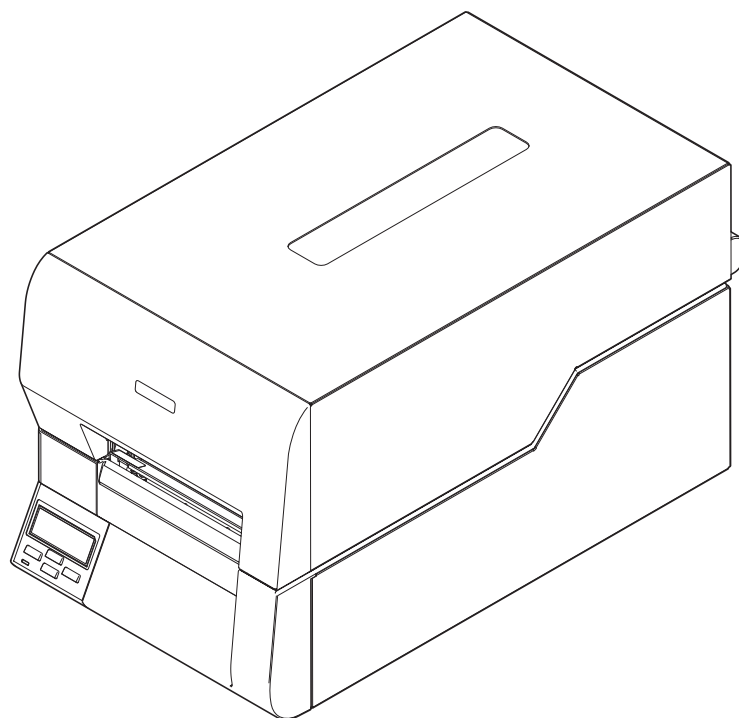


Technical Manual

CL-E700 series

Thermal Transfer Printer



CITIZEN SYSTEMS JAPAN CO., LTD.

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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. Otherwise, electric shock may occur.

Observe the following in maintenance work:

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: 864 dots (effective dots: 832 dots)	
Max. print width	104 mm	4.1"
Max. print length	2539.7 mm	99.99"
Print density	Print density is adjustable with software.	
Printing speed setting	8, 7, 6, 5, 4, 3 or 2 inches per second (Direct thermal) * At a printing speed of 8 or 7 inches per second, use density 10 and recommended thermal paper at normal temperature. * 6, 5, 4, 3 or 2 inches per second when an optional peeler is used. 6, 5, 4, 3 or 2 inches per second (Thermal transfer)	
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 liner 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 Corporation) Direct thermal media: label media (150LA-1 Ricoh), tag media (130LHB Ricoh)	
Max. media width	118.0 mm	4.65"
Min. media width	19.5 mm	0.77"
Min. label width	19.5 mm	0.77"
Min. label pitch* ²	6.35 mm	0.25"
Max. media thickness	0.254 mm	0.01"
Max. media length	2539.7 mm	99.99"
Min. media length	6.40 mm	0.25"
Min. media thickness	0.0635 mm	0.0025"

*1: Options can be separately purchased.

*2: When a media pitch of less than 25.4 mm (1 inch) is used, set the "Small Media Adjustment" setting in the "Page Setup" menu to "ON".

Media (continued)		
On-board roll media diameter	Max. external diameter: 203 mm	8"
	Media core internal diameter: 25 to 76 mm	1 to 3"
	Min. media core external diameter (when using label media)	
	Outside winding: 50.8 mm	2"
	Inside winding: 76.0 mm	3"
Ribbon		
Recommended ribbon	B110A Ricoh	
Max. ribbon width	114.0 mm	4.50"
Min. ribbon width	25.4 mm	1.00"
Max. ribbon length	360.0 m	1,181 ft
Max. roll diameter	74.0 mm	2.90"
Inner diameter of the paper core	25.4 ± 0.254 mm	1.00 ± 0.01"
Outer diameter of the paper core	33.4 ± 0.50 mm	1.31 ± 0.02"
Ribbon end tape length	Max. 80.0 mm	Max. 3.15"
Ribbon end detection	Ribbon end detection by a ribbon encoder sensor	
Bar code		
For Datamax® emulation		
One-dimension	• Code3of9 • UPC-A • UPC-E • EAN-13 (JAN-13) • EAN-8 (JAN-8) • Interleaved2of5 • Code128 • HIBC (Modulus 43-used code3of9) • CODABAR (NW-7) • Int2of5 (Modulus 10-used Interleaved2of5) • Plessey • CASE CODE • UPC2DIG ADD • UPC5DIG ADD • Code 93 • Telepen • ZIP • UCC/EAN128 • 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		
One-dimension	• Code11 • Interleaved2of5 • Code39 • EAN-8 • UPC-E • Code93 • Code128 • EAN-13 • Industrial2of5 • Standard2of5 • ANSI CODABAR • LOGMARS • MSI • Plessey • UPC/EAN Extensions • UPC-A • POSTNET • Planet	
Two-dimension	• Code49 • PDF-417 • CODA BLOCK • UPS Maxi Code • Micro PDF-417 • Data Matrix • QR Code • GS1 DataBar • TLC39 • Aztec	

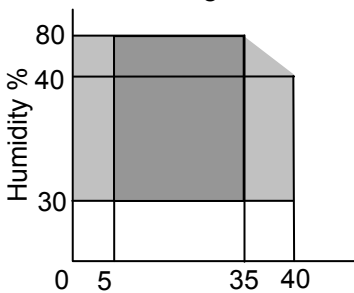
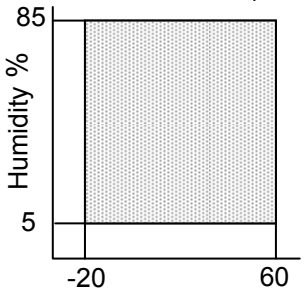
Font	
For Datamax® emulation	
	1. Seven kinds of fixed pitch font Overseas, English fonts and European fonts 2. OCR fonts OCR-A^{*3}, OCR-B^{*3} 3. Proportional fonts CG Triumvirate smooth font CG Triumvirate Bold smooth font (6, 8, 10, 12, 14, 18, 24, 30, 36, 48 points) • Character set: Conforms with code page 850 standards 4. TrueType™ rasterizer ^{*4}
For Zebra® emulation	
	1. Five kinds of fixed pitch font Overseas, English fonts and European fonts 2. OCR fonts OCR-A^{*3}, OCR-B^{*3} 3. Proportional font CG Triumvirate Condensed Bold 4. True type™ rasterizer^{*4}
Symbol set	
1-byte system	PC866U Ukraina ^{*5} , 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
2-byte system	EUC, JIS, Shift JIS, Unicode, KS Code, GB Code

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

*4: UFST™ and TrueType™ rasterizer are licensed from Monotype Imaging, Inc.

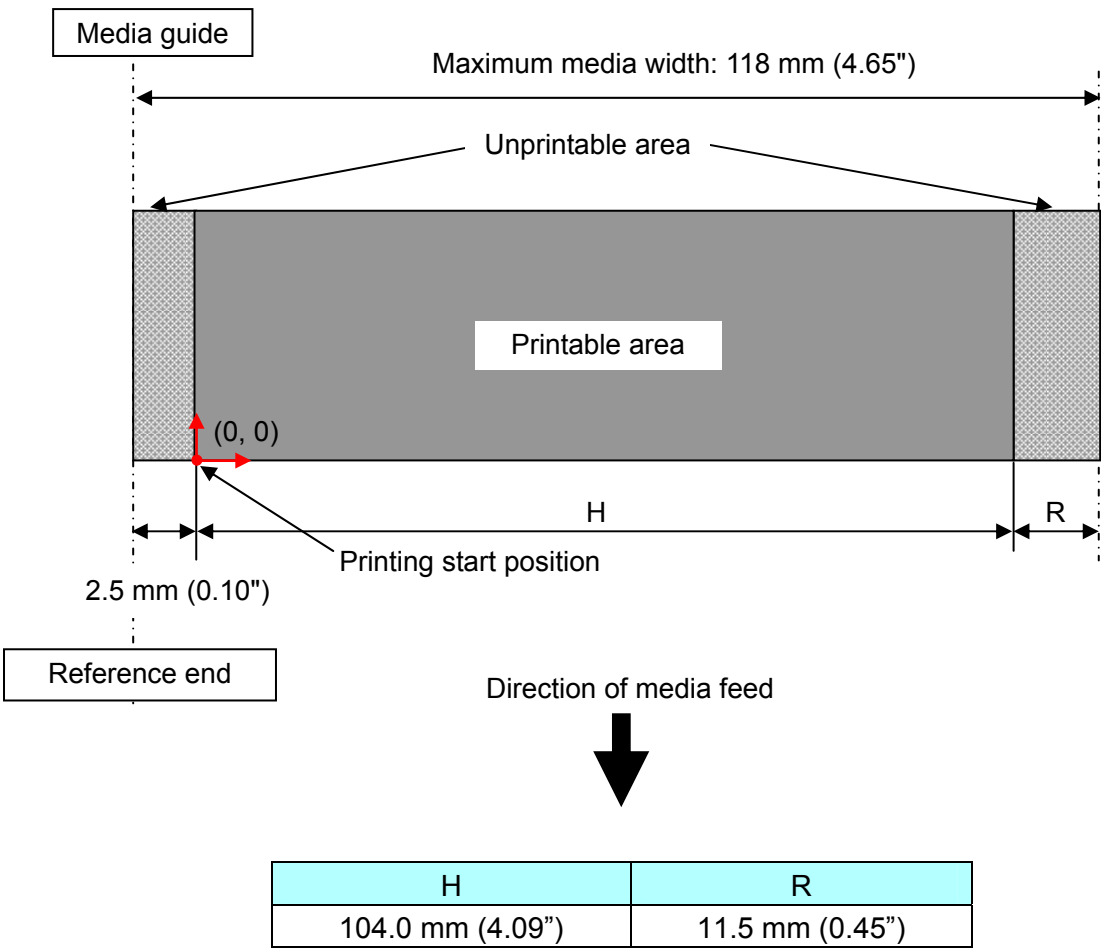
*5: "PC866U Ukraina" is available for Datamax® emulation only.

Control language	
	Conforms to Datamax [®] programming language and Zebra [®] programming language
Outline of electronic devices	
CPU	ARM [®] Cortex [™] -A9 (Max. operating frequency: 400 MHz)
ROM	FLASH ROM 16MByte (User area: 4MByte)
RAM	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.
Ribbon tension sensor	Detects tension/slack of ink ribbon.
Ribbon encoder sensor	Detects running of ink ribbon, and ink ribbon out.
Label peeling sensor *1	Detects labels that are peeled off.
Communication interfaces	
USB	Conforms to USB2.0 (High speed 480Mbps / Full speed 12Mbps)
Wired LAN	100BASE-TX / 10BASE-T
Communication interface (Options)	
Serial	2400 4800 9600 19200 38400 57600 115200 bps
Parallel	IEEE1284 (Compatible, Nibble, ECP mode)
Network	Multi-functional Ethernet (10BASE-T / 100BASE-TX) Standard Wi-Fi(1) (IEEE802.11n / IEEE802.11g / IEEE802.11b) Standard Wi-Fi(2) (IEEE802.11n / IEEE802.11a / IEEE802.11g / IEEE802.11b) Multi-functional Wi-Fi (IEEE802.11n / IEEE802.11g / IEEE802.11b)
Indications and switches	
LCD	Displays instructions for operation and settings. Also displays an error.
LED	Power ON (green), Error (red)
Buzzer	Alarms, errors, etc.
Operating panel keys	PAUSE, FEED, STOP, MENU
Head-up detection sensor	Detects head open.
Power switch	Turns power on and off.
Power supply	
Power supply voltage/ frequency	100V to 240V, 50/60Hz UL60950-1st/2nd Edition, CSA No. 950, FCC Part 15 Subpart B (Class A) EN60950-1, EN55022 (Class A), EN55024, EN61000-3-2, EN61000-3-3 GB4943.1-2011, GB9254-1998, GB17625.1-2003
Power consumption	100V: 72W (operating at 6 IPS at 12.5% printing duty), 2.9W (standby) 230V: 65W (operating at 6 IPS at 12.5% printing duty), 2.6W (standby)

Others	
Environment	Operating temperature conditions: Operating assurance temperature: 0 to 40°C Printing assurance temperature: 5 to 35°C Humidity: 30 to 80%, condensation free (Conditions: With good ventilation and natural convection) Storage temperature conditions Temperature: -20 to 60°C Humidity 5 to 85%, condensation free (Conditions: Stored with the head block opened and media removed. With good ventilation and natural convection)  Humidity % Temperature °C Operating assurance temperature Printing assurance temperature  Humidity % Temperature °C Storage assurance temperature [Operating and printing assurance condition] [Storage assurance condition]
External dimensions	250 (W) X 458 (D) X 261 (H) mm 9.8 (W) X 18.0 (D) X 10.3 (H)"
Weight	11 kg (24.3 lb.), excluding media and the power cord
Accessories	Power cord, "Shaft Holder" and "SA Paper Flange", "Ribbon Core φ25x114", Cleaner head, "Manual User's (CD-R)", "Guide Quick-Start", "Safety Instructions", Label paper, Ribbon, "SA Ribbon Holder" (2 pcs.)
Options	Auto-cutter unit, Peeler unit, Serial I/F board, Parallel I/F board, Wired LAN I/F board (multi-functional) Wireless LAN board (standard/multi-functional)

1-2. Printable Area

The printable area of the printer is as follows:
When media is set to the printer, aligned it with the media guide at the left of the “Unit Mechanism”.
Though the available maximum media width is 118 mm (4.65”), there are unprintable areas on both sides: 2.5 mm (0.10”) width on the left side and 11.5 mm (0.45”) width on the right side.
The unprintable areas on both sides apply to any size media.

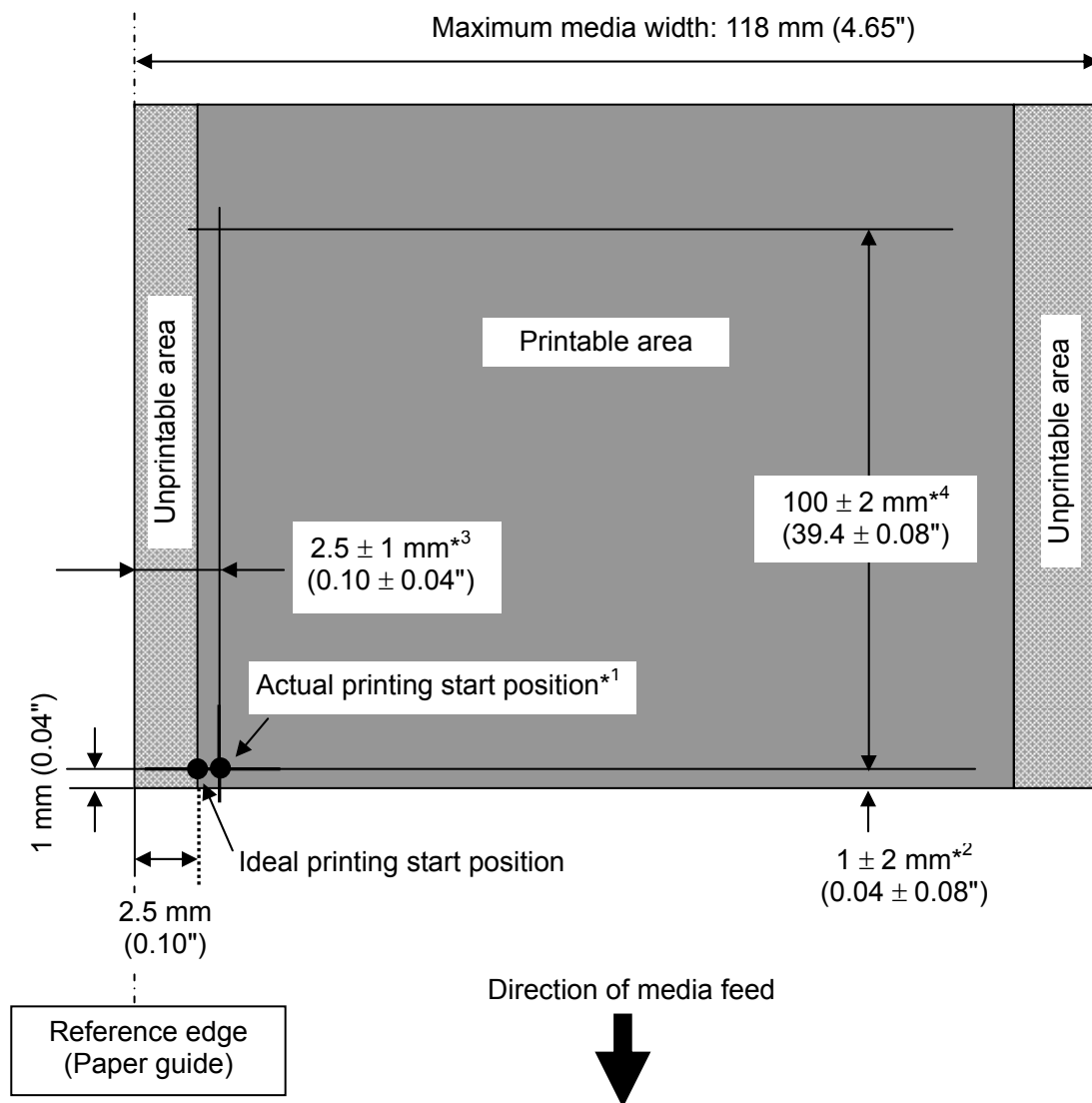


1-3. Printing Position Accuracy

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 "1-2. Printable Area".

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



*1: Actual printing start position. May deviates from the ideal position 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). Both upper sensor and bottom sensor are 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 ranges of sensors are as follows.

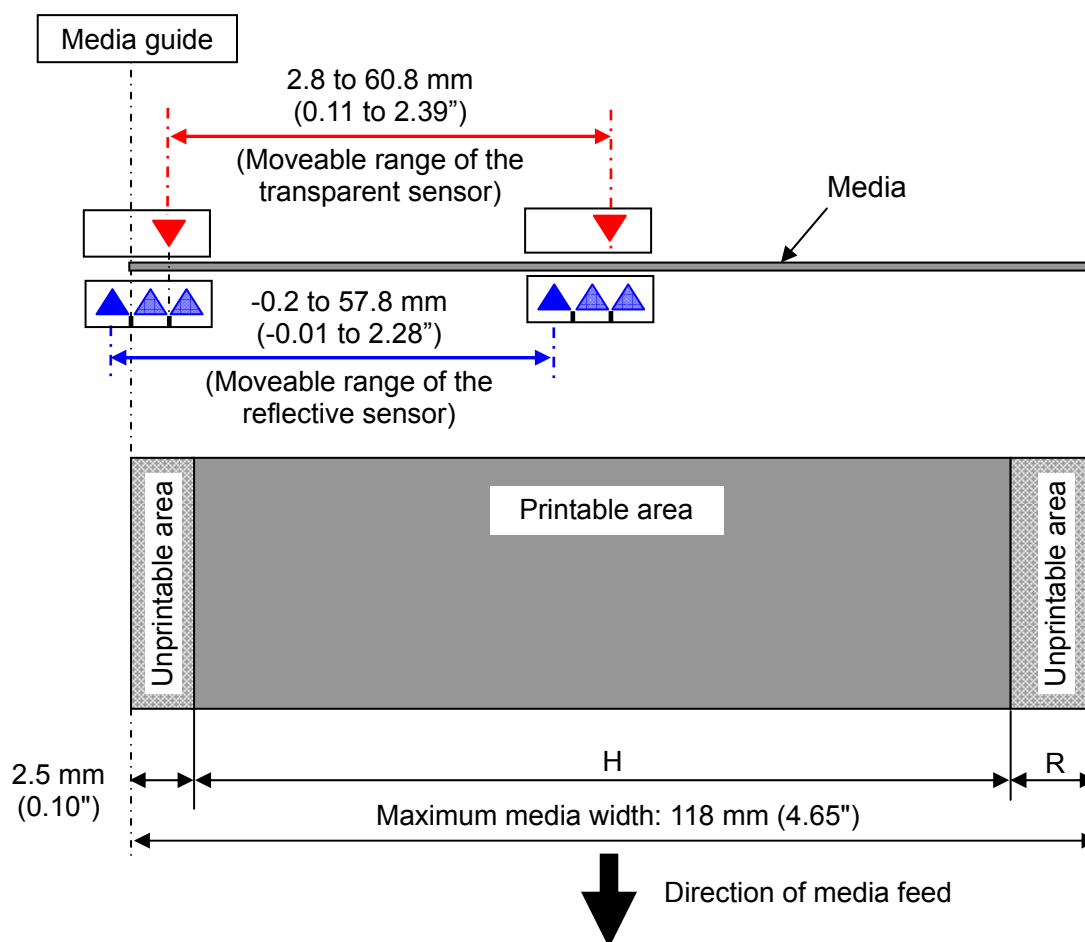
Upper sensor (transparent sensor): 2.8 to 60.8 mm (0.11 to 2.39")

Lower sensor (reflective sensor): -0.2 to 57.8 mm (-0.01 to 2.28")

Each sensor is adjustable independently. However, when you use the upper sensor (transparent sensor), the lower sensor (reflective sensor) must be always used together so that they become a set of sensors.

When both sensors are moved to the left end or the right end (center of the printing mechanism), both sensors coincide for detecting a label or U-shaped notch.

For details about the media sensors, refer to “[2-1-3 Label/Tag Detection Mechanism](#)”.



H	R
104.0 mm (4.09")	11.5 mm (0.45")

CHAPTER 2

OPERATING PRINCIPLES



CHAPTER 2 OPERATING PRINCIPLES

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2-1. Operation of Each Mechanism

This printer is comprised of the following mechanisms:

media feed/printing, label/tag detection, ribbon feed, ribbon running detection, print head up/down detection, head balance adjustment and media thickness adjustment.

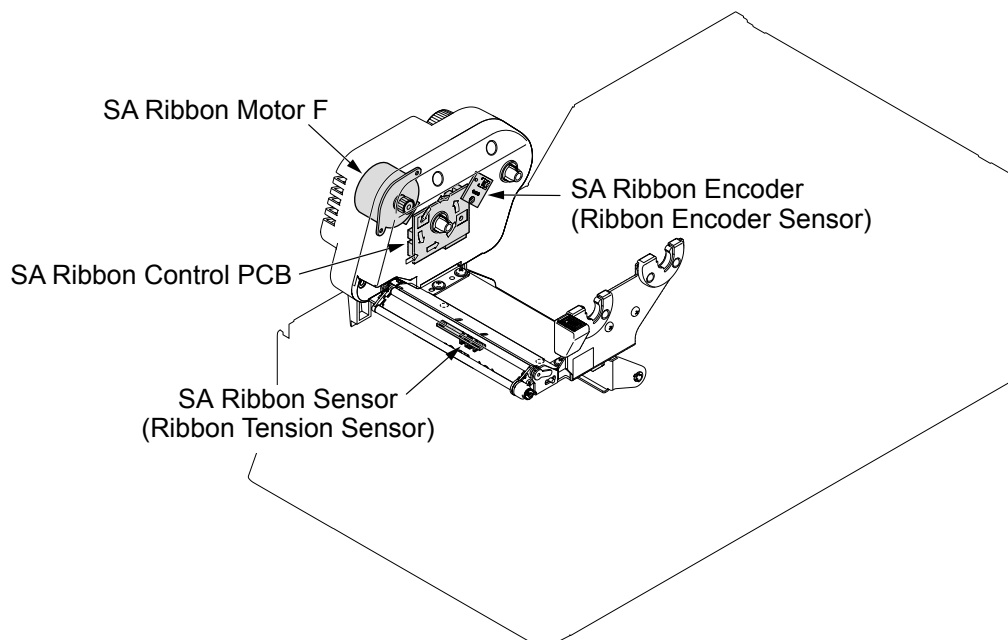
This section describes the operation of each of these mechanisms.

2-1-1. Locations and Functions of Major Electrical Parts

The following shows the locations and functions of major electrical parts.

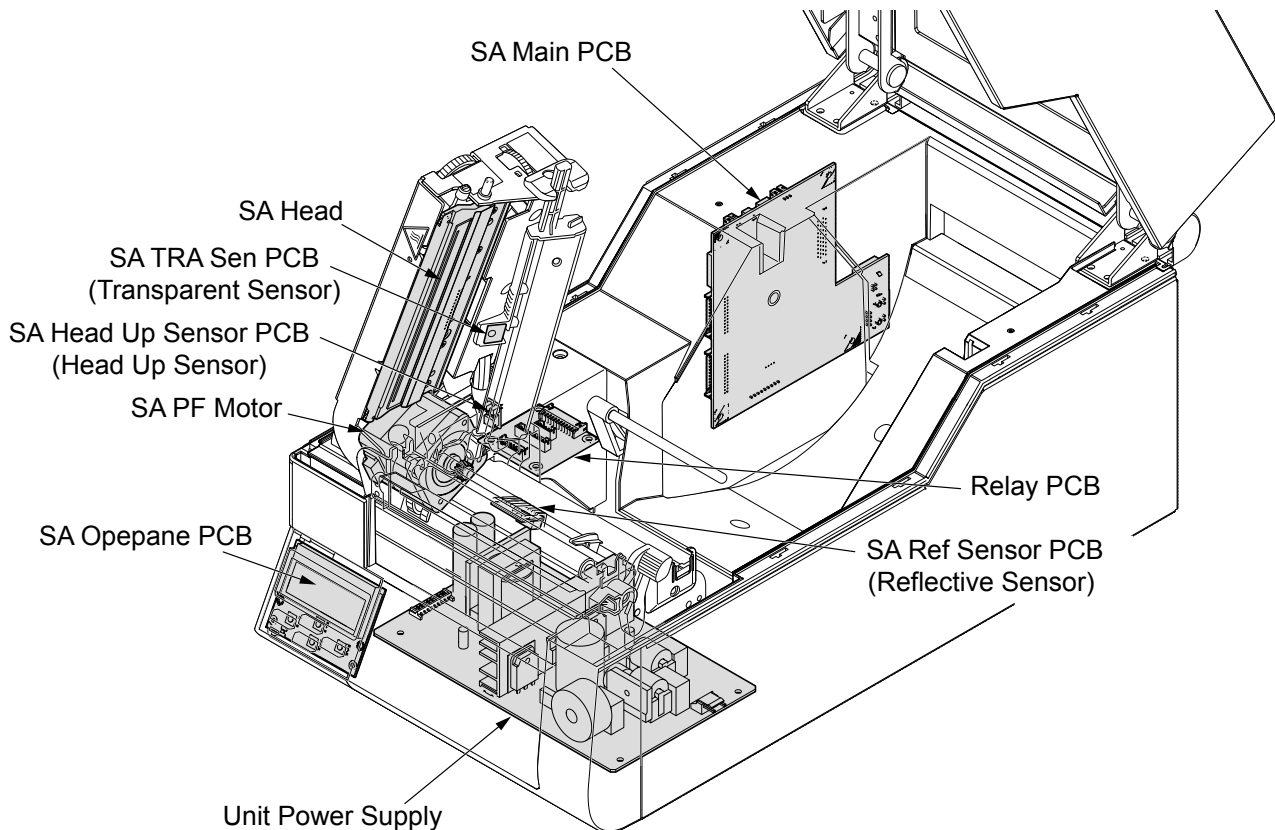
(1) “Unit Ribbon” section

Part name	Description
SA Ribbon Motor F	This motor takes up ribbon. A thermistor is attached to the motor to detect the motor temperature.
SA Ribbon Sensor (Ribbon Tension Sensor)	This sensor consists of two photointerrupters that detect the tension applied to the take-up side ribbon. Using the sensor output, the tension applied to the take-up side ribbon is controlled at a constant value.
SA Ribbon Control PCB	This PCB drives the “SA Ribbon Motor F” and the fan.
SA Ribbon Encoder (Ribbon Encoder Sensor)	This sensor is a photointerrupter that detects the running state of the supply reel. Using the sensor output, the ribbon running state as well as the ribbon end are detected



(2) Printing section

Part name	Description
SA PF Motor	This motor feeds media. A thermistor is attached to the motor to detect the motor temperature.
SA Head	It consists of a head driver and thermal elements. The thermal elements are heated to make printing on media. The thermal head incorporates a thermistor to detect the thermal head temperature.
SA Head Up Sensor PCB (Head Up Sensor)	This sensor is a photointerrupter to detect the print head position; up or down.
SA TRA Sen PCB (Transparent Sensor)	This sensor is a photo sensor to detect a label stuck on liner or U-shaped notches on tag. It also detects the media end.
SA Ref Sensor PCB (Reflective Sensor)	This sensor is a photo sensor to detect a black mark on tag. It also detects the media end
SA Main PCB	It controls entire printer system.
SA Relay PCB	It is a relay PCB located between the "SA Main PCB" and the "Unit Mechanism". The optional auto cutter unit or the peeler unit is connected to this PCB.
SA Opepane PCB	It consists of LCD, LED and switches for operation.
Unit Power Supply	It converts AC input to DC24 V.



2-1-2. Media Feed/Printing Mechanism

The major components of the media feed/printing mechanism are:

- (a) SA Head
- (b) SA PF Motor
- (c) SA Platen
- (d) Gear train

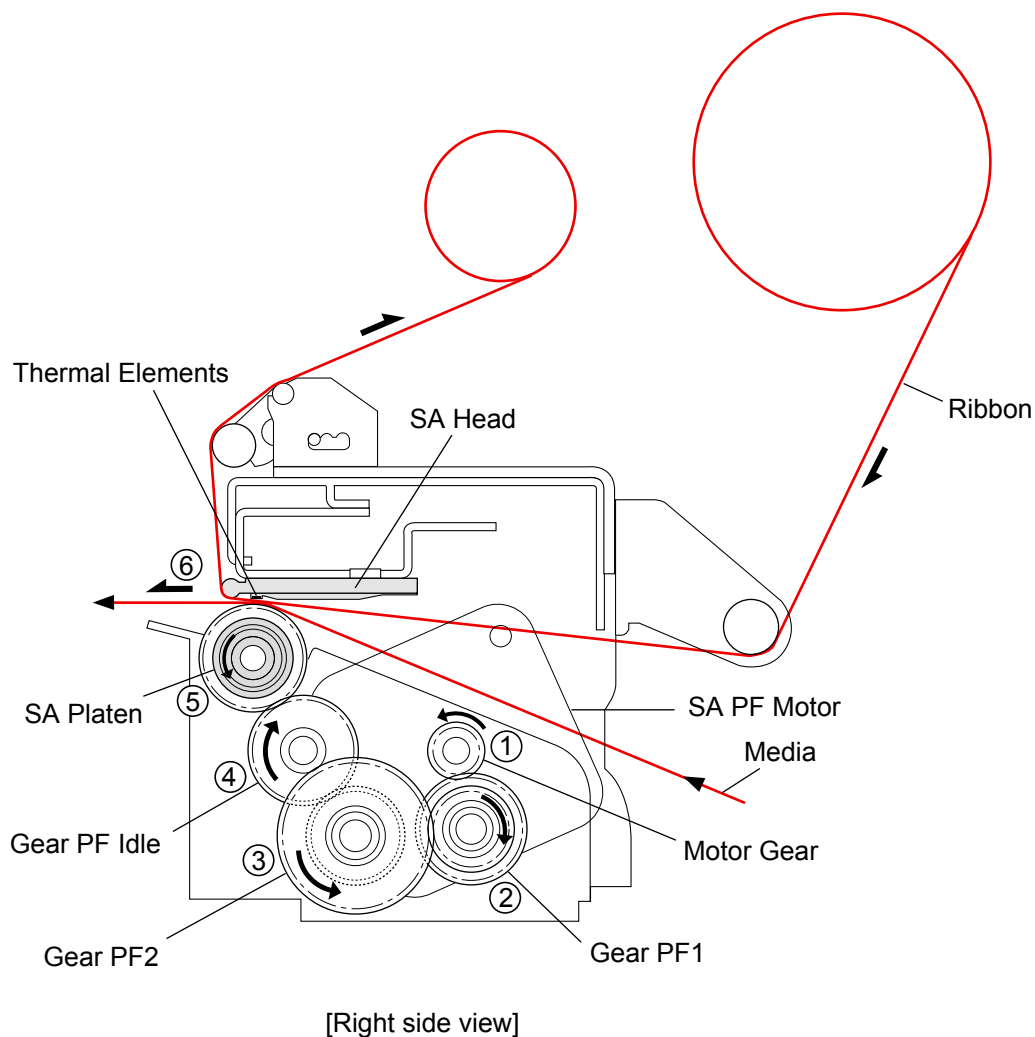
By setting the head block to the down position, the media is pushed against the “SA Platen” by the “SA Head”.

As the “SA PF Motor” (stepping motor) turns counterclockwise viewing from the right side of the printer, the “SA Platen” turns counterclockwise via the gear train (“Gear PF1”, “Gear PF2” and “Gear PF Idle”) and the media is fed forward by a friction force produced between the “SA Platen” and the “SA Head”.

In the direct thermal printing, thermal paper is heated by the energized thermal elements of the “SA Head” and printing is done.

While in the thermal transfer printing using ink ribbon, ink on the ribbon is melted by the energized thermal elements of the “SA Head” and transferred on the media surface.

When the “SA PF Motor” turns clockwise, the media is fed backwards.



2-1-3. Label/Tag Detection Mechanism

The major components of the label/tag detection mechanism are:

- (a) SA Ref Sensor PCB (Bottom sensor, Reflective sensor)
- (b) SA TRA Sen PCB (Upper sensor, Transparent sensor)

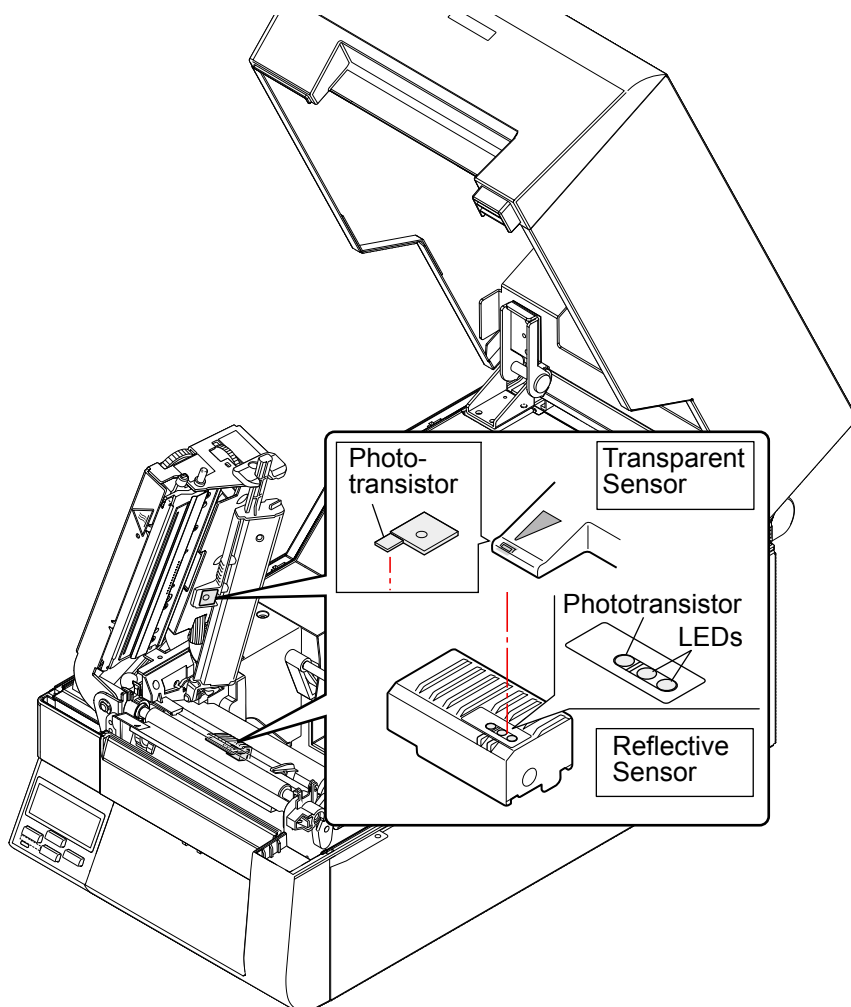
There are two sensors, the reflective sensor (bottom sensor) and the transparent sensor (upper sensor). As shown in the figure blow, the reflective sensor has two LEDs and one phototransistor. The reflective sensor is used to detect black marks on the back of tag. On the other hand, the transparent sensor is a phototransistor that receives the transparent light from the reflective sensor's 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, and tag with U-shaped notches:

For label paper, align both reflective and transparent sensors at the center of the label. For tags with U-shaped notches, align both sensors with the U-shaped notch. In both cases, align the arrow mark of the transparent sensor with the right side mark of the reflective sensor as shown below.

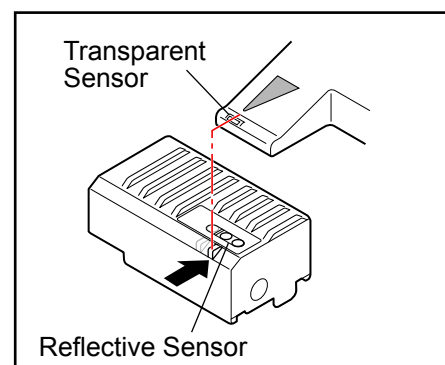
Aligning the reflective sensor for tag with black marks:

For tag with black marks, align the reflective sensor alone with the black mark. In this case, align the left side mark of the reflective sensor with the black mark as shown below.



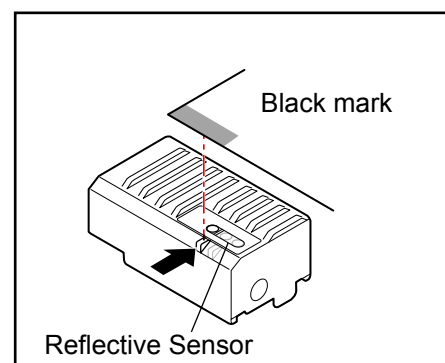
[For label paper/tag with U-shaped notches]

* Both sensors are used.



[For tag with black marks]

* Reflective sensors alone is used.



Detecting labels: (Media Sensor menu: “See Through”)

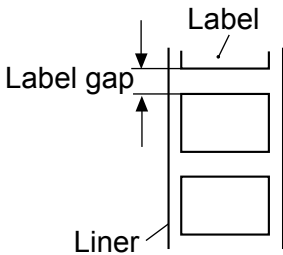
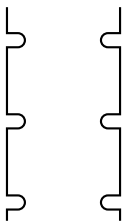
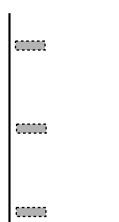
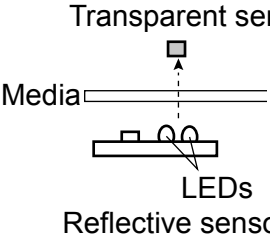
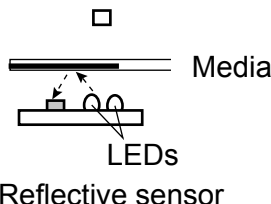
For detecting label, both reflective sensor and transparent sensor are used. Label paper passes between both sensors. The light emitted from the LEDs of the reflective sensor passes through the liner (base part of label paper) where no label is stuck on it, and the light reaches the transparent sensor. Accordingly, the phototransistor of the transparent sensor conducts. Meanwhile, in the label part, the light is blocked by the label and does not reach the phototransistor. So, the phototransistor turns OFF. By sensing the output from the transparent sensor, the CPU on the “SA Main PCB” can detect the arrival of 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 “SA Main PCB” detects the black mark by sensing the output from the reflective sensor.

	Label	Tag	
	 Label gap Label Liner	 U-shaped notch	 Black mark
Sensor to be used	Transparent and Reflective sensors		Reflective sensor
	 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, the reflective sensor detects the media end only.

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. Ribbon Feed Mechanism

The major components of the ribbon feed mechanism are:

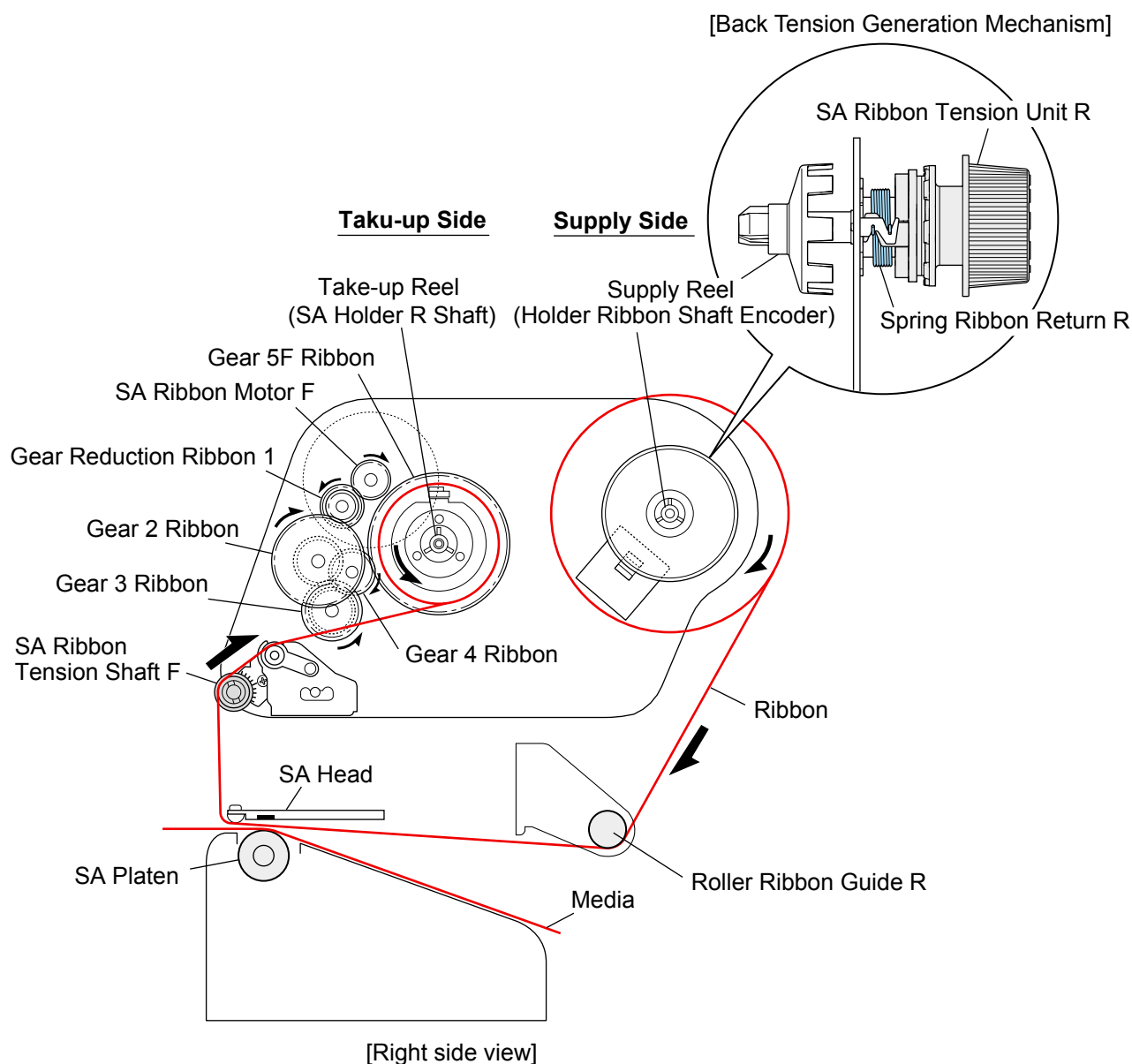
- | | |
|--|------------------------------|
| (a) SA Ribbon Motor F | (d) SA Ribbon Tension Unit R |
| (b) SA Ribbon Tension Shaft F | (e) Ribbon gear train |
| (c) SA Ribbon Sensor (Ribbon tension sensor) | |

Ink ribbon is set to the take-up reel (SA Holder R Shaft) and the supply reel (Holder Ribbon Shaft Encoder) via the supplied ribbon holders.

As the ribbon motor “SA Ribbon Motor F” on the take-up side turns in the direction shown in the figure, the take-up reel (Gear 5F Ribbon) is driven via the “Gear Reduction Ribbon 1”, “Gear 2 Ribbon”, “Gear 3 Ribbon” and “Gear 4 Ribbon”.

The ribbon is supplied from the supply reel via the “Roller Ribbon Guide R” and “SA Ribbon Tension Shaft F”, and then taken up.

A back tension generating mechanism that is formed by the “SA Ribbon Tension Unit R” and “Spring Ribbon Return R” is directly connected to the supply reel. When the ribbon is supplied, the back tension generating mechanism gives an appropriate back tension to the ribbon.



Taking up the ribbon on the take-up side:

Ribbon is taken up on the take-up side in the sequence shown below. (See the figure on the previous page.)

- * Details of ribbon tension control on the take-up side are explained in “Detecting ribbon tension (Ribbon tension sensor)” on the next page.
- (1) As the media is fed, the ribbon is also fed by a friction force produced between the media and the “SA Head”, and the ribbon on the take-up side slacks accordingly.
- (2) As the ribbon slacks, the “SA Ribbon Tension Shaft F” is pushed outward by the internal springs and the ribbon tension sensor (SA Ribbon Sensor) turns OFF.
- (3) As the ribbon tension sensor turns OFF, the “SA Ribbon Motor F” rotates faster to take up the slackened ribbon.
- (4) As the ribbon tightens, the “SA Ribbon Tension Shaft F” is pushed inward by the ribbon and the ribbon tension sensor turns ON.
- (5) As the ribbon tension sensor turns ON, the “SA Ribbon Motor F” rotates slower to take up the tightened ribbon.
- * Although the ribbon holder is directly connected to the take-up reel, since it incorporates a spring mechanism, the ribbon is also taken up via this spring mechanism.

Supplying the ribbon on the supply side:

As the media is fed, the ribbon on the supply side is fed together with the media. Thus, the ribbon is supplied from the supply reel. To the supply reel, the back tension generating mechanism (consisting of the “SA Ribbon Tension Unit R” and “Spring Ribbon Return R”) is directly connected. As the ribbon is pulled and the supply reel turns, a reversely-directed force is generated in the “SA Ribbon Tension Unit R” of the back tension generating mechanism to give an adequate back tension to the ribbon.

- * Although the ribbon holder is directly connected to the supply reel, since it incorporates a spring mechanism, the ribbon is also supplied via this spring mechanism.

The “SA Ribbon Tension Unit R” incorporates a clutch mechanism and the tension is adjustable with the parallel pin inside the adjust knob. Numbers “1” to “5” are marked on the adjust knob and the tension changes by changing the position of the parallel pin as follows.

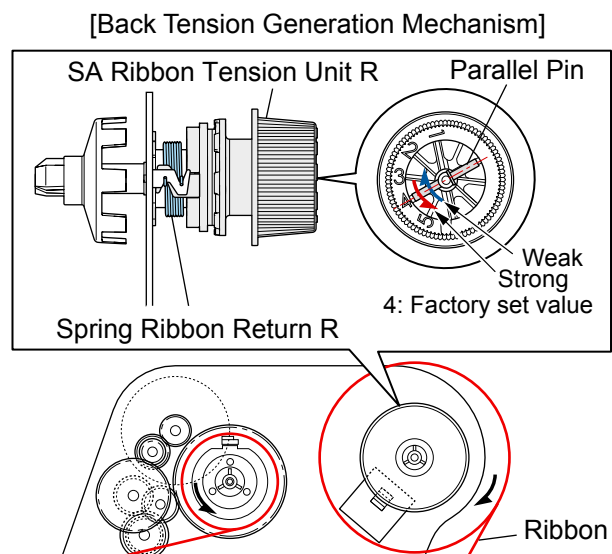
“1”: The weakest tension

|

“5”: The strongest tension

- * When shipping, the parallel pin is set to “4”.

The printer is designed to obtain an optimum tension by changing the position of the parallel pin. For wider ribbon (4 inches, etc.), set to “4” as a rough indication to give a strong tension. For narrower ribbon (2 inches, etc.), set to “2” as a rough indication to give weak tension.



Detecting ribbon tension (Ribbon tension sensor):

The ribbon tension sensor consists of two photointerrupters and is mounted on the “SA Ribbon Sensor” located on the take-up side (front side) of the “Unit Ribbon”. It detects the ribbon tension to adequately control it.

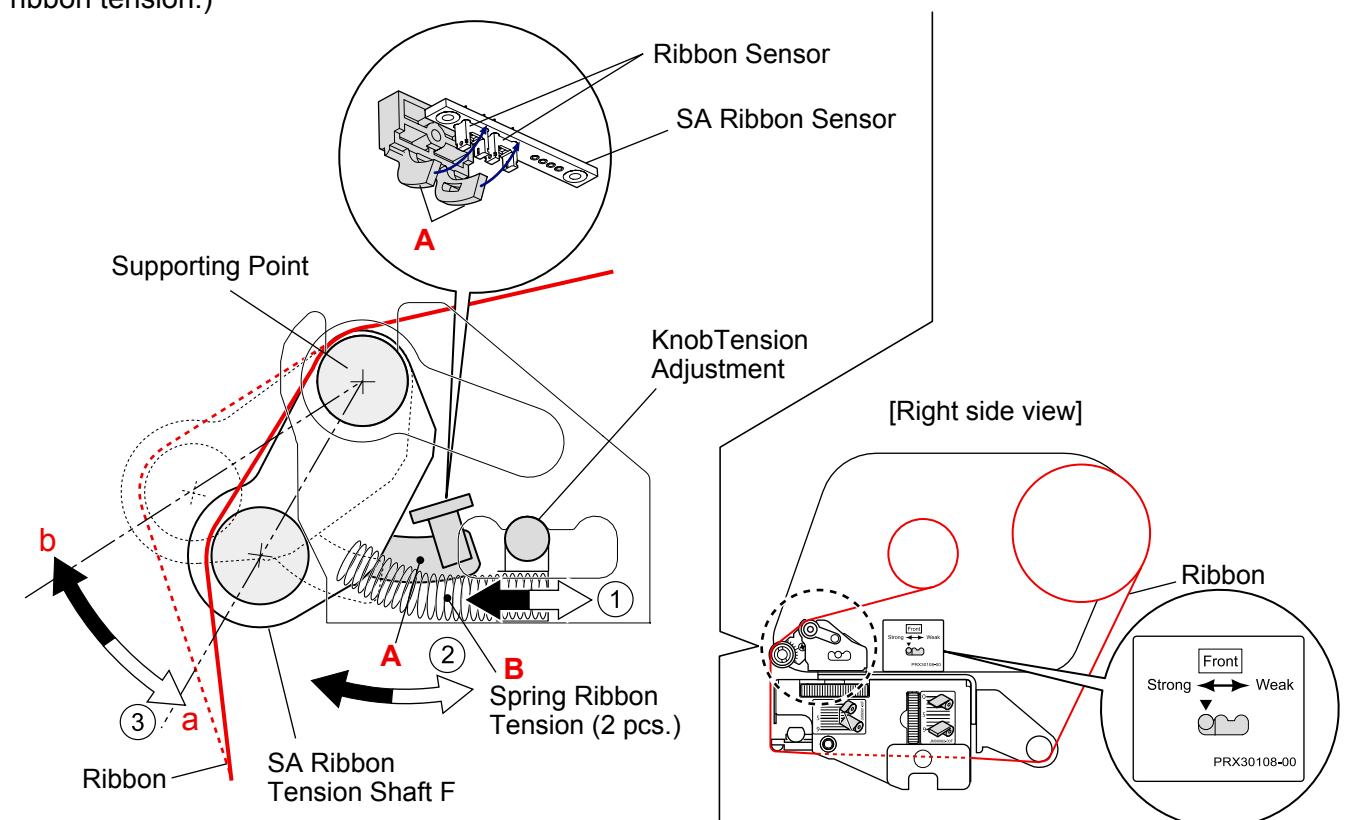
As the “SA Ribbon Motor F” takes up the ribbon on the take-up side, the ribbon tightens, and the “SA Ribbon Tension Shaft F” is pushed inward (in the direction “a”) by the ribbon. As a result, the projecting parts “A” of the “SA Ribbon Tension Shaft F” are inserted into the photointerrupters of the “SA Ribbon Sensor”, and the photointerrupters turn OFF.

As the printing proceeds, the ribbon is fed together with the media and the ribbon on the take-up side slackens. Then, the “SA Ribbon Tension Shaft F” is pushed outward (in the direction “b”) by the internal springs “B”.

As a result, the projecting parts “A” come off the photointerrupters and the photointerrupters turn ON.

When the ribbon slackens and the photointerrupters turn ON, the “SA Ribbon Motor F” increases its rotational speed to take up the ribbon. Then, the ribbon tightens again and the projecting parts “A” are inserted into the photointerrupters. At this time, the “SA Ribbon Motor F” decreases its rotational speed to loosen the ribbon.

The above ribbon tension control cycle is repeated and the tension applied to the ribbon is kept constant. (The projecting parts “A” are shifted a bit each other with respect to the photointerrupters so that each photointerrupter turns ON or OFF at a different timing, resulting in finely controlling the ribbon tension.)



Tension adjustment mechanism:

To apply adequate ribbon tension, you can change the spring force of “B”. The spring force is adjustable in 3 steps with the “Knob Tension Adjust”. As you move the knob toward the ▼ mark indicated on the label, since the spring is pushed to the left and compressed, the spring force becomes stronger and stronger tension is applied to the ribbon.

2-1-5. Ribbon Running Detection Mechanism

The major components of the ribbon running detection mechanism are:

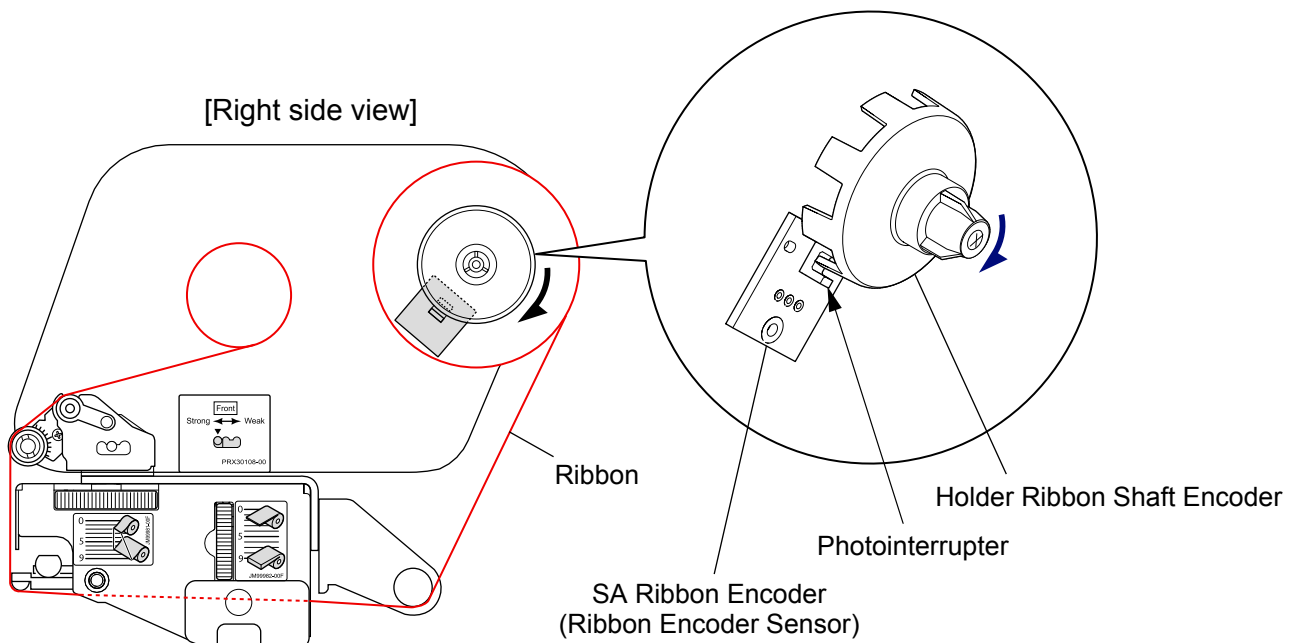
- (a) Holder Ribbon Shaft Encoder
- (b) SA Ribbon Encoder (Ribbon encoder sensor)

The ribbon running is detected by using the photointerrupter on the “SA Ribbon Encoder” (Ribbon encoder sensor) and the “Holder Ribbon Shaft Encoder” (the supply reel).

Slits are around the bottom of the “Holder Ribbon Shaft Encoder” as shown below.

When the ribbon is supplied from the supply reel, the “Holder Ribbon Shaft Encoder” turns and its slits cross the photointerrupter. Then the photointerrupter turns ON and OFF to produce a pulse output. The CPU of the “SA Main PCB” receives the pulse and detects the ribbon running on the supply side.

If no pulse is output from the photointerrupter while the ribbon motor “SA Ribbon Motor F” is taking up the ribbon, the CPU judges as the ribbon end.



2-1-6. Print Head Up/Down Detection Mechanism

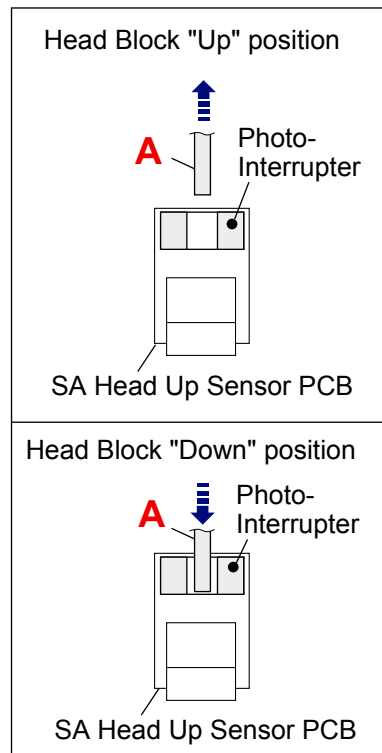
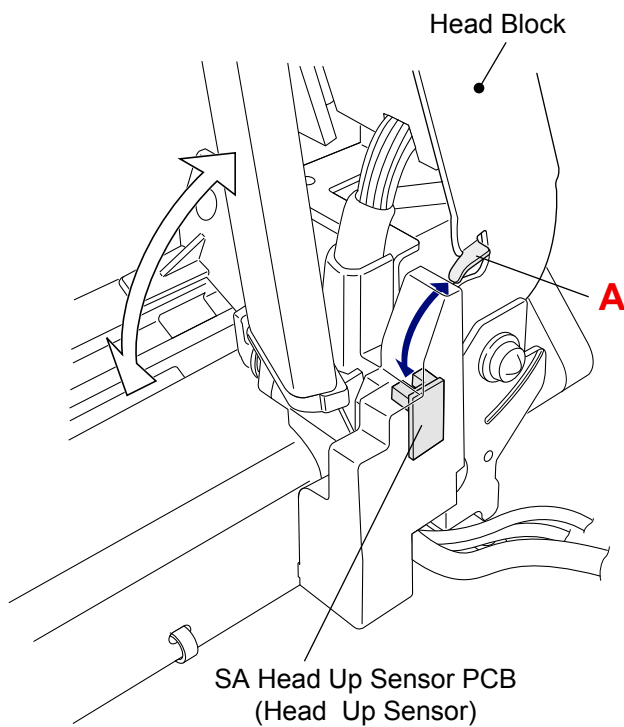
The components of the print head up/down detection mechanism are:

- (a) SA Head Up Sensor PCB (Head up sensor)
- (b) Projection that engages with the photointerrupter

The print head up/down detection mechanism detects the up (open)/down (close) status of the head block.

When the head block is in the up position, the projection “A” is disengaged from the photointerrupter of the “SA Head Up Sensor PCB” (head up sensor). At this time, the photointerrupter turns ON and “Low” level is output from the head up sensor.

When the head block is in the down position, the projection “A” is engaged in the photointerrupter. At this time, the photointerrupter turns OFF and “High” level is output from the head up sensor. The CPU on the “SA Main PCB” detects the up or down position of the head block by sensing the output from the head up sensor.



2-1-7. Head Balance Adjustment Mechanism

The major components of the head balance adjustment mechanism are:

- (a) Lever Head Balance (c) Spring Head L/R
- (b) Cam Head Balance

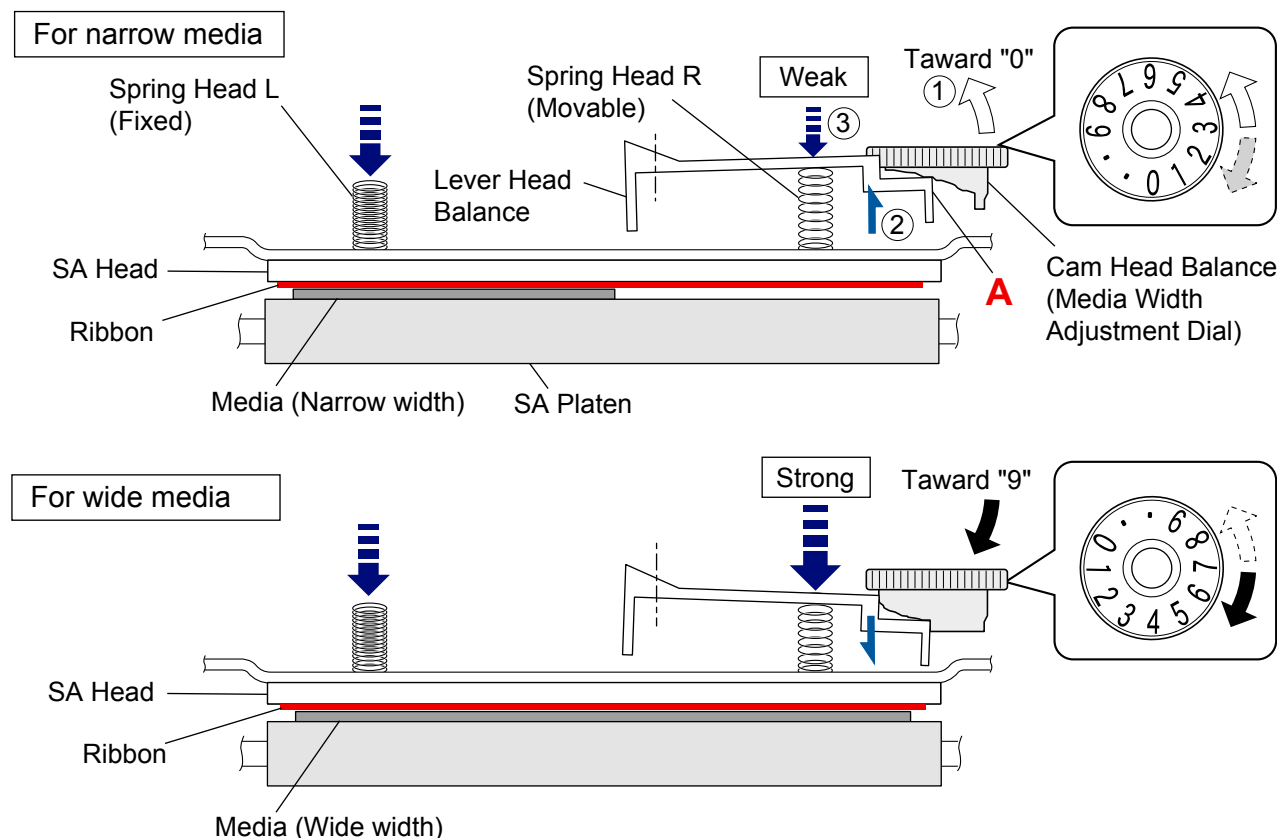
The head balance adjustment mechanism eliminates uneven printing density on the media. The head balance adjustment is accomplished by changing the right side head pressure according to the media width to be used. To adjust, the blue Media width adjustment dial (Cam Head Balance) is used. When narrow width media is used, set the dial toward "0" to give weaker pressure. On the other hand, when wide width media is used, set it 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" act to press the "SA Head" against the "SA 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 "Lever 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 the part "A" moves up, the "Spring Head R" is pressed with weaker force by the "Lever Head Balance" (③), and the right side pressure against the "SA Head" decreases, resulting in even printing density. You need to adjust 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, turn the Media width adjustment dial toward "9". Then the part "A" of the "Lever Head Balance" moves down to apply stronger pressure to the "SA Head". (Larger number for wider media)



2-1-8. Media Thickness Adjustment Mechanism

The major components of the media thickness adjustment mechanism are:

- (a) Cam Head Adjust (Media thickness adjustment dial)
- (b) Bracket Head
- (c) SA Lever Head Adjust 2

According to the softness of media, the optimum thermal element position against the media is displaced. The media thickness adjustment mechanism shifts the position of the “SA Head” back and forth a little to obtain optimum printing quality.

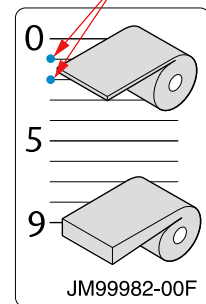
* When shipping, the Media thickness adjustment dial is set to “1” or “2” depending on your printer.

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

When soft media is used, the optimum thermal element position is obtained by setting the dial to “1” or “2” (the shipping value (default value)).

* On the label, a dot is marked to either “1” or “2” depending on your printer as shown on the right. The marked value is the optimum position for soft media.

Marking (Default position)
Either “1” or “2”



When hard media is used (tag paper):

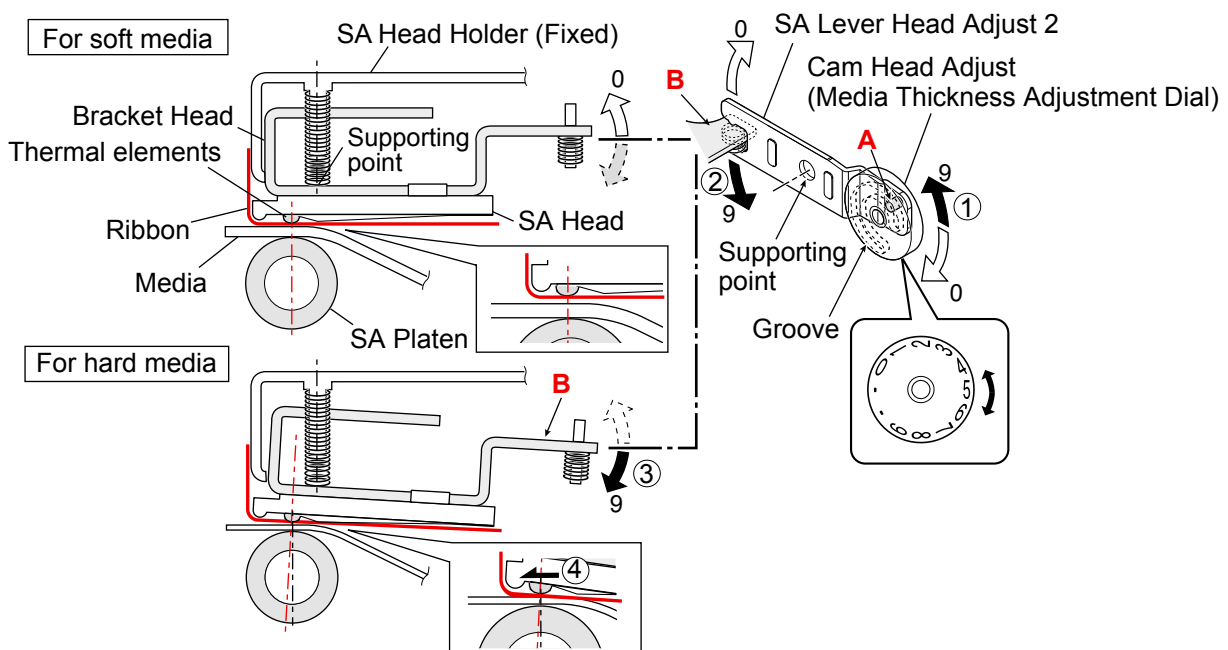
When hard media is used, the optimum thermal element position shifts a bit toward the front (toward the left viewing from the right side) from the center of the “SA Platen”.

Since the optimum position varies according to the hardness of media, it is necessary to adjust the Media thickness adjustment dial from “1” or “2” to a larger number to find the optimum position.

As the dial is turned, the projection “A” of the “SA Head Adjust Lever 2” moves along the groove of the dial, and the end part of the “SA Head Adjust Lever 2” swings up and down around its supporting point.

Since the end part of the “SA Head Adjust Lever 2” is connected to the end “B” of the “Bracket Head” via the spring, the end “B” also swings and down. When the end “B” swings, the “Bracket Head” turns around its supporting point, resulting in shifting the thermal element position slightly.

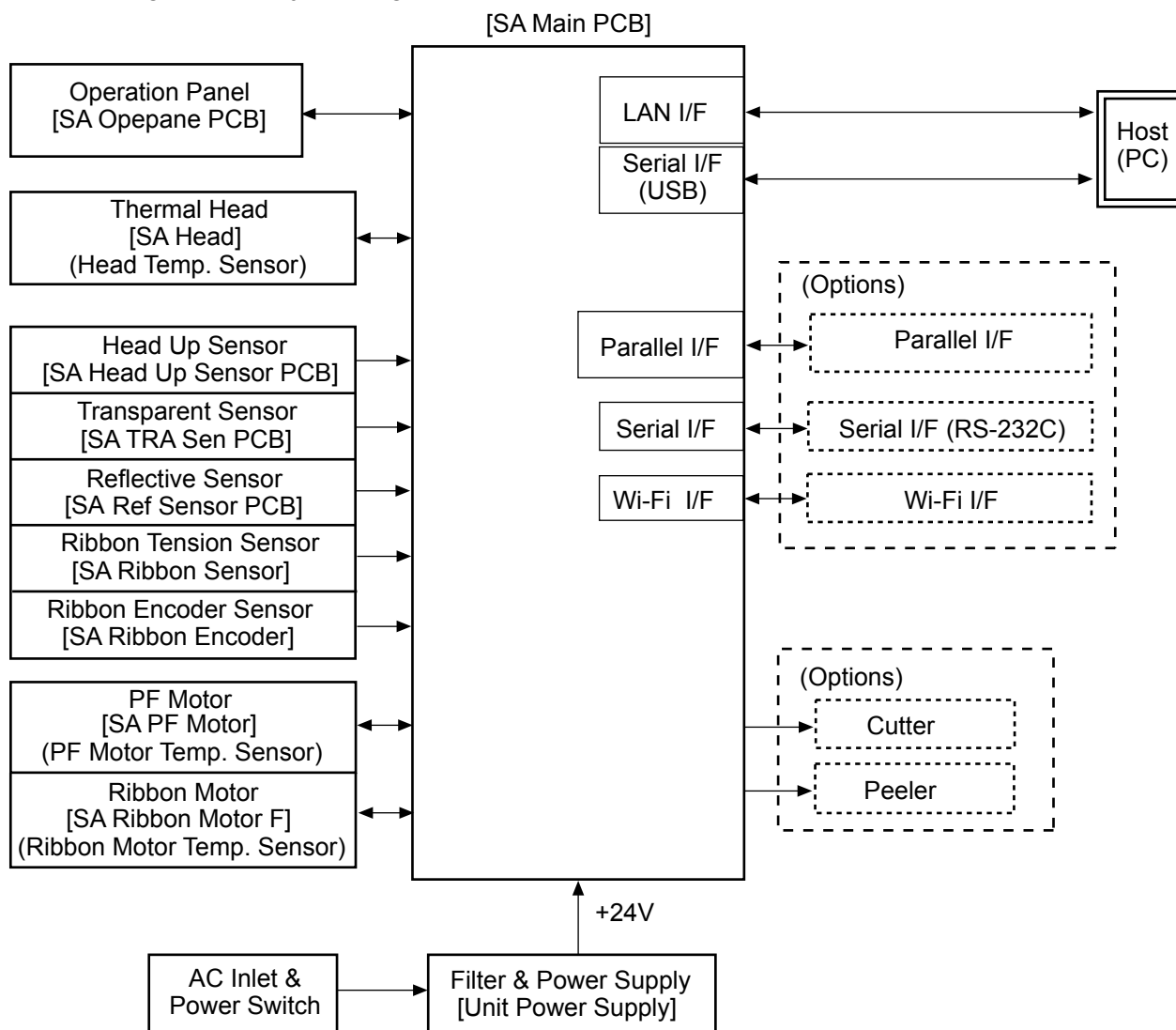
When the Media thickness adjustment dial is set to the larger number (①) for hard media, the end “B” of the “Head Bracket” lowers more (②, ③). Then, the thermal element position shifts to the left from the center of the “SA Platen” (④), viewing from the right side of the “SA Platen”.



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) Filter & power supply section

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.

(2) SA Main PCB

Controls the entire operations of the printer. It consists of CPU, ROM, RAM, FPGA, driver circuits, etc.

(3) Operation panel (SA Opepane PCB)

A panel used to indicate the operating status of the printer and to set specifications. It consists of 4 keys, 1 LED (Green/Red) and 1 LCD.

(4) Thermal print head

The thermal print head has the following thermal elements. It also has the print head driver circuit.

- 864 dots

(5) Sensors

The following 8 sensors are used:

Sensor name	Description
Head Up Sensor [SA Head Up Sensor PCB]	Photointerrupter.
Transparent Sensor [SA TRA Sen PCB]	Photo sensor using the phototransistor.
Reflective Sensor [SA Ref Sensor PCB]	Photo sensor consisting of 2 LEDs and 1 phototransistor.
Head Temperature Sensor (SA Head)	Thermistor incorporated in the "SA Head".
PF Motor Temperature Sensor (SA PF Motor)	Thermistor attached to the "SA PF Motor".
Ribbon Motor Temperature Sensor (SA Ribbon Motor F)	Thermistor attached to the "SA Ribbon Motor F".
Ribbon Tension Sensor (SA Ribbon Sensor)	Photo sensor using 2 photointerrupters. Located on the front side of the "Unit Ribbon".
Ribbon Encoder Sensor (SA Ribbon Encoder)	Photointerrupter to detect the running status of ribbon. Located on the ribbon supply side.

(6) Motors

Two motors are used. The "SA PF Motor" is a stepping motor to feed media. The "SA Ribbon Motor F" is a stepping motor to take up ribbon.

(7) USB I/F (USB2.0 compatible full-speed mode/high-speed mode)

This is a circuit to transmit and receive serial data between the printer and the host by means of USB2.0 compatible full-speed mode (12Mbps) or high-speed mode (480Mbps).

USB I/F or Wired LAN I/F is automatically selected when data is received.

(8) Wired LAN I/F

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

USB I/F or Wired LAN I/F is automatically selected when data is received.

(9) Serial I/F (RS-232C) (Option)

This is a circuit to transmit and receive serial data between the printer and the host.

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

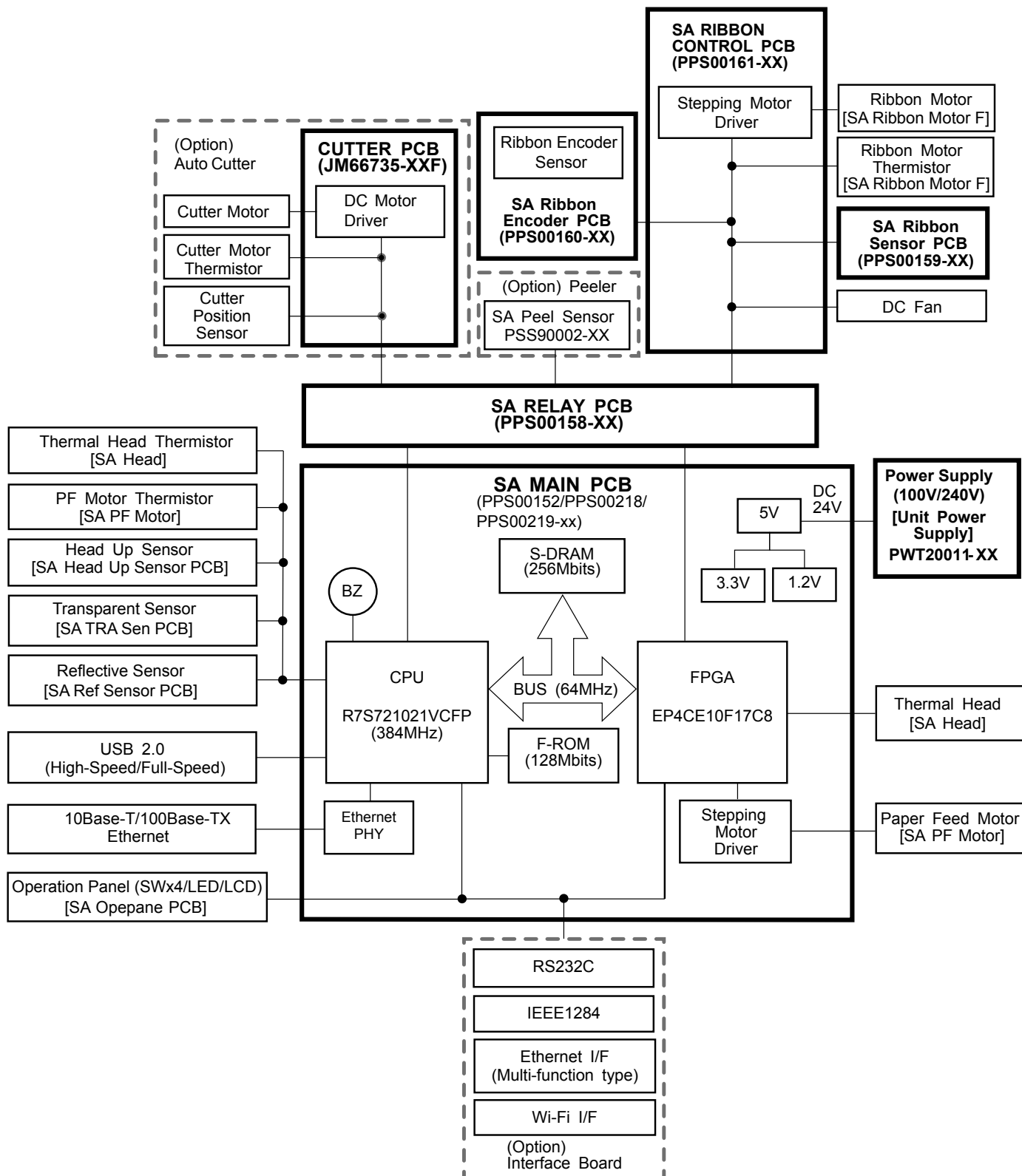
This is the parallel I/F to transmit and receive parallel data between the printer and the host. It supports Centronics Compatible mode, NIBBLE mode and ECP mode.

(11)Wireless LAN I/F (Option)

This is a circuit that supports wireless LAN protocols (IEEE802.11n/IEEE802.11g/IEEE802.11b).

2-2-2. Operation of Control Unit

The following descriptions are for major functions of the components.



(1) CPU

The CPU is a microprocessor with 32-bit architecture. The clock fed to the CPU is 48 MHz. The CPU internally multiplies this 48 MHz by 8 times and uses 384 MHz clock. The CPU includes cache memory, RAMs, DMA controller, serial I/F, USB function controller, LAN function controller, A/D converter, etc.

(2) Flash ROM

A flash ROM of 128M bits (16M bytes) that stores the firmware and CG (character generator).

(3) SDRAM (Synchronous dynamic RAM)

A SDRAM of 256M bits (32M bytes) that is used as working area, input buffer and download buffer

(4) FPGA

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

(5) Head control

This is a circuit to control the thermal head driver incorporated in the thermal head. It also checks if a thermal element of the thermal head is faulty.

(6) Stepping motor driver (For “SA PF Motor”)

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

(7) Stepping motor driver (For “SA Ribbon Motor F”)

This is a circuit to drive the “SA Ribbon Motor F”. The “SA Ribbon Motor F” is a stepping motor.

(8) Buzzer

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

(9) DC Fan (SA Fan)

A cooling fan for the “SA Ribbon Motor F”. When the temperature of the “SA Ribbon Motor F” exceeds a certain value, the fan starts to work.

2-2-3. Memory map

00000000h	I/O		FPGA
000000FFh			
0C000000h	RAM Downloading Area (4M Bytes) Image Buffer Others		SDRAM 32M Bytes
0DFFFFFFh			
18000000h	Boot Loader		Serial Flash ROM 16M Bytes
1802FFFFh			
18030000h	Firmware		
1834FFFFh			
18350000h	ROM Downloading Area (4M Bytes)		
1874FFFFh			
18760000h	FPGA Data		
1879FFFFh			
187A0000h	Setting Information (User Settings)		
187AFFFFh			
187B0000h	Setting Information (Factory-set Settings)		
187BFFFFh			
187C0000h	LCD Character Data (For downloading) (For CSA/CSE)		
187CFFFFh			
187D0000h	LCD Font Data (For downloading) (For CSA/CSE)		
187DFFFFh			
187E0000h	Service Information (Backup)		
187EFFFFh			
187F0000h	Service Information		
187FFFFFh			
18800000h	Chinese Font (8M Bytes)		
18FFFFFFh			
20000000h	Command RAM/Data RAM (Built-in CPU)		CPU
202FFFFFh			
20300000h	I/O (Built-in CPU) Reserved Area		
FFFFFFFh			

2-2-4. Sensors

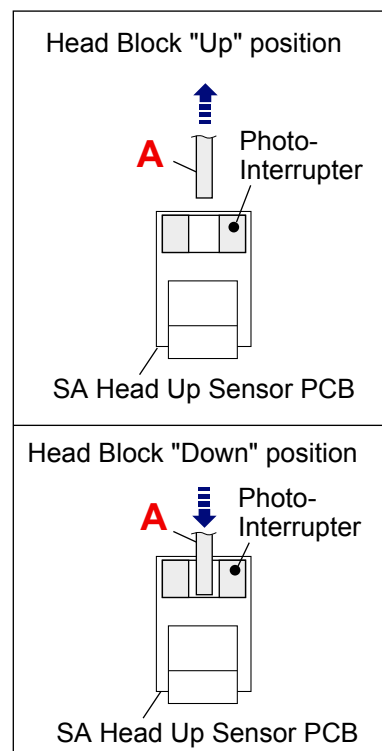
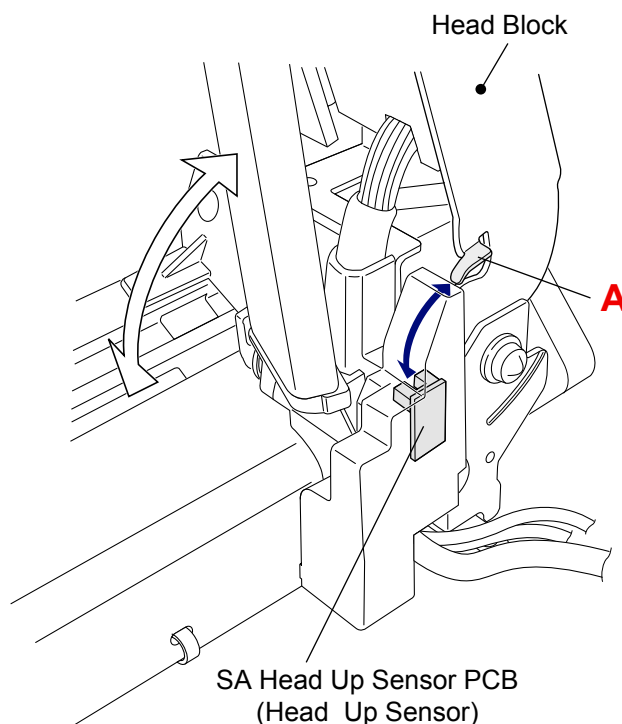
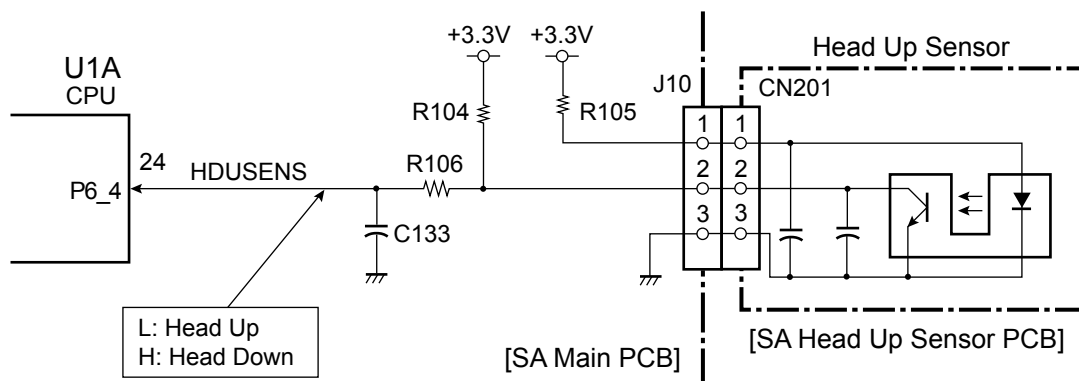
(1) Head up sensor (SA Head Up Sensor PCB)

The head up sensor is used to detect the head position (up or down). This sensor uses a photointerrupter.)

When the head block is closed (in the down position), the projection “A” of the head block is engaged in the head up sensor, and the light emitted from the LED of the photointerrupter is blocked by the projection “A”. Thus, the phototransistor turns OFF, and pin 24 (HDUSENS) of the CPU (U1A) goes to “High” level.

When the head block is opened (in the up position), the projection “A” is disengaged from the head up sensor, and the light emitted from the LED reaches the phototransistor. Thus, the phototransistor turns ON and pin 24 (HDUSENS) of the CPU goes to “Low” level.

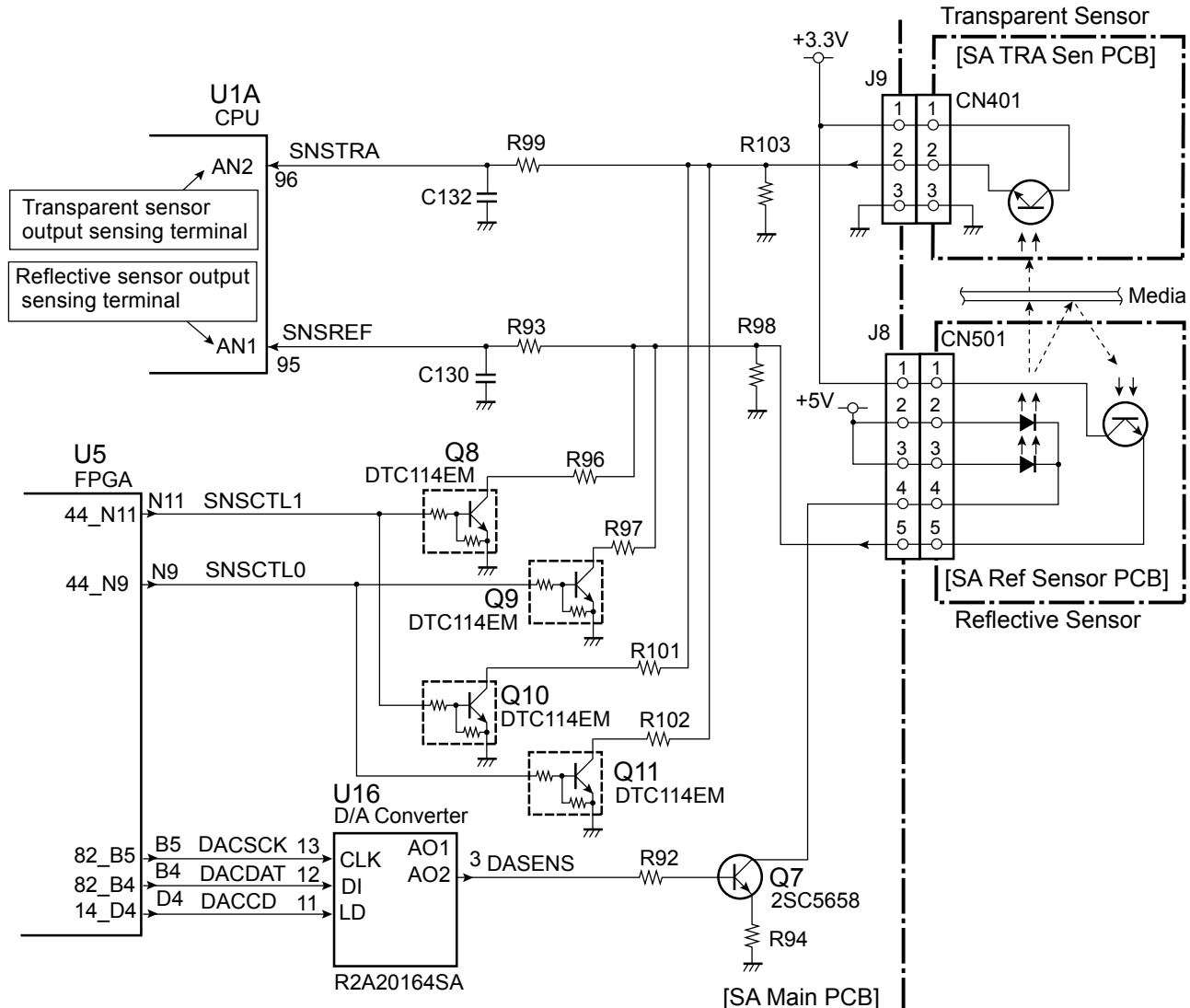
When the head block is opened, the LED on the operation panel blinks in red and the LCD displays “Error Head Open”. Then, the printer goes off-line.



(2) Transparent sensor (SA TRA Sen PCB) and reflective sensor (SA Ref Sensor PCB)

The transparent sensor and the reflective sensor are used together to detect labels stuck on the liner or U-shaped notches on tag. On the other hand, the reflective sensor alone is used to detect black marks 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 and reflective sensor (for detecting labels or U-shaped notches):

When the portion of the liner where no label stuck on it passes between both sensors, the light emitted from the reflective sensor's LEDs reaches the transparent sensor, passing through the liner only. Thus, the transparent sensor (phototransistor) conducts and the voltage corresponding to the amount of light is applied to pin 96 (SNSTRA) of the CPU (U1A).

Meanwhile, when the portion of the liner where 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 96 (SNSTRA) of the CPU goes to "Low" level. From these levels, the CPU can detect the arrival of the label leading edge. When media runs out, since the light emitted from the LEDs directly falls on the transparent sensor continuously, media end can be detected. In this case, pin 96 (SNSTRA) of the CPU will go to "High" level.

When the transparent sensor is conducted, the voltage at pin 96 (SNSTRA) varies depending on the characteristics of the light receiving element (phototransistor) of the transparent sensor and other factors. To solve this problem, the FPGA (U5) outputs SNSCTL0 (pin N9) and SNSCTL1 (pin N11) signals to turn ON or OFF Q11 and Q10. Thus, R102 and R101 (voltage dividing resistors) are connected or disconnected to minimize the difference in level at pin 96 (SNSTRA).

The current flowing into the LEDs is determined by the data sent from the FPGA to the digital-to-analog converter (U16). The digital-to-analog converter converts the data received from the FPGA and outputs resultant level at pin 3. The base current of the transistor Q7 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 FPGA changes data (LED current) to keep the level at pin 96 (SNSTRA) of the CPU constant.

Reflective sensor (for detecting black marks on tag):

When tag with black marks is used, light is reflected by the tag in the place where no black mark is on it. In this case, the phototransistor of the reflective sensor conducts and the voltage corresponding to the amount of light is applied to pin 95 (SNSREF) of the CPU (U1A).

When the light falls on the black mark, no light is reflected. Thus, the phototransistor turns OFF and pin 95 (SNSREF) of the CPU goes to “Low” level.

When media runs out, since the light is not reflected, no light continuously falls on the phototransistor. Thus, pin 95 (SNSREF) of the CPU goes to “Low” level continuously and media end is detected.

When the reflective sensor is conducted, the voltage at pin 95 (SNSREF) varies depending on the characteristics of the light receiving element (phototransistor) of the reflective sensor and other factors. To solve this problem, the FPGA (U5) outputs SNSCTL0 (pin N9) and SNSCTL1 (pin N11) signals to turn ON or OFF Q9 and Q8. Thus, R97 and R96 (voltage dividing resistors) are connected or disconnected to minimize the difference in level at pin 95 (SNSREF).

As to the current control of the LEDs, the operation is the same as for “Transparent sensor and reflective sensor (for detecting labels or U-shaped notches):” mentioned above.

to pin 3.

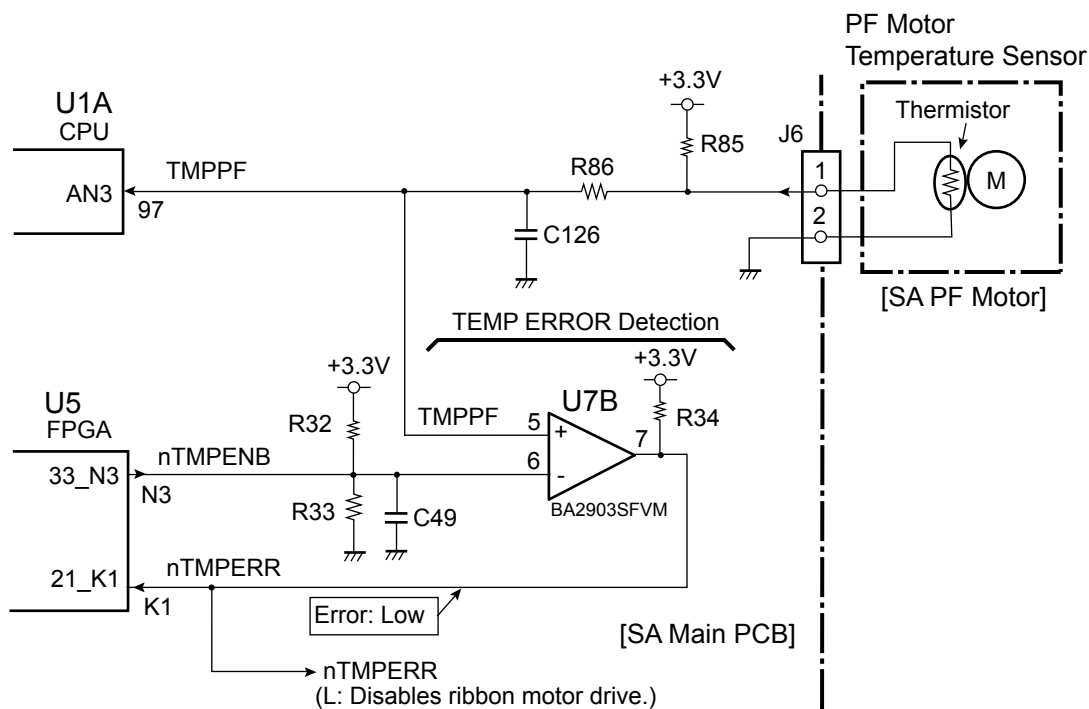
If the temperature of the “SA Head” exceeds 100°C (212°F), the head temperature sensor output voltage becomes lower than the reference voltage, and pin 1 of U7A goes to “Low” level. At this time, pin K1 (nTMPERR) is “Low” and the FPGA (U5) detects an abnormally high temperature.

In this abnormal state, the printer stops +24V DC supply to the “SA Head”. Also it stops +24V DC supply to the “SA PF Motor” and “SA Ribbon Motor F”.

(4) 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”.

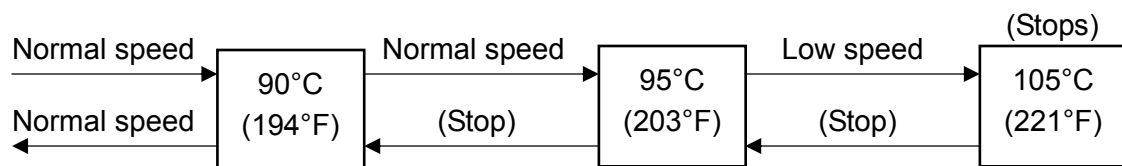
Since the resistance of the thermistor changes according to the temperature change, the voltage at pin 97 (TMPPF) of the CPU (U1A) changes accordingly. The CPU senses the voltage at pin 97 (TMPPF) to detect the temperature of the “SA PF Motor”.



Printing operation when the “SA PF Motor” temperature rises:

When the temperature of the “SA PF Motor” rises to 95°C (203°F), printing speed is reduced to avoid overheating. If it reaches 105°C (221°F), the “SA PF Motor” stops after printing the current label. In this case, the LED on the operation panel blinks in red and the LCD displays “Error PFMotor Hot”, and the printer goes off-line.

When the temperature of the “SA PF Motor” falls below 90°C (194°F), the LED and LCD returns to normal display, and printing automatically resumes.



Abnormally high temperature detection:

To protect the “SA PF Motor” from being damaged, an abnormally high temperature detection circuit is provided. If the temperature of the “SA PF Motor” exceeds a set temperature limit, the LED on the operation panel blinks in red and the LCD displays “Error System Fail”, and the printer goes off-line. To recover from the error status, turn OFF the printer once and then turn it ON.

A reference voltage, i.e., an allowable temperature limit, is applied to pin 6 of the comparator (U7B), while the sensor output voltage (TMPPF) from the PF motor temperature sensor is applied to pin 5.

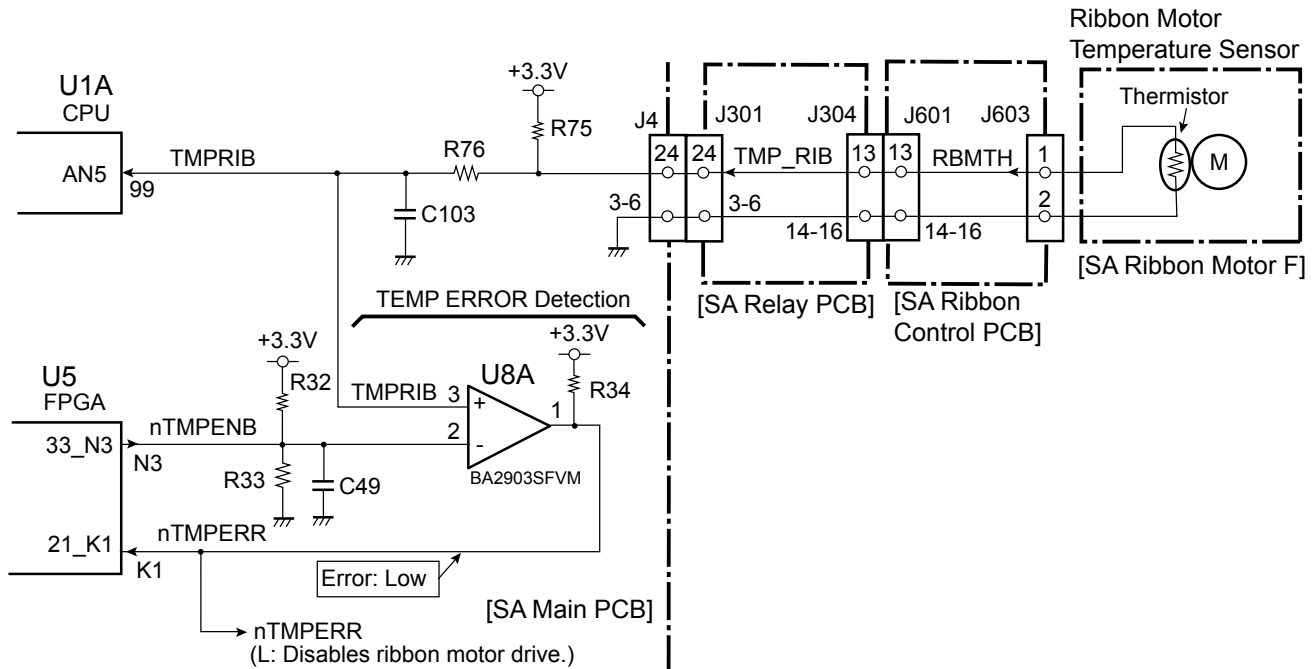
If the temperature of the “SA PF Motor” exceeds a certain level, the PF motor temperature sensor output voltage becomes lower than the reference voltage, and the pin 7 of U7B goes to “Low” level. At this time, pin K1 (nTMPERR) is “Low” and the FPGA (U5) detects an abnormally high temperature.

In this abnormal state, the printer stops +24V DC supply to the “SA PF Motor”. Also, it stops +24V DC supply to the “SA Head” and “SA Ribbon Motor F”.

(5) Ribbon motor temperature sensor

The ribbon motor temperature sensor is used to detect the temperature of the “SA Ribbon Motor F” on the ribbon take-up side. This sensor is a thermistor bonded to the “SA Ribbon Motor F”.

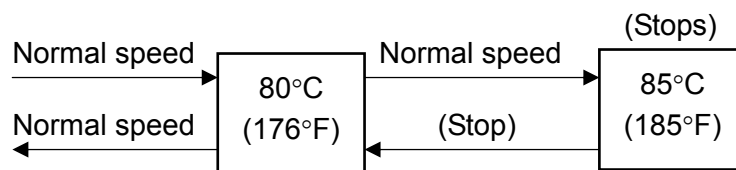
Since the resistance of the thermistor changes according to the temperature change, the voltage at pin 99 (TMPRIB) of the CPU (U1A) changes accordingly. The CPU senses the voltage at pin 99 (TMPRIB) to detect the temperature of the “SA Ribbon Motor F”.



Printing operation when the “SA Ribbon Motor F” temperature rises:

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 LED on the operation panel blinks in red and the LCD displays “Error RBMotor Hot”, and the printer goes off-line. When the temperature of the “SA Ribbon Motor F” falls below 80°C (176°F), the LED and LCD returns to normal display, and printing automatically resumes.



Abnormally high temperature detection:

To protect the “SA Ribbon Motor F” from being damaged, an abnormally high temperature detection circuit is provided. If the temperature of the “SA Ribbon Motor F” exceeds a set temperature limit, the LED on the operation panel blinks in red and the LCD displays “Error System Fail”, and the printer goes off-line. To recover from the error status, turn OFF the printer once and then turn it ON.

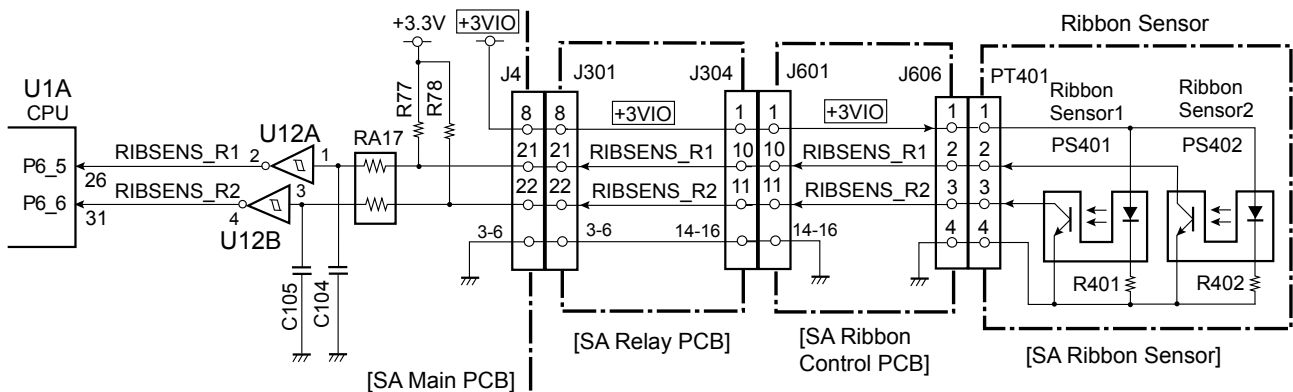
A reference voltage, i.e., an allowable temperature limit, is applied to pin 2 of the comparator (U8A), while the sensor output voltage (TMPRIB) from the ribbon motor temperature sensor is applied to pin 3.

If the temperature of the “SA Ribbon Motor F” exceeds a certain level, the ribbon motor temperature sensor output voltage becomes lower than the reference voltage, and the pin 1 of U8A goes to “Low” level. At this time, pin K1 (nTMPERR) is “Low” and the FPGA (U5) detects an abnormally high temperature.

In this abnormal state, the printer stops +24V DC supply to the “SA Ribbon Motor F”. Also, it stops +24V DC supply to the “SA PF Motor” and “SA Head”.

(6) Ribbon tension sensor (SA Ribbon Sensor)

The ribbon tension sensor consists of two photointerrupters and is located on the ribbon take-up side (front side) of the “Unit Ribbon”. It is used to detect the ribbon tension on the ribbon take-up side to maintain the ribbon tension on the take-up side constant.



* In power saving mode, **+3VIO** is not supplied. For details, refer to “[2-2-6\(1\) Power supply circuit](#)”.

Ribbon tension sensor operation when the ribbon slacks:

During printing, the ribbon is fed forward together with the media. Thus, the ribbon on the take-up side slacks and the projections of the “SA Ribbon Tension Shaft F” come off the photointerrupters (PS401 and PS402) on the “SA Ribbon Sensor”. Thus, the photointerrupters turn ON, and pin 26 (RIBSENS_R1) and pin 31 (RIBSENS_R2) go to “High” level.

At this time, the printer increases the rotational speed of the “SA Ribbon Motor F” to wind the take-up side ribbon faster to give more tension to the ribbon.

Ribbon tension sensor operation when the ribbon tightens:

When the ribbon is wound and tightened, the projections of the “SA Ribbon Tension Shaft F” are inserted into the photointerrupters (PS401 and PS402) and pin 26 (RIBSENS_R1) and pin 31 (RIBSENS_R2) go to “Low” level.

At this time, the printer decreases the rotational speed of the “SA Ribbon Motor F” to give less tension to the ribbon.

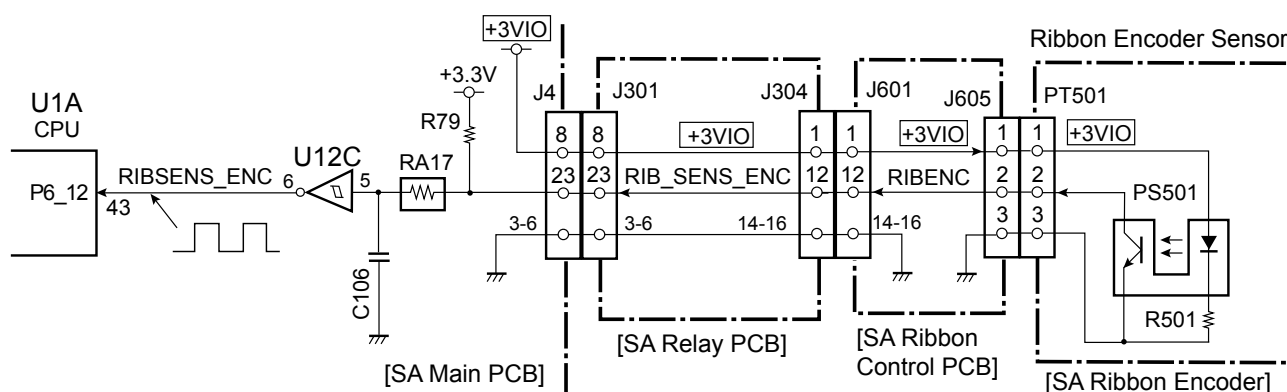
During printing, the above ribbon tension control cycle is repeated to give constant tension to the take-up side ribbon. Further, by using 2 photointerrupters, ribbon tension is finely controlled.

(7) Ribbon encoder sensor

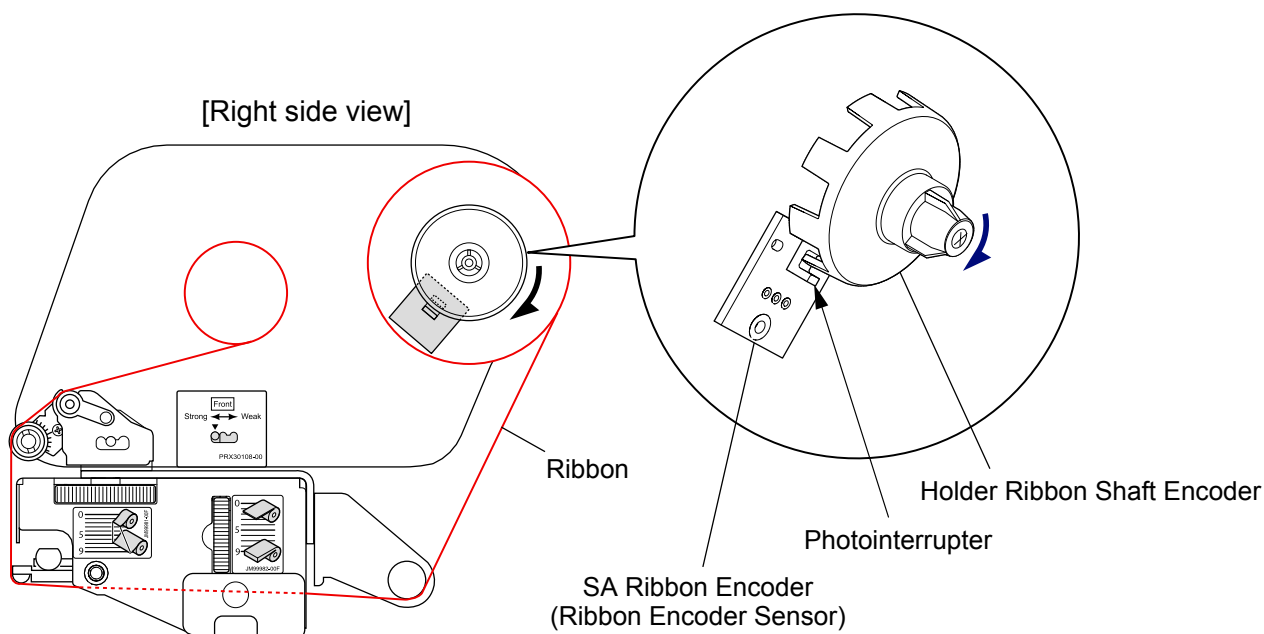
The ribbon encoder sensor consists of one photointerrupter and is located on the ribbon supply side (rear side) of the “Unit Ribbon”. It is used to detect the running status of ribbon as well as the ribbon end.

While the ribbon is running, the “Holder Ribbon Shaft Encoder” (supply reel) is rotated by the running ribbon and its slits on the bottom cross the interrupter (PS501) on the “SA Ribbon Encoder”. Thus, a pulse train is output from the interrupter to pin 43 (RIBSENS_ENC) of the CPU (U1A).

When the ribbon runs out during printing, the CPU detects the ribbon end state as no pulse train is given. When the ribbon end is detected, the LED on the operation panel blinks in red and the LCD displays “Error Ribbon End”, and the printer goes off-line.



* In power saving mode, **+3VIO** is not supplied. For details, refer to “[2-2-6\(1\) Power supply circuit](#)”.



2-2-5. 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.

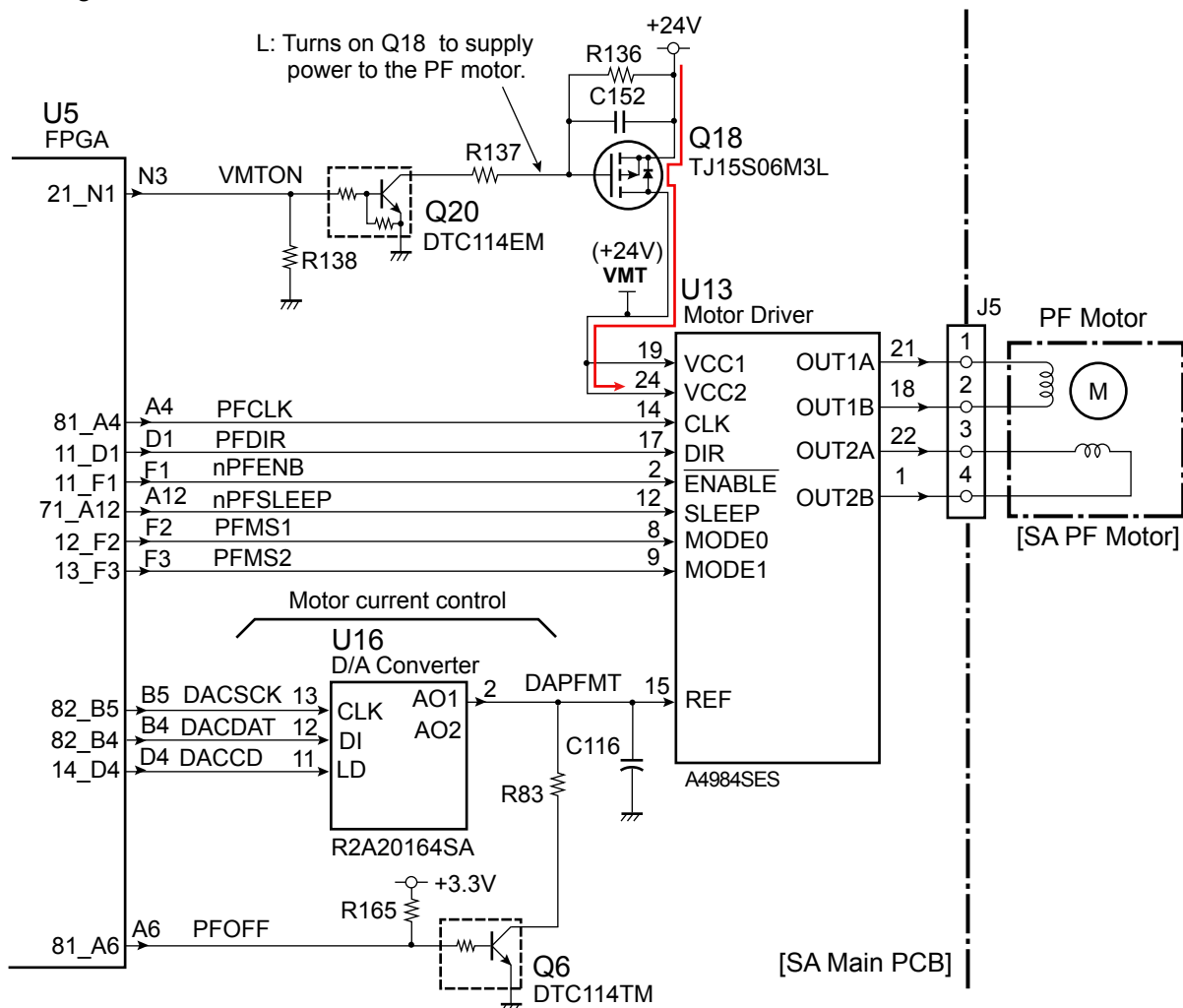
The “SA PF Motor” is driven by the bipolar constant current chopper method. The excitation mode for the motor is the 1-2 phase.

The power supply to the “SA PF Motor” is controlled by the VMTON signal at pin N3 of FPGA (U5). When the VMTON signal is “High”, Q20 turns ON, FET Q18 turns ON, and +24V DC (VMT) is supplied to the “SA PF Motor”.

The excitation mode of the “SA PF Motor” is determined by the PFMS1 and PFMS2 signals at pins F2 and F3 of the FPGA. The rotational direction is determined by the PFDIR signal and the motor drive pulse is fed from pin A4 (PFCLK signal). The motor driver (U13) drives the “SA PF Motor” using these signals.

The digital-to-analog converter (U16) controls the drive current to the “SA PF Motor”. Its output signal (DAPFMT) is fed to pin 15 (REF) of the motor driver (U13) to determine the amount of drive current to the “SA PF Motor”.

In power saving mode, the VMTON signal goes to “Low” and VMT to the motor driver (U13) stops. At this time, the PFOFF signal at pin A6 of FPGA goes to “High”, Q6 turns ON, and the DAPFMT signal output from the digital-to-analog converter (U16) is fixed to a certain low voltage level.



Forcible stop of the “SA PF Motor” at an abnormally high temperature:

If the temperature of the “SA PF Motor” reaches 105°C (221°F), the “SA PF Motor” stops. In addition, an abnormally high temperature is monitored by the abnormally high temperature detection circuit. (Refer to “2-2-4(4) PF motor temperature sensor”.) If an abnormally high temperature is detected with this circuit, the FPGA changes the level at pin N3 from “High” to “Low” so that +24V DC (VMT) to the motor driver (U13) stops.

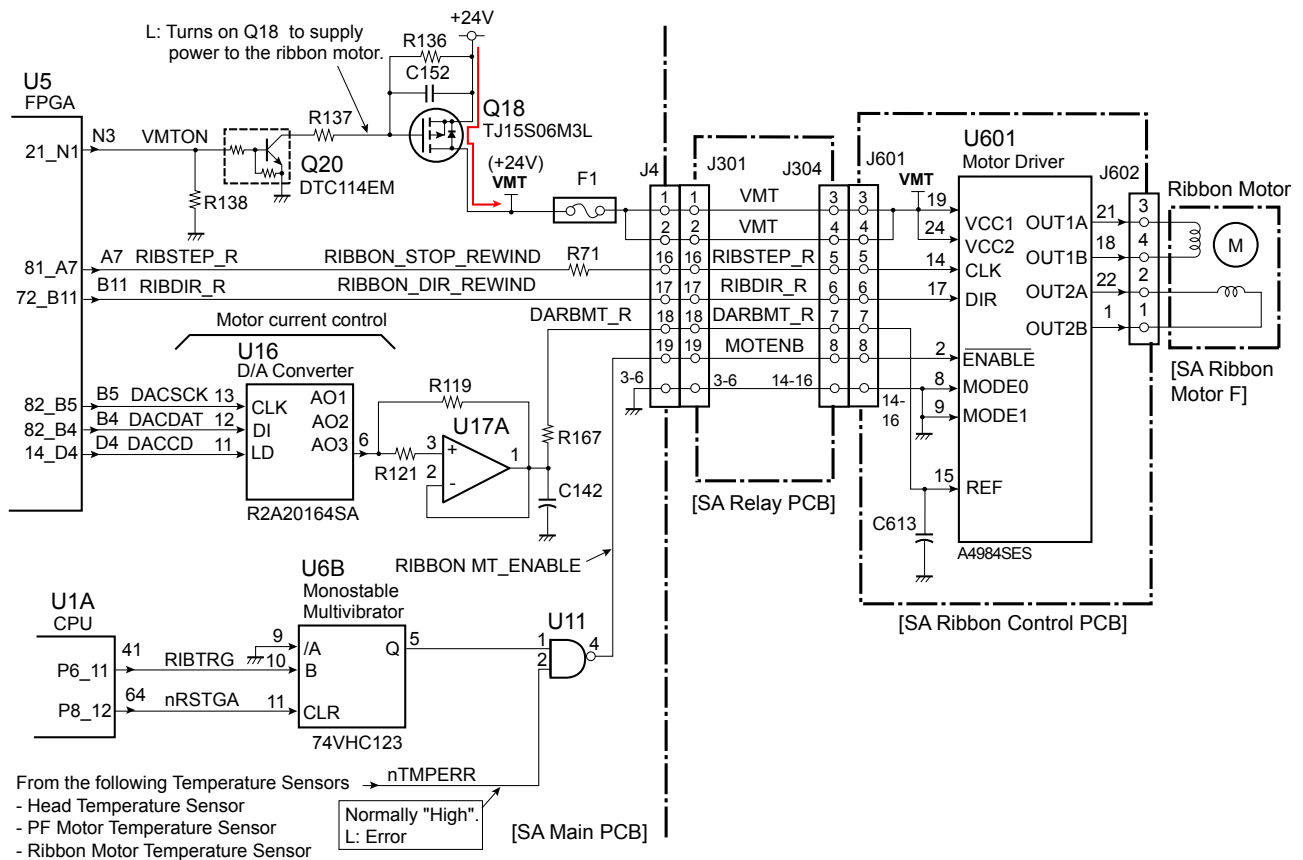
(2) Ribbon motor driver

This is a driving circuit to drive the “SA Ribbon Motor F” (stepping motor). The “SA Ribbon Motor F” is used to take up the ribbon.

In the same way as mentioned in “2-2-5(1) PF motor driver”, the power supply to the “SA Ribbon Motor F” is controlled by the VMTON signal at pin N3 of FPGA (U5). When the VMTON signal is “High”, Q20 turns ON, FET Q18 turns ON, and +24V DC (VMT) is supplied to the “SA Ribbon Motor F”.

The rotational direction is determined by the RIBDIR_R signal at pin B11 of FPGA and the motor drive pulse is fed from pin A7 (RIBSTEP_R). The motor driver (U601) drives the “SA Ribbon Motor F” using these signals.

The digital-to-analog converter (U16) controls the drive current to the “SA Ribbon Motor F”. The output from pin 6 (DARBMT_R) of U16 is fed to pin 15 (REF) of the motor driver (U601) to determine the amount of drive current to the “SA Ribbon Motor F”.



Forcible stop of the “SA Ribbon Motor F” at an abnormally high temperature:

If the temperature of the “SA Ribbon Motor F” reaches 85°C (185°F), the “SA Ribbon Motor F” stops.

In addition, an abnormally high temperature is monitored by the abnormally high temperature detection circuit. (Refer to “[2-2-4\(5\) Ribbon motor temperature sensor](#)”.) If the abnormally high temperature (100°C (212°F)) is detected with this circuit, the FPGA controls the circuits as follows.

- Changes the level at pin N3 (VMT ON) from “High” to “Low” so that +24V DC (VMT) to the motor driver (U601) stops.
- Stops the output from the motor driver (U601).

From the temperature error detection circuits, the following error signals nTMPERR (abnormally high temperature errors) are output to the NAND gate (U11). If any of the following abnormally high temperature errors occurs, the error signal nTMPERR changes from “High” level to “Low” level. Thus, pin 2 ($\overline{\text{ENABLE}}$) of the motor driver (U601) goes to “High” level to stop its outputs.

- An abnormally high temperature error from the head temperature sensor
- An abnormally high temperature error from the PF motor temperature sensor
- An abnormally high temperature error from the ribbon motor temperature sensor
- An abnormally high temperature error from the cutter temperature sensor (option)

Further, the output from pin 5 of monostable multivibrator (U6B) is used as another condition to forcibly stop the “SA Ribbon Motor F”. If an edge input sent from the CPU (U1A) to the U6B stops for some reason, pin 5 of U6B goes to “Low” level and the output of U11 goes to “High” level. As a result, pin 2 ($\overline{\text{ENABLE}}$) of the motor driver (U601) goes to “High” level to stop its outputs for safety. This forcible function prevents the “SA Ribbon Motor F” from being damaged even if an abnormal condition happens.

(3) Head driver

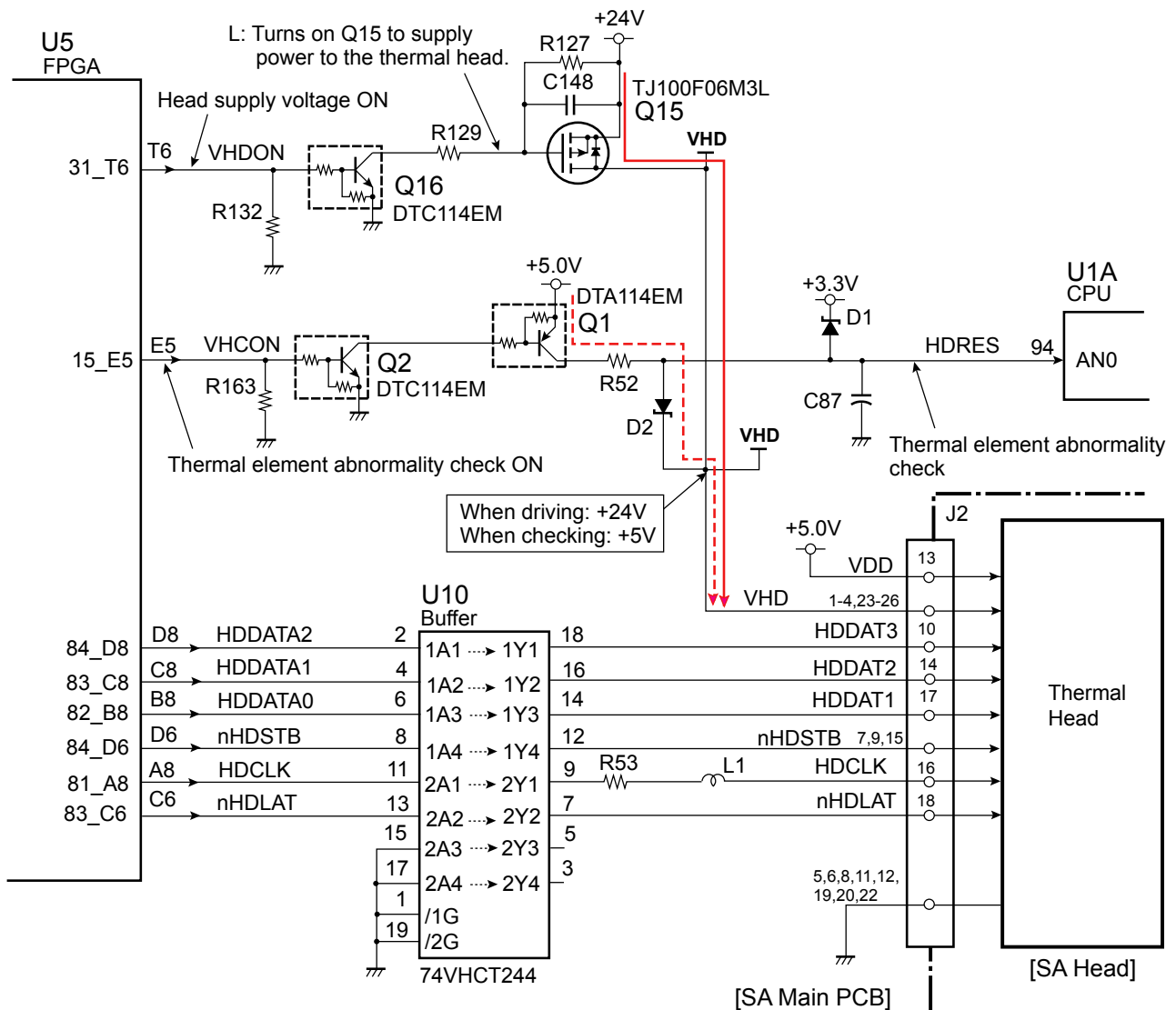
The head driver is incorporated in the “SA Head”.

During printing, pin T6 (VHDON) of the FPGA (U5) goes to “High” level, Q16 and Q15 turn ON, and +24V DC (VHD) is supplied to the “SA Head”.

The print data is sent from the FPGA to the head driver via the buffer (U10) and the thermal elements to be heated are selected.

The print data is sent from HDDATA0 to HDDATA2 in synchronization with HDCLK and latched by nHDLAT. Then, the thermal elements are energized by the strobe pulse nHDSTB.

According to the print data received, the thermal head heats the thermal elements to transfer melted ink dots to media or to print dots on thermal transfer paper. The width of energizing pulse (nHDSTB pulse) changes according to the head temperature to keep the printing density constant.



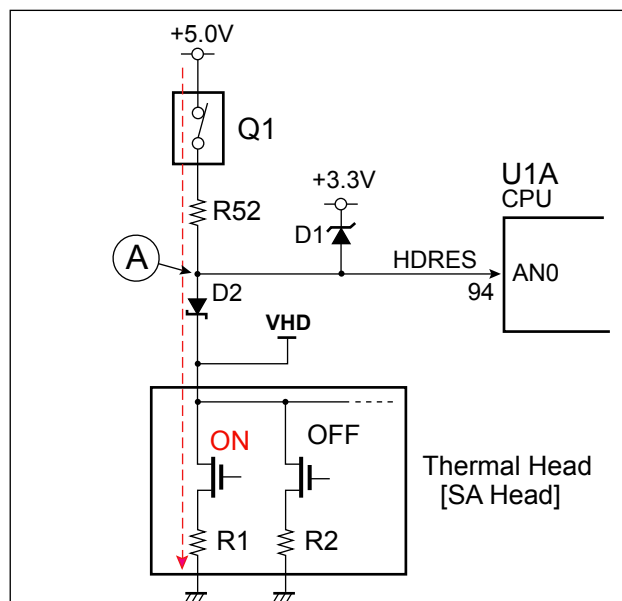
Thermal resistance check:

When the printer is turned ON, the thermal resistance check is conducted for the “SA Head”. If any fault is found, the LED on the operation panel blinks in red and the LCD displays “Alarm Head Check”.

During the thermal resistance check, +24 DC (VHD) to the “SA Head” stops, but +5V DC is supplied instead as pin E5 (VHCON) of the FPGA goes to “High” level and Q2 and Q1 turn ON.

The following is a simplified circuitry under checking, where Q1 turns ON and the first thermal element “R1” is selected. At the point “A”, the voltage divided by R52 and the thermal element resistance R1 is developed. The CPU (U1A) monitors this voltage at pin 94 (HDRES), and checks if the voltage is within the allowable range. (For example, if R1 is broken and disconnected, the voltage at point “A” (pin 94, HDRES) will be about +3.3V as the line is clamped by the diode D1.)

Each thermal element is successively checked in this way.

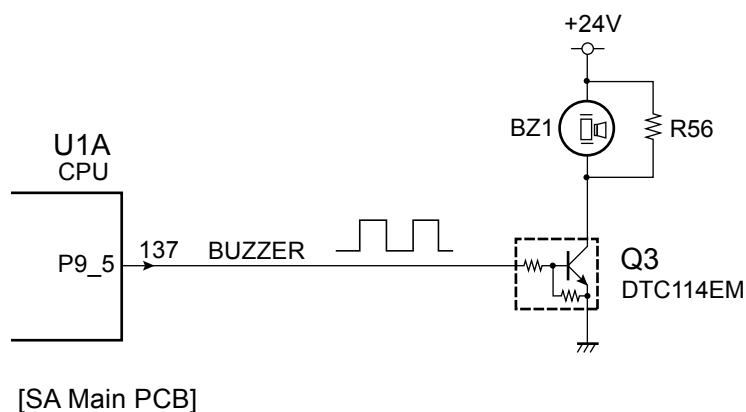


R1, R2, ... ,Rn: Resistance of thermal elements

(4) Buzzer driver

This circuit drives the buzzer.

Buzzer will sound at the time of key operation or error occurrence. To sound the buzzer, the CPU (U1A) outputs a pulse from pin 137 (BUZZER). The transistor Q3 turns ON and OFF, and the buzzer sounds.

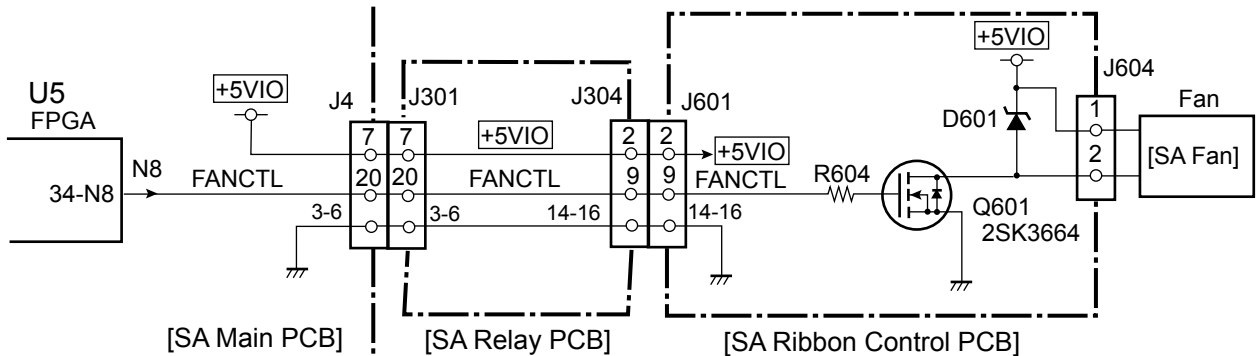


[SA Main PCB]

(5) Fan driver

This circuit drives the ribbon motor cooling fan, “SA Fan”.

When pin N8 (FANCTL) of the FPGA (U5) is set to “Low” level, Q601 turns ON and the “SA Fan” is driven.



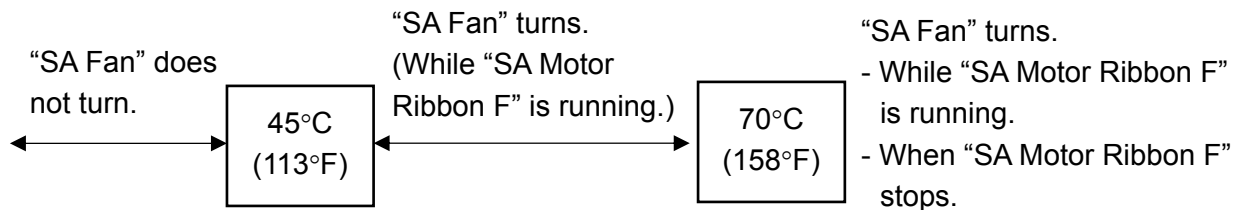
* In power saving mode, **+5VIO** is not supplied. For details, refer to “[2-2-6\(1\) Power supply circuit](#)”.

The “SA Fan” is driven according to the temperature of the “SA Ribbon Motor F” that is detected by the ribbon motor temperature sensor.

When the temperature is under 45°C (113°F), the “SA Fan” is not driven.

While the “SA Ribbon Motor F” is running, if the temperature exceeds 45°C (113°F), the “SA Fan” starts to turn.

If the temperature is 70°C (158°F) or more, the “SA Fan” keeps turning until the temperature falls below 70°C (158°F) regardless of the “SA Ribbon Motor F” is running or not.



2-2-6. Other circuits

(1) Power supply circuit

+24V DC is supplied from the “Unit Power Supply” to the “SA Main PCB”.

U19 is the switching regulator IC to produce +5V DC from +24V DC. U20 is the switching regulator IC to produce +3.3V DC and +1.2V DC from +5V DC.

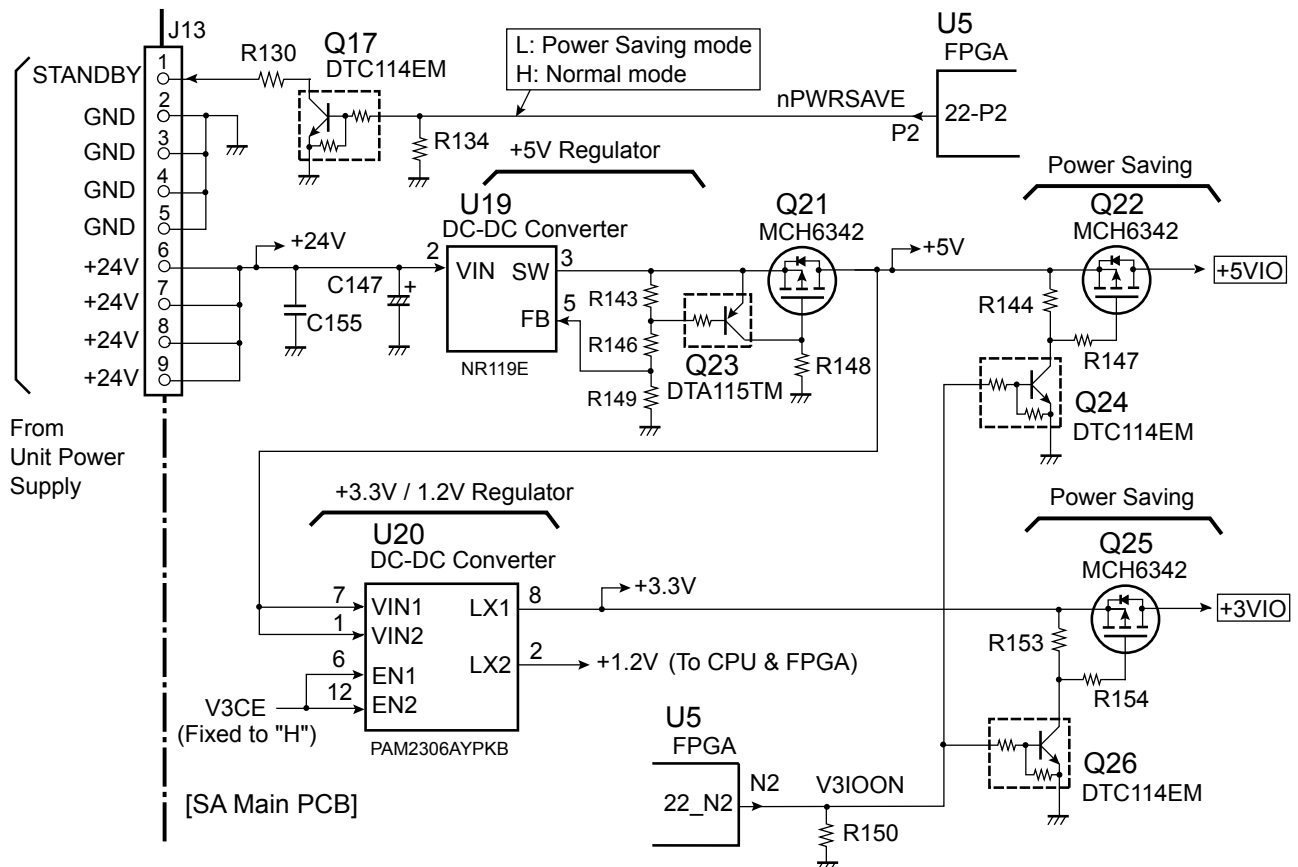
Each produced voltage is supplied to the following circuits.

+24V DC: For driving circuits (motors, print head, buzzer and cutter (option)) and I/F circuits

+5V DC: For sensors, power to the head logic circuit, operation panel, fan, I/F circuits (option) and peeler (option)

+3.3V DC: For logic circuits

*1.2V DC: For the CPU and FPGA



* In power saving mode, +3VIO and +5VIO are not supplied to the subsequent circuits.

Power saving circuit:

When the printing standby state continues for a certain period of time, the printer automatically enters the power saving mode. In this mode, +24V DC output from the “Unit Power Supply” reduces to +9V DC and the power consumption of the printer becomes minimum.

The period from entering the printing standby to entering the power standby mode is changeable with the “Standby Timer” of the “System Setup Menu”.

During the power saving mode, if print data is received or any key operation is done, +9V DC output from the “Unit Power Supply” resumes +24V DC and the printer automatically returns to the normal mode.

* By setting the “LCD Standby” of the “System Setup Menu” to ON, the LCD display turns off for further power saving when the printer enters the power saving mode.

+3VIO and +5VIO:

+3VIO and +5VIO are the power supply for driving circuits. Since pin 2 (V3IOON) of the FPGA is at “High” level and Q26/Q25 and Q24/Q22 turn ON, +3VIO and +5VIO are normally supplied to the subsequent circuit.

However, in power saving mode, V3IOON goes to “Low” level, and Q26/Q25 and Q24/Q22 turn OFF. Thus, supply of +3VIO and +5VIO stops.

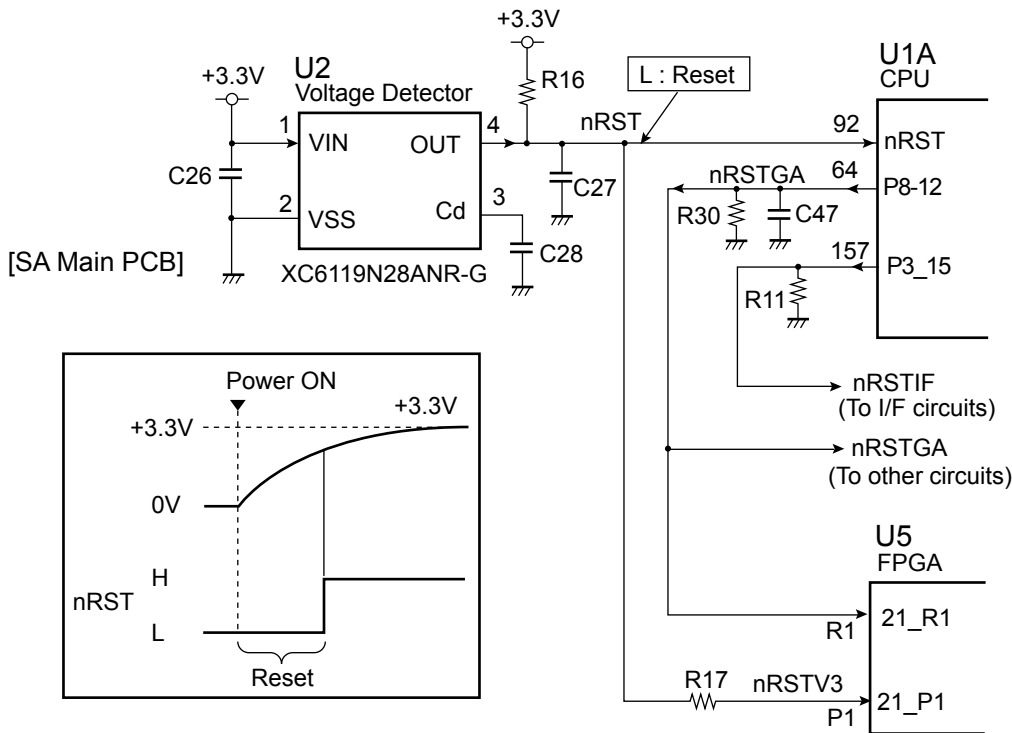
(2) Reset circuit

This circuit performs the system reset.

When power is turned ON, +3.3V gradually increases from 0V. When the voltage at pin 1 (VIN) of the voltage detector (U2) reaches approx. at 2.8 V, pin 4 (nRST) of U2 changes from “Low” level to “High” level.

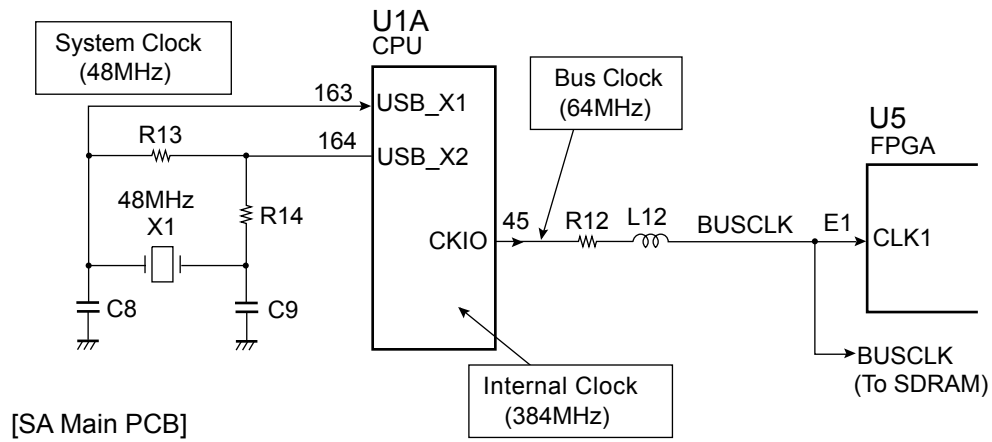
While the nRST signal is “Low”, the CPU (U1A) and the FPGA (U5) are reset.

The CPU outputs the nRSTGA signal to reset the FPGA and other circuits. Also the CPU outputs the nRSTIF signal to reset the I/F circuits.



(3) Clock circuit

Crystal oscillator X1 oscillates a 48 MHz clock. This clock is send to the CPU (U1A) and the CPU generates a 384 MHz internal clock and 64 MHz bus clock. The 64MHz bus clock is fed to the FPGA (U5) and SDRAM (U4).



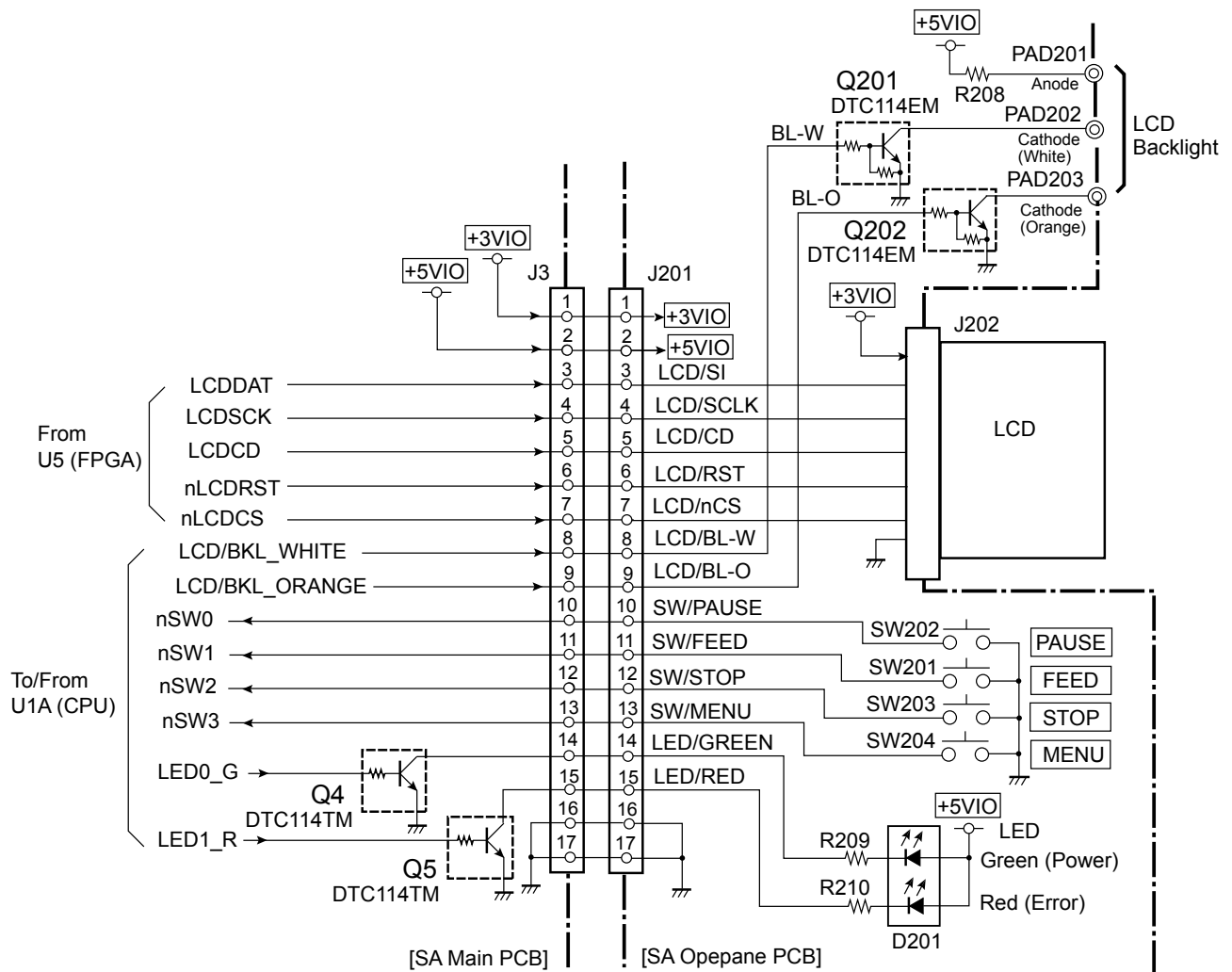
(4) Ope-pane circuit

The circuit consists of 1 LED (Green/Red), 4 switches (PAUSE, FEED, STOP and MENU) and 1 LCD.

The LCD is controlled by the signals send from the FPGA (U5). The backlight of LCD is controlled by LCD/BKL-WHITE and LCD/BKL-ORANGE signals sent from the CPU (U1A).

The signals output from the switches are sent to the CPU.

The LED controlling signals are sent from the CPU and fed to the LED D201 via Q4 and Q5, and the green LED (for power display) and red LED (for error display) are driven, respectively.



* In power saving mode, +3VIO and +5VIO are not supplied. For details refer to “2-2-6(1) Power supply circuit”.

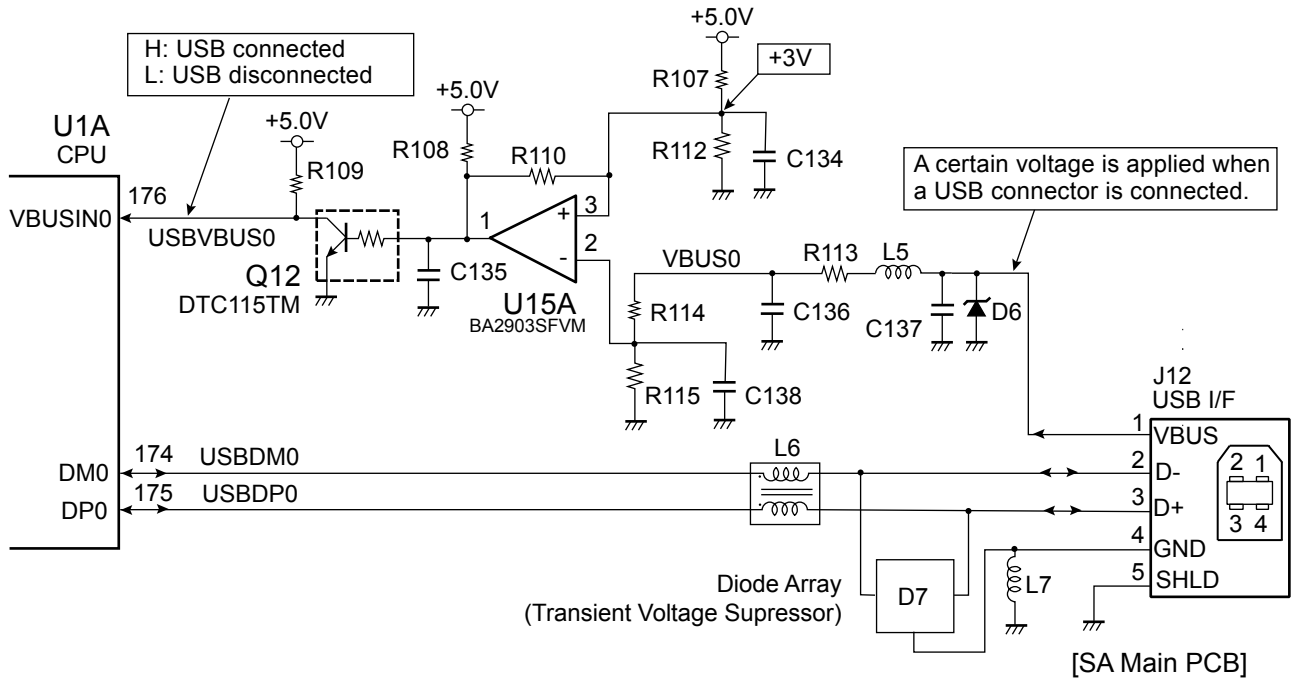
(5) USB I/F control circuit

The USB (Universal Serial Bus) I/F circuit interfaces with the USB I/F.

The comparator (U15A) and Q12 consist of a USB connection detecting circuit.

When a USB connector is connected to the printer, pin 1 (VBUS) of connector J12 goes to "High" level. Thus, Q12 turns OFF, pin 176 (USBVBUS0) of the CPU (U1A) goes to "High" level, and USB connection is detected.

The data transmission is carried out via pins 174 (USBDM0) and 175 (USBDP0) of the CPU.

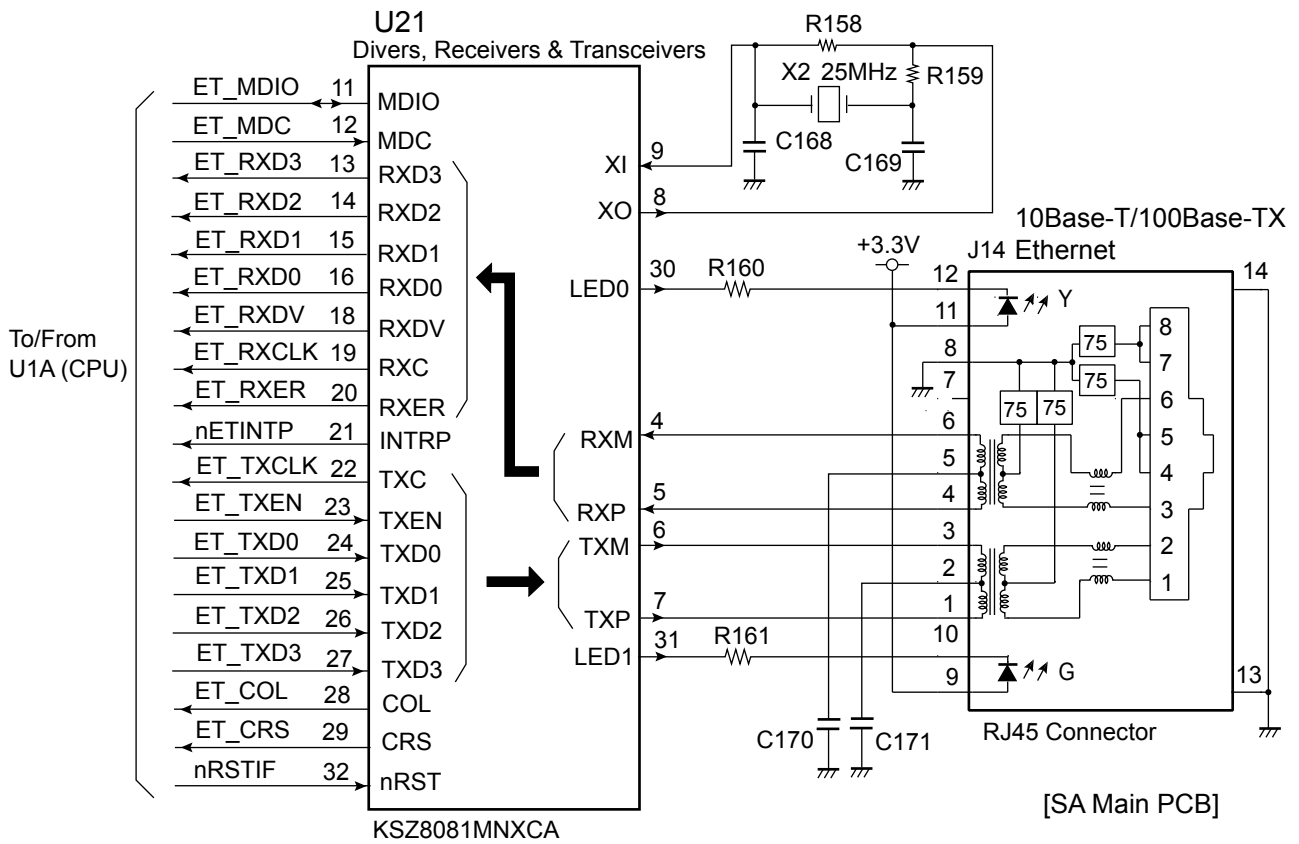


(6) Wired LAN I/F circuit

The Wired LAN I/F circuit interfaces with the Ethernet (100BASE-TX / 10BASE-T).

Transmission is done between the CPU (U1A) and the Ethernet via U21 (Drivers, Receivers & Transceivers).

The 25 MHz clock is output to U21 from the crystal oscillator X2.

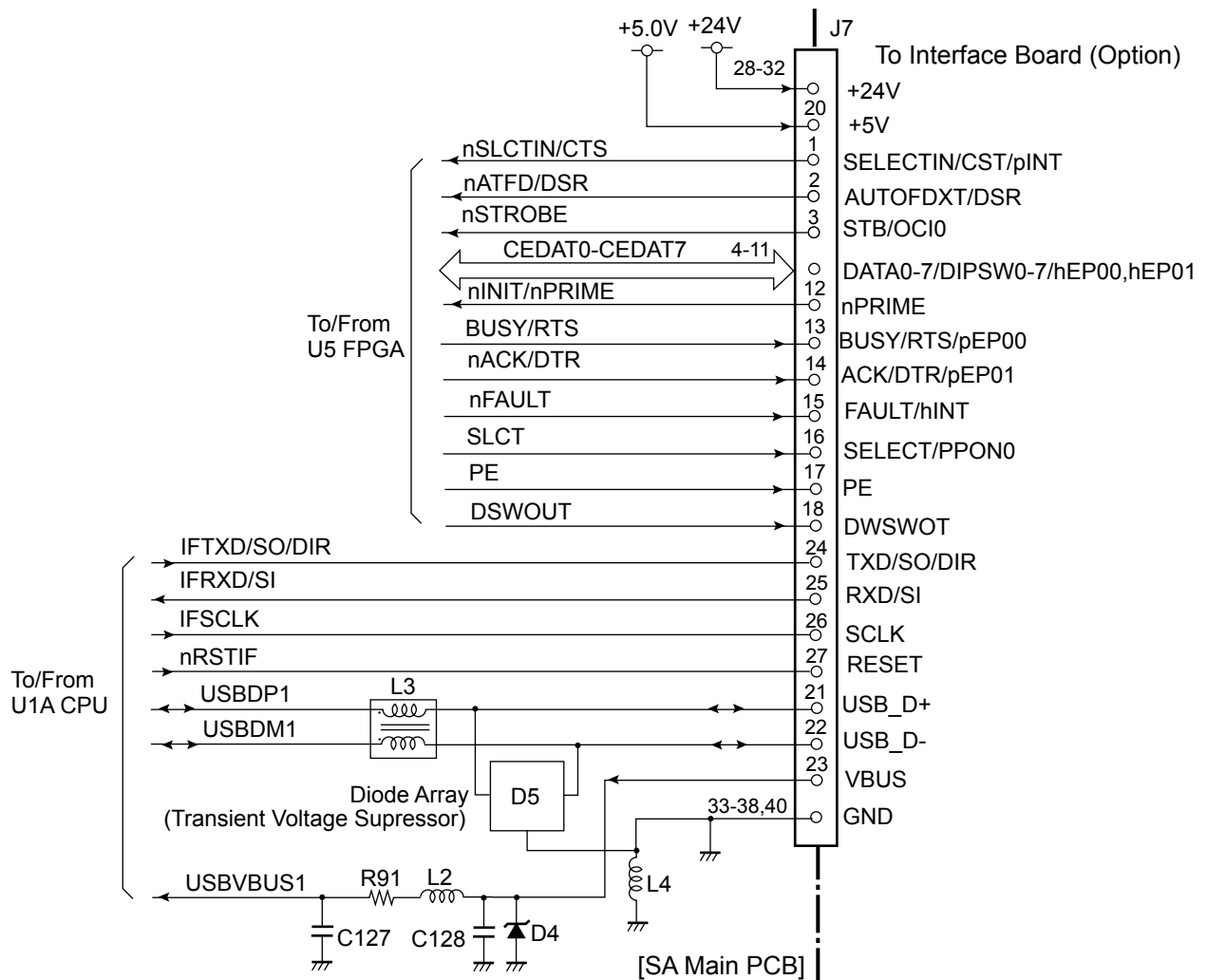


(7) Option board I/F circuit (option)

The I/F circuit of the option board supports the following interfaces.

- RS232C (Serial I/F)
- IEEE1284 (Parallel I/F)
- Ethernet I/F (Multi-function type)
- Wi-Fi I/F

Each signal of the option board is directly connected to the CPU (U1A) and the FPGA (U5). It is controlled by the CPU and the FPGA.



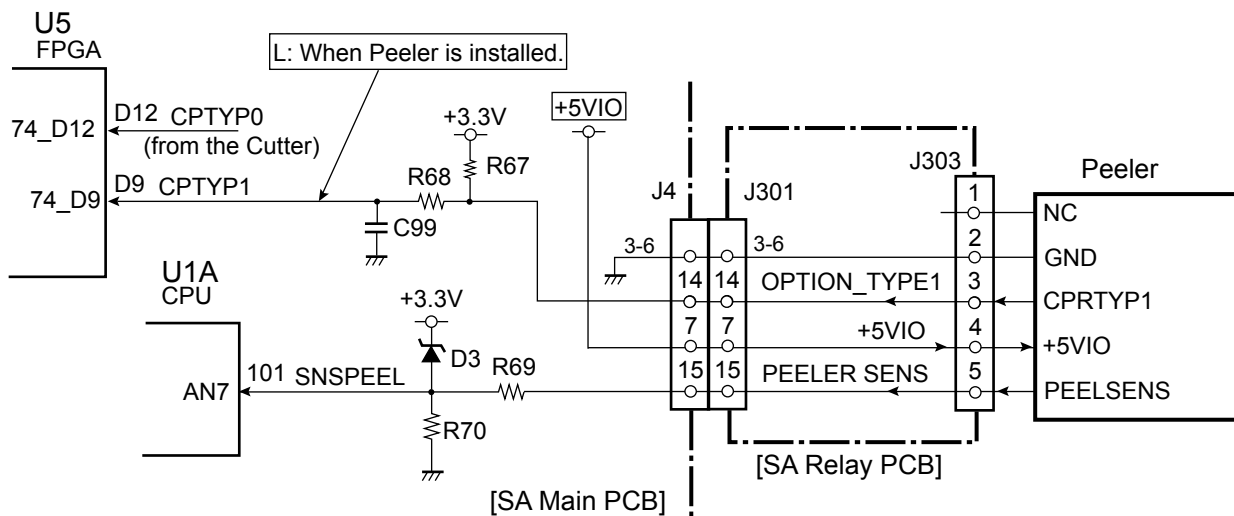
(8) Peeler circuit (for optional peeler)

+5VIO is supplied to an optional peeler.

When a peeler is installed in the printer, pin D9 (CPTYP1) is set to “Low” level. With this “Low” level signal, the printer recognizes that the peeler is connected to. (In reality, the FPGA (U5) judges the connected optional device (either peeler or cutter) by detecting both signals CPTYP0 (at pin D12) and CPTYP1 (at pin D9)).

A peel sensor detects that the printed label is peeled off by the peeler. Then, the printer stops printing. When you remove the label, the peeler sensor detects it and the printer resumes printing.

The peel sensor output signal (analog voltage) is input to pin 101 (SNSPEEL) of the CPU (U1A). To the CPU, two kinds of signal levels are input depending on the peeling conditions, whether the label is peeled off or it is removed by hand.



* In power saving mode, **+5VIO** is not supplied. For details refer to “[2-2-6\(1\) Power supply circuit](#)”.

(9) Cutter control circuit (for optional cutter)

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

* For VMT (+24V DC), refer to “2-2-5(1) PF motor driver”.

When a cutter is installed in the printer, pin D12 (CPTYP0) of the FPGA (U5) is set to “Low” level. With this “Low” level signal, the printer recognizes that the cutter is connected to. (In reality, the FPGA judges the connected optional device (either cutter or peeler) by detecting both signals CPTYP0 (at pin D12) and CPTYP1 (at pin D9)).

The cutter action is controlled by the signals CUTCON0 and CUTCON1 (at pins J1 and J2) output from the FPGA. The cutter home position signal is input to pin B1 (CUTHP).

A thermistor is attached to the cutter motor for detecting the motor temperature. The signal from the thermistor is input to pin 100 (TMPCUT) of the CPU (U1A). The CPU detects the temperature by monitoring the TMPCUT signal and controls the printer as follows.

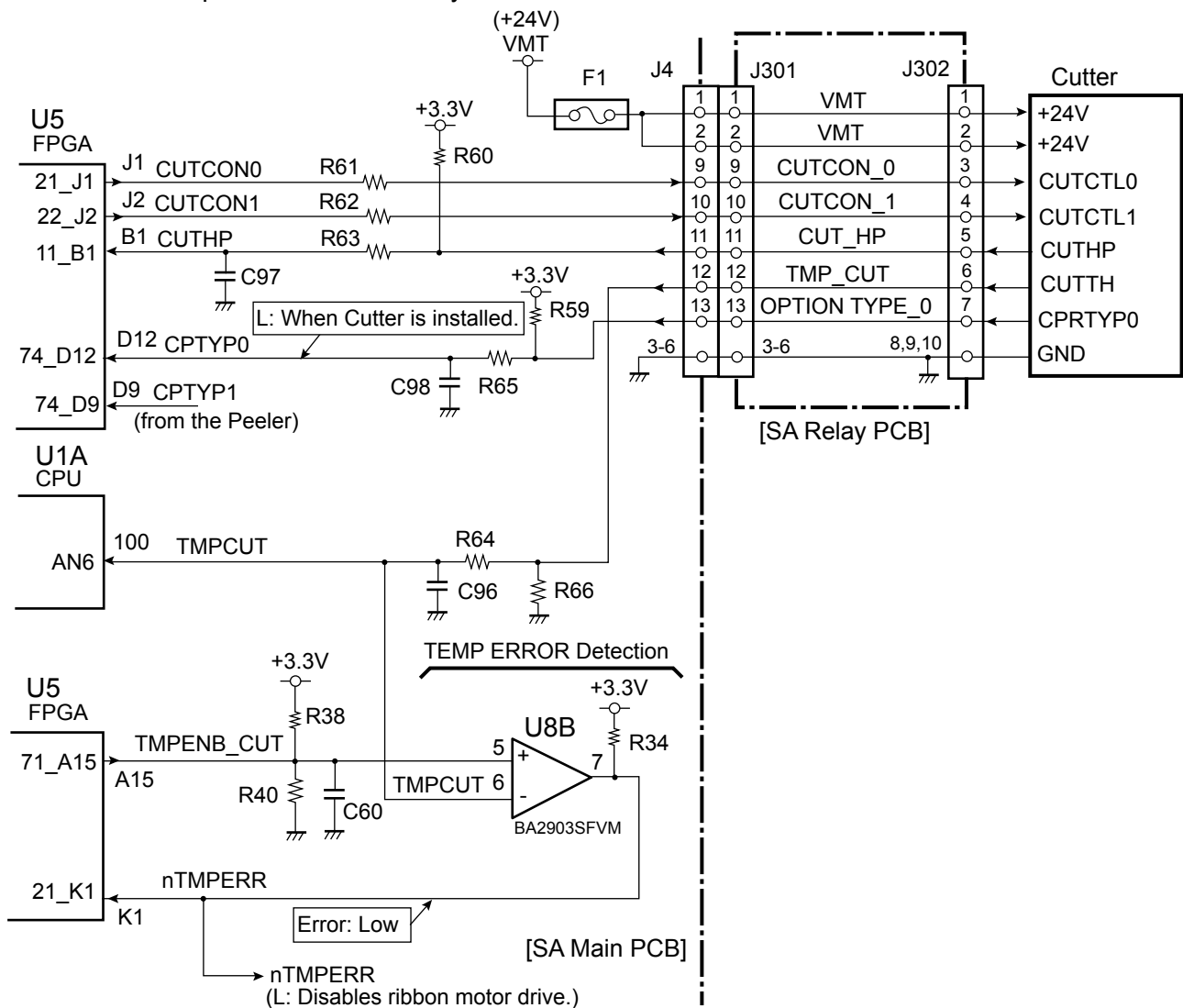
- When the temperature is 78°C (172.4°F) or more:

Stops the cutter motor.

The LED on the operation panel blinks in red and the LCD displays “Error Cutter Fail”.

- When the cutter motor get cold and the temperature falls below 70°C (158°F):

The cutter operation automatically resumes.



Abnormally high temperature detection:

To protect the cutter motor from being damaged, an abnormally high temperature detection circuit is provided. If the temperature of the cutter motor exceeds a set temperature limit, the LED on the operation panel blinks in red and the LCD displays “Error System Fail”, and the printer goes off-line. To recover from the error status, turn OFF the printer once and then turn it ON.

A reference voltage, i.e., an allowable temperature limit, is applied to pin 5 of the comparator (U8B), while the sensor output voltage (TMPCUT) from the cutter motor temperature sensor is applied to pin 6.

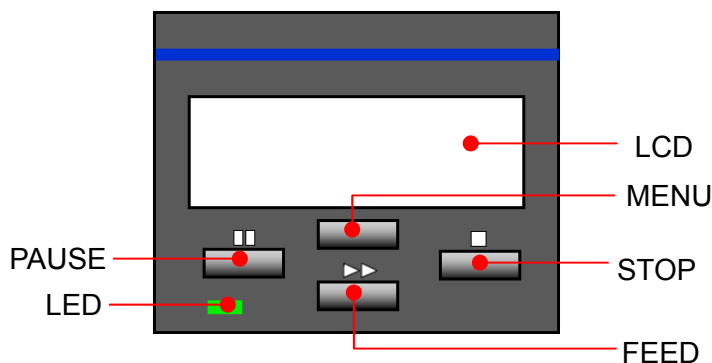
If the temperature of the cutter motor becomes higher than the set temperature limit, the cutter motor temperature sensor output voltage exceeds the reference voltage at pin 5, and pin 7 of U8B goes to “Low” level. At this time, pin K1 (nTMPERR) is “Low” and the FPGA detects an abnormally high temperature.

In this abnormal state, the printer stops +24V DC (VMT) supply to the cutter. Also it stops +24V DC supply to the “SA Head”, “SA PF Motor” and “SA Ribbon Motor F”.

2-3. Operation Panel

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

Operation panel consists of 4 keys to set the condition of the printer, and 1 LED (Green/Red) and 1 LCD that indicate the operating condition of the printer.



2-3-1. External view

(1) LED (Green/Red)

Green: Lights on when the printer turns ON.

Blinks during receiving print data.

Red: Blinks when the printer is in error status.

(2) LCD

The LCD displays printer statuses including error status, menus and operation guide.

(3) Keys

There are 4 keys, **[MENU]**, **[PAUSE]** (■), **[FEED]** (▶▶) and **[STOP]** (■).

[PAUSE] (■) key:

Temporarily stops printing.

- When the **[PAUSE]** (■) key is pressed, "Pause" is displayed on the LCD and the printer enters pause mode.
- When it is pressed during printing, the printer stops after printing the current one label. Pressing the key once again will resume further printing and the remaining number of designated labels is printed.

[FEED] (▶▶) key:

Feeds media.

- When the **[FEED]** (▶▶) key is pressed once, media is fed and stops at the printing start position.
The distance to be fed before stopping there depends on media. In the case of label media, printing start position is automatically detected and then label media stops. In the case of continuous media, it is fed by a certain distance and then stops.
- When "TEAR OFF" setting is enabled, media is fed to TEAR OFF position and stops there.

- When an optional auto cutter unit is installed, media is fed to the cut position and then cutter unit is activated. Cutting operation is done for each feed.
- When an optional peeler unit is installed, media is fed to the peeling position.
Note that the **[FEED]** (▶▶) key does not work if media is already set in the peeling position.

[STOP] (■) key:

Stops printing or cancels an error.

- When the **[STOP]** (■) key is pressed during printing, the printer enters pause mode after printing the current one label. In pause mode, if the **[STOP]** (■) key is pressed for more than 4 seconds, 1 batch of printing job is cancelled.
The LCD displays “Job Clear” during cancel.

[MENU] key:

Enters menu setup mode or reissues the last label.

- When the **[MENU]** key is pressed in on-line ready status, the printer enters menu configuration mode.
- By changing the printer configuration, you can reissue the last label by pressing the **[MENU]** key.

To enable this function, set the “Menu Key Action” submenu under “After Print” main menu to “Repeat Last One”.

Once you have set to “Repeat Last One”, pressing the **[MENU]** key reissues the last label. However, in this case, to enter menu setup mode, you need to press and hold the **[MENU]** key for more than 4 seconds.

2-3-2. Test mode

The following Test modes are available:

Operation	Description
[FEED] (▶▶) + “Power ON”	Enters self print mode.
[STOP] (■) + “Power ON”	Enters hex dump mode.
[MENU] + “Power ON”	Enters menu list printing mode.

(1) Self print mode

You can check the printing quality by printing the built-in self print pattern.

This function is convenient to obtain optimum printing while adjusting the media thickness with the Media thickness adjustment dial and media width with the Media width adjustment dial.

For label (prints 2 labels):

1. While pressing and holding the **[FEED]** (▶▶) key, turn on the power.



2. Wait until the LED (green) lights on and the LCD indicates “Self Print Mode Label Media”, and then release the **[FEED]** (▶▶) key.
* If the **[FEED]** (▶▶) key is kept pressed, the display of the LCD changes to the next “Self Print Mode Cont. Media”. In this case, repeat from Step 1.
The printer enters self print mode and the label is fed. Self test printing is made for two labels, and then stops.
3. To repeat self test printing, press the **[FEED]** (▶▶) key again.

To exit from self print mode: Turn off the power.

For continuous media:

1. While pressing and holding the **[FEED]** (▶▶) key, turn on the power.



2. Wait until the LED (green) lights on and the LCD changes from “Self Print Mode Label Media” to “Self Print Mode Cont. Media”, and then release the **[FEED]** (▶▶) key.
The printer enters self print mode for self test printing, and then stops after printing.
3. To repeat self test printing, press the **[FEED]** (▶▶) key again.

To exit from self print mode: Turn off the power.

[Print pattern in self print mode]



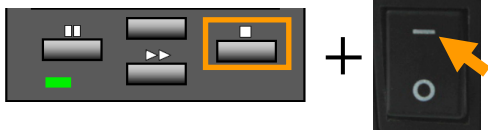
Media feed direction

(2) Hex dump mode

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

For label:

1. While pressing and holding the **[STOP]** (■) key, turn on the power.



2. Wait until the LED (green) lights on and the LCD indicates “Hex Dump Mode Label Media”, then release the **[STOP]** (■) key.

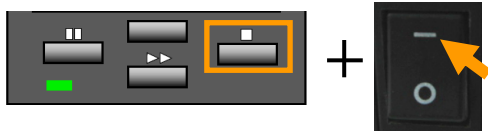
* If the **[STOP]** (■) key is kept pressed, the display of the LCD changes to the next “Hex Dump Mode Cont. Media”. In this case, repeat from Step 1.

The printer enters hex dump mode and, when print data is sent to the printer, hex dump printing starts.

To exit from hex dump mode: Turn off the power.

For continuous media:

1. While pressing and holding the **[STOP]** (■) key, turn on the power.



2. Wait until the LED (green) lights on and the LCD changes from “Hex Dump Mode Label Media” to “Hex Dump Mode Cont. Media”, then release the **[STOP]** (■) key.

The printer enters hex dump mode and, when print data is sent to the printer, hex dump printing starts.

To exit from hex dump mode: Turn off the power.

[Dump list example]

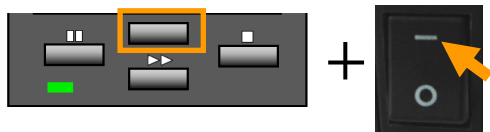
DUMP LIST

```
02 40 30 31 30 30 0D02 60 30 30 32 30 0D02 4C .M0100..c0020..L
44 31 31 0D31 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) Menu list print mode

You can print the list of machine information and current menu settings.

1. While pressing and holding the **[MENU]** key, turn on the power.



2. When the LED (green) lights on and the LCD indicates "Print Settings", release the **[MENU]** key.

The printer prints the menu list in continuous mode and the list of machine information and current menu settings are printed. Then the printer enters menu setup mode for further menu operation.

To exit from menu list print mode: In Main menu, press the **[PAUSE]** (||) key twice.

Machine Information

Model Number	: CL-E720
Serial Number	: **-*****
Boot Version	: *. *
ROM Version	: *****
ROM Date(DD/MM/YY)	: **/**/**
ROMCheck Sum	: ****
FPGA Version	: ***.***
Head Check	: OK
Print Counter	: 0002.2km
Service Counter	: 0002.2km
Cut Counter	: 0
Sensor Monitor	: 2.73V
Option Interface	: None
MAC Address	: **.*.*.*.*.*.*.*

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
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
LCD Standby	: Off

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.

Standby Timer	: 5 min
Control Code	: STD
Emulation Select	: DMI
Emulation Auto Detect	: Full Auto
[After Print Menu]	
AutoConfigure	: On
Function Select	: Tear
Cutter Action	: Backfeed
Paper Position	: 0.00 inch
Menu Key Action	: Enters Menu
[Interface Menu]	
USB Device Class	: Printer
USB VCOM Protocol	: Auto
USB 2.0 High Speed	: On
IPv4 Address	: 169.254.001.010
IPv4 Subnet Mask	: 255.255.000.000
IPv4 Gateway	: 000.000.000.000
IPv4 DHCP	: On
IPv6	: On
[Option 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

<Example of Datamax[®] emulation selected>

2-3-3. Factory/Service mode

Factory mode and Service mode are available for maintenance work.

Factory mode:

You can change the factory-set items such as logical shift of the sensor or head.

Service mode:

You can perform checks such as head check and service counter value check to see the media length printed.

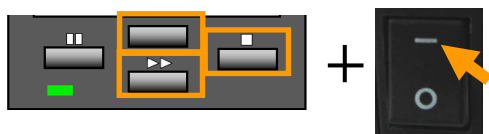
In this section, the followings are explained.

- How to enter Factory/Service Mode
- How to print the Factory Mode Settings menus
- How to change the settings in Factory mode
- How to operate submenus in Service mode

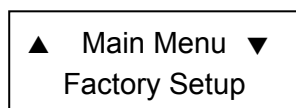
(1) How to enter Factory/Service Mode

To enter Factory/Service mode, perform the following operation.

- While pressing and holding the **[MENU]**, **[FEED]** (▶▶) and **[STOP]** (■) keys, turn on the power.



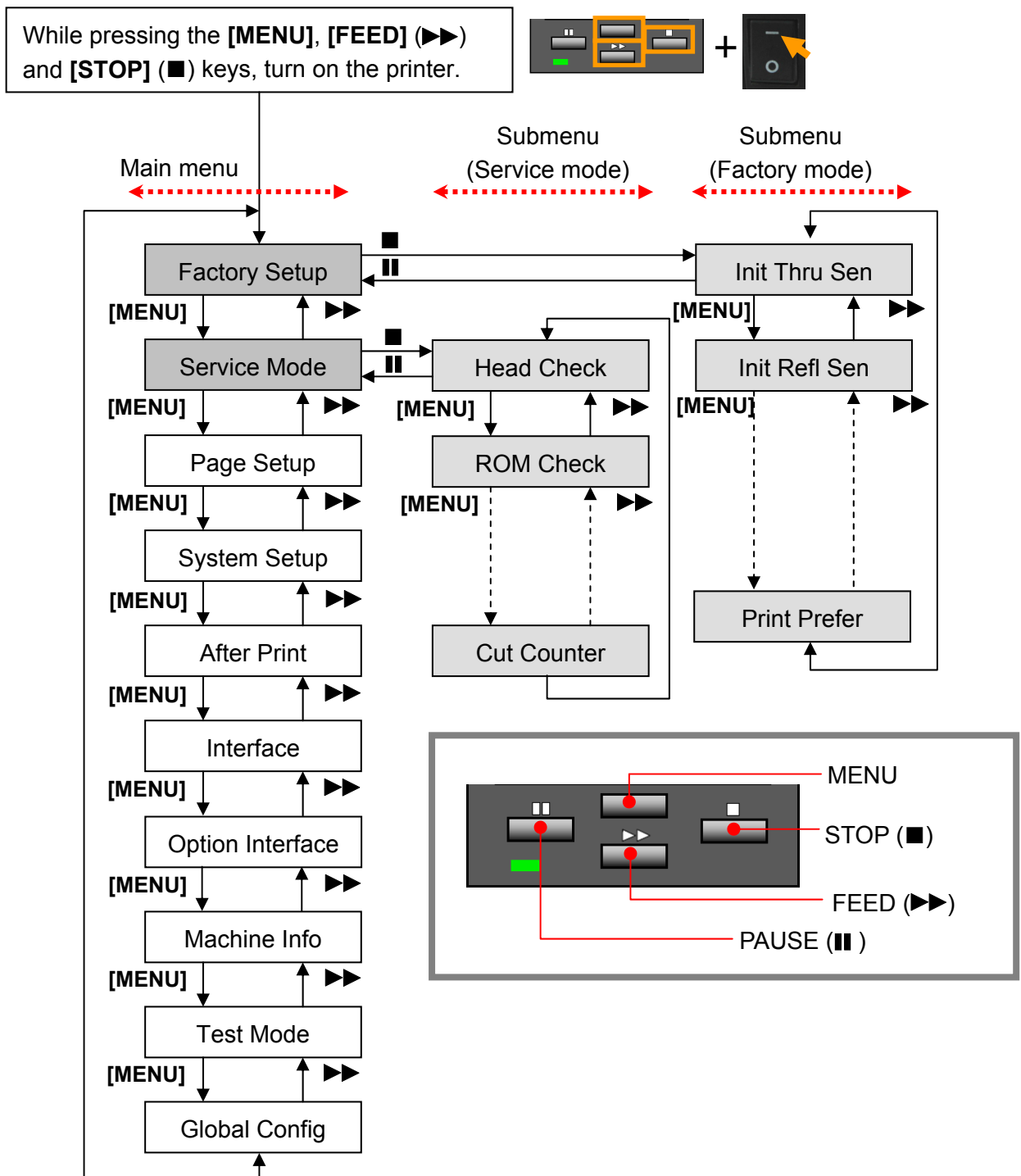
Then, the following appears on the LCD.



Key function in Factory/Service mode:

[FEED] (▶▶)	Returns to previous item, or the value is incremented/changed.
[MENU]	Goes to the next item, or the value is decremented/changed.
[PAUSE] ()	Resets the printer, or exits from the current menu.
[STOP] (■)	Acts as the Enter key.

The following diagram shows the menu transition in Factory/Service mode.



To exit from Factory/Service mode:

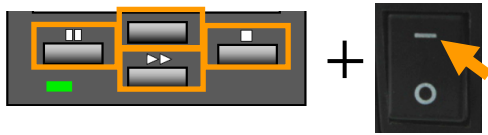
In main menu, press the [PAUSE] (||) key.

(2) How to print the Factory Mode Settings menus

You can print the current factory mode setting values in the following two ways.

Method 1:

While pressing and holding all keys ([MENU], [PAUSE] (||), [FEED] (▶▶) and [STOP] (■)), turn on the power.



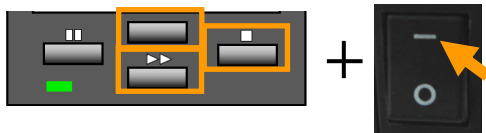
The current factory mode setting values are printed, and then the printer enters the Factory mode.

To exit from the Factory mode: Press the [PAUSE] (||) key.

Method 2

- 1) Enter the Factory/Service mode by turning on the power while pressing and holding the [MENU], [FEED] (▶▶) and [STOP] (■) keys.

(Refer to “2-3-3(1) How to enter Factory/Service Mode” mentioned earlier.)



- 2) Press the [MENU] or [FEED] (▶▶) key until “Test Mode” main menu appears.
- 3) Press the [STOP] (■) key to enter the “Test Mode”.
- 4) Press the [MENU] or [FEED] (▶▶) key until “Print Pattern” submenu appears.
- 5) Press the [STOP] (■) key to enter the “Print Pattern” submenu.
- 6) Press the [MENU] or [FEED] (▶▶) key and select “Current Config”.
- 7) Press the [STOP] (■) key to print the configuration settings.

The current factory mode setting values are printed.

To exit from menu mode:

Press the [PAUSE] (||) key several times until the printer exits from the “Test Mode” main menu.

[Print sample]

Machine Information

```

Model Number           : CL-E720
Serial Number          : **-*****
Boot Version           : *.
ROM Version            : *****
ROM Date(DD/MM/YY)    : **/**/**
ROMCheck Sum           : ****
FPGA Version           : *** **
Head Check             : OK
Print Counter          : 0002.2km
Service Counter        : 0002.2km
Cut Counter            : 0
Sensor Monitor         : 2.73V
Option Interface       : None
MAC Address            : ** ** ** ** ** ** ** ** ** **

```

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.	: 8 dot
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
TT Hot HeatRate Adjust	: 0.0%
TT Cold HeatRate Adjust	: 0.0%
DT Hot HeatRate Adjust	: 0.0%
DT Cold HeatRate Adjust	: 0.0%
PowerOn Head Check	: On
Head Check Start Pos.	: Dot 1
Head Check Stop Pos.	: Dot 848
Head Error Print	: No
Ribbon Control	: Auto
Ribbon End Detection	: Normal
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

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

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
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
LCD Standby : Off
Standby Timer : 5 min
Control Code : STD
Emulation Select : DMI
Emulation Auto Detect : Full Auto

[After Print Menu]

AutoConfigure : On
Function Select : Tear
Cutter Action : Backfeed
Paper Position : 0.00 inch
Menu Key Action : Enters Menu

[Interface Menu]

USB Device Class : Printer
USB VCOM Protocol : Auto
USB 2.0 High Speed : On
IPv4 Address : 169.254.001.010
IPv4 Subnet Mask : 255.255.000.000
IPv4 Gateway : 000.000.000.000
IPv4 DHCP : On
IPv6 : On

[Option 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

<Example of Datamax® emulation selected>

(3) How to change the settings in Factory mode



- In Factory mode, **DO NOT** change the factory-set values unless you need to change them, since there are essential items related to printing accuracy, etc.
- 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. Note that, even if you perform initialization by selecting “Test Mode” main menu, “Factory Default” submenu and “Yes” in that order, the changed value here does not return to the initial value set at the factory.

(3-1) Submenu table in Factory mode

The following table shows the submenus of “Factory Setup” main menu.

For the factory submenu operation, refer to the next item “(3-2) Setting submenu in Factory mode”.

- *1 “[Factory Mode Settings Menu name]” in “Submenu Name” column shows the name that will be printed in “Factory Mode Settings”. (Refer to “2-3-3(2) How to print the Factory Mode Settings menus”.)
- *2 “+” shows that the object moves forward/rightward electrically, while “-” shows that it moves backward/leftward electrically. 8 dots correspond to 1 mm (203 dots correspond to 1 inch).

Submenu Name [Factory Mode Settings Menu name]	Adjustable Value (Default Value)	Description
Init Thru Sen		Performs calibration of the transparent sensor sensitivity. For details, refer to “3-7-1(2) Sensor sensitivity adjustment (Factory mode)” in Chapter 3.
Init Refl Sen		Performs calibration of the reflective sensor sensitivity). For details, refer to “3-7-1(2) Sensor sensitivity adjustment (Factory mode)” in Chapter 3.
Through Pos [Through Sensor Position]	-256 to +256 dot (+000 dot)	Electrically shifts the position of transparent sensor back and forth. (-32 to +32 mm, -1.26 to +1.26 inches)
Reflect Pos [Reflect Sensor Position]	-256 to +256 dot (+000 dot)	Electrically shifts the position of reflective sensor back and forth. (-32 to +32 mm, -1.26 to +1.26 inches)
Mach Tear Pos [Machine Tear Position]	-256 to +256 dot (+000 dot)	Electrically shifts the tear off position back and forth. (-32 to +32 mm, -1.26 to +1.26 inches)
Mach Cut Pos [Machine Cut Position]	-256 to +256dot (+000 dot)	Electrically shifts the cut position back and forth. (-32 to +32 mm, -1.26 to +1.26 inches) (Option)
Mach Peel Pos [Machine Peel Position]	-256 to +256dot (+000 dot)	Electrically shifts the peel position back and forth. (-32 to +32 mm, -1.26 to +1.26 inches) (Option)

Submenu Name [Factory Mode Settings Menu name]	Adjustable Value (Default Value)	Description
Mach Hor Pos [Machine Horizontal Pos.]	-16 to +32dot (+008 dot)	Electrically shifts the head position to the right or left side. (-2 to +4 mm, -0.08 to +0.16 inches)
Auto Cal Mode [AutoCal Mode]	On/Off (On)	Automatically controls the light amount of each media sensor.
Through LED [See Through Sensor]	0.0 to 3.3V (0.0 V)	This menu is effective when "Auto Cal Mode" is set to OFF. The light amount emitted from the light emitter can be changed when "Media Sensor" submenu is set to "See Through".
Reflect LED [Reflect Sensor]	0.0 to 3.3V (0.0 V)	This menu is effective when "Auto Cal Mode" is set to OFF. The light amount emitted from the light emitter can be changed when "Media Sensor" submenu is set to "Reflect".
Thru Sensitiv [See Through Sensitivity]	Low, Medium, High (Low)	This menu is effective when "Auto Cal Mode" submenu is set to OFF. The sensitivity of transparent sensor can be changed in three steps.
Refl Sensitiv [Reflect Sensitivity]	Low, Medium, High (Low)	This menu is effective when "Auto Cal Mode" submenu is set to OFF. The sensitivity of reflective sensor can be changed in three steps.
Cal Thru Level [Through Cal Level]	0.01 to 3.30V (2.30V)	Performs sensitivity adjustment for "Media Sensor" submenu "See Through". The amount of light received is set to "2.30V".
Cal Refl Level [Reflect Cal Level]	0.01 to 3.30V (2.10 V)	Performs sensitivity adjustment for "Media Sensor" submenu "Reflect". The amount of light received is set to "2.10V".
Cal None Level [SensNone Cal Level]	0.01 to 3.30V (2.05 V)	Performs sensitivity adjustment for "Media Sensor" submenu "None". The amount of light received is set to "2.05V".
Peel Sens Level	0.01 to 3.30V (1.50 V)	Sets the threshold value for the peel sensor.
Cont Paper Sens	Through/Reflect (Reflect)	When continuous media is used, selects the sensor type to be used for detecting paper end.
Darkness Rate [Darkness Rate]	High, Low (High)	Selects the rate to increase or decrease the print darkness.
DbI Heat Menu [Double Heat Menu]	On/Off (Off)	Selects whether to display the menu of "Double Heat" or not.
TT Hot HeatRate [TT Hot HeatRate Adjust]	-1.0 to +1.0% (0.0%)	In TT (Thermal Transfer) mode, adjusts the head temperature compensation coefficient for the head temperature 25°C (77°F) and higher. To increase the print darkness, increase the value.

Submenu Name [Factory Mode Settings Menu name]	Adjustable Value (Default Value)	Description
TT Cold HeatRat [TT Cold HeatRate Adjust]	-1.0 to +1.0% (0.0%)	In TT (Thermal Transfer) mode, adjusts the head temperature compensation coefficient for the head temperature less than 25°C (77°F). To increase the print darkness, increase the value.
DT Hot HeatRate [DT Hot HeatRate Adjust]	-1.0 to +1.0% (0.0%)	In DT (Direct Thermal) mode, adjusts the head temperature compensation coefficient for the head temperature 25°C (77°F) and higher. To increase the print darkness, increase the value.
DT Cold HeatRat [DT Cold HeatRate Adjust]	-1.0 to +1.0% (0.0%)	In DT (Direct Thermal) mode, adjusts the head temperature compensation coefficient for the head temperature less than 25°C (77°F). To increase the print darkness, increase the value.
PwrOn Head Chk [PowerOn Head Check]	On/Off (On)	Selects whether to perform head check at power ON or not.
Head Chk Start [Head Check Start Pos.]	Dots 001 to 848 (Dot 001)	Designates the start dot for head check.
Head Chk Stop [Head Check Stop Pos.]	Dots 001 to 848 (Dot 848)	Designates the end dot for head check.
Rbn End Detect [Ribbon End Detection]	Normal/Slow (Normal)	Selects the time until the ribbon end status is in effect.
Parallel ErrOut [Parallel Error Output]	On/Off (On)	Select whether to activate the Fault signal of parallel interface at the time of error occurrence or not.
USB Serial Num [USB Serial Number]	On/Off (Off)	Select whether to send the serial number to the host or not, when operating the printer through the USB interface.
Auto Exec Prn [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 [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.
Head Clean Msg [Head Clean Message]	0 to 9999999 (0000000m)	Designates the length where a head cleaning message is to be printed.
Print Prefer [Printer Preference]	Darkness/Speed (Darkness)	To put the priority on printing density or printing speed is selectable.

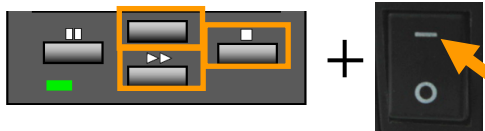
(3-2) Setting submenu in Factory mode

In Factory mode, there are 2 types of submenus.

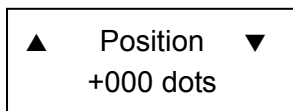
- Value setting type
- Option selection type

Procedure:

1. Enter Factory/Service mode by turning on the power while pressing and holding the **[MENU]**, **[FEED]** (▶▶) and **[STOP]** (■) keys.
“Factory Setup” main menu appears.



2. In “Factory Setup” main menu, press the **[STOP]** (■) key to enter Factory Setup mode.
The first submenu “Init Thru Sen” appears.
3. Press the **[MENU]** or **[FEED]** (▶▶) key until “Through Pos” submenu (example) appears.
4. Press the **[STOP]** (■) key to select that submenu.
The current value is shown on the LCD.



5. Press the **[MENU]** or **[FEED]** (▶▶) key to increase or decrease the value (or select a desired option).
In this example, the position of transparent sensor will be electrically moved back (-) and forth (+).
6. Press the **[STOP]** (■) key to save the set value in the printer.
7. Press the **[PAUSE]** (||) key to return to “Factory Setup” menu. (To set other submenu, repeat from Step 2.)
8. Press the **[PAUSE]** (||) key once again.
The changed value is stored in the printer and the printer restarts internally. Then, the printer returns to normal operation.

(4) How to operate submenus in Service mode

(4-1) Submenu table in Service mode

The following table shows the submenus of “Service Mode” main menu.

For the operation of the submenu, refer to subsequent item “(4-2) Submenu operation in Service mode”.

Submenu Name	Value	Description
Head Check	-	Checks the number of defective thermal elements of the “SA Head” and displays it. If no defective thermal element is found, “0000” will be displayed. Example: PASS 0000dots
ROM Check	-	Performs ROM checksum test, and displays the check result (OK or NG) and the checksum value. Example: PROGRM OK 4F4E.
RAM Check	-	Performs RAM capacity check and displays the check result. Example: DRAM OK 16384KByte
Motor Feed	-	Performs feed check of the “SA PF Motor”.
Print Counter	-	Displays the total printed length since the printer is firstly used. Example: Length 1234.567Km
Service Counter	-	Displays the service counter length in Km since you reset it last. Example: Length 0123.456Km To clear the service counter, press the [STOP] (■) key.
Cut Counter	-	Displays the cut count since you reset it last. Example: Count 123 To clear the cut counter, press the [STOP] (■) key.

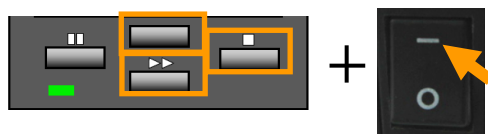
(4-2) Submenu operation in Service mode

The submenu operation procedures in Service mode are explained here. The submenus other than “Service Counter/Cut Center”, and the “Service Counter/Cut Center” submenu are separately explained.

Operation procedure for submenus other than “Service Counter/Cut Center”:

1. Enter Factory/Service mode by turning on the power while pressing and holding the **[MENU]**, **[FEED]** (▶▶) and **[STOP]** (■) keys.

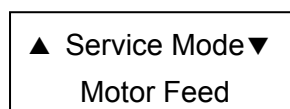
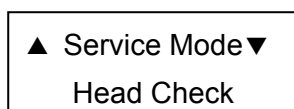
“Factory Setup” main menu appears.



2. Press the **[MENU]** or **[FEED]** (▶▶) key until “Service Mode” main menu appears.
3. Press the **[STOP]** (■) key to enter Service mode.
4. Press the **[MENU]** or **[FEED]** (▶▶) key until a desired submenu appears.

[When selecting “Head Check”]

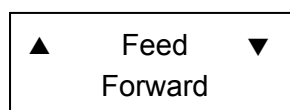
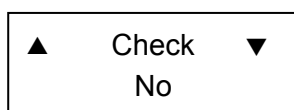
[When selecting “Motor Feed”]



5. Press the **[STOP]** (■) key to enter that submenu.
 - * For submenus “ROM Check”, “RAM Check”, and “Print Counter”, the result is displayed and further operation is not necessary.
 - * For submenu “Head Check”, the following screen appears and prompts you whether to perform the head check or not.
 - * For submenu “Motor Feed”, the following screen appears and prompts you whether to feed media forward or backward.

[When selecting “Head Check”]

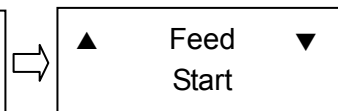
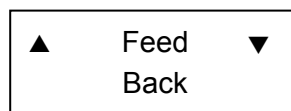
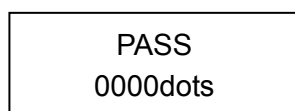
[When selecting “Motor Feed”]



6. Press the **[MENU]** or **[FEED]** (▶▶) key and select “Yes” (when “Head Check” is selected) or “Forward”/”Back” (when “Motor Feed” is selected).
7. Press the **[STOP]** (■) key to execute the selected item.
 - * When “Head Check” is selected, the number of defective dots of the thermal head is displayed.
 - * When “Motor Feed” is selected, “Feed Start” is displayed. Press the **[STOP]** (■) key once again. Then, the “SA PF Motor” turns to feed media forward or backward. (The “SA PF Motor” turns each time you press the **[STOP]** (■) key.)

[When selecting “Head Check”]

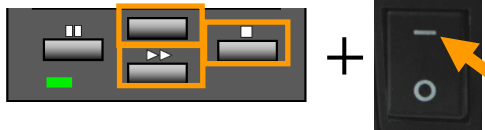
[When selecting “Motor Feed”]



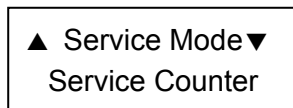
8. Press the **[PAUSE]** (■) key several times to return to “Service Mode” main menu.
9. To operate other submenu, repeat from Step 3. Otherwise, turn off the power to terminate Factory/Service mode.

Operation procedure for “Service Counter/Cut Center” submenu:

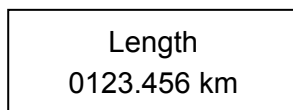
1. Enter Factory/Service mode by turning on the power while pressing and holding the **[MENU]**, **[FEED]** (▶▶) and **[STOP]** (■) keys.
“Factory Setup” main menu appears.



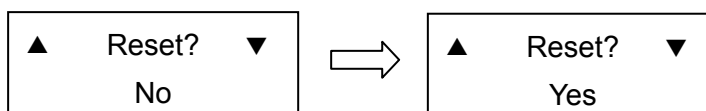
2. Press the **[MENU]** or **[FEED]** (▶▶) key until “Service Mode” main menu appears.
3. Press the **[STOP]** (■) key to enter Service mode.
4. Press the **[MENU]** or **[FEED]** (▶▶) key until a desired submenu appears.
[When selecting “Service Counter”]



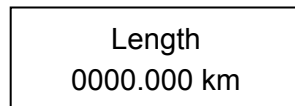
5. Press the **[STOP]** (■) key to select “Service Counter” submenu.
Then, the service counter length since the service counter is reset last is displayed.
* To reset the service counter, proceed to the next step. Otherwise, jump to Step 7.



6. Resetting the service counter:
 - 1) Press the **[STOP]** (■) key.
 - 2) Press the **[MENU]** or **[FEED]** (▶▶) key and select “Yes”.



- 3) Press the **[STOP]** (■) key to execute resetting.



7. Press the **[PAUSE]** (■) key twice to return to “Service Mode” main menu.
8. To check other submenu, repeat from Step 3. Otherwise, turn off the power to terminate Factory/Service mode.

2-4. Interface

2-4-1. USB Interface

(1) Specifications

Standards	Complies with Universal Serial Bus 2.0 Specification
Transmission speed	Compatible with 480 Mbps (high-speed) transmission and 12Mbps (full speed) transmission
Receive buffer	16K bytes
Connector	DUSB 15120-00400 (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

2-4-2. Wired LAN Interface

(1) Specifications

Supporting protocols	Network layer: ARP, IP, TCP Transport layer: TCP, UDP Application layer: DHCP, HTTP, SNMP, Raw Socket Port
Connector	RJ-45

(2) Signal line and pin arrangement

Pin No.	Signal name	Function
1	TX+	Send (+)
2	TX-	Send (-)
3	RX+	Receive (+)
4	NC	Not used.
5	NC	Not used.
6	RX-	Receive (-)
7	NC	Not used.
8	NC	Not used.

2-4-3. Serial Interface (Option)

(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 25AE25FGTBBA3 25-pin (COXOC)

(2) Signal line and pin assignment

Pin No.	Signal Abbr.	Signal name	Function
1	FG	Frame 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	Request To Send	Signal line that is active when the printer can receive data from the host
5	CTS	Clear To Send	Signal line that is active when the host 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, 15-19	NC	-	Not used
14	VCC	+5V	(Factory use only)
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:

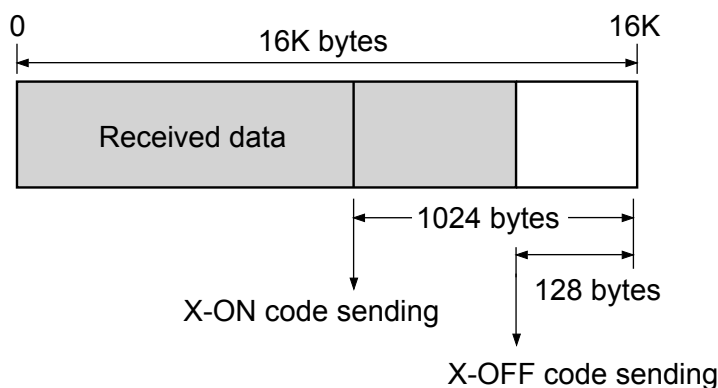
- When the printer is turned from off-line to on-line.
- When the remaining of receive buffer is 1024 bytes or more after sending X-OFF code.

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.)

2-4-4. 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	STROBE	Input	Strobe signal to read in 8-bit data
2-9	DATA0-7	Input	8-bit parallel signal
10	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 10KΩ resistor.)
19-30	GND	---	Ground for twisted pair return
31	PRIME	Input	Printer reset
32	FAULT	Output	Signal specifying printer error
33	GND	---	Signal ground
34	NC	---	Not used
35	VCC	---	Pulled up to +5V at 10KΩ resistor.
36	SELECTIN	Input	Invalid (ignored)

(3) Parallel port status signals when an error occurs

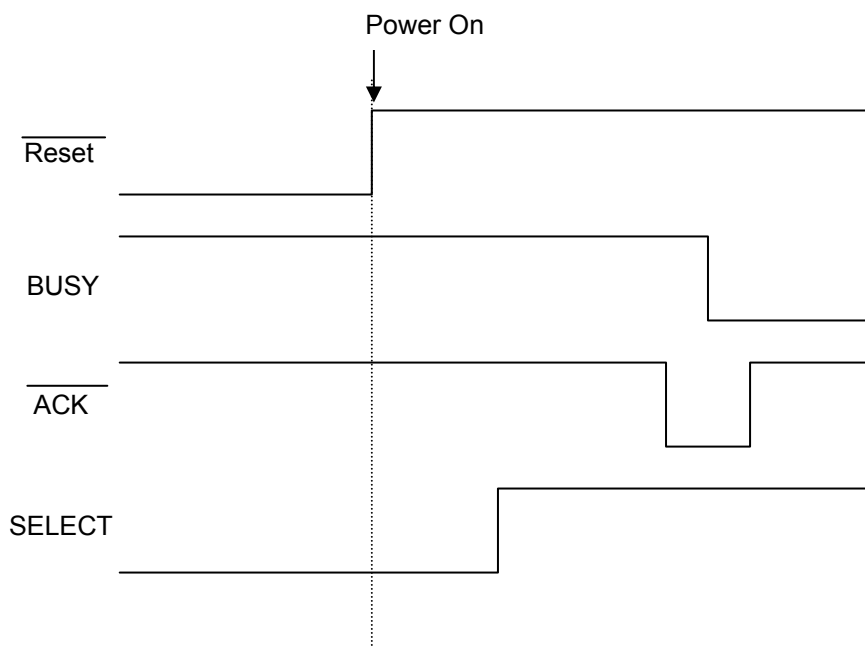
The following table shows the status signal change when an error occurs.

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 ("High").

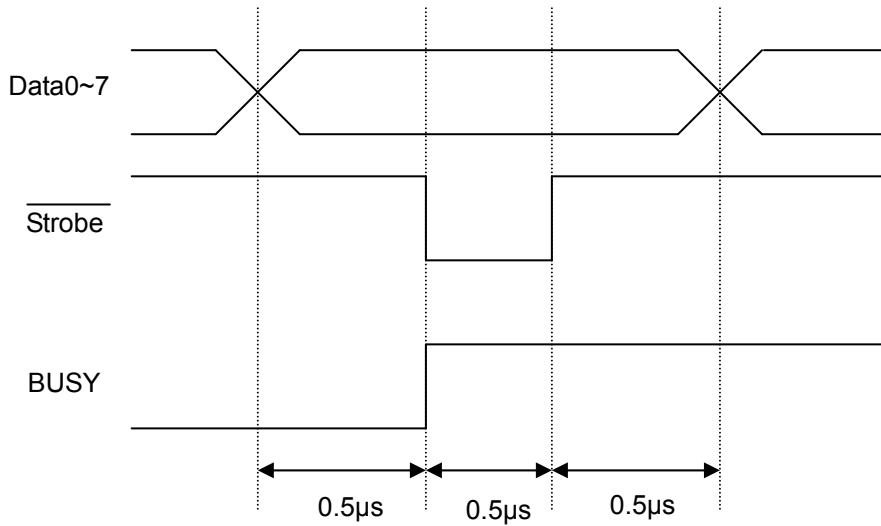
Error	Compatible mode
Paper end	Busy: L → H PError: L → H Select: H → L Fault: H → L
Error other than paper end • Head open • Other	Busy: L → H PError: L → unchanged Select: H → L Fault: H → L
Conditions for Busy	• Receive buffer full • Data being read • Error

(4) Compatible timing specification

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

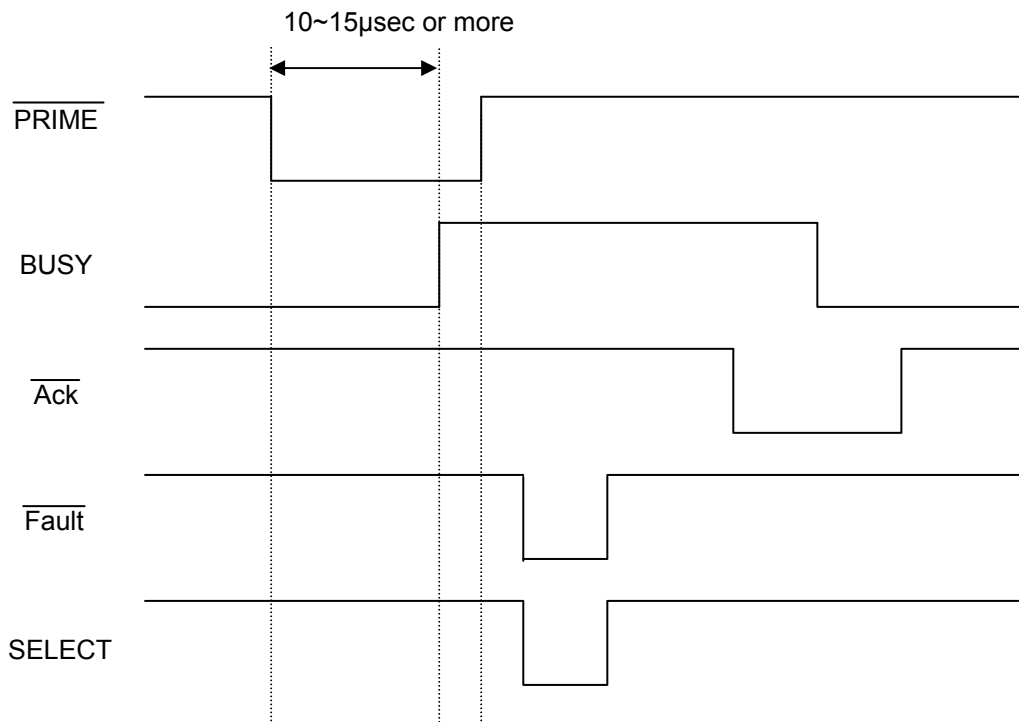


[While receiving data]



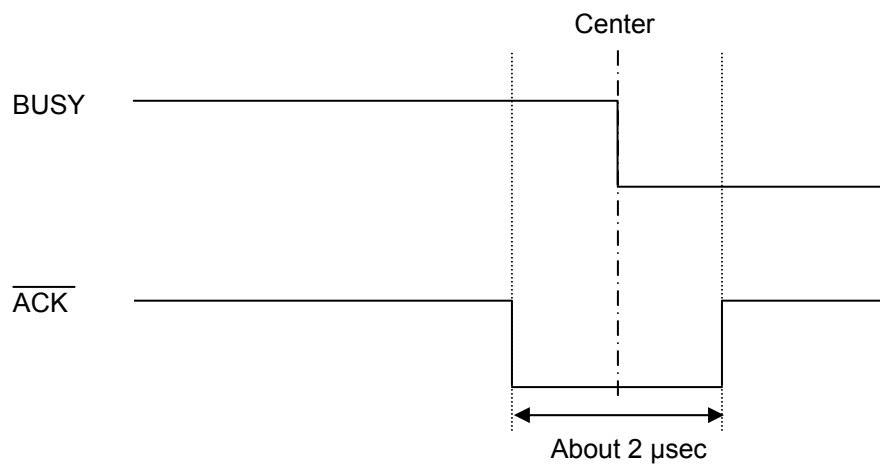
Note: BUSY goes to “High” at the falling edge of $\overline{\text{Strobe}}$, and data is latched at the leading edge of $\overline{\text{Strobe}}$.

[While receiving PRIME signal]



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 $\overline{\text{ACK}}$]



CHAPTER 3

DISASSEMBLY AND MAINTENANCE



CHAPTER 3 DISASSEMBLY AND MAINTENANCE

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3-1. Maintenance Precautions



Before starting disassembly/reassembly or mechanical adjustment, be sure to disconnect the power cord from the power source. Otherwise, electric shock may occur.

Observe the following in maintenance work:



- **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.
SA Platen	Clean the platen with a soft cloth.
Media running surface ("SA Platen", etc.)	Wipe off media refuse, etc., on and around the media running surface.

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.

3-4. Maintenance Tools List

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

Maintenance Tools List

No.	Name	Q'ty	Description
1	Phillips Screwdriver (Length 200mm)	1	Bit: #0, #1, #2
2	Phillips Screwdriver (Length 100mm)	1	Bit: #0, #1, #2
3	Flat-blade Screwdriver	1	4.3 mm width
4	Box wrench	1	Box size: 5 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
- SA Platen
- SA Ribbon Tension Unit R (Gives a back tension to the supply side ribbon.)

3-5-1. SA Head



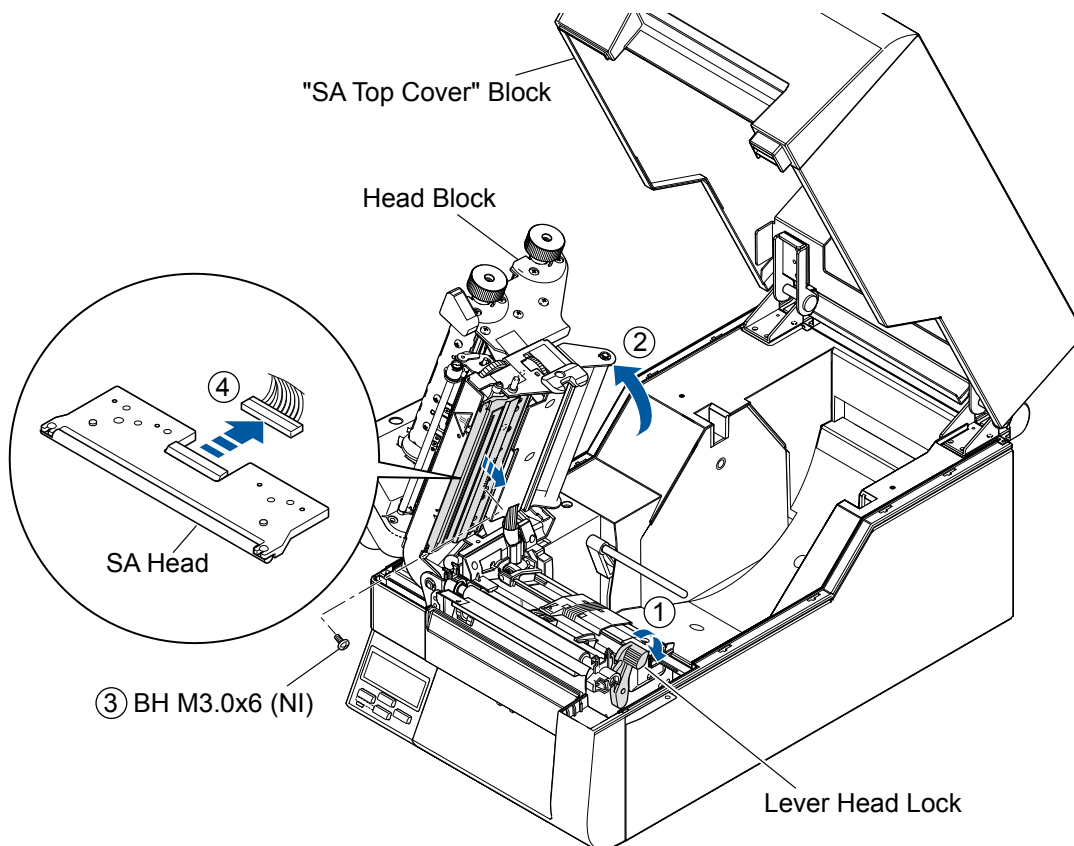
Caution

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 “SA Top Cover” Block.
2. Push the “Lever Head Lock” (①) and open the Head Block (②).
3. Remove the 1 screw (BH M3.0x6 (NI)) (③) and detach the “SA Head”.
4. Disconnect the 1 connector (④) from the “SA Head”.

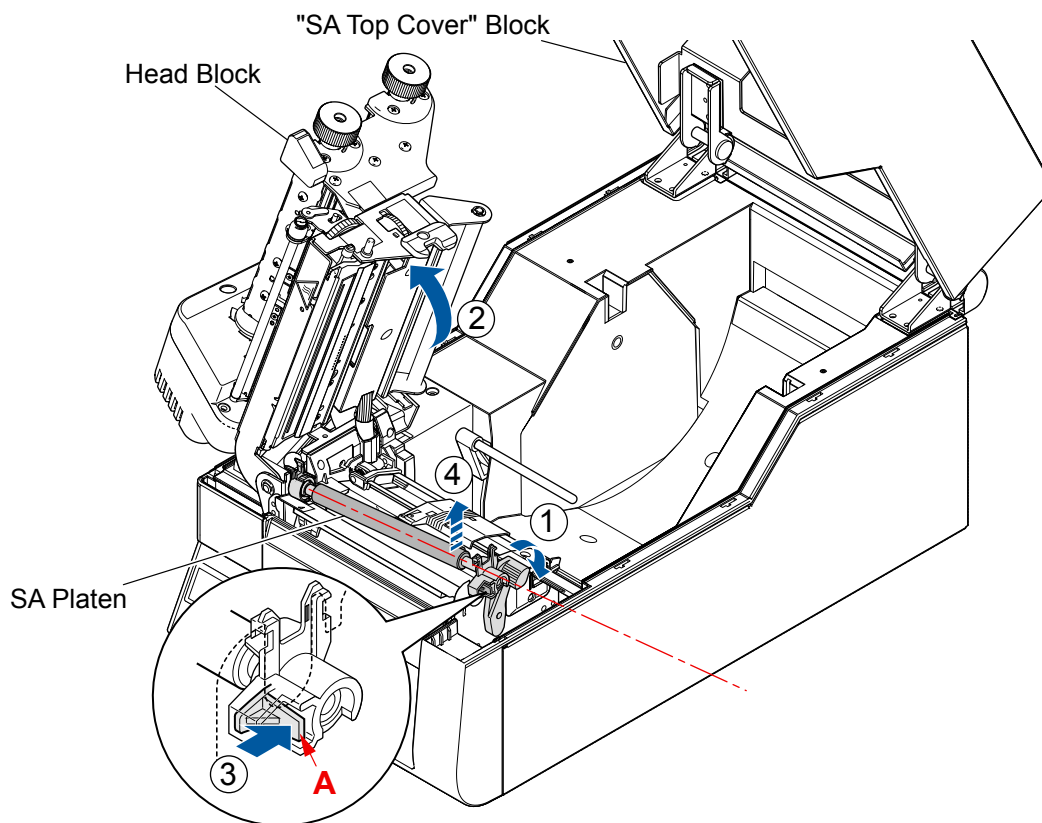


Note on reassembling:

- The “SA Cover Frame” has two bosses that allow easy positioning of the “SA Head”. When mounting the “SA Head” with the 1 screw (BH M3.0x6 (NI)) (③), be sure that it is securely engaged with the bosses.

3-5-2. SA Platen

1. Open the "SA Top Cover" Block.
2. Push the "Lever Head Lock" (①) and open the Head Block (②).
3. While pressing the part "A" of the "SA Platen" (③), raise its right end by about indicated degrees, and then remove the "SA Platen" by lifting it upwardly.

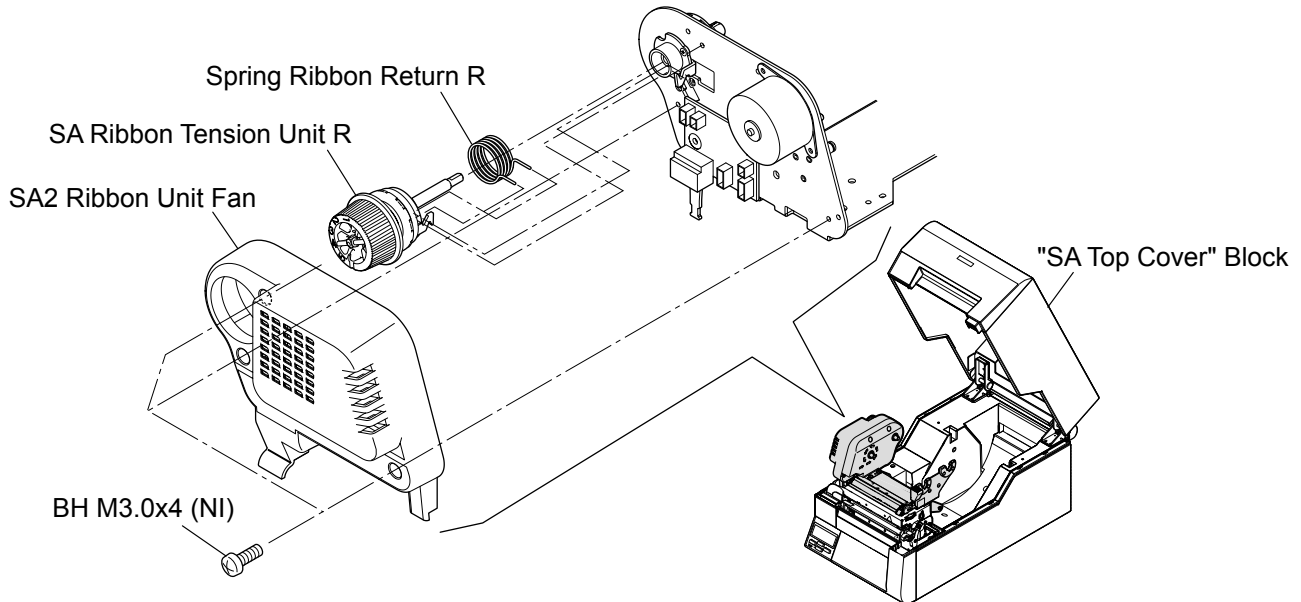


Note on reassembling:

- After mounting the "SA Platen", be sure that it is securely engaged with the main body.

3-5-3. SA Ribbon Tension Unit R

1. Open the "SA Top Cover" Block.
2. Remove the 3 screws (BH M3.0x4 (NI)) and detach the "SA2 Ribbon Unit Fan".
3. Remove the "Spring Ribbon Return R" from the "SA Ribbon Tension Unit R", and detach both from the frame.

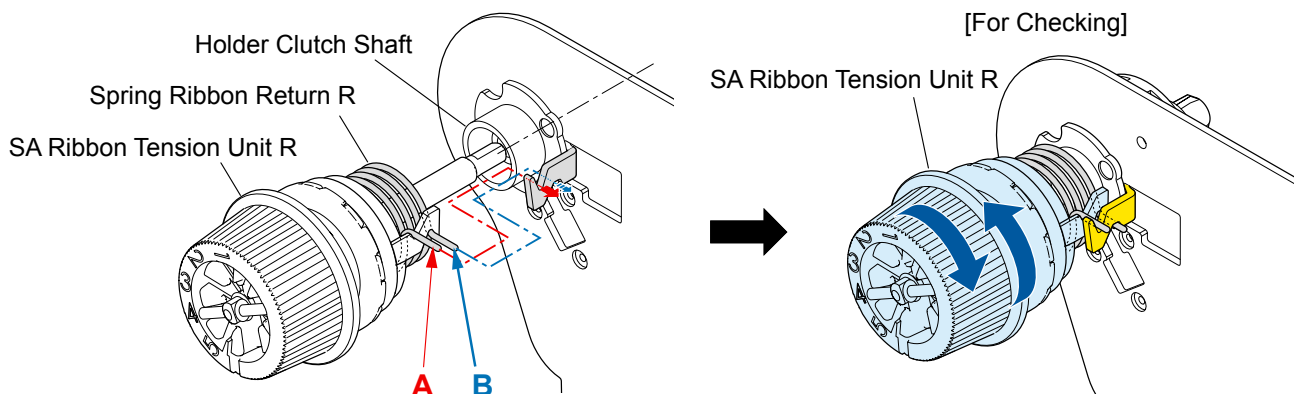


4. Mount the "SA Ribbon Tension Unit R" as follows:
 - 1) Hook the ends "A" and "B" of the "Spring Ribbon Return R" on each hook part of the "SA Ribbon Tension Unit R" and "Holder Clutch Shaft", respectively, as shown on the right side figure.

* The "Spring Ribbon Return R" has no orientation.

The table below shows the positions where the ends "A" and "B" of the "Spring Ribbon Return R" should be hooked on.

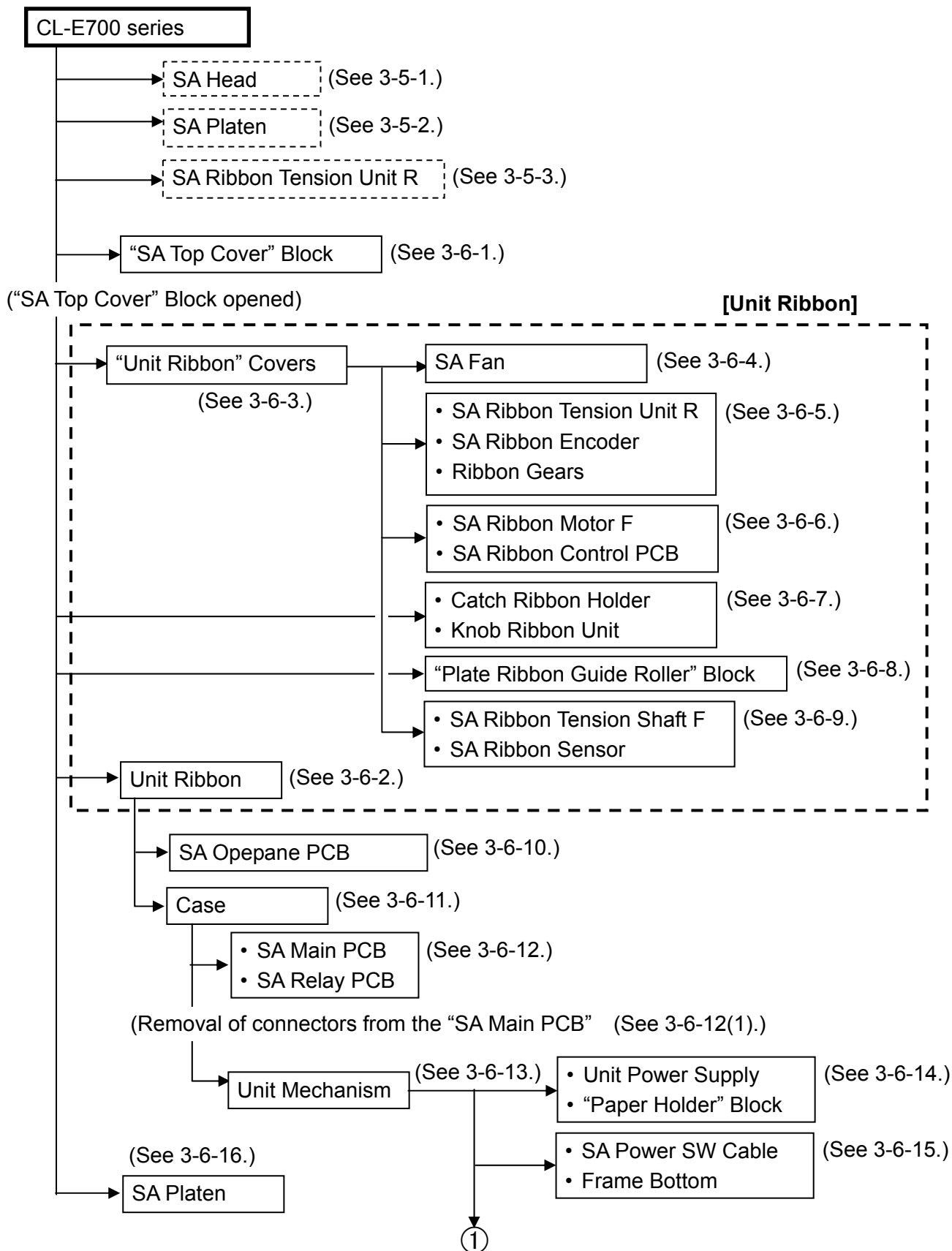
Spring Ribbon Return R	SA Ribbon Tension Unit R	Holder Clutch Shaft
End "A"	Front/Upper side	Front/Upper side
End "B"	Rear/Lower side	Rear/Lower side

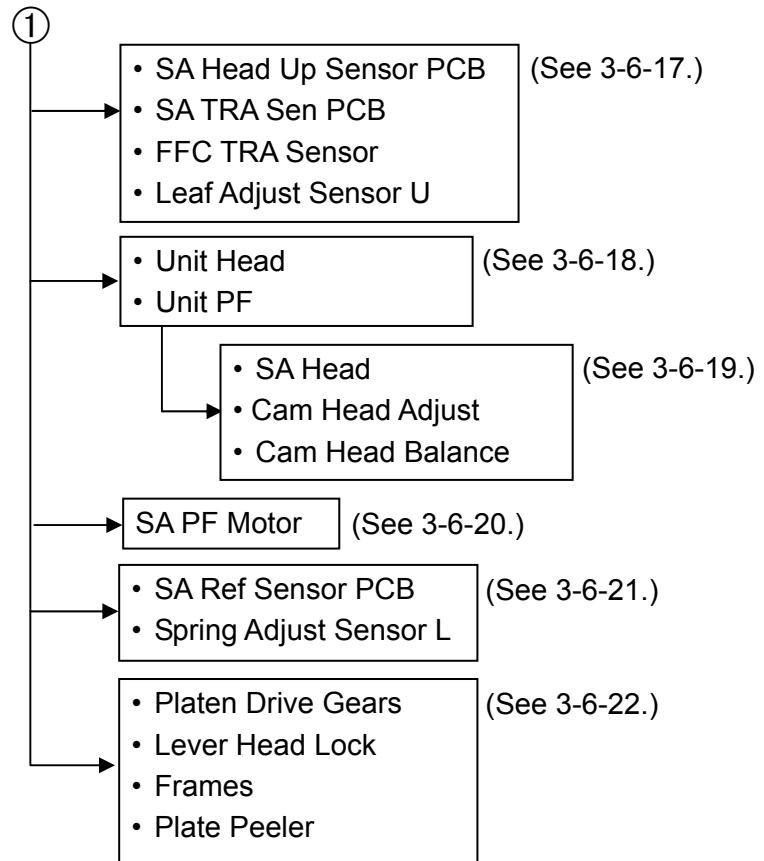


- 2) To check for correct mounting, rotate the "SA Ribbon Tension Unit R" clockwise and counterclockwise as shown in the above right figure to be sure that it returns to the original position by the force of the spring "Spring Ribbon Return R".
5. Mount the "SA2 Ribbon Unit Fan" with the 3 screws (BH M3.0x4 (NI)).

3-6. Disassembly, Reassembly and Lubrication

[Disassembly Flowchart for Major Parts]

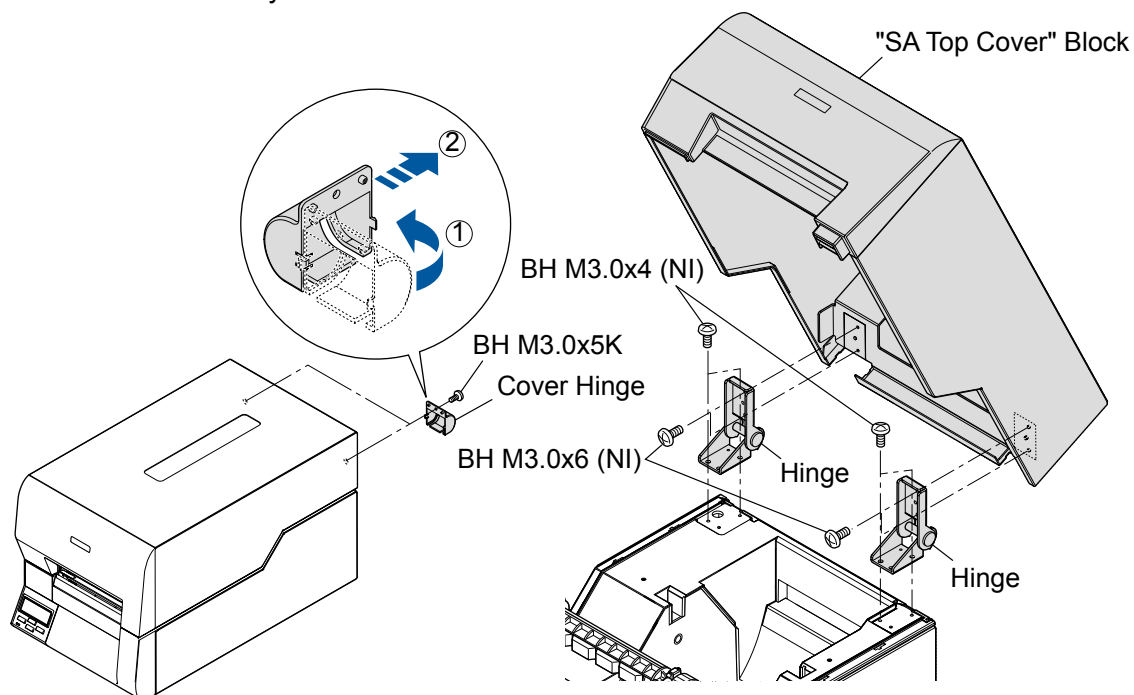




3-6-1. "SA Top Cover" Block

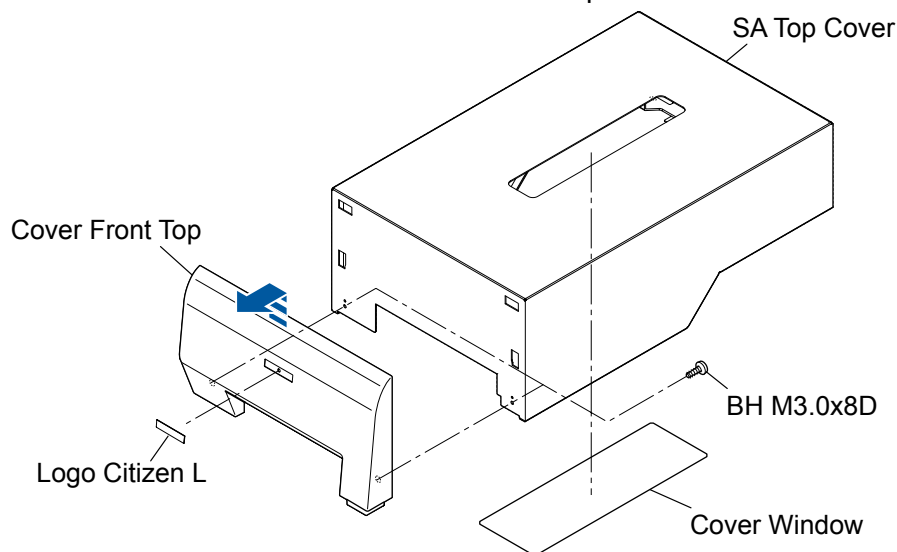
(1) "SA Top Cover" Block

1. Remove the 1 screw (BH M3.0x5K) on each side, at the back of the "SA Top Cover", and fully open (①) each "Cover Hinge" as shown in the magnified view to remove it (②).
2. Open the "SA Top Cover" Block.
3. Remove the 2 screws (BH M3.0x6 (NI)) on each side and detach the "SA Top Cover" Block.
4. Remove the 2 screws (BH M3.0x4 (NI)) on each side and detach the "Hinge" (2 pcs.) from the main body.



(2) SA Top Cover

1. Remove the 2 screws (BH M3.0x8D) and detach the "Cover Front Top" in the direction shown by the arrow.
2. Remove the "Logo Citizen L" from the "Cover Front Top".
3. Remove the "Cover Window" from the "SA Top Cover".



3-6-2. Unit Ribbon

When removing the “Unit Ribbon”, do not loosen the **“Forbidden Screws”**.

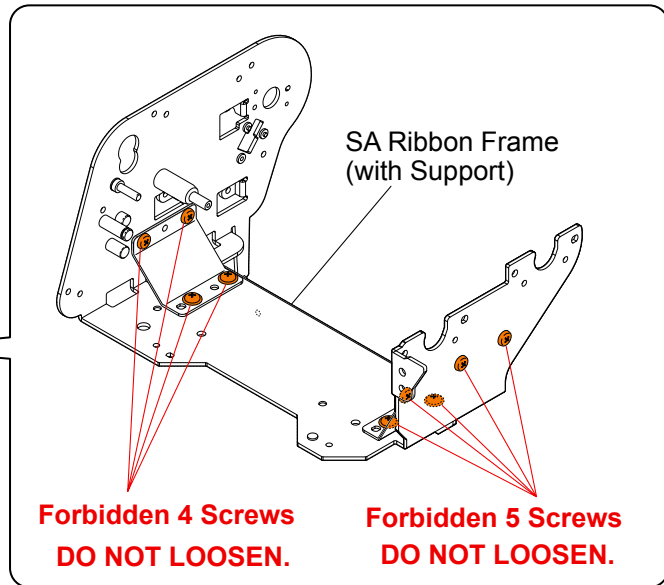
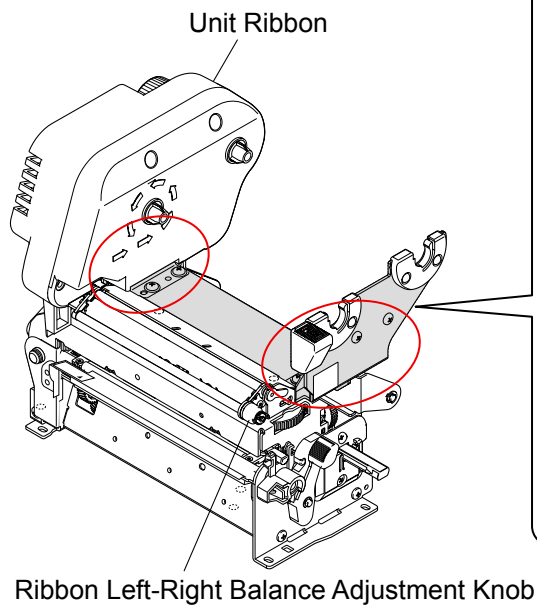


“Forbidden Screws” in the “Unit Ribbon”

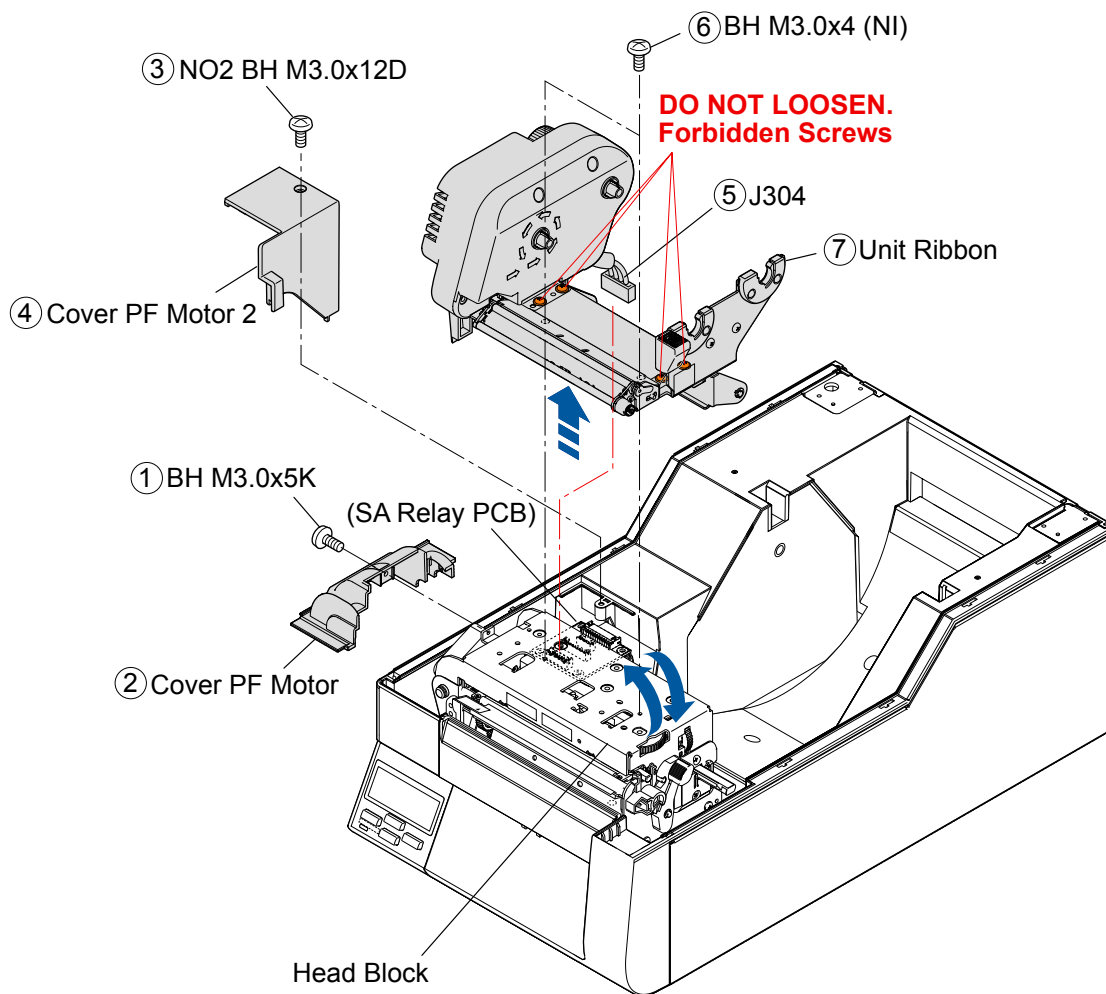
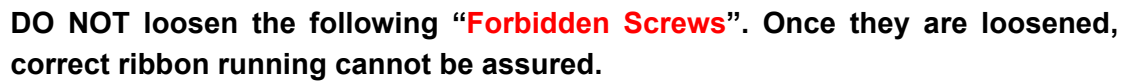
DO NOT loosen the 9 **“Forbidden Screws”** of the “SA Ribbon Frame (with Support)”.

The “SA Ribbon Frame (with Support)” consists of three parts and is assembled with the 9 screws.

Once the “SA Ribbon Frame (with Support)” is disassembled, correct ribbon running cannot be assured. Therefore, a ribbon wrinkle may not be removed with the Ribbon Left-Right Balance Adjustment Knob, as expected.



1. Remove the 1 screw (BH M3.0x5K) (①) and detach the “Cover PF Motor” (②) to the left.
2. Open the Head Block.
3. Remove the 1 screw (NO2 BH M3.0x12D) (③) and detach the “Cover PF Motor 2” (④) upwardly.
4. Disconnect the connector J304 (⑤) from the “SA Relay PCB”.
5. Close the Head Block.
6. Remove the 2 screws (BH M3.0x4 (NI)) (⑥) and detach the “Unit Ribbon” (⑦) by lifting it upwardly.

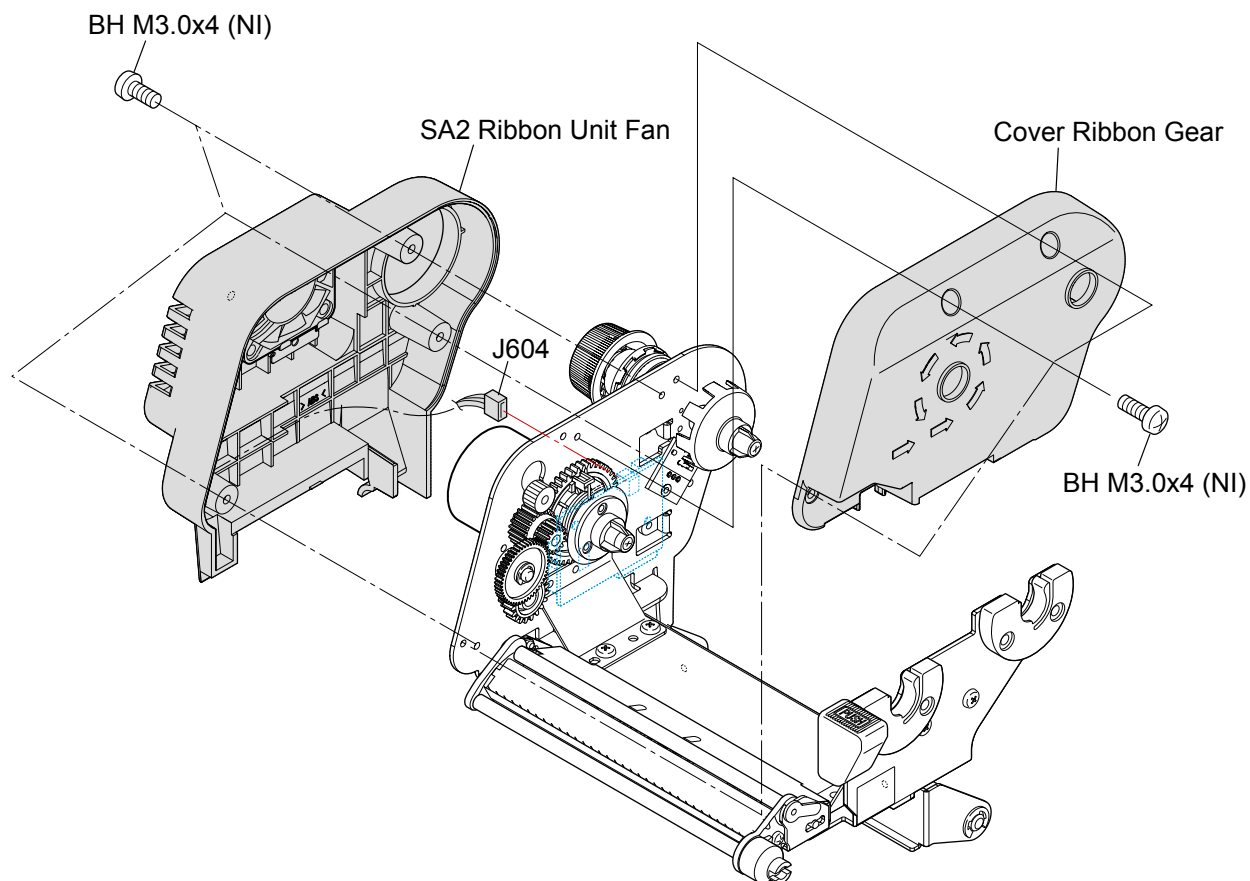


Note on reassembling:

- Mount the “Cover PF Motor 2” (④) with the Head Block opened.

3-6-3. “Unit Ribbon” Covers

1. Remove the 3 screws (BH M3.0x4 (NI)) and detach the “Cover Ribbon Gear” to the right.
2. Remove the 3 screws (BH M3.0x4 (NI)) and detach the “SA2 Ribbon Unit Fan” to the left.
3. Disconnect the connector J604 from the main body.

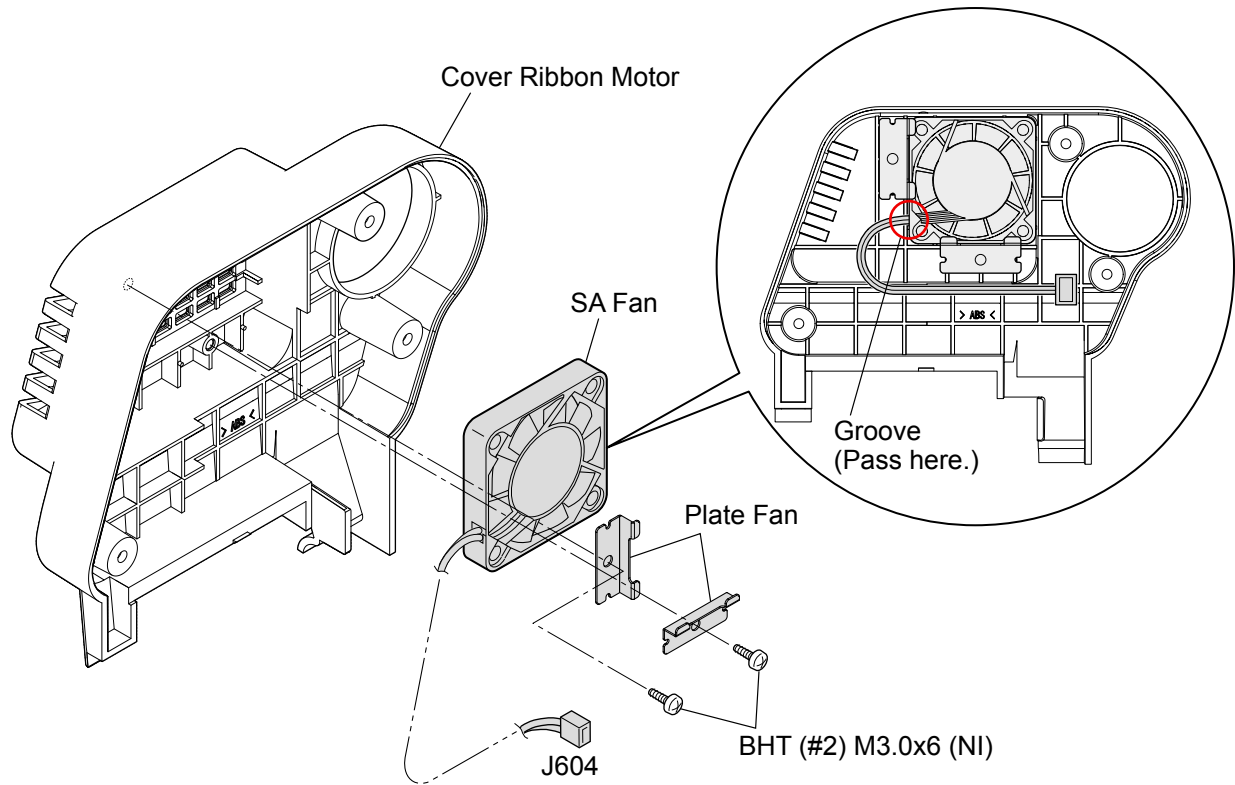


Note on reassembling:

- When mounting the “SA2 Ribbon Unit Fan”, pay attention so as not to pinch the cable of J604.

3-6-4. “SA Fan” of the “Unit Ribbon”

1. Remove the “SA2 Ribbon Unit Fan”. Refer to “3-6-3 “Unit Ribbon” Covers”.
2. Remove the 2 screws (BHT (#2) M3.0x6 (NI)) and detach the “Plate Fan” (2 pcs.).
3. Remove the “SA Fan” from the “Cover Ribbon Motor”.



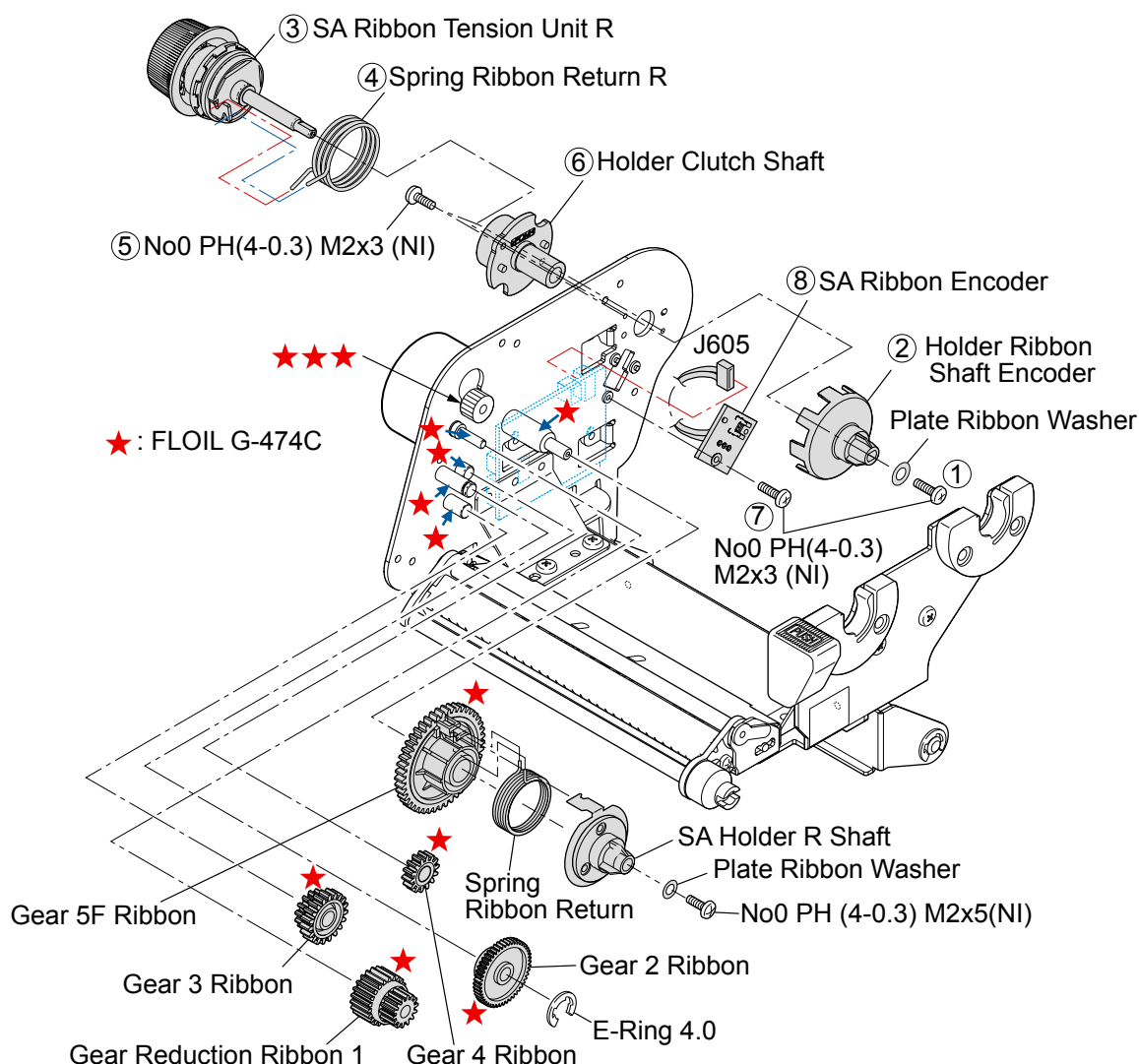
Note on reassembling:

- Referring to the magnified view, insert the cable of the “SA Fan” into the groove indicated by a circle.

3-6-5. “SA Ribbon Tension Unit R”, “SA Ribbon Encoder” and Ribbon Gears

(1) “SA Ribbon Tension Unit R” and “SA Ribbon Encoder”

1. Remove the “SA2 Ribbon Unit Fan”. Refer to “3-6-3 “Unit Ribbon” Covers”.
2. Remove the 1 screw (No0 PH(4-0.3) M2x3 (NI)) (①) and detach the “Plate Ribbon Washer” and the “Holder Ribbon Shaft Encoder” (②).
3. Remove the “SA Ribbon Tension Unit R” (③) and the “Spring Ribbon Return R” (④).
4. Remove the 2 screws (No0 PH(4-0.3) M2x3 (NI)) (⑤) and detach the “Holder Clutch Shaft” (⑥).
5. Remove the 1 screws (No0 PH(4-0.3) M2x3 (NI)) (⑦), disconnect the connector J605, and detach the “SA Ribbon Encoder” (⑧).



Note on reassembling:

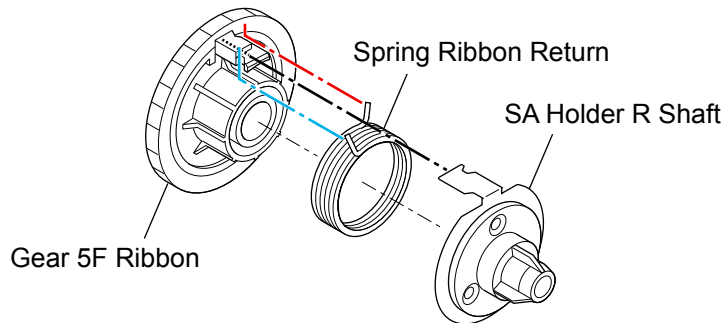
- Correctly hook both ends of the “Spring Ribbon Return R” (④) on the hook part of the “SA Ribbon Tension Unit R” (③) and “Holder Clutch Shaft” (⑤).
To correctly hook them, refer to “3-5-3 SA Ribbon Tension Unit R”. After hooking both ends, rotate the “SA Ribbon Tension Unit R” (③) right and left to be sure that it returns to the original position by the spring force.

(2) Ribbon Gears

1. Disengage the 1 E-ring (E-Ring 4.0) and remove the “Gear 2 Ribbon”, “Gear 1 Ribbon”, “Gear 3 Ribbon” and “Gear 4 Ribbon” in that order.
2. Remove the 1 screw (No0 PH (4-0.3) M2x5(NI)) and remove the “Plate Ribbon Washer”, “SA Holder R Shaft”, “Spring Ribbon Return” and “Gear 5F Ribbon” in that order.

Notes on reassembling:

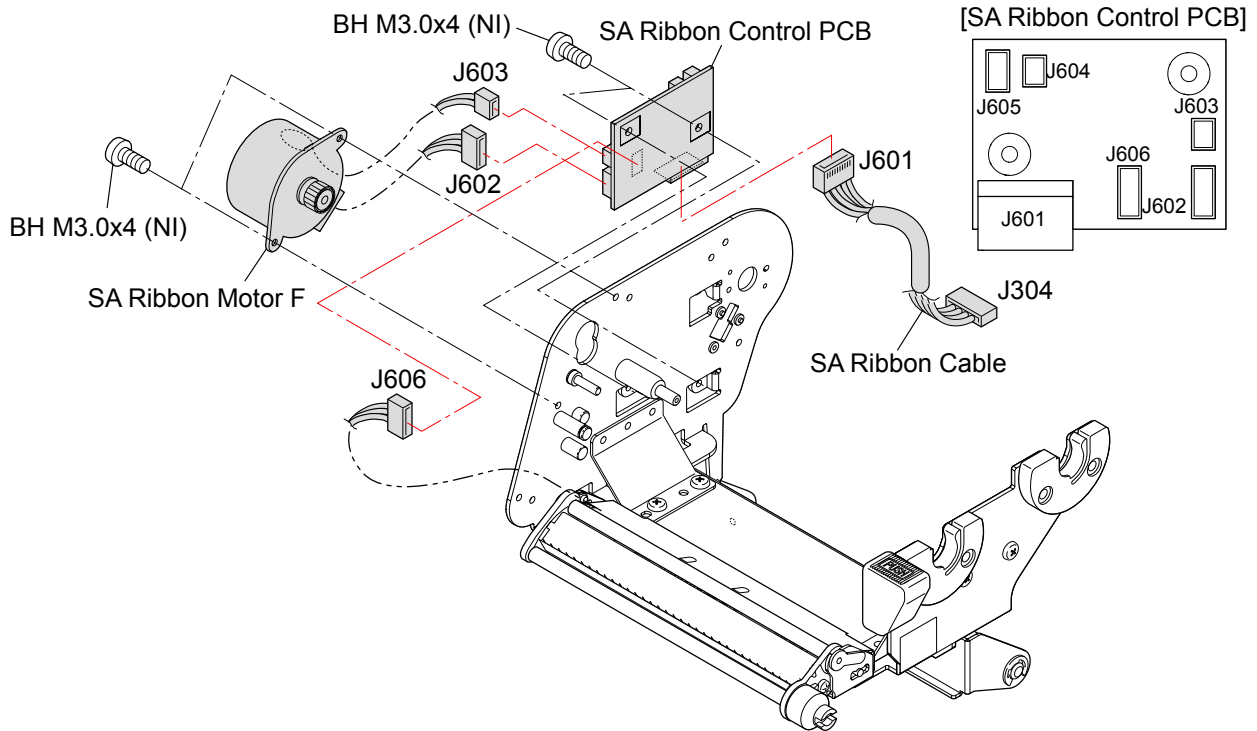
- Assemble the “SA Holder R Shaft”, “Spring Ribbon Return” and “Gear 5F Ribbon” as shown below.



- Apply FLOIL G-474C to the gears and the shafts marked with “★”. Refer to the figure on the previous page.

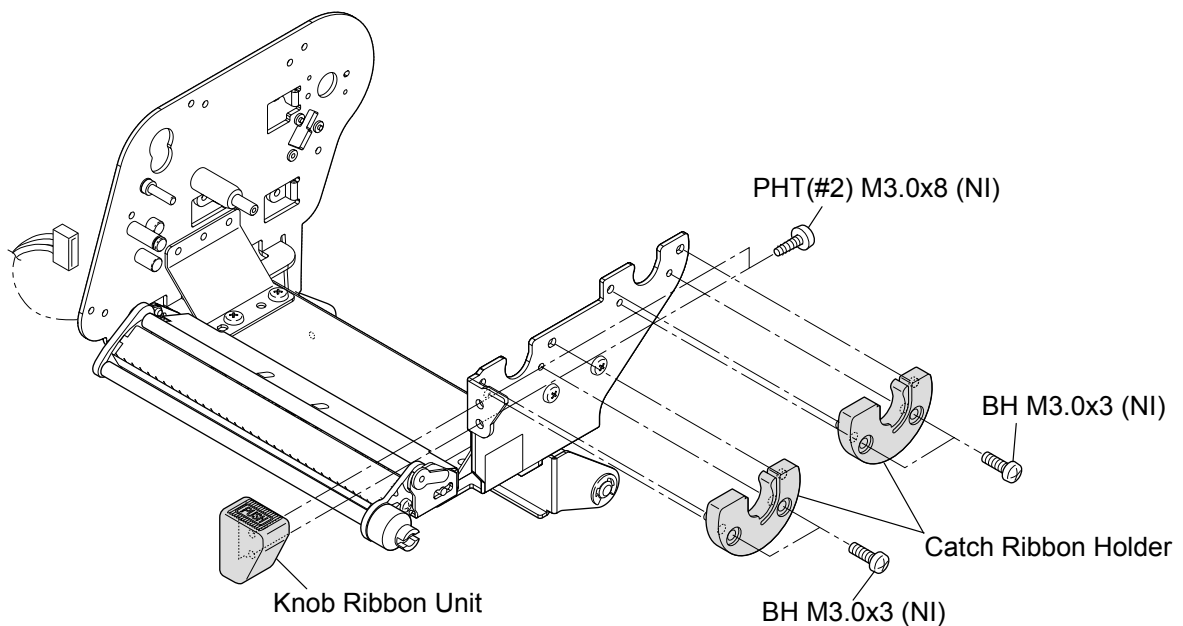
3-6-6. “SA Ribbon Motor F” and “SA Ribbon Control PCB”

1. Remove the “SA2 Ribbon Unit Fan”. Refer to “3-6-3 “Unit Ribbon” Covers”.
2. Disconnect the connectors J602 and J603 from the “SA Ribbon Control PCB”.
3. Remove the 2 screws (BH M3.0x4 (NI)) and detach the “SA Ribbon Motor F”.
4. Disconnect the connectors J606 and J601 (SA Ribbon Cable) from the “SA Ribbon Control PCB”.
5. Remove the 2 screws (BH M3.0x4 (NI)) and detach the “SA Ribbon Control PCB”.



3-6-7. “Catch Ribbon Holder” and “Knob Ribbon Unit”

1. Remove the 4 screws (BH M3.0x3 (NI)) and detach the “Catch Ribbon Holder” (2 pcs.).
2. Remove the 2 screws (PHT(#2) M3.0x8 (NI)) and detach the “Knob Ribbon Unit”.

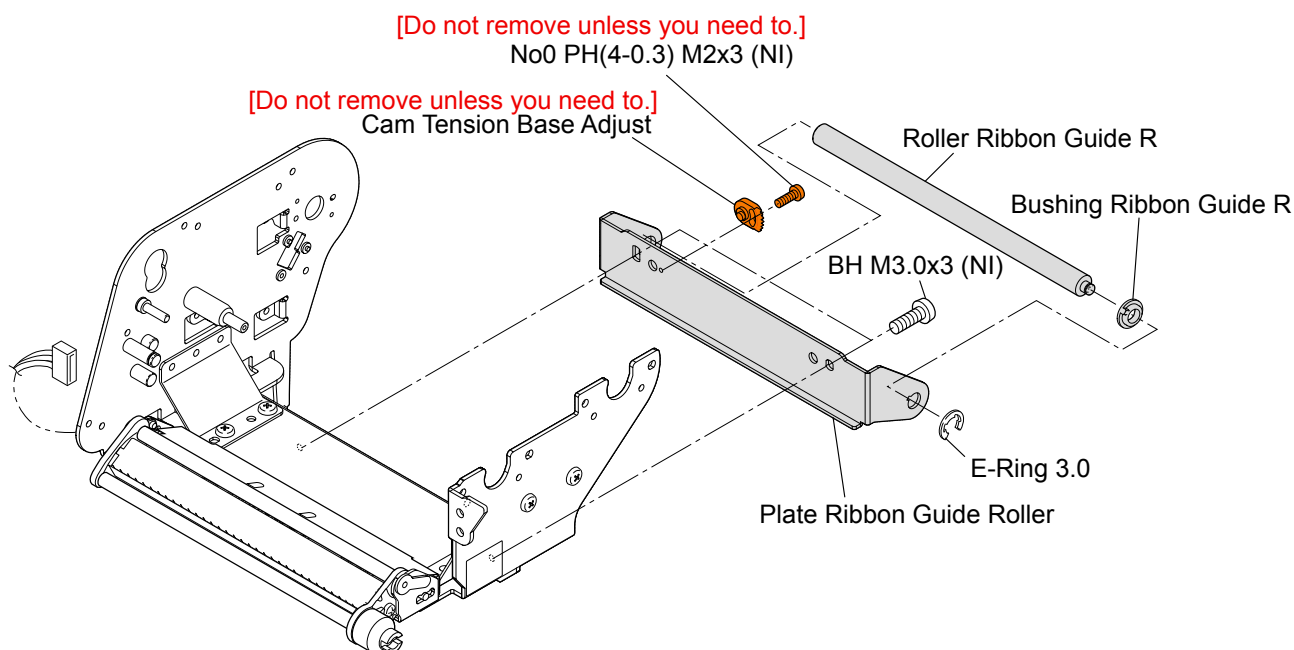


3-6-8. “Plate Ribbon Guide Roller” Block

1. Remove the 2 screws (BH M3.0x3 (NI)) and detach the “Plate Ribbon Guide Roller” Block.
2. Disengage the 1 E-ring (E-Ring 3.0) and remove the “Bushing Ribbon Guide R” and “Roller Ribbon Guide R”.
3. **If required**, remove the 1 screw (No0 PH(4-0.3) M2x3 (NI)) and detach the “Cam Tension Base Adjust”.



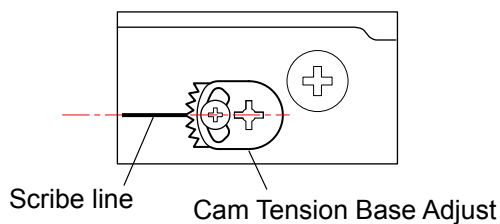
Do not remove the “Cam Tension Base Adjust” unless you need to. Once it is removed, readjustment is required.



Note on reassembling:

- When remounting the “Cam Tension Base Adjust”, align the + mark of the “Cam Tension Base Adjust” with the scribe line as shown below. (The “Cam Tension Base Adjust” is set to the mechanical center.)

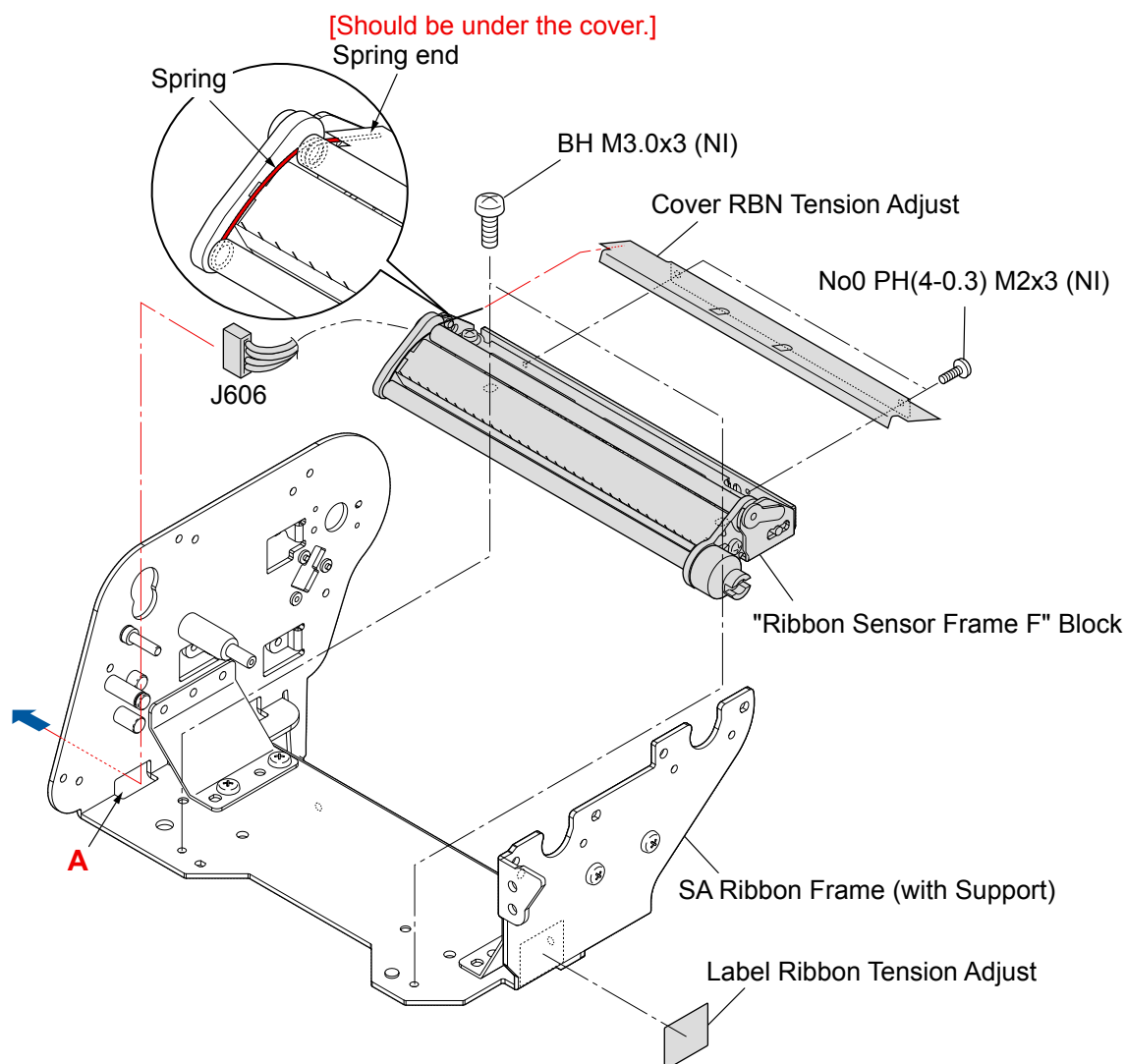
Next, perform the adjustment according to [“3-7-2\(2-2\) Rear side “Cam Tension Base Adjust” position adjustment \(For user\)”](#).



3-6-9. “SA Ribbon Tension Shaft F” and “SA Ribbon Sensor”

(1) “Ribbon Sensor Frame F” Block

1. Remove the “SA2 Ribbon Unit Fan”. Refer to “3-6-3 “Unit Ribbon” Covers”.
2. Remove the 2 screws (BH M3.0x3 (NI)) and detach the “Ribbon Sensor Frame F” Block from the “SA Ribbon Frame (with Support)”.
3. Remove the 2 screws (No0 PH(4-0.3) M2x3 (NI)) and detach the “Cover RBN Tension Adjust”.
4. Peel off the “Label Ribbon Tension Adjust” from the “SA Ribbon Frame (with Support)”.



Notes on reassembling:

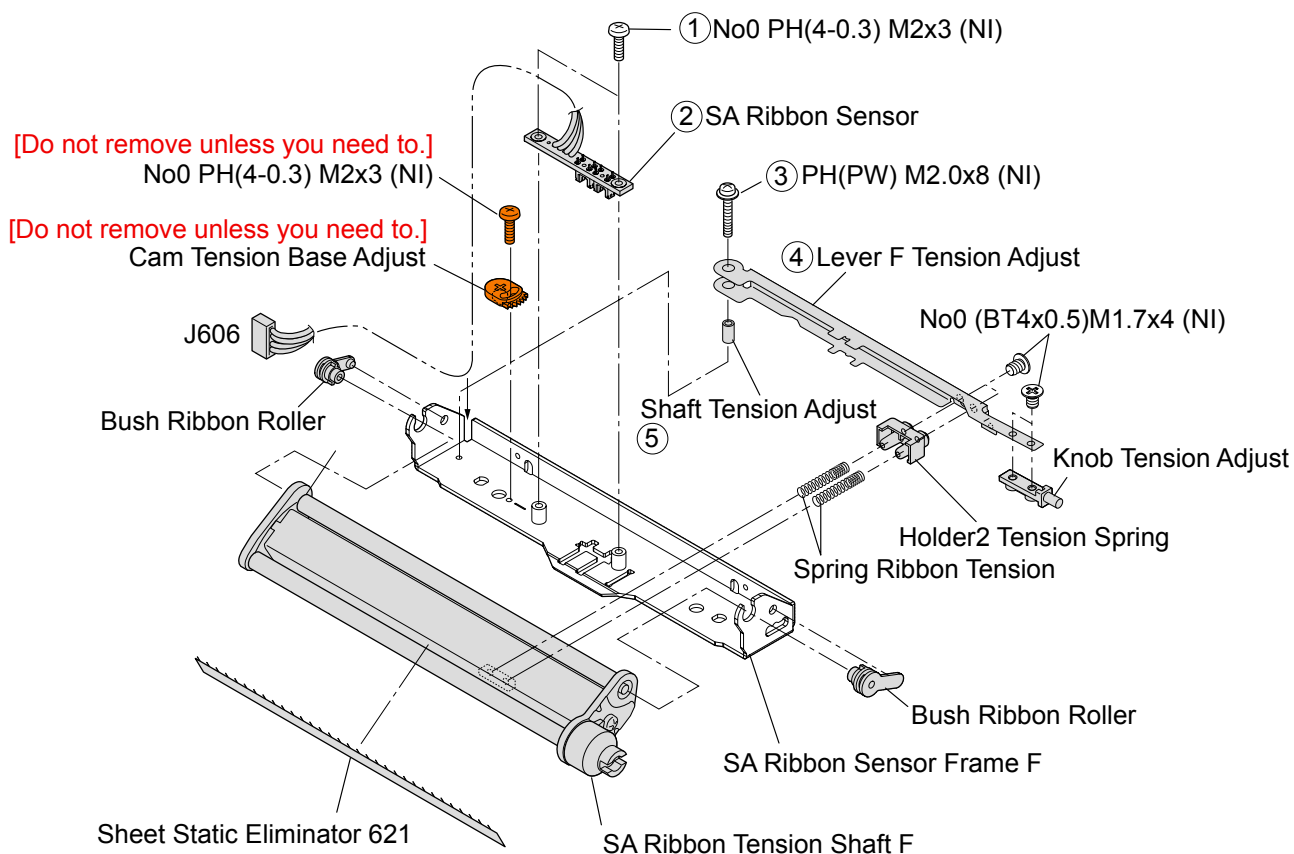
- Referring to the magnified view, mount the “Cover RBN Tension Adjust” so that the spring end of the “Ribbon Sensor Frame F” Block is under the “Cover RBN Tension Adjust”.
- Pass the connector J606 through the hole “A” in the frame.
- When remounting the “Ribbon Sensor Frame F” Block, perform the ribbon slant elimination adjustment. Refer to “3-7-2(1) Ribbon Left-Right Balance Adjustment Knob (For user)”.
- Once the label is peeled off, it cannot be reused.

(2) “SA Ribbon Tension Shaft F” and “SA Ribbon Sensor”

1. Remove the “Bush Ribbon Roller” (2 pcs.) on both sides, detach the “SA Ribbon Tension Shaft F”, and peel off the “Sheet Static Eliminator 621”.
2. Remove the 2 screws (No0 PH(4-0.3) M2x3 (NI)) (①) and detach the “SA Ribbon Sensor” (②).
3. Remove the 1 screw (PH(PW) M2.0x8 (NI)) (③) and remove the “Lever F Tension Adjust” Block (④) and “Shaft Tension Adjust” (⑤).
4. Remove the 2 screws (No0 (BT4x0.5)M1.7x4 (NI)) from the “Lever F Tension Adjust” Block and detach the “Holder2 Tension Spring” and “Spring Ribbon Tension” (2 pcs.). Also, remove the 2 screws (No0 (BT4x0.5)M1.7x4 (NI)) and detach the “Knob Tension Adjust”.
5. **If required**, remove the 1 screw (No0 PH(4-0.3) M2x3 (NI)) and detach the “Cam Tension Base Adjust”.

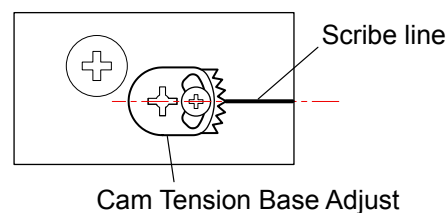


Do not remove the “Cam Tension Base Adjust” unless you need to. Once it is removed, readjustment is required.



Note on reassembling:

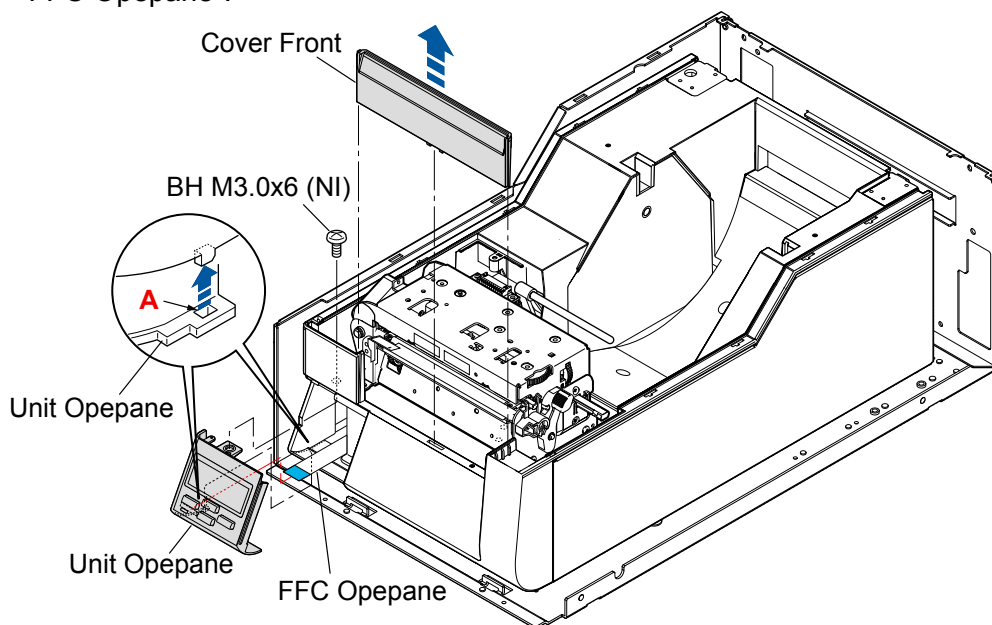
- When remounting the “Cam Tension Base Adjust”, align the + mark of the “Cam Tension Base Adjust” with the scribe line as shown on the right (The “Cam Tension Base Adjust” is set to the mechanical center.) Next, perform the adjustment according to “3-7-2(2-1) Front side “Cam Tension Base Adjust” position adjustment (For service personnel)”.



3-6-10. SA Opepane PCB

(1) Unit Opepane

1. Remove the "Unit Ribbon". Refer to "3-6-2 Unit Ribbon".
2. Remove the "Cover Front" by lifting it upwardly.
3. Remove the 1 screw (BH M3.0x6 (NI)), detach the "Unit Opepane", and disconnect the "FFC Opepane".

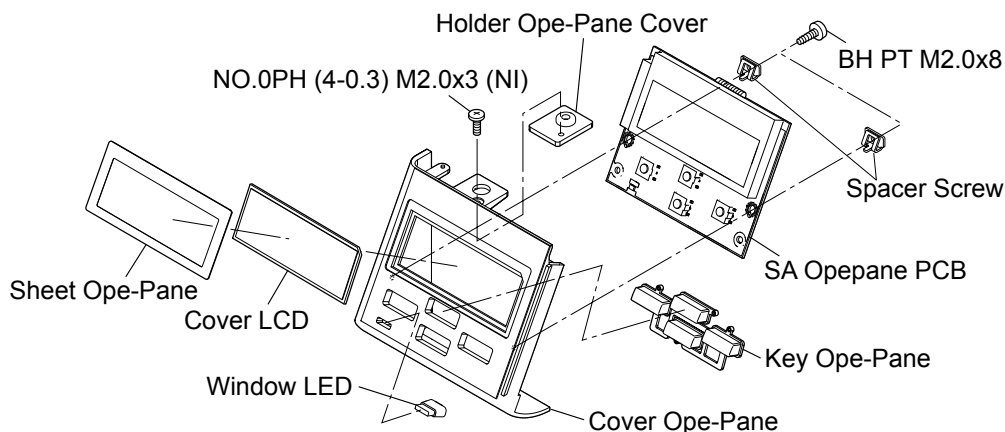


Notes on reassembling:

- When connecting the "FFC Opepane", see on which side the blue tape is, and correctly insert in in the right direction. If it is inserted reversely, the circuit is not electrically connected.
- Referring to the magnified view, install the "Unit Opepane" so that its hole "A" is correctly engaged with the projection of the case.

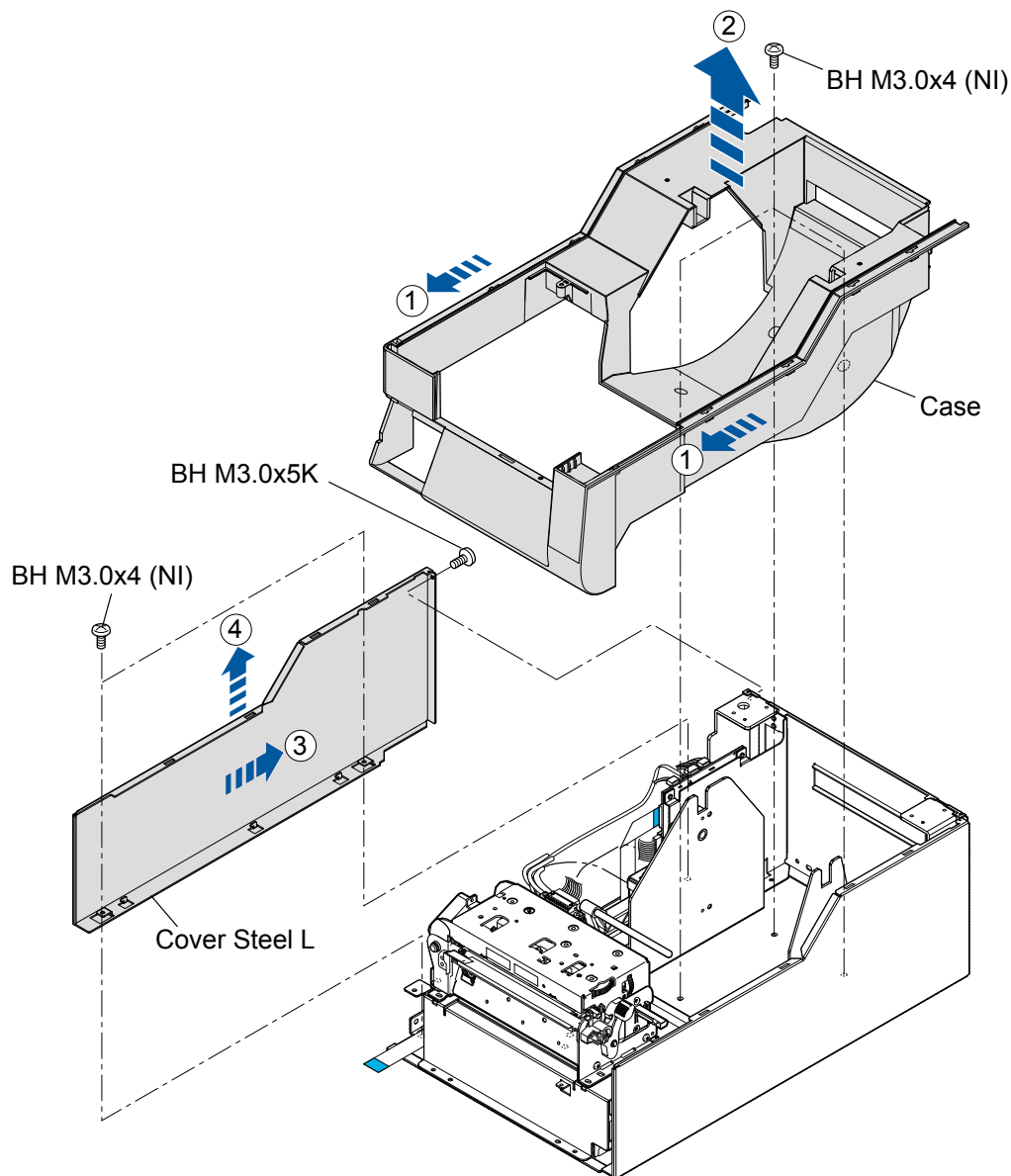
(2) SA Opepane PCB

1. Remove the 2 screws (BH PT M2.0x8) and detach the "Spacer Screw" (2 pcs.) and "SA Opepane PCB".
2. Remove the "Window LED" and "Key Ope-Pane".
3. Remove the 1 screw (NO.0PH (4-0.3) M2.0x3 (NI)) and detach the "Holder Ope-Pane Cover".
4. Remove the "Sheet Ope-Pane" and "Cover LCD" from the "Cover Ope-Pane".



3-6-11. Case

1. Remove the "Unit Ribbon". Refer to "3-6-2 Unit Ribbon".
2. Remove the "Unit Opepane". Refer to "3-6-10(1) Unit Opepane".
3. Remove the 3 screws (BH M3.0x4 (NI)), slide the "Case" toward the front (①), and then detach it by lifting upwardly (②).
4. Remove the 1 screw (BH M3.0x5K) and 2 screws (BH M3.0x4 (NI)), slide the "Cover Steel L" backward (③), and then detach it by lifting upwardly (④).



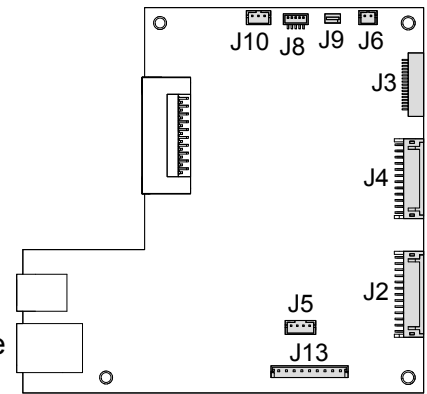
3-6-12. “SA Main PCB” and “SA Relay PCB”

(1) “SA Main PCB” Connectors

1. Remove the “Unit Ribbon”. Refer to “3-6-2 Unit Ribbon”.
2. Remove the “Unit Opepane”. Refer to “3-6-10(1) Unit Opepane”.
3. Remove the “Case” and “Cover Steel L”. Refer to “3-6-11 Case”.
4. Disconnect all connectors from the “SA Main PCB”.
J2, J3 (FFC Opepane), J4, J5, J6, J8, J9, J10, J13

Note on reassembling:

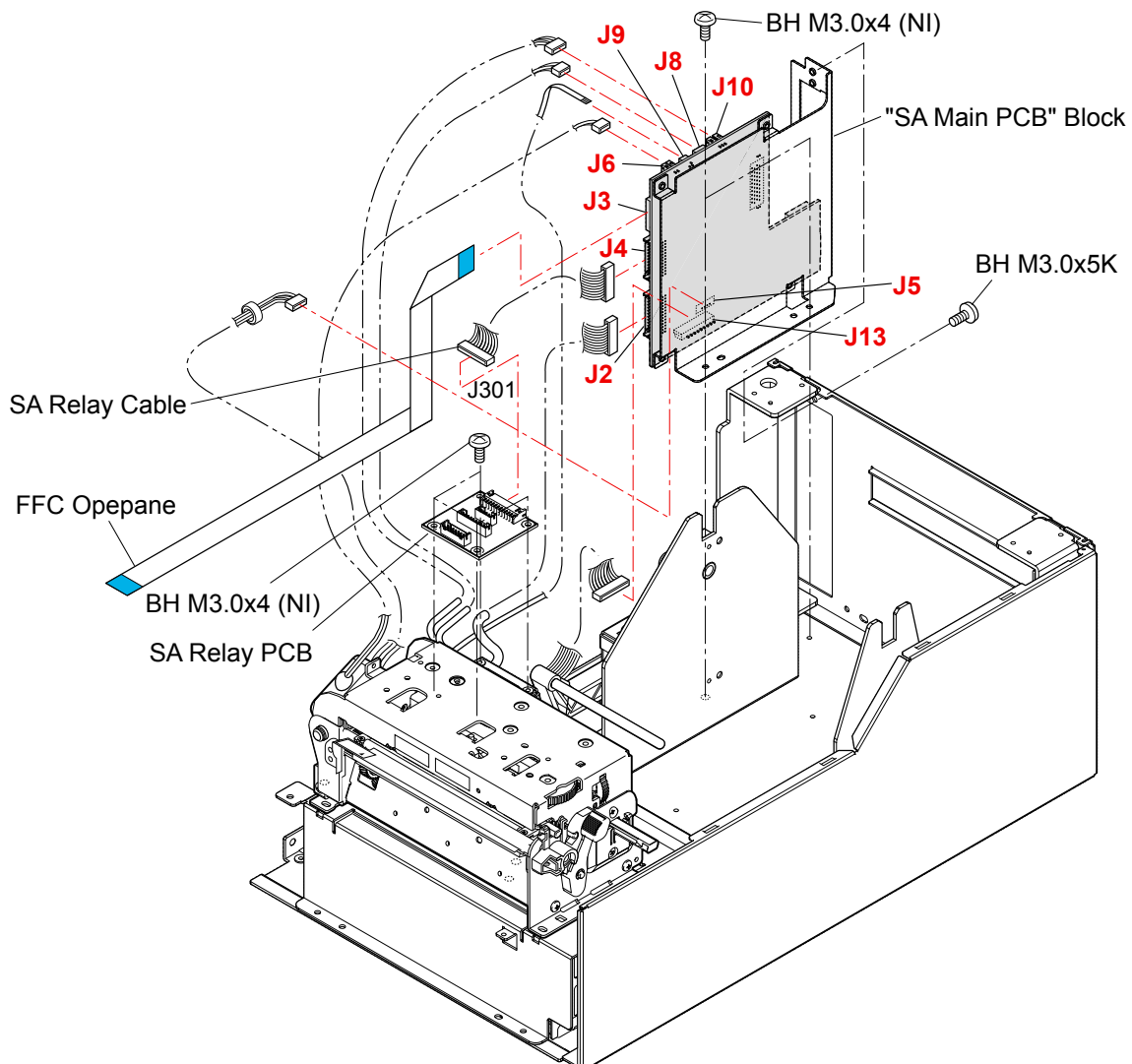
- When connecting J3 (FFC Opepane), see on which side the blue tape is, and correctly insert it in the right direction. If it is inserted reversely, the circuit is not electrically connected.



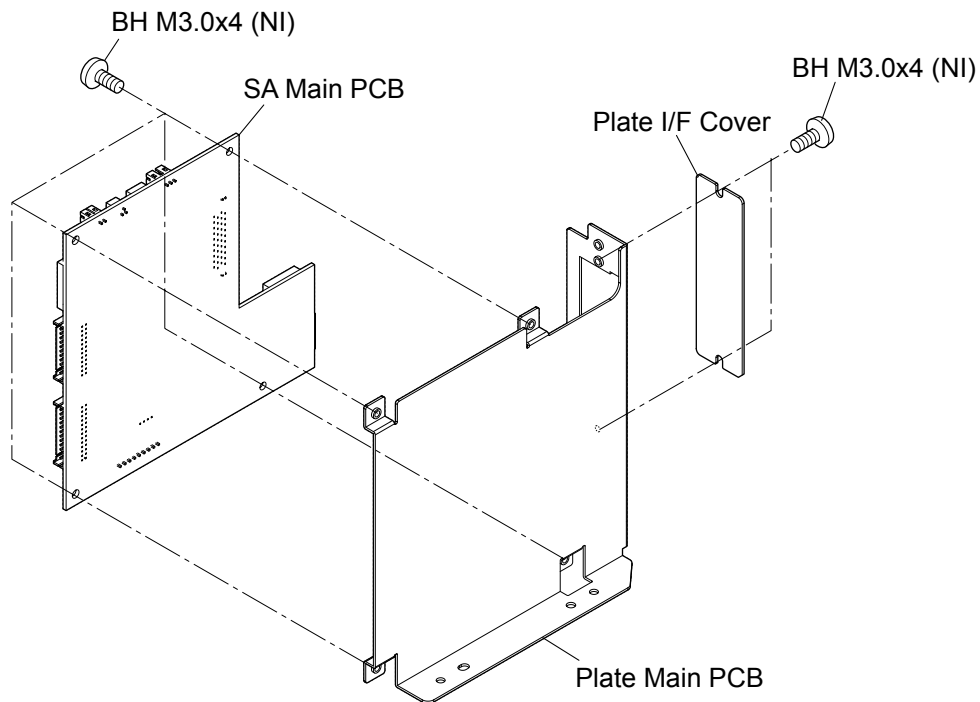
[SA Main PCB]

(2) “SA Main PCB” and “SA Relay PCB”

1. Remove the 1 screw (BH M3.0x5K) and 2 screws (BH M3.0x4 (NI)), and detach the “SA Main PCB” Block by lifting it upwardly.
2. Disconnect the “SA Relay Cable” from the “SA Relay PCB”.
3. Remove the 4 screws (BH M3.0x4 (NI)) and detach the “SA Relay PCB”.



4. Remove the 4 screws (BH M3.0x4 (NI)) and detach the "SA Main PCB".
5. Remove the 2 screws (BH M3.0x4 (NI)) and detach the "Plate I/F Cover" from the "Plate Main PCB".

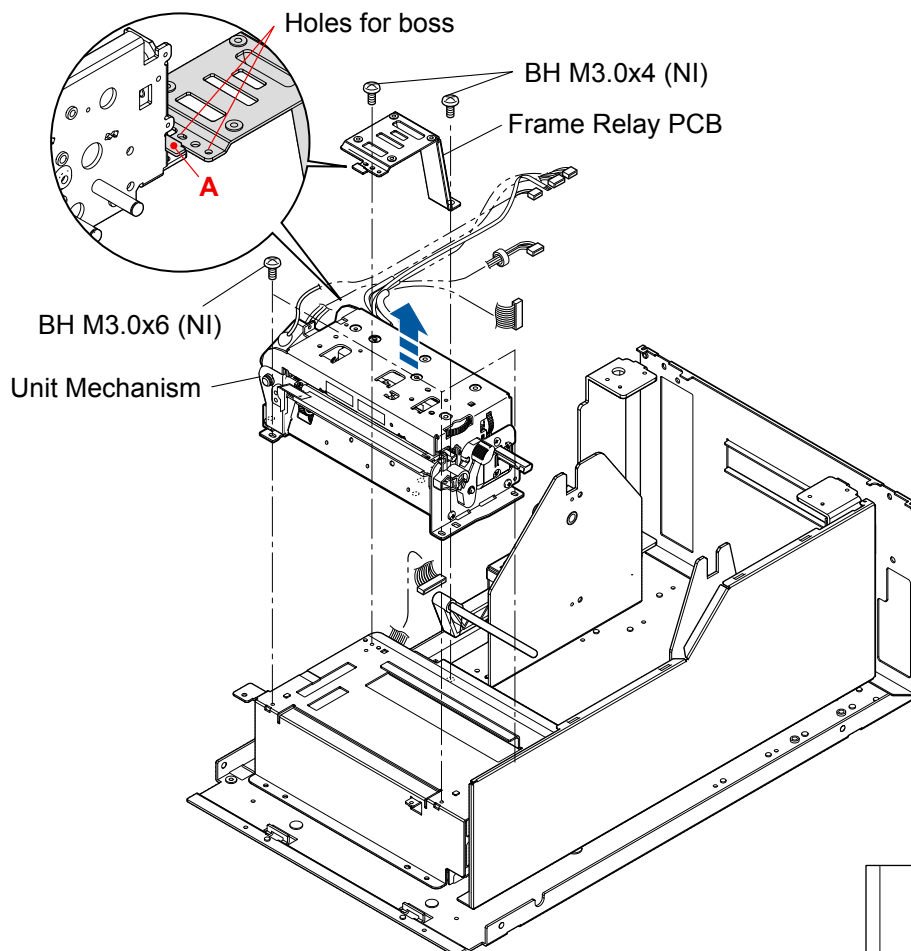


Note on reassembling:

- When the "SA Main PCB" is replaced with a new one, be sure to perform the transparent/reflective sensor adjustment. Refer to ["3-7-1 Transparent/Reflective Sensor Adjustment"](#).

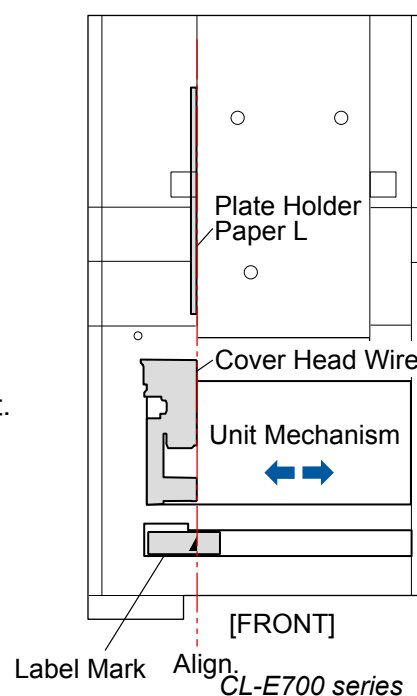
3-6-13. Unit Mechanism

1. Remove the "Unit Ribbon". Refer to "3-6-2 Unit Ribbon".
2. Remove the "Unit Opepane". Refer to "3-6-10(1) Unit Opepane".
3. Remove the "Case" and "Cover Steel L". Refer to "3-6-11 Case".
4. Remove all connectors from the "SA Main PCB". Refer to "3-6-12(1) "SA Main PCB" Connectors".
5. Remove the 2 screws (BH M3.0x4 (NI)) and detach the "Frame Relay PCB".
6. Remove the 3 screws (BH M3.0x6 (NI)) and detach the "Unit Mechanism" by lifting it upwardly.



Notes on reassembling:

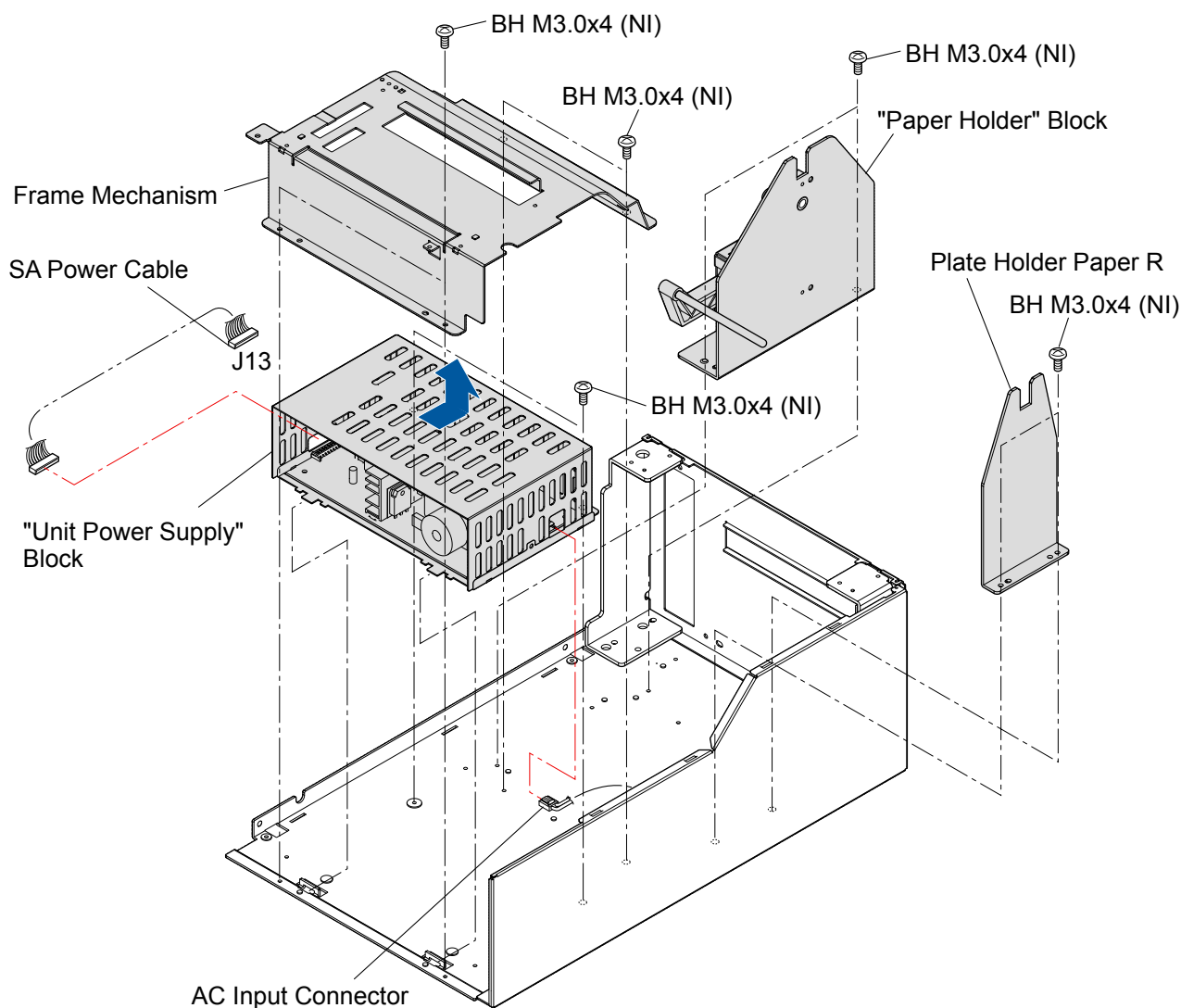
- Media-path left-edge alignment:
Mount the "Unit Mechanism" so that the media guide end of the "Cover Head Wire" is aligned with the mark on the "Label Mark" and the "Plate Holder Paper L".
* Since the mounting holes of the "Unit Mechanism" are of elongated ones, the "Unit Mechanism" can move right and left.
- When mounting the "Frame Relay PCB", fit its 2 holes to the bosses of the main body, referring to the magnified view. At this time, be sure that the part "A" of the "Frame Relay PCB" is correctly placed on the foot of the "Unit Mechanism".



3-6-14. “Unit Power Supply” and “Paper Holder” Block

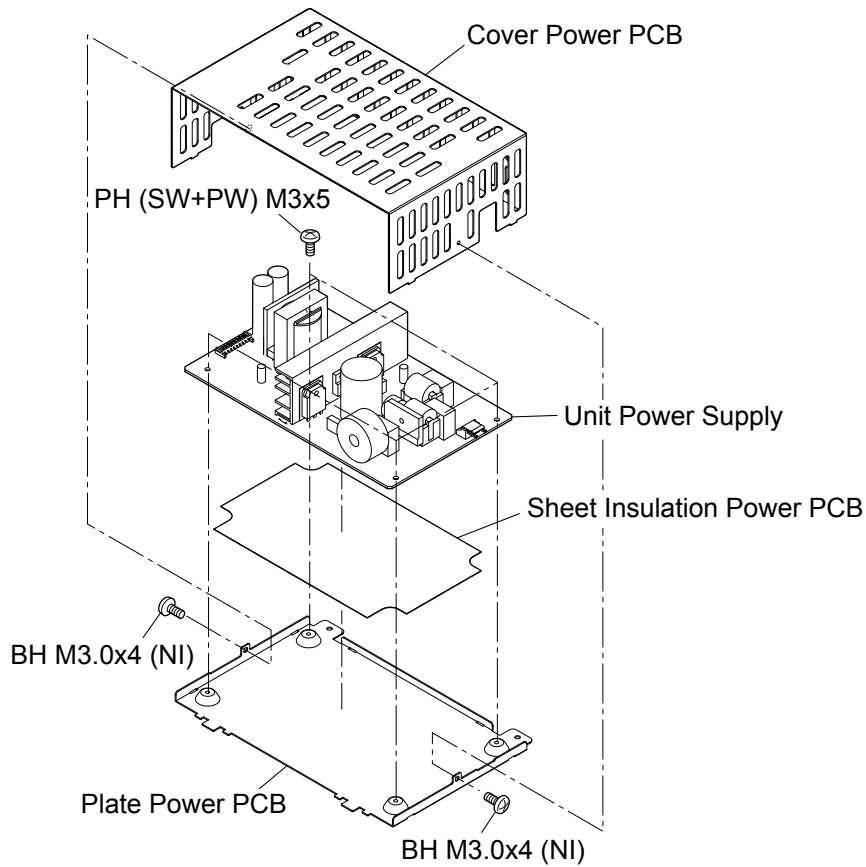
(1) “Unit Power Supply” Block and “Paper Holder” Block

1. Remove the “Unit Ribbon”. Refer to “3-6-2 Unit Ribbon”.
2. Remove the “Unit Opepane”. Refer to “3-6-10(1) Unit Opepane”.
3. Remove the “Case” and “Cover Steel L”. Refer to “3-6-11 Case”.
4. Remove all connectors from the “SA Main PCB”. Refer to “3-6-12(1) “SA Main PCB” Connectors”.
5. Remove the “Unit Mechanism”. Refer to “3-6-13 Unit Mechanism”.
6. Remove the 4 screws (BH M3.0x4 (NI)) and detach the “Frame Mechanism”.
7. Remove the 2 screws (BH M3.0x4 (NI)) and detach the “Unit Power Supply” Block by lifting it upwardly after shifting it toward the rear as shown by the arrow.
8. Disconnect the “SA Power Cable” and the AC input connector from the left side and right side of the “Unit Power Supply” Block, respectively.
9. Remove the 2 screws (BH M3.0x4 (NI)) and detach the “Paper Holder” Block from the bottom frame.
10. Remove the 2 screws (BH M3.0x4 (NI)) and detach the “Plate Holder Paper R” from the bottom frame.



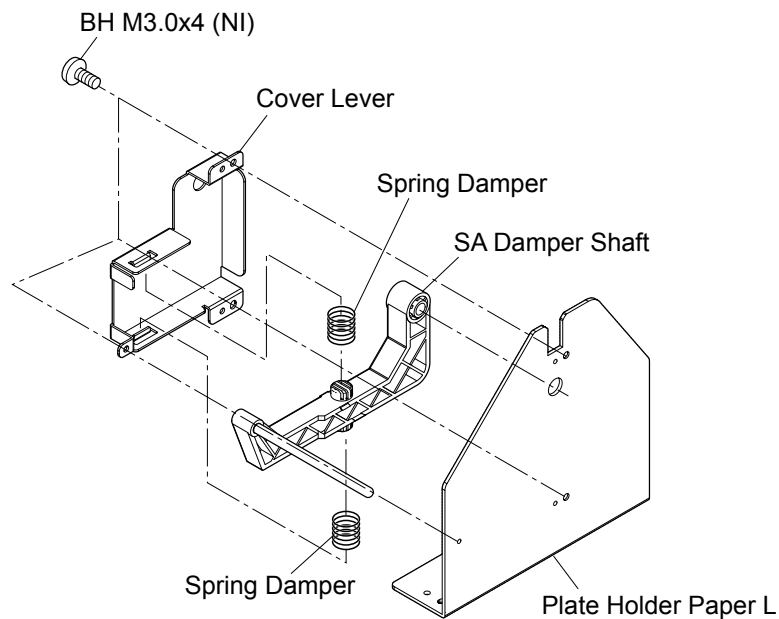
(2) Unit Power Supply

1. Remove the 2 screws (BH M3.0x4 (NI)) and detach the "Cover Power PCB".
2. Remove the 4 screws (PH (SW+PW) M3x5) and detach the "Unit Power Supply".
3. Remove the "Sheet Insulation Power PCB" from the "Plate Power PCB".



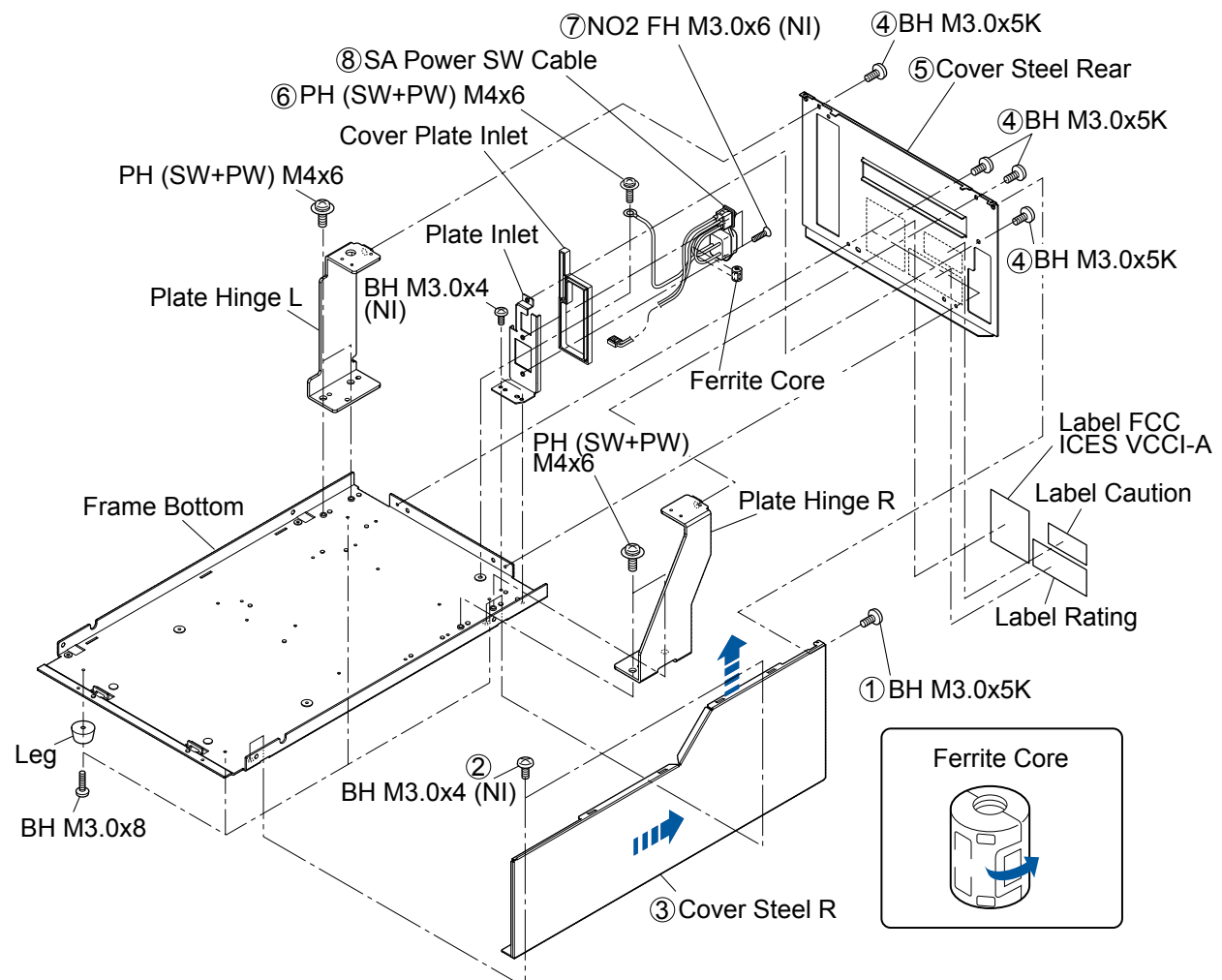
(3) Plate Holder Paper L

1. Remove the 3 screws (BH M3.0x4 (NI)) and detach the "Cover Lever".
2. Remove the "SA Damper Shaft" and "Spring Damper" (2 pcs.) from the "Plate Holder Paper L".



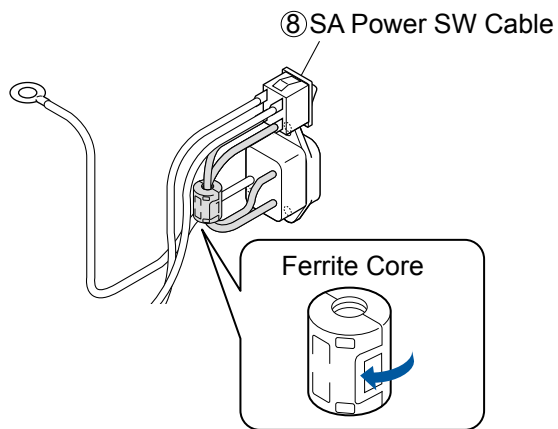
3-6-15. “SA Power SW Cable” and “Frame Bottom”

1. Remove the “Unit Ribbon”. Refer to “3-6-2 Unit Ribbon”.
2. Remove the “Unit Opepane”. Refer to “3-6-10(1) Unit Opepane”.
3. Remove the “Case” and “Cover Steel L”. Refer to “3-6-11 Case”.
4. Remove all connectors from the “SA Main PCB”. Refer to “3-6-12(1) “SA Main PCB” Connectors”.
5. Remove the “Unit Mechanism”. Refer to “3-6-13 Unit Mechanism”.
6. Remove the “Unit Power Supply” Block and “Paper Holder” Block. Refer to “3-6-14(1) “Unit Power Supply” Block and “Paper Holder” Block”.
7. Remove the 1 screw (BH M3.0x5K) (①) and 2 screws (BH M3.0x4 (NI)) (②), and detach the “Cover Steel R” (③).
8. Remove the 5 screw (BH M3.0x5K) (④), detach the “Cover Steel Rear” (⑤), and peel off the labels (“Label FCC ICES VCCI-A”, Label Caution and Label Rating) from it.
9. Remove the 1 screw (PH (SW+PW) M4x6) (⑥) and 2 screws (NO2 FH M3.0x6 (NI)) (⑦), and detach the “SA Power SW Cable” (⑧) and “Cover Plate Inlet”. Then, by releasing the hook, remove the “Ferrite Core” from the “SA Power SW Cable” (⑧). (Refer to the magnified view.)
10. Remove the 2 screw (BH M3.0x4 (NI)) and detach the “Plate Inlet”.
11. Remove the 2 screw (PH (SW+PW) M4x6) and detach the “Plate Hinge R”.
12. Remove the 2 screw (PH (SW+PW) M4x6) and detach the “Plate Hinge L”.
13. Remove the 4 screw (BH M3.0x8) and detach the “Leg” (4 pcs.).



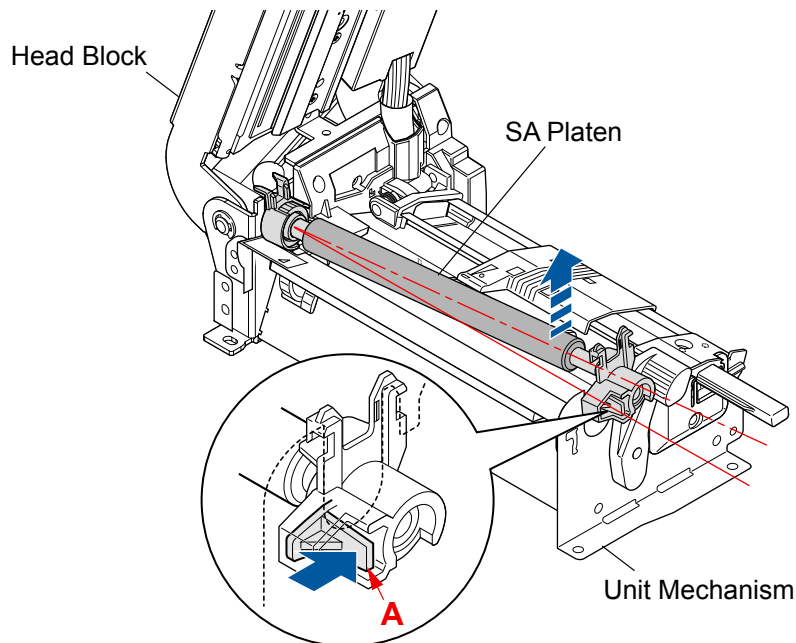
Notes on reassembling:

- Once the label is peeled off, it cannot be reused.
- Attach the “Ferrite Core” to the “SA Power SW Cable” (⑧) so that the 2 AC power lines pass through the “Ferrite Core”. Then securely close the hook to fasten the “Ferrite Core”.



3-6-16. SA Platen

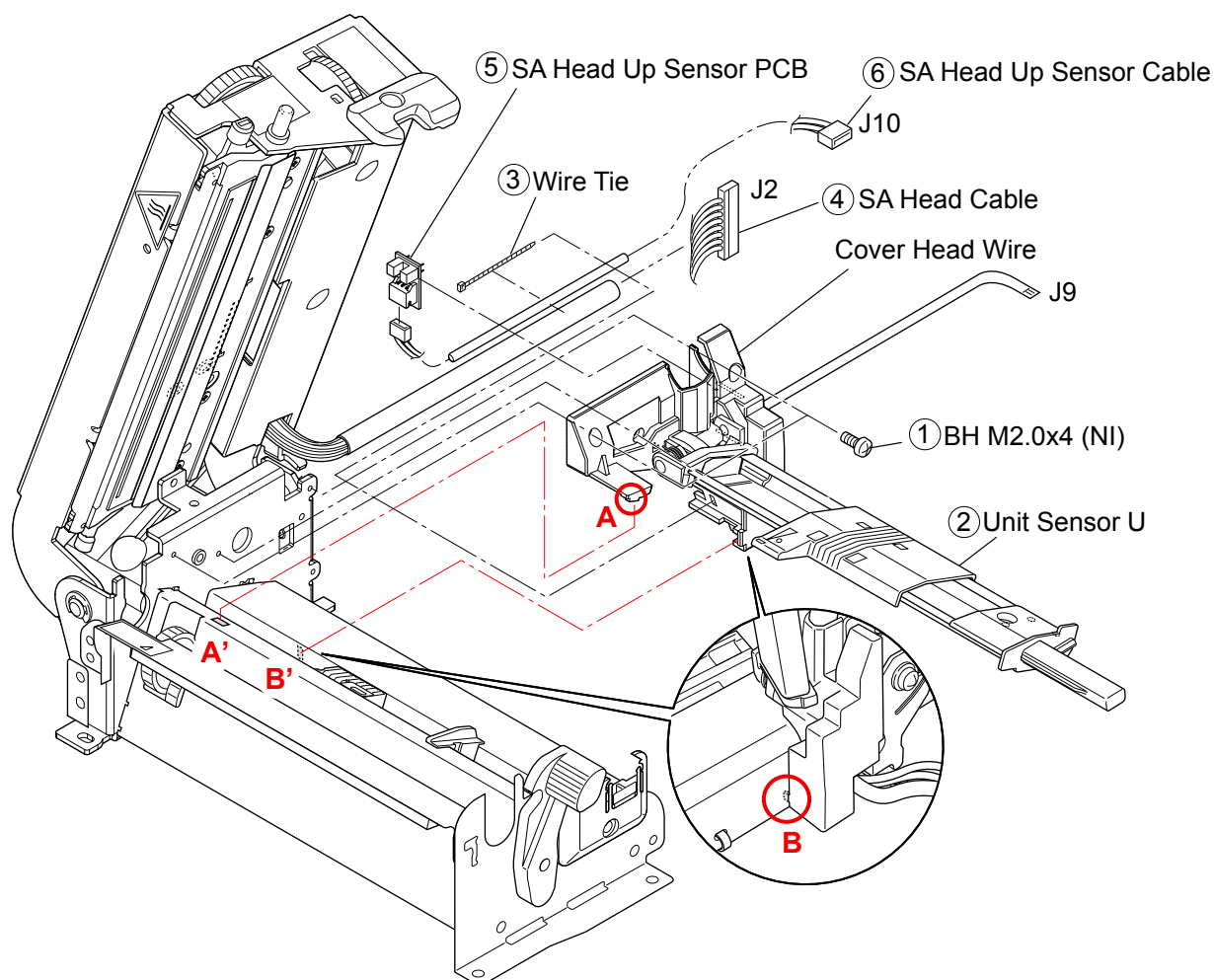
1. Open the Head Block.
2. While pressing the part “A” of the “SA Platen”, raise its right end by about the indicated degrees.
3. Remove the “SA Platen” by lifting it upwardly.



3-6-17. “SA Head Up Sensor PCB”, “SA TRA Sen PCB”, “FFC TRA Sensor” and “Leaf Adjust Sensor U”

(1) “Unit Sensor U” and “SA Head Up Sensor PCB”

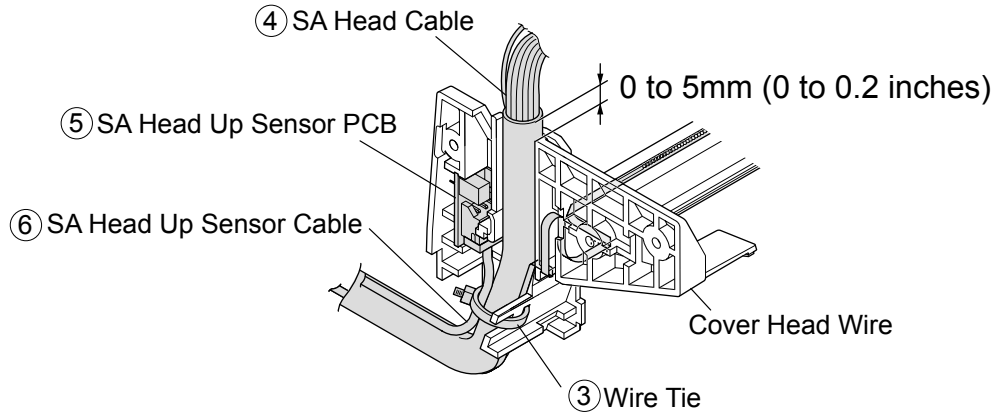
1. Remove the “Unit Ribbon”. Refer to “3-6-2 Unit Ribbon”.
2. Remove the “Unit Opepane”. Refer to “3-6-10(1) Unit Opepane”.
3. Remove the “Case” and “Cover Steel L”. Refer to “3-6-11 Case”.
4. Remove all connectors from the “SA Main PCB”. Refer to “3-6-12(1) “SA Main PCB” Connectors”.
5. Remove the “Unit Mechanism”. Refer to “3-6-13 Unit Mechanism”.
6. Open the Head Block and release the right end of the “Unit Sensor U” (②) from the frame to set it free.
7. Remove the 3 screws (BH M2.0x4 (NI)) (①) and detach the “Unit Sensor U” (②).
8. Cut the “Wire Tie” (③) and set the one end of the “SA Head Cable” (④) free.
9. Remove the “SA Head Up Sensor PCB” (⑤) from the “Cover Head Wire”, and then disconnect the “SA Head Up Sensor Cable” (⑥) from the “SA Head Up Sensor PCB” (⑤).



Notes on reassembling:

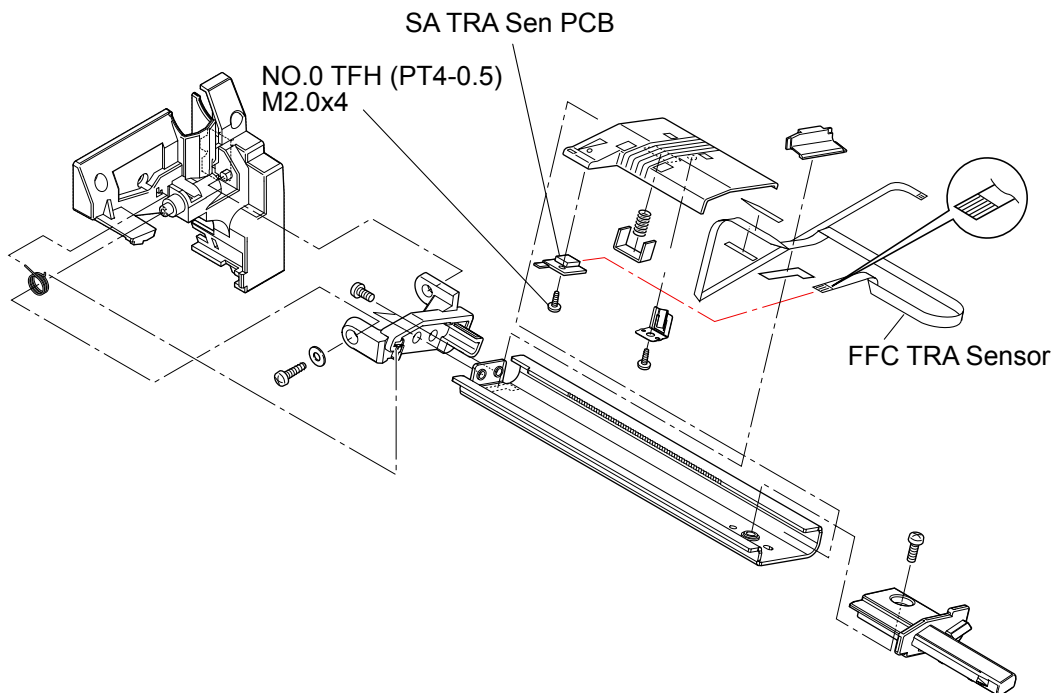
- When mounting the “Unit Sensor U” (②), insert its projections “**A**” and “**B**” into the corresponding holes “**A'**” and “**B'**” in the main body.

- Referring to the following figure, mount the “SA Head Cable” (④) and “SA Head Up Sensor PCB” (⑤) (with the “SA Head Up Sensor Cable” (⑥)) on the “Cover Head Wire”, and tie them with the “Wire Tie” (③).
At this time, mount the “SA Head Cable” (④) so that the distance between its tube end and the top of the “Cover Head Wire” is 0 to 5mm (0 to 0.2 inches) as shown below.



(2) SA TRA Sen PCB

- Remove the 1 screw (NO.0 TFH (PT4-0.5) M2.0x4), detach the “SA TRA Sen PCB”, and disconnect the “FFC TRA Sensor” from the “SA TRA Sen PCB”.

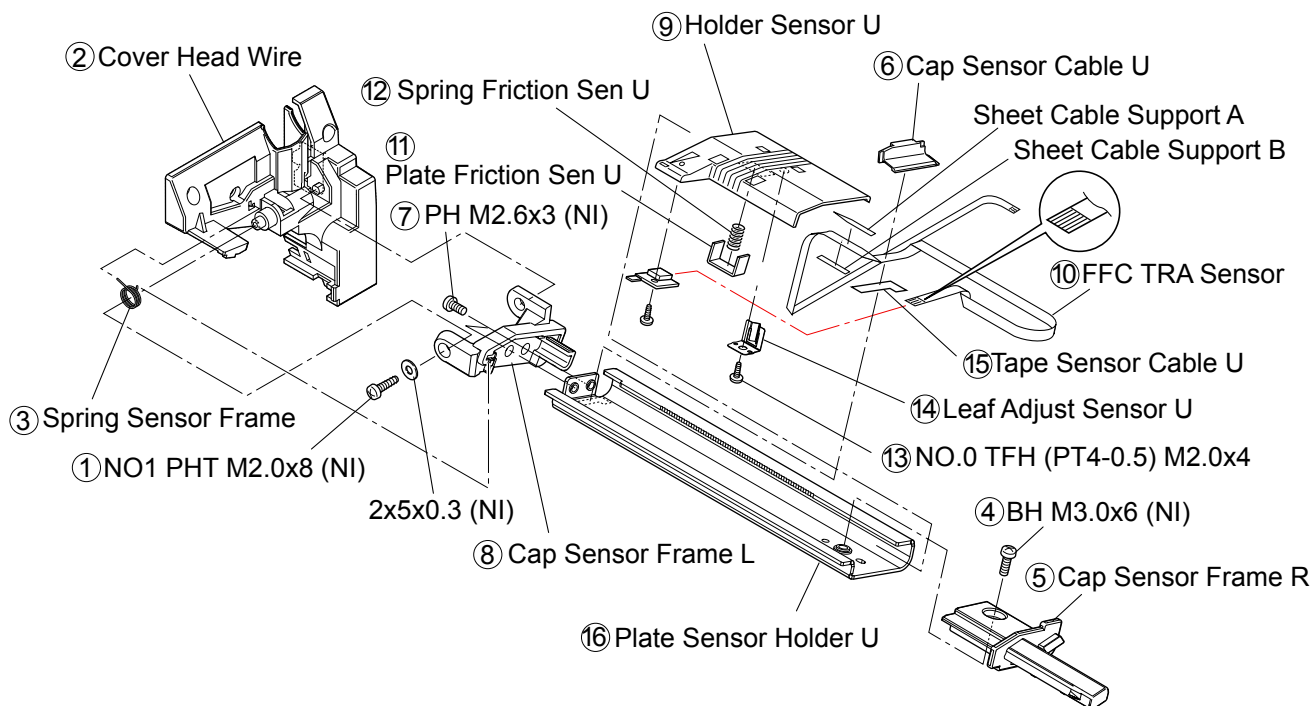


Notes on reassembling:

- Correctly insert the “FFC TRA Sensor” in the correct direction, referring to the magnified view in the above figure. If it is inserted upside down, the circuit is not electrically connected.
- When the “SA TRA Sen PCB” is replaced with a new one, be sure to perform the sensor adjustment. Refer to “[3-7-1 Transparent/Reflective Sensor Adjustment](#)”.

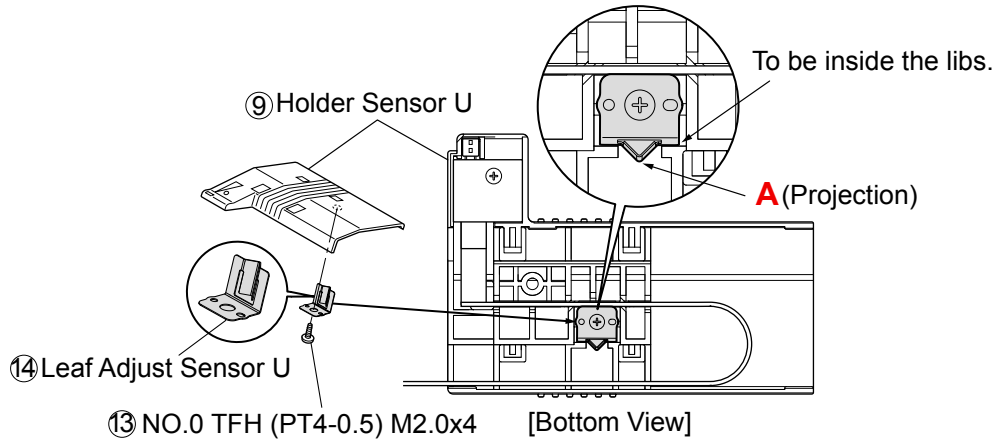
(3) “FFC TRA Sensor” and “Leaf Adjust Sensor U”

1. Remove the 1 screw (NO1 PHT M2.0x8 (NI)) (①) and 1 plain washer (2x5x0.3 (NI)), and detach the “Unit Sensor U” Block from the “Cover Head Wire” (②). At this time, also remove the “Spring Sensor Frame” (③).
2. Remove the 1 screw (BH M3.0x6 (NI)) (④) and detach the “Cap Sensor Frame R” (⑤) to the right.
3. Remove the “Cap Sensor Cable U” (⑥) to set the “FFC TRA Sensor” (⑩) free.
4. Remove the 2 screws (PH M2.6x3 (NI)) (⑦) and detach the “Cap Sensor Frame L” (⑧).
5. Slide the “Holder Sensor U” (⑨) to the right and detach the “FFC TRA Sensor” (⑩).
6. Peel off the “Sheet Cable Support A” and “Sheet Cable Support B” from the “FFC TRA Sensor” (⑩).
7. Remove the “Plate Friction Sen U” (⑪) and “Spring Friction Sen U” (⑫) from the “Holder Sensor U” (⑨).
8. Remove the 1 screw (NO.0 TFH (PT4-0.5) M2.0x4) (⑬) and detach the “Leaf Adjust Sensor U” (⑭) from the “Holder Sensor U” (⑨).
9. Peel off the “Tape Sensor Cable U” (⑮) from the “Plate Sensor Holder U” (⑯).

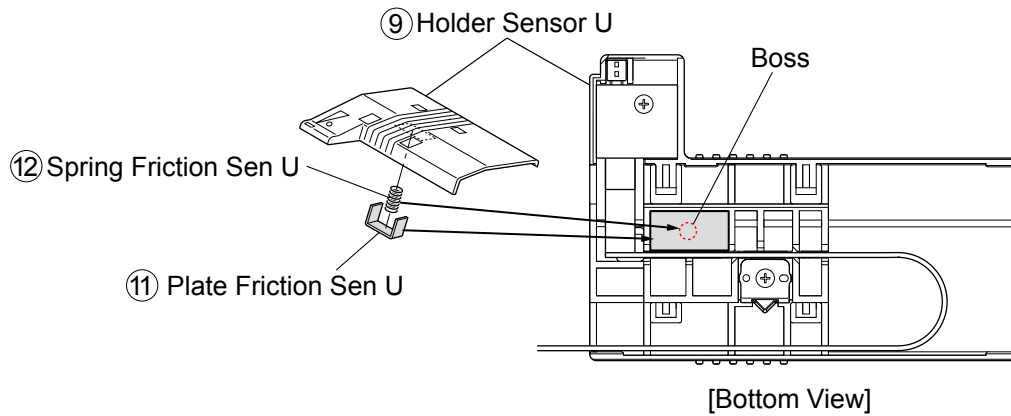


Notes on reassembling:

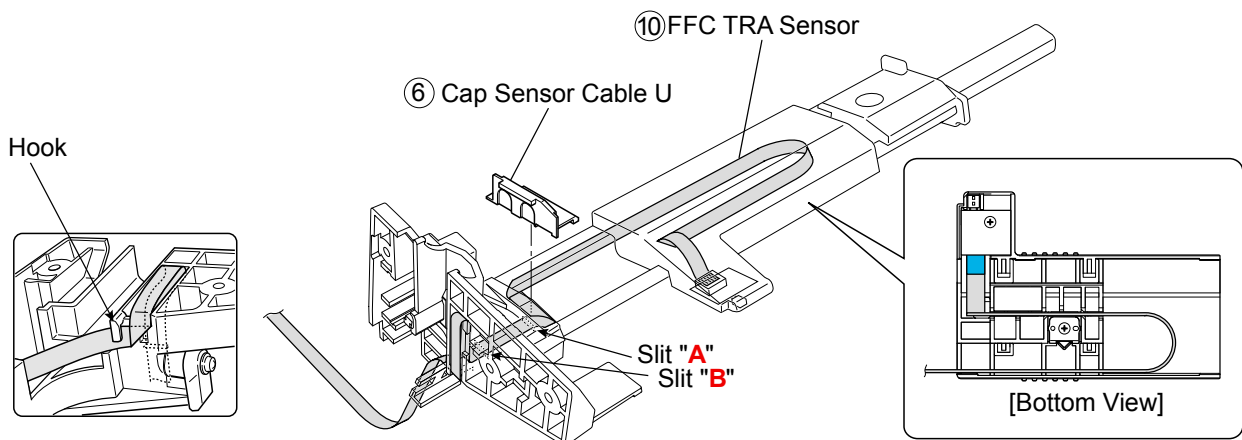
- Be sure that the projection “**A**” of the “Leaf Adjust Sensor U” (14) directs as shown below and the “Leaf Adjust Sensor U” (14) is seated inside the lib.



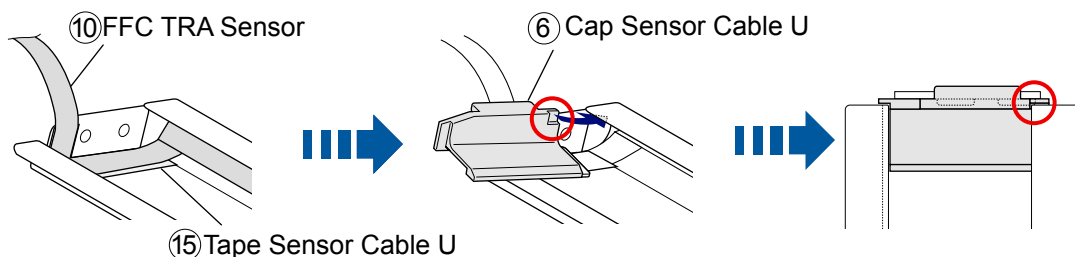
- First, insert the spring “Spring Friction Sen U” (12) into the boss of the “Holder Sensor U” (9). Next, put the “Plate Friction Sen U” (11) on the spring and mount it in place.



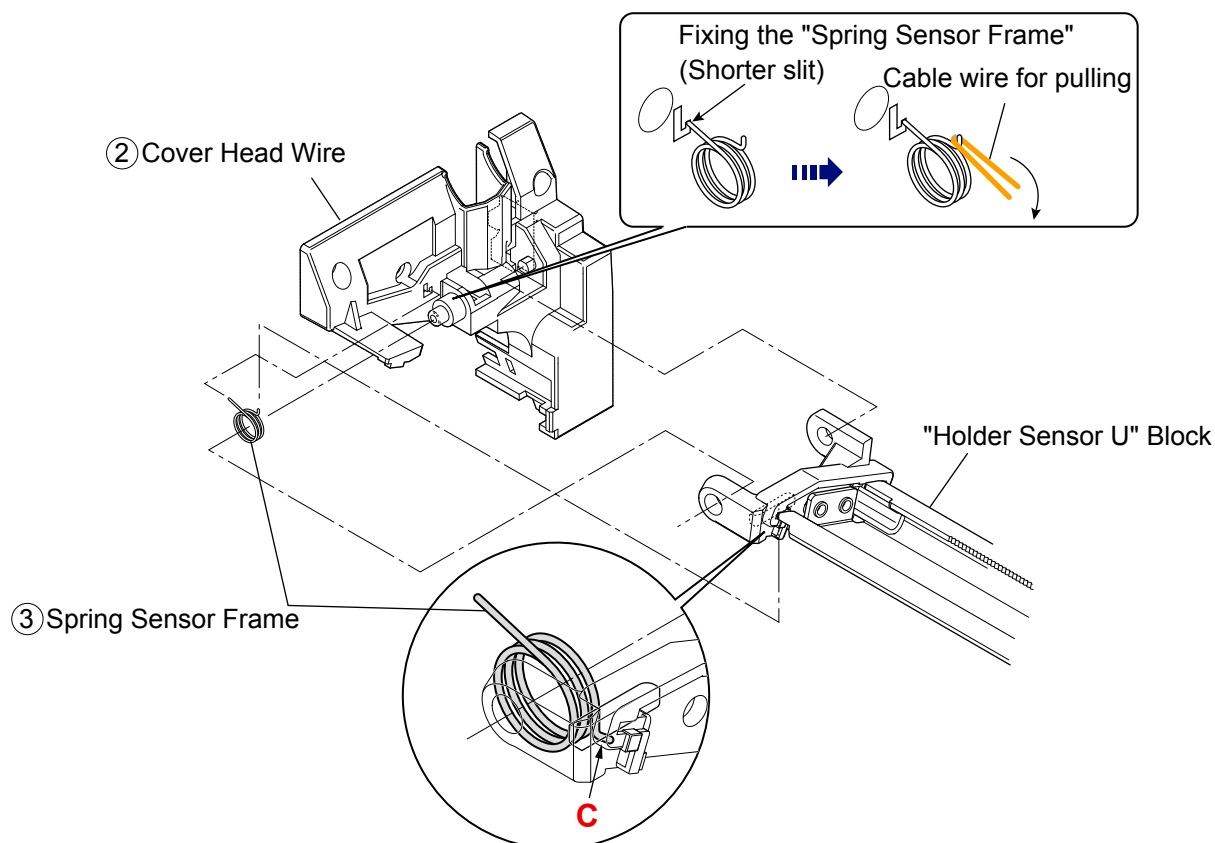
- Run the “FFC TRA Sensor” (10) as shown below. Pass it through the two slits (“**A**” and “**B**”) and the hook part.



- Securely seat the "Cap Sensor Cable U" (⑥) in place as shown below. At this time, engage its notched corner with the chassis.

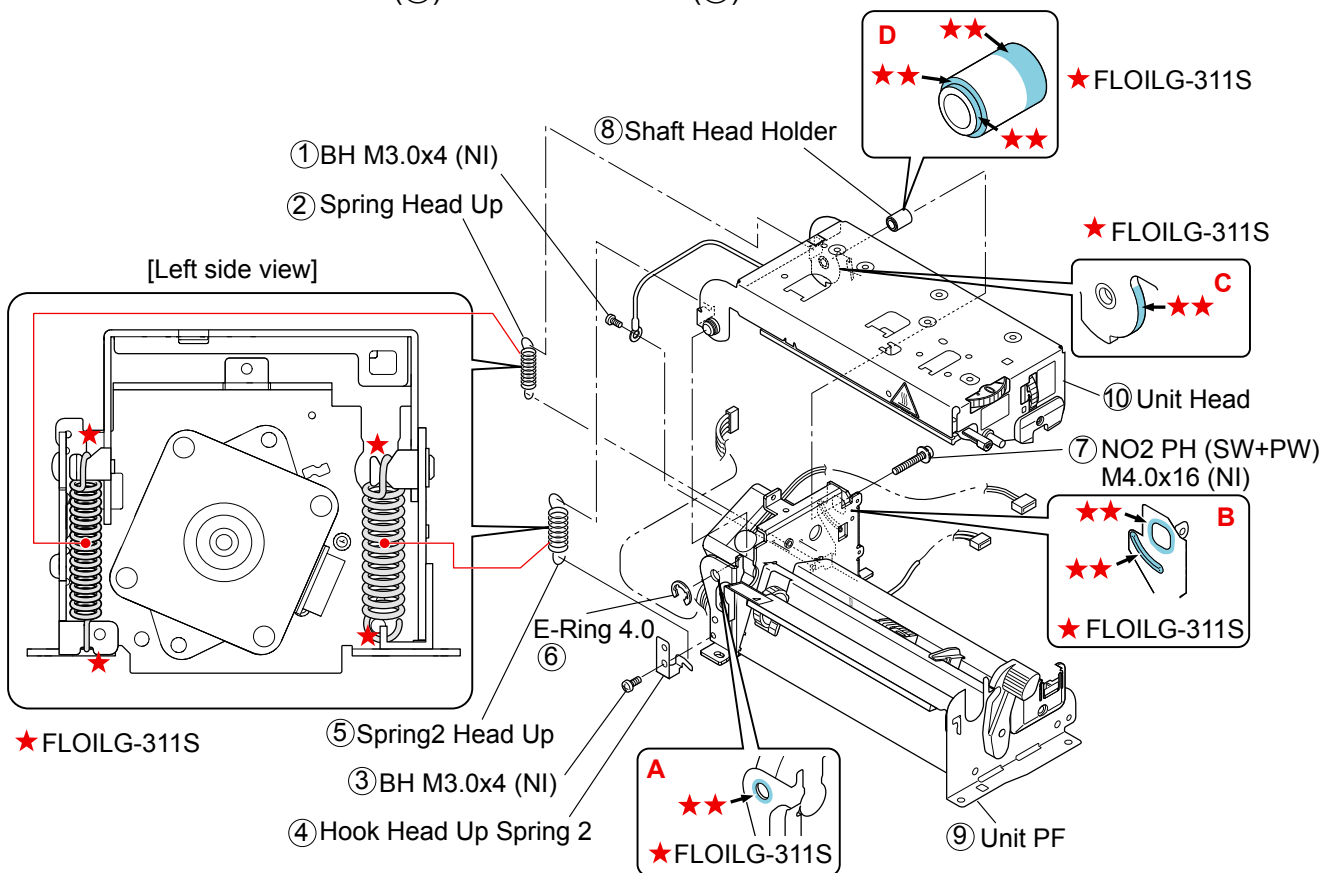


- When mounting the "Holder Sensor U" Block on the "Cover Head Wire" (②), engage the spring "Spring Sensor Frame" (③) as follows.
 - 1) Insert the long end of the spring into the shorter slit in the "Cover Head Wire" (②).
 - 2) Hook a cable wire or similar on the short end of the spring, and pull it to lower the short end of the spring.
 - 3) While pulling the cable wire, mount the "Holder Sensor U" Block on the "Cover Head Wire" (②), and then hook the short end of the spring on the part "C" of the "Holder Sensor U" Block.



3-6-18. “Unit Head” and “Unit PF”

1. Remove the “Unit Ribbon”. Refer to “3-6-2 Unit Ribbon”.
 2. Remove the “Unit Opepane”. Refer to “3-6-10(1) Unit Opepane”.
 3. Remove the “Case” and “Cover Steel L”. Refer to “3-6-11 Case”.
 4. Remove all connectors from the “SA Main PCB”. Refer to “3-6-12(1) “SA Main PCB” Connectors”.
 5. Remove the “Unit Mechanism”. Refer to “3-6-13 Unit Mechanism”.
 6. Remove the 1 screw (BH M3.0x4 (NI)) (①) and detach the earth wire of the “Unit Head” (⑩).
 7. Open the “Unit Head” (⑩) and disengage the “Spring Head Up” (②).
 8. Remove the 1 screw (BH M3.0x4 (NI)) (③), and detach the “Hook Head Up Spring 2” (④) and “Spring2 Head Up” (⑤).
- NOTE:** At this time, hold the “Unit Head” (⑩) as it can fall off.
9. Disengage the 1 E-ring (E-Ring 4.0) (⑥), and then remove the 1 screw (NO2 PH (SW+PW) M4.0x16 (NI)) (⑦) and “Shaft Head Holder” (⑧).
 10. Remove the “Unit Head” (⑩) from the “Unit PF” (⑨).



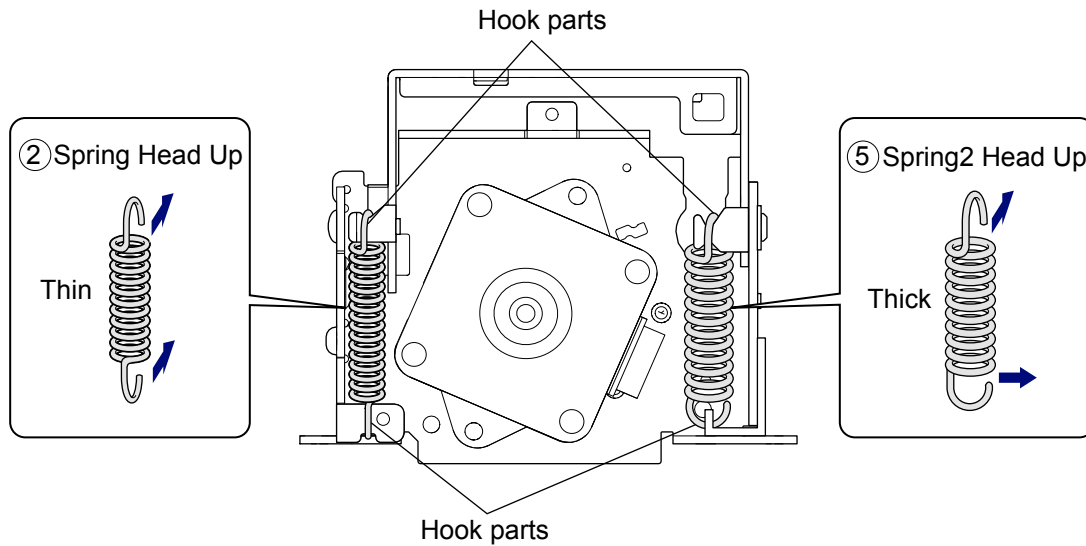
Notes on reassembling:

- When assembling parts, apply FLOIL G-311S to the following places shown by the mark “★”.
 - A:** Hole (front left). Circumference surface of the hole (on both sides) and inside the hole
 - B:** Hole and projection (rear left). Circumference surface of the hole (on both sides) and along the projection surface.
 - C:** Along the contacting surface (rear left).
 - D:** 3 surfaces on the “Shaft Head Holder” (⑧).
- Hooks for “Spring Head Up” (②) and “Spring2 Head Up” (⑤) (4 places)
- When mounting the “Shaft Head Holder” (⑧), be sure that its mounting direction is correct.

- When engaging the “Spring Head Up” (②, thin) and “Spring2 Head Up” (⑤, thick), first, hook them on the upper hooks of the “Unit Head” (⑩), and next on the lower hooks of the “Unit PF” (⑨)).

At this time, hook the “Spring Head Up” (②) so that its hook parts direct inward of the mechanism as shown below. (This can prevent unwanted noise that might occur when the “Unit Head” (⑩) is opened or closed.)

Hook the “Spring2 Head Up” (⑤) so that its hook parts direct as shown below.



3-6-19. "SA Head", "Cam Head Adjust" and "Cam Head Balance"



Caution

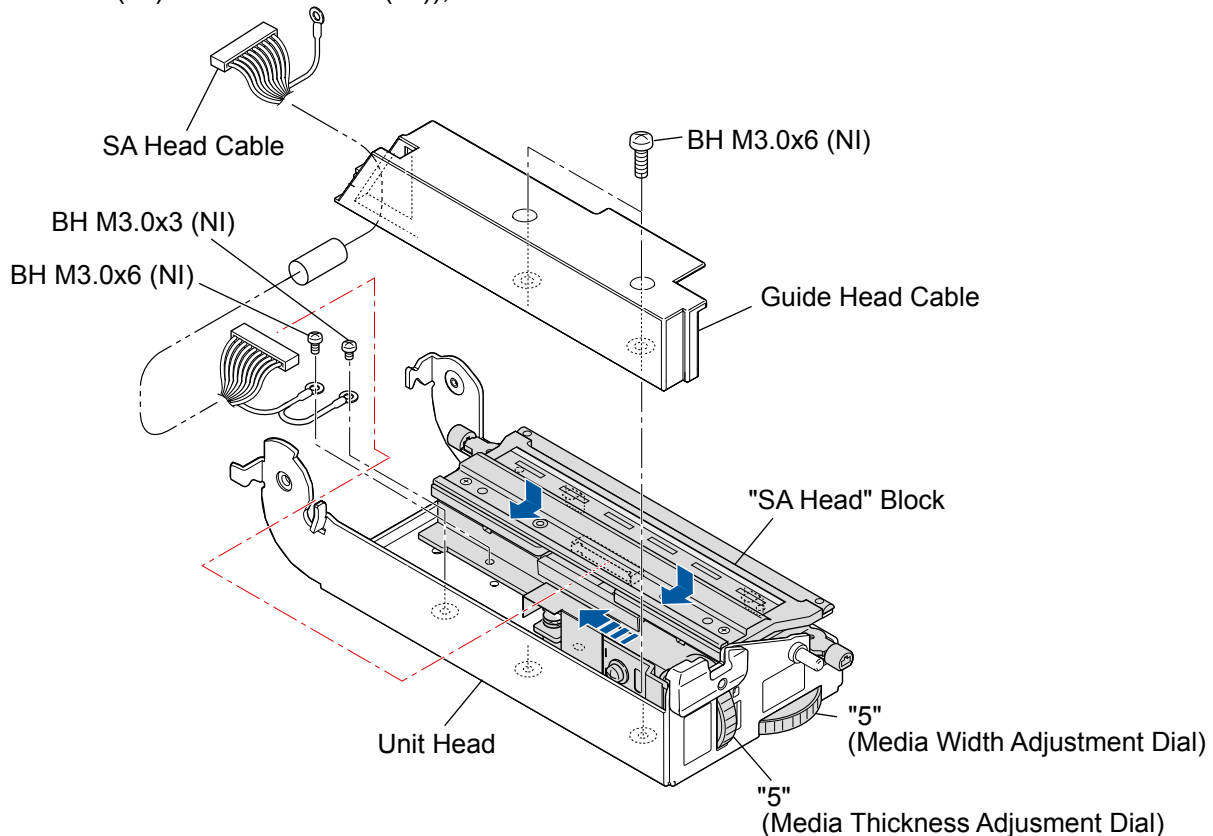
When detaching or reinstalling the "SA Head", be careful not to damage the thermal elements. Especially, avoid contacting the thermal elements with a metal part, etc.



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

(1) "SA Head" Block

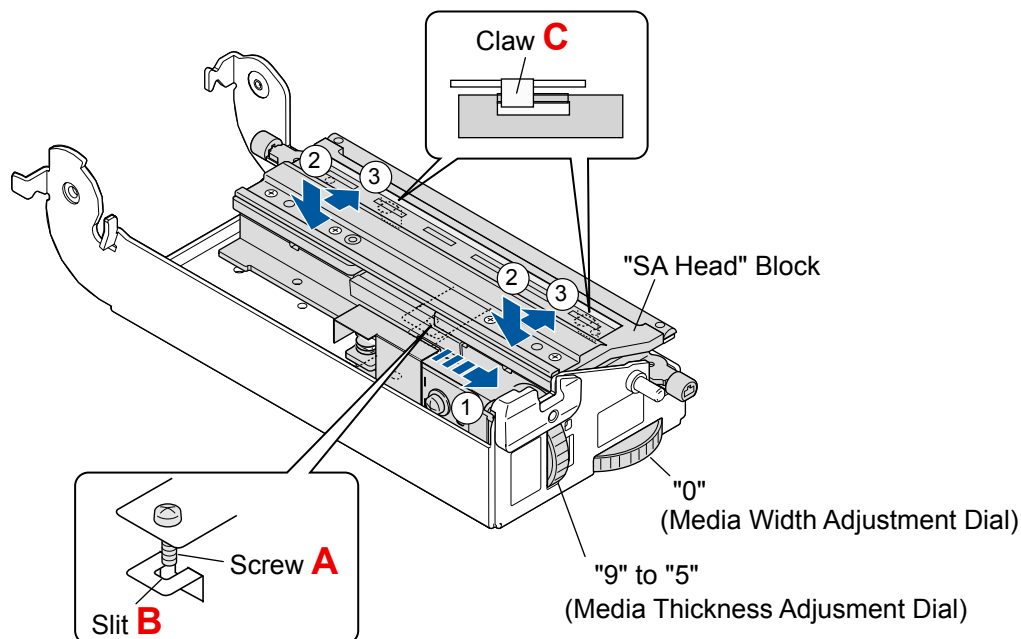
1. Remove the "Unit Ribbon". Refer to "3-6-2 Unit Ribbon".
2. Remove the "Unit Opepane". Refer to "3-6-10(1) Unit Opepane".
3. Remove the "Case" and "Cover Steel L". Refer to "3-6-11 Case".
4. Remove all connectors from the "SA Main PCB". Refer to "3-6-12(1) "SA Main PCB" Connectors".
5. Remove the "Unit Mechanism". Refer to "3-6-13 Unit Mechanism".
6. Remove the "Unit Head". Refer to "3-6-18 "Unit Head" and "Unit PF"".
7. Place the "Unit Head" upside down as shown below.
8. Remove the 2 screws (BH M3.0x6 (NI)) and detach the "Guide Head Cable".
9. To make removal easy, set both dials (Media width adjustment dial and Media thickness adjustment dial) to "5".
10. While pressing down the "SA Head" Block, first move it forward and then to the left to remove it. Refer to the arrows in the figure.
11. Disconnect the connector from the "SA Head" Block, remove the 2 screws (BH M3.0x3 (NI) and BH M3.0x6 (NI)), and remove the "SA Head Cable".



Note on reassembling:

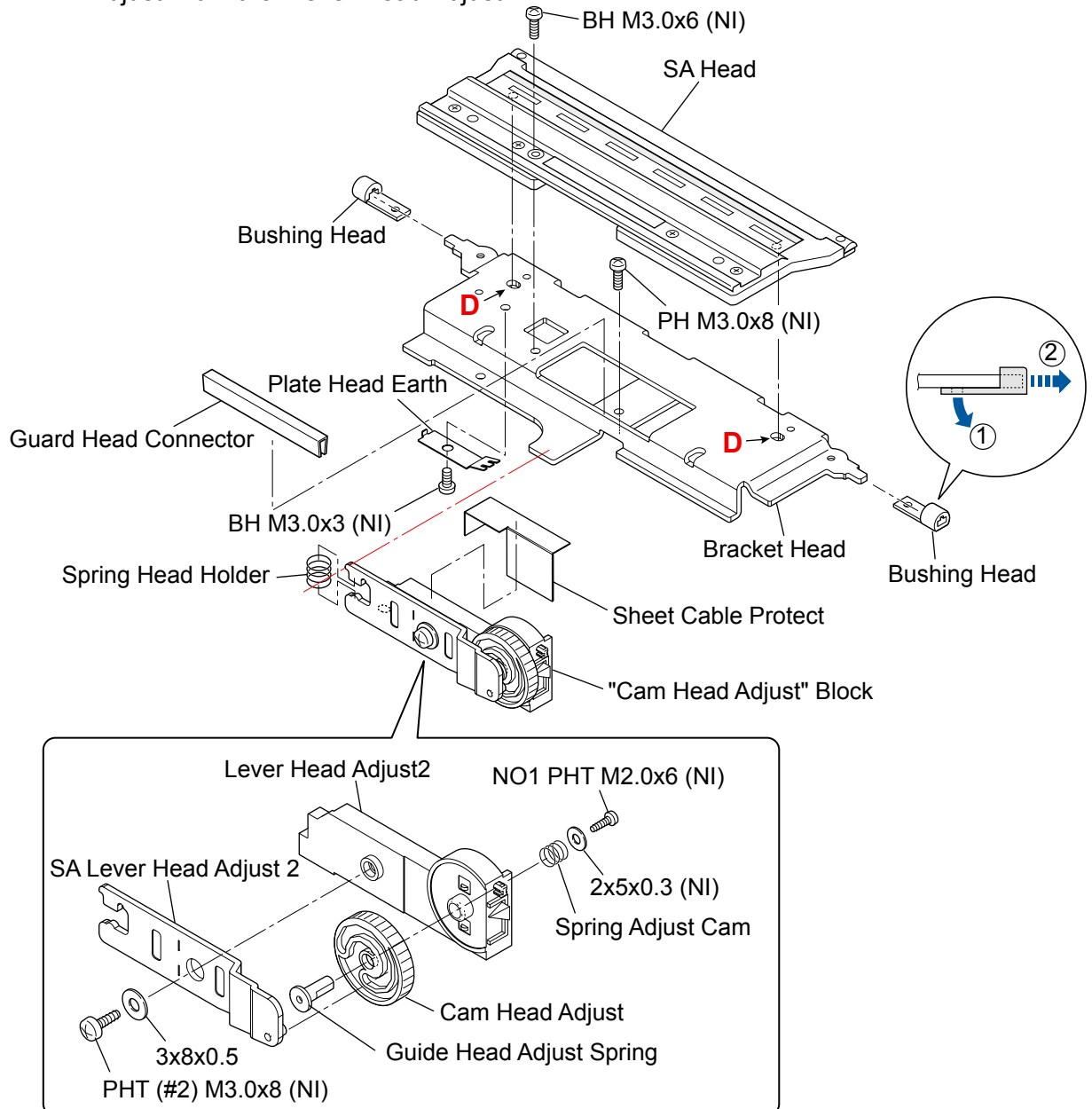
When mounting the “SA Head”, follow the next procedure.

1. Set the dials as follows.
Media width adjustment dial: “0” (for easier mounting)
Media thickness adjustment dial: “9”
2. Put the entire “SA Head” Block in the frame and move it to the direction “①”.
At this time, be sure that the screw “A” is inserted into the slit “B”. (If it is not correctly inserted, the “SA Head” Block cannot be assembled on the frame.)
3. While lightly pressing down the “SA Head” Block (②), move it toward the rear (③) and hook its rear ends on the 2 claws “C” of the frame.
4. After mounting the “SA Head” Block, set the Media width adjustment dial to “5” to give tension to the “SA Head” Block.



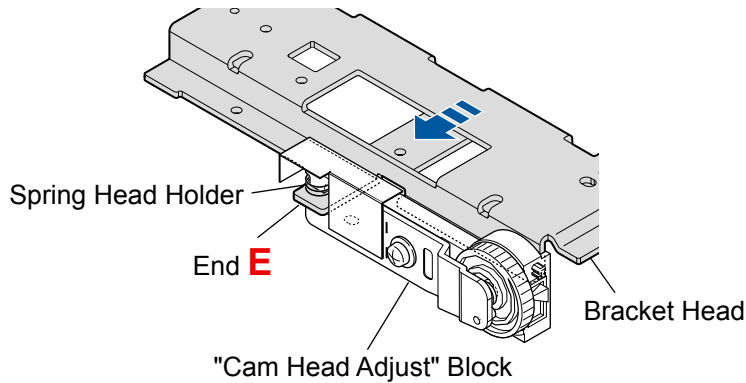
(2) "SA Head" and "Cam Head Adjust"

1. Separate the "Cam Head Adjust" Block from the "Bracket Head" by pulling it. (Both parts are connected via the spring "Spring Head Holder".)
2. Remove the 1 screw (BH M3.0x6 (NI)) and detach the "SA Head".
3. Remove the 1 screw (BH M3.0x3 (NI)) and detach the "Plate Head Earth".
4. Remove the "Bushing Head" (2 pcs.) from the "Bracket Head" in the order of ① to ② as indicated in the magnified view.
5. Remove the 1 screw (PH M3.0x8 (NI)) and also detach the "Guard Head Connector".
6. Remove the "Spring Head Holder" and "Sheet Cable Protect" from the "Cam Head Adjust" Block.
7. Disassemble the "Cam Head Adjust".
 - 1) Remove the 1 screw (PHT (#2) M3.0x8 (NI)), and detach the 1 plain washer (3x8x0.5) and "SA Lever Head Adjust 2".
 - 2) Remove the 1 screw (NO1 PHT M2.0x6 (NI)), and detach the 1 plain washer (2x5x0.3 (NI)), "Spring Adjust Cam", "Guide Head Adjust Spring" and "Cam Head Adjust" from the "Lever Head Adjust2".



Notes on reassembling:

- Insert the end “E” of the “Bracket Head” under the “Spring Head Holder” that is assembled on the “Cam Head Adjust” Block.

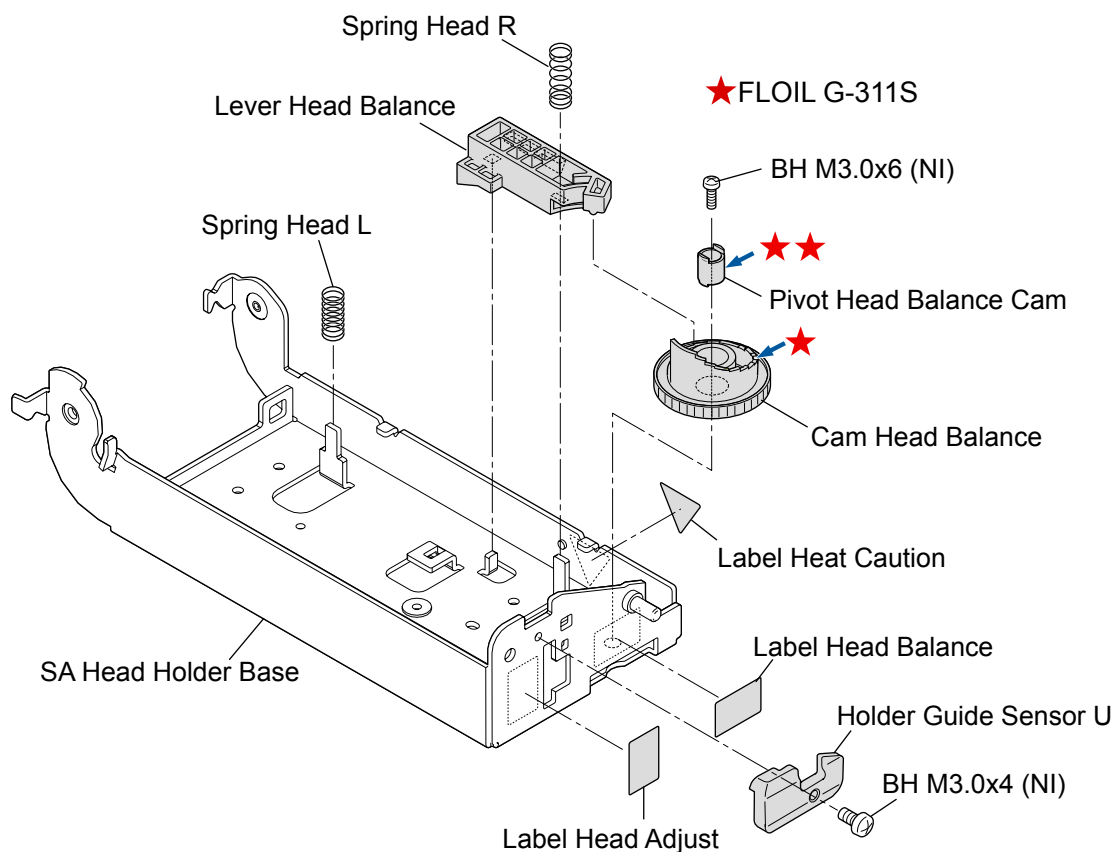


- When mounting the “SA Head”, fix it with the 1 screw after fitting its 2 projections to the guide holes “D” of the frame, as shown on the previous page.
- Clean the thermal element surface of the “SA Head” with the head cleaner.
- After assembling the “SA Head”, perform test print in self print mode to check the print quality. (Refer to “[2-3-2\(1\) 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](#)”.

(3) Cam Head Balance

1. Remove the "Spring Head L" (short) and "Spring Head R" (long).
2. Remove the "Cam Head Balance" as follows.
 - 1) Set the "Cam Head Balance" (Media width adjustment dial) to "0" and remove the "Lever Head Balance".
 - 2) Remove the 1 screw (BH M3.0x6 (NI)), and detach the "Cam Head Balance" and "Pivot Head Balance Cam".
3. Remove the 1 screw (BH M3.0x4 (NI)) and detach the "Holder Guide Sensor U".
4. Peel off the "Label Head Adjust", "Label Head Balance" and "Label Heat Caution" from the "SA Head Holder Base".



Notes on reassembling:

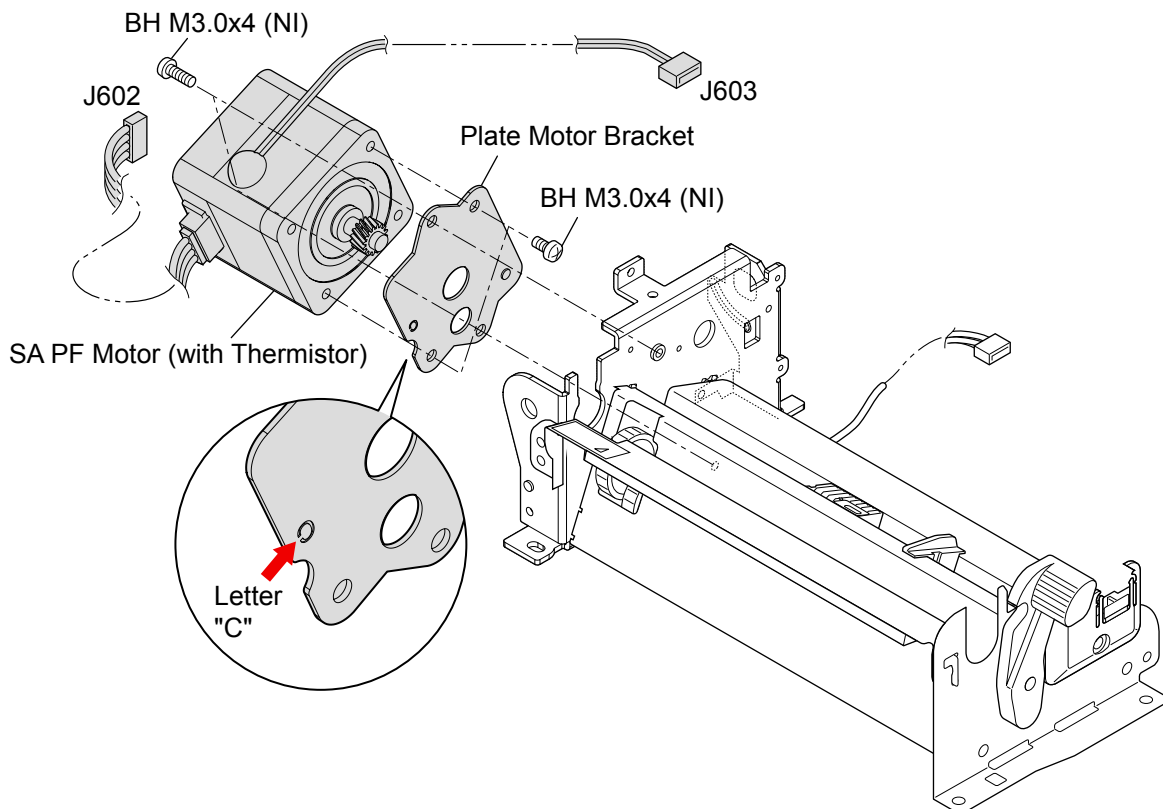
- Apply FLOIL G-311S to the following parts marked with "★".
 - Pivot Head Balance Cam: Surface
 - Cam Head Balance: Cam portion
- Once the label is peeled off, it cannot be reused.

3-6-20. SA PF Motor

1. Remove the "Unit Ribbon". Refer to "3-6-2 Unit Ribbon".
2. Remove the "Unit Opepane". Refer to "3-6-10(1) Unit Opepane".
3. Remove the "Case" and "Cover Steel L". Refer to "3-6-11 Case".
4. Remove all connectors from the "SA Main PCB". Refer to "3-6-12(1) "SA Main PCB" Connectors".
5. Remove the "Unit Mechanism". Refer to "3-6-13 Unit Mechanism".

Tips: The "SA PF Motor (with Thermistor)" can be removed without detaching the "Unit Mechanism".

6. Remove the 2 screws (BH M3.0x4 (NI)) and detach the PF Motor Block.
7. Remove the 2 screws (BH M3.0x4 (NI)) and detach the "Plate Motor Bracket" from the "SA PF Motor (with Thermistor)".

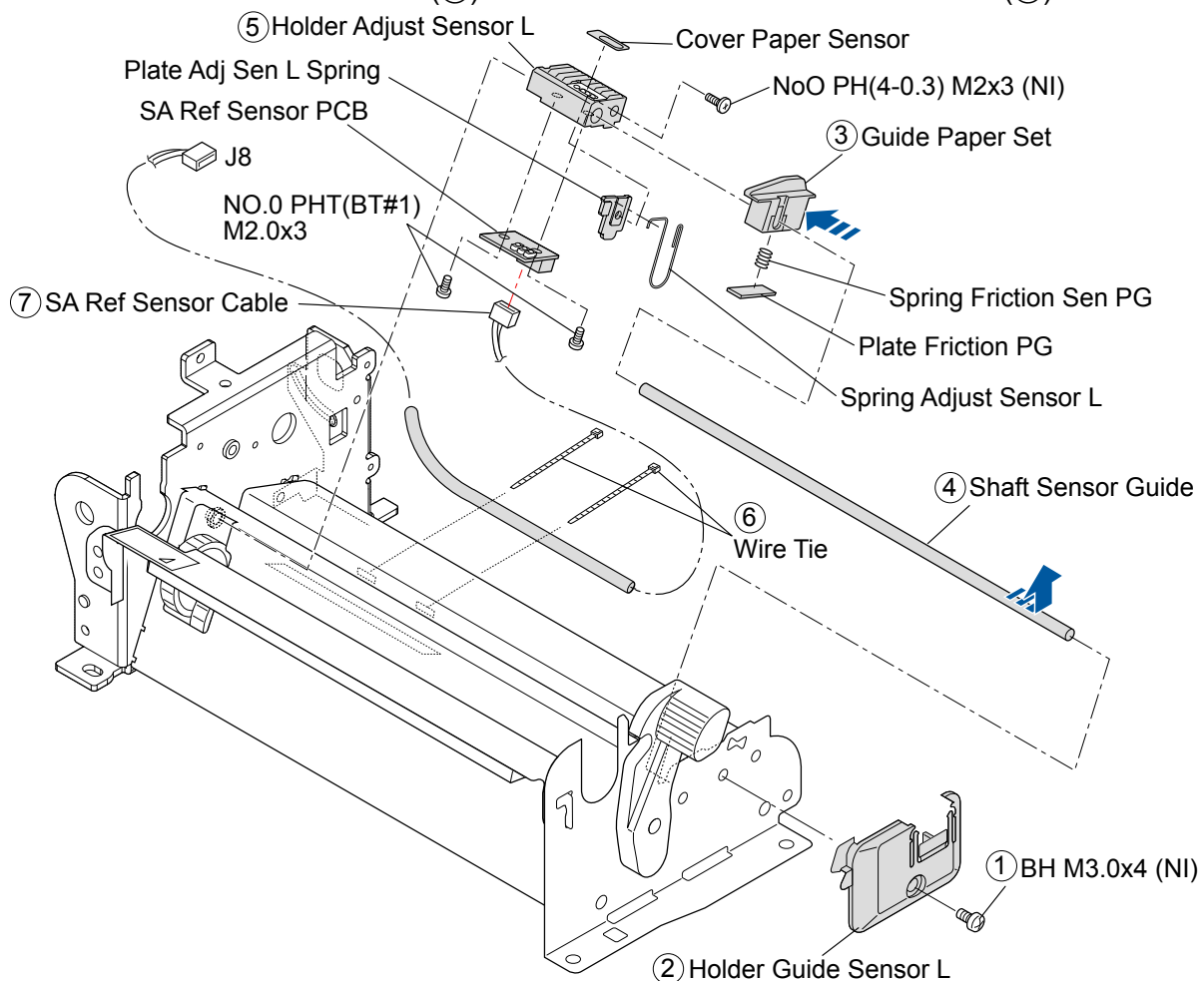


Notes on reassembling:

- Referring to the above magnified view, mount the "Plate Motor Bracket" on the "SA PF Motor (with Thermistor)" so that its letter "C" is located on the connector side of the "SA PF Motor (with Thermistor)".
- Mount the "SA PF Motor (with Thermistor)" on the frame so that its connector faces the front.

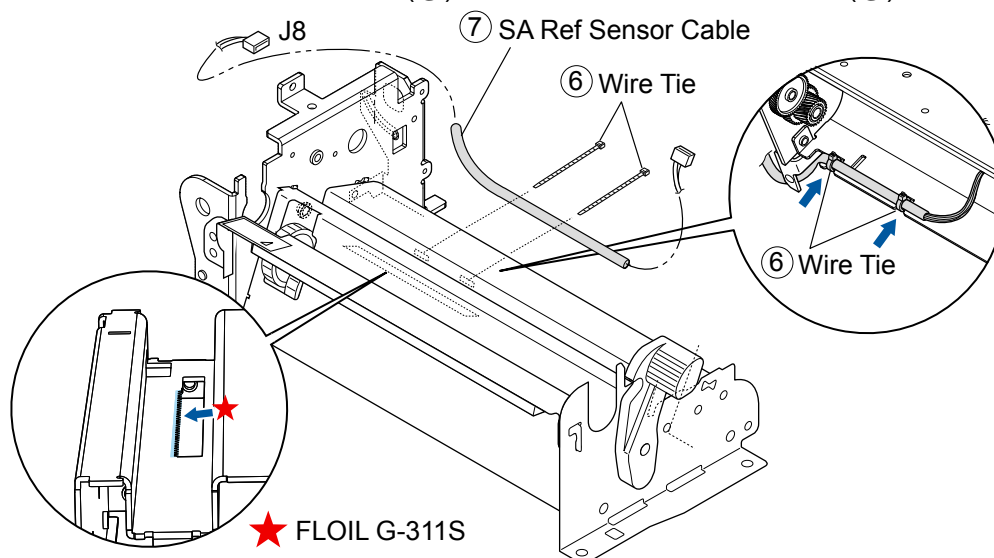
3-6-21. “SA Ref Sensor PCB” and “Spring Adjust Sensor L”

1. Remove the “Unit Ribbon”. Refer to “3-6-2 Unit Ribbon”.
2. Remove the “Unit Opepane”. Refer to “3-6-10(1) Unit Opepane”.
3. Remove the “Case” and “Cover Steel L”. Refer to “3-6-11 Case”.
4. Remove all connectors from the “SA Main PCB”. Refer to “3-6-12(1) “SA Main PCB” Connectors”.
5. Remove the “Unit Mechanism”. Refer to “3-6-13 Unit Mechanism”.
6. Access to the bottom of the “Unit Mechanism”, and disconnect the connector of the “SA Ref Sensor Cable” (⑦) from the “SA Ref Sensor PCB”.
7. Remove the 1 screw (BH M3.0x4 (NI)) (①) and detach the “Holder Guide Sensor L” (②).
8. Slide the “Guide Paper Set” (③) to the left, and pull out the “Shaft Sensor Guide” (④) (with the “Guide Paper Set” (③) and “Holder Adjust Sensor L” (⑤)) in the direction of the arrow.
9. Pull out the “Guide Paper Set” (③) from the “Shaft Sensor Guide” (④), and detach the “Spring Friction Sen PG” and “Plate Friction PG” from it.
10. Pull out the “Holder Adjust Sensor L” (⑤) from the “Shaft Sensor Guide” (④), and then detach the following parts.
 - 1) Remove the 2 screws (NO.0 PHT(BT#1) M2.0x3) and detach the “SA Ref Sensor PCB”.
 - 2) Remove the 1 screw (NoO PH(4-0.3) M2x3 (NI)), and detach the “Plate Adj Sen L Spring” and “Spring Adjust Sensor L”.
 - 3) Peel off the “Cover Paper Sensor”.
11. Cut the 2 wire ties “Wire Tie” (⑥) and remove the “SA Ref Sensor Cable” (⑦).

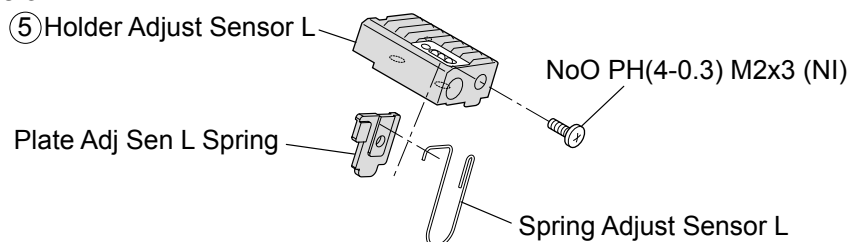


Notes on reassembling:

- Apply FLOIL G-311S along the tooth side of the slit as shown below.
- Tie the “SA Ref Sensor Cable” (⑦) with the 2 wire ties “Wire Tie” (⑥) as shown below.



- When mounting the “Plate Adj Sen L Spring” and “Spring Adjust Sensor L”, direct them as shown below.



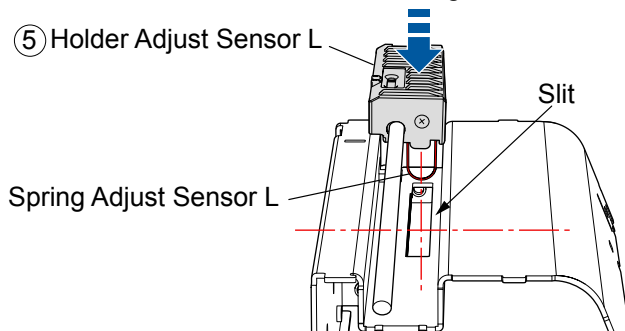
- When mounting the shaft “Shaft Sensor Guide” (④) (with the “Guide Paper Set” (③) and “Holder Adjust Sensor L” (⑤), align both ends of the shaft in place. At this time, press down the “Holder Adjust Sensor L” (⑤) by pushing its top to insert the “Spring Adjust Sensor L” into the slit. (Since the width of the “Spring Adjust Sensor L” is wider than that of the slit, it is required to push in.



Caution

Push straight down the “Holder Adjust Sensor L” (⑤). If it is pushed slantwise, the “Spring Adjust Sensor L” can be damaged.

Press straight down.



- When the “SA Ref Sensor PCB” is replaced with a new one, be sure to perform the sensor adjustment. Refer to “[3-7-1 Transparent/Reflective Sensor Adjustment](#)”.

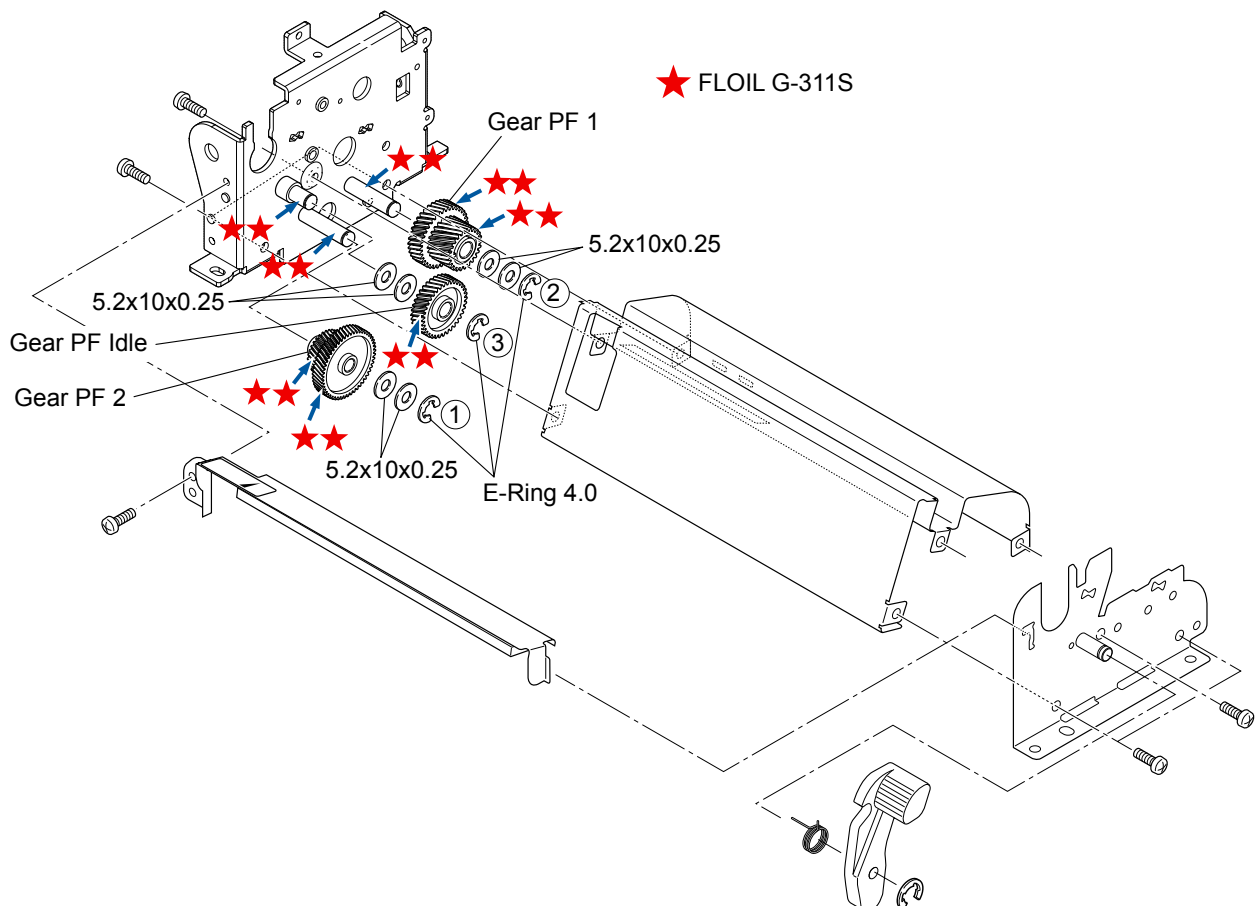
3-6-22. Platen Drive Gears, “Lever Head Lock”, Frames and “Plate Peeler”

(1) Platen Drive Gears

1. Remove the “Unit Ribbon”. Refer to “3-6-2 Unit Ribbon”.
2. Remove the “Unit Opepane”. Refer to “3-6-10(1) Unit Opepane”.
3. Remove the “Case” and “Cover Steel L”. Refer to “3-6-11 Case”.
4. Remove all connectors from the “SA Main PCB”. Refer to “3-6-12(1) “SA Main PCB” Connectors”.
5. Remove the “Unit Mechanism”. Refer to “3-6-13 Unit Mechanism”.
6. Remove the “Unit Head”. Refer to “3-6-18 “Unit Head” and “Unit PF”.
7. Remove the “SA PF Motor”. Refer to “3-6-20 SA PF Motor”.

Tips: The gears can be removed without detaching the “Unit PF” and “SA PF Motor”.

8. Disengage the 1 E-ring (E-Ring 4.0) (①), remove 2 plain washers (5.2x10x0.25), and detach the “Gear PF 2”.
9. Disengage the 1 E-ring (E-Ring 4.0) (②), remove the 2 plain washers (5.2x10x0.25), and detach the “Gear PF 1”.
10. Disengage the 1 E-ring (E-Ring 4.0) (③), pull out the “Gear PF Idle”, and remove the 2 plain washers (5.2x10x0.25).

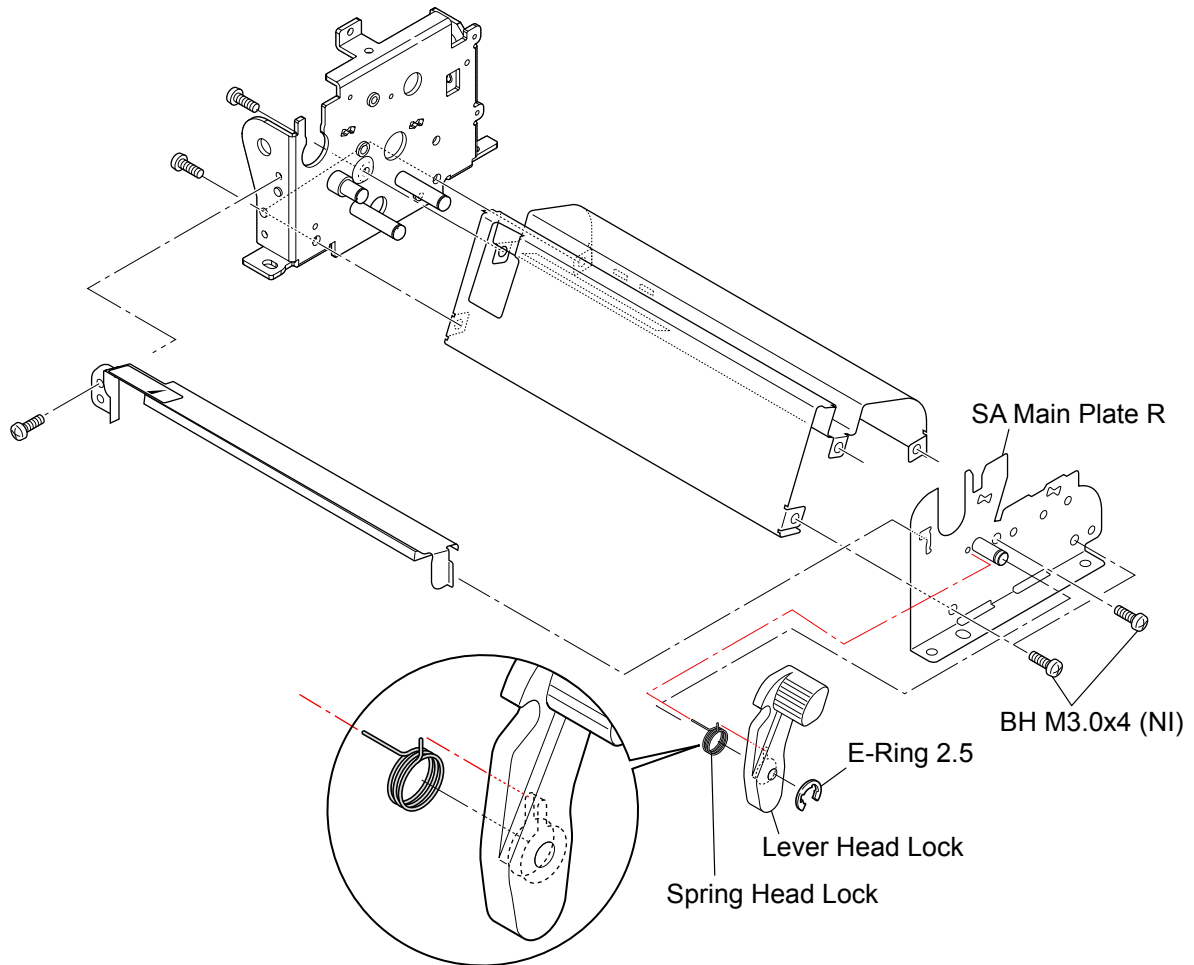


Notes on reassembling:

- Apply FLOIL G-311S to each gears and shafts marked with “★”.
- The gears have their own orientation except the “Gear PF Idle”.

(2) “Lever Head Lock” and “SA Main Plate R”

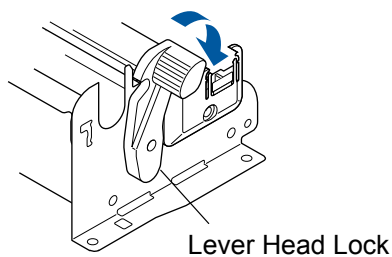
1. Remove the 3 screws (BH M3.0x4 (NI)) and detach the “SA Main Plate R”.
2. Disengage the 1 E-ring (E-Ring 2.5), and remove the “Lever Head Lock” and “Spring Head Lock” from the “SA Main Plate R”.



Note on reassembling:

- When mounting the “Lever Head Lock”, hook the “Spring Head Lock” as shown in the magnified view on the above figure. Hook one end of the “Spring Head Lock” on the groove of the “Lever Head Lock”, and insert the other end into the hole in the “SA Main Plate R”.

Also, mount the “Lever Head Lock” on the “SA Main Plate R” as shown below. Then, be sure that the lever moves smoothly.

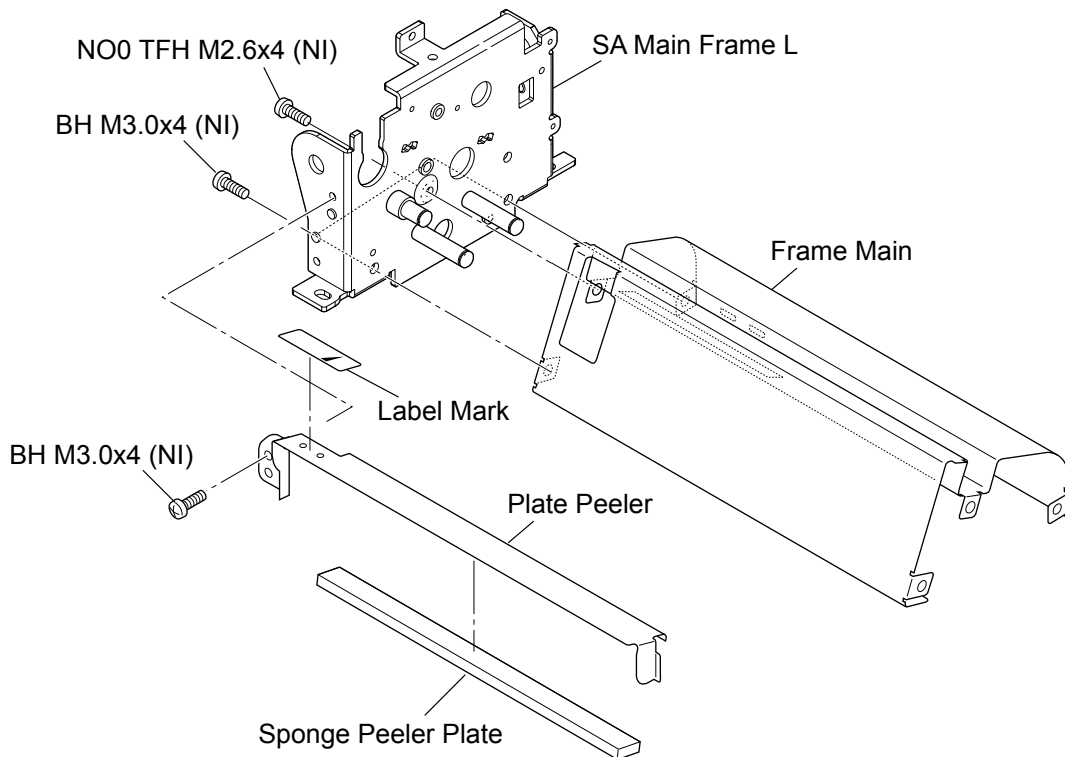


(3) “Frame Main”, “SA Main Plate L” and “Plate Peeler”

1. Remove the 2 screws (BH M3.0x4 (NI)) and 1 screw (NO0 TFH M2.6x4 (NI)), and detach the “Frame Main”.
2. Remove the 1 screw (BH M3.0x4 (NI)) and detach the “Plate Peeler” Block from the “SA Main Frame L”.

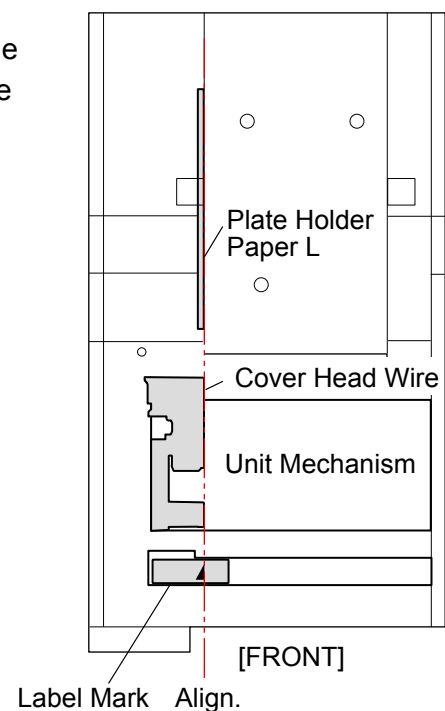
Tips: The “Plate Peeler” Block can be removed by simply opening the “SA Top Cover” Block.

3. Peel off the “Label Mark”, and remove the “Sponge Peeler Plate” from the “Plate Peeler”.



Note on reassembling:

- Stick the “Label Mark” so that its mark is aligned with the media guide end of the “Cover Head Wire” (a part of the “Unit Mechanism”).



3-7. Adjustments

3-7-1. Transparent/Reflective Sensor Adjustment

When one of the following parts is replaced with a new one, perform sensor position adjustment and sensor sensitivity adjustment as shown in the table below.

Parts replaced	Sensor position adjustment	Sensor sensitivity adjustment
SA Main PCB	Through Pos, Reflect Pos	Init Thru Sen, Init Refl Sen
SA TRA Sen PCB (Transparent sensor)	Through Pos	Init Thru Sen
SA Ref Sensor PCB (Reflective sensor)	Reflect Pos	Init Thru Sen, Init Refl Sen

(1) Sensor position adjustment (Factory mode)

In Factory mode, perform the following sensor position adjustment. For the adjustment procedure, refer to the following “Refer to” column.

Submenu	Adjust when the following part is replaced.	Refer to
Through Pos	- SA TRA Sen PCB (Transparent sensor) - SA Main PCB	“2-3-3. Factory/Service mode” in Chapter 2
Reflect Pos	- SA Ref Sensor PCB (Reflective sensor) - SA Main PCB	

(2) Sensor sensitivity adjustment (Factory mode)



- Since Factory mode menu includes essential items that can affect the printing accuracy, etc, DO NOT change the factory set values unless otherwise required.
- Do not turn OFF the power of the printer until you finish the adjustment. If the power is turned OFF before finishing, 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 by selecting “Test Mode” main menu, “Factory Default” submenu and then “Yes”, the changed value here does not return to the initial value set at the factory.

Perform the sensitivity adjustment for each sensor with the following submenu. For the adjustment procedure, refer to the following “Refer to” column.

Submenu	Adjust when the following part is replaced.	Refer to
Init Thru Sen	- SA TRA Sen PCB (Transparent sensor) - SA Ref Sensor PCB (Reflective sensor) - SA Main PCB	“3-7-1(2-1) “Init Thru Sen” sensitivity adjustment”
Init Refl Sen	- SA Ref Sensor PCB (Reflective sensor) - SA Main PCB	“3-7-1(2-2) Init Refl Sen sensitivity adjustment”

(2-1) “Init Thru Sen” sensitivity adjustment

Perform this adjustment when one of the following parts is replaced with a new one.

- SA TRA Sen PCB (Transparent sensor)
- SA Ref Sensor PCB (Reflective sensor)
- SA Main PCB

“Init Thru Sen” is a submenu for adjusting the sensitivity of the “SA TRA Sen PCB” (Transparent sensor).

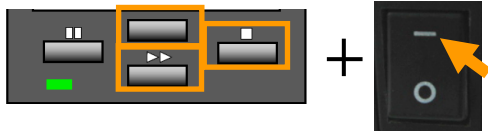
Preparation:

1. Prepare recommended label media or label media to be used.
2. Peel off a label from the liner.
3. Open the Head Block and set the liner prepared in above 2.
4. Correctly put the liner under the “SA TRA Sen PCB”.
For liner with black marks, keep away the black mark from the “SA TRA Sen PCB”.
5. Close the Head Block.

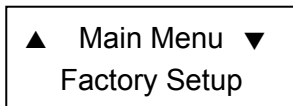
Procedure:

- * For detailed menu operation in Factory mode, refer to “[2-3-3. Factory/Service mode](#)” in Chapter 2.

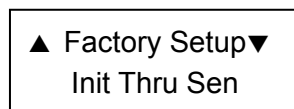
1. Enter Factory/Service mode by turning on the power while pressing and holding the **[MENU]**, **[FEED]** (▶▶) and **[STOP]** (■) keys.



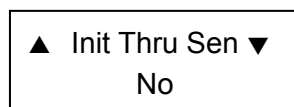
“Factory Setup” main menu appears.



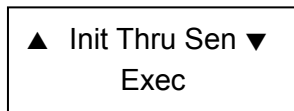
2. In “Factory Setup” main menu, press the **[STOP]** (■) key to enter Factory Setup mode.
3. Be sure that the first submenu “Init Thru Sen” is displayed.



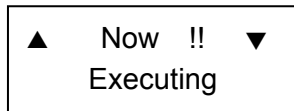
4. Press the **[STOP]** (■) key to enter “Init Thru Sen” sensitivity adjustment mode.



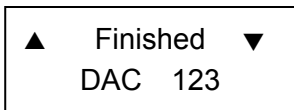
5. Press the **[MENU]** key to select “Exec”.



6. Press the **[STOP]** (■) key to execute adjustment.
Adjustment starts and the following screen is display.



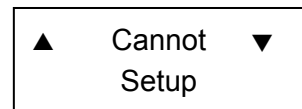
7. Be sure that the adjustment is successfully completed and the following screen is displayed. (The value “123” is an example.)



When the adjustment has failed:

“Cannot Setup” is displayed. In this case, follow the next steps.

- 1) Press any key of the printer.
The screen returns to Step 3.
- 2) Check for correct media setting position, media, active sensor, etc. and repeat from Step 3.



8. Press any key of the printer.
Then, the obtained value is saved into the printer and the screen returns to Step 3.
9. When the “SA Main PCB” or “SA Ref Sensor PCB” is replace, go to the following item [“3-7-1\(2-2\) Init Refl Sen sensitivity adjustment”](#) to carry out further adjustment.
When the “SA TRA Sen PCB” is replaced proceed to the next step.
10. Press the **[PAUSE]** (■) key to return to “Factory Setup” menu.
11. Press the **[PAUSE]** (■) key once again.
The changed value is saved in the printer and the printer is restarted internally.
Then, the printer returns to normal operation.

(2-2) Init Refl Sen sensitivity adjustment

Perform this adjustment when either of the following parts is replaced with a new one.

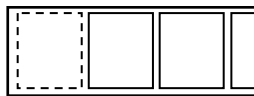
- SA Ref Sensor PCB (Reflective sensor)
- SA Main PCB

“Init Refl Sen” is the submenu for adjusting the sensitivity of the “SA Ref Sensor PCB” (reflective sensor).

Preparation:

Open the Head Block and set media (label media with black marks or tag media with black marks).

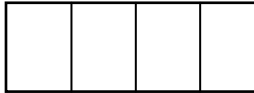
When die cut label media with black marks is used:



(Die cut label media: Gap between labels exists.)

1. Prepare recommended label media or label media to be used.
2. Peel off a label from the liner.
3. Correctly put the liner with no label on it on the “SA Ref Sensor PCB” (reflective sensor).
 - *Keep away the black mark from the “SA Ref Sensor PCB”.
4. Close the Head Block.

When butt cut label media with black marks is used:



(Butt cut label media: No gap between labels exists.)

1. Prepare recommended label media or label media to be used.
2. Correctly put the media on the “SA Ref Sensor PCB” (reflective sensor).
 - * Keep away the black mark from the “SA Ref Sensor PCB”.
 - * Do not peel off the labels from the liner.
3. Close the Head Block.

When tag media with blacks mark is used:

1. Prepare recommended tag media or tag media to be used.
2. Correctly put the tag media (or continuous tag media) on the “SA Ref Sensor PCB” (Reflective sensor). In this case, keep away the black mark from the “SA Ref Sensor PCB”.
3. Close the Head Block.

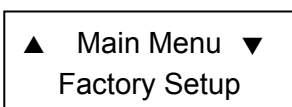
Procedure:

- * For detailed menu operation in Factory mode, refer to “2-3-3. Factory/Service mode” in Chapter 2.

1. Enter Factory/Service mode by turning on the power while pressing and holding the **[MENU]**, **[FEED]** (▶▶) and **[STOP]** (■) keys.



“Factory Setup” main menu appears.

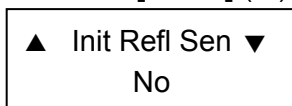


2. In “Factory Setup” main menu, press the **[STOP]** (■) key to enter Factory Setup mode.
The first submenu “Init Thru Sen” is displayed.

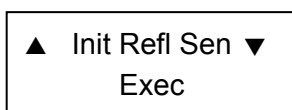
3. Press the **[MENU]** key until “Init Refl Sen” submenu appears.



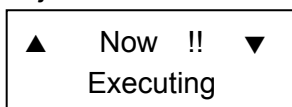
4. Press the **[STOP]** (■) key to enter “Init Refl Sen” sensitivity adjustment mode.



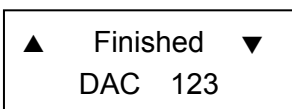
5. Press the **[MENU]** key to select “Exec”.



6. Press the **[STOP]** (■) key to execute adjustment.
Adjustment starts and the following screen is display.

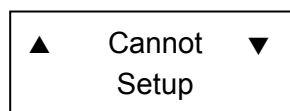


7. Be sure that adjustment is successfully completed and the following screen is displayed. (The value “123” is an example.)



When the adjustment has failed:

“Cannot Setup” is displayed. In this case, follow the next steps.



- 1) Press any key of the printer.
The screen returns to Step 3.
- 2) Check for correct media setting position, media, active sensor, etc. and repeat from Step 3.

8. Press any key of the printer.
Then, the obtained value is saved into the printer and the screen returns to Step 3.
9. Press the **[PAUSE] (III)** key twice to return to “Factory Setup” menu.
10. Press the **[PAUSE] (III)** key once again.
The changed value is saved in the printer and the printer is restarted internally.
Then, the printer returns to normal operation.

3-7-2. Ribbon Slant Elimination Adjustment

There are two kinds of ribbon slant elimination adjustment: for user and service personnel.

1) For User

- Adjustment with the Ribbon Left-Right Balance Adjustment Knob
- Cam Tension Base Adjust" position adjustment (Rear side)

2) For Service Personnel

- "Cam Tension Base Adjust" position adjustment (Front side)
- Ribbon guide position adjustment (a part of the "SA Head".)

Each adjustment method is separately explained here.

NOTE: A series of operation how to eliminate ribbon wrinkles is explained on later page.

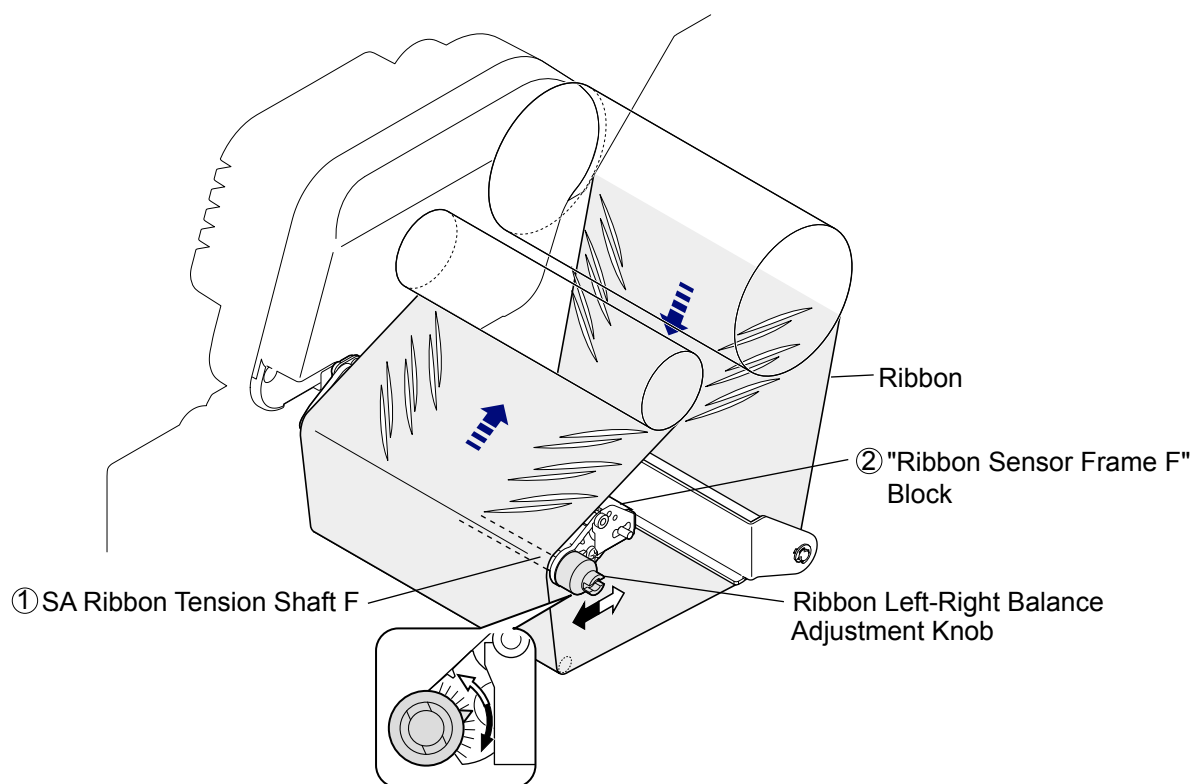
Refer to "[Removing Ribbon Wrinkles](#)".

(1) Ribbon Left-Right Balance Adjustment Knob (For user)

As you turn the Ribbon Left-Right Balance Adjustment Knob, the knob side (right side) of the "SA Ribbon Tension Shaft F" (①) moves back and forth with the eccentric mechanism.

(The left end of the "SA Ribbon Tension Shaft F" (①) is fixed.)

With this eccentric mechanism, ribbon slant can be adjusted.



Adjustment with the Ribbon Left-Right Balance Adjustment Knob is required in the following cases.

- When ribbon slants and ribbon wrinkles are observed.
- When the "Ribbon Sensor Frame F" Block (②) is replaced or reassembled.

1. Set the Ribbon Left-Right Balance Adjustment Knob to the center of the scale.
2. Turn the Ribbon Left-Right Balance Adjustment Knob to eliminate ribbon wrinkles.

(2) "Cam Tension Base Adjust" position adjustment

This adjustment is required in the following cases:

- When ribbon wrinkles cannot be eliminated by the Ribbon Left-Right Balance Adjustment Knob.
- When the "Cam Tension Base Adjust" on the front/rear side is replaced or reassembled.

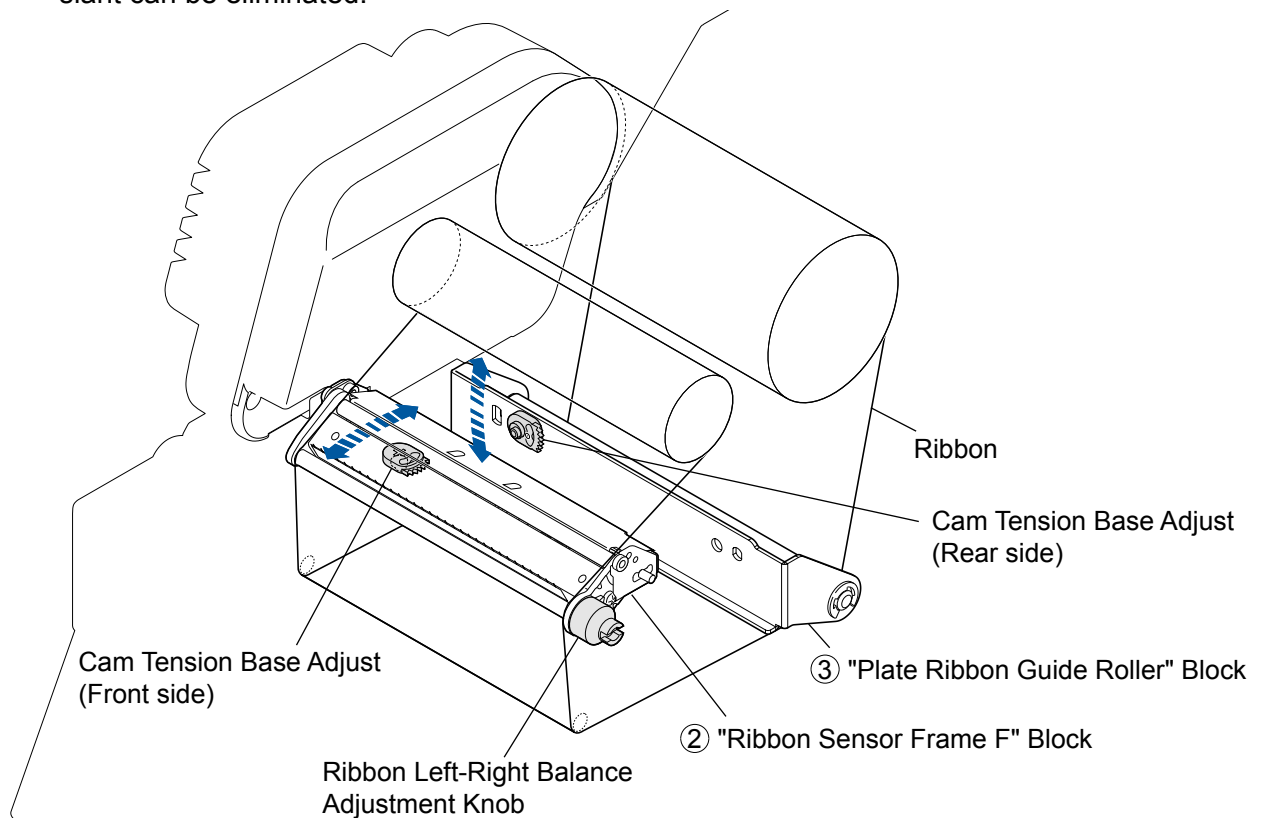
Adjust the position of the "Cam Tension Base Adjust" on the front/rear side as follows.

- * To eliminate ribbon wrinkles, front side adjustment is more effective than the rear side one.
- * To see how the "Cam Tension Base Adjust" works, refer to "Principle of operation of parallelism change with the "Cam Tension Base Adjust" on later page.

NOTE: Since the "Cam Tension Base Adjust" is adjusted at the factory, it may be off-center when shipped.

1) Front side "Cam Tension Base Adjust" position adjustment (For service personnel):
By adjusting the position of the "Cam Tension Base Adjust" at the front, the "Ribbon Sensor Frame F" Block (②) rotates horizontally within a limited range. Since the "Ribbon Sensor Frame F" Block (②) incorporates the Ribbon Left-Right Balance Adjustment Knob mechanism, the mechanism itself also rotates. Therefore, ribbon slant that could not be eliminated in the original knob position can now be eliminated in a newly adjusted position.

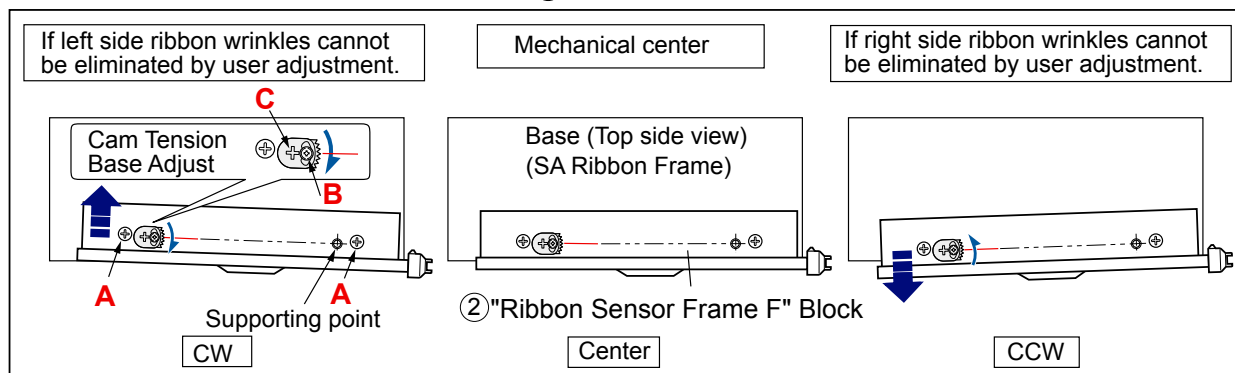
2) Rear side "Cam Tension Base Adjust" position adjustment (For user):
By adjusting the position of the "Cam Tension Base Adjust" at the rear, the "Plate Ribbon Guide Roller" Block (③) rotates vertically in a limited range. With this rotation, ribbon slant can be eliminated.



(2-1) Front side “Cam Tension Base Adjust” position adjustment (For service personnel)

1. To allow access to the “Cam Tension Base Adjust”, detach the “Cover RBN Tension Adjust” from the “Ribbon Sensor Frame F” Block (②) by removing 2 screws.
(Refer to “3-6-9(1) “Ribbon Sensor Frame F” Block”)
2. Loosen (do not remove) the 2 screws “A” shown in the figure below.
3. Loosen (do not remove) the 1 screw “B” and, by turning “C”, rotate the “Cam Tension Base Adjust” either in the clockwise or counterclockwise depending upon on which side the ribbon slants as viewed from the front/above.
By rotating the “Cam Tension Base Adjust”, the horizontal parallelism of the “Ribbon Sensor Frame F” Block (②) (movable part) with respect to the “SA Ribbon Frame” (fixed part) of the unit ribbon base changes.
4. Tighten the 1 screw “B” and the 2 screws “A”.

Shifting the “Ribbon Sensor Frame F” Block (②) (Viewing from the front/top side)

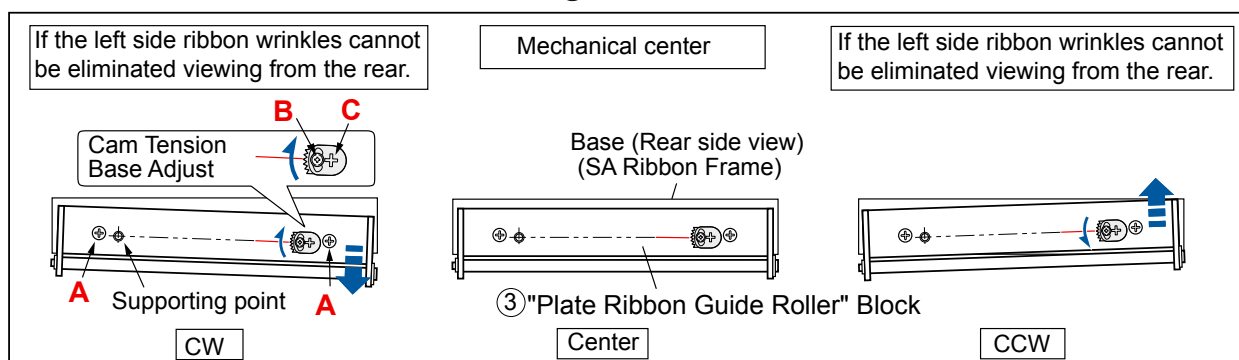


CW: Clockwise
CCW: Counterclockwise

(2-2) Rear side “Cam Tension Base Adjust” position adjustment (For user)

1. Access to the rear side of the “Unit Ribbon” and loosen (do not remove) the 2 screws “A” shown in the figure below.
3. Loosen (do not remove) the 1 screw “B” and, by turning “C”, rotate the “Cam Tension Base Adjust” either in the clockwise or counterclockwise depending upon on which side the ribbon slants as viewed from the rear.
By rotating the “Cam Tension Base Adjust”, the vertical parallelism of the “Plate Ribbon Guide Roller” Block (③) (movable part) with respect to the “SA Ribbon Frame” (fixed part) of the unit ribbon base changes.
4. Tighten the 1 screw “B” and the 2 screws “A”.

Shifting the “Plate Ribbon Guide Roller” Block (③) (Viewing from the rear side)



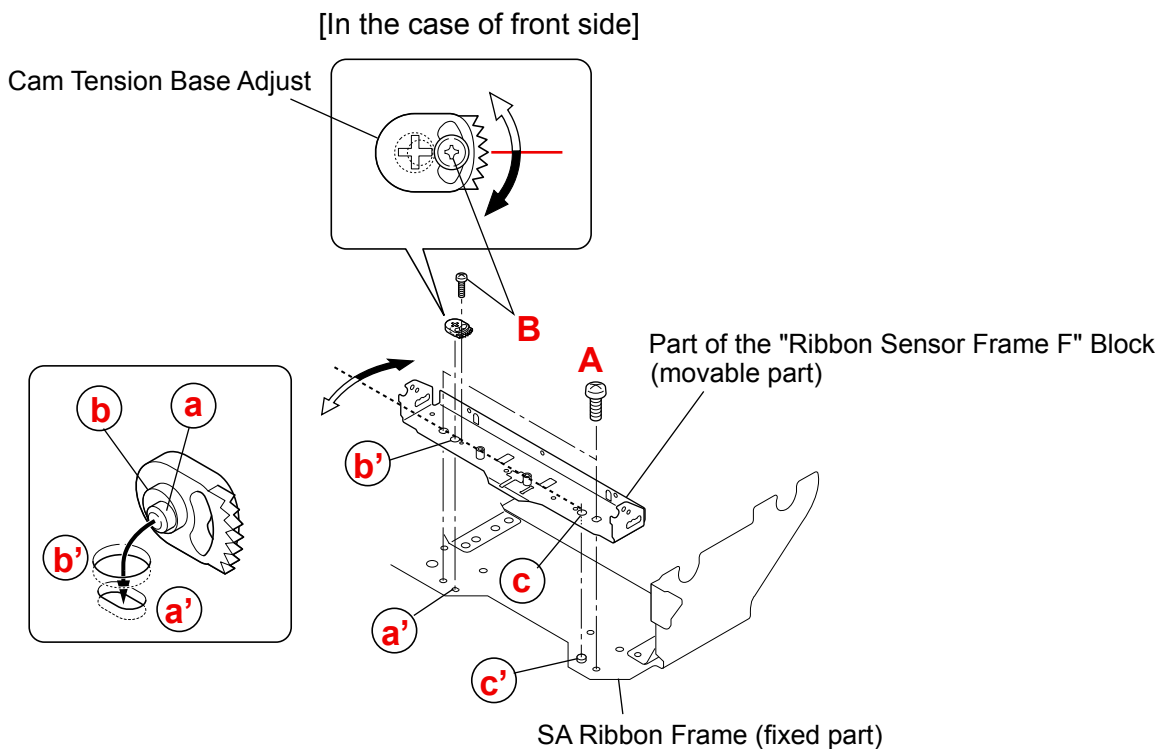
Principle of operation of parallelism change with the “Cam Tension Base Adjust”:

Though the operation on the front side “Cam Tension Base Adjust” is explained here, the same principle applies to “Cam Tension Base Adjust” on the rear side.

The horizontal parallelism of the “Ribbon Sensor Frame F” Block (movable part) with respect to the “SA Ribbon Frame” (fixed part) can be changed by means of the eccentric mechanism in the “Cam Tension Base Adjust”.

The “Cam Tension Base Adjust” has projections **“a”** and **“b”**. The projection **“a”** is inserted into the slotted hole **“a’”** in the “SA Ribbon Frame” (fixed part), while the projection **“b”** is inserted into the hole **“b’”** in the “Ribbon Sensor Frame F” Block (movable part).

As you can see from the figure, the projection **“a”** is eccentric with respect to the projection **“b”**. Accordingly, as you turn the “Cam Tension Base Adjust” (after loosening screws **“A”** (2 pcs.) and **“B”**), the eccentric projection **“a”** pushes the slotted hole **“a’”** so that the “Ribbon Sensor Frame F” Block (movable part) itself turns around the supporting point **“c”**. (The “Ribbon Sensor Frame F” Block (movable part) turns in the same direction as you turn the “Cam Tension Base Adjust”).

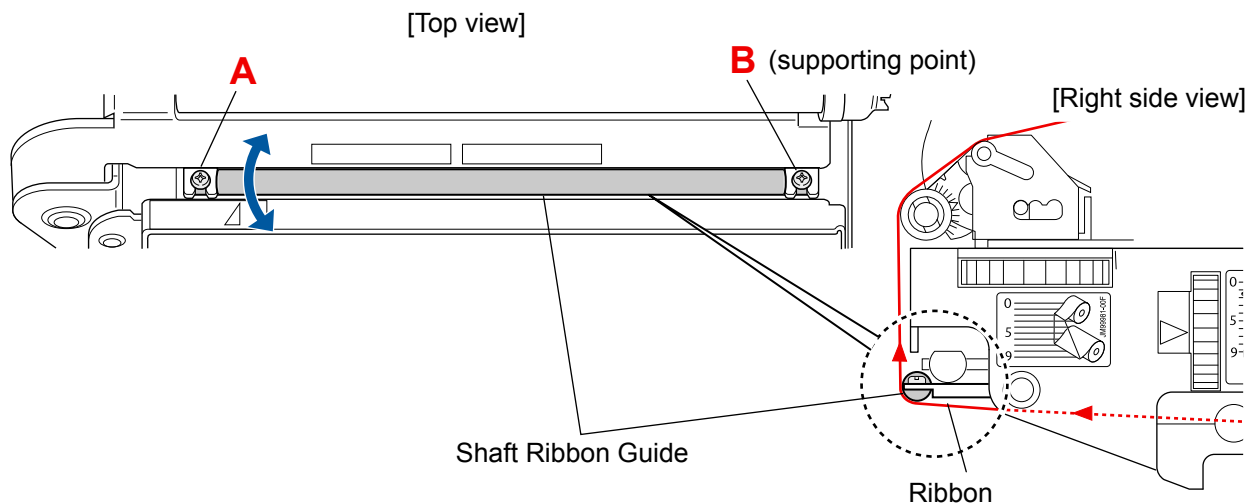


(3) Ribbon guide position adjustment (with a part of the “SA Head”)

By shifting the left end of the “Shaft Ribbon Guide” of the “SA Head”, ribbon wrinkle on the front side can be corrected.

Adjustment procedure:

1. Loosen (do not remove) the screws “A” and “B”.
2. Shift the left end of the “Shaft Ribbon Guide” back and forth to move the ribbon contacting surface.

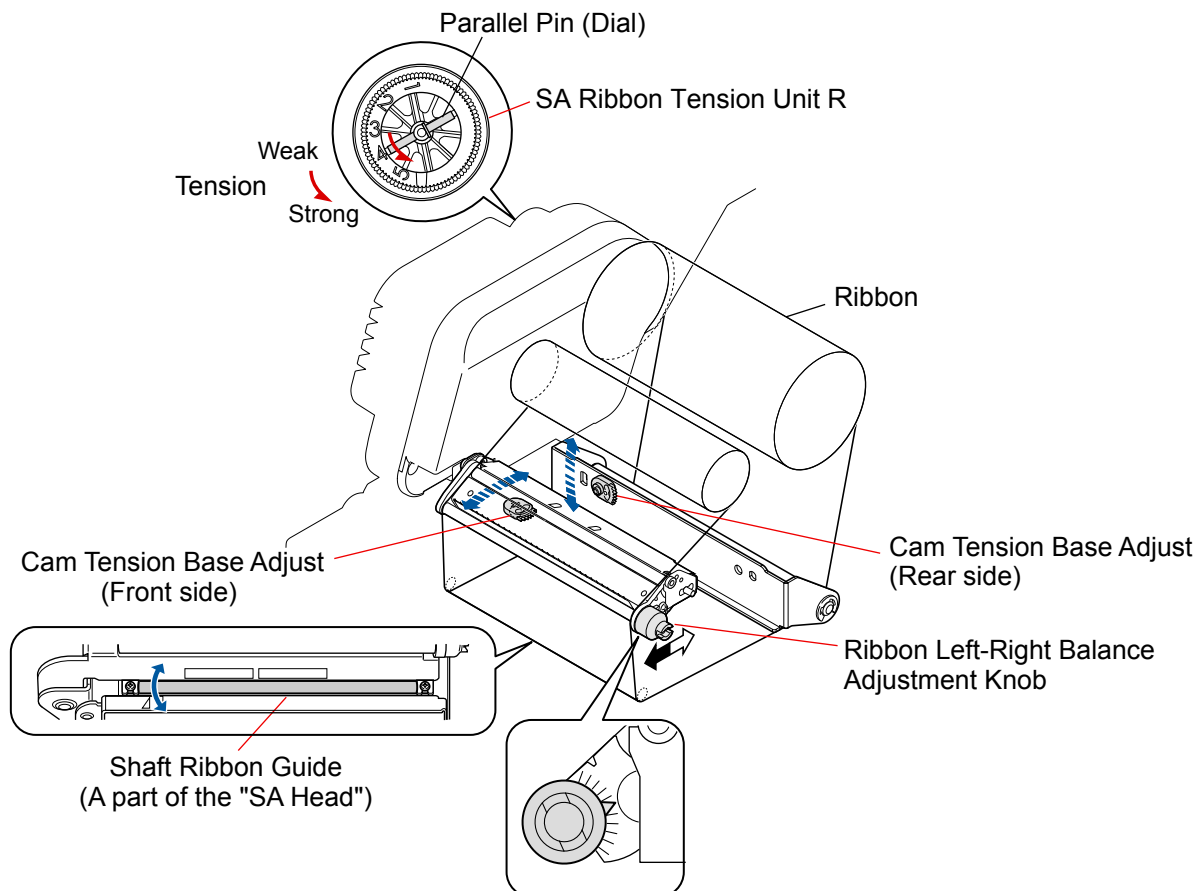
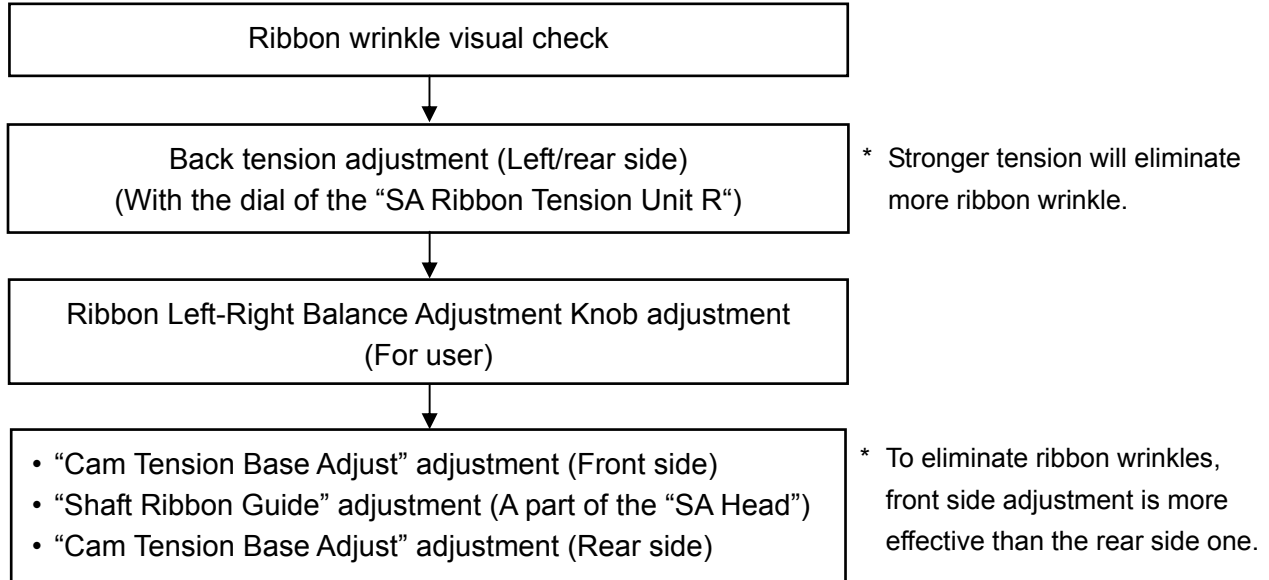


Removing Ribbon Wrinkles

General procedure how to remove ribbon wrinkles is explained here.

General:

Adjustment flow and adjustment location diagram are shown below.



[Adjustment locations for eliminating ribbon wrinkles]

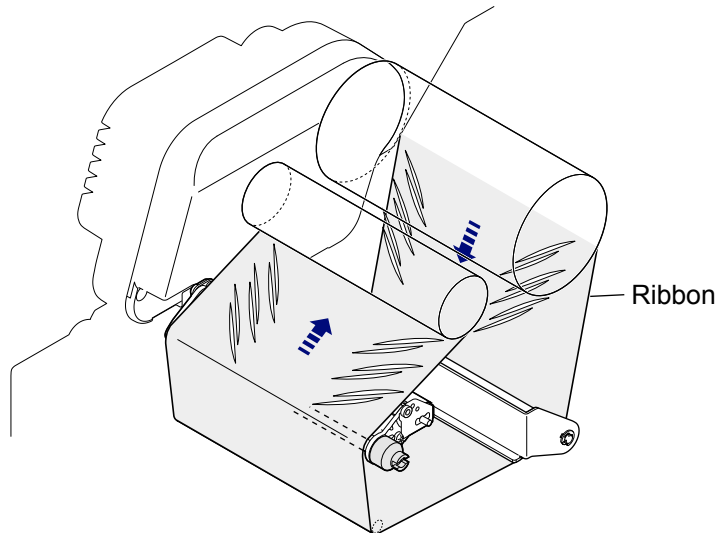
Adjustment Procedure

Perform the following procedure to eliminate ribbon wrinkles.

(1) Ribbon wrinkle visual check

Checking the ribbon surface visually is a good way to see whether wrinkles are on the ribbon or not. You can find wrinkles by the reflected light on the ribbon surface.

Check wrinkles on both the front side (take-up side) and rear side (supply side) to see where wrinkles are observed.



(2) Back tension adjustment (Left/rear side)

Adjust the tension applied to the supply side ribbon by setting the parallel pin (dial) of the "SA Ribbon Tension Unit R" of the "Unit Ribbon" on the left/rear side.

1. Perform test print in self print mode. (Refer to ["2-3-2\(1\) Self print mode"](#).)

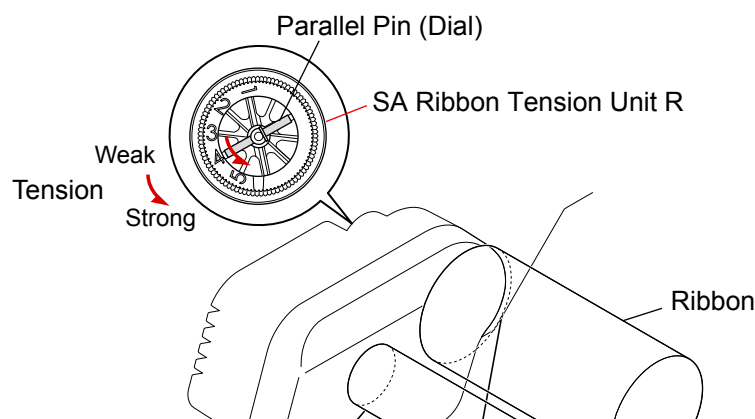
2. Visually check ribbon wrinkles.

3. Set the tension to reduce wrinkles by turning the parallel pin (dial).

Setting value: 1 to 5 (5: max. tension)

* By setting the number to a larger one i.e., by giving a stronger tension to the ribbon, wrinkles tend to be reduced.

4. Proceed to the next item.



(3) Adjustment on the front side

NOTE: To eliminate ribbon wrinkles, front side adjustment is more effective than the rear side one.

1. Perform test print in self print mode. (Refer to “[2-3-2\(1\) Self print mode](#)”.)
2. Visually check ribbon wrinkles on the front side (take-up side).

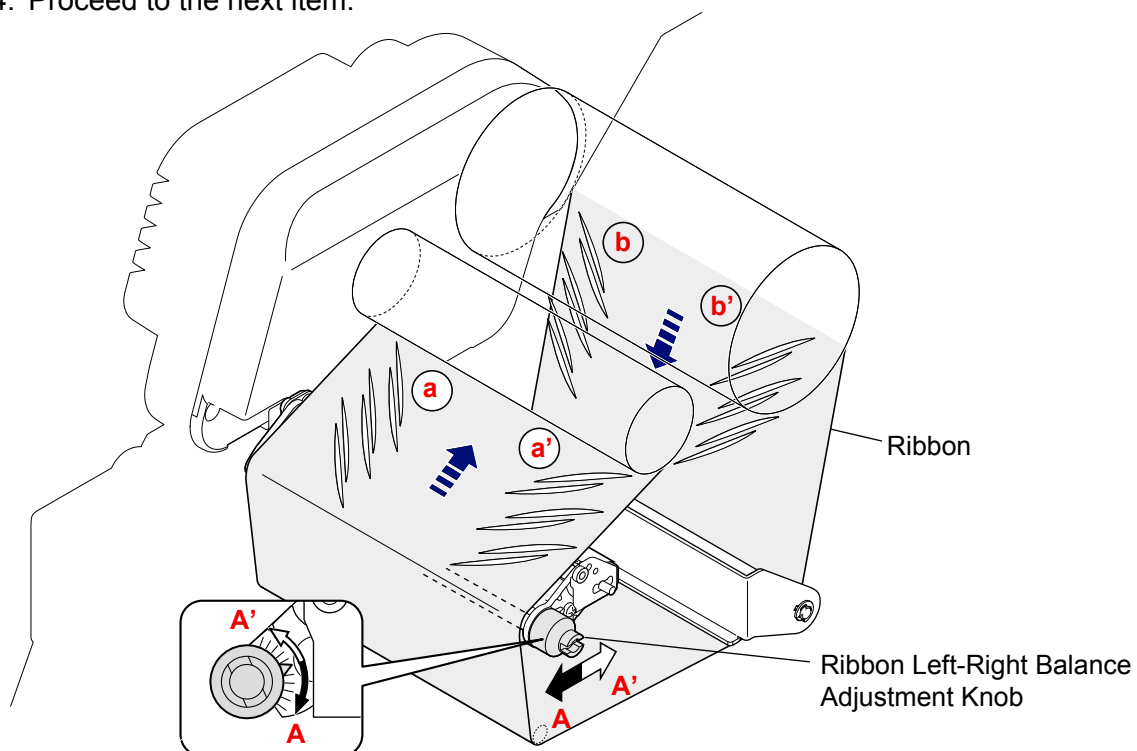
Since the ribbon is taken up stronger on the shorter ribbon path side, wrinkles appear on the longer path side.

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 clockwise.
 - If wrinkles are found on the right side (“a’ ” in the figure), turn the knob counterclockwise.
 - If wrinkles are found at around the center, find on which side the wrinkles are, and turn the knob accordingly.
3. Be sure that the adjusted position in Step 2 is at around the center of the scale (adjustable range) of the Ribbon Left-Right Balance Adjustment Knob. (The center of the scale shows the mechanical center of the Knob.)

NOTES:

1. If the adjusted position of the Knob is off-center widely or wrinkles cannot be removed, the “Cam Tension Base Adjust” position may be wrong.
In this case, refer to “[3-7-2\(2\) “Cam Tension Base Adjust” position adjustment](#)” and perform adjustment according to “[3-7-2\(2-1\) Front side “Cam Tension Base Adjust” position adjustment \(For service personnel\)](#)”.
 2. Perform ribbon guide adjustment to eliminate ribbon wrinkles, as required. Refer to “[3-7-2\(3\) Ribbon guide position adjustment \(with a part of the “SA Head”\)](#)”.
4. Proceed to the next item.



(4) Adjustment on the rear side

1. Observe the ribbon wrinkles on the rear side (supply side) in the same manner as on the front side (take-up side) stated as above.

The adjustable part on the rear side is the “Cam Tension Base Adjust” only.

Refer to “3-7-2(2) “Cam Tension Base Adjust” position adjustment” and perform adjustment according to “3-7-2(2-2) Rear side “Cam Tension Base Adjust” position adjustment (For user)”.

2. When adjustment is done on the rear side, repeat above “(3) Adjustment on the front side” again.

CHAPTER 4

TROUBLESHOOTING



CHAPTER 4 TROUBLESHOOTING

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4-1. Error Message and Corrective Actions

When an error occurs, the error condition will be displayed on the operation panel. The LED flashes in red and the LCD shows the error contents.

In case of an error, the printer enters off line except for the following errors.

- LCD: Alarm Head Hot
- LCD: Alarm Cutter Hot
- LCD: Alarm Head Check

Causes/Corrective Actions	LED	LCD
Head temperature - high temperature abnormality • Printing stops temporarily. Wait until the "SA Head" gets cool.	Flashing in red	Alarm Head Hot
Head temperature - low temperature abnormality • Printing is impossible. Start printing after the "SA Head" becomes warm.	Flashing in red	Error Head Cold
PF motor temperature abnormality • Printing is impossible. Wait until the "SA PF Motor" gets cool.	Flashing in red	Error PFMotor Hot
Ribbon motor temperature abnormality • Printing is impossible. Wait until the "SA Ribbon Motor F" gets cool.	Flashing in red	Error RBMotor Hot
Cutter motor temperature abnormality (Option) • Cutting action stops temporarily. Wait until the cutter motor gets cool.	Flashing in red	Alarm Cutter Hot
Head open • Close the head.	Flashing in red	Error Head Open
Paper end • Add media.	Flashing in red	Error Paper End
Paper out (paper position undetectable) - defective paper loading • Incorrect positioning of the sensors: Adjust the sensor position correctly to label media and the black mark of tag media. • Incorrect setting of "Media Sensor" submenu: Match the setting (See Through, Reflect, None) with media to be used. • Incorrect sensor adjustment against media to be used: Enter sensor adjustment mode by turning ON while pressing and holding [MENU], [FEED] (▶▶) and [STOP] (■) keys. Then perform sensor adjustment. For details, refer to "2-3-3(3) How to change the settings in Factory mode" in Chapter 2.	Flashing in red	Error Paper Load

Causes/Corrective Actions	ERROR LED	LCD
Paper jam Remove the jammed media.	Flashing in red	Error Paper Jam
Head resistance abnormality - Resistance is small Defective thermal element(s). Print quality will degrade.	Flashing in red	Alarm Head Check
Ribbon end Replace the ribbon with new one.	Flashing in red	Error Ribbon End
Ribbon running error - Set the ribbon correctly. - Check the operation of the ribbon sensor mechanism. It does not work or does not move smoothly. (Refer to “4-2-4 Ribbon-feed / Ribbon winding Problem” - “Ribbon slacks on the take-up side. “Error Ribbon Run” is displayed on the LCD.”) - Defective ribbon sensor: Replace the “SA Ribbon Encoder” or “SA Ribbon Sensor”. (Refer to Chap. 3 “Disassembly and Maintenance”.)	Flashing in red	Error Ribbon Run
Serial communication error Receiving buffer overrun error	Flashing in red	Error Serial Over Run
Serial communication error Parity error	Flashing in red	Error Serial Parity
Serial communication error Framing error	Flashing in red	Error Serial Framing
System error Power to the “SA Head”, “SA PF Motor” and “SA Ribbon Motor F” is shut off. (To resume, turn the power OFF and then ON.)	Flashing in red	Error System Fail
Auto-cutter abnormality (foreign object etc.) (Option) Jamming, etc.	Flashing in red	Error Cutter Fail

4-2. Troubleshooting

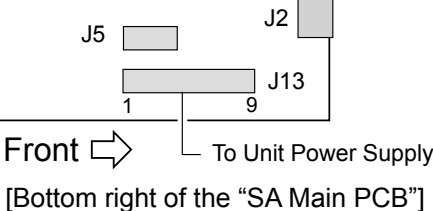
The following tables show possible remedies for various symptoms that might occur. Symptoms are given in the left column, and the corresponding remedies in the right column.

Notes: 1. When parts are replaced, refer to Chapter 3 “Disassembly and Maintenance”.
2. For the location of each connector, refer to “[4-2-7 Connector Location](#)”.

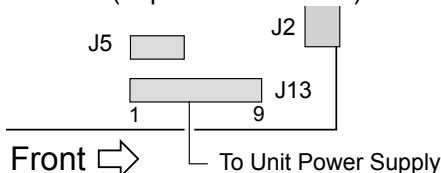
4-2-1. Problems in Powering Up the Printer

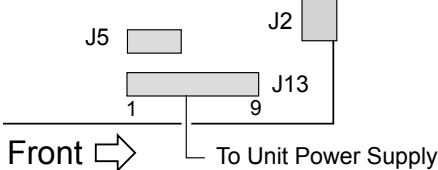
Symptoms	Checks	Remedies
No power to the printer	1. Check voltage on the input power line. Acceptable supply voltage: 100 to 240V AC 2. Is the power cord loosely connected? 3. Is the “SA Power Cable” firmly connected between the “Unit Power Supply” and the “SA Main PCB” (J13)? 4. Is the “FFC Opepane” connected between the “SA Main PCB” (J3) 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. Also, nothing is displayed on the LCD. 5. Failure in the power supply circuit.	1. Supply correct voltage. 2. Connect it firmly. 3. Connect it firmly. 4. Connect it firmly. 5. Replace the “Unit Power Supply”.

4-2-2. Media-feed Problems

Symptoms	Checks	Remedies
No media feed	1. Is the connector J5 for the "SA PF Motor" connected firmly? 2. Is the connector J13 for "Unit Power Supply" connected firmly? 3. Is +24V DC supplied to the "SA Main PCB" (at pins 6 to 9 of JJ13)?  Front → To Unit Power Supply [Bottom right of the "SA Main PCB"] 4. Does the "SA PF Motor" turn? 5. Failure in the control circuit or in the paper feed motor driver.	1. Connect it firmly. 2. Connect it firmly. 3. Replace the "Unit Power Supply". 4. Replace the "SA PF Motor". 5. Replace the "SA Main PCB".
Irregular media feed pitch	1. Is the connector J5 for "SA PF Motor" connected firmly? 2. Is dust or other foreign matter on the "SA Platen"? 3. Does the media feed mechanism work smoothly? 4. Failure in the control circuit or in the paper feed motor driver.	1. Connect it firmly. 2. Remove dust or foreign matter. 3. Check, clean and lubricate mechanical parts. Note: Refer to Chap. 3 "Disassembly and Maintenance". 4. Replace the "SA Main PCB".
Media jamming	1. Is media set correctly? 2. Is the media being used within manufacturer's specifications? 3. Check the media feed mechanism and media path for dust or other foreign matter.	1. Set media correctly. 2. Use media within manufacturer's specifications. 3. Remove dust or foreign matter.

4-2-3. Problems in Printing

Symptoms	Checks	Remedies
No print (Overheating problems)	- Is the "SA Head" over heated? (The LCD displays "Alarm Head Hot".) - Is the "SA PF Motor" over heated? (The LCD displays "Error PFMotor Hot".) - Is the "SA Ribbon Motor F" over heated? (The LCD displays "Error RBMotor Hot".) - Is "Error System Fail" displayed on the LCD?	- Wait until the "SA Head" gets cool. Printing resumes automatically. - Wait until the "SA PF Motor" gets cool. Printing resumes automatically. - Wait until the "SA Ribbon Motor F" gets cool. Printing resumes automatically. - Turn OFF the power and then turn it ON.
No print	- Is the head block securely closed? (The LCD displays "Error Head Open".) - Is the interface cable firmly connected between the printer and the host? - Is the "SA Head Cable" firmly connected between the "SA Head" and the "SA Main PCB" (J2)? - Does the transparent/reflective sensor detect presence of media? - Is +24V DC supplied to the "SA Main PCB" (at pins 6 to 9 of J13)?  Front → To Unit Power Supply [Bottom right of the "SA Main PCB"] "SA Head" is broken. - Failure in the head driver circuit. - Failure in the control circuit.	- Close the head block correctly. - Connect it firmly. - Connect it firmly. - To check, see "4-2-5 Sensor Problems". - Replace the "Unit Power Supply". - Replace the "SA Head". - Replace the "SA Head". - Replace the "SA Main PCB".

Symptoms	Checks	Remedies
Poor printing	- The "SA Head" is dirty. - Head offset adjustment is improper. - Is the printing density set to an optimal condition? - Is +24V DC supplied to the "SA Main PCB" (at pins 6 to 9 of J13)?  Front → To Unit Power Supply [Bottom right of the "SA Main PCB"]	- Clean the head surface with the specified head cleaner. - Adjust the media thickness adjustment dial according to media thickness to be used. - Adjust the printing density. - Replace the "Unit Power Supply".
Uneven print density	- Head balance is improper. Uneven printing density may be observed either on the right side or the left side. - Is the printing density set to an optimal condition?	- Adjust the media width adjustment dial to suit to the media width to be used. - Adjust the printing density.

4-2-4. Ribbon-feed / Ribbon winding 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? 2. Is the ribbon path correct? 3. Is the cable firmly connected between the "SA Main PCB" (J4) and the "SA Relay PCB" (J301)? 4. Is the cable firmly connected between "SA Relay PCB" (J304) and the "SA Ribbon Control PCB" (J601)? 5. Is the cable firmly connected between "SA Ribbon Control PCB" (J602) and the "SA Ribbon Motor F"? 6. Is the cable firmly connected between "SA Ribbon Control PCB" (J603) and the thermistor "SA PF MTR THM"? 7. Does the "SA Fan" work correctly? (It starts to turn when the temperature of the "SA Ribbon Motor F" exceeds a certain value.) If it does not, check if the cable is firmly connected between the "SA Fan" and the "SA Ribbon Control PCB" (J604). 8. Does the ribbon tension sensor work correctly? See "4-2-5 Sensor Problems". 9. Does the ribbon encoder sensor work correctly? See "4-2-5 Sensor Problems". 10. Do the ribbon drive gears turn correctly? 11. Does the "SA Ribbon Motor F" turn correctly? 12. Failure in the ribbon motor drive circuit. 13. Failure in the ribbon motor control circuit.	1. Insert the ribbon correctly. 2. Re-install the ribbon correctly. 3. Connect it firmly. 4. Connect it firmly. 5. Connect it firmly. 6. Connect the cable firmly. 7. Connect the cable firmly. 8. Replace the "SA Ribbon Sensor". 9. Replace the "SA Ribbon Encoder". 10. Replace the defective ribbon gear. 11. Replace the "SA Ribbon Motor F". 12. Replace the "SA Ribbon Control PCB". 13. Replace the "SA Relay PCB" or "SA Main PCB".

Symptoms	Checks	Remedies
Ribbon slants.	1. Is the ribbon correctly inserted into the ribbon holders? 2. Is the ribbon path correct? 3. Is the ribbon slant elimination adjustment made?	1. Insert the ribbon correctly. 2. Re-install the ribbon correctly. 3. Adjust it according to "3-7-2 Ribbon Slant Elimination Adjustment".
Ribbon slacks on the take-up side. "Error Ribbon Run" is displayed on the LCD.	1. Is the "SA Ribbon Tension Shaft F" to give an adequate tension to the take-up side ribbon correctly installed? (Push it by hand and check if it moves smoothly.) 2. Are the sensor projections incorporated in the "SA Ribbon Tension Shaft F" free from contacting with the photointerrupters of the "SA Ribbon Sensor"? (Push the "SA Ribbon Tension Shaft F" by hand and check if it moves smoothly. For its operation, refer to "2-1-4. Ribbon Feed Mechanism".)	1. Install the "SA Ribbon Tension Shaft F" correctly. 2. Replace the "SA Ribbon Tension Shaft F" or the "SA Ribbon Sensor".

4-2-5. Sensor Problems

Symptoms	Checks	Remedies
Head block is closed, but "Error Head Open" is indicated on the LCD. (Head up sensor problem)	1. Is the "SA Head Up Sensor Cable" firmly connected between the "SA Head Up Sensor PCB" and the "SA Main PCB" (J10)? 2. Is the protrusion (metal end) inserted into the photointerrupter of the "SA Head Up Sensor PCB"? 3. Failure in the control circuit.	1. Connect it firmly. 2. Replace the "SA Head Up Sensor PCB". 3. Replace the "SA Main PCB".
Ribbon tension is not correctly controlled. (Ribbon tension sensor problem)	1. Is the cable firmly connected between the "SA Main PCB" (J4) and the "SA Relay PCB" (J301)? 2. Is the cable firmly connected between "SA Relay PCB" (J304) and the "SA Ribbon Control PCB" (J601)? 3. Is the cable firmly connected between "SA Ribbon Control PCB" (J606) and the "SA Ribbon Sensor"? 4. Failure in the ribbon tension sensor? 5. Failure in the control circuit.	1. Connect it firmly. 2. Connect it firmly. 3. Connect it firmly. 4. Replace the "SA Ribbon Sensor". 5. Replace the "SA Ribbon Control PCB", "SA Relay PCB", or "SA Main PCB".
Ribbon end is not correctly detected. or Mistakenly "Error Ribbon End" is displayed on the LCD (Ribbon encoder sensor problem)	1. Is the cable firmly connected between the "SA Main PCB" (J4) and the "SA Relay PCB" (J301)? 2. Is the cable firmly connected between "SA Relay PCB" (J304) and the "SA Ribbon Control PCB" (J601)? 3. Is the cable firmly connected between "SA Ribbon Control PCB" (J605) and the "SA Ribbon Encoder"? 4. Failure in the ribbon encoder sensor? 5. Failure in the control circuit.	1. Connect it firmly. 2. Connect it firmly. 3. Connect it firmly. 4. Replace the "SA Ribbon Encoder". 5. Replace the "SA Ribbon Control PCB", "SA Relay PCB", or "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? 2. Does the transparent sensor marker match with the bottom sensor (Reflective Sensor) marker? 3. Is the user sensor adjustment performed? 4. Is the "FFC TRA Sensor" firmly connected between the "SA Main PCB" (J9) and "SA TRA Sen PCB"? 5. Is the "FFC TRA Sensor" inserted upside down? 6. Is the cable firmly connected between the "SA Main PCB" (J8) and "SA Ref Sensor PCB"? 7. Is dust on the LEDs of the reflective sensor? 8. Failure in the transparent sensor or the reflective sensor. 9. Failure in the control circuit.	1. Set it to "See Through". 2. Move both sensors to align their positions for transparent use. 3. Perform the sensor adjustment for user. Refer to "Sensor Adjustment for user (Transparent Sensor/ Reflective Sensor)" on page 4-13. 4. Connect it firmly. 5. Connect it in the right orientation. 6. Connect it firmly. 7. Clean the LEDs on the "SA Ref Sensor PCB" to remove dust. 8. Replace the "SA TRA Sen PCB" or "SA Ref Sensor PCB". 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? 2. Is the reflective sensor correctly aligned with the black mark? 3. Is the user sensor adjustment performed? 4. Is the connector firmly connected between the "SA Main PCB" (J8) and "SA Ref Sensor PCB"? 5. Is dust on the LEDs and the phototransistor of the reflective sensor? 6. Failure in the reflective sensor. 7. Failure in the control circuit.	1. Set it to "Reflect". 2. Align it with the center part of the black mark. 3. Perform the sensor adjustment for user. Refer to "Sensor Adjustment for user (Transparent Sensor/ Reflective Sensor)" on page 4-13. 4. Connect it firmly. 5. Clean the LEDs and the phototransistor on the "SA Ref Sensor PCB" to remove dust. 6. Replace the "SA Ref Sensor PCB". 7. Replace the "SA Main PCB".

[Sensor Adjustment for user (Transparent Sensor/Reflective Sensor)]

The following describes the transparent sensor (SA TRA Sen PCB) and reflective sensor (SA Ref Sensor PCB) adjustment method for user.

* This method is described in “Sensor Adjustments” in the User’s Manual.

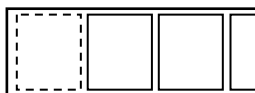
Preparation:

(1) Transparent sensor

1. Peel off labels from the liner.
2. Open the head block and put that liner so that it is located on the platen roller and both transparent sensor (SA TRA Sen PCB) and reflective sensor (SA Ref Sensor PCB).
NOTE: If the liner has a black mark, keep away the black mark from both sensors.
3. Close the head block.

(2) Reflective sensor

1. Open the head block and put the label media so that it is located on the platen roller and the reflective sensor (SA Ref Sensor PCB).
 - When die cut label media with black marks is used, peel off a label beforehand.



(Die cut label media: Gap between labels exists.)

- When butt cut label media with black marks is used, leave the labels as they are.



(Butt cut label media: No gap between labels exists.)

NOTE: Keep away the black mark from the reflective sensor.

2. Close the head block.

Sensor Adjustment Procedure (common to both sensors):

1. Turn on the power while pressing and holding the **[MENU]**, **[PAUSE]** (||), and **[STOP]** (■) keys.



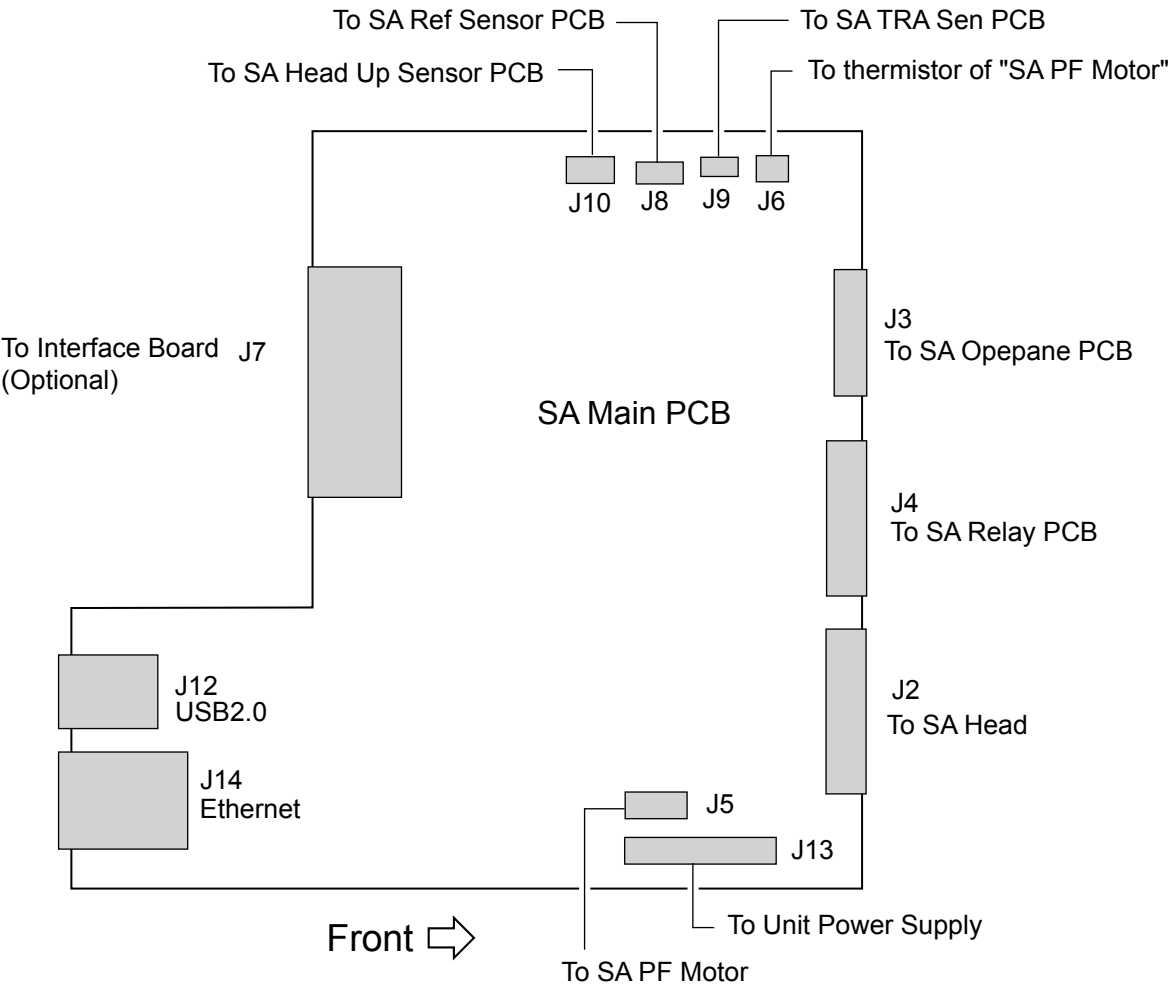
2. Release the keys when the LED lights in green and “Sensor Cal Mode See Through” is displayed on the LCD.
To switch the LCD display between “See Through” and “Reflect”, press and release the **[STOP]** (■) key while pressing and holding the **[FEED]** (▶▶) key.
Choose either one as required.
3. Press and release the **[PAUSE]** (||) key while pressing and holding the **[FEED]** (▶▶) key.
“Sensor Cal Mode Executing” and then “Sensor Cal Mode Succeeded” will be displayed on the LCD.
 - * If the adjustment ends abnormally (adjustment impossible), the LED flashes in red and “Failed” is displayed on the LCD.
4. Press the **[STOP]** (■) key.
Then the printer internally restarts, and then enters the normal operation.

4-2-6. Operation Panel Problems

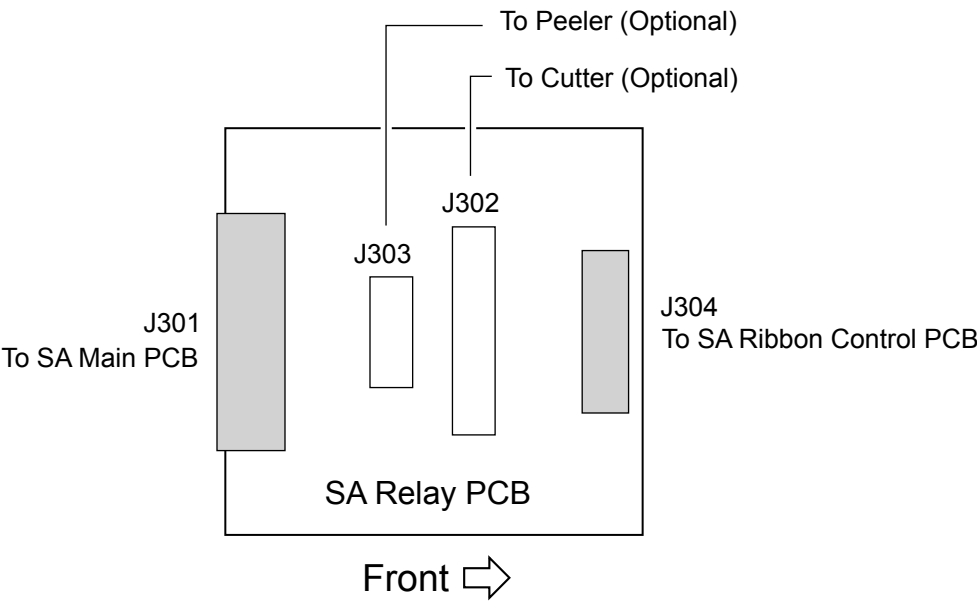
Symptoms	Checks	Remedies
Nothing is displayed on the LED	1. Is the "FFC Opepane" firmly connected between the "SA Main PCB" (J3) and "SA Opepane PCB"? 2. Is the "FFC Opepane" inserted upside down? 3. Failure in the "SA Opepane PCB". 4. Failure in the control circuit.	1. Connect it firmly. 2. Connect it in the right orientation. 3. Replace the "SA Opepane PCB". 4. Replace the "SA Main PCB".
No key works.	1. Is the "FFC Opepane" firmly connected between the "SA Main PCB" (J3) and "SA Opepane PCB"? 2. Is the "FFC Opepane" inserted upside down? 3. Failure in the "SA Opepane PCB". 4. Failure in the control circuit.	1. Connect it firmly. 2. Connect it in the right orientation. 3. Replace the "SA Opepane PCB". 4. Replace the "SA Main PCB".
Nothing is displayed on the LCD	1. Is the printer in standby mode (the LED lights in green)? 2. Is the "FFC Opepane" firmly connected between the "SA Main PCB" (J3) and "SA Opepane PCB"? 3. Is the "FFC Opepane" inserted upside down? 4. Failure in the "SA Opepane PCB". 5. Failure in the control circuit.	1. Press any key. 2. Connect it firmly. 3. Connect it in the right orientation. 4. Replace the "SA Opepane PCB". 5. Replace the "SA Main PCB".

4-2-7. Connector Location

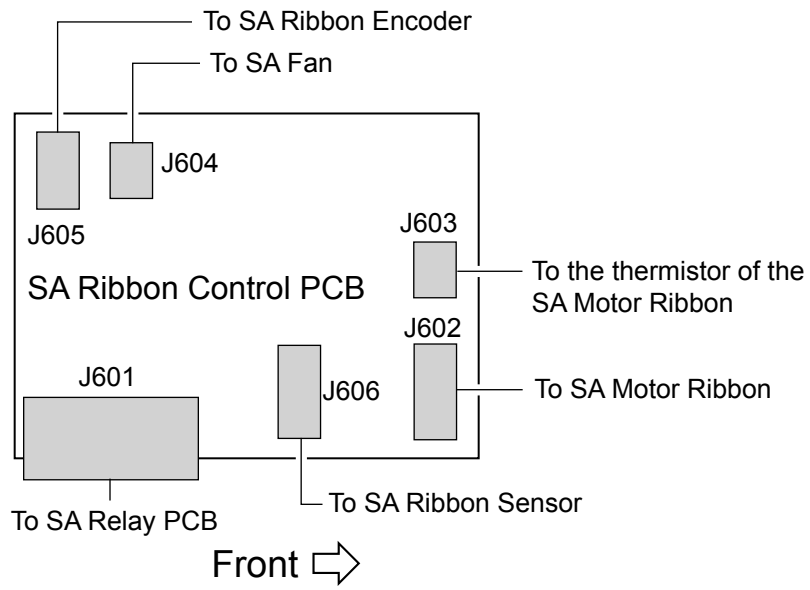
[SA Main PCB]



[SA Relay PCB]



[SA Ribbon Control PCB]



CHAPTER 5

PARTS LISTS



Chapter 5 Parts Lists

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CL-E700 series

Recommended Spare Parts List

Revision Up List		
Sheet No.	Rev. No.	Date
1/1	0	Oct. 10, 2014

PARTS LIST for CL-E700 series

TITLE: Recommended Spare Parts List

Sheet No. 1/1

Rev. No. 0

Item No.	Location	Part No.	Part Name	Q'ty/ Unit	Maint. Class		Remarks	@
					Worn	Casual		
1	2-8	PWT20011-0	Unit Power Supply	1		○		
2	2-13-1	PPS00152-0	SA Main PCB (200ENG)	1		○	For CSA/CSE	
3	2-13-2	PPS00218-0	SA Main PCB (200CHN)	1		○	For CHINA	
4	2-13-3	PPS00219-0	SA Main PCB (200ASIA)	1		○	For ASIA	
5	3-9	PPK90020-0	SA Platen	1	○			
6	4-6	PPM80015-0	SA Head (200dpi)	1	○			
7	5-1	PPF80010-0	SA PF Motor (with Thermistor)	1	○			
8	5-11	JM66730-1	SA Ref Sensor PCB	1		○		
9	6-1	JM66715-1	SA Head Up Sensor PCB	1		○		
10	6-10	JM66725-0	SA TRA Sen PCB	1		○		
11	8-1	PPG30002-0	SA Ribbon Tension Unit R	1	○			
12	8-5	PPS00161-0	SA Ribbon Control PCB	1		○		
13	8-6	PPF80004-0	SA Ribbon Motor F	1	○			
14	8-14	PPS90029-0	SA Ribbon Sensor	1		○		
15	8-21	PPS90030-0	SA Ribbon Encoder	1		○		
16								
17								
18								
19								
20								

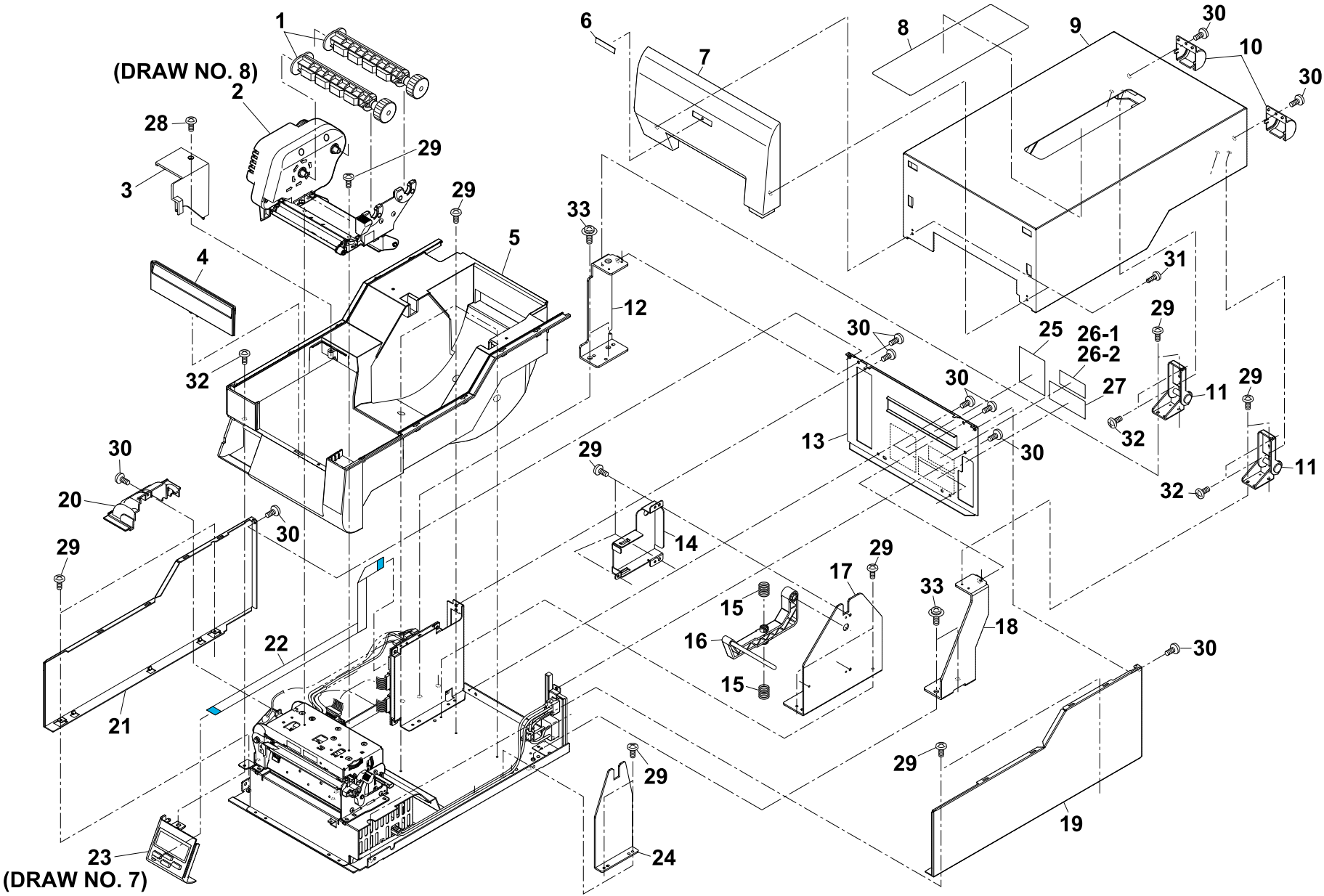
CL-E700 series

Drawing No. 1

Parts List & Location for General Assembly

Revision Up List		
Sheet No.	Rev. No.	Date
1/2	0	Oct. 10, 2014
2/2	0	Oct. 10, 2014

DRAWING NO. 1 General Assembly (Rev. 0)



PARTS LIST for CL-E700 series

TITLE: General Assembly

Sheet No. 1/2

Drawing No. 1

Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
1-1	SA Ribbon Holder	JM34710-1	2	(Ref. Drawing No. 8)	
-2	Unit Ribbon	-	1		
-3	Cover PF Motor 2	PBA00100-0	1		
-4	Cover Front	PBA00094-0	1		
-5	Case	PBA00093-0	1		
-6	Logo Citizen L	PAX30002-0	1		
-7	Cover Front Top	PBA00096-0	1		
-8	Cover Window	PRC70011-0	1		
-9	SA Top Cover	PPA00038-0	1		
-10	Cover Hinge	JN56209-0	2		
-11	Hinge	JN59909-0	2		
-12	Plate Hinge L	PAC70075-0	1		
-13	Cover Steel Rear	PAA00008-0	1		
-14	Cover Lever	PAC80001-0	1		
-15	Spring Damper	PJG60007-0	2		
-16	SA Damper Shaft	PPG40002-0	1		
-17	Plate Holder Paper L	PAC70072-0	1		
-18	Plate Hinge R	PAC70076-0	1		
-19	Cover Steel R	PAA00007-0	1		
-20	Cover PF Motor	PBA00097-0	1		

PARTS LIST for CL-E700 series

TITLE: General Assembly

Sheet No. 2/2

Drawing No. 1

Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
1-21	Cover Steel L	PAA00006-0	1	(Ref. Drawing No. 7)	
-22	FFC Op panel	PSS40015-0	1		
-23	Unit Op panel	PPN30005-0	1		
-24	Plate Holder Paper R	PAC70073-0	1		
-25	Label FCC ICES VCCI-A	TZ99901-0	1		
-26-1	Label Caution North EU	PRX10006-0	1		
-26-2	Label Caution (CHINA)	FB99985-0	1		
-27	Label Rating E720	PRX00050-0	1		
-28	Screw NO2 BH M3.0x12D	E12830-120DF	1		
-29	Screw BH M3.0x4 (NI)	E00530-040WF	20		
-30	Screw BH M3.0x5K	E00530-050KF	11		
-31	Screw BH M3.0x8D	E12830-080DF	2		
-32	Screw BH M3.0x6 (NI)	E00530-060WF	5		
-33	Screw PH (SW+PW) M4x6	E00940-060F	4		

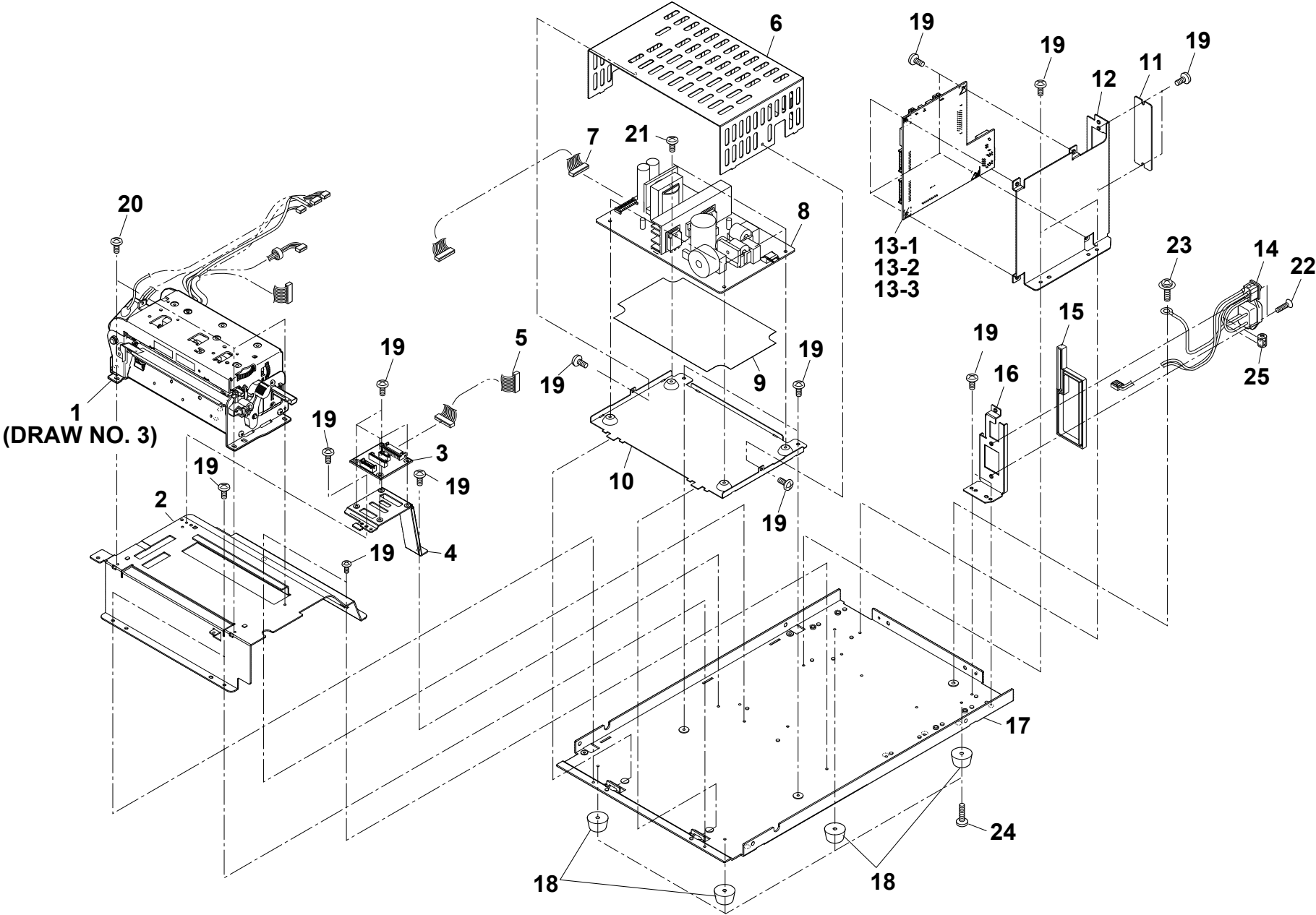
CL-E700 series

Drawing No. 2

Parts List & Location for Unit Base

Revision Up List		
Sheet No.	Rev. No.	Date
1/2	0	Oct. 10, 2014
2/2	0	Oct. 10, 2014

DRAWING NO. 2 Unit Base (Rev. 0)



PARTS LIST for CL-E700 series

TITLE: Unit Base

Sheet No. 1/2

Drawing No. 2

Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
2-1	Unit Mechanism	-	1	(Ref. Drawing No. 3)	
-2	Frame Mechanism	PAC60059-0	1		
-3	SA Relay PCB	PPS00158-0	1		
-4	Frame Relay PCB	PAC60060-0	1		
-5	SA Relay Cable	PPS30047-0	1		
-6	Cover Power PCB	PAC80021-0	1		
-7	SA Power Cable	PPS30049-0	1		
-8	Unit Power Supply	PWT20011-0	1		
-9	Sheet Insulation Power PCB	PRC00016-0	1		
-10	Plate Power PCB	PAC70071-0	1		
-11	Plate I/F Cover	TA54107-1	1		
-12	Plate Main PCB	PAC70074-0	1		
-13-1	SA Main PCB (200ENG)	PPS00152-0	1	For CSA, CSE	
-13-2	SA Main PCB (200CHN)	PPS00218-0	1	For CHINA	
-13-3	SA Main PCB (200ASIA)	PPS00219-0	1	For ASIA	
-14	SA Power SW Cable	PPS30050-0	1		
-15	Cover Plate Inlet	PBC80048-0	1		
-16	Plate Inlet	PAC70078-0	1		
-17	Frame Bottom	PAA00005-0	1		
-18	Leg	PWA10002-0	4		

PARTS LIST for CL-E700 series

TITLE: Unit Base

Sheet No. 2/2

Drawing No. 2

Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
2-19	Screw BH M3.0x4 (NI)	E00530-040WF	24		
-20	Screw BH M3.0x6 (NI)	E00530-060WF	3		
-21	Screw PH (SW+PW) M3x5	E04030-050F	4		
-22	Screw NO2 FH M3.0x6 (NI)	E00230-060WF	2		
-23	Screw PH (SW+PW) M4x6	E00940-060F	1		
-24	Screw BH M3.0x8	E00530-080F	4		
-25	Ferrite Core	CS58-00004893	1		

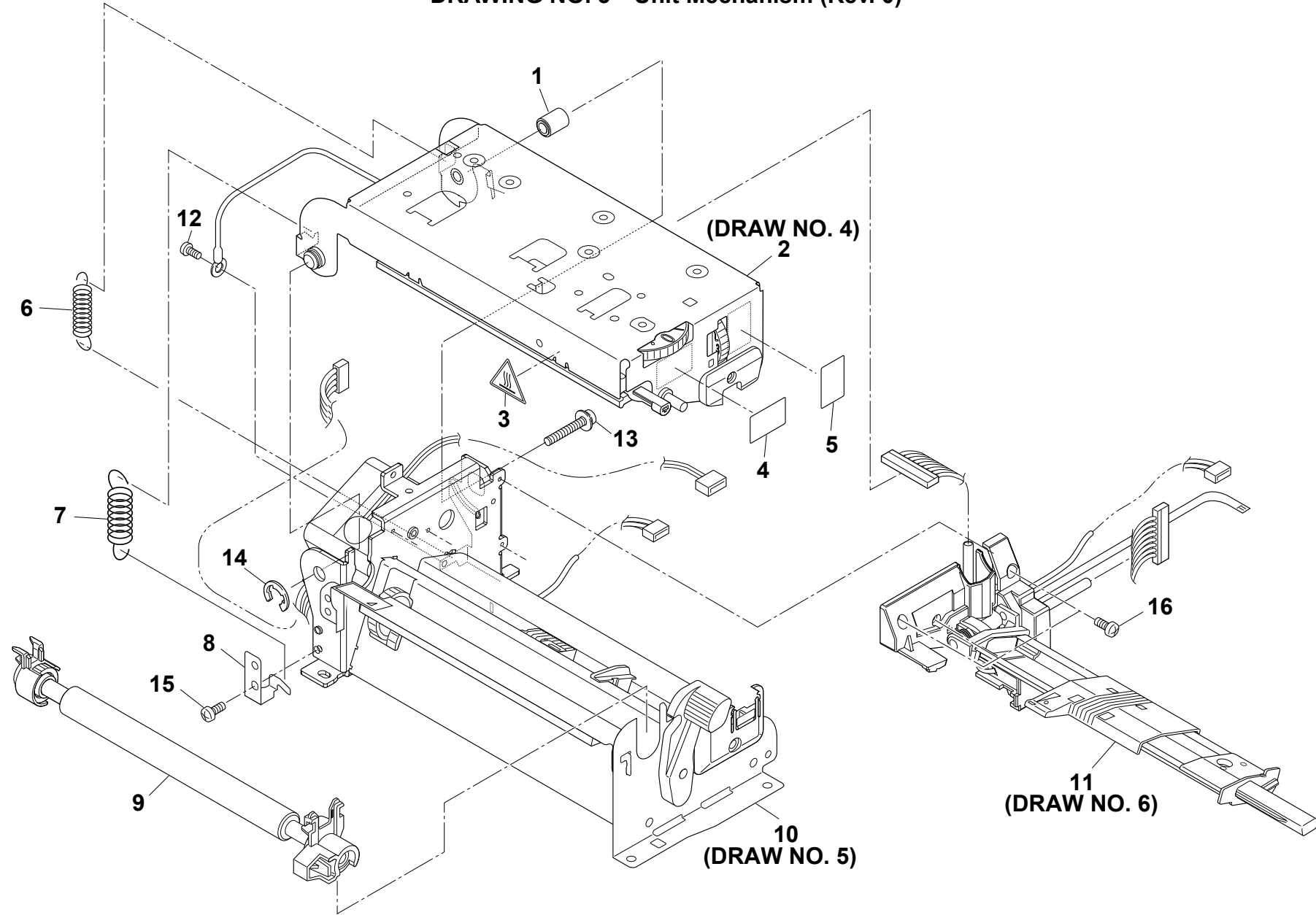
CL-E700 series

Drawing No. 3

Parts List & Location for Unit Mechanism

Revision Up List		
Sheet No.	Rev. No.	Date
1/1	0	Oct. 10, 2014

DRAWING NO. 3 Unit Mechanism (Rev. 0)



PARTS LIST for CL-E700 series

TITLE: Unit Mechanism

Sheet No. 1/1

Drawing No. 3

Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
3-1	Shaft Head Holder	JM42007-0	1		
-2	Unit Head	-	1		
-3	Label Heat Caution	TZ99981-0	1		
-4	Label Head Balance	JM99981-0	1		
-5	Label Head Adjust	JM99982-0	1		
-6	Spring Head Up	JM13601-0	1		
-7	Spring2 Head Up	JM13605-0	1		
-8	Hook Head Up Spring 2	JM14112-0	1		
-9	SA Platen	PPK90020-0	1		
-10	Unit PF	-	1	(Ref. Drawing No. 5)	
-11	Unit Sensor U	PPC90004-0	1	(Ref. Drawing No. 6)	
-12	Screw BH M3.0x4 (NI)	E00530-040WF	1		
-13	Screw NO2 PH (SW+PW) M4.0x16 (NI)	E00940-160WF	1		
-14	E-Ring 4.0	E60340-000F	1		
-15	Screw BH M3.0x4 (NI)	E00530-040WF	1		
-16	Screw BH M2.0x4 (NI)	E00520-040WF	3		

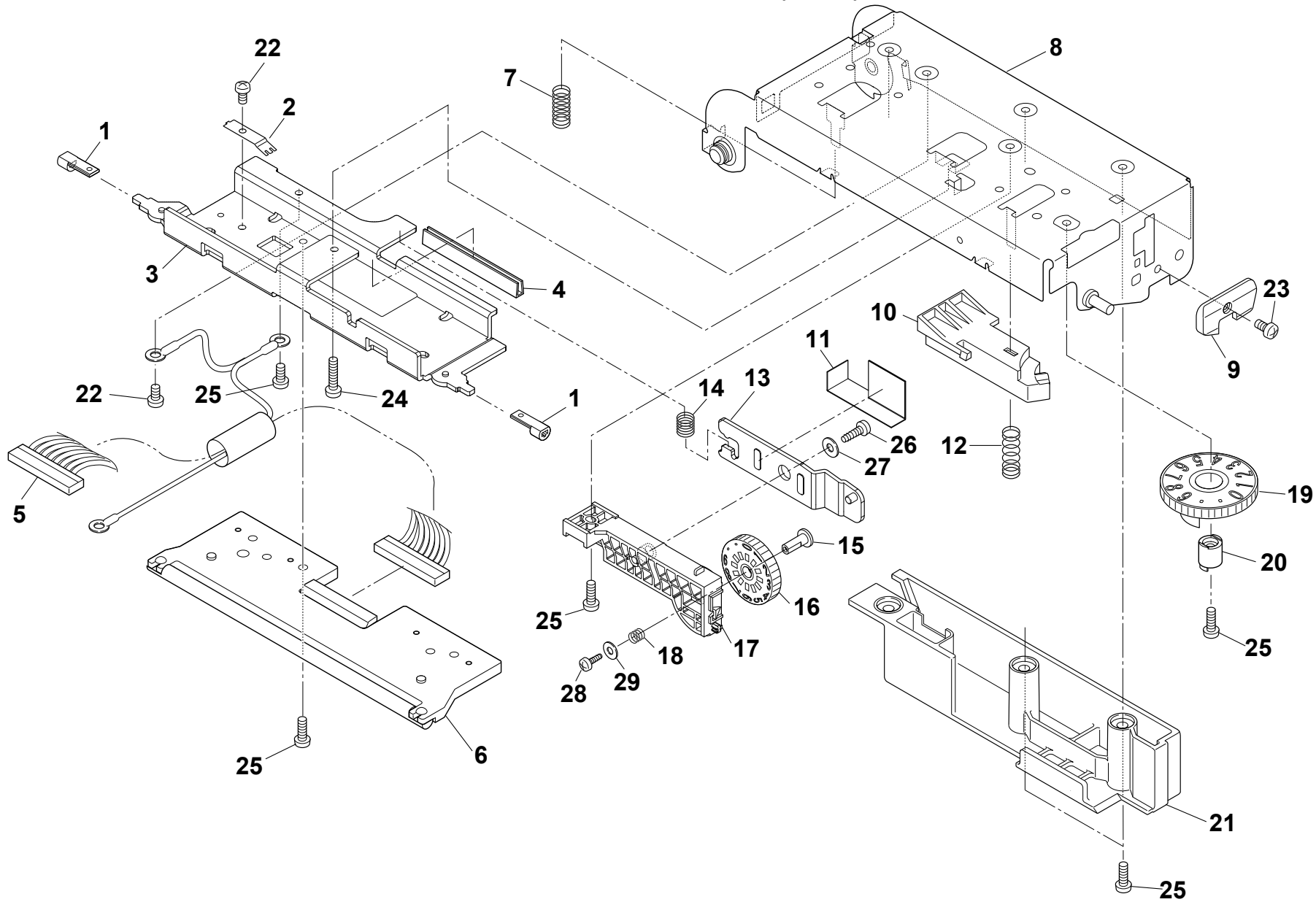
CL-E700 series

Drawing No. 4

Parts List & Location for Unit Head

Revision Up List		
Sheet No.	Rev. No.	Date
1/2	0	Oct. 10, 2014
2/2	0	Oct. 10, 2014

DRAWING NO. 4 Unit Head (Rev. 0)



PARTS LIST for CL-E700 series

TITLE: Unit Head
Drawing No. 4Sheet No. 1/2
Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
4-1	Bushing Head	JM11201-0	2		
-2	Plate Head Earth	JM14105-0	1		
-3	Bracket Head	JM14101-0	1		
-4	Guard Head Connector	JM19902-0	1		
-5	SA Head Cable	PPS30043-0	1		
-6	SA Head (200dpi)	PPM80015-0	1		
-7	Spring Head L	JM13603-0	1		
-8	SA Head Holder Base	JM14704-1	1		
-9	Holder Guide Sensor U	JM14211-0	1		
-10	Lever Head Balance	JM14203-0	1		
-11	Sheet Cable Protect	PRA90017-0	1		
-12	Spring Head R	JM13602-0	1		
-13	SA Lever Head Adjust 2	PPC90003-0	1		
-14	Spring Head Holder	PJG60051-0	1		
-15	Guide Head Adjust Spring	JM14204-0	1		
-16	Cam Head Adjust	JM19201-0	1		
-17	Lever Head Adjust2	JM14202-0	1		
-18	Spring Adjust Cam	JM13604-0	1		
-19	Cam Head Balance	JM19203-0	1		
-20	Pivot Head Balance Cam	JM12201-0	1		

PARTS LIST for CL-E700 series

TITLE: Unit Head
Drawing No. 4Sheet No. 2/2
Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
4-21	Guide Head Cable	JM14212-1	1		
-22	Screw BH M3.0x3 (NI)	E00530-030WF	2		
-23	Screw BH M3.0x4 (NI)	E00530-040WF	1		
-24	Screw PH M3.0x8 (NI)	E00130-080WF	1		
-25	Screw BH M3.0x6 (NI)	E00530-060WF	6		
-26	Screw PHT (#2) M3.0x8 (NI)	E10130-080WF	1		
-27	Washer Plain 3x8x0.5	E50130-005WF	1		
-28	Screw NO1 PHT M2.0x6 (NI)	E10120-060WF	1		
-29	Washer Plain 2x5x0.3 (NI)	E50120-003WF	1		

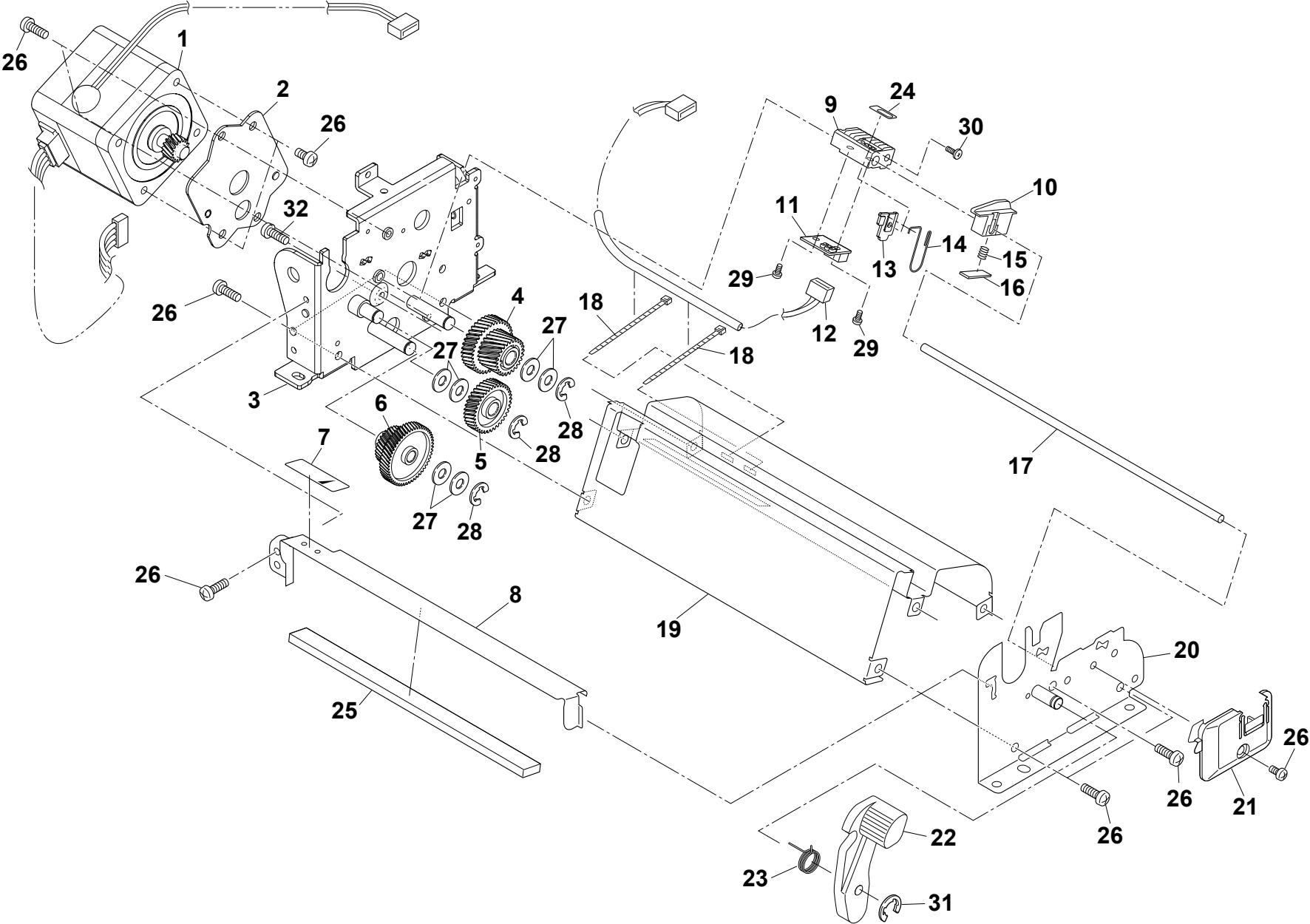
CL-E700 series

Drawing No. 5

Parts List & Location for Unit PF

Revision Up List		
Sheet No.	Rev. No.	Date
1/2	0	Oct. 10, 2014
2/2	0	Oct. 10, 2014

DRAWING NO. 5 Unit PF (Rev. 0)



PARTS LIST for CL-E700 series

TITLE: Unit PF

Sheet No. 1/2

Drawing No. 5

Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
5-1	SA PF Motor (with Thermistor)	PPF80010-0	1		
-2	Plate Motor Bracket	PAE00039-0	1		
-3	SA Main Frame L	PPC60029-0	1		
-4	Gear PF 1	PBF00075-0	1		
-5	Gear PF Idle	PBF00077-0	1		
-6	Gear PF 2	PBF00076-0	1		
-7	Label Mark	JM99978-02	1		
-8	Plate Peeler	JM44105-03	1		
-9	Holder Adjust Sensor L	PBE00067-0	1		
-10	Guide Paper Set	PBM30040-0	1		
-11	SA Ref Sensor PCB	JM66730-10	1		
-12	SA Ref Sensor Cable	PPS30044-0	1		
-13	Plate Adj Sen L Spring	PAE00040-0	1		
-14	Spring Adjust Sensor L	PJG60084-0	1		
-15	Spring Friction Sen PG	JM23604-0	1		
-16	Plate Friction PG	JM24117-0	1		
-17	Shaft Sensor Guide	JM42008-0	1		
-18	Wire Tie	C6701-202#	2	8432 L=100	
-19	Frame Main	PAC60062-0	1		
-20	SA Main Plate R	JM44702-0	1		

PARTS LIST for CL-E700 series

TITLE: Unit PF
Drawing No. 5Sheet No. 2/2
Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
5-21	Holder Guide Sensor L	JM44207-0	1		
-22	Lever Head Lock	JM44203-0	1		
-23	Spring Head Lock	JM43601-0	1		
-24	Cover Paper Sensor	JM24107-0	1		
-25	Sponge Peeler Plate	JM57101-0	1		
-26	Screw BH M3.0x4 (NI)	E00530-040WF	11		
-27	Washer Plain 5.2x10x0.25	PAH40005-00.	6		
-28	E-Ring 4.0	E60340-000F	3		
-29	Screw NO.0 PHT(BT#1) M2.0x3	E11920-030F	2		
-30	Screw NoO PH(4-0.3) M2x3 (NI)	E03920-030WF	1		
-31	E-Ring 2.5	E60325-000F	1		
-32	Screw NO0 TFH M2.6x4 (NI)	E01626-040WF	1		

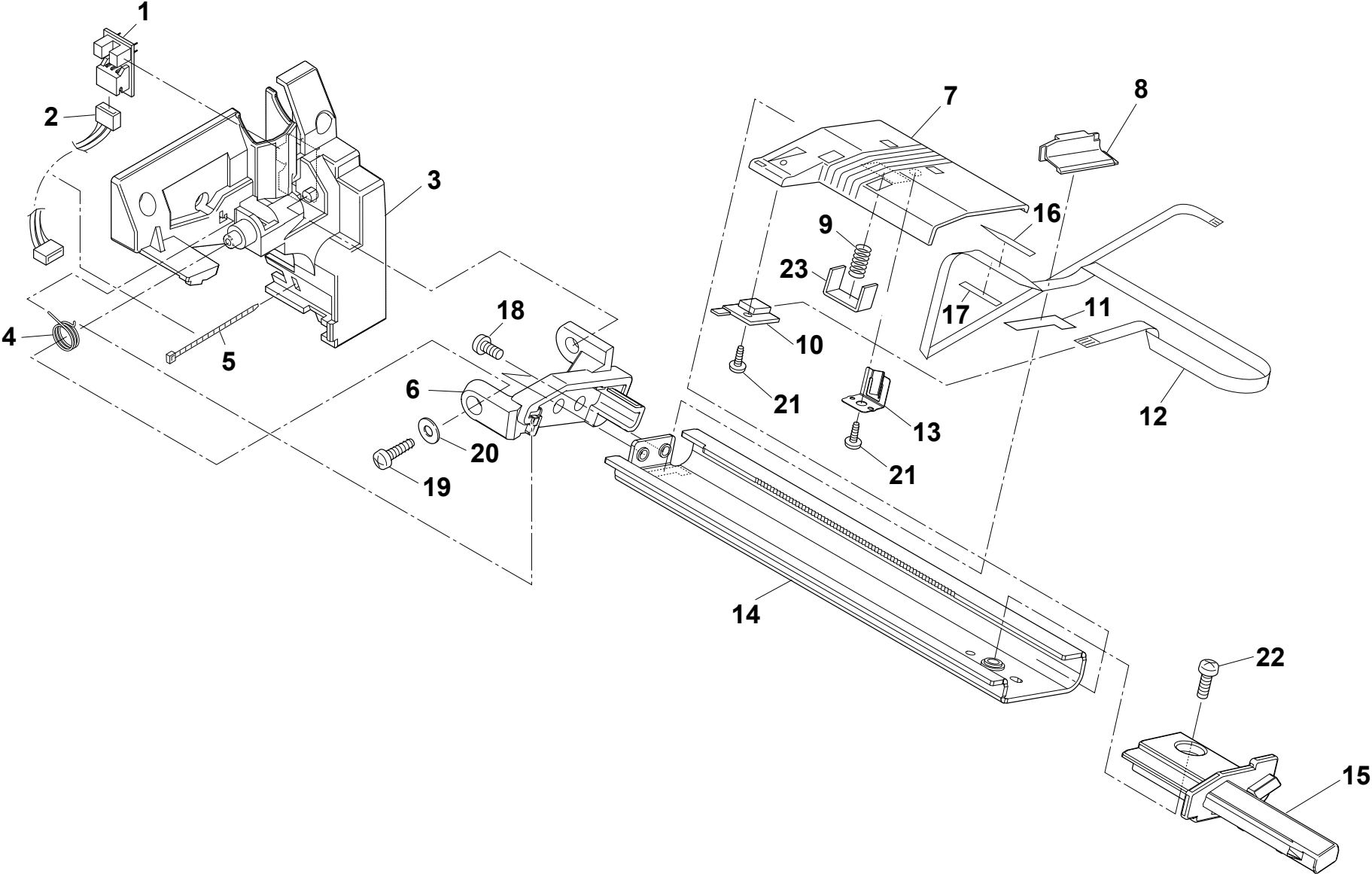
CL-E700 series

Drawing No. 6

Parts List & Location for Unit Sensor U

Revision Up List		
Sheet No.	Rev. No.	Date
1/2	0	Oct. 10, 2014
2/2	0	Oct. 10, 2014

DRAWING NO. 6 Unit Sensor U (Rev. 0)



PARTS LIST for CL-E700 series

TITLE: Unit Sensor U

Sheet No. 1/2

Drawing No. 6

Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
6-1	SA Head Up Sensor PCB	JM66715-1	1	8432 L=100	
-2	SA Head Up Sensor Cable	PPS30046-0	1		
-3	Cover Head Wire	PBC80046-0	1		
-4	Spring Sensor Frame	JM23602-0	1		
-5	Wire Tie	C6701-202#	1		
-6	Cap Sensor Frame L	JM24210-0	1		
-7	Holder Sensor U	PBE00068-0	1		
-8	Cap Sensor Cable U	JM24212-0	1		
-9	Spring Friction Sen U	JM23605-0	1		
-10	SA TRA Sen PCB	JM66725-0	1		
-11	Tape Sensor Cable U	JM24105-0	1		
-12	FFC TRA Sensor	PSS40016-0	1		
-13	Leaf Adjust Sensor U	PAG60014-0	1		
-14	Plate Sensor Holder U	PAC70079-0	1		
-15	Cap Sensor Frame R	PBH20010-0	1		
-16	Sheet Cable Support A	JM24114-0	1		
-17	Sheet Cable Support B	JM24115-0	1		
-18	Screw PH M2.6x3 (NI)	E00126-030WF	2		
-19	Screw NO1 PHT M2.0x8 (NI)	E10120-080WF	1		
-20	Washer Plain 2x5x0.3 (NI)	E50120-003WF	1		

PARTS LIST for CL-E700 series

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	Screw NO.0 TFH (PT4-0.5) M2.0x4	E15920-040WF	2		
-22	Screw BH M3.0x6 (NI)	E00530-060WF	1		
-23	Plate Friction Sen U	PRA80005-0	1		

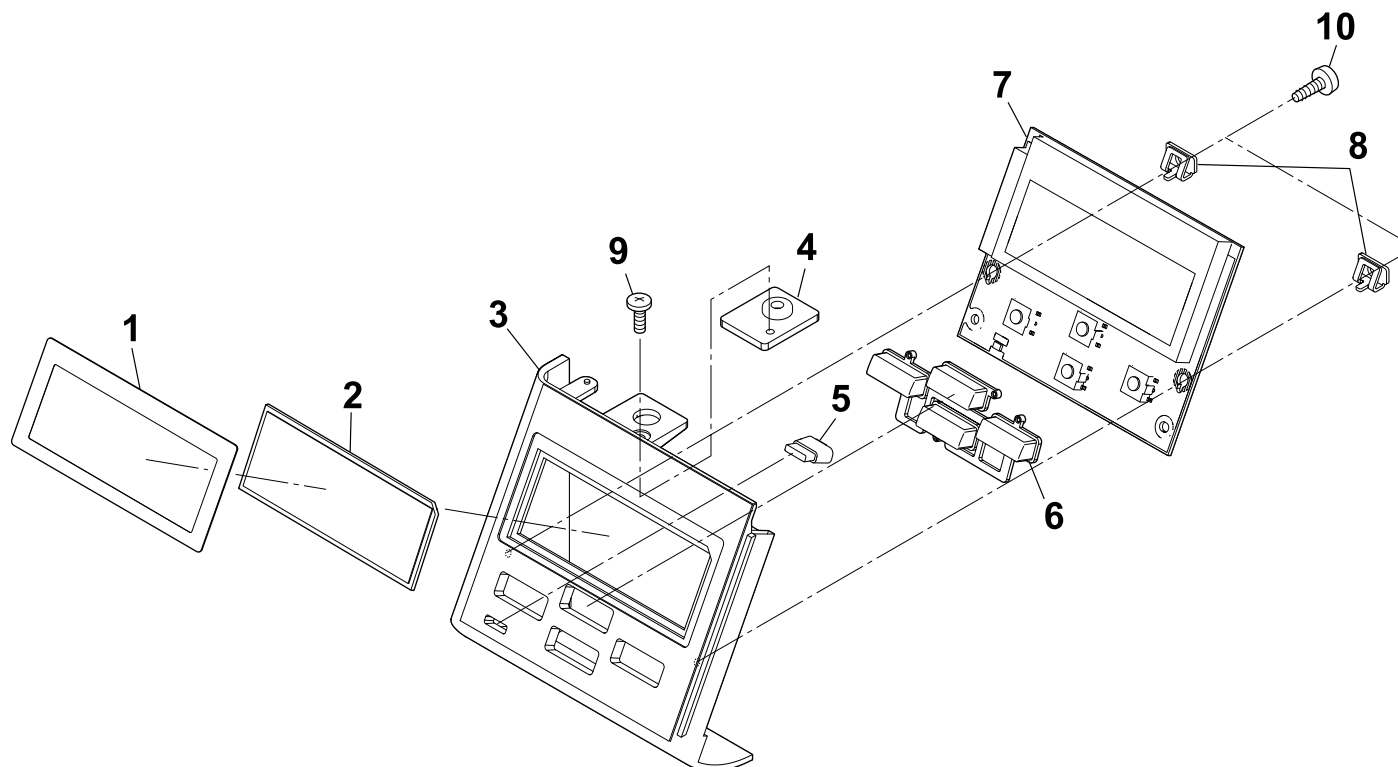
CL-E700 series

Drawing No. 7

Parts List & Location for Unit Opepane

Revision Up List		
Sheet No.	Rev. No.	Date
1/1	0	Oct. 10, 2014

DRAWING NO. 7 Unit Opepane (Rev. 0)



PARTS LIST for CL-E700 series

TITLE: Unit Opepane

Sheet No. 1/1

Drawing No. 7

Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
7-1	Sheet Ope-Pane	PRN30010-0	1		
-2	Cover LCD	PBA10002-0	1		
-3	Cover Ope-Pane	PBA00095-0	1		
-4	Holder Ope-Pane Cover	PAE00041-0	1		
-5	Window LED	PBA10038-0	1		
-6	Key Ope-Pane	PBA10037-0	1		
-7	SA Opepane PCB	PPS00157-0	1		
-8	Spacer Screw	PAH40008-0	2		
-9	Screw NO.0PH (4-0.3) M2.0x3 (NI)	E03920-030WF	1		
-10	Screw BH PT M2.0x8	E12820-080F	2		

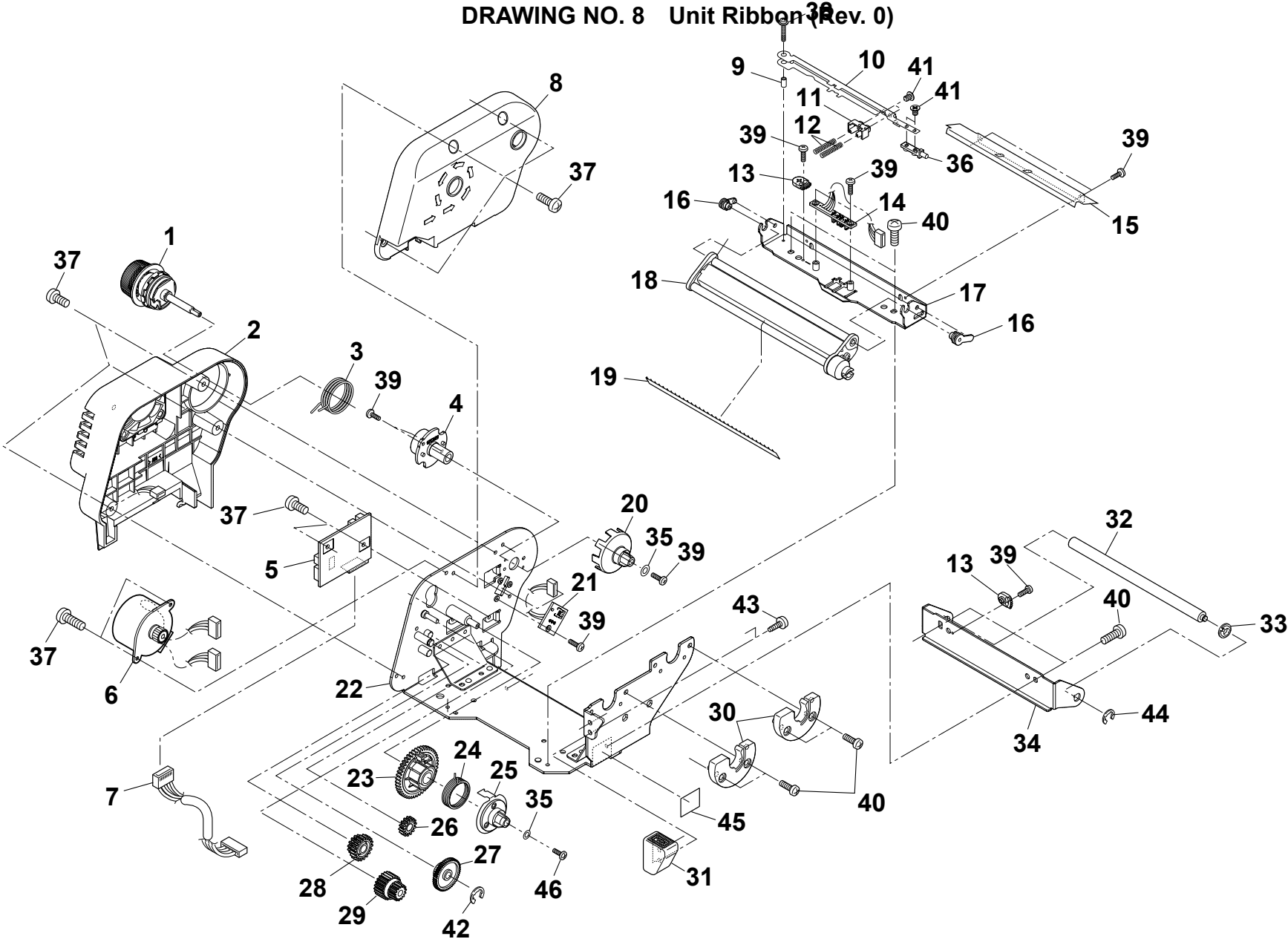
CL-E700 series

Drawing No. 8

Parts List & Location for Unit Ribbon

Revision Up List		
Sheet No.	Rev. No.	Date
1/3	0	Oct. 10, 2014
2/3	0	Oct. 10, 2014
3/3	0	Oct. 10, 2014

DRAWING NO. 8 Unit Ribbon (Rev. 0)



PARTS LIST for CL-E700 series

TITLE: Unit Ribbon

Sheet No. 1/3

Drawing No. 8

Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
8-1	SA Ribbon Tension Unit R	PPG30002-0	1	(Ref. Drawing No. 9)	
-2	SA2 Ribbon Unit Fan	-	1		
-3	Spring Ribbon Return R	PJG60085-0	1		
-4	Holder Clutch Shaft	PBE40025-0	1		
-5	SA Ribbon Control PCB	PPS00161-0	1		
-6	SA Ribbon Motor F	PPF80004-0	1		
-7	SA Ribbon Cable	PPS30048-0	1		
-8	Cover Ribbon Gear	PBA00099-0	1		
-9	Shaft Tension Adjust	JM32011-0	1		
-10	Lever F Tension Adjust	JM34118-0	1		
-11	Holder2 Tension Spring	PBE00062-0	1		
-12	Spring Ribbon Tension	PJG60082-0	2		
-13	Cam Tension Base Adjust	JM39201-0	2		
-14	SA Ribbon Sensor	PPS90029-0	1		
-15	Cover RBN Tension Adjust	JM34112-0	1		
-16	Bush Ribbon Roller	PBE40018-0	2		
-17	SA Ribbon Sensor Frame F	PPC70008-0	1		
-18	SA Ribbon Tension Shaft F	PPM10004-0	1		
-19	Sheet Static Eliminator 621	JM29909-0	1		
-20	Holder Ribbon Shaft Encoder	PBE00065-0	1		

PARTS LIST for CL-E700 series

TITLE: Unit Ribbon

Sheet No. 2/3

Drawing No. 8

Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
8-21	SA Ribbon Encoder	PPS90030-0	1		
-22	SA Ribbon Frame (with Support)	PPC60035-0	1		
-23	Gear 5F Ribbon	JM30206-0	1		
-24	Spring Ribbon Return	PJG60107-0	1		
-25	SA Holder R Shaft	JM31701-0	1		
-26	Gear 4 Ribbon	JM30203-1	1		
-27	Gear 2 Ribbon	JM30202-0	1		
-28	Gear 3 Ribbon	JM30205-0	1		
-29	Gear Reduction Ribbon 1	PBF00079-0	1		
-30	Catch Ribbon Holder	JM34203-0	2		
-31	Knob Ribbon Unit	JM34204-0	1		
-32	Roller Ribbon Guide R	PCM10012-0	1		
-33	Bushing Ribbon Guide R	PBE40026-0	1		
-34	Plate Ribbon Guide Roller	PAC70069-0	1		
-35	Plate Ribbon Washer	JM34122-0	2		
-36	Knob Tension Adjust	JM34207-0	1		
-37	Screw BH M3.0x4 (NI)	E00530-040WF	10		
-38	Screw PH(PW) M2.0x8 (NI)	E00620-080WF	1		
-39	Screw No0 PH(4-0.3) M2x3 (NI)	E03920-030WF	10		
-40	Screw BH M3.0x3 (NI)	E00530-030WF	8		

PARTS LIST for CL-E700 series

TITLE: Unit Ribbon

Sheet No. 3/3

Drawing No. 8

Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
8-41	Screw No0 (BT4x0.5)M1.7x4 (NI)	E13717-040WF	4		
-42	E-Ring 4.0	E60340-000F	1		
-43	Screw PHT(#2) M3.0x8 (NI)	E10130-080WF	2		
-44	E-Ring 3.0	E60330-000F	1		
-45	Label Ribbon Tension Adjust	PRX30108-0	1		
-46	Screw No0 PH (4-0.3) M2x5(NI)	E03920-050WF	1		

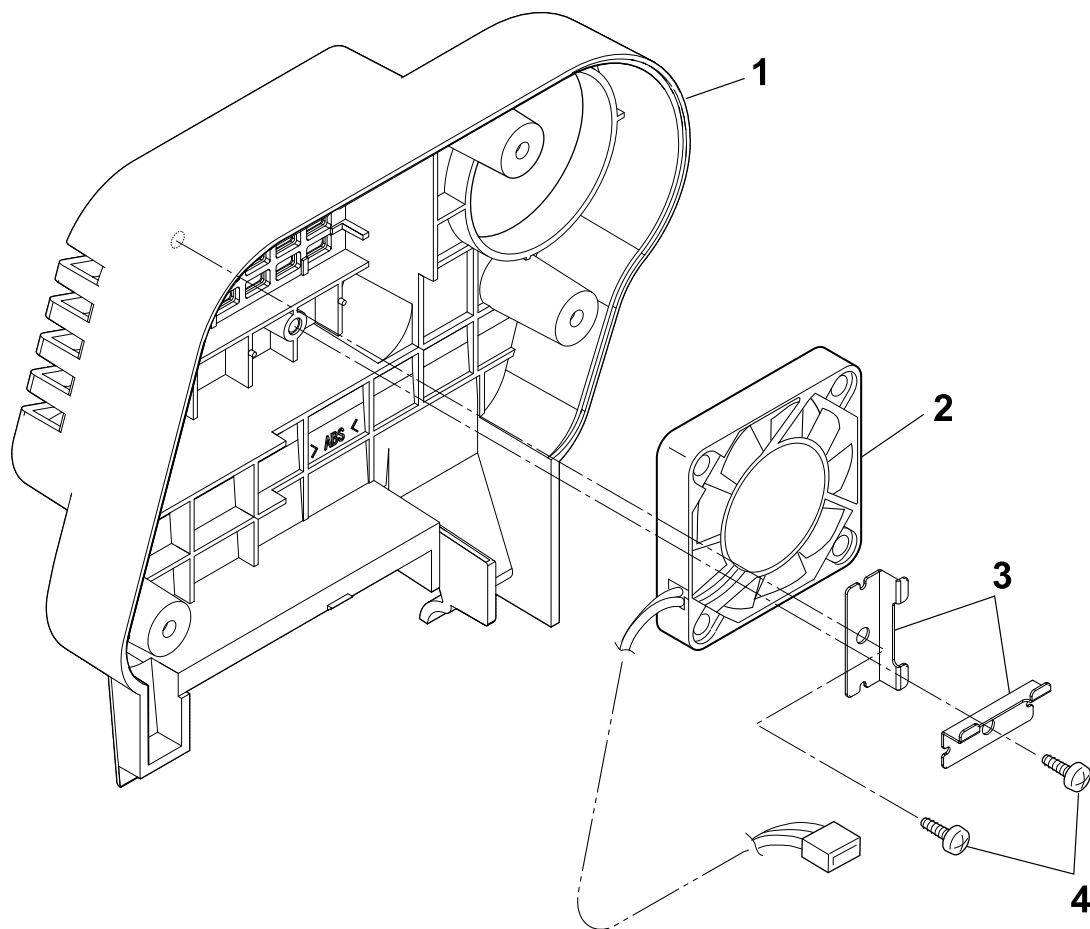
CL-E700 series

Drawing No. 9

Parts List & Location for SA2 Ribbon Unit Fan

Revision Up List		
Sheet No.	Rev. No.	Date
1/1	0	Oct. 10, 2014

DRAWING NO. 9 SA2 Ribbon Unit Fan (Rev. 0)



PARTS LIST for CL-E700 series

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 Motor	PBA00098-0	1		
-2	SA Fan	JM68702-0	1		
-3	Plate Fan	PAE00038-0	2		
-4	Screw BHT (#2) M3.0x6 (NI)	E10530-060WF	2		

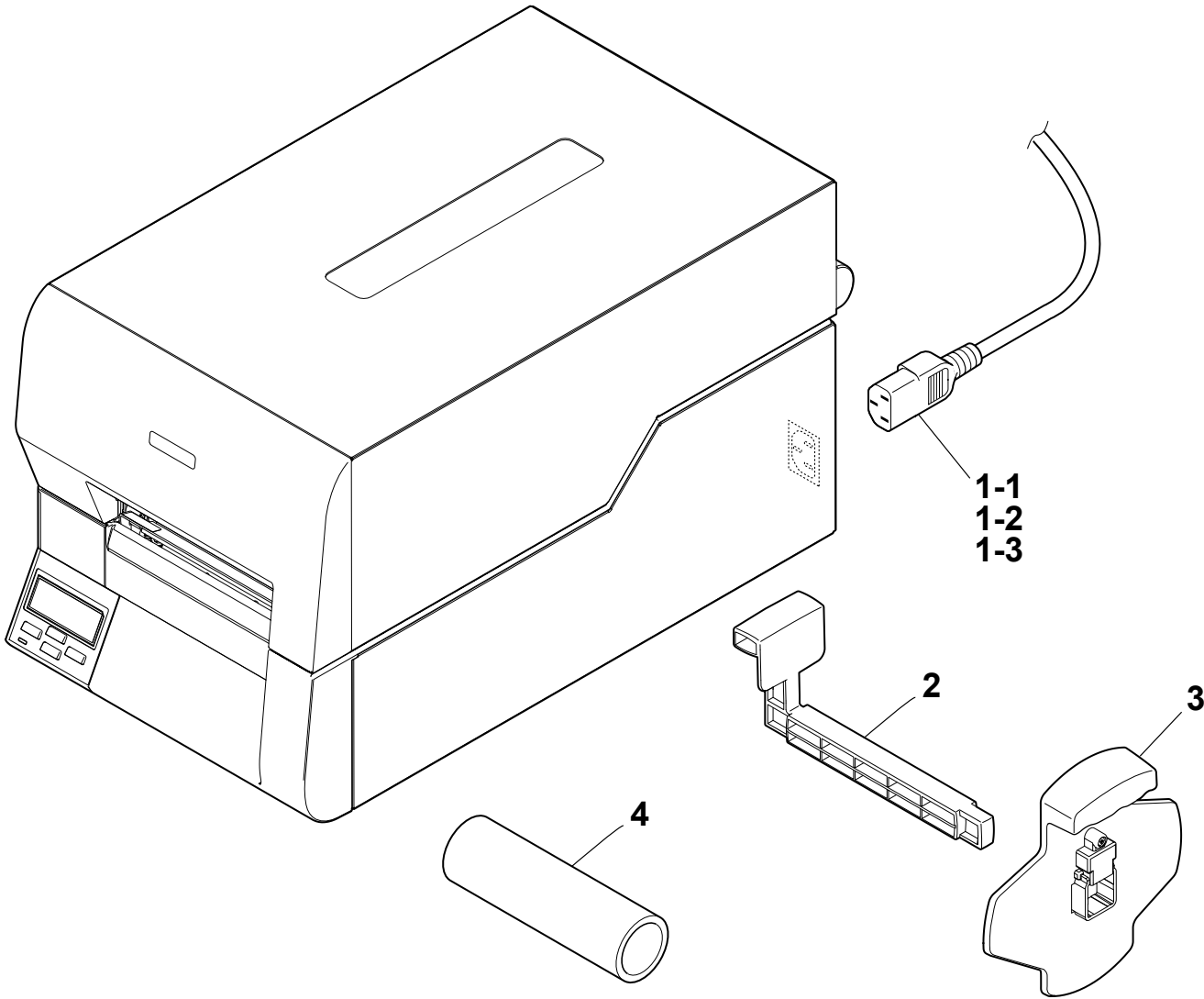
CL-E700 series

Drawing No. 10

Parts List & Location for Accessories

Revision Up List		
Sheet No.	Rev. No.	Date
1/1	0	Oct. 10, 2014

DRAWING NO. 10 Accessories (Rev. 0)



PARTS LIST for CL-E700 series

TITLE: Accessories

Sheet No. 1/1

Drawing No. 10

Rev. No. 0

Location	Part Name	Part No.	Q'ty/ Unit	Remarks	@
10-1-1	Cord Set	CS87-00004605	1	For CSA	
-1-2	Cord Set	CS87-00004848	1	For CSE	
-1-3	Cord Set	CS87-00004611	1	For CHINA	
-2	Shaft Paper	PBM30041-0	1		
-3	SA Paper Flange	PPM30010-1	1		
-4	Ribbon Core $\phi 25 \times 114$	JM39902-0	1		
—	Cleaner Head	JM79904-0	1		
—	Manual User's (CD-R)	PXY90034-0	1		
—	Guide Quick-Start	PXZ00117-0	1		
—	Safety Instructions CL-E720	PXZ00120-0	1		
—	Label Paper (Accessory)	PXX60011-0	1		
—	Ribbon	JM39901-0	1		

CHAPTER 6

CIRCUIT DIAGRAMS

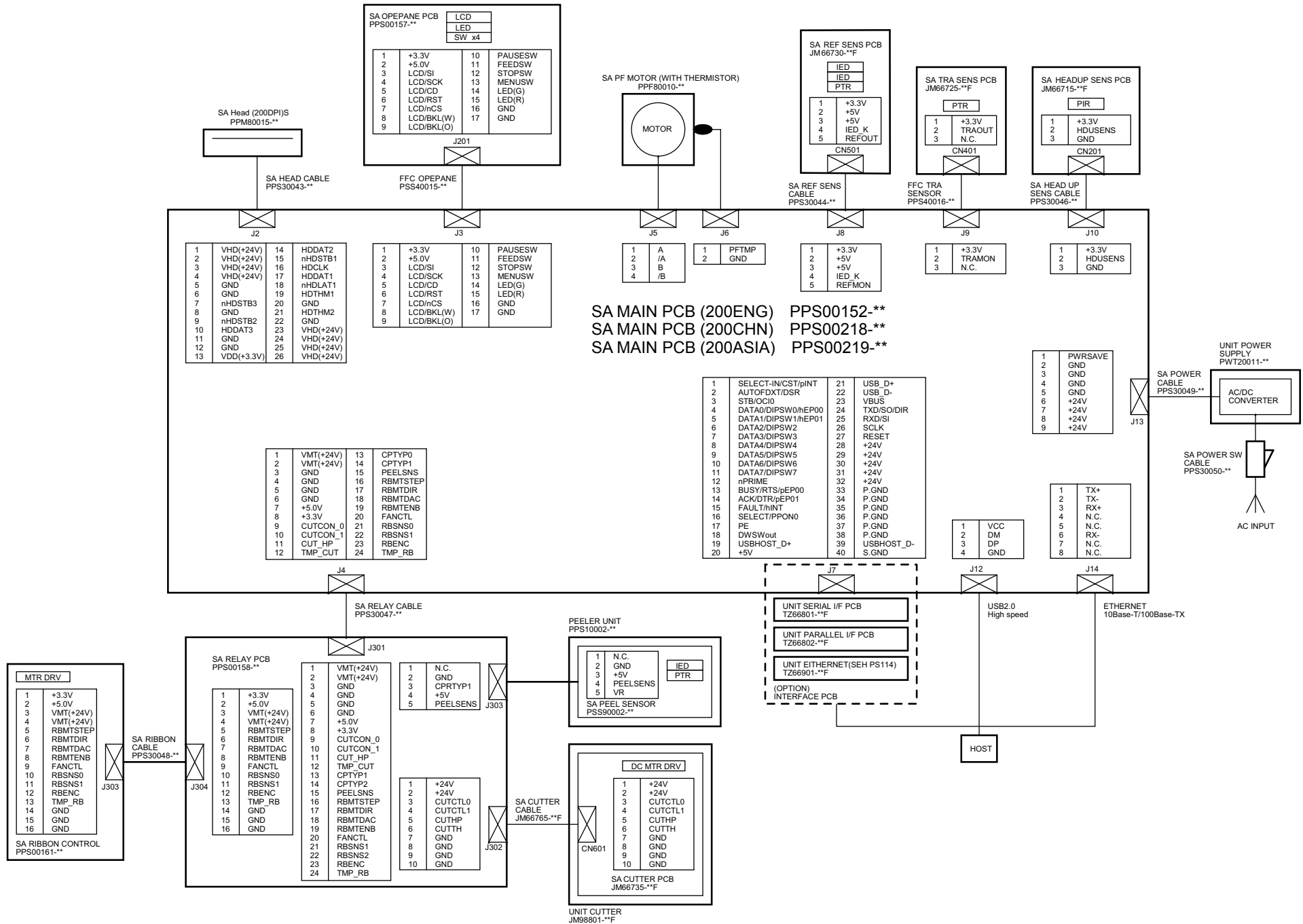


CHAPTER 6 CIRCUIT DIAGRAMS

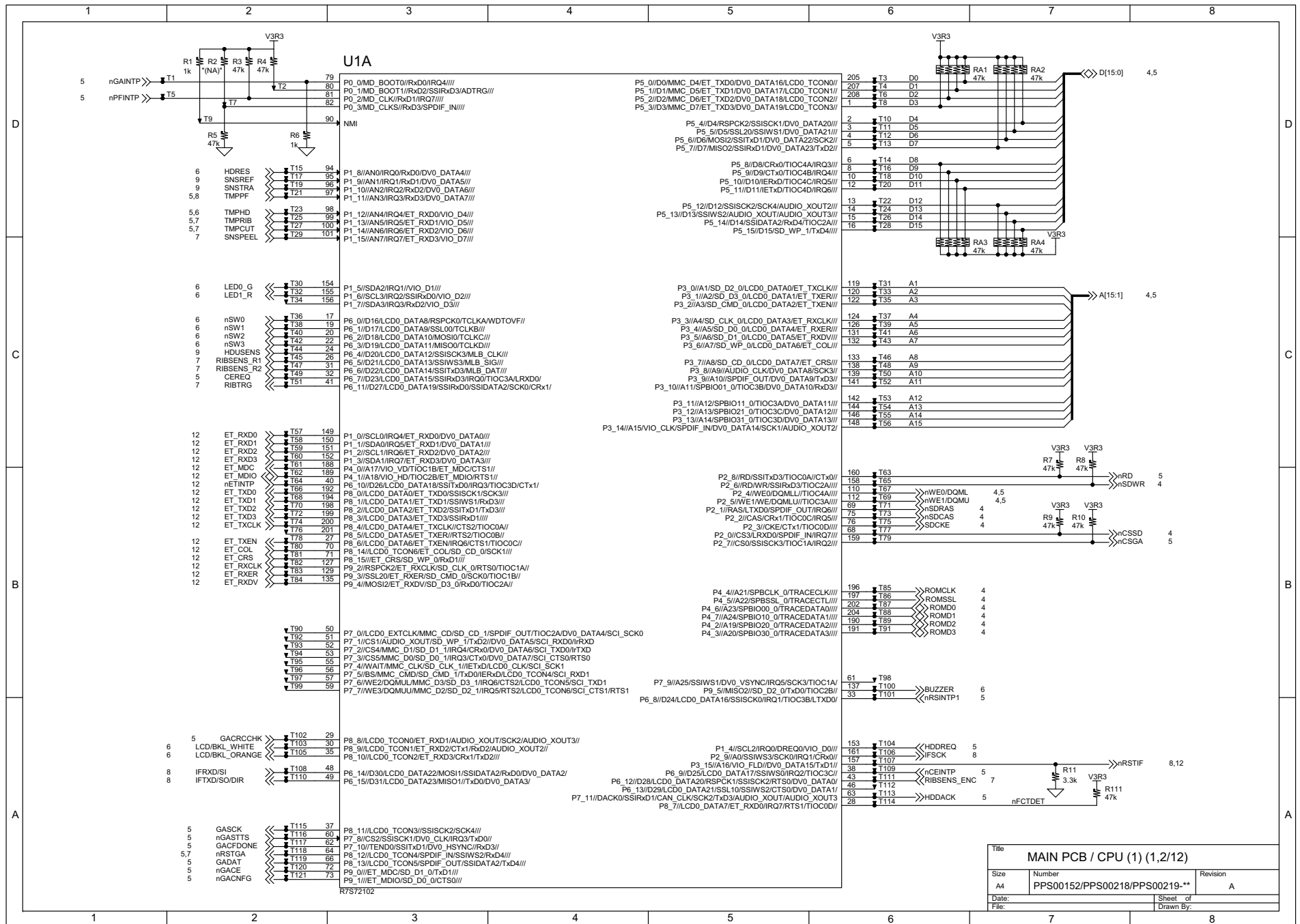
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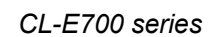
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Inter Connection

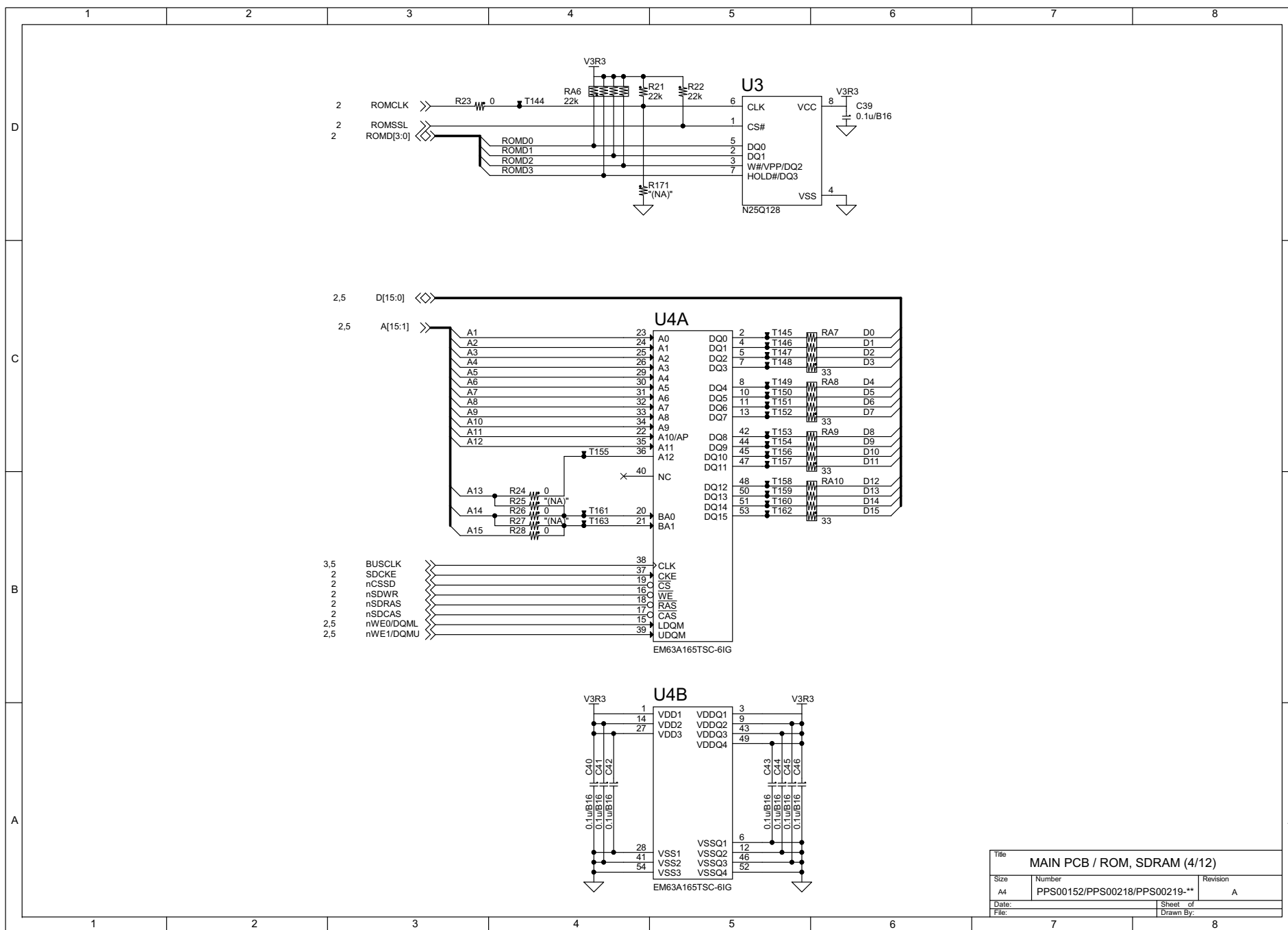


SA Main PCB (1, 2/12) [CPU (1)]



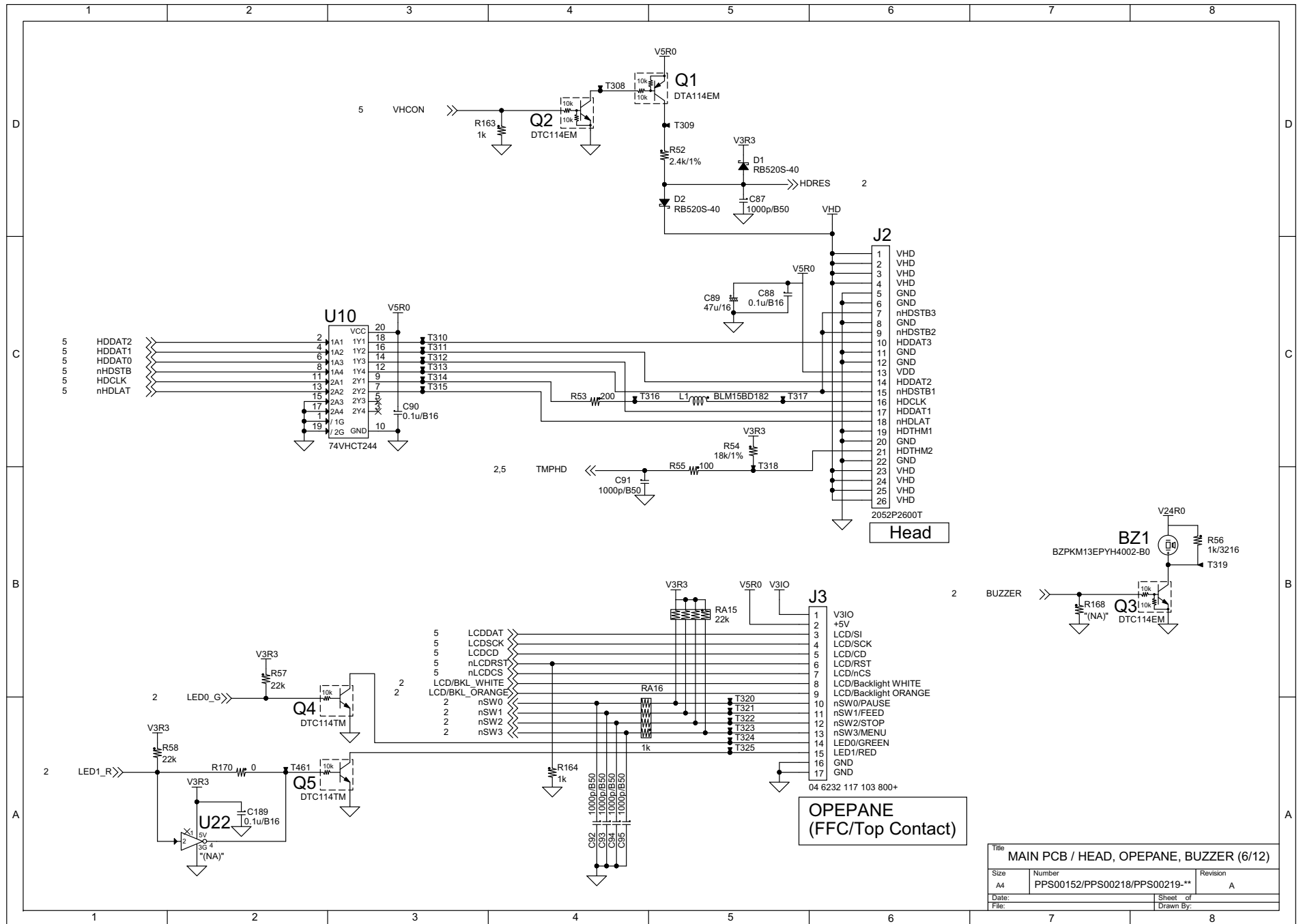


SA Main PCB (4/12) [ROM, SDRAM]



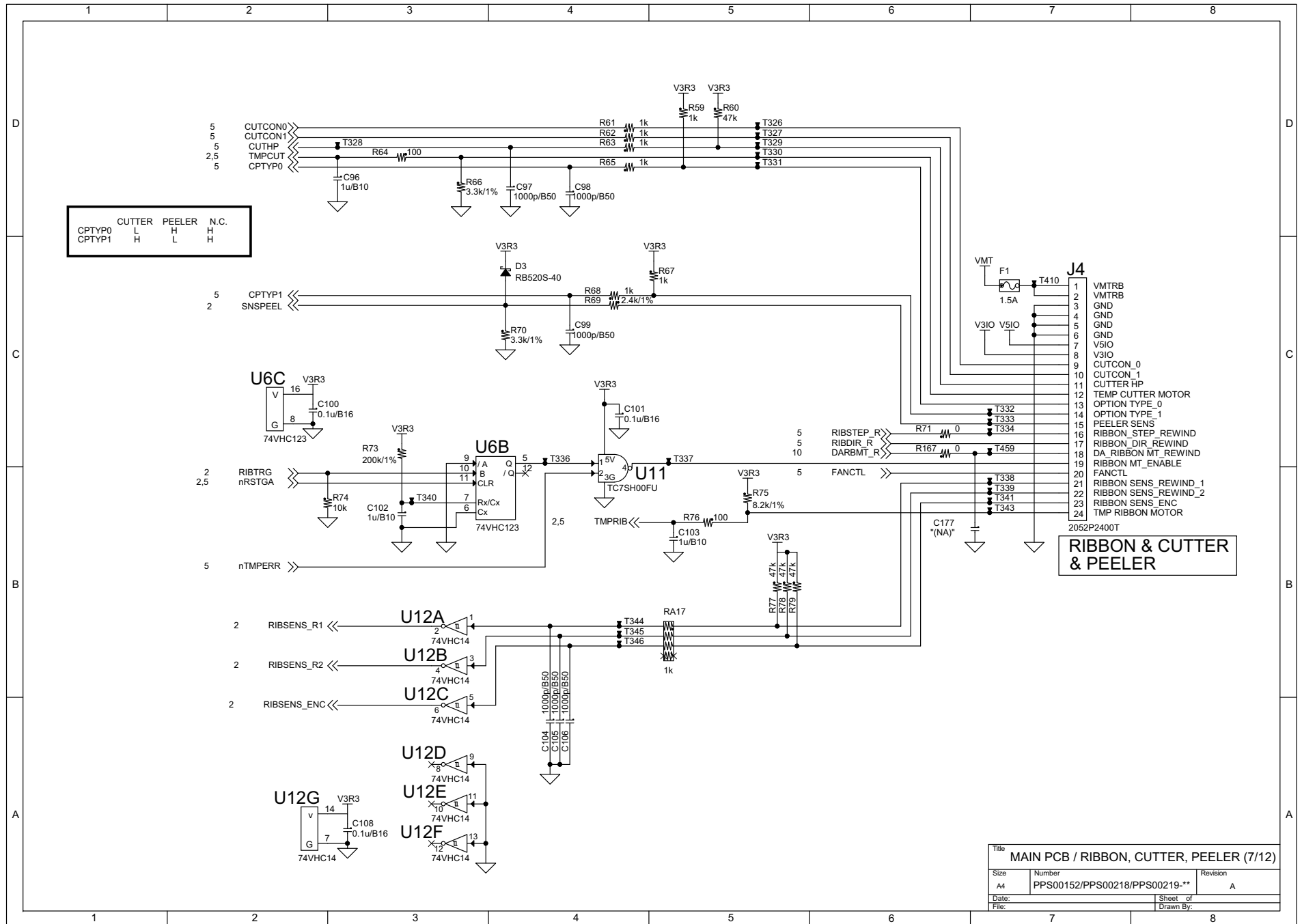


SA Main PCB (6/12) [Head, Opepane & Buzzer]



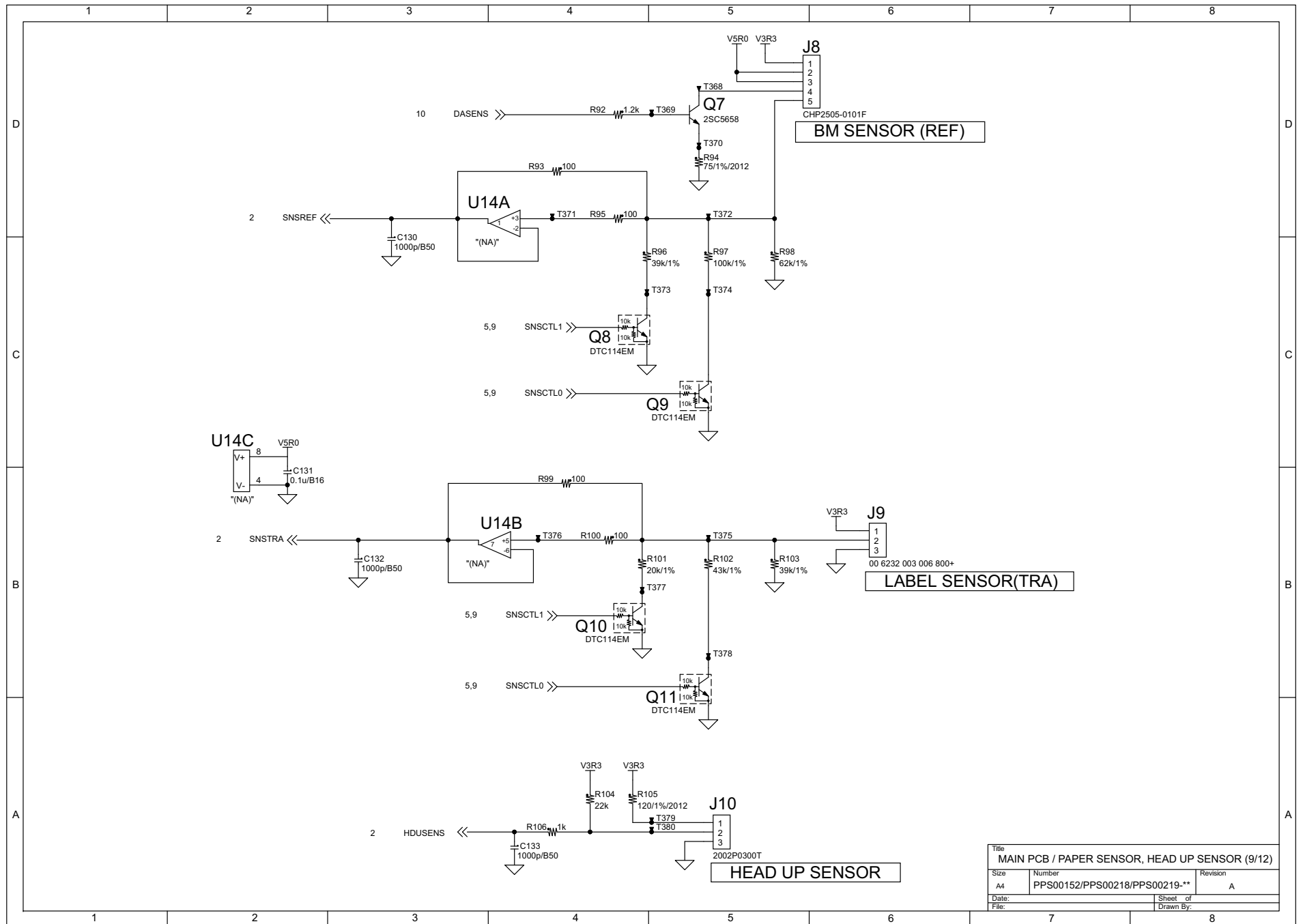
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Size A4	Number PPS00152/PPS00218/PPS00219-*	Revision A
Date:	Sheet of	Drawn By:
File:		

SA Main PCB (7/12) [Ribbon, Cutter & Peeler]

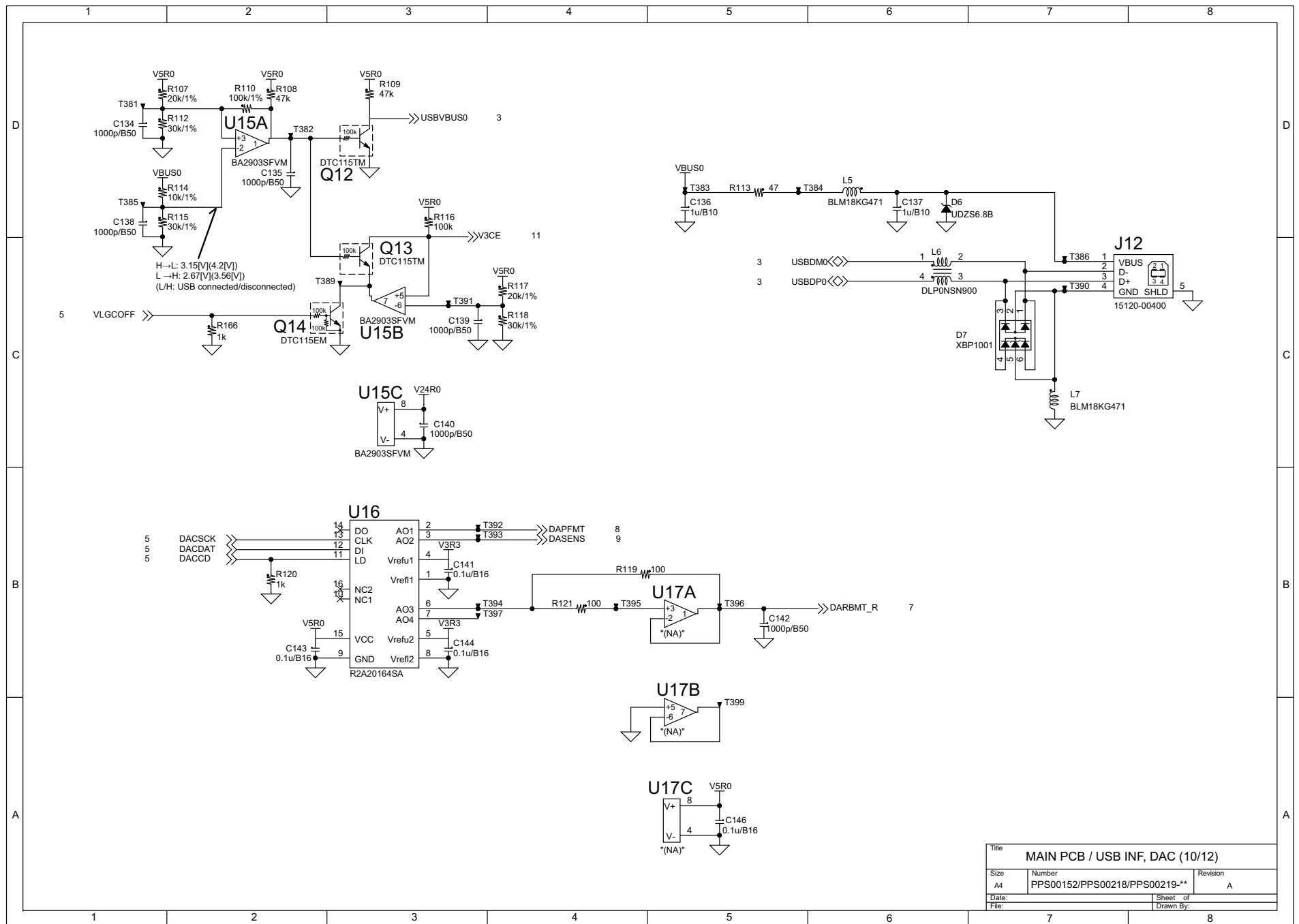


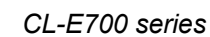


SA Main PCB (9/12) [Media Sensors & Head Up Sensor]

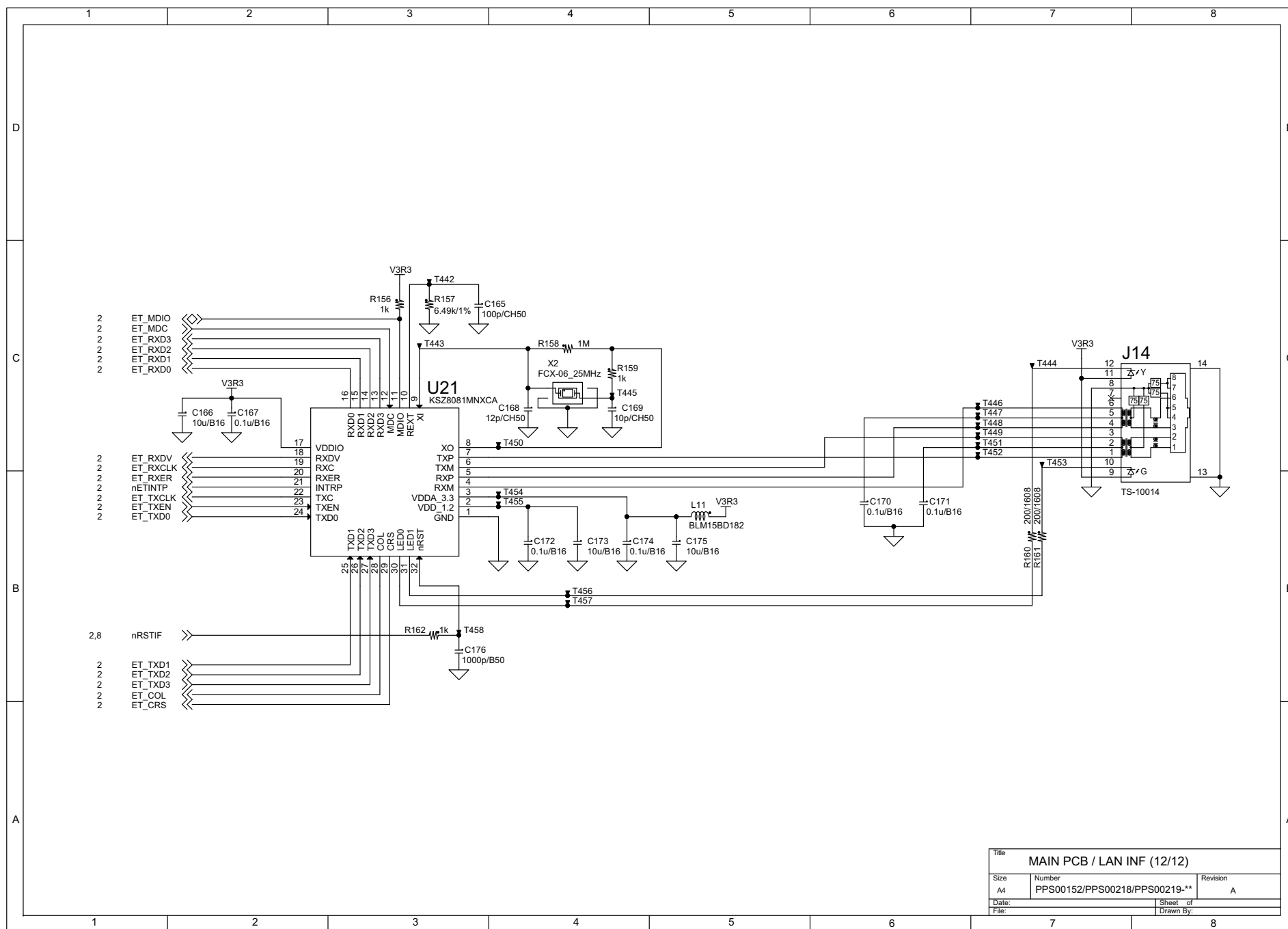


SA Main PCB (10/12) [USB I/F & DAC]



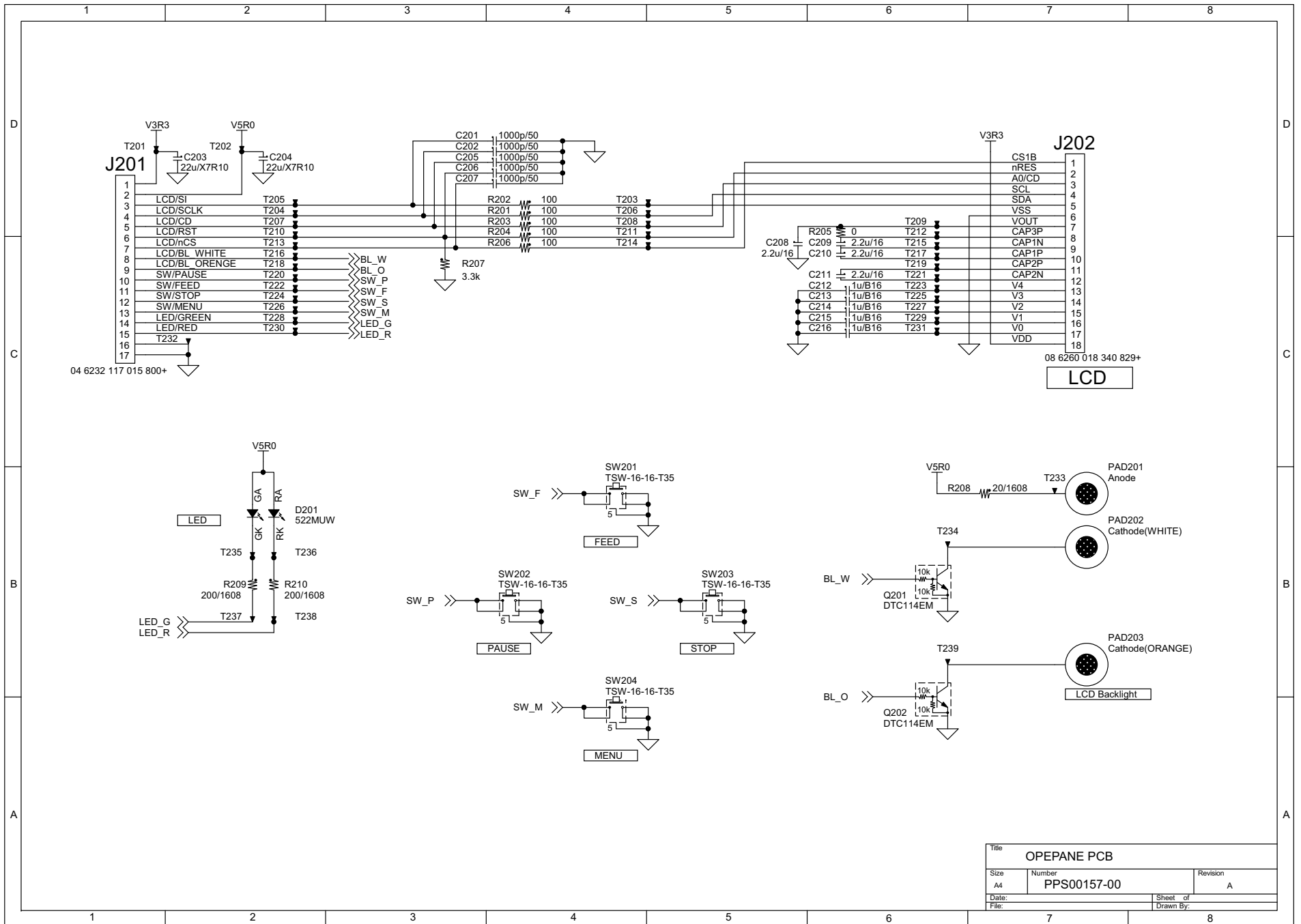


SA Main PCB (12/12) [LAN I/F]

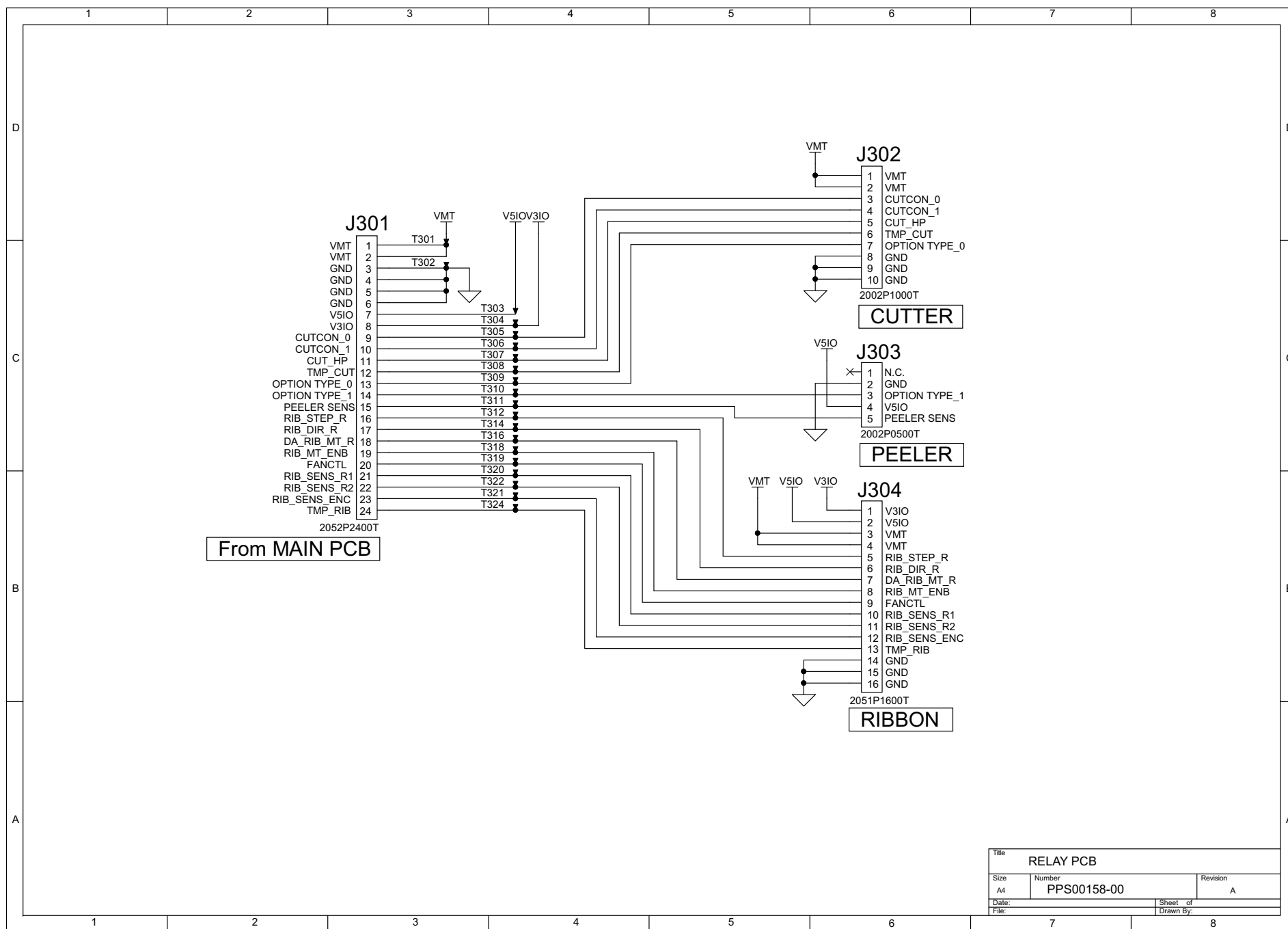


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MAIN PCB / LAN INF (12/12)		
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Date:	Sheet of	
File:	Drawn By:	

SA Opepane PCB

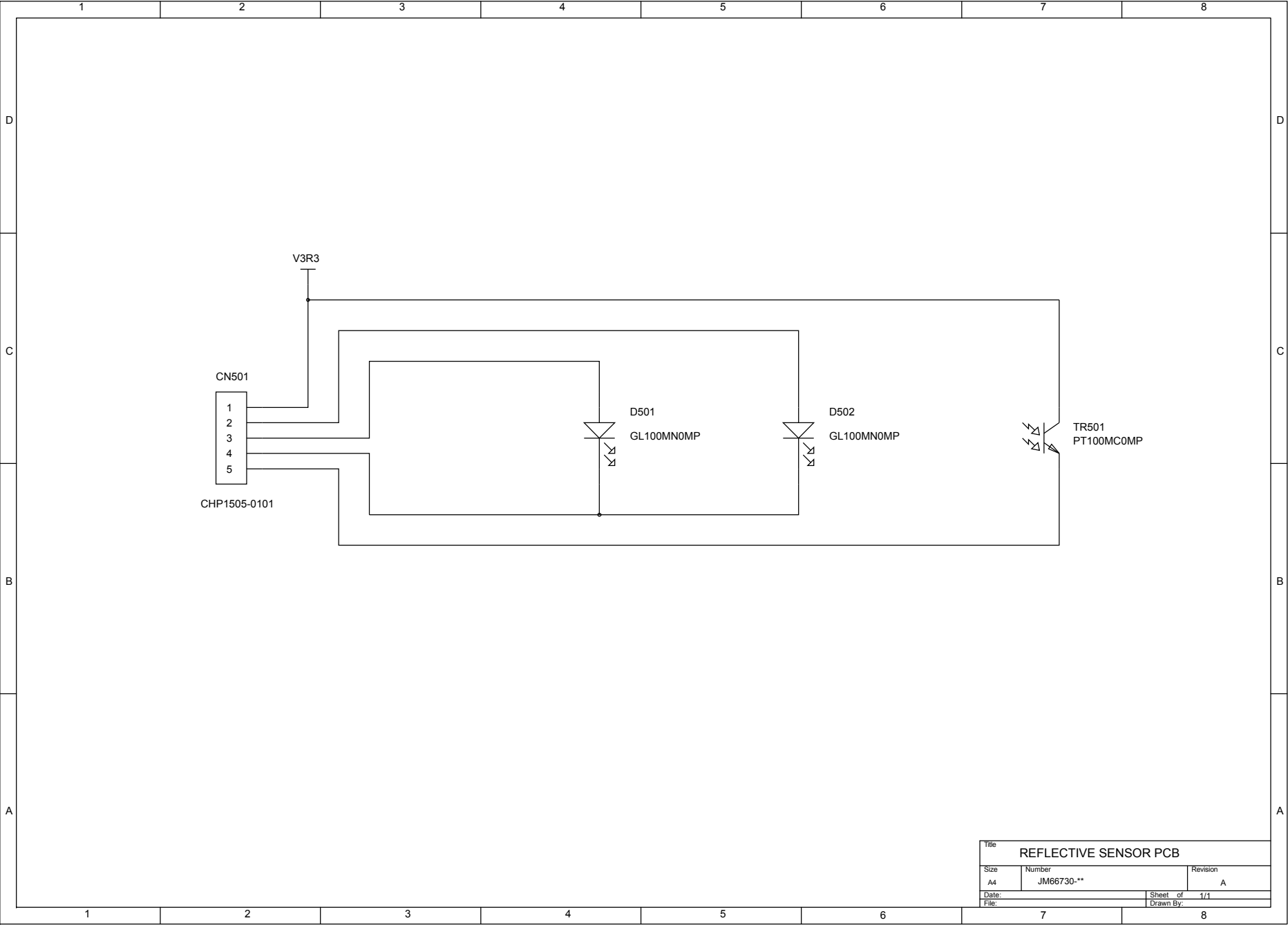


SA Relay PCB



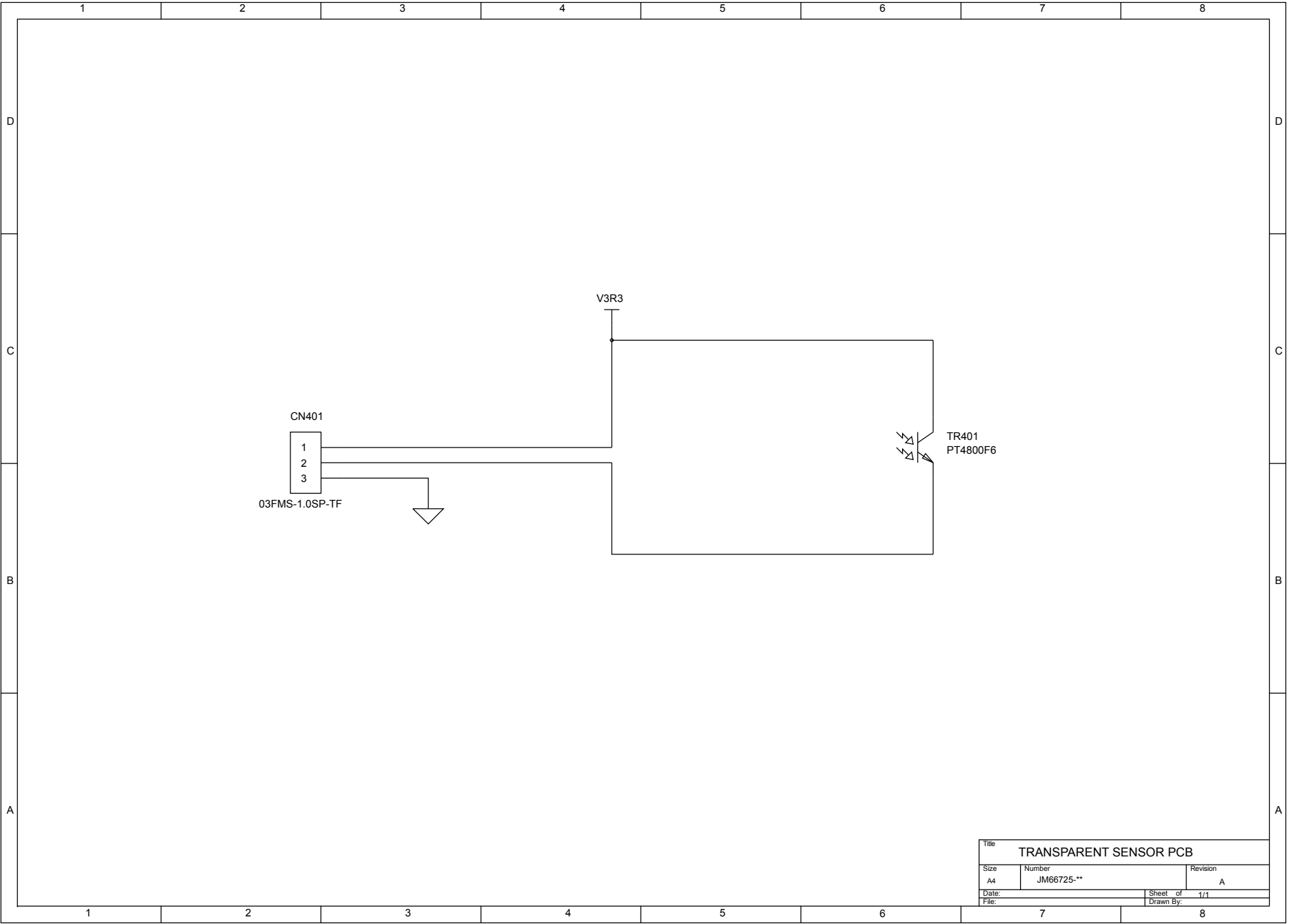
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Size A4	Number PPS00158-00	Revision A	
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File:			

SA Ref Sensor PCB



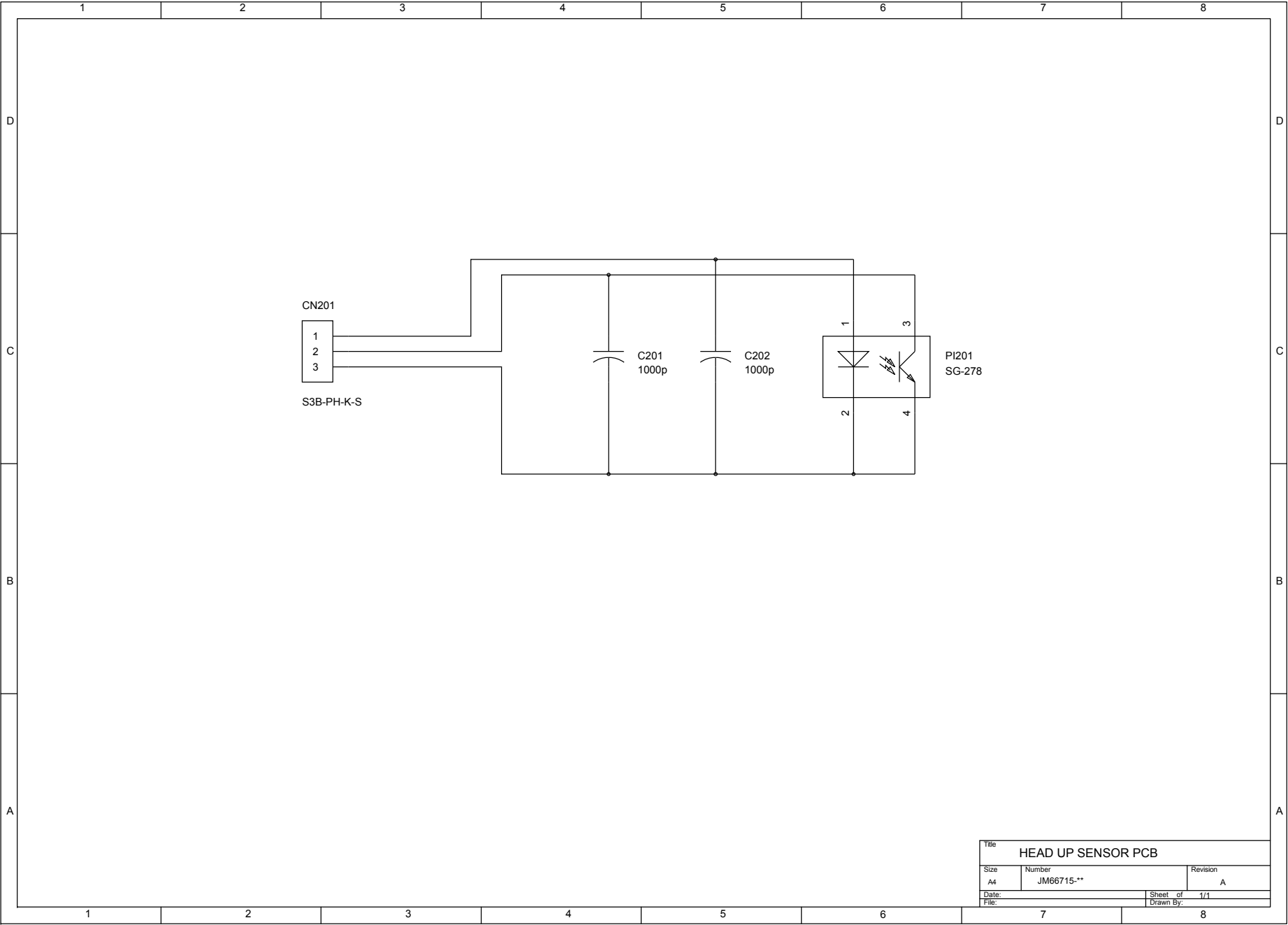
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REFLECTIVE SENSOR PCB		
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File:	Drawn By:	

SA TRA Sen PCB

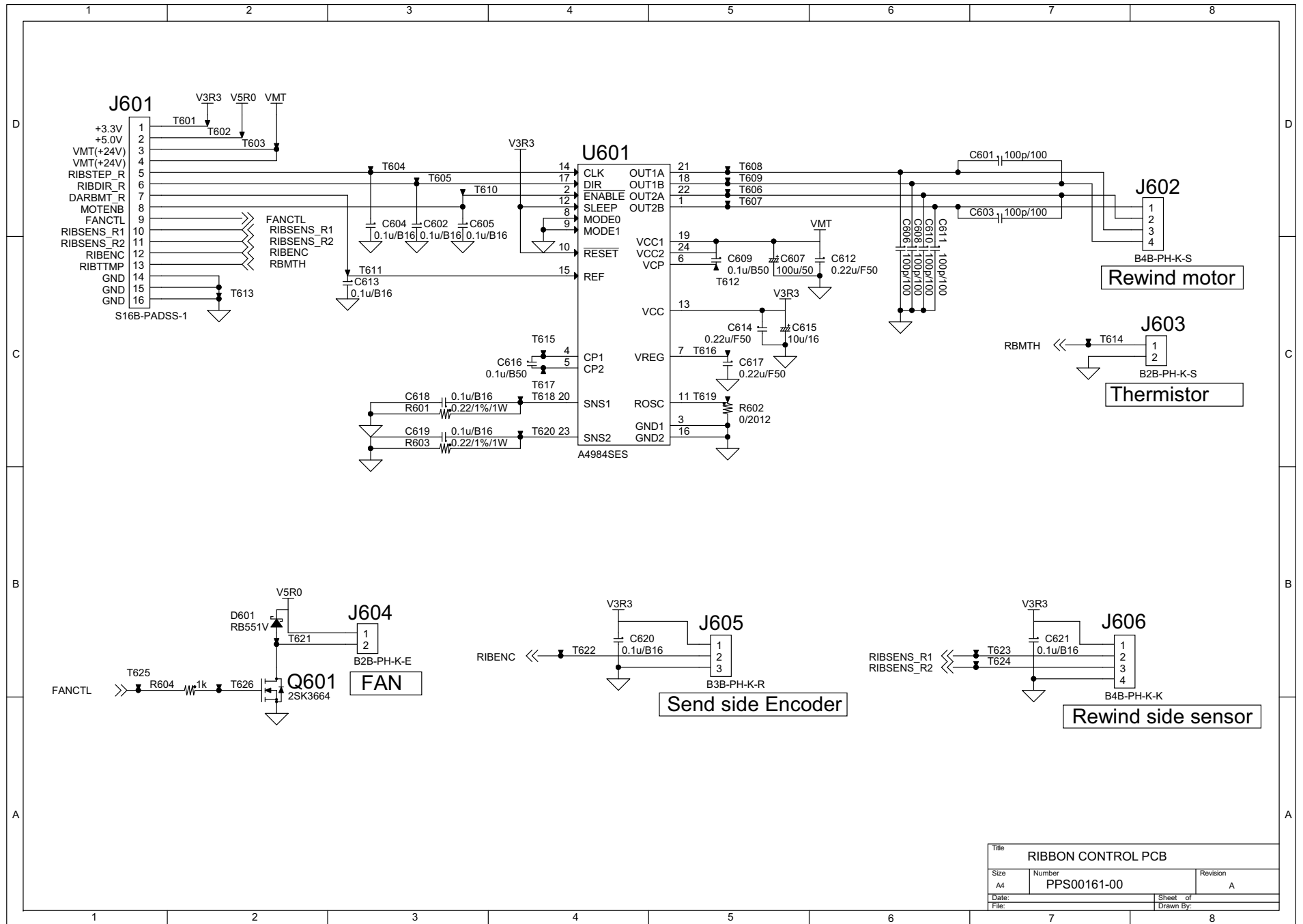


Title			TRANSPARENT SENSOR PCB	
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SA Head Up Sensor PCB

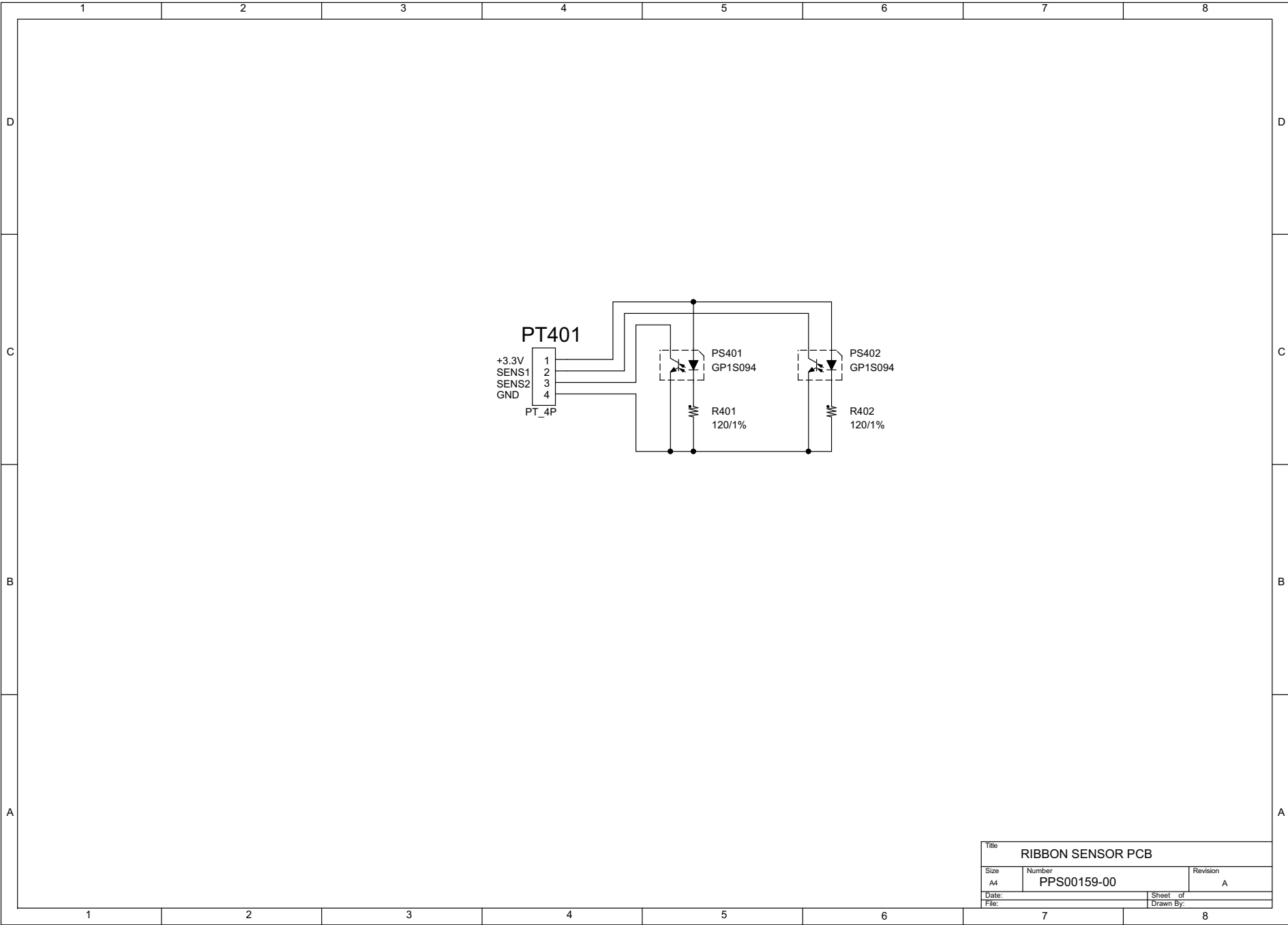


SA Ribbon Control PCB



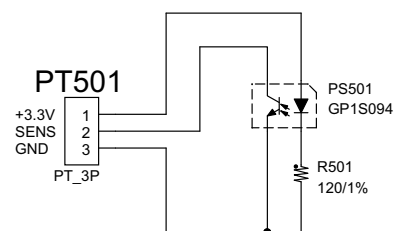
Title		
RIBBON CONTROL PCB		
Size	Number	Revision
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Date:	Sheet of	
File:	Drawn By:	

SA Ribbon Sensor



Title			
RIBBON SENSOR PCB			
Size	Number	Revision	
A4	PPS00159-00	A	
Date:	Sheet of		
File:	Drawn By:		

SA Ribbon Encoder



Title			RIBBON ENCODER PCB
Size	Number	Revision	
A4	PPS00160-00	A	
Date:	Sheet of		Drawn By:
File:			

APPENDICES



APPENDICES

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 A-6. SA Head Up Sensor PCB AP-6

 A-7. SA Ribbon Control PCB..... AP-6

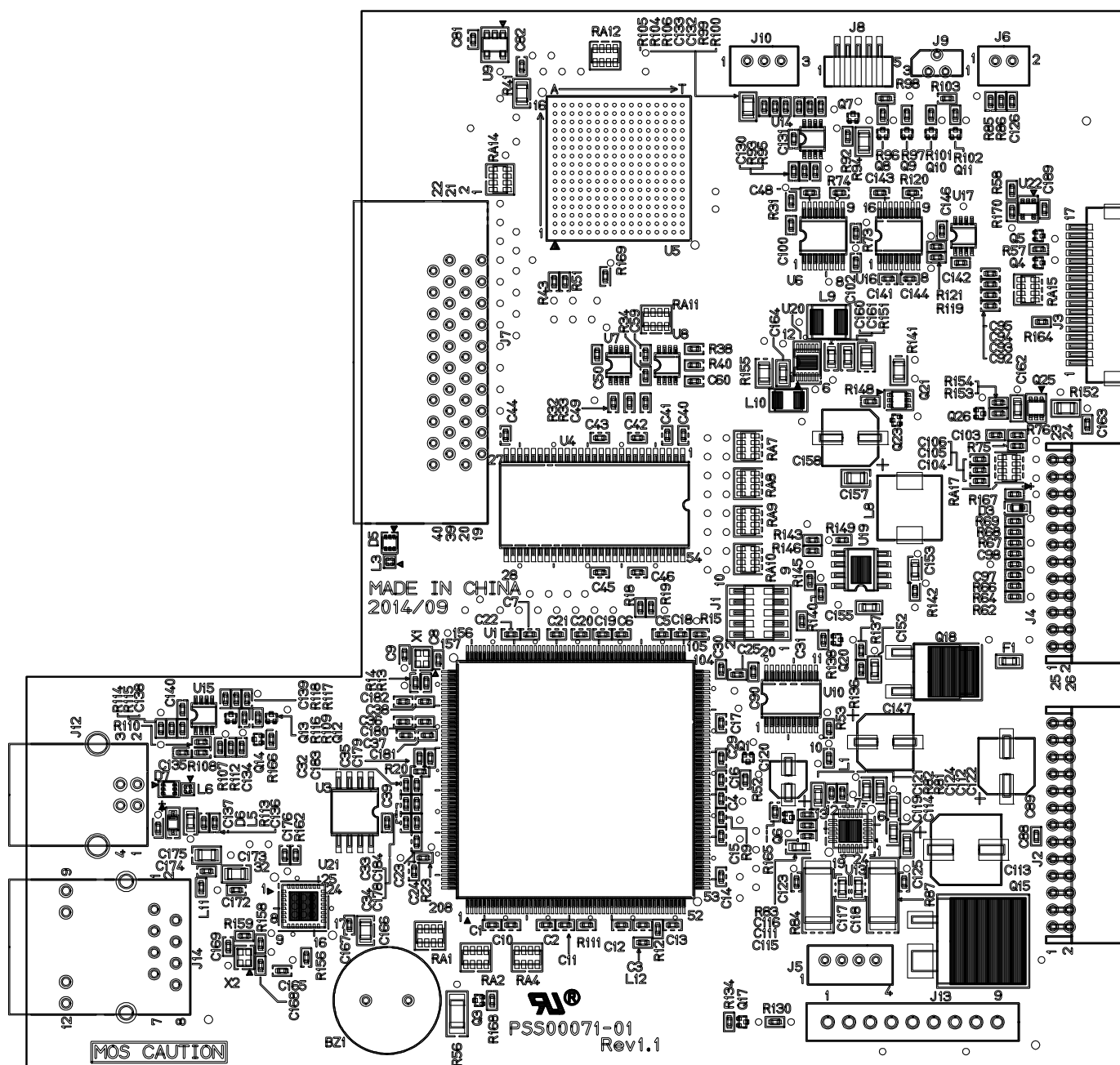
 A-8. SA Ribbon Sensor AP-6

 A-9. SA Ribbon Encoder AP-6

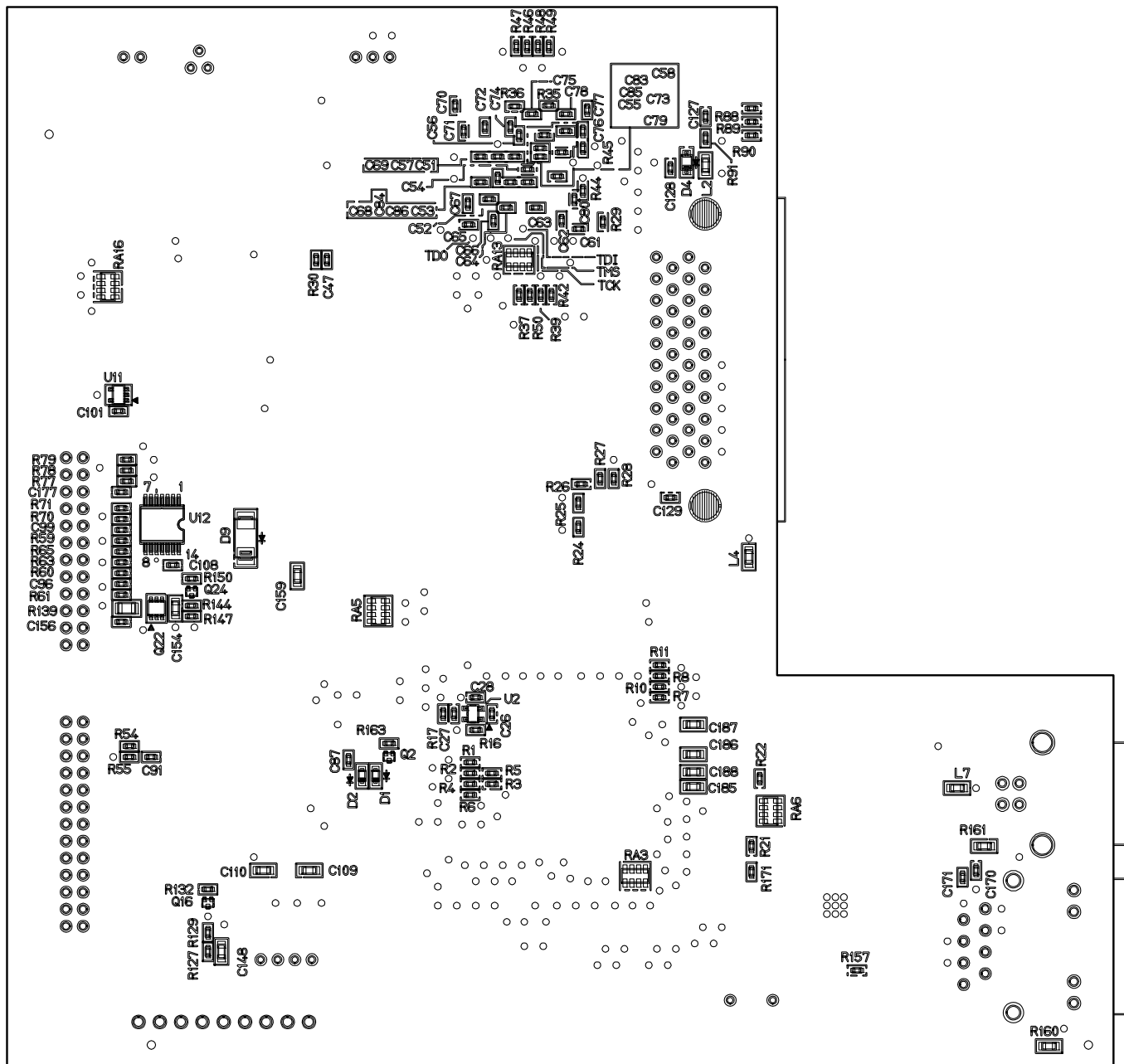
A. Mounting Diagrams

A-1. SA Main PCB

(1) Parts side

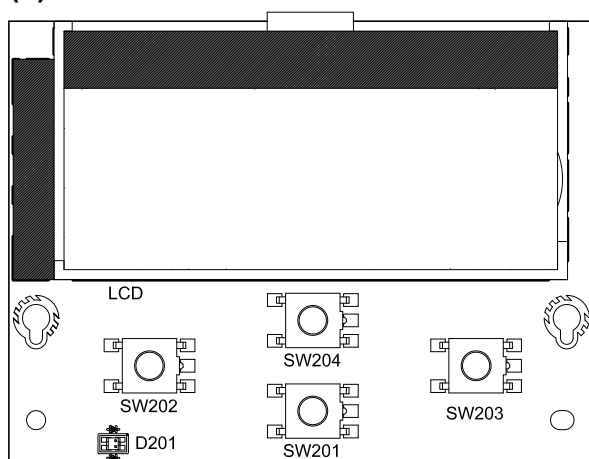


(2) Solder side

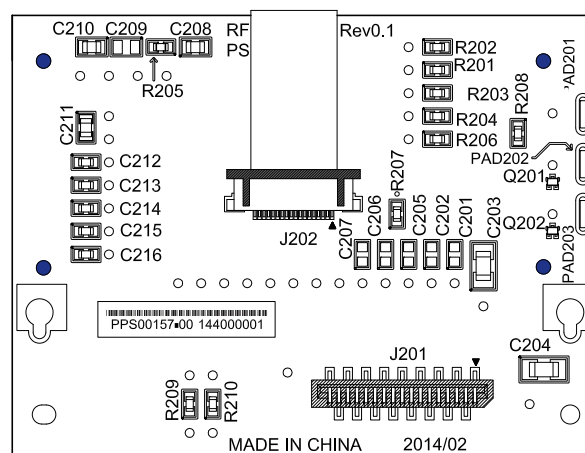


A-2. SA Opepane PCB

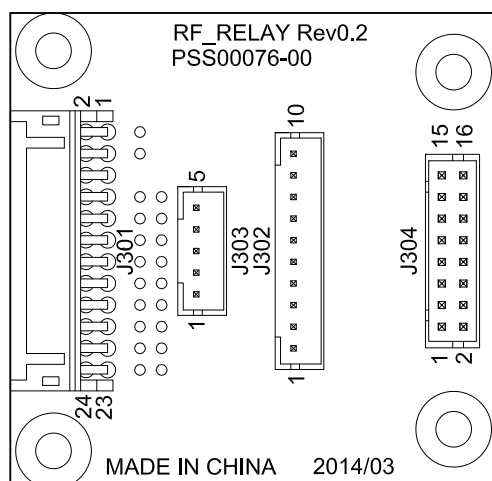
(1) Parts side



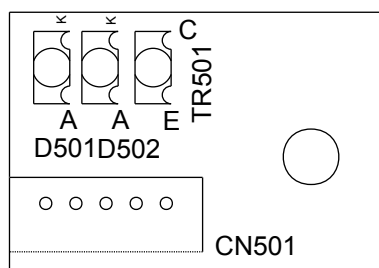
(2) Solder side



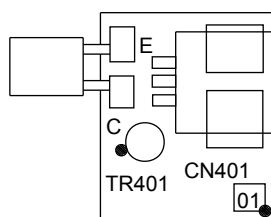
A-3. SA Relay PCB



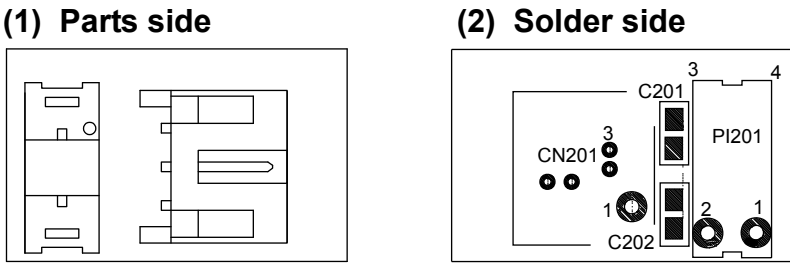
A-4. SA Ref Sensor PCB



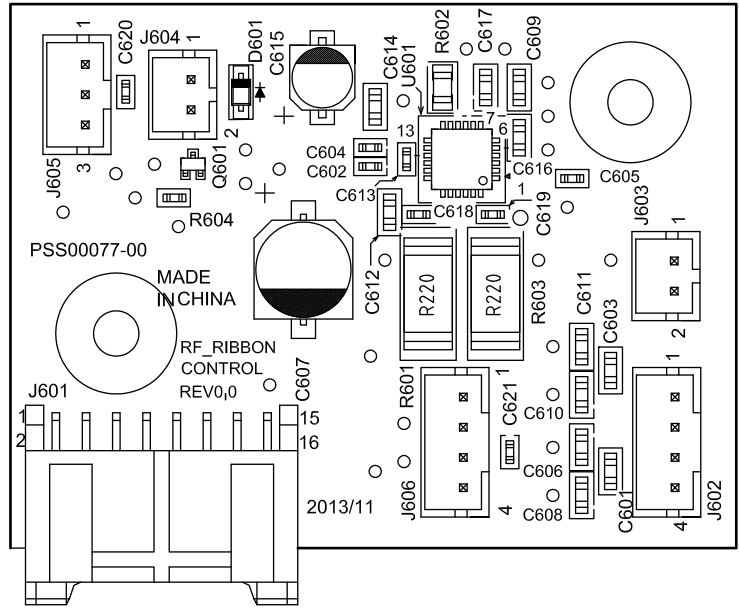
A-5. SA TRA Sen PCB



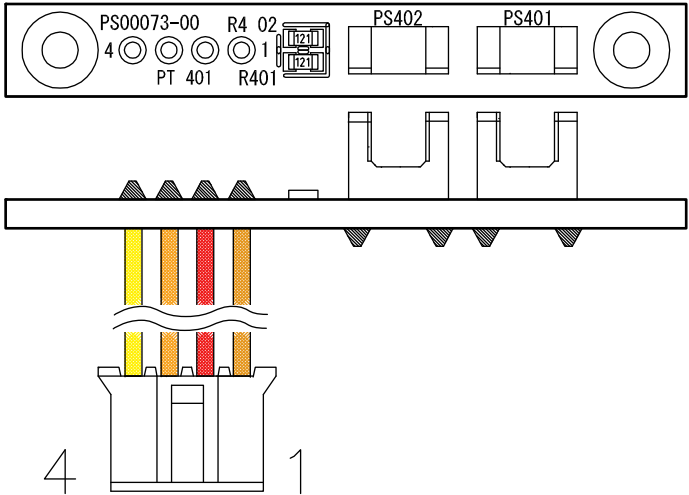
A-6. SA Head Up Sensor PCB



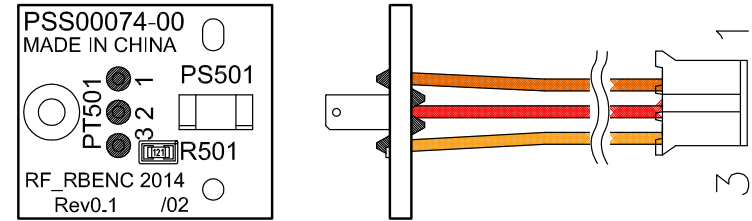
A-7. SA Ribbon Control PCB



A-8. SA Ribbon Sensor



A-9. SA Ribbon Encoder



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