brother

SERVICE MANUAL

MODEL: HS-5000 / 5300

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CHAPTER I FEATURES AND SPECIFICATIONS

1. SYSTEM REQUIREMENTS

Check the following minimum system requirements to setup and operate the printer:

- IBM PC or compatible with 80486 SX (higher microprocessor recommended)
- Parallel interface port
- 4MB or more memory on PC (8MB recommended)
- 10MB of space available on your hard disk for the printer driver and all fonts
- Microsoft Windows 3.1/ 3.11/ 95
- MS-DOS™ or PC-DOS

* Macintosh connectivity is available with an optional MIO board.

2. FEATURES

This printer has the following features:

600dpi Resolution and 4.5ppm Printing speed

Excellent printing quality at 600 dots per inch (dpi) resolution and fine output at 300dpi resolution. Fast print speed of 4.5 pages per minute (ppm) in normal mono mode and 4ppm in normal color mode (Letter size).

High print quality

The ink is solid and water-proof so that you can get fine print quality even on plain paper without having to use special coated paper. Solid ink provides a professional print quality with sharp text and vivid color.

User-Friendly Operation for Windows

The dedicated printer driver and TrueType™ - compatible fonts for Microsoft Windows 3.1/3.11/ 95 are available on the floppy disk supplied with a printer. You can easily install them into the Windows system using our installer program. The printer driver provides a Brother own color matching engine and automatic color selection function. It helps you to get fine color printing easily.

Color Matching

The Brother original color matching system which is included in the printer driver enables color matching between the monitor and printer and offers control of various color effects. It helps you to get fine color output. This printer also supports the Windows 95 Image Color Matching (ICM) system.

Environment-Friendly

This printer has two Power Saving Modes. Printers consume power to keep some parts of the printer at operating (high) temperature, but this feature will save electricity when the printer is ON but not being used. The factory setting of Power Save mode1 and mode 2 are both OFF, however, for reduced power consumption, you can turn Power Save Mode 1 and 2 to ON. The default time-out of each mode is one hour. This meets Energy Star power save requirements.

3. CONFIGURATION

3.1 Mechanics

<Overview>

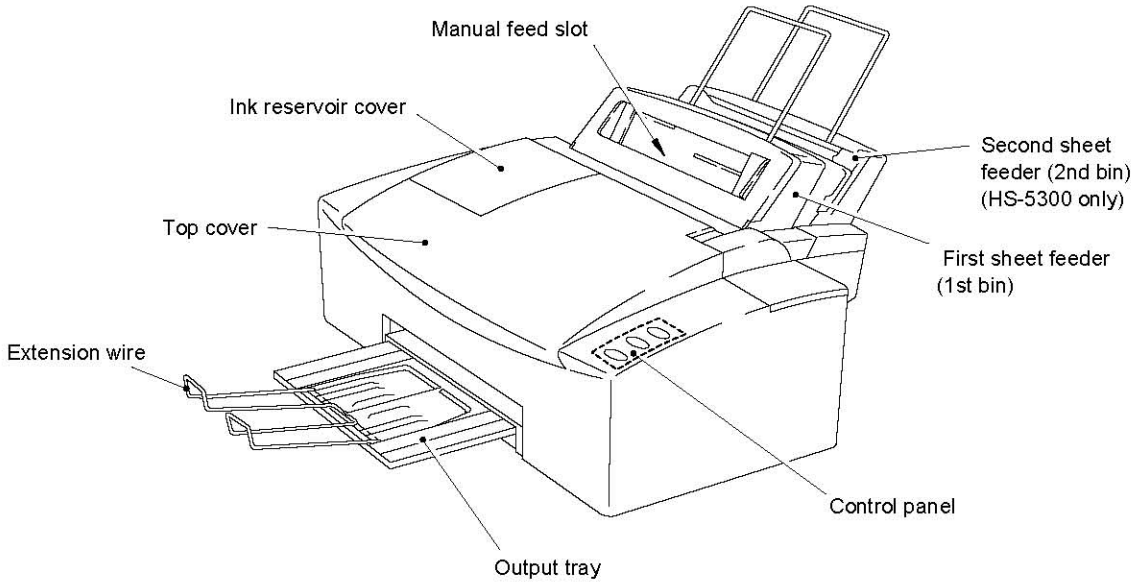


Fig. 1.1

3.2 Electronics

The configuration diagram is as shown below.

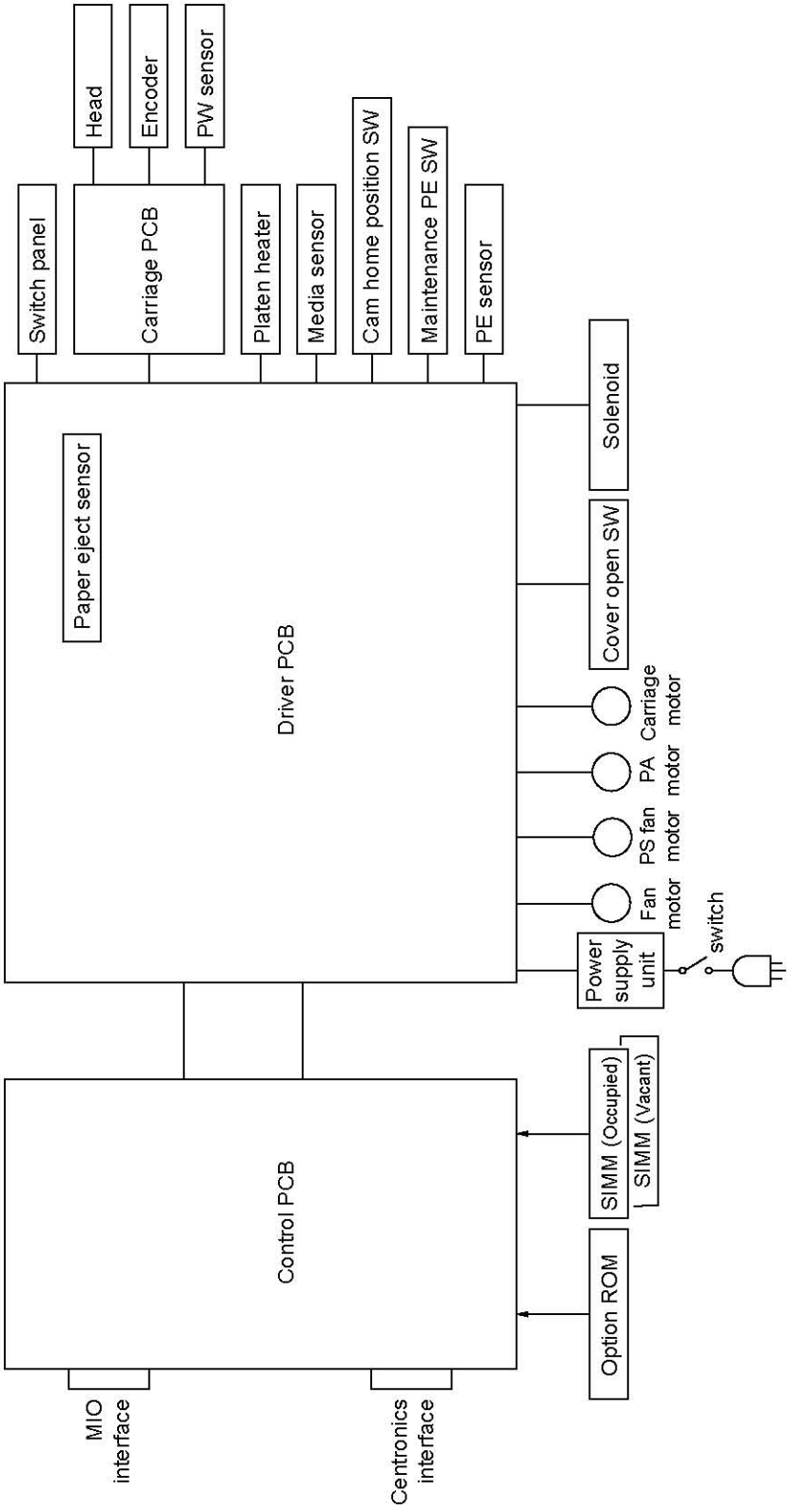


Fig. 1.2

4. SPECIFICATIONS

4.1 Printing

Print Method	Piezo Electronic Hot Melt Ink Jet
Head nozzle	512 nozzles (128 nozzles/color)
Resolution	300 and 600 dots/inch
Print Quality	Fine/Normal/Draft mode
Print Speed	Normal (Mono / Color): 4.5ppm / 4 ppm Fine (Mono / Color): 2ppm / 1.9ppm OHP (Mono / Color): 1.3ppm / 1.3ppm *Letter size from the sheet feeder at 5% coverage
Warm-Up	Max. 9.5 minutes at 23^{O}C (73.4^{O}F)
Ink	Black, Cyan, Magenta, Yellow Each 3 cc x 3 blocks = 9cc Life Expectancy : 460 pages / 9cc (when printing A4 or letter size at 5% coverage)
TrueType Fonts on disks	TrueType-compatible soft-fonts for Windows 3.1/3.11/95 on the supplied disks

4.2 Functions

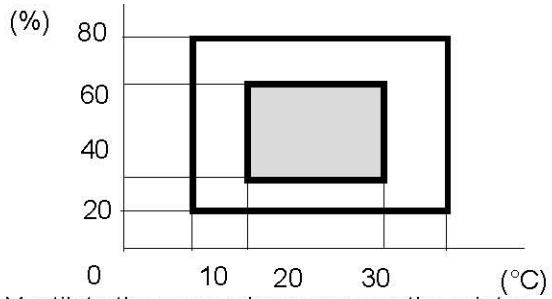
Printer Driver Compression	Windows 3.1/3.11/95 driver, supporting Brother Native mode and bi-directional capability
Emulation	PCL5c, PCL5e with standard and BR-Script Level2 for option
Interface	Bi-directional parallel
Memory	24MB standard 8MB on the Main PCB and 16MB on a SIMM slot. Expandable up to 72MB with SIMMs
Diagnostics	Printer self-check at power on
RPC (for DOS)	Remote Printer Console program on the supplied disks

4.3 Electrical and Mechanical

Power Source	U.S.A. and Canada: AC 110 to 120V, 60Hz Europe and Australia: AC 220 to 240V, 50Hz
Power Consumption	Warming up: 480W or less Printing: 170W or less Stand-by: 100W or less Power Saving Mode 1: 100W or less Power Saving Mode 2: 20W or less (without installing an optional card/optional RAM/SIMM)
Noise	Printing: 55dB A or less Stand-by: 40dB A or less

4.4 Environment

Temperature	Operating: 10 to 35°C (59 to 90.5°F) Storage: 0 to 35°C (32 to 104°F)
Humidity	Operating: 20 to 80% (without condensation) For optimum quality: 30 to 60%



Ventilate the room where you use the printer.
Place the printer on a flat, horizontal surface.
Keep the printer clean. Do not place the printer in a dusty place.

Storage: 10 to 85% (without condensation)

4.5 Dimensions (W x H x D) and Weight

HS-5000:	490 x 410 x 310mm (19.3 x 16.2 x 12.2 inches)
HS-5300:	490 x 510 x 310mm (19.3 x 20 x 12.2 inches, when the output is closed.)
Weight	HS-5000: Approx. 12kg (27 lb.) HS-5300: Approx. 13kg (28.6 lb.)

4.6 Paper Specifications

The printer can handle plain paper, transparencies and envelopes that meet the following specifications.

Feeder	Paper Size	Capacity
Manual feed	A4, Letter, Legal, Custom size, Envelope (DL, C5, COM-10), Transparencies (A4, Letter) (70 ~ 229 x 127 ~ 356mm, 2.75 ~ 9 x 5 ~ 14 inches, 60 ~ 157g/m^2, 16 ~ 42lbs)	Sheet by sheet
First sheet feeder	A4, Letter, Legal, Custom size, Envelope (DL, C5, COM-10), Transparencies (A4, Letter) (70 ~ 229 x 127 ~ 356mm, 2.75 ~ 9 x 5 ~ 14 inches, 60 ~ 157g/m^2, 16 ~ 42lbs)	22mm (0.87 inch) 200 sheets of 80g/m^2 (20lb.) (A4/Letter) 100 sheets (Legal) 10 (Envelopes) 50 (Labels/Transparency)
Second sheet feeder (HS-5300 only)	A4, Letter, Legal, Custom size, (70 ~ 229 x 250 ~ 356mm, 9.8 ~ 16 x 7 ~14 inches, 60 ~ 135g/m^2, 16 ~ 36lbs)	22mm (0.87inch) 200 sheets of 80g/m^2 (20lb.) (A4/Letter) 100 sheets (Legal)

	Cut Sheet	Envelope
Caliper	± 0.03~± 0.08 in. (0.09 ~ 0.2mm)	0.0033 to 0.0058 in. (0.084 to 0.14mm) single thickness
Moisture	4% to 6% by weight	4% to 6% by weight
Smoothness	100 to 250 (Sheffield)	100 to 250 (Sheffield)

Fig. 1.3

Remarks: Avoid feeding labels, or the printer will be damaged.
Do not use ordinary transparencies designed for photocopiers or laser printers. Use Brother special transparencies which are designed for the HS-5000/5300 printers to obtain optimum print quality.
Before printing on transparencies, the printer adjusts its temperature for transparency printing. It may take around 1 minute.
If the paper will not feed from the sheet feeder, use the manual feed slot and try again.
There will be no paper transport problems in the printer for A5, B5, C4, Executive and Monarch sizes, however these paper and envelope sizes are out of the paper specification because there will be smudging in the non-warranted printable area.

4.7 Print Delivery

Stacker capacity : Maximum 100 sheets (80g/m^2)

4.8 Paper (Recommended)

• Plain paper

Hammermill copyplus (20lb) (in USA)
Xerox Premier (80g/m^2) (in Europe)

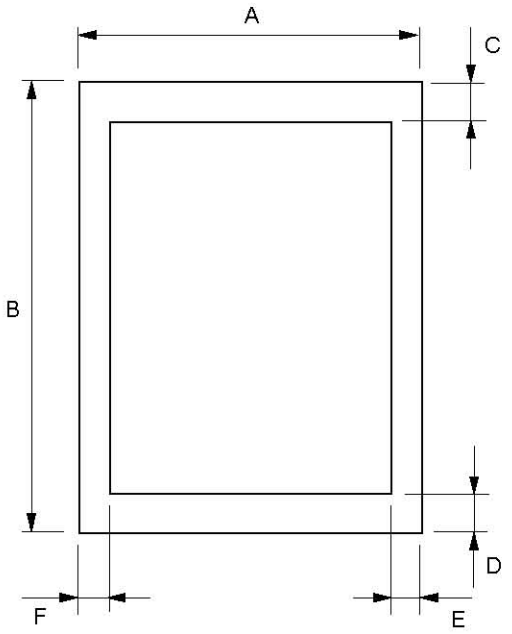
• Special paper

Brother special transparencies
Letter size No. HSTRL
A4 size No. HSTRA

4.9 Printable Area

	Paper size (mm)	
	A	B
A4	210.0	297.0
Letter	215.9	279.4
Legal	215.9	355.6
COM-10	106.0	240.0

	Printable area (mm)			
Type of paper	C	D	E	F
Plain paper	12.7	6.5	4.0	4.0
Transparency	12.7	6.5	4.0	4.0
Envelope	25.4	6.5	4.0	4.0
Recommended paper	6.5	6.5	4.0	4.0



A: Width
B : Length
C : Top margin, printable area
D : Bottom margin, printable area
E : Left margin, printable area
F : Right margin, printable area

Fig. 1.5

4.10 Control Panel

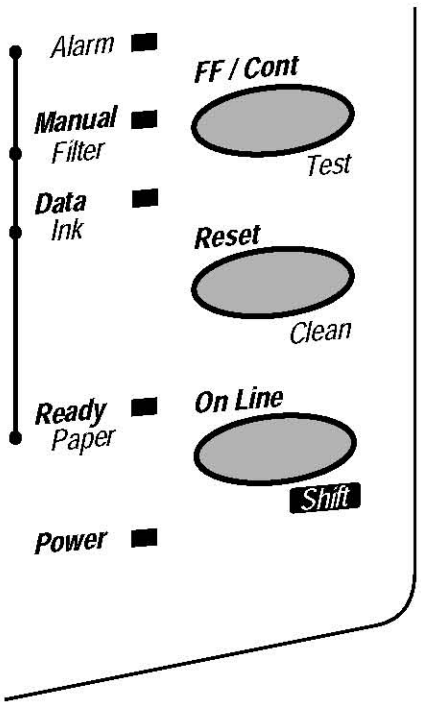


Fig. 1.6

4.10.1 Power LED

The **Power** LED indicates whether the printer is turned ON or OFF.

LED	Printer status
Off ○	The printer is turned Off.
On ●	The printer is turned On.

4.10.2 Ready LED

The **Ready** LED indicates the current status of the printer.

LED	Printer status
Off ○	The printer is off-line. The printer cannot receive any print data.
Blinking ○↔●	The printer is warming up or cleaning the print head.
On ●	The printer is ready to print.

This LED blinks with the **Alarm** LED to indicate a paper error. See 3.3 Error Codes in Chapter 4.

4.10.3 Data LED

The **Data** LED indicates the current status of the print data process.

LED	Printer status
Off ○	The printer has no print data.
Blinking ○↔●	The printer is receiving data from the computer or the printer is processing data in memory.
On ●	Print data remains in the printer memory. If the **Data** LED is on for a long period of time and nothing has printed, you need to press the **FF/Cont** button to print the remaining data.

This LED blinks with the **Alarm** LED to indicate an ink empty error.

4.10.4 Manual LED

The **Manual** LED indicates the current paper source.

LED	Printer status
Off ○	Sheet Feeder mode
Blinking ○↔●	The printer is waiting for paper to be loaded in the manual feed slot.
On ●	Manual feed mode

This LED blinks with the **Alarm** LED to indicate a Maintenance paper empty or no Maintenance cassette error.

4.10.5 Alarm LED

The **Alarm** LED blinks to indicate a printer error such as cover open, memory full or interface error etc. Also, the following combination of LEDs indicate errors.

Alarm + **Paper**	Paper empty or Paper Jam	Add paper or Clear paper jam, and then press the **FF/Cont** button.
Alarm + **Ink**	Ink empty	Add ink into the ink reservoir and then press the **FF/Cont** button.
Alarm + **Filter**	Maintenance paper empty or No maintenance cassette	Replace Maintenance paper with a new one or re-install the maintenance cassette correctly.

4.10.6 Online Button

The **Online** button alternately turns the printer on-line and off-line.

If you press this button during printing, the printer immediately stops printing and ejects the paper. Pressing this button again prints the rest of the print data. If you want to cancel printing, cancel the print job in your application first and then reset the printer.

When the printer becomes off-line because of an error, the printer can recover from some errors and return to on-line by pressing this button.

When performing cleaning or resetting, the printer must be set to off-line first.

4.10.7 Reset Button

The **Reset** button is valid only in the off-line mode.
The printer is reset and restored to the user default settings.

*Note: Remember that the **Reset** button clears data from the printer memory.*

4.10.8 FF/Cont Button

This button is valid only in the off-line mode.

If the **Data** LED is on, pressing the **FF/Cont** button prints any data remaining in the printer after turning the printer off-line.

When you select manual feed in your application, the printer alerts you to load paper in the manual feed slot by blinking the **Manual** LED. Press this button to start feeding the paper.

If a recoverable error occurs, press the **FF/Cont** button to recover from the error and return to the on-line state.

4.10.9 Shift + Test Button

Pressing the **Test** button while holding down the **Shift** button starts the test print. Check the printed test page and if you find any printing problems, perform the print head cleaning as described below.

4.10.10 Shift + Clean Button

Pressing the **Clean** button while holding down the **Shift** button starts head cleaning. If you see any problems on printouts, clean the print head and try again.

Note: Do not open the top cover during the head cleaning operation.

4.10.11 Test Print Mode

The printer has the following test print modes.

1. Keep the **Online** button depressed until all four LEDs light. Then, release the button.

   The printer enters test print mode. The **Alarm** LED blinks to indicate that the first choice, Print Config, is selected. See the table below.

2. Press the **Online** button to select another test.

   Every time you press the button, the blinking LED changes to select another choice. See the table below.

3. Press the **FF/Cont** button to perform the selected choice.

LED	Choice	Function
Alarm	Print Config	The printer prints the current printer settings.
Manual	Print Fonts I	The printer prints a list of the printer resident fonts.
Data	Print Fonts P	The printer prints a list of the permanent download fonts.

4. The printer returns to the ready status after printing.

4.10.12 Reset and Hex Dump print mode

The printer has the following Reset and Hex Dump print modes.

1. Keep the **FF/Cont** button depressed until all four LEDs light. Then, release the button.

   The printer enters the reset/hex dump mode. The **Alarm** LED blinks to indicate that the first choice, User Reset, is selected. See the table below.

2. Press the **Online** button to select another choice.

   Every time you press the button, the blinking LED changes to indicate another choice. See the table below.

3. Press the **FF/Cont** button to perform the selected choice.

LED	Choice	Function
Alarm	User Reset	The printer is restored to the user default settings without clearing permanent fonts and macros.
Manual	Factory Reset	The printer is restored to the factory settings and permanent fonts and macros are cleared.
Data	Hex Dump print	The printer can print data as hexadecimal values, so that you can check data errors and problems. To exit from this mode, press the Reset button or turn the printer off.

4. The printer returns to the ready status after printing

5. SAFETY INFORMATION

5.1 Ink Safety

Potential Health Effects

EYE CONTACT:	Contact unlikely.
SKIN CONTACT:	Prolonged exposure may cause skin irritation.
INGESTION:	Small amounts swallowed during normal handling operations are not likely to cause injury; swallowing larger amounts may cause injury.
INHALATION:	Negligible in normal use.

First Aid Measures

EYE CONTACT:	If any particles get into the eyes, immediately flush with running water for at least 15 minutes. If necessary, get medical attention.
SKIN CONTACT:	Wash with soap and water. Burns from molten ink should be treated as for a thermal burn.
INGESTION:	Do not induce vomiting. If necessary, get medical attention.
INHALATION:	Move into the fresh air.

6. CONSUMABLES AND SERVICE ACCESSORIES

6.1 Brother Special Transparencies

Letter size	No. HSTRL
A4 size	No. HSTRA

6.2 Maintenance Paper Cassette

Maintenance paper cassette and 1 paper roll	No. MR1
Maintenance paper cassette and 5 paper rolls	No. MR5

6.3 Ink (3 pellets/cartridge)

5 cartridges of Black ink	No. HS5K
5 cartridges of Cyan ink	No. HS5C
5 cartridges of Magenta ink	No. HS5M
5 cartridges of Yellow ink	No. HS5Y
2 cartridges of Black and 1 cartridge each of Cyan, Magenta and Yellow	No. HS5S

6.4 Print Head

For 230V	No. HD501
For 120V	No. HD502

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CHAPTER II THEORY OF OPERATION

1. ELECTRONICS

1.1 General Block Diagram

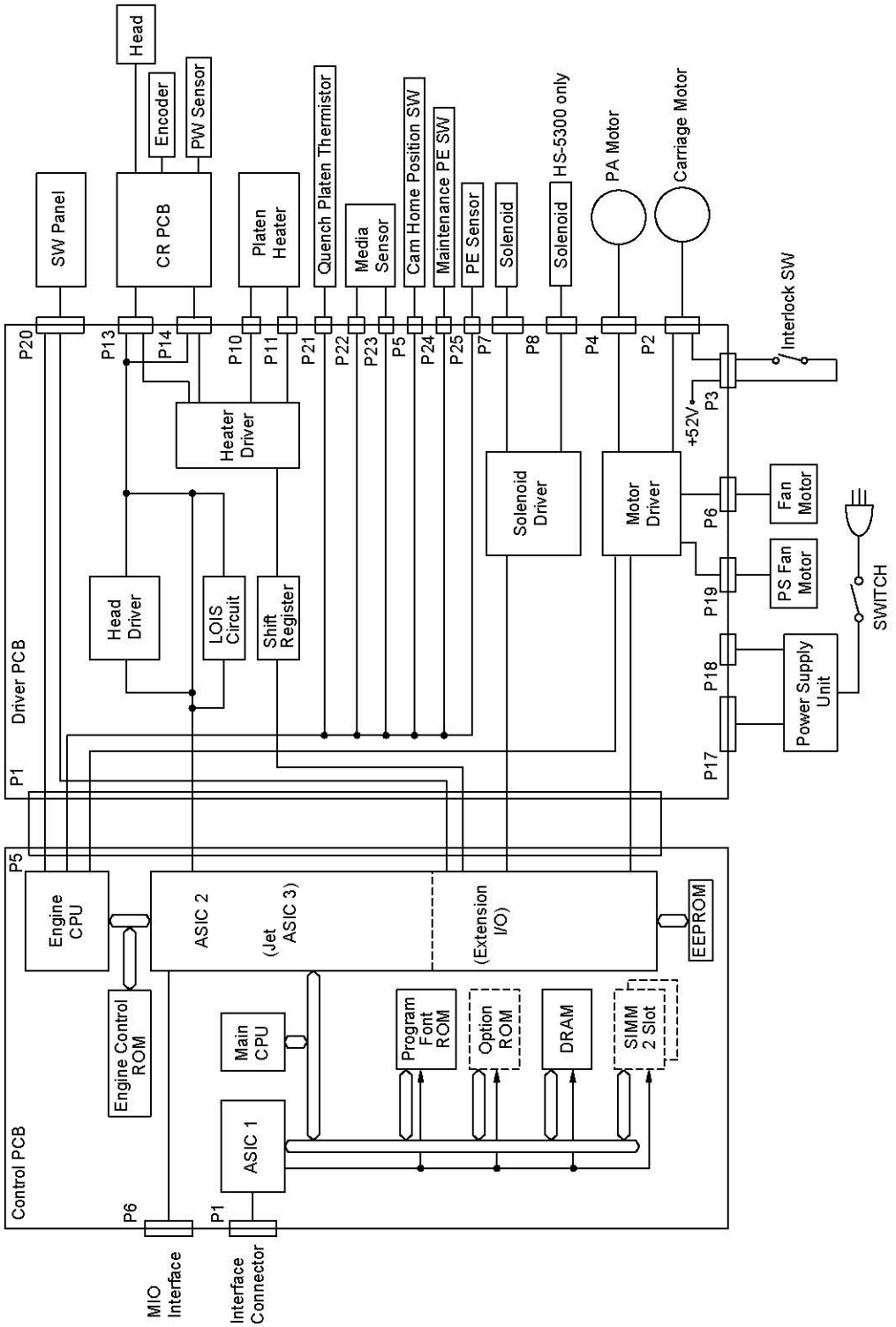


Fig. 2.1

1.2 Configuration of Electronics

(1) Control PCB

Receives the data and controls the PA and carriage motors, solenoids, platen heater, switch panel, paper sensing, head temperature, platen temperature head voltage, PS fan motor and fan motor. It also detects the amount of ink remaining, the maintenance PE and sends the data to the head driver.

(2) Driver PCB

Drives the PA and carriage motors, solenoids, LEDs on the switch panel, platen heater, head heater, ink remaining detection circuit, PS fan motor, fan motor, head and sensors.

(3) Panel PCB

Three switches and five LEDs are mounted on this PCB.

(4) CR PCB

Connects the driver PCB to the following parts on the carriage.
Paper width sensor, encoder, head heater, head OHS heater and LOIS circuit

(5) Power supply unit:

Generates voltages as below.
Head drive ICs are mounted on the head and connected to the driver PCB through the CR PCB.

5V	:	Logic circuits
25V	:	Solenoids PS fan motor Fan motor
52V	:	Heater Carriage motor
39 / 30V	:	Print head PA motor

1.3 Main PCB

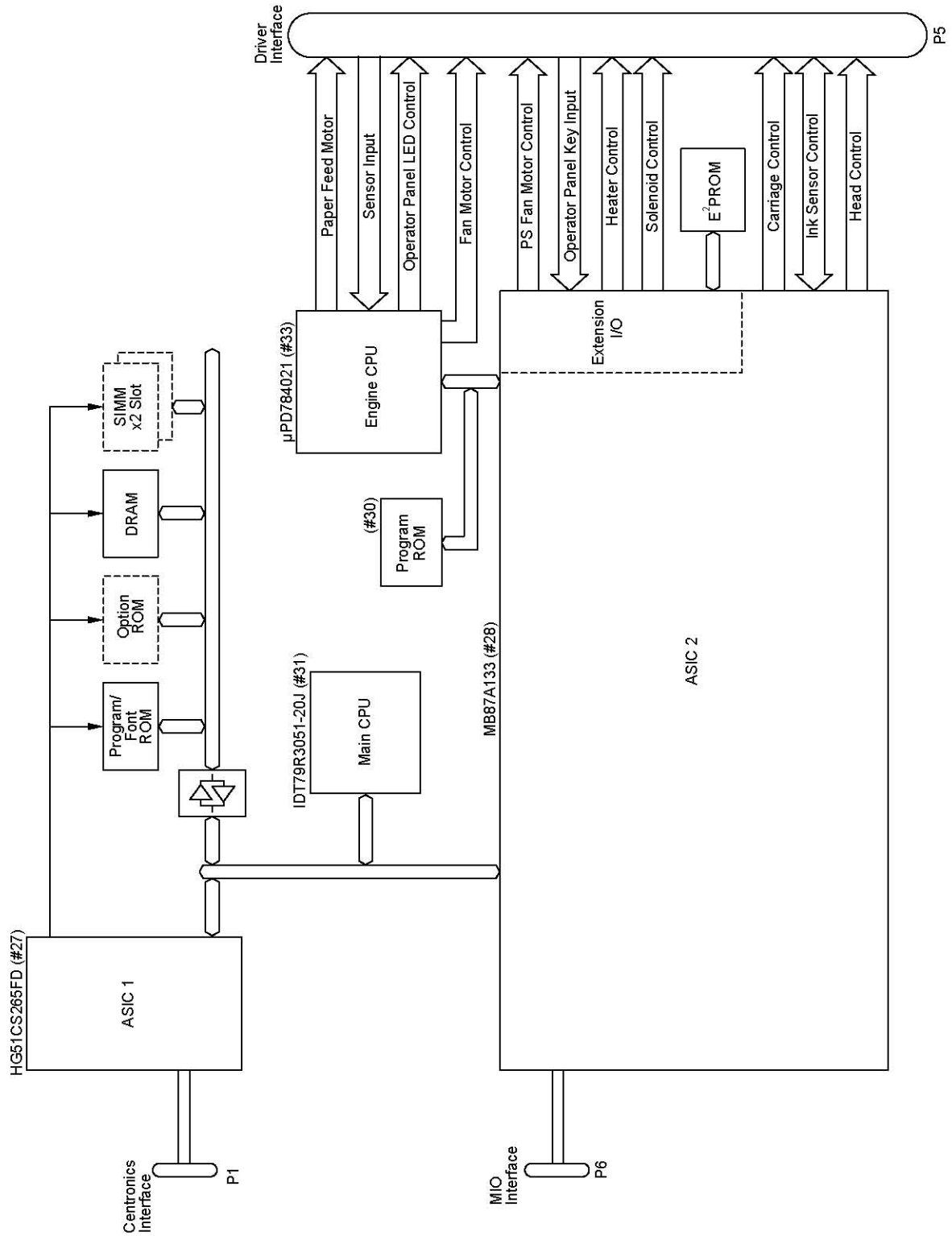


Fig. 2.2

1.3.1. Features

The circuit on the control PCB is classified into the following three sections.

- Image processing

  Converts the image data received from the centronics parallel interface into the bit map.

- Print head control

  Sends the bitmap data, which is converted from the image data, to the head and generates the ink jet timing.

- Engine control

  Controls the motors and heaters, and receives the input data from the sensors.

1.3.2 Image Processing

(1) Main CPU

The IDT79R3051-20J, a 32bits RISC processor, is used to process the image data. The main CPU operates at a clock speed of 19.6608 MHz.

(2) ASIC1

The HG51CS265FD is used as the ASIC to control the CPU peripheral and centronics interface circuits..

(3) ROM

Two 16Mbits (1048576word x 16bits) mask ROMs (or flash ROMs) are used to store the program for the main CPU and font data. A ROM with an access time of 120 nsec. or faster must be used.

(4) DRAM

Four 16Mbits (1048576word x 16bits) DRAMs (TC5118160AJ-7 or equivalent) are used as a CPU work area and image data receiving buffer. A DRAM with an access time of 80 nsec. or faster must be used. The data in the DRAMs is refreshed based on the CBR (CAS before RAS) system.

(5) SIMM

Up to two 72pin SIMMs can be additionally installed to expand the memory capacity up to 72MB. One or two SIMMs selected from 1, 2, 4, 8, 16, and 32MB can be installed. When expanding the memory, install the SIMMs in SLOT 1 and SLOT 2 in that order. Additionally, when installing two SIMMs having a different capacity, the SIMM with a larger capacity must be installed in SLOT 1.

The SIMM must have the following specifications:

Type:	72 pin and 32 bit or 36 bit output
Access Time:	80 nsec. or less
Capacity:	1, 2, 4, 8, 16 or 32 Mbytes
Height	38 mm (1.5 inches) or less

The following capacity of a SIMM for installing is recommended;:

- 1 Mbyte HITACHI HB56D25632B-6A, -7A,
  MITSUBISHI MH25632BJ-7
- 2 Mbyte HITACHI HB56D51232B-6A, -7A
  MITSUBISHI MH51232BJ-7
- 4 Mbyte HITACHI HB56A132BV-7A, -7AL, -7B, -7BL
  MITSUBISHI MH1M32ADJ-7
- 8 Mbyte HITACHI HB56A232BT-7A, -7AL, -7B, -7BL
  MITSUBISHI MH2M32EJ-7, MH2M32DJ-7
- 16 Mbyte TOSHIBA THM324000BSG-60,-70,-80
- 32 Mbyte TOSHIBA THM328020BSG-60,-70,-80

There are available 40 bit output SIMMs for workstations. Such SIMMs do not fit this printer.

1.3.3 Print Head Control

(1) ASIC 2

The MB87A133 is used as the ASIC to control the print head. The ASIC becomes the bus master instead of the main CPU during the print process and reads the converted image data from the DRAM based on the encoder signal and conditions sent from the main CPU and engine CPU. It also sends the data to the head and outputs the ink jet timing to the head drive circuit.
This ASIC includes the following functions in addition to the print head control.

- Extended I/O of the engine CPU
- MIO interface
- Timing generating circuit for the ink sensor
- Carriage motor drive timing generating circuit

1.3.4 Engine Control

(1) Engine CPU

The µPD784021GC, a 16bit one-chip microprocessor, is used for the engine control.
The engine CPU controls the following.

- Carriage motor control
- PA motor control
- Fan motor control
- Inputs and outputs from/to the operator panel
- Heater control
- Sensor inputs

(2) ROM

The HM27C101AG-12 or equivalent, a 1Mbit (131072-word x 8bits) EP-ROM, is used to store the program and data for the engine CPU.

(3) EEPROM

A 4Kbits EEPROM (X24C04 or equivalent) is used to store certain conditions. When the main CPU reads/writes the data from/to the EEPROM, the main CPU communicates with the engine CPU and the engine CPU actually reads and writes the data.

1.4 Driver PCB

1.4.1 PA Motor Drive Circuit

The PA motor is a uni-polar stepper motor and is driven at a constant current by the specially designed drive IC.
Each phase of the step motor is excited by the PF_A, PF_AN, PF_B and PF_BN signals. The current flowing in the stepper motor is switched by the PF_Hold signal output from the Jet ASIC3.
The PA motor drive circuit controls the current flowing when the step motor is in the hold mode compared to when rotating. The circuit makes PF_Hold signal low when the motor starts rotating and the PF_Hold signal high when it is in the hold mode.

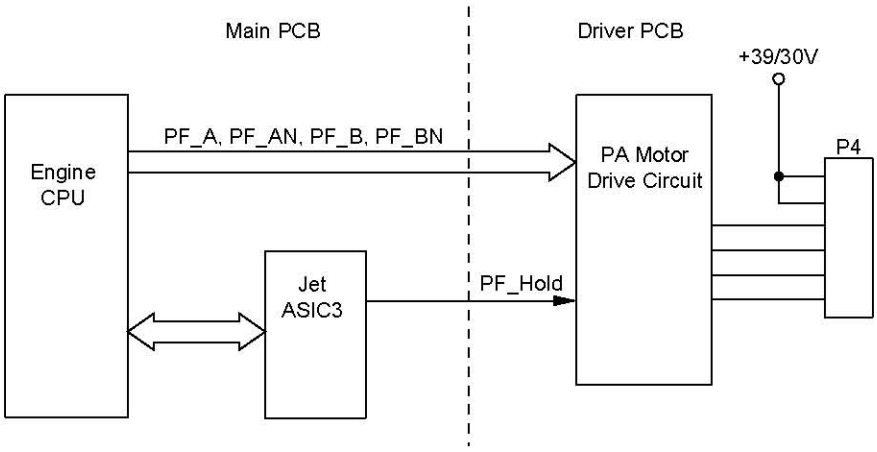


Fig. 2.3

1.4.2 Carriage Motor Drive Circuit

The carriage motor is a DC motor and its speed is controlled by the PWM control of the engine CPU through the JET ASIC3 using the feed back signals (ENC_A and ENC_B) output from the linear encoder. Also it stops, when the interlock switch is off.
The H bridge circuit is driven by the CR_Q1_ENA, CR_Q2_ENA, CR_Q3_ENA, and CR_Q4_ENA signals output from the Jet ASIC3 and the current flows to the DC motor to rotate it.

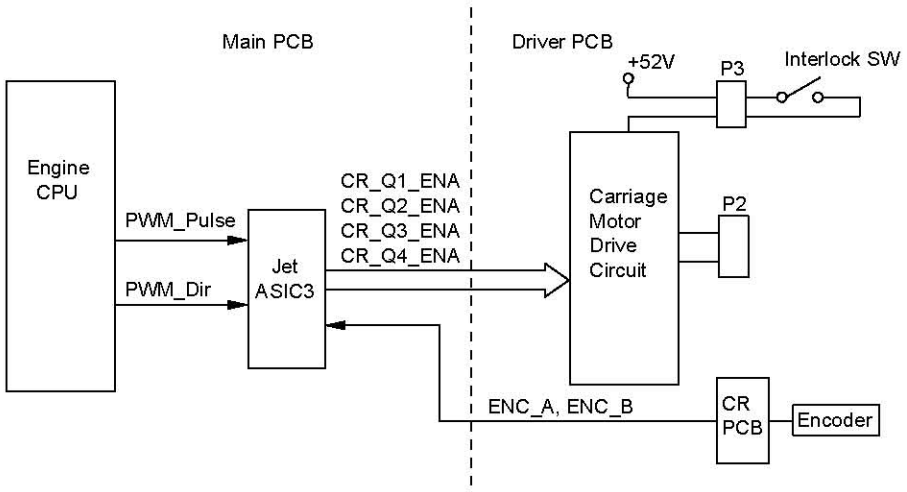


Fig. 2.4

1.4.3 Solenoid Drive Circuit

The HS-5000 uses one solenoid while the HS-5300 uses three solenoids.
In the HS-5000, the solenoid is activated to rotate the paper feed roller for paper feeding.
In the HS-5300, the solenoids are activated to rotate the paper feed roller (1st bin or 2nd bin) for paper feeding or to stop rotation of the regist roller.

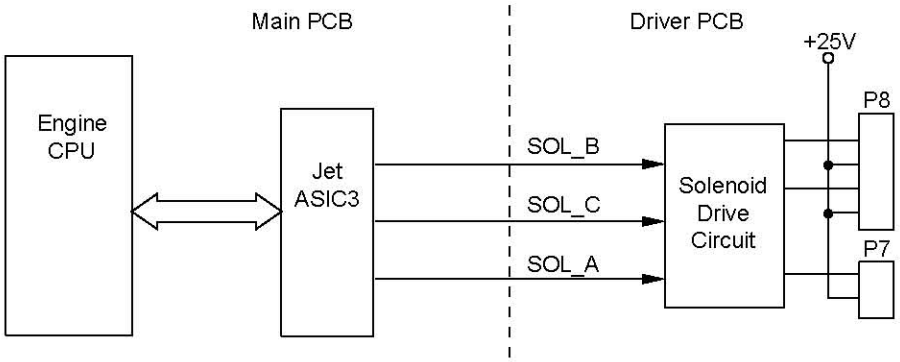


Fig. 2.5

When the SOL_A signal is high, the paper feed roller for the 1st bin starts rotating.
When SOL_B signal is high, the paper feed roller for the 2nd bin starts rotating.
When SOL_C signal is high, the regist roller stops rotating.

1.4.4 Switch Panel Control Circuit

The switch panel control circuit controls the input from the three buttons and the ON/OFF status of the five LEDs.
When a button is pressed, the switch signal becomes low and it is detected by the engine CPU through the Jet ASIC3.
The ON/OFF status of each LED is controlled by the engine CPU. When the status signal is low, the LED is lit.

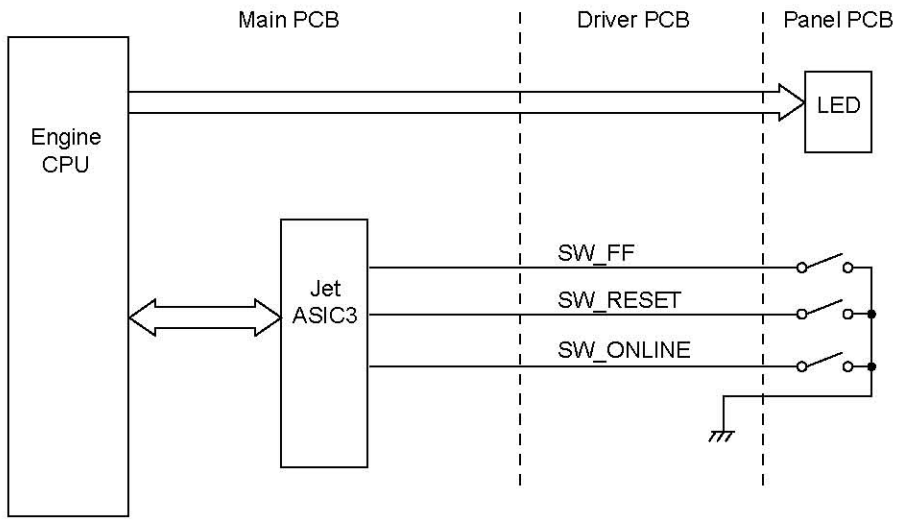


Fig. 2.6

1.4.5 Heater Drive Circuit

The heater drive circuit is used to drive the heater which heats up the platens (pre-platen and platen), the head and the OHS tank.
The engine CPU turns ON or OFF the heater through the Jet ASIC3. When the control signal output from the Shift Register is low, the heater is turned ON and heats the corresponding platen.

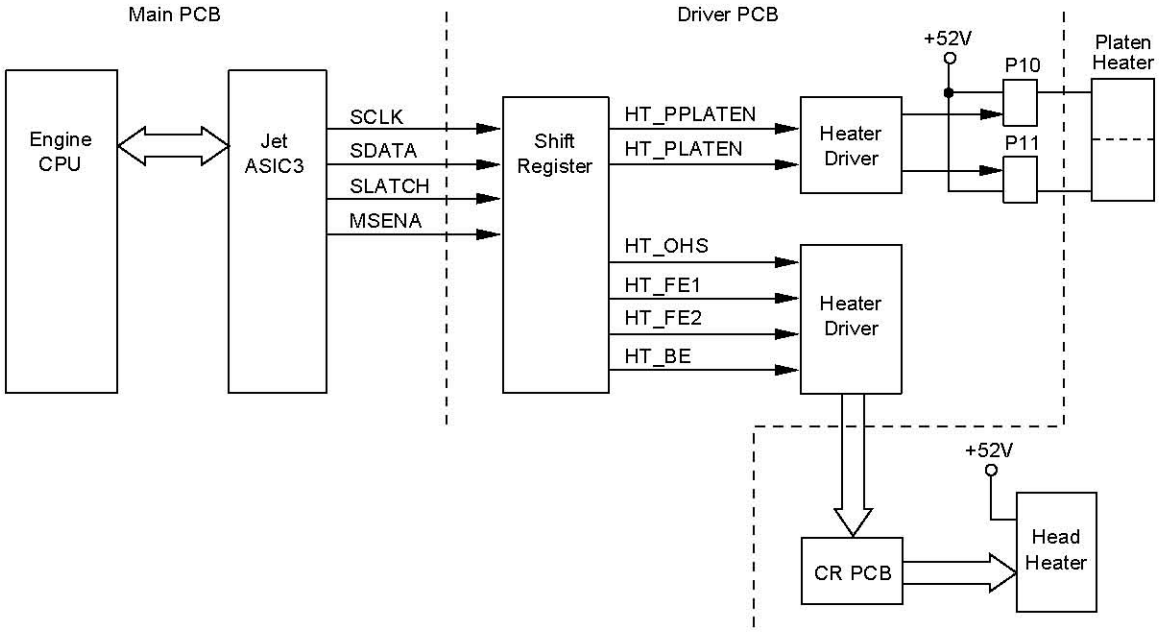


Fig. 2.7

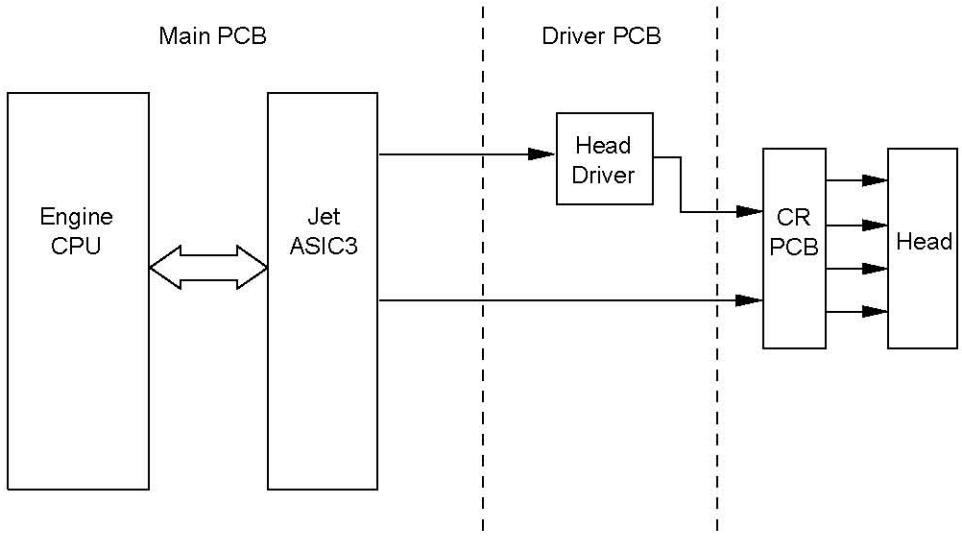


Fig. 2.8

1.4.6 LOIS Circuit

A thermistor is attached to the head ink tank for each color as an ink empty sensor. When a specified voltage level is applied to the thermistor, it heats up by itself.
When the ink level in the ink tank is higher than the thermistor position, the ink absorbs the heat produced by the thermistor and the temperature at the thermistor rises slowly. When the ink level in the ink tank is below the thermistor position, the heat produced by the thermistor is not absorbed and the temperature at the thermistor rises fast. By watching the difference between these temperature increase speeds, it can be detected whether ink remains in the head ink tank or not.

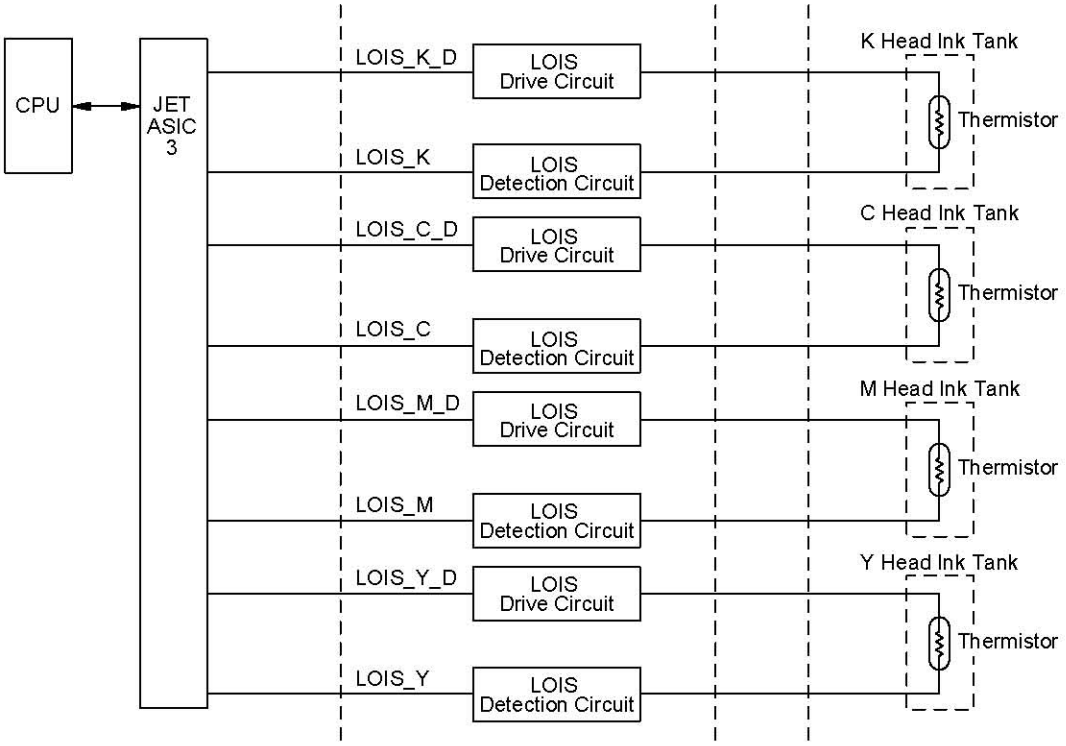


Fig. 2.9

The Jet ASIC3 makes the LOIS_K_D signal level high at 32 msec. intervals. When the LOIS_K_D signal is high, the LOIS drive circuit applies a voltage to the thermistor to start the self-heating of the thermistor.
When the LOIS detection circuit detects that the temperature at the thermistor reaches a specified level, the LOIS_K signal becomes low.

As the LOIS_K signal becomes low, the Jet ASIC3 makes the LOIS_K_D signal low. When the LOIS_K_D signal is low, the LOIS drive circuit stops, the self heating of the thermistor finishes, and the LOIS_K signal returns to the high level.

The CPU detects through the Jet ASIC3 whether the duration of the high level of the LOIS_K_D signal is shorter or longer than a specified length. When it is longer than a specified time, the CPU determines that ink still remains. When it is shorter, the CPU determines that the ink has run out.
This procedure applies to the all head ink tanks for K, C, M, and Y.

1.4.7 Fan Drive Circuit

The fan drive circuit controls the rotation speed of the fan motor. The fan can rotate at high speed, low speed or stopped by the combination of the FAN_HIGH and FAN_LOW signals output from the engine CPU. The relationship between the signals and rotation speed are shown in the table below.

FAN_HIGH	FAN_LOW	Rotation speed
High	Low	High
Low	High	Low
Low	Low	Stop

Fig. 2.10

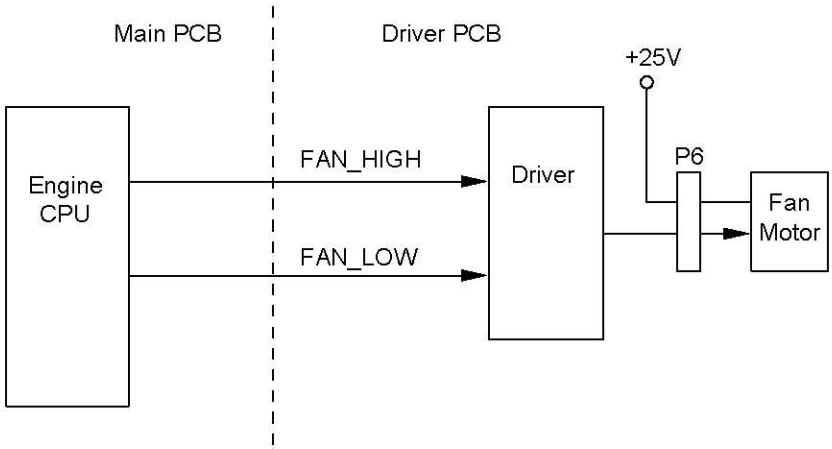


Fig. 2.11

1.4.8 PS Fan Motor Drive Circuit

The PS fan motor drive circuit controls the rotation of PS fan motor to cool down the power supply unit. It is controlled by the C_FAN signal output through the Jet ASIC3 from the engine CPU which controls the fan rotation and stop. The motor starts rotating when the signal is high and stops when the signal is low.

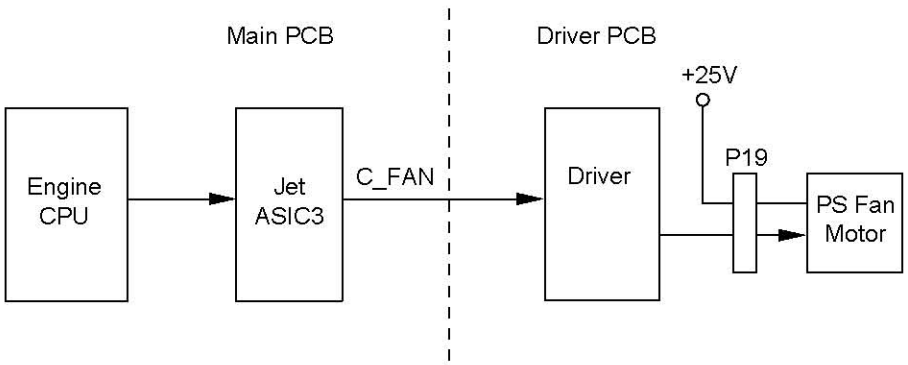


Fig. 2.12

1.4.9 Head Drive Circuit

The head drive circuit sends the print data to the driver IC for the print head and generates pulses to drive the head.

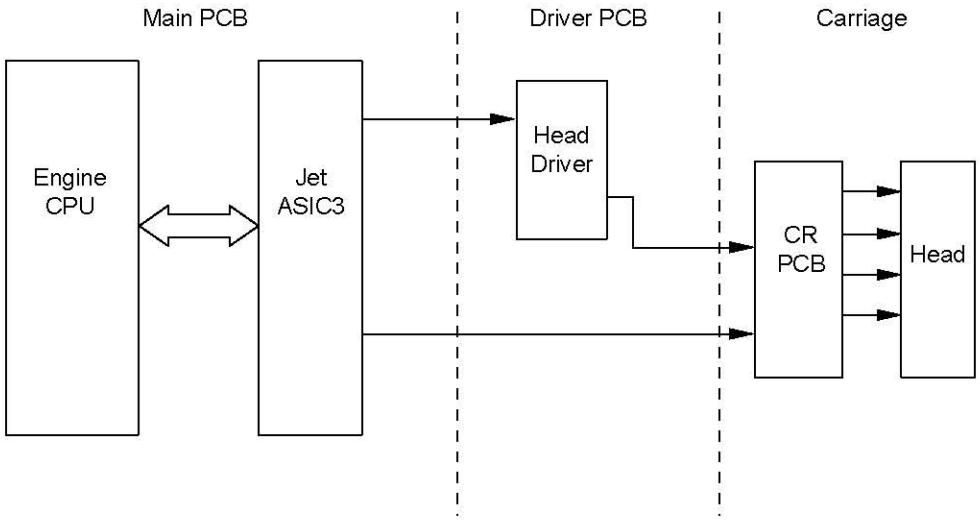


Fig. 2.13

1.5 CR PCB

The CR PCB connects the driver PCB and the head on the carriage, the head heater, the encoder, the PW sensor, the tank heater and the LOIS circuit as shown below.

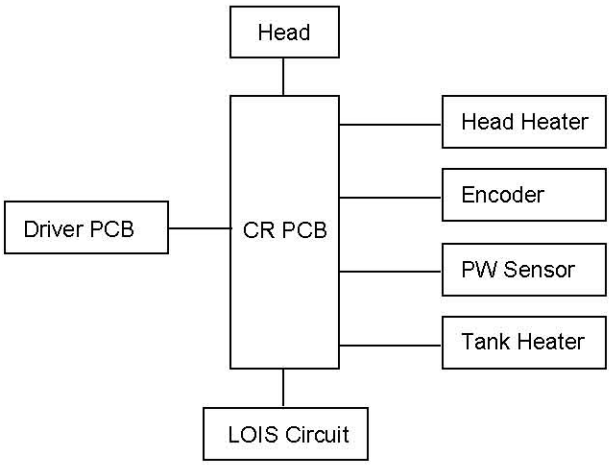


Fig. 2.14

1.6 Control Panel PCB

Three switches and five LEDs are mounted on this PCB.

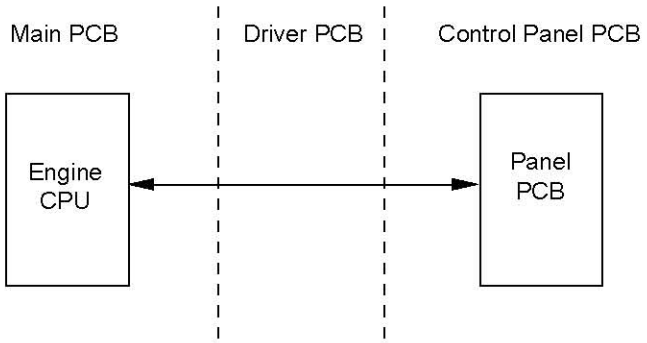


Fig. 2.15

1.7 Power Supply Unit

The power supply unit generates several DC power sources from the AC power source. The DC power sources generated by the power unit are +5V, +25V, +52V, and +39/30V. The DC CHG signal switches the output between +39V and +30V. The power supply unit contains the AC heater ON/OFF circuit, which is controlled by the AC HT CTL signal.

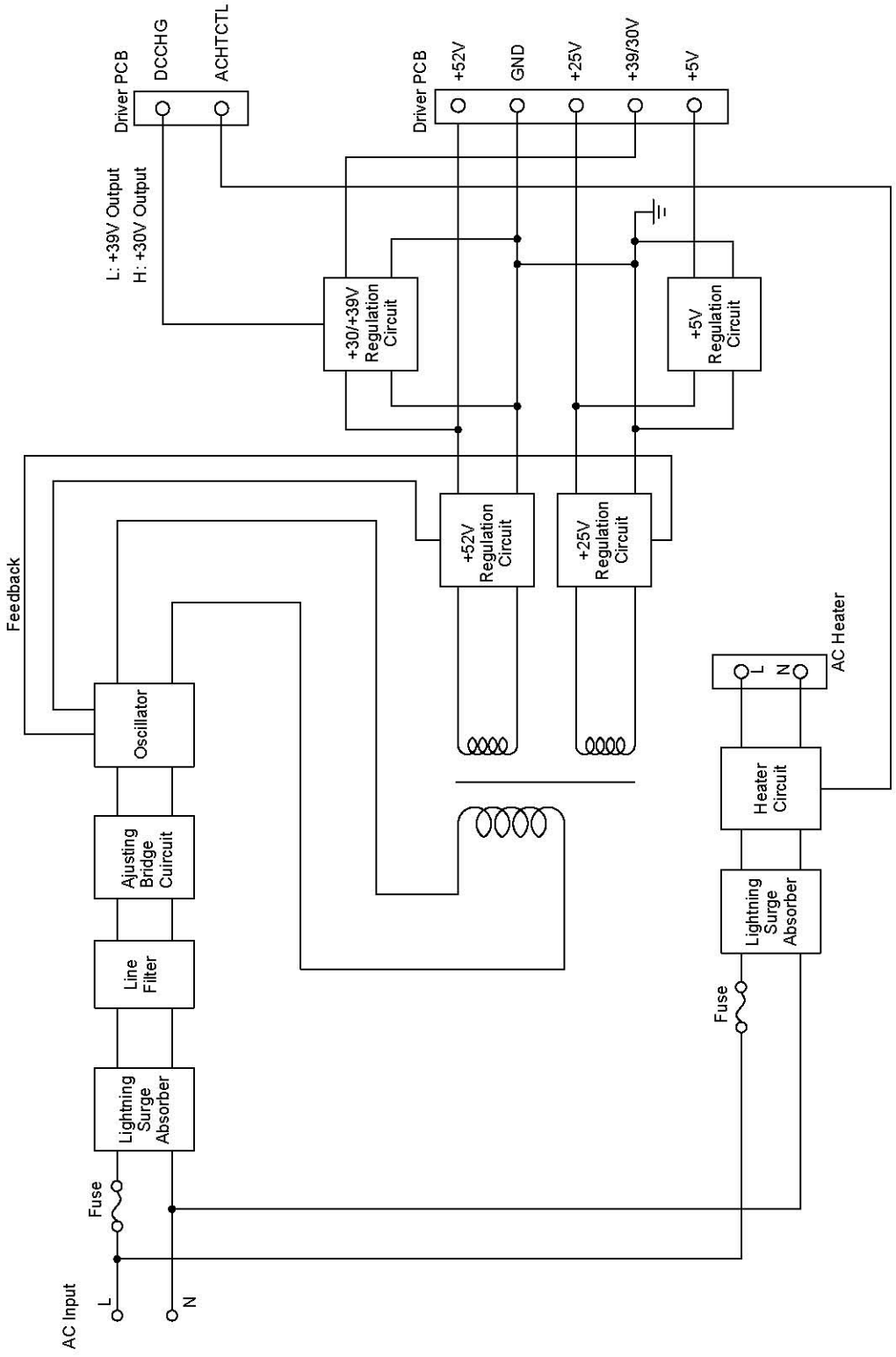


Fig. 2.16

2. MECHANICS

2.1 Overview of Printing Mechanism

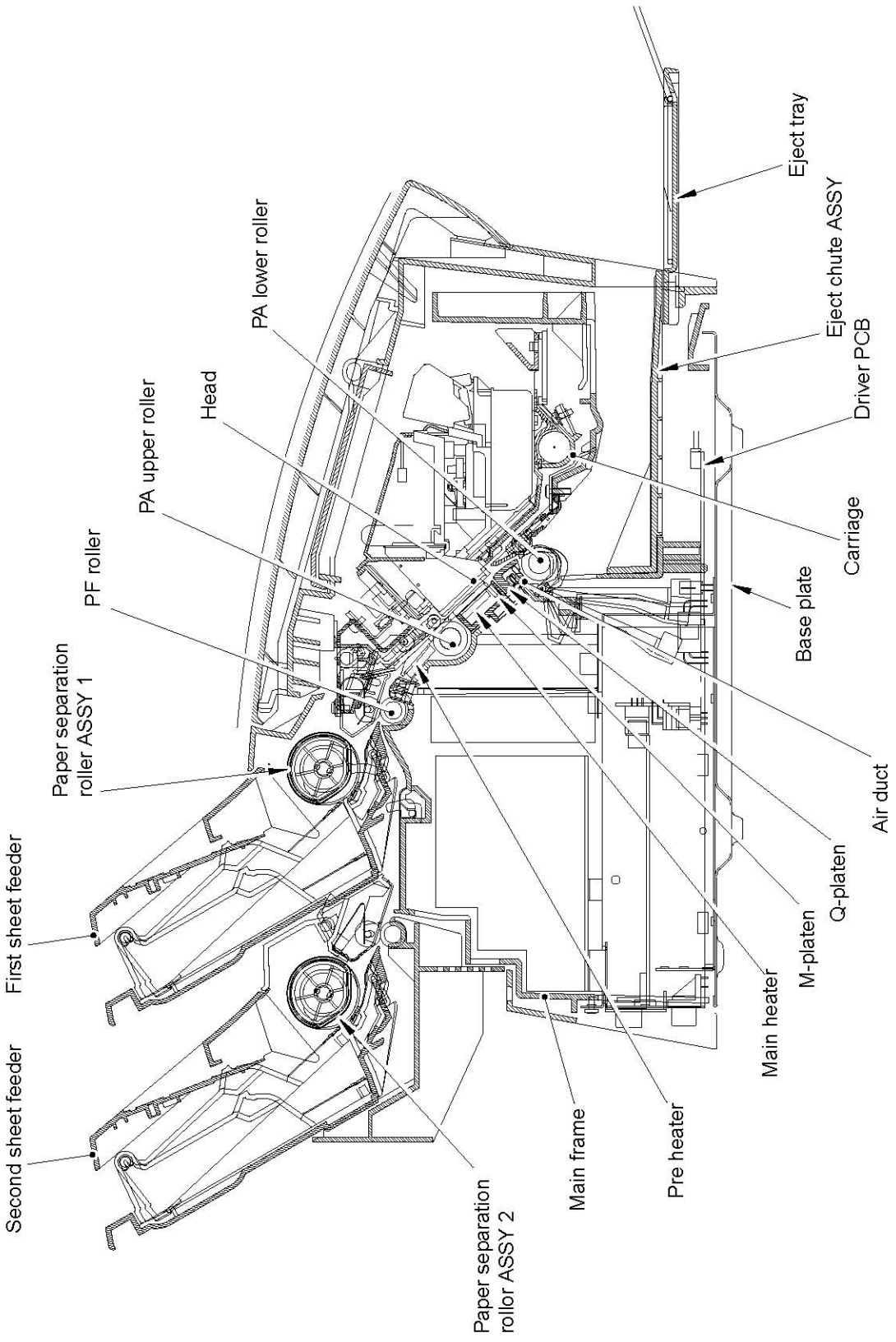


Fig. 2.17

2.2 Print Head

2.2.1 Functions of the Print Head

The print head used in this printer is an on-demand type using a piezoelectric ceramic actuator to fire ink. The print head is composed of four Front ends each of which has 128 nozzles and one Back end combined with the Front ends. Each Front end fires the special hot melt color ink (yellow/cyan/magenta/black). The print head is applicable for two resolutions, 300dpi and 600dpi.

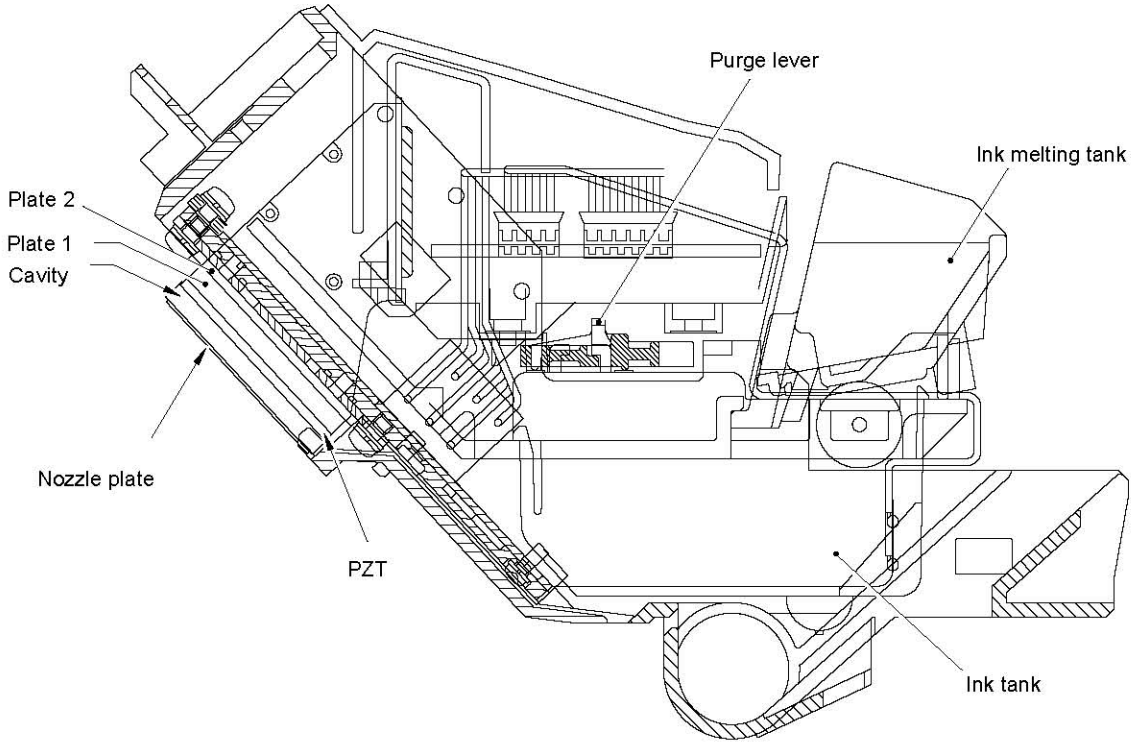


Fig. N2.28

2.2.2 Structure of the Print Head

(1) Front end

Each Front end has 128 nozzles arranged in zigzags and fires the ink supplied from the Back end in drops.

(2) Back end

The Back end is connected to four (four-color) Front ends and supplies the hot melt ink in each color to the respective Front end. Solid ink in the ink supply unit is melted and supplied to the Front end through the ink circulation passage.

• Ink melting tank

The ink melting tank melts solid ink in the ink supply unit and supplies the melted ink to the ink tank.

• Ink tank

The ink tank keeps the hot melted ink and supplies it to the Front end when required. The ink tank has a two-chamber structure and also keeps the ink circulated by purging. The chambers are always connected to keep the same ink level in the two chambers.

• Filter

The filter eliminates foreign objects and air bubbles included in the hot melted ink supplied from the ink tank to the Front end, resulting in uniform and consistent ink firing from the Front end.

• LOIS

The LOIS detects a low ink level in the ink tanks.

• Purge lever

The purge lever functions when a purge is carried out. The purge lever disconnects the two chambers in the ink tank to create an ink circulation passage.

• Ink circulation mechanism (purge mechanism)

The ink circulation mechanism (purge mechanism) circulates the hot melted ink in the four individual colors that is remaining in the print head passage when the printer is turned ON or carrying out the purge from the control panel. When circulating the ink, it supplies new ink to the Front end through the filter and passes the old ink in the Front end (containing any air bubbles and foreign objects) to the ink tank in order to ensure optimal ink firing status.

2.3 Ink Holder and Ink Supply Mechanism

In this printer, ink is supplied from a solid ink block which is set into the ink case and fed to the head through the ink supply mechanism.

(1) Refilling of solid ink blocks

- Opening the ink silo cover enables setting of solid ink blocks in the ink case.
- Unpack the ink package, take out a new ink holder, and set it in the ink case. Press the concave section on the top of the ink holder to insert the solid ink blocks into the ink case. After that, dispose of the ink holder.
- After the solid ink has been inserted, close the ink silo cover to enable the ink supply to the head.

(2) Ink supply to the head

- The carriage is moved to the home position and the change mechanism operated to connect the paper transport mechanism and the ink supply mechanism using a clutch. After they are engaged, the ink supply mechanism can be operated by the PA motor.
- The carriage is moved to the ink supply position. (Four positions for each individual color)
- Rotation of the PA motor starts the ink supply mechanism, which is in a stand-by mode, to supply the ink from the solid ink block set in the ink case to the head.
- Another rotation of the PA motor brings the ink supply mechanism back to the stand-by mode.
- The carriage is moved to an area beyond the ink supply position, the change mechanism operated to release the clutch and disengage the drive between the paper transport mechanism and the ink supply mechanism.

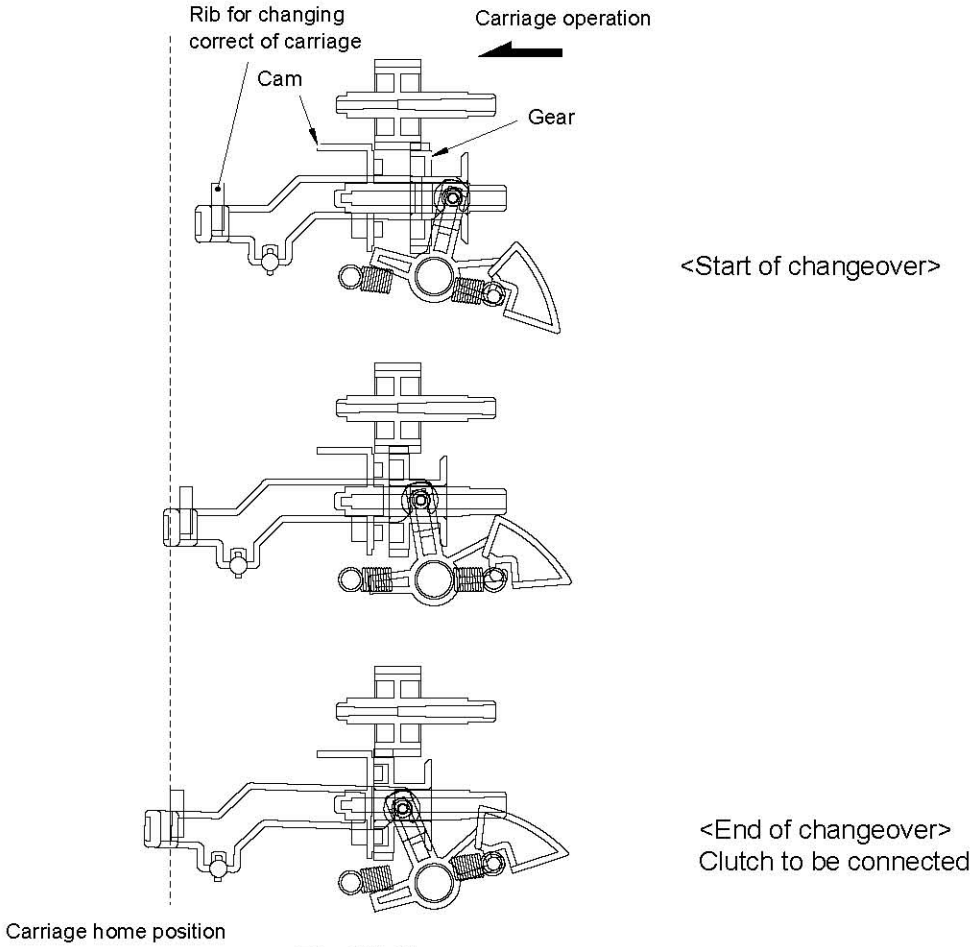


Fig. N2.29

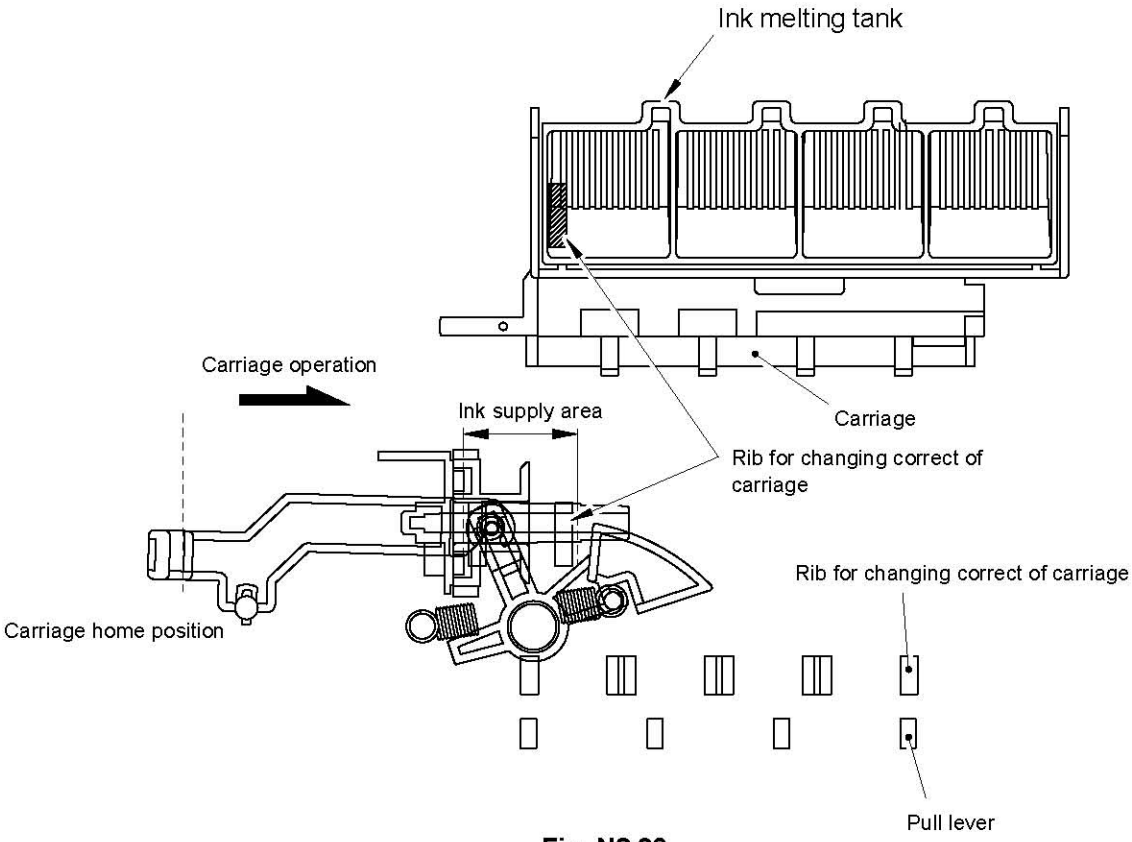


Fig. N2.30

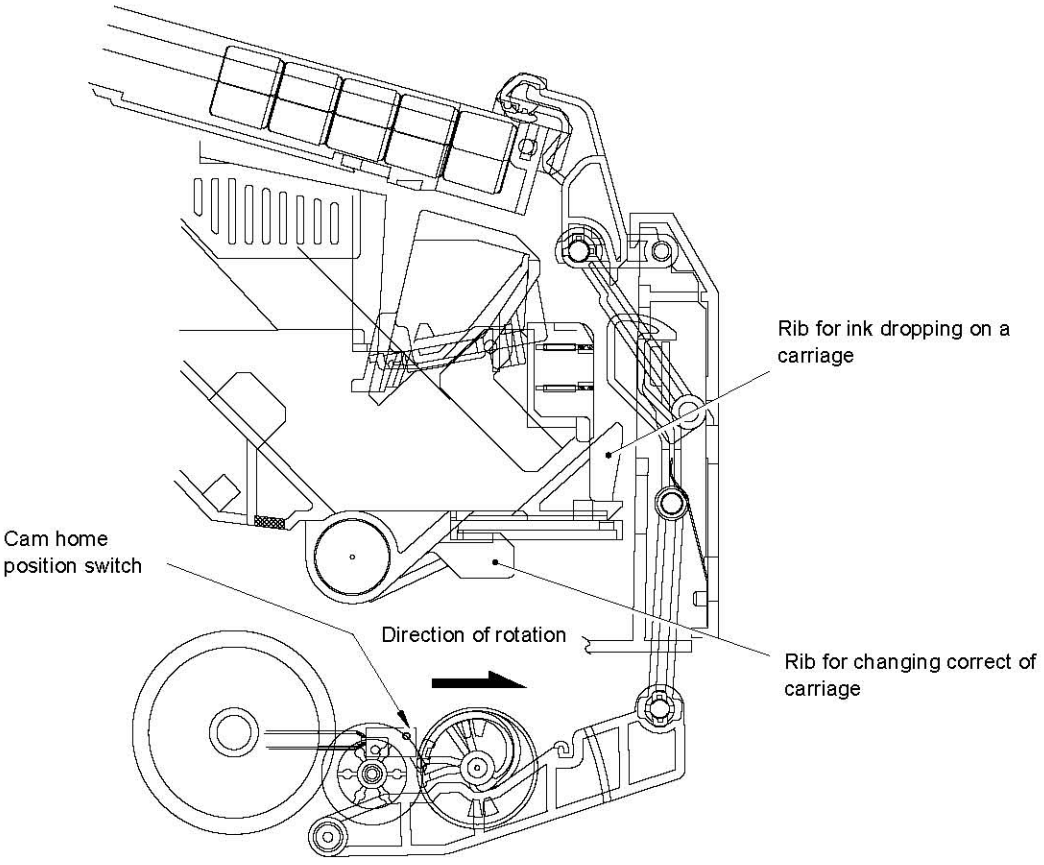
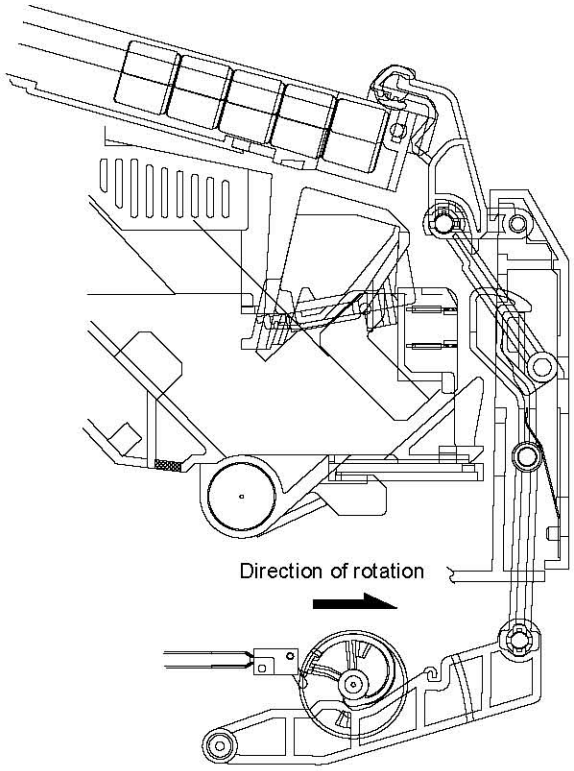
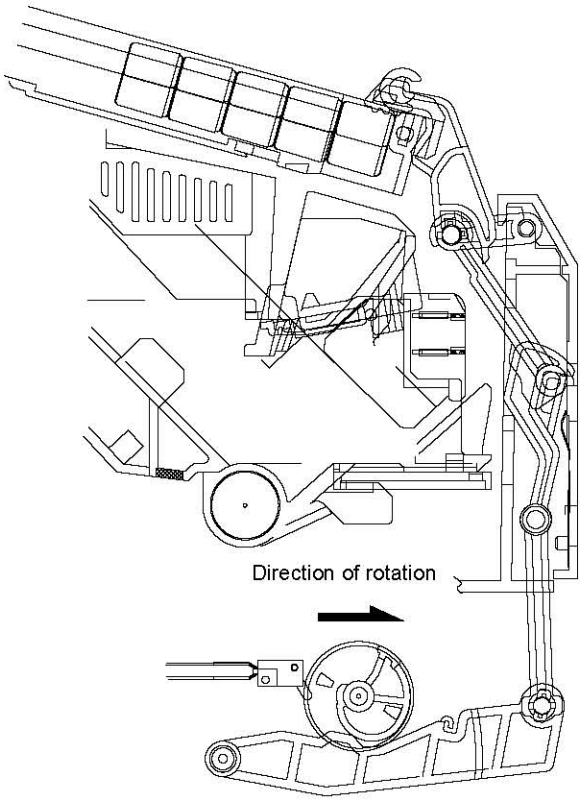


Fig. N2.31



(OHS SW: OFF)

Fig. N2.32



Starting of pushing ink

Fig. N2.33

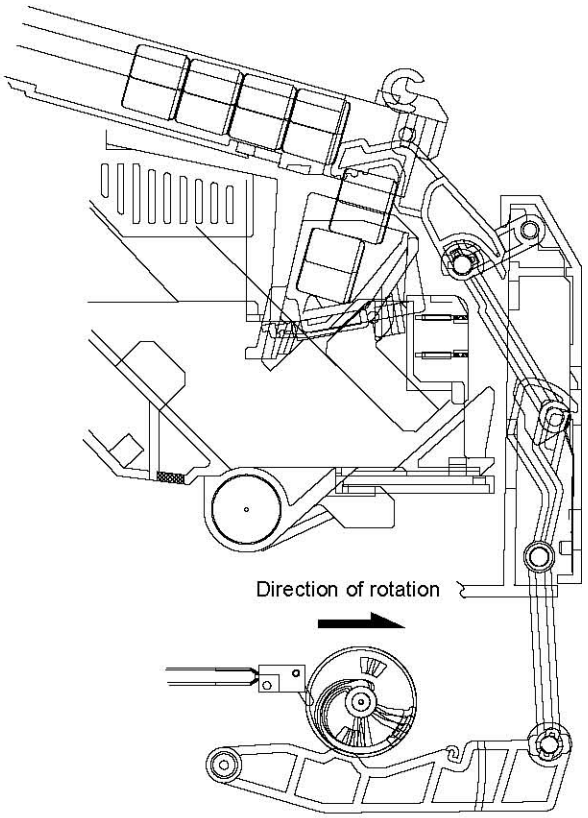


Fig. N2.34

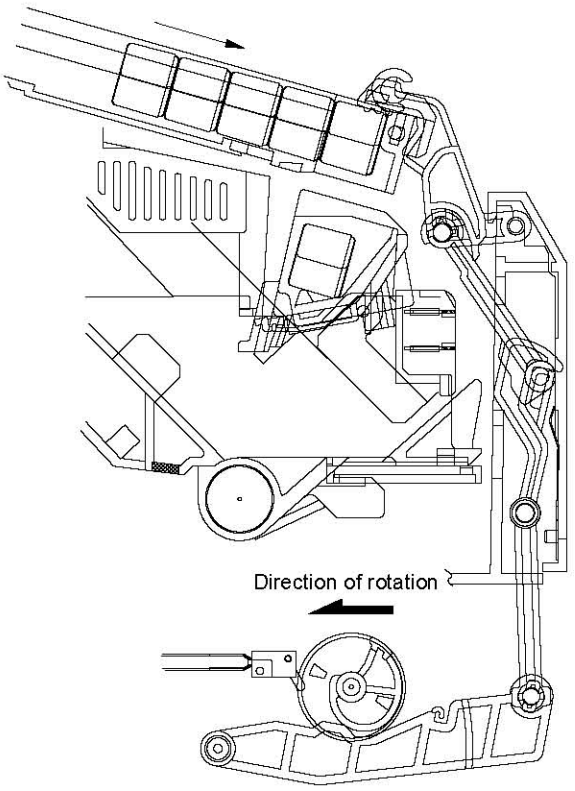
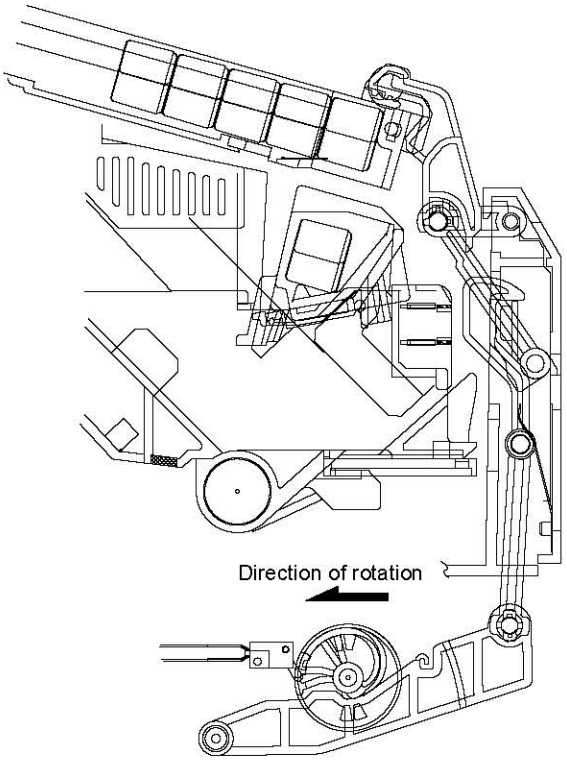


Fig. N2.35



Wait condition (OHS SW: ON)

Fig. N2.36

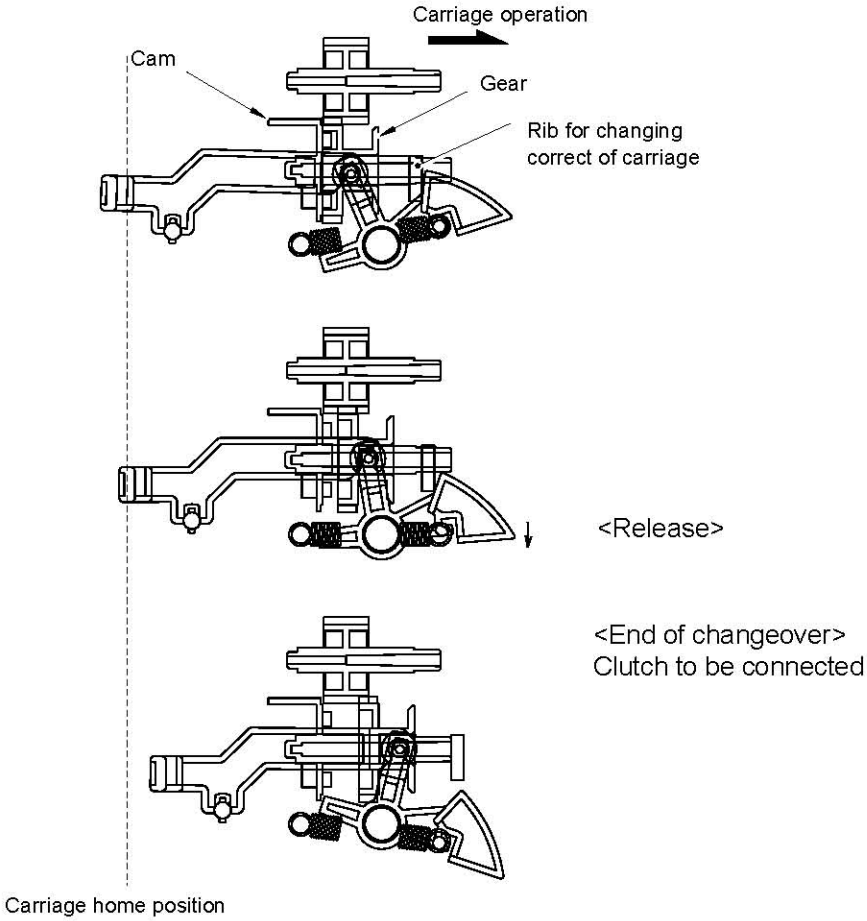


Fig. 2.18

2.4 Head Cleaning

2.4.1 Functions of the Maintenance Unit

The maintenance unit driven by the PA motor performs maintenance of the head unit to always produce high quality output.

(1) Purging

Purging starts at power on or when the purge is chosen from the control panel. This eliminates air bubbles and foreign objects in the ink remaining in the ink passage of the head unit by applying pressure to the ink tank.

(2) Wiping

Wiping is carried out when 50 sheets are printed in order to remove paper dust and ink dust sticking on the nozzles of the head unit using special paper.

2.4.2 Structure of the Maintenance Unit

(1) Maintenance unit frame

The maintenance frame supports the mechanisms (2)~(7) below and secures them to the frame.

(2) Maintenance cartridge

The maintenance cartridge is a consumable part and composed of the following parts (a)~(d).

(a) Special roll paper

The center of the roll paper has a paper tubeless structure and the paper tube that engages with the winding core is taped at its periphery by adhesive tape.

(b) Press contacting plate

This plate with the special heat resistant flexible sheet makes even contact between the special roll sheet and the nozzle surface of the head unit. The press contacting plate is moved perpendicularly towards the nozzle surface by the press contacting mechanism on the maintenance frame unit.

(c) Winding core

The winding core is driven by the drive gear train installed on the maintenance unit frame to wind the special roll paper sheet during purging and wiping.

(d) Paper transport roller and nip roller

The paper transport roller and nip roller are placed at the down stream side of the press contacting plate so that they hold the special roll paper sheet. When the maintenance cartridge is installed on the maintenance frame unit, the nip force is applied to drive the paper transport roller and nip roller together.

(3) Press contacting mechanism

When the carriage moves to the maintenance position, it moves the lever to drive the press contacting link. By driving the press contacting link, the press contacting plate moves up and down.

(4) Drive gear train

The drive gear train installed on the maintenance unit frame transmits the power of the PA motor to the winding core and the pumping mechanism through the paper delivery roller. The drive gear train is turned ON and OFF by the press contacting link position of the press contacting mechanism moved by the carriage.

(5) Pumping mechanism

Two pistons in the syringe are controlled by the disc cam to feed air to the tube. It is constructed to prevent negative pressure from being produced.

(6) Capping mechanism

The capping mechanism supports a capping block with a rubber seal using a spring plate. When the head unit moves to the right end position, it is connected to a hole made in the ink tank. An air tube from the pumping mechanism is connected to the block and pressure is applied to the ink tank through the hole made in the rubber cap.

(7) Maintenance paper empty sensor

If the special roll paper runs out or the maintenance cartridge is not installed, the maintenance paper empty sensor detects it.

(8) Maintenance paper level gauge

The maintenance paper level gauge is installed at the right shoulder position of the 1st sheet feeder (right above the maintenance cartridge) and detects the change of diameter of the winding core using a mechanical link and mechanically indicates the amount of the remaining special roll paper.

2.5 Sensors

The printer has the following sensors.

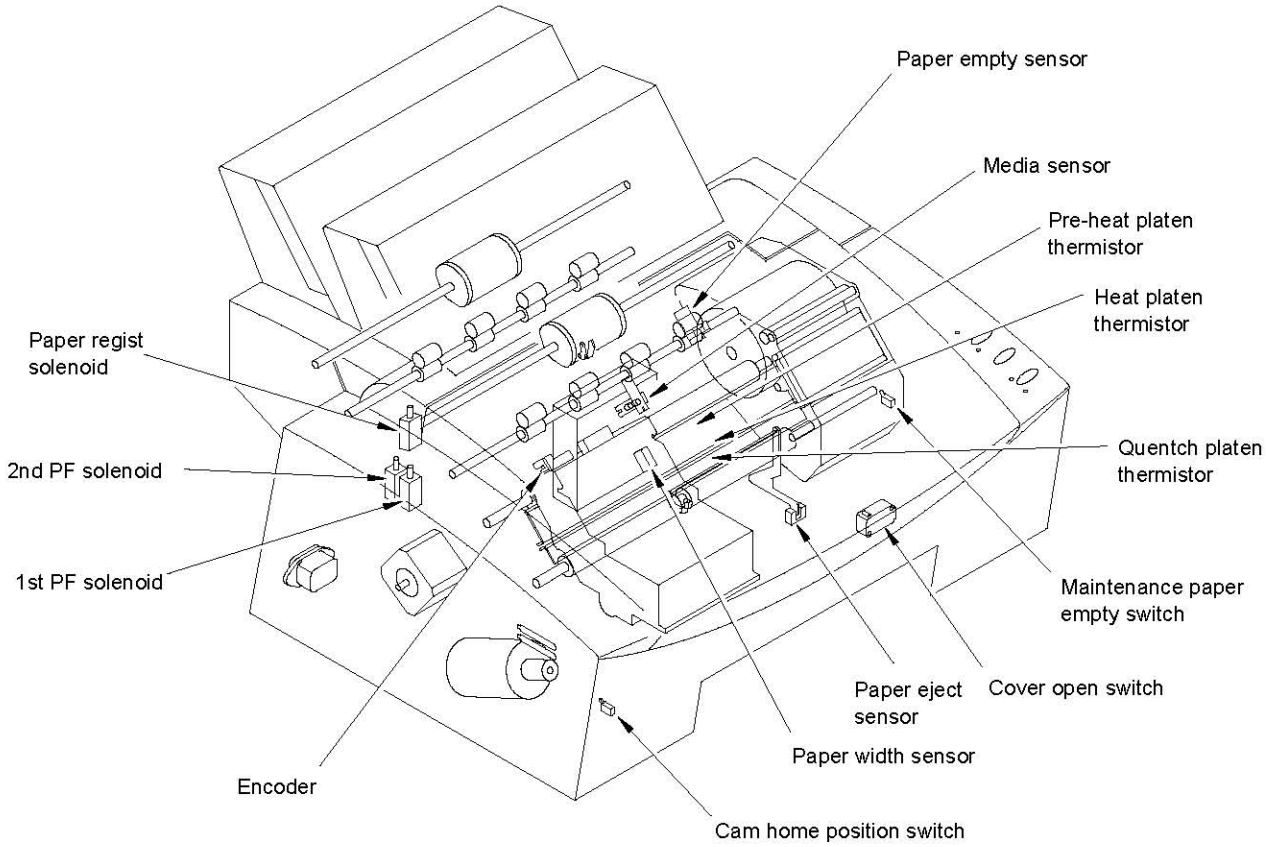


Fig. 2.20

(1) Paper empty sensor (PFS)

The paper empty sensor is placed adjacent to the regist roller and detects the top edge of the paper fed by the paper feed roller. If the paper feed sensor cannot detect the top edge of the paper, it is handled as either a miss-pick or paper empty. After the top edge of the paper is detected, the paper feeding amount to correct skewing and the timing to start rotating the regist roller are calculated.

(2) Media sensor (MED)

The media sensor is placed between the regist roller and the PA roller. This is used to detect whether the fed media is paper or an OHP film. Depending on the type of the media, the platen temperature is controlled.

(3) Paper width sensor (PW)

The paper width sensor is placed on the carriage and detects width of the fed paper to prevent printing onto the platen.

(4) Encoder (ENC)

The encoder is placed on the carriage and detects the carriage position using the encoder strip to control the printing process.

(5) Paper eject sensor (POS)

The paper delivery sensor is placed at the down stream of the PA lower roller and detects paper jamming during paper transportation.

(6) Maintenance paper empty switch (MPE)

The maintenance paper empty switch is placed in the maintenance mechanism and detects the maintenance paper empty.

(7) Cover open switch (CO)

The cover open switch detects the open/close status of the top cover.

(8) Cam home position switch (CHP)

This is a cam home position switch for the ink supply mechanism.

(9) Pre-heat platen thermistor (PPT)

The Pre-heat platen thermistor is placed on the heater at the back of the Pre-heat platen and detects the temperature of the Pre-heat platen.

(10) Heat platen thermistor (HPT)

The heat platen thermistor is placed on the heater at the back of the heat platen and detects the temperature of the platen.

(11) Quench Platen thermistor (QPT)

This thermistor is attached to the quench platen to detect the temperature of the quench platen.

(12) Ink sensor (LOIS)

The ink sensors for each color are attached to the head and detects ink empty in the head while the carriage is moving. When it detects ink empty, the ink is supplied from the ink silo to the head after completion of the printing operation. If the ink empty is still detected after performing an ink supply operation, an ink empty error occurs.

(13) Head Front end thermistor (FET)

The Head Front end thermistor is placed on the Head Front end section and detects the temperature of the Front end. Using this thermistor, the temperature of the ink nozzles on the head is controlled at 117^{O}C.

(The temperature at the thermistor is controlled at 130^{O}C)

(14) Head Back end thermistor (BET)

The Head Back end thermistor is placed in the ink tank and detects the temperature of the ink tank. Using this thermistor, the temperature of the ink tank is controlled at 122^{O}C.

(15) Ink melting tank thermistor

The ink melt tank thermistor is placed on the top of the ink tank and detects the temperature of the ink melting tank. The temperature of the ink melting tank is controlled at 100^{O}C for normal state and 130^{O}C for melting ink.

2.6 Carriage Drive Mechanism

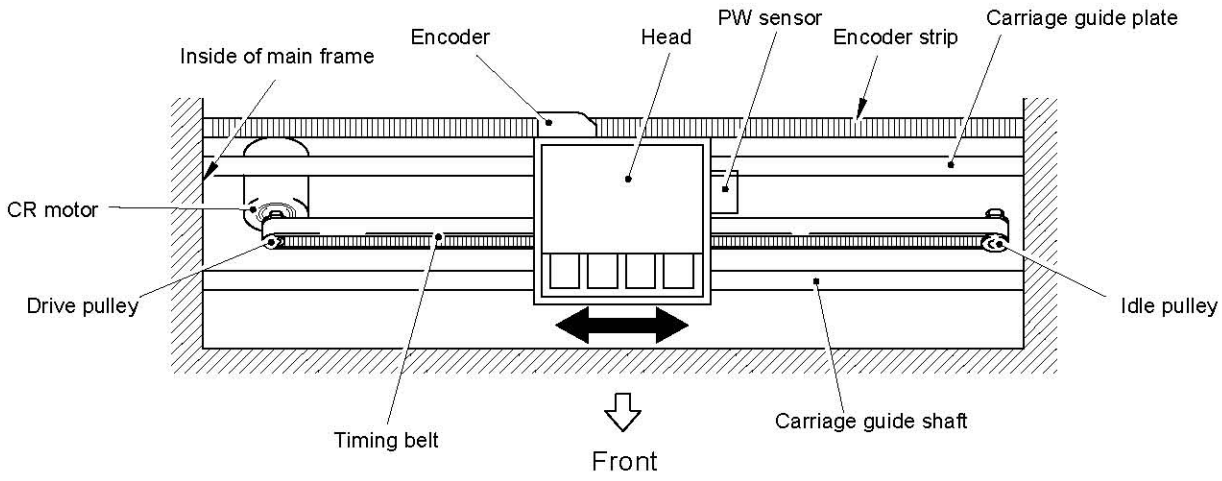


Fig. 2.21

The carriage is supported by the guide shaft and guide plate installed on the main frame so that it freely moves in the horizontal direction.
A brush DC motor is used as the drive source for the carriage. The timing belt transmits the power of the DC motor to the carriage to move it.
An optical encoder is installed on the carriage and a encoder strip is held taut inside the main frame. The optical encoder counts the lines on the encoder strip to control the carriage position and speed.

2.7 Paper Feed Mechanism

2.7.1 Paper Feed Mechanism

The paper feed mechanism is driven by the PA motor on the main unit.
The solenoid A is operated by a paper feed command and the power is transmitted to the paper feed roller through an actuator.
The paper pick up roller rotates in the direction of paper feeding to transport paper in the paper feed mechanism to a separation pad. The paper is fed out by the separation pad sheet by sheet.
The paper skew is corrected when its top edge hits the contact point between the regist roller and the pinch roller.
Next, the solenoid C is reset and the PA motor is driven by a specified number of pulses to drive the regist roller to feed the paper to the print start position.

(HS-5000)

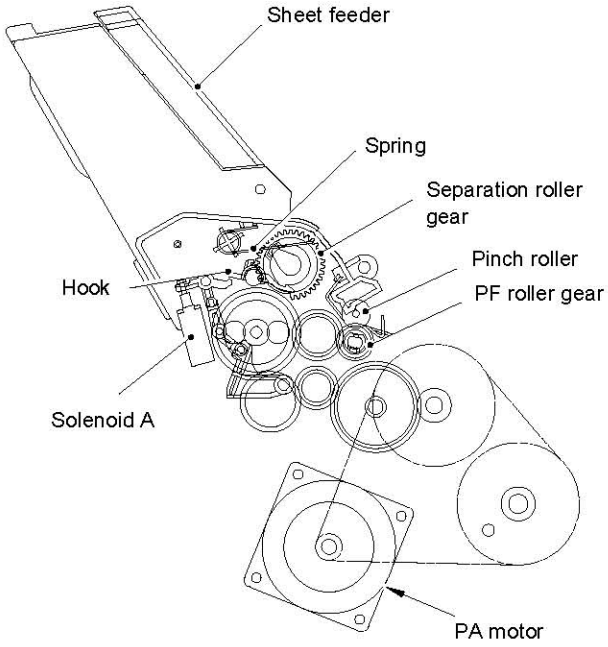


Fig. 2.22

(HS-5300)

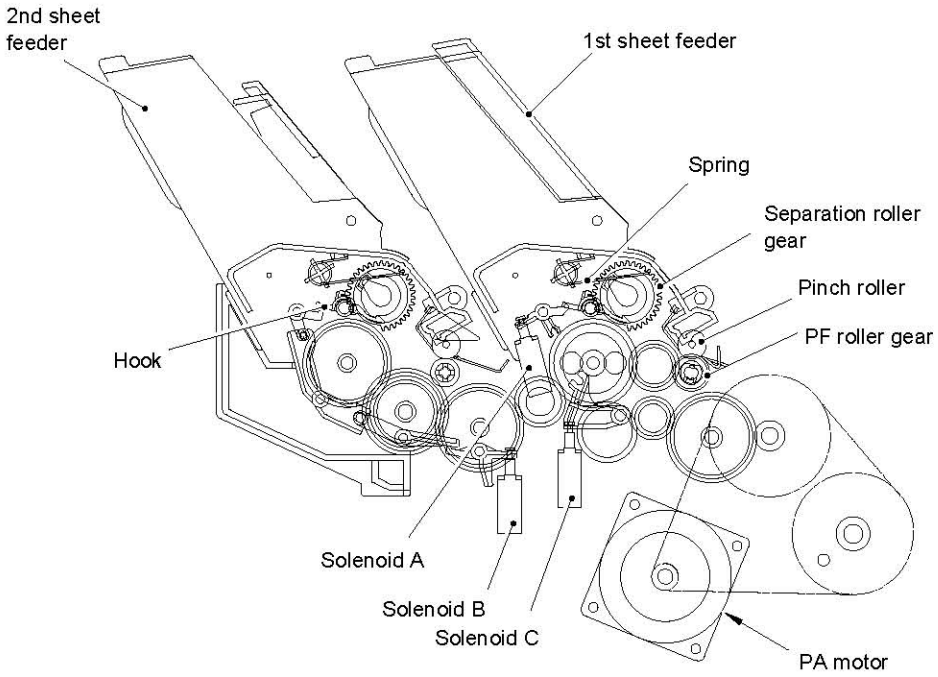


Fig. 2.23

Paper separation and registration mechanism

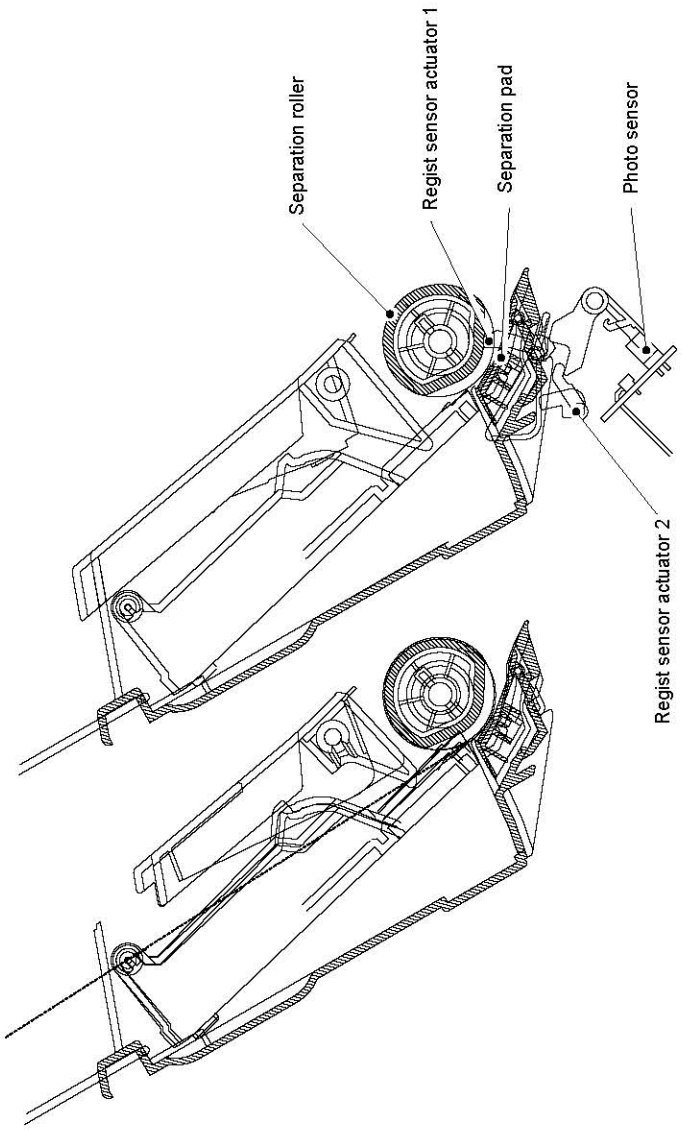


Fig. 2.24

2.7.2 Paper Advance Mechanism

The paper advance mechanism is composed of two PA rollers, a 400 step hybrid stepper motor and the timing belt. The speed reduction ratio between the PA motor and PA roller is 1/4.5 and paper is fed by 1/300 inches in 3 steps (2-2 phases). After the paper fed from the regist roller is transported to the print position on the M-platen by the PA upper roller, printing starts. The printed paper is delivered by the PA lower roller.

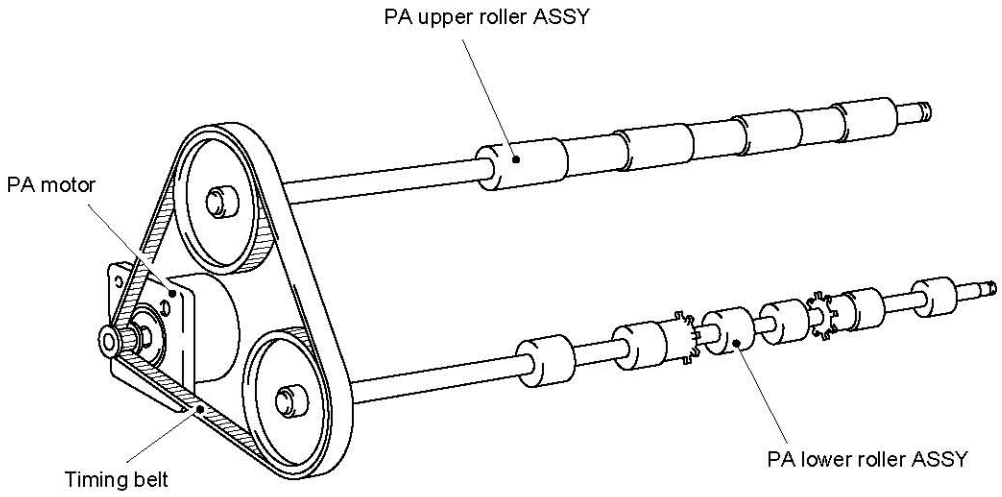


Fig. 2.25

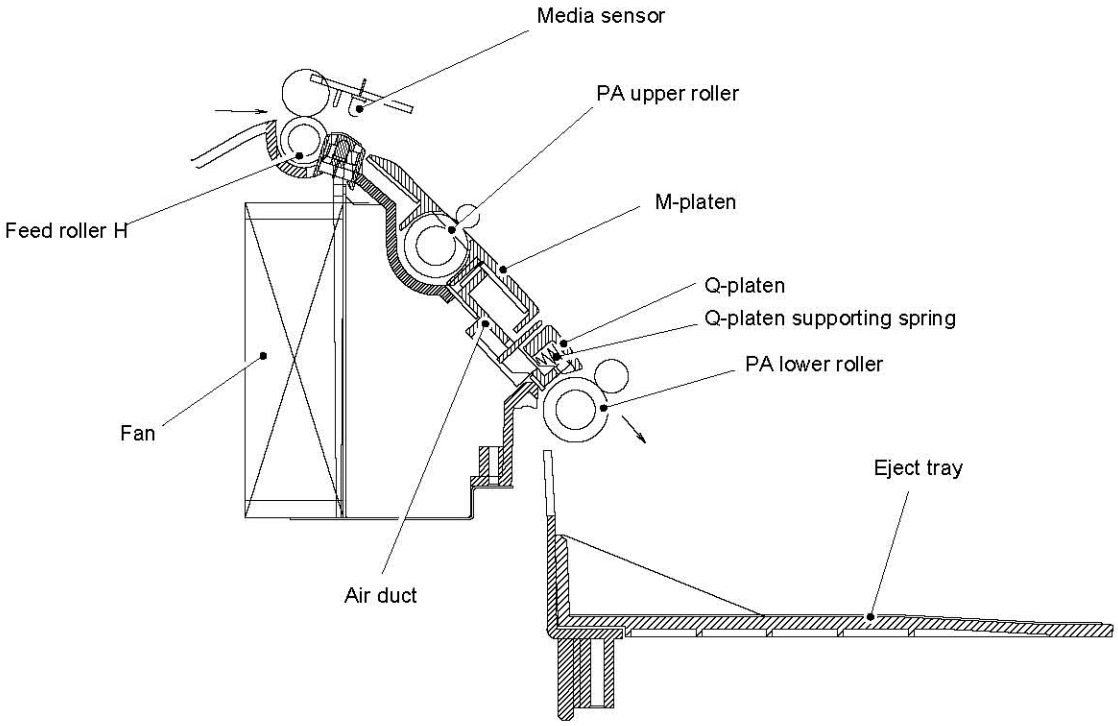


Fig. 2.26

2.8 Heated Platen

• M-platen

Two heaters are attached to the back of the M-platen to fix the ink onto the paper. The upstream side from the upper PA roller is called a Pre-heating area and the area from the upper PA roller towards the head is called the main heating area. Temperatures of these two areas are controlled individually. To hold the paper in close contact with the platen, the platen has a spring plate to hold down the paper, the pre-heating area has a pre-baffle and the main heating area has a baffle.

• Q-platen

The Q-platen solidifies and fixes the ink onto the paper. This platen is prepared to rapidly cool the paper to improve the ink transparency on OHPs. The pressure to hold the paper or OHP stay in close contact with the platen is produced by the Q-platen support spring.

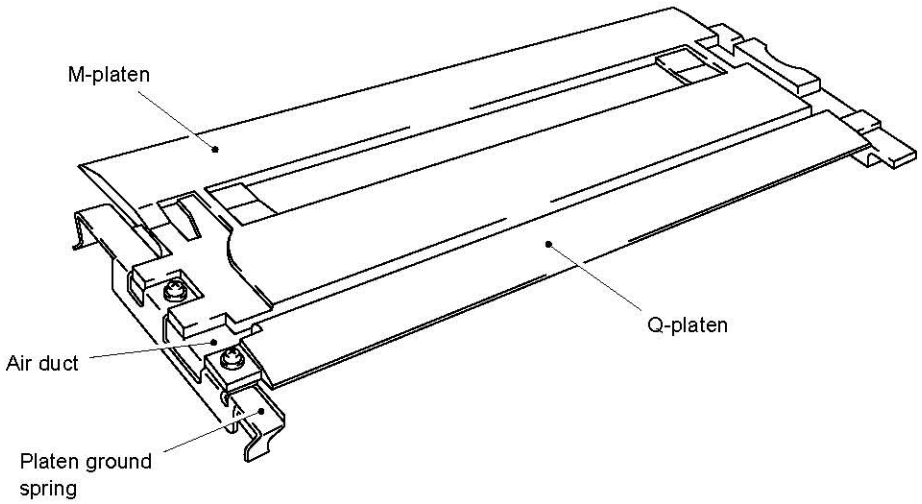


Fig. 2.27

• Functions

(1) As a chute for paper transportation.

(2) Heats paper to fix the ink onto the paper.

(3) Changes the temperature for OHP. (The media sensor detects the OHP.) Melts the ink again on the M-platen and rapidly cools it on the Q-platen to improve the ink transparency.

(4) An air duct makes an air suction passage for the fan. Paper is pulled between the M-platen and the Q-platen to improve the paper contact with the platen and prevent paper from floating.

CONTENTS

CHAPTER III DISASSEMBLY AND REASSEMBLY

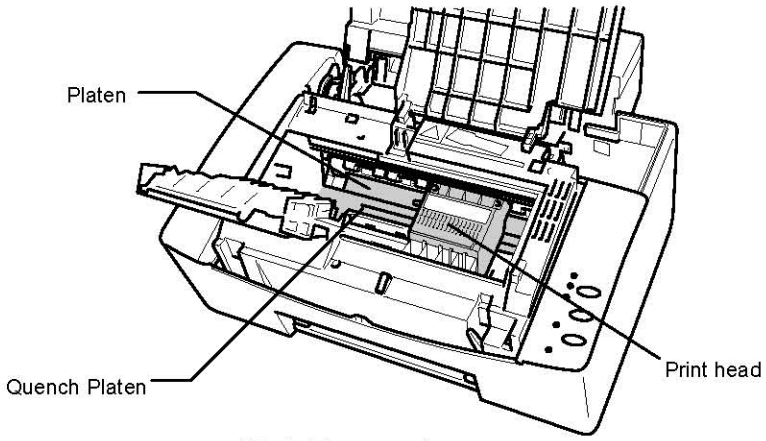
1. SAFETY PRECAUTIONS

To prevent the creation of secondary problems by mishandling, be careful to observe the following precautions during maintenance work.

(1) Always turn off the power switch before replacing parts or units. When accessing the power supply PCB or any of its components be sure to unplug the power cord from the power outlet.

Warning

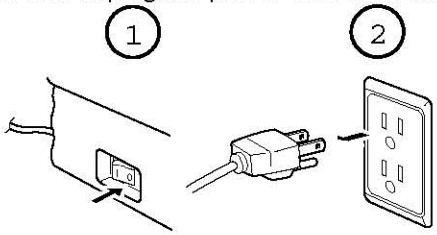
- *When shipping the printer, pack it after waiting 30 minutes after turning the power Off to allow the printer to cool down. Moving the printer with ink melted will cause severe damage to the printer.*
- After you have just used the printer, some internal parts of the printer are extremely hot. Do not open the inside cover unnecessarily and never touch the shaded parts (Quench Platen, Platen and Print head) shown in the following illustration.



High Temperature

Inside the Printer

- There are high voltages inside the printer. Before cleaning the printer, be sure to turn the power off and unplug the power cord from the power outlet.



(2) Be careful not to lose screws, washers, or other parts removed.

(3) Be sure to apply grease to the gears and applicable positions specified in this chapter. See 6. LUBRICATION.

(4) When using soldering irons or other heat-generating tools, take care not to damage parts such as the wiring, PCBs and covers.

(5) Before handling the PCBs, touch a metal portion of the equipment to discharge the static electricity in your body, or electronic parts or components may be damaged.

(6) When transporting PCBs, be sure to wrap them in the correct conductive packaging.

(7) Be sure to replace self-tapping screws correctly. Unless otherwise specified, tighten screws to the correct torque values. See 2. TIGHTENING TORQUE LIST.

(8) When connecting or disconnecting cable connectors, hold the connector bodies not the cables. If the connector has a lock, release the connector lock first.

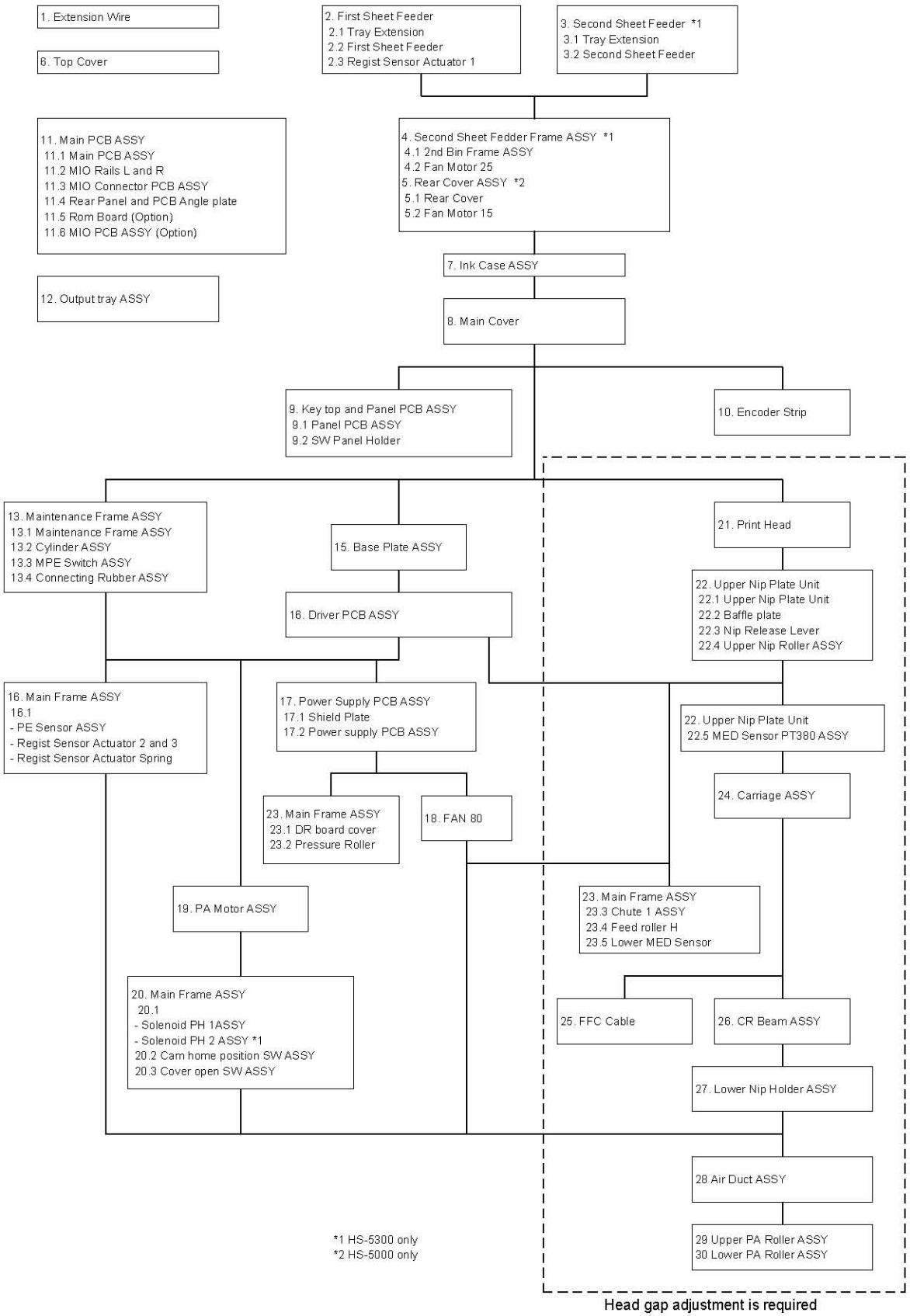
(9) After a repair, check not only the repaired portion but also the connectors and other related portions are functioning properly before doing operation checks.

2. TIGHTENING TORQUE LIST

Location	Screw type	Q'ty	Tightening torque (kgf•cm)	Loosing torque (kgf•cm)
Fan	Screw, pan (s/p washer) M3X32	2	7 ± 1	Min. 4
Fan holder	Taptite, pan B M3X6	3	7 ± 1	Min. 4
Gap lever arm	Taptite, cup B M26X6	1	4 ± 1	Min. 2
Reinforcing plate for the gap lever arm	Taptite, bind B M26X6	2	2 ± 0.5	Min. 1
Head fixing plate	Taptite, cup B M2.6X5	2	1.5 ± 0.5	Min. 0.5
Head	Screw, pan (s/p washer) M3X10	2	9 ± 1	Min. 4
	Screw, pan (s/p washer) M2X12	2	2 ± 0.5	Min. 1
Paper width sensor ASSY	Taptite, pan B M2.6X5	1	1.5 ± 0.5	Min. 0.5
Encoder PCB ASSY	Taptite, bind B M2.6X6	1	1.5 ± 0.5	Min. 0.5
T fence guide	Taptite, bind B M2.6X6	1	1.5 ± 0.5	Min. 0.5
Relay PCB cover	Taptite, bind B M2.6X6	1	1.5 ± 0.5	Min. 0.5
CR motor ASSY	Screw, pan (s/p washer) M4X8	2	12 ± 2	Min. 8
CRI pulley holder	Taptite, cup S M3X6	2	7 ± 1	Min. 4
CR beam	Taptite, pan B M3X6	5	7 ± 1	Min. 4
Belt holder	Taptite, bind B M3X10	1	9 ± 1	Min. 4
PA motor	Screw, pan cup M4X5	1	10 ± 1	Min. 6
	Shoulder screw, M4X5	1	10 ± 1	Min. 6
PA motor holder	Taptite, bind B M3X10	3	10 ± 1	Min. 7
PA belt fixing plate	Taptite, cup S M3X6	2	7 ± 1	Min. 4
PA roller gear	Taptite, cup S M3X6	1	7 ± 1	Min. 4
MQ platen	Taptite, flanged M2X6	4	4 ± 0.5	Min. 2
Upper paper support spring	Taptite, cup S M3X6	2	7 ± 1	Min. 4
Upper nip plate unit	Taptite, bind B M4X10	2	9 ± 1	Min. 6
High-damping rubber	Screw, pan cup M4X5	2	7 ± 1	Min. 4
Gear 31/24	Taptite, pan B M3X6	2	5 ± 1	Min. 3
Maintenance frame ASSY	Taptite, bind B M3X10	1	9 ± 1	Min. 4
Gear holder	Taptite, bind B M3X10	1	9 ± 1	Min. 4
Main PCB angle plate	Screw, bind M3X6	4	6 ± 1	Min. 3
MIO board	Screw, bind M3X6	2	6 ± 1	Min. 3
MIO connector PCB ASSY, MIO connector PCB holder	Screw, bind M3X6	4	6 ± 1	Min. 3
Main PCB plate	Taptite, cup S M3X6	5	7 ± 1	Min. 4
Heat sink	Screw, bind M3.5X8	2	7 ± 1	Min. 4
Driver PCB	Screw, bind M3X6	2	7 ± 1	Min. 4
CR PCB	Taptite, bind B M26X6	1	2 ± 0.5	Min. 1
AC electrode support C ASSY	Taptite, bind B M2.6X6	2	1.5 ± 0.5	Min. 0.5

Electrode spring holder	Taptite, pan B M3X6	1	7 ± 1	Min. 4
Interlock SW	Taptite, bind B M3X16	1	7 ± 1	Min. 4
Panel PCB holder	Taptite, pan B M3X6	2	7 ± 1	Min. 4
G-Bar earth plate	Taptite, pan B M3X6	1	7 ± 1	Min. 4
PS PCB ASSY	Screw, pan (s/p washer) M4X8	5	7 ± 1	Min. 4
Earth plate	Taptite, cup S M3X6	2	7 ± 1	Min. 4
Base plate	Taptite, bind B M4X10	5	9 ± 1	Min. 6
Inlet holder	Taptite, bind S M4X8	1	9 ± 1	Min. 6
Earth wire	Screw, bind M3.5X8	1	7 ± 1	Min. 4
LED light guide	Taptite, pan B M3X6	1	2 ± 0.5	Min. 1
Main cover	Taptite, bind B M4X10	4	9 ± 1	Min. 6
	Screw, pan (s/p washer) M4X10	2	9 ± 1	Min. 6
Fan motor 15 (HS-5000 only)	Taptite, cup B M3X20	2	4 ± 0.5	Min. 1.5
Rear cover (HS-5000 only)	Taptite, bind B M3X10	1	7 ± 1	Min. 4
Earth (Base plate)	Screw, bind M3.5X8	6	9 ± 1	Min. 6
Earth cable	Screw, pan (s/p washer) M3X5	2	7 ± 1	Min. 4
Shield plate CRM	Screw, pan (s/p washer) M3X5	2	7 ± 1	Min. 4
Joint plate	Taptite, cup S M3X6	3	7 ± 1	Min. 4
Shield plate DR	Screw, pan M3X5	2	7 ± 1	Min. 4
Fan motor 25 (HS-5300 only)	Taptite, cup B M3X8	2	7 ± 1	Min. 4
2 bin frame (HS-5300 only)	Taptite, bind B M4X10	2	9 ± 1	Min. 6
Chute 1	Taptite, cup S M3X6	3	7 ± 1	Min. 4
Pre-Baffle ASSY	Taptite, cup S M3X6	2	7 ± 1	Min. 4
Harness film	Taptite, cup B M3X8	1	7 ± 1	Min. 4
Side guide gear (1st bin)	Taptite, cup B M3X6	1	5± 1	Min. 3
	Taptite, cup B M3X6	1	5± 1	Min. 3

3. DISASSEMBLY ORDER FLOW



4. DISASSEMBLING AND REASSEMBLING PROCEDURE

Note: Reassembly is the reverse of Disassembly unless otherwise stated. Please refer to Notes relating to Reassembly information.

4.1 Extension Wire

<Disassembly>

(1) Push both end of the Extension wire and remove it.

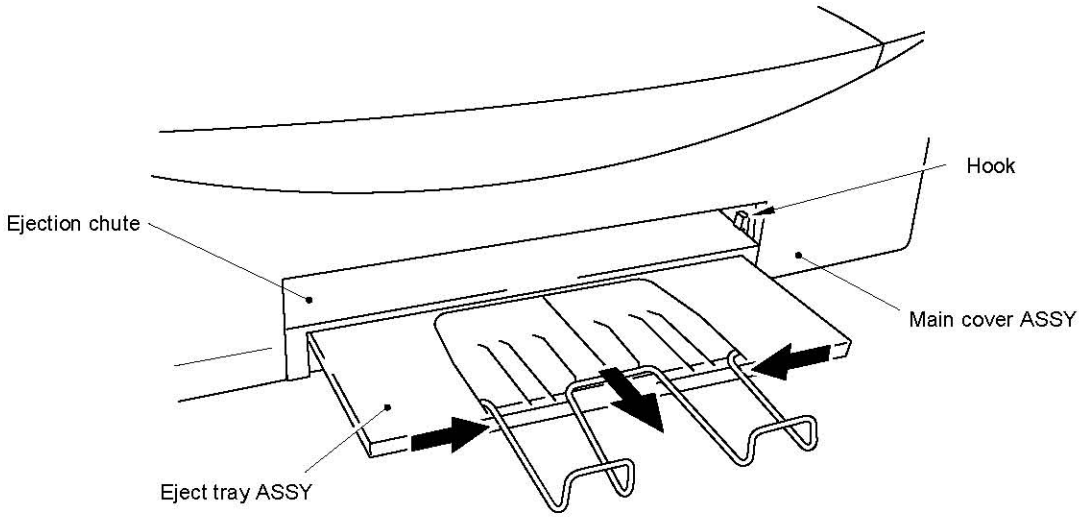


Fig. 4.1

4.2 First Sheet Feeder ASSY (1st Bin)

4.2.1 Tray Extension

<Disassembling>

(1) Pull the Tray extension outward to remove it.

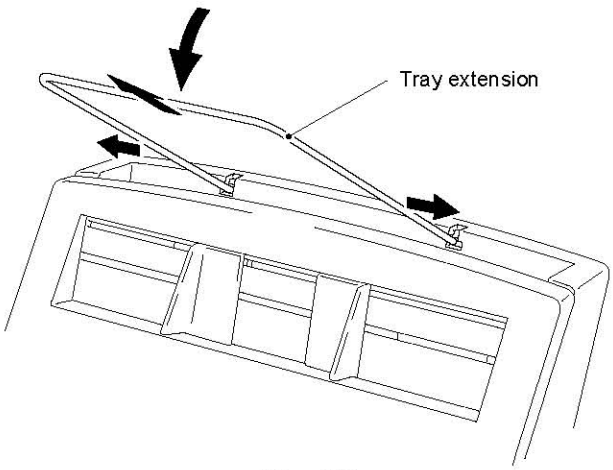


Fig. 4.2

4.2.2 First Sheet Feeder

<Disassembly>

(1) Lift the First sheet feeder upwards to remove it from the printer body.

Note: After reassembling, check that the left and right holes in the First sheet feeder are securely mounted on the positioning bosses.

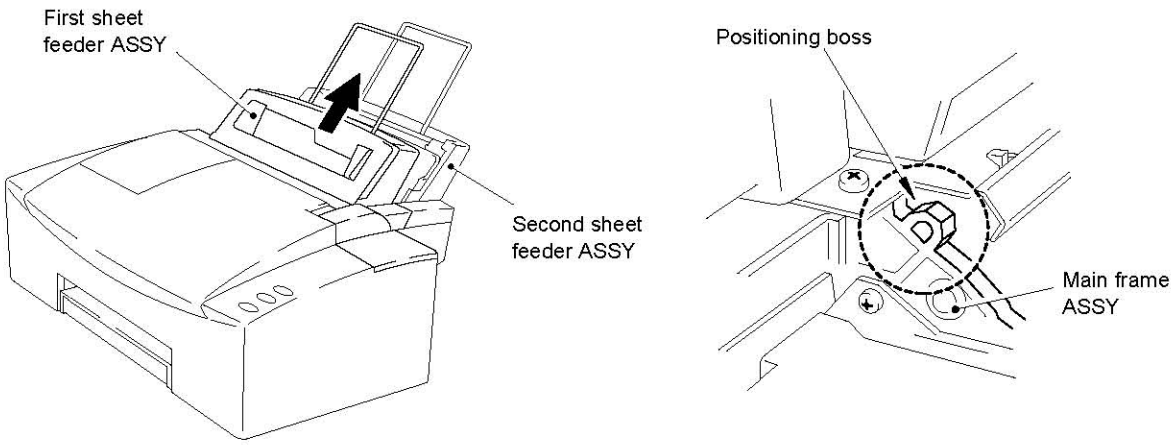


Fig. 4.3

4.2.3 Regist Sensor Actuator 1

<Disassembly>

(1) Pull the Regist sensor actuator 1 upwards to remove it.

<Reassembly>

(1) Insert the left shaft of the Regist sensor actuator 1 and the actuator into the hole in the First sheet feeder and insert the right shaft into the hook of the First sheet feeder.

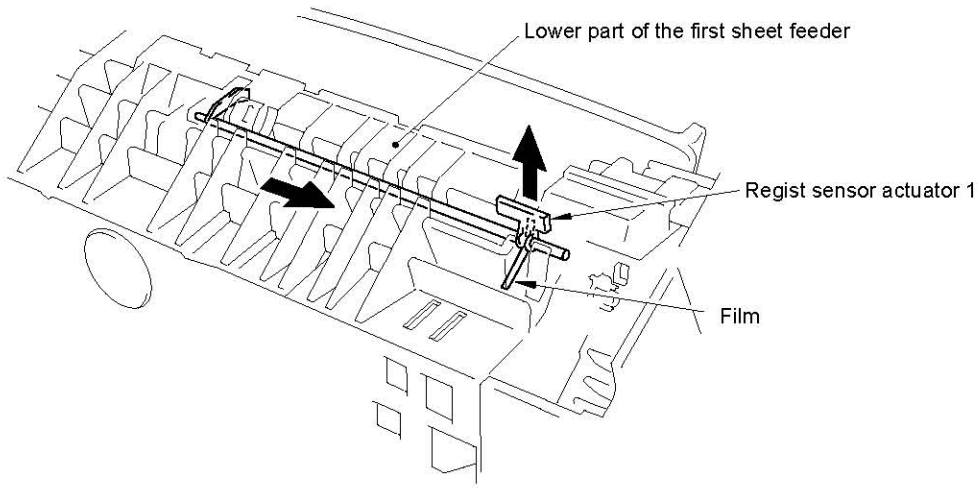


Fig. 4.4

4.3 Second Sheet Feeder ASSY (2nd Bin)

4.3.1 Tray Extension

<Disassembly>

(1) Pull the Tray extension outward to remove it.

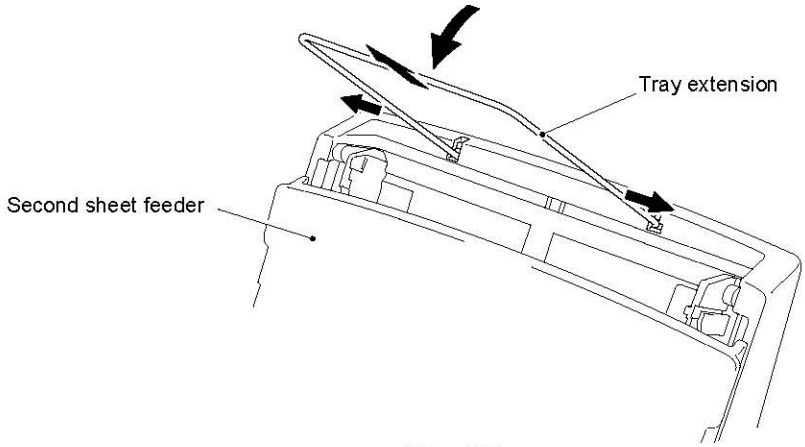


Fig. 4.5

4.3.2 Second Sheet Feeder

<Disassembly>

(1) Lift the Second sheet feeder upwards to remove it from the 2nd bin frame ASSY.

<Reassembly>

Note: After reassembling, check that the left and right holes in the Second sheet feeder are securely mounted on the positioning bosses.

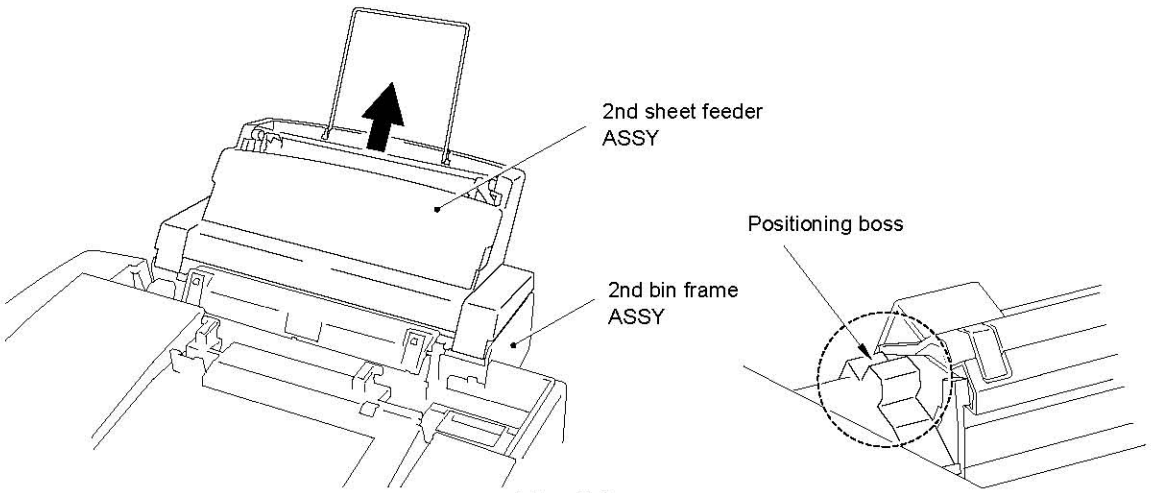


Fig. 4.6

4.4 Second Sheet Feeder Frame ASSY

4.4.1 2nd Bin Frame ASSY

<Disassembly>

(1) Remove the screw and the harness film and then disconnect the PS fan motor connector.

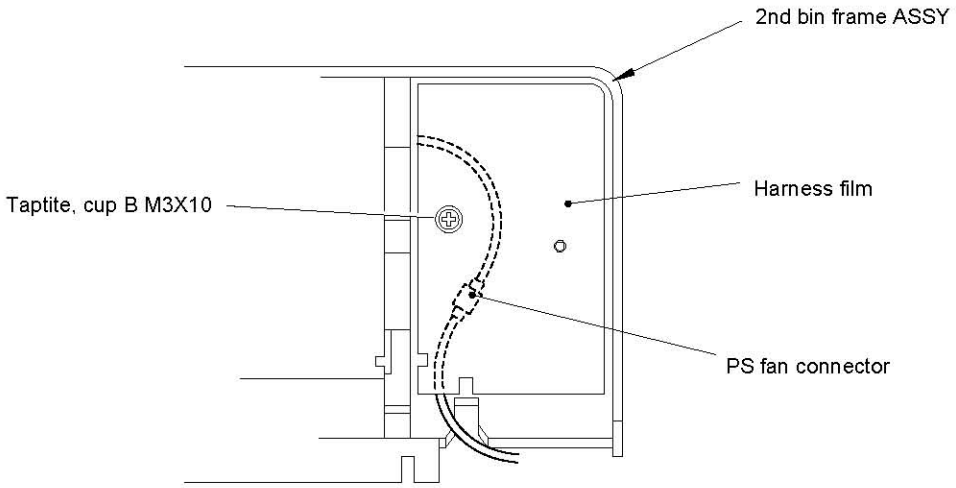


Fig. 4.7

(2) Remove the two screws and disassemble the 2nd bin frame ASSY from the Main frame ASSY.

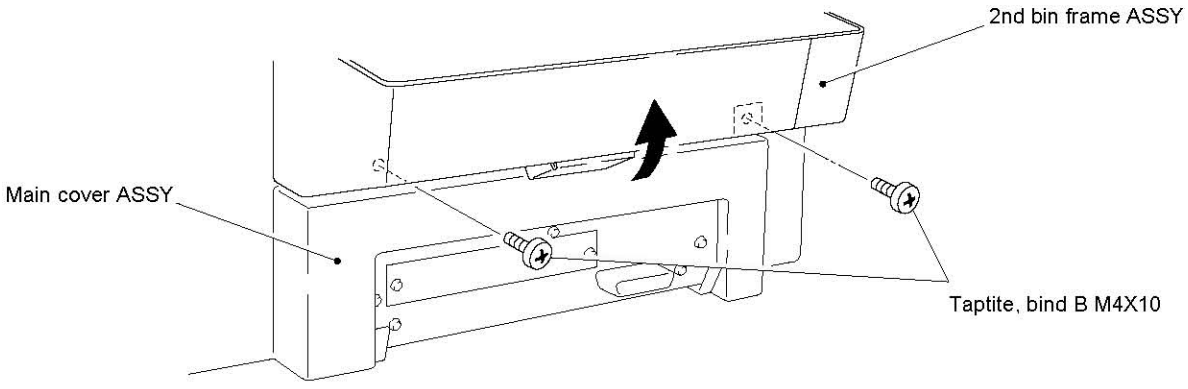


Fig. 4.8

4.4.2 Fan Motor 25 ASSY

<Disassembly>

(1) Remove two screws securing the Motor holder.
(2) Remove the Fan motor 25 ASSY from the Motor holder.

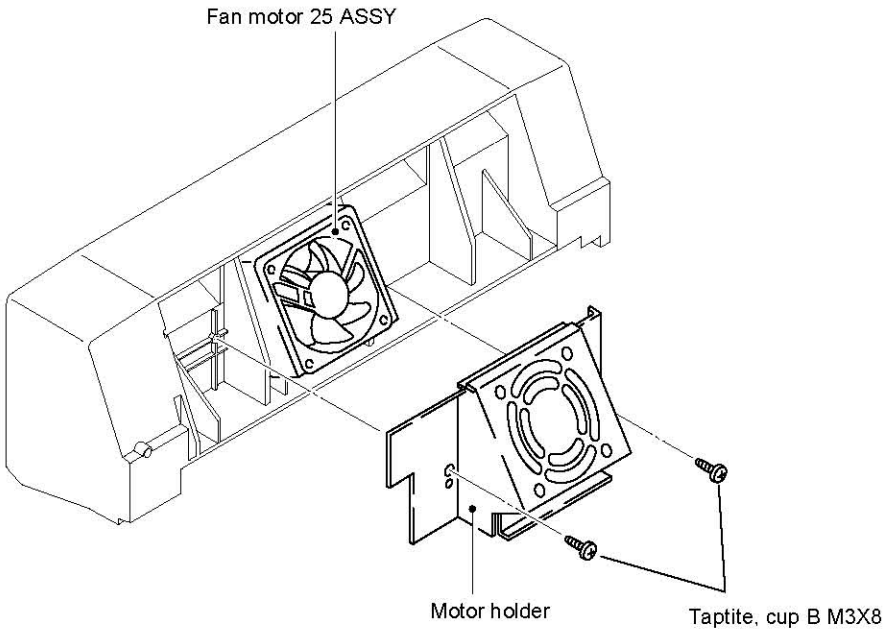


Fig. 4.9

4.5 Rear Cover ASSY (HS-5000 only)

4.5.1 Rear Cover

<Disassembly>

(1) Remove the screw and take off the Rear cover ASSY while releasing the hooks.

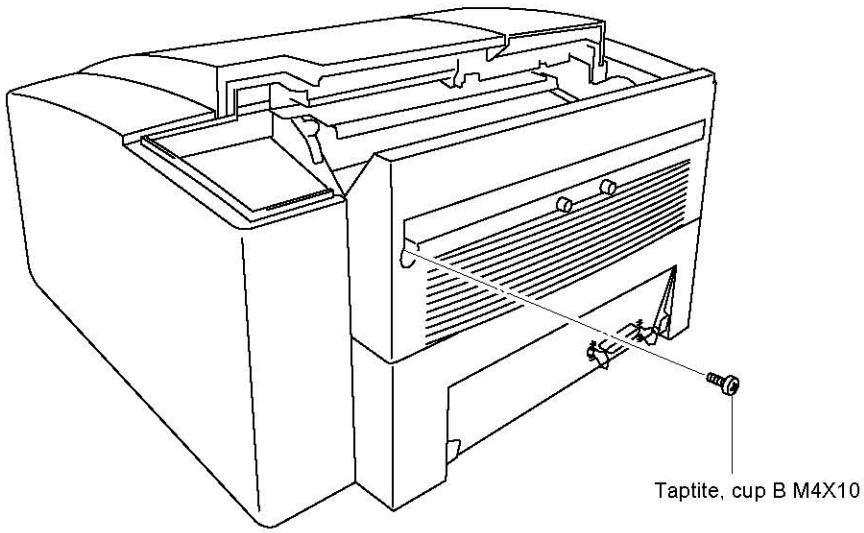


Fig. 4.10

4.5.2 Fan Motor 15

<Disassembly>

(1) Remove two screws securing the Fan motor 15.

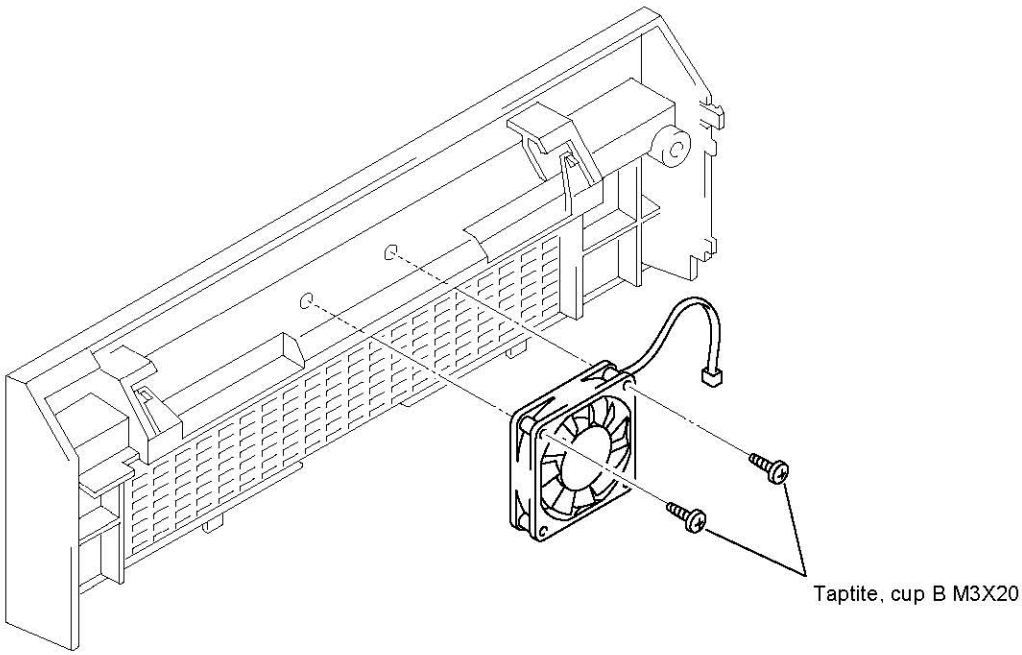


Fig. 4.11

4.6 Top Cover

<Disassembly>

(1) Hold the Top cover ASSY with the sheet feeder removed, open it to its stop position and then press it further in the same direction to bend the left and right hooks to remove it.

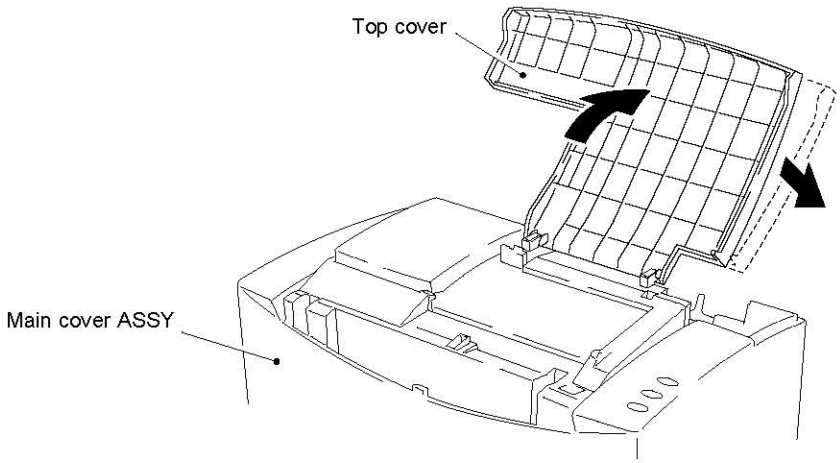


Fig. 4.12

<Reassembly>

Fit the Top cover onto the hooks as shown below

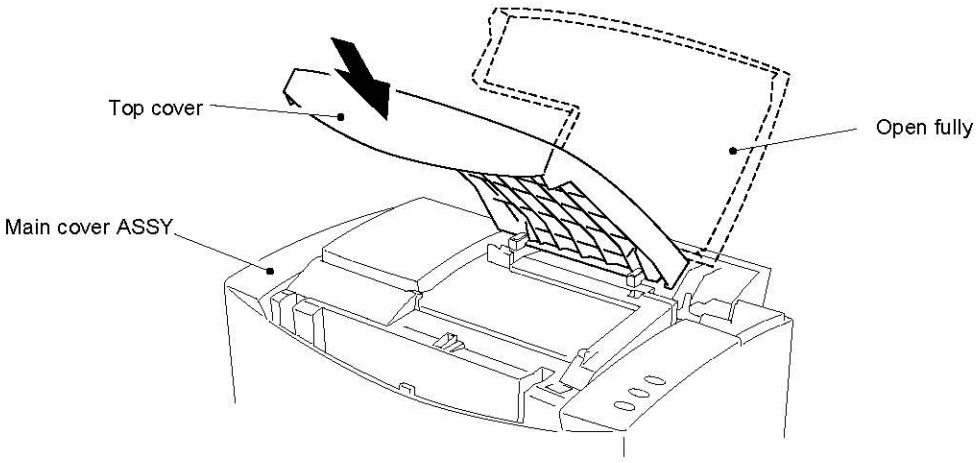


Fig. 4.13

4.7 Ink Case ASSY

<Disassembly>

(1) Release the hook of the Ink case ASSY to open it, then lift it upwards slightly just before it reaches its stop position to remove.

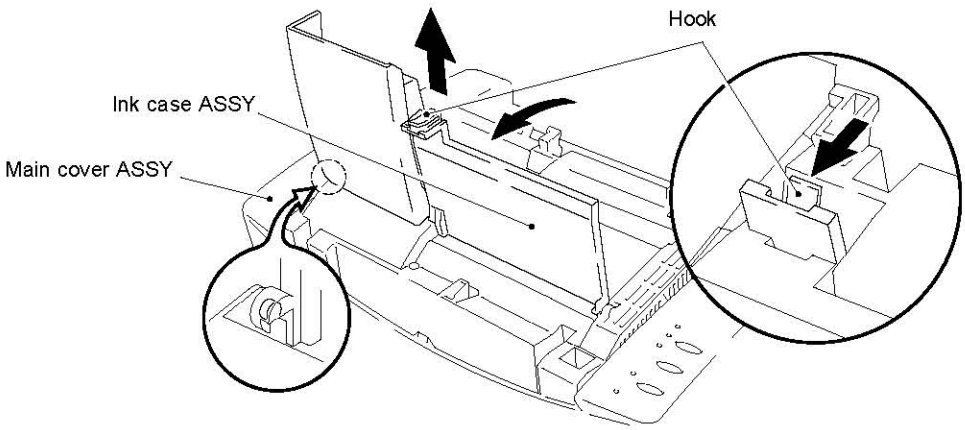


Fig. 4.14

(2) Open the Upper ink case, lift it upwards slightly just before it reaches its stop position to remove.

(3) Lift it upwards slightly just before it reaches the stop position to remove it.

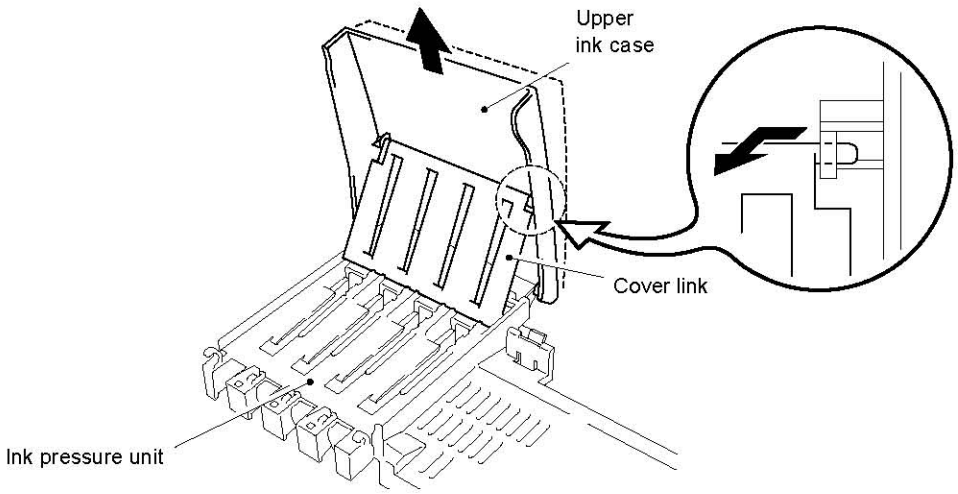


Fig. 4.15

4.8 Main Cover

<Disassembly>

(1) Remove the four screws and two screws securing the Main cover ASSY.

(2) Hold the left and right lower edges of the Main cover ASSY and lift it upwards to remove.

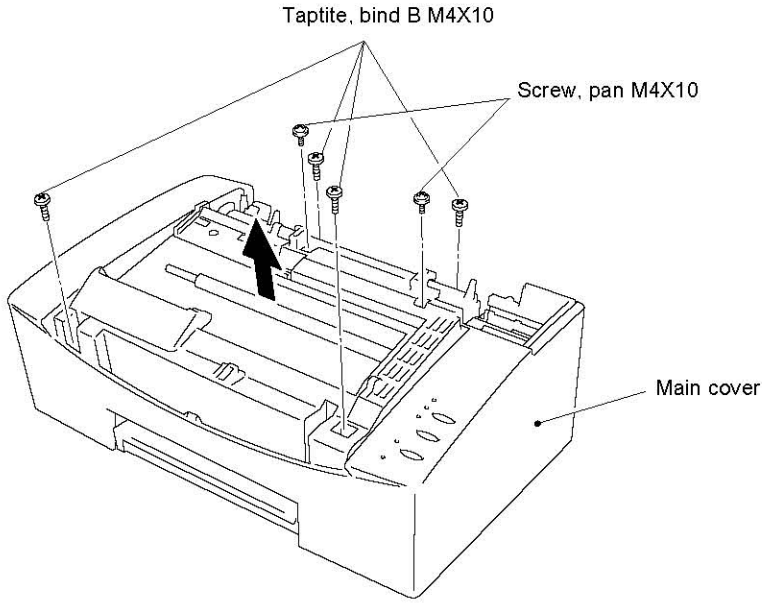


Fig. 4.16

Note: Ensure that the Ink case ASSY is removed prior to removing the Main cover ASSY.
Always position the Head gap lever vertically before reassembling the Main cover ASSY.

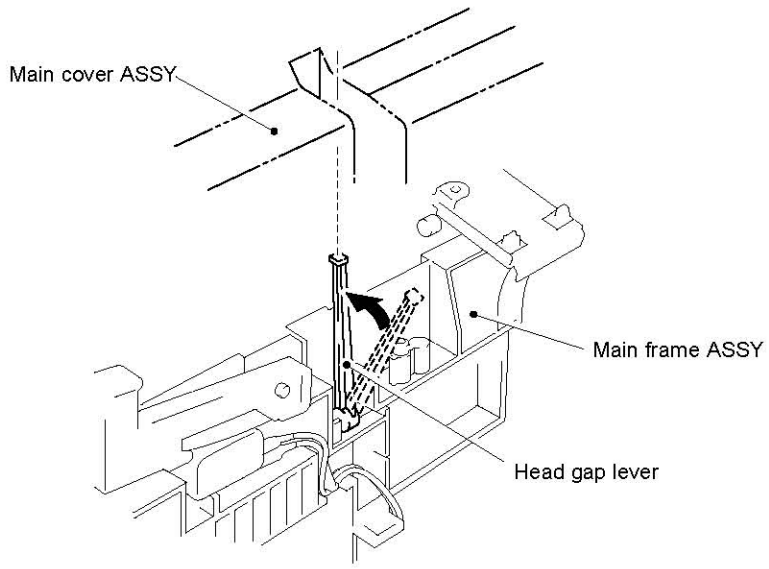


Fig. 4.17

4.9 Key Top and Panel PCB ASSY

4.9.1 Panel PCB ASSY

<Disassembly>

(1) Lift the Key top upwards by releasing the three hooks.

(2) Lift the Panel PCB ASSY upwards by releasing the hook at the SW panel holder.

(3) Disconnect the SWP harness ASSY from the connector on the Panel PCB ASSY.

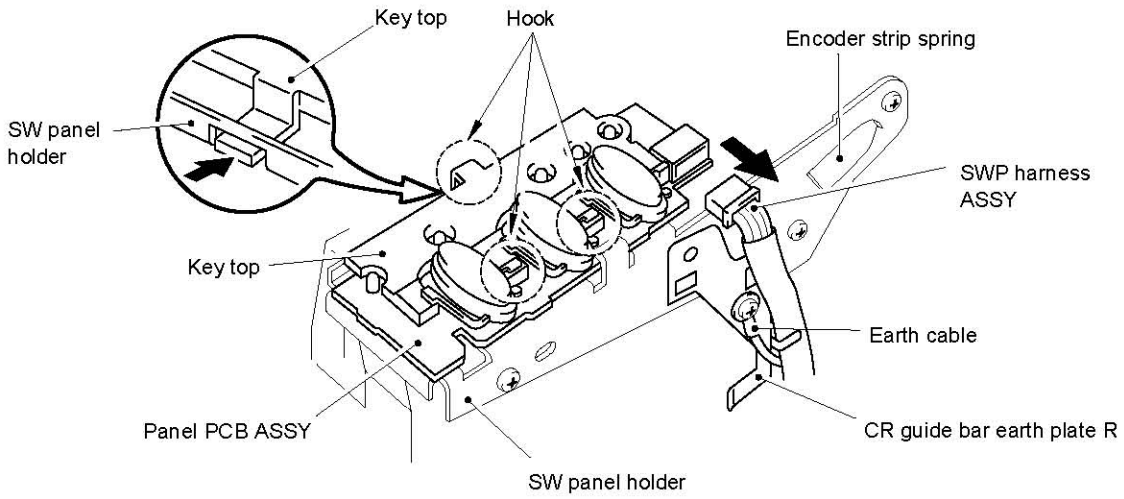


Fig. 4.18

<Reassembly>

Note: Check that the harness is securely connected to the connector.

4.9.2 SW Panel Holder

<Disassembly>

(1) Remove the Encoder strip from the Encoder strip spring. (Refer to section 4.10 Encoder strip.)

(2) Remove the screw securing the earth cable. (Refer to fig. 4.18)

(3) Remove the two screws and remove the SW panel holder from the two bosses on the Main frame ASSY.

(4) Remove the CR guide bar earth plate R from the SW panel holder.

4.10 Encoder strip

<Disassembly>

Caution: *This part is a very thin metal plate. Be careful with the sharp edge while handle it.*

(1) Remove the Encoder strip from the Upper nip plate unit by pulling the end of the Encoder strip on the left side of the Main frame ASSY towards the left.

(2) Remove the Encoder strip from the Encoder strip spring on the right.

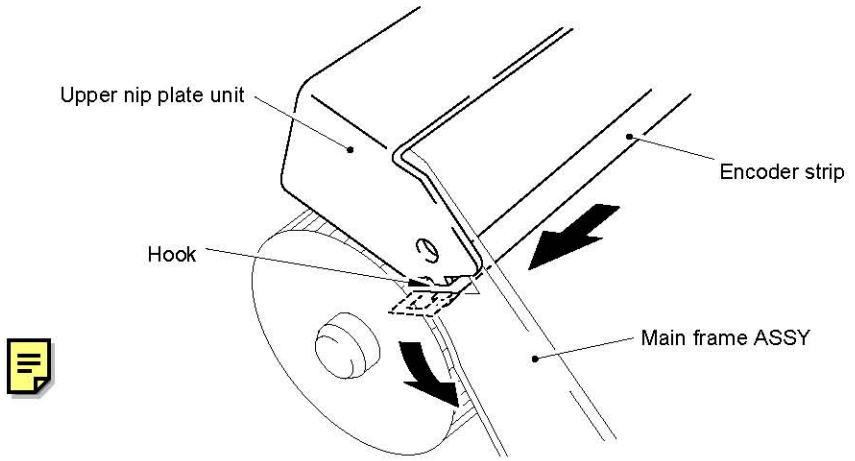
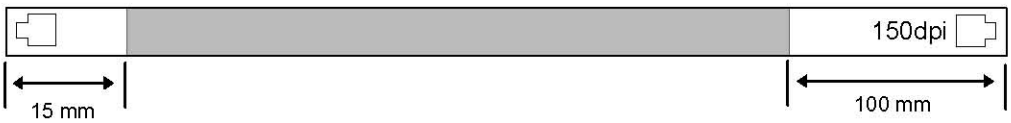


Fig. 4.19

Note: *Do not touch the grayed part of the Encoder strip.*



<Reassembly>

(1) Before reassembling, check that it is not contaminated.
If it is contaminated by finger prints or oil, replace it. ***Do not clean it with a cloth soaked in alcohol.***
If it is contaminated by the dust, blow it out by a air blush.

(2) When reassembling, check the orientation of the Encoder strip. See below.

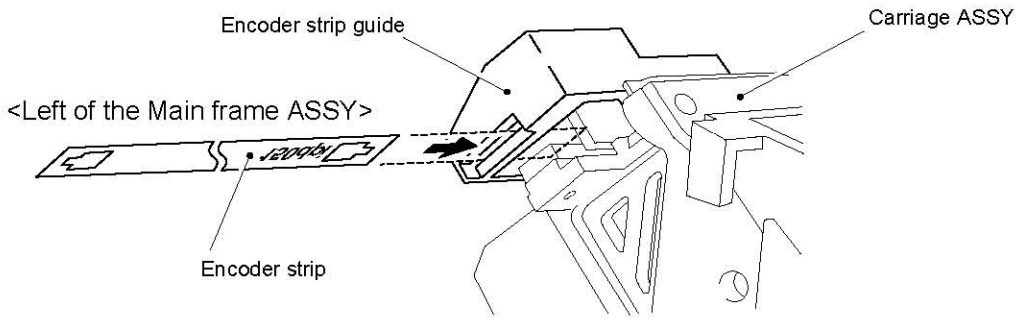


Fig. 4.20

(3) As shown in the illustration above, insert the right end of the Encoder strip into the Encoder strip guide on the Carriage ASSY and then pass it through the Encoder strip guide.

(4) Hook the right hand end of the Encoder strip onto the Encoder strip spring at the right hand of the Main frame ASSY.

(5) Hook the oval hole at the left hand end of the Encoder strip onto the hook of the Upper nip plate.

Note: Ensure that the Encoder strip is not twisted.

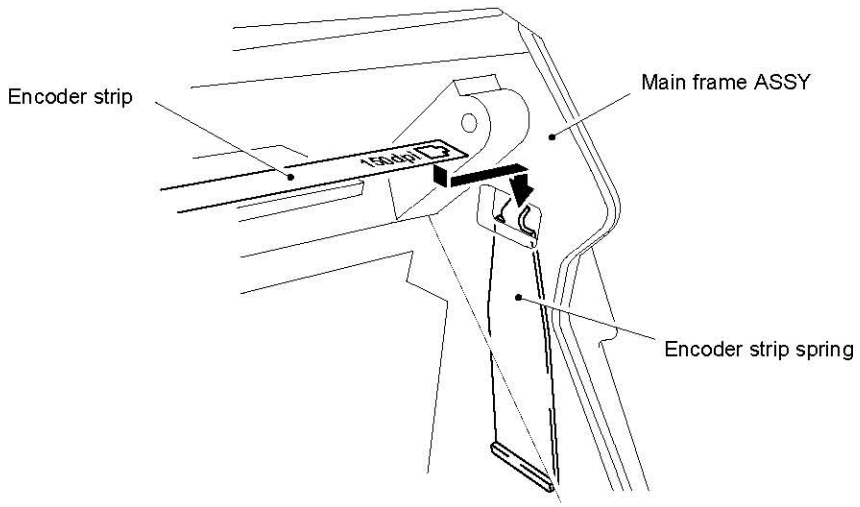


Fig. 4.21

4.11 Main PCB ASSY

4.11.1 Main PCB ASSY

<Disassembly>

(1) Remove the five screws at the locations marked with ▼ on the Rear panel and pull the Main PCB ASSY toward you.

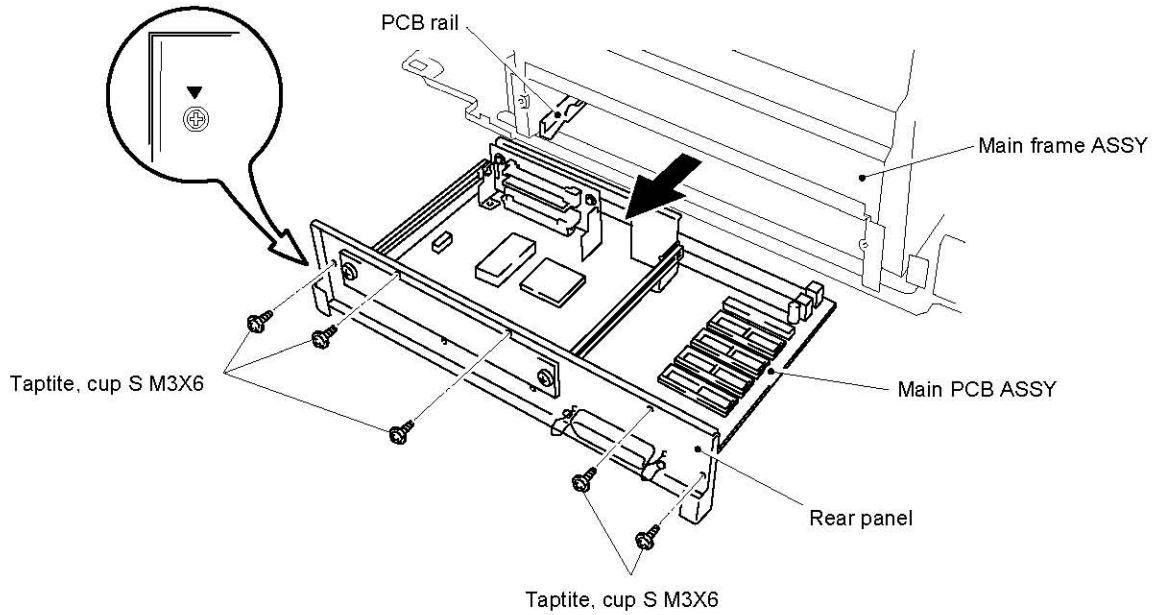


Fig. 4.22

<Reassembly>

Note: Insert the PCB into the groove of the rail.
After replacing the Main PCB, offset, TOF (Timing Of Fire) and LF adjustments must be done. See section 5.4 Offset, TOF and LF Adjustment in this chapter.

4.11.2 MIO Rails L and R

<Disassembly>

(1) Slide the MIO rails L and R out after pressing and releasing the hook of the MIO rails L and R inserted into the hole on the Rear panel.

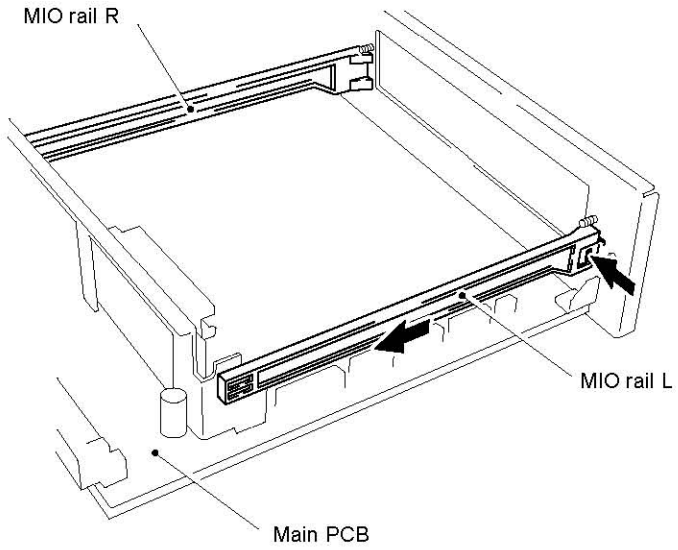


Fig. 4.23

<Reassembly>

(1) Match the hook of the MIO rails with the key hole in the Connector PCB holder. By inserting the top into the bent part of the Rear panel and sliding the MIO rails toward the Rear panel, press the MIO rail until the hook is secured.

4.11.3 MIO Connector PCB ASSY

<Disassembly>

(1) Remove the two screws from the bottom of the MIO connector PCB to remove the MIO connector PCB ASSY. Disconnect the connector by lifting it upwards to remove the whole MIO connector PCB ASSY and the two screws from the Connector PCB holder.

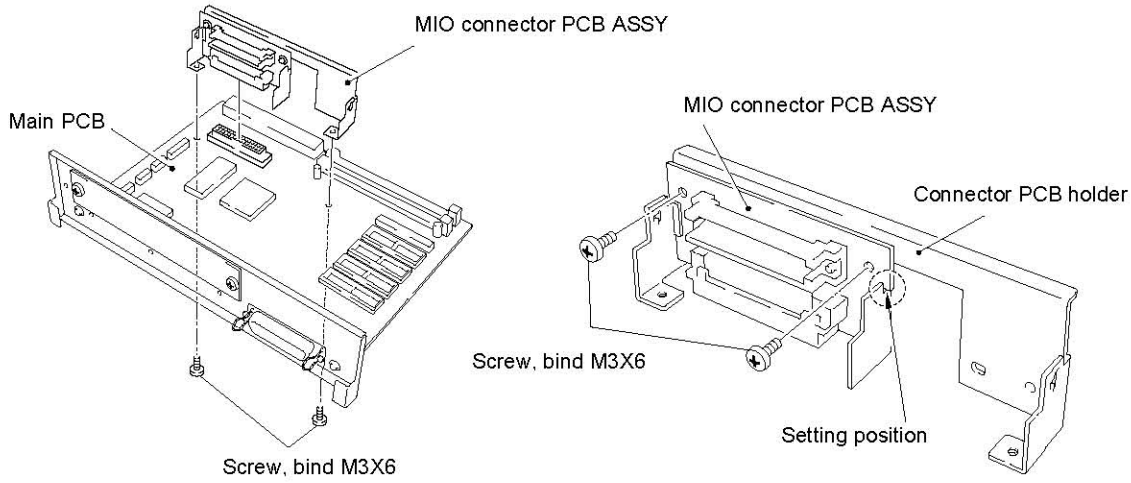


Fig. 4.24

4.11.4 Rear Panel and PCB Angle Plate

<Disassembly>

(1) Remove the two screws from the Rear panel and the two screws securing the parallel I/F connector.

(2) Remove the two screws (one for each PCB angle bracket) from the bottom of the Main PCB.

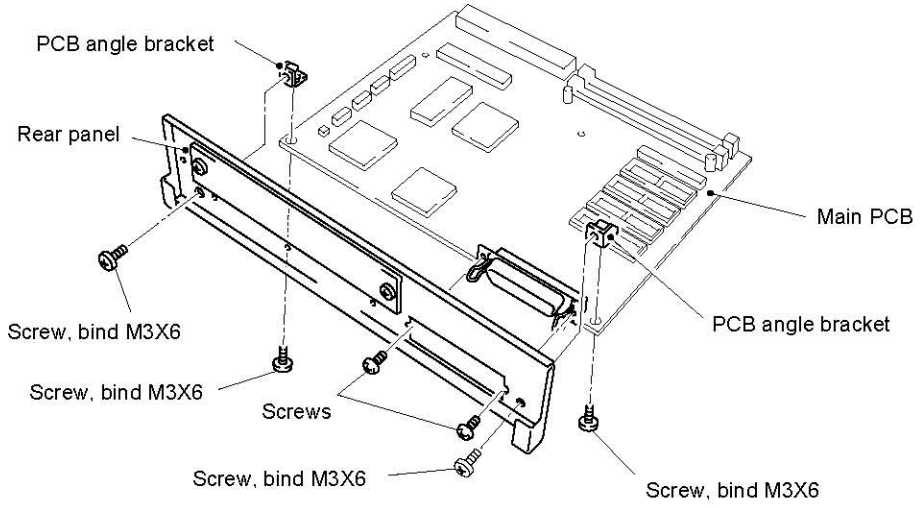


Fig. 4.25

<Reassembly>

Note: Tighten the PCB angle bracket as shown in fig. 4.25.

4.11.5 ROM PCB (Option)

<Disassembly>

(1) Make sure that the power is turned off.

(2) Release the clip at the top of the PCB spacer and remove the ROM PCB.

<Reassembly>

(1) Reassemble the ROM PCB on the PCB spacer so that it is engaged with the connector.

Note: Make sure that the ROM PCB is securely engaged with the connector.

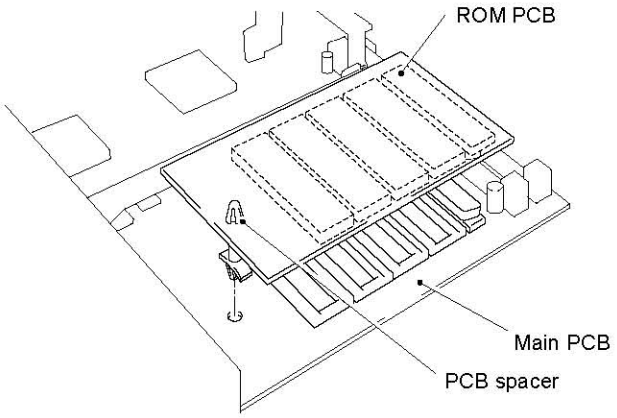


Fig. 4.26

4.11.6 MIO PCB ASSY (Option)

<Disassembly>

(1) Make sure that the power is turned OFF.

(2) Remove the two screws and pull the MIO PCB ASSY toward you to remove it.

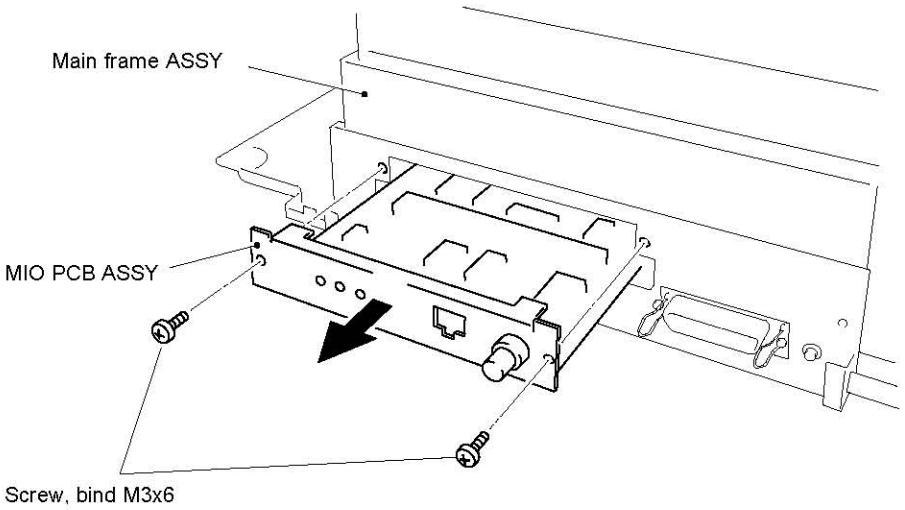


Fig. 4.27

4.12 Output Tray ASSY

<Disassembly>

(1) Fully pull the Output tray toward you, lift it upwards to release the two hooks from the Ejection chute, and pull out the Output tray ASSY together with the Ejection chute.

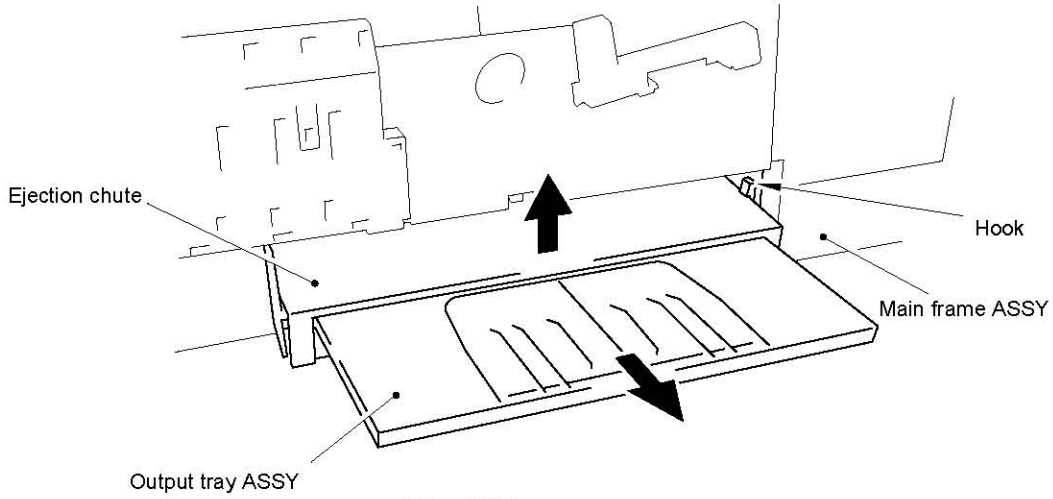


Fig. 4.28

(2) Place the Output tray up side down and remove the Output tray ASSY by pressing the center of the Ejection chute.

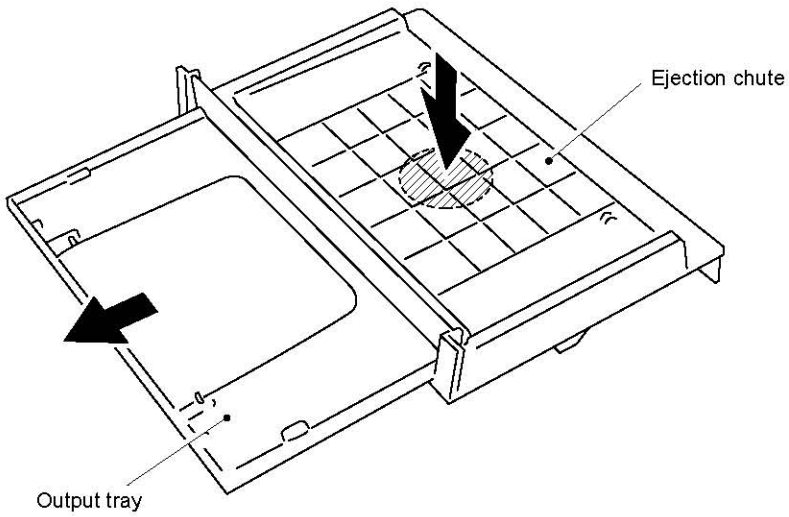


Fig. 4.29

4.13 Maintenance frame ASSY

4.13.1 Maintenance frame ASSY

<Disassembly>

(1) Move the Carriage ASSY to the center and take out the Maintenance cassette ASSY.

(2) Remove the Purge tube from the Cylinder ASSY.

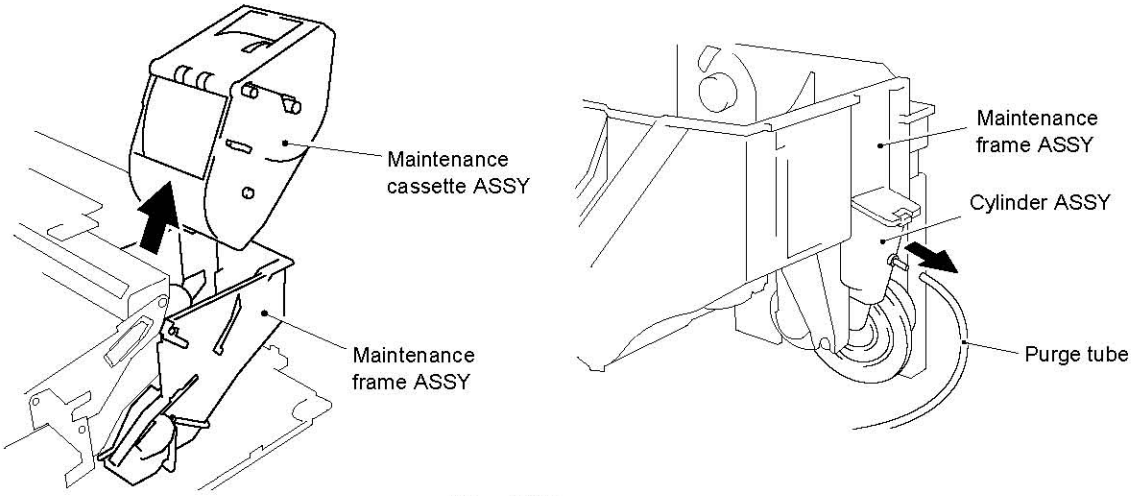


Fig. 4.30

(3) Remove the screw.

(4) Slide the Maintenance frame ASSY backwards slowly until the hook releases.

(5) Remove the Maintenance frame ASSY from the Main frame ASSY being careful not to hit the Link lever 1, which is a white plastic lever, into the Main frame ASSY.

(6) Remove the connector of the PE switch ASSY from the Driver PCB ASSY.

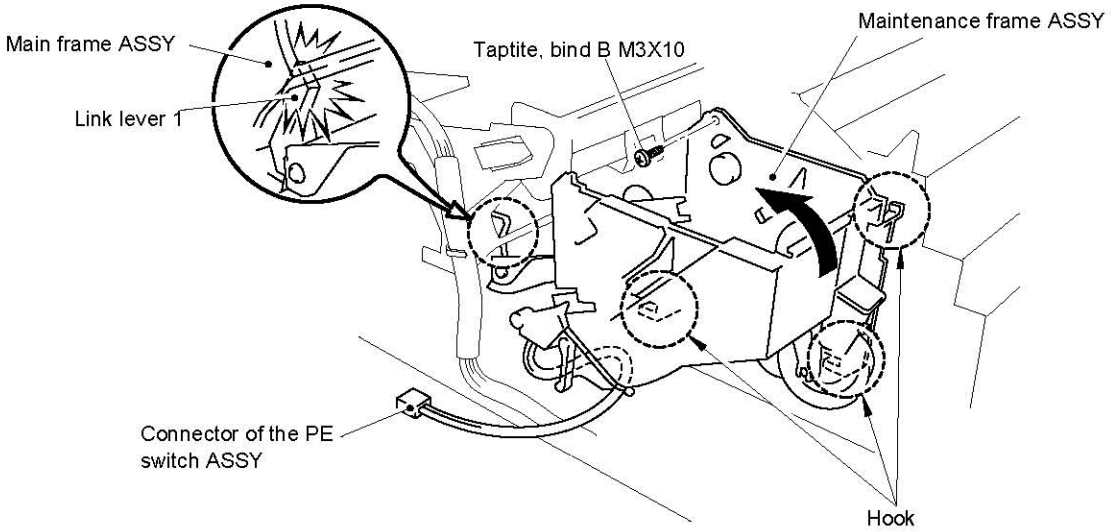


Fig. 4.31

<Reassembly>

Note: Using tweezers may help securing the connector.

4.13.2 Cylinder ASSY

<Disassembly>

Disassembling the Cam gear 33 and the Cylinder ASSY.

(1) Place the Maintenance frame ASSY up-side down.

(2) Pull the Cylinder ASSY toward you by pressing downwards the hook on the Maintenance frame ASSY .

(3) Rotate the Cylinder ASSY approximately 170°. When the Cylinder ASSY is vertical, slide the Cylinder ASSY toward the right hand side until it stops.

(4) Pull the Cylinder ASSY upwards. The Cam gear 33 can now be removed from the Main frame ASSY.

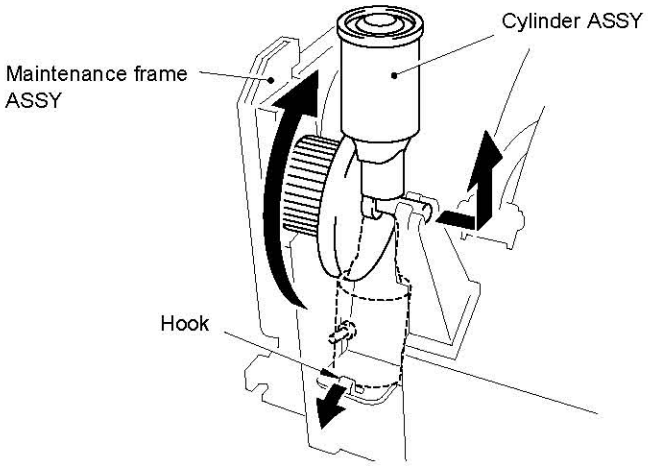


Fig. 4.32

(5) Remove the Cam gear 33 from the Cylinder ASSY.

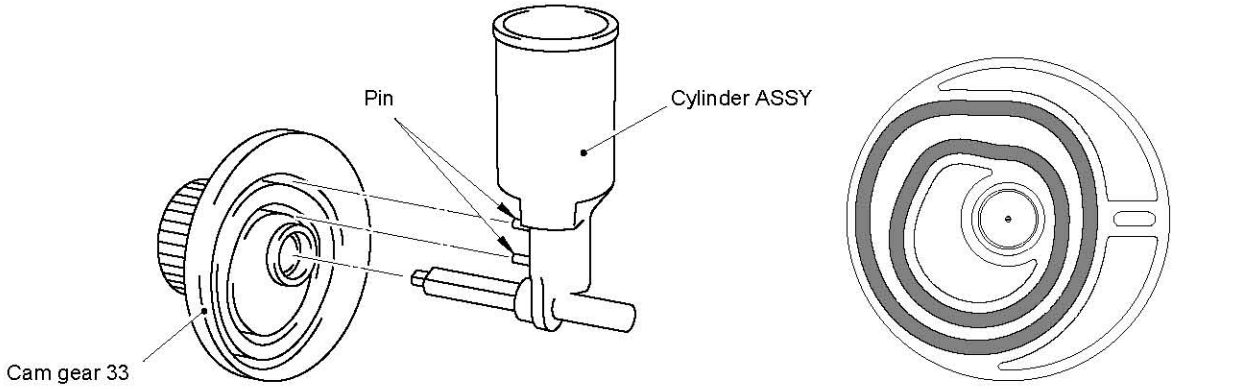


Fig. 4.33

<Reassembly>

Note: Securely insert the pins of the Cylinder ASSY into the grooves of the Cam gear 33.
Check that the Cam gear 33 rotates full circle.

4.13.3 MPE Switch ASSY

<Disassembly>

(1) Remove the Maintenance switch lock spring.

(2) Unlock the Maintenance switch lock by pressing the hook in the boss.

(3) Remove the PE switch ASSY. Remove the harness from the hook on the bottom of the Maintenance frame ASSY.

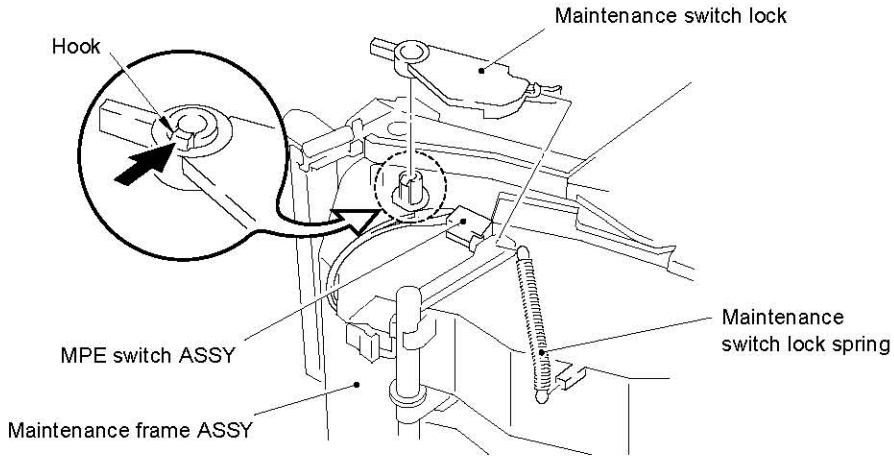


Fig. 4.34

4.13.4 Connecting Rubber ASSY

<Disassembly>

(1) Release the spring from the boss and slide it in the direction indicated by the arrow to remove the Main frame ASSY.

(2) Remove the Connecting rubber ASSY from the Main frame ASSY.

(3) Remove the Purge tube from the Connecting rubber ASSY.

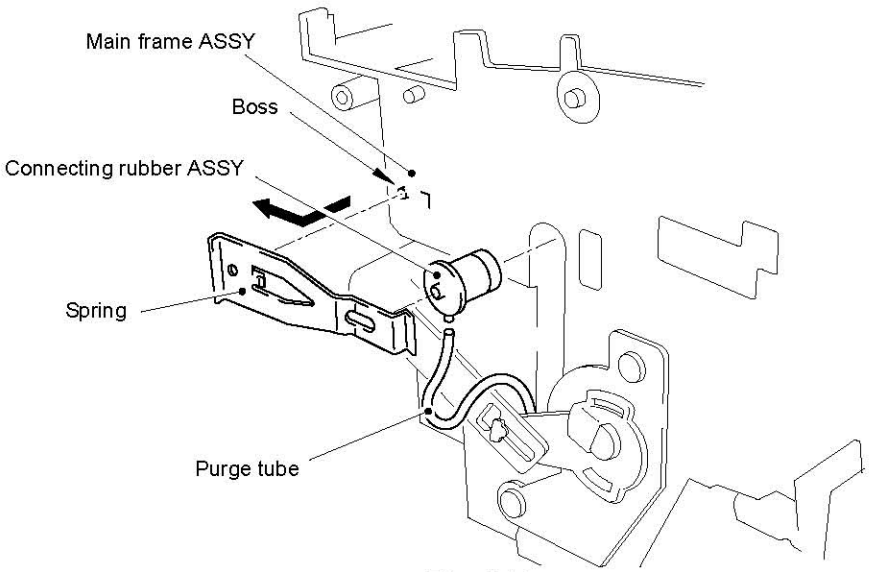


Fig. 4.33

4.14 Base Plate ASSY

<Disassembly>

(1) Remove the harness and the Purge tube from the harness clamps.
Remove the two screw fixing the earth cables.

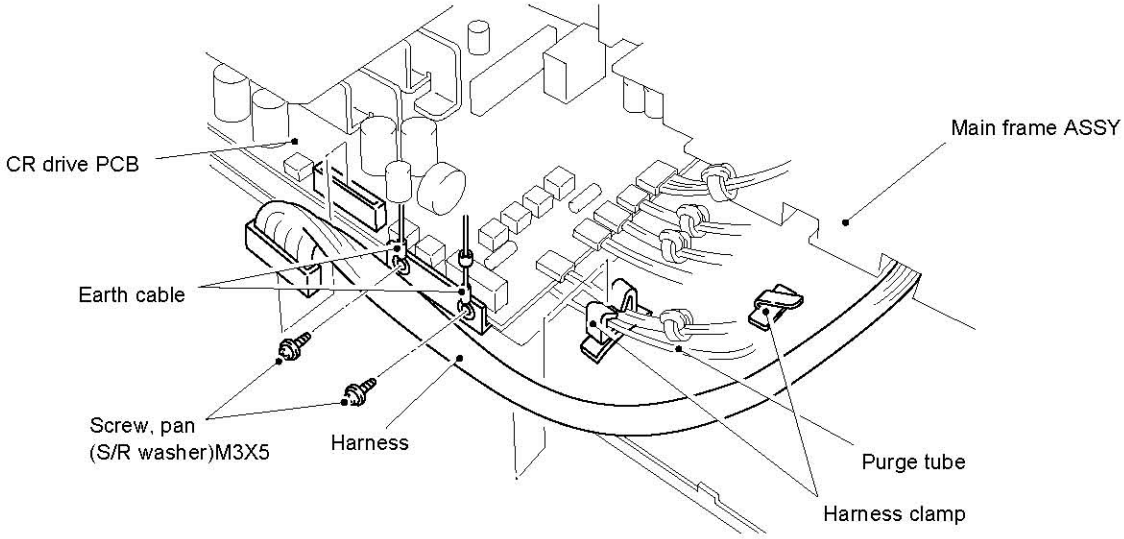


Fig. 4.36

(2) Remove the harness from the harness clamp under the left pulley.
Remove the two screws from the Shield plate CRM.

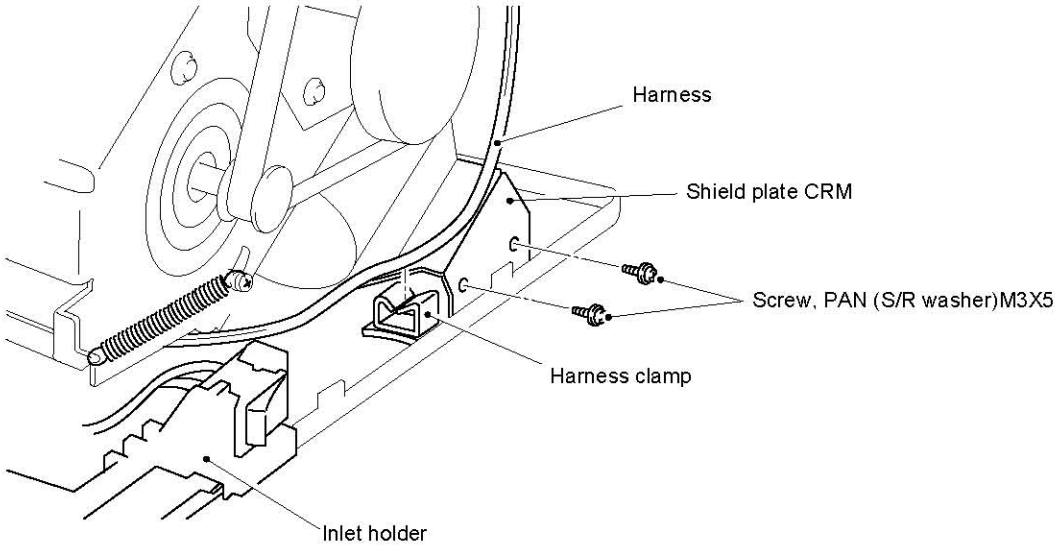


Fig. 4.37

(3) Remove the three screws and the Joint plate.
Remove the screw securing the Grounding wire.
Remove the screw securing the Inlet holder.

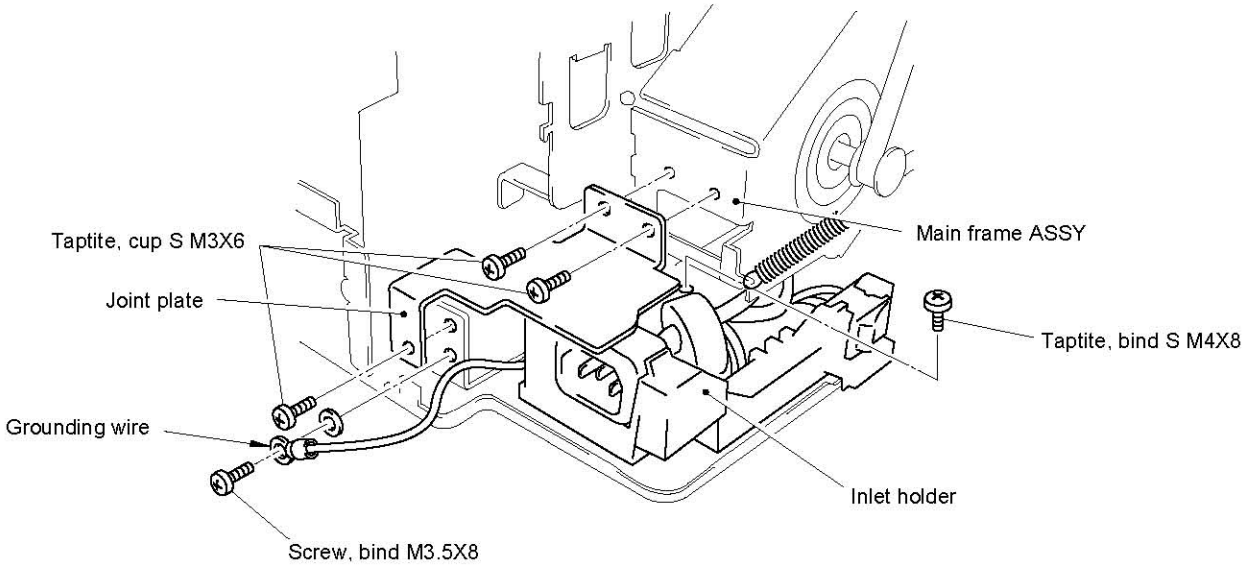


Fig. 4.38

(4) Turn the Main frame ASSY over being careful not to damage the Head gap lever, which is a blue plastic lever.

Note: Perform the following work while the Main frame ASSY is placed up side down. To prevent any damage to the Main frame ASSY, always place a spacer (e.g. 2 reams of paper) under the Main frame ASSY before starting any of the following work.

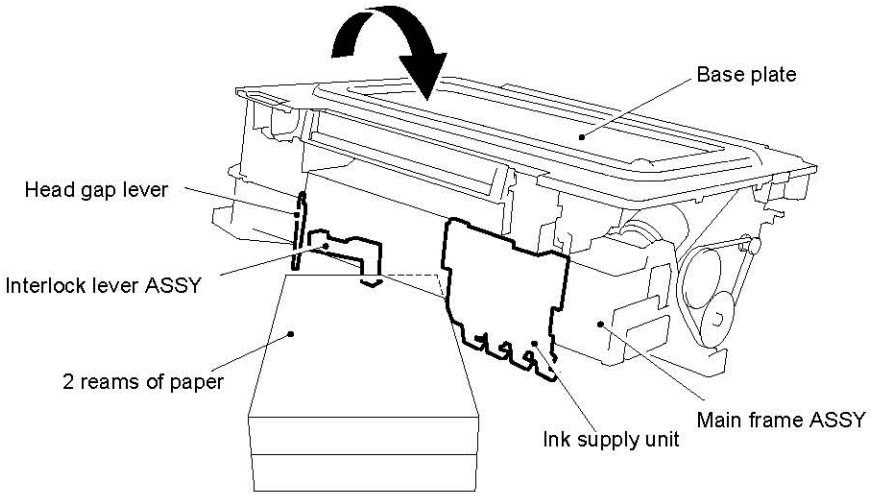


Fig. 4.39

(5) Press the hook to release the Inlet holder.

Note: The harness from the Inlet holder is still connected to the power supply at this stage.

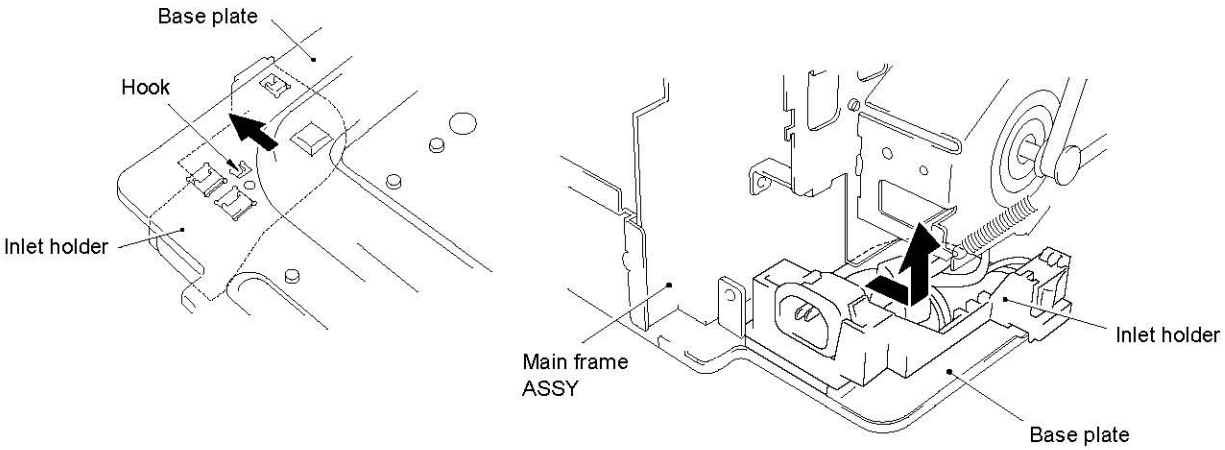


Fig. 4.40

(6) Remove the 13 screws securing the Base plate.

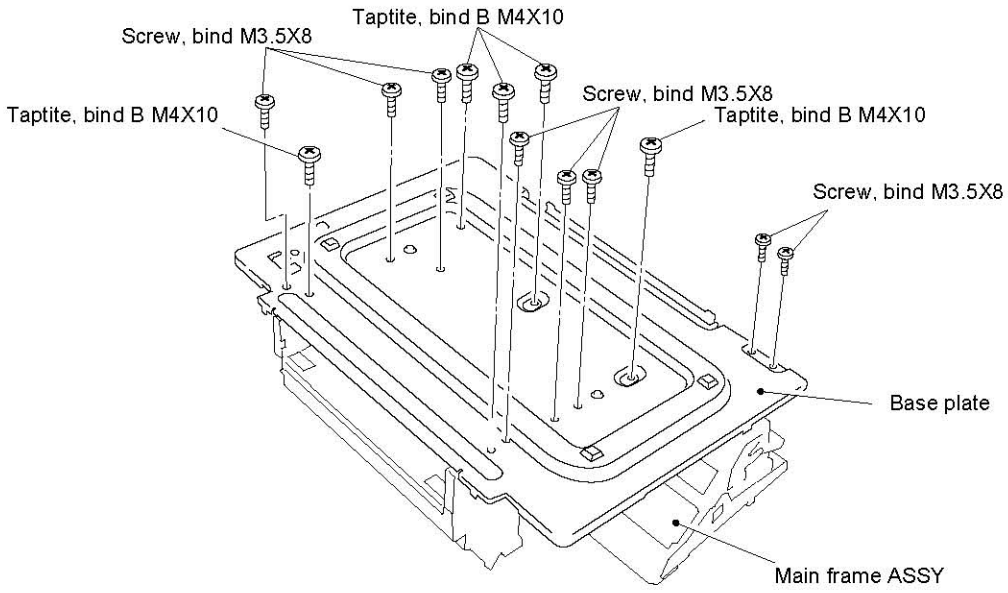


Fig. 4.41

<Reassembly>

(1) Position the Base plate on the two bosses on the Main frame ASSY.

(2) Secure the Base plate with 13 screws.

(3) Turn over the Main frame ASSY.

(4) Press the Inlet holder and slide the hook of the Inlet holder until the hook secures the Base plate.

(5) Secure the Inlet holder with one screw.

(6) Secure the Joint plate with three screws while pushing it toward the Spring hook plate. Refer to fig. 4.38.

(7) Secure the grounding wire so that the washer, the grounding wire terminal, and screw are fitted in that order.

(8) Clamp the AC electrode harness with the left harness clamp and clamp the harness with the right harness clamp.

(9) Fit the Shield plate CRM and secure with two screws.

(10) Fit the earth cables and secure with two screw.

(11) Refit the Maintenance cassette.

4.15 Driver PCB ASSY

<Disassembly>

(1) Remove all the harness connectors from the Driver PCB ASSY.

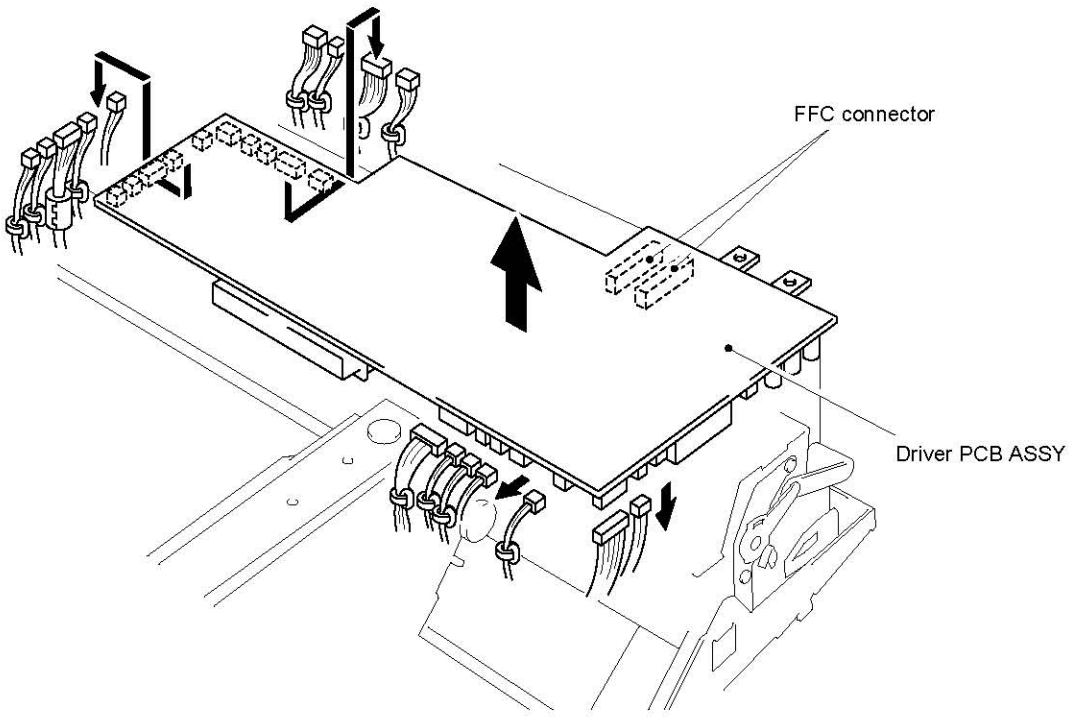


Fig. 4.42

(2) Slightly lift the Driver PCB ASSY upwards and disconnect the FFC cables from the FFC connectors.

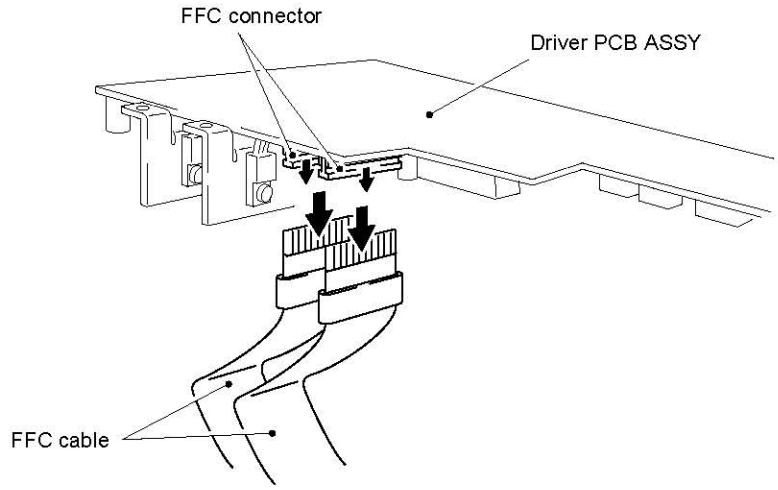


Fig. 4.43

<Reassembly>

(1) Insert the FFC cables into the connectors and hold the Driver PCB ASSY upside down.

(2) Insert the cables into slot 1 and 2 securely.

(3) Position the two bosses on the Main frame ASSY.

(4) Insert the harnesses into the connectors securely.

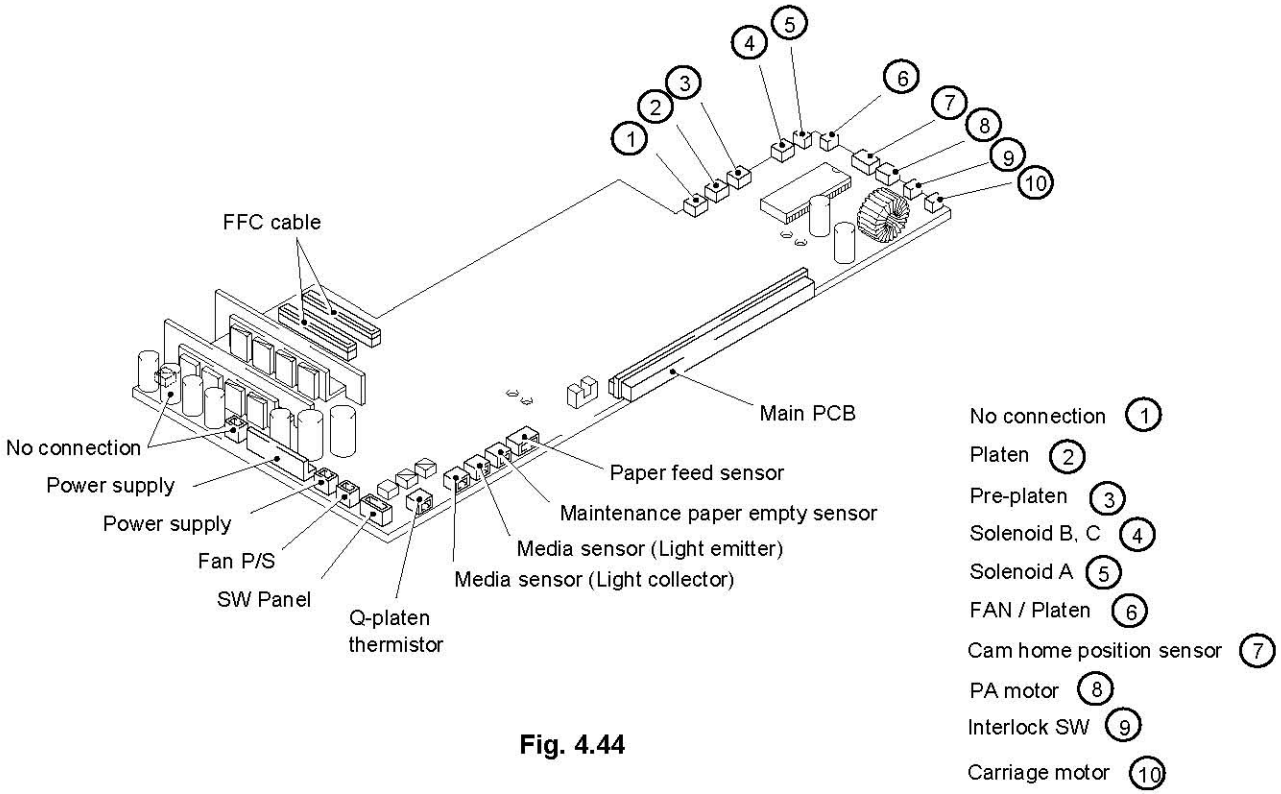


Fig. 4.44

4.16 Main Frame ASSY

4.16.1 PE Sensor ASSY, Regist Sensor actuators 2 and 3 and Regist Sensor Actuator Spring

<Disassembly>

(1) Remove the PE sensor ASSY together with the Regist sensor actuator 3 and the Regist sensor actuator spring.

(2) Disconnect the PE sensor ASSY connector from the Driver PCB ASSY.

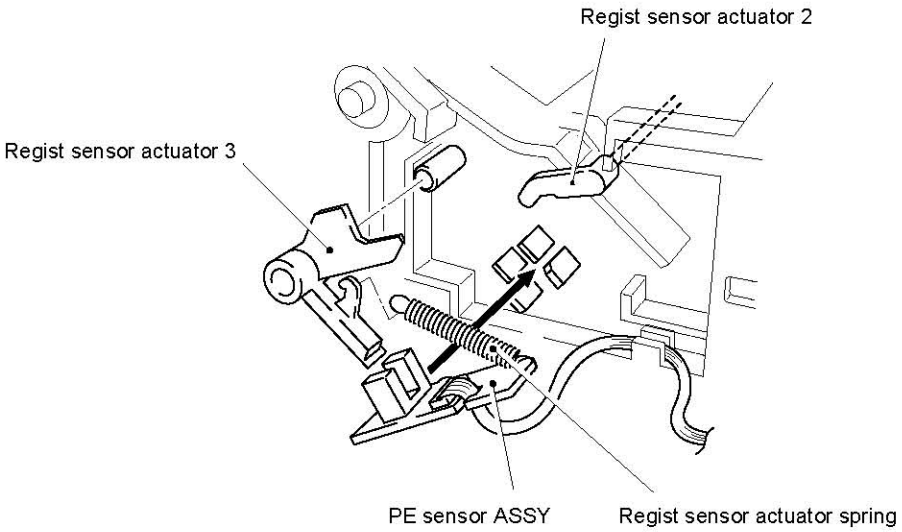


Fig. 4.45

<Reassembly>

Note 1: After reassembly, check that the Regist sensor actuators 2 and 3 rotate smoothly.

Note 2: For HS-5300, mount the Regist sensor actuators so that the Regist sensor actuator 3 is located under the Regist sensor actuator 2.

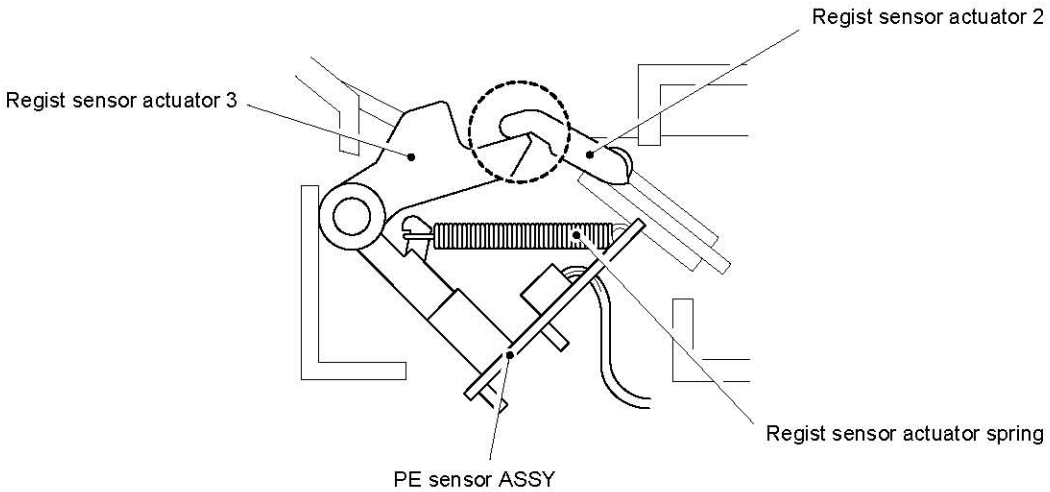


Fig. 4.46

4.17 Power Supply PCB ASSY

<Disassembly>

(1) Release all the harnesses from the grooves on the Main frame ASSY and lift the Shield plate upwards while carefully observing the Paper empty actuator.

(2) Remove the four harnesses from the Power supply PCB ASSY.

(3) Remove the five screws from the Power supply PCB.

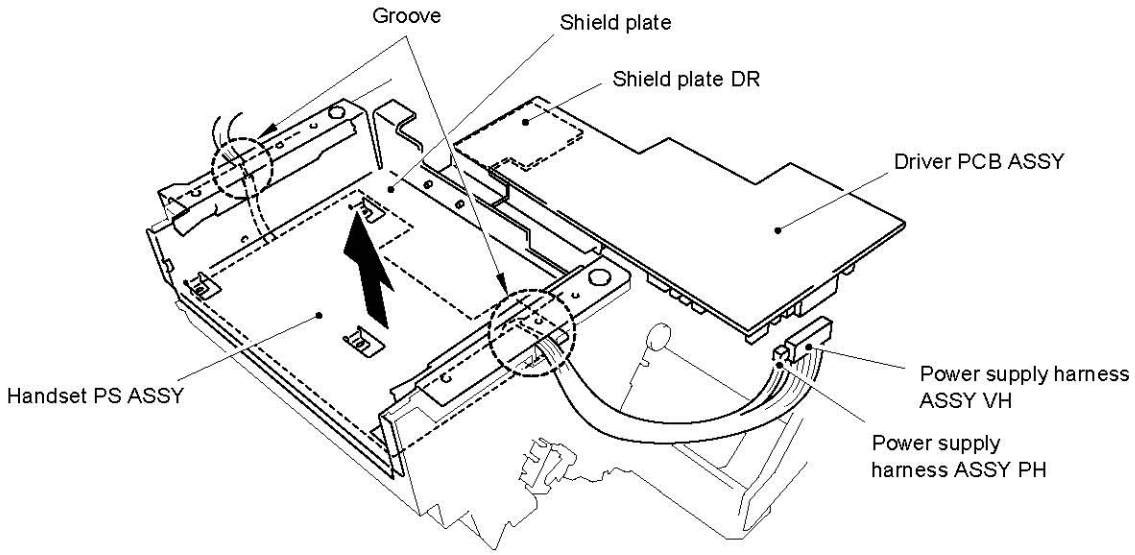


Fig. 4.47

<Reassembly>

(1) Position the Power supply PCB on the two bosses on the Shield plate.

(2) Secure the Power supply PCB with five screws.

(3) Securely connect the four harnesses to the connectors.

(4) Put the harnesses in the grooves to make them tidy.

(5) Stand the Paper empty actuator straight up and slowly position the Shield plate on the bosses on the Main frame ASSY while carefully checking so that the Paper empty actuator does not get caught under the Shield plate.

(6) Securely connect the Power supply harness ASSY VH and PH to the Driver PCB.

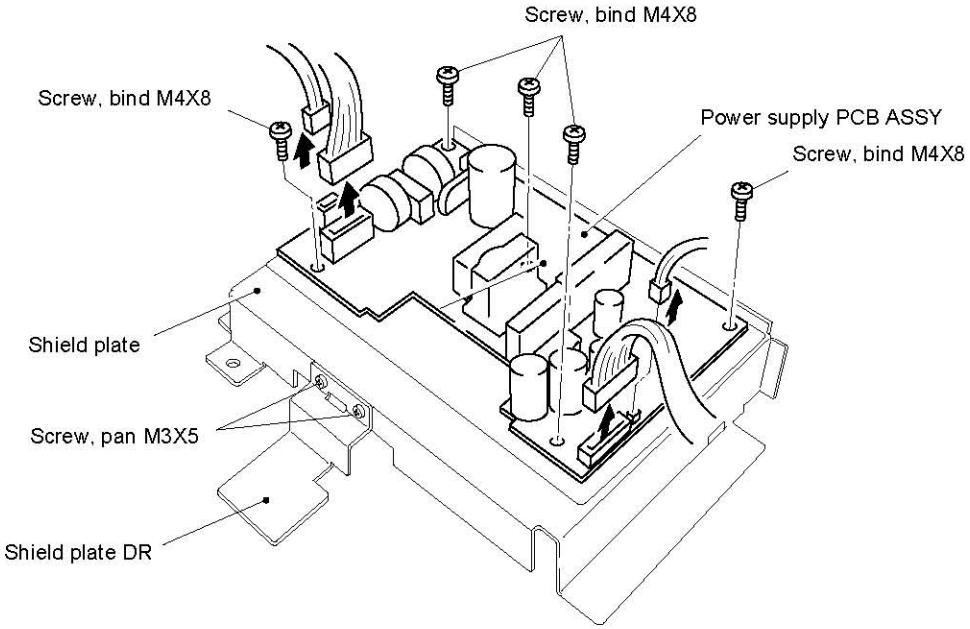


Fig. 4.48

Note: After replacing the Power supply PCB ASSY, adjustment must be done. See section 5.3 Electrical Adjustment and 5.4 Offset, TOF and LF Adjustment in this chapter.

4.18 Fan 80

<Disassembly>

(1) Remove the two springs which secure the Air duct.

(2) Remove three screws from the Fan holder and lift the Fan holder up.

(3) Remove two screws from the Fan motor.

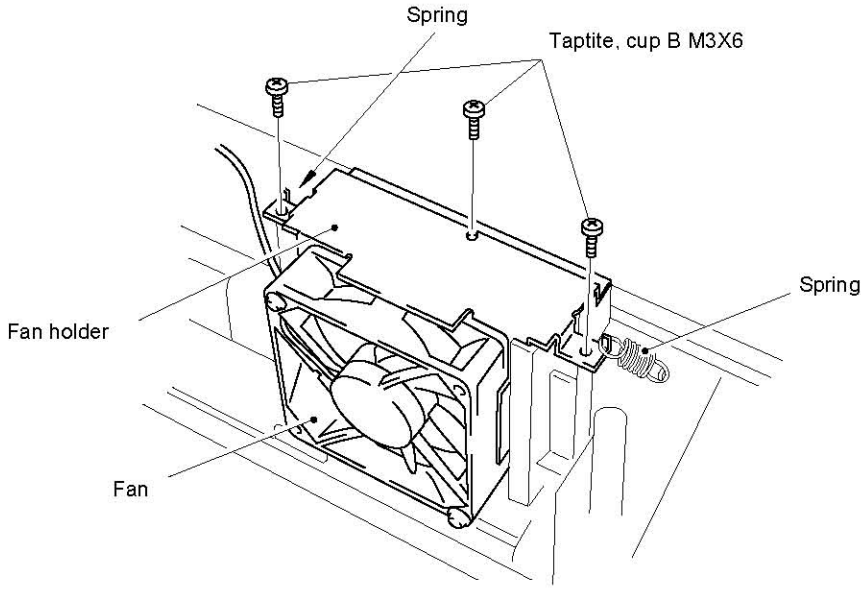


Fig. 4.49

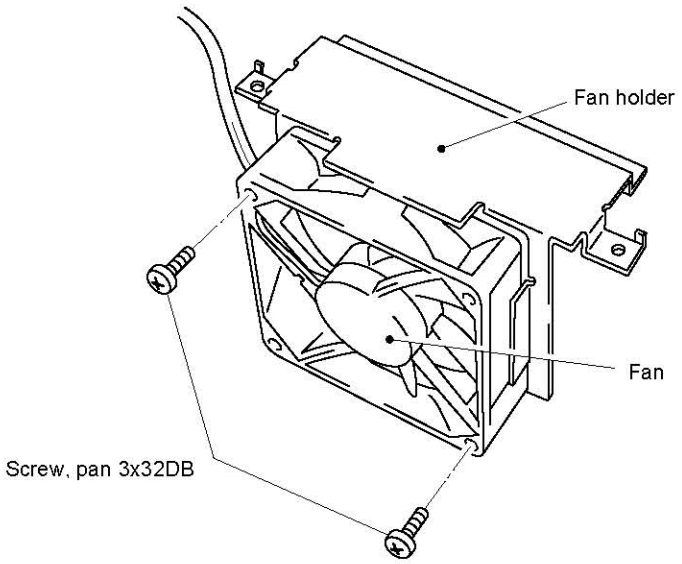


Fig. 4.50

4.19 PA Motor ASSY

<Disassembly>

(1) Slightly loosen the two screws securing the PA motor ASSY and remove the PA motor spring. Remove the Timing belt by sliding the PA motor ASSY in the direction indicated by the arrow.

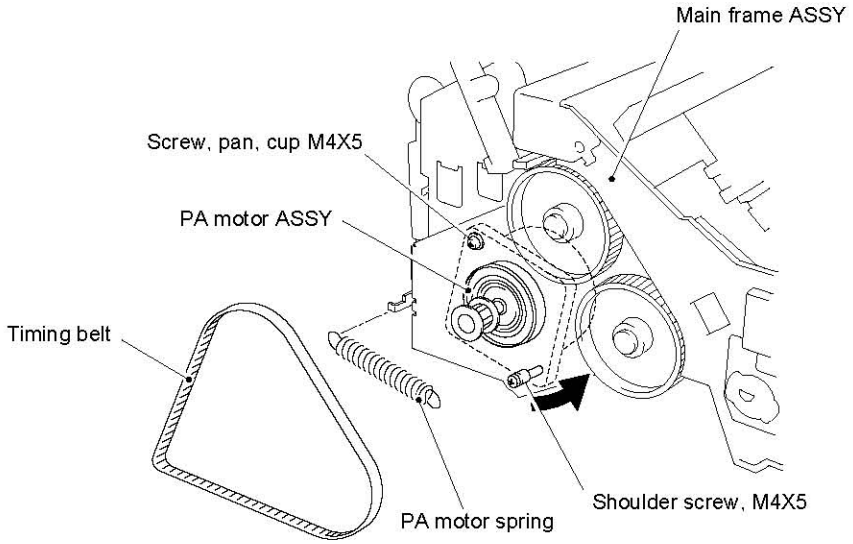


Fig. 4.51

(2) Remove the two screws and the PA belt support plate.

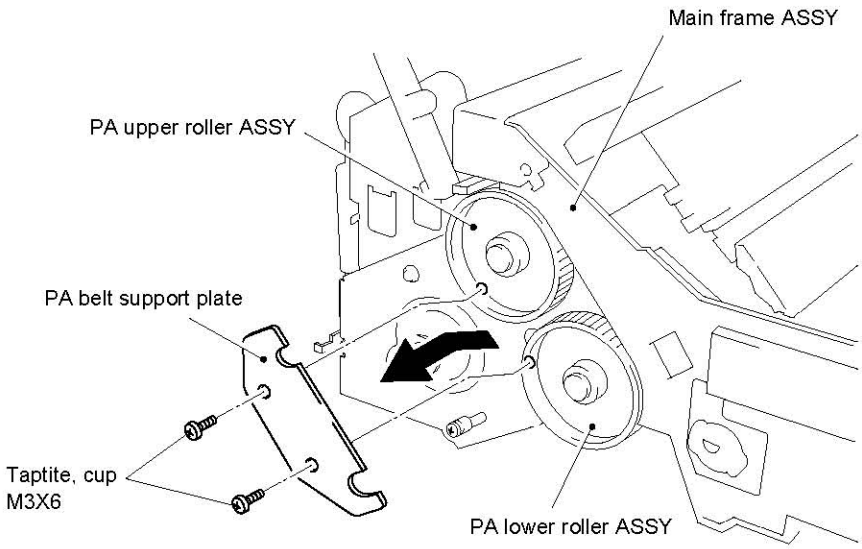


Fig. 4.52

(3) Remove the screw securing the PA roller gear plate and the three screws securing the PA motor holder weld ASSY, slightly pull the PA motor ASSY towards you and move it backwards.

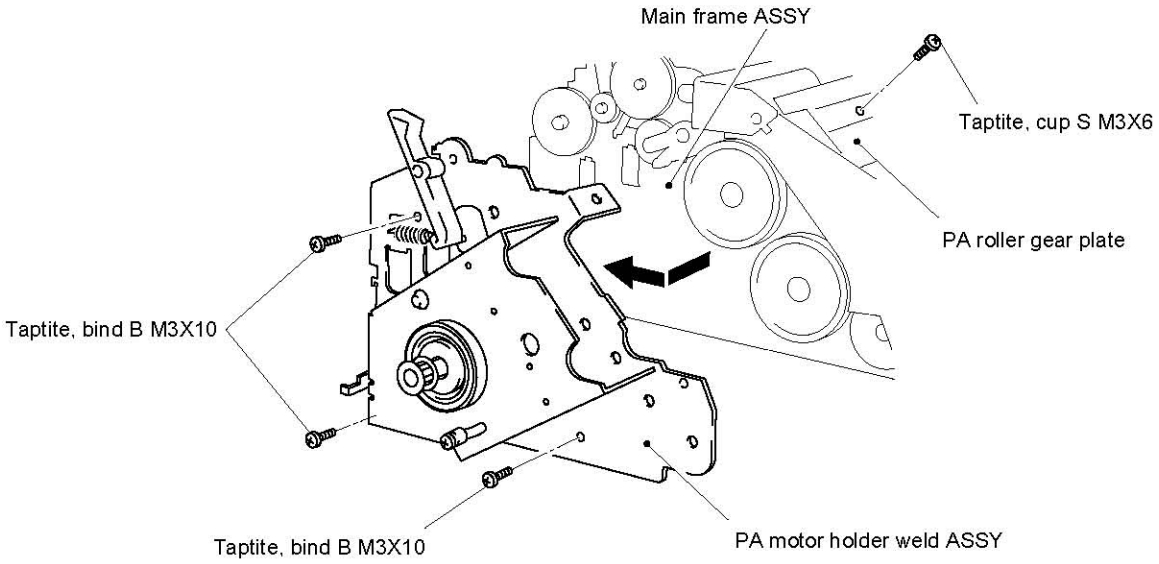


Fig. 4.53

(4) Remove the two screws securing the PA motor ASSY and remove it.

(5) Remove the two screws, then remove the High-damping rubber.

(6) Remove the Ferrite core.

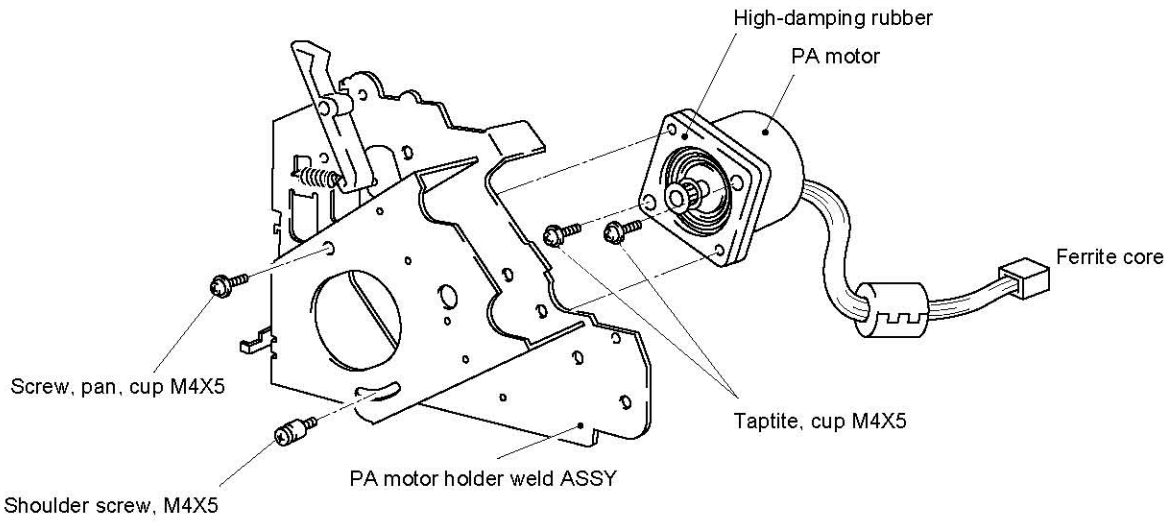


Fig. 4.54

<Reassembly>

Note1: There are three kinds of screws used to secure the PA motor holder weld ASSY. Ensure that they are all refitted correctly. Refer to fig. 4.54.
Mind the order of securing screws. Screw, pan, cup M4X5 has to be secured prior to Shoulder screw, M4X5.

Note 2: Secure the PA belt support plate at a position where the two positions shown in the Fig. 3.82 are slightly in contact with the Bearing A. At this time, the Nip release lever must be held. (It is in the release mode.) Put the project part of the Bearing A at the opposite side of the PA belt support plate and mount the plate at a position where it is not in contact with the project part of the Bearing A.

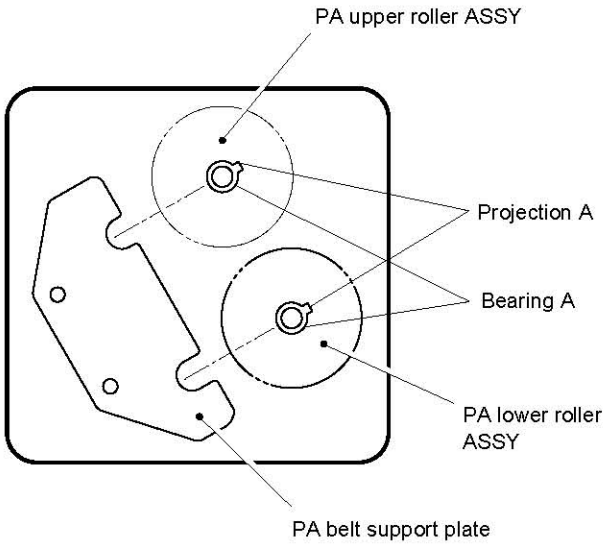


Fig. 4.55

4.20 Main Frame ASSY

4.20.1 Solenoid PH 1 ASSY and PH 2 ASSY

<Disassembly>

■ **HS-5000**

(1) Remove the Gear 20 Taiyo HS.
(2) Remove the Gear Z30 ASSY.
(3) Remove the Gear 45 arm.
(4) Remove the Gear 40/54.
(5) Remove the Solenoid PH 1 ASSY together with the Actuator C and the Solenoid spring.

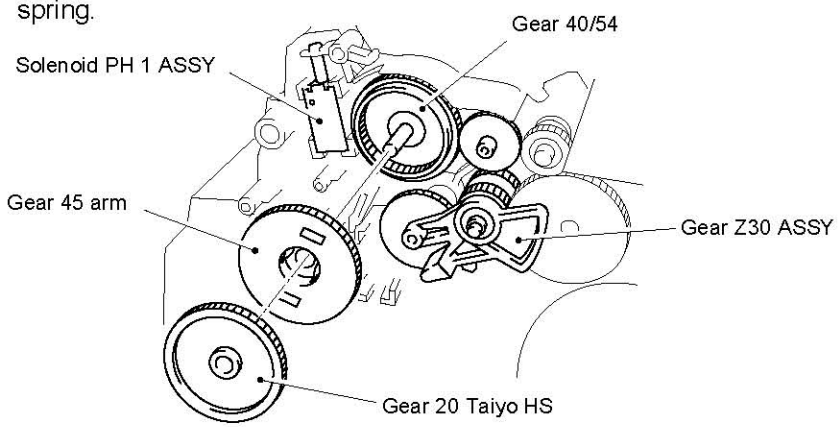


Fig. 4.56

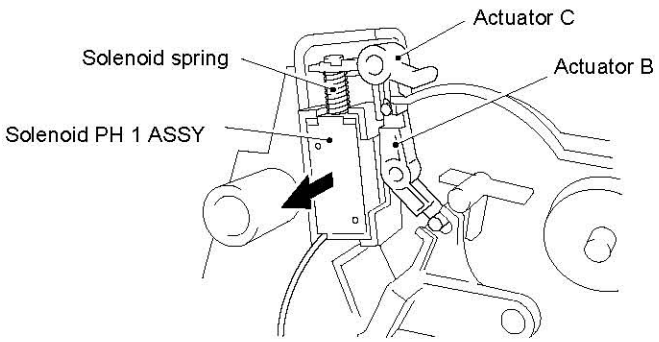


Fig. 4.57

(6) Remove the Actuator A.
(7) Remove the Actuator B.

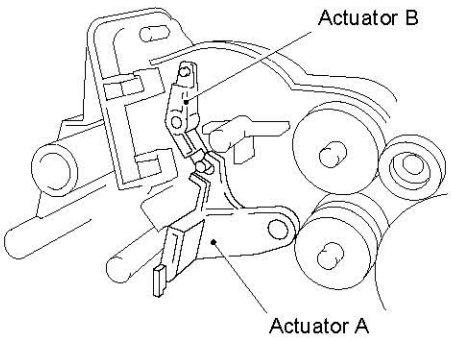


Fig. 4.58

■ **HS-5300**

(1) Remove the Gear 20 Taiyo HS.
(2) Remove the Idle gears Z25 and Z45.
(3) Remove the Gear Z30 ASSY.
(4) Remove the Gear 45 arm.
(5) Remove the Gear 40/54.

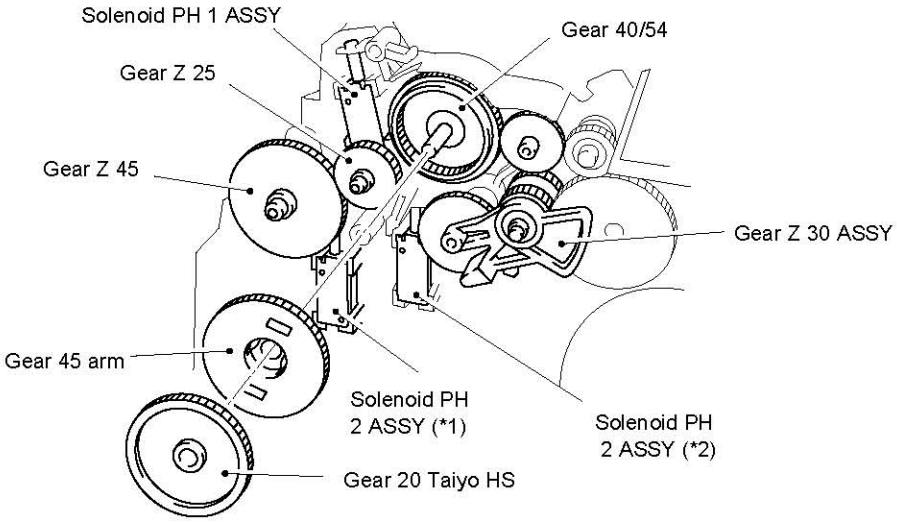


Fig. 4.59

(6) Remove the Solenoid PH 1 ASSY together with the Actuator C and the Solenoid spring.

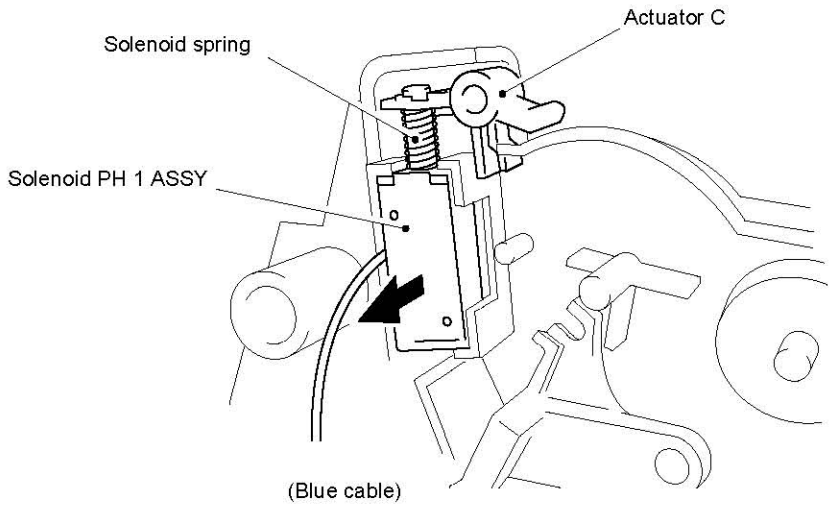


Fig. 4.60

(7) Remove the Solenoid PH 2 ASSY (*1), Actuator 1 and the Solenoid spring at the same time.

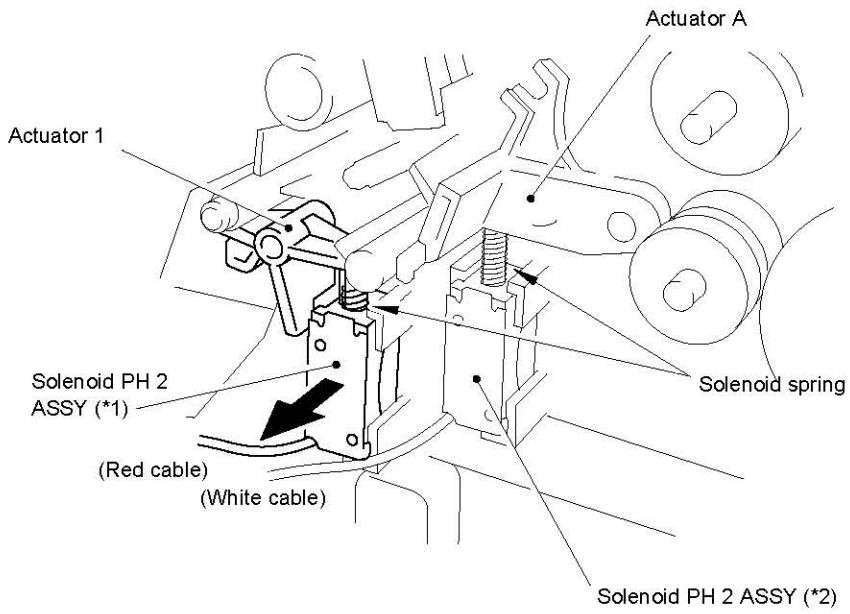


Fig. 4.61

(8) Remove the Actuator A and Solenoid PH 2 ASSY (*2) at the same time.

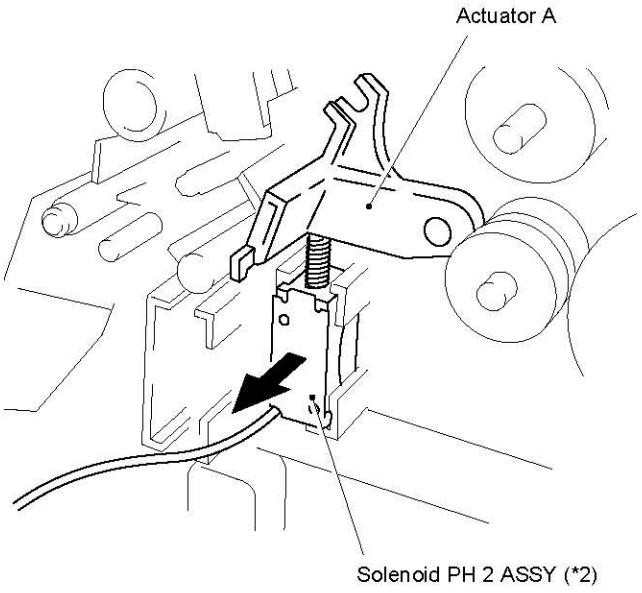


Fig. 4.62

4.20.2 Cam Home Position SW ASSY

<Disassembly>

(1) Loosen the screw (do NOT remove it) from the CR I pulley holder ASSY through the hole on the right front side of the Main frame ASSY.
Push the CR I pulley holder ASSY toward the Carriage motor and remove the Timing belt from the pulley of the Carriage motor. Refer to fig. 4.96.
(2) Remove the two screws on the left of the Carriage beam ASSY and remove the Carriage motor ASSY.
(3) Release the hook of the gear holder to remove the Cam position SW ASSY from the Gear unit. Refer to fig. 4.107.

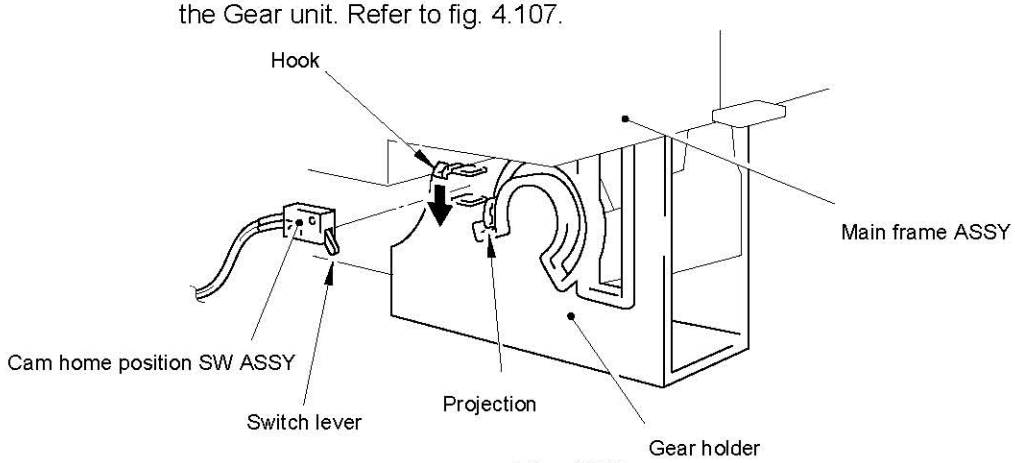


Fig. 4.63

Note When reassembling the Cam home position SW ASSY, make sure that the projection of the gear is underneath the switch lever.

4.20.3 Cover Open SW ASSY

<Disassembly>

(1) Remove the Cover open lever ASSY from the Main frame ASSY.
(2) Remove the screw and remove the Cover open SW ASSY.

<Reassembly>

Note: When reassembling, run the harness through the hole in the Main cover.

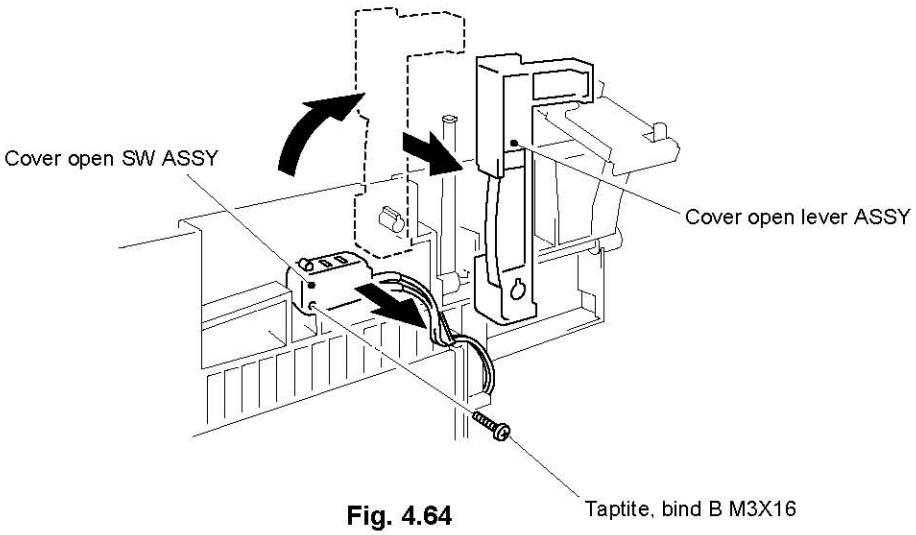


Fig. 4.64

If you go further disassembly flow from this page, the head gap adjustment is necessary after reassembly See section 5.1 Head Gap in this chapter.

4.21 Print Head

<Disassembly>

(1) Move the Carriage ASSY to the center of the Main frame ASSY.

(2) Remove the two screws and release the hooks at both sides and then remove the CR PCB cover from the Carriage ASSY.

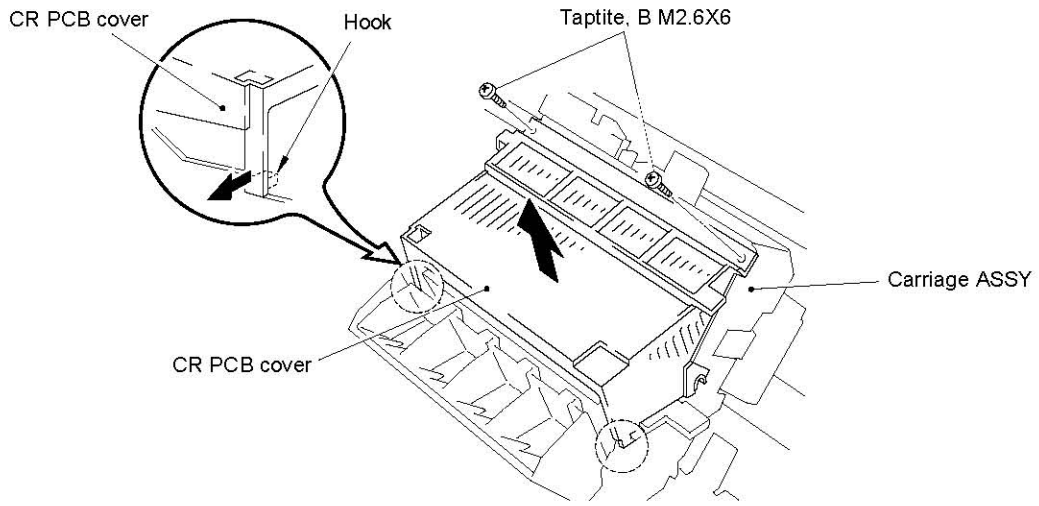


Fig. 4.65

(3) Remove five connectors (B) from the CR PCB ASSY.
Remove the FFC cables (A) after releasing the lock and the screw from the CR PCB ASSY.

Note: Carefully disconnect the Cables (A) since they easily damaged.

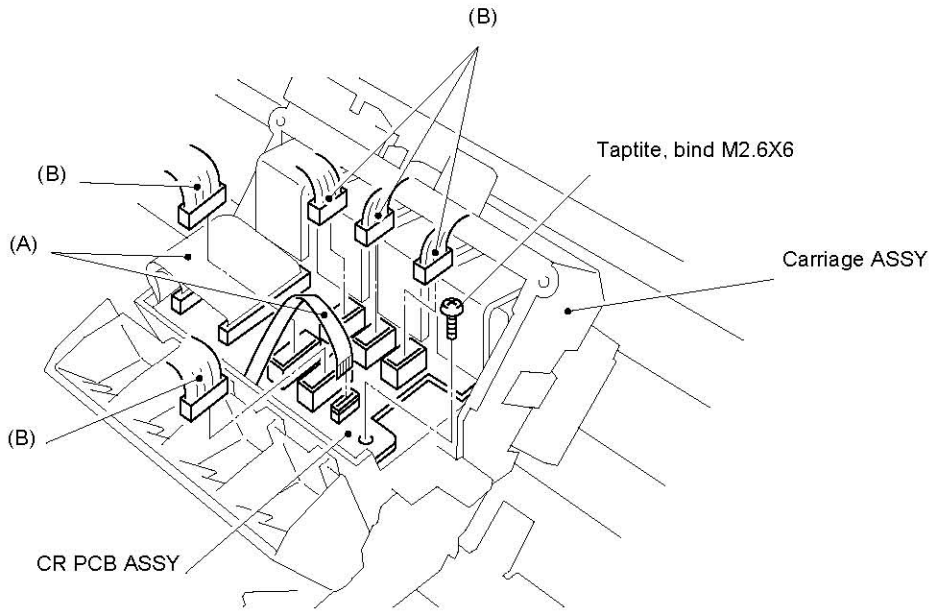


Fig. 4.66

(4) Make sure that the Carriage ASSY is in the center position of the printer.

(5) Remove the screw from the left hand side of the AC electrode support C ASSY.

(6) Remove the connectors from the AC electrodes support C ASSY.

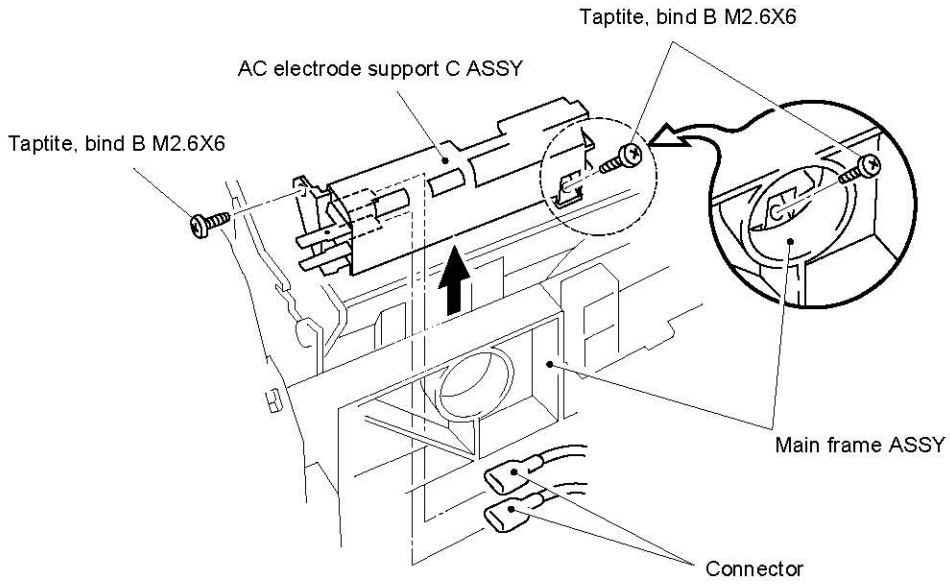


Fig. 4.67

(7) Lift the CR PCB ASSY together with the heat insulation film.

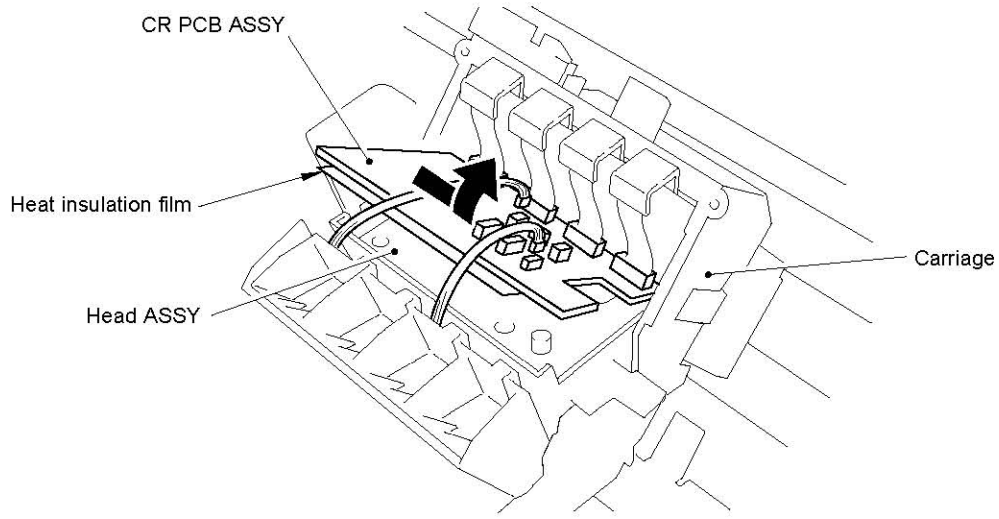


Fig. 4.68

(8) Remove two screws (A) and two screws (B) and remove the Head from the Carriage ASSY.

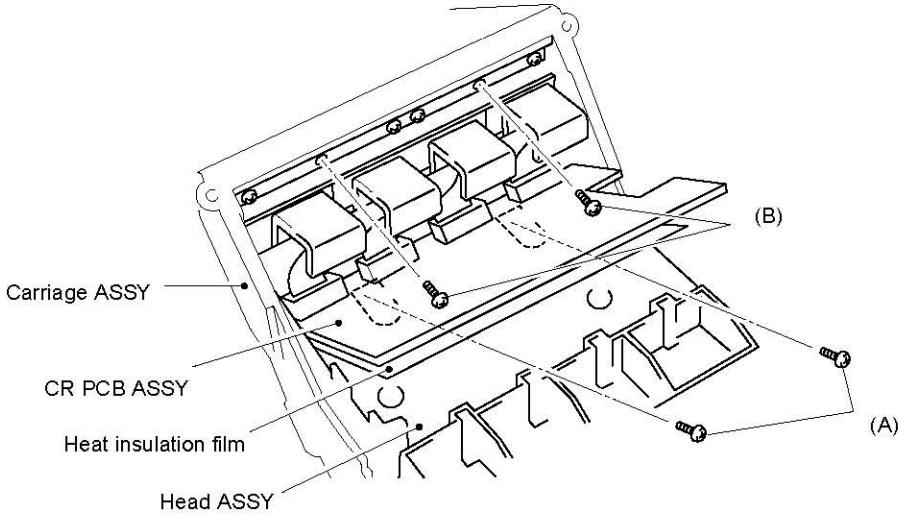


Fig. 4.69

<Reassembly>

(1) Put the Gap spacer on the Carriage ASSY. As shown in fig. 4.70, place the Head ASSY on the Carriage ASSY to keep the 0.18 mm gap between the Head ASSY and the reference surface.

(2) Tighten the screws (A) first, then (B) while pushing down the Head ASSY using a screw driver. Refer to fig. 4.69 for the screws. Remove the Gap spacer.

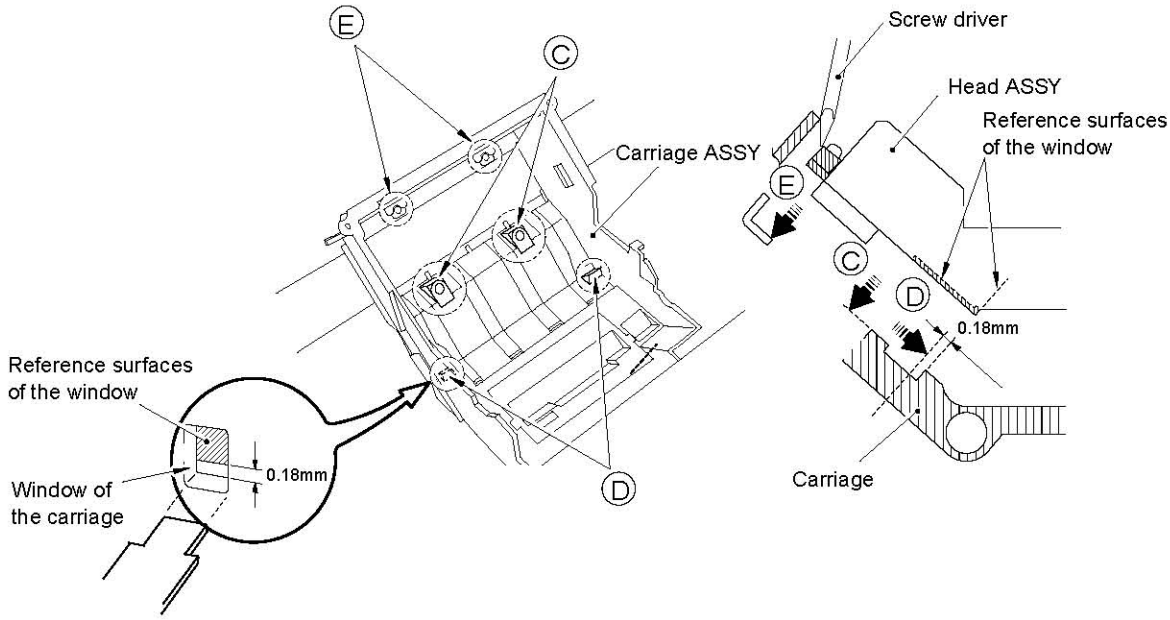


Fig. 4.70

Note: Make sure that there is 0.18 mm gap between the Carriage ASSY and the Head ASSY.
Be sure to remove the Gap spacer after reassembling.

(3) Fit the AC electrode support C ASSY with the two screws.

Note: Make sure that the left flange of the AC electrode support C ASSY holds the FFC cables in place.

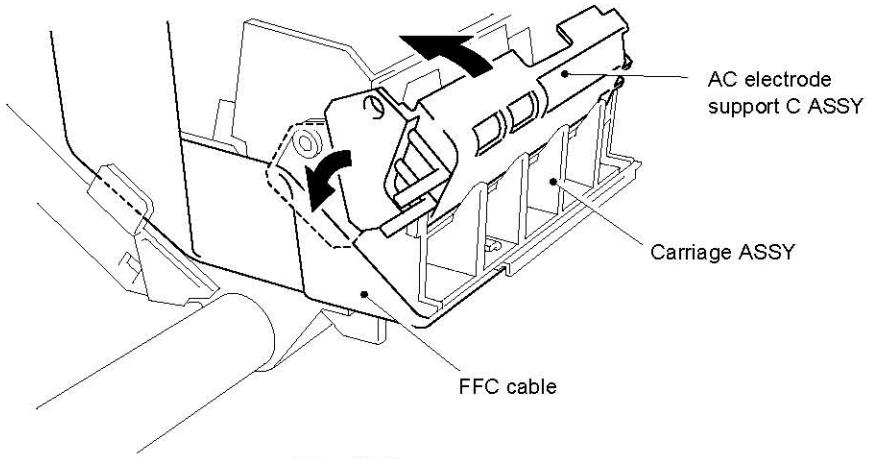


Fig. 4.71

(5) Fit the CR PCB ASSY to the connector position on the Head ASSY. Push the CR PCB ASSY towards the upper left hand corner as shown in fig. 4.72.

(6) At this time, check that the front end heater harness and the PW sensor harness are secured by the hooks on the Head ASSY as shown in the enlarged figure.

(7) Reassemble the CR PCB cover onto the Carriage ASSY.

Note: At this time, carefully reassemble the CR PCB cover so that the head FFC cable is not damaged.
Make sure that the ENC harness is correctly inserted into the notch of the Relay PCB cover.

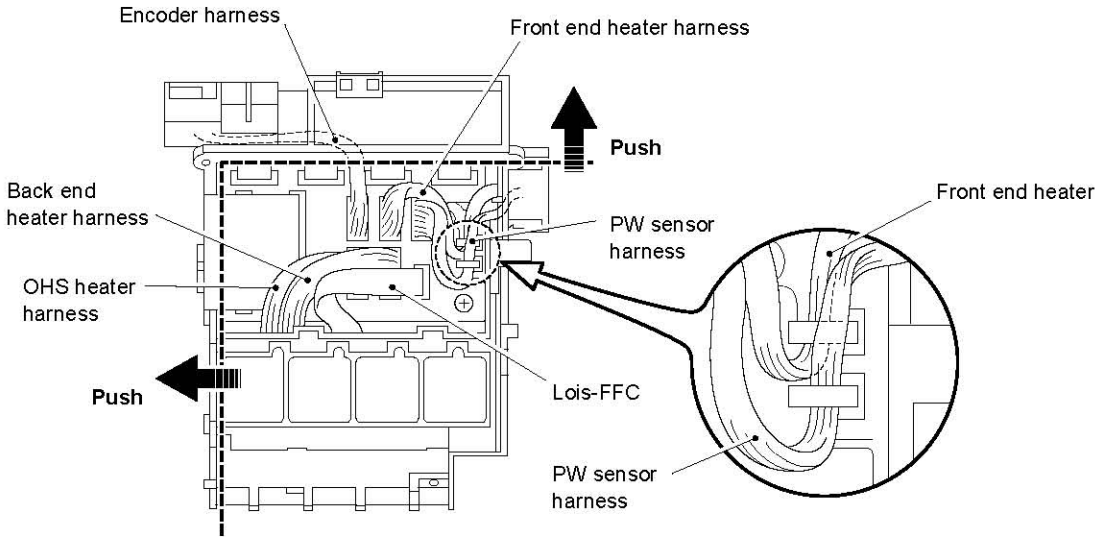


Fig. 4.72

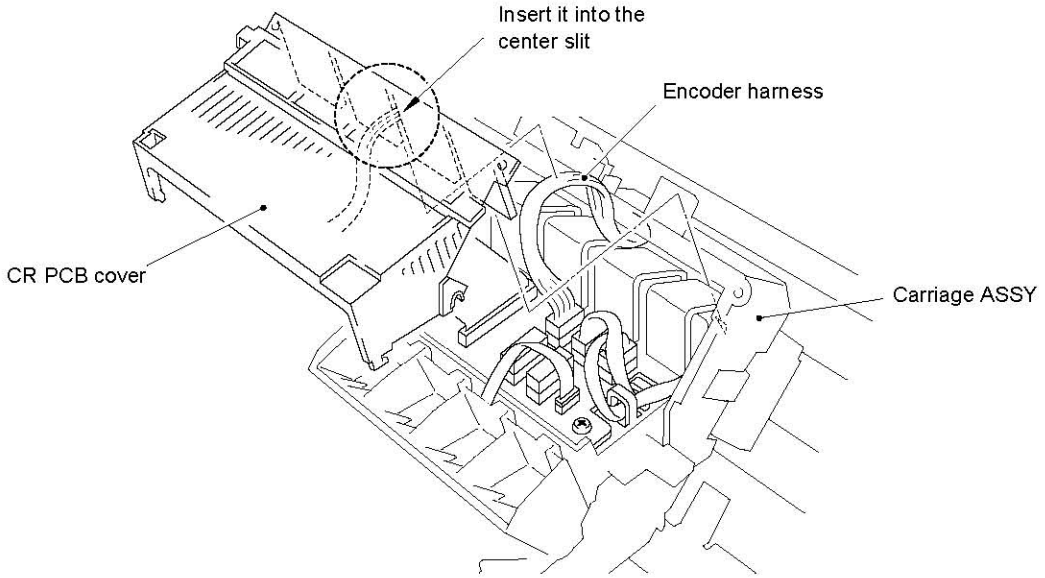

Insert it into the
center slit
Encoder harness
CR PCB cover
Carriage ASSY

Fig. 4.73

4.22 Upper Nip Plate Unit

4.22.1 Upper Nip Plate Unit

<Disassembly>

Caution!: Do not loosen the two screws securing the Carriage guide plate. The Carriage guide plate has been fixed by using an adjustment tool. (See section 5.2 Head Gap and Parallel Alignment in this chapter).

(1) Move the Carriage ASSY to the right hand end.

(2) Remove the four screws.

(3) Remove the Upper nip plate unit while holding the Carriage ASSY.

Note: Take care that the Baffle plate is not bent.

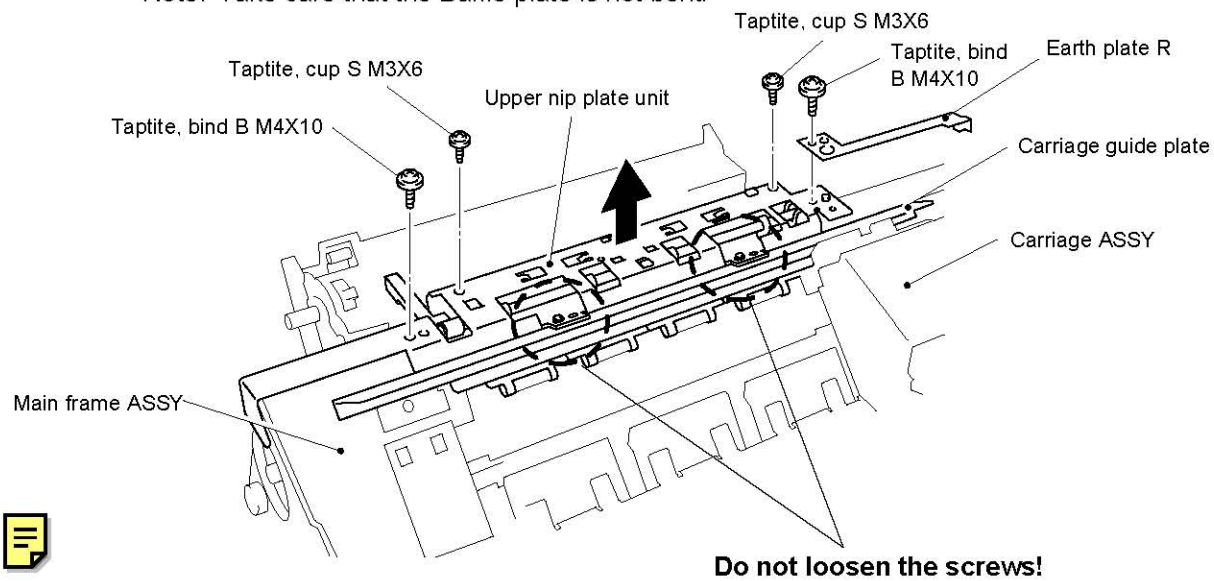


Fig. 4.74

<Reassembly>

(1) Run the harness of the MED sensor PT380 ASSY through the hole in the Main frame ASSY. Insert the CR guide plate between the CR sub guide and Carriage ASSY by slightly lifting the Carriage ASSY upwards.

(2) Position the Upper nip plate onto the two bosses on the Main frame ASSY so that the harness is not loose. At this time, check that the two regist roller springs are correctly located on the pinch roller shaft. Fit the Earth plate R on the right hand side of the Upper nip plate. Secure the Upper nip plate unit with four screws. Refer to fig. 4.74.

Note: Put a sheet of paper over the platen before reassembly so that damage of the Baffle plate can be avoidable.

(3) Run the harness of the MED sensor PT380 ASSY through the hook on the right hand side of the Main frame ASSY, then run it toward the inside of the printer under the Main frame ASSY once, and then run it toward the outside again.

4.22.2 Baffle Plate

<Disassembly>

Caution: The Baffle plate is the very thin metal part. Be careful with the sharp edge while handle it.

(1) Carefully lift up the left hand side of the Baffle plate and release from the bosses. Slide it horizontally being careful not to bend it.

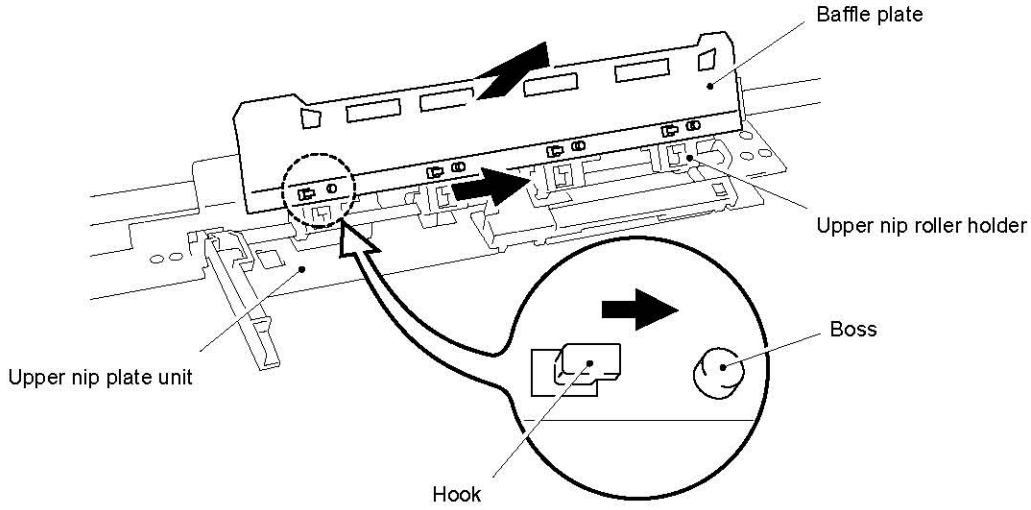


Fig. 4.75

<Reassembly>

(1) Set the Baffle plate so that the four L-shape hooks of the Upper nip roller holder are inserted into the holes of the Baffle plate. Slide the Baffle horizontally until the two bosses at the both ends locate correctly.

4.22.3 Nip Release Lever

<Disassembly>

(1) Remove four Upper nip springs.

(2) Remove the Nip release lever by sliding the Nip release shaft horizontally while releasing the hook of the Nip release lever.

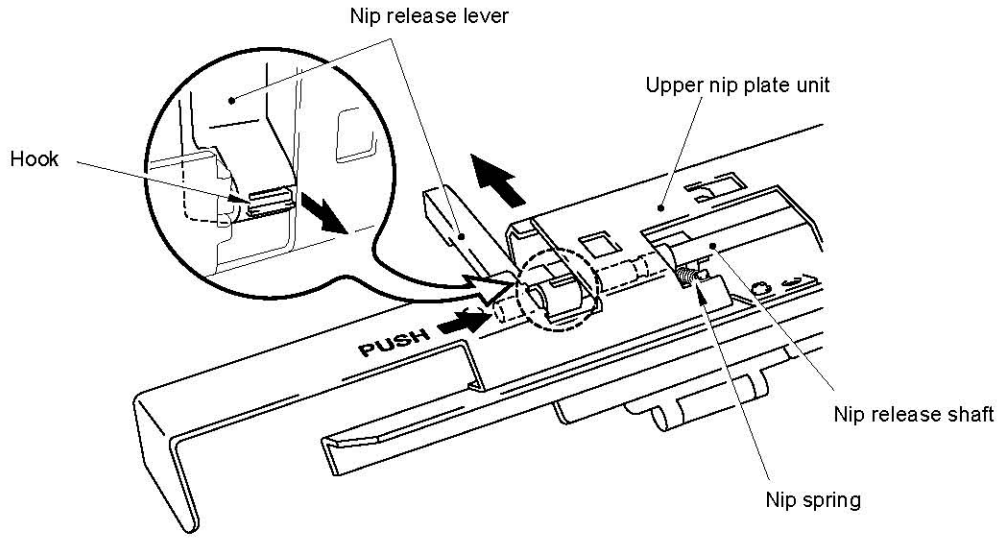


Fig. 4.76

(3) Slide the Nip release shaft horizontally and sequentially remove the four Nip release cams.

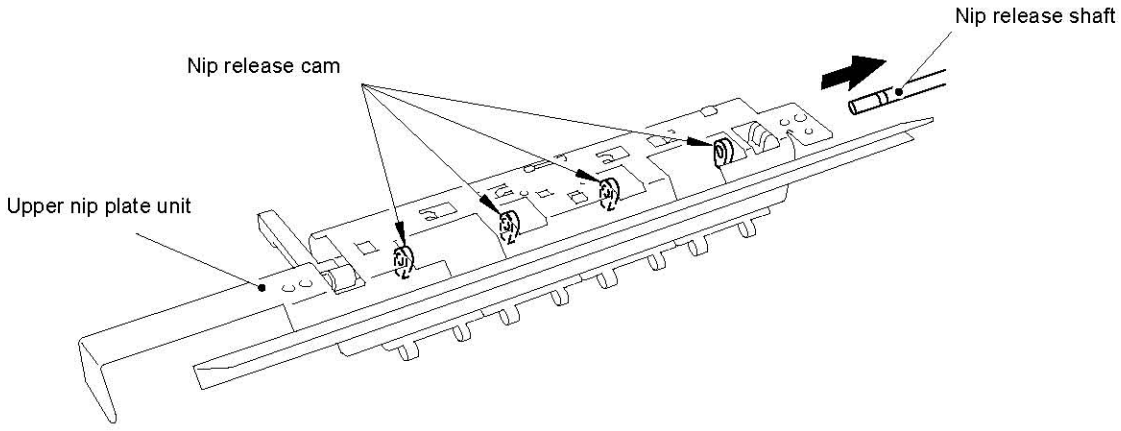


Fig. 4.77

<Reassembly>

(1) Insert the Nip release shaft with the D-cut portion face down onto the Nip release cam.
(2) Push the Nip release shaft until the hook is securely located in the groove on the shaft.
(3) Fit the springs

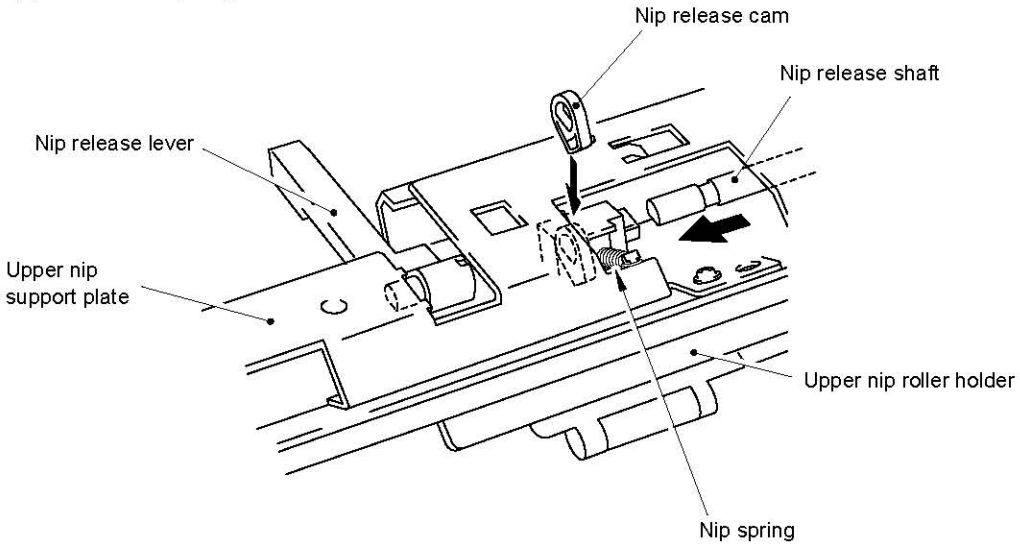


Fig. 4.78

Note: Locate the correct springs onto the correct positions of the Nip springs. See below.

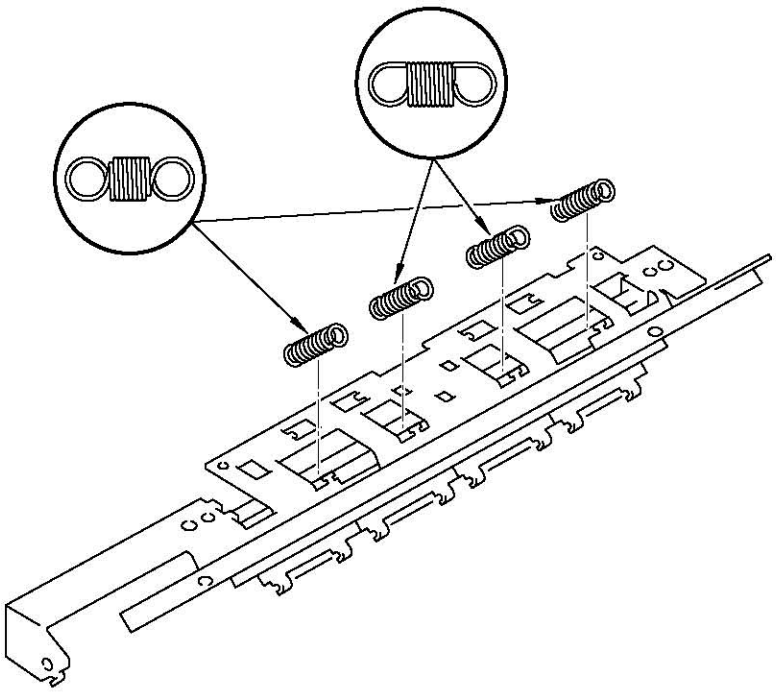


Fig. 4.79

4.22.4 Upper Nip Roller ASSY

<Disassembly>

(1) Remove the Upper nip roller ASSY from the Upper nip roller holder.

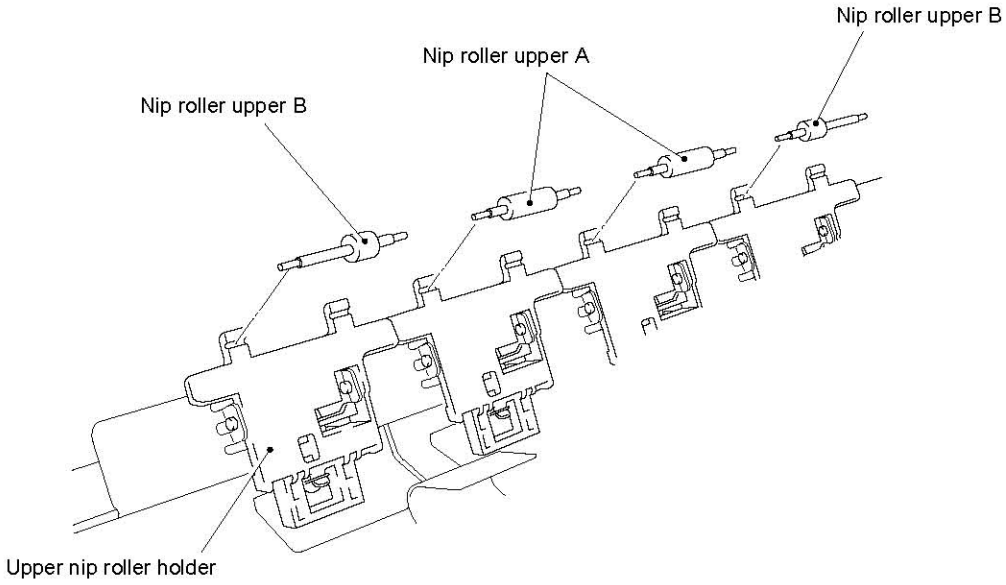


Fig. 4.80

Note: Ensure the Nip roller upper B is correctly located.

4.22.5 MED Sensor PT380 ASSY

<Disassembly>

(1) Cut the cable tie and remove the core from the bottom of the Main frame ASSY.

(2) Slide the Upper sensor holder after releasing the hook.

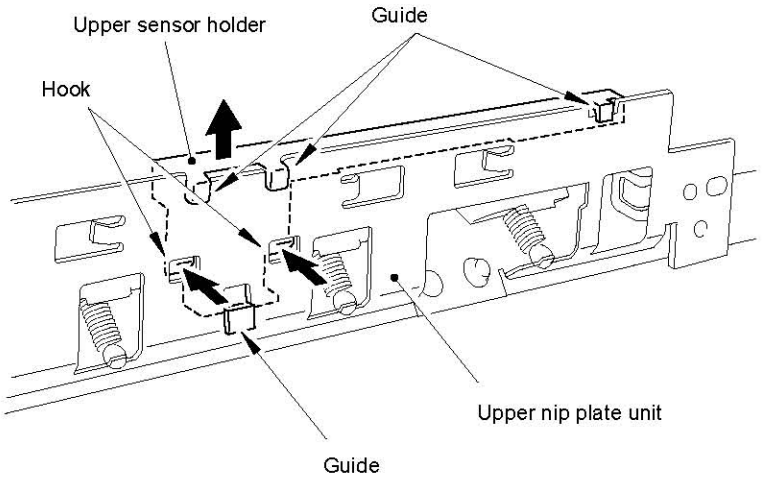


Fig. 4.81

(2) Remove the MED sensor PT380 ASSY by releasing the hook of the Upper sensor holder.

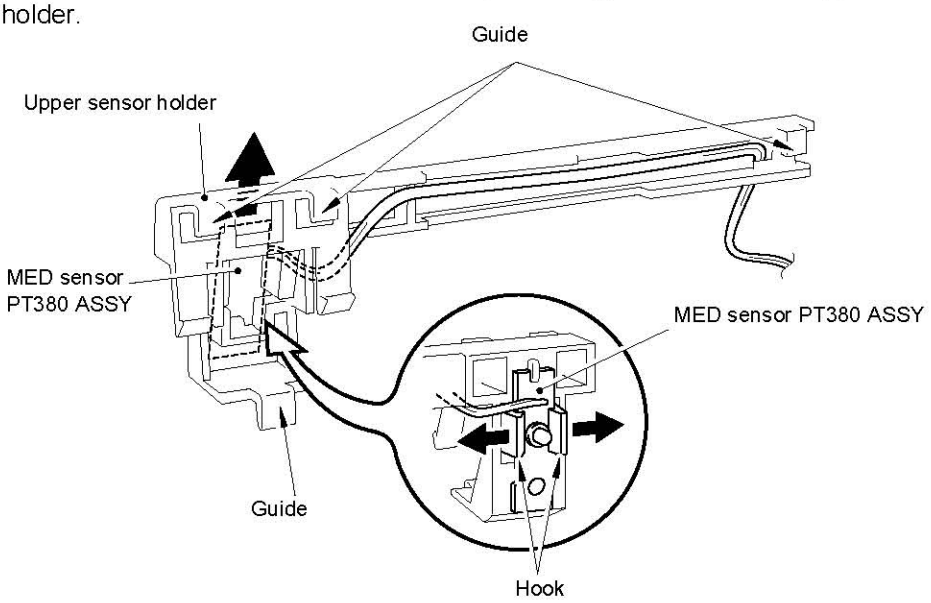


Fig. 4.82

<Reassembly>

(1) Position the MED sensor PT380 ASSY on the Upper sensor holder and secure it with the hook.

(2) Run the harness and put it in the groove.

(3) Slide and press the Upper sensor holder by putting it into the three hooks so that it is properly located onto the hooks. Hook the Upper sensor holder onto the Upper nip plate unit by matching the four guides (Refer to fig. 4.82) and then press it downwards.

(4) Put the harness into the hole of the Main frame ASSY and attach the core with a cable tie.

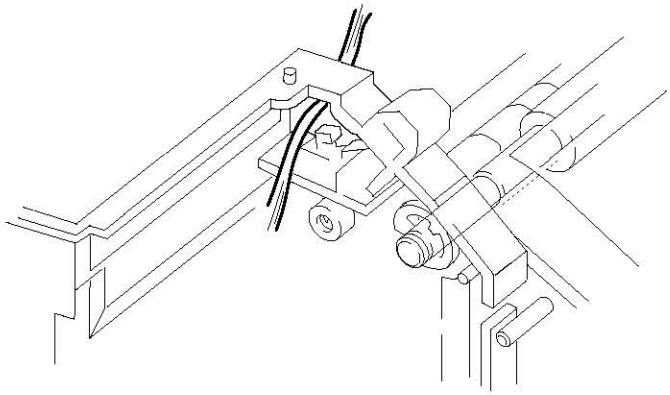


Fig. 4.83

4.23 Main Frame ASSY

4.23.1 DR Board Cover

<Disassembly>

Remove the DR board cover, which is located at the bottom of the Main frame ASSY, by releasing the two hooks.

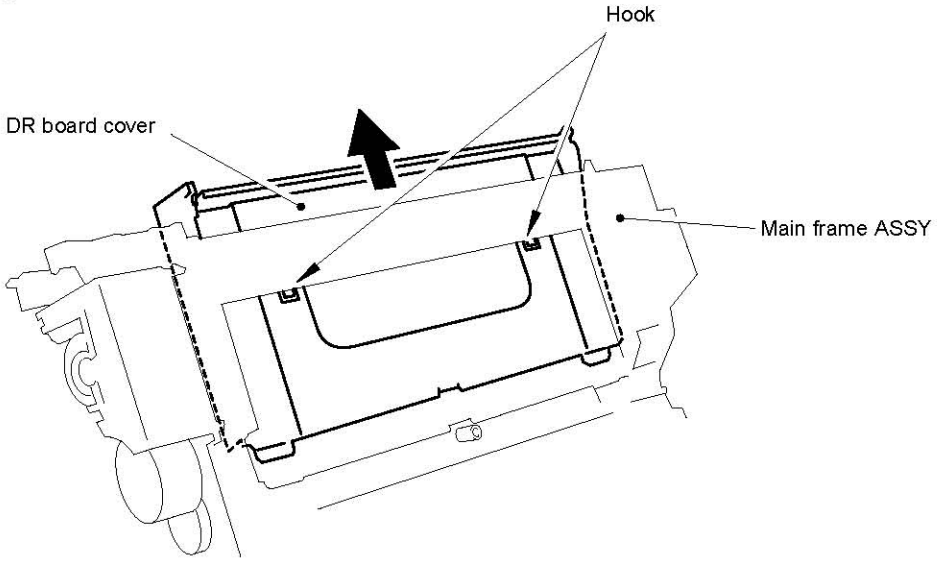


Fig. 4.84

4.23.2 Pressure Roller

<Disassembly>

(1) Remove the Pressure roller by releasing the two hooks on the Main frame ASSY.

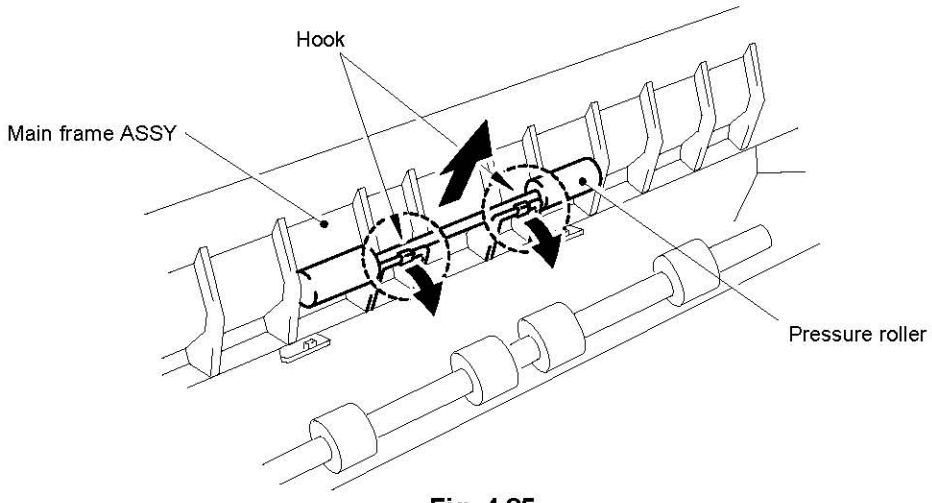


Fig. 4.85

<Reassembly>

(1) Put the two Pressure rollers into the Pressure roller shaft and secure it to the Main frame ASSY with the hook.

(2) Check that the Pressure rollers rotate smoothly.

4.23.3 Chute 1 ASSY

<Disassembly>

Caution: The Chute 1 ASSY is the thin metal part. Be careful with the sharp edge while handing it.

(1) Remove the screw on the left hand side and remove the Grounding plate spring and the Chute 1 ASSY.

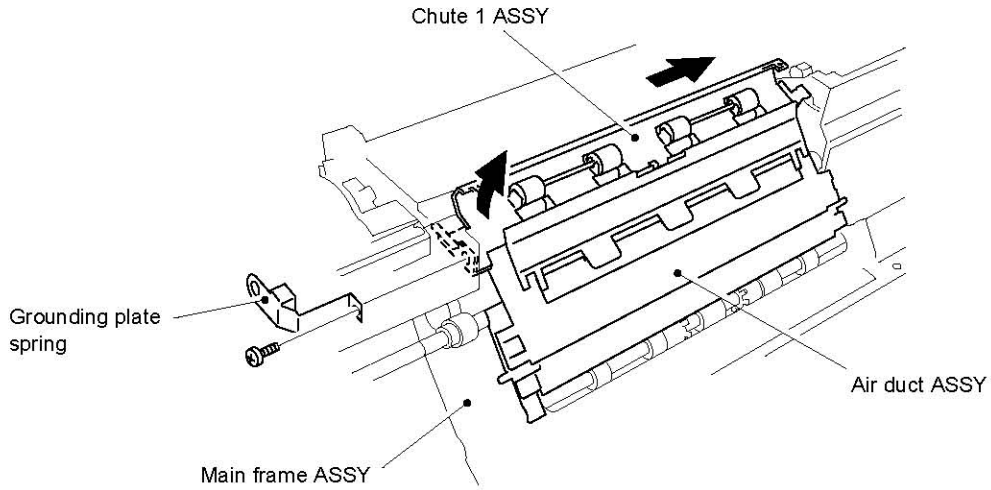


Fig. 4.86

4.23.4 Feed Roller H

<Disassembly>

(1) Remove the Retaining ring E and the PF shaft bearig.

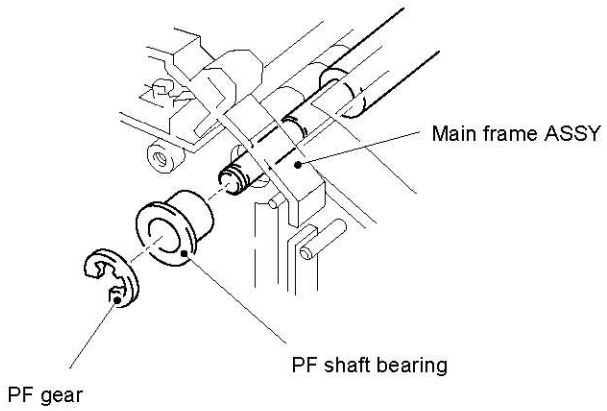


Fig. 4.87

(2) Slide the Feed roller H to the left hand side.

(3) Remove the PF gear by releasing the hook and remove the PF shaft bearin g.

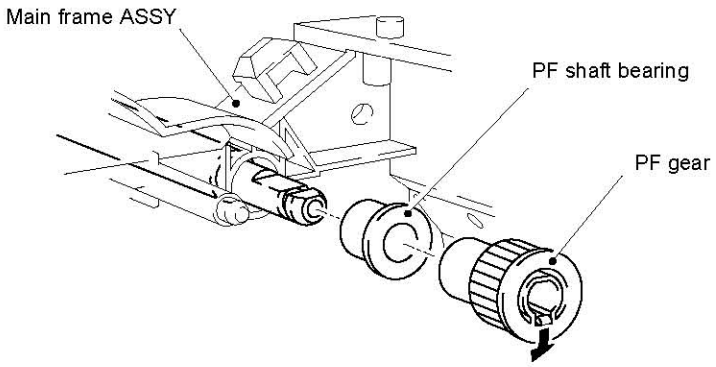


Fig. 4.88

(4) Slide the Feed roller H further more till the end of the shaft comes out from the hole of the Main frame ASSY.

(5) Lift the end of the Feed roller H and remove it.

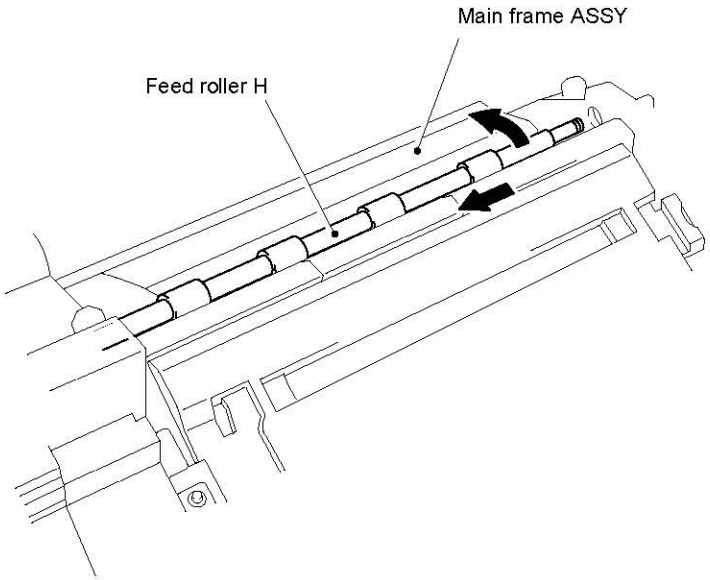


Fig. 4.89

4.23.5 Lower MED sensor (Photo diode side)

<Disassembly>

(1) Remove the Chute 1 ASSY. (See section 4.23.3)

(2) Remove the Lower sensor holder by releasing the four hooks from the rear of the Main frame ASSY.

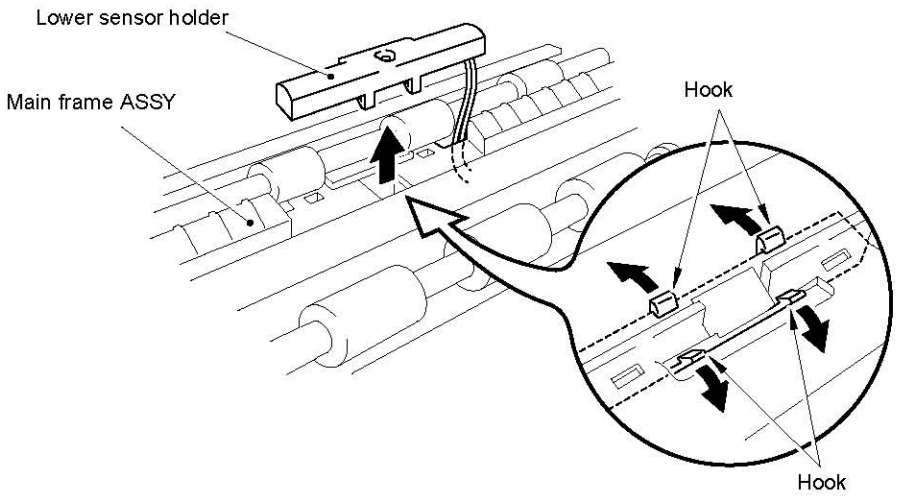


Fig. 4.90

(3) Remove the MED sensor GL 380 ASSY by releasing the hook from the Lower sensor holder.

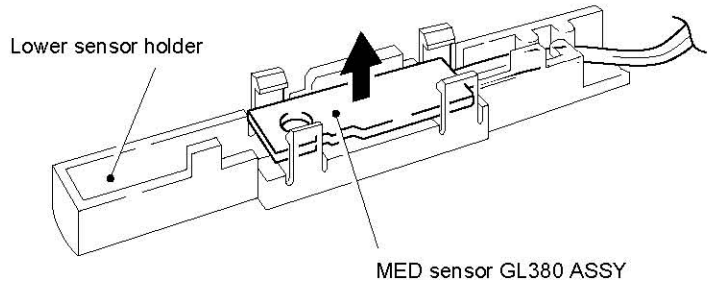


Fig. 4.91

<Reassembly>

Note: When reassembling, fit the MED sensor GL380 ASSY in the Lower sensor holder by matching the lower rib with the notch of the MED sensor GL380 ASSY. Ensure the harness is in the groove on the MED sensor GL380 ASSY of the Lower sensor holder. Carefully run the harness through the hole in the Main frame ASSY and secure it to the Main frame ASSY with the hook so that it is not caught in the Main frame ASSY. Check that the Lower sensor holder is securely fitted to the Main frame ASSY.

4.24 Carriage ASSY

<Disassembly>

(1) Remove the Oil holder cover and the Oil holder from the Carriage ASSY.

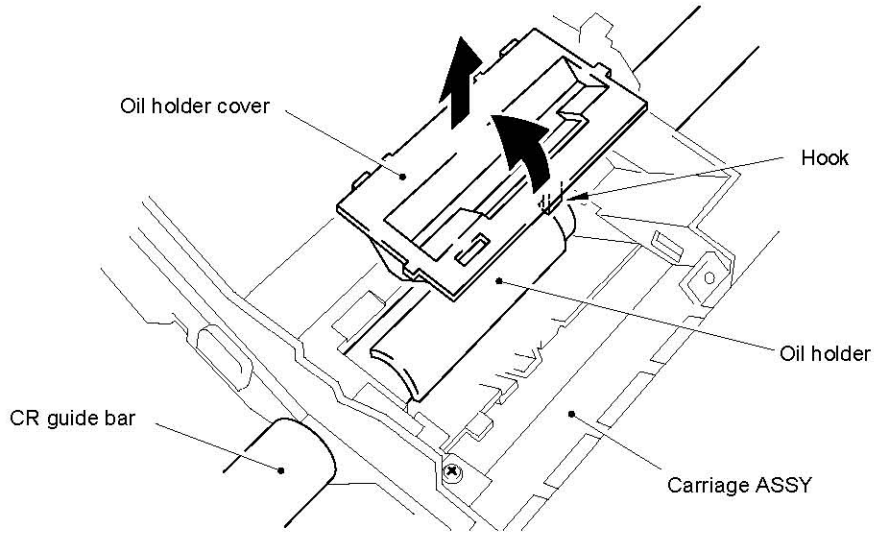


Fig. 4.92

(2) Push the latch hook on the right hand side towards the right and remove the FFC pressure bottom downwards.

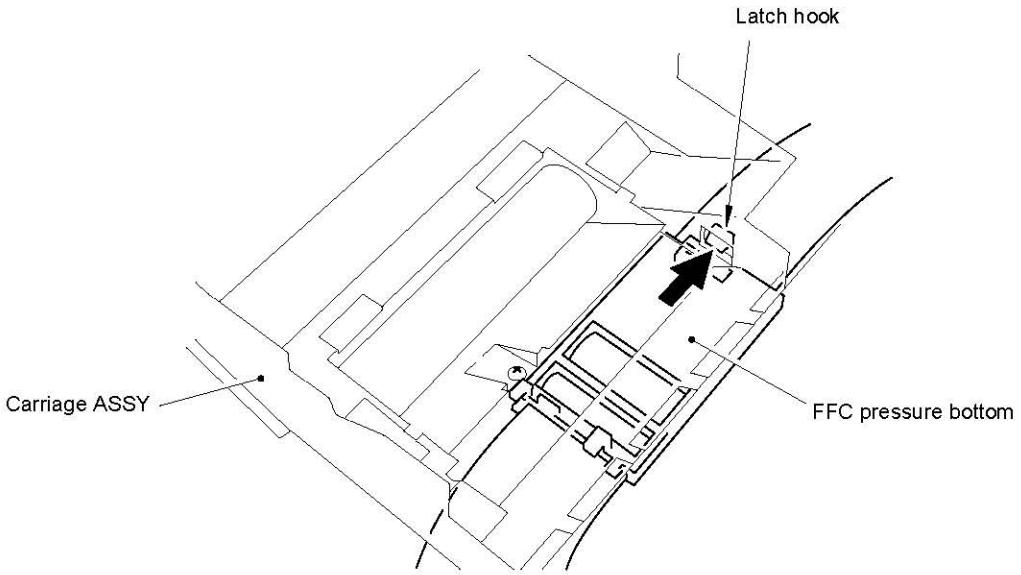


Fig. 4.93

(5) Remove the screw, then remove the CR guide bar earth plate R.

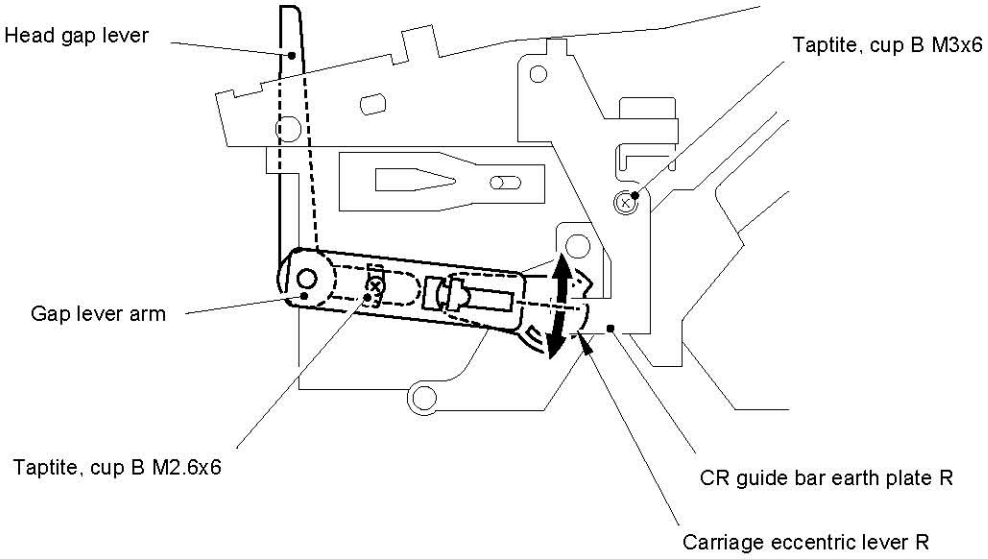


Fig. 4.94

(6) Remove the screw and Guide lever arm.
(7) Remove the Stop ring.
Rotate the Carriage eccentric lever R until the key matches the hole shape to remove it.

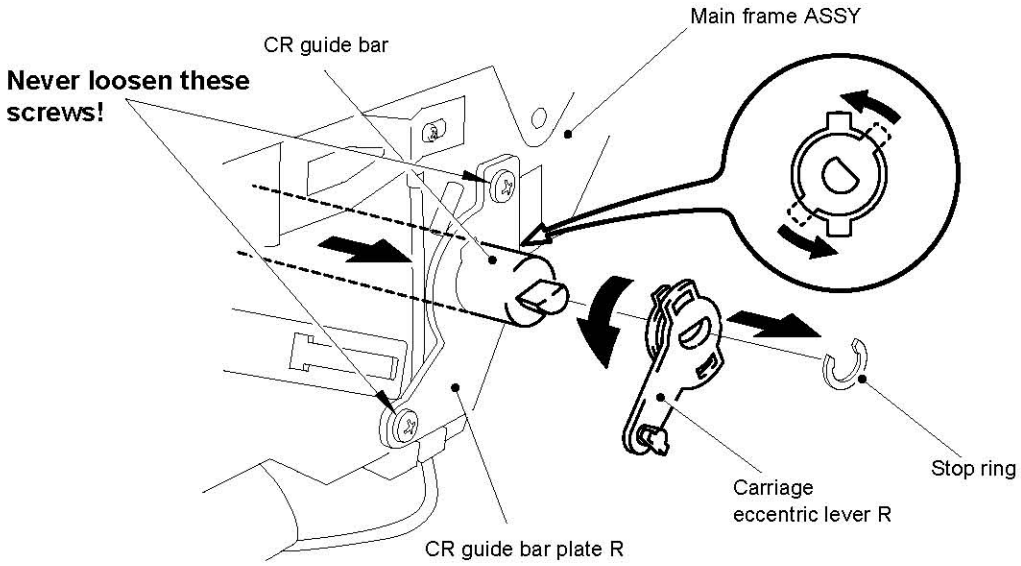


Fig. 4.95

Caution: *The position of the Guide bar plate is not adjustable. The position of the Guide bar plate R and the Guide bar plate L, which is located on the left hand side of the Main frame ASSY, is severely adjusted and secured with those screws at the factory site to have parallelism between the CR guide bar and the PA roller.*

(8) Pull out the CR guide bar from the hole in the right hand side of the Main frame ASSY.

(9) Remove the screw A and loosen the screw from the CR idle pulley holder ASSY through the hole on the right front side of the Main frame ASSY.
Push the CR idle pulley holder ASSY toward the Carriage motor and remove the Timing belt from the pulley of the Carriage motor. Then remove the Carriage ASSY.

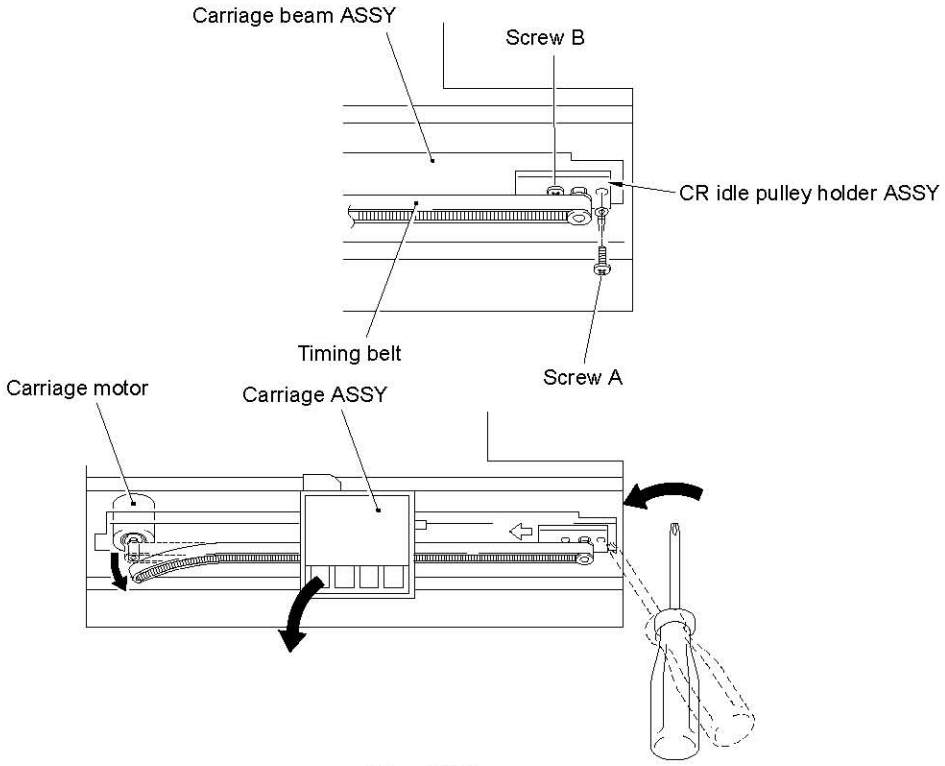


Fig. 4.96

Note: Using a screwdriver may help to push the CR idle pulley.

(10) Remove the screw and the Belt fixing plate. The Carriage ASSY and Timing belt are disengaged.

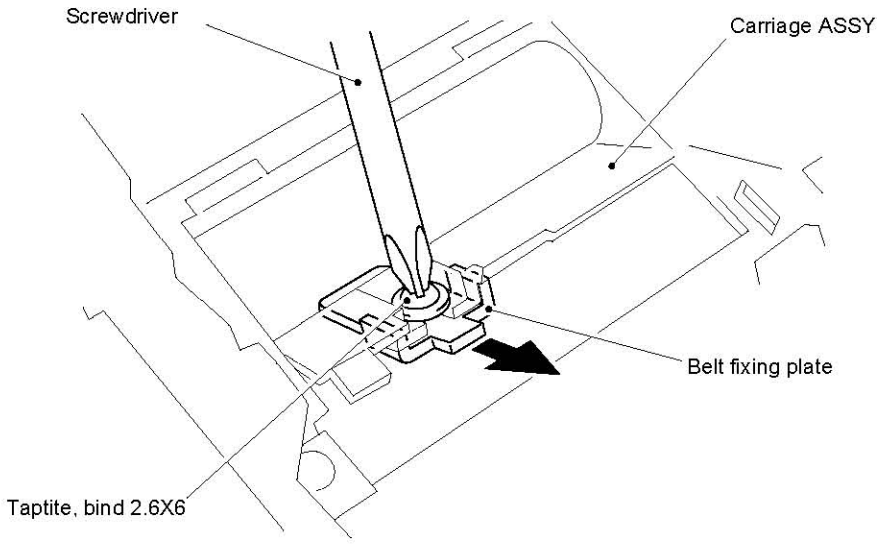


Fig. 4.97

(11) Remove the screws and the Encoder strip guide at the top of the Carriage ASSY. Remove the screw and the Encoder PCB ASSY.

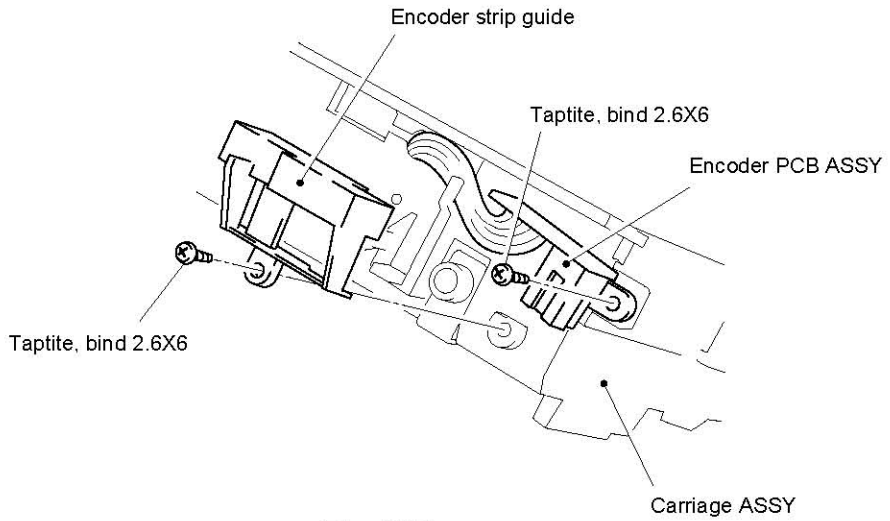


Fig. 4.98

(12) Release the two hooks and remove the PWS cover on the right of the Carriage ASSY. Remove the screw and remove the Paper width sensor ASSY.

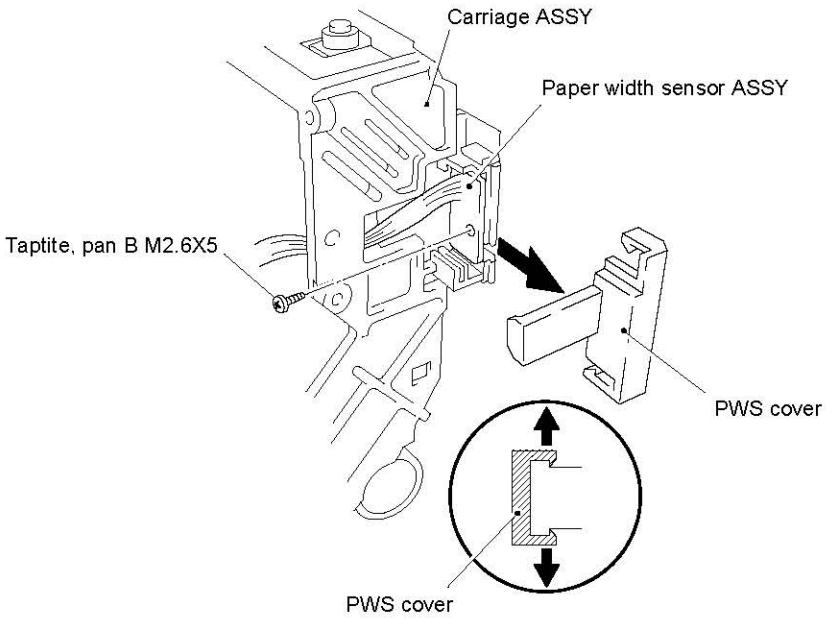


Fig. 4.99

<Reassembly>

Note 1: When reassembling the Paper width sensor ASSY on the Carriage ASSY, push it in the direction A and B. Make sure that the line C and the line D are aligned. When tightening the screw, securely hold the PCB so that it does not move.

< View from the bottom of the Carriage ASSY >

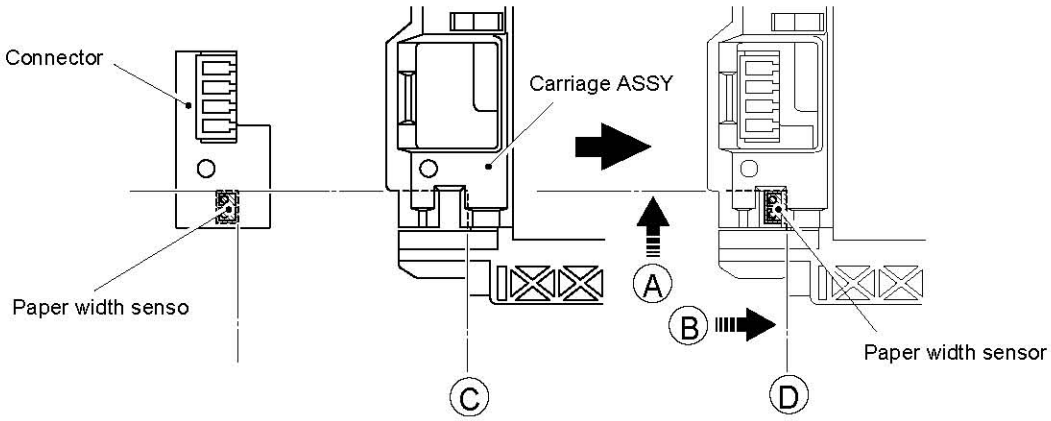


Fig. 4.100

Note 2: When remounting the Carriage ASSY on to the Main frame ASSY, insert the rib (A) under the CR guide plate. Make sure that the CR guide plate is held by the rib and the CR sub upper guide.

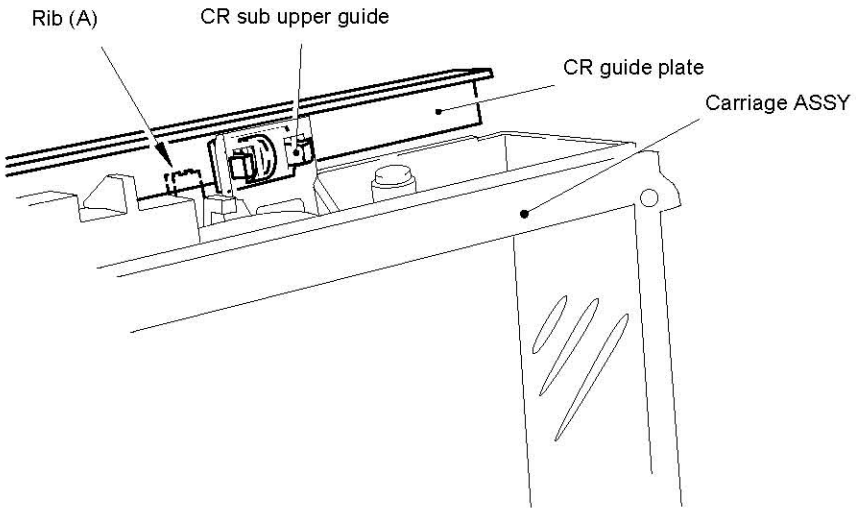


Fig. 4.101

Note 3: For running of the sensor harness, refer to fig. 4.44.

4.25 FFC Cable

<Disassembly>

(1) Remove the FFC cable cap by releasing the hook from the bottom of from the Main frame ASSY.

(2) Remove the FFC cable from the hook on the Main frame ASSY.

(3) Remove the FFC cable from the FFC pressure bottom.

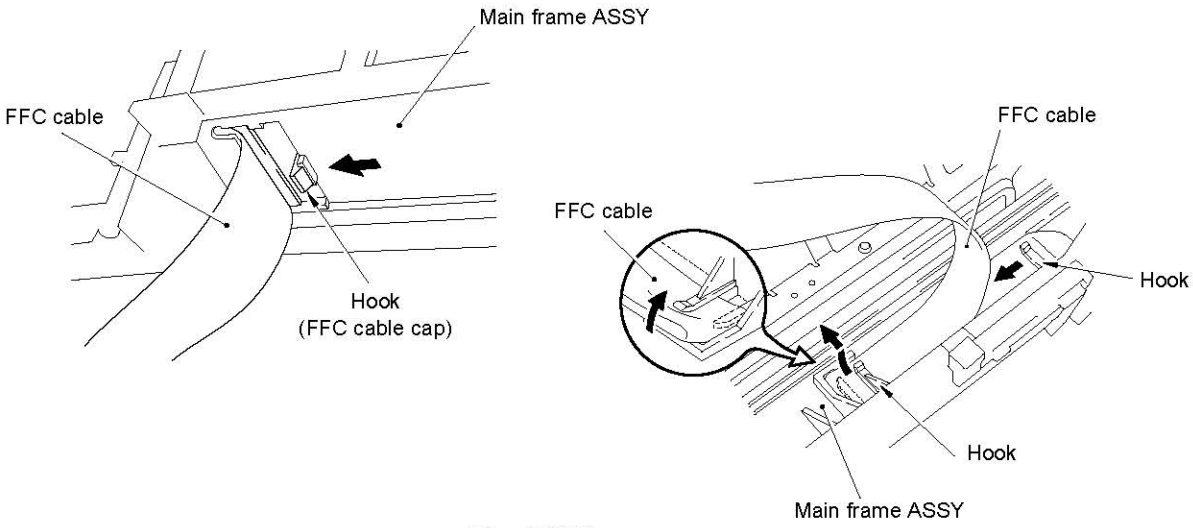


Fig. 4.102

<Reassembly>

Note 1: During reassembly, attach the FFC cable to the FFC pressure bottom. For details of the mounting dimensions, see below.

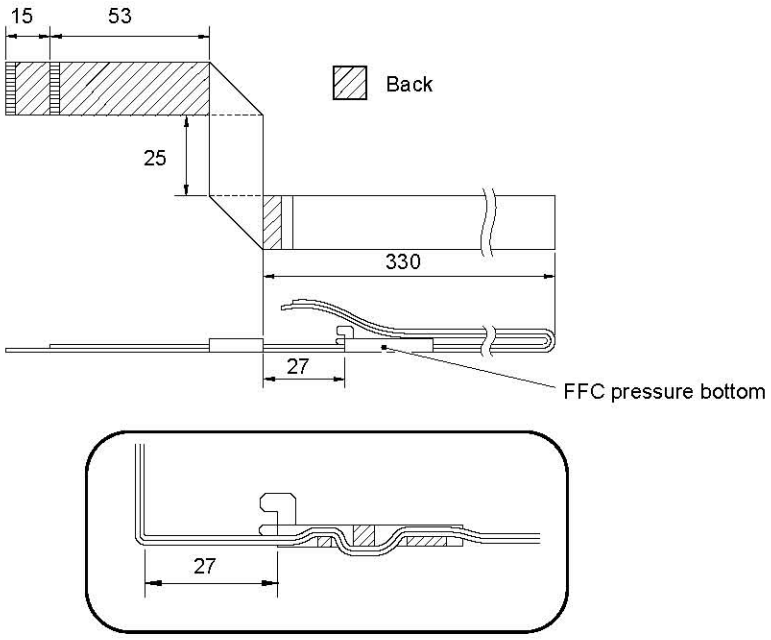


Fig. 4.103

Note 2: When connecting the FFC cable to the Carriage ASSY, check that the FFC cable is folded as below.

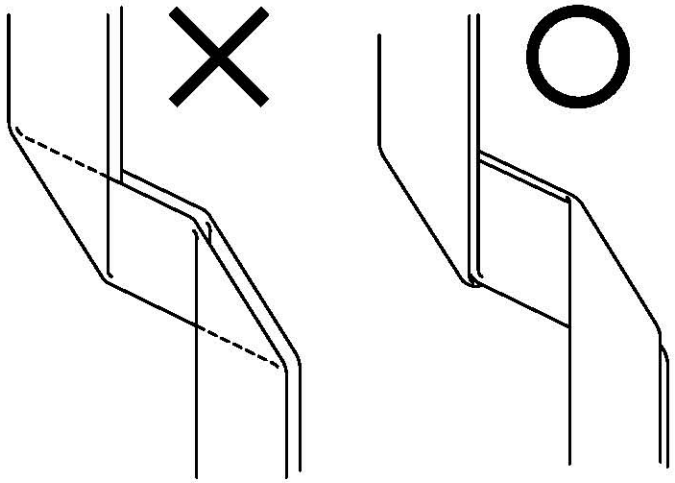


Fig. 4.104

Note 3: When connecting the FFC cable to the Carriage ASSY, check that the FFC cable is secured by the two hooks on the left hand end of the Carriage ASSY as shown below.

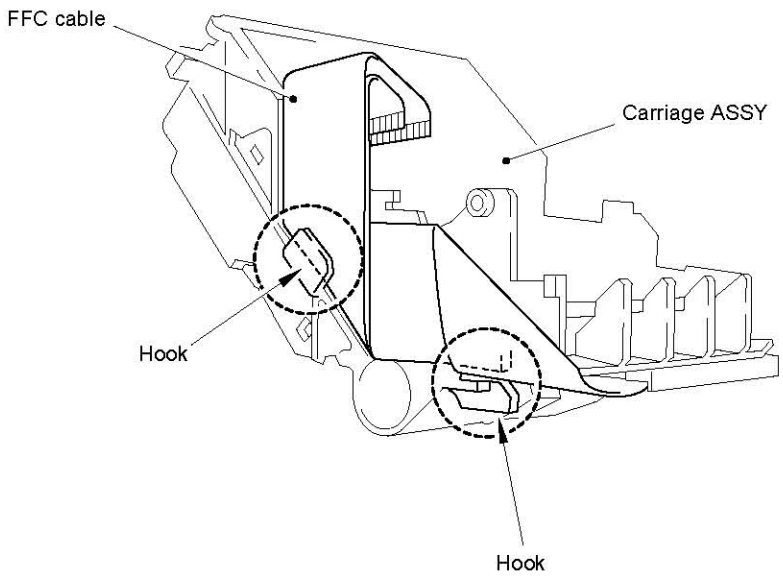


Fig. 4.105

4.26 CR Beam ASSY

<Disassembly>

(1) Remove the Shield plate CRM.
(2) Remove the five screws and carefully remove the Carriage beam ASSY so that the motor harness is not caught in the Main frame ASSY.

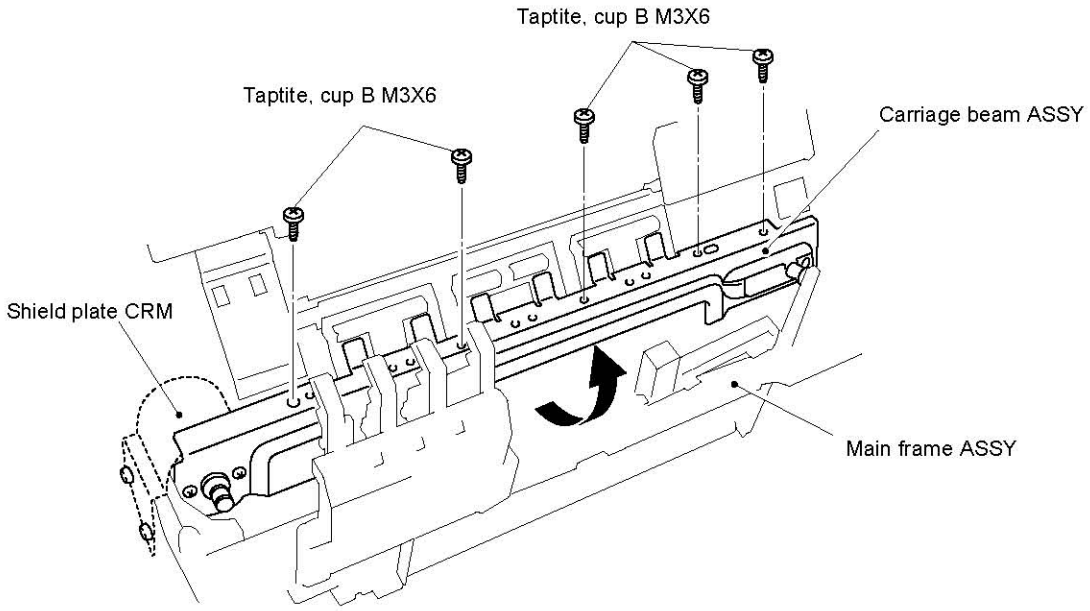


Fig. 4.106

(3) Remove the two screws on the left hand of the Carriage beam ASSY and remove the Carriage motor ASSY.

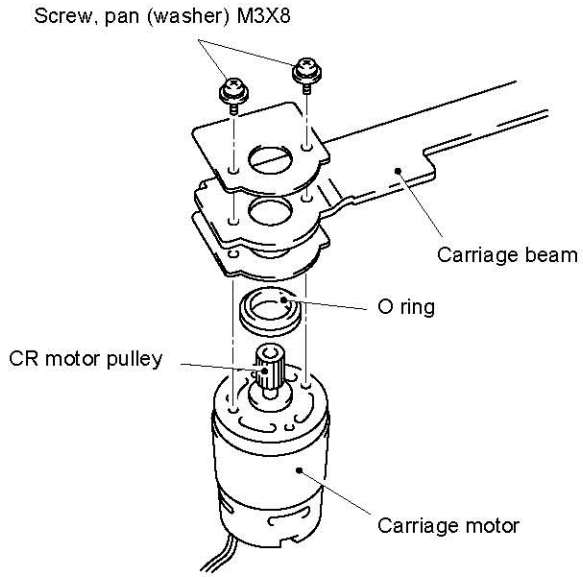


Fig. 4.107

<Reassembly>

Note: During reassembly, make sure that that the O ring is placed in position.

4.27 Lower Nip Holder ASSY

<Disassembly>

Caution: The Lower nip roller spring B is the thin metal part. Be careful with the sharp edge.

(1) Remove all of the Lower nip roller spring and the Lower nip holder ASSY A, B and C.

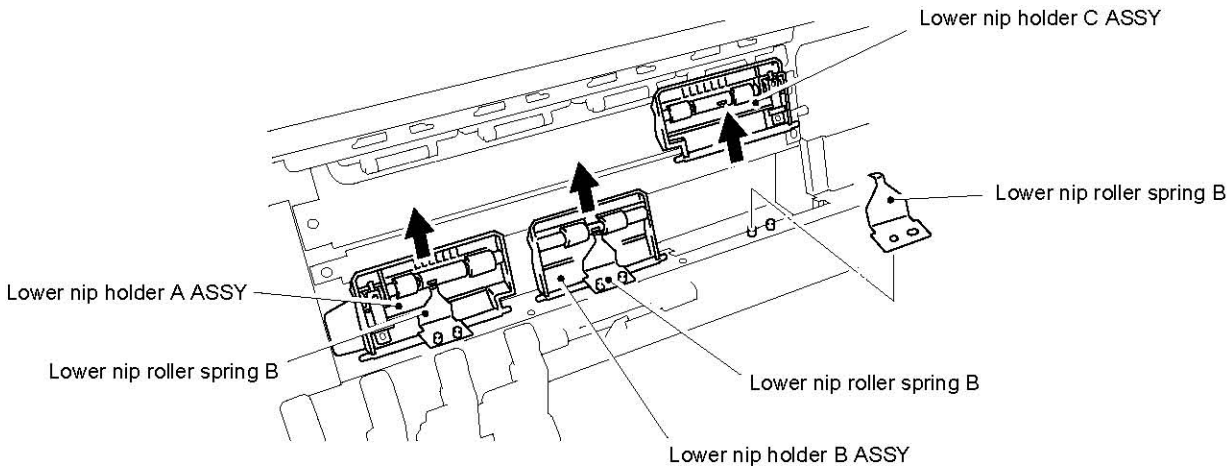


Fig. 4.108

4.28 Air Duct ASSY

4.28.1 Air duct ASSY

<Disassembly>

(1) Cut the cable ties for the core on the Pre-heater harness, the Main heater harness and the Q-platen thermistor harness from the bottom of the Main frame ASSY. Then remove all the core.

(2) Lift the Air duct ASSY and the Platen grounding spring upwards while carefully observing the harness.

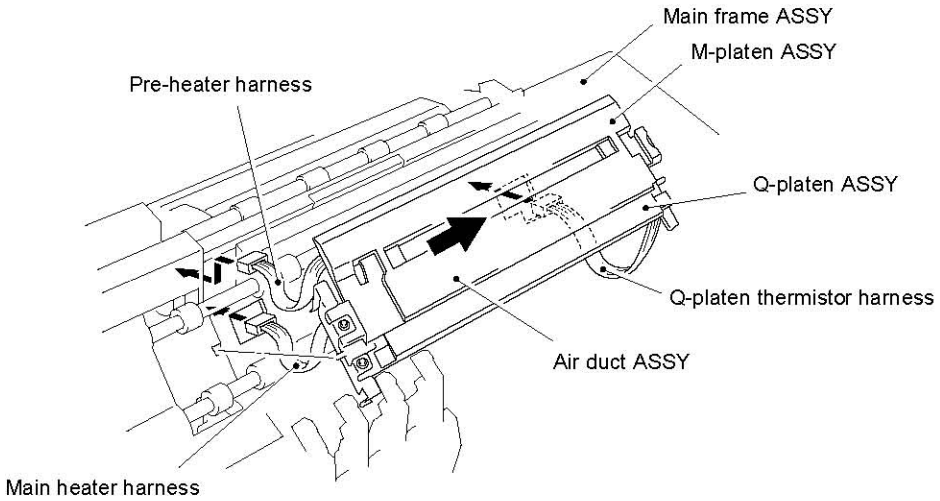


Fig. 4.109

(3) Remove the two screw and the Q-platen ASSY.

(4) Remove the two screw and the M-platen ASSY.

<Reassembly>

Note: During reassembly, carefully run the Pre-heater ASSY, the Main heater ASSY and the Q-platen ASSY through the holes in the Main frame ASSY so that they are not caught in the Main frame ASSY. Fit the Air duct ASSY so that it is correctly positioned on the bearings of the PA roller ASSY. The Platen ground spring is in contact with the bearing.

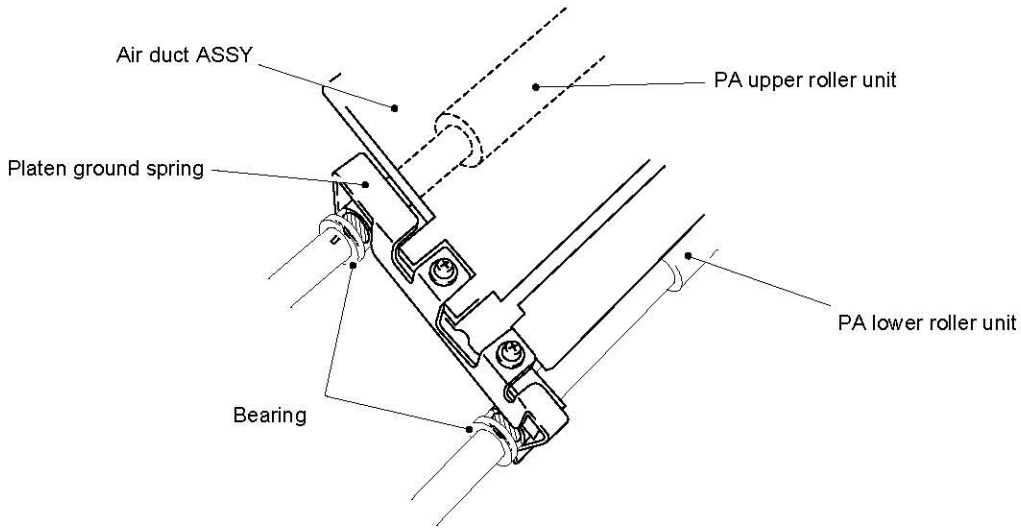


Fig. 4.110

4.29 Upper PA Roller ASSY

<Disassembly>

(1) Remove the Retaining external 31 ring and the Bearing A from the Main frame ASSY.

(2) Remove the Bearing A and then remove the Upper PA roller.

(3) Remove the PA roller.

4.30 Lower PA Roller ASSY

<Disassembly>

(1) Release the hook of the Maintenance gear and then remove the Lower PA roller ASSY from the Main frame ASSY while pushing the Paper empty actuator.

(2) Remove the Bearing A and then the Rower PA roller.

(3) Remove the PA roller gear plate.

(4) Remove both the Upper and Lower PA rollers.

<Reassembly>

Note: After reassembling the Upper and Lower PA roller ASSY on the Main frame ASSY, check that they rotate smoothly.
Be sure to fit the projection of the Bearing A into the groove in the Main frame ASSY.

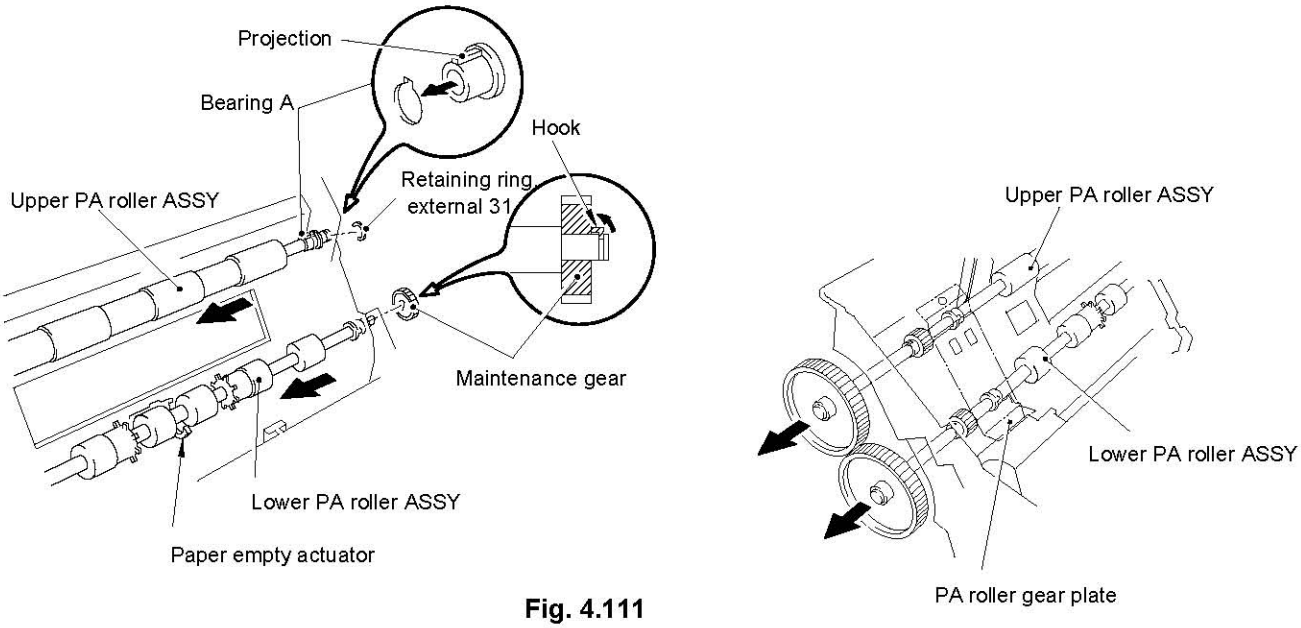


Fig. 4.111

5. ADJUSTMENT

5.1 Head Gap

When the Print head or other head related parts such as the Upper Nip Plate Unit is replaced, the following adjustment is required.

(1) Move the Carriage to the center of the Main frame and remove the Encoder strip.
(2) Set the Gap lever to the 'Regular' position and check the Head gap. If the Print head is replaced, conduct Head Drive Voltage Adjustment (See section 5.3). If the Head gap is not correct, loosen the screw securing the Gap lever arm.

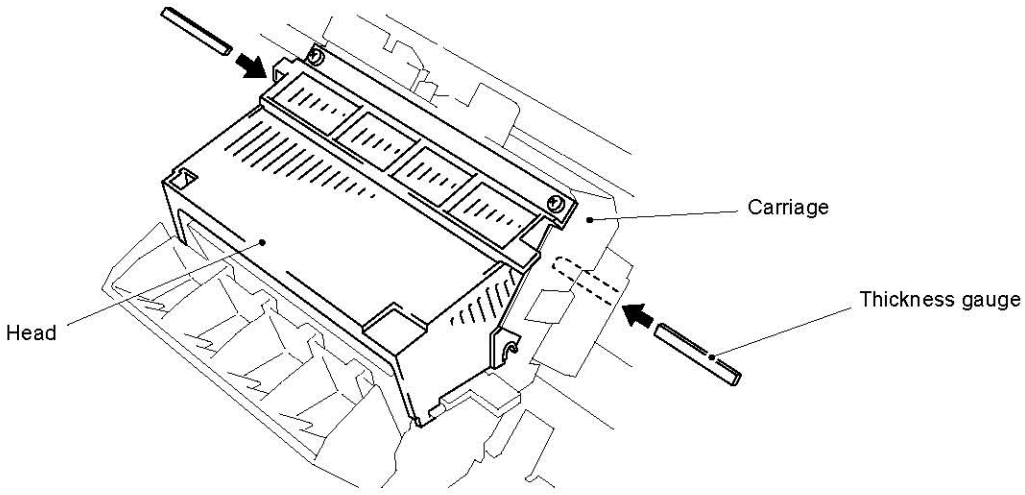


Fig. 5.1

(3) Insert the thickness gauge between the Print head and the Platen.
(4) Check that the head gap is 1.0 mm between the head nozzle plate of the Black and Yellow heads and platen.
(5) Make sure that a 1.2 mm gauge will not fit into the gap.

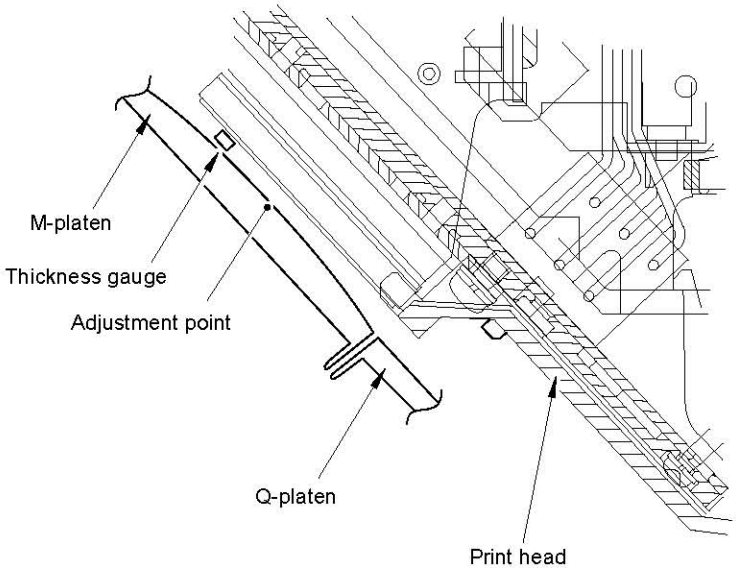


Fig. 5.2

Note: The M-platen has a convex shape so that the head gap must be checked at the center.

(6) Tighten the screw to secure the Gap lever arm.

5.2 Head Gap and Parallel Alignment

When the head gap cannot be adjusted by using the thickness gauges, it may require the following adjustment.

(1) Mount the Head gap gauges onto the master gauge.
Make sure the dial gauges indicate "0".

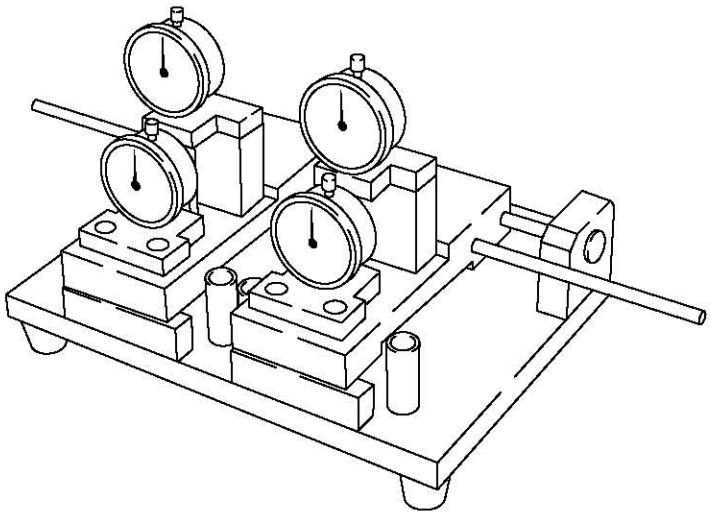


Fig. 5.3

(2) Remove the Encoder strip from the Main frame. (Refer to section 4.10 Encoder Strip in this chapter.)
(3) Set the Gap lever to the 'Regular' position and move the Carriage to the center of the Main frame.
(4) Fit the Head gap gauges so they are positioned from the CR guide bar to the CR guide plate. Make sure the bars of the Head gap gauge touch inside of the Main frame.

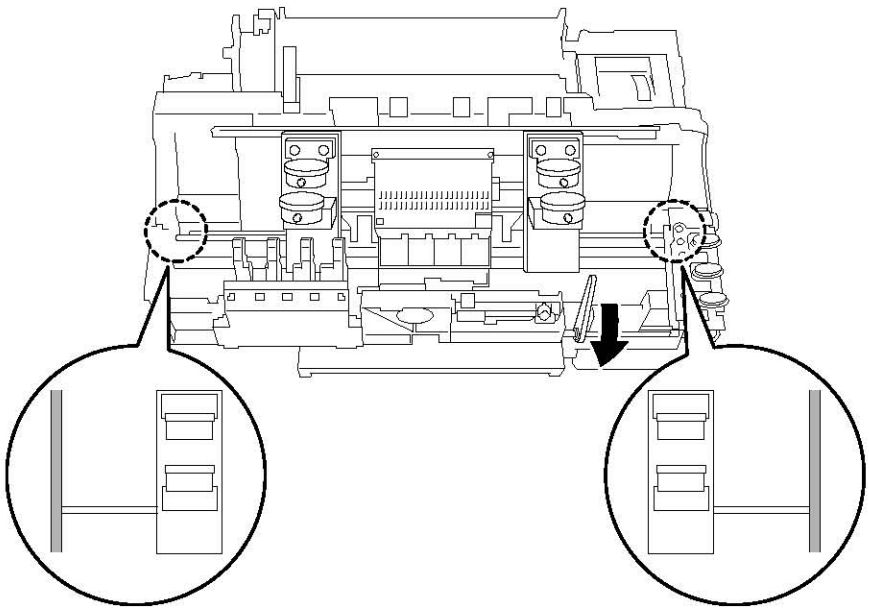


Fig. 5.4

(5) Loosen the screw securing the CR guide plate.

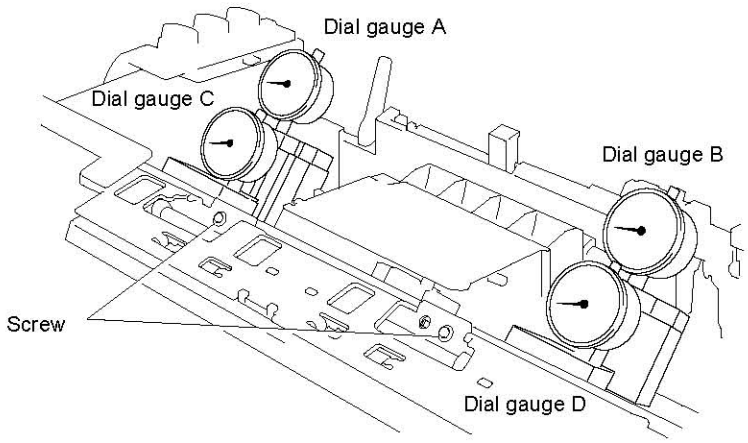


Fig. 5.5

(6) Adjust the parallelism between the CR guide plate and the Platen by using a special wrench. Tighten the screws to secure the CR guide plate. The dial gauge A and B should read around “30”. Secure the screw for the CR guide plate.

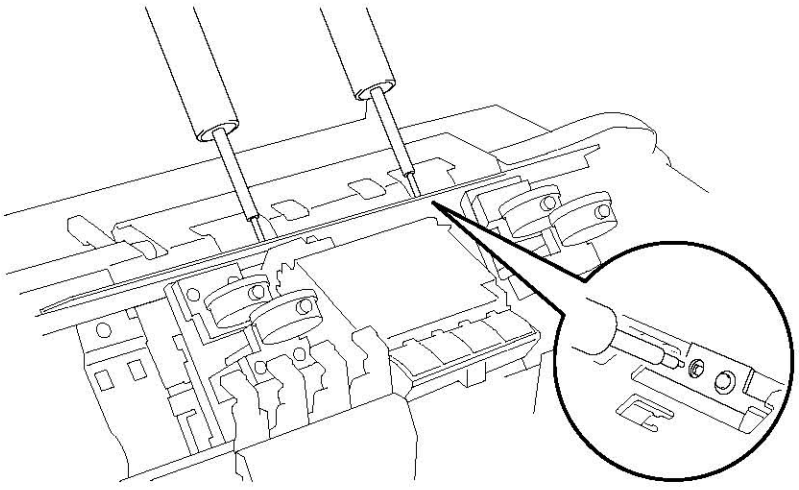


Fig. 5.6

(7) Adjust the Gap lever arm angle against the Carriage eccentric bearing R.
The dial gauge A and C should read around “30” and if the accuracy in the table below is achieved, secure the screw for the Gap lever arm. If not, return to (6) of 5.2 Head Gap and Parallel Adjustment in order to re-adjust the parallelism between the CR guide and the Platen. The dial gauge A, B, C and D should read a value in the range from "10" to "50". Then adjust again the Gap lever arm angle against the Carriage eccentric bearing R so that the accuracy shown in the table below can be achieved.

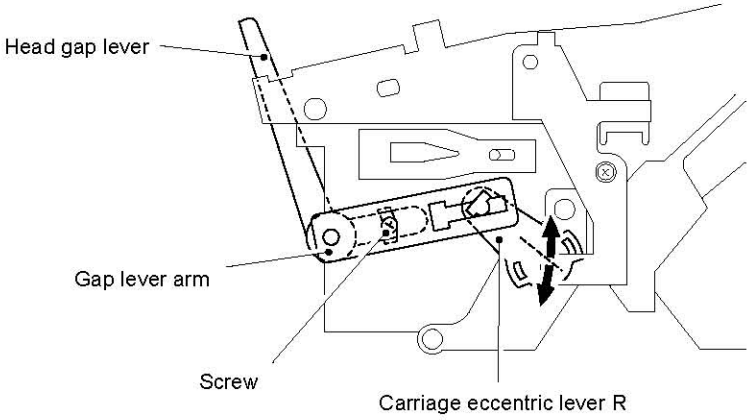


Fig. 5.7

Required Accuracy

Dial gauges	Difference between the gauges
Gauge A and gauge B	Up to 0.04 mm
Gauge A and gauge C	Up to 0.04 mm
Gauge B and gauge D	Up to 0.04 mm

(8) Move the Carriage to the center of the Main frame and insert the thickness gauges between the Print head and the Platen. Check the gap is in the range from “1.0” to “1.2”. If the gap is not in that range, return to (6) of 5.2 Head Gap and Parallel Adjustment and re-adjust the parallelism between the CR guide plate and the Platen. The dial gauge A and B should read in the range from “10” to “50”. Then proceed to (7) in order to adjust again the Gap lever angle to achieve the accuracy shown in the above table.

5.3 Head Drive Voltage Adjustment

When the Print head or the Power supply PCB ASSY is replaced, the following adjustment is required.

(1) Go to the Head voltage adjustment in the Test 2 Mode. (Refer to Chapter 4, section 3.2.5 Test 2 Mode.)
(2) Connect a Voltage meter to the connector on the Driver PCB ASSY.

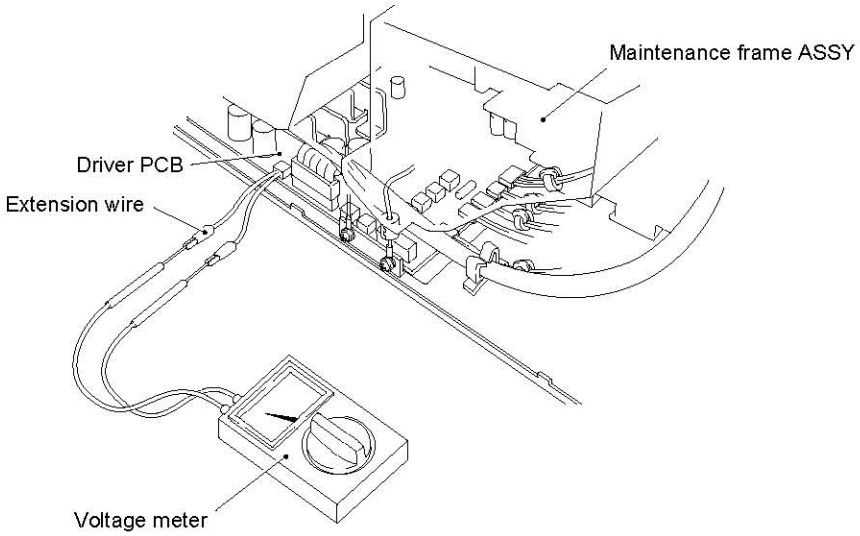


Fig. 5.8

(3) Adjust the head drive voltage to be adjusted by the variable resistors on the Power supply PCB ASSY. Adjust the voltage for 600 dpi first and then 300 dpi as the voltage for 300 dpi is made by adding a voltage onto the 600 dpi voltage.

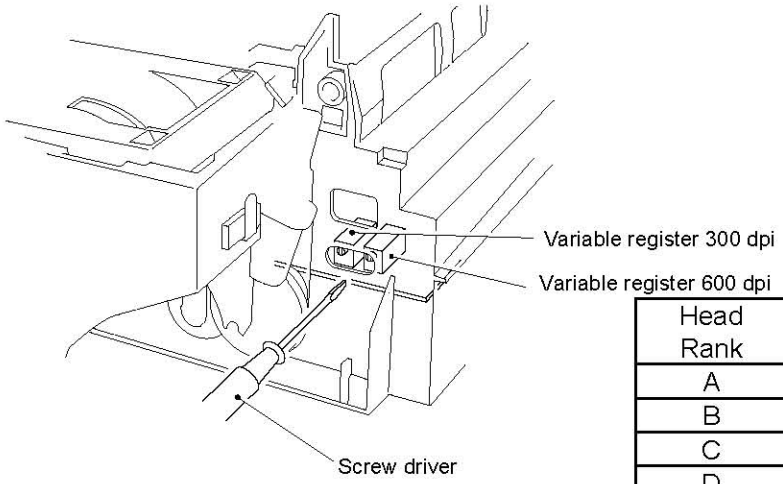


Fig. 5.9

Head Rank	600 dpi	300 dpi
A	35.9 V	41.8 V
B	34.6 V	40.5 V
C	33.4 V	39.2 V
D	32.2 V	37.9 V
E	31.0 V	36.6 V
F	29.7 V	35.3 V
G	28.5 V	34.0 V

5.4 Offset, TOF and LF Adjustment

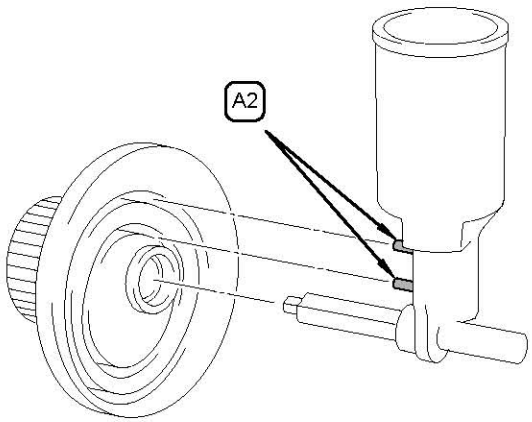
When the Print head or the Main PCB ASSY is replaced, adjust the Offset, TOF, LF and nozzle alignment by using the support tool provided separately.

6. LUBRICATION

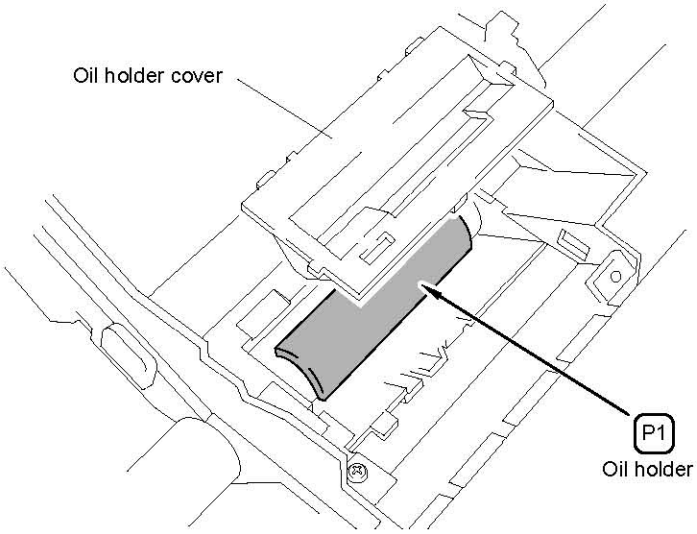
Apply the following lubricants to the lubrication points as illustrated below.

	Lubricant amount				
Lubricant type (Manufacturer)	Half of a rice-sized pinch of grease (3 mm^3)	Rice-sized pinch of grease (6 mm^3)	Bean-sized pinch of grease (12 mm^3)	0.6 - 1.0 g	Evenly
Molykote EM-30L (Dow Corming)	----------	EM1	----------	----------	----------
Synteso Pro AA2 PE3302-A00D0 (NOK)	----------	----------	A2	----------	----------
Floil 946P (Kanto Kasei)	----------	----------	----------	P1	P2
Floil GE334C (Kanto Kasei)	----------	----------	GE2	----------	----------
KS-64F (Shinetsu Silicone)	----------	KS1	----------	----------	----------

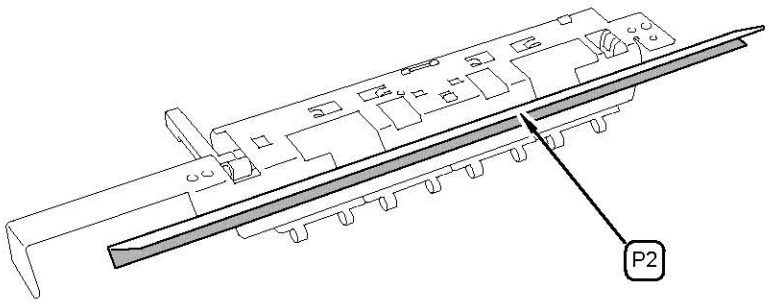
[1] Cylinder ASSY

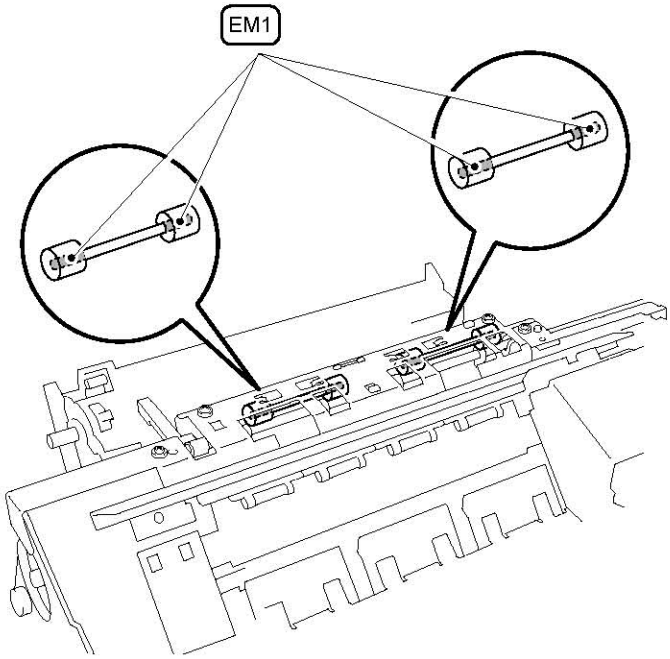


[2] Carriage ASSY

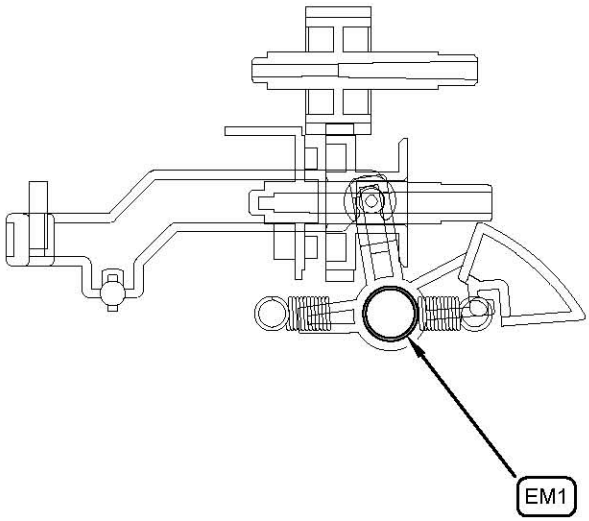


[3] Upper Nip Plate Unit

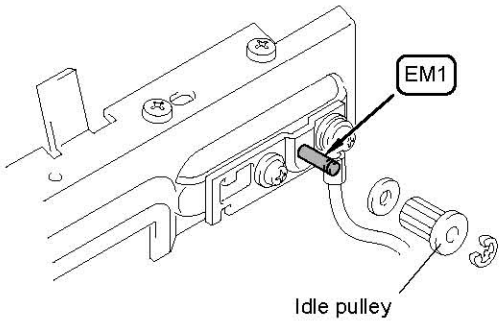




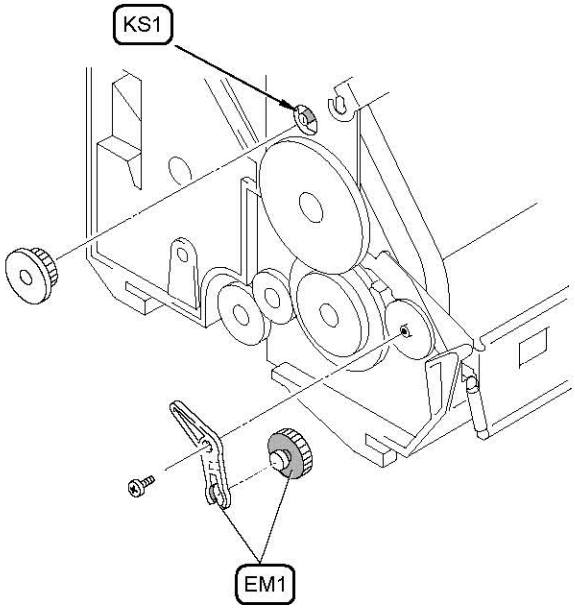
[4] Changeover Lever



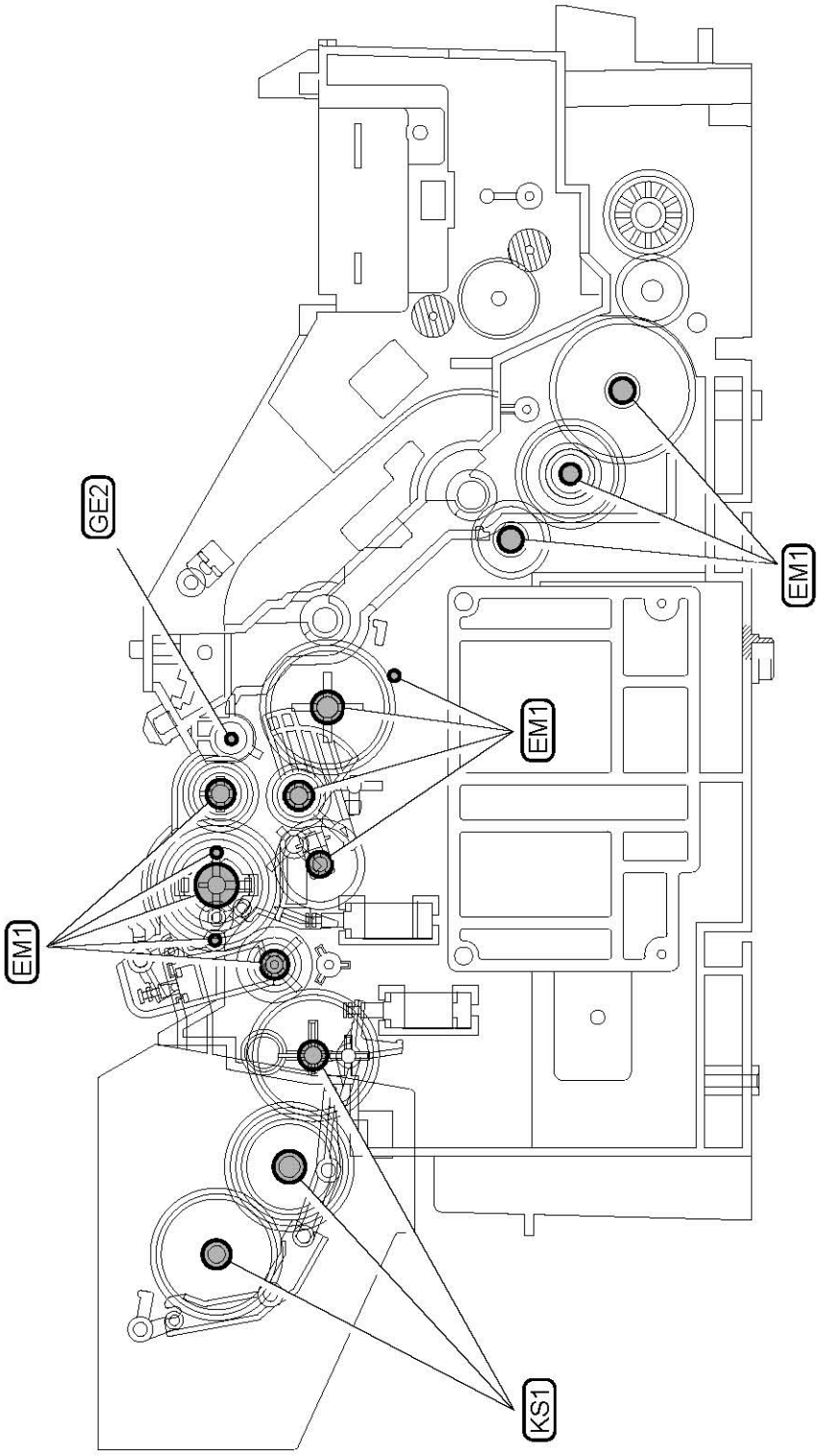
[5] CR Beam ASSY



[6] Maintenance frame ASSY



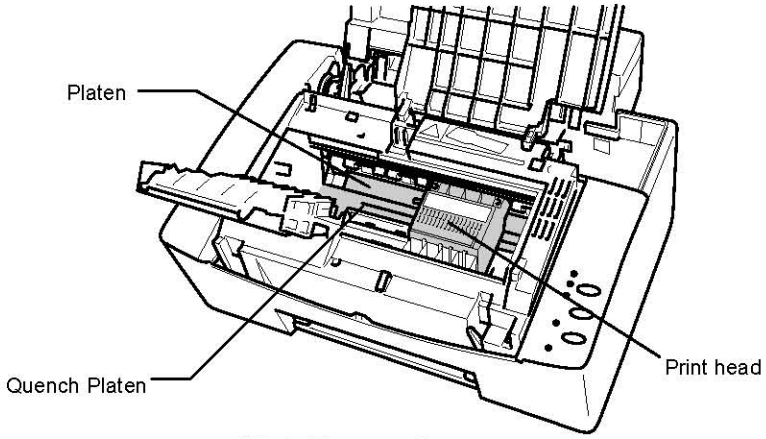
[7] Gear Train



7. CLEANING THE PRINTER

Warning

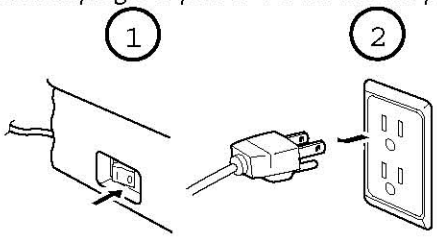
After you have just used the printer, some internal parts of the printer are extremely hot. Do not open the inside cover unnecessarily and never touch the shaded parts (Quench Platen, Platen, and Print head) shown in the following illustration.



High Temperature

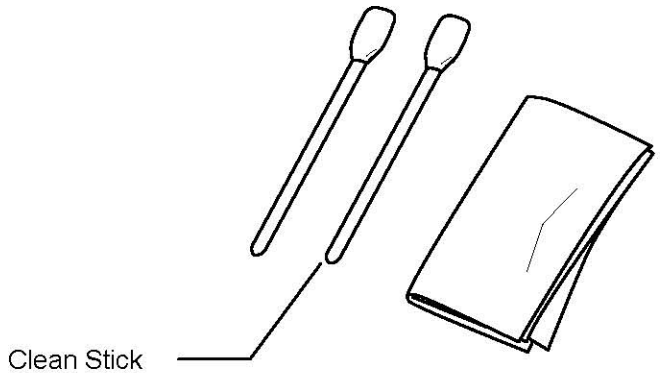
Inside the Printer

There are high voltages inside the printer. Before cleaning the printer, be sure to turn the power off and unplug the power cord from the power outlet.



7.1 Cleaning the Platen

The following cleaning kitis supplied with the printer.

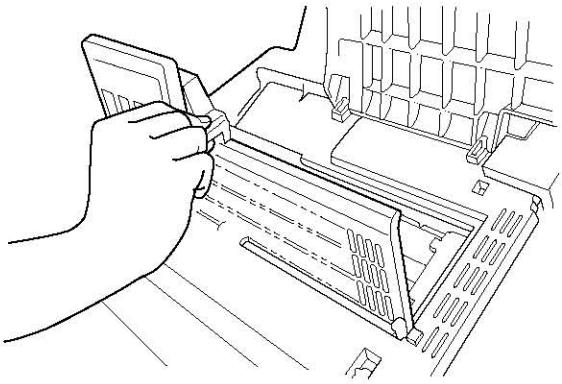


Cleanthe printer interior when the platen or rollers are stained by ink due to some problem such as a paper jam.
You will need to clean out the spilt ink and remove any small pieces of paper remaining inside the printer.

(1) Turn the printer power off.

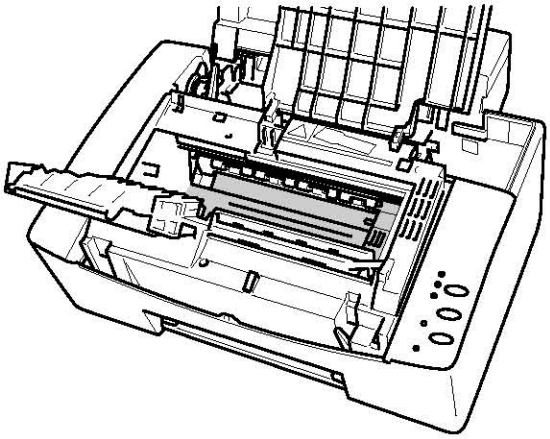
(2) Wait around 30 minutes after power off to allow the printer to cool down.

(3) Open the top cover. Then open the inside cover.

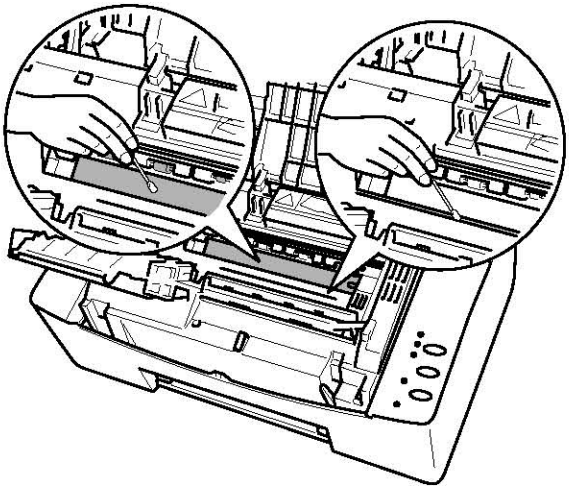


(4) Dampen the cleaning stick or wipers with the IPA(Isopropyl Alcohol)(90% or higher alcoholity) or the denatured alcohol(90% or higher alcoholity).

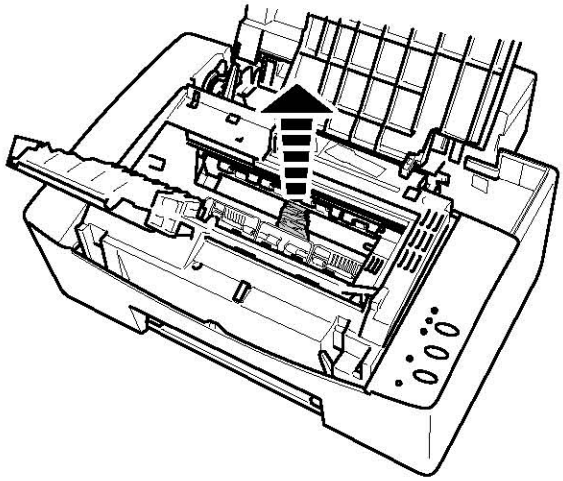
(5) Move the Print head to the right by hand until you can see the part of the platen and rollers that you want to clean.



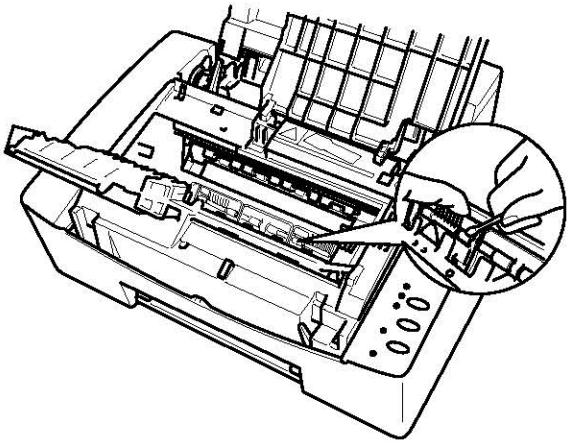
(6) Wipe up the spilt ink in the printer interior with a cleaning stick or wiper in the shaded area in the figure below.



(7) Remove any small pieces of paper remaining in the printer interior.



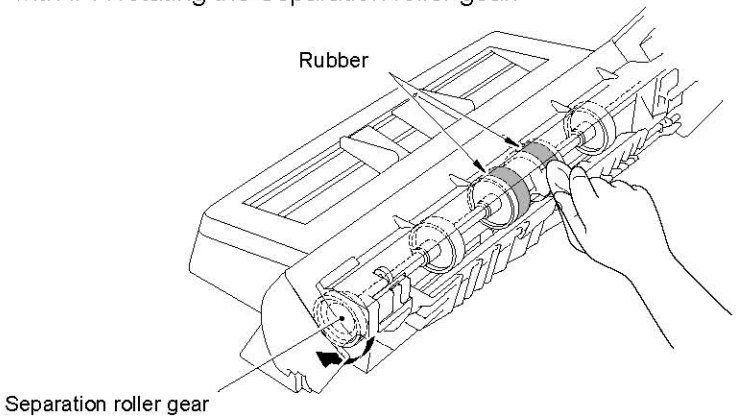
(8) To clean the rollers, wipe them with a cleaning stick. The rollers can be freed from the printer for cleaning by pulling the holders toward you.



Warning!: ***NEVER*** *touch the interior of the printer without waiting 30 minutes after power off before commencing cleaning. This is because some parts of the interior are extremely hot after you have used the printer.*

7.2 Cleaning the Sheet Feeder

(1) Remove the Sheet feeder upwards.
(2) Wipe up the paper dust on the rubber of the Separation roller with a cloth dumped with IPA rotating the Separation roller gear.



8. PACKING

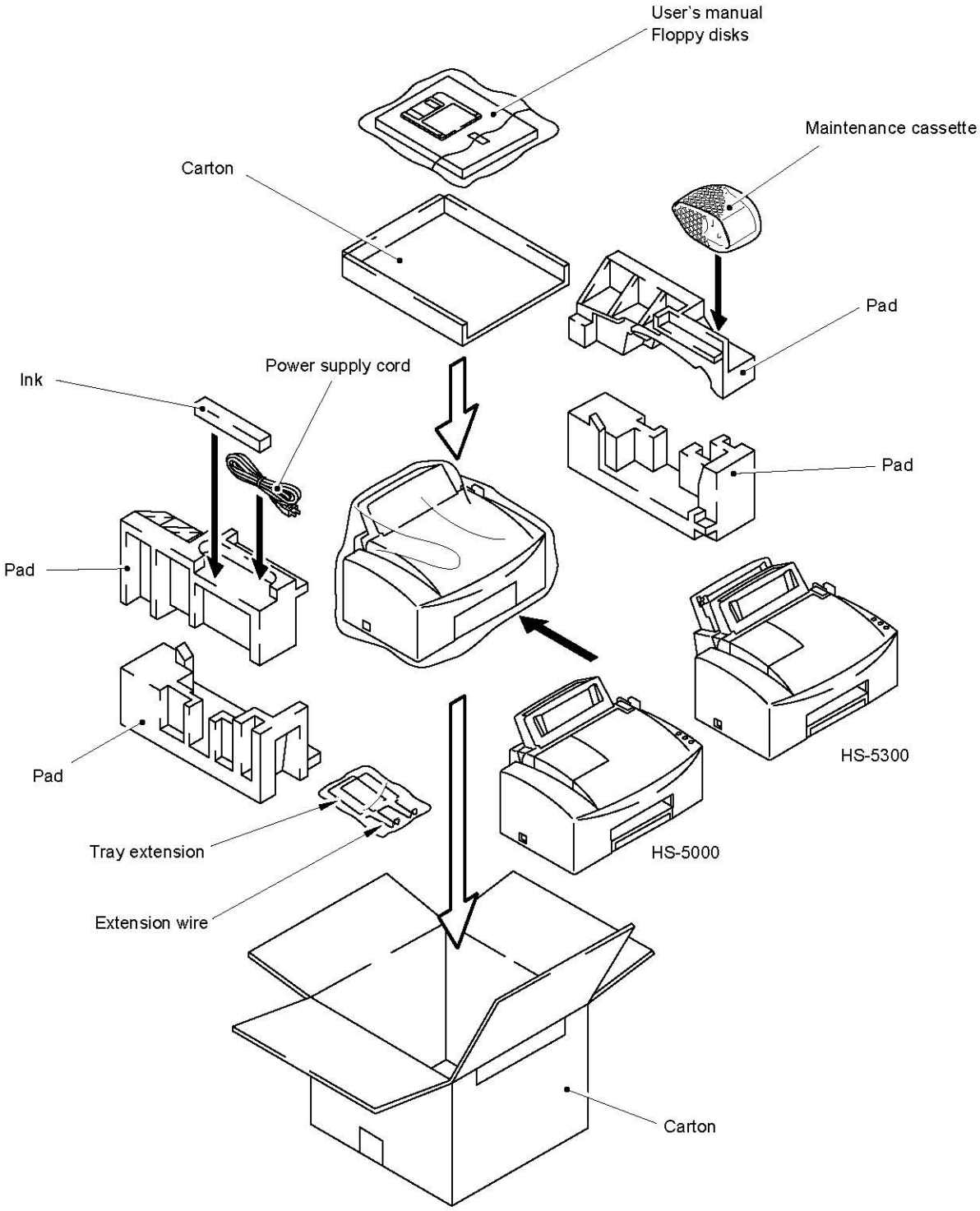


Fig. 3.104

CONTENTS

CHAPTER IV TROUBLE SHOOTING

1. INTRODUCTION

1.1 Initial Check

If a malfunction or incorrect print appears, make an initial check, then follow the basic procedure below:

(1) Operating environment

Check if:

1) The source voltage stays within ±10% from the rating voltage shown on the rating plate.

2) The printer is installed on a solid, level surface.

3) The room temperature is maintained between 10°C and 35°C (59°F and 95°F). The relative humidity is maintained between 20% and 80%.

4) The printer is not exposed to ammonia fumes or other harmful gases.

5) The printer is not located in a hot or humid area (such as near water or a humidifier).

6) The printer is not exposed to direct sunlight.

7) The room is well-ventilated.

(2) Paper

Check if:

1) A recommended type of print paper is being used. (If the paper is too thin, or tends to curl, paper jams or paper feed problems may occur, or prints may be blurred.)

2) The print paper is damp.
[If so, use fresh paper and check whether the print quality improves or not.]

(3) Consumables

Check if:

1) If there is ink remaining, the LED which indicates ink empty is not on.
(If the LED is on, install the indicated color ink.)

1.2 Basic Procedure

(1) Check the error lamps according to the procedure of the inspection mode described later in this section.

(2) If any incorrect image is found, refer to the image defect description in this section.

2. TROUBLESHOOTING

2.1 Troubleshooting procedure

2.1.1 Malfunctions

When carrying out the countermeasures for malfunctions described in this section, check connectors for contact failure before measuring the voltage at specified connector pins.

(1) No AC power supplied

Possible cause	Step	Check	Result	Remedy
Supply voltage	1	Is the correct voltage present at the outlet?	NO	Inform the user that the correct voltage is not supplied at the outlet.
Power plug	2	Is the power cord securely plugged into the outlet?	NO	Plug the power cord securely into the outlet.
Fuse (F2)	3	Is the fuse blown?	NO	If the fuse blows again immediately after replacing the power supply PCB, check if there is a short circuit somewhere in the AC power supply line.
Wiring	4	Unplug the power supply plug. Is there a broken wire between the AC input connector of the power supply and the power plug?	YES	Replace the AC power cord.

(2) No DC power supplied

<table>
<tr><th>Possible cause</th><th>Step</th><th>Check</th><th>Result</th><th>Remedy</th></tr>
<tr><td>AC power supply</td><td>1</td><td>Is AC power supplied between connectors P1-L and P1-N when the power plug is plugged into the outlet?</td><td>NO</td><td>Follow the same check procedure of 1) “No AC power supplied”.</td></tr>
<tr><td>Wiring, DC load</td><td rowspan="2">2</td><td rowspan="2">Turn the power switch OFF and disconnect the P17 connector (Driver PCB).
Turn the power back on and measure the voltage between the terminals.
Do the measured voltage satisfy the value in the table below?
<table>
<tr><th>PCB</th><th>+lead pin</th><th>-lead</th><th>Voltage</th></tr>
<tr><td rowspan="4">Driver PCB</td><td>P17-1</td><td>P17-2</td><td>+5V</td></tr>
<tr><td>P17-4</td><td>P17-7</td><td>+25V</td></tr>
<tr><td>P17-5</td><td>P17-7</td><td>+52V</td></tr>
<tr><td>P17-8</td><td>P17-7</td><td>+39/30V</td></tr>
</table></td><td>YES</td><td>Turn the power switch OFF, reconnect the connector and turn the power switch ON again. If the protector circuit is activated, check the connector, the wiring from the connector, and the DC load.</td></tr>
<tr><td>Power supply unit</td><td>NO</td><td>Replace the power supply unit.</td></tr>
</table>

(3) The PA motor does not rotate.

Possible cause	Step	Check	Result	Remedy
Connection failure of connector	1	Is the connection of connector P4 on the driver PCB correct?	NO	Reconnect the connector.
PA motor	2	Disconnect connector P4 from the driver PCB.	NO	Replace the PA motor.
Driver circuit		Measure the resistance between the connector pins of the PA motor by using a circuit tester. Do the measured resistances satisfy the prescribed value in the table below? P4-3 and P4-2 / P4-3 and P4-5 / P4-4 and P4-1 / P4-4 and P4-6 : Approx. 3 Ω	YES	Replace the driver PCB. Replace the Main PCB.

(4) The carriage motor does not rotate.

Possible cause	Step	Check	Result	Remedy
Connection failure of connector P2. Connection failure of connector P3.	1	Are the connectors P2 and P3 on the driver PCB securely connected?	NO	Connect them securely.
Carriage motor	2	Disconnect the connector P2 from the driver PCB.	NO	Replace the carriage motor.
Driver circuit		Measure the resistance between the connector pins of the carriage motor with a circuit tester. Does the measured resistance satisfy the value in the table below? P2-1 and P2-2 : Approx.10 Ω	YES	Replace the driver PCB. Replace the Main PCB.

(5) CR error 

Possible cause	Step	Check	Result	Remedy
Ink pellet or foreign material	1	Is an ink pellet or foreign material inside the printer?	YES	Remove it out.
Encoder strip	2	Encoder strip is contaminated with dust.	YES	Blow the dust out with a air brush.
		Encoder strip is contaminated with oil.	YES	Replace it.
Carriage motor	3	Check the Carriage motor operation referring to (4) The carriage motor does not rotate.		

(6) The fan motor does not rotate.

Possible cause	Step	Check	Result	Remedy
Connection failure of connector P6.	1	Is the connector P6 on the driver PCB securely connected?	NO	Connect it securely.
Fan motor	2	Turn the power switch OFF and disconnect the P6 connector (Driver PCB). Turn the power switch ON and measure the voltage between the terminals. Does the measured voltage satisfy the value in the table below? P6-1 and P6-2 | Approx. 25V	YES	Replace the fan motor.
Driver circuit			NO	Replace the driver PCB. Replace the Main PCB.

(7) Fan 15 ASSY (for HS-5000) or Fan 25 ASSY (for HS-5300) does not rotate.

Possible cause	Step	Check	Result	Remedy
Connection failure of connector P19.	1	Is the connector P19 on the driver PCB securely connected?	NO	Connect it securely.
Fan 15 ASSY or Fan 25 ASSY.	2	Turn the power switch OFF and disconnect the P19 connector	YES	Replace the Fan 15 ASSY or Fan 25 ASSY.
Driver circuit		(Driver PCB). Turn the power switch ON and measure the voltage between the terminals. Does the measured voltage satisfy the value on the table below? P19-1 and P19-2 | Approx. 25V	NO	Replace the driver PCB. Replace the Main PCB.

(7) No paper supplied

Possible cause	Step	Check	Result	Remedy
HS-5000: Connection failure of connector P7. HS-5300: Connection failure of connector P7 and P8.	1	Is (Are) the connector(s) P7 (and P8) on the driver PCB securely connected?	NO	Connect it (them) securely.
Paper pick-up clutch solenoid.	2	Disconnect connector P7 (and P8) from the driver PCB. Measure the resistance between the connector pins of the paper pick-up clutch solenoid with a circuit tester. Do the measured resistances satisfy the values in the table below? P7-1 and P7-2 / P8-1 and P8-2 / P8-3 and P8-4 : Approx. 80 Ω	NO	Replace the paper pick-up clutch solenoid.
Driver circuit			YES	Replace the driver PCB. Replace the Main PCB.

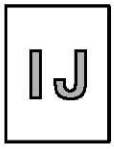
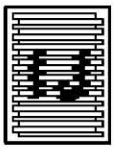
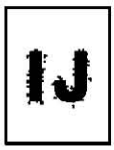
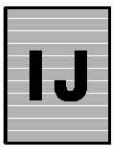
(8) Platen heater temperature is not controlled properly.

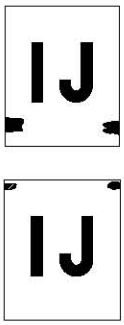
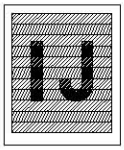
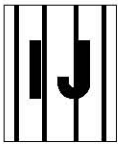
Possible cause	Step	Check	Result	Remedy
Harness connection failure	1	Is the connector P11 on the driver PCB securely connected?	NO	Connect it securely.
Heater failure	2	Remove connector P11 from the driver PCB. Measure the resistance between the connector pins of the heater (P11-2 and P11-3) with a circuit tester. Is it open circuit?	YES	Replace the M-platen ASSY.
Thermistor failure	3	Remove connector P11 from the driver PCB. Measure the resistance between the connector pins of the heater (P11-1 and P11-4) with a circuit tester. Is it open or short circuit?	YES	Replace the M-platen ASSY.

(9) Pre-platen heater temperature is not controlled properly.

Possible cause	Step	Check	Result	Remedy
Harness connection failure	1	Is the connector P10 on the driver PCB securely connected?	NO	Connect it securely.
Heater failure	2	Remove connector P10 from the driver PCB. Measure the resistance between the connector pins of the heater (P10-2 and P10-3) with a circuit tester. Is it open circuit?	YES	Replace the M-platen ASSY.
Thermistor failure	3	Remove connector P10 from the driver PCB. Measure the resistance between the connector pins of the heater (P10-1 and P10-4) with a circuit tester. Is it open or short circuit?	YES	Replace the M-platen ASSY.

2.1.2 Print-image Related

Trouble	Action to be taken
Light 	Check the followings: - The room temperature is between 10 to 35^{O}C (59 to 90.5^{O}F). - A correct media setting is selected on the printer driver. Check the following components: - Driver PCB - Power supply PCB - M-platen - Pre-baffle - Baffle
Print edges not aligned 	Check the followings: - A correct media setting is selected on the printer driver. - The alignment of vertical print lines. - Print head. - The gap lever is in the correct position for the paper being printed. - The head gap is correct.
Ink splash  	- Perform the head cleaning operation several times to remove dust or air bubbles from its nozzles. - Replace the print head. - Replace the driver PCB. - Replace the power supply PCB. - Adjust the head gap with the gap lever. (If the problem persists, adjust the gap of the CR guide plate or the guide bar.)
Random missing dots  	- Perform the head cleaning operation several times to remove dust or air bubbles from its nozzles. - Check the Maintenance paper if it is jamming like an accordion. If yes, rotate its gear and wind up the jamming paper. Maintenance paper jam is likely to happen after transportation of the printer and replacing the Maintenance paper. - Replace the carriage PCB. - Check the connection of the FFC cable to the carriage PCB. - Replace the print head. (If the problem persists, replace the carriage ASSY.) - Check the connection of the head flat cables on the driver PCB. (If either or those cables is broken or damaged, replace the FFC cable ASSY.) - Replace the driver PCB.
White horizontal streaks 	- Perform the head cleaning operation several times to remove dust or air bubbles from its nozzles. - Replace the print head. - Adjust the LF by using the adjustment tool software. (See Chapter 3, section 5 Adjustment) - Check the paper feed-related rollers. (Replacement of the paper feed roller or paper eject roller requires the special adjustment jig set.)

Stained leading edge of print paper  	- Check a correct media setting is selected on the printer driver. - Use the anti-curl mode.(Open the printer driver property, click [Control/Maintenance] tab, then click [Advanced Option] button while holding down the CTRL key.) ***Limitations with the anti-curl mode*** a. As this mode brings down the temperature to fix ink, the fixing strength goes down. b. Color become brighter. - Adjust the head gap with the gap adjust lever. (If the problem persists, adjust the gap of the CR guide plate or the guide bar.) - Use flesh paper. - Perform the head cleaning operation several times. - Check that the maintenance paper is correctly rolled up. - Replace the Upper paper support spring L and R. - Replace the Lower nip holder A ASSY, B ASSY and C ASSY. - Replace the Lower PA roller ASSY. - Replace the FAN 80.
Banding 	- Check the position of the gap lever. - Check a correct media setting is selected on the printer driver. - After checking the head gap, adjust the LF. - Adjust the TOF and the nozzles alignment using the adjustment tool. - Replace the print head. - Replace the carriage ASSY.
Vertical lines exist 	- Check a correct media setting is selected on the printer driver. - Wipe up the Lower nip roller with a alcohol dampened cloth or replace it. - Wipe up the Lower PA roller ASSY with a alcohol dampened cloth or replace it. (If the problem persists, replace the Q-platen ASSY.)
Ink easily comes off if touching the fixed ink on paper. Ink is not completely fixed on paper	Check the followings: - The room temperature is between 10 to 35^{O}C (59 to 90.5^{O}F). - A correct media setting is selected on the printer driver. Check the following components: - Driver PCB - Power supply PCB - M-platen - Pre-baffle - Baffle

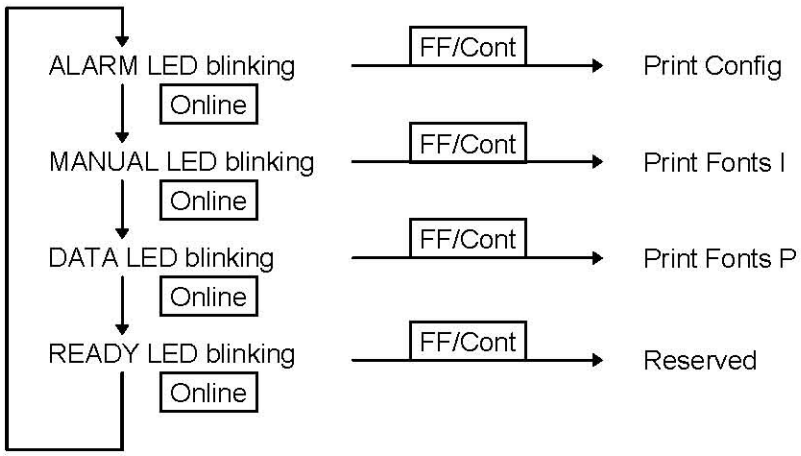
3. INSPECTION MODE

3.1 Extended Functions

The following two extended functions will be executed by holding down the online switch or the FF/Cont switch for 4 seconds or more regardless of online or offline status.

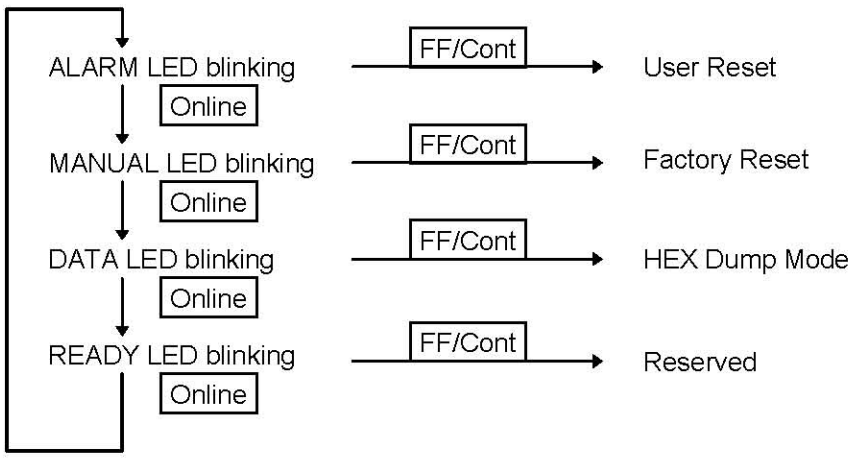
3.1.1 Self Printing Mode

The printer goes into the self printing mode by holding down the online switch for 4 seconds or more. Immediately after entering this mode, the Alarm LED blinks. Every time the online switch is pressed, the lit LED position steps on to the next position. The following self printing tests are assigned to the respective LED. By pressing the FF/Cont switch, the self printing will be executed. As soon as the self printing is done, the printer will return to ready status.



3.1.2 Reset and HEX Dump Mode

The printer performs a reset or goes into the HEX dump mode by holding down the FF/Cont switch for 4 seconds or more. Immediately after entering this mode, the Alarm LED blinks. Every time the online switch is pressed, the lit LED position steps on to the next position. The following actions are assigned to the respective LED. By pressing the FF/Cont switch, the selected function will be executed. Although it will return to the ready status after reset, it is necessary to reset by turning off the power switch or pressing the reset switch to quit the HEX dump mode.



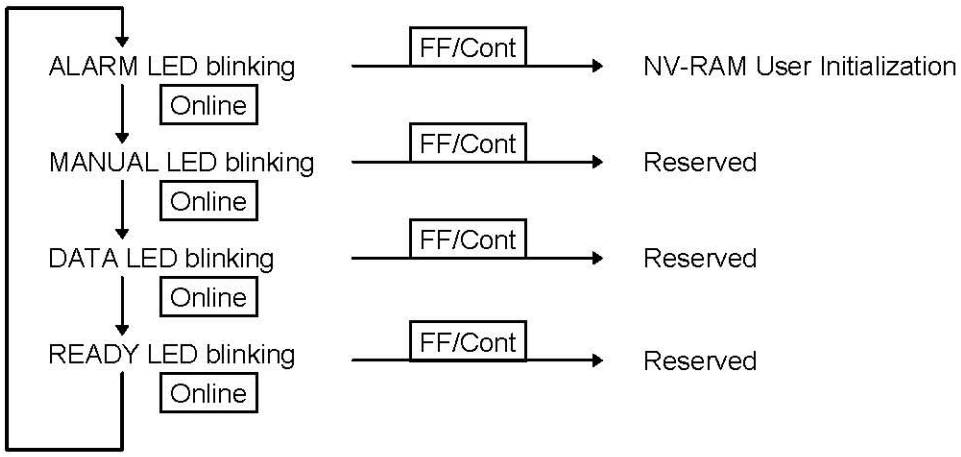
3.2 Hidden Functions

The printer goes into the inspection mode by turning the power on while holding down a specified switch. Holding down these switches immediately after reset also puts the printer into the respective inspection mode.

FF/Cont	Printer setting mode
Reset	Self printing 1 mode
Online	Self printing 2 mode
Online + FF/Cont	Test 1 mode
Online + Reset	Test 2 mode
FF/Cont + Reset	Online inspection mode

3.2.1 Printer Setting Mode

Immediately after entering this mode, the Alarm LED blinks. Every time the online switch is pressed, the LED position steps down to the next one. The following hidden functions are assigned to the respective LED. By pressing the FF/Cont switch, the selected setting function will be executed. After being executed, the printer will return to the ready status.

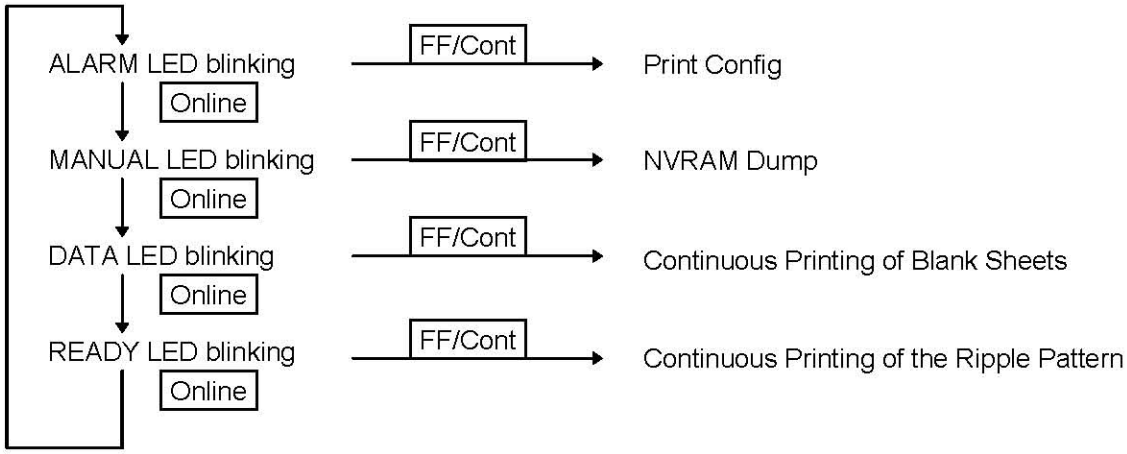


[NV-RAM User Initialization]

Initializes the user area of the NVRAM.

3.2.2 Self Printing 1 Mode

Immediately after entering this mode, the Alarm LED blinks. Every time the online switch is pressed, the LED position steps down to the next one. The following hidden functions are assigned to the respective LED. By pressing the FF/Cont switch, the selected self printing will be executed.



[Print Config]

Prints the status of the hidden function settings. After printing, the printer will return to the ready status.

[NVRAM Dump]

Prints the contents of the whole NVRAM as a HEX dump. After printing, the printer will return to the ready status.

[Continuous Printing of Blank Sheets]

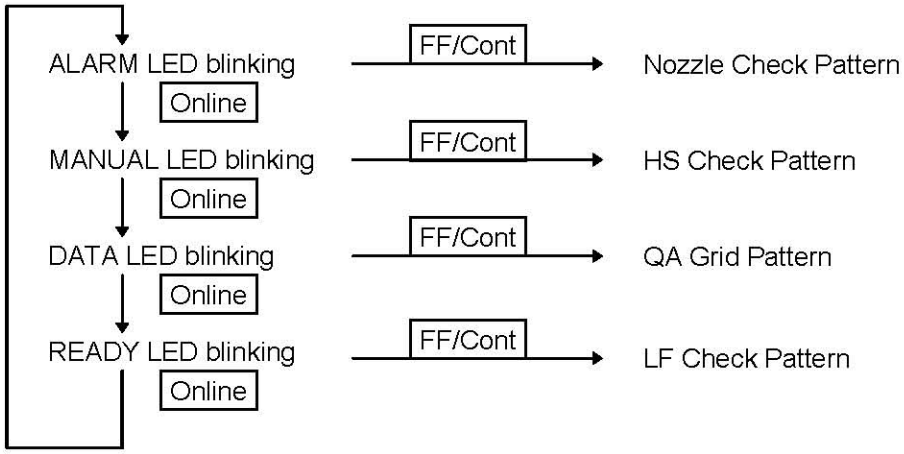
Continuously prints a blank page with a count of the printed pages.
It is possible to pause and restart by pressing the online switch.
The FF/Cont switch can be used to release errors.
It is necessary to reset by turning off the power switch or pressing the reset switch to quit this mode.

[Continuous Printing of the Ripple Pattern]

Continuously prints a ripple pattern sheet with a count of the printed pages.
It is possible to pause and restart by pressing the online switch.
The FF/Cont switch can be used to release errors.
It is necessary to reset by turning off the power switch or pressing the reset switch to quit this mode.

3.2.3 Self Printing 2 Mode

Immediately after entering this mode, the Alarm LED blinks. Every time the online switch is pressed, the LED position steps down to the next one. The following hidden functions are assigned to the respective LED. By pressing the FF/Cont switch, the selected self printing will be executed.

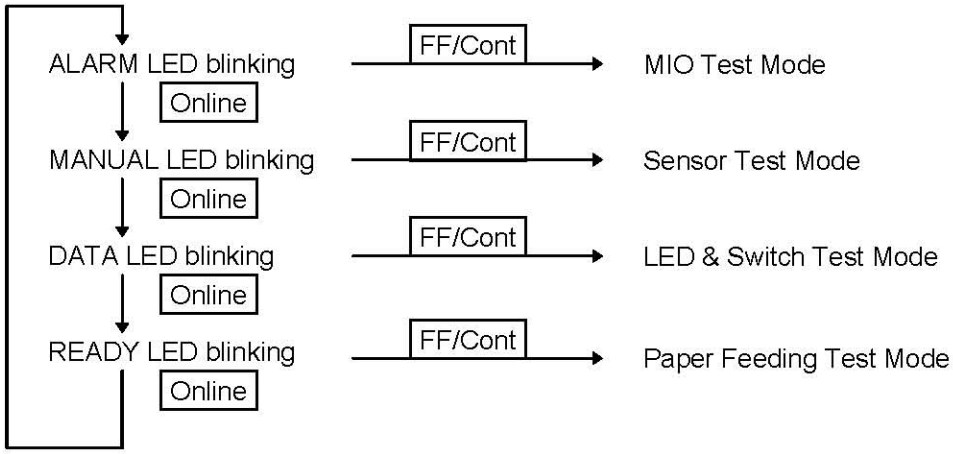


[Print Test Pattern]

Prints a test pattern. The FF/Cont switch can be used to release errors. After printing, the printer will return to the ready status.

3.2.4 Test 1 Mode

Immediately after entering this mode, the Alarm LED blinks. Every time the online switch is pressed, the LED position steps down to the next one. The following hidden functions are assigned to the respective LED. By pressing the FF/Cont switch, the selected test function will be executed.



[MIO Test Mode]

It tests MIO and the LED indicates the results.

During the test	:	Ready LED blinks
Result OK	:	Back to ready status
Result NG	:	The LEDs indicate an MIO error

After the test, the printer will return to the ready status..

[Sensor Test Mode]

The respective LED indicates the status of the following sensors.

SENSOR	:	LED
Cover Sensor	:	Alarm LED
Maintenance Paper	:	Manual LED
Paper Feeding Sensor	:	Data LED
Paper Ejection Sensor	:	Ready LED

It is possible to perform the above tests repeatedly and it is necessary to reset the printer by turning off the power switch or pressing the reset switch to quit this mode.

[LED & Switch Test Mode]

First, the printer enters the LED test mode, the lit LED position steps down to the next one continuously at intervals of 0.5 seconds. During this test mode, it can be turned to the switch test mode by pressing one of the switches. Then the LED indicates the status of the following switches.

SWITCH	:	LED
FF/Cont	:	Manual LED
Reset	:	Data LED
Online	:	Ready LED

It is possible to perform the above tests repeatedly and it is necessary to reset the printer by turning off the power switch to quit this mode

[Paper Feeding Test Mode]

By pressing one of the following switches, it will feed paper from the selected feeder and detect paper width and media, then display the result on the LED.

SWITCH	:	FEEDER
FF/Cont	:	1st sheet feeder
Reset	:	2nd sheet feeder (HS-5300 only)

It is possible to perform the above test repeatedly and it is necessary to reset the printer by turning off the power switch to quit this mode.

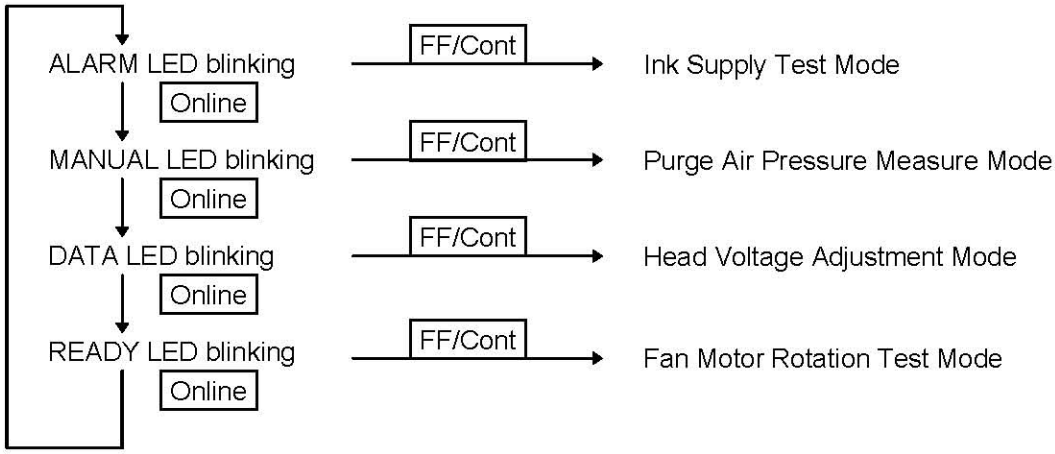
Display the Result

			LED
Paper Width	:	A4	Manual LED is on
		Letter	Manual LED is off
		Others	Data LED is on
Media	:	Plain paper	Ready LED is on
		Transparency	Ready LED is off

In case of a paper error, the LEDs indicate the sttus as above.

3.2.5 Test 2 Mode

Immediately after entering this mode, the Alarm LED blinks. Every time the online switch is pressed, the LED position steps down to the next one. The following hidden functions are assigned to the respective LED. By pressing the FF/Cont switch, the selected test function will be executed.



[Ink Feeder Test Mode] (**DO NOT USE!**)

Remove the Ink case ASSY.
According to the pressing of following switches, it will feed a ink pellet.

SWITCH	:	INK
FF/Cont	:	Magenta
Reset	:	Cyan
Online + FF/Cont	:	Black
Online + Reset	:	Yellow

It is possible to perform the above repeatedly and it is necessary to reset the printer by turning off the power switch to quit this mode.

[Purge Air Pressure Measure Mode] (**DO NOT USE!**)

Rotates the purge motor continuously by pressing the FF/Cont switch. it will stop the purge motor if the FF/Cont switch is pressed while the purge motor is rotating. It is possible to perform the above repeatedly and it is necessary to reset by turning off the power switch to quite this mode.

[Head Voltage Adjustment Mode]

This is a mode for adjustment of the voltage to drive the heads. The selected voltage can be changed for 300 dpi or 600 dpi according to the pressing of the following switches.

SWITCH	:	MODE
FF/Cont	:	600 dpi
Reset	:	300 dpi

It is possible to perform the above repeatedly and it is necessary to reset the printer by turning off the power switch to quit this mode.

[Fan Motor Rotation Test Mode] (Not neccessary for the service)

Changes the rotation of the fan motor according to the pressing of following switches.

SWITCH	:	MODE
FF/Cont	:	High
Reset	:	Low
Online	:	Stop

It is possible to perform the above repeatedly and it is necessary to reset the printer by turning off the power switch to quit this mode.

3.3 Error Codes

There are 2 kinds of error code.
Operator calls: Alarm LED and specific LED(s) blink alternately.
Service calls: All the LEDs and specific LED(s) go ON alternately.

The specific combination of ON or blinking indicates the type of the error.

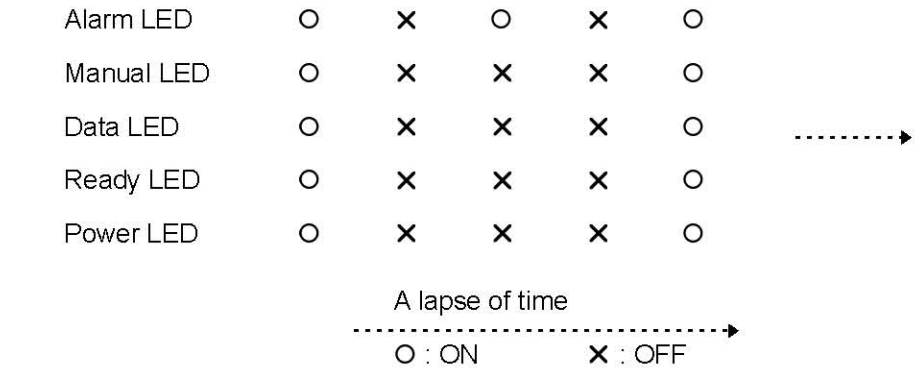
✳ : Blinking O : ON ✕ : OFF

Operator calls	Alarm LED	Manual LED	Data LED	Ready LED	Note
Paper Empty	✳	✕	✕	✳	No paper in the sheet feeder(s), or paper is not picked up correctly.
Paper Jam	✳	✕	✕	✳	Paper is jamming
Ink Empty	✳	✕	✳	✕	An ink is empty
Maintenance Paper Short	✳	✳	✕	✕	The maintenance paper has run out.
Cover Open	✳	✕	✕	✕	The top cover is open.
Memory full	✳	✕	✕	✕	A memory full error occurred. (An error print sheet is printed out.)
CDCC Line Error	✳	✕	✕	✕	a CDCC I/F communication error
MIO Error SIMM Error	✳	✕	✕	✕	A SIMM or the MIO board is not installed correctly. (An error print sheet is printed out.)

Service calls	Alarm LED	Manual LED	Data LED	Ready LED	Power LED	Note
ROM Error	O	✕	✕	✕	✕	ROM Check sum Error
RAM Error	✕	O	✕	✕	✕	RAM Read/Write Error
NVRAM Error	O	O	✕	✕	✕	NVRAM Read/Write Test Error
Controller Service Error	✕	✕	O	✕	✕	CPU Runtime Error
ASIC Error	O	✕	O	✕	✕	ASIC Error
Engine ROM Error	✕	✕	✕	O	✕	Engine ROM Check sum error
Engine RAM Error	O	✕	✕	O	✕	Engine RAM Read/Write Error
Engine Program Error	✕	O	✕	O	✕	Engine Program Error
Communication Error	O	O	✕	O	✕	Main communication error
Paper Width Sensor Error	✕	✕	O	O	✕	Unable to detect paper width
Paper Width Level Error	O	✕	O	O	✕	Failure of paper width sensor level
Paper Dust Error	✕	O	O	O	✕	Paper dust on paper width sensor
CAM Position Error	O	O	O	O	✕	Unable to detect the CAM position
LOIS Error	✕	✕	✕	✕	O	Short or Open circuit of LOIS
Carriage Position Error / PWM Error	O	✕	✕	✕	O	Wrong carriage position / abnormal PWM
Carriage Lock	✕	O	✕	✕	O	The carriage is locked.
Carriage Initialize Error	O	O	✕	✕	O	Cannot detect a carriage home position / There are foreign objects in the sensor.
Encoder Error	✕	✕	O	✕	O	Something wrong with the encoder / Dirt on the encoder.
Thermistor Error	O	✕	O	✕	O	Short or Open circuit of the thermistors.
Heater Overheat Error	✕	O	O	✕	O	Overheating of the heaters.
Heater Break Error	O	O	O	✕	O	Short circuit of the heaters
AC Heater Error	✕	✕	✕	O	O	Abnormal supply of AC heater
Quench Platen Error	O	✕	✕	O	O	The temperature at the quench platen does not go down.

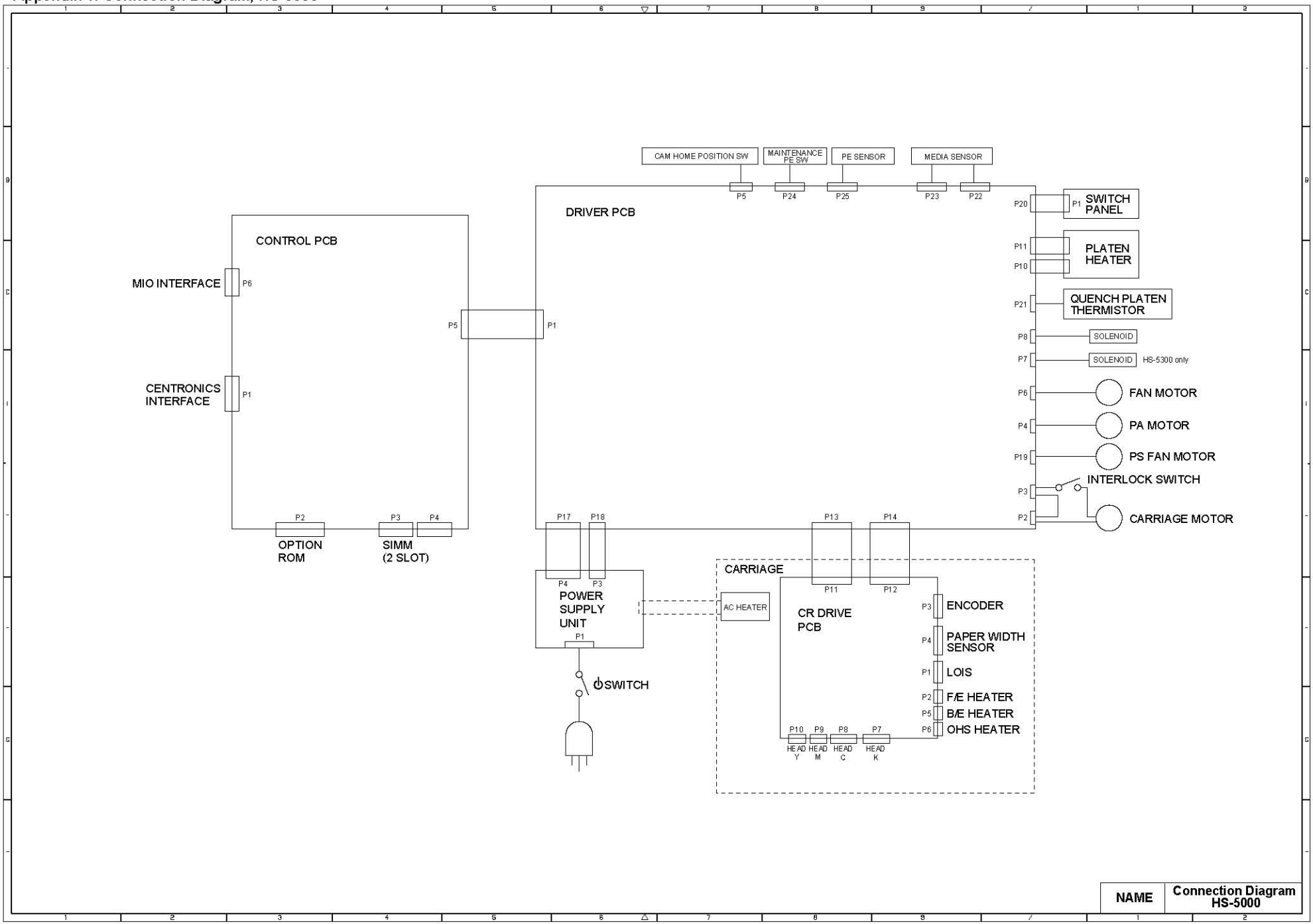
LED INDICATING THE ERROR

Example: ROM Error

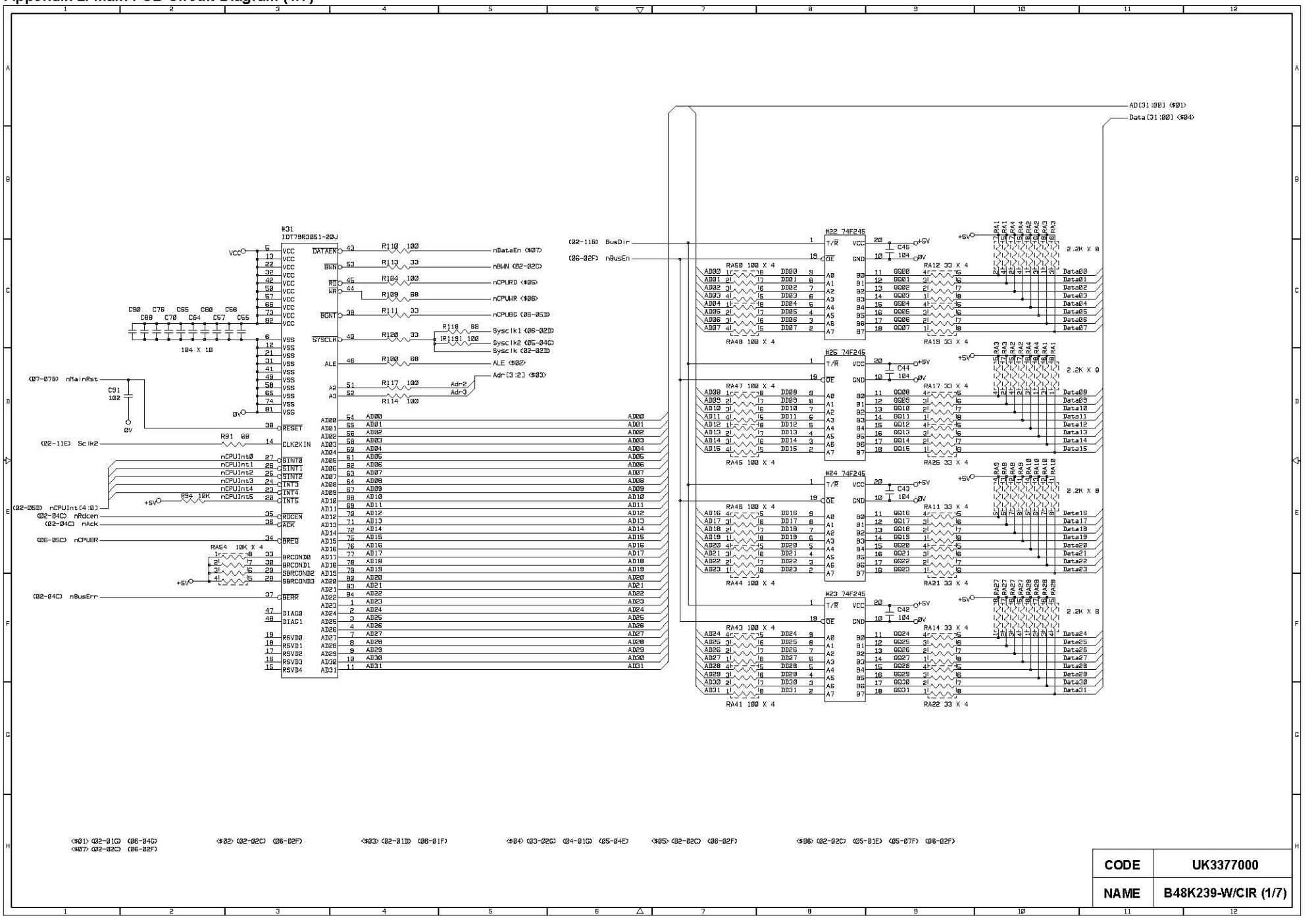


CONTENTS

1. Appendix

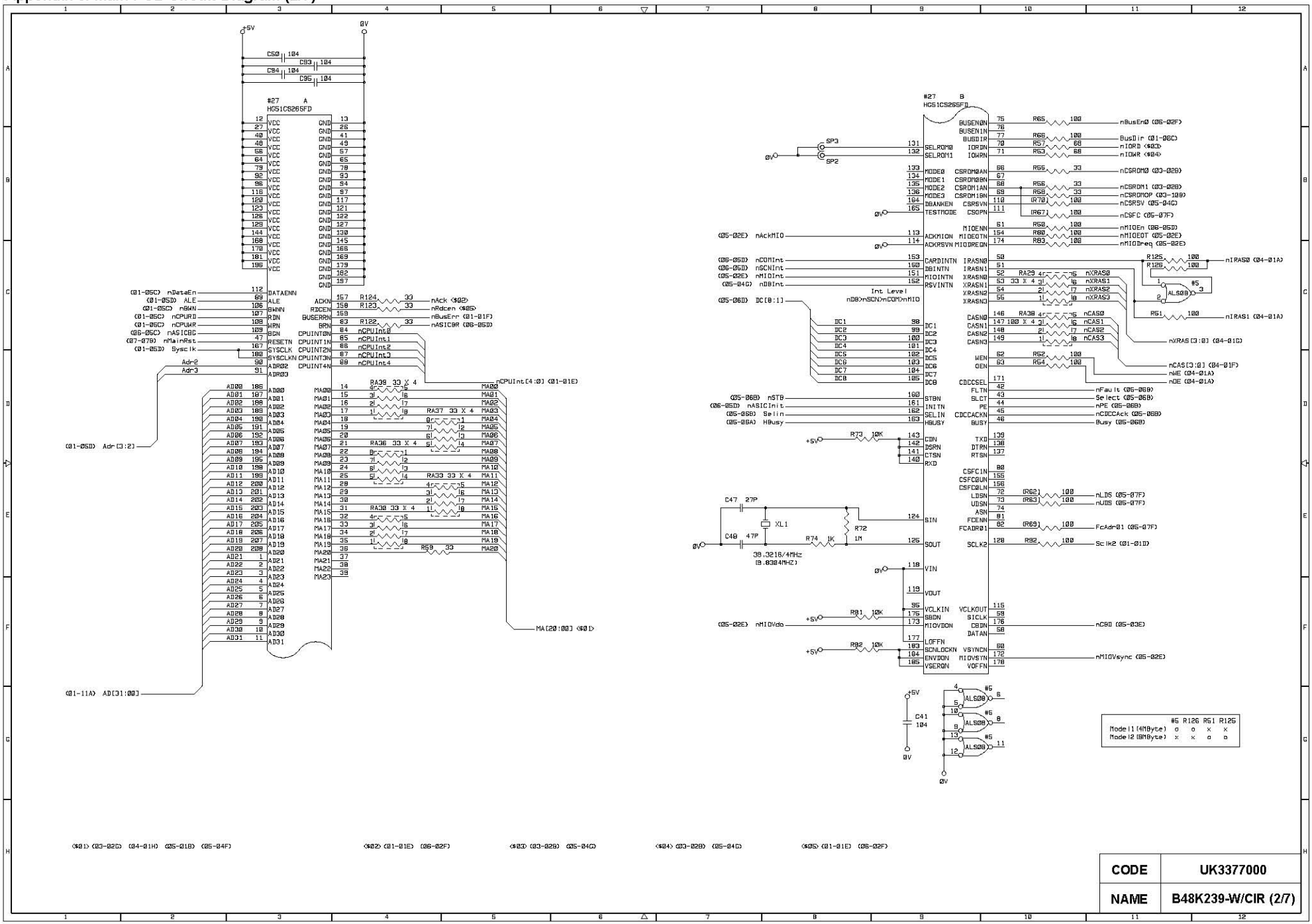

CAM HOME POSITION SW
MAINTENANCE PE SW
PE SENSOR
MEDIA SENSOR
P5
P24
P25
P23
P22
DRIVER PCB
CONTROL PCB
MIO INTERFACE
P6
CENTRONICS INTERFACE
P1
P5
P1
P2
P3
P4
OPTION ROM
SIMM (2 SLOT)
P17
P18
P4
P3
POWER SUPPLY UNIT
P1
SWITCH
AC HEATER
CARRIAGE
P13
P14
P11
P12
CR DRIVE PCB
P10
P9
P8
P7
HEAD Y
HEAD M
HEAD C
HEAD K
P20
P1
SWITCH PANEL
P11
P10
PLATEN HEATER
P21
QUENCH PLATEN THERMISTOR
P8
SOLENOID
P7
SOLENOID
HS-5300 only
P6
FAN MOTOR
P4
PA MOTOR
P19
PS FAN MOTOR
P3
P2
INTERLOCK SWITCH
CARRIAGE MOTOR
P3
ENCODER
P4
PAPER WIDTH SENSOR
P1
LOIS
P2
F/E HEATER
P5
B/E HEATER
P6
OHS HEATER
NAME
Connection Diagram HS-5000

Appendix 2. Main PCB Circuit Diagram (1/7)

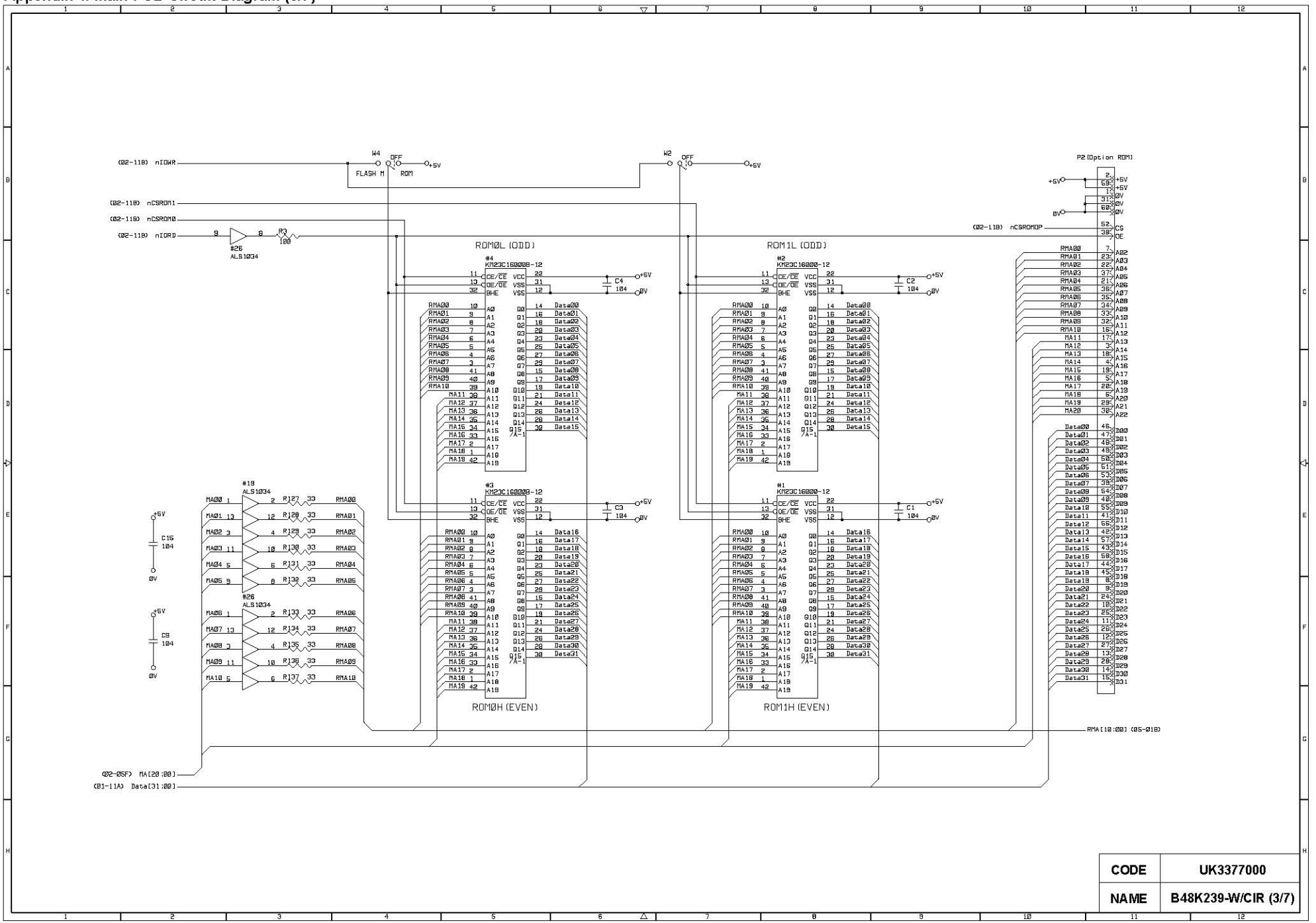


CODE	UK3377000
NAME	B48K239-W/CIR (1/7)

Appendix 3. Main PCB Circuit Diagram (2/7)

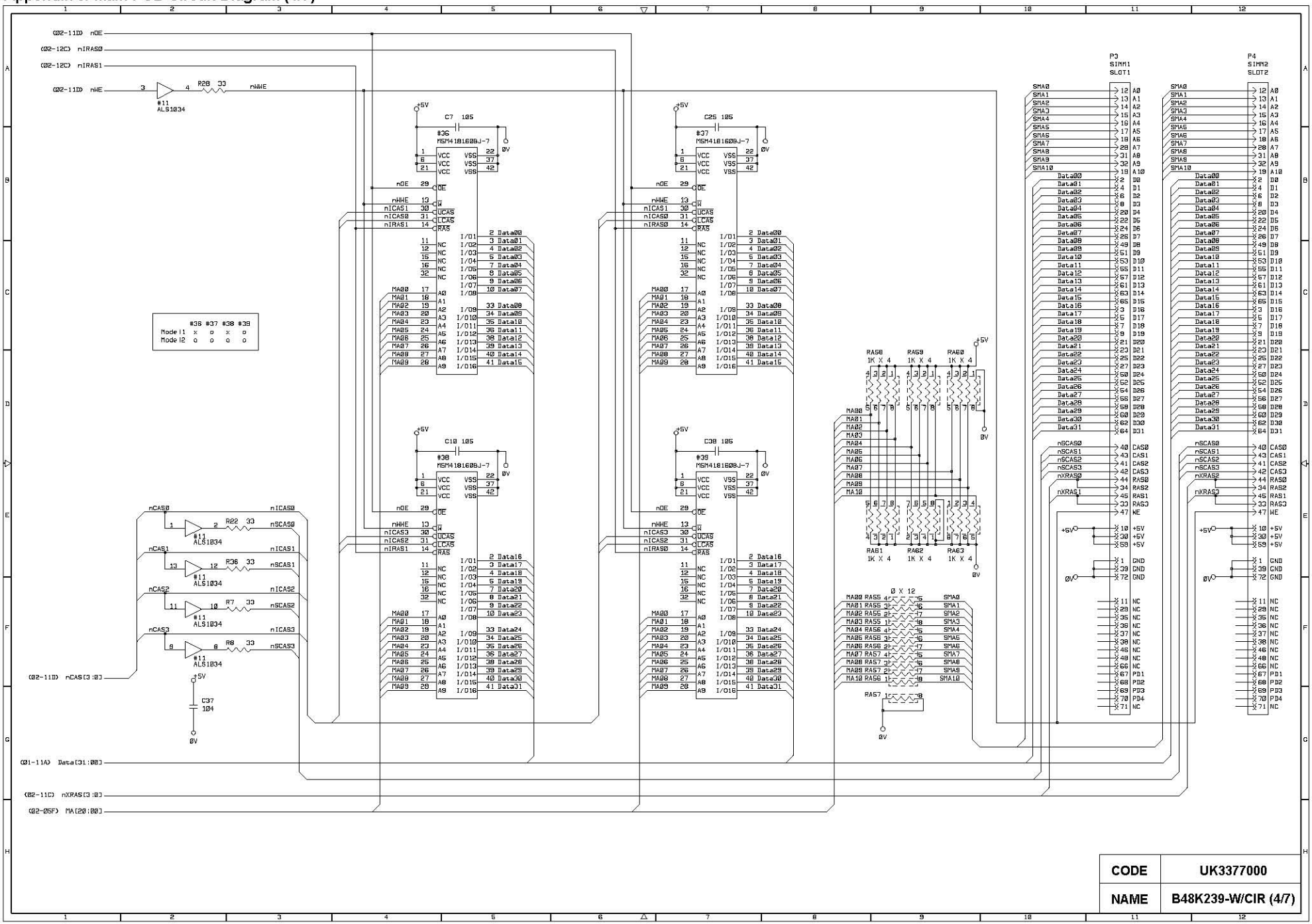


CODE	UK3377000
NAME	B48K239-W/CIR (2/7)

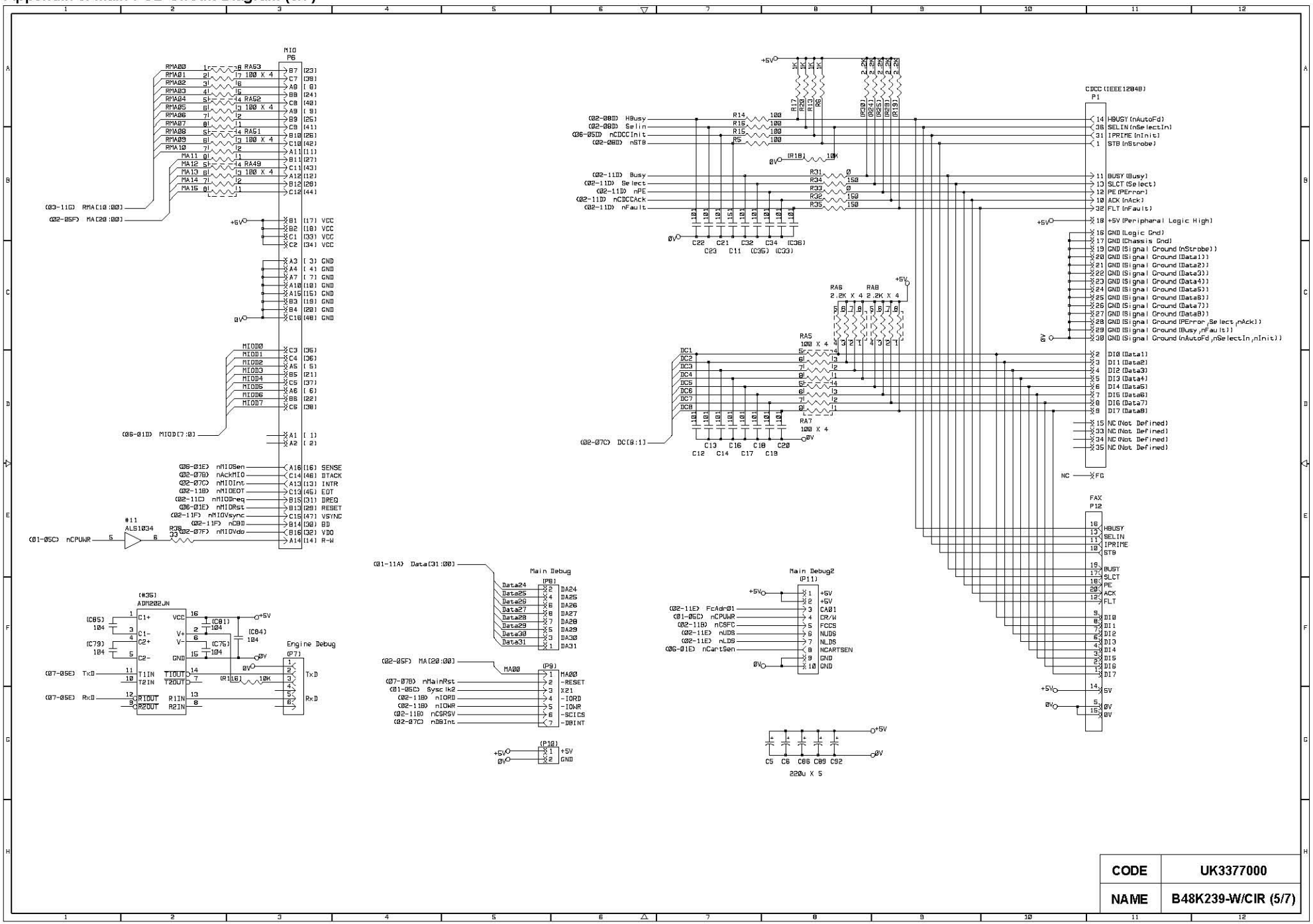


CODE	UK3377000
NAME	B48K239-W/CIR (3/7)

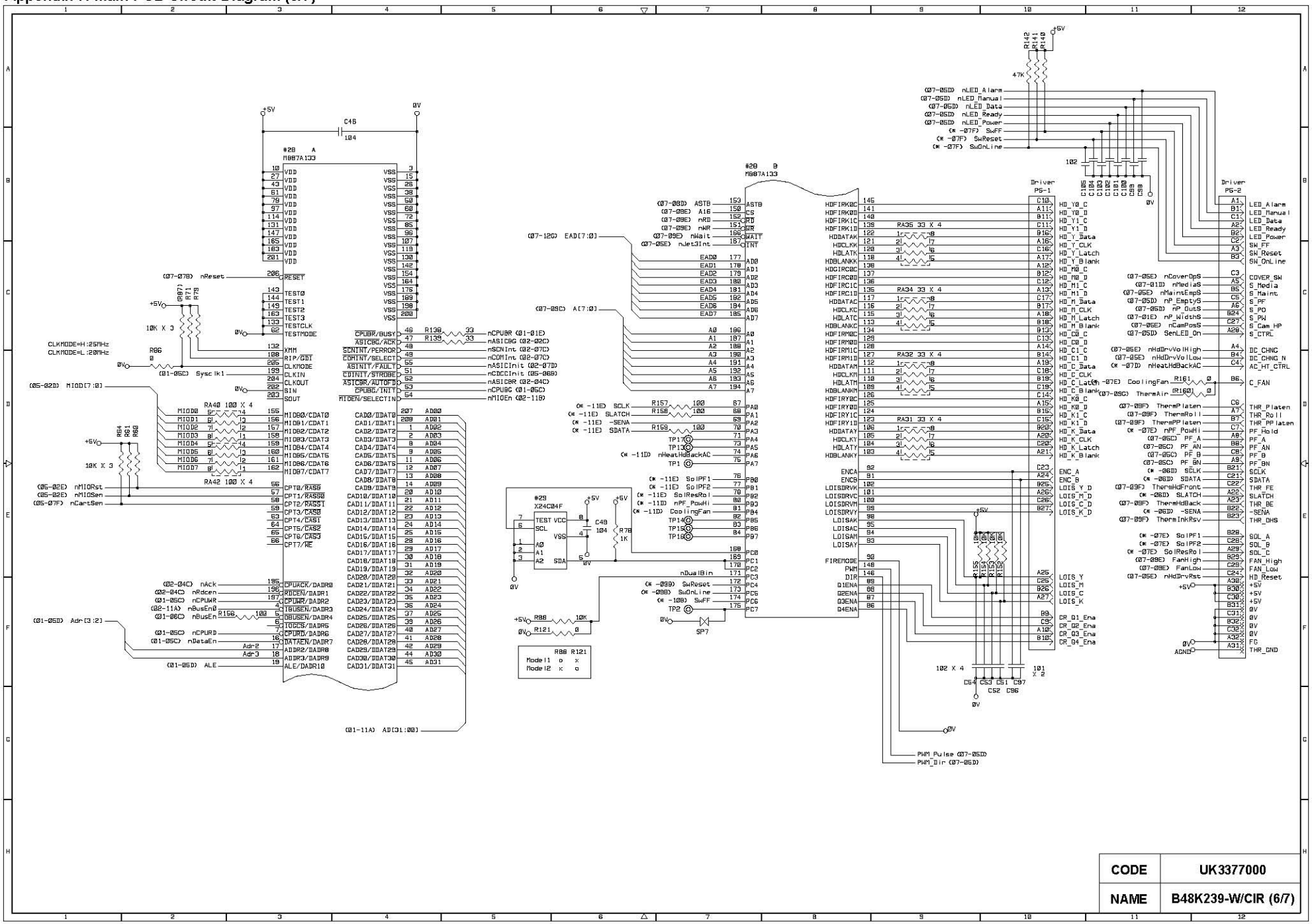
Appendix 5. Main PCB Circuit Diagram (4/7)



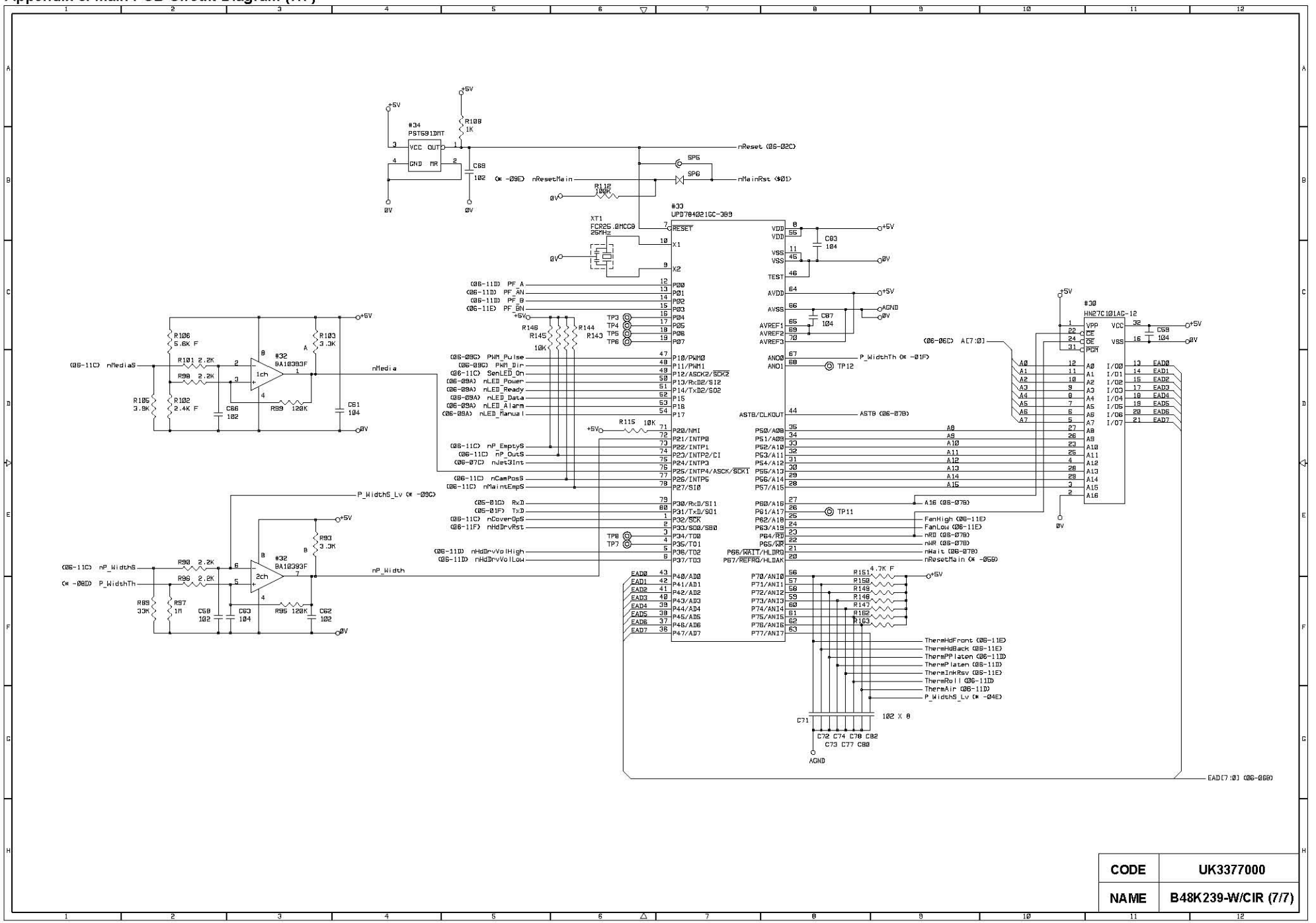
Appendix 6. Main PCB Circuit Diagram (5/7)



Appendix 7. Main PCB Circuit Diagram (6/7)

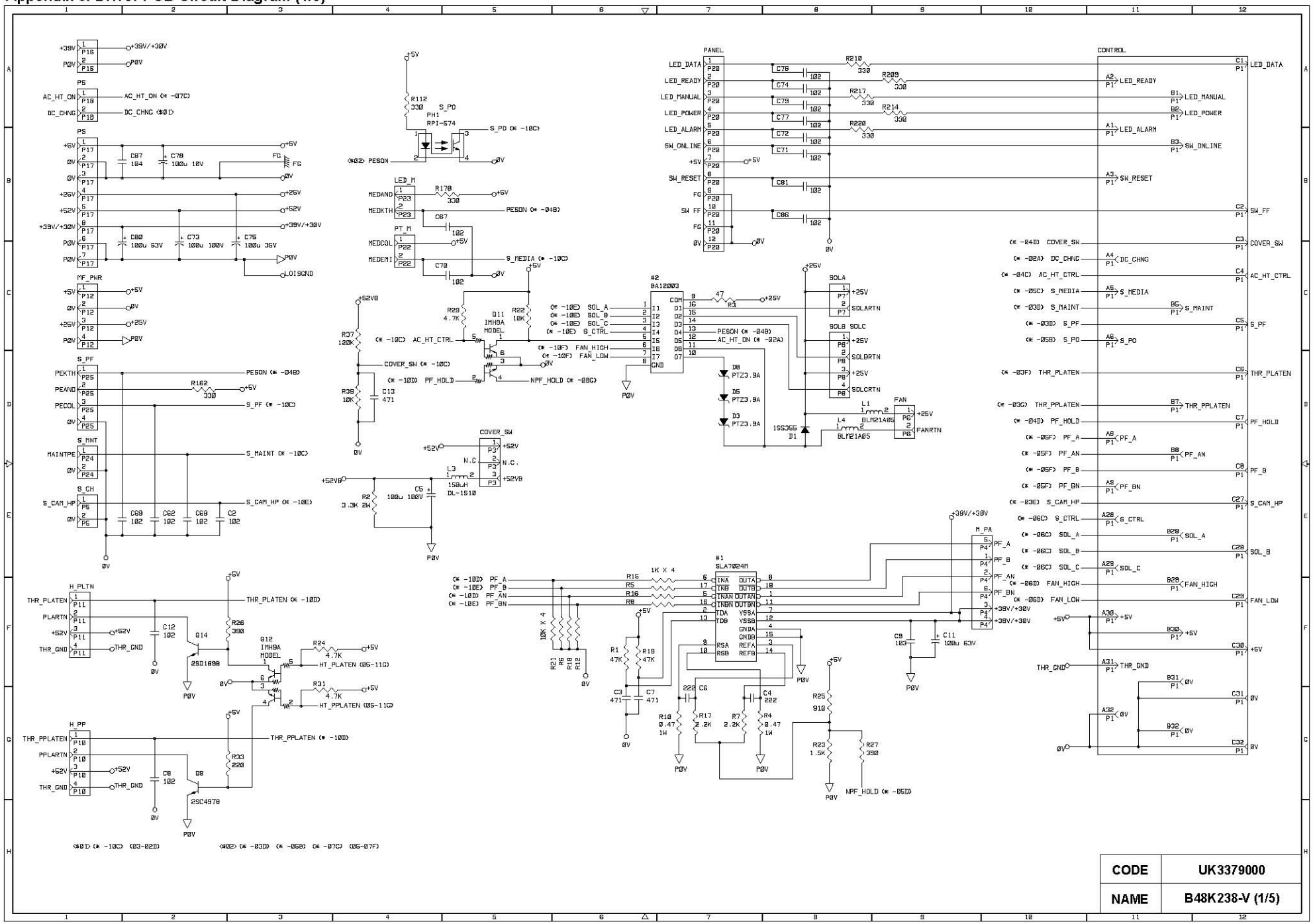


CODE	UK3377000
NAME	B48K239-W/CIR (6/7)

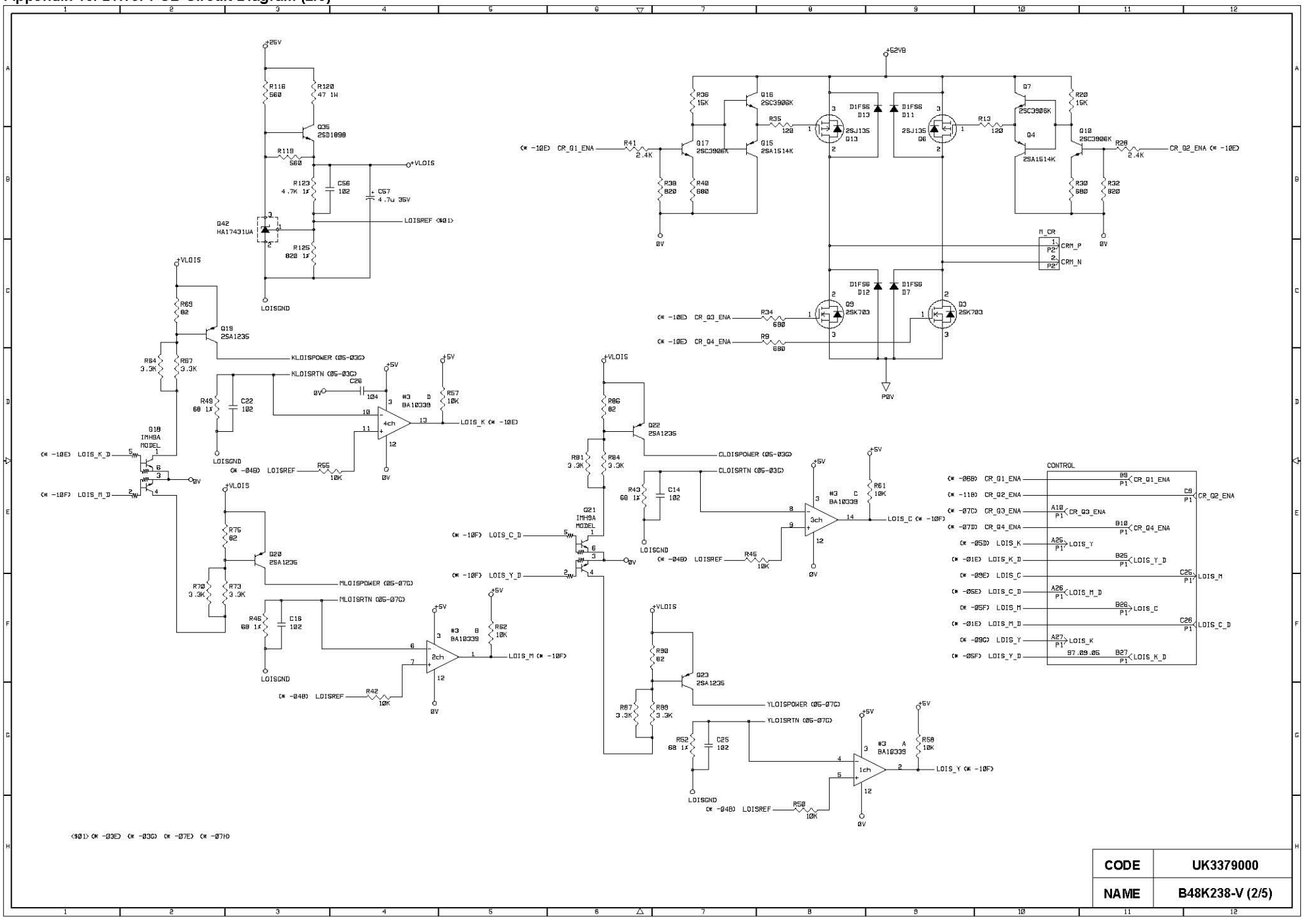


CODE	UK3377000
NAME	B48K239-W/CIR (7/7)

Appendix 9. Driver PCB Circuit Diagram (1/5)

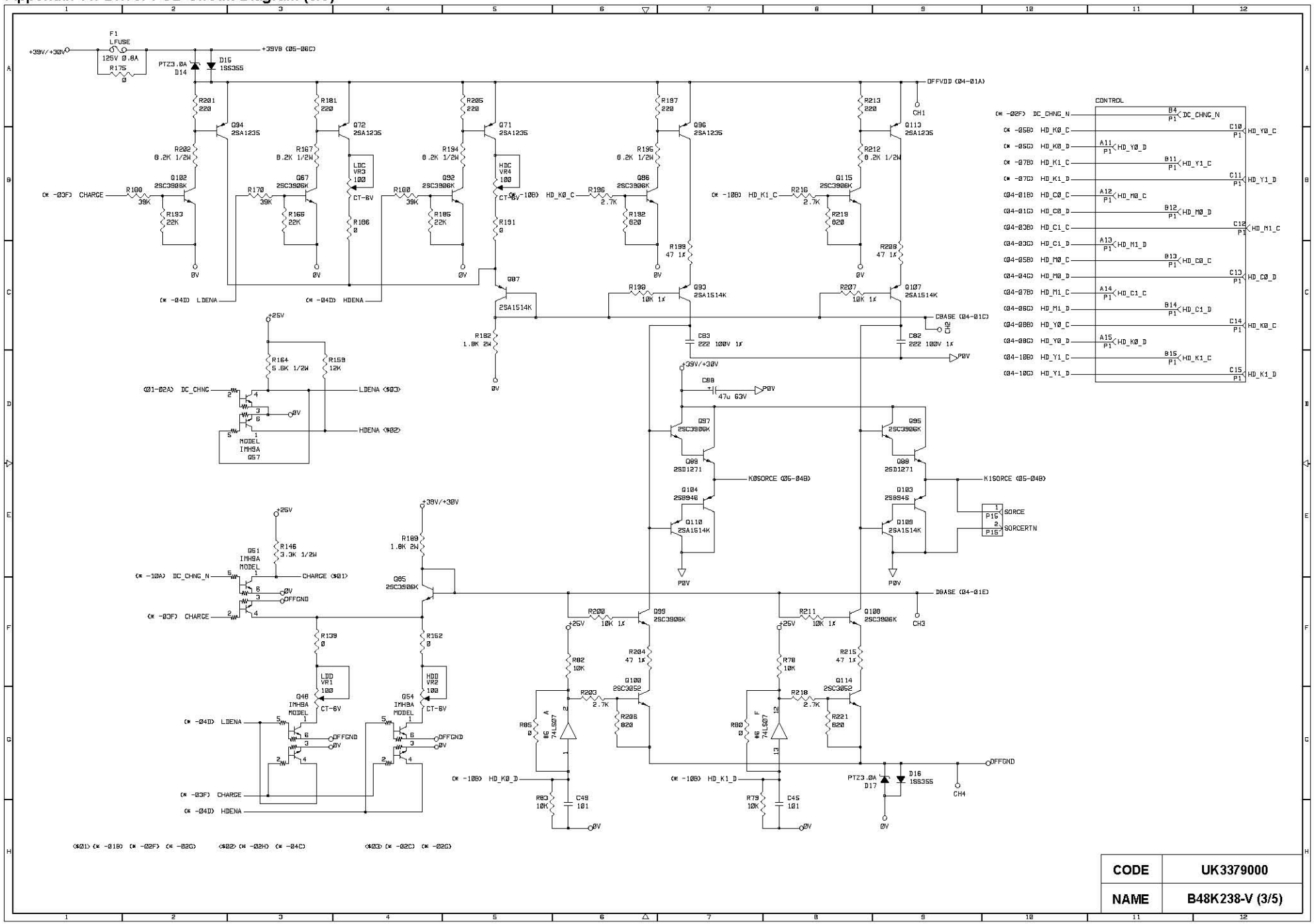


Appendix 10. Driver PCB Circuit Diagram (2/5)



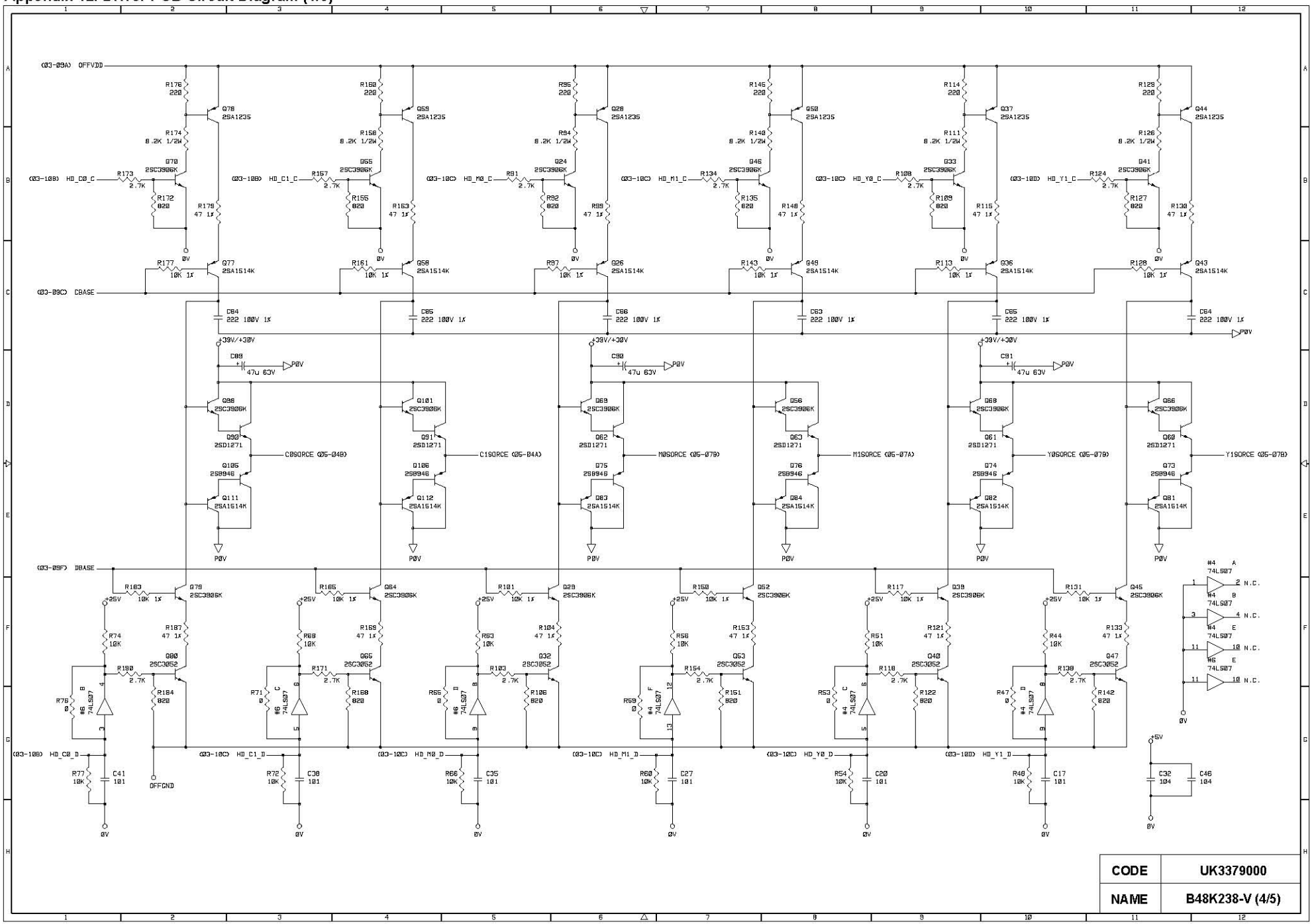
CODE	UK3379000
NAME	B48K238-V (2/5)

Appendix 11. Driver PCB Circuit Diagram (3/5)

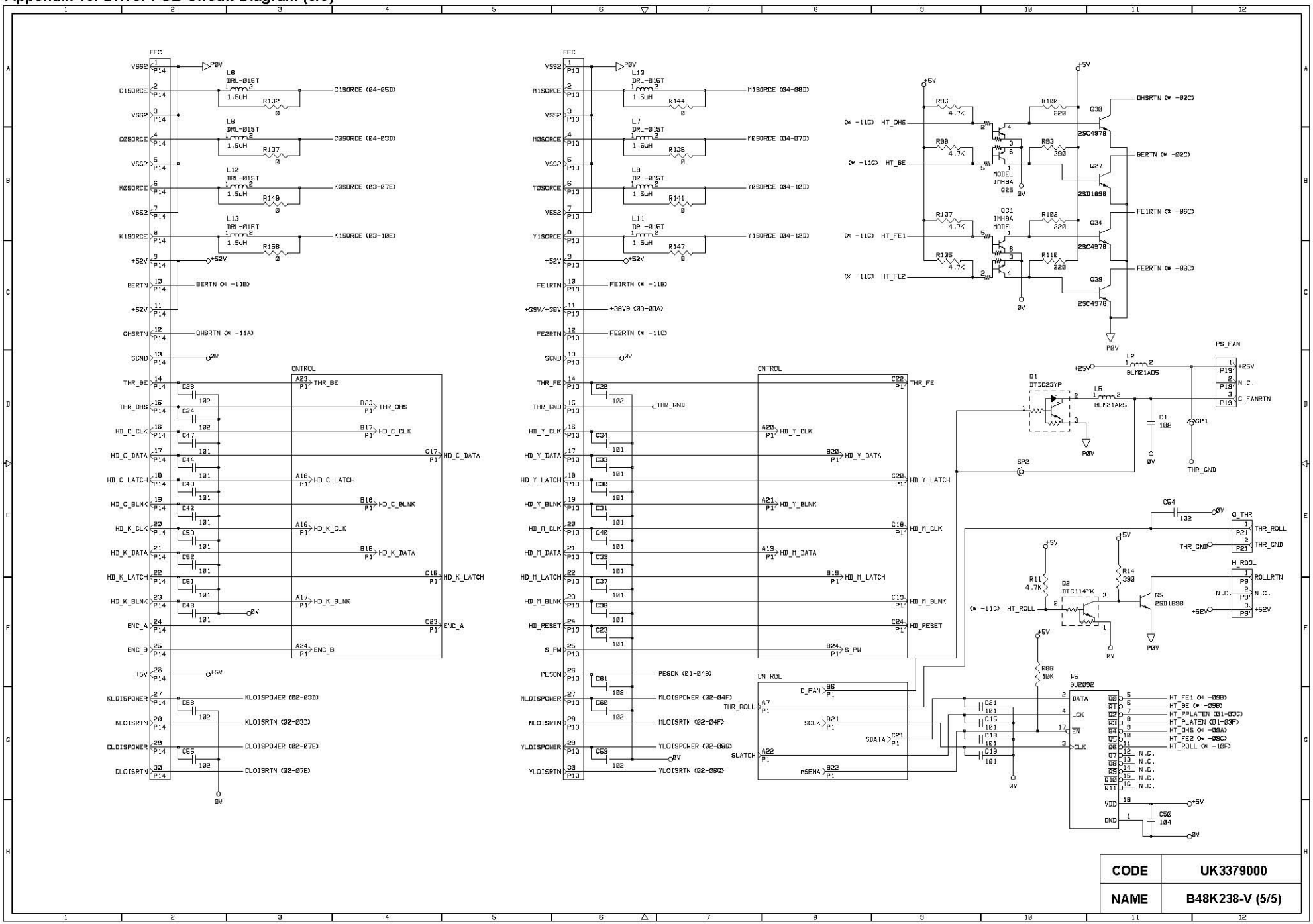


CODE	UK3379000
NAME	B48K238-V (3/5)

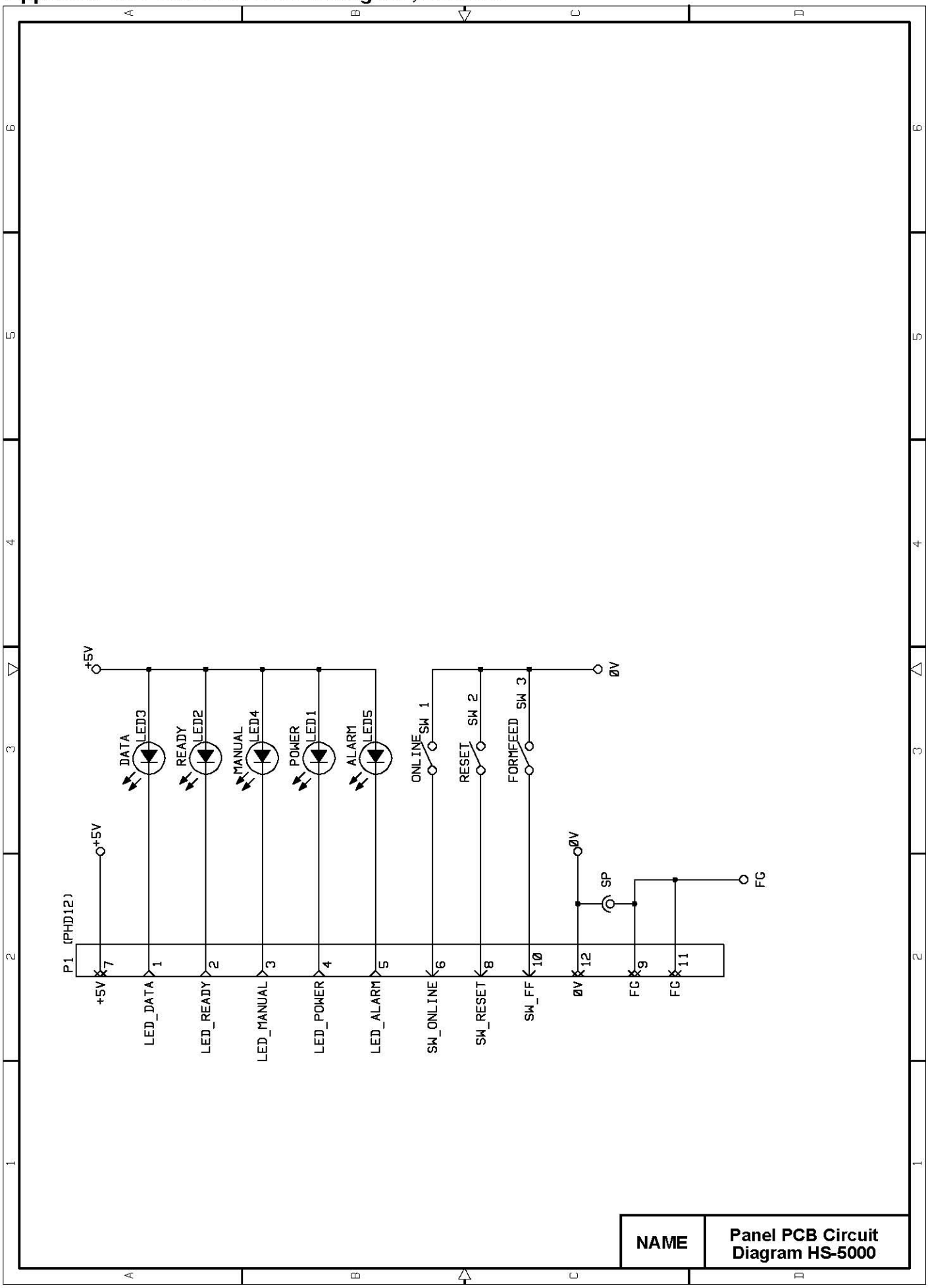
Appendix 12. Driver PCB Circuit Diagram (4/5)

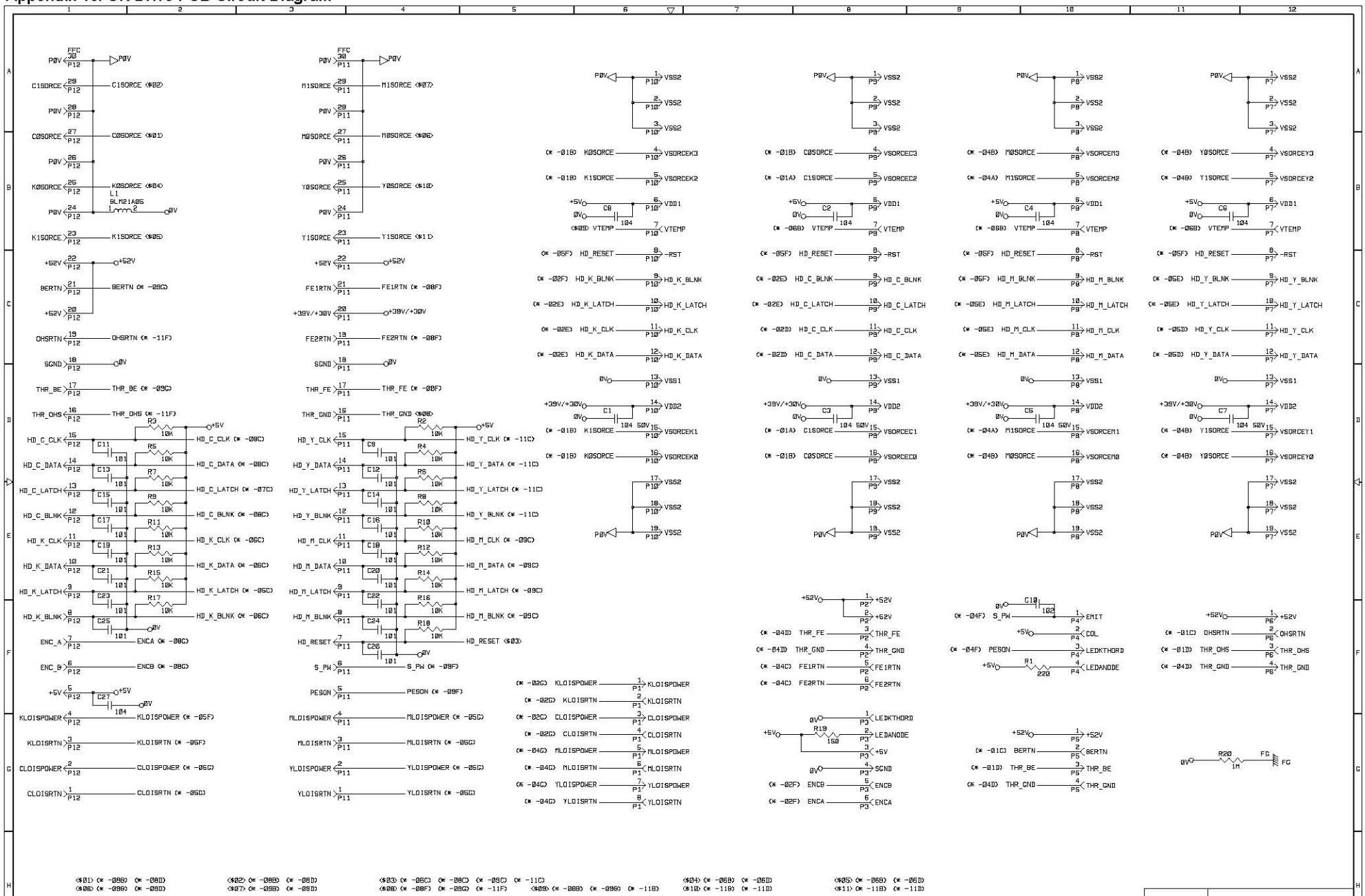


Appendix 13. Driver PCB Circuit Diagram (5/5)



Appendix 14. Panel PCB Circuit Diagram, HS-5000




CODE
UK3381000
NAME
B48K237