Technical Manual
CL-S6621

Thermal Transfer Barcode & Label Printer
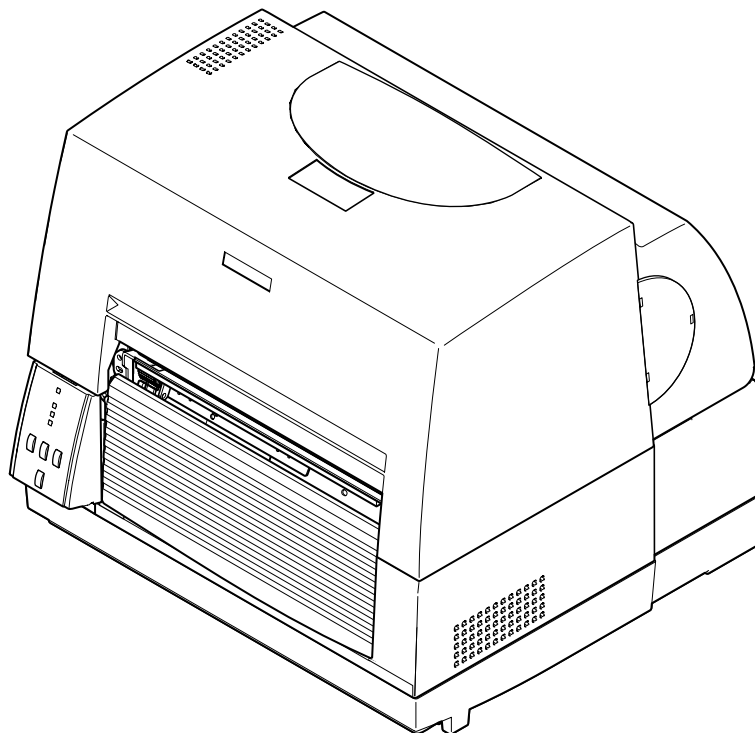
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APPENDICES

Safety Precautions

To prevent personal injury or property damage, the following shall be strictly observed.
The degree of possible injury and damage due to incorrect use/maintenance or improperly following instructions is described below.

⚠ Warning	Indicates a situation which, if not observed and handled properly, could result in death or serious injury.
⚠ Caution	Indicates a situation which, if not observed and handled properly, could result in injury or property damage.

⚠ : This is a mark to call attention to the reader.

⚠ Warning

- **Before starting disassembly/reassembly or mechanical adjustment, be sure to disconnect the power cord from the power source.**
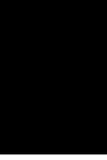
⚠ Caution

- **Do not disassemble/reassemble or adjust the machine, if it functions properly. Particularly, do not loosen screws on any component, unless necessary.**
- **After completing an inspection and before turning on the power, be sure to check that there is no abnormality.**
- **Never try to print without media.**
- **Check that the media is properly set.**
- **Do not lay anything on the cover or lean against it during maintenance or while the printer is in operation.**
- **During maintenance, be careful not to leave parts or screws unattached or loose inside the printer.**
- **When handling a printed circuit board, do not use gloves, etc., which can easily cause static electricity. Since ICs, such as CPU, RAM and ROM, might be destroyed by static electricity, do not touch lead wires or windows unnecessarily.**
- **Do not put the printed circuit boards directly on the printer or on the floor.**
- **When disassembling or reassembling, check wires for any damage and do not pinch or damage them. Also, run wires as they were.**

CHAPTER 1
SPECIFICATIONS

CHAPTER 1   SPECIFICATIONS

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1-1. General Specifications

Printing	
Printing method	Thermal transfer/Direct thermal
Resolution	Main scanning line density: 203 dots/inch (8 dots/mm)
	Sub-scanning line density: 203 dots/inch (8 dots/mm)
	Head 1344 dots (effective dots: 1344 dots)

Max. print width	168 mm	6.6inch
Max. print length	2539.7 mm	99.99 inch

Print density	Print density is adjustable with software
Printing speed setting	6, 5, 4, 3 or 2 inches per second

Print mode	
Batch mode	Normal printing (single or multiple sheets)
Tear off mode	Feeds back media to the tear-off position after printing is completed.
Cut mode *[1]	Prints while cutting at designated sheet units. The following two kinds of cut mode operations are available. • Back feed • Cut through (Cut through refers to stopping present printing to cut the previous label when it reaches the cut position. After cutting, printing restarts but a gap may be created at the seam of the printing at this time.)
Peel mode*[1]	Peels labels from the liners after printing them.

Media		
Types of media	Roll, fanfold (continuous media, die-cuts, continuous tags, paper or tickets)	
Recommended media	Thermal transfer: label media (LR1111 Lintec) Direct thermal media: label media (150LA-1 Ricoh), tag media (130LHB Ricoh)	
Max. media width	178.0 mm	7.01"
Min. media width	50.0 mm	1.97"
Min. label width	50.0 mm	1.97"
Min. label pitch*[2]	19.0 mm	0.748"
Max. media thickness	0.254 mm	0.01"
Max. media length	2539.7 mm	99.99"
Min. media length	16.0 mm	0.63"
Min. media thickness	0.0635 mm	0.0025"
On-board roll media diameter	Max. external diameter: 127mm	5"
	Media core: 25.4 to 76mm	1 to 3"
	Min. media core external diameter (when using label media): 50.8 mm	2"

*1: Options can be separately purchased.

*2: When a media pitch of less than 1" is used, set the "Small Media Adjustment" setting in the "Page Setup" menu to "On".

Ribbon		
Recommended ribbon	B110A Ricoh	
Max. ribbon width	174.0 mm	6.85"
Min. ribbon width	50.0 mm	1.97"
Max. ribbon length	360.0 m	1181 ft
Max. roll diameter	74.0 mm	2.90"
Outer diameter of the paper core	33.4±0.50mm	1.31 ± 0.02"
Inner diameter of the paper core	25.4 ± 0.25 mm	1.00 ± 0.01"
Ribbon end tape length	Max. 80.0 mm	3.15"
Ribbon end detection	Ribbon out detection by a ribbon sensor	
Bar code		
	For Datamax® emulation*3	
	One-dimension	• Code 3 of 9 • UPC-A • UPC-E • EAN-13 (JAN-13) • EAN-8 (JAN-8) • Interleaved 2 of 5 • Code 128 • HIBC (Modulus 43-used code 3 of 9) • Codabar (NW-7) • Int 2 of 5 (Modulus 10-used Interleaved 2 of 5) • Plessey • Case Code • UPC 2DIG ADD • UPC 5DIG ADD • Code 93 • Telepen • ZIP • UCC/EAN 128 • UCC/EAN128 (for K-MART) • UCC/EAN128 Random Weight • FIM
	Two-dimension	• UPS Maxi Code • PDF-417 • Data Matrix • QR Code • Aztec • GS1 DataBar
	For Zebra® emulation*4	
	One-dimension	• Code 11 • Interleaved 2 of 5 • Code 39 • EAN-8 • UPC-E • Code 93 • Code 128 • EAN-13 • Industrial 2 of 5 • Standard 2 of 5 • ANSI CODABAR • LOGMARS • MSI • Plessey • UPC/EAN Extensions • UPC-A • POSTNET • Planet
	Two-dimension	• Code 49 • PDF-417 • CODA BLOCK • UPS Maxi Code • Micro PDF-417 • Data Matrix • QR Code • GS1 DataBar • TLC39 • Aztec

*3: Datamax® is a registered trademark of Datamax Bar Code Products Corporation.

*4: Zebra® is a registered trade mark of ZIH Corp.

Font		
	For Datamax® emulation*3	

		1. Seven kinds of fixed pitch font
		   Overseas, English fonts and European fonts
		2. OCR fonts
		   OCR-A*5, OCR-B*5
		3. Proportional fonts
		   CG Triumvirate smooth font
		   CG Triumvirate Bold smooth font
		   (6, 8, 10, 12, 14, 18, 24, 30, 36, 48 points)
		   • Character set: Conforms with code page 850 standards
		4. TrueType™ rasterizer *6

	For Zebra® emulation*4	

		1. Five kinds of fixed pitch font
		   Overseas, English fonts and European fonts
		2. OCR fonts
		   OCR-A*5, OCR-B*5
		3. Proportional font
		   CG Triumvirate Condensed Bold
		4. True type™ rasterizer*6

Symbol set		
		PC866U Ukraina*7, PC Cyrillic, ISO 60 Danish/Norwegian, DeskTop, ISO 8859/1 Latin 1, ISO 8859/2 Latin 2, ISO 8859/9 Latin 5, ISO 8859/10 Latin 6, ISO 8859/7 Latin/Greek, ISO 8859/15 Latin 9, ISO 8859/5 Latin/Cyrillic, ISO 69: French, ISO 21: German, ISO 15: Italian, Legal, Math-8, Macintosh, Math, PC-858 Multilingual, Microsoft Publishing, PC-8, Code Page 437, PC-8 D/N, Code Page 437N, PC-852 Latin 2, PC-851 Latin/Greek, PC-862 Latin/Hebrew, Pi Font, PC-850 Multilingual, PC-864 Latin/Arabic, PC-8 TK, Code Page 437T, PC-1004, PC-775 Baltic, Non-UGL, Generic Pi Font, Roman-8, Roman-9, ISO 17: Spanish, ISO 11: Swedish, Symbol, PS Text, ISO 4: United Kingdom, ISO 6: ASCII, Ventura International, Ventura Math, Ventura US, Windows 3.1 Latin 1, Wingdings, Windows 3.1 Latin 2, Windows 3.1 Baltic (Latv, Lith), Windows 3.0 Latin 1, Windows Latin/Cyrillic, Windows 3.1 Latin 5
Control language		
		Conforms to Datamax® programming language*3 and Zebra® programming language*4

*5: The OCR font may have a low recognition rate according to the reader.

*6: It is equipped with UFST™ and TrueType™ rasterizer that are licensed from Monotype Imaging, Inc.

   TrueType™ is a trademark of Apple Inc.

   UFST™ is a trademark of Monotype Imaging, Inc.

*7: "PC866U Ukraina" is available for Datamax® emulation only.

Outline of electronic devices	
CPU	32-bit RISC CPU
ROM	Standard equipment: FLASH ROM 16MByte (User area: 4MByte)
RAM	Standard equipment: SDRAM 32MByte (User area: 4MByte)
Media detection sensors	
Transparent sensor	Detects media gap between labels, notches on tags, and media out
Reflective sensor	Detects reflective mark on back of media and media out
PNE (Paper Near End) sensor	Detects the near end state of roll paper (By default, issuing a paper near end alarm is disabled by the menu settings.)
Label peeling sensor [1]	Detects labels that are peeled off.
Communication interfaces	
Serial	2400, 4800, 9600, 19200, 38400, 57600, or 115200 bps
USB	High-speed USB2.0 (480Mbps)
Communication interface (Options)	
Parallel[8]	IEEE1284 (Compatible, Nibble, ECP mode)
Network	Wired LAN: Ethernet interface (10-Base-T/100-Base-TX)
	Wireless LAN: IEEE802.11n/IEEE802.11g/IEEE802.11b
Indications and switches	
LED	POWER, PRINT, CONDITION, ERROR
Buzzer	Alarms, errors, etc.
Operating panel keys	PAUSE, FEED, STOP, MODE/REPEAT
Head-up detection switch	Detects head open.
Power switch	Turns power on and off.
Power supply	
120V version	120V (-10%+6%), 2.5A, 60Hz (U.S.A., Canada)
	UL60950-1st/2nd Edition, CSA No. 950, FCC Part 15 Subpart B (Class A)
220V version	220V-240V (-10%+6%), 1.5A, 50/60Hz (Europe)
	EN60950-1, EN55022 (Class A), EN55024, EN61000-3-2, EN61000-3-3, CCC GB4943-2001/GB9254-1998/GB17625.1-2003
Power consumption (max. value)	
120V version	105W (operation at 6 IPS at 12.5% printing duty)
	4.4W (printer standby in Normal mode)
	2.3W (printer standby in Standby mode[9])
220V version	105W (operating at 6 IPS at 12.5% printing duty)
	5.0W (printer standby in Normal mode)
	2.8W (printer standby in Standby mode[9])

*8: This interface is Non-L. P. S. (Limited Power Source).

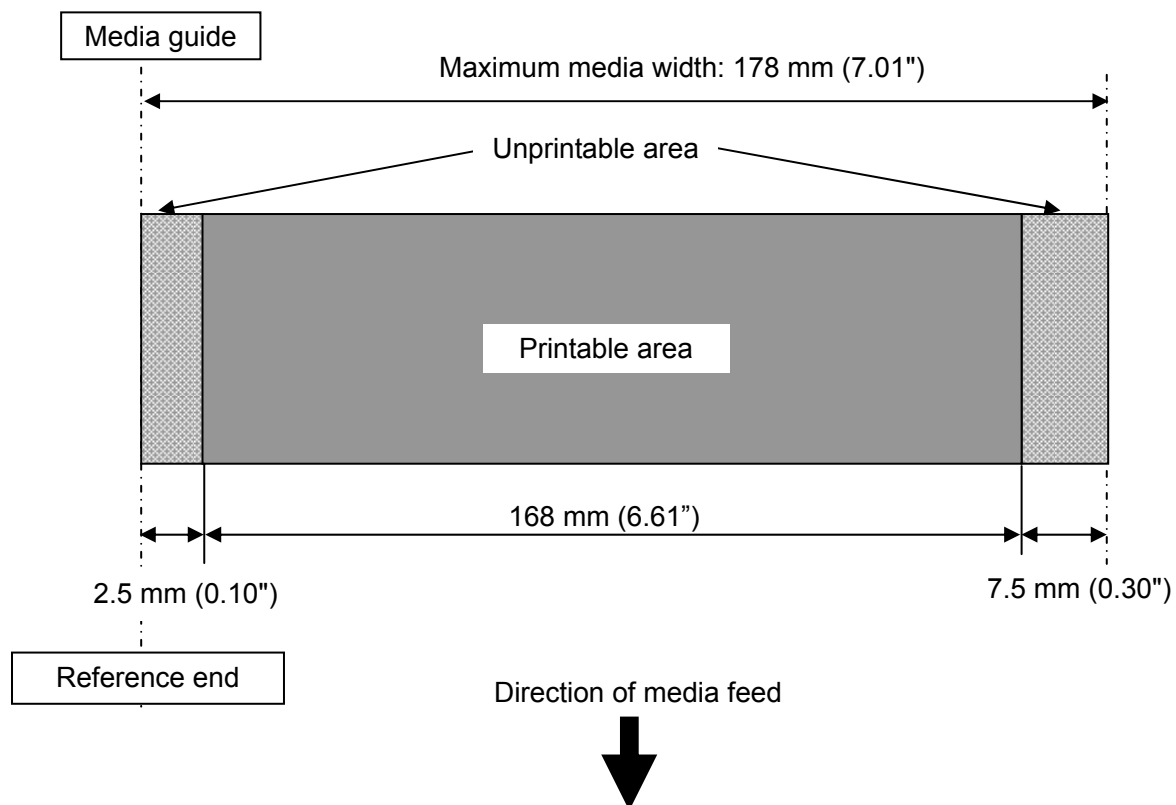*9: Standby mode is default OFF.

Others	
Environment	Operating temperature conditions: Operating temp. 0 to 40°C, humidity 30 to 80%, condensation free (Conditions: ventilation, and natural convection) Storage temperature conditions Temp. -20 to 60°C, humidity 5 to 85% (Store the printer with the Head Unit up, without paper installed and without condensation.) (Conditions: ventilation, and natural convection) [Operating and printing assurance condition] [Storage assurance condition]
External dimensions	Approx. 303 (W) X 290.1 (D) X 273.2 (H) mm 11.9 (W) X 11.4 (D) X 10.76 (H)"
Weight	Approx. 7.9 kg (17.4 lb.)
Accessories	Test label media, Test ribbon, CD-ROM (User's Manual), Quick start guide, Head cleaner, Power cord, Media holder bar and Media holder guide, Ribbon holder, Paper core
Option	Auto-cutter unit, Peeler unit, IEEE1284 Parallel I/F board, Ethernet I/F board, Wireless LAN I/F board

1-2. Printable Area

The printable area of the printer is as follows:

When media is set to the printer, it must be aligned with the media guide at the left of the printing mechanism. Though the available maximum media width is 178 mm (7.01"), there are unprintable areas on both sides: 2.5 mm (0.10") width is on the left side and 7.5 mm (0.30") width on the right side as shown below.

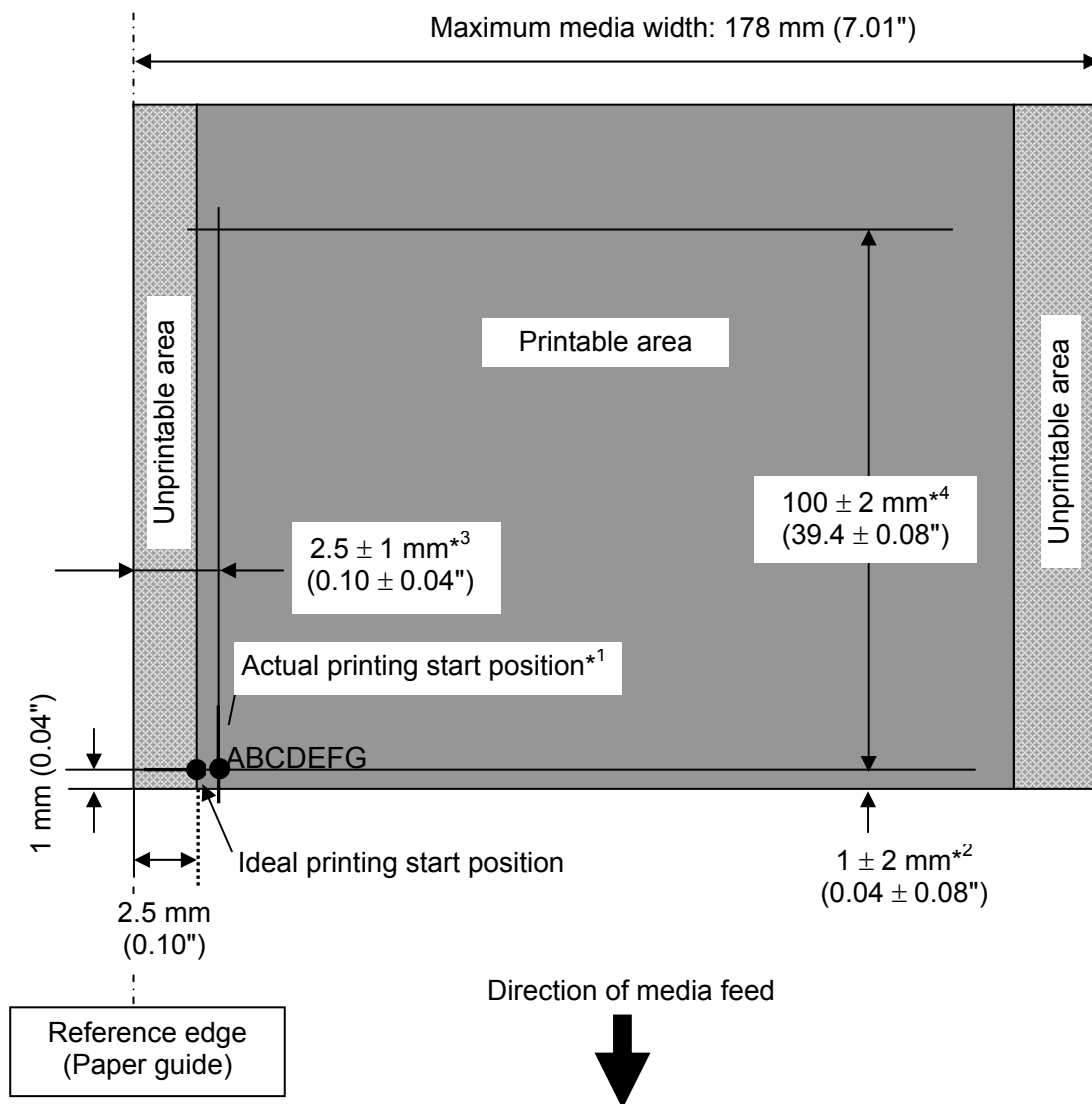The left side unprintable area applies for media of any size.

Media guide

Maximum media width: 178 mm (7.01")

Unprintable area

Printable area

168 mm (6.61")

2.5 mm (0.10")

7.5 mm (0.30")

Reference end

Direction of media feed

1-3. Printing Position Accuracy

By default, the printing start position is 2.5 mm (0.10") from the left end of the media and 1 mm (0.04") backward the leading edge of the label, U-shaped notch, or black mark.
2.5 mm (0.10") is the necessary value to avoid printing in the unprintable area as mentioned in "Printable Area".

The printing start position can deviate from the ideal position as follows:

Maximum media width: 178 mm (7.01")

Unprintable area

Printable area

100 ± 2 mm*4
(39.4 ± 0.08")

Unprintable area

2.5 ± 1 mm*3
(0.10 ± 0.04")

Actual printing start position*1

ABCDEFG

1 mm (0.04")

Ideal printing start position

2.5 mm (0.10")

1 ± 2 mm*2
(0.04 ± 0.08")

Reference edge
(Paper guide)

Direction of media feed

*1: Actual printing start position. May deviates from the ideal one in the indicated range.
*2: Deviation of vertical positioning when printing position is set to 0.
*3: Deviation of horizontal positioning when printing position is set to 0.
*4: Deviation of vertical printing position when 100 mm is specified from the printing start position.

1-4. Adjustable Sensors

There are two media sensors; the upper sensor (transparent sensor) and the bottom sensor (reflective sensor). The upper sensor is used to detect the labels on the liner or the U-shaped notches of tag. The bottom sensor is used to detect the black marks on tag. Also, both sensors are used to detect media end.
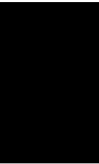
The mechanical adjustable range of both sensors is equal and they are adjusted at the same time by turning the blue knob ("Gear Bevel Lead Screw U").

For details about the media sensors, refer to "2-1-3 Label/Tag Detection Mechanism".
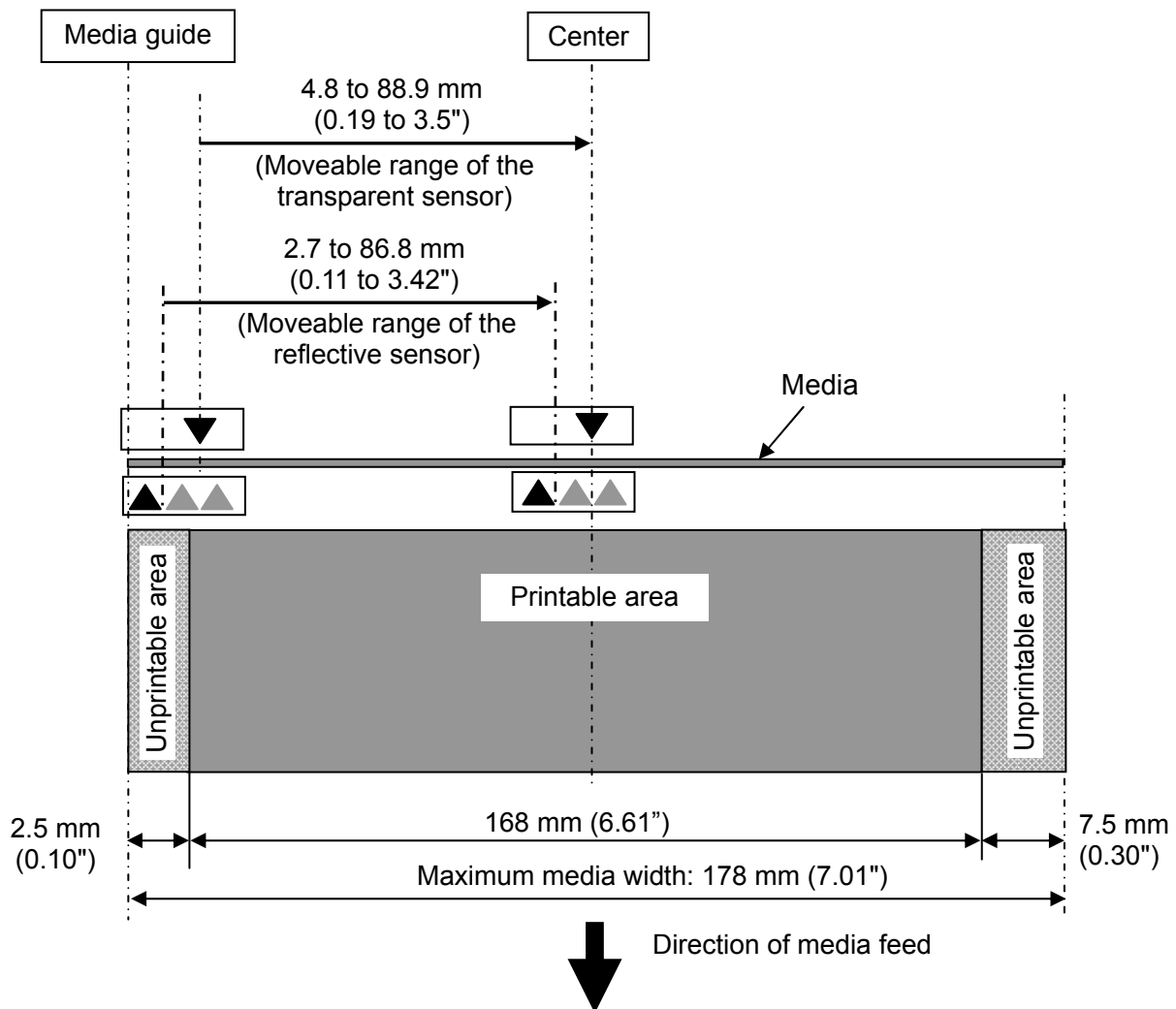
CHAPTER 2
OPERATING PRINCIPLES

CHAPTER 2   OPERATING PRINCIPLES

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2-1. Operation of Each Mechanism

This printer is a thermal transfer barcode & label printer comprised of the following mechanisms: media feed, ribbon feed, label/tag detection, print head up/down detection, paper near end detection, head balance adjustment, media thickness adjustment and transparent/reflective sensor travel.

This section describes the operation of each of these mechanisms.

2-1-1. Locations and Functions of Motors, Sensors and Thermal Head

This printer has the following motors, sensors and thermal head.

(1) "Unit, Ribbon" section

Part name	Description
SA Ribbon Motor F (Front side)	This motor takes up ribbon. A thermistor is attached to the side of this motor to detect the motor temperature.
SA Ribbon Motor R (Rear side)	This motor gives back tension to ribbon.
Ribbon Sensor F ("SA, Ribbon Sensor" on the front side)	This sensor consists of two photointerrupters to detect if appropriate tension is given to the front side ribbon. It also detects a ribbon-running error.
Ribbon Sensor R ("SA, Ribbon Sensor" on the rear side)	This sensor consists of two photointerrupters to detect if appropriate tension is given to the rear side ribbon. It also detects the ribbon end status.

SA Ribbon Motor R

SA Ribbon Motor F

Ribbon Sensor R ("SA, Ribbon Sensor" on the rear side)

Ribbon Sensor F ("SA, Ribbon Sensor" on the front side)
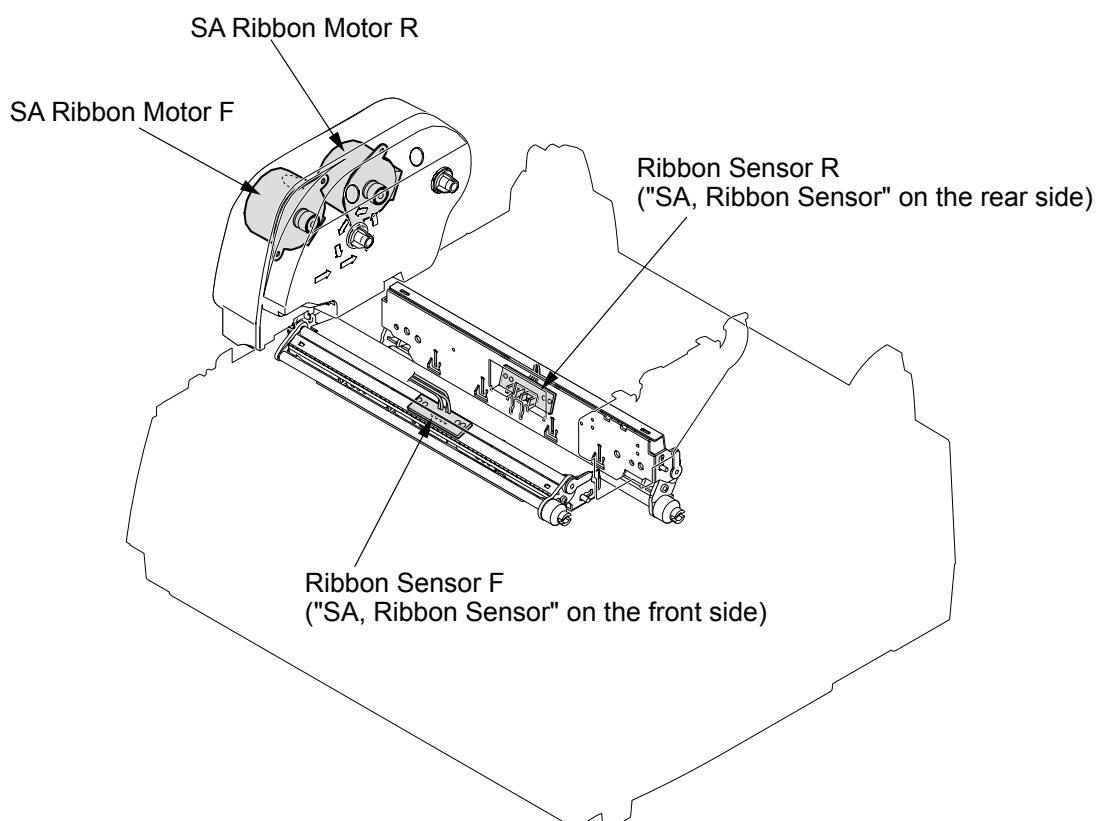
(2) Printing section

Part name	Description
SA PF Motor	This motor feeds media. A thermistor is attached to the side surface of this motor to detect the motor temperature.
SA, Head Up Switch	This switch is a mechanical lever switch to detect the print head position; up or down.
Transparent Sensor (Upper sensor) (SA TRA Sen PCB)	This sensor is a photo sensor to detect the labels stuck on liner or U-shaped notches on tag. It also detects the media end.
Reflective Sensor (Bottom sensor) (SA Ref Sen PCB)	This sensor is a photo sensor to detect the black marks on tag. It also detects the media end.
SA, Head	It consists of a head driver and thermal elements. Thermal elements are heated to make printing on media. The thermal head incorporates a thermistor to detect the thermal head temperature.
SA PNE Sensor (Paper near end sensor)	This sensor is a photo sensor to detect a near end status of roll paper installed.
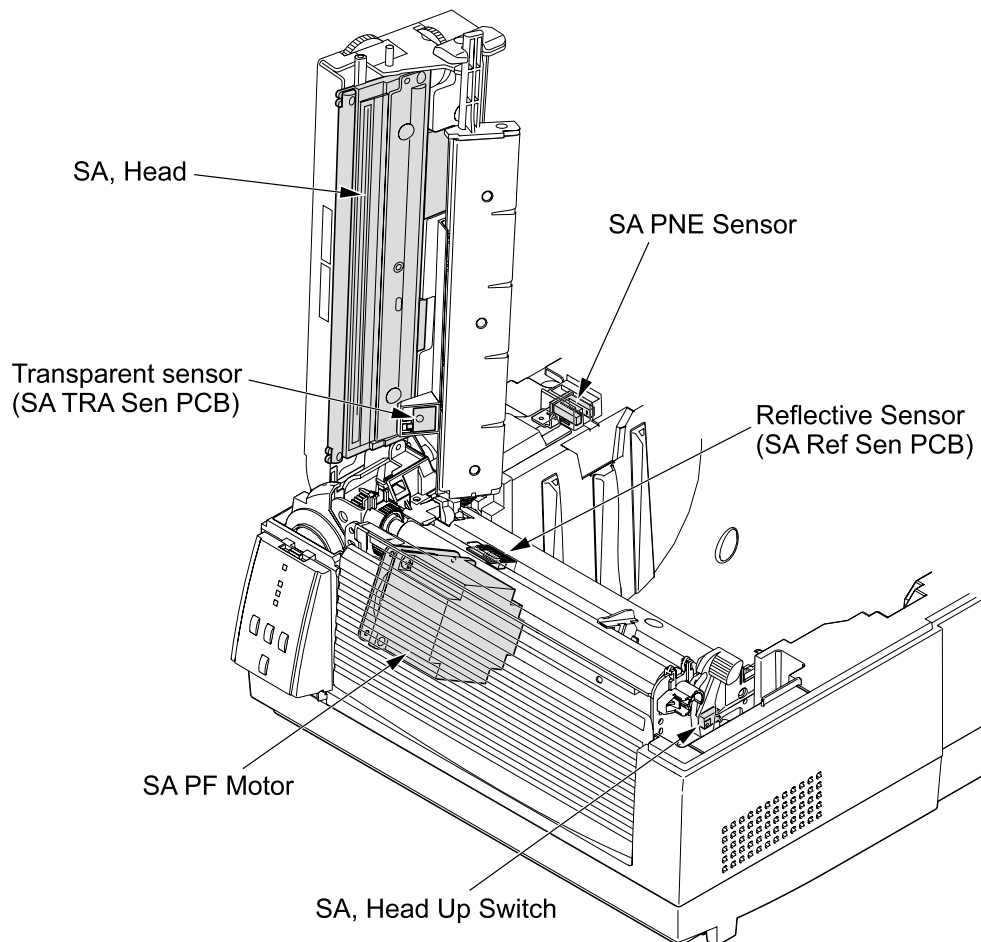
2-1-2. Media Feed Mechanism

The major components of the media feed mechanism are:
(a) SA PF Motor
(b) SA2_Platen
(c) Gear train

By setting the head block to the down position, media is pushed against the "SA2_Platen" by the "SA, Head".
As the "SA PF Motor" (stepping motor) turns counterclockwise viewing from the right side of the printer, the "SA2_Platen" turns counterclockwise via the gear train ("Gear Reduction PF 1", "Gear Reduction PF 2" and "Gear Idle PF") and media is fed forward by the friction force produced between the "SA2_Platen" and the "SA, Head".

When the "SA PF Motor" turns clockwise, media is fed backwards.
One step of the "SA PF Motor" feeds media by 1/16 mm (0.0025").

[Right side view]
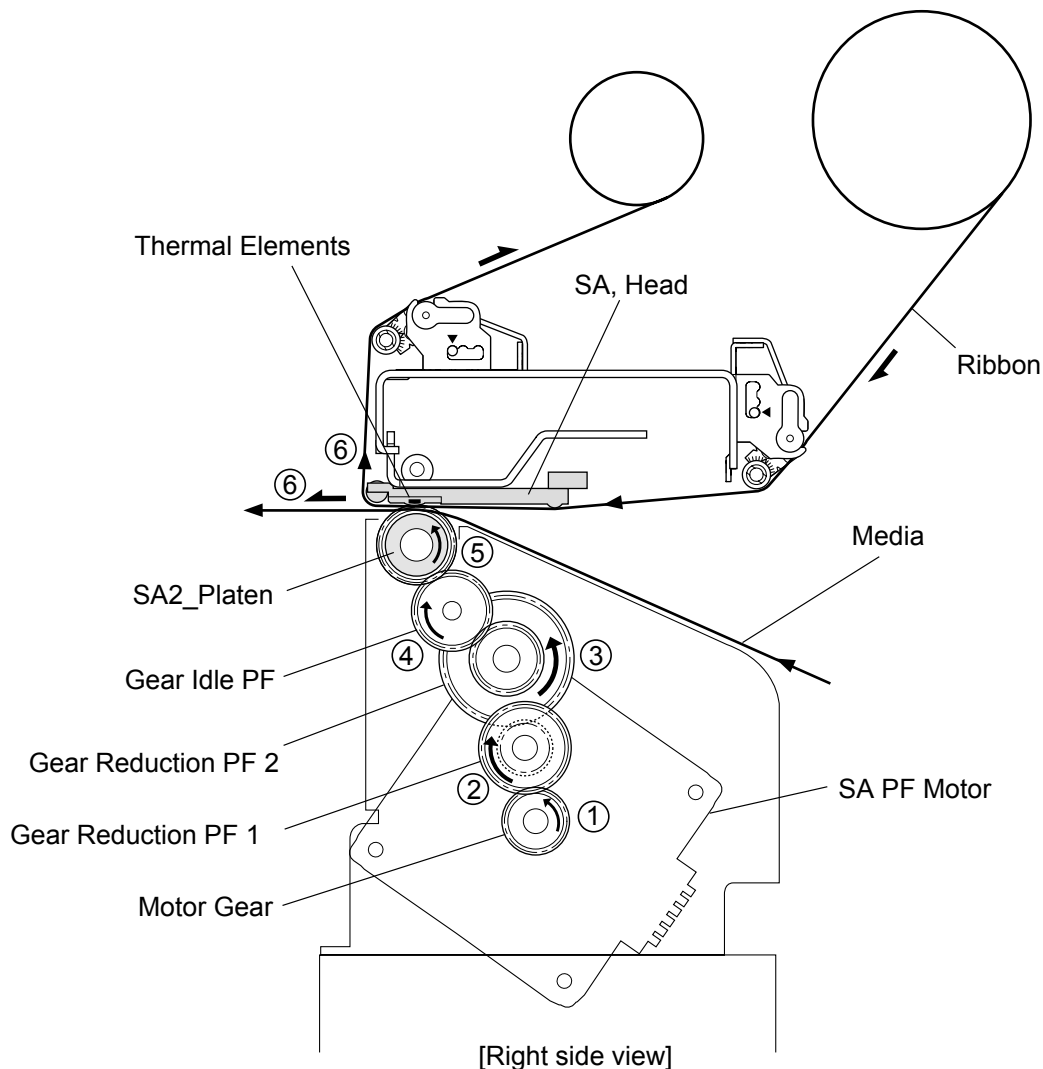
2-1-3. Label/Tag Detection Mechanism

The major components of the label/tag detection mechanism are:
(a) Reflective sensor (Bottom sensor) (SA Ref Sen PCB)
(b) Transparent sensor (Upper sensor) (SA TRA Sen PCB)

There are two movable sensors, the reflective sensor (bottom sensor) and the transparent sensor (upper sensor). As you adjust the sensor position with the blue knob ("Gear Bevel Lead Screw U"), both sensors move at the same time.
As shown in the figure below, the reflective sensor has two LEDs and one phototransistor. The reflective sensor is used to detect black marks at the back of tag. On the other hand, the transparent sensor is a phototransistor that will receive the transparent light from the LEDs through the media. The transparent sensor is used to detect labels on liner or U-shaped notches of tag. Both reflective and transparent sensors are used to detect the media end.

Aligning the sensors for label paper or tag with U-shaped notches:

For label paper, turn the blue knob ("Gear Bevel Lead Screw U") to align the ▌ mark of the transparent sensor at the center of label. (The transparent sensor and the reflective sensor move at the same time.) For tags with U-shaped notches, turn it to align the ▌ mark with the U-shaped notch.

Aligning the reflective sensor for tag with black marks:

For tag with black marks, turn the blue knob ("Gear Bevel Lead Screw U") to align the left side mark of the reflective sensor with the black mark of tag.

Gear Bevel Lead Screw U

[For label paper/tag with U-shaped notches]
* Both sensors are used.

Transparent Sensor

Reflective Sensor

Photo-transistor

Transparent Sensor

Phototransistor
LEDs

Reflective Sensor

[For tag with black marks]
* Reflective sensors alone is used.

Black mark
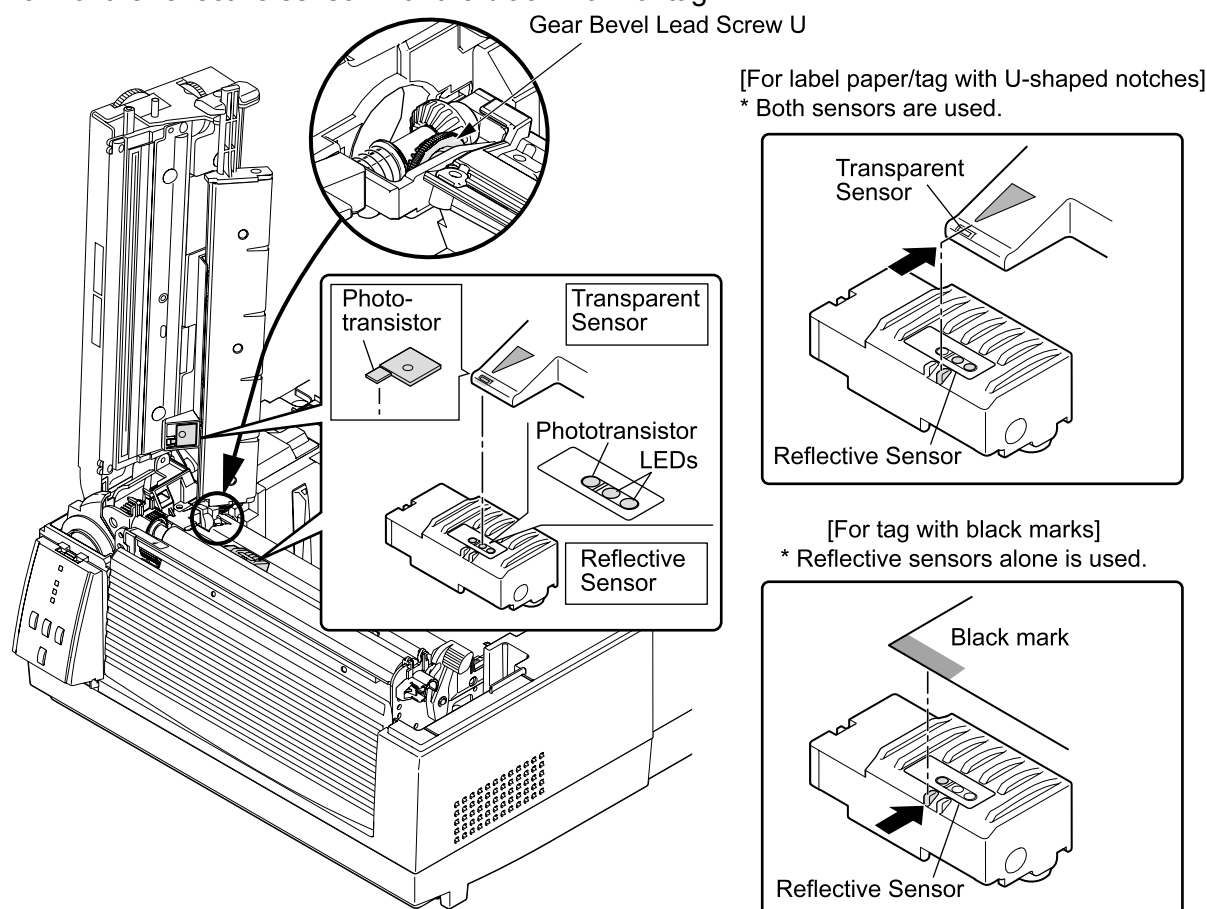
Reflective Sensor

Detecting labels: (Media Sensor menu: "See Through")
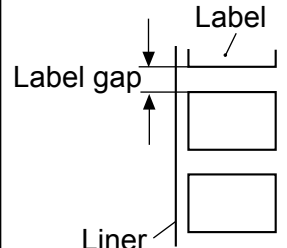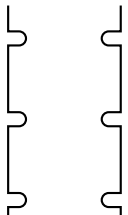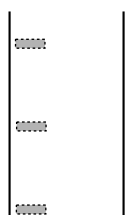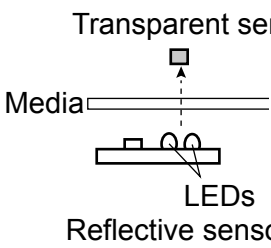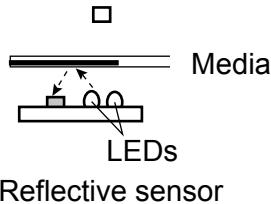
For detecting label, both reflective sensor and transparent sensor are used. Label paper passes between both sensors. The light emitted from the LEDs of the reflective sensor passes through the liner (base part of label paper) where no label is stuck on it, and the light reaches the transparent sensor. Accordingly, the phototransistor of the transparent sensor turns ON. Meanwhile, in the label part, the light is blocked by label and does not reach the phototransistor. So, the phototransistor turns OFF. By sensing the output of the transparent sensor, the CPU on the Main PCB can detect the label leading edge for printing.

Detecting U-shaped notches of tag: (Media Sensor menu: "See Through")

For detecting U-shaped notches of tag, both reflective sensor and transparent sensor are used. The U-shaped notches are detected in the same way as the label mentioned above, except that the light is directly falls on the transparent sensor through the notch.

Detecting black marks on tag: (Media Sensor menu: "Reflect")

For detecting black marks on tag, only the reflective sensor is used. Light emitted from the LEDs is reflected by the tag (at other than the black mark) and reaches the phototransistor of the reflective sensor. At the black mark, the light is not reflected. The CPU on the Main PCB detects the black mark by sensing the output of the reflective sensor.

	Label	Tag	
Media	Label gap / Label / Liner	U-shaped notch	Black mark
	Transparent and Reflective sensors	Reflective sensor	
Sensor to be used	Transparent sensor / Media / LEDs / Reflective sensor	Media / LEDs / Reflective sensor	
Media Sensor menu	See Trough	Reflect	

Detecting continuous media: (Media Sensor menu: "None")

For detecting continuous media, only the reflective sensor is used. In this case, only media end is detected by the reflective sensor.

LED light amount control:

According to the media selected by the Media Sensor menu ("See Through", "Reflect", or "None"), the amount of light is well controlled to detect the label/U-shaped notch, black mark, or continuous media. The amount of light is as follows (the largest amount is for "See Through):

• Continuous media (None) < Black mark (Reflect) < Label/U-shaped notch (See Through)

2-1-4.   Printing and Ribbon Feed Mechanism

The major components of the printing and ribbon feed mechanism are:

(a) SA, Head

(b) SA Ribbon Motor F/R

(c) Ribbon gear train

(d)   SA, Ribbon Tension Shaft F/R

(e)   SA, Ribbon Sensor (Front/Rear)

Ink ribbon is set to the printer using the ribbon holders. Ribbon is supplied from the supply reel and is taken up by the take-up reel with adequate ribbon tension, via the "SA, Ribbon Tension Shaft R" and "SA, Ribbon Tension Shaft F". The "SA, Ribbon Tension Shaft F/R" is always pushed outward by the internal springs, and, when ribbon slacks, it moves outward. When ribbon tightens, it moves inward. (Refer to the figures on the later pages.)

The same ribbon sensor is installed on the front and rear sides. The ribbon sensor on the front side is used to detect the position of the "SA, Ribbon Tension Shaft F" (i.e., the ribbon tension on the front side). While, the ribbon sensor on the rear side is used to detect the position of the "SA, Ribbon Tension Shaft R" (i.e., the ribbon tension on the rear side).

The ribbon sensor on the front side is also used to detect a ribbon running condition, and that on the rear side is used to detect the ribbon end.

On the front side, the "SA Ribbon Motor F" turns to take up ribbon. On the rear side, the "SA Ribbon Motor R" turns to supply ribbon, while applying adequate back tension to ribbon to eliminate ribbon slack.
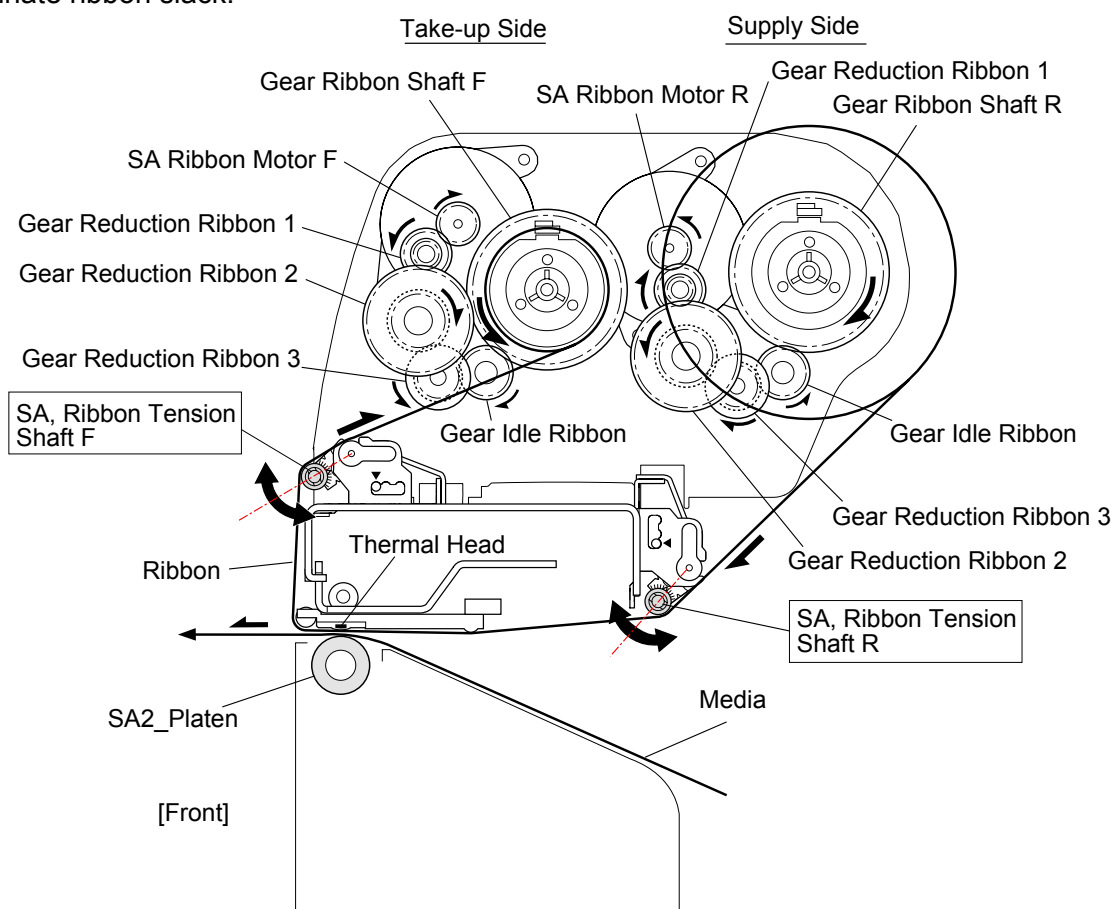
Printing:

When printing with ink ribbon, ink on the ribbon is melted by the heated thermal element of the "SA, Head" and is transferred on the media surface.

Taking up Ribbon:

Ribbon will be taken up on the front side as follows:

(1) As media is fed, ribbon is also fed by the friction force produced between media and the "SA, Head".

(2) Ribbon slacks and the ribbon sensor on the front side turns OFF as the "SA, Ribbon Tension Shaft F" is pushed outward.

(3) The "SA Ribbon Motor F" starts to turn and ribbon is taken up.

(4) Ribbon tightens and the ribbon sensor on the front side turns ON. Then, the "SA Ribbon Motor F" stops.

Supplying Ribbon:

On the rear side, the "SA Ribbon Motor R" turns to supply ribbon, while applying adequate back tension. In the same way as on the front side, the ribbon sensor on the rear side detects the ribbon tension to keep the ribbon tension constant. However, when printing is made and ribbon is fed, the ribbon sensor on the rear side turns ON since ribbon is tightened at this time.

Reel Drive Mechanism:

Though the ribbon holders are directly installed in the reels, ribbon is connected to the reels via the spring mechanism of the ribbon holders. This means that ribbon is taken up via the spring mechanism when the "SA Ribbon Motor F"/"SA Ribbon Motor R" turns.

On the front side, the "SA Ribbon Motor F" turns in the clockwise direction viewing from the right side of the printer, and the "Gear Ribbon Shaft F" (take-up reel) turns in the counterclockwise direction via the "Gear Reduction Ribbon 1", "Gear Reduction Ribbon 2", "Gear Reduction Ribbon 3" and "Gear Idle Ribbon". Thus, ribbon is taken up.

On the rear side, the "SA Ribbon Motor R" turns in the counterclockwise direction, and the "Gear Ribbon Shaft R" (supply reel) turns in the clockwise direction via the "Gear Reduction Ribbon 1", "Gear Reduction Ribbon 2", "Gear Reduction Ribbon 3" and "Gear Idle Ribbon", Ribbon". Thus, ribbon is supplied.

Detecting Ribbon Tension (Ribbon Sensors):

The same ribbon sensor is installed on the front and rear sides. Since the operation is the same on both sides, the front side operation is explained here:

When ribbon is taken up, the ribbon tightens and the "SA, Ribbon Tension Shaft F" is pushed inward (in the direction of "**a**") by the ribbon. At this time, the claws "**A**" attached to the "SA, Ribbon Tension Shaft F" are inserted into the photointerrupters of the "SA, Ribbon Sensor", and the photointerrupters turn OFF.

During printing, the ribbon is fed forward together with media and the ribbon will slack. This, the "SA, Ribbon Tension Shaft F" is moved outward (in the direction of "**b**") by the spring ("**B**") force, and the claws "**A**" come off the photointerrupters. So, the photointerrupters turn ON and the "SA Ribbon Motor F" turns faster to take up the ribbon quickly. Then, the claws "**A**" are inserted into the photointerrupters again, and the "SA Ribbon Motor F" resumes normal speed.

This cycle is repeated and constant tension is applied to the ribbon.

(The two claws "**A**" are arranged so that they are inserted into or released from the photointerrupters with a slightly different timing. This function enables to finely control the ribbon tension.)

On the rear side, during printing, ribbon will be tightened. If it is tightened, the ribbon sensor turns ON and the "SA Ribbon Motor R" turns faster than normal speed to quickly supply ribbon.
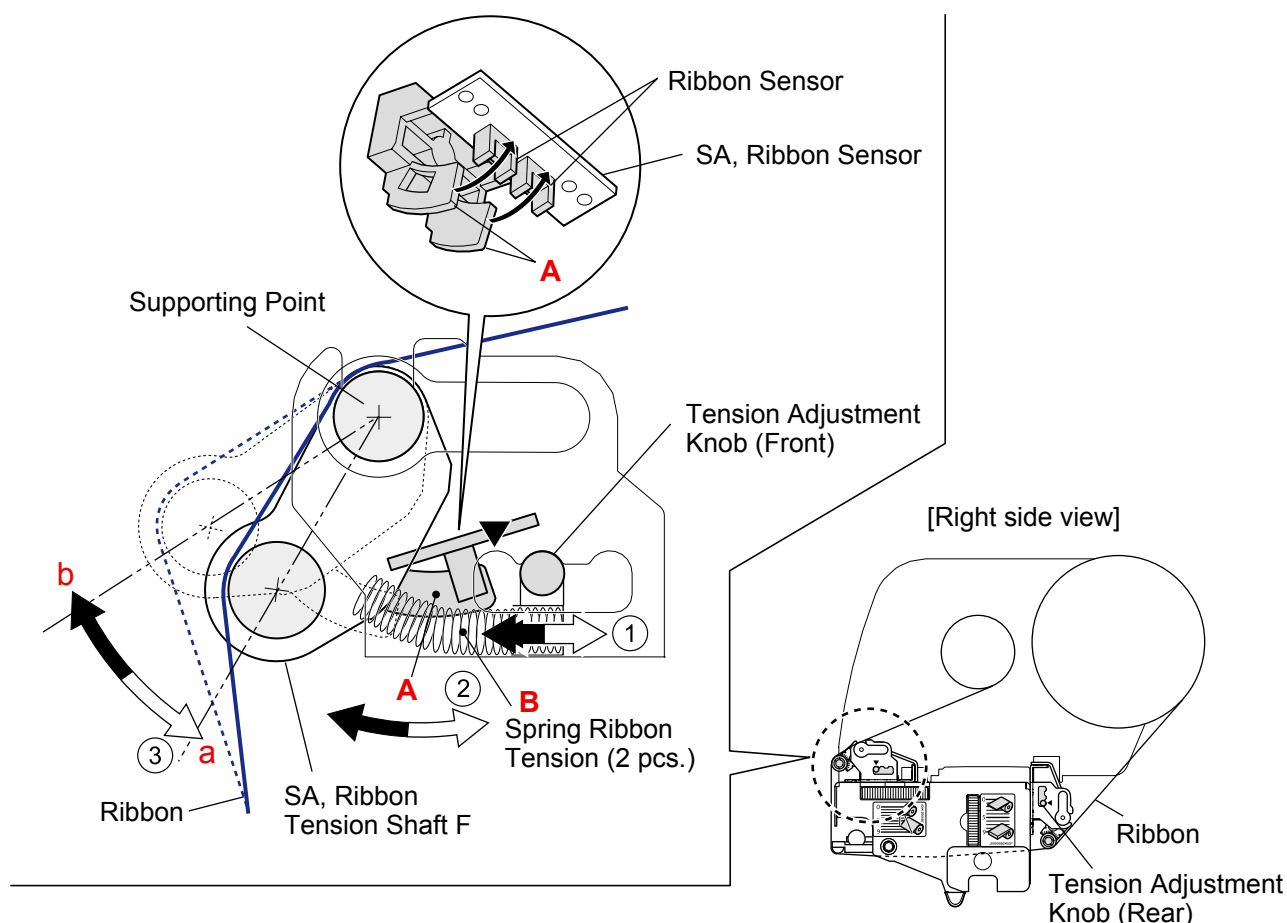
Tension Adjustment Mechanism:

To apply adequate ribbon tension, you can change the spring "**B**" force as follows:

The spring force is adjustable in 3 steps with the "Tension Adjustment Knob (Front/Rear)". As you move the knob toward the ▼ mark, the spring force becomes stronger since the spring "**B**" is moved to the left in the above figure.

2-1-5. Print Head Up/Down Detection Mechanism

The component of the print head up/down detection mechanism is as follows:

(a) SA, Head Up Switch

(b) Pop Up Cover Frame

(c) Spring Pop Up

(d) Support Pop Up

The print head up/down detection mechanism detects the up (open)/down (close) status of the "Unit, Head".

When the "Unit, Head" is in the down position, the "Support Pop Up" (a part of the "Unit, Head") pushes down the top of the "Pop Up Cover Frame", and the lever of the "SA, Head Up Switch" is pushed. In this state, the "SA, Head Up Switch" turns ON and the signal line is in "Low" level.

While, the "Unit, Head" is in the up position, since the "Pop Up Cover Frame" is released from the "Support Pop Up", it pops up by the force of "Spring Pop Up" and the switch lever is set free. In this state, the "SA, Head Up Switch" turns OFF and the signal line is in "High" level.

The CPU on the Main PCB detects up or down position of the "Unit, Head" by sensing the output of the "SA, Head Up Switch.
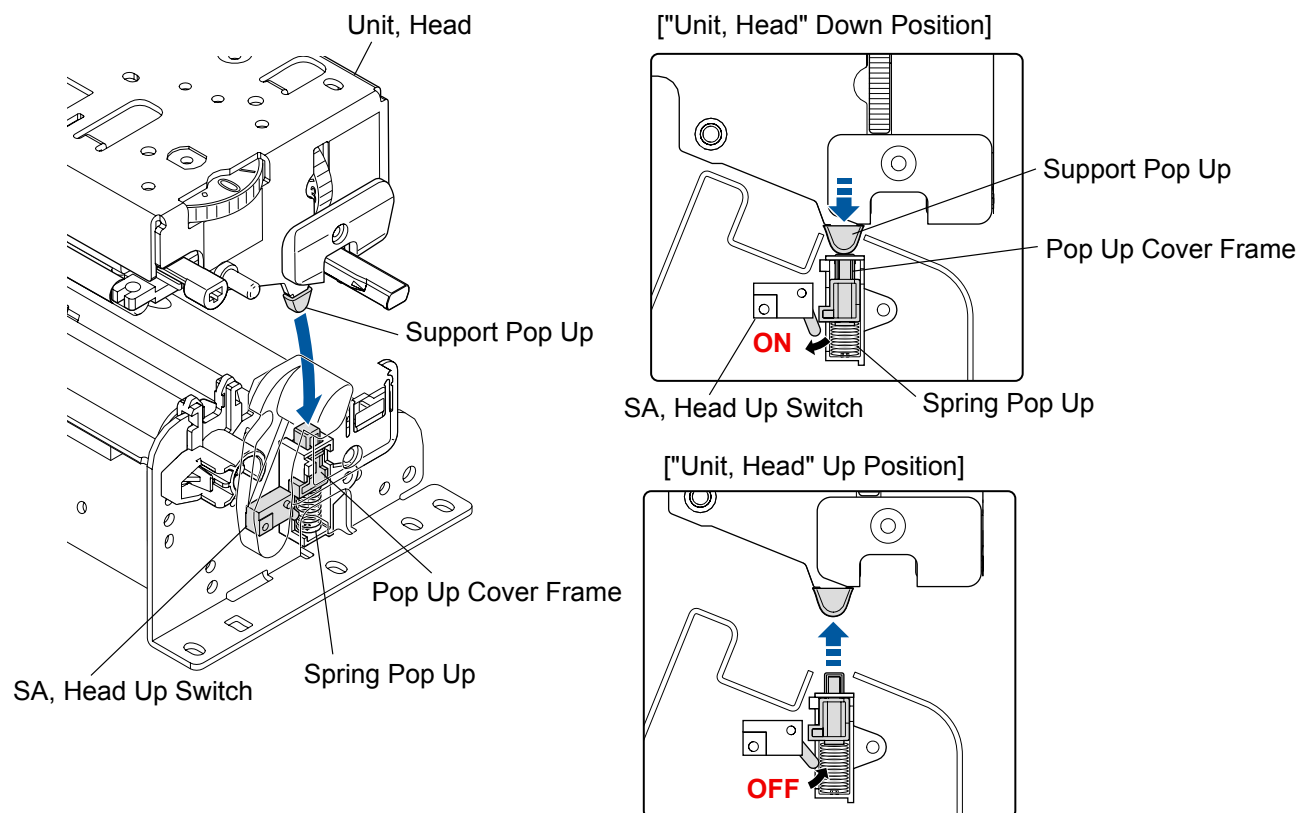
2-1-6. Paper Near End Detection Mechanism

The component of the Paper near end detection mechanism is as follows:
(a) SA PNE Sensor (A part of the main body)
(b) Lever PNE (A part of the "Roll Paper Holder")
(c) Slider PNE (A part of the "Roll Paper Holder")
(d) Spring PNE (A part of the "Roll Paper Holder")

The paper near end sensor is used to detect a paper near end status of roll paper installed in the printer.
The knob of the "Lever PNE" is pushed by the side of roll paper and the "Slider PNE" engages with the "SA PNE Sensor" (fixed part on the main body). In this state, the "SA PNE Sensor" (photointerrupter) turns OFF.
When printing proceeds and the diameter of roll paper is reduced to the preset paper near end point, the knob of the "Lever PNE" that was pushed by the roll paper pops up, and the "Slider PNE" comes off the "SA PNE Sensor". In this state, the "SA PNE Sensor" (photointerrupter) turns ON.
The CPU on the Main PCB detects the ON/OFF status of the "SA PNE Sensor" (photointerrupter) and judges if the roll paper reaches the near end status.

The paper near end position can be changed mechanically by sliding the knob of the "Lever PNE" up or down.
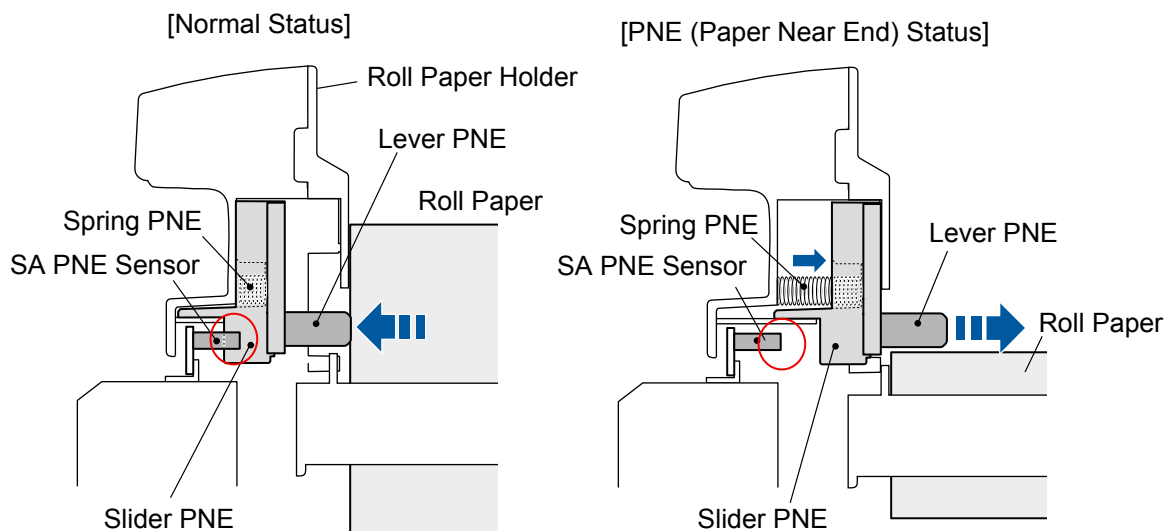
2-1-7. Head Balance Adjustment Mechanism

The major components of the head balance adjustment mechanism are:

(a) Cam Head Balance   (c) Spring Head L/R

(b) Plate Head Balance

The head balance adjustment mechanism is used to eliminate uneven printing density on media. The head balance adjustment is accomplished by changing the right side head pressure according to media width to be used. To adjust, the blue Media width adjustment dial ("Cam Head Balance") is used. When narrow width media is used, the dial should be set toward "0" to give weaker pressure. While, wide width media is used, it should be set toward "9" to give stronger pressure.

When narrow width media is used (need to give weak pressure):

The "Spring Head L" and "Spring Head R" (2 pcs.) act to press the "SA, Head" against the "SA2_Platen". For narrow width media, if the same pressure is given on both sides, since no media exists on the right side of the "SA, Head", the "SA, Head" will slant to the right, resulting in uneven printing density. The part "**A**" of the "Plate Head Balance" is pushed against the cam part of the "Cam Head Balance" by the force of "Spring Head R" and it moves up step by step (②) as the Media width adjustment dial is turned toward "0" (①). As it moves up, the "Spring Head R" is pressed with weaker force by the "Plate Head Balance" (③), and the right side pressure against the "SA, Head" decreases, resulting in even printing density. You need to align the dial number according to the media width to be used. (Smaller number for narrower media)

When wide width media is used (need to give strong pressure):

The same principle applies to wide media. However, in this case, the Media width adjustment dial should be turned toward "9". Then the part "**A**" of the "Plate Head Balance" moves down to apply stronger pressure to the "SA, Head". (Larger number for wider media)

CL-S6621
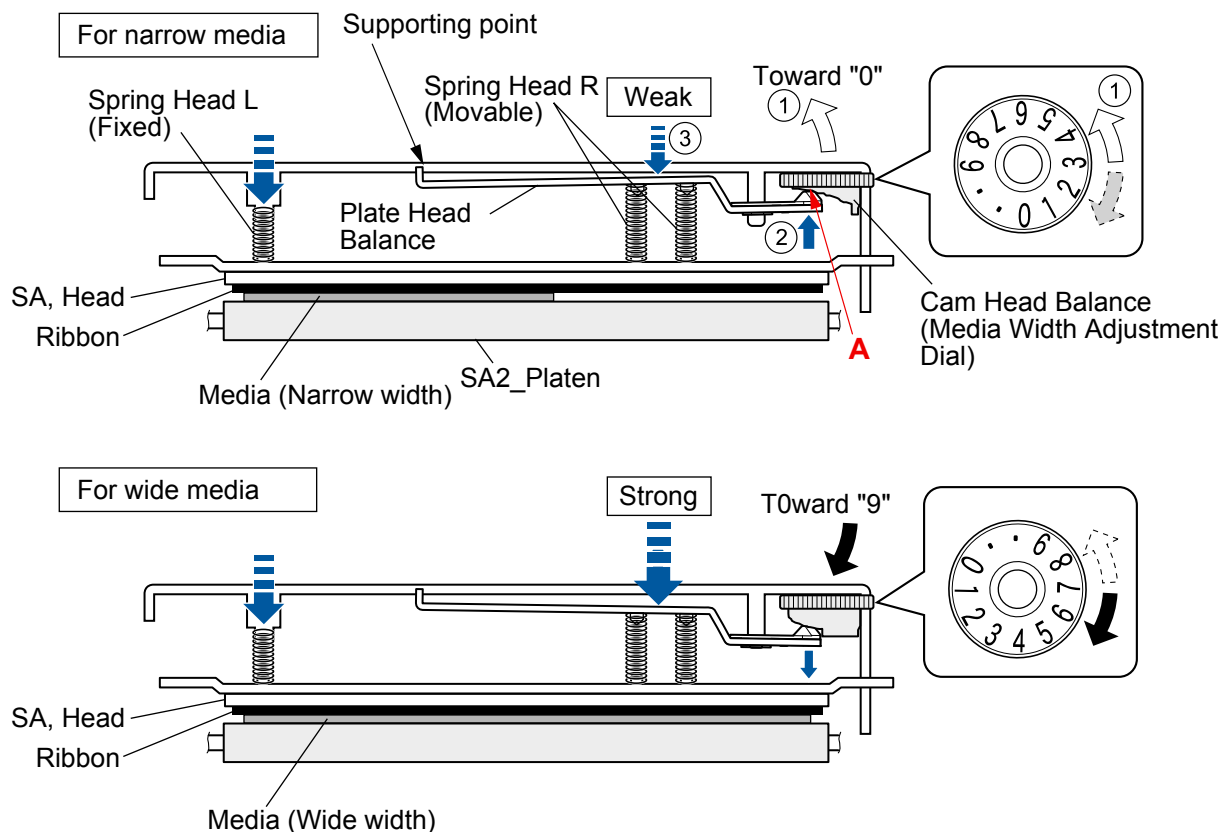
2-1-8.   Media Offset Adjustment Mechanism

The major components of the media thickness adjustment mechanism are:

(a) Cam Head Adjust   (c) Spring Head Holder

(b) SA Head Adjust Lever   (d) Plate Holder Head

According to the softness of media, the thermal element position is displaced from the optimum position. The head offset adjustment mechanism is used to correct this by moving the "SA Head" back and forth a little. By performing the head adjustment properly, optimum printing quality is obtained. (When shipping, the Media thickness adjustment dial is set to "1" for soft media.)

When soft media is used (thin thermal paper, label paper, etc.):

When soft media is used, the optimum position of the thermal elements will be nearly right above the center of the "SA2_ Platen". (In dial No. "1", they are aligned with the platen center.)

When hard media is used (tag paper):

When hard media is used, the optimum position of the thermal elements will shift toward the front a little from the center of the "SA2_Platen", i.e. toward the left viewing from the right side of the "SA2_ Platen" as shown below. As the optimum position varies according to the hardness of media, it is necessary to adjust the Media thickness adjustment dial from "1" to up to "9" for optimum printing. As the dial is turned (①), the "SA Head Adjust Lever" swings up and down (②) as its projection "**A**" moves along the groove of the dial.

The "Plate Holder Head" end is pinched by the "Spring Head Holder" at end "**B**" of the "SA, Head Adjust Lever". (Namely, both parts are connected via the "Spring Head Holder".)

Therefore, as the "SA, Head Adjust Lever" swings up and down (②), the "Plate Holder Head" swings up and down accordingly (③). With this movement of the "Plate Holder Head", the thermal element position slightly moves back and forth against the "SA2_Platen".
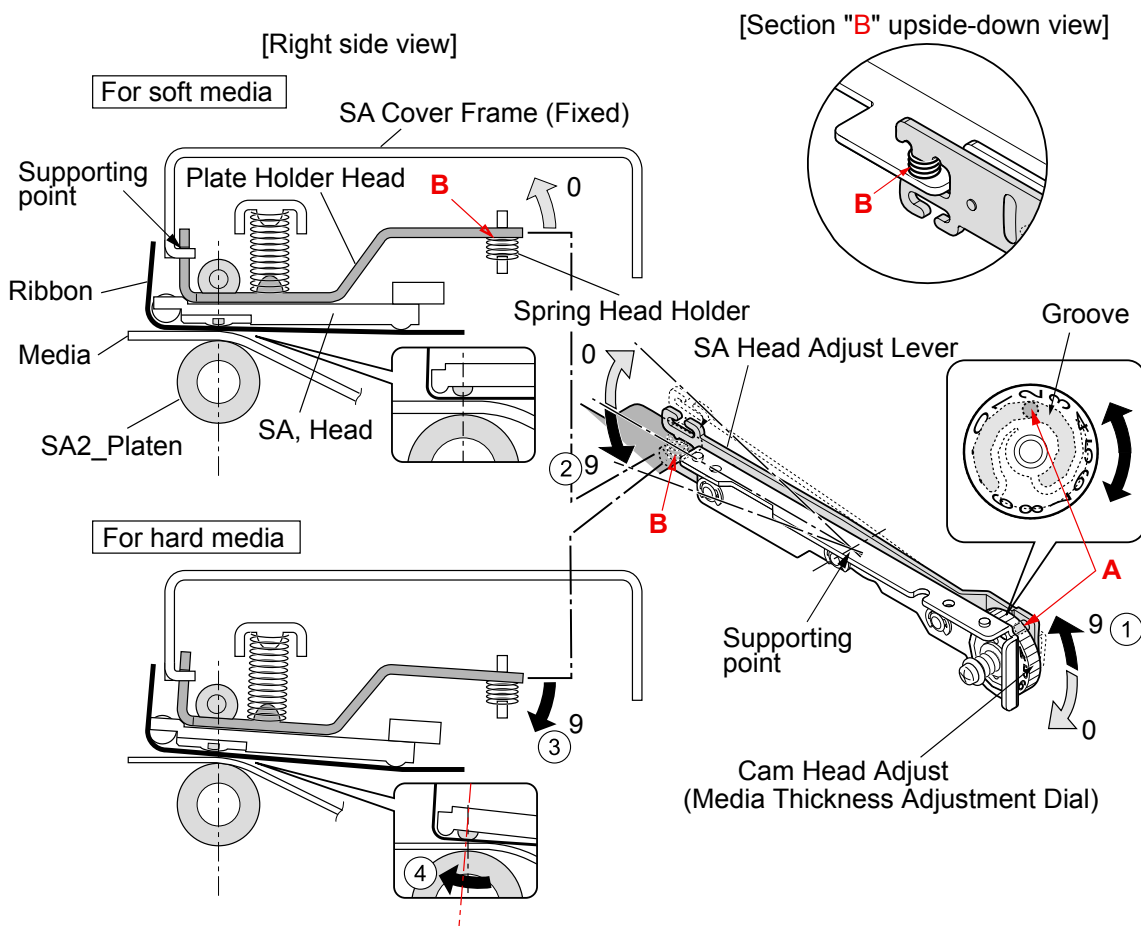
2-1-9. Transparent/Reflective Sensor Travelling Mechanism

The major components of the transparent/reflective sensor travelling mechanism are:

(a) Gear Bevel Lead Screw U (Blue) (d) Shaft Lead Screw (Upper/Lower)

(b) Gear Lead Screw L (e) Holder Sensor Adjust U (Transparent sensor)

(c) Gear train (f) Holder Sensor Adjust L (Reflective Sensor)

The transparent sensor is incorporated in the "Holder Sensor Adjust U" and the reflective sensor is incorporated in the "Holder Sensor Adjust L". Both sensor housings move to the right and left simultaneously by turning the "Gear Bevel Lead Screw U" (blue).
Note that the sensor housings ("Holder Sensor Adjust U" and "Holder Sensor Adjust L") are engaged with the groove of respective "Shaft Lead Screw" (upper and lower). Therefore, they move horizontally when the "Shaft Lead Screw" (upper and lower) turns.

When the "Gear Bevel Lead Screw U" (blue) turns in the direction as shown by the arrow (①), the "Screw Lead Screw" (upper) turns ("**a**") and the "Holder Sensor Adjust U" moves to the right ("**a'** "). At this time, via the gears ((②) and (③)), the "Gear Lead Screw L" turns in the direction shown by the arrow (④), and the "Screw Lead Screw" (lower) turns ("**b**") and the "Holder Sensor Adjust L" moves to the right ("**b'** ").

When the "Gear Bevel Lead Screw U" (blue) is turned reversely, the sensor housings move to the left.
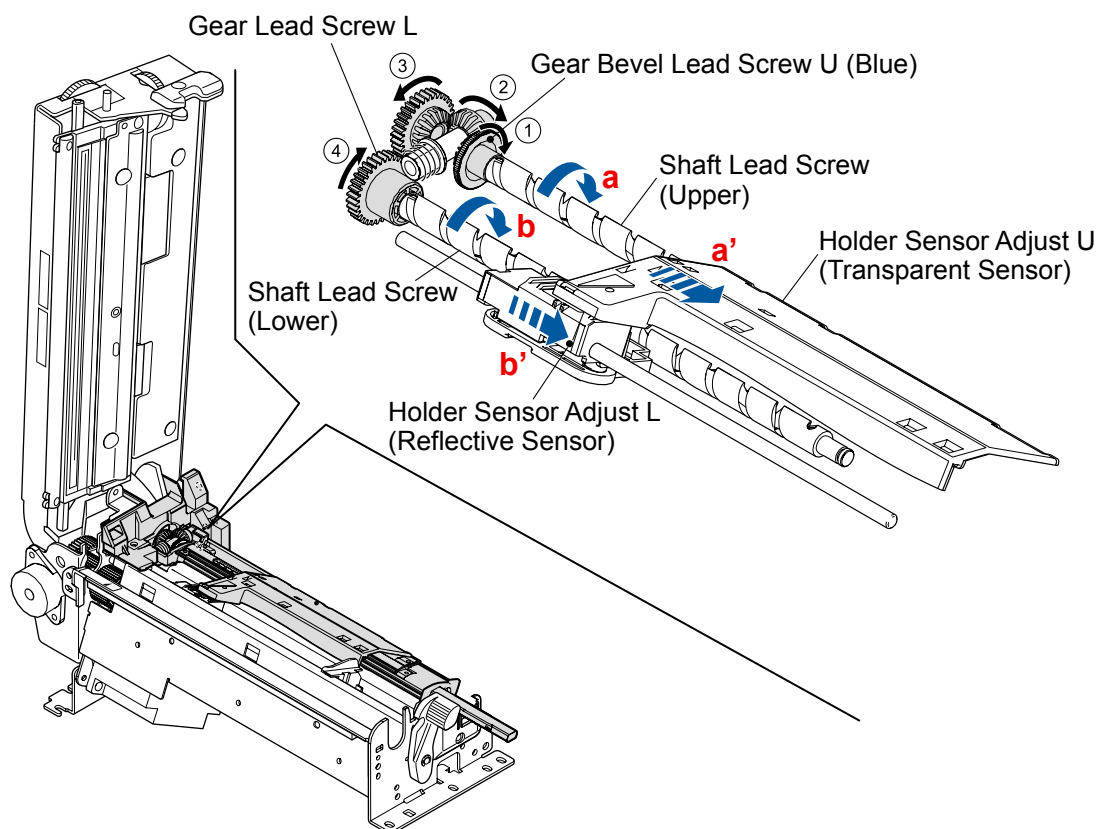
2-2. Operation of Control Parts

2-2-1. Configuration of Printer

The following shows major configuration blocks.
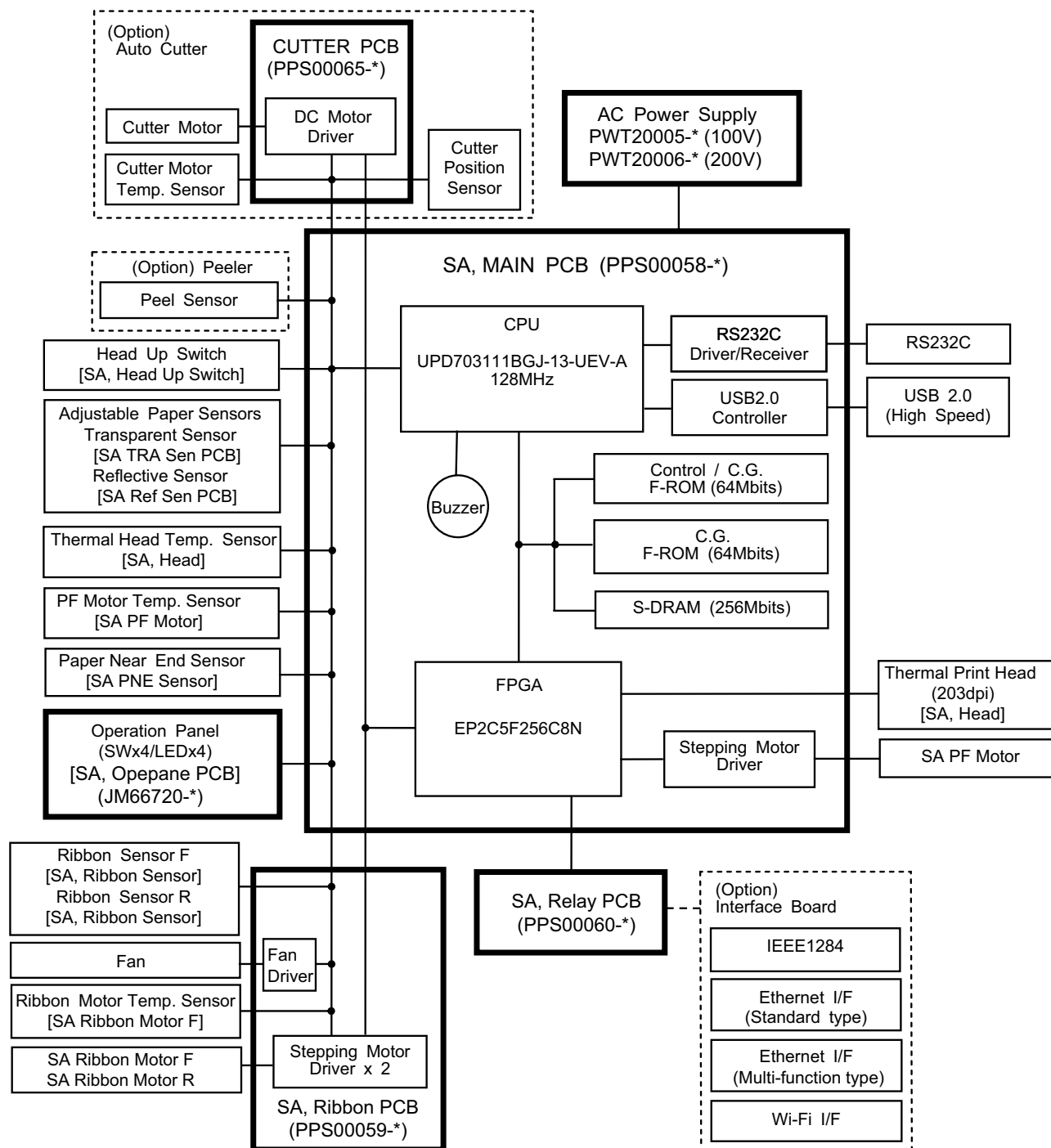
Major functions of individual components are described below:

(1) AC power supply

Consists of a fuse, a filter circuit to eliminate external electric noise, and a switching type regulator to transform an AC input to +24V DC output required to drive the printer.

(2) SA, Main PCB

Controls the entire operations of the printer. It consists of CPU, Flash ROM, S-DRAM, FPGA (Field-Programmable Gate Array), driver circuits, etc.

(a) CPU

The CPU is a microprocessor with 32-bit architecture. The clock fed to the CPU is 16 MHz. The CPU internally multiplies this 16 MHz by 8 times and uses 128 MHz clock. The CPU includes cache memory, RAMs, DMA controller, serial I/F, USB function controller, A/D converter, etc.

(b) Flash ROM

A flash ROM of 64M bits (8M bytes) that stores the firmware and CG (character generator)

(c) S-DRAM (Synchronous dynamic RAM)

An S-DRAM of 256M bits (32M bytes) that is used as working area, input buffer and download buffer.

(d) FPGA

The FPGA (Field-Programmable Gate Array) incorporates a control circuit for the interface I/O port, motors, print head, etc.

(e) Serial I/F (RS-232C Driver/Receiver)

This is a circuit to transmit and receive serial data between the printer and the host.
Serial I/F, USB I/F, Parallel I/F (Option), Wired LAN (Option) or Wireless LAN (Option) is automatically selected when data is received.

(f) USB I/F (High-speed USB2.0 Controller)

This is a circuit to transmit and receive serial data between the printer and the host using the high-speed USB2.0 I/F.
Serial I/F, USB I/F, Parallel I/F (Option), Wired LAN (Option) or Wireless LAN (Option) is automatically selected when data is received.

(g) Stepping motor driver

This is a circuit to drive the "SA PF Motor". The "SA PF Motor" is a stepping motor.

(h) Buzzer

The buzzer is driven when an alarm, etc. occurs.

(3) Operation panel (SA, Opepane PCB)

Used to indicate the operating status of the printer and to set specifications. It consists of 4 keys and 4 LEDs.

(4) Thermal print head (SA, Head)

Makes printing on paper. The number of thermal elements (dots) is as follows. The thermal print head includes the print head driver circuit.

•1344 dots

(5) Sensors

The following 9 sensors are used in the printer:

Sensor name	Description
Head Up Switch (SA, Head Up Switch)	A mechanical lever switch.
Transparent Sensor	A photo sensor using a phototransistor. (On the "SA TRA Sen PCB".)
Reflective Sensor	A photo sensor consisting of 2 LEDs and 1 phototransistor. (On the "SA Ref Sen PCB".)
Ribbon Sensor F	Photo sensors (2 pcs.) using photointerrupters. (Located on the "SA, Ribbon Sensor" on the front side.)
Ribbon Sensor R	Photo sensors (2 pcs.) using photointerrupters. (Located on the "SA, Ribbon Sensor" on the rear side.)
Thermal Head Temperature Sensor	A thermistor incorporated in the "SA, Head".
PF Motor Temperature Sensor	A thermistor attached to the "SA PF Motor".
Ribbon Motor Temperature Sensor	A thermistor attached to the "SA Ribbon Motor F" (the front side of ribbon motor).
Paper Near End Sensor	A photo sensor using a photointerrupter. (On the "SA PNE Sensor".)

(6) Motors

Three motors are used.
- The "SA PF Motor" is a stepping motor to feed media.
- The "SA Ribbon Motor F" and "SA Ribbon Motor R" are stepping motors to take up and supply ribbon, respectively.

(7) SA, Ribbon PCB

Controls the operations of the "Unit, Ribbon".

(a) Stepping motor driver

This is a circuit to drive the "SA Ribbon Motor F" on the front side for taking up ribbon and the "SA Ribbon Motor R" on the rear side for supplying ribbon. Both are stepping motors.

(b) Fan driver

This is a fan drive circuit. The fan is used to cool both "SA Ribbon Motor F" and "SA Ribbon Motor R". When the temperature of the "SA Ribbon Motor F" exceeds a certain value, the fan starts to rotate.

(8) SA, Relay PCB

Relays the signals between the "SA, Main PCB" and an optional I/F board.

(9) Optional I/F

(a) Parallel I/F (IEEE1284) (Option)

This is the parallel I/F to transmit and receive parallel data between the printer and the host. It supports Centronics Compatible mode, NIBBLE mode and ECP mode.

Parallel I/F, serial I/F, or USB I/F is automatically selected when data is received.

(b) Wired LAN I/F (Option)

This is a circuit which supports Ethernet protocol. LAN connection is possible.

(c) Wireless LAN I/F (Option)

This is a circuit which supports wireless LAN protocol (IEEE802.11n/IEEE802.11g/ EEE802.11b).

2-2-2. Memory map

Address	Contents		
0000000H – 001FFFFFH	Command RAM (Built-in CPU)		CPU
0100000H – 0103FFFH	Boot Loader (1)		
0104000H – 0105FFFH	Setting Information (User Settings)		
0106000H – 0107FFFH	Setting Information (Factory-set Settings)		
0108000H – 011FFFFH	Boot Loader (2)		
0120000H – 030FFFFH	Firmware (Datamax)		
0310000H – 04FFFFFH	Firmware (Zebra)		8M bytes Flash ROM
0710000H – 074FFFFH	FPGA Data		
07E0000H – 07EFFFFH	Service Information (Backup)		
07F0000H – 07FFFFFH	Service Information		
0800000H – 27FFFFFFH	Firmware (about 400K bytes) Receiving Buffer (16K bytes x 4)* Command Buffer (128K bytes) Others		SDRAM 32M bytes *: 16K bytes for each I/F (USB, IEEE1284, Serial, USB for optional I/F)
8000000H – 80FFFFFH	I/O		FPGA
C000000H – C3FFFFFH	Download Area (4MByte)		FROM 8MByte
C400000H – C7FFFFFH	Kanji Font (4MByte)		
F800000H – F8FFFFFH	I/O		USB2.0 Controller
FFFB000H – FFFEFFFH	Data RAM (Built-in CPU)		CPU
FFFF000H – FFFFFFFFH	I/O (Built-in CPU)		

2-2-3. Sensors

(1) Head up switch

The "SA, Head Up Switch" is used to detect the head position (up or down).

When the "Unit, Head" is closed (in the down position), the "Support Pop Up" of the "Unit, Head" pushes the "Pop Up Cover Frame" and the "SA, Head Up Switch" pushes the lever of the "SA, Head Up Switch" and the switch turns ON. Then, pin 117 (HDUSW) of U1A (CPU) goes "Low" level.

When the "Unit, Head" is opened (in the up position), the "Support Pop Up" is disengaged from the "Pop Up Cover Frame", the lever of the "SA, Head Up Switch" is set free, and the switch turns OFF. Then, pin 117 (HDUSW) of U1A (CPU) goes "High" level.
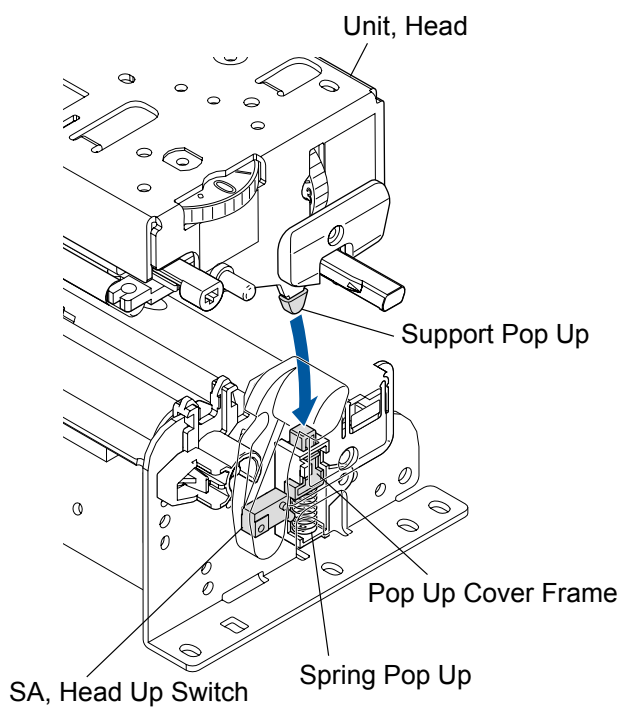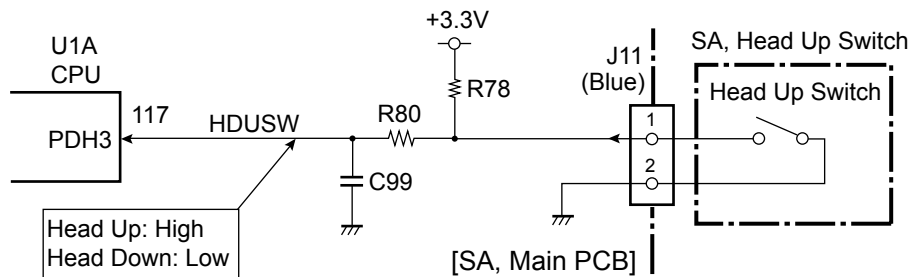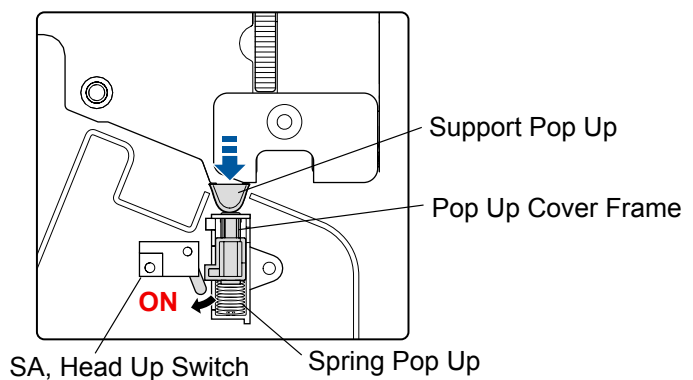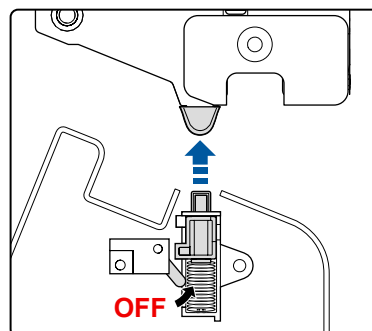
(2) Transparent sensor and reflective sensor

The transparent sensor ("SA TRA Sen PCB") is used to detect the label stuck on liner and the U-shaped notch on tag. On the other hand, the reflective sensor ("SA Ref Sen PCB") is used to detect the black mark printed on the bottom surface of tag. Both sensors are also used to detect the media end.

The upper side transparent sensor is the phototransistor, and the lower side reflective sensor consists of 2 LEDs and 1 phototransistor. Media passes between these sensors.
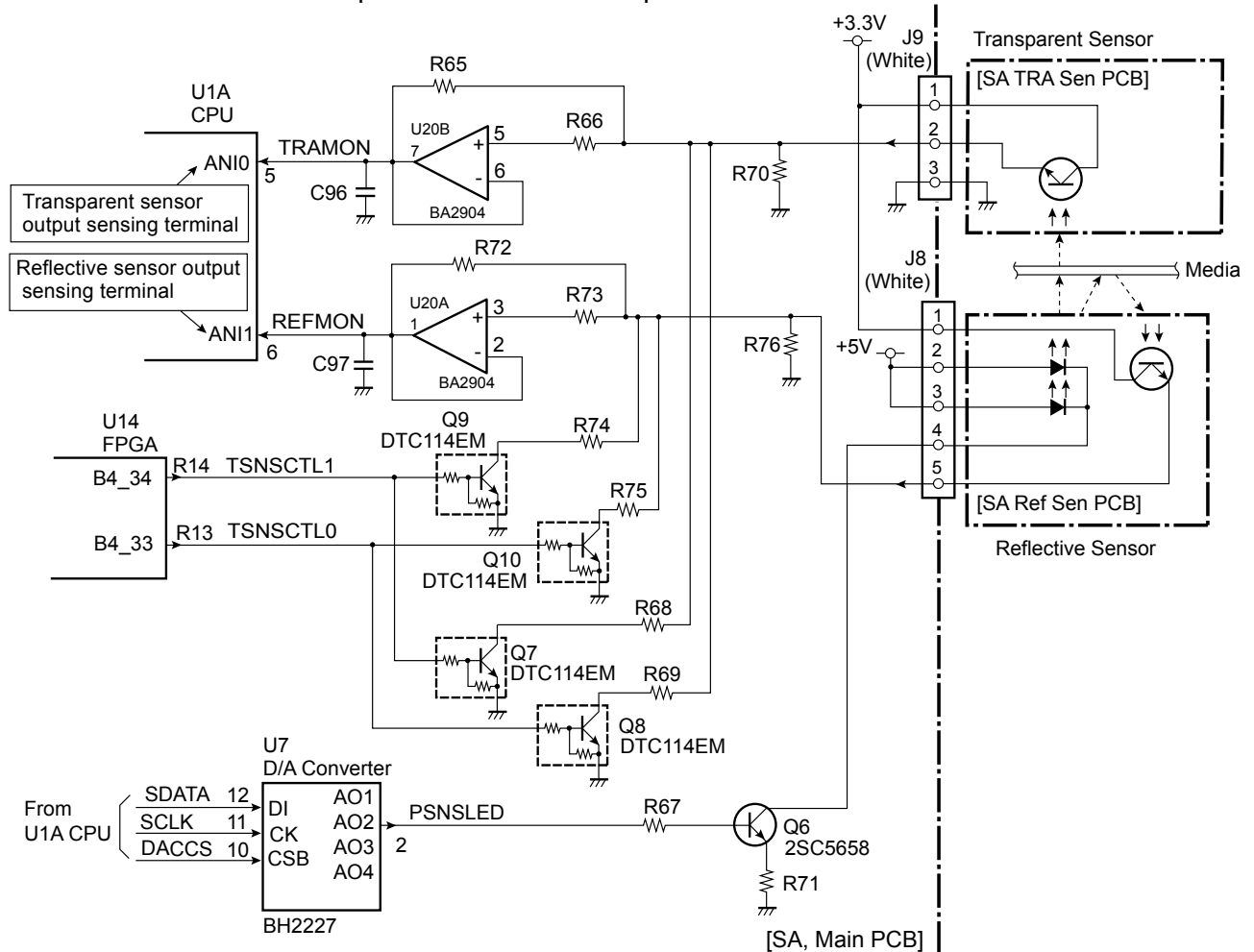
Transparent sensor (used for detecting the label or U-shaped notch):

When the liner without label stuck on it passes between both sensors, the light emitted from the LEDs reaches the transparent sensor, passing through the liner. Thus, the transparent sensor (phototransistor) conducts and the voltage corresponding to the amount of light is applied to pin 5 (TRAMON) of U1A (CPU).

Meanwhile, when the liner with the label stuck on it passes between both sensors, the light is blocked by the label and the transparent sensor (phototransistor) turns OFF. Thus, pin 5 (TRAMON) of U1A (CPU) goes "Low" level. From the difference in these levels at pin 5 (TRAMON) of U1A (CPU), U1A (CPU) can detect the leading edge (arrival) of the label on the liner.

When media runs out, the light directly falls on the transparent sensor and media end is detected. In this case, pin 5 of U1A (CPU) will go "High" level.

When the transparent sensor is conducted, the voltage at pin 5 (TRAMON) varies depending on the characteristics of the light receiving element (phototransistor) of the transparent sensor and other factors. To solve this problem, U14 (FPGA) outputs TSNSCTL0 (pin R13) and TSNSCTL1 (pin R14) signals to turn ON/OFF Q8 and Q7 to connect/disconnect R69 and R68 (voltage dividing resistors) to minimize the difference in level at pin5 (TRAMON).

The current flowing into the LEDs is determined by the data sent from the CPU to the digital-to-analog converter (U7). The digital-to-analog converter converts the data received from the CPU, and then outputs a resultant level at pin 2. The base current of the transistor Q6 is determined by this level. This means that the current flowing into the LEDs is also determined by this level. In the actual control, the CPU changes data (for controlling the LED current) to keep the level at pin 5 (TRAMON) of CPU constant.

Reflective sensor (used for detecting the black mark on tag):
When tag with black marks is used, light is reflected by the tag. In the place where no black mark is there, the phototransistor of the reflective sensor conducts and the voltage corresponding to the amount of light is applied to pin 6 (REFMON) of U1A (CPU).
When the light falls on the black mark, no light is reflected. In this case, the lower phototransistor turns OFF and pin 6 (REFMON) of U1A (CPU) will go "Low" level.
When media runs out, the light is not reflected and no light falls on the reflective sensor. In this case, pin 6 (REFMON) of CPU will go "Low" level and media end is detected.

When the reflective sensor is conducted, the voltage at pin 6 (REFMON) varies depending on the characteristics of the light receiving element (phototransistor) of the reflective sensor and other factors. To solve this problem, U14 (FPGA) outputs TSNSCTL0 (pin R13) and TSNSCTL1 (pin R14) signals to turn ON/OFF Q10 and Q9 to connect/disconnect R75 and R74 (voltage dividing resistors) to minimize the difference in level at pin6 (REFMON).

As to the current control of the LEDs, the operation is the same as for the transparent sensor mentioned above.

(3) Ribbon Sensor F/R

The ribbon sensor F ("SA, Ribbon Sensor" mounted on the front side) is used to detect the ribbon tension on the front side as well as ribbon running. While, the ribbon sensor R ("SA, Ribbon Sensor" mounted on the rear side) is used to detect the ribbon tension on the rear side as well as the ribbon end. These sensors are photointerrupters.
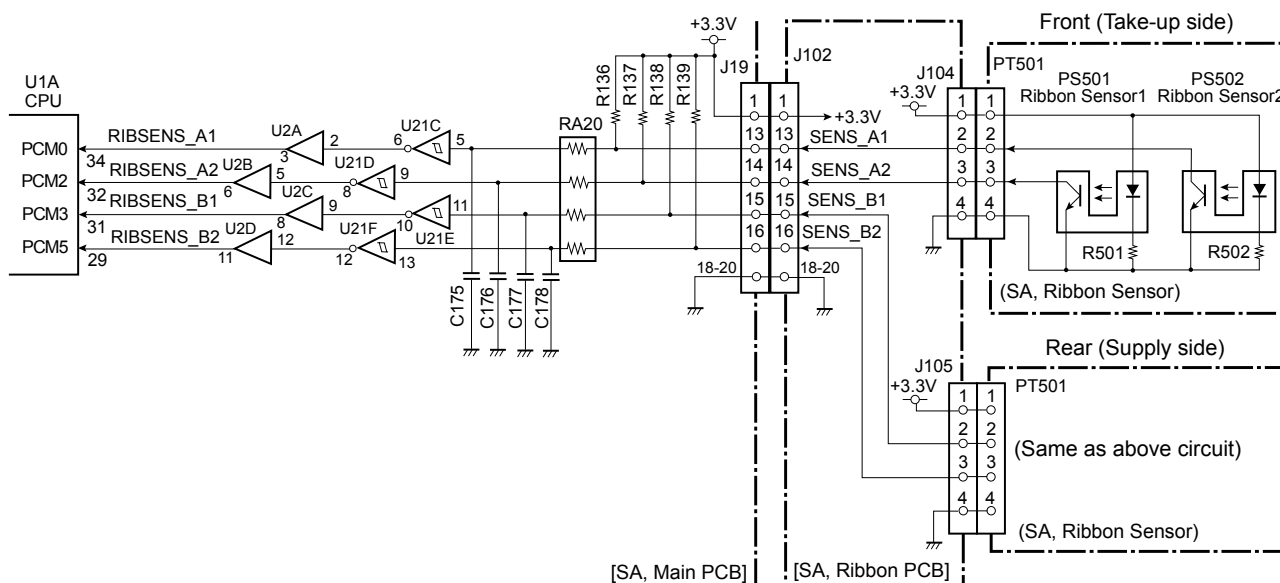
Ribbon sensor F:

The ribbon sensor F is used to keep the ribbon tension on the front side constant. When printing starts, ribbon is fed and then the front side ribbon slacks. Then, the claws of the "SA, Ribbon Tension Shaft F" come off the photointerrupters on the "SA, Ribbon Sensor" and the photointerrupters turn ON. Thus, pin 34/32 (RIBSENS_A1/A2) of U1A (CPU) goes "High" level. In this case, U1A (CPU) increases the revolution speed of "SA Ribbon Motor F" to take up the slack of ribbon. As a result, ribbon tightens and the claws are inserted into respective photointerrupters. Thus, pin 34/32 (RIBSENS_A1/A2) of U1A (CPU) goes "Low" level. Then, U1A (CPU) slows down the revolution speed of "SA Ribbon Motor F". During printing, this cycle is repeated and constant ribbon tension is maintained.

If ribbon is not correctly fed during printing, the ON/OFF state of the photointerrupters on the "SA, Ribbon Sensor" becomes improper. Thus, the CPU can detect an abnormal ribbon feed.

Ribbon sensor R:

The ribbon sensor R is used to keep the ribbon tension on the rear side constant. When printing starts, ribbon is fed and the rear side ribbon tightens. Then, the claws of the "SA, Ribbon Tension Shaft R" are inserted into respective photointerrupters on the "SA, Ribbon Sensor" and the photointerrupters turn OFF. Thus, pin 31/29 (RIBSENS_B1/B2) of U1A (CPU) goes "Low" level. In this case, U1A (CPU) increases the revolution speed of "SA Ribbon Motor R" to supply ribbon faster. As a result, ribbon slacks and the claw comes off the photointerrupter. Thus, pin 31/29 (RIBSENS_B1/B2) of U1A (CPU) goes "High" level. Then, U1A (CPU) slows down the revolution speed of the "SA Ribbon Motor R". During printing, this cycle is repeated and constant ribbon tension is maintained.

When ribbon runs out, the ON/OFF state of the photointerrupters on the "SA, Ribbon Sensor" becomes unchangeable. Thus, the CPU can detect the ribbon end.

(4) Head temperature sensor

The head temperature sensor is used to detect the temperature of the "SA, Head". This sensor is a thermistor incorporated in the "SA, Head". Since the resistance of the thermistor changes according to a temperature change, the voltage at pin 7 (HDTMP) of U1A (CPU) changes accordingly. The CPU senses the voltage at pin 7 (HDTMP) to detect the head temperature. According to the temperature of the "SA, Head", the CPU controls the printing pulse width applied to the thermal elements to keep the printing density constant.
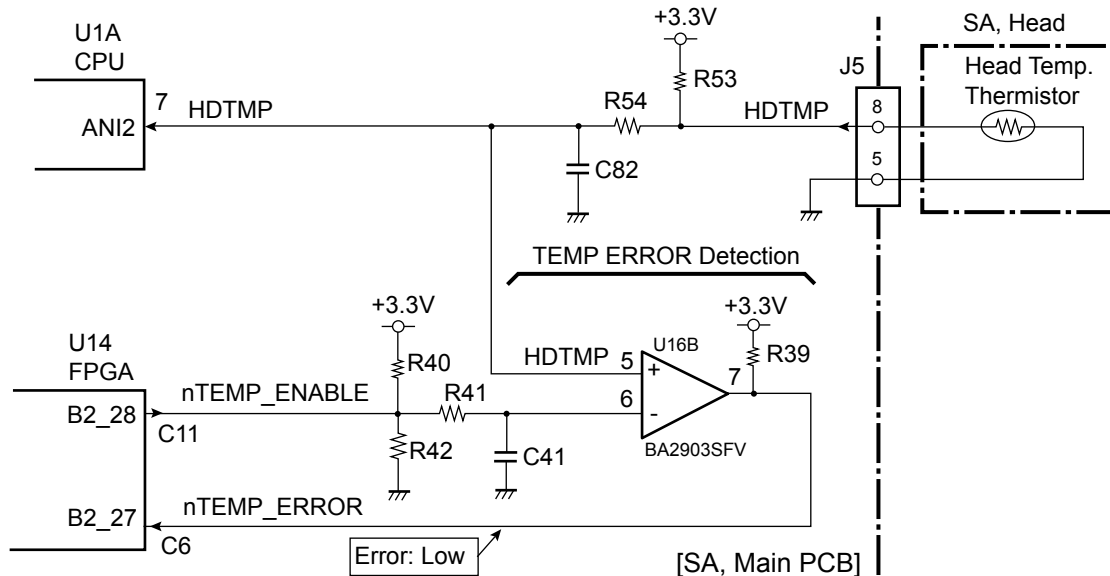
Printing operation when the head temperature rises:

If the head temperature reaches 70°C (158°F), printing stops after printing the current label. In this case, the PRINT LED and CONDITION LED simultaneously blink on the operation panel. When the temperature of the "SA, Head" falls below 60°C (140°F), the LEDs stop blinking and printing will be resumed.
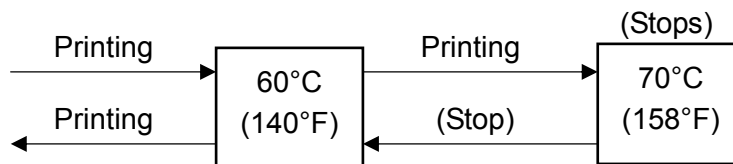
For further safety, an abnormally high temperature detection circuit is provided. In case this circuit is activated, the System error is displayed, and the printer stops.

The comparator U16B detects if the level at pin 5 (HDTMP) (i.e., the temperature of the "SA, Head") exceeds a certain reference level determined by the output from pin C11 (nTEMP_ENABLE) of U14 (FPGA) (i.e., the predetermined allowable limit temperature). If it does, nTEMP_ERROR at pin C6 goes "Low" level and this signal is fed to U14 (FPGA). Then, the System error is displayed and the printer stops. At this time, nTEMP_ENABLE at pin C11 is set to "Low" level so that nTEMP_ERROR is securely maintained at "Low" level. (To clear the System error, you need to turn OFF the printer once and then turn it ON.)

(5) PF motor temperature sensor

The PF motor temperature sensor is used to detect the temperature of the "SA PF Motor". This sensor is a thermistor bonded to the "SA PF Motor". Since the resistance of the thermistor changes according to a temperature change, the voltage at pin 8 (PFTMP) of U1A (CPU) changes accordingly. The CPU senses the voltage at pin 8 (PFTMP) to detect the PF motor temperature.

Printing operation when motor temperature rises:

When the temperature of the "SA PF Motor" rises above 90°C (194°F), printing speed is reduced to avoid overheating. If it reaches 95°C (203°F), the "SA PF Motor" stops after printing the current label. In this case, the PRINT LED and CONDITION LED alternately blink on the operation panel.

When the temperature of the "SA PF Motor" falls below 85°C (185°F), the LEDs stop blink and printing will be resumed.

For further safety, an abnormally high temperature detection circuit is provided. In case this circuit is activated, the System error is displayed, and the printer stops.

The comparator U16A detects if the level at pin 8 (PFTMP) (i.e., the temperature of the "SA PF Motor") exceeds a certain reference level determined by the output from pin C11 (nTEMP_ENABLE) of U14 (FPGA) (i.e., the predetermined allowable limit temperature). If it does, nTEMP_ERROR at pin C6 goes "Low" level and this signal is fed to U14 (FPGA). Then, the System error is displayed and the printer stops. At this time, nTEMP_ENABLE at pin C11 is set to "Low" level so that nTEMP_ERROR is securely maintained at "Low" level. (To clear the System error, you need to turn OFF the printer once and then turn it ON.)

(6) Ribbon motor temperature sensor

The ribbon motor temperature sensor is used to detect the temperature of the "SA Ribbon Motor F" on the front side. This sensor is a thermistor bonded to the "SA Ribbon Motor F". Since the resistance of the thermistor changes according to a temperature change, the voltage at pin 11 (RBTMP) of U1A (CPU) changes accordingly. The CPU senses the voltage at pin 11 to detect the temperature of the "SA Ribbon Motor F".
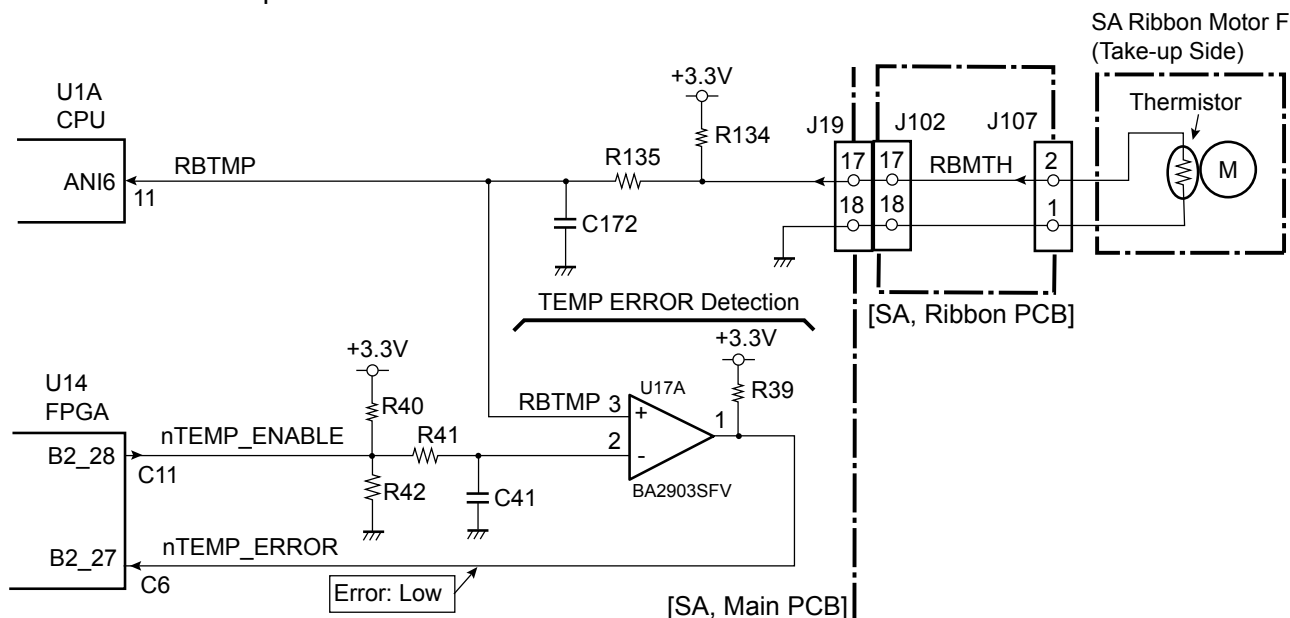
Printing operation at ribbon motor temperature rise:

When the temperature of the "SA Ribbon Motor F" reaches 85°C (185°F), the "SA Ribbon Motor F" stops after printing the current label. In this case, the PRINT LED and CONDITION LED alternately blink on the operation panel.

When the temperature of the "SA Ribbon Motor F" falls below 80°C (176°F), the LEDs stop blink and printing resumes.
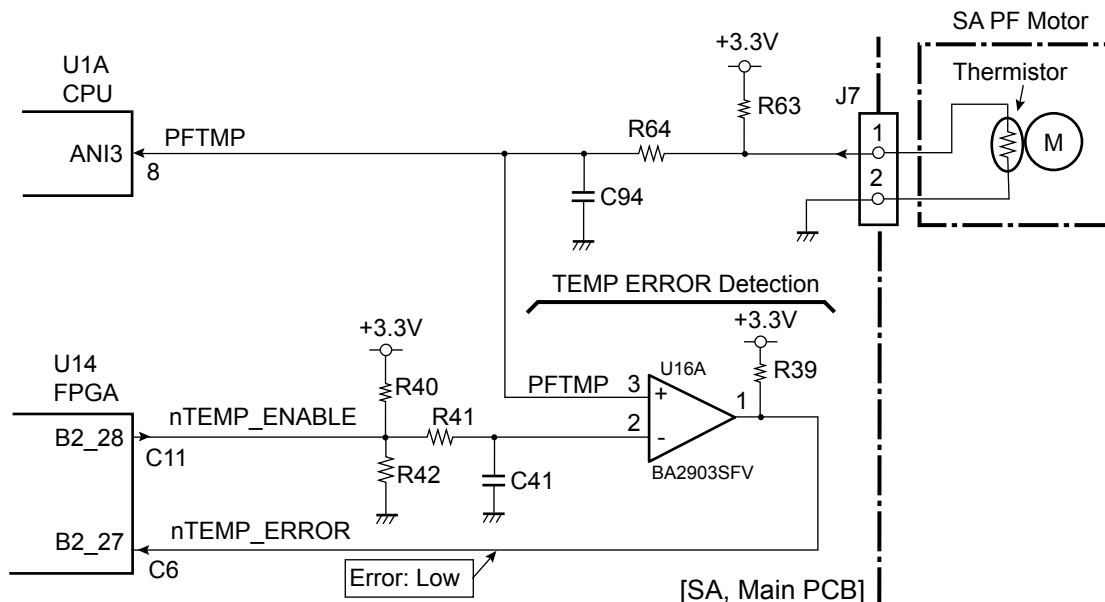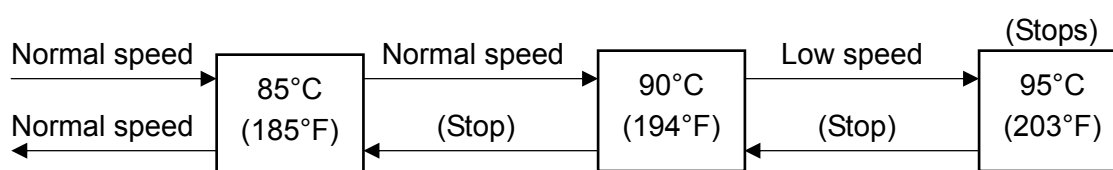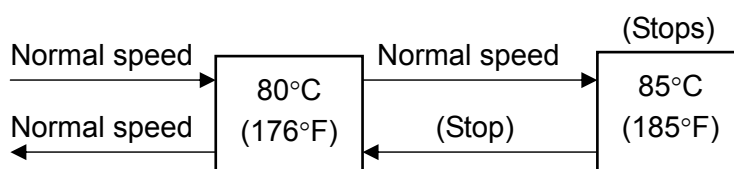

For further safety, an abnormally high temperature detection circuit is provided. In case this circuit is activated, the System error is displayed, and the printer stops.

The comparator U17A detects if the level at pin 3 (RBTMP) (i.e., the temperature of the "SA Ribbon Motor F") exceeds a certain reference level determined by the output from pin C11 (nTEMP_ENABLE) of U14 (FPGA) (i.e., the predetermined allowable limit temperature). If it does, nTEMP_ERROR at pin C6 goes "Low" level and this signal is fed to U14 (FPGA). Then, the System error is displayed and the printer stops. At this time, nTEMP_ENABLE at pin C11 is set to "Low" level so that nTEMP_ERROR is securely maintained at "Low" level. (To clear the System error, you need to turn OFF the printer once and then turn it ON.)

(7) **Paper Near End sensor**

The paper near end sensor ("SA PNE Sensor") is used to detect a paper near end status of roll paper installed in the printer.

By default, issuing a paper near end alarm is disabled. To enable it, you need to change the Paper Near End Alarm submenu under the "PageSetup" main menu from Off to On.

Before a paper near end status occurs, the "Lever PNE" is pushed by the roll paper edge and the "Slider PNE" of the paper shaft is engaged with the "SA PNE Sensor". Then, pin 77 (PNESNS) of U1A (CPU) goes "High" level, and the non paper near end status is detected by the CPU.

When the roll paper diameter reaches the paper near end point being mechanically set, the "Lever PNE" that was pushed by the roll paper edge pops up and the "Slider PNE" of the paper shaft comes off the "SA PNE Sensor". Then, pin 77 (PNESNS) of U1A (CPU) goes "Low" level, and the paper near end status is detected by the CPU. (Q12 turns ON in normal mode (i.e., in other than power saving mode).)

[Normal Status]

[PNE (Paper Near End) Status]
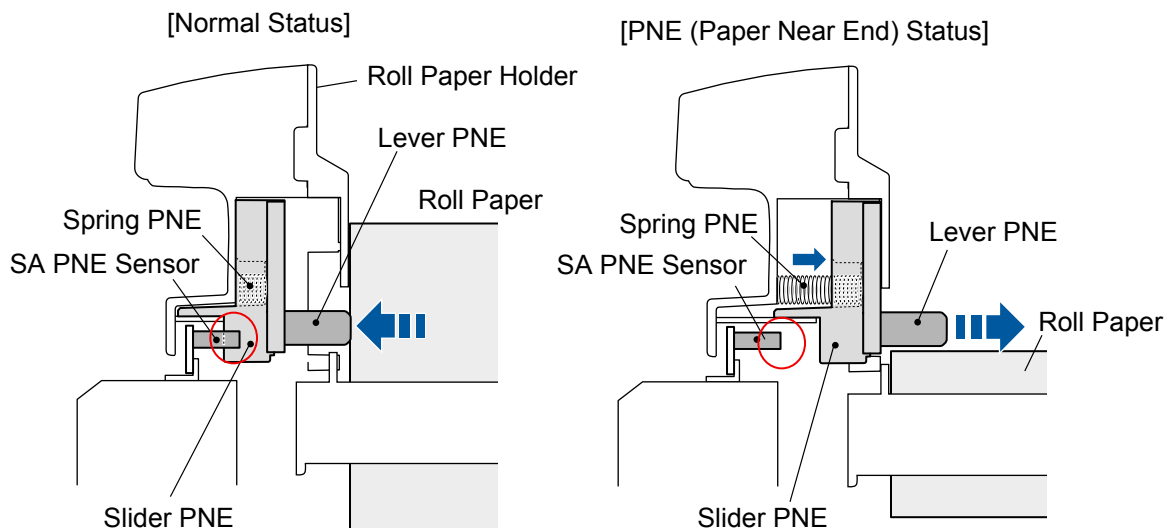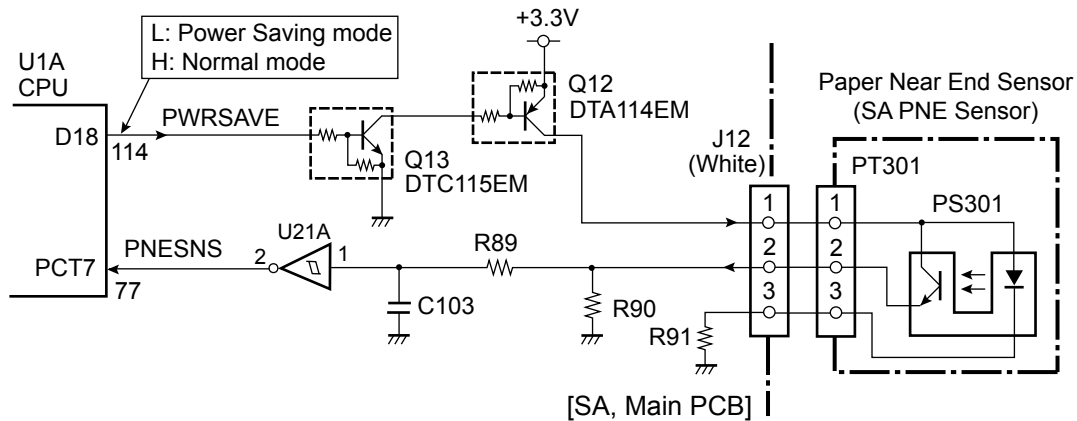
2-2-4. Drivers

(1) PF motor driver

This is a driving circuit to drive the "SA PF Motor" (stepping motor).

The following illustration shows a simplified circuit.

The "SA PF Motor" is driven by the unipolar constant current chopper method.

The exciting method for the motor is the 1-2 phase method.

The power to the "SA PF Motor" is controlled by U14 (FPGA). When pin P1 (VMTON) is "High" level, Q27 and Q25 turn ON and +24V is supplied to the "SA PF Motor".

The exciting method is determined by PFMD1 and PFMD2 signals sent from U14 (FPGA) to U19 (Motor Driver).

The rotational direction of the "SA PF Motor" is determined by PFDIR signal and PFCLK signal is a clock signal for turning the "SA PF Motor".

The digital-to-analog converter (U7) is used to control the PF motor current. Its output is controlled by the data sent from U1A (CPU).
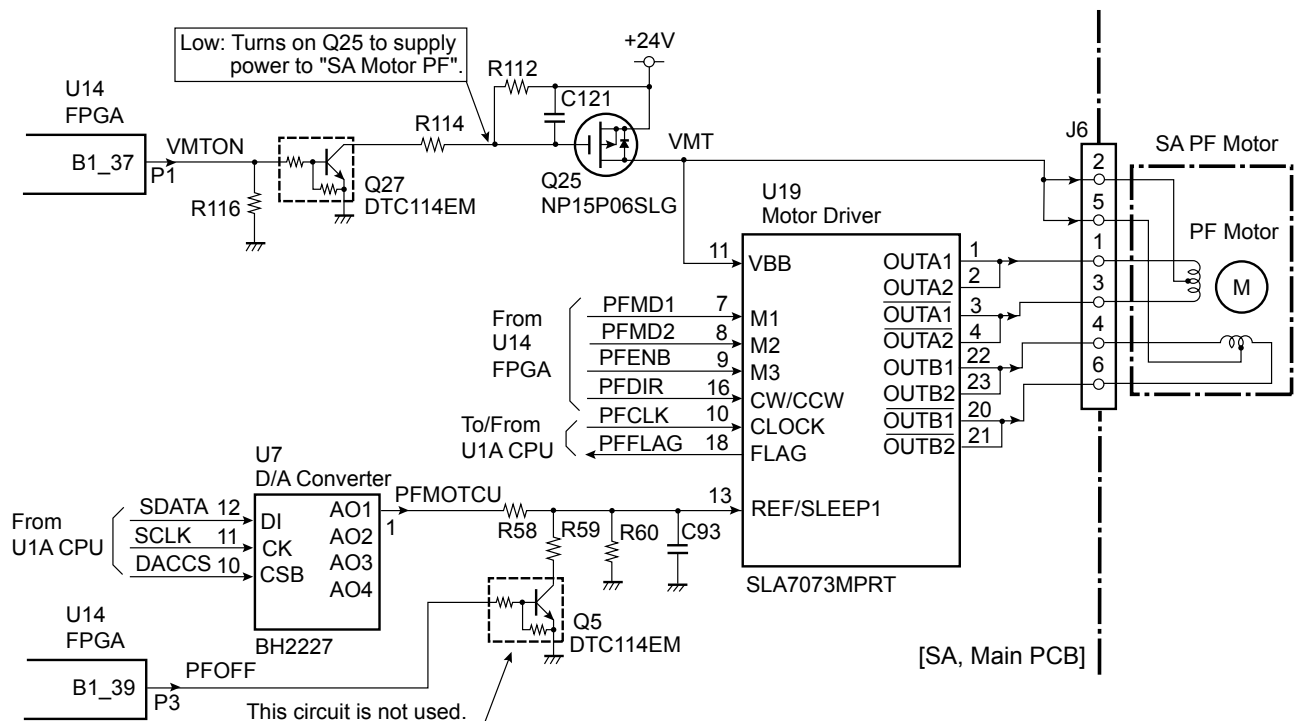
(2) Ribbon motor driver

This is a driving circuit to drive the "SA Ribbon Motor F" and "SA Ribbon Motor R" (stepping motors). The "SA Ribbon Motor F" is used to take up ribbon, while the "SA Ribbon Motor R" is used to supply ribbon.

Since the motor drive circuit is the same as for both motors, the following describes only for the "SA Ribbon Motor F" that takes up ribbon.

The "SA Ribbon Motor F" is driven by U101 (Motor Driver) via the RIBSTEP_A signal sent from U1A (CPU). The rotational direction of the motor is determined by the RIBDIR_A signal sent from U14 (FPGA). The strength of PF motor excitation (strong and weak) or PF motor current is controlled by the RBMOTCU signal sent from the U7 (D/A Converter) via U1A (CPU).

Ribbon motor forcible stop function by circuitry:

The CPU monitors the temperature of the "SA Ribbon Motor F" and stops it if its temperature reaches a certain level, as mentioned in "(6) Ribbon motor temperature sensor".

In addition to this function, for further safety measures, a circuitry is provided to forcibly stop the ribbon motors. When the signal nTEMP_ERROR becomes "Low" level, pin2 ($\overline{\text{ENABLE}}$) of U101 and U102 becomes "High" level, resulting in stopping the "SA Ribbon Motor F" as well as "SA Ribbon Motor R".

The signal nTEMP_ERROR is an ORed error of the following signals.

- Abnormal ribbon motor temperature
- Abnormal PF motor temperature
- Abnormal head temperature
- Abnormal cutter temperature (Optional)
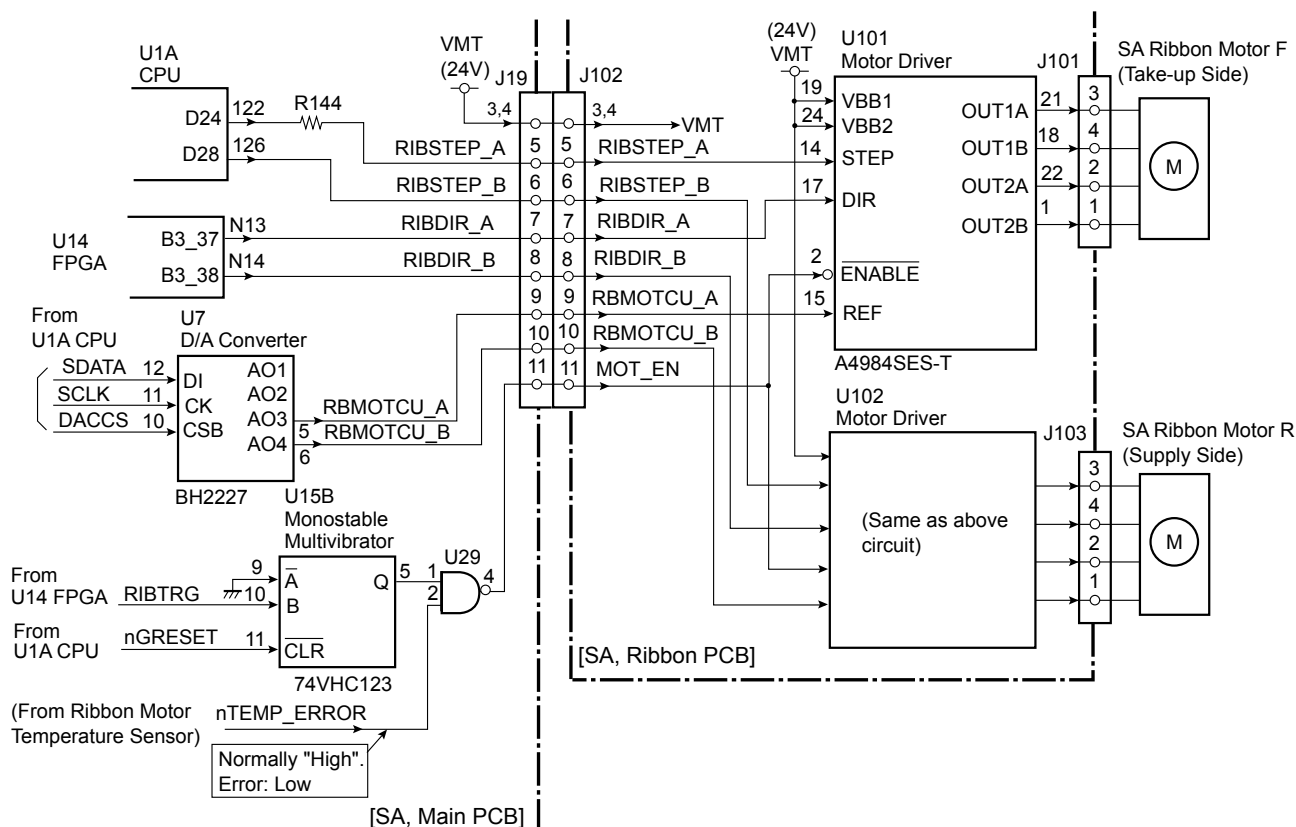
(3) Head driver

The head driver is incorporated in the "SA, Head".

During printing, pin P16 (VHDON) of U14 (FPGA) goes "High" level, Q28 and Q26 turn ON, and +24V (VHD) is supplied to the "SA, Head".

The print data is sent fromU14 (FPGA) to the head driver in the "SA, Head" to select the thermal elements to be heated. The data is sent from HD1-HD4, nHDSTB, HDCLK and nHDLAT signal lines (pins K15, K16, M16, M14, N16, N15 and P14 of U14).

According to the print data received, the "SA, Head" heats the thermal elements to print dots on paper. The width of heating pulse will be changed according to the head temperature to keep the printing density constant.
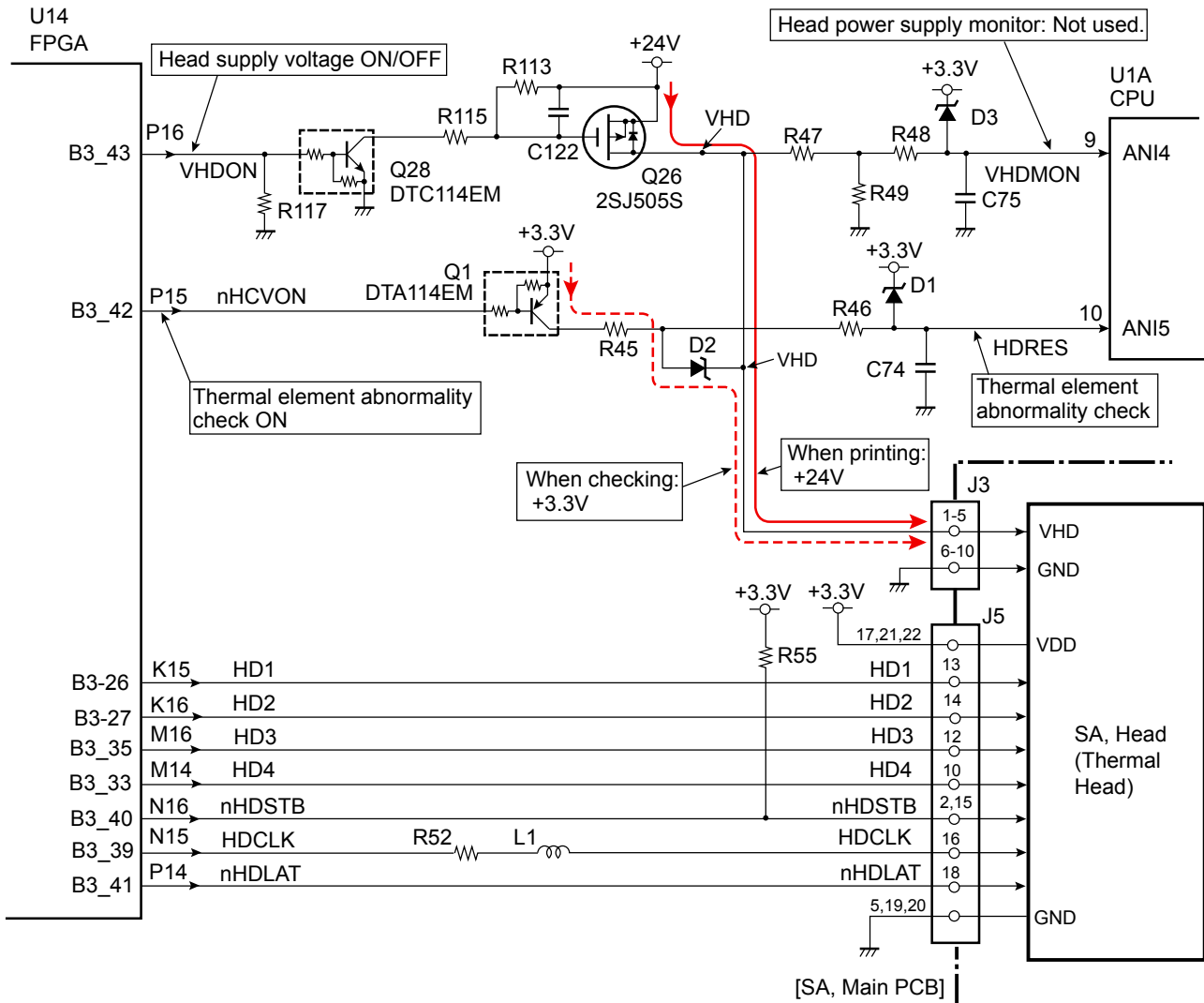
Thermal resistance check:

When the printer is turned ON, the thermal resistance check is conducted. If any fault is found, it is memorized and, when the printer is turned ON next time, the CONDITION LED and ERROR LED alternately blink on the operation panel.

During the thermal resistance check, pin P15 (nHCVON) of U14 (FPGA) goes "Low" level, Q1 turns ON, and +3.3V is supplied to the "SA, Head", instead of +24V.

The following is a simplified circuitry under checking, where Q1 turns ON and +3.3V is applied to the "SA, Head". The thermal resistance check (dot check) is done by selecting each thermal element (dot) one by one. In the following example, a thermal element with resistance R1 is selected (rest of the thermal elements are disconnected).

At the point "A", the voltage divided by R45 and R1 is developed. The CPU monitors this voltage at pin 10 (HDRES) and checks if the voltage is out of the allowable range. If it is, the CPU judges that the thermal element is defective. (For example, if R1 is open, the voltage at point "A" will be about +3.3V. If R1 is open, corresponding dot will be missing.)

R1, R2, ... ,Rn: Resistance of thermal elements
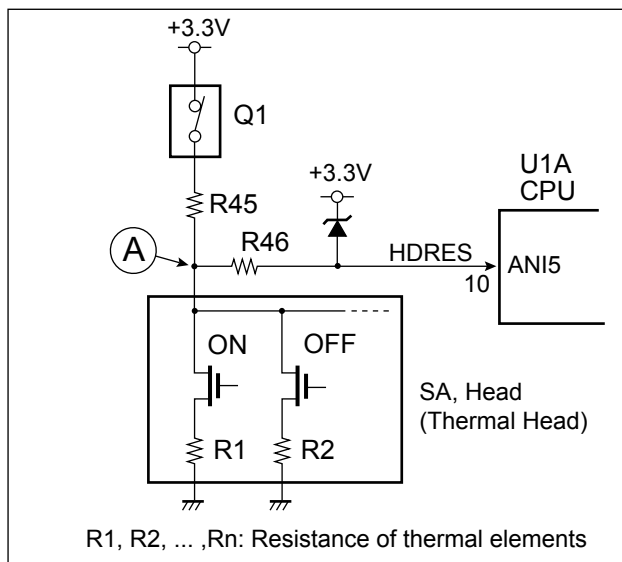
To see the total number of defective thermal elements:

You can print the total number of defective thermal elements in Service mode.

For details, refer to "" and "".

The number will be printed as follows.

   Bad head element: n dot(s)

   Where, n is a number. If no defective thermal element is found, n is 0.

(4) Buzzer driver

This circuit drives the buzzer.

To sound the buzzer, the CPU outputs a pulse waveform from pin 171 (BUZZER). The transistor Q24 turns ON and OFF, and the buzzer sounds.

[SA, Main PCB]
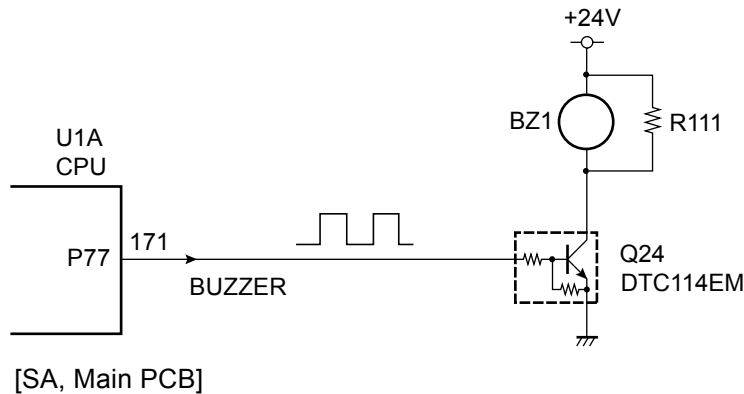
(5) Fan driver

This circuit drives the cooling fan ("SA, Fan") for ribbon motors.

When pin 130 (FANCTL_R) is set to "Low" level, Q101 turns ON and the fan is driven.

The fan is driven according to the temperature raise of the "SA Ribbon Motor F".

When the temperature detected by the thermistor bonded to the "SA Ribbon Motor F" is under 45°C (113°F), the fan is not driven.

When the temperature exceeds 45°C (113°F) during ribbon motor running, the fan starts to turn.

If the temperature is 60°C (140°F) or more after the ribbon motor is stopped, the fan is kept turned until the temperature falls below 60°C (140°F).
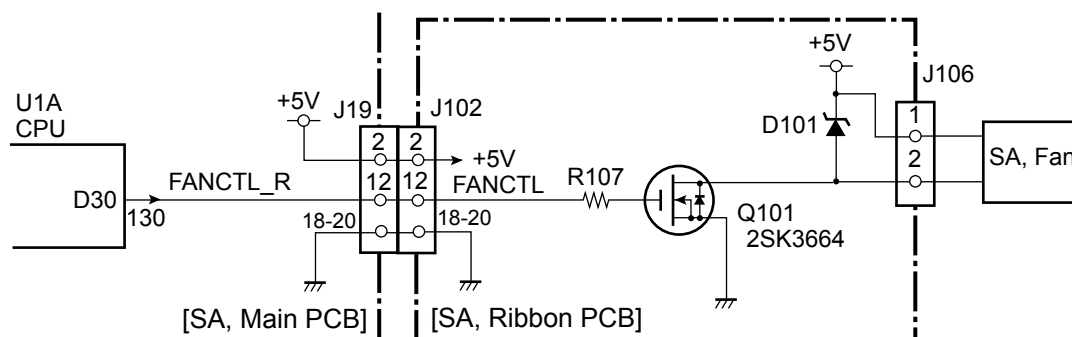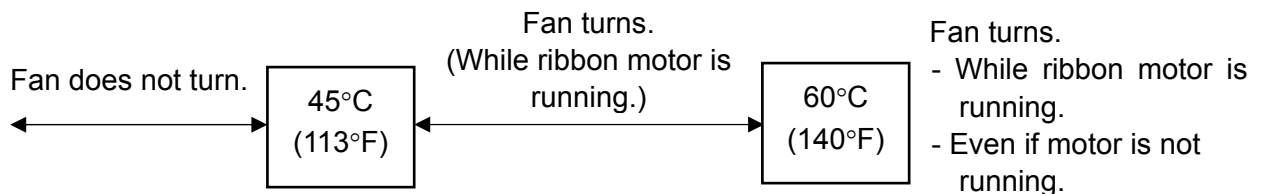
2-2-5. Other circuits

(1) Power supply circuit

The "SA, Main PCB" receives +24V from the "Unit, Power Supply" and produces each DC power.

U22, U24 and U23 are DC-DC converter ICs to produce +5V, +3.3V and +1.5V/+1.2V from +24V, respectively.

The DC power produced and their purposes are as follows:

+24V:　For driving circuits

+5V:　For transparent/reflective circuit, "SA, Ribbon PCB", optional I/F, etc.

+3.3V:　For logic circuits, LED, etc.

+1.5V:　For U1 (CPU)

+1.2V:　For U14 (FPGA)

If +1.5V for CPU is not produced, Q22 turns OFF and +3.3V for logic circuits is shut off for safety.

When pin 114 (PWRSAVE) of U1A (CPU) goes "Low", Q19 turns OFF and the "Unit, Power Supply" enters Power Saving mode.

In Power Saving mode, the DC output from the "Unit, Power Supply" is changed over from +24V to approx. +9V.

(Power saving mode is effective if the "Standby Mode" submenu under the "System Setup" main menu is set to "On". However, it is set to "Off" at factory default.)
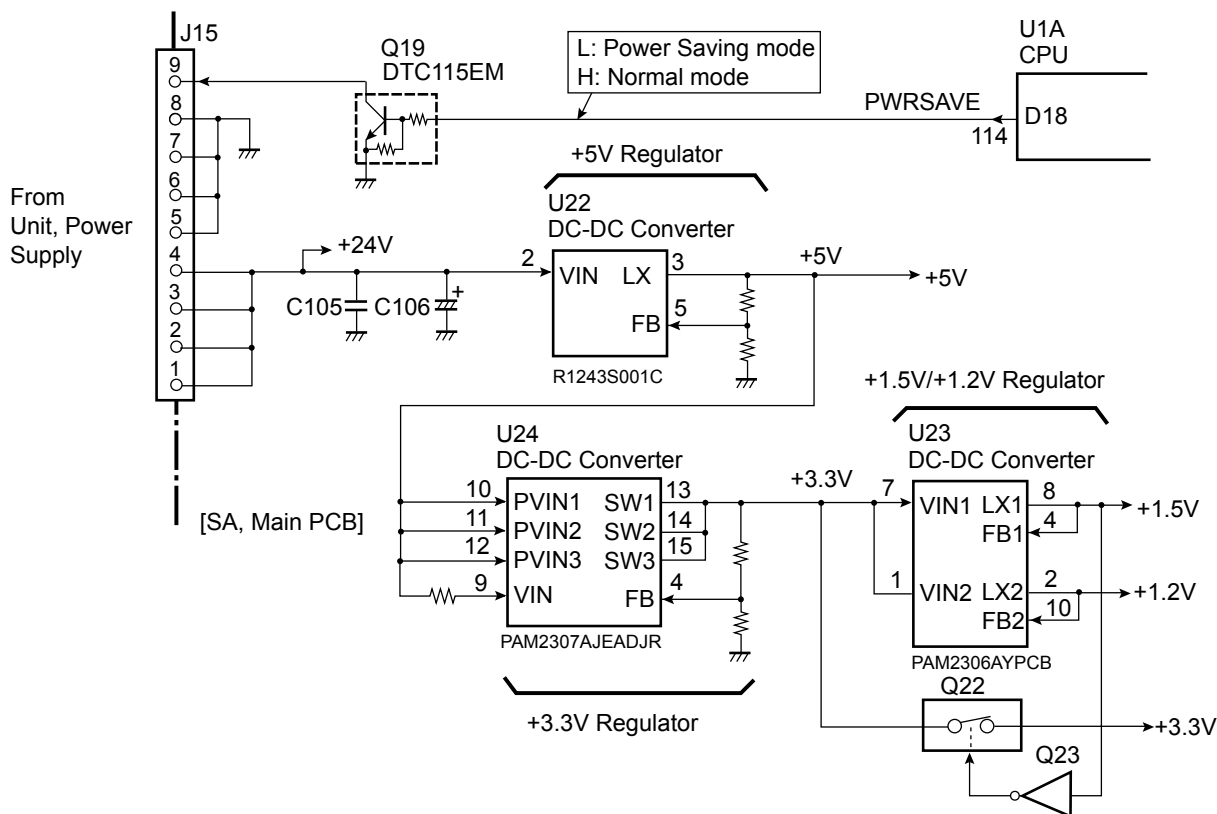
(2) Reset circuit

This circuit performs the system reset.

When power is turned ON, +3.3V increases gradually from 0V. When the voltage at pin 2 (+3.3V) of U6 (Voltage detector) reaches approx. at 2.8 V, nRESET33 signal goes from "Low" to "High" level after a certain delay time (determined by C7 at pin 5 of U3) has passed. While nRESET33 signal is "Low", U1A (CPU) and U14 (FPGA) are reset. Also, by nGRESET signal output from U1A (CPU), U14 (FPGA) and other circuits are reset.
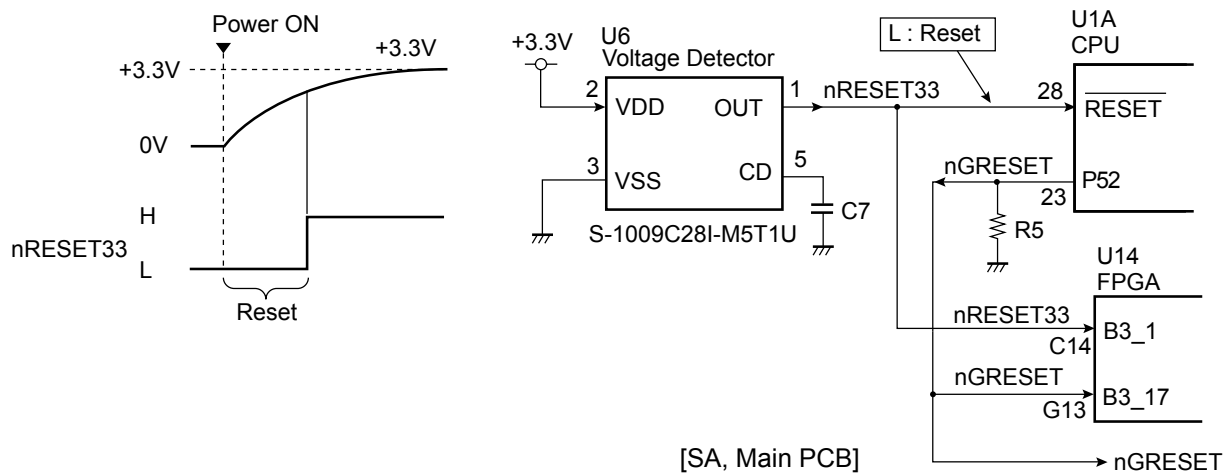
(3) Clock circuit

Crystal oscillator X1 oscillates a 16 MHz clock. This clock is send to U1A (CPU) and the CPU generates a 128 MHz internal clock and 64 MHz clock.
The 64MHz clock is fed to U14 (FPGA) and U13 (SDRAM)
X2 (Clock generator) oscillates a 48 MHz clock used for optional I/F control.
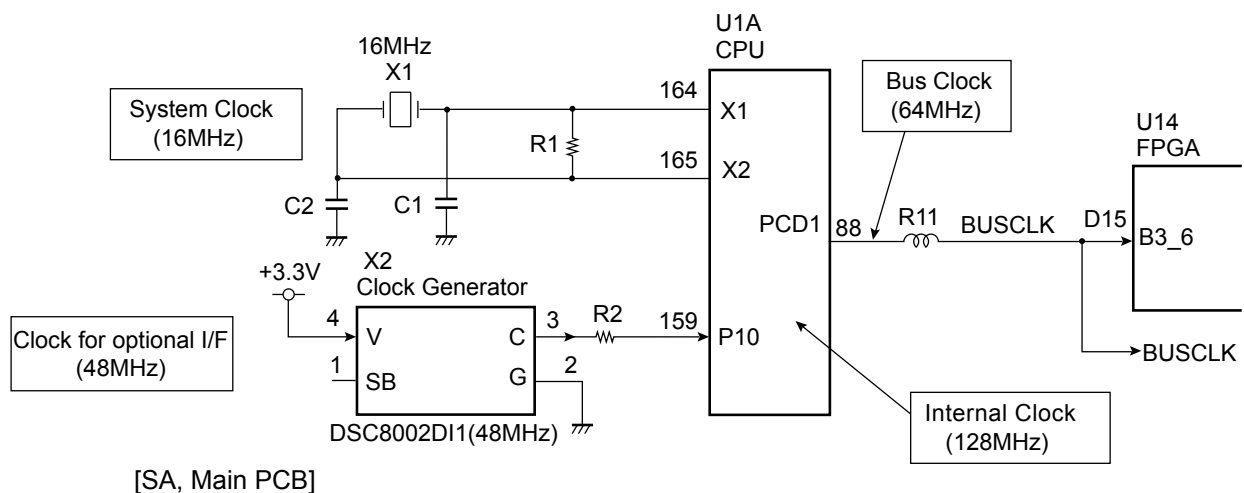
(4) Ope-pane circuit

The ope-pane circuit consists of 4 LEDs and 4 switches.

U14 (FPGA) controls the transistors (Q2 to Q4) to turn ON/OFF the LEDs. Each switch signal is input to U1A (CPU). (The following shows the simplified circuit diagram.)
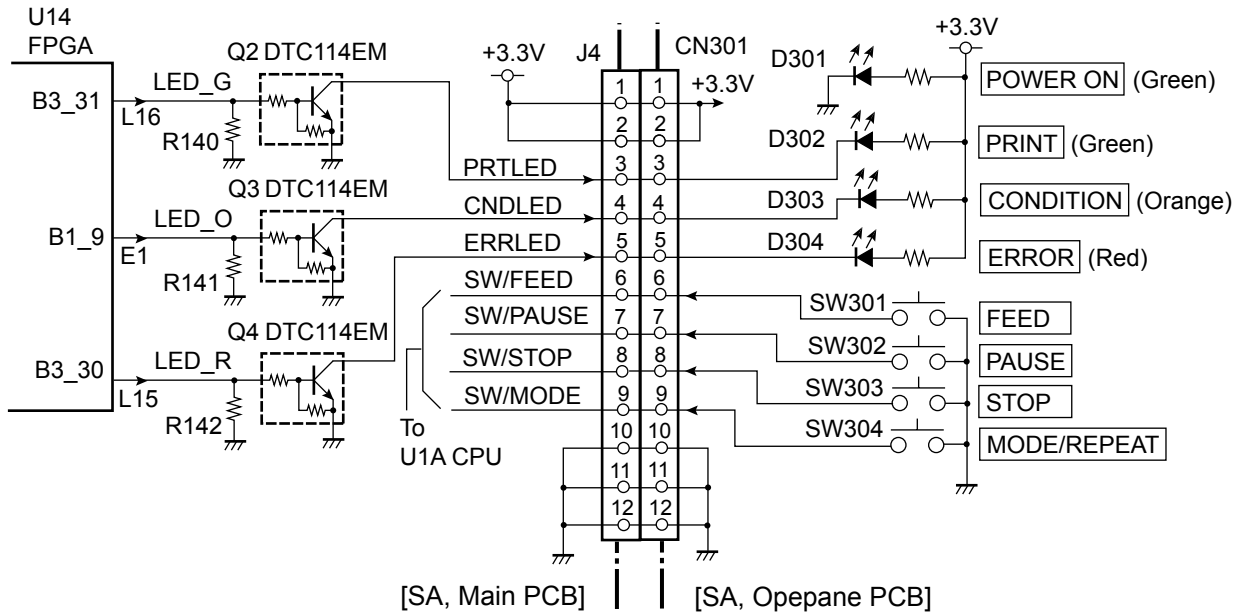
(5) USB I/F control circuit

The USB I/F control circuit supports the interface with a high-speed USB2.0 device.

It consists of U28 (high-speed USB2.0 controller) and peripheral circuits.

X3 (clock generator) generates a 48MHz clock for U28. Pins 41 (VBUS), 39 (DM0) and 40 (DP0) are for USB interface. U28 is controlled by U1A (CPU).
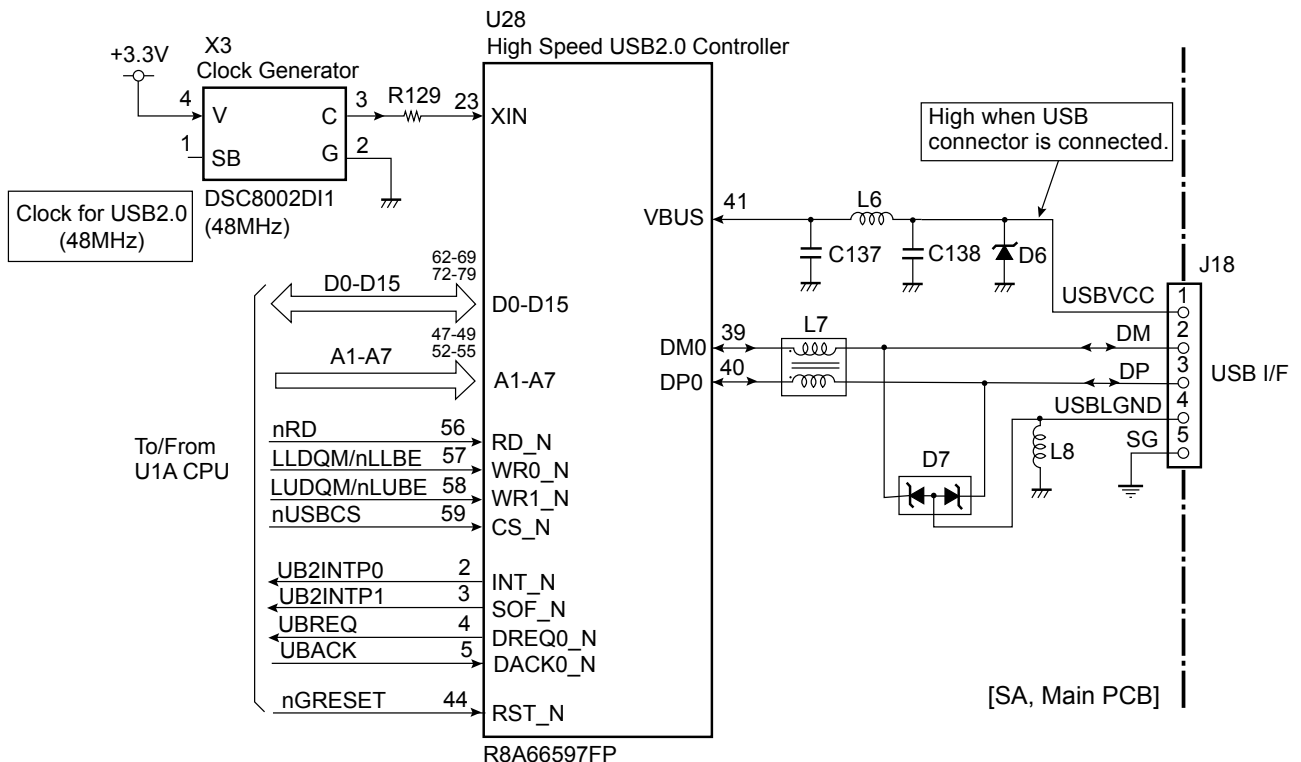
(6) RS232C I/F circuit

The RS232C I/F circuit consists of U25 and U26 (receiver/transmitter) and receives and transmits the RS232C I/F signals.
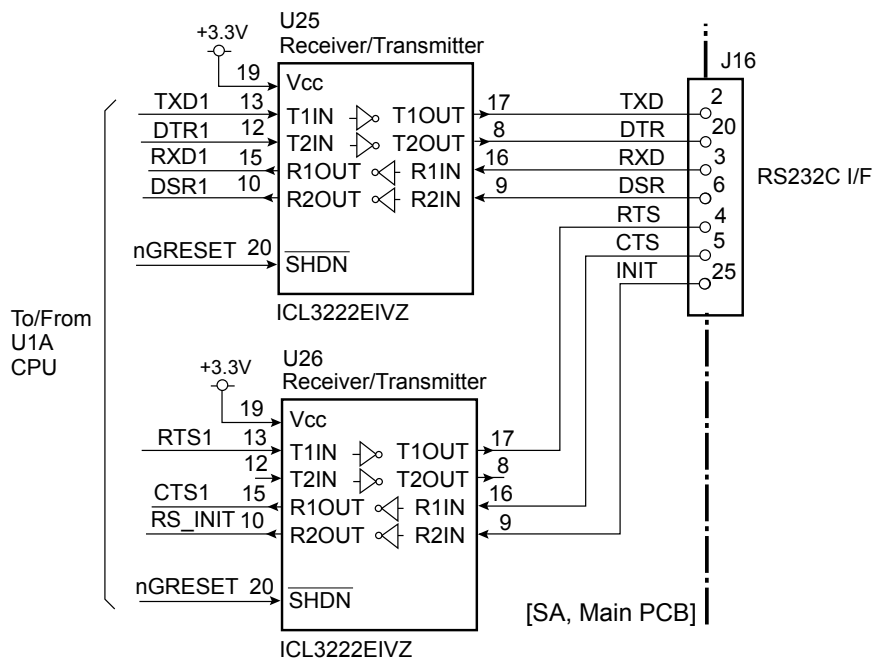
(7) Option I/F circuit

The optional I/F circuit consists of an ordinary USB interface circuit and communication I/F signal lines that are connected to U1A (CPU) and U14 (FPGA).

NAND gates (U27A, U27B and U27C) and transistor Q29 consist of a USB connection detecting circuit. When USB I/F is connected to the printer, pin 23 (VBUS) of J17 is set to "High". The detection circuit detects this level and outputs a UBINTP pulse to the CPU to inform of the USB connection.
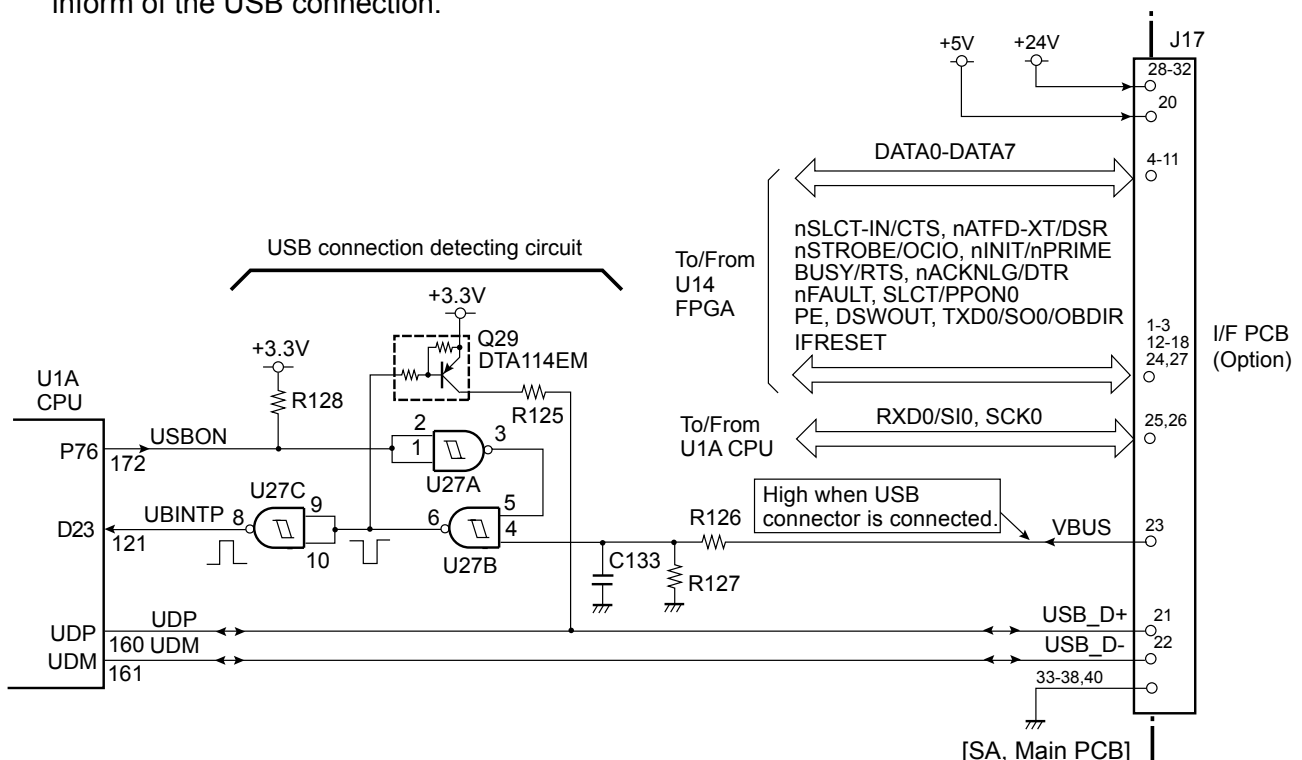
(8) Peeler circuit (for optional peeler)

The peeler circuit supplies +5V to an optional peeler by turning Q15 and Q14 ON.

When a peeler is installed in the printer, pin 80 (CPRTYP1) is set to "Low" level. With this "Low" level signal, the printer recognizes the connected peeler. (The CPU judges the connected optional device (either peeler or cutter) by detecting signals CPRTYP0 (at pin 81) and CPRTYP1 (at pin 80). The signal CPRTYP0 for an optional cutter is now at "High" level (not connected).)

A peel sensor detects the printed label that is peeled off by the peeler. Upon detection of the label peeled, printing stops and the printer waits for removal of the label. When you remove the label, the peeler sensor detects it and the printer resumes printing.

The peel sensor signal is input to pin 12 (ANI7) of U1A (CPU). From the input level of this signal, the CPU detects the peeler condition. (Since pin 80 (CPRTYP1) is "Low" level, Q16 turns OFF and U3 (analog switch) is ON.)
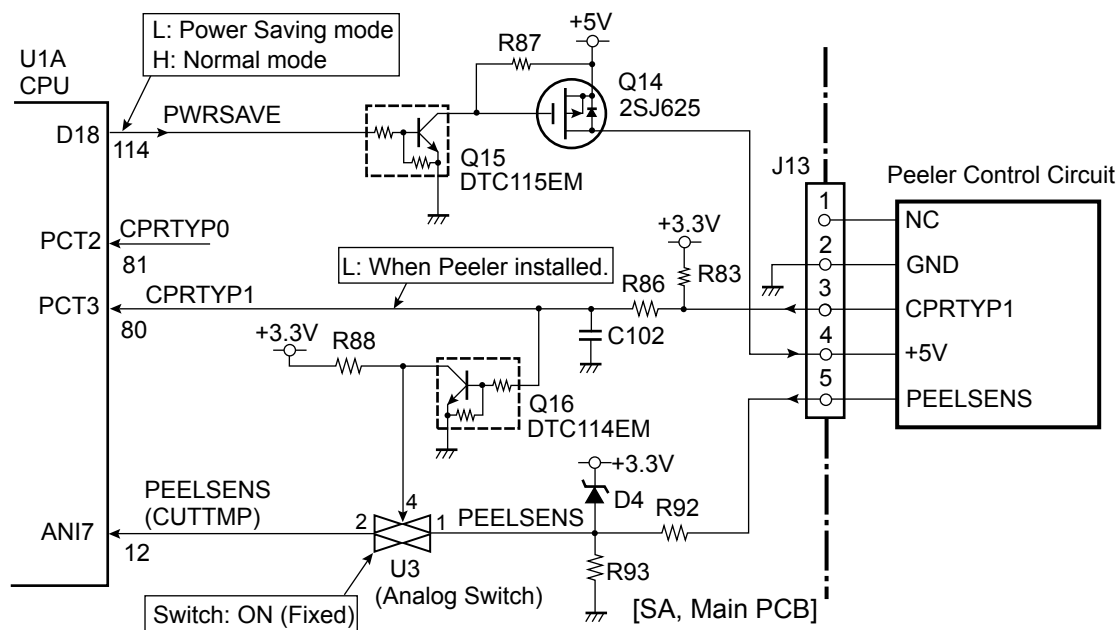
(9) Cutter control circuit (for optional cutter)

The cutter control circuit supplies VMT (+24V) to an optional cutter.

When a cutter is installed in the printer, pin 81 (CPRTYP0) is set to "Low" level. With this "Low" level signal, the printer recognizes the connected cutter. (The CPU judges the connected optional device (either peeler or cutter) by detecting signals CPRTYP0 (at pin 81) and CPRTYP1 (at pin 80). The signal CPRTYP1 for an optional peer is now at "High" level (not connected).) The cutter action is controlled by the signals CUTCON0 and CUTCON1 (at pins N1 and N2) output from U14 (FPGA). The cutter home position signal is input to pin 118 (CUTHP) of U1A (CPU).

A thermistor is attached to the cutter motor for detecting the motor temperature. The signal from the thermistor is input to pin 12 (CUTTMP) of U1A (CPU). The CPU detects the temperature by monitoring the signal CUTTMP and, if the temperature reaches 78°C (108.4°F), the cutter motor stops its operation. At this time, an error is issued and the PRINT LED and CONDITION LED blink alternatively. Wait until the cutter motor gets cool. When the temperature of the cutter motor falls below 70°C (185°F), the cutter operation will automatically resume.
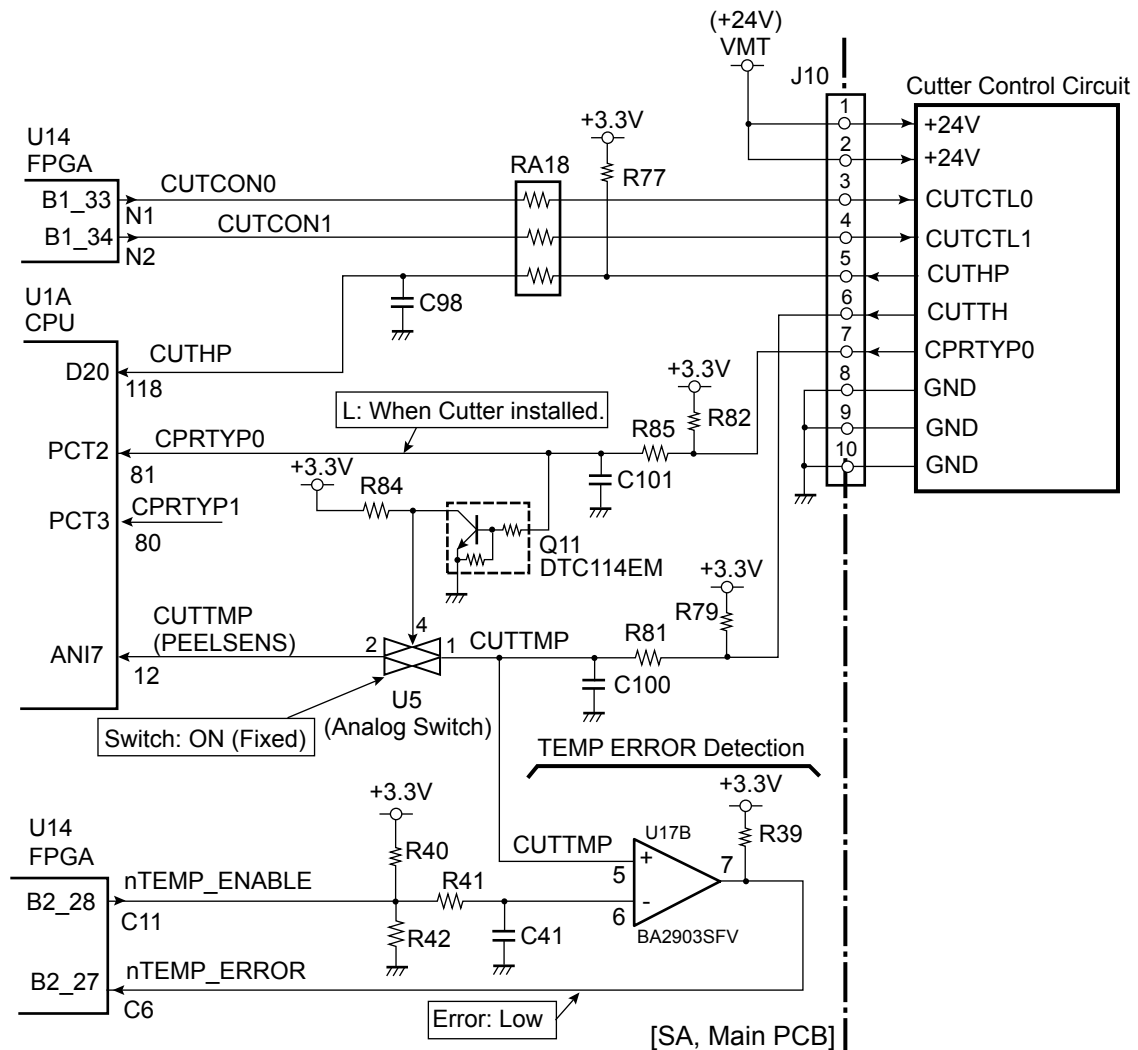
For further safety, an abnormally high temperature detection circuit is provided. In case this circuit is activated, the System error is displayed, and the printer stops.

The comparator U17B detects if the level at pin 5 (CUTTMP) exceeds a certain reference level determined by the output from pin C11 (nTEMP_ENABLE) of U14 (FPGA) (i.e., the predetermined allowable limit temperature). If it does, the signal nTEMP_ERROR at pin C6 of U14 (FPGA) goes "Low" level. Then, the System error is displayed and the printer stops. At this time, nTEMP_ENABLE at pin C11 is set to "Low" level so that nTEMP_ERROR is securely maintained at "Low" level. (To clear the System error, you need to turn OFF the printer once and then turn it ON.)

2-3. Operation Panel

Operation panel is located on the left/front side of the printer.

Operation panel consists of 4 keys and 4 LEDs, which perform to set the condition of the printer and indicate the operating condition.
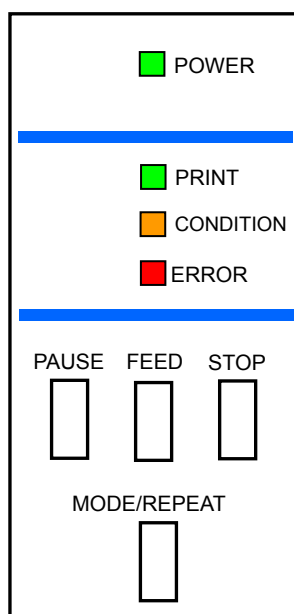
2-3-1. External view

(1) Keys

There are 4 keys, [MODE/REPEAT], [PAUSE], [FEED] and [STOP]. The function name on the key is selected when the key is pressed.

(2) LEDs

There are 4 LEDs, POWER, PRINT, CONDITION and ERROR. The LEDs light up or blink to indicate printer status, setting modes, or error conditions.

POWER LED lights up when power is turned on. (green)

PRINT LED lights up when the printer is ready to print (on-line state). (green) It is also used in Menu Setting mode and Sensor Adjustment mode.

CONDITION LED lights up in Menu Setting mode or Sensor Adjustment mode. (orange)

ERROR LED lights or blinks when error occurs. (red)

(To indicate an error, PRINT and CONDITION LEDs will be also used.)

2-3-2.   Operation using the keys

The following explains the normal operation and test operation accessible by pressing and holding the keys while turning ON the power.

In this manual, pressing and holding the key while turning the power ON is described as follows:

| [Key name] | **+** | [Key name] | **+** | [POWER] |
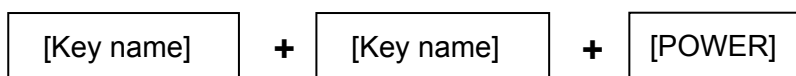
Example: **[MODE] + [POWER]** (to enter menu setting mode)

(1) Normal operation

The following two operations are available.

Operation	Description	Remarks
[PAUSE] + [FEED] + [STOP] + [POWER]	Enters sensor adjustment mode.	See "(1-1) Sensor adjustment mode". For details, see the User's Manual.
[MODE] + [POWER]	Enters menu setting mode.	See "(1-2) Menu setting mode". For details, see the User's Manual.

(1-1) Sensor adjustment mode

According to media to be used, you need to perform the sensor adjustment.

The following shows the rough description how to adjust the sensor. For details, refer to the User's manual.

Before performing the sensor adjustment, select the Media Sensor menu ("See Through", "Reflect", or "None") according to media to be used. See "(1-2) Menu setting mode" on the next page.

Media Sensor menu	Media
See Through	Label paper or tag with U-shaped notches
Reflect	Tag with black marks
None	Continuous media

All operations are made with the key.

1.   Entering the sensor adjustment mode (**[PAUSE]** + **[FEED]** + **[STOP]** + **[POWER]**)

2.   Selecting the sensor to be used (either the transparent sensor or reflective sensor)
    Transparent sensor: Label paper, Tag with U-shaped notches
    Reflective sensor: Tag with black marks

3.   Positioning of the sensor(s) against media

4.   Sensitivity adjustment using actual media to be used

(1-2) Menu setting mode

Set the menu according to your requirements. The following shows the menu settings print sample. To enter this mode, while pressing and holding the **[MODE]** key, turn ON the power. (**[MODE] + [POWER]**) For details, refer to the User's Manual.

Machine Information

Model Number	: CL-S6621
Boot Version	: X.X
ROM Version	: EBXXXXXX
ROM Date(DD//MM//YY)	: XX/XX/XX
ROM Check Sum	: XXXX
FPGA Version	: XXXXXXX
Head Check	: OK
Print Counter	: 0000.068km
Service Counter	: 0000.068km
Cut Counter	: 0
Sensor Monitor	: 2.53V
Option Interface	: None

Current Menu Settings

[Global Config Menu]
Config Set	: 1

[PageSetup Menu]
Print Speed	: 6 IPS
Print Darkness	: 10
Darkness Adjust	: 00
Print Method	: Thermal Transfer
Ribbon Winding	: Outside
Continuous Media Length	: 4.00 inch
Vertical Position	: 0.00 inch
Horizontal Shift	: 0.00 inch
Vertical Image Shift	: 0.00 inch
Auto Side Shift	: 0 dot
Media Sensor	: See Through
Small Media Adjustment	: Off
Small Media Length	: 1.00 inch
Symbol Set	: PM

[System Setup Menu]
Sensor Level	: 1.7 V
Paper End Level	: 2.80 V
Error Reporting	: On Printing
Buzzer Select	: On
Metric/Inch	: Inch
Max Media Length	: 10.00 inch
Settings Lock	: Off
Keyboard Lock	: Off
Standby Mode	: Off
Standby Timer	: 5 min
Paper Near End Status	: On
Paper Near End Alarm	: Off
Control Code	: STD
Emulation Select	: DM4
Emulation Auto Detect	: Full Auto

[After Print Menu]
AutoConfigure	: On
Function Select	: Tear
Cutter Action	: Backfeed
Paper Position	: 0.00 inch
Mode/Repeat Key	: Disabled

Note:

Citizen continually enhances its printers with new options and settings based on our customer's requests. Extra or changed menu items may appear on the print out in some cases.

```
[Interface Menu]
RS-232C Baud rate      : 9600 bps
RS-232C Parity         : None
RS-232C Length         : 8 bit
RS-232C Stop bit       : 1 bit
RS-232C X-ON           : Yes
IEEE1284               : On
USB Device Class       : Printer
USB VCOM Protocol      : Auto
USB 2.0 High Speed     : On
```

(2) Test mode

The following test modes are available.

Operation	Description	Remarks
[FEED] + [POWER]	Enters self print mode	See "(2-1) Self print mode".
[STOP] + [POWER]	Enters hex dump mode	See "(2-2) Hex dump mode".

(2-1) Self print mode

You can check the printing quality by printing the self print pattern.

For label (prints 2 labels):

1. While pressing and holding the **[FEED]** key, turn on the power.
2. When the PRINT LED blinks <u>slowly</u> (later, it will blink rapidly), release the **[FEED]** key.
   The printer enters self print mode. The label is fed, self test printing is made for two labels, and then printing stops.
3. To repeat printing, press the **[FEED]** key again.
   To exit self print mode, turn off the power.

For continuous media:

1. While pressing and holding the **[FEED]** key, turn on the power.
2. The PRINT LED will blink slowly. When it changes to <u>rapid</u> blink, release the **[FEED]** key.
   The printer enters self print mode and self test printing is made.
3. To repeat printing, press the **[FEED]** key again.
   To exit self print mode, turn off the power.

[Print pattern in self print mode]
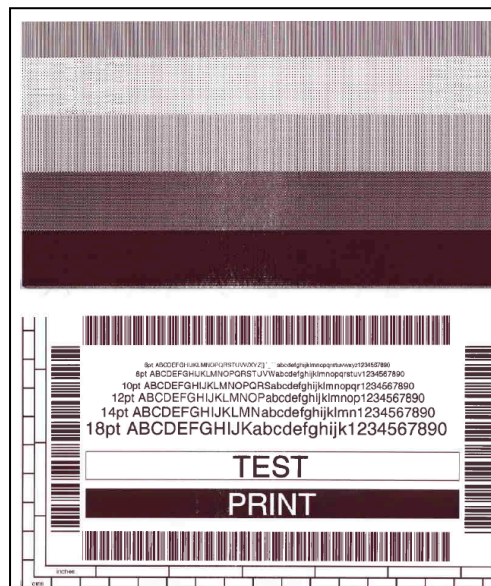
Media feed direction

(2-2) Hex dump mode

You can print the data in the receive buffer in the hexadecimal form.

For label:

1. While pressing and holding the **[STOP]** key, turn on the power.
2. When the PRINT LED blinks <u>slowly</u> (later, it will blink rapidly), release the **[STOP]** key.
   The printer enters hex dump mode and hex dump printing starts.
   To exit hex dump mode, turn off the power.

For continuous media:

1. While pressing and holding the **[STOP]** key, turn on the power.
2. The PRINT LED will blink slowly. When it changes to <u>rapid</u> blink, release the **[STOP]** key.
   The printer enters hex dump mode and hex dump printing starts.
   To exit hex dump mode, turn off the power.

[Dump list example]

DUMP LIST

02 40 30 31 30 30 0D 02 60 30 30 32 30 0D 02 4C   .M0100..c0020..L

44 31 31 0D 31 30 30 30 30 30 30 30 30 30 31 30   D11.100000000010

30 30 31 30 31 32 33 34 35 36 37 38 39 3A 3B 3C   0010123456789:;<

(3) Factory/Service mode

Operation	Description	Remarks
All keys + **[POWER]**	Enters factory mode and service mode	

(3-1) General

Factory mode and Service mode are available for maintenance.

Factory mode:

You can change the factory-set items such as logical shift of the sensor or head, and double heat (printing the same dot twice).

⚠ **In Factory mode, DO NOT change the factory-set values unless you need it, since there are essential items related to printing accuracy, etc.**

Service mode:

You can perform checks such as "head check "and "counter print" to print the total print length since the printer is firstly used.

(3-2) How to enter the Factory/Service Mode

How to enter Factory/Service mode differs from the "user menu setup mode" operation. However, once you have entered Factory/Service mode, the basic operation is the same as that for the "user menu setup mode" explained in the User's manual.

The Factory/Service mode menu appears at the top of the user menus as follows:
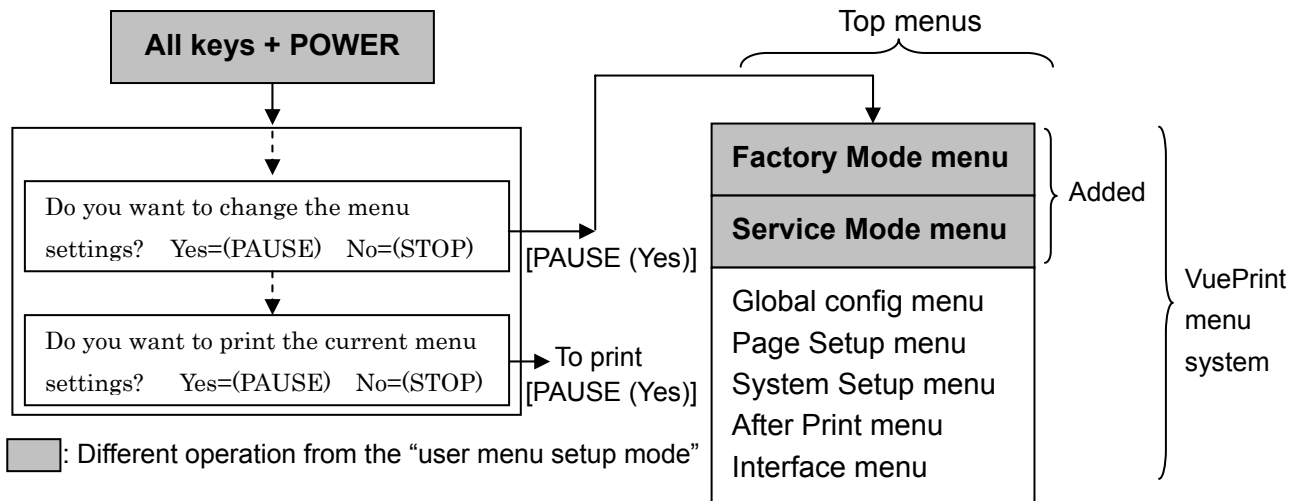
The menu operation principle is the same as for the "user menu setup mode" operation. The keys to be used and the functions are as follow:
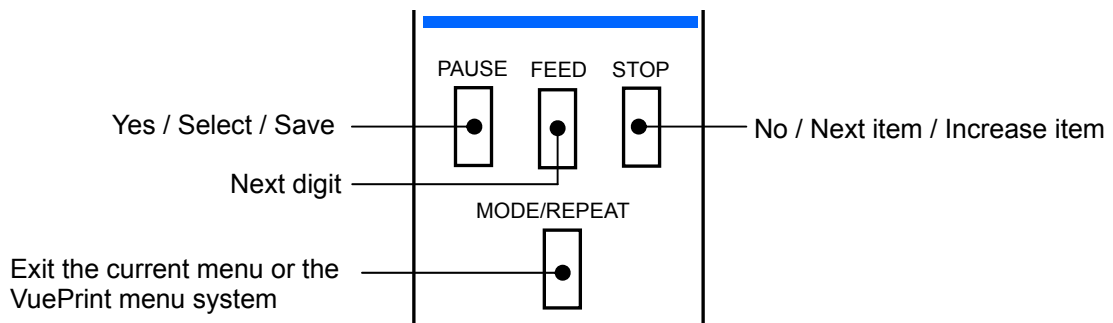
[Menu settings print sample in Factory/Service mode]

Machine Information

Model Number	: CL-S6621
Boot Version	: X.X
ROM Version	: EBXXXXXX
ROM Date(DD//MM//YY)	: XX/XX/XX
ROM Check Sum	: XXXX
FPGA Version	: XXXXXXX
Head Check	: OK
Print Counter	: 0000.068km
Service Counter	: 0000.068km
Cut Counter	: 0
Sensor Monitor	: 2.53V
Option Interface	: None

Factory Mode Settings

Through Sensor Position	: 0 dot
Reflect Sensor Position	: 0 dot
Machine Tear Position	: 0 dot
Machine Cut Position	: 0 dot
Machine Peel Position	: 0 dot
Machine Horizontal Pos.	: 0 dots
AutoCal Mode	: On
See Through Sensor	: 0.0 V
Reflect Sensor	: 0.0 V
SeeThrough Sensitivity	: Low
Reflect Sensitivity	: Low
Through Cal Level	: 2.30 V
Reflect Cal Level	: 2.10 V
SensNone Cal Level	: 2.05 V
Darkness Rate	: High
Double Heat Menu	: Off
PowerOn Head Check	: On
Head Check Start Pos.	: Dot 1
Head Check Stop Pos.	: Dot 1344
Head Error Print	: No
Ribbon Control	: Auto
Ribbon End Detection	: Quick
Void to TOF	: Off
Reverse Media Length	: 0.00 inch
Min Cut Length	: Default
Paper End Sensor	: On
Paper End Length	: Default
Parallel Error Output	: On
Auto Online	: Off
Auto Online Delay	: 2 sec
Top Form Sensing	: On
USB Serial Number	: Off
Auto Exec Print	: On
Config Print Layout	: Standard
Head Clean Message	: Off
Print Preference	: Darkness

Current Menu Settings

[Global Config Menu]
Config Set	: 1

Note:

Citizen continually enhances its printers with new options and settings based on our customer's requests. Extra or changed menu items may appear on the print out in some cases.

Submenus for maintenance only

[PageSetup Menu]
Print Speed   : 6 IPS
Print Darkness   : 10
Darkness Adjust   : 00
Print Method   : Thermal Transfer
Ribbon Winding   : Outside
Continuous Media Length : 4.00 inch
Vertical Position   : 0.00 inch
Horizontal Shift   : 0.00 inch
Vertical Image Shift   : 0.00 inch
Auto Side Shift   : 0 dot
Media Sensor   : See Through
Small Media Adjustment   : Off
Small Media Length   : 1.00 inch
Symbol Set   : PM

[System Setup Menu]
Sensor Level   : 1.7 V
Paper End Level   : 2.80 V
Error Reporting   : On Printing
Buzzer Select   : On
Metric/Inch   : Inch
Max Media Length   : 10.00 inch
Settings Lock   : Off
Keyboard Lock   : Off
Standby Mode   : Off
Standby Timer   : 5 min
Paper Near End Status   : On
Paper Near End Alarm   : Off
Control Code   : STD
Emulation Select   : DM4
Emulation Auto Detect   : Full Auto

[After Print Menu]
AutoConfigure   : On
Function Select   : Tear
Cutter Action   : Backfeed
Paper Position   : 0.00 inch
Mode/Repeat Key   : Disabled

[Interface Menu]
RS-232C Baud rate   : 9600 bps
RS-232C Parity   : None
RS-232C Length   : 8 bit
RS-232C Stop bit   : 1 bit
RS-232C X-ON   : Yes
IEEE1284   : On
USB Device Class   : Printer
USB VCOM Protocol   : Auto
USB 2.0 High Speed   : On

[Procedure to enter Factory/Service Mode]

1. Set media.
2. While pressing and holding **all keys**, turn on the power. (**ALL keys + [POWER]**)
    The printer enters Factory/Service mode. The PRINT LED and CONDITION LED light up
    and the following message is printed on media.

    > ### Citizen CL-S6621 VuePrint Menu System
    >
    > The four control panel buttons are used to select different options.   Generally:
    > Yes / Select / Save   = PAUSE (P) key
    > No / Next Item / Increase Item   = STOP (S) key
    > Next Digit   = FEED (F) key
    > Exit to previous menu   = MODE (M) key
    >
    > Do you want to reset this printer to factory settings?   Yes=(PAUSE)   No=(STOP)

3. Press the **[STOP]** key to skip to the next message.
    Then, the following message is printed.

    > Do you want to print the current menu settings?   Yes=(PAUSE)   No=(STOP)

4. Press the **[STOP]** key to skip to the next message.
    Then, the following message is printed.

    > Do you want to change the menu settings?   Yes=(PAUSE)   No=(STOP)

5. Press the **[PAUSE]** key to enter the menu settings mode.
    Then, the following top menu is printed.

    > Do you want to change "Factory Mode Menu" items?
    >   Yes=(PAUSE)   No=(STOP)   Exit=(MODE)

    • To enter the Factory Mode menu, proceed to the next step 6.
    • To proceed to the next top menu (Service Mode menu), press the **[STOP]** key. See step
    7.
    • To return to the previous one, press the **[MODE]** key.

6. Press the **[PAUSE]** key to enter the submenus.
    *   The following submenus under the Factory Mode menu will be printed as you press the
        [PAUSE] key repeatedly.
    *   For setting each item, see "(3-3) Factory/Service Mode menu table - (a) Factory Mode
        menu table", and setting example "How to change the value in the Factory Mode menu"
        on page 2-56.

    > Through Sensor Position   **+000dots**
    > Save=(PAUSE)   Next Digit=(FEED)   Change value=(STOP)   Exit=(MODE)
    >
    > Reflect Sensor Position   **+000dots**
    > Save=(PAUSE)   Next Digit=(FEED)   Change value=(STOP)   Exit=(MODE)
    >
    > Mach Tear Pos   **+000dots**
    > Save=(PAUSE)   Next Digit=(FEED)   Change value=(STOP)   Exit=(MODE)
    > (to be continued)

Mach Cut Pos   +000dots
Save=(PAUSE)   Next Digit=(FEED)   Change value=(STOP)   Exit=(MODE)

Mach Peel Pos   +000dots
Save=(PAUSE)   Next Digit=(FEED)   Change value=(STOP)   Exit=(MODE)

Mach Hor Pos   +00dots
Save=(PAUSE)   Next Digit=(FEED)   Change value=(STOP)   Exit=(MODE)

AutoCal Mode   **ON**
Save=(PAUSE)   Change value=(STOP)   Exit=(MODE)

SeeThrough Sensor   0.0
Save=(PAUSE)   Next Digit=(FEED)   Change value=(STOP)   Exit=(MODE)

Reflect Sensor   0.0
Save=(PAUSE)   Next Digit=(FEED)   Change value=(STOP)   Exit=(MODE)

SeeThrough Sensitivity   **Low**
Save=(PAUSE)   Change value=(STOP)   Exit=(MODE)

Reflect Sensitivity   **Low**
Save=(PAUSE)   Change value=(STOP)   Exit=(MODE)

Darkness Rate   **High**
Save=(PAUSE)   Change value=(STOP)   Exit=(MODE)

Double Heat Menu   **OFF**
Save=(PAUSE)   Change value=(STOP)   Exit=(MODE)

PowerOn Head Check   **ON**
Save=(PAUSE)   Change value=(STOP)   Exit=(MODE)

Ribbon End Detection   **Quick**
Save=(PAUSE)   Change value=(STOP)   Exit=(MODE)

Parallel Error Output   **ON**
Save=(PAUSE)   Change value=(STOP)   Exit=(MODE)

USB Serial Number   **OFF**
Save=(PAUSE)   Change value=(STOP)   Exit=(MODE)

Auto Exec Print   **ON**
Save=(PAUSE)   Change value=(STOP)   Exit=(MODE)

Config Print Layout   **Standard**
Save=(PAUSE)   Change value=(STOP)   Exit=(MODE)

Print Preference   **Darkness**
Save=(PAUSE)   Change value=(STOP)   Exit=(MODE)

Note: In the actual printing, the cursor "**^**" will be printed instead of "_ (underline)".

7. When the Service Mode Menu message is printed as shown below, press the [PAUSE] key to enter its submenus.
   * The following submenus will be printed successively as you press the [PAUSE] key repeatedly.
   * When you press the [PAUSE] key, check is done and the check result will be printed. For performing each item, see "(3-3) Factory/Service Mode menu table - (b) Service Mode menu table" and setting example "How to perform the check in the Service Mode menu" on page 2-58.

```
Do you want to change "Service Mode Menu" items?
 Yes=(PAUSE)   No=(STOP)   Exit=(MODE)

    Head Check          Exec
    Yes=(PAUSE)    No=(STOP)    Exit=(MODE)

    ROM Check           Exec
    Yes=(PAUSE)    No=(STOP)    Exit=(MODE)

    RAM Check           Exec
    Yes=(PAUSE)    No=(STOP)    Exit=(MODE)

    Print Counter       Exec
    Yes=(PAUSE)    No=(STOP)    Exit=(MODE)

    Service Counter     Exec
    Yes=(PAUSE)    No=(STOP)    Exit=(MODE)

    Cutter Counter      Exec
    Yes=(PAUSE)    No=(STOP)    Exit=(MODE)

Do you want to change "Page Setup Menu" items?
 Yes=(PAUSE)   No=(STOP)   Exit=(MODE)
```

8. To exit the Factory/Service mode, press the **[MODE]** key.

(3-3) Factory/Service Mode menu table

The following table shows the value and description of each submenu under Factory Mode menu and Service Mode menu.

(a) Factory Mode menu table

* : "+" shows that the object logically moves forward/rightward. "-" shows that the object logically moves backward/leftward.

** : 8 dots correspond to 1 mm for each adjustment value. (Namely, 203 dots correspond to 1".)

Submenu Name	Adjustable Value (Default Value)	Description
Through Sensor Position (See **Note**.)	-256 to +256 [dots] (+000 [dots])	Logically shifts the transparent sensor position back and forth. (-32 to +32 mm, -1.26 to +1.26")
Reflect Sensor Position (See **Note**.)	-256 to +256 [dots] (+000 [dots])	Logically shifts the reflective sensor position back and forth. (-32 to +32 mm, -1.26 to +1.26")
Mach Tear Pos	-256 to +256 [dots] (+000 [dots])	Logically shifts the tear off position back and forth. (-32 to +32 mm, -1.26 to +1.26")
Mach Cut Pos	-256 to +256 [dots] (+000 [dots])	Logically shifts the cutting position back and forth. (-32 to +32 mm, -1.26 to +1.26") (Optional)
Mach Peel Pos	-256 to +256 [dots] (+000 [dots])	Logically shifts the peel position back and forth. (-32 to +32 mm, -1.26 to +1.26") (Optional)
Mach Hor Pos	-16 to +32 [dots] (+00 [dots])	Logically shifts the head position right and left. (-2 to +4 mm, -0.08 to +0.16")
AutoCal Mode	ON, OFF (ON)	Automatically controls the light amount in each Media sensor menu (See Through, Reflect, None).
SeeThrough Sensor	0.0 to 3.3 [V] (0.0 [V])	This menu is effective when "AutoCal Mode" is set to OFF. The light amount in Media sensor menu "See Through" can be changed manually. Larger value emits larger amount of light.
Reflect Sensor	0.0 to 3.3 [V] (0.0 [V])	This menu is effective when "AutoCal Mode" is set to OFF. The light amount in Media Sensor menu "Reflect" can be changed manually. Larger value emits larger amount of light.
SeeThrough Sensitivity	Low, Medium, High (Low)	This menu is effective when "AutoCal Mode" is set to OFF. The sensitivity of the transparent sensor can be changed in 3 levels.
Reflect Sensitivity	Low, Medium, High (Low)	This menu is effective when "AutoCal Mode" is set to OFF. The sensitivity of the reflective sensor can be changed in 3 levels.
Darkness Rate	High, Low (High)	The rate for darkness increase/decrease can be set.
Double Heat Menu	ON, OFF (OFF)	To display the item "Double Heat Menu" in the "PageSetup Menu" or not is selectable.

| Submenu Name	Adjustable Value (Default Value)	Description
PowerOn Head Check	ON, OFF (ON)	To perform the head check at power ON or not is selectable.
Ribbon End Detection	Quick, Normal, Slow (Quick)	Sets the ribbon end detection time.
Parallel Error Out	ON, OFF (ON)	To set the Fault signal to ON or not at the time of error occurrence in parallel interface is selectable.
USB Serial Number	ON, OFF (OFF)	To send the serial number to the host when the USB interface is connected to the printer or not is selectable.
Auto Exec Print	ON, OFF (ON)	To execute the Auto Exec file stored in the printer at power ON or not is selectable.
Config Print Layout	Standard, Reversed (Standard)	Print layout type can be selected. Standard: Prints setting items on the left and set values on the right. Reversed: Prints set values on the left and setting items on the right.
Print Preference	Darkness, Speed (Darkness)	To put the priority on printing density or printing speed is selectable.

Note: "Through Sensor Position" adjustment and "Reflect Sensor Position" adjustment must be done after one of the following parts is replaced.
• SA, Main PCB
• SA, Ribbon Sensor (on both front and rear sides)

How to change the value in the Factory Mode menu

For example, the following shows how to logically move the thermal head position 1 mm (0.04") toward the right side. In this case, you should add 8 (dots) to the current value (e.g. +08).

• Variable range: -16 to +32 dots (default +00 dot) (-2 to +4 mm, -0.08 to +0.16")
• 8 dots correspond to 1 mm. (203 dots correspond to 1".)

[Front]
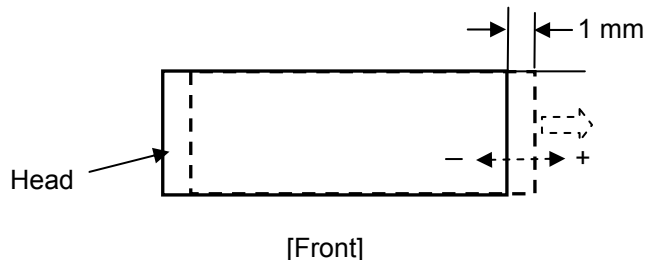
1. Perform steps 1-6 on page 2-51 to enter the Factory Mode menu. See "(3-2) How to enter the Factory/Service Mode".

2. Press the **[PAUSE]** key until "Mach Hor Pos" submenu is printed.

```
Do you want to change "Factory Mode Menu" items?
     Y es=(PAUSE) No=(STOP) Exit=(MODE)
     Through Sensor Position        +000dos
     S ave=(PAUSE)   Next Digit=(FEED)   Change value=(STOP)   Exit=(MODE)
                    :
                    :
     Mach Hor Pos                   +00dots
     Save=(PAUSE)   Next Digit=(FEED)   Change value=(STOP)   Exit=(MODE)
```

Note: In the actual printing, the cursor "^" will be printed instead of "_ (underline)".

3. To set the value to 16 (0 plus 16), press the **[FEED]** key to move the cursor to the next digit (+00), and then press the **[STOP]** key once to specify "1".
   Each time you press the **[STOP]** key, the value of the current digit with the cursor will scroll (0, 1, 2, 3, 4, ..., 9, 0).

4. Next, press the **[FEED]** key to move the cursor to the next digit (+10).
   The changed value is printed.

```
Mach Hor Pos                   +10dots
Save=(PAUSE)   Next Digit=(FEED)   Change value=(STOP)   Exit=(MODE)
```

5. Press the **[STOP]** key 6 times to specify "6".
   Each time you press the key, the value will scroll (8, 9, 0, 1, ..., 6).

6. To save the set value, press the **[PAUSE]** key.
   The set value will be printed. Be sure that the new value is "16", and then press the **[MODE]** key to exit the item.
   * If the value is not the one you expected, repeat above operation.

```
Mach Hor Pos                   +16dots
Save=(PAUSE)   Next Digit=(FEED)   Change value=(STOP)   Exit=(MODE)
```

(b) Service Mode menu table

Submenu Name	Value	Description
Head Check	None	**[PAUSE]**: Checks the number of defective thermal elements and prints it. If no defective thermal element is found, "0" will be printed. Example: Bad head element: 0 dot(s) **[STOP]:** Nothing is printed.
ROM Check	None	**[PAUSE]**: Performs ROM checksum test, and prints the check result (OK or NG) and the checksum value. Example: PROGRM ROM OK 4F4E **[STOP]:** Nothing is printed.
RAM Check	None	**[PAUSE]**: Performs RAM capacity check and prints the check result. Example: RAM OK 32768K **[STOP]:** Nothing is printed.
Print Counter	None	**[PAUSE]**: Prints the total printed length accumulated from when the printer is firstly used. Example: Length 1234.5Km **[STOP]:** Nothing is printed.
Service Counter	None	**[PAUSE]**: Prints the service counter length in Km accumulated from when it was reset last time. Example: Length 0123.4Km Clear Service Counter ? Yes=(PAUSE) No=(STOP) To clear the service counter, press the **[PAUSE]** key again. To quit, press the **[STOP]** key. **[STOP]:** Nothing is printed.
Cut Counter	None	**[PAUSE]**: Prints the cut counter value accumulated from when it was reset last time. Example: Count 10 Clear Cut Counter ? Yes=(PAUSE) No=(STOP) To clear the cut counter, press the **[PAUSE]** key again. To quit, press the **[STOP]** key. **[STOP]:** Nothing is printed.

How to perform the check in the Service Mode menu

For example, the following shows how to perform the head check.

1. Perform steps 1-7 on pages 2-51 to 2-53 to enter the Service Mode menu. See "(3-2) How to enter the Factory/Service Mode".

2. Press the **[PAUSE]** key until "Head Check" submenu is printed.

> Do you want to change "Service Mode Menu" items?
>   Yes=(PAUSE)   No=(STOP)   Exit=(MODE)
>
> Head Check   Exec
>   Yes=(PAUSE)   No=(STOP)   Exit=(MODE)

3. Press the **[PAUSE]** key to check for head abnormality.
   The number of faulty thermal elements is printed.
   Example: Bad head element: 0 dot(s)
   After printing the check result, the next submenu is automatically printed.

   If you press the [**STOP**] key, nothing is printed.

2-4.   Interface

2-4-1.   Serial Interface

(1) Specifications

System	Start/stop asynchronous full duplex communication
Signal level	RS-232C
Baud rate	2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Data length	7 bits, 8 bits
Stop bit	1 bit, 2 bits
Parity	Odd, even, none
Connector	D-SUB 25PIN 225AE25FSNBBA3(COXOC)

(2) Signal line and pin assignment

Pin No.	Signal Abbr.	Signal name	Function
1	FG	Protective ground	Protective grounding
2	TXD	Transmit Data	Signal line that transmits data from the printer to the host
3	RXD	Receive data	Signal line that transmits data from the host to the printer
4	RTS	Transmission request	Signal line that becomes active when the printer can receive data
5	CTS	Able to transfer data	Signal line that becomes active when other devices can receive data from the printer
6	DSR	Data Set Ready	Signal line that is active when the host can interface with the printer
7	SGND	Signal ground	Signal grounding line
8-13	NC	------	Not used
14	VCC	+3.3V	(Factory use only)
15-19	NC	------	Not used
20	DTR	Data Terminal Ready	Signal line that is active when the printer can interface with the host
21-25	NC	------	Not used

(3) Protocol

XON/XOFF system:

Controlled with the data transmission request signal X-ON (11H) code and the data transmission stop request signal X-OFF (13H) code.

The conditions for the X-ON code output are as follows:
• When the printer is turned from off-line to on-line.
• When the remaining of receive buffer is 1024 bytes or more after sending X-OFF code.

The conditions for the X-OFF code output are as follows:
• When the remainder of receive buffer is 128 bytes or less.
• When the printer is turned from on-line to off-line.
  When the media end is detected.
  When a printer error occurs.
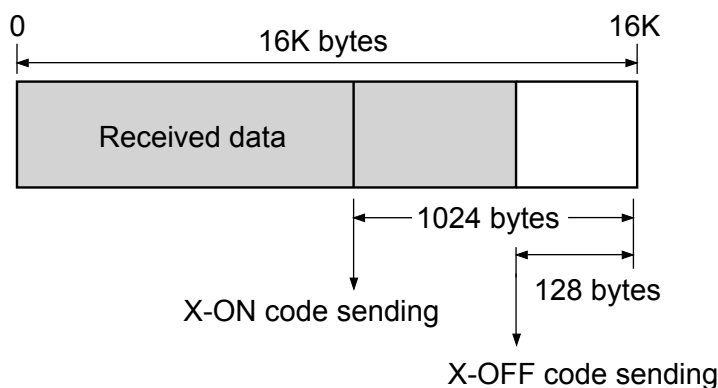
READY/BUSY System:

DTR signal is controlled with READY ("High")/BUSY ("Low") level.

DTR turns to "High (Ready)" in the following conditions:
• When the printer is in on-line mode, and
• When the remaining buffer is 128 bytes or more.
  (After DTR becomes "High", DTR retains "High" until the remaining buffer becomes 1024 bytes or less.)

DTR turns to "Low (Busy)" in the following conditions:
• When the printer is in off-line mode.
• When the remaining buffer is less than 128 bytes.
  (After DTR becomes "Low", DTR retains "Low" until the remaining buffer becomes 1024 bytes or more.)

2-4-2. USB Interface

(1) Specifications

Standards	Complies with Universal Serial Bus Specification 2.0
Transmission speed	Compatible with 480Mbps (high speed) transmission
Receive buffer	16K bytes
Connector	15120-00410 (KST)

(2) Signal line and pin arrangement

Pin No.	Signal code	Signal	Function
1	VBUS	USB power	USB power (+5V)
2	D+	Signal line +	+ signal line
3	D-	Signal line -	- signal line
4	GND	GND	GND

2-4-3. Parallel Interface (Option)

(1) Specifications

Transmission system	8-bit parallel data
Receive buffer size	16K bytes
Transmission modes	**Compatible mode** It is an asynchronous forward channel mode to send the byte width data from the host to the printer. The interface line of the data is operated in accordance with signal line definitions of Centronics. **NIBBLE mode** It is an asynchronous reverse channel mode to send the data from the printer to the host. In Nibble mode, 4-bit data (half byte) is sent at a time using the 4 status lines (FAULT, SELECT, PE, and BUSY). To send one complete byte data, the printer sends 2 nibbles (8 bits in total) to the host. Nibble mode is usually combined with Compatible mode to create a complete bi-directional channel. **ECP mode** ECP mode permits bi-directional asynchronous data transmission, and by means of interlock handshake, it does not require the timing necessary with Compatible mode.
Signal level	IEEE1284 compatible

(2) Signal line and pin assignment

Pin No.	Signal name	I/O	Function in Compatible Mode
1	$\overline{\text{STROBE}}$	Input	Strobe signal to read in 8-bit data
2-9	DATA0-7	Input	8-bit parallel signal
10	$\overline{\text{ACKNLG}}$	Output	8-bit data request signal
11	BUSY	Output	Signal specifying printer busy
12	PERROR	Output	Signal specifying media end
13	SELECT	Output	Signal specifying if the printer is on-line (printing enabled) or off-line
14	AUTOFD	Input	Invalid (ignored)
15	NC	---	Not used
16	SGND	---	Signal ground
17	FGND	---	Frame ground
18	P.L.H	Output	Peripheral logic high (pulled up to +5V at 1KΩ)
19-30	GND	---	Ground for twisted pair return
31	$\overline{\text{PRIME}}$	Input	Printer reset
32	$\overline{\text{FAULT}}$	Output	Signal specifying printer error
33	GND	---	Signal ground
34	NC	---	Not used
35	NC	---	Not used
36	SELECTIN	Input	Invalid (ignored)

(3) Parallel port status signals when an error occurs

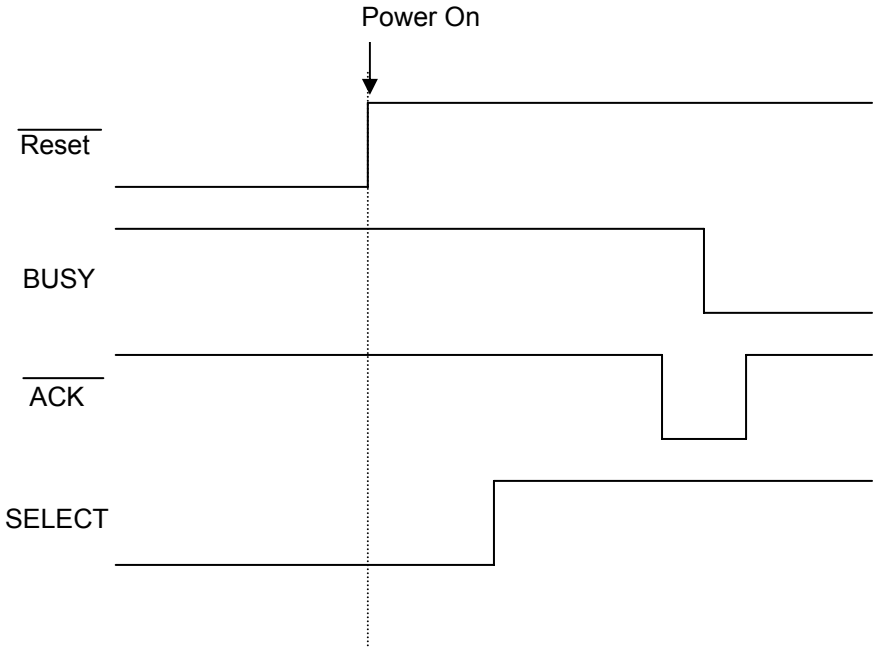The following table shows the status signal change when an error occurs.

Under the specifications for this bi-directional parallel interface, the parallel port status signals when an error occurs are, as shown below, partially processed differently than with Compatible mode used up till now. When bi-directional parallel interface is on in the setting menu, even if a printer error has occurred, the BUSY signal line is not active ("H").

Error	Compatible mode
Paper end	Busy: $L \rightarrow H$ PError: $L \rightarrow H$ Select: $H \rightarrow L$ $\overline{\text{Fault}}$: $H \rightarrow L$
Error other than paper end • Head open • Other	Busy: $L \rightarrow H$ PError: $L \rightarrow$ unchanged Select: $H \rightarrow L$ $\overline{\text{Fault}}$: $H \rightarrow L$
Conditions for Busy	• Receive buffer full • Data being read • Error

(4) Compatible timing specification

[When power is on] (Timing to go on-line)

Power On

Reset

BUSY

ACK

SELECT

[While receiving data]

Data0~7

Strobe

BUSY

0.5µs   0.5µs   0.5µs
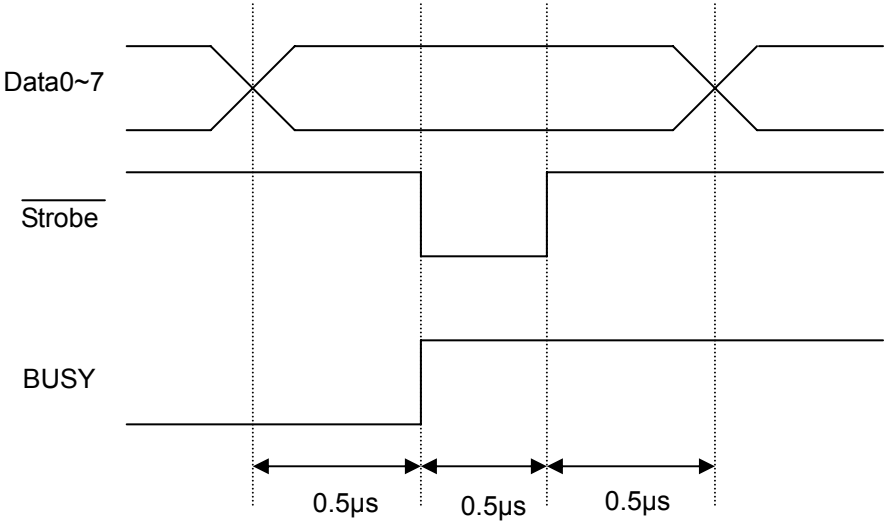
Note: BUSY goes "High" at the falling edge of Strobe, and data is latched at the leading edge of Strobe.

[While receiving PRIME signal]

10~15μsec or more

$\overline{\text{PRIME}}$

BUSY

$\overline{\text{Ack}}$

$\overline{\text{Fault}}$

SELECT
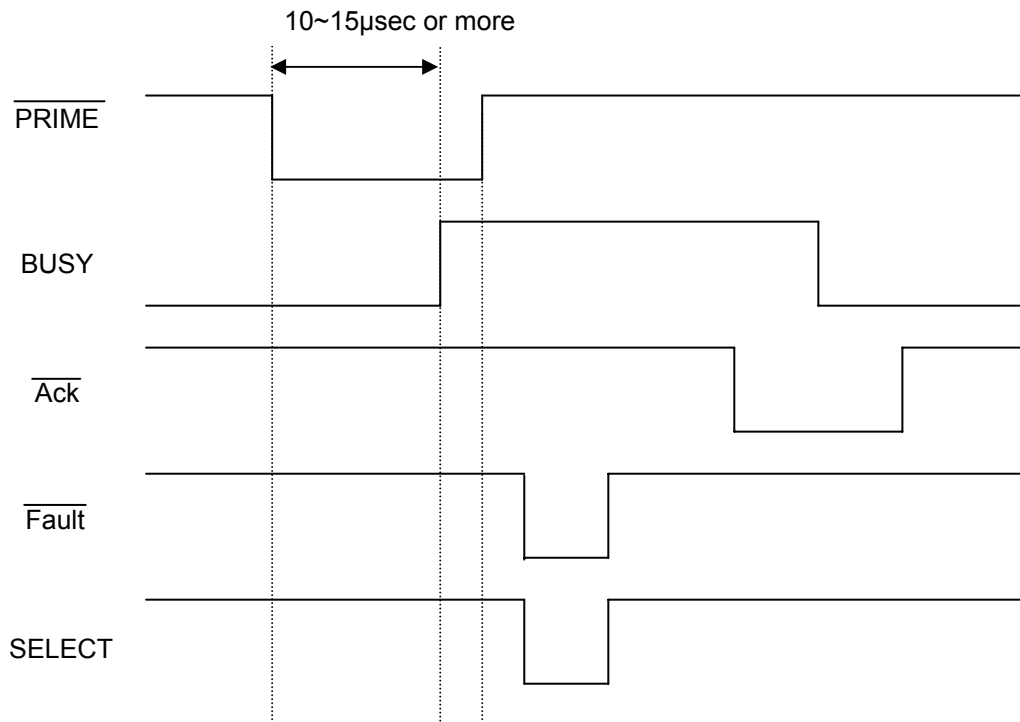
Note: If the $\overline{\text{PRIME}}$ signal width is 10 μsec or less, it is not accepted.
BUSY goes to "High" when the $\overline{\text{PRIME}}$ signal is accepted by the printer.

[Timing relationship between BUSY and $\overline{\text{ACK}}$]

Center

BUSY

$\overline{\text{ACK}}$

About 2 μsec
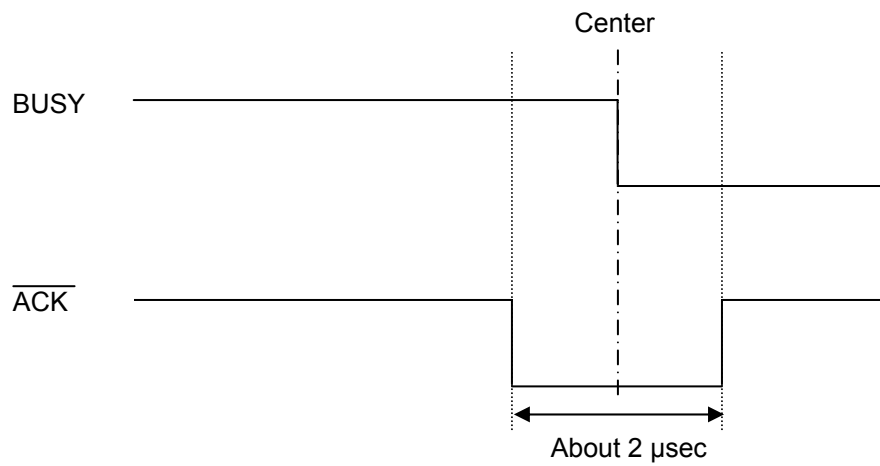
CHAPTER 3
DISASSEMBLY AND MAINTENANCE
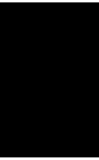
CHAPTER 3   DISASSEMBLY AND MAINTENANCE

TABLE OF CONTENTS

3-1. Maintenance Precautions

⚠ Warning

- **Before starting disassembly/reassembly or mechanical adjustment, be sure to disconnect the power cord from the power source.**

⚠ Caution

- **Do not disassemble/reassemble or adjust the machine, if it functions properly. Particularly, do not loosen screws on any component, unless necessary.**
- **After completing an inspection and before turning on the power, be sure to check that there is no abnormality.**
- **Never try to print without media.**
- **Check that the media is properly set.**
- **Do not lay anything on the cover or lean against it during maintenance or while the printer is in operation.**
- **During maintenance, be careful not to leave parts or screws unattached or loose inside the printer.**
- **When handling a printed circuit board, do not use gloves, etc., which can easily cause static electricity. Since ICs, such as CPU, RAM and ROM, might be destroyed by static electricity, do not touch lead wires or windows unnecessarily.**
- **Do not put the printed circuit boards directly on the printer or on the floor.**
- **When disassembling or reassembling, check wires for any damage and do not pinch or damage them. Also, run wires as they were.**

3-2. Cleaning

Cleaning spots are listed below.

Cleaning Position	Description
Cabinet	Wipe soiled parts of the printer with a clean dry cloth. Remove bits of media, etc., using tweezers. **Note:** When cleaning, be careful not to scratch the equipment or to bend parts, etc.
SA, Head	Clean the thermal head with the head cleaner only.
SA2 Platen	Clean the platen with a soft cloth.
Media running surface	Wipe off media refuse, etc., on and around the media running surface including the "SA2 Platen".

Clean inside the printer in accordance with the following:

• Cleaning frequency: Every 6 months or 300 hours of operation. (Whichever comes first)
• Materials: Dry cloth (gauze or soft cloth) and thermal head cleaner

3-3. Lubrication

3-3-1. Lubrication frequency

This is a maintenance-free machine and requires no lubrication under normal use. However, the machine should be lubricated whenever it is disassembled and reassembled, or when lubricated parts are cleaned.

The parts to be lubricated are indicated in the disassemble procedure with the mark ★.

3-3-2. Types of lubricant

• Floil G-311S (by Kanto Chemical Co., Ltd.)
• Floil G-474C (by Kanto Chemical Co., Ltd.)

3-3-3. Quantity of lubricant

Small quantity.......... ★ ....   About 1 drop.
Ordinary quantity .... ★★ ....   About 3 to 4 drops.
                                                      About 0.2 mm thick for grease.
Large quantity.......... ★★★ ....   Apply sufficiently.

3-3-4. Adhesive

• LOCTITE263 (by Henkel AG & Co. KGaA)

3-4. Maintenance Tools List

Maintenance tools shown below are needed when replacing the maintenance parts such as the "SA, Main PCB", "SA PF Motor", etc.

Maintenance Tools List

No.	Name	Q'ty	Description	Remarks
1	Phillips Screwdriver (Length 200 mm)	1	Bit: #0, #1, #2	
2	Phillips Screwdriver (Length 100 mm)	1	Bit: #0, #1, #2	
3	Flat-blade Screwdriver (Length 100 mm)	1	4.3 mm width	
4	Nut driver	1	4 mm	
5	Tweezers	1		
6	Round Nose Pliers	1		
7	Cutting Nippers	1		
8	Soldering Iron (30W)	1		
9	Volt-ohm Meter	1		

3-5. Quick Detachment of Major Parts

How to quickly detach the following major parts separately is explained here.

• SA, Head
• SA2 Platen

3-5-1. SA, Head

⚠ Caution
• **When detaching or reinstalling the "SA, Head", be careful not to damage the thermal elements. Especially, avoid contacting the thermal elements with a metal part, etc.**

⚠ **Do not touch the thermal elements of the "SA, Head" with your bare hand.**

1. Open the "Cover Top" Block.
2. Push the "Lever Head Lock" (①) and open the Ribbon & Head Block (②).
3. Remove the 2 screws (NO.1, TFH (6-0.7), M3.0x6 (NI)) (③) and detach the "SA, Head" (④).
4. Disconnect the 2 connectors (⑤ and ⑥) from the "SA, Head".
   NOTE: To disconnect the connector (⑤), unlock the connector lock.
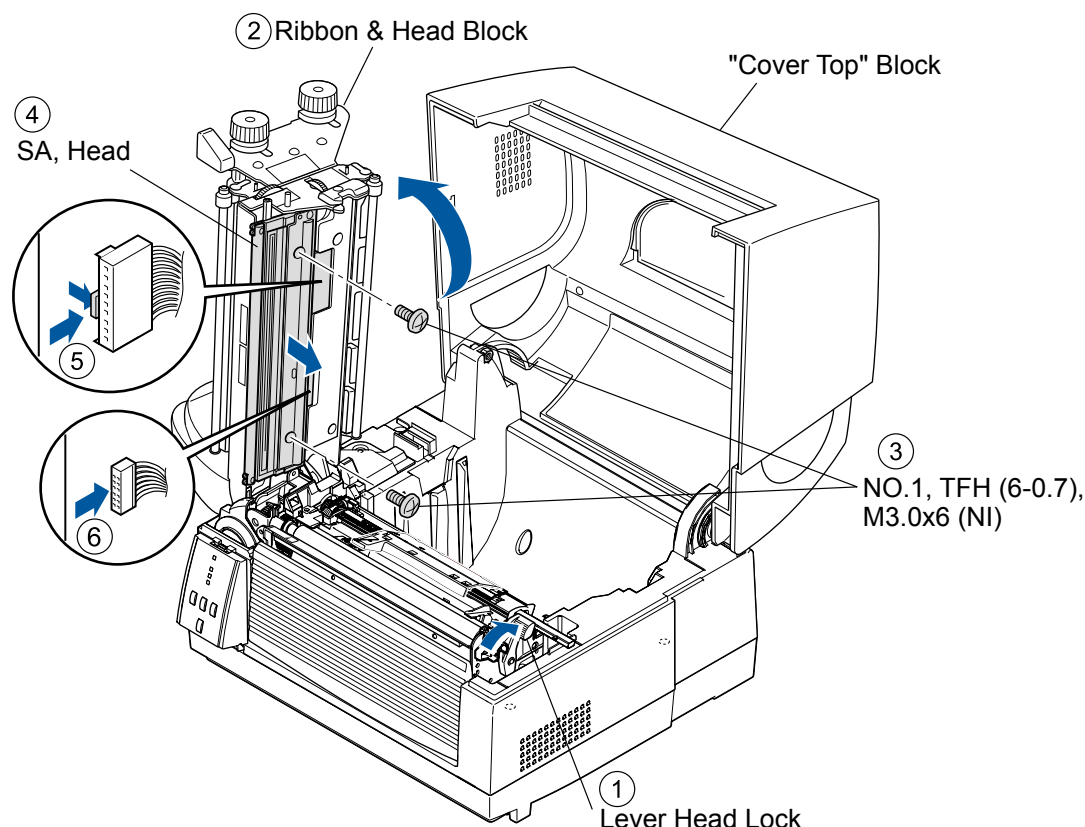
Notes on reassembling:

• The Ribbon & Head Block has two bosses that allow easy positioning of the "SA, Head". When assembling the "SA, Head", be sure that it is securely engaged with the Ribbon & Head Block.
• Insert the connectors firmly.

3-5-2.　SA2 Platen

1.　Open the "Cover Top" and then the ribbon & head Block.
2.　While pressing the part "**A**" of the "SA2 Platen", lift the right end of the "SA2 Platen" a little. (See the arrow "**a**".)
　　Next, move it to the right and then remove it from the printer by lifting it upwardly. (See the arrow "**b**".)

Head Block

"Cover Top" Block
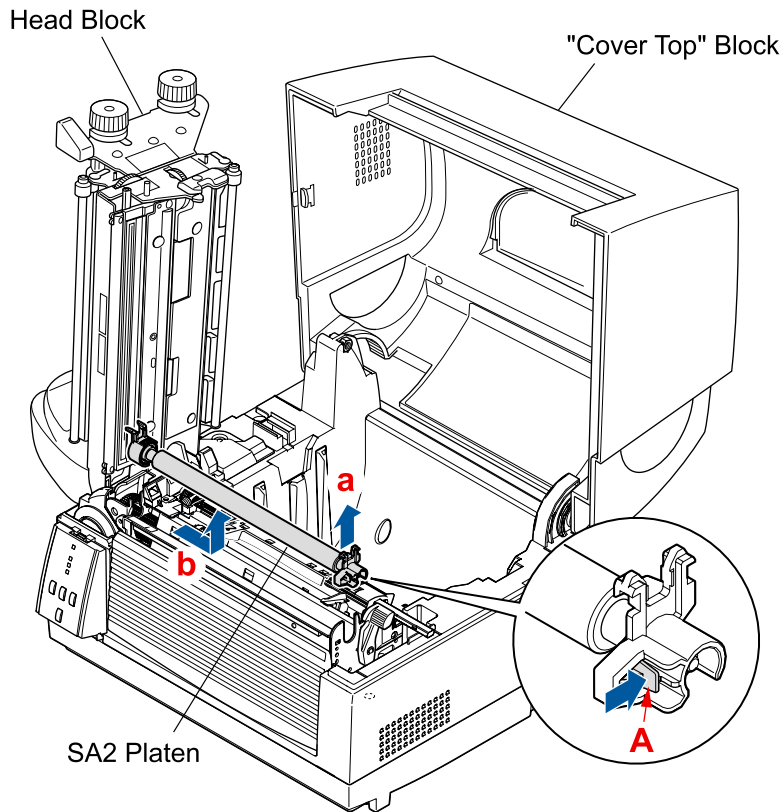
SA2 Platen

Note on reassembling:

• After reassembling the "SA2 Platen", be sure that it is securely engaged with the main body.

3-6. Disassembly, Reassembly and Lubrication

[Disassembly Flowchart for Major Parts]

```
CL-S6621
    ├──────────────────────────────► Roll Paper Shaft        (See 3-6-24.)
    │
    ├──────────────► SA, Head          (See 3-5-1.)
    │
    ├──────────────► SA2 Platen        (See 3-5-2.)           ┌─► SA, Fan              (See 3-6-4.)
    │                                                          │
    └──────► Cover Top    (See 3-6-1.)                         ├─► Ribbon Gears         (See 3-6-5.)
                │                                              │
                ▼                                              ├─► SA Ribbon Motor F    (See 3-6-6.)
             Unit, Ribbon ────────────────────────────────────┤
                │        (See 3-6-2.)                          ├─► SA Ribbon Motor R    (See 3-6-6.)
                ▼                                              │
             Case U      (See 3-6-3.)                          ├─► SA, Ribbon PCB       (See 3-6-6.)
                │                                              │
                │                                              └─► SA, Ribbon Sensor    (See 3-6-9/10.)
                │
                ├──────► SA, Opepane PCB       (See 3-6-12.)
                │
                ├──────► SA PNE Sensor         (See 3-6-11(2).)
                │
                ├──────► Unit, Power Supply    (See 3-6-13(2).)
                │
             Cover Main PCB    (See 3-6-11(3).)
                │
                ├──────► SA, Relay PCB         (See 3-6-11(3).)
                │
                ├──────► SA, Main PCB          (See 3-6-11(3).)
                │
             Unit, Mechanism   (See 3-6-13(1).)
                │
                ├──────► Unit, Power Supply ──────► Case L        (See 3-6-13(3).)
                │              (See 3-6-13(2).)
                │
                ├──────► SA2 Platen         (See 3-6-14.)
                │
                ├──────► Unit, Sensor U ──────► SA TRA Sen PCB   (See 3-6-16.)
                │              (See 3-6-15.)
                │
                ├──────► Unit, Head ──────► SA, Head             (See 3-6-18.)
                │              (See 3-6-17.)
                │
                └──────► SA PF Motor ──────► SA, Head Up Switch  (See 3-6-20(1).)
                               (See 3-6-19.)  └─► SA Ref Sen PCB  (See 3-6-20(2).)
```
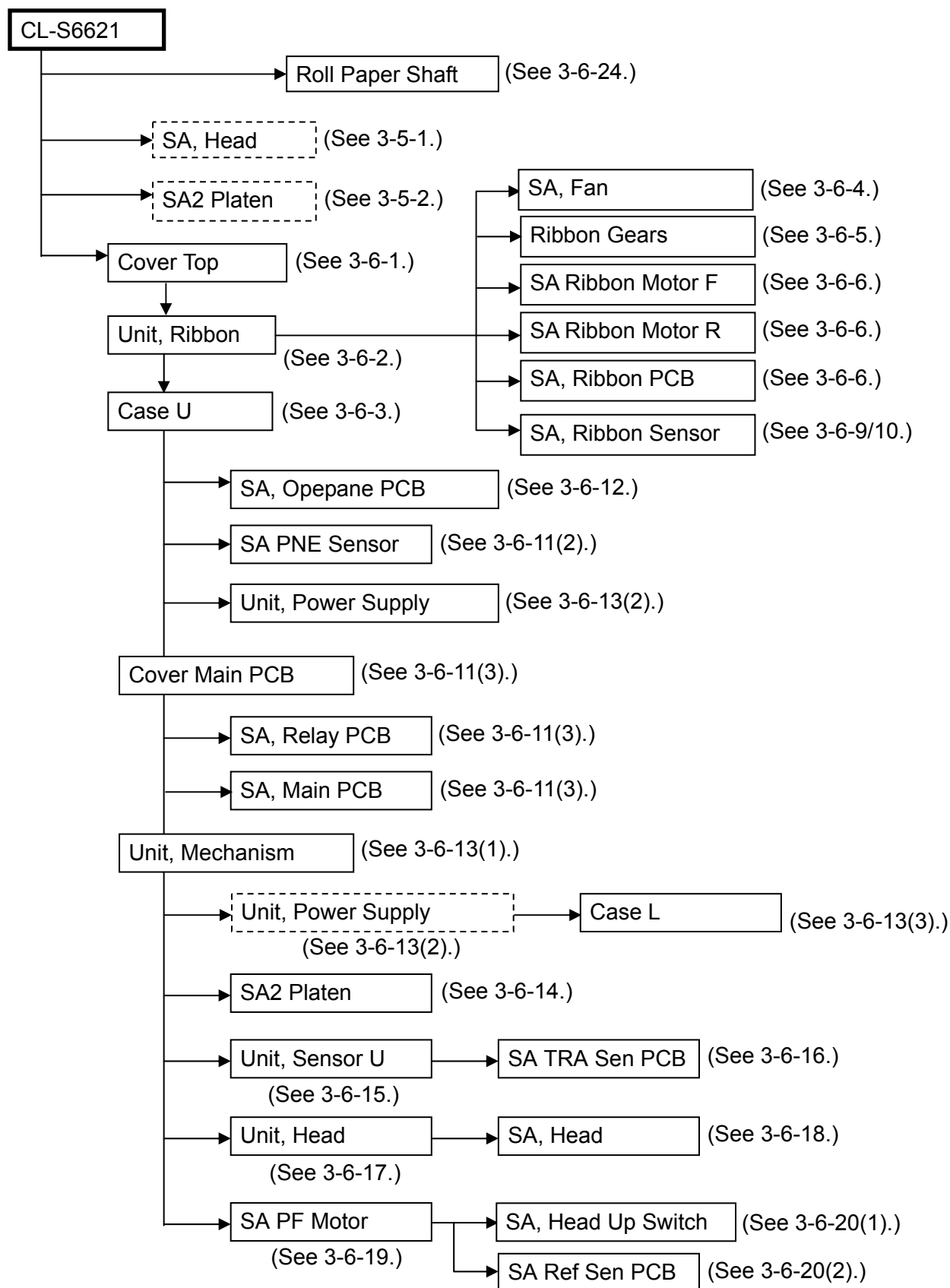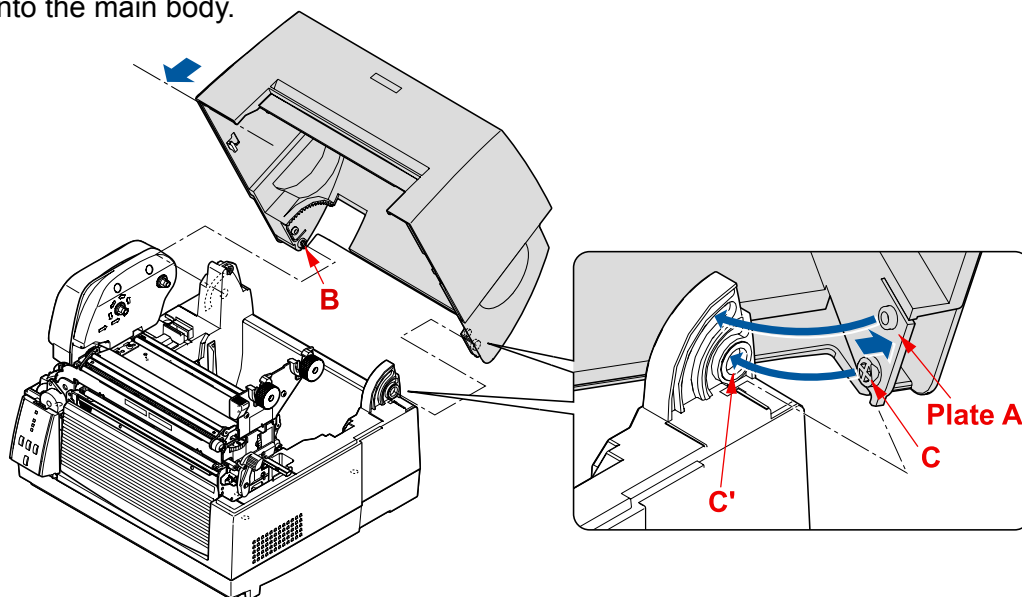
3-6-1. "Cover Top" and "Support Top Cover"

(1) Removing the "Cover Top" Block

1. Before starting, remove the "SA, Ribbon Holder" (2 pcs.) from the printer.
2. Open the "Cover Top" Block half way as shown in the figure. (Do not fully open it.)
3. Insert a flat-blade screwdriver into the right side corner of the "Cover Top" Block as shown, then push the "**Plate A**" outward with the screwdriver end. (The projections of the "Cover Top" Block come off the main body.)

   Then, remove the "Cover Top" Block. (At this moment, a sound may be heard to some degree.)
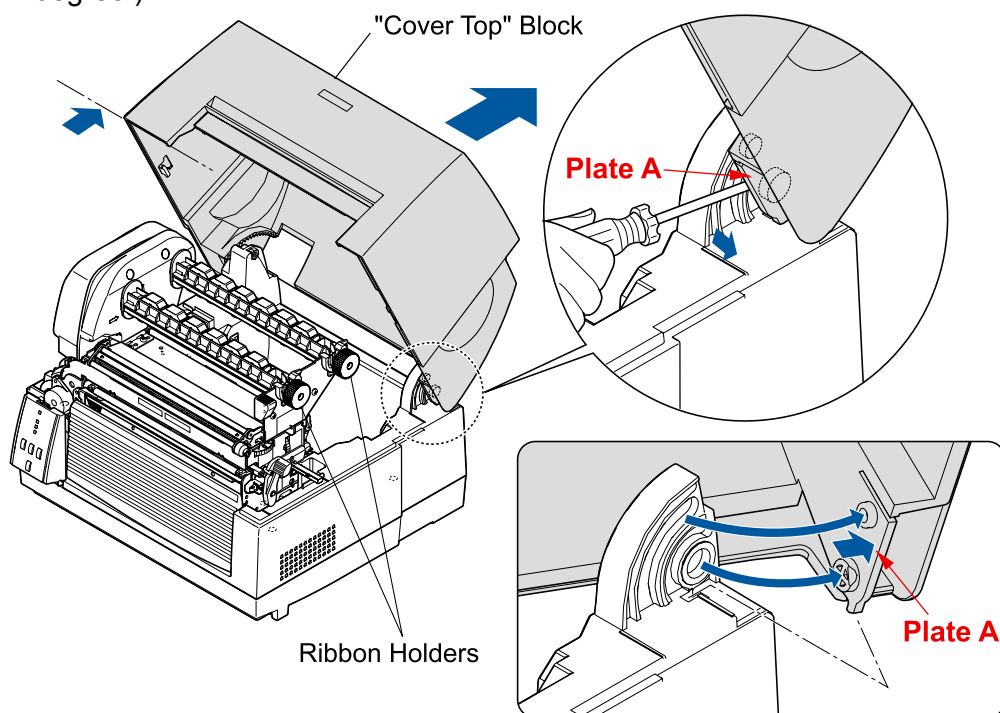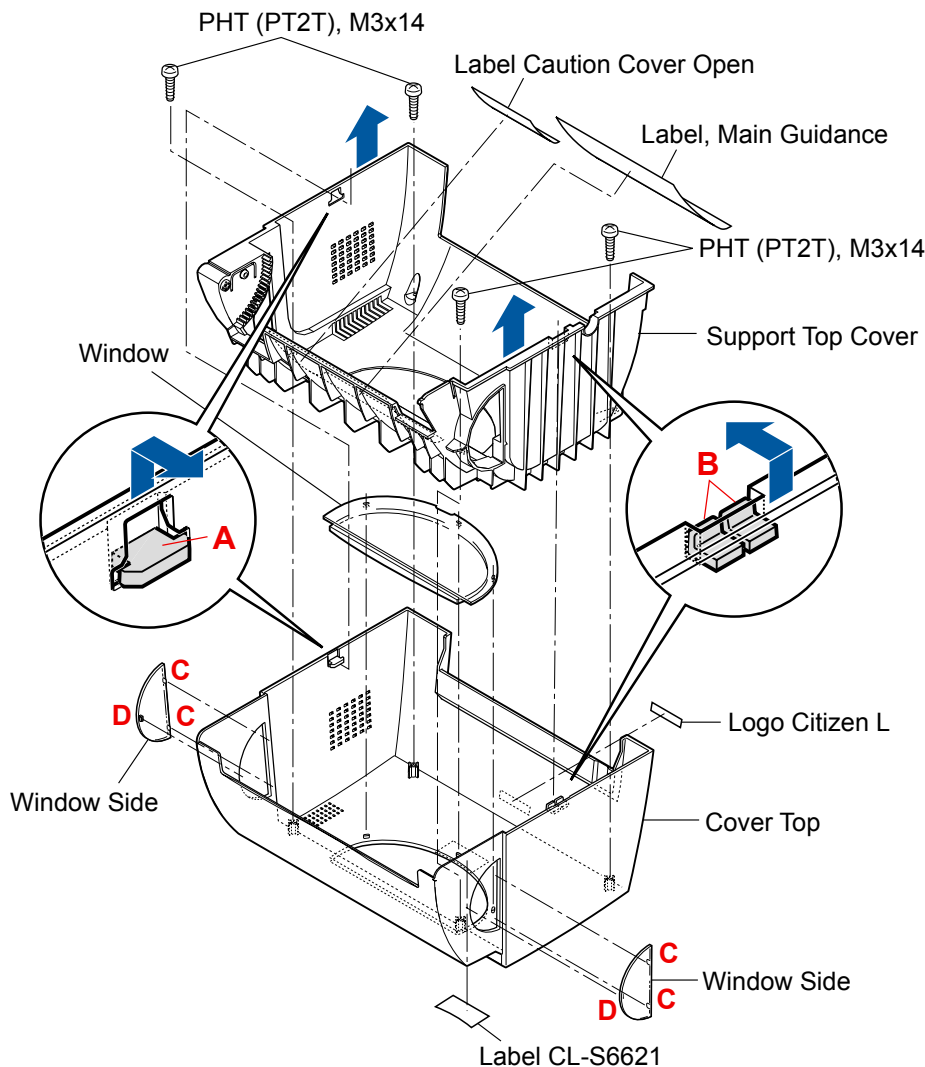

Note on reassembling:

- First, with the opening angle of the "Cover Top" Block set as shown, insert the protrusion "**B**" on the left side of the "Cover Top" Block into the hole in the main body.

  Next, align the protrusion "**C**" with the hole "**C'**", and, while pushing the "**Plate A**" outward again with the flat-bladed screwdriver, insert the right side corner of the "Cover Top" Block into the main body.

(2) Removing the "Cover Top" and "Support Top Cover"

The "Cover Top" Block forms a double structure where the outer cover is the "Cover Top" and the inner cover is the "Support Top Cover".

1. Remove the 4 screws (PHT (PT2T), M3x14) and pull out the <u>left side</u> of the "Support Top Cover" until it stops. (It hits the stopper "**A**" and stops.)
2. Bend the "Support Top Cover" inward to keep away from the stopper "**A**".
3. Pull out the <u>right side</u> of the "Support Top Cover" until it stops. (It hits the stoppers "**B**" and stops.)
4. Bend the "Support Top Cover" inward to keep away from the stoppers "**B**", and then remove the "Support Top Cover" upwardly.
5. Remove the "Label, Main Guidance" and "Label Caution Cover Open" from the "Support Top Cover".
6. Remove the "Window" and "Window Side" (2 pcs.) from the "Cover Top".
    NOTE: When removing the "Window Side", first, remove the 2 claws "**C**", and then "**D**".
7. Remove the "Label CL-S6621" and "Logo Citizen L" from the "Cover Top".

Notes on reassembling:

*   Place the "Window" so that 3 bosses of the "Cover Top" are inserted into respective holes in the "Window".
*   When assembling the "Window Side" on the "Cover Top", first hook the claws "**C**" and then the claw "**D**".

3-6-2.　Unit, Ribbon

⚠ **Caution**

- **Forbidden screws in the "Unit, Ribbon"**
  DO NOT loosen the 10 screws of the "SA Ribbon Frame". The "SA Ribbon Frame" consists of three parts and is assembled with the 10 screws.
  Once the "SA Ribbon Frame" is disassembled, correct ribbon running cannot be assured. Therefore, a ribbon wrinkle may not be removed with the Ribbon Left-Right Balance Adjustment Knobs (Front/Rear), as expected.

Unit, Ribbon

SA Ribbon Frame

5 screws
DO NOT LOOSEN

5 screws
DO NOT LOOSEN

Ribbon Left-Right Balance Adjustment Knobs (Front/Rear)
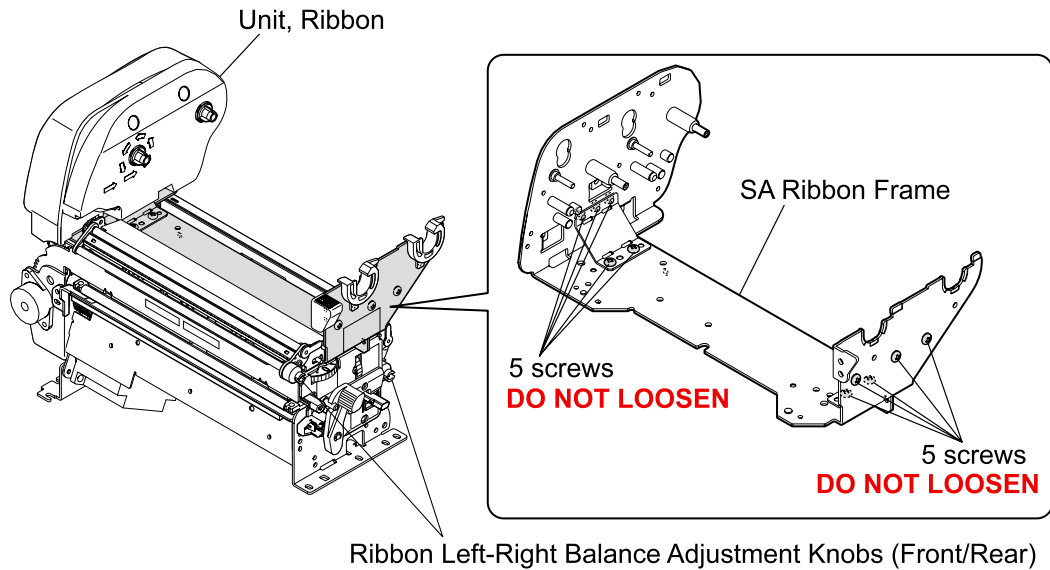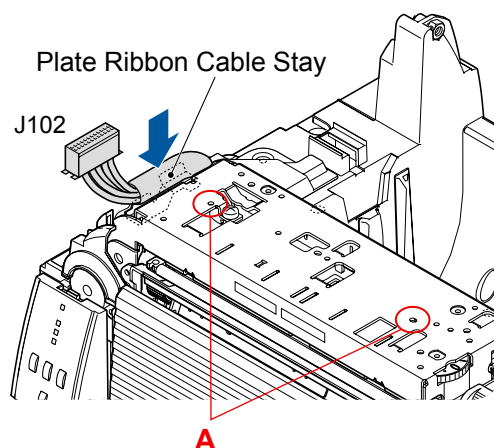
1. Remove the "Cover Top" Block. Refer to "3-6-1(1) Removing the "Cover Top" Block".

2. Remove the 4 screws (BH, M3x4 (NI)) and detach the "Unit, Ribbon" by lifting it upwardly. At this time, disconnect 1 connector (J102) from the "Unit, Ribbon".

Unit, Ribbon

BH, M3x4 (NI)
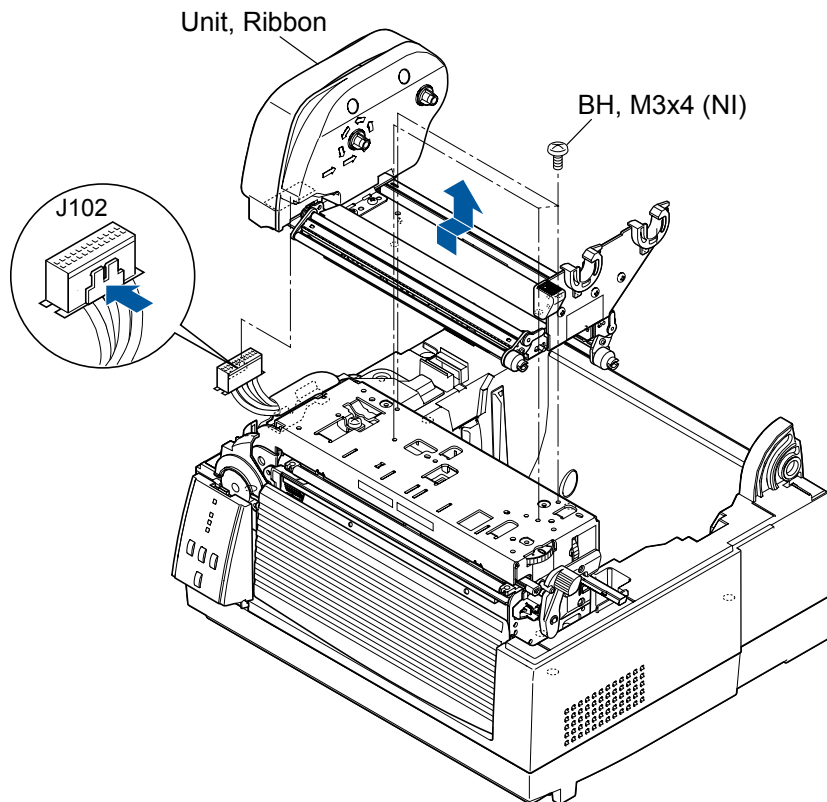
J102

Notes on reassembling:

• Seat the cable (J102) on the "Plate Ribbon Cable Stay" as shown below.

• When assembling the "Unit, Ribbon", be sure that it is securely seated on the main body. The 2 protrusions on the bottom of the "Unit, Ribbon" are naturally inserted in the respective holes "**A**" of the main body for positioning the "Unit, Ribbon".

Plate Ribbon Cable Stay

J102

A

3-6-3. Case U

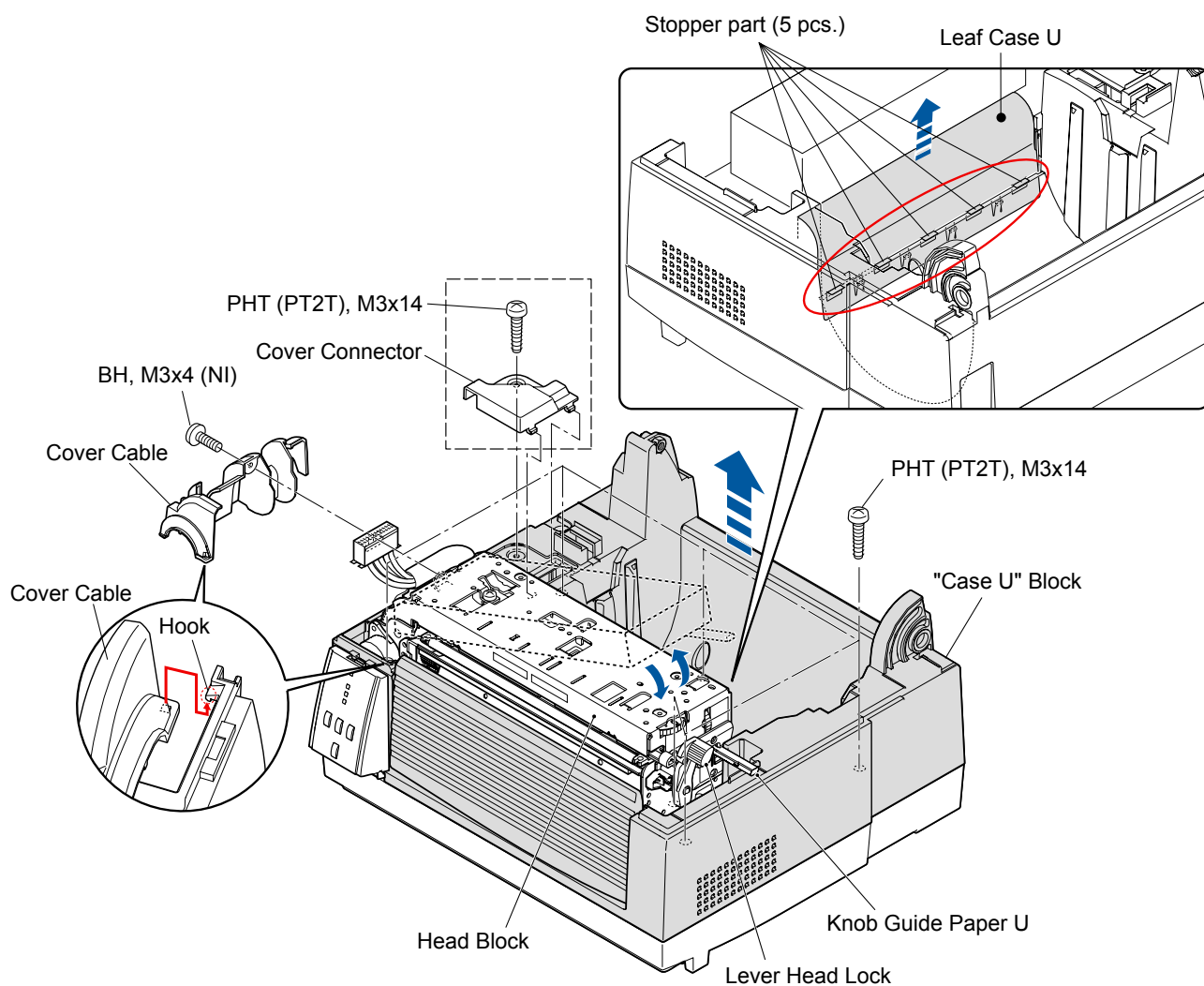### (1) Removing the "Case U" Block

1. Remove the "Cover Top" Block. Refer to "3-6-1(1) Removing the "Cover Top" Block".

2. Remove the "Unit, Ribbon". Refer to "3-6-2 Unit, Ribbon".

3. Remove the 1 screw (BH, M3x4 (NI)) and detach the "Cover Cable".

4. When an optional peeler or cutter is installed, remove the 1 screw (PHT (PT2T), M3x14) and detach the "Cover Connector".

5. Open the Head Block by pressing the "Lever Head Lock".
   NOTE: This step is required as the "Knob Guide Paper U" extends beyond the "Case U" Block.

6. Lift the "Case U" Block to the half-way height, and while lowering the Head Block a little, remove the "Case U" upwardly.
   NOTE: As the front edge of the "Case U" Block is directly beneath the stopper part" (5 pcs.) of the "Leaf Case U", avoid these stopper part when lifting the "Case U" Block".

7. After removing the "Case U" Block, detach the "Leaf Case U" upwardly

Notes on reassembling:

• When assembling the "Case U" Block, do not forget to open the Head Block and the "Knob Guide Paper U". Otherwise, the extended "Knob Guide Paper U" gets caught between the "Case U" Block and the main body.

• After assembling the "Case U" Block, install the "Leaf Case U" as follows.

   NOTE: While inserting the "Leaf Case U" (thin metal), carefully handle it so as not to deform it.

   1)   While aligning both edges of the "Leaf Case U" with those of the part "**A**" (a part of the "Case L"), insert the "Leaf Case U" into the main body (between the part "**A**" and the "Case U" Block) until the ends of claws (4 pcs.) securely fit to the grooves (4 pcs.) on the "Case U" Block.

   NOTE: Do not insert it downward too much, as its stoppers will be bent.

   2)   To be sure if the "Leaf Case U" is securely inserted, move it a little. If the claws of the "Leaf Case U" are securely engaged with the grooves of the "Case U" Block, the "Leaf Case U" does not move.
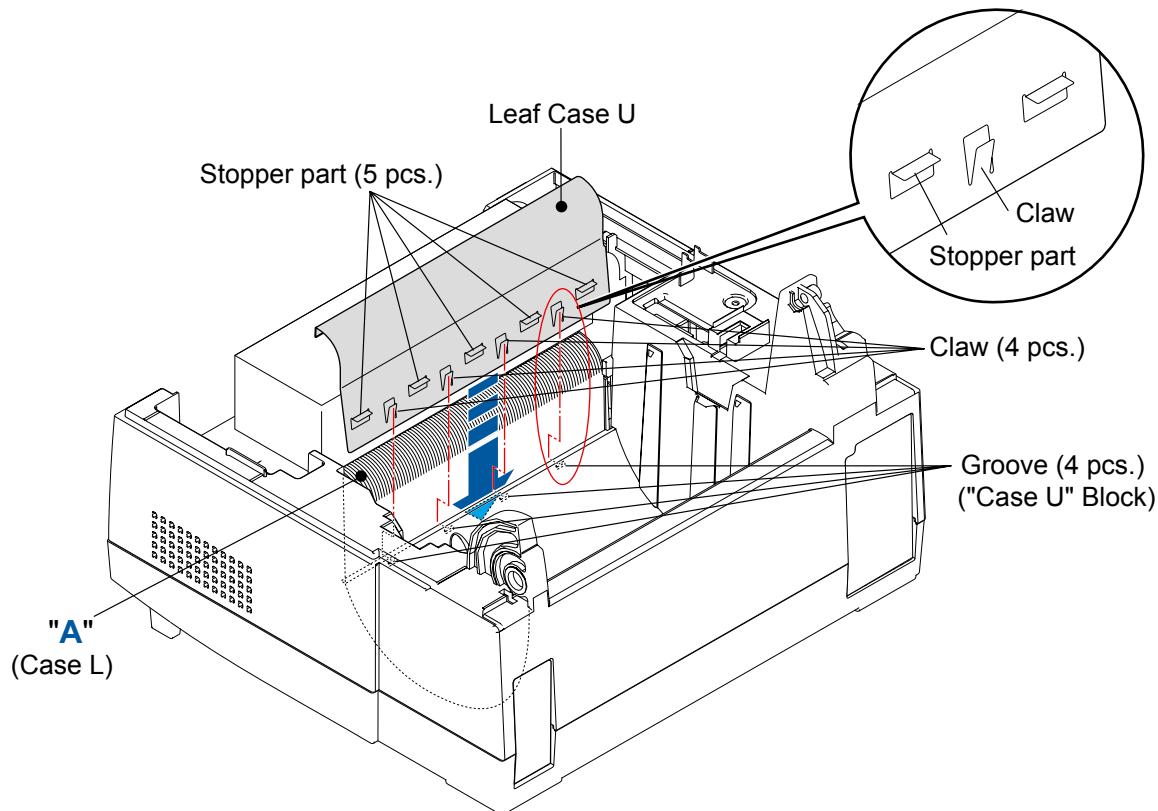
• Assemble the "Cover Cable" so that the hook of the main body is correctly inserted into the rectangle hole of the "Cover Cable" as shown in the magnified view.

(to be continued on the next page)

- **When once the "Unit, Mechanism" was removed (Paper path adjustment):**

  When once the "Unit, Mechanism" was removed in "3-6-13(1) Unit, Mechanism", you need to perform the following paper path adjustment after reassembling the "Case U" Block.

  NOTE: If you haven't removed the "Unit, Mechanism", you don't need to perform this adjustment.

  This procedure is to align the position of the "Unit, Mechanism" with the "Case U" Block. So, you need to shift the "Unit, Mechanism" a little <u>after loosening its screws</u>.

  1) Before starting, be sure that the "Case U" Block is already assembled in the printer.
  2) Loosen (do not remove) 8 screws that fasten the "Unit, Mechanism" to the printer.
  3) Open the "SA, Head" Block.
  4) Open the "Unit, Sensor U".
  5) Set a ruler along the 5 places (2 places (①,②) of the "Unit, Mechanism" and 3 places (③,④,⑤) of the "Case U" Block.
  6) Move the "Unit, Mechanism" so that 5 places are aligned in line.
  7) Close the "Unit, Sensor U" and "SA, Head" Block, and then fasten the 8 screws to fix the "Unit, Mechanism".

"SA, Head" Block

Unit, Sensor U

Align ① to ⑤ in line.

8 screws
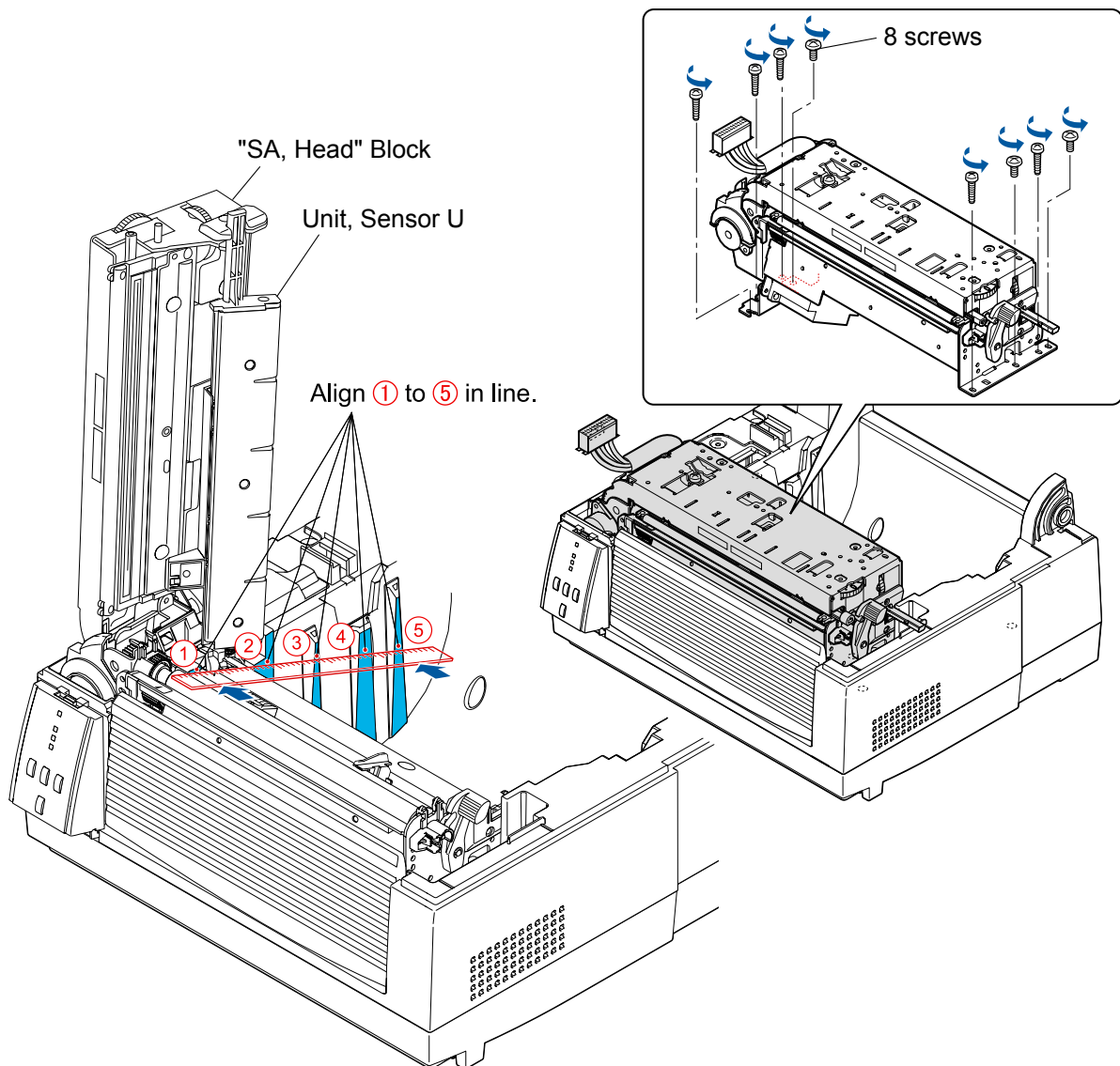
(2) Removing the "Case U"

1. Remove the "Case U" Block. Refer to the above "(1) Removing the "Case U" Block"
2. Remove the "Cover Front" upwardly.
3. Remove the 1 screw (PHT (PT2T), M3x14) and detach the "Cover Connector".
4. Remove the 1 screw (PH, M5x15 (NI)) and 1 nut ((#3), M5 (NI)), and detach the "Damper Cover".
5. Remove labels ("Label Rating" and "Label Caution") from the "Case U".

PHT (PT2T), M3x14

Cover Connector

PH, M5x15 (NI)

Damper Cover

(#3), M5 (NI)

Cover Front

Label Caution

Label Rating

Case U
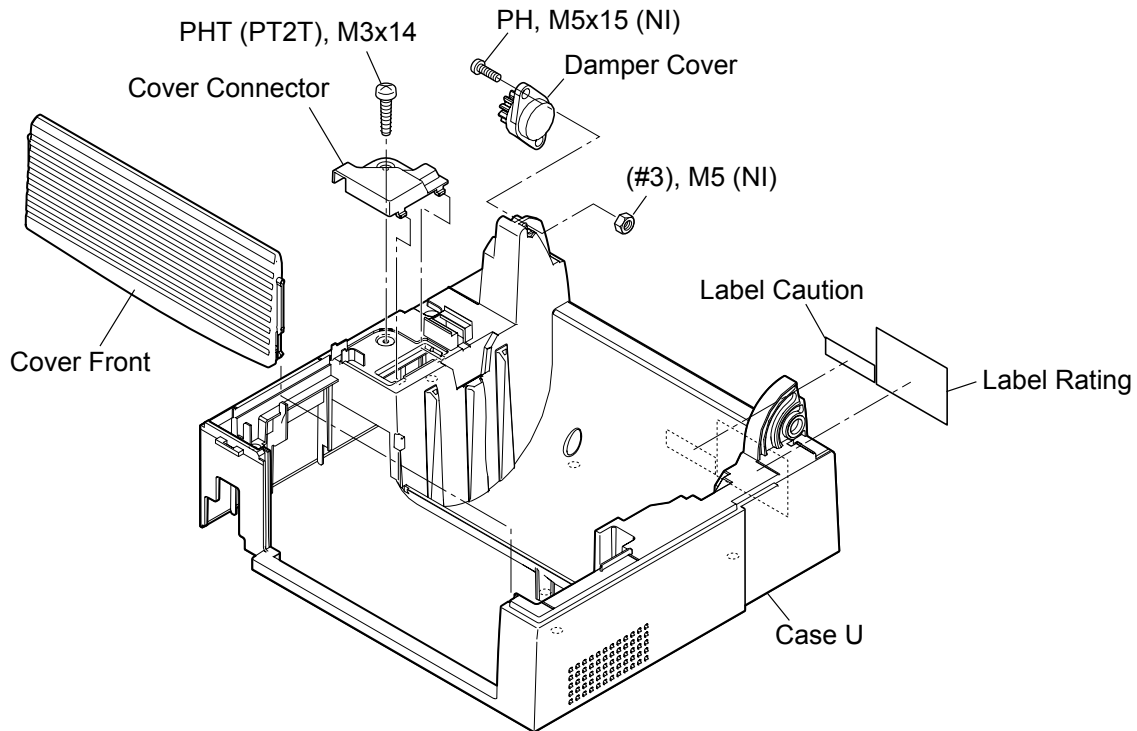
Note on reassembling

•   When assembling the "Damper Cover", tighten the screw while pushing down the "Damper Cover".

3-6-4.   SA, Fan

(1) Removing the ribbon covers

1. Open the "Cover Top" Block and remove the "Unit, Ribbon". Refer to "3-6-2 Unit, Ribbon".
2. On the right, remove the 2 screws (BH, M3x4 (NI)) and detach the "Cover Ribbon Frame R".
3. On the left, remove the 2 screws (BH, M3x4 (NI)) and detach the "SA2, Ribbon Unit Fan" to the left after lifting it to unhook the claws "**A**" from the chassis.
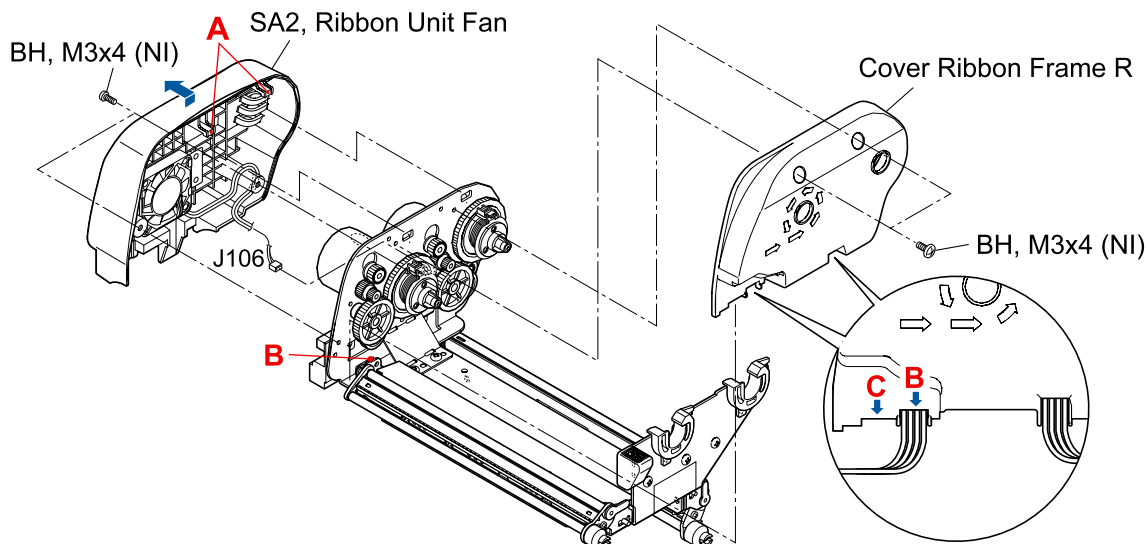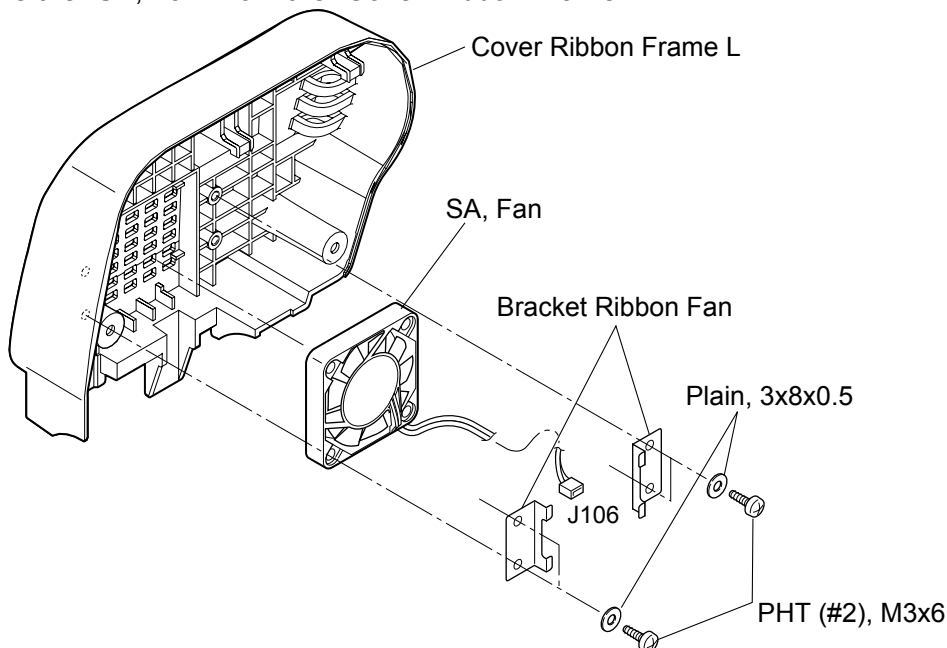

Note on reassembling:

• When assembling the "Cover Ribbon Frame R", pass the wires of the front side cable through the opening "**B**" (not "**C**").
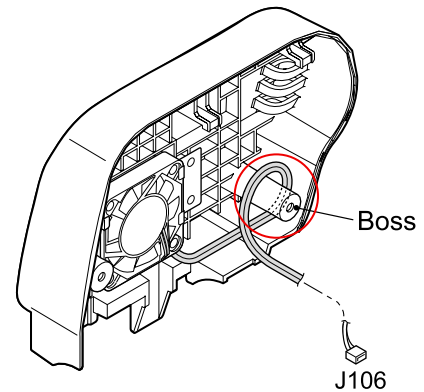
(2) Removing the "SA, Fan"

1. Remove the 4 screws (PHT (#2), M3x6) and 4 washers (Plain, 3x8x0.5), and detach the "Bracket Ribbon Fan" (2 pcs.).
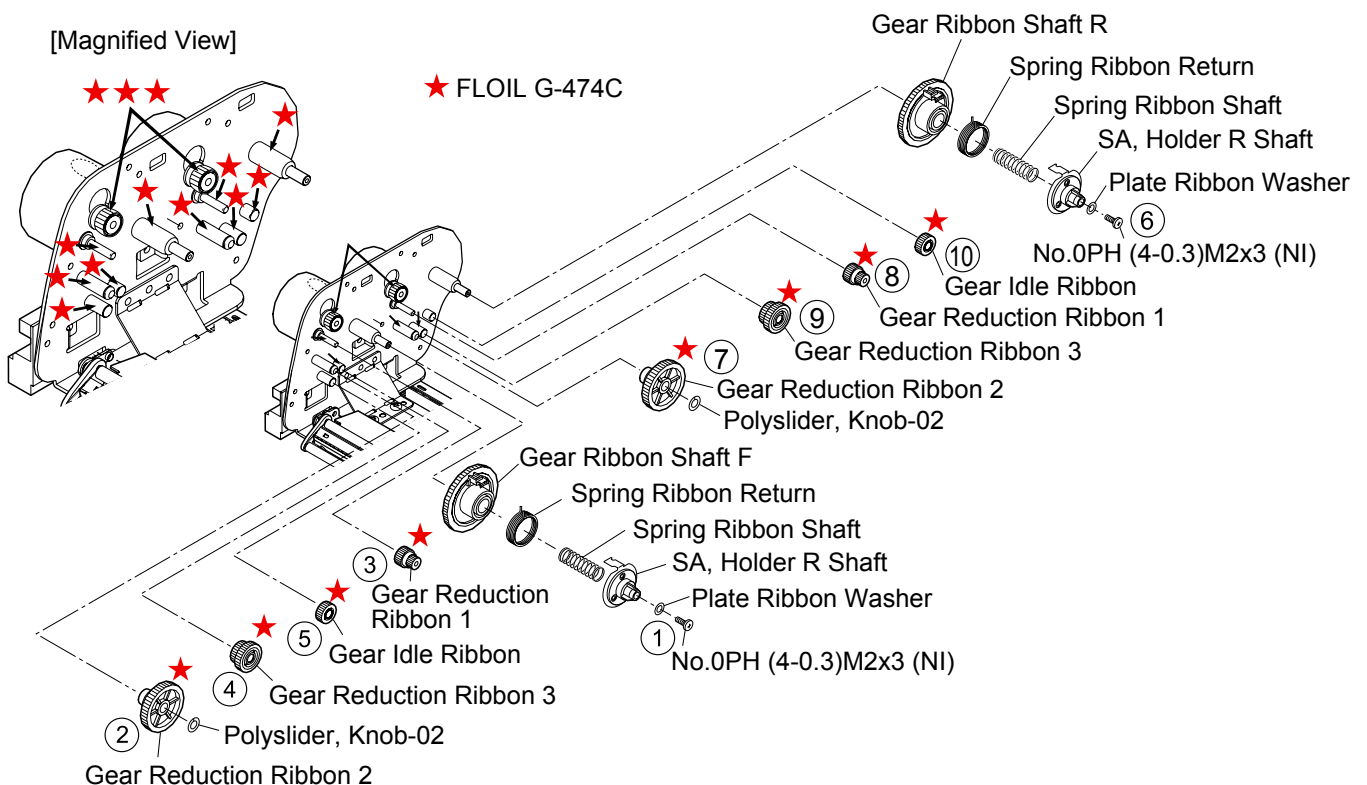2. Remove the "SA, Fan" from the "Cover Ribbon Frame L".

Note on reassembling:

• When assembling the "SA, Fan", pass the cable between the boss and the frame as shown on the right. (Wind the cable on the boss counterclockwise.)

Boss

J106

3-6-5. Ribbon Gears

1. Open the "Cover Top" Block and remove the "Unit, Ribbon". Refer to "3-6-2 Unit, Ribbon".

2. Remove the ribbon covers. Refer to "3-6-4(1) Removing the ribbon covers".

3. On the front side, remove the 1 screw (No.0PH (4-0.3)M2x3 (NI)) (①) and "Plate Ribbon Washer". Then, remove the "SA, Holder R Shaft", "Spring Ribbon Shaft", "Spring Ribbon Return" and "Gear Ribbon Shaft F" in that order.

4. Also on the front side, disengage the "Polyslider, Knob-2" and remove the "Gear Reduction Ribbon 2" (②), "Gear Reduction Ribbon 1" (③), "Gear Reduction Ribbon 3" (④), and "Gear Idle Ribbon" (⑤) in that order.

5. On the rear side, remove the 1 screw (No.0PH (4-0.3)M2x3 (NI)) (⑥) and "Plate Ribbon Washer". Then, remove the "SA, Holder R Shaft", "Spring Ribbon Shaft", "Spring Ribbon Return" and "Gear Ribbon Shaft R" in that order.

6. Also on the rear side, disengage the "Polyslider, Knob-2" and remove the "Gear Reduction Ribbon 2" (⑦), "Gear Reduction Ribbon 1" (⑧), "Gear Reduction Ribbon 3" (⑨), and "Gear Idle Ribbon" (⑩) in that order.

[Magnified View]

★ FLOIL G-474C

Gear Ribbon Shaft R
Spring Ribbon Return
Spring Ribbon Shaft
SA, Holder R Shaft
Plate Ribbon Washer
⑥
No.0PH (4-0.3)M2x3 (NI)
⑩ Gear Idle Ribbon
⑧ Gear Reduction Ribbon 1
⑨ Gear Reduction Ribbon 3
⑦ Gear Reduction Ribbon 2
Polyslider, Knob-02

Gear Ribbon Shaft F
Spring Ribbon Return
Spring Ribbon Shaft
SA, Holder R Shaft
Plate Ribbon Washer
①
No.0PH (4-0.3)M2x3 (NI)
③ Gear Reduction Ribbon 1
⑤ Gear Idle Ribbon
④ Gear Reduction Ribbon 3
② Polyslider, Knob-02
Gear Reduction Ribbon 2

Notes on reassembling:

• Distinguish the "Gear Ribbon Shaft F" from the "Gear Ribbon Shaft R", referring to the following projection.

Gear Ribbon Shaft F   Gear Ribbon Shaft R

Projection
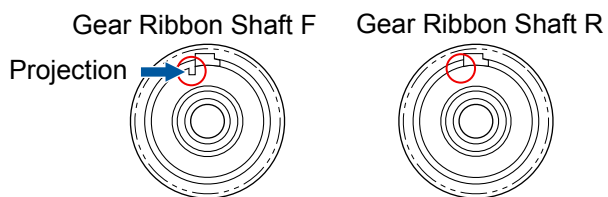
• On the front side, assemble the "SA, Holder R Shaft", "Spring Ribbon Shaft", and "Spring Ribbon Return" on the "Gear Ribbon Shaft F".
Apply FLOIL G-311S to both ends of the "Spring Ribbon Shaft". Refer to the ★ marks shown in the left figure below.

• On the rear side, assemble the "SA, Holder R Shaft", "Spring Ribbon Shaft", and "Spring Ribbon Return" on the "Gear Ribbon Shaft R".
Apply FLOIL G-311S to both ends of the "Spring Ribbon Shaft". Refer to the ★ marks shown in the right figure below.

[Front side]   **[Rear side]**

Gear Ribbon Shaft F   Gear Ribbon Shaft R

Spring Ribbon Return   Spring Ribbon Return

SA, Holder R Shaft   SA, Holder R Shaft

Spring Ribbon Shaft   Spring Ribbon Shaft

★ FLOIL G-311S
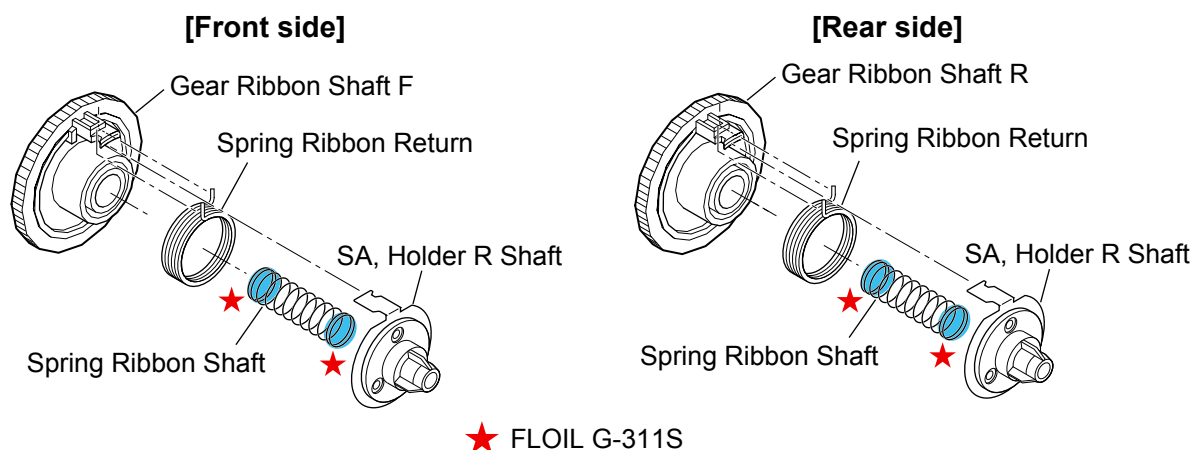
• Apply FLOIL G-474C to the parts (gears and shafts) shown by the ★ marks. (Refer to the figure on the previous page.)

3-6-6. "SA Ribbon Motor F/R" and "SA, Ribbon PCB"

1. Open the "Cover Top" Block and remove the "Unit, Ribbon". Refer to "3-6-2 Unit, Ribbon".
2. Remove the ribbon covers. Refer to "3-6-4(1) Removing the ribbon covers".
3. Disconnect 2 connectors (J101 and J107) from the "SA, Ribbon PCB".
4. On the front side, remove the 2 screws (BH, M3x4 (NI)) and detach the "SA Ribbon Motor F".
5. Disconnect 1 connector (J103) from the "SA, Ribbon PCB".
6. On the rear side, remove the 2 screws (BH, M3x4 (NI)) and detach the "SA Ribbon Motor R".
7. Remove the 2 screws (BH, M3x4 (NI)), and detach the "SA, Ribbon PCB".
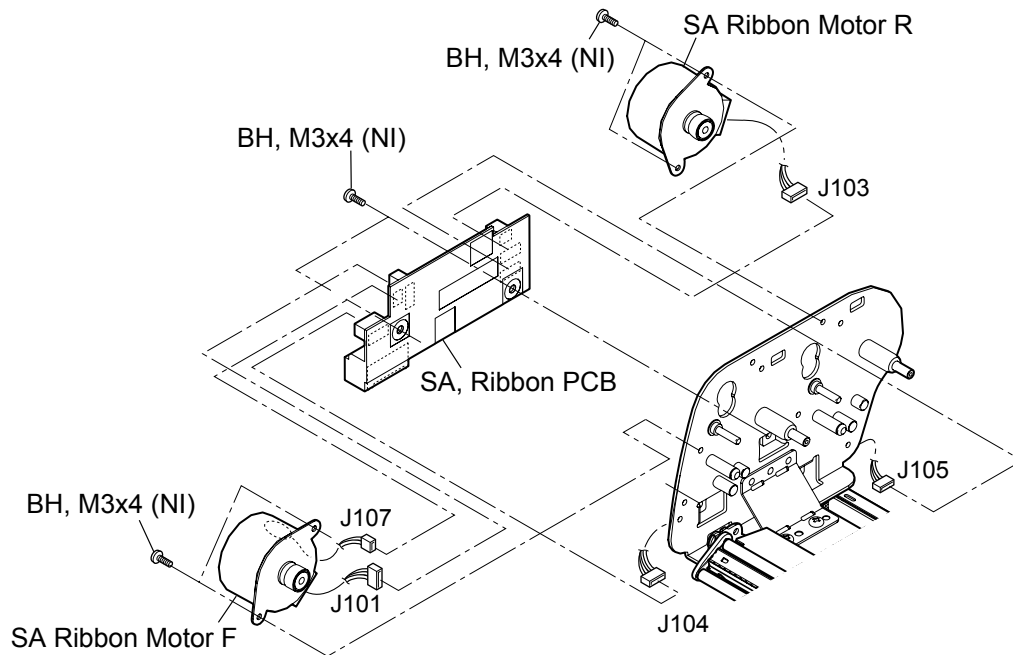
Note on reassembling:

• Correctly connect each connector.
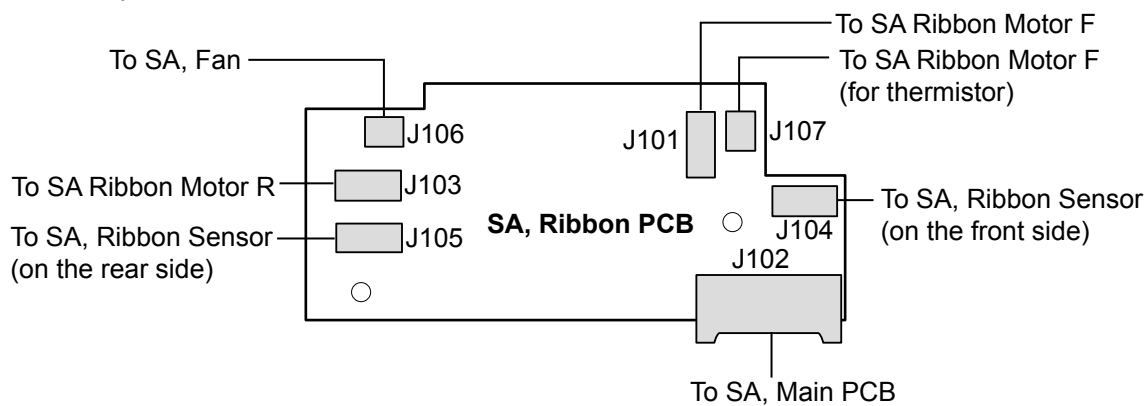
3-6-7. "Holder, Ribbon Shaft" and "Holder 2 Tension Spring"

1. Open the "Cover Top" Block .
2. Release the lock by moving the part "**A**" toward the right and remove the "Holder, Ribbon Shaft" (2 pcs.) toward the front.
3. Remove the 2 screws (PHT (#2), M3x6) and detach the "Holder 2 Tension Spring".


PHT (#2), M3x6

Holder, Ribbon Shaft

Holder 2 Tension Spring

Holder, Ribbon Shaft

A
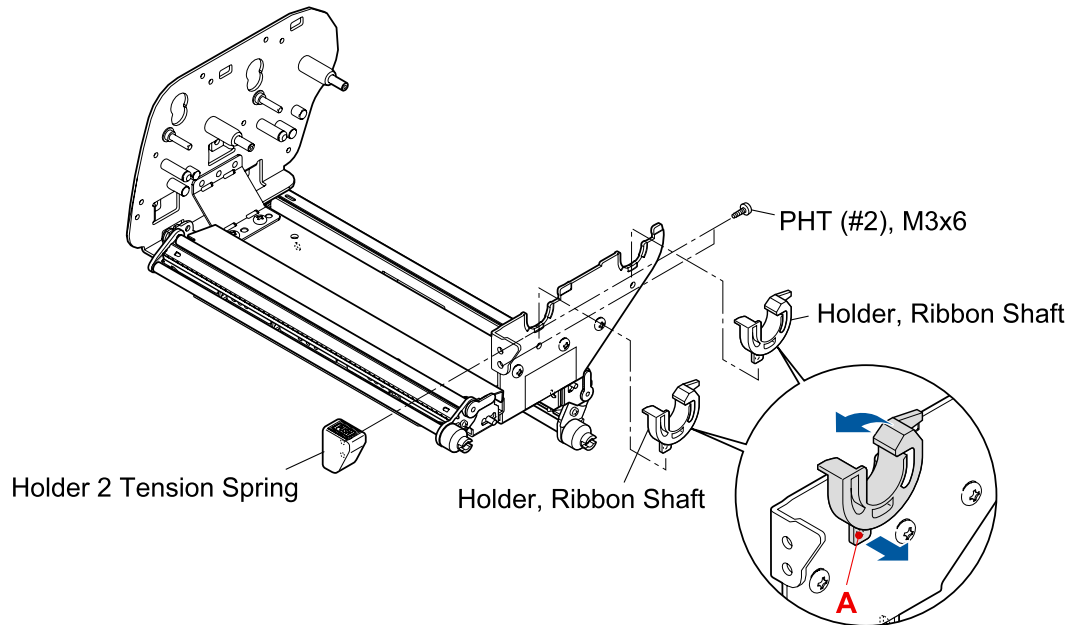
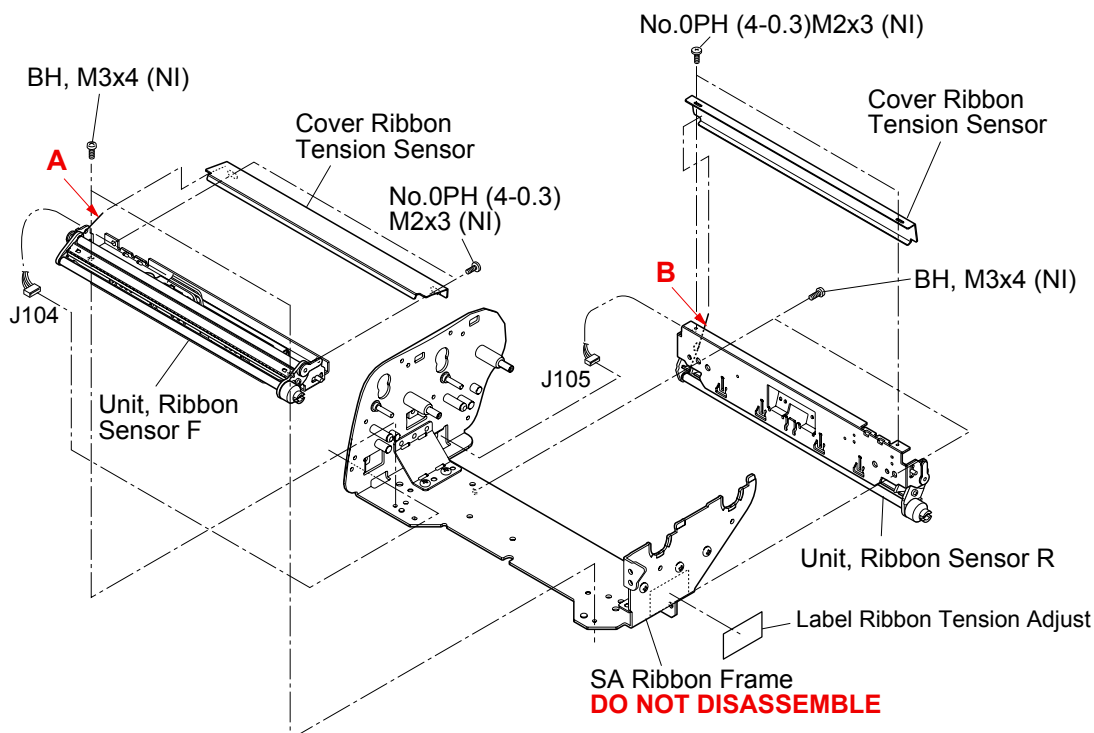## 3-6-8. "Unit, Ribbon Sensor F/R" and "SA Ribbon Frame"

⚠ Caution

- **DO NOT loosen the 10 screws of the "SA Ribbon Frame". The "SA Ribbon Frame" consists of three parts and is assembled with the 10 screws.**
  Once the "SA Ribbon Frame" is disassembled, correct ribbon running cannot be assured. Therefore, a ribbon wrinkle may not be removed with the Ribbon Left-Right Balance Adjustment Knobs (Front/Rear), as expected.
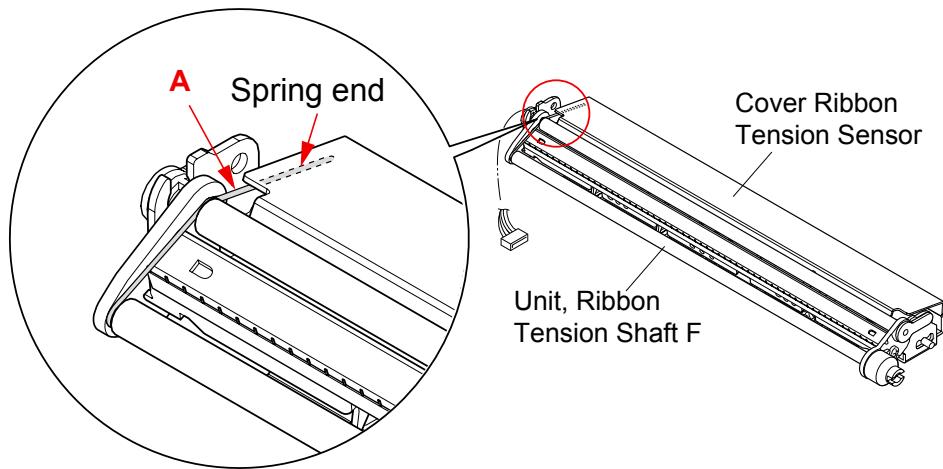
SA Ribbon Frame

5 screws
DO NOT LOOSEN

5 screws
DO NOT LOOSEN

---
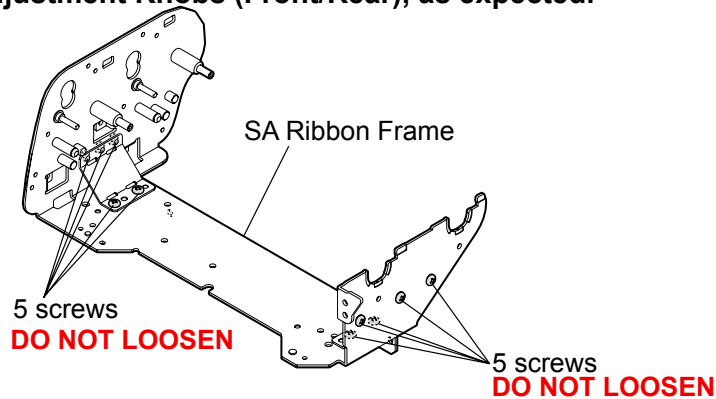
1. Open the "Cover Top" Block and remove the "Unit, Ribbon". Refer to "3-6-2 Unit, Ribbon".
2. Remove the ribbon covers. Refer to "3-6-4(1) Removing the ribbon covers".
3. Remove the 4 screws (No.0PH (4-0.3)M2x3 (NI)) and detach the "Cover Ribbon Tension Sensor" (2 pcs.) on the front and rear sides.
4. On the front side, remove the 2 screws (BH, M3x4 (NI)) and detach the "Unit, Ribbon Sensor F".
5. On the rear side, remove the 2 screws (BH, M3x4 (NI)) and detach the "Unit, Ribbon Sensor R".
6. Peel off the "Label Ribbon Tension Adjust" from the "SA Ribbon Frame".

No.0PH (4-0.3)M2x3 (NI)

BH, M3x4 (NI)

Cover Ribbon
Tension Sensor

Cover Ribbon
Tension Sensor

A

No.0PH (4-0.3)
M2x3 (NI)

B

BH, M3x4 (NI)

J104

J105

Unit, Ribbon
Sensor F

Unit, Ribbon Sensor R

Label Ribbon Tension Adjust

SA Ribbon Frame
DO NOT DISASSEMBLE

CL-S6621

Notes on reassembling:

• Be sure that the end of wire spring ("**A**"/"**B**" in the above figure) of the "Unit, Ribbon Sensor F"/"Unit, Ribbon Sensor R" is set under the "Cover Ribbon Tension Sensor" as shown below.

[Example of "**A**"]

• After assembling the "Unit, Ribbon Sensor F"/"Unit, Ribbon Sensor R", perform "3-7-2 Ribbon Slant Elimination Adjustment".

3-6-9. "SA, Ribbon Tension Shaft F" and "SA, Ribbon Sensor" on the front side

1. Open the "Cover Top" Block and remove the "Unit, Ribbon". Refer to "3-6-2 Unit, Ribbon".

2. Remove the ribbon covers. Refer to "3-6-4(1) Removing the ribbon covers".

3. Remove the "Unit, Ribbon Sensor F". Refer to "3-6-8 "Unit, Ribbon Sensor F/R" and "SA Ribbon Frame"".

4. Release the "Bush Ribbon Roller" (2 pcs.) (①) at both ends. First, lift its end with the blade of a flat-blade screwdriver or the like ("**a**") and then turn it by approx. 90 degrees ("**b**"). (See the magnified view.) Next, remove the "SA, Ribbon Tension Shaft F" Block, and then the "Bush Ribbon Roller" (2 pcs.).

5. Peel off the "Sheet Static Eliminator 6621" from the "SA, Ribbon Tension Shaft F" Block.

6. Remove the 2 screws (No.0, TFH (PT4-0.5), M2.), and detach the "Interrupter Ribbon Sensor" and "Holder Tension Spring 1" from the "SA, Ribbon Tension Shaft F" (②).

7. Remove the 1 screw (PH (PW), M2x8) (③), and detach the "Lever Tension Adjust F" Block and "Shaft Tension Adjust".

8. Remove the 2 Screws (No.0, TFH (PT4-0.5), M2) (④), and detach the "Knob, Tension Adjust" from the "Lever Tension Adjust F".

9. Remove the 1 screw (No.0, TFH (PT4-0.5), M2), and detach the "Holder Tension Spring 2" and "Spring Ribbon Tension" (2 pcs.) from the "Lever Tension Adjust F".

10. Remove the 2 screws (No.0PH (4-0.3)M2x3 (NI)) (⑤), and detach the "SA, Ribbon Sensor" from the "Plate Ribbon Tension Sensor".
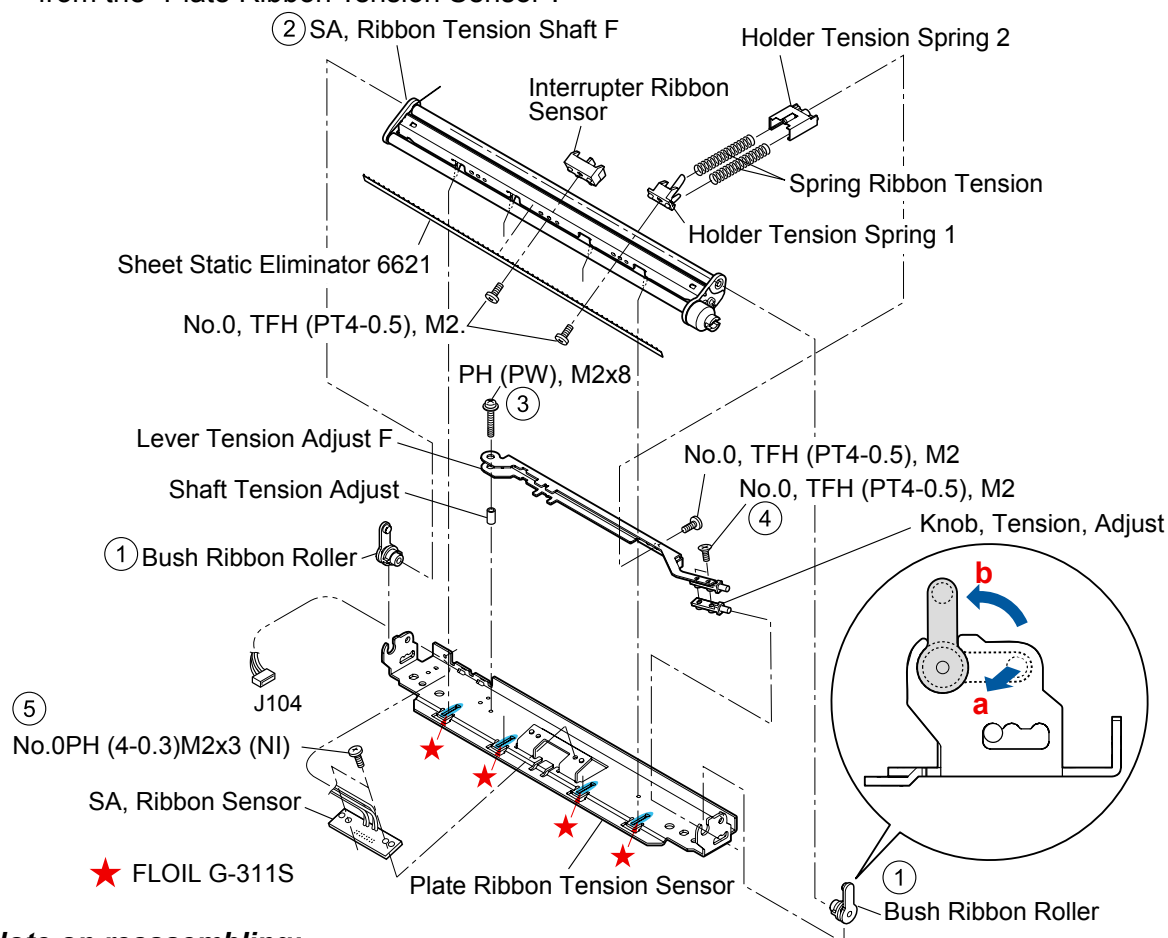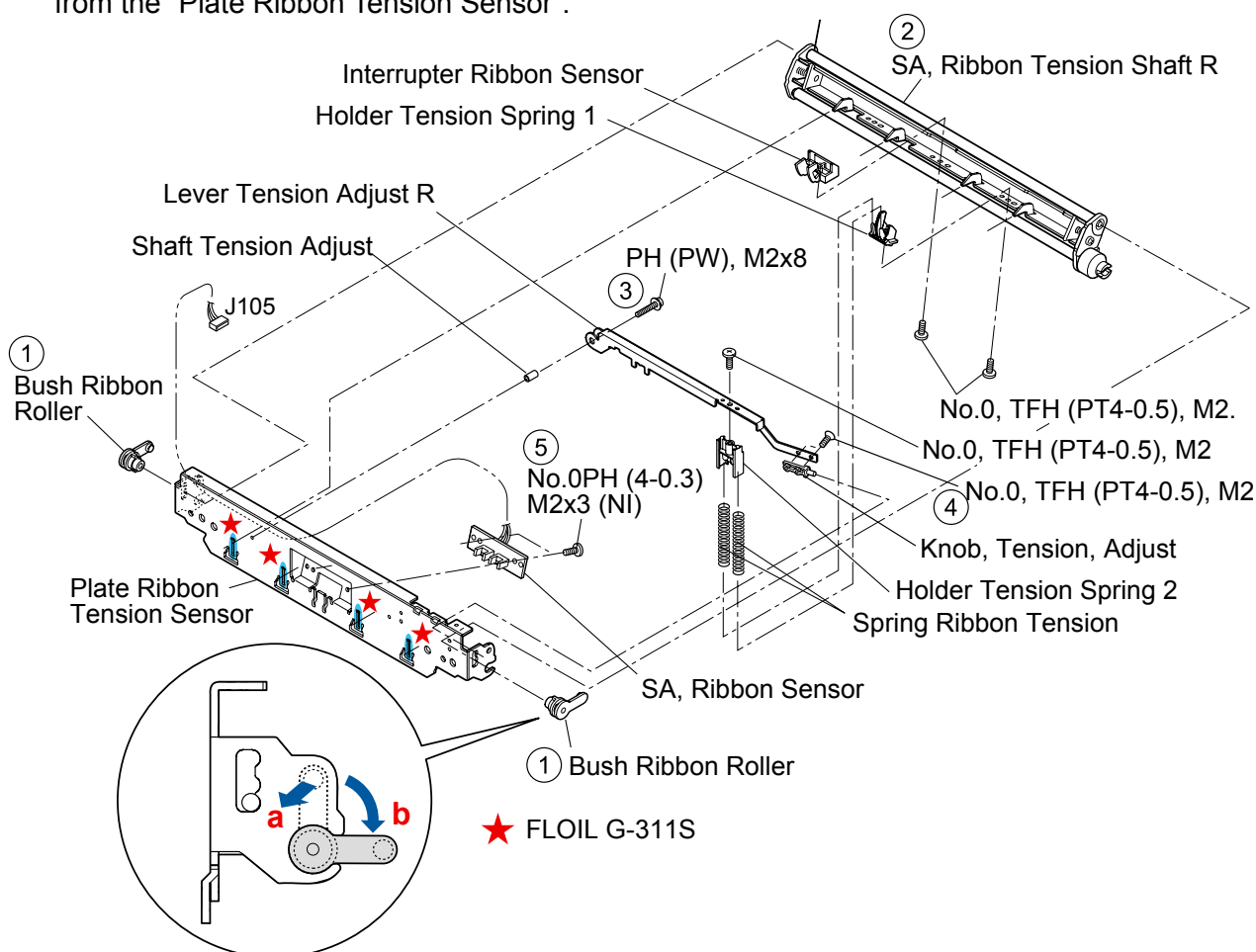

Note on reassembling:

- Apply FLOIL G-311S to the slits (4 places) shown by the ★ marks.

3-6-10. "SA, Ribbon Tension Shaft R" and "SA, Tension Sensor" on the rear side

1. Open the "Cover Top" Block and remove the "Unit, Ribbon". Refer to "3-6-2 Unit, Ribbon".
2. Remove the ribbon covers. Refer to "3-6-4(1) Removing the ribbon covers".
3. Remove the "Unit, Ribbon Sensor R". Refer to "3-6-8 "Unit, Ribbon Sensor F/R" and "SA Ribbon Frame"".
4. Release the "Bush Ribbon Roller" (2 pcs.) (①) at both ends. First, lift its end with the blade of a flat-blade screwdriver or the like ("a") and then turn it by approx. 90 degrees ("b"). (See the magnified view.) Next, remove the "SA, Ribbon Tension Shaft R" Block, and then the "Bush Ribbon Roller" (2 pcs.).
5. Remove the 2 screws (No.0, TFH (PT4-0.5), M2.), and detach the "Interrupter Ribbon Sensor" and "Holder Tension Spring 1" from the "SA, Ribbon Tension Shaft R" (②).
6. Remove the 1 screw (PH (PW), M2x8) (③), and detach the "Lever Tension Adjust R" Block and "Shaft Tension Adjust".
7. Remove the 2 Screws (No.0, TFH (PT4-0.5), M2) (④), and detach the "Knob, Tension Adjust" from the "Lever Tension Adjust R".
8. Remove the 1 screw (No.0, TFH (PT4-0.5), M2), and detach the "Holder Tension Spring 2" and "Spring Ribbon Tension" (2 pcs.) from the "Lever Tension Adjust R".
9. Remove the 2 screws (No.0PH (4-0.3)M2x3 (NI)) (⑤), and detach the "SA, Ribbon Sensor" from the "Plate Ribbon Tension Sensor".

Note on reassembling:

- Apply FLOIL G-311S to the slits (4 places) shown by the ★ marks.

3-6-11. "Unit, Control Panel", "SA PNE Sensor", "SA, Relay PCB" and "SA, Main PCB"

(1) Unit, Control Panel

1. Remove the "Case U". Refer to "3-6-3(1) Removing the "Case U" Block".

3. Remove the "Unit, Control Panel" upwardly by releasing the hooks (2 pcs.).

4. Remove the "Cushion, Ope-Pane Cable" and disconnect the "Cable, Opepane" from the "Unit, Control Panel" (①).

Note on reassembling:

• When connecting the flexible cable, be sure that the insertion direction is correct. If you insert it reversely, circuit is not electrically connected. (Its foil side faces to the right.)

(2) SA PNE Sensor

1. Disconnect the connector (J12), remove the 1 screw (BH, M3x4 (NI)), and detach the "SA PNE Sensor" Block.

2. Remove the 2 screws (PH, M2x4) and detach the "SA PNE Sensor" (②) from the "Holder PNE".
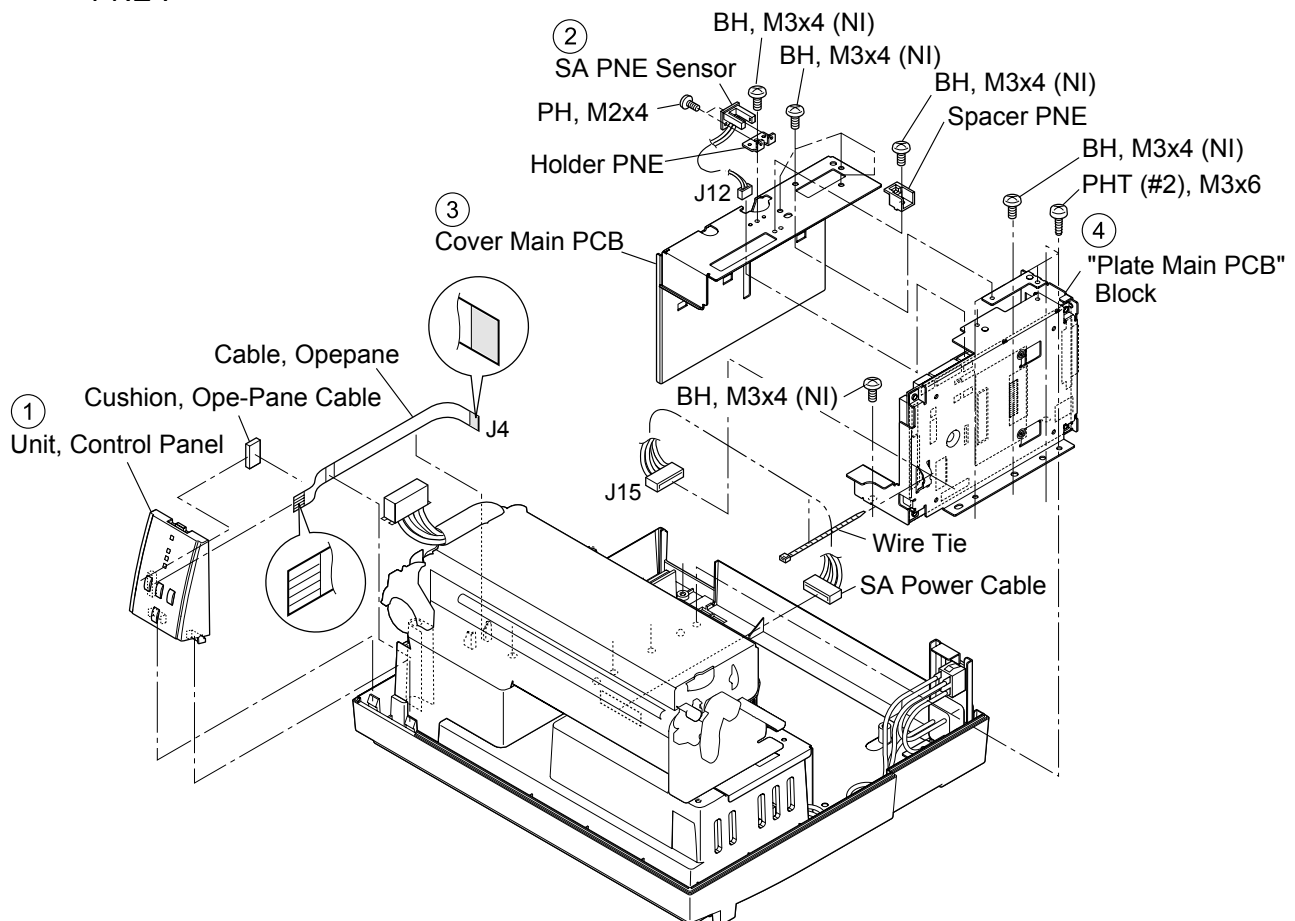
(3) "SA, Relay PCB" and "SA, Main PCB"

1. Remove the 4 screws (BH, M3x4 (NI)) and detach the "Cover Main PCB" Block.
2. Remove the 1 screw (BH, M3x4 (NI)) and detach the "Spacer PNE" from the "Cover Main PCB" (③).
3. Disconnect all cables from the "SA, Main PCB".
   - J3 (with hook), J4, J5, J6, J7, J8, J9, J11, J15, J19 (with hook)
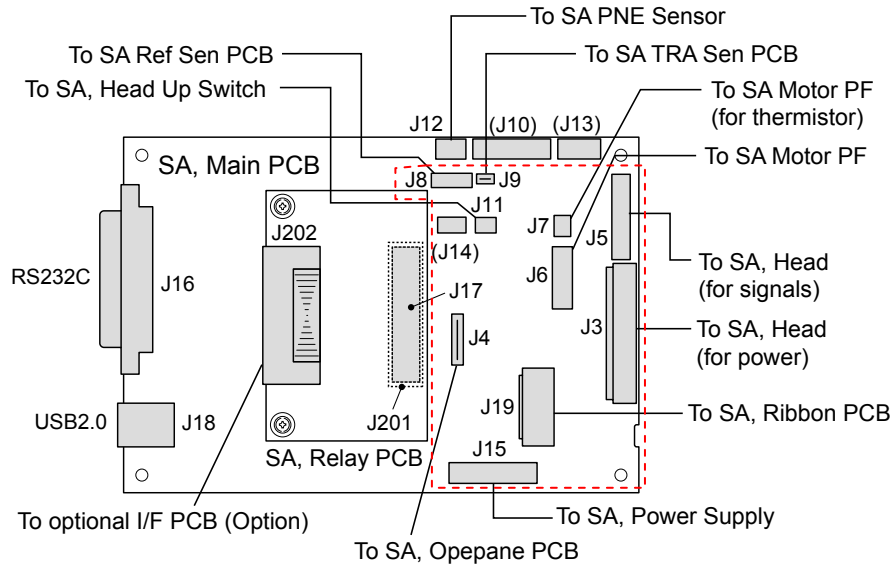
4. Remove the 3 screws (PHT (#2), M3x6) and 2 screws (BH, M3x4 (NI)), and then detach the "Plate Main PCB" Block (④). (See the figure on the previous page.)
5. Cut the "Wire Tie", disconnect the "SA Power Cable" from the main body to remove it.
6. Remove the 2 screws (BH, M3x4 (NI)) and detach the "SA, Relay PCB" (⑤) from the "SA, Main PCB". Then, remove the "Spacer (M3 H20mm)" (2 pcs.). (See the following figure.)
7. Remove the 2 "Lock Screw (Inch)" and 4 screws (BH, M3x4 (NI)), and detach the "SA, Main PCB" (⑥) and "Sheet Insulation Main PCB".
8. Remove the 2 screws (BH, M3x4 (NI)), and detach the "Plate, I/F Cover" from the "Plate Main PCB".
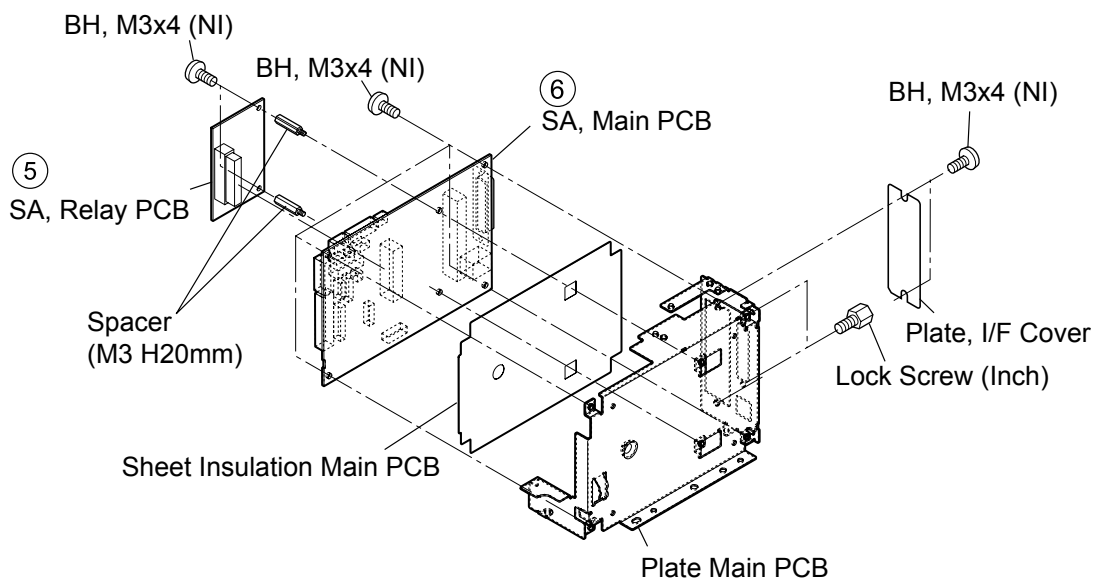
Notes on reassembling:

• When the "SA, Main PCB" is replaced with new one, <u>perform the sensor adjustment.</u> Refer to "3-7-1 Transparent/Reflective Sensor Position Adjustment.

• When running the "Cable, Opepane", pass it inner side of the case arms "**A**". Also, after running the "Cable, Opepane", stick it to the case frame at point "**B**" with a double-faced tape.
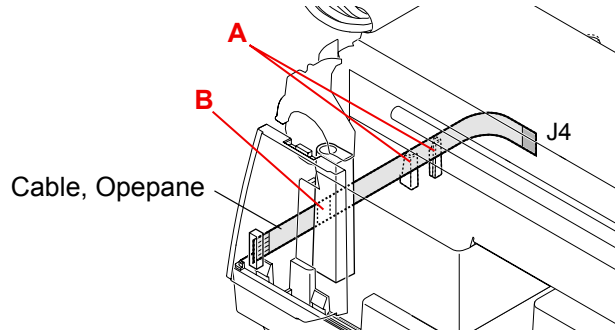

• When connecting the flexible cable, be sure that the insertion direction is correct. If you insert it reversely, circuit is not electrically connected.

• For the "Cable, Opepane" connected to the connector (J4), face its foil side to the rear of the printer.

• For the cable (J9), face up its foil side.
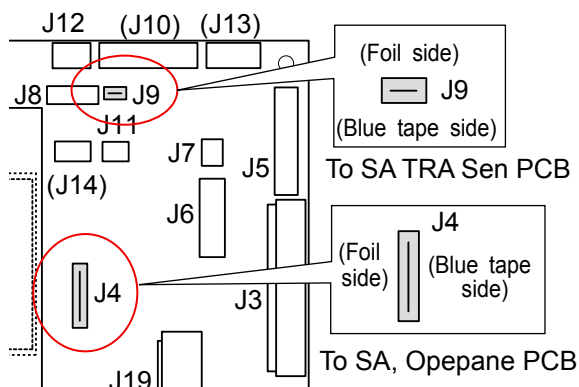
Note on installing the optional Parallel I/F Board:

1. On the back side of the printer, remove the 2 screws (BH, M3x4 (NI)) and detach the "Plate, I/F Cover".

2. Align the bottom of the optional Parallel I/F Board with the rail of the printer as shown by the arrow.

3. Slide the optional Parallel I/F Board along the rail and insert its connector into the I/F connector (J201) of the "SA, Relay PCB").

4. Fix the optional Parallel I/F Board to the printer with the 2 screws (BH, M3x4 (NI)) that were used for the "Plate, I/F Cover".
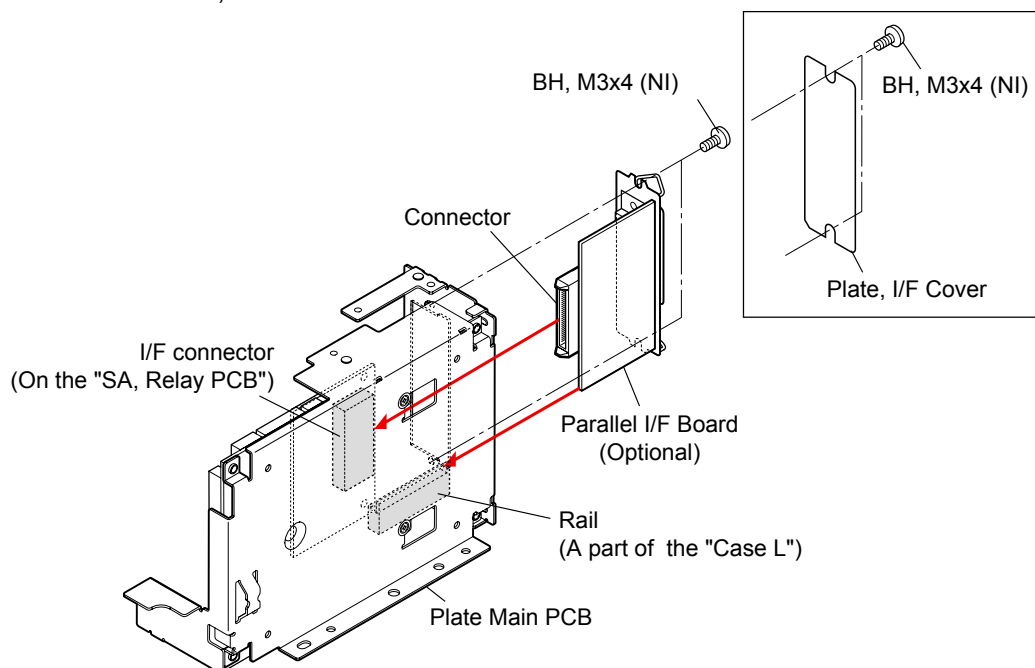
3-6-12. SA, Opepane PCB

1. Remove the "Case U". Refer to "3-6-3(1) Removing the "Case U" Block".
2. Remove the "Unit, Control Panel". Refer to "3-6-11(1) Unit, Control Panel".
3. Remove 3 screws (PHT (#2), M3x6) and detach the "SA, Opepane PCB".
4. Remove the "Switch, CL-S" and "LED, Window" from the "Cover Ope-pane".
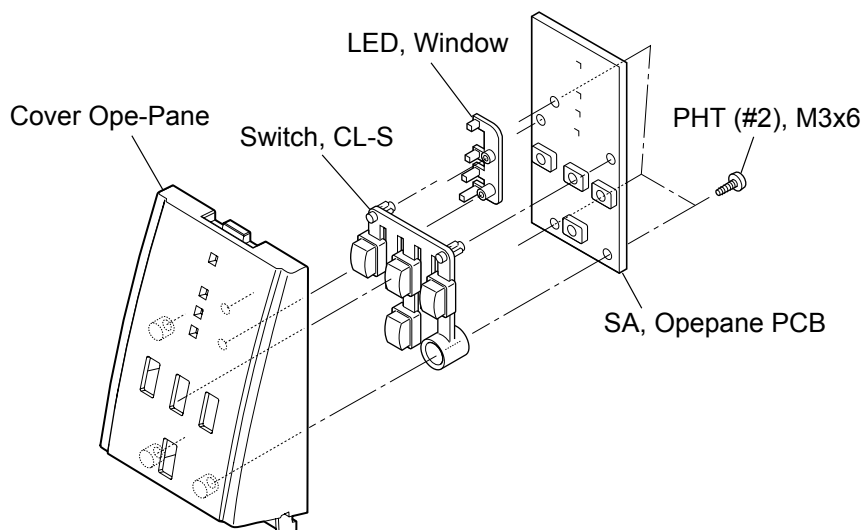
3-6-13. "Unit, Mechanism", "Unit, Power Supply" and "Case L"

(1) Unit, Mechanism

1. Remove the "Case U". Refer to "3-6-3(1) Removing the "Case U" Block".

2. Remove the cables from the "SA, Main PCB". Refer to "3-6-11 "Unit, Control Panel", "SA PNE Sensor", "SA, Relay PCB" and "SA, Main PCB"".

3. Remove the 3 screws (BH, M3x4 (NI)) and 5 screws (PHT (PT2T), M3x14), and detach the "Unit, Mechanism" upwardly.

BH, M3x4 (NI)

PHT (PT2T), M3x14

PHT (PT2T), M3x14

BH, M3x4 (NI)

Unit, Mechanism

Unit, Case L
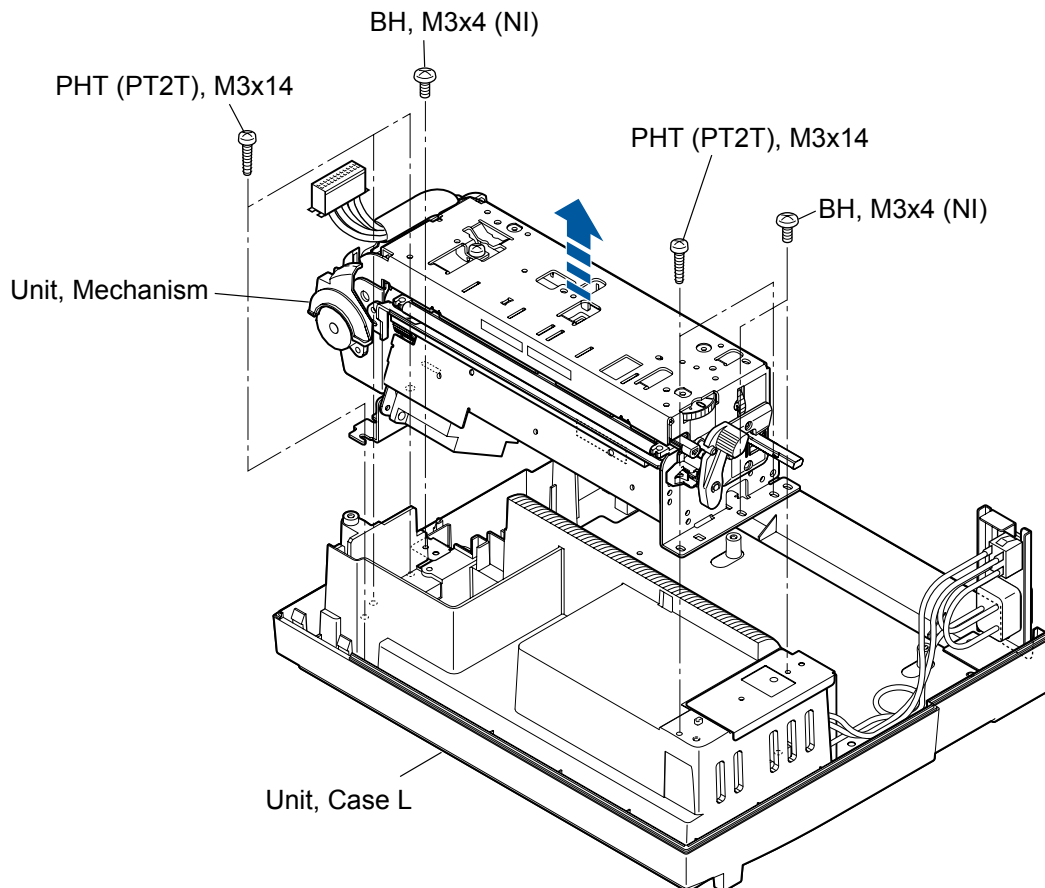
Note on reassembling:

- When you once removed the "Unit Mechanism", you need to adjust the paper path after assembling the "Case U" Block.
  For details, refer to "**When once the "Unit, Mechanism" was removed (Paper path adjustment):** " in "3-6-3(1) Removing the "Case U" Block".

(2) Unit, Power Supply

1. Remove the 2 screws (FH, M3x6) (①), and then 1 screw (BH, M4x5 (NI)) (②) and 1 washer (Ext.T, 4 (NI)).

2. Disconnect the 1 connector and carefully pull out the "SA, Power SW Cable" (③) from the "Plate Inlet".

3. Remove the 2 screws (PHT (#2), M3x6) and remove the "Plate Inlet". Then, remove the "Label Inlet Volt (200-240)/(100-120)" from the "Plate Inlet".

4. Turn over the "Case L" Block and remove the 2 screws (BH (N), M3x6 (NI)) (④) and detach the "Case Power PCB". Remove the "Leg Case L R" from the "Case Power PCB".

5. Remove the 2 screws (BH (N), M3x6 (NI)) and detach the "Power PCB" Block from the "Case L" Block.

   • To disassemble the "SA, Power PCB", go to the next step.

   • To disasseble the "Case L", go to the following "".
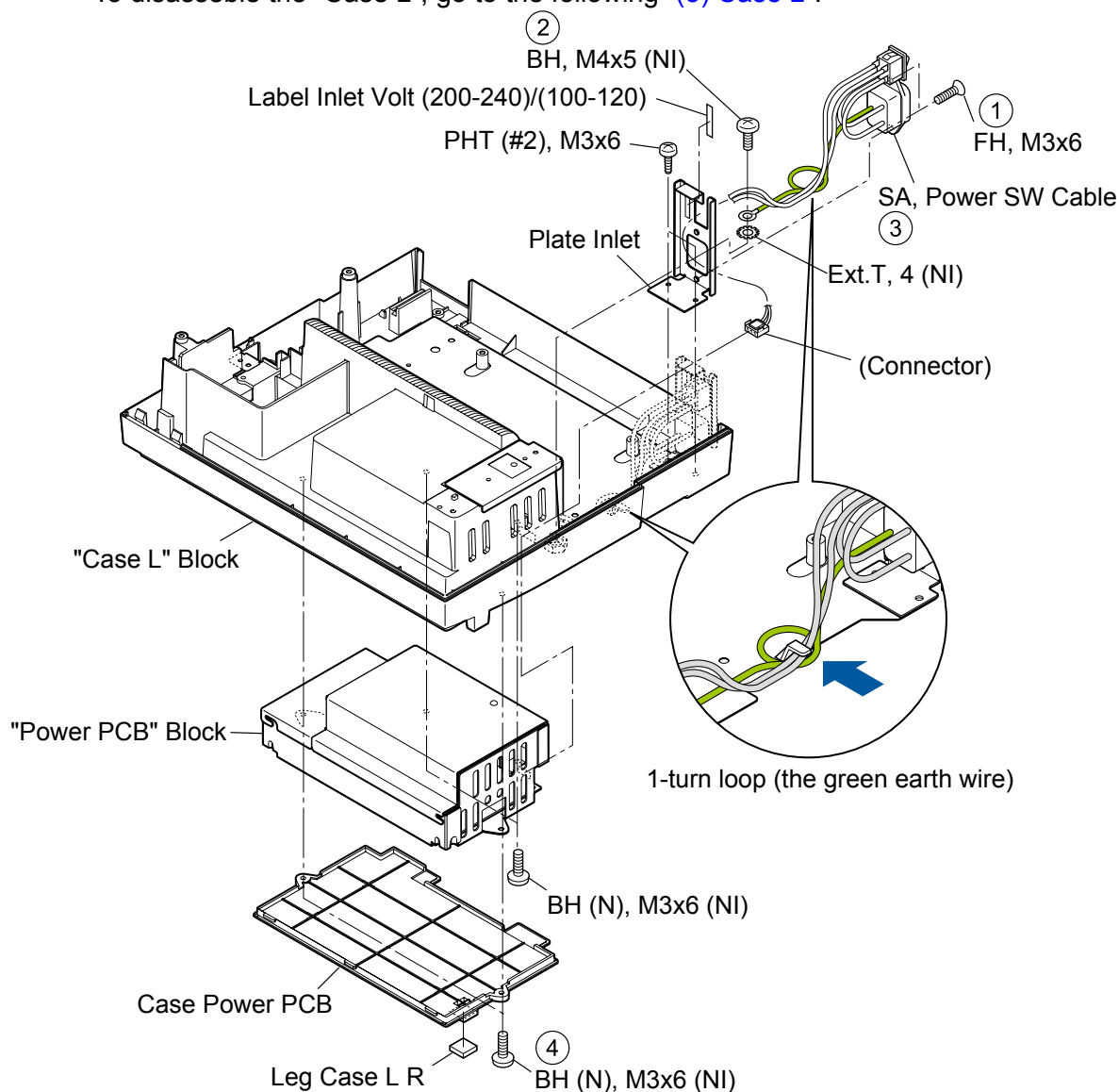
6. Remove the 1 screws (BH, M3x4 (NI)) and detach the "Cover Power PCB" by sliding it to the left and then lifting it.
7. Remove the 4 screws (BH, M3x4 (NI)), and detach the "Unit, Power Supply" and the "Spacer (fai3.5 7xL4mm)".
8. Remove the "Sheet Insulation Power PCB" from the "Plate Power PCB".

BH, M3x4 (NI)

Cover Power PCB

BH, M3x4 (NI)

Unit, Power Supply

Spacer (fai3.5 7xL4mm)

Sheet Insulation Power PCB

Plate Power PCB
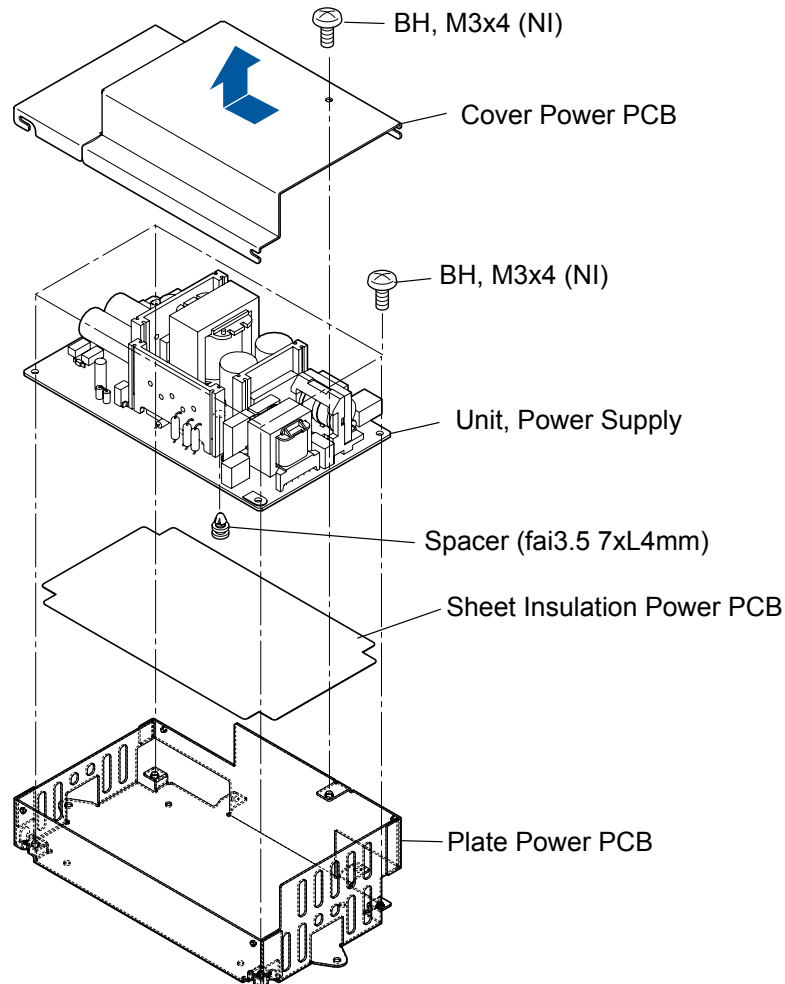
Note on reassembling:

*   When assembling the "SA, Power SW Cable", run the wires as shown in the magnified view on the previous page. Pass the wires through the hook and, for the green earth wire, make a 1-turn loop around the hook as shown.

(3) Case L

1. Lift the parts "**a**" and "**b**" of the "Plate Earth" a little to disengage them from the bosses "**A**" and "**B**".
2. Remove the "Plate Earth" upwardly.
3. Remove the 1 nut ((#3), M4) and "Leg Case L R" (3 pcs.) from the "Case L".
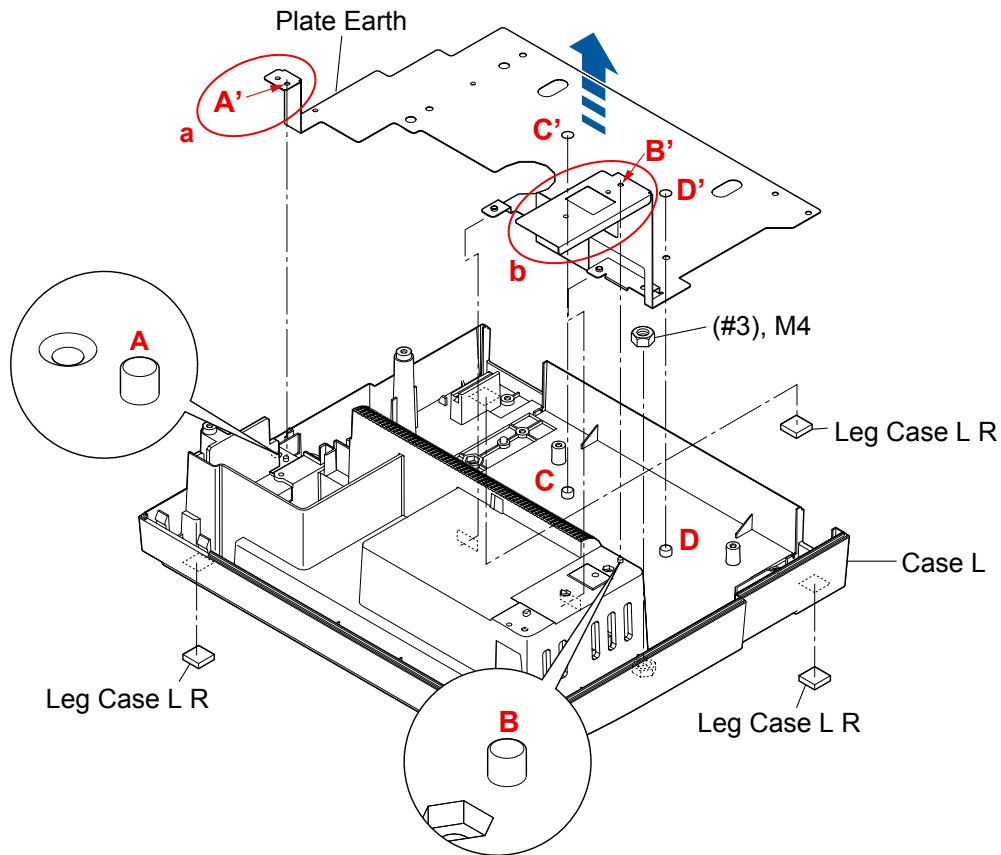
Note on reassembling:

• When assembling the "Plate Earth" on the "Case L", be sure that 4 holes ("**A'** ", "**B'** ", "**C'** " and ""**D'** ") are securely engaged with the respective bosses ("**A**", "**B**", "**C**" and ""**D**") of the "Case L".

3-6-14. SA2 Platen

1. Remove the "Unit, Mechanism". Refer to "3-6-13(1) Unit, Mechanism".
2. Open the "SA, Head" Block.
3. While pressing the part "**A**" of the "SA2 Platen", lift the right end of the "SA2 Platen" a little. (See the arrow "**a**".)

   Next, move it to the right and then remove it from the printer by lifting it upwardly. (See the arrow "**b**".)

"SA, Head" block
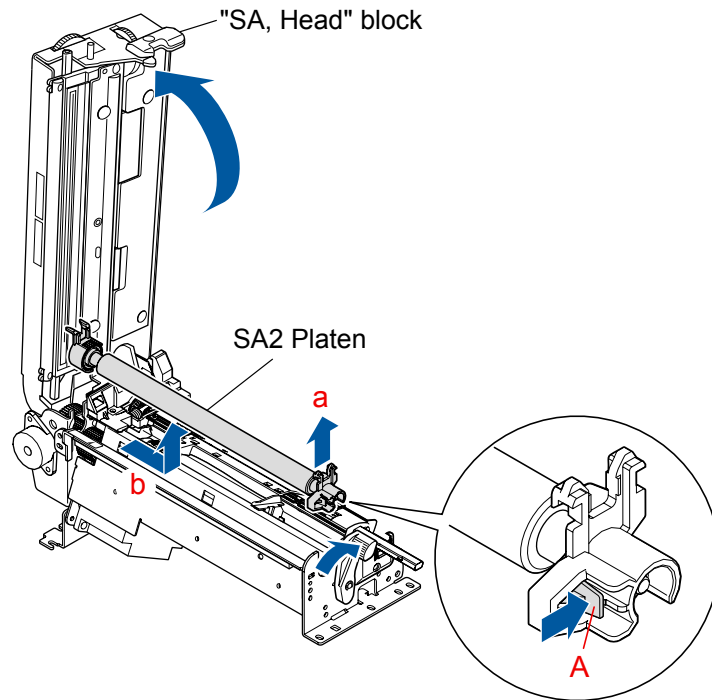
SA2 Platen

Note on reassembling:

• After reassembling the "SA2 Platen", be sure that it is securely engaged with the main body.

3-6-15. Unit, Sensor U

1. Remove the "Unit, Mechanism". Refer to "3-6-13(1) Unit, Mechanism".
2. Open the "Unit, Sensor U" to set it free. (See the arrow "a".)
3. Remove 3 screws (BH, M3x4 (NI)) and detach the "Unit, Sensor U" upwardly.

BH, M3x4 (NI)

BH, M3x4 (NI)

Unit, Sensor U

a
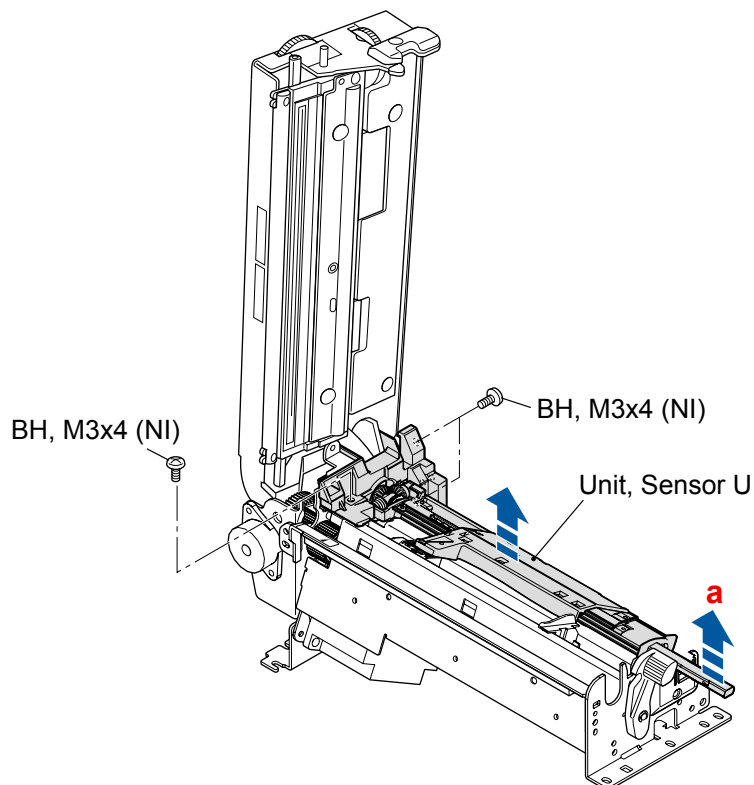
Notes on reassembling:

• Before assembling the "Unit, Sensor U", run the "FFC, TRA Sensor" as follows.

["FFC, TRA Sensor" wiring route]

Unit, Sensor U

FFC, TRA Sensor

Wiring route
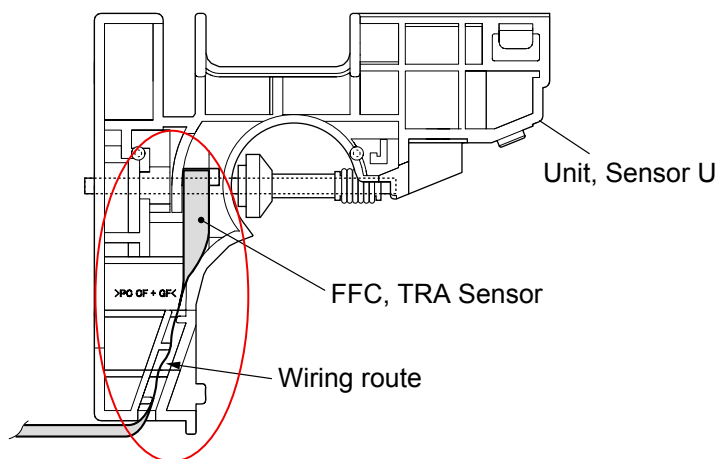
(to be continued on the next page)

- When assembling the "Unit, Sensor U", follow the next steps.

    1) <u>Before assembling the "Unit, Sensor U"</u>, turn the "Gear Bevel Lead Screw U" (blue knob) in the direction "**a**" to move the "Holder Adjust Sensor U" to the left ("**a'** "). Turn it until the "Holder Adjust Sensor U" <u>hits the left end and stops</u>.

    2) <u>Before assembling the "Unit, Sensor U"</u>, turn the "Gear Bevel Joint Lead Screw" in the direction "**b**" to move the "Holder Adjust Sensor L" to the left ("**b'** "). Turn it until the "Holder Adjust Sensor L" <u>hits the left end and stops</u>.

    3) Assemble the "Unit, Sensor U" with the 3 screws (BH, M3x4 (NI)).
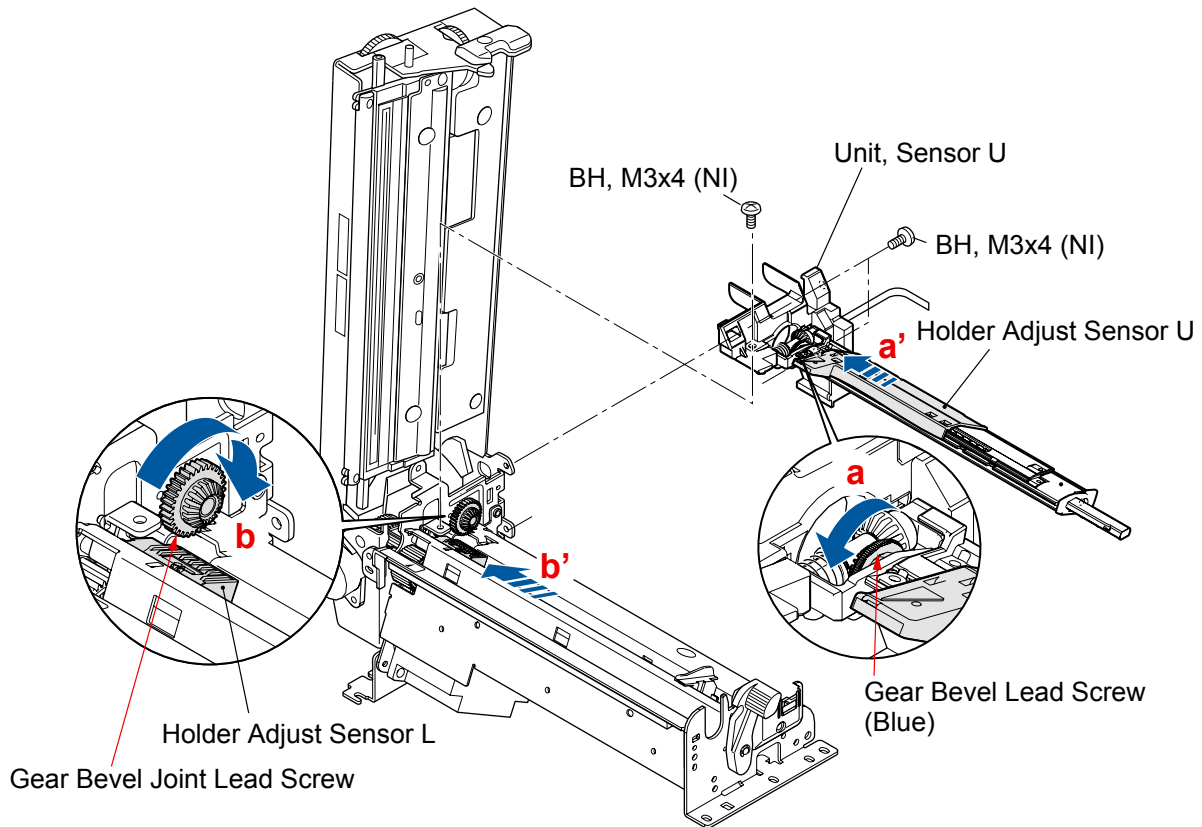
    4) Be sure that both indicators meet each other as shown below.
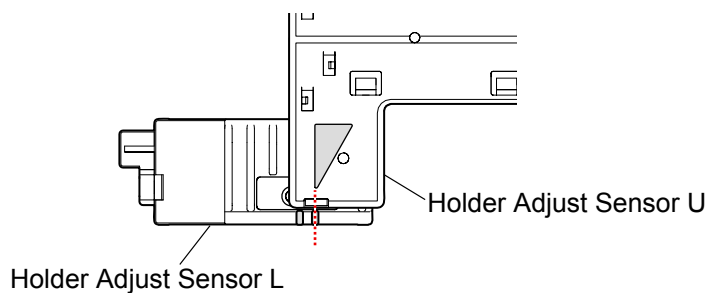
3-6-16. "SA TRA Sen PCB" and "Gear Bevel Lead Screw U"

1. Remove the "Unit, Mechanism". Refer to "3-6-13(1) Unit, Mechanism".
2. Remove the "Unit, Sensor U". Refer to "3-6-15 Unit, Sensor U".
3. Remove the 1 screw (BHT (#2), M3x6 (NI)) and detach the "Knob Guide Paper U".
4. Turn the "Gear Bevel Lead Screw U" (blue knob) in the direction as shown in the magnified view to move the "Head Adjust Sensor U" to the right.
    NOTE: Turn the "Gear Bevel Lead Screw U" (blue knob) until it stops.

Gear Bevel Lead Screw U (Blue Knob)

J9

Holder Adjust Sensor U

Cover Guide Paper U

Guide Paper U

Knob Guide Paper U

BHT (#2), M3x6 (NI)
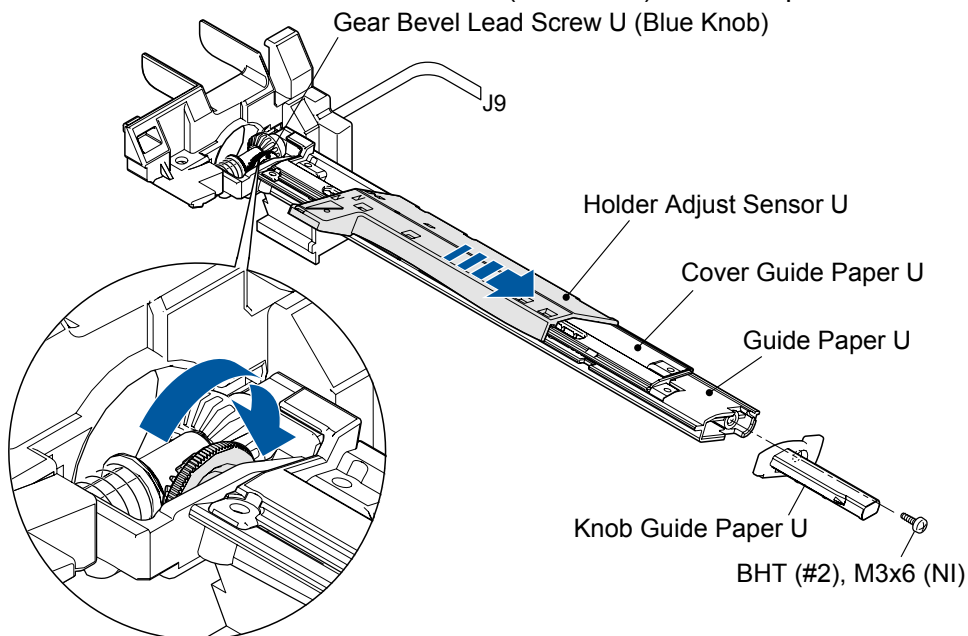
5. Open the "Head Adjust Sensor U".

Holder Adjust Sensor U
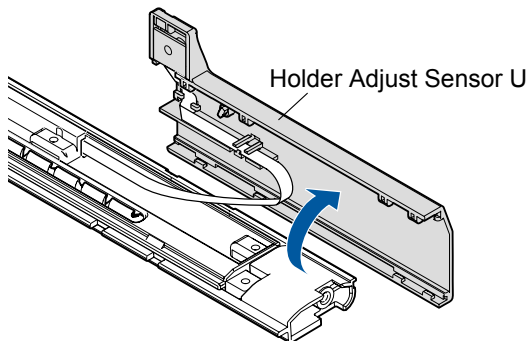
6. Remove the 1 screw (No.0, TFH (PT4-0.5), M2x4) from the "SA TRA Sen PCB", and then disconnect the "FFC TRA Sensor" from the "SA TRA Sen PCB".
7. Remove the "FFC TRA Sensor" from the "Holder Adjust Sensor U".

Holder Adjust Sensor U

SA TRA Sen PCB

No.0, TFH (PT4-0.5), M2x4

FFC, TRA Sensor
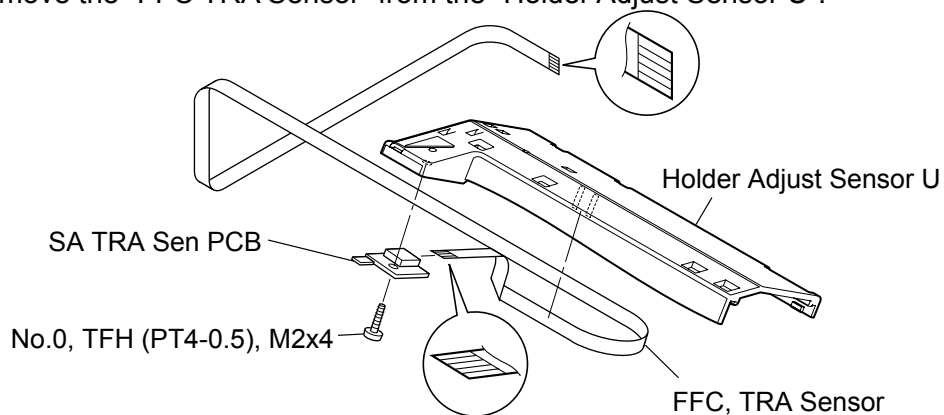
8. Move the end "**A**" of the "Spring Guide Paper U" from "**a**" to "**a'** " to set the end free.
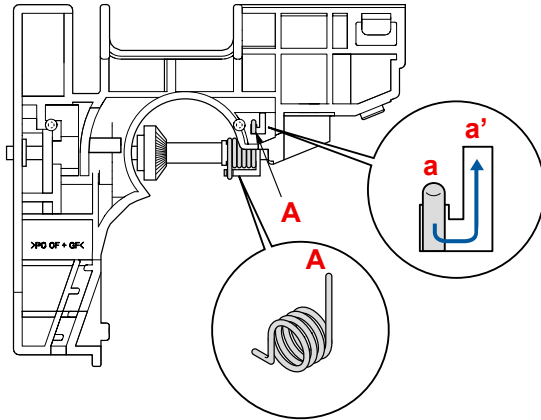
9. Disengage the "E-Ring, 2.5" (①) and pull out the "Shaft Hinge Guide Paper U" (②), and then remove the "Wave Washer 4x8xt0.15", "Polyslider", "Spring Guide Paper U", "Spacer Hinge Shaft" and "Gear Bevel Idle Sensor U".

10. Remove the 5 screws (BHT (PT), M2x6) (③) and detach the "Cover Guide Paper U".

11. Disengage the "E-Ring 3" (④), remove the "Spacer, CR Shaft", and pull out the "Shaft Lead Screw" from the "Gear Bevel Lead Screw U" and "Guide Paper U" Block.

12. Remove the 3 nuts ((#3), M2) (⑤) with a nut driver and detach the "Pin Guide Paper U" (3 pcs.), and then remove the "Leaf Holder Adjust Sensor U" from the "Guide Paper U".
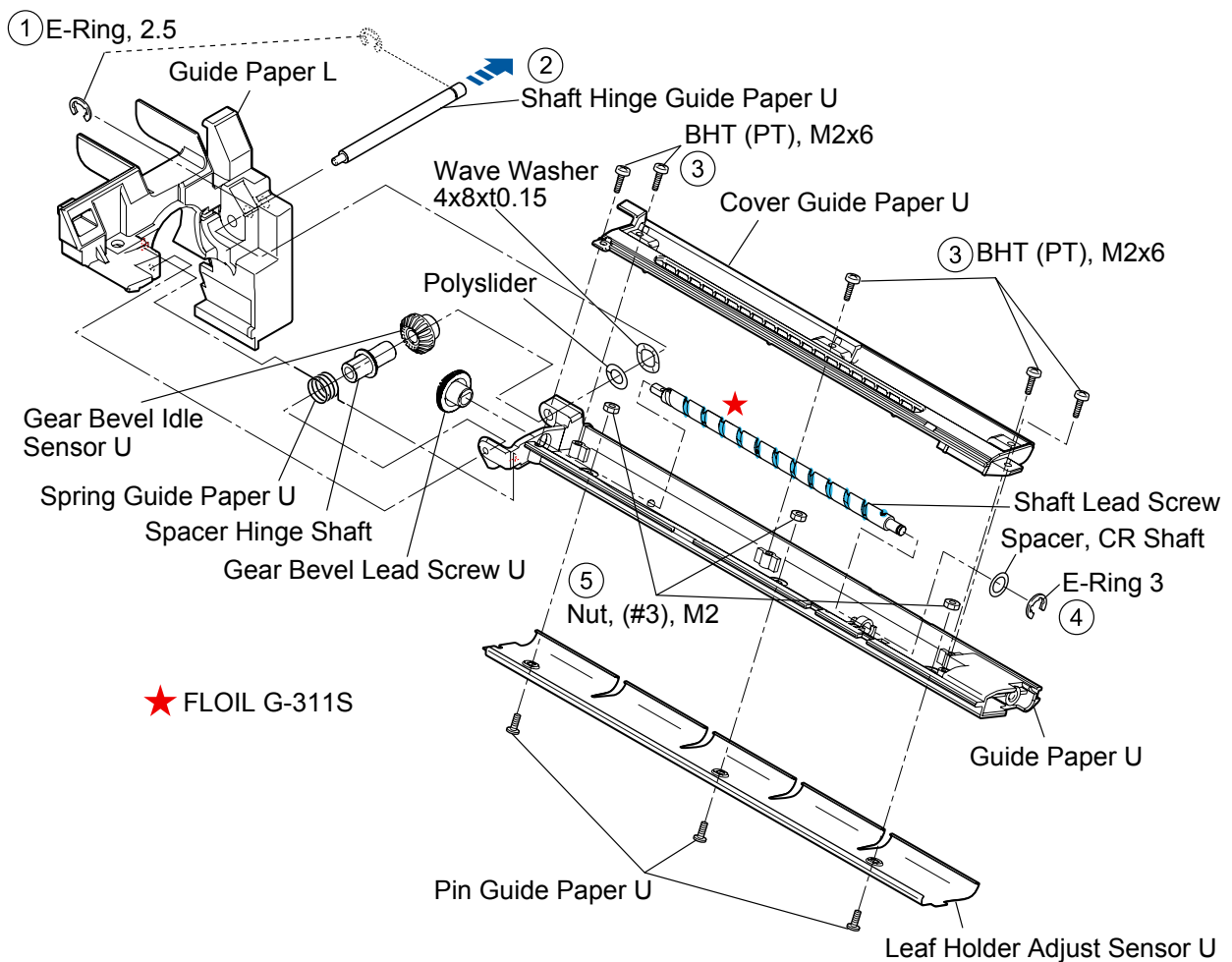
Notes on reassembling:

- Apply FLOIL G-311S to the groove of the "Shaft Lead Screw" shown by the ★ mark.
- When assembling the "Spring Guide Paper U", follow the next steps.
    1) First, hook the end "**B**" as shown below.
    2) Next, insert the end "**A**" into the opening "**a**" and move it from "**a**" to "**a'** " to hook it on the opening "**a'** " as shown below.

Spring Guide Paper U
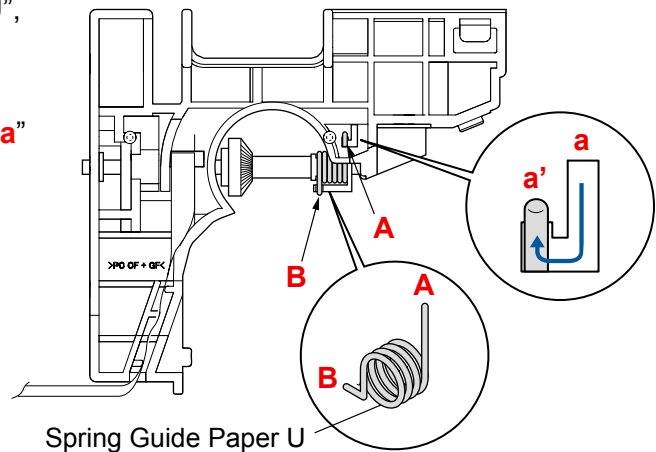
- When assembling the "FFC, TRA Sensor", run it as shown below.

FFC, TRA Sensor

Holder Adjust Sensor U
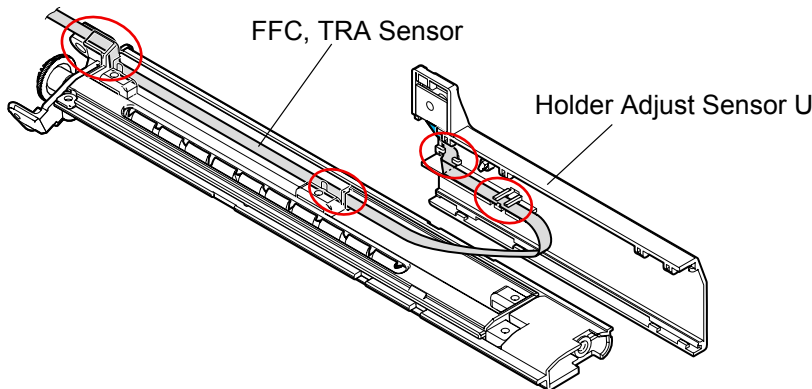
- When assembling the "Holder Adjust Sensor U", assemble it so that its projection "**A**" is inserted into the groove end "**A'** "of the "Shaft Lead Screw". Also, securely engage the "Holder Adjust Sensor U" with the "Guide Paper U" by aligning the projected parts "**B**" and "**B'** ".

Projection "**A**"

B

Holder Adjust Sensor U

Shaft Lead Screw

Groove end "**A'** "   **B'**

Guide Paper U
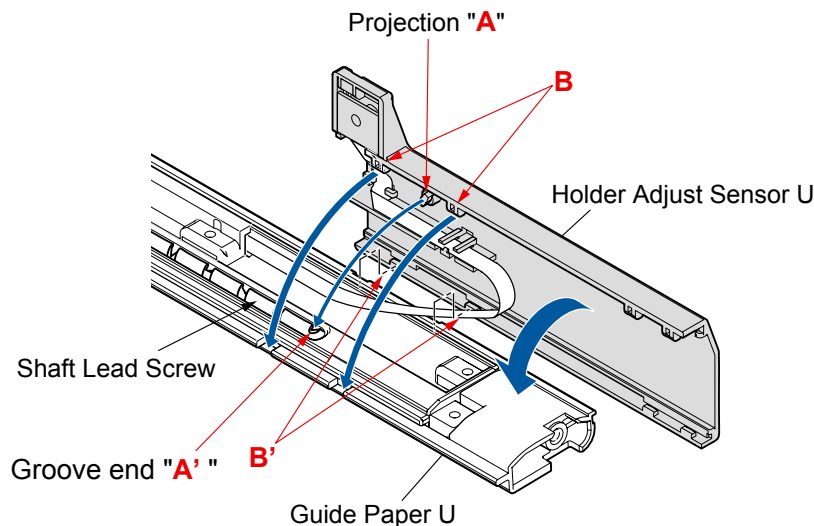
- When the "SA TRA Sen PCB" is replaced with new one, <u>perform the sensor adjustment.</u> Refer to "3-7-1 Transparent/Reflective Sensor Position Adjustment.

3-6-17. Unit, Head

1. Remove the "Unit, Mechanism". Refer to "3-6-13(1) Unit, Mechanism".
2. Cut the "Wire Tie" (2 pcs.) (①) and remove the "SA, Ribbon Cable" (②).
3. Open the "Unit, Head" and remove the 1 screw (PH (SW+PW), M4x16) (③), then remove the "Shaft Head Holder" (④) and "Spring Ribbon Unit Dumper" (⑤).
4. Disengage the "E-ring 4" (⑥), remove the "Bush Head Holder", and detach the "Unit, Head" (⑦) from the "Unit, PF".
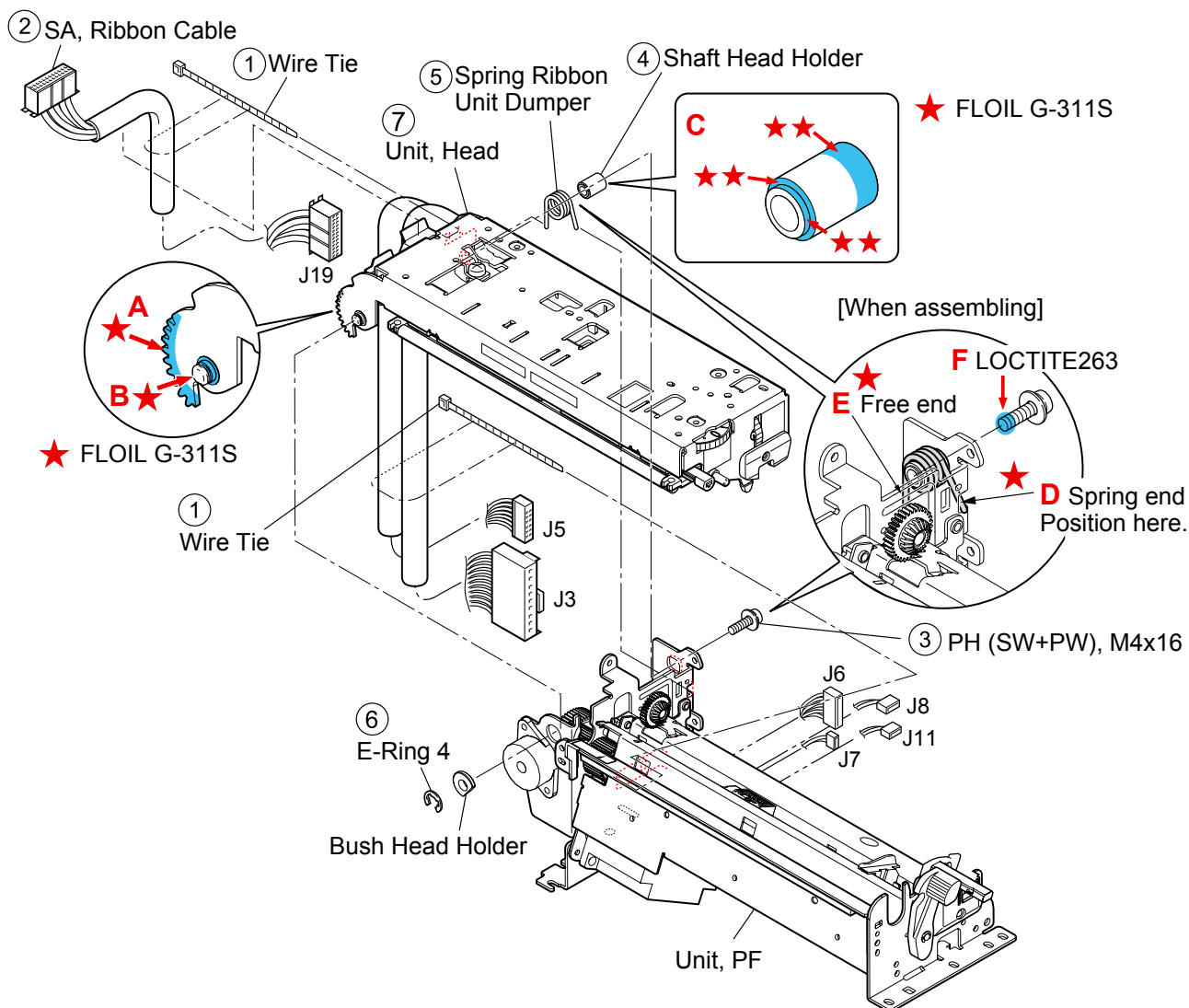
Notes on reassembling:

- Apply FLOIL G-311S to the following places. (See the mark ★ shown in the figure.)
  A: Hole (front left). Circumference surface of the hole (on both sides) and inside the hole
  B: Along the rack part.
  C: 3 surfaces on the "Shaft Head Holder" (④).
  D and **E**: Both ends of the "Spring Ribbon Unit Dumper" (⑤).
- Apply adhesive LOCTITE263 to the end (**F**) of screw (PH (SW+PW), M4x16) (③).
- When assembling the "Shaft, Head Holder" (④), be sure that its assembling direction is correct. (See the magnified view.)
- Set the "Spring Ribbon Unit Dumper" (⑤ as shown in the magnified view. Insert its rear end to the opening "**D**". Other end is a free end.

3-6-18. "SA, Head", "Cam Head Balance" and "Cam Head Adjust"

⚠ **Caution**

- **When detaching or reinstalling the "SA, Head", be careful not to damage the thermal elements. Especially, avoid contacting the thermal elements with a metal part, etc.**

⚠ **Do not touch the thermal elements of the "SA, Head" with your bare hand.**

---

(1) SA, Head

1. Remove the "Unit, Mechanism". Refer to "3-6-13(1) Unit, Mechanism".
2. Remove the "Unit, Head". Refer to "3-6-17 Unit, Head".
3. Place the "Unit, Head" upside down as shown in the figure.
4. Remove the 2 screws (NO.1, TFH (6-0.7), M3x6 (NI)) and lift the "SA, Head" Block. Then, disconnect the "SA, Head Signal Cable" and "SA, Head Power Cable" from the "SA, Head".
   NOTE: To disconnect the "SA, Head Power Cable", unlock the connector lock.
5. Remove the 2 screws (BH, M3x4 (NI)) and detach the "Cover Head Cable".
6. Cut the "Wire Tie" (2 pcs.) and remove the "SA, Head Signal Cable" and "SA, Head Power Cable".
7. Remove the "Sheet Head Connector P" from the "SA, Head Power Cable".
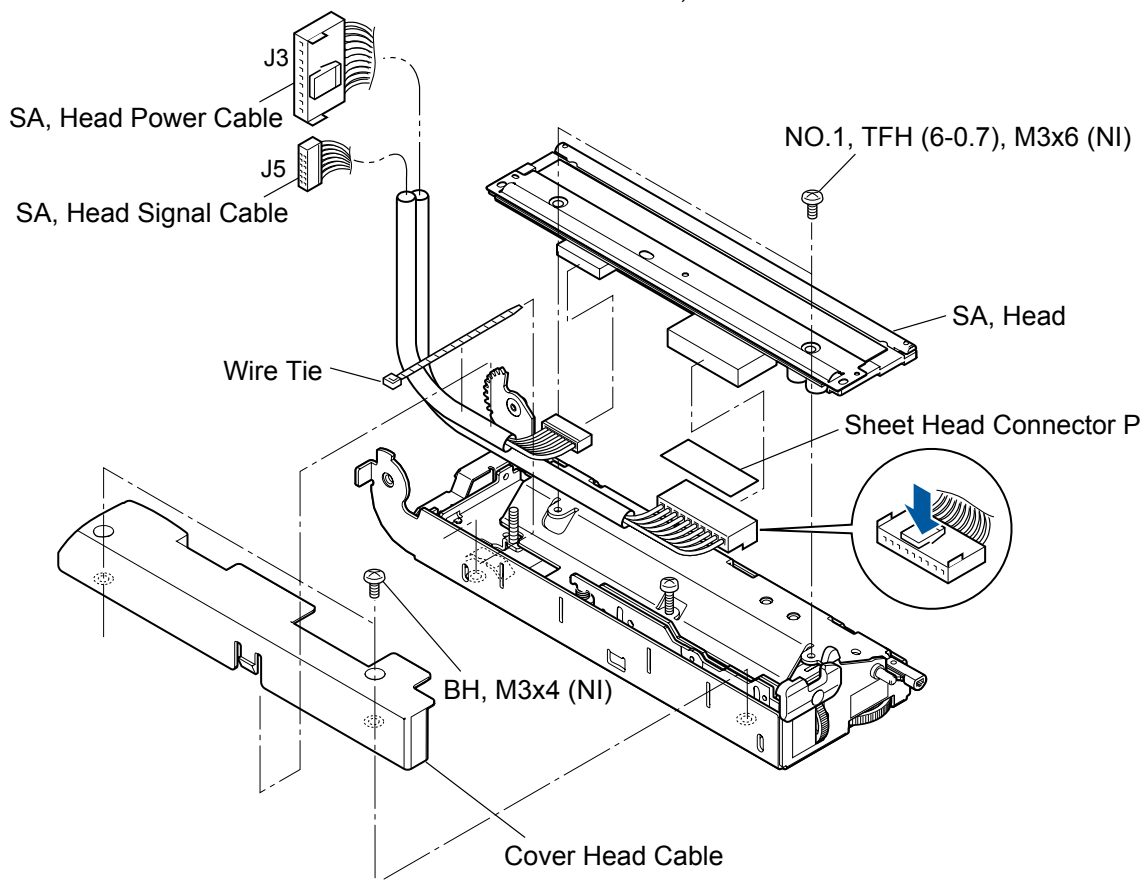
Notes on reassembling:

- After assembling the "SA, Head", clean the surface of the thermal elements with the head cleaner.
- After assembling the "SA, Head", perform a test printing in self print mode to check the print quality. (Refer to "2-3-2-(2-1) Self print mode".) If the print quality is not enough, ribbon slanting or ribbon wrinkle may occur. In this case, perform "3-7-2 Ribbon Slant Elimination Adjustment".

(2) Cam Head Balance

1. Place the Head Frame Block upside down and set the blue dials as follows for easier disassembly.

   Media width adjustment dial: Location "5"
   Media thickness adjustment dial: Location "5"

"5"
Cam Head Balance
(Media width adjustment dial)

"5"
Cam Head Adjust
(Media thickness adjustment dial)
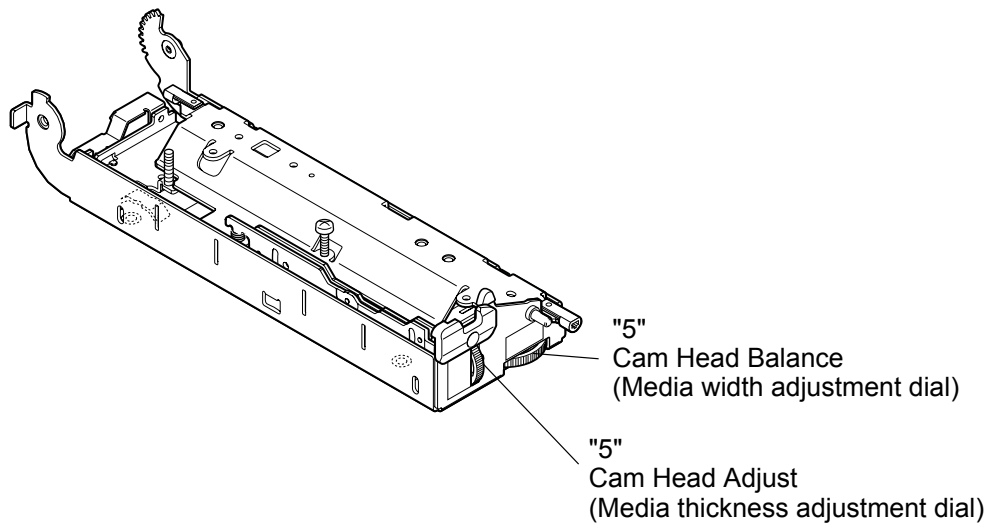
2. Remove the 2 screws (PH, M3x10) (① and ②) and 2 screws (BH, M3x4 (NI)) (③). Then, remove the "Plate Holder Head" Block (④) in the direction of arrow.

3. Remove the "Spring Head L", "Spring Head R" (2 pcs.), "Plate Head Balance" and "Spacer Head Balance".

4. Remove the 1 screw (PH, M3x6) (⑤) and detach the "Pivot Head Balance Cam" and "Cam Head Balance".

5. Remove the 1 screw (BH, M3x4 (NI)) and detach the "Holder Guide Sensor U".

6. Remove the 1 screw (BH, M3x4 (NI)) and detach the "Plate Ribbon Cable Stay".

7. Remove the ""Support Pop Up" and peel off the labels ("Label 2, Caution Head (AH50)", "Label 6, Caution, Head/Label 7, Caution, Head/Label, Caution Head (China)" "Label, Head Adjust" and "Label, Head Balance") from the "SA Cover Frame".
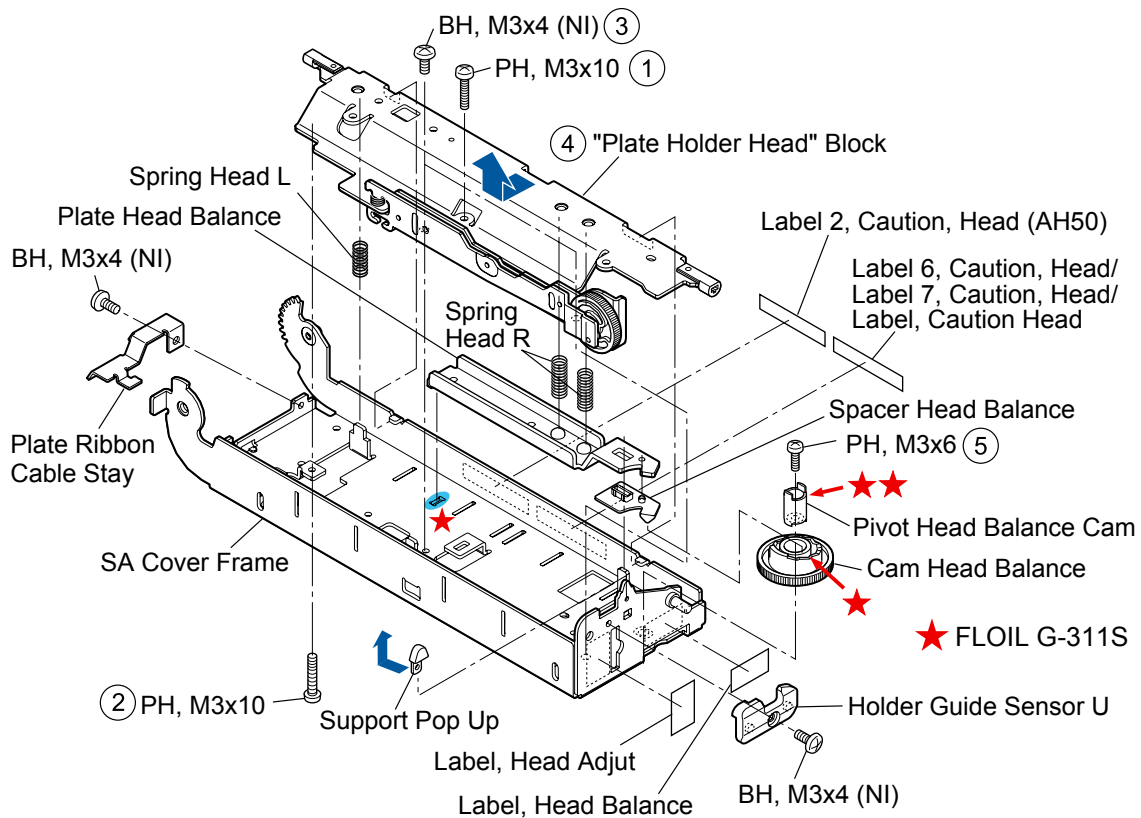
Notes on reassembling:

• Apply FLOIL G-311S to the following places. (See the mark★ shown in the figure.)
   Pivot Head Balance Cam: Surface.
   Cam Head Balance: Along the cam surface.
   SA Cover Frame: The slit into which the claw of "Plate Head Balance" is inserted.
(to be continued on the next page)

- When assembling the "Plate Holder Head" Block on the "SA Cover Frame" Block, follow the next steps.
    1) Insert the "Spring Head L" and "Spring Head R" on the "SA Cover Frame" Block. (See the figure below.)
       NOTE: The "Spring Head L" is shorter than the "Spring Head R".
    2) Align the "Plate Holder Head" Block so that the top ends of the "Spring Head L" and "Spring Head R" are securely seated in the depressed parts "**A**" and "**B**", respectively.
    3) Gently press down the "Plate Holder Head" Block and then slide it in the direction of the arrow so that the projections "**C**" of the "SA Cover Frame" Block are inserted in the slits "**C'** ".
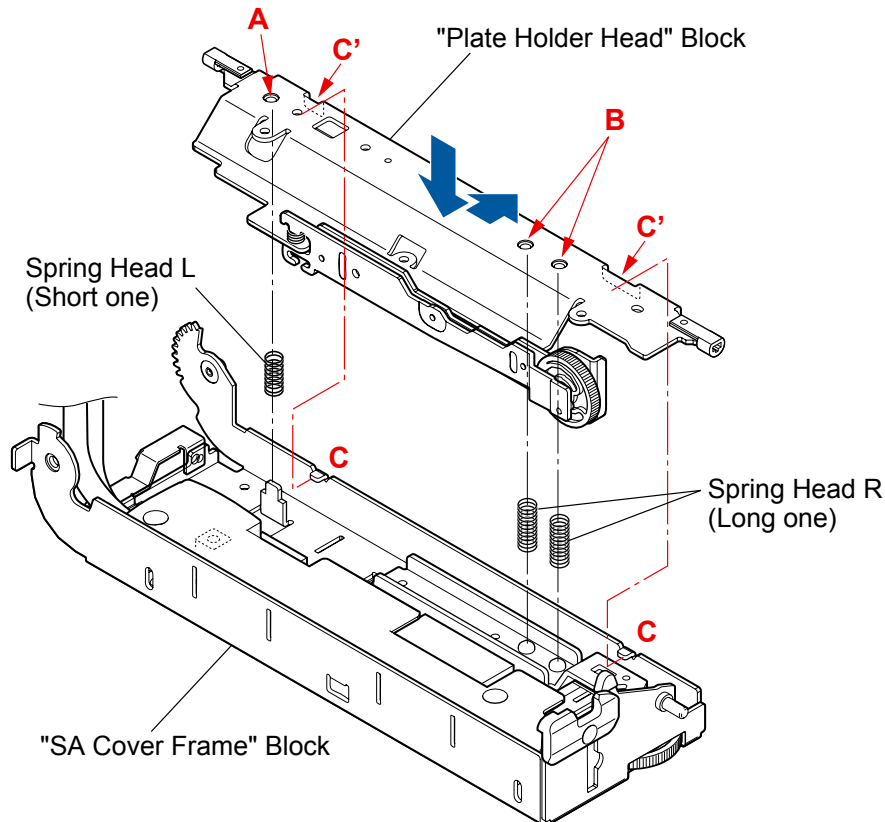
(3) Cam Head Adjust

1. In the "Plate Holder Head" Block, detach the "SA Head Adjust Lever" Block by pulling it out from the "Plate Holder Head" Block. (They are simply connected with the "Spring Head Holder".)
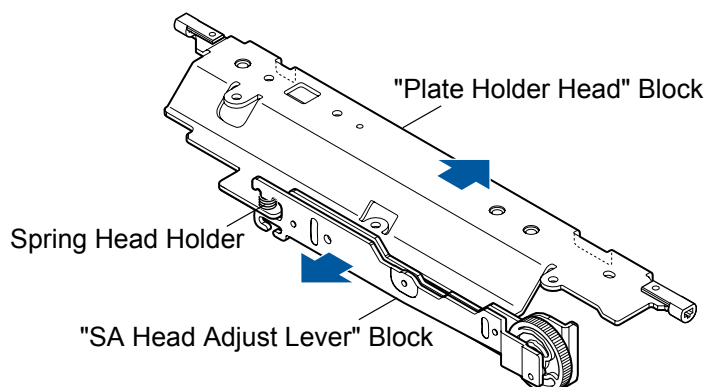
2. Remove the "Spring Head Holder" (①) from the "SA Head Adjust Lever" Block.

3. In the "SA Head Adjust Lever" Block, disengage the 3 E-rings (E-Ring 3) (②) to detach the "SA Head Adjust Lever" from the "Base Head Adjust" Block.

4. Remove the 1 screw (PHT (#2), M2x6) (③), and detach the 1 washer (Plain, 2.6x6.5x0.5) and "Spring, Adjust Cam". Next, pull out the "Bush Head Adjust" from the "Guide, Head Adjust (Spring)" and detach the "Guide, Head Adjust (Spring)" and "Cam Head Adjust" from the "Base Head Adjust".

5. Pull out the "Bushing Head" (2 pcs.), and then remove the 1 screw (BH, M3x4 (NI)) and detach the "Plate Head Earth" from the "Plate Holder Head".
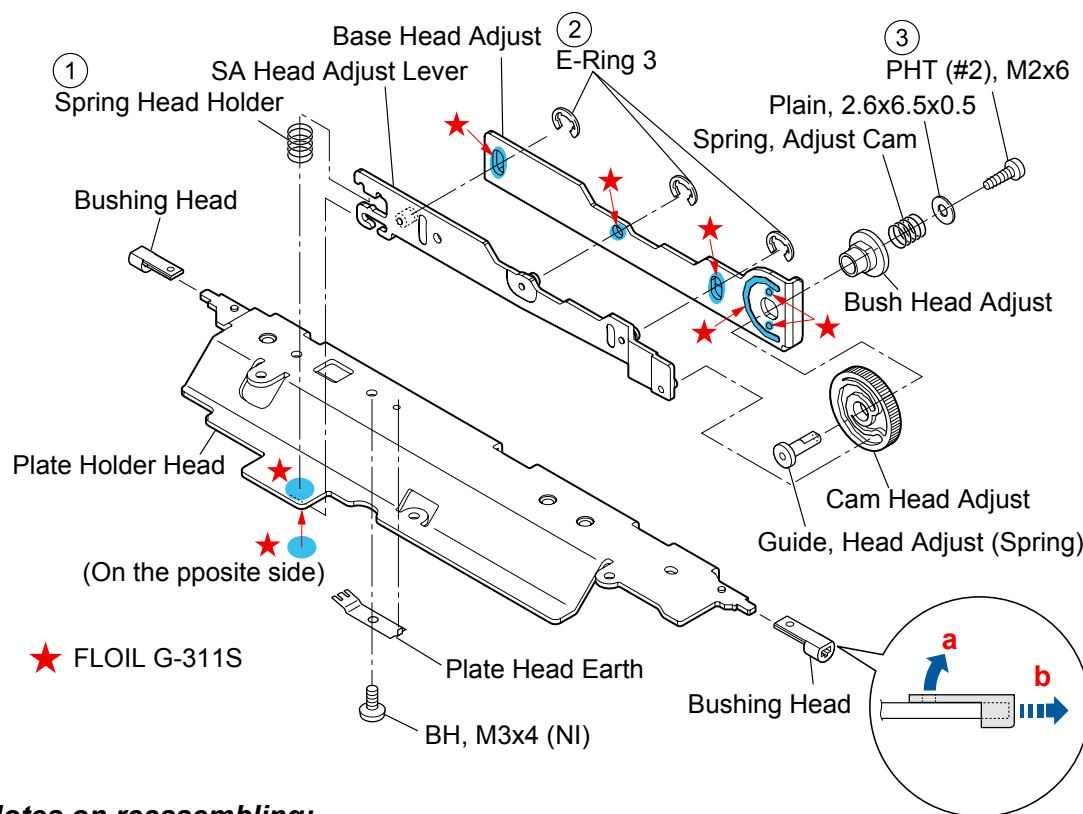

Notes on reassembling:

• Apply FLOIL G-311S to the following places. (See the mark ★ shown in the figure.)
  Plate Holder Head: Surface where the "Spring Head Holder" (①) contacts and its opposite side.
  Base Head Adjust: Holes (5 pcs.) and 1 groove.

• When assembling the "Spring Head Holder":
  Assemble the "Spring Head Holder" ("**D**") on the "SA Head Adjust Lever" Block as shown in the magnified view. Then, insert them into the "Plate Holder Head" Block as shown.
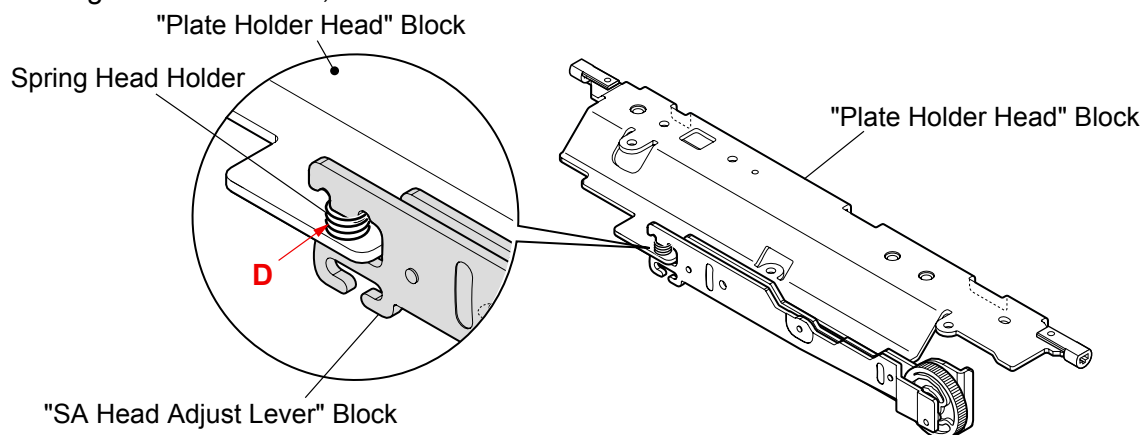
3-6-19. SA PF Motor

1. Remove the "Unit, Mechanism". Refer to "3-6-13(1) Unit, Mechanism".
2. Cut the "Wire Tie". Then remove 2 screws (BH, M3x4 (NI)) and detach the "SA PF Motor" Block.
3. Disconnect the "SA, PF Motor Cable" from the "SA PF Motor".
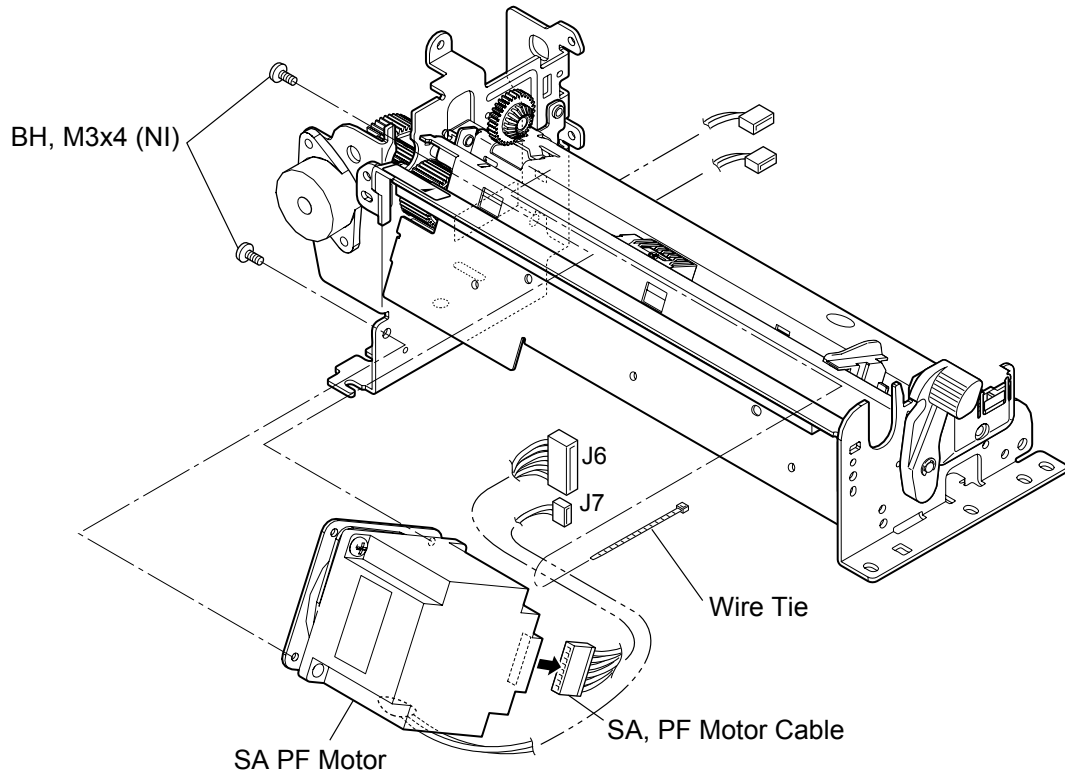
3-6-20. "Carriage Adjust Sensor L", "SA, Head Up Switch" and "SA Ref Sen PCB"

(1) "Carriage Adjust Sensor L" and "SA, Head Up Switch"

1. Remove the "Unit, Mechanism". Refer to "3-6-13(1) Unit, Mechanism".
2. Remove the "Unit, Sensor U". Refer to "3-6-15 Unit, Sensor U".
3. Remove the "Unit, Head". Refer to "3-6-17 Unit, Head".
4. Remove the "SA, PF Motor". "Refer to "3-6-19 SA PF Motor".
5. Turn over the PF Block.
6. Cut the "Wire Tie" (2 pcs.) and unhook the wires from the 2 hooks.
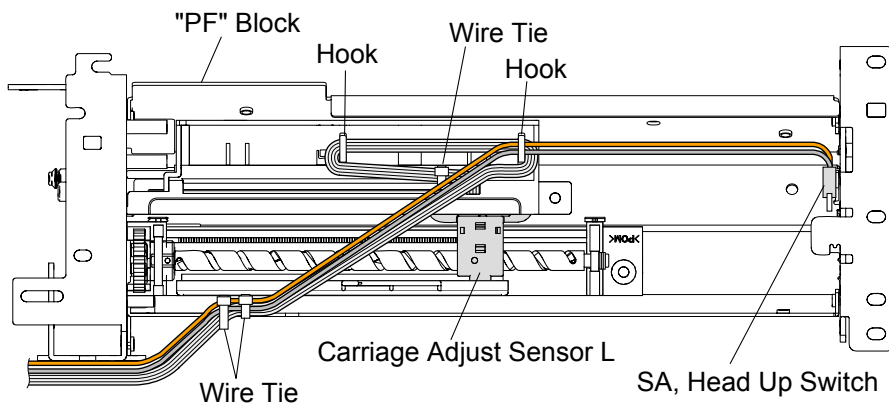
[Bottom View]

7. Remove the "Carriage Adjust Sensor L" and other related parts.
   1) Remove the 1 screw (BH, M3x4 (NI)) (①), and detach the "Cover Sensor Cable L".
   2) Remove the 2 screws (BHT (PT), M2x6) (②) and detach the "Carriage Adjust Sensor L".
   3) Remove the "Pinion Sensor L" and "Leaf Pinion Sensor L" from the "Carriage Adjust Sensor L".
   4) Disengage the "E-Ring 3" (③), remove the "Wave Washer 4x8xt0.15" and "Spacer, CR Shaft", and then detach the "Shaft Lead Screw".
   5) Remove the 1 screw (BH, M3x4 (NI)) (④) and detach the "Holder Screw L" and "Gear Lead Screw L".
   6) Remove the "Sheet Blind" from the frame.

8. Remove the "SA, Head Up Switch".
   1) Remove the 1 screw (BH, M3x4 (NI)) (⑤) and detach the "Guide Cover Frame Pop Up" Block. Then, remove the "Spring Pop Up" and "Pop Up Cover Frame" from the "Guide Cover Frame Pop Up".
   2) Remove the 1 screw (No.0, PHT (BT #3), M1.7x7) (⑥) and detach the "SA, Head Up Switch".

★ FLOIL G-311S

Disassembly, Reassembly and Lubrication
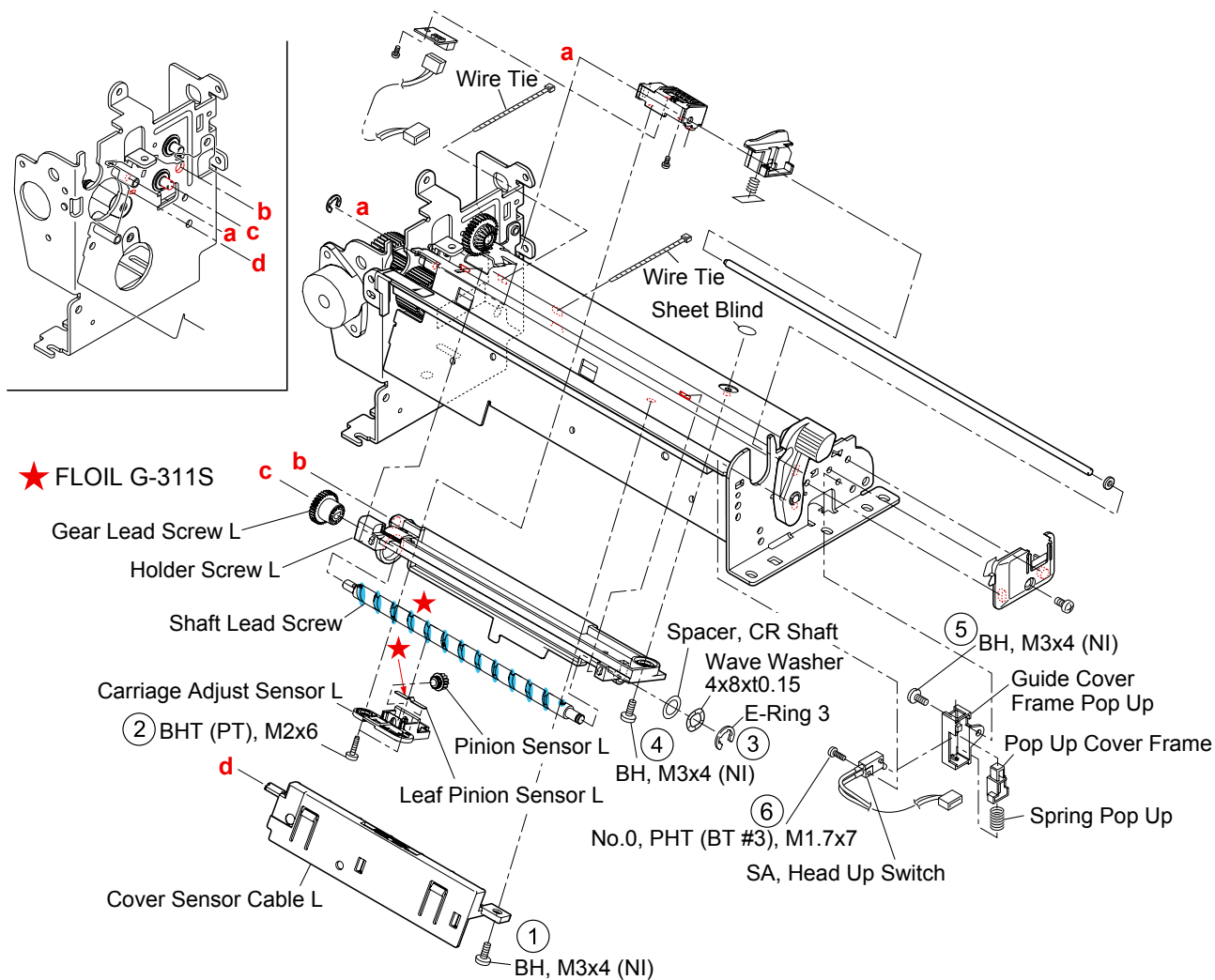
Notes on reassembling:

- When assembling the "Leaf Pinion Sensor L" and "Pinion Sensor L" on the "Carriage Adjust Sensor L":

  1) First, place the "Leaf Pinion Sensor L" inside the "Carriage Adjust Sensor L" <u>with the convex side facing up</u>.

  2) Next, place the "Pinion Sensor L" inside the "Carriage Adjust Sensor L". Pat attention to its installing direction.

  3) Insert the projection "**A**" into the groove "**A'**"of the "Shaft Lead Screw".

  4) Apply FLOIL G-311S to the "Leaf Pinion Sensor L". (See the mark★ shown below.)
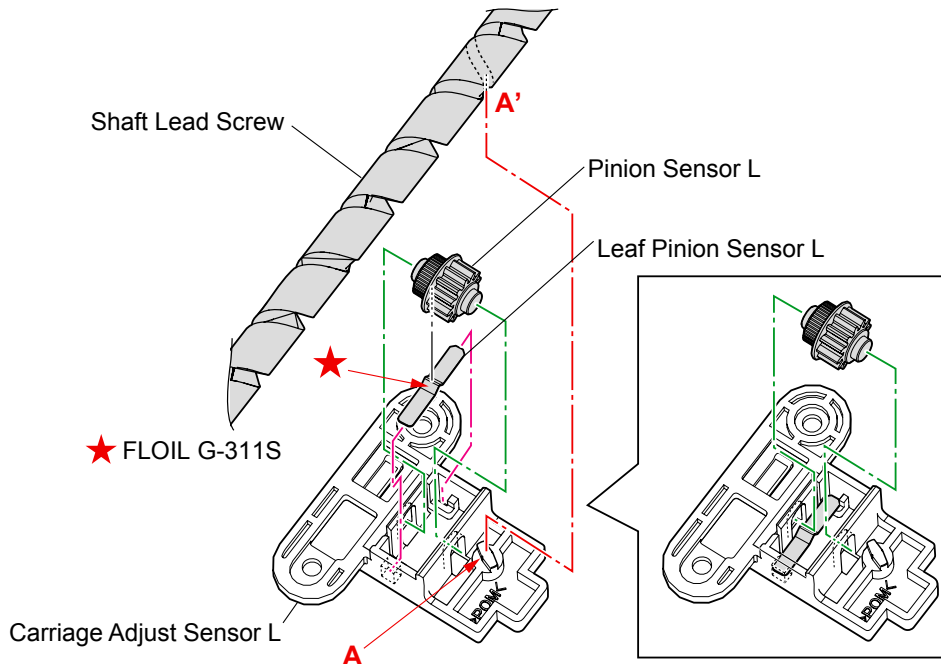
- Apply FLOIL G-311S to the groove of "Shaft Lead Screw".

- After assembling each part, arrange the wires as follows.

  1) Turn the "Gear Lead Screw L" in the direction shown by the arrow to move the "Carriage Adjust Sensor L" to the right until it stops.

  2) In this condition, run the 5 wires from the "SA Ref Sen PCB" on the top side as shown below. Hook them on the hooks.

  3) Run the 2 wires from the "SA, Head Up Switch" as shown below. Hook them on the right side hook.

  4) Bind the wires with "Wire Tie" at two places.

[Bottom View]

3-49   CL-S6621
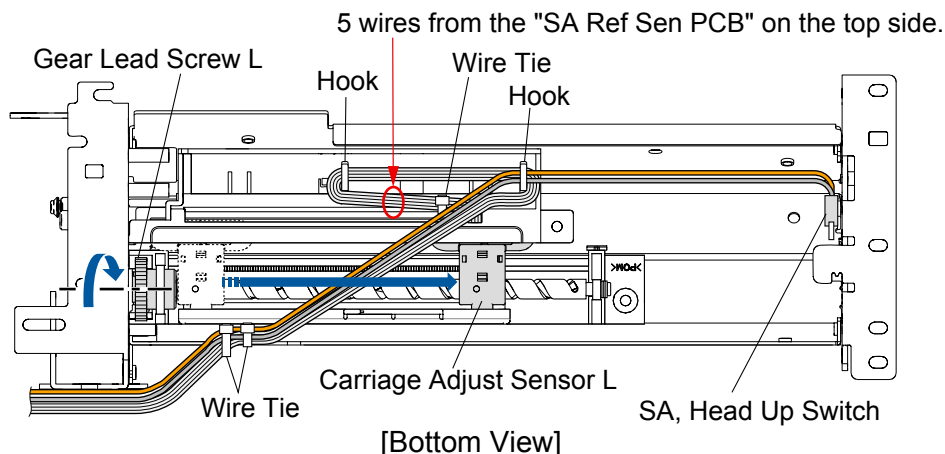
(2) SA Ref Sen PCB

1. Remove the "Carriage Adjust Sensor L". Perform steps 1 to 7)-2 in above "3-6-20(1) "Carriage Adjust Sensor L" and "SA, Head Up Switch"".

2. Disengage the "E-Ring, 1.5" (⑦), remove 1 screw (BH, M3x4 (NI)) (⑧), and detach the "Holder, Guide Sensor L".

3. Slide the "Guide Paper R" (⑨) to the left and remove the "Shaft Sensor Guide" (⑩) in the direction shown by the arrow, together with the "Guide Paper R" Block and "Holder Adjust Sensor L" Block.

4. Remove the "Spacer Guide Shaft", and then pull out the "Guide Paper R" Block and "Holder Adjust Sensor L" Block from the "Shaft Sensor Guide".

5. Remove the "Spring Friction Sen PG" and the "Plate Friction PG" from the "Guide Paper R".

6. Disconnect the "SA, Ref Sensor Cable" from the "SA Ref Sen PCB".

7. Remove the 2 screws (No.0 PHT (BT#1) M2x3) and detach the "SA Ref Sen PCB" from the "Holder Adjust Sensor L".
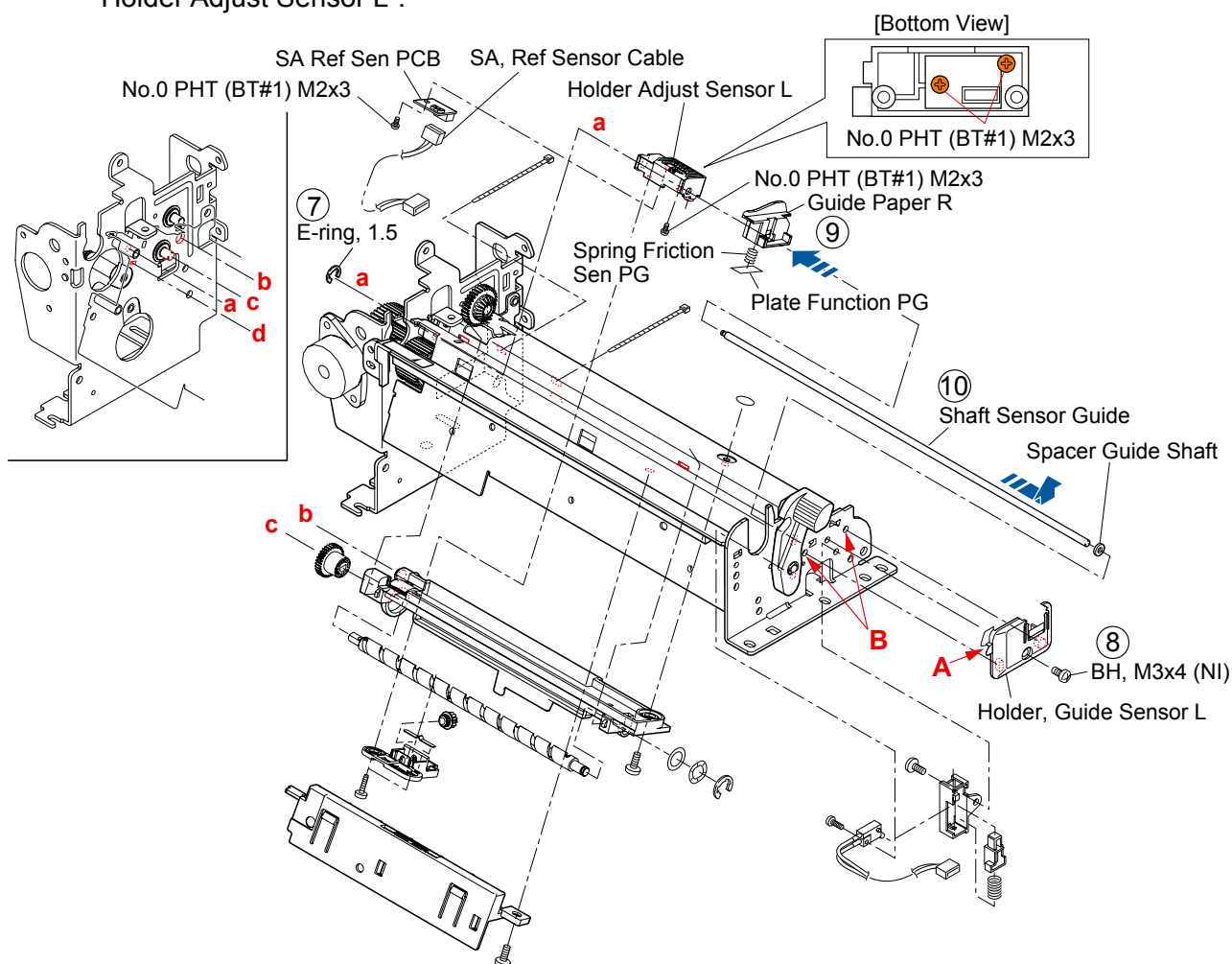
Notes on reassembling:

• When the "SA Ref Sen PCB" is replaced with new one, <u>perform the sensor adjustment.</u> Refer to "3-7-1 Transparent/Reflective Sensor Position Adjustment".

• Assemble the "Shaft Sensor Guide" (⑩) (with the "Holder Adjust Sensor L" Block, "Guide, Paper R" Block and the "Spacer Guide Shaft"), and align its ends in places. Next, assemble the "Holder, Guide Sensor L". (Its groove "**A**" should engage with the frame plate. Also its protrusions should be inserted into the holes "**B**" in the frame.)

- After assembling the "Holder, Guide Sensor L", push the "Spacer Guide Shaft" <u>toward the right side frame</u> as shown on the right.
- After assembling each part, arrange the wires. (Refer to the "***Notes on reassembling***" in above "3-6-20(1) "Carriage Adjust Sensor L" and "SA, Head Up Switch"".)

Spacer Guide Shaft

Holder, Guide Sensor L
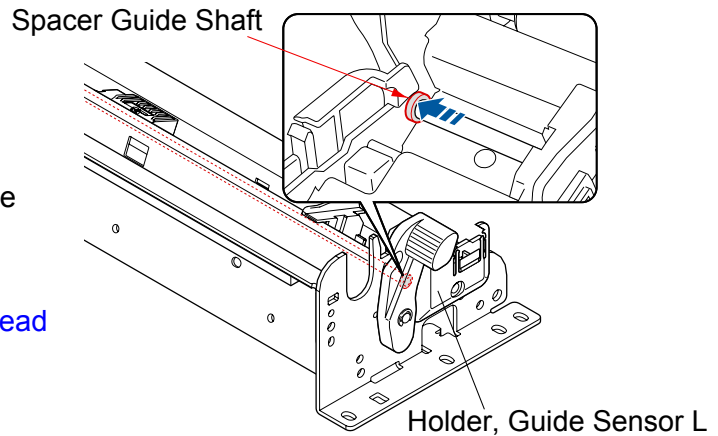
3-6-21. Gears

1. Remove the "Unit, Mechanism". Refer to "3-6-13(1) Unit, Mechanism".
2. Remove the 1 screw (PH (PW), M2x8), and detach the "Support PF Idle Gear".
3. Remove the "Washer, Platen" and pull out the "Gear Reduction PF2. Then, pull out the "Gear Reduction PF1" and "Gear Idle PF".
4. Remove the 2 screws (PH, M3x6) and remove the "Hinge One Way" Block.
5. Disengage the "E-Ring 4" and remove the "Gear One Way Hinge" and "Shaft One Way Hinge" from the "Hinge One Way".

PH (PW), M2x8
Support PF Idle Gear
Washer, Platen
Gear Reduction PF 2
★ FLOIL G-311S
Gear Idle PF
Gear Reduction PF 1
Gear One Way Hinge
Shaft One Way Hinge
Hinge One Way
E-Ring 4
PH, M3x6

D-cut
[When assembling]
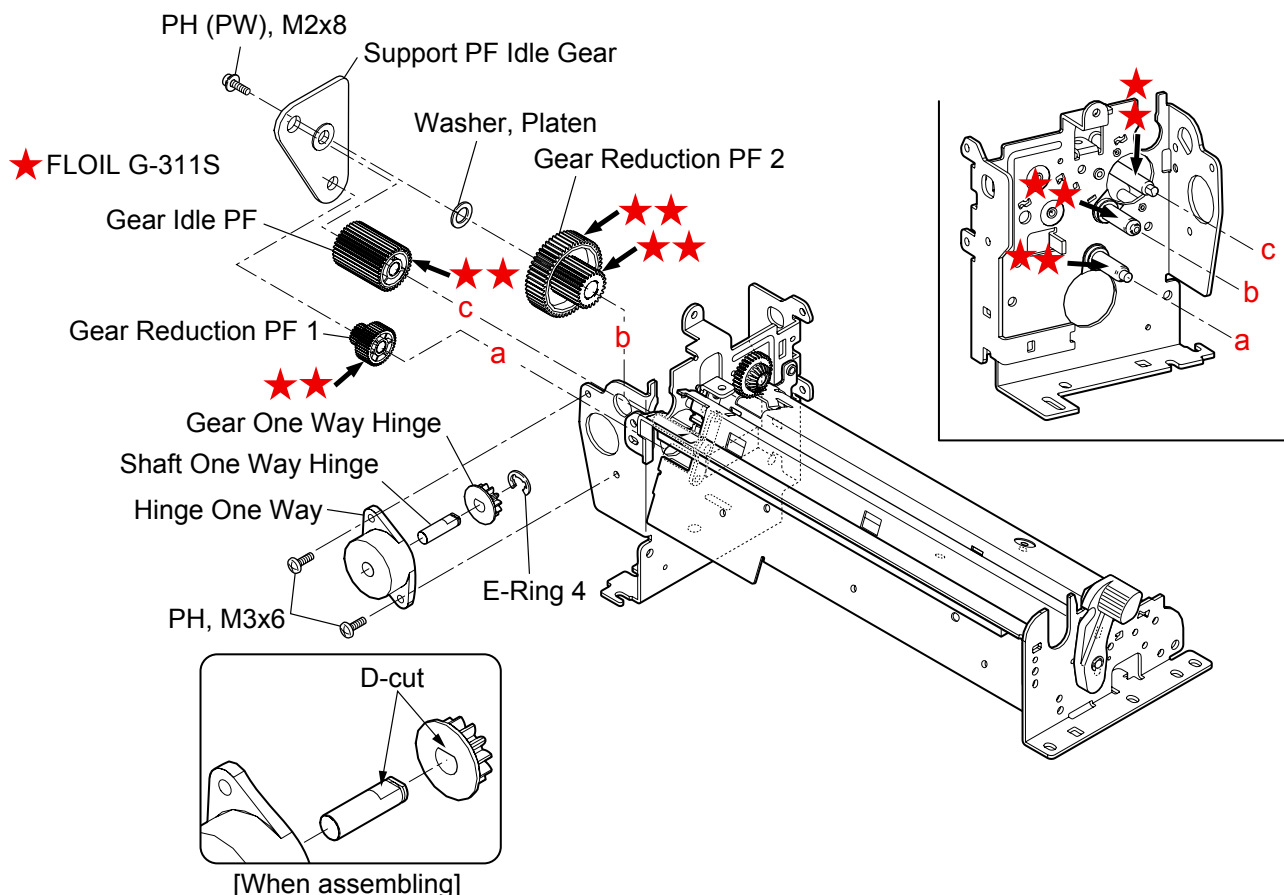
Note on reassembling:

- Apply FLOIL G-311S to each gear shaft (3 shafts) and to each gear surface. (See the mark ★ shown in the figure.)

3-6-22. "Lever Head Lock" and "SA Main Frame R"

1. Remove the "Unit, Mechanism". Refer to "3-6-13(1) Unit, Mechanism".
2. Remove the "SA, PF Motor". "Refer to "3-6-19 SA PF Motor".
3. Remove the "Carriage Adjust Sensor L" and "SA, Head Up Switch". Refer to "3-6-20(1) "Carriage Adjust Sensor L" and "SA, Head Up Switch"".
4. Remove the 4 screws (BH, M3x4 (NI)) and detach the "SA Main Frame R" Block.
5. Disengage the "E-Ring, 2.5", and remove the "Lever Head Lock" and "Spring Head Lock" from the "SA Main Frame R".
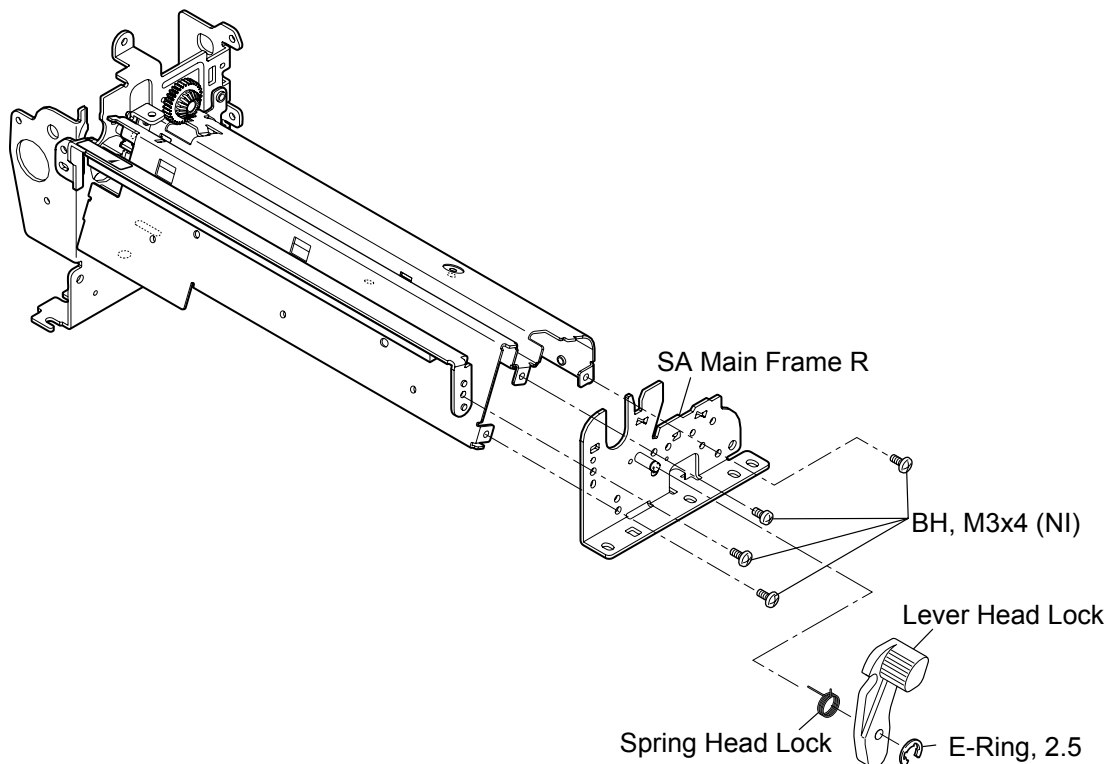
Note on reassembling:

• When assembling the "Lever Head Lock", hook the "Spring Head Lock" as shown below. (Shorter end is inserted into the groove of the "Lever Head Lock" and the longer end into the frame hole.)
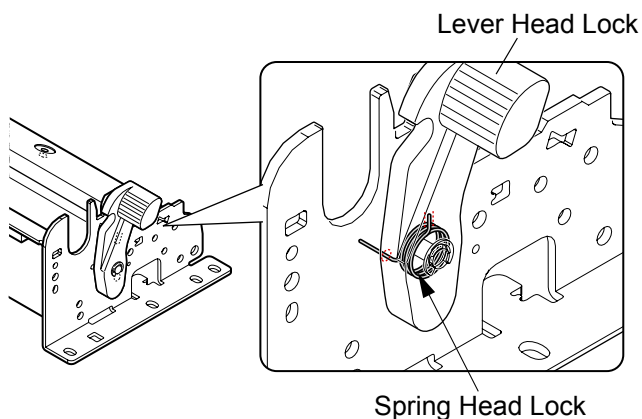
3-6-23. "Frame Main", "SA Main Frame L" and "Plate Peel Guide"

1. Remove the "Unit, Mechanism". Refer to "3-6-13(1) Unit, Mechanism".
2. Remove the "Unit, Sensor U". Refer to "3-6-15 Unit, Sensor U".
3. Remove the "Unit, Head". Refer to "3-6-17 Unit, Head".
4. Remove the "SA, PF Motor". "Refer to "3-6-19 SA PF Motor".
5. Remove the "Carriage Adjust Sensor L" "SA, Head Up Switch" and "SA Ref Sen PCB". Refer to "3-6-20 "Carriage Adjust Sensor L", "SA, Head Up Switch" and "SA Ref Sen PCB"".
6. Remove the gears. Refer to "3-6-21 Gears".
7. Remove the "SA Main Frame R". Refer to "3-6-22 "Lever Head Lock" and "SA Main Frame R"".
8. Remove the 3 screws (BH, M3x4 (NI)) and detach the "Frame Main".
9. Pull out the "Gear Bevel Joint Lead Screw".
10. Remove the 1 screw (BH, M3x4 (NI)) and remove the "Plate Peel Guide" Block from the "SA2 Main Frame L".
11. Peel off the "Label Edge Mark" from the "Plate Peel Guide".
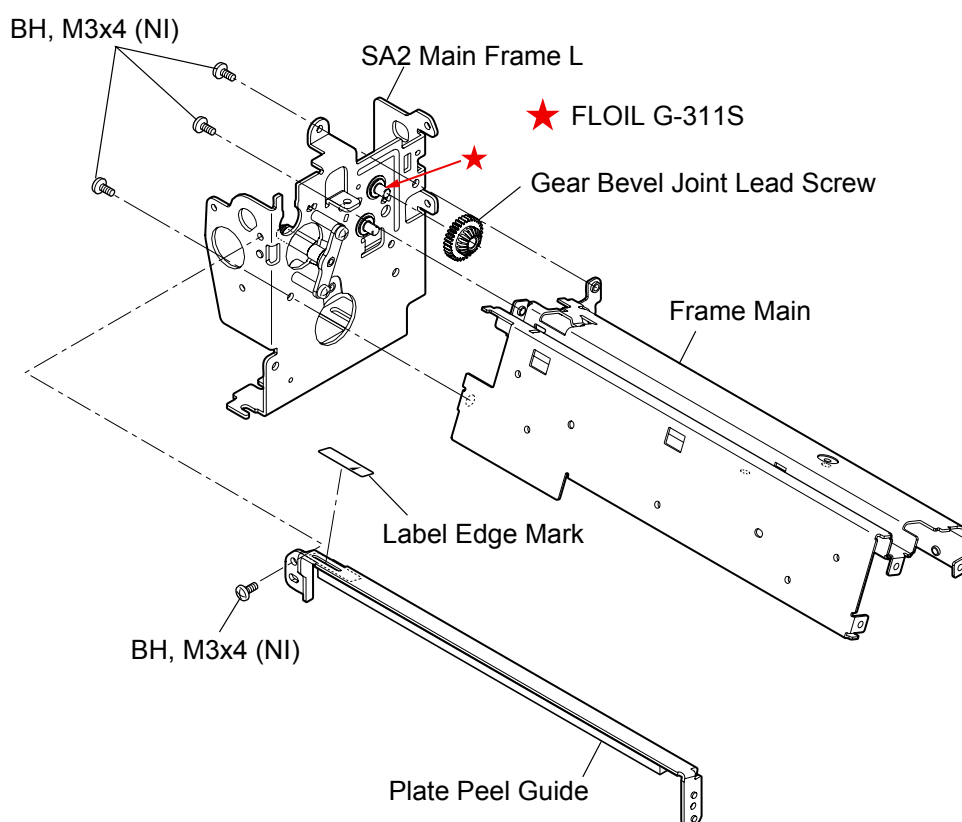
Notes on reassembling:

- Apply FLOIL G-311S to the gear shaft. (See the mark★ shown in the figure.)
- Stick the "Label Edge Mark" as shown on the right. Pay attention to the direction of the Mark. Then, align the right edge of the "Label Edge Mark" with the slit "A" and stick the "Label Edge Mark" onto the "Plate Peel Guide" so that it covers in the slit "A".
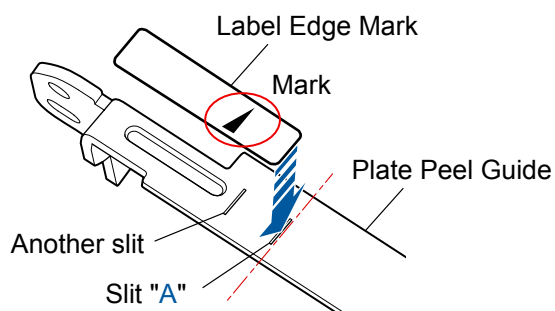
3-6-24. Disassembling the "Roll Paper Shaft"

1. Remove the 2 screws (BHT (#2), M3x6 (NI)) and detach the "Shaft Paper".
2. Remove the "Slider PNE", "Lever PNE" and "Spring PNE" from the "Cover Shaft Paper".
    NOTE: To remove the "Lever PNE", pull it out from the "Slider PNE".
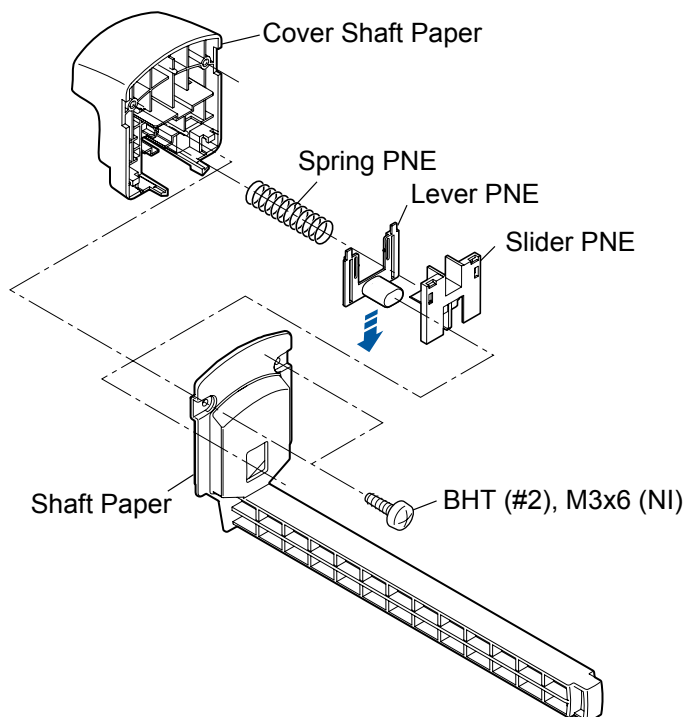
Notes on reassembling:

*   Apply FLOIL G-311S to the convex parts (2 places) of the "Lever PNE. (See the mark ★ shown in the figure.)
*   Insert the "Lever PNE" into the "Slider PNE" as shown below.
*   Insert the end of the "Spring PNE" ("**A**") into "**A'** " of the "Slider PNE". Also, insert the projection "**B**" into the slit "**B'** " as shown below.
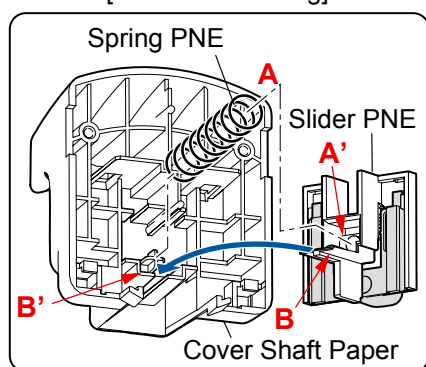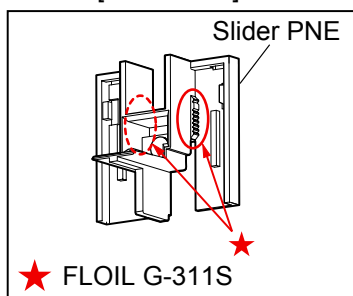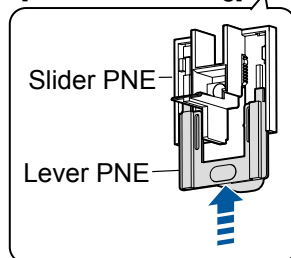
3-7. Adjustments

3-7-1. Transparent/Reflective Sensor Position Adjustment

When you replace one of the following parts, perform both sensor position adjustment and sensor sensitivity adjustment.

• SA, Main PCB
• SA TRA Sen PCB
• SA Ref Sen PCB

(1) Sensor position adjustment (factory mode)

After entering Factory mode, adjust the following submenu items:

• Through Sensor Position
• Reflect Sensor Position

For details, refer to "2-3-2-(3-3)-(a) Factory mode menu table".

(2) Sensor sensitivity adjustment (maintenance mode)

In this adjustment, since the printer has not a display, PC is used instead.

All operations will be done with the keys on the printer's control panel.

Communication between the printer and a PC is made through the serial port.

(2-1) Preparation

Before starting adjustment, prepare the following items:

• Media (both label paper and tag) (recommended media or media you use)
• RS-232C serial cable
• PC which is installed Terminal software such as HyperTerminal and TeraTerm.
   Windows normally comes with the HyperTerminal. If the software is not installed, you
   need to install it.
* Windows® is a registered trademark of Microsoft Corporation in the United States
   and/or other countries.

Setting on the PC side:

Make the following settings on the PC beforehand:

1. Connect the RS-232C serial cable between the printer and the PC.
2. On the PC, start the Terminal software.
3 Set the transmission conditions on the Terminal software so that they are identical to
   those on the printer side.

   Default values of the printer:

   • Transmission speed (baud rate): 9,600 bps
   • Data length: 8 bits
   • Stop bit: 1 bit
   • Protocol: XON/XOFF

Key operation on the printer:
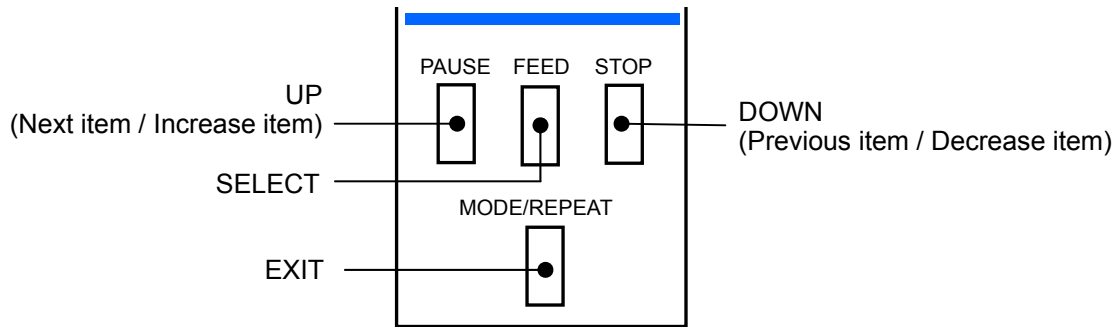
(2-2) Adjustment procedures

⚠ **Caution**

- **DO NOT adjust for other menus not explained here. They are for factory setup use and changing them will cause the printer to be defective.**

⚠
- **Do not turn OFF the power of the printer until you finish the adjustment. If it is turned OFF, you need to repeat the adjustment from the beginning.**
- **The value adjusted here is retained until you change it with the same procedure. Even if you perform initialization in the "user menu setup mode", it is not initialized.**

---

1. Turn on the PC and run the Terminal software.
2. While pressing and holding the **[MODE]**, **[FEED]** and **[STOP]** key, turn on the power. (**[MODE] + [FEED] + [STOP] + [POWER]**)
3. The following initial maintenance screen will appear on the PC.

```
*Factory
   Setup

Up:PAUSE Select:FEED Down:STOP Exit:MODE
Settings Terminal mode to VT100
```

[Transparent sensor sensitivity adjustment, Media: Label paper]
4. Press the **[FEED]** key to select the transparent sensor menu ("Ini Thru Sensor").

```
Ini Thru
   Sensor

Up:PAUSE Select:FEED Down:STOP Exit:MODE
Settings Terminal mode to VT100
```

5. Peel off the label from liner (base) and set the liner part to the printer. Be sure that the normal adjustments for printing are correctly made.
   • Media sensor menu: "See Through"
   • Sensor positioning for the liner

6. Press the **[FEED]** key to enter the transparent sensor adjustment mode.

```
Ini Thru
Exec./No

Up:PAUSE Select:FEED Down:STOP Exit:MODE
Settings Terminal mode to VT100
```

7.Press the **[PAUSE]** key to move the cursor to "Exec.".

```
Ini Thru
Exec./No

Up:PAUSE Select:FEED Down:STOP Exit:MODE
Settings Terminal mode to VT100
```

8. Press the **[FEED]** key to perform adjustment.
   Liner is automatically fed little by little and adjustment is performed.
   During adjustment, the following screen appears.

```
Now !!
Excuting

Up:PAUSE Select:FEED Down:STOP Exit:MODE
Settings Terminal mode to VT100
```

When adjustment is successful, "Finished DAC XXX" is displayed.

```
Finished
DAC  143

Up:PAUSE Select:FEED Down:STOP Exit:MODE
Settings Terminal mode to VT100
```

*The value "143" is one of samples.

9. Press **any key** on the control panel to store the adjusted value.
   <u>Proceed to step 10</u> to perform reflective sensor adjustment.

[When adjustment failed]

When adjustment failed, "Cannot Setup" is displayed.

1) Press any key on the control panel to return to the screen in step 4.
2) Check the mechanical sensor positions, current Media sensor menu setting, label paper, etc. and try again.

```
Cannot
Setup

Up:PAUSE Select:FEED Down:STOP Exit:MODE
Settings Terminal mode to VT100
```

[Reflective sensor sensitivity adjustment, Media: Tag]

10. Press the [PAUSE] key to select the reflective sensor menu.
    "Ini Refl Sensor" screen will appear.

```
Ini Thru
  Sensor

Up:PAUSE Select:FEED Down:STOP Exit:MODE
Settings Terminal mode to VT100
```

⇩ **[PAUSE]** key

```
Ini Refl
  Sensor

Up:PAUSE Select:FEED Down:STOP Exit:MODE
Settings Terminal mode to VT100
```

11. Press the [FEED] key to enter the reflective sensor menu.

```
Reflect
Exec./No

Up:PAUSE Select:FEED Down:STOP Exit:MODE
Settings Terminal mode to VT100
```

12. Set tag with black marks, but avoid placing the black mark part on the reflective sensor.
    If you use continuous tag, set it to the printer.
    Be sure that the normal adjustments for printing are correctly made.
    • Media sensor menu: "Reflect"/"None" (for continuous paper)
    • Sensor positioning:
    The bottom sensor should meet the black mark position.
    (However, avoid putting the black mark on the sensor.)

Black mark
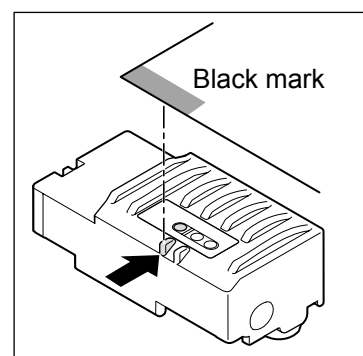
13. Press the **[PAUSE]** key to move the cursor to "Exec.".
14. Press the **[FEED]** key to perform adjustment.

    Tag is automatically fed little by little and adjustment is performed.

    During adjustment, "Now!! Executing" appears.

    When adjustment is successful, "Finished DAC XXX" is displayed.

```
Finished
DAC  168

Up:PAUSE Select:FEED Down:STOP Exit:MODE
Settings Terminal mode to VT100
```

    *The value "168" is one of samples.
15. Press **any key** on the control panel to store the adjusted value.

    Then, the screen returns to the one in step 10 and "Ini Refl Sensor" is displayed.
16. Turn OFF the power to terminate the adjustment.

3-7-2. Ribbon Slant Elimination Adjustment

NOTE: The general procedure how to remove ribbon wrinkles is explained in "Removing Ribbon Wrinkles" on page 3-62.

(1) Ribbon slant elimination adjustment

As you turn the Ribbon Left-Right Balance Adjustment Knob (Front), the knob side (right side) of the "SA, Ribbon Tension Shaft F" moves back and forth with the eccentric mechanism. In the same way, when you turn the Ribbon Left-Right Balance Adjustment Knob (Rear), the knob side (right side) of the "SA, Ribbon Tension Shaft R" moves up and down. With this eccentric mechanism, ribbon running can be adjusted.

TIP: The adjustment on the front side is more effective than that on the rear side.
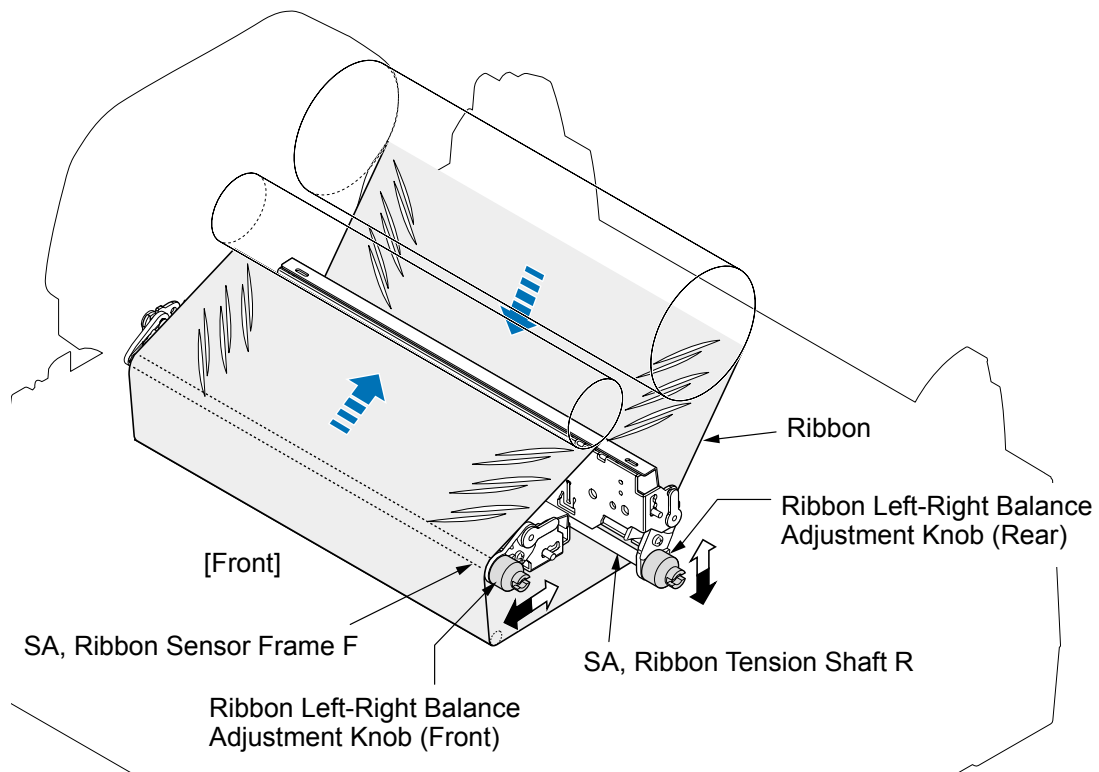
(1-1) Ribbon slant elimination adjustment (FRONT)

This front side adjustment is required in the following cases:
 • Ribbon slant occurs, resulting in ribbon wrinkle.
 • "Unit, Ribbon Sensor F" is replaced or reassembled.

1. Turn the Ribbon Left-Right Balance Adjustment Knobs (Front) to the center of the scale.
2. Turn the Ribbon Left-Right Balance Adjustment Knob (Rear) to the center of the scale.

Ribbon Left-Right Balance
Adjustment Knob (Front)

Ribbon

Ribbon Left-Right Balance
Adjustment Knob (Rear)
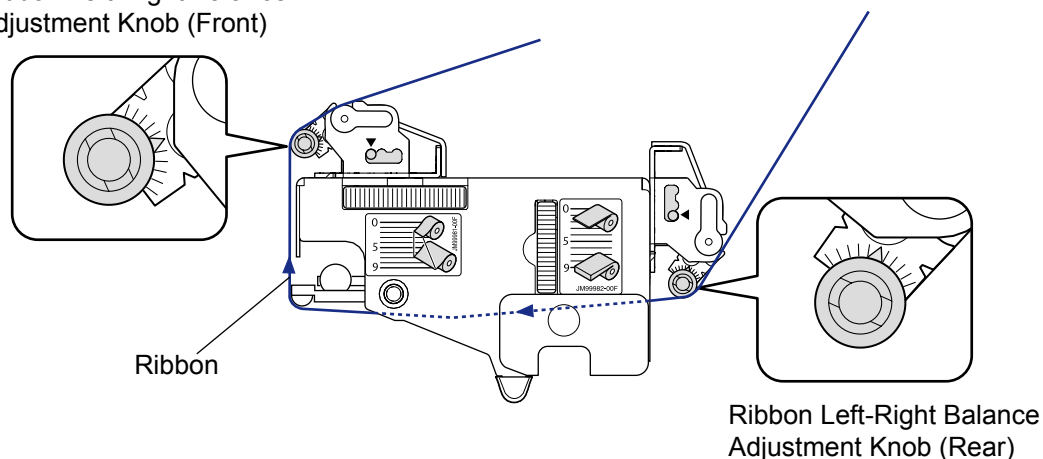
3. Turn the Ribbon Left-Right Balance Adjustment Knob (Front) to remove ribbon wrinkle.
4. If ribbon slant is not removed yet, proceed to the next item, (1-2).

(1-2) Ribbon slant elimination adjustment (REAR)

This rear side adjustment is required in the following cases:
 • Ribbon slant occurs, resulting in ribbon wrinkle.
 • "Unit, Ribbon Sensor R" is replaced or reassembled.

1. Turn the Ribbon Left-Right Balance Adjustment Knob (Rear) and remove ribbon wrinkle.
2. If ribbon slant is not removed, repeat from the above item, (1-1).

Removing Ribbon Wrinkles

The following explains the general procedure for removing ribbon wrinkles.

Adjusting points:
• Ribbon tension
• Ribbon Left-Right Balance Adjustment Knob (Front) - Ribbon slant
• Ribbon Left-Right Balance Adjustment Knob (Rear) - Ribbon slant
• "Shaft, Ribbon Guide" (a part of the "SA, Head") - Ribbon slant

How to check ribbon wrinkles:
• Visual check

Adjustment procedure:
First, adjust the ribbon tension and then the ribbon paths (front/rear) to remove ribbon wrinkles.

(1) Ribbon slant elimination adjustment
Ribbon is fed from the supply side and taken up on the take-up side via the "SA, Ribbon Tension Shaft R" and the "SA, Ribbon Tension Shaft F". (See the figure on the next page.)

1. Adjust the Ribbon Left-Right Balance Adjustment Knob (Front) and then the Ribbon Left-Right Balance Adjustment Knob (Rear) to remove ribbon wrinkle.
    Refer to "3-7-2(1) Ribbon slant elimination adjustment".

(2-1) Visual check and adjustment
Checking the ribbon surface visually is a good way to see whether the ribbon wrinkles or not. You can find wrinkles by the reflected light on the ribbon surface. Check both take-up side and supply sides of ribbon. (See the figure on the next page to find the places where wrinkles may appear.)
**NOTE:** For removing wrinkles, <u>front side adjustment is more effective than the rear side one</u>.

1. Perform test print in self print mode. (Refer to "2-3-2-(2-1) Self print mode".)
2. Visually check the take-up side for ribbon wrinkles.
    Since ribbon is taken up stronger on the shorter ribbon path side, wrinkles appear on the longer path side. During printing the self print patterns, check wrinkles and correct the ribbon travel as follows:
    • If wrinkles are found on the left side ("**a**" in the figure), turn the Ribbon Left-Right Balance Adjustment Knob (Front) clockwise.
    • If wrinkles are found on the right side ("**a'** " in the figure), turn the knob counterclockwise.
    • If wrinkles are found at around center, find the side (either front or rear) and turn the knob accordingly.
3. Visually check on the supply side for ribbon wrinkles.
    Since ribbon is pulled stronger on the shorter ribbon path side, wrinkles appear on the longer path side.
    During printing the self print patterns, check wrinkles and correct ribbon travel as follow:
    • If wrinkles are found on the left side ("**b**" in the figure), turn the Ribbon Left-Right Balance Adjustment Knob (Rear) counterclockwise.

- If wrinkles are found on the right side ("**b'** " in the figure), turn the knob clockwise.
- If wrinkles are found at around center, find the side (either front or rear) and turn the knob accordingly.

4. Be sure that the adjusted positions in Steps 2 and 3 are at around the center of the scales, respectively.

[Front]

Ribbon

Ribbon Left-Right Balance Adjustment Knob (Front)

SA, Ribbon Sensor Frame F

SA, Ribbon Tension Shaft R

Ribbon Left-Right Balance Adjustment Knob (Rear)
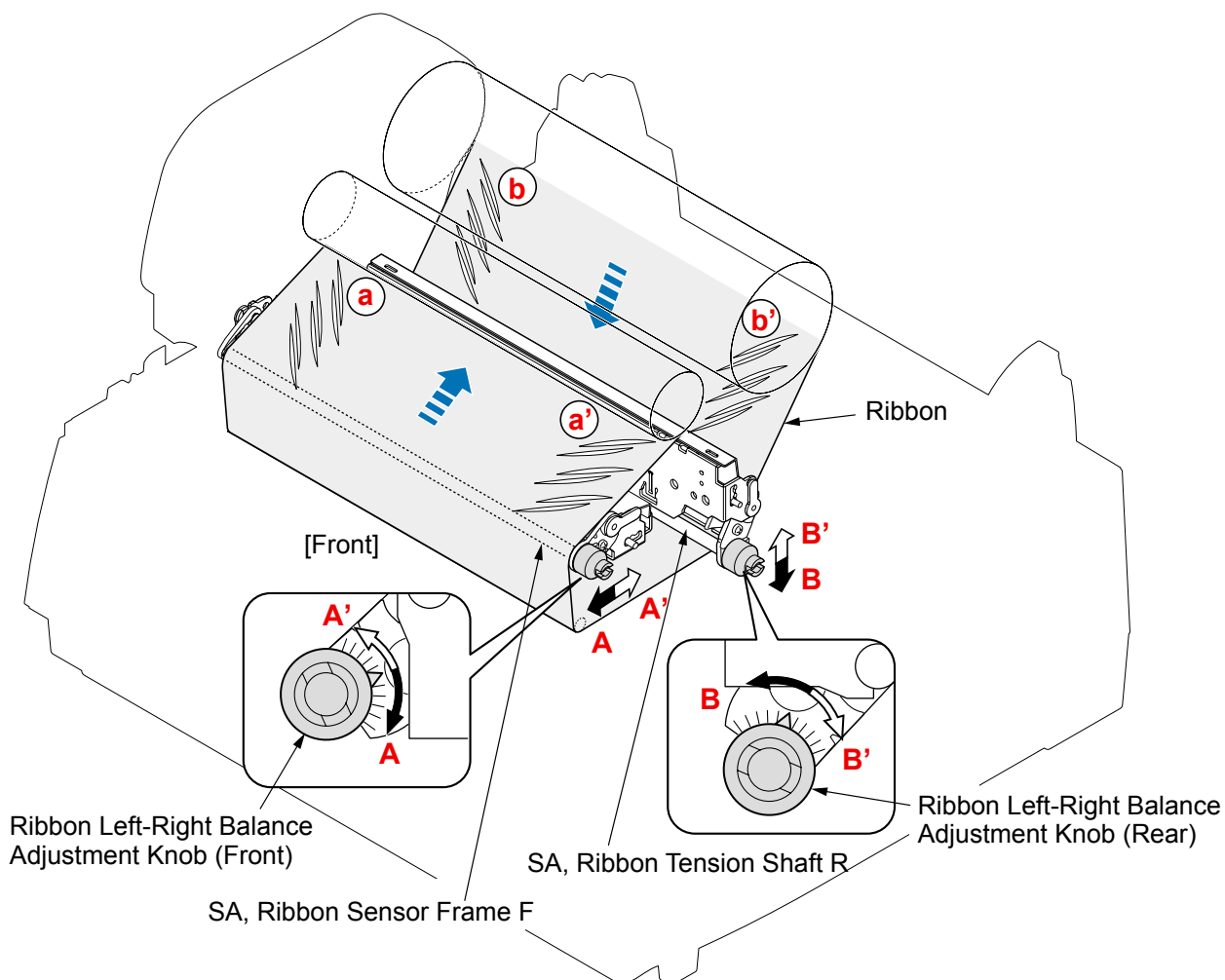
CHAPTER 4
TROUBLESHOOTING
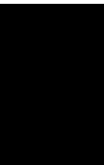
CHAPTER 4   TROUBLESHOOTING

TABLE OF CONTENTS

4-1. Error Message and Corrective Actions

When an error occurs, the error condition will be displayed on the operation panel. The LEDs on the control panel blink to tell you the error contents.

In case of error (except for abnormal head/motor temperature), the printer enters off line and the PRINT LED goes out.

Causes/Corrective Actions	PRINT LED	CONDITION LED	ERROR LED
Head open • Close the head.	OFF	OFF	(ON/OFF blinking)
Media end • Add media.	OFF	OFF	(ON steady)
Media out (Media not detected) • Incorrect sensor positioning: Correct the sensor position to match the sensor position with the label/tag's black mark. • Incorrect Media mode menu: Match the Media mode menu (e.g. SeeThrough) and media to be used. • Incorrect sensor adjustment against media to be used: Enter sensor adjustment mode ([PAUSE]+[FEED]+[STOP]+[POWER]), and perform sensor adjustment.	OFF	(ON steady)	(ON steady)
Abnormal ribbon feed	OFF	(ON/OFF blinking)	(ON/OFF blinking)
Ribbon out (Ribbon end)	OFF	(ON/OFF blinking)	(ON/OFF blinking)
Abnormal temperature raise of "SA, Head" • Printing will temporarily stop. Wait until the "SA, Head" gets cool.	(ON steady)	(ON steady)	OFF
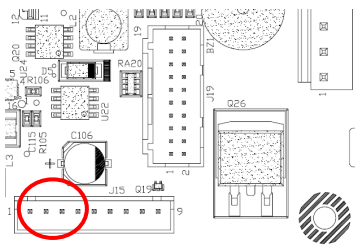
Causes/Corrective Actions	PRINT LED	CONDITION LED	ERROR LED
Abnormal temperature raise of "SA PF Motor" or "SA Ribbon Motor F" • Printing will temporarily stop. Wait until the motor gets cool.	ON / OFF (turns ON)	ON / OFF (turns OFF)	OFF
Abnormal temperature raise of auto cutter (Optional) • Printing will temporarily stop. Wait until the auto cutter gets cool.	ON / OFF (turns ON)	ON / OFF (turns OFF)	OFF
Abnormal head resistance • Due to defective thermal element: Printing quality will degrade.	OFF	ON / OFF (turns ON)	ON / OFF (turns OFF)
Communication error • Reception buffer overrun • Parity or framing error • Transmission buffer overflow	OFF	ON / OFF (turns ON)	OFF
System error • Overheat of "SA PF Motor", "SA Ribbon Motor F", "SA, Head" or the cutter motor (option) • Overcurrent of "SA PF Motor"	OFF	ON / OFF (blinking)	ON / OFF (ON)
Auto cutter abnormality (Optional) • Jamming, etc.	OFF	OFF	ON / OFF (ON)
Paper near end * By default, issuing a paper near end alarm is disabled. To enable it, change the Paper Near End Alarm submenu under the "PageSetup" main menu from Off to On.	ON	OFF	ON / OFF (turns ON)

4-2. Troubleshooting
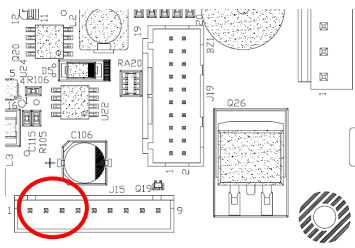
The following tables show possible remedies for various symptoms that might occur. Symptoms are given in the left column, and the corresponding remedies in the right column.

Notes: 1. When parts are replaced, refer to Chapter 3 "Disassembly and Maintenance".

2. Connectors (J . . .) given in the column of checks and remedies are connected with the "SA, Main PCB". For the location of each connector, refer to "4-2-7 Connector Location".
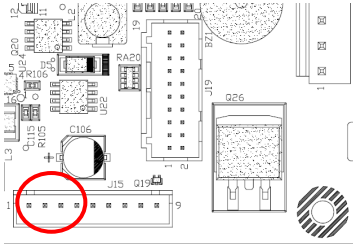
4-2-1. Problems in Powering Up the Printer

Symptoms	Checks	Remedies
No power to the printer	1. Check voltage on the input power line. Acceptable supply voltage: 85V to 132V AC for 120V version 185V to 264V AC for 220V version	1. Supply correct voltage.
	2. Is the connector of "SA, Power SW Cable" firmly connected to the "Unit, Power Supply"?	2. Connect it firmly.
	3. Is the "SA, Power Cable" firmly connected between the "Unit, Power Supply" and the "SA, Main PCB" (J15)?	3. Connect it firmly.
	4. Is +24V supplied to the pins 1-4 of J15 on the "SA, Main PCB"? (GND: Pins 5-8) [Bottom right of the "SA, Main PCB"]	4. If no DC voltage is supplied, replace the "Unit, Power Supply". **NOTE:** If the "Unit, Power Supply" is NOT connected to the "SA, Main PCB", the output will be +9V. This is not a trouble. If both PCBs are connected, +24V will be correctly output.
	5. Is the "Cable, Opepane" connected between the "SA, Main PCB" (J4) and the "SA, Opepane PCB" firmly? If it is not connect or is inserted upside down, no LED lights even if you turned ON the power.	5. Connect it firmly.
	6. Failure in the power supply circuit.	6. Replace the "Unit, Power Supply".
	7. Failure in the control circuit.	7. Replace the "SA, Main PCB".
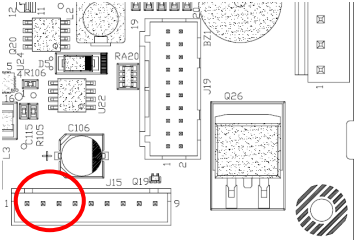
4-2-2. Media-feed Problems

Symptoms	Checks	Remedies
No media feed	1. Are the connectors J6 and J7 (for "SA PF Motor") connected firmly?	1. Connect them firmly.
	2. Is the connector J15 (for "Unit, Power Supply") connected firmly?	2. Connect it firmly.
	3. Is +24V supplied to the pins 1-4 of J15 on the "SA, Main PCB"? (GND: Pins 5-8) [Bottom right of the "SA, Main PCB"]	3. Replace the "Unit, Power Supply".
	4. Failure in the control circuit or in the paper feed motor driver.	4. Replace the "SA, Main PCB".
	5. Does the "SA PF Motor" work?	5. Replace the "SA PF Motor".
Irregular media feed pitch	1. Are the connectors J6 and J7 (for "SA PF Motor") connected firmly?	1. Connect them firmly.
	2. Is dust or other foreign matter on the "SA2_Platen"?	2. Remove dust or foreign matter.
	3. Does the media feed mechanism work smoothly?	3. Check, clean and lubricate mechanical parts. **Note:** Refer to Chap. 3 "Disassembly and Maintenance".
	4. Failure in the control circuit or in the paper feed motor driver.	4. Replace the "SA, Main PCB".
Media jamming	1. Is media set correctly?	1. Set media correctly.
	2. Is the media being used within manufacturer's specifications?	2. Use media within manufacturer's specifications.
	3. Check the media feed mechanism and media path for dust or other foreign matter.	3. Remove dust or foreign matter.

4-2-3. **Problems in Printing**

Symptoms	Checks	Remedies
No print	1. Is the head block securely closed?	1. Close the head block correctly.
	2. Is the "SA, Head" over heated? In this case, PRINT LED and CONDITION LED simultaneously blink.	2. Wait until the "SA, Head" gets cool. Printing will resume automatically.
	3. Is the "SA PF Motor" over heated? In this case, PRINT LED and CONDITION LED blink alternatively.	3. Wait until the "SA PF Motor" gets cool. Printing will resume automatically.
	4. Is "SA Ribbon Motor F" over heated? In this case, PRINT LED and CONDITION LED blink alternatively.	4. Wait until the "SA Ribbon Motor F" gets cool. Printing will resume automatically.
	5. Is the interface cable firmly connected between the printer and the host?	5. Connect it firmly.
	6. Are the "SA, Head Signal Cable" and "SA, Head Power Cable" connected between the "SA, Head" and the "SA, Main PCB" (J3 and J5)?	6. Connect them firmly.
	7. Does the transparent/reflective sensor detect presence of media?	7. To check, see "Sensor Problems".
	8. Is +24V supplied to the pins 1-4 of J15 on the "SA, Main PCB"? (GND: Pins 5-8) [Bottom right of the "SA, Main PCB"]	8. Replace the "Unit, Power Supply".
	9. "SA, Head" is broken.	9. Replace the "SA, Head".
	10. Failure in the head driver circuit.	10. Replace the "SA, Head".
	11. Failure in the control circuit.	11. Replace the "SA, Main PCB".
	12. For thermal transfer printing: Is ribbon set correctly?	12. Set the ribbon correctly. (Be sure that the inked surface faces the media.)
	13. For thermal printing: Is thermal paper used?	13. Use thermal paper.

Symptoms	Checks	Remedies
Poor printing	1. The "SA, Head" is dirty.	1. Clean it with a head cleaner.
	2. Thickness adjustment is improper.	2. Adjust the media thickness adjustment dial to suit to the media thickness being used.
	3. Is +24V supplied to the pins 1-4 of J15 on the "SA, Main PCB"? (GND: Pins 5-8) [Bottom right of the "SA, Main PCB"]	3. Replace the "Unit, Power Supply".
Uneven print density	1. Head balance is improper. Uneven print density may appear either on the right side or the left side.	1. Adjust the media width adjustment dial to suit to the media width being used.

4-2-4. Ribbon-feed Problem

Symptoms	Checks	Remedies
Ribbon is not fed at all, or is not fed correctly.	1. Is the ribbon correctly inserted into the ribbon holders?	1. Insert the ribbon correctly.
	2. Is the ribbon path correct?	2. Install the ribbon correctly.
	3. Is the cable connected between J19 on the "SA, Main PCB" and J102 on the "SA, Ribbon PCB" firmly?	3. Connect it firmly.
	4. Are the cables connected between J101/J107 on the "SA, Ribbon PCB" and the "SA Ribbon Motor F" firmly?	4. Connect them firmly.
	5. Is the cable connected between J103 on the "SA, Ribbon PCB" and the "SA Ribbon Motor R" firmly?	5. Connect it firmly.
	(to be continued)	

Symptoms	Checks	Remedies
Ribbon is not fed at all, or is not fed correctly.	6. Does the ribbon cooling fan work correctly for cooling the ribbon motors? If not, check if the cable of the "SA, Fan" is firmly connected to the "SA, Ribbon PCB" (J106). **Note:** The fan does not turn all the time. It turns when the temperature of the "SA Ribbon Motor F" on the front side exceeds a certain value.	6. Connect the cable firmly.
	7. Do the ribbon sensors on the front and rear sides work correctly? See "4-2-5 Sensor Problems".	7. Replace the "SA, Ribbon Sensor" on the front/rear side.
	8. Do the ribbon drive gears work correctly?	8. Replace a defective ribbon gear.
	9. Does the "SA Ribbon Motor F"/"SA Ribbon Motor R" work correctly?	9. Replace the "SA Ribbon Motor F"/ "SA Ribbon Motor R".
	10. Failure in the ribbon motor drive circuit.	10. Replace the "SA, Ribbon PCB".
	11. Failure in the ribbon motor control circuit.	11. Replace the "SA, Main PCB".
Ribbon slants.	1. Is the ribbon correctly inserted into the ribbon holders?	1. Insert the ribbon correctly.
	2. Is the ribbon path correct?	2. Install the ribbon correctly.
	3. Is the ribbon slant elimination adjustment made?	3. Adjust it according to "3-7-2 Ribbon Slant Elimination Adjustment".

4-2-5. Sensor Problems

Symptoms	Checks	Remedies
Head block is closed, but head open error is indicated by LEDs. (Head up switch problem)	1. Is the connector of "SA, Head Up Switch" firmly connected to the "SA, Main PCB" (J11)? 2. Does the head up switch activating mechanism push the switch lever and the switch turn ON properly? 3. Failure in the control circuit.	1. Connect it firmly. 2. Replace the "SA, Head Up Switch". 3. Replace the "SA, Main PCB".
Ribbon tension is not correctly controlled. (Front/rear side of "SA, Ribbon Sensor" problem)	1. Is the connector of "SA, Ribbon Sensor" on the front side firmly connected to the "SA, Ribbon PCB" (J104)? 2. Is the connector of "SA, Ribbon Sensor" on the rear side firmly connected to the "SA, Ribbon PCB" (J105)? 3. Does the "SA, Ribbon Sensor" on the front/rear side work correctly? 4. Failure in the control circuit.	1. Connect it firmly. 2. Connect it firmly. 3. Replace the "SA, Ribbon Sensor" on the front/rear side. 4. Replace the "SA, Ribbon PCB" or the "SA, Main PCB".
Ribbon end is not correctly detected. (Rear side of "SA, Ribbon Sensor" problem)	1. Is the connector of the "SA, Ribbon Sensor" on the rear side firmly connected to the "SA, Ribbon PCB" (J105)? 2. Does the "SA, Ribbon Sensor" on the rear side work correctly? 3. Failure in the control circuit.	1. Connect it firmly. 2. Replace the "SA, Ribbon Sensor" on the rear side. 3. Replace the "SA, Ribbon PCB" or the "SA, Main PCB".

Symptoms	Checks	Remedies
Label on liner or notch of tag is not detected. (Transparent sensor problem) or Paper end is not detected.	1. Is the Media Sensor menu setting correct?	1. Set it to "See Through".
	2. Does the marker of Transparent Sensor match with that of the bottom sensor (Reflective Sensor)?	2. They match each other unless they are reassembled incorrectly. Correct them. **Note:** Refer to Chap. 3 "Disassembly and Maintenance".
	3. Is the sensor adjustment performed against media to be used?	3. Perform the sensor adjustment. See "2-3-2 (1-1) Sensor Adjustment mode".
	4. Is the "FFC, TRA Sensor" (flexible cable) firmly connected between the "SA TRA Sen PCB" and the "SA, Main PCB" (J9)?	4. Connect it firmly.
	5. Is the "FFC, TRA Sensor" (flexible cable) inserted correctly (not upside down) on the "SA, Main PCB" (J9)?	5. Insert it in the correct direction.
	6. Is the "SA, Ref Sensor Cable" firmly connected between the "SA Ref Sen PCB" and the "SA, Main PCB" (J8)?	6. Connect it firmly.
	7. Is dust on the LEDs of the Reflective Sensor?	7. Clean the LEDs to remove dust.
	8. Failure in the Transparent Sensor or the Reflective Sensor.	8. Replace the "SA TRA Sen PCB" or the "SA Ref Sen PCB".
	9. Failure in the control circuit.	9. Replace the "SA, Main PCB".
Black mark on tag is not detected. (Reflective sensor problem) or Paper end is not detected.	1. Is the Media Sensor menu correct?	1. Set it to "Reflect".
	2. Does the Reflective Sensor match with the black mark?	2. Match them.
	3. Is the sensor adjustment is performed against media to be used?	3. Perform the sensor adjustment. See "2-3-2 (1-1) Sensor Adjustment mode".
	4. Is the "SA, Ref Sensor Cable" firmly connected between the "SA Ref Sen PCB" and the "SA, Main PCB" (J8)?	4. Connect it firmly.
	5. Is dust on the LEDs or photo transistor of the Reflective Sensor?	5. Clean the LEDs to remove dust.
	6. Failure in the Reflective Sensor.	6. Replace the "SA Ref Sen PCB".
	7. Failure in the control circuit.	7. Replace the "SA, Main PCB".

Symptoms	Checks	Remedies
Paper near end alarm does not occur for roll paper.	1. Are the following Paper Near End menus set correct in the Menu Settings? Paper Near End Status: ON Paper Near End Alarm: ON (by default, this is set to OFF)	1. Set the Paper Near End menus correctly.
	2. Is the connector of "SA PNE Sensor" firmly connected to the "SA, Main PCB" (J12)?	2. Connect it firmly.
	3. Failure in the PNE Sensor circuit or cable.	3. Replace the "SA PNE Sensor".
	4. Failure in the control circuit.	4. Replace the "SA, Main PCB".

4-2-6. Operation Panel Problems

Symptoms	Checks	Remedies
Nothing is displayed on the LED.	1. Is the "Cable, Opepane" (flexible cable) connected between the "SA, Main PCB" (J4) and the "SA, Opepane PCB" firmly?	1. Connect it firmly.
	2. Is the "Cable, Opepane" (flexible cable) inserted in a wrong direction?	2. Insert it in the correct direction.
	3. Failure in the "SA, Opepane PCB".	3. Replace the "SA, Opepane PCB".
	4. Failure in the control circuit.	4. Replace the "SA, Main PCB".
No key works.	1. Is the "Cable, Opepane" (flexible cable) connected between the "SA, Main PCB" (J4) and the "SA, Opepane PCB" (CN301) firmly?	1. Connect it firmly.
	2. Is the "Cable, Opepane" (flexible cable) inserted in a wrong direction?	2. Insert it in the correct direction.
	3. Failure in the "SA, Opepane PCB".	3. Replace the "SA, Opepane PCB".
	4. Failure in the control circuit.	4. Replace the "SA, Main PCB".

4-2-7. Connector Location

[SA, Main PCB]

To SA PNE Sensor

To SA Ref Sen PCB

To SA, Head Up Switch

To SA TRA Sen PCB

To SA PF Motor
(for thermistor)

J12   (J10)   (J13)

To SA PF Motor

SA, Main PCB

J8   J9

J11

RS232C   J16

J202

(J14)

J17

J7   J5

J6

To SA, Head
(for signals)

To SA, Head
(for power)

J3

USB2.0   J18

J201

J19

To SA, Ribbon PCB

SA, Relay PCB

J15

To optional I/F PCB (Option)

To SA, Opepane PCB

To Unit, Power Supply

[SA, Ribbon PCB]

To SA Ribbon Motor F

To SA, Fan

To SA Ribbon Motor F
(for thermistor)

J106

J101   J107

To SA Ribbon Motor R

J103

SA, Ribbon PCB

To SA, Ribbon Sensor
(on the rear side)

J105

J104

To SA, Ribbon Sensor
(on the front side)

J102

To SA, Main PCB

CHAPTER 5
PARTS LISTS

CHAPTER 5   PARTS LIST

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CL-S6621

Recommended Spare Parts List

Revision Up List		
Sheet No.	Rev. No.	Date
1/1	0	Mar. 12, 2013

Item No.	Location	Part No.	Part Name	Q'ty/ Unit	Maint. Class		Remarks	@
					Worn	Casual		
1	2-12	PPS00058-0	SA, Main PCB (200ENG)	1		○		
2	2-23-1	PWT20005-0	Unit, Power Supply (100V)	1		○	For CSA	
3	2-23-2	PWT20006-0	Unit, Power Supply (200V)	1		○	For CSE/China	
4	3-5	PPK90007-0	SA2 Platen	1	○			
5	4-12	PPM80005-0	SA, Head	1	○			
6	5-12	JM66730-1	SA Ref Sen PCB	1		○		
7	5-28	PF80003-0	SA PF Motor	1	○			
8	6-9	JM66725-0	SA TRA Sen PCB	1		○		
9	8-2	PPS00059-0	SA, Ribbon PCB	1		○		
10	8-3	PWF80014-0	SA Ribbon Motor R	1	○			
11	8-5	PPF80004-0	SA Ribbon Motor F	1	○			
12	816	PPS90020-0	SA, Ribbon Sensor	2		○		
13								
14								
15								
16								
17								
18								
19								
20								

CL-S6621

Drawing No. 1

Parts List & Location for General Assembly

Revision Up List		
Sheet No.	Rev. No.	Date
1/2	0	Mar. 12, 2013
2/2	0	Mar. 12, 2013

DRAWING NO. 1   General Assembly (Rev. 0)
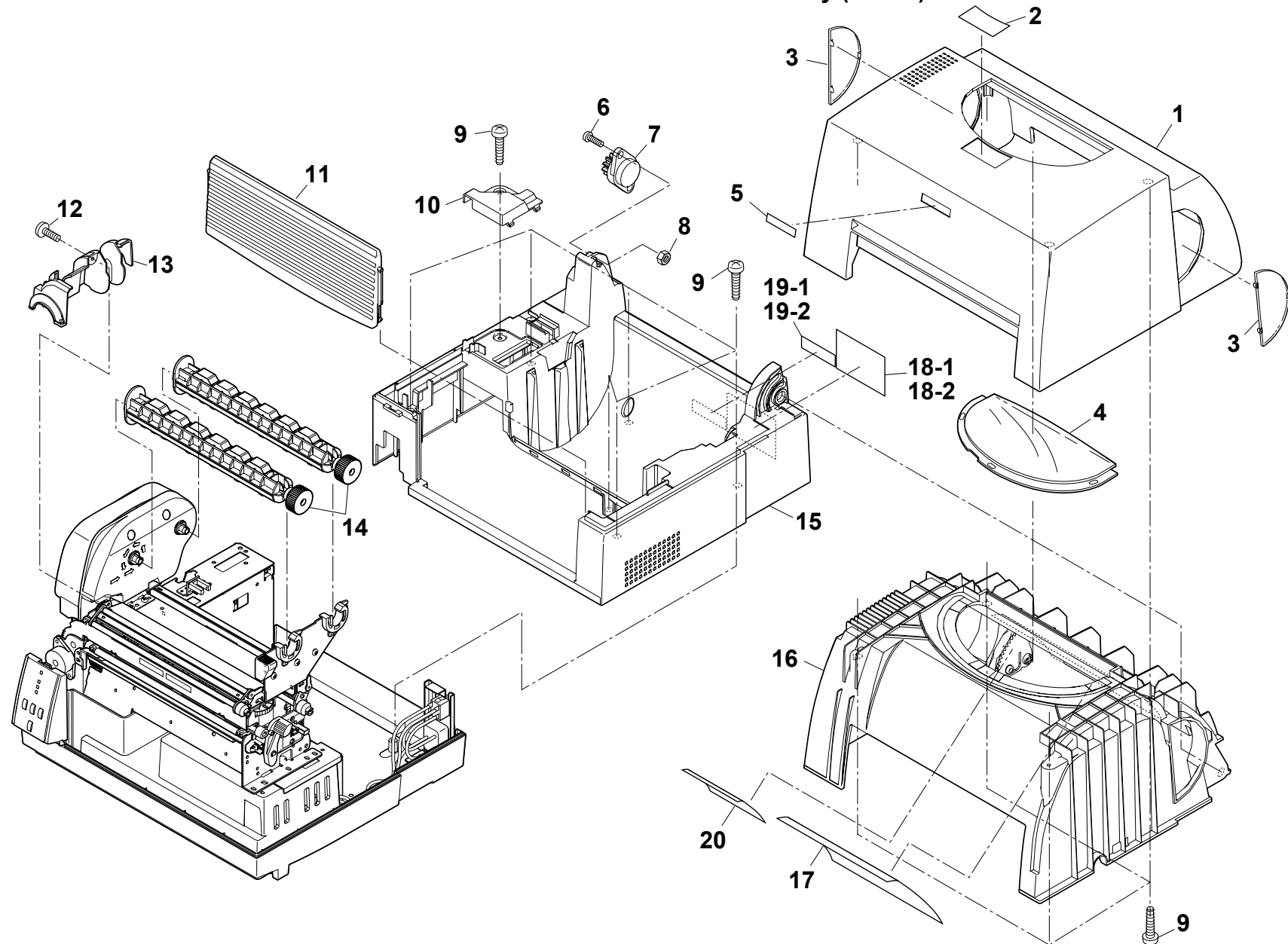
PARTS LIST for CL-S6621   TITLE: General Assembly   Sheet No. 1/2

Drawing No. 1   Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
1-1	Cover Top (BK)	PBA00062-0	1		
-2	Label CL-S6621	PRX30043-0	1		
-3	Window Side	JM56224-1	2		
-4	Window	JM56209-0	1		
-5	Logo Citizen L	PAX30002-0	1		
-6	Screw, PH, M5.0x15 (NI)	E00150-150WF	1		
-7	Damper Cover	PWG40004-0	1		
-8	Nut, (#3), M5 (NI)	E40250-000WF	1		
-9	Screw, PHT (PT2T), M3.0x14	E10130-140F	11		
-10	Cover Connector (BK)	PBA00064-0	1		
-11	Cover Front (BK)	PBA00065-0	1		
-12	Screw, BH, M3.0x4 (NI)	E00530-040WF	1		
-13	Cover Cable	PBA00058-0	1		
-14	SA, Ribbon Holder	PPM40001-0	2		
-15	Case U (BK)	PBA00061-0	1		
-16	Support Top Cover (BK)	PBA00063-0	1		
-17	Label, Main Guidance	PRX30059-0	1		
-18-1	Label Rating JS12 US	PRX00020-0	1	For CSA	
-18-2	Label Rating JS12 EU	PRX00021-0	1	For CSE/China/Korea	
-19-1	Label Caution North EU	PRX10006-0	1	For CSE	

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
1-19-2	Label Caution (China)	FB99985-0	1	For China	
-20	Label Caution Cover Open	PRX10014-0	1		

CL-S6621

Drawing No. 2

Parts List & Location for Unit, Base

Revision Up List		
Sheet No.	Rev. No.	Date
1/3	0	Mar. 12, 2013
2/3	0	Mar. 12, 2013
3/3	0	Mar. 12, 2013

DRAWING NO. 2　Unit, Base (Rev. 0)
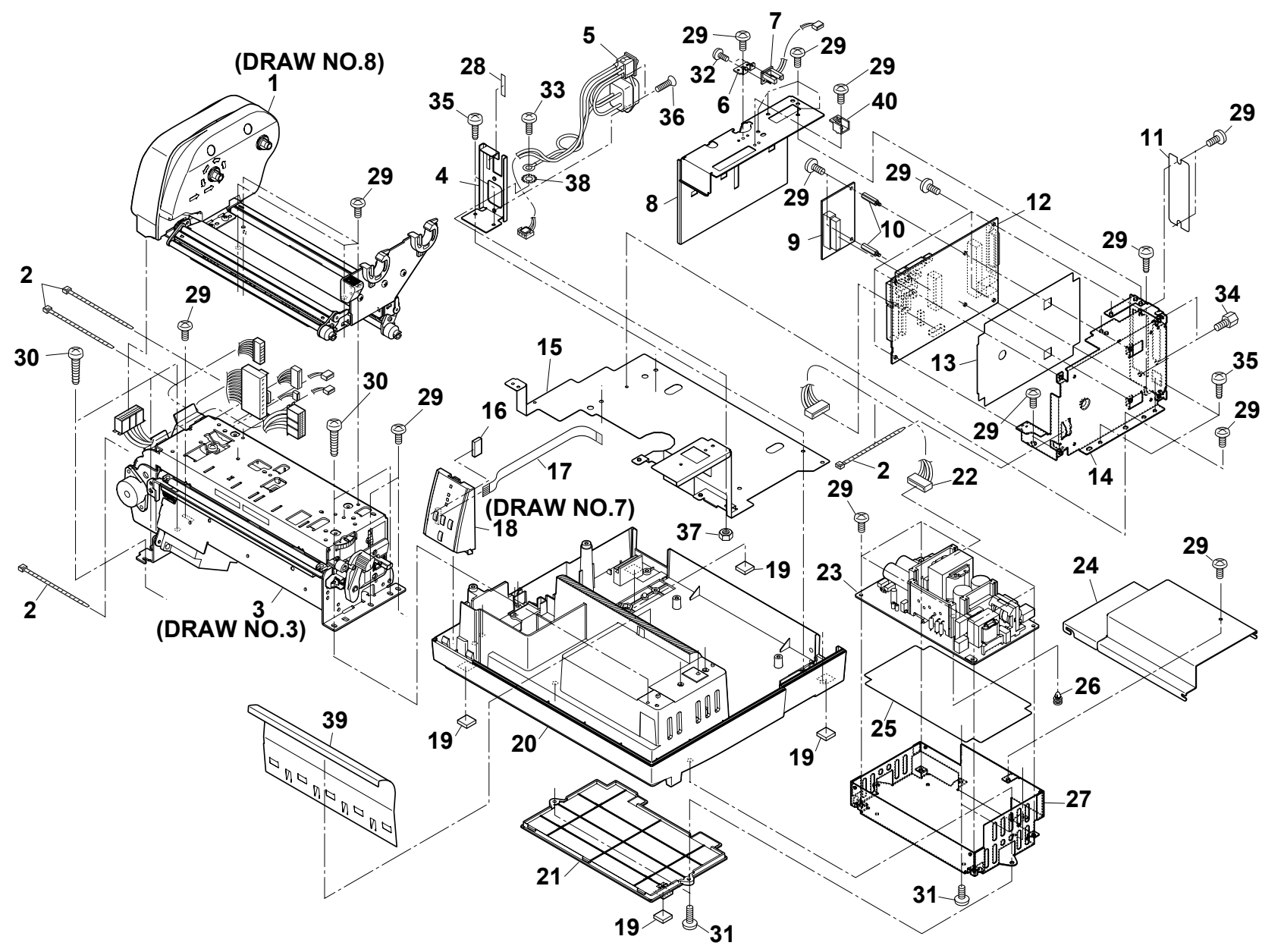
CL-S6621

PARTS LIST for CL-S6621   TITLE: Unit, Base   Sheet No. 1/3

Drawing No. 2   Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
2-1	Unit, Ribbon	-	1	(Ref. Drawing No. 8)	
-2	Wire Tie	C6701-003#	4		
-3	Unit, Mechanism	-	1	(Ref. Drawing No. 3)	
-4	Plate Inlet	PAC70027-0	1		
-5	SA, Power SW Cable	PPS30023-0	1		
-6	Holder PNE	PAE00026-0	1		
-7	SA PNE Sensor	PPS90021-0	1		
-8	Cover Main PCB	PAC70029-0	1		
-9	SA, Relay PCB	PPS00060-0	1		
-10	Spacer (M3 H20mm)	PCH40003-0	2		
-11	Plate, I/F Cover	TA54107-1	1		
-12	SA, Main PCB (200ENG)	PPS00058-0	1		
-13	Sheet Insulation Main PCB	PRC00008-0	1		
-14	Plate Main PCB	PAC70028-0	1		
-15	Plate Earth	PAC70030-0	1		
-16	Cushion, Ope-Pane Cable	JM59903-0	1		
-17	Cable, Opepane	JM67900-1	1		
-18	Unit, Control Panel	-	1	(Ref. Drawing No. 7)	
-19	Leg Case L R	JM59901-0	4		
-20	Case L (BK)	PBA00056-0	1		

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
2-21	Case Power PCB	PBA00057-0	1		
-22	SA Power Cable	PPS30019-0	1		
-23-1	Unit, Power Supply (100V)	PWT20005-0	1	For CSA	
-23-2	Unit, Power Supply (200V)	PWT20006-0	1	For CSE/China/Korea	
-24	Cover Power PCB	PAC70032-0	1		
-25	Sheet Insulation Power PCB	PRC00006-0	1		
-26	Spacer (fai3.5 7xL4mm)	PWH10002-0	1		
-27	Plate Power PCB	PAC70031-0	1		
-28-1	Label Inlet Volt (100-120)	PRX30001-0	1	For CSA	
-28-2	Label Inlet Volt (200-240)	PRX30002-0	1	For CSE/China/Korea	
-29	Screw, BH, M3.0x4 (NI)	E00530-040WF	29		
-30	Screw, PHT (PT2T), M3.0x14	E10130-140F	5		
-31	Screw, BH (N), M3.0x6 (NI)	E00530-060WF	4		
-32	Screw, PH, M2.0x4	E00120-040F	2		
-33	Screw, BH, M4.0x5 (NI)	E00540-050WF	1		
-34	Lock Screw (Inch)	C6390-071#	2		
-35	Screw, PHT (#2), M3.0x6	E10130-060F	4		
-36	Screw, FH, M3.0x6	E00230-060F	2		
-37	Nut, (#3), M4	E40140-000F	1		
-38	Washer, Ext.T, 4 (NI)	E50740-000WF	1		

PARTS LIST for CL-S6621 TITLE: Unit, Base Sheet No. 3/3

Drawing No. 2 Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
2-39	Leaf Case U	PAG60010-0	1		
-40	Spacer PNE	PBH40011-0	1		

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Drawing No. 3

Parts List & Location for Unit, Mechanism

Revision Up List		
Sheet No.	Rev. No.	Date
1/1	0	Mar. 12, 2013

DRAWING NO. 3　Unit, Mechanism (Rev. 0)

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4 (DRAW NO.4)

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7-1
7-2
7-3

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2

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16

14
(DRAW NO.5)

15
(DRAW NO.6)
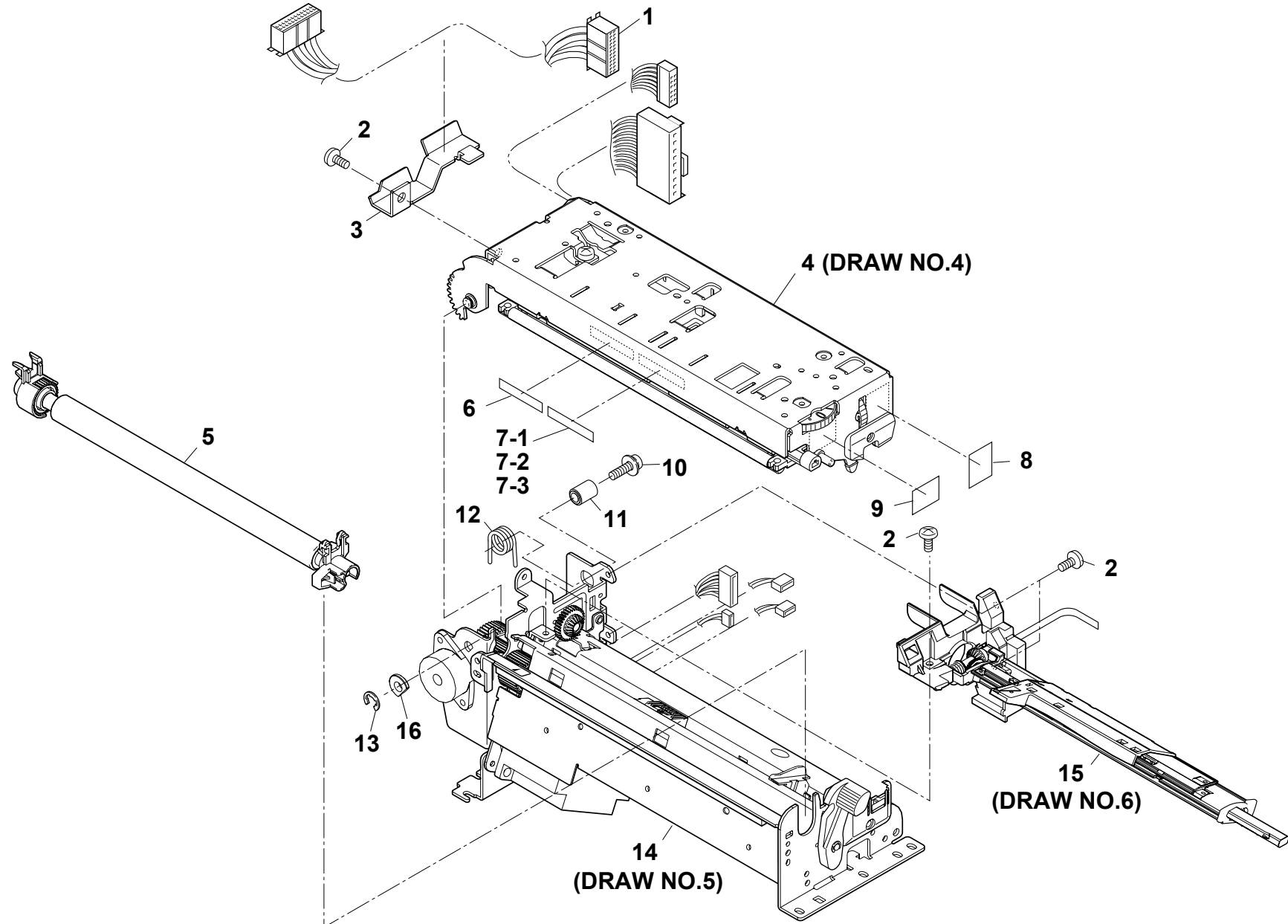
Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
3-1	SA, Ribbon Cable	PPS30018-0	1		
-2	Screw, BH, M3.0x4 (NI)	E00530-040WF	4		
-3	Plate Ribbon Cable Stay	PAE00027-0	1		
-4	Unit, Head	-	1	(Ref. Drawing No. 4)	
-5	SA2 Platen	PPK90007-0	1		
-6	Label 2, Caution, Head (AH50)	AH90935-0	1	For CSA/CSE/Korea	
-7-1	Label 6, Caution, Head	AR99901-0	1	For CSE/Korea	
-7-2	Label 7, Caution, Head	AR99902-0	1	For CSA	
-7-3	Label, Caution Head	AM90901-0	1	For China	
-8	Label, Head Adjust	JM99982-0	1		
-9	Label, Head Balance	JM99981-0	1		
-10	Screw, PH (SW+PW), M4.0x16	E00940-160F	1		
-11	Shaft Head Holder	JM42007-0	1		
-12	Spring Ribbon Unit Dumper	PHG60001-0	1		
-13	E-Ring 4.0	E60340-000F	1		
-14	Unit, PF	-	1	(Ref. Drawing No. 5)	
-15	Unit, Sensor U	-	1	(Ref. Drawing No. 6)	
-16	Bush Head Holder	PCE40003-0	1		

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Drawing No. 4

Parts List & Location for Unit, Head

Revision Up List		
Sheet No.	Rev. No.	Date
1/2	0	Mar. 12, 2013
2/2	0	Mar. 12, 2013

DRAWING NO. 4   Unit, Head (Rev. 0)
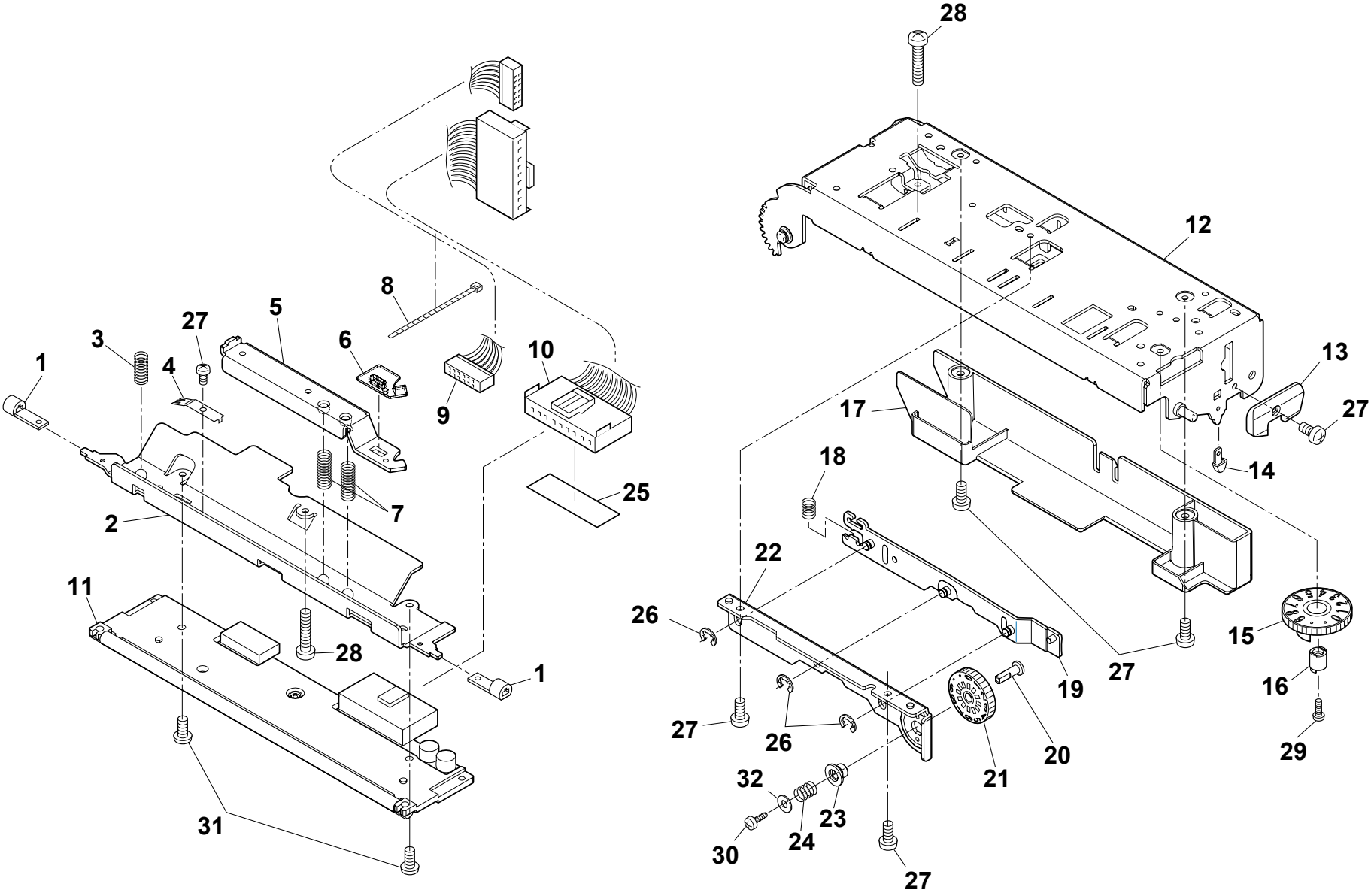
PARTS LIST for CL-S6621   TITLE: Unit, Head-TT   Sheet No. 1/2

                                 Drawing No. 4   Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
4-1	Bushing Head	JM11201-0	2		
-2	Plate Holder Head	PAE00023-0	1		
-3	Spring Head L	PJG60045-0	1		
-4	Plate Head Earth	JM14105-0	1		
-5	Plate Head Balance	PAC70037-0	1		
-6	Spacer Head Balance	PBH40009-0	1		
-7	Spring Head R	PJG60044-0	2		
-8	Wire Tie	C6701-003#	1		
-9	SA, Head Signal Cable	PPS30017-0	1		
-10	SA, Head Power Cable	PPS30016-0	1		
-11	SA, Head	PPM80005-0	1		
-12	SA Cover Frame	PPC60012-0	1		
-13	Holder Guide Sensor U	JM14211-0	1		
-14	Support Pop Up	PBC80029-0	1		
-15	Cam Head Balance	JM19203-0	1		
-16	Pivot Head Balance Cam	JM12201-0	1		
-17	Cover Head Cable	PBC80023-0	1		
-18	Spring Head Holder	PJG60051-0	1		
-19	SA Head Adjust Lever	PPC70005-0	1		
-20	Guide, Head Adjust (Spring)	JM14204-0	1		

Location	Part Name	Part No.	Q'ty/Unit	Remarks	@
4-21	Cam Head Adjust	JM19201-0	1		
-22	Base Head Adjust	PAC70035-0	1		
-23	Bush Head Adjust	PBE40017-0	1		
-24	Spring, Adjust Cam	JM13604-0	1		
-25	Sheet Head Connector P	PRC00010-0	1		
-26	E-Ring 3.0	E60330-000F	3		
-27	Screw, BH, M3.0x4 (NI)	E00530-040WF	6		
-28	Screw, PH, M3.0x10	E00130-100F	2		
-29	Screw, PH, M3.0x6	E00130-060F	1		
-30	Screw, PHT (#2), M2.0x6	E10120-060F	1		
-31	Screw, NO.1, TFH (6-0.7), M3.0x6 (NI)	E04630-060WF	2		
-32	Washer, Plain, 2.6x6.5x0.5	E50126-005F	1		

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Drawing No. 5

Parts List & Location for Unit, PF

Revision Up List		
Sheet No.	Rev. No.	Date
1/3	0	Mar. 12, 2013
2/3	0	Mar. 12, 2013
3/3	0	Mar. 12, 2013

DRAWING NO. 5   Unit, PF (Rev. 0)
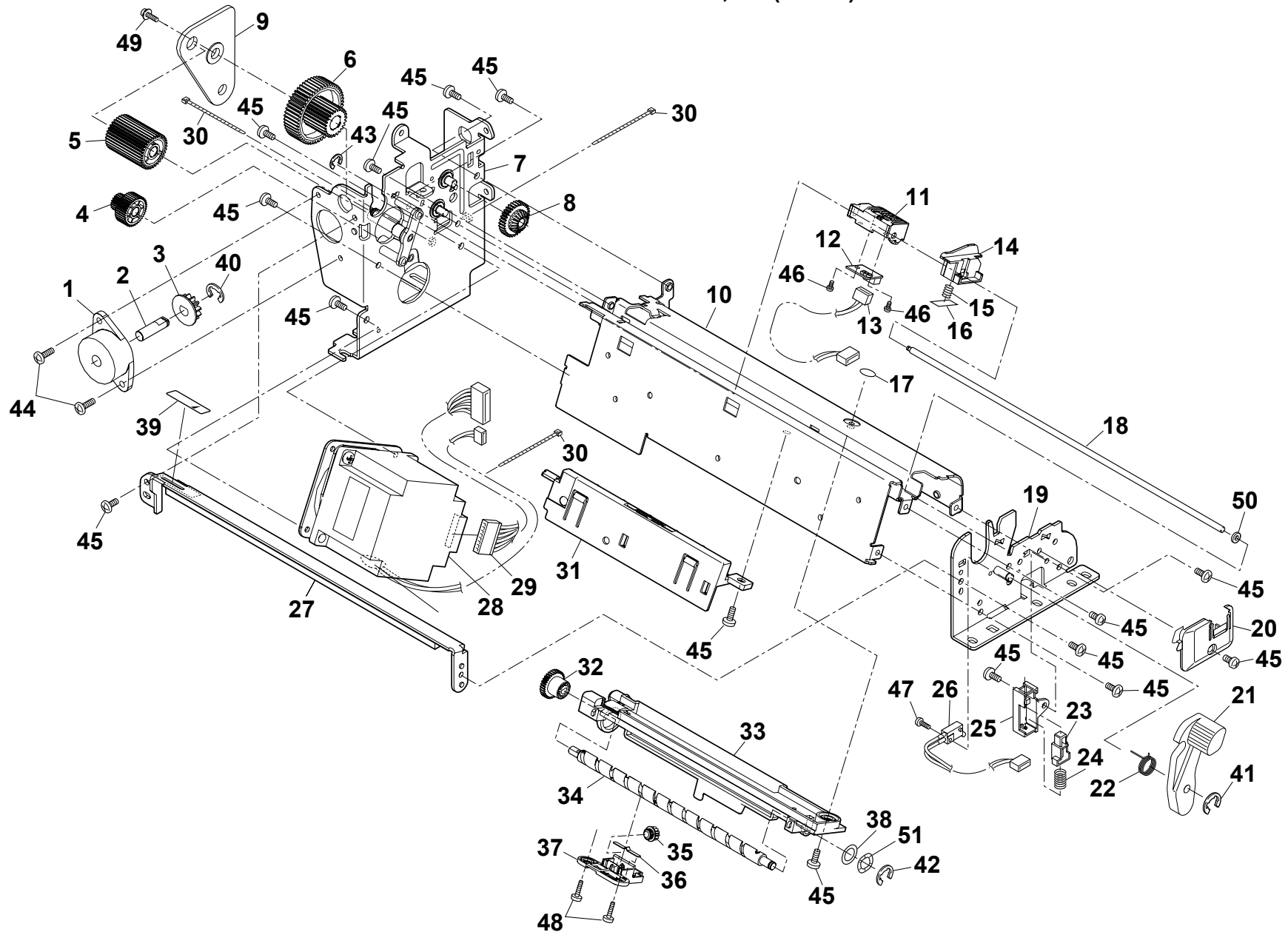
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PARTS LIST for CL-S6621   TITLE: Unit, PF   Sheet No. 1/3

                                 Drawing No. 5   Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
5-1	Hinge One Way	PWG40003-0	1		
-2	Shaft One Way Hinge	PCG80057-0	1		
-3	Gear One Way Hinge	PFF00002-0	1		
-4	Gear Reduction PF 1	PBF00032-0	1		
-5	Gear Idle PF	PBF00034-0	1		
-6	Gear Reduction PF 2	PBF00033-0	1		
-7	SA2 Main Frame L	PPC60020-0	1		
-8	Gear Bevel Joint Lead Screw	PBF00039-0	1		
-9	Support PF Idle Gear	PAE00033-0	1		
-10	Frame Main	PAC60031-0	1		
-11	Holder Adjust Sensor L	PBE00033-0	1		
-12	SA Ref Sen PCB	JM66730-1	1		
-13	SA, Ref Sensor Cable	PPS30022-0	1		
-14	Guide Paper R	PBM30020-0	1		
-15	Spring Friction Sen PG	JM23604-0	1		
-16	Plate Function PG	JM24117-0	1		
-17	Sheet Blind	PRC80005-0	1		
-18	Shaft Sensor Guide	PCG80045-0	1		
-19	SA Main Frame R	PPC60011-0	1		
-20	Holder, Guide Sensor L	JM44207-0	1		

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
5-21	Lever Head Lock	JM44203-0	1		
-22	Spring Head Lock	JM43601-0	1		
-23	Pop Up Cover Frame	PBA80002-0	1		
-24	Spring Pop Up	PJG60052-0	1		
-25	Guide Cover Frame Pop Up	PBA70008-0	1		
-26	SA, Head Up Switch	PPT00007-0	1		
-27	Plate Peel Guide	PAC70034-0	1		
-28	SA PF Motor	PPF80003-0	1		
-29	SA, PF Motor Cable	PPS30021-0	1		
-30	Wire Tie	C6701-003#	3		
-31	Cover Sensor Cable L	PBC80028-0	1		
-32	Gear Lead Screw L	PBF00036-0	1		
-33	Holder Screw L	PBE00034-0	1		
-34	Shaft Lead Screw	PCG80046-0	1		
-35	Pinion Sensor L	PBF00035-0	1		
-36	Leaf Pinion Sensor L	PAG60005-0	1		
-37	Carriage Adjust Sensor L	PBK00003-0	1		
-38	Spacer, CR Shaft	NH19102-0	1		
-39	Label Edge Mark	PRX30058-0	1		
-40	E-Ring 4.0	E60340-000F	1		

PARTS LIST for CL-S6621   TITLE: Unit, PF   Sheet No. 3/3

Drawing No. 5   Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
5-41	E-Ring, 2.5	E60325-000F	1		
-42	E-Ring 3.0	E60330-000F	1		
-43	E-Ring 1.5	E60315-000F	1		
-44	Screw, PH, M3.0x6	E00130-060F	2		
-45	Screw, BH, M3.0x4 (NI)	E00530-040WF	15		
-46	Screw No.0 PHT (Bt#1) M2.0x3	E11920-030F	2		
-47	Screw, No.0, PHT (Bt #3), M1.7x7	E13517-070F	1		
-48	Screw, BHT (PT), M2.0x6	E12820-060WF	2		
-49	Screw, PH (PW), M2.0x8	E00620-080F	1		
-50	Spacer Guide Shaft	PRH40001-0	1		
-51	Wave Washer 4x8xt015	E51440-001SF	1		

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Drawing No. 6

Parts List & Location for Unit, Sensor U

Revision Up List		
Sheet No.	Rev. No.	Date
1/2	0	Mar. 12, 2013
2/2	0	Mar. 12, 2013

DRAWING NO. 6   Unit, Sensor U (Rev. 0)
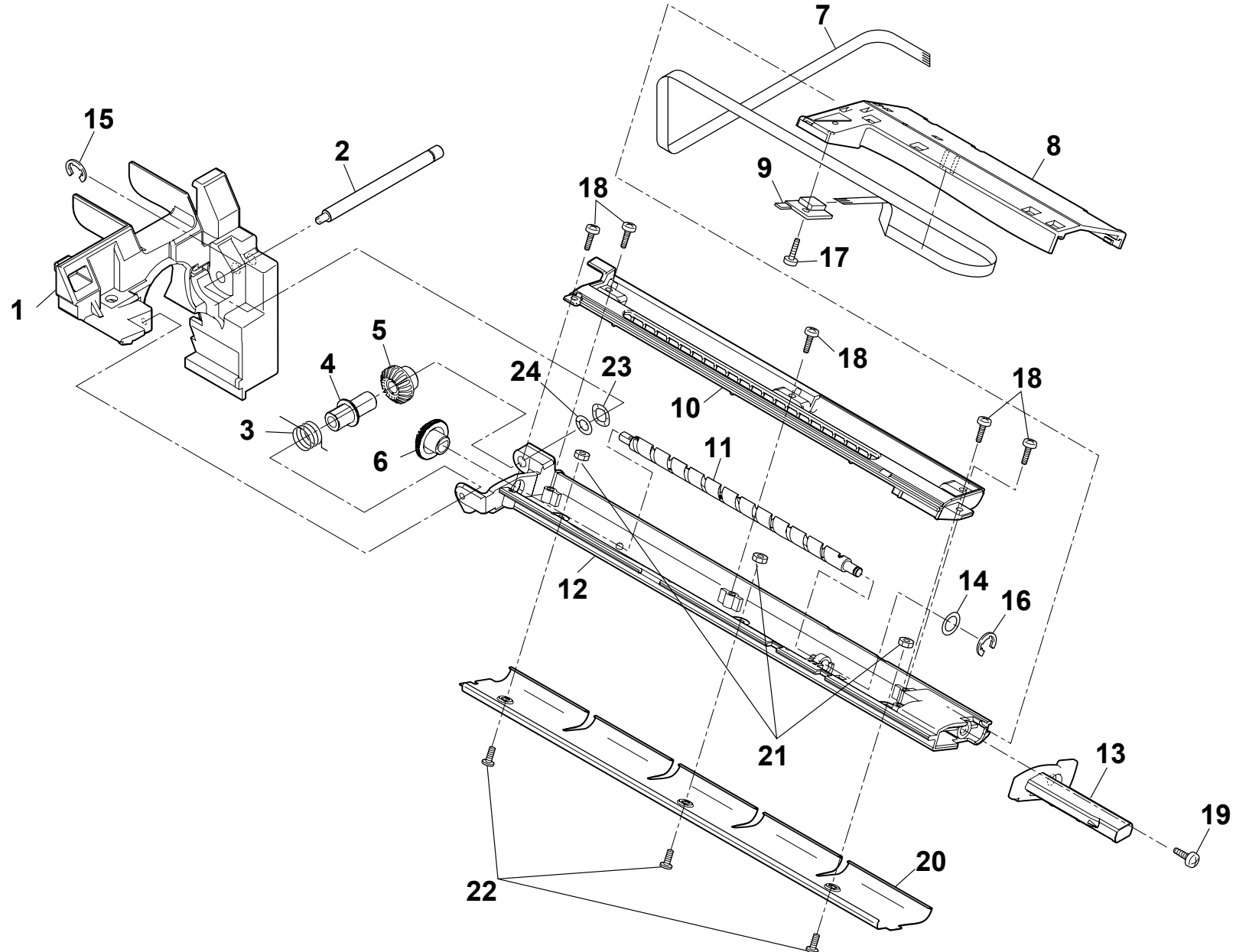
Location	Part Name	Part No.	Q'ty/Unit	Remarks	@
6-1	Guide Paper L	PBM30019-0	1		
-2	Shaft Hinge Guide Paper U	PCG80047-0	1		
-3	Spring Guide Paper U	PJG60041-0	1		
-4	Spacer Hinge Shaft	PBH40008-0	1		
-5	Gear Bevel Idle Sensor U	PBF00037-0	1		
-6	Gear Bevel Lead Screw U	PBF00038-0	1		
-7	FFC, TRA Sensor	PSS40010-0	1		
-8	Holder Adjust Sensor U	PBE00035-0	1		
-9	SA TRA Sen PCB	JM66725-0	1		
-10	Cover Guide Paper U	PBC80022-0	1		
-11	Shaft Lead Screw	PCG80046-0	1		
-12	Guide Paper U	PBM30021-1	1		
-13	Knob Guide Paper U	PBH20006-0	1		
-14	Spacer, CR Shaft	NH19102-0	1		
-15	E-Ring, 2.5	E60325-000F	1		
-16	E-Ring 3.0	E60330-000F	1		
-17	Screw No.0, TFH (PT4-0.5), M2.0x4	E15920-040WF	1		
-18	Screw, BHT (PT), M2.0x6	E12820-060WF	5		
-19	Screw, BHT (#2), M3.0x6 (NI)	E10530-060WF	1		
-20	Leaf Holder Adjust Sensor U	PAG60009-0	1		

PARTS LIST for CL-S6621   TITLE: Unit, Sensor U   Sheet No. 2/2

Drawing No. 6   Rev. No. 0

Location	Part Name	Part No.	Q'ty/Unit	Remarks	@
6-21	Nut, (#3), M2	E40220-00W	3		
-22	Pin Guide Paper U	PCG80079-0	3		
-23	Wave Washer 4x8xt015	E51440-001SF	1		
-24	Polyslider	JN39901-0	1		

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Drawing No. 7

Parts List & Location for Unit, Control Panel

Revision Up List		
Sheet No.	Rev. No.	Date
1/1	0	Mar. 12, 2013

DRAWING NO. 7   Unit, Control Panel (Rev. 0)
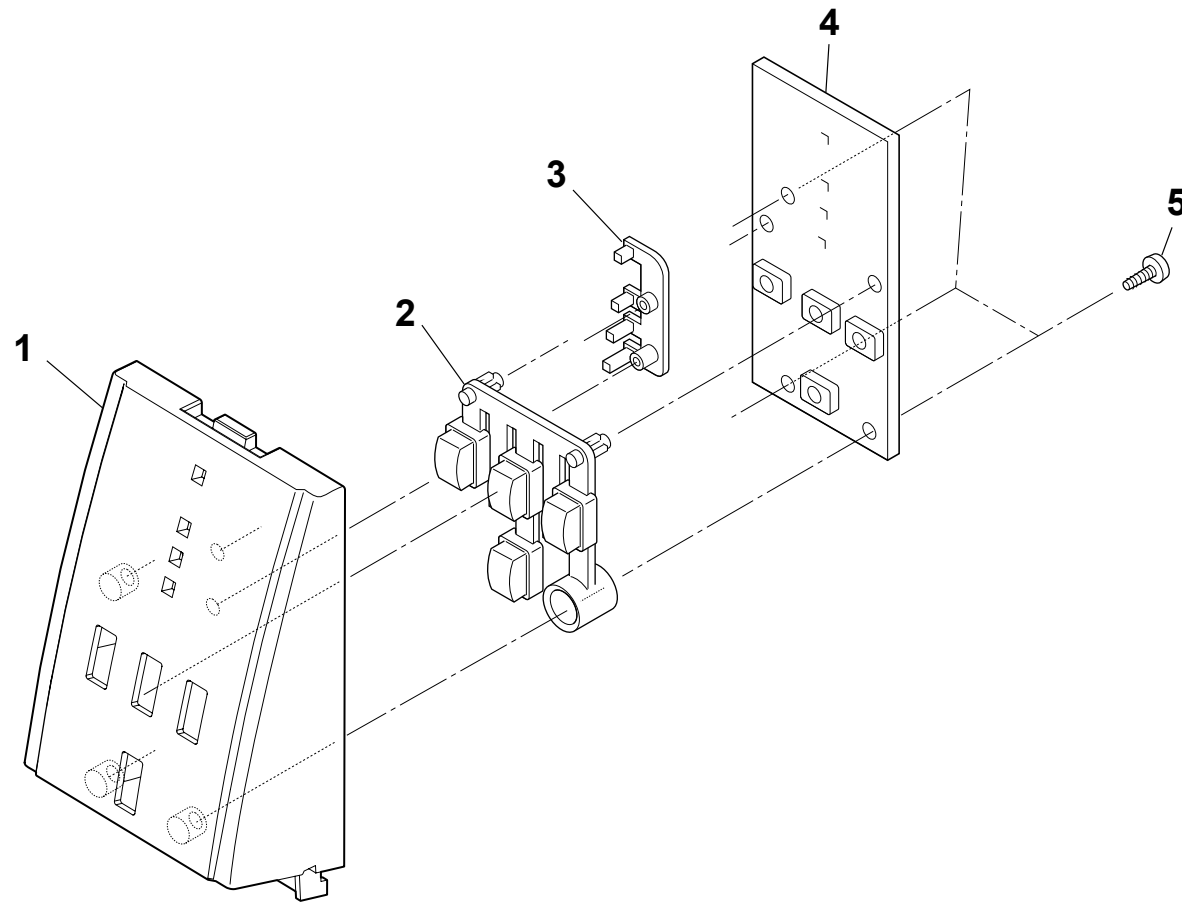
Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
7-1	Cover Ope-Pane (BK)	PBA00066-0	1		
-2	Switch, CL-S	JM56253-0	1		
-3	LED, Window	JM56208-0	1		
-4	SA, Opepane PCB	JM66720-1	1		
-5	Screw, PHT (#2), M3.0x6	E10130-060F	3		

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Drawing No. 8

Parts List & Location for Unit, Ribbon

Revision Up List		
Sheet No.	Rev. No.	Date
1/2	0	Mar. 12, 2013
2/2	0	Mar. 12, 2013

DRAWING NO. 8   Unit, Ribbon (Rev. 0)
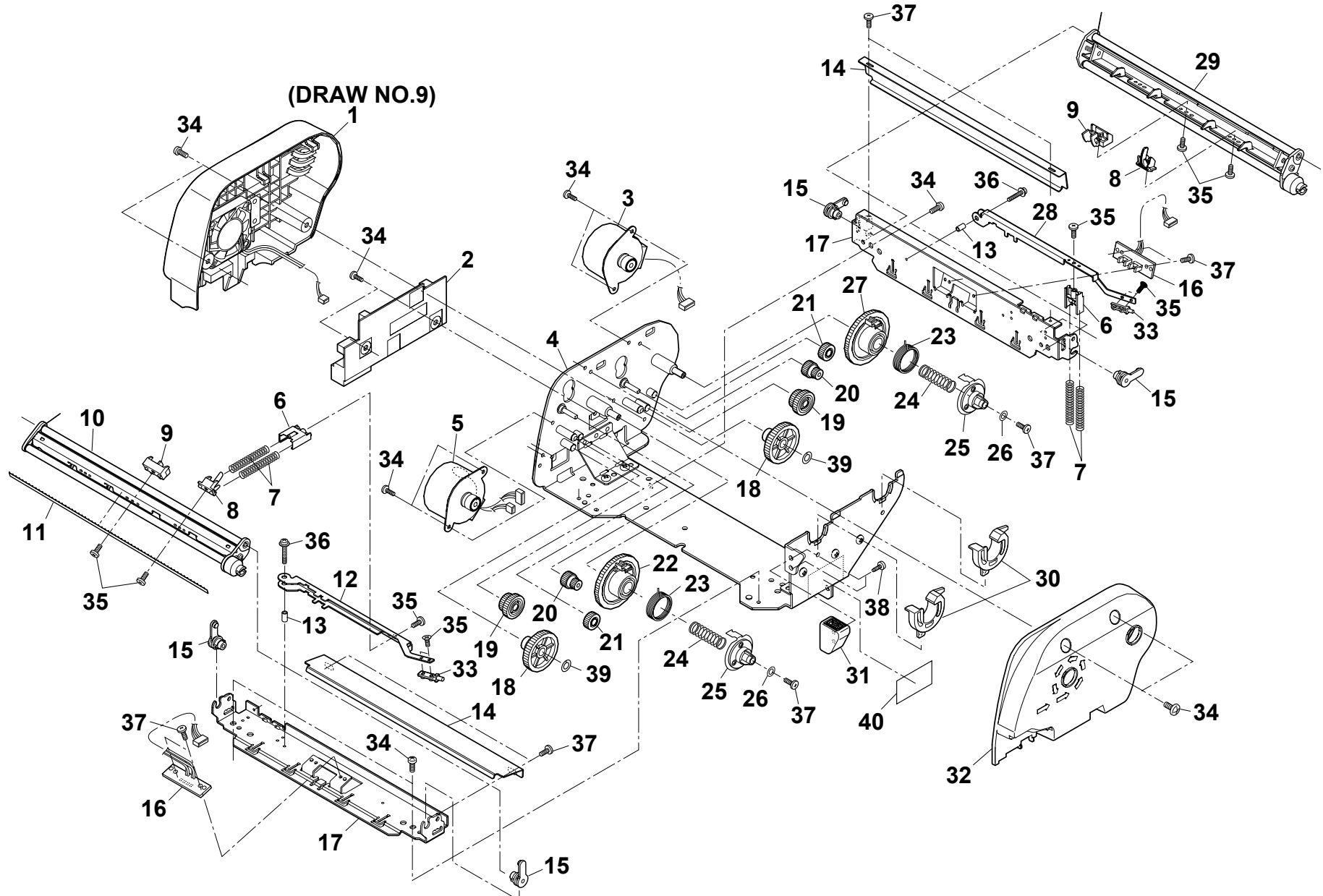
PARTS LIST for CL-S6621   TITLE: Unit, Ribbon   Sheet No. 1/2

Drawing No. 8   Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
8-1	SA2, Ribbon Unit Fan	-	1	(Ref. Drawing No. 9)	
-2	SA, Ribbon PCB	PPS00059-0	1		
-3	SA Ribbon Motor R	PWF80014-0	1		
-4	SA Ribbon Frame	PPC60013-0	1		
-5	SA Ribbon Motor F	PPF80004-0	1		
-6	Holder Tension Spring 2	PBE00036-0	2		
-7	Spring Ribbon Tension	PJG60046-0	4		
-8	Holder Tension Spring 1	PBE00037-0	2		
-9	Interrupter Ribbon Sensor	PBC90018-0	2		
-10	SA, Ribbon Tension Shaft F	PPM10001-0	1		
-11	Sheet Static Eliminator 6621	PRC10002-0	1		
-12	Lever Tension Adjust F	PAC90006-0	1		
-13	Shaft Tension Adjust	JM32011-0	2		
-14	Cover Ribbon Tension Sensor	PAC80013-0	2		
-15	Bush Ribbon Roller	PBE40018-0	4		
-16	SA, Ribbon Sensor	PPS90020-0	2		
-17	Plate Ribbon Tension Sensor	PAC70038-0	2		
-18	Gear Reduction Ribbon 2	PBF00041-0	2		
-19	Gear Reduction Ribbon 3	PBF00042-0	2		
-20	Gear Reduction Ribbon 1	PBF00040-0	2		

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
8-21	Gear Idle Ribbon	PBF00043-0	2		
-22	Gear Ribbon Shaft F	PBF00044-0	1		
-23	Spring Ribbon Return	PJG60054-0	2		
-24	Spring Ribbon Shaft	PJG60053-0	2		
-25	SA, Holder R Shaft	JM31701-0	2		
-26	Plate Ribbon Washer	JM34122-0	2		
-27	Gear Ribbon Shaft R	PBF00045-0	1		
-28	Lever Tension Adjust R	PAC90007-0	1		
-29	SA, Ribbon Tension Shaft R	PPM10002-0	1		
-30	Holder, Ribbon Shaft	JN34201-0	2		
-31	Holder 2 Tension Spring	JM34204-0	1		
-32	Cover Ribbon Frame R (BK)	PBA00059-0	1		
-33	Knob, Tension, Adjust	JM34207-0	2		
-34	Screw, BH, M3.0x4 (NI)	E00530-040WF	14		
-35	Screw, No.0, TFH (PT4-0.5), M2.0x4	E15920-040WF	10		
-36	Screw, PH (PW), M2.0x8	E00620-080F	2		
-37	Screw, No.0PH (4-0.3)M2.0x3 (NI)	E03920-030WF	10		
-38	Screw, PHT (#2), M3.0x6	E10130-060F	2		
-39	Polyslider,Knob-02	TZ44130-00F	2		
-40	Label Ribbon Tension Adjust	PRX30073-0	1		

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Drawing No. 9

Parts List & Location for SA2, Ribbon Unit Fan

Revision Up List		
Sheet No.	Rev. No.	Date
1/1	0	Mar. 12, 2013

DRAWING NO. 9   SA2, Ribbon Unit Fan (Rev. 0)
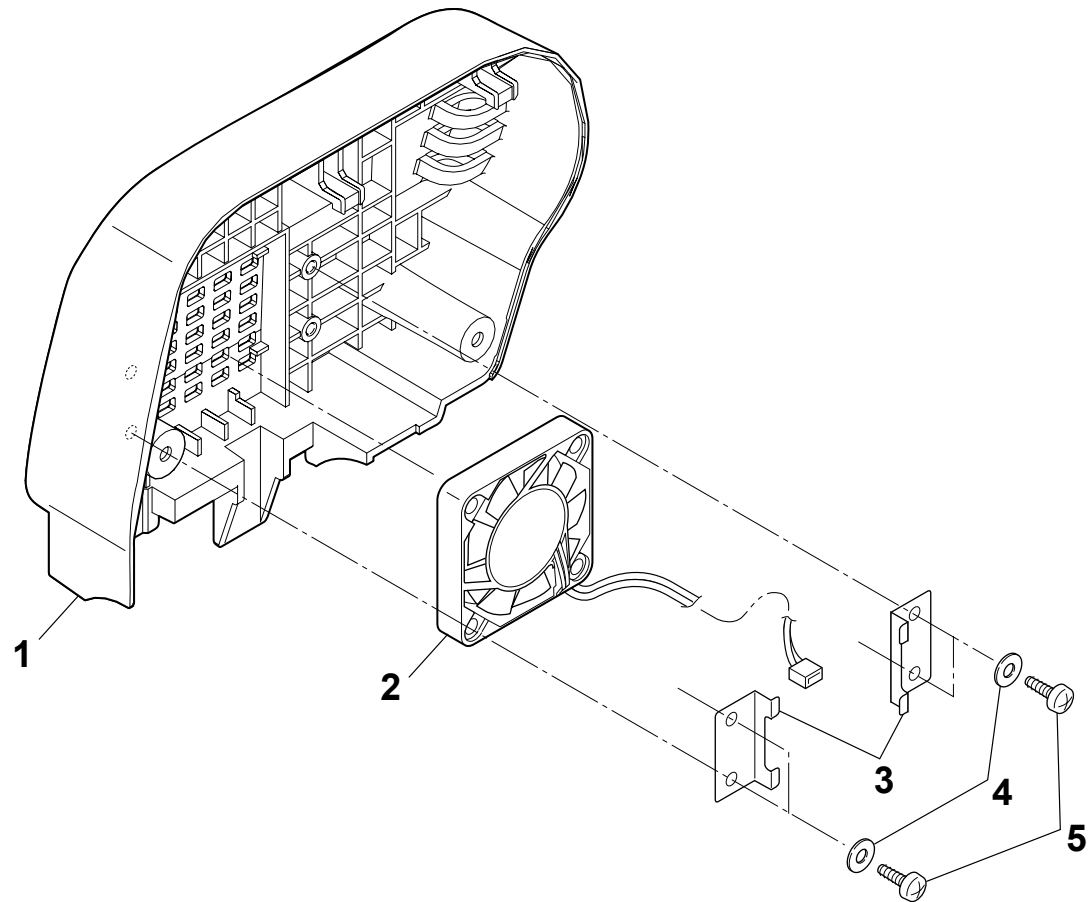
PARTS LIST for CL-S6621   TITLE: SA2, Ribbon Unit Fan   Sheet No. 1/1

Drawing No. 9   Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
9-1	Cover Ribbon Frame L (BK)	PBA00060-0	1		
-2	SA, Fan	JM68702-0	1		
-3	Bracket Ribbon Fan	JM34116-0	2		
-4	Washer, Plain, 3x8x0.5	E50130-005WF	4		
-5	Screw, PHT (#2), M3.0x6	E10130-060F	4		

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Drawing No. 10

Parts List & Location for Accessories

Revision Up List		
Sheet No.	Rev. No.	Date
1/2	0	Mar. 12, 2013
2/2	0	Mar. 12, 2013

DRAWING NO. 10   Accessories (Rev. 0)

1-1
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1-4
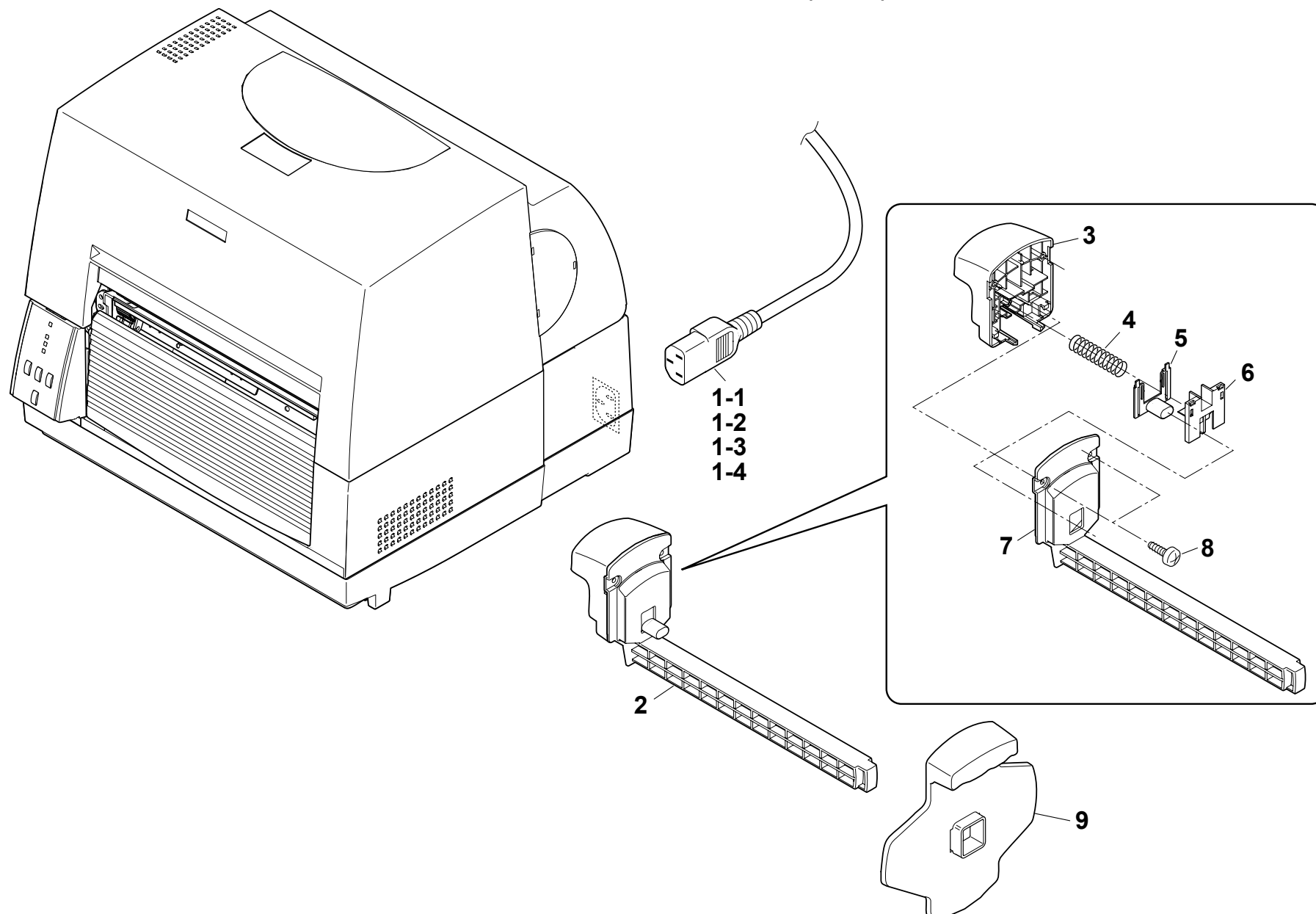
Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
10-1-1	Cord Set (UL/CSA)	C6009-000#	1	For CSA	
-1-2	Cord Set (OE Straight)	C6009-200#	1	For CSE, Korea	
-1-3	Cord Set	C6009-300#	1	For CSE, Korea	
-1-4	Cord Set (China)	C6009-800#	1	For China	
-2	SA Paper Shaft	PPM30008-0	1		
-3	Cover Shaft Paper	PBC80024-0	1		
-4	Spring PNE	PJG60047-0	1		
-5	Lever PNE	PBC90019-0	1		
-6	Slider PNE	PBA80003-0	1		
-7	Shaft Paper	PBM30022-0	1		
-8	Screw, BHT (#2), M3.0x6 (NI)	E10530-060WF	2		
-9	Flange Paper Wide	PBM30023-0	1		
-	Cleaner, Head (KT-PJB12)	PWZ80001-0	1		
-	Ribbon (B110Ti) 174x30 W/Core	PWM50004-0	1		
-	Label Accessory LR1111 178x102	PXX60012-0	1		
-	CD-ROM CL-S6621	PXY90001-3	1	For CSA, CSE	
-	CD-ROM CL-S6621 (CN)	JN74939-4	1	For China	
-	CD-ROM, Users (KOR), S621/631/6621	JM74950-2	1	For Korea	
-	QSG CL-S6621 (ITA)	PXZ00065-0	1		
-	QSG CL-S6621 (ESP)	PXZ00066-0	1		

PARTS LIST for CL-S6621   TITLE: Accessories   Sheet No. 2/2

                                          Drawing No. 10   Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
-	QSG CL-S6621 (GER)	PXZ00068-0	1		
-	QSG CL-S6621 (POR)	PXZ00067-0	1		
-	QSG CL-S6621 (RUS)	PXZ00069-0	1		
-	QSG CL-S6621 (FRA)	PXZ00064-0	1		
-	QSG CL-S6621 (CN)	PXZ00071-0	1		
-	QSG CL-S6621 (EN)	PXZ00072-0	1		
-	Quick Start Guide (KOR) S621/631/CL-S6621	JM74949-1	1		

CHAPTER 6
CIRCUIT DIAGRAMS
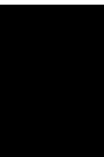
CHAPTER 6   CIRCUIT DIAGRAMS

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V3R3

RA6
RA7
22
22

R12 47k

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	23	24

*24FLT
V3R3

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V850/ME2

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EVDD	70
EVDD	89
EVDD	100
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UVDD	162
OSCVDD	163

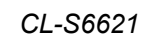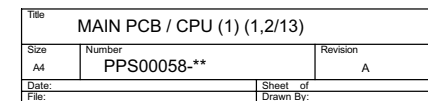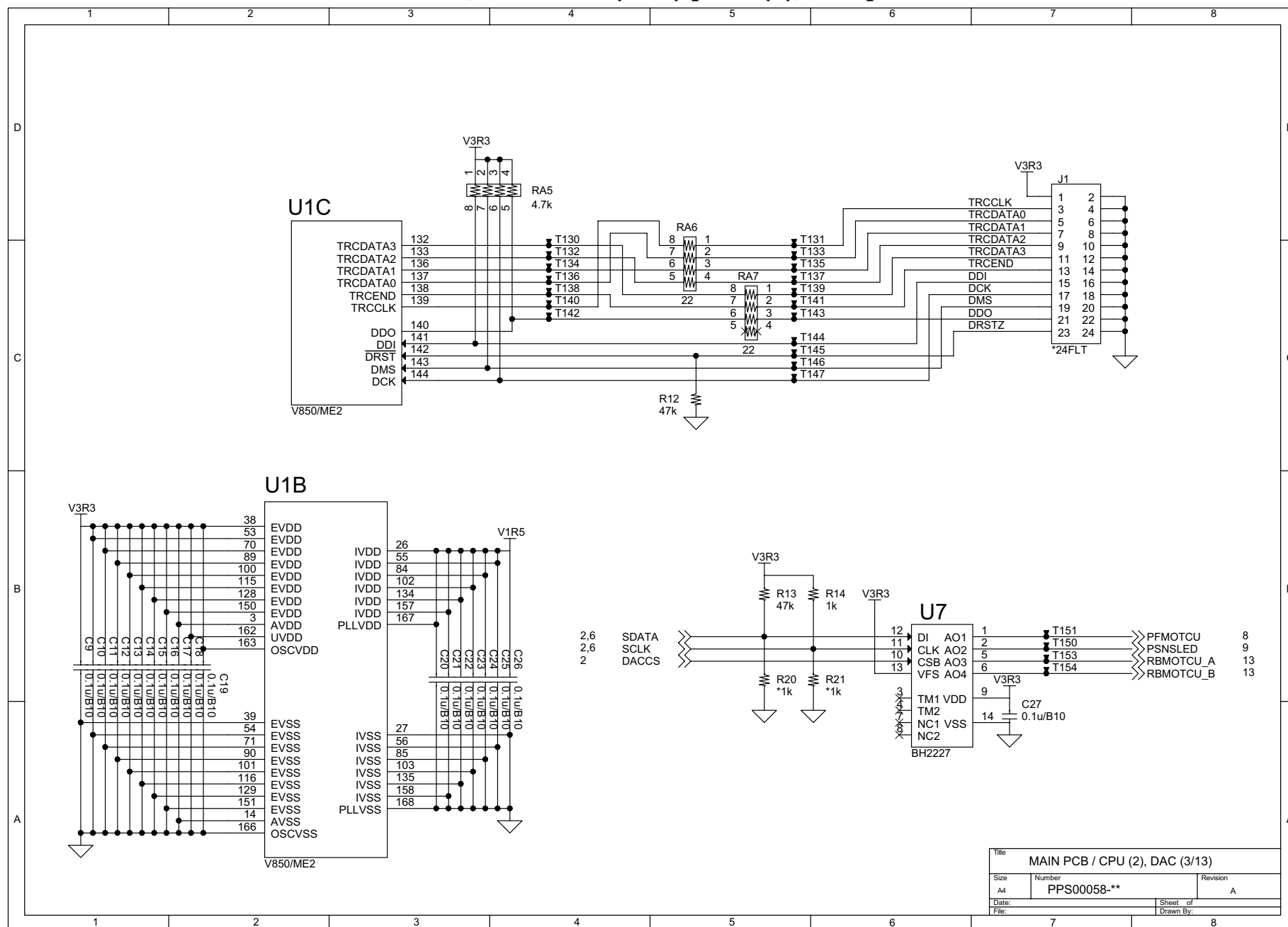|	
IVDD	26
IVDD	55
IVDD	84
IVDD	102
IVDD	134
IVDD	157
PLLVDD	167

V3R3
V1R5

C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19
0.1u/B10

C20 C21 C22 C23 C24 C25 C26
0.1u/B10

EVSS	39
EVSS	54
EVSS	71
EVSS	90
EVSS	101
EVSS	116
EVSS	129
EVSS	151
AVSS	14
OSCVSS	166

IVSS	27
IVSS	56
IVSS	85
IVSS	103
IVSS	135
IVSS	158
PLLVSS	168

U7

BH2227

V3R3
R13 47k R14 1k V3R3

DI	12	AO1 1
CLK	11	AO2 2
CSB	10	AO3 5
VFS	13	AO4 6
TM1	3	VDD 9
TM2	4	
NC1	7	VSS 14
NC2	8	

R20 *1k R21 *1k

C27 0.1u/B10
V3R3

SDATA	2,6	T151 PFMOTCU 8
SCLK	2,6	T150 PSNSLED 9
DACCS	2	T153 RBMOTCU_A 13
		T154 RBMOTCU_B 13

Title	MAIN PCB / CPU (2), DAC (3/13)
Size A4	Number PPS00058-**
	Revision A
Date:	Sheet of
File:	Drawn By:

CL-S6621

SA, Main PCB (4/13) [ROM]

MAIN PCB / ROM (4/13)

Size	Number	Revision
A4	PPS00058-**	A

Date:
File:
Sheet of
Drawn By:

SA, Main PCB (5/13) [RAM]

U13A

EM63A165TS-6IG

256Mbit SDRAM

CL-S6621

MAIN PCB / RAM (5/13)

Size	Number	Revision
A4	PPS00058-**	A

SA, Main PCB (6/13) [FPGA]

MAIN PCB / FPGA (6/13)

Size: A4
Number: PPS00058-**
Revision: A

SA, Main PCB (7/13) [Head, Opepane]

				MAIN PCB / HEAD, OPEPANE (7/13)
Size	Number		Revision	
A4	PPS00058-**		A	
Date:		Sheet of	
File:		Drawn By:	

CL-S6621

SA, Main PCB (8/13) [PF Motor]

MAIN PCB / PF MOTOR (8/13)

Size A4 Number PPS00058-** Revision A
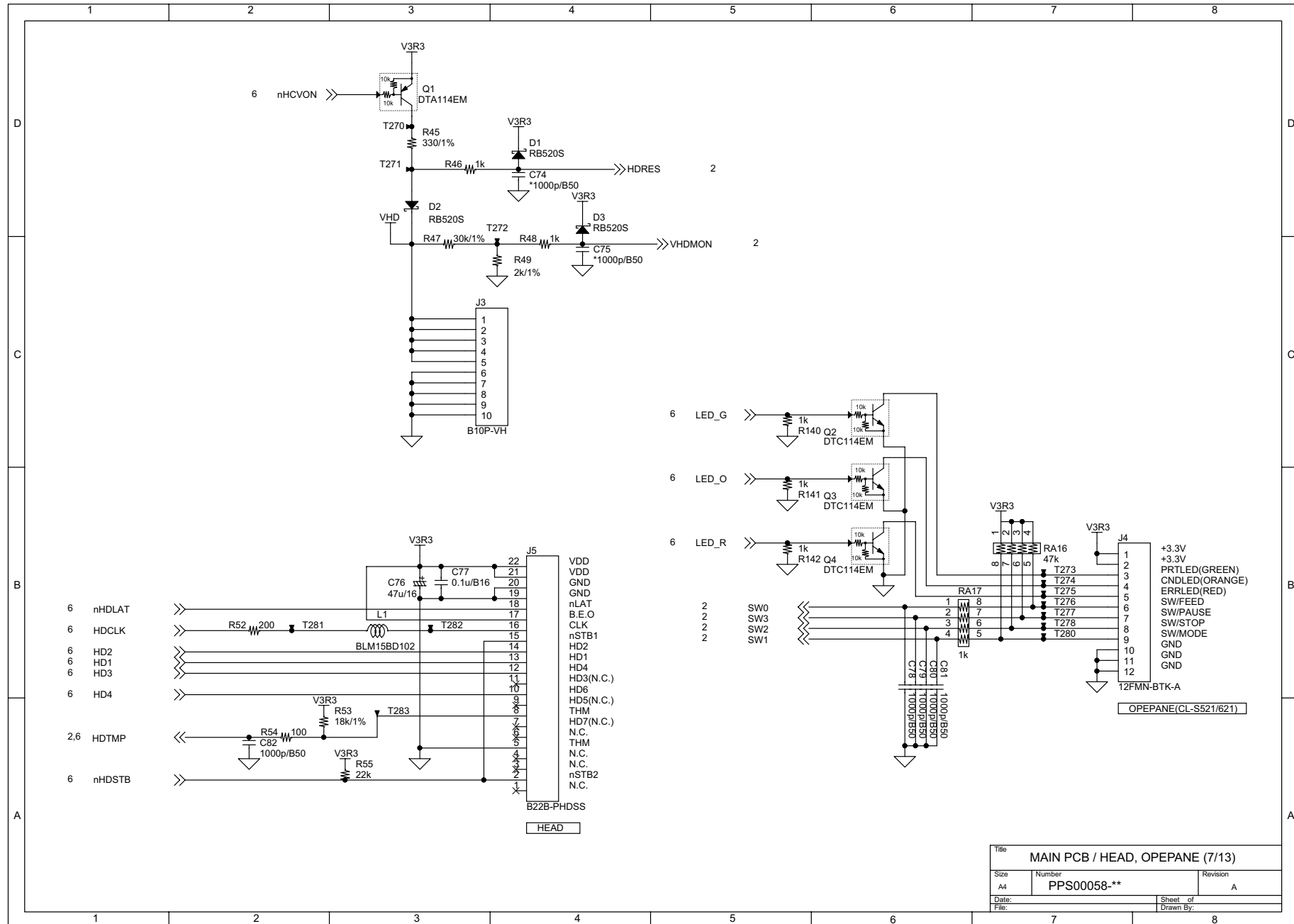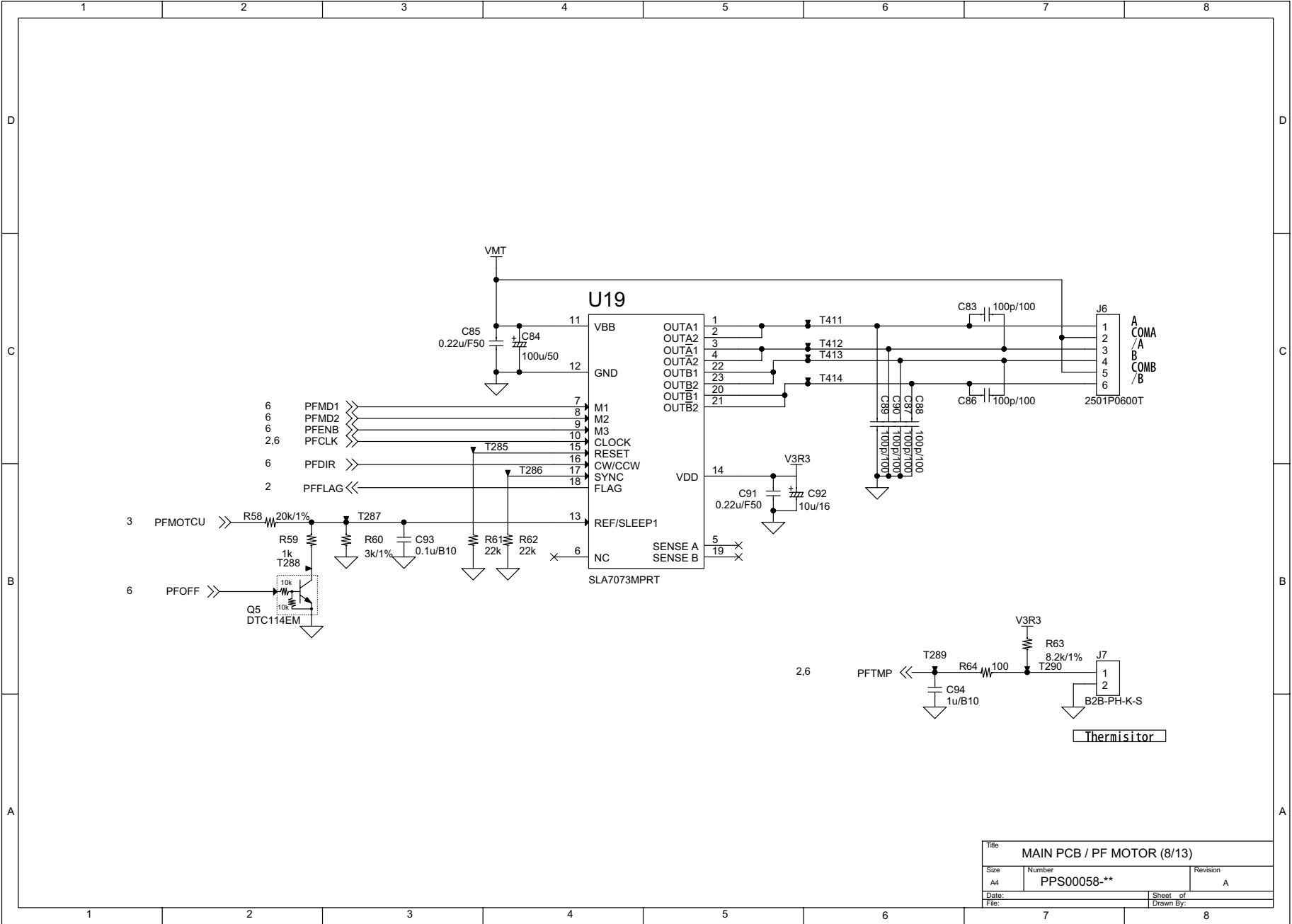
SA, Main PCB (9/13) [Sensor, Option]

Title	MAIN PCB / SENSOR, OPTION (9/13)		
Size A4	Number PPS00058-**		Revision A
Date:		Sheet of	
File:		Drawn By:	

SA, Main PCB (10/13) [Power, Buzzer]

[PWRSAVE]
L: Low voltage mode
H: Nomal mode

Motor **drive power and Head drive power control circuit**

Title	MAIN PCB / POWER, BUZZER (10/13)		
Size A4	Number PPS00058-**		Revision A
Date:		Sheet of	
File:		Drawn By:	
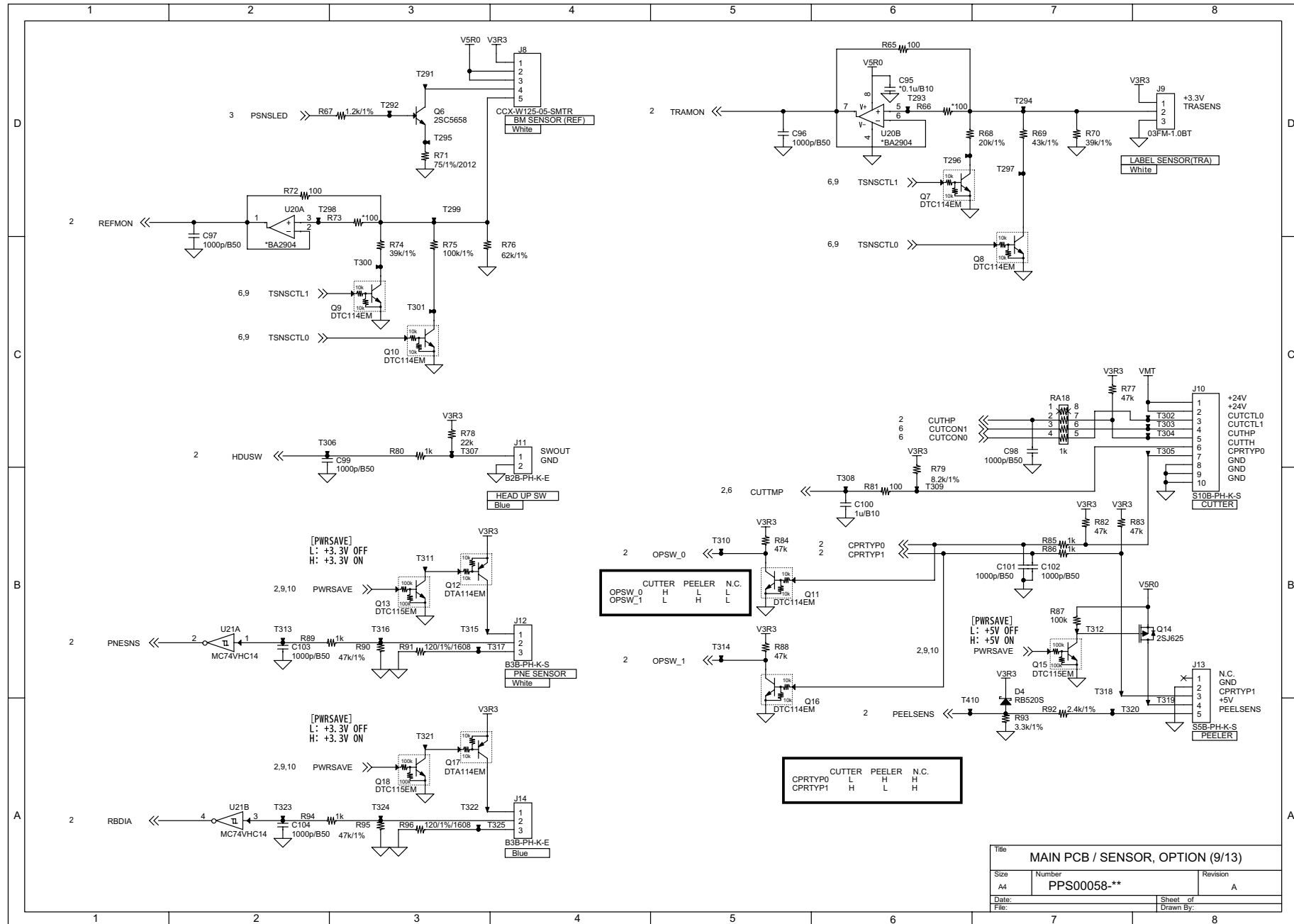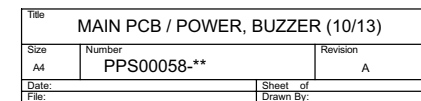
SA, Main PCB (11/13) [I/F (RS232C, Option)]

	24pin	26pin	2pin
IEEE1284	L	L	X
RS232C	H	L	X
USB	L	L	X
RS232C+USB	H	L	X
LAN	H	H	X
SPI	L	H	H
P. USB	L	H	L

Title MAIN PCB / I/F (RS232C, OPTION) (11/13)

Size	Number	Revision
A4	PPS00058-**	A

Date:
File:

Sheet of
Drawn By:

CL-S6621

SA, Main PCB (12/13) [I/F (USB2.0)]

MAIN PCB / I/F (USB2.0) (12/13)

Size	Number	Revision
A4	PPS00058-**	A

SA Main PCB (13/13) [Ribbon]

Title: MAIN PCB / RIBBON (13/13)
Size: A4
Number: PPS00058-**
Revision: A

6-15

CL-S6621

SA, Opepane PCB

PRINT (GREEN) CONDITION (ORANGE) ERROR (RED) POWER (GREEN)

V3R3

| R302 360/2012 | R303 360/2012 | R304 360/2012 | R301 360/2012 |

T301 T302 T303 T304

| D302 310PT | D303 310DT | D304 310VT | D301 310PT |

CN301 V3R3

1	T305
2	T306	PRTLED
3	T307	CNDLED
4	T308	ERRLED
5	T309	FEED
6	T310	PAUSE
7	T311	STOP
8	T312	MODE
9	T313
10	
11	
12	

12FMN-BTK-A

| C301 1000p/50 | C302 1000p/50 | C303 1000p/50 |

V3R3

R305 22k/1608

FEED

SW301

1 3 TSW-16-10-T35
2 4

C304 1000p/50

5

V3R3

R306 22k/1608

SW302

1 3 TSW-16-10-T35
2 4

C305 1000p/50

5

PAUSE

V3R3

R307 22k/1608

SW303

1 3 TSW-16-10-T35
2 4

C306 1000p/50

5

STOP

V3R3

R308 22k/1608

SW304

1 3 TSW-16-10-T35
2 4

C307 1000p/50

5

MODE

Title	OPEPANE PCB		
Size A4	Number JM66707-**		Revision A
Date:		Sheet of	
File:		Drawn By:	

SA Ref Sen PCB

					REFRECTIVE SENSOR CIRCUIT		
Title							

CN501
CHP1505-0101

1
2
3
4
5

V3R3

D501
GL100MN0MP

D502
GL100MN0MP

TR501
PT100MC0MP

Size	Number		Revision
A4	JM66730-**		A

Date: 7-Nov.-2003   Sheet of 1/1
File: Drawn By:

CL-S6621

SA TRA Sen PCB

	1	2	3	4	5	6	7	8

V3R3

CN401

1
2
3

03FMS-1.0SP-TF

TR401
PT4800F6

Title	TRANSPARENT SENSOR CIRCUIT		
Size	Number		Revision
A4	JM66725-**		A
Date: 7-Nov.-2003		Sheet of	1/1
File:		Drawn By:	

SA, Relay PCB

SELECT-IN/CST/pINT	J201	T201	J202	SELECT-IN/CST/pINT

J201 (TX24-40R-12ST) — From Main PCB

Signal	Pin		Pin	Signal
SELECT-IN/CST/pINT	1	T201	1	SELECT-IN/CST/pINT
AUTOFDXT/DSR	2	T202	2	AUTOFDXT/DSR
STB/OCI0	3	T203	3	STB/OCI1
DATA0/DIPSW0/hEP00	4	T208	4	DATA0/DIPSW0/hEP01
DATA1/DIPSW1/hEP01	5	T209	5	DATA1/DIPSW1/hEP02
DATA2/DIPSW2	6	T204	6	DATA2/DIPSW3
DATA3/DIPSW3	7	T205	7	DATA3/DIPSW4
DATA4/DIPSW4	8	T206	8	DATA4/DIPSW5
DATA5/DIPSW5	9	T210	9	DATA5/DIPSW6
DATA6/DIPSW6	10	T211	10	DATA6/DIPSW7
DATA7/DIPSW7	11	T207	11	DATA7/DIPSW8
nPRIME	12	T212	12	nPRIME
BUSY/RTS/pEP00	13	T213	13	BUSY/RTS/pEP01
ACK/DTR/pEP01	14	T214	14	ACK/DTR/pEP02
FAULT/hINT	15	T215	15	FAULT/hINT
SELECT/PPON0	16	T216	16	SELECT/PPON1
PE	17	T217	17	PE
DWSWout	18	T218	18	DWSWout
USBHOST_D+	19	T219	19	USBHOST_D+
+5V	20	T220	20	+5V
USB_D+	21	T221	21	USB_D+
USB_D-	22	T222	22	USB_D-
VBUS	23	T223	23	VBUS
TXD/SO/DIR	24	T224	24	TXD/SO/DIR
RXD/SI	25	T225	25	RXD/SI
SCLK	26	T226	26	SCLK
RESET	27	T227	27	RESET
+24V	28	V24R0 T228	28	+24V
+24V	29		29	+24V
+24V	30		30	+24V
+24V	31		31	+24V
+24V	32		32	+24V
P.GND	33	PGND T233	33	P.GND
P.GND	34		34	P.GND
P.GND	35		35	P.GND
P.GND	36		36	P.GND
P.GND	37		37	P.GND
P.GND	38		38	P.GND
USBHOST_D-	39	T239	39	USBHOST_D-
S.GND	40	T240	40	S.GND

TX24-40R-12ST — From Main PCB

TX25-40P — To I/F PCB

Title	RELAY PCB		
Size A4	Number PPS00060-**		Revision A
Date:		Sheet of	
File:		Drawn By:	

SA, Ribbon PCB

RIBBON PCB

Size: A4

Number: PPS00059-**

Revision: A

SA, Ribbon Sensor

PT501

+3.3V
SENS1
SENS2
GND

1
2
3
4

PT_4P

PS501
GP1S094

PS502
GP1S094

R501
120/1%/1608

R502
120/1%/1608

Title
Ribbon Sensor PCB

Size	Number	Revision
A4	PPS90020-**	A

Date:
File:

Sheet   of
Drawn By:

SA PNE Sensor

V3R3

PT301

1
2 SENSOUT
3 K

PT_3P

PS301
SG2C05

Title	Ribbon Sensor PCB		
Size A4	Number PPS90021-**		Revision A
Date: File:		Sheet of Drawn By:	

APPENDICES

APPENDICES

TABLE OF CONTENTS

A. Mounting Diagrams

A-1. SA, Main PCB

[Component side]

[Dip side]
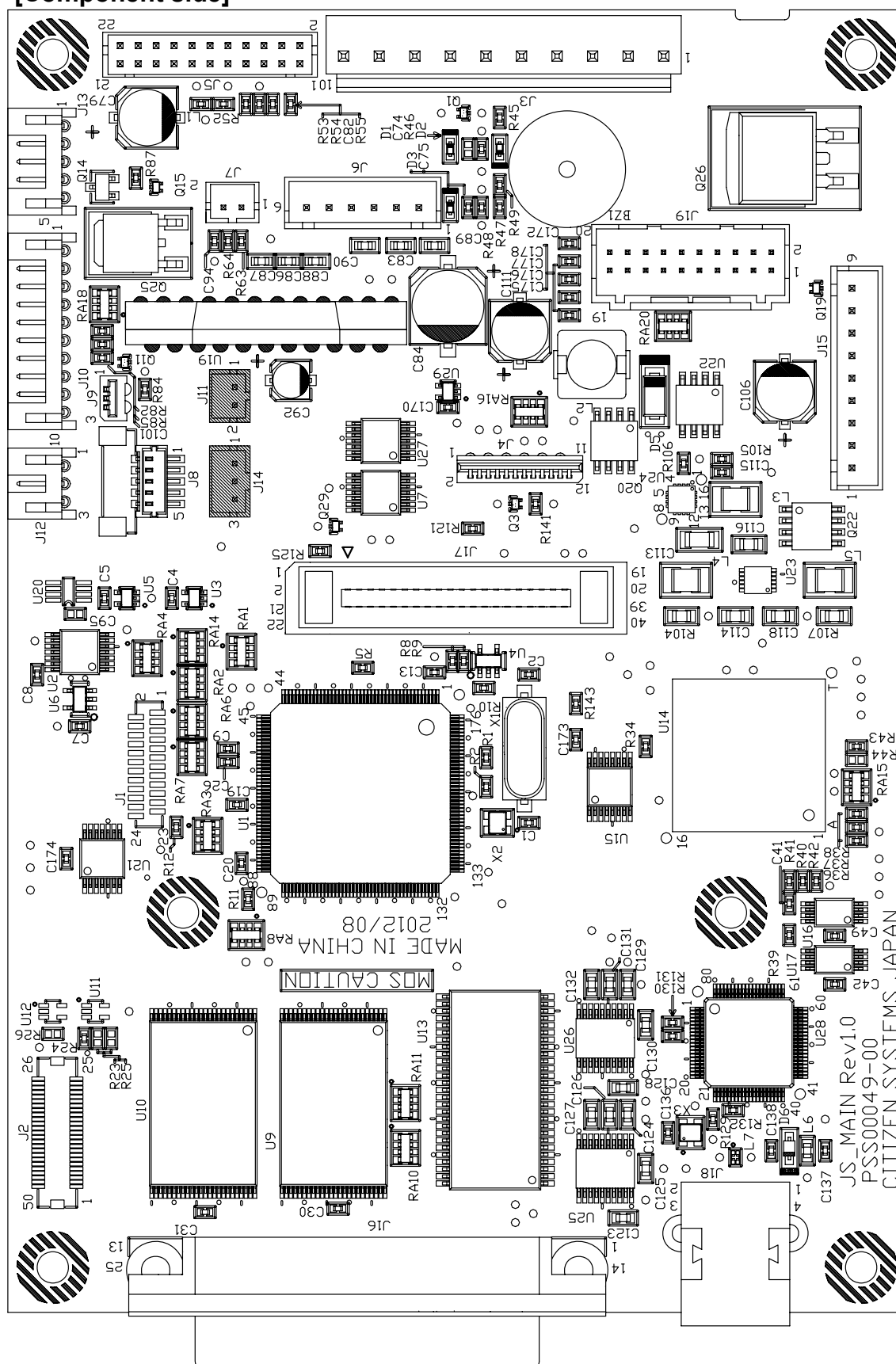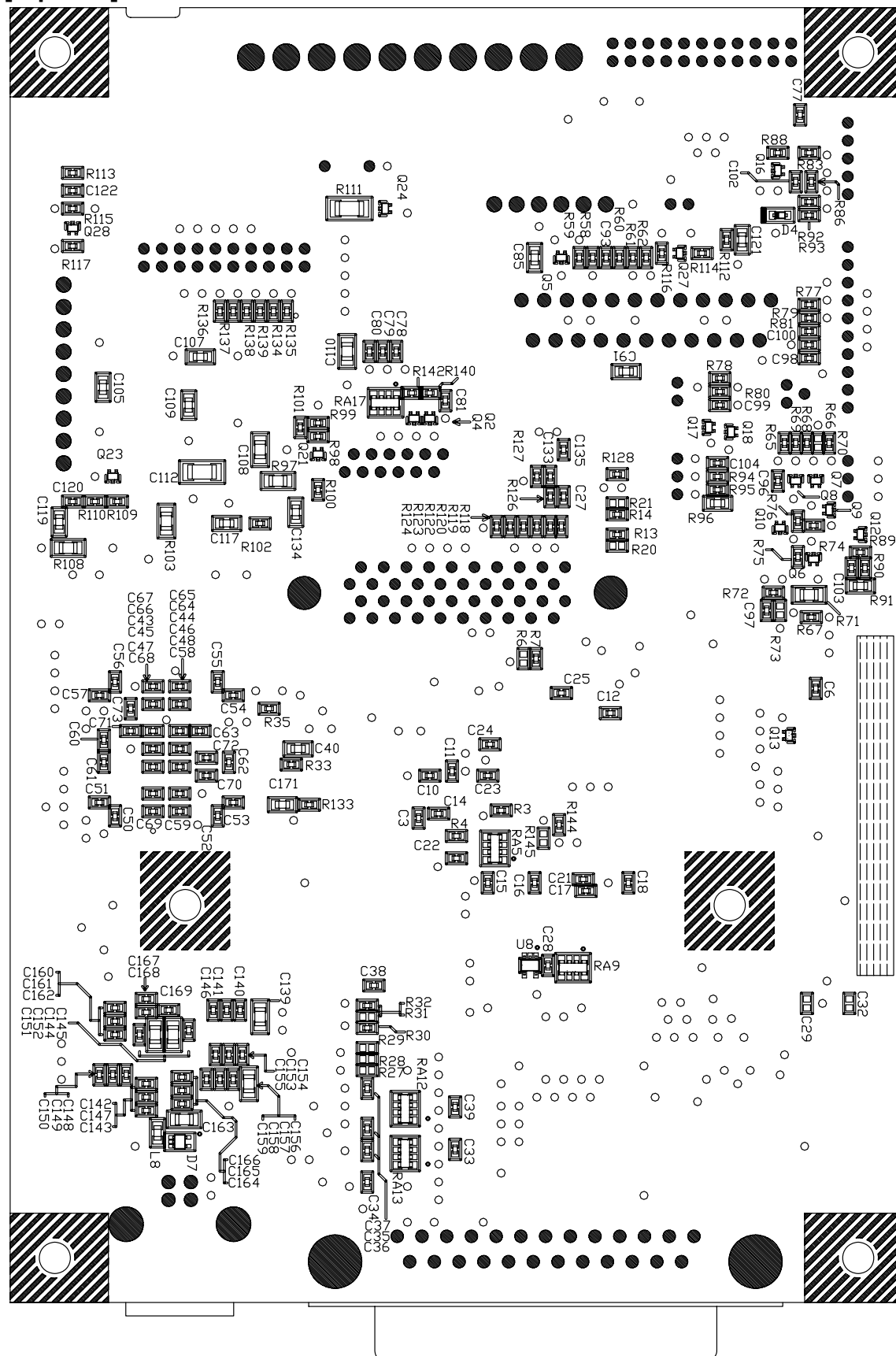
A-2. SA, Opepane PCB

[Parts side]

[Solder side]

MOS CAUTION

MADE IN JAPAN

JM667

CN301

JM66930-01

D301
K
POWER ON

PRINT
K D302

CONDITION
K D303

ERROR
K D304

PAUSE

FEED

STOP

MODE

A-3. SA Ref Sen PCB

TR501
C

A A E
D501 D502

CN501

A-4. SA TRA Sen PCB

E

C
TR401   CN401

01
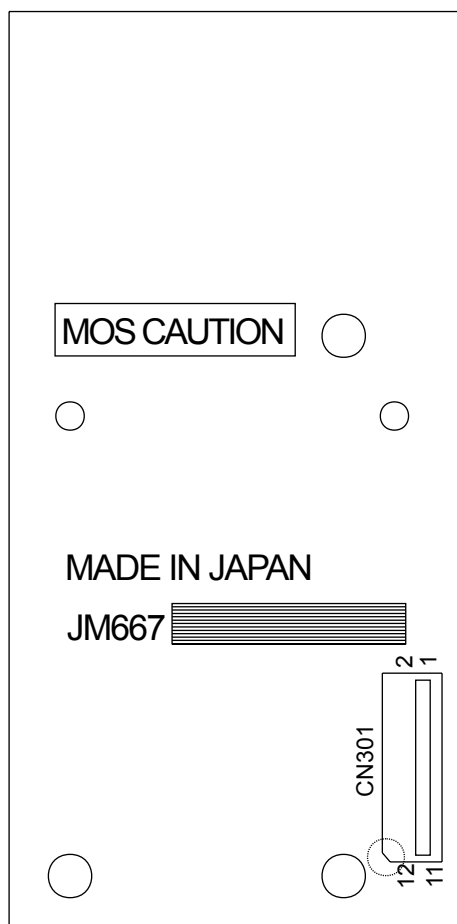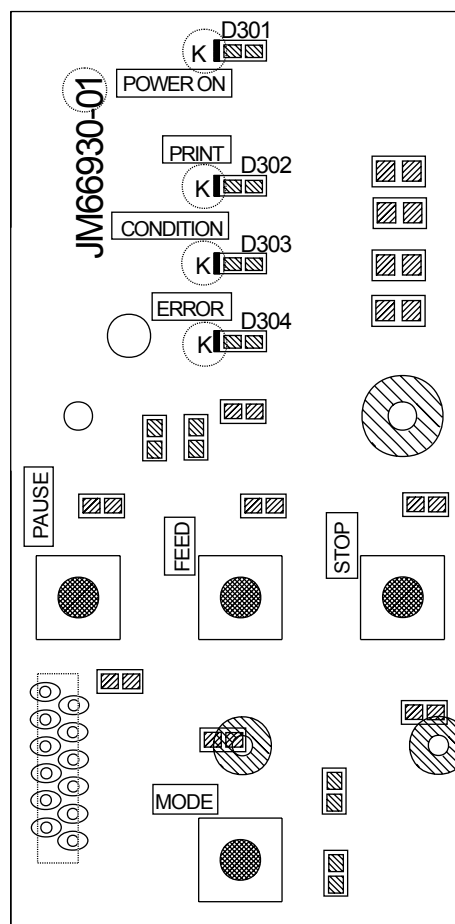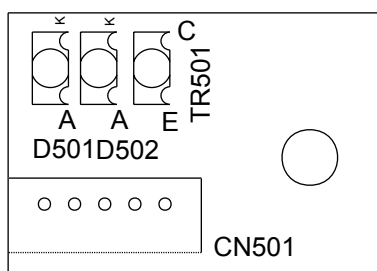
A-5. SA, Relay PCB
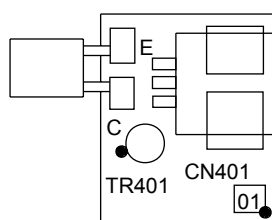
[Parts side]　　　　　　　　　　　**[Solder side]**
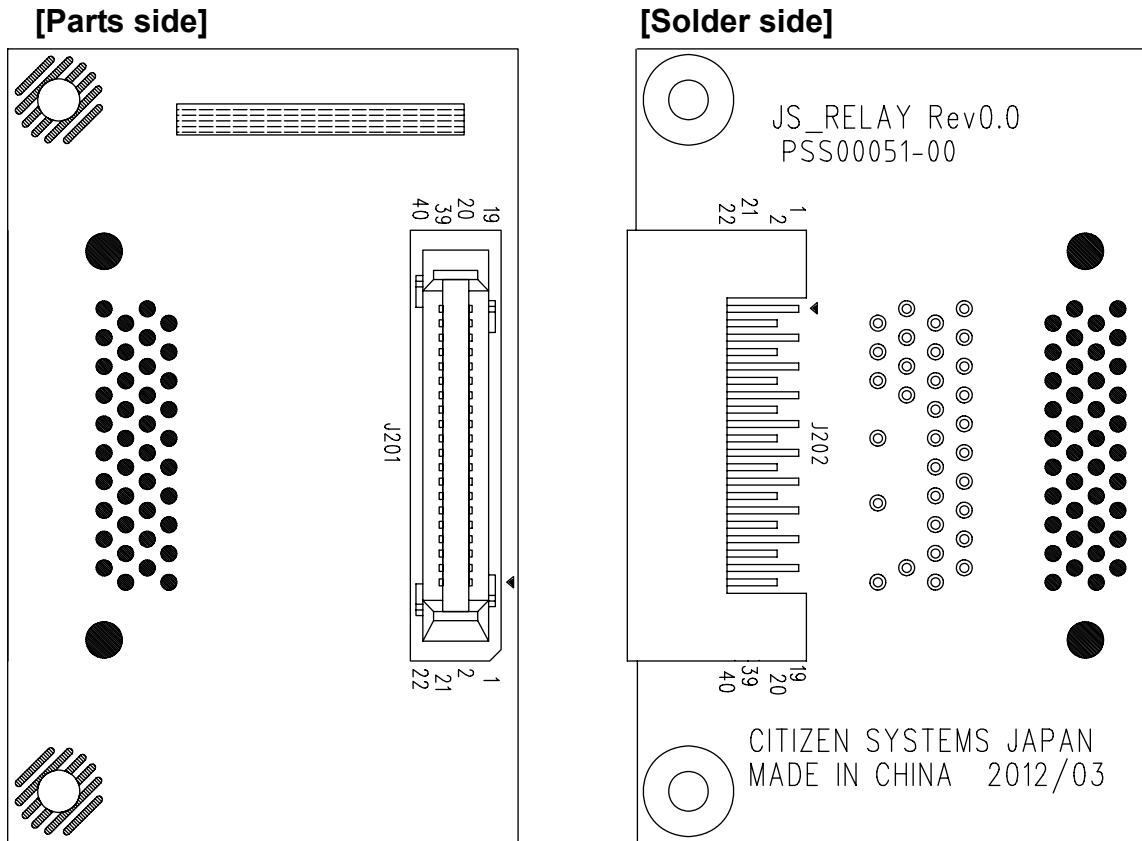
A-6. SA, Ribbon PCB
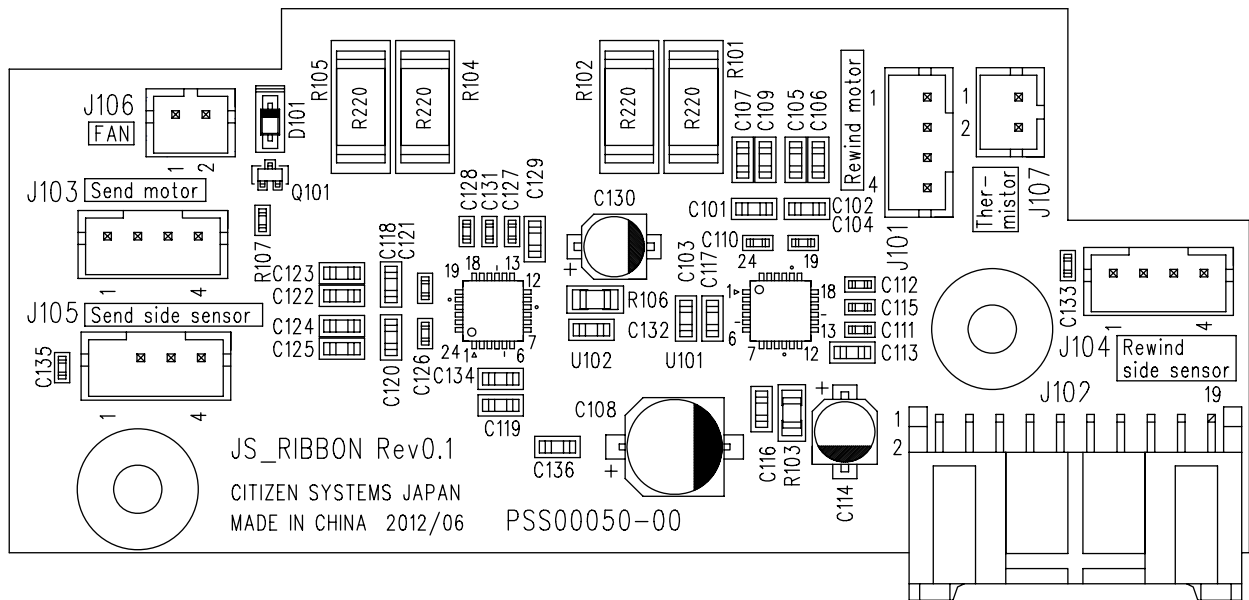
A-7. SA, Ribbon Sensor
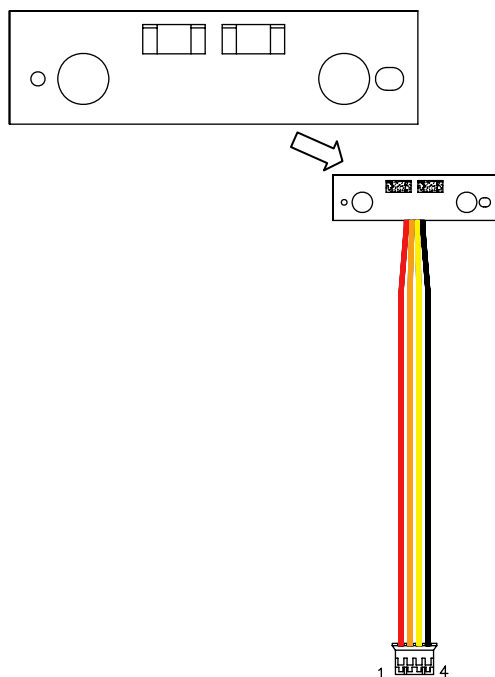
[Parts side]   **[Solder side]**
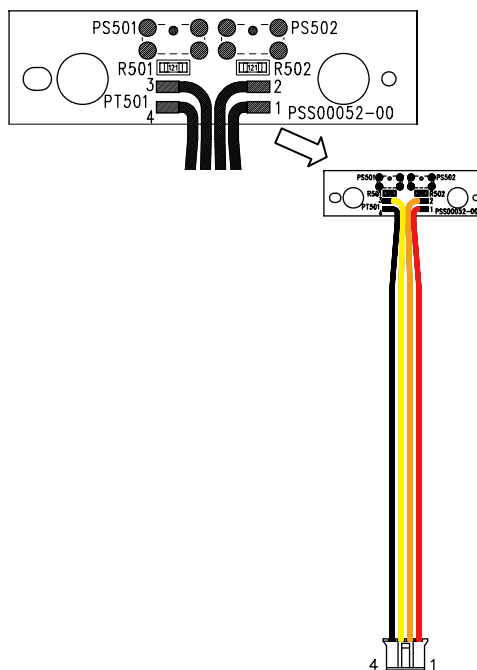
A-8. SA PNE Sensor

[Parts side]   **[Solder side]**