hz	
Rated current	1.0A	0.5A
Power consumption	operating = 100W or less standby mode = 30W or less	
Insulation resistance	10MΩ minimum (between AC line and chassis, DC 500 V)	
Dielectric strength	AC 1.0KVrms per minute AC 1.2KVrms per second	
Current leakage	0.25mA maximum	

CONFORMITY/SAFETY APPROVALS

Safety Standards:

US Model UL 1950, CSA 22.2 No. 950
 European Model EN60950 (VDE)

EMC:

US Model FCC part 15 subpart B class B
 CSA C108.8 class B
 European Model EN 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

Australian Model AS/NZS 3548 class B

International Energy Star Compliant
 (EPA MOU2.1 Category Large Format Printer)

RELIABILITY

Useful life: Printer = 18,000 pages at B1 size
 Printheads = 2,000,000,000 dots/nozzle
 Cutter = 2,000 times

ENVIRONMENTAL SPECIFICATIONS

Temperature/Humidity: See the following table.

Table 1-9. Temperature & Humidity

Condition	Temperature	Humidity	Notes
Operating	15~35°C (59~95°F)	30~80%	<ul style="list-style-type: none"> • Less than a month at 40°C (104°F) • Less than 120 hours at 60°C (140°F) • Without condensation
Storage	-20~40°C (-4~104°F)	20~85%	
Transportation	-20~60°C (-4~140°F)	5~85%	

Notes:

- 1) When storing the printer, make sure the printheads are in the home, capped, position.
- 2) Before transporting the printer, remove the ink cartridges and turn the ink valves screws to the closed position. Also make sure the printheads are in the home, capped, position. After transporting the printer, install new ink cartridges.
- 3) When the temperature drops below -15°C (5°F), the ink in the cartridges and printheads freezes. The ink thaws completely after three hours at 25°C (77°F).

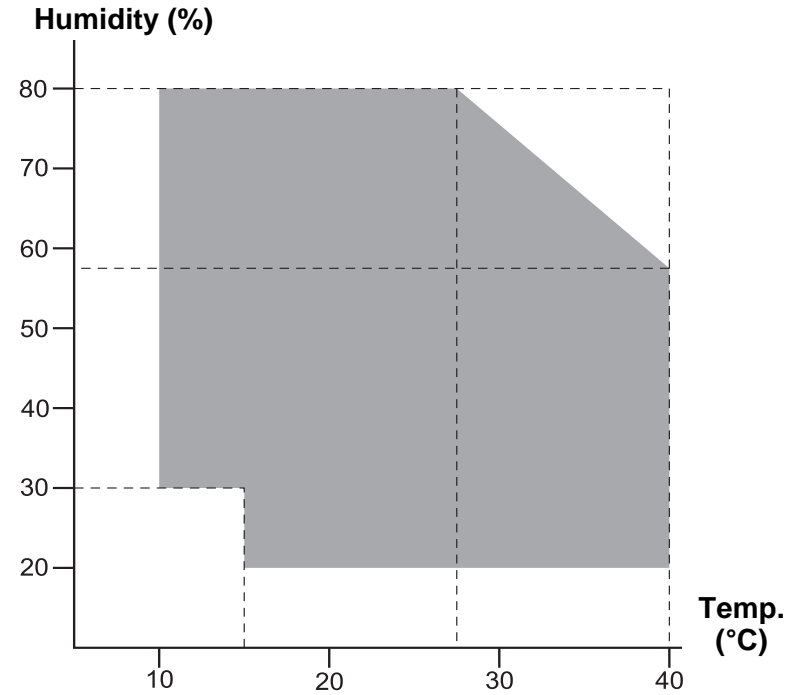


Figure 1-2. Print Temperature and Humidity

Resistance to

Vibration & Shock: See the following table.

Table 1-10. Vibration & Shock Resistance

Condition	Vibration Resistance	Shock Resistance	Notes
Operating	0.15G 10~55Hz	1G less than 1ms	X/Y/Z direction
Storage	0.50G 10~55Hz	2G less than 2ms	

INK CARTRIDGE SPECIFICATIONS

Shape: Each ink cartridge is uniquely shaped so the cartridges cannot be inserted in the wrong slots.

Ink colors: Black, Cyan, Magenta, Yellow, Light Cyan, Light Magenta

Ink volume: 220 ± 5 ml

Ink avail. for printing: 190 ± 14ml

Print capacity: A0 = approx. 28 pages at 720dpi and 40% coverage
A0 = approx. 11 pages at 720dpi and 100% coverage

Dimensions: 25.1 x 260 x 105.3mm (WxDxH)


Weight: Approx. 370~385g (cartridge only)

Effective period: 2 years from production (in the sealed packaging) plus time used (at room temp.)

Storage temperature: See the table below.

Table 1-11. Ink Cartridge (Environmental) Specifications

Situation	Temperature	Notes
Transporting	-30~60°C (-22~140°F)	<ul style="list-style-type: none"> • Less than month at 40°C (104°F) • Less than 120 hours at 60°C (140°F)
Storage	-30~40°C (-22~104°F)	Less than a month at 40°C (104°F)
Installed	-20~40°C (-4~104°F)	Less than a month at 40°C (104°F)

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

ACOUSTIC NOISE

Approximately 50 dB

CONTROLLER SPECIFICATIONS

CPU: 32 bit RISC-CPU (SH7043) 33Mhz

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

CUTTER SPECIFICATIONS

Attributes: Consumable item that is replaced by the user, and it is made of very hard steel, so the blade can easily be chipped.

Life: Can cut well over 2,000 pages, but the actual wear-and-tear depends on the type and thickness of the paper used.
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 OK.
The cutter position is determined by the carriage cover position; see “Carriage Cover Height Adjustment” on page 139 and “Cutter Position Adjustment” on page 140 for more information.

PRINTER DIMENSIONS & WEIGHT

Dimensions: 1688 x 699 x 1259mm (WxDxH)
(66.46 x 27.52 x 49.57 inches)

Weight: 96Kg (211.91 lb.s)
Printer alone = 74Kg (163.32 lb.s)
Stand = 22Kg (48.59 lb.s)

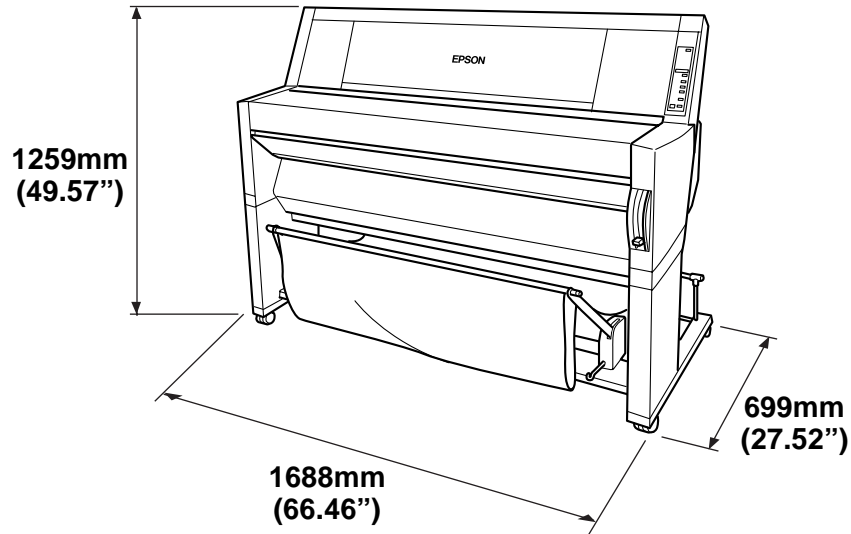


Figure 1-3. Printer Dimensions

1.3 Control Panel

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

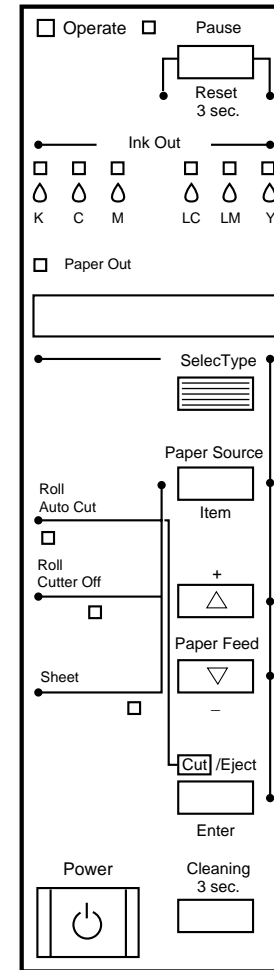


Figure 1-4. Control Panel

BUTTONS

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

Table 1-12. Control Panel Buttons & Functions

Button (Second function)	Function (Normal)	SelecType Function	Power-On Function	
Power	Power on/off	N/A	N/A	
Pause (Reset)	<ul style="list-style-type: none"> Switch - online/off-line Reset (press for three seconds) 	N/A	Maintenance mode	
SelecType	Enters SelecType mode (when printer is in Standby mode)	Selects menu or major category	N/A	
Cut/Eject (Enter)	Selects *1 <ul style="list-style-type: none"> Auto Cut Cutter Off Sheet 	Confirm and save value		
Paper Feed ↑	Feeds paper backward *2	Cycles backward/ increases value		
Paper Feed ↓ (-)	Feeds paper forward *3	Cycles forward/ decrease value		
Paper Source (Item)	Selects paper source	Selects item or minor category		
Cleaning	Cleans both heads if pressed for three seconds	N/A		
Paper Source Cut/Eject Paper Feed ↓	N/A			Maintenance Mode 2
Paper Source Cut/Eject Cleaning	N/A			Firmware Update Mode

Notes:

- 1: Interrupts ink drying and runs the specified operation.
- 2: 1.27cm/second paper feed for 2 seconds after key is pressed.
7.62cm/second paper feed if pressed for over two seconds.
Maximum feed of 20cm with one press of the button.
- 3: 1.27cm/second paper feed for 2 seconds after key is pressed.
7.62cm/second paper feed if pressed for over two seconds.

LED INDICATORS

Table 1-13. LED Indicators

LED	Status	Condition
Operate	<ul style="list-style-type: none"> On Flashing 	<ul style="list-style-type: none"> Power on Receiving data or performing power-down sequence
Paper Out	<ul style="list-style-type: none"> On Flashing 	<ul style="list-style-type: none"> No paper loaded Paper jam
Pause	<ul style="list-style-type: none"> On Flashing 	<ul style="list-style-type: none"> Printer ready Performing head cleaning or the printer is in ink drying phase. Also flashes during ink charging operation.
Ink Out Y	<ul style="list-style-type: none"> On Flashing 	<ul style="list-style-type: none"> Ink out* Ink low
Ink Out LM	<ul style="list-style-type: none"> On Flashing 	<ul style="list-style-type: none"> Ink out* Ink low
Ink Out LC	<ul style="list-style-type: none"> On Flashing 	<ul style="list-style-type: none"> Ink out* Ink low
Ink Out M	<ul style="list-style-type: none"> On Flashing 	<ul style="list-style-type: none"> Ink out* Ink low
Ink Out C	<ul style="list-style-type: none"> On Flashing 	<ul style="list-style-type: none"> Ink out* Ink low
Ink Out K	<ul style="list-style-type: none"> On Flashing 	<ul style="list-style-type: none"> Ink out* Ink low
Paper Source (Auto Cut)	On	Roll paper will automatically be cut.
Paper Type (Cut Off)	On	Roll paper will not be cut. (When using the optional Take-up Roller, you need to select this setting.)
Paper Type (Single Sheet)	On	Single sheet printing mode.

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

1.3.1 Control Panel Messages

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

Table 1-14. LCD Messages

Display Message	Meaning
Service Call nnnnnnnn *2	Fatal error
Maintenance Call nnnn *3	Printer requires maintenance from qualified service person (such as replace waste ink tank)
Wait *1	Resetting Timer IC Clearing NVRAM Performing reset operation Performing ink sequence operation Initializing the printer Dealing with initial paper operation
Switching Power Off	Preparing to shut down.
Install Ink Cartridge	Replacing ink cartridge.
Cover Open	The cover is open.
Option I/F Card Error	A Type-B interface error has occurred.
Lower Release Lever	Paper Release lever is in the release position.
Load xxx Paper	Wrong paper loaded.
Paper Jam	Paper is caught inside the printer.
Paper Not Cut	Printer did not cut the paper (when Auto Cut selected)
Paper Skew	Paper was fed at an angle, and the printer stopped to prevent printing the page offcentered.
Paper Out	End of roll or sheet (or the paper detect sensor may have dust or grime blocking its operation)
Reload Paper	Paper check error
Compartment Open	Replacing ink cartridge
Replace Cartridge	An ink cartridge is empty
Press Pause Button	Waiting for paper initialize start trigger
Pause	Pause state.

Table 1-14. LCD Messages (continued)

Display Message	Meaning
Ink Drying xx *1	Printer waits xx minutes before the next print job to allow ink on previous print job time to dry.
Ink Low	Prepare a replacement cartridge for the color ink indicated.
Printing *1	Processing print data.
Ready *1	Can receive and print data.
Reset	In the process of re-initializing.
Restart Printer	Turn the printer off and turn it on again.

Notes:

- *1: If the printer's platen gap setting is set to Thick, a "W" will appear in the last space on the LCD display.
- *2: See "Service Errors" on page 25.
- *3: See "Maintenance Errors" on page 24.

1.3.2 Control Panel Settings

To access the control panel settings, press the SelectType button while the printer is not printing. The printer enters the SelectType mode and cannot print. The following table lists LCD display messages in SelectType mode.

Table 1-15. Control Panel Settings

Display Message	Menu
SelectType Menu	SelectType menu, page 22
Test Print Menu	Test Print Menu, page 23
Printer Status Menu	Printer Status Menu, page 23
Paper Settings Menu	User Paper Settings, page 23
Cutter Replacement Menu	Cutter Replacement Menu, page 24
Head Alignment Menu	Gap Adjustment Menu, page 24

Selecting a menu provides you with detailed options.

SELECTYPE MENU

Table 1-16. SelectType Menu

Display Message	Item	Notes
PLATEN GAP	<u>Auto</u> Thick	Adjusts the platen gap. (Normally, leave set to Auto.)
PAGE LINE	<u>ON</u> OFF	When Auto Cut Off is selected on the control panel, this setting determines whether a line for manual cutting is printed.
INTERFACE	<u>Auto</u> Parallel MAC Option	Determines which interface the printer checks for data. Auto continuously checks all interfaces and is good for normal use.
PARALLEL INTERFACE	<u>Compatible</u> ECP	Determines the data transfer rate when using this interface. (Normally, leave set to Compatibility.)
CODE PAGE	<u>PC437</u> PC850	Character code setting. (PC437: expanded graphics/PC850: multi-lingual)
ROLL PAPER MARGIN	<u>Top/Bottom 15mm</u> 15mm 3mm	Roll sheet margin setting. <ul style="list-style-type: none"> • Top/Bottom 15mm*: the top and bottom margins = 15mm while left and right margins = 3mm • 15mm: all margins = 15mm • 3mm all margins = 3mm
INITIALIZE PANEL	Run	Initialize control panel setup values

Notes:

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

Also, the underlined item equals the default.

TEST PRINT MENU

Table 1-17. Test Print Menu

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

PRINTER STATUS MENU

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

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

Table 1-18. Printer Status Menu

Display message	Meaning
VERSION	Shows the firmware version.
INK REMAINING (C)	Shows the amount of remaining ink - Cyan
INK REMAINING (M)	Shows the amount of remaining ink - Magenta
INK REMAINING (LC)	Shows the amount of remaining ink - Light Cyan
INK REMAINING (LM)	Shows the amount of remaining ink - Light Magenta
INK REMAINING (Y)	Shows the amount of remaining ink - Yellow
INK REMAINING (K)	Shows the amount of remaining ink - Black
CUTTER LIFE	Shows the remaining useful life of the cutter
TOTAL PRINTS	Shows the total number of printed documents

Table 1-18. Printer Status Menu (continued)

Display message	Meaning
WASTE INK	Maintenance information
CR MOTOR	Maintenance information
PF MOTOR	Maintenance information
HEAD UNIT	Maintenance information
CLEANING UNIT	Maintenance information

USER PAPER SETTINGS

Table 1-19. User Paper Settings Menu

Display Message	Item	Notes
PAPER NUMBER	<u>Standard</u> 1~4	Select Standard for Epson special paper. Select the appropriate number for thick paper.
THICKNESS PATTERN	Print	Prints a pattern to detect the paper thickness. If "Paper Number" is set to "Standard", this message does not appear.
PAPER THICKNESS NO.	1~17	If "Paper Number" is set to "Standard", this message does not appear.
DRYING TIME	<u>0</u> ~30 Minutes	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

Note: The underlined item equals the default.

CUTTER REPLACEMENT MENU

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

Table 1-20. Cutter Replacement Messages

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

GAP ADJUSTMENT MENU

Table 1-21. Platen Gap Adjustment Menu

Display Messages	Item	Notes
ADJUSTMENT PATTERN	<u>Print All</u> Print #1~12	Selects which patterns to print. (All patterns or selected patterns only.)
SELECT #1-12	1~ <u>4</u> ~7	Choose a pattern from #1 to #12.
PAPER THICKNESS	<u>Standard</u> 0.0~1.6mm	Select the thickness, to 0.1mm, of the paper you are using to check the platen gap. Normally, leave set to Standard.

Note: The underlined item equals the default.

1.3.3 Maintenance Errors

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

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

To clear the Maintenance error, perform the following.

Replace: The following seven items are need to be replaced.

- Waste Ink Pads (R/L)
- Pump Assembly
- Cap Assembly
- F Box (R/L)
- Cleaner, Head



The above mentioned seven items are available as a kit.

Description: **MAINTENANCE KIT**

Parts code: **1048434**

Required Adjustments: The following adjustments are need to be performed after replacing the corresponding items.

- Waste Ink Counter Clear
(See “Maintenance Mode 2” on page -26.)
- Cleaner Counter
(See “Maintenance Mode 2” on page -26.)
- Cutter Position Adjustment
(See “Cutter Position Adjustment” on page 140.)

1.3.4 Service Errors

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

Table 1-22. Service Error Code List

Service Code	Explanation
00000100	Waste ink pads are full and need to be replaced. *1 (Replace the unit and reset the counter.)
00000101	Ink tubes
00010000	PF Motor Encoder Check error
00010001	PF Motor out of step
00010002	PF Motor overcurrent
00010003	PF Motor in-position time-out error
00010004	CR Motor Encoder Check error
00010005	CR Motor out of step
00010006	CR Motor overcurrent
00010007	CR Motor in-position time-out error
00010008	Servo interrupt watchdog time-out error
00010009	System interrupt watchdog time-out error
00010000A	CR origin sensor error
00010000B	PF origin sensor error
00010000C	PG origin sensor error
00010000D	Cover sensor error (00)
00010000E	Cover sensor error (01)
00010000F	CR motor PWM output error
000100010	PF motor PWM output error
000200000	NVRAM Error
000200001	Internal RAM Check Error

Table 1-22. Service Error Code List (continued)

Service Code	Explanation
000200002	SRAM Check Error
000200003	DRAM Check Error
100000004	CPU Vector 4 - General illegal instruction
100000006	CPU Vector 6 - Slot illegal instruction
100000006	CPU Vector 9 - CPU address error
10000000A	CPU Vector 10 - DMAC\DTC address error
10000000B	CPU Vector 11 - Watchdog time-out error
1000000**	CPU Vector 32~63



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

[Effective parts]

- Waste Ink Pads (right/left)
- F Box (left/right)
- Pump Assembly
- Cap Assembly
- Cleaner, Head

[Effective counters]

- Init. Waste Ink
- Init. Cleaning Unit



The above mentioned parts are also available as a KIT.

Description: MAINTENANCE KIT
Parts code: 1048434

1.3.5 Service Related Printer Settings

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

CAUTION


The following explanations regarding control panel service functions and for service and support purposes only, none of this information is to be shared with the end user.

MAINTENANCE MODE

Power-on button: Pause

Message	Item	Explanation
Hex Dump	Print	Prints the print data in hexadecimal form
Language	English Japanese	Determines which language is used to display messages on the LCD display.

MAINTENANCE MODE 2

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

Message	Item	Explanation
INIT. ALL	Execute	Initializes NVRAM, Timer, life counters, and mechanical counters
INIT. NVRAM	Execute	Initializes NVRAM
INIT. TIMER	Execute	Initializes timer
INIT. CR MOTOR	Execute	Initializes CR Motor counter (after replacing ink tubes)
INIT. PF MOTOR	Execute	Initializes PF Motor counter
INIT. HEAD UNIT	Execute	Initializes Head unit counter
INIT. CLEANING UNIT	Execute	Initializes cleaning unit counter
INIT. TOTAL PRINTS	Execute	Initializes total print counter
INIT. INK	Execute	Initializes ink counter
INIT. WASTE INK	Execute	Initializes waste ink counter
DETECT INK LABEL	ON OFF	Determines whether the Ink ID sensor checks the Ink ID label on the ink cartridge.

SELF-DIAGNOSTIC MODE

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

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

1.3.6 Firmware Update

The firmware contained on the Main Board is Flash ROM; therefore if you need to replace the Main Board or update the firmware, select one of the following methods.



- If for any reason power is cut off during the update operation (using either method), restart the update operation to return the printer to normal status.
- Use the following PC card for update.
Name: #F725 Flash Memory Card
Code: 1050073

UPDATING THE FIRMWARE VIA THE PC

1. Make sure the PC is connected to the printer using the parallel port. Compatible mode connection only.
2. While pressing and holding the following buttons, turn on the printer. Paper Source + Cut/Eject + Cleaning
3. From the PC, send the firmware-update file to the printer using the following command. At the DOS prompt, enter

copy (filename) prn:



The firmware data file for downloading via the PC is XXXXXXXX.MOT (Motrola format data).

4. "Update complete" appears indicating the Flash ROM has been properly updated.
5. Turn the printer off and back on.

UPDATING THE FIRMWARE VIA MEMORY CARD

For details on this operation, see Chapter 5, "Adjustment".

1. Copy firmware data file to the PC card.



The firmware data file to be copied to the PC card is XXXXXXXX.BIN (Binary format data).

2. Make sure the printer is off.
3. Remove the access cover towards the rear of the Paper Guide U, and insert the Flash memory card containing the updated firmware into the card slot (CN20).
4. Turn the printer on.
5. "Update complete" appears indicating the Flash ROM has been properly updated.
6. Turn the printer off, remove the memory card, and turn the printer back on.

1.3.7 Jumper Settings

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

Table 1-23. Jumper Settings

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

1.4 Interfaces

The EPSON Stylus Pro 9000 is equipped with parallel and Macintosh serial interfaces and a card slot for an optional Type-B interface. This section provides information on each interface.

SERIAL INTERFACE

Table 1-24. Serial Interface

	Description
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 1-25. Pin Assignment

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

- X-ON/X-OFF, DTR protocol:

Table 1-26. 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

PARALLEL INTERFACE

Table 1-27. Parallel Interface - Compatibility Mode

Item	Description
Transmission mode	8-bit parallel, IEEE-1284 compatibility mode
Synchronization	By STROBE pulse
Handshaking	By BUSY and ACKNLG signal
Logic Level	TTL compatible level (IEEE-1284 Level 1 device)
Connector	57-30360 (Amphenol) or equivalent 36-pin
<p>Note 1: Use a twisted-pair cable.</p> <p>Note 2: 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.</p>	

The BUSY signal is high:

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

The ERROR signal is low when there is a:

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

NOTE: The PE signal is high during a paper-out error.

Table 1-28. Connector Pin Assignments - Forward Channel

Pin No.	Signal Name	Return Pin	In/Out	Functional Description
1	STROBE	19	I	Data reception pulse, 0.5uS or greater pulse width required. Usual state is HIGH, and reads data after going to LOW state.
2-9	DATA0~7	20-27	I	The DATA0 through DATA7 signals represent data bits 0 to7, respectively. Each signal is at high level when data is logical 1 and low level when data is logical 0. These signals are used to transfer the 1284 extensibility request values to the printer.
10	ACKNLG	28	O	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	O	HIGH means the printer cannot receive data. This occurs when the printer is receiving data or when the printer is in an error state.
12	PE	28	O	HIGH means no paper is loaded. (LOW means an error.)
13	SLCT	28	O	Always HIGH. Pulled up to +5V via 1.0Kohm
14	AFXT	30	I	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 +5V via 3.9Kohm
19-30	GND			Ground for twisted pair return
31	-INIT	30	I	Pulse width of 50uS or more means LOW pulse, and the falling edge of LOW signal causes the printer to initialize.
32	ERROR	29	O	LOW means printer error
33	GND	----	----	Ground for twisted pair return
34	NC	----	----	Not connected
35	+5V	----	O	HIGH during normal operation. Pulled up to +5V via 1.0Kohm
36	SLCTIN	30	I	Not used

Note: "In/Out" is signal direction as viewed from 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.

Table 1-29. Nibble Mode

	Description
Transmission mode	IEEE-1284 nibble mode
Synchronization	Refer to IEEE-1284 specification
Handshaking	Refer to IEEE-1284 specification
Signal level	TTL level (IEEE-1284 level 1 device)
Connector	57-30360 (Amphenol) or equivalent
Data transfer timing	Refer to IEEE-1284 specification
Data requests/ device ID	<p>When the printer receives the hexadecimal values 00H or 04H, the printer responds in the following manner:</p> <p>00H: The printer enters reverse channel mode, allowing data to be sent to the host.</p> <p>04H: The printer sends the device ID to the host; the device ID consists of the following strings:</p> <p><00H><4EH> MFG: EPSON CMD: ESCPL2, BDC MDL: Stylus[SP]Pro[SP]9000; CLS: PRINTER DES: EPSON[SP]Stylus[SP]Pro[SP]9000</p> <p>Note: [00H] denotes a hexadecimal value of zero. [SP] equals space code 20H</p>

Table 1-30. ECP Mode

	Description
Transmission mode	IEEE-1284 ECP mode
Synchronization	Refer to IEEE-1284 specification
Handshaking	Refer to IEEE-1284 specification
Signal level	IEEE-1284 level 1 device
Adaptable connector	57-30360 (Amphenol) or equivalent
Data transfer timing	Refer to IEEE-1284 specification
Data requests/ device ID	<p>When the printer receives the hexadecimal values 10H or 14H, the printer responds in the following manner:</p> <p>10H: The printer enters reverse channel mode, allowing data to be sent to the host.</p> <p>14H: The printer sends the device ID to the host; the device ID consists of the following strings:</p> <p><00H><4EH> MFG: EPSON CMD: ESCPL2, BDC MDL: Stylus[SP]Pro[SP]9000 CLS: PRINTER DES: EPSON[SP]Stylus[SP]Pro[SP]9000</p> <p>Note: [00H] denotes a hexadecimal value of zero. [SP] equals space code 20H</p>

Table 1-31. Connector Pin Assignments - Reverse Channel

Pin No.	Signal Name	Return Pin	In/Out	Functional Description
1	HostClk	19	I	Host clock signal.
2-9	Data0-7	20-27	I	The DATA0 through DATA7 signals represent data bits 0 to7, respectively. Each signal is at high level when data is logical 1 and low level when data is logical 0. These signals are used to transfer the 1284 extensibility request values to the printer.
10	PeriphClk	28	O	Printer clock signal
11	PeriphAck/ PtrBusy	29	O	Printer busy signal and reverse channel transfer data bit 3 or 7.
12	AckData Req	28	O	Acknowledge data request signal and reverse channel transfer data bit 2 or 6.
13	Xflag	28	O	X-flag signal and reverse channel transfer data bit 1 or 5.
14	HostBusy	30	I	Host busy signal.
15	NC			Not connected
16	GND			Signal ground
17	Chassis GND			Chassis ground
18	Logic-H		O	Pulled up to +5V via 3.9K ohm resistor.
19-30	GND			Ground for twisted pair return
31	/INIT	30	I	Not used.
32	/DataAvail	29	O	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	----	O	Pulled up to +5V via 3.3K ohm resistor.
36	1284-Active	30	I	1284 Active Signal

TYPE-B OPTIONAL INTERFACE

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 (KAxxx)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

BUFFER OPERATION

When there is no space left in the buffer (4Kb or less), the EPSON Stylus Pro 9000 sends the host a BUSY signal. If the host receives this signal for a long time, it times out and stops sending data.

1.5 Initialization

This section describes the initialization procedures for the EPSON Stylus Pro 9000. There are three ways to initialize the EPSON Stylus Pro 9000:

- Hardware initialization:**
When the power is turned on or a cold-reset command is sent to the printer (remote RS command), the printer does the following:
 - Initializes the printer mechanism
 - Clears the input data buffer
 - Clears the print buffer
 - Restores the default values
- Software initialization:**
When the printer receives an ESC@ command, it does the following:
 - Clears the print buffer
 - Restores the default values
- Control panel (operator) initialization:**
When the Reset button is pressed or the printer receives an -INIT signal (negative pulse) from the parallel interface, the printer:
 - Caps the printheads
 - Ejects the paper if a cut sheet is loaded
 - Clears the input data buffer
 - Clears the print buffer
 - Resets the default values

The default values are shown below.

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

1.6 Interface selection

The printer has three built-in interfaces: parallel, serial, and Type-B (an optional interface requiring an interface card). These interfaces are selected automatically or manually through the control panel.

- Manual Selection:**
Select the desired interface through the default setting mode, described below under Maintenance Mode (Level 1).
- Automatic Selection:**
Automatic interface selection is enabled by the default setting mode, described below under Maintenance Mode (Level 1). When the automatic selection is active, the printer passively scans all interfaces. The interface that receives data first is selected as the active interface. When the host stops sending data and the printer has been in a standby state for 10 seconds, the printer returns to an idle state. Otherwise, the interface remains active.

Other things to keep in mind about interface selection:

- The host checks whether the logic signal is low or high before requesting data through the reverse channel.
- If the parallel interface is not selected, it enters a BUSY state and the logic signal is set low.
- When the serial interface is not selected, the DTR (data terminal ready) signal is set to MARK.
- When the optional type-B interface is not selected, the off-line bit is set to Main Status Register (MNSTS).
- When the printer is initialized or returns to an idle state, the parallel interface enters a ready condition, the serial DTR signal is set to low, and the off-line bit of the Main Status Register (MNSTS) is reset.
- The /INIT signal on the parallel interface is not active while that interface is in Nibble or ECP Mode, or is not selected.

CHAPTER

2

OPERATING PRINCIPLES

2.1 Component List & Illustrations

This section explains the print mechanism and operating principles for the EPSON Stylus Pro 9000.

2.1.1 Print Mechanism Components

The printer mechanism of EPSON Stylus Pro 9000 consists of the following mechanism parts.

Component	Explanation
Carriage Assembly	Carriage section: printheads (B head/C head) <input type="checkbox"/> PG Motor <input type="checkbox"/> Linear Encoder <input type="checkbox"/> HP sensor <input type="checkbox"/> PG sensor <input type="checkbox"/> Paper Width sensor <input type="checkbox"/> Paper cutter-drive component
	Carriage guide rail section: <input type="checkbox"/> CR Motor
Paper Feed Mechanism	Paper feed rail: <input type="checkbox"/> Grid roller assembly <input type="checkbox"/> Secondary roller assembly (opposite the grid rollers) <input type="checkbox"/> PF Motor (Rotary Encoder internal part)
	<input type="checkbox"/> Paper Suction Fans <input type="checkbox"/> P_FRONT Sensor (detects front edge) <input type="checkbox"/> P_REAR Sensor (detects rear edge) <input type="checkbox"/> Paper Thickness Sensor <input type="checkbox"/> Paper Release-Lever Position Sensor
Cleaning Assembly	<input type="checkbox"/> Pump Assembly/Pump Motor <input type="checkbox"/> Cap Assembly <input type="checkbox"/> CR Lock Mechanism

Component	Explanation
Ink Delivery System	I/C Holder Assembly <input type="checkbox"/> Ink Cartridge Holder/Valve Mechanism <input type="checkbox"/> I/H Lever Position Sensor <input type="checkbox"/> Ink Cartridge Detect Sensor <input type="checkbox"/> Ink Low Sensor <input type="checkbox"/> Ink ID Sensor
Other	Cover Position Sensor (interlock switch)

CARRIAGE COMPONENTS

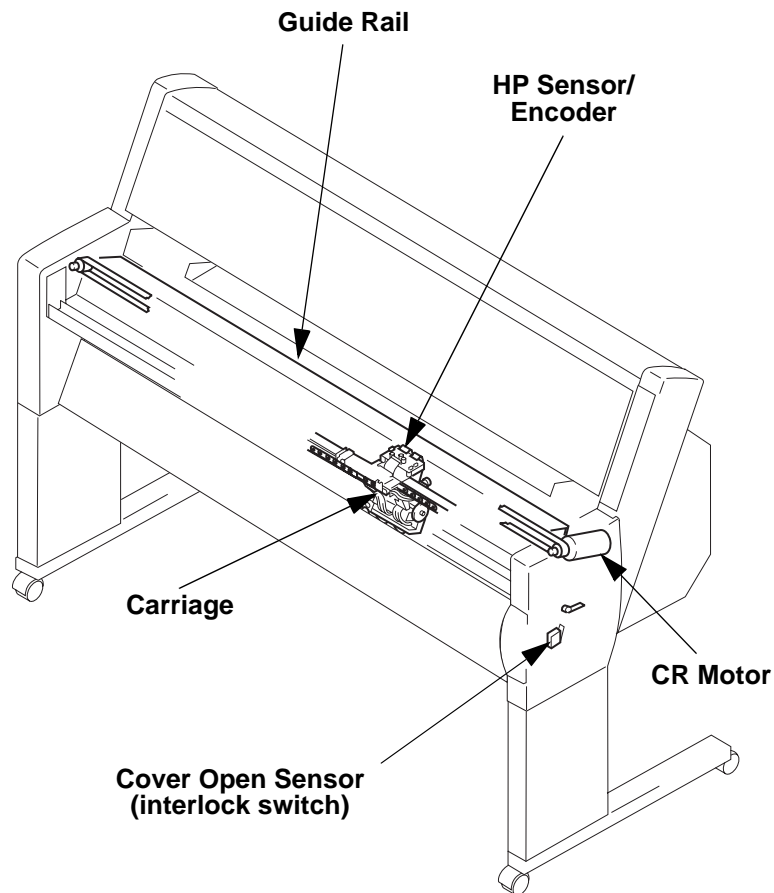


Figure 2-1. Carriage Components/Main Parts

PAPER FEED PATH & COMPONENTS

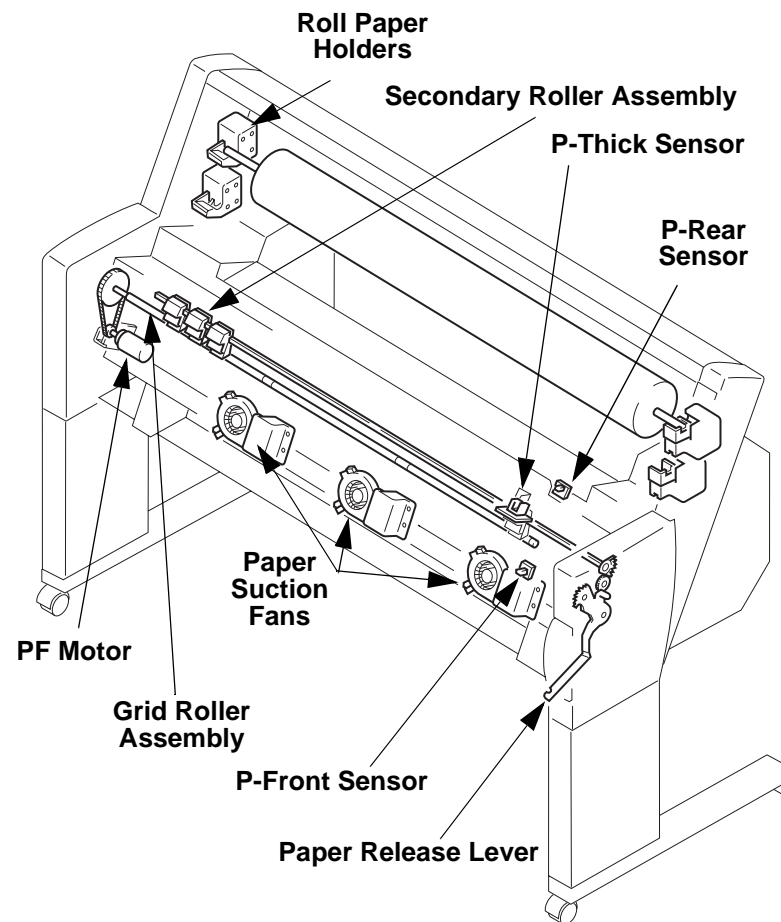


Figure 2-2. Paper Feed Components/Main Parts

INK SYSTEM COMPONENTS

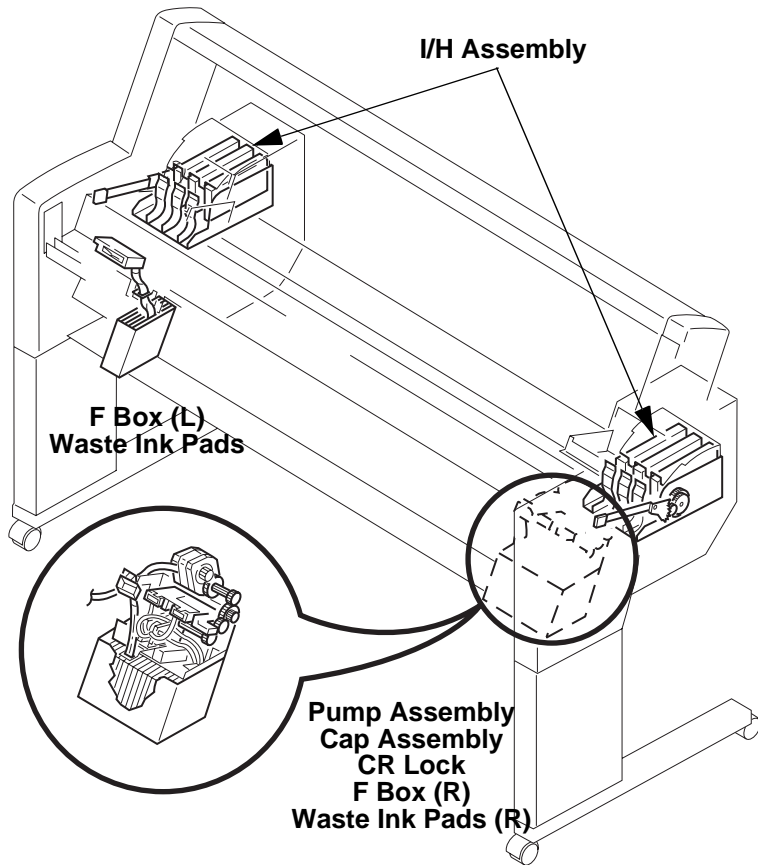


Figure 2-3. Ink System - Main Parts

ELECTRICAL CIRCUIT BOARDS

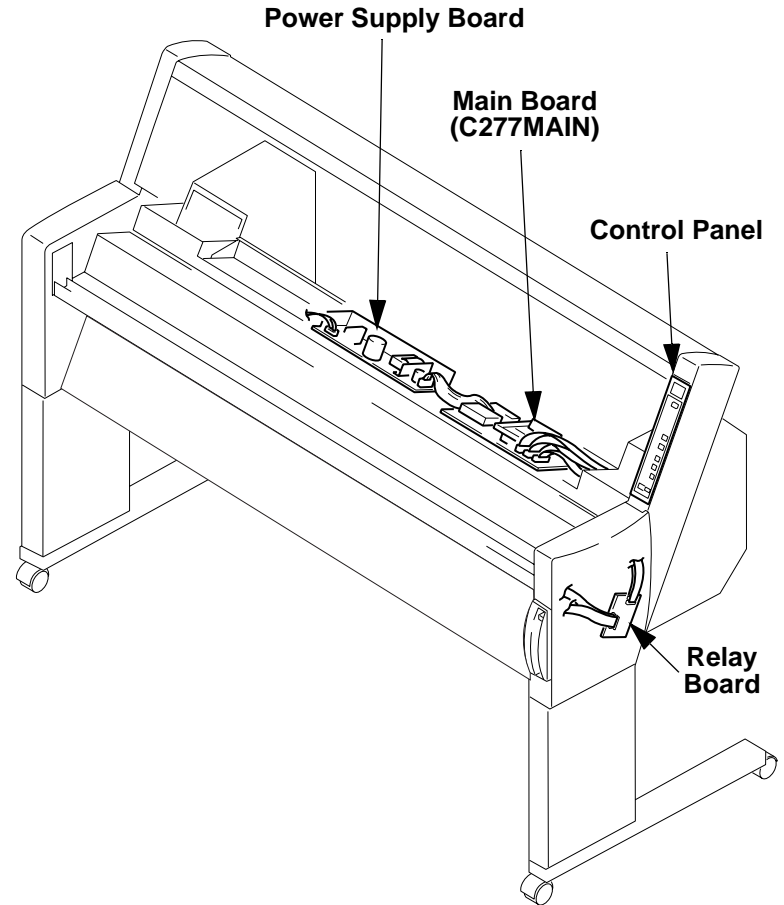


Figure 2-4. Electrical Circuit Boards

2.2 Description of Components

2.2.1 Carriage Mechanism

CR GUIDE RAIL

To print on paper as wide as B0 Wide, the printhead carriage must be more stable and must travel further than the usual carriage. To make the printheads more stable, EPSON added the CR Guide Rail to the SP 9000.

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

The CR motor uses a DC motor to move the carriage, and the Linear Encoder determines the lateral position of the carriage by counting the shaded areas of the plastic Step Ruler (timing fence). See Figure 2-5 below. The Linear Encoder reads the shaded stripes to determine the position of the carriage as well as the carriage speed, and this data is sent to the software servo. To allow for the extra distance the carriage must travel during printing, the rubber timing belt has been changed to a belt made from steel.

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

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

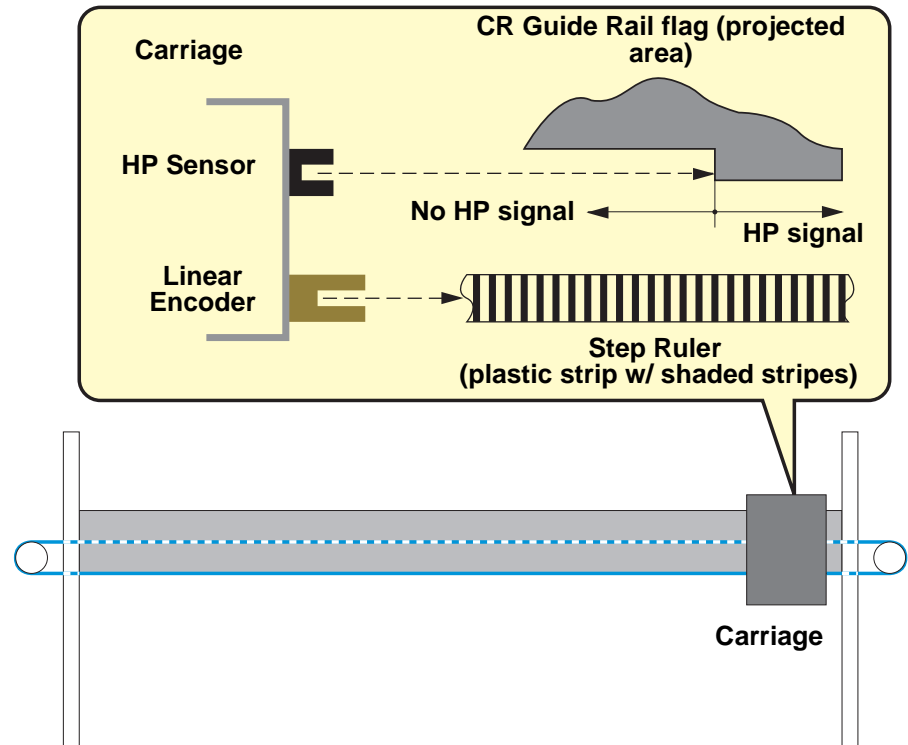


Figure 2-5. Carriage Mechanism & CR Guide Rail

CARRIAGE

Unlike previous models, the SP 9000 uses a special system to ensure the distance between the printhead nozzles and paper remains the same for all supported paper types. The carriage (main) attaches to the CR Guide Rail using bearings, and the carriage (main) contains the subcarriage. The subcarriage holds the ink cavities, printheads, and so on.

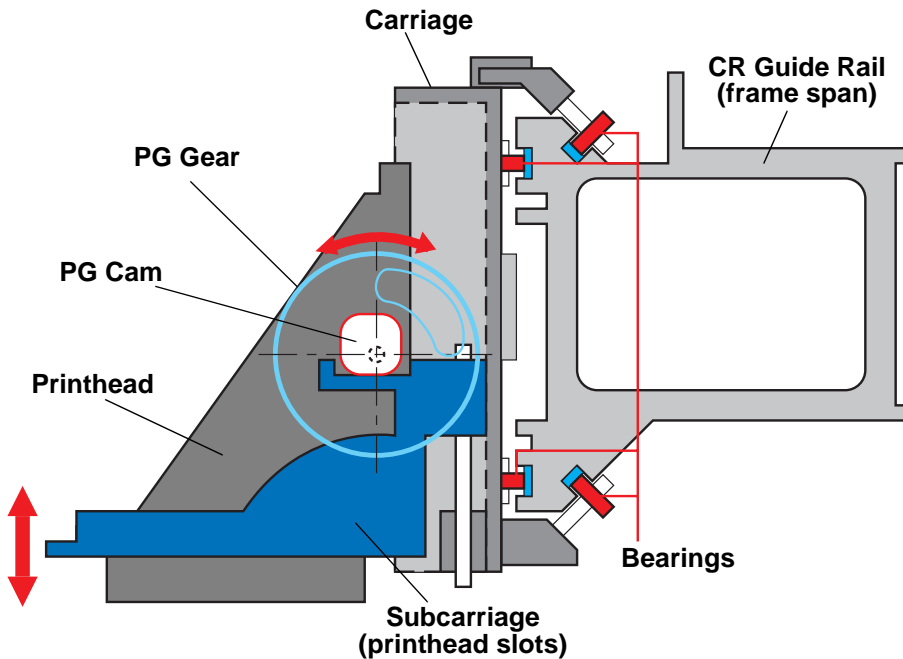


Figure 2-6. Carriage Mechanism & CR Guide Rail (side view)



Be aware that the PG Cam and the PG Gear (hole) must line up properly for the platen gap adjustment operation to work properly. The Cam and Gear are lined up properly if when the flattest side of the Cam faces the Lower Paper Guide, the hole of the Gear faces the CR steel directly above.

The subcarriage can be moved using the PG Cam which is driven by the PG Gears, causing the subcarriage and all its components to move slightly up or down. The position depends on the thickness of the paper. The position changes because the PG Cam is somewhat oval shaped and off-centered, so one side pushes the subcarriage up further than the other side.

The printheads are the same type used in the EPSON Stylus Pro 5000, and are installed in the same way. Therefore, when installing or replacing the printheads, make sure neither head leans one way or the other, and make sure the nozzles of both printheads are exactly lined up vertically. To adjust the heads, separate adjust levers are provided.

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

- P-EDGE sensor
This sensor measures the distance between the right and left edges of the paper. 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.
- PG origin sensor
This sensor detects when the subcarriage is in the thick paper position or normal paper position. The PG Gear rotates with the PG Cam, and the PG origin sensor uses a light-reflecting sensor to determine (according to the hole in the PG Gear) the current subcarriage position, thick paper or normal paper.

□ Cutter solenoid

The solenoid is attached to the carriage on the opposite side of the home position and it activates the cutter to cut roll paper. In order to cut roll paper evenly, the following method is used:

- 1) The cutter cuts from the right of center (when facing the printout) to the right edge.
- 2) The cutter cuts from several centimeters inside the left edge to the left edge.
- 3) The cutter cuts the remaining uncut portion, in the center, from the left side to the right.

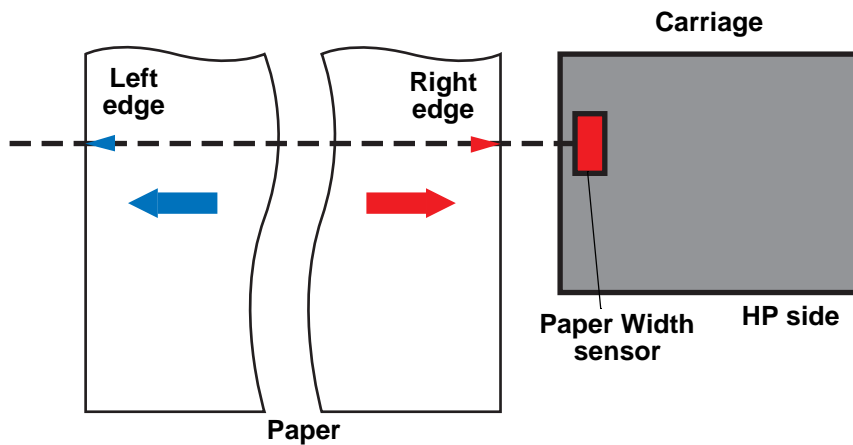


Figure 2-7. Paper width sensor

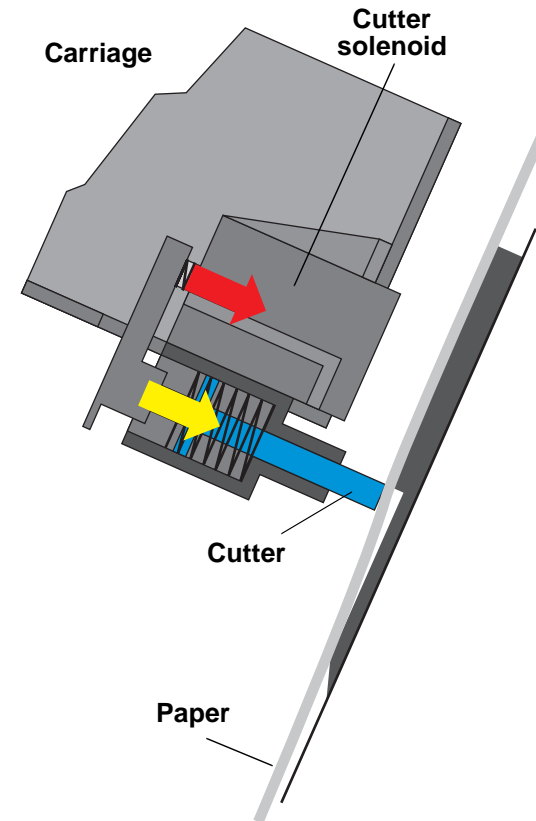


Figure 2-8. Carriage and Cutter Solenoid

2.2.2 Paper Feed Assembly

PF RAIL

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

The PF Motor uses a DC Motor and is controlled by the software servo system which receives a pulse from the built-in optical rotary encoder. The PF Roller torque is transferred through the PF Roller shaft edge (left frame), and turns the PF motor pinion gear and timing belt.

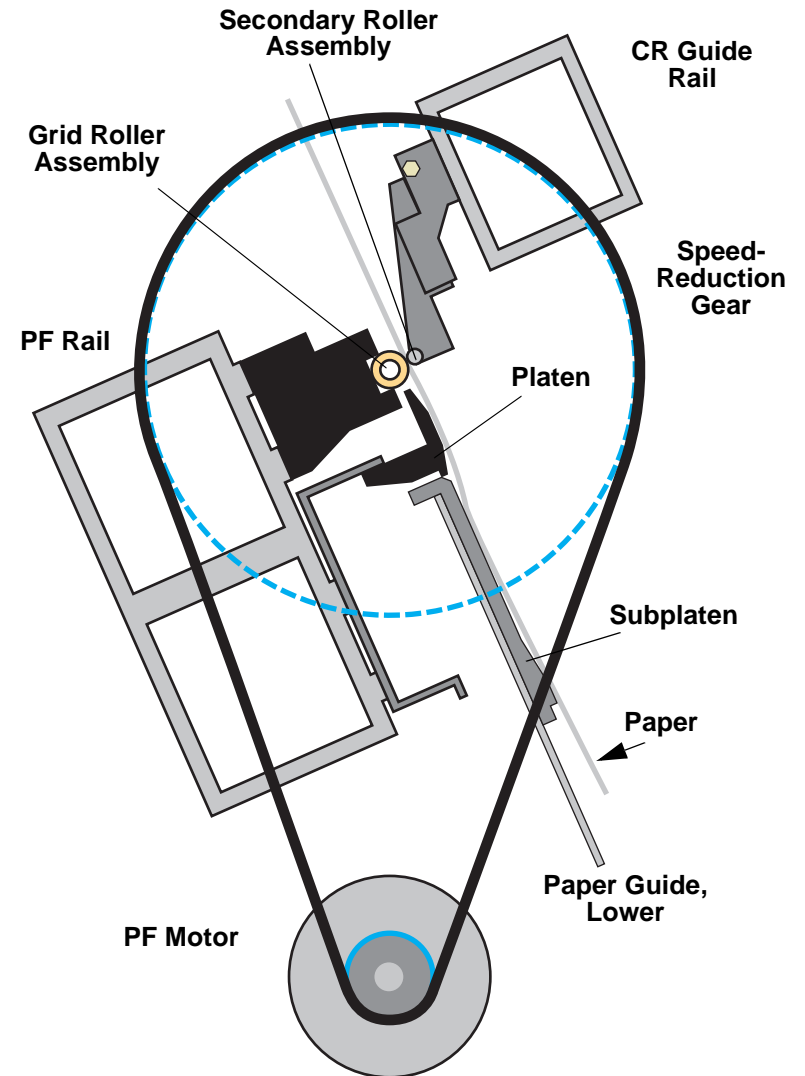


Figure 2-9. Paper Feed Path

SENSORS

The following sensors aid in the paper feeding process.

- P-FRONT sensor
This sensor is attached to the back side of the Lower Paper Guide and is an optical (photo-reflective) sensor. This sensor detects the front edge of the paper after paper has been loaded but before it is set and ready to print.
- P-REAR sensor
This sensor is attached to the back side of the Upper Paper Guide and is an optical (photo-reflective) sensor. This sensor detects the rear edge of the paper as an end of page and detects the front edge when the paper is first inserted in the paper path.
- P-THICK sensor
This sensor physically gauges whether the paper in falls into the normal/thin category or the thick category. The Secondary Roller unit closest to the HP has a thin metal flag on top. When the Paper Release Lever is in the Lock position and thin paper is loaded, this flag enters 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, signalling that thick paper is loaded.

Sensor signal = "ON" at 0.7V or less: Normal/Thin paper

Sensor signal = "OFF" at 2.4V or more: Thick paper

- Paper Release Lever Position sensor
The Paper Release Lever is located on the right side of the printer, and this sensor is attached at the bottom of the lever, inside the right-side frame. This sensor's signal goes "ON" when the lever is in the lock position, meaning it is OK to print like a mad man.

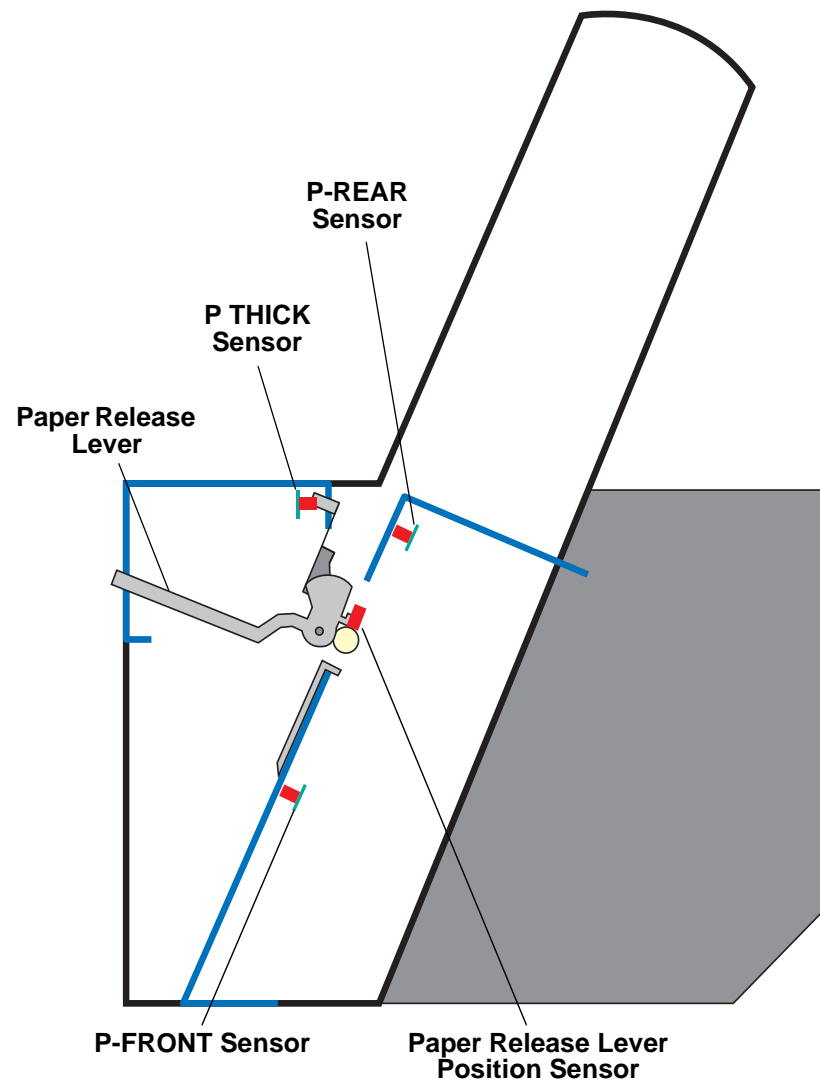


Figure 2-10. Paper Feed Sensors

2.2.3 Cleaning Mechanism

The cleaning mechanism for the SP 9000 is similar to the mechanism in the Stylus Pro 5000. The main components are:

- Pump Assembly (Cleaner, Head)
- Pump Motor (stepping motor)
- Cap Assembly (B head/C head independent)
- Flushing Box R (receives ejected ink during flushing)
- Waste Ink pads

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

Additionally, the following unit is installed above the subframe.

- CR Lock Mechanism
The printer uses an electromagnetic solenoid to activate or release the carriage lock. The carriage lock comes into effect when the carriage is in the home position and the CR Motor is not running. 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.

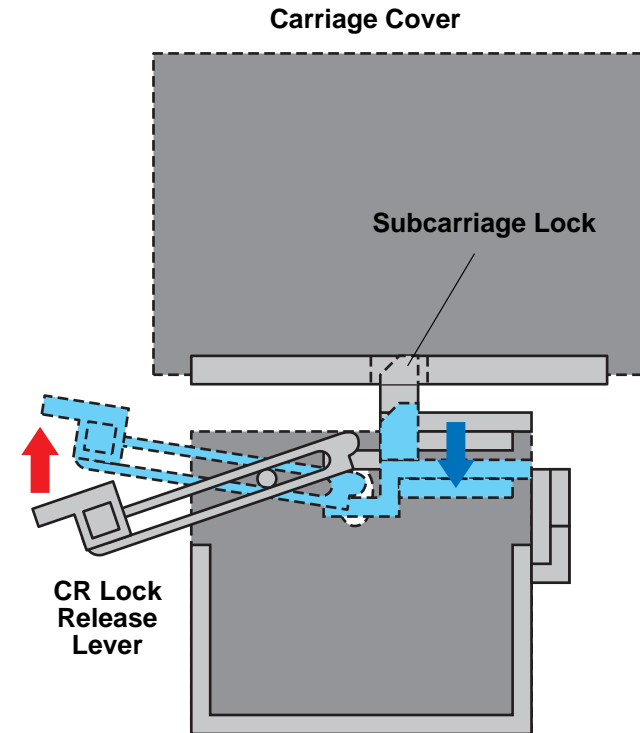


Figure 2-11. Cleaning Mechanism

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, "Ink Supply Mechanism". To prevent users from accidentally 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 and shuts off the flow of ink during printer transportation. The valve close under the following conditions:

- The user turns the valve to the "CLOSE" position to transport the printer.
- The I/H lever is lifted to the up/cartridge install position.

The ink flows out of the ink cartridges, through stainless steel pipes, through ink tubes, and finally into the printheads.

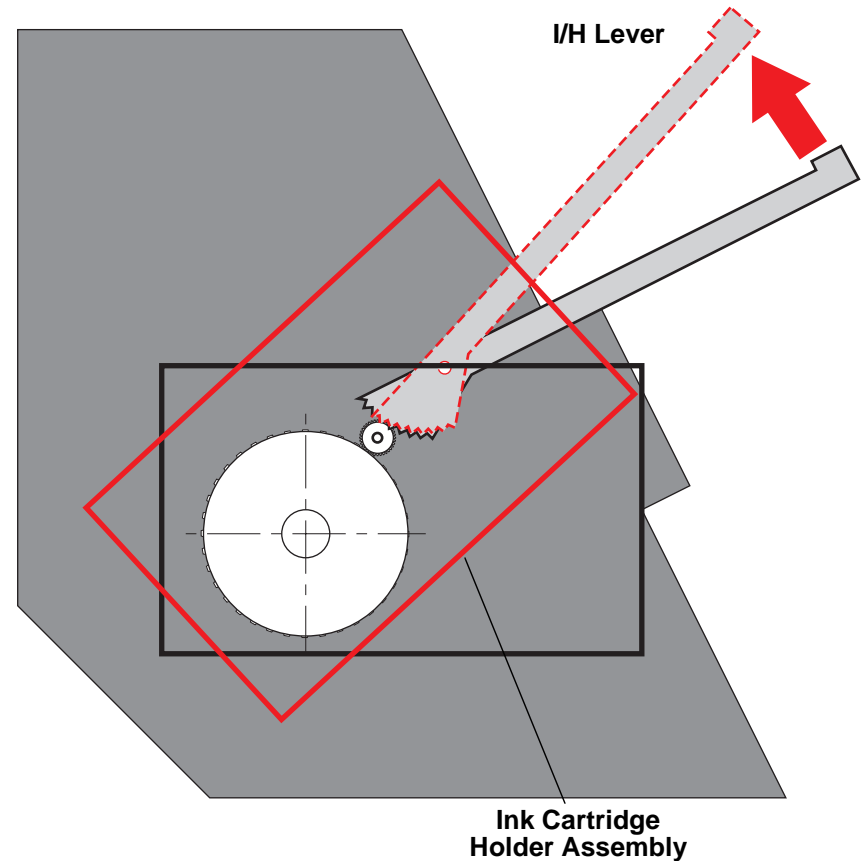


Figure 2-12. Ink Supply Mechanism

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 at the side of all six ink cartridge slots and detects the which market the cartridge is for. Although not implemented currently, the sensor can also detect the type of ink (presently dye only) and the type of 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)

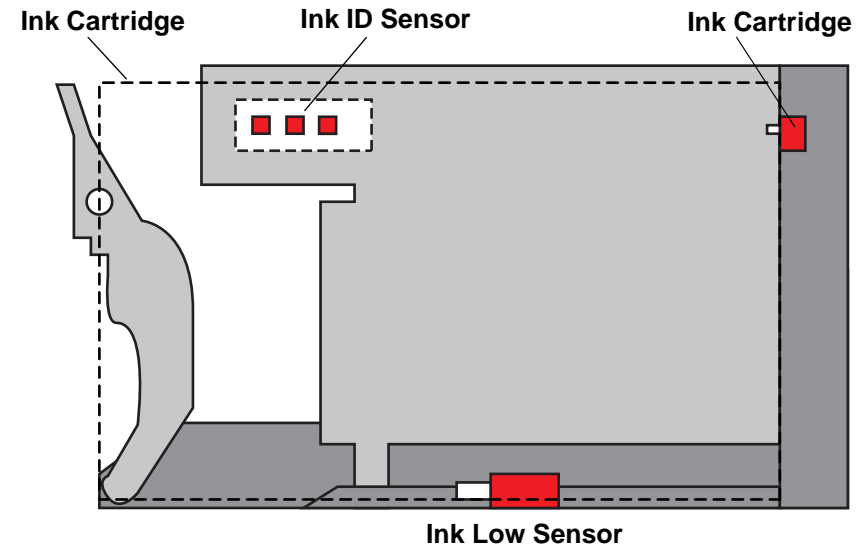


Figure 2-13. Ink Cartridge Holder Sensors

□ Cover open sensor

To ensure proper paper feeding and to prevent paper jams, the front cover must be closed during printing. There are two cover open sensors, one on each side of the printer, that detect when the cover is open using an interlock switch. When the cover is open, the relay that controls the current to the CR motor and PF motor cuts off the flow of that current. The motors lose their electromagnetized state when the current is cut off.

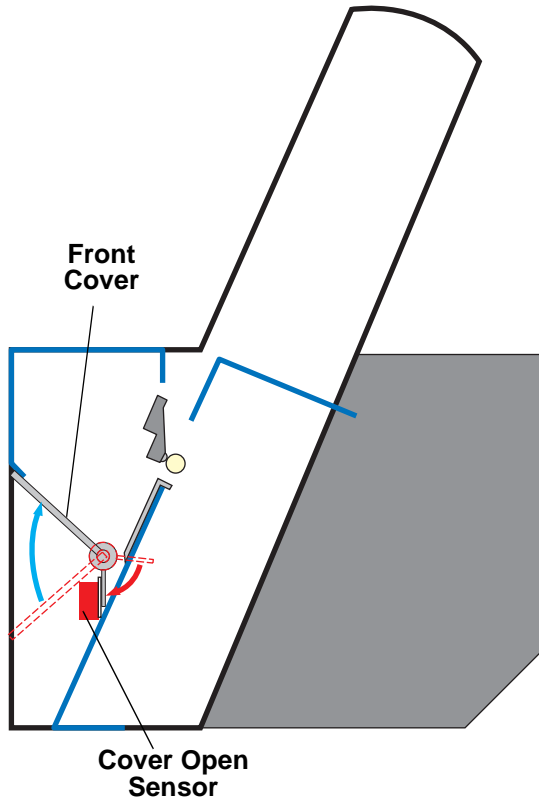


Figure 2-14. Cover Open Sensor

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

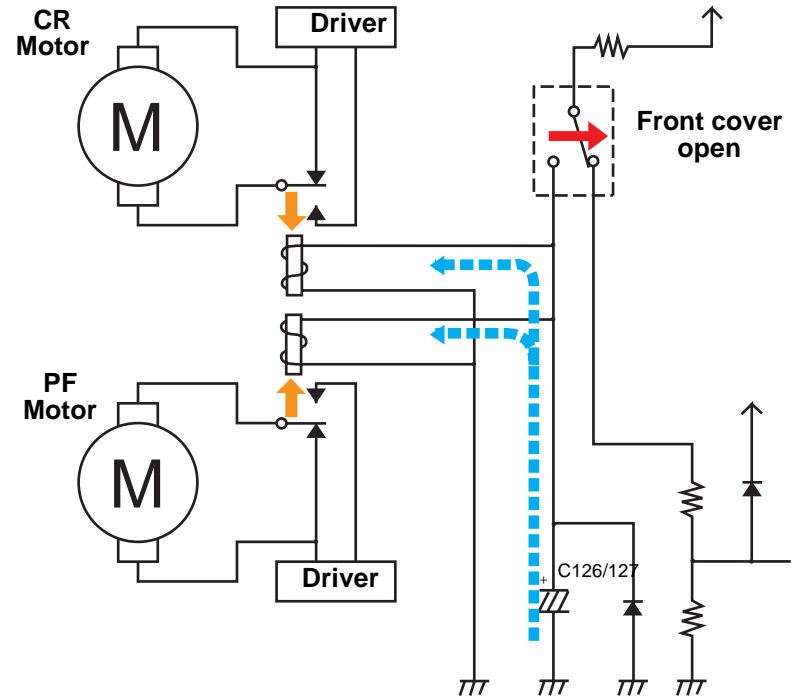


Figure 2-15. Cover-Open-Motor Control Circuit

2.3 Printer Mechanism Operation Outline

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

CARRIAGE MECHANISM

The carriage speed is determined by a software servo system. This software servo is a closed-loop system where the CR motor (DC motor) must provide constant torque or speed, so an encoder sensor is used to measure the output and to provide feedback to the motor controller, which adjusts the current or voltage to the motor accordingly.

Print Control

The carriage speed during printing is described below.

Table 2-1. Carriage Speed

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

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

Stop Control (stop position)

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

CR Motor Abnormality Detection

The software servo sends a series of pulses to the CR Motor to drive the carriage a certain distance (depends on current operation, paper size, and so on). At the same time the encoder measures the distance the carriage

travels. If the position of the carriage according to the Software Servo is different from the position according to the encoder, a fatal error occurs (Service Call 00010005).

PLATEN GAP MECHANISM

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 2-2. 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 the paper thickness as well as the control panel Platen Gap setting.

Table 2-3. Platen Gap Position & PG Settings

Control Panel Setting	Platen Thickness Sensor	Platen Gap Position
Wide	Wide	PG “Large”
	Standard	PG “Medium”
Auto	Wide	PG “Large”
	Standard	PG “Small”

PAPER FEED MECHANISM

The EPSON Stylus Pro 9000 feeds roll paper and cut-sheet paper using friction-feed, and the sensor along the paper feed path provide all necessary information for controlling the paper feed process.

□ Paper Suction Fan

The Paper Suction Fan is located behind the lower paper guide and sucks air through the holes in the lower paper guide, pulling the paper flat/even with the lower paper guide. This helps to keep the paper straight as it is fed through the printer and prevents ink smears.

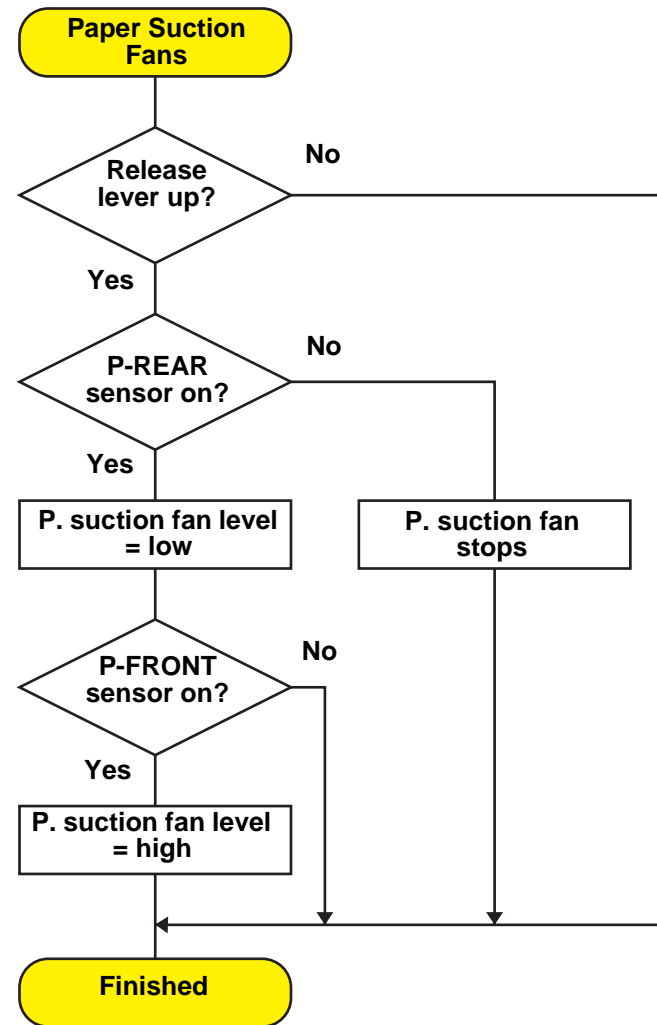
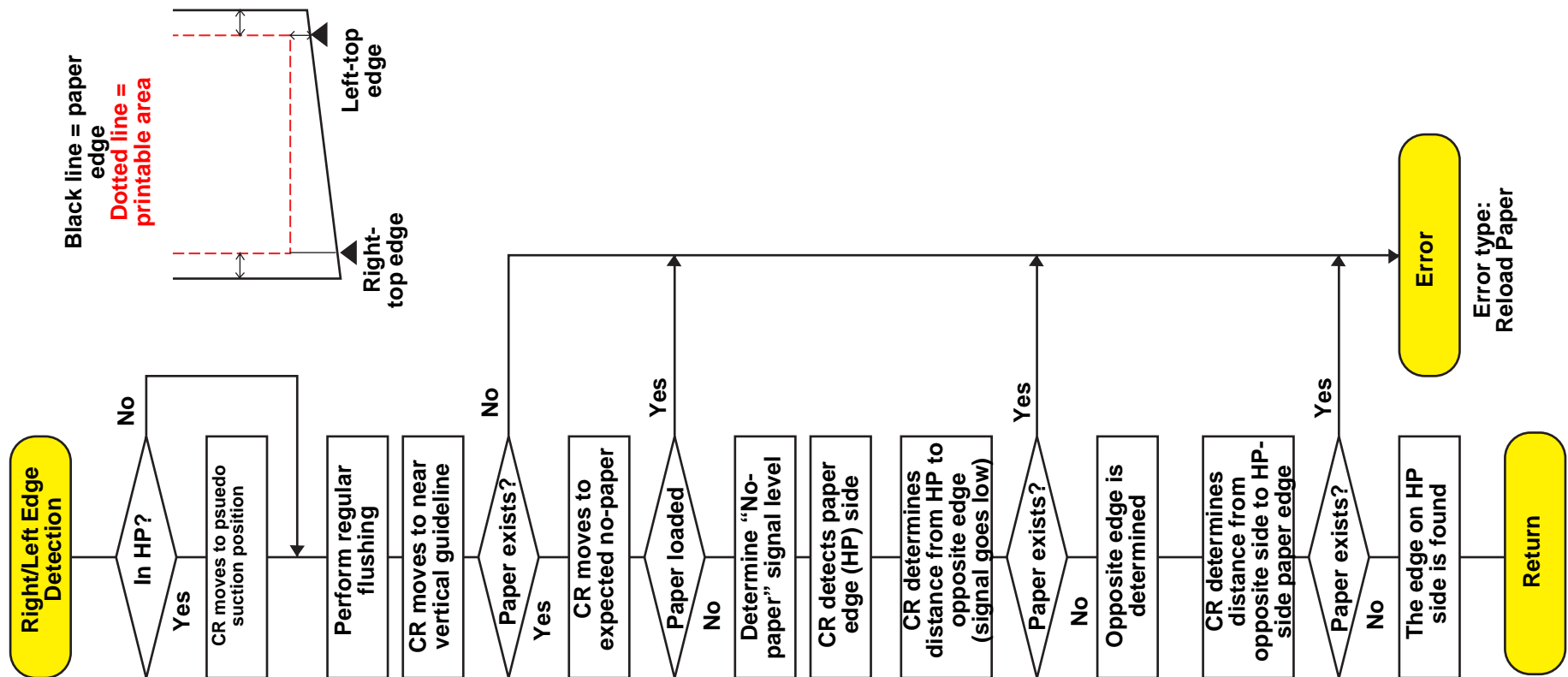


Figure 2-16. Paper Suction Fan Operation

- Paper size detection - right and left edges

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

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



- Paper size detection - front edge
- Before printing the printer needs to determine the location of the front edge.

Before beginning this procedure, the printer must determine the sensor's high and low reflection levels (see page 48).

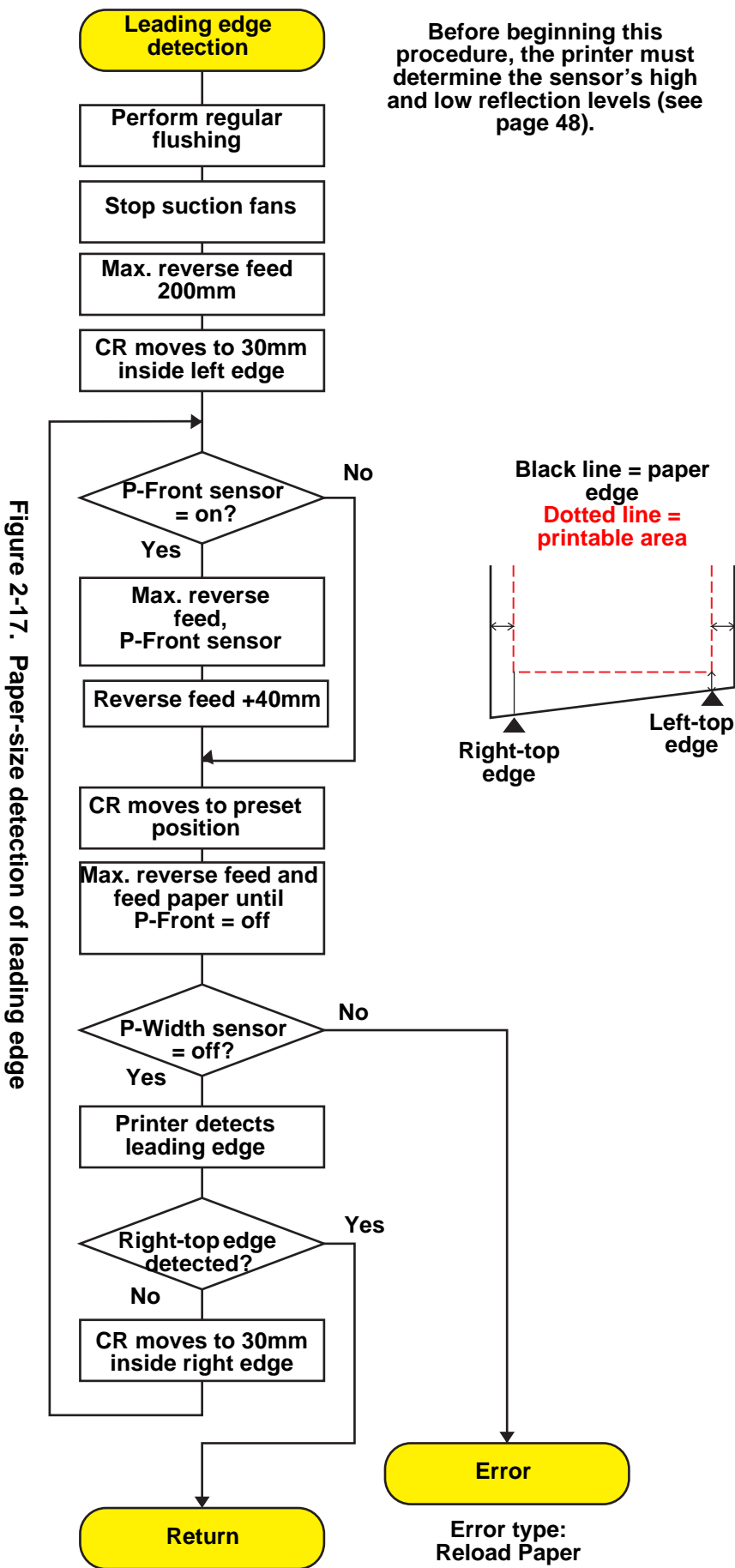


Figure 2-17. Paper-size detection of leading edge

- Paper condition detection

After paper is loaded in the printer, the printer performs the above left, right, and leading edge detection operations to make sure the paper not outside of the printable range of the printheads. If any of these edges is outside of this area, a “Reload Paper” errors.

 - Basic loading procedure

Make sure the left edge (near the HP) is lined up with the vertical line of holes in the Lower Paper Guide.
 - Normal loading area

Paper loaded within 10mm of the center of the vertical line of holes in the Lower Paper Guide is considered in the printable zone; however, paper loaded outside that 10mm zone causes an error.
- Paper skew

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

 - Basics

The right and left edge positions are checked at the top of every page.
 - Degree of skew

Any change in the edge position (from the originally detected position) over 3mm causes an error.

2.4 Summary of Control Circuit Operations

This section summarizes the functions of the (C277MAIN) Main Board and the controls used to operate the printer.

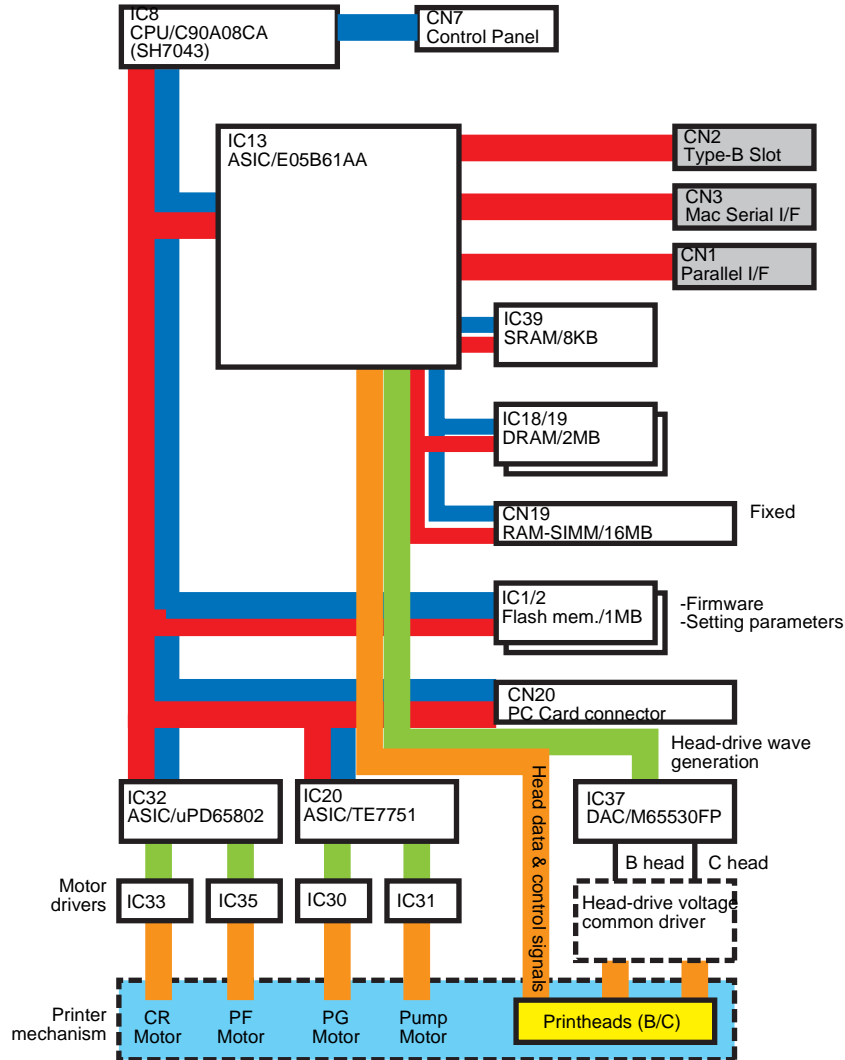


Figure 2-18. C277MAIN Board-Circuit Block Diagram

Table 2-4. C277MAIN Board Main Components

Name/Code	Location	Function
CPU (C90A08CA) SH7043	IC8	32 bit RISC-CPU <input type="checkbox"/> Clock speed = 33MHz <input type="checkbox"/> 128KB PROM internal
ASIC (E05B61AA)	IC13	1) Regulates print data <input type="checkbox"/> Command handling <input type="checkbox"/> Rasterizer (image data handling) <input type="checkbox"/> Head drive regulation (DAC) <input type="checkbox"/> Print timing regulation 2) Memory (DRAM/SRAM) 3) I/F Circuit Control <input type="checkbox"/> Parallel interface (IEEE1284) <input type="checkbox"/> Macintosh Serial interface <input type="checkbox"/> Type-B
ASIC (TE7751)	IC20	Regulates Motor <input type="checkbox"/> Pump Motor <input type="checkbox"/> PG Motor (PG setting) <input type="checkbox"/> Fan (PS, Paper Suction)
ASIC (uPD65802)	IC32	Regulates motor (PWM regulation) <input type="checkbox"/> CR Motor <input type="checkbox"/> PF Motor
DAC (M65530FP)	IC37	3 channel 10 bit DA converter <input type="checkbox"/> head-drive voltage control
Flash Memory (MBM29F400TC)	IC1/2	Flash Memory (1Mbyte) <input type="checkbox"/> Save firmware <input type="checkbox"/> Register setting parameters
DRAM (EDO)	IC18/19	EDO RAM <input type="checkbox"/> 2Mbyte <input type="checkbox"/> 16Mbyte (CN19 mounted SIMM)
SRAM (LC3564SM-10)	IC39	64Kbit SRAM <input type="checkbox"/> External data ring buffer type
Driver IC (L6203)	IC33/35	CR/PF Motor Driver
Driver IC (LB1845)	IC30/31	PG/Pump Motor Driver

2.4.1 Reset Circuit

The Reset-IC (IC7/BH6150F) used in the C277MAIN board has two built-in reset circuits, each of which detects input voltage and power supply voltage respectively as shown in the diagram on the right.

Pin 2 detects the voltage level of the head driver, using the input terminal of the input voltage detection circuit. The voltage level to be detected is preset at 1.25V. When the preset voltage level is detected, the Pin 2 sends a reset signal to reset the mechanism control circuit.

Pin 8 detects the voltage level of the logic power supply, using the input terminal of the power supply voltage detection circuit. The voltage level to be detected is preset at 4.2V. When the preset voltage level is detected, the Pin 8 sends a reset signal to reset the main logic circuits.

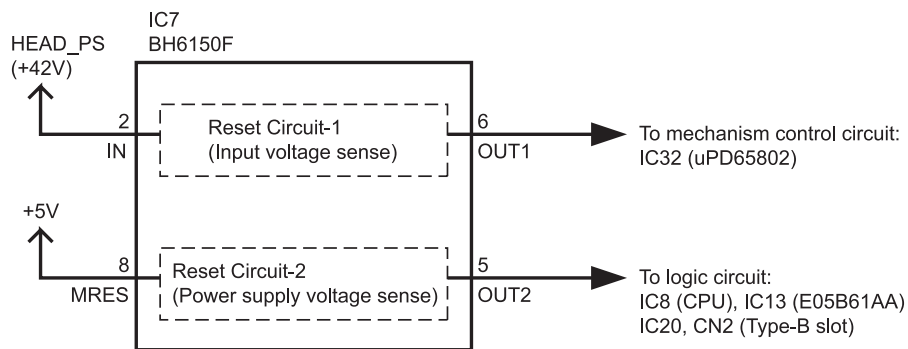


Figure 2-19. Reset Circuit

2.4.2 CR/PF Motor Driver Circuit

The EPSON Stylus Pro 9000 uses the DC servomotor to drive the CR and PF motors. Therefore, the encoder is installed to detect the position, direction, and speed of the carriage, and feedback from the encoder enables the software servo control system to control the CR/PF motors.

The signal received from the Pin 60/61 in the IC32 enables the chopping control system to control the output from the motor drive IC, and the output from the Pin 10 in the motor drive IC (IC35/33) feeds back the output current level to the IC32.

The Electro-magnetic Relay (LA1/LA2) is located on the power supply line for the DC/PF motors, and it cuts off the power supply when the front cover is open.

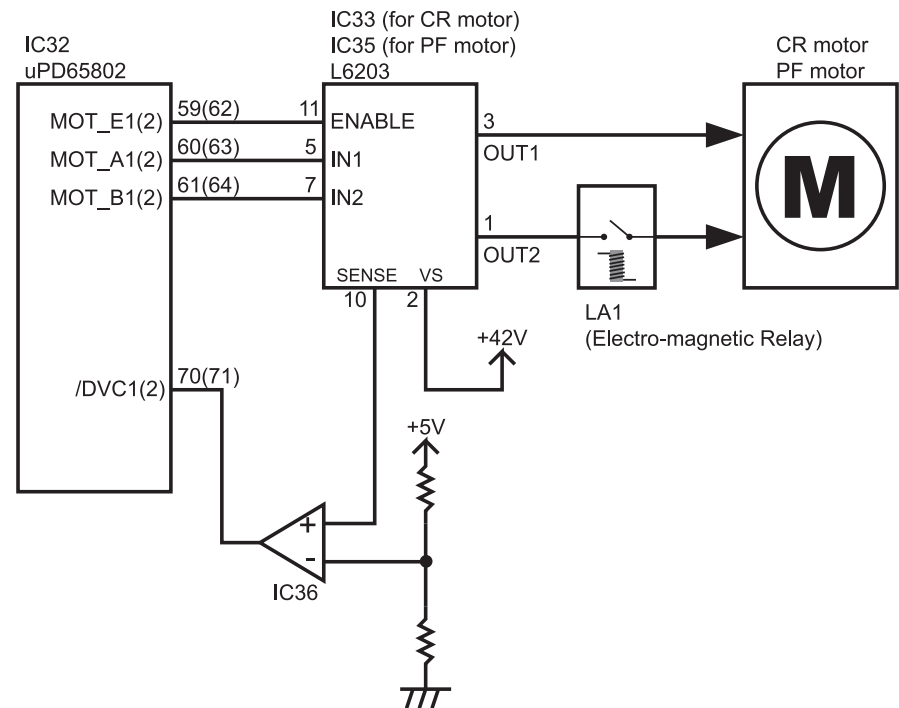


Figure 2-20. CR/PF Motor driver circuit

2.4.3 Head SLID Motor Driver Circuit

The Head SLID Motor vertically adjusts the position of the printhead on the carriage according to the thickness of the media in the printer. The motor is driven by the constant current bipolar drive system, and the current supply to the motor is controlled by the PWM current control system. The 4-phase 48-pole PM pulse motor is used for the drive motor, and it is driven by the W1-2 phase excitation.

Based on the preset data received from the IC20, the motor driver IC (IC31) determines the current level to be output to the motor, and the motor is driven by the drive phase switching signal which is input into the Pin 25/18.

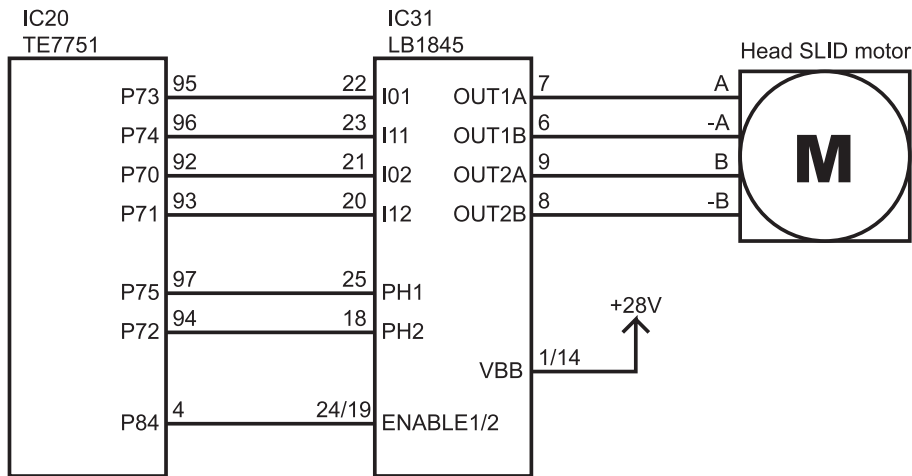


Figure 2-21. HD_SLID Motor driver circuit

2.4.4 Pump Motor Driver Circuit

The 4-phase 200-pole HB stepping motor is used to enable the ink system to conduct ink absorption. The basic control method and the circuit configuration are the same as those of the Head SLID Motor Driver Circuit.

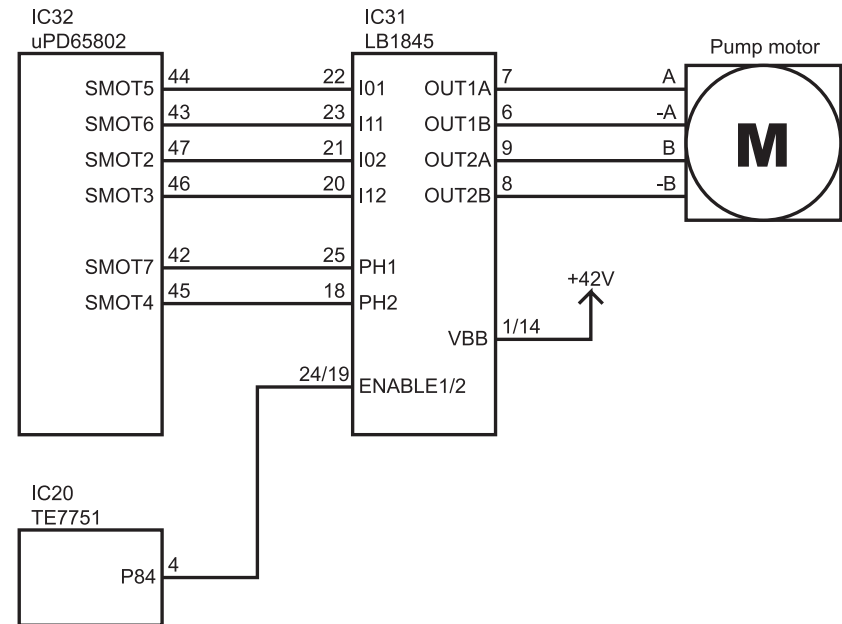


Figure 2-22. Pump Motor driver circuit

2.4.5 Printhead Driver Circuit

The EPSON Stylus Pro 9000 uses the same printhead as that of the EPSON Stylus Pro 5000 (both dark-color head and light-color head), and the basic configuration of the driver control circuit is also the same.

Print data is rasterized on the memory (DRAM). Triggered by the LAT signal (BHLAT, CHLAT), the IC13 reads the print data in the format and the order according to the print mode, and transfers the data to the printhead (driver circuit on the printhead) synchronizing with the clock signal (BHCLK, CHCLK). The IC13 is equipped with the counter function, which keeps count of each color's data "1" being transferred to the printhead, and the accumulated count is used to calculate the ink consumption.

The waveform signal is processed at the IC13. Triggered by the input of the PTS signal from the CPU (IC8), the waveform signal is input into the DAC in the IC37 as 10-bit data, synchronizing with the clock signal (20MHz). The DAC then converts the head driver voltage waveform data to analog data, and outputs it to the trapezoid waveform generation circuit (common driver).

The driver circuit on the printhead (nozzle selector) receives the serial data on nozzle selection ("H" level = printing nozzle / "L" level = non-printing nozzle) from the IC13. The circuit then latches the data to the data latch using the LAT signal, and selects the printing nozzles and non-printing nozzles. Once the nozzles are selected, the trapezoid waveform generation circuit (common driver) generates the trapezoid waveform to fire ink. The NCHG signal (BHNCHG, CHNCHG), which is input into the printhead from the IC13, prepares all the nozzles for the next firing by applying slight vibrations during the non-printing phase.

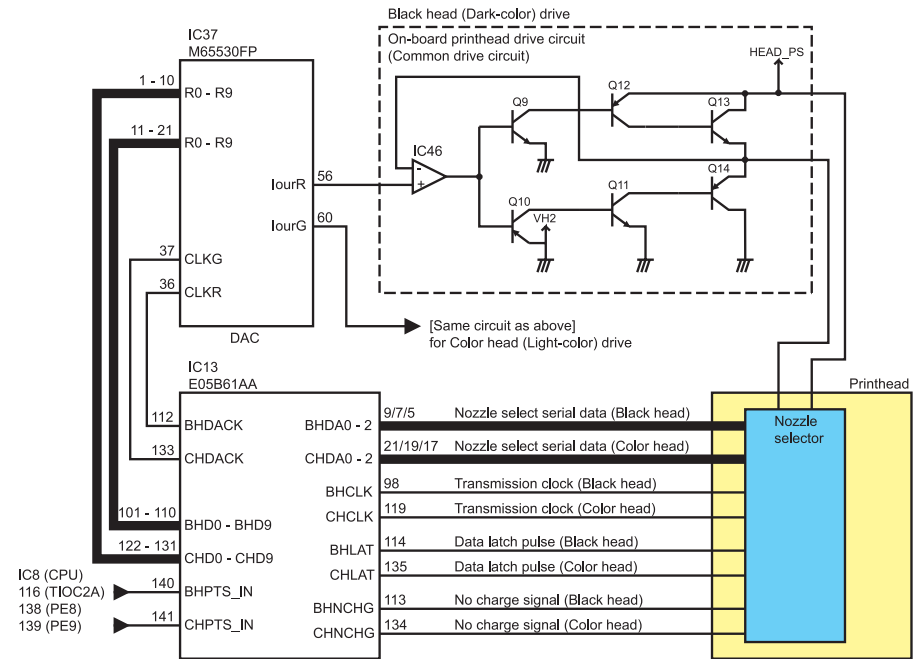


Figure 2-23. Printhead driver circuit

2.4.6 Sensors

The output signal sent from each sensor of the EPSON Stylus Pro 9000 is connected to each IC on the control circuit as shown in the diagram on the right.

In order to process the detected results as analog signal, the following sensors input the results into the analog port in the CPU (IC8) via comparator. The analog signal is then converted to the digital signal by the CPU built-in ADC (10-bit) and is compared with the standard value for state analysis.

- P_REAR Sensor
- P_FRONT Sensor
- P_EDGE Sensor

Thermister is attached to the printhead to monitor the temperature around the printhead, and it feeds back the detected temperature to the CPU, which in turn conducts the driver voltage adjustment according to the temperature detected.

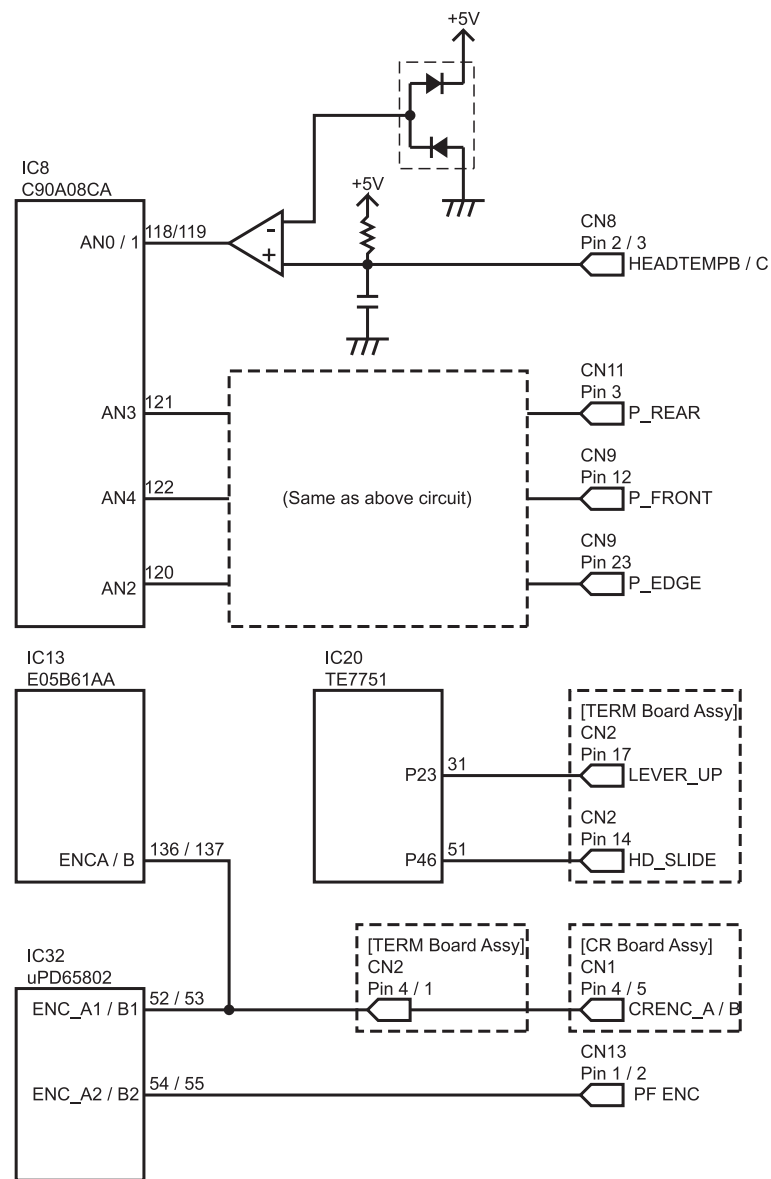


Figure 2-24. Sensors

CHAPTER

3

TROUBLESHOOTING

3.1 Outline

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

- Troubleshooting using the error messages
- Troubleshooting based on printout

In addition to the above troubleshooting points, this section covers check points as well.

3.1.1 Test Points

The following table lists the test points for electrical components.

Table 3-1. Test Points for Electrical Components

Component	Standard
CR Motor	Armature resistance: 10.0 ohm
PF Motor	Armature resistance: 2.3 ohm
SLID Motor	Coil resistance: 17.5 ohm
PUMP Motor	Coil resistance: 3.9 ohm
Cutter Solenoid	Coil resistance: 58 ohm
CR Lock Solenoid	Coil resistance: 58 ohm

3.2 Troubleshooting Using the Error Messages

The EPSON Stylus Pro 9000 performs self-diagnostic tests using the data supplied by its various sensors, and if an error is detected by one or more sensors, a corresponding error message appears on the control panel display. No matter what kind of error occurs, use the Error Message List for Service Technicians table on page 58 or the General Error Message List table on page 58 to determine what and where the problem is, as well as where to look for directions on fixing the problem.

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



See “Elec.” on page 135 for instructions on how to access a list of the last seven fatal errors.

Table 3-2. 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 59
Service Req. nnnnnnnn	00000100	Waste Ink pads must be replaced	page 59
	00000101	Ink Tube worn out	page 59
	00010000	PF motor encoder check error	page 59
	00010001	PF motor out of step	page 59
	00010002	PF motor overcurrent	page 60
	00010003	PF in-position time-out	page 60
	00010004	CR motor encoder check error	page 60
	00010005	CR motor out of step	page 60
	00010006	CR motor overcurrent	page 61
	00010007	CR in-position time-out	page 61
	00010008	Servo interrupt watchdog time-out error	page 61
	00010009	System interrupt watchdog time-out error	page 61
	0001000A	CR origin sensor malfunction	page 61
	0001000C	PG origin sensor malfunction	page 61
	0001000D	Cover sensor malfunction (00)	page 61
	0001000E	Cover sensor malfunction (01)	page 61
	0001000F	CR motor PWM output error	page 62
	00010010	PF motor PWM output error	page 62
	00020000	NVRAM error	page 62
	00020001	Internal RAM check error	page 62
	00020002	SRAM check error	page 62
	00020003	DRAM check error	page 62
	10000004	CPU vector 4 - General illegal instruction	page 62
	10000006	CPU vector 6 - Slot illegal instruction	page 62
	10000009	CPU vector 9 - CPU address error	page 62
1000000A	CPU vector 10 - DMAC/DTC address error	page 62	
1000000B	CPU vector 11 - Watchdog time-out error	page 62	
100000""	CPU vector 32~63	page 62	

Table 3-3. General Error Message List

Error Type	Message	Refer to
Warning	Ink Low	page 63
Error	Paper Out	page 63
	Load xxx Paper	page 63
	Load Paper	page 63
	Paper Jam	page 64
	Cover Open	page 64
	Paper Not Cut	page 64
	Paper Not Straight	page 64
	Reload Paper	page 65
	Push Lever Down	page 65
	Compartment Open	page 65
	Ink Out	page 66
	No Ink Cartridge	page 66
	Remove Paper	page 66
	Option I/F Error	page 66

3.2.1 Errors that require a service technician

This section describes the errors listed in Table 3-2 on page 58 in detail.

MAINTENANCE REQ. 0100

- Problem
The waste ink pads have absorbed 99% of their potential. The printer can continue printing, but the “Maintenance Req. 0100” message appears instead of the “Ready” or “Printing” messages.
- Solution
Replace the following parts and reset the ink counter
 - Waste Ink Pads (right, left)
 - F Box (right, left)
 - Pump Assembly
 - Cap Assembly
 - Cleaner, Head

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.

SERVICE REQ. 00000101

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

SERVICE REQ. 00010000

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

SERVICE REQ. 00010001

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

SERVICE REQ. 00010002

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

SERVICE REQ. 00010003

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

SERVICE REQ. 00010004

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

SERVICE 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 regular pulse.
- Solution
Make sure there is nothing blocking the carriage. If that does not solve the problem, check the CR motor encoder connection. If there still is a problem, try the following.
 - Check the plastic step ruler for soiled areas, obstructions, and damage
 - Replace the encoder sensor
 - Replace the CR motor
 - Replace the Main Board

SERVICE REQ. 00010006

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

SERVICE 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. The linear encoder is activate for the predetermined "in-position time" and if the encoder sends a pulse, this means the carriage is moving even though it is supposed to be at a full stop, this generates an error.
- Solution
 - Replace the encoder sensor
 - Replace the CR motor
 - Replace the Main Board

SERVICE 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 sensor malfunction - CR home position sensor malfunction
- Solution
 - 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 connection. 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 switch) located at either end of the cover shaft is malfunctioning.
(00): right sensor (HP side)
(01): left sensor
- Solution
Make sure the sensor(s) are properly installed. If that does not solve the problem, check the cover open sensor connection. If there still is a problem, try the following.
 - Replace the malfunctioning cover sensor
 - Replace the Main Board

SERVICE 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)

- Problem
 - Unusual condition detected.
- Solution
 - Write down the error code, turn the printer off and back on again to confirm whether the error recurs. If the same error recurs, replace the Main Board.
 - For "Service Req. 00020003" (DRAM error), replace the SIMM installed in CN19 and confirm 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, turn the printer off and back on again to confirm whether the error recurs. If the same error recurs, replace the Main Board.
 - Send a different print job to make sure the error wasn't due to electrical noise or bad print data.

3.2.2 General Errors

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



By using “Check: Test” function in the built-in self-diagnostic mode, you can check control panel, sensors, encoders function. Refer to Chapter-4 Adjustment for more details.

INK LOW

- Problem

An ink end sensor has detected that the corresponding ink cartridge is almost empty (ever ink cartridge has an ink level gauge). It is possible to print about 100% duty on B1 size paper with the remaining ink, but the cartridge should be replaced as soon as possible.

If you re-install an ink cartridge that was detected as being in a “Near End” state, the status will immediately go to “Ink Out”. Only install new cartridges.
- Solution

Replace the ink cartridge.



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

PAPER OUT

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

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



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

LOAD XXX PAPER

- Problem

The selected paper source (according to the remote PP command) and the paper type selected on the control panel do not match.
- Solution

Load the correct paper or change the panel setting to match the type of paper loaded in the printer.

LOAD PAPER

- Problem

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

PAPER JAM

- Problem**

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

COVER OPEN

- Problem**

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

PAPER NOT CUT

- Problem**

The paper that was supposed to be cut was not cut completely, or the paper was cut but is still in front of the P-Front sensor.
- **Solution**
 - Remove the cut paper if it is on or near the Front Cover and Lower Paper Guide.
 - Replace the cutter if it is worn out.
 - If the paper was cut, but not cut straight across, you need to adjust the cutter position. See “Cutter Position Adjustment” on page 140 for details.

PAPER NOT STRAIGHT

- Problem**

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

RELOAD PAPER

- Problem

This error occurs when,

 - 1) The front edge is loaded too far and the paper is not in the loading position after it is reverse fed.
 - 2) The paper was loaded in such a way that the left and/or right edge is out of the printable area (due to mis-loading or because the paper is too wide).
 - 3) After printing has finished, the right or left edge is out of the area where the cutter can cut the paper.
 - 4) The loaded paper was longer than the selected paper, and the paper was not fully ejected. (For example, roll paper is loaded in the printer but cut sheet is selected on the control panel.)
 - 5) A cutter error occurred after the paper was ejected.
- Solution
 - 1~3 above

Properly reload paper. If the front edge of the paper is not straight and clean, cut the paper.
 - 4~5 above

Cut off the section of the paper that has ejected/protruded and reload the rest of the paper. For paper that is automatically cut, lift up the Release Lever (the "Load Paper" message appears), fix the position of the paper, and lower the Release Lever. If you select you "Roll Paper/ Auto Cut" setting, you can cut off the protruding part of the paper using the Cut button.
 - If the error recurs even after reloading the paper, make sure the paper-end sensor on top of the carriage is installed correctly and working properly.

PUSH LEVER DOWN

- Problem

The printer is not able to continue paper feeding/initializing, printing, or ink sequencing because the Release lever was moved to the Release position. Or, the printer cannot begin printing because the lever is in the release position.
- Solution
 - Push down the lever. However, if printing was interrupted because the lever was pushed to the release position and the paper shifted, the print job may be marred.
 - If the lever is down and this error still occurs, check the Release-Lever position sensor.

COMPARTMENT OPEN

- Problem

An Ink Holder (I/H) compartment door is open.
- Solution
 - Push the I/H lever down to the lock position.
 - If the lever is down and this error still occurs, check the lever position sensor.

INK OUT

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

CAUTION

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

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

NO INK CARTRIDGE

- Problem
An ink cartridge is not installed or is not installed properly.
- Solution
 - Install the proper ink cartridge in the empty slot.

CAUTION

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

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

REMOVE PAPER

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

OPTION I/F ERROR

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

3.3 Troubleshooting Based on Your Printout

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

Table 3-4. Print Quality Problems

Description	Refer to
Dot missing	page 67
Uneven printing/poor resolution	page 68
Smudged or marred printout on front side	page 68
Smudged or marred printout on reverse side	page 68
White/black banding	page 68

DOT MISSING

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

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

CAUTION



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

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



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

UNEVEN PRINTING/POOR RESOLUTION

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

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



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

SMUDGED OR MARRED PRINTOUT (FRONT)

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

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

SMUDGED OR MARRED PRINTOUT (REVERSE SIDE)

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

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

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

WHITE OR BLACK BANDING

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

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

CHAPTER

4

DISASSEMBLY & ASSEMBLY

4.1 Summary

This section describes the disassembly and assembly methods for the EPSON Stylus Pro 9000. However, full assembly instructions are not given apart from following the disassembly instructions in reverse order, and where special instructions are necessary, check points are provided.

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

4.1.1 Warnings

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



- **The power switch is located at the top of the control panel, and to prevent shock or damage to the printer, always remove the power cable before disassembly or assembly**
- **For safety reasons, the front cover position, up or down, is automatically detected by the cover-open sensors which are interlock switches. Do not block or modify these sensors.**
- **Because the Main Board provides a Lithium battery for memory backup purposes, you must keep the following in mind when handling the Main Board.**
 - Be careful to avoid damaging the Lithium electrodes due to short circuits.
 - When replacing the battery, make sure the positive/negative sides are installed correctly
 - The battery can become very hot, so be careful when touching it
- **If ink gets on your hands, wash them thoroughly with soap and water. If ink gets in your eyes, rinse them immediately with water.**
- **If it is necessary to remove external printer parts while the printer is on to view the internal operations, be very careful around high speed parts such as the carriage fan.**
- **Keep in mind that the steel carriage drive belt and cutter blade can be dangerous.**



- Before servicing or performing maintenance on the printer, make sure you have enough space. If you need to move the printer, be sure the space is you move to is safe.
- Because the printer is much heavier than most printers (about 96Kg for the printer and options), you need to take extra care. If you need to take apart the printer and stand or lift the printer, four people are necessary.
- Ink may leak onto other printer parts or the printer basket when removing printer parts, so it is recommended to put a sheet or cloth under the printer, especially when working on or near ink-related parts.
- When working on the electrical circuit board, be careful concerning static electricity, which can cause damage to the board. If necessary, use an anti-static wrist band or similar grounding device to prevent static electricity buildup.
- When removing/re-inserting the flat-cable (FFC) from/to a connector, make sure to pull/insert the cable straight. Otherwise, internal contact of the connector may be damaged and this causes a short-circuit to destroy the electrical circuitries.
- The cutter blade is very hard and can damage or scratch printer parts, and it can also be chipped or damaged. Be careful when handling or replacing the cutter.

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 necessary	-
(-) Standard screwdriver		-
Round-nosed pliers		-
Tweezers		-
Hex (Allen key) wrench		<ul style="list-style-type: none"> 1.5 (CR Motor) and 2.5mm (PF Motor) 4.0 & 5.0 mm for assembly/disassembly 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, washer
CP(W2)M4x12	silver	(+) Crosshead Pan, spring washer, washer
CP(W2)M4x6	silver	(+) Crosshead Pan, spring washer, washer
CP(W2)M4x12	black	(+) Crosshead Pan, spring washer, washer
CP(W2)M3x8	silver	(+) Crosshead Pan, spring washer, washer
CP(W2)M3x6	silver	(+) Crosshead Pan, spring washer, washer
CP(W2)M4x5	silver	(+) Crosshead Pan, spring washer, washer
CBF3x6	silver	(+) Bind screw, flange
CPM2x4	silver	(+) Crosshead Pan
CBM3x6	silver	(+) Bind screw
Hex screw	silver	six-sided hex screw, 2.5mm

4.2 Disassembly Flow

Refer to the following flowchart when determining the disassembly flow.

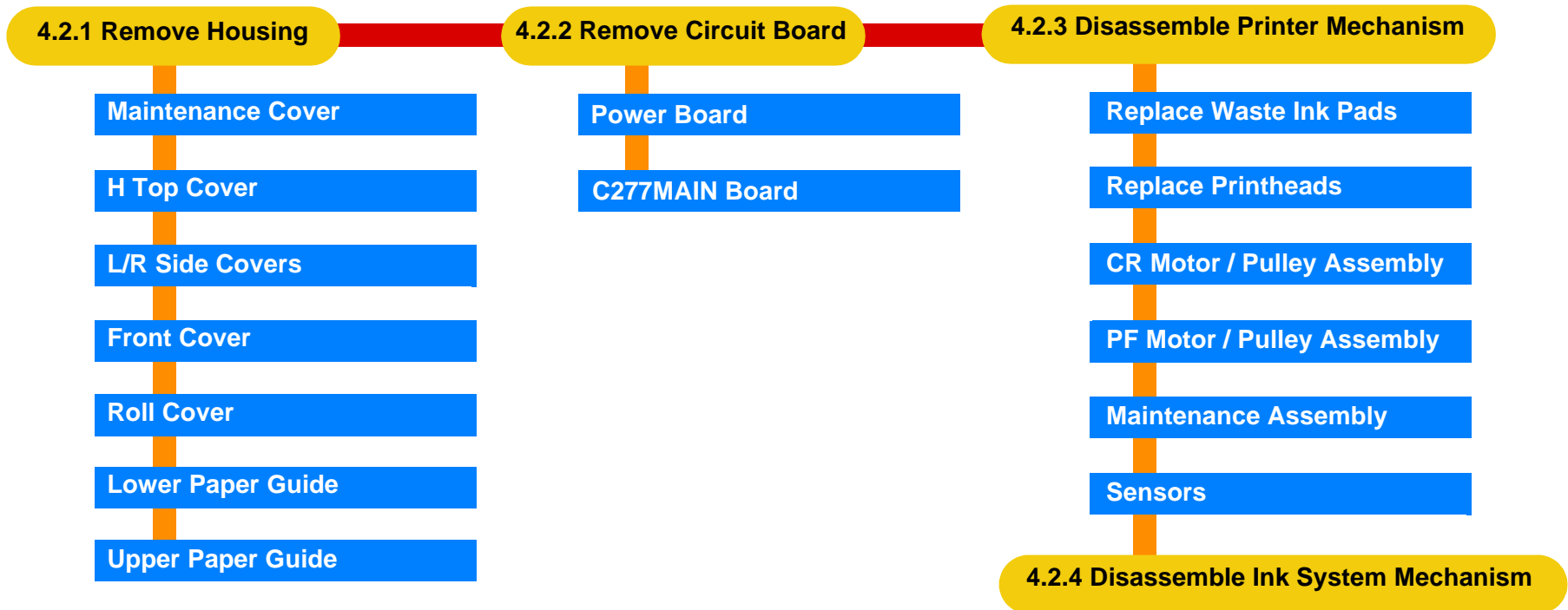


Figure 4-1. Disassembly Process Flowchart

4.2.1 Removing the Housing

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

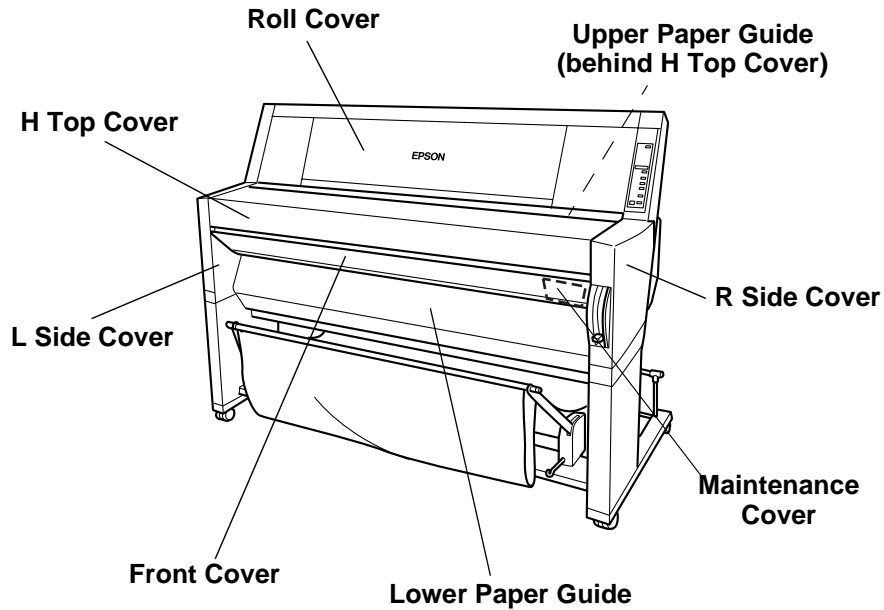
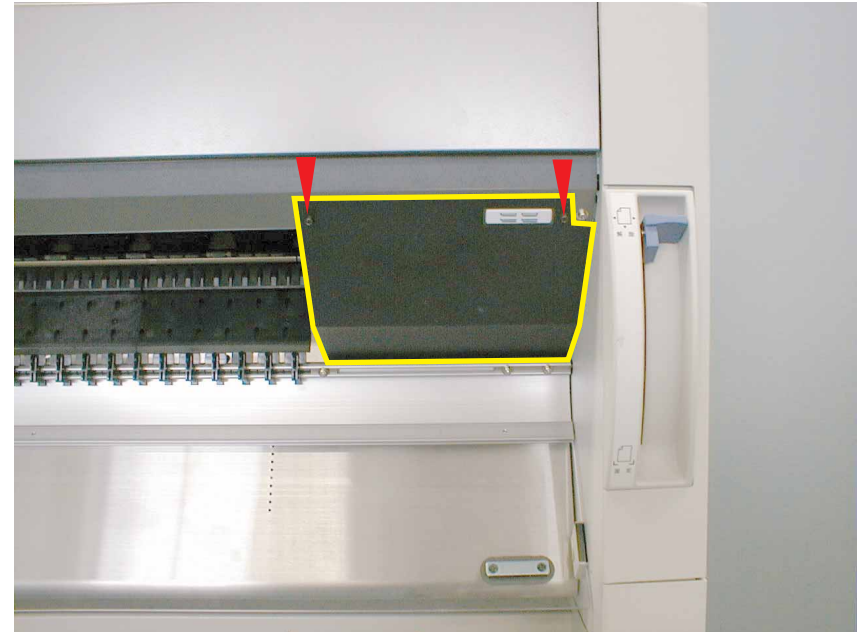


Figure 4-2. Housing Part Diagram

MAINTENANCE COVER REMOVAL

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



▶ CP(W2) M3x6 screw

Figure 4-3. Maintenance Cover Removal

H TOP COVER REMOVAL

1. Remove the Maintenance Cover. See "Maintenance Cover Removal" on page 73.
2. Remove the four screws, CP(W2) M4x12, that secure the left-side lower mounting bracket and remove the bracket. Repeat for the right-side lower mounting bracket.

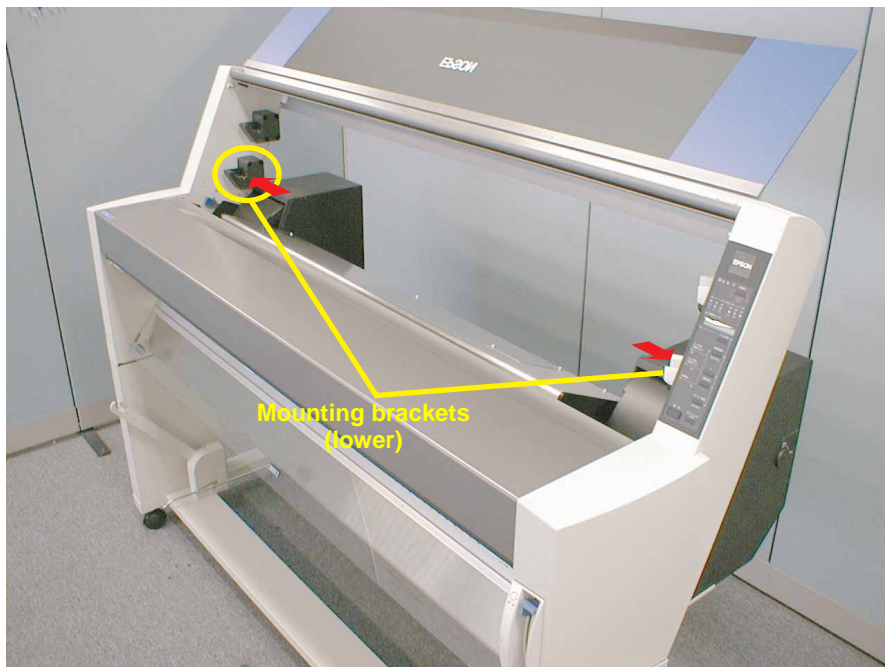


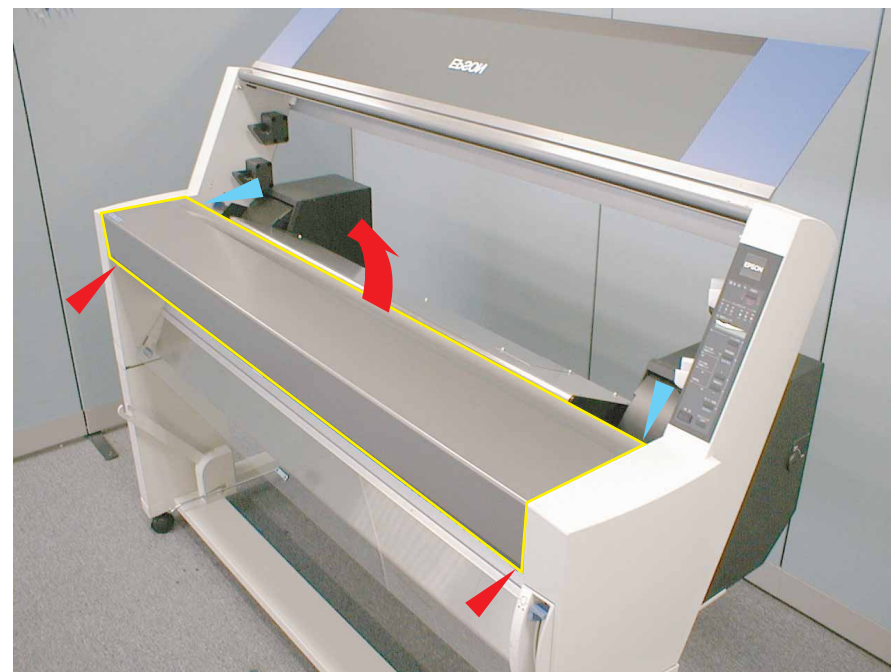
Figure 4-4. Lower Mounting Bracket Removal

3. Remove the four screws, two silver CP(W2) M3x6 and two silver CP(W2) M4x6.

4. Lift the H Top cover from the rear edge, and carefully tilt it forward, and lift it away from the printer.



CAUTION When lifting the H Top Cover off the printer, be careful not to catch the rear edge of the Cover on the P-Thick sensor lever which is in the paper path to the right of center. If the P-Thick sensor is knocked out of position, the printer cannot properly determine the paper thickness.





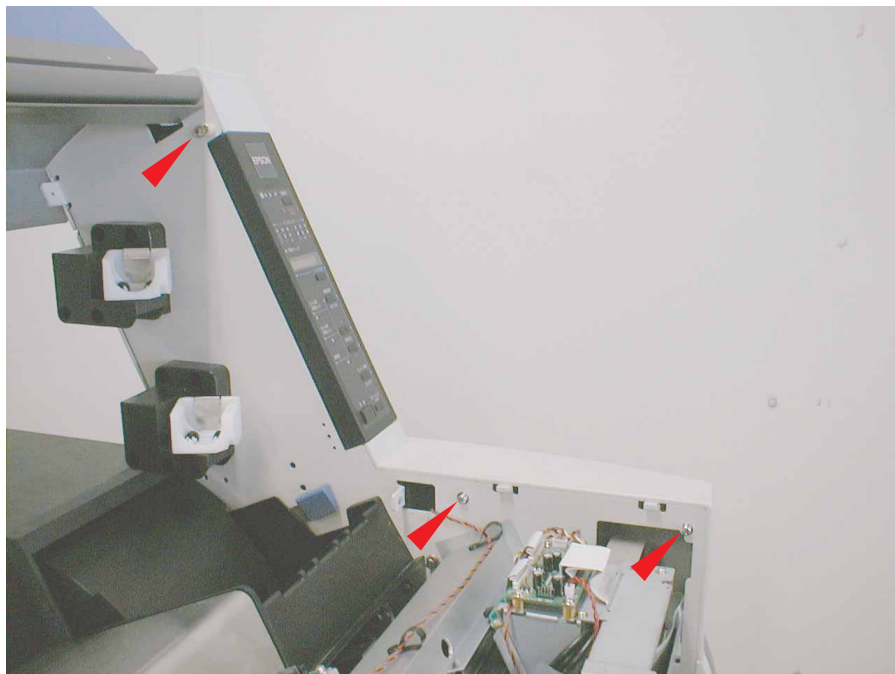
-  CP(W2) M3x6 screws
-  CP(W2) M4x6 screws

Figure 4-5. H Top Cover Removal

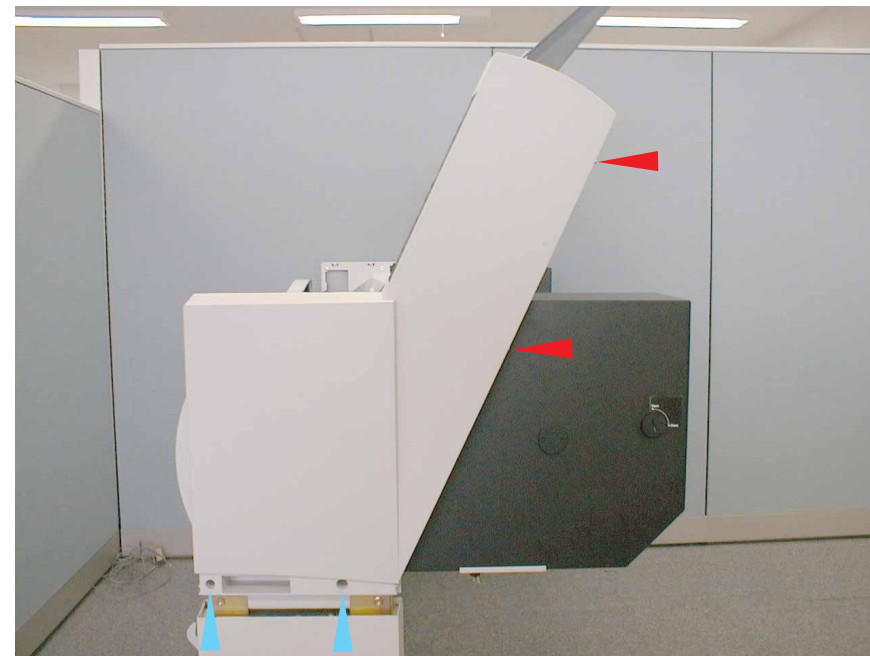
L/R SIDE COVERS REMOVAL

1. Remove the Maintenance Cover as described in "Maintenance Cover Removal" on page 73.
2. Remove the H Top Cover as described in "H Top Cover Removal" on page 74.
3. Remove the left and right joint-cover plates (between the stand and printer).
4. Remove the seven screws (five silver CP(W2) M4x12 screws and two black CP(W2) M4x12) securing the Left Side Cover, and remove the Left Side Cover. Repeat for the Right Side Cover plus remove one cable from the back of the control panel.



 CP (W2) M4x12 silver screws

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



 CP (W2) M4x12 silver screws

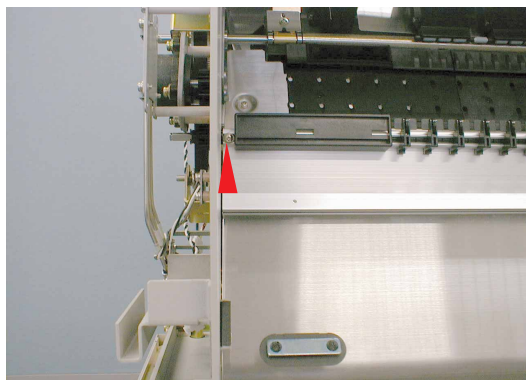
 CP (W2) M4x12 black screws

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

FRONT COVER ASSEMBLY REMOVAL

1. Remove the Maintenance Cover as described in "Maintenance Cover Removal" on page 73.
2. Remove the H Top Cover as described in "H Top Cover Removal" on page 74.
3. Remove the L/R Side Covers as described in the previous section.
4. Remove the three screws (CP(W2) M3x8) securing the damper assembly on the left side, and then remove the damper assembly.
5. As shown below, the Front Cover Assembly is supported by a shaft and brackets on both sides. The shaft is secured to these brackets with three screws (CP (W2) M3x8), two on the right and one on the left.

Left side



▶ CP(W2) M3x8

Right side

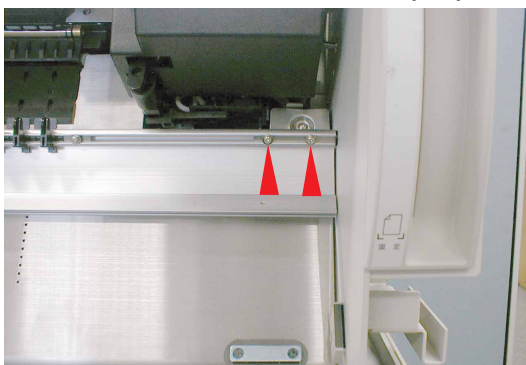


Figure 4-8. Locations of Front Cover shaft screws



The roll assembly parts and guide on the left side of the Front Cover shaft are not fixed and will slide off the shaft if the shaft is tilted down to the left.



Figure 4-9. Front Cover Removal

ROLL COVER ASSEMBLY REMOVAL

1. Remove the Maintenance Cover as described in "Maintenance Cover Removal" on page 73.
2. Remove the H Top Cover as described in "H Top Cover Removal" on page 74.
3. Remove the L/R Side Covers as described in "L/R Side Covers Removal" on page 75.
4. Remove the four screws (CP(W2) M3x8), two on each side, that secure the Roll Cover Shaft.
5. From the outer sides of the L/R Side Frames, remove the Cover Gear Assemblies, and then remove the Roll Cover Assembly.

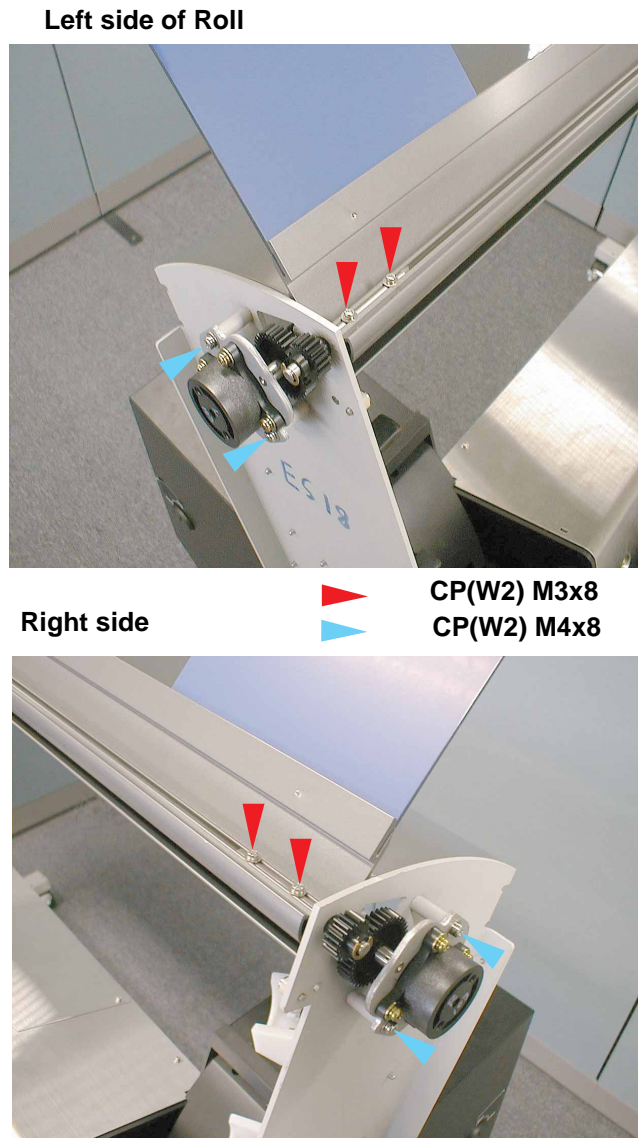


Figure 4-10. Roll Cover Assembly Removal

LOWER PAPER GUIDE REMOVAL



When removing/installing the Lower Paper Guide, the following adjustment procedure is required.

- Cutter Position Adjustment

1. Remove the Maintenance Cover as described in "Maintenance Cover Removal" on page 73.
2. Open the Front Cover, and remove the eight screws (CP(W2) M3x6) securing the Lower Paper Guide.



▶ CP(W2) M3x6

Figure 4-11. Location of Lower Paper Guide Screws

3. While supporting the Front Cover with your hands, lower the Lower Paper Guide as shown below.



- You may find it useful or necessary to move the Front Cover up/down while removing the Lower Paper Guide.
- To avoid interfering with the P-Front sensor, pull the top out towards you as you lower the Lower Paper Guide.
- When installing Lower Paper Guide, push it all the way up before tightening the screws; then perform the cutter position adjustment as described in Chapter 5.

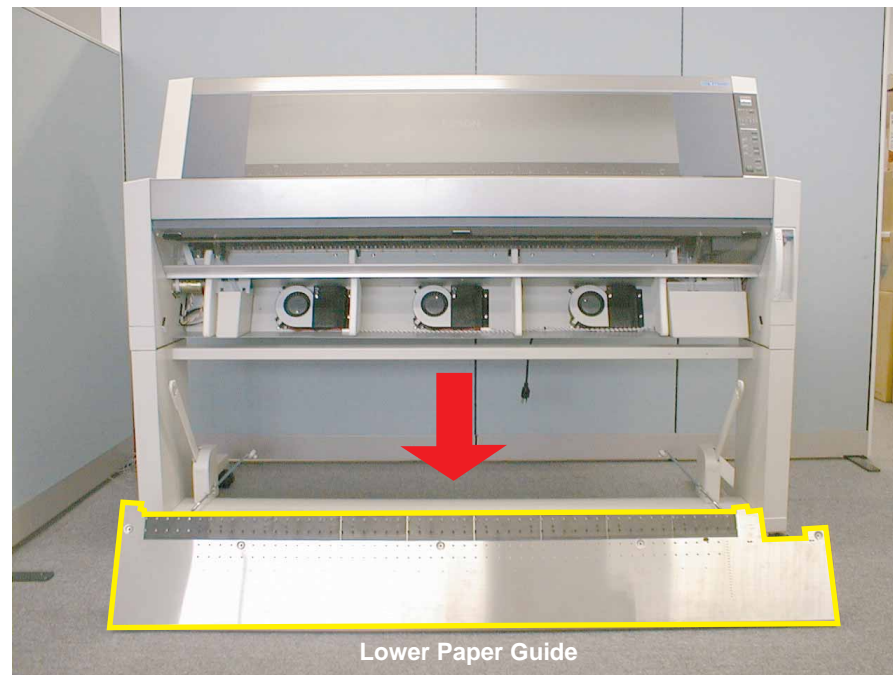


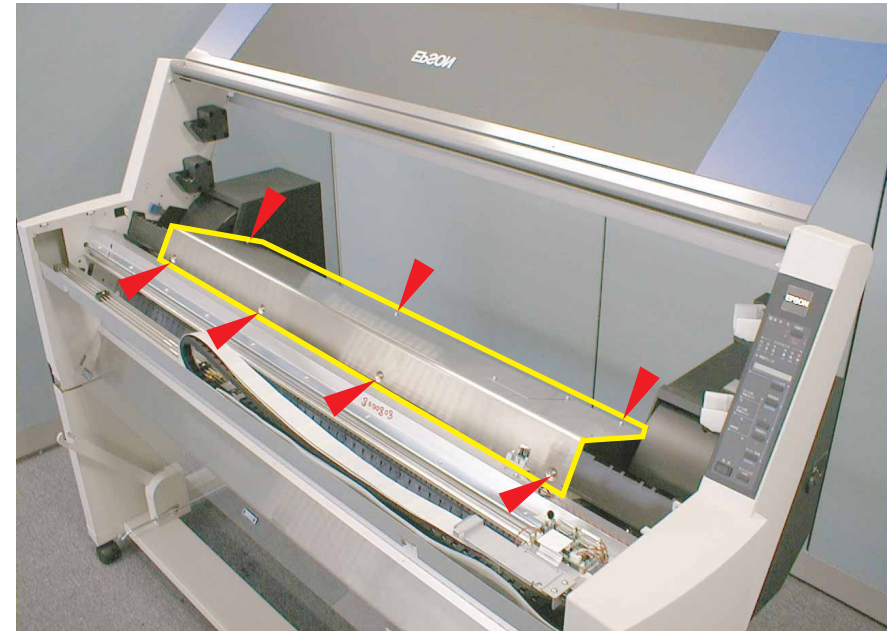
Figure 4-12. Lower Paper Guide Removal

UPPER PAPER GUIDE REMOVAL

1. Remove the Maintenance Cover as described in "Maintenance Cover Removal" on page 73.
2. Remove the H Top Cover as described in "H Top Cover Removal" on page 74.
3. Open the Roll Cover.
4. Remove the seven screws (CP(W2) M3x6) that secure the Upper Paper Guide, and then remove the Upper Paper Guide.

**CHECK
POINT**

When removing or re-installing the Upper Paper Guide, be sure the Paper Release lever is set to the Lock (lower) position; otherwise the Grid Roller Assembly is in the way.



▶ CP(W2) M3x6

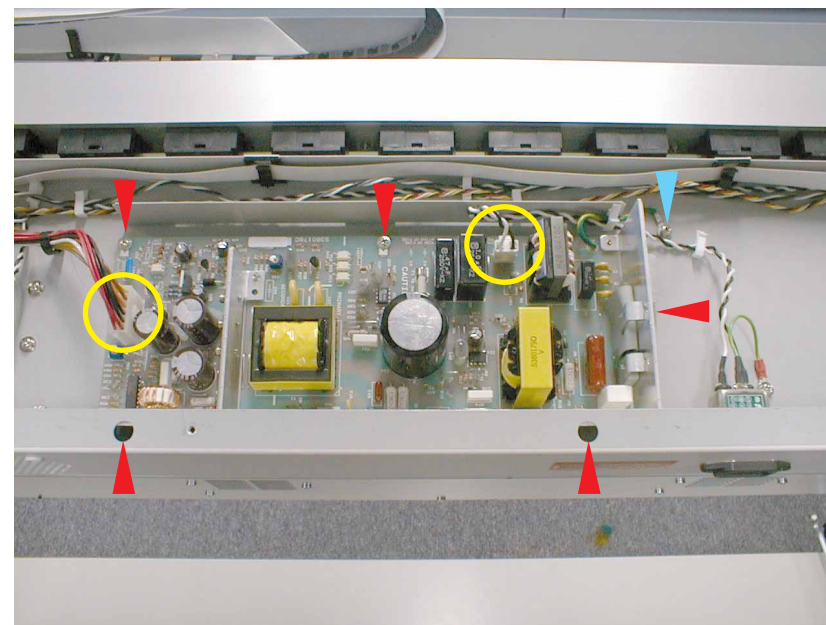
Figure 4-13. Upper Paper Guide Removal

4.2.2 Circuit Board Removal

This section explains how to remove the Circuit Board (C277PSU) and the Main Board (C277MAIN).

POWER BOARD REMOVAL

1. Remove the H Top Cover as described in "H Top Cover Removal" on page 74.
2. Remove the Upper Paper Guide as described in "Upper Paper Guide Removal" on page 79.
3. Remove the two cables connected to the Power Board as shown below.
4. Remove the one ground screw and five screws that secure the Power Board, and then remove the Power Board.
 - Five CBF M3x6 screws
 - One CP(W2) M4x5 screw





-  CBF M3x6 screw
-  CP(W2) M4x5 screws

Figure 4-14. Power Board Removal

C277MAIN BOARD REMOVAL

1. Remove the H Top Cover as described in "H Top Cover Removal" on page 74.
2. Remove the Upper Paper Guide as described in "Upper Paper Guide Removal" on page 79.
3. Remove the cables from the following connectors.
CN6 CN7 CN8 CN9 CN10 CN11 CN13 CN14
CN15 CN17 CN18 CN21 CN24 CN26 CN27
4. Remove the two screws securing the Type-B Option Slot Cover, and remove the cover.
5. Remove the twelve screws securing the MAIN Board, and then remove the MAIN board.
 - Board: Nine CBF M3x6 screws
 - I/F connector: Three CP M2x4 screws

CAUTION

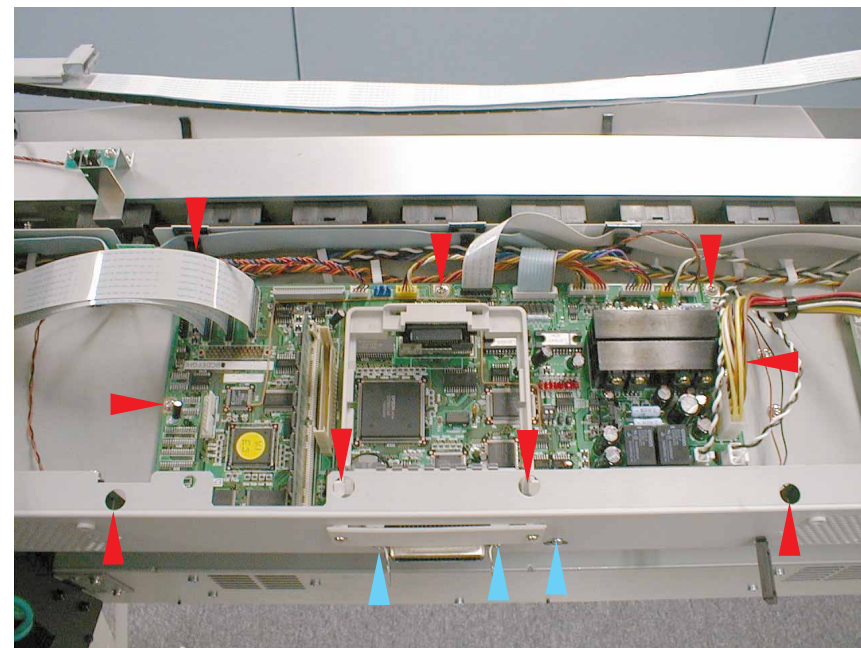


When removing/re-inserting the flat-cable (FFC) from/to a connector, make sure to pull/insert the cable straight. Otherwise, internal contact of the connector may be damaged and this causes a short-circuit to destroy the electrical circuitries.

ADJUSTMENT REQUIRED



After replacing the main board to new one, various adjustments are required. For the details of each adjustment, refer to Chapter-5 Adjustment at page 112.



▶ CBF M3x6 screw

▶ CP M2x4

Figure 4-15. C277MAIN Board Removal

4.2.3 Printer Mechanism Disassembly

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

CAUTION

This manual only describes the repair and replacement procedures for parts that can be serviced on site. Therefore, only perform repair or replace procedures that are described here. Other service procedures can only be done at the factory and can become permanent fatal errors if not done correctly.

REPLACING THE WASTE INK PADS

To keep the printhead clean and maintain quality, the printer drains waste ink away from the printhead surface and nozzles into the Waste Ink Boxes. Once a predetermined amount of waste ink has been drained into one of the Waste Ink Boxes, the printer displays the "Maintenance Call 0100" or "Service Call 00000100" to indicate one of the boxes is full and needs to be replaced.

CAUTION



When the printer's useful life counter indicates the ink pads need to be replaced, the following parts all need to be replaced at the same time.

- Waste Ink Pads, Left & Right
- Pump Assembly
- Cap Assembly
- Head Cleaner
- F Box, Left & Right

CHECK POINT



The above mentioned parts are also available as a Kit.

Description: MAINTENANCE KIT
Parts code: 1048434

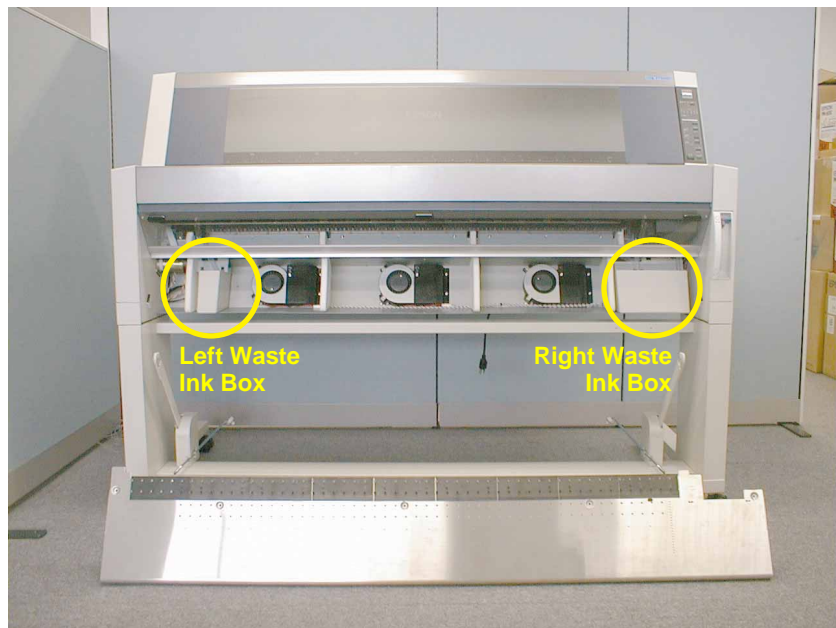
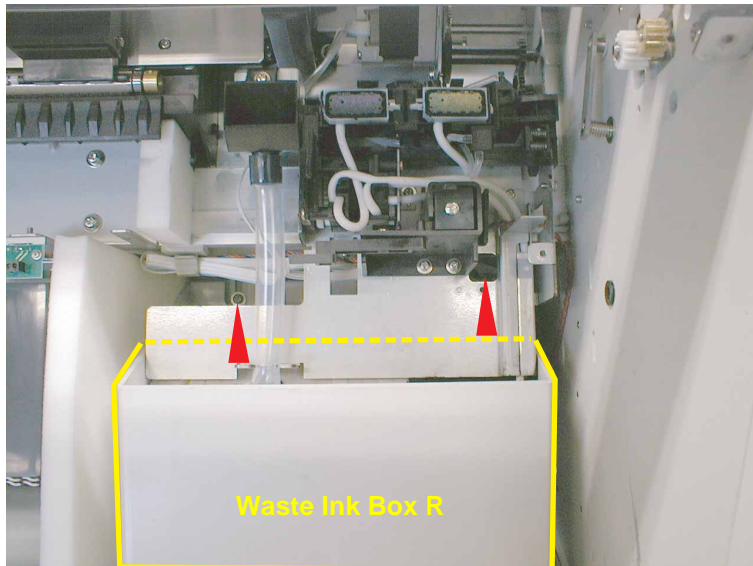


Figure 4-16. L/R Waste Ink Box Positions

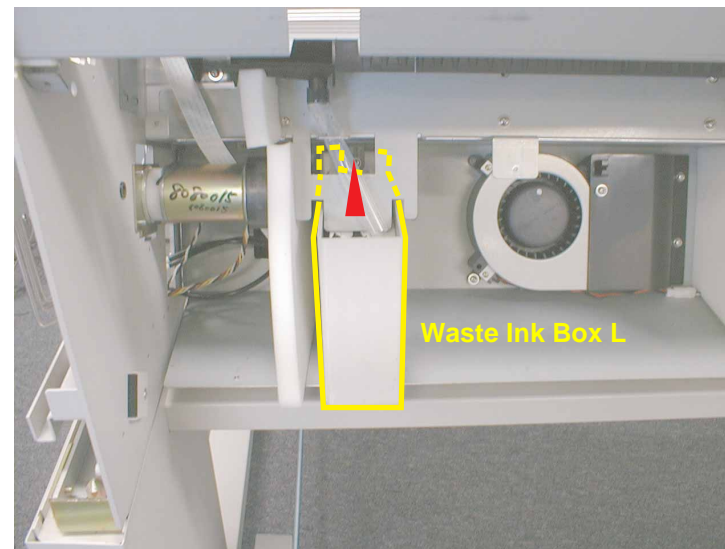
1. Remove the Maintenance Cover as described in "Maintenance Cover Removal" on page 73.
2. Remove the H Top Cover as described in "H Top Cover Removal" on page 74.
3. Remove the L/R Side Covers as described in "L/R Side Covers Removal" on page 75.
4. Remove the Front Cover Assembly as described in "Front Cover Assembly Removal" on page 76.
5. Remove the Lower Paper Guide as described in "Lower Paper Guide Removal" on page 78.

6. Remove the following screws that secure the L/R Waste Ink Boxes, and then remove the L/R Waste Ink Boxes.
 - Waste Ink Box L: One CP(W2) M4x8 screw
 - Waste Ink Box R: Two CP(W2) M4x8 screws



▶ CP(W2) M4x8 screws

Figure 4-17. Waste Ink Box R



▶ CP(W2) M4x8

Figure 4-18. Waste Ink Box L

7. Remove the old Waste Ink Pads from inside both of the Waste Ink Boxes.
8. Insert new Waste Ink Pads in the Waste Ink Boxes, and re-install the Waste Ink Boxes in the printer.



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



When replacing the Waste Ink Pads, the following adjustment procedures are required.

- INIT. WASTE INK
- INIT. CLEANER
- Cutter Position

REPLACING THE PRINTHEADS

CAUTION



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

- B head
F055040: "Printhead, IJ192-OAD"
- C head
F055050: "Printhead, IJ192- OAE"

ADJUSTMENT REQUIRED



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

- Self-diagnostic function/adjustment
- Head unit counter reset
- Carriage cover height check

1. Turn the ink valve knob located on the sides of the I/H Holders to the "Close" position, or lift up the I/C Holder lever. Both operations perform the same function of shutting off the flow of ink through the ink tubes.
2. Open the Front Cover.
3. Remove the Maintenance Cover as described in "Maintenance Cover Removal" on page 73.
4. *Optional:* Remove the H Top Cover as described in "H Top Cover Removal" on page 74. This is an extra step during removal and re-installation, but it provides more light and room.

5. Manually release the Carriage Lock and move the carriage away from the capping position.

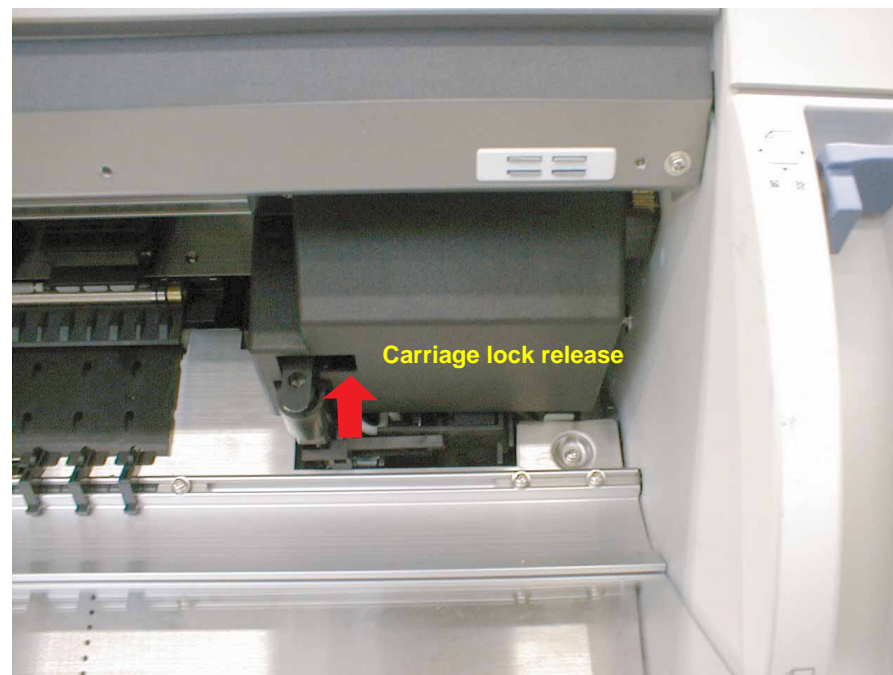
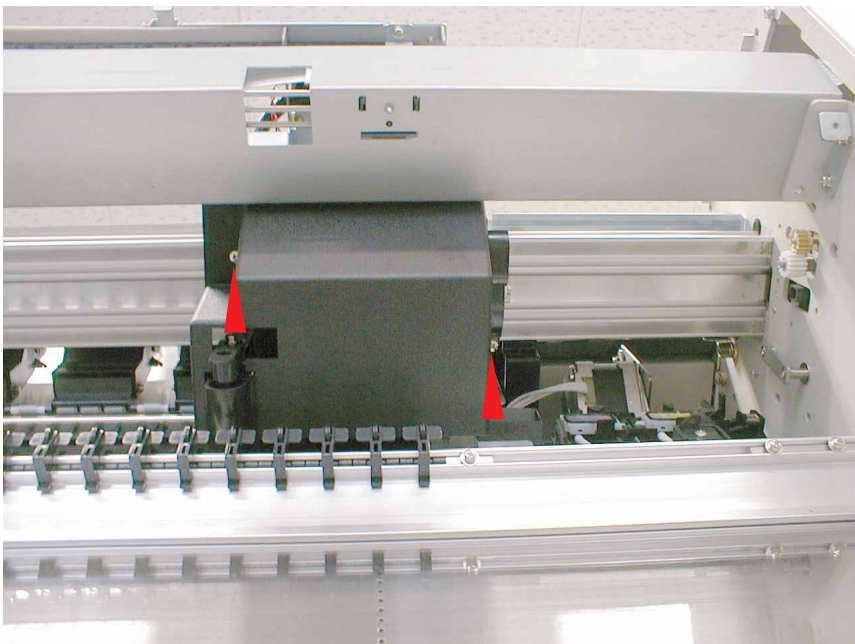


Figure 4-19. Carriage Lock Release

6. Remove two screws (CB M3x6), and remove the carriage cover.



▶ CB M3x6 screws

Figure 4-20. Carriage Cover Removal *with H Top removed

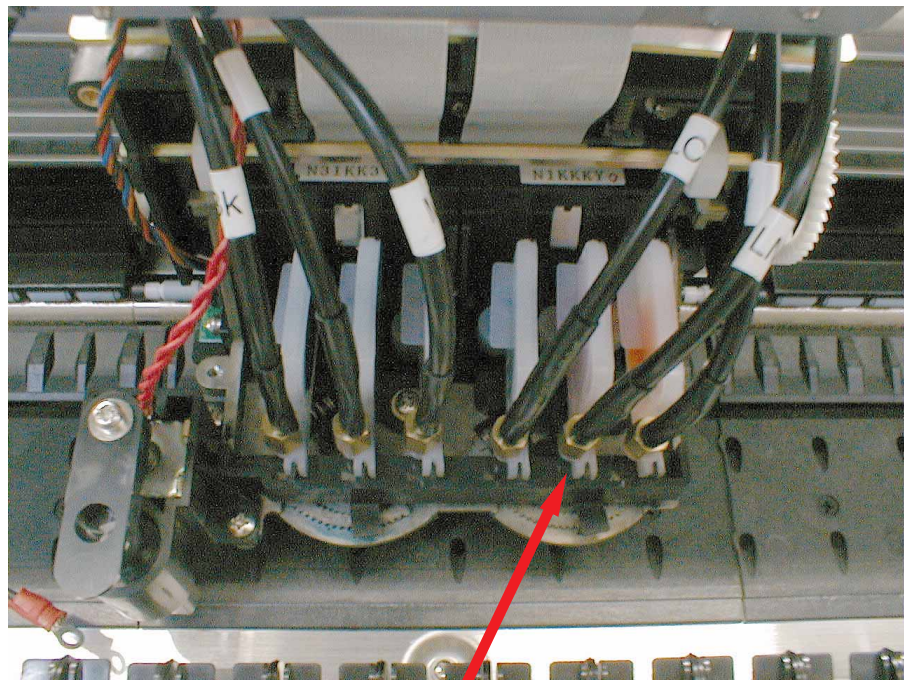
7. Remove one screw (CP(W2) M3x6) securing the damper holder and the ground, unhook the ink tubes from the damper holder, and then remove the damper holder.

8. Pull out the dampers. To pull out the dampers, place the tip of a flat-head screwdriver or similar tool under the damper and steady the damper with your other hand. Then pull out the damper.

CAUTION



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



Insert a flat-head screwdriver between the bottom of the damper and the printhead to remove the damper.

Figure 4-21. Damper Removal

9. Using round-nosed pliers, remove the “Tension Spring, 9.9”.

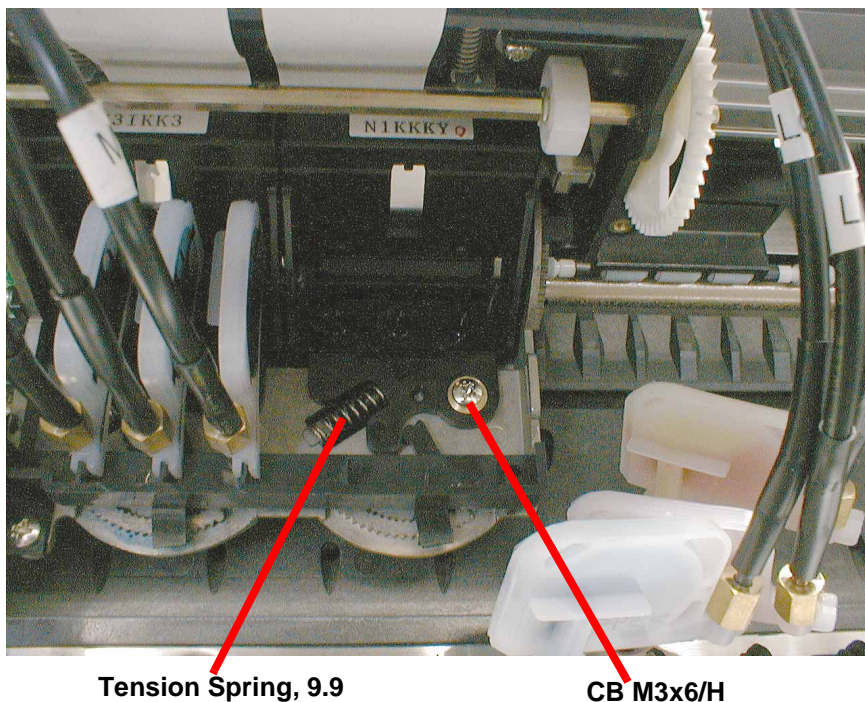


Figure 4-22. Printhead Tension Spring and Screw Removal

10. Remove the CB M3x6 screw, also called the “H Spacer” screw, and then remove the printhead from the carriage.
11. Remove the flat cable from the back of the printhead).

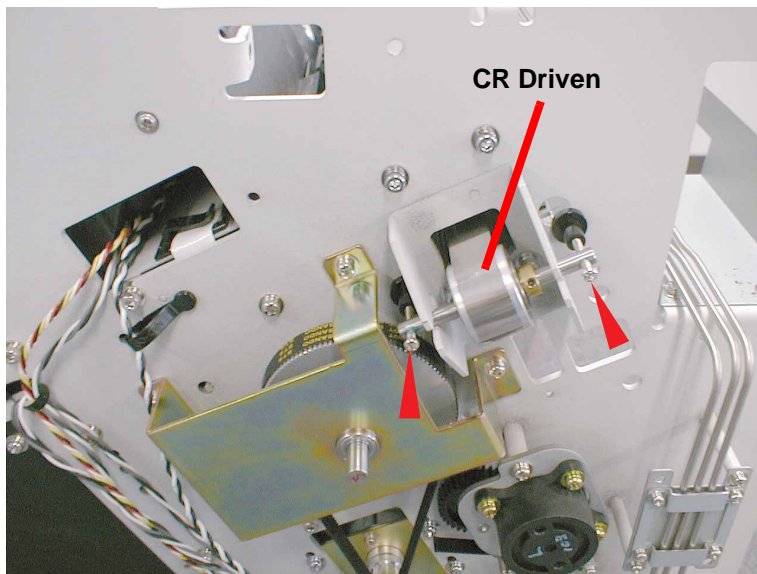
12. Repeat steps 10 and 11 for the other printhead if necessary.



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

REMOVING THE CR MOTOR/PULLEY ASSEMBLY

1. Remove the L/R Side Covers as described in "L/R Side Covers Removal" on page 75.
2. Manually release the Carriage Lock and move the carriage away from the capping position.
3. On the Left Side Frame, find the CR Driven Pulley and loosen the two screws securing it to the frame. Then loosen the tension on the steel belt.



▶ Loosen these two

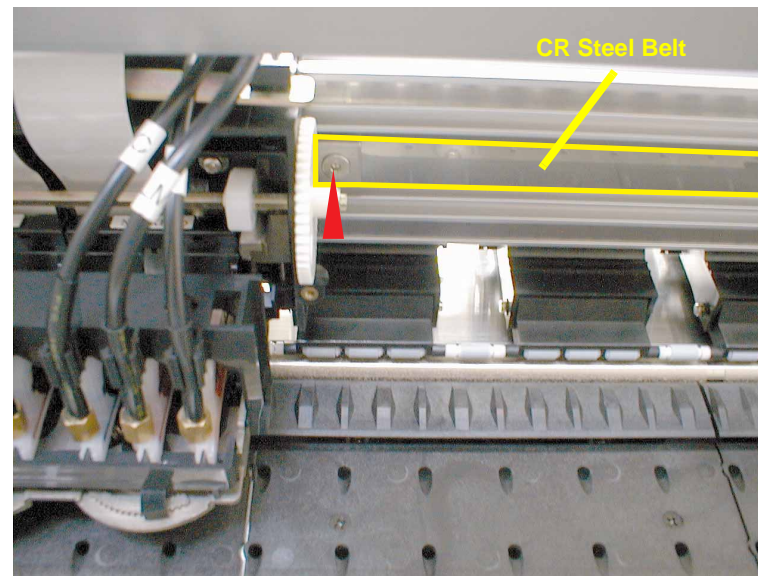
Figure 4-23. CR Motor Removal & CR Steel Belt Loosening



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

- CR Steel Belt Tension Adjustment

4. Towards the right side of the frame there is one screw securing the steel belt, remove this screw. Then remove one edge of the steel belt, and finally pull out the steel belt to the Right Side Frame.

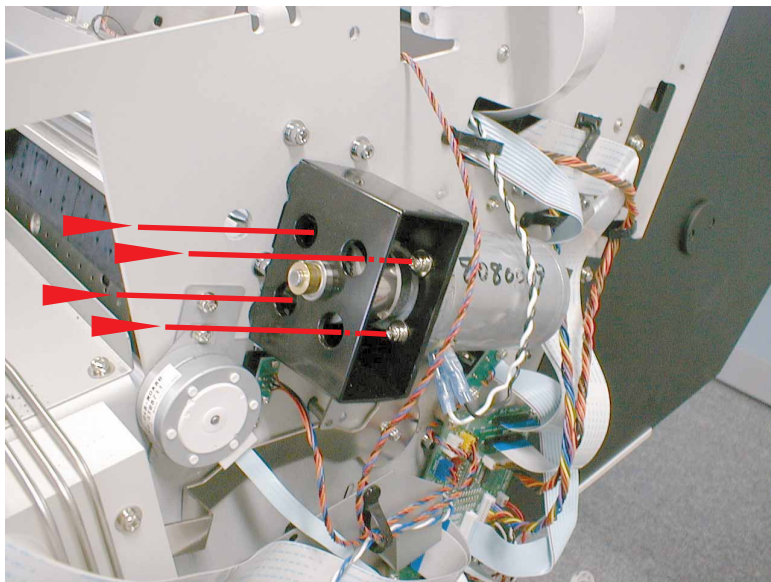


▶ Remove one Hex

Figure 4-24. CR Motor Removal/Steel Belt Removal

5. Loosen the Hex (Allen key) screw (2.5mm), and then remove the bearing stopper attached to end of the CR Motor Shaft.

6. On the Right Side Frame, remove the four screws securing the CR Motor Assembly, and then remove the CR Motor Assembly.

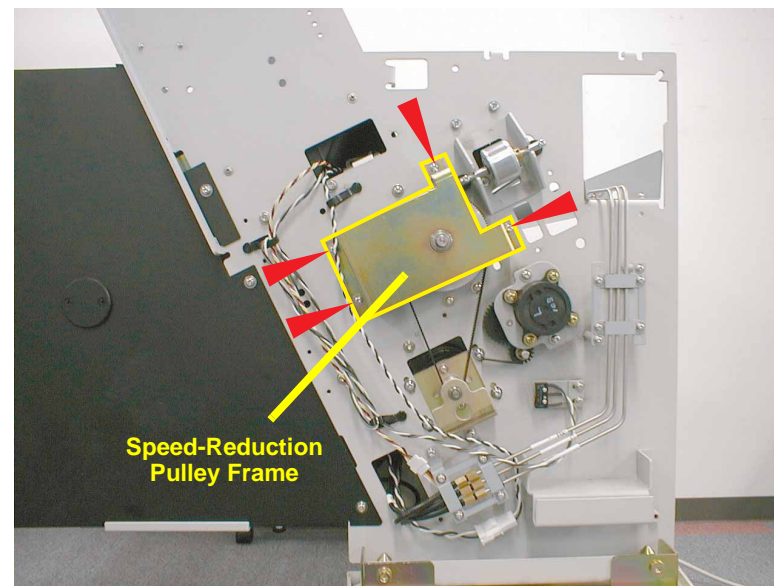


▶ Four CP(W2) M4x8

Figure 4-25. CR Motor Removal

REMOVING THE PF MOTOR ASSEMBLY

1. Remove the L Side Cover as described in "L/R Side Covers Removal" on page 75.
2. Remove the Lower Paper Guide as described in "Lower Paper Guide Removal" on page 78.
3. Remove the four screws (CP(W2) M4x8) securing the "Speed-Reduction Pulley Frame", and then remove the Speed-Reduction Pulley Frame.



▶ CP(W2) M4x8

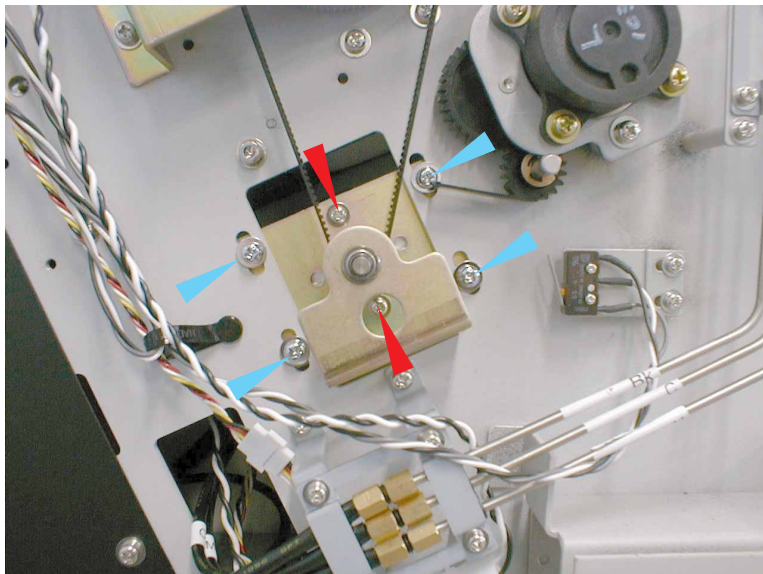
Figure 4-26. PF Motor Assembly/Speed-Reduction Frame Removal

4. Loosen the four screws (CP(W2) M4x12) that secure the "PF Motor Attachment Frame", and then loosen the tension on the PF Speed-Reduction Belt.



When re-assembling the CR Driven Pulley Assembly, move the carriage back-and-forth by hand, and while making sure the steel belt is exactly in the middle and evenly rotating, tighten the steel-belt screws. (The steel belt must be within 1mm of center on top of the pulley.)

- Remove the two CP(W2) M3x8 screws securing the PF Motor Assembly to the PF Motor Frame, and then remove the PF Motor Pulley. If necessary, hold the PF Motor Frame to reduce the tension and make the motor assembly removal easy.





-  CP(W2) M3x8
-  CP(W2) M4x12 screws: only

Figure 4-27. PF Motor Assembly Removal



When removing/installing the Lower Paper Guide, the following adjustment procedure is required.
 - Cutter Position Adjustment

REMOVING THE HD_SLID MOTOR ASSEMBLY

- Remove the R side cover (refer to "L/R Side Covers Removal" on page 75).
- Disconnect the cable from the connector CN18 on the relay board.
- Remove the two screws (CP(W2) M3x8) securing the HD_SLID motor assembly to the side frame.

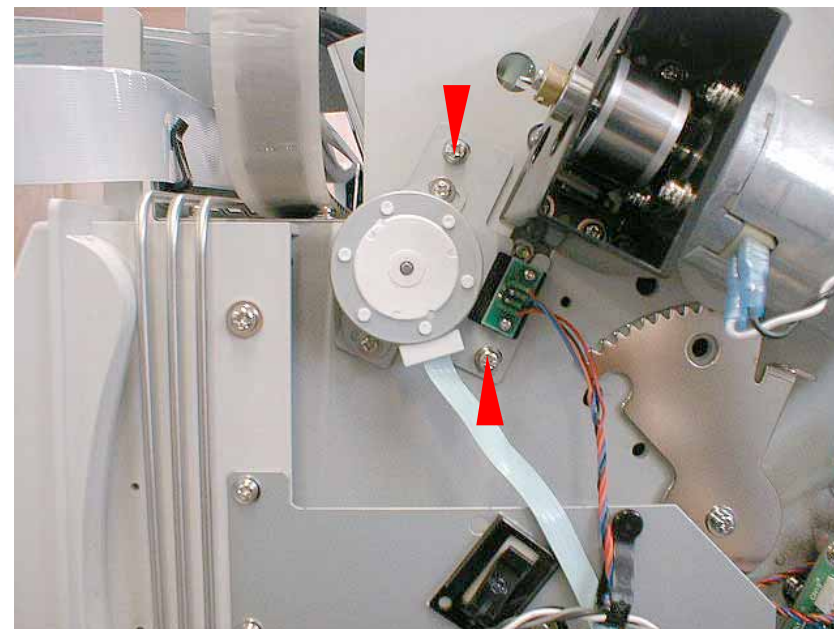


Figure 4-28. HD_SLID Motor Assembly Removal



When removing/installing the HD_SLID Motor assembly, the following adjustment procedure is required.
 - Gear backrush adjustment

MAINTENANCE ASSEMBLY REMOVAL & DISASSEMBLY

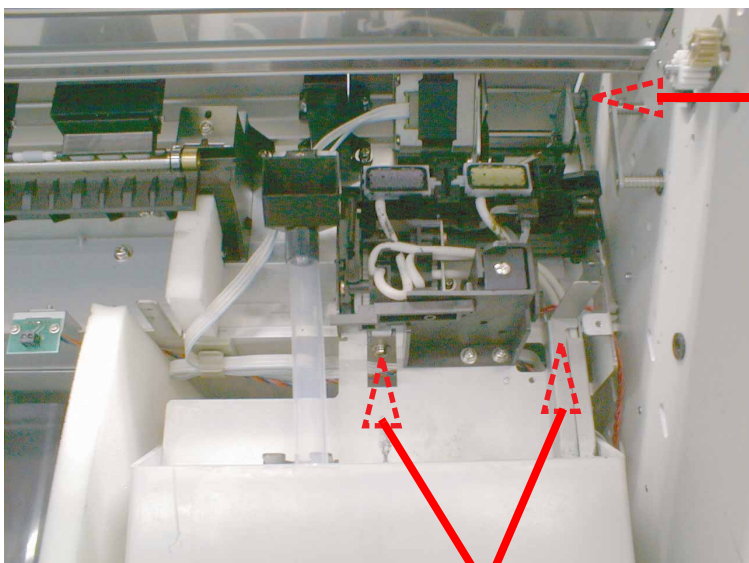


If the “Service Call 00000100” error occurs, you need to replace the Waste Ink Pads and F Box R as well as replace the Pump Assembly, Cap Assembly, and Head Cleaner on top of the Maintenance Assembly. In addition, you need to reset the following counters. (See “Service Related Printer Settings” on page 26.)

- INIT. WASTE INK
- INIT. CLEANER

You also need to perform the Cutter Position Adjustment.

1. Remove the right-side Waste Ink Box as described in “Replacing the Waste Ink Pads” on page 83.
2. Remove the two (CP(W2) M4x6) screws securing the Maintenance Assembly frame to the printer.



One screw: from outer

Two screws: towards the back of the

Figure 4-29. Maintenance Assembly Removal - 1

3. From the R Side Frame, remove the one (CP(W2) M3x6) screw securing the Maintenance Assembly upper frame.
4. Disconnect the two cables from the connectors CN9 (to CR Lock Solenoid) and CN19 (to Pump motor), and then remove the Maintenance Assembly.



When removing the Maintenance Assembly, the ink tubes connected to the Pump Assembly may leak or drip ink. It is a good idea to wipe the ends of these ink tubes off before removing the Maintenance Assembly.

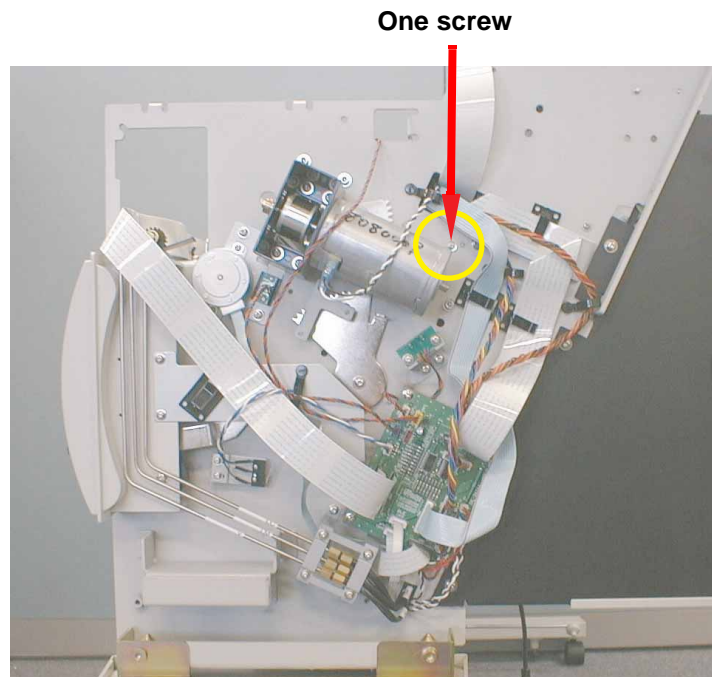


Figure 4-30. Maintenance Assembly Removal - 2

- After removing the two (CP(W2) M3x6) screws on the side of the Maintenance Assembly, remove the Cap Assembly and the plate. Then remove the Pump Speed-Reduction Gear1 as shown below.

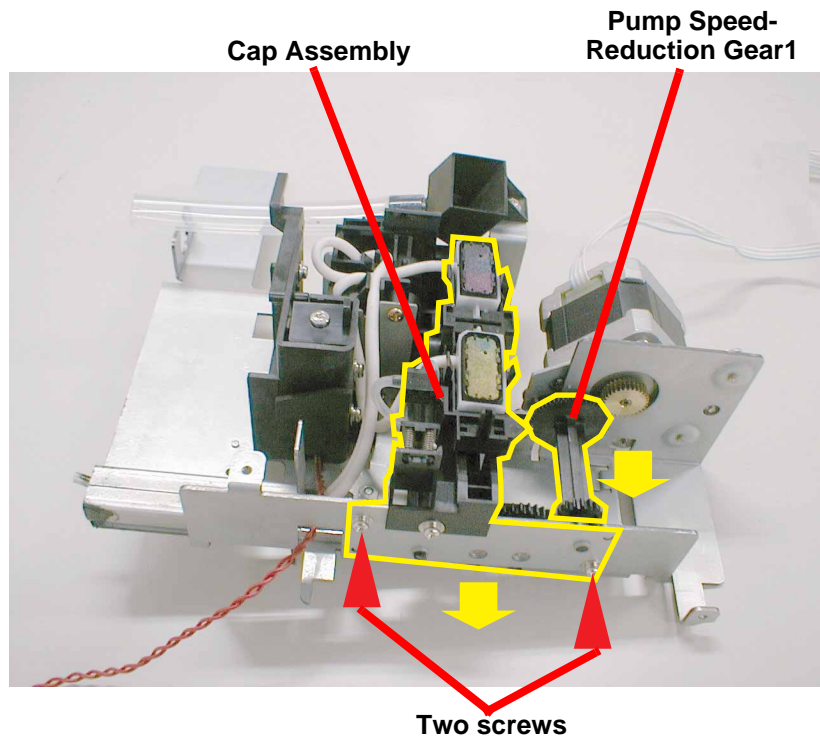


Figure 4-31. Maintenance Assembly disassembled - 1

- Remove two (CP(W2) M3x6) screws securing the CR Lock, and then remove the CR Lock Assembly (solenoid).
- Remove one (CP(W2) M3x6) screw securing the Pump Assembly to the Maintenance Assembly Frame, and then remove the Pump Assembly along with the Cap Assembly and plate.

- If necessary, disassemble the Cap Assembly and Pump Assembly (remove the ink tubes) and remove the Head Cleaner from the Pump Assembly.



If you plan to re-install the Cap Assembly you removed, keep the following important points in mind.

- After re-installing the spring that holds the cap in place, try moving the cap by hand to make sure it operates properly.
- Make sure there is no leakage around the valve position.

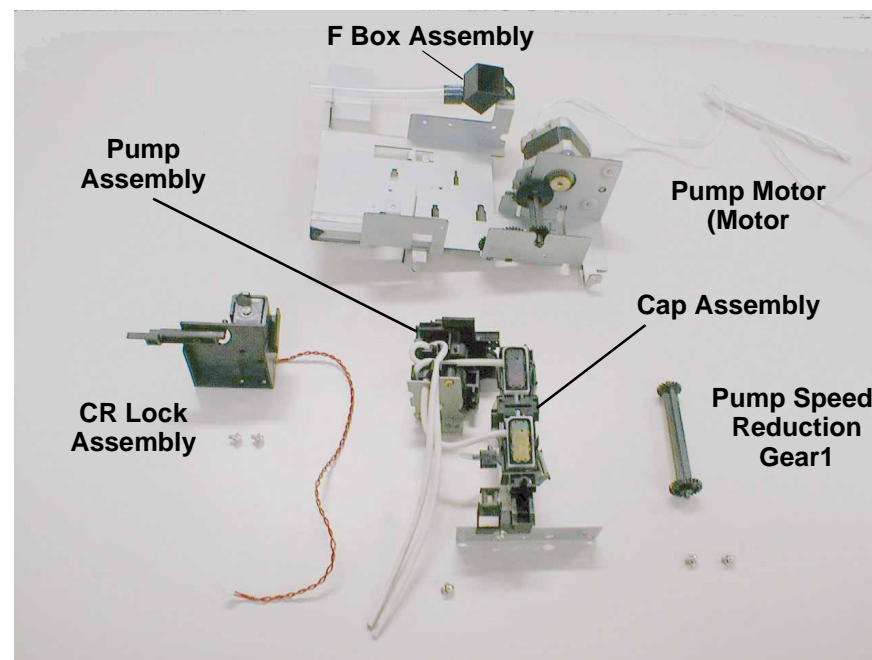


Figure 4-32. Maintenance Assembly disassembled - 2

REMOVING THE INTERLOCK SWITCH (L/R)

1. Remove the L/R side cover (refer to "L/R Side Covers Removal" on page 75).
2. To remove the interlock switch (R), disconnect the cable from the connector CN13 on the relay board.
3. Remove the two screws (CP(W2) M3x6) securing the interlock switch mount plate to the side frame, and remove the interlock switch (R) together with the mount plate.

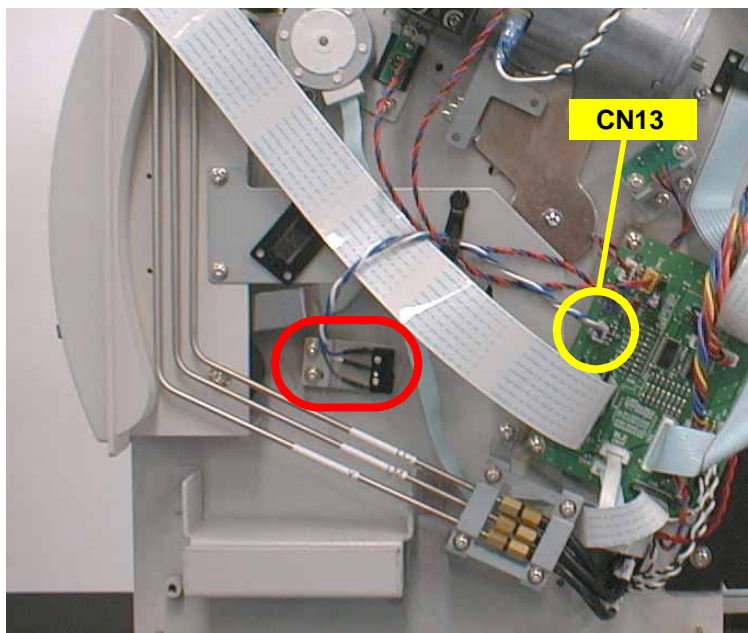


Figure 4-33. Interlock Switch (R) removal

4. To remove the interlock switch (L), disconnect the cable from the connector CN27 on the C277MAIN board.
5. Remove the two screws (CP(W2) M3x6) securing the interlock switch mount plate to the side frame, and remove the interlock switch (L) together with the mount plate.

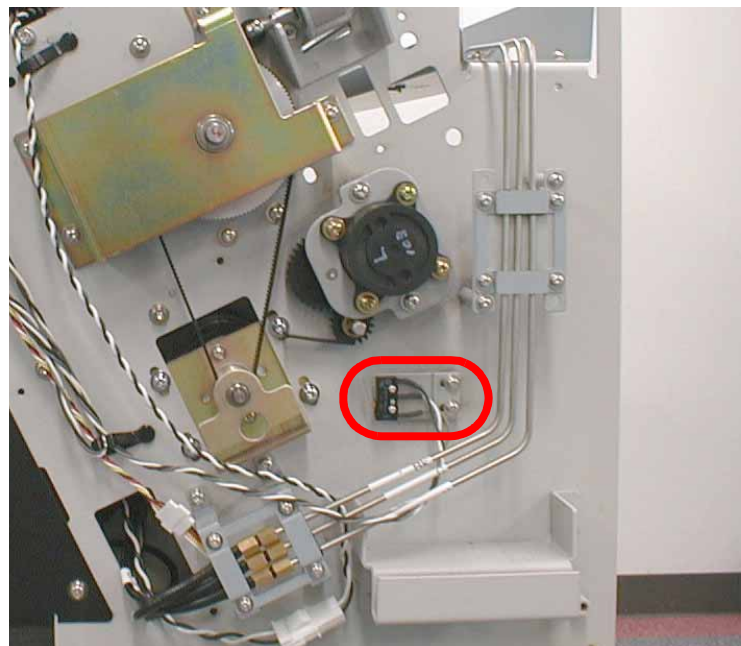


Figure 4-34. Interlock Switch (L) removal

REMOVING THE P_THICK SENSOR

1. Remove the H-TOP cover (refer to "H Top Cover Removal" on page 74).
2. Disconnect the cable from the connector CN12 on the relay board.
3. Remove the two screws (CP(W) M3x6) securing the sensor assembly, and remove the P_THICK sensor together with the mount plate.

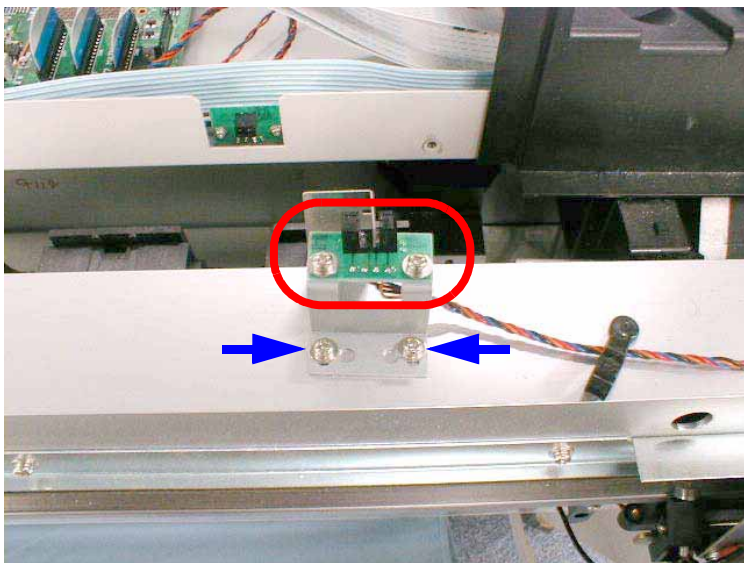


Figure 4-35. P_THICK sensor removal

REMOVING THE P_REAR SENSOR

1. Remove the upper paper guide (refer to "Upper Paper Guide Removal" on page 79).
2. Disconnect the cable from the connector CN11 on the C277MAIN board.
3. Remove the one screws (CP(W) M3x6) securing the sensor assembly, and remove the P_REAR sensor together with the mount plate.

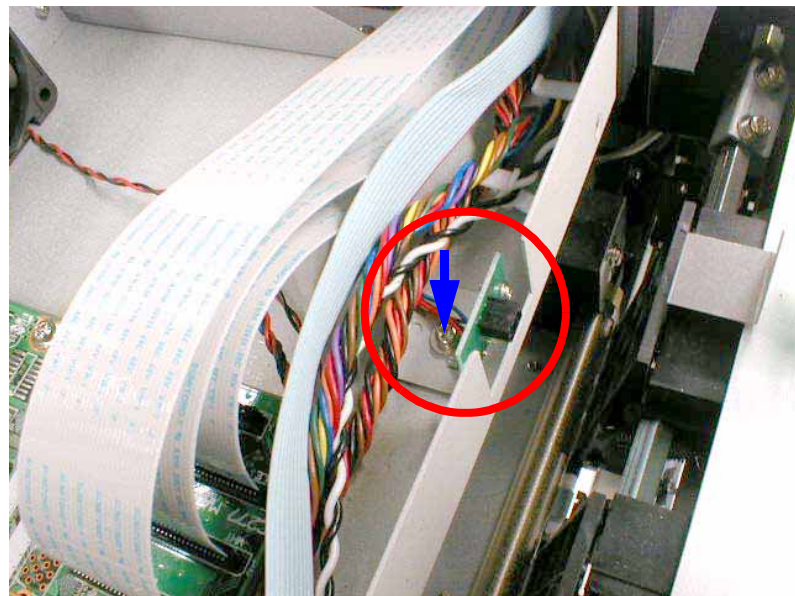


Figure 4-36. P_REAR sensor removal

REMOVING THE P_FRONT SENSOR

1. Remove the lower paper guide (refer to "Lower Paper Guide Removal" on page 78).
2. Disconnect the cable from the connector CN11 on the relay board.
3. Remove the one screws (CP(W) M3x6) securing the sensor assembly, and remove the P_FRONT sensor together with the mount plate.

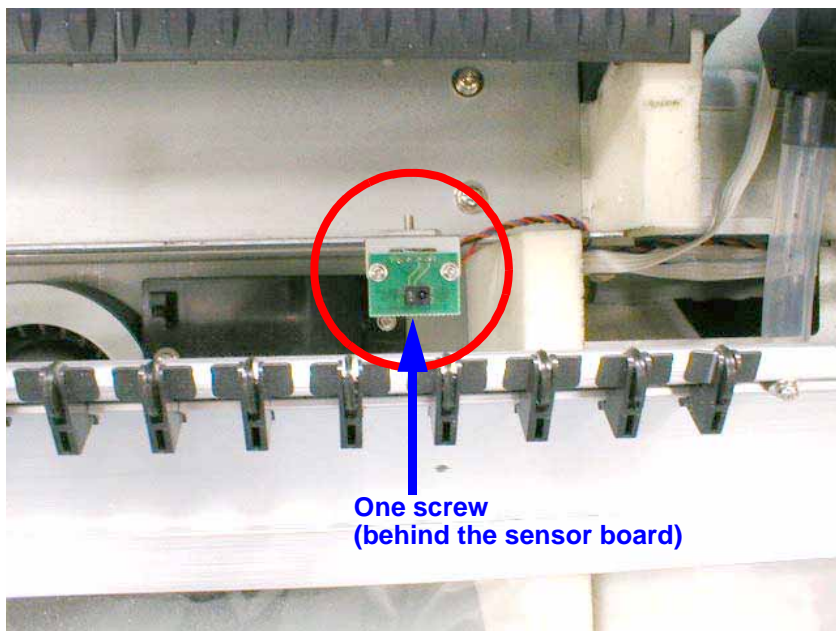


Figure 4-37. P_FRONT sensor removal

REMOVING THE LEVER POSITION SENSOR / HD_SLID HP SENSOR

1. Remove the side cover R (refer to "L/R Side Covers Removal" on page 75).
2. Disconnect the cable from the connectors on the relay board.
CN17 = to HD_SLID HP sensor
CN10 = to LEVER POSITION sensor
3. Remove the two screws (CP(W) M3x6) securing each sensor assembly, and remove the LEVER POSITION / HD_SLID HP sensor together with the mount plate.

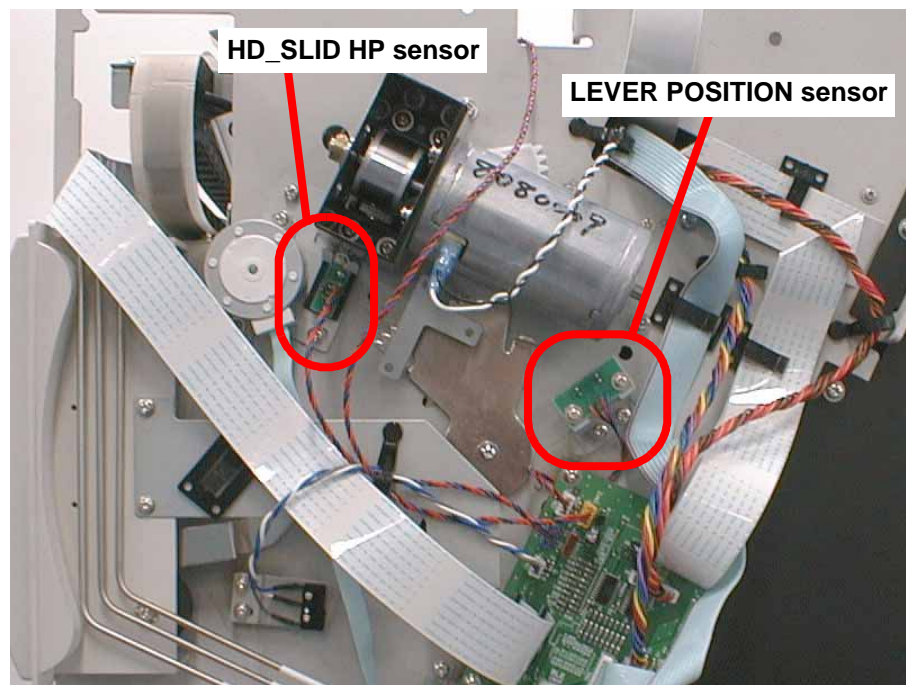


Figure 4-38. LEVER POSITION / HD_SLID HP sensor removal

REMOVING THE CR-HP SENSOR AND ENCODER

1. Remove the H-TOP cover (refer to "H Top Cover Removal" on page 74).
2. Remove the two screws (CP(W2) M3x6) securing the cable connection plate to the carriage assembly at both left and right sides.
3. Disconnect the cables from the connectors on the CR-RELAY board:
CN2 = to Linear Encoder
CN4 = to CR-HP Sensor

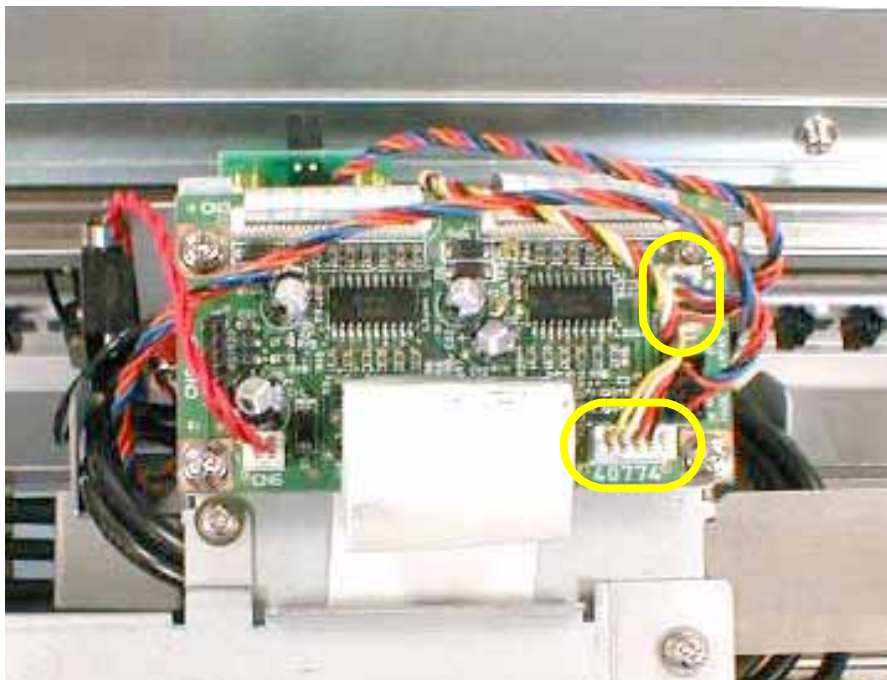


Figure 4-39. Disconnect the cables

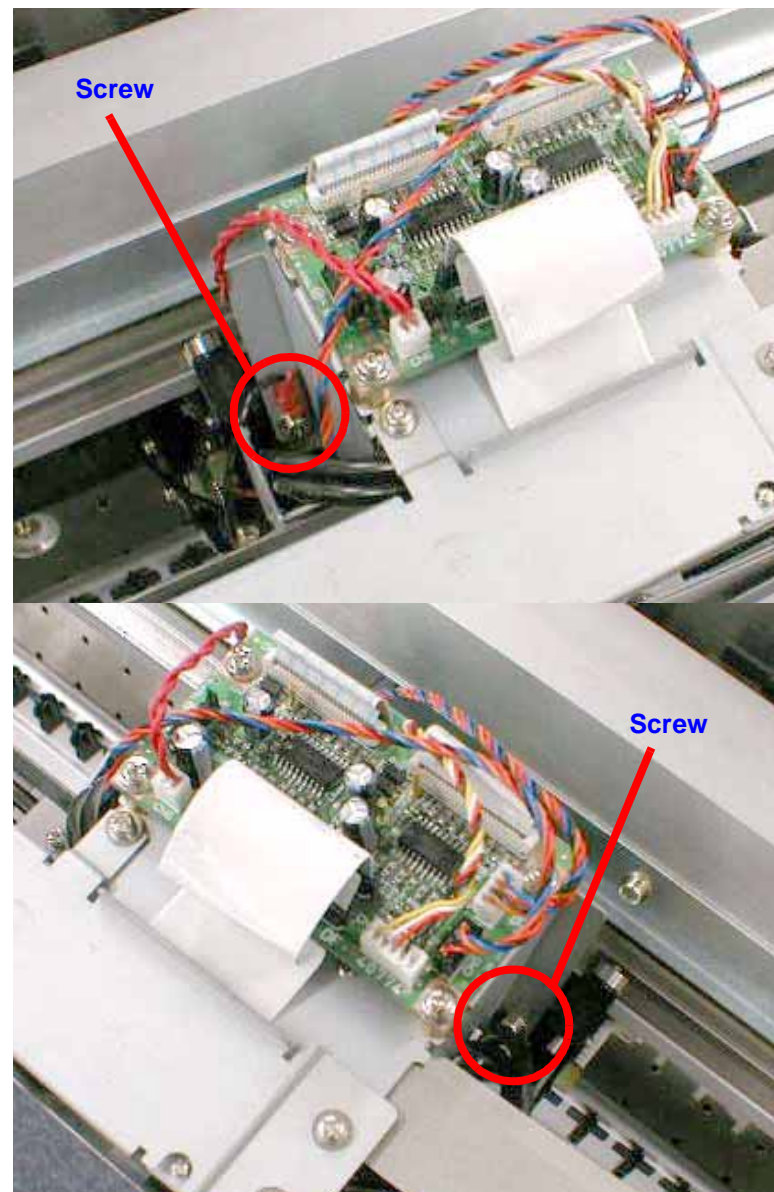


Figure 4-40. Removing the screws (L/R)

4. Dismount the connection plate from the carriage assembly as shown below.
5. Remove the two screws (CP(W2) M3x6) each securing the CR-HP sensor and the encoder sensor assemblies to the back of of the cable connection plate, and remove them.

CAUTION

Do not damage the timing fense (slit film) when removing / attaching the encoder.

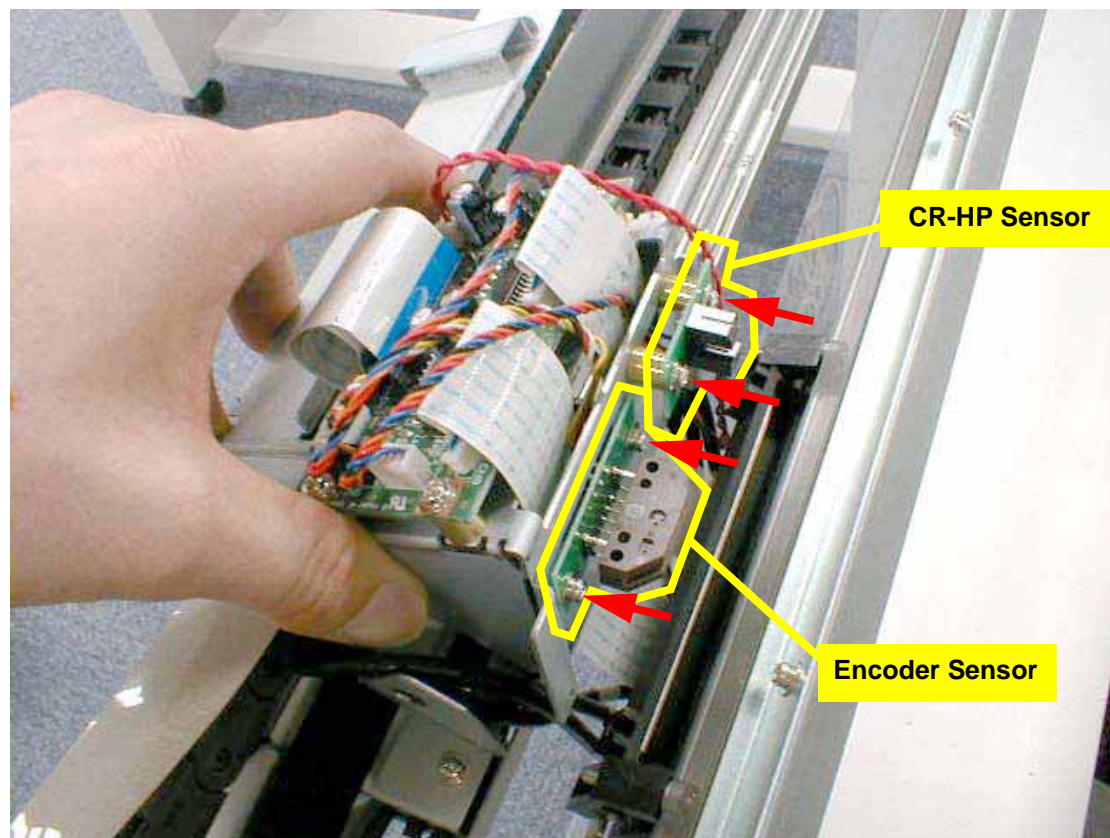


Figure 4-41. Removing the CR-HP sensor / Encoder sensor

4.2.4 Ink System Mechanism Disassembly

This section describes the Ink System Mechanism components and the procedure for disassembly.

CAUTION



Removing and re-installing the ink system mechanism components requires ink discharge and initial charge operation. Refer to Chapter-4 Adjustment for the detail procedures.

4.2.4.1 Removing the I/C Holder Assembly

1. Perform ink discharge operation to eject inks from all ink paths (refer to "Clean Head (drain ink)" on page 129).
2. Remove the side covers (L/R) (refer to "L/R Side Covers Removal" on page 75).
3. Remove the four screws (CP(W2) M3x6) securing the ink tube fixing plate, and loosen the lock nut securing the ink tubes to the ink pipes and 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.

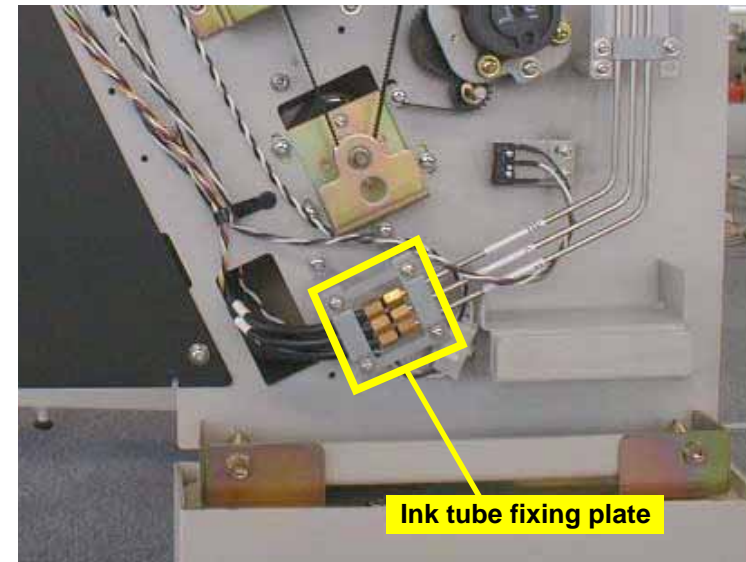


Figure 4-42. Disconnecting the ink tubes

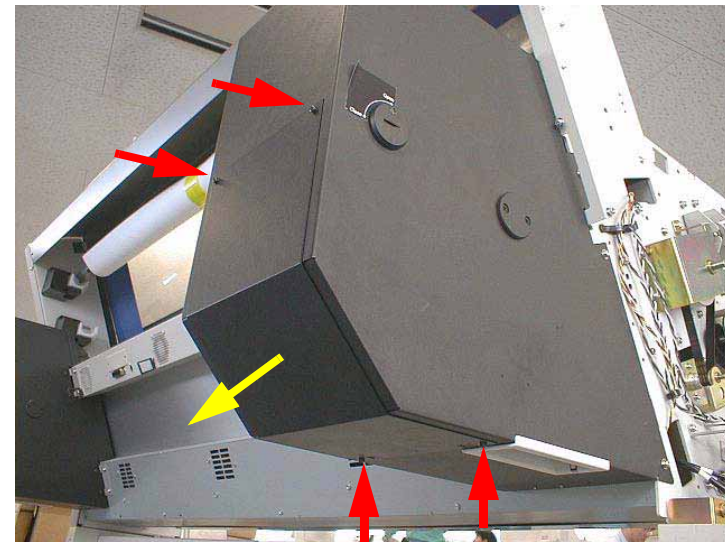


Figure 4-43. Removing the access cover

5. Loosen two screws securing the fixing 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 CN1 on the I/H relay board attached at the bottom of the I/H assembly.

**CHECK
POINT**


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

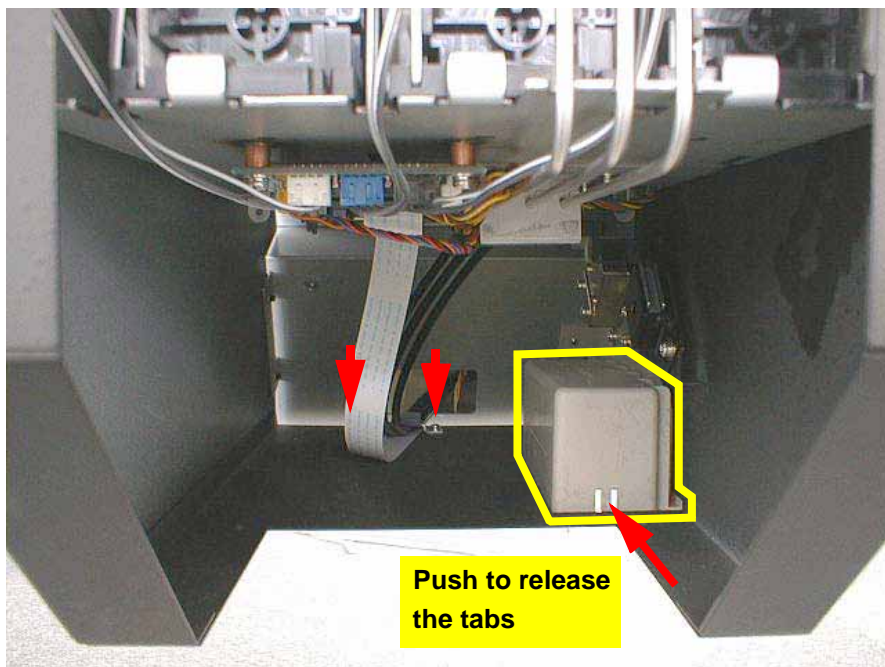


Figure 4-44. Removing the fixing plate

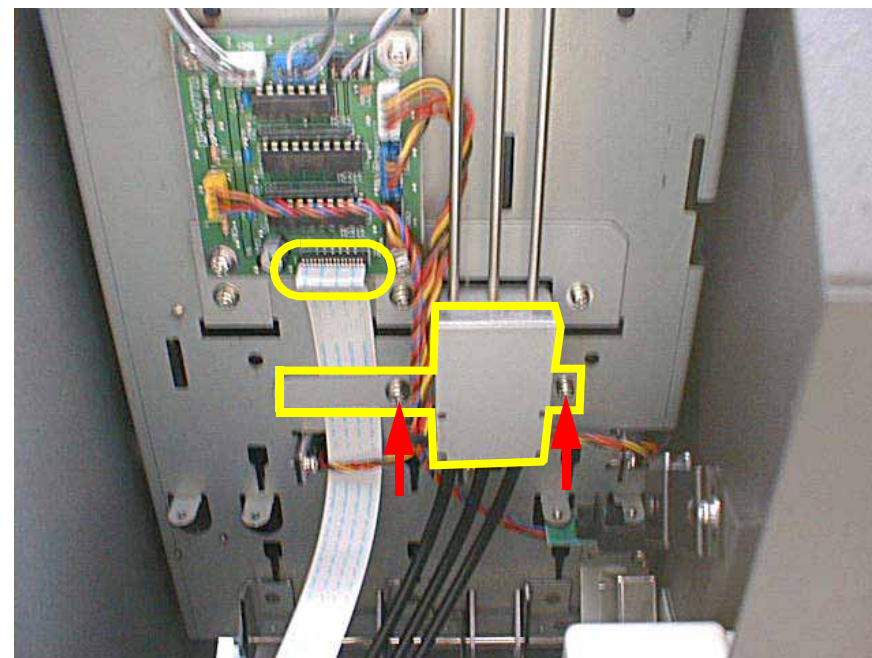


Figure 4-45. Removing the FFC

- 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.

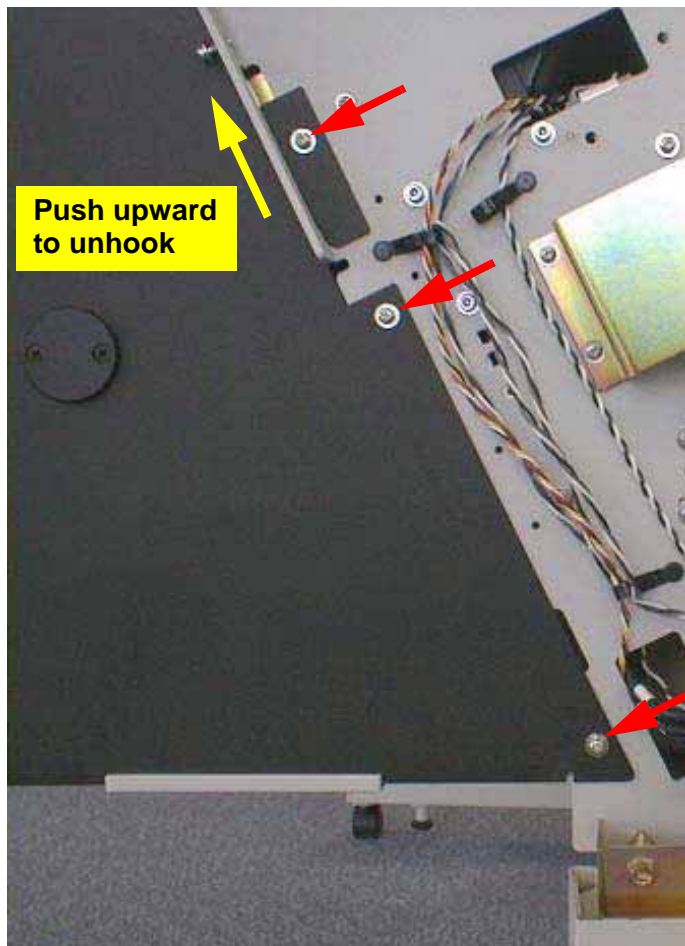


Figure 4-46. Removing the screws (3 pcs)

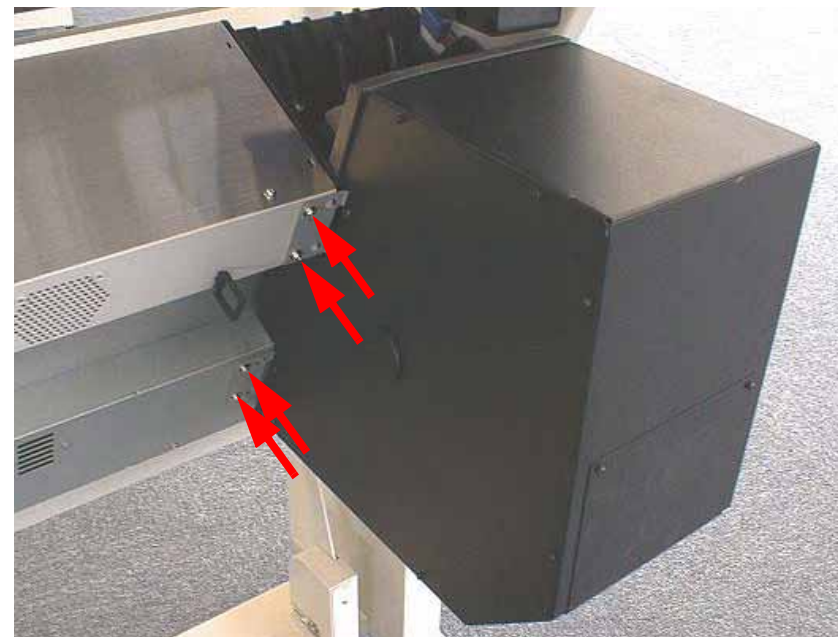


Figure 4-47. Removing the screws (4 pcs)



Figure 4-48. 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 it.

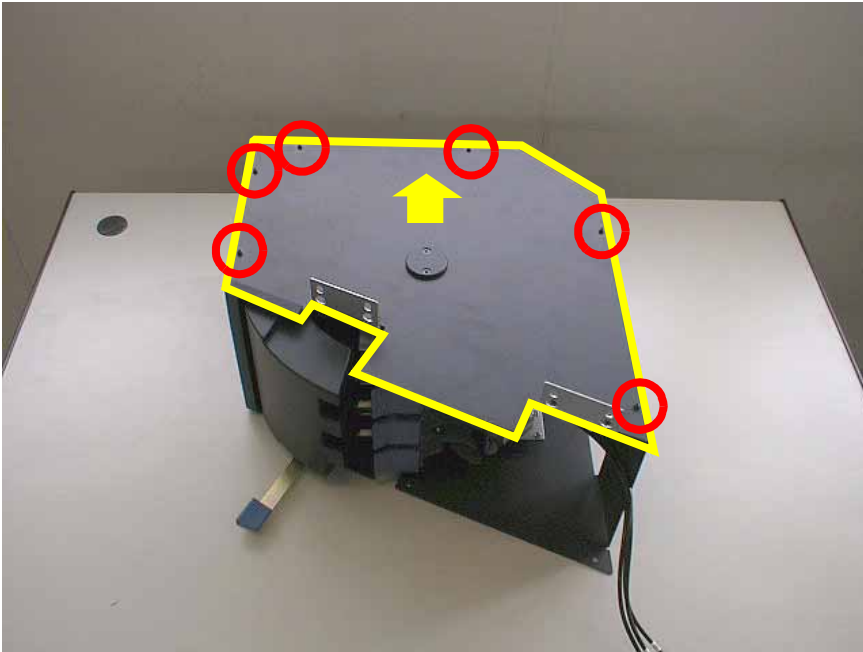


Figure 4-49. Removing the side cover of I/H assembly

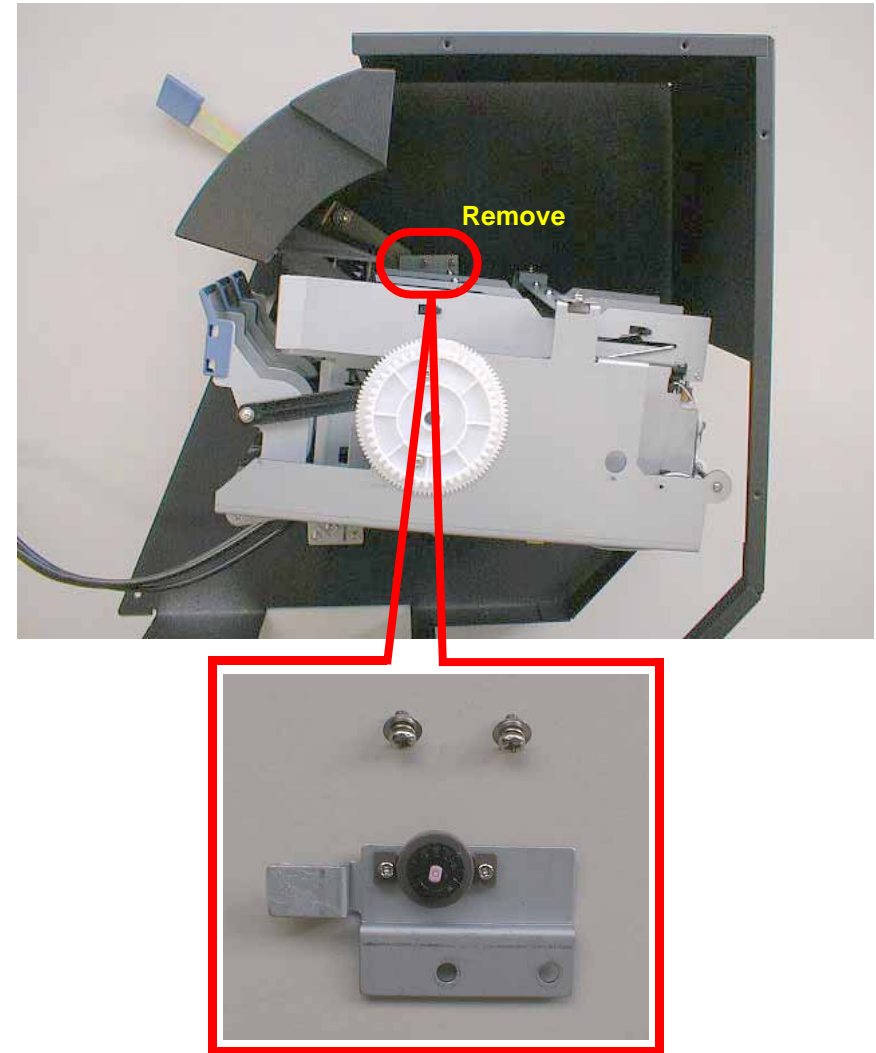


Figure 4-50. Removing the friction gear assembly.

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.

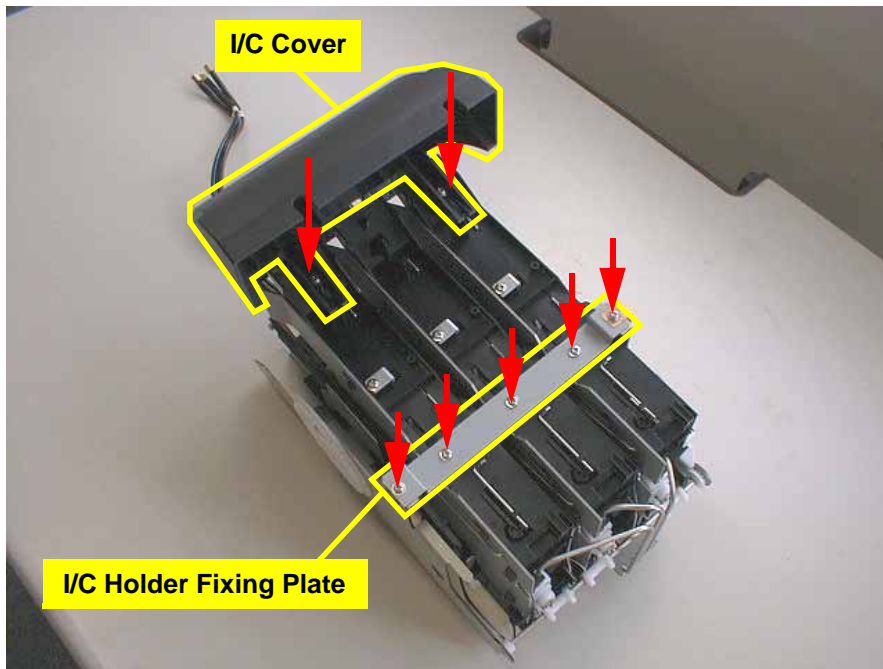


Figure 4-51. Removing the I/C cover and the fixing plate

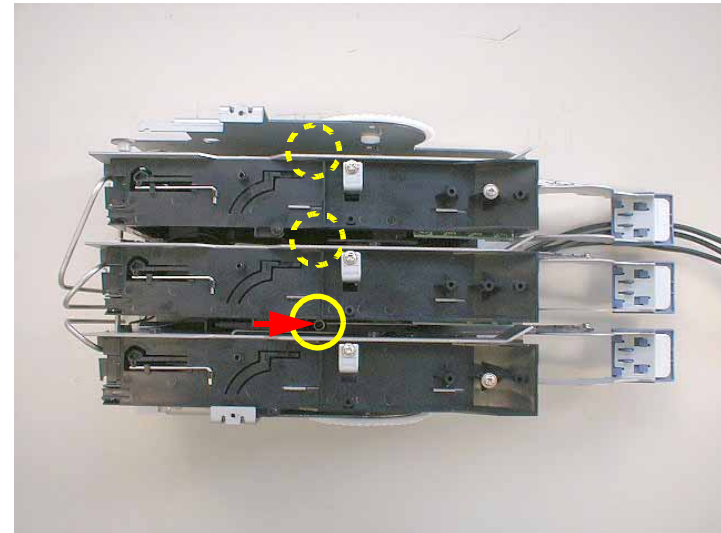


Figure 4-52. Removing the screw (from the top)

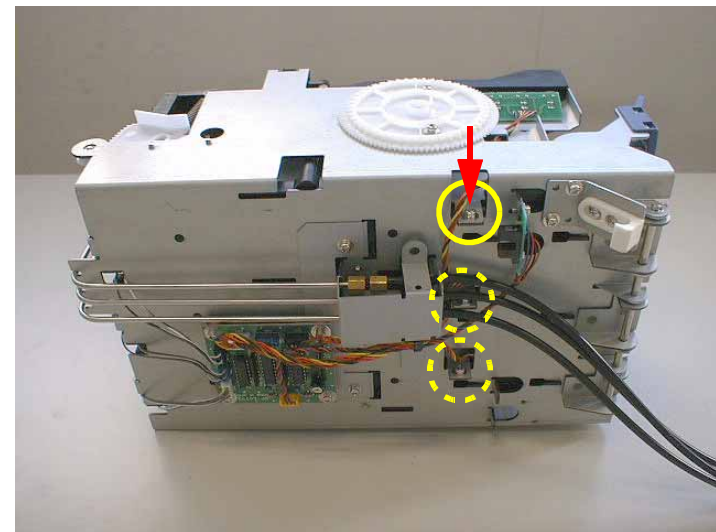


Figure 4-53. Removing the screw (from the bottom)

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 that to be removed, from the connector on the I/H relay board.

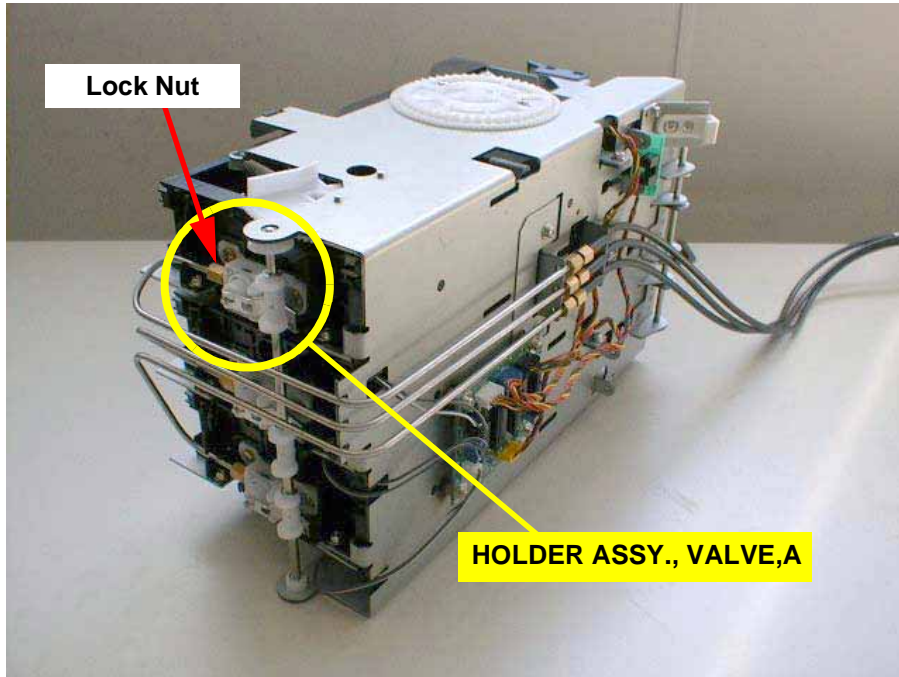


Figure 4-54. Removing the ink pipe

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

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

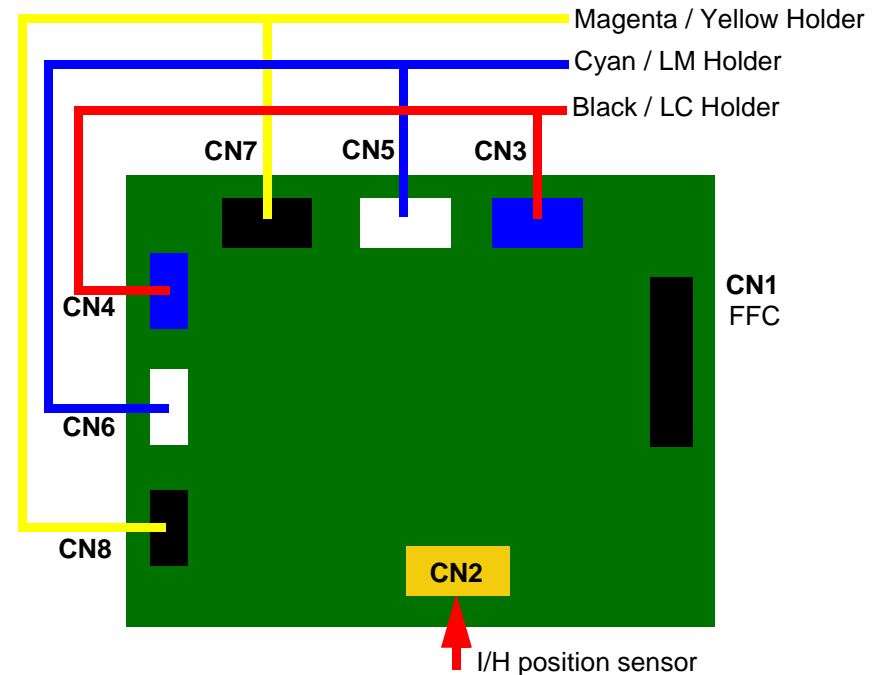


Figure 4-55. Connector location on the I/H relay board

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.

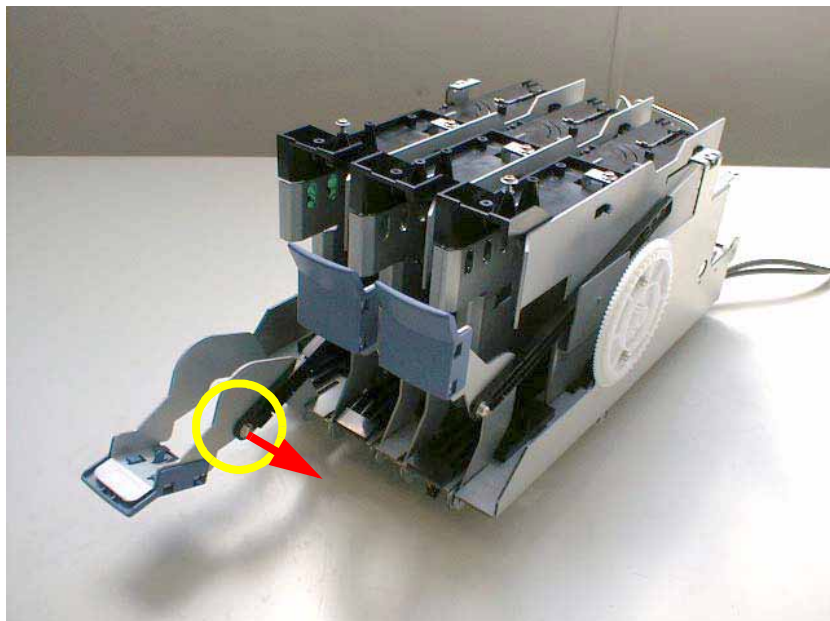


Figure 4-56. Removing the screw (I/C link)

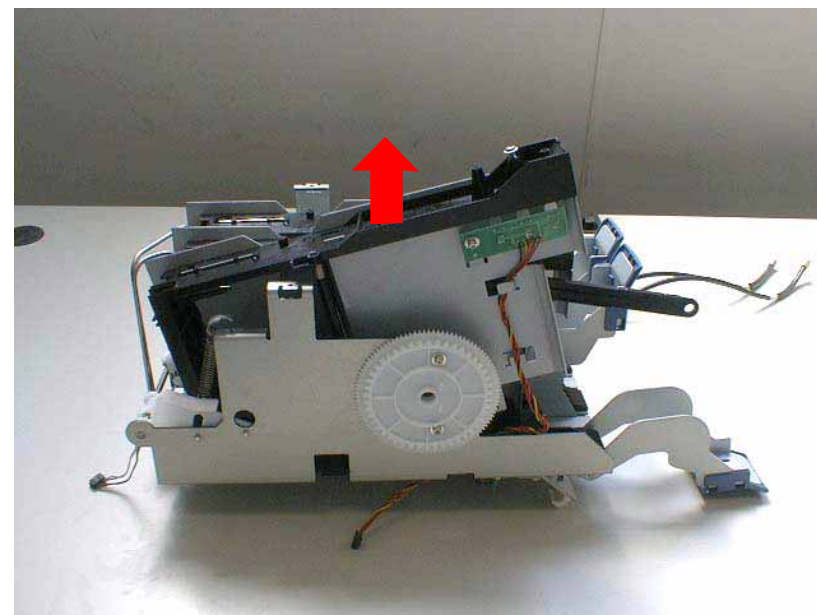


Figure 4-57. Removing the I/C holder

4.2.4.2 Disassembling the I/C Holder

1. Unhook the hooks fixing the upper I/C guide and slide it backward. Then, slide out a 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 .

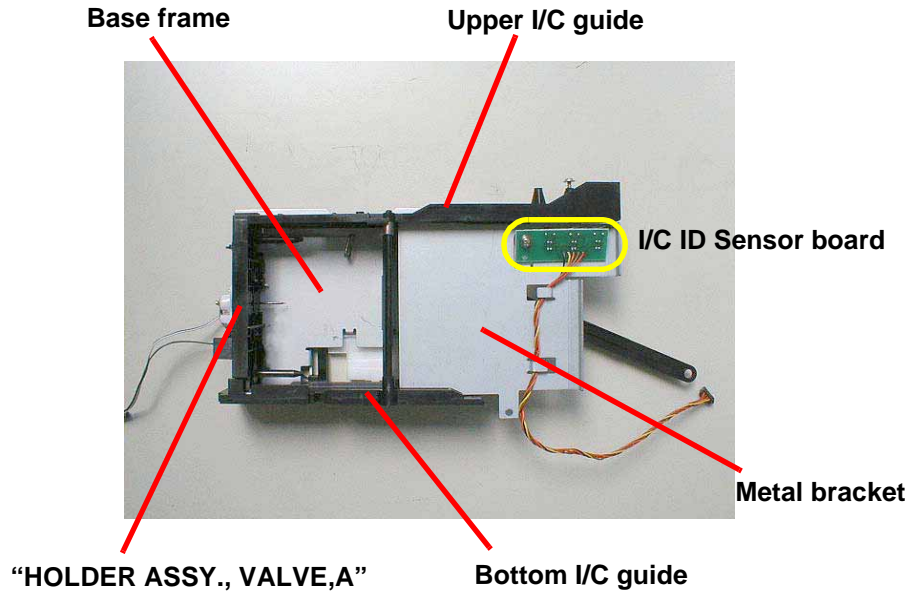


Figure 4-58. I/C Holder

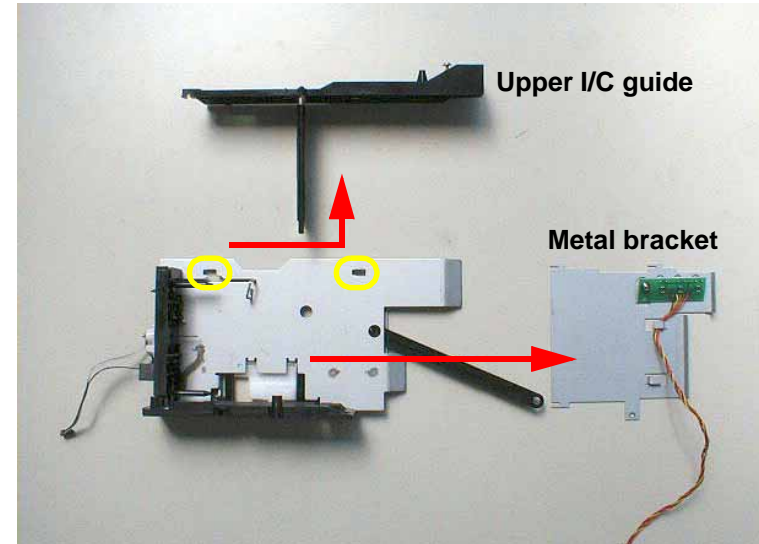


Figure 4-59. I/C Holder Disassembly (1)

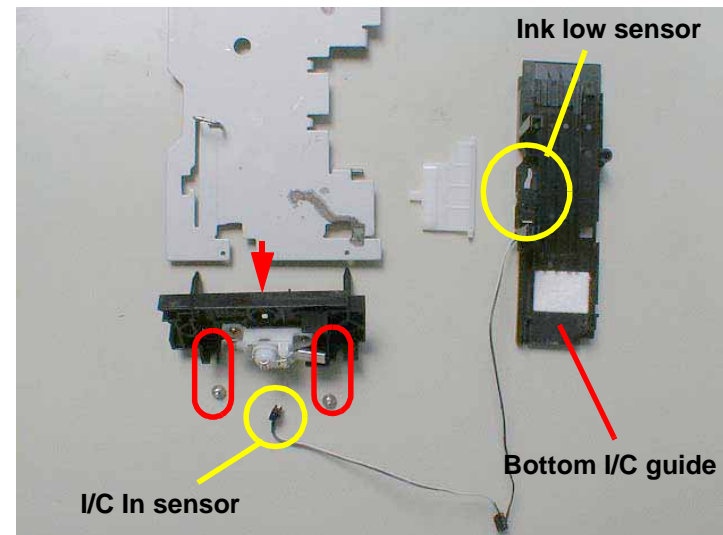


Figure 4-60. I/C Holder Disassembly (2)

CHAPTER

5

ADJUSTMENT

5.1 Summary

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

5.1.1 Caution

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



- **Before starting any adjustment procedure, find the adjustment procedure you need to perform in Table 5-2 on page 108 and verify the order or the tasks you need to perform.**
- **When performing an adjustment procedure, double-check the detailed instructions and caution information for that procedure; otherwise you may damage the printer.**
- **To make proper adjustment, make sure to avoid strong light (sun-light) around the printer. Since this printer uses photo-sensitive devices (photo-sensors), the printer may not function properly if it is operated under such conditions.**
- **When replacing the following, always install a new ink cartridge.**
 - Printheads
 - Main Board
 - "Holder, Assembly, Valve"

5.1.2 Adjustment Tools

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

Table 5-1. Adjustment Tools

Name	Part Code	Notes
Tension Gauge	B747700300/ standard tool acceptable	Max. 4000g
Tension Gauge #F712	1047744/ standard tool acceptable	Max. 200g
Straight edge/ruler 1000mm #F713	1047746/ standard tool acceptable	Length: 1000mm
Scale Stopper	1047745/ standard tool acceptable	Used in combination with #F713 (0.1mm scale)
CR Cover-Position Adjustment Tool #F724	Special Tool 1049975	Material: Plastic Color: White
Flash Memory Card #F727	1050073 standard PC card acceptable	Type: 2MB Flash memory card Standard: Type-II (PCMCIA Rel 2.1/ JEIDA Ver. 4.2) Voltage: 5V Read/Write
Self-Training Kit #F708	1047105	CD-ROM based

5.1.3 Adjustment Items

All parts that require adjustment when being replaced are listed in the table below. You will also find a list of required adjustment procedures along with the order of those procedures.

Table 5-2. Service Parts & Required Adjustments

Service Operation	Step Number	Adjustment Items	Refer to
Printhead replacement	1	<Start the Self-Diagnostic Function> <input type="checkbox"/> Capping position adjustment	page 113 page 115
	2	<input type="checkbox"/> Head rank input (and initial ink charge)	
	3	<input type="checkbox"/> Head nozzle check	
	4	<input type="checkbox"/> Head slant adjustment (B/C heads)	
	5	<input type="checkbox"/> Head Height (Linear) adjustment	
	6	<input type="checkbox"/> Bi-D adjustment	
	7	<input type="checkbox"/> Head Gap adjustment	
	8	<input type="checkbox"/> Test print	
	9	<Reset the Head unit counter>	
	10	<Adjust the carriage cover height>	
Main Board replacement	1	<Parameter backup> *1	page 112 page 113 page 115 page 134
	2	<Firmware update>	
	3	<Self-Diagnostic Function>	
	4	<input type="checkbox"/> Sensor Adjustment	
	5	<input type="checkbox"/> Capping position adjustment	
	6	<input type="checkbox"/> Head rank input (initial ink charge not necessary)	
	7	<input type="checkbox"/> Bi-D adjustment	
	8	<input type="checkbox"/> Head Gap adjustment	
	9	<input type="checkbox"/> Flush point adjustment (L/R)	
	10	<input type="checkbox"/> Feed adjustment	
	11	<input type="checkbox"/> Top/bottom adjustment	
	12	<input type="checkbox"/> Rear Sensor position adjustment	
	13	<input type="checkbox"/> Test print <Replace the Waste Ink Pads and clear the counter>	

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

Service Operation	Step Number	Adjustment Items	Refer to	
CR Motor replacement	1	<CR Steel belt tension adjustment> •Required tool: Tension Gauge	page 141 page 113 page 115	
	2	<Self-Diagnostic Function> <input type="checkbox"/> Capping position adjustment		
	3	<input type="checkbox"/> Bi-D adjustment		
	4	<input type="checkbox"/> Head Gap adjustment		
	5	<input type="checkbox"/> Flush point adjustment (L/R)		
	6	<input type="checkbox"/> Top/bottom adjustment		
	7	<input type="checkbox"/> Test print		
PF Motor replacement	1	<CR Steel belt tension adjustment> •Required tool: Tension Gauge	page 141 page 113 page 126	
	2	<Self-Diagnostic Function> <input type="checkbox"/> Feed adjustment		
	3	<input type="checkbox"/> Top/bottom adjustment		
	4	<input type="checkbox"/> Rear Sensor adjustment		
	5	<input type="checkbox"/> Test print		
Sensor assembly replacement <input type="checkbox"/> P Front <input type="checkbox"/> P Edge	1	<Self-Diagnostic Function> <input type="checkbox"/> Sensor Adjustment <input type="checkbox"/> Top/bottom adjustment	page 113 page 134 page 127	
	Sensor assembly replacement P Rear	1		<Self-Diagnostic Function> <input type="checkbox"/> Sensor Adjustment <input type="checkbox"/> Top/bottom adjustment
		1		<Self-Diagnostic Function> <input type="checkbox"/> From the "Test" menu select "Sensor" and then "Paper Thickness" •Required tool: Schema Gauge
Sensor assembly replacement P Thick	1	<Self-Diagnostic Function> <input type="checkbox"/> From the "Test" menu select "Sensor" and then "Paper Thickness" •Required tool: Schema Gauge	page 113 page 143	
Sensor assembly replacement HP Sensor	1	<Self-Diagnostic Function> <input type="checkbox"/> Capping position adjustment	page 113 page 117	
Sensor assembly replacement Cover R/L Sensor	1	<Self-Diagnostic Function> <input type="checkbox"/> From the "Test" menu select "Sensor" and then "Cover"	page 113 page 144	

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

Service Operation	Step Number	Adjustment Items	Refer to
PG Motor Gear Assembly replacement/removal		Gear backlash adjustment	page 142
Lower Paper Guide removal/ replacement <input type="checkbox"/> Waste Ink Pad replacement <input type="checkbox"/> Pump Assembly replacement <input type="checkbox"/> Cap Assembly replacement, and so on		Cutter position adjustment	page 140
I/H Assembly disassembly		I/H lever position adjustment	page 142
Carriage Cover removal/ replacement <input type="checkbox"/> Printhead replacement <input type="checkbox"/> Cutter solenoid assembly replacement		Carriage cover height adjustment	page 139

NOTE:

*1: If you can backup the parameters, no adjustment required using the self-diagnostic function after replacing the main board.

5.2 Adjustment Steps

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

5.2.1 Parameter Backup

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

Therefore, before performing service that requires the removal of the Main Board, you need to back up all of the parameters in case you have to update a new Main Board which must work with the Printer Mechanism exactly the same way the old one did. Backing up the parameters also helps minimize the amount of and number of adjustments you may need to perform.

REQUIREMENTS FOR BACKUP

- #F727 Flash Memory Card (1050073)
(Conforms to PCMCIA Rel 2.1/JEIDA Ver 4.2 (Type II) / 5V Read/Write operation)
- IPL data
Before backing up the parameters to the PC card, the following file must be copied to the Flash Memory Card:

Backup.exe (distributed on manual/STK CD-ROM)



- **BACKUP.EXE is a self-extraction file and you have to copy extracted data to the PC Card.**
- **You cannot back up the firmware that is stored on the firmware backup PC card. Attempting to back up the card will result in the loss of firmware data.**

BACKUP & DOWNLOAD PROCEDURES

- Backing up (uploading) data to the PC card
1. Remove the access cover the top of the Upper Paper Guide, if necessary. Also, make sure the Control Panel unit is attached.
 2. Insert the PC card into the PC card slot connector on the Main Board, and then turn on the printer.
 3. Make sure the following message appears on the LCD, and wait for the procedure to begin.

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

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

Flash -> Mcard



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

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

End [Success]

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

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

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

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

Mcard -> Flash

CAUTION



If you wait 15 seconds before you press one of the Control Panel buttons, the printer will start the backup procedure instead of the download procedure. This overwrites data stored in the PC card with data stored in the Main Board Flash memory.

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

End [Success]

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

OTHER/NOTES

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

End [Error]

If you see the message above, one of the following errors has occurred. Using a different PC card, try the operation again.

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

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

5.2.2 Firmware Update

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



- **No matter which method you use, if the printer loses power during the update procedure, progress is lost and you need to try again.**
- **Use the following PC card for update.**
Name: #F727 Flash Memory Card
Code: 1050073

UPDATING VIA THE PC

1. Make sure the printer and PC are connected using a parallel or serial connection.
 <Parallel Connection>
 Compatible Mode connection only
2. While pressing the following buttons, turn on the printer.
 Paper Source + Cut/Eject + Cleaning
3. From the PC, send the firmware program to the printer as follows.
 <Parallel Connection>
 From the DOS prompt, type "**copy [filename] prn:**" and press Enter.



The firmware data file for downloading via the PC is XXXXXXXX.MOT (Motrola HEX format file).

4. When successfully finished, "Update Complete" appears.
5. Turn the printer off, and then back on.

UPDATING FROM A MEMORY CARD

1. Copy the firmware data file to the PC card.



- **The firmware data file to be copied to the PC card is XXXXXXXX.BIN (Binary format data).**

2. Turn off the printer.
3. Remove the access cover from the top of the Upper Paper Guide, and insert the card containing the firmware data into the card slot (CN20) on the Main Board.
4. Turn on the printer.
5. "Update Complete" appears when the firmware update has finished.
6. Turn off the printer, remove the memory card, and then turn on the printer.

5.2.3 Self-Diagnostics

This section gives detailed descriptions of the items in Table 5-2, "Service Parts & Required Adjustments," on page 108.

5.2.3.1 Entering Self-Diagnostic Mode

1. Push down the Release Lever to the Lock position.
2. Press the following buttons on the Control Panel while turning on the printer.

Paper Feed ↓ + Cut/Eject + Cleaning

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

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.

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

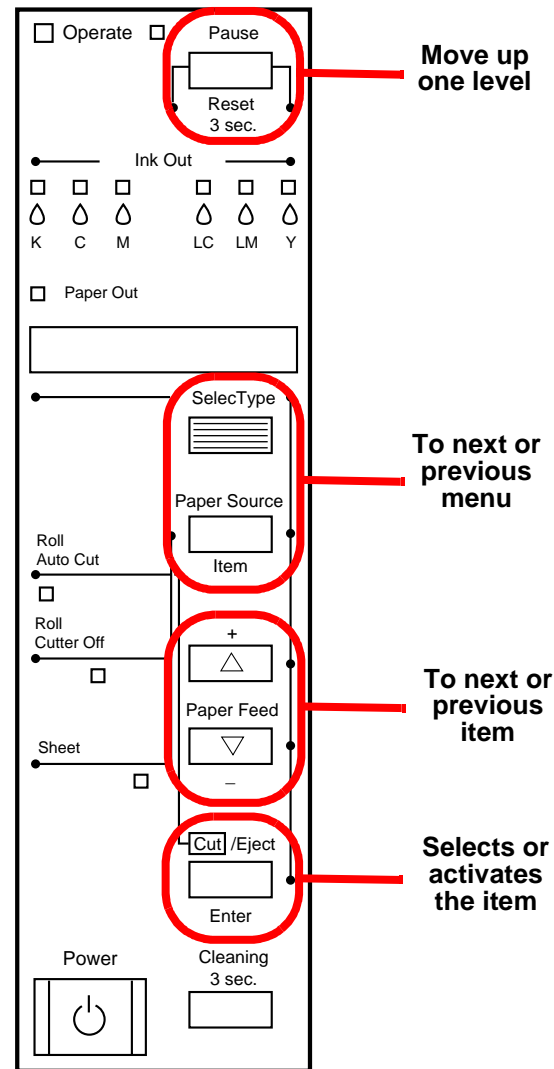


Figure 5-1. Self-Diagnostic Controls

5.2.3.2 Self-Diagnostic Mode Menus

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

Table 5-4. Self-Diagnostic Menu

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



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

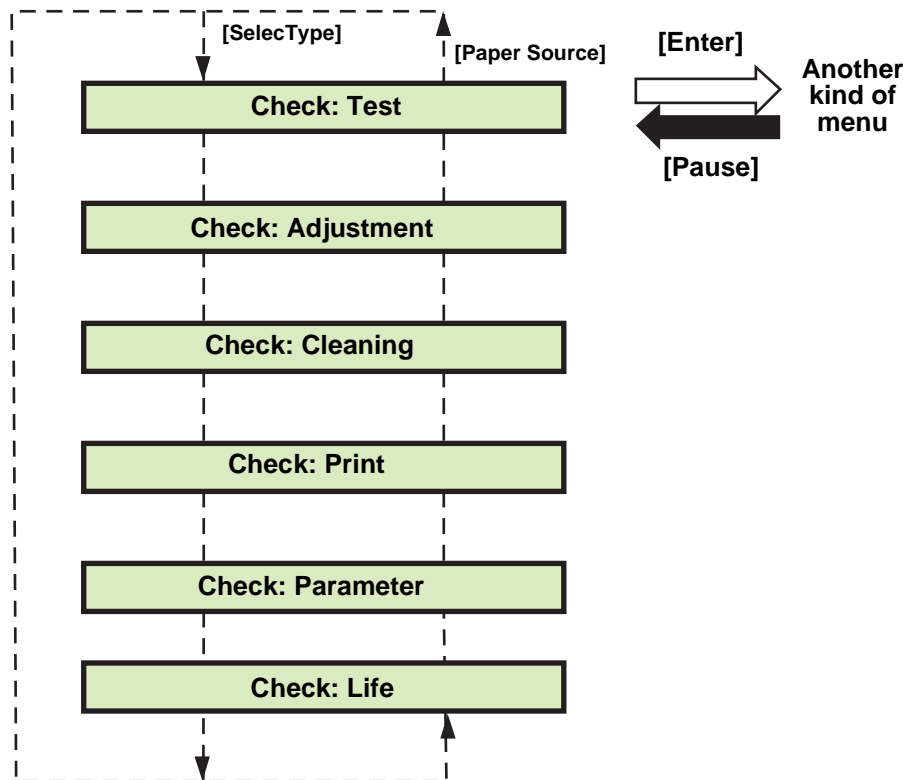


Figure 5-2. Self-Diagnostic Menu Flow

5.2.4 Adjustment Menu

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

Table 5-5. Adjustment Menu Items

Adjustment Item	Description
Capping Position	Sets the Capping position (automatic Adjustment)
Paper Skew Check	Verifies the degree of skew (slant) allowed during printing
Head Rank Input	Sets the printhead ID
Head Nozzle Check	Prints the check pattern to make sure the nozzles are not clogged
B Head Angle	Adjusts the angle of the B Head (mechanism adj.)
C Head Angle	Adjusts the angle of the C Head (mechanism adj.)
BC Head Height	Verifies the B/C Head nozzles are at the same height (mechanism adj.)
Bi-D Print Position	Verifies the printed lines match up when performing bi-directional printing.
Head Gap	Adjusts the B/C Head Gap as well as sets the left margin
R Flush Point	Adjusts the flush position on the HP side
L Flush Point	Adjusts the flush position on the opposite side
Feed Correction	Checks paper feeding (w/ruler)
Top & Bottom	Checks the top and bottom margins (w/ruler)
Rear Paper Sensor Position	Sets the detection position of the rear paper-edge sensor
Test Pattern Print	Checks print quality (prints setting information, check pattern and so on)
Head Cleaning	Initiates cleaning/flushing of the heads and ink path
Counter Clear	Resets all counters in Table 5-9 on page 130



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

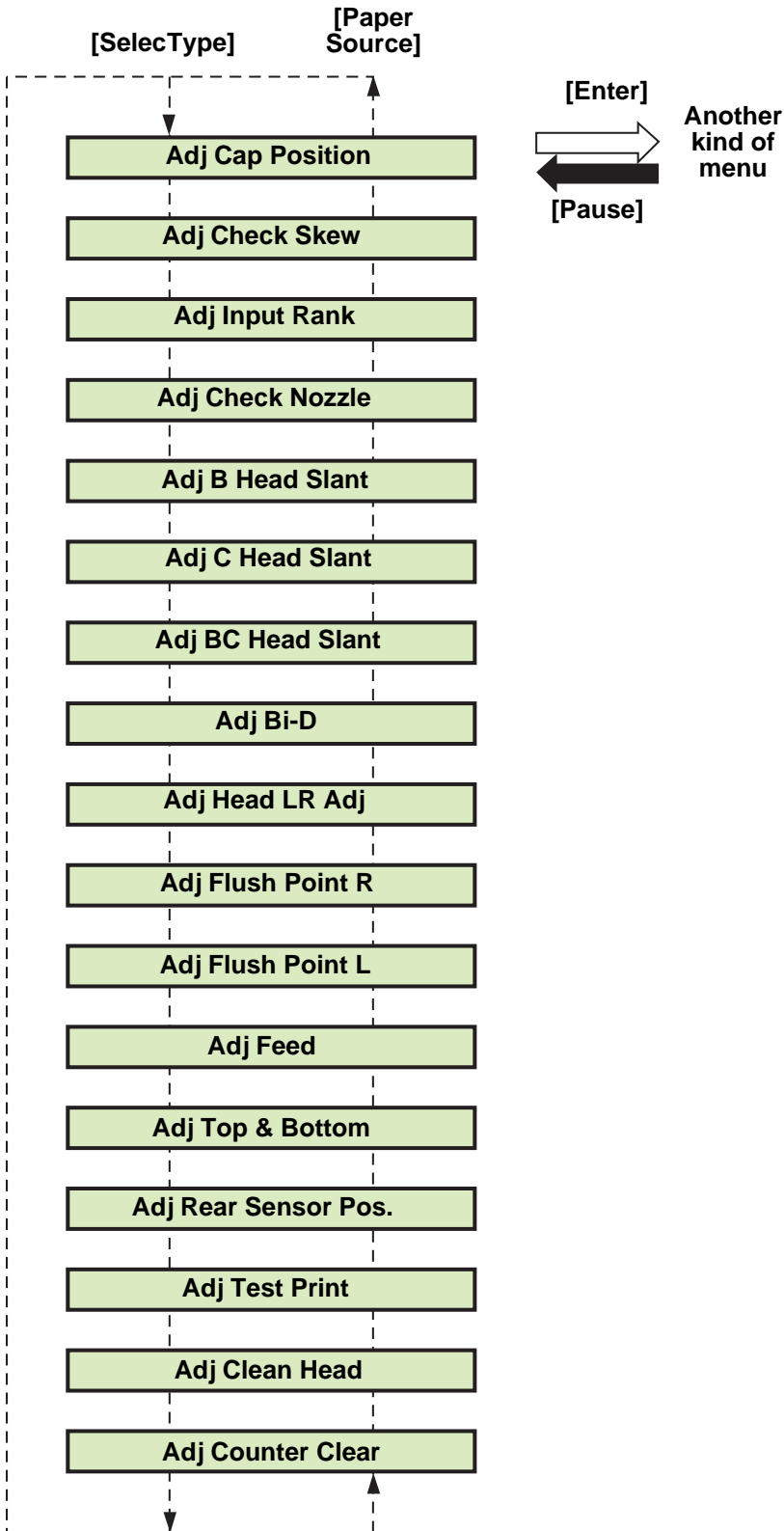


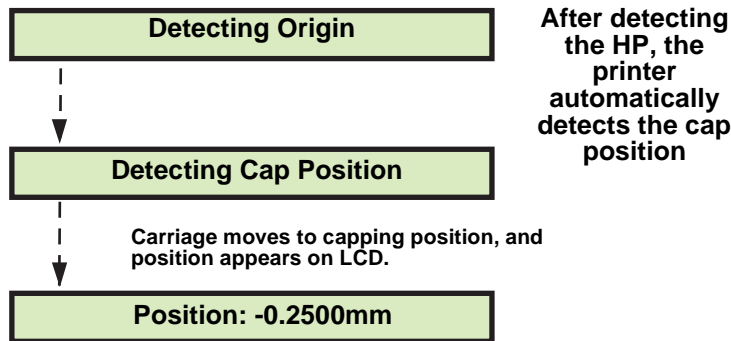
Figure 5-3. Adjustment Menu

ADJ CAP POSITION

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

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

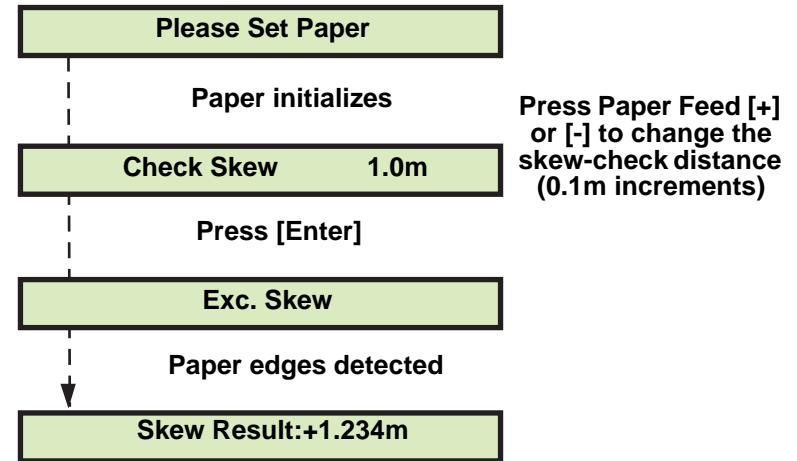
1. Make sure "Adj Cap Position" appears on the LCD and press the Enter button.
2. The printer begins the HP detection sequence and automatically detects the capping position.
3. After the adjustment process is finished, the detected distance between the HP and the capping position is displayed.
4. Pressing 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



ADJ CHECK SKEW

When the band turns a predetermined amount (during printing), the printer detects the paper edge using the P EDGE sensor. This value is compared to the originally detected value for the paper-edge position to determine if the paper is feeding at a slant. This adjustment is for service printouts and does not affect user printouts.

1. Make sure "Adj: Check Skew" appears on the LCD and press the Enter button.
2. If the paper is not loaded correctly, "Reload Paper" appears indicating you need to properly load the paper. If the paper is set correctly, the printer initializes the paper.
3. After paper is loaded and initialized, "Check Skew 1.0m" appears. Use the Paper Feed + and Paper Feed - buttons to adjust the distance between paper-skew detection checks in increments of 0.1m.
4. After setting the distance between checks, 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, and a "-" indicates the paper is skewed away from the HP.




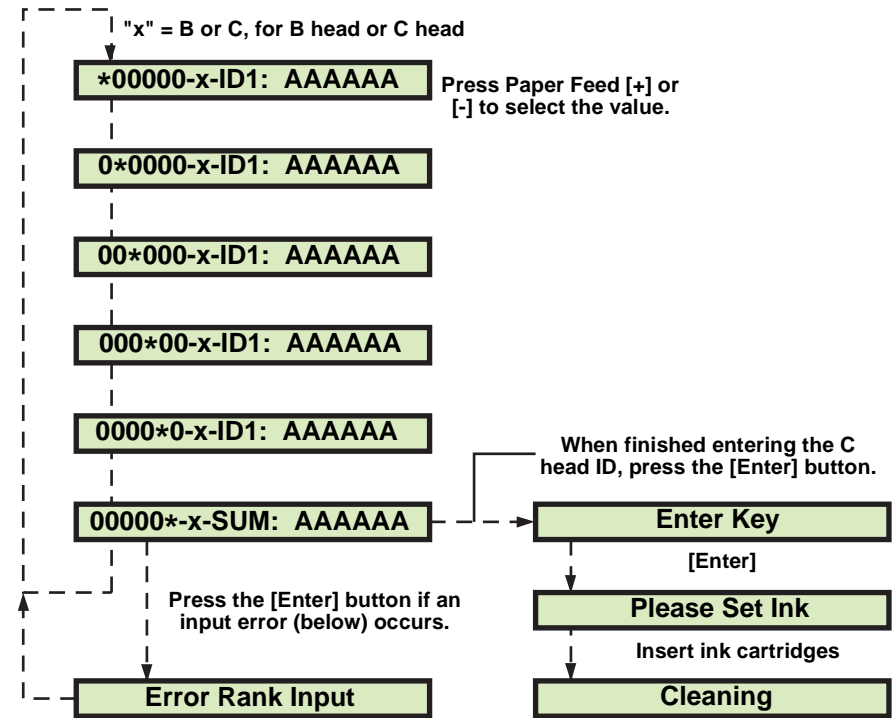
ADJ INPUT RANK

NOTE: Not necessary if you replace the Main Board but do not replace the printheads.

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

1. Make sure "Adj: Input Rank" appears on the LCD and press the Enter button.
2. First enter the B head (K/C/M) ID. Press the Paper Feed + or Paper Feed - button to select the ID value. After correctly entering the B head ID, press the Enter button to begin entering the C head 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 value to the Main Board and begin the initial-ink charge in the heads.

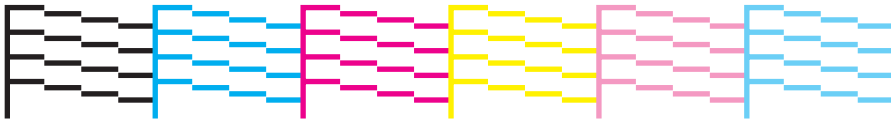
 **After entering B & C head ID's, "Enter Key" appears on the LCD. To avoid wasting ink, if you do not replace the printheads, press the Pause button instead of the Enter button to skip the initial-ink charge process.**



ADJ CHECK NOZZLE

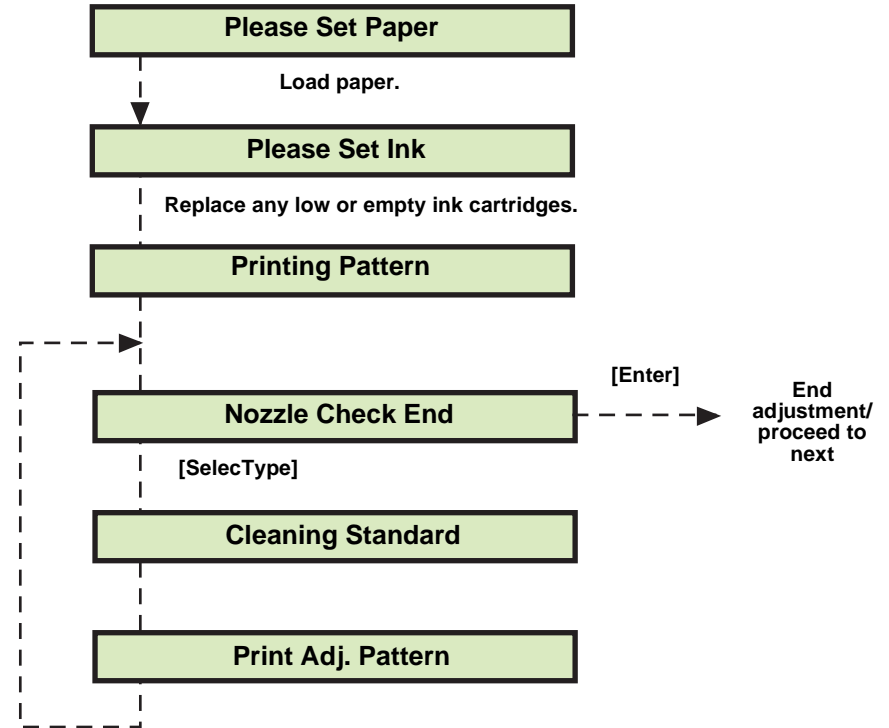
After the initial ink charge, this function verifies that the nozzles are properly firing ink. If some nozzles are not firing correctly or at all, you can run the cleaning operation from this menu.

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



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

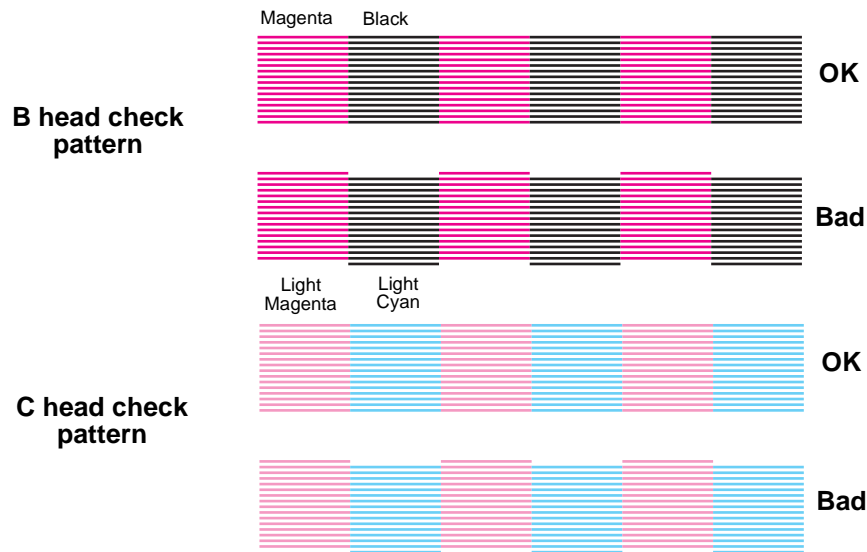
3. When the check pattern is finished printing, "Nozzle Check End" appears on the LCD. If the pattern printed all six colors properly with no lines or dots missing, press the Enter button to end this adjustment procedure. If lines or dots are missing, press the SelecType button to start the cleaning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



ADJ X HEAD SLANT (B/C HEADS)

This function prints a check pattern (one-at-a-time for each head) to make sure the printheads are installed straight up-and-down. If the pattern confirms one or both heads are offset, at a slant, use the corresponding "Head Adjust Lever A" to straighten the slanted head.

1. Make sure "Adj: x Head Slant" appears in the LCD, and press the Enter button. (x = B or C depending on the printhead)
2. After the check pattern prints, "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 adjust level is OK like the top row shown below. If there is a slant, open the front cover, release the carriage lock by hand, and move the carriage away from the carriage cap position. Next, loosen the screw securing the head that is printing at a slant, and move the Head Adjust Lever A left or right depending on the slant direction. Tighten the screw. (The C head pattern prints with different colors.)



3. After finishing the slant-adjustment procedure for both heads, move the carriage back to the capping position by hand and close the front cover.

4. Make sure "x Slant Check End" appears, and press the Enter button if the check pattern prints with no slant. Press the SelecType or Item button if the pattern contains slants and you have adjusted the heads. (You may need to repeat.)

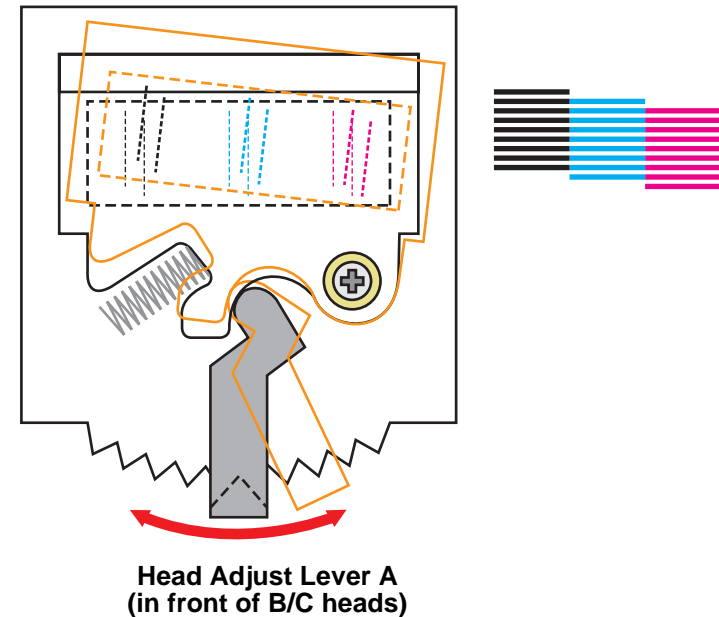
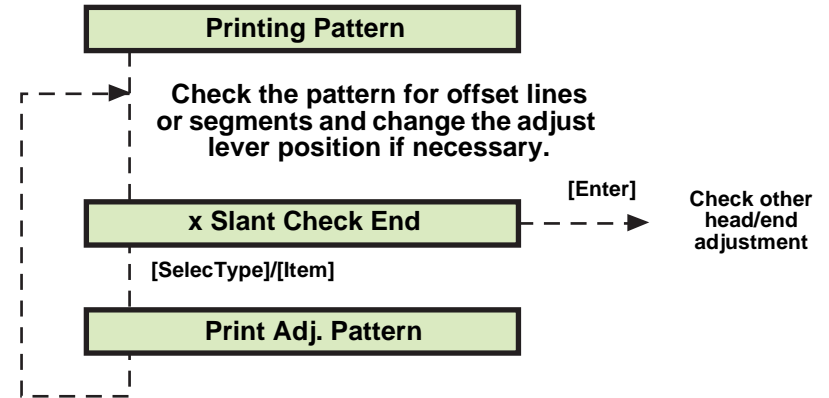


Figure 5-4. B/C Head Skew Adjust Lever

ADJ B/C HEAD HEIGHT

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

1. Make sure "BC Slant Check End" appears in the LCD, and press Enter.
2. After the check pattern prints, "BC Slant Check End" appears in the LCD. Compare the printed pattern with the illustration below. Press Enter if the adjust level is OK like the top row. If there is a slant, open the front cover, release the carriage lock by hand, and move the carriage away from the carriage cap position. Next, loosen the screw securing the head that is printing at a slant, and move the Head Adjust Lever A left or right depending on the slant direction. Tighten the screw.



3. After finishing the slant-adjustment procedure for both heads, move the carriage back to the capping position by hand and close the front cover.

4. Make sure "BC Slant Check End" appears, and press the Enter button if the check pattern prints with no misalignment. Press the SelecType or Item button if the printed pattern contains misalignment and you have adjusted the heads. (You may need to repeat.)

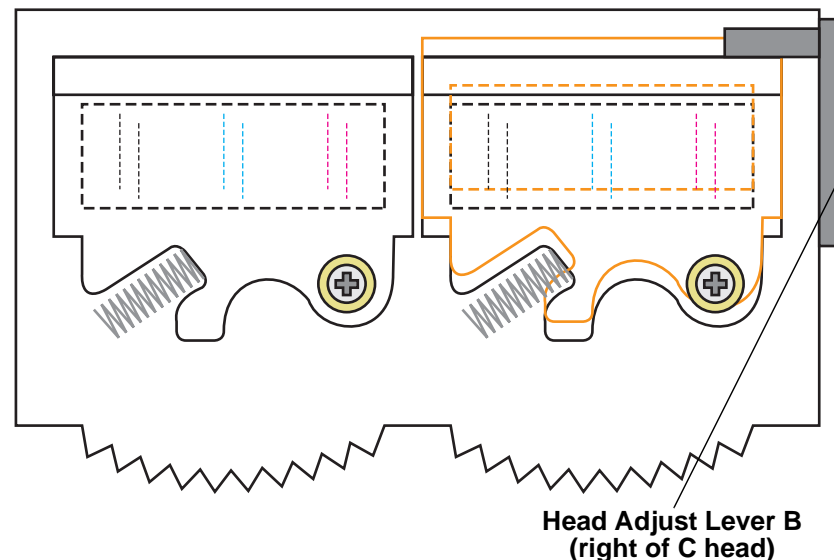
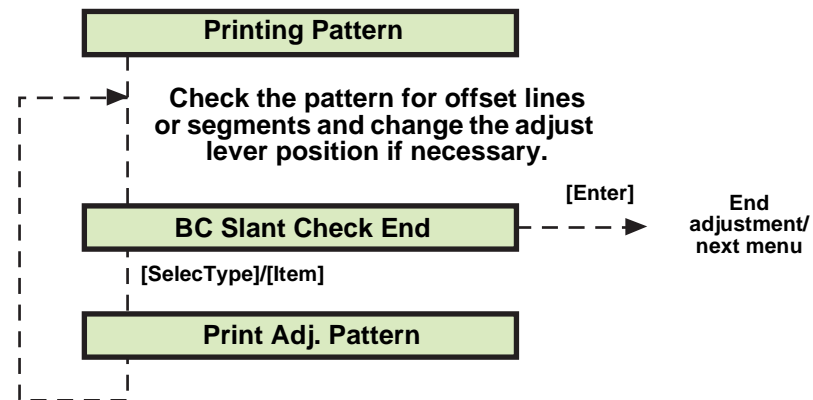


Figure 5-5. B/C Height Adjust Lever

ADJ BI-D

This function adjusts the Bi-D print position for both printheads. The printer prints a test pattern in both directions (toward the HP and away from the HP), and lines that do not line up vertically indicate the heads need Bi-D adjustment. The Bi-D adjust items are shown in the table below.

Table 5-6. Bi-D Adjust Items

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

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

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

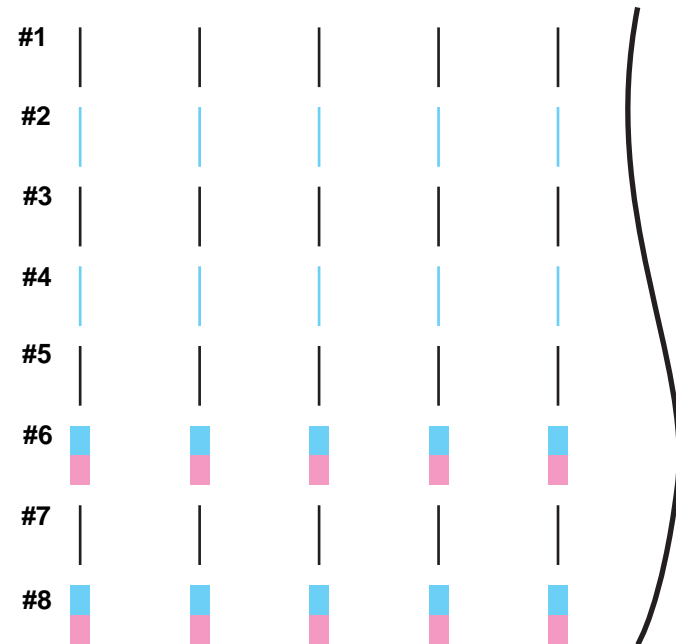
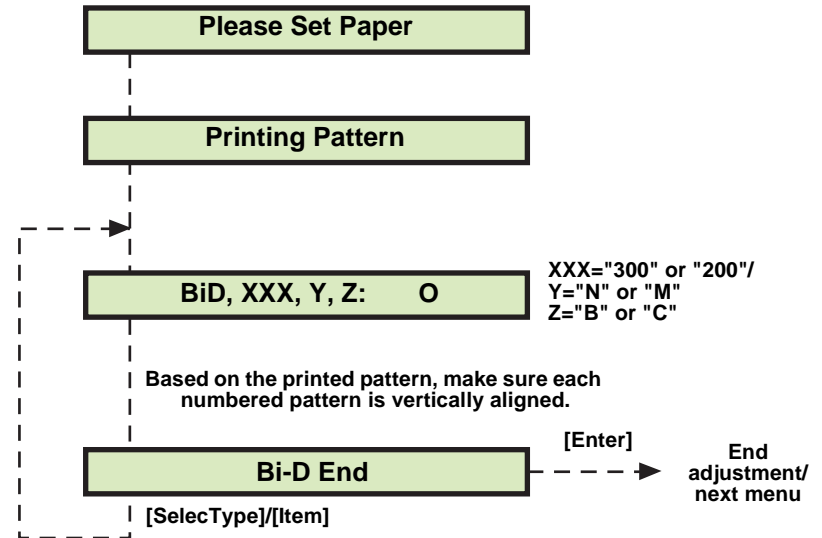


Figure 5-6. Bi-D Adjustment Test Pattern

3. At this point, you need to check the vertical alignment of the lines on the printed test pattern.
 - If all the lines are correctly lined up as in the above sample, (make sure "BiD End" appears in the LCD and) press the Enter button to finish.
 - If some lines are not aligned, select the numbered pattern using the Paper Feed +/- buttons.

Correction increment: 1/2880 inch

Correction direction: "+" = toward HP and "-" = away from HP

Aim:

#1~5, #7 =	Align the lines vertically
#6, #8 =	Make sure light cyan and light magenta are equal width without overlapping (see the illustration below)

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

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

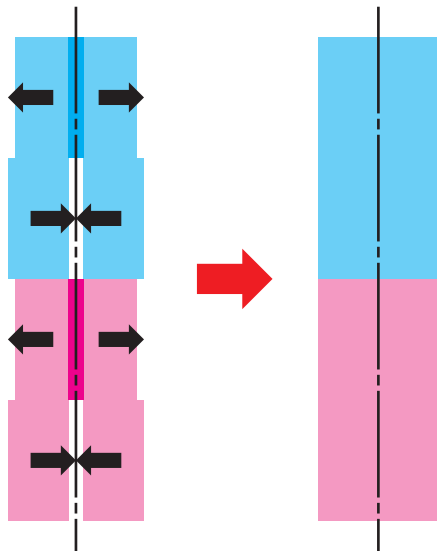


Figure 5-7. Bi-D Adjustment for Patterns #6 and #8

HEAD GAP ADJUSTMENT

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

Table 5-7. Head Gap Adjustment Items

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

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

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

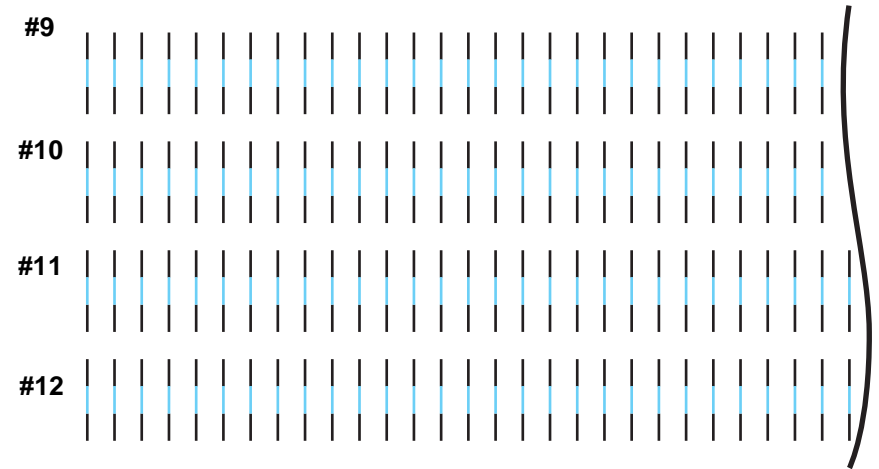
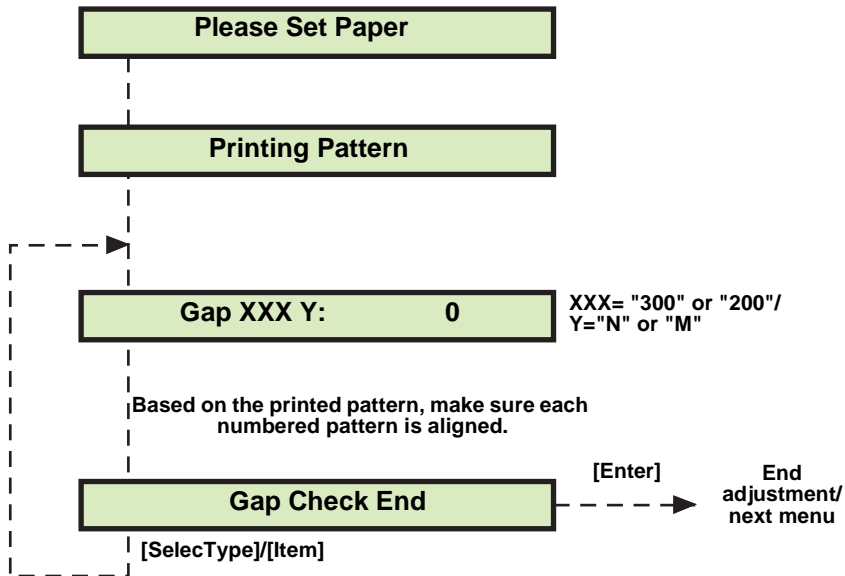


Figure 5-8. Gap Adjustment Test Pattern

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

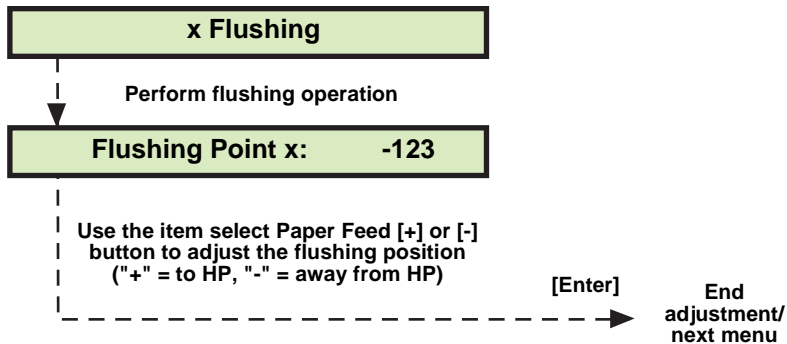
FLUSH POINT RIGHT AND LEFT ADJUSTMENT

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

1. Put a piece of paper over the flushing box.
2. Make sure "Adj. Flush 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 confirm the ink is ejected into the flushing box. If the ink-flushing position is correct, press the Enter button to finish. Otherwise, press the SelectType or Item button to correct the flushing position. The settings increment as follows.

Correction distance: One press = 1/720 inch

Direction: "+" = toward HP and "-" = away from HP



FEED ADJUSTMENT

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

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

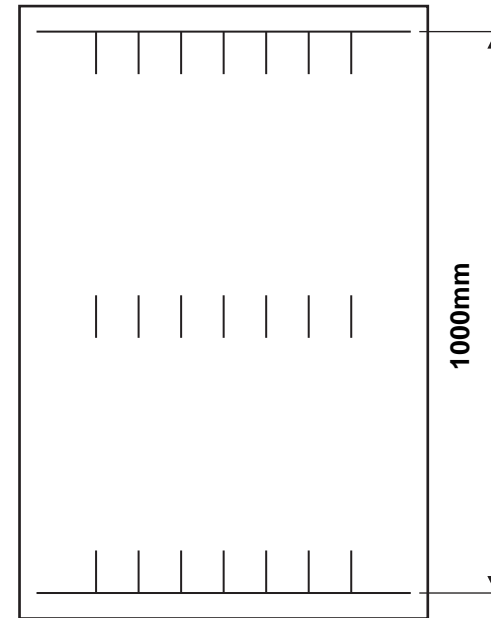
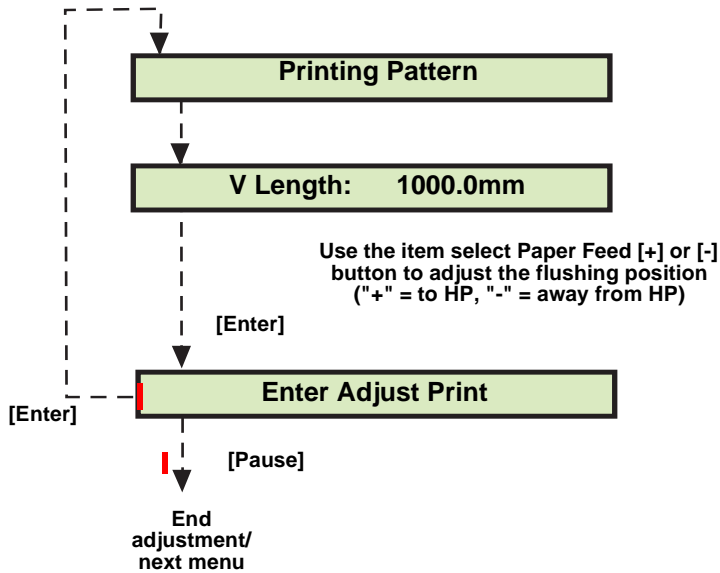


Figure 5-9. Feed Distance Check Pattern

ADJ TOP & BOTTOM

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

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

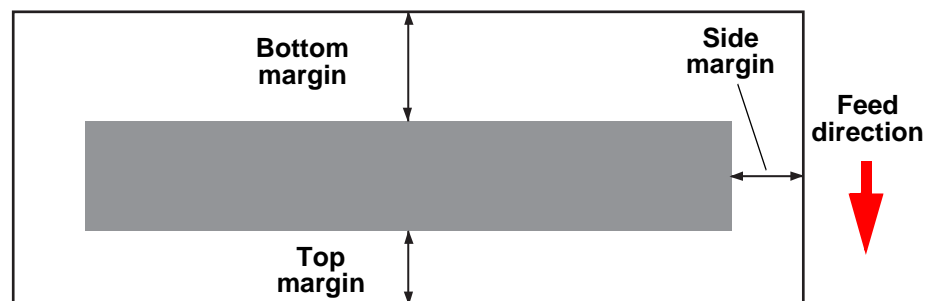
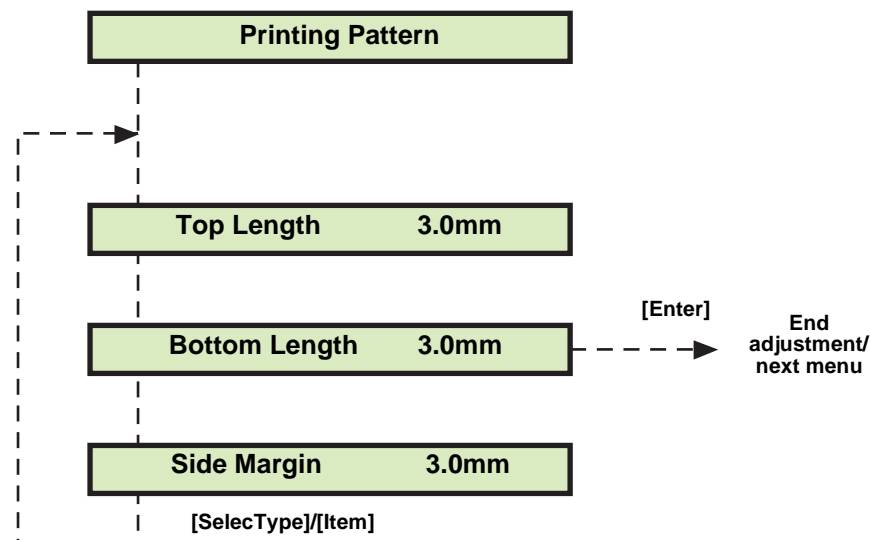


Figure 5-10. Measuring Sections/Margin Adjustment Pattern

ADJ REAR SENSOR POSITION

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

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

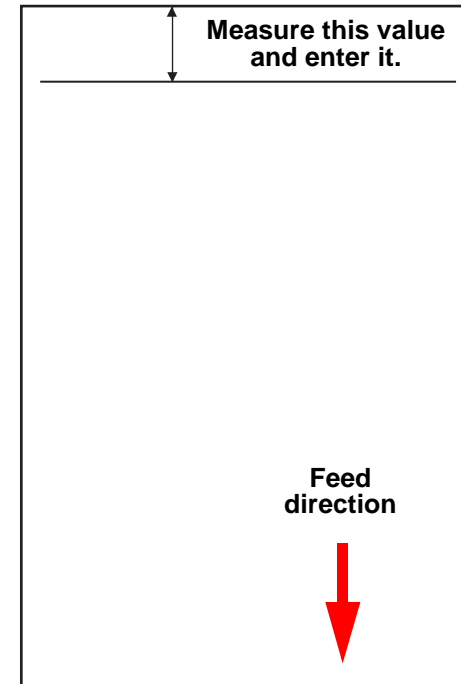
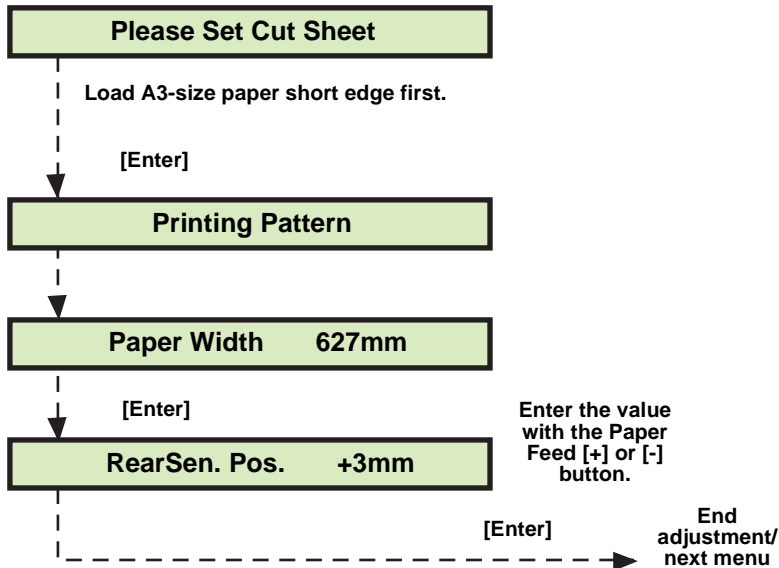


Figure 5-11. Rear Sensor Position Adjustment/M Measurement

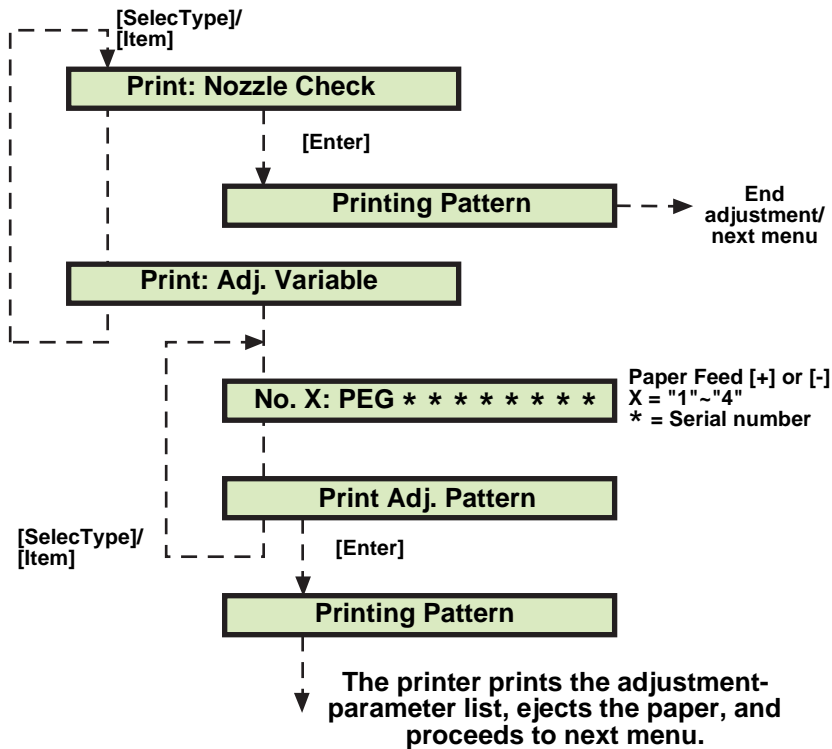
TEST PATTERN PRINT

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

Table 5-8. Printed Items in the Test Pattern

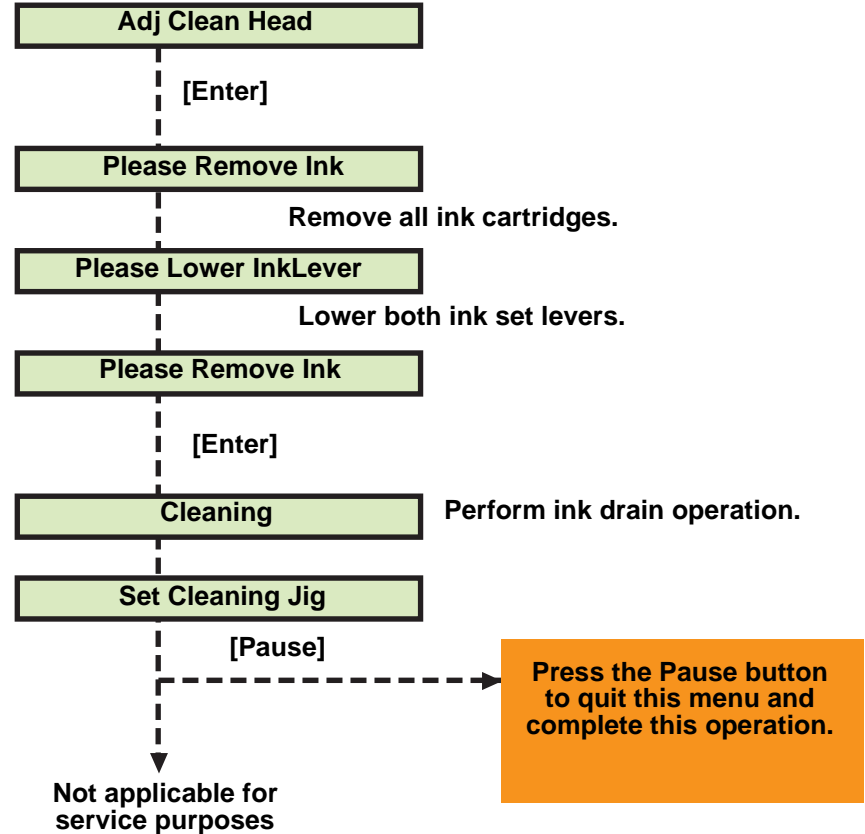
Item	Description
Nozzle Check	Prints all of the check/test patterns that are available from the "Adjustment" menu.
Adjustment Variables	Prints a list of all the adjustable items from the "Adjustment" menu.

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



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.



After draining the ink and performing any necessary operation and/or moving the printer, be sure to perform the initial ink charge as described in "Cleaning menu" on page 137.

COUNTER CLEAR

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

Table 5-9. Counters Reset by "Counter Clear"

Counter	Reset Value
Protection Counter A/B	0
Ink Volume Counter Rb/ Ry/ Rx Rz	0
Consumed Ink Counter Cb/ Cy/ Cm/ Cc/ 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.

5.2.5 Test Menu

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

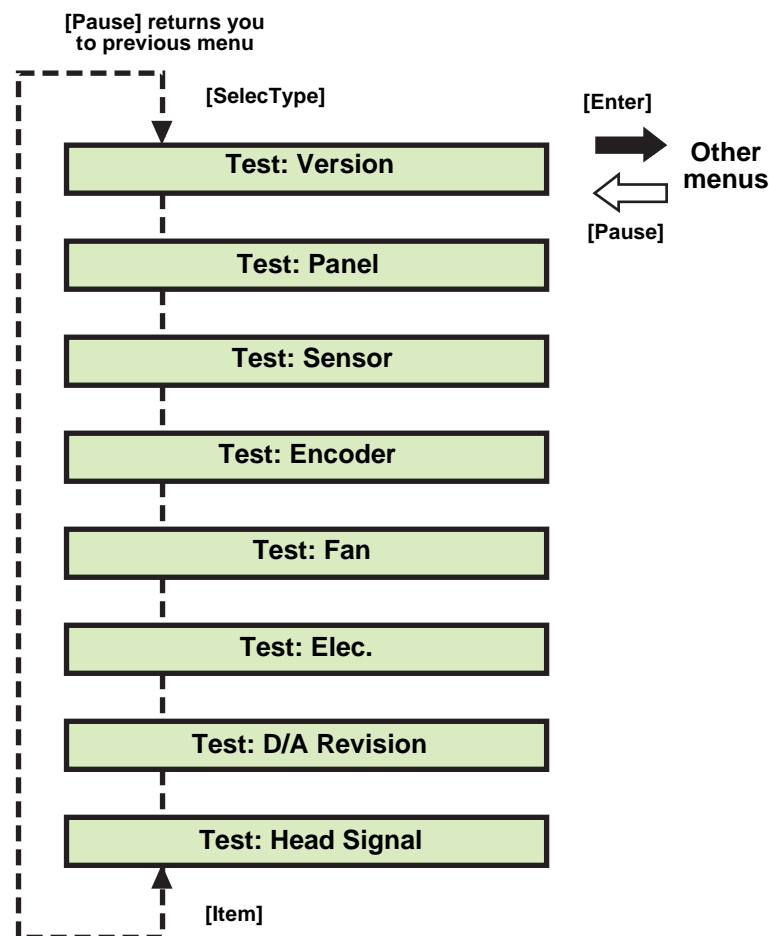
Table 5-10. Test Menu Items

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



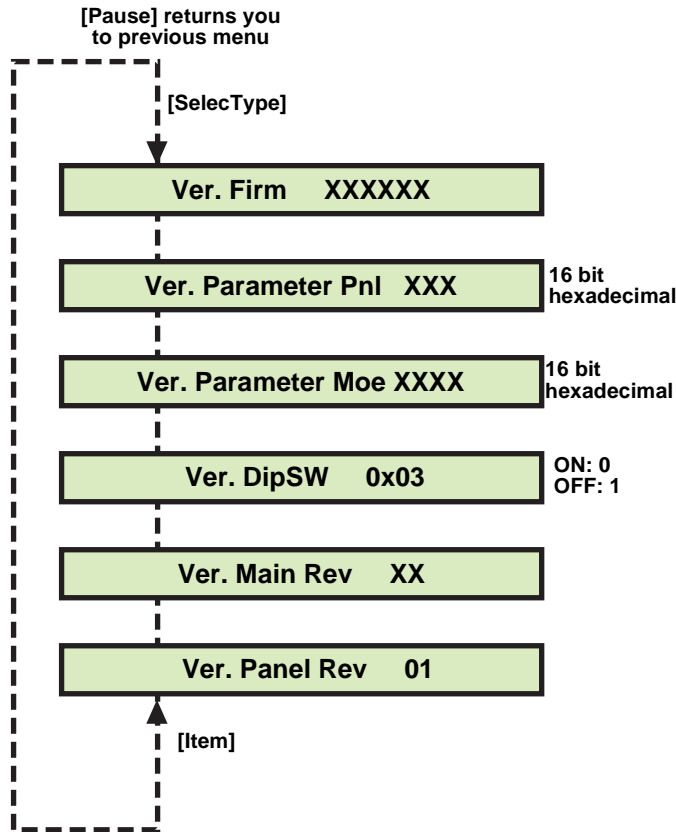
Do not attempt the D/A Revision or Head Signal test. These tests are only performed with special equipment during the manufacturing process. Any changes will mar print quality

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



VERSION

This function confirms the firmware version and dip switch settings.

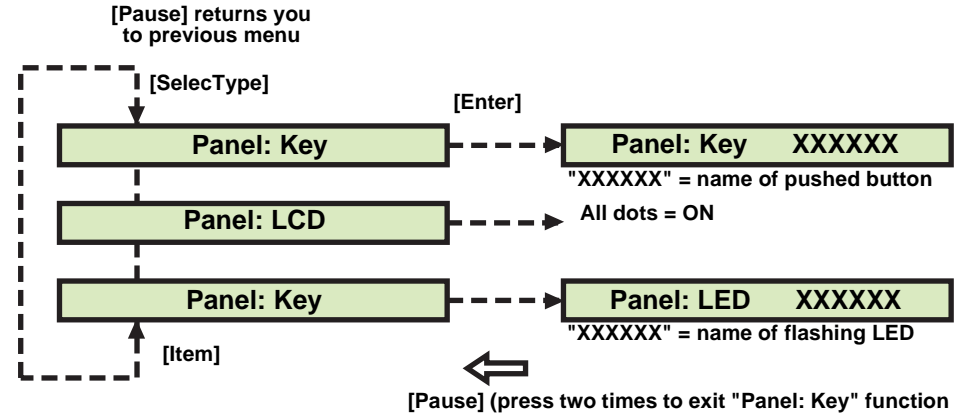


NOTE: The Dip switch

The dip switch located on the Main Board is a 2-bit switch, SW-1 is LSB (Least Significant Bit) and SW-2 is MSB (Most Significant Bit). For example, if SW-1 = Off and SW-2 = On, the LCD will display "Ver. DipSW 0x01".

CONTROL PANEL

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

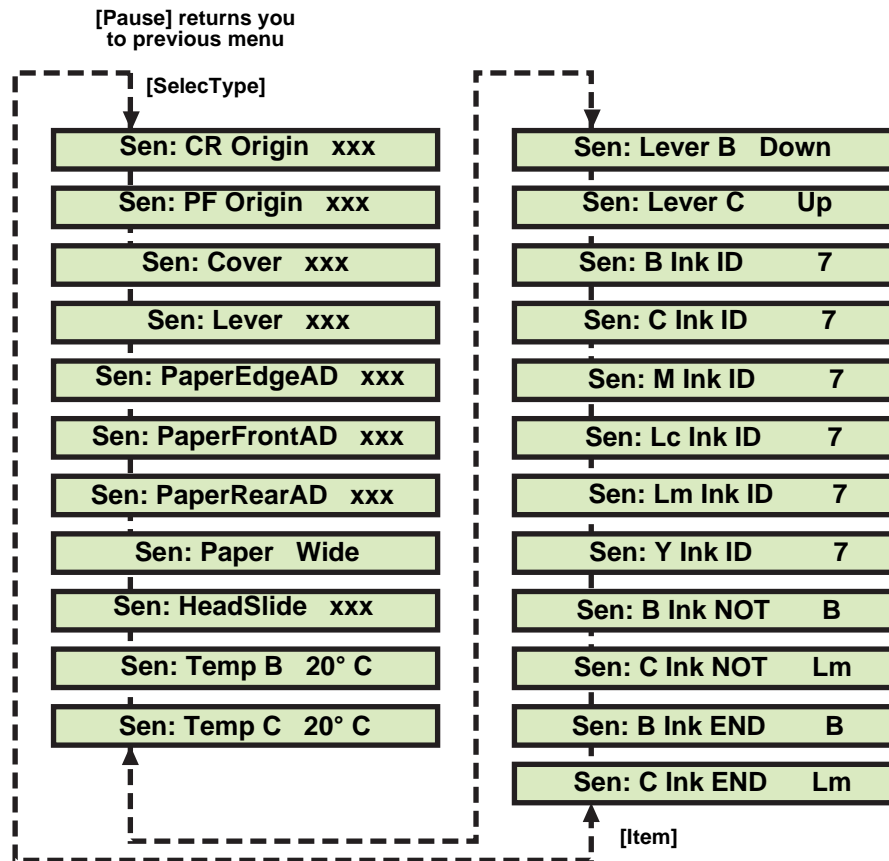


- "Key" check
The name of the button that is pressed appears. Press the [Pause] button twice to exit the "Panel: Key" function.
- "LCD" check
All dots turn on. If a dot is not on, the LCD is not working properly.
- "LED" check
The LED indicators turn on in the following order and the name of the indicator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

SENSORS

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

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



SENSOR ADJUSTMENT

After replacing the C277MAIN board or one of the sensors: P_EDGE, P_FRONT and P_REAR, you need to adjust a corresponding volume (variable resistor) on the main board to determine the correct detection level of sensors.

First, remove the access cover on the Paper Guide-U and enter "Test Menu" of self-diagnostic mode and select "Sensors" check mode. And then go to the check item for the corresponding sensor.



When you make these adjustments, make sure to avoid strong light (sun-light) around the printer. (These sensors are photo-sensitive sensor and may not function properly under such conditions.)

□ **P_EDGE Sensor**

1. First, move the carriage left and right manually and make sure that the signal level indicated on the LCD is smaller than 18H.
2. Place one sheet of "EPSON Photo Quality Inkjet Paper" in the paper path.
3. Lower the release lever to the lock position.
4. Move the carriage over the paper where the P_EDGE sensor is located in the middle of paper.
5. Adjust the volume **VR1** on the main board so that the signal level indicated on the LCD is 80H ±8H.

□ **P_FRONT Sensor**

1. Make sure that the signal level indicated on the LCD is smaller than 18H.
2. Place one sheet of "EPSON Photo Quality Inkjet Paper" over the P_FRONT sensor on the Paper guide-L.
3. Lower the release lever to the lock position.
4. Adjust the volume **VR2** on the main board so that the signal level indicated on the LCD is 8AH ±8H.

□ **P_REAR Sensor**

1. Make sure that the signal level indicated on the LCD is smaller than 18H.
2. Place one sheet of "EPSON Photo Quality Inkjet Paper" over the P_REAR sensor on the Paper guide-U, and hold it at both sides of sensors.
3. Adjust the volume **VR3** on the main board so that the signal level indicated on the LCD is 87H ±8H.

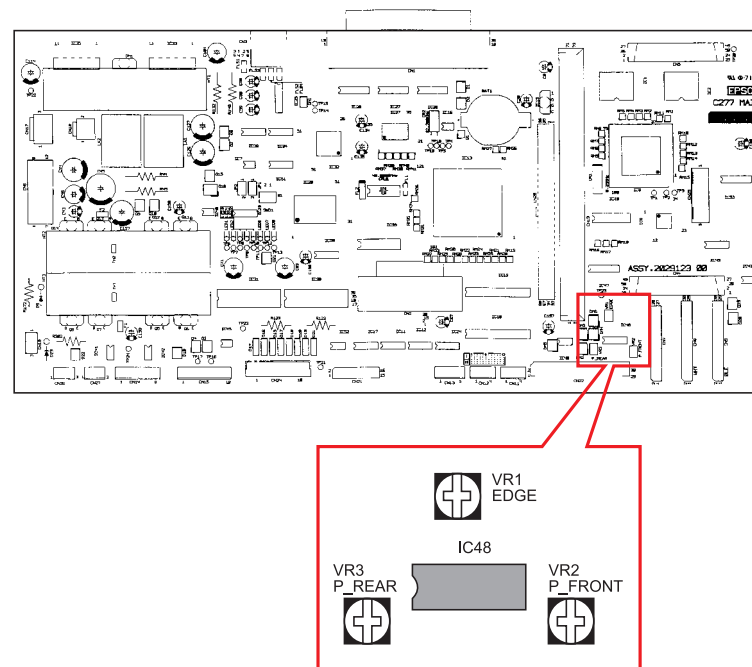


Table 5-11. Sensor Adjustment Values

Sensor	VR	Without Paper	With Paper
P_EDGE Sensor	VR1	18H or less	80H ±8H
P_FRONT Sensor	VR2	18H or less	8AH ±8H
P_REAR Sensor	VR3	18H or less	87H ±8H

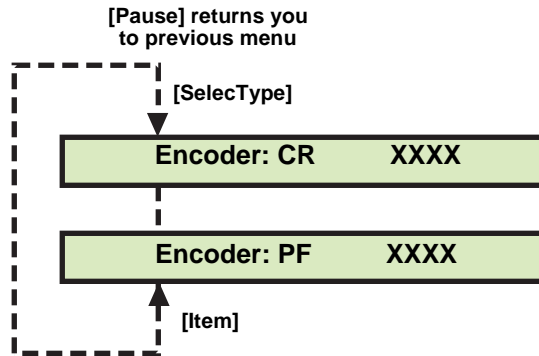
Figure 5-12. Adjust Volume on the C277MAIN Board

ENCODER

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

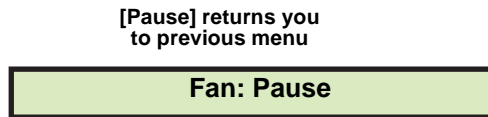
To check an encoder, follow the instructions below for the corresponding encoder.

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



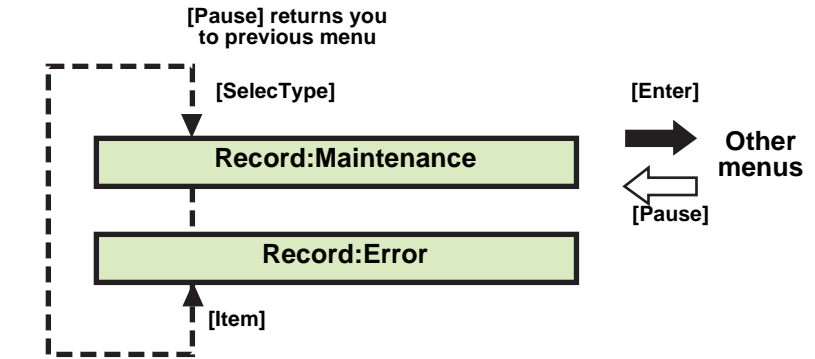
FAN

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

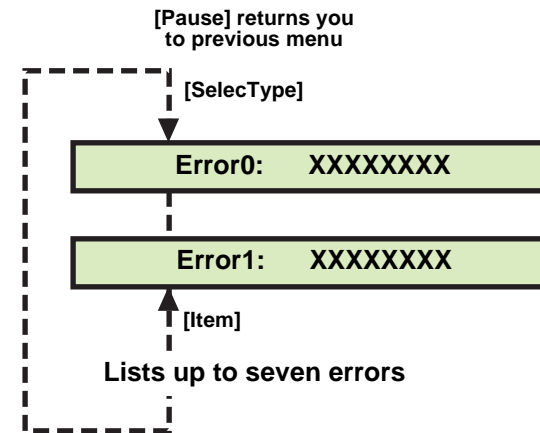


ELEC.

This function allows you to check the operation-record information and the fatal-error record stored in the control circuit. See the Error Message List for Service Technicians table on page 58 for details on the error messages.



- Record: Error menu



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

□ Record: Maintenance menu

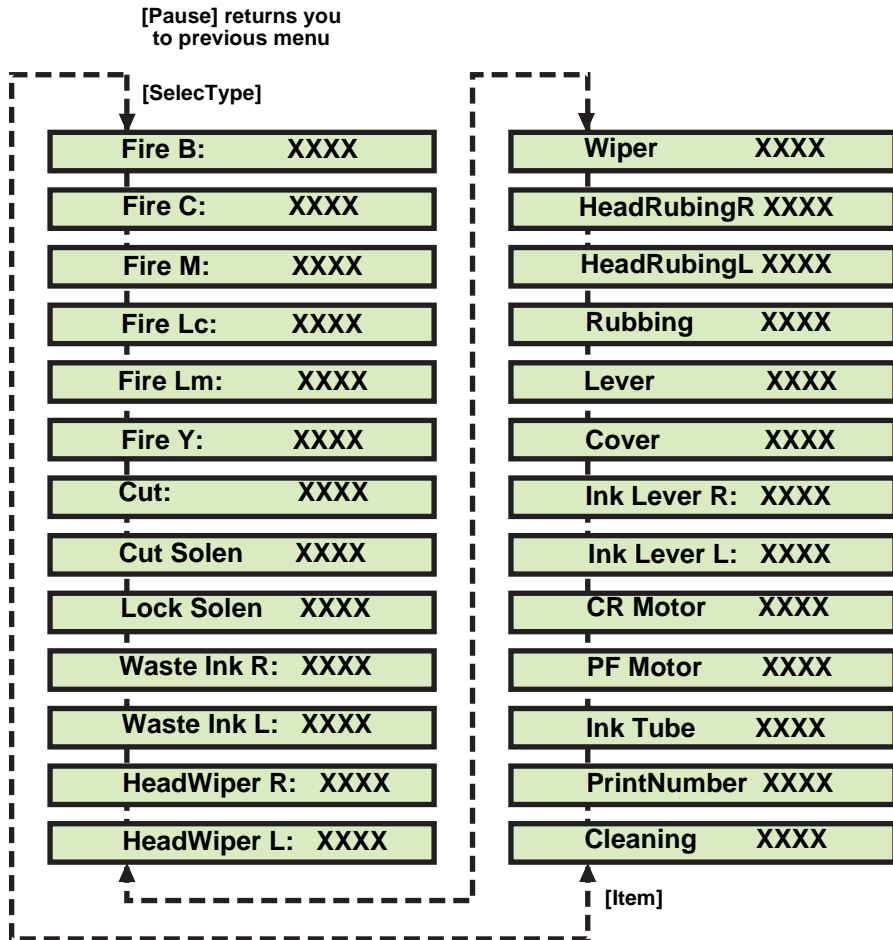
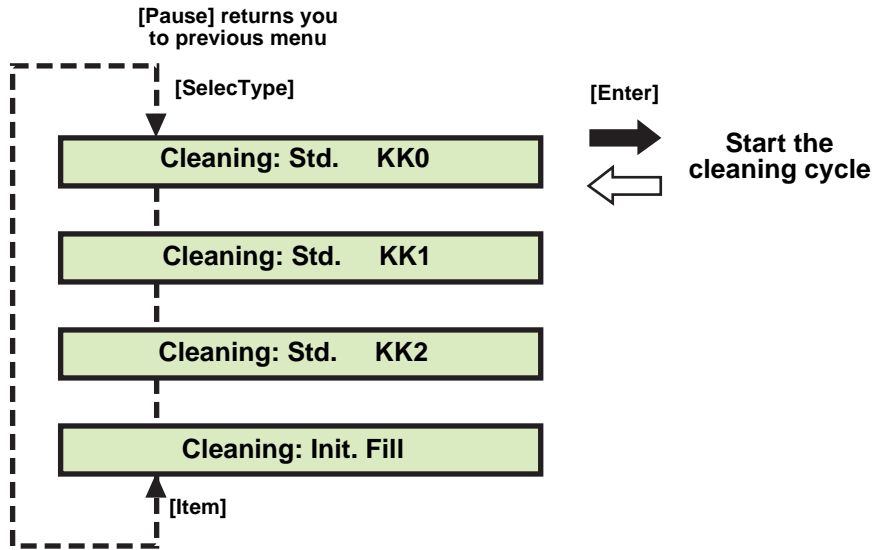


Table 5-12. Maintenance Record Items

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 printout)
Cleaning	Accumulated number of cleaning operations

5.2.6 Cleaning menu

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



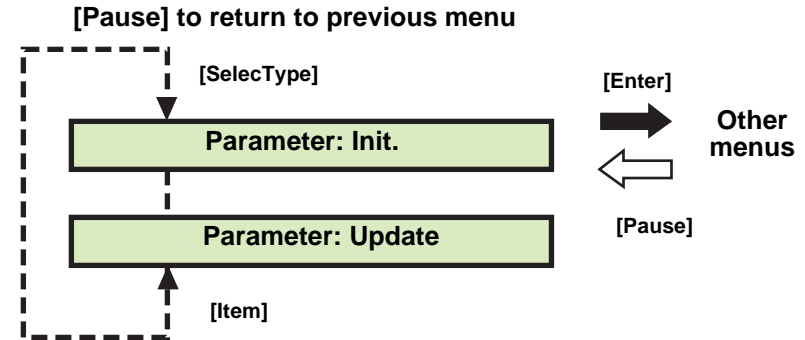
- Std. KK0 (CL1)
Normal cleaning cycle Volume of ink cleared = low
- Std. KK1 (CL1')
Strong cleaning cycle Volume of ink cleared = medium
rubbing = off
- Std. KK2 (CL2)
Strong cleaning cycle Volume of ink cleared = high
rubbing = on
- Init. Fill Perform Initial charge sequence

PRINT MENU

The Print menu performs the same test-printing functions as the "Test Print" option on the Adjustment menu. For details, see "Test Pattern Print" on page 129.

5.2.7 Parameter menu

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



"INITIALIZE" ITEMS

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

- Capping Position
- PF
- Serial No.
- Maintenance Record

"UPDATE" ITEMS

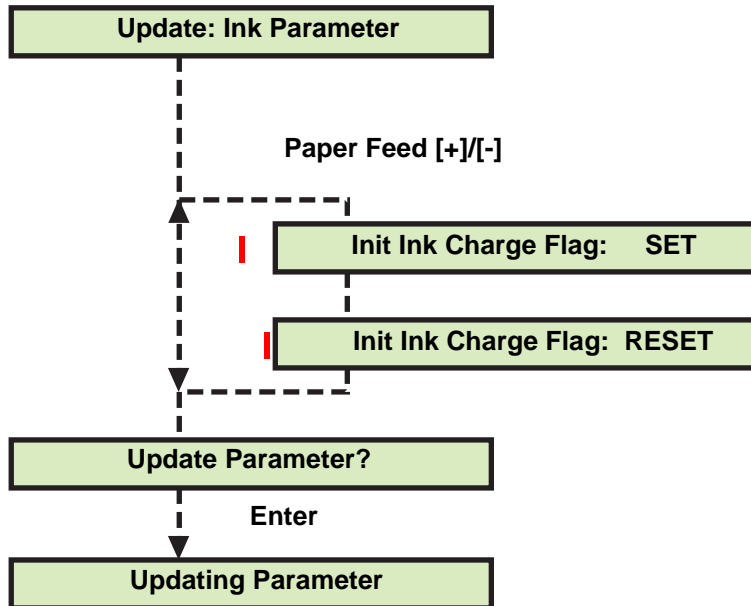
The items you can update are described below.



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

- Capping Position
- Head Rank
- Print Position Items (Bi-D Adjustment/Gap Adjustment)
- Paper Feed Distance
- Mechanism Adjustments
- Ink Parameters

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



5.2.8 Mechanism Adjustment

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

Table 5-13. Necessary Mechanism Adjustments

Parts	Adjustment	Necessary Tools	Refer to
<input type="checkbox"/> Printhead <input type="checkbox"/> Ink Damper Assembly <input type="checkbox"/> Cutter solenoid <input type="checkbox"/> Carriage cover	Carriage cover height	CR Cover Position Adjustment Tool #F724 code: 1049975	page 139
CR Motor	CR Steel Belt Tension	Tension Gauge #F712 code: 1047744 Standard: 200g	page 141
PF Motor	PF Belt Tension	Tension Gauge code: B747700300 Standard: 4000g	page 141
PG Motor	Gear Backlash	confirm by sight	page 142
Lower Paper Guide	Cutter Position	confirm by sight or by measuring with a ruler	page 140
I/H Assembly	I/H Handle Gear position match	confirm by sight	page 142
P THICK sensor	Self-diagnostic test - "Paper Thickness"	-	page 143
Cover Open R/L sensor	Self diagnostic test - "Cover"	-	page 144

CARRIAGE COVER HEIGHT ADJUSTMENT

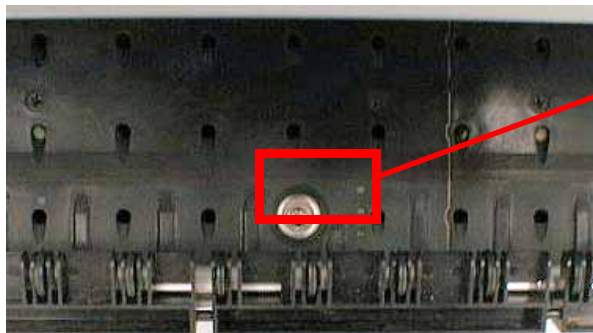
This adjustment is necessary for service operations that require you to remove the carriage cover. The carriage cover limits the operation of the cutter-solenoid actuator, and it acts in a way to fix the stroke or movement of the cutter during paper-cutting operations.

1. Set the "CR Cover Position Adjustment Tool #F724" at the specified position on the surface of the Lower Paper Guide so that it lines up with the subplaten as shown below.
2. While lining up the indented gutter of the tool with the cutter blade, move the carriage over the tool. Make sure the tool fits tightly against the subplaten and Lower Paper Guide while securing the cutter blade in the gutter.

CAUTION



The cutter blade is very hard, so be careful not to strike the blade against metal parts as this can damage the blade.



Set the tool here.

3. While holding the cutter in position with the tool, push the carriage cover down to fix the cutter in place.
4. Replace the two carriage cover screws, move the carriage, and remove the tool.



The standard height from the cutter's bottom surface to the subplaten's upper surface is $9.75 \pm 0.25\text{mm}$.

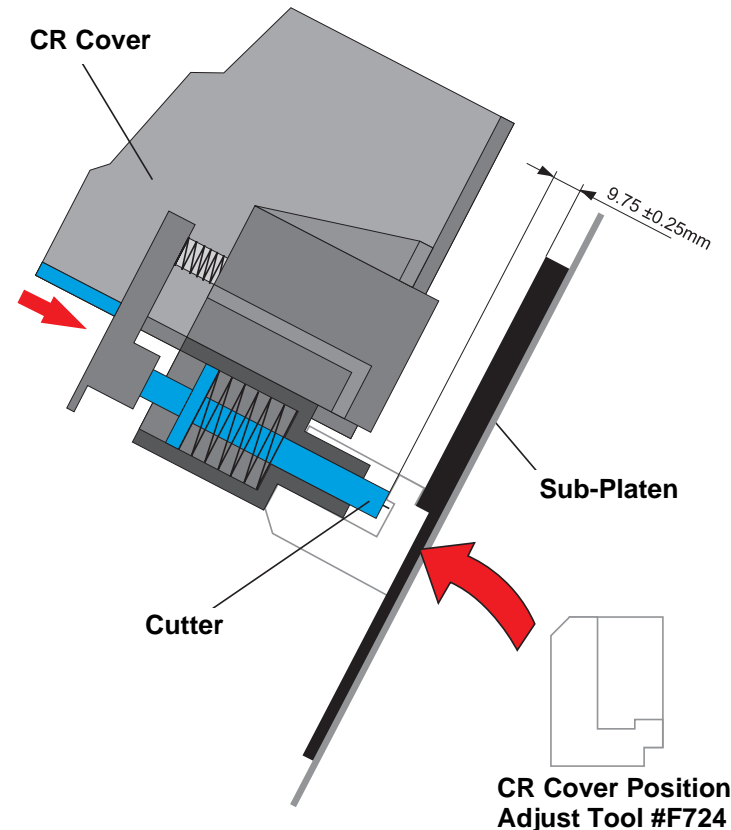


Figure 5-13. Carriage Cover Position Adjustment Tool

CUTTER POSITION ADJUSTMENT

This adjustment is necessary for service operations that require you to remove the Lower Paper Guide. The subplaten, which lies on top of the Lower Paper Guide, guides paper as it is fed and provides support as the cutter performs the cutting operation. The subplaten and cutter must be aligned properly for the cutting operation to work.

1. Load a suitable piece of paper in the feed path so that it protrudes over the subplaten and lock the release lever.
2. Move the carriage over the paper by hand.
3. Push the cutter down by hand and move the carriage and cut off the paper.
4. Compare the position of the cut line on the paper to the edge of the upper surface of the subplaten, as shown in Figure 5-14.



The blade should be below the edge, but close to the edge. The standard distance (lateral) from the blade to the subplaten's upper surface is 0.5 (0.2~0.7mm).

If the cut line is above the edge or too far below the edge, reposition the Lower Paper Guide and repeat the above steps.

5. Perform the above steps at the right side, left side, and center of the Lower Paper Guide to make sure the guide is even.

CHECK
POINT



When re-installing the Lower Paper Guide, it is very important to lift and support the Guide to make sure the screws are correctly centered in the Guide holes. Otherwise, the subplaten will be offset.

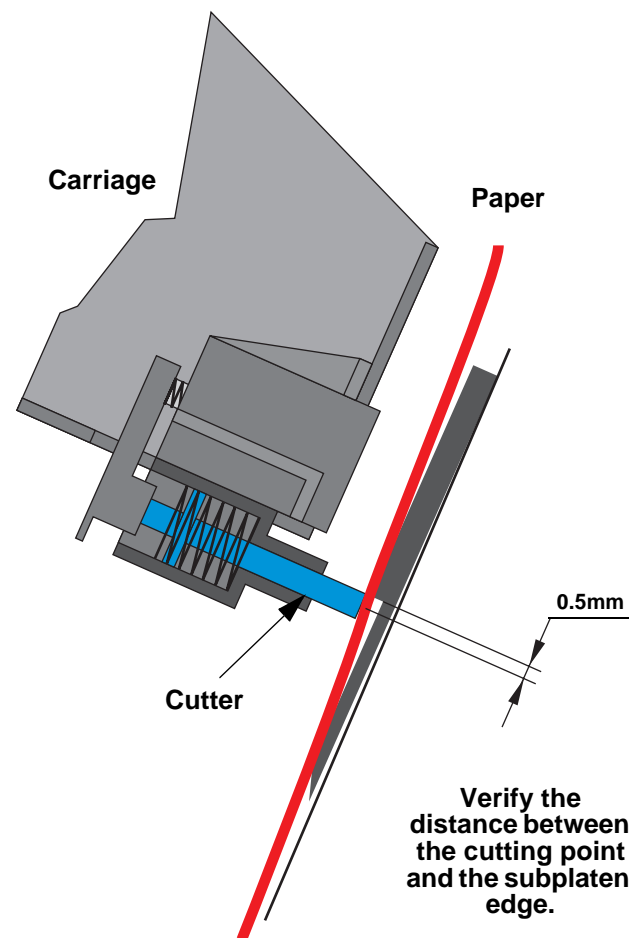


Figure 5-14. Cutter Position Verification

CR STEEL BELT TENSION ADJUSTMENT

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

Standard: 100g ± 10% (at the point where the CR Steel Belt contacts the CR Rail)

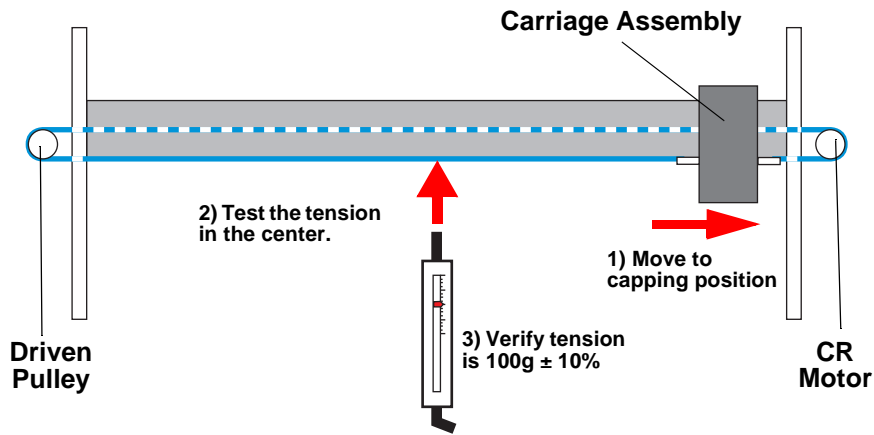


Figure 5-15. CR Steel Belt Tension



After making sure the tension is 100g ± 10g, look at the position of the Steel Belt on the Driven Pulley as you move the carriage back and forth by hand. The Steel Belt should be in the center of the pulley and must not slide/drift to one side or the other. If the Belt drifts to one side loosen the screw on that side a quarter turn (or tighten the screw on the opposite side a quarter turn). Test the drift again by manually moving the carriage. When satisfied the drift is almost completely gone, test the tension again.

PF BELT TENSION ADJUSTMENT

This adjustment is necessary for service operations that require you to remove/loosen the PF Motor or PF Belt. When replacing or re-installing the PF Belt, you need to confirm the tension of the PF Belt.

Standard: 3500g ± 10%

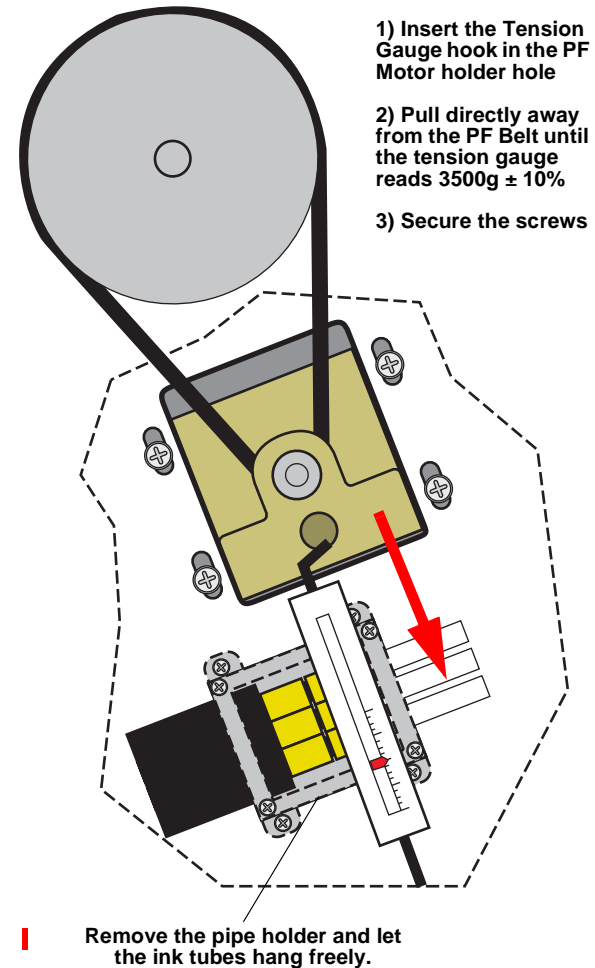


Figure 5-16. PF Belt Tension

GEAR BACKLASH ADJUSTMENT

This adjustment is necessary for service operations that require you to remove or re-install the PG Motor.

Standard: PG gear turns smoothly
 To adjust backlash, slightly loosen the screw A and B, then move the motor in the direction shown in figure with YELLOW arrow.

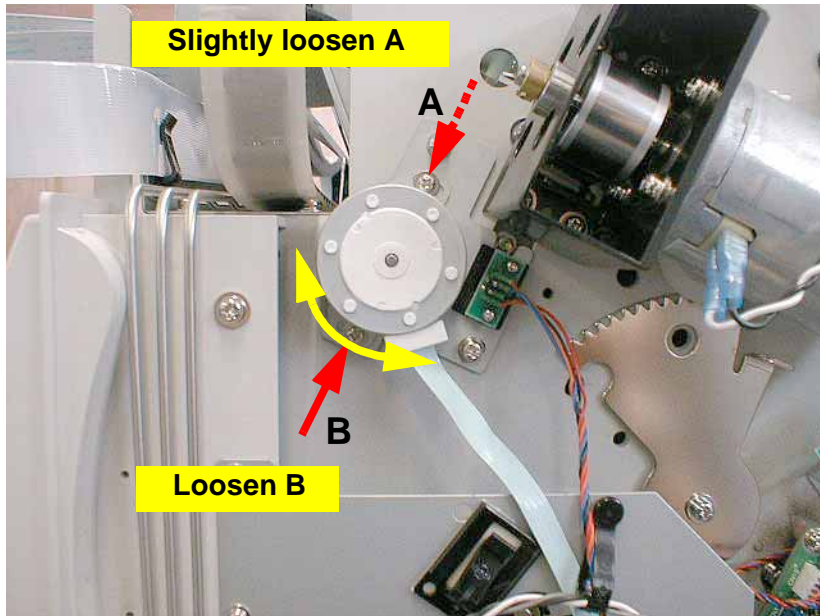


Figure 5-17. PG Motor - Backlash Adjustment

I/H LEVER POSITION ADJUSTMENT

This adjustment is necessary for service operations that require you to remove the I/H subassembly which is located inside the Ink Cartridge Holder. The I/H Lever controls the I/H subassembly position (up or down), and when the I/H lever is properly installed, the I/H subassembly moves up and down smoothly.

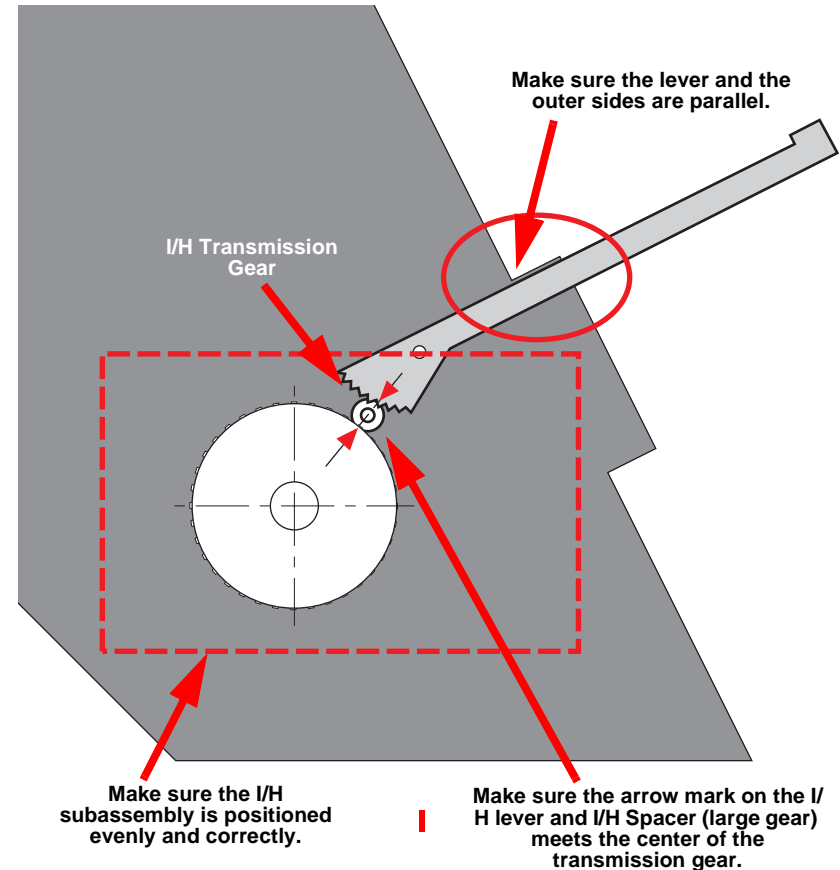


Figure 5-18. I/H Lever Position

P THICK SENSOR ASSEMBLY ADJUSTMENT

When removing/replacing the P THICK sensor, verify the sensor operation using the Self-Diagnostic mode as described below.

1. Press the following buttons and turn on the printer to enter the Self-Diagnostics mode.
Paper Feed ↓ + Cut/Eject + Cleaning
2. Press the SelecType or Item button until "Check: Test" appears in the LCD, then press the Enter button to select the Test menu.
3. Press the SelecType or Item button until "Test: Sensor" appears in the LCD, then press the Enter button to select the Test Item menu.
4. Press the SelecType or Item button until "Sen: Paper xxxx" appears.
5. Raise the Release lever to the "Release" position, and verify that "Sen: Paper Thick" appears in the LCD.
6. Insert a schema gauge (0.6mm/0.7mm) between the PF Grid Rollers and Driven Rollers nearest the HP. Lower the Release lever to the "Lock" position. The LCD message will vary according to the schema gauge as shown in the table below.

Table 5-14. P THICK Sensor Operation Check

Schema Gauge	LCD Message
0.7mm (thick paper)	Sen: Paper Wide
0.6mm (standard paper)	Sen: Paper Std

7. If the correct message does not appear or any other message appears, verify the P THICK sensor is installed correctly and check the operation again.

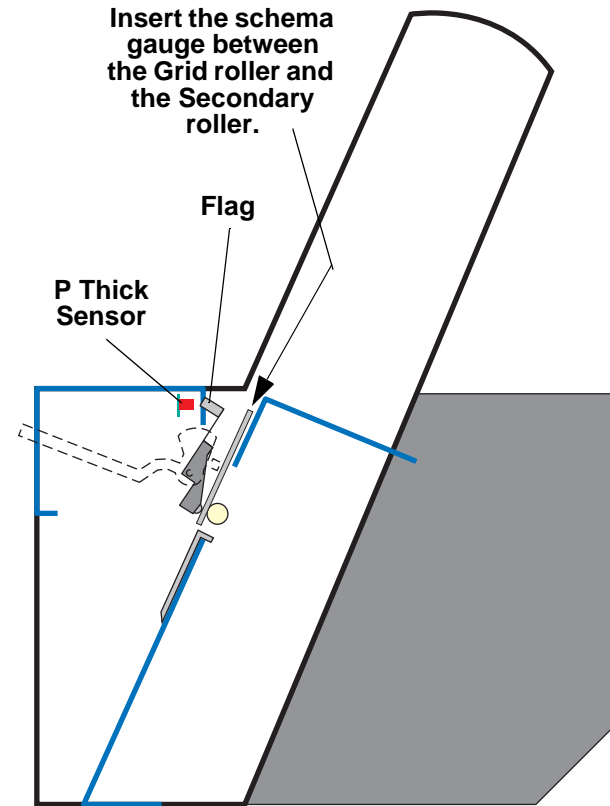


Figure 5-19. P Thick Sensor Adjustment



The PG sensor flag is made of very thin metal, and it is easy to bend the flag or base of the flag. If the P Thick sensor is not operating correctly, (remove the H Top Cover and) make sure the base and flag are straight, as shown in Figure 5-19 above.

COVER R/L SENSOR ASSEMBLY

When removing/replacing the Cover R/L Assembly or the Front Cover, verify the sensor operation using the Self-Diagnostic mode as described below.

1. Press the following buttons and turn on the printer to enter the Self-Diagnostics mode.
Paper Feed ↓ + Cut/Eject + Cleaning
2. Press the SelecType or Item button until "Check: Test" appears in the LCD, then press the Enter button to select the Test menu.
3. Press the SelecType or Item button until "Test: Sensor" appears in the LCD, then press the Enter button to select the Test Item menu.
4. Press the SelecType or Item button until "Sen: Cover xxxx" appears.
5. Open and close the Front Cover, checking the LCD to make sure the message changes depending on the Front Cover position.

Table 5-15. Cover R/L Sensor Assembly Check

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

6. If the correct message does not appear or any other message appears, verify the Cover R/L Sensors are installed correctly and check the operation again.

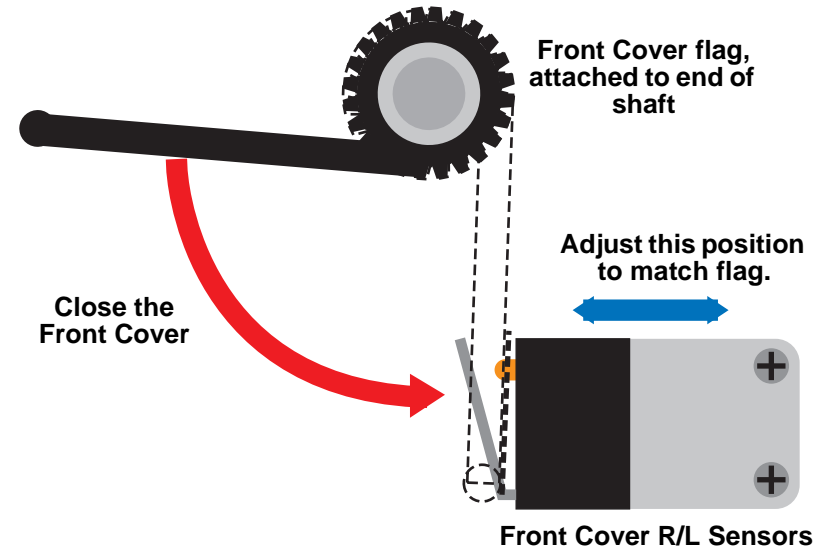


Figure 5-20. Interlock Switch Mechanism



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

CHAPTER

6

MAINTENANCE & SETUP

6.1 General Maintenance Issues

This section explains necessary maintenance items and their details for this product. Basically for this product, service technicians are required to visit the user's location where the EPSON Stylus Pro 9000 is used, and perform necessary maintenance service on-site while following the precautions below. Service technicians have to be extra careful not to cause any accident to the product or the user's environment.



- Since the power switch mounted on the secondary circuit of the power supply circuit, unless otherwise specified, always disconnect the power cable from the AC plug socket in order to prevent electric shock during service operations.
- The cover open sensor for detecting the open/close condition of the front cover has an interlock switch that functions as a safety device. Therefore, it is prohibited to turn off this switch.
- A lithium battery is used to back up memory and is mounted on the control circuit board. To prevent accidents, follow the precautions below when handling the board.
 - *Do not short the battery.
 - *Do not set the battery on the wrong poles, double check the plus and minus sides when installing the battery.
 - *Do not heat up or place the battery neat a heat source.
- Be careful not to let ink get into your eyes or your skin. If ink gets in your eye, flush the eye with water, and see a doctor if you feel discomfort in your eye.



- Due to the printer's size, when performing any service or maintenance operations, confirm there is plenty of space for the operation.
- Due to the printer's size and weight, make sure the area you move and place the printer is stable.
- Since the EPSON Stylus Pro 9000 is very heavy (approximately 96 Kg for the printer body + stand), be careful when handling it. When separating or assembling the printer body and legs, it is recommended to do so with at least 4 people.
- When removing parts, ink may drip on the floor or lower sections of the printer. Therefore, spread a sheet or similar object when removing ink-related parts.
- When handling the electric circuit boards, do not touch the elements on the board by the bare hands in order to prevent the elements from getting damage by static electricity. If necessary, wear the earth band.
- If it is necessary to power on the printer after removing various covers by necessity, be careful not to get injured from the carriage or fan.
- Since the steel belt for driving the carriage and cutter blade are very sharp, be careful not to cut yourself.
- Since the cutter blade is made of very hard material but weak against shocks, do not let it collide with the printer's metal parts.
- If the installed printer needs to be packed and transported for any reasons, use the all the exclusive packing materials and protection materials written on the "Start-Up Guide" and "Assembly and Setup Guide".

6.1.1 Periodic Maintenance Items

The printer uses sensors and counters to determine when consumable items need to be replaced. When a consumable part has reached its predetermined end-of-life according to the corresponding counter, a message appears. See the table below for parts which require periodic replacement.

Table 6-1. Parts That Require Periodic Replacement

Items	LCD Message	Description
Waste Ink Pads (R/L)	“Maintenance Call 0100” or “Service Call 00000100”	Solution Replace the following parts: <input type="checkbox"/> Waste Ink Pads (R/L) <input type="checkbox"/> Pump Assembly <input type="checkbox"/> Cap Assembly <input type="checkbox"/> F Box (R/L) <input type="checkbox"/> Cleaner, Head *Required Adjustments <input type="checkbox"/> Waste Ink Counter Clear (See “Counter Clear” on page 130.) <input type="checkbox"/> Cleaner Counter (See “Counter Clear” on page 130.) <input type="checkbox"/> Cutter Position Adjustment (See “Cutter Position Adjustment” on page 140.)
Ink Tubes	“Service Call 00000101”	Solution <input type="checkbox"/> Check the ink tube (The printer indicates this error when the useful-life ends for the specified part.)



When replacing the waste ink pads, replace the pads in the waste ink tank and not the whole tank. Put the old pads in a plastic bag and throw away the used ink pads correctly, according to the laws and rules in your area.

6.1.2 Product Life Information

The table below shows the product life about the printer body, each mechanism and various parts. Information regarding to the product life can be checked by the following way.

- Panel Setting: “Printer Status Menu”
 The amount of ink remaining is indicated on the LCD. (“F****E” - F = full, E = empty, and each asterisk * represents a percentage of the total ink.) Also, the counters which record these values can be initialized by “Maintenance Mode 2”.



Do not perform the counter initialization without replacing the corresponding parts and checking their operation. Since the counters for “Waste Ink Life” and “Ink Remaining Quantity” influence printer operations, do not clear them unnecessarily.

- Self-Diagnostic Function: “Check: Maintenance” under “Test” menu

Table 6-2. Product Life Information

Items	Setting value	Notes	Result = Error
Printer	18,000 pages	B1 paper	See Ink Tubes in Table 6-1
Printheads	2 billion dots	Each nozzle	No
Waste Ink Pads	Right: 132,000 points Left: 6,600 points	1 point = 0.02ml	Yes
CR Motor	2,500,000 passes	1 pass = 1 round trip *Ink tube life is monitored based on this counter value.	Yes
PF Motor	23,000 meters	Paper feed distance	No
Cutter	2,000 operations	1 operation = cut one page	No

6.1.3 Important Maintenance Items During Service Operations

Check the following items during printer maintenance/service and perform any necessary operations.

Table 6-3. Items to be Checked During Maintenance/Service

Items	Check Points	Remedy
Lower Paper Guide and the surface of the Subplaten	Make sure no paper, dust, or foreign objects are attached or have accumulated.	Cleaning (If there is an ink stain, wipe with dry, clean cloth after cleaning the ink stain with damp cloth.)
Step Ruler (Striped plastic sheet used by Linear Encoder to determine CR position)	Make sure no dust or foreign objects are attached or have accumulated, and make sure it is not ripped, bent, or stained.	After attempting to clean, if there are any rips or stains, replace with new one.
Rail on the CR guide frame	Make sure there are no foreign objects attached.	Cleaning
P_REAR sensor and P_FRONT sensor surface	Make sure no paper, dust, or foreign objects are attached or have accumulated.	Cleaning

6.1.4 Lubrication

In this product, there are no required lubrication parts.



Therefore, never lubricate the printer mechanism since the lubrication may damage the mechanical parts and shorten the product life.

6.2 Unpacking and Installing

Since the EPSON Stylus Pro 9000 is extremely large (W x H x D: 1688 x 1259 x 699mm) and very heavy (96Kg/ printer body + legs), carefully follow the procedures explained here from unpacking and assembly to setup and installation. Read and follow all safety instructions carefully for the safety of the installers and the equipment. Also, if the printer needs to be repacked and transported again after it is installed, perform necessary packing procedures after checking the service operations and packing conditions written here.

6.2.1 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).

BEFORE OPENING THE LARGE & MEDIUM BOXES

See the figure below for the packing condition and contents.

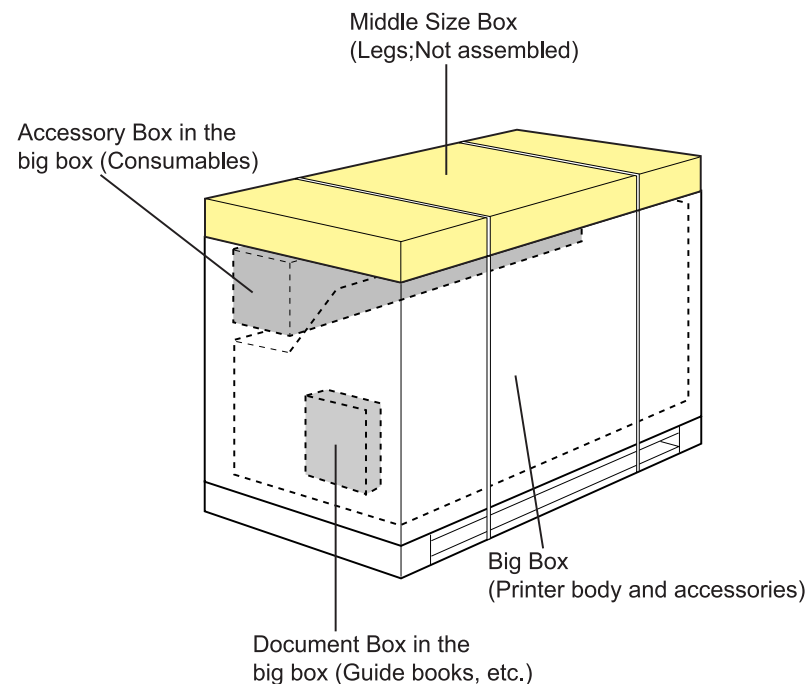


Figure 6-1. The printer and parts shipped in boxes

6.2.2 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.)

6.2.3 Unpacking and Assembling

FROM UNPACKING TO ASSEMBLING THE STAND

CAUTION



- It is recommended at least two people (four for printer body) unpack and assemble the stand. (Weight of stand: approximately 22kg after assembling.)
- Perform unpacking and assembly in a stable, open place (about 4 x 4m).

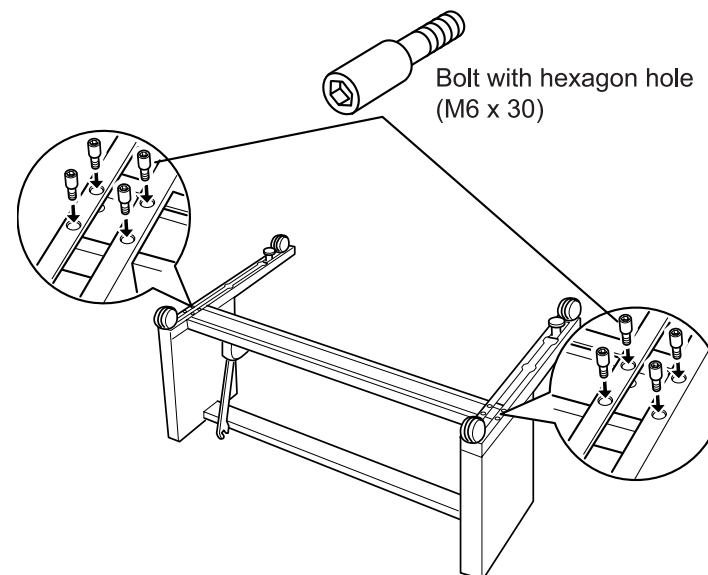
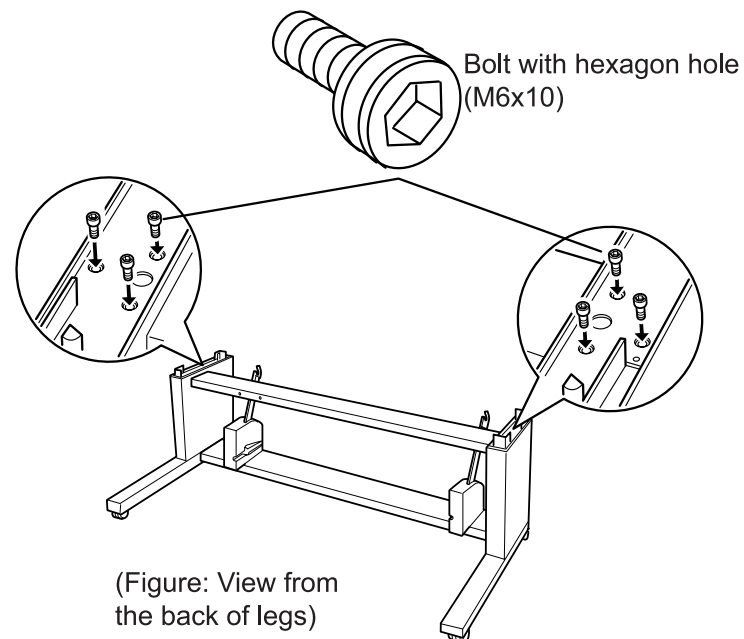
1. Remove the band connecting the large box and medium size box, and take out the medium size box.
2. Open the medium size box and verify the contents. (See the previous page.)
3. Install the top and bottom horizontal stand supports (holes facing correct direction) to the right-side leg and temporarily 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.

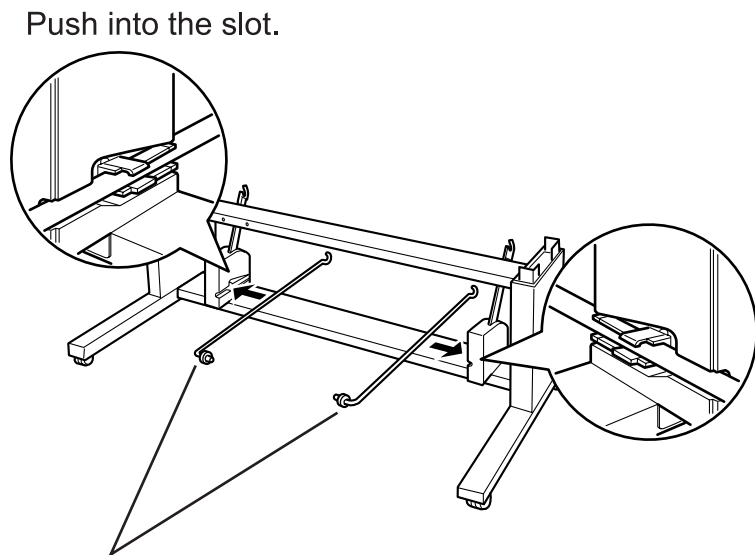
4. Turn over the stand so that the bottom faces up. Then, connect the bottom support and secure the support with the hexagonal bolts (M6 x 30).
5. Turn over the assembled stand again, and completely secure the top-support bolts.



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

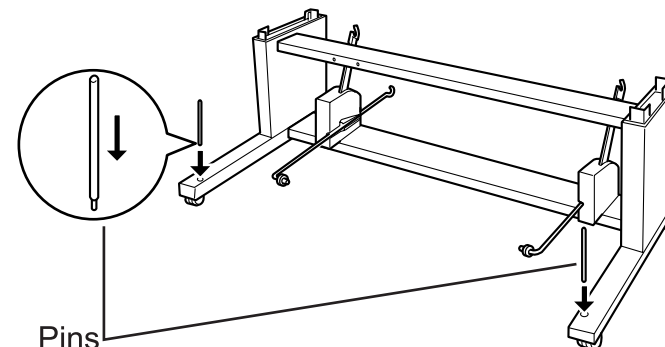


When installing the tray hooks, the sides with the plastic (resin) caps should be toward the rear of the printer and should face inward. (See the figure below.)



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.

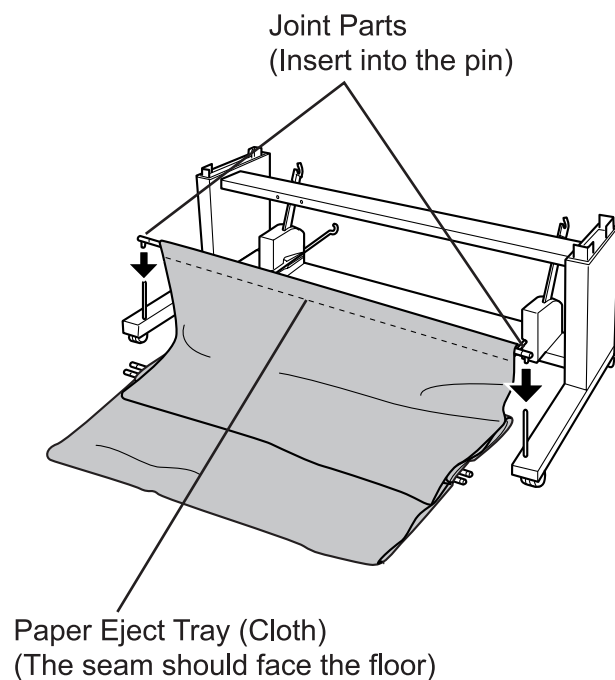


Pins
(for holding the joint part of the paper eject tray/
Push the smaller circle side into the each hole at the rear side of the legs)

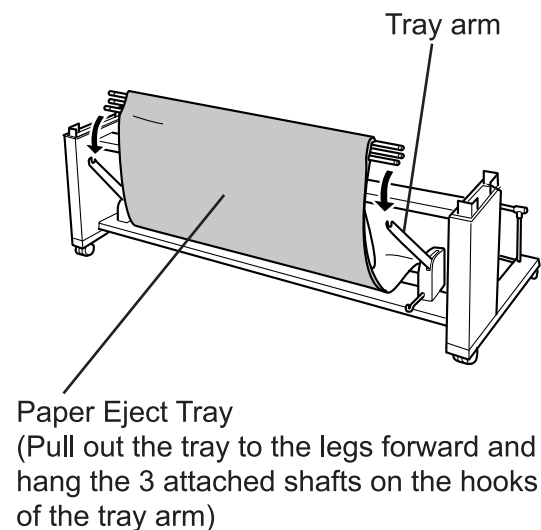
8. Holding the eject tray cloth, locate the shaft which has a joint at both ends and connect those joint ends to the pins you set up in step 7. Connect the joints to the top of the pins and push down securely.

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”.

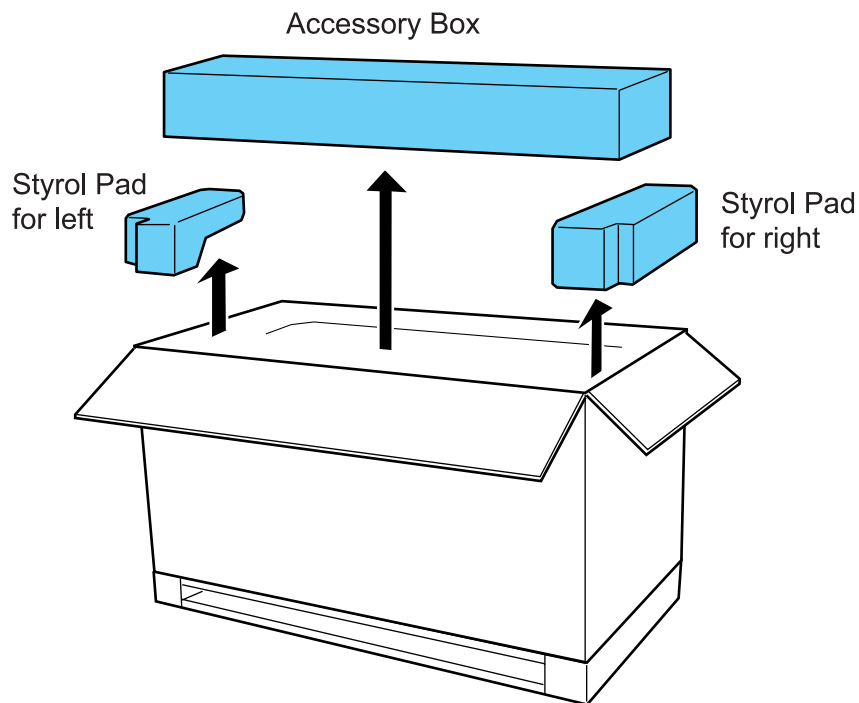


ASSEMBLING THE PRINTER BODY

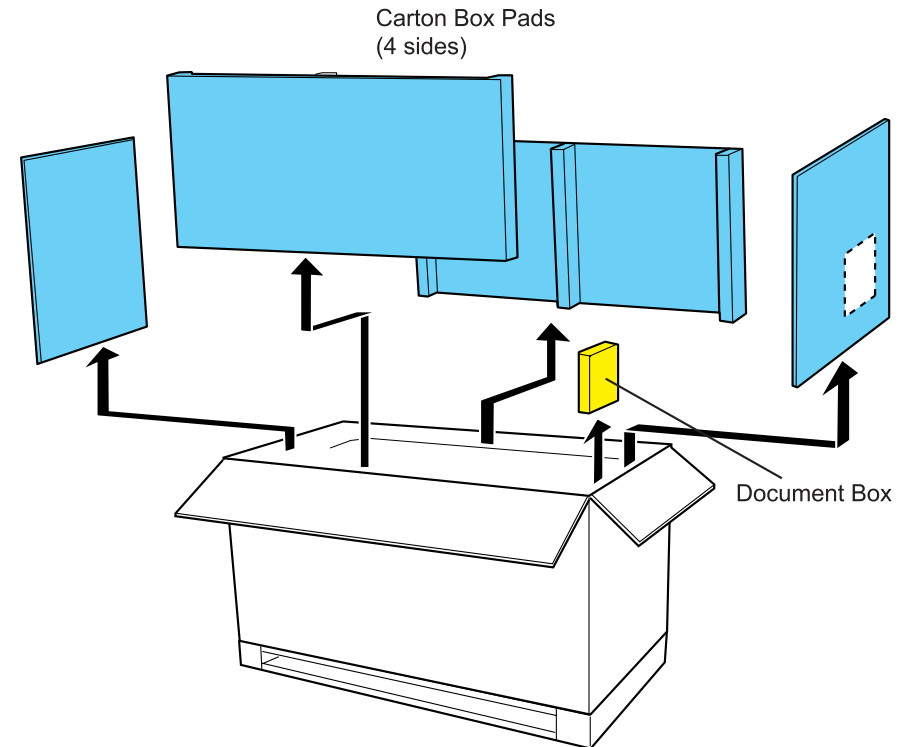


- When lifting or moving the printer body, make sure to do so with at least 4 people. (The printer weighs approximately 74kg.)
- When removing the large box, be sure that there is enough space overhead. (2 meters of clearance is required.)

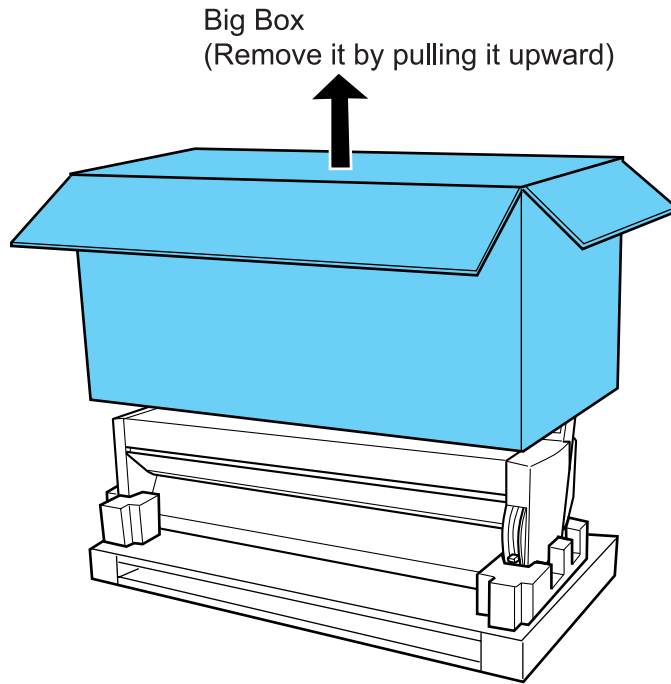
1. Open the large box by cutting the center of the sealed tape and take out the Accessory Box, two spindles and two styrol pads protecting the printer body on the right and left.



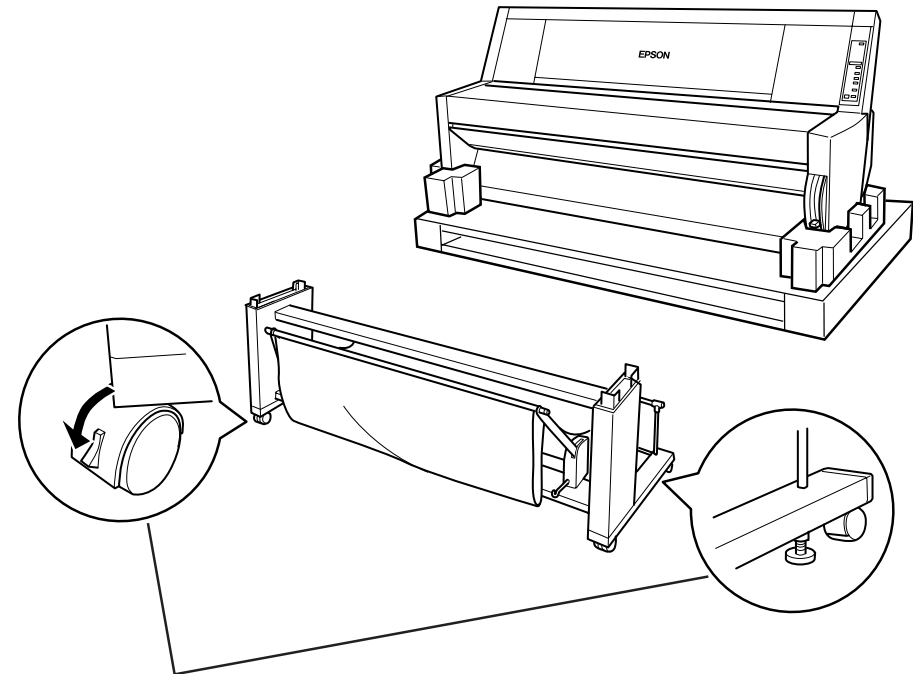
2. Take out the four box panels, one on each side of the box and remove the Documentation box.



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.

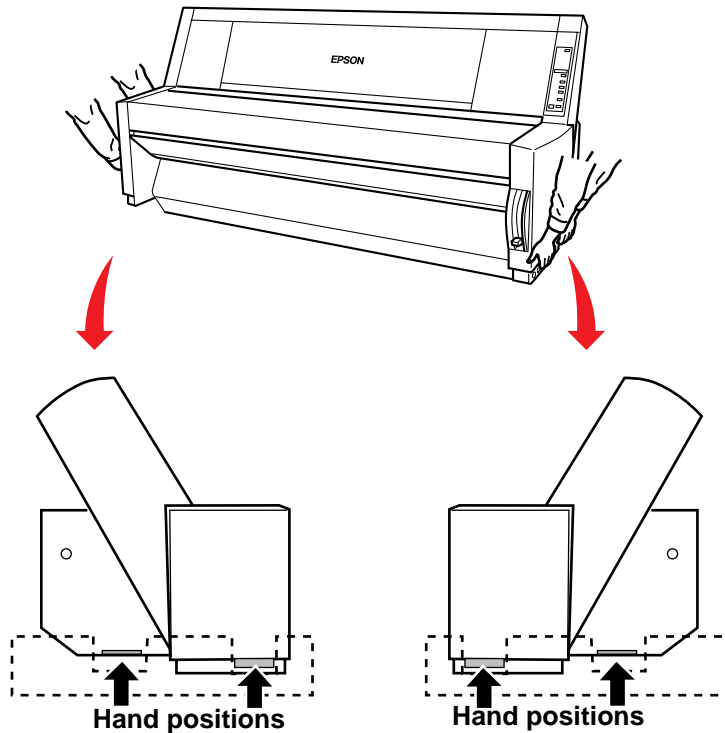


Leg parts
(Lock the casters and
fix the leveling screws)

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



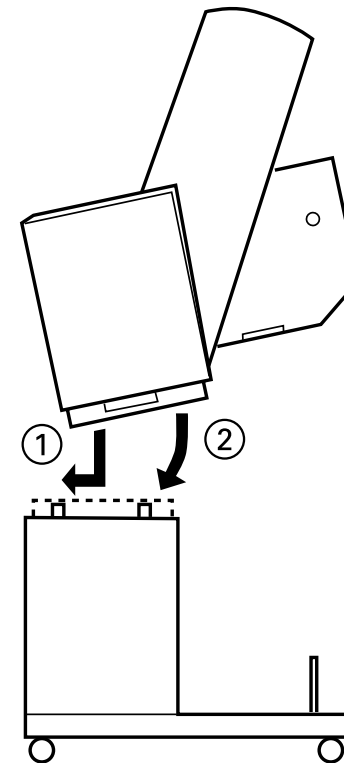
Lifting the printer requires four people, and all four people need to lift the printer by the hand position while supporting/steadying the printer with their free hands.



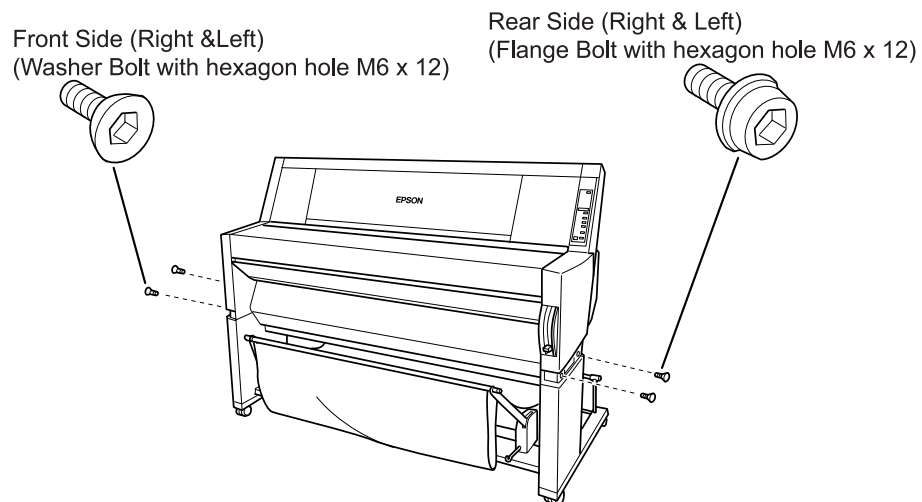
6. To set the printer on the stand, tilt the printer forward and slide the front-bottom section of the printer under the hooks on both sides of the top of the stand. Then carefully lower the rear of the printer so the pegs fit correctly into the holes in the printer.



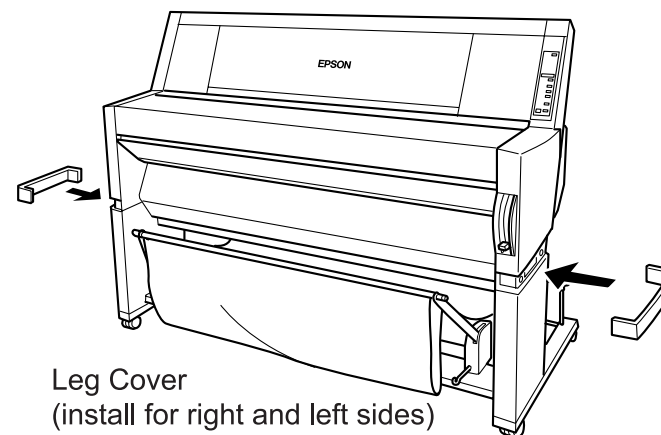
**After setting the printer body on the stand correctly, at least one person needs to support the printer body to make sure it does not fall to the rear.
(Once the bolts in step 6 are secured, you no longer need to support the body.)**



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)



CHAPTER

7

APPENDIX

7.1 Wiring Diagrams

The following illustration shows the connection between the printer mechanism and the electrical circuits.

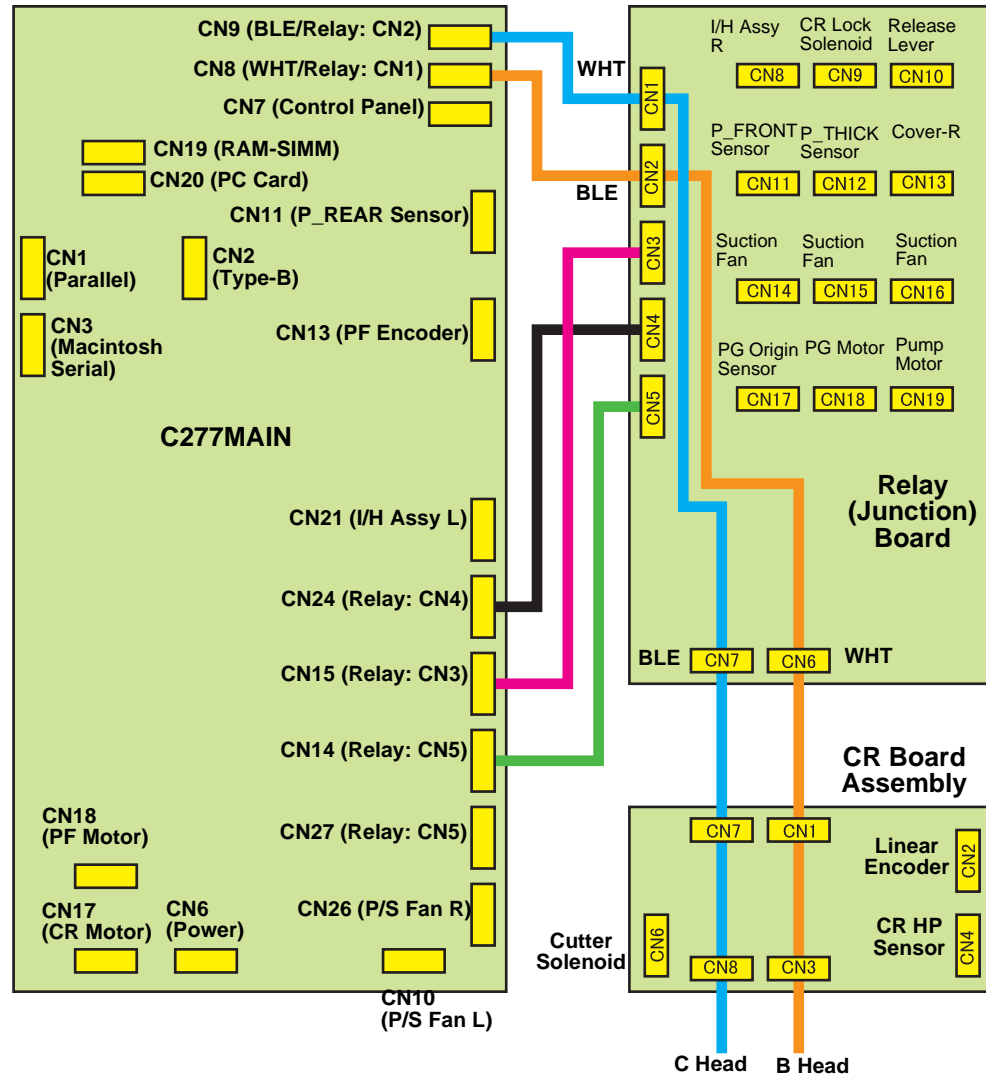


Figure 7-1. Stylus Pro 9000 Wiring Diagram

Table 7-1. 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 7-1. 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	

7.2 Parts List

Table 7-2. 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 7-2. 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 7-2. 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 7-2. 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	PRINT HEAD,IJ192-0AE	1
PRINTER MECHANISM	304	1044288	HEAD TAPE CABLE	2
PRINTER MECHANISM	305	F055040	PRINT HEAD,IJ192-0AD	1
PRINTER MECHANISM	306	1044290	P EDGE ASSY	1
PRINTER MECHANISM	307	1044291	HEAD ADJUSTOR A	2

Table 7-2. 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	SOLOINOID SPRING	1
PRINTER MECHANISM	311	1044295	CUTTER SOLOINOID 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 7-2. 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 7-2. 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 7-2. 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 7-2. 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 7-2. 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 7-2. 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 7-2. 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 400990 3	UNPACKING SHEET	1	
PACKING MATERIAL	NON FIG 401022 1	SUPPLEMENT	1	

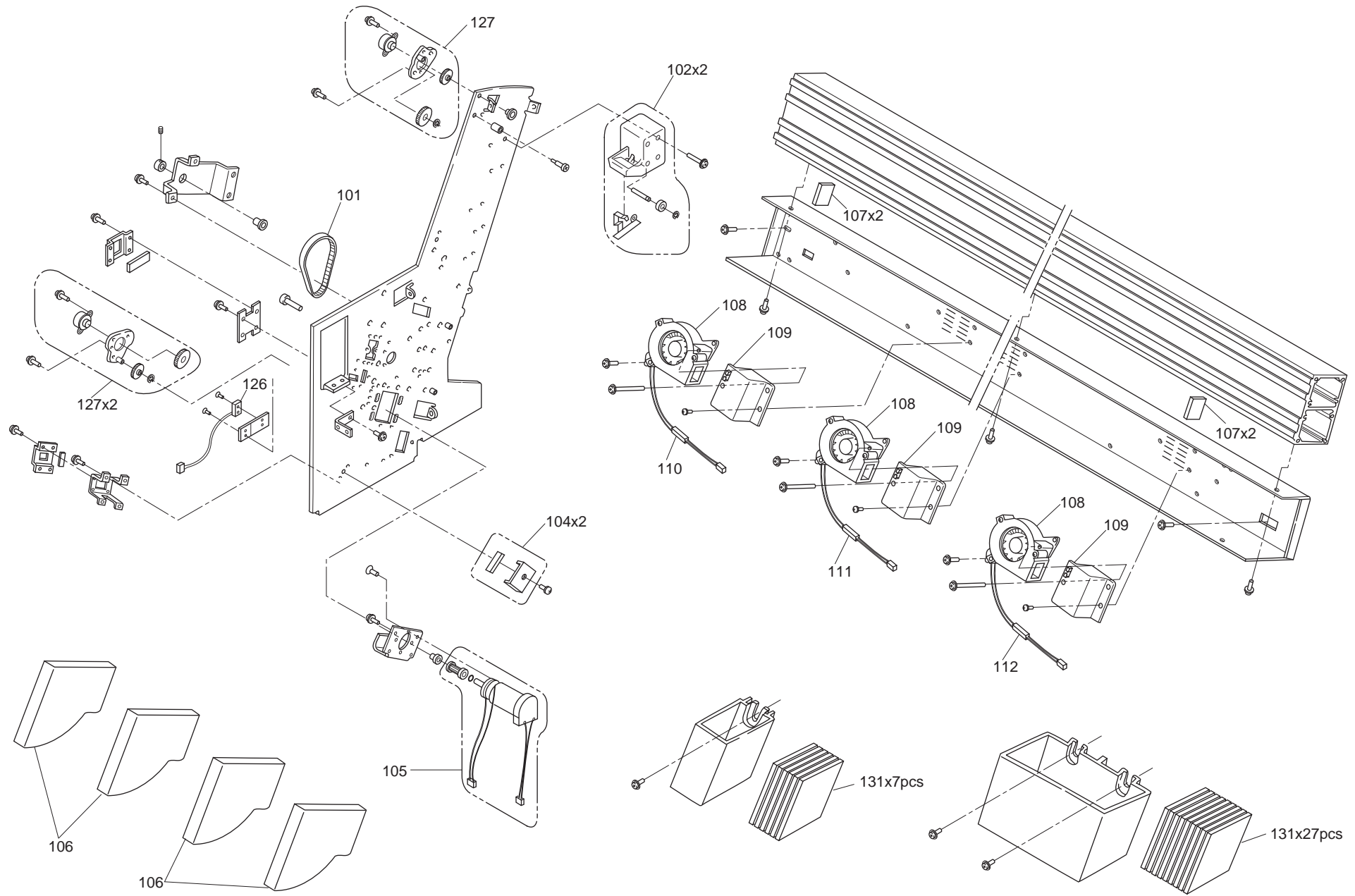
7.3 Exploded View Diagram

The illustrations in the following pages show the printer components and arrangement. The part numbers in the illustrations refer to the illustration numbers in Table 7-2, page 161.

- 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

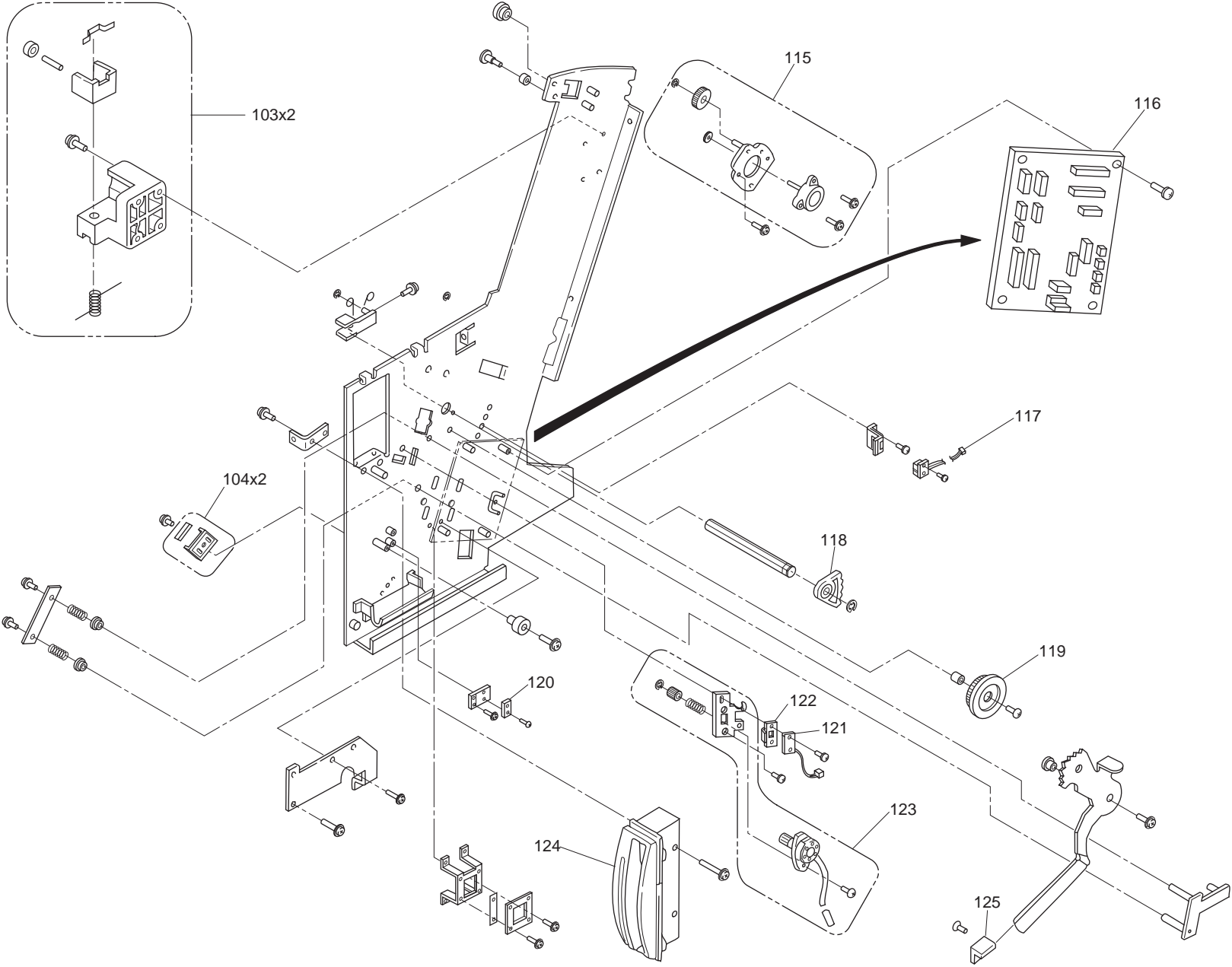
PF L Frame Assy, Fan Bracket Assy

CAT 5001



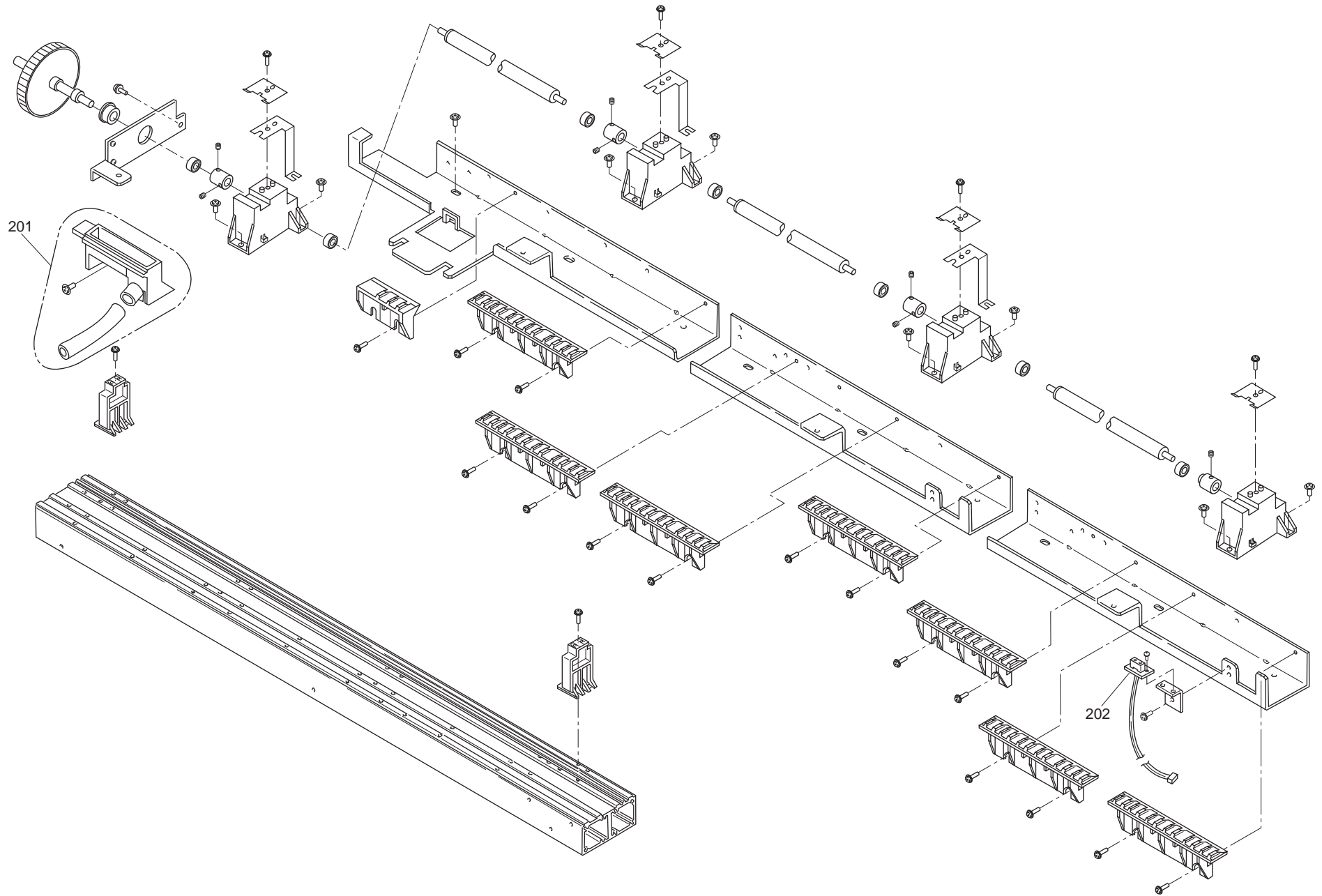
R Frame Assy

CAT 5002



PF Role Assy

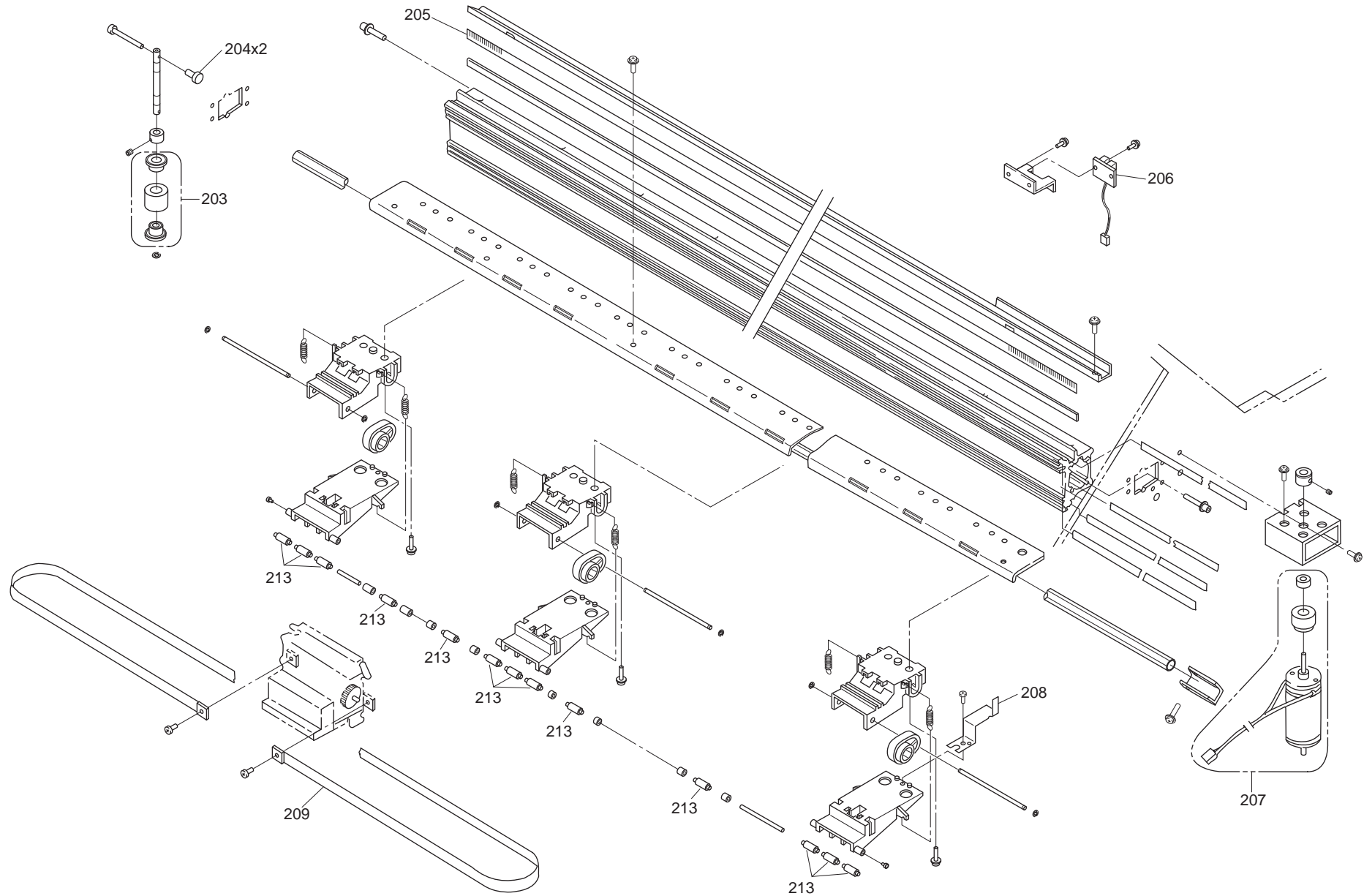
CAT 5003



STYLUS PRO 9000 / PM-9000C No.3
Rev.01 10052

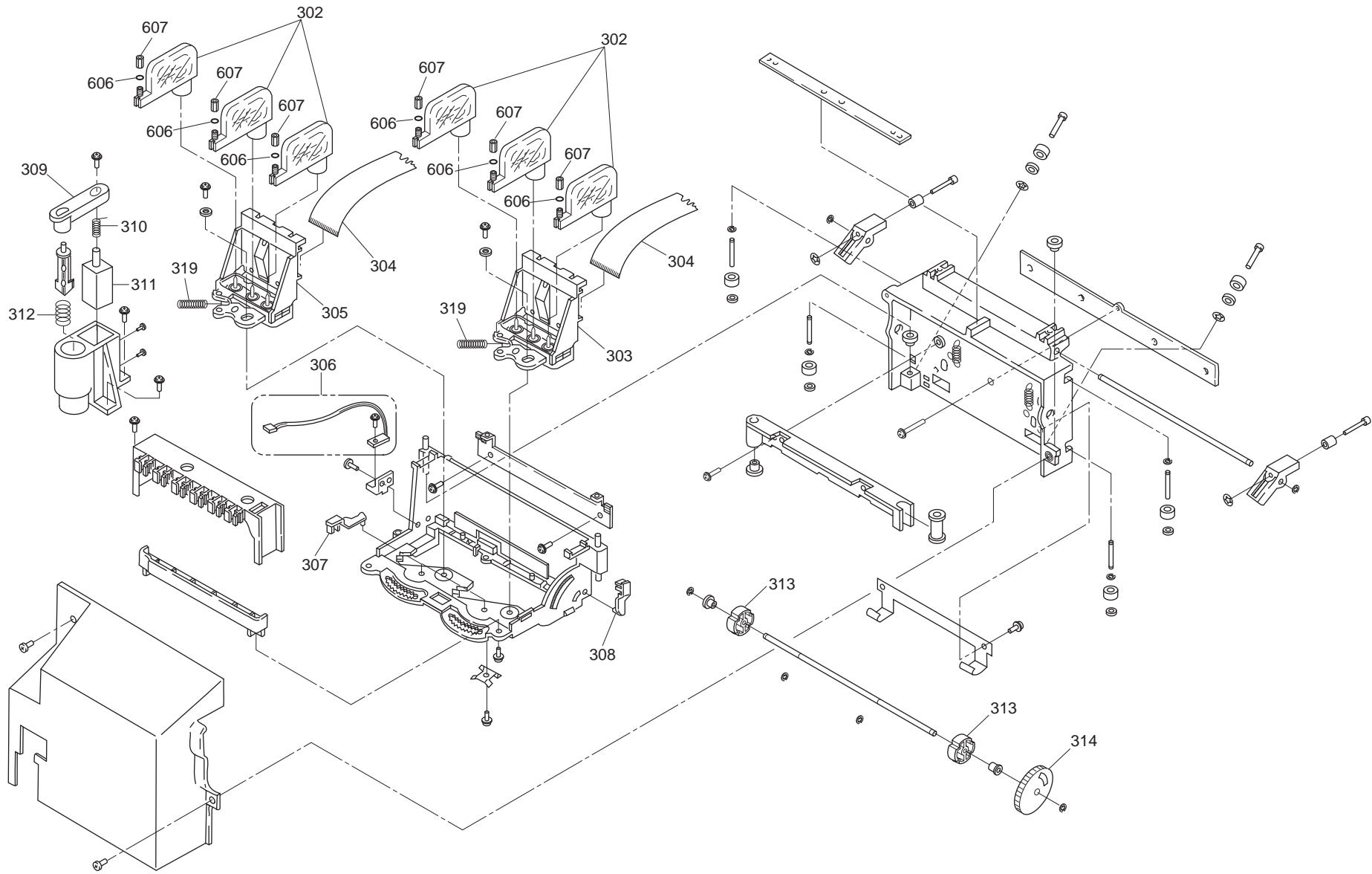
CR Role Assy

CAT 5004



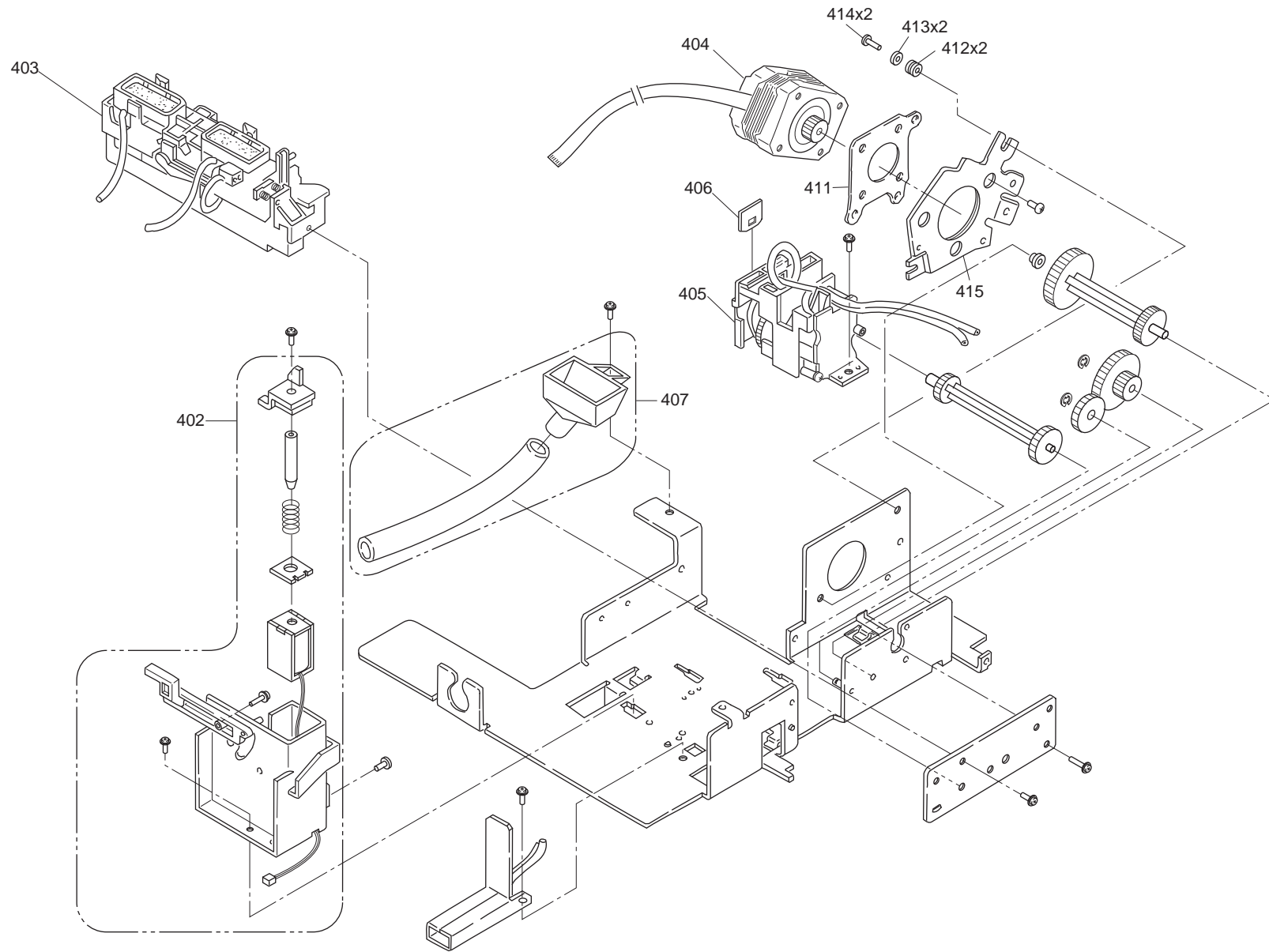
Carriage Assy

CAT 5005



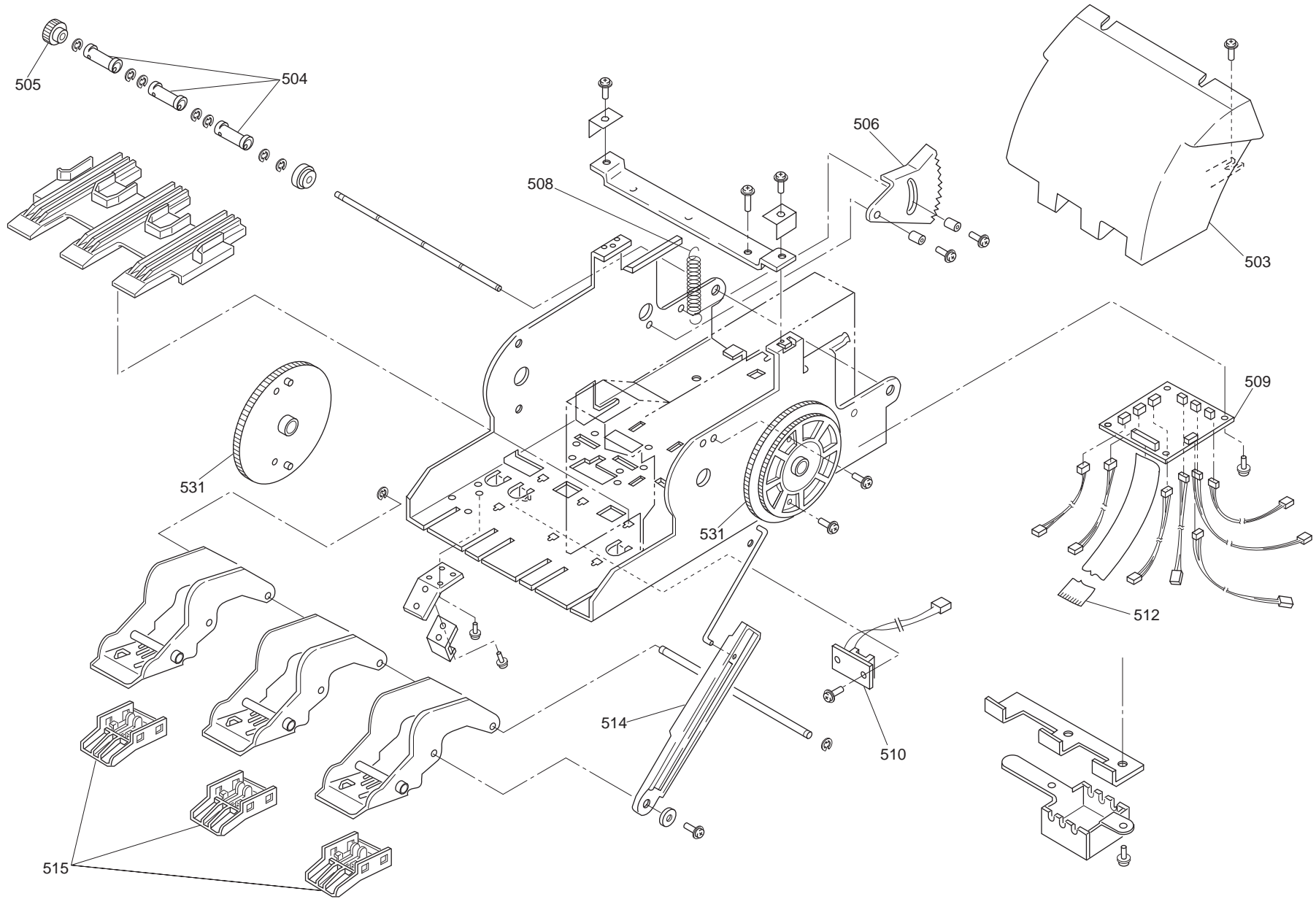
Mente Assy

CAT 5006



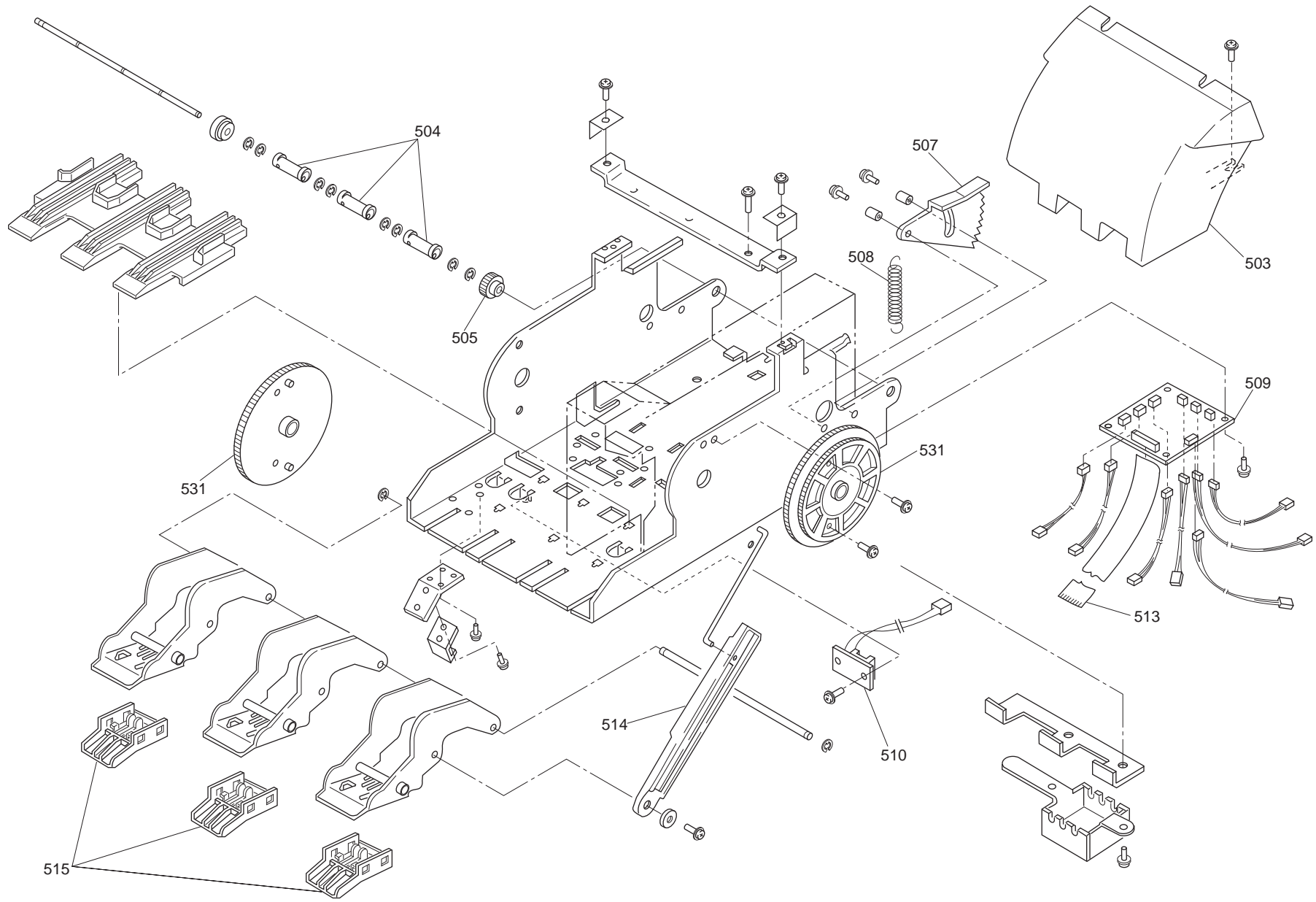
IH Assy(1) Left

CAT 5008



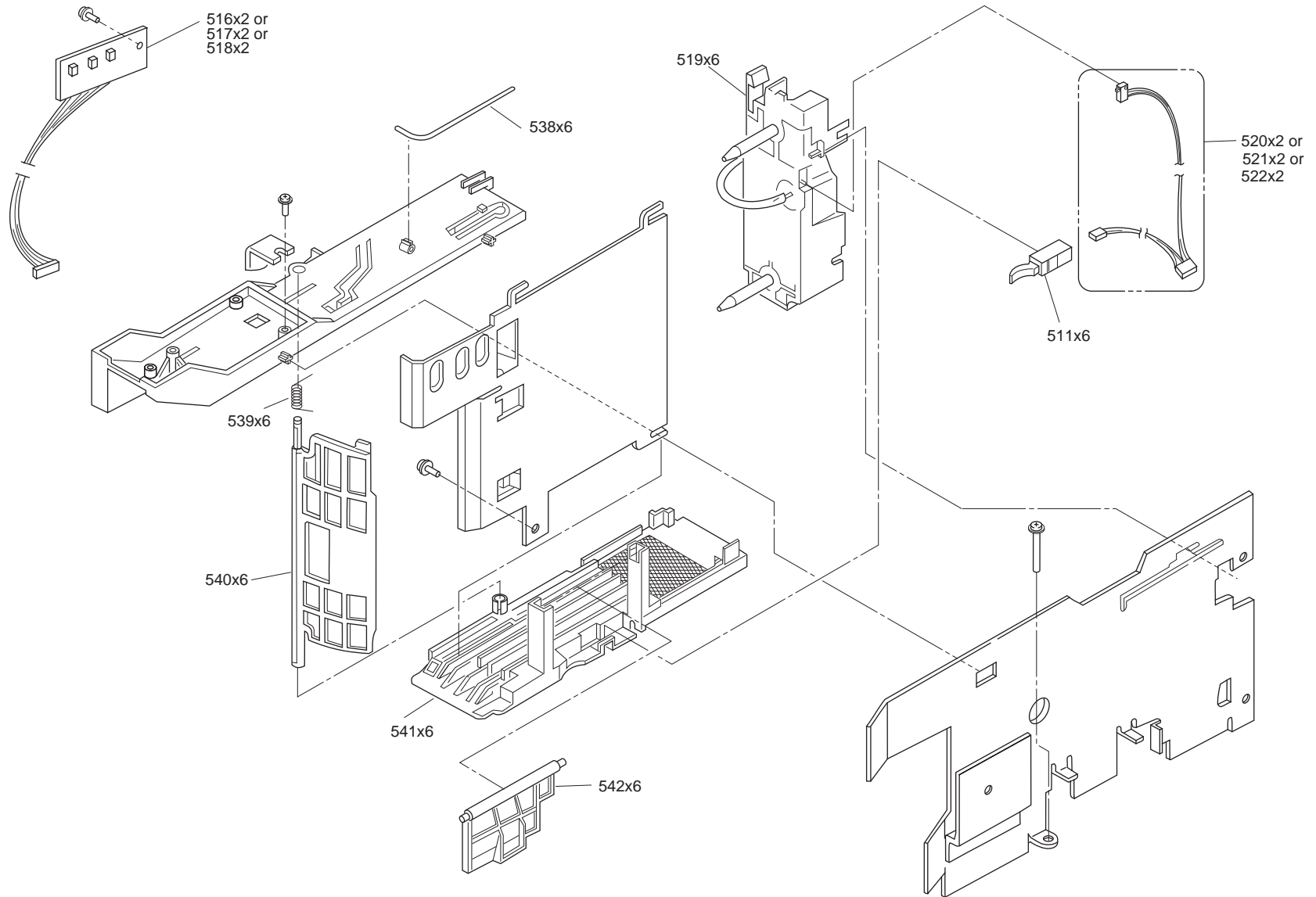
IH Assy(1) Right

CAT 5007



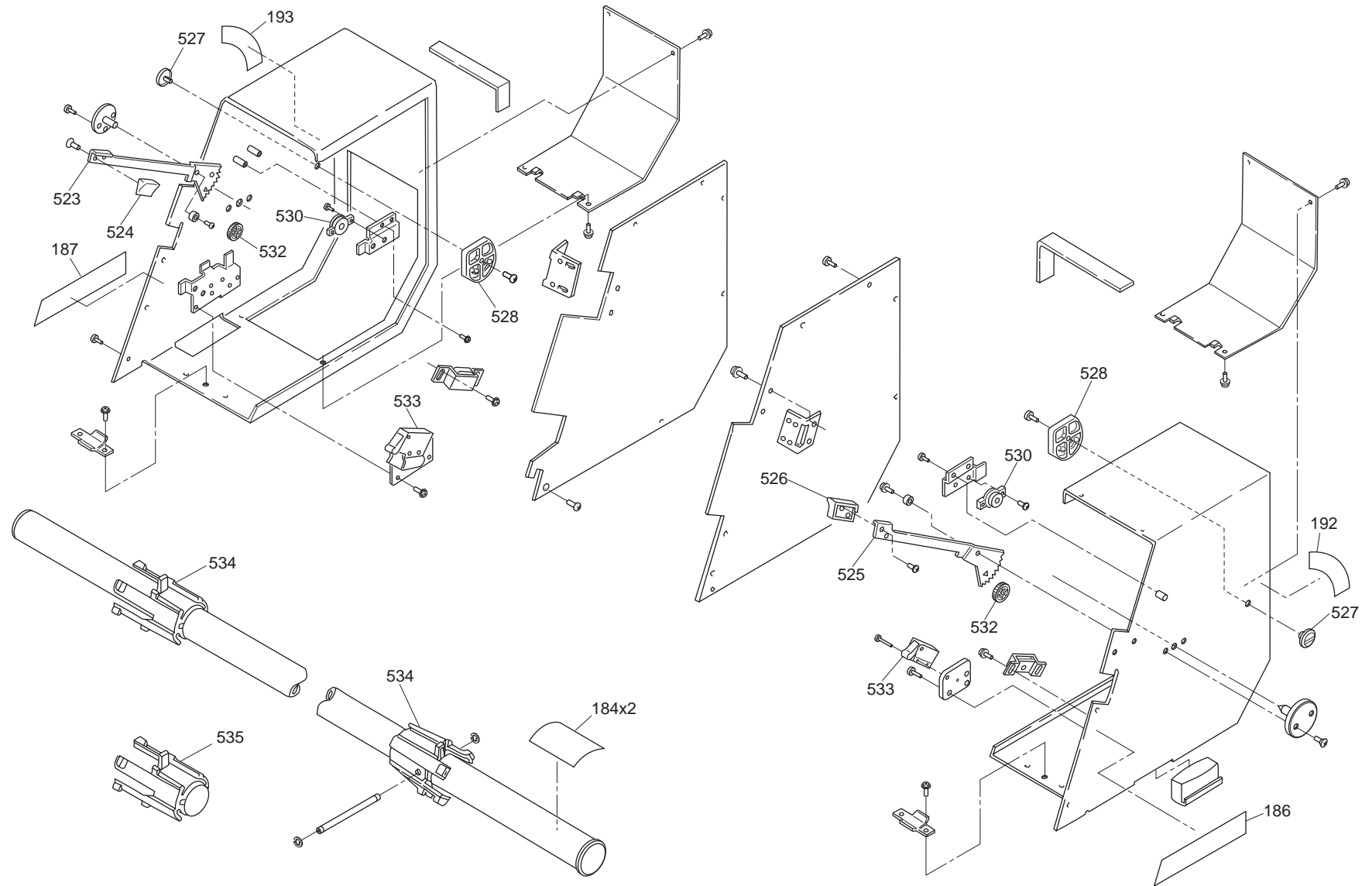
IH Assy(1) IH assy

CAT 5008



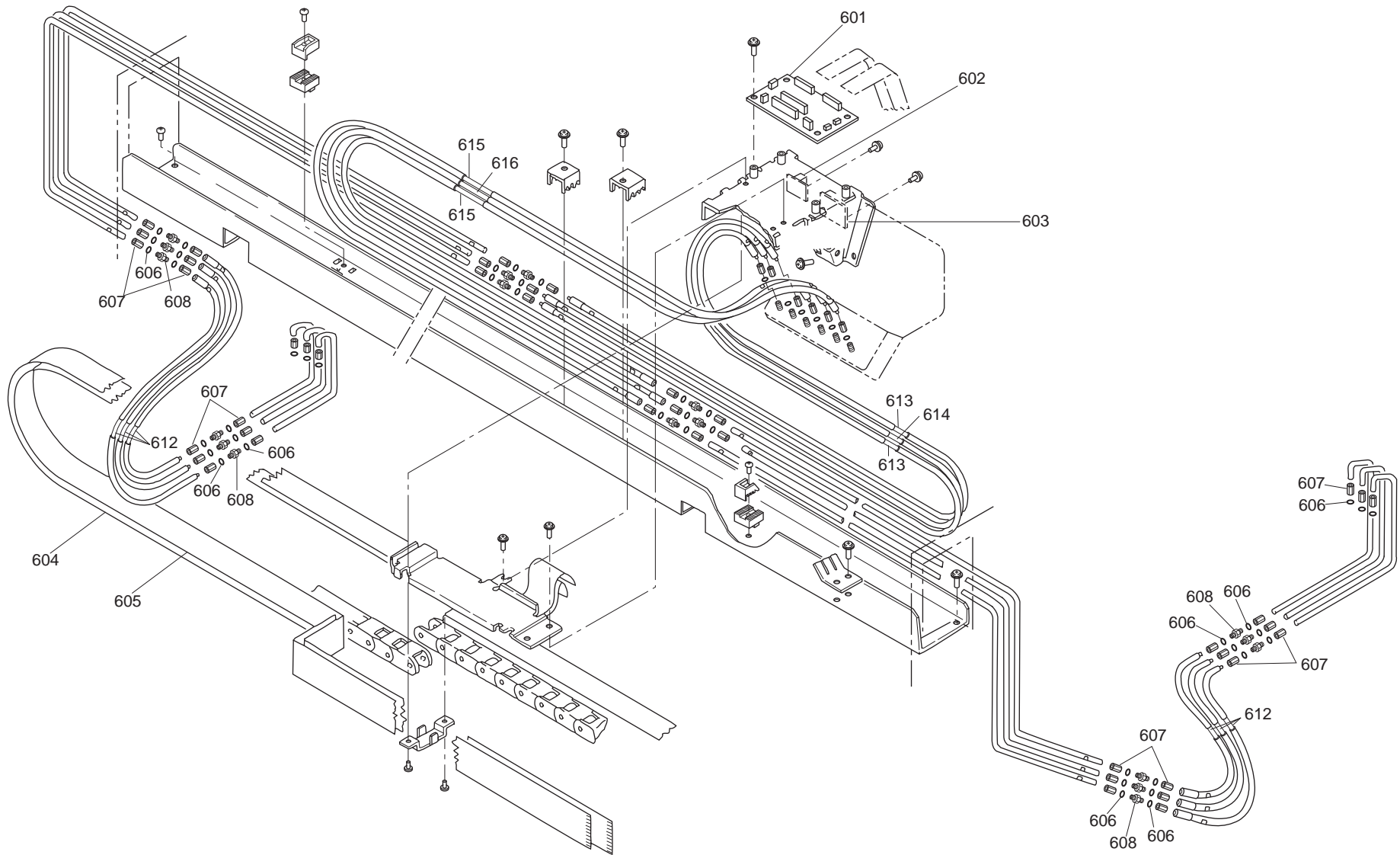
I/H Assy(2)

CAT 5009



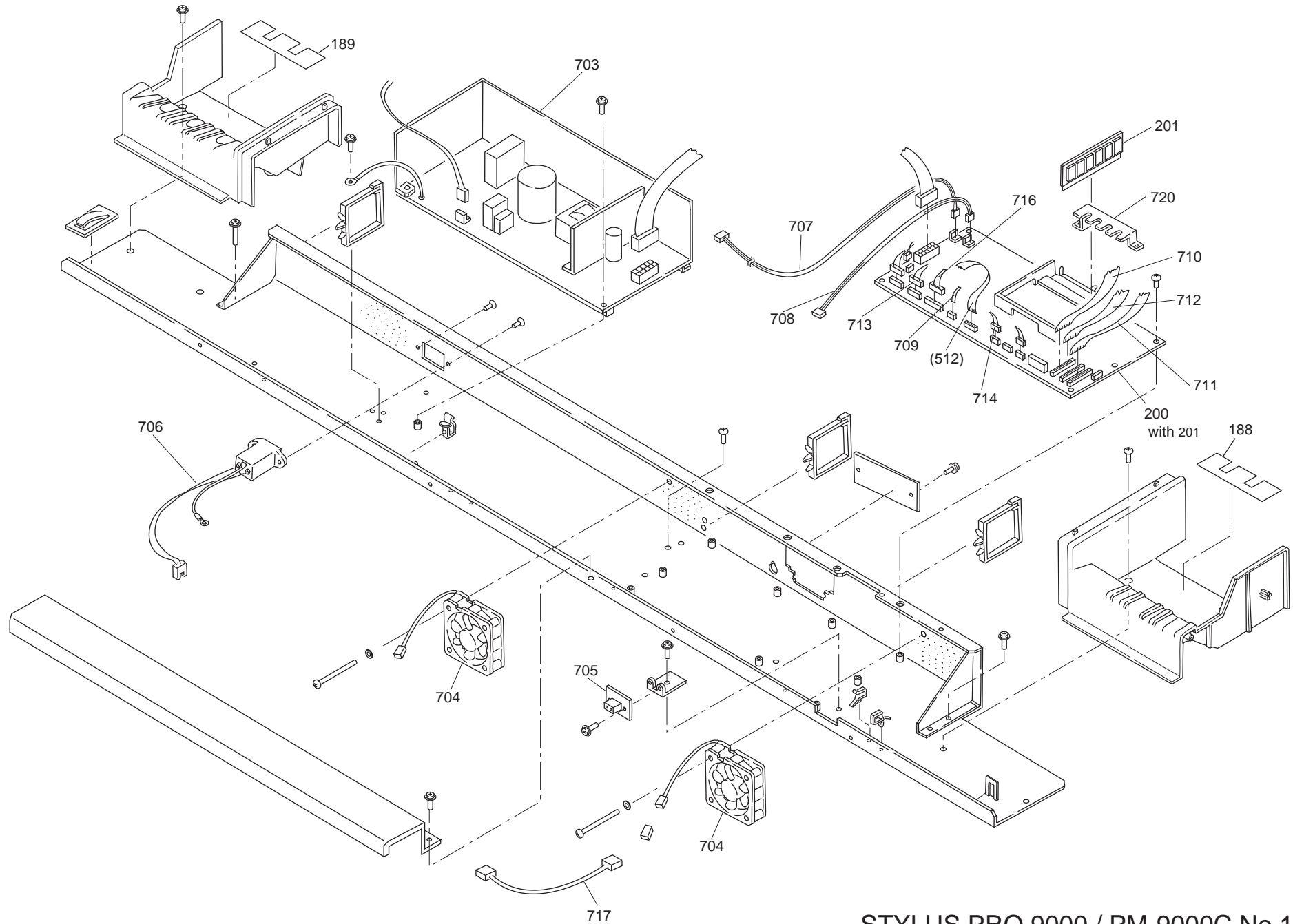
Tube Assy

CAT 5010



Board Assy

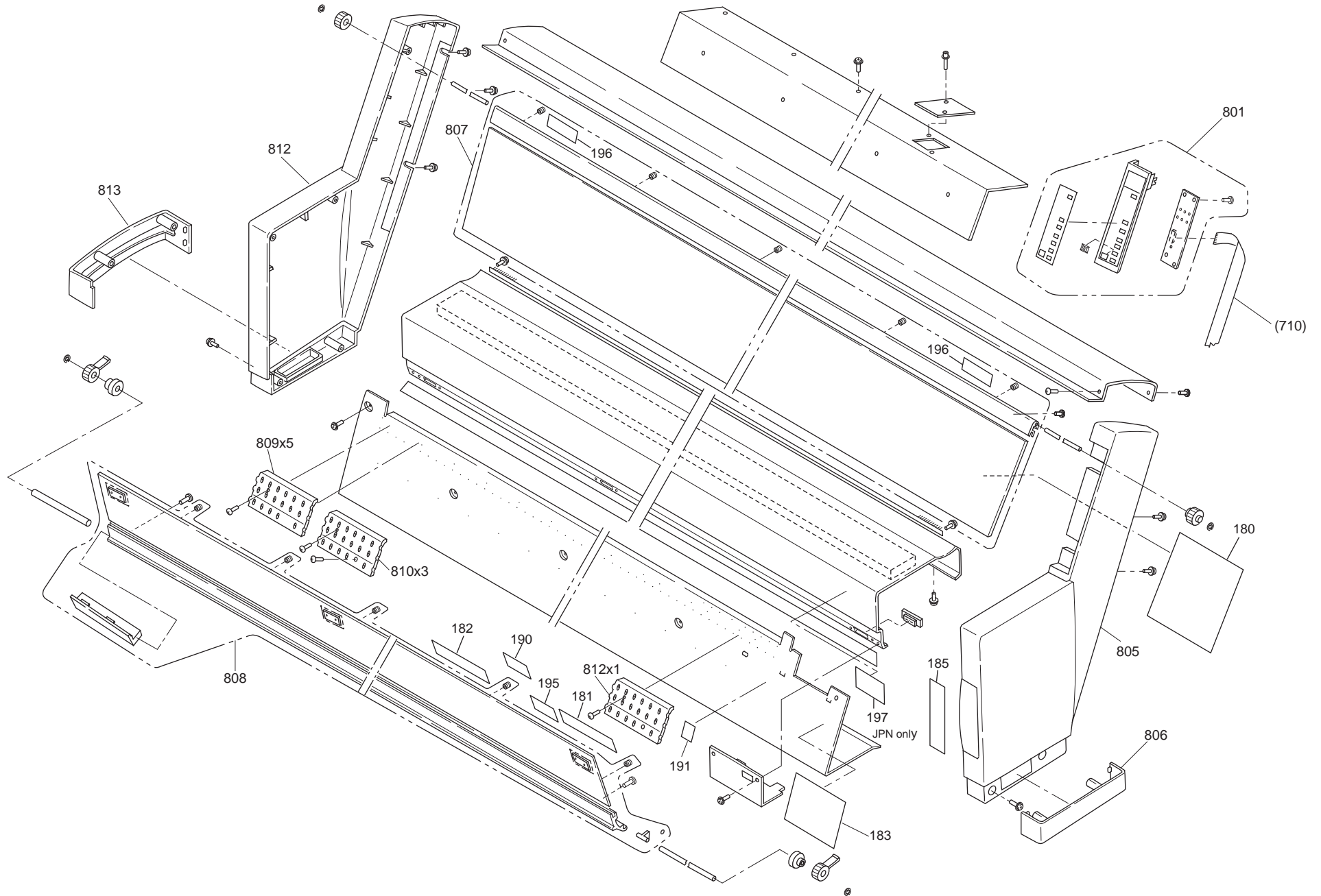
CAT 5011



STYLUS PRO 9000 / PM-9000C No.12
Rev.01 10052

Cover Assy

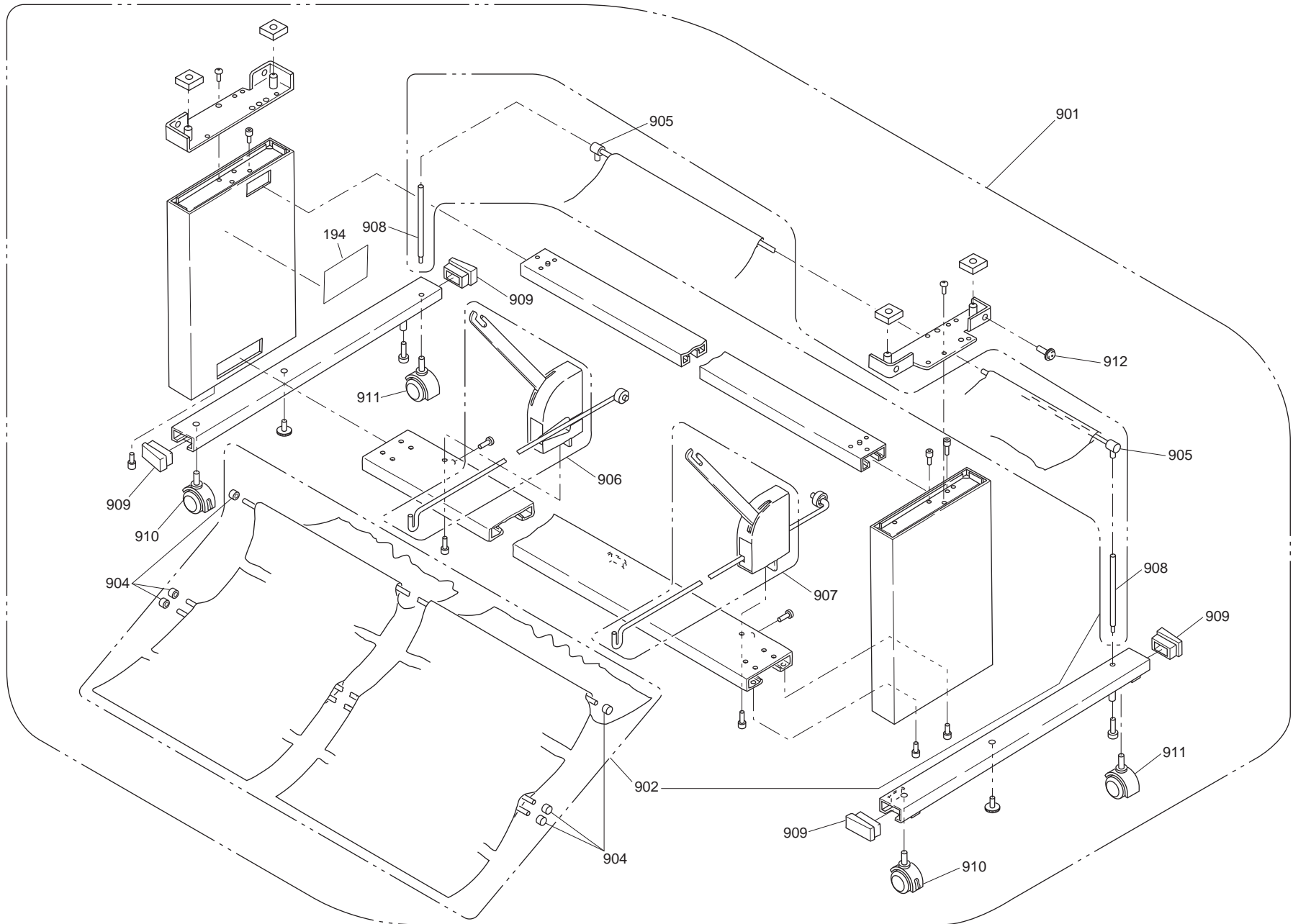
CAT 5012



STYLUS PRO 9000 / PM-9000C No.13
Rev.01 10052

Stand Assy

CAT 5013



7.4 Component Layout

The illustrations below show the C277MAIN Board component layout.

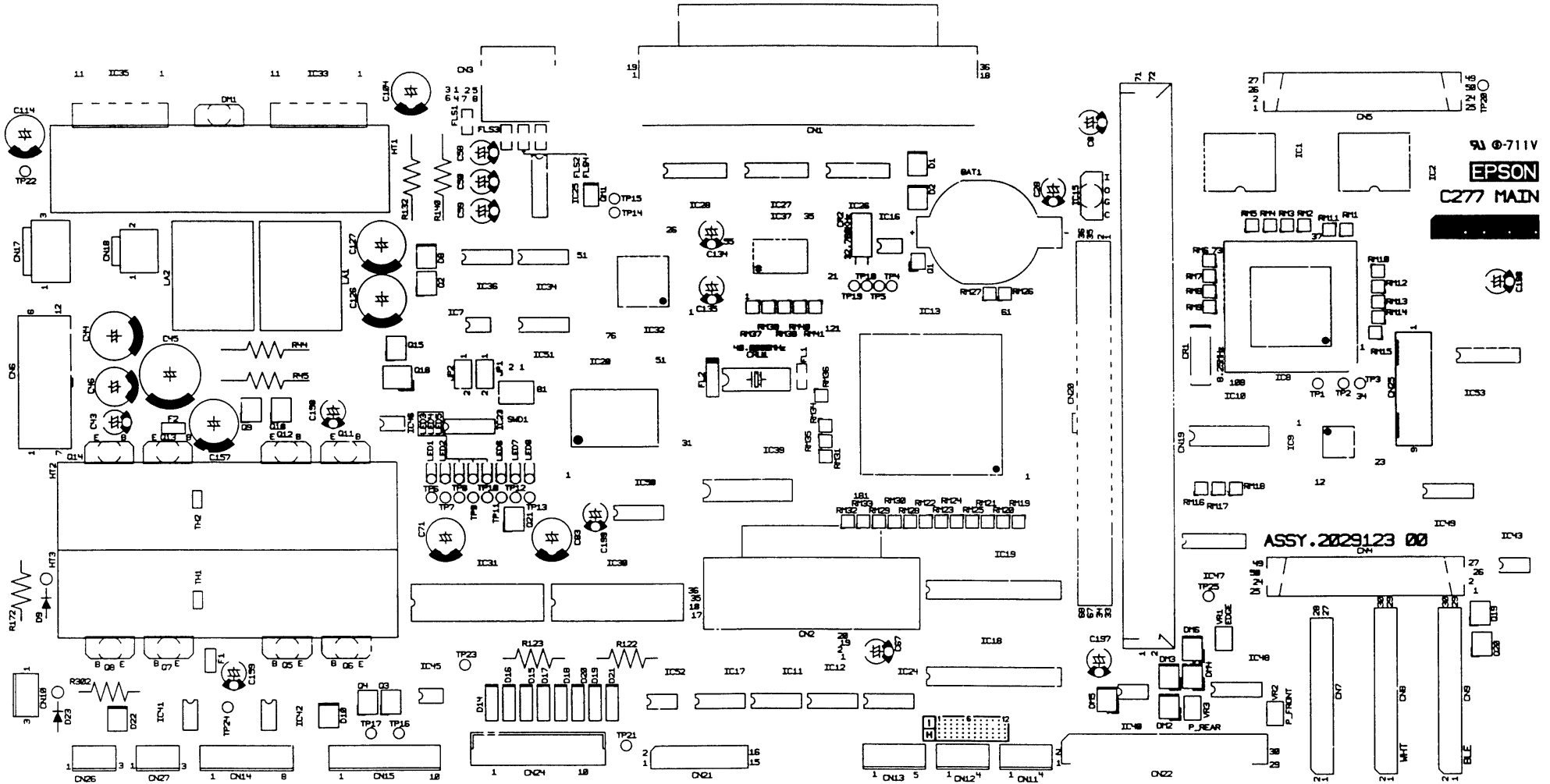


Figure 7-2. C277MAIN Board Component Layout of Component side

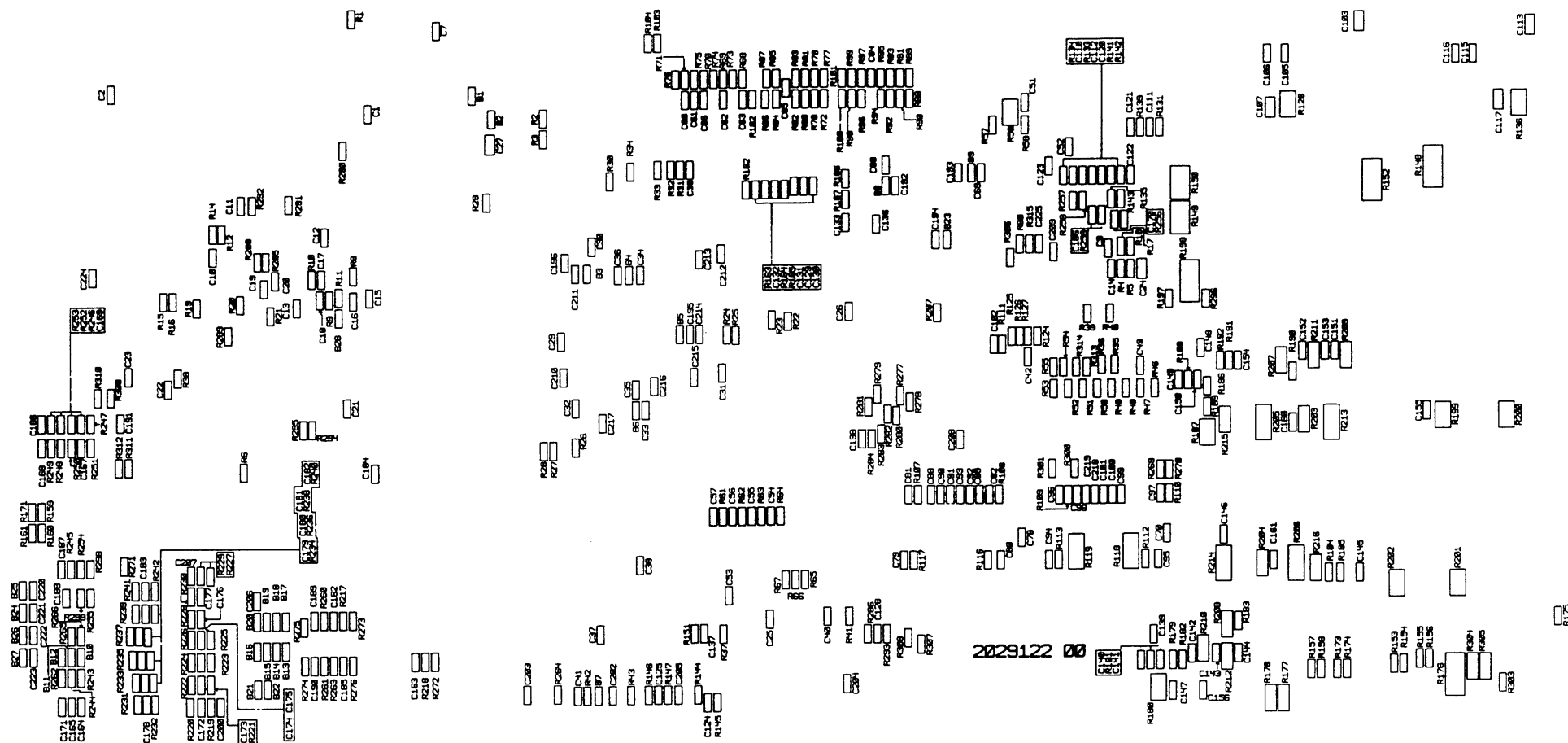
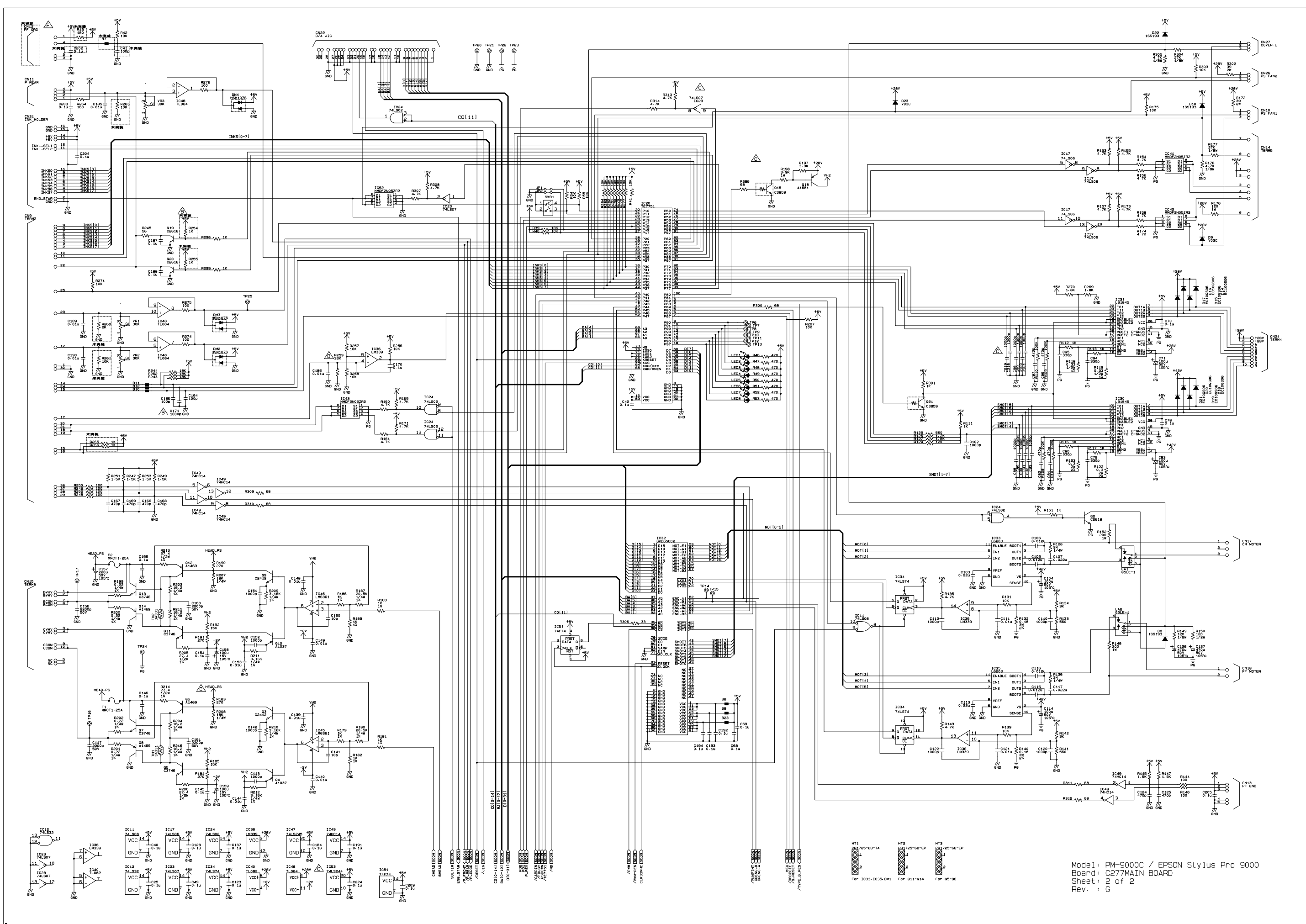


Figure 7-3. C277MAIN Board Component Layout of Soldering Side

7.5 Circuit Diagrams

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

- C277MAIN (1/2)
- C277MAIN (2/2)



Model: PM-9000C / EPSON Stylus Pro 9000
 Board: C277MAIN BOARD
 Sheet: 2 of 2
 Rev.: 6