SERVICE MANUAL

Color Ink Jet Printer
EPSON Stylus Pro 5000

4008867

NOTICE

PRECAUTIONS

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

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

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

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

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NOWORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIER WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.
3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

WARNING

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

PREFACE

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of Stylus Pro5000. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page. The chapters are organized as follows:

CHAPTER 1.   PRODUCT DESCRIPTIONS

Provides a general overview and specifications of the product.

CHAPTER 2.   OPERATING PRINCIPLES

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

CHAPTER 3.   TROUBLESHOOTING

Provides the step-by-step procedures for troubleshooting.

CHAPTER 4.   DISASSEMBLY AND ASSEMBLY

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

CHAPTER 5.   ADJUSTMENTS

Provides Epson-approved methods for adjustment.

CHAPTER 6.   MAINTENANCE

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

APPENDIX

Provides the following additional information for reference:
• Connector pin assignments
• Electric circuit boards components layout
• Exploded diagram
• Electrical circuit boards schematics

REVISION STATUS

Rev.	Date	Page(s)	Contents
A	1998/01/23	All	First release
B	1998/03/10	4-68~4-93 4-8 4-59 4-60 Chapter4	• Added "Disassembly and Assembly for ASF Unit". • Modified flow chart for disassembling the mechanism according to addition of "Disassembly and Assembly for ASF Unit". • Added "CAUTION". • Added sentences to "CHECKPOINT". • Word "phase" is replaced by "alignment".

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PRODUCT DESCRIPTION

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PRODUCT DESCRIPTION

1.1 FEATURES

EPSON Stylus Pro 5000 is a 6-color ink jet printer , which can output colors for the professional level. Major features are following.

❑ Professional color print quality
- 1440(H) x 720(V) dpi printing at the highest resolution setting.
- Photo reproduction quality(6 color printing, C.M, Y, K, LC, LM)
- By micro dot + super micro dot, super fine printing equivalent to Comoro Wide is available.
- PostScript printing(option)

❑ High speed printing
- Color 360 dpi A4:   1.1 PPM
- Color 720 dpi A4:   0.39 PPM

❑ Built in 3 types of interfaces
- Bi-directional parallel interface (IEEEP1284.4/ECP support)
- Mac. Serial interface(up to approx. 1.8M bps)
- Type-B interface (SIM for copying up to approx. 98M is available to install on the same board;C228 main board)

❑ Low running cost
- Long life ink cartridge;
  Black: 3200 papers, Yellow: 3200 papers, Cyan/Magenta:3000 papers
  (5% ECOMA duty printing)

  Note) Cyan/Magenta ink is united as one, which light color and ordinary color ink are separated. The reason why that ink life span is not so different from others even though they are separated is that users are usually unable to perform printing which require strict separation of light color and ordinary color. Therefore, since light color and ordinary color inks are adjusted to be used alternately on the application, the life span of Cyan/Magenta does not become simply half life span of the other inks.

- Independent 4 colors ink cartridges: Black, Yellow, Cyan including with light cyan, Magenta including light magenta.
- Ink quantity sensor.
  Note) After ink near end is detected by the mechanical switch, the firmware counts the determined absorbing quantity.

❑ Paper handling
- Double bin ASF(second bin option)
- Manual feeding from the top cover of first bin and from the rear with opened rear cover.
- Paper volume for ASF/Paper size sensor/Paper type sensor
  Note) Those sensors do not work correctly, if users set the paper size or media type lever wrong.
- Increased paper loading capacity in the paper tray (55 g/m^2 250 cut sheets/ Standard, option ASF)

❑ Windows/Macintosh exclusive

Following table shows optional items for Stylus Pro 5000.

✓**CHECK POINT**   *Since there are many kinds of exclusive papers, please refer to "Special Media" on the Reference Guide for Stylus Pro 5000.*

Table 1-1. Optional Items and Available Consumable

Name	Remark	Code No.
Ink cartridge	Black ink cartridge	S020118
	Cyan (including light cyan)	S020147
	Magenta(including light magenta)	S020143
	Yellow	S020122
Paper tray unit	B5 ~A3 (55g/m^2:250 sheet)	C81275*(lower paper cassette) C81276*
Exclusive Paper	Refer to the reference guide	---
SIMM memory	Max.96MB(32MB x3), 72 pins	---
Type-B I/F Card	32KB Serial interface card	C82307*/C82308*
	LocalTalk^{TM} interface card	C82312*
	Co-ax interface card	C82314*
	Twin-ax interface card	C82315*
	Ethernet interface card	C82357*
	Bi-directional Parallel interface card	C82345*

*Note) *The asterisk is a substitute for the last digit, which varies by country.

1.2 SPECIFICATIONS

PRINTING SPECIFICATION

❑ Print method: On demand MACH ink jet
❑ Nozzle configuration   Black - 64 nozzles
                         Color(5 colors) - 64 nozzles for each
                         color(total: 320 colors, Y, M, C, LM, LC)
❑ Print direction   Bi-direction with logic seeking
❑ Print speed   See the tables below

Table 1-2. Character Mode

Item	Content
Character quality	High quality
Character pitch	10 CPI (Pica)
Printable columns	127 columns
LQ speed	200 CPS*

Note*) This value is the speed of one print-pass in which the ¼ of character matrix is printed.

Table 1-3. Raster Graphics Mode

Horizontal Resolution	Printable Area	Available dot	CR speed (IPS)
360 dpi	323mm(12.7 inch)	4578	20 IPS
720 dpi	323mm(12.7 inch)	9156	20 IPS

Note) 20 IPS is equivalent to 200 CPS at printing 10 CPI.

CHARACTER SPECIFICATION

❑ Character tables: 2 international character sets;
                        PC437(US, Standard Europe)
                        PC850(Multilingual)
❑ Type face: Bit map LQ font
                        EPSON courier   10 CPI

CONTROL CODE

❑ ESC/P Raster
❑ EPSON Remote command

PAPER FEED SPECIFICATION

❑ Feeding method: Friction feed with ASF
❑ Line spacing: 1/6 inch or programmable at 1/360 inch
❑ Paper path: Cut-sheet ASF
❑ Paper feeding: Standard cassette, optional lower paper
                        cassette, front manual feeding, rear manual
                        feeding.(All friction feeding)
❑ Feed speed   79 ms. (1/6 inch paper feeding)
                        6 inch/sec.(Continuous paper)

PAPER SPECIFICATION

Table 1-4. Cut sheet specification

Item	Remark
Paper size	•Super A3 327 mm(W) x 483 mm(L) •A3 297 mm(W) x 420 mm(L) •A5 148mm(W) x 210 mm(L) •B4 257 mm(W) x 364 mm(L) •Letter 216 mm(W) x 279 mm(L) •A4 210 mm(W) x 297 mm(L) •B5 182 mm(W) x 257 mm(L) •Legal 216 mm(W) x 356 mm(L) •Statement 139.7 mm(W) x 215.9 mm(L) •Exclusive 190.5 mm(W) x 254 mm(L)
Thickness	0.08 mm(0.003") ~ 0.11 mm(0.004")
Weight	64 g/m^2 (17lb.) ~ 90 g/m^2 (24lb.)
Quality	Exclusive paper, Bond paper, PPC, Special papers.
Paper	•Regular plain paper •EPSON Photo Quality Ink Jet Paper •EPSON Photo Paper
Note1) No curled, wrinkled, scuffing or torn paper be used.	

Table 1-5. Transparency and Glossy film and paper specification

Item	Remark
Paper size	•Super A3/B 13"(W) x 19"(L) •A3 297 mm(W) x 420 mm(L) •A4 210 mm(W) x 297 mm(L) •Letter 216 mm(W) x 279 mm(L) •A6 105 mm(W) x 148 mm(L)**
Thickness	0.075 mm(0.003") - 0.085 mm(0.0033")
Paper	•EPSON Photo Quality Glossy Film •EPSON Photo Quality Glossy Paper •EPSON Ink Jet Transparencies
Note) Transparency printing is only available at normal temperature. *Note**)*Glossy film only.	

Table 1-6. Index card specification

Item	Remark
Size	•A6 Index card: 105 mm(4.1")(W) x 148 mm(5.8")(L) •5x8" Index card 127 mm(5.0")(W) x 203 mm(8.0")(L) •10x8" Index card 127 mm(5.0")(W) x 203 mm(8.0")(L)
Thickness	Less than 0.23 mm(0.0091")
Paper	•EPSON Photo Quality Ink Jet Card •EPSON Photo Card

Table 1-7. Envelope specification

Item	Remark
Size	•No.10 241 mm(9 1/2")(W) x 104.8 mm(4 1/8")(L) •DL 220 mm(8.7")(W) x 110 mm(4.3")(L) •C6 162 mm(6.4")(W) x 114 mm(4.5")(L)
Thickness	0.16 mm(0.006") - 0.52 mm(0.02")
Weight	45 g/m^2 (12lb.) - 75 g/m^2 (20lb.)
Quality	Bond paper, Plain paper, Air mail
Note) Envelope printing is only available at normal temperature. *Note)* Keep the longer side of the envelope horizontally at setting.	

INK CARTRIDGE

Table 1-8. Black, Yellow Ink Cartridge

Item	Specifications
Type	Exclusive ink cartridge
Color	Black, Yellow
Print capacity	3200 pages/A4 (360 dpi, ECOMA 5% duty)
Validity	2 years from production date(sealed in package, or being installed to the printer)
Environmental conditions	•Transit: $-30°C \sim 60°C$ (within 120 hours at 60°C, and within a month at 40°C) •Package storage: $-30°C \sim 40°C$ (within a month at 40°C) •Storage(installed to the printer):$-20°C \sim 40°C$ (within a month at 40°C)
Dimension	25.1 mm(W) x 139.6 mm(D) x 105.3 mm(H)
Weight	Approximately 200g

Table 1-9. Magenta and Cyan Ink Cartridge

Item	Specifications
Type	Exclusive ink cartridge
Color	Magenta +Light magenta(I/C1), Cyan + Light cyan(I/IC2)
Print capacity	3000 pages/A4 (360 dpi, 5% duty)
Validity	2 years from production date(sealed in package, or being installed to the printer)
Environmental conditions	•Transit: $-30°C \sim 60°C$ (within 120 hours at 60°C, and within a month at 40°C) •Package storage: $-30°C \sim 40°C$ (within a month at 40°C) •Storage(installed to the printer):$-20°C \sim 40°C$ (within a month at 40°C)
Dimension	35.1 mm(W) x 140.9 mm(D) x 105.3 mm(H)
Weight	Approximately 200g

Note1) Ink cartridge can not re-fill, only ink cartridge is prepared for article of consumption.
Note2) Do not use the ink cartridge which was passed away the ink life.
Note3) Ink will be frozen under -15°C environment, however it will be useable after placing it more than 3 hours at room temperature.

INPUT DATA BUFFER

❑ 6 K-byte

ELECTRIC SPECIFICATION

1) 120V version

❑ Rated voltage: AC 120 V
❑ Input voltage range: AC 99 V - 132 V
❑ Rated frequency range: 50 - 60 K Hz
❑ Input frequency range: 49.5 - 60.5 Hz
❑ Rated current: 1.0A (Max.1.6A)
                             Energy Star compliant
❑ Power consumption: Approx. 32W(ISO/IEC 10561 Letter pattern)
❑ Insulation resistance: 10 M ohms min. (between AC line and chassis, DC 500 V)
❑ Dielectric strength: AC 1000 V rms. 1 minute or AC1200 V rms. 1 second(between AC line and chassis)
❑ Sneak current: Less than 0.25 mA

2) 220-240V version

❑ Rated voltage: AC 220 V - 240 V
❑ Input voltage range: AC 198 V - 264 V
❑ Rated frequency range: 50 - 60 Hz
❑ Input frequency range: 49.5 - 60.5Hz
❑ Rated current: 0.5 A(Max.0.8 A)
❑ Power consumption: Approx. 32 W(ISO/IEC 10561 Letter pattern)
                             Energy Star compliant
❑ Insulation Resistance: 10 M ohms min.(between AC line and chassis, DC 500 V)

❑ Dielectric strength: AC 1500 V rms. 1 minute(between AC line and chassis)

RELIABILITY

❑ Total print volume: 75,000 pages (A4, letter)
❑ Print head life: 2000 million dots/nozzle

SAFETY APPROVALS

1)120 V version
❑ Safety standards: UL1950 with D3
                           CSA22.2 No.950 with D3
❑ EMI: FCC part15 subpart B class B
                           CSA C108.8 class B

2)220-240 V version
❑ Safety standards: EN 60950 (VDE, NEMKO)
❑ EMI: EN 55022 (CISPR Pub.22) class B
                           AS/NZS 3548 class B

ACOUSTIC NOISE

❑ Level: Approx.47dB(A) (According to ISO 7779)

CE MARKING

❑ 220-240 V version
  ■ Low Voltage Directive 73/23/EEC   :EN60950
  ■ EMC Directive 89/336/EEC   :EN55022 Class B
                                        EN61000-3-2
                                        EN61000-3-3
                                        EN50082-1
                                             IEC801-2
                                             IEC801-3
                                             IEC801-4

ENVIRONMENT CONDITION

❑ Temperature: Operating: 10°C ~ 35°C
                     Storage: −20°C ~ 40°C
                     Non-operating: −20°C ~ 60°C
Note) Within 1 month at 40°C, within 120 hours at 60°C

❑ Humidity: Operating: 20% ~ 80% RH (without condensation)
                     Storage: 20% ~ 85% (without condensation)
                     Non-operating: 5% ~ 85% (without condensation)
Note) Refer to the figure below.
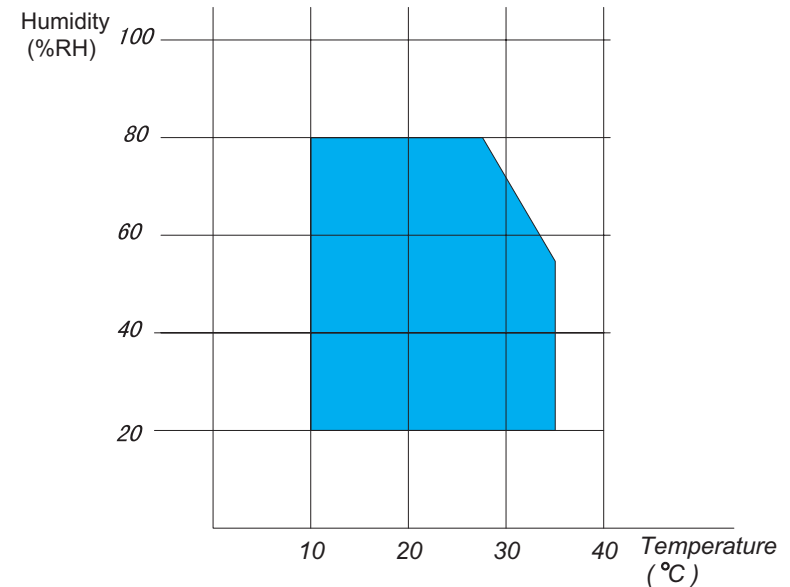

Figure 1-1. Temperature/Humidity Range

❑ Resistance to vibration: Operating: 0.15G, 10 ~ 55 Hz X,Y,Z directions
                                     Non-operating: 0.50G, 10 ~ 55 Hz X,Y,Z directions

❑ Resistance to shock: Operating: 1G, within 1 ms   X,Y,Z directions
                                       Non-operating:2G, within 2 ms   X,Y,Z directions

Note1) During non-operating, make sure that the cap is capped.
Note2) During the transport, make sure that the head is capped and ink cartridge is installed to the printer.
Note3) If the head is not capped at the power-off state, turn the printer on while the ink cartridge is installed, and turn off the power after capping the head.
Note4) Ink will be frozen under −15°C environment, however it will be useable after placing it more than 3 hours at 25°C.

PHYSICAL SPECIFICATION

❑ Weight: 22 Kg (only a main frame)

❑ Dimension: 640 mm(W) x 439 mm(D) x 224 mm(H)(Body only)
                    640 mm(W) x 704 mm(D) x 224 mm(H)(Printing on A3 size paper tray)
                    640 mm(W) x 584 mm(D) x 318 mm(H)(Printing on A4 size paper, optional cassette installed)

SERIAL INTERFACE SPECIFICATION

Table 1-10. Serial Interface

Item	Content
Transmission mode	Based on RS-423
Synchronization	Synchronous
Transfer speed	About 1.8M bps
Data format	Start bit: 1bit Data bit: 8bit Parity bit: none Stop bit: 1bit
Handshaking	X-ON/X-Off, DTR protocol
Adaptable connector	8-pin mini circular connector
Recommended I/F cable	Apple system peripheral-8cable

PARALLEL INTERFACE

[Compatibility Mode]

Table 1-11. Compatibility Mode

Item	Content
Transmission mode	8-bit Parallel, IEEE-1284 compatibility mode
Synchronization	By STROBE pulse
Handshaking	By BUSY and ACKLG signal
Logic Level	TTL compatible level (IEEE-1284 Level 1 device)
Adaptable connector	57-30360(amphenol) or equivalent
*Note1):*Recommend to use short interface cable according to your necessity.	
*Note2):*Use the twist pair line for each control signal of input connector and connect the return side to the signal ground.	

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

Busy signal is at high level in the following cases;
- During data entry(see Data transmission timing)
- When input data buffer is full
- During /INT signal is at low level or during hardware initialization
- During printer error (See /ERROR signal)
- When the parallel interface is not selected

ERROR signal is at low level when the printer is one of the following states.
- Printer hardware error (fatal error)
- Paper out error
- Paper jam error
- Ink out error

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

[Nibble Mode]

Table 1-12. Nibble Mode

Item	Content
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)
Adaptable connector	See forward channel
Data transfer timing	Refer to IEEE-1284 specification

Extensibility request data	The printer responds affirmatively when the extensibility request values are 00H or 04H, that mean,
	00H :Request nibble mode reverse channel transfer.
	04H :Request device ID; Return Data using Nibble Mode Rev channel transfer.
	The printer sends following device ID string when it is requested.
	        [00H] [3BH]
	        MFG : EPSON
	        CMD : ESCPL2, BDC
	        MDL : Stylus[SP]Pro[SP]5000;
	        CLS : PRINTER
	Note)[00H] denotes a hexadecimal value of zero.
	        MDL value depends on the EEPROM setting.

PARALLEL INTERFACE (CONT.)

[ECP Mode]

Table 1-13. ECP Mode

Item	Content
Transmission mode	IEEE-1284 ECP mode
Synchronization	Refer to IEEE-1284 specification
Handshaking	Refer to IEEE-1284 specification
Signal level	TTL level (IEEE-1284 level 1 device) See forward channel
Adaptable connector	See forward channel
Data transfer timing	Refer to IEEE-1284 specification
Extensibility request data	The printer responds affirmatively when the extensibility request values are 10H or 14H, that mean, 10H :Request ECP mode reverse channel transfer. 14H :Request device ID; Return Data using ECP Mode Rev channel transfer. The printer sends following device ID string when it is requested. 　　　[00H]　　　[3BH] 　　MFG　:　　EPSON 　　CMD　:　　ESCPL2, BDC 　　MDL　:　　Stylus[SP]Pro[SP]5000 　　CLS　:　　PRINTER *Note)* [00H] denotes a hexadecimal value of zero. MDL value depends on the EEPROM setting.

TYPE B OPTIONAL INTERFACE SPECIFICATION

Type-B interface level 2 is supported.

❑ Reply message (Short version):
■ Case of using Co-ax / Twin-ax I/F card:
Main Type:　　　　　　MTP48p, PW127cl10cpi, PGR(KAxxxx)rev, AP1200ma
Product Name:　　　　Stylus[SP]Pro[SP]5000
Emulation Type:　　　ESCPL2-00
Entity Type:　　　　　EPSONLQ2

❑ Reply message
■ Case of using except Co-ax / Twin-ax I/F card
Main Type:　　　　　　MTP48p, PW127cl10cpi, PGR(KAxxx)rev, AP1200ma, SPD0fast
Product Name:　　　　Stylus[SP]Pro[SP]5000
Emulation Type:　　　ESCPL2-00
Entity Type:　　　　　ESPONLQ2

BUFFER OPERATION

Stylus Pro5000 starts sending BUSY signal when it acknowledges no available area left in the buffer. When the host keeps receiving this signal for a long time, it acknowledges as time out and stops sending data.

INTERFACE SELECTION

The printer has 3-built in interfaces; the parallel interface and serial interface, and has 1 optional Type-B interface card slot. These interfaces are selected manually by the default setting mode or selected automatically. (However, it is necessary to set these settings within the maintenance mode level 1 of the panel operation.)

■ Manual Selection:
One of three interfaces can be selected by the default setting mode.

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

Following explains conditions of other interfaces when a particular interface
is selected.

■ When the parallel interface is not selected, the interface gets into
  BUSY state. At this time, LH signal is set to "L". That means blocking
  power supply and no responds from 1284. Therefore, it is necessary
  for the host, which requires Reverse transfer, to check LH state.
■ When the serial interface is not selected, the interface sets the DTR
  signal MARK.
■ When the optional interface is not selected, Off-Line bit is set to Main
  Status Register(MNSTS).
■ When the printer is initialized or returned to the idle state, Parallel
  interface becomes the ready condition and DTR of serial interface
  becomes SPACE(Low) condition and reset off-line bit of Main Status
  Register(MNSTS)to, option interface.
■ /INIT signal on the parallel interface is not effective while that
  interface is not selected or nibble Mode, ECP Mode.

CONTROL PANEL

There are 4 non-lock push buttons and 8 LEDs. Each button function and indicator are explained briefly below and on your right.
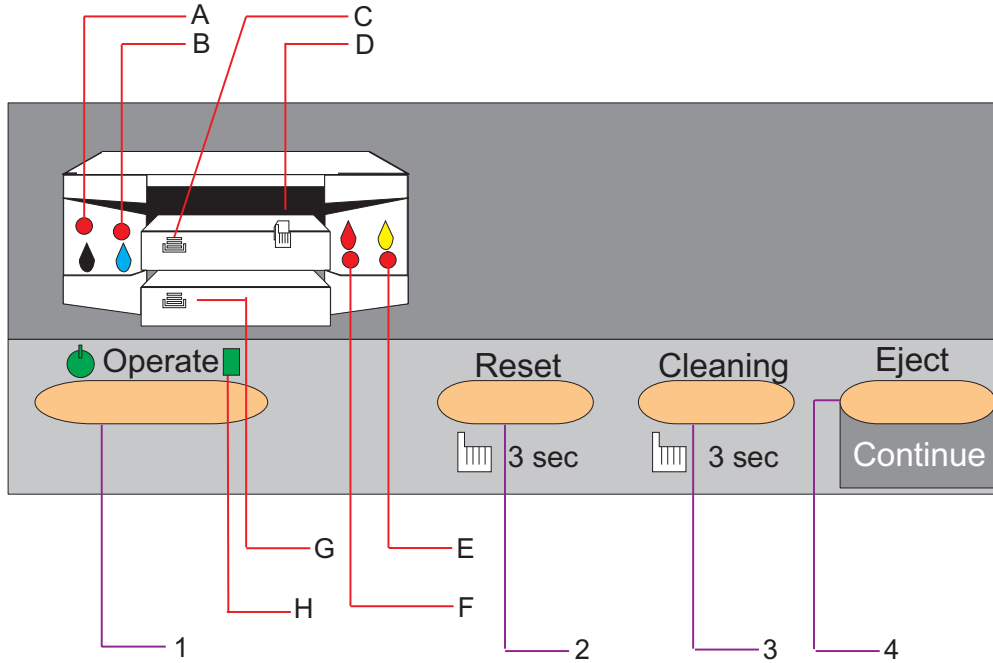

Figure 1-2. Control Panel

Table 1-14. Control Panel Function

No.	Button / Indicator	Function
1	Operate button (power)	Power source switch on the secondary side. *Note)* Current is constantly flowing in the primary side.
2	Reset button(Pressing for 3 sec.)	Printer reset. Buffer clear.
3	Cleaning button(Pressing for 3 sec.)	Perform cleaning all heads of both sides.
4	Eject(Error recover) button (2 sec.)	Ejects the paper, or recovers from error.
A	Black I/C out indication LED	Blinks for low ink quantity and light is on for out of ink.
B	Cyan I/C out indication LED	Blinks for low ink quantity and light is on for out of ink.
C	Paper out indication LED for cassette (paper tray) 1	Indication for paper out or paper loading miss of cassette 1.
D	Paper out indication LED for manual feed slots	All 3 LEDs (C, D, G) blink at the same time for paper loading miss.
E	Magenta I/C out LED	Blinks for low ink quantity, and light is on for out of ink.
F	Yellow I/C out LED	Blinks for low ink quantity, and light is on for out of ink.
G	Paper out indication LED for optional lower cassette (paper tray) 2.	Indication for paper out or paper loading miss of cassette 2.
H	Operate LED (power)	Green light is on while the current is flowing, or receiving data, or CL operation.

Following table shows function when the power is turned on.

Following table shows LED indications.

Table 1-15. Functions with power on

No.	Name of switch	Function
1	Reset	Perform status printing (Refer to Note1)
2	Cleaning	Changes paper size, type verification.
3	Eject/Continue	Changes platen gap adjustment for the manual feed slots.
4	Reset + Cleaning	Changes parallel I/F ECP mode
5	Reset + Eject/Continue	Enters print head alignment mode.
6	Cleaning + Eject/Continue	Enters the maintenance mode, level1.(Factory use only)
7	Reset +Cleaning + Eject/Continue (All SW)	Enters the Firmware uploading mode. (Factory use only)
*Note1):*This status printing prints firmware version, ink counter, selected code page and nozzle check patterns. Since the value of the waste ink counter is indicated by HEX, it is recommended to use the exclusive service program for checking the counter value. *Note2):*Refer to Table1-17 for Download of Firmware and Maintenance mode.		

Table 1-16. Printer condition and Panel status

No.	Printer Status	Indicators (Figure 1-2)					Priority No.
		H	AB EF	D	C	G	
1	Power On	On	---	---	---	---	9
2	Performing Ink sequence	blink	---	---	---	---	6
3	Receiving Data	blink	---	---	---	---	8
4	Paper jam	---	---	blink	blink	blink	3
5	Cassette 1/paper out, wrong paper feeding	---	---	---	blink	---	5
6	Out of paper in Cassette 1(paper tray1)	---	---	---	On	---	5
7	Cassette(Paper tray)2	---	---	---	---	On	5
8	Paper out in Cassette(Paper tray)2	--	---	---	---	On	5
9	SIMM copy error (over flow)	blink	On	On	On	On	4
10	Ink end, No I/C	---	On	---	---	---	7
11	Ink low	---	blink	---	---	---	7
12	Reset, Timer IC reset, EEPROM clear	---	On (1 sec.)				---
13	Maintenance request (waste ink counter over flow)	blink	All On	blink	blink	blink	2
14	Fatal error	blink	All blink	blink	blink	blink	1
Note): "---" means no changes.							

Table 1-17. Download/Maintenance Mode

Name of Switch	Function	
All switches + Power on	1.Manual feed LED turns on when the printer enters this mode correctly. Exclusive starting command(*IPL2.HEX*) is transmitted on the DOS (or DOS prompt). Black ink LED blinks during this transmission and Cyan ink LED will be turned on when the transmission is completed correctly. 2.Wait 2 or 3 seconds after the Cyan ink LED is turned on. Firmware*(KEYWEST.HEX)* is transmitted. At this time, Magenta ink LED is turned one during this transmission, and Yellow ink LED is turned on when it is completed. 3.Turn off the power.	
Cleaning + Eject Switch + Power on (Level1)	I/F Diseng age	1. After the operation written in the left column is performed, press Reset switch until the black ink LED is turned on. During entering this mode, black, Cyan, Magenta and Yellow LEDs are turned on alternatively, every time the reset switch is pressed. 2.When the black ink LED turns on, press Eject switch to determine. 3.Press the Reset switch until the corresponding LED turns on, according to the following explanation. Black ink LED→Automatic, Cyan ink LED→Parallel, Magenta ink LED→Serial, Yellow ink LED→Option 4.Press either Eject switch or turn the power off for registering to EEPROM.
	Hexade cimal dump	1.After the operation written in the left column is performed, press Reset switch until the Magenta ink LED is turned on. During entering mode, black, Cyan, Magenta and Yellow LEDs are turned on alternatively, every time the Reset switch is pressed. Press Eject switch to determine after Magenta LED turns on. 2.Turning power off is the only way to escape.

Table 1-18. Download/Maintenance Mode(Cont.)

Name of Switch	Function	
Cleaning + Eject Switch + Power on	P-I/F receiving speed	1.After the operation written in the left column is performed, press Reset switch until the Cyan ink LED is turned on. During entering this mode, black, Cyan, Magenta and Yellow LEDs are turned on alternatively, every time the reset switch is pressed. 2.Press Eject switch to determine after Cyan ink LED is turned on. 3.Press the Reset switch until the corresponding LED turns on, according to the following explanation. Black ink LED→High speed, Cyan ink LED→Standard 4.Press Eject switch to register in the EEPROM. Note)It is not registered to EEPROM, if power is turned off without pressing Eject switch.
	CG Disenga ge	1. After the operation written in the left column is performed, press Reset switch until the Yellow ink LED is turned on. During entering this mode, black, Cyan, Magenta and Yellow LEDs are turned on alternatively, every time the reset switch is pressed. 2.Press Eject switch to determine after Yellow ink LED is turned on. 3. Press the reset switch until the corresponding LED turns on, according to the following explanation. Black ink LED→PC437, Cyan ink LED→PC850 4. Press Eject switch to register in the EEPROM.

Table 1-19. Download/Maintenance Mode(Cont.)

Name of Switch	Function
After inputting modes written in the previous page, press Cleaning, then, Reset switch. (Level 2)	Note)After entering maintenance mode level1, it becomes EEPROM reset function by pressing Cleaning switch, then, Reset switch. 1.Make sure that black ink LED is on. If it is not on, press Reset switch until the black ink LED turns on. 2.After black ink LED turns on, press Eject switch and confirm the reset. 3.To end this operation, turn the power off.

INITIALIZATION

Stylus Pro 5000 has following 3 initializations.

❑ Power on (Hardware) initialization:
   This printer is initialized when turning the printer power on, or printer recognized the cold-reset command (remote RS command). When printer is initialized, following action is performed.

   1. Initializes printer mechanism
   2. Clears input data buffer
   3. Clears print buffer
   4. Resets default values

❑ Software initialization
   The ESC@ command also initializes the printer. When printer is initialized, following action is performed.

   1. Clears print buffer
   2. Resets default values

❑ Operator(Panel) initialization
   This printer is initialized when pushing the panel reset switch, or printer recognized the /INT signal(negative pulse) of parallel interface. When printer is initialized, following action is performed.

   1. Caps the print head
   2. Ejects a paper
   3. Clears input data buffer
   4. Clears print buffer
   5. Resets default values

SETTING VALUES BY INITIALIZATION

By performing initialization, the following items return to the initial values. Also, the panel setting, default setting, and item that can be saved on the remote command will be default values.

1. Page position:	Page heading location as present paper location
2. Line spacing:	1/6 inch
3. Right margin position:	127 lines
4. Left margin position:	First line
5. Word pitch:	10 CPI
6. Printing mode:	Text mode(Not raster graphics mode)

ERROR CONDITION

Stylus Pro5000 goes to error condition when it falls to the following conditions. Out of Centronics interface signals, BUSY signal is set High and /ERROR signal is set LOW. Then, the printer goes to unprintable state, stopping data input from outside. Once the error happens, the printer can go back to the standby position or ready status for printing again by removing the error causes.

❑ Ink near end and Ink out Error
   When the printer runs out the most part of the ink of any one color, it warns ink-low and keeps printing. When the printer runs out the whole ink of any one color, it stops printing and indicates ink-out error. User is requested to install a new ink-cartridge in this state.
   A ink-cartridge once taken out should never be used again. Re-installation of the cartridge not filled fully upsets the ink level detection and may cause a serious problem in the print head as a result.

⚠**CAUTION** *Although there is no worry of bubble invasion by pulling out or installing the ink cartridge, it is necessary to pay attention to the following points. 1)If the ink cartridge is once removed and installed again in the condition that the ink out(end) sensor detects the ink is still in, ink consumption based on the previous ink life will be kept counting. 2)If the ink cartridge is once removed and the ink cartridge whose left ink quantity is little is installed again in the condition that the ink is still in, Stylus Pro5000 goes to the ink out error condition, even though there is still enough ink in it.*

❑ Paper out sensor
   When there is no paper in the paper tray, or paper tray itself is not installed, this sensor detects and goes paper out error.

❑ Paper loading miss:
   When printer fails to load a sheet or PE sensor does not detect the paper on the path, it goes paper out error.

❑ Paper Jam Error
   Even when the paper feeding is performed at the power on, if the PE sensor detects the paper on the paper path or fails to eject a paper by FF command or Eject button, the printer considers it as paper jam and goes to the error condition. In the Stylus Pro5000, the linear encoder monitors detection of paper jam in the carriage running range.

❑ No ink-cartridge
   When the printer detects that ink cartridge comes off or is not installed, it goes to the error condition.

❑ Maintenance Request
   When the total quantity of ink wasted through the cleanings and flushing reaches to the limit, printer indicates this error and stops. The absorber(waste ink pad) in the printer enclosure is needed to be replaced with new one by a service person. This error does not recover until the waste ink pad is replaced and "0" is written to the particular address in the EEPRON by a service man.

❑ Fatal Errors
   When fatal errors such as carriage control error or CG access error are detected, the printer goes to error condition and stops. Repair service is required for this error.

PANEL SETTING FUNCTION

Here explains input method for each panel setting.

■ Printing nozzle check pattern and printer configuration
  • Operation: Reset SW + Power On
  • Exit: Power Off
  • Function: (Power LED blinking while in this mode)
                          1)Reset SW + Power on →2)Position change
                           to thick→3)Starts printing pattern→
                          4)Printing 1-page→5)Eject paper→6) Stand by
                          mode in self-test by pressing →Refer to
                          followings.

        [Pressing Cleaning SW: in standby mode only]
        1)Execute cleaning→2)Eject paper 3)Reprint self test
        page→4)self-test stand by mode.

        [Pressing Eject SW: in standby mode only]
        1)Feed paper→2)Reprint self test page→3)self-test
        stand by mode.

Note) Ignore Cleaning SW while printing and Power off to exit this mode.

✓**CHECK POINT**   ▪ *Even if Cleaning or Eject switch is pressed*
                      during printing, the panel operation is ignored.
                    ▪ *You can escape from the self-test mode only by*
                      turning the power off.

Printing Pattern: Print nozzle test pattern, firmware version, the value
                     of wasted ink count and current setting values are
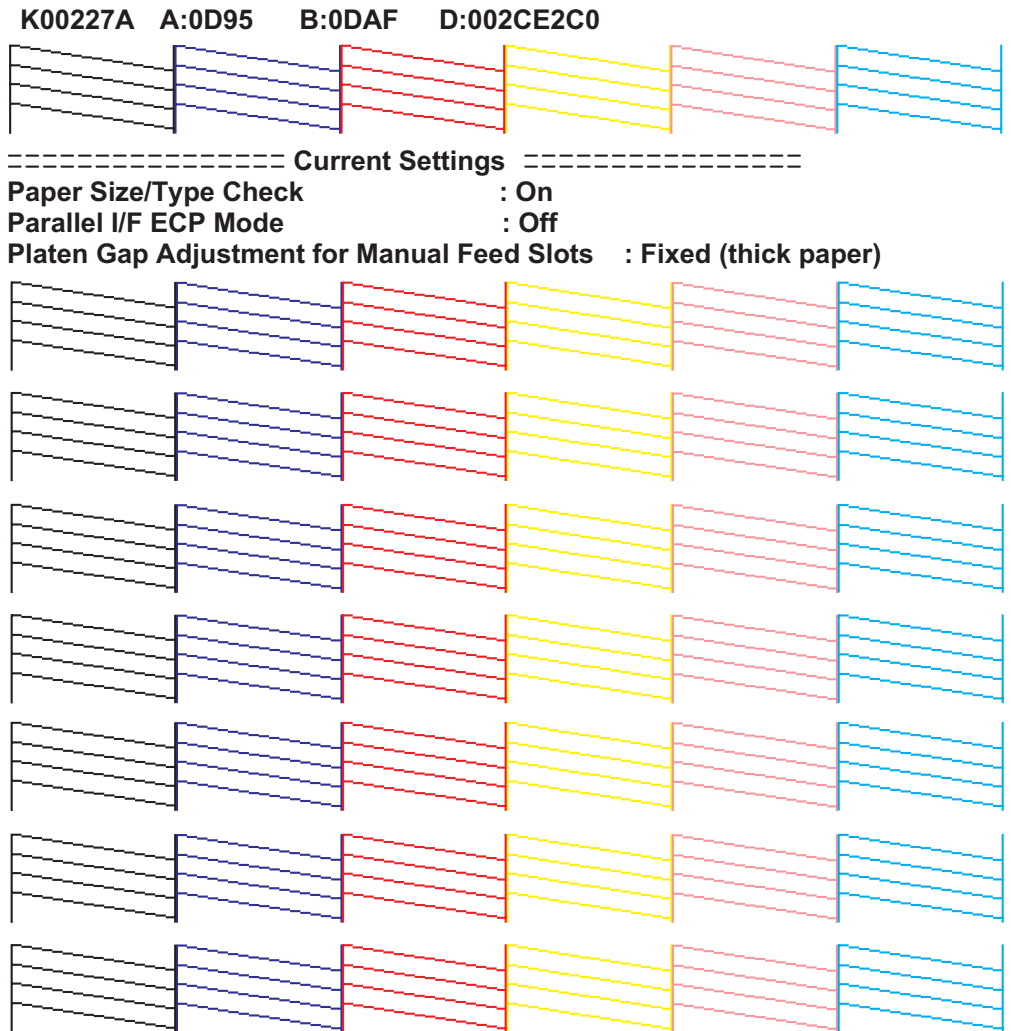   printed. Following shows printing pattern.

K00227A   A:0D95   B:0DAF   D:002CE2C0

=============== **Current Settings** ===============
Paper Size/Type Check   : On
Parallel I/F ECP Mode   : Off
Platen Gap Adjustment for Manual Feed Slots   : Fixed (thick paper)

Figure 1-3. Printing Sample

[Explanation]
K00227A: Firmware version.
A:0D95 :   The present counting value of ink absorber only for
                      dark colors head.

B:0DAF :   The present counting value of ink absorber for light
                       color head only.
D: 002CE2C0 :   The present counting value of waste ink absorber for
                       flushing.
Note) Maintenance Error occurs at the point either A or B becomes full
         counter condition. In other words, it occurs when A becomes 46650,
         or B becomes 47200. Since the value is indicated by HEX indication,
         it is recommended to use the exclusive program to check the counter
         value.

By referring to the printing pattern on the previous page, it becomes
possible to check ink discharge conditions (or dot missing or alignment
failure) from all nozzles in each color. As an example, refer to "A" ~ "D" lines
shown on the black nozzle pattern. "A" line is printed by black nozzle #1 to
#16, "B" line is by #17 to #32, "C" line is by #33 to #48, and "D" is #49 to
#64. Since the nozzle for different colors is also aligned in the same way,
you can consider in the same way.

■ **Paper check mode**
This setting decides to turn the paper check function on or off. For Stylus Pro5000, it is necessary to match the lever located paper feed cassette(tray) above to the presently used paper type (media type) and its size. If the PC which supports bi-directional communication is used, it is not necessary to make this paper check setting effective(on), because the user can change the lever positions on the cassette, according to the error message on the PC screen. However, if the user uses the PC which does not support the bi-directional communication, it is necessary to set this mode on the printer body, since he/she can not check the error message on the computer screen.

• Operation: Cleaning SW + Power on to enter this mode.
• To change paper check mode setting On/Off:
                        Reset SW
• Save setting: Press Eject switch or turn off the power.
• Setting and LED indicator:
                        Paper check On→ Black ink LED On.
                        Paper check Off→ Cyan ink LED On.
• Function: 1)Cleaning SW +Power on to enter this mode→2)Power LED blinks, Cassette1 LED turns on→3)Ink LED indicates current setting→ 4)Change paper check On/Off by Reset SW.

[After completing the setting, if the power is turned off]
        1)Save setting→2)Exit mode→3)Power off
[After completing the setting, if Eject switch is pressed]
        1)Save setting→2)Exit mode→3)Idle state

■ ECP Mode
• Operation: Reset SW + Cleaning SW + Power On to enter this mode.
• To change ECP mode On/Off:
                        Reset SW
• Save setting :   Turn off the power or press the Eject SW

• Setting and LED indicator:
                        ECP mode off→Cyan LED on
                        ECP mode on→Black ink LED on.
• Function: 1)Reset SW+ Cleaning SW+ Power on to enter this mode→2)Power LED turns on and Cassette1LED blinks→ 3)Indicate the current setting by blinking ink LED.→4)Change ECP On/Off by Reset SW.

[After completing the setting, if the power is turned off]
1)Printer escapes from the selected paper check mode.→2)Printer goes to the power off condition.

[After completing the setting, if Eject switch is pressed]
1)Printer escapes from the selected paper check mode. →2)Printer goes to the ordinal printing mode(idle state).

■ **Manual feed slots paper thickness - Auto mode**
The setting for Manual feed thick paper and auto mode is the function
only to deal with using manual feed slots(front/rear). After checking the
result of the printing by the manual feeding, this function becomes
effective when the printing is blurry or faint. The reason why there is this
kind of function only for manual feeding is that the printer can not
recognize the paper thickness, unlike the other paper feed cassettes.
There is no influence on the other paper feeding path(or standard
cassette or optional cassette), when this function becomes effective.
Also, unless this function is set effective, manual paper feeding always
make PG(platen gap) big or wider and perform printing. Following shows
conditions when the PG becomes wider(big).

Table 1-20. Setting conditions when PG becomes thick paper mode

Setting	No.	Conditions
Setting on the Driver side.	1	In case A4 size paper (landscape) is set.
	2	In case SF exclusive paper (landscape) is set.
Lever setting on the cassette side.	3	In case Media type is the combination of ordinary paper and paper size A4(landscape).
	4	In case Media type is the combination of SF exclusive paper and A4 size(landscape).
Special Panel setting.	5	In case of thick paper mode for the manual feed.

⚠**CAUTION** *According to the Table above, priority order for each setting is determined as follows.*
■ *Paper Feed from paper feed cassette (standard/option).*
Priority order1.:In case the media type is set to "Thick Paper".
Priority order2.:In case there is mis-matching between driver and lever position on the printer, the priority is given to the driver setting, if "Ignore" button is selected on the screen.

⚠**CAUTION** ■ *Paper Feed from Manual Paper Feed Slot*
Priority order1.:PG is wider(big) if thick paper mode is set.
Priority order2.:In case, media type is set to the envelope.

•Operation: Eject switch + Power on to enter this mode.
•To change setting Manual/Auto mode:
                         Reset SW
•Save setting: Turn off the power or press the Eject switch.
•Setting and LED indication: *Auto→Black ink LED On. Platen gap
                         is defined by platen gap command
                         'PG'.
                         *Manual feed(thick paper)→Cyan ink
                         LED on. Platen gap ignores PG
                         command and uses platen gap thick
                         position.
•Function: 1)Eject SW + Power On to enter this
                         mode→2)Power LED blinks and
                         Cassette 2 LED turns on→3)Ink LED
                         indicates current setting→4)Automatic
                         or manual (thick paper) is changed
                         over everytime the Reset SW is
                         pressed.

[After completing the setting, if the power is turned off]
1)Save setting→ 2)Exit setting mode →3)Printer goes
to the power off condition.

[After completing the setting, if Eject switch is pressed]
1)Save setting→ 2)Exit setting mode →3)Printer goes
to the ordinary printing mode.(idle state)

■Maintenance Mode 1

- Operation: Cleaning SW + Eject SW + Power ON to enter this mode.
- To change maintenance item:
            Reset SW
- Determine the selection(maintenance item):
            Eject SW
- Maintenance item and LED indicator:
            I/F selection → Black ink LED is on.
            Parallel input speed→Cyan ink LED is on.
            HEX dump→Magenta ink LED is on.
            Character set→Yellow ink LED is on.
- Function: 1)Cleaning SW + Eject SW+ Power ON to enter this mode→2)Power LED blinks. Manual cassette(tray), Cassette1 and 2 turn on→3)Ink LED indicates current setting→4) Paper check, I/F selection, Parallel input speed, Hex change is changed over everytime the Reset SW is pressed.
    Ink LED turn on in the order of left to right and returns to left side.

[In case of pressing Eject SW]
1)Select item(Data registration)→2)Exit this mode→3)Enter each setting mode.

⚠**CAUTION**   *Following explains setting of each item in the maintenance mode selection.*

■Select I/F mode(Cont1. from Maintenance mode)

- Operation: After Eject SW + Power ON, turn the black ink LED on by pressing Reset SW, and determine that selection by pressing Eject SW.
- To select I/F mode:
            Reset SW(Parallel→Serial→Option)
- Save setting:
            Eject SW or Power off
- Setting item and LED indicator:
            Auto selection setting→Black ink LED is on.
            Parallel I/F mode→Cyan ink LED is on.
            Serial I/F mode→Magenta ink LED is on.
            Option I/F mode→Yellow ink LED is on.
- Function: 1)Select "Black" in maintenance mode to enter this mode.→2)Power LED blinks. Cassette1 and 2 turn on →3)Ink LED indicates current setting. →4)By pressing Reset SW, Auto, Parallel, Option is selected in this order. Ink LED moves left to right and return to left.

[After completing the setting, if power is turned off]
1)Save setting(Data registration)→ 2)Exit setting mode →3)Printer goes to the power off condition.

[After completing the setting, if Eject switch is pressed
1)Save setting(Data registration)→ 2)Exit setting mode →3)Printer goes to the ordinary printing mode(idle state).

■HEX dump mode (Cont2. from Maintenance mode)

- Operation: After pressing Eject SW + power on, turn on the Magenta ink LED by pressing Reset SW and determine by Eject SW. After that, HEX dump and ordinary mode is changed over by pressing Reset SW.
- Save setting: Press Eject SW.
- Function: 1)Enter HEX dump mode →2)Hex dump idle →3)HEX dump printing.
  Exit mode by power off.

■Parallel I/F speed(/ACK plus width) (Cont3. from Maintenance mode)

- Operation: After pressing Cleaning SW + Eject SW + Power on, turn on the Cyan ink LED by pressing Reset SW and determine by Eject SW. After that, High speed and standard is changed over by pressing Reset SW.
- Save setting: Press Eject SW.
- Setting item and LED indicator:
  /ACK with short(0.5us)→Black ink LED is on.
  /ACK with standard(2us)→Cyan ink LED is on.
- Function: 1)Select "Cyan" in maintenance mode to enter this mode. →2)Power LED and Cassette 1 blink. Cassette2 LED turns on. →4) Ink LED indicates current setting. →
  5)Short or Standard is changed over everytime Reset SW is pressed.

[In case of turning power off]
1)Save setting(Data registration)→2)Exit this mode→3)Power off

[In case of pressing Eject SW]
1)Save setting→2)Exit this mode→3)Ordinary printing mode(idle state)

■PC437-PC850 Code Page select(Cont4.from Maintenance mode)

- Operation: After pressing Cleaning SW +Eject SW +Power on, turn on the Yellow ink LED by pressing Reset SW and determine by Eject SW. After that, PC-437 and PC-850 is changed over by pressing Reset SW.
- Save setting: Power off or Eject SW
- Setting item and LED indicator:
  PC437→Black ink LED is on.
  PC850→Cyan ink LED is on.
- Function: 1)Select maintenance mode "Yellow" to enter this mode. →2)Power LED and cassette 2 LED blink. →3)Ink LED indicates current setting. →4)PC437 and PC850 is changed over every time Eject SW is pressed.

[In case of turning power off]
1)Save setting(Data registration)→2)Exit this mode→3)Power off

[In case of pressing Eject SW]
1)Save setting→2)Exit this mode→3)Ordinary printing mode(idle state)

■Maintenance Mode 2

This operation is to input particular address "0" in the EEPROM.

- Operation: In maintenance mode, press Cleaning SW and then Reset SW to enter maintenance mode2.
- Select maintenance mode2 setting item:
                            Reset SW
- Select item: Eject SW
- Setting item and LED indicator:
                            Reset EEPROM→Black ink LED is on.
- Function: 1)In maintenance mode, press Cleaning SW and then press Reset SW to enter this mode. →2)Power LED and manual tray LED blink. Cassette 1 and 2 turn on. →3)Ink LED indicates current setting. → 4)Ink LED moves left to right and return to left by every Reset SW.

[In case of pressing Eject SW]
1)Save setting→2)Exit this mode→3)Execute one of setting mode.

⚠**CAUTION**   *There is only one available item in the maintenance 2. See the item on your right.*

■Reset EEPROM (Cont. from Maintenance Mode2)

There is only one item that you can actually operate in the maintenance mode2. This function is the same reset as other EEPROM reset of other EPSON printer products.

- Operation: After entering maintenance mode, press Cleaning SW, then, press Reset SW to enter maintenance mode2. At this time, black ink LED is on. Select maintenance mode 2 "BLACK" to clear EEPROM.
- Execute: Eject SW
- Function: Pressing Eject SW clears only particular address in the EEPROM.
- Exit: Exit this mode by power off.

Following shows items which are actually cleared by this operation.

✓**CHECK POINT**   *Following items are reset forcefully by executing maintenance mode2.*
■ *Waste ink counter (protect counter) is cleared.*
■ *Total power off time(timer IC) is cleared.*
■ *Cleaning counter is cleared.*
■ *The value of Auto I/F returns to Auto(initial value).*

■Gap Adjustment Mode

This adjustment is Bi-D adjustment and head gap adjustment.
By turning on power, pressing Cleaning SW and Eject SW, the printer enters to the gap adjustment mode and prints out the present adjustment values.

> **⚠CAUTION**
>
> *In this gap adjustment mode, 4 printing patterns are printed out; 1. Normal dot, 2.Micro dot, 3.Bi-D printing of Super micro dot, 4.Head Gap pattern. However, in this present model, Bi-D printing by other dots except normal dot is not performed. The reason why Bi-D adjustments for micro and super micro are included is for the future use, in case of specification changes.*

- Operation: Rese SW+ Eject SW + Power On to enter this mode. After entering to the gap adjustment mode, 4 patterns(#1~#4) of Bi-D sample with present values is printed out. At this time, set the sample number you want to adjust by referring to the Table below.

Table 1-21. Number selection after entering adjustment mode

No.	Ink LED	#1	#2	#3	#4
1	Black	On	Off	Off	Off
2	Cyan	Off	On	Off	Off
3	Magenta	Off	Off	On	Off
4	Yellow	Off	Off	Off	On

- Select setting item: Number is changed from #1 to #4 everytime Reset SW is pressed.
- Determination: Press Eject SW, and the next pattern (1~7) is printed out.

- Select: Select most appropriate No. of line from the samples by referring to the table below.
In this selection, LED moves from 1→7 direction by Reset SW, and 7→1 direction by Eject SW.

Table 1-22. Selecting Adjustment values after selecting number

No.	Ink LED	#1	#2	#3	#4	#5	#6	#7
1	Black	On	Blink	Off	Off	Off	Off	Off
2	Cyan	Off	Off	On	Blink	Off	Off	Off
3	Magenta	Off	Off	Off	Blink	On	Off	Off
4	Yellow	Off	Off	Off	Off	Off	Blink	On

- Determination: Determine No. by Cleaning SW and perform printing again.
- Exit: Exit this mode by power off. Also, it is written to EEPROM at this time. By pressing Eject SW, the printer exits from this mode and stores the memory of adjustment values.

■Firmware uploading

If any changes occur on the firmware after the products are sent, it is possible to perform uploading from the PC without changing ROM of Stylus Pro5000.

- Operation1:   Turn on the power, pressing Cleaning SW, Reset SW and Eject SW, in order to enter the firmware uploading mode. IPL2.HEX file in the FD for uploading, which will be distributed, is transferred first. IPL2 file is the program to make the next firmware to transfer. Without performing this operation, following uploading program can not get started.

✓**CHECK POINT**
- ■ *Type the following sentence on DOS screen or on the DOS prompt for transmission. Copy X :IPL2.HEX_LPT1*
- ■ *During transmission, black ink LED turns on and Cyan ink LED turns on when the transmission is completed correctly.*

- Opeation2: Check if the operation is completed correctly and wait 2 or 3 seconds. Main firmware K0xxxx.HEX is transferred.

✓**CHECK POINT**
- ■ *Type the following sentence on DOS screen or on the DOS prompt for transmission. Copy X: K0xxxx.HEX_LPT1*
- ■ *During transmission, Magenta ink LED turns on and Yellow ink LED turns on when the transmission is completed correctly.*

- Exit: Exit this mode by power off.

1.3 ADDING PAPER GUIDE ROLLER UNIT

Here explains installing and removing Paper Guide Roller Unit, which can be installed to the paper feed cassette. Paper Guide Roller Unit is designed to improve the credibility of paper feeding for large exclusive papers (especially glossy paper), such as A3 or Super A3/B,.

Table 1-23. Parts Code List

Parts Name	Parts Code
Paper Guide Roller Unit	1040445

[Installing Paper Guide Roller Unit]

Step1. As it is shown in Figure1-4, insert the yellow side of the unit, which is located at left side of Paper Guide Roller Unit, into the yellow spaced of paper feed cassette, and insert the other hook into the hole on the paper feed cassette. (Refer to Figure1-4)

⚠️**WARNING**

When installing Paper Guide Roller Unit to the paper feed cassette, be careful not to involve the protection board for signal cable of paper type/size sensor.

Step2. Push the Paper Guide Roller Unit hard until it clicks and the unit is attached completely.
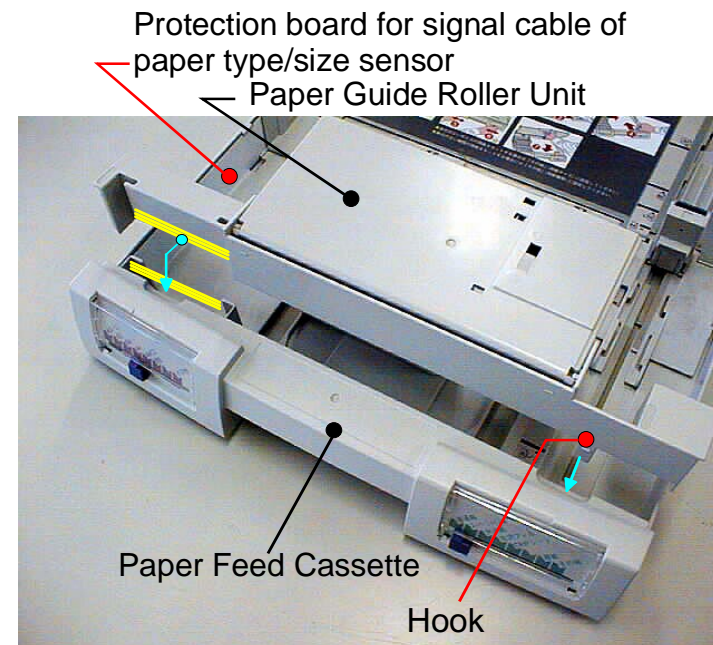
Figure 1-4. Installing Paper Guide Roller Unit

[Removing Paper Guide Roller Unit]

Step1. Looking at the front side of paper feed cassette from its bottom, release the big hook, which is located under its right side(paper type lever), as it is shown in Figure1-5. (Refer to Figure1-5)

Step2. Looking at the front side of paper feed cassette from its bottom, release the hook by inserting a minus driver into 2 small hooks from their sides, which are located under the left side of paper feed cassette(paper size lever), and remove Paper Guide Roller Unit. (Refer to Figure1-6)

Big Hook — Minus Driver
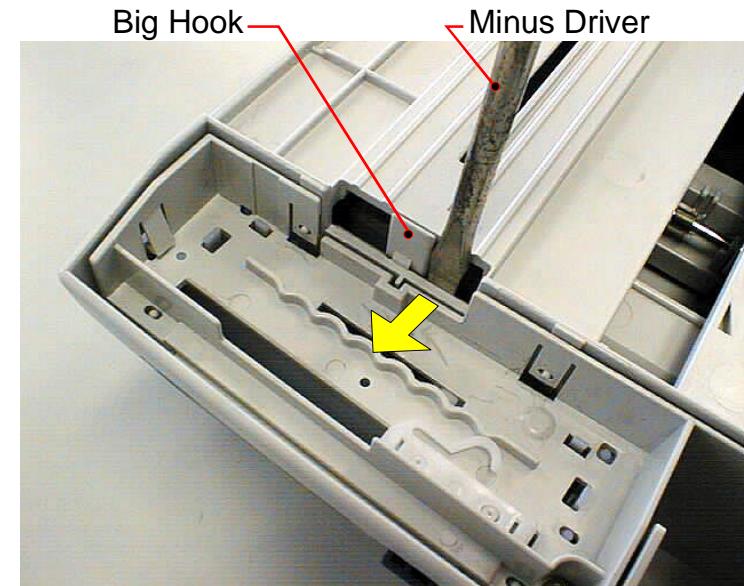
Figure 1-5. Paper Guide Roller Unit Removal (1)

Minus Driver

2 small hooks
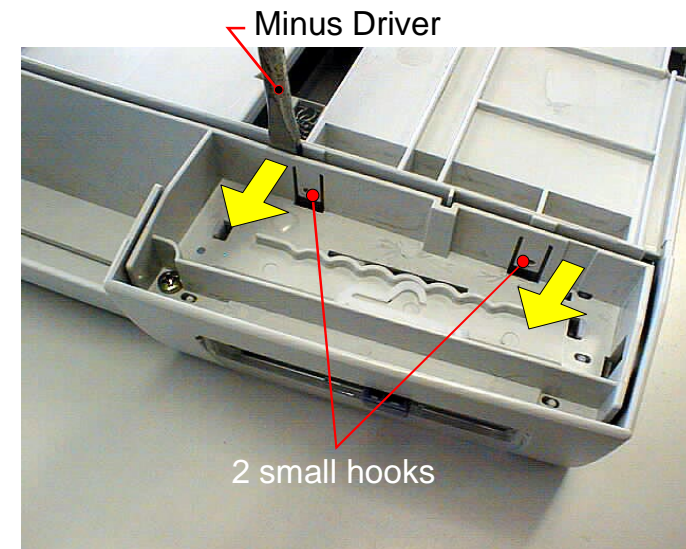
Figure 1-6. Paper Guide Roller Unit Removal (2)

2

OPERATING PRINCIPLES

2.1 FEATURE

This section explains mechanical and electrical operating principles for Stylus Pro5000.

2.1.1 Operating Principles of Printer Mechanism

The printer mechanism of Stylus Pro5000 consists of the following mechanism parts.

Table 2-1 . Mechanism Components

No.	Mechanism	Motor	Function(Purpose)
1	Printing Mechanism	-----	•Ink Discharge
2	Carriage Mechanism	CR	•Driving Carriage •Input or Output trigger to ink mechanism
3	Paper Load/Paper Feed Mechanism	PF+ASF	•Paper transport. •Open or close the ink valve.
4	Upper Surface Sensor Mechanism	-----	•Load adjustment of the Paper Load Roller, according to the paper volume.
5	Paper Return Mechanism		•Prevention of multi-feeding.
6	Lifter Gear Train Mechanism	Pump, ASF	•Lifter Up/Down.
7	Hopper 5mm Down Mechanism		•Prevention of folding paper on the paper skew. •Improvement of credibility of paper loading.
8	Sub Roller Gear Train Mechanism		•Big roller for paper transport.

Table 2-2. Mechanism Components(Con.)

No.	Mechanism	Motor	Function(Purpose)
9	Gear Train Changes with Hopper installed	-----	•Engaging to the Lifter Gear Train.
10	Ink Engage/Disengage Mechanism	PF	•Changes over Paper Load line/ Pump line
11	PG Engage/Disengage Mechanism	CR+PF	•Changes PG according to the paper type.
12	Ink Valve Mechanism	PF	•Prevention of ink leaking during the re-transportation.
13	Friction Release Mechanism	Pump, ASF	•Friction Release Mechanism in the range 10cm of the paper end edge.

2.1.1.1 Printing Mechanism

Printing method for Stylus Pro5000 uses EPSON original's MACH method, like the previous models. Although 2 color heads which are the same ones used for Stylus Color 800, are used for Stylus Pro500, auto color calibration function is added to the heads used for Stylus Pro5000. Therefore, since the ID contents written in the head is completely different from the ones of Stylus Color 800, **the color heads of Stylus Color 800 can not be used for Stylus Pro5000 on the service.**

Table 2-3. Head Code

Head Name	Parts Code
IJ192-AD(Left Head)	F055040
IJ192-AE(Right Head)	F055050

⚠**CAUTION**

- ◾ *Head shape of 2 heads mentioned above look same. Therefore, when replacing 2 heads at the same time, do not get confused which is right head and which is left head.*
- ◾ *It is possible to use the right head as left head, but left head can not be used as right head. If you ignore this, it gives bad influence directly on the printing quality.*

[Cleaning Operation]
Also, 2 printing heads are mounted on the carriage, but black head or color head are not divided in this Stylus Pro5000.
Therefore, there is no cleaning function that clean the black head or color head respectively. So, when the cleaning command is input from the printer body or from the driver, these 2 heads are cleaned with the same ink absorbing quantity.

[Nozzle Component]
Nozzle component is shown in the figure 2-1. It is one of the major characteristics that black nozzles are included as a part of the color nozzles. Also, 2 head are divided into either dark colors or light colors. In the dark colors, there are black, Cyan, Magenta. In the light colors, there are light cyan, light magenta, and yellow.
Each head: < (64 nozzles / Color x 3 lines) x 2 heads = Total 384 nozzles >
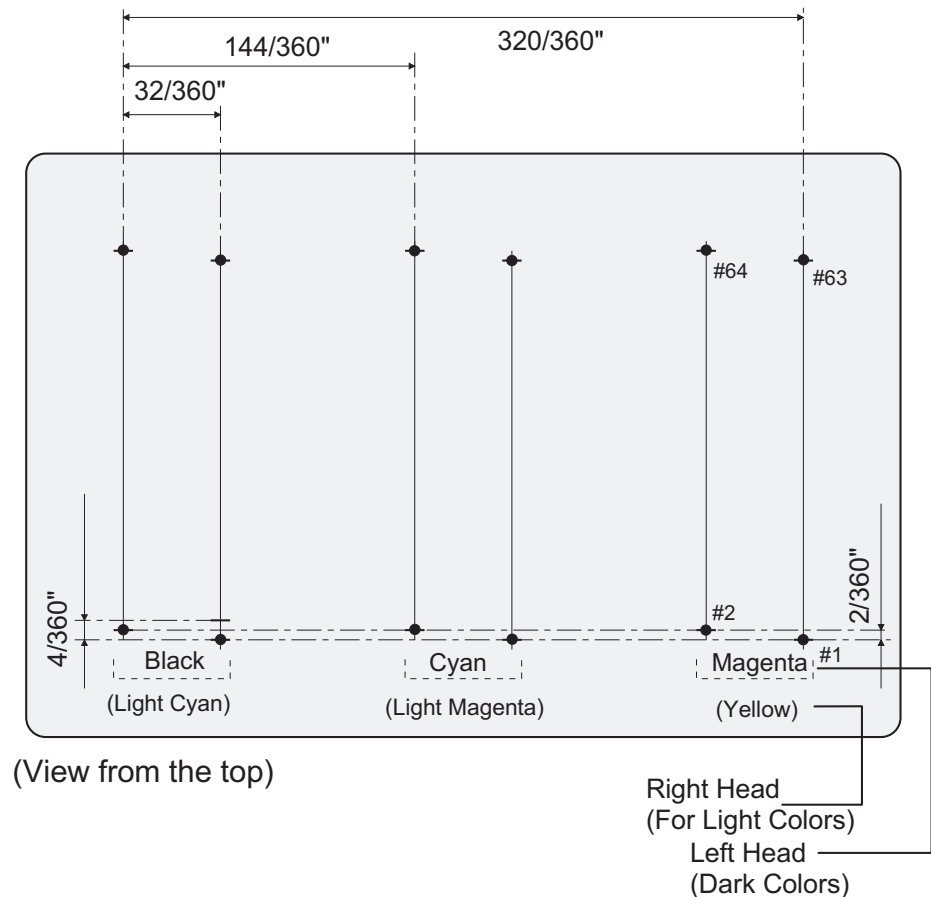
Figure 2-1. Nozzle Configulation

2.1.1.2 Carriage Mechanism

The carriage unit of Stylus Pro5000 performs on/off of D/E lever not only to control motive power transmission to the pump mechanism(at "0" digit side), but also to change the platen gap(at "137" digit side).

Head for
Light Colors
Head for
Dark Colors

D/E Mechanism
for PG change
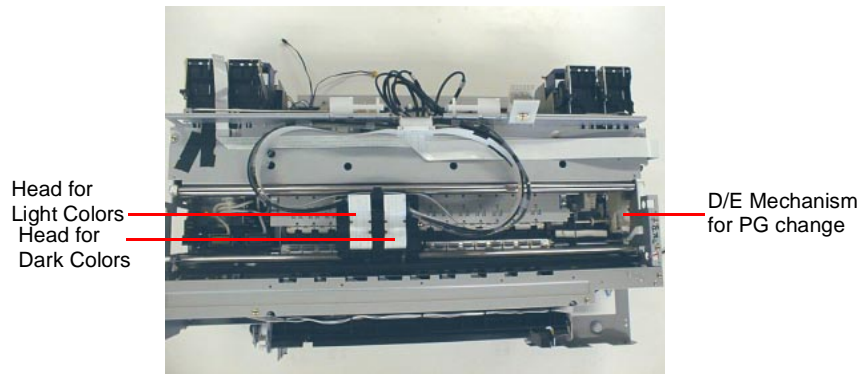
Figure 2-2. Carriage Mechanism

[Carriage Unit]

3 sensors are mounted on the carriage unit and each sensor detects the following printer conditions.

Table 2-4. Sensors on the carriage and their function

No.	Name of Sensor	Function
1	Carriage Home Position Sensor	Detects paper jam and acknowledges the standard position when the carriage is driven.
2	Encorder Pulse Sensor	PTS compensation signal to PZT driving trapezoidal waveform.
3	Paper width sensor	Detects the paper width every time the paper is loaded. (Prevention of printing on the platen)

[Carriage Guide Axis]

Unlike the previous EPSON ink jet printer models, 2 carriage guide axes support the whole carriage in the Stylus Pro 5000. Also, since eccentric shafts are used for both guide axes, more sophisticated PG changes are possible. Following picture shows its concept.
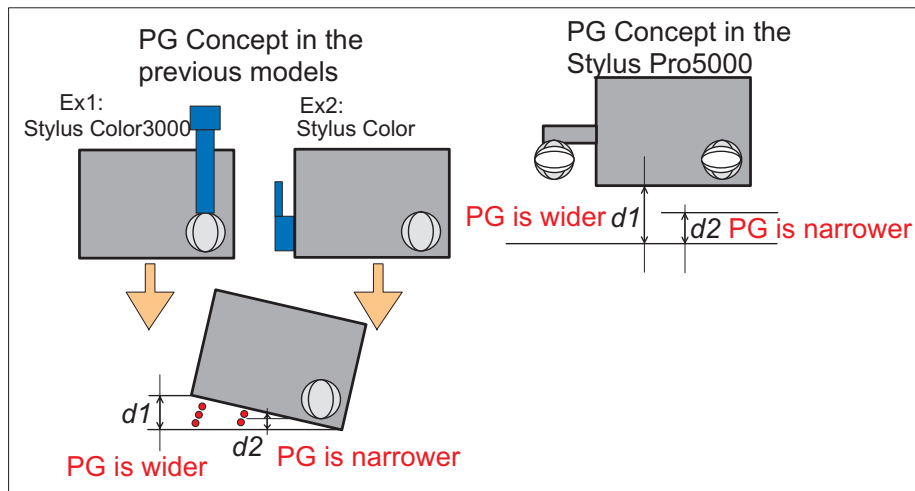
Figure 2-3. Concept of PG Mechanism

As it is shown in the figure above, it is understandable that the PG mechanism of Stylus Pro5000 equals the flying time for all nozzles.(Flying time means the time span that ink is discharged and until it reaches to the paper.)

2.1.1.3 Paper Feed Mechanism

There are 4 paper feed paths in the Stylus Pro5000; 1) Standard Paper Tray, 2)Optional Paper Cassette, 3)Front Manual Feed, 4)Rear Manual Feed.
Following figure shows the paper feed path from the standard paper tray. In case of the rest of other paper feed paths, the same operation is done, except a point that the Paper Load Roller does not rotate.

Cross Section Diagram for Paper Path
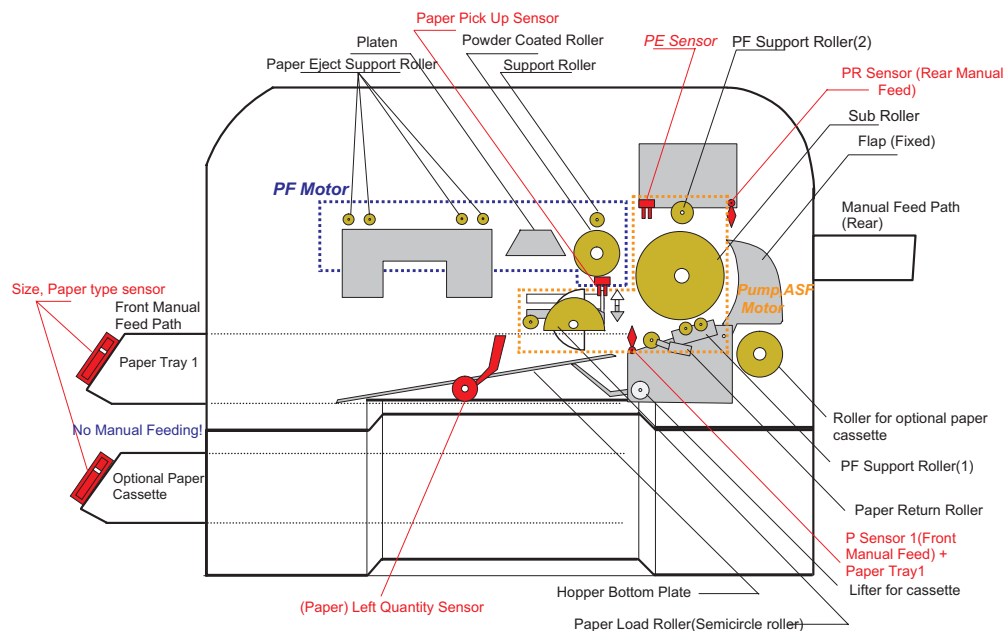
Figure 2-4. Paper Feed Path

[Paper Loading from the Standard Paper Tray]

1. While the printer is turned on, Papers in the tray are always monitored by 3 sensors; Left Quantity Sensor, Paper size sensor and Paper type sensor.
2. When the printing command is input from the PC, the paper load roller, which is at the waiting mode, rotates half circle towards left direction and stops once in this position.
3. While the Paper Load Roller maintains this position, the lifter pushes up the hopper in the paper tray. This makes the paper on the hopper up. (Refer to "Lifter Gear Train Mechanism")
4. At this time, when the Upper surface sensor detects THLD(THLD value: almost On or Off condition) by the Paper Pick Up mechanism, lifter operation is stopped. (Refer to "Paper Pick Up Mechanism")
5. By rotating the Paper Load Roller again, the top paper on the paper pile is separated, and picked up from the rest of the other papers on the separation pad.
6. While the top paper is separated from the other papers, the credibility of this paper separation is improved, and also the problem that the paper edge is bent or folded at the skew removal operation can be avoided by moving the hopper 5mm down. (Refer to "5mm Down Mechanism") The skew removal operation is to correct the skew part by colliding the loaded paper to the surface of PF Support Roller(1).
7. The head edge of the loaded paper is collided to the edge of the PF Support Roller for skew removal.
8. Sub roller is rotated and the loaded paper is transported to the printing start position.
9. When the Step 8 operation is completed, the Paper Load Roller returns to the waiting mode.
10.Lifter returns down and hopper returns to the waiting position. (Refer to "Lifter Gear Mechanism")

[Paper Feeding From the Optional Cassette]

Although inside of the optional cassette is composed of same parts as you can find in the standard cassette, there is some distance from the optional cassette to the standard cassette. Therefore, paper load roller for optional cassette mounted on the printer becomes impossible to pick up the tip of the paper correctly in case of relatively short paper and paper type, which rolls back, and causes paper jam. Therefore, paper type that can be used for optional cassette is limited.

[Paper Feeding from Front Manual Feed Slot]

1. When the user insert a paper directly from the manual feed slot, the heading tip of the paper motivates P sensor(1), then, stops by colliding with edge of PF support roller. This sensor is in charge of detecting the heading tip of the paper in both cases, paper feeding from the front manual feed slot and from the standard cassette.
2. When this P sensor(1) works, the printer enables the sub roller to rotate without rotating the paper load roller, and carry the paper with friction between sub roller and paper support roller(1) up to the point that the heading tip of the paper can be completely hold.(Actually, the paper is fed only a few mm) Also, in case of front manual feeding, since the distance between the paper setting positing and P sensor(1) is very long, relatively short paper becomes impossible to make its heading tip to touch with this sensor. Therefore, like the optional cassette, paper size for using the front manual feed slot is limited.
3. After that, the printer rotates the sub roller again by inputting the printing command, and carries the paper's heading tip to the platen quickly.
4. When the paper is carried to the platen, the paper is fixed completely by the friction between powder coated roller(paper feed roller) and support roller, and also between sub roller and PF support roller. As s result, the printer tries to release the friction between the sub roller and PF support roller(1), and to prevent kick back at the end of printing operation.

[Paper Feeding from Rear Manual Feed Slot]

In case of paper feeding from rear manual feed slot, exclusive PR sensor is mounted. This sensor enables the printer to carry the paper to the inside of the printer in the same process as front manual feeding does but without driving the paper load roller. Refer to "Paper Feeding from Front Manual Feed Slot" for the rest of operations. If you select this paper path, since paper loading is almost straight loading, the printer supports paper sizes from A6 to 22 inches, as it is mentioned in the specification.

2.1.1.4 Upper Surface Sensor Mechanism

As printing operation goes on, of course, the number of paper in the paper tray decreases. Unlike the previous ink jet printer models, since the lifter supports the hopper directly in the Stylus Pro5000, if the height which this lifer rises is always constant, the credibility of paper loading decreases by the change of the paper volume in the paper tray. In order to avoid this symptom, the Paper Load Roller itself moves up and down with its axis.

[Waiting Condition]   [Paper Loading Condition]
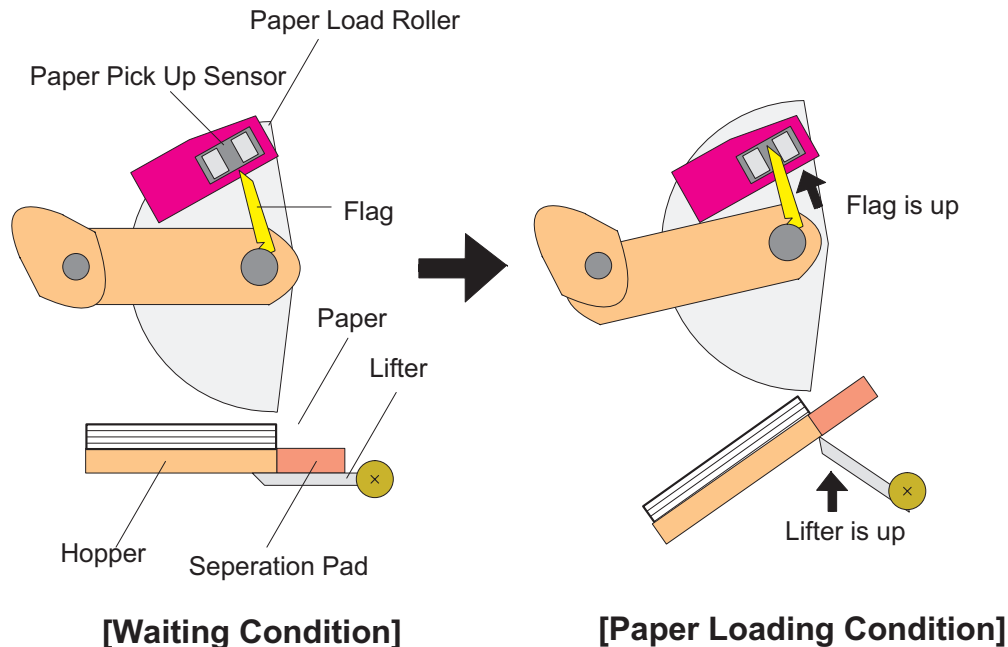
Figure 2-5. Transition of Paper Load Roller Unit Condition at Paper Loading

[Explaining the operation]

As it is shown in the figure 2-5, since the lifter does not rise at the waiting mode, the hopper in the paper tray does not contact with the Paper Load Roller. After the printer receives the printing order, the lifter rises up for paper loading and the hopper is also pushed up together. When the flag which is fixed to the unit reaches the upper surface sensor, C228 main control board stops the rotation of the gear train so that the lifter does not keep rising up any more. Also, this timing to stop the rotation of gear sets the best height for Paper Load Roller to pick up the top paper from the paper pile.

2.1.1.5 Paper Return Mechanism

The purpose of paper return mechanism is to return the second paper, or papers after the first paper to the paper tray by force, in case the multi-feeding happens. When the Paper Load Roller rotate, this mechanism is performed by conveying motive power to the transmission gears in order to drive the Paper Return Lever by the timing belt .
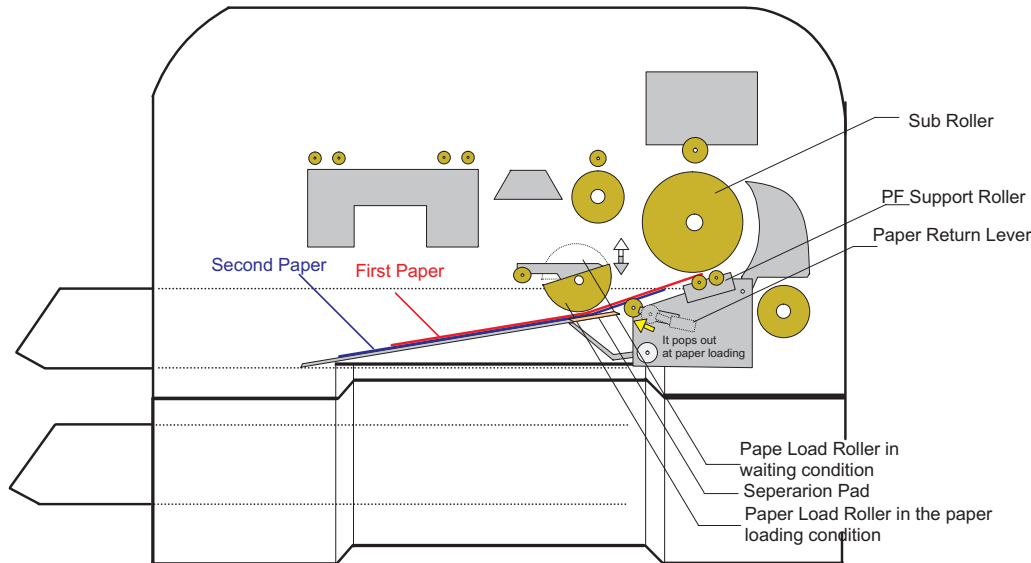
Figure 2-6. Paper Return Lever Operation

[Explaining the operation]

As it is shown in the figure2-6, when the paper loading starts, the Paper Load Roller which was in the waiting mode rotates left and loads the top paper from the pile of papers. Since paper loading is performed on the Separation Pad, in many cases, even if multiple feeding occurs, the different distance occurs between the head of the first(top) paper and second one.

The head of the first paper reaches the friction between the Sub Roller and Paper Feed Support Roller, and as soon as it goes to the state that the paper is about to be transferred not by the rotation of Paper Load Roller but the rotation of Sub Roller, the Paper Return Lever jumps out as it is shown in the figure and kicks back the following paper(s), which is(are) attached to the first(top) paper by static electricity, to the tray inside.

2.1.1.6 Lifter Gear Train Mechanism

Lifter Gear Train Mechanism is the mechanism to control the lifter, which operates the hopper up or down. Unlike the previous paper trays, the hopper of Stylus Pro5000 does not go up automatically, even the user installs the tray to the printer body. Therefore, the lifter pushes up the hopper forcefully from the hole located under the paper tray.
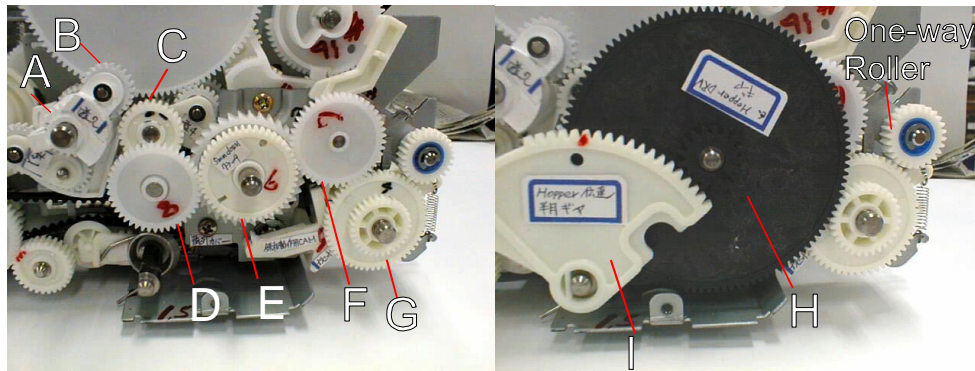
Figure 2-7. Lifter Gear Train Mechanism

[Explaining the operation]

Power source is pump/ASF motor. This motive power is conveyed from the transmission gear located under pump frame to the top surface of the sun gear, which has 3 planetary gears. (See "A" in the figure 2-7)

When the pump/ASF motor rotates right, the motive power is conveyed from "A" to "I" shown in the figure and in that alphabetic order, and the lifter goes up. At this time, semicircle gear "I" moves the axis of the lifter up and down directly, and maintains reverse rotation at paper loading and upper surface sensor operation so that the lifted up lifter does not return to the opposite direction by One-way Roller. (When the paper is actually loaded, refer to the next section, since hopper 5mm Down mechanism works.)

2.1.1.7 Hopper 5mm Down Mechanism

Hopper 5mm down is to improve the paper loading credibility and to prevent the head of paper from being folded at the moment that the Paper Load Roller picks up the top of the paper in the paper tray.

5 mm Mechanism Outline
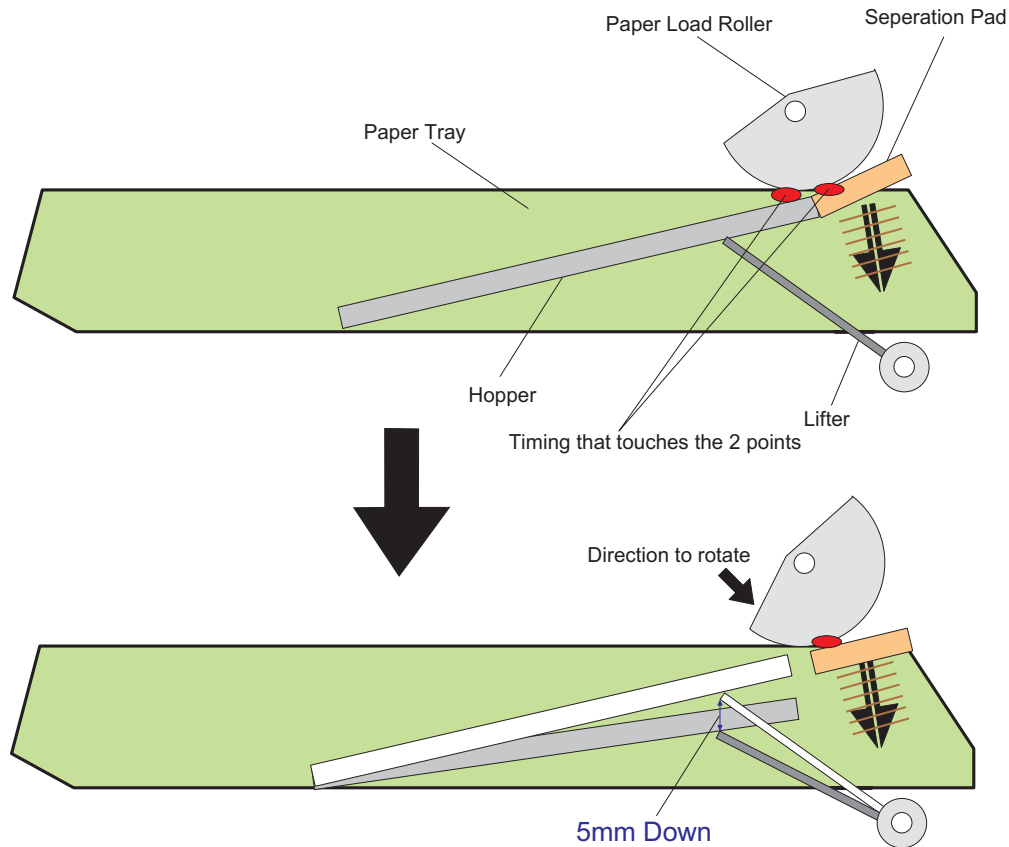
Figure 2-8. Concept of Hopper 5mm Down Mechanism

[Explaining the operation]

At the moment that Paper Load Roller rotates and picks up the top paper on the paper pile, there is a timing that the loading of Paper Load Roller touches both hopper and separation pad. At this time, since the head of paper might be folded by the rotation of Paper Load Roller because of different angles and locations of the separation pad and hopper, this phenomenon is controlled by pushing the lifter 5mm down at the moment that the paper is picked up.

[Outline of Paper Gear Train]

Power source is Pump/ASF motor. Also, refer to section 2.1.1.6 Lifter Gear Train Mechanism for the transmission of motive power. Figure 2-9 shows important gear train of 5mm down mechanism.
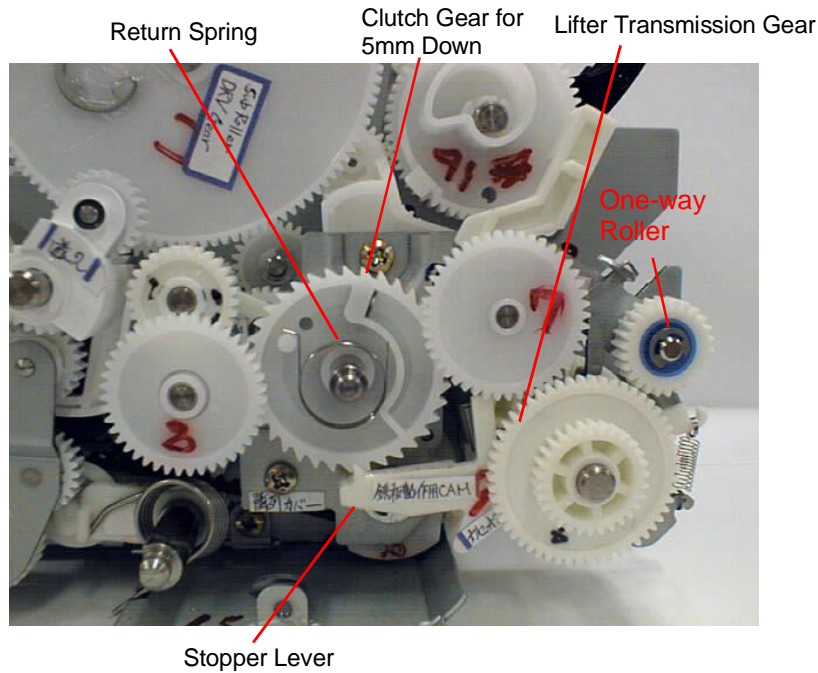
Figure 2-9. 5mm Mechanism Gear Train

[Explaining the operation]

Like lifter gear train mechanism explained in the section 2.1.1.6, the motive power from pump/ASF motor is transmitted to the transmission gear for driving the lifter. At the moment which the paper is loaded by the rotation of Paper Load Roller, only One-way Roller moves away from the lifter transmission gear.

Even when One-way Roller release the gear train, since the stopper lever of clutch gear is stopping rotation of clutch gear forcefully, the clutch gear does not rotate in reverse completely and only the gear shown in the figure 2-9, whose upper clutch gear is removed, rotates in reverse(left rotation) by the power of the return spring located inside.

Only the range that this return spring located in the clutch gear rotates in reverse enables the lifter to go down 5mm. The movement that only this One-way Roller releases is performed by rotating the paper return transmission cam with 2-step clutch gear, which is the transmission gear for rotating the paper load roller.
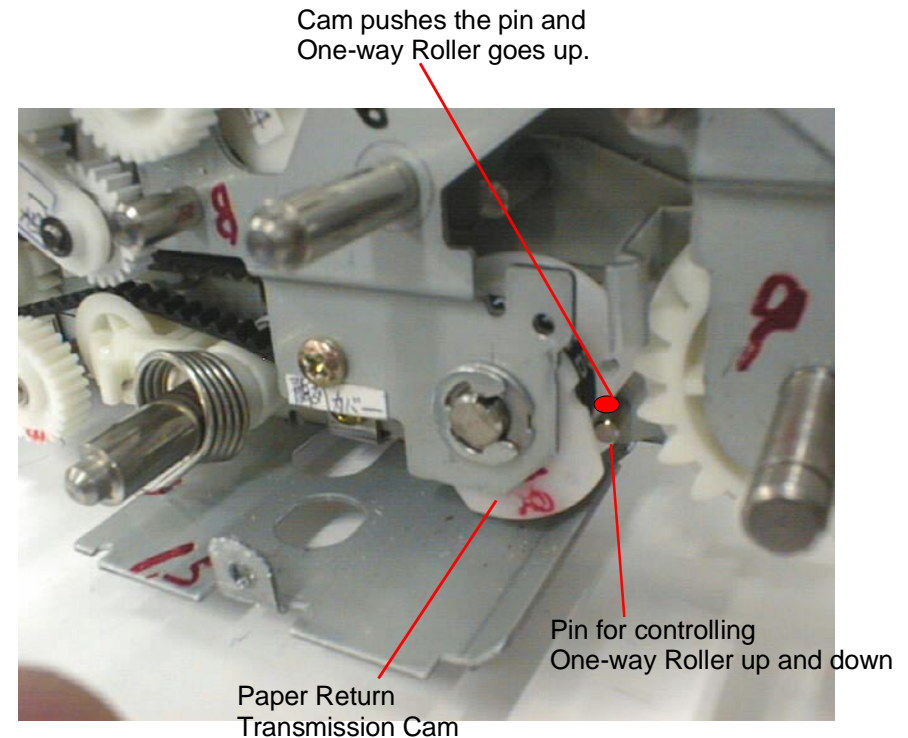
Figure 2-10. Controlling One-way Roller Up and Down

[Explaining the operation(Con.)]

After the Paper Load Roller loads the paper and performs hopper down 5mm, lifter returns to the original position and the hopper is reset. In order to perform this operation, the stopper lever which fix the clutch gear must leave to downward. In order to perform this, the lever for lifter release needs to be pushed to right side by the rotation of Cam gear. (See ① in the figure2-11)

Cam gear is released by laying down the lever for lifter release toward right direction.(See ② in the figure2-11)
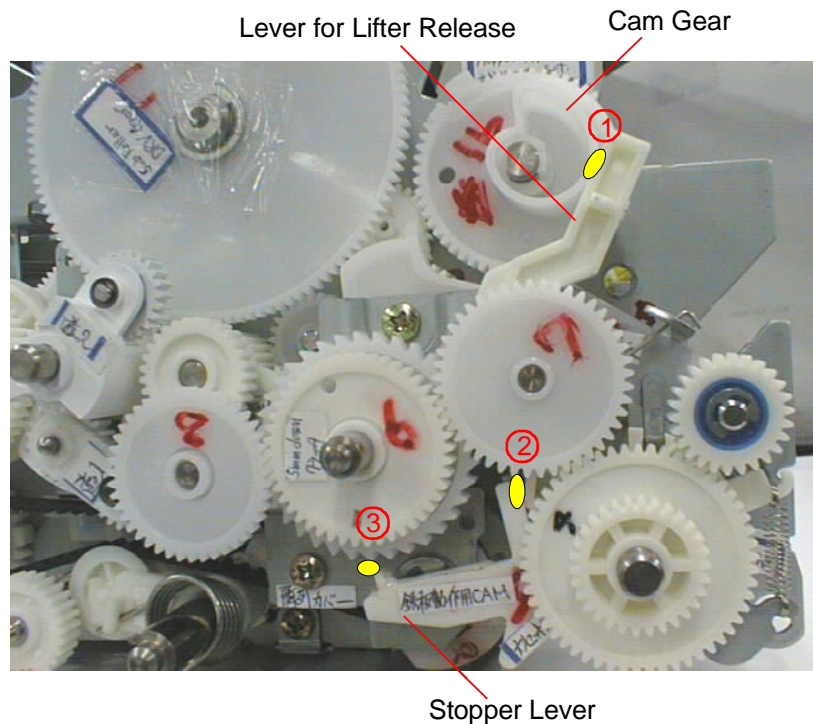
Figure 2-11. Conceptual Figure for Lifter Reset

As a result, the stop lever, which stops the clutch gear, releases the connection with the clutch gear. On the other hand, since the tension spring of the semicircle gear for driving the lifter is always trying to reset, the lifter goes back the original position immediately after the stop lever is released.
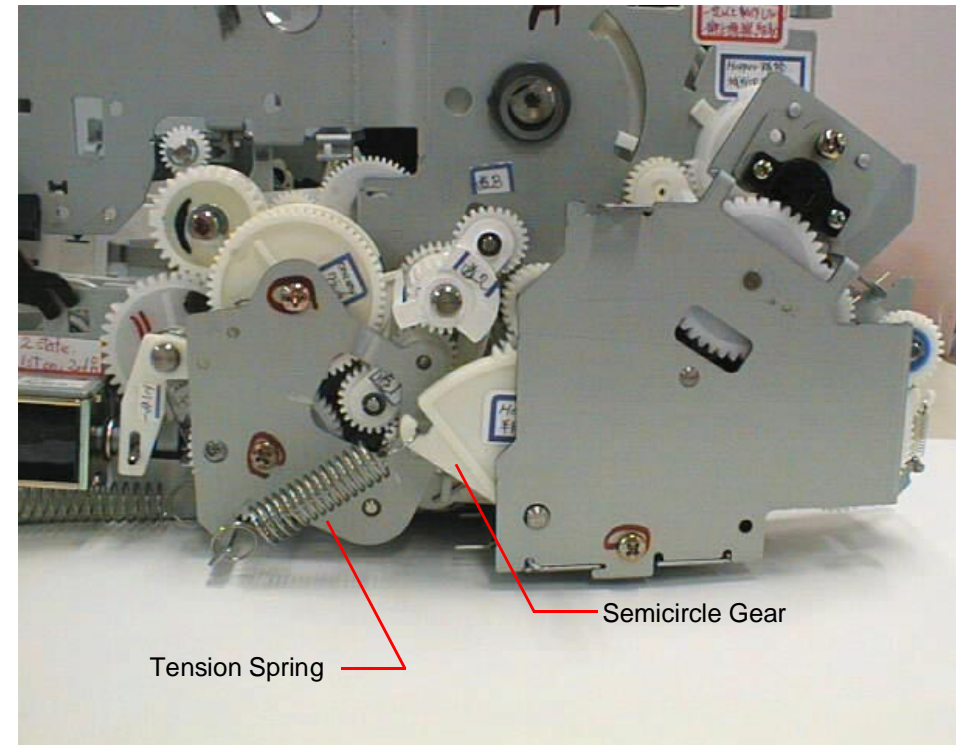
Figure 2-12. Position of Tension Spring

2.1.1.8 Sub Roller Gear Train Mechanism

The sub roller of Stylus Pro5000 is the big roller which always rotates, no matter which paper tray is used to load the paper. This roller rotates only while the pump/ASF motor rotates in reverse. Figure 2-13 shows motive power transmission.
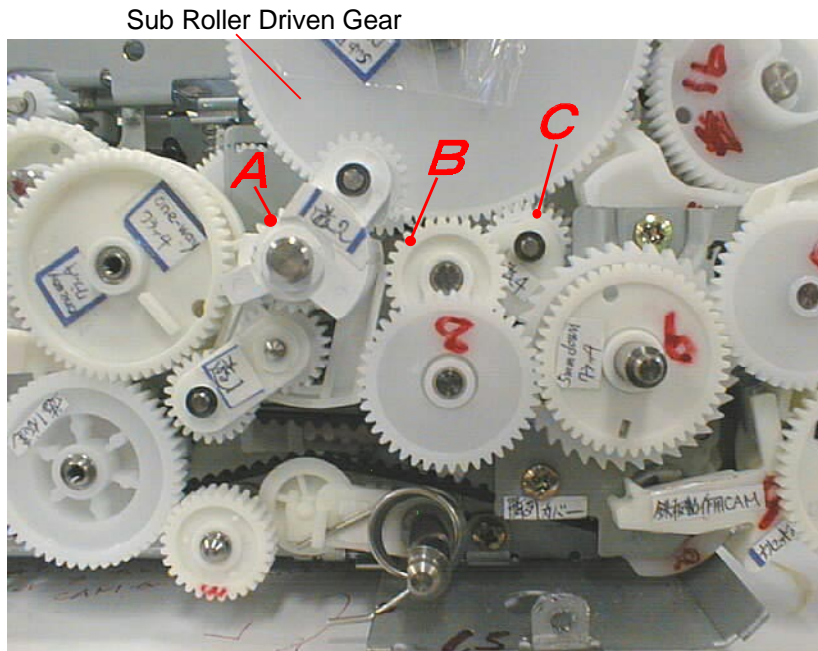
Figure 2-13. Conveying Motive Power in the Sub Roller Gear Train

[Explaining the operation]

Pump/ASF motor rotates in reverse, then the sun gear marked "A" in the figure2-13 also performs reversed rotation. By this reverses rotation of this sun gear, the planetary gear 3 makes the transmission gear, which is located rear side of Gear B. rotate in reverse. (Since Gear 3 is located behind the planetary gear2, it is not shown in the figure2-13) By this, the planetary gear 4(Gear "C" in the figure), which is hiding itself in the below, comes up as it is shown in the figure, and makes it possible to have engagement with Sub Roller Driven gear.

2.1.1.9 Gear Train Change with Hopper installed

Gear train of Stylus Pro5000 is controlled so that it is not until the user install the paper tray that the motive power becomes available for the lifter gear train. However, if the user removes the paper tray while the printer is performing the paper loading, the lifter which has been lifted up, returns to the reset position. Also, if the paper tray is not installed, C228 main control board prevents the lifter from being lifted up by the feedback signal from the logical line in order to avoid accidents. Figure2-14 shows all parts which changes their conditions, when the hopper is installed.
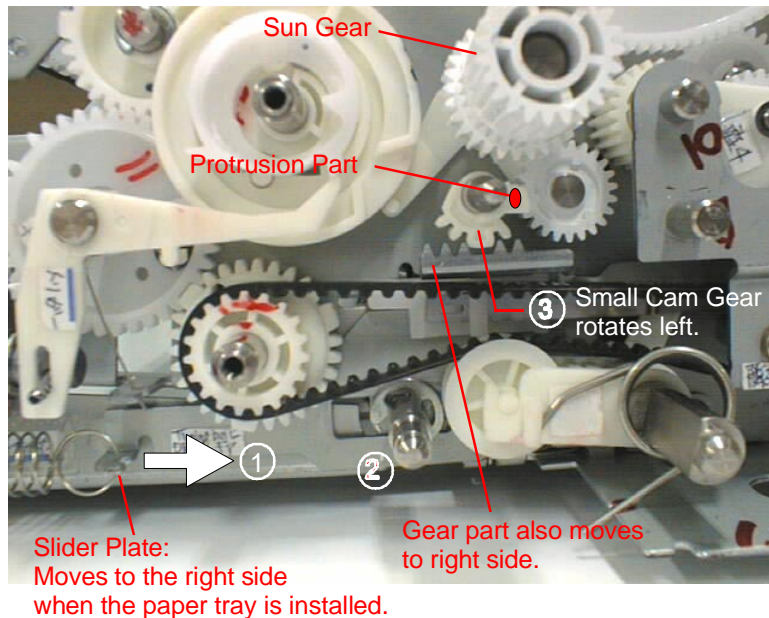
Figure 2-14. Gear Train Transmission(1)

[Explaining the operation]

Flag, which collides with paper tray, is sticking out in the mechanism frame.
By installing the paper tray to the printer body, this flag moves to rear side (to right direction in the figure2-14). Along with this, the slider plate moves to right side. (See ① in the figure2-14) On this plate, the small cam gear always engages with the notched part, which looks like the gear teeth. (See ② in the figure2-14). This cam gear is located under the sun gear, and is usually located behind planetary gear 2(Refer to figure2-13). Therefore, when the slider plate moves to the right side, cam gear rotates left . As a result, the protrusion side of the cam gear faces upward.

[Explaining the operation]

Figure 2-15 and 2-16 shows 2 conditions; one is the case that pump/ASF motor rotates right without installing paper tray and the planetary gear2 does not fall to right side, being unable to convey the motive power, and the other case that pump/ASF motor rotates forward (rotates right) with the paper tray installed.

Planetary Gear 2 does not fall to right side without installing the Paper tray.

Therefore, the planetay gear2 can not convey the motive power to the next transmission gear.

Planetary Gear2 falls to the right side with Paper tray installed

As a result, Planetary Gear2 can transmit the motive power to the next transmission gear.
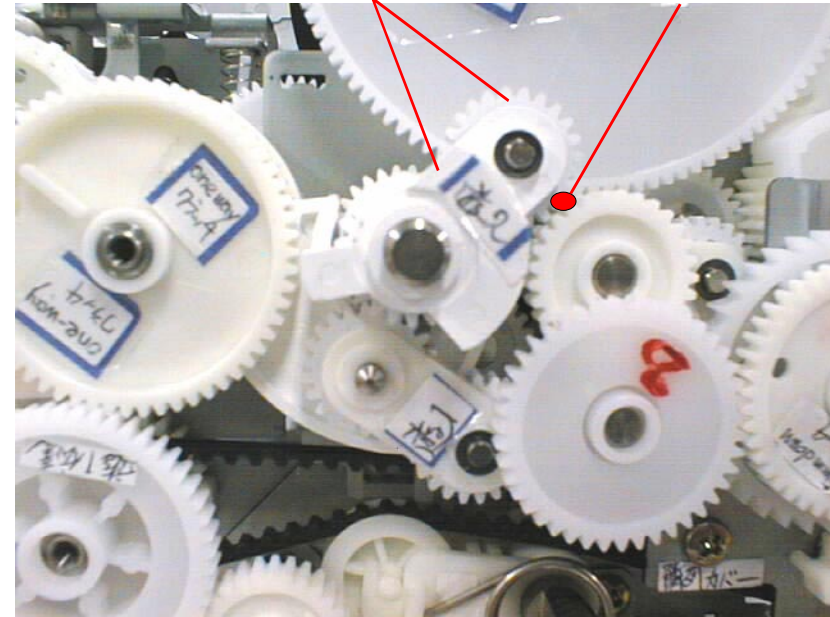
Figure 2-16. Condition of Planetary Gear 2 with Paper Tray Installed

Figure 2-15. Condition of Planetary Gear 2 without Paper Tray

Also, the planetary gear 2 mentioned in the figure above is not the only one part, which gear train changes by installing the paper tray to the printer body. The lever to release the lifter gear train mounted on the printer rear side is also influenced. Refer to section 2.1.1.7 Hopper 5mm Down Mechanism for the details about this operation.

2.1.1.10 Ink Engage/Disengage Mechanism

The ink disengage mechanism for Stylus Pro5000 is called D/E(disengage/engage mechanism). This determines to conveys the motive power from paper load/eject line to the pump line for absorbing ink or not. Figure 2-17 shows the exterior view of pump frame.
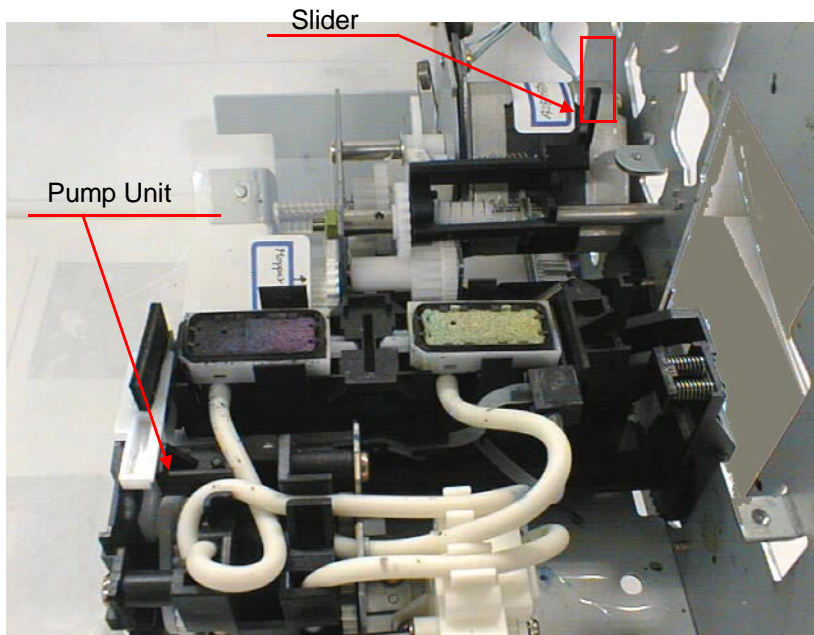
Figure 2-17. Exterior View of Pump Frame

[Explaining Figure2-17]

The major parts mounted on the pump frame above consists of various gears, which determines whether to convey the motive power from pump/ASF motor, cap unit and pump unit to the paper load/eject line gear train, or to the pump only. Out of these gears, the gear train for engaging or disengaging the motive power is the same as the one of Stylus Color 800.
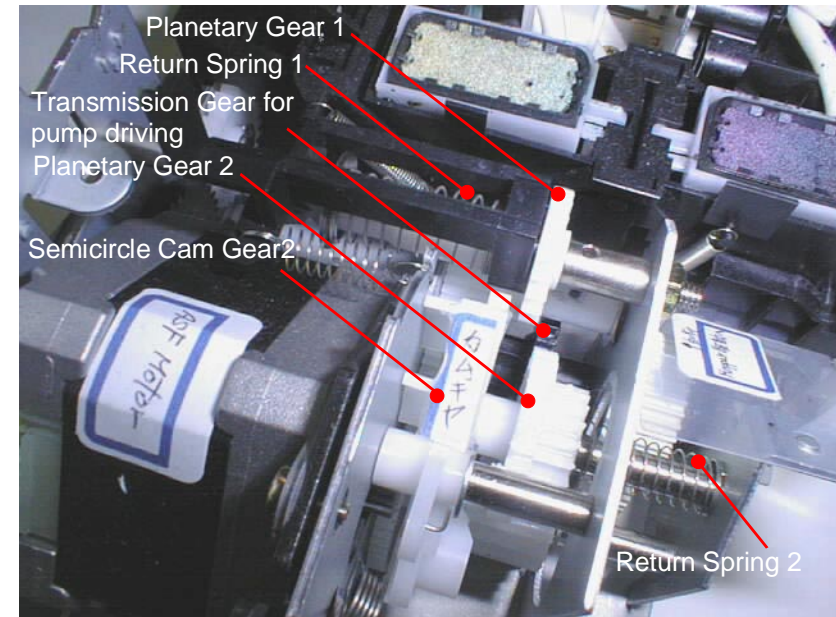
Figure 2-18. Gear Train Condition at transmitting power to the Pump

[Explaining Operation1]

Figure 2-18 shows the condition that motive power of pump/ASF motor is transmitted only to the pump unit. When the printer performs the pump operation, the planetary gear 1 moves to left direction, since the carriage collides with the slider, as it is shown in the figure2-17. While the carriage collides with the slider, the return spring 1 on the same axis, which the planetary gear 1 is also on, is compressed. When this spring expands, it moves the planetary gear 1 to left direction. In this condition, when the pump/ASF motor rotates forward, the motive power charged on the planetary gear 1 is transmitted to the semicircle cam gear. Then, as this cam gear goes up, the planetary gear 2 is pushed out to the notch of the right frame. (Refer to Figure2-19)

Transmission gear for pump driving and Planetary Gear 2 after the gear train is released.

Motive power goes to Paper Load/Eject Gear Train

Semi circle gear after its direction changed
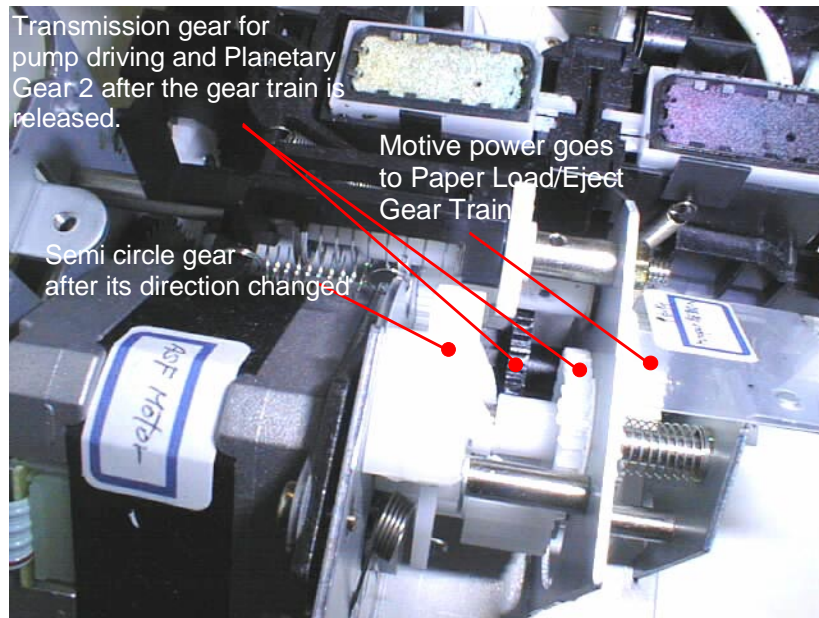
Figure 2-19. Gear Train Condition at transmitting power to the Paper Load/Eject Line

[Explaining Operation2]

The planetary gear1 gets engaged with the cam gear and pump/ASF motor is rotated forward, the motive power to the transmission gear(black) for driving pump is shut off, but instead, the motive power is conveyed to the transmission gear, which transmits the power to the paper load/eject line.

2.1.1.11 PG Disengage Mechanism

Stylus Pro 5000 performs automatic control to change the platen gap, which the users were controlling the platen gap manually in the previous models. Usually, the printer perform this operation automatically, according to the paper type setting from the driver.
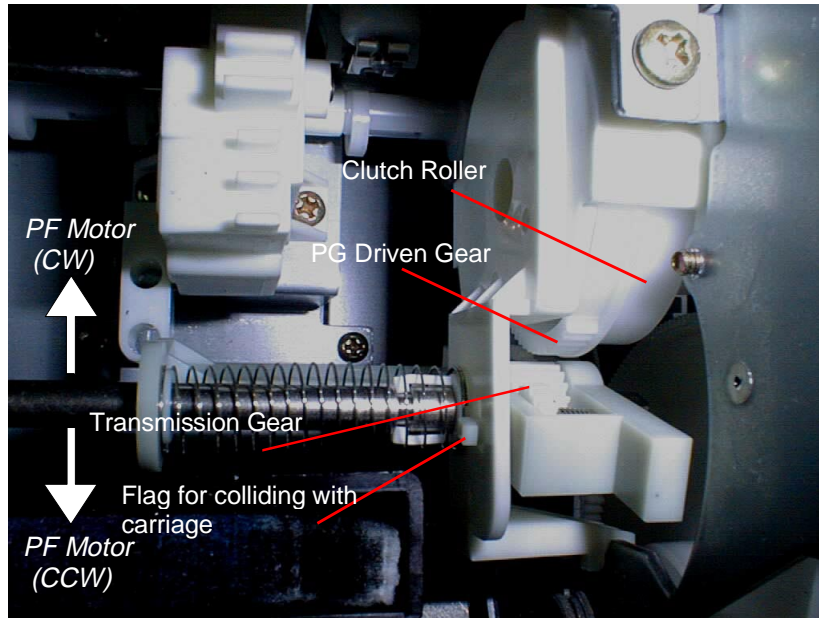
Figure 2-20. PG Changes

[Explaining the operation]

When the printing command is input in the conditions that plain paper or Photo Quality Ink Jet paper (landscape) is selected on the driver, or the media type lever is set to Thick Paper, or manual feed thick paper mode is selected by the alternative function on the control panel, the carriage lets the flag, which is waiting at the most left edge with the paper width sensor, collide with the protrusions on the carriage. Once the flag collides with the carriage, although the positions of the transmission gear and PG driven gear match as it is shown in the figure 2-20, they can not be really engaged with each other, since there is still gap between them. Therefore, the whole transmission gear falls into the PG driven gear side by rotating the PF motor counterclockwise, then, the PG driven gear rotates. The figure 2-21 shows the condition of small(narrow) platen gap before the PG driven gear rotates, and figure2-22 shows the condition of the gear train after the PG gap becomes wider.
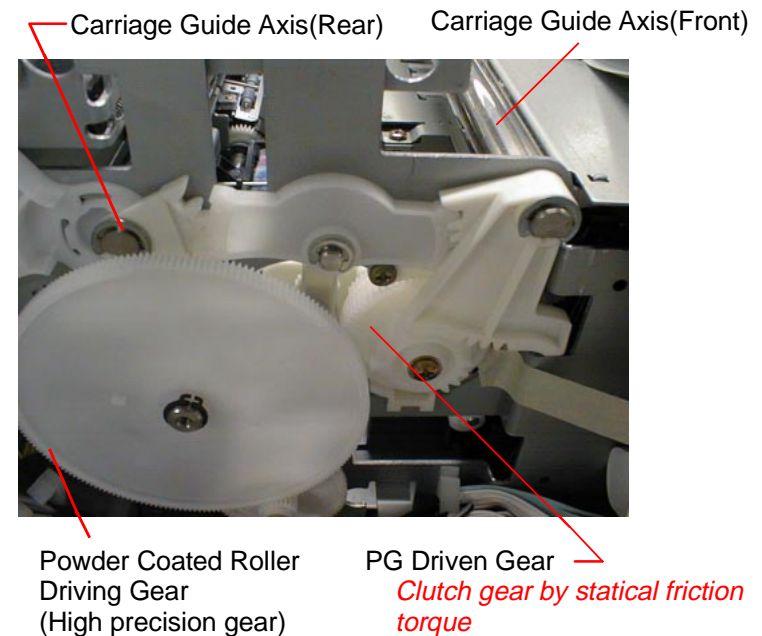
Figure 2-21. Gear Train Condition when PG is narrow(small)

[Explaining the operation(Con.)]

Once the transmission gear is engaged with the PG driven gear, PG driven gear is rotated counterclockwise by the forward rotation of PF motor, and PG mechanism starts its operation. (See figure 2-20) The figure 2-22 shows the gear train condition, when the platen gap becomes big(wider).

Middle Transmission Gear

Up

Down

No gear teeth
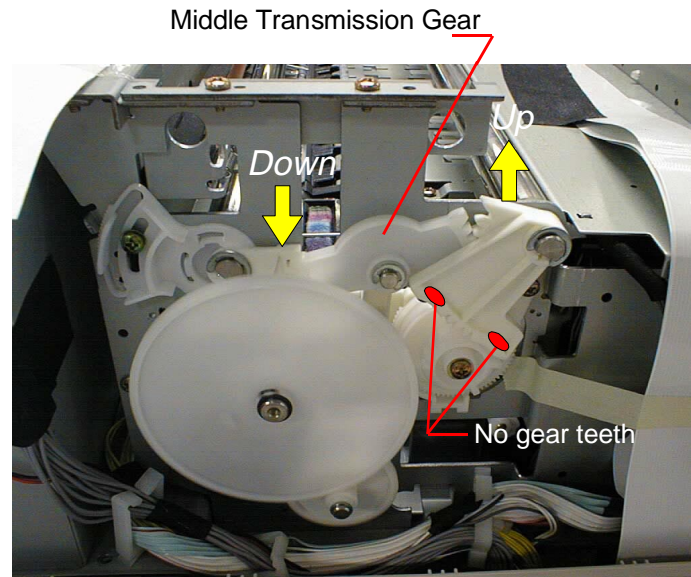
Figure 2-22. Gear Train Condition when PG is wider(big)

[Explaining the operation]

When the PG driven(clutch) gear starts rotating right direction, each lever with gear located on both sides of the transmission gear, changes the condition. Also, as it is shown in the figure2-22, since the some portions of gear teeth are removed on the surface of the driving gear and on the lever with gear on the right side, the rotation by the PF motor can not be transmitted more than necessary. Since the PG driven gear itself is the clutch gear applied with static friction torque, even the motive power tries to go to the other areas except for the area of controlling PG(2.1mm) and small PG(1.2mm), the PG driven gear loses its clutch and can not transmit the power.

2.1.1.12 Ink Valve Mechanism

The purpose of ink valve mechanism is to prevent ink leaking during re-transport after the serve is completed. Stylus Pro5000 does not have the waste ink sequence like Stylus Color 3000 had, instead, this ink valve mechanism prevents leaking from the ink pack. Also, in case of Stylus Color 3000, when the waste ink sequence is performed, the program performs initial ink charge automatically by turning the printer on after installing each ink cartridge. On the other hand, in case of Stylus Pro5000, since the printer itself does not have the function to perform initial ink charge, it is recommended not to remove the ink cartridge from the printer during the re-transport.

Valve is opened by CW PF motor rotation

CW(Valve is opened)

CCW(Valve is closed)

Transmission Gear

Clutch Gear

Protrusion of cam faces out by CW PF motor rotation
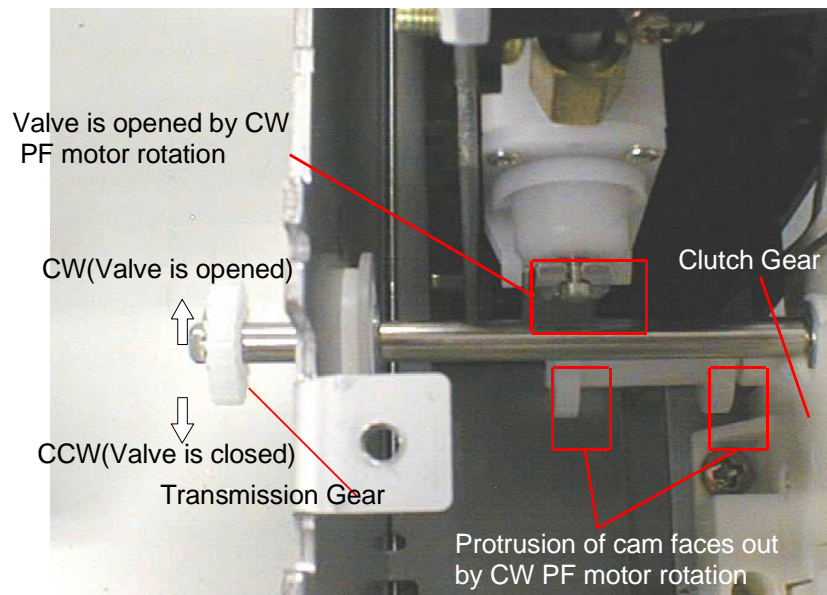
Figure 2-23. Ink Valve Mechanism when the Valve is opened

Valve is closed by CCW PF motor rotation

Protrusion of Cam faces the valve side by CCW PF motor rotation
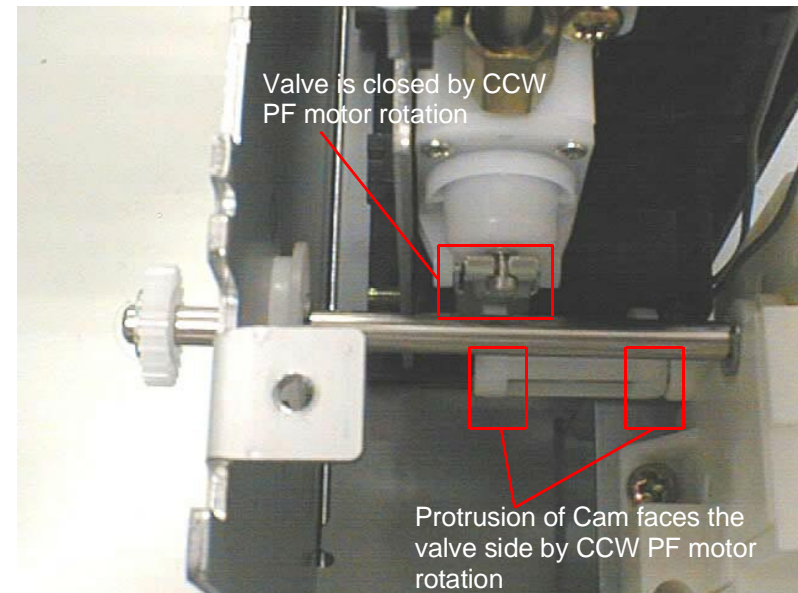
Figure 2-24. Ink Valve Mechanism when the Valve is closed

[Explaining the operation]
The motive power source of ink valve mechanism is PF motor. When the PF motor is rotating, although ink valve mechanism is always receiving the motive power, the cam loses its clutch in the clutch unit so that the cam to operate the valve does not rotate more than 180 degree.
In the actual operation, when the printer is turned on, the valve is opened by rotating the PF motor forward with initialization operation, and the valve mechanism stays open, but stays always close in the non-printing condition.

2.1.1.13 Friction Release Mechanism

In the previously used paper feed mechanism, which was applied for Stylus Color 1520 and Stylus Color 3000, the paper feed roller always contacts with the paper feed support roller located under the paper feed roller. In this condition, as the printing on the presently moving the paper gets closer to the end, since the friction between paper feed roller and the paper feed support roller is all released at the paper ending edge, strictly speaking, there is a possibility that the paper feed pitch varies slightly.
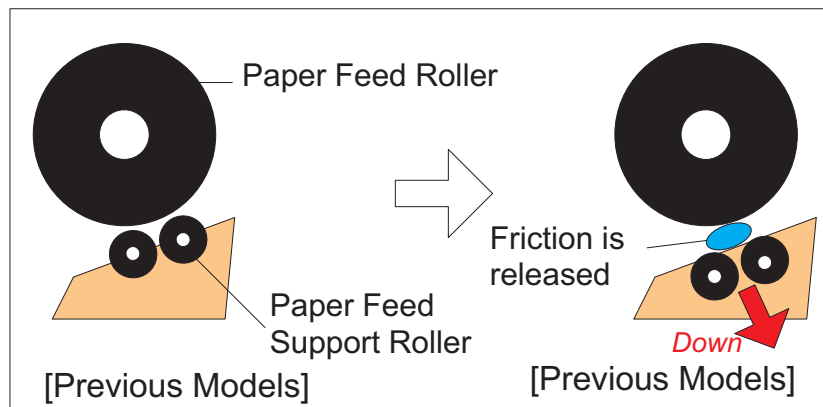
Figure 2-25. Concept of Friction Release

[Explaining the operation]
The gear train, which sets or releases the friction with paper feed support roller, depends on the sub roller driven gear train. As it is mentioned in the section 2.1.1.7 Hopper 5mm Down Mechanism, when the pump/ASF motor rotates, the cam gear always rotates too, regardless the motor's rotational direction. This cam gear not only pushes or pulls the lever in order to encourage the lifter gear train to be released, but also conveys the motive power to the transmission gear to encourage the paper feed support roller to move up and down in the frame inside.
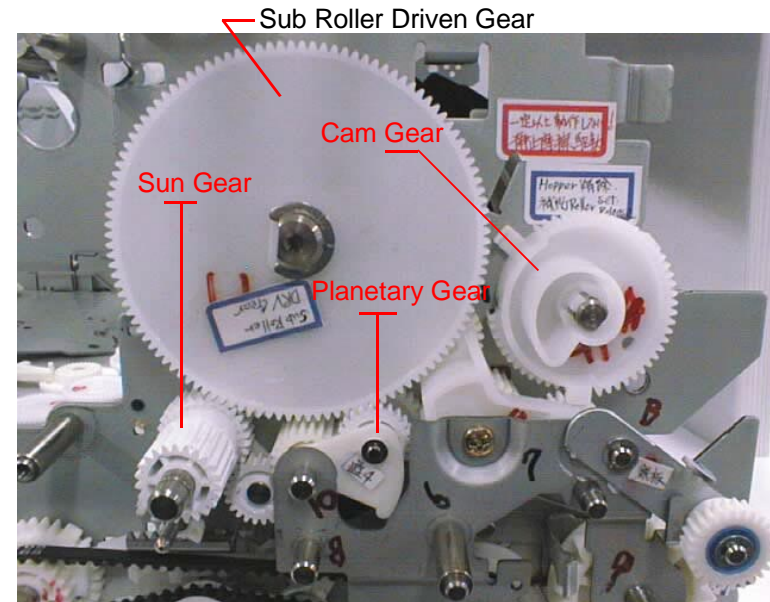
Figure 2-26. Transmitting the motive power to the Cam Gear

Since the sub roller is not supposed to rotate forward, this gear train are not able to rotate in reverse, unless the pump/ASF motor rotates backward, using planetary gears and conveys the motive power. On the other hand, when the pump/ASF motor rotates forward, the motive power is not transmitted to the Sub Roller Driven gear but only to the cam gear. If this cam gear keeps rotating, it will come off eventually, since there is a limit for up and down operation by the paper feed support roller.
In order to prevent this, a part of gear teeth of the cam gear is removed and this avoids conveying the unnecessary motive power from the planetary gears.
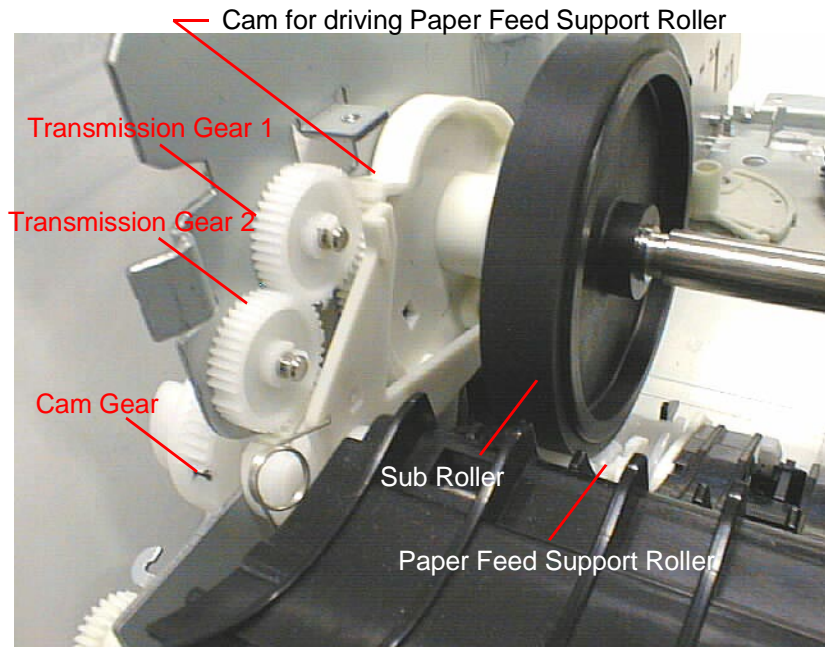
Figure 2-27. Transmitting motive power to Paper Feed Support Roller

Table 2-5. Relation between Rotational Direction of Motive Power and Gear Train Changes

Rotational direction for Pump/ASF motor	Sub Roller condition	Cam Gear condition	PF Support Roller
CW(right) rotation	Not operate	Right rotation (It stops after the certain rotation)	Release condition
CCW(left) rotation	Left rotation (Paper transportation)	Left rotation (It stops after the certain rotation)	Friction condition

[Explaining the operation(Con.)]

Figure2-27 shows transmission of motive power, which the motive power of pump/ASF motor is conveyed to the paper feed support roller.
The cam gear must rotate, as a condition to set or release the paper feed support roller. However, while the sub roller is rotating in reverse, the cam gear loses motive power and stops, after setting the paper feed support roller in the friction condition. Also, while the pump/ASF motor rotates forward, since the planetary gear in the figure2-26 does not engage with the Sub Roller Driven gear, the motive power is not transmitted to the sub roller, and the paper feed support roller is set in the release condition by rotating the cam gear clockwise. The table 2-5 shows the relation between the rotation of pump/ASF motor and operation of each mechanism.

2.1.1.14 Gear Train Block Diagram

Diagram below shows the most complicated mechanism in the Stylus Pro5000; the Gear Train for Paper Load/Eject line control.
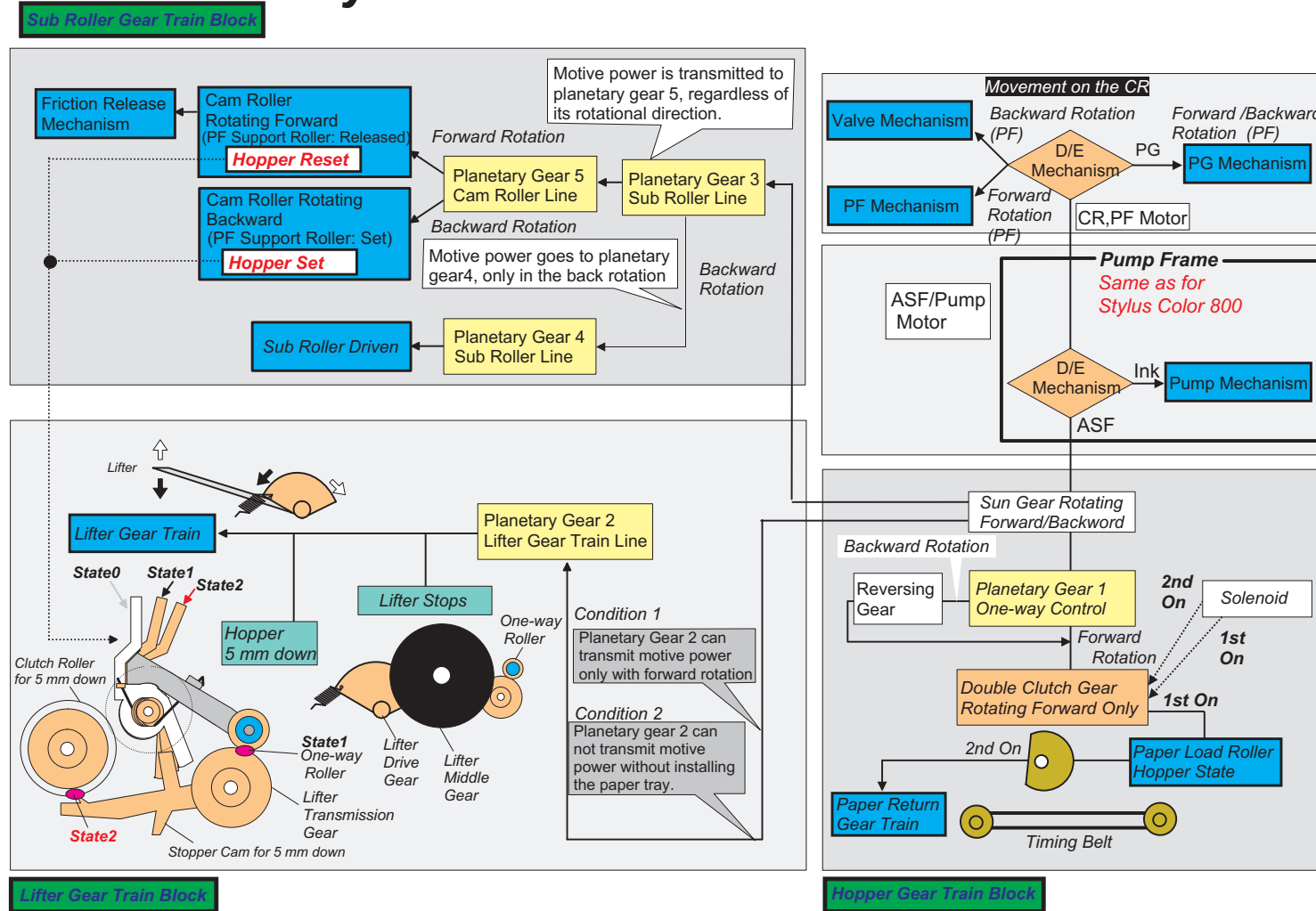
Figure 2-28. Flow Chart for Paper Load/Eject Line Gear Train

2.1.2 Outline of Electrical Circuit

Here explains outline of various electric circuit boards.

2.1.2.1 C228 PSB Board

In the power supply circuit of Stylus Pro5000, the switching power supply called C228 PSB board is used, and plays role of generating various driving voltages. Table below shows the voltage, which C228 PSB board generates, and its usage.

Table 2-6. Output Voltages of C228 PSB Board and their Usage

No.	Output Voltages	Usage or Roles
1	+42V	•Driving Pump/ASF motor. •Driving PF motor. •Driving CR motor. •Driving Paper Load Solenoid (Driving Optional solenoid) •Source of the print head common voltage. •Source of the Fan driving voltage.
2	+5V	•Logical signal of C228 Main Board. •Current setting signal of various motor drivers. •Source of nozzle selector for head driving. •Control Panel LED driving voltage. •Reset IC standard monitoring voltage. •Timer IC driving voltage, etc.
3	+28V	•Standard voltage of comparator for generating head driving voltage.

Figure 2-29 shows circuit block for C228 PSB board.
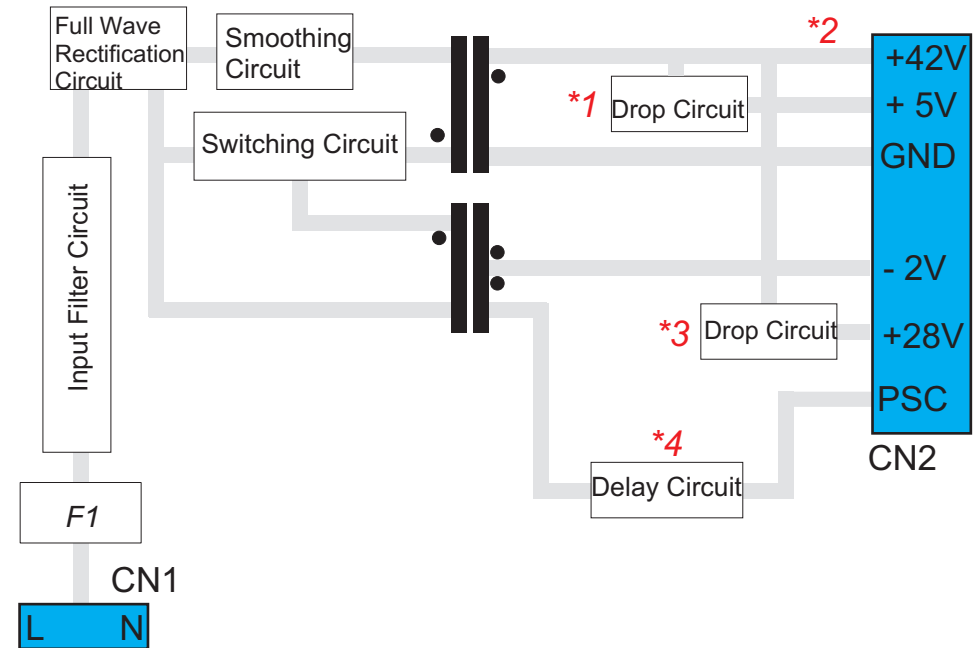
Figure 2-29. C228 PSB Power Supply Circuit Block

[Various Protection Circuits]

Each output power source from *1 through *4 numbered in the figure2-29 has protection circuit, as it is explained below.

*1)   5 VDC Stabilization Circuit
IC51(L4960), which is also HIC for drop circuit, outputs +5 VDC, as +42 V line power supply voltage. If the switching circuit on the primary side gets shorted by any malfunctions, the output voltage level on the secondary side gradually increases and may damage C228 main board and C228 DRV board. Therefore, +5 V output line is always monitored by ZD94, and output will be stopped completely, if the voltage level exceeds 9 VDC.

*2)   +42 VDC Line Stabilization Circuit
+42 V consists of 2 stabilization circuits. It is the control circuit to vary the On/Off timing of the switching circuit located on the primary side by 7 Zener diodes, which are from ZD51 to ZD86 on the circuit. If +42V lines falls to +38V by the influence of overloading, electromagnetic induction on the primary side is encouraged to be stopped periodically by turning the main switching FET(Q1) off. This circuit is called constant voltage control circuit.

The other one is the over voltage protection circuit. If the voltage of +42 V line falls into the abnormal situations, especially assuming the malfunction on the switching circuit on the primary side, this protection circuit stops all the operations on the C228 PSB board so that the abnormally increased voltage is not output. This circuit is called the over voltage protection circuit.

*3)   +28 VDC Line Stabilization Circuit
This circuit is mounted on the same line as the +42 V line over voltage protection circuit is on, which is mentioned above. It stops all the operations on the C228 PSB board, when +28V line falls to the abnormal situations by malfunctions of the switching circuit on the primary side, etc., and the voltage level exceeds 33V. This circuit is also called over voltage protection circuit.

*4)   Delay Circuit
Since the power supply switch is on the secondary side, even if the power is turned off on the control panel, the exclusive power off sequence still operates. Following shows various power off sequences, which are always performed, when the power is turned off from the control panel.

- ■ Closing ink valve
- ■ Carriage lock set
- ■ Paper eject operation(if the printer is still printing)
- ■ ASF load paper system reset (If it is operating)

2.1.2.2 C228 DRV Board

In the C228 DRV board, E05B48(IC9) plays its central role. On this board, 2 printing heads, 3 motors and solenoids, and all sensor circuits are mounted. These driving/stop signal, monitoring the conditions of all sensors in the motive power line, and the control in the driving line according to the conditions are determined by E05B48 through communication with C228 main board. Figure below shows block diagram of C228 DRV board.
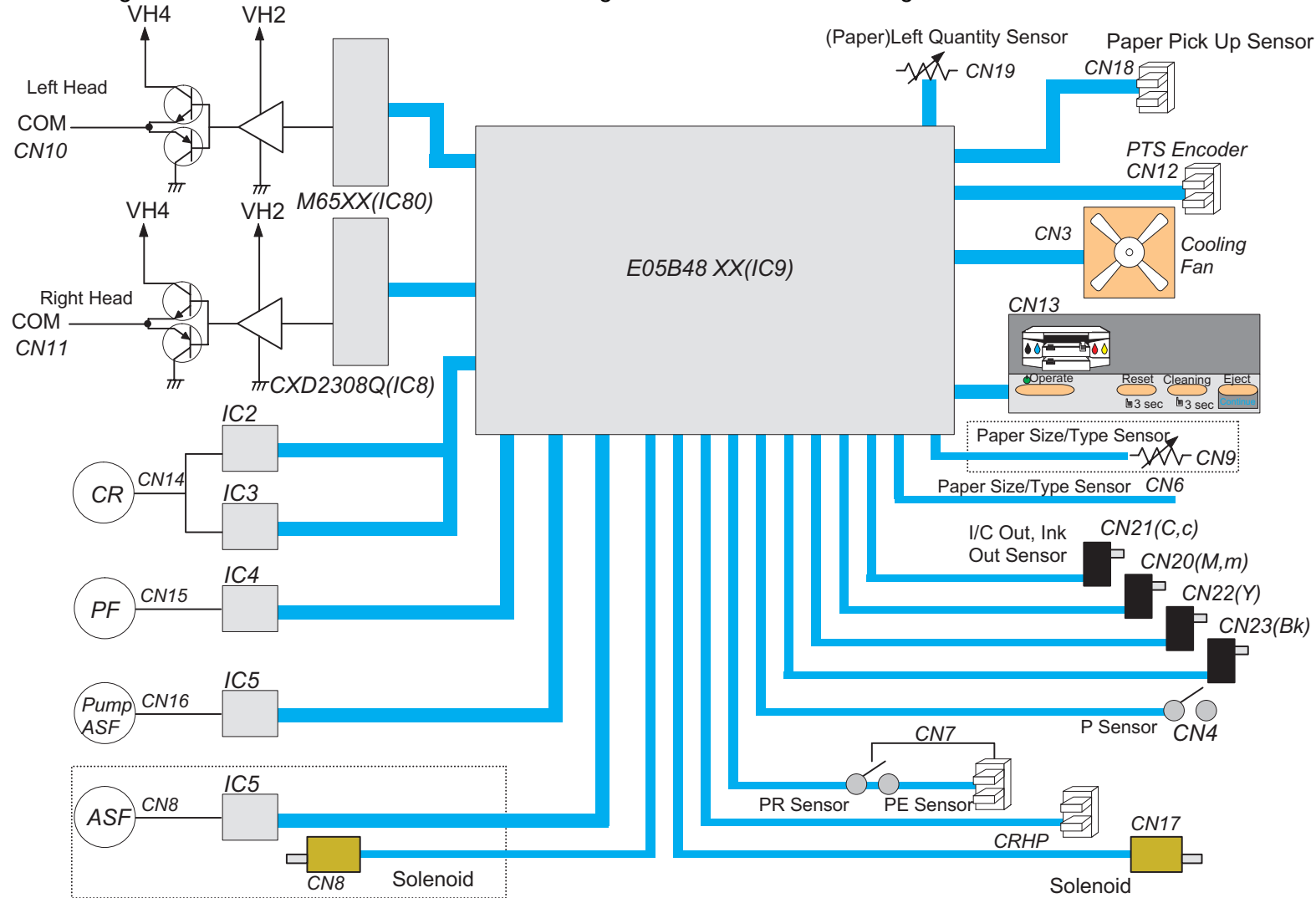
Figure 2-30. C228 DRV Board Block

2.1.2.3 C228 Main Board

In the C228 Main board, mainly, memory control
(Flash/DRAM/SRAM/PDRAM), taking CPU as its center, optional SIM
control and Bus control are performed, and this board plays the major role
for the whole circuit.
Also, this board plays role of sending or receiving information between
interfaces(Parallel/Type-B/Mac.) and various exterior parts. Figure below
shows block diagram for C228 main board.
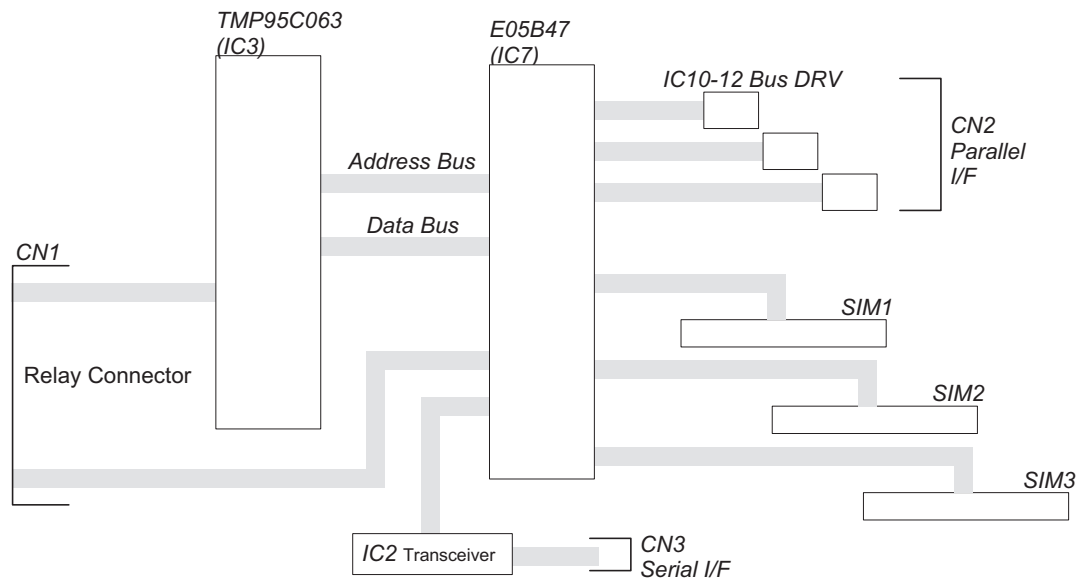
Figure 2-31. C228 Main Board Block

3

TROUBLESHOOTING

3.1 FEATURES

This chapter describes how to troubleshoot abnormal operations of Stylus Pro5000.

3.1.1 Problems relating to the printer mechanism

In this section, problems which may occur in the printer mechanism and their remedies are described in each table.

Table 3-1. Phenomenon:
Cleaning does not solve the problem in print quality.

Step	Remedy
1	Connect the printer and the PC with a cable and turn them on. If any error condition is found, the cause of the error must be eliminated.
2	Start the service program "Stylus Pro5000.EXE" and select "Head cleaning" from the menu 'Maintenance". (Repeat the cleaning 5, 6 times or more to remove severe head clogging. (See Chapter 5 for details.) If this operation does not recover the head condition, go to Step 4.
3	Select "Ink charge flag reset" from the same menu. Note that this operation does not start initial charge operation.
4	Turn the printer off.
5	Turn the printer back on, and the initial charge operation starts.
6	Run the self-test to check the output. If the problem is not solved yet, go back to Step 1 and repeat the operation.

⚠WARNING *The servicing program runs on DOS program only. Therefore, do not run the program on Mac. ®PC.*

⚠CAUTION
- *In the cleaning operation by the servicing program, always CL2(strong cleaning) is forcibly performed. Therefore, make sure to perform printing test every time CL is performed.*
- *Note that "Ink charge flag reset" in the servicing program does not reset the initial charge flag by itself. For this reason, be sure to turn the printer off and then back on after the operation.*
- *Be careful no to perform initial ink charge more than necessary as it spends a considerable amount of ink. In case you need to repeat the operation to solve the head clogging problem, make sure that you have an extra cartridge ready, since you can not repeat the operation three times at a time. (The ink usually ends before the second operation is complete.)*

Table 3-2. Phenomenon:
Cleaning does not solve the problem in print quality. (Continued)

Step	Remedy
7	Remove the upper case and then the cover on the carriage. (Refer to Chapter4)
8	Check the damper inserted in the needle for each color. If it is loose, fix it securely.
9	Check that hexagon nuts connecting the pipes and ink supply tubes for all colors routed out to the front side of the printer are securely tightened.
10	Check that the hexagon nuts securing the ink supply port at the back of the ink cartridge holders are securely tightened.
11	When the printhead is at the home position, check the rubber on the cap and the head surface, which should be in tight contact with each other, for the correct position. If they are not properly positioned, following conditions can be assumed: ■ Lack of parallelism due to bad repair or severe shock. ■ Incorrect engagement of the parts around the cap, such as the spring dislocated and the cap supporting shaft unhooked. ■ Ink tube has come off or deformed. ■ Small concavities on the cap rubber surface
12	Using the tester, check the signal change in on and off for that the detected signal is properly fed back from the ink out sensor.
13	Head driver common voltage and the nozzle selector control signals may not be sent to the printhead. Therefore, check that the FFCs are correctly connected to CN10 and CN11 on the C228 DRV board.
14	Check that the FFCs for the printheads are correctly connected. If it is not connected completely, there is a possibility that excess current already flew into PZT in the head, damaging the head.
15	Waveform for the head driver voltage output from the C228DRV board may be abnormal. Therefore, replace the C228DRV board.
16	C228MAIN board may be bad. Replace the C228MAIN board.
17	If the problems is not solved through the steps, replace the printhead.

⚠️**WARNING** | *Mind that 2 printhead used for the printer, the dark color version (left) and light color version (right), have different ordering codes. Therefore, be sure to install the head of the correct code, as a wrong head has a direct effect on print quality.*

Table 3-3. Phenomenon:
Printer ejects ink but prints badly.

Step	Remedy
1	When the printer ejects ink in a improper direction, that condition is considered "improper alignment". The possible causes other than head clogging are failure in any of the following adjustments: Bi-D adjustment, Head gap adjustment, Head angle adjustment, Head vertical adjustment Referring to Chapter 5, print a check pattern to see the current adjustment condition.

⚠️**WARNING** | *The adjustments mentioned above must be performed in the specified order. Make sure that you perform the adjustments in the order specified in Chapter 5.*

Table 3-4.Phenomenon:
Printer Fails to Load Paper Frequently.

Step	Remedy
1	Paper types available and the way to set vary depending on the cassette types; standard cassette or optional cassette. Look into the User's Guide and set the paper which is not available to the optional cassette to the standard one.
2	Check that the paper set in the cassette does not exceed the capacity.
3	Check that the edge guides in the cassette are properly aligned with the paper sides.
4	A separation pad in the paper cassette must be kept to have proper friction with paper. If the user touches the pad surface, it affects paper separation. Therefore, when this problem occurs wipe the paper separation pad surface with a cloth moistened with alcohol.
5	If a PF roller is used for many years, it starts losing proper μ due to friction built up on its surface. In stand by status, the roller can not be cleaned as it is facing upward. Therefore, clean the roller in the following order when this problem occurs: 1. Remove the paper cassette. 2. Turn the printer off and back on, and the ASF resets. 3. Using the cloth moistened with alcohol, wipe the PF roller as the roller rotates.

Table 3-5.Phenomenon:
Printer Loads Multiple Paper Frequently.

Step	Remedy
1	The hopper 5-mm down mechanism may not be properly functioning. Referring to Section 2.1.1.7 in Chapter 2, check the mechanism in the following step.
2	Check that the spring in the clutch gear which acts to bring the lifter down by 5 mm is properly set. To check it, hold one gear (either inner one or outer one) and then turn the other gear manually. If the turned gear spins back with the tension of the spring, it means the spring is set properly.

Table 3-6.Phenomenon:
Hopper does not Reset after Paper Is Loaded.

Step	Remedy
1	The tension spring is dislocated form the lifter driving gear (a crescent gear). Therefore, mount it properly.

**Table 3-7. Abnormal Phenomenon:
LED Indicates "Paper Out (tray 1)".**

Step	Remedy
1	Remove the paper cassette and check the paper left quantity sensor actuator (an acting pole with a roller attached on it) for the proper function. If it is dislocated or not functioning properly, reinstall it to the correct position. (Refer to Chapter 4.)
2	The LED status may remain the same after the cassette is properly reinstalled to the printer. It is because the LED indication also shows "No Tray" condition.
3	Check that the CN6 on the C228DRV board is properly set.
4	Referring to Table 3-3, perform the adequate cleaning.
5	Check that each connector connecting the paper cassette with the printer is properly connected.
6	C228DRV board is not feeding back the cassette presence status properly. Therefore, replace it.
7	C228MAIN board may be defective. Therefore, replace it.

**Table 3-8. Abnormal Phenomenon:
LED Indicates "Paper Out (tray 2)".**

Step	Remedy
1	Remove the paper cassette and check the paper left quantity sensor actuator (an acting pole with a roller attached on it) for the proper function. If it is dislocated or not functioning properly, reinstall it to the correct position. (Refer to Chapter 4.)
2	The LED status may remain the same after the cassette is properly reinstalled to the printer. It is because the LED indication also shows "No Tray" condition.
3	Check that the CN9 on the C228DRV board is properly set.
4	Referring to Table 3-3, perform the adequate cleaning.
5	Check that each connector connecting the paper cassette with the printer is properly connected.
6	C228DRV board is not feeding back the cassette presence status properly. Therefore, replace the C228DRV board.
7	C228MAIN board may be defective. Therefore, replace it.

**Table 3-9. Abnormal Phenomenon:
LED Indicates "Paper Out (manual feed)".**

Step	Remedy
1	If the P sensor does not come on despite the manual feed is selected in the printer driver, the printer assumes that no paper is loaded in the manual feed paper entrance. In this case, following problems may be considered.
2	A sheet is set but the front edge has not reached the P sensor, and the sheet is not loaded into the printer as the result. In this case, push the sheet further until it meets resistance. *Note: Paper types and setting directions available to manual feed are limited. Look into the User's Guide, and if you find the paper not available to manual feed, set the paper to the cassette. Also, be sure to switch the paper source from manual feed to cassette feed in the printer driver.*
3	Check the P sensor, since it is disconnected or defective.
4	Check that the CN4 on the C228DRV board is securely connected.
5	Replace C228DRV board is not detecting the signal from the P sensor. Therefore, replace it.
6	C228MAIN board may be defective. Therefore, replace it.

**Table 3-10. Abnormal Phenomenon:
LED Indicates "Paper Jam".**

Step	Remedy
1	The same LEDs come on when the rear cover is open. Therefore, check that the rear cover is securely closed to the printer side.
2	The printer refers to the points below to determine 'Paper Jam" condition: ■ Point where the P sensor comes on. (Right after a sheet is picked up from the paper cassette.) ■ Point where the PE sensor comes on. ■ Point where the PR sensor comes on. (Comes on at manual rear insertion only.) ■ In the CR scanning area (Paper jam is detected based on the change in the pulse output from the encoder belt.) The printer monitors the conditions for these sensors and determines if any paper or paper debris is remaining.
3	Check that the following connectors on the C228DRV board are properly connected. *CN4 (P sensor), CN7(PE,PR sensors), CN12(PTS)*
4	C228DRV board may not be detecting the signals from the sensors. Therefore, replace it.
5	C228MAIN may be defective. Therefore, replace it.

**Table 3-11. Abnormal Phenomenon:
Any of the Ink End LEDs Stays On or Blinking.**

Step	Remedy
1	Check that the life of the ink cartridge currently installed as a repair tool almost expires, or check that the ink cartridge is installed to the printer.
2	Check that the ink out sensor and I/C out sensor are properly functioning. Also, check if they are securely set to the specified positions.
3	Check that the following connectors for the ink out sensor and I/C out sensor on the C228DRV board are properly connected. *CN23(Bk), CN22(Y), CN20(Mm), CN21(Cc)*
4	C228DRV board may not be detecting the signals from the sensors. Therefore, replace it.
5	C228MAIN board may be defective. Therefore, replace it.

Table 3-12 .Abnormal Phenomenon:
LED indicates "Fatal Error".

Step 1:	Summary

The printer indicates "Fatal Error" condition by bringing all LEDs on. This is caused by the troubles occurred in the driver lines including electrical circuit, as shown below:

- Trouble occurred in the CR motor control mechanism
- Trouble occurred in the PF motor control mechanism
- Trouble occurred in the pump/ASF drive mechanism
    (Occurs when an abnormally excess force applied to a specific gear train or mechanism is preventing the motor from rotating.)

To find out the cause of the problem, follow the steps and isolate the defective part. Exceptionally, you can go straight to the corresponding step for a quick solution when you notice the following problem:

  The printer operates at power on and then indicates "Fatal Error" when it enters a specific sequence. (Ex.: The PF motor rotates normally at power on but enters "Fatal Error" condition when the CR starts moving.)

Therefore, be sure to refer to the following steps when "Fatal Error" occurs at power on only.

Note: *Following steps correspond to the sequence which the mechanisms operate.*

Step 2:	Checking the PF motor drive line

At power on, the PF motor is driven first. If you notice "Fatal Error" immediately after power on, you are to check the following parts to see the condition of the PF motor drive line:

- Check internal coil resistance for the PF motor. If the result does not meet the specification, replace the motor.
    - *Specification:*   *2.8 $\Omega \pm$ 10% (each phase)*
    - *Check points:*   *Between Pins 1 and 3 or Pins 2 and 4 for CN15 on the C228DRV board*
- Replace the C228DRV board and check for the proper operation.
- Replace the C228MAIN board and check for the proper operation.

Table 3-13 .Abnormal Phenomenon:
LED indicates "Fatal Error". (Continued)

Step 3:	Checking the CR motor drive line

When the PF motor drives and releases the CR lock and ink valve mechanisms, the CR motor comes in operation. The printer then checks that the CR shifts in the scanning area normally. Therefore, if "Fatal Error" occurs while the CR is in operation after PF motor drive is complete, check the following for the correct operation of the CR motor line:

- Check internal coil resistance for the CR motor. If the result does not meet the specification, replace the motor.
    - *Specification:*   *4.3 $\Omega \pm$ 10% (each phase)*
    - *Check points:*   *Between Pins 1 and 3 or Pins 2 and 4 for CN14 on the C228DRV board*
- Replace the C228DRV board and check for the proper operation.
- Replace the C228MAIN board and check for the proper operation

Step 4:	Checking the Pump/ASF motor (1)

After the CR moves normally and returns to the home position, the printer starts ink absorbing operation (Timer-CL) for the period determined based on the power off time. To enter this operation, the D/E mechanism (Disengage Mechanism), or the switch for the pump gear train, crashes into the carriage to transmit torque from the Pump/ASF motor to the gear train on the pump side. If "Fatal Error" occurs during this operation, following must be checked:

- Check internal coil resistance for the Pump/ASF motor, and replace the motor if the result does not meet the specification.
    - *Specification:*   *3.9 $\Omega \pm$ 10% (each phase)*
    - *Check points:*   *Between Pins 1 and 3 or Pins 2 and 4 for CN16 on the C228DRV board*
- Check the D/E switch, a slider switch on the home position side, manually for the proper operation. (Push the switch into the HP side and see if it bounds with spring tension.)
- Rotate the transmission gear (white) next to the motor pinion gear manually and check that each transmission gear for pump drive turns smoothly.
- Replace the C228DRV board and check for the proper operation.
- Replace the C228MAIN board and check for the proper operation.

Table 3-14 .Abnormal Phenomenon:
LED Indicates "Fatal Error". (Continued)

Table 3-15. Abnormal Phenomenon:
LED Indicates "Maintenance Error".

Step 5:   Checking the Pump/ASF Motor (2)

After ink is absorbed properly from the printhead by the pump mechanism, the built-in ASF resets. When drive is not properly transmitted to the ASF, it causes the motor to rotate abnormally because of lack or excess of drive produced in the mechanism. If "Fatal Error" occurs as a result, check the following:

■ Check that the gear (white) sticking out from the bottom the pump frame is properly set so that torque is transmitted to the root of the basic rack (See Chapter 2.) in the gear train at the right of the mechanism frame. Note that gears in the gear train must be engaged with each other at right phases, as listed below, and a wrong phase may stop the whole gear train mechanism at worst.

  *Phase: Enables the gears with specified notches on them to engage with each other so that they drive properly.

  1. Between the paper load roller driving transmission gear and the double clutch gear
  2. Between the double clutch gear and the paper return transmission gear (white)
  3. Between the white and cream paper return transmission gears
  4. Between the paper return transmission gear on the timing belt and the paper return transmission cam
  5. Between the paper return transmission cam and the paper return drive roller
  6. Between the cam gear in the friction release gear train, 2 transmission gears inside the frames, and the paper return driving cam gears (for both frames)

■ Check internal coil resistance for the solenoid.

  – *Specification: 115 Ω*

  – *Check points: Between Pins 1 and 3 or Pins 2 and 4 for CN16 on the C228DRV board*
    (Between Pins 5 and 11 for CN8 for the option.)

If resistance is infinitive, replace the motor.

Remedy

One of the waste ink counters has passed the limit. Refer to Chapter 1 or Chapter 6 and clear the error.

⚠**WARNING**

The printer is equipped with the following 3 different waste ink counters A, B and D, which can be found in the self-test. Be careful not to replace the corresponding waste ink pad only, since all the counters reset at a time when the "Maintenance Error" is reset.

Table 3-16. Abnormal Phenomenon:
Color Gradation Differs Among the Printers

Step	Remedy
1	If 2 or more Stylus Pro5000 are used in an office of by an individual user, they may print the same data in different color gradations. Generally, sine the printer is equipped with the Auto Color Calibration, it only creates different color graduations at an unnoticeable level. However, if the PC does not support a Bi-directional parallel interface, it does not write the adjusted value stored in the C228DRV board into the driver. Therefore, it is required to register the adjusted value in the driver forcibly by following the steps below.
2	Connect the printer with the PC with the cable and turn them on.
3	Select "Utility" and next "Printer and Option Information (P)" from the menu.
4	The windows for 'Printer ID" are ineffective. Select 'Setting Sheet" so that the printer prints the adjusted values stored in the EEPROM.
5	See the values output and input them to the 6 windows for "Printer ID".

⚠**CAUTION**   *Each of 2 printheads consists of 2 rows of head nozzles for each color, and ink ejected differs in weight from nozzle to nozzle. Therefore, Ink ejected from each nozzle is weighed in the manufacture and the data is stored in the driver as the Printer ID. As a result, the printer manages to equalize ink ejected from each nozzle in weight, referring to the IDs.*

C H A P T E R

4

ASSEMBLY AND DISASSEMBLY

4.1 OVERVIEW

This section explains disassembly and assembly of the printer. Basically, the disassembled components can be re-assembled by reversing the disassembly procedure, but we explains procedure of assembling the gear trains for ASF control since it is complicated part. "Caution" and "Check Point" are mentioned for the procedures which requires extra attention. "Adjustment" is for required adjustments resulted by assembly or disassembly. Also, read the precautions below before disassembling and assembling in this chapter.

4.1.1 Precautions

The lithium battery, which is necessary for managing the ink system, is mounted on the main control board of this printer. Since mishandling the lithium battery may cause explosion at the worst case, read the warning and caution below carefully and start disassembly or assembly.

⚠️**WARNING**

> ■ *Plug off and disconnect the power cable before disassembling or assembling the printer.*
> ■ *If ink gets in your eye, flush the eye with fresh water and see a doctor immediately.*
> ■ *A lithium battery is installed on the main board of this printer. Be sure to observe the following instructions.*
>> *1. Keep the battery away from any metal or other batteries so that electrodes of the opposite polarity do not come in contact with each other.*
>> *2. Do not heat the battery or put it near fire.*
>> *3. Do not solder on any part of the battery. (Doing so may result in leakage of electrolyte from the battery, burning or explosion. The leakage may affect other devices close to the battery)*

⚠️**WARNING**

> *4. Do not dismantle the battery.(The gas inside the battery may hurt your throat. Leakage, burning or explosion may also be resulted.)*
> *5. Do not install the battery in the wrong direction. (This may cause burning or explosion.)*
> *6. Do not charge the battery. (An explosion may be generated inside the battery, and cause burning or explosion)*

⚠️**CAUTION**

> *Remove any accessories such as paper cassettes or tray before starting disassembly.*

⚠️**WARNING**

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

4.1.2 Tools

Use only specified tools to maintain quality of the printer.

Table 4-1. Required Tools

Name	Supplier	EPSON parts code
Phillips Screw Driver (No.1)	EPSON	B743800400
Phillips Screw Driver (No.2)	EPSON	B743800200
Minus Driver (−)	EPSON	B74300100
Cutting pliers	Commercially available	−
Thickness gauge set	EPSON	B776702201
Tweezers	EPSON	B741000100
Exclusive pliers for C-ring for shaft ST-0	EPSON	103983900
Exclusive pliers for C-ring for shaft ST-1	EPSON	103984000
Paper pick up detector adjust tool	EPSON	103983200
Positioning pin	Commercially available	Use nail whose diameter is φ1.8~2.
Torque Wrench	EPSON	B765106901

4.1.3 Screws

Following abbreviation for screws are used in the explanation for disassembly and assembly.

Table 4-2. Screw Abbreviation

Abbreviation	Name
CBS	Cross/Bind/S-tight screw
CBP	Cross/Bind/P-tight screw
CP	Cross/Pan-head screw
CB	Cross/Binding Screw

4.2 DISASSEMBLY

This section describes disassembly procedure until mechanism and "MB Rear Unit" are removed. Refer to section 4.3 to disassemble more fine parts on the mechanism. Refer to flow chart below for items explained on section4.2.
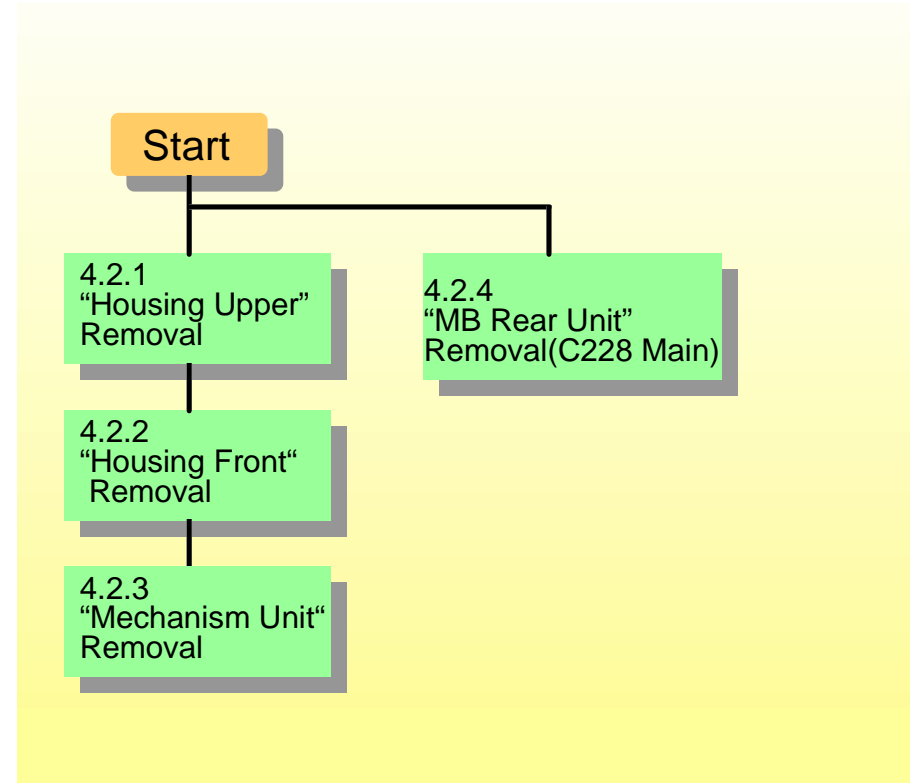
Figure 4-1. Flowchart of Disassembly

⚠**CAUTION**

- *The MB rear unit, which C228 main board is mounted on, can be removed directly, without disassembling other parts in advance.*
- *Refer to sections from Section 4.3 for disassembly and assembly which are not mentioned on the flow chart above.*

4.2.1 Housing Upper Removal

1. Open the rear tray.
2. Remove the "Cover, printer", releasing 2 hooks on the "Cover, printer".
3. Remove 5 CBS screws(3x8) securing "Housing Upper" to the mechanism unit. The rest of one CBS screw(3x6) does not effect on removing "Housing Upper".
4. Open "Paper Guide Assembly, Cover" united with rear tray completely and remove one CBS screw(2x6) located on the left side of AC cable.
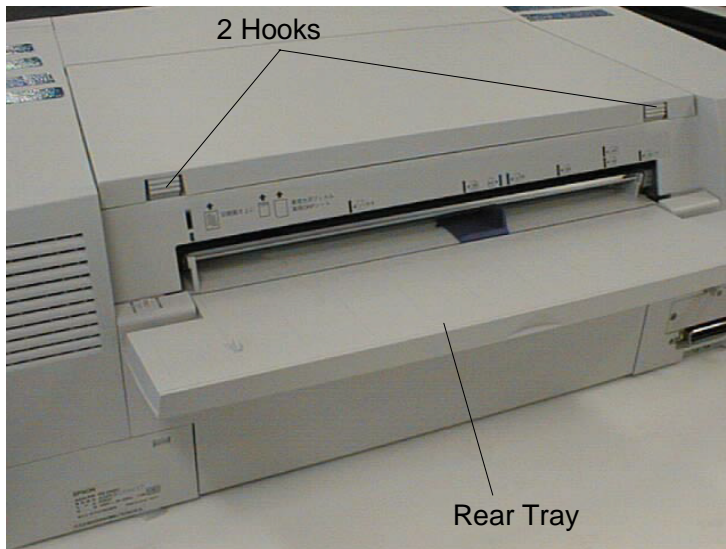
Figure 4-2. Cover, Printer Removal
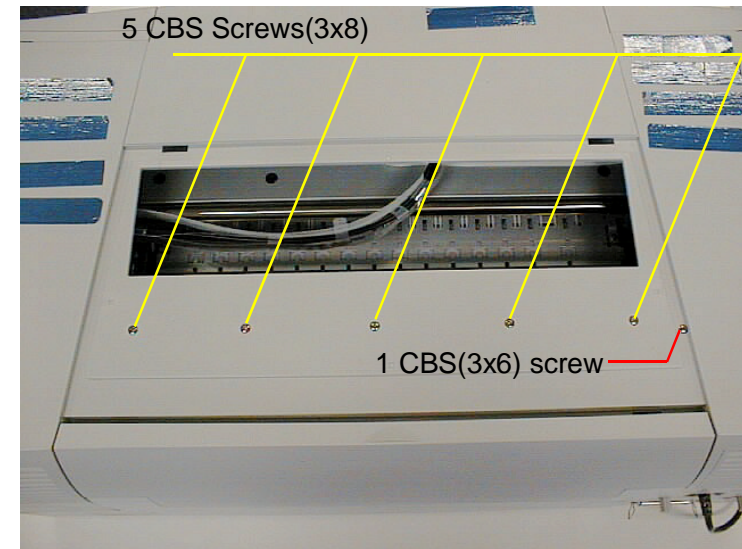
Figure 4-3. Positions of fixing screws for Housing Upper(1)
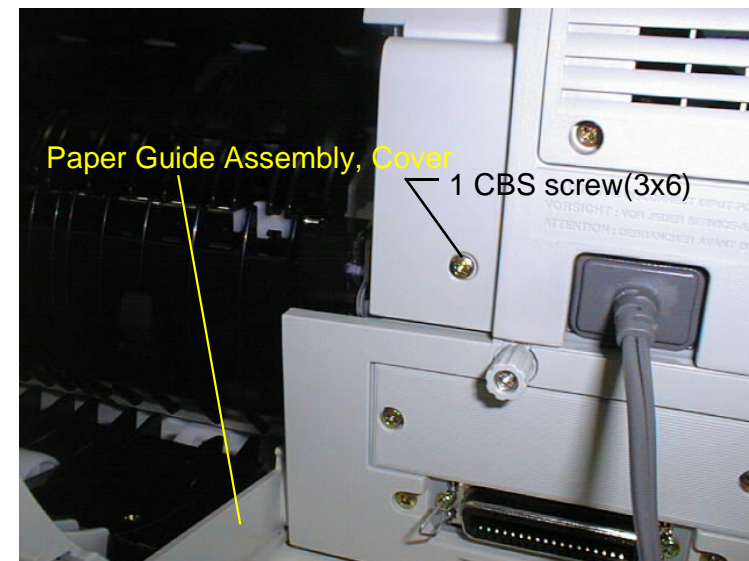
Figure 4-4. Position of fixing screw for Housing Upper(2)

5. Insert a minus driver to 3 airspace (A), located upper paper eject of "Housing Front Unit", and remove hooks which are connecting "Housing Upper" and "Housing Front Unit". (Refer to Figure 4-5)
6. Insert a minus driver to 2 airspace (B), located both right and left of the front printer and remove the hooks which are connecting "Housing Assembly Upper" and "Housing Lower". (Refer to Figure 4-6)
7. Release one hook connecting with "Housing Lower" at the rear side of "Housing Assembly, Upper". (Refer to Figure4-7)

⚠**WARNING**   *If you try to remove "Housing Assembly, Upper" forcibly from the front direction, the rib located inside of "Housing Assembly, Upper" may be broken. So, be careful of removing it.*

8. Remove "Housing Assembly Upper", lifting it up.

2 Hooks

Housing Upper   Housing Front Unit

Figure 4-6. Position of Hooks(located both right and left side)

3 Hooks

Housing Front Unit

Figure 4-5. Location of Hooks

One hook on the "Housing Assembly, Upper".
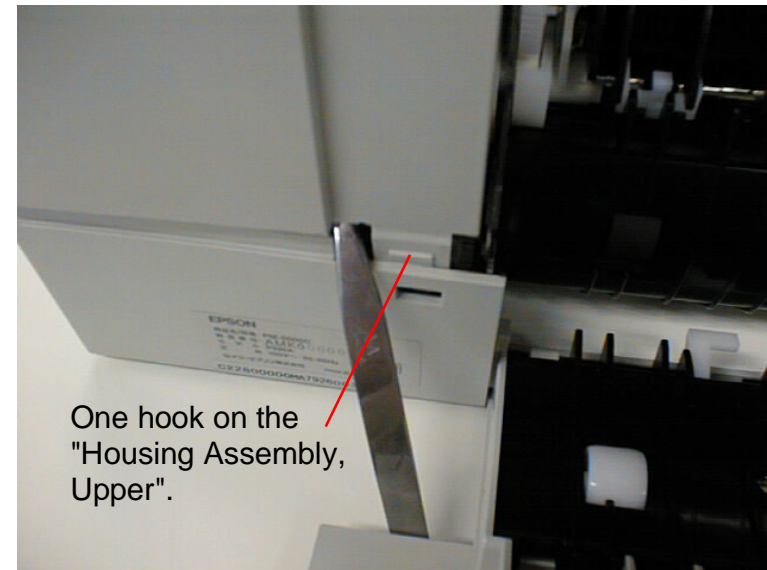
Figure 4-7. One hook at back of the printer

4.2.2 Housing Front Unit Removal

1. Remove "Housing Upper".(See Section4.2.1)
2. Remove "Cable, Panel" connecting to "Board Assembly, Panel" from connector on the board.
3. Remove 2 CBS screws(3x6) securing "Grounding plate, Panel" to "Frame, Paper Eject". (Refer to Figure4-8)
4. Release 2 hooks securing "Housing Front Unit" located front bottom side of "Housing Lower". (Refer to Figure4-9)
5. Remove ""Housing Front Unit".
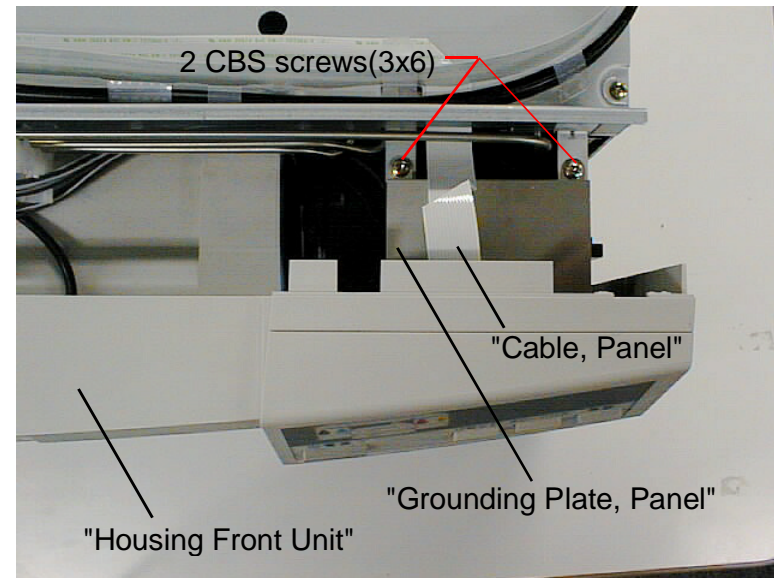
Figure 4-8. Housing Front Unit Removal
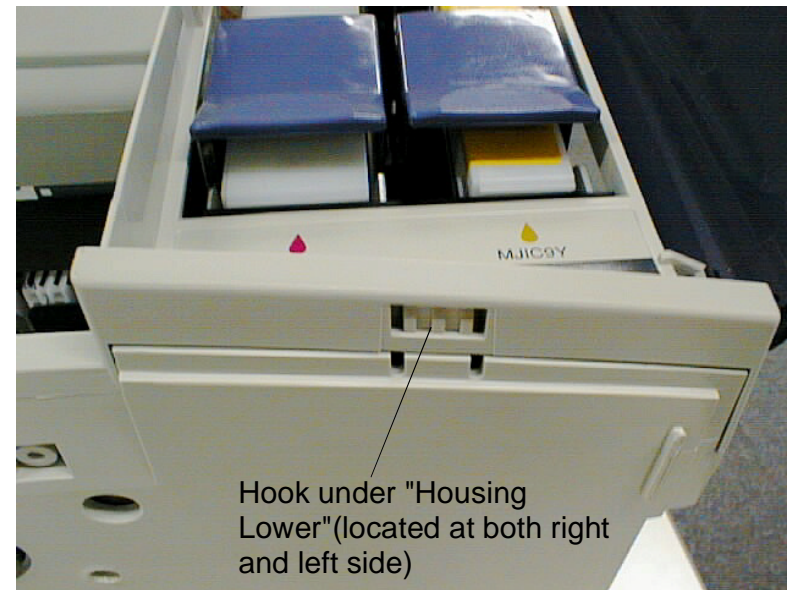
Figure 4-9. Discharge Brush Removal

4.2.3 Mechanism Unit Removal

1. Remove "Housing Upper". (See section 4.2.1)
2. Remove "Housing Front Unit". (See section 4.2.2)
3. Looking from back side of printer, insert the plus screw driver into the notch which is located at "Frame, Main, Rear" and remove 2 CBP screws(4x12) securing the mechanism to "Housing Lower". (Refer to Figure4-10)
4. From the printer front, remove 2 CBP screws(4x12) securing the mechanism to "Housing Lower". (Notice that the fixing screw at the left side is also securing reinforcing frame.)

⚠**WARNING**

When installing the mechanism to "Housing Lower", it is recommended to do so by 2 service men. And connect 2 waste ink tubes of right and left head into each holes of waste ink absorber. Failing to do so causes ink leaking.

✓**CHECK POINT**

When installing the mechanism to "Housing Lower", install them matching 2 dimples of "Housing Lower" to 2 notched parts on the mechanism frame, as it is shown in the figure 4-11.

5. Lift up the mechanism and remove it from "Housing Lower".
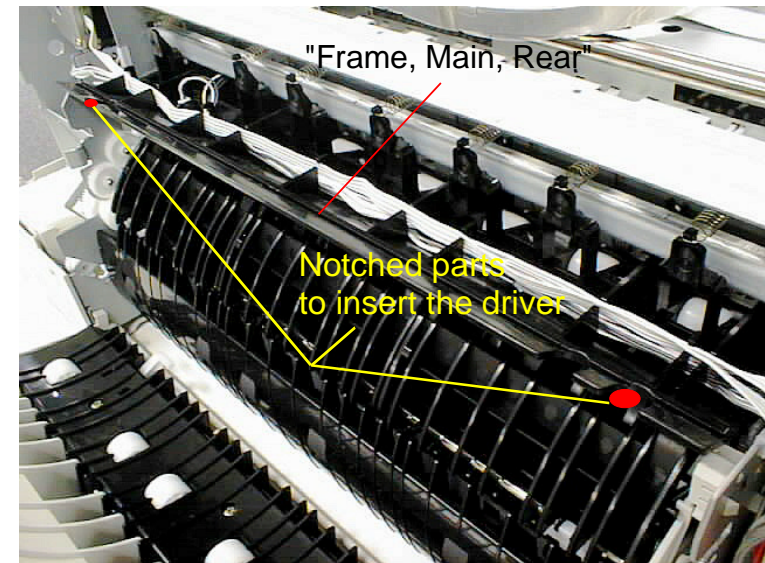
Figure 4-10. MB Rear Unit Removal (1)
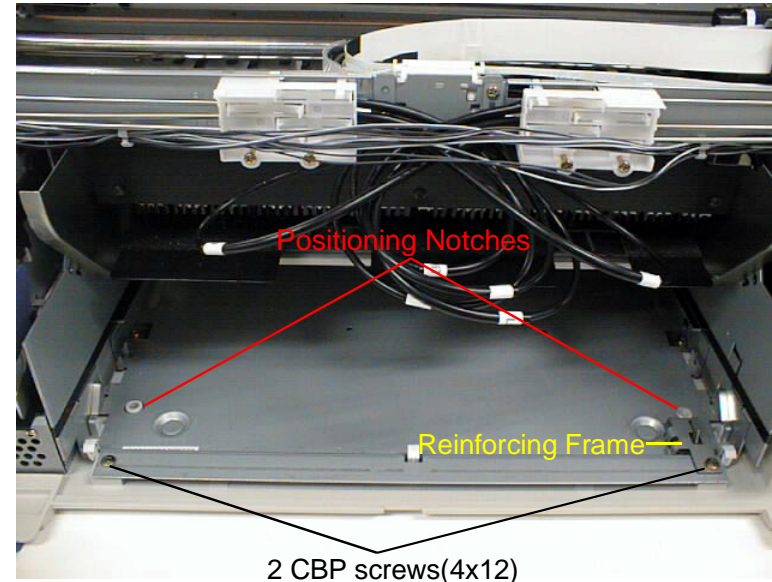
Figure 4-11. Mechanism Removal (2)

4.2.4 MB Rear Unit Removal

⚠CAUTION

■ *The MB rear unit, which C228 main board is mounted on, can be removed directly, without disassembling other parts in advance.*
■ *When installing this unit again, push in hard so that it can be firmly connected to the connector on the C228 DRV board.*

ADJUSTMENT▶

EEPROM ,which various adjustment values are registered, is not mounted on C228 main board. In the flash memory of spare part C228 main board, the program is not registered. Therefore, refer to "Firmware uploading"(page 1-23) and perform re-installation of the program.

Fixing screws

"Cover,Connector,Upper"

CBS
(3x12)

CBS
(3x8)

"Cover, Rear"   MB Rear Unit

Figure 4-12. Cover, Rear Removal

1. Remove 2 fixing screws securing "MB Rear Unit" to "Frame, Main, PF" of the mechanism unit.
2. Remove 2 CBS screws(3x12) securing "Cover, Connector, Upper", and remove "Cover, Connector, Upper".
3. Remove 2 CBS screws(3x12) securing "Cover, Rear" and remove "Cover, Rear". (Refer to Figure4-12)
4. Insert the driver into 2 bail locks on the I/F connector and remove "MB Rear Unit" toward back. (Refer to Figure4-13)

Bail Lock

MB Rear Unit

Figure 4-13. MB Rear Unit Removal

4.2.5 Disassembling the Mechanism

Here explains procedure to disassemble the removed mechanism to more fine pieces.

4.4 Disassembly and Assembly for ASF Unit	4.41. Disassembly of ASF Unit	4.4.2. Assembling ASF Unit
4.3. Disassembly and Assembly for GearTrain	4.3.1. Disassembly of Gear Train	4.3.2. Assembling Gear Train

Start

- 4.2.5.1 Discharge Brush Removal
- 4.2.5.2 Paper Guide Assembly, Cover, Removal
- 4.2.5.3 Print Head Removal
- 4.2.5.4 MB Front Unit Removal
- 4.2.5.5 Fan Assembly Removal
- 4.2.5.6 PS Unit Removal
- 4.2.5.7 Motor Assembly, PF Removal
- 4.2.5.8 Motor Assembly, CR, Removal
- 4.2.5.9 Motor Assembly, ASF Removal
- 4.2.5.10 Carriage Unit Removal
- 4.2.5.11 Frame, Main,Paper Eject, Removal
- 4.2.5.12 Paper Guide Upper Unit Removal
- 4.2.5.13 Pump Frame Removal
- 4.2.5.14 Frame, Main, PF, Removal
- 4.2.5.15 ASF Unit Removal
- 4.2.5.16 Upper Surface Sensor Removal
- 4.2. 5.17 PE Sensor Removal
- 4.2.5.18 PR Sensor Removal
- 4.2.5.19 HP Sensor Removal
- 4.2.5.20 Cable Assembly,Sensor FPC Removal
- 4.2.5.21 Interlock Assembly Removal

Figure 4-14. F low Chat for Disassembling the Mechanism

4.2.5.1 Discharge Brush Removal

1. Remove 3 CBS Sems W2 screws(3x8) securing "Discharge brush" to "Frame, Main, Paper Eject" of the mechanism unit, and remove "Discharge Brush".

⚠**CAUTION** | *It is necessary to remove the discharge brush when performing "Head Angular Adjustment" or "Head Height Adjustment".*

CBS Sems W2(3x4)
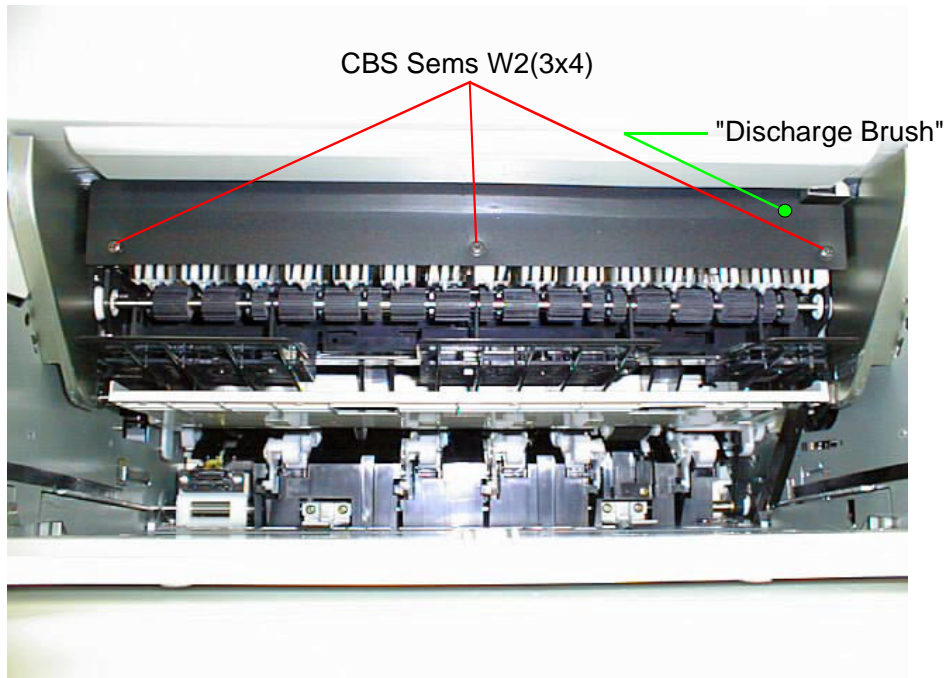
"Discharge Brush"

Figure 4-15. Discharge Brush Removal

4.2.5.2 Paper Guide Assembly, Cover Removal

1. Remove "Housing Upper". (See section 4.2.1)
2. Remove "Housing Front Unit". (See section 4.2.2)
3. Remove the mechanism. (See section 4.2.3)
4. Push hard "Paper Guide Assembly, Cover" toward right or left direction releasing it from the protrusion at the side you pushed, and remove "Paper Guide Assembly, Cover" from the mechanism.
   (Refer to Figure4-16)

> ⚠**CAUTION**   *When removing "Paper Guide Assembly, Cover", do not lose a plain washer and "U" shaped spring washer; a plain washer and "U" shaped spring washer come off from right side.*
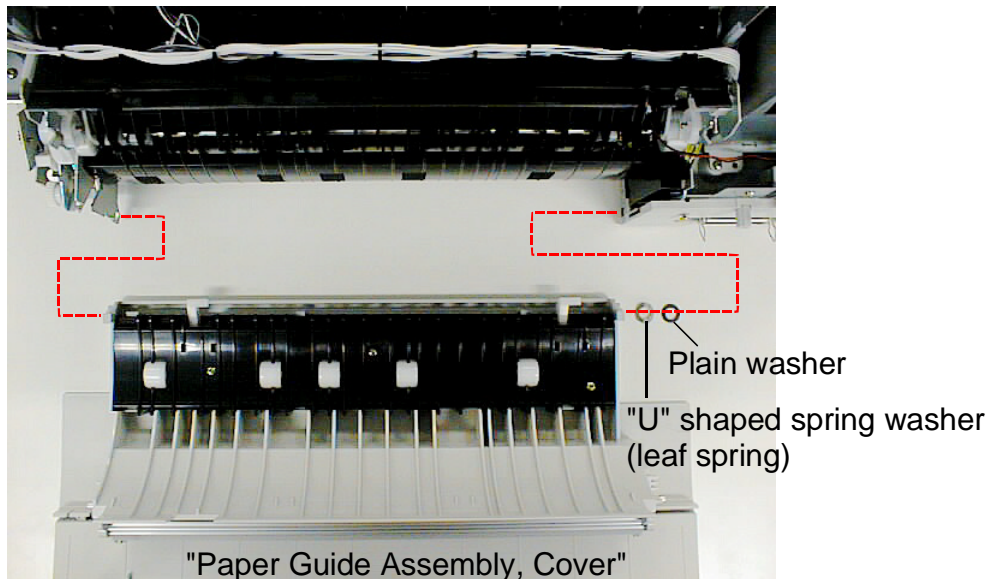
Figure 4-16. Paper Guide Assembly, Cover Removal

✓**CHECK POINT**   *Since the "U" shaped spring washer has a determined direction to be installed, install the washer so that concave side of the spring washer faces to the "Assembly Cover" side. (See figure 4-17)*
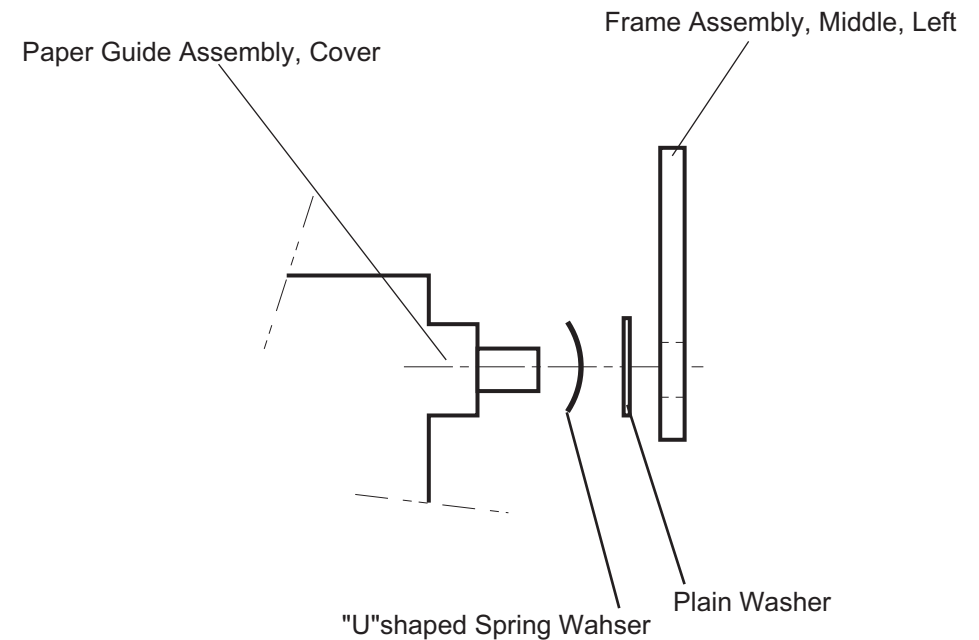
Figure 4-17. Installation of Spring Washer

4.2.5.3 Print Head Removal

⚠WARNING

> *This printer uses left head for dark colors and right head for light colors, and each head has different parts code. Therefore, in case of exchanging right and left heads at the same time, make sure to follow the points below. Failing to do so gives bad influence on the printing quality.*
> - ■ *It is prohibited to use the left head(for dark colors) as right head(for light colors).*
> - ■ *It is allowed to use the right head as left head.*
> - ■ *In case of replacing both right and left heads, make sure to install each head at proper position.*

Figure 4-18. Releasing Carriage Lock

1. Remove "Mechanism Unit". (Refer to section 4.2.7)
2. In case of replacing the head, if the carriage is fixed at the home position, that makes difficult to replace the head. Therefore, it is necessary to rotate the paper feed roller driven gear(Gear,80), holding 2 protrusions on the gear surface and release the carriage lock. (Refer to Figure4-18)

⚠WARNING

> *Do not touch the teeth part of "Gear,80" by your fingers. Since it is a high precision gear, touching the gear with bare hands gives bad influence on paper feeding and printing quality.*

3. Release the "Cable, head, left/right" for head control located on the carriage from the hook.
4. Move the carriage unit to the center of the mechanism, and remove one CBP screw(3x8) securing "Cover, CR, Rear" over the carriage, and remove "Cover, CR, Rear". (Refer to Figure4-19)

Figure 4-19. Cover, Carriage, Rear, Removal

5. Release each 2 fixing parts of "Cover, CR, Front" located rear and front, and release "Cover, CR, Front". (Refer to Figure4-20)

6. Pull out each 6 dampers from the head needle.

> ⚠️**CAUTION**
>
> *Total 6 dampers are fixed in the order(from left); Bk→Cyan→Magenta→Light Cyan→Light Magenta →Yellow.*

> ⚠️**WARNING**
>
> *Since the print head is not strong against static electricity, wear rubber glove.*

7. Remove each one CBB screw(2.5x6) securing left and right head to the carriage and plain washer(3.4x1.0x8.2x2).

8. Remove "Compression Spring,9.9" pressing left and right head to the carriage side. (Refer to Figure4-21)

> ✓**CHECK POINT**
>
> *Even after releasing the fixing part of head, if the head can not be removed easily, pull the parts marked with arrow in the figure 4-21 so that the head can be removed easily.*

"Cover, CR, Front"   Fixing Hooks(each at both right and left sides)
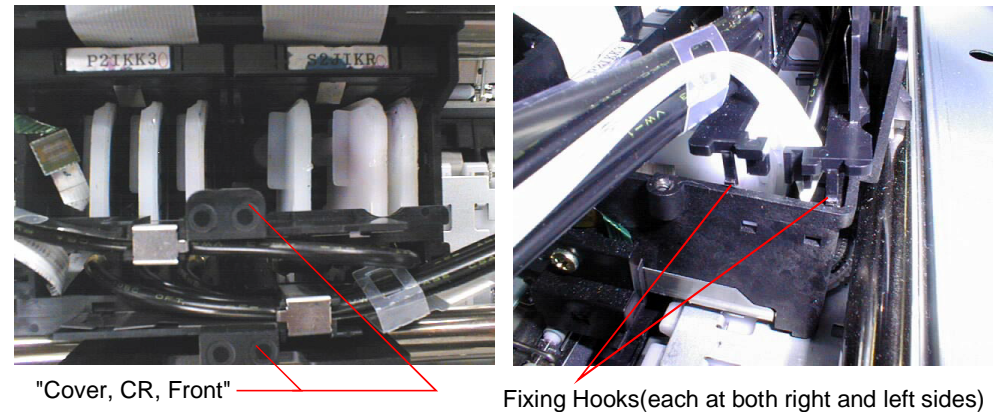
Figure 4-20. Releasing "Cover, CR, Front"

"Compression Spring,9.9"
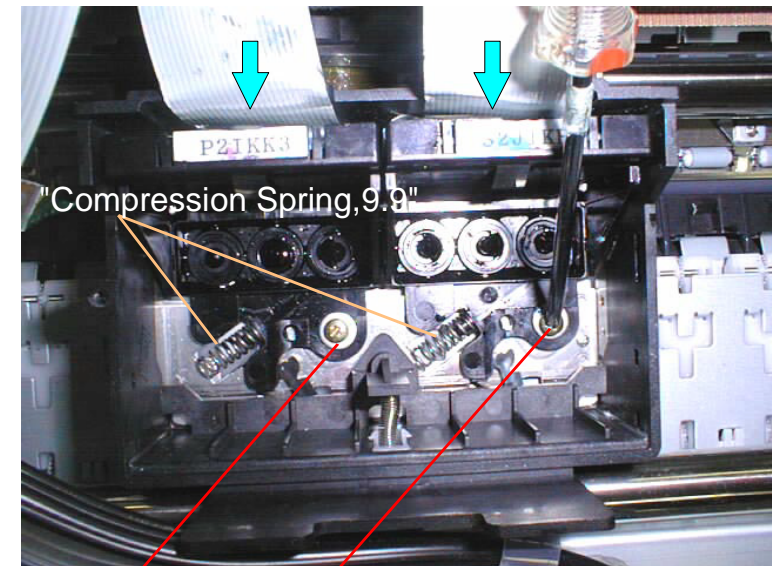
Screw with plain washer for fixing left head.   Screw with plain washer for fixing right head.

Figure 4-21. Print Head Removal(1)

9. Remove FFC inserted in each right and left head, and remove the print head. (Refer to Figure4-22)

✓**CHECK POINT**

> ■ *When replacing heads to new ones, connect FFC correctly. Only the FFC which should be installed for left head is marked with "O".*

ADJUSTMENT ▶

> *After replacing the print head, refer to Table5-1 of Chapter5, and perform necessary adjustment items according to the procedure order.*

"O" is marked only on the FFC for lleft head
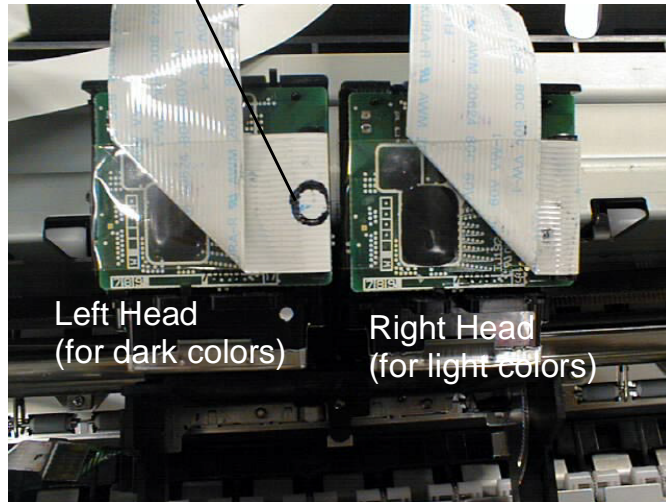
Figure 4-22. Print Head Removal(2)

4.2.5.4 MB Front Unit Removal

1. Remove the mechanism unit.(Refer to section 4.2.7)
2. Remove one CBS screw(3x6) securing "Grounding plate, DB2" to "Shield plate, M/B, Front".
3. Remove one CBS screw(3x6) securing "Grounding plate, DB2" to "Frame Assembly, Left".
4. Remove "Grounding plate, DB2". (Refer to Figure4-23)
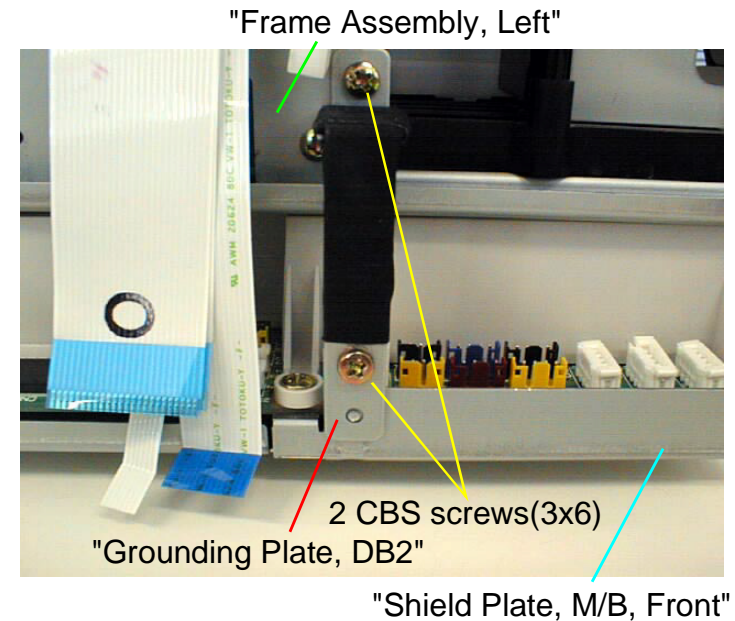
Figure 4-23. Grounding Plate, DB2 Removal

5. Disconnect all connectors on C228 DRV board.

✓**CHECK POINT**   *As it is shown in the figure4-23, the FFC to install to connector CN10 is marked with "O" on the cable surface.(FFC for left head)*

⚠**WARNING**   *Since the same connectors are used for CN14, CN15 and CN16, the mechanism might get damaged by wrong connector insertion. Since 1-pin of each cable corresponding to these 3 connectors are marked red, black, and blue respectively, check red, black and blue printed on the connector location and install them correctly.*

6. Looking from the printer front, remove 2 CBS screws(3x6) securing "MB Front Unit" to "Frame Assembly, Left", and remove "MB Front Unit". (Refer to Figure below)
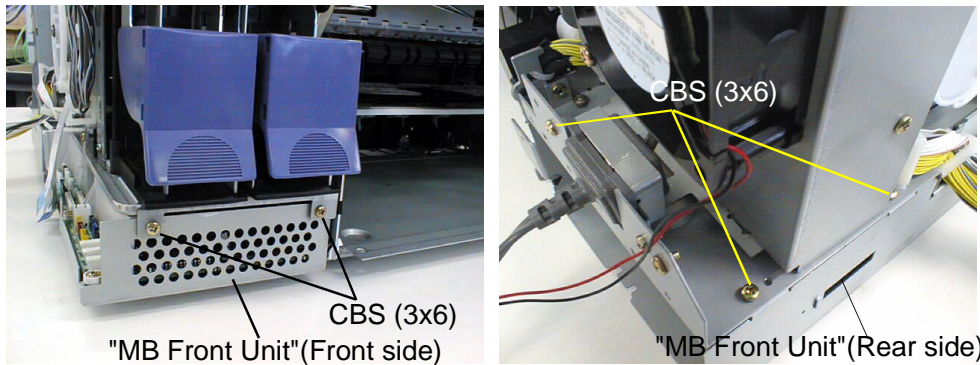
Figure 4-24. MB Front Unit Removal

✓**CHECK POINT**   *Following shows connectors on C228 DRV board, which is necessary for installing MB front unit again.*

ADJUSTMENT ▶   *After replacing C228 DRV board, refer to Table5-1 of Chapter5, and perform necessary adjustment items according to its procedure order.*

Table 4-3. Connectors on C228 DRV Board

Connector No.	Connector Color	Name of Harness / Destination of Connection
CN1	Black	MB rear unit(C228 Main:Only when removing MB rear unit)
CN2	White	Board Assembly, P/S
CN3	White	Fan Assembly
CN4	Black	Harness, sensor, P
CN5	White	Harness, sensor, HP
CN6	White	Mounting board, connector(Standard paper type/size sensor)
CN7	White	Harness sensor, PE(cable for PE/PR sensor)
CN8	Black	Harness, option connector, B(for optional motor, solenoid, P sensor)
CN9	White	Harness, option, connector sensor(Optional paper type/size)
CN10	White	Cable, Head, Right(for dark colors)
CN11	White	Cable, Head, Left(for light colors)
CN12	Black	Cable, Sensor FFC(for both PTS, paper width sensor)
CN13	Black	Cable, Panel (control panel)
CN14	White	Motor Assembly, CR
CN15	White	Motor Assembly, PF

Table 4-4. Connectors on the C228 DRV Board(Cont.)

Connector No.	Connector Color	Name of Harness / Destination of Connection
CN16	White	Motor Assembly, ASF
CN17	Yellow	Solenoid, ASF(standard side)
CN18	Yellow	Harness, Upper Surface Sensor(standard paper surface sensor)
CN19	Black	Left quantity sensor(paper level sensor at standard side)
CN20	Red	Holder Assembly, Ink cartridge, M
CN21	Blue	Holder Assembly, Ink cartridge, C
CN22	Yellow	Holder Assembly, Ink cartridge, Y
CN23	Black	Holder Assembly, Ink cartridge, BK
CN24	White	Case, Open sensor(CR/Pump for rear manual feed, Turn on or off ASF motor)

4.2.5.5 Fan Assembly Removal

⚠️**CAUTION**   *It is necessary to remove the fan assembly before removing PS unit(Power supply unit).*

1. Remove the mechanism unit.(Refer to section 4.2.7)
2. Remove connector CN3 on the "Board assembly, Driver, C228 DRV".
3. Release a harness of "Fan Assembly" from locking wire saddle"(Lead wire cramp).
4. Remove 3 CBS screws(3x30) securing "Fan assembly" to "Shield Plate, P/S, Cover" of PS unit, and remove "Fan Assembly".
   (Refer to Figure below)
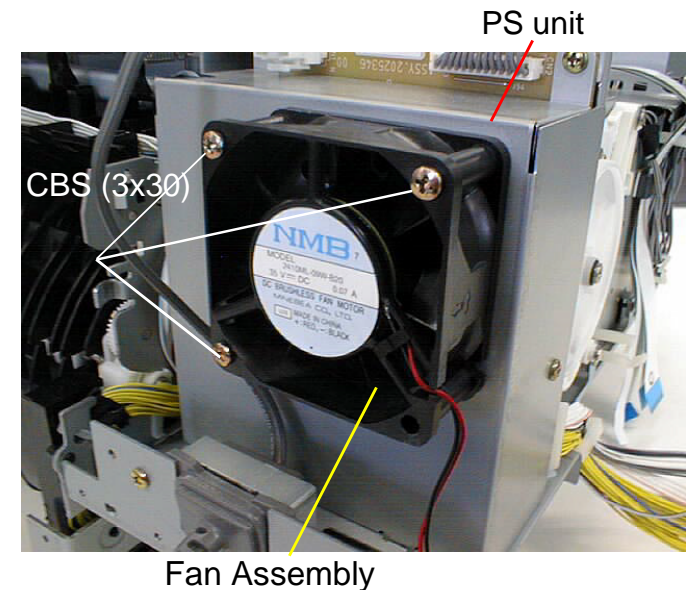
Figure 4-25. Fan Assembly Removal

4.2.5.6 PS Unit Removal

1. Remove "Fan assembly" (Refer to section 4.2.8.3)
2. Remove "AC cable" from connector CN1 of "Board Assembly, P/S".
   Note) Remove AC cable, pressing the hook located under the connector.
3. Remove connector CN2(white) on the "MB Front Unit"
4. Remove 2 CBS screws(3x6) securing "PS Unit" to "Frame, Main, Rear". (Refer to Figure below)
5. Remove 2 CBS screws(3x6) securing "PS Unit" to "Frame, Main, PF", and remove "PS Unit". (Refer to Figure below)
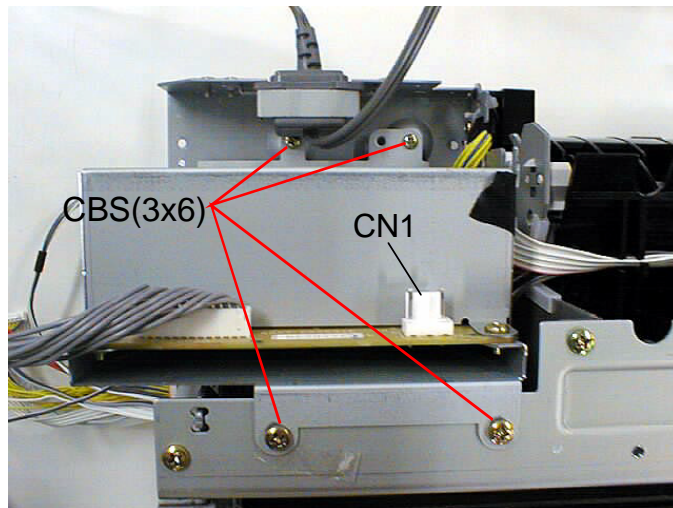
Figure 4-26. PS Unit Removal

4.2.5.7 Motor Assembly, PF Removal

1. Remove the mechanism unit.(Refer to section 4.2.7)
2. Remove MB Front Unit. (Refer to section 4.2.8.2)
3. Remove PS Unit. (Refer to section 4.2.8.4)
4. Remove the harness of "Motor Assembly, PF" from the connector (CN15, white) of "MB Front Unit" and also remove it from "Locking Wire Saddle" on the "Frame, Main, PF".
5. Remove 2 CBS screws(3x6) securing "Mounting board, Motor, PF" to "Frame, Left", and remove "Motor Assembly, PF" with "Mounting Board, Motor, PF". (Refer to Figure below)
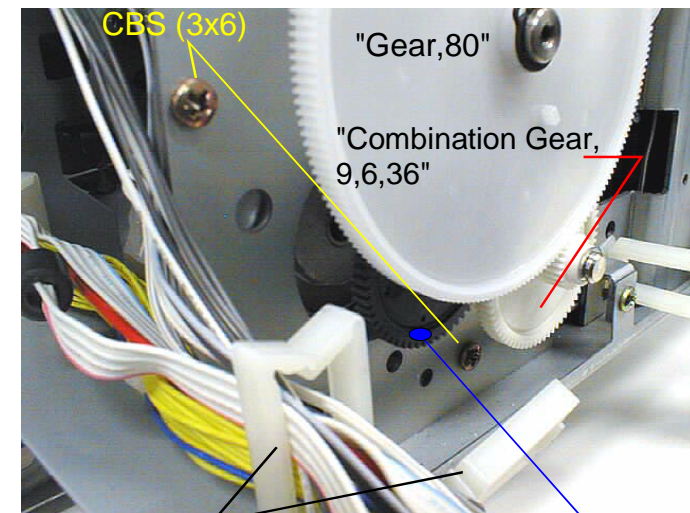
Figure 4-27. Motor Assembly, PF Removal

⚠**WARNING**

When you try to touch the tip of the drive to 2 fixing screws for "Motor Assembly, PF", be careful not to let the tip or shank of the driver to touch the gear teeth of "Gear,80" or "Combination gear,9,6,36". Since these gears are high precision gears, small impact can damage them.

4.2.5.8 Motor Assembly, CR Removal

1. Remove the PS Unit. (Refer to section 4.2.5.6)
2. Remove the timing belt hanging on the pinion of "Motor Assembly, CR". (Refer to Figure4-28)
3. Remove 4 CBS screws(3x6) securing "Mounting board, CR" to "Frame, Main, Rear", and remove "Motor Assembly, CR" with "Mounting board, Motor, CR". (Refer to Figure4-29)

ADJUSTMENT ▶ *In case of replacing "Motor Assembly, CR", refer to Chapter5 and perform "Bi-D Adjustment".*
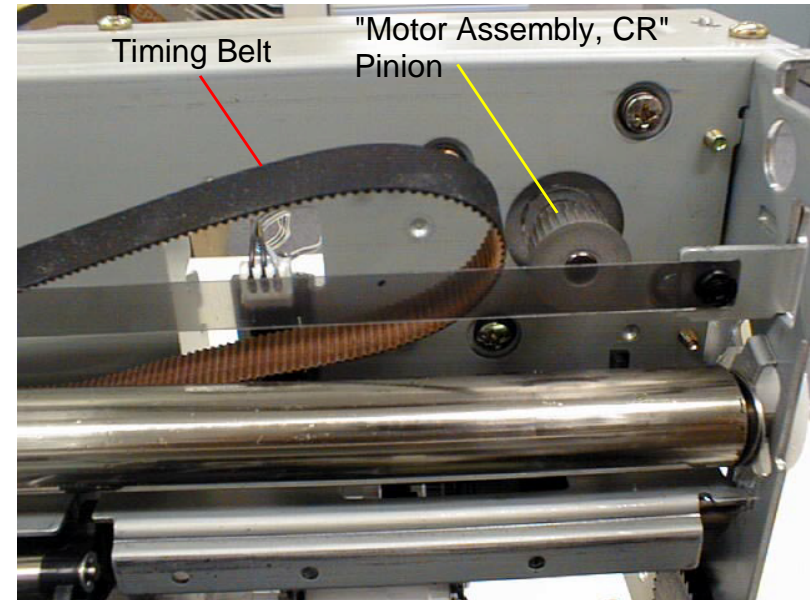
Figure 4-28. Timing Belt Removal
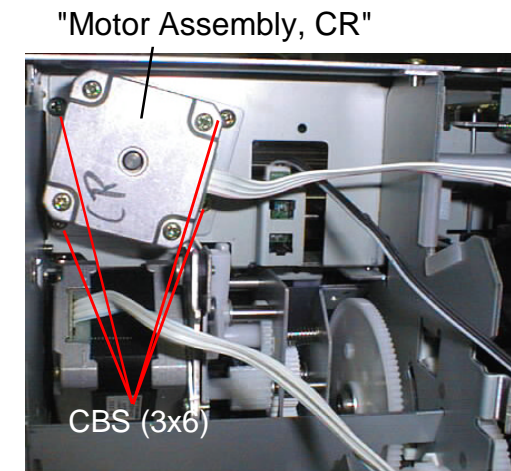
Figure 4-29. Motor Assembly, CR Removal

4.2.5.9 Motor Assembly, ASF Removal

1. Remove PS unit. (Refer to section 4.2.5.6)
2. Remove a harness of "Motor Assembly, ASF" from the connector(CN16, white) of "MB Front Unit", and remove it from locking wire saddles located at 3 locations(around PS unit was installed) on the "Frame, Main, PF".
3. Remove a harness of "Motor Assembly, ASF" from lead cramp on the "Paper Guide, Upper".
4. Remove one CBS screw(3x6) securing pump unit and "Frame Assembly, DE, Left". (Refer to Figure4-30)
5. Remove 2 CBS screws(3x6) securing "Mounting board assembly, Cap" and "Frame Assembly, DE, Left", and remove "Mounting board assembly, Cap". (Refer to Figure4-30)
6. Remove 3 "Axis, damper, CR"s securing "Motor Assembly, ASF" to "Frame Assembly, Pump, " by inserting the driver to notched part on the mechanism frame, and remove "Motor Assembly, ASF" with "Mounting board, Motor, ASF" from the frame rear side. (Refer to Figure4-31)

⚠**CAUTION**   *Washers are attached to each "Axis, damper, CR".*
Be careful not to lose them.
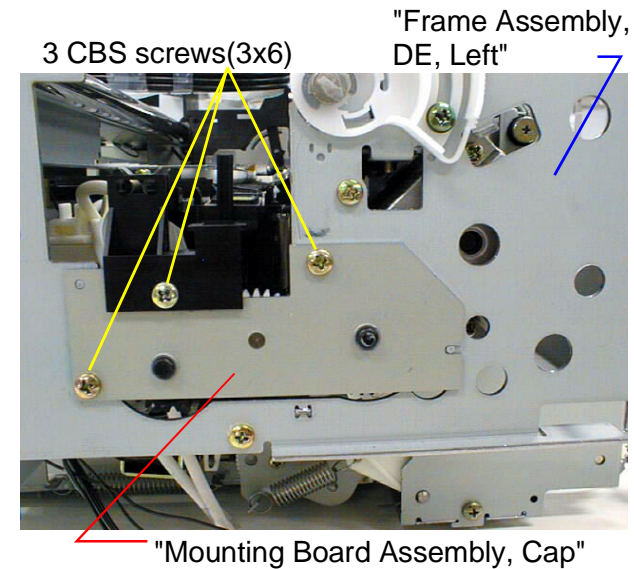
Figure 4-30. Mounting Board Assembly, Cap Removal
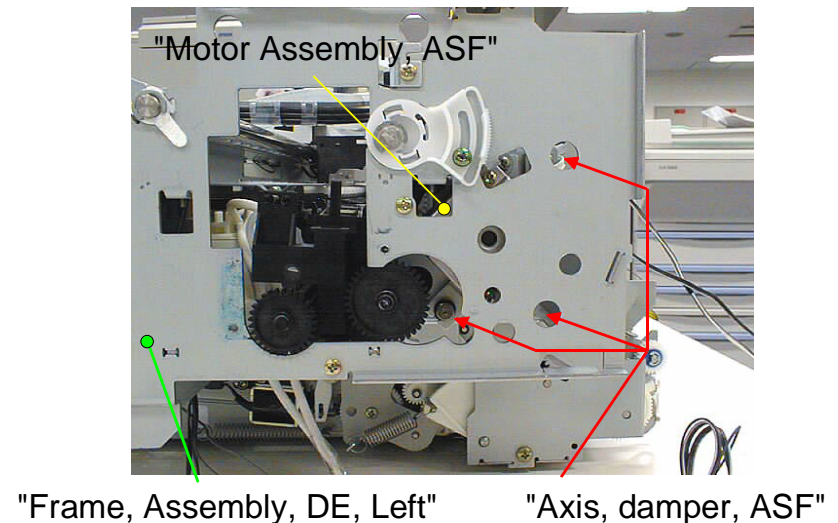
Figure 4-31. Motor Assembly, ASF Removal

4.2.5.10 Carriage Unit Removal

1. Remove print head. (Refer to section 4.2.5.3)
2. Remove "Motor Assembly, CR". (Refer to section 4.2.5.8)
3. Remove "C" shaped ring securing "Gear,80" by a pair of tweezers or stop ring pliers. (Refer to Figure4-32)
4. Remove "Gear,80".

⚠️**WARNING**

Never use "Gear,80",which is once removed, again. Failing to do so can not guarantee normal paper feeding. Also, when installing a new "Gear,80", attach it by pushing its surface and do not touch the gear teeth.

5. Remove "E" shaped ring (#6) pressing "Combination gear, 36,36", and remove "Combination gear, 36,36".
6. Remove one CBS screw(3x8) pressing "Bush, Parallelism, Adjustment" and remove "Bush, Parallelism, Adjustment". (Refer to Figure4-33)

✓**CHECK POINT**

There is alignment between "Combination Gear, 36,36" and "Gear,49". When assembling them, install them to each axis, matching "O" marked on the both gear surface(red circle in the figure4-33).

⚠️**CAUTION**

When removing "Bush, Parallelism, Adjustment", "Reinforcing board, Axis, CR" attached behind of "Bush, Parallelism, Adjustment" can easily come off. Be careful not to lose this board. (Refer to Figure4-34)

"Gear,80"

"C" shaped ring

Stop ring Pliers
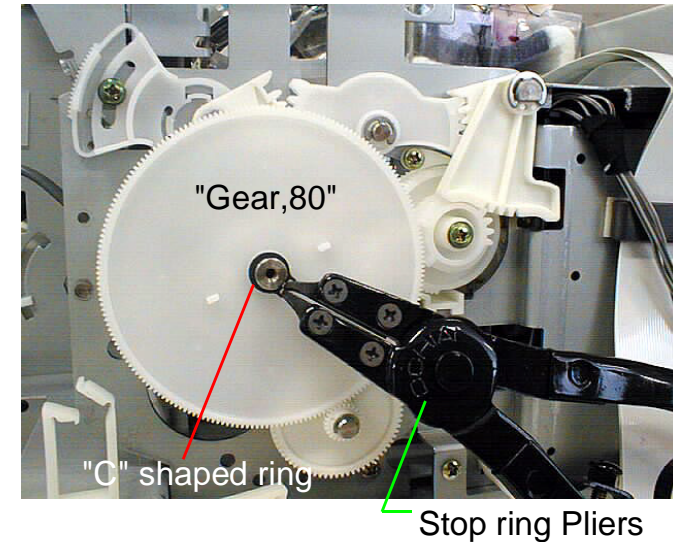
Figure 4-32. Releasing Gear

CBS(3x6)   "E" shaped ring   "Combination Gear,36,36"

"Gear,49"

"Bush, Parallelism, Adjustment"
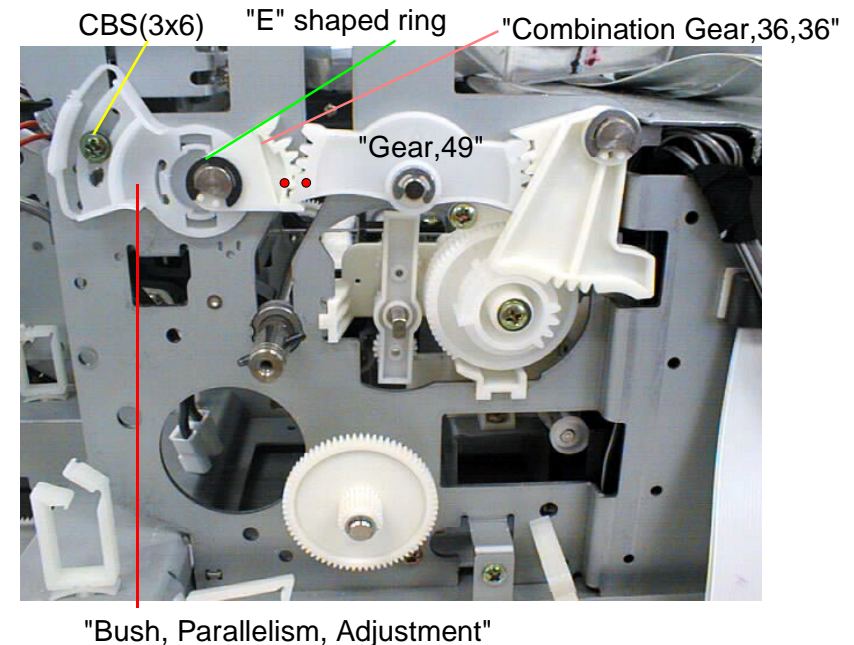
Figure 4-33. Releasing Carriage Guide Axis at left side

7. Remove "E" shaped ring(#6) and one CBS screw(3x8) securing "Bush, Parallelism, Adjustment" at the right side of mechanism, and remove "Bush, Parallelism, Adjustment".

> ⚠️**CAUTION**
>
> *When removing "Bush, Parallelism, Adjustment", "Reinforcing board, Axis, CR" attached behind of "Bush, Parallelism, Adjustment" can easily come off. Be careful not to lose this board. (Refer to Figure4-34)*

8. Remove "Axis, CR" from the notched part for "Bush, Parallelism, Adjustment", which is removed at Step7. At this time, do not lose one leaf spring and a plane washer.

> ✓**CHECK POINT**
>
> *When installing "Axis, CR" again, install leaf spring(8.2x0.15x15) first, then install plane washer(8.2x0.15x15). When installing the leaf spring, convex side should face inside.*

> **ADJUSTMENT** ▶
>
> *After removing "Axis, CR", make sure to perform "Platen Gap Adjustment", referring to Chaper5.*

Figure 4-34. Back of "Bush, Parallelism, Adjustment"
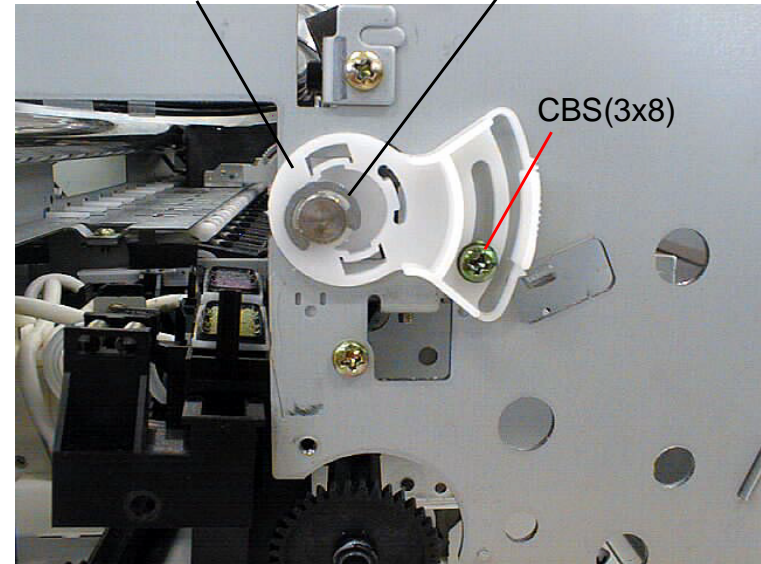
Figure 4-35. Removal of "Bush, Parallelism, Adjustment" at right side
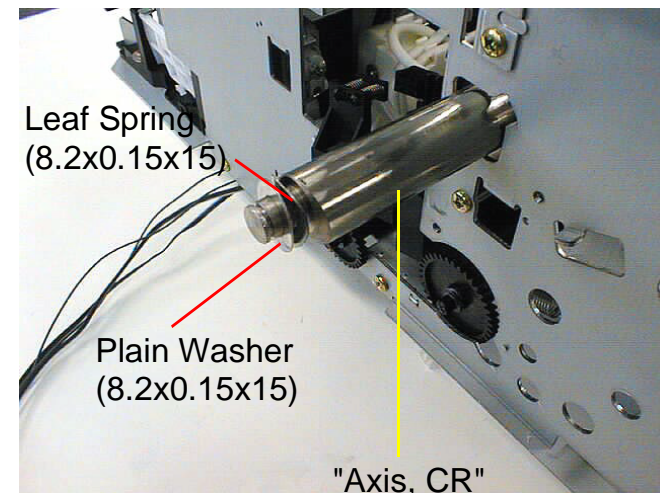
Figure 4-36. Axis, CR Removal

9. Remove "Tension spring,28.76" located back of the belt pulley unit at the left side of the mechanism, and release the timing belt.
10. Remove "Timing belt" from the pulley unit, and remove "Tension spring,2.44" for linear scale from the frame. (Refer to Figure4-37)
11. Remove the connector for paper width sensor on the carriage unit.
12. Release engagement between the carriage unit and timing belt.

✓**CHECK POINT**   *When installing "Timing belt" to the carriage unit again, match the inside surface of the belt, which has no ditches, to "A" part in the figure 4-38.*
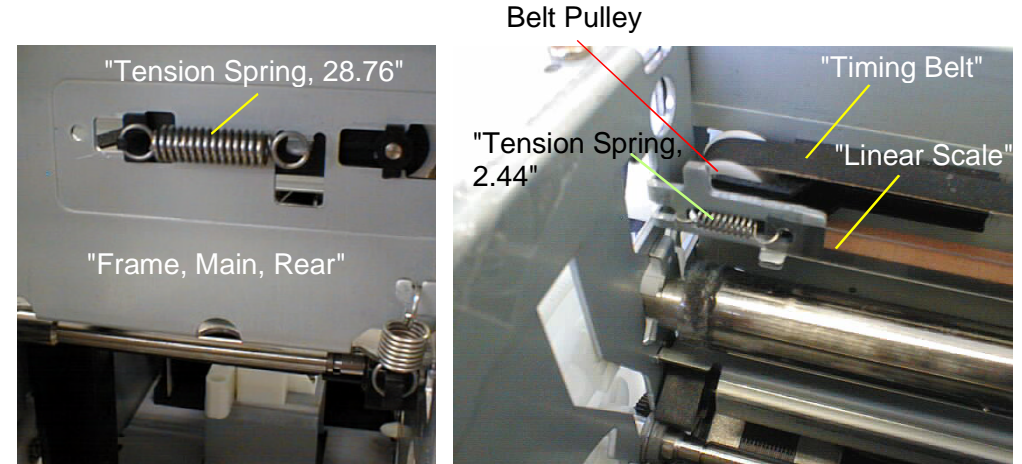
Figure 4-37. Tension spring, Timing Belt and Linear Scale Removal
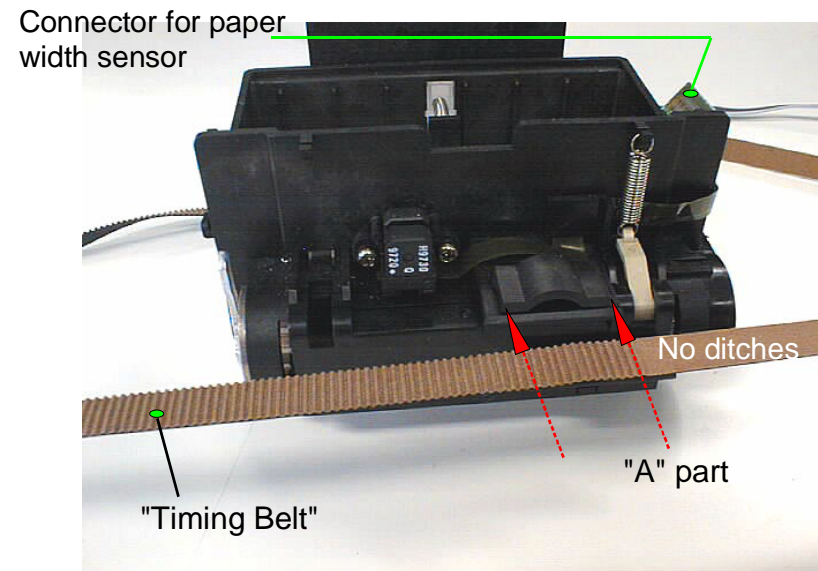
Figure 4-38. Carriage Unit Removal

4.2.5.11 Frame, Main, Paper Eject Removal

1. Remove print head. (See section4.2.5.3)
2. Remove each 2 CBS screws(3x30) securing "Holder, Fixing, Tube, B", and remove "Holder, Fixing, Tube, B" from the mechanism. (Refer to Figure4-39)

✓**CHECK POINT** *"Holder, Fixing, Tube, B" located both right and left sides are exclusive ones. Therefore, before reinstalling them, check "L"(for left) and "R"(for right) written on the surface of "Holder, Fixing, Tube, B" and install them correctly.*

3. Perform prevention for ink leakage to 6 dampers, which are removed from print head.

⚠**WARNING** *Removing "Tube, Locking Screw" in the condition that the print head is removed has a risk of ink leakage from damper side. This may make clothing or mechanism dirty. In order to prevent this, have a container in advance, which can absorb ink leakage from the damper, and put the damper in it. (See Figure4-40)*

"Holder,Fixing,Tube, B"
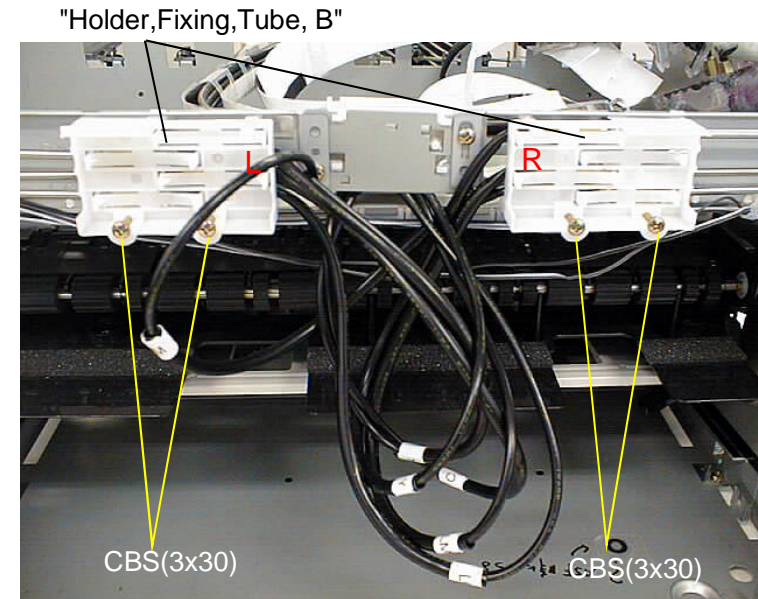
Figure 4-39. "Holder, Fixing, Tube, B" Removal
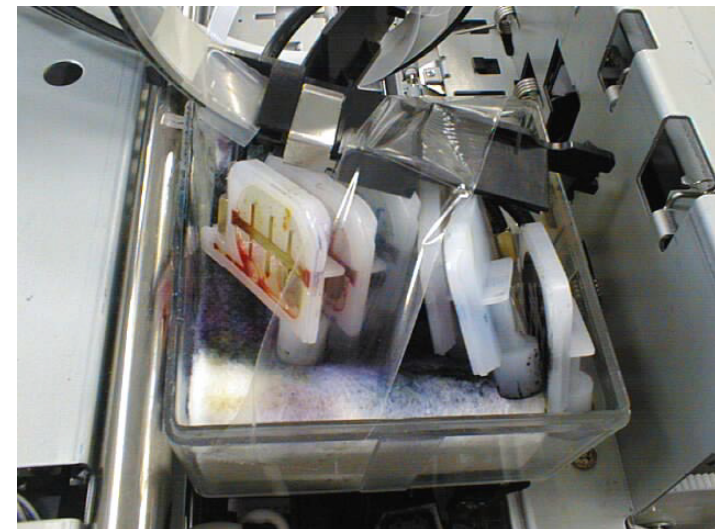
Figure 4-40. Preventing Ink Leakage

4. Remove only 6, which are located inside, out of 12 "Tube, Locking Screw"s securing 6 ink tubes respectively, and remove ink tubes. (Refer to Figure4-41)

⚠️**WARNING**
> *After removing each ink tube from "Relay, Tube", handle it so that the tip of the tune does not face down but face up. Otherwise, ink charged in the tube may leak out.*

4. Remove 2 CBS screws(3x6) securing "Reinforcing board, Fixing, FFC" to the mechanism, and remove ink tubes for each color with dampers.
5. From left side of the printer mechanism, remove "E" shaped ring securing "Combination gear,36.36.67", and remove "Combination gear, 36.36.67". (Refer to Figure4-42)

✓**CHECK POINT**
> *There is alignment between "Combination Gear, 36,36.67" and "Gear,49". When assembling them, install them to each axis, matching "O" marked on the both gear surface(red circle in the figure4-42).*
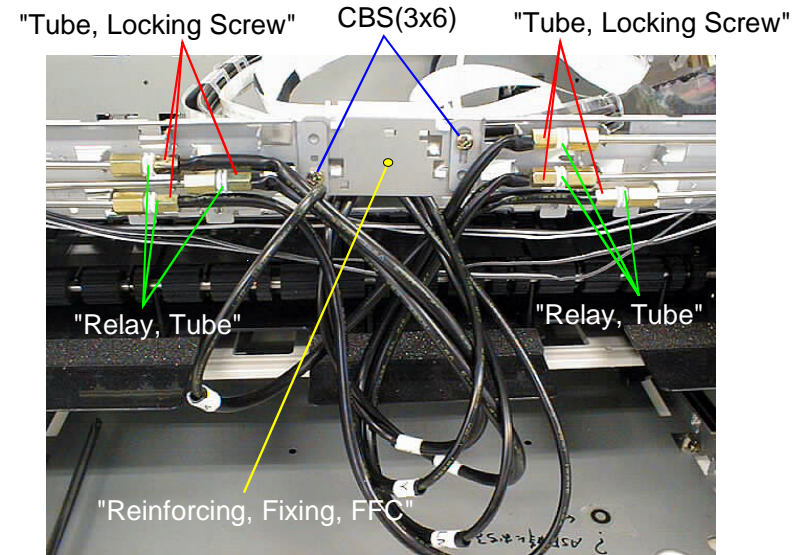
Figure 4-41. "Tube, Locking Screw" Removal
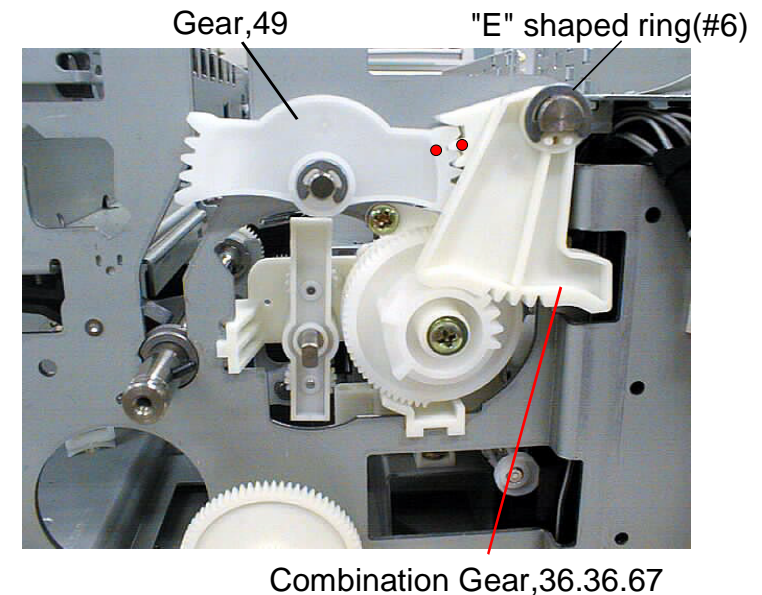
Figure 4-42. "Combination Gear,36.36.67"

7. From right side of the printer mechanism, remove one "E" shaped ring securing "Axis, CR, Support".
8. Rotate a bush for fixing an axis(shaft) toward right direction and remove the bush. (Refer to Figure4-43)
9. Remove "Axis, CR, Support" from the mechanism.

✓ **CHECK POINT**   *When re-installing "Axis, CR", set a leaf spring(8.2x0.15x15) to the axis first, then, install a plain washer(8.2x0.15x15). Also, when installing a leaf spring, convex side should face to inside. (Refer to Figure4-44)*
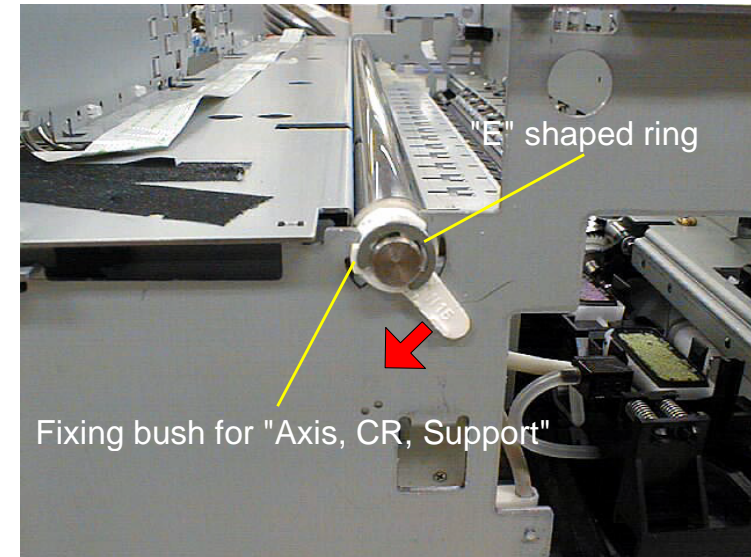
Figure 4-43. Removing a fixing bush for Axis, CR Support
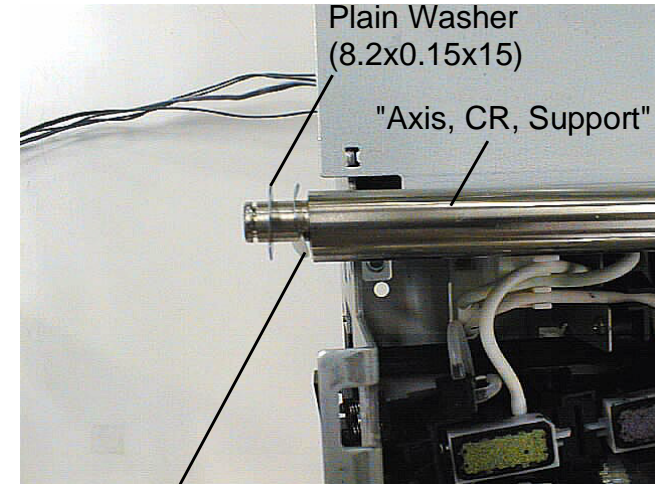
Figure 4-44. Axis, CR, Support Removal

10. Release various harness from 3 "Mini-cramp(small cramp)"s located at the front side of "Frame, Main, Paper Eject". (Refer to Figure4-45)
11. Remove one CBS screw(3x6) securing "Tank, Absorber", and remove "Tank, Absorber".
12. Remove 8 CBS screws(3x6) securing "Frame, Main, Paper Eject", and remove "Frame, Main, Paper Eject".
    (Refer to Figure4-46)

"Mini Cramp"
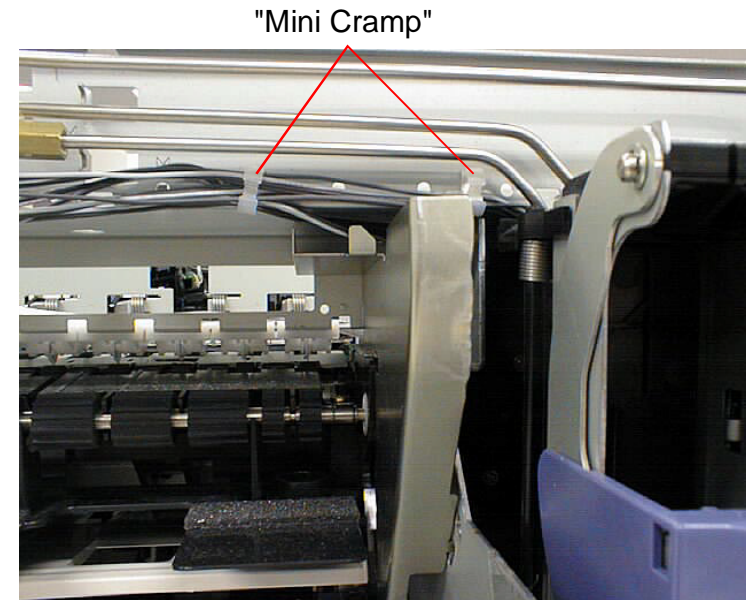
Figure 4-45. Releasing Harness at the front side of "Frame, Main, Paper Eject"

"Tank, Absorber"   CBS(3x6)

"Frame, Main, Paper Eject"

CBS(3x6)   CBS(3x6)
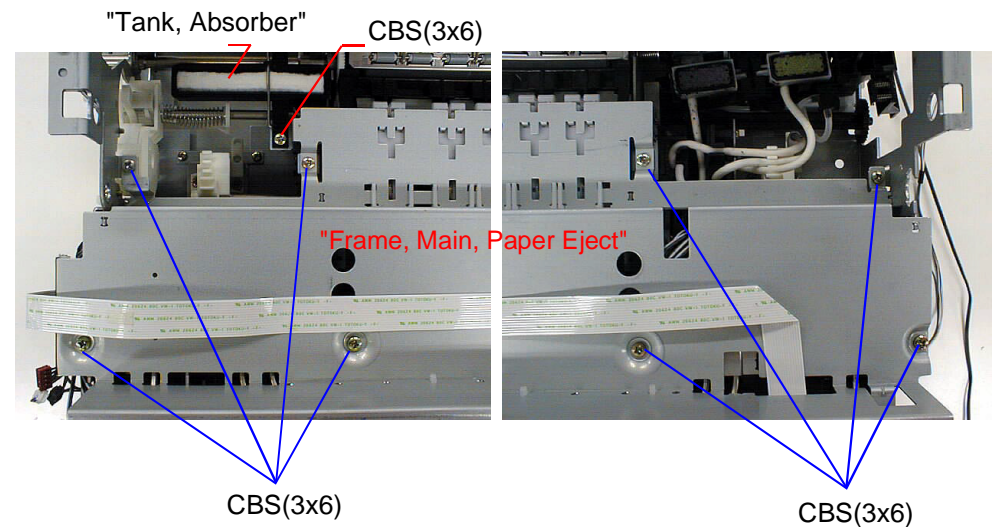
Figure 4-46."Frame, Main Paper Eject" Removal

4.2.5.12 Paper Guide Upper Unit Removal

1. Remove carriage unit.(See section 4.2.5.10)
2. Remove a connector of carriage home position sensor from CN5(white,3-pin) located on the "MB Front Unit".
3. Remove a connector of PE sensor including PR sensor from CN7(white, 5-pin) located on the "MB Front Unit".
4. Remove "Tank, Absorber". (See section 4.2.5.11)
5. Remove "Tension spring,11.7" which is pulling "Lever, PF roller, Pressing". (Refer to Figure4-47)
6. Remove 8 CBS screws(3x6) and 4 CBP screws(3x8) securing "Paper Guide Upper Unit" to the mechanism, and remove "Paper Guide Upper Unit". (Refer to Figure4-48)

✓**CHECK POINT** | *When re-installing "Paper Guide Upper Unit", assemble it so that the slider to disengage the motive power to the pump system is inserted correctly to the notched parts on the unit. (See Figure4-48)*
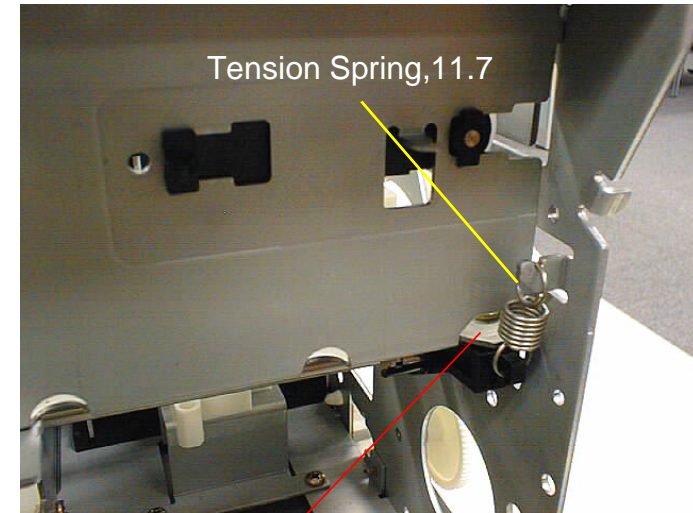
Tension Spring,11.7

"Lever, PF Roller, Pressing"

Figure 4-47."Tension Spring,11.7" Removal

Notched part and Slider position   CBP(3x8)

CBS(3x6)   CBS(3x6)
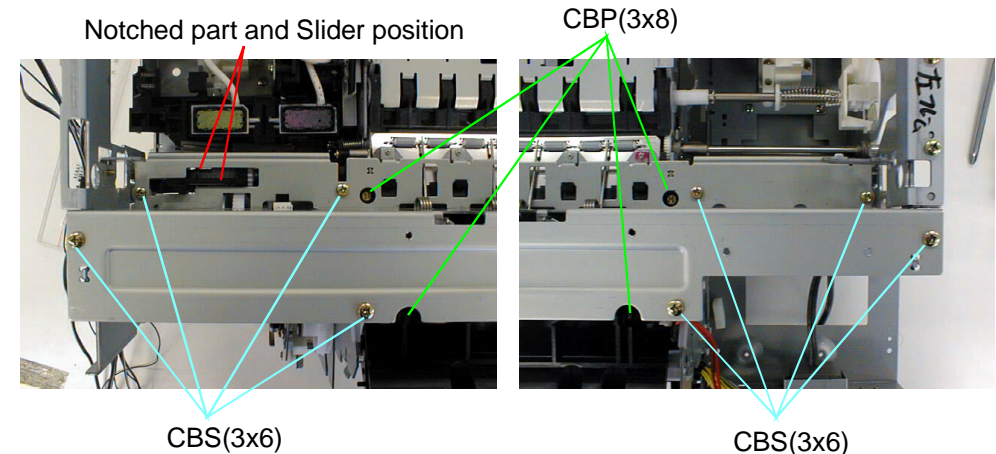
Figure 4-48. Paper Guide Upper Unit Removal

4.2.5.13 Pump Frame Removal

1. Remove Carriage Unit.(See section 4.2.5.10)
2. Remove "Frame, Main, Paper Eject". (See section 4.2.5.11)
3. Remove "Paper Guide Upper Unit".(See section4.2.5.12)
4. Remove 2 CBS screws(3x6) and one CBS screw with nuts(3x6) securing "Pump Frame" to "Frame, Main, Right". (Refer to Figure4-49)

✓**CHECK POINT**

> ■ *When re-installing "Pump Unit", insert the positioning pin for the cap unit and ink valve driven gear to each corresponding holes. (See Figure4-50)*
> ■ *There is a bush to fix the ink valve driven gear to "Frame, Main, Right". Therefore, when installing, make sure to push the protrusion of the bush to the hole on the "Frame, Main, Right". (See Figure 4-50)*
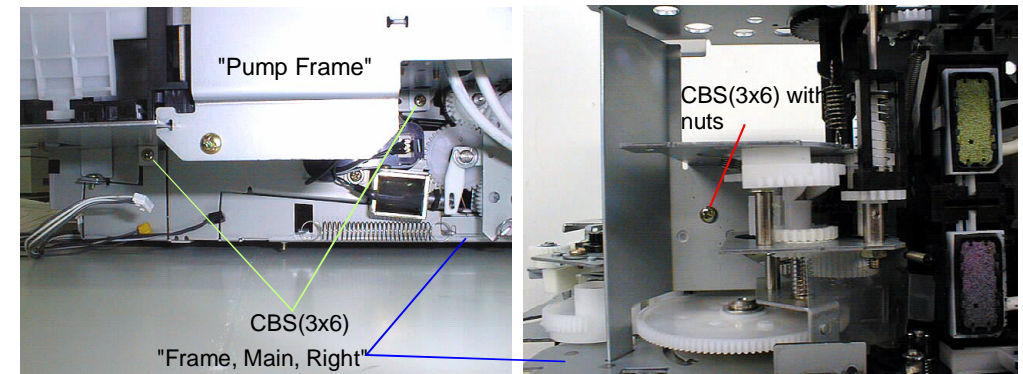
Figure 4-49. Pump Frame Removal
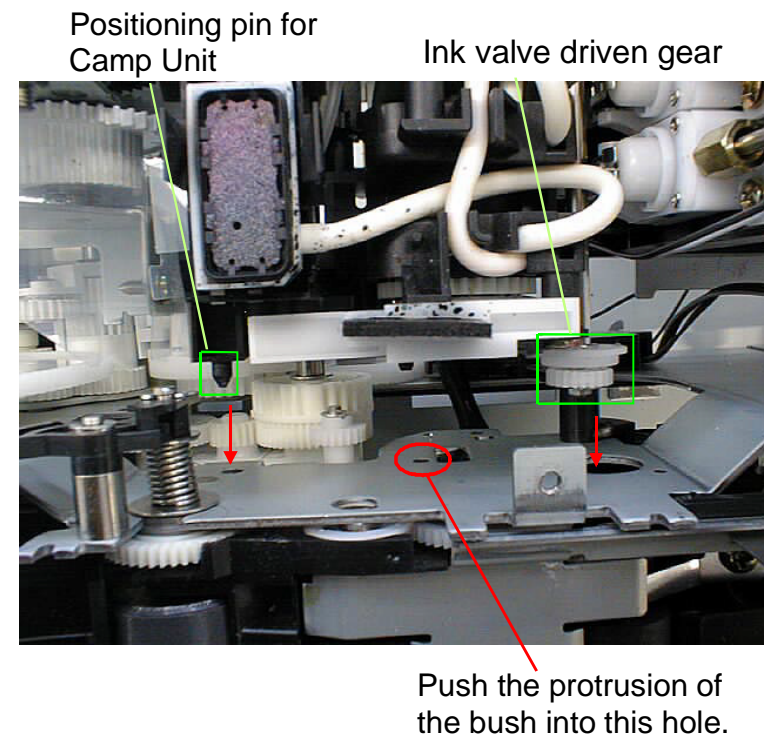
Figure 4-50. Check points when re-installing pump unit

4.2.5.14 Frame, Main, PF Removal

1. Remove Carriage Unit.(See section 4.2.5.10)
2. Remove "Frame, Main, Paper Eject". (See section 4.2.5.11)
3. Remove "Paper Guide Upper Unit". (See section 4.2.5.12)
4. Remove 2 CBS(3x6) screws securing "Frame, Main, PF" to "Frame, Middle, Left", and remove "Frame, Main, PF". (Refer to Figure4-51)

✓**CHECK POINT**

> ◼ *When re-installing "Frame, Main, PF", insert ink valve driven gear and driven axis for PG change into each corresponding holes on the "Frame, Main, Left".(Refer to Figure4-52)*
> ◼ *There is a bush to fix the ink valve driven gear to "Frame, Main, Right". Therefore, when installing, make sure to push the protrusion of the bush to the hole on the "Frame, Main, Left". (See Figure5-52)*
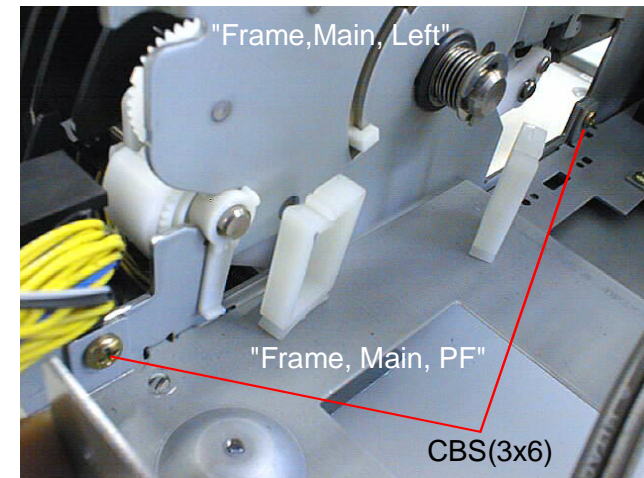
Figure 4-51. Frame, Main, PF Removal
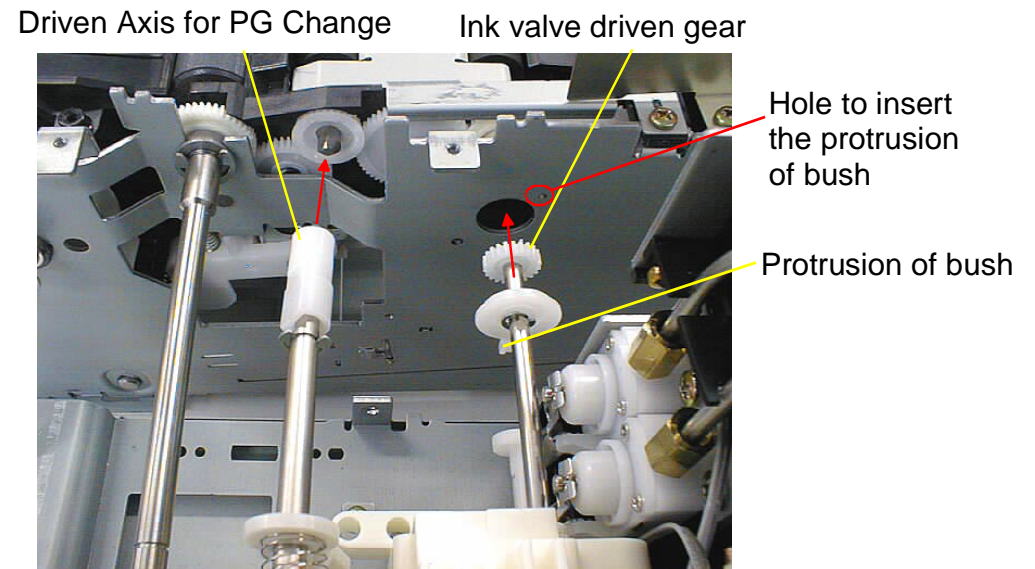
Figure 4-52. Points when re-installing "Frame, Main, PF"

5. Remove each one CBS screw(3x8) fixing "Mounting board, Tray, Left" and "Mounting board, Tray, Right" respectively and remove both left and right mounting boards. (Refer to Figure4-53)

6. Remove 2 CBS screws(3x8) and one CBP screw(3x8) securing "Paper Guide, Front", and remove "Paper Guide, Front" as whole paper eject unit.

7. Remove 2 CBS screws(3x8) securing "Paper Guide, Middle" to "Frame, Main, Left/Right", and remove "Paper Guide, Middle".
   (Refer to Figure4-54)
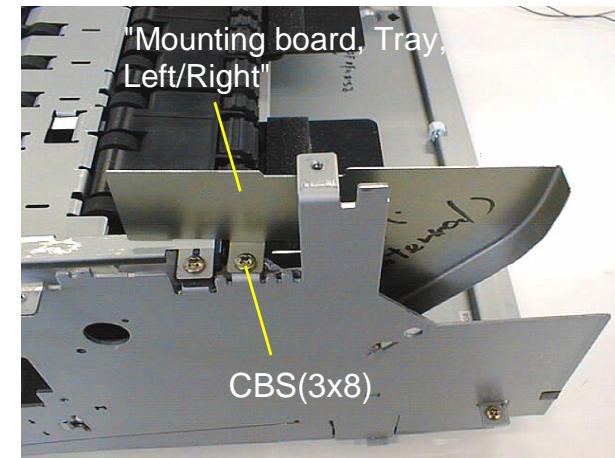
Figure 4-53. Mounting Board Removal
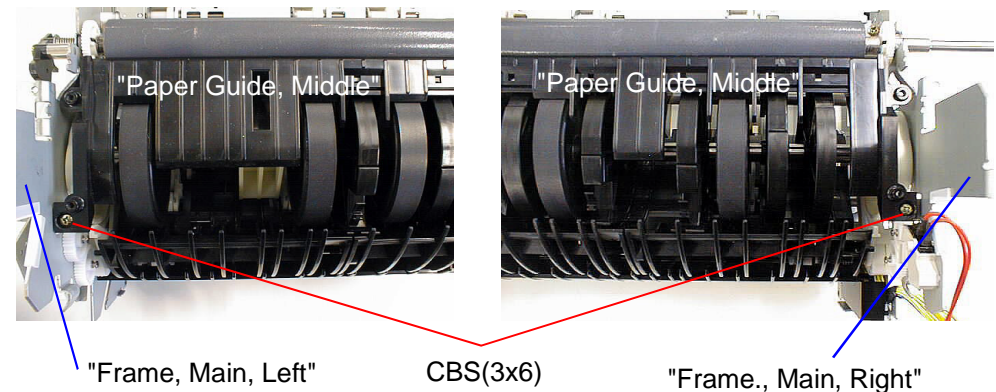
Figure 4-54."Paper Guide, Middle" Removal

8. Remove "E" shaped ring(#3) securing "Stopper, CR, Lock", and remove "Stopper, CR, Lock". (Refer to Figure4-55)

⚠️**WARNING**

> *When removing "E" shaped ring(#3), following parts may jump out. So, be careful no to lose them.(The Number below is listed from exterior side)*
> 1. *"Spacer, CR, Lock"*
> 2. *Plain washer(5.07x0.3x10)*
> 3. *Compression spring,5.85*
> 4. *Spacer, Roller PF,B*
> 5. *Plain washer(5.07x0.3x10)*
> 6. *Plain washer(4.4x0.5x14)*
> 7. *Plain washer(4.4x0.5x14)*
> 8. *Bush, 8B*
> *Refer to Figure4-56 and check shapes of each parts.*

9. From left side of the mechanism, remove one "E shaped ring(#7), and remove PF roller. (Refer to Figure4-57)
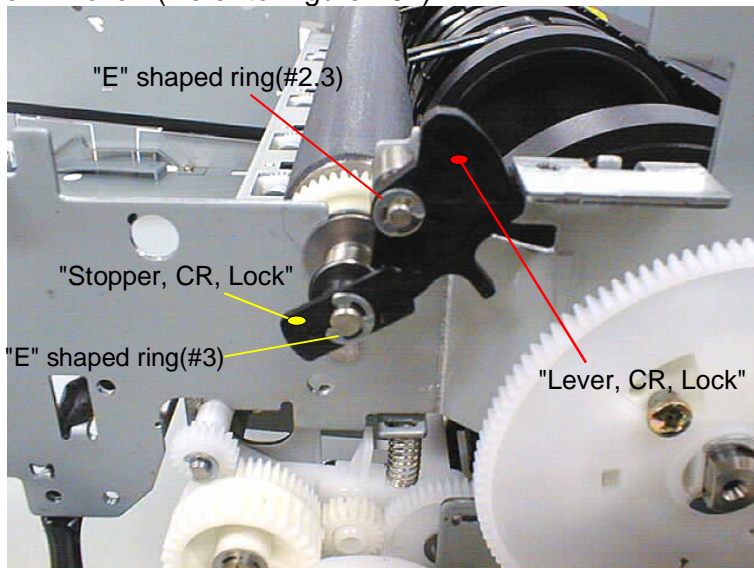
Figure 4-55. "Stopper, CR, Lock" and "Lever, CR, Lock" Removal
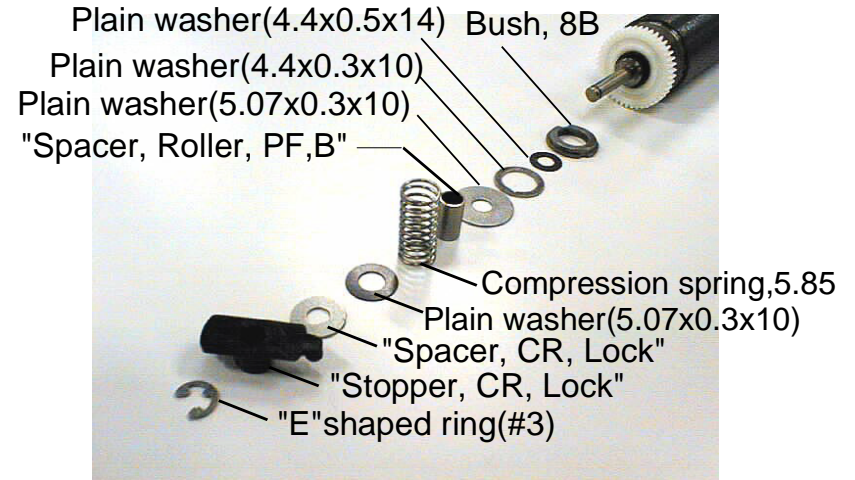
Figure 4-56. The order to install parts at re-installing "Stopper, CR, Lock"
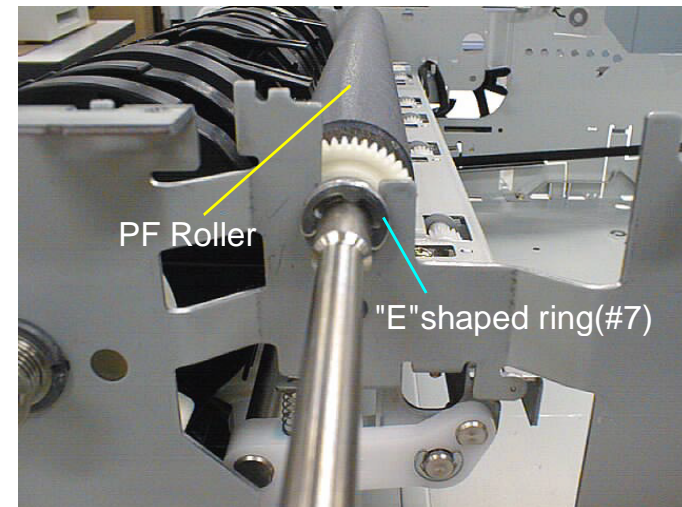
Figure 4-57. PF Roller Removal

4.2.5.15 ASF Unit Removal

1. Remove PF roller. (Refer to section 4.2.5.14)
2. Remove "Left Quantity sensor set", and release the fixing part of a harness 3-pin for upper surface sensor on the ASF from the ditch of "Left Quantity sensor set". (Refer to Figure4-58)
3. Remove 2 CBS screws(3x6) securing "ASF Unit" to "Frame, Middle, Left/right", and remove "ASF Unit". (Refer to Figure4-59)

⚠**WARNING**

"Gear, 24.24", which drives "ASF Unit" is combined with 2 gears, taking alignment with them.
Therefore, if "ASF Unit" is removed, be sure to refer to section 4.3.2"Assembling Gear Train" in this Chapter and get appropriate alignment. Otherwise, the printer goes to fatal error.

ADJUSTMENT▶

In case of removing or replacing "Upper surface sensor" on the ASF unit, refer to "Upper Surface Sensor Positioning Adjustment" in Chapter5 and perform adjustment.
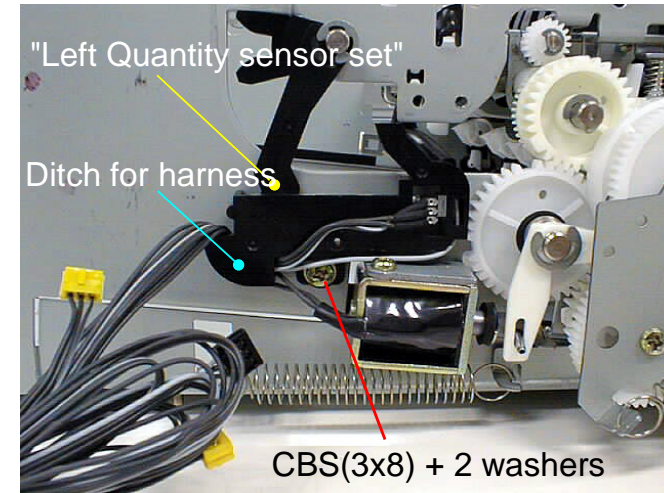
Figure 4-58. Releasing harness for Paper Pick Up (Upper surface)Sensor
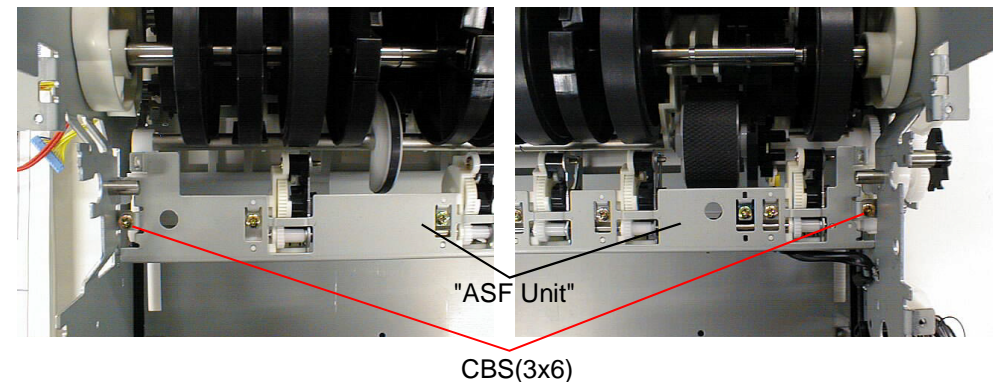
Figure 4-59. ASF Unit Removal

4.2.5.16 Upper Surface Sensor Removal

1. Remove "ASF Unit". (Refer to section 4.2.5.15)
2. Remove the connector (Yellow, 3-pin) located on the "Upper Surface Sensor".
3. Remove one CBS screw(3x8) securing "Upper Surface Sensor" to "ASF Unit", and remove "Upper Surface Sensor". (Refer to Figure4-60)

ADJUSTMENT ▶

> *In case of removing or replacing "Upper Surface Sensor" on the "ASF Unit", refer to Chapter5 and perform "Upper Surface Positioning Adjustment".*

✓CHECK POINT

> ■ *In case of re-installing the upper surface sensor, perform "Upper Surface Positioning Adjustment", then, apply Neji Lock (screw lock) to fix the position of tightened screw.*
> ■ *When removing "Upper Surface Sensor" from "ASF Unit", one spring washer comes off. When re-assembling them, refer to Figure4-60 and install this spring washer so that its convex side should face to the ASF frame, and tighten the screw.*

"Mounting Board Assembly, Upper Surface Sensor"

CBS(3x8)

Connector(Yellow,3-pin)

"Upper Surface Sensor"

Apply screw lock after adjustment is over.

ASF Frame

Spring Washer (Convex side should face up)

Sensor Mounting Board
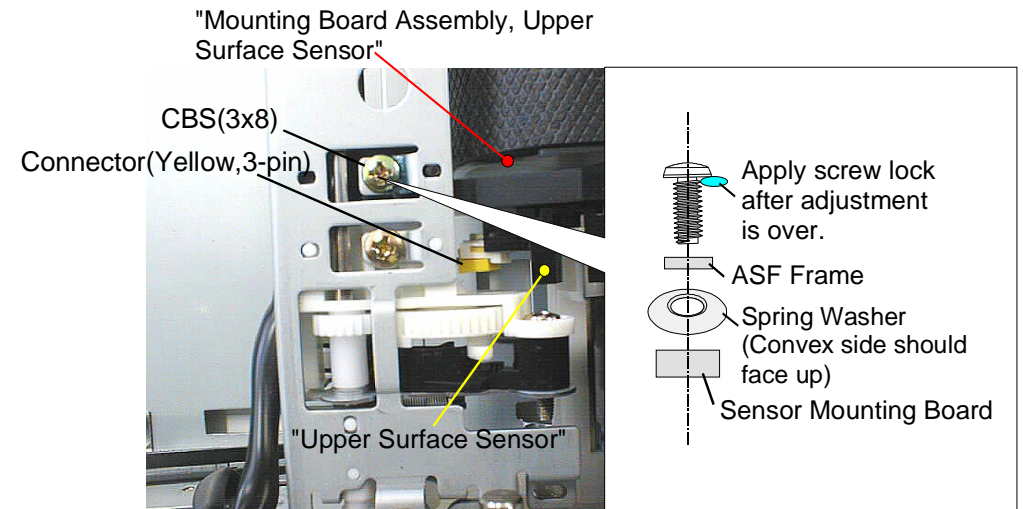
Figure 4-60. Upper Sensor Removal

4.2.5.17 PE Sensor Removal

1. Remove "Paper Guide Upper Unit". (Refer to section 4.2.5.12)
2. Remove "Tension Spring,1.2", which is installed between "Lever, Release" and "Frame, Main, Rear".
3. Remove 2 CBP screws(3x8) securing "Lever, Assembly, Release, Cam" to "Paper Guide Upper Unit".
4. Remove 2 "Bush, Release, Cam" from both left and right sides, and remove "Lever, Assembly, Release, Cam". (Refer to Figure4-61)
5. Pick up 2 hooks securing "PE Sensor" to the frame, and remove "PE Sensor". (Refer to Figure4-62)
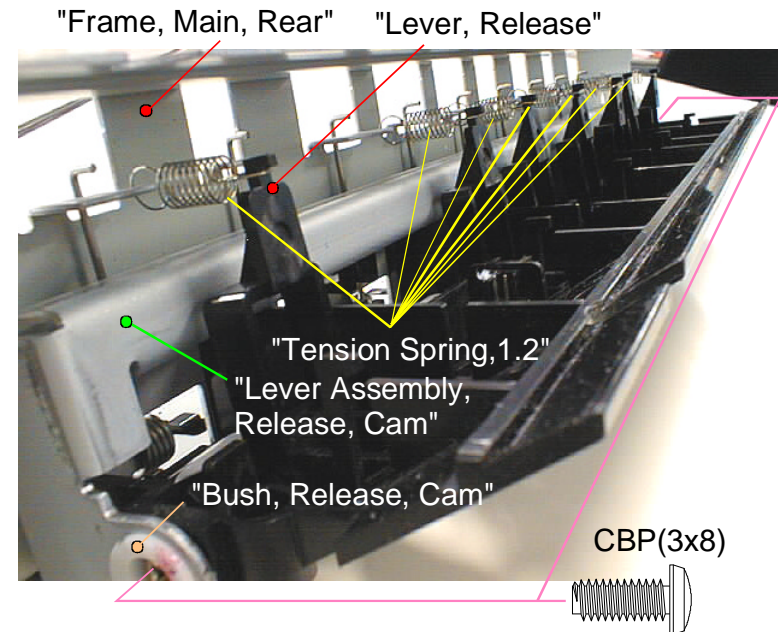
Figure 4-61. "Tension Spring,1.2", and "Lever Assembly, Release, Cam" Removal
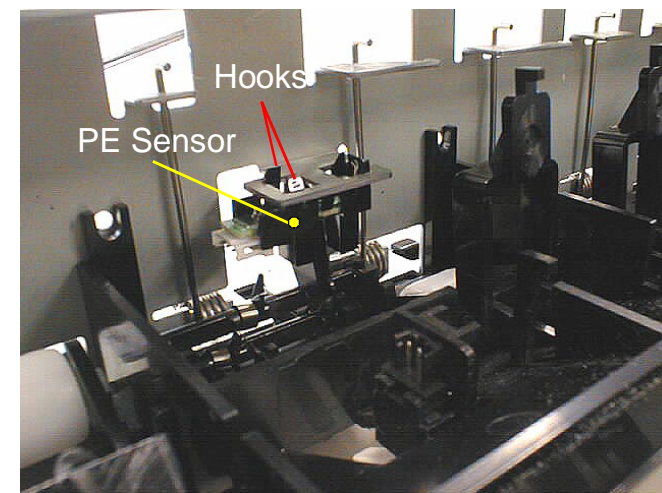
Figure 4-62. PE Sensor Removal

4.2.5.18 PR Sensor Removal

1. Remove "PE Sensor". (See section 4.2.17)
2. Release 2 hooks securing PR Sensor, and remove PR sensor.
   (Refer to Figure4-63)

✓**CHECK POINT**   *During operation, if you get confused or don't know how to install 2 actuators for "PE sensor", follow the following steps and re-assemble them correctly.*

3. Remove 10 small screws on the "Frame, Main, Rear" and 9 "Torsion Spring,189", and separate "Frame, Main, Rear" and "Paper Guide, Upper". (Refer to Figure4-64)

Remove PR sensor toward red arrow direction, pressing 2 hooks.
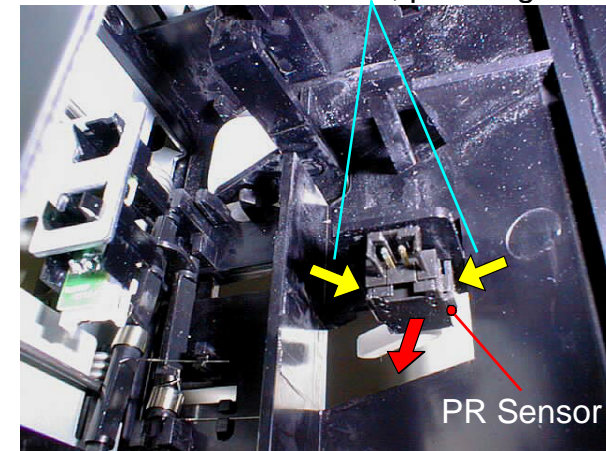
PR Sensor

Figure 4-63. PR Sensor Removal

"Frame,Main, Rear"

"Torsion Spring,189"

10 small screws (2x4)
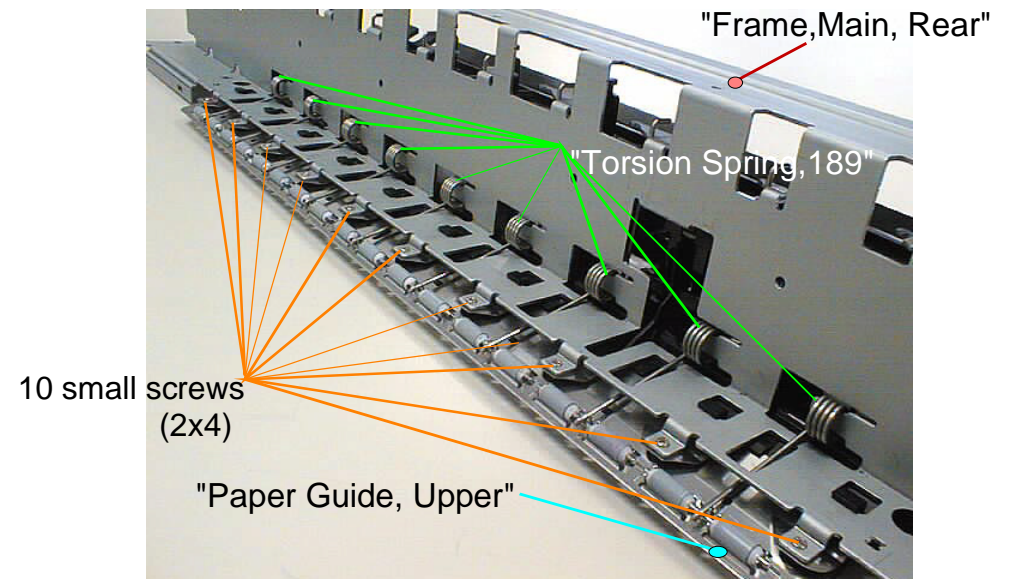
"Paper Guide, Upper"

Figure 4-64. Separating "Frame, Main, Rear" and "Paper Guide, Upper"

4. Install "Torsion Spring,0.089" to "Lever, PE, Sensor" as it is shown in Figure 4-65. (Refer to Figure4-65)
5. Install "Torsion Spring, 0.089" to "Lever, PE, Sensor, B", as it is shown in Figure4-65. (Refer to Figure4-65)
6. Install "Lever, PE, Sensor" to "Paper Guide, Upper" as it is shown in Figure4-66. (Refer to Figure4-66)
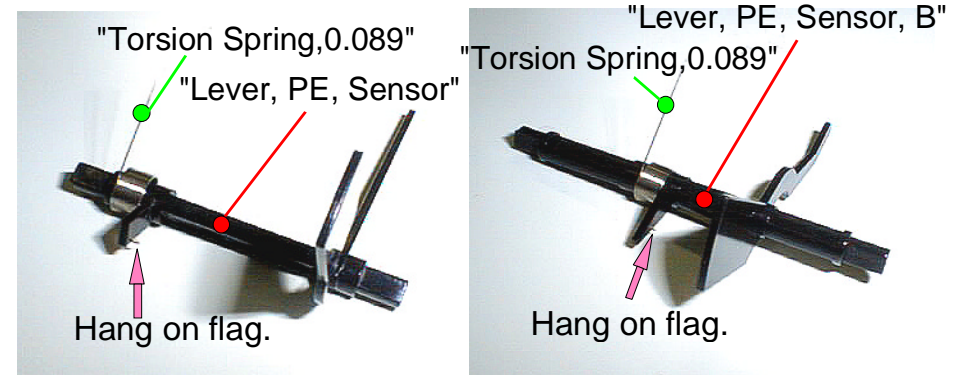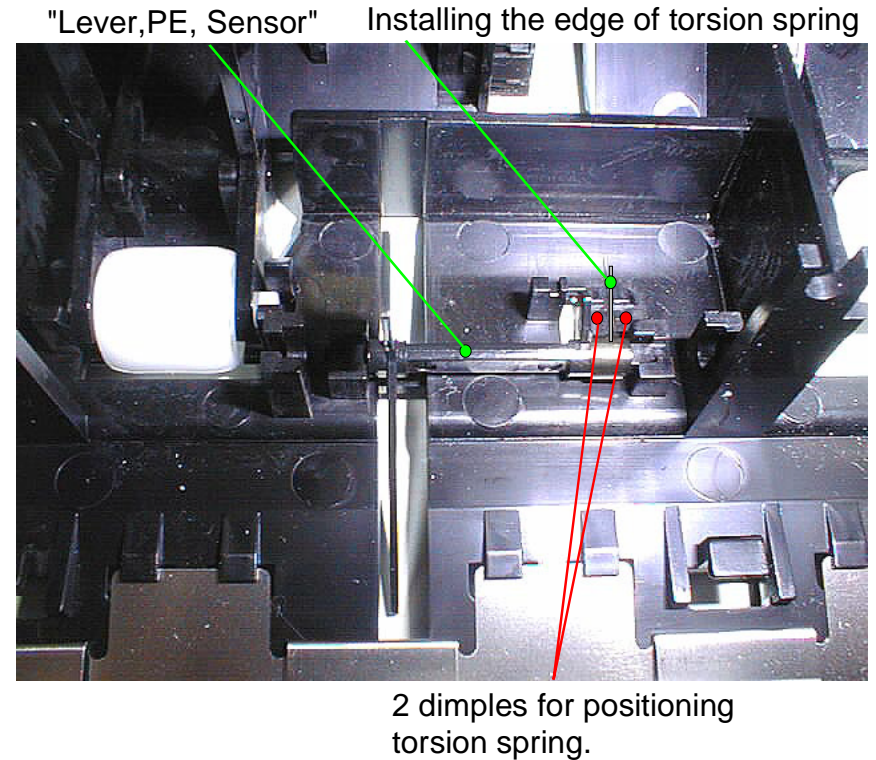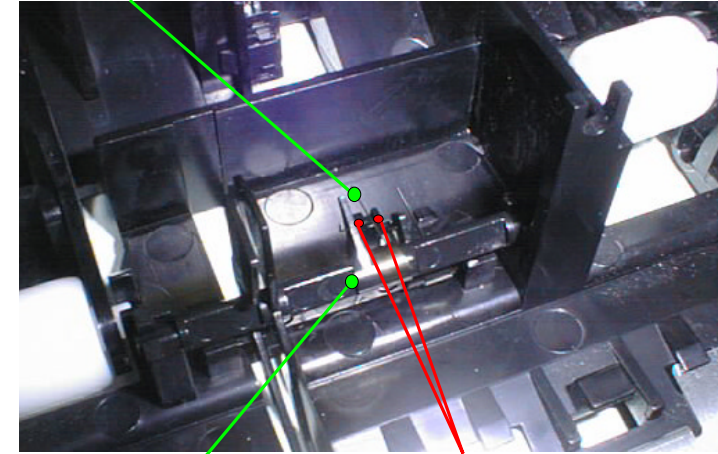

Figure 4-65. Installing "Lever, PE, Sensor(B)

Figure 4-66. Installing "Lever, PE, Sensor"

7. Install "Lever, PE, Sensor, B" to "Paper Guide, Upper", as it is shown in the Figure4-67. (Refer to Figure4-67)
8. Re-install 10 small screws on the "Frame, Main, Rear" and 9 "Torsion Spring, 189", and combine "Frame, Main, Rear" and "Paper Guide, Upper" and complete "Paper Guide, Upper".

4.2.5.19 HP Sensor Removal

1. Remove "Housing Upper". (See section 4.2.1)
2. Remove a connector(white, 3-pin) from "HP Sensor".
3. Release 2 hooks of "HP Sensor" and remove "HP Sensor" from the mechanism. (Refer to Figure4-68)

Installing edge of torsion spring.

"Lever, PE, Sensor, B"   2 dimples for positioning torsion spring.

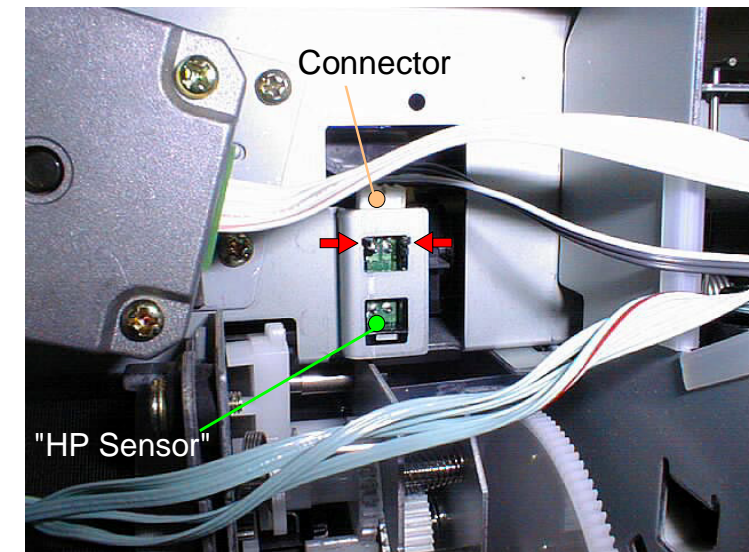**Figure 4-67. Installing "Lever, PE, Sensor, B"**

Connector

"HP Sensor"

Figure 4-68. HP Sensor Removal

4.2.5.20 Cable Assembly, Sensor FPC Removal

1. Remove "Carriage Unit". (See section 4.2.5.10)
2. Remove 2 small screws(2.5x5) securing encoder and one CBP
   screw(3x8) securing the paper width sensor, and remove "Cable,
   Assembly, Sensor FPC". (Refer to Figure4-69)

4.2.5.21 Interlock Assembly Removal

1. Remove "PS Unit". (See section 4.2.5.6)
2. Remove a connector(white, 2-pin with hook) of "Interlock Assembly" from
   connector CN24 on the "MB Front Unit".
3. Release a cable(red, 2-pin) of "Interlock Assembly" from 3 "Locking wire
   saddles".
4. Release 2 hooks on the "Cover, Interlock" from "Frame, Middle, Left", and
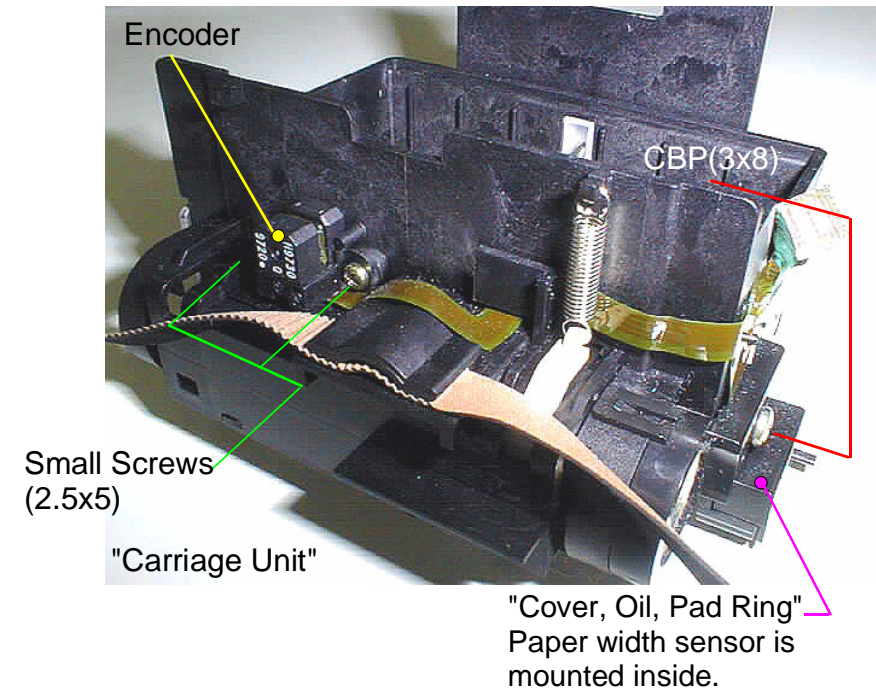   remove "Inter lock Assembly". (Refer to Figure4-70)

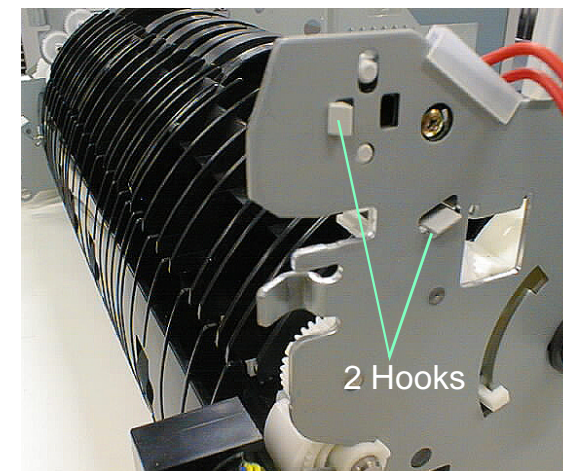**Figure 4-69. "Cable Assembly, Sensor FPC" Removal**

Figure 4-70. Interlock Assembly Removal

4.3 DISASSEMBLY AND ASSEMBLY FOR GEAR TRAIN

Gear Train of Stylus Pro5000 is very complicated and has a lot of alignments(engagement). Therefore, since procedures for disassembly and assembly is quite difficult, this section has disassembly procedure and assembly procedure separately. Refer to section 4.3.1 for disassembly and section 4.3.2 for assembly.

> ⚠**WARNING**
>
> *Gears in the gear train have their own pair to have a alignment(engagement). Therefore, in case removing or replaces those gears, install them with their alignments. "CHECK POINT" or "CAUTION" mark are mentioned for gears which require alignment. If gears are assembled without matching each alignments, printer goes to fatal error with abnormal sound, when the printer is turned on.*

4.3.1 Disassembly of Gear Train

1. Remove Pump Frame. (See section 4.2.5.13)
2. Remove one CBS screw(3x6) securing "Rotary Damper Set".
3. Remove "Tension Spring, 8.49". (Refer to Figure4-71)
4. Remove "Gear,69.6", and also remove "Gear,67.8".
   (Refer to Figure4-72)

> ⚠**CAUTION**
>
> *In the market, there are 2 kinds of "Gear,69.6"; the one has "Reinforcing board, Gear,69.6" and the other does not have it. In case of "Gear,69.6" with "Reinforcing board, Gear, 69.6", refer to Figure4-72 and install "Reinforcing board, Gear, 69.6" to "Gear, 69.6" correctly.*
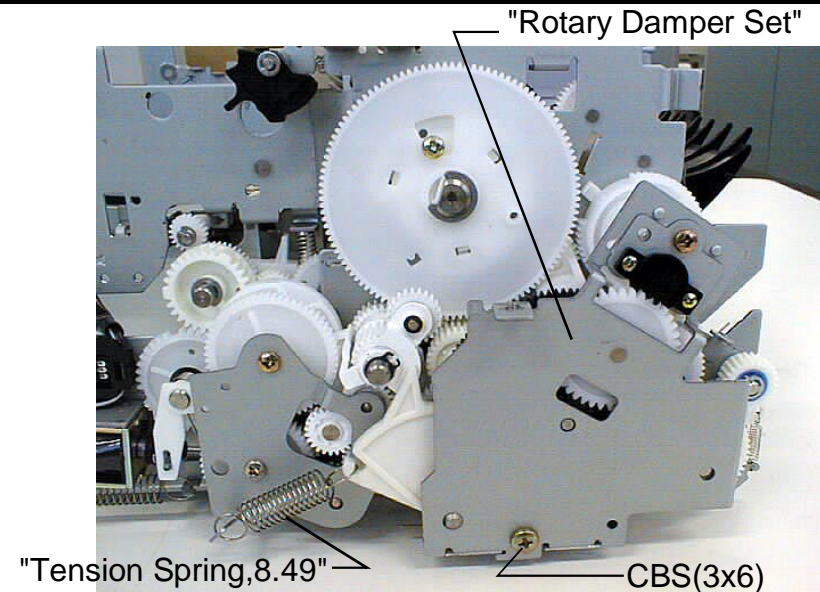

"Rotary Damper Set"

"Tension Spring,8.49"   CBS(3x6)

Figure 4-71. Rotary Damper Set Removal

"Reinforcing board, Gear,69.6"

"Gear,67.8"

"Axis, Arm Lifter"
Convex side shoud face
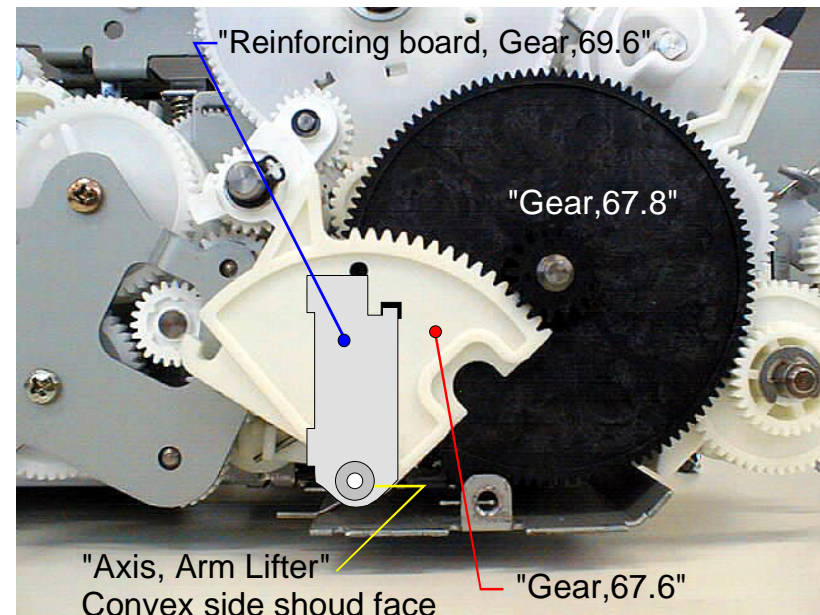to front at installing it.   "Gear,67.6"

Figure 4-72. "Gear,69.6" and "Gear,67.8" Removal

5. As it is shown in Figure4-73, remove gears according to the following
   order; 1."Combination Gear,12,25.8", 2."Gear,27", 3. "Clutch, Lifter" +
   "Gear,27.6", 4."E" shaped ring on the "Combination Gear, 18,32.4",
   5. "Combination Gear,18,32.4". (Refer to Figure4-73)

✓**CHECK POINT**

■ **Spring is installed between "Clutch, Lifter" and**
"Gear,27.6". In case of separating these 2 gears,
refer to Figure4-73 ~4-76 and install them
correctly.
■ **In case of separating "Clutch, Lifter" and**
"Gear,27.6", refer to following steps; from Step
A to Step C, and install 2 gears correctly.

Step. A   Reverse "Clutch, Lifter" and set "Torsion Spring,1.77" as it is
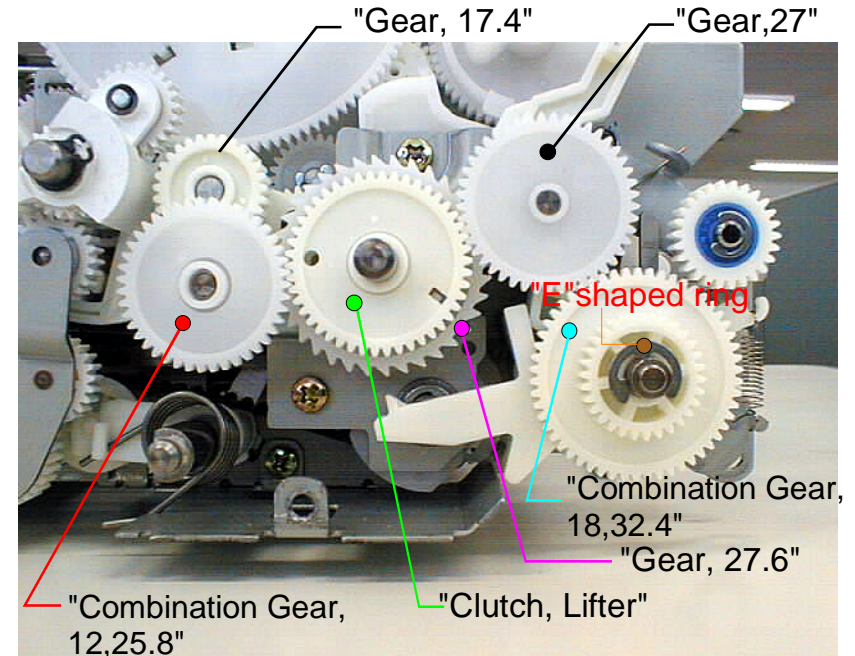   shown in Figure4-74. (Refer to Figure4-74)

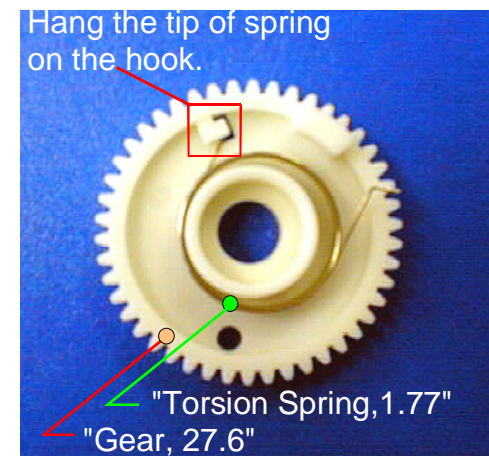**Figure 4-73. Gears of "Lifter Gear Train" Removal**

Figure 4-74. Setting "Torsion Spring,1.77"

Step. B   Cover "Gear, 27.6" on "Clutch, Lifter", hanging the leg of
              "Torsion Spring, 1.77", which is bent right angle, to one hook
              located on the back side of "Gear,27.6". (Refer to Figure4-75)
Step. C   After covering "Gear,27.6" to "Clutch, Lifter", make them go
              over the hooks, which is located both gear inside.
              (Refer to Figure4-76)

⚠**CAUTION**   *As it is shown in Figure4-76, rotate "Clutch, Lifter"*
              to yellow arrow direction and "Gear,27.6" to red
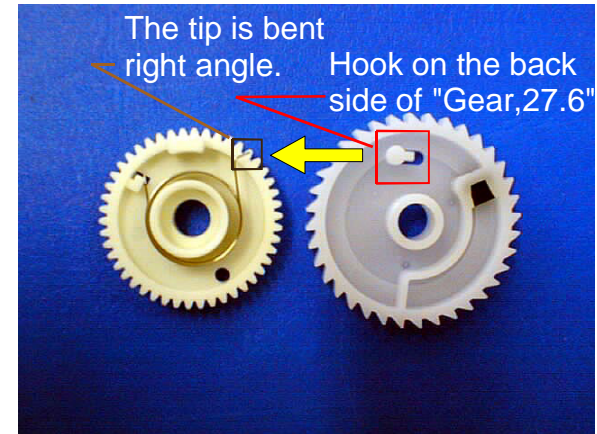   *arrow direction, then make them go over each*
              other's hook.

The tip is bent right angle.   Hook on the back side of "Gear,27.6"

Figure 4-75. Connecting "Gear,27.6" and "Clutch Lifter"(1)

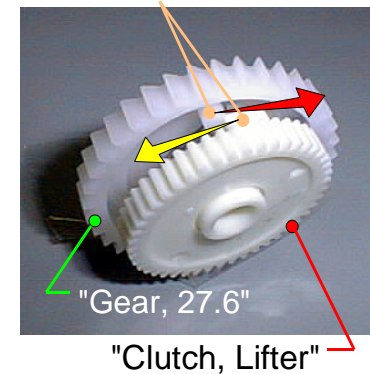Hooks of both gears

"Gear, 27.6"

"Clutch, Lifter"

Figure 4-76. Connecting "Gear, 27.6" and "Clutch Lifter"(2)

6. Remove "Tension Spring,0.588", which is giving tension to "Lever, Hopper", and remove "Tension Spring,0.588". (Refer to Figure4-77)
7. Remove "Torsion Spring 25.5", which is giving tension to "Lever, Hopper, Lock".(Refer to Figure4-77)
8. In the condition that "Hopper, Release, Lever" is manually slid to the right side, remove "Lever, Hopper, Lock". (Pressing toward yellow arrow direction in Figure4-77 makes "Lever, Hopper, Lock" up at the left side, and "Lever, Hopper, Lock" can be removed easily.) (Refer to Figure4-77)
9. Remove 2 CBS screws(3x6) securing "ASF Gear Train Cover Assembly", and remove "ASF Gear Train Cover Assembly". (Refer to Figure4-77)
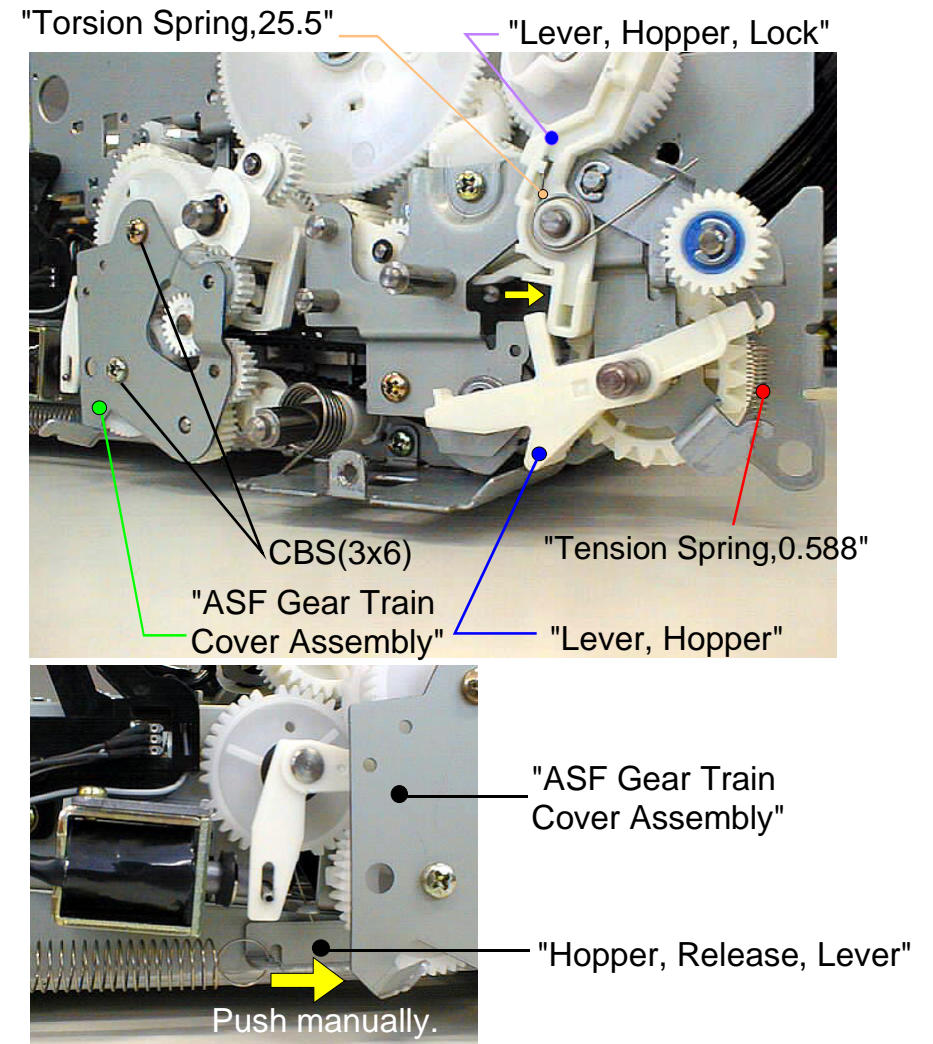

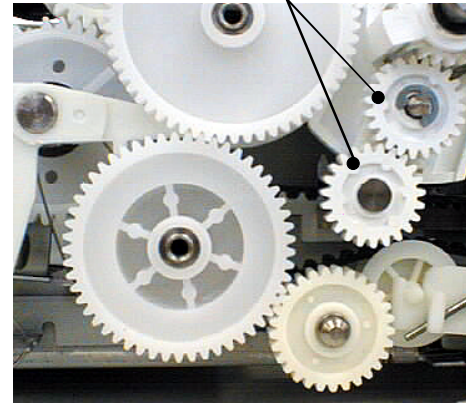**Figure 4-77. Hopper Control Parts Removal**

✓**CHECK POINT** | *When installing "ASF Gear Train Cover Assembly", install it so that the angle of "Lever Assembly, Planetary, ASF" is up at the left side. (Refer to Figure4-78)*

10.Remove "Gear,11.4". (Refer to Figure4-79)
11.Remove "Gear,31.8". (Refer to Figure4-79)
12.Remove "Gear, 35.4". (Refer to Figure4-79)
13.Release tension of "Torsion Spring, 1.27", and remove it.
　(Refer to Figure4-79)
14.Remove "Lever Belt Tension" with "Roller Belt Tension" and "Roller Belt".
　(Refer to Figure4-79)
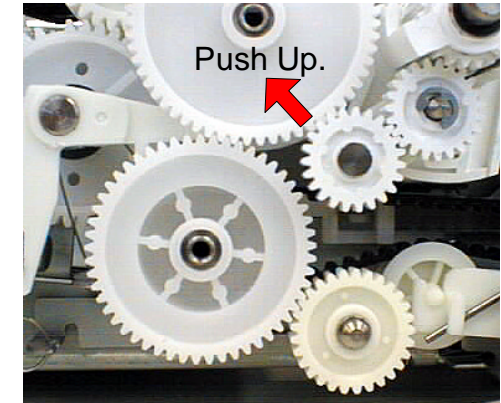
✓**CHECK POINT** | *"Lever, Belt Tension", "Roller Belt Tension" and "Roller Belt" are installed, as it is shown in Figure4-80. (Refer to Figure4-80)*
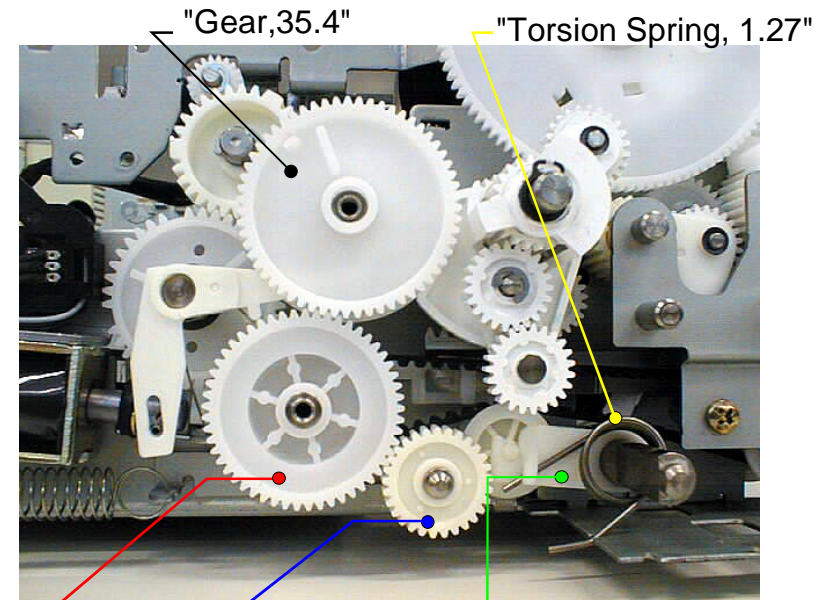
"Lever Assembly, Planetary, ASF"

Not Good Condition　　　　　　　Correct Condition

Push Up.

Figure 4-78. Condition of "Lever Assembly, Planetary, ASF" before installing "ASF Gear Train Cover Assembly"

"Gear,35.4"　　　　　　"Torsion Spring, 1.27"

"Gear,31.8"　　"Gear,11.4"　"Lever Belt Tension"

Figure 4-79. ASF Control Parts Removal

✓**CHECK POINT**   *"Lever, Belt Tension", "Roller Belt Tension" and*
"Roller Belt" are installed, as it is shown in
Figure4-80. (Refer to Figure4-80)

15. Remove "E" shaped ring(#2.3) on the "Lever Assembly, Planetary, ASF",
and remove "Lever Assembly, Planetary, ASF" with 2 gears.
(Refer to Figure4-81)
16. Remove "C" shaped ring on the "Lever Assembly, Planetary, Lifter" by
using stop ring pliers, and remove "Lever Assembly, Planetary, Lifter".
(Refer to Figure4-81)
17. Remove 2 "E" shaped rings on the "Lifter Gear Train Cover Assembly".
(Refer to Figure4-81)
18. Remove 2 CBS screws(3x6) on the "Lifter Gear Train Cover Assembly",
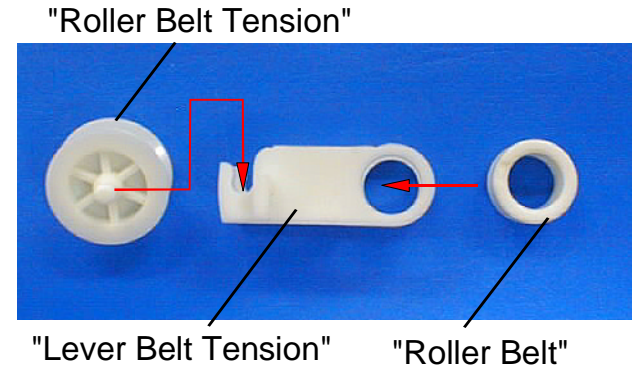and remove "Lifter Gear Train Cover Assembly". (Refer to Figure4-81)

"Roller Belt Tension"

"Lever Belt Tension"   "Roller Belt"

Figure 4-80. Setting "Lever Belt Tension"

"Lever Assembly, Planetary, Lifter"
"E" shaped ring
"C" shaped ring   CBS(3x6)

"Lever Assembly, Planetary, ASF"   "E" shaped ring
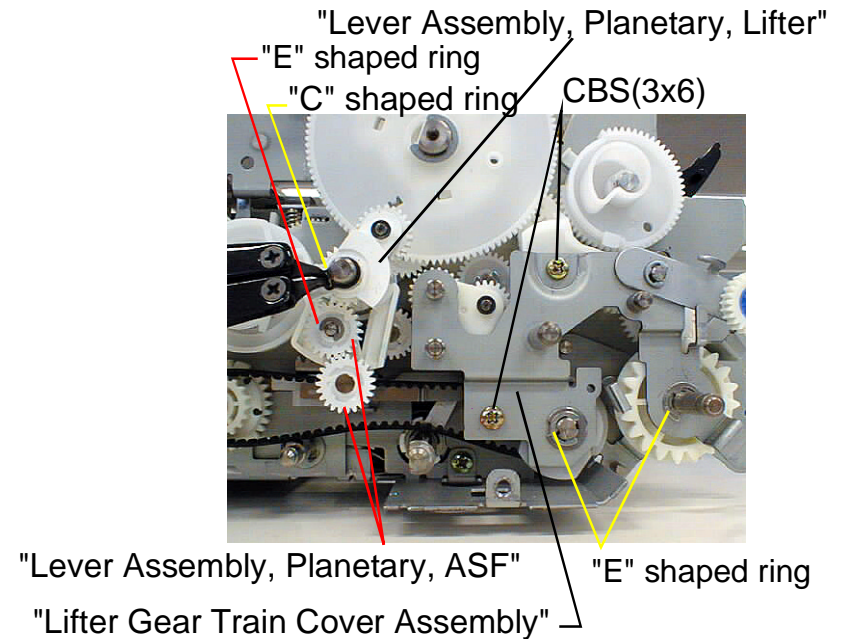
"Lifter Gear Train Cover Assembly"

**Figure 4-81. "Lifter Gear Train Cover Assembly" and "Lever Assembly,
Planetary, Lifter" Removal**

19. Release "Torsion Spring,3.92" which is giving tension to "Lever, Stopper, ASF", and remove "Lever, Stopper, ASF". (Refer to Figure4-82)
20. Remove "Combination Gear,30.30", and remove "Lever Assembly, Hopper".
21. Remove "Combination Gear,13.8,17.4". (Refer to Figure4-82)
22. Remove "Gear,12.8". (Refer to Figure4-82)

✓ **CHECK POINT**

> *In case of removing "Gear,12.8", since there is alignment(engagement) between the gear located on the "Hopper Release Assembly" and "Gear,12.8", refer to Figure4-83 and arrange alignment between these two gears. When moving "Hopper Assembly" right and left manually, insert "Gear,12.8" into the axis so that the big gear of "Gear,12.8" can engage with the big gear on the "Hopper Release Assembly".*
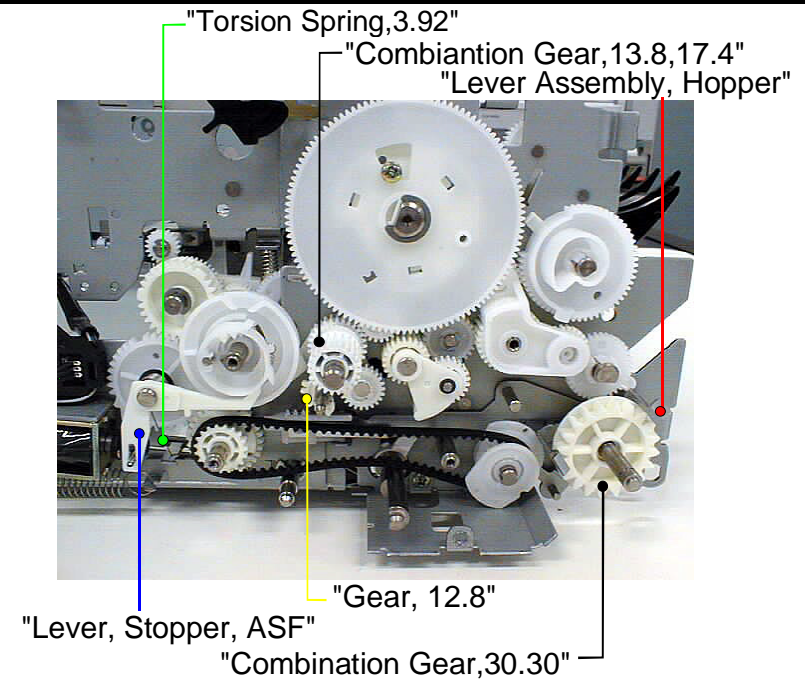

"Torsion Spring,3.92"
"Combiantion Gear,13.8,17.4"
"Lever Assembly, Hopper"
"Gear, 12.8"
"Lever, Stopper, ASF"
"Combination Gear,30.30"

Figure 4-82. "Lever, Stopper, ASF" ,"Combination Gear 13.8.17","Lever, Stopper, ASF", "Gear,12.8", "Combination Gear,13.8, 17.4", "Lever Assembly Hopper" Removal
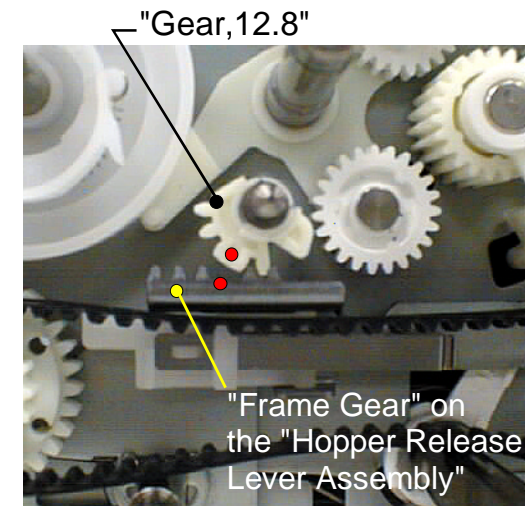

"Gear,12.8"
"Frame Gear" on the "Hopper Release Lever Assembly"

Figure 4-83. Adjusting alignment for "Gear, 12.8"

23.Remove the timing belt, which is installed between "Hopper Lock Transmission Gear Assembly" and "Combination Gear,18.144,24". (Refer to Figure4-84)

> **✓CHECK POINT**   *In case of removing "Timing Belt, Hopper", it is necessary to match the alignment at re-installing. Refer to section 4.3.2 "Assembling Gear Train" and assemble gear train.*

24.Remove "Hopper Lock Transmission Gear Assembly" from axis. (Refer to Figure4-84)

> **✓CHECK POINT**   *In case of removing "Hopper Lock Transmission Gear Assembly", it becomes necessary to match the alignment at re-installing. Refer to section 4.3.2 "Assembling Gear Train" and assemble gear train.*

25.Remove "Combination Gear,18.144,24" from axis. (Refer to Figure4-84)

> **✓CHECK POINT**   *In case of removing "Combination Gear,18.144,24", it becomes necessary to match the alignment at re-installing. Refer to section 4.3.2 "Assembling Gear Train" and assemble gear train.*

26.Remove "Cam ASF Assembly". (Refer to Figure4-84)

> **✓CHECK POINT**   *In case of removing "Cam ASF Assembly", it becomes necessary to match the alignment at re-installing. Refer to section 4.3.2 "Assembling Gear Train" and assemble gear train.*
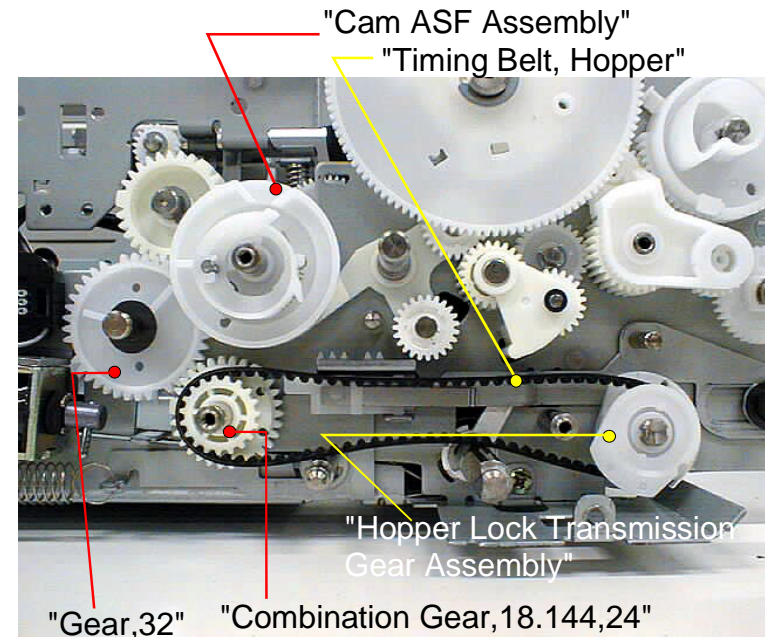

Figure 4-84. "Cam ASF Assy", "Timing Belt, Hopper", "Gear,32", "Combination Gear,18.144,24" and "Hopper Lock Transmission Assy" Removal

4.3.2 Assembling Gear Train

Here explains procedure to assemble gear train. Since assembling gear train require to have several alignments between gears, it will be almost impossible to assemble gear train without referring this section. Therefore, in case of disassembling gear train, make sure to refer to this section and assemble the gear train. Also, this procedure is written based on the assumption that the final step(Step26) in the previous section; Disassembly of Gear Train is completed.

1. Insert "Lever, Stopper, ASF" into axis, and also insert "Combination Gear, 30.30" into the same axis.

✓**CHECK POINT**

When installing "Combination Gear,30.30", be careful of which is top. The bigger gear side is top.

2. Insert "Gear,12.8" into the axis.

✓**CHECK POINT**

In case of removing "Gear,12.8", since there is alignment(engagement) between the gears located on the "Hopper Release Assembly" and "Gear,12.8", refer to Figure4-86 and arrange alignment between these two gears. When moving "Hopper Release Assembly" right and left manually, insert "Gear,12.8" into the axis so that the big gear of "Gear,12.8" can engage with the big gear on the "Hopper Release Assembly".
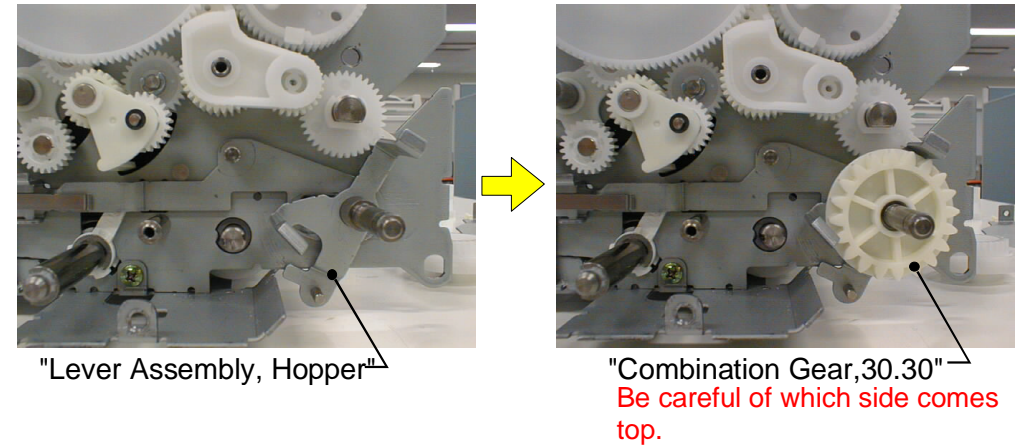

"Lever Assembly, Hopper"   "Combination Gear,30.30"
                               Be careful of which side comes top.

Figure 4-85. Installing "Combination Gear,30.30"

"Gear,12.8"

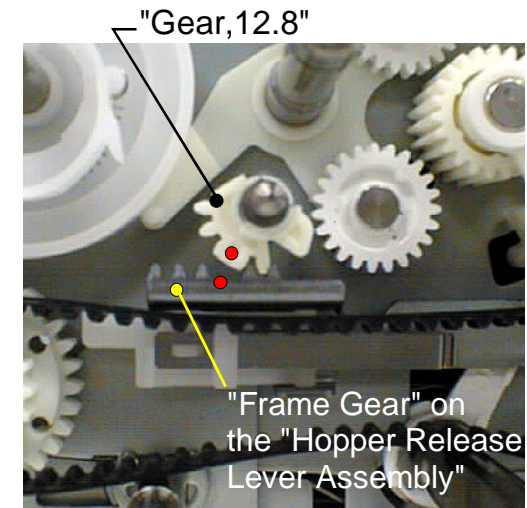"Frame Gear" on the "Hopper Release Lever Assembly"

Figure 4-86. Installing "Gear,12.8"

3. In case of separating "Hopper Lock Transmission Gear Assembly" into "Gear,18.144" and "Lock, Hopper, Transmission", insert 2 holes on the "Lock, Hopper, Transmission" to 2 dimples on the "Gear, 18.144" and assemble them. (Refer to Figure4-87)

> ⚠ **WARNING**
>
> *If "Gear, 18.144" and "Lock, Hopper, Transmission" are combined in wrong direction, the printer will be unable to operate correctly and go to fatal error with abnormal sound, when it is turned on.*

4. Push out "Axis, Paper Return, Cam" toward arrow direction in Figure4-88 from the back of the mechanism by finger, and insert "Hopper Lock Transmission Gear Assembly" under the condition that "Axis, Paper Return, Cam" and bush are stable. (Refer to Figure4-88)
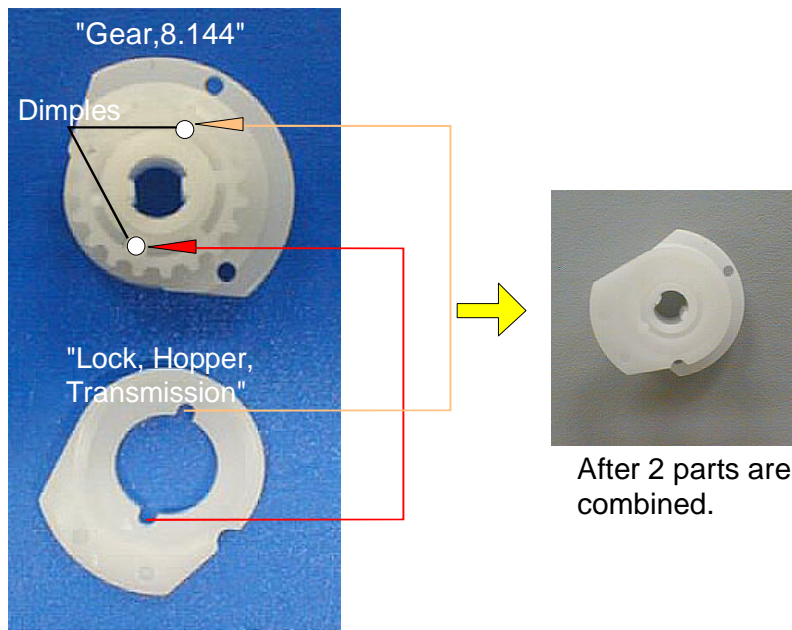

Figure 4-88. Installing "Hopper Lock Transmission Gear Assembly"

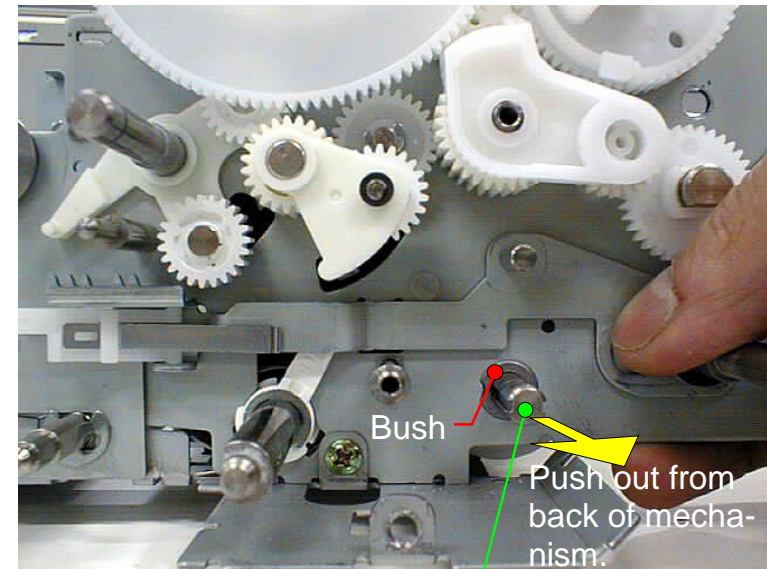
After 2 parts are combined.

Figure 4-87. Combining "Hopper Lock Transmission Gear Assembly"

5. Hang the one side of "Timing Belt, Hopper" on "Hopper Lock Transmission Gear Assembly", and hand the other side on axis "A" temporarily. (Refer to Figure4-89)
6. Install "Lifter Gear Train Cover Assembly" and attach a bush to the axis of "Hopper Lock Transmission Gear Assembly".
7. Fix "Lifter Gear Train Cover Assembly" with 2 "E" shaped rings and 2 CBS screws(3x6). (Refer to Figure4-90)
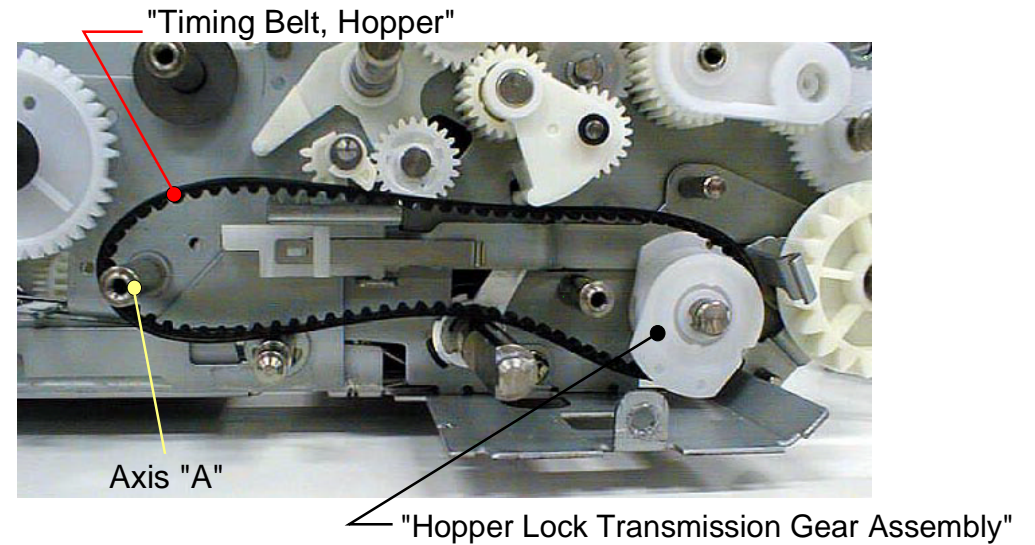

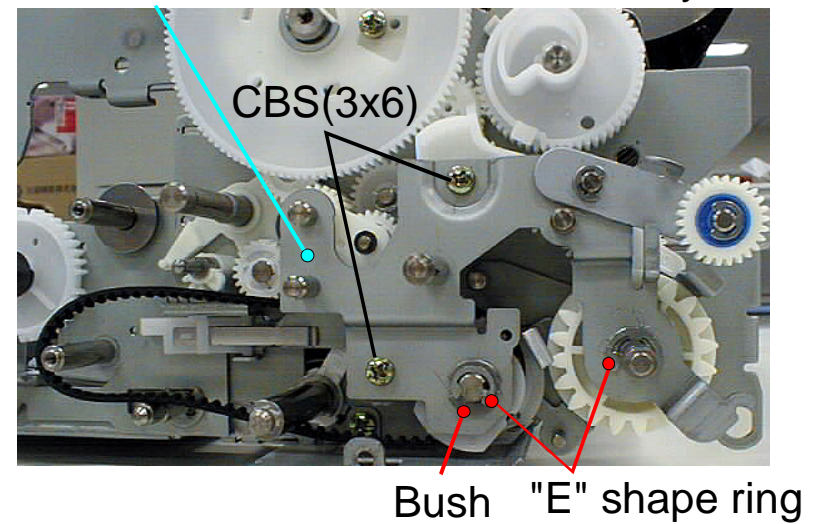**Figure 4-89. Fixing "Timing Belt, Hopper" Temporarily**

Figure 4-90. Installing "Lifter Gear Train Cover Assembly"

✓**CHECK POINT**   *After installing "Lifter Gear Train Cover Assembly", as it is shown in Figure4-91, make sure that "Lever Assembly, Hopper" is located under "Lever Assembly, Lifter, Clutch". (Refer to Figure4-91)*

8. Remove one side of "Timing Belt, Hopper", which was hang on axis "A" temporarily, and insert "Combination Gear,18.144,24" into the axis. (Refer to Figure4-92)

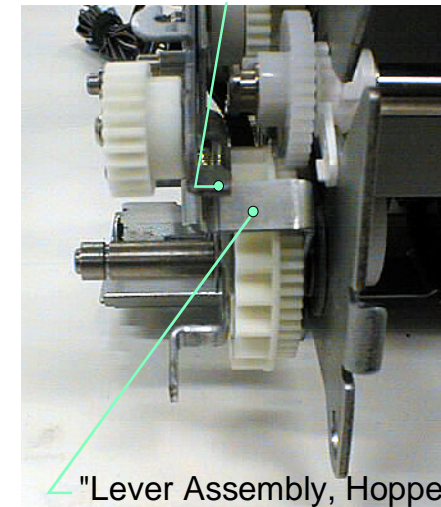"Lever Assembly, Lifter, Clutch"

"Lever Assembly, Hopper"

Figure 4-91. Check Point After installing "Lifter Gear Train Cover Assembly"

"Timing Belt, Hopper"
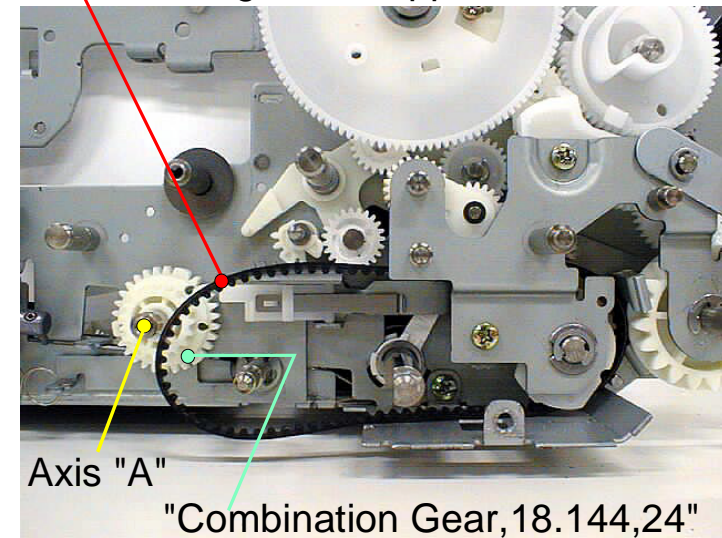
Axis "A"

"Combination Gear,18.144,24"

Figure 4-92. Installing "Combination Gear,18.144,24"

9. Pressing "Hopper Release Lever Assembly" to right side, rotate 3 holes on the "Combination Gear,18.144,24" until they become the condition shown in Figure4-93, and insert the positioning pin for alignment into the red marked hole(see figure) and pierced it to the hole of the mechanism. (Refer to Figure4-93)

⚠**CAUTION**   *When inserting the positioning pin, the hole does not appear unless "Hopper Release Lever Assembly" is pushed to right side.*

10.Slightly adjust the tilt of "Hopper Lock Transmission Gear Assembly" until the hole of "Hopper Lock Transmission Gear Assembly" can be seen from the hole on the "Lifter Gear Train Cover Assembly". At the point that you can confirm the hole, insert the positioning pin for alignment.
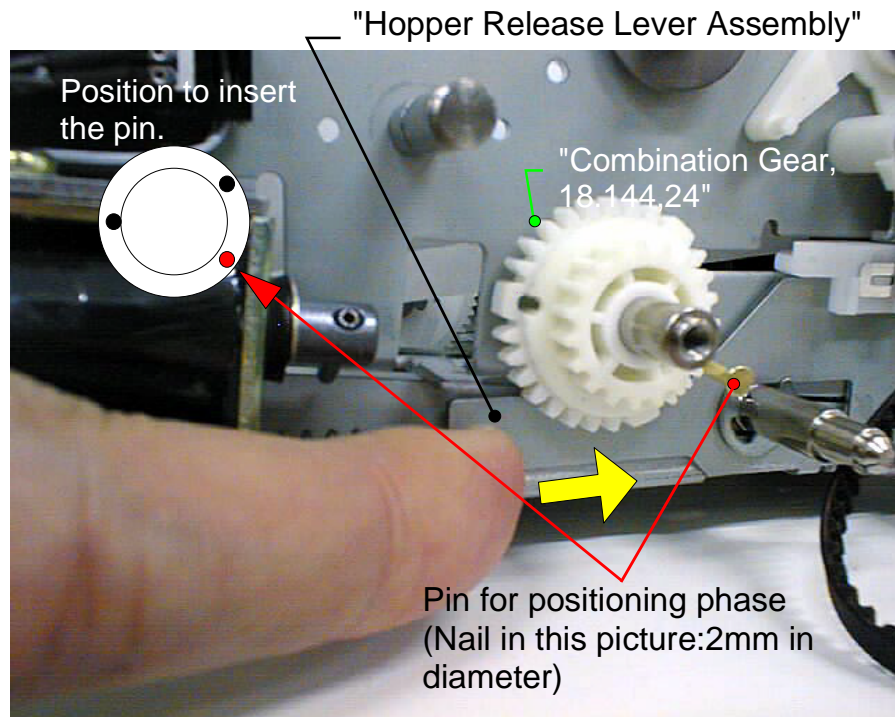

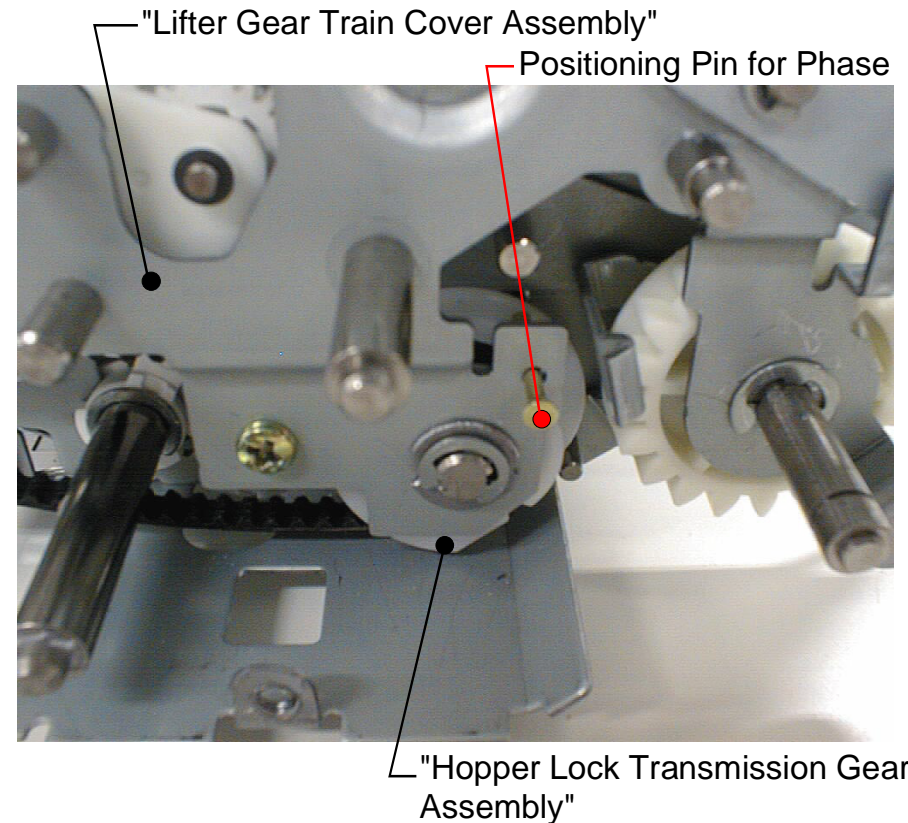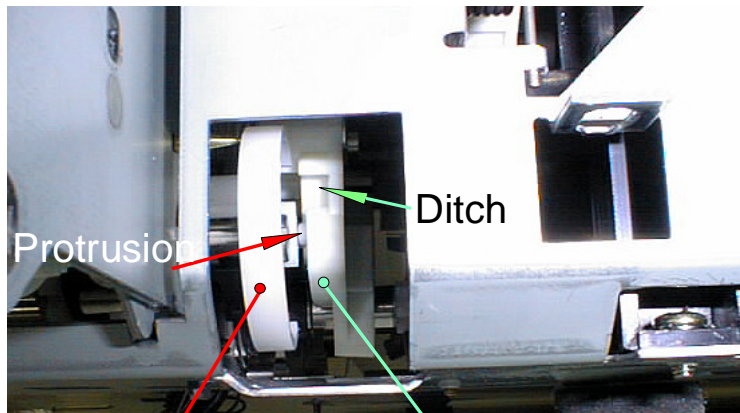**Figure 4-93. Adjusting Alignment for "Combination Gear,18.144,24"**

Figure 4-94. Adjusting Alignment for "Hopper Lock Transmission Gear Assembly"

✓**CHECK POINT**

In the condition that alignment of "Hopper Transmission Gear Assembly" is made correctly, as it is shown in Figure4-95, in the inside of "Frame, Assembly, Middle, Right", the protrusion of "Cam Assembly, Paper Return" should be inserted into the ditch of "Lever, Paper Return, Cam" and also 5 paper return levers should be sticking out.(Refer to Figure4-95 and Figure4-96)

11. Hang "Timing Belt, Hopper" on the "Combination Gear, 18.144,24".
   (Refer to Figure4-97)

Paper Return Lever should be sticking out.

Figure 4-96. Paper Return Lever After Adjusting Alignment of "Hopper Lock Transmission Gear Assembly"

Ditch

Protrusion

"Cam, Assembly, Paper Return"

"Lever, Paper Return, Cam"

Figure 4-95. Frame Inside After Adjusitng Alignment of "Hopper Lock Transmission Gear, Assembly"
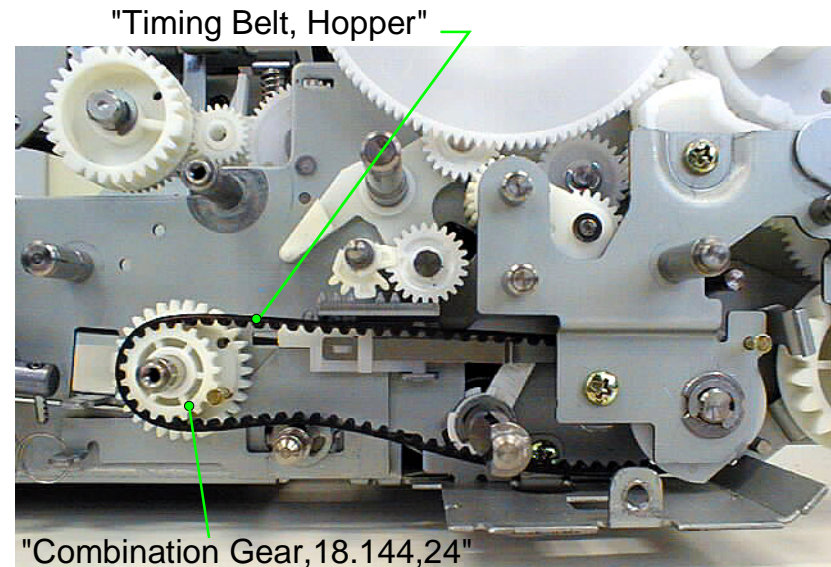
"Timing Belt, Hopper"

"Combination Gear,18.144,24"

Figure 4-97. Setting "Timing Belt, Hopper"

12. Set the rib of "Gear,32" to the axis so that the rib faces outside. At this time, 2 holes on the "Gear,32" should match with 2 holes on the "Frame, Assembly, Middle, Right". (Refer to Figure4-98)

13. Attach "E" shaped ring. (Refer to Figure4-98)

✓**CHECK POINT** *In case of removing "Gear,32", since there is alignment between "Gear,32" and "Combination Gear,18.44,24", refer to Figure4-98 and make correct alignment(engagement). Also, when setting "Gear,32", set it so that its ribs on the gear surface indicate 10:35, like a clock. (Refer to Figure4-98)*

14. Set a washer (black) on the same axis. (Refer to Figure4-99)

"E" shaped ring"   "Gear,32"

Set ribs on the surface at 10:35 position.

Make phase with "Combination Gear,18.144,24".   "Combination Gear, 18.144,24"
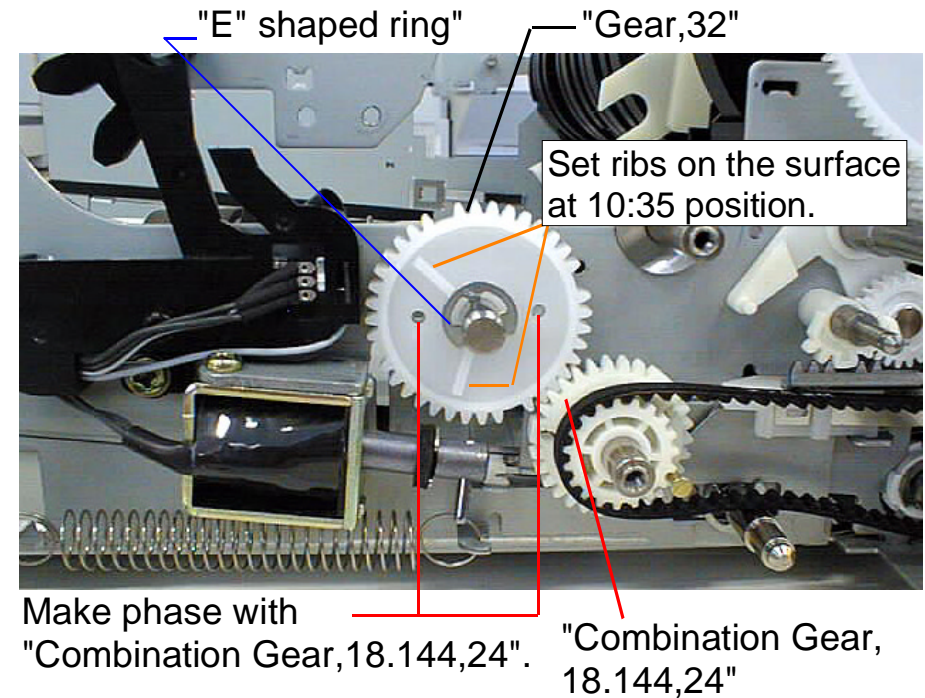
Figure 4-98. Setting "Gear,32"
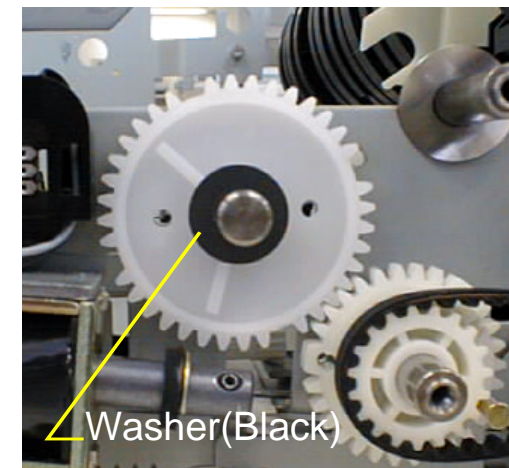
Washer(Black)

Figure 4-99. Setting a Washer(black)

15. Install a plain washer(6.2x0.5x17,S/Na) to axis "A".
16. Install a leaf spring(6.2x0.15x15, S/Na) to the same axis.
   (Refer to Figure4-100)

✓CHECK POINT   *When installing a leaf spring(6.2x0.15x15,S/Na), its convex side should face to the mechanism frame.*

17. Set a leaf spring(6.2x0.15x15, S/Na) to the same axis.
   (Refer to Figure4-100)
18. Set "Cam, ASF" to the same axis. (Refer to Figure4-101)

✓CHECK POINT   *Although there is alignment between "Cam, ASF" and surrounding gears, it is not necessary to arrange them at this point.*

Leaf Spring
(6.2x0.15x15,S/Na)

Axis"A"

"Plain Washer(6.2x0.2x 21, L/Na)" "Plain Washer(6.2x0.5x 17, S/Na)"
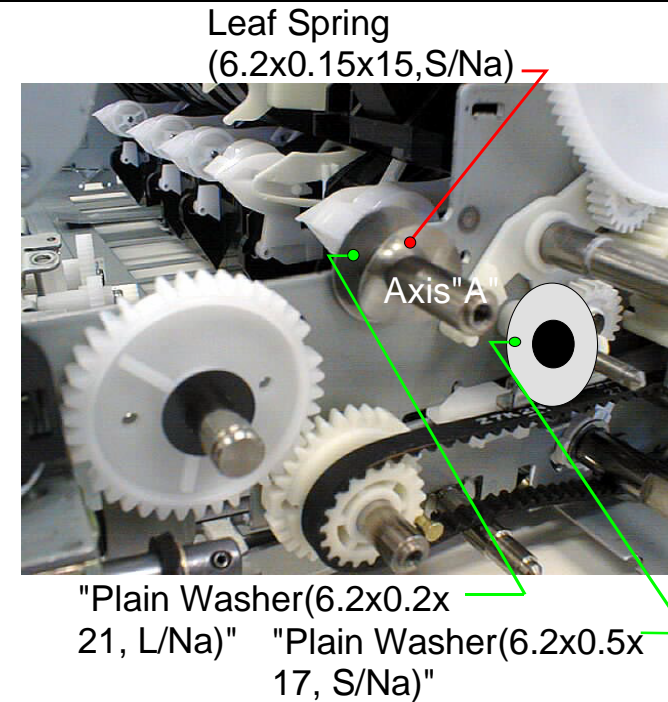
Figure 4-100. Before installing "Cam, ASF"
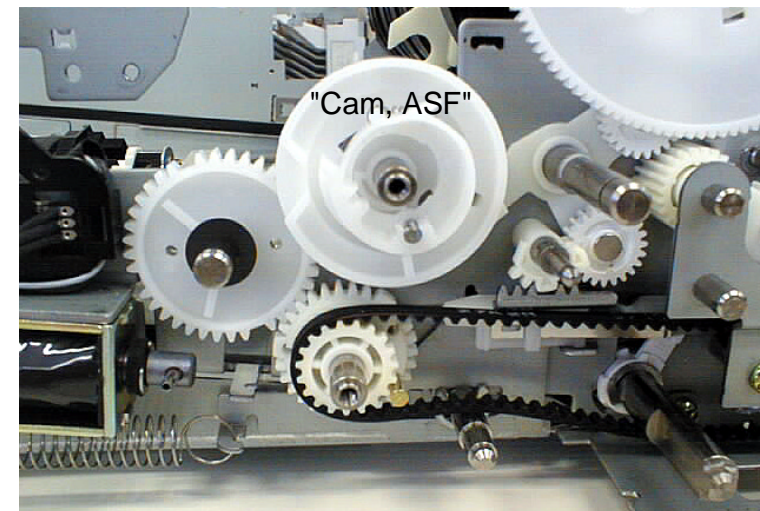
"Cam, ASF"

Figure 4-101. Installing "Cam, ASF"

19. Remove the positioning pin which is inserted between "Cam, Hopper Lock" and "Combination Gear,18.144,24".
20. Install "Torsion Spring,3.92" to "Lever, Stopper, ASF". Hang the tip of the shorter leg to the hook of "Lever, Stopper, ASF".
    (Refer to Figure4-102)
21. Install "Lever, Stopper, ASF" to the same axis which "Gear,32" is installed, and hang the tip of longer leg of "Torsion Spring,3.92" to the hook of "Frame Assembly, Middle, Right". (Refer to Figure4-103)
22. Insert the pin of "Solenoid, ASF" to the long hole on the "Lever, Stopper, ASF". (Refer to Figure4-103)
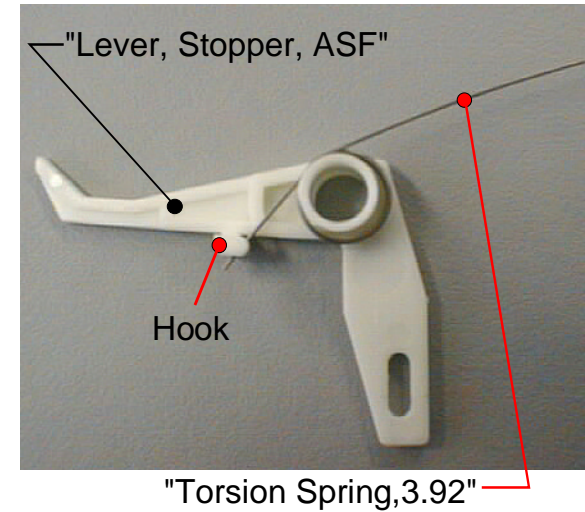
Figure 4-102. Setting "Lever, Stopper, ASF"
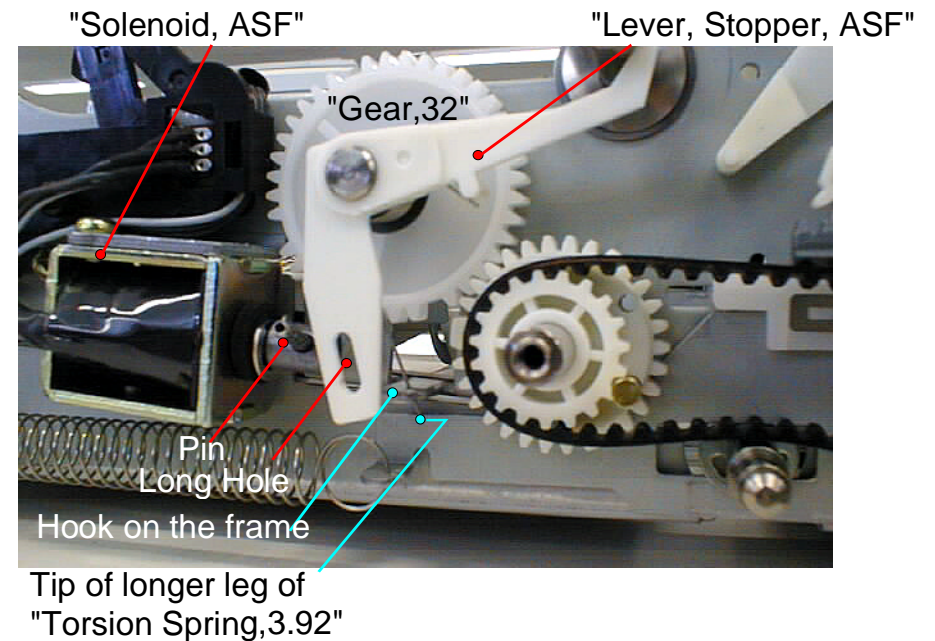
Figure 4-103. Installing "Lever, Stopper, ASF"(1)

23. Fix "Lever, Stopper, ASF" with "E" shaped ring. (Refer to Figure4-104)
24. Insert "Combination Gear,13.8,17.4" into axis "A". (Big gear side should face to the mechanism frame) (Refer to Figure4-105)
25. Insert "Lever Assembly, Planetary, Lifter" into the same axis(axis "A") and fix it with "C" shaped ring. (Refer to Figure4-106)

"E" shaped ring
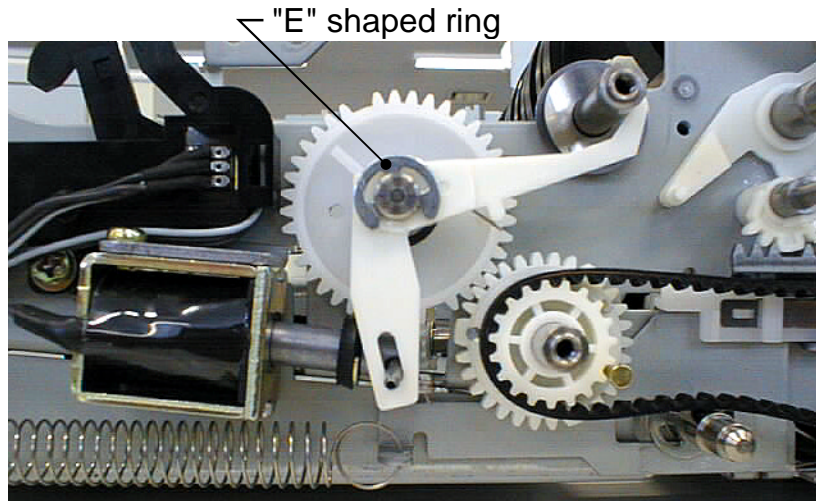
Figure 4-104. Installing "Lever, Stopper, ASF"(2)

"Combination Gear,13.8,17.4"

Axis"A"
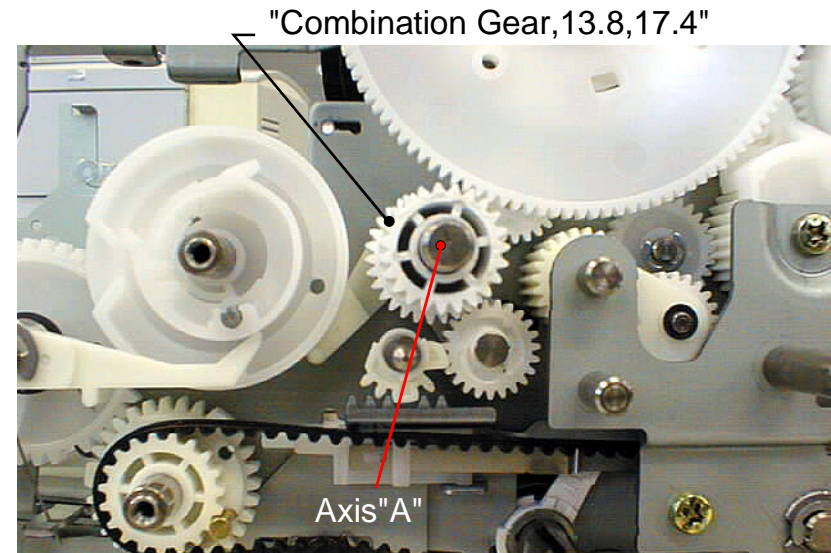
Figure 4-105. Installing "Combination Gear,13.8,17.4"

"Lever Assembly,Planetary, Lifter"

"C" shaped ring

Axis"A"
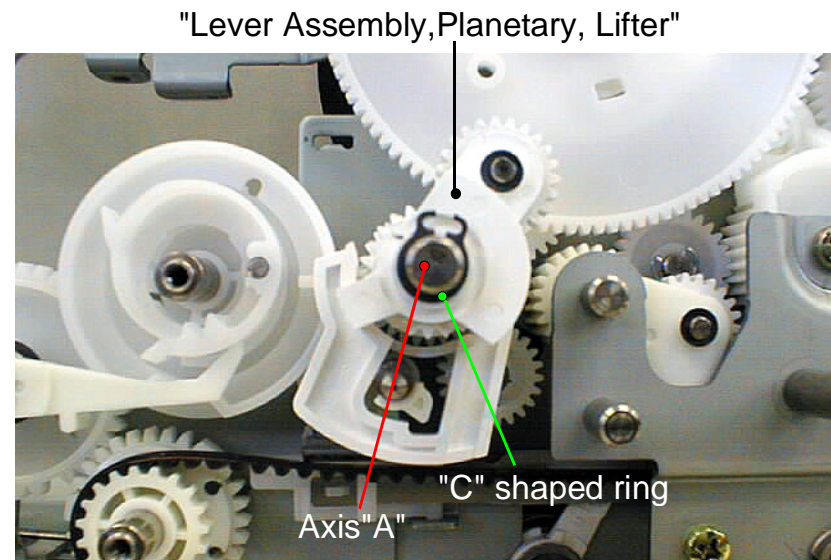
Figure 4-106. Installing "Lever, Assembly, Planetary, Lifter"

26.Insert "Gear,13.8" into axis "B", and also insert "Lever Assembly, Planetary, ASF" into the same axis.

27.Fix "Lever Assembly, Planetary, ASF" with "E" shaped ring(#2.3). (Refer to Figure4-107)

28.Insert "Gear,35.4" into the same axis which "Cam, ASF" is installed.

✔**CHECK POINT**

"Gear,35.4" has a small gear behind of it, and this small gear should face to the mechanism frame side, when installing it.

⚠**CAUTION**

At this point, check again that the positioning pin for alignment is removed from "Combination Gear,18.144,24". If you continue following procedures without removing this pin, the gear train will not work correctly.
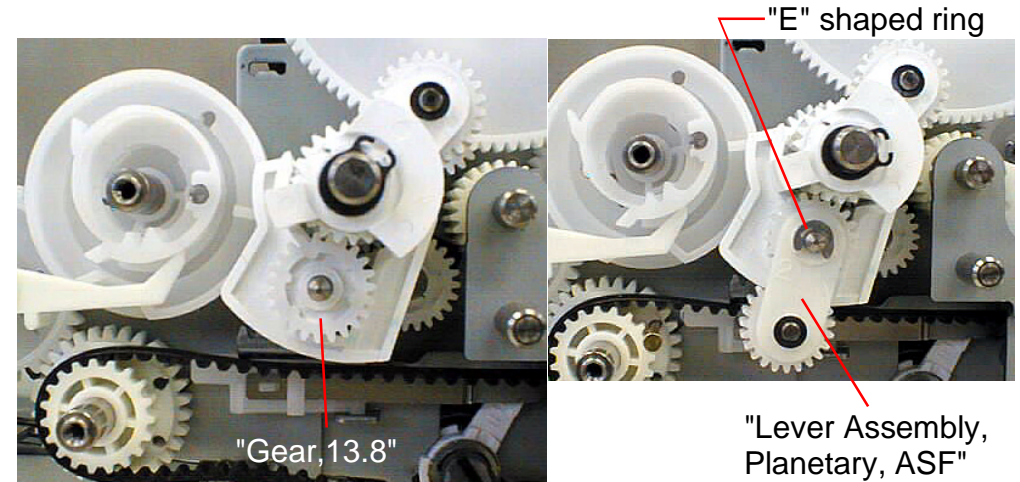
Figure 4-107. Installing "Lever Assembly, Planetary, ASF"
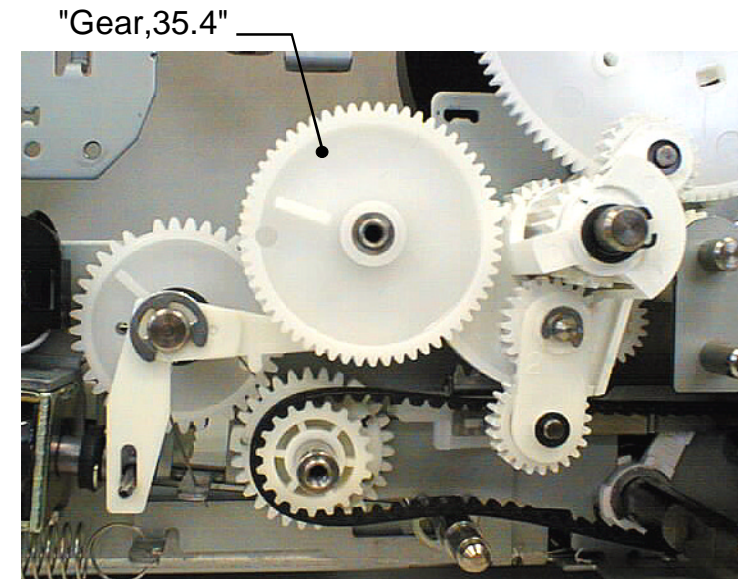
Figure 4-108. Installing "Gear,35.4"

29. Insert "Gear, 31.8" into the same axis, which "Combination Gear,18.144,24" is installed, and insert "Gear,17.4" into an axis located at right next side. (Refer to Figure4-109)
30. Insert an axis on the "Lever Assembly, Planetary, ASF" and an axis on the "Gear,17.4" into 2 holes on the "ASF Gear Train Cover Assembly", and tighten 2 CBS screws(3x6) on the axes of "Gear,35.4" and "Gear,31.8". (Refer to Figure4-110)

✓**CHECK POINT**

> *When installing "ASF Gear Train Cover Assembly", install it after checking that the angle of "Lever Assembly, Planetary, ASF" is tilted toward left, as it is shown in Figure4-110.*
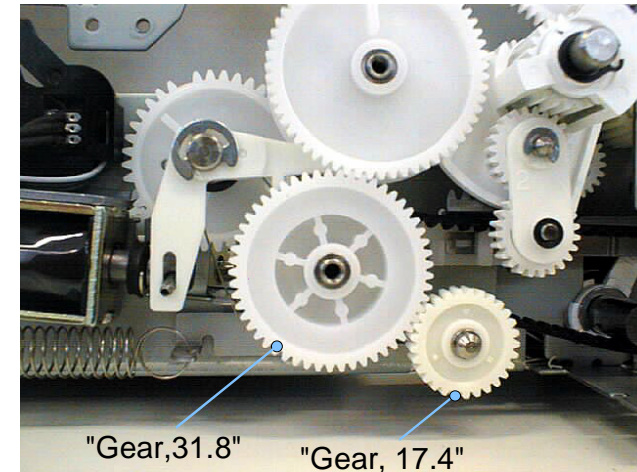
"Gear,31.8"   "Gear, 17.4"

Figure 4-109. Installing "Gear,31.8" and "Gear,17.4"

"Lever Assembly, Planetary, ASF"
"Gear, 35.4"   Positioning holes

CBS(3x6)
"Gear,31.8"   "ASF Gear Train Cover Assembly"
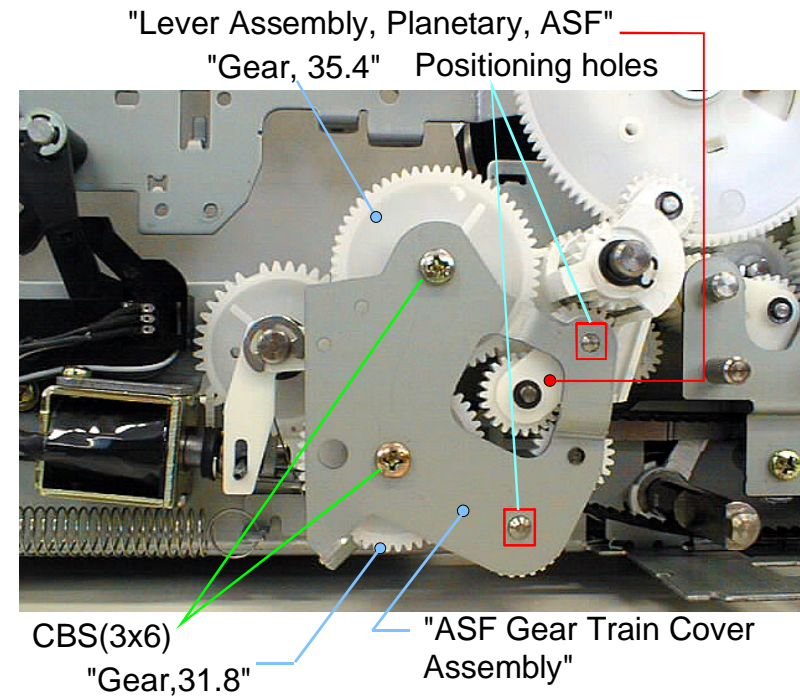
Figure 4-110. Installing "ASF Gear Train Cover Assembly"

31. Check the operation of "Frame Assembly, Middle, Right" by following procedures. (Refer to Figure4-111)

Step.A   Rotate "Gear,35.4" manually to left direction, and check that "Gear,64" for driving sub-roller rotates left direction and the the motive power is transmitted to the edge gears.

Step.B   When rotating "Gear,35.4" to right direction manually, make sure that the clutch works and slips by itself.

Step.C   When rotating "Gear,32" to right direction manually, the motive power is transmitted to "Cam, Hopper Lock" and also the paper return lever comes out and in correctly.

→ Slipping

⇨ "Gear,64" rotates reversive, and motive power is transmitted to "Lever Assembly, Planetary, Sub Cam"

⇨ "Cam, Hopper Lock" rotates correctly, and paper return lever works.

Figure 4-111. Checking operation of "Frame Assembly, Middle, Right"

32.Rotate "Gear,35.4" and "Cam, ASF" manually, then, insert 2 positioning
    pins for alignment into positions shown in left picture of Figure4-112.

✓**CHECK POINT**

> *When inserting a positioning pin into "Gear,35.4",
> push "Lever, Stopper, ASF" once toward green
> arrow direction shown in Figure4-112, and rotate
> only the "Gear, 35.4" to the right direction only
> one round, then, insert a pin after checking the
> hole of "ASF Gear Train Cover Assembly" and the
> hole of "Gear,35.4" are matched. If these holes do
> not match by only one rotation, rotate "Gear,35.4"
> one more round, then, those holes will be
> matched. **Also, release the pushed "Lever,
> Stopper, ASF" as soon as you rotate "Gear 35.4"
> to right direction.***

"Lever, Stopper, ASF"
Fixing "Gear,35.4" and "Cam, ASF"
"Cam,ASF"
"Gear,35.4"
Fixing "Gear,32"
"ASF Gear Train Cover Assembly"
Fixing "Cam, Hopper Lock"

*Note) Red arrow positions shows holes to
insert pins.*

Figure 4-112. Before installing "ASF Unit"

33.By performing procedure above, the hole on the "Cam, Hopper Lock" can
    match with the hole of the mechanism frame again. Then, insert a
    positioning pin into this hole.
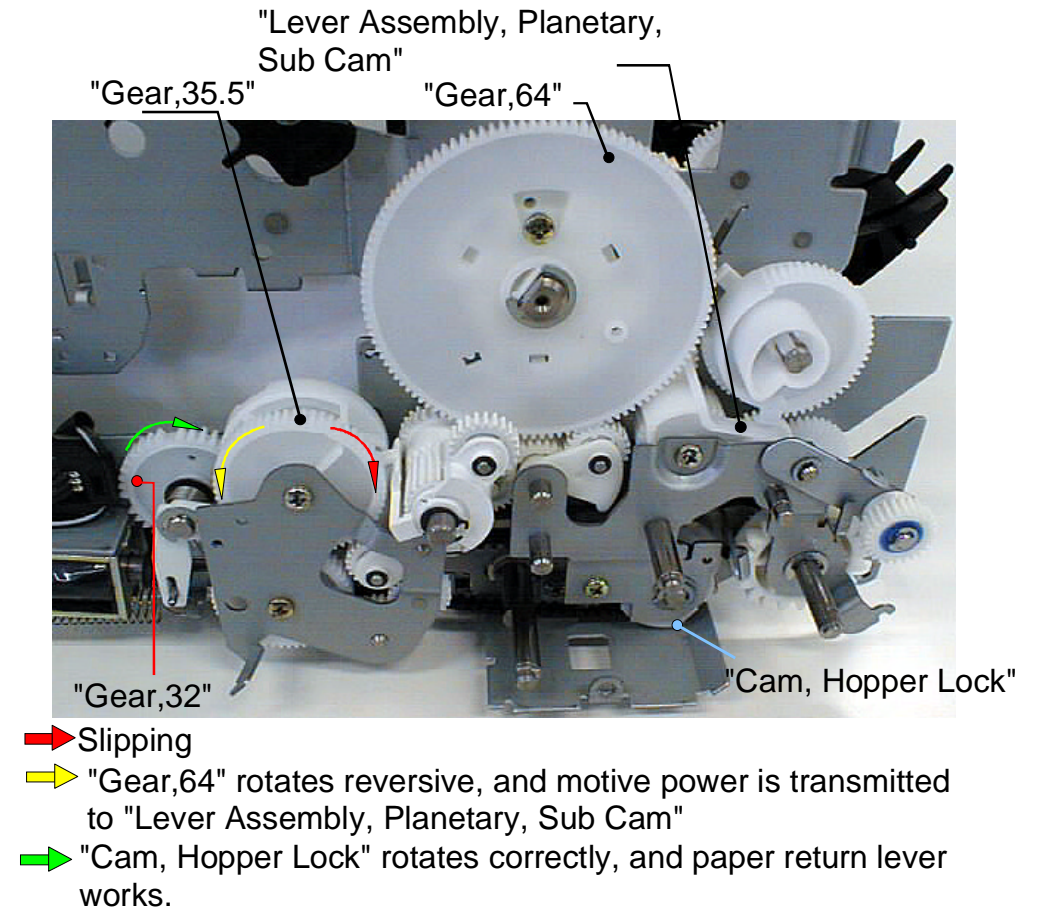34.Check the alignment of "ASF Unit" by following procedure.
    (Refer to Figure4-113)
    Step.A   When rotating "Gear,24" and "Combination Gear,24,24"
                manually, make sure that each positioning holes (for
                alignment) appear at the same time.
    Step.B   After Step.A above, in the condition that the positioning pin is
                inserted into the hole, check if the axis of "Gear,10" shows
                almost "reversed "D" " shape, as it is shown in Figure4-113
                on next page.

⚠**CAUTION**

> *At Step B above, since circumferences of
> "Gear,10" and "Combination Gear,24,24" are
> different, if "Combination Gear,24,24" is rotated to
> left even once from the reversed "D" condition,
> you have to rotate "Combination Gear,24, 24" 9 or
> 10 rotations until the axis shape of "Gear, 19"
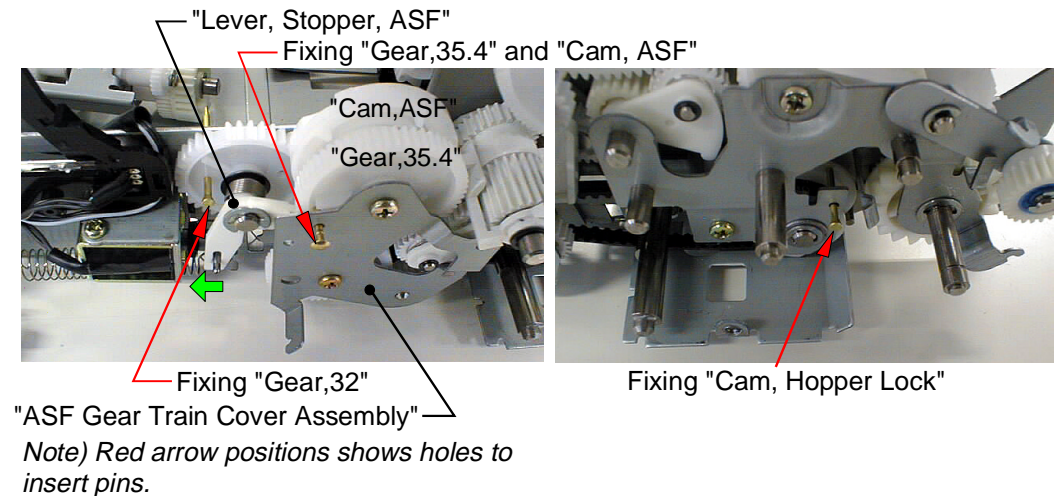> becomes reversed "D" shape again.*

StepC.   If you find any failures on any checking procedures written above, remove each "E" shaped ring, which is securing gear, and arrange alignment until they become just like as it is shown in Figure4-113, then fix them by "E" shaped ring. (Refer to next section for more details)

✓**CHECK POINT**

> *When installing "ASF Unit", if your condition is quite different from the condition shown in Figure4-113, or if you rotate "Combination Gear,24,24" to left direction and gear(s) get locked and stops rotation, refer to following procedure. Also, if it is necessary to disassemble or assemble "ASF Unit" because of damaged parts in the "ASF Unit" or separated parts by dropping, refer to section 4.4 "Disassembly and Assembly for ASF Unit".*

Figure 4-113. Adjusting Alignment for ASF Unit

Step.A   Remove "E" shaped rings on the "Gear,24", "Combination Gear,24,24" and "Gear,11", then, remove "Gear,24", "Combination gear,24,24", "Gear,11" and "Gear,10" from "ASF Unit".

Step.B   Insert a positioning pin for alignment into "Curl Unit" and fix it. (It is recommended to fix the second "Curl Unit" from left) (Refer to Figure4-114)

✓**CHECK POINT**

> *If you want to match the hole on the metal frame of "Curl Unit" and hole on the plastic part, those holes can be easily matched by rotating a small axis for "Gear,10". (Refer to Figure4-113)*

Figure 4-114. Setting "Curl Unit"

Step.C   Insert "Gear,24", and fix it with "E" shaped ring. (Refer to Figure4-113)

Step.D   Rotate "Gear,24"and insert the pin into the positioning hole(for alignment).

Step.E   Set "Gear,11". (Refer to Figure4-113)

Step.F   Set "Gear,10", and fix it with "E" shaped ring. (Refer to Figure4-113)

Step.G   Insert a positioning pin into "Combination Gear,24,24" and
              push it gradually toward the hole on the frame. On the way,
              set "Combination Gear,24,24", engaging the teeth of
              "Gear,11" and "Gear,10", and fix then by "E" shaped ring.
              (Refer to Figure4-115)

✓**CHECK POINT**

*After arranging alignment of "ASF Unit", the
protrusion part of "Roller, Paper Feed" should be
up. If the alignment is arranged in the condition
that protrusion of "Roller, Paper Feed" faces
down, remove "Gear,24" and "Combination
Gear,24,24" once, and arrange alignment again in
the condition that protrusion faces up.*

35.Rotate "Roller, Paper Feed" on the "ASF Unit" as it is shown in Figure4-
   116. (We call this condition of "Roller, Paper Feed" as it is shown in
   Figure4-116 *Hopper State.*)

✓**CHECK POINT**

*The reason why to keep "ASF Unit" in the
condition shown in Figure4-116 is to install it into
the main unit easily.*

"Gear,10" already fixed at StepB.

"Gear,11"   "Gear,24" already fixed at StepD.

"Combination Gear,24,24"
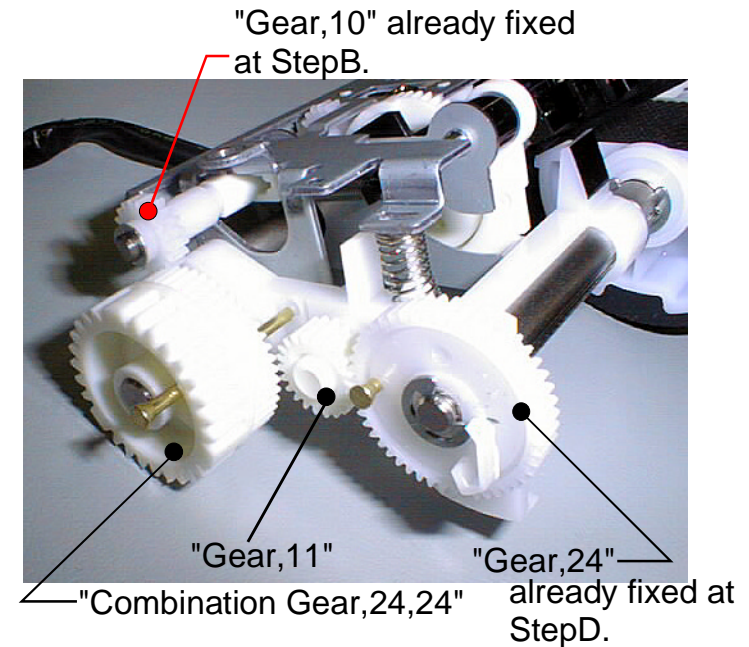
Figure 4-115. Fixing "Combination Gear,24,24"

Rotate flat side to the printer body side.
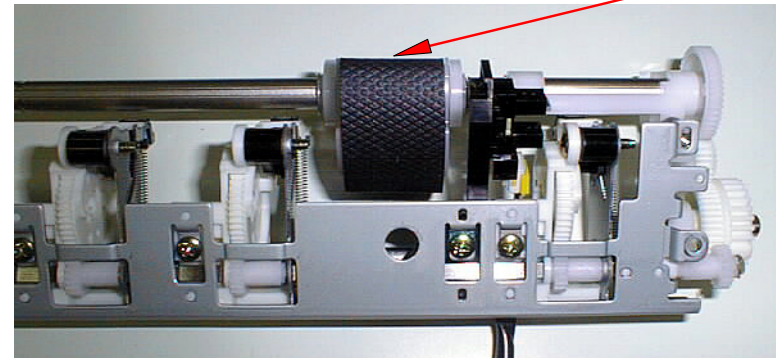
Figure 4-116. Preparation Before Installing "ASF Unit"

36. At first, stick the gear part of "ASF Unit" out through the square hole, and lift up the other side of frame up to the fixing position, and leave it on the fixing position.

> ✓**CHECK POINT**   *At this time, match "U" shaped ditch of "Mounting board, Stopper, Paper, Left" and "Axis, Paper Feed" on the "ASF Unit". (Refer to Figure4-117)*

37. Refer to the following procedure in order to make the flat side of "Roller, Paper Feed" face down.
38. Lift up the gear side of "ASF Unit" lightly, and make the flat side of "Roller, Paper Feed" face down by rotating "Combination Gear,24,24" or "Roller, Paper Feed". (Refer to Figure4-118)

"Mounting Board, Stopper, Paper, Left"

"Axis, Paper Feed"

"U" shaped ditch
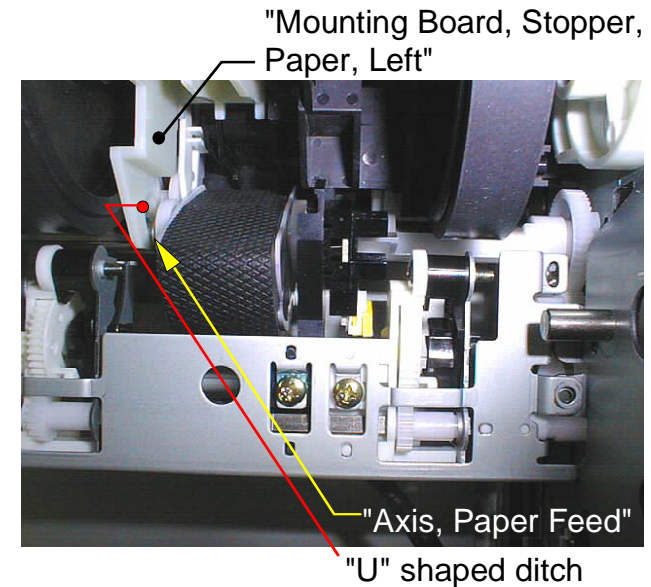
Figure 4-117. Installing ASF
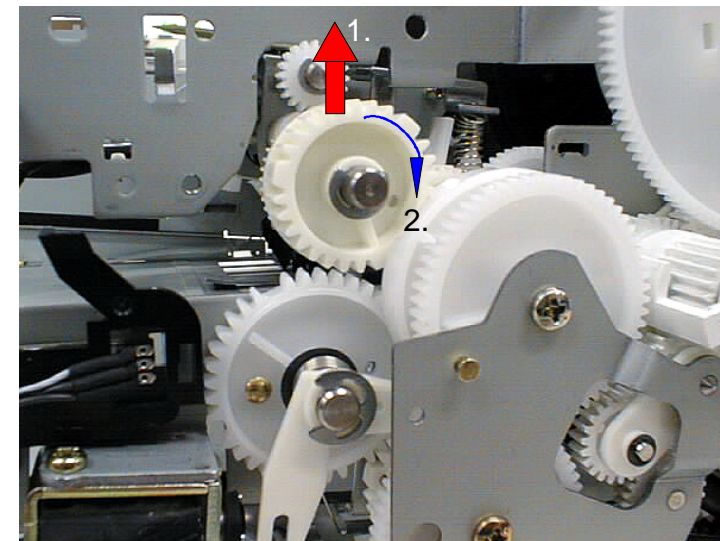
1. Lif it up lightly.
2. Rotate "Combination Gear,24,24".

Figure 4-118. Condition Changes of "Roller, Paper Feed"

39. At the point that the flat side of "Roller, Paper Feed" faces down, since the positioning hole of "Combination Gear,24,24" and the hole on the "ASF Unit" should be matched, insert the positioning pin into this hole and leave it on the "Cam, ASF". (Refer to Figure4-119)

✓**CHECK POINT**

- ■ *At this point, make sure that "A" teeth part of "Combination Gear,24,24" and "B" teeth part of "Gear,32" can engage each other. Also, although same king of alignment(engagement) exists between "Gear,32" and "Cam, ASF", it is very difficult to check. Therefore, if you can make sure that "A" teeth part of "Combination Gear,24,24" and "B" teeth part of "Gear,32" can engage, you can judge that another alignment between "Gear,32" and "Cam, ASF" is all right.*
- ■ *There is a protrusion(looks like a fish hook) on the surface of "Gear,24". In the condition that "ASF Unit" is installed to the main unit, the dimple at the back side of the mechanism frame should be in the certain position as it is shown in Figure4-120. If the dimple is located in the wrong position, arrange the installing position of "ASF Unit" so that the dimple is located in the correct position.*

"Cam, ASF"

"A" teeth part

"B" teeth part

Positioning Pin(for phase)
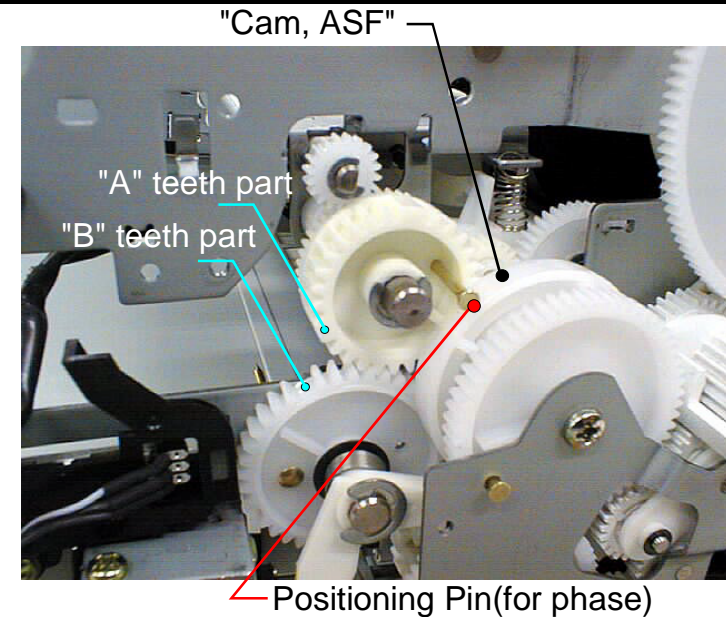
Figure 4-119. Arranging Alignment between "ASF Unit" and Gear Train

Protrusion looks like a fish hook

"Gear,24"

Dimple position inside of the mechanism frame at right side.

Correct dimple position which is installed to "ASF Unit".
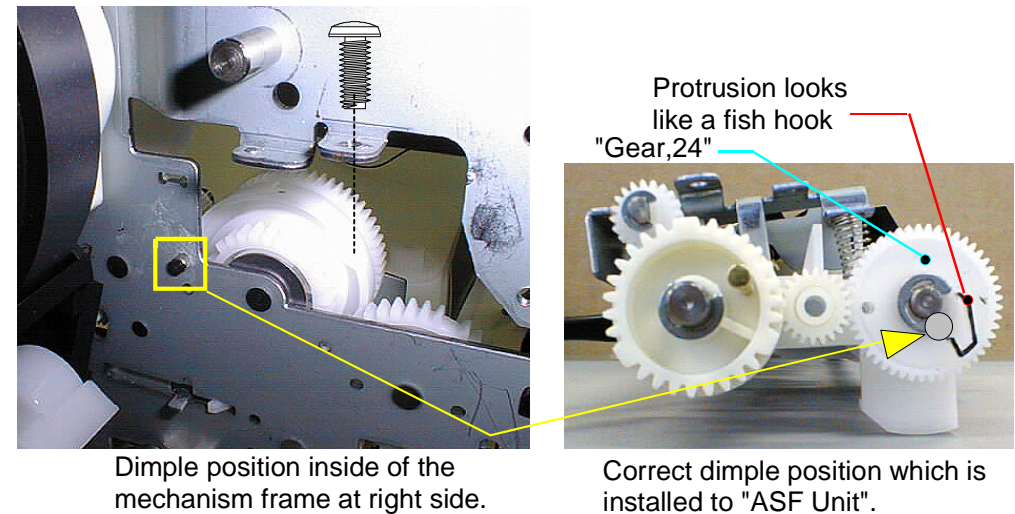
Figure 4-120. Dimple position to touch "Gear,24" at installing "ASF Unit"

40.Fix "ASF Unit" with 2 CBS screws(3x6), and do not forget to remove total 4 positioning pins, which are being inserted into the mechanism at this point. (Refer to Figure4-121)

⚠**WARNING**

In case of gear train on the "Frame Assembly, Middle, Right", if you try to check its operation forcibly by hand at completing procedures above and previous pages, arranged alignment will be dislocated, since "ASF Unit" is not fixed steady to the mechanism. Therefore, check it operation by the following procedure. (Go to next page for procedure)

Positioning Pins for phase
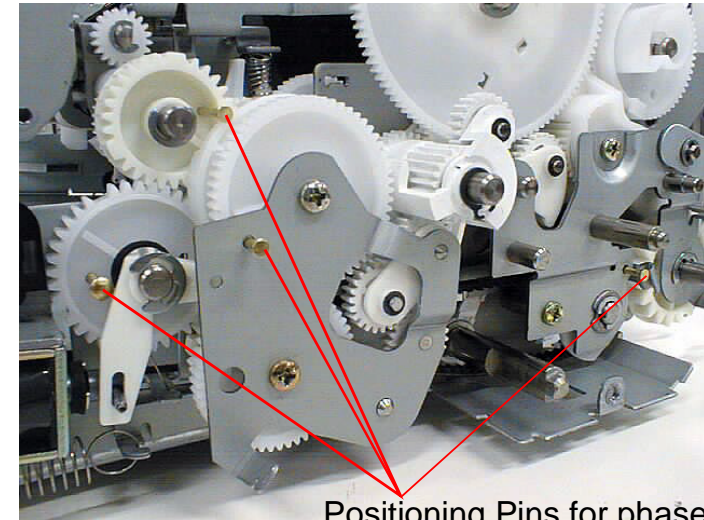
Figure 4-121. Removing positioning pins

41. Check the operation of "Frame, Assembly, Middle, Right" by the following procedure.

⚠WARNING

> *In case of gear train on the "Frame Assembly, Middle, Right", if you try to check its operation forcibly by hand at completing procedures on the previous pages, arranged alignment will be dislocated, since "ASF Unit" is not fixed steady to the mechanism. Therefore, check its operation by the following procedure.*

Step.A   Rotate "Gear,35.4" about 5°(5 degree) right direction, pressing "Lever, Stopper, ASF" toward green arrow direction. (Gear will be heavy and it won't be able to rotate just by "Gear,35.4") (Refer to Figure4-123)

Step.B   Take your hand off from "Lever, Stopper, ASF", and rotate "Gear,35.4" as soon as rotate "Roller, Paper Feed" on the "ASF Unit" toward yellow direction slowly. (Refer to Figure4-123)

Step.C.   At the point that "Roller, Paper Feed" changes from "Stand-by Position" to "Hopper Position", take your hand off from "Roller, Paper Feed" (the hand which was rotating "Roller, Paper Feed"), and make sure that "Gear,35.4" slips when only "Gear,35.4" is rotated right direction. (Refer to Figure4-122)

Step.D   Rotate only "Gear,35.4" to right direction one round, pressing "Lever, Stopper, ASF" toward green arrow direction again. (It is all right to take your hand off from "Lever, Stopper, ASF", if "Gear, 35.4" starts rotating with duty.) (Refer to Figure4-123)

Step.E   Make sure that paper return lever pops out toward front as soon as "Roller, Paper Feed" returns to "Sand-by position".
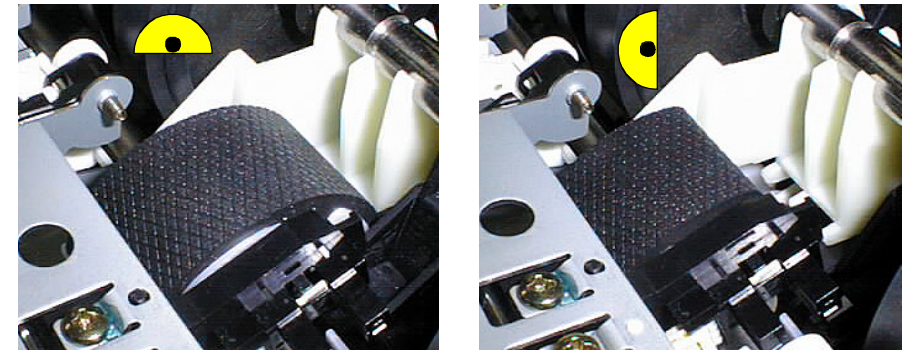
Stand-by Position   Hopper Position

Figure 4-122. Stand-by position and Hopper position of "Roller, Paper Feed"
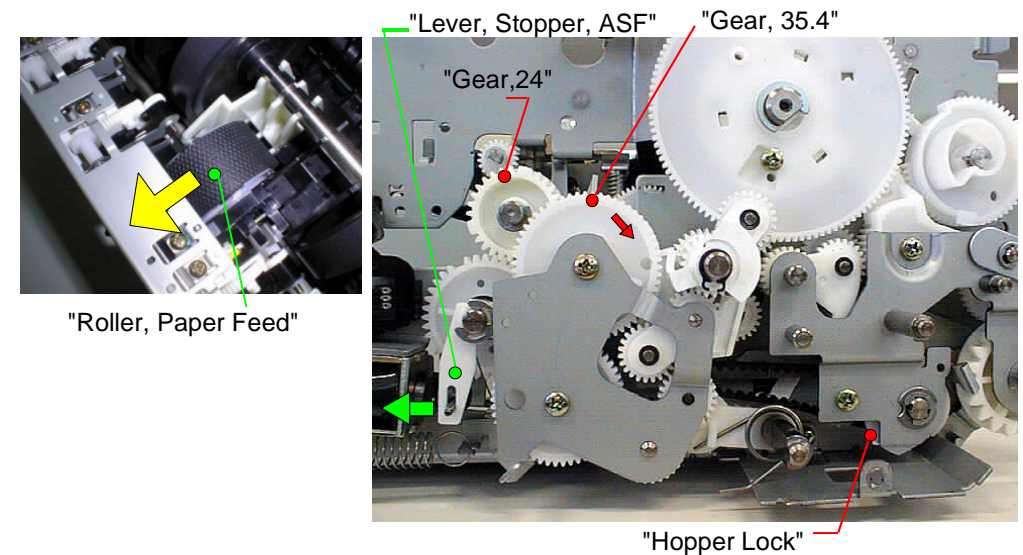
Figure 4-123. Checking Operation of "Frame Assembly, Middle, Right"

42. Install "Lever Belt Tension" and "Torsion Spring,1.27".
    (Refer to section 4.3.1., Figure4-79 and 4-80)
43. Install "Lever, Hopper", then, also install "Tension Spring,0.588".
    (Refer to section 4.3.1, Figure4-77)
44. Install "Lever, Hopper, Lock", then install "Tension Spring,25.5".
    (Refer to section 4.3.1, Figure4-77)

✓CHECK POINT	*Install "Lever, Hopper Lock", pressing "Hopper, Release, Lever". (Refer to section 4.3.1, Figure 4-77 for more details)*

45. Install "Gear,17.4". (Refer to Figure4-124)
46. Install "Clutch, Lifter" and "Gear,27.6" with "Torsion Spring,1.77".
    (Refer to Figure4-124)

✓CHECK POINT	*Before installing "Clutch, Lifter", make sure that tension of "Torsion Spring,1.77" located inside is working. (Refer to section 4.3.1, Figure4-74~76 for more details)*

47. Install "Combination Gear, 12,25.8".(Refer to Figure4-124)
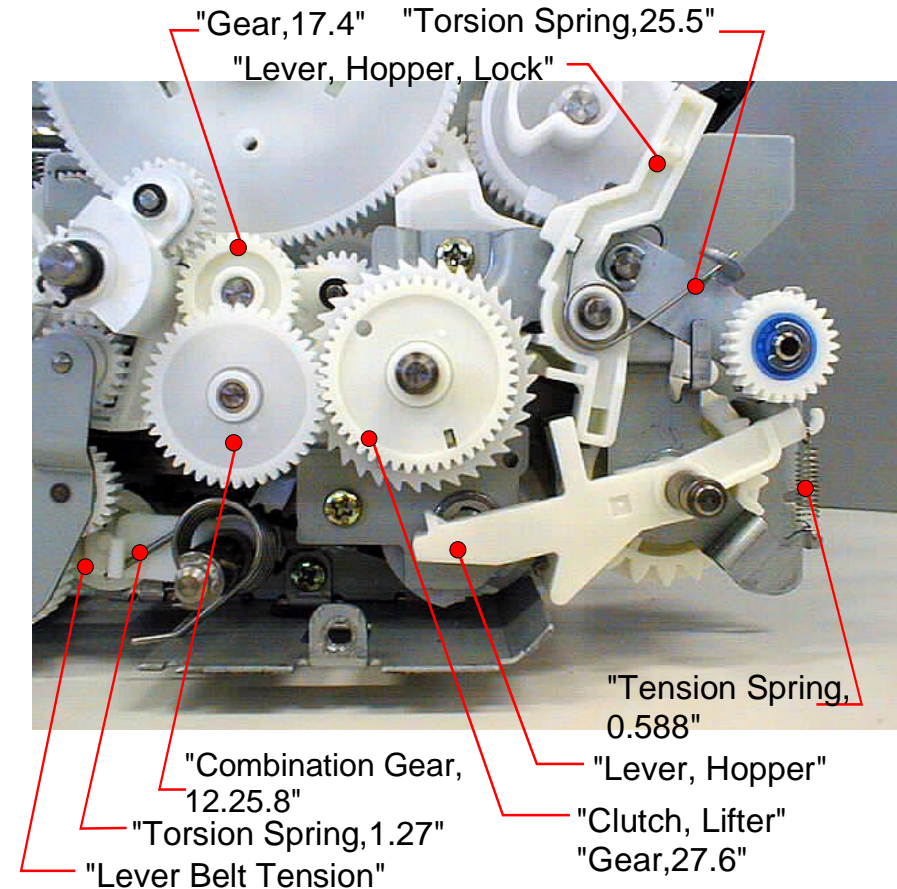
Figure 4-124. Installing the rest parts of "Frame Assembly, Middle, Right"(1)

48. Install "Gear,27". (Refer to Figure4-125)
49. Install "Combination Gear,18,32.4", and fix it with "E" shaped ring.
    (Refer to Figure4-125)
50. Install "Gear,67.8". (Refer to Figure4-126)
51. Install "Gear,67.6". (Refer to Figure4-126)
52. Install "Tension Spring,8.49" into between "Gear,67.6" and "ASF Gear
    Train Cover Assembly". (Refer to Figure4-126)
53. Install "Reinforcing board, Gear,67.6". (Refer to Figure4-126)
54. Install "Axis, Arm Lifter" so that its convex side faces front.
    (Refer to Figure4-126)
55. Install "Rotary Damper Set" and fix it by one CBS screw(3x6).
    (Refer to section 4.3.1, Figure4-71)
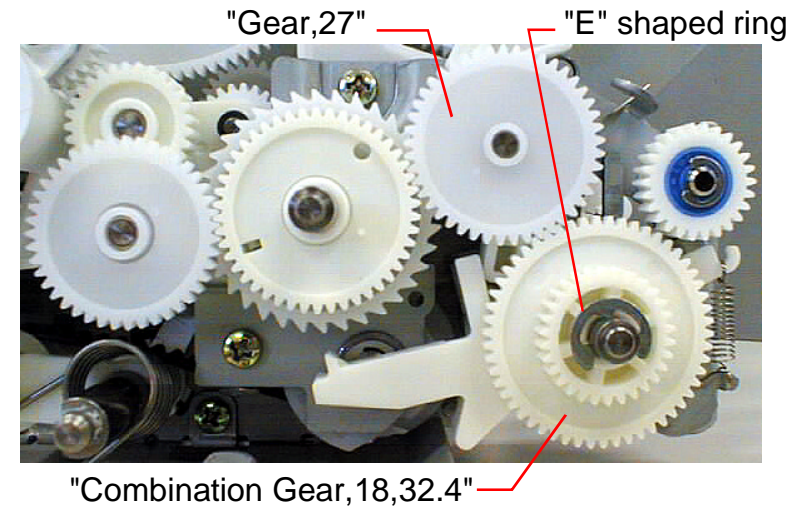
Figure 4-125. Installing the rest parts of "Frame Assembly, Middle, Right"(2)
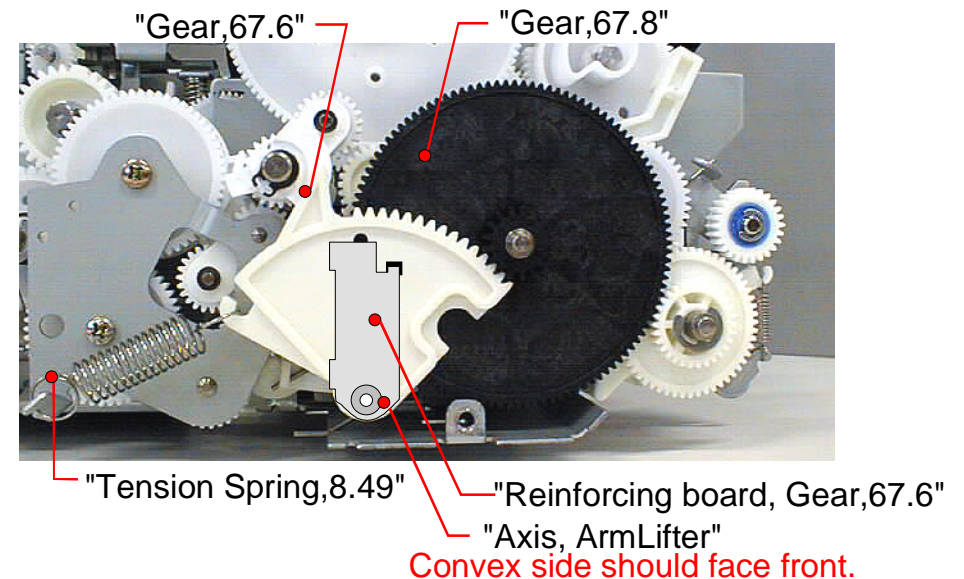
Figure 4-126. Installing the rest parts of "Frame Assembly, Middle, Right"(3)

4.4 DISASSEMBLY AND ASSEMBLY FOR ASF UNIT

Here explains assembly and disassembly of ASF. Conditions which require disassembly of ASF unit are as follows.

> ⚠️ **WARNING**
>
> *In case of disassembling "ASF Unit", it is necessary to match gear alignment. Refer to Section 4.4.2 "Assembling ASF Unit" and assemble the unit correctly. If you fail to do this, the operation of ASF unit is locked and may cause fatal error, or may be unable to feed paper correctly without appropriate curl unit operation.*

Table 4-5. Required Conditions for disassembly of ASF Unit

No.	Disassembly conditions and Phenomenon at the printer
1	Upper surface sensor is defective, and the printer goes to fatal error with severe locking noise everytime the printer tries to feed a paper. Or paper loading failure, or multi-paper feeding occur.
2	The value of sensor positioning for upper surface sensor, which is adjusted at the factory went wrong, and the printer goes to fatal error with locking noise everytime the printer tries to feed a paper. Or paper feeding failure or multi-paper feeding occur very often.
3	Gear teeth skipping is happening between "Gear,10", "Combination gear,24,24" and "Gear,24" which are located on the "ASF Unit", and "Roller, Paper Feeding" does not rotate correctly, even "Combination Gear,24,24" is rotated toward left manually.
4	When the paper jam occurs, the user pulls out the paper forcibly, and as a result, the positioning parts of "Curl Unit" on the "ASF Unit" are damaged or come off.
5	The surface rubber of "Roller, Paper Feeding" is worn out because of long time use, and it causes paper loading failure very often.

4.4.1 Disassembly of ASF Unit

1. Remove "ASF Unit". (Refer to Section 4.2.5.15)
2. Remove 3 "E" shaped rings on the "ASF Unit", and remove "Gear,10",
   "Combination Gear,24,24", "Gear,11" and "Gear,24".
   (See figure4-127)
3. Pull out "Lever, Roller, Paper Feed, Right" from "ASF Unit".
   (See figure 4-128)

⚠**WARNING** *When puling out the "Lever, Roller, Paper Feed, Right", "Compression Spring, 2.16" jumps out. So, pull out the "Lever, Roller, Paper Feed, Right", pressing "Compression Spring, 2.16"by your hand.*
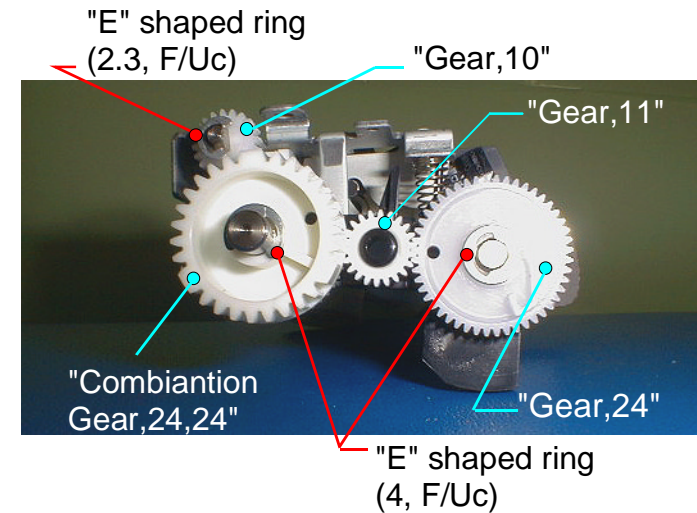
Figure 4-127. Removing 4 Gears on the ASF Unit
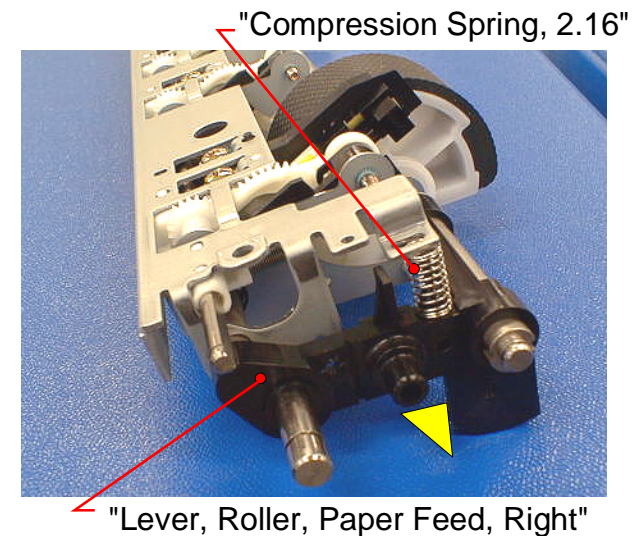
Figure 4-128. "Lever, Roller, Paper Feed, Right" Removal

4. Pull out "Axis, Paper Feed, Roller Set" from "ASF Unit".
    (See figure4-129)
5. Reverse "ASF Unit", and take "Compression Spring, 0.98" out.

⚠️**CAUTION**

> ◼ *When installing "Compression Spring,0.98"*
> *again, apply "Neji Lock"(Screw Lock) on the*
> *"Lever, Roller, Paper Feed, Left".*
> ◼ *Note that each compression spring attached to*
> *"Lever, Roller, Paper Feed, Left" and "Lever,*
> *Roller, Paper Feed, Right" is different. The*
> *number of coil(spring strength) is different.*

6. Remove one "E" shaped ring (4, F/Uc) from "Axis, Paper Feed, Fixing".
    (See figure4-130)
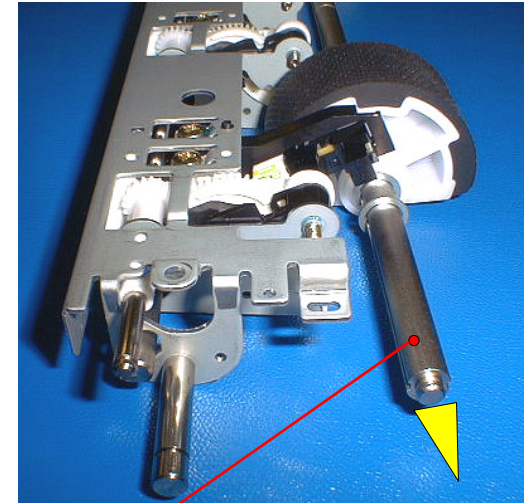
"Axis, Paper Feed, Roller Set"

Figure 4-129. "Axis, Paper Feed, Roller Set" Removal

"E" shaped ring
(4,F/Uc)

"Axis, Paper
Feed, Fixing"

"Compression
Spring,0.98"

"Lever, Roller,
Paper Feed, Left"
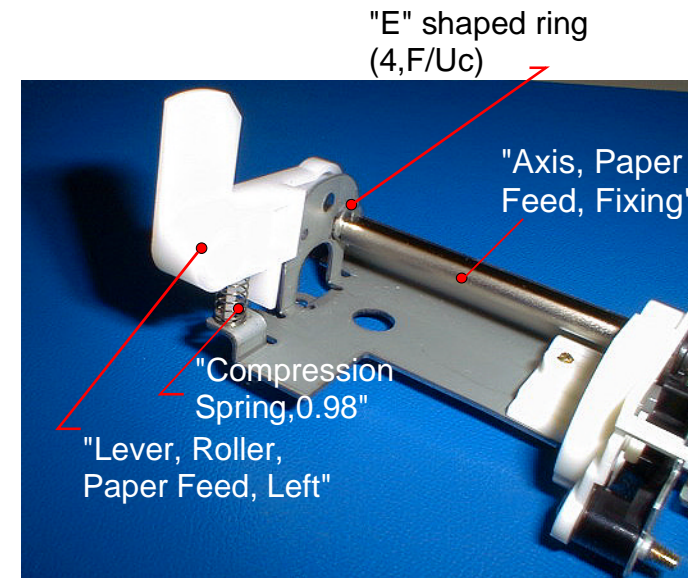
Figure 4-130. "Axis, Paper Feed, Fixing" Removal

"Axis, Paper Feed, Fixing"

7. From "ASF Unit", pull out "Axis, Paper Feed, Fixing" toward the side that upper surface sensor is installed. (See figure4-131)

8. From the opposite side to the other side that "Upper surface sensor" is attached, remove one "E" shaped ring(2, F/Uc) on the "Axis, Transmission, Curl". (See figure4-132)
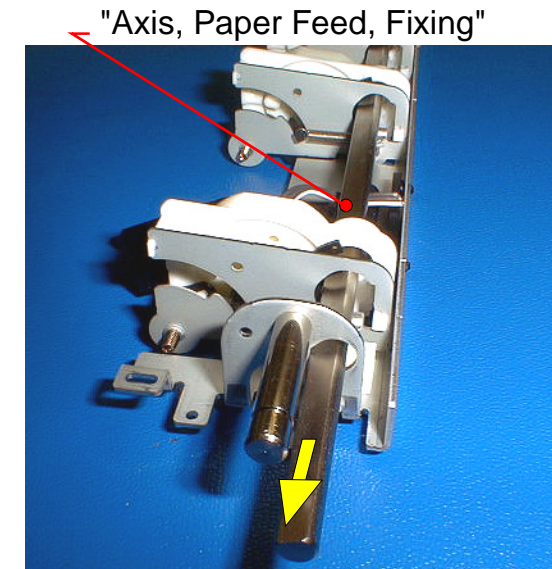
Figure 4-131. "Axis, Paper Feed, Fixing" Removal

"E" shaped ring (2, F/Uc)

"Axis, Transmission, Curl"
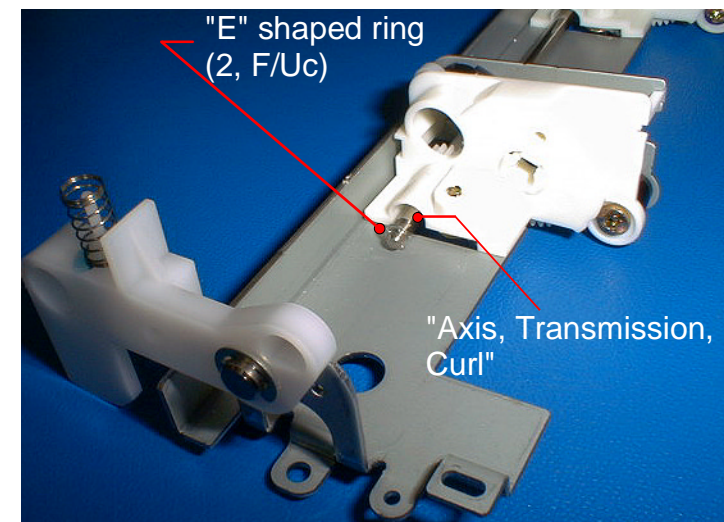
Figure 4-132. Releasing "Axis, Transmission, Curl"

9. Pull out "Axis, Transmission Curl" from side that upper surface sensor is attached. (See figure4-133)

10.Reverse the "ASF Unit" again, and remove one CBP screw(3x8) securing the upper surface, and also remove "Upper surface sensor" with cable. (See figure 4-134)

> ⚠️**CAUTION**
>
> ■ *One spring washer comes off when removing the CBP screw which is securing "Upper Surface Sensor". This washer is to adjust the paper position that the upper surface sensor detects, and its position can be changed slightly by tightening or loosing the screw. Therefore, be careful not to lose this washer when removing "Upper surface sensor".*
> ■ *When installing this spring washer, refer to Figure4-60 and tighten the washer by screw after placing the convex side of the washer up.*

> **ADJUSTMENT** ▶
>
> *In case of removing "Upper surface sensor", or loosing or tightening the screw, it is necessary to perform "Upper Surface Sensor Positioning Adjustment" on Chapter5.*
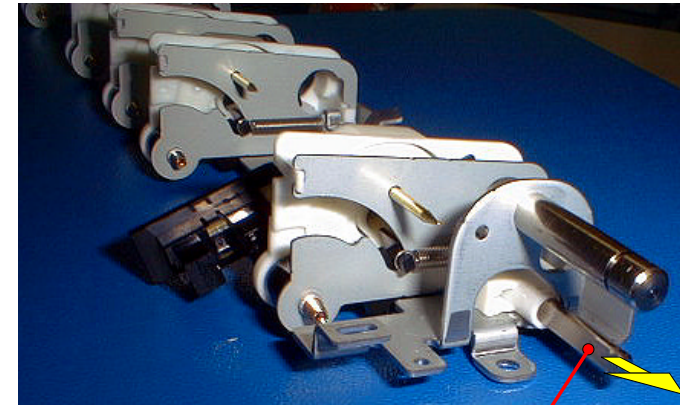
"Axis, Transmission, Curl"

Figure 4-133. "Axis, Transmission, Curl" Removal

Upper Surface Sensor

CBP(3x8)
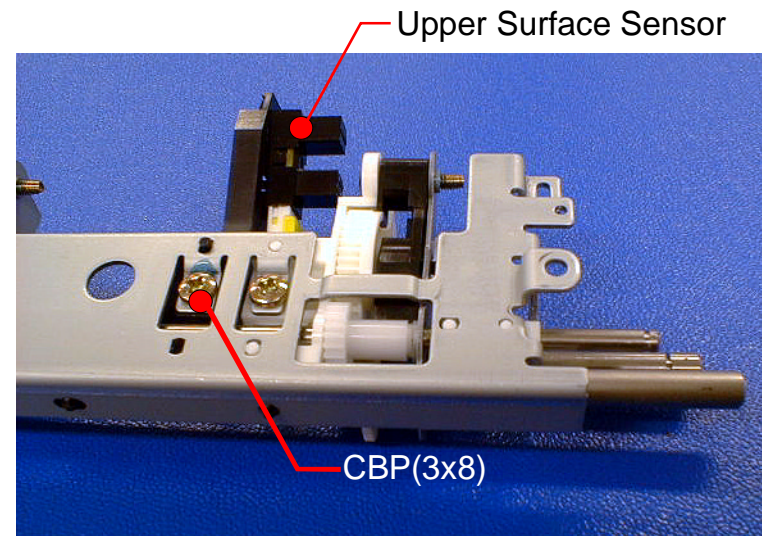
Figure 4-134. "Upper Surface Sensor" Removal

11. Remove each CBP screws(3x6, total 5 screws) securing each "Curl Unit", and remove "Curl Unit". (See figure4-135)

12. Remove each CBS screw(3x15) securing "Curl Unit".
    (See figure4-136)

⚠**CAUTION** *5 curl units which are attached to "ASF Unit" are all same. Therefore, here explains disassembly procedure about only one curl unit.*

13. Reverse the Curl Unit opposite to the side which screw(3x5) is removed at 12 above, and remove "Tension Spring,1.11".
    (See figure4-137)

CBS(3x15)

"Curl Unit"

Figure 4-136. Disassembling "Curl Unit" (1)

CBP(3x6)

Figure 4-135. Curl Unit Removal

Tension Spring,1.11
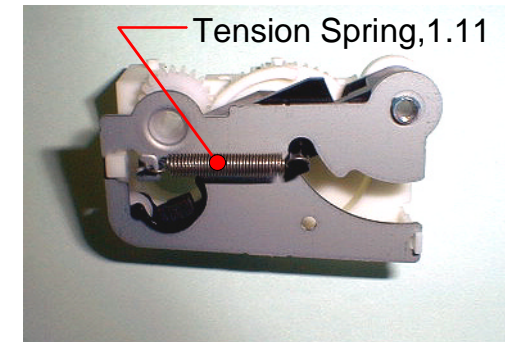
Figure 4-137. Disassembling "Curl Unit"(2)

14. Remove "Cover, Guide, Curl".
15. Take out "Compression Spring,0.399" from "Lever Assembly, Curl". (Do not lose it)
16. Change the angle of "Lever Assembly, Curl" toward yellow direction in the figure until it stops, and remove "Lever Assembly Curl", lifting it up toward yourself. (See figure4-138)
17. Remove "Gear 24" from the reversed side, pressing 2 hooks. (See figure4-139)
18. Remove "Gear,10". (See figure4-139)

"Lever Assembly, Curl"   "Compression Spring, 0.399"
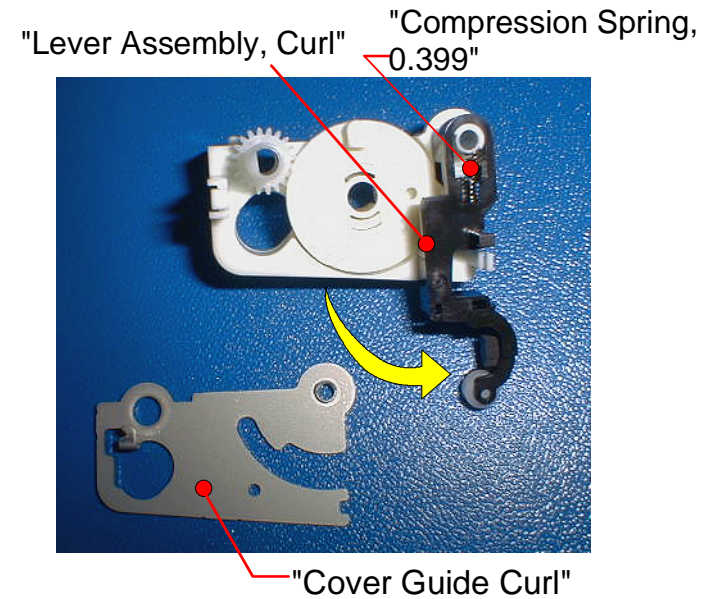
"Cover Guide Curl"

Figure 4-138. Disassembling "Cover, Guide, Curl"(3)

Gear,10   Gear,24   2 Hooks
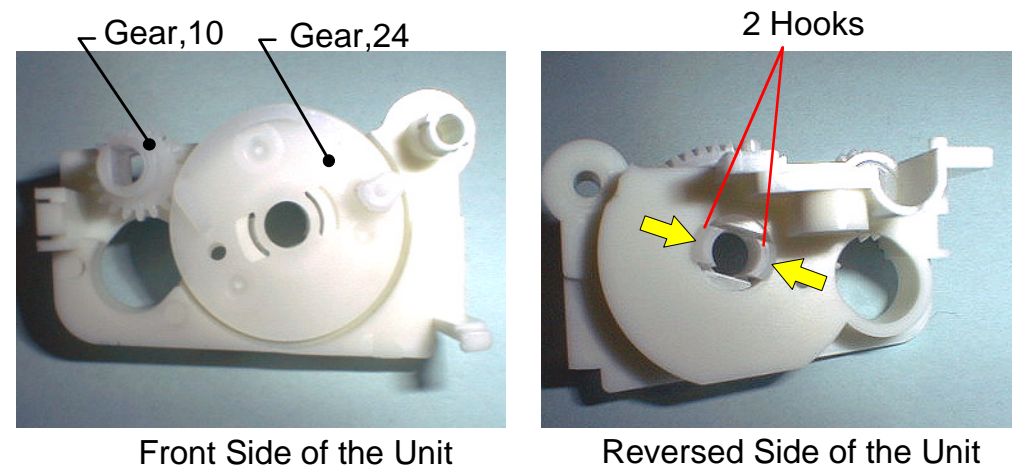
Front Side of the Unit   Reversed Side of the Unit

Figure 4-139. "Gear,24" and "Gear,10" Removal

4.4.2 Assembling ASF Unit

Here explains procedure of assembly for ASF Unit. Since there are several alignments in the ASF unit, it is important to perform following procedures and assemble the unit correctly after disassembly.

⚠**WARNING**

Make sure to perform procedures in this section after disassembling the "ASF Unit". "ASF Unit" will not work correctly, if you assemble it by ignoring following procedures.

1. Install "Gear, 10" to "Holder, Lever, Curl", locating "Gear10" in the reversed "D" shape, as it is shown in figure4-140.
2. Insert a nail(diameter 2.0mm) to the hole on the "Gear,24".
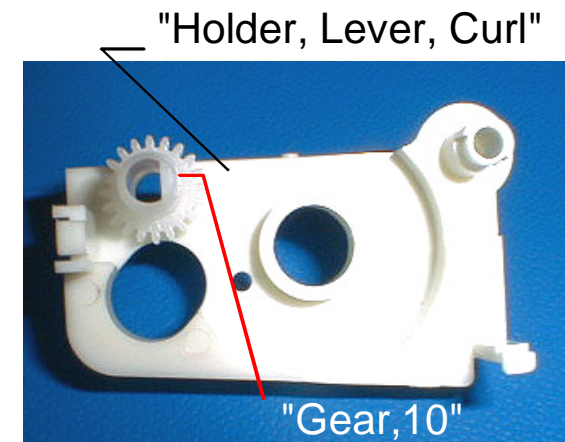
Figure 4-140. Setting "Gear, 10"
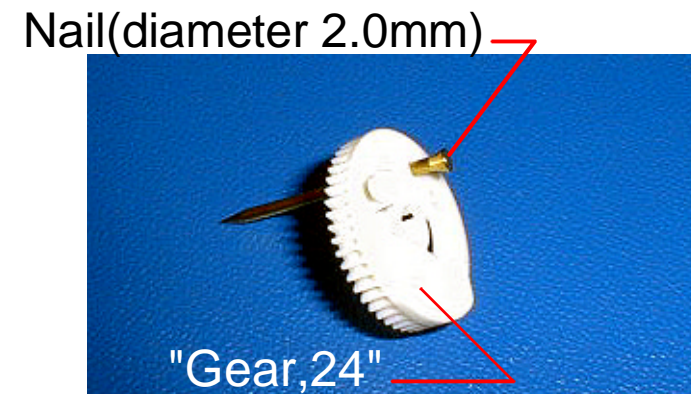
Figure 4-141. Setting a nail for Adjusting Alignment

Install "Gear,24", engaging the teeth of "Gear,24" and "Gear,10"

3. Engage the teeth of "Gear,10" and the teeth of "Gear,24", inserting the needle tip to the hole on the "Holder, Lever, Curl", and install "Gear,24". (See figure4-142)

✓**CHECK POINT** | *After installing "Gear,24", make sure that convex side on the "Gear,10" and concave side on the "Gear,24" match each other. If they don't match each other, perform procedures from 1 to 3 again.*
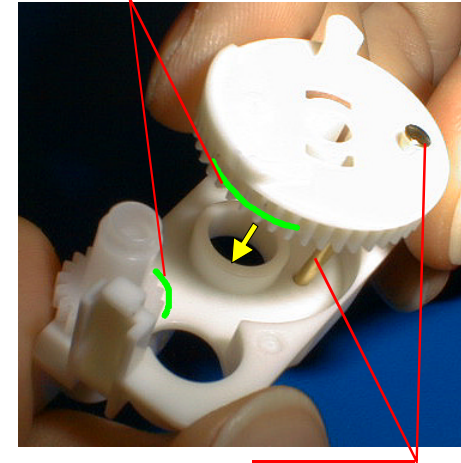
From "Gear,24", pierce the nail into "Holder, Lever, Curl"

Figure 4-142. Installing "Gear,24"

Convex Side
Concave Side
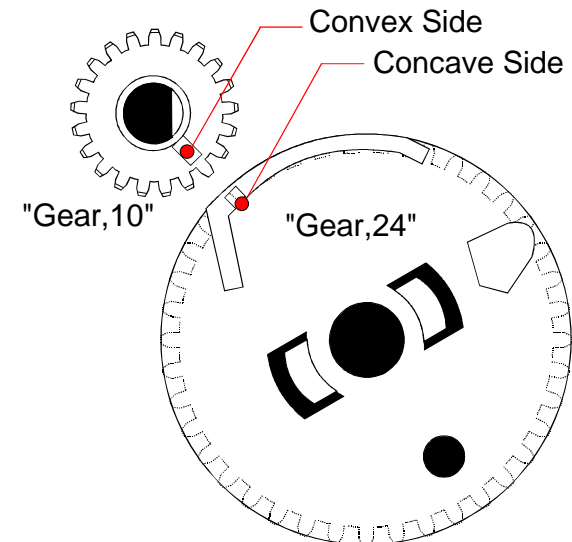
"Gear,10"

"Gear,24"

Figure 4-143. Matching Alignment of "Gear,10" and "Gear,24"

4. Insert "Lever Assembly, Curl" to the axis on the "Holder, Lever, Curl", placing "Lever Assembly, Curl" vertically, as it is shown in figure4-144. After inserting, make sure that some space is left between "Lever Assembly, Curl" and the protrusion on the "Gear,24", as it is shown in figure4-144.

5. Remove the needle once.

6. Move the "Lever Assembly, Curl" toward arrow direction(toward "Gear 10"), as it is indicated in figure4-145, until it stops. At this time, make sure that hinge part of "Lever Assembly, Curl" is pierced through the inside of protrusion on the "Gear, 24". (See figure4-145)
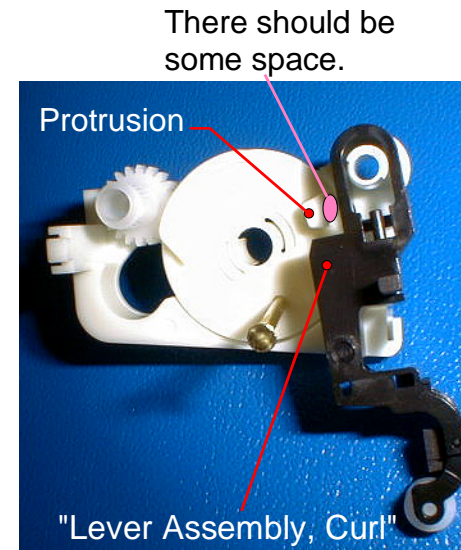
Figure 4-144. Setting "Lever Assembly, Curl(1)"
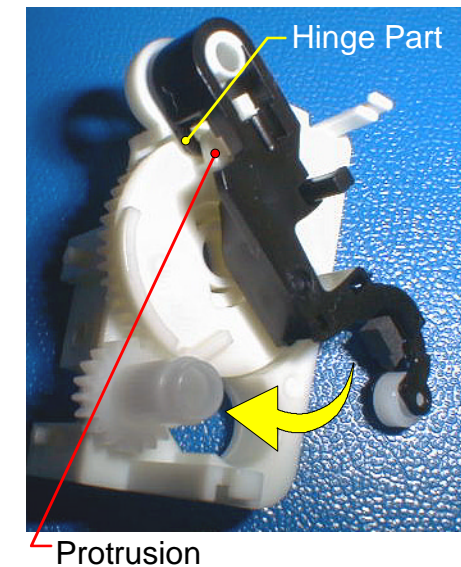
Figure 4-145. Setting "Lever Assembly, Curl(2)"

7. Insert "Compression Spring, 0.399" to "Lever Assembly, Curl".
   (See figure4-146)

⚠**CAUTION**

When installing "Compression Spring, 0.399",
hang the one side of "Compression Spring, 0.399"
to the protrusion "A" first, then insert the other
side to "B" surface part of axis, pushing it.

8. Cover with "Cover, Guide, Curl", and fix it with one CPS screw(3x15) from
   the back(opposite) side.

⚠**CAUTION**

When covering "Cover, Guide Curl", see the
figure4-147 and fix it with a screw after checking
that following 3 points are in the correct positions.
•Point 1:Fook is out side of the frame, and frame
*   and hook are overlapped.*
•Point 2:Hook is out side of the frame, and frame
*   and hook are overlapped.*
•Point 3: "Gear, 10" is firmly attached by the
*   frame.*
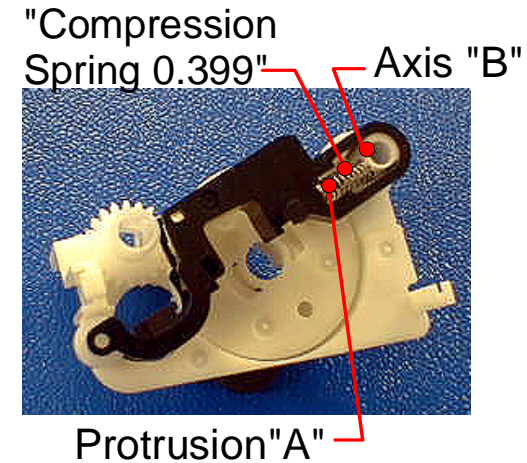
Figure 4-146. Setting "Compression Spring,0.399"
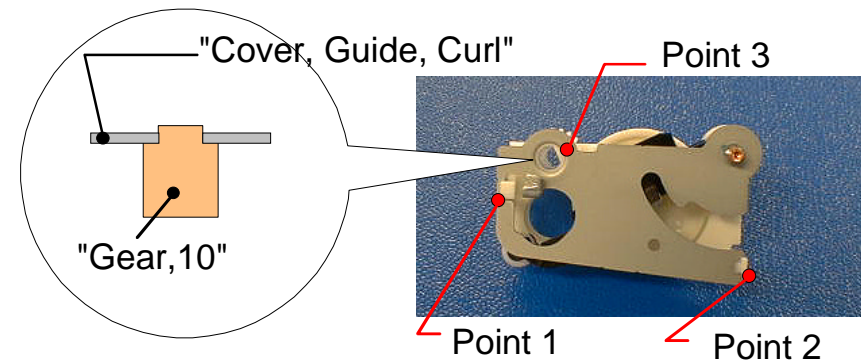
Figure 4-147. Installing "Cover, Guide, Curl"

9. Hang one leg of "Tension Spring,1.11" on hook "A" on the frame and the other leg on the hook "B" on the "Lever Assembly, Curl". (See figure4-148)

✓**CHECK POINT**

> *After completing procedure 9 above, check its operation by performing following operations.*
> *1. Pull "Lever Assembly, Curl" to yellow arrow direction by you hand. (See figure4-149)*
> *2. Make sure that "Lever Assembly, Curl" returns to the original position as soon as releasing your hand from "Lever, Assembly, Curl".*

10. Apply Neji-Lock(Screw Lock) on the tip of the CPS screw(3x15) and around the frame.

⚠**WARNING**

> *If "Lever Assembly, Curl" does not operate correctly after following procedures above, loosen the CPS screw(3x15) little by little, and apply Neji-Lock(Screw Lock) after making sure that "Lever Assembly, Cover" operates correctly. Failing to do so causes paper feeding failure.*

11. Repeat the same procedures from 1 to 10 for the rest of 4 "Curl Unit"s.
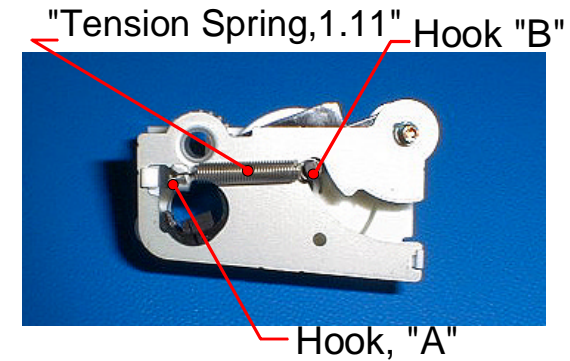
Figure 4-148. Setting "Tension Spring,1.11"
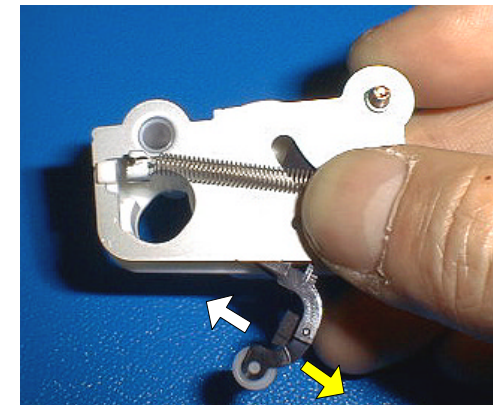
Figure 4-149. Checking Operation of "Curl Unit"

12. Look into the hole located at the plastic side on the "Curl Unit", and rotate "Gear, 10" or "Gear,24" so that the hole at the plastic side can match with the hole at the frame side.
13. Insert a nail(diameter about 2.0mm) from the plastic side of "Curl Unit". (See figure4-150)
14. Repeat the same procedures from 12 to 13 for the rest of 4 "Curl Units".
15. Reverse "Frame Assembly, ASF", and place "Curl Unit" as it is shown in figure4-151. Tighten each "Curl Unit" by one CBP screw(3x8) from the front side of "Frame Assembly, ASF".

The nail should pierce.

Nail(diameter 2.0mm)
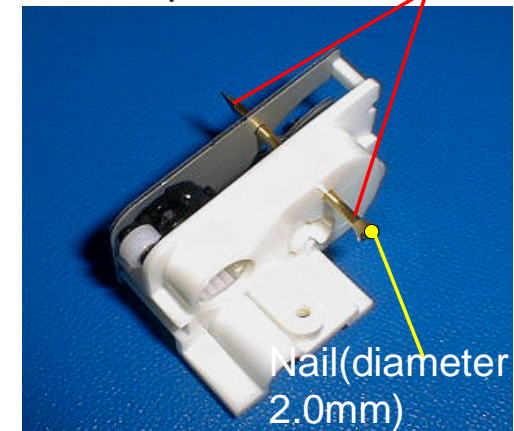
Figure 4-150. Adjusting Alignment of "Curl Unit"

Fixing CBP Screws(3x8)

Left Side of "ASF Unit"
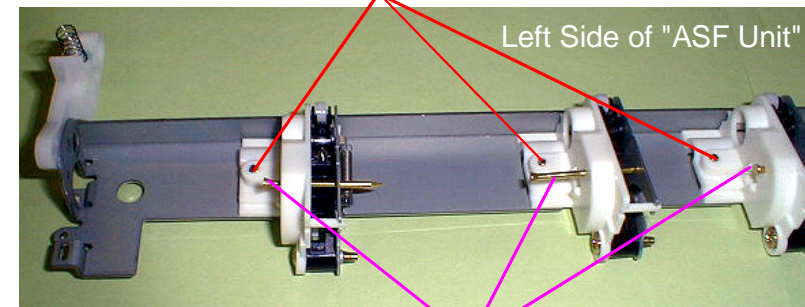
Nails for Adjusting Alignment (diameter of nail;2.0mm)

Figure 4-151. Installing "Curl Unit" at Left Side

⚠**CAUTION**   *In the figure4-152, the hole written "Caution" is for installing "Upper Surface Sensor". Do not install "Curl Unit" to this hole.*

16. Insert "Harness, Upper Surface Sensor" to "Sensor, HP". (See figure4-153)
17. Install "Sensor, HP" to "Mounting Board Assembly, Upper Surface Sensor". (See figure4-154)

Fixing CBP Screws(3x8)

Right side of "ASF Unit"

Caution
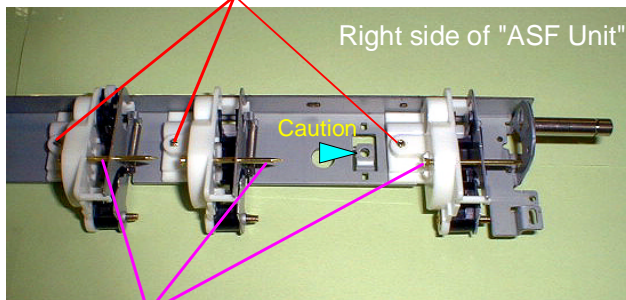
Nails for Adjusting Alignment
(diameter of nail:2.0mm)

Figure 4-152. Installing "Curl Unit" at Right Side

"Sensor, HP"

"Harness, Upper Surface Sensor"
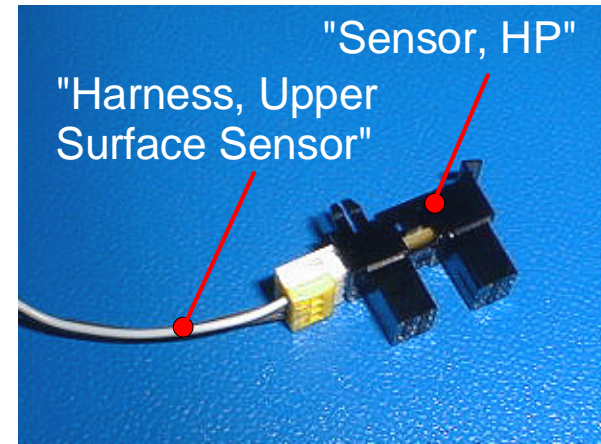
Figure 4-153. Setting "Upper Surface Sensor"(1)

"Mounting Board Assembly, Upper Surface Sensor"
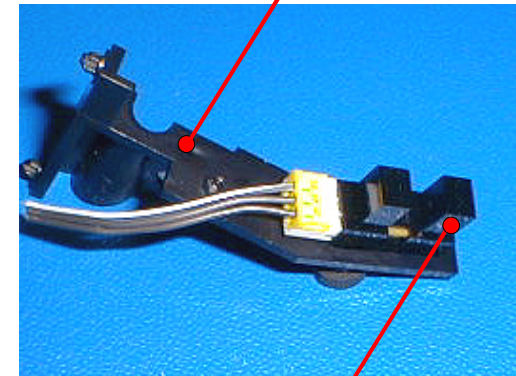
"Sensor, HP"

Figure 4-154. Setting "Upper Surface Sensor"(2)

18. Reverse "ASF Unit" so that its front side comes back, and insert one CBP screw(3x8) to the hole for installing "Upper Surface Sensor". (See figure4-155)
19. Reverse "ASF Unit" again, and insert the hole of the leaf spring to the screw tip, facing convex side of the leaf spring toward "ASF Unit". (See figure4-156)
20. Insert 2 protrusions on the "Mounting Board Assembly, Upper Surface Sensor" to 2 holes on the "ASF Unit", and fix them by the screw, which you already inserted at procedure 18, from the front side of "ASF Unit". (See figure4-157)

Leaf Spring
(Convex side should face down)
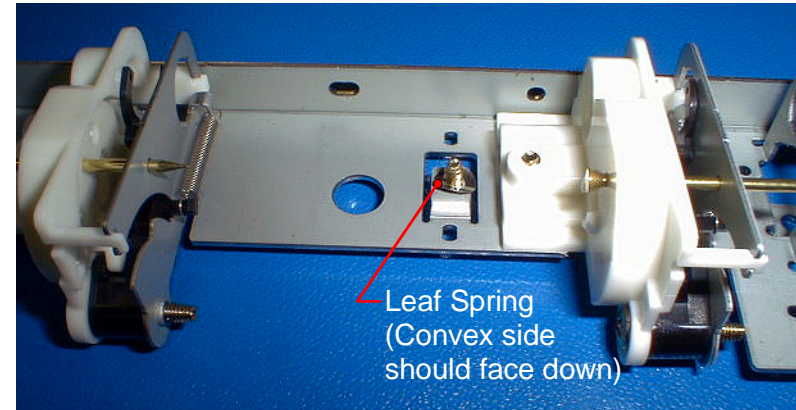
Figure 4-156. Setting "Upper Surface Sensor"(4)

CBP Screw(3x8)
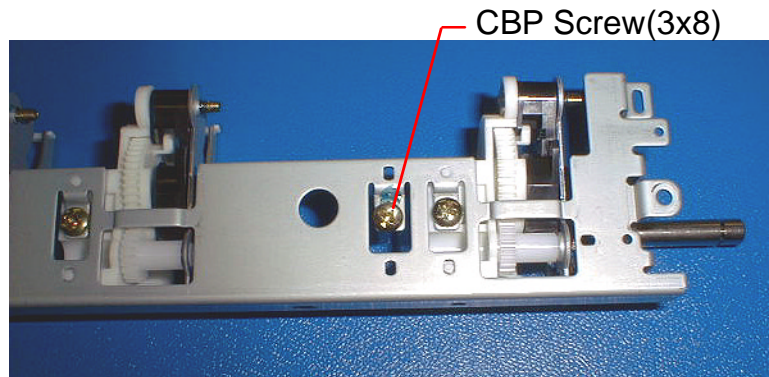
Figure 4-155. Setting "Upper Surface Sensor"(3)

2 Protrusions
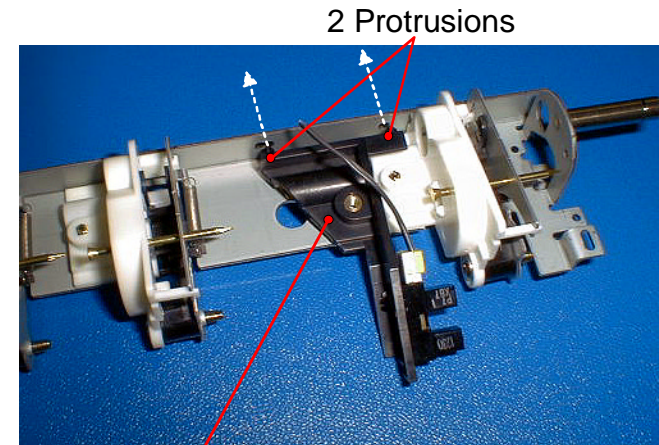
"Mounting Board Assembly, Upper Surface Sensor"

Figure 4-157. Setting "Upper Surface Sensor"(5)

ADJUSTMENT ▶ | *In case of rotating the screw which is to fix "Mounting Board Assembly, Upper Surface Sensor", and exchanging "Sensor, HP", perform "Upper Surface Positioning Adjustment" on Chapter5 and apply Neji-Lock(Screw Lock) to top of the screw, which is to fix "Mounting Board Assembly, Upper Surface Sensor".*

"Bush, Curl, Tramsmission"

21. Reverse the "ASF Unit" so that its back side comes up.
22. Locate "Bush, Curl, Transmission" on the "ASF Unit" so that 2 protrusions on the back side of "Bush, Curl, Transmission" and 2 points on the "ASF Unit" match respectively, and attach them by pushing.

Figure 4-158. Installing "Bush, Curl, Transmission"

⚠**WARNING** | *Do not use the sharp pointed tools such as tweezers or driver , when installing "Bush, Curl, Transmission" to "ASF Unit". Using those tools may cause hole on the "Bush, Curl, Transmission", making "Axis, Transmission, Curl" unable to insert on the later procedure.*

23. Insert "Axis, Curl, Transmission" to the hole of "Bush, Curl, Transmission", and pierce "Axis, Transmission, Curl" into 5 holes on the "Curl Unit"s. At this time, the shape of axis should be "D" shape , looking from "A" marked side in figure 4-159. Otherwise, the axis can not go through.

⚠️**CAUTION**   *"Axis, Transmission, Curl" has a direction to insert. Refer to figure 4-160 for the shape of the axis to insert to the hole of "Bush, Curl, Transmission" first, and the shape of axis that comes out of "Bush, Curl, Transmission" after inserting. Do not insert the wrong side.*

"Bush, Curl, Transmission"
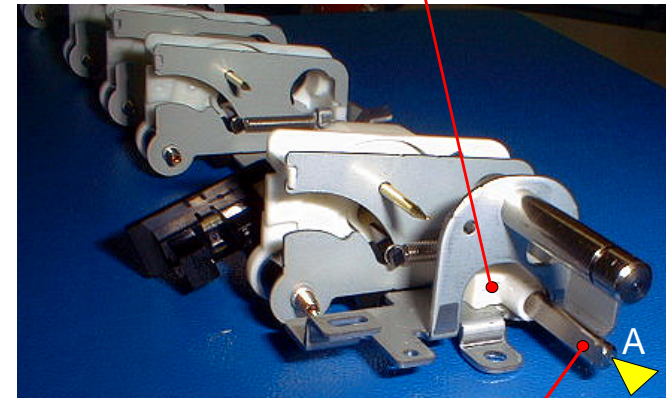
"Axis, Transmission, Curl"

Figure 4-159. Inserting "Axis, Transmission, Curl"

Shape of Axis to insert

Opposite side to the inserted side
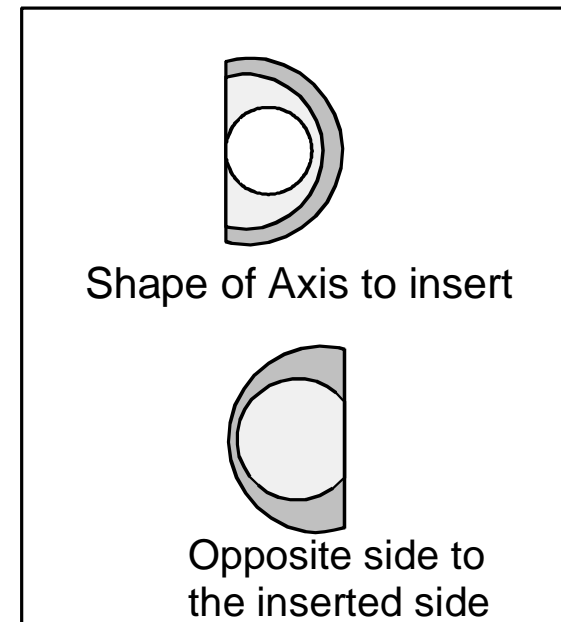
Figure 4-160. Checking Direction of "Axis, Transmission, Curl" to insert

24. Remove all 5 nails which are inserted into each "Curl Unit"s.
25. Attach "E" shaped ring(2, F/Uc) to the side of inserted axis.
    (See figure4-161)
26. Pull "Axis, Transmission, Curl" toward the inserted side("Bush, Curl , Transmission" side) until it stops. (See figure4-161 and 4-162)
27. Pierce "Lever, Roller, Paper Feed, Right" to the axis "A" at the right side of "ASF Unit". (See figure4-162)

"E" shaped ring
(2,F/Uc)

Pull it after attaching
"E"shaped ring.
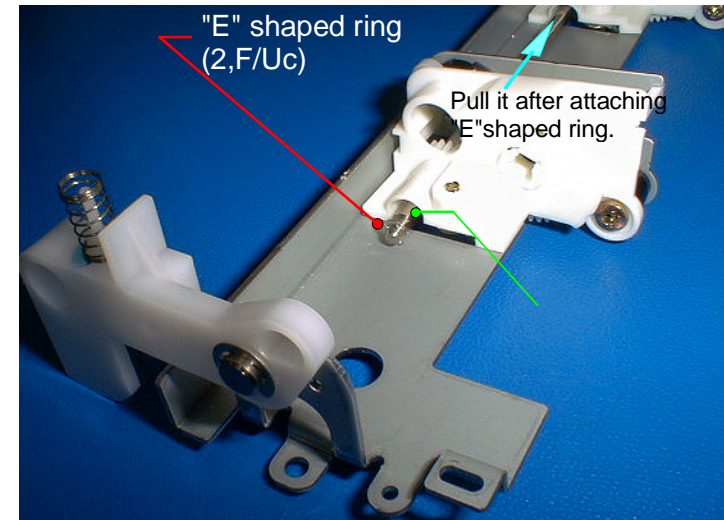
Figure 4-161. Fixing "Axis, Transmission, Curl"

"Bush, Curl Transmission"

Axis "A"
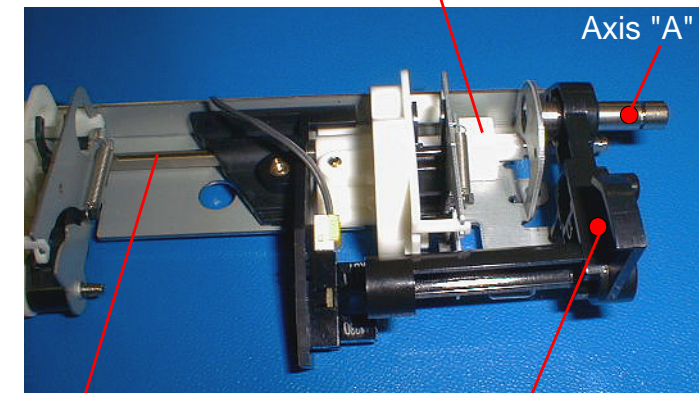
"Axis, Transmission, Curl"

"Lever, Roller, Paper Feed, Right"

Figure 4-162. Installing "Lever, Roller, Paper Feed, Right"

28.Install "Axis, Paper Feed, Roller Set" to "Lever, Roller, Paper Feed, Right". (See figure4-163)

29.Reverse "ASF Unit" so that front side comes.

30.Install "Compression Spring,2.16" to the pin on the "Lever, Roller, Paper Feed, Right". (See figure4-164)
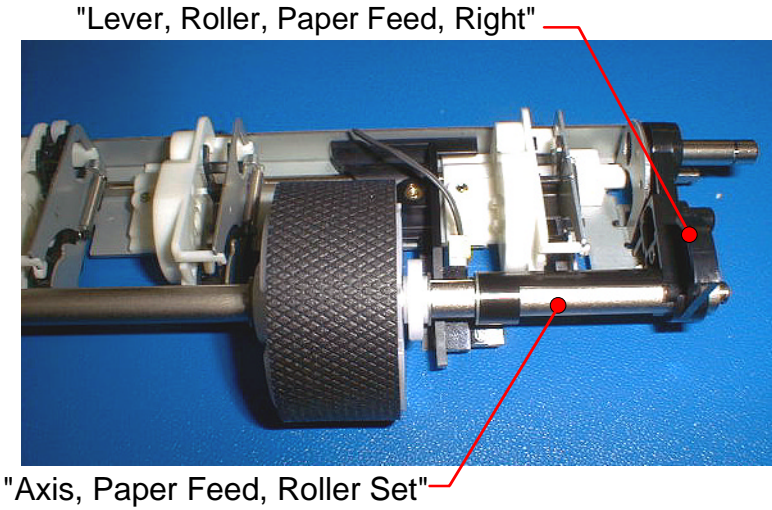
Figure 4-163. Installing Right Side of "Axis, Paper Feed, Roller Set"
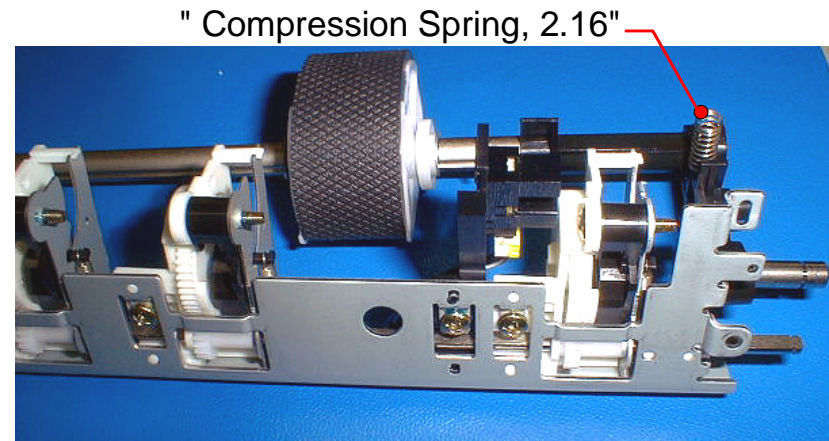
Figure 4-164. Setting "Compression Spring,2.16"

31. Install the left edge of axis of "Axis, Paper Feed, Roller Set" to "Lever Roller, Paper Feed, Left". Pull "Axis, Paper Feed, Roller Set" to yellow arrow direction as it is shown in figure 4-165, and hang it on "Lever, Roller, Paper Feed, Left".

32. Reverse "ASF Unit" so that back face comes up.

33. From outside of "Lever, Roller, Paper Feed, Left", insert the axis edge side opposite from the side which has a ditch for installing "E" shaped ring of "Axis, Paper Feed, Fixing", and push it until it reaches the hole of "Lever, Roller, Paper Feed, Right". (See figure4-166)

"Axis, Paper Feed, Roller Set"

"Lever, Roller, Paper Feed, Left"
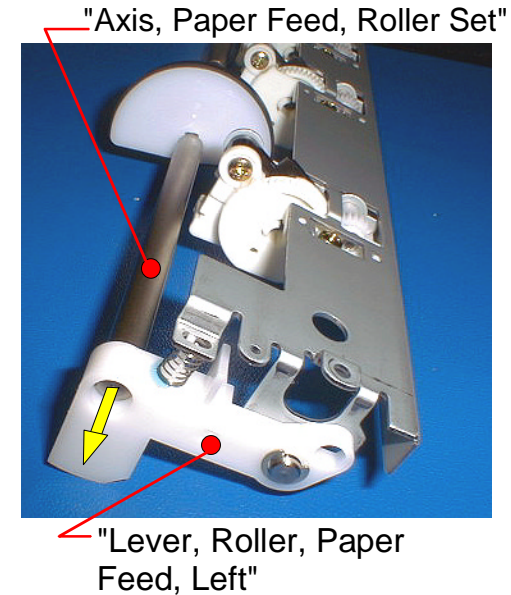
Figure 4-165. Installing left side of "Axis, Paper Feed, Roller Set"

"Axis, Paper Feed, Fixing"

Ditch for installing "E" shaped ring
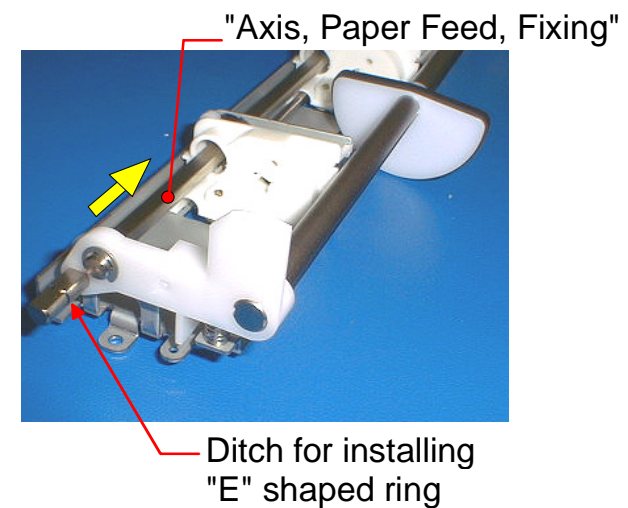
Figure 4-166. Installing "Axis, Paper Feed, Fixing"

34.Make sure that the harness from "Upper Surface Sensor" is under "Axis, Paper Feed, Fixing", which was installed at procedure 33, and attach "E" shaped ring to the ditch for fixing "E" shaped ring. (See figure4-167)

⚠**CAUTION**

When attaching "E" shaped ring, fix the ring to the ditch on the "Axis, Paper Feed, Fixing", which is inside, not outside of "Lever, Roller, Paper Feed, Left".

35.Reverse "ASF Unit" to its front face.
36.Rotate "Roller, Paper Feed" until it comes to stand-by position. (Protrusion side comes top) (See figure4-168)

"Lever, Roller, Paper Feed, Left"

Fix "E"-shaped ring inside.

"E" shaped ring (4,F/Uc)

"Axis, Paper Feed, Fixing"
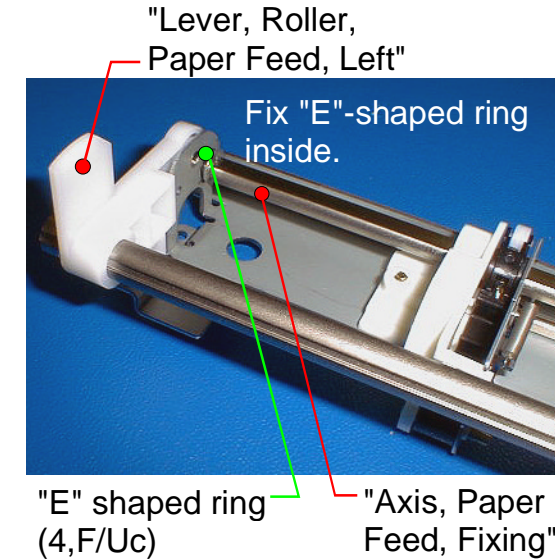
Figure 4-167. Fixing "Axis, Paper Feed, Fixing"

"Roller, Paper Feed" should be in stand-by position.
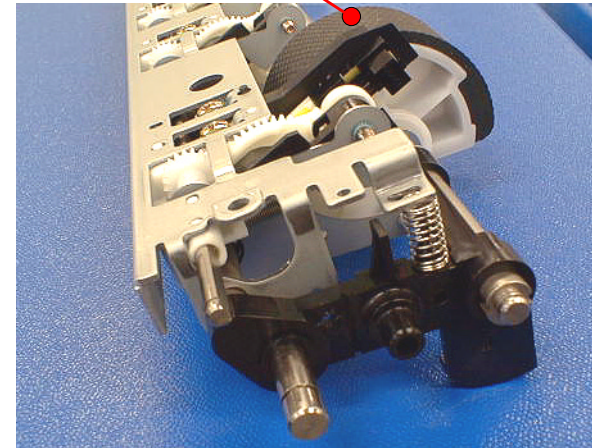
Figure 4-168. Angle of "Roller, Paper Feed" Before installing "Driven Gear"

37.Insert "Gear,24" to "Axis, Paper Feed, Roller Set", and fix it with "E" shaped ring(4,F/Uc). (See figure4-169)

> ⚠**CAUTION**
>
> *There are 2 ditches for inserting "Gear, 24" on the "Axis, Roller, Paper Feed, Roller Set". Set "Gear,24" so that its surface protrusion is located like a fish hook shape, as it is shown in figure 4-169.*

38.Push "Gear,11" into the protrusion on the "Lever, Roller, Paper Feed, Right". (See figure4-170)
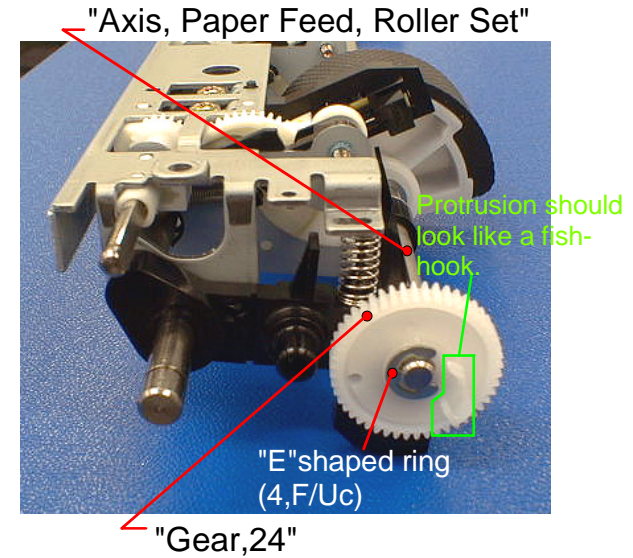
Figure 4-169. Installing "Gear,24"
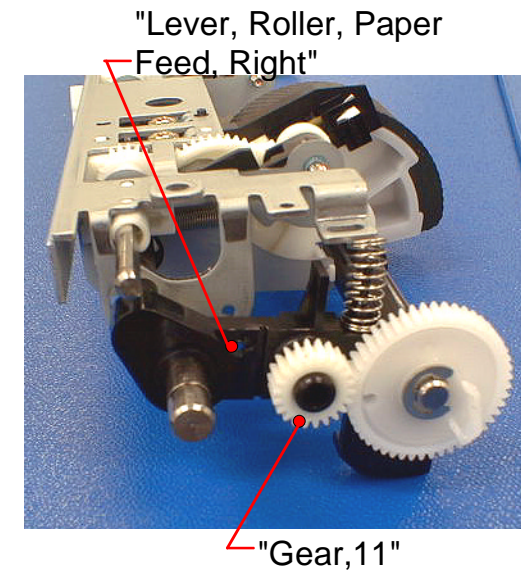
Figure 4-170. Installing "Gear,11"

39. Insert "Gear,10" to "Axis, Transmission, Curl", and fix it with "E" shaped ring(2.3,F/Uc). (See figure4-171)
40. Pierce a needle(diameter 2.0mm) into the "Curl Unit", which is the nearest to "Lever, Roller, Paper Feed, Left" side. (See figure4-172)

✓**CHECK POINT** *The reason to perform procedure 40 is to make the axis shape of "Gear,10" perfect reversed "D" shape, as it is shown in figure4-171, and prepare to adjust alignment of the whole "ASF Unit."*
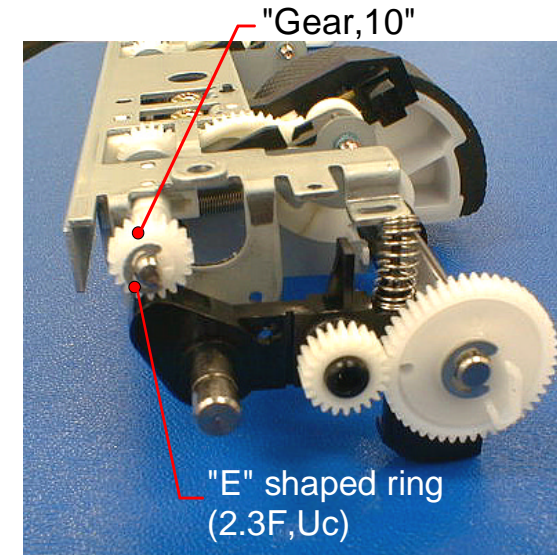
Figure 4-171. Installing "Gear,11"
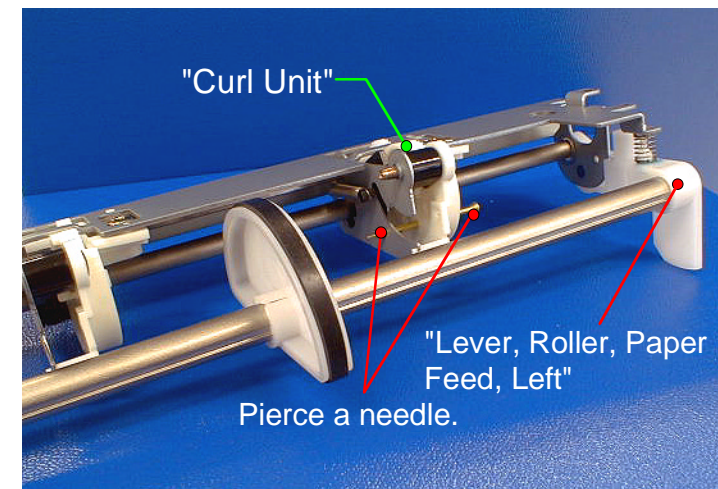
Figure 4-172. Inserting A Needle for Adjusting Alignment

41. Insert a needle(diameter 2.0mm) for alignment into "Gear,24", and let the needle pierce to the hole on the "Lever, Roller, Paper Feed, Right", and fix "Gear,24". (See figure 4-173)

42. Insert a needle(diameter 2.0mm) for adjusting alignment to the hole on the "Combination Gear,24,24". At this time, insert the needle from big gear side to the smaller gear side. (See figure 4-174)

"Gear,24"

"Lever, Roller, Paper Feed, Right"

Needle for adjusting alignment(diameter 2.0mm)
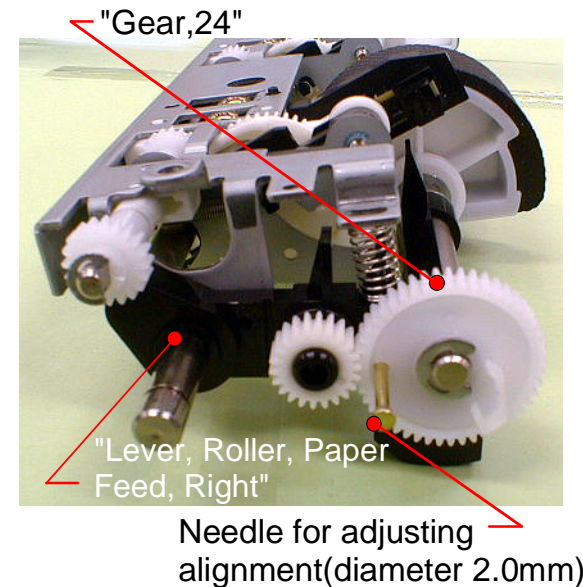
Figure 4-173. Fixing "Gear,24"

Needle for adjusting alignment(diameter 2.0mm)

"Combination Gear,24,24"
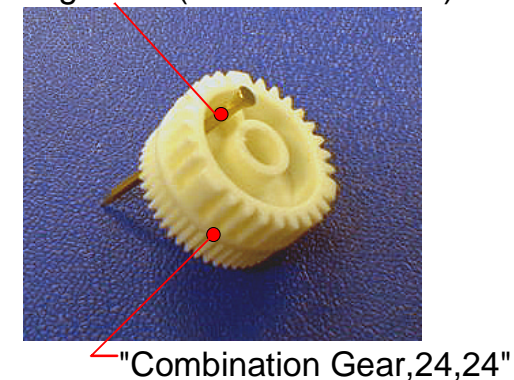
Figure 4-174. Preparation Before Installing "Combination Gear,24,24"

43. Let the needle tip, which is inserted to "Combination Gear,24,24", pierce into the hole on the "Lever, Roller, Paper Feed, Right", and push in "Combination Gear,24,24", engaging its teeth with the teeth of "Gear,10" and of "Gear,11". (See figure4-175)
44. Attach "E" shaped ring (4,F/Uc) to the axis, which "Combination Gear, 24,24" is inserted.
45. Make sure again that the shape of axis, which "Gear,10" is inserted, is reversed "D" shape, as it is shown in figure4-176, while needles for alignment are still inserted in the "Combination Gear,24 24" and "Gear,24".

⚠**CAUTION**

Even if "ASF Unit" is assembled correctly with needles for adjusting alignment inserted, "Gear, 10" can move back and forth because of backlash. Therefore, even if the shape of axis is not exact reversed "D" shape, it is no problem as long as 3 needles fix each part at procedure 45.

46. Remove all 3 needles for alignment.

Pierce a needle into the hole on the "Lever, Roller, Paper Feed, Right".

Shape of axis should be reversed "D" shape.

Engage with 2 gears.

Needle for adjusting phase (diameter 2.0mm)

"Combination Gear,24,24"

"Gear,11"
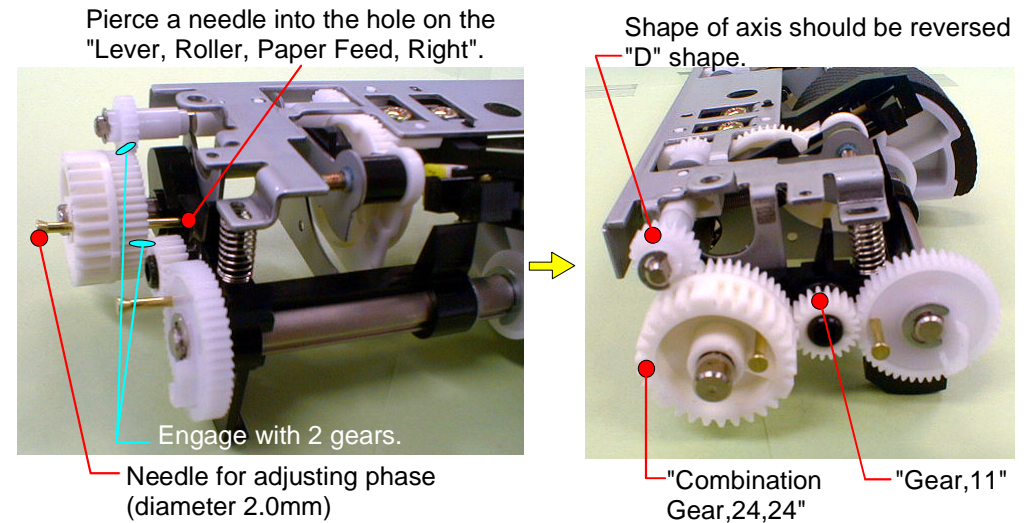
Figure 4-175. Installing "Combination Gear,24,24"

(should be reversed "D" shape, like this)

"E" shaped ring (4,F/Uc)
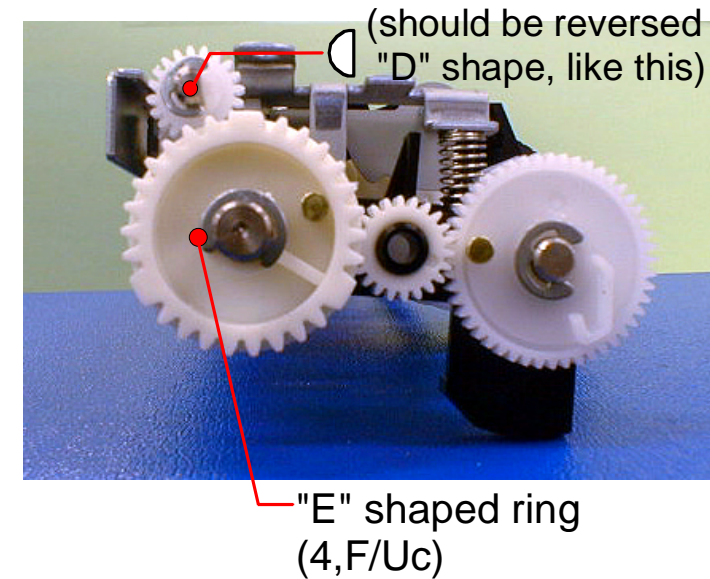
Figure 4-176. Fixing "Combination Gear,24,24"

47. Rotate "Combination Gear,24,24" one round to left direction, and check the operation of "ASF Unit". Make sure that all "Lever Assembly, Curl"s located inside of "Curl Unit" return to the waiting position simultaneously by spring force, as soon as "Roller, Paper Feed" return to the sand-by position.

⚠️**WARNING**   *Do not rotate "Combination Gear,24,24" to right direction. "Combination Gear, 24,24" rotates only to left direction. If you rotate this to right direction by force, the alignment(gear arrangement) adjusted in the "ASF Unit" go wrong. As a result, it may damage parts.*

⚠️**CAUTION**   *Of course the shape of axis with "Gear,10" is not reversed "D" shape any more, once you rotate "Combination Gear,24,24" to left direction. However, since the alignment in the "ASF Unit" is already adjusted, it is all right to install "ASF Unit" to the printer body without worrying about the shape of axis.*

Rotate to left direction(only one round) and check the gear operation.
⚠️ Do Not rotate to right

Figure 4-177. Checking Operation After Assembling "ASF Unit"

ADJUSTMENT

5.1 OVERVIEW

This section explains required adjustments for Stylus Pro5000.

5.1.1 Conditions which adjustment is required

Here explains required adjustment items, in case of repairing or replacing particular parts. Since the order of adjustment procedures is differ according to each adjustments, perform necessary adjustment after reading the following "WARNING" carefully.

⚠WARNING

- *When performing adjustment, make sure to refer to Table5-1 on the next page, and perform necessary adjustments following the procedure order without skipping. Failing to do so causes bad influence on the printing quality.*
- *When performing the Head Angular Adjustment, make sure to remove the upper case and the cover on the carriage. Then, loosen the screws securing each head and perform adjustment to change the lever position for head angular adjustment. Failing to do so may not change the actual head angle, even the lever position for head angular is changed and also may damage the lever.*
- *The C language program provided for Stylus Pro5000 can only deal with DOS/V type computer. Since using this program for the other kinds of PCs, which does not support the parallel communication, may limit the function and be unable to continue the operation, use only the DOS/V type.*
- *When changing the head position to front or rear, it is necessary to remove the upper case. (This is because the lever is located on the right side of the carriage) Also, it is necessary to loosen the fixing screw of right head.*

⚠WARNING

- *It is necessary to copy the mode commands; MS-DOS command, before executing the adjustment program.*
  By making a copy of the commands, it prevents the printer from going to Time Out Error . Even if the parallel communication fails once, since the PC automatically enters to the endless scan mode of the printer ID until the printer ID is completely transferred to PC, the program can not accept the printer ID and it prevents the printer from going to Time Out Error.
  (A:\MODE LPT:_RETRY=P)
- *EEPROM that stores various adjustment values is mounted on C228 DRV. Therefore, if C228 Main Board is replaced, it is not necessary to perform adjustment.*
- *The flag for ink initial charge still stands up on the spare part of C228 DRV board. Therefore, the initial ink charge is not performed automatically, unless the flag for the ink initial charge is reset intentionally.*
- *In case of clearing the waste ink pad counter in the exclusive program(service program), it is necessary to replace the waste ink pad before clearing the value. Failing to do so may induce the ink leaking from the lower case.*
- *Right after starting the exclusive program(service program), the screen enters mode to check the printer name. At this time, if the printer name is indicates "NULL", it means that present data in the EEPROM is cleared. (ex. Data is clear when C228 DRV board is replaced) In this case, the screen goes to the mode to re-input the model name by pressing "E" key while pushing "Alt" key. Then, type the model name "Stylus Pro 5000", being careful for space and capital words.*

⚠WARNING ┃ ■ *It is necessary to have the new ink cartridge in advance, in case of performing the ink initial charge forcefully.*

Table 5-1.Adjustment Items

No.	Contents of Operation	Category	The Order of operation	Required Adjustment Item
1	Head Exchange	Adjustment Program (Maintenance)	1	Reset the initial ink charge flag
		Adjustment Program (Adjustment)	2	Head Voltage Value Adjustment
			3	Head Angular Adjustment
			4	Head Height Adjustment
			5	Head Gap Adjustment
			6	Bi-D Adjustment
2	C228 DRV Board Exchange	Adjustment Program (Adjustment)	1	Re-input the model name
			2	Head Voltage Value Adjustment
			3	Head Gap Adjustment
			4	Bi-D Adjustment
3	C228 Main Board Exchange	Upload Program	1	Uploading the firmware
4	CR(Guide Axis) Exchange	Mechanism Adjustment	1	Parallelism Adjustment

Table 5-2. Adjustment Items(Cont.)

No.	Contents of Operation	Category	The Order of operation	Required Adjustment
5	Operation for Clogging Recovery	Adjustment Program (Maintenance)	1	Head Cleaning*1
			2	Reset of initial ink charge flag (If it does not recover by performing *1)
6	Waste Ink Pad Exchange	•Adjustment Program (Maintenance) •Alternative function on the control panel	1	Clear the waste ink pad counter value by the exclusive program service program) or alternative function from the control panel
7	Upper surface Sensor Exchange/ Removal	Mechanism Adjustment	1	Upper surface Sensor Positioning Adjustment
8	CR Motor Exchange	Adjustment Program	1	Head Gap Adjustment
			2	Bi-D Adjustment

⚠CAUTION ┃ *In order to clear the value of the waste ink pad counter, you can do it either by the exclusive program (service program) or by alternative function on the control panel. It is necessary to install the new ink cartridges, in case of clearing the value from the control panel, since the values of the ink end counter are also cleared at the same time.*

5.1.1.1 Resetting Initial Ink Charge Flag

Initial ink charge is the absorbing operation with large quantity of ink, when the users turn the printer on for the first time. This operation should be done at the following conditions.

Table 5-3. Conditions for Resetting the Initial Ink Charge Flag

No.	Conditions	Reason
1	Head Exchange	Transit liquid is filled in the spare parts head instead of real ink. This liquid should be ejected correctly and the cartridge should be filled with ink in order to have the normal printing.
2	Head Clogging	In order to prevent of wasting the ink consumption, selecting Cleaning on the exclusive program (service program) helps to recover the printing. But, if the printing quality does not improve even by CL2(Strong) cleaning, this initial ink charge becomes the effective means.

Following shows procedures.

Step1.　　　Connect the PC and printer by the printer cable and turn both PC and printer on.

Step2.　　　Type the following sentence on the DOS or DOS Prompt.

> **C:\mode lpt1:_retry=p**

⚠**WARNING** | *Typing this sentence prevents PC from going to Time Out Error, maintaining the scan mode until the PC is able to recognize the printer ID correctly, which comes back from the printer. If you ignore this operation, the program may hang up on the initial screen.*

Step3.　　　Type as it is following on the DOS Prompt for exclusive program Stylus Pro5000.EXE attached with this manual.

> **A(In case of FD): \spro.5000.EXE**

⚠**WARNING** | *When typing the sentence above, the program hangs up on the initial screen, if the printer is not turned on. In this case, start again from Step1.*

Step4.　　　Following screen appears.

```
Starting SERVICE PROGRAM

Printer model name is Stylus Pro5000
          Is this ok?

             YES
             NO




ESC: Return  UP/DOWN: Select  ENTER: Determine
```

Figure 5-1. Initial screen for Stylus Pro5000.EXE

⚠**CAUTION** | *If the screen shown on the previous page does not appear, following case might be the reason.*
■ Mode Command is not typed. (Refer to Step2)

Step5.   When PC reads the printer ID, the screen in the condition that "Yes" is selected appears. Press Return key.

Step6.   Following screen appears.

```
******Stylus Pro5000 SERVICE PROGRAM  Version 1.0******

  SERVICE ITEMS

            << ADJUSTMENT >>
            << MAINTENANCE >>
            << A4 PATTERN PRINTING >>



       ESC: Return  UP/DOWN: Select  ENTER: Determine
```
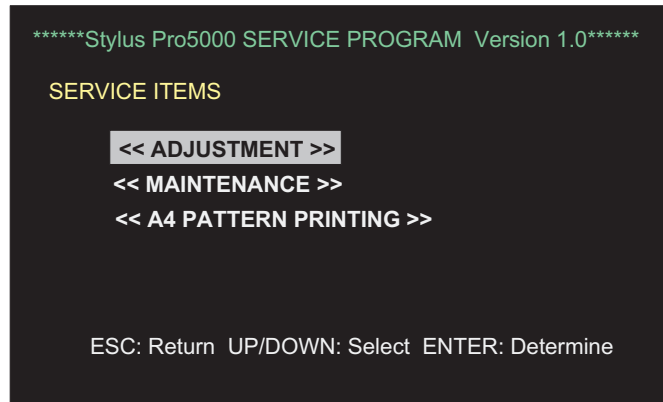
Figure 5-2. Main Menu Screen

Step7.   Select "Maintenance" and press Return key.

Step8.   Following screen appears.

```
******Stylus Pro5000 SERVICE PROGRAM  Version 1.0******

  << MAINTENANCE >>

        Head Cleaning
        Ink charge flag reset
        Indication of the counter value for the waste ink pad


       ESC: Return  UP/DOWN: Select  ENTER: Determine
```
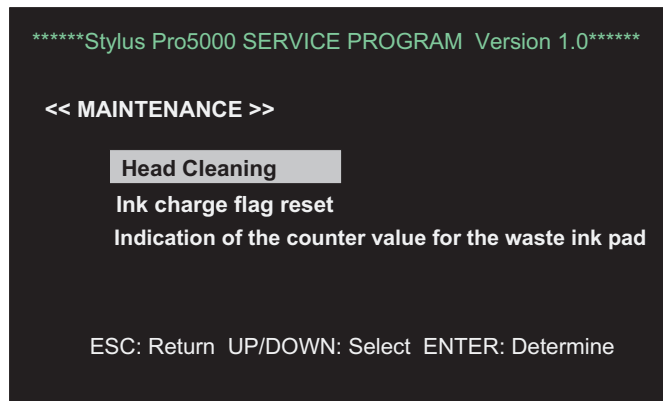
Figure 5-3. Maintenance Selection Screen

Step9.   Select "Ink Charge Flag Reset" and press Return key.

Step10.   Following screen appears.

```
  Do you wanna reset the flag of the initial ink charge?

         YES
         NO

  --- Be Careful of  ink comsumption ---
    (1/5 of non-used ink is consumed by one time)

  ** Perform this operation after installing the  brand-new I/C **

  INITIAL INK CHARGE ---->
           Performing the first initial ink charge after the purchase.
  [Total quantity of each ink absorption = 11.6ml]


           ESC: Return    UP/DOWN: Select    ENTER: Determine
```
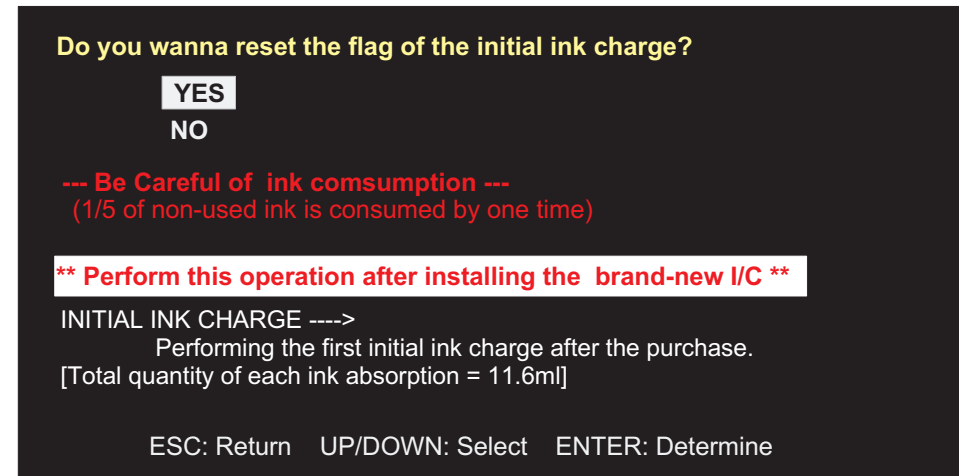
Figure 5-4. Initial Charge Flag Reset Selection Screen

Step11.   Select "Yes" and press Return key.

Step12.   Following screen appears.

```
  << Writing initial ink charge is completed. >>


  Turn off the printer once and wait for 10 seconds. Then, turn on the printer
  again. Initial Ink Charge will start.

  It takes about 5 minutes.


  >** Don't use any commands until  INITIAL INK CHARGE completes. **<


  ESC:Return
```
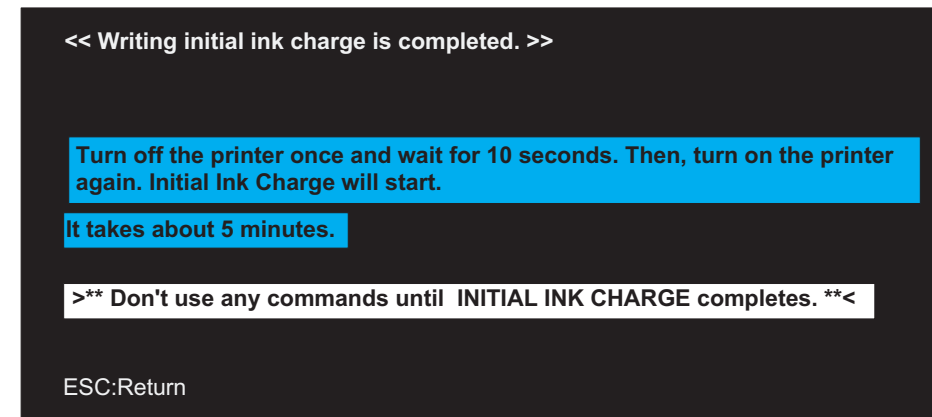
Figure 5-5. Caution Screen After the Initial Charge Flag Reset

Step13.   Turn off the printer once.
Step14.   Wait for 10 seconds and turn the printer on again.
Step15.   Initial ink charge starts.

⚠️**WARNING**   **When performing ink initial charge, make sure to install new each 4 colors ink cartridges. If this is not done, only a particular color ends in the middle. And if only that cartridge is replaced, initial ink charge is performed again from the beginning, and initial ink charge will never be finished correctly.**

5.1.1.2 Re-input the Model Name

Here shows procedure to re-input the printer model name. Table below shows the conditions which require this procedure.

Table 5-4. Conditions which require re-input of model name

No.	Condition	Reason
1	C228 DRV Board Exchange	In the EEPROM on the C228DRV board, since the printer model name is registered as character data, if this data is cleared, PC becomes unable to recognize the printer ID under Windows95® and to perform next operations. Therefore, it is very important to perform this operation after C228 DRV board is replaced.

Following shows procedure.

Step1.   Connect PC and printer by the printer cable, and turn both PC and printer on.

Step2.   Type the following sentence on the DOS or DOS prompt.

> **C:\mode lpt1:_retry=p**

⚠**WARNING** *Typing this sentence prevents PC from going to Time Out Error, maintaining the scan mode until the PC is able to recognize the printer ID correctly, which comes back from the printer. If you ignore this operation, the program may hang up on the initial screen.*

Step3.   Type as following on the DOS Prompt for exclusive program Stylus Pro.5000.EXE attached with this manual.

> **A(In case of FD): \spro.5000.EXE**

⚠**WARNING** *When typing the sentence above, the program hangs up on the initial screen, if the printer is not turned on. In this case, start again from Step1.*

Step4.   Following screen appears.

Starting SERVICE PROGRAM

Printer model name is (null)

Figure 5-6. Initial Screen when the model name is clear

Step5.   Check that the model name has not been input yet, press "E" key while pressing "Alt" key on the keyboard.

⚠**CAUTION**   *In the future, there is a possibility that model name for each destination is registered on the spare parts of EEPROM in the factory without notice. If the correct model name appears on the initial screen of the program after C228 DRV board is replaced, it is not necessary to perform following operation. So, you may go to the next necessary adjustment.*

Step6.   Following screen appears to re-input the model name.

Please type "Stylus Pro 5000" correctly!
(Enter key is determine)
>>_
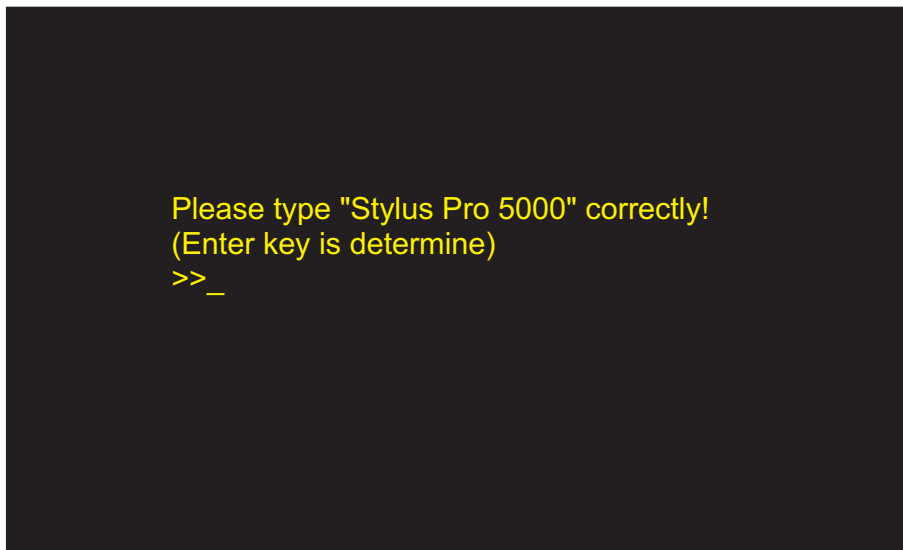
Figure 5-7. Screen after pressing "Alt" + "E" keys

Step7.   Type the following model name correctly and press "Enter" key.

Stylus Pro 5000

Step8.   Press "Enter" key to register the character data to EEPROM.

5.1.1.3 Head Voltage Value Adjustment

Head voltage value adjustment function is to write Head ID, which becomes most important for discharging ink. If this ID is not written correctly, it results in white or color lines and also bad influence to the Dot weight. This adjustment is required at the following cases.

Table 5-5. Head Voltage Value Adjustment

No.	Conditions	Reason
1	Head Exchange	On the production process of heads, dispersion of electrical characteristic for PZT is strictly controlled, and data is registered on each head, then finally is stored in the EEPROM on the C228 DRV. Therefore, when the head is replaced with the new spare part, if the head ID and the data stored on the EEPROM do not match, this mismatch gives bad influence on the dot weight and auto color calibration, and as a result, it causes bad printing quality.
2	C228 DRV Board Exchange	• Even in the condition that C228 DRV board needs to be replaced, if the communication circuit with PC is still alive, it is possible to check the present head ID value by bi-directional communication on the exclusive program(service program). After the C228 DRV board is replaced, head ID can be registered to EEPROM immediately without removing the head by inputting the data, which you made a note in advance.

Table 5-6. Head Voltage Value Adjustment(Con.)

No.	Conditions	Reason
2	C228 DRV Board Exchange	• Even if the communication became impossible on the C228 DRV or C228 Main board by malfunction, the head ID can be checked easily just by removing the black cover from the top of the carriage, since it is written on the sticker attached on the top of the head.

Following shows procedure.

Step1.   Connect PC and printer with printer cable and turn both PC and printer on.

Step2.   Type the following sentence on the DOS or DOS Prompt.

> **C:\mode lpt1:_retry=p**

⚠️**WARNING**   *Typing this sentence prevents PC from going to Time Out Error, maintaining the scan mode until the PC is able to recognize the printer ID correctly, which comes back from the printer. If you ignore this operation, the program may hang up on the initial screen.*

Step3.   Type as following on the DOS Prompt for exclusive program Stylus Pro.5000.EXE attached with this manual.

> **A(In case of FD): \spro.5000.EXE**

⚠️**WARNING**   *When typing the sentence above, the program hangs up on the initial screen, if the printer is not turned on. In this case, start again from Step1.*

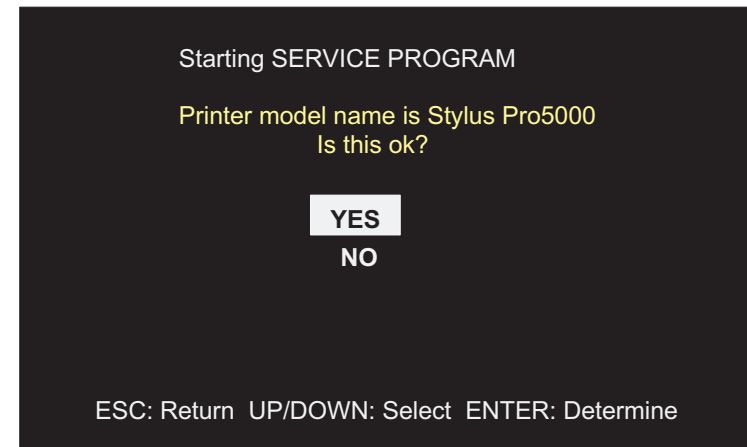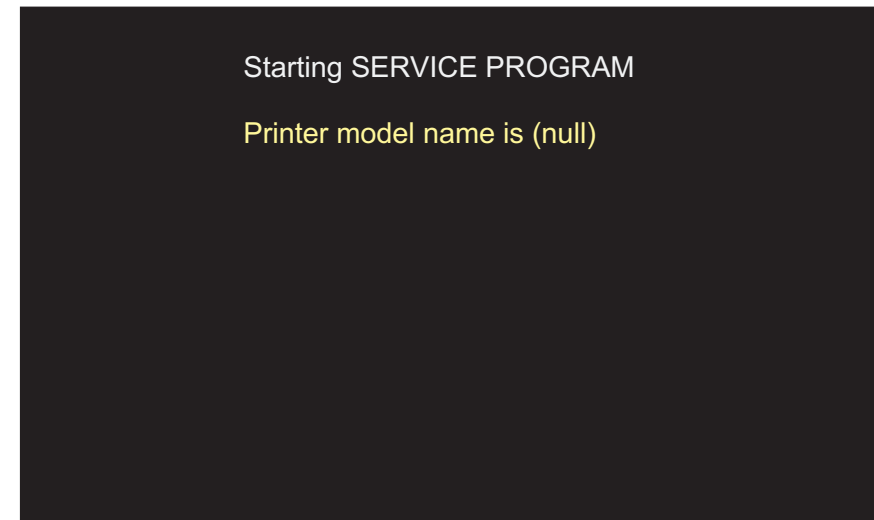Step4.   Following screen appears.

```
            Starting SERVICE PROGRAM

        Printer model name is Stylus Pro5000
                    Is this ok?


                      YES
                      NO




        ESC: Return  UP/DOWN: Select  ENTER: Determine
```

Figure 5-8. Initial Screen for Stylus Pro5000. EXE

⚠**CAUTION**   *If this screen does not appear, following case*
might be the reason.
■ *Mode Command is not typed. (Refer to Step2)*

Step5.   When PC reads the printer ID, the screen in the condition
                that "Yes" is selected appears. Press Return key.
Stpe6.   Following screen appears.

```
******Stylus Pro5000 SERVICE PROGRAM  Version 1.0******

  SERVICE ITEMS

          << ADJUSTMENT >>

          << MAINTENANCE >>
          << A4 PATTERN PRINTING >>




        ESC: Return  UP/DOWN: Select  ENTER: Determine
```
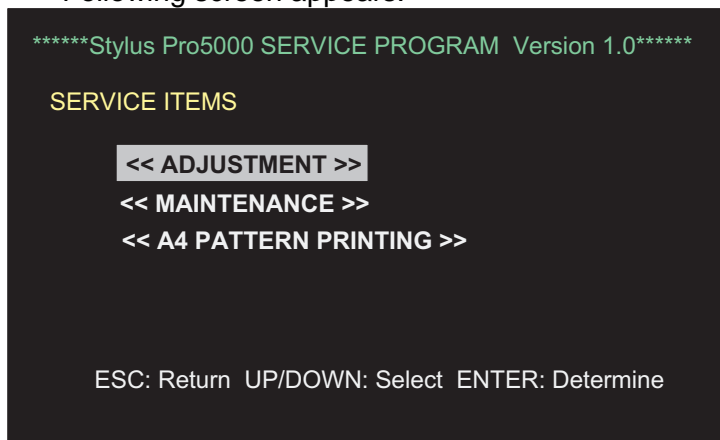
Figure 5-9. Main Menu Screen

Step7.   Select "Maintenance" and press Return key.
Step8.   Following screen appears.

```
******Stylus Pro5000 SERVICE PROGRAM  Version 1.0******

    << ADJUSTMENT >>

          Market Destination Check

          Head Voltage ID Input
          Head Angular Adjustment(Check pattern printing)
          Head Height Adjustment (Check pattern Printing)
          Head GAP Timing Adjustment
          Bi-Directional Adjustment



        ESC: Return  UP/DOWN: Select  ENTER: Determine
```
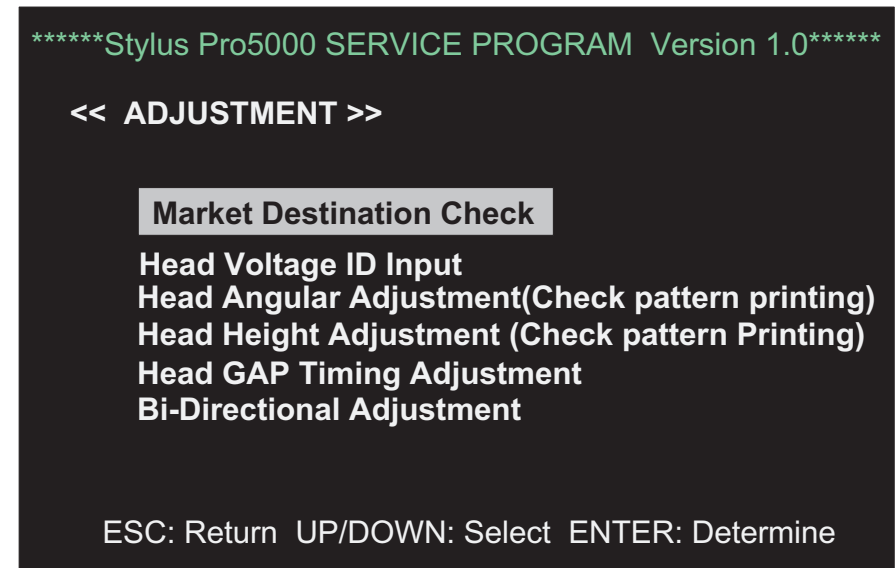
Figure 5-10. Screen After "Maintenance" is selected.

Step9.   Select "Head Voltage ID Input" and press Return.
Step10.   Following screen appears.

Head actuator voltage ID adjustment

Checking a present data

Changing a data

ESC: Return   UP/DOWN: Select   ENTER: Determine
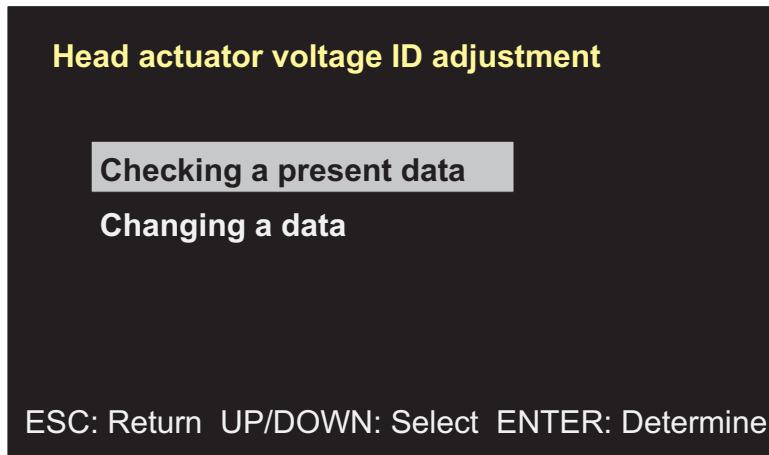
Figure 5-11. Checking Head ID/Writing ID

Step11.   If you need to check the current data according to the content
                of Table5-3, select "Checking a present data" and press the
                Return key. If you want to write new data, select "Changing a
                data" and press Return key. Following shows each screen
                for each case.

Reading out a head actuator ID

Left head actuator ID = I1ELJM
Right head actuator ID = I1FKKC
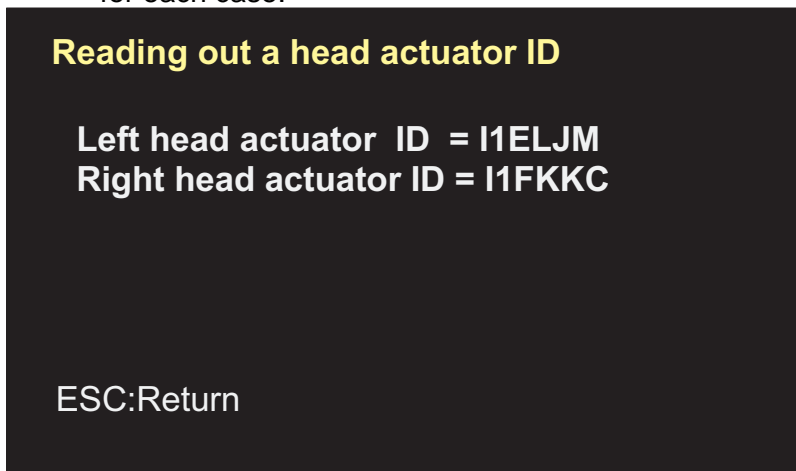
ESC:Return

Figure 5-12. Checking Present Data

Changing data

Left head

Right head

ESC: Return   UP/DOWN: Select   ENTER: Determine

Figure 5-13. Data Change

Step12.   In case of selecting "Checking a present data", make a note
                of each right and left head ID, as it is shown in the figure5-12.
                Then, press ESC key and return to the previous screen.
                Select "Changing a data" and write ID, which you made a
                note of it, after replacing C228 DRV board.
Step13.   In case of selecting "Changing a data" from the beginning,
                (head replacement), make a note of head ID, which is written
                on the top of the head, and input those values for each
                right and left head ID.

5.1.1.4 Head Angular Adjustment

The head angular mechanism is the same as Stylus Color 800's. This adjustment is to operate the levers for the head angular, which stick out to the carriage front, and to print out the adjusted pattern every time the lever position is changed. Following shows conditions which require this adjustment.

| ⚠️**CAUTION** | ■ *Remove the upper case before starting the head angular adjustment.* |

| ⚠️**WARNING** | ■ *Even if you move the lever(s) for head angular adjustment without loosening the screw, which is securing the head, not only the head angle is not changed, but also the lever may get damaged. Therefore, make sure to remove the cover over the carriage and loosen the screw, which is securing the head, when moving the lever(s) for head angular.* |

Table 5-7. Head Angular Adjustment

No.	Conditions	Reason/Background
1	Head Exchange	Following phenomena occur, if the head angle is not correct.
2	Carriage Removal	• Process of color mixing is not performed correctly.
3	When loosening the head fixing screw(screw which is securing the head)	• Print starting dot differs according to the color.
4	When moving the lever for head angular adjustment	• White/Color lines appear.

Following shows procedure.

Step1.   Remove the upper case of the printer. (Refer to Chapter4 Assembly/Disassembly)

Step2.   Remove the head cover on the carriage (Refer to Chapter4 Assembly/Disassembly) and make a condition that screws which are securing 2 heads can be seen. (Refer to Figure below)
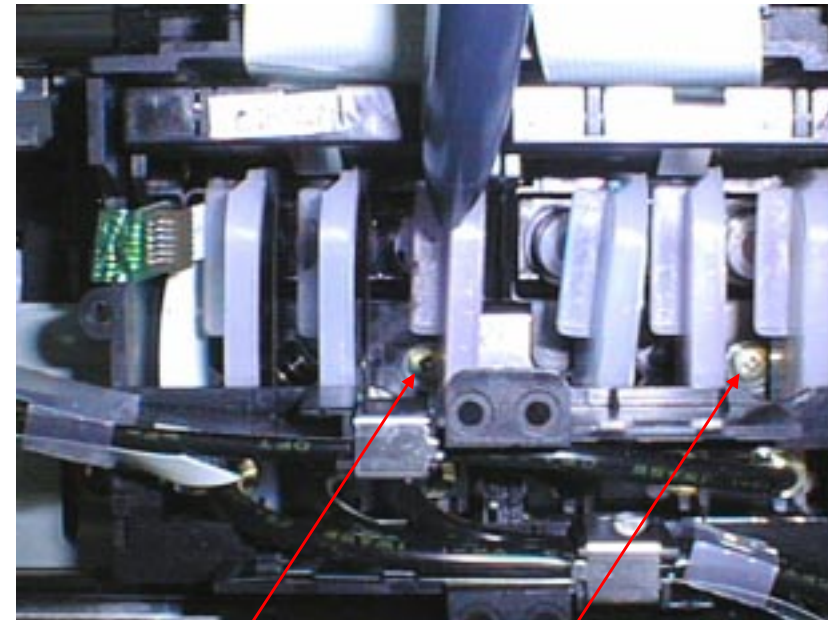
Fixing screw for the head of dark colors

Fixing screw for the head of light colors

Figure 5-14. Positions of Fixing Screws for Heads

Step3.   Connect PC and printer with printer cable and turn both PC and printer on.

Step4.   Type the following sentence on the DOS or DOS Prompt.

> **C:\mode lpt1:_retry=p**

⚠WARNING *Typing this sentence prevents PC from going to Time Out Error, maintaining the scan mode until the PC is able to recognize the printer ID correctly, which comes back from the printer. If this operation is not performed, the program may hang up on the initial screen.*

Step5.   Type as following on the DOS Prompt for exclusive program Stylus Pro.5000.EXE attached with this manual.

> **A(In case of FD): \spro.5000.EXE**

⚠WARNING *When typing the sentence above, the program hangs up on the initial screen, if the printer is not turned on. In this case, start again from Step1.*

Step6.   Following screen appears.

Starting SERVICE PROGRAM

Printer model name is Stylus Pro5000
Is this ok?

YES
NO

ESC: Return UP/DOWN: Select ENTER: Determine
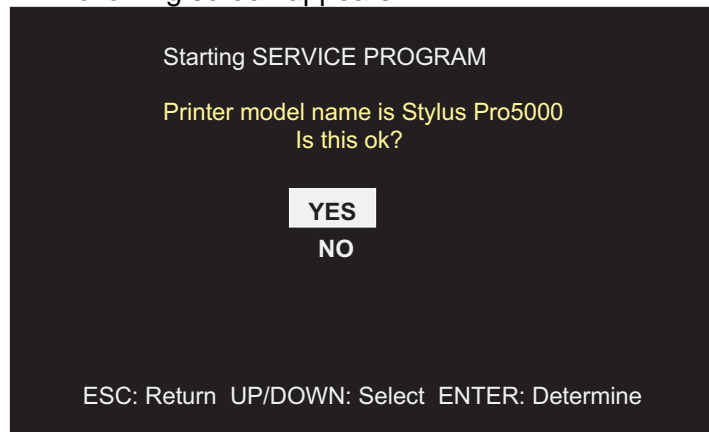
Figure 5-15. Initial Screen for Stylus Pro5000

⚠CAUTION *If this screen does not appear, following case might be the reason.*
■ Mode Command is not typed. (Refer to Step4)

Step7.   When PC reads the printer ID, the screen in the condition which "Yes" is selected appears. Then, press Return key.

Step8.   Following screen appears.

******Stylus Pro5000 SERVICE PROGRAM Version 1.0******

SERVICE ITEMS

<< ADJUSTMENT >>
<< MAINTENANCE >>
<< A4 PATTERN PRINTING >>

ESC: Return UP/DOWN: Select ENTER: Determine
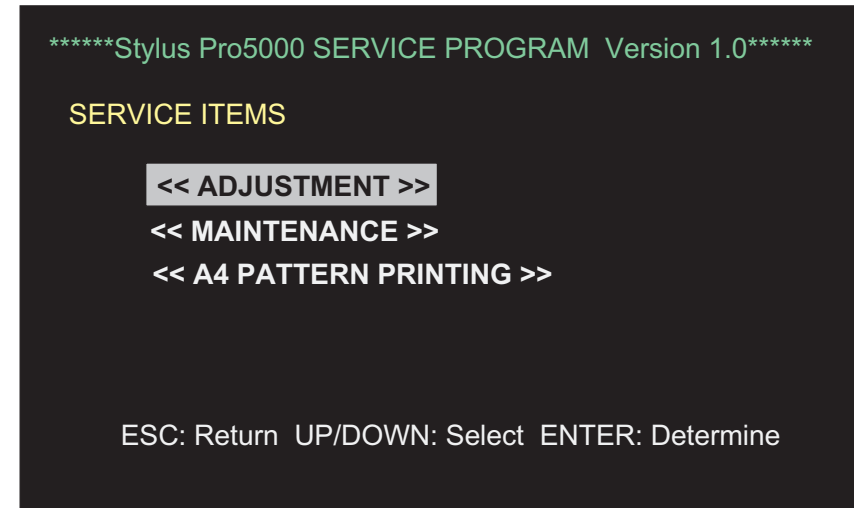
Figure 5-16. Main Menu Screen

Step9.   Select "Adjustment" and press Return key.

Step10.   Following screen appears.

```
******Stylus Pro5000 SERVICE PROGRAM  Version 1.0******

   <<  ADJUSTMENT >>

        Market Destination Check

        Head Voltage ID Input
        Head Angular Adjustment(Check pattern printing)
        Head Height Adjustment (Check pattern Printing)
        Head GAP Timing Adjustment
        Bi-Directional Adjustment


   ESC: Return  UP/DOWN: Select  ENTER: Determine
```
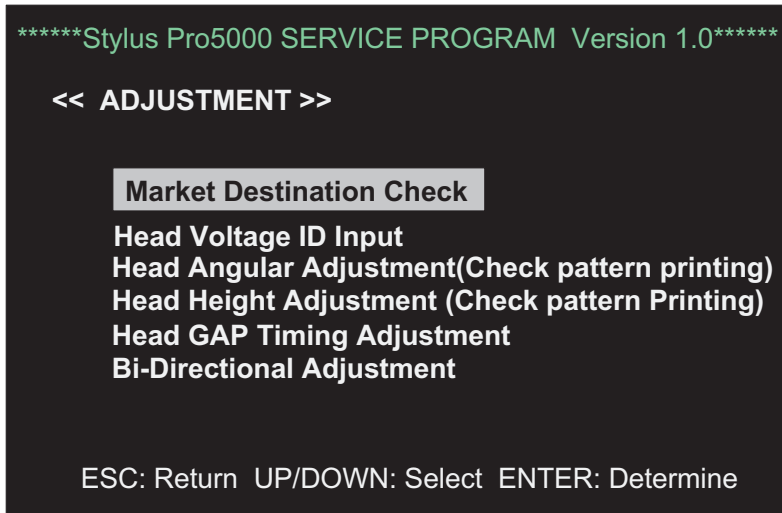
Figure 5-17. Maintenance Selection

Step11.   Select "Head Angular Adjustment(Check pattern printing)"
          and press Return key.

Step12.   Following screen appears.

```
   Head angular adjustment



        Print out a right & left head adjustment pattern




   ESC: Return                ENTER: Determine
```
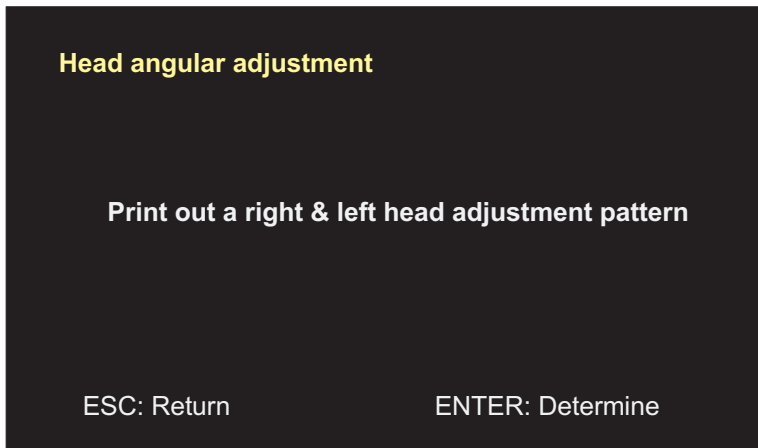
Figure 5-18. Screen After the Head Angular Adjustment is determined

Step13.   Execute printing by pressing Return key.

Step14.   The following pattern is printed. Since the paper is not
          ejected automatically, press "Eject" button on the control
          panel after the printing is over, and check the result.

Left Head Angular Adjustment Pattern

Right Head Angular Adjustment Pattern
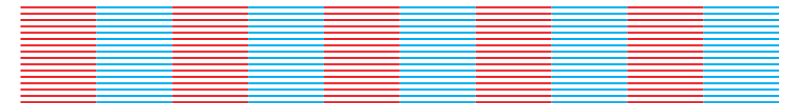
Figure 5-19. Head Angular Adjustment Checking Pattern

Step15.   Refer to the following good and bad examples in order to judge if the adjustment is necessary or not.

Step16.   Adjustment is not necessary, if the bad example shown in Figure5-20 is not found on the printed pattern. If the bad example is found, follow the next procedure and continue adjustment.
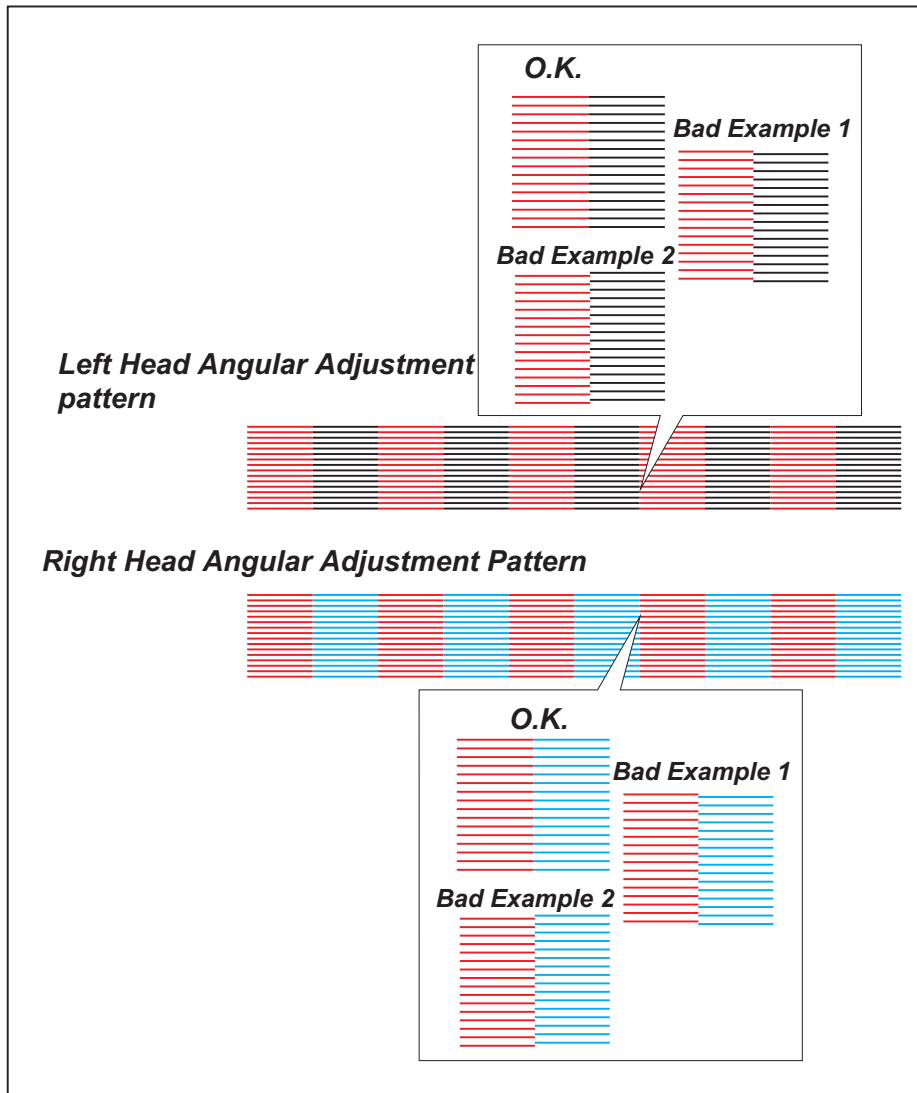
Figure 5-20. Judgment Standard to decide adjustment is necessary or unnecessary

Step17.   Turn off the printer once.
Step18.   Release the carriage lock manually. (Refer to figure below)
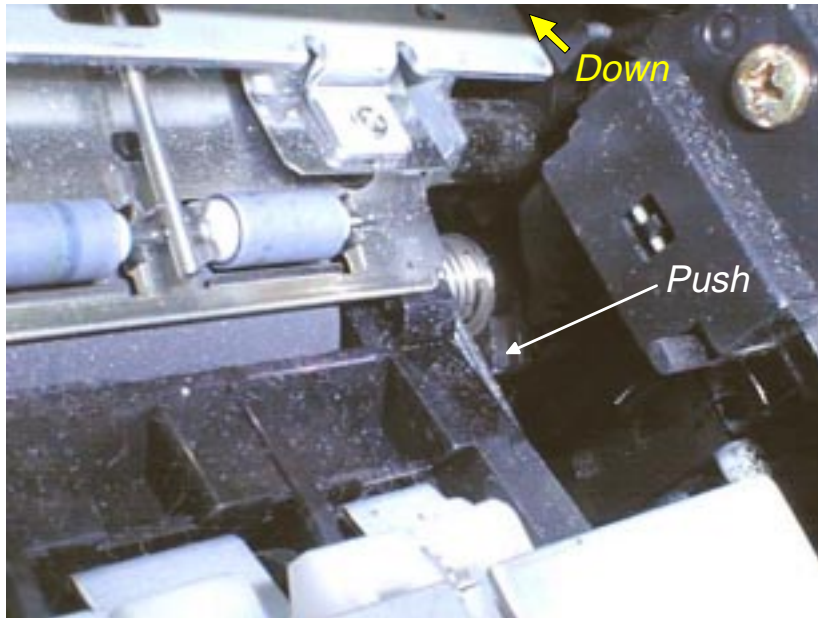
Figure 5-21. Forceful Release of Carriage Lock

Step19.   Out of carriage lock lever(2 levers component), the upper lever falls rear side automatically by pushing the lower lever with driver. By this, the carriage can be moved freely by hands.

⚠️**WARNING**

In order to release or set the carriage lock, although it is possible to rotate the paper feed driven (high precision) gear by hand, touching this gear surface directly causes unstable paper feed pitching. Therefore, if you need to rotate this gear, do so, using 2 dimples on the gear surface.

Step20.   Remove 3 screws securing the black frame with discharge brush to the front case, and remove this frame. Then, 2 notched parts on the frame appear. They are the levers for head angular adjustment. (Refer to figure below)

Fixing the frame part with discharge brush

Windows for changing the lever position
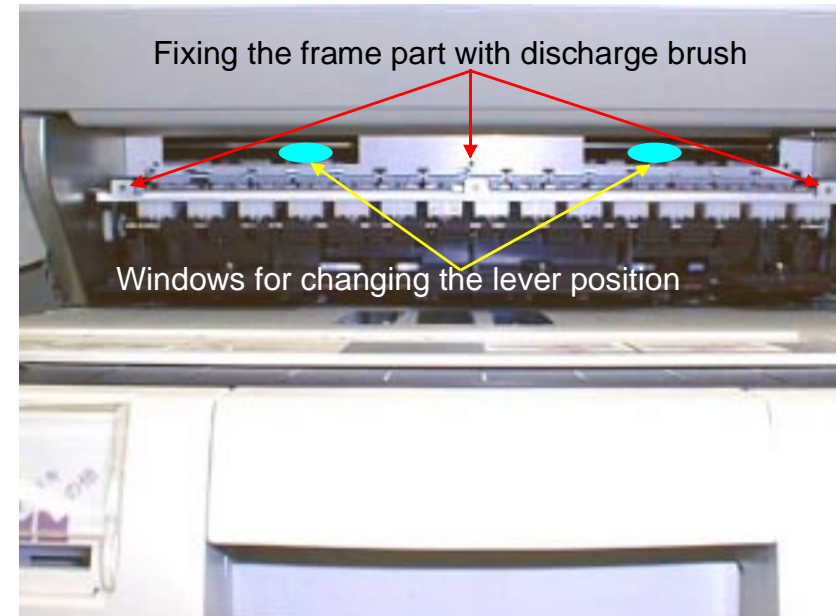
Figure 5-22. Positions of Discharge Brush and Windows for Changing the Lever Position

Step21.   In the out of 2 windows in the figure above, move the carriage manually, until 2 levers for head angular adjustment from the carriage appear.

Step22.   After moving the lever position left or right side, return the carriage to the home position manually. Following shows the relation between the changing direction of the lever and changes of printing pattern.

⚠**CAUTION**   *After changing the lever position, if the carriage is not returned to the home position manually, the printer acknowledges the carriage is out of home position when the printer is turned on. Then, the printer will go to the cleaning routine and waste the time.*

Table 5-8. Relation between the Lever Position and Changes of Printing Pattern

No.	Position of the lever for right and left head angle	Changes of printing pattern
1	If it is moved to left direction	Refer to figure5-24(Bottom figure)
2	If it is moved to right direction	Refer to figure5-24(Top figure)

In case of moving the adjustment lever to right
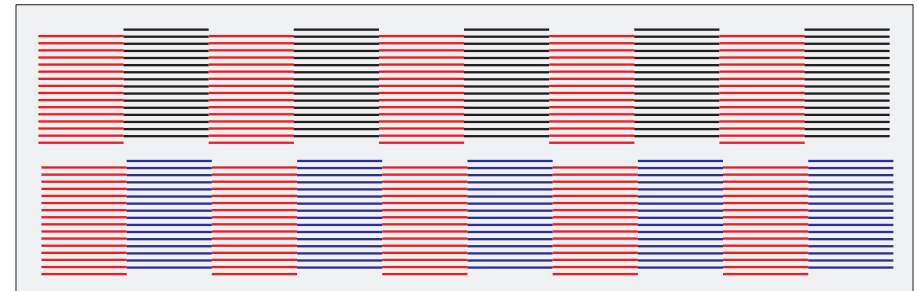
In case of moving the adjustment lever to left
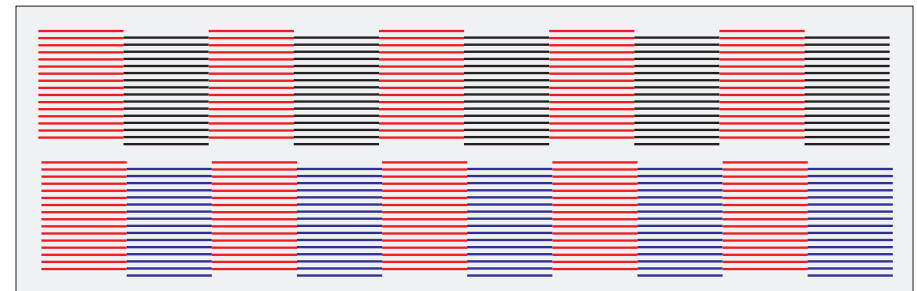
Figure 5-24. Changes of Printing Pattern After the Lever Position is changed

Lever for Left Head Angular Adjustment   **Lever for Right Head Angular Adjustment**

Figure 5-23.Condition that the Carriage is moved to notched parts

Step23.   Turn the printer on again.
Step24.   Press Return key on the current screen, and check the
                   adjusted head angle from the printed pattern. Refer to figure
                   5-20 and repeat Step12 through Step24, until the printer
                   pattern becomes just like the O.K sample shown in the
                   figure5-20.
Step25.   After adjustment is completed, leave the loosened screws as
                   they are loosened for next head height adjustment.

⚠**WARNING**

> ■ *Make sure to perform Head Height Adjustment,*
> *after the head angular adjustment is completed.*
> ■ *Even if only the left head is replaced and the*
> *head angular adjustment is performed only for*
> *the left head, since head height adjustment is to*
> *change the right head(for right colors) position*
> *based on the left head (for dark colors) position,*
> *loosen the screw in advance, which is fixing the*
> *right head.*

5.1.1.5 Head Height Adjustment

Head height adjustment is to align the horizontal line of #1 nozzle for each color in the right head based on the #1 nozzle position for each color in the left head. Therefore, when either head or both heads are removed or replaced, it is necessary to perform this adjustment. If this adjustment is done correctly, color overlapping or white/color line appear.

> ⚠️**WARNING**
>
> ■ *Before starting the head height adjustment, loosen a screw, which is fixing the right head(for light colors). Failing to do so does not change the head position, even though the lever for head height adjustment is changed.*
> ■ *Please be careful not to forget to loosen the screw, which is securing the right head. Since it might be forgotten to do so, especially after the only left head angular adjustment is performed in the previous section.*

Table 5-9. Conditions which Head Height Adjustment is required

No.	Conditions	Reason/Background
1	Head Exchange	When replacing the either or both heads, the nozzle line for horizontal direction between both heads becomes incorrect. Therefore, this head height adjustment is necessary whenever the heads are replaced or removed.
2	When changing the head height adjustment lever	The position of head height adjustment lever is changed by mistake.

Next pages show its procedure.

Step1.   If the head angular adjustment for right head(for light colors) is not performed in the previous section 5.1.1.4 "Head Angular Adjustment", loosen the screw, which is fixing the right head. (Refer to figure below)
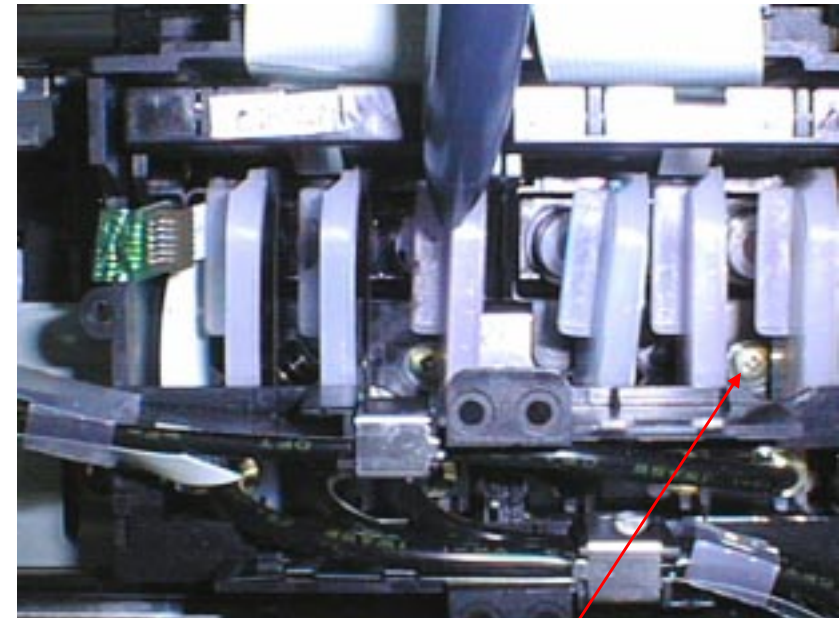
Fixing screw for securing right head(for light colors)

Figure 5-25. Position of the Fixing Screw for Right Head(light colors)

Step2.   Go back to the main menu screen for adjustment, which was used for the previous section; 5.1.1.4 "Head Angular Adjustment Program", by pressing ESC key.

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<< ADJUSTMENT >>

Market Destination Check

Head Voltage ID Input
Head Angular Adjustment(Check pattern printing)
Head Height Adjustment (Check pattern Printing)
Head GAP Timing Adjustment
Bi-Directional Adjustment

ESC: Return UP/DOWN: Select ENTER: Determine
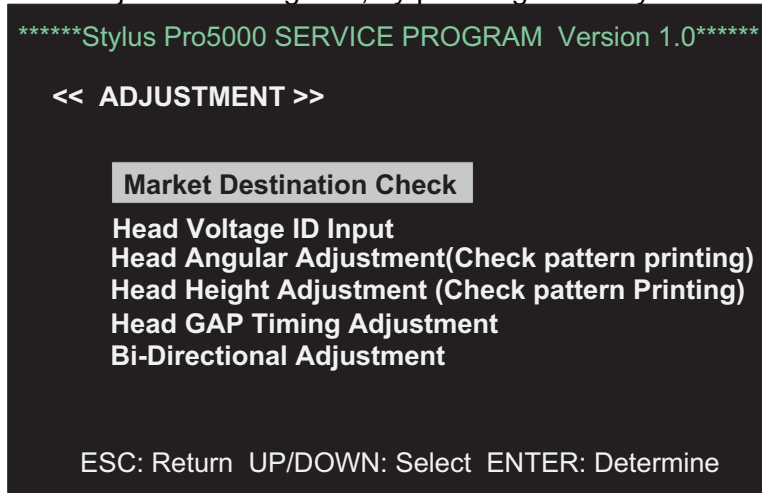
Figure 5-26. Main Menu for Adjustment

Step3.   Select "Head Height Adjustment(Check pattern printing)" and press Return key.
Step4.   Following screen appears.

Head height adjustment

Printing out a head height adjustment pattern

ESC: Return   ENTER: Determine
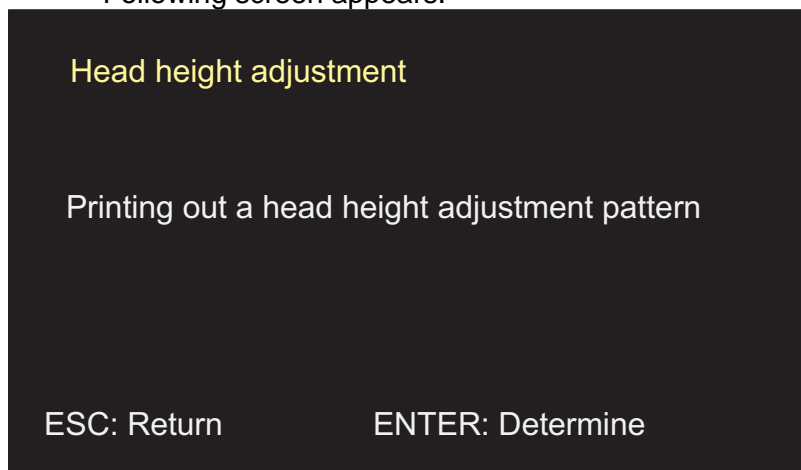
Figure 5-27. Screen After Selecting "Head Height Adjustment"

Step5.   Printing is performed by pressing Return key.
Step6.   Following printing pattern is printed. Since the paper is not ejected automatically, press "Eject" button on the control panel after the printing is over, and check the result.

Head Height

Black Ink(Left head)   Light Magenta Ink(Right head)
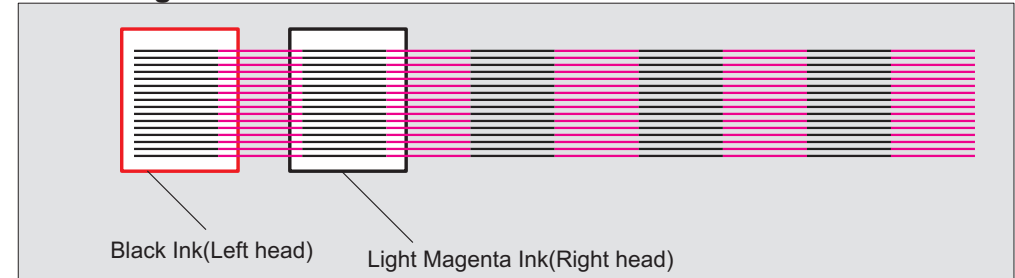
Figure 5-28. Checking Pattern for Head Height Adjustment

[Explaining]
As a structure to match the #1 nozzle of left and right heads, the printer prints printing pattern using the black nozzle in the left head and light magenta nozzle in the right head. Adjustment is to change the right head position front or rear slightly based on the present left head position.
If the height position is correct, all the black and light magenta lines from the top to the bottom appear on the alignments.

Step7.   Refer to the figure below to judge if your printed result is O.K pattern or not good pattern.
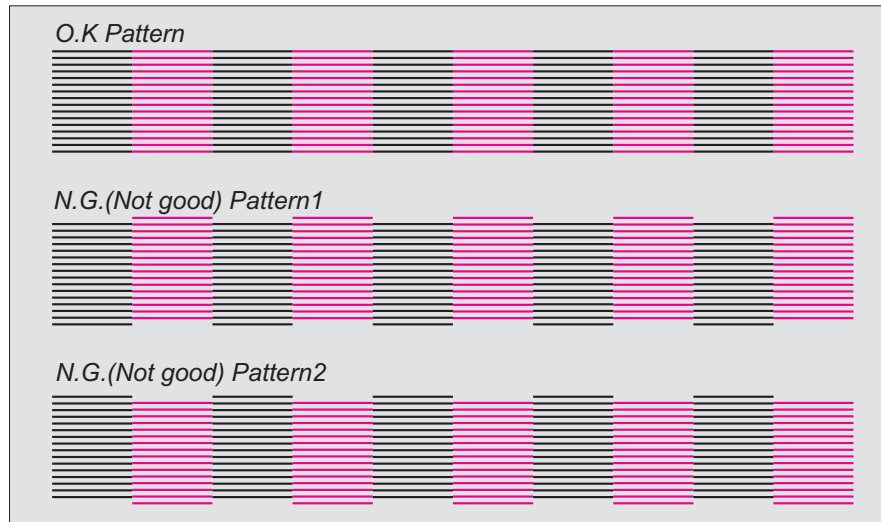
Figure 5-29. Judgment Standard for Head Height Adjustment

Step.8   It is not necessary to perform adjustment, if all the black and light magenta lines are matched in alignment, as it is shown as O.K pattern in the figure above.

Step9.   The position of the lever for the head height adjustment can be checked from the notched part of the mechanism located on the right side of the front printer. (Refer to figure5-30)

Printing pattern changes as following(figure5-31) by moving the adjustment lever up or down, as it is shown in the figure below.
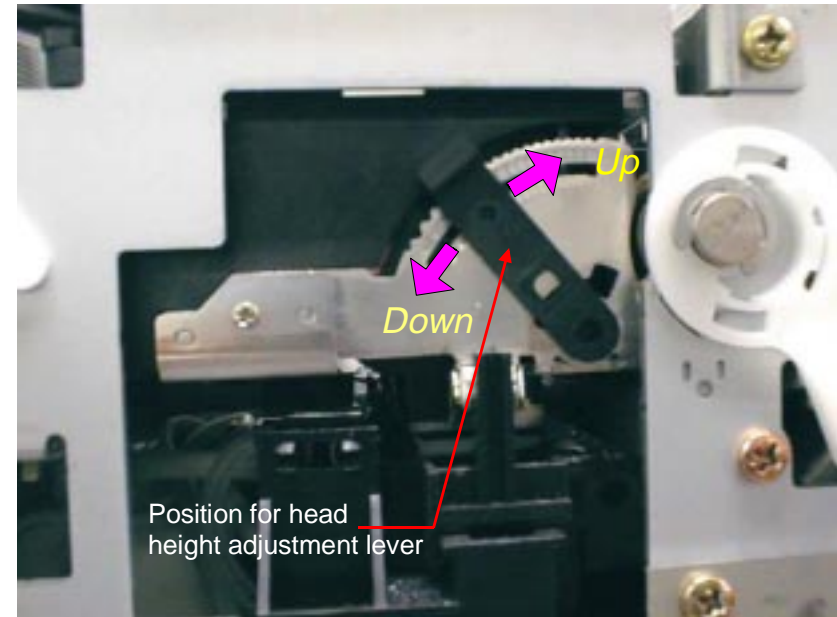
Figure 5-30. Position for Head Height Adjustment Lever
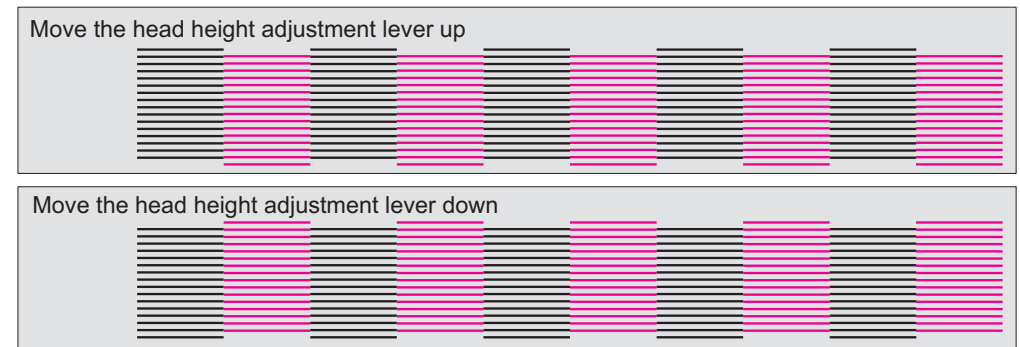
Figure 5-31. Tendency of Pattern Changes by Adjustment Lever

Step10.   Refer to figure 5-31, and move the lever to appropriate
               direction after checking the lever position and tendency of
               pattern changes. Then, press Return key on the program
               again and execute printing.
Step11.   Press Eject button on the control panel and check the
               result of the printed pattern.
Step12.   Refer to O.K pattern in the figure5-29, and repeat Step4
               through 11 until the head height adjustment is completed.
Step13.   Tighten a screw (2 screws if both heads are replaced) to fix
               the head completely, and install the cover over the carriage
               by one screw.
Step14.   Install the upper case.
Step15.   Perform the next section 5.1.1.6 "Head Gap Adjustment".

5.1.1.6 Head Gap Adjustment

The head gap adjustment checks the mixed pattern of black from the left head (for dark colors) and light magenta from the right head(for light colors) by the following procedure; Printing →Checking→Adjustment→Checking. Following shows conditions that require this adjustment.

Table 5-10. Conditions that Head Gap Adjustment is required

No.	Conditions	Reason/Background
1	Head Exchange	If the head is exchanged, new head ID or various characteristics are newly registered in the C228 DRV board. Because of this, it becomes necessary to change the head gap adjustment value and Bi-D adjustment value.
2	C228 DRV Board Exchange	Head gap adjustment value and Bi-D adjustment values are stored in the EEPROM on the C228 board by parameter, which is electrical Timing corrected data. Therefore, if C228 DRV board is replaced, since these data are all cleared, it becomes necessary to register them again.
3	Other environmental changes	In the ink jet printers, there are cases that the adjusted data in the factory does not work as it is supposed to under the particular environments. As a more specific example, there is a problem that the perfect color matching becomes difficult by the adjusted head gap values in the factory, because ink viscosity changes in the extremely cold or hot environments. Considering this kind of possibilities, the user is able to adjust directly from the driver in the present EPSON ink jet printers.

Following shows procedure.

Step1.   Connect PC and printer with printer cable and turn both PC and printer on.

Step2.   Type the following sentence on the DOS or DOS Prompt.

> **C:\mode lpt1:_retry=p**

⚠**WARNING**   *Typing this sentence prevents PC from going to Time Out Error, maintaining the scan mode until the PC is able to recognize the printer ID correctly, which comes back from the printer. If you ignore this operation, the program may hang up on the initial screen.*

Step3.   Type as following on the DOS Prompt for exclusive program Stylus Pro.5000.EXE attached with this manual.

> **A(In case of FD): \spro.5000.EXE**

⚠**WARNING**   *When typing the sentence above, the program hangs up on the initial screen, if the printer is not turned on. In this case, start again from Step1.*

Step4.   Following screen appears.

```
Starting SERVICE PROGRAM

Printer model name is Stylus Pro5000
          Is this ok?


              YES
              NO




ESC: Return  UP/DOWN: Select  ENTER: Determine
```

Figure 5-32. Initial Screen for Stylus Pro5000.EXE

⚠️ **CAUTION**   *If this screen does not appear, following case might be the reason.*
■ Mode Command is not typed. (Refer to Step2)

Step5.   When PC reads the printer ID, the screen in the condition which "Yes" is selected appears. Then, press Return key.
Step6.   Following screen appears.

```
******Stylus Pro5000 SERVICE PROGRAM  Version 1.0******

 SERVICE ITEMS


     << ADJUSTMENT >>
     << MAINTENANCE >>
     << A4 PATTERN PRINTING >>




ESC: Return  UP/DOWN: Select  ENTER: Determine
```
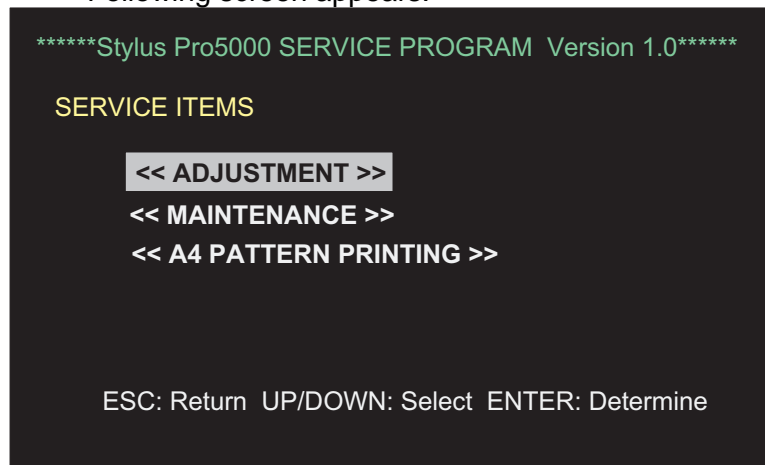
Figure 5-33. Selecting "Adjustment" on the screen

Step7.   Select "Adjustment" and press Return key.
Step8.   Following screen appears.

```
******Stylus Pro5000 SERVICE PROGRAM  Version 1.0******

   << ADJUSTMENT >>


       Market Destination Check

       Head Voltage ID Input
       Head Angular Adjustment(Check pattern printing)
       Head Height Adjustment (Check pattern Printing)
       Head GAP Timing Adjustment
       Bi-Directional Adjustment



ESC: Return  UP/DOWN: Select  ENTER: Determine
```
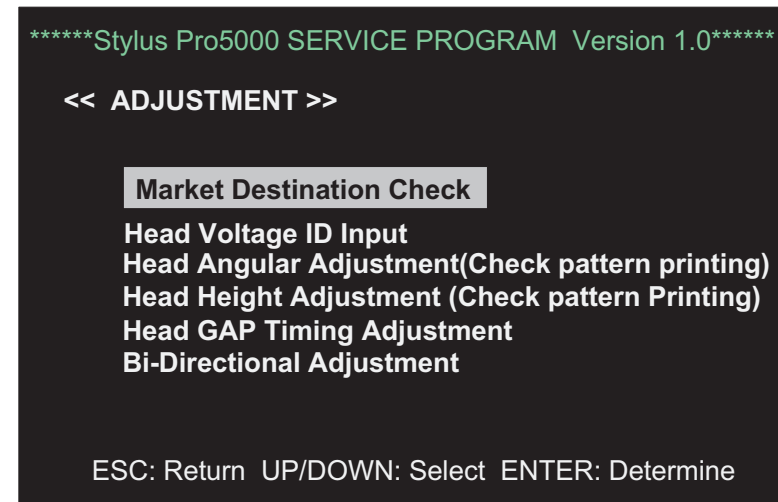
Figure 5-34.Main Menu for Adjustment

Step9.   Select "Head Gap Timing Adjustment" and press Return key.
Step10.   Following screen appears.

```
Head Gap adjustment


     Printing out head Gap pattern

     Adjustment
     Reading out a present adjustment data




ESC: Return  UP/DOWN: Select  ENTER: Determine
```
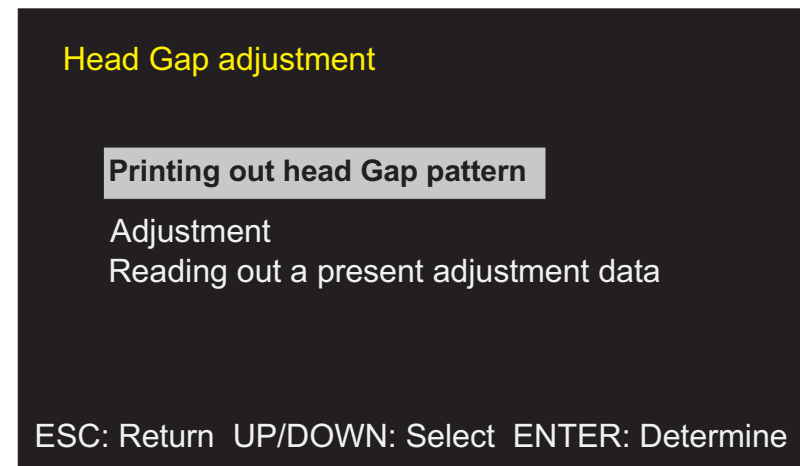
Figure 5-35. Screen After Selecting the Head Timing Gap Adjustment

Stpe11.   Select "Printing out head gap pattern" .
Stpe12.   Following screen appears.

Printing out a head Gap pattern by present data
200CPS: present data-2, present data, present data+2

ESC: Return   ENTER: Determine
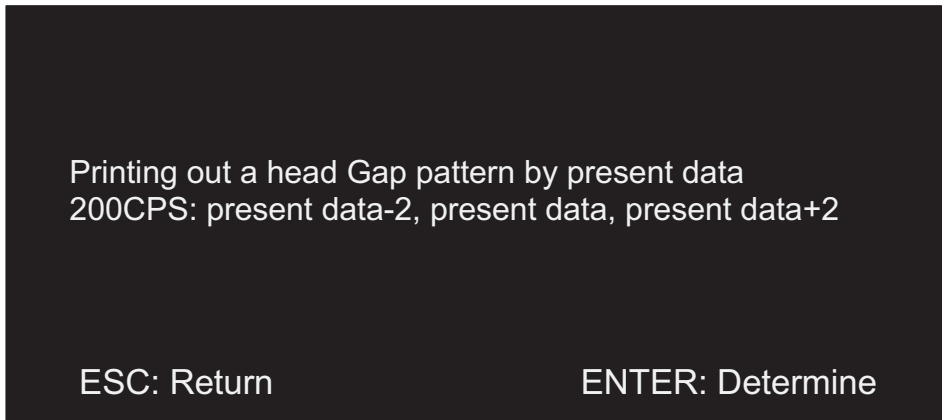
Figure 5-36. Screen Before Performing Head Gap Adjustment

⚠**CAUTION**   *The message on the screen of figure above means to perform 3 printing sample patterns, taking offset of the present head gap adjustment value. Therefore, if the center value "0" is already input, you can check the 3 printing sample patterns, based on – 2, 0, and +2 adjustment values.*

Step13.   Press Return key. (At this time, the screen shows the message; "Printing the head gap pattern")
Step14.   Following printing result is output. (After the printing is over, the screen returns to the screen of figure5-35)It is not necessary to perform this adjustment, if each black line and magenta line make one straight line just like Head Gap adjustment=0 in the figure5-37.

Head Gap adjustment= -2

Head Gap adjustment= 0

Head Gap adjustment= +2
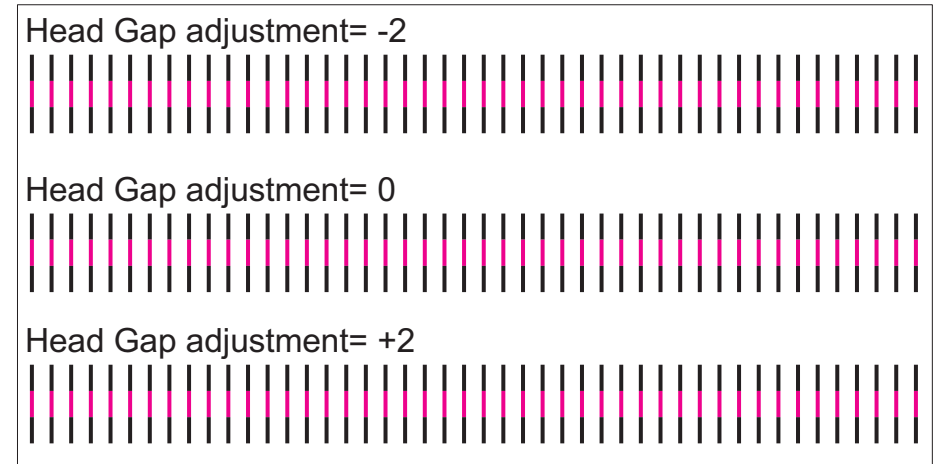
Figure 5-37. Printing Sample for Checking the Head Gap

Step15.   Tendency of changes for the parameter and printing samples is seen as following, by referring to figure5-37.

- Parameter is small: Magenta line moves to left direction.
- Parameter is big: Magenta line move to right side direction.

Step16.   Select "Adjustment" on the "Head Gap Adjustment" screen.
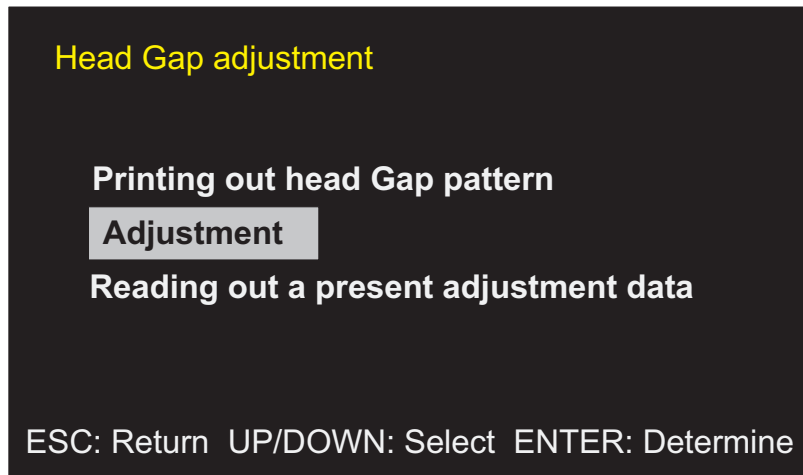
Figure 5-38. Selecting "Adjustment" on the Screen

Step17.   Following screen appears.
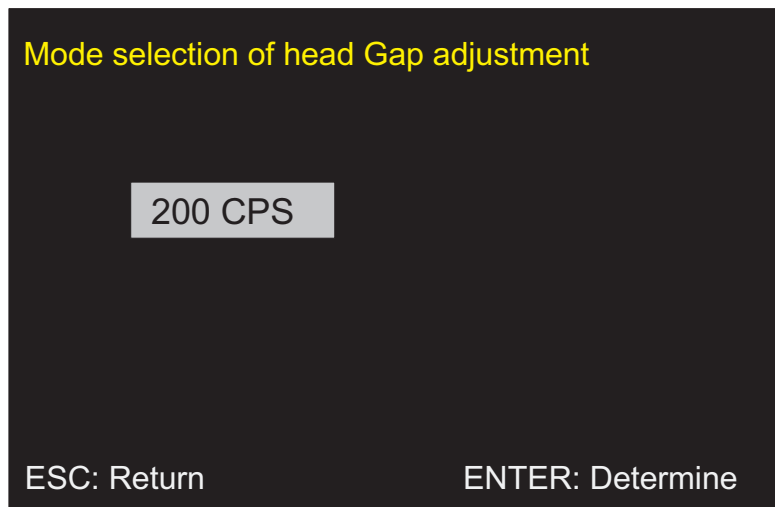
Figure 5-39. Screen After Selecting "Adjustment"

Step18.   Press Return key on the screen above.

Step19.   Following screen appears.(Initial value "0" is output, as it is shown in the figure below)
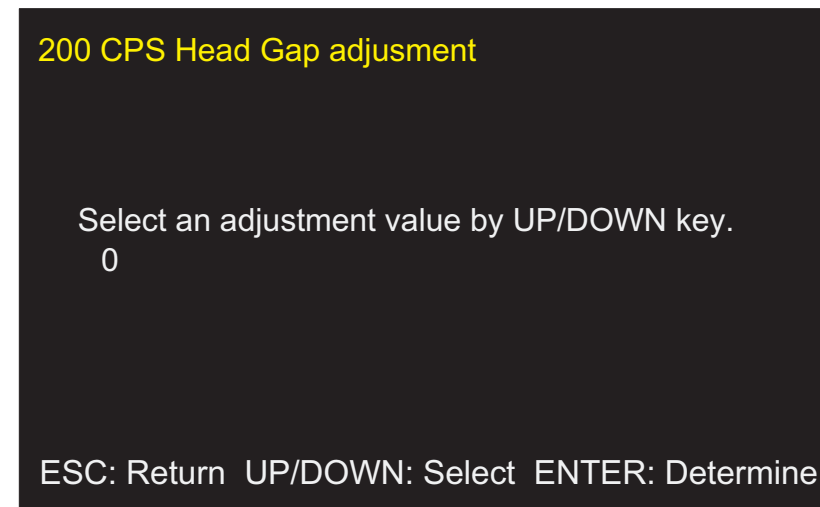
Figure 5-40. Selecting the Setting Value

Step20.   From the tendency of parameter changes and actual printing
               sample(Step.15), select the assumed center value, which you
               want to change, by up/down key and press Return key.
               If the printer accepts the selected value, the carriage
               operates once and stops soon.
Step21.   The printer prints out 3 patterns(initial value −2/initial
               value/initial value+2) based on the newly selected parameter
               as initial value. (Printing sample like figure5-37 is output)
Step22.   Check the printed pattern output on the Step21, if correct
               black and magenta lines, which should make straight one
               lines, are output or not. It is not necessary to perform more
               adjustment, if the black and magenta lines match each other
   and make straight lines in the middle example.
Step23.   Repeat Step10 through Step22 until one sample which black
               and magenta lines match each other is output among 3
               patterns.
Step24.   When the good sample is found among 3 patterns, remember
               that parameter value and select "Adjustment" on the "Head
               Gap Adjustment" screen. (Refer to figure5-38)
Step25.   Press Return key. (It goes to the screen of figure5-39)
Step26.   Press Return key. (It goes to the screen of figure5-40)
Step27.   By using up and down key, change the initial value "0" to the
               parameter value, which is remembered at Step 24.
Step28.   Press Return key. If the printer accepts the selected value,
               the carriage operates once and stops soon.
Step29.   Press ESC key 3 times, then the screen returns to the
               adjustment menu.
Step30.   Go to the next section "Bi-D Adjustment".

⚠CAUTION   *By pressing ESC key 5 times at Step29, the*
                   program can be completed. In this program
                   (service program), the printer is turned off
                   completely, since the power off command is
                   always output when the program finishes.
                   However, this is not the malfunction. By this
                   command, the adjustment values are surely
                   registered in the EEPROM.

5.1.1.7 Bi-D Adjustment

Bi-D adjustment is performed only to the black nozzle in the left head(for dark colors), and its procedures are done like head gap adjustment; printing→checking→adjustment→checking. This adjustment should be done until 2 vertical lines; one even line and one odd line match each other and make one straight line. Following shows conditions which require this adjustment.

Table 5-11. Conditions that require Bi-D Adjustment

No.	Conditions	Reason/Background
1	Head Exchange	If the head is exchanged, new head ID or various characteristics are newly registered in the C228 DRV board. Because of this, it becomes necessary to change the head gap adjustment value and Bi-D adjustment value.
2	C228 DRV Board Exchange	Head gap adjustment value and Bi-D adjustment values are stored in the EEPROM on the C228 board by parameter, which is electrical Timing corrected data. Therefore, if C228 DRV board is replaced, since these data are all cleared, it becomes necessary to register them again
3	Other environmental changes	In the ink jet printers, there are cases that the adjusted data in the factory does not work as it is supposed to under the particular environments. As a more specific example, there is a problem that the perfect color matching becomes difficult by the adjusted head gap values in the factory, because ink viscosity changes in the extremely cold or hot environments. Considering this kind of possibilities, the user is able to adjust directly from the driver in the present EPSON ink jet printers.

Following shows its procedure.

Step1.   Connect PC and printer with printer cable and turn both PC and printer on.
Step2.   Type the following sentence on the DOS or DOS Prompt.

> **C:\mode lpt1:_retry=p**

⚠**WARNING**   *Typing this sentence prevents PC from going to Time Out Error, maintaining the scan mode until the PC is able to recognize the printer ID correctly, which comes back from the printer. If this operation is not performed, the program may hang up on the initial screen.*

Step3.   Type as following on the DOS Prompt for exclusive program; Stylus Pro.5000.EXE attached with this manual.

> **A(In case of FD): \spro.5000.EXE**

⚠**WARNING**   *When typing the sentence above, the program hangs up on the initial screen, if the printer is not turned on. In this case, start again from Step1.*

Step4.   Following screen appears.

```
Starting SERVICE PROGRAM

Printer model name is Stylus Pro5000
        Is this ok?


          YES
           NO




ESC: Return  UP/DOWN: Select  ENTER: Determine
```

Figure 5-41. Initial Screen for Stylus Pro5000.EXE

⚠️**CAUTION**   *If this screen does not appear, following case might be the reason.*
■ Mode Command is not typed. (Refer to Step2)

Step5.   When PC reads the printer ID, the screen in the condition which "Yes" is selected appears. Then, press Return key.
Step6.   Following screen appears. (See Figure5-42)

```
******Stylus Pro5000 SERVICE PROGRAM  Version 1.0******

 SERVICE ITEMS

          << ADJUSTMENT >>

        << MAINTENANCE >>

        << A4 PATTERN PRINTING >>




ESC: Return  UP/DOWN: Select  ENTER: Determine
```
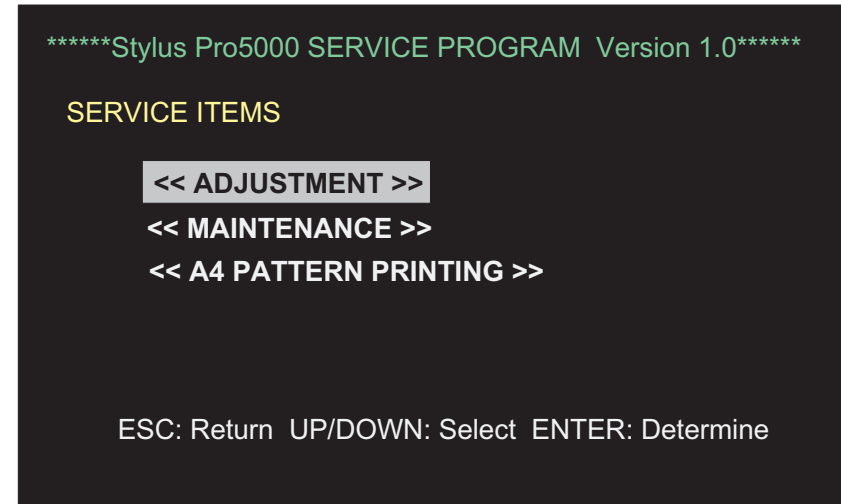
Figure 5-42. Selecting "Adjustment" on the Screen

Step7.   Select "Adjustment" and press Return key.
Step8.   Following screen appears.

```
******Stylus Pro5000 SERVICE PROGRAM  Version 1.0******

  << ADJUSTMENT >>


      Market Destination Check

    Head Voltage ID Input
    Head Angular Adjustment(Check pattern printing)
    Head Height Adjustment (Check pattern Printing)
    Head GAP Timing Adjustment
    Bi-Directional Adjustment



ESC: Return  UP/DOWN: Select  ENTER: Determine
```

Figure 5-43. Main Menu for Adjustment

Step9.   Select "Bi-Directional Adjustment" and press Return key.

Step10.   Following screen appears.

> **Bi-directional adjustment**
>
>   **Print out Bi-d pattern**
>
>   **Adjustment**
>   **Checking a present adjustment data**
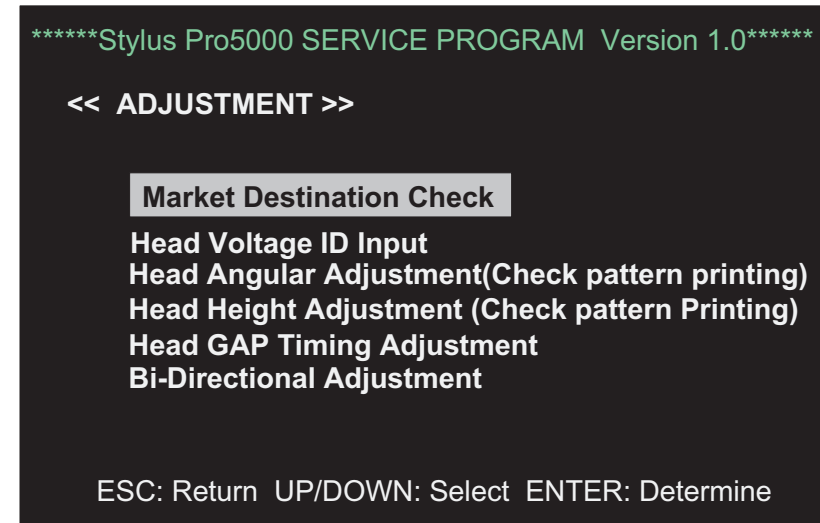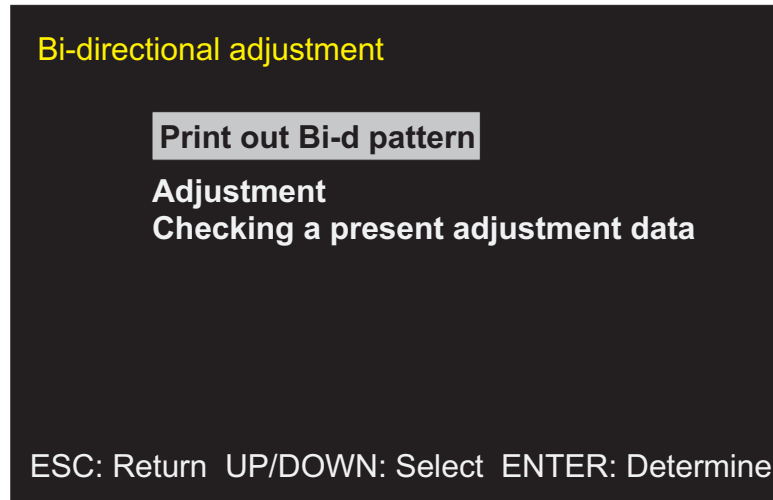>
>
>
> ESC: Return   UP/DOWN: Select   ENTER: Determine

Figure 5-44. Main Menu for Bi-D Adjustment

Step11.   Select "Print out Bi-D pattern".
Step12.   Following screen appears.

>   Print out a Bi-d pattern by present data
>
>   **Normal Dot: present data-2, present data, present data+2**
>   **Micro Dot : present data-2, present data, present data+2**
> **Super Micro Dot: present data-2, present data, present data+2**
>
>
>   ESC: Return   ENTER: Determine
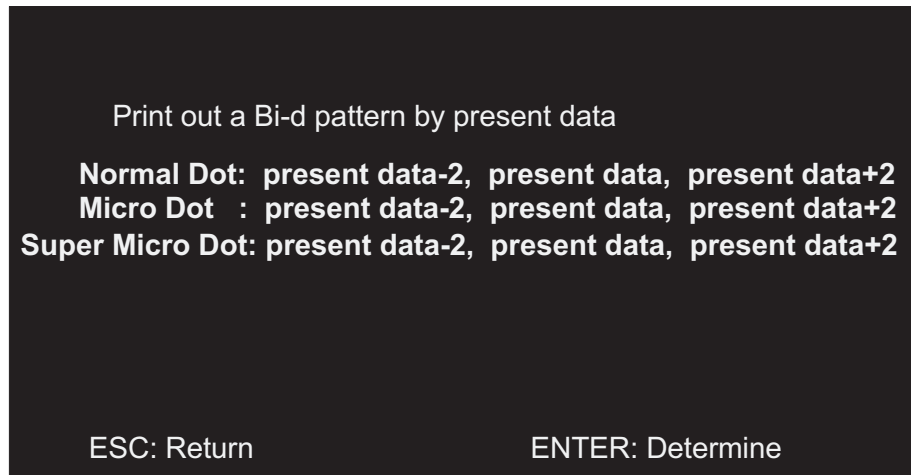
Figure 5-45. Screen After Selecting "Print out Bi-D pattern"

⚠**CAUTION**

> *The message on the screen of figure5-45 means to adjust 3 printing patterns for 3 dot types respectively ; normal, micro and super micro dot, taking offset of the present head gap adjustment value. Therefore, if the center value "0" is already input, you can check the 9 printing sample patterns, based on –2, 0, and +2 adjustment values.*

Step13.   Press Return key. (During printing, the message, "Bi-D pattern is being printed out now" appears on the screen)

Step14.　　Printing sample as it is shown in the figure5-46 is output. (After printing is completed screen returns to the screen of figure5-44)

Normal Dot Bi-D Data=-20

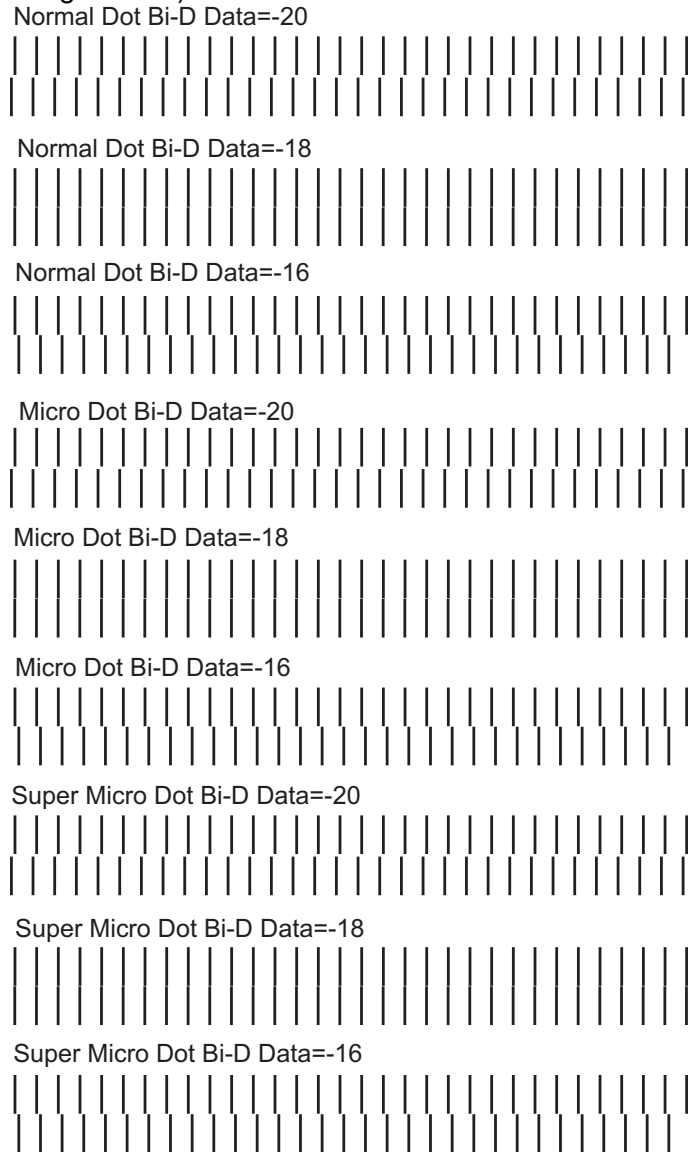||||||||||||||||||||||||||||||||||||||||||
||||||||||||||||||||||||||||||||||||||||||

Normal Dot Bi-D Data=-18

||||||||||||||||||||||||||||||||||||||||||
||||||||||||||||||||||||||||||||||||||||||

Normal Dot Bi-D Data=-16

||||||||||||||||||||||||||||||||||||||||||
||||||||||||||||||||||||||||||||||||||||||

Micro Dot Bi-D Data=-20

||||||||||||||||||||||||||||||||||||||||||
||||||||||||||||||||||||||||||||||||||||||

Micro Dot Bi-D Data=-18

||||||||||||||||||||||||||||||||||||||||||
||||||||||||||||||||||||||||||||||||||||||

Micro Dot Bi-D Data=-16

||||||||||||||||||||||||||||||||||||||||||
||||||||||||||||||||||||||||||||||||||||||

Super Micro Dot Bi-D Data=-20

||||||||||||||||||||||||||||||||||||||||||
||||||||||||||||||||||||||||||||||||||||||

Super Micro Dot Bi-D Data=-18

||||||||||||||||||||||||||||||||||||||||||
||||||||||||||||||||||||||||||||||||||||||

Super Micro Dot Bi-D Data=-16

||||||||||||||||||||||||||||||||||||||||||
||||||||||||||||||||||||||||||||||||||||||

Figure 5-46. Bi-D Printing Sample(Example)

Step15.　　Tendency of changes for the parameter and printing samples is seen as following, by referring to figure5-46.

- Parameter is small:　　Even lines move to left direction.
- Parameter is big:　　Even lines move to right direction.

Step16.　　Select "Adjustment" on the screen of figure 5-44 and input the parameter value that you think most appropriate to the center values of 3 printing samples for each dot size, referring to figure5-46.
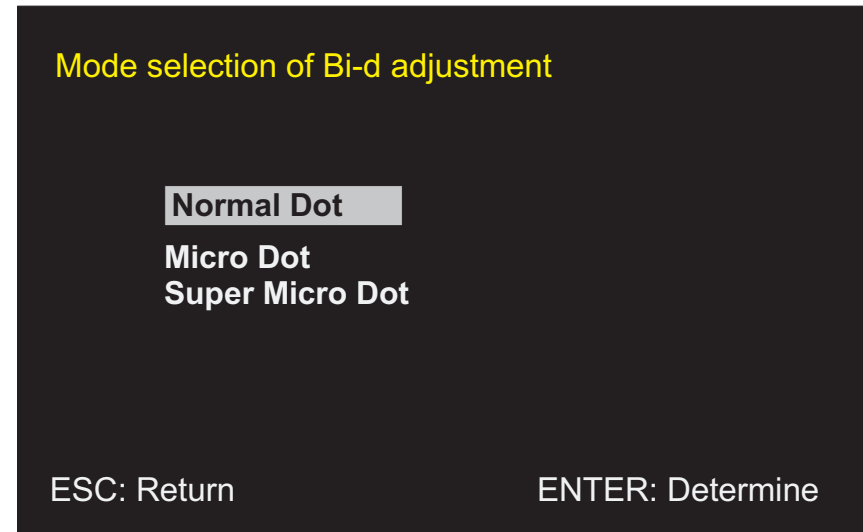
Mode selection of Bi-d adjustment

　　　　Normal Dot

　　　　Micro Dot
　　　　Super Micro Dot

ESC: Return　　　　　　　　ENTER: Determine

Figure 5-47. Selecting Dot Type

Step17.　　Select dot type which you wish to adjust, or select all in order, referring to each 3 types of printed results in the figure 5-46.

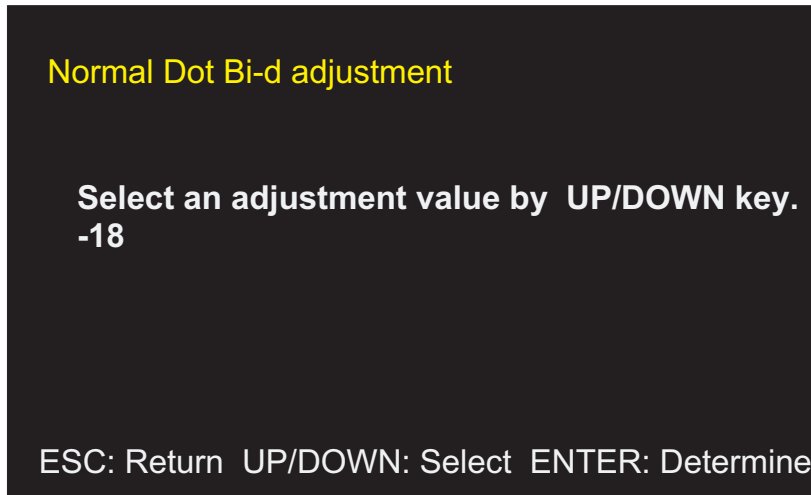Step18.   Following screen appears.(Example in the figure; Normal Dot)

```
   Normal Dot Bi-d adjustment


     Select an adjustment value by  UP/DOWN key.
     -18




  ESC: Return  UP/DOWN: Select  ENTER: Determine
```

Figure 5-48. Inputting Bi-D Adjustment Value

Step19.   Input assumed center value, using up and down key. (Following screen appears)

```



   As Normal Dot data, -18 has been written in EEPROM.




  ESC: Return
```
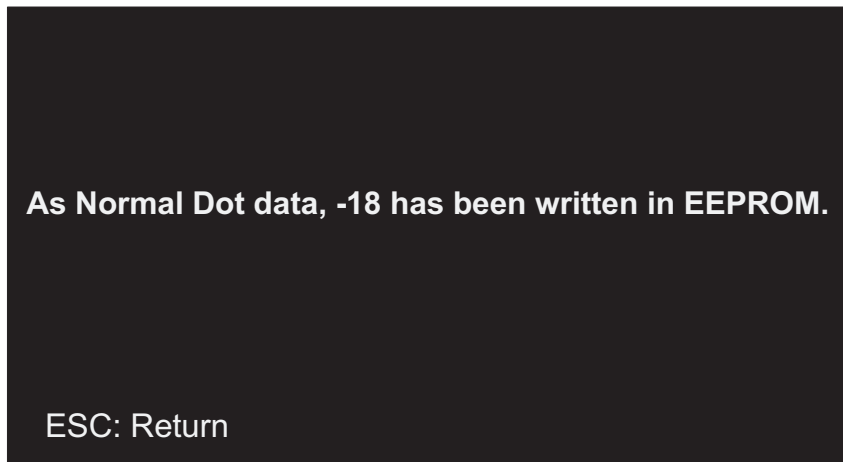
Figure 5-49. Determining Bi-D Adjustment Value

Step20.   If you need to continue adjustment for other dot types, press ESC key one time and go back to the screen of figure5-47, then repeat Step17 through 19. If you need not to continue adjustment, move to Step21.

Step21.   Press ESC twice and go back to the screen of figure5-44, then select "Print out Bi-D pattern".

Step22.   Repeat Step12 through Step 21and continue adjustment until the correct printing sample (each even and odd line match) is found.

Step23.   After adjustment is completed, press ESC key for 4 times and finish the program.

⚠**CAUTION**   *When the program is finished at Step23, since the power off command is always output, the printer is turned off completely. However, this is not the malfunction. By this command, the adjustment values are surely registered in the EEPROM.*

5.1.1.8 Uploading of Firmware

In the spare part C228 main board for exchange, the program for firmware is not input in the flash memory. Therefore, when C228 main board needs to be replaced on the service, make sure to take the following procedure and to perform uploading firmware.

⚠**WARNING** *After C228 main board is replaced, if Uploading Firmware explained in this section is not performed, the printer does not operate, even after the power is turned on.*

Step1. Connect PC and the printer by the printer cable, and turn only the PC on.

Stpe2. Turn on the printer, pressing all 3 buttons except the operate button on the control panel.

⚠**CAUTION** *When the printer enters this mode correctly, LED light for manual feed(red) turns on. If this light does not turn on, perform Step2 again.*

Figure 5-50. Panel Condition when Entering Upload Mode

Step3. Type the following sentence on the DOS or DOS Prompt.

> **X:\COPY_IPL2.HEX_LPT1**

Note) "X" means drive.

⚠**CAUTION** *While the command sentence above is transmitted correctly, black ink out light(black ink LED) blinks. Then, when the transmission of IPL2 is completed correctly, the cyan ink out light (cyan ink LED) blinks to indicate that transmission is over. (Transmission is completed in 3 seconds.)*

⚠**WARNING** *This command sentence is just a wake up command in order to get the firmware started, and not to operate the firmware itself. Therefore, even if only this operation is performed and turn the printer on or off, the printer does not go to the waiting mode. Hence, you must continue adjustment until Step 8.*

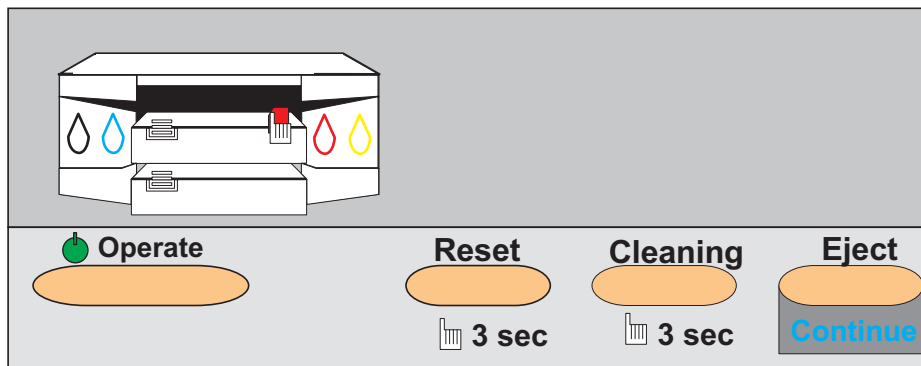Step4. When the transmission of IPL2 is completed correctly, it goes to the following panel condition.
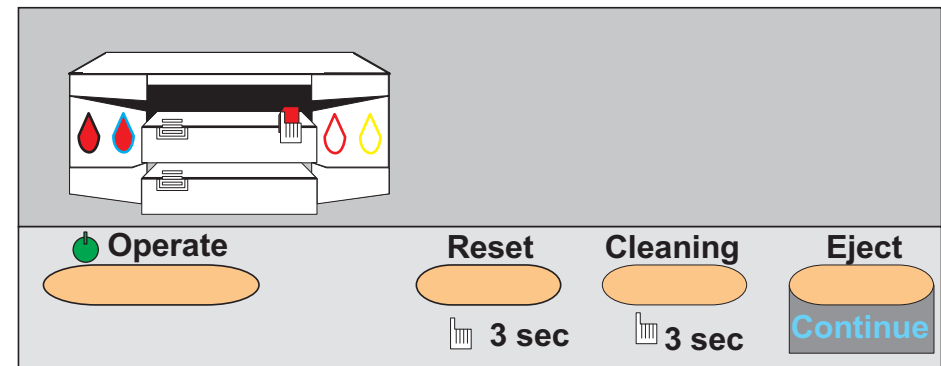

Figure 5-51. Panel Condition After IPL2 Transmission is over

Step5.   After Step4, make sure the black ink out light(black ink LED)
                and cyan ink out light(cyan ink LED)are completely turned on.
                Then, wait for 5 to 6 seconds and type the following sentence
                on the PC.

X:\COPY_K0287X.HEX_LPT1

Note) "X" means drive.

Step6.   About 10 seconds later, magenta ink out light (magenta ink
                LED) turns on.
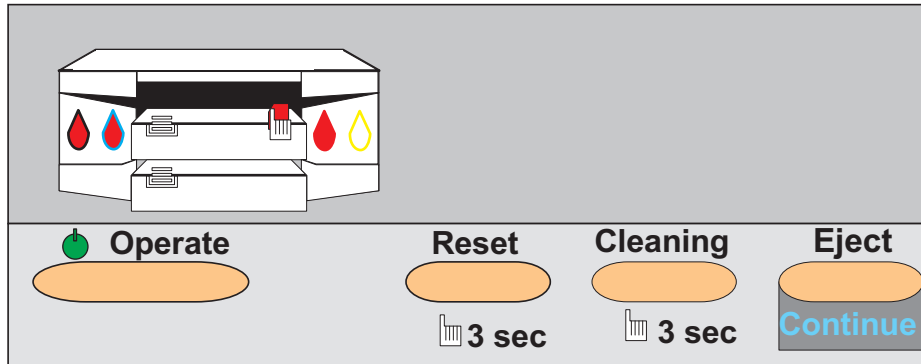

Figure 5-52. Panel Condition During the Firmware Transmission

Step7.   When the transmission of firmware is completed correctly,
                yellow ink out light(yellow ink LED) turns on.

⚠**CAUTION**   *It takes about 3 minutes to complete the firmware*
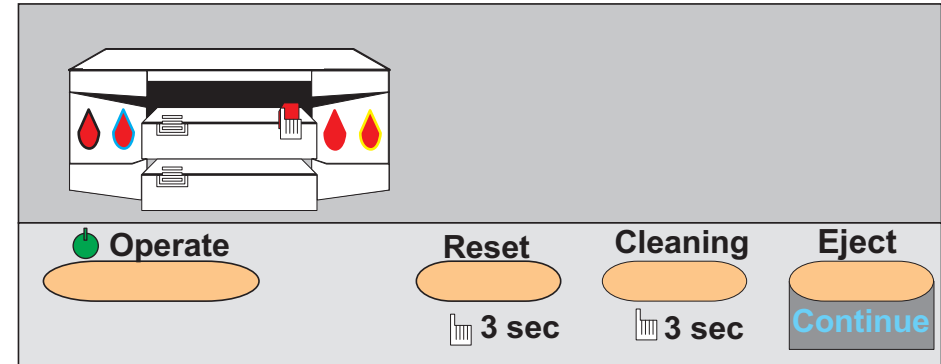   *transmission.*

Figure 5-53. Panel Condition After the Firmware Transmission is over

Step8.   Make sure to turn off the printer, otherwise, the printer does
                not go to the waiting mode when it is turned on again.

5.1.1.9 Parallelism Adjustment

Parallelism adjustment is to adjust the distance between the nozzle plate surface and platen, setting the thickness gage to the both edges of the carriage running range, which the carriage can move, and to secure that distance.
If this adjustment is not performed correctly, problems such as dirty printing or partial ink dry printing, or no contact between the head surface and the cleaning blade occur. In the worst case, the printer may go to the carriage error. Therefore, make sure to perform this adjustment at the following conditions.

Table 5-12. Conditions which require Parallelism Adjustment

No.	Conditions	Reason/Background
1	Carriage removal	Even if you make a mark to the position of the parallelism adjustment bush before disassembly, it is still necessary to perform this adjustment(if the left conditions apply), since precise assembling difference occurs on the process of assembly.
2	When moving the parallelism adjustment bush	

Step1.   After removing the upper case, insert the A3 exclusive glossy paper to the rear manual feed slot. As an actual method to, insert the paper, pull out the iron part, which is pressed by 7 tension wires to the reverse rotational mechanism, toward you(in other words, toward print rear direction), and push the glossy film until it stops in the position between the paper load roller and paper feed support roller at the same time. (Refer to figure below)
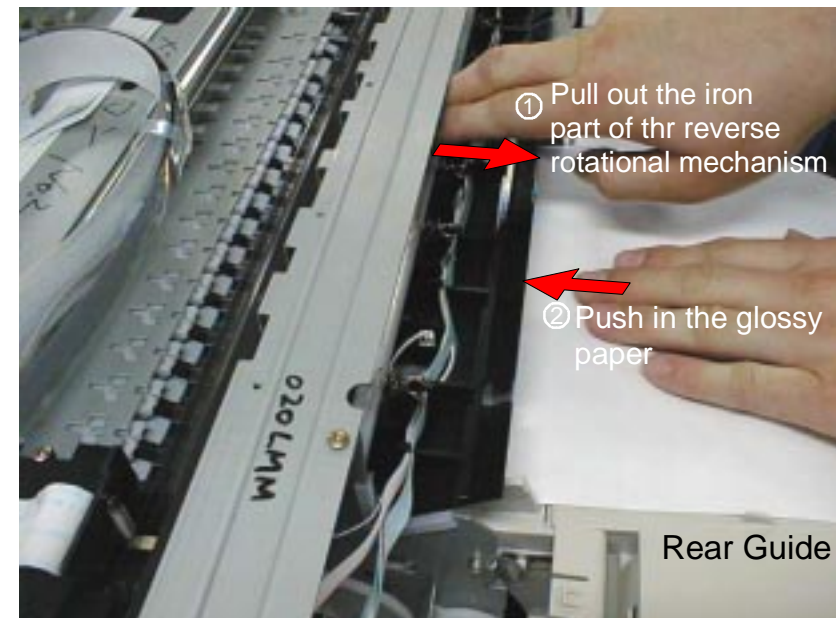

Figure 5-54. Setting the Glossy Paper At the Parallelism Adjustment

Step2. When the paper stops, rotate the paper feed driven(high precision) gear clockwise manually, adding hand power to 2 dimples of the gear surface.

⚠ **WARNING**

> *It is prohibited to touch the paper feed driven gear directly. If the paper feed driven gear is touched directly by hand, it is found out that even the grease from hands gives bad influence on the paper feed pitch. So, rotate the gear manually, holding the 2 dimples on the gear surface.*
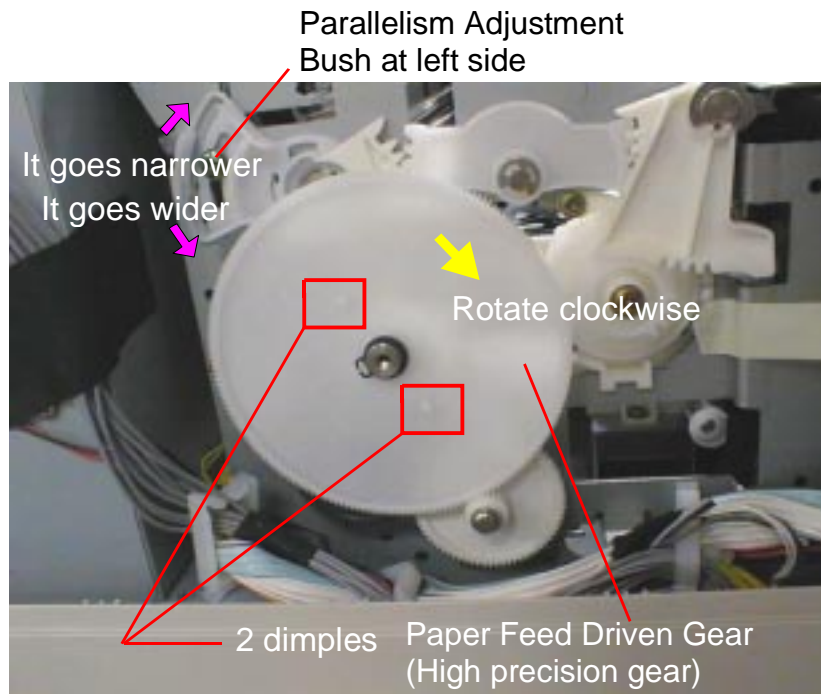

Figure 5-55. Rotational Direction of Paper Feed Driven Gear

Step3. Rotate the paper feed driven gear until the glossy film is pushed completely into the paper eject unit side. The figure below shows glossy film condition before the adjustment is performed.
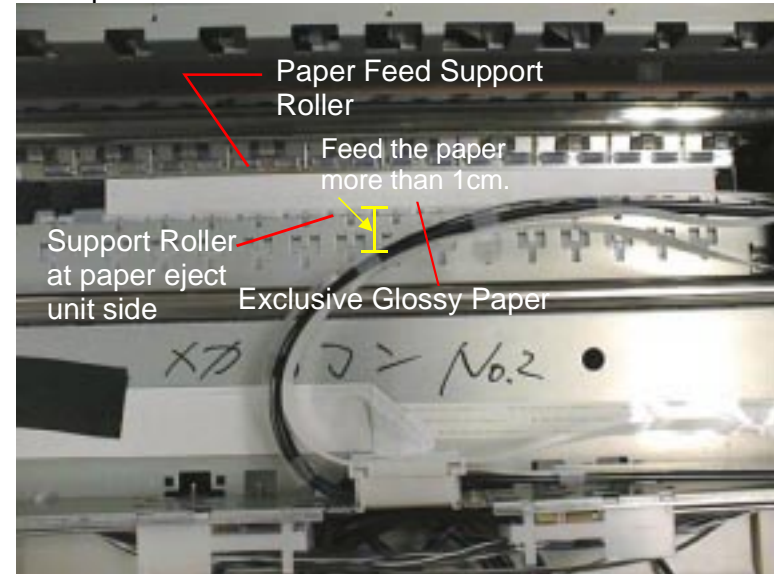

Figure 5-56. Condition After the Glossy Paper is set

⚠ **WARNING**

> *After involving A3 exclusive glossy paper into the paper eject unit, feed the paper more than 1 cm additionally, by rotating the paper feed driven gear. Otherwise, paper does not become stable and PG value might be measured wrong when placing the thickness gage.*

⚠ **CAUTION**

> *Although the platen gap mechanism is controlled automatically, it is not necessary to make PG small before performing the parallelism adjustment, since PG becomes small in the waiting condition, even if PG is set big intentionally from the driver or by the special setting from the control panel.*

Step4.   Loosen 2 parallelism adjustment bushes on both sides once. Figure below shows the position of fixing screw for adjustment bush at the right side. (Refer to figure5-55 for the fixing screw at the left side.)
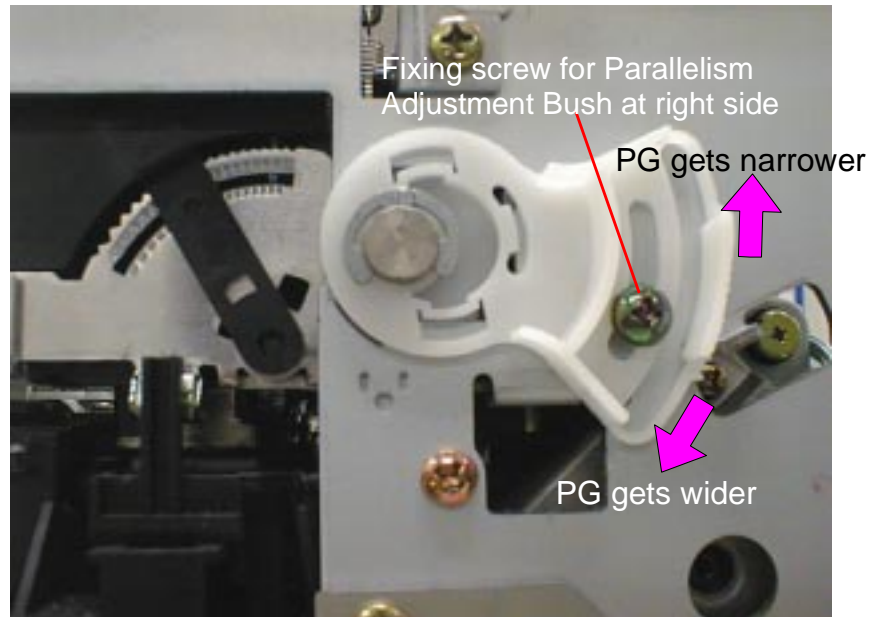

Fixing screw for Parallelism Adjustment Bush at right side

PG gets narrower

PG gets wider

Figure 5-57. Fixing Screw for Parallelism Adjustment Bush (Right Side)

Step5.   Set the 1mm thickness gage, matching it with the right edge of A3 glossy paper.

Step6.   When moving the carriage, holding the timing belt by your hand but not touching the carriage unit directly, move the parallelism adjustment bush upward gradually, until the 1mm thickness gage is interfered and stars moving.

Step7.   Move back the parallelism adjustment bush one notch toward the direction that PG becomes wider, based on the position that the thickness gage moved.

Step8.   Place the thickness gage, matching it with the left edge of A3 glossy paper, and repeat the procedure Step5 through Step7 until adjustment is completed.

Step9.   Set the 1mm thickness gage, matching it with the right edge of A3 glossy paper again. Holding the timing belt with your hand, and make sure that the thickness gage does not move when the carriage unit moves to right side.
                If it moves, repeat Step5 through Step9.

Step10.   Remove the glossy paper and tighten both left and right fixing screws for parallelism adjustment bush.

Step11.   Install the upper case.

Step12.   Check the printing result and complete the operation.

5.1.1.10 Upper Surface Sensor Positioning Adjustment

Upper surface sensor is the sensor to stop the lifter height at appropriate position according to the paper volume, when the paper is picked up from the paper tray. (Refer to Chapter2 for more details) If the timing of this sensor is not right, the position that the lifter stops becomes too high or too low. As a result, it causes mis-paper loading or double feeding. Following shows conditions that require this upper surface sensor positioning adjustment.

Table 5-13. Conditions that require Paper Pick Up Positioning Adjustment

No.	Conditions	Reason/Background
1	ASF Unit Exchange	Even the whole ASF unit is removed, the timing that the sensor detects the lifted lifter condition should be very accurate. Therefore, even in the simple operation to attach the removed ASF unit again, this adjustment is necessary. (This prevents precise assembling differences which happen on the process of assembly)
2	Upper Surface Sensor Exchange/Removal	Upper surface sensor is attached to the ASF unit through the spring washer by the screw. Therefore, as the screw is tightened, the angle of the sensor also changes(angle tilts downward), and as a result, its sensor timing also changes,

⚠️**WARNING**

Following exclusive tool is required for this adjustment. It is prohibited to perform disassembly and assembly without this tools.
■ *Tool Name:*   *Pick up detector(upper surface sensor) adjust tool*
■ *Adaptive Model :*   *Use only for Stylus Pro5000*
■ *Code No.:*   *103983200*

Following shows its procedure.

Step1.   Plug in the AC adapter of the adjust tool.
Step2.   Switch on the adjust tool.
Step3.   Insert the signal cable from the ASF unit to the connector of the adjust tool. Next page shows the cable connection between the adjust tool and ASF unit.
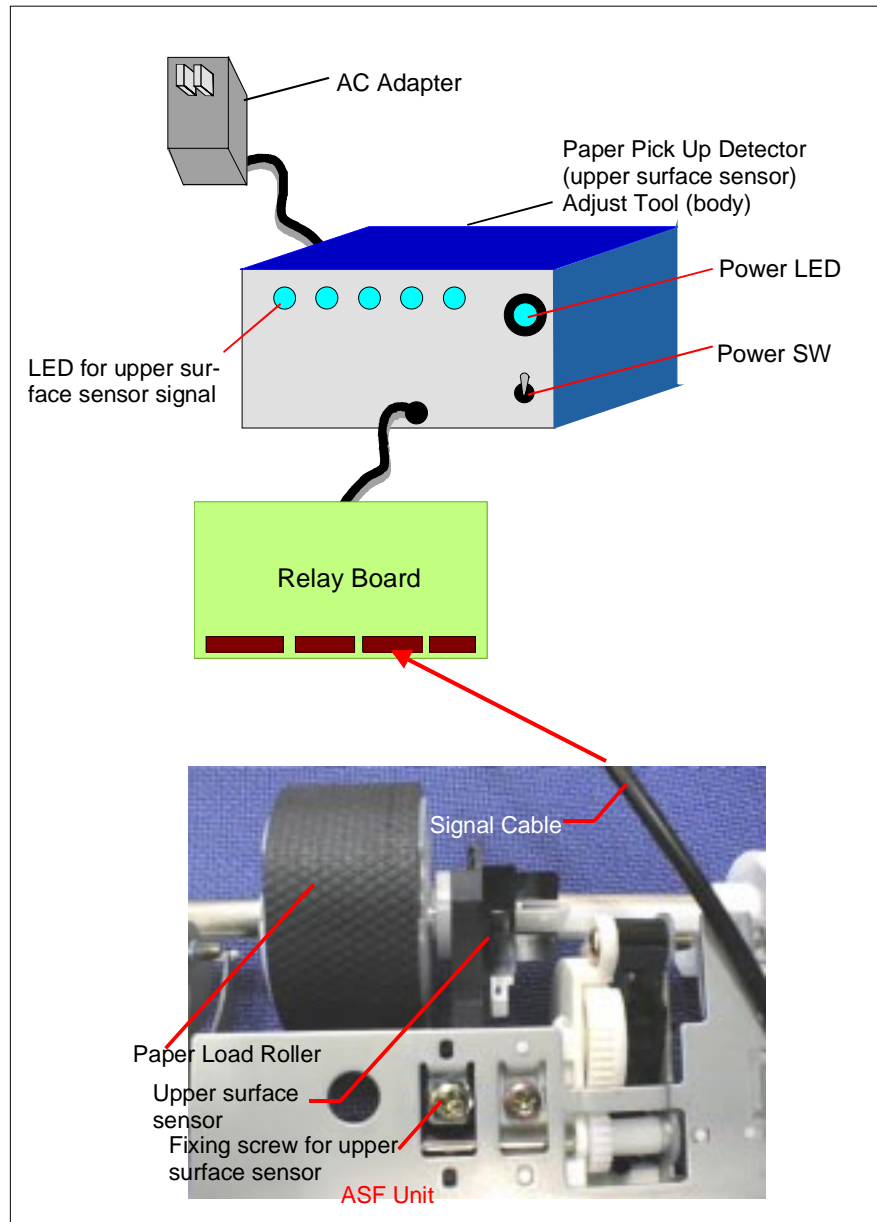
Figure 5-58. Connection between ASF Unit and Adjust Tool

Step4.   Attach the paper tray to the printer body.
Step5.   Tighten the fixing screw until the LED of the adjust tool(LED which detect the upper surface sensor signal) turns on.
Step6.   Tighten the screw slowly until LED turns off.
Step7.   When the LED goes off, apply the Neji Lock (screw lock) on the position that LED is turned on by pressing ASF unit lightly and LED goes off by leaving hand off ASF unit.

6

MAINTENANCE

6.1 CLEANING

Here explains warnings before cleaning the printer.

⚠WARNING

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

⚠WARNING

- ■ *Never use thinner, trichloroethlyene, or ketone-based solvents on the plastic components of the printer for cleaning. Instead, it is recommended to use a dry soft cloth. In case of heavy dirt, use a soft cloth moistened with diluted neutral detergent.*
- ■ *Do not use hard brush for cleaning. This may scar the case.*
- ■ *Be careful not to damage the components when you attempt to clean the inside of the printer.*

⚠CAUTION

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

6.2 MAINTENANCE

When printing failure or maintenance request occur, perform appropriate procedure as follows.

6.2.1 Head cleaning

After checking the printing result, if white banding, color banding, dot missing or alignment failure are found, it is necessary to perform cleaning for the print head. There are 3 ways of head cleaning for Stylus Pro5000.

⚠**CAUTION**

■ *Head cleaning using ink absorption does not improve the recovery from dot missing, in proportion to the quantity of absorbing. Therefore, in case of persistent dot missing, it is necessary to recover from dot missing, combining 3 cleaning methods mentioned in the figure6-1.appropriately.*
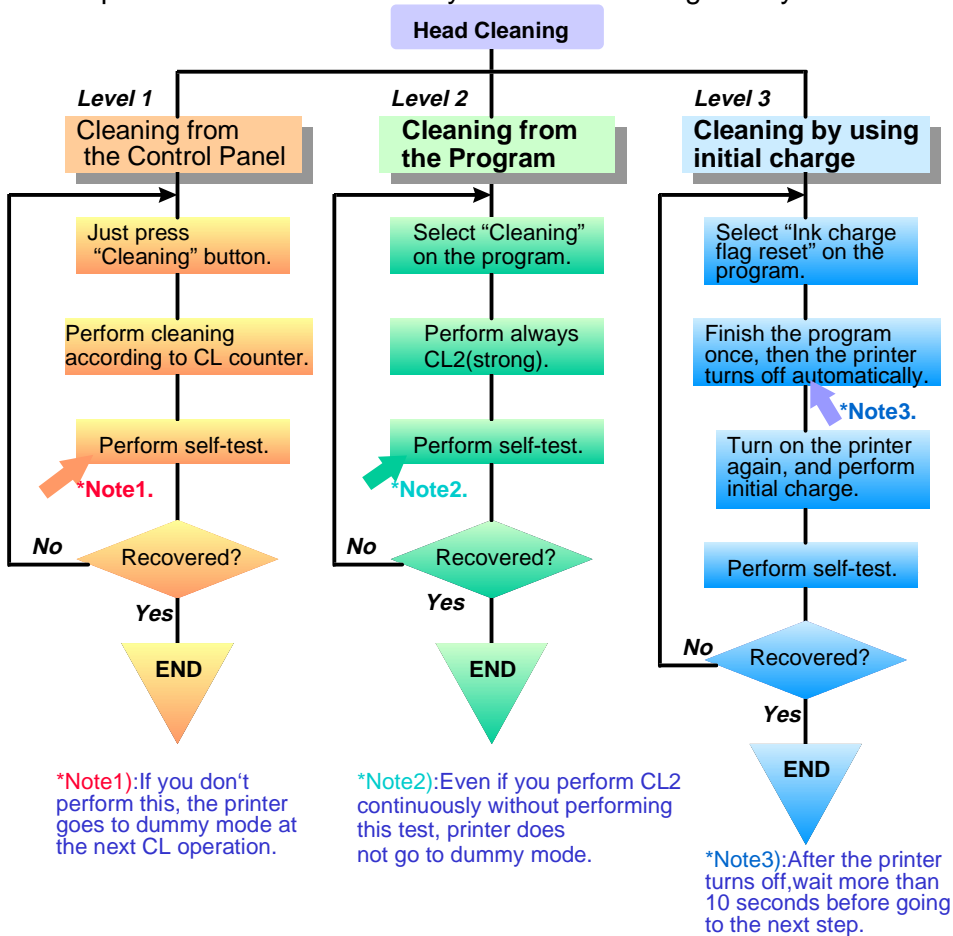
Head Cleaning

Level 1
Cleaning from the Control Panel

Just press "Cleaning" button.

Perform cleaning according to CL counter.

Perform self-test. ***Note1.**

No — Recovered?

Yes

END

*Note1):If you don't perform this, the printer goes to dummy mode at the next CL operation.

Level 2
Cleaning from the Program

Select "Cleaning" on the program.

Perform always CL2(strong).

Perform self-test. ***Note2.**

No — Recovered?

Yes

END

*Note2):Even if you perform CL2 continuously without performing this test, printer does not go to dummy mode.

Level 3
Cleaning by using initial charge

Select "Ink charge flag reset" on the program.

Finish the program once, then the printer turns off automatically. ***Note3.**

Turn on the printer again, and perform initial charge.

Perform self-test.

No — Recovered?

Yes

END

*Note3):After the printer turns off,wait more than 10 seconds before going to the next step.

Figure 6-1. Types of Cleaning

6.2.2 Maintenance Request

Maintenance request is the error to let you know that the ink absorbing capacity in the waste ink absorber located in the lower case is reaching its limit. Following shows the procedure to recover from the maintenance request.

Table 6-1. Recovering from Maintenance Request

No.	Method	Content	Procedure
1	Panel	• Reset the waste ink counter A,B,D. • Reset the Timer IC. • Reset I/F selection to Auto.	Refer to page 1-22 Maintenance mode2.
2	Program	• Waste ink counter A or B can be reset separately.	Select Waste ink counter reset in the maintenance items on the program.

⚠**CAUTION**

- ◼ **In case performing the reset from the control panel, 3 kinds of values mentioned in the table above will be cleared. Therefore, it is necessary to change 2 waste ink counters at the same time.**
- ◼ **On the other hand, in case of performing the reset from the program, since counter A or B can be cleared separately, waste ink counter can be replaced individually. However, under the normal environment, since big difference in the waste ink quantity from counter A and B(in other words, right and left heads) does not occur, it is recommended to replace the waste ink absorber and reset at the same time.**

6.3 LUBRICATION AND ADHESION

Both grease, oil and adhesive give great influence on printer's endurance. EPSON determines the type of oil and grease based on the results of internal evaluations. Grease or oil should be applied for the parts that their lubrication are worn out by cleaning, disassemble/assemble, or parts replacement. Adhesive should be used for assembly or parts replacement.

> ⚠ **CAUTION**
>
> ■ *Never use the grease, oil and adhesive other than those specified in this manual. Using different type of lubricant can damage the printer and components.*
> ■ *Never apply the exceeding the amount of grease or adhesive, in order to prevent function failure.*

Table 6-2. Specified Lubricants and Adhesive

Type	Name	Amount	EPSON Code	Application
Grease	G-26	40g	B702600001	EPSON exclusive
	G-20	40g	B702000001	EPSON exclusive
Oil	0-8	40g	1019753	EPSON exclusive
Adhesive	Screw lock 1410B	1000g	B730200200	EPSON exclusive

Table 6-3. Lubricating Points

No.	Lubricating Points	Type/Amount
1	Inside of 2 gear areas of "Cam, ASF".	G-26 (φ1x2mm)
2	2 contact areas; "Cover Assembly, Lifter" and "Lever assembly, Lifter Clutch".	G-26 (φ1x2mm)
3	2parts; Top and bottom of A axis , "Frame Assembly, Middle Right".	G-26 (φ1x2mm)
4	2 parts; Top of "E-shaped retaining ring" and A axis of "Frame Assembly, Middle, Right".	G-26 (φ1x2mm)
5	From "Lever Assembly, Planetary Gear, Sub" on the "Frame, Assembly, Middle, Right" of F axis to the ditch on the axis.	G-26 (φ1x25mm)
6	G axis of "Frame Assembly, Middle, Right".	G-26 (φ1x2mm)
7	Bent area located on the tip of "Lifter Gear Train Cover Assembly".	G-26 (φ1x2mm)
8	Contact area between "Frame Assembly Middle Right", and "Lever Assembly Hopper".	G-26 (φ1x2mm)
9	Rib of "Cam Assembly, Paper Return "	G-26 (φ1x2mm)
10	5 contact areas; "Lever Assembly, Paper Return A and B" located under the "Paper Lower Guide". (Although only 2 points are indicated in the figure, lubricate the rest of 3 points which are similarly located as indicated 2 points in the figure.)	G-26 (φ1x5mm)
11	2 contact areas between "Reinforcing Plate, Assembly, Base" and "Mounting Board, Rotary damper".	G-26 (φ1x1mm)
12	Gear teeth of Gear 11.5.	G-26 (φ1x1/3 of gear teeth)
13	2 parts on the slope of "Cam Disengage".	G-26 (φ1x5mm)
14	Gear teeth of Combination Gears 14.4, 21.6.	G-26(1/3 of gear teeth)
15	Teeth surface of the bigger "Combination gear 15" (compared with the combination gear 12)	G-26 (φ1x1/3 of gear teeth)
16	Axis of "Frame assembly, DE, Right".	G-26(φ1x10mm)

*Note)*φ means diameter.

Table 6-4. Lubricating Points(Con.)

No.	Lubricating Points	Type/Amount
17	Teeth surface of "Gear 25.8".	G-26 (φ1mm x1/3 of gear teeth)
18	Axis of "Frame assembly, DE, Left".	G-26 (φ1x10mm)
19	"Combination gear 12". (smaller one compared with a combination gear 26)	G-26 (φ1mm x1/3 of gear teeth)
20	12 points on "Paper Guide, Front".	G-26 (φ1x2mm)
21	4 points on "Earth plate, Paper Eject".	G-20 (φ1x2mm)
22	2 contact areas; between "Roller Assembly, Paper Eject, Rear" and "Earth plate, Eject".	G-20 (φ1x2mm)
23	2 contact areas; between "Roller Assembly, Eject" and "Earth Plate, Eject".	G-20 (φ1x2mm)
24	2 points; Teeth surface of "Gear 27" located on both right and left sides.	G-26 (φ1x 1/4 of gear teeth)
25	2 points on the axis of "Lever Assembly, Release Cam". *Note)* Do not lubricate the roller surface.	G-26 (φ1x2mm)
26	Oil pad. Supply oil from the oil supply hole on the carriage. *Note)* Do not lubricate the other area except oil pad.	0-8 (0.8cc)
27	A hole of "Frame Assembly Middle, Left".	G-26 (φ1x3mm)
28	Roller axis part of "Lever Assembly, Roller Release, Right".	G-26 (φ1x1mm)
29	Pin of "Frame Middle, Right".	G-26 (φ1x3mm)
30	Stair parts of "Axis, Arm Lifter".	G-26 (φ1x2mm)
31	"U" shape ditches of "Paper Guide Unit" on the both right and left sides.	G-26 (φ1x5mm top and bottom)

No.	Lubricating Points	Type/Amount
32	Surface of "Axis, CR". *Note)* Do not lubricate "Axis, CR, Support".	0-8 (Wipe with cloth moisten with oil)
33	Holes on the axis of "Combination gears 29.6, 29.6".	G-26 (φ1x5mm)
34	Axis part that contacts with "Combination gear 29.6, 29.6" and the "Assembly cap board" to install "Combination gear 15.2, 23.2". *Note)* Do not lubricate on an axis that connects with the hole of "Pump Assembly". of "Combination gear 15.2, 23.2".	G-26 (φ1x5mm)

Table 6-5. Adhesive Points

No.	Adhesive points	Amount
1	Bottom part of plastic located under the compression spring 0.98.	Half circle
2	Fixing Screw for Upper Surface Sensor	1/3 of screw head circumference

(1)

(1)

Cam, ASF

Lever Assembly, Lifter, Clutch

Cover Assembly, Lifter

(2)

(2)

(4)

(3)

(3)

(4)

Gear Assembly, 24

(5)

(6)

(8)

(7)

(8)

(9)

(10)

(10)
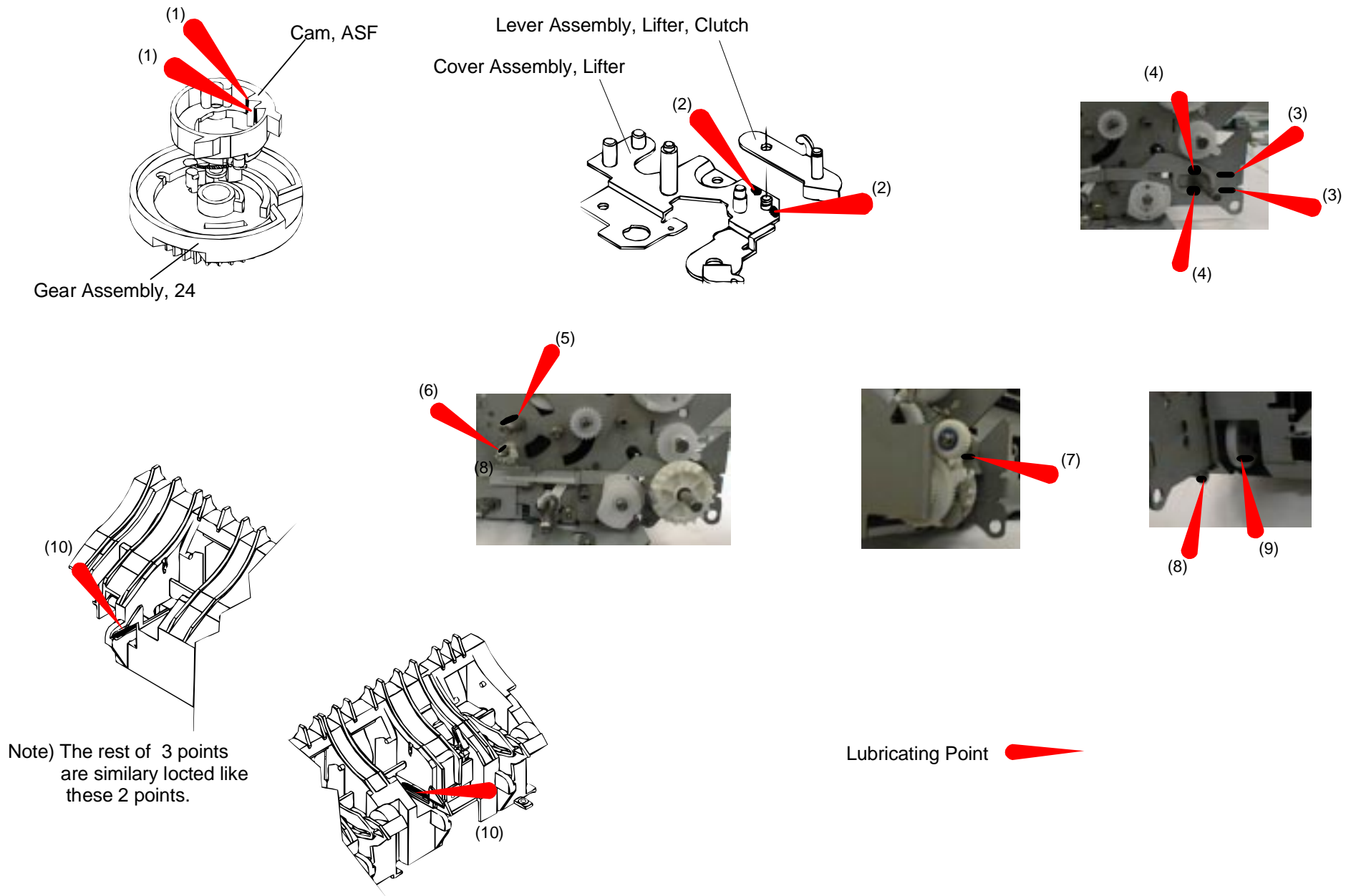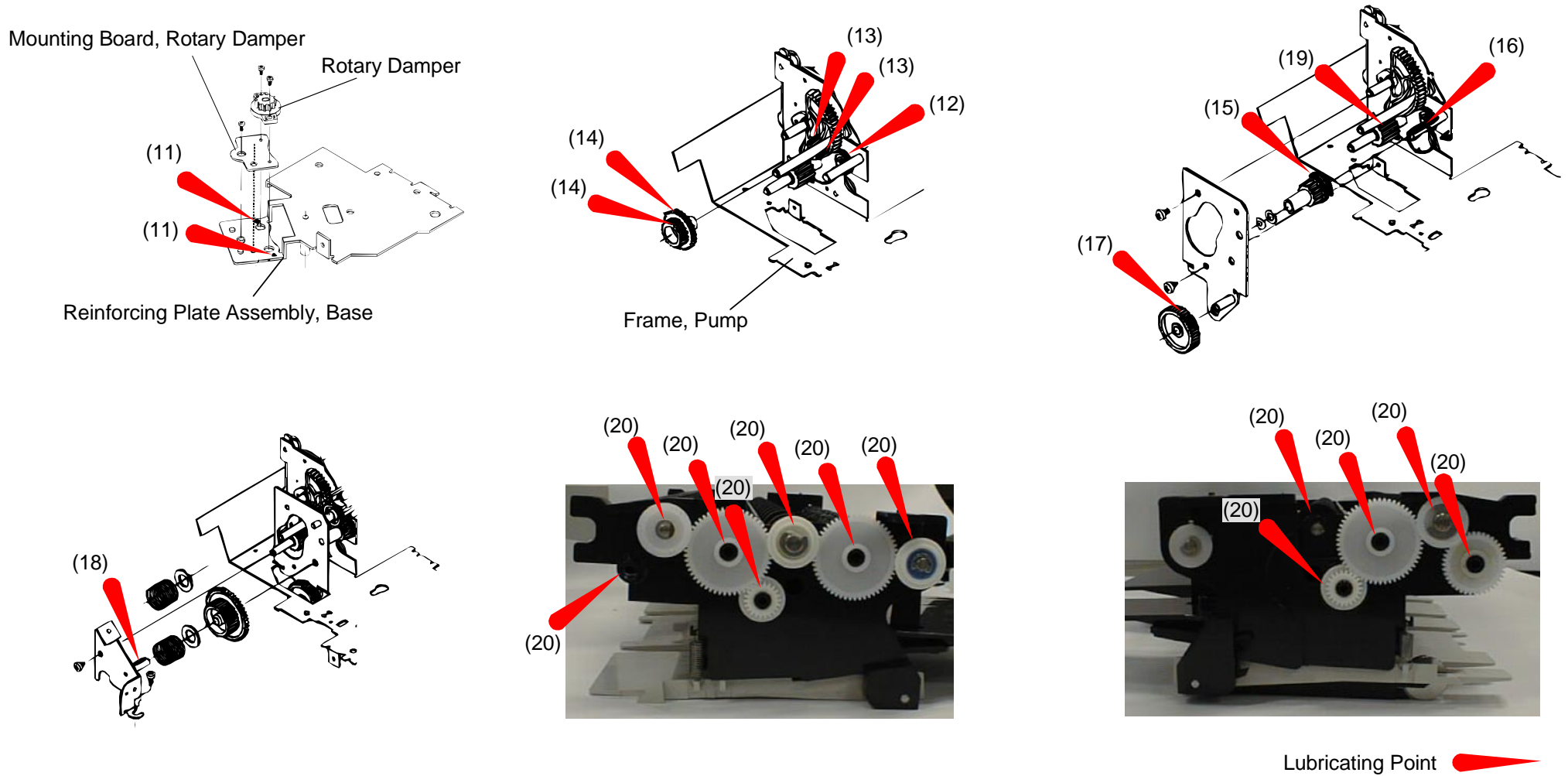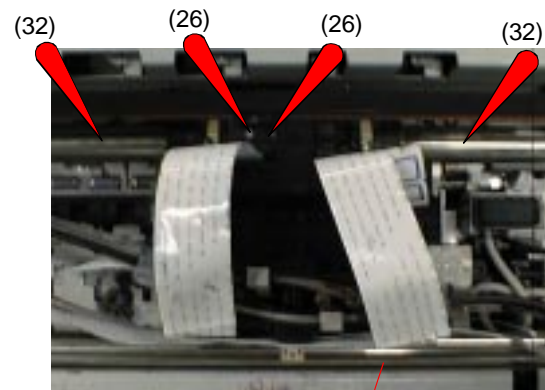
Note) The rest of 3 points
are similary locted like
these 2 points.

Lubricating Point

Figure 6-2. Lubricating Points

Mounting Board, Rotary Damper
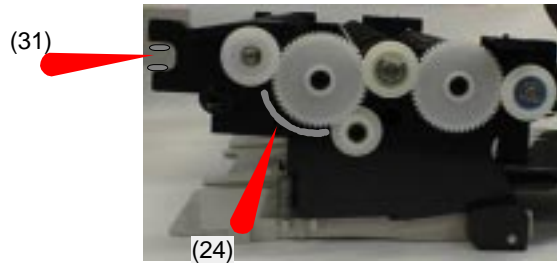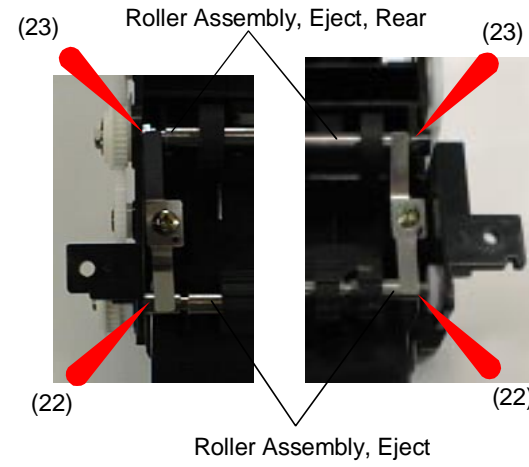
Rotary Damper

(11)

(11)

Reinforcing Plate Assembly, Base

(14)

(14)

(13)

(13)

(12)

Frame, Pump

(19)

(16)

(15)

(17)

(18)

(20) (20) (20) (20) (20)

(20)

(20)

(20) (20) (20)

(20)

(20)

Lubricating Point

Figure 6-3. Lubricating Points

Figure 6-4. Lubricating Points

Roller Assembly, Eject, Rear

Roller Assembly, Eject
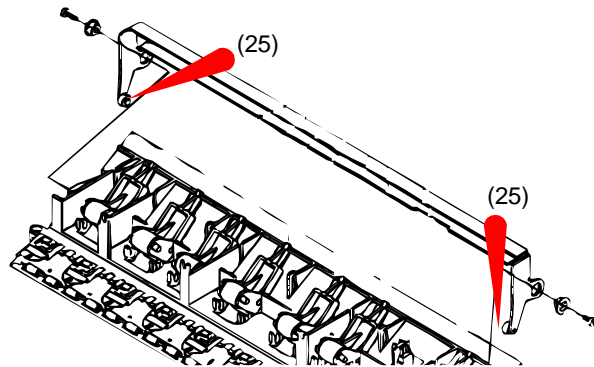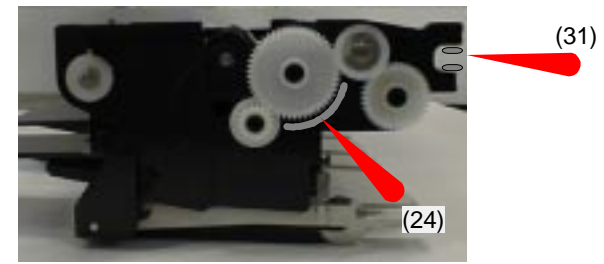
Lubricating Point

Do not lubricate "Axis, CR, Support".

(28)

(27)
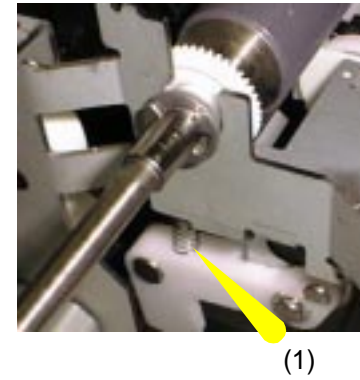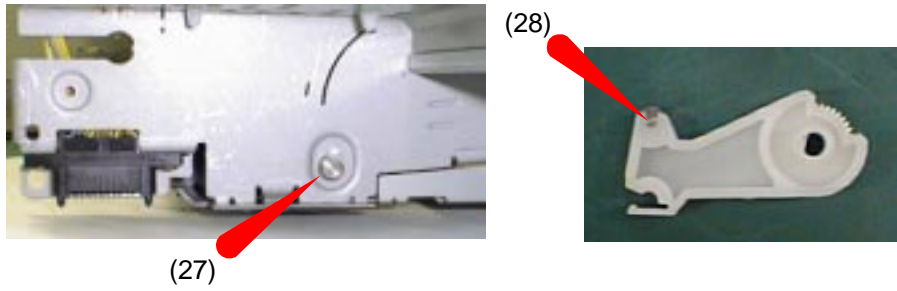
Lubricating Point

Adhering Point

(1)

(29)

(30)

(2)
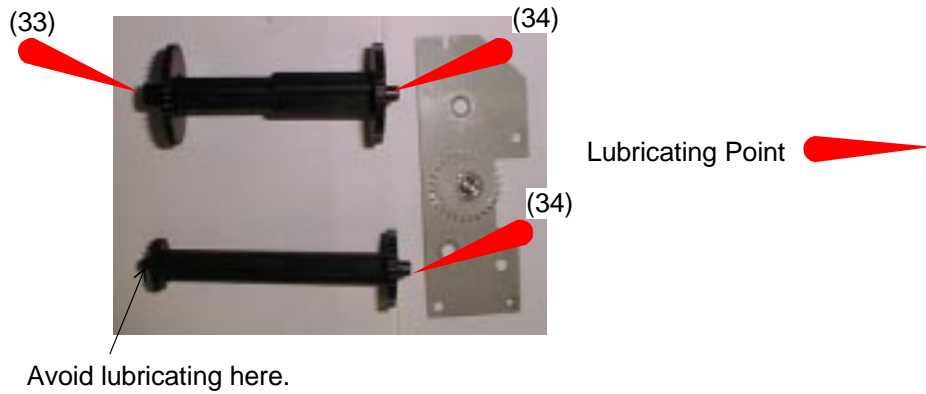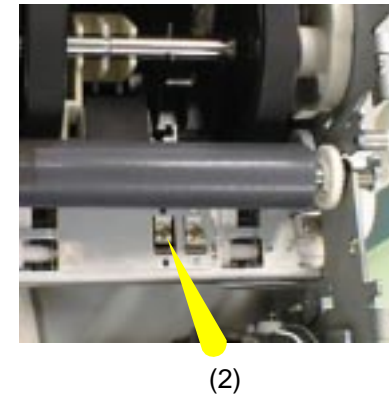
Figure 6-6. Adhering Points

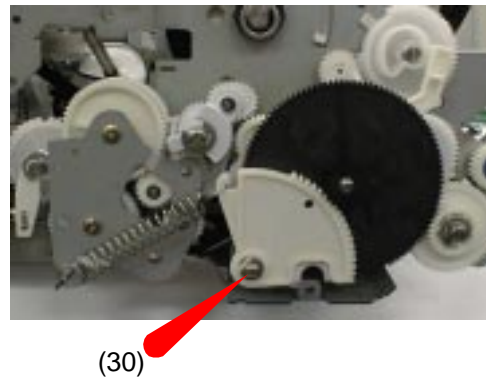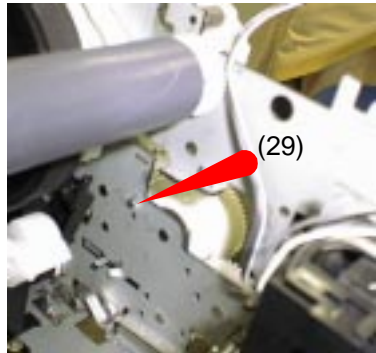(33)　　　　　　　　　(34)

(34)

Lubricating Point

Avoid lubricating here.

Figure 6-5. Lubricating Points

CHAPTER

7

APPENDIX

7.1 CONNECTOR SUMMARY

Following tables show connector pin assignment of the C228 DRV board.

Table 7-1. Connector summary of C228 DRV board

Connector	Function	Table to refer
CN1	Junction(repeating) connector	
CN2	Power supply	Table7-2
CN3	Fan	Table7-3
CN4	P sensor	Table7-4
CN5	HP sensor	Table7-5
CN6	Paper size/type sensor tray out	Table7-6
CN7	PE/PR sensor	Table7-7
CN8	Option ASF2	Table7-8
CN9	Option ASF1	Table7-9
CN10	Head(Bk,C,M)	Table7-10
CN11	Head(c,m,y)	Table7-11
CN12	PTS paper width sensor	Table7-12
CN13	Control panel	Table7-13
CN14	CR motor	Table7-14
CN15	PF motor	Table7-15
CN16	ASF/Pump motor	Table7-16
CN17	ASF solenoid	Table7-17
CN18	Upper surface sensor	Table7-18
CN19	Paper left quantity sensor	Table7-19
CN20	Mm ink cartridge/Ink end sensor	Table7-20
CN21	Cc ink cartridge/Ink end sensor	Table7-21
CN22	Y ink cartridge/Ink end sensor	Table7-22
CN23	Bk ink cartridge/Ink end sensor	Table7-23
CN24	Rear Cover Sensor	Table7-24
CN25		Table7-25

Table 7-2. Connector CN2

Pin	Signal Name	I/O	Function
1, 2	+42V	I	Power system source
3 ~ 7	GND	I	Ground
8 ~ 10	+5V	I	Logic system source
11	+28V	I	Source of VH2 power for print head
12	-2V	I	Trapezoidal wave-form control

Table 7-3. Connector CN3

Pin	Signal Name	I/O	Function
1	+35V	I	Power source for cooling fan
2	PG	-	Ground

Table 7-4. Connector CN4

Pin	Signal Name	I/O	Function
1	P-SIG	O	1st paper sensor signal
2	GND	-	Ground

Table 7-5. Connector CN5

Pin	Signal Name	I/O	Function
1	HP-SIG	O	Home position detector signal
2	HP-Vcc	I	Power source of HP sensor
3	GND	-	Ground

Table 7-6. Connector CN6

Pin	Signal Name	I/O	Function
1	Pk3	I	Paper kind data 3
2	Pk2	I	Paper kind data 2
3	Pk1	I	Paper kind data 1
4	GND	-	Ground
5	TO	I	Cassette in/out signal
6	Ps3	I	Paper size data 3
7	Ps2	I	Paper size data 2
8	Ps1	I	paper size data 1

Table 7-7. Connector CN7

Pin	Signal Name	I/O	Function
1	GND	-	Ground
2	PR-SIG	I	Manual PE(Rear) sensor signal In
3	PE-VCC	I	Power for PE/PR sensor
4	GND	-	Ground
5	PE-SIG	I	PE sensor signal In

Table 7-8. Connector CN8

Pin	Signal Name	I/O	Function
1	OPTHH-VCC	O	Power for option cassette sensors
2	OPTHH-SIG	O	Option in/out signal
3	OPTP-SIG	I	Option 1st PE Sensor signal
4	OPTOP-SIG	I	Option Paper Pick up signal
5	OPTVBB	O	Power for Solenoid
6	OPTASF/B	O	ASF Motor Phase /B
7	OPTASF/A	O	ASF Motor Phase /A
8	OPTASFB	O	ASF Motor Phase B
9	OPTASFA	O	ASF Motor Phase A
10	GND2	-	Ground
11	GND2	-	Ground

Table 7-9. Connector CN9

Pin	Signal Name	I/O	Function
1	GND	-	Ground
2	GND	-	Ground
3	OPTPk3	I	Paper kind data 3
4	OPTPk2	I	Paper kind data 2
5	OPTPk1	I	Paper kind data 1
6	OPTT0	I	Cassette in/out signal
7	OPTPs3	I	Paper size data 3
8	OPTPs2	I	Paper size data 2
9	OPTPs1	I	paper size data 1
10	OPTPZ-SIG	O	Option in/out signal
11	VCC	O	Power for all sensors

Table 7-10.Connector CN10

Pin	Signal Name	I/O	Function
1	CO	-	Not used
2	THM	I	Head Temperature signal
3,5,7,9, 11,13,15	GND	-	Ground
4	LAT	O	Print data latch control signal
6	SI3	O	Serial data 3(Row 3)
8	SI2	O	Serial data 2(Row 2)
10	SI1	O	Serial data 1(Row 1)
12	CLK	O	Clock signal for data transmission
14	NCHG	O	Charge pulse for trapezoidal wave-form
16	VDD	O	Power for nozzle selector
17~19	GND2	-	Ground
20~22	COM	O	Common pulse(Trapezoidal) output
23~24	VHV	O	Dot Control reference voltage

Table 7-11. Connector CN11

Pin	Signal Name	I/O	Function
1	CO	-	Not used
2	THM	I	Head Temperature signal
3,5,7,9, 11,13,15	GND	-	Ground
4	LAT	O	Print data latch control signal
6	SI3	O	Serial data 3(Row 3)
8	SI2	O	Serial data 2(Row 2)
10	SI1	O	Serial data 1(Row 1)
12	CLK	O	Clock signal for data transmission
14	NCHG	O	Charge pulse for trapezoidal wave-form
16	VDD	O	Power for nozzle selector
17~19	GND2	-	Ground
20~22	COM	O	Common pulse(Trapezoidal) output
23~24	VHV	O	Dot Control reference voltage

Table 7-12. Connector CN12

Pin	Signal Name	I/O	Function
1	PW-SIG	I	Paper width detection signal
2	PW-VCC	O	Power for paper with sensor
3	GND	-	Ground
4	EN-A	I	PTS encoder signal phase A
5	EN-B	I	PTS encoder signal phase B
6	Vcc	O	Power for Linear encoder sensor

Table 7-13. Connector CN13

Pin	Signal Name	I/O	Function
1	PSC	O	Power switch state detection signal
2,4,6	GND	-	Ground
3	SW0	I	Power switch
5,7,9	+5V	O	Signal source for all control switch
8	SW1	I	Reset switch
10	SW2	I	Cleaning switch
11	CKL	O	CLK pulse for Switch state detection
12	SW3	I	Ejecting switch
13	LEDDAT	O	LED indication while receiving data
14	CKS		CLK pulse for Switch state detection

Table 7-14. Connector CN14

Pin	Signal Name	I/O	Function
1	Phase drive signal (A)	O	CR Motor Phase A
2	Phase drive signal (/A)	O	CR Motor Phase /A
3	Phase drive signal (B)	O	CR Motor Phase B
4	Phase drive signal (/B)	O	CR Motor Phase /B

Table 7-15. Connector CN15

Pin	Signal Name	I/O	Function
1	Phase drive signal (A)	O	PF Motor Phase A
2	Phase drive signal (B)	O	PF Motor Phase /A
3	Phase drive signal (/A)	O	PF Motor Phase B
4	Phase drive signal (/B)	O	PF Motor Phase /B

Table 7-16. Connector CN16

Pin	Signal Name	I/O	Function
1	Phase drive signal (A)	O	ASF/Pump Motor Phase A
2	Phase drive signal (B)	O	ASF/Pump Motor Phase B
3	Phase drive signal (/A)	O	ASF/Pump Motor Phase /A
4	Phase drive signal (/B)	O	ASF/Pump Motor Phase /B

Table 7-17.Connector CN17

Pin	Signal Name	I/O	Function
1	VBB	O	Power for Solenoid
2	GND2	-	Ground

Table 7-18. Connector CN18

Pin	Signal Name	I/O	Function
1	HH-SIG	I	Upper surface sensor signal
2	GND	-	Ground
3	HH-VCC	O	Power for sensor

Table 7-19. Connector CN19

Pin	Signal Name	I/O	Function
1	PZ-SIG	I	Remained paper signal
2	VCC	O	Power for sensor
3	GND	-	Ground

Table 7-20. Connector CN20

Pin	Signal Name	I/O	Function
1	CO-M	I	Magenta I/C In/Out signal
2	GND	-	Ground
3	IE-M	I	Magenta I/C Full/End signal
4	GND	-	Ground

Table 7-21. Connector CN21

Pin	Signal Name	I/O	Function
1	CO-C	I	Cyan I/C In/Out signal
2	GND	-	Ground
3	IE-C	I	Cyan I/C Full/End signal
4	GND	-	Ground

Table 7-22. Connector CN22

Pin	Signal Name	I/O	Function
1	CO-Y	I	Yellow I/C In/Out signal
2	GND	-	Ground
3	IE-Y	I	Yellow I/C Full/End signal
4	GND	-	Ground

Table 7-23. Connector CN23

Pin	Signal Name	I/O	Function
1	CO-K	I	Black I/C In/Out signal
2	GND	-	Ground
3	IE-K	I	Black I/C Full/End signal
4	GND	-	Ground

Table 7-24. Connector CN24

Pin	Signal Name	I/O	Function
1	+42V	O	Power for CR/PF Motor(cover open R)
2	VAM	I	Ground

Table 7-25. Connector CN25

Pin	Signal Name	I/O	Function
1	+5V	O	Power for sensor
2	GND	-	Ground

7.2 EEPROM ADDRESS MAP

Address	Explanation	Setting	QPIT settings	Factory settings
00H	EEPROM data area password		5AH	--
01H	EEPROM data area password		F0H	--
02H	EEPROM Mapping Revision		00H	--
03H	Model Name ID	00H:World Standard Name 01H:Japan Standard Name 02H:Custom(PM-) 03H:Custom(Stylus [SP]) 04H:Custom(Other Name)	01H	00H
04H	Custom EEPROM sub Number		00H	00H
05H	Custom EEPROM sub Number		00H	00H
06H	Custom EEPROM sub Number		00H	00H
07H	Custom EEPROM sub Number		00H	00H
08H	CPSI License Password		00H	00H
09H	CPSI License Password		00H	00H
0AH	CPSI License Password		00H	00H
0BH	CPSI License Password		00H	00H

Address	Explanation	Setting	QPIT settings	Factory settings
0CH	CPSI License Password		00H	00H
0DH	CPSI License Password		00H	00H
0EH	Entity type (Model Name ID value>02H)	00H:EPSON LQ2 01H:EPSON LQ2J	00H	--
0FH	Korean version	00H:no DES 01H:Korean version DES	00H	--
10H	Interface selection	00H:Auto 02H:Parallel 03H:Mac serial 04H:Option	00H	00H*2
11H	Interface wait time	10 to 255(unit :seconds) (if n<10 then n=10)	1EH	1EH
12H	Parallel I/F Speed	00H:High speed 01H:Normal speed	01H	01H
13H	ECP Mode	00H:OFF 01H:ON	00H	00H
14H	Network I/F mode	Bit0:Network I/F mode0:OFF 1:ON	00H	00H
15H	Reserved		00H	--
16H	Panel Masking	Bit0:Mask Paper-Ejection switch Bit1:Mask Reset switch Bit2:Mask cleaning switch Bit3:Mask Firmware Download function Bit4-7:Reserved	00H	00H
17H	Reserved		00H	--

Note*) Refer to "Notes" on page7-8 for *1 and *2.

Address	Explanation	Setting	QPIT settings	Factory settings
18H	Code Page	00H:PC437 01H:PC850	00H	00H
19H	Reserved		00H	--
1AH	PG Adj.for Manual Feed slots	00H:Auto 01H:Fixed(Thick paper)	00H	00H
1BH	Reserved		00H	--
1CH	Paper size/Type Check	00H:OFF 01H:ON	01H	01H
1DH	Paper Width Detection	00H:OFF 01H:ON	01H	00H
1EH	Reserved		00H	--
1FH	Reserved		00H	--
20H	Head Actuator Rank ID for VhN-A		00H	*1
21H	Head Actuator Rank ID for VhM-A		00H	*1
22H	Head Actuator Rank ID for VhSM-A		00H	*1
23H	Head Actuator Rank ID for Twh2-A		00H	*1
24H	Head Actuator Rank ID for VhN-B		00H	*1
25H	Head Actuator Rank ID for VhM-B		00H	*1
26H	Head Actuator Rank ID for VhSM-B		00H	*1
27H	Head Actuator Rank ID for Twh2-B		00H	*1

Address	Explanation	Setting	QPIT settings	Factory settings
28H	Head Actuator Rank ID for IwAB-A		00H	*1
29H	Head Actuator Rank ID for IwCD-A		00H	*1
2AH	Head Actuator Rank ID for IwEF-A		00H	*1
2BH	Head Actuator Rank ID for IwAB-B		00H	*1
2CH	Head Actuator Rank ID for IwCD-B		00H	*1
2DH	Head Actuator Rank ID for IwEF-B		00H	*1
2EH	Reserved		00H	--
2FH	Reserved		00H	--
30H	Bi-D Adjustment for ND	Unit:1/1440inch	00H	*1
31H	Bi-D Adjustment for MD	Unit:1/1440inch	00H	*1
32H	Bi-D Adjustment for SMD	Unit:1/1440inch	00H	*1
33H	1stdot position adjustment	Unit:1/1440inch	00H	*1
34H	Head gap adjustment	Unit:1/1440inch	00H	*1
35H	Reserved		00H	--
36H	Reserved		00H	--
37H	Reserved		00H	--
38H	PWS reference level		00H	--
39H	PWS reference level		00H	--

Note*) Refer to "Notes" on page7-8 for *1 and *2.

Address	Explanation	Setting	QPIT settings	Factory settings
3AH	Reserved		00H	--
3BH	Reserved		00H	--
3CH	Reserved		00H	--
3DH	Reserved		00H	--
3EH	Reserved		00H	--
3FH	Reserved		00H	--
40H	Power switch status		00H	--
41H	Fetal Error Code		00H	--
42H	I/S flags	Bit0:Initial fill required Bit1:in cleaning seq.	00H	01H*1
43H	I/S flags	Bit0:Initial fill required Bit1:in cleaning seq.	00H	00H
44H	Ink counter Cb (total)	1count=100(ng)	00H	00H
45H	Ink counter Cb (total)	1count=100(ng)	00H	00H
46H	Ink counter Cb (total)	1count=100(ng)	00H	00H
47H	Ink counter Cb (total)	1count=100(ng)	00H	00H
48H	Ink counter Cy (total)	1count=100(ng)	00H	00H
49H	Ink counter Cy (total)	1count=100(ng)	00H	00H
4AH	Ink counter Cy (total)	1count=100(ng)	00H	00H
4BH	Ink counter Cy (total)	1count=100(ng)	00H	00H

Address	Explanation	Setting	QPIT settings	Factory settings
4CH	Ink counter Cm (total)	1count=100(ng)	00H	00H
4DH	Ink counter Cm (total)	1count=100(ng)	00H	00H
4EH	Ink counter Cm (total)	1count=100(ng)	00H	00H
4FH	Ink counter Cm (total)	1count=100(ng)	00H	00H
50H	Ink counter Cc (total)	1count=100(ng)	00H	00H
51H	Ink counter Cc (total)	1count=100(ng)	00H	00H
52H	Ink counter Cc (total)	1count=100(ng)	00H	00H
53H	Ink counter Cc (total)	1count=100(ng)	00H	00H
54H	Ink counter Clm (total)	1count=100(ng)	00H	00H
55H	Ink counter Clm (total)	1count=100(ng)	00H	00H
56H	Ink counter Clm (total)	1count=100(ng)	00H	00H
57H	Ink counter Clm (total)	1count=100(ng)	00H	00H
58H	Ink counter Clc (total)	1count=100(ng)	00H	00H
59H	Ink counter Clc (total)	1count=100(ng)	00H	00H
5AH	Ink counter Clc (total)	1count=100(ng)	00H	00H
5BH	Ink counter Clc (total)	1count=100(ng)	00H	00H

Note*) Refer to "Notes" on page7-8 for *1 and *2.

Address	Explanation	Setting	QPIT settings	Factory settings
5CH	Ink counter Rb (total)	1count=100(ng)	00H	00H
5DH	Ink counter Rb (total)	1count=100(ng)	00H	00H
5EH	Ink counter Ry (total)	1count=100(ng)	00H	00H
5FH	Ink counter Ry (total)	1count=100(ng)	00H	00H
60H	Protection counter A	1count=100(ng)	00H	00H*2
61H	Protection counter A	1count=100(ng)	00H	00H*2
62H	Protection counter B	1count=100(ng)	00H	00H*2
63H	Protection counter B	1count=100(ng)	00H	00H*2
64H	Protection counter D	1count=100(ng)	00H	00H*2
65H	Protection counter D	1count=100(ng)	00H	00H*2
66H	Protection counter D	1count=100(ng)	00H	00H*2
67H	Protection counter D	1count=100(ng)	00H	00H*2
68H	Power off time		00H	00H*2
69H	Power off time		00H	00H*2
6AH	CL time		00H	00H*2
6BH	CL time		00H	00H*2
6CH	Accumulated printing time	Unit: minute	00H	--
6DH	Accumulated printing time	Unit: minute	00H	--

Address	Explanation	Setting	QPIT settings	Factory settings
6EH	CL time3		00H	00H*2
6FH	CL time3		00H	00H*2
70H	Head Driver Data		00H	--
To	Head Driver Data		:	--
8FH	Head Driver Data		00H	--
90H	Reserved		00H	--
To	Reserved		:	--
9FH	Reserved		00H	--
A0H	Length of model name string		00H	00H
A1H	Length of model name string		00H	00H
A2H	String of model name		00H	00H
To	String of model name		:	:
BFH	String of model name		00H	00H
C0H	Reserved		00H	--
To	Reserved		:	--
FDH	Reserved		00H	--
FEH	Proper Main Program on Flash	"KW":Proper else:Un-proper	00H	--
FFH	Proper Main Program on Flash	"KW":Proper else:Un-proper	00H	--

Note) *1 Adjusted at factory.

*2 Initialized after performed panel initialization of EEPROM.

[Specification for Korean version]

1)EEPROM factory setting for Korean version

Address	Explanation	Korea Factory settings
0FH	Korean version	01H

2)IEEE1284 Device ID

[00H] [5CH]
MFG:EPSON;
CMD:ESCPL2,BDC;
MDL:Stylus[SP]Pro[SP]5000;
CLS:PRINTER;
DES:EPSON/TriGem[SP]Stylus[SP]Pro[SP]5000;

3)BDC-ID command reply

@EJL<SP>ID<CR><LF>
MFG:EPSON;
CMD:ESCPL2,BDC;
MDL:Stylus[SP]Pro[SP]5000;
CLS:PRINTER;
DES:EPSON/TriGem[SP]Stylus[SP]Photo;
<FF>

7.3 COMPONENT LAYOUT
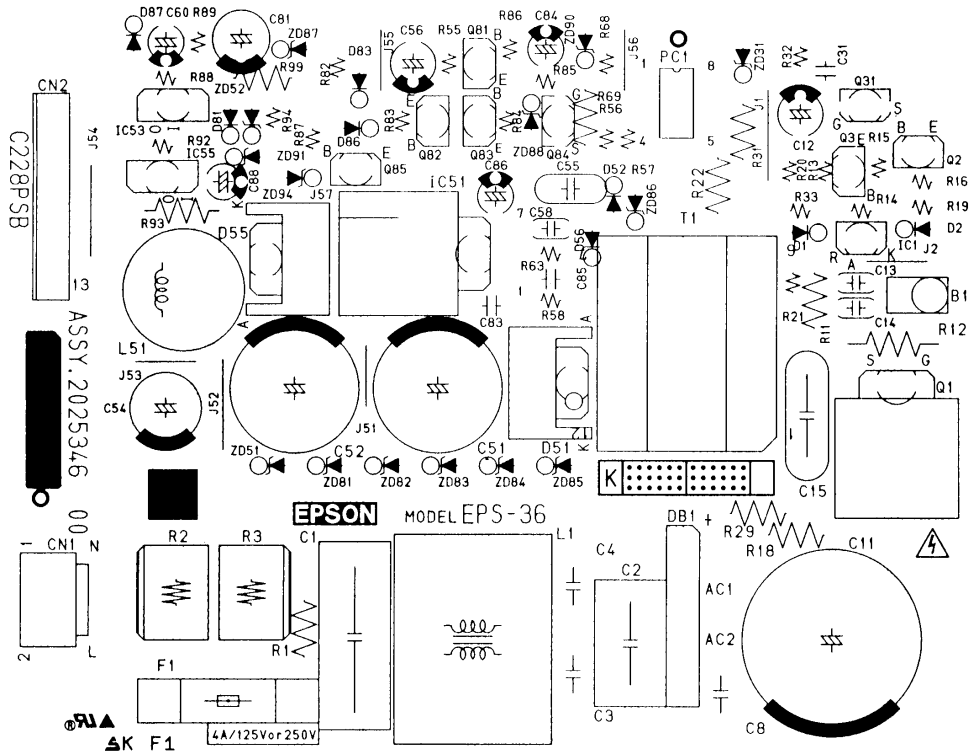
Figure 7-1. C228PSB BOARD
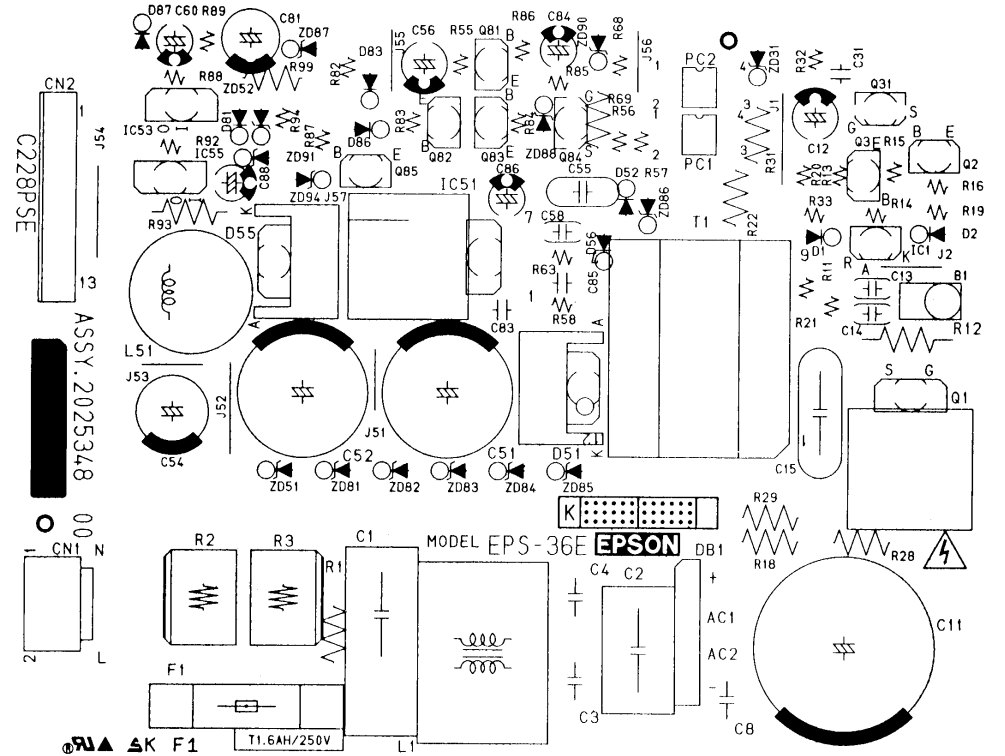
Figure 7-2. C228PSE BOARD

Figure 7-4. C228MAIN BOARD (Soldering side)

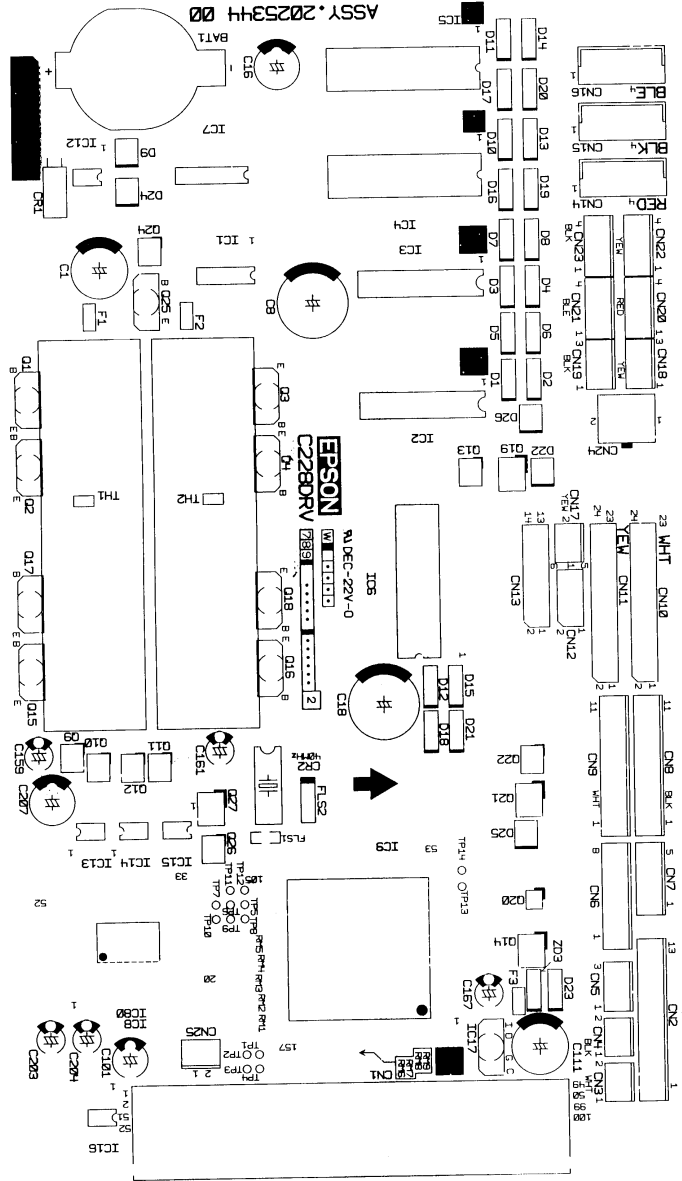**Figure 7-3. C228MAIN BOARD (Component side)**

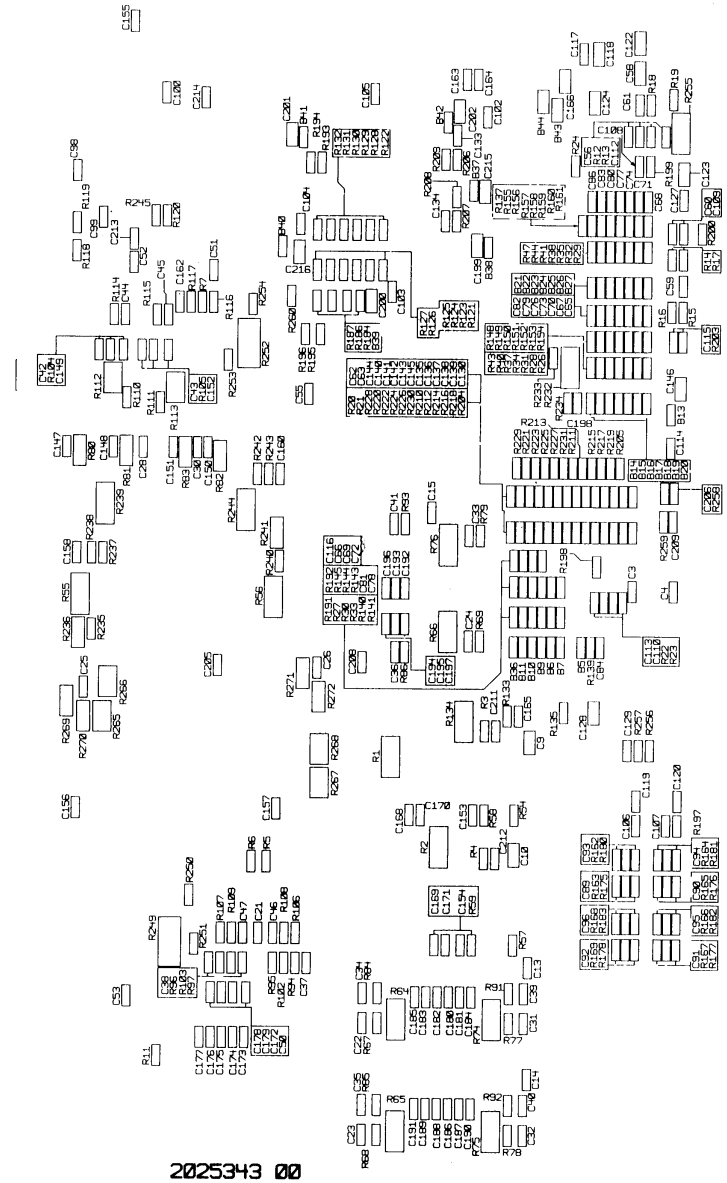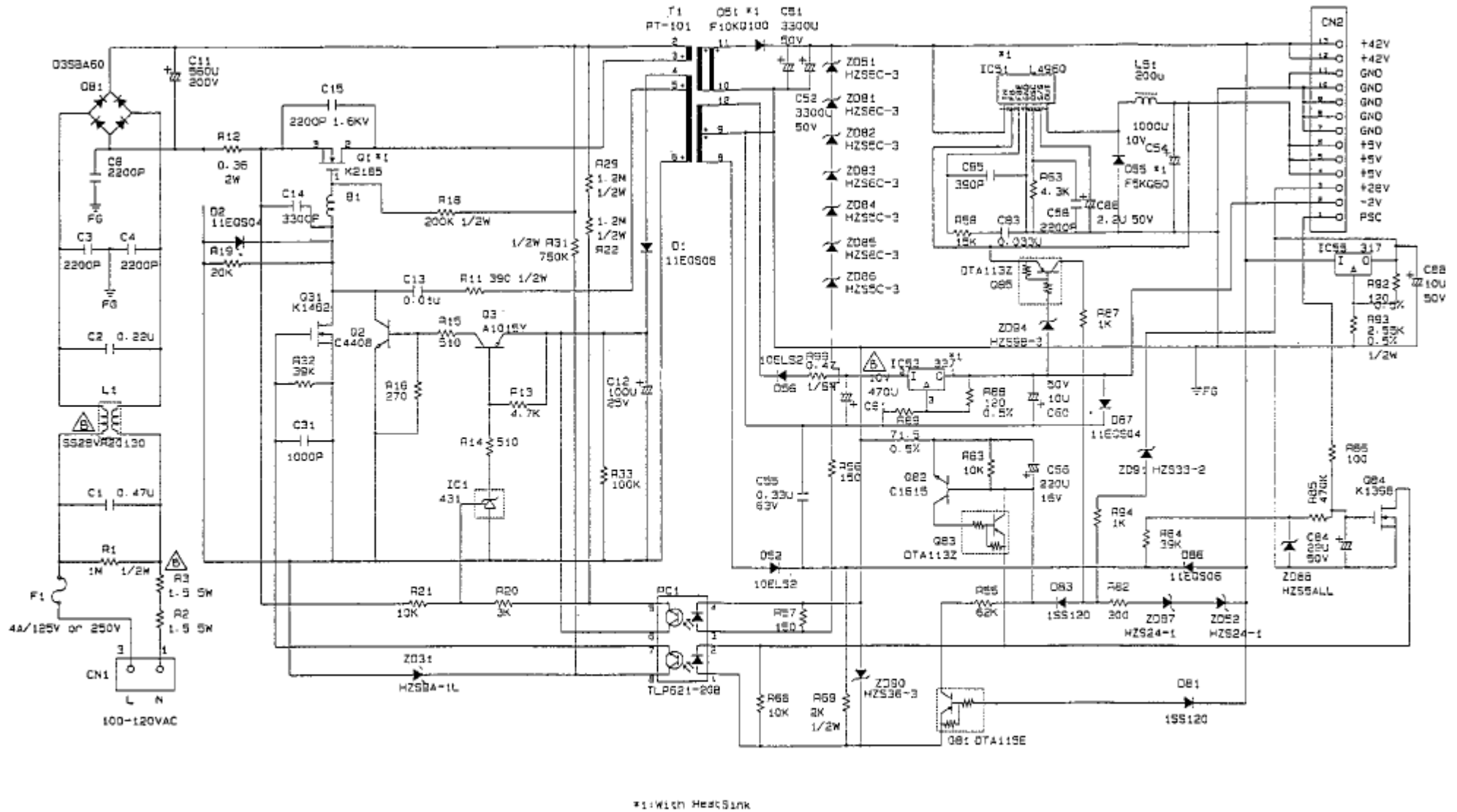**Figure 7-5. C228DRV BOARD (Component side)**

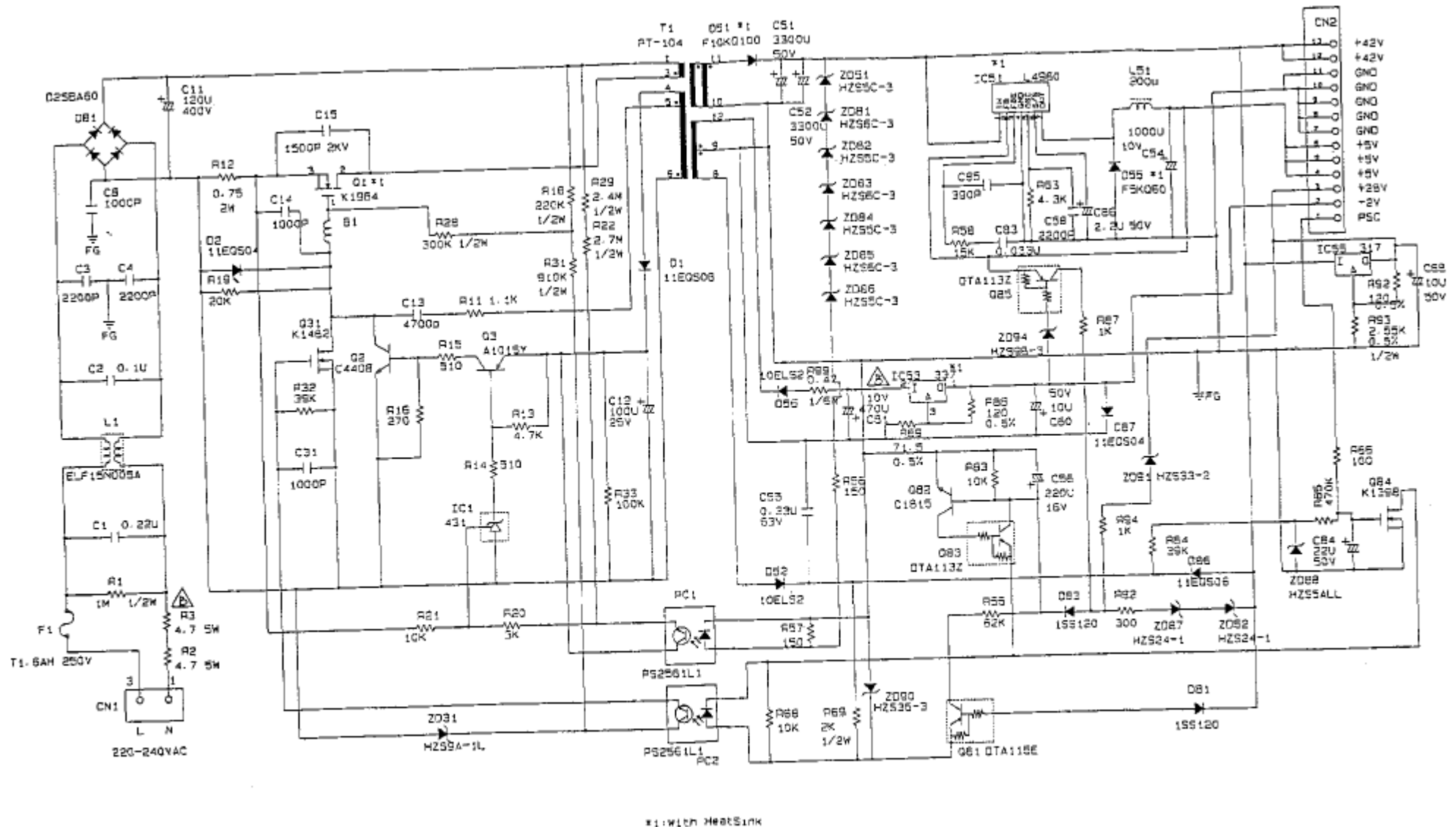**Figure 7-6. C228DRV BOARD (Soldering side)**

7.4 CIRCUIT DIAGRAM
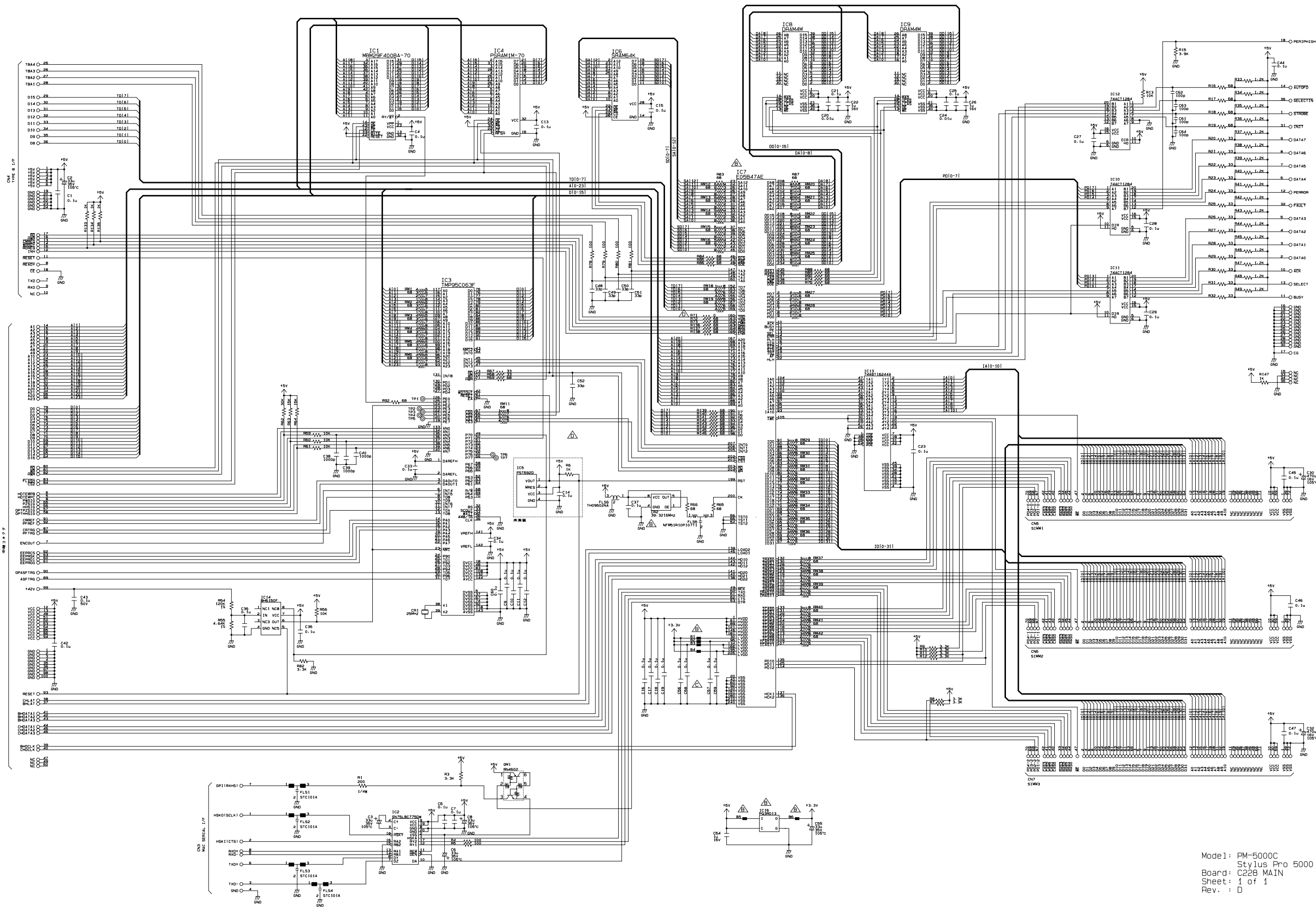
Refer to Circuit Diagrams on the following pages for;

❑ C228PSB Board (Power supply unit for 120VAC input)
❑ C228PSE Board (Power supply unit for 220-240VAC input)
❑ C228MAIN Board (Main control circuit)
❑ C228DRV Board (Drive circuit)
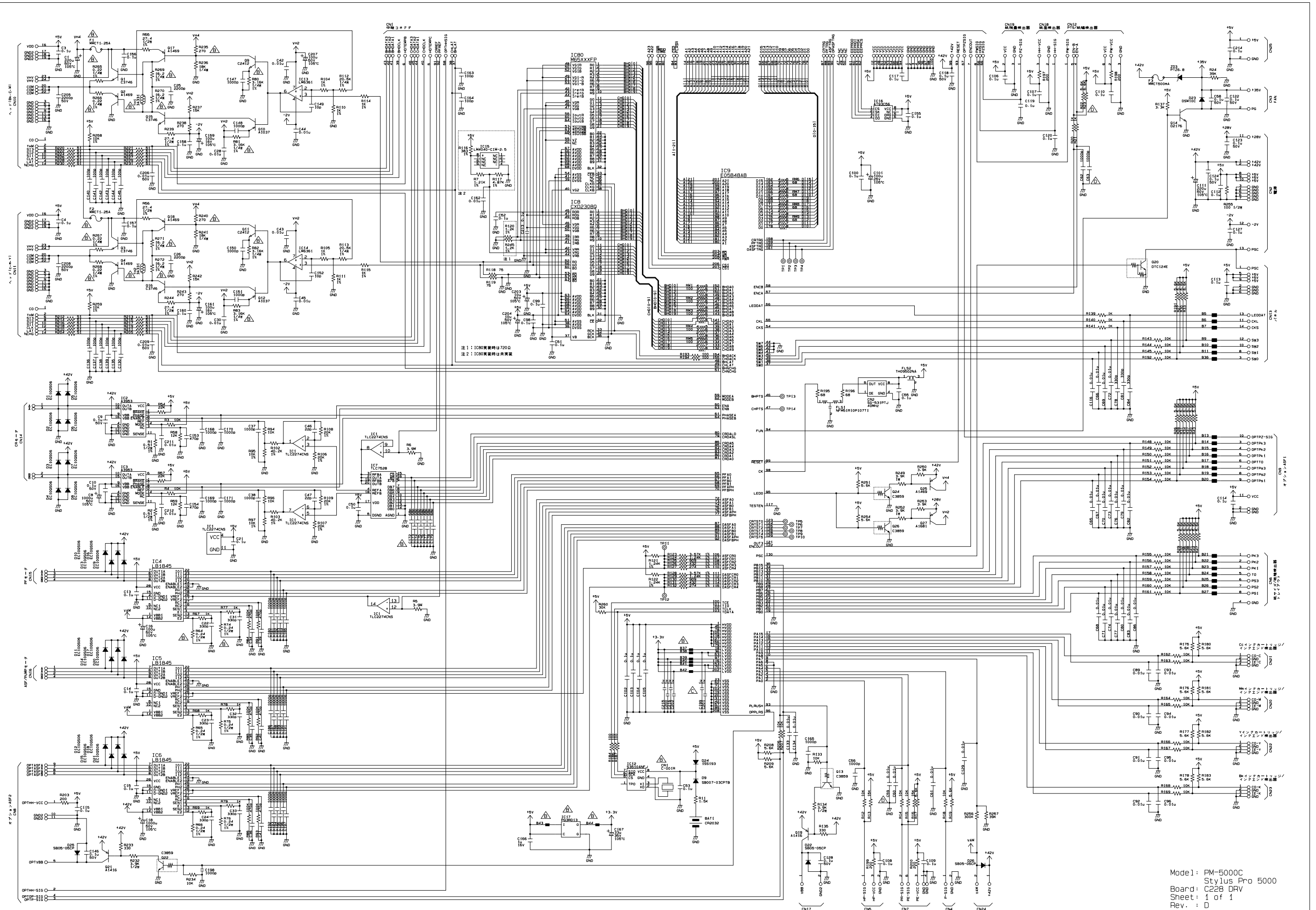❑ C228PNL boards (Control panel)
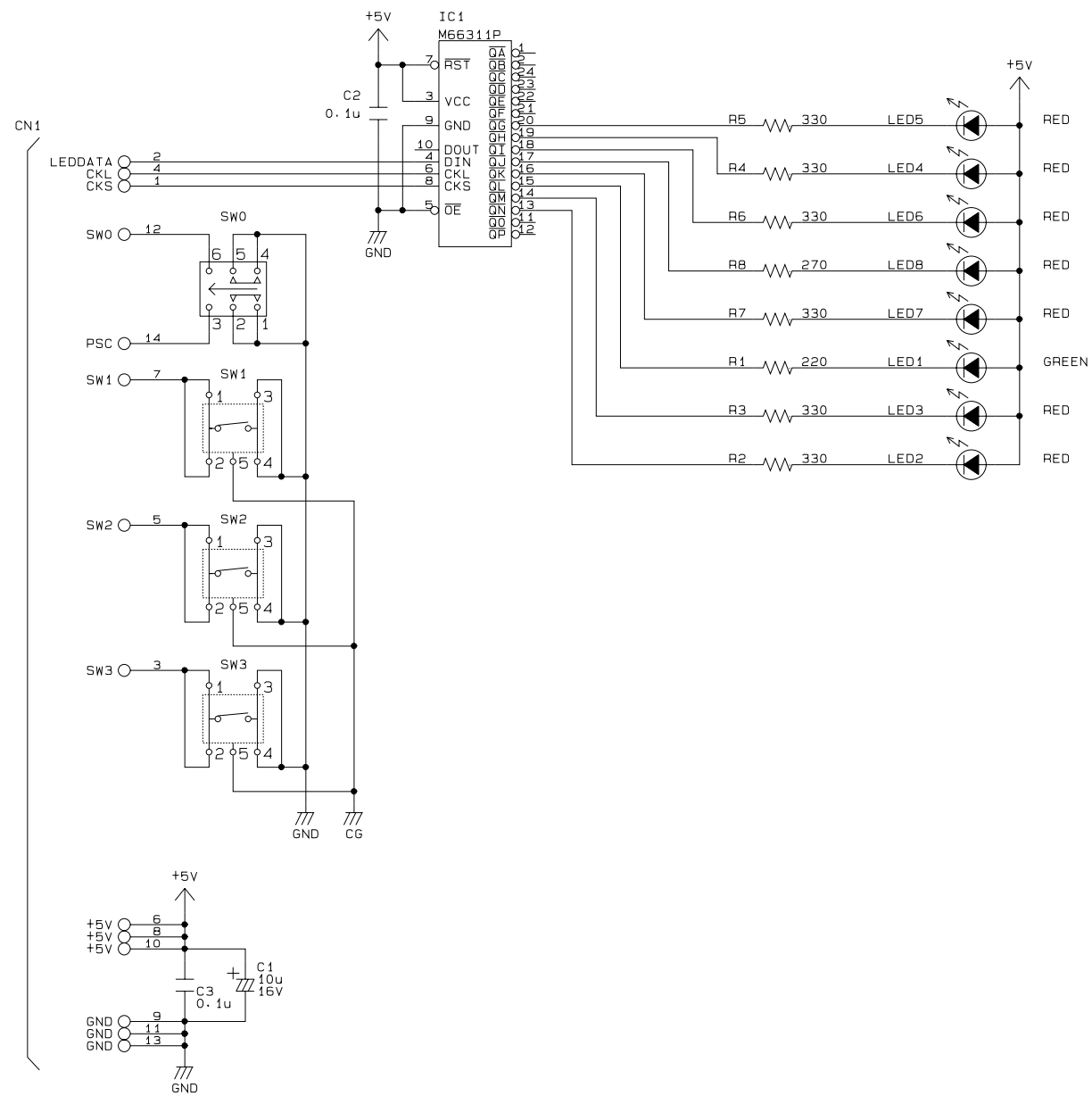
C228 PSB Circuit for Stylus Pro5000

C228 PSE Circuit for Stylus Pro5000

Model: PM-5000C
Stylus Pro 5000
Board: C228 MAIN
Sheet: 1 of 1
Rev. : D

IC1
M66311P

+5V

C2
0.1u

7 RST
3 VCC
9 GND
10 DOUT
4 DIN
6 CKL
8 CKS
5 OE

GND

CN1

LEDDATA 2
CKL 4
CKS 1

SW0 12
PSC 14

SW0

6 5 4
3 2 1

SW1 7

SW1

1 3
2 5 4

SW2 5

SW2

1 3
2 5 4

SW3 3

SW3

1 3
2 5 4

GND   CG

+5V

+5V 6
+5V 8
+5V 10

C1
10u
16V

C3
0.1u

GND 9
GND 11
GND 13

GND

+5V

R5 330   LED5   RED
R4 330   LED4   RED
R6 330   LED6   RED
R8 270   LED8   RED
R7 330   LED7   RED
R1 220   LED1   GREEN
R3 330   LED3   RED
R2 330   LED2   RED

Model: PM-5000C
       Stylus Pro 5000
Board: C228 PNL
Sheet: 1 of 1
Rev. : A